



LOW- ϵ -RING network: Update

R. Bartolini (Oxford Un.), S. Guiducci (INFN-LNF) and
Y. Papaphilippou (CERN)

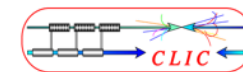


- Bring together scientific communities of **synchrotron light sources' storage rings, damping rings** and **e+/e- ring colliders** in order to communicate, identify and promote common work on topics affecting the design of **low emittance electron and positron rings**
- Initiated by the CLIC-ILC collaboration working group on damping rings, chaired by YP and Mark Palmer (now at FNAL)
- State of the art in design of accelerator systems especially in **X-ray storage rings** approaches the **goals of damping rings** for linear colliders and **future e+/e- ring collider** projects

Workshop on

Low Emittance Rings 2010

CERN, 12-15 January 2010




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The goal of this workshop is to bring together experts from the scientific communities working on low emittance lepton rings (including damping rings, test facilities for linear colliders, B-factories and electron storage rings) in order to discuss common beam dynamics and technical issues. It is organized by the joint ILC/CLIC working group on damping rings and specifically targets strengthening the collaboration within the two damping ring design teams and with the rest of the community. The workshop will profit from the experience of colleagues who have designed, commissioned and operated lepton ring colliders and synchrotron light sources.

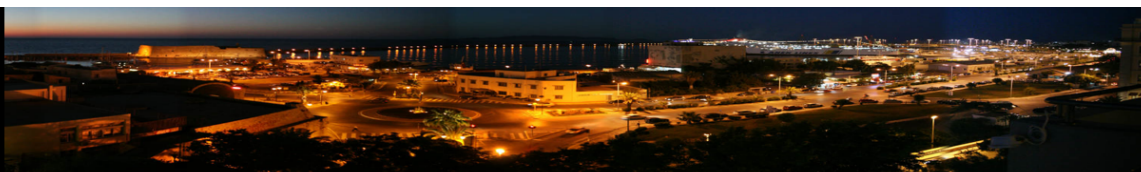
Workshop sessions will include:

- **Low Emittance Design and Tuning**
- **Collective Effects (electron cloud, fast ion, IBS, impedances)**
- **Low Emittance Ring Technology (wigglers, kickers, instrumentation, etc.)**

- Organization of the 1st Low Emittance Rings' workshop in January 2010, at CERN (~70 participants)
- Common tasks identified including beam dynamics but also technology



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3-5 Oct
2011
Heraklion,
Crete, Greece

ICFA Beam Dynamics Mini Workshop on Low Emittance Rings 2011

The goal of the workshop is to bring together experts from the scientific communities working on low emittance lepton rings. This includes damping rings, test facilities for linear colliders, B-factories and electron storage rings. The theme will be common beam dynamics and technology challenges for producing and controlling ultra-low emittance beams and the participants will benefit from the experience of colleagues who have designed, commissioned and operated such rings. This is the second in a series of workshops initiated in 2010 (<http://ler2010.web.cern.ch>), by the joint CLIC/ILC working group on damping rings. During the 1st workshop and subsequent discussions, it was found that the state of the art in the design of accelerator systems in X-ray storage rings approaches the goals of linear collider damping rings and future e+/e- circular collider upgrade projects. This workshop specifically targets the strengthening of interactions within the low emittance ring community by forming a LOWeRING collaboration network.

Workshop sessions will include:

Low emittance optics design and tuning

- Low emittance cells design
- Non-linear optimization
- Minimization of vertical emittance
- Collective effects reduction through lattice design

Collective Effects and beam instabilities

- Electron cloud effect and fast ion instability
- Intrabeam Scattering
- Impedances
- Coherent Synchrotron Radiation

Supported by



- Second workshop on October 2011 in Creta acted as a catalyzer
- Proposal of a collaboration network enabling scientific interaction and coordination for common design work including measurements and tests in existing facilities for achieving ultra-low emittance, high intensity beams with remarkable stability

- Task 6.1: Coordination and Communication
- Task 6.2: Low Emittance Ring Design (LERD)
- Task 6.3: Instabilities, Impedances and Collective Effects (IICE)
- Task 6.4: Low Emittance Rings Technology (LERT)

- Coordinators:
 - R. Bartolini (UOXF)
 - S. Guiducci (INFN-LNF)
 - Y. Papaphilippou (CERN)

Each one representing community of X-ray storage rings of e+/e- colliders and damping rings
- Formed **collaboration board**, representing the Low Emittance Rings community (including non-EU members)
 - B. Hettel (SLAC)
 - Q. Qin (IHEP)
 - D. Rubin (Cornell)
 - J. Urakawa (KEK)
 - Task coordinators: M. Böge (PSI), R. Nagaoka (Soleil), H. Schmickler (CERN)

Representing “Ultimate-storage ring” community and damping ring test facilities
- Organize Low Emittance Rings’ general and topical workshops

• Membership

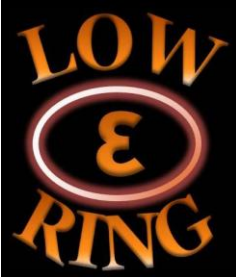
- Co-ordinators: R. Bartolini (UOX), S. Guiducci (INFN-LNF), Y. Papaphilippou (CERN)
- International non-EU members: B. Hettel (SLAC), Q. Qin, D. Rubin (Cornell), J. Urakawa (KEK)
- Task coordinators: M. Böge (PSI), R. Nagaoka (Soleil), H. Schmickler (CERN)
- Sub-Task coordinators:
 - Optics Design of Low Emittance Rings: S. Leeman (MAXIV), L. Nadolski (Soleil)
 - Minimization of Vertical Emittance: M. Biagini (INFN-LNF), P. Raimondi (ESRF)
 - Impedances and Instabilities: E. Karantzoulis (Elettra)
 - Two-Stream Instabilities and vacuum: G. Rumolo (CERN), E. Al-Dmour (MAXIV)
 - Particle Scattering: F. Antoniou (CERN), T. Demma (LAL)
 - Coherent Synchrotron Radiation: A. Muller (KIT)
 - Insertion devices magnets and alignment: S. Prestemon (Berkeley)
 - Instrumentation for Low Emittance: E. Bravin (CERN)
 - Kicker systems: A. Faus-Colfe (IFIC, Valencia)
 - RF design: F. Perez (ALBA)

• Meetings

- Phone meeting (every 3 months), interleaved with a face-to-face meeting every 6 months (usually during workshops)

Third Low Emittance Rings' workshop

 EuCARD²



Low emittance ring 2013 workshop



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Agenda

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Delegates list

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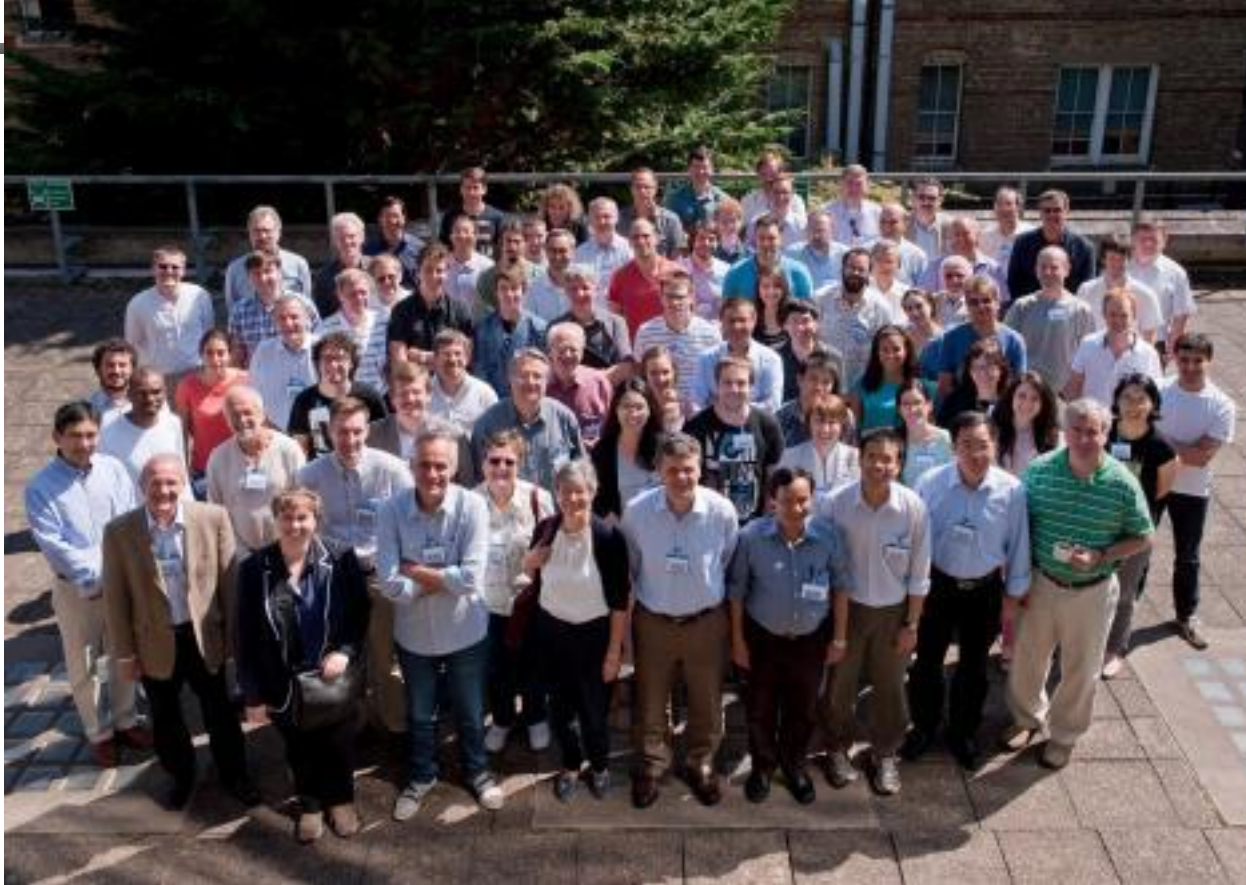
 IOP Institute of Physics



- 1st workshop sponsored by network
- ~80 participants
- Great scientific and organizational success

06/02/14

CLIC 2014, YP

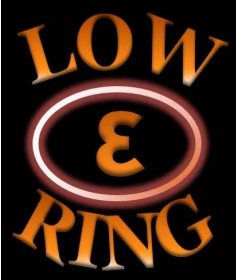


- 1st workshop sponsored by network
- ~80 participants
- Great scientific and organizational success (thanks to Riccardo et al.)

- Sponsor trip to a major accelerator conference for presenting work related to low emittance rings
- Selection procedure:
 - Poster presentations in general Low- ϵ -ring workshops
- And the first ex-quo winners are...
 - **Eirini Koukovini Platia** (CERN/EPFL), **Simone Liuzzo** (ESRF/Un. Of Rome)



TWICE2014 - Topical workshop EuCARD² on Instabilities, Impedances and Collective Effects

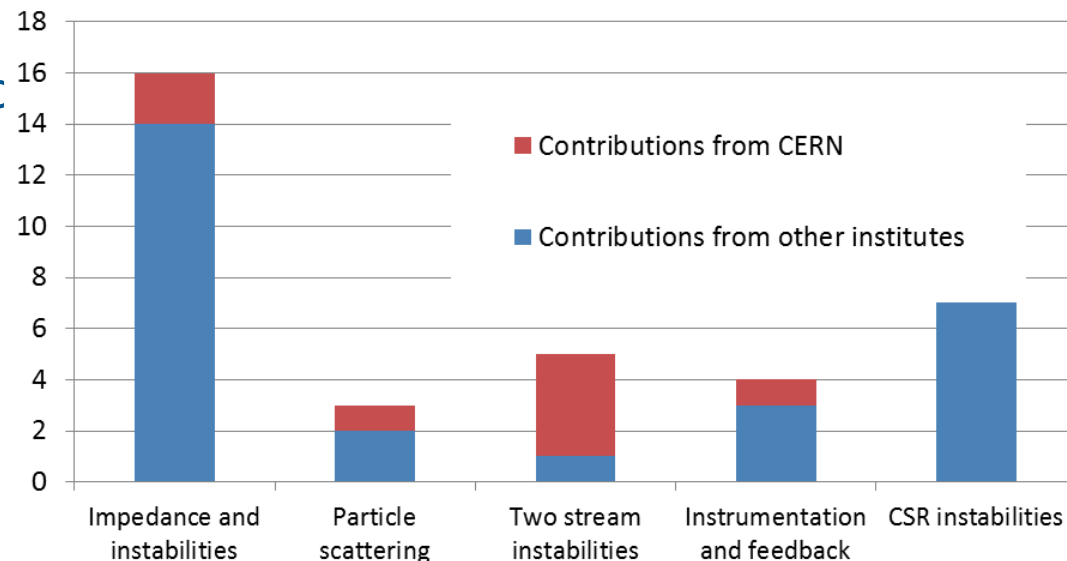


TWICE 2014
Topical Workshop on Instabilities,
Impedances and Collective Effects

Synchrotron SOLEIL, 16-17 January 2014

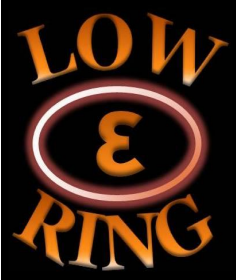


Number of talks per topic and CERN contribution



- 1st workshop on collective effects sponsored by the network
- ~75 participants (at least 1/3rd students and post-docs)
- Great scientific and organizational success

TWICE2014 - Topical workshop EuCARD² on Instabilities, Impedances and Collective Effects



- 1st workshop on collective effects sponsored by the network
- ~75 participants (at least 1/3rd students and post-docs)
- Great scientific and organizational success (thanks to Ryutaro et al.)

- One interim and one final report per task
- Help provided by sub-task coordinators (already identified)

Deliverable Number ⁶¹	Deliverable Title	Lead beneficiary number	Estimated indicative person-months	Nature ⁶²	Dissemination level ⁶³	Delivery date ⁶⁴
D6.1	Low Emittance Ring Design interim report	19	2.00	R	PU	18
D6.2	Instabilities, Impedances and Collective Effects interim report	9	2.00	R	PU	18
D6.3	Low Emittance Ring Technology interim report	1	2.00	R	PU	18
D6.4	Low Emittance Ring Design final report	30	3.00	R	PU	46
D6.5	Instabilities, Impedances and Collective Effects final report	9	3.00	R	PU	46
D6.6	Low Emittance Ring Technology final report	1	3.00	R	PU	46

- 3 topical and 3 general workshops (dates will be slightly adapted)
- Organize common events with other WPs (X-BEAM, Future magnets, Innovative RF technologies)

Milestone number ⁵⁹	Milestone name	Lead beneficiary number	Delivery date from Annex I ⁶⁰	Comments
MS41	First workshop of Collective effects in Low Emittance Rings	9	6	Activity report
→ MS42	First workshop of Low Emittance Rings Technology	1	9	Activity report
MS43	Annual LOW-e-RING workshop, first year	40	12	Activity report
- - - → MS44	First workshop of Low Emittance lattice design	30	18	Activity report
- - - → MS45	Annual LOW-e-RING workshop, second year.	40	24	Activity report
MS46	Second workshop of Collective effects in Low Emittance Rings	9	30	Activity report
MS47	Second workshop of Low Emittance Rings Technology	1	33	Activity report
MS48	Annual LOW-e-RING workshop, third year.	40	36	Activity report
MS49	Second workshop of Low Emittance lattice design	30	36	Activity report

- Total of 15.75 person months and 330KEuros
- Already made estimates for budget allocation for each workshop, including trip sponsorship and student prize

Participant short name ¹¹	Person-months per participant
CERN	5.25
SOLEIL	3.50
INFN	1.75
PSI	3.50
UOXF	1.75
Total	15.75

- Low emittance rings technology (2 days)
 - Time: 5-6 May 2014
 - Place proposal: IFIC-Valencia
 - Organizing committee: H. Schmickler, S. Prestemon, E. Bravin, A. Faus-Golfe, F. Perez
- Low emittance rings general (3 days)
 - Time: 17-19 September 2014
 - Place: INFN-LNF, Frascati
 - Organizing committee: R. Bartolini, S. Guiducci, Y. Papaphilippou, B. Hettel, Q. Qin, D. Rubin, J. Urakawa
- Low emittance rings design (2 days)
 - Time proposal: Early winter 2014
 - Place proposal: PSI?
 - Organizing committee: M. Böge, S. Leeman, L. Nadolski, M. Biagini, P. Raimondi

EuCARD² Public web-page



- On-line since July 2013 (thanks to Merethe!)
<https://espace.cern.ch/EuCARD2-Low-Emittance-Rings/default.aspx>
- To be further developed

Site Actions Browse Page Yannis Papaphilippou

EuCARD² EuCARD2-Low-Emittance-Rings

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All Site Content

Announcements

<input type="checkbox"/> Title	Modified
ICFA Mini-Workshop on Commissioning of SuperKEKB and e+e- Colliders - November 11-13, 2013	30/07/2013 02:06 PM
1st Low Emittance Ring Prize Awarded	25/07/2013 09:15 AM
Low Emittance Rings Student Prize	25/07/2013 09:09 AM

Add new announcement





THANK
YOU!!!

LOW
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RING