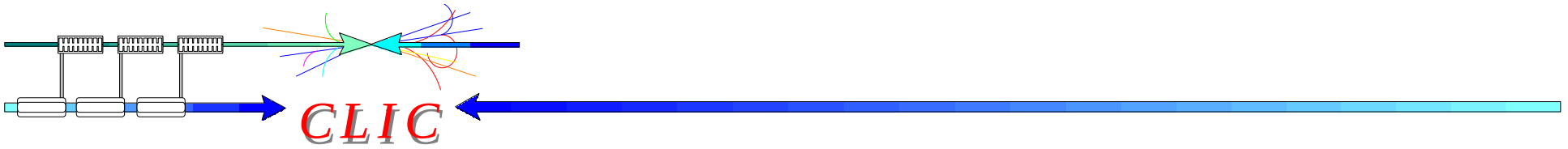
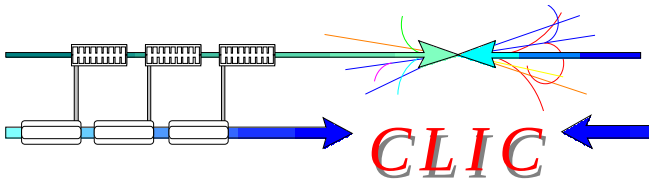


CLIC damping rings working plan towards the CDR and beyond

Yannis Papaphilippou

March 12th, 2009

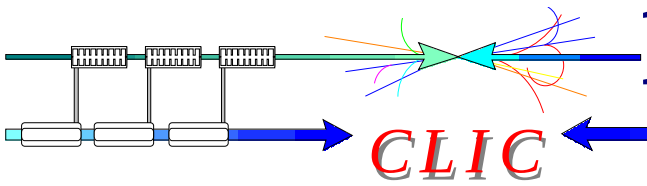


Working packages

- Basic lattice design
- Linear imperfections and correction
- Non-linear dynamics and correction
- Injection and extraction
- Super-conducting wiggler design
- Magnet systems
- Collective effects (including IBS)
- Vacuum systems
- RF systems
- Instrumentation
- Power system
- Survey and stabilization

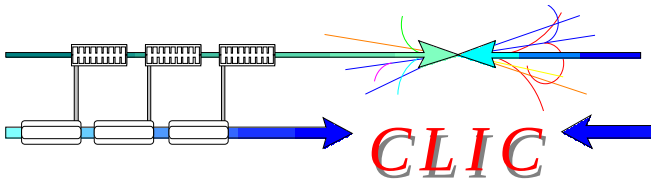
} Not critical for CDR

- System integration and parameters



Damping ring energy

- Raising the energy may reduce collective effects (especially space charge and IBS)
- Evaluating the benefits and fixing the impact is of major importance for the overall design of the damping rings
- It is the 1st priority for the next couple of weeks



Basic lattice design

- Linear optics optimization including IBS
- Working point and tunability
- Chromaticity correction and DA with sextupoles

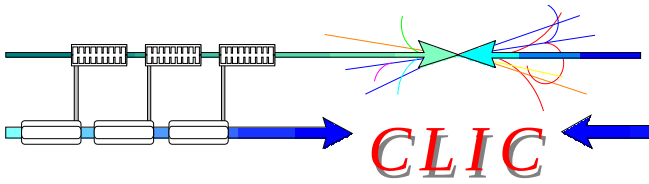
May 09

- PDR optics optimization including DA

April 09

- Geometrical aperture for DR and PDR
- Magnet specifications for DR and PDR

September 09



Linear imperfections

- Orbit, coupling and vertical dispersion correction estimates (low emittance tuning)
- Revised tolerances for magnet alignment and linear imperfections

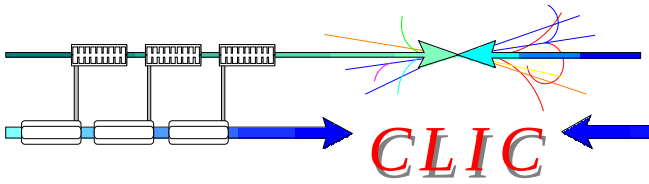
October 09

- Correction systems for PDR and rough tolerances

September 09

- Corrector magnet parameters
- Gradient and optics correction

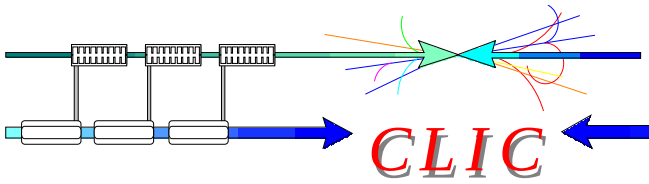
December 09



Non-liner dynamics

- Non-linear imperfections and DA
- Non-linear correction systems (sextupole, octupoles)
- Error specifications for magnets
- Effect of wigglers and tolerances

October 09



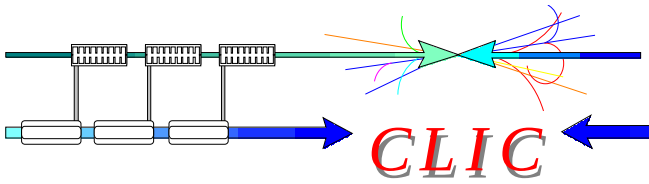
Injection-Extraction

- Injection and extraction optics and concept for DR and PDR
- Injection and extraction elements specifications and tolerances

April 09

- Conceptual design of kicker and septa

October 09

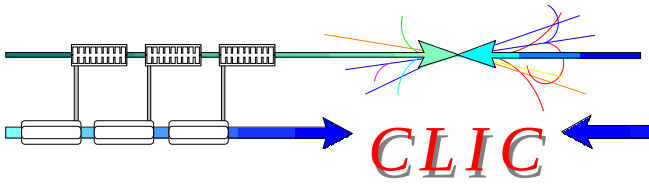


Wiggler design

- NbTi prototype work, including measurements — **May 09**
- Nb3Sn prototype work, including magnet models, mechanical design and measurements — **October – December 09**
- Radiation absorptions scheme and mechanical design — **October 09**
- Wiggler parameters for PDR — **October 09**

Magnet systems

- Magnetic modeling of main magnets for DR and PDR including field quality — **December 09**



Collective effects

- E-cloud and fast ion instability evaluation for final lattice design
- Instabilities (transverse and longitudinal)
- Space charge

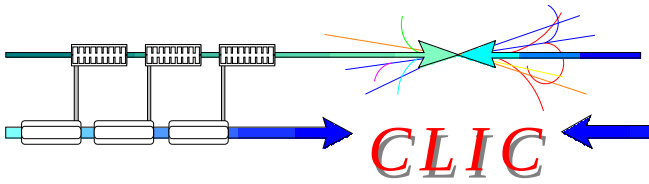
May 09

- Impedance evaluation for key components (absorbers, collimators, wiggler chambers, BPMs…)

October 09

- Coherent synchrotron radiation
- Intrabeam scattering for non-Gaussian distributions
- Vacuum specs
- Feedback systems

December 09



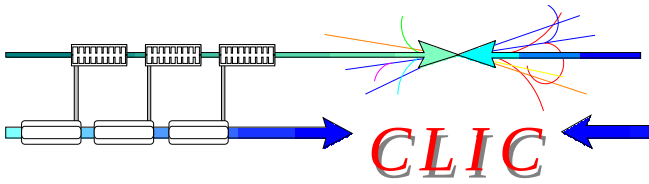
Vacuum systems

- Chamber coatings and experimental program for e-cloud mitigation (ESRF, CESR-TA)

October 09

- Preliminary chamber mechanical design
- Vacuum quality (pumps)

December 09



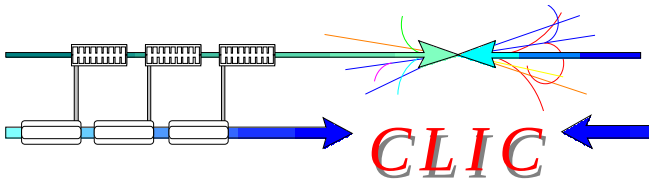
RF system

- Conceptual design of RF system

October 09

- Longitudinal impedances
- Evaluation of longitudinal instabilities (HOM)
- Design of the PDR RF system

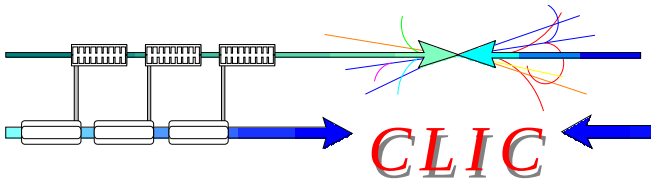
December 09



CLIC @ 500GeV

- Evaluate the impact of higher current and emittance on all systems
  - RF system
  - Collective effects
  - Absorption scheme
  - Tolerances' scaling (alignment, magnets, kickers, vacuum)
- Strategy for a staged approach from 500GeV to 3TeV

December 09



Meetings organization

- Every 2-4 weeks treating damping ring issues
  - Is Thursday morning a good day?
- Set-up a mailing list (ask me to include interested colleagues)
- Informal with round table discussion and progress reports of selected topics
- Combined with Wednesday's beam dynamics meeting on damping rings which can be attended by external collaborators through WEBX
- Three important milestones
  - ACE on May 2009
  - CLIC workshop on October 2009
  - Damping ring workshop on winter 2009