

# Beam Physics

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# Mandate?

- The working group should foster the exploitation of synergy between the ILC and CLIC beam physics studies. It should promote common meetings, standards, codes and studies.

# Common Meetings

- Regular meetings
  - Basis for collaboration
  - To not forget relevant effects
  - To profit from clever ideas of the other project
  - Agree on common standards, codes etc.
  - Some information exchange took place in ILC workshops
  - ILC webex meetings exist
  - CLIC will start webex meetings from next week
- Need to agree on common workshop
  - Just a few visitors at ILC or CLIC workshop
  - Or truly common workshop?

# Common Standards

- Simplify collaboration
  - Benchmarking
  - Fast application of simulation tools on the other project
  - Reduces the likelihood of errors
  - Reduced resources requirements
- Some collaboration is already ongoing
- Machine models
  - AML will be supported by both projects
  - Updates may be necessary
- Imperfection models
  - Ensure completeness and correctness of model
  - Simplify the collaboration
- Correction, feedback and tuning modules
  - To be able to build integrated simulation tools, necessary within each project
- Interfaces
  - E.g. beam model to allow use of chain of codes

# Common Codes

- A number of codes is needed
  - Tracking and correction procedures (too many, but more detail needed)
  - Background and losses (about OK, more benchmarking and more details may be needed)
  - Beam-beam (about OK, more detail needed)
- Benchmarking of codes is essential
  - Need to have at least two
  - Very time consuming
    - In particular creates a competition between more results and more certain results
- In this area strong collaboration already exists

# Common Studies

- For ILC a supporting second study is required for all critical results
  - Will do the same for CLIC at some point
- Serious work is needed to establish specifications for hardware
  - Many questions to be answered day to day
  - Seems project specific
  - But the model used for the specification could be the same
- Seems reasonable to work together on the supporting studies
  - Less tight schedule
- Common workshops would be a first step

# Specific Studies

- Damping ring
  - Alignment and tuning exist for ILC and CLIC
    - Benchmarking could be of interest (also ATF)
    - Improvements required for CLIC
  - Electron cloud
    - Benchmarking of codes for specific cases could be interesting
  - Fast beam-ion instability
    - benchmarking
- RTML
  - Design for CLIC needs completion
    - Performance studies required
  - Collaboration between ILC and CLIC exists on BC alignment for ILC
    - Should be extended to cover CLIC

# Specific Studies (cont.)

- Main Linac
  - Strong contributions from CLIC to ILC
  - Would welcome contributions to CLIC
- BDS
  - Correction algorithm exist for ILC
    - Should be applied to CLIC
  - A correction algorithm is being developed for CLIC
    - Can be applied to ILC to serve as supporting study
- Luminosity measurement
  - A fast measurement is important for both projects
  - The luminosity spectrum reconstruction is important
- Integrated luminosity studies
  - Integrated feedback is essential for CLIC
  - Use of similar alignment, feedback and tuning strategies should be investigated