

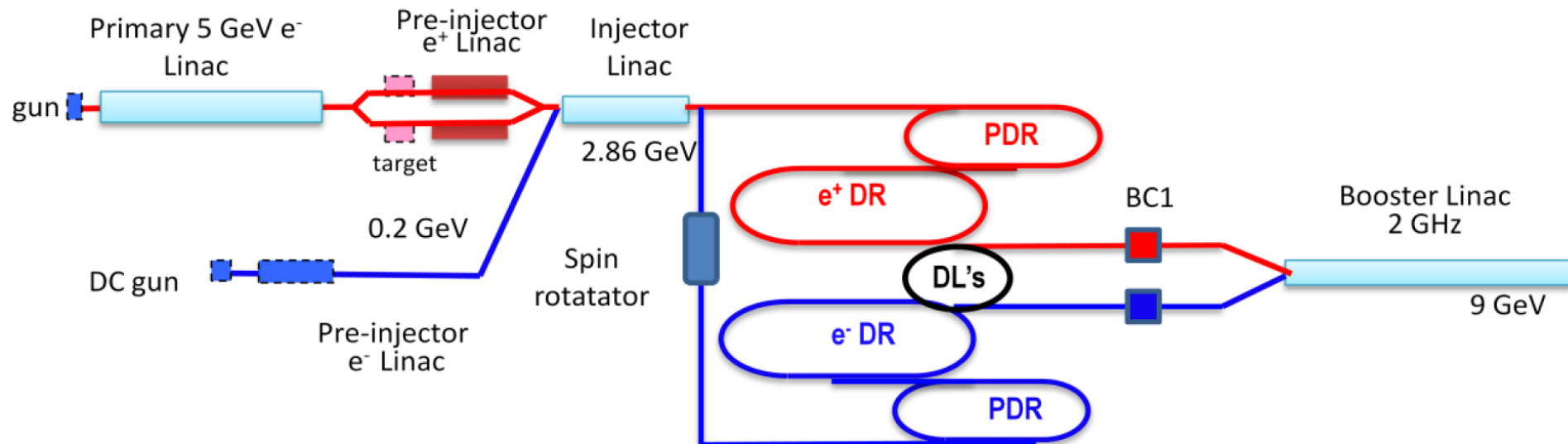
Beam Physics News

D. S. for the beam physics team

June 1^{rst}, 2011

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- Mainly CDR writing and last minute adjustments
 - Drafts of all area chapters with two exceptions, DR is expected in two weeks
 - Key issues and feasibility chapters are being written (luminosity chapter is almost there)
 - 500 GeV and energy scan chapter drafts are available (one section missing in each)
- Adjustment: relative timing of the electron and positron beams in the sources, damping rings and RTML (Igor, Steffen, Yannis, Frank, D.)
 - Spacing before first electron bunch and first positron bunch in RTML is now 1100ns
 - Not fully consistent with layout (120m)
 - But seems to work in injector (some issue with beam loading)



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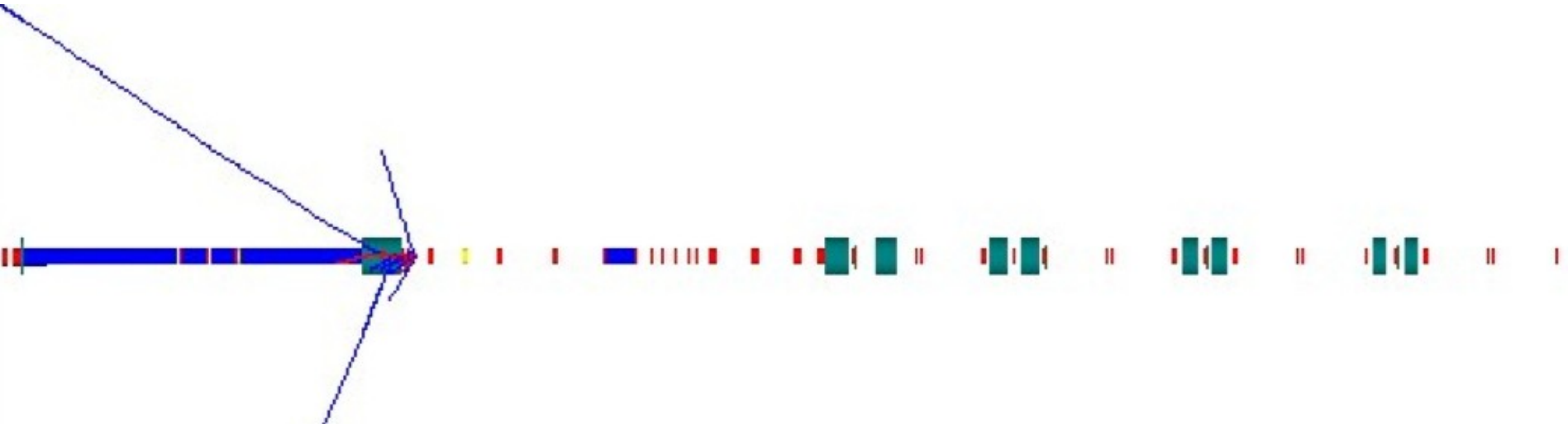
- Damping ring
 - The 2nd Low- ϵ -Ring Workshop is being prepared for 3-5 of October 2011 in Heraklion, Creta, Greece.
 - Proposal for a Low- ϵ -Ring network under EuCARD is being finalized
 - A number of improvements/refinements
 - Meeting at KIT-ANKA with the participation of CERN and BINP experts took place last week, for revising wiggler specs and time-table
 - Refined specs for the DR injection and extraction area optics were established by Brennan
 - New model with correctors and BPMs, coupling correction simulations started (Kent Wooton, Australian Synchrotron)
 - Non-linear dynamics simulations (DA and frequency maps) for working point optimisation and impact of alignment errors and wiggler imperfections are initiated by Yves.
 - Analytical treatment for establishing a parameterisation of Low Emittance Cells with respect to high-order momentum compaction factors and non-linear dispersion is ongoing (design of delay loop/Panagiotis)
 - A wide range of activities for TIARA WP6 (SVET) took place including measurements at SLS, meeting for IBS theory and simulations, beam instrumentation for measuring ultra-low vertical emittances and experiment planning for SLS low energy running.
 - A wiki page was developed by Fanouria with all relevant DR information

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- BDS
 - Pulse-to-pulse ground motion and beam measurement in preparation for ATF2/3 (Ives, Rogelio, D.)
 - A collaboration discussion in preparation for June 9th (collimator tests at SLAC)
 - Crab cavity presentation (Amos Dexter, Graeme Burt) on June 8th
 - Collaboration with LAL and Valencia (PhD students)
 - BDS tuning studies are ongoing
 - Faster tuning, still hope for the CDR (Andrea)
 - Unexplained improvement of tuning but not maximum luminosity for some small change in system
 - Use of tuning knobs is under study to recover from ground motion
 - Will try BPM-based sextupole steering (Jochem)
 - Luminosity loss due to crab cavity (5%) is being studied (Javier, Eduardo)
 - Long-term aim is to better understand BDS
 - L* choices, design for tuning performance, energy dependence, ...
 - Welcome to Hector Garcia Morales
- MDI, background, physics
 - Muon background finally found too high, seem to have found a solution (Lawrence, Helmut, Lau, Edda, Rogelio, Andrea, D.)
 - [Muon spoilers added](#)
 - Better vacuum
 - Identified source of 90% of residual muons: particles travelling in beam pipe close to IP
 - Provided 500GeV hadronic background data
 - Barbara Dalena left, interested in collaboration

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- MDI, background, physics
 - Muon background finally found too high (factor $O(100)$), seem to have found a solution (Lawrence, Helmut, Lau, Edda, Rogelio, Andrea, D.)
 - Muon spoilers added, factor 10
 - Magnetised spoilers have 55cm outer radius
 - Better main linac vacuum (required for beam stability) factor 10
 - Identified source of 90% of residual muons: particles travelling in beam pipe close to IP, potentially factor 10
 - Provided 500GeV hadronic background data
 - Barbara Dalena left, interested in collaboration



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- RTML
 - BC2 RF has been investigated, CLIC 500 structure seems fine
 - Frank Stulle will leave us, Andrea is taking over
- Main linac
 - Impact of wakefields penetrating from the PETS to the main linac are under study (Yiwei Wei, D.)
- Drive beam
 - Improved studies of steering the drive beam decelerator are ongoing (Guido Sterbini)
 - Non-linear magnetic fields, realistic correctors (Guido, Andrea)
 - Discussion of phase stability experiment in CTF3
 - Thermionic injector design (Alessandro, Simona), in particular satellite cleaning (Bernard)
 - Avni has been promoted to Dr. Aksoy, interested in collaborating
- Klystron-based CLIC
 - Need to finalise report, some input still needed (update of efficiency calculations, Bernard, Igor)

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- Stage approach of CLIC foreseen
 - Higgs, top threshold, ...
 - Will require some fundamental work