Work toward the CLIC CDR Plans from JAI, Oxford

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Collimation System

Collimation review and optimization (in collaboration with CERN and CI):

- ✓ Collimator wakefield effects with optimized coll. apertures:
  - ✓ Luminosity performance studies (introducing transverse angle and position jitters + coll. wakefields)
  - ✓ Estimate beam-collimator offset tolerances
- ✓ Collimation efficiency studies
- ✓ Geometric optimization of spoiler design: taper angle optimization to reduce wakefields (combining luminosity studies, thermal-stress studies of the spoilers (CI), checking if enough beam angular dispersion by multiple Coulomb scattering, etc.)
- Similar study for 500 GeV CLIC BDS collimation system: wakefields + coll. efficiency. Apply design optimization (to be done)

Collimation System

Possible IPAC10 paper:

TITLE: Optimization of the CLIC Baseline Collimation System

D. Angal-Kalinin, B. Dalena, L. Fernandez-Hernando, F. Jackson, J. Resta-Lopez, D. Schulte, A. Seryi, R. Tomas

Abstract:
Important efforts have recently been dedicated to the improvement of the design of the baseline collimation system of the Compact Linear Collider (CLIC). Different aspects of the design have been optimized: the transverse collimation depths have been recalculated in order to reduce the collimator wakefield effects while maintaining a good efficiency in cleaning the undesired beam halo; the geometric design of the spoilers have also been reviewed to minimize wakefields; in addition, the optics design have been polished to improve the collimation efficiency. This paper describes the current status of the CLIC collimation system after this optimization.

Please, let me know comments and suggestions, …

Beam stability studies and feedback systems in the CLIC BDS

- ✓ Design of intra-train FB system at the CLIC IP. Luminosity performance simulations:
  - ✓ Applying dynamic imperfections, i.e ground motion
  - ✓ Calculation of FD transverse jitter tolerance

- Integrated simulation studies (CERN + JAI collaboration):

  – BDS static misalignment + BBA (1-to-1, DFS): a lot of work done already by A. Latina, D. Schulte and R. Tomas

  – Dynamic imperfections (GM, different scenarios)
  – Additional quadrupole and sextupole position jitters (fast vibrations ~ 50 Hz)
  – Detailed study of tolerances

  – Application of feedback system with different time scales:
    - Pulse-to-pulse
    - Intra-train at the IP (1 iteration every ~74 bunches, possibility to reduce latency ?)