

**ERL2015**  
**WG4:**  
**RF & superconducting RF**  
**for ERL**

Conveners:

Hiroshi Sakai(KEK)

Erk Jensen(CERN)

# ERL2015 WG4: Charge

The WG4 charge is to identify the critical issues of each component in cryomodule construction, assembly works and beam operation for ERL. Especially, we need to evaluate what is the critical issues of SRF cryomodules for high current and high charge with low emittance beam operation.

Following themes will be discussed in WG4.

# Discussion Items

- Recent progress of each lab for ERL from ERL2013
- Cavity & module design for ERL
- Cavity fabrication & testing
- HOM damping
  - HOM damper and coupler development for high current
  - HOM calculation
- RF control for stable beam operation
  - RF source
  - LLRF control
- SRF Gun
- High Q R&D

# ERL2015 **WG4:** WG4 Prenary session

June 8 16:20-16:45	High-Q R&D for SRF Challenge in ERLS	F. Furuta	Cornell University
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## SRF challenge:

- Pick up the topics of “High-Q R&D” for SRF challenge.
- Recent High Q R&D is the hot topic for SRF field and one of the critical issues for CW operation cavities
- This challenging approach give the higher gradient ERL operation.

# ERL2015 WG4: WG2-WG4 joint session

<b>Jun. 9</b>	<b>14:00 – 15:40</b>	<b>Lecture Hall 2</b>
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## ERL Beam dynamics and SRF

- HOM-BBU simulation
- Impedance issue to recirculating beam

# ERL2015 WG4:

## WG2-WG4 joint session

<b>Jun. 9</b>	<b>14:00 – 15:40</b>	<b>Lecture Hall 2</b>
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<b>14:00-14:25</b>	<b>Investigations on Transverse Beam Break Up Using a Recirculated Electron Beam</b>	<b>T. Kuerzeder</b>	<b>TU Darmstadt</b>
<b>14:25-14:50</b>	<b>HOM-BBU Simulation for KEK ERL light Source</b>	<b>S. Chen</b>	<b>KEK</b>
<b>14:50-15:15</b>	<b>Linear Microbunching Gain Estimation Including CSR, LSC And Linac Geometric Impedances In Recirculation Machines</b>	<b>C.Y. Tsai</b>	<b>Virginia University</b>
<b>15:15-15:40</b>	<b>Study of CSR impact on electron beam in the JLab ERL</b>	<b>C. Hall</b>	<b>Colorado University</b>

# ERL2015 WG4: WG1-WG4 joint session

Jun. 9	15:55 – 17:35	Lecture Hall 1
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## ERL Injectors and SRF

### ➤ SRF gun

- Present progress of SRF gun development
- New approach for SRF gun improvement

# ERL2015 WG4: WG1-WG4 joint session

<b>Jun. 9</b>	<b>15:55 – 17:35</b>	<b>Lecture Hall 1</b>
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<b>15:55-16:20</b>	<b>Commissioning program for the 704 MHz SRF gun at BNL</b>	<b>W. Xu</b>	<b>BNL</b>
<b>16:20-16:45</b>	<b>Commissioning and first RF results of the 2nd 3.5 cell SRF for ELBE</b>	<b>A.Arnold</b>	<b>HZDR</b>
<b>16:45-17:10</b>	<b>First beam characterization of SRF gun II at ELBE with a Cu photocathode</b>	<b>J. Teichert</b>	<b>HZDR</b>
<b>17:10-17:35</b>	<b>Discussion</b>		



# ERL2015 WG4:

## WG4-session 1

<b>Jun. 10</b>	<b>10:45 – 12:25</b>	<b>Lecture Hall 2</b>
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Overview of the progress after ERL13 and review of the cavity and cryomodule test:

- Laboratory talks
- Cavity design for high current & its performance
  - Module design for ERL & its performance
  - Operation experiment of cryomodule
    - SCRF related development
- HOM damper and coupler development
  - Input coupler development

# ERL2015 WG4:

## WG4-session 1

<b>Jun. 10</b>	<b>10:45 – 12:25</b>	<b>Lecture Hall 2</b>
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Chair : J. Knobloch

<b>10:45-11:10</b>	<b>Cornell's ERL main linac cryomodule: design, construction and results</b>	<b>R. Eichhorn</b>	<b>Cornell University</b>
<b>11:10-11:35</b>	<b>Operational experience of CW SRF Injector and Main linac cryomodules at the Compact ERL</b>	<b>H. Sakai</b>	<b>KEK</b>
<b>11:35-12:00</b>	<b>The development of the high current superconducting cavity at IHEP</b>	<b>Z. Liu</b>	<b>IHEP</b>
<b>12:00-12:25</b>	<b>Recent Progress in SRF Acceleration Technology at Peking University</b>	<b>S.Huang</b>	<b>Peking University</b>

# ERL2015 WG4: WG4-session 2

<b>Jun. 10</b>	<b>14:00 – 15:40</b>	<b>Lecture Hall 2</b>
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## Cavity design & test and fabrication for ERL:

- Cavity design for high current ERLs & its performance
  - Cavity fabrication for mass production
  - Cavity design for kicker cavity

# ERL2015 WG4:

## WG4-session 2

<b>Jun. 10</b>	<b>14:00 – 15:40</b>	<b>Lecture Hall 2</b>
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Chair : H. Sakai

<b>14:00-14:25</b>	<b>SRF cavities for high current ERLs</b>	<b>W. Xu</b>	<b>BNL</b>
<b>14:25-14:50</b>	<b>Development for mass production of superconducting cavity by MHI</b>	<b>K. Kanaoka</b>	<b>Mitsubishi Heavy Industries (MHI)</b>
<b>14:50-15:15</b>	<b>Harmonic Resonant Kicker Design for the MEIC Electron Circular Cooler Ring</b>	<b>Y. Huang</b>	<b>IMP</b>
<b>15:15-15:40</b>	<b>Discussion</b>		

# ERL2015 WG4: WG3-WG4 joint session

<b>Jun. 10</b>	<b>15:55 – 17:35</b>	<b>Lecture Hall 2</b>
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## ERL Instrument and SRF

- LLRF control and its stability performance for ERL
  - RF sources for ERL
  - Tuner performance and control for ERL

# ERL2015 WG4:

## WG3-WG4 joint session

<b>Jun. 10</b>	<b>15:55 – 17:35</b>	<b>Lecture Hall 2</b>
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Chair : E.Jensen

<b>15:55-16:20</b>	<b>Performance of the digital LLRF systems for cERL at KEK</b>	<b>F. Qiu</b>	<b>KEK</b>
<b>16:20-16:45</b>	<b>Resonance Control for Narrow-Bandwidth, Superconducting Accelerator Applications</b>	<b>J. P. Holzbauer</b>	<b>FNAL</b>
<b>16:45-17:10</b>	<b>Using a 1.3GHz 20kW Solid State Amplifier as RF Power Supply for DC-SRF Photo-injector</b>	<b>F. Wang</b>	<b>Peking University</b>
<b>17:10-17:35</b>	<b>Discussion</b>		

**Thank you**