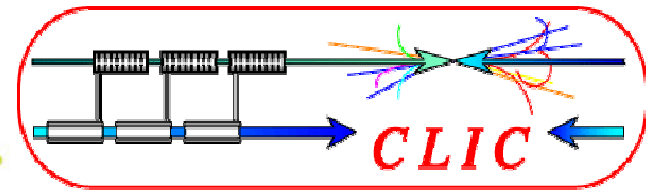


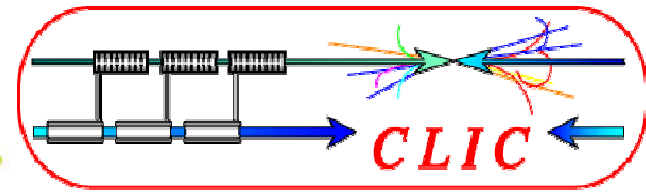
LER 2010 Closeout

Mark Palmer

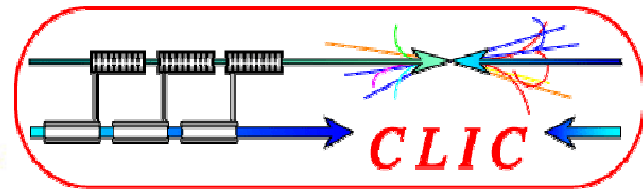
Co-Convener CLIC-ILC Damping Ring
Working Group



- **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.
- Target **strengthening the collaboration** within the two damping ring design teams and with the rest of the community.
- **Profit from the experience** of colleagues who have designed, commissioned and operated lepton ring colliders and synchrotron light sources.



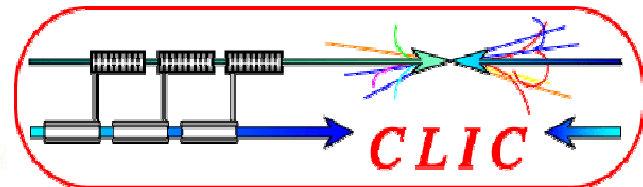
- 59 scheduled talks (all plenary)
 - 56 were successfully presented
 - Our sincerest apologies for the 3 that were not due to the technical difficulties with establishing the WebEx connections
- The talks covered a broad range of topics:
 - Status of linear collider damping ring designs, B factory designs, and test facilities
 - Low emittance lattice design
 - Low emittance tuning
 - Nonlinear dynamics
 - Collective Effects
 - Fast Ion
 - Electron Cloud (characterization and mitigations)
 - CSR
 - IBS
 - Impedance Modeling and Measurement
 - Technical Issues
 - Vacuum design (including EC mitigation, wiggler radiation absorbers,...)
 - Kickers
 - Magnets and Wigglers
 - Alignment
 - Instrumentation
 - Feedback systems
 - RF systems



- Bringing together experts...
 - **69 registered participants representing a cross section of all the major groups working on low emittance rings**
- Profiting from experience...
 - **56 presentations highlighting critical design issues for low emittance electron and positron rings**
 - **An impressive range of observations from light sources, B factories and test facilities presented**
 - Clear areas of mutual interest identified
 - Many design issues highlighted
 - **There appear to be many synergies between plans being developed for future light source development and the plans for low emittance high energy physics rings**
- All leading to...
 - **a range of animated discussions**
 - **exploration of possibilities for collaboration**



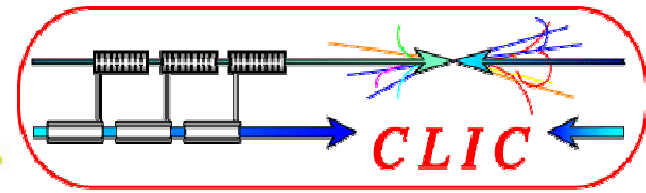
Have Our Hopes Been Met?



- Profiting from Experience – an example:
 - Major concern for damping ring teams has been the attainability of the targeted ultra low emittance parameters

- Vertical emittance in the range required for the ILC Damping Rings has been demonstrated
 - Demonstrated emittances are also very similar to the values proposed for the Super B factories
 - Values are rapidly approaching the CLIC damping ring regime!
 - Plans for future light sources are in even closer proximity to the damping ring parameters
- ⇒ Greatly improves our confidence in the proposed designs!

ALS					
APS					
ASP					
CLS					
Dian					
ESR					
SLS					
SOL					
SPEAR3	9.8 nm	9.8 nm	< 1%	0.05%	5 pm
SPring8	3.4 nm	3.2-3.6 nm	1.9% H; 1.5% V	0.2%	6.4 pm

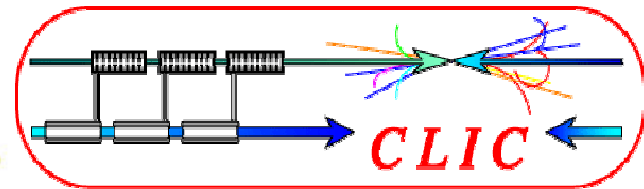


- Strengthening collaboration
 - Many discussions explored the possibility of developing new collaborations or enhancing existing ones
 - Summary presentations clearly identified areas where further collaboration across the community can yield benefits for all
 - This shows great promise, but how should we proceed?

A proposal...

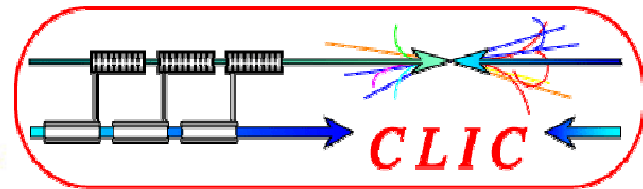


Beyond LER2010

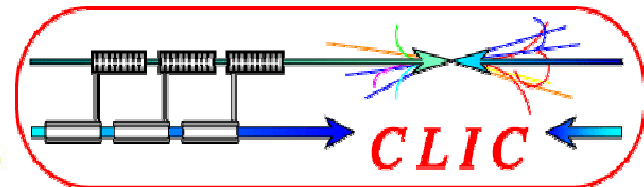


- Low emittance rings working groups
 - Any other subjects?
 - Coordinators to be confirmed (others to be added?)
 - Task: Identify collaboration items as discussed in the workshop
 - Collect “expressions of interest” from community (LER2010 participants and beyond)
 - Start collaboration work to be reported at the 2nd workshop in a series!

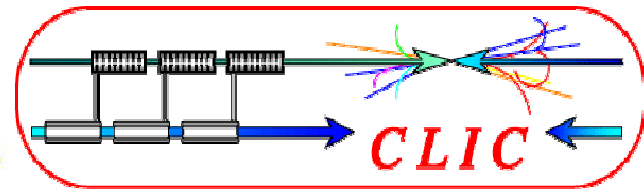
	Subject	Coordinators
1	Low emittance cells design	M. Borland (APS), Y. Cai (SLAC), A. Nadgi (Soleil)
2	Non-linear optimization	R. Bartolini (DIAMOND/JAI), C. Steier (LBNL)
3	Minimization of vertical emittance	A. Streun (PSI), R. Dowd (Australian Synchrotron)
4	Integration of collective effects in lattice design	R. Nagaoka (SOLEIL), Y. Papaphilippou (CERN)
5	Insertion device, magnet design and alignment	S. Prestemon (LBNL), E. Wallen (MAXlab)
6	Instrumentation for low emittance	M. Palmer (Cornell), G. Decker (APS)
7	Fast Kicker design	P. Lebasque (Soleil), C. Burkhardt (SLAC)
8	Feedback systems (slow and fast)	A. Drago (INFN/LNF), B. Podobedov (BNL), T. Nakamura (JASRI/SPring8)
9	Beam instabilities	G. Rumolo (CERN), R. Nagaoka (SOLEIL)
10	Impedance and vacuum design	K. Bane (SLAC), S. Krinsky (BNL), E. Karantzoulis (Elettra), Y. Suetsugu (KEK)



LER 2011

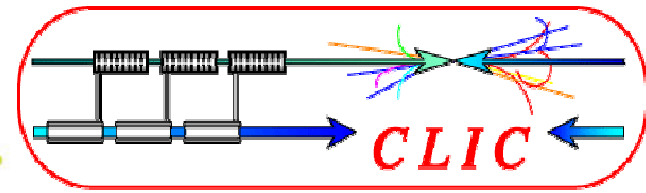


- On behalf of the CLIC-ILC Joint Damping Ring Working Group, I would like to thank each of you for your attendance, your wonderful presentations, and the many productive discussions in which you all participated.
- We are looking forward to a continuing fruitful interaction between the light source, collider, and damping ring groups.
- We hope that all of you will join us for the second meeting next year (in a warmer location...)



- I would like to express our thanks to the local organizing committee:
 - **Fanouria Antoniou**
 - **Alexia Augier**
 - **Ioannis Papaphilippou**
 - **Alessandro Vivoli**
- They have provided us with a most enjoyable workshop and nothing could stop them:
 - **Neither snow**
 - **Nor electrical failures**
 - **Nor technical difficulties...**

Thank You!



Introducing the QUANTUM

Limit **O**f **V**ertical **E**mittance

Prize

for the Low Emittance Ring

first reaching this limit

More details to follow

