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ILC Damping Ring EDR Work Package for Lattice Design and Acceptance (WP #1)

*Louis Emery, November 5th 2007
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U.S. Department
of Energy



A U.S. Department of Energy laboratory
managed by The University of Chicago

Description of Work Package

- Lattice description for the electron and positron rings:
 - geometrical layout
 - magnet and rf cavity parameters
 - physical apertures at all points around the ring
- Check dynamic aperture
- Injection and extraction transfer lines. Need to determine the extent of beamlines in WP
- Design will be tolerant of reasonable errors and perturbations following simulated corrections where possible
- Acknowledge information from the S3 report for dependencies and schedule

Participating Institutions

- ANL, Cornell U., IHEP, INFN-LNF, Kyungpook U., LBNL, U of Maryland
- Not all people were contacted yet

Dependencies on Other Damping Ring WPs

Input from

- WP3 (Damping wiggler design)
- WP10 (650 MHz SRF design)
- WP11 (Magnets and supports)
- WP12 (Systems integration and availability)
- WP14 (Injection and extraction systems)

Output to

- WP2 (Orbit, optics and coupling correction)
- WP5 (Impedance and impedance-driven instabilities)
- WP6 (Fast instability control feedback)
- WP7 (Electron cloud)
- WP9 (Other collective effects)
- WP11 (Magnets and supports)
- WP12 (Systems integration and availability)
- WP13 (Vacuum system)
- WP14 (Injection and extraction systems)
- WP15 (Ion effects)

Immediate Deliverables (End of 2007)

■ Lattice design

- Compare the two proposed lattices in dynamic aperture (DA) and other measures to be determined
- Create other momentum-compaction lattices for TME-cell
- Includes modified injection/extraction section for more space between pulsed magnets
- Optics for collimation sections (?) upstream of SC devices
- Correctors (dipole, skew quads), BPMs at standard positions. They may be moved/removed/added to in 2008 by WP #2 (correction) and other WP during their study.
- Nomenclature added (obtained from a global package)
- Provide also: physical apertures, magnet quality

Deliverables for 2008 and Later

- Characterize acceptance using technical designs of magnets (following completion of a WP #11 (magnets) milestone)
- Explore dynamic aperture limitations and possible improvement techniques (following the above WP #11 (magnets) milestone)
- Develop baseline design of injection/extraction transfer lines, including tolerances
- Develop baseline design of abort line
- Explore optimizations and operational flexibility (connected with WP #2 (optics correction))

List of Deliverables

- Make necessary changes to lattice design (following a WP #5 (impedance) milestone)
- Make necessary changes to injection/extraction lines (following a WP #14 (pulsed magnet) milestone)
- Make necessary changes to abort line (following a WP #14 milestone)