IBIC 2014

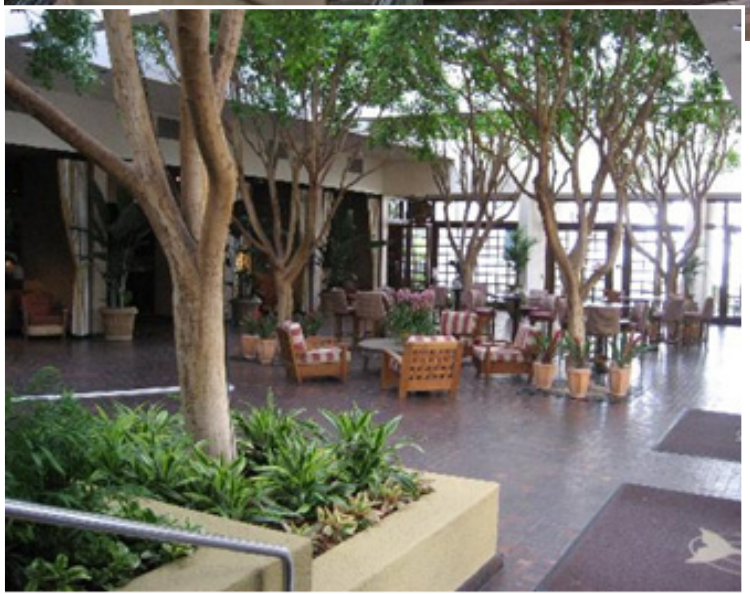
Highlights

Monterey, California, USA

September 14-18, 2014

http://accelconf.web.cern.ch/AccelConf/IBIC2014/

Monterey, California



Downtown Monterey
California coast
Close to marina,
Fisherman's Wharf
Restaurants
Whale watching

Program

- 2 tutorials
  - "Managing EM interference"
    - Mike Gruchalla
  - "Dark Secrets or RF Design"
    - Thomas H. Lee
- 11 invited talks
- 19 contributed oral
- 180 posters
- 21 exhibitors
- Reception / discussion sessions:
  - Sunday evening
  - Monday
    - (Faraday Cup celebration)
  - Tuesday
- Banquet Wednesday
- SLAC tour Thursday

Time	Monday 9/15/2014	Tuesday 9/16/2014	Wednesday 9/17/2014	Thursday 9/18/2014
7:30	Conference Desk (07:30-16:00)	Conference Desk (07:30-16:00)	Conference Desk (07:30-16:00)	Conference Desk (07:30-11:00)
8:00				
8:15	Opening Remarks	Invited Talk #5 - Rhodri Jones (35 + 10 min)	Invited Talk #8 - Henrik Loos (35 + 10 min)	
8:20				
8:25	Invited Talk #1 - Marc Ross (35 + 10 min)			Invited Talk #11 - Nicoleta Baboi (35 + 10 min)
8:30				
8:35				
8:40				
8:45				
8:50				
8:55				
9:00		Tutorial #1 - Mike Gruchalla (60 + 10 min)	Tutorial #2 - Thomas H. Lee (60 + 10 min)	
9:05				
9:10				John Sikora
9:15	Invited Talk #2 - Kent Irwin (50 + 10 min)			
9:20				Makoto Tobiyama
9:25				
9:30				
9:35				
9:40				
9:45				
9:50				
9:55				
10:00				
10:05				Coffee Break
10:10	Coffee Break	Coffee Break	Coffee Break	
10:15				
10:30				
10:35				
10:40	Invited Talk #3 - Guenther Rehm (35 + 10 min)	Invited Talk #6 - Steve Lidia (35 + 10 min)	Invited Talk #9 - Manfred Wendt (35 + 10 min)	IBIC 2015, 2016, 2017 Announcements, Closing Remarks, Adjourn
10:45				
10:50				
10:55				
11:00				
11:05				
11:10				
11:15				
11:20				
11:25	Kees Bertus Scheidt	Ling-Ying Lin	Andreas Penirschke	
11:30				
11:35				
11:40				
11:45	Ryota Takai	Arpit Rawankar	Joe Mead	Lunch Break
11:50				
11:55				
12:00				
12:05	Alexander Zhukov	Rasmus Ischebeck	Sergio Marques	
12:10				
12:15				
12:20				
12:25	Announcements	Announcements	Announcements	
12:30				
12:45	Lunch Break	Lunch Break	Lunch Break	Travel to SLAC (optional trip; allow 2 hours)
13:00				
13:15				
13:30				
13:45				
14:00				
14:05	Invited Talk #4 - Weixing Cheng (35 + 10 min)	Invited Talk #7 - Gero Kube (35 + 10 min)	Invited Talk #10 - Dave Fritz (35 + 10 min)	
14:10				
14:15				
14:20				
14:25				
14:30				
14:35				
14:40				
14:45	Michele Casselle	Mitsuhiro Masaki	Rene Geithner	
14:50				
14:55				
15:00				
15:05	Stephan Hunziker	Christopher Bloomer	Mark Boland	
15:10				
15:15				
15:20				
15:25	Michael Heuer	Adam Jeff	Coffee Break	SLAC Tours
15:30				
15:35				
15:40				
15:45	Coffee Break	Coffee Break		
15:50				
15:55				
16:00	Poster Session 1	Poster Session 2	Poster Session 3	
17:00				
18:00	Reception			Travel to Monterey
18:30				

181 Participants

Europe wins participation contest

Asia /Australia waiting for IBIC 2015

Attendee Registration		
Country	People	Continent
Japan	13	
People's Republic of China	1	Asia
Republic of Korea	8	23
Taiwan	1	
Australia	2	Australia
		2
Armenia	1	
Belgium	1	
France	8	
Germany	37	
Italy	8	
Poland	1	Europe
Slovenia	2	
Spain	4	
Sweden	3	
Switzerland	16	
United Kingdom	15	
		96
United States of America	57	North America
		57
Brazil	2	South America
Colombia	1	
		3

Lab	People
SLAC/Stanford U	18
DESY	16
Brookhaven N L	13
CERN	11
Pohang	7
Alba	5
Elettra	5
GSI	5
KEK	5
LANL	5
Diamond	4
FRIB	4
FNAL	4
HZDR	4
PSI	4
ISIS	4
Daresbury	3
ESS	3
GANIL	3
Darmstadt	3
Others	55

Talks

Classification	Papers
Charge Monitor	9
Loss Monitor	6
Profile	36
Position & Stability	36
Feedbacks	7
General Diagnostics	20
Overview & Commissioning	11
Time Resolved & Synchronization	20
Xray	3

- Many talks on
  - Beam Position
  - Profile
  - Longitudinal

Accelerator type	
Linac	79
Ring	64
ERL	4
electron	90
proton	31
ion	27

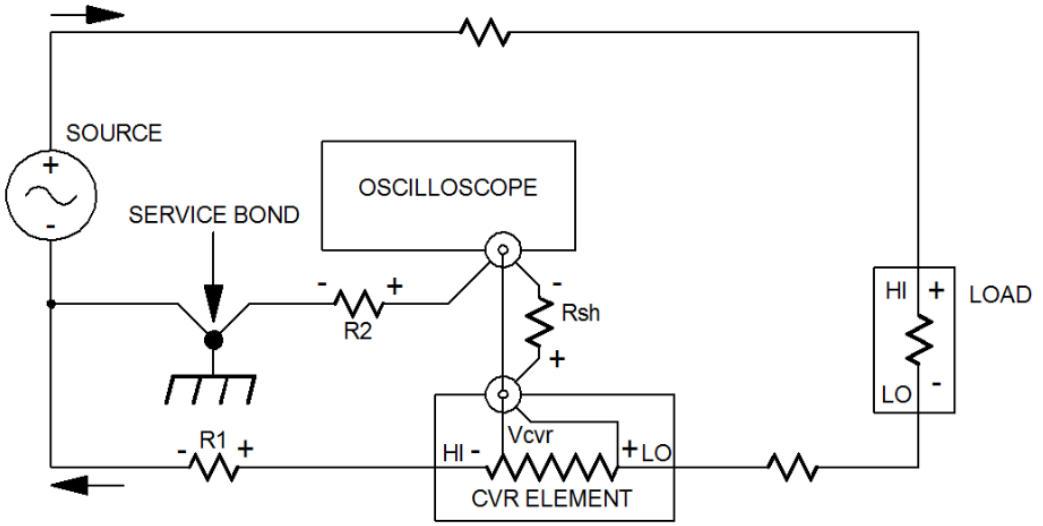
Purpose	
FEL	37
Light Source	33
HEP	27
nuclear	24
neutron source	6
medical	5


TUTORIAL
MANAGING ELECTROMAGNETIC INTERFERENCE
in
LARGE INSTRUMENTATION ENVIRONMENTS
Mike Gruchalla
Subject Matter Expert – EG&G Division of URS
Visiting Scientist at Los Alamos National Laboratory
Mike Thuot
Los Alamos National Laboratory (Retired)
Los Alamos
PORTOLA HOTEL & SPA
AT MONTEREY BAY

Tutorial - Mike Gruchalla

Managing Electromagnetic Interference in Large Instrumentation Environments

Low-Frequency EMI Errors – Another Real-Life Example
I Drew a *Picture* of the Configuration



Brief Summary

- ***Must*** **understand how "your" system works – this is the first step in managing EMI**

DRAW A PICTURE !

- **Understand how nuisance signals couple – electric, magnetic, currents**
- **Filtering – use only the bandwidth you need**
- **Grounding – separate signal grounds from "other" grounds**
- **It is all about the currents – pretty much**

Bottom Line to EMI Management

All EMI Mitigation Solutions Must be Engineered!

- **Every situation is unique**
- **No "one-size-fits-all" solution, No standard "cook-book" solution**
- **A complete system approach is needed considering the full facility: the EMI sources, the instrumentation systems, and the potential points of entry of EMI signals**
  - Many external EMI sources
  - But, often we create our own EMI unintentionally
- **If you chase the wrong problem, you will find it difficult to solve EMI issues**
- **And:** ***DRAW A PICTURE !***

Tutorial

Dark (and Bright) Secrets of RF Design

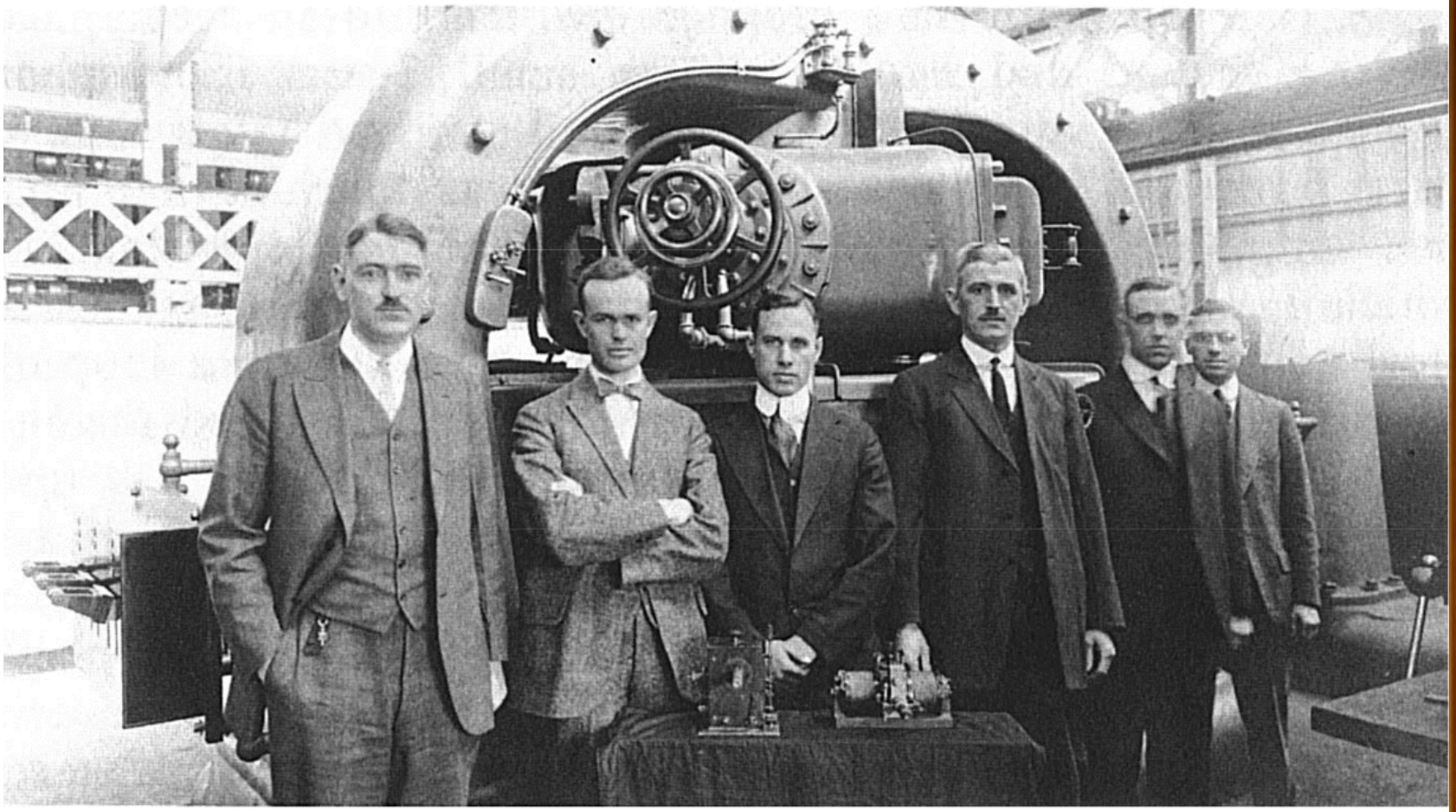
Prof. Tom Lee

Stanford University

RF design is a mystery to many engineers …
It sometimes seems that a pointy hat and arcane incantations are needed to make oscillators oscillate and amplifiers amplify (and not vice-versa).
Part of the mystery has to do with the many ways that ever-present parasitics undergo surprising impedance transformations, as well as the sometimes counterintuitive ways that nonlinear and time-varying processes can affect noise in amplifiers, oscillators and mixers.

Tutorial – Thomas H. Lee

RF and the accelerator story: 1917



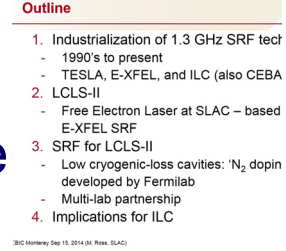
Leonard Fuller (left) standing with Federal coworkers.

On table: Original Poulsen model on left, first Federal arc on right.)

Traditional RF design flow

- Put on wizard hat.
- Obtain chicken (don't ask).
- Design first-pass circuit.
- Utter magical Latin incantations ("*semper ubi sub ubi…omnia pizza in octo partes divisa est…e pluribus nihil*").
- Test circuit. Weep.
- Adjust chicken. Iterate.

Lab / Project Reports



- Marc Ross (SLAC), "Technical Developments in Support of Accele Based Science at SLAC"
  - Superconducting RF for SLAC XFEL/International Linear Collider
- Kent Irwin (Stanford), "Superconducting Spectrometers for X-ray Beamline Applications and Cosmology"
  - Superconducting photon spectrometer arrays for Cosmic Microwave Background studies, Xray detectors for XFELs & other things
  - mK noise, electronics, massively parallel SQUID readout,…
- Ryota Takai (KEK), "Beam Diagnostics for the KEK Compact ERL"
  - BPMs, YAG screens, Beam loss fibers
  - design and early commissioning.
- Weixing Cheng (BNL), "NSLS2 Diagnostic Systems Commissioning and Measurements" and Yong Hu (BNL), "Diagnosing NSLS-II: A New Advanced Synchrotron Light Source"
  - Commissioning starts
  - Most diagnostic systems commissioned with beam
  - proved to be critical to success of machine commissioning.

Lab / Project Reports (2)

- Rhodri Jones (CERN), The Beam Instrumentation and Diagnostic Challenges for LHC Operation at High Energy”
  - Machine protection, beam loss, & abort gap monitor interlocks on the beam position and fast beam current change system.
  - profile monitoring challenges: synchrotron light imaging limited by diffraction, rest gas ionization dominated by space charge effects.
  - beam instabilities require synchronized bunch-by-bunch, turn-by-turn information from many distributed instrumentation systems
- Rasmus Ischebeck (PSI), Overview of Beam Instrumentation Activities for SwissFEL”
- Henrik Loos (SLAC), “LCLS Beam Diagnostics”
  - What worked / what didn’t / what’s new & improved since initial commissioning
  - New operational modes

Lab / Project Reports (3)

- Nicoletta Baboi (DESY), “Commissioning of the FLASH2 Electron Beam Diagnostics in Respect to its use at the European XFEL”
  - first operation of electron beam diagnostics at FLASH2.
  - Most electron beam diagnostics installed (beam loss monitors, cavity beam position monitors, toroids, beam halo monitors) designed for the European XFEL.
- Dirk Noelle (DESY), “Status of the Standard Diagnostic Systems of the European XFEL”
  - design phase finished for all main systems
  - most components in production

Highlights

- Faster electronics
  - High Bandwidth Sampling
  - Laser wire for longitudinal profile
    - SNS
  - ps sample/hold
    - KIT
  - Short optical pulse timing systems (OMO)
    - PSI, DESY

- Higher dynamic range
  - Halo measurements far out on tails
  - BPM resolutions over dynamic range

- More digital processing
  - FPGAs

Proceedings

- Papers:

Proceedings of the 3rd International Beam Instrumentation Conference

http://accelconf.web.cern.ch/AccelConf/IBIC2014/

http://accelconf.web.cern.ch/AccelConf/IBIC2014/

- Slides:

https://conf-slac.stanford.edu/ibic-2014/


Thank You
Very Much
PORTOLA HOTEL & SPA
AT MONTEREY BAY


Princess
MONTEREY
WHALE WATCHING
FIRST TRIP
10 AM
RAPPA'S
HARBOR VIEW
Restaurant
OPEN
TO PUBLIC

Dirk Nölle


Dirk Nölle

Dirk Nölle


Dirk Nölle