2013 North American Particle Accelerator Conference

September 29 – October 4, 2013

Pasadena, California

http://www.napac13.lbl.gov/

Pasadena Convention Center
300 East Green Street
Pasadena, California 91101

Organized by
Lawrence Berkeley National Laboratory,
SLAC National Accelerator Laboratory, and the
University of California, Los Angeles.

Jointly sponsored by
Institute of Electrical and Electronics Engineers
through its Nuclear and Plasma Sciences Society
and the American Physical Society through its
Division of Physics of Beams.

Orientation

NA-PAC'13 will take place in two buildings. The Convention Center has the industrial exhibition hall/poster sessions and the Ballroom, where the oral presentations occur. In its foyer is the Registration Desk.

The nearby Conference Building offers business and support functions of the conference (except registration). On its street level you will find Author Reception, a Speaker Preparation Room, and a place to sit with your laptop to work on your Proceedings manuscript and connect to the Internet.

Contents Section I

Contents Section II

Sponsors & Supporters

We would like to acknowledge and thank the following for their sponsorship and support.

Sponsors

American Physical Society
Division of Physics of Beams

Institute of Electrical and Electronics Engineers
Nuclear and Plasma Sciences Society

Dimtel, Inc.

Supporters

Lawrence Berkeley National Laboratory

SLAC National Accelerator Laboratory

University of California, Los Angeles

US Department of Energy, Office of Science
Offices of Basic Energy Sciences, Fusion Energy Science, High Energy Physics, and Nuclear Physics

Introduction

Welcome from the NA-PAC'13 Chair

We welcome you to Pasadena, California, for the North American Particle Accelerator Conference. Held from September 30 through October 4 at the Pasadena Convention Center, NA-PAC'13 will bring together scientists, engineers, students, and industrial exhibitors, representing all aspects of accelerators and particle beams, for an information-sharing experience focused on technology. This conference is the 25th in the series of Particle Accelerator Conferences and the second regional North American PAC.

The conference is organized jointly by the Lawrence Berkeley National Laboratory (LBNL), the SLAC National Accelerator Laboratory (SLAC), and the University of California Los Angeles (UCLA), and sponsored by the IEEE Nuclear and Plasma Sciences Society and the APS Division of Physics of Beams.

The Scientific Program Committee has created a diverse and exciting program covering the latest topics in the field of accelerator science and technology. It is geared toward early career scientists, engineers and students but will retain the historic international flavor with invited speakers from around the world. The program begins on Sunday with a student poster session and we will continue the tradition of offering a number of tutorials on the latest hot topics.

Accelerators involve not just science and technology but a community of friends old and new, and the social program is an important aspect of these conferences. A Companion Orientation is scheduled for Monday. Everyone is invited to a Women in Engineering Networking Event on Wednesday evening. Finally, the Conference Banquet on Thursday evening is designed to facilitate networking and interaction with colleagues—you won't want to miss it!

We are very fortunate to have secured Pasadena for the venue. Pasadena is embedded in a large urban setting but has a small town feel. It is a pedestrian-friendly town with excellent restaurants and access to the many attractions of the Los Angeles metropolitan area. It won't be difficult finding things to do before, during and after the conference.

On behalf of myself and the NA-PAC'13 Organizing Committee, welcome to Pasadena!

Steve Gourlay
Chair, NA-PAC'13

Introduction

Welcome from the NA-PAC'13 SPC Chair

Our community has made important advances and achieved much in recent years in many areas on many fronts. The scientific program of NA-PAC'13 is designed foremost to reflect this progress. While making this progress, our community has also been evolving rapidly in terms of demography, emphasis, and admittedly also available resources. These considerations were also taken into account as much as possible in developing the scientific program.

The Scientific Program Committee has accordingly put together a rich program consisting of 126 oral and 500 poster presentations. I hope you will find this program informative, rewarding and enjoyable.

One of the realizations over the past years has been the increasing importance to our community of accelerator applications. We have continued the effort this year to emphasize applications. We introduced two sets of dedicated sessions, on Medical and Industrial Applications of Accelerators, with authoritative presentations. We encourage you to participate in these new sessions.

Following the success of Tutorials at NA-PAC'11, we also have early morning Tutorials in four parallel sessions. Students and experts alike are welcome to enjoy these tutorials.

Posters are an efficient way to carry out in-depth communication. They play a critical part of our conference. They are designed as stand-alone sessions without overlap with oral sessions to encourage your maximum attendance and participation. We also have an Award session during which great achievers of our community will be recognized.

Representing the Scientific Program Committee, I warmly welcome you to the conference!

Alex Chao
Chair, Scientific Program Committee

Conference Committees

Organizing Committee

Stephen Gourlay *Chair*	LBNL
Joseph Bisognano	UW-Madison/SRC
John R. Cary	CIPS
Alex Chao	SLAC
Yu-Jiuan Chen	LLNL
John Erickson	LANL
Stuart Henderson	FNAL
Robert Hettel	SLAC
Georg H. Hoffstaetter	Cornell University (CLASSE)
Andrew Hutton	Jefferson Lab
Kevin Jones	ORNL
Chan Joshi	UCLA
Lin Liu	LNLS
Lia Merminga	TRIUMF
Thomas Roser	BNL
Stan Owen Schriber	SOS
Vladimir Shiltsev	FNAL
Bruce Paul Strauss	DOE
Victor Paul Suller	LSU/CAMD
David Sutter	UMD
Alan Murray Melville Todd	AES
Jie Wei	FRIB
Marion White	ANL
Robert Miles Zwaska	FNAL

Scientific Program Coordination Committee

Alex Chao *Chair*	SLAC
Riccardo Bartolini	Diamond
Oliver Boine-Frankenheim	GSI and TU Darmstadt
Mark Boland	ASCo
Sotirios Charisopoulos	IAEA, Vienna
John Corlett	LBNL
Hartmut Eickhoff	GSI
Robert Hamm	R&M Technical Enterprises
Stuart Henderson	FNAL
Mark Hogan	SLAC
Valeri Lebedev	FNAL
Patric Müggli	MPI
Katsunobu Oide	KEK
Peter Ostroumov	ANL

Conference Committees

Christine Petit-Jean-Genaz	CERN
Søren Prestemon	LBNL
Dave Robin	LBNL
Todd Satogata	Jefferson Lab
Jingyu Tang	IHEP Beijing
Akira Yamamoto	KEK
Yoshihige Yamazaki	MSU

Scientific Program Committee

Alex Chao *Chair*	SLAC

Chris Adolphsen	SLAC
Kazunori Akai	KEK
Alexander Aleksandrov	ORNL
Jose Alonso	LBNL
Gerard Andonian	UCLA
Giorgio Apollinari	FNAL
Rick Baartman	TRIUMF
Riccardo Bartolini	Diamond
Christoph Bert	GSI
Jean-Luc Biarrotte	IPN
Mike Blaskiewicz	BNL
Oliver Boine-Frankenheim	GSI and TU Darmstadt
Mark Boland	ASCo
Michael Borland	ANL
Lucas Brouwer	UC Berkeley
David Bruhwiler	RadiaSoft LLC
John Byrd	LBNL
Alok Chakrabarti	VECC
Andrzej Chmielewski	Inst. Nucl. Chem. & Tech.
Sotirios Charisopoulos	IAEA
Eric Colby	OHEP/DOE
Phil Cole	ISU
Manoel Conde	ANL
Jeff Corbett	SLAC
John Corlett	LBNL
Marie-Emanuelle Couprie	CEA
Sarah Cousineau	ORNL
Bob Dalesio	BNL
Winfried Decking	DESY
Jean-Pierre Delahaye	CERN on leave at SLAC
Mike Downer	U.T. Austin
Hartmut Eickhoff	GSI
Eckhard Elsen	DESY
Phil Ferguson	ORNL

Conference Committees

Wolfram Fischer	BNL
Jay Flanz	Massachusetts General Hospital
John Fox	SLAC
Arne Freyberger	Jefferson Lab
Robert Garnett	LANL
John Galambos	ORNL
Thomas Haberer	Heidelberg Ion Therapy Ctr.
Robert Hamm	R&M Technical Enterprises
Bumsoo Han	EB Tech Co. Ltd.
Michael Harrison	BNL
Stuart Henderson	FNAL
Georg Hoffstaetter	Cornell University (CLASSE)
Mark Hogan	SLAC
Takahiro Inagaki	RIKEN
Carol Johnstone	FNAL
Michael Kelley	College of William and Mary
Vince Kempson	Diamond
Robert Kephart	FNAL
Shane Koscielniak	TRIUMF
Tadashi Koseki	J-PARC
Thomas Kroc	FNAL
Richard Lanza	MIT
Valeri Lebedev	FNAL
S.Y. Lee	Indiana University
Simon Leemann	MAX-Lab
Matthaeus Leitner	FRIB, MSU
Evgeni Levichev	BINP
Ute Linz	FZJ
Derek Lowenstein	BNL
Mika Masuzawa	Ibaraki University
Lia Merminga	TRIUMF
Michiko Minty	BNL
Nikolai Mokhov	FNAL
Francoise Muehlhauser	IAEA
Patric Müggli	MPI
Sergei Nagaitsev	FNAL
George Neil	Jefferson Lab
Koji Noda	NIRS
Greg Norton	NEC
Heinz-Dieter Nuhn	SLAC
Kazuhito Ohmi	KEK
Katsunobu Oide	KEK
Peter Ostroumov	ANL
Mark Palmer	FNAL
Steve Peggs	BNL/ESS
Michael Peiniger	Research Instruments

Conference Committees

Dmitry Pestrikov	BINP
Thomas Peterson	FNAL
Christine Petit-Jean-Genaz	CERN
Fulvia Pilat	Jefferson Lab
Nathaniel Pogue	Texas A&M University
Eric Prebys	FNAL
Søren Prestemon	LBNL
Christopher Prior	STFC/RAL/ASTeC
Qing Qin	IHEP Beijing
Pantaleo Raimondi	INFN/LNF
Tor Raubenheimer	SLAC
Dave Robin	LBNL
Thomas Roser	BNL
Dave Rubin	Cornell University
Lawrence Rybarcyk	LANL
GianLuca Sabbi	LBNL
James Safranek	SLAC
Kenji Saito	FRIB
Fernando Sannibale	LBNL
Todd Satogata	Jefferson Lab
Carl Schroeder	LBNL
Timur Shaftan	BNL
Vladimir Shiltsev	FNAL
Luis Silva	IST Portugal
Markus Steck	GSI
Gennady Stupakov	SLAC
Hitoshi Tanaka	RIKEN
Chuanxiang Tang	Tsinghua University
Jingyu Tang	IHEP Beijing
John Thomason	STFC/RAL
Alan Todd	AES
Grigoriy Trubnikov	JINR
Alexander Valishev	FNAL
Nikolai Vinokurov	BINP
Will Waldron	LBNL
Dong Wang	SINAP
Jiawen Xia	IMPCAS
Gang Xu	IHEP, Beijing
Vitaly Yakimenko	SLAC
Akira Yamamoto	KEK
Yoshihige Yamazaki	MSU
X.Q. Yan	Peking University IHIP
Masahiro Yoshimoto	JAEA
Peter Zavodszky	GE Global Research
Stefan Zeisler	TRIUMF
Yuhong Zhang	Jefferson Lab

Conference Committees

Local Organizing Committee

Chan Joshi *Chair*	UC Los Angeles
Sandra Biedron	Colorado State University
Alex Chao	SLAC
Joe Chew	LBNL
Tom Gallant	LBNL
Jan Hennessey	LBNL
Marcos Ruelas	RadiaBeam Technologies
Christine Petit-Jean-Genaz	CERN
Todd Satogata	Jefferson Lab
Sam Vanecek	LBNL

Centennial Conferences
Conference Management

Awards

Student Travel Grant Awardees

Afnan Al Marzouk	Northern Illinois University
Simon Albright	University of Huddersfield
Mahmoud Ali	Jefferson Lab
Anthony Andrews	IAC
Sergey Arsenyev	MIT/PSFC
Taras Bondarenko	MEPhI
Alejandro Castilla	ODU
David Cesar	UCLA
Nathan Cook	Stony Brook University
Alexandra Day	Wellesley College
Yann Dutheil	BNL
Christopher Eckman	IAC
Jonathan Edelen	CSU
Steve Full	Cornell University (CLASSE)
Bamunuvita R. Gamage	ODU
Colwyn Gulliford	Cornell University (CLASSE)
Christopher Hopper	ODU
Siddharth Karkare	Cornell University
Nermeen Khalil	SBU
Xue Liang	BNL
Yosuke Matsumura	University of Tokyo
Harsha Panuganti	Northern Illinois University
Sam Posen	Cornell University (CLASSE)
Blake Riddick	UMD
Aakash Sahai	Duke ECE
Herman Schaumburg	Northern Illinois University
Ki Shin	ORNL RAD
Nihan Sipahi	CSU
William Stem	UMD
Ozhan Turgut	Stanford University
Alysson Vrielink	TRIUMF
Joel Williams	CSU
Eric Wisniewski	ANL
Tianmu Xin	BNL
Hao Zhang	UMD
Zhihong Zheng	FRIB
Timofey Zolkin	University of Chicago

The NA-PAC'13 Student Poster Award

Two prizes in the amount of $500 each for the best student posters will be awarded for particularly meritorious work, selected by members of the Scientific Program Committee (SPC) during the special poster session for students on Sunday, September 29. The prizes and certificates will be presented during the Accelerator Prizes Session on Thursday, October 3.

Awards

IEEE/NPSS Particle Accelerator Science and Technology Awards

The IEEE Nuclear and Plasma Sciences Society confers the Particle Accelerator Science and Technology Award upon individuals who have made outstanding contributions to the development of particle accelerator science and technology. Two Awards are granted in each occurrence of the Particle Accelerator Conferences held in North America (NA-PAC or IPAC).

The 2013 awardees are:

Alexander J. Dragt, Professor Emeritus, Department of Physics, University of Maryland College Park, "for substantial contributions to the analysis of non-linear phenomena in accelerator beam optics by introducing and developing map-based approaches."

Mark Hogan, Plasma Group Leader and Head of the Advanced Accelerator Research Department at SLAC National Accelerator Laboratory, "for leadership and scientific contributions in forging an unprecedented partnership between plasma-based and conventional particle accelerator science and technology."

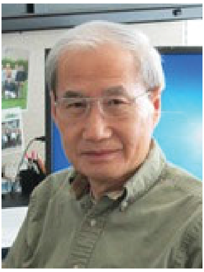
The Particle Accelerator Science and Technology Doctoral Student Award recognizes outstanding thesis research in particle accelerator science and technology.

Anna Grassellino of Fermi National Accelerator Laboratory receives the Particle Accelerator Science and Technology Doctoral Student Award "for contributions to the fundamental understanding of the field dependent loss mechanisms in SRF cavities".

Awards

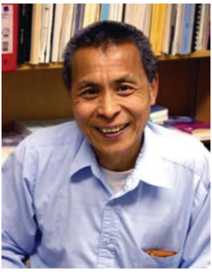
U.S. Particle Accelerator School Prizes for Achievement in Accelerator Physics and Technology

Two USPAS Prizes for Achievement in Accelerator Physics and Technology are awarded every other year, one of them to a scientist under 45 years of age. They recognize outstanding achievements over the full range of accelerator physics and technology. The prizes are awarded on a competitive basis without bias to race, sex, and/or nationality. The 2013 honorees are Kwang-Je Kim of ANL and Jean-Luc Vay of LBNL. This year a special Lifetime Achievement Award goes to Indiana University's S.Y. Lee.



Kwang-Je Kim of Argonne National Laboratory is honored "for a life-time of leadership in beam physics and for significant theoretical contributions improving our understanding of photocathode electron guns, synchrotron radiation and free-electron lasers, and for his work educating young scientists."

Jean-Luc Vay of Lawrence Berkeley National Laboratory is recognized "for original contributions to the development of novel methods for simulating particle beams, particularly the Lorentz boosted frame techniques, and for the successful application of these methods to multi-scale, multi-species problems."



S. Y. Lee of Indiana University will be given the USPAS Prize for Lifetime Achievement in Accelerator Physics and Technology "for his extra-ordinary contributions to accelerator education including mentoring a large cadre of highly-regarded students, for overseeing the Indiana University - USPAS Master's Degree Program in Accelerator Physics and for serving as USPAS Director from 1998 to 2002."

Social Events

Welcome Reception

Sunday, September 29, 2013

18:00 – 20:00

North Ballroom Foyer, Convention Center

Companion Orientation

Monday, September 30, 2013

09:30 – 10:30

San Diego Room, Hilton Pasadena

Join NA-PAC'13 companions for a light breakfast and conversation. The Hilton Concierge will provide information about sightseeing, shopping and restaurants in Pasadena.

Women in Engineering Event

Wednesday, October 2, 2013

18:00 -20:00

Ballroom A, Convention Center

All conference attendees are invited to join the Women in Engineering networking mixer. Enjoy a cocktail and appetizers as you meet with fellow NA-PAC'13 attendees. Get your business cards ready and join us for an interactive evening to Grow Your Network and enter for raffle prizes!

Conference Banquet

Thursday, October 3, 2013

20:00 – 22:00

Ballroom DE, Convention Center

This year, the NA-PAC banquet will not be a seated dinner. The evening will feature Southern California food stations, casual seating to facilitate networking and conversation, and live music to set the mood.

Registration & Miscellaneous

Registration

All participants MUST have a badge for entry to all technical sessions, exhibits, and social events.

Registration is located **outside the Exhibit Hall in the Convention Center**. Hours are as follows:

Sunday, 9/29	14:00 – 20:00
Monday, 9/30	07:00 – 18:00
Tuesday, 10/01	07:30 – 18:80
Wednesday, 10/02	07:30 – 18:00
Thursday, 10/03	07:30 – 18:00
Friday, 10/04	07:30 – 12:00

Internet

Wireless internet is available in public areas. Login details will be provided at registration.

Internet Café (self-service)

A self-service Internet Café will be available in **room 204 of the Conference Building**. A flat surface, power outlets, and internet connection will be provided as long as you bring a laptop. Instructions will be provided for connecting to the internet and to a local printer for small print jobs.

Business Center

A small Business Center will be available in **room 205** for those few who do not travel with a laptop. This room will have a few computers set up for very minor print jobs relating to conference business (copyright forms, boarding passes, etc...)

Hours of operation are as follows:

Sunday, 9/29	14:00 – 18:00
Monday, 9/30	08:00 – 18:00
Tuesday, 10/01	08:00 – 18:00
Wednesday, 10/02	08:00 – 18:00
Thursday, 10/03	08:00 – 18:00
Friday, 10/04	08:00 – 13:00

Registration & Miscellaneous

Message Boards

Useful information and daily updates can be found in the registration area.

- Special Announcements & General Message Board: Information, special announcements as well as program updates will be posted and participants can post or receive messages here.

- Job Postings and Resume Board: Participants should post to this board as appropriate.

Satellite Meetings

Organizers of satellite meetings are welcome to post information on the Message Boards and also to submit it for the conference website.

If you are interested in securing space to hold a meeting while attending NA-PAC'13 or to publicize a meeting, please see the staff at the Conference Registration Desk for assistance.

Scientific Program

Oral Sessions

The plenary sessions will take place in Ballroom DE ("Auditorium A") of the Convention Center Monday morning, September 30, before the coffee break and Friday afternoon, October 4, after the lunch break. The Award Session takes place Thursday afternoon, October 3, and will be held in Ballroom DE ("Auditorium A"). All other oral sessions will take place in two parallel sessions in Ballroom DE ("Auditorium A") and Ballroom BC ("Auditorium B").

Visual Aids

Oral presentations will be made using the computers and projection equipment provided. Individual laptops cannot be accommodated.

Guidelines for speakers are published at the conference website. All presentations must be uploaded via SPMS half a day in advance of the presentation.

Speaker Preparation Room

A speaker preparation room is available for speakers in **room 212/214 at the Conference Building**. This is an area where speakers should preview/test their presentations. Please upload to SPMS at least a day in advance of your scheduled presentation.

Hours of operation are as follows:

Sunday, 9/29	14:00 – 18:00
Monday, 9/30	08:00 – 18:00
Tuesday, 10/01	08:00 – 18:00
Wednesday, 10/02	08:00 – 18:00
Thursday, 10/03	08:00 – 18:00
Friday, 10/04	08:00 – 13:00

Scientific Program

Identification of Contributions

All contributions to the scientific program have a code whereby:

- the first two letters correspond to the day of presentation, Monday, Tuesday, Wednesday, etc. (i.e. MO, TU, WE, etc.),

- the third letter indicates the type of presentation: X, Y and Z (or XA, XB etc.,) are invited oral presentations, O (or OA, OB, OC, OD) indicate contributed oral presentations, and P is for poster presentations,

- the fourth letter indicates the location for orals in parallel sessions (A for Auditorium A *(Ballroom DE)* and B for Auditorium B *(Ballroom BC)*), AC, BA, HO, MA and SM are the poster session areas named for Angeles Crest, Bel Air, Hollywood, Malibu and Santa Monica,

- the program code finishes with 1 digit for oral presentations and two digits for poster presentations, corresponding to the poster panel number.

Poster Sessions

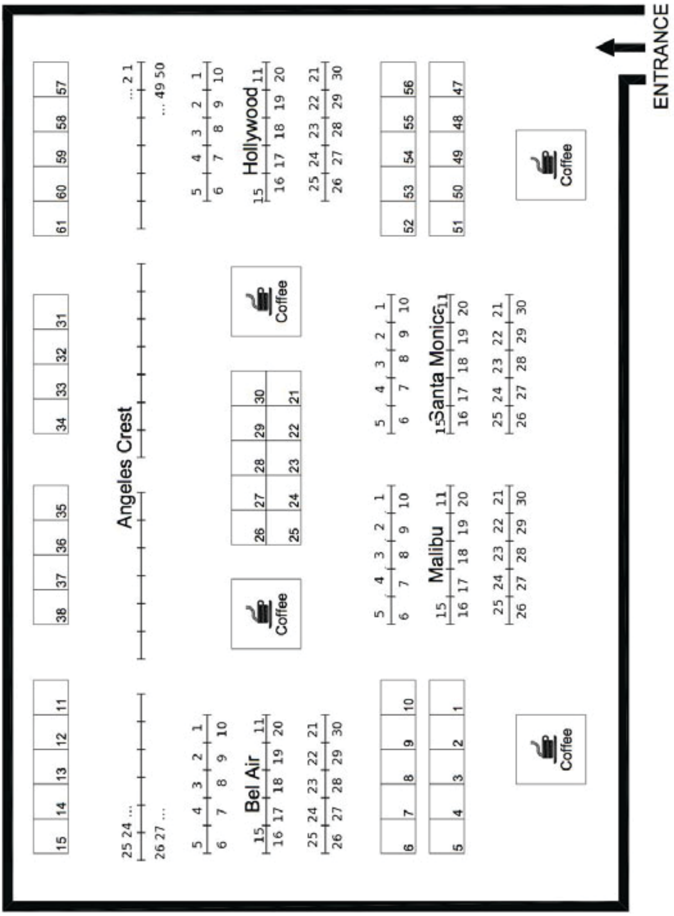
Poster Sessions will take place each afternoon from Monday to Thursday, September 30 – October 3 from 16:30 to 18:00 in the **Exhibit Hall at the Convention Center**. The poster sessions are de-coupled from the oral sessions to enable all delegates to participate fully in the conference program.

Poster sessions are a focal point of the conference. To make the sessions as attractive, successful and rewarding as possible, authors of posters are strongly encouraged to take particular care in their preparation.

Authors are reminded that no contributions are accepted for publication only. Any paper accepted for presentation, but which is not presented at the conference, will be excluded from the Proceedings.

Placing a Proceedings manuscript (even if enlarged) on a poster board is not considered an acceptable poster, and if presented in this way, the paper will not be approved for publication in the Proceedings.

Posters should be mounted between 08:30 and 10:30 the day of the presentation, and ***must be attended*** from 16:30 to 18:00. Poster panels are 8 feet (2.4 meters) wide by 4 feet (1.2 meters) in height. Push pins will be provided for mounting of posters. Posters must be removed immediately after 18:00 or will be discarded.



Scientific Program

Poster Locations

Location Code	Description
AC	Poster Area Angeles Crest
BA	Poster Area Bel Air
HO	Poster Area Hollywood
MA	Poster Area Malibu
SM	Poster Area Santa Monica

Student Poster Session

A special student poster session will take place during delegate registration on Sunday, September 29, 2013. All students attending the conference have been encouraged to present their work in this session. All students attending the conference with a grant must present their work in this session, and must submit a contribution to the proceedings.

All work to be presented by students will be compiled into a special abstracts brochure. They will be assigned a poster panel, reserved for this session. NOTE: All student posters are also presented during the "normal" poster sessions.

Student posters must be mounted early in the afternoon, from 14:00 to 14:30. Students must be present to discuss their work between 14:30 and 18:00. The posters must remain in place until 20:00.

The NA-PAC´13 Scientific Program Committee will judge the posters competing for the Student Poster Awards also from 14:00.

Proceedings

Proceedings

The Conference Proceedings will be published at the JACoW website (http://www.jacow.org).

Contributed oral and poster presentations may be up to three pages long and invited papers up to five pages. To ensure consistency of the conference proceedings, all papers have to meet formal criteria, specified by JACoW.

Guidelines can be found at the conference website under *For Authors, Proceedings Paper Preparation*.

The paper submission deadline is Wednesday, September 25, 2013.

Copyright Forms

NA-PAC'13 is co-sponsored by the Institute of Electrical and Electronic Engineers, so you will have to fill out the customary IEEE copyright form and hand it in at the conference. Your JACoW SPMS account will have a link to the form. A copyright form MUST be turned in before a paper can be published.

Proceedings Office

Authors are requested to check on their papers via the status or "dot" board located near Author Reception and near the presentation and exhibit areas. Authors may also check on the status of their papers via SPMS at http://appora.fnal.gov/pls/pac13/edot.html.

Author Reception will be located in **room 207 of the Conference Building** where staff will be available to answer any questions.

Proceedings Office Hours

Monday, 9/30	08:00 – 18:00
Tuesday, 10/01	08:00 – 18:00
Wednesday, 10/02	08:00 – 18:00
Thursday, 10/03	08:00 – 18:00
Friday, 10/04	08:00 – 13:00

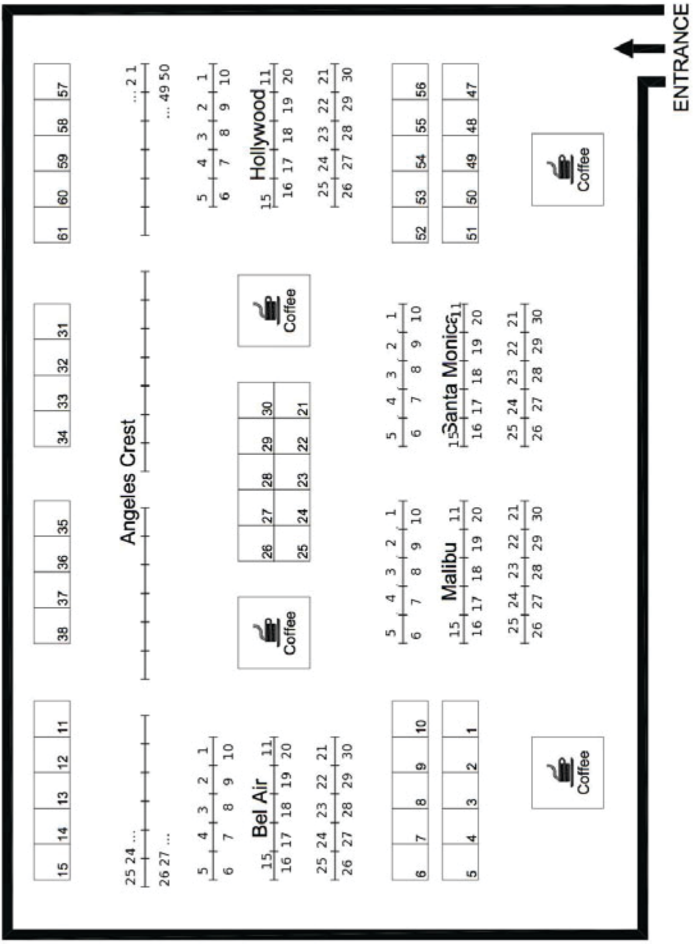
Industry Exhibition

NA-PAC’13 Industry Exhibition

The NA-PAC’13 Industry Exhibition will take place in the **Exhibit Hall of the Pasadena Convention Center**.

Exhibition dates and times are:

Monday, 9/30	09:30 - 18:00
Tuesday, 10/1	09:30 - 18:00
Wednesday, 10/2	09:30 - 18:00



Industry Exhibition

Registered Exhibitors (A –Z)

2 – AccSys Technology, Inc.

29 – Advanced Energy Systems

50 – American Physical Society

22 – AWR Corporation

12 – Bailey Tool & Mfg. Co.

54 – Buckley Systems Ltd.

9 – CAEN

47 – Ceramic Magnetics

6 – CML Engineering

33 – Continental Electronics Corporation

10 – CPC

27 – CPI

60 – CST of America, Inc.

7 – Danfysik

58 – Dean Technology Inc.

24 – Dimtel, Inc.

Industry Exhibition

5 – Diversified Technologies, Inc.

56 – Euclid TechLabs, LLC

32 – Everson Tesla Inc.

37 – FAR-TECH, Inc.

11 – FRIATEC NA LLC

26 – GMW Associates

1 – High-Tech Manufacturing

23 – Instrumentation Technologies

49 – IOP Publishing

59 – Kepco Inc.

15 – L-3 Electron Devices

4 – Magnetic Metals Corp

30 – Mega Industries, LLC.

57 – Meyer Tool & Mfg., Inc.

38 – Micro Communication Inc

28 – Microwave Amplifiers Ltd.

13 – Muons, Inc.

Industry Exhibition

35 – National Instruments

52 – Pearson Electronics Inc.

14 – PHPK Technologies

21 – RadiaBeam Technologies

26 – RI Research Instruments GmbH

31 – SAES Group

53 – ScandiNova

48 – Sigmaphi Accelerator Technologies

51 – Stangenes Industries, Inc.

55 – Struck Innovative Systeme

8 – TDK-Lambda Americas

34 – THALES

36 – Tomco Technologies

3 – Toshiba Electron Tubes & Devices

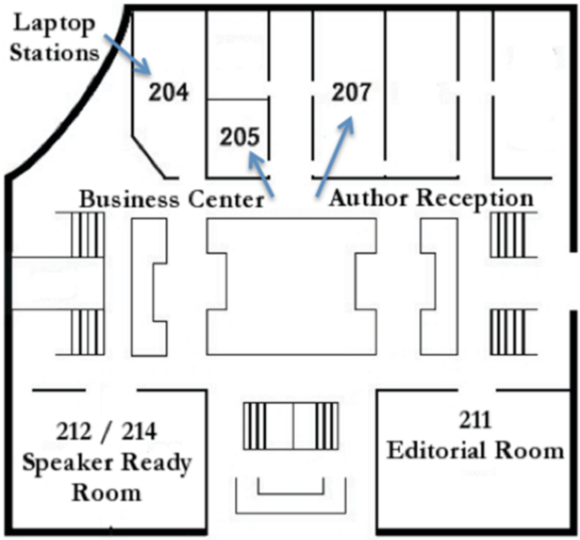
61 – TREK, Inc.

Conference Venue

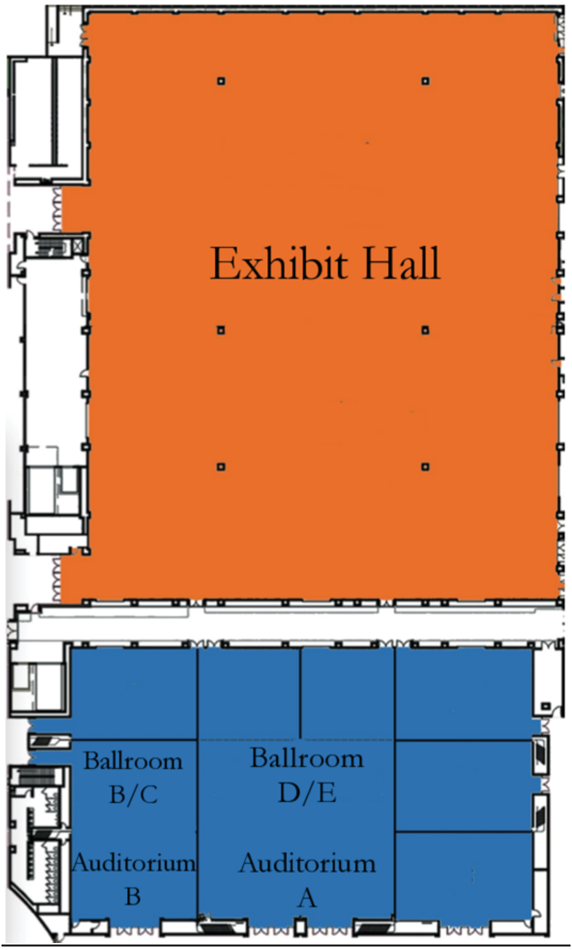
Conference Building and Convention Center

Conference Venue

Conference Building: Upper Level



Convention Center: Exhibit Hall & Ballroom



Notes

30-Sep-13	09:00 – 09:30	Oral	Main Auditorium (Plenary)

MOXAP — Plenary Invited Oral Presentation, Colliders

Chair: S.A. Gourlay (LBNL)

MOXAP1 09:00 **Review of the Possible Projects towards a Higgs Factory** – ***S. Henderson*** *(Fermilab)*

Following Higgs discovery at CERN, several accelerator technologies from linear to circular colliders using various kinds of particles from leptons (electron, positrons, muons) or gammas or hadrons in LHC. The speaker should review the varios proposals outlining the pros&cons of each technology as well as the corresponding challenges and issues to be addressed by specific R&D before a proposal can be realistically be proposed. The talk should also dicsuss Snowmass-2013 recommendations.

30-Sep-13	09:30 – 10:00	Oral	Main Auditorium (Plenary)

MOXBP — Plenary Invited Oral Presentation, Medical Accelerators and Applications

Chair: S.A. Gourlay (LBNL)

MOXBP1 09:30 **Demands and Perspectives of Hadron Therapy** – ***A. Lin*** *(University of Pennsylvania School of Medicine, Perelman Center for Advanced Medicine)*

This presentation should cover the clinical and biophysical aspects of hadron therapy and according technological perspectives. A comparison should be made of the benefits for hadrons in treating various tumor sites as compared with x-rays. Benefits as defined by survival rate and side effects will be given.

30-Sep-13	10:30 – 11:30	Oral	Auditorium A (Parallel)

MOYAA — Invited Oral Presentations, Colliders

Chair: D.F. Sutter (UMD)

MOYAA1 10:30 **LHC Operation at Higher Energy and Luminosity** – ***G. Papotti*** *(CERN)*

The Large Hadron Collider at CERN (Geneva) was commissioned and operated in the years 2009-2013 up to a beam energy of 4 TeV. A peak luminosity of 0.77 10^{34} $cm^{-2}s^{-1}$ was reached and an integrated luminosity of around 29 fb-1 was delivered to both ATLAS and CMS. This performance allowed the discovery of a scalar boson. The LHC is presently in a shutdown phase dedicated to consolidation and maintenance that will allow the restart of beam operation in early 2015 at an increased beam energy of 6.5 to 7 TeV. Maximum acceptable pile-up, effectiveness of electron-cloud scrubbing, and fast loss events are some of the issues that will shape the choice of operational parameters, cycle setup, and the commissioning strategy. The baseline choices and options for the restart after the shutdown are presented. In addition the roadmap for future performance upgrades is sketched.

MOYAA2 11:00 **The R&D Program for a Future Muon Collider** – ***M.A. Palmer*** *(Fermilab)*

The U.S. Muon Accelerator Program is conducting a multi-year R&D program to evaluate the feasibility of the technologies required for a Neutrino Factory and Muon Collider. The design concepts for a Higgs Factory and multi-TeV Muon Collider are described and the status of the major R&D activities for these machines are summarized. The potential for a high energy physics facility based on muon accelerator technology is discussed.

30-Sep-13	11:30 – 12:00	Oral	Auditorium A (Parallel)

MOYBA — Invited Oral Presentation, Colliders

Chair: D.F. Sutter (UMD)

MOYBA1 11:30 **The CLIC Project - Status and Prospects** – ***E. Adli*** *(University of Oslo, CERN, SLAC)*

Following the feasibilty demonstration of the novel CLIC technology and the publication in 2012 of a CLIC Conceptual Design Report for a Multi-TeV Linear Collider to be built in stages, a new phase towards a Technical Design is being launched by a global collaboration of volunteer institutes. The presentation will review the status and plans of the CLIC study outlining the developments planned for the next project phase.

30-Sep-13	12:00 – 12:30	Oral	Auditorium A (Parallel)

MOOAA — Contributed Oral Presentations, Colliders

Chair: D.F. Sutter (UMD)

MOOAA1 12:00 **High-Energy Particle Colliders: the Past 20 Years, the Next 20 Years, and the Distant Future** – ***V.D. Shiltsev*** *(Fermilab)*

Particle colliders for high-energy physics have been in the forefront of scientific discoveries for more than half a century. The accelerator technology of the colliders has progressed immensely, while the beam energy, luminosity, facility size, and cost have grown by several orders of magnitude. The method of colliding beams has not fully exhausted its potential but has slowed down considerably in its progress. This paper briefly reviews the colliding beam method and the history of colliders, discusses the development of the method over the last two decades in detail, and examines near-term collider projects that are currently under development. The paper concludes with an attempt to look beyond the current horizon and to find what paradigm changes are necessary for breakthroughs in the field.

MOOAA2 12:15 **Status of the Electron-positron Collider VEPP-2000** – ***A.L. Romanov****, D.E. Berkaev, I. Koop, A.N. Kyrpotin, A.P. Lysenko, E. Perevedentsev, V.P. Prosvetov, Yu. A. Rogovsky, A.I. Senchenko, P.Yu. Shatunov, Y.M. Shatunov, D.B. Shwartz, A.N. Skrinsky, I. Zemlyansky (BINP SB RAS)*

VEPP-2000 began high energy physics experiments at the end of 2010 and finished its third experimental season in June of 2013. The last season was dedicated to the energy range of 160-510 MeV per beam. Compton backscattering based energy measurements were used for the regular energy calibration of the VEPP-2000 in conjunction with resonance depolarization and NMR based methods. The concept of the round colliding beams lattice along with the precise orbit and lattice correction yielded the high peak luminosity of $1.2*10^{31}$ $cm^{-2}s^{-1}$ at 505 MeV with average luminosity of $0.9*10^{31}$ $cm^{-2}s^{-1}$ per run. The total tune shift up to 0.14 that corresponds to beam-beam parameter ksi=0.1 per one interaction point was achieved in runs at 390MeV. The injection system is currently in the process of being upgraded to allow the injection of particles at the top energy of the collider VEPP-2000 and to eliminate the present lack of positrons.

30-Sep-13	10:30 – 11:00	Oral	Auditorium B (Parallel)

MOYAB — Invited Oral Presentation, Light Sources

Chair: M. Borland (ANL)

MOYAB1 10:30 **Challenges and Perspectives for Diffraction Limited Storage Ring Light Sources** – ***R.O. Hettel*** *(SLAC)*

This presentation provides an overview of the scientific motivation for developing diffraction limited storage ring (DLSR) light sources, reviews the main R&D challenges associated with DLSR implementation and summarizes the worldwide effort presently in progress to build a new generation of very low emittance rings.

30-Sep-13	11:00 – 11:30	Oral	Auditorium B (Parallel)

MOOAB — Contributed Oral Presentations, Light Sources

Chair: M. Borland (ANL)

MOOAB1 11:00 **Initial Design of the MaRIE 1.0 X-FEL Linac** – ***J.W. Lewellen***, *B.E. Carlsten, L.D. Duffy, Q.R. Marksteiner, S.J. Russell, N.A. Yampolsky (LANL)*
The MaRIE 1.0 X-FEL requires an electron beam at 12 GeV with 100pC bunch charge, 0.2 μm RMS normalized transverse emittance, and 0.15% RMS slice energy spread. These requirements place significant constraints upon the use of techniques, such as laser heaters, which have enabled other X-FELs to reach their design goals. In this paper, we present the current baseline design and performance of the MaRIE 1.0 linac, highlight current and anticipated challenges and describe potential alternate approaches for meeting our design performance goals.

MOOAB2 11:15 **Ultra-low Emittance Upgrade Options for the Diamond Light Source** – ***R. Bartolini***, *N.P. Hammond, J. Kay, R.P. Walker (Diamond) T. Pulampong (JAI)*
Many synchrotron radiation facilities are studying lattice upgrades in order to lower the natural emittance and hence increase the radiation brightness. While large circumference rings are favoured in reaching ultra small emittance, recent advances in design and optimisation tools allow also medium size ring to reach emittances down to the 100s pm region with workeable lattices. Diamond is investigating a novel design whereby low emittance is conjugated with doubling of the capacity of the ring, based on a double double bend achromat (DDBA) cell. Plans for the installation of two low emittance cells will be presented. These will serve as prototype for a full phased upgrade of the storage ring.

30-Sep-13	11:30 – 12:30	Oral	Auditorium B (Parallel)

MOYBB — Invited Oral Presentations, Beam Dynamics and Electromagnetic Fields

Chair: M. Borland (ANL)

MOYBB1 11:30 **Analysis of Transverse Instabilities observed at J-PARC MR and their Suppression using Feedback Systems** – ***Y.H. Chin*** *(KEK)*
This talk should present an analysis of transverse instabilities observed at the J-PARC MR (Main Ring) and their suppression using feedback systems. Instabilities were mainly observed at low energies. About 30% of particles are lost due to the instabilities if the feedback system is turned off at the beam power of 120kW. Both horizontal and vertical instabilities were observed. An analysis unveils that a dipole mode has a temporal appearance of higher-order head-tail modes if the chromaticity is suffisiently large. The development of instabilities in the presence of a large chromaticity should be considered for conditions beyond the Sacherer's text book case.

MOYBB2 12:00 **Transverse Impedance and Transverse Instabilities in Fermilab Booster** – ***A. Macridin*** *(Fermilab)*
Impedances of the Fermilab Booster are strongly amplified by direct beam interaction with laminations of its bending dipoles. It results in a fast transverse instability. Interference of effects of large space charge and large impedance does not allow building an analytical theory of the instability leaving numerical simulations as only reliable way to describe the instability. The paper should present a comparison of computer simulations with experimental measurements for the Fermilab Booster.

30-Sep-13	14:00 – 15:00	Oral	Auditorium A (Parallel)

MOZAA — Invited Oral Presentations, Accelerator Systems

Chair: C. Steier (LBNL)

MOZAA1 14:00 **The CEBAF 12 GeV Upgrade at Jefferson Lab** – ***L. Harwood*** *(JLAB)*
This presentation should describe the progress of the 12GeV Upgrade of CEBAF at Jefferson Lab. The status of the upgrade should be presented as well as details on the construction, procurement, installation and commissioning of the magnet and SRF components of the upgrade.

MOZAA2 14:30 **Full 3D Stochastic Cooling at RHIC** – ***K. Mernick****, M. Blaskiewicz, J.M. Brennan (BNL)*
Over the past several years, the installation of the full 3-dimensional stochastic cooling system in RHIC has been completed. The FY12 U-U and Cu-Au collider runs were the first to benefit from the full installation. In the U-U run, stochastic cooling improved the integrated luminosity by a factor of 5. This presentation provides an overview of the design of the stochastic cooling system and reviews the performance of the system during the FY12 heavy ion runs.

30-Sep-13	15:00 – 15:30	Oral	Auditorium A (Parallel)

MOOBA — Contributed Oral Presentations, Accelerator Systems

Chair: C. Steier (LBNL)

MOOBA1 15:00 **ARIEL Electron Linac** – ***S.R. Koscielniak*** *(TRIUMF)*
The TRIUMF Advanced Rare Isotope Laboratory (ARIEL) phase I is funded since 2010 June by federal and BC provincial governments. ARIEL I comprises buildings and electron linac; the future phase II includes hot cells, target stations, mass separators and beam transport to ISAC experimental areas. The linac vault and He compressor building were completed 2012. The ARIEL targets building completion is 2013 Aug. With the exception of the 30 MeV accelerator cryomodule and second klystron and HV power supply, the linac major procurements are complete. This paper reports highlights from preliminary equipment tests in the following systems: locally manufactured niobium 9-cell cavity, 300 keV electron gun, 4 K cryogenic plant and sub-atmospheric pumps, 270 kW c.w. klystron and 65 kV DC power supply. Status of the 10 MeV injector cryomodule assembly and beamlines construction will also be addressed.

MOOBA2 15:15 **The RHIC Polarized Source Upgrade** – ***A. Zelenski*** *(BNL)*
A novel polarization technique had been successfully implemented in the RHIC polarized H^- ion source upgrade to higher intensity and polarization for use in the RHIC polarization physics program at enhanced luminosity RHIC operation. In this technique a primary proton beam inside the high magnetic field solenoid is produced by charge-exchange ionization of the atomic hydrogen beam in the He-gas ionizer cell. Further proton polarization is produced in the process of polarized electron capture from the optically-pumped Rb vapour. Formation of the proton beam is produced by four-electrode spherical multi-aperture ion-optical system with geometrical focusing. Polarized beam intensity produced in the source exceeds 4.0 mA.Maximum polarization of 84% was measured at 0.3 mA beam intensity and 80% at 0.5 mA in 200 MeV polarimeter. This high beam intensity allowed reduction of the longitudinal and transverse beam emittances at injection to AGS to reduce polarization losses in AGS. The source reliably delivered polarized beam for 2013 run in RHIC at $\sqrt{s}$=510 GeV. This was a major contribution to the RHIC polarization increase to over 60 % for colliding beams.

30-Sep-13	15:30 – 16:30	Oral	Auditorium A (Parallel)

MOZBA — Invited Oral Presentations, Hadron Accelerators

Chair: J.Y. Tang (IHEP)

MOZBA1 15:30 **First Commissioning Experience with the Linac4 3 MeV Front-end at CERN** – ***J.-B. Lallement***, *A. Akroh, G. Bellodi, J.F. Comblin, V.A. Dimov, E. Granemann Souza, J. Lettry, A.M. Lombardi, O. Midttun, E. Ovalle, U. Raich, F. Roncarolo, C. Rossi, J.L. Sanchez Alvarez, R. Scrivens, C.A. Valerio, M. Vretenar, M. Yarmohammadi Satri (CERN) M. Yarmohammadi Satri (IPM)*
Linac4 is a normal-conducting 160 MeV H^- linear accelerator presently under construction at CERN. It will replace the present 50 MeV Linac2 as injector of the proton accelerator complex as part of a project to increase the LHC luminosity. The Linac front-end, composed of a 45 keV ion source, a Low Energy Beam Transport (LEBT), a 352.2 MHz Radio Frequency Quadrupole (RFQ) and a Medium Energy Beam Transport (MEBT) housing a beam chopper, have been commissioned at the 3 MeV test stand during the first half of 2013. The status of the installation and the results of the first commissioning stage are presented in this paper.

MOZBA2 16:00 **Proton Accelerator Development in China** – ***S. Fu*** *(IHEP)*
The China Spallation Neutron Source (CSNS) and the Chinese Accelerator Driven Systems (C-ADS) projects are both underway in China. The CSNS includes a 100 kW RCS accelerator and first beam on target is planned for 2017. The C-ADS project includes a high power superconducting linac with a low energy (25-50 MeV) initial stage by 2015 and higher power deployment later. In addition to these intense-beam proton accelerators, some other proton accelerators for various applications are also under construction or planned. In this paper, the plans, R&D and construction activities of these projects will be discussed.

30-Sep-13	14:00 – 14:30	Oral	Auditorium B (Parallel)

MOZAB — Invited Oral Presentation, Industrial Accelerators and Applications

Chair: J.R. Delayen (ODU)

MOZAB1 14:00 **Accelerator-Driven Subcritical Fission - How to Destroy the Transuranics in Spent Nuclear Fuel and Close the Nuclear Fuel Cycle** – ***P.M. McIntyre*** *(Texas A&M University)*
Accelerator-driven subcritical fission in a molten salt core (ADSMS) can use depleted uranium or thorium as fuel and produce 1 GWe power while destroying the transuranics produced. ADSMS requires multiple proton beams of 800 MeV energy and 10 mA CW current. A strong-focusing cyclotron (SFC) is being developed that uses sector dipoles each configured as a flux-coupled stack, creating independent cyclotrons that can be integrated within a common footprint. This presentation will introduce a 4-stack SFC that can provide the beam power needed in an ADSMS core to destroy transuranics at the rate and proportion made in a commercial GWe power reactor while also producing 300 MWe of power, equivalent to a x5 energy amplifier.

30-Sep-13	14:30 – 15:00	Oral	Auditorium B (Parallel)

MOZBB — Invited Oral Presentation, Alternative Acceleration Schemes

Chair: J.R. Delayen (ODU)

MOZBB1 14:30 **The Fermilab Advanced Superconducting Test Accelerator (ASTA) Facility** – ***P. Piot*** *(Fermilab, Northern Illinois University)*

The Advanced Superconducting Test Accelerator (ASTA) currently in construction at Fermilab will enable a broad range of beam-based experiments to study fundamental limitations to beam intensity and to develop transformative approaches to particle-beam generation, acceleration and manipulation. ASTA incorporates a superconducting radiofrequency (SRF) linac coupled to a photoinjector and small-circumference storage ring capable of storing electrons or protons. This report describes the facility, its capabilities, and provide an overview of enabled research thrusts.

30-Sep-13	15:00 – 15:30	Oral	Auditorium B (Parallel)

MOOBB — Contributed Oral Presentations, Alternative Acceleration Schemes

Chair: J.R. Delayen (ODU)

MOOBB1 15:00 **The AWAKE Proton-Driven Plasma Wakefield Acceleration Experiment at CERN** – ***P. Muggli*** *(MPI)*

Proton (p^+) bunches are interesting as wakefield drivers because they carry large amounts of energy (many kJ) and because the p^+ rigidity is also large. Simulations show that a short p^+ bunch (~100 microns) can drive and sustain GV/m accelerating fields over very long plasma distance, corresponding to a large average acceleration gradient. These wakefields can potentially accelerate a witness electron bunch to the TeV level in a few hundred meters. Self-modulation instability (SMI) of long p^+ bunches (~10 cm) available today can lead to the formation of a train ofµbunches that can resonantly drive wakefields to the GV/m level. Based on this scheme the AWAKE collaboration proposes to use the CERN SPS bunch to study the SMI of p^+ bunches in ~10m plasma with density in the 1-$10x10^{15}$/cc range. The wakefields is sampled by externally “side-injected” electrons. Acceleration from a few MeV to a few GeV is expected. Operating at lower plasma density eases external injection requirements. The experimental set up and program will be presented. Expectations based on numerical simulations of the SMI and acceleration processes will be described. Long-term goals will also be outlined.

MOOBB2 15:15 **High Gradient Acceleration of Electrons in a Laser-Driven Dielectric Micro-Structure** – ***E.A. Peralta****, R.L. Byer, C. McGuinness (Stanford University) E.R. Colby (OHEP/DOE) R.J. England, B. Montazeri, K. Soong, Z. Wu (SLAC) J.C. McNeur (UCLA)*

We report the first observation of high-gradient acceleration of electrons in a lithographically fabricated micron-scale dielectric optical accelerator driven by a mode-locked Ti:sapphire laser. We have observed acceleration gradients far exceeding those of conventional microwave accelerator structures. Additionally, we have verified the dependence of the observed acceleration gradient on: the laser pulse energy, the laser-electron temporal overlap, the polarization of the laser, and the incidence angle of the laser. In all cases, we have found good agreement between the observed results, the analytical predictions, and the particle simulations.

30-Sep-13	15:30 – 16:00	Oral	Auditorium B (Parallel)

MOOCB — Contributed Oral Presentations, Alternative Acceleration Schemes

Chair: J.A. Holmes (ORNL)

MOOCB1 15:30 **Generation of Monoenergetic Protons by Laser Acceleration of Multi-Ion Foils with Polarization Switch** – ***T.-C. Liu****, C.-S. Liu, X. Shao (UMD) S.-H. Chen (NCU) B. Eliasson (Ruhr-Universität Bochum) J. Wang (IAMS)*

Laser radiation pressure acceleration is considered as an effective method in obtaining high energy quasi-monoenergetic ions. By irradiating a laser beam on a multi-species target made of carbon and hydrogen, the proton layer can be accelerated ahead of the carbon ion layer due to a higher charge-to-mass ratio. And the shielded Coulomb repulsion provided by the left-behind electron-carbon layer can not only further accelerate the proton layer, but also stabilize it for a long time. The acceleration time of quasi-monoenergetic protons by the combined mechanisms is extended over ten times longer compared to the case of applying single-species targets and using radiation pressure acceleration alone. 60 MeV of quasi-monoenergetic protons from a multi-species foil with input laser power of 70 TW is obtained, which is at least five times greater than the energy obtainable from pure hydrogen targets. To further increase the efficiency, we achieve an improvement of 30 percent energy enhancement by introducing a polarization switch in the laser profile. An analytical approach to interpret and optimize the results is also studied.

MOOCB2 15:45 **Modeling Underdense Plasma Photocathode Experiments** – ***D.L. Bruhwiler*** *(CIPS) G. Andonian, J.B. Rosenzweig, Y. Xi (UCLA) G. Andonian (RadiaBeam) E. Cormier-Michel (Tech-X) B. Hidding (Uni HH)*

The underdense plasma photocathode concept (aka Trojan horse) *,** is a promising approach to achieving fs-scale electron bunches with pC-scale charge and transverse normalized emittance below 0.01 mm-mrad, yielding peak currents of order 100 A and beam brightness as high as 10^{19} A/(m rad)^2, for a wide range of achievable beam energies up to 10 GeV. A proof-of-principle experiment will be conducted at the FACET user facility in early 2014. We present 2D and 3D simulations with physical parameters relevant to the planned experiment.

* Hidding et al., PRL 108:035001 (2012). ** Xi et al., PRST-AB 16:031303 (2013).

30-Sep-13	16:00 – 16:30	Oral	Auditorium B (Parallel)

MOODB — Contributed Oral Session, Beam Dynamics and Electromagnetic Fields

Chair: J.A. Holmes (ORNL)

MOODB1 16:00 **Beam-Beam Limit in an Integrable System** – ***A. Valishev****, S. Nagaitsev (Fermilab) V.V. Danilov (ORNL) D.N. Shatilov (BINP SB RAS)*

Round colliding beams have been proposed as a way to push the attainable beam-beam tune shift limit, and recent successful experiments at the VEPP-2000 collider at BINP demonstrated the viability of the concept. In a round-beam system the dynamical stability is improved by introducing an additional integral of motion, which effectively reduces the system from a two and a half dimensional to one and a half dimensional. In this report we discuss the possible further improvement through adding the second integral of motion and thus making the system fully integrable. We explore the ultimate beam-beam limit in such a system using numerical simulations taking into account various imperfections.

MOODB2 16:15

A Model Ring With Exactly Solvable Nonlinear Motion – ***T.V. Zolkin*** *(University of Chicago) Y. Kharkov, I.A. Morozov (BINP SB RAS) S. Nagaitsev (Fermilab)*

Recently, a concept of nonlinear accelerator lattices with two analytic invariants has been proposed. Based on further studies, the Integrable Optics Test Accelerator (IOTA) was designed and is being constructed at the FNAL. Despite the clarity and transparency of the proposed idea, the detailed analysis of the beam motion remains quite complicated and should be understood better even for the case when no perturbations are taken into account. In this paper we will review one of the three proposed realizations of the integrable optics, where the variables separation is possible in polar coordinates. This system allows for an exact analytical solution expressed in terms of elliptic integrals and Jacobi elliptic functions. It gives the possibility to check numerical algorithms used for tracking and to perform more rigorous analysis of the motion in comparison with the "crude" analysis of the topology of the phase space. In addition we will discuss some difficulties associated with numerical simulations of such a comparatively complex dynamical system and will take a look at the possible perturbations for a model machine.

01-Oct-13	08:30 – 09:00	Oral	Auditorium A (Parallel)

TUOAA — Contributed Oral Presentations, Colliders

Chair: S.D. Holmes (Fermilab)

TUOAA1 08:30 **Bunched Beam Electron Cooler for Low-energy RHIC Operation** – ***A.V. Fedotov***, *S.A. Belomestnykh, I. Ben-Zvi, M. Blaskiewicz, D.M. Gassner, D. Kayran, V. Litvinenko, W. Meng, I. Pinayev, B. Sheehy, S. Tepikian, J.E. Tuozzolo, G. Wang (BNL) S.A. Belomestnykh, I. Ben-Zvi, V. Litvinenko (Stony Brook University)*

RHIC operations with heavy ion beams at energies below 10 GeV/nucleon are motivated by a search for the QCD Critical Point. An electron cooler is proposed as a means to increase RHIC luminosity for collider operations at these low energies. The electron cooling system should be able to deliver an electron beam of adequate quality over a wide range of electron beam energies (0.9-5 MeV). It also should provide optimum 3-D cooling for both hadron beams in the collider. A method based on bunched electron beam, which is also a natural approach for high-energy electron cooling, is being developed. In this paper, we describe the requirements for this system, its design aspects, as well as the associated challenges.

TUOAA2 08:45 **RHIC Machine Studies towards Improving the Performance at 2.5 GeV** – ***C. Montag***, *H. Huang, G.J. Marr, G. Robert-Demolaize, V. Schoefer, T.C. Shrey, S. Tepikian, K. Zeno (BNL)*

To search for the critical point in the QCD phase diagram, Au-Au collisions at beam energies between 2.5 and 15 GeV are required. While RHIC has successfully operated at 3.85 and 5.75 GeV, the performance achieved at 2.5 GeV is not sufficient for a meaningful physics program. We report on dedicated beam experiments performed to understand and improve this situation.

01-Oct-13	09:00 – 10:00	Oral	Auditorium A (Parallel)

TUXA — Invited Oral Presentations, Colliders

Chair: S.D. Holmes (Fermilab)

TUXA1 09:00 **Burn-off Dominated Uranium and Asymmetric Copper-gold Operation in RHIC** – ***Y. Luo***, *M. Blaskiewicz, J.M. Brennan, W. Fischer, N.A. Kling, K. Mernick, T. Roser (BNL)*

In the 2012 RHIC heavy ion run, we collided uranium-uranium (U-U) ions at 96.4~GeV/nucleon and copper-gold (Cu-Au) ions at 100~GeV/nucleon for the first time in RHIC. The new Electron-Beam Ion Source (EBIS) was used for the first time to provide ions for the RHIC physics program. After adding the horizontal cooling, 3-D stochastic cooling became operational in RHIC for the first time, which greatly enhanced the luminosity. In this article, we first review the improvements and performances in the 2012 RHIC ion runs. Then we discuss the conditions and approaches to achieve the burn-off dominated Uranium beam lifetime at physics stores. And we discuss the asymmetric copper-gold collision due to different IBS and stochastic cooling rates, and the operational solutions to maximize the integrated luminosity.

TUXA2 09:30 **Nanometer Beam Generation and Measurements in KEK-ATF2** – ***G.R. White*** *(SLAC)*

Techiques for generation and measurements of ultra small beams in the few nanmeter range for applications in the final focus of high energy linear colliders are being developped and tested in the KEK ATF2. After reviewing the presently achieved performances and their possible progress in the future, the presentation should outline the basic limitations and realistic figures for application in future facilities.

01-Oct-13	10:30 – 11:30	Oral	Auditorium A (Parallel)

TUYAA — Invited Oral Presentations, Accelerator Systems

Chair: A.K. Mitra (TRIUMF)

TUYAA1 10:30 **The Project-X Injector Experiment: A Novel High Performance Front-end for a Future High Power Proton Facility at Fermilab** – ***S. Nagaitsev*** *(Fermilab)*

This presentation should describe the Project X Injector Experiment (PXIE)and its connection with Project X. It should focus on the novel aspects of PXIE, namely the programmable, bunch-by-bunch chopping of a CW H^- beam; acceleration in CW superconducting RF structures immediately following the RFQ; operation of SRF structures adjacent to a high-power chopper target; and preservation of high-quality chopped beams with acceptable emittance growth and halo.

TUYAA2 11:00 **High Power (MW-class) Targets for Particle Beams** – ***E.J. Pitcher*** *(ESS) C.J. Densham (STFC/RAL)*

This presentation will cover advances in high power (MW class) targets for particle beams, including targets for particle physics and neutron spallation systems.

01-Oct-13	11:30 – 12:00	Oral	Auditorium A (Parallel)

TUYBA — Invited Oral Presentation, Accelerator Technology

Chair: A.K. Mitra (TRIUMF)

TUYBA1 11:30 **Beam Instrumentation for High Power Hadron Beams** – ***A.V. Aleksandrov*** *(ORNL)*

This presentation will describe developments in the beam diagnostics which support the understanding and operation of high power hadron accelerators. These include the measurement of large dynamic range transverse and longitudinal beam profiles, beam loss detection, and non-interceptive diagnostics.

01-Oct-13	12:00 – 12:30	Oral	Auditorium A (Parallel)

TUOBA — Contributed Oral Presentations, Accelerator Technology

Chair: A.K. Mitra (TRIUMF)

TUOBA1 12:00 **A Fast Rotating Wire Scanner For Use In High Current Accelerators** – ***S.J. Full****, N.I. Agladze, A.C. Bartnik, I.V. Bazarov, J. Dobbins, B.M. Dunham, Y. Li, X. Liu, T.P. Moore, J.J. Savino, K.W. Smolenski (Cornell University (CLASSE), Cornell Laboratory for Accelerator-Based Sciences and Education)*

We have developed a cost-effective, fast rotating wire scanner for use in accelerators where high beam currents would otherwise melt even carbon wires. This new design uses a simple planetary gear setup to rotate a carbon wire, fixed at one end, through the beam at speeds in excess of 20 m/s. We will present results from bench tests, as well as transverse beam profile measurements taken at Cornell's high-brightness ERL photoinjector, for a beam energy of 4 MeV and currents up to 40 mA.

TUOBA2 12:15 **The DOE-HEP Accelerator R&D Stewardship Program** – ***M.S. Zisman*** *(US DOE)*

Since the Accelerators for America's Future (AfAF) Symposium in 2009, the U.S. Dept. of Energy's Office of High Energy Physics (DOE-HEP) has worked toward broadening its accelerator R&D activities beyond support of only discovery science to include medicine, energy and environment, defense and security, and industry. Accelerators play a key role in many aspects of everyday life, and improving their capabilities will enhance U.S. economic competitiveness. In 2011, a SLAC-led task force was initiated by HEP to develop more fully the information from the original AfAF Symposium. Subsequently, a DOE-HEP concept (coordinated with the other cognizant Office of Science program offices) was developed for accelerator R&D stewardship. Here we describe the evolution of the stewardship task starting from its origins in the ongoing accelerator R&D program, the mission of the new program, and initial steps being taken to implement it. Several initiatives are currently being considered to launch the program, and these will be indicated. Involvement of the accelerator community in developing ideas for future stewardship activities will be crucial to the ultimate success of the program.

01-Oct-13	08:30 – 09:30	Oral	Auditorium B (Parallel)

TUTB — Tutorial, Light Sources

Chair: T. Rao (BNL)

TUTB1 08:30 **High-energy, High-current ERLs** – ***G.H. Hoffstaetter*** *(Cornell University (CLASSE), Cornell Laboratory for Accelerator-Based Sciences and Education)*

This tutorial covers the design issues for ERLs and description of various projects that rely on ERLs, including the JLAB-FEL, LHeC, eRHIC, Cornell's x-ray ERL, KEK's CERL, B*ERL*inPro, and MARS. It highlights recent progress toward beam parameters of ERL beams in terms of emittance and current, as well as hardware prototypes and progress toward ERL cryomodules, and operational experiences with CW SRF, essential for ERLs.

01-Oct-13	09:30 – 10:00	Oral	Auditorium B (Parallel)

TUOAB — Contributed Oral Presentations, Accelerator Technology

Chair: T. Rao (BNL)

TUOAB1 09:30 **Advances in Photocathode Technology at Cornell University** – ***S.S. Karkare*** *(Cornell University) I.V. Bazarov, L.E. Boulet, M. Brown, L. Cultrera, B.M. Dunham, N. Erickson, G. Gabriel, A. Kim, B. Lillard, T.P. Moore, C. Nguyen, W.J. Schaff, K.W. Smolenski, H. Wang (Cornell University (CLASSE), Cornell Laboratory for Accelerator-Based Sciences and Education)*

Beam brightness from modern day photoinjectors is limited by the photocathode. A multifaceted photocathode development program has been undertaken at Cornell University with a goal to develop the ultimate photocathode which has high quantum efficiency, low mean transverse energy, quick response time and a long lifetime. Positive affinity cathodes like CsK2Sb and NaK2Sb have been grown using different kinds of alkali metal sources (alkali-azide and pure metal), characterized and tested in the Cornell-ERL photoinjector. Novel layered structures of various III-V semiconductors like GaAs and AlGaAs grown using Molecular Beam Epitaxy and activated to negative electron affinity using Cs and NF3 are also being investigated. Surface and photoemission diagnostics like Auger spectroscopy, LEED, RHEED and the 2D-electron energy analyzers have been connected in vacuum to the photocathode growth and preparation chambers to fully characterize the surface and emission properties of the materials grown. A Monte Carlo based simulation has also been developed to predict photoemission from layered semiconductor structures and help design novel structures to optimize the photoemission properties.

TUOAB2 09:45 **Carbon Nanotube Cathode Development and Testing** – ***J.J. Hartzell****, R.B. Agustsson, S. Boucher, L. Faillace, A.Y. Murokh, A.V. Smirnov (RadiaBeam)*

RadiaBeam Technologies is developing carbon nanotube (CNT) based field emission cathodes for DC-pulsed and radio-frequency electron sources. CNT cathodes offer simple operation, have demonstrated high current densities, and can maintain low thermal emittance due to their ability to emit at room temperature. The experimental results of testing CNT cathodes are presented, including high-voltage tests, lifetime studies, and initial performance in an RF gun. Additionally, some of the challenges posed by the fabrication and handling of the CNT cathodes are discussed.

01-Oct-13	10:30 – 11:30	Oral	Auditorium B (Parallel)

TUYB — Invited Oral Presentations, Beam Dynamics and Electromagnetic Fields

Chair: J. Bisognano (UW-Madison/SRC)

TUYB1 10:30 **Corrugated Structures for Terahertz Generation and Beam Dechirping** – ***K.L.F. Bane*** *(SLAC)*

In recent studies a metallic pipe with small corrugations has been considered for two applications: as a beam-based method of generating pulses of terahertz radiation, and for simply and cheaply removing unwanted energy chirp in linac-based X-ray FEL's. With a pipe of length ∼10 cm and aperture ∼1 mm, narrow-band, multi-cycle pulses of radiation can be generated, with frequency ∼1 THz and pulse energy of a few mJ. In linac-based FEL's, after the final bunch compressor, the electron bunch typically is left with an energy chirp. An inexpensive way for dechirping is to have the beam pass through ∼10 m of corrugated pipe. This report presents and analyzes the performance of the corrugated structure for both mentioned purposes. Experimental tests are also discussed.

TUYB2 11:00 **Novel Methods for Experimental Characterization of 3D Superconducting Linac Beam Dynamics** – ***A.P. Shishlo*** *(ORNL)*

This presentation should describe new measurement techniques used to understand linac beam dynamics, and the results of their application in the SNS superconducting linac.

01-Oct-13	11:30 – 12:30	Oral	Auditorium B (Parallel)

TUOBB — Contributed Oral Presentations, Beam Dynamics and Electromagnetic Fields

Chair: W. Leemans (LBNL)

TUOBB1 11:30 **Space-charge Compensation for High-intensity Linear and Circular Accelerators at Fermilab** – ***M. Chung***, *L.R. Prost, V.D. Shiltsev (Fermilab)*

Space-charge effects have long been recognized as a fundamental intensity limitation in high-intensity linear and circular accelerators. As the mission of the US high energy physics program is pushing the Intensity Frontier, it is very timely to explore novel schemes of space-charge compensation that could significantly improve the performance of leading high-intensity proton accelerator facilities such as Project-X. In this work, we present two activities at Fermilab on the space-charge compensation experiments based on residual gas ionization: 1) neutralized beam transport of continuous-wave (CW) H^- beam in Project-X Injector Experiment (PXIE); and 2) trapped electron plasmas for space-charge compensation in the newly proposed Integrable Optics Test Accelerators (IOTA) ring. Characteristics of the stability in the beam-plasma system, the dynamics of beam neutralization, and the transition between neutralized and un-neutralized beam transports are discussed for each configuration.

TUOBB2 11:45 **Experimental Verification of Single-bunch Accumulation Limit Dependence on Impedance at the APS** – ***V. Sajaev***, *M. Borland, Y.-C. Chae, L. Emery (ANL)*

One of the unique features of the Advanced Photon Source is operation with a small number of intense bunches – standard operating mode has twenty four 16-nC bunches, while in a special operating mode one of the bunches has a charge of 60 nC. Such high single bunch currents are achieved by a combination of high operational chromaticity and transverse bunch-by-bunch feedback. In the near future, more narrow-gap insertion device vacuum chambers will be installed, which will increase impedance of the storage ring and make operation with high single-bunch current more problematic. Simulations exist that quantify the effect of increased impedance on the APS single-bunch accumulation limit; however, no experimental verification has been performed yet. In this paper, we will present our first measurement of the single-bunch accumulation limit as a function of effective impedance. Different impedance values were achieved by changing storage ring beta functions.

TUOBB3 12:00 **Imposing Strong Energy Slews with Transverse Deflecting Cavities** – ***N.A. Yampolsky***, *A. Malyzhenkov (LANL)*

We propose a novel scheme for imposing strong energy slews in short electron bunches using a set of transverse deflecting cavities. Such a cavity introduces the angular divergence depending on the longitudinal position and the energy variation depending on the transverse position. Combining several cavities and vacuum drifts we first expand the beam transversally keeping x-z correlation of the distribution, then apply the energy variation, and focus the beam back. The transform matrix of the scheme is equivalent to a single chirping cavity. At the same time, the strength of the R_{65} element is strongly increased compared to conventional accelerating cavities. The overall energy variation along the bunch is defined by the transverse size of the beam in the middle of the beamline rather than its longitudinal size. As a result, the strength of the R_{65} element can be increased by 2 orders of magnitude compared to conventional design. This scheme allows for acceleration on crest increasing average accelerating gradient and reducing accelerator cost. It also allows for using weaker chicanes in compressors.

TUOBB4 12:15 **Measurement of Ultrasmall Transverse Spot Size** – ***K.G. Roberts***, *R.K. Li, P. Musumeci (UCLA), B.T. Jacobson (RadiaBeam)*

The imaging of extremely small, sub-5 micron, transverse beam spot sizes has been a priority in accelerator physics. Here we propose a scheme to generate and image a beam spot size about 1 micron at PEGASUS laboratory at UCLA. We are preparing a 0.8 mm, 1 pC, 10 MeV electron beam to be sent through a permanent magnet quadrupole (PMQ) triplet of strength 130 T/m, focusing the beam to a waist 1.5 microns and a total focal length of 4.5 mm. We use a YAG screen at the beam waist and a mirror to direct optical (520 nm green) light into a Schwarzschild microscope to collimate the light. We will then image the beam using a CCD camera outside of the beam line.

01-Oct-13	14:00 – 15:00	Oral	Auditorium A (Parallel)

TUZAA — Invited Oral Presentations, Colliders

Chair: Y.H. Chin (KEK)

TUZAA1 14:00 **Electron-Ion Collider Proposals Worldwide** – ***Y. Zhang*** *(JLAB)*

This talk should review the status of world-wide Electron-Ion Colliders proposals and designs, including the MEIC at JLAB, eRHIC at BNL and the LHeC at CERN.

TUZAA2 14:30 **Beam Physics in Future Electron Hadron Colliders** – ***A. Valloni*** *(CERN)*

High-energy electron-hadron collisions could support a rich research programme in particle and nuclear physics. Several future projects are being proposed around the world, in particular eRHIC at BNL and MEIC at JLAB in the US, and LHeC at CERN in Europe. This presentation will highlight some of the accelerator physics issues, and describe related technical developments and challenges for these machines. In particular, optics design and beam dynamics studies are discussed, including longitudinal phase space manipulation, coherent synchrotron radiation, beam-beam kink instability, ion effects, as well as mitigation measures for beam break up and for space-charge induced emittance growth, all of which could limit the machine performance. Finally, first steps are presented towards an LHeC R&D facility, which should investigate relevant beam-physics processes.

01-Oct-13	15:00 – 15:30	Oral	Auditorium A (Parallel)

TUOCA — Contributed Oral Presentations, Colliders

Chair: Y.H. Chin (KEK)

TUOCA1 15:00 **Collimation with Hollow Electron Beams: A Proposed Design for the LHC Upgrade** – ***G. Stancari***, *V. Previtali, A. Valishev (Fermilab) R. Bruce, S. Redaelli, A. Rossi, B. Salvachua (CERN) V. Moens (EPFL)*

Collimation with hollow electron beams is a technique for halo removal in high-power hadron beams. A magnetically confined, pulsed electron beam with a hollow current-density profile overlaps with the circulating beam over a short section of the ring. If the electron distribution is axially symmetric, the beam core is unperturbed, whereas the halo experiences smooth and tunable transverse kicks. This device addresses some of the limitations of traditional collimators, such as material damage, impedance, loss spikes during setup, and fragmentation in the case of ion collimation. The technique was tested extensively at the Fermilab Tevatron collider using a hollow electron gun installed in one of the Tevatron electron lenses*. Within the US LHC Accelerator Research Program and the European HiLumi LHC Design Study, the applicability of this technique to the LHC is being investigated and a conceptual design was developed. We review some of the main topics related to this study: the development of hollow electron guns; tracking simulations to estimate achievable halo removal rates and the effects of imperfections on the proton core; and integration of the device in the LHC machine.

* G. Stancari et al., Phys. Rev. Lett. 107, 084802 (2011).

TUOCA2 15:15 **RHIC Electron Lens Commissioning** – ***X. Gu***, *Z. Altinbas, M. Anerella, D. Bruno, M.R. Costanzo, W.C. Dawson, K.A. Drees, W. Fischer, B. Frak, D.M. Gassner, K. Hamdi, J. Hock, L.T. Hoff, A.K. Jain, J.P. Jamilkowski, R.F. Lambiase, Y. Luo, M. Mapes, A. Marone, C. Mi, R.J. Michnoff, T.A. Miller, M.G. Minty, C. Montag, S. Nemesure, W. Ng, D. Phillips, A.I. Pikin, S.R. Plate, P.J. Rosas, P. Sampson, J. Sandberg, L. Snydstrup, Y. Tan, R. Than, C. Theisen, P. Thieberger, J.E. Tuozzolo, P. Wanderer, W. Zhang (BNL)*

In the 2013 RHIC polarized proton run, it was found that the RHIC bunch intensity has reached a limit due to the head-on beam-beam interaction at $2x10^{11}$, as expected by simulations. To overcome this limitation, two electron lenses will be used for compensation. We report on the commissioning of new lattices that reduce beam-beam driven resonance driving terms, and bunch-by-bunch proton diagnostic during 2013 run. The effect of electron beam transport solenoids on the proton orbit was tested. The instrumentation for Blue electron lens was tested and electron beam was propagated from the gun to the collector. A timing system was implemented for the electron beam. Control software, machine protection and synoptic display were developed and tested during commissioning. Both Blue and Yellow electron lens superconducting magnets are installed and their field straightness was measured and corrected in the tunnel using a magnetic needle. The Yellow vacuum system and backscattered electron detectors installation are also completed now.

01-Oct-13	15:30 – 16:00	Oral	Auditorium A (Parallel)

TUODA — Contributed Oral Presentations, Accelerator Systems

Chair: T. Satogata (JLAB)

TUODA1 15:30 **High Pressure Gas-Filled RF Cavities for Use in a Muon Cooling Channel** – ***B.T. Freemire***, *P.M. Hanlet, Y. Torun (IIT) M. Chung, M.R. Jana, M.A. Leonova, A. Moretti, T.A. Schwarz, A.V. Tollestrup, Y. Torun, K. Yonehara (Fermilab) M.G. Collura (Politecnico di Torino) R.P. Johnson (Muons. Inc.)*

A high pressure hydrogen gas-filled RF (HPRF) cavity can operate in the multi-Tesla magnetic fields required for a muon accelerator cooling channel. A beam test was performed at the Fermilab MuCool Test Area by sending a 400 MeV proton beam through an 805 MHz cavity and quantifying the effects of the resulting plasma within the cavity. The resulting energy loss per electron-ion pair produced has been measured at 10^{-18} to 10^{-16} J every RF cycle. Doping the hydrogen gas with oxygen greatly decreases the lifetime of an electron, thereby improving the performance of the HPRF cavity. Electron lifetimes as short as 1 ns have been measured. The recombination rate of positive and negative ions in the cavity has been measured on the order of 10^{-8} cm^3/s. Extrapolation in both gas pressure and beam intensity are required to obtain Muon Collider parameters, however the results indicate HPRF cavities can be used in a muon accelerator cooling channel.

TUODA2 15:45 **Test of Optical Stochastic Cooling in the IOTA Ring** – ***V.A. Lebedev***, *Y. Tokpanov (Fermilab) M.S. Zolotorev (LBNL)*

A new 150 MeV electron storage ring is being built at Fermilab. The construction of a new machine pursues two goals a test of highly non-linear integrable optics and a test of optical stochastic cooling (OSC). This paper discusses details of OSC arrangements, choice of major parameters of the cooling scheme and experimental tests of the optical amplifier prototype. The amplifier uses highly doped Ti-sapphire crystal as amplification medium. The major goal of experiments is to measure the amplifier dispersion which determines lengthening of single particle signal and the effective bandwidth of the system.

01-Oct-13	16:00 – 16:30	Oral	Auditorium A (Parallel)

TUZBA — Invited Oral Presentation, Accelerator Systems

Chair: T. Satogata (JLAB)

TUZBA1 16:00 **The Digital RF Control Revolution** – ***C. Hovater*** *(JLAB)*

Over the last 20 years a migration has taken place from analog signal processing to digital signal processing for RF cavity control. The motivation behind the new generation of RF controls is twofold. Some of it can be attributed to the challenging RF control requirements needed for the higher performing cavities and accelerators. Second is the explosive growth of digital communication technology and its applicability to RF cavity control. The flexibility and performance of digital controls has allowed these new accelerators (especially light sources) to meet their requirements. This presentation reviews the historical advances of the technology and the world-wide progress in digital RF system control for linacs, rings, normal conducting and superconducting RF systems.

01-Oct-13	14:00 – 15:00	Oral	Auditorium B (Parallel)

TUZB — Invited Oral Presentations, Light Sources and FELs

Chair: M. Peiniger (RI Research Instruments GmbH)

TUZB1 14:00 **Free Electron Lasers in the Soft X-ray Regime** – ***J.N. Corlett*** *(LBNL)*
The science needs for probing materials to determine electronic structure with elemental specificity, imaging, and spectroscopies, with ultrafast time resolution, drive soft X-ray FEL design. In addition to operational soft X-ray facilities, there are FEL construction projects under way that include soft X-ray laser capabilities, and planned facilities with novel capabilities. This paper provides a review of the exciting field of existing and planned soft X-ray Free Electron Lasers with the emphasis on new schemes and new technologies to achieve better performance.

TUZB2 14:30 **Developments in Hard X-ray FELs** – ***H.-S. Kang*** *(PAL)*
LCLS has accumulated significant operational experience, now including hard X-ray self-seeding, and SACLA has successfully delivered hard X-ray laser beams to users. The European XFEL is in an advanced stage of construction, the SwissFEL and PAL-XFEL projects are in early stages of construction, and MaRIE is in planning stages. This presentation should provide an overview of progress and plans for hard x-ray facilities worldwide.

01-Oct-13	15:00 – 15:30	Oral	Auditorium B (Parallel)

TUOCB — Contributed Oral Presentations, Light Sources and FELs

Chair: M. Peiniger (RI Research Instruments GmbH)

TUOCB1 15:00 **Machine Based Optimization Using Genetic Algorithms in a Storage Ring** – ***K. Tian****, J.A. Safranek, Y.T. Yan (SLAC)*
The genetic algorithm (GA) has been a popular technique in optimizing the design and operation of particle accelerators. As a population based algorithm, GA requires a large amount of evaluations of the objective functions, which can be very time consuming. One can benefit from parallel computing with significantly reduced computing time when fulfilling the function evaluation by a numerical machine model in simulation codes. As a result, this is the most common approach in GA applications. In this paper, we present a successful experimental demonstration of applying the GA in real machine based optimization. We conduct the optimization of the linear coupling of the SPEAR3 storage ring using the GA by directly varying the strengths of SPEAR 3 skew quadrupoles, the decision variables, and measuring the beam loss rates, the sole objective function. The results in this paper can shed light on new applications of GAs in particle accelerator community.

TUOCB2 15:15 **Successful Completion of the ALS Brightness Upgrade** – ***C. Steier****, A. Biocca, P.W. Casey, N. Li, A. Madur, H. Nishimura, D. Robin, S.L. Rossi, T. Scarvie, C. Sun, W. Wan (LBNL)*
The Advanced Light Source (ALS) at Berkeley Lab is one of the brightest sources for soft xrays worldwide. A multi-year upgrade of the ALS is underway, which includes new and replacement x-ray beamlines, a replacement of many of the original insertion devices and many upgrades to the accelerator. The accelerator upgrade that affects the ALS performance most directly is the brightness upgrade, which reduced the horizontal emittance from 6.3 nm to 2.0 nm (2.5 nm effective), resulting in one of the lowest horizontal emittance of operating light sources. Magnets for this upgrade were installed in late 2012 and early 2013 followed by successful commissioning and user operation with 2.0 nm horizontal emittance.

TUODB — Contributed Oral Presentations, Hadron Colliders

Chair: L. Rybarcyk (LANL)

TUODB1 15:30 **Studies of the Low Energy Proton Beam Halo Experiment** – ***H. Jiang***, *P. Chen, S. Fu, T. Huang, F. Li, P. Li, H.C. Liu, C. Meng, M. Meng, Z.C. Mu, H.F. Ouyang, J. Peng, L.Y. Rong, B. Sun, J.M. Tian, B. Wang, S.C. Wang, W.Q. Xin, T.G. Xu, L. Zeng, F.X. Zhao (IHEP)*

Space charge forces acting in a mismatched beam have been commonly identified as a major cause of beam halo. The knowledge of the details of the initial 6D phase-space distribution is very important for simulation. We have charactered the beam transversal 4D distribution in the experiment and then used this initial beam parameters to simulate the beam dynamics.

TUODB2 15:45 **Longitudinal Beam Dynamics and LLRF Requirements for the Project X Pulsed Linac** – ***A. Vivoli***, *G.I. Cancelo, B. Chase, N. Solyak (Fermilab)*

Project X is a high intensity proton facility being developed to support the intensity frontier physics program over the next two decades at Fermilab. The Reference Design is based on a continuous wave (CW) superconducting 3 GeV linac providing up to 1 and 3 MW of beam power at 1 and 3 GeV respectively, while a superconducting pulsed linac provides acceleration of roughly 4.3% of the beam delivered from the CW linac to the 8 GeV injection energy of the existing Recycler/Main Injector complex. In this paper we present the results of simulation of longitudinal beam dynamics and Low Level RF (LLRF) control system in the pulsed linac, operated for long pulses in presence of errors and cavity detuning for different RF configurations and settings, and set the requirements for the LLRF necessary to fulfill the specifications of the design.

TUODB3 16:00 **Multi-Turn Injection of 50 MeV Protons Into the CERN Proton Synchrotron Booster** – ***V. Raginel***, *E. Benedetto, C. Carli, B. Mikulec (CERN)*

Since 1978, Linac2 produces beams of 50 MeV protons with an average current of 150 mA, which are injected into the CERN Proton Synchrotron Booster (PSB) with conventional multi-turn injection using a septum. It is planned to replace Linac2 during a future long stop with a new H^- linac, Linac4, injecting at higher energy (160 MeV) and making use of the modern charge-exchange injection principle. Due to the age of Linac2 and to a delicate vacuum situation the risk of a serious Linac2 breakdown has to be considered. Therefore it is necessary to know if the PSB could produce beams useful for the LHC and other experiments injecting a Linac4 proton beam at 50 MeV with much lower average current compared to Linac2 and without the need for a long installation of the 160 MeV H^- injection hardware. Benchmarking of the PSB injection model with the existing injection system with Linac2 using the ORBIT code has been done for several types of beams (low intensity to high intensity beams), and then the injection model was used to estimate the brightness for LHC-type beams that could potentially be reached in one PSB ring with the injection of a Linac4 proton beam.

TUODB4 16:15 **nuSTORM: Neutrinos from STORed Muons** – ***A.D. Bross*** *(Fermilab)*

Neutrino beams produced from the decay of muons in a racetrack-like decay ring provide a powerful way to study short-baseline neutrino oscillation and neutrino interaction physics. In this talk, I will describe the facility, nuSTORM, and show how the unique neutrino beam at the facility will enable experiments of unprecedented precision to be carried out. I will present sensitivity plots that indicated that this approach can provide well over 5 sigma confirmation or rejection of the LSND/MinBooNE results and can be used to perform neutrino interaction measurements of unprecedented precision. The unique ν beam available at the nuSTORM facility has the potential to be transformational in our approach to ν interaction physics, offering a "ν light source" to physicists from a number of disciplines. Finally, the nuSTORM facility can also provide intense short-pulsed beams of low energy muons suitable for future 6D muon ionization cooling experiments. This can be simultaneously while carrying out the neutrino program.

WEOAA — Contributed Oral Presentations, Light Sources and FELs

Chair: K.-J. Kim (ANL)

WEOAA1 08:30 **NGLS - A Next Generation Light Source** – ***J.N. Corlett***, *A.P. Allezy, D. Arbelaez, J.M. Byrd, C.S. Daniels, S. De Santis, W.W. Delp, P. Denes, R.J. Donahue, L.R. Doolittle, P. Emma, D. Filippetto, J.G. Floyd, J.P. Harkins, G. Huang, J.-Y. Jung, D. Li, T.P. Lou, T.H. Luo, G. Marcus, M.T. Monroy, H. Nishimura, H.A. Padmore, C. F. Papadopoulos, G.C. Pappas, S. Paret, G. Penn, M. Placidi, S. Prestemon, D. Prosnitz, H.J. Qian, J. Qiang, A. Ratti, M.W. Reinsch, D. Robin, F. Sannibale, R.W. Schoenlein, C. Serrano, J.W. Staples, C. Steier, C. Sun, M. Venturini, W.L. Waldron, W. Wan, T. Warwick, R.P. Wells, R.B. Wilcox, S. Zimmermann, M.S. Zolotorev (LBNL) C. Adolphsen, K.L.F. Bane, Y. Ding, Z. Huang, C.D. Nantista, C.-K. Ng, H.-D. Nuhn, C.H. Rivetta, G.V. Stupakov (SLAC) D. Arenius, G. Neil, T. Powers, J.P. Preble (JLAB) C.M. Ginsburg, R.D. Kephart, A.L. Klebaner, T.J. Peterson, A.I. Sukhanov (Fermilab)*

We present an overview of design studies and R&D toward NGLS – a Next Generation Light Source initiative at LBNL. The design concept is based on a multi-beamline soft x-ray FEL array powered by a CW superconducting linear accelerator, and operating with a high bunch repetition rate of approximately 1 MHz. The linac design uses TESLA and ILC technology, supplied by an injector based on a CW normal-conducting VHF photocathode electron gun. Electron bunches from the linac are distributed by RF deflecting cavities to the array of independently configurable FEL beamlines with nominal bunch rates of ∼100 kHz in each FEL, with uniform pulse spacing, and some FELs capable of operating at the full linac bunch rate. Individual FELs may be configured for different modes of operation, including self-seeded and external-laser-seeded, and each may produce high peak and average brightness x-rays with a flexible pulse format.

WEOAA2 08:45 **Cornell ERL Update** – ***G.H. Hoffstaetter***, *C.E. Mayes (Cornell University (CLASSE), Cornell Laboratory for Accelerator-Based Sciences and Education)*

Cornell University has pioneered the design and hardware for ERL lightsources. This preparatory research for ERL-lightsource construction will be discussed. Important milestones have been achieved in Cornell's prototype ERL injector, including the production of a prototype SRF cavity that exceeds design specifications, the regular production of long-lived and low emittance cathodes, the acceleration of ultra-low emittance bunches, and the world-record of 75 mA current from a photoemission DC gun. We believe that demonstration of the practical feasibility of these technologies have progressed sufficiently to allow the construction of an ERL-based lightsource like the Cornell ERL.

WEOAA3 09:00 **APS Superconducting Undulator Beam Commissioning Results** – ***K.C. Harkay***, *L.E. Boon, M. Borland, G. Decker, J.C. Dooling, C.L. Doose, L. Emery, J. Gagliano, Q.B. Hasse, Y. Ivanyushenkov, M. Kasa, J.C. Lang, D. Robinson, V. Sajaev, K.M. Schroeder, N. Sereno, Y. Shiroyanagi, D. Skiadopoulos, M.L. Smith, E. Trakhtenberg, A. Xiao, A. Zholents (ANL) L.E. Boon (Purdue University)*

The first prototype superconducting undulator (SCU0) was successfully installed and commissioned at the Advanced Photon Source (APS) and is delivering photons for user science. All the requirements before operating the SCU0 in the storage ring were satisfied during a short but detailed beam commissioning. The cryogenic system performed very well in the presence of the beam. The total beam-induced heat load on the SCU0 agreed well with the predictions, and the SCU0 is protected from excessive heat loads through a combination of orbit control and SCU0 alignment. When powered, the field integral measured with the beam agreed well with the magnet measurements. An induced quench caused very little beam motion, and did not cause loss of the beam. The device was found to quench during unintentional beam dumps, but quench recovery is transparent to storage ring operation. There were no beam chamber vacuum pressure issues and no negative effect observed on the beam. Finally, the SCU0 was operated well beyond its design requirements, and no significant issues were identified. The beam commissioning results are described in this paper.

WEOAA4 09:15 **Low Emittance in the Cornell ERL Injector Prototype** – ***C.M. Gulliford****, A.C. Bartnik, I.V. Bazarov, B.M. Dunham (Cornell University (CLASSE), Cornell Laboratory for Accelerator-Based Sciences and Education)*

We present a detailed study of the emittances produced in the Cornell Energy Recovery Linac Photoinjector. Both the horizontal and vertical transverse phase spaces, as well as the time-resolved (sliced) horizontal phase space, were simulated and directly measured at the end of the injector for 19 pC and 77 pC bunches at roughly 8 MeV. The resulting 90% normalized transverse emittances for 19 (77) pC/bunch were 0.23 ± 0.02 (0.51 ± 0.04) μm in the horizontal plane, and 0.14 ± 0.01 (0.29 ± 0.02) μm in the vertical plane, respectively. These emittances were measured with a corresponding bunch length of 2.1±0.1 (3.0±0.2) ps, respectively. For both bunch charges, the rms momentum spread was determined to be on the order of 10–3. Excellent overall agreement between measurement and simulation has been demonstrated. The beam brightness measured in this work is significantly better than the best of modern storage rings, and represents a milestone for the field of high-brightness, high-current photoinjectors.

02-Oct-13 09:30 – 10:00 Oral Auditorium A (Parallel)

WEXA — Invited Oral Presentation, Light Sources and FELs

Chair: K.-J. Kim (ANL)

WEXA1 09:30 **Overview of Seeded FELs and Harmonic Generation** – ***Z.T. Zhao*** *(SINAP)*

Overview of Seeded FELs and Harmonic Generation High-gain free-electron lasers (FELs) have been a remarkable success as the fourth generation light sources. In the last decade, tremendous progress has been made in both theoretical understandings and successful constructions and operations of large-scale FEL facilities all over the world. To generate fully coherent, ultrafast X-rays with high brightness, various novel seeded FEL schemes, including self-seeding, HHG seeding, HGHG and harmonic cascade, ECHO, etc., have been proposed and experimentally demonstrated in recent years. This paper gives an overview of recent achievements and prospects for future developments in these seeded high-gain FELs.

02-Oct-13 10:30 – 11:30 Oral Auditorium A (Parallel)

WEYA — Invited Oral Presentations, Accelerator Systems

Chair: M. White (ANL)

WEYA1 10:30 **Recent Results from the APEX Gun Project at LBNL** – ***F. Sannibale*** *(LBNL)*

The commissioning at the Lawrence Berkeley National Laboratory (LBNL) of a high-brightness high-repetition rate (MHz-class) photo-gun, based on a normal conducting 186 MHz (VHF-band) RF cavity operating in CW mode, is now completed. The gun has been designed to satisfy the requirements for operating high-repetition rate

4th generation light sources. Test of high quantum efficiency photocathodes with bunches of hundreds pC at MHz repetition rate are now underway. They include, Cs2Te cathodes developed in collaboration with INFN-LASA and multialkali antimonides (CsK2Sb), prepared by a collaborating group at LBNL. The present experimental results and the plan for future activities are presented.

WEYA2 11:00 **Experience with the SNS Loss Monitoring and Machine Protection** – ***A.P. Zhukov*** *(ORNL)*
The Spallation Neutron Source (SNS) is a megawatt class hadron accelerator. Beam loss monitoring is essential for machine protection, residual activation control and machine tuning. We discuss all parts of our beam loss monitoring system including its detectors, electronics, machine protection system (MPS) interface and its role in the accelerator tuning process. The system was designed more than 10 years ago, so we are now addressing obsolescence problems by designing a new FPGA based replacement. The plans for this next generation BLM system are presented.

02-Oct-13	11:30 – 12:00	Oral	Auditorium A (Parallel)

WEOBA — Contributed Oral Presentations, Accelerator Systems

Chair: W.L. Waldron (LBNL)

WEOBA1 11:30 **Initial X-band Photoinjector Performance at SLAC** – ***C. Limborg-Deprey***, *C. Adolphsen, M.P. Dunning, C. Hast, R.K. Jobe, H. Li, T.J. Maxwell, D.J. McCormick, T.O. Raubenheimer, S.P. Weathersby (SLAC)*
The X-Band Test Area (XTA) at SLAC is an all X-Band compact RF photoinjector that can produce short, high current electron bunches. Computations have shown that the peak bunch brightness should exceed that from S-Band RF photoinjectors by a factor of four. This improved performance principally comes from the high (200 MV/m) peak fields that can be sustained on the gun cathode. During the first three months of XTA commissioning, 20 pC electron bunches have been routinely generated with the gun cathode operating at greater than 200 MV/m while the dark current levels have been low. The electron bunches are accelerated to 70 MeV in a one-meter long, travelling-wave, X-band structure after the gun (a newer version of this structure should allow acceleration to more than 100 MeV). This paper reviews progress to date including measurements of the bunch properties and the bunch-to-bunch stability. The lengths of the 20 pC bunches have been measured with a transverse X-Band deflection cavity to be 250 fs rms, as expected from simulations. Transverse emittance in the range of 0.9 mm-mrad have been measured. A path to reach expected low transverse emittance numbers is described.

WEOBA2 11:45 **Ultra-Short Electron Bunch Generation by a Photocathode RF Gun** – ***M. Mizugaki***, *Y. Koshiba, K. Sakaue, M. Washio (Waseda University) R. Kuroda (AIST) T. Takatomi, J. Urakawa (KEK)*
We have been studying on the accelerator physics at Waseda University with BNL type 1.6cell rf gun. Such photocathode rf gun can generate low emittance and short bunch electron beam. Generating ultra-short electron bunch (shorter than 1ps) in a compact accelerator system would be meaningful because some applications need to be miniaturized, THz imaging, for example. However a short laser pulse cannot generate the bunch length of less than 1ps due to the space charge effects. So as to generate ultra-short electron bunch in compact system, we have newly designed Energy Chirping Cell attached rf gun (ECC rf gun). ECC is attached subsequently to the 1.6 cell. The role of ECC is to chirp the electron energy so that the electron bunch is compressed by velocity difference as it drifts. Simulation results show ECC rf gun can accelerate100pC electron bunch with the bunch length

shorter than 100fs. We have successfully measured the coherent THz light by synchrotron radiation and transition radiation. Therefore, we inferred that the bunch was compressed into shorter than 1ps. In this conference, we will report the results of the bunch length measurement, present progresses and future plans.

02-Oct-13	12:00 – 12:30	Oral	Auditorium A (Parallel)

WEOCA — Contributed Oral Presentations, Accelerator Technology

Chair: W.L. Waldron (LBNL)

WEOCA1 12:00 **Robust High Average Power Modulator** – ***I. Roth***, *N. Butler, M.P.J. Gaudreau, M.K. Kempkes (Diversified Technologies, Inc.)*
Diversified Technologies Inc. (DTI) designed a modulator which meets the requirements of the Spallation Neutron Source (SNS) modulators at Oak Ridge National Laboratory and will be less expensive than copies of the current modulators. The SNS modulators, under development for a decade, still do not meet the specifications for voltage, droop, or pulsewidth. The modulators must provide pulses of 85 kV, 165 A, with pulsewidths of 1.5 ms and voltage flatness of 1%. The current modulator switches the full power at high frequency during each pulse, and has a complex output transformer. DTI designed a modulator that meets all specifications and is less expensive. The proposed design is cheaper because there is an HV switch that operates at full current only once per pulse, a corrector that switches only 5% of the power at high frequency, a low-cost transformer-rectifier power supply, and no output transformer. DTI's patented switch uses IGBTs, allowing the switch to operate at full capacity even if 20% of the devices fail. The modulator will be installed in 2013 at SNS to test klystrons. DTI will present the system components of the design as well as the performance results to date.

WEOCA2 12:15 **Inductively Coupled Pulsed Energy Extraction System for 2G Wire-based Magnets** – ***R.B. Agustsson***, *J.J. Hartzell, S. Storms (RadiaBeam)*
This project seeks to develop a novel method for quench protection of high-temperature superconducting (HTS) magnets based on coupling the magnet with a high-power resonant coil. The quench protection is realized by applying an electromagnetic pulse through the resonant coil and disrupting the superconducting state in the conductor. This creates a large (10s of meters) normal zone in less than 10 ms thus ensuring even distribution of the energy dissipation. The proposed protection system does not involve generation of high voltage on the coil leads and does not contribute to cryogenic losses. The system is easily scaled to a magnet of arbitrary size. Preliminary design and POC bench top test results are presented below.

02-Oct-13	08:30 – 09:30	Oral	Auditorium B (Parallel)

WETB — Tutorial, Colliders

Chair: Y. Yamazaki (FRIB)

WETB1 08:30 **Physics of Polarized Protons in Accelerators** – ***M. Bai*** *(BNL)*
RHIC has reached new record luminosity and proton beam polarizations at the collisions energy of 510 and 200 GeV. Depolarizing effects during acceleration and storage can lead to polarization profiles and therefore reduced average polarization at the collision points. The presentation will introduce the concept of depolarizing resonances and methods to overcome them during beam acceleration, measuring techniques for the proton beam polarization and techniques to maintain the beam polarization during an extended store.

02-Oct-13	09:30 – 10:00	Oral	Auditorium B (Parallel)

WEOAB — Contributed Oral Presentations, Hadron Accelerators

Chair: Y. Yamazaki (FRIB)

WEOAB1 09:30 **Status of the FRIB Front End** – ***E. Pozdeyev***, *N.K. Bultman, G. Machicoane, G. Morgan, X. Rao, Q. Zhao (FRIB)*
The FRIB Front End will provide beams of stable ions with a mass up to uranium at a beam energy of 500 keV/u and intensity required to achieve a power of 400 kW on the fragmentation target. In this paper, we describe progress with the design and construction of the Front End and its systems.

WEOAB2 09:45 **Upgrade of Argonne's CW SC Heavy Ion Accelerator** – ***P.N. Ostroumov***, *A. Barcikowski, Z.A. Conway, S.M. Gerbick, M. Kedzie, M.P. Kelly, S.H. Kim, R.C. Murphy, B. Mustapha, T. Reid, S.I. Sharamentov, G.P. Zinkann (ANL)*
The ATLAS National User Facility is world's first CW superconducting linac and provides variety of ion beams for nuclear physics experiments for the past 30 years. The accelerator is being continuously upgraded to extend the scientific reach. A new normal conducting CW RFQ capable to provide total voltage up to 2.1 MV for the heaviest uranium ions has been added in the front of the SC linac in order to increase efficiency and intensity of both stable and radioactive ion beams. The RFQ has been fully integrated into the ATLAS and it is routinely operated since January 2013. A new cryomodule of high-performance 72.75 MHz SC QWRs has been built and currently it is being commissioned off-line. New design and fabrication techniques have been applied for production of QWRs which resulted to new record voltages up to 4-5 MV per cavity and low residual resistance of 2-3 nOhm at 2K as was demonstrated in individual cold testing of several QWRs. Primary purpose of the new cryomodule is to increase intensity of accelerated stable ion beams. Beam commissioning will take place at the end of year after substantial modification of the booster area including radiation shielding.

02-Oct-13	10:30 – 12:30	Oral	Auditorium B (Parallel)

WEYB — Invited Oral Presentations, Industrial Accelerators and Applications

Chair: R.W. Hamm (R&M Technical Enterprises)

WEYB1 10:30 **Commercial Applications of Small SRF Accelerators** – ***T.L. Grimm*** *(Niowave, Inc.)*
Niowave, Inc. has developed complete turn-key superconducting electron linacs for a broad range of commercial applications. In addition to the niobium accelerating structure, the complete system includes the liquid helium refrigerator, high power microwave source, radiation shielding and licensing from the Nuclear Regulatory Commission. This integrated system enables a company or university research group to quickly and inexpensively use the electron beam for a number of applications, including high-power x-ray sources, production of medical radioisotopes, and high-power free-electron lasers. Superconducting technology allows the linac to operate continuously with higher average beam intensity (current) than any other type of accelerator (cyclotron, copper linac, etc.). Linacs with beam energy of 0.5 to 50 MeV and average beam power of 1 W to 1 MW are under development, and two integrated helium refrigerator models have been developed with leading experts in the cryogenic industry. This contribution will discuss these integrated accelerator systems.

WEYB2 11:00 **Ion Implantation: The Largest Use of Industrial Accelerators** – ***S.B. Felch*** *(Susan Felch Consulting) M.I. Current (Current Scientific) M.C. Taylor (Taylor Consulting)*
The implantation of ion beams into materials, primarily semiconductors, is by far the largest industrial accelerator application, with more than 10,000 systems having been sold for this purpose during the past 30 years. This talk should review the status of this very large application.

WEYB3 11:30 **Electron Beam Irradiation Applications** – ***S. Sabharwal*** *(IAEA)*
The irradiation of materials with electron beams or X-rays is used extensively to enhance or modify their physical, chemical, or biological properties. These electron beam "irradiators" cover a very wide range of accelerator technology, beam current and energies to produce a wide variety of products, mostly with polymers. They also are used for curing ink, coatings, and adhesives, as well as for the sterilization of medical products, disinfection and preservation of food. The emerging applications include treatment of waste waters and flue gases, and degradation of plastics for use in coating and inks. The status of applications and role of IAEA in enhancing these will be presented.

WEYB4 12:00 **Low Energy Electron Linacs for Homeland Security** – ***H.B. Chen*** *(TUB)*
This presentation should provide an overview of the latest developments on the technologies of low energy electron linacs and their applications at cargo inspection, irradiation for quarantine, and so on.

02-Oct-13 14:00 – 15:30 Oral Auditorium A (Parallel)

WEZAA — Invited Oral Presentations, Accelerator Technology

Chair: H.-D. Nuhn (SLAC)

WEZAA1 14:00 **Advanced Instrumentation Systems for FELs** – ***P.E. Evtushenko*** *(JLAB)*
This presentation will cover advanced instrumentation systems for FELs and ERLs.

WEZAA2 14:30 **Overview and Lessons Learned of the Jefferson Lab Cryomodule Production for the CEBAF 12 GeV Upgrade** – ***J. Hogan****, M.A. Drury, L. Harwood, C. Hovater (JLAB) A. Burrill (HZB) C.E. Reece (JLab)*
The Continuous Electron Beam Accelerator Facility (CEBAF) at Jefferson Lab is nearing completion of an energy upgrade from 6 to 12 GeV. An integral part of the upgrade is the addition of ten new cryomodules, each consisting of eight seven-cell superconducting radio-frequency (SRF) cavities. An average performance of 100+MV of acceleration per cryomodule is needed to achieve the 12 GeV beam energy goal. The production methodology was for industry to provide and deliver the major components to Jefferson Lab, where they were tested and assembled into cryomodules. The production process begins with an inspection upon receiving of all major components followed by individual performance qualification testing. The SRF cavities received their final chemical processing and cleaning at Jefferson Lab. The qualified components along with all associated hardware and instrumentation are assembled, tested, installed into CEBAF and run through an integrated system checkout in preparation for beam operations. The production process is complete and one of the first completed cryomodules has successfully produced 10^8 MV of acceleration with a linac beam current of 465 uA.

WEZAA3 15:00 **Advances in SRF Materials Science aimed at High Q Cavities** – ***A. Grassellino*** *(Fermilab)*

Several SRF accelerators worldwide target continuous wave operation at medium accelerating gradients. Examples include light sources, ERLs, Project X, accelerator driven systems and more. For these machines cryogenic losses dominate and therefore the quality factors of the SRF niobium cavities has a large impact on capital and operating costs. In this talk we will present the state of the art R&D in surface processing for maximization of quality factors in SRF niobium cavities, with consideration regarding different operating frequencies and temperature.

02-Oct-13	15:30 – 16:00	Oral	Auditorium A (Parallel)

WEZBA — Invited Oral Presentation, Accelerator Technology

Chair: P. Ferracin (LBNL)

WEZBA1 15:30 **SRF Cavities Beyond Niobium: Potential and Challenges** – ***S. Posen***, *M. Liepe (Cornell University (CLASSE), Cornell Laboratory for Accelerator-Based Sciences and Education)*

After many years of development, current preparation methods for niobium SRF cavities regularly achieve performance levels very close to the fundamental limitations of the material. Continued progress requires looking to alternative superconductors, but fabricating a high quality RF surface from these materials has proven uniquely challenging. In this talk, I will discuss the worldwide progress towards fabricating SRF cavity surfaces with alternative materials such as Nb3Sn, NbN, and MgB2. I will also discuss thin films and multilayer films of alternative materials, proposed as an alternative to bulk superconductors. I will present an improved theoretical understanding of the potential of such films. I will discuss new results and make suggestions for future directions beyond niobium.

02-Oct-13	16:00 – 16:30	Oral	Auditorium A (Parallel)

WEODA — Contributed Oral Presentations, Accelerator Technology

Chair: P. Ferracin (CERN)

WEODA1 16:00

Design of the Superconducting Magnet System for the SuperKEKB Interaction Region – ***N. Ohuchi***, *Y. Arimoto, N. Higashi, H. Koiso, A. Morita, Y. Ohnishi, K. Oide, H. Sugimoto, M. Tawada, K. Tsuchiya, H. Yamaoka, Z.G. Zong (KEK) M. Anerella, J. Escallier, A.K. Jain, A. Marone, B. Parker, P. Wanderer (BNL)*
SuperKEKB are now being constructed with a target luminosity of 8×10^{35} which is 40 times higher than KEKB. This luminosity can be achieved by the "Nano-Beam" scheme, in which both beams should be squeezed to about 50 nm at the beam interaction point, IP. The superconducting magnet system has been designed in order to attain high luminosity. The system consists of 8 superconducting quadrupoles, 4 superconducting solenoids and 43 superconducting correctors. The magnets are installed into two cryostats in the interaction region, IR. For each beam, the final focusing system consists of quadrupole-doublets with 8 superconducting quadrupoles. To reduce the beam emittance at the IP, the superconducting solenoids cancel the integral solenoid field of the particle detector, Belle II, on the beam lines. The corrector system is very complicated and the multi-layered coils are mainly assembled inside of the quadrupole bores. In the paper, we would like to describe the most updated design of the superconducting magnet system for the SuperKEKB IR.

WEODA2 16:15

Rapid Cycling Dipole Magnet – ***H. Witte***, *M. Anerella, J.S. Berg, P. Kovach (BNL) M.L. Lopes (Fermilab)*
One option for acceleration Muons from 30 to 750 GeV is to use a rapid cycling synchrotrons with frequencies of 400-550 Hz. A lattice has been proposed which employs 8T, 4.2 m long superconducting dipole magnets which are interleaved with 1.8T, 7.5 m long normal conducting dipoles. The present design of the normal conducting dipoles for this lattice is based on grain oriented steel, which possesses good magnetic properties in the direction of the grains. Grain oriented steel however is highly anisotropic, which can potentially lead to field quality problems. In this paper we present an alternative design, which suggests lower losses, a higher peak field and better field quality.

02-Oct-13	14:00 – 14:30	Oral	Auditorium B (Parallel)

WEZB — Invited Oral Presentation, Industrial Accelerators and Applications

Chair: S. Charisopoulos (International Atomic Energy Agency, Physics Section, Div. Physical and Chemical Sciences)

WEZB1 14:00

The Illinois Accelerator Research Center – ***R.D. Kephart*** *(Fermilab)*
The Illinois Accelerator Research Center (IARC) is a state-of-the-art facility being built at Fermilab to develop cutting-edge accelerator technologies in collaborations with private industrial partners. The center will also collaborate with local universities to serve as a training facility for a new generation of scientists, engineers and technical staff in accelerator technology.

02-Oct-13	14:30 – 15:00	Oral	Auditorium B (Parallel)

WEOBB — Contributed Oral Presentations, Industrial Accelerators and Applications

Chair: S. Charisopoulos (International Atomic Energy Agency, Physics Section, Div. Physical and Chemical Sciences)

WEOBB1 14:30 **Development of THz-TDS System on the Basis of the S-band Compact Electron Linac** – ***R. Kuroda*** *(AIST)*

The terahertz (THz) radiation is a useful tool for progressing on security field. Especially, THz time-domain spectroscopy (THz-TDS) has recently emerged as a powerful probe for the investigation of various dangerous materials such as explosives. A high power THz source has been developed on the basis of the S-band compact electron linac at AIST. The THz pulse is generated with coherent radiation using ultra-short electron bunch with bunch length of less than 0.5 ps (rms) and energy of around 40 MeV. The THz pulse is detected by Electro-Optical (EO) sampling method with a ZnTe crystal like the pump-probe technique. The THz temporal waveform can be measured using the probe laser. The spectrum and the phase information of the sample is calculated by the Fourier Transform of the obtained waveform. In this conference, we will talk about details of our system and results of THz-TDS experiments.

WEOBB2 14:45 **Development of a Time-tagged Neutron Source for Imaging with Enhanced Spatial Resolution** – ***T. Schenkel****, Q. Ji, B.A. Ludewigt, W.L. Waldron (LBNL)*

Associate particle imaging (API) is an active interrogation method for neutron based imaging of materials. Energetic alpha particles are emitted in kinematic correlation with neutrons in DT fusion reactions, forming a virtual neutron beam. When alphas are detected in a position sensitive detector and their arrival time is also recorded then time tagged neutrons can be used for 3D imaging e. g. of concealed objects in a transmission geometry or through detection of a prompt gamma ray. The imaging resolution in API systems is often limited by the area from which neutron originate. This area is determined by the spot size of a mixed D^+ and T^+ ion beam. We have adapted microwave driven ion sources (permanent magnets, 2.45 GHz) for the efficient production of hydrogen ions (all isotopes) with high current density (50 to 100 mA/cm^2) and high fractions of atomic ions [1]. The high current density allows us to extract ions with small apertures and form beam spots on the neutron production target of less than 1 mm in diameter. In our presentation we will describe the API principle and report our results on the development of an API system with high spatial resolution.

02-Oct-13 15:00 – 15:30 Oral Auditorium B (Parallel)

WEOCB — Contributed Oral Presentations, Medical Accelerators and Applications

Chair: S. Charisopoulos (International Atomic Energy Agency, Physics Section, Div. Physical and Chemical Sciences)

WEOCB1 15:00 **Diagnostic Proton Computed Tomography using Laser-driven Ion Acceleration** – ***K.E. Woods***, *S. Boucher (RadiaBeam) V.A. Bashkirov, R.W. Schulte (LLU/MC) B.M. Hegelich (The University of Texas at Austin)*

Although the growing utilization of computed tomography (CT)-based imaging has led to major advances in diagnostic capabilities, it has also resulted in higher cumulative radiation doses to patients. In order to fully exploit the benefits of high-resolution diagnostic CT scans while minimizing the risks of radiation-induced cancer, the realization of low-dose CT is crucial. Recent research has shown that the use of protons, rather than X-rays, for CT has the potential to greatly reduce the radiation dose delivered to the patient without reducing image quality. RadiaBeam Technologies, in collaboration with the Loma Linda University Medical Center and the University of Texas at Austin, is proposing the development of a proton CT scanner utilizing laser-driven ion acceleration (LDIA) techniques. The initial design of this system is presented.

WEOCB2 15:15 **Novel System for Radiography based on Channeling Radiation from LINAC** – ***T.V. Bondarenko***, *S.M. Polozov, A.Yu. Smirnov (MEPhI)*

Angiography is one of the most reliable and contemporary radiography procedures of the vascular system imaging. X-ray spectrums provided by all modern medical angiographs are too broad to acquire high contrast images and provide low radiation dose at the same time. The new method of narrow X-ray spectrum achieving is based on the idea of channeling radiation applications[1]. The X-ray polycapillary optics used in this method allows eliminating the high energy part of the spectrum and providing dramatic dose reduction. The scheme of the facility including the X-ray filter is discussed. The results of the spectrum analysis for the channeling radiation source and typical angiography X-ray tube are discussed. Doses obtained by the water phantom and contrast of the iodine agent image are also provided for both cases.

[1] Yu.A. Bashmakov, T.V. Bondarenko, S.M. Polozov, G.B. Sharkov Angiography X-ray monochromatic source based on radiation from crystals / Proceedings of RuPAC 2012, Saint-Petersburg, Russia, p. 406-408

02-Oct-13 15:30 – 16:00 Oral Auditorium B (Parallel)

WEZBB — Invited Oral Presentation, Beam Dynamics and Electromagnetic Fields

Chair: J.R. Cary (CIPS)

WEZBB1 15:30 **Optimizing Short Quadrupoles** – ***R.A. Baartman*** *(TRIUMF)*

Tradition quadrupoles have a constant vertical cross section with nearly discontinuous ends. A new shape is derived analytically that yields dramatically smaller aberrations.

WEODB — Contributed Oral Presentations, Beam Dynamics and Electromagnetic Fields

Chair: J.R. Cary (CIPS)

WEODB1 16:00 **New Method for Point-Charge Wakefield Calculation** – ***B. Podobedov*** *(BNL) G.V. Stupakov (SLAC)*

Extending our approach recently described in [1] we present a new method to accurately calculate point-charge geometric wakefields from wake potentials due to a much longer bunch, typically obtained with a time-domain EM field solver. By allowing a long bunch in the EM solver, this method can significantly reduce the need for computer resources as well as drastically shorten the computing time. On top of that, the method provides profound physics insights. We give examples of longitudinal and transverse wakefield calculations for 2D and 3D accelerator structures which illustrate the effectiveness of the new method.

[1] B. Podobedov, G. Stupakov, PRST-AB 16, 024401 (2013)

WEODB2 16:15 **Space Charge Models for Particle Tracking on Long Time Scales** – ***J.A. Holmes****, S.M. Cousineau, A.P. Shishlo (ORNL) R.E. Potts (UTK)*

In order to efficiently track charged particles over long times, most tracking codes use either analytic charge distributions or particle-in-cell (PIC) methods based on fast Fourier transforms (FFTs). While useful for theoretical studies, analytic distribution models do not allow accurate modeling of real machines. PIC calculations can utilize realistic space charge distributions, but these methods suffer from the presence of numerical diffusion. We examine the situation for particle tracking with space charge over long times, and consider possible ideas to improve the accuracy of such calculations.

03-Oct-13	08:30 – 09:00	Oral	Auditorium A (Parallel)

THOAA — Contributed Oral Presentations, Industrial Accelerators and Applications

Chair: R.P. Johnson (Muons. Inc.)

THOAA1 08:30 **Single-Shot Ultrafast Electron Microscopy** – ***R.K. Li***, *P. Musumeci (UCLA)*

Electron microscopy is an extremely powerful tool for a variety of studies in physics, biology, material science, and industrial applications. One of the mostly desired capabilities of a future electron microscopy is the improved resolving power in the time domain approaching ps or even fs levels. In this paper we show that the low emittance, low energy spread electron beams from a state-of-the-art photoinjector can be used to take single-shot intensity-contrast snapshots of the sample. The spatial-temporal resolution can achieve 10 nm – 1 ps level. The beam optics is based on permanent quadrupole magnets which are compact and avoid the high charge density cross-over in contrast to solenoids. The proposed single-shot ultrafast electron microscopy will greatly facilitate the studies of irreversible dynamic process in materials.

THOAA2 08:45 **Compact, Inexpensive X-band Linacs as Radioactive Isotope Source Replacements** – ***S. Boucher***, *R.B. Agustsson, L. Faillace, J.J. Hartzell, A.Y. Murokh, S. Seung, A.V. Smirnov, S. Storms, K.E. Woods (RadiaBeam)*

Radioisotope sources are commonly used in a variety of industrial and medical applications. The US National Research Council has identified as a priority the replacement of high-activity sources with alternative technologies, due to the risk of accidents and diversion by terrorists for use in Radiological Dispersal Devices ("dirty bombs"). RadiaBeam Technologies is developing novel, compact, inexpensive linear accelerators for use in a variety of such applications as cost-effective replacements. The technology is based on the MicroLinac (originally developed at SLAC), an X-band linear accelerator powered by an inexpensive and commonly available magnetron. Prototypes are currently under construction. This paper will describe the design, engineering, fabrication and testing of these linacs at RadiaBeam. Future development plans will also be discussed.

03-Oct-13	09:00 – 10:00	Oral	Auditorium A (Parallel)

THOBA — Contributed Oral Presentations, Accelerator Technology

Chair: R.P. Johnson (Muons. Inc.)

THOBA1 09:00 **High-Gradient Metallic Photonic Band-Gap (PBG) Structure Breakdown Testing At 17 GHz** – ***B.J. Munroe***, *M.A. Shapiro, R.J. Temkin (MIT/PSFC)*

Photonic Band-gap (PBG) structures continue to be a promising area of research for future accelerator structures. Previous experiments at X-Band have demonstrated that PBG structures can operate at high gradient and low breakdown probability, provided that pulsed heating is controlled. A metallic single-cell standing-wave structure has been constructed at MIT to investigate breakdown performance of PBG structures with very high surface temperature rise. The MIT standing-wave structure test stand has an available power of 4 MW for a maximum gradient of 130 MV/m; the actual realized gradient may be lower due to breakdown limitations. The MIT test stand will also utilize novel diagnostics, including fast camera imaging and optical spectroscopy of breakdowns.

THOBA2 09:15 **First Cavity Results from the Cornell SRF Group's Nb3Sn Program** – ***S. Posen****, M. Liepe (Cornell University (CLASSE), Cornell Laboratory for Accelerator-Based Sciences and Education)*

As an alternative material for SRF accelerator cavities, Nb3Sn presents two important benefits. Its large Tc gives it a very small surface resistance, leading to a huge reduction in cooling costs; and its predicted Hsh of nearly 400 mT would allow for very high gradients and therefore fewer cavities in high energy linacs. Researchers in the Cornell SRF group have recently fabricated two 1.3 GHz cavities coated with Nb3Sn. Testing of these first cavities has produced encouraging results, including a very high Tc and some very high performing regions. These cavity results as well as new sample results under TEM will be presented.

THOBA3 09:30 **Completion of the First SSR1 Cavity for PXIE and First Jacketed Tests** – ***L. Ristori*** *(Fermilab)*

Fermilab is in the process of constructing a proton linac to accelerate a 1 mA CW beam up to 30 MeV to serve as a test beam for the Project X Injector Experiment (PXIE). The major goals of PXIE are the validation of the Project X concept and mitigation of technical risks. The SSR1 cryomodule comprises the last portion of PXIE and contains 8 SSR1 cavities operating at 325 MHz with an optimal beta of 0.22. In this paper we present the lessons learned from the completion of the first cavity including the welding operations necessary to install the Nb-SST transition ring and the SST helium jacket. The results of various tests on the jacketed resonator are also presented.

THOBA4 09:45 **Development of Yb Laser For High Power Ultra-Short Pulse** – ***Y. Matsumura****, K. Koyama (University of Tokyo) M. Uesaka (The University of Tokyo, Nuclear Professional School) M. Yoshida, X. Zhou (KEK)*

Passively mode-locked Yb lasers can easily generate femtosecond pulse at high repetition rate. The Yb lasers also have a property of high efficiency, which enables us to obtain high power laser. Because of these characteristics, the Yb lasers have been applied to many fields such as optical frequency comb and X-ray generation. Now, femtosecond pulse of much higher energy at high repetition rate is being required for dielectric laser accelerator (DLA) and lasertron. We have developed high power mode-locked Yb laser, and achieved 20W mode-locked Yb fiber laser amplification system at repetition rate of 62MHz. At the conference, our latest results will be reported.

03-Oct-13 10:30 – 11:30 Oral Auditorium A (Parallel)

THYAA — Invited Oral Presentations, Alternative Acceleration Schemes

Chair: M.J. Hogan (SLAC)

THYAA1 10:30 **Latest Laser Plasma Acceleration Results from the BELLA Facility** – ***W. Leemans*** *(LBNL)*

The BELLA Project was formally launched and funded in 2009 by the Department of Energy, Office of High Energy physics to develop a new laser facility for forefront experiments on laser plasma acceleration at LBNL. The laser specifications were determined by relying on previous experiments that showed GeV electron beams and simulations. The BELLA laser can operate at peak power levels on the order of a Petawatt with a record setting repetition rate of 1 Hz for such a class of laser. Experiments have started in early 2013 and are aimed at studying the interaction of intense laser pulses in both gas jet and capillary discharge based plasma sources with as goal to obtain multi-GeV beams from structures that are less than a meter in length.

THYAA2
11:00

Latest Plasma Wakefield Acceleration Results from the FACET Project – ***M.D. Litos***, *E. Adli, C.I. Clarke, S. Corde, J.-P. Delahaye, R.J. England, A.S. Fisher, J.T. Frederico, S.J. Gessner, M.J. Hogan, S.Z. Li, D.R. Walz, G.R. White, Z. Wu, V. Yakimenko (SLAC) E. Adli (University of Oslo) W. An, C.E. Clayton, C. Joshi, W. Lu, K.A. Marsh, W.B. Mori, N. Vafaei-Najafabadi (UCLA) P. Muggli (MPI)*

SLAC's new FACET facility had its second user run in April–June, 2013. Several new milestones were reached during this run, including the achievement of beam driven plasma wakefield acceleration of a discrete witness bunch for the first time, and energy doubling in a noble gas plasma source. The FACET beam is a 20 GeV electron bunch with a charge of 3.2 nC that can be compressed and focused to a size of 20 μm × 20 μm × 20 μm rms. To create the two-bunch, drive/witness beam structure, a chirped and over-compressed beam was dispersed horizontally in a chicane and a bite was taken from its middle with a tantalum finger collimator, corresponding to a longitudinal notching of the beam due to the head-tail energy correlation. A new 10 terawatt Ti:Sapphire laser was commissioned and used during this run to pre-ionize the plasma source in order to increase the efficiency of energy transfer from the beam to the wake. Ultimately, a witness beam of hundreds of pC in charge was accelerated by a drive beam of similar charge in a pre-formed lithium plasma with a density of 5×10^{16} cm^{-}-3, experiencing gradients reaching several GeV/m in magnitude.

03-Oct-13	11:30 – 12:00	Oral	Auditorium A (Parallel)

THYBA — Invited Oral Presentation, Alternative Acceleration Schemes

Chair: X.Q. Yan (PKU)

THYBA1
11:30

Dielectric Wakefield Acceleration and Tests in the BNL ATF and SLAC FACET Facilities – ***S.P. Antipov*** *(Euclid TechLabs, LLC)*

In this presentation we will review Dielectric Wakefield Acceleration (DWA) methods and related concepts. Recent results obtained at SLAC FACET, BNL ATF and other facilities will be presented and possible applications outlined.

03-Oct-13	12:00 – 12:30	Oral	Auditorium A (Parallel)

THOCA — Contributed Oral Presentations, Alternative Acceleration Schemes

Chair: X.Q. Yan (PKU)

THOCA1
12:00

Ionization Injection and Betatron Radiation due to Envelope Oscillation of the Drive Electron Beam in Plasma Wakefield Accelerator (PWFA) Experiments at FACET – ***K.A. Marsh***, *W. An, C.E. Clayton, C. Joshi, W. Lu, W.B. Mori, N. Vafaei-Najafabadi (UCLA) E. Adli (University of Oslo) E. Adli, C.I. Clarke, S. Corde, J.-P. Delahaye, R.J. England, A.S. Fisher, J.T. Frederico, S.J. Gessner, M.J. Hogan, S.Z. Li, M.D. Litos, D.R. Walz, Z. Wu (SLAC) W. Lu (TUB) P. Muggli (MPI)*

Recent PWFA results at FACET at the SLAC National Accelerator Laboratory have shown a correlation between ionization-injected electrons and the betatron x-ray yield. PWFA experiments were carried out using a rubidium vapor heat pipe oven. The vapor density was $2.5\text{x}10^{17}$ cm^{-3} and was ionized by the electron beam via tunneling ionization. Injection of plasma electrons into the wake can limit the wake amplitude and deplete the accelerating gradient. Here, the source of injection and beam loading is the ionization of the second Rb electron. The amount of injected charge and x-ray yield are expected to be a function of the beam envelope oscillations where at the oscillation minima, the field of the beam is strong enough to ionize RbII, and at the oscillation maxima, the beam electrons radiate x-rays. For a matched beam, there is no beam oscillation and the x-ray yield is much lower. Thus, the x-ray yield and unwanted beam loading are greatly reduced. The FACET x-ray diagnostic can be used to tune the drive beam parameters for matched propagation in the plasma by minimizing the x-ray yield. Minimizing the x-ray yield should also reduce unwanted beam loading from secondary electrons.

THOCA2 12:15 **Experimental Progress on Staged Laser-plasma Acceleration** – ***S. Shiraishi**, C. Benedetti, E. Esarey, C.G.R. Geddes, A.J. Gonsalves, W. Leemans, N.H. Matlis, K. Nakamura, C.B. Schroeder, B. Shaw, T. Sokollik, S. Steinke, C. Tóth, J. van Tilborg (LBNL)*

Laser-plasma accelerators (LPAs)* have produced GeV electron beams (e-beams) from cm-scale devices, demonstrating that LPAs have great potential for reducing accelerator size and cost**]. LPA experiments performed to date utilize a single laser that drives the wakefield for injection and acceleration. For applications such as high-energy accelerators, LPA designs will rely on sequencing multiple acceleration stages, each driven by its own laser***. We present recent progress on the experiment staging two LPA modules at the LOASIS Program at Lawrence Berkeley National Laboratory. The experiment utilizes a 40 TW class laser which is split into two laser pulses. The first laser drives the first LPA module to produce an e-beam. The second laser drives the second LPA module and accelerates the e-beam from the first LPA. Excited wakefields in the second LPA module are diagnosed through spectral redshifting of the drive laser, which is an indicator of the efficiency of laser energy transfer into the plasma through the generation of coherent plasma wakefields****.

* E. Esarey, C.B. Schroeder, and W.P. Leemans, Rev. Mod. Phys. 81 (2009). ** W.P. Leemans, et al., Nature Physics 2, 696 (2006). *** W.P. Leemans and E. Esarey, Physics Today 62, 44 (2009). **** B.A. Shadwick, et al. Phys. Plasmas 16, 056704 (2009).

03-Oct-13 08:30 – 09:30 Oral Auditorium B (Parallel)

THTB — Tutorial, Beam Dynamics and Electromagnetic Fields

Chair: A. Schempp (IAP)

THTB1 08:30 **Genetic Algorithms and Their Applications in Accelerator Physics** – ***A.S. Hofler** (JLAB)*

Multi-objective optimization techniques are being widely used in an extremely broad range of fields. The genetic optimization was introduced in the accelerator community in relatively recent time and quickly spread around becoming a fundamental tool in multidimensional optimization problems. The talk introduces the basics of the technique and reviews present applications in accelerator problems.

03-Oct-13 09:30 – 10:00 Oral Auditorium B (Parallel)

THOAB — Contributed Oral Presentations, Medical Accelerators and Applications

Chair: A. Schempp (IAP)

THOAB1 09:30 **A Specialized High-power (50 kW) Proton Beamline for BNCT** – ***M.P. Dehnel**, T. Christensen, D.E. Potkins, T.M. Stewart (D-Pace) S. Bucci, P. Creely, S. Domingo, G. James, H. Seki, S. Shibuya (AccSys)*

D-Pace has developed a specialized high-power beamline for transporting a 20 mA 2.5 MeV CW proton beam for a BNCT (Boron Neutron Capture Therapy) application. The 2 m horizontal by 4 m vertical layout transports the space-charge dominated beam with less than 1% beam-spill using two sets of 10 T/m quadrupole doublets, DC xy steerer, 90 degree bending magnet, and AC x & y magnets for raster-scanned flat-topped round or square intensity distributions deposited over targets with 40 - 100 mm maximum dimensions. Diagnostics include New Parametric Current Transformers, graphite water-cooled electrically-isolated collimators with readbacks, and a low-power sapphire beam profile monitor for macro-pulsed beams (~100 micro-second wide pulses at low frequency). This paper describes the specialized: beam-optics, device designs, intensity distributions, and also the latest commissioning results.

THOAB2
09:45

Large Momentum Acceptance Superconducting NS-FFAG Gantry for Carbon Cancer Therapy – ***D. Trbojevic***, *B. Parker (BNL)*

Carbon cancer radiation therapy has clear advantages with respect to the other radiation therapy treatments. Cost of the ion cancer therapy is dominated by the delivery systems. An new design of the superconducting Non-Scaling FFAG (NS-FFAG) carbon isocentric gantry is presented. The magnet size and weight is dramatically smaller with respect to other gantries in cancer therapy treatment. The weight of the transport elements of the carbon isocentric gantry is estimated to be 1.5 tons to be compared to the 130 tons weight of the top-notch Heidelberg facility gantry.

03-Oct-13 10:30 – 11:30 Oral Auditorium B (Parallel)

THYAB — Invited Oral Presentations, Medical Accelerators and Applications

Chair: J. Flanz (MGH-FHBPTC)

THYAB1
10:30

Where is Medical Accelerator Technology Headed and How Will Accelerator Technology in Medical and Particle Beam Therapy Impact Health Care Costs? – ***W. Kaissl*** *(VMS-PT)*

This presentation should cover what the speaker views as the future for ion beam therapy. How does the speaker view the impact of the expansion of large accelerators into medicine? Will economies of scale drive costs down or will particle beam therapy be a niche modality and remain relatively expensive? Will improvements in technology lower costs and increase effectiveness or are there inherent limits to localized radiation therapy that preclude dramatic increases in effectiveness(survival)? How does any of this impact the overall cost of health care (industrial versus developing countries)?

THYAB2
11:00

The US Carbon Therapy Initiative – ***D. Robin*** *(LBNL)*

This presentation will summarize the findings of a joint DOE-NIH workshop to be held in early January 2013, outlining technical, clinical, and radiobiological issues key to establishing carbon therapy. This workshop is being commissioned as part of an initiative to restart the US hadron therapy program after many years' hiatus.

03-Oct-13 11:30 – 12:30 Oral Auditorium B (Parallel)

THYBB — Invited Oral Presentations, Medical Accelerators and Applications

Chair: J. Flanz (MGH-FHBPTC)

THYBB1
11:30

Prospects for Cyclotrons from Protons to Carbon for Hadron Therapy – ***Y. Jongen*** *(IBA)*

This presentation should cover the perspectives of cyclotrons for protons to Carbon 12 hadron therapy. Presently the majority of proton facilities use cyclotrons. However only synchrotrons are used for heavier ions. What is the status of cyclotron development for heavier particles? Isochronous versus synchrocyclotrons? Raster scanning? Comparison with conventional synchrotrons?

THYBB2 12:00 **Cyclotron Production of Positron Emitting Radioisotopes** – ***S.E. Lapi*** *(Washington University Medical School)*

This presentation will provide an overview of standard methods and modern trends in isotope production for positron emitters for use in medical imaging. This will include production routes, separation chemistry and examples of applications.

03-Oct-13 14:00 – 14:30 Oral Auditorium A (Parallel)

THODA — Contributed Oral Presentations, Industrial Accelerators and Applications

Chair: K. Jimbo (Kyoto University)

THODA1 14:00 **Low Energy Fusion for a Safe and Compact Neutron Source** – ***S.C.P. Albright****, R. Seviour (University of Huddersfield) R. Seviour (Lund University)*

Neutrons are primarily produced at large international facilities using either spallation reactions or nuclear fission. There is a demand for small scale neutron production for use at hospitals and borders for a variety of applications. Isolated fission sources and sealed tube deuterium-tritium fusors are able to provide a reliable neutron flux at small scale but are impractical due to the associated radioactivity. A beam of protons or deuterons accelerated onto a thin target will undergo a fusion reaction resulting in the emission of a quasi-monochromatic neutron beam. The total flux and energy spectrum of the neutrons produced through fusion is primarily dependent on target material, target thickness, beam energy and projectile. The use of neutrons for security screening at border crossings, ports and airports has the potential to drastically improve threat detection and contents verification. Monte Carlo code MCNPX is being used to investigate the most suitable target and beam characteristics for a neutron source for security applications.

THODA2 14:15 **Accelerator-based Neutron Damage Facility using LEDA** – ***N. Pogue****, S. Assadi, P.M. McIntyre, A. Sattarov, P.V. Tsvetkov (Texas A&M University)*

An accelerator based neutron damage facility (AND) is proposed to generate a high-dose fast neutron flux for testing of advanced reactor materials. The facility will be implemented in two stages. In AND-1, the 350 MHz LEDA RFQ will be re-commissioned to deliver 100 mA CW proton beam at 6.5 MeV. The beam will be targeted on a sheet-flow Li target to produce fast neurons. Samples located at a target station behind the sheet flow will receive up to 10 dpa/year of neutron damage with a mean neutron energy of 1.75 MeV. In AND-2, the LEDA beam will be modulated and passed through a spectrometer to produce three 117 MHz bunch trains, and two of them will be injected to two 100 MeV strong-focusing cyclotrons (SFC). The beams extracted from the two cyclotrons will be targeted in opposite directions onto sheet-flow Pb targets. Samples located in the space between the two targets will receive ~140 dpa/year of fast neutron damage with mean neutron energy ~10 MeV. AND-1 and AND-2 will provide the fast neutron flux needed for life-cycle damage studies for advance reactor technologies and for first-wall simulations for fusion systems.

03-Oct-13 14:00 – 14:30 Oral Auditorium B (Parallel)

THOBB — Contributed Oral Presentations, Medical Accelerators and Applications

Chair: C. Joshi (UCLA)

THOBB1 14:00 **Next Generation of Radiobiology Experiments** – ***P.A. Posocco***, *S.H. Tsang (Imperial College of Science and Technology, Department of Physics) H. Larose (The Imperial College of Science, Technology and Medicine)*

Proton Therapy (PT) is a well-established cancer treatment, which has helped more than 10'000 patients in the world in the last year alone. The outcomes are very positive and for most patients PT yields much better results in terms of morbidity and tumour control than conventional Radio Therapy, because with protons it is possible to control more precisely the energy deposition inside the tumour. However, the understanding of the interaction between radiation and cells is fundamental to fully exploit this aspect, and therefore in-vitro and in-vivo experiments comparing the effect of protons and photons need to be carried out. In this paper we will critically explore the options provided by the research groups and facilities operating in this field and we will be compiling a list of desiderata for the next generation of accelerators used for these experiments.

THOBB2 14:15 **Development of Low Energy Accelerator-Based Production of Medical Isotopes** – ***N. Ratcliffe***, *R.J. Barlow, R. Cywinski (University of Huddersfield) P. Beasley (Siemens AG, Healthcare Technology and Concepts)*

Here we present methods for production of new and existing isotopes for SPECT (Single Photon Emission Computed Tomography) imaging using accelerator-based systems. Such isotopes are already widely used in medical diagnostics and research, and there is constant development of new drugs and isotopes. However the main production method for Tc-99m, is currently in research reactors and is at risk due to scheduled and unscheduled shut downs. Therefore, a low cost an alternative accelerator-based system could provide many advantages. Various compact low energy proton machines are being proposed to enable cheap and accessible production: here we present a discussion of potential new SPECT isotopes and simulations of suitable targets for their manufacture.

THAP — Awards Session

Chair: F.C. Pilat (JLAB)

THAP1 14:50 **An Overview of Lie Methods for Accelerator Physics** – ***A. Dragt*** *(UMD)*

This talk will sketch how Hamiltonian mechanics can be formulated in Lie algebraic terms (indeed Poisson and Jacobi almost invented Lie algebras without knowing it), and how this formulation can be applied to the description and computation of particle orbits in accelerators in a way that both unifies both linear and nonlinear theory and leads to explicit results for realistic machines.

THAP2 15:10 **Perspectives on Beam Driven Plasma Acceleration: How We Got Here and Where Might We Be Going?** – ***M.J. Hogan*** *(SLAC)*

This talk is a review of the past and future of beam-driven plasma acceleration.

THAP3 15:30 **Field Dependent Losses in Superconducting Niobium Cavities** – ***A. Grassellino*** *(Fermilab)*

In this presentation I will report the investigation of superconducting properties of niobium samples via application of the muon spin rotation/relaxation (muSR) technique. We employ for the first time the muSR technique to study samples that are cutout from large and small grain 1.3 GHz radio frequency (RF) single cell niobium cavities. The RF test of these cavities was accompanied by full temperature mapping to characterize the RF losses in each of the samples. An interesting correlation is found between high field RF losses and field dependence of the sample magnetic volume fraction measured via muSR, suggesting an important role of magnetic flux motion and surface pinning in the high RF field cavity losses.

THAP4 15:50 **The Quest for Bright Coherent X-rays: A Personal Story** – ***K.-J. Kim*** *(ANL)*

This presentation will include stories associated with the author's work on the development of bright x-rays from the third generation sources and x-ray free-electron lasers.

THAP5 16:10 **Advanced Modeling of Beams and Accelerators** – ***J.-L. Vay*** *(LBNL)*

Computer modeling of beams and accelerators has had a profound impact on the design and operations of modern particle accelerators, and its importance is growing with the development of more powerful computers and codes. The development and application of such codes have become extremely complex and specialized endeavors, and the complexity is about to reach new heights with the rise of heterogeneous many-core hardware. The breadth and depth of computational accelerator science and technology are both widening (trend toward multi-physics models with realistic geometry at full scale) and deepening (more sophisticated software on more complex architecture), calling for the development of teams of specialists including computational physicists, applied mathematicians and computer scientists. The importance and complexity of computer modeling of accelerators will be highlighted by examples of simulations of laser plasma accelerator stages, including recent advances in the application of the Lorentz boosted frame technique*.

* J.-L. Vay, Phys. Rev. Lett. 98, 130405 (2007)

04-Oct-13 08:30 – 09:30 Oral Auditorium A (Parallel)

FROAA — Contributed Oral Presentations, Beam Dynamics and Electromagnetic Fields

Chair: A. Dragt (UMD)

FROAA1 08:30 **The University of Maryland Electron Ring (UMER) Program - Recent Developments** – ***R.A. Kishek***, *B.L. Beaudoin, S. Bernal, M. Cornacchia, D.W. Feldman, R.B. Fiorito, I. Haber, T.W. Koeth, Y. Mo, K. Poor Řežaei, K.J. Ruisard, W.D. Stem, D.F. Sutter, H.D. Zhang (UMD)*
Space charge, especially in the beam source and low energy regions, can substantially impact the dynamics of advanced accelerators at the intensity frontier. UMER uses scaled electron beams at nonrelativistic energies (10 keV) to inexpensively access the intense space charge dynamics directly relevant to low-energy hadron and ion beams, in both rings and linacs. In UMER, space charge tune depressions at injection are adjustable in the range of 0.14 - 0.8, enabling scaled examination of a wide range of phenomena. Longitudinal induction focusing is used to counteract the space charge force at the edges of a long rectangular bunch, confining it for 100s of turns. This paper reviews recent experimental, computational, and theoretical research on UMER. Specific topics include longitudinal induction bunch-end focusing; generation and propagation of longitudinal space charge waves, including large-amplitude solitons; bunch end interpenetration and observation of a resulting multi-stream instability; beam halo studies; beam current-dependence of classical ring parameters (natural chromaticity, lattice dispersion and momentum compaction); and diagnostic development.

FROAA2 08:45 **Transverse Beam Transfer Functions via the Vlasov Equation** – ***M. Blaskiewicz***, *V.H. Ranjbar (BNL)*
A semi-numerical method of integrating the Vlasov equation to obtain beam transfer functions directly as a function of frequency is presented. The results are compared with beam transfer functions calculated via particle tracking and excellent agreement is shown. The technique works well with both transverse wakes and detuning wakes from space charge.

FROAA3 09:00 **Control of Intrabunch Dynamics at CERN SPS Ring using 3.2 GS/s Digital Feedback Channel** – ***C.H. Rivetta***, *J.M. Cesaratto, J.D. Fox, K.M. Pollock, O. Turgut (SLAC) H. Bartosik, W. Höfle, G. Kotzian, K.S.B. Li (CERN)*
The feedback control of intra-bunch instabilities driven by electron-clouds or strong head-tail coupling requires bandwidth sufficient to sense the vertical position and apply correction fields to multiple se ctions of a nanosecond-scale bunch. These requirements impose challenges and limits in the design of the feedback channel. We present experimental measurements taken from CERN SPS machine development studies with an intra-bunch feedback channel prototype. The performance of a 3.2 GS/s digital processing system is evaluated, quantifying the effect of noise and limits of the feedback channel in the bunch stability as well as transient and steady state motion of the bunch. The controllers implemented are general purpose 16 tap FIR filters and the impact on the bunch stability of controller parameters are analyzed and quantified. These studies based on the limited feedback prototype are crucial to validate reduced models of the system and macro-particle simulation codes including the feedback channel. These models will allow us predicting the beam dynamics and controller limits when future wideband hardware is installed in the final prototype to stabilize multiple bunches.

FROAA4 09:15 **Simulation Study on Transverse Laser Cooling and Ordering of Heavy-Ion Beams in a Storage Ring** – ***Y. Yuri*** *(JAEA/TARRI)*

Molecular dynamics approach in which stochastic interaction between laser photons and ions is incorporated is employed to study the formation of three-dimensionally ultralow-temperature coasting beams by means of laser cooling in a storage ring. The effect of momentum dispersion on the laser-cooling process is investigated for efficient transverse cooling through tapered cooling and resonant coupling. The indirect transverse cooling force is dependent on the displacement of the laser axis and laser detuning as well as on dispersion. A string-like crystalline state of the beam can be attained at low line density by means of three-dimensional (3D) cooling. On the other hand, 3D ordered structures can be formed at higher line density by adjusting the tapered laser-cooling force. The characteristics of Coulomb-ordered beams are discussed.

04-Oct-13 09:30 – 10:00 Oral Auditorium A (Parallel)

FRXA — Invited Oral Presentations, Beam Dynamics and Electromagnetic Fields

Chair: A. Dragt (UMD)

FRXA1 09:30 **Particle Motion in a System with a Strong Longitudinal Magnetic Field** – ***V.B. Reva*** *(BINP SB RAS)*

Motion of electrons in a low energy electron cooler is usually described in the drift approximation. A magnetic field non-uniformity becomes more essential with electron energy increase breaking condition of the drift approximation usage. The paper considers a description of particle motion based on a decomposition of the Hamiltonian into two parts presenting the fast and slow motions. The suggested method enables a generalization of the classical drift approach resulting in simple Hamiltonians for each motion type. For small longitudinal field the coupling term in the Hamiltonian between two modes is essential and needs to be taken into account. The concept is illustrated with the COSY 2 MeV electron cooler.

04-Oct-13 10:30 – 11:30 Oral Auditorium A (Parallel)

FRYAA — Invited Oral Presentations, Hadron Accelerators

Chair: J.L. Erickson (LANL)

FRYAA1 10:30 **SNS Performance and the Next Generation of High Power Accelerators** – ***J. Galambos*** *(ORNL)*

The SNS accelerator at ORNL has been operating near the MW level for several years now. This presentation will discuss the successes and challenges, new insight gained and lessons learned with regard to the operation of a modern high power accelerator. In particular, issues with the RFQ, the target and the superconducting RF linac will be discussed.

FRYAA2 11:00 **ESS Status and Design Considerations** – ***M. Lindroos*** *(ESS)*

The European Spallation Neutron Source project includes a 5 MW superconducting linac, and aims for initial operation at 1.5 MW in 2019 with 5 MW capacity installed for 2023. Design considerations including the work done to find the minimum cost for preserved beam quality at low beam loss will be discussed. This will include a discussions on lessons learnt from SNS regarding e.g. superconducting RF performance and RF power sources. The design and construction plans and status will be described including a description of how in-kind and contingency will be managed.

04-Oct-13	11:30 – 12:30	Oral	Auditorium A (Parallel)

FRYBA — Invited Oral Presentations, Hadron Accelerators

Chair: J.L. Erickson (LANL)

FRYBA1 11:30 **Progress towards the Facility for Rare Isotope Beams** – ***J. Wei***, *N.K. Bultman, F. Casagrande, C. Compton, K.D. Davidson, J. DeKamp, B. Drewyor, K. Elliott, A. Facco, P.E. Gibson, T . Glasmacher, K. Holland, M.J. Johnson, S. Jones, D. Leitner, M. Leitner, G. Machicoane, F. Marti, D. Morris, J.A. Nolen, J.P. Ozelis, S. Peng, J. Popielarski, L. Popielarski, E. Pozdeyev, T. Russo, K. Saito, R.C. Webber, M. Williams, T. Xu, Y. Yamazaki, A. Zeller, Y. Zhang, Q. Zhao (FRIB) D. Arenius, V. Ganni (JLAB) A. Facco (INFN/LNL) R.E. Laxdal (TRIUMF) J.A. Nolen (ANL)*

The Facility for Rare Isotope Beams (FRIB) is based on a continuous-wave superconducting heavy ion linac to accelerate all the stable isotopes to above 200 MeV/u with a beam power of up to 400 kW. At an average beam power approximately two-to-three orders-of-magnitude higher than those of operating heavy-ion facilities, FRIB stands at the power frontier of the accelerator family - the first time for heavy-ion accelerators. To realize this innovative performance, superconducting RF cavities are used starting at the very low energy of 500 keV/u, and beams with multiple charge states are accelerated simultaneously. Many technological challenges specific for this linac have been tackled by the FRIB team and collaborators. Furthermore, the distinct differences from the other types of linacs at the power front must be clearly understood to make the FRIB successful. This report summarizes the technical progress made in the past years to meet these challenges.

FRYBA2 12:00 **Status of the ReAccelerator facility RϵA for rare isotopes** – ***D. Leitner***, *T. Baumann, B. Durickovic, A. Lapierre, J.A. Rodriguez, S. Schwarz, C. Sumithrarachchi, S. Williams, W. Wittmer (NSCL) X. Wu (FRIB)*

The Facility for Rare Isotope Beams (FRIB) is currently in the preliminary design phase at Michigan State University (MSU). FRIB consists of a driver linac for the acceleration of heavy ion beams, followed by a fragmentation target station and a ReAccelerating facility (RϵA). While FRIB is expected to start commissioning in 2017, the first stage of RϵA called ReA3 is already under commissioning and was coupled to the Coupled Cyclotron Facility in 2012. Once FRIB is completed RϵA will continue operation as post-accelerator facility for FRIB. RϵA consists of a gas stopper, an Electron Beam Ion Trap (EBIT) charge state booster, a room temperature radio frequency quadrupole (RFQ), a LINAC using superconducting quarter wave resonators, and an achromatic beam transport and distribution line to a new experimental area. An overview of the facility will be discussed. In particular, this talk will focus on the technical progress and commissioning results using pilot beams from the off-line ion source and charge bred beams from the online EBIT injector.

04-Oct-13	08:30 – 09:30	Oral	Auditorium B (Parallel)

FRTB — Tutorial, Accelerator Systems

Chair: R. Hrovatin (I-Tech)

FRTB1 08:30 **Femtosecond Timing and Synchronization of Laser Systems for Accelerators** – ***J.C. Frisch*** *(SLAC)*

This tutorial should describe the challenges and demands in timing and synchronization for accelerators, with an emphasis on femtosecond timing of laser systems. The tutorial should describe the wide variety of timing and laser timing challenges and system approaches.

04-Oct-13	09:30 – 10:00	Oral	Auditorium B (Parallel)

FRXB — Invited Oral Presentation, Medical Accelerators and Applications

Chair: R. Hrovatin (I-Tech)

FRXB1 09:30 **Superconducting Gantry and Other Developments at HIMAC** – ***Y. Iwata***, *T. Furukawa, Y. Hara, K. Mizushima, S. Mori, T.M. Murakami, K. Noda, S. Sato, T. Shirai, K. Shoda, S.S. Suzuki (NIRS) N. Amemiya (Kyoto University) H. Arai, T. Fujimoto (AEC) T.F. Fujita (National Institute of Radiological Sciences) T. Obana (NIFS) T. Ogitsu (KEK) T. Orikasa, S. Takayama (Toshiba)*

New developments at HIMAC include a superconducting carbon gantry, a new therapy area with three new treatment rooms, and substantial enhancements to the synchrotron extraction system to enable energy-variation within a synchrotron cycle to match characteristics of the gantry and three-dimensional raster scanning. This carbon gantry equips ten combined-function superconducting magnets, allowing us to design the compact gantry; the length and the radius of the gantry will be approximately 13 and 5.5 m, respectively, which are comparable to those for the existing proton gantries. Further, these superconducting magnets were designed to provide the fast slew rate of the magnetic field for the energy-variation operation of the synchrotron. The fabrication of the superconducting magnets has been made, and field measurements of the several magnets were performed. In this talk, the design of the superconducting gantry including the magnet design and results of the field measurements will be presented.

04-Oct-13	10:30 – 11:30	Oral	Auditorium B (Parallel)

FRYAB — Invited Oral Presentations, Accelerator Technology

Chair: S. Prestemon (LBNL)

FRYAB1 10:30 **Review of Superconducting Magnet (LTS and HTS) Developments for Accelerator Applications** – ***P. Ferracin*** *(CERN)*

This presentation will focus on superconducting magnet developments needed by future accelerators/colliders at the energy frontier. A review of the various technologies based on LTS and HTS materials will be provided, outlining their capablities and applications as well as the challenges and critical issues which will have to be addressed by specific R&D.

FRYAB2 11:00 **Protection of High-field Superconducting Magnets** – ***H. Felice*** *(LBNL)*

As superconducting accelerator magnets see the increase of their magnetic field and stored energy, quench protection becomes a critical part of magnet design. Apprehending the quench phenomenon requires a multidisciplinary approach combining magnetic, electrical and thermal analysis. Numerical codes are key components of this process. Due to the complexity of the topic, and because multiphysics approach might lead to long computational times, a frequent technique relies on breaking down the problem, using dedicated tools for each physical phenomenon and interfacing the results. We propose here an overview of the various aspects of the magnet protection, and we will address the way the community is presently addressing the challenge of quench protection simulation.

04-Oct-13 11:30 – 12:30 Oral Auditorium B (Parallel)

FRYBB — Invited Oral Presentations, Accelerator Technology

Chair: A.M.M. Todd (AES)

FRYBB1 11:30 **Progress on Superconducting Undulators** – ***Y. Ivanyushenkov*** *(ANL)*

Superconducting technology could be employed for building undulators with enhanced parameters for synchrotron light sources and free–electron lasers. Expected and measured performance of superconducting undulators will be presented. Although superconducting technology is already working in superconducting wigglers, the development of superconducting undulators was slowed down by a variety of challenges that will be discussed. Possible solutions with examples will be presented. Finally, an overview of recent developments in superconducting undulators will be given.

FRYBB2 12:00 **Development and Operation of the SNS Fast Chopper Systems** – ***R.B. Saethre*** *(ORNL RAD) D.E. Anderson, C. Deibele, V.V. Peplov, M.P. Stockli (ORNL)*

The Spallation Neutron Source (SNS) at Oak Ridge National Laboratory requires fast chopper systems to create a series of mini-pulses in the Linear Accelerator (LINAC) for injection into the accumulation ring. The fast chopper systems are in the front end of the accelerator with one set of four choppers in the Low Energy Beam Transport (LEBT), immediately upstream of the Radio Frequency Quadrupole (RFQ), and another set of two choppers in the Medium Energy Beam Transport (MEBT), downstream of the RFQ, where the beam energy is approximately 2.5 MeV. Clean bunching requires fast rise and fall time and low jitter to minimize the amount of charge in the ring extraction gap. The chopper systems operate at a burst frequency of 1 MHz and a burst width of greater than 1 ms. The choppers have had historically poor reliability especially in the LEBT system. This paper describes the development of reliable LEBT and MEBT choppers and the operational performance since SNS commissioning in 2006.

04-Oct-13 14:00 – 14:30 Oral Main Auditorium (Plenary)

FRZAP — Invited Oral Presentation, Industrial Accelerators and Applications

Chair: A. Chao (SLAC)

FRZAP1 14:00 **Current & Future Industrial Applications of Accelerators** – ***R.W. Hamm*** *(R&M Technical Enterprises)*

As demonstrated by several presentations at this meeting, particle accelerators are now very widely used for a number of industrial applications. Many of the systems being employed have their origins in accelerators developed for basic science research, but now their production is a worldwide business conducted by more than 70 companies and institutes that collectively ship more than 1000 units per year. The industrial applications of these accelerators cover a broad range of business segments from low energy electron beam systems for welding, machining, and product irradiation to high energy cyclotrons and synchrotrons for radioisotope production and synchrotron radiation production. This talk is a review of the status of these business segments and the predicted growth in them. It will also cover the new accelerator technology under development that will be used by industry in the future.

04-Oct-13 14:30 – 15:00 Oral Main Auditorium (Plenary)

FRZBP — Invited Oral Presentation, Light Sources and FELs

Chair: A. Chao (SLAC)

FRZBP1 14:30 **Challenges and Opportunities for X-ray Free Electron Lasers** – ***C. Pellegrini*** *(SLAC)* ***C. Pellegrini*** *(UCLA)*

This talk should present an overview of the technical challenges for delivering coherent beams of X-rays, and opportunities for new FEL designs. Topics to be discussed include increased repetition rate, higher flux per pulse, temporal control and coherence, and undulator developments.

MOPAC — Poster Session

03 Alternative Acceleration Schemes

MOPAC01 **Nonparaxial Transverse Effects on the Propagation of Nonlinear Electromagnetic Pulses** – ***A. Bonatto***, *R. Pakter, F.B. Rizzato (IF-UFRGS)* ***A. Bonatto***, *S.R. Lopes (UFPR) C. Bonatto (UFPel) R.P. Nunes (UFRGS)*

MOPAC02 **Electron and Positron Bunch Self-modulation Experiments at SLAC-FACET** – ***P. Muggli*** *(MPI) E. Adli, S.J. Gessner, M.J. Hogan, S.Z. Li, M.D. Litos (SLAC) Y. Fang (USC) C. Joshi, K.A. Marsh, W.B. Mori, N. Vafaei-Najafabadi (UCLA) N.C. Lopes, L.O. Silva, J. Vieira (Instituto Superior Tecnico) O. Reimann (MPI-P)*

MOPAC03 **Generation of High Brightness Electron Beams via Ionization Induced Injection by Transverse Colliding Lasers in a Beam-Driven Plasma Wakefield Accelerator** – ***F. Li***, *H.B. Chen, Y.-C. Du, J.F. Hua, W.-H. Huang, W. Lu, C.-X. Tang, X.L. Xu, L.X. Yan, C.J. Zhang (TUB) Y.Q. Gu (Laser Fusion Research Center, China Academy of Engineering Physics) C. Joshi, W. Lu, W.B. Mori (UCLA)*

MOPAC04 **High Transformer Ratio Plasma Wakefield Acceleration in the Blowout Regime** – ***W. Lu***, *X.L. Xu (TUB) W. An, C. Joshi, W.B. Mori (UCLA) C. Huang (LANL)*

MOPAC05 **Emittance Dynamics of Ionization-induced Injection in Plasma Based Accelerators** – ***X.L. Xu***, *J.F. Hua, F. Li, W. Lu (TUB) C. Joshi, W.B. Mori (UCLA)*

MOPAC06 **Study of Beam Break-up Control for a THz Dielectric Wakefield Linac** – ***C. Li***, *W. Gai, C.-J. Jing, J.G. Power (ANL) C.-J. Jing (Euclid TechLabs, LLC)* ***C. Li*** *(TUB)*

MOPAC07 **Photonic Crystal as a Passively Driven Structure to Boost Beam Energy** – ***B.R. Poole*** *(LLNL), J.R. Harris, S.V. Milton (CSU)*

MOPAC08 **Modeling Beam-driven Planar Dielectric Bragg Structure Experiments** – ***D.L. Bruhwiler*** *(CIPS) G. Andonian, P.D. Hoang, B. Naranjo, J.B. Rosenzweig (UCLA) P. Stoltz (Tech-X)*

MOPAC09 **Coupling to Photonic Crystal Fiber Accelerator Structures** – ***G.R. Werner***, *C.A. Bauer, J.R. Cary (CIPS) J.R. Cary (Tech-X)*

MOPAC10 **Long Term Evolution of Plasma Wakefields** – ***A. A. Sahai***, *T.C. Katsouleas (Duke ECE) W.B. Mori, F.S. Tsung (UCLA)*

MOPAC11 **Test of A Standing Wave Dielectric Loaded Accelerating Structure** – ***C.-J. Jing***, *S.P. Antipov, A. Kanareykin, P. Schoessow (Euclid TechLabs, LLC) W. Gai (ANL) S.H. Gold (NRL)*

MOPAC12 **Analysis of High Repetition Rate Effects in Dielectric Wakefield Accelerators** – ***P. Schoessow***, *S.P. Antipov, C.-J. Jing, A. Kanareykin, S.S. Zuo (Euclid TechLabs, LLC) J.G. Power, A. Zholents (ANL)*

MOPAC13 **Luminosity Limitations in Plasma-Based Collider Concepts** – ***S. Nagaitsev***, *V.A. Lebedev (Fermilab)*

MOPAC14 **Opportunities for Beam-driven-acceleration Experiments at the Fermilab's ASTA Facility** – ***P. Piot*** *(Fermilab)*

MOPAC15 **ASTA at Fermilab: Accelerator Physics and Accelerator Education Programs of the Modern Accelerator R&D Users Facility for HEP and Accelerator Applications** – ***V.D. Shiltsev*** *(Fermilab) P. Piot (Northern Illinois University)*

04 Hadron Accelerators

MOPAC16 **Issues and R&D Required for the Intensity Frontier Accelerators** – ***V.D. Shiltsev****, S. Henderson, S. Nagaitsev (Fermilab)*

03 Alternative Acceleration Schemes

MOPAC17 **RF-Components Embedded with Photonic-Band-Gap (PBG) and Fishnet-Metamaterial Structures for High Frequency Accelerator Application** – ***Y.-M. Shin*** *(Fermilab) D. Boyden, S. Robak (Northern Illinois University)*

MOPAC18 **Feasibility Study of Channeling Acceleration Experiment at the Fermilab Advanced Superconducting Test Area (ASTA)** – ***Y.-M. Shin****, T. Xu (Northern Illinois University) V.D. Shiltsev, D.A. Still (Fermilab)*

MOPAC19 **Commissioning and Initial Target Experiments at NDCX-II** – ***T. Schenkel****, W.G. Greenway, S.M. Lidia, K. Murphy, W.L. Waldron, C.D. Weis (LBNL)*

MOPAC20 **Simulations of Multiple Consecutive Laser-plasma Acceleration Stages** – ***J.-L. Vay****, E. Esarey, C.G.R. Geddes, W. Leemans, C.B. Schroeder (LBNL)*

MOPAC21 **Tomographic Reconstruction of Electron Trajectories in a Laser-Plasma Accelerator Using Betatron X-Ray Radiation** – ***F. Albert****, A.E. Pak, B.B. Pollock, J.E. Ralph (LLNL) C.E. Clayton, C. Joshi, K.A. Marsh, J.L. Shaw (UCLA)*

MOPAC22 **Quasi-Monoenergetic Electron Ring Production From Laser Wakefield Acceleration in the Blowout Regime** – ***B.B. Pollock****, F. Albert, J.D. Moody, J.E. Ralph (LLNL) C.E. Clayton, C. Joshi, K.A. Marsh, J.L. Shaw (UCLA) S.H. Glenzer (SLAC) N. Lemos (Instituto Superior Tecnico)*

MOPAC23 **Full-scale 2D and 3D Simulations of Electron Beam Acceleration for the LANL Dielectric Wakefield Accelerator Experiment** – ***C. Huang****, T.J. Kwan, D.Y. Shchegolkov, E.I. Simakov (LANL)*

MOPAC24 **Beam Pulse Shaping Experiments for Uniform High Gradient Dielectric Wakefield Acceleration** – ***D.Y. Shchegolkov****, E.I. Simakov (LANL) S.P. Antipov (Euclid TechLabs, LLC) S.P. Antipov (ANL) M.G. Fedurin (BNL)*

MOPAC25 **Update on Fabrication and Tuning of the Photonic Band Gap Accelerating Structure for the Wakefield Experiment** – ***E.I. Simakov****, S. Arsenyev, R.L. Edwards, S. Elson, C.E. Heath, D. C. Lizon, W.P. Romero (LANL) S. Arsenyev (MIT/PSFC)*

MOPAC26 **Beam Brightness Booster With Ionization Cooling of Superintense Circulating Beams** – ***V.G. Dudnikov****, C.M. Ankenbrandt, R.P. Johnson (Muons. Inc.)*

MOPAC27 **External Injection Into Laser Based Accelerators** – ***D.B. Cesar****, P. Musumeci (UCLA)*

MOPAC28 **Applications for Optical-Scale Dielectric Laser Accelerators** – ***R.J. England***, *Z. Huang, C. Lee, R.J. Noble, J.E. Spencer, Z. Wu (SLAC) B. Montazeri, E.A. Peralta, K. Soong (Stanford University) M. Qi (Purdue University) L. Schächter (Technion)*

MOPAC29 **Fabrication of an 18 Layer 3D Photonic Crystal for Dielectric Laser Acceleration** – ***C. Lee***, *R.J. England, Z. Wu (SLAC) M. Qi (Purdue University)*

MOPAC30 **Multibunch Beam Physics at FACET** – ***S.J. Gessner***, *M.J. Hogan, M.D. Litos (SLAC)*

MOPAC31 **Simulation of Power Coupling and Wakefield in Photonic Band Gap Fibers for Dielectric Laser Acceleration** – ***C.-K. Ng***, *R.J. England, R.J. Noble, J.E. Spencer (SLAC)*

MOPAC32 **Design of a Subnanometer Resolution Beam Position Monitor for Dielectric Laser Accelerators** – ***K. Soong*** *(SLAC)*

MOPAC33 **Silica Rod Array for Laser-Driven Particle Acceleration** – ***Z. Wu***, *R.J. England, R.J. Noble (SLAC) E.A. Peralta, K. Soong (Stanford University) M. Qi (Purdue University)*

MOPAC34 **Impurity Free Ion Beams Accelerated from Over Dense Plasmas Irradiated by 1 TW CO2 Laser Pulses** – ***N.M. Cook***, *P. Shkolnikov (Stony Brook University) N. Dover, Z. Najmudin (Imperial College of Science and Technology, Department of Physics) C. Maharjan (SBU) I. Pogorelsky, M.N. Polyanskiy, O. Tresca (BNL)*

MOPAC35 **Full-scale Simulations of Dielectric Grating Accelerator Structures** – ***B.M. Cowan***, *D.T. Abell, B.T. Schwartz (Tech-X)*

MOPAC36 **Advanced Simulation Methods for Laser-plasma Acceleration Stages** – ***B.M. Cowan***, *J.R. Cary, E. Cormier-Michel, E.J. Hallman, N. Naseri (Tech-X), J.R. Cary (CIPS)*

MOPAC37 **Mitigate Ionization Induced Beam Head Erosion in a Plasma Wake Field Accelerator** – ***W. An***, *C.E. Clayton, C. Joshi, W. Lu, K.A. Marsh, W.B. Mori, N. Vafaei-Najafabadi, M. Zhou (UCLA) E. Adli (University of Oslo) E. Adli, S. Corde, J.-P. Delahaye, R.J. England, J.T. Frederico, S.J. Gessner, M.J. Hogan, S.Z. Li, M.D. Litos, D.R. Walz (SLAC) W. Lu (TUB) P. Muggli (MPI)*

MOPAC38 **Preliminary Experiments on Ionization Injection of Electrons into a Plasma Wakefield Accelerator at FACET** – ***C.E. Clayton***, *W. An, C. Joshi, K.A. Marsh, W.B. Mori, N. Vafaei-Najafabadi (UCLA) E. Adli, C.I. Clarke, S. Corde, J.-P. Delahaye, R.J. England, A.S. Fisher, J.T. Frederico, S.J. Gessner, M.J. Hogan, S.Z. Li, M.D. Litos, D.R. Walz, Z. Wu (SLAC) W. Lu (TUB) P. Muggli (MPI)*

MOPAC39 **Ionization Injection in LWFA for Near Term Lasers** – ***A.W. Davidson***, *C. Joshi, W. Lu, W.B. Mori (UCLA) R.A. Fonseca, J.L. Martins, L.O. Silva (Instituto Superior Tecnico) M. Zeng (Tsinghua University)*

MOPAC40 **Single-Shot Emittance Measurement via Spectrometer Beam Profile Measurement** – ***J.T. Frederico***, *C.E. Clayton, C. Joshi, K.A. Marsh (UCLA) E. Adli, S. Corde, S. Corde, S.J. Gessner, M.J. Hogan, S.Z. Li, M.D. Litos, T.O. Raubenheimer, T.O. Raubenheimer (SLAC)*

MOPAC41 **Forward Directed Low-Divergence Electron and Ion Beams from a Gas Jet Irradiated by a Multi-TW CO2 Laser** – ***C. Gong***, *C. Chandrashekar, J.J. Pigeon, S. Tochitsky (UCLA)*

MOPAC42 **High-throughput Analysis of CR39 Detectors using Lensfree Holographic On-Chip Microscopy** – ***W. Luo***, *A.F. Coskun, C. Gong, A. Greenbaum, C. Gulec, C. Joshi, A. Ozcan, J.J. Pigeon, F. Shabbir, J.L. Shaw, T.W. Su, S. Tochitsky (UCLA)*

MOPAC43 **Results of Short Pulse Driven LLNL/UCLA IFEL Experiment** – ***J.T. Moody***, *P. Musumeci (UCLA) G.G. Anderson, S.G. Anderson, S.M. Betts, S.E. Fisher, D.J. Gibson, A.M. Tremaine, S.S.Q. Wu (LLNL)*

MOPAC44 **Development of a High-repetition Rate TW CO2 Laser Driver for a Compact Ion Source** – ***J.J. Pigeon***, *C. Joshi, S. Tochitsky (UCLA)*

MOPAC45 **Controlling the Divergence and the Divergence Growth in LWFA-produced Electron Beams** – ***J.L. Shaw***, *C. Joshi, K.A. Marsh, N. Vafaei-Najafabadi (UCLA)*

MOPAC46 **Suppression of the Transformer Ratio due to Distributed Injection of Electrons in a Plasma Wakefield Accelerator** – ***N. Vafaei-Najafabadi***, *W. An, C.E. Clayton, C. Joshi, W. Lu, K.A. Marsh, W.B. Mori (UCLA) E. Adli (University of Oslo) E. Adli, C.I. Clarke, S. Corde, J.-P. Delahaye, R.J. England, A.S. Fisher, J.T. Frederico, S.J. Gessner, M.J. Hogan, S.Z. Li, M.D. Litos, D.R. Walz, Z. Wu (SLAC) W. Lu (TUB) P. Muggli (MPI)*

MOPAC47 **Modeling of Laser Wakefield Accelerator in Lorentz Boosted Frame Using an Em-Pic Code With Spectral Solver: UPIC-EMMA** – ***P. Yu***, *V.K. Decyk, W.B. Mori, F.S. Tsung (UCLA) R.A. Fonseca, L.O. Silva, J. Vieira (Instituto Superior Tecnico) W. Lu, X.L. Xu (TUB)*

MOPAC48 **Laser Acceleration of Multi-ion Thin Foil Target** – ***X. Shao***, *W.T. Hill, C.-S. Liu, T.-C. Liu, J.J. Su (UMD) S.-H. Chen (NCU) B. Eliasson (Ruhr-Universität Bochum) J. Wang (IAMS)*

MOPAC49 **Seeding of the Self-modulation of a Long Particle Bunch in a Plasma** – ***Y. Fang***, *P. Muggli (USC) M. Babzien, M.G. Fedurin, K. Kusche, R. Malone, C. Swinson, V. Yakimenko (BNL) W.B. Mori (UCLA) P. Muggli (MPI) J. Vieira (IPFN)*

MOPBA — Poster Session

05 Beam Dynamics and Electromagnetic Fields

MOPBA01 **Current Induced In Vacuum Chamber During NSLS-II Booster Ramp** – ***S.M. Gurov***, *V.A. Kiselev, S.V. Sinyatkin (BINP SB RAS)*

MOPBA02 **Simulations of a Dipole Detuned Multi-Harmonic Cavity Structure With Applications to Linear Colliders** – ***L.R. Carver***, *R.M. Jones (UMAN) J.L. Hirshfield (Yale University, Physics Department) J.L. Hirshfield (Omega-P, Inc.) Y. Jiang (Yale University, Beam Physics Laboratory)*

MOPBA03 **Self-Consistent Simulations of Passive Landau Cavity Effects** – ***G. Bassi***, *A. Blednykh, S. Krinsky, J. Rose (BNL)*

MOPBA04 **Polarization Profile and Spin Dynamics Simulations in the AGS Using the Zgoubi Code** – ***Y. Dutheil***, *L. Ahrens, H. Huang, F. Méot, V. Schoefer (BNL)*

04 Hadron Accelerators

MOPBA05 **Design of the Injection Line into the INFN Molecular H^{2+} 800 MeV High Power Cyclotron** – ***M. Haj***, *Y. Dutheil, F. Méot, N. Tsoupas (BNL) L. Calabretta (INFN/LNS) A. Calanna (CSFNSM)*

05 Beam Dynamics and Electromagnetic Fields

MOPBA06 **Algorithms and Self-consistent Simulation of Beam-induced Plasma in Muon Cooling Devices** – ***V. Samulyak*** *(BNL) M. Chung, A.V. Tollestrup, K. Yonehara (Fermilab) B.T. Freemire (IIT) R.D. Ryne (LBNL)*

MOPBA07 **Applications of Parallel Optimization Algorithms to Muon Collider / Neutrino Factory Design** – ***H. K. Sayed***, *J.S. Berg (BNL) J. Qiang, R.D. Ryne (LBNL)*

MOPBA08 **Modeling of Electron Cloud Induced Beam Dynamics at CesrTA: An Update** – ***K.G. Sonnad*** *(Cornell University (CLASSE), Cornell Laboratory for Accelerator-Based Sciences and Education) M.T.F. Pivi (SLAC)*

MOPBA09 **Advanced Modeling Tools for Muon-Based Accelerators** – ***P. Snopok*** *(Illinois Institute of Technology), J.S. Ellison (IIT) T.J. Roberts (Muons. Inc.)*

MOPBA10 **Progress of the Matter-dominated Muon Accelerator Lattice Simulation Tools Development for COSY Infinity** – ***P. Snopok***, *J.D. Kunz (IIT)*

MOPBA11 **Space Charge Simulation in COSY Using Fast Multipole Method** – ***P. Snopok*** *(Illinois Institute of Technology) M. Berz, B.T. Loseth, K. Makino (MSU) H. Zhang (JLAB)*

MOPBA12 **Mitigation of Numerical Noise for Space Charge Calculations in Tracking Codes** – ***L.G. Vorobiev***, *C.M. Ankenbrandt, R.P. Johnson, T.J. Roberts (Muons. Inc.)*

MOPBA13 **Optimization of the Multipole to Local Translation Operator in the Adaptive Fast Multipole Method** – ***S. Abeyratne***, *B. Erdelyi (Northern Illinois University) B. Erdelyi (ANL)*

MOPBA14 **Numerical Integrator for Coulomb Collisions** – ***A.A. Al Marzouk***, *B. Erdelyi (Northern Illinois University)*

MOPBA15 **Study and Comparison of the Method of Moments and the Single Level Fast Multipole Method for 2D Space Charge Tracking** – ***A.J. Gee***, *B. Erdelyi (Northern Illinois University) B. Erdelyi (ANL)*

MOPBA16 **A Picard Iteration Based Integrator** – ***H.D. Schaumburg***, *B. Erdelyi (Northern Illinois University)*

MOPBA17 **A User Friendly, Modular Simulation Tool for Laser-Electron Beam Interactions** – ***S. Seung***, *G. Andonian, M.A. Harrison, S. Wu (RadiaBeam) D.L. Bruhwiler (CIPS) T.V. Shaftan (BNL)*

MOPBA18 **Multipacting Simulation of Accelerator Cavities using ACE3P** – ***C.-K. Ng***, *L. Ge, C. Ko, Z. Li, L. Xiao (SLAC)*

MOPBA19 **Inter-bunch Communication through CSR in Whispering Gallery Modes** – ***R.L. Warnock*** *(SLAC) J.C. Bergstrom (CLS) M. Klein (SOLEIL)*

02 Light Sources

MOPBA20 **Nonlinear Vlasov Simulation of an FEL in a One-dimensional Model** – ***R.L. Warnock*** *(SLAC)*

05 Beam Dynamics and Electromagnetic Fields

MOPBA21 **Modeling Localized States and Band Bending Effects on Electron Emission from GaAs** – ***D.A. Dimitrov***, *Y. Choi, C. Nieter (Tech-X) I.V. Bazarov, S.S. Karkare, W.J. Schaff (Cornell University (CLASSE), Cornell Laboratory for Accelerator-Based Sciences and Education) I. Ben-Zvi, T. Rao, J. Smedley (BNL)*

MOPBA22 **Complex Charge Pair Model and Simulations of the FEL Amplifier for Coherent Electron Cooling** – ***I.V. Pogorelov***, *B.T. Schwartz (Tech-X) D.L. Bruhwiler (CIPS) V. Litvinenko (BNL)*

MOPBA23 **Current Status of the GPU-Accelerated Version of ELEGANT** – ***I.V. Pogorelov***, *K.M. Amyx, J.R. King (Tech-X) M. Borland, R. Soliday (ANL)*

MOPBA24 **Integrated Kinetic and Plasma Dielectric Models of Electron Cloud Buildup and TE Wave Transmission** – ***S.A. Veitzer***, *P. Stoltz (Tech-X) P. Lebrun (Fermilab)*

30-Sep-13	16:30 – 18:00	Poster	Poster Area Hollywood

MOPHO — Poster Session

02 Light Sources

MOPHO01 **Creation of Gamma Radiation Using Anihilation of Channeled Positrons in Crystals** – ***K.B. Oganesyan*** *(ANSL)*

MOPHO02 **How Acts Plane Wiggler Magnetic Field Inhomogeneity on the Spontaneous Radiation and Gain** – ***K.B. Oganesyan*** *(ANSL)*

MOPHO03 **Generation of Intensive Transition Radiation in Modulated Medium** – ***K.B. Oganesyan*** *(ANSL)*

MOPHO04 **Ultra-Low Emittance Light Source with a Torus-knot Type Accumulator Ring** – ***A. Miyamoto***, *S. Sasaki (HSRC)*

MOPHO05 **Coupling and Brightness Considerations for the MAX IV 3 GeV Storage Ring** – ***S.C. Leemann***, *M. Eriksson (MAX-lab)*

MOPHO06 **Simulation of Using Orbit Bumps to Test Sextupole Compensation for the Short Pulse X-ray System at the Advanced Photon Source** – ***M. Borland***, *V. Sajaev (ANL)*

MOPHO07 **A Seven-bend-achromat Lattice as a Potential Upgrade for the Advanced Photon Source** – ***M. Borland***, *V. Sajaev, Y. Sun (ANL)*

MOPHO08 **Various Canting Schemes for Utilizing More Than One Insertion Device in an Insertion Device Straight Section** – ***V. Sajaev***, *G. Decker, L. Emery (ANL)*

MOPHO09 **New Consideration for Insertion-Device Dipole-Error Perturbation Requirements when including the Effects of Orbit Feedback** – ***L. Emery***, *V. Sajaev (ANL)*

MOPHO10 **Optics Design and Beam Dynamics Optimization of a Five-bend Achromat Lattice for the Advanced Photon Source Upgrade** – ***Y. Sun***, *M. Borland (ANL)*

MOPHO11 **Linear scaling on Choosing Bunch Compression Ratio for an FEL Driver** – ***Y. Sun*** *(ANL)*

MOPHO12 **Simulation of an X-band Hard X-ray FEL with LCLS Injector** – ***Y. Sun*** *(ANL) P. Emma (LBNL) T.O. Raubenheimer (SLAC)*

MOPHO13 **Achieving Quasi Third Order Achromat in APS Upgrade Lattice** – ***Y. Sun***, *M. Borland (ANL)*

MOPHO14 **Analytical Evaluation of Correlated Timing Jitter Cancellation in a staged bunch compression system** – ***Y. Sun*** *(ANL)*

MOPHO15 **X-band FEL Driver Linac Design with Optics Linearization** – ***Y. Sun*** *(ANL) P. Emma (LBNL) T.O. Raubenheimer, J. Wu (SLAC)*

MOPHO16 **NSLS-II Linac Beam Loading Compensation Study** – ***G.M. Wang***, *W.X. Cheng, F. Gao, J. Rose, T.V. Shaftan (BNL)*

MOPHO17 **NSLS II Commissioning Tools** – ***G.M. Wang***, *M.A. Davidsaver, T.V. Shaftan, G. Shen, L. Yang (BNL)*

MOPHO18 **CESR Upgrade using Defocusing Dipole Magnets** – ***C.E. Mayes***, *L. Gupta, G.H. Hoffstaetter, V.O. Kostroun, A.A. Mikhailichenko (Cornell University (CLASSE), Cornell Laboratory for Accelerator-Based Sciences and Education)*

MOPHO19 **A Tunable Energy Chirp Correction** – ***S.P. Antipov***, *C.-J. Jing, A. Kanareykin, P. Schoessow (Euclid TechLabs, LLC) S. Baturin (LETI) M.G. Fedurin (BNL) W. Gai, A. Zholents (ANL) V. Yakimenko (SLAC)*

MOPHO20 **Demonstration of a Compact High Average Power THz Light Source at the IAC** – ***Y. Kim*** *(IAC), A. Andrews, P. Buaphad, C.F. Eckman (ISU) A.V. Smirnov (RadiaBeam)*

MOPHO22 **Pseudo Single Bunch with Adjustable Frequency: A New Operation Mode for Synchrotron Light Sources** – ***C. Sun***, *M.P. Hertlein, J. Kirz, G.J. Portmann, D. Robin (LBNL)*

MOPHO23 **Lattice Design Proposal for Diffraction Limited Advanced Light Source** – ***H. Tarawneh***, *H. Nishimura, D. Robin, C. Steier, C. Sun, W. Wan (LBNL)*

MOPHO24 **THz Free-Electron Laser Driven by a Superconducting Linac** – ***W.B. Colson***, *J. Blau, K. R. Cohn, C.M. Pogue, R. Swent (NPS) C.H. Boulware, D. Gorelov, T.L. Grimm (Niowave, Inc.) S.C. Gottschalk (STI)*

MOPHO25 **Removal of Residual Chirp in Compressed Beams using a Passive Wakefield Technique** – ***M.A. Harrison***, *G. Andonian, P. Frigola, T.J. Hodgetts, A.Y. Murokh, F.H. O'Shea, M. Ruelas (RadiaBeam)*

MOPHO26 **Laser-undulator FEL with Nearly Copropagating Laser Pulse** – ***R.A. Bosch***, *J. Bisognano, M.A. Green, K. Jacobs, R. Wehlitz (UW-Madison/SRC) T.-C. Chiang, T.J. Miller (University of Illinois) J.E. Lawler, D. Yavuz (UW-Madison/PD) R.C. York (FRIB)*

MOPHO27 **A Formula of Optimum Out-coupling Fraction for Maximum Output Power in Oscillator FEL** – ***Q.K. Jia*** *(USTC/NSRL)*

30-Sep-13	16:30 – 18:00	Poster	Poster Area Malibu
MOPMA — Poster Session			

04 Hadron Accelerators

MOPMA03 **Studies on Short-Bunch Extraction at CSNS RCS** – ***Y. Zou***, *J.F. Chen, J.Y. Tang (IHEP)*

MOPMA04 **Design Considerations for the ESS Accelerator-to-Target Region** – ***T.J. Shea***, *K.H. Andersen, P. Bentley, P.F. Henry, E.J. Pitcher, P. Sabbagh, A. Takibayev (ESS) A.I.S. Holm, S.P. Møller, H.D. Thomsen (ISA)*

MOPMA05 **Thermal Design of the FETS Chopper Beam Dump** – ***P. Savage***, *M. Aslaninejad, P.A. Posocco, J.K. Pozimski (Imperial College of Science and Technology, Department of Physics) S. Mishra (Imperial College of Science and Technology) J.K. Pozimski (STFC/RAL)*

MOPMA06 **Proposal for Simultaneous Acceleration of Stable and Unstable Ions in ATLAS** – ***A. Perry*** *(IIT) B. Mustapha, P.N. Ostroumov,* ***A. Perry*** *(ANL)* ***A. Perry*** *(Soreq NRC)*

MOPMA07 **The D-Line Project at Michigan State University** – ***J.A. Rodriguez***, *W. Wittmer (FRIB) A. Lapierre, G. Perdikakis, M. Portillo, S. Schwarz, M. Steiner, C. Sumithrarachchi, S.J. Williams, X. Wu (NSCL)*

MOPMA08 **Systems Engineering and Integration on the FRIB Project** – ***D. Stout***, *T. Borden, N.K. Bultman, R. Frazee, M. Leitner, P. Nguyen, T. Russo, E. Tanke, C. Thronson (FRIB)*

MOPMA09 **Status and Opportunities at Project X: A Multi-MW Facility for Intensity Frontier Research** – ***S.D. Holmes***, *M. Kaducak, R.D. Kephart, I. Kourbanis, V.A. Lebedev, C.S. Mishra, S. Nagaitsev, N. Solyak, R.S. Tschirhart (Fermilab)*

MOPMA10 **Studies of Fault Scenarios in SC CW Project-X Linac** – ***A. Saini***, *N. Solyak (Fermilab)*

MOPMA12 **Design Issues of High Intensity SC CW Ion Linac for Project-X facility.** – ***A. Saini***, *N. Solyak (Fermilab)*

MOPMA13 **Layout of Project-X Facility: A Reference Design** – ***A. Saini***, *V.A. Lebedev, J.-F. Ostiguy, N. Solyak (Fermilab)*

MOPMA14 **Status of the LANSCE RFQ Front-End Upgrade** – ***R.W. Garnett***, *Y.K. Batygin, I. Draganić, C.M. Fortgang, S.S. Kurennoy, R.C. McCrady, J.F. O'Hara, R.J. Roybal, L. Rybarcyk (LANL) J. Haeuser (Kress GmbH) A. Schempp (IAP)*

MOPMA15 **Experimental Results from a Diagnostic Pulse for Single-Particle-Like Beam Position Measurements during Accumulation/Production Mode in the Los Alamos Proton Storage Ring** – ***J.S. Kolski***, *E. Björklund, M.J. Hall, M.P. Martinez, F.E. Shelley (LANL)*

MOPMA16 **Design Analysis of the New LANL 4-Rod RFQ** – ***S.S. Kurennoy***, *E.R. Olivas, L. Rybarcyk (LANL)*

MOPMA17 **Design Requirements and Expected Performance of the New LANSCE H^+ RFQ** – ***L. Rybarcyk***, *Y.K. Batygin, I. Draganić, C.M. Fortgang, R.W. Garnett, S.S. Kurennoy, R.C. McCrady, T.P. Wangler (LANL) J. Haeuser (Kress GmbH) A. Schempp (IAP)*

05 Beam Dynamics and Electromagnetic Fields

MOPMA18 **GPU-accelerated Online Multi-Particle Beam Simulator for the LANSCE Linac** – ***X. Pang***, *S.A. Baily, L. Rybarcyk (LANL)*

04 Hadron Accelerators

MOPMA19 **Fault Conditions and Recovery Studies for the FRIB Linac** – ***Q. Zhao*** *(NSCL)*

MOPMA20 **Impact of RF Reference Line Stability on the FRIB Linac Performance** – ***Q. Zhao*** *(NSCL)*

MOPMA21 **Optimization of the Target Subsystem for the New g-2 Experiment** – ***C. Y. Yoshikawa***, *C.M. Ankenbrandt (Muons. Inc.) A.F. Leveling, N.V. Mokhov, J.P. Morgan, C.E. Polly, S.I. Striganov (Fermilab)*

30-Sep-13 16:30 – 18:00 Poster Poster Area Santa Monica

MOPSM — Poster Session

04 Hadron Accelerators

MOPSM01 **High Voltage Stabilization System of CARIBU/ECR for ATLAS** – ***Y. Luo***, *R.C. Pardo, G. Savard, S.I. Sharamentov, R.C. Vondrasek (ANL)*

MOPSM02 **Design and Simulation of the Argonne Inflight Radiactive Ion Separator** – ***B. Mustapha***, *M. Alcorta, B. Back, P.N. Ostroumov (ANL)*

MOPSM03 **Proposal for a nTOF Facility at BNL** – ***W. Fischer***, *J.G. Alessi, M. Blaskiewicz, K.A. Brown, C.J. Gardner, W. Horak, H. Huang, F. Méot, S. Peggs, P.H. Pile, D. Raparia, T. Roser, N. Simos (BNL)*

MOPSM04 **Beam Dynamics Simulations of SRF Based Electron Cooler for Low Energy RHIC Operation** – ***D. Kayran***, *S.A. Belomestnykh, I. Ben-Zvi, A.V. Fedotov, V. Litvinenko, I. Pinayev, B. Sheehy (BNL) S.A. Belomestnykh, I. Ben-Zvi, V. Litvinenko (Stony Brook University)*

MOPSM05 **Diagnostics for the LANSCE RFQ Front-End Test Stand** – ***R.C. McCrady***, *Y.K. Batygin, I. Draganić, C.M. Fortgang, R.W. Garnett, S.S. Kurennoy, J.F. O'Hara, E.R. Olivas, L. Rybarcyk (LANL)*

MOPSM06 **Design and Cold Test of a 17 GHz Overmoded Hybrid PBG Accelerator Cavity** – ***J.X. Zhang***, *A.M. Cook, B.J. Munroe, M.A. Shapiro, R.J. Temkin (MIT/PSFC)*

MOPSM07 **Results From the Linac Commissioning of the Rare Isotope Reaccelerator - ReA** – ***W. Wittmer***, *S.W. Krause, A. Lapierre, D. Leitner, F. Montes, S. Nash, G. Perdikakis, R. Rencsok, S. Schwarz, X. Wu (NSCL) L.Y. Lin, J.A. Rodriguez (FRIB)*

MOPSM08 **The Electron Counterpart of a Multi-Cavity Proton Cyclotron Accelerator** – ***S.V. Shchelkunov***, *M.A. LaPointe (Yale University, Beam Physics Laboratory) J.L. Hirshfield (Yale University, Physics Department) J.L. Hirshfield (Omega-P, Inc.) V.P. Yakovlev (Fermilab)*

03 Alternative Acceleration Schemes

MOPSM09 **Status of Dielectric-Lined Two-Channel Coaxial High Transformer Ratio Accelerator Structure Experiment** – ***S.V. Shchelkunov*** *(Yale University, Beam Physics Laboratory) M.E. Conde, W. Gai, J.G. Power, E.E. Wisniewski (ANL) J.L. Hirshfield (Yale University, Physics Department) J.L. Hirshfield, T.C. Marshall (Omega-P, Inc.) G.V. Sotnikov (NSC/KIPT)*

TUPAC — Poster Session

05 Beam Dynamics and Electromagnetic Fields

TUPAC01 **Kinetic Theory of Halo Formation in Charged Particle Beams** – ***W. Simeoni***, *F.B. Rizzato (IF-UFRGS)*

TUPAC02 **Beam Dynamics Studies of a 30 MeV Standing Wave Electron Linac** – ***R. Dash*** *(Homi Bhbha National Institute (HBNI), DAE) K.C. Mittal, J. Mondal, A.S. Sharma (BARC)*

TUPAC03 **Beam Transport System for the High Current Injector at IUAC** – ***A. Mandal***, *D. Kanjilal, S. Kumar, G.O. Rodrigues (IUAC)*

TUPAC04 **Pre-separator Design of the In-flight Fragment Separator using High-power Beam** – ***J.Y. Kim***, *D.G. Kim, E.H. Kim, J.-W. Kim, M. Kim, M. Kim, C.C. Yun (IBS)*

TUPAC05 **Proton Beam Dynamics Simulation at Linac for ADS** – ***V.S. Dyubkov***, *T.V. Bondarenko, A.V. Samoshin (MEPhI)*

TUPAC06 **Horizontal Dispersion Studies for the CERN Proton Synchrotron Booster Rings** – ***V. Raginel***, *S.S. Gilardoni, M.J. McAteer, B. Mikulec (CERN)*

TUPAC07 **Beam Dynamics and Wakefield Suppression in Interleaved Damped and Detuned Structures for CLIC** – ***A. D'Elia***, *R.M. Jones, I. Nesmiyan (UMAN)*

TUPAC08 **Beam-Based Alignment of Sextupoles at the APS** – ***A. Xiao*** *(ANL)*

TUPAC09 **Serpentine Acceleration with a Generalized Time of Flight** – ***J.S. Berg*** *(BNL)*

TUPAC10 **Energy Calibration in the AGS Using Depolarization Through Vertical Intrinsic Spin Resonances** – ***Y. Dutheil***, *L. Ahrens, H. Huang, F. Méot, V. Schoefer (BNL)*

TUPAC11 **Halo Generation and Control in RHIC** – ***C. Montag***, *K.A. Drees (BNL)*

TUPAC12 **A Graphic Interface for Full Control of the RHIC Optics** – ***G. Robert-Demolaize***, *M. Bai (BNL) X. Shen (Indiana University)*

TUPAC13 **Trajectories of Low Energy Electrons in Particle Accelerator Magnetic Structures** – ***E.E. Cowan*** *(Syracuse University), K.G. Sonnad (Cornell University (CLASSE), Cornell Laboratory for Accelerator-Based Sciences and Education) S.A. Veitzer (Tech-X)*

TUPAC14 **A Linear Envelope Model for Multi-Charge State Linac** – ***Z.Q. He***, *Z. Liu, J. Wei, Y. Zhang (FRIB) R.M. Talman (Cornell University (CLASSE), Cornell Laboratory for Accelerator-Based Sciences and Education)*

TUPAC15 **Calculation of the Kick Maps Generated by a Hollow Electron Lens for Studies of High-energy Proton Beam Collimation** – ***G. Stancari***, *M. Chung, A. Valishev (Fermilab) H.-J. Lee (Pusan National University) V. Moens (EPFL)*

TUPAC16 **A Preliminary Study on Possible Applications of Curved Helical Quadrupole Focusing Channel** – ***W. Wan***, *L.N. Brouwer, S. Caspi, D. Robin, A. Sessler (LBNL)*

TUPAC17 **Limitations of Increasing the Intensity of a Relativistic Electron Beam** – ***J.E. Coleman***, *M.T. Crawford, C. Ekdahl, B.T. McCuistian, D.C. Moir, G. Sullivan (LANL)*

TUPAC18 **Numerical Model and Self-Consistent Simulations of Coherent Synchrotron Radiation in Two and Three Dimensions** – ***C. Huang***, *B.E. Carlsten, T.J. Kwan (LANL)*

TUPAC19 **Experimental Verification of Dipole Edge Focusing in Linear Model by Operating in the Weak Focusing Regime at the Los Alamos Proton Storage Ring** – ***J.S. Kolski***, *R.J. Macek, T. Spickermann (LANL)*

TUPAC20 **Coherent Space Charge Tune Shift Measurements in the Los Alamos Proton Storage Ring** – ***J.S. Kolski***, *R.J. Macek, T. Spickermann (LANL)*

TUPAC21 **Performance Comparisons of Emittance-exchanger Beamlines** – ***C.R. Prokop***, *P. Piot (Northern Illinois University) B.E. Carlsten (LANL) M.D. Church, P. Piot (Fermilab)*

TUPAC22 **New Modes of Intense Beam Propagation in General Focusing Lattices** – ***H. Qin***, *R.C. Davidson (PPPL)*

TUPAC23 **Generalized Courant-Snyder Theory for Charged Particle Dynamics in General Focusing Lattices** – ***H. Qin***, *J.W. Burby, R.C. Davidson (PPPL) M. Chung (Fermilab)*

TUPAC24 **Studies of Ion Beam Charge Neutralization by Ferroelectric Plasma Sources** – ***A.D. Stepanov***, *R.C. Davidson, E.P. Gilson, L. Grisham (PPPL)*

TUPAC25 **Identification of Intra-Bunch Dynamics using CERN SPS Machine Measurements** – ***O. Turgut***, *J.D. Fox, C.H. Rivetta (SLAC)*

TUPAC26 **Nonlinear Beam Dynamics Studies of High Intensity, High Brightness Proton Drivers** – ***S. Assadi***, *P.M. McIntyre (Texas A&M University)*

TUPAC27 **Exploration of Electron Polarization for the MEIC Electron Collider Ring** – ***F. Lin***, *Y.S. Derbenev, V.S. Morozov, Y. Zhang (JLAB) D.P. Barber (DESY)*

01 Colliders

TUPAC28 **Interaction Region Design and Detector Integration at MEIC** – ***V.S. Morozov***, *P.D. Brindza, Y.S. Derbenev, R. Ent, F. Lin, P. Nadel-Turonski, Y. Zhang (JLAB) C. Hyde (Old Dominion University) M.K. Sullivan (SLAC)*

05 Beam Dynamics and Electromagnetic Fields

TUPAC29 **Space Charge Effects in Optical Bunchers** – ***L.V. Ho***, *J.P. Duris, R.K. Li, P. Musumeci (UCLA)*

TUPAC30 **Nonlinear Accelerator Lattice With Transverse Motion Integrable in Normalized Parabolic Coordinates** – ***T.V. Zolkin*** *(University of Chicago) Y. Kharkov, I.A. Morozov (BINP SB RAS) S. Nagaitsev (Fermilab)*

TUPAC31 **Stability of Emittance vs. Space-Charge Dominated Beams in an Electron Recirculator** – ***S. Bernal***, *B.L. Beaudoin, M. Cornacchia, D.F. Sutter (UMD)*

TUPAC32 **Experimental Detection of Envelope Resonance in a Space-Charge-Dominated Electron Ring** – ***W.D. Stem***, *B.L. Beaudoin, I. Haber, T.W. Koeth (UMD)*

TUPAC33 **Measurement of Plasma Wave Speed from Beam End Erosion** – ***D.F. Sutter***, *B.L. Beaudoin (UMD)*

TUPAC34 **Experimental Study of Halo Formation in Space Charge Dominated Beam** – ***H.D. Zhang***, *R.B. Fiorito, R.A. Kishek (UMD)*

01-Oct-13	16:30 – 18:00	Poster	Poster Area Bel Air

TUPBA — Poster Session

01 Colliders

TUPBA01 **Exploring the Possibility of High-energy Polarized Electron Beam at BEPCII** – ***Z. Duan***, *Q. Qin (IHEP) M. Bai (BNL)*

TUPBA02 **Study of Beam-Beam Effects on Proton Beam Polarization in RHIC** – ***Z. Duan***, *Q. Qing (IHEP) M. Bai, A.I. Kirleis, V.H. Ranjbar, D. Smirnov (BNL)*

TUPBA03 **Accelerator Design for a Circular Higgs Factory in IHEP** – ***J.Y. Tang***, *Y.W. An, S. Bai, J. Gao, H. Geng, Y.Y. Guo, Q. Qin, D. Wang, N. Wang, S. Wang, Y. Wang, M. Xiao, G. Xu, S.Y. Xu, Y. Yue, J.Y. Zhai, C. Zhang (IHEP)*

TUPBA04 **AC Dipole Based Optics Measurement and Correction at RHIC** – ***X. Shen***, *S.-Y. Lee (IUCEEM), M. Bai, Y. Luo, A. Marusic, G. Robert-Demolaize, S.M. White (BNL) R. Tomás (CERN)*

TUPBA05 **Implementation of Optics Correction on the Ramp in RHIC** – ***C. Liu***, *A. Marusic, M.G. Minty (BNL)*

TUPBA06 **Global Optics Correction in RHIC Based on Turn-by-turn Data from ARTUS Tune Meter** – ***C. Liu***, *M. Bai, M. Blaskiewicz, K.A. Drees, W. Fischer, A. Marusic, M.G. Minty, G. Robert-Demolaize (BNL)*

TUPBA07 **Maximizing Dynamic Aperture with Head-on Beam-beam Compensation in RHIC** – ***Y. Luo***, *W. Fischer, S.M. White (BNL)*

TUPBA08 **Measurement of Beam Optical Functions during Acceleration in RHIC** – ***M.G. Minty***, *K.A. Drees, R.L. Hulsart, A. Marusic, R.J. Michnoff, P. Thieberger (BNL)*

TUPBA09 **Simulation of High Power Mercury Jet Targets for Neutrino Factory, Muon Collider, and Beyond** – ***V. Samulyak***, *H.G. Kirk (BNL) H.C. Chen (SBU) K.T. McDonald (PU)*

TUPBA10 **Impact of the Proton Beam Bunch Length on the Performance of the Front End of a Neutrino Factory** – ***H. K. Sayed***, *J.S. Berg, H.G. Kirk (BNL) K.T. McDonald (PU)*

TUPBA11 **Towards a Global Optimization of the Muon Collider / Neutrino Factory Front End Baseline** – ***H. K. Sayed***, *J.S. Berg, H.G. Kirk, R.B. Palmer, D. Stratakis (BNL) D.V. Neuffer (Fermilab)*

TUPBA12 **Design of ILC RTML Extraction Lines for the Renovated Two-stage Bunch Compressor** – ***S. Seletskiy*** *(BNL)*

TUPBA13 **Non-scaling FFAG for Electron-ion Collider in RHIC (eRHIC)** – ***D. Trbojevic***, *J.S. Berg, S.J. Brooks, O.V. Chubar, Y. Hao, V. Litvinenko, C. Liu, W. Meng, F. Méot, B. Parker, V. Ptitsyn, T. Roser, N. Tsoupas, W.-T. Weng (BNL)*

TUPBA14 **Dynamical Beta Squeeze from 80 to 40 cm at RHIC Top Energy** – ***D. Trbojevic***, *C. Liu, Y. Luo (BNL)*

TUPBA15 **eRHIC Interaction Region Design*** – ***D. Trbojevic***, *E.C. Aschenauer, V. Litvinenko, B. Parker, V. Ptitsyn (BNL)*

TUPBA16 **Production of Tritium at Zero Cost in Blewett Strong-Focusing Self-Collider** – ***B.C. Maglich***, *T. Hester (CALSEC) M. Srivinivasan (BARC)*

TUPBA17 **A Muon Collider as a Higgs Factory** – ***D.V. Neuffer***, *Y.I. Alexahin, M.A. Palmer (Fermilab) J.-P. Delahaye (SLAC)*

TUPBA18 **The Nustorm Facility-Muon Storage Ring and Injection Design** – ***A. Liu***, *A.D. Bross, D.V. Neuffer (Fermilab) S.A. Bogacz (JLAB) S.-Y. Lee (Indiana University)*

TUPBA20 **A Staged Muon-based Facility to enable Intensity and Energy Frontier Science in the US** – ***J.-P. Delahaye*** *(SLAC) C.M. Ankenbrandt (Muons. Inc.) C.M. Ankenbrandt, S. Brice, A.D. Bross, D.S. Denisov, E. Eichten, R.J. Lipton, D.V. Neuffer, M.A. Palmer, P. Snopok (Fermilab) S.A. Bogacz (JLAB) P. Huber (Virginia Polytechnic Institute and State University) D.M. Kaplan, P. Snopok (Illinois Institute of Technology) H.G. Kirk, R.B. Palmer (BNL) R.D. Ryne (LBNL)*

TUPBA21 **Beam-Beam Studies for HL-LHC** – ***A. Valishev*** *(Fermilab)*

TUPBA22 **Study Muon Polarization in Muon Collider** – ***K. Yonehara*** *(Fermilab)*

TUPBA23 **Coherent Instability Due to Beam-Beam Interaction in Hadron Colliders** – ***S. Paret***, *J. Qiang (LBNL)*

TUPBA24 **Particle Flow Algorithm Application for Lepton Collider Background Mitigation** – ***M.A.C. Cummings***, *P. Saha, V. Zutshi (Northern Illinois University)*

TUPBA25 **Design And High Order Optimization Of The ATF2 Lattices** – ***E. Marín***, *G.R. White, M. Woodley (SLAC) K. Kubo, T. Okugi, T. Tauchi, J. Urakawa (KEK) R. Tomás (CERN)*

TUPBA26 **Coupling Spin Resonances With Siberian Snakes** – ***N.Z. Khalil*** *(SBU) V. Ptitsyn (BNL)*

01-Oct-13	16:30 – 18:00	Poster	Poster Area Hollywood

TUPHO — Poster Session

01 Colliders

TUPHO01 **The RHIC E-Lens Test Bench Experimental Results** – ***X. Gu***, *Z. Altinbas, E.N. Beebe, W. Fischer, B. Frak, D.M. Gassner, K. Hamdi, J. Hock, L.T. Hoff, P. Kankiya, R.F. Lambiase, Y. Luo, M. Mapes, J.-L. Mi, T.A. Miller, C. Montag, S. Nemesure, R.H. Olsen, A.I. Pikin, D. Raparia, P.J. Rosas, J. Sandberg, Y. Tan, C. Theisen, P. Thieberger, J.E. Tuozzolo, W. Zhang (BNL)*

TUPHO02 **Electron Cooling Simulations for MEIC** – ***G.I. Bell***, *I.V. Pogorelov, B.T. Schwartz (Tech-X) H. Zhang, Y. Zhang (JLAB)*

TUPHO03 **Advances in MEIC Design Studies** – ***Y. Zhang***, *Y.S. Derbenev, D. Douglas, A. Hutton, G.A. Krafft, R. Li, F. Lin, V.S. Morozov, E.W. Nissen, R.A. Rimmer, C. Tennant, H. Wang, S. Wang, B.C. Yunn, H. Zhang (JLAB) D.P. Barber (DESY) A.M. Kondratenko (Science and Technique Laboratory Zaryad) M.K. Sullivan (SLAC)*

TUPHO04 **Electron Cooling Simulation for the Ion Collider Ring in MEIC and LEIC** – ***H. Zhang***, *Y. Zhang (JLAB)*

TUPHO05 **Advances in MEIC Electron Cooling Studies** – ***Y. Zhang***, *Y.S. Derbenev, D. Douglas, A. Hutton, R. Li, C. Tennant, H. Zhang (JLAB) E.W. Nissen (Northern Illinois University)*

01-Oct-13	16:30 – 18:00	Poster	Poster Area Malibu

TUPMA — Poster Session

02 Light Sources

TUPMA01 **Status and Future Plan of the Development of a Compact X-ray Source Based on ICS at Laser Undulator Compact X-ray (LUCX)** – ***M.K. Fukuda***, *S. Araki, A.S. Aryshev, Y. Honda, N. Terunuma, J. Urakawa (KEK) K. Sakaue, M. Washio (RISE)*

TUPMA02 **High-chromaticity Optics for the MAX IV 3 GeV Storage Ring** – ***T. Olsson***, *S.C. Leemann (MAX-lab)*

TUPMA03 **Creation of High-charge Bunch Trains from the APS Injector for Swap-out Injection** – ***C. Yao***, *M. Borland, L. Donley, L. Emery, F. Lenkszus (ANL)*

TUPMA04 **Observation of +1 Bucket Bunch Impurity Growth at the APS Storage Ring** – ***C. Yao***, *M. Borland, B.X. Yang (ANL)*

TUPMA05 **Alignment of the NSLS-II Linac** – ***R.P. Fliller***, *D. Davis, F.X. Karl, T.V. Shaftan (BNL)*

TUPMA06 **Comparison of the NSLS-II Linac Model to Measurements** – ***R.P. Fliller***, *T.V. Shaftan (BNL)*

TUPMA07 **Future Upgrades of the NSLS-II Injector** – ***T.V. Shaftan***, *R.P. Fliller, J. Rose, G.M. Wang, F.J. Willeke (BNL)*

TUPMA08 **Subpicosecond Bunch Train Production for High Power Tunable THz Source** – ***S.P. Antipov***, *C.-J. Jing, A. Kanareykin, P. Schoessow (Euclid TechLabs, LLC) M.G. Fedurin (BNL) W. Gai, A. Zholents (ANL) V. Yakimenko (SLAC)*

TUPMA09 **Analysis and Optimization of Coupler Effects on APEX Beam** – ***H.J. Qian***, *S. Kwiatkowski, C. F. Papadopoulos, Z. Paret, F. Sannibale, J.W. Staples, R.P. Wells (LBNL)*

TUPMA10 **LLNL X-band Test Station Status** – ***R.A. Marsh***, *F. Albert, G.G. Anderson, S.G. Anderson, C.P.J. Barty, D.J. Gibson, F.V. Hartemann, S.S.Q. Wu (LLNL)*

TUPMA11 **Photo-injector Optimization Studies for the MaRIE X-Ray Free Electron Laser** – ***L.D. Duffy***, *B.E. Carlsten, F.L. Krawczyk, J.W. Lewellen, S.J. Russell (LANL) C. Limborg-Deprey (SLAC)*

TUPMA12 **Low Emittance Injector Design for the MaRIE 1.0 X-FEL Linac** – ***S.J. Russell***, *B.E. Carlsten, L.D. Duffy, F.L. Krawczyk, S.S. Kurennoy, J.W. Lewellen, R.L. Sheffield (LANL)*

TUPMA13 **Shaping Electron Bunches for Ultra-bright Electron Beam Acceleration in Dielectric Loaded Waveguides** – ***E.I. Simakov***, *C. Huang, T.J. Kwan, D.Y. Shchegolkov (LANL)*

TUPMA14 **Two-Stream Instability at Soft X-ray Wavelengths for Increasing Brightness of Compton Sources.** – ***N.A. Yampolsky***, *G.L. Delzanno, C. Huang, D.Y. Shchegolkov (LANL)*

TUPMA15 **Monte Carlo Simulations of Charge Transport and Photoemission from Electron Affinity GaAs Photocathodes** – ***Y. Choi***, *D.A. Dimitrov, C. Nieter (Tech-X) I.V. Bazarov, S.S. Karkare (Cornell University (CLASSE), Cornell Laboratory for Accelerator-Based Sciences and Education)*

TUPMA16 **High Capture Low Energy Spread Inverse Free Electron Laser Accelerator** – ***J.P. Duris*** *(UCLA)*

TUPMA17 **Prototype Controlled Porosity Reservoir Photocathode: Design and Demonstration** – ***E.J. Montgomery***, *D.W. Feldman, P.Z. Pan, B.C. Riddick (UMD) A.L. Day (Wellesley College) R.L. Ives (CCR) K. L. Jensen (NRL)*

TUPMA18 **DMD-Based Photocathode QE Mapping** – ***B.C. Riddick***, *R.B. Fiorito, S.A. Khan, E.J. Montgomery, P.Z. Pan, A.G. Shkvarunets (UMD)*

TUPMA19 **Wisconsin SRF Gun Commissioning** – ***J. Bisognano***, *M.J. Bissen, R.A. Bosch, M.Y. Efremov, D. Eisert, M.V. Fisher, M.A. Green, K. Jacobs, K.J. Kleman, R.A. Legg, G.C. Rogers, M.C. Severson, D. Yavuz (UW-Madison/SRC)*

TUPMA20 **Effect of RF Gradient upon the Performance of the Wisconsin SRF Electron Gun** – ***R.A. Bosch*** *(UW-Madison/SRC) R.A. Legg (JLAB)*

TUPMA21 **Rejuvenation of a Cesium-Based Dispenser Photocathode in Response to Atmospheric Contamination** – ***A.L. Day*** *(Wellesley College) S. Eustice, S.A. Khan, E.J. Montgomery, B.C. Riddick (UMD) K. L. Jensen (NRL)*

01-Oct-13 16:30 – 18:00 Poster Poster Area Santa Monica

TUPSM — Poster Session

06 Accelerator Systems

TUPSM01 **Study on 2 Cell RF-Deflector Cavity for Ultra-short Electron Bunch Measurement** – ***T. Takahashi***, *Y. Nishimura, M. Nishiyama, K. Sakaue, M. Washio (Waseda University) T. Takatomi, J. Urakawa (KEK)*

TUPSM02 **Design and Experiment of a Compact C-band Photocathode RF Gun for UED** – ***X.H. Liu*** *(TUB)*

TUPSM03 **10s Femtosecond Bunch Length Measurement Based on Coherent Transition Radiation** – ***X.H. Lu*** *(TUB) R.K. Li, P. Musumeci, K.G. Roberts, H.L. To (UCLA)*

TUPSM04 **High-Charge Femtosecond Electron Generations for Ultrafast, High-Brightness Electron Beam Applications** – ***J.H. Park***, *H. Bluem, J. Rathke, T. Schultheiss, A.M.M. Todd (AES)*

TUPSM05 **Studies of Field and Photo-emission in a New Short-pulse, High-charge Cs2Te RF Photocathode Gun** – ***E.E. Wisniewski***, *M.E. Conde, W. Gai, C.-J. Jing, W. Liu, J.G. Power (ANL) C.-J. Jing (Euclid TechLabs, LLC) L.K. Spentzouris, Z.M. Yusof (Illinois Institute of Technology)*

TUPSM06 **The Cathode Preparation Chamber for the DC High Current High Polarization Gun (The Gatling Gun)** – ***O.H. Rahman***, *I. Ben-Zvi, D.M. Gassner, A.I. Pikin, T. Rao, E.J. Riehn, B. Sheehy, J. Skaritka, E. Wang, Q. Wu (BNL) I. Ben-Zvi (Stony Brook University)*

TUPSM07 **Parmela Simulation for BNL 704MHz SRF Gun in Low Emittance Operation** – ***E. Wang***, *I. Ben-Zvi, J. Kewisch (BNL)*

TUPSM08 **Beam Dynamics and Design of a Funneling Electron Gun** – ***E. Wang***, *I. Ben-Zvi, D.M. Gassner, W. Meng, A.I. Pikin, O.H. Rahman, T. Rao, E.J. Riehn, J. Skaritka (BNL)*

TUPSM09 **A Two-Frequency Gun for High Current Thermionic Cathode Election Injection Systems** – ***J.P. Edelen***, *S. Biedron, J.R. Harris, S.V. Milton (CSU) J.W. Lewellen (LANL)*

TUPSM10 **The Conceptual Design of PXIE Vacuum System** – ***A.Z. Chen***, *V.A. Lebedev, A.V. Shemyakin (Fermilab)*

TUPSM11 **Development of a Compact Photo-injector with RF-Focusing Lens for Short Pulse Electron Source Application** – ***Y.-M. Shin*** *(Fermilab) D.W. Eaton (Scandinova Systems AB) A.F. Grabenhofer (Northern Illinois University)*

TUPSM12 **High Power Test of a 3.9 GHz 5-Cell deflecting-mode cavity in a cryogenic operation** – ***Y.-M. Shin***, *M.D. Church (Fermilab)*

TUPSM13 **RF Gun Water Temperature Control System at ASTA** – ***P. Stabile***, *M. Ball, J. Czajkowski, J.D. Firebaugh, P.A. Kasley, P.S. Prieto, T.J. Zuchnik (Fermilab)*

TUPSM14 **Development of EPICS Control Systems for Lambda EMS and TCR Power Supplies** – ***A. Andrews***, *B.L. Berls, K. Folkman, Y. Kim, C. O'Neill, J. Ralph (IAC) P. Buaphad, C.F. Eckman, Y. Kim (ISU)*

TUPSM15 **The Muon Ionization Cooling Experiment: Controls and Monitoring System** – ***P.M. Hanlet*** *(IIT)*

TUPSM16 **Progress Report of H^- Ion Beam Production at the LANL Ion Source Test Stand** – ***I. Draganić***, *Y.K. Batygin, C.M. Fortgang, R.W. Garnett, J.G. Gioia, S.S. Kurennoy, R.C. McCrady, J.F. O'Hara, M. Pieck, G. Rouleau, L. Rybarcyk, F.E. Shelley (LANL)*

TUPSM17 **A Specialized MEBT Design for the LANSCE H^+ RFQ Upgrade Project** – ***C.M. Fortgang***, *Y.K. Batygin, R.W. Garnett, S.S. Kurennoy, L. Rybarcyk (LANL)*

TUPSM18 **Design of a Duoplasmatron Extraction Geometry and LEBT for the LANSCE H^+ RFQ Project** – ***C.M. Fortgang***, *Y.K. Batygin, I. Draganić, R.W. Garnett, R.C. McCrady, L. Rybarcyk (LANL)*

TUPSM19 **Application and Calibration Aspects of a New High-Performance Beam-Dynamics Simulator for the LANSCE Linac** – ***L. Rybarcyk***, *X. Pang (LANL)*

TUPSM20 **Integration between the FRIB Linac Mechanical CAD Model Geometry and the Accelerator Physics Lattice Database** – ***M.J. Johnson*** *(NSCL) N.K. Bultman, M. Leitner, Q. Zhao (FRIB)*

TUPSM21 **Beam Brightness Booster with Ionization Cooling of Super-intense Circulating Beams** – ***C.M. Ankenbrandt****, V.G. Dudnikov (Muons. Inc.)*

TUPSM22 **Improving Efficiency of Ion Production in a Saddle Antenna Surface Plasma Source** – ***V.G. Dudnikov****, R.P. Johnson (Muons. Inc.) C.A. Johnson (UW-Madison) S.N. Murray (ORNL RAD) T.R. Pennisi, C. Piller, M. Santana, M.P. Stockli, R.F. Welton (ORNL) M.W. Turvey (University of Florida)*

TUPSM23 **Quarter-Wave Superconducting RF Electron Guns with Field-Emitter Array Cathodes** – ***C.H. Boulware****, T.L. Grimm (Niowave, Inc.)*

TUPSM24 **Operation of a Field-Emission Diamond Cathode in an RF-gun** – ***P. Piot****, B.R. Blomberg, D. Mihalcea, H. Panuganti (Northern Illinois University) C.A. Brau, B.K. Choi, J.D. Jarvis, M.H. Mendenhall (Vanderbilt University) W.E. Gabella (Vanderbilt University, W.M. Keck Foundation Free-Electron Laser Center)* ***P. Piot*** *(Fermilab)*

TUPSM25 **Recent CsTe Cathode Investigations at Fermilab's HBESL** – ***H. Panuganti****, P. Piot, C.R. Prokop (Northern Illinois University) P. Piot (Fermilab)*

TUPSM26 **Android Application for Monitoring the Status of the Advanced Photon Source** – ***M. Borland*** *(Private Address)*

TUPSM27 **High-power Tests and Initial Electron Beam Measurements of the New High-gradient Normal-conducting RF Photoinjector System for the Sincrotrone Trieste** – ***L. Faillace****, R.B. Agustsson, P. Frigola (RadiaBeam) J.B. Rosenzweig (UCLA)*

TUPSM28 **Status of the experimental setup of an Innovative Low-Energy Ultra-Fast Electron Diffraction (UED) System** – ***L. Faillace****, S. Boucher, A.V. Smirnov (RadiaBeam) P. Musumeci, E.W. Threlkeld (UCLA)*

TUPSM29 **Operational Testing and Performance Results of a Miniature ECR Source** – ***W. D. Cornelius*** *(SSolutions)*

TUPSM30 **Modeling the Development and Mitigation of Charge Accumulation for Photo Emission Electron Guns** – ***C. Nieter****, Y. Choi, D.A. Dimitrov (Tech-X)*

WEPAC — Poster Session

07 Accelerator Technology

WEPAC01 **Thermal Dynamics Study of Crab Cavity for SPX Project at Advanced Photon Source** – ***Y. Yang*** *(TUB) P. Dhakal, J.D. Mammosser, H. Wang (JLAB) J.D. Fuerst, J.P. Holzbauer, A. Nassiri, G. Wu,* ***Y. Yang*** *(ANL)*

WEPAC02 **Copper Prototype Measurement of SC Deflecting Cavity for SPX Project at Advanced Photon Source** – ***Y. Yang****, A. Nassiri, T.L. Smith, G.J. Waldschmidt (ANL) H. Wang (JLAB)* ***Y. Yang*** *(TUB)*

WEPAC03 **An Increased Gradient Design for the ReA6 Quarter Wave Resonators** – ***Z. Zheng****, Z.Q. He (TUB) A. Facco (INFN/LNL) A. Facco, Z.Q. He, Z. Liu, J. Wei, Y. Zhang,* ***Z. Zheng*** *(FRIB)*

WEPAC04 **Hydrogen Degassing Study During the Heat Treatment of 1.3-GHz SRF Cavities** – ***M.J. Joung****, H.J. Kim (IBS) A.M. Rowe, M. Wong (Fermilab)*

WEPAC05 **Measurement of a Superconducting Solenoid with Applications to Low-beta SRF Cryomodules** – ***S.H. Kim****, Z.A. Conway, M.P. Kelly, P.N. Ostroumov (ANL) E. Burkhardt (Cryomagnetics, Inc.)*

WEPAC06 **Mechanical Design of the 704 MHz 5-cell SRF Cavity Cold Mass for CeC PoP Experiment** – ***J.C. Brutus****, S.A. Belomestnykh, I. Ben-Zvi, Y. Huang, V. Litvinenko, I. Pinayev, J. Skaritka, L. Snydstrup, R. Than, J.E. Tuozzolo, W. Xu (BNL) T.L. Grimm, R. Jecks, J.A. Yancey (Niowave, Inc.)*

WEPAC07 **Mechanical Design of 112 MHz SRF Gun FPC for CeC PoP Experiment** – ***J.C. Brutus****, S.A. Belomestnykh, Y. Huang, V. Litvinenko, G.J. Mahler, I. Pinayev, J. Skaritka, L. Snydstrup, R. Than, J.E. Tuozzolo, Q. Wu, T. Xin (BNL)*

WEPAC09 **A Multi-cell Temperature Mapping System for SRF Cavities at Cornell University** – ***G.M. Ge****, G.H. Hoffstaetter (Cornell University (CLASSE), Cornell Laboratory for Accelerator-Based Sciences and Education)*

WEPAC10 **Investigation of the Surface Resistivity of SRF Cavities via the Multi-cell Temperature Mapping System at Cornell** – ***G.M. Ge****, G.H. Hoffstaetter (Cornell University (CLASSE), Cornell Laboratory for Accelerator-Based Sciences and Education)*

WEPAC11 **Cornell's Main Linac Cryo-module Prototype for the ERL** – ***G. Eichhorn****, Y. He, G.H. Hoffstaetter, M. Liepe, T. O'Connel, P. Quigley, D.M. Sabol, J. Sears, E.N. Smith, V. Veshcherevich (Cornell University (CLASSE), Cornell Laboratory for Accelerator-Based Sciences and Education)*

WEPAC12 **Theoretical Description of SIS Multilayer Films for SRF Cavities** – ***S. Posen****, M. Liepe (Cornell University (CLASSE), Cornell Laboratory for Accelerator-Based Sciences and Education) G. Catelani (Forschungszentrum Jülich, Peter Gruenberg Institut (PGI-2)) J.P. Sethna (Cornell University) M.K. Transtrum (M.D.A.C.C.)*

WEPAC13 **Achieving High Accuracy in Cornell's ERL Cavity Production** – ***G. Eichhorn***, *B. Bullock, B. Clasby, B. Elmore, J.J. Kaufman, S. Posen, J. Sears, V.D. Shemelin (Cornell University (CLASSE), Cornell Laboratory for Accelerator-Based Sciences and Education) T. Kürzeder (TU Darmstadt)*

WEPAC14 **Studies of the Superconducting Traveling Wave Cavity for High Gradient Linac** – ***P.V. Avrakhov***, *A. Kanareykin, R.A. Kostin (Euclid TechLabs, LLC) N. Solyak, V.P. Yakovlev (Fermilab)*

WEPAC15 **Ferroelectric Based High Power RF Components for L-band Accelerator Applications** – ***A. Kanareykin*** *(Euclid TechLabs, LLC) S. Kazakov, V.P. Yakovlev (Fermilab) A.B. Kozyrev (LETI) E. Nenasheva (Ceramics Ltd.)*

02 Light Sources

WEPAC16 **A Beam-Driven Short Wavelength Microwave Undulator for FEL** – ***A. Kanareykin*** *(Euclid TechLabs, LLC) S. Baturin (LETI) C.-J. Jing, A. Zholents (ANL)*

07 Accelerator Technology

WEPAC17 **Study on Particulate Retention on Polished Niobium Surfaces after BCP Etching** – ***I.M. Malloch***, *C. Compton, L. Popielarski (FRIB)*

WEPAC18 **SRF Cavity Etching Developments for FRIB Cavity Processing** – ***K. Elliott*** *(NSCL), I.M. Malloch (FRIB)*

WEPAC19 **Using Higher Order Modes of a Quarter Wave Resonator to Accelerate Ion Beam** – ***E. Pozdeyev*** *(FRIB)*

WEPAC20 **Magnetic Shield Optimization for the FRIB Superconducting Quarter-Wave Resonator Cryomodule** – ***Y. Xu***, *A.D. Fox, M.J. Johnson, M. Leitner, S.J. Miller, K. Saito, M. Shuptar (FRIB)*

WEPAC21 **Tuning Process of SSR1 Cavity for Project X at FNAL** – ***P. Berrutti***, *M.H. Awida, T.N. Khabiboulline, L. Ristori, V.P. Yakovlev (Fermilab)*

WEPAC22 **Single Spoke Resonator Inner Electrode Optimization Driven by Reduction of Multipoles** – ***P. Berrutti***, *T.N. Khabiboulline, L. Ristori, N. Solyak, V.P. Yakovlev (Fermilab)*

WEPAC23 **Multipacting Simulations of SSR2 Cavity at FNAL** – ***P. Berrutti***, *T.N. Khabiboulline, L. Ristori, G.V. Romanov, V.P. Yakovlev (Fermilab)*

WEPAC24 **Mechanical Resonance Simulations of Dressed SRF Cavities** – ***I.V. Gonin***, *M.H. Awida, T.N. Khabiboulline, Y.M. Pischalnikov, L. Ristori, W. Schappert, V.P. Yakovlev (Fermilab)*

WEPAC25 **New Helium Vessel and Lever Tuner Designs for 650 MHz Project X Cavities** – ***I.V. Gonin***, *M.H. Awida, E. Borissov, M.H. Foley, C.J. Grimm, T.N. Khabiboulline, M. Merio, T.J. Peterson, L. Ristori, V.P. Yakovlev (Fermilab)*

WEPAC26 **Development of Variable Coupler for Vertical Testing of High Q SRF Single Cell Cavities** – ***M.H. Awida***, *A. Grassellino, T.N. Khabiboulline, Y.M. Pischalnikov, V. Poloubotko, K.S. Premo, V.P. Yakovlev (Fermilab)*

WEPAC27 **High Q SCRF Cavities R&D Program at Fermilab** – ***A. Grassellino****, A.C. Crawford, R.D. Kephart, O.S. Melnychuk, A. Romanenko, A.M. Rowe, D.A. Sergatskov, V.P. Yakovlev (Fermilab) Y. Trenikhina (IIT)*

WEPAC28 **R&D Program for 650 MHz Niobium Cavities for Project X** – ***A. Grassellino****, A.C. Crawford, C.M. Ginsburg, T.N. Khabiboulline, O.S. Melnychuk, A. Romanenko, A.M. Rowe, D.A. Sergatskov, A.I. Sukhanov, V.P. Yakovlev (Fermilab)*

WEPAC29 **CM2, Second 1.3GHz Cryomodule Fabrication at Fermilab** – ***T.T. Arkan****, M.H. Awida, P. Berrutti, E. Borissov, C.M. Ginsburg, C.J. Grimm, E.R. Harms, A. Hocker, T.N. Khabiboulline, Y. Orlov, Y.M. Pischalnikov, K.S. Premo, L. Ristori, V.P. Yakovlev (Fermilab)*

WEPAC30 **The Double-Lever Tuning System for SSR1** – ***L. Ristori*** *(Fermilab)*

WEPAC31 **Mechanical Design of SSR2 Resonators for Project X and RISP** – ***L. Ristori****, M.H. Awida, P. Berrutti, I.V. Gonin, T.N. Khabiboulline, M. Merio, D. Passarelli (Fermilab)*

WEPAC32 **Wakefield Loss Analysis of the Elliptical 3.9 GHz Third Harmonic Cavity** – ***M.H. Awida****, P. Berrutti, T.N. Khabiboulline, A. Saini, V.P. Yakovlev (Fermilab)*

WEPAC33 **Results of the New High Power Tests of Superconducting Photonic Band Gap Structure Cells** – ***E.I. Simakov****, S. Arsenyev, W.B. Haynes, S.S. Kurennoy, D. C. Lizon, J.F. O'Hara, E.R. Olivas, D.Y. Shchegolkov, T. Tajima (LANL) S. Arsenyev (MIT/PSFC) C.H. Boulware, T.L. Grimm (Niowave, Inc.)*

WEPAC34 **Designing PBG Resonators for Effective HOM Suppression in SRF Accelerators** – ***S. Arsenyev*** *(MIT/PSFC) E.I. Simakov (LANL)*

WEPAC35 **Multipactor Suppression Via Secondary Modes In A Coaxial Cavity** – ***S.A. Rice****, J.P. Verboncoeur (Michigan State University)*

WEPAC36 **A Comparison of Multipactor Predictions Using Two Popular Secondary Electron Models** – ***S.A. Rice****, J.P. Verboncoeur (Michigan State University)*

WEPAC37 **700 MHz Multi-Spoke Accelerating Cavity for Light Sources with Integrated Cryocooler** – ***D. Gorelov****, C.H. Boulware, T.L. Grimm (Niowave, Inc.)*

WEPAC38 **500 MHz SRF Quarter-Wave Accelerating Cavity for Light Sources** – ***C.H. Boulware****, T.L. Grimm (Niowave, Inc.)*

WEPAC39 **Tests of an RF Dipole Crabbing Cavity for an Electron-Ion Collider** – ***A. Castilla****, J.R. Delayen (ODU)* ***A. Castilla****, J.R. Delayen (JLAB)* ***A. Castilla*** *(DCI-UG)*

WEPAC40 **Mechanical Analysis of the 400 MHz RF-Dipole Crabbing Cavity Prototype for LHC High Luminosity Upgrade** – ***S.U. De Silva****, J.R. Delayen, H. Park (ODU)* ***S.U. De Silva****, J.R. Delayen, H. Park (JLAB) Z. Li (SLAC)*

WEPAC41 **Comparison of Electromagnetic, Thermal and Mechanical Calculation with RF Test Results in RF-Dipole Deflecting/Crabbing Cavities** – ***H. Park***, *S.U. De Silva, J.R. Delayen (JLAB) S.U. De Silva, J.R. Delayen,* ***H. Park*** *(ODU)*

WEPAC42 **Geometry Effects on Multipole Components and Beam Emittance in High-velocity Multi-spoke Cavities** – ***C.S. Hopper***, *K.E. Deitrick, J.R. Delayen (ODU) J.R. Delayen (JLAB)*

WEPAC43 **Study of Cavity Imperfection Impact on RF Parameters and Multipole Components in a Superconducting RF Dipole Cavity** – ***R.G. Olave***, *S.U. De Silva, J.R. Delayen (ODU)*

WEPAC44 **Higher Order Modes Damping and Multipacting Analysis for the SPX Deflecting Cavity in APS Upgrade** – ***C.-K. Ng***, *Z. Li, L. Xiao (SLAC) A. Nassiri, G.J. Waldschmidt, G. Wu (ANL) R.A. Rimmer, H. Wang (JLAB)*

WEPAC45 **Effects of Cavity Imperfection for Project X CW Superconducting Linac Using ACE3P** – ***C.-K. Ng***, *L. Ge, Z. Li, L. Xiao (SLAC)*

02 Light Sources

WEPAC46 **Wakefield Computations for a Corrugated Pipe as a Beam Dechirper for FEL Applications** – ***C.-K. Ng***, *K.L.F. Bane (SLAC)*

07 Accelerator Technology

WEPAC47 **Mechanical Design of a New Injector Cryomodule 2-cell Cavity at CEBAF** – ***G. Cheng***, *J. Henry, J.D. Mammosser, R.A. Rimmer, H. Wang, M. Wiseman, S. Yang (JLAB)*

WEPAC48 **Low HOM Impedance SRF Cavity for MEIC** – ***S. Wang***, *R.A. Rimmer, H. Wang, Y. Zhang (JLAB)*

02-Oct-13 16:30 – 18:00 Poster Poster Area Bel Air

WEPBA — Poster Session

05 Beam Dynamics and Electromagnetic Fields

WEPBA01 **Noise Reduction using Filters on Turn-by-Turn LHC Orbits to Obtain Magnetic Errors with the Action and Phase Jump Analysis Method** – ***A.C. Garcia-Bonilla***, *J.F. Cardona (UNAL)*

WEPBA02 **Observation of Peaks of Synchrotron Oscillation of a cold ion beam in S-LSR** – ***K. Jimbo*** *(Kyoto University) M. Nakao, A. Noda, T. Shirai (NIRS) H. Souda (Gunma University, Heavy-Ion Medical Research Center) H. Tongu (Kyoto ICR) Y. Yuri (JAEA/TARRI)*

WEPBA03 **Beam-based RF-to-Laser Jitter Measurement in a Photocathode RF Gun** – ***Y.-C. Du***, *H.B. Chen, J.F. Hua, W.-H. Huang, C.-X. Tang, L.X. Yan (TUB) Q. Du (Tsinghua University)*

WEPBA04 **Luminosity Estimation and Beam Phase Space Analysis at VEPP-2000** – ***A.L. Romanov***, *I. Koop, E. Perevedentsev, D.B. Shwartz (BINP SB RAS)*

WEPBA05 **Combining Multiple BPM Measurements for Precession AC Dipole Bump Closure** – ***P. Oddo***, *M. Bai, W.C. Dawson, J. Kewisch, Y. Makdisi, C. Pai, P.H. Pile, T. Roser (BNL)*

WEPBA06 **Stripline Beam Impedance** – ***A. Blednykh***, *W.X. Cheng, S. Krinsky (BNL)*

WEPBA07 **Longitudinal Wakefield for an Axisymmetric Collimator** – ***A. Blednykh***, *S. Krinsky (BNL)*

WEPBA08 **Wake Fields due to Wall Roughness for Realistic Surfaces** – ***A.V. Fedotov***, *I. Pinayev (BNL) A. Novokhatski (SLAC)*

WEPBA09 **Changes in Electron Cloud Density with Beam Conditioning at CesrTA** – ***J.P. Sikora***, *J.A. Crittenden, D.O. Duggins, Y. Li, X. Liu (Cornell University (CLASSE), Cornell Laboratory for Accelerator-Based Sciences and Education) S. De Santis (LBNL)*

WEPBA10 **Electron Cloud Measurements Using a Shielded Pickup in a Quadrupole at CesrTA** – ***J.P. Sikora***, *M.G. Billing, J.V. Conway, J.A. Lanzoni, Y. Li (Cornell University (CLASSE), Cornell Laboratory for Accelerator-Based Sciences and Education)*

WEPBA11 **Tomographic Reconstruction of Transverse Phase Space for Strongly Coupled Beams** – ***Z. Liu***, *Y. Zhang, Z. Zheng (FRIB) Z.Q. He (TUB)*

WEPBA12 **Magnetic Field Expressions for Helical Accelerator Magnets** – ***L.N. Brouwer***, *S. Caspi, D. Robin, W. Wan (LBNL)*

WEPBA13 **Retrieval of Effective Parameters of Metamaterials for Accelerator and Vacuum Electron Device Applications** – ***Z. Duan***, *J.S. Hummelt, M.A. Shapiro, R.J. Temkin (MIT/PSFC)*

WEPBA14 **Simulation of Wakefields from an Electron Bunch in a Metamaterial Waveguide** – ***M.A. Shapiro***, *J.S. Hummelt, B.J. Munroe, R.J. Temkin (MIT/PSFC) S.M. Lewis (MIT)*

WEPBA15 **Ribbon Electron Beam Source for Bunched Beam Profile Monitor and Tomography** – ***V.G. Dudnikov*** *(Muons. Inc.), A.V. Aleksandrov (ORNL)*

WEPBA16 **Possible Experiments on Wave Function Localization Due to Compton Scattering** – ***V.V. Danilov***, *A.V. Aleksandrov, J. Galambos, T.V. Gorlov, Y. Liu, A.P. Shishlo (ORNL) S. Nagaitsev (Fermilab)*

WEPBA17 **Measurement of Non-Linear Insert Magnets** – ***F.H. O'Shea***, *R.B. Agustsson, A.Y. Murokh, E. Spranza (RadiaBeam) S. Nagaitsev, A. Valishev (Fermilab)*

WEPBA18 **Performance of Planar Radiator in the Radiabeam-IAC Experiment** – ***A.V. Smirnov***, *R.B. Agustsson, S. Boucher, J.J. Hartzell, S. Storms (RadiaBeam) Y. Kim (IAC)*

WEPBA19 **Wakefield Calculations for Septum Magnet in LCLS-II** – ***K.L.F. Bane***, *T.O. Raubenheimer (SLAC)*

WEPBA20 **New Technique to Measure the Emittance of Beams with Space Charge** – ***K. Poor Řežaei***, *R.B. Fiorito, R.A. Kishek (UMD)*

WEPHO — Poster Session

07 Accelerator Technology

WEPHO01 **High Power RF System for E-linac for TRIUMF** – ***A.K. Mitra***, *Z.T. Ang, I.V. Bylinskii, S. Calic, D. Dale, S.R. Koscielniak, R.E. Laxdal, F. Mammarella (TRIUMF)*

WEPHO02 **Solid-state Marx Modulator for RF Accelerators** – ***B. Cadilhon***, *B. Cassany (CEA)*

WEPHO03 **The Layout of 352 MHz 400 kW Power Amplifier** – ***A.Yu. Smirnov***, *E.V. Ivanov, A.A. Krasnov, K.I. Nikolskiy, S.A. Polikhov, I. Řežanov (Siemens Research Center) G.B. Sharkov (Siemens LLC)*

WEPHO04 **The Layout of 72 MHz 16 kW RF Power Generator** – ***A.Yu. Smirnov***, *E.V. Ivanov, A.A. Krasnov, K.I. Nikolskiy, S.A. Polikhov, I. Řežanov (Siemens Research Center) G.B. Sharkov (Siemens LLC)*

WEPHO05 **Overview of the RHIC e-Lens Superconducting Magnet Power Supply System** – ***D. Bruno***, *A. Di Lieto, G. Ganetis, R.F. Lambiase, W. Louie, C. Mi, T. Samms, J. Sandberg (BNL)*

WEPHO06 **Elens Superconducting Magnet Power Supply System Design, Testing, Installation and Commissioning** – ***C. Mi***, *D. Bruno, A. Di Lieto, T. Samms, J. Sandberg, C. Schultheiss, C. Sirio, R. Zapasek (BNL)*

WEPHO07 **RHIC IR Power Supply Performance Upgrade over Run 11, 12 and 13** – ***C. Mi***, *D. Bruno, A. Di Lieto, G. Heppner, W. Ng, T. Samms, J. Sandberg, C. Schultheiss, C. Sirio, R. Zapasek (BNL)*

WEPHO08 **200 kW CW, 350 MHz Multiple Beam Inductive Output Tube** – ***R.L. Ives***, *G. Collins, R. Karimov, D. Marsden, M.E. Read (CCR) E.L. Eisen, T. Kumura (CPI)*

WEPHO09 **10 MW, L-Band, Annular Beam Klystron for Accelerator Applications** – ***M.E. Read***, *G. Collins, P. Ferguson, R.L. Ives, R.H. Jackson, D. Marsden (CCR)*

WEPHO10 **X-Band RF Power Generation via an L-Band Accelerator System and Uses** – ***N. Sipahi***, *S. Biedron, S.V. Milton, T. Sipahi (CSU) C. Adolphsen (SLAC)*

WEPHO11 **Components of Heating and Fueling of Fusion Plasmas** – ***F.M. Niell***, *M.P.J. Gaudreau, K. Schrock, B.E. Simpson (Diversified Technologies, Inc.)*

WEPHO12 **Short Pulse Marx Modulator Optimization for Advanced Accelerators** – ***R.A. Phillips***, *M.P.J. Gaudreau, B.E. Simpson (Diversified Technologies, Inc.)*

WEPHO13 **Test of an L-Band Energy-Efficiency Solid State RF Power Source** – ***X. Chang***, *N. Barov, D.J. Newsham, D. Wu (Far-Tech, Inc.)*

WEPHO14 **System Considerations for 201.25 MHz RF System for LANSCE** – ***J.T.M. Lyles***, *W.C. Barkley, J. Davis, A.C. Naranjo, P.D. Olivas, D. Rees, G. M. Sandoval, Jr. (LANL) D. Baca, R.E. Bratton, R.D. Summers (Compa Industries, Inc.)*

WEPHO15 **Modelling of a Magnetron Transmitter for the Project X CW 1 GEV Linac** – ***G.M. Kazakevich***, *R.P. Johnson (Muons. Inc.) B. Chase, R.J. Pasquinelli, V.P. Yakovlev (Fermilab)*

WEPHO16 **High MTBF RF Source Based upon the Injection Locked Magnetron** – ***M.L. Neubauer***, *A. Dudas (Muons. Inc.) H. Wang (JLAB)*

WEPHO17 **MW-Level Coax Coupler** – ***M.L. Neubauer*** *(Muons. Inc.) R.A. Rimmer (JLAB)*

WEPHO18 **High Power S-Band Vacuum Load** – ***M.L. Neubauer***, *A. Dudas (Muons. Inc.) H. Wang (JLAB)*

WEPHO19 **High-Power Low-Voltage Multi-Beam Klystrons for ILC and Project X** – ***S.V. Shchelkunov*** *(Yale University, Beam Physics Laboratory) J.L. Hirshfield (Yale University, Physics Department) J.L. Hirshfield (Omega-P, Inc.) S. Kazakov, N. Solyak, V.P. Yakovlev (Fermilab) V.E. Teryaev (BINP SB RAS)*

WEPHO20 **Second Harmonic Multiplier at 5.7 GHz for Testing Multi-Frequency Structures** – ***S.V. Shchelkunov***, *Y. Jiang (Yale University, Beam Physics Laboratory) J.L. Hirshfield (Yale University, Physics Department) J.L. Hirshfield (Omega-P, Inc.)*

02-Oct-13	16:30 – 18:00	Poster	Poster Area Malibu

WEPMA — Poster Session

07 Accelerator Technology

WEPMA01 **Optimization of the SLED Phase Modulation Parameters of the FERMI@Elettra Linac** – ***C. Serpico***, *M. Dal Forno, A. Fabris (Elettra-Sincrotrone Trieste S.C.p.A.)*

WEPMA02 **Energy and Repetition Rate Upgrade of the S-Band RF System of the FERMI@Elettra Linac** – ***A. Fabris***, *P. Delgiusto, F. Gelmetti, M.M. Milloch, A. Milocco, F. Pribaz, C. Serpico, N. Sodomaco, R. Umer, L. Veljak (Elettra-Sincrotrone Trieste S.C.p.A.)*

WEPMA03 **Tuner System Assembly and Tests for the 201-MHz MICE Cavity** – ***L. Somaschini*** *(INFN-Pisa) A.J. DeMello, D. Li, S.P. Virostek (LBNL) P.M. Hanlet (IIT) A. Moretti, R.J. Pasquinelli, D.W. Peterson, Y. Torun (Fermilab)*

WEPMA04 **Choke-mode Damped Accelerating Structure for the CLIC Main Linac** – ***J. Shi***, *H.B. Chen, H. Zha (TUB)*

WEPMA05 **RF Design Optimization of a 176 MHz CW RFQ** – ***B. Mustapha***, *S.V. Kutsaev, P.N. Ostroumov (ANL)*

WEPMA06 **Engineering Design and Analysis of a 176 MHz CW RFQ** – ***B. Mustapha***, *S.V. Kutsaev, P.N. Ostroumov (ANL)*

WEPMA07 **Modeling Vacuum Arcs in Linac Structures** – ***J. Norem*** *(ANL) Z. Insepov, S. Nurkenov (Nano Synergy, Inc.) A. Moretti (Fermilab)*

WEPMA08 **Tuning, Conditioning, and Dark Current Measurements of the 1300 MHz NCRF Cavities at Argonne Wakefield Accelerator (AWA) Facility** – ***J.G. Power***, *M.E. Conde, D.S. Doran, W. Gai, C.-J. Jing (ANL, Euclid TechLabs, LLC)*

WEPMA09 **PPM-Focused Klystrons for Accelerator Systems** – ***P. Ferguson***, *R.L. Ives, D. Marsden, M.E. Read (CCR) J.E. Clayton (Varian Medical Systems, Oncology Systems)*

WEPMA10 **Passively Driven X-band RF Linac Structure** – ***T. Sipahi***, *S. Biedron, S.V. Milton, N. Sipahi (CSU) C. Adolphsen (SLAC)*

WEPMA11 **Progress Toward the Development of a Rapidly Tunable RF Cavity** – ***D.J. Newsham***, *J.R. Thompson (Far-Tech, Inc.)*

WEPMA12 **Investigation of Breakdown Induced Surface Damage on 805 MHz Pill Box Cavity Interior Surfaces** – ***M.R. Jana***, *M. Chung, M.A. Leonova, A. Moretti, A.V. Tollestrup, K. Yonehara (Fermilab) D.L. Bowring (LBNL) B.T. Freemire, Y. Torun (IIT)*

WEPMA13 **Design and High Power Testing of 52.809 MHz RF Cavities for Slip Stacking in the Fermilab Recycler Ring** – ***R.L. Madrak***, *D. Wildman (Fermilab)*

WEPMA14 **Perpendicularly Biased YIG Tuners for the Fermilab Recycler 52.809 MHz RF Cavities** – ***R.L. Madrak***, *V.S. Kashikhin, A.V. Makarov, D. Wildman (Fermilab)*

WEPMA15 **Research and Development of Dielectric Material Loaded High-pressure Gas Filled RF Cavity Tests for Muon Colliders** – ***K. Yonehara***, *M.A. Leonova, A. Moretti, M. Popovic, A.V. Tollestrup (Fermilab) G. Flanagan, R.P. Johnson, F. Marhauser, J.H. Nipper (Muons. Inc.) L.M. Nash (University of Chicago) Y. Torun (IIT)*

WEPMA16 **Assembly and Testing of the First 201-MHz MICE Cavity at Fermilab** – ***Y. Torun*** *(Illinois Institute of Technology) D.L. Bowring, A.J. DeMello, D. Li, T.H. Luo, S.P. Virostek (LBNL) P.M. Hanlet (IIT) M.A. Leonova, A. Moretti, R.J. Pasquinelli, D.W. Peterson, R.P. Schultz, J.T. Volk (Fermilab) T.H. Luo (UMiss) L. Somaschini (INFN-Pisa)*

WEPMA17 **Extended RF Testing of the 805-MHz Pillbox "All-Season" Cavity for Muon Cooling** – ***Y. Torun*** *(Illinois Institute of Technology) D.L. Bowring (LBNL) M. Chung, M.R. Jana, M.A. Leonova, A. Moretti, D.W. Peterson, A.V. Tollestrup, K. Yonehara (Fermilab) G. Flanagan, G.M. Kazakevich (Muons. Inc.) B.T. Freemire, P.M. Hanlet (IIT)*

WEPMA18 **RF Design and Characterization of a Modular Cavity for Muon Ionization Cooling R&D** – ***D.L. Bowring***, *A.J. DeMello, A.R. Lambert, D. Li, S.P. Virostek, M.S. Zisman (LBNL) C. Adolphsen, L. Ge, A.A. Haase, K.H. Lee, Z. Li, D.W. Martin (SLAC) A.D. Bross, A. Moretti, M.A. Palmer, R.J. Pasquinelli, Y. Torun (Fermilab) D.M. Kaplan (Illinois Institute of Technology) T.H. Luo, D.J. Summers (UMiss) R.B. Palmer (BNL)*

WEPMA19 **Progress on the Fabrication of a CW Radio-frequency Quadrupole (RFQ) for the Project X Injector Experiment (PXIE)** – ***M.D. Hoff***, *A.J. DeMello, A.R. Lambert, D. Li, J.W. Staples, S.P. Virostek (LBNL)*

WEPMA20 **RF, Thermal, and Structural Finite Element Analysis of the Project X Injector Experiment (PXIE) CW Radio-frequency Quadrupole (RFQ)** – ***A.R. Lambert***, *M.D. Hoff, D. Li, J.W. Staples, S.P. Virostek (LBNL)*

WEPMA21 **Final Design of a CW Radio-frequency Quadrupole (RFQ) for the Project X Injector Experiment (PXIE)** – ***S.P. Virostek***, *A.J. DeMello, M.D. Hoff, A.R. Lambert, D. Li, J.W. Staples (LBNL)*

WEPMA22 **Investigation on Double Dipole Four-Vane RFQ Structure** – ***K.R. Shin*** *(ORNL RAD) M.S. Champion, Y.W. Kang (ORNL) A.E. Fathy (University of Tennessee)*

WEPMA23 **Design and Measurement of Double Gap Buncher Cavity Proposed for Reduction of X- ray Radiation** – ***K.R. Shin*** *(ORNL RAD) M.S. Champion, Y.W. Kang (ORNL) A.E. Fathy (University of Tennessee)*

WEPMA24 **Experimental results of the High-Power Tests of an Ultra-high Gradient Compact S-Band (HGS) Accelerating Structure** – ***L. Faillace****, R.B. Agustsson, P. Frigola, A.Y. Murokh (RadiaBeam) S.G. Anderson (LLNL) V.A. Dolgashev, V. Yakimenko (SLAC) J.B. Rosenzweig (UCLA)*

WEPMA25 **Harmonic Ratcheting for Fast Ferrite Tuned RF Acceleration** – ***N.M. Cook*** *(Stony Brook University) J.M. Brennan, S. Peggs (BNL)*

WEPMA26 **Multipacting Study for the RF Test of the MICE 201 MHz RF Cavity at MTA** – ***T.H. Luo****, D.J. Summers (UMiss) D. Li, M.S. Zisman (LBNL)*

WEPMA27 **Tests of a Detuned Single-Mode Two-Beam Accelerator Structure** – ***Y. Jiang****, L.R. Carver, R.M. Jones (Yale University, Beam Physics Laboratory) L.R. Carver, R.M. Jones (UMAN) L.R. Carver, R.M. Jones (Cockcroft Institute) J.L. Hirshfield (Yale University, Physics Department) J.L. Hirshfield (Omega-P, Inc.)*

WEPMA28 **Study of a Detuned Multi-Harmonic Two-Beam Accelerator Structure** – ***Y. Jiang****, L.R. Carver, R.M. Jones (Yale University, Beam Physics Laboratory) L.R. Carver, R.M. Jones (UMAN) L.R. Carver, R.M. Jones (Cockcroft Institute) J.L. Hirshfield (Yale University, Physics Department) J.L. Hirshfield (Omega-P, Inc.)*

02-Oct-13 16:30 – 18:00 Poster Poster Area Santa Monica

WEPSM — Poster Session

02 Light Sources

WEPSM01 **Design Study of Knot-APPLE Undulator for PES-Beamline at SSRF** – ***S. Sasaki****, A. Miyamoto (HSRC) S. Qiao (SIMIT)*

WEPSM02 **Concepts for Short Period RF Undulators** – ***S.V. Kuzikov****, A.V. Savilov, A.A. Vikharev (IAP/RAS)*

07 Accelerator Technology

WEPSM03 **High Power, Short Pulse, Extremely High Repetition Rate RF Sources and Pulse Compressors** – ***S.V. Kuzikov****, A.V. Savilov (IAP/RAS)*

WEPSM04 **Helical Self Focusing and Cooling Accelerating Structure** – ***S.V. Kuzikov****, A.A. Vikharev (IAP/RAS)*

02 Light Sources

WEPSM05 **Progress on Pulsed Multipole Injection for the MAX IV Storage Rings** – ***S.C. Leemann*** *(MAX-lab) L.O. Dallin (CLS)*

WEPSM06 **Beam-Induced Heat Load Predictions and Measurements in the APS Superconducting Undulator** – ***K.C. Harkay****, L.E. Boon, M. Borland, Y.-C. Chae, R.J. Dejus, J.C. Dooling, C.L. Doose, L. Emery, Y. Ivanyushenkov, M.S. Jaski, M. Kasa, S.H. Kim, R. Kustom, V. Sajaev, Y. Shiroyanagi, X. Sun (ANL) L.E. Boon (Purdue University)*

WEPSM07 **Beam-based Alignment of the First Superconducting Undulator at APS** – ***K.C. Harkay***, *L.E. Boon, M. Borland, L. Emery, R. Kustom, V. Sajaev, Y. Shiroyanagi, A. Xiao (ANL) L.E. Boon (Purdue University)*

WEPSM08 **Fast-Switching Variably Polarizing Undulator** – ***M.S. Jaski***, *R.J. Dejus, B. Deriy, E. Gluskin, E.R. Moog, I. Vasserman, J. Wang, A. Xiao (ANL)*

WEPSM09 **An Electromagnetic Variably Polarizing Quasi-Periodic Undulator** – ***M.S. Jaski***, *M. Abliz, R.J. Dejus, B. Deriy, E. Gluskin, E.R. Moog, I. Vasserman, A. Xiao (ANL)*

WEPSM10 **Design of a 17.2-mm-Period Planar Undulator for the APS** – ***E.R. Moog***, *M. Abliz, R.J. Dejus, J.H. Grimmer, M.S. Jaski (ANL)*

WEPSM11 **The Intermediate Energy X-ray (IEX) Undulator Commissioning Results** – ***A. Xiao***, *M. Abliz, B. Deriy, M.S. Jaski, M.L. Smith, I. Vasserman, J.Z. Xu (ANL)*

WEPSM12 **Non-linear Effects of Insertion Devices: Simulation and Experiment Results** – ***A. Xiao***, *L. Emery, V. Sajaev (ANL)*

WEPSM13 **On-axis Injection Scheme for Ultra-Low-Emittance Light Sources** – ***A. Xiao***, *M. Borland, C. Yao (ANL)*

WEPSM14 **Advanced X-ray Beam Position Monitor System Design at the APS** – ***B.X. Yang***, *G. Decker, J.S. Downey, Y. Jaski, T.L. Kruy, S.-H. Lee, F. Westferro (ANL)*

WEPSM15 **Design and Measurement of Three-Pole Wiggler (3PW) Prototype for NSLS-II Storage Ring** – ***P. He***, *P.L. Cappadoro, O.V. Chubar, T.M. Corwin, H.C. Fernandes, D.A. Harder, A.K. Jain, J.W. Keister, C.A. Kitegi, M.M. Musardo, J. Rank, T. Tanabe (BNL) A. Deyhim, J.D. Kulesza, M. Popov (Advanced Design Consulting, Inc)*

WEPSM16 **Plans for the First Turns Commissioning in NSLS-II Storage Ring** – ***S. Seletskiy*** *(BNL)*

WEPSM17 **Non-invasive Detection and Characterization of Beams** – ***J.E. Williams***, *S. Biedron, J.R. Harris, S.V. Milton (CSU) S.V. Benson, P.E. Evtushenko, G. Neil, S. Zhang (JLAB)*

WEPSM18 **Investigation of Upstream Transient Wakefields due to Coherent Synchrotron Radiation in Bunch Compression Chicanes** – ***C.E. Mitchell***, *J. Qiang (LBNL)*

WEPSM19 **Highly Parallelized Implementations of the Undulator Radiation Spectrum Calculation** – ***H. Tarawneh***, *S. James, K. Muriki, H. Nishimura, Y. Qin, K. Song (LBNL) A. Miyamoto, S. Sasaki (HSRC)*

THPAC — Poster Session

07 Accelerator Technology

THPAC01 **Longitudinal Emittance Measurement System for the ARIEL Electron Linac** – ***A.R. Vrielink***, *Y.-C. Chao, C. Gong, R.E. Laxdal, V. Zvyagintsev (TRIUMF)*

THPAC02 **Numerical Evaluation of Field Profiles of Undulators with Ring and Semicircle Bulk High-Tc Superconductors** – ***M. Tsuchimoto*** *(Hokkaido Institute of Technology)*

THPAC03 **Beam Dump Design for the In-flight Fragment Separator using High-power Beam** – ***J.Y. Kim***, *J.-W. Kim, M. Kim (IBS)*

THPAC04 **Beam Position Electronics Based on System on Chip Platform** – ***G. Jug***, *M. Cargnelutti, R. Hrovatin, P. Leban (I-Tech)*

THPAC05 **Design and Fabrication of a BPM with Low-Q for Measurement of EM Fields in a Cavity to Investigate Multi Beam Concepts** – ***L.R. Carver***, *R.M. Jones (UMAN) J.L. Hirshfield (Yale University, Physics Department) J.L. Hirshfield (Omega-P, Inc.) Y. Jiang (Yale University, Beam Physics Laboratory)*

THPAC06 **Comparison of Simulations and Analytical Theory of Radiation Heating on the Advanced Photon Source Superconducting Undulator** – ***L.E. Boon*** *(Purdue University)* ***L.E. Boon***, *R.J. Dejus, K.C. Harkay, M.S. Jaski (ANL)*

THPAC07 **Thermal Modeling of the Prototype Superconducting Undulator** – ***Y. Shiroyanagi***, *C.L. Doose, J.D. Fuerst, K.C. Harkay, Q.B. Hasse, Y. Ivanyushenkov, M. Kasa (ANL)*

THPAC08 **Modernization of the Bergoz Multiplexed BPM System for the APS Upgrade** – ***X. Sun***, *H. Bui, G. Decker, R.T. Keane, R.M. Lill, B.X. Yang (ANL)*

THPAC09 **Ultra-high Vacuum Seal for Long Chambers using Wire Seals** – ***H.C. Fernandes***, *P.L. Cappadoro, T.M. Corwin, P. He, P. He, C.A. Kitegi, B.N. Kosciuk, G. Rakowsky, J. Rank, S.K. Sharma, T. Tanabe (BNL)*

THPAC10 **Design and Testing of Faraday Cup and Dump for NSLS-II Linac and Booster** – ***H.C. Fernandes***, *B. Belkacem, W.X. Cheng, R.P. Fliller, B.N. Kosciuk, J. Rank, S.K. Sharma, O. Singh, T. Tanabe (BNL)*

THPAC11 **Integral Magnetic Field Measurement Using an Long-Loop-Flip Coil System at NSLS-II** – ***P. He***, *P.L. Cappadoro, T.M. Corwin, H.C. Fernandes, D.A. Harder, C.A. Kitegi, M.M. Musardo, J. Rank, T. Tanabe (BNL) A. Deyhim, J.D. Kulesza (Advanced Design Consulting, Inc)*

THPAC12 **Preparation and Investigation of Multi-Alkali Photocathodes** – ***X. Liang***, *K. Attenkofer, T. Rao, S.G. Schubert, J. Smedley, E. Wang (BNL) I. Ben-Zvi, M. Ruiz-Osés (Stony Brook University) H.A. Padmore, J.J. Wong (LBNL) J. Xie (ANL)*

THPAC13 **Simulation and Optimization of Multi-Slit Based Emittance Measurement for BNL ERL** – ***C. Liu***, *D.M. Gassner, D. Kayran, M.G. Minty, P. Thieberger (BNL)*

THPAC14 **3D Hall Probe Calibration System at BNL Insertion Devices Laboratory** – ***M.M. Musardo***, *T.M. Corwin, D.A. Harder, P. He, C.A. Kitegi, W. Licciardi, G. Rakowsky, T. Tanabe (BNL)*

THPAC15 **NSLS II Magnetic Measurement System Facility** – ***M.M. Musardo***, *T.M. Corwin, D.A. Harder, P. He, C.A. Kitegi, W. Licciardi, G. Rakowsky, J. Rank, C. Rhein, T. Tanabe (BNL)*

THPAC16 **Upgrade of Beam Injection Diagnostics at BNL NSLS** – ***S. Seletskiy*** *(BNL)*

THPAC17 **Alkali Antimonide Cathodes for Accelerators - a Materials Perspective** – ***J. Smedley***, *S.G. Schubert (BNL) I. Ben-Zvi, X. Liang, E.M. Muller, M. Ruiz-Osés (Stony Brook University) H.A. Padmore, J.J. Wong (LBNL) J. Xie (ANL)*

THPAC18 **Progress on Growth of a Multi-alkali Photocathode for ERL** – ***E. Wang***, *S.A. Belomestnykh, I. Ben-Zvi, T. Rao, J. Smedley (BNL) I. Ben-Zvi, M. Ruiz-Osés (Stony Brook University) X. Liang (SBU)*

THPAC19 **Temperature Dependence of Photoemission from Copper and Niobium** – ***J.R. Harris*** *(CSU) C.W. Bennett, M.D. Galt, A.D. Holmes, A. Kara, R. Swent (NPS) J.W. Lewellen (LANL) J. Sears (Cornell University (CLASSE), Cornell Laboratory for Accelerator-Based Sciences and Education)*

THPAC20 **Beam Position and Phase Measurements of Microampere Beams at the Michigan State University ReA3 Facility** – ***J.A. Rodriguez*** *(FRIB)*

THPAC21 **Beam Diagnostic Challenges for PXIE** – ***V.E. Scarpine***, *N. Eddy, D.E. Johnson, V.A. Lebedev, P.S. Prieto, L.R. Prost, A. Semenov, A.V. Shemyakin, R.M. Thurman-Keup (Fermilab)*

THPAC22 **Gating and Emission Enhancement of Diamond Field-emitter Arrays** – ***H.L. Andrews*** *(LANL) C.A. Brau, B.K. Choi, W.E. Gabella, B.L. Ivanov (Vanderbilt University)*

THPAC23 **Lifetime Study of Tungsten Filaments in an H^- Surface Convertor Ion Source** – ***I. Draganić***, *J.F. O'Hara, L. Rybarcyk (LANL)*

THPAC24 **PIN Diode Detectors at DARHT II** – ***J.B. Johnson*** *(LANL)*

THPAC25 **LANSCE-RM Wire Scanners: SLIP-Encoded Serial Communication for Maintenance Display at the Instrument** – ***J.D. Sedillo***, *J.D. Gilpatrick (LANL)*

THPAC26 **Analog Front End Design for High Speed Digitizing of Beam Position and Phase Measurements at LANSCE** – ***H.A. Watkins***, *J.D. Gilpatrick, R.C. McCrady (LANL)*

THPAC27 **Coherent Light Carrying Orbital Angular Momentum Generated via FEL Interaction** – ***A. Knyazik*** *(UCLA) M.P. Dunning, C. Hast, E. Hemsing, A. Marinelli, T.O. Raubenheimer, D. Xiang (SLAC)*

THPAC28 **Fabrication and low-power validation of a Normal Conducting Radio Frequency X-Band Deflecting Cavity for Brookhaven National Lab** – ***L. Faillace***, *R.B. Agustsson, A.Y. Murokh, S. Storms (RadiaBeam) V.A. Dolgashev, J.R. Lewandowski, V. Yakimenko (SLAC) J.B. Rosenzweig (UCLA)*

THPAC29 **Fabrication and Validation of a Normal Conducting Radio Frequency S-Band Deflecting Cavity for the Pohang Accelerator Laboratory (PAL)** – ***L. Faillace***, *R.B. Agustsson, J.J. Hartzell, A.Y. Murokh, S. Storms (RadiaBeam)*

THPAC30 **Design of a Fast, XFEL-Quality Wire Scanner** – ***M.A. Harrison***, *R.B. Agustsson, P.S. Chang, T.J. Hodgetts, A.Y. Murokh, M. Ruelas (RadiaBeam)*

THPAC31 **Laser Wire Scanner for Energy Recovery Linacs** – ***B.T. Jacobson*** *(RadiaBeam)*

THPAC32 **Transverse Beam Profile Diagnostic Using Fiber Optic Array** – ***S. Wu***, *R.B. Agustsson, G. Andonian, T.J. Hodgetts (RadiaBeam) G. Andonian, R.K. Li, C.M. Scoby (UCLA)*

THPAC33 **Scintillator Diagnostics for the Detection of Laser Accelerated Ion Beams** – ***N.M. Cook*** *(Stony Brook University) R.S. Lefferts (SBUNSL) O. Tresca (BNL) V. Yakimenko (SLAC)*

THPAC34 **Diamond Amplifier Design and Preliminary Test** – ***T. Xin***, *S.A. Belomestnykh, I. Ben-Zvi (Stony Brook University) S.A. Belomestnykh, I. Ben-Zvi, T. Rao, J. Skaritka, E. Wang, Q. Wu (BNL)*

THPAC35 **Multipacting Study of 112 MHz SRF Electron Gun** – ***T. Xin***, *S.A. Belomestnykh, I. Ben-Zvi (Stony Brook University) S.A. Belomestnykh, I. Ben-Zvi, X. Liang, T. Rao, J. Skaritka, E. Wang, Q. Wu (BNL) C.H. Boulware, T.L. Grimm (Niowave, Inc.) X. Liang (SBU)*

THPAC36 **Progress in the Development of Textured Dysprosium for Undulator Applications** – ***F.H. O'Shea*** *(UCLA) R.B. Agustsson, Y.C. Chen, T.J. Grandsaert, A.Y. Murokh, K.E. Woods (RadiaBeam) J. Park, R.L. Stillwell (NHMFL)*

THPAC37 **Surface Plasmon Resonance Enhanced Multiphoton Emission from Metallic Cathode** – ***H.L. To***, *G. Andonian, R.K. Li, P. Musumeci (UCLA) G. Andonian (RadiaBeam)*

03-Oct-13	16:30 – 18:00	Poster	Poster Area Bel Air

THPBA — Poster Session

07 Accelerator Technology

THPBA01 **Beam Dynamics Driven Requirements on the ARIEL e-linac SRF Separator Cavity** – ***D.W. Storey*** *(Victoria University) Y.-C. Chao, L. Merminga (TRIUMF)*

THPBA02 **Feasibility of an RF Dipole Cavity for the ARIEL e-linac SRF Separator** – ***D.W. Storey*** *(Victoria University) R.E. Laxdal, L. Merminga, V. Zvyagintsev (TRIUMF)*

THPBA03 **Design, Fabrication, Measurement, Installation and Alignment of Two Types of Quadrupole/sextupole Combined Magnets for the Upgrade of the 1.2 GeV Booster Synchrotron at Tohoku University** – ***W. Beeckman***, *S. Antoine, P. Bocher, F. Forest, P. Jehanno, P. Jivkov, M.J. Leray, S. Taillardat (Sigmaphi) H. Hama, F. Hinode (Tohoku University, Research Center for Electron Photon Science) L. Swinnen (Sigmaphi Japan)*

THPBA04 **Design and Construction of the Proto-type Quadrupole Magnets for the SuperKEKB Interaction Region** – ***N. Ohuchi***, *Y. Arimoto, N. Higashi, H. Koiso, A. Morita, Y. Ohnishi, K. Oide, H. Sugimoto, M. Tawada, K. Tsuchiya, H. Yamaoka, Z.G. Zong (KEK)*

THPBA05 **Multipole Magnetic Measurements using a Lock-in Amplifier Technique** – ***C.L. Doose***, *M. Kasa (ANL)*

THPBA06 **Magnetic Measurements of the First Superconducting Undulator at the Advanced Photon Source** – ***C.L. Doose***, *M. Kasa (ANL)*

THPBA07 **Superconducting Corrector IR Magnet Production for SuperKEKB** – ***B. Parker***, *M. Anerella, J. Escallier, A.K. Jain, A. Marone, P. Wanderer (BNL) Y. Arimoto, H. Koiso, A. Morita, Y. Ohnishi, N. Ohuchi, K. Oide, H. Sugimoto, K. Tsuchiya, H. Yamaoka, Z.G. Zong (KEK)*

THPBA08 **Partial Return Yoke for MICE - Engineering Design** – ***H. Witte***, *S.R. Plate (BNL) A.D. Bross (Fermilab) J.S. Tarrant (STFC/RAL)*

THPBA09 **Partial Return Yoke for MICE - General Concept and Performance** – ***H. Witte***, *S.R. Plate (BNL) A.D. Bross (Fermilab) J.S. Tarrant (STFC/RAL)*

THPBA11 **A Kicker Driver for the International Linear Collider** – ***N. Butler***, *M.P.J. Gaudreau, M.K. Kempkes, F.M. Niell (Diversified Technologies, Inc.)*

THPBA12 **Progress on the Assembly of the MSU Superferric Cyclotron Gas Stopper Superconducting Magnet** – ***M.A. Green***, *G. Bollen, S. Chouhan, A. Zeller (FRIB) J. DeKamp, D. Lawton, C. Magsig, D.J. Morrissey, J. Ottarson, S. Schwarz (NSCL)*

THPBA13 **Mechanical Design of the Cryogenic Sub-Systems for the FRIB Quarter Wave Resonator Cryomodule** – ***M. Shuptar***, *F. Casagrande, A.D. Fox, M.J. Johnson, M. Leitner, S.J. Miller, T. Xu, Y. Xu (FRIB)*

THPBA14 **Impact of Radiation on the Mu2e Production Solenoid Performance** – ***V.V. Kashikhin***, *M.J. Lamm, N.V. Mokhov, V.S. Pronskikh (Fermilab)*

THPBA15 **A Highly Configurable and Scriptable Software System for Fully Automated Tuning of Accelerator Cavities** – ***J.M. Nogiec***, *R.H. Carcagno, S. Kotelnikov, A. Makulski, R. Nehring, D.F. Orris, W. Schappert (Fermilab)*

THPBA16 **A New Facility for Testing Superconducting Solenoid Magnets with Large Fringe Fields at Fermilab** – ***D.F. Orris***, *R.H. Carcagno, J.M. Nogiec, R. Rabehl, C. Sylvester, M.A. Tartaglia (Fermilab)*

THPBA17 **Status Of PXIE 200 Ω MEBT Kicker Development** – ***G.W. Saewert***, *M.H. Awida, H. Pfeffer, D. Wolff (Fermilab) D. Frolov (Kuban State University)*

THPBA18 **Testing of a Single 11T Nb3Sn Dipole Coil Using a Magnetic Mirror Structure** – ***A.V. Zlobin***, *N. Andreev, E.Z. Barzi, G. Chlachidze, V.V. Kashikhin, A. Nobrega, I. Novitski, D. Turrioni (Fermilab) M. Karppinen, D. Smekens (CERN)*

THPBA19 **Storage Ring and Interaction Region Magnets for a μ+μ- Higgs Factory** – ***A.V. Zlobin***, *Y.I. Alexahin, V.V. Kashikhin, N.V. Mokhov (Fermilab)*

THPBA20 **Analysis and Parallelization of Pseudo-spectral Electromagnetic Simulations of Relativistic Plasmas** – ***J.-L. Vay*** *(LBNL) B.B. Godfrey, I. Haber (UMD)*

THPBA21 **Fiber Optic Quench Protection for High Temperature Superconducting Magnets.** – ***G. Flanagan***, *R.P. Johnson (Muons. Inc.) W.K. Chan, J. Schwartz (North Carolina State University)*

THPBA22 **Helical Muon Beam Cooling Channel Engineering Design** – ***G. Flanagan***, *R.P. Johnson, S.A. Kahn (Muons. Inc.) N. Andreev, R. Bossert, S. Krave, M.L. Lopes, J.C. Tompkins, K. Yonehara (Fermilab) F. Marhauser (MuPlus, Inc.)*

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THPBA23 **Disposition of Weapons-grade Plutonium with GEM*STAR** – ***R.P. Johnson***, *G. Flanagan (Muons. Inc.) C. Bowman, R.B. Vogelaar (ADNA)*

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THPBA24 **A Dipole Magnet for the FRIB High Radiation Environment Nuclear Fragment Separator** – ***S.A. Kahn***, *A. Dudas, G. Flanagan (Muons. Inc.) M. Anerella, R.C. Gupta, J. Schmalzle (BNL)*

THPBA25 **Radiation Tolerant Multipole Correction Coils for FRIB Quadrupoles** – ***S.A. Kahn*** *(Muons. Inc.) R.C. Gupta (BNL)*

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THPBA26 **Using Elliptical Magnetic Coils in a Muon Cooling Channel** – ***S.A. Kahn***, *G. Flanagan, R.P. Johnson (Muons. Inc.) M.L. Lopes, K. Yonehara (Fermilab)*

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THPBA27 **Simulation Workstation** – ***T.J. Roberts***, *C.M. Ankenbrandt (Muons. Inc.)*

THPBA28 **Status of Spallation Neutron Source Cryogenic Test Facility** – ***M.P. Howell***, *S.-H. Kim, W.H. Strong (ORNL) B.D. DeGraff, T.S. Neustadt, J. Saunders, D.M. Vandygriff (ORNL RAD) T. Xu (FRIB)*

THPBA29 **Recent Improvements in Particle Simulation Support in Analyst-MP** – ***J.F. DeFord***, *B.L. Held, A.A. Nichols, K.J. Willis (STAAR/AWR Corporation)*

THPHO — Poster Session

06 Accelerator Systems

THPHO01 **Parameter Optimization for Multi-Dimensional Laser Cooling for an Ion Beam in the Storage Ring S-LSR** – ***Z.Q. He*** *(TUB) K. Jimbo (Kyoto University, Institute for Advanced Energy) M. Nakao, A. Noda (NIRS) H. Okamoto, K. Osaki (HU/AdSM) H. Souda (Gunma University, Heavy-Ion Medical Research Center) J. Wei (FRIB) Y. Yuri (JAEA/TARRI)*

THPHO02 **Design of the Final Focus of the Proton Beam for a Neutrino Factory** – ***J. Pasternak****, M. Aslaninejad (Imperial College of Science and Technology, Department of Physics) K. E. Gollwitzer (Fermilab) H.G. Kirk (BNL) K.T. McDonald (PU)*

THPHO03 **APS Fast Orbit Feedback System Upgrade** – ***R. Lipa****, N.D. Arnold, H. Bui, G. Decker, T. Fors, R. Laird, F. Lenkszus, A.J. Scaminaci, N. Sereno, S.E. Shoaf (ANL)*

THPHO04 **Linear Analysis for Several 6-D Ionization Cooling Lattices** – ***J.S. Berg****, R.B. Palmer, D. Stratakis (BNL)*

THPHO05 **A Planar Snake Muon Ionization Cooling Lattice** – ***R.B. Palmer****, J.S. Berg, R.C. Fernow, D. Stratakis (BNL)*

THPHO06 **SRF and RF Systems for CeC PoP Experiment** – ***S.A. Belomestnykh****, I. Ben-Zvi, J.C. Brutus, Y. Huang, D. Kayran, V. Litvinenko, P. Orfin, I. Pinayev, T. Rao, J. Skaritka, K.S. Smith, R. Than, J.E. Tuozzolo, E. Wang, Q. Wu, W. Xu, A. Zaltsman (BNL)* ***S.A. Belomestnykh****, I. Ben-Zvi, V. Litvinenko, M. Ruiz-Osés, T. Xin (Stony Brook University) X. Liang (SBU)*

THPHO07 **Novel Mechanical Design for RHIC Transverse Stochastic Cooling Kicker** – ***C.J. Liaw****, S. Bellavia, J.M. Brennan, K. Mernick, M. Myers, J.E. Tuozzolo (BNL)*

THPHO08 **Robust Mechanical Design for RHIC Transverse Stochastic Cooling Pickup** – ***C.J. Liaw****, J.M. Brennan, V. De Monte, K. Mernick, M. Myers, J.E. Tuozzolo (BNL)*

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THPHO09 **High Intensity RHIC Limitations Due to Signal Heating of Cryogenic BPM Cables** – ***P. Thieberger****, J.A. D'Ambra, A.K. Ghosh, K. Hamdi, K. Mernick, T.A. Miller, M.G. Minty, C. Pai (BNL)*

06 Accelerator Systems

THPHO10 **Upgrading the RHIC Beam Dump for Higher Intensity** – ***C. Montag****, L. Ahrens, K.A. Drees, W. Fischer, H. Hahn, C.J. Liaw, J.-L. Mi, S.K. Nayak, T. Roser, P. Thieberger, J.E. Tuozzolo, K. Yip, W. Zhang (BNL)*

THPHO11 **Optimization of the Capture Section of a Staged Neutrino Factory** – ***H. K. Sayed****, H.G. Kirk, D. Stratakis (BNL) X.P. Ding (UCLA) K.T. McDonald (PU) D.V. Neuffer (Fermilab) P. Snopok (Illinois Institute of Technology)*

THPHO12 **Studies on New, High-Performance, 6-Dimensional Ionisation Cooling Lattices for Muon Acceleration** – ***D. Stratakis****, J.S. Berg, R.C. Fernow, R.B. Palmer (BNL)*

THPHO13 **Limitations Imposed by Space Charge on the Final Stages of a Muon Collider Ionization Cooling Channel** – ***D. Stratakis***, *J.S. Berg, R.B. Palmer (BNL) D.P. Grote (LLNL)*

THPHO14 **RF Cavity Phase Calibration using Electromagnetic Pickups** – ***B. Durickovic***, *J.L. Crisp, G. Kiupel, D. Leitner, J.A. Rodriguez, R.C. Webber (FRIB) D. Constan-Wahl, S.W. Krause, S. Nash, R. Rencsok, W. Wittmer (NSCL)*

THPHO15 **Analysis of MICE Spectrometer Solenoid Magnetic Field Measurements** – ***M.A. Leonova*** *(Fermilab)*

THPHO16 **Six-dimensional Ionization Cooling Lattice based on 325 and 650 MHz RF Cavities** – ***D. Stratakis*** *(BNL), P. Snopok (Illinois Institute of Technology)*

THPHO17 **a Muon Beam Line for Cooling Experiments at NuSTORM** – ***D.V. Neuffer***, *A.D. Bross (Fermilab) , A. Liu (Indiana University) P. Snopok (Illinois Institute of Technology)*

THPHO18 **Status of the Muon Ionization Cooling Experiment (MICE)** – ***Y. Torun*** *(IIT) M.S. Zisman (LBNL)*

THPHO19 **Complete Muon Cooling Channel Design and Simulations** – ***C. Y. Yoshikawa***, *C.M. Ankenbrandt, R.P. Johnson (Muons. Inc.) Y.S. Derbenev, V.S. Morozov (JLAB) D.V. Neuffer, K. Yonehara (Fermilab)*

THPHO20 **Optimization and Aberration Correction of the Twin Helix Parametric Ionization Cooling Channel for Muon Beams** – ***J.A. Maloney*** *(Northern Illinois University) A. Afanasev (GWU) R.P. Johnson (Muons. Inc.) V.S. Morozov (JLAB)*

THPHO21 **Magnetic Bunch Compression for a Compact Compton Source** – ***T. Satogata***, *B.R.P. Gamage (ODU)* ***T. Satogata*** *(JLAB)*

THPHO22 **Recent Developments on Parametric-resonance Ionization Cooling** – ***V.S. Morozov***, *Y.S. Derbenev (JLAB) A. Afanasev (GWU) C.M. Ankenbrandt (Muons. Inc.) B. Erdelyi (Northern Illinois University)*

THPHO23 **Improvement of Digital Filter for the FNAL Booster Transverse Dampers** – ***T.V. Zolkin*** *(University of Chicago) N. Eddy, V.A. Lebedev (Fermilab)*

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THPMA01 **Fast FPGA Based Low-Trigger-Jitter Waveform Generator Method for Barrier-Bucket Electronics at FAIR** – ***E. Bayer***, *P. Zipf (University of Kassel) A. Klaus, H. Klingbeil, G. Schreiber (GSI)*

THPMA02 **ADRC Based Piezo-electric Tuner Design for RF Cavity** – ***Z. Zheng*** *(TUB) Z. Liu, D. Morris, J. Wei, Y. Zhang, S. Zhao (FRIB)*

THPMA03 **Systems of Radiation Monitoring at SR Facilities at BINP** – ***M. Petrichenkov***, *V.Ya. Chudaev, V.V. Eksta, V.F. Pindyurin, A.V. Repkov, M.A. Sheromov (BINP SB RAS)*

THPMA04 **Next Generation CW Reference Clock Transfer System with Femtosecond Stability** – ***P.L. Lemut***, *R. Hrovatin, P. Orel, S. Zorzut (I-Tech) S. Hunziker, V. Schlott (PSI)*

THPMA05 **Energy Deposition in the Sector 37 Scraper of the Advanced Photon Source Storage Ring** – ***J.C. Dooling***, *M. Borland, Y.-C. Chae, R.R. Lindberg, A. Xiao (ANL)*

07 Accelerator Technology

THPMA06 **Android Application for Accelerator Physics and Engineering Calculations** – ***M. Borland*** *(Private Address)*

06 Accelerator Systems

THPMA07 **Cryomodule Performance of the Main Linac Prototype Cavity for Cornell's Energy Recovery Linac** – ***N.R.A. Valles***, *G. Eichhorn, F. Furuta, G.M. Ge, D. Gonnella, D.L. Hall, Y. He, K.M.V. Ho, G.H. Hoffstaetter, M. Liepe, T.I. O'Connell, S. Posen, P. Quigley, J. Sears, V. Veshcherevich (Cornell University (CLASSE), Cornell Laboratory for Accelerator-Based Sciences and Education)*

THPMA08 **Fermilab MuCool Test Area Cavity Conditioning Control Using LabVIEW** – ***D.W. Peterson***, *Y. Torun (Fermilab), Y. Torun (Illinois Institute of Technology)*

THPMA09 **SSR1 Cryomodule Design for PXIE** – ***T.H. Nicol***, *S. Cheban, M. Chen, M. Merio, Y. Orlov, D. Passarelli, T.J. Peterson, V. Poloubotko, O. Pronitchev, L. Ristori, I. Terechkine (Fermilab)*

THPMA10 **Energy Deposition in Magnets and Shielding of the Target System of a Staged Neutrino Factory** – ***X.P. Ding*** *(UCLA) H.G. Kirk (BNL) K.T. McDonald (PU) C.T. Rogers (STFC/RAL/ASTeC) P. Snopok (IIT) R.J. Weggel (Particle Beam Lasers, Inc.)*

THPMA11 **Optimization of Particle Production for a Staged Neutrino Factory** – ***X.P. Ding*** *(UCLA) H.G. Kirk (BNL) K.T. McDonald (PU)*

THPMA12 **Design of Magnets for the Target and Decay Region of a Staged Neutrino Factory** – ***R.J. Weggel*** *(Particle Beam Lasers, Inc.) X.P. Ding (UCLA) V.B. Graves (ORNL) H.G. Kirk, H. K. Sayed (BNL) K.T. McDonald (PU)*

THPMA13 **A Bunch Length Monitor for the JLab 12 GeV Upgrade** – ***M.M. Ali***, *A. Freyberger, J.G. Gubeli, G.A. Krafft (JLAB)*

THPMA14 **A High-Intensity Neutron Production Target based on Rotary Valving** – ***B. Rusnak***, *P. Fitsos, M. Hall, R. Souza (LLNL)*

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THPSM — Poster Session

08 Medical Accelerators and Applications

THPSM01 **Ion-irradiation Response of Gafchromic Films and their Application to the Measurement of the Transverse Beam Intensity Distribution** – ***Y. Yuri***, *I. Ishibori, T. Ishizaka, S. Okumura, T. Yuyama (JAEA/TARRI)*

09 Industrial Accelerators and Applications

THPSM02 **Simulation of X-band 30 MeV Linac Neutron Source** – ***K. Tagi*** *(University of Tokyo) K. Dobashi, T. Fujiwara, M. Uesaka (The University of Tokyo, Nuclear Professional School) M. Yamamoto (Accuthera Inc.)*

THPSM03 **Direct Diagnostic Technique for a High Intensity Laser Based on Laser Compton Scattering** – ***R. Sato***, *A. Endo, K. Nonomura, K. Sakaue, M. Washio, Y. Yoshida (Waseda University)*

THPSM04 **Conceptual Design on Accelerator Physics for China-ADS Linac** – ***J.Y. Tang***, *P. Cheng, H. Geng, Z. Guo, Z. Li, C. Meng, H.F. Ouyang, S. Pei, B. Sun, J.L. Sun, F. Yan, Z. Yang, C. Zhang (IHEP) Y. He, Y. Yang (IMP)*

08 Medical Accelerators and Applications

THPSM05 **The Monte Carlo Simulation of Scintillant for Detector System in Proton Radiography** – ***X.M. Hu***, *H.B. Xu, Y.J. Ying, N. Zheng (Institute of Applied Physics and Computational Mathematics)*

THPSM06 **The Monte Carlo Simulation for Detector Quantum Efficiency in High-Energy Gamma Camera** – ***H.B. Xu***, *X.M. Hu, Y.J. Ying, N. Zheng (Institute of Applied Physics and Computational Mathematics)*

THPSM07 **The Monte Carlo Simulation of the Dosimetric Features for 6702 125I Brachytherapy** – ***Y.J. Ying***, *X.M. Hu, H.B. Xu, N. Zheng (Institute of Applied Physics and Computational Mathematics)*

09 Industrial Accelerators and Applications

THPSM08 **Horn Antenna Design for THz Band Radiation Source** – ***T.V. Bondarenko***, *S.M. Polozov, A.Yu. Smirnov (MEPhI)*

THPSM09 **Application of Low-Energy Proton LINAC to ADS for Energy Production** – ***A.G. Golovkina***, *D.A. Ovsyannikov (St. Petersburg State University) I.V. Kudinovich (KSRC)*

08 Medical Accelerators and Applications

THPSM10 **Statistical Analysis of Propagated Effects on Depth-Dose Distribution Curves due to Uncertainties in Initial Proton Beam Energy** – ***P.A. Posocco***, *M. Aslaninejad, J.F. Piech, S. Zalel (Imperial College of Science and Technology, Department of Physics)*

THPSM11 **A Novel Solution for FFAG Proton Gantries** – ***J. Pasternak***, *M. Aslaninejad, P.R.N. Holland, P.A. Posocco, G.W. Walton (Imperial College of Science and Technology, Department of Physics)*

THPSM12 **A Ready-to-use Application of Laser-Plasma Accelerators using Gabor Lenses** – ***J.K. Pozimski***, *M. Aslaninejad, N. Dover, Z. Najmudin, R.M. Nichols, P.A. Posocco (Imperial College of Science and Technology, Department of Physics)*

06 Accelerator Systems

THPSM13 **Characterisation of Nitrogen Clusters and Gas Jet Targets under Varied Nozzle Geometries** – ***P.A. Posocco***, *N. Dover, C. Hughes, Z. Najmudin (Imperial College of Science and Technology, Department of Physics)*

09 Industrial Accelerators and Applications

THPSM14 **Construction and Testing of the Dual Slot Resonance Linac** – ***N. Barov***, *X. Chang, R.H. Miller, D.J. Newsham (Far-Tech, Inc.)*

07 Accelerator Technology

THPSM15 **A Compact Cavity BPM System for 1300 MHz Cryomodules** – ***N. Barov*** *(Far-Tech, Inc.)*

08 Medical Accelerators and Applications

THPSM16 **Design of X-band Linac Structures for the Medical CyberKnife Project** – ***C.F. Eckman****, T. Downer (IAC) A. Andrews, P. Buaphad, Y. Kim (ISU)*

09 Industrial Accelerators and Applications

THPSM17 **Tunable, Nearly Monoenergetic Gamma Ray Beams for SNM Interrogation** – ***C.M. Ankenbrandt****, R.J. Abrams, M.A.C. Cummings (Muons. Inc.)*

THPSM18 **Adaptive High Speed Rail Cargo Scanning System** – ***S. Boucher****, A. Arodzero, A.Y. Murokh (RadiaBeam)*

THPSM19 **Compact Schemes for Laser-free THz-Sub-THz Source** – ***A.V. Smirnov*** *(RadiaBeam)*

THPSM20 **Linac-based Photonuclear Applications at the Idaho Accelerator Center** – ***M. Mamtimin****, F. Harmon, V. Starovoitova (IAC) F. Harmon (ISU)*

THPSM21 **Adaptation of the ISIS Induction-cell Driver to a Low-Impedance X-pinch Driver** – ***R.V. Shapovalov*** *(IAC)*

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