ILC – BDIR

Collimation and Detector Backgrounds

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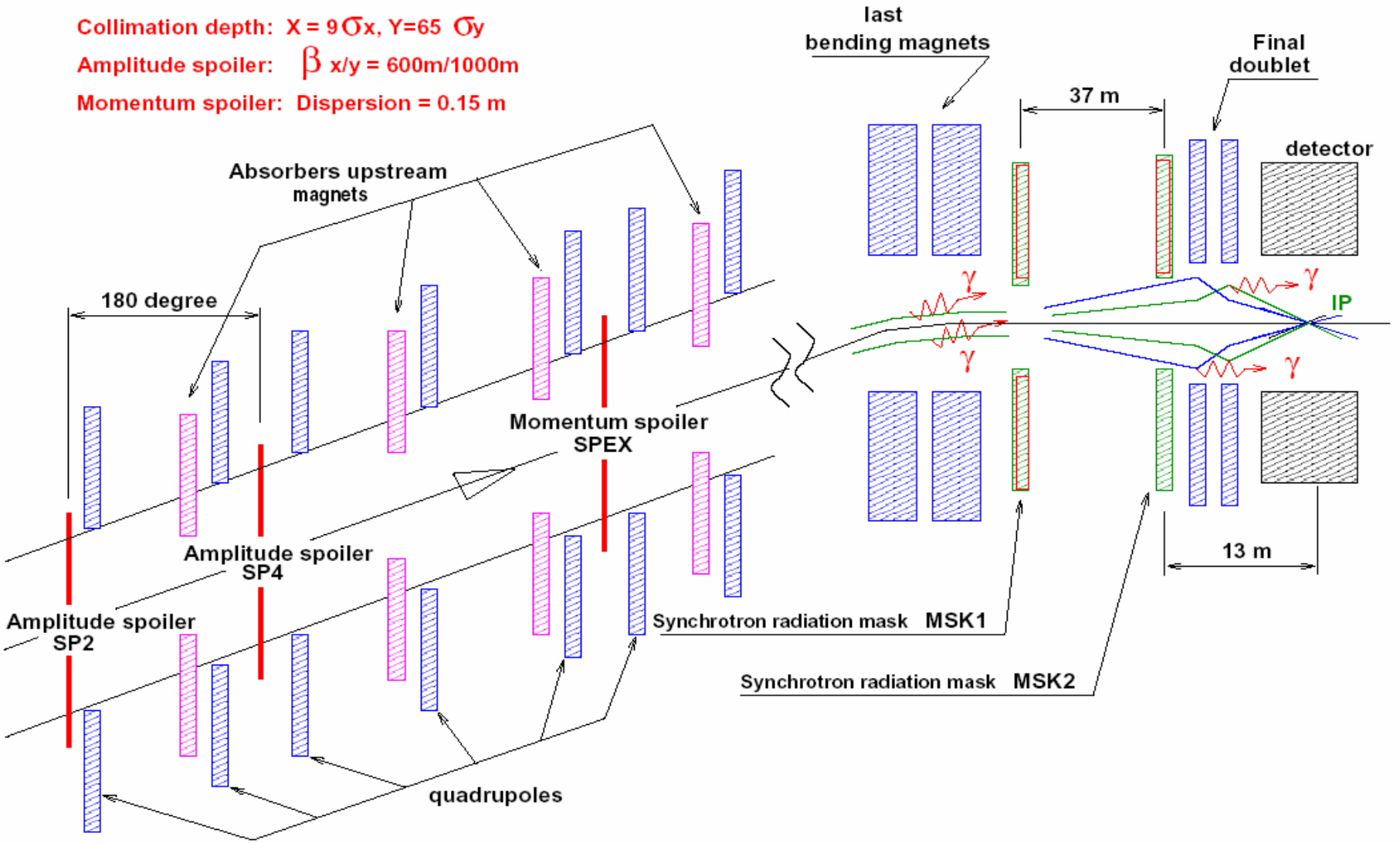
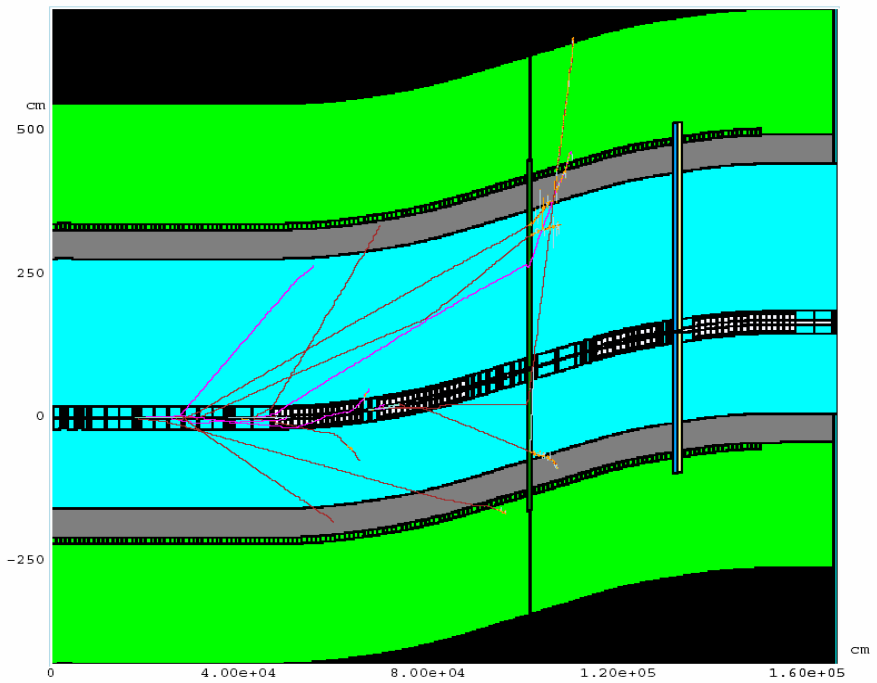
ILC COLLIMATION SYSTEM



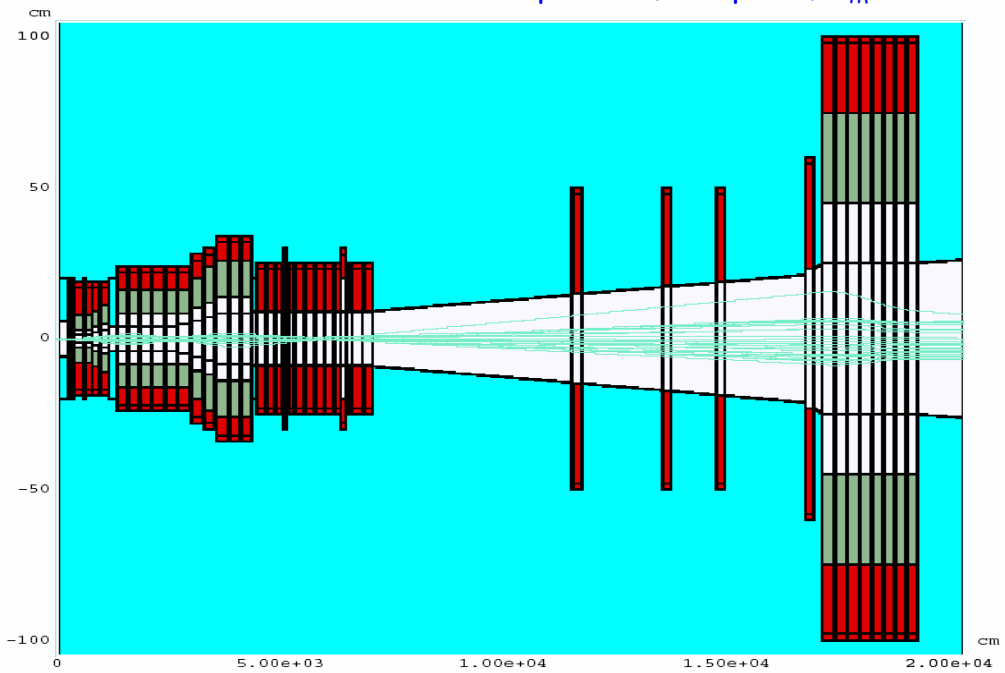
BDIR MODEL



BDS 1700 m upstream IP, with SiD detector at IP. MARS-GEANT4 collaboration between FNAL, SLAC and TPU on SiD has just started

MARS model of extraction beam line (20-mrad crossing) has been built and tested and is ready for optimization studies.

100 disrupted e^+ , hor plane, E_{th}=10 GeV



What we need to do to accomplish

Progress since 1st ILC Workshop on:

1. Critical choices:
   - detector tolerances (hardware damage and operation)
     - Need integrated IR-detector model (including mask and SC quad optimizations), iterate with detector group on background tolerances.
   - beam loss models
   - muon spoilers
   - apertures+pair&halo masking
   - consumable vs passive (survivable) collimators.

2. Simulation standards and interfacing, very important

3. Iterations with optic designers on collimator locations and parameters.

4. Optimization of individual spoiler and absorber configurations, dimensions and material w.r.t. to their performance, survivability and impedance.

What we need to accomplish (2)

5. Modeling of beam loss in BDS, IR & extraction line followed by realistic energy deposition simulations in BDIR, detector and extraction components (including tunnels and experimental halls) to minimize backgrounds, radiation loads and environmental impact.

6. Based on results of simulations, iterations with conventional construction group on tunnel magnetic spoilers, tunnel and experimental hall parameters.

7. Validation, inter-comparison and improvements of simulation codes used in the BDIR studies: tracking, production models, energy deposition, thermal/stress/DPA analyses,wakefield.

AGENDA-I

1. Daniel Schulte "Halo & Tail Generation Studies"
2. Karsten Buesser "Pair Backgrounds in the Large Detector"
3. Toshiaki Tauchi "Pair Backgrounds with the ILC Parameter Sets in the GLD"
4. Ilya Agapov/Grahame Blair "Collimation System Studies"
5. Tom Markiewicz/Takhashi Maruyama "Backgrounds in 2/20 mrad IR"
6. Alexander Drozhdin "STRUCT Modeling of Collimation and Extraction System Performance"
7. Nikolai Mokhov "MARS Modeling of Energy Deposition and Backgrounds"
8. Carl Beard "Wakefield Simulations for ESA BEAM Tests"

AGENDA-II

9. Adrian Vogel "Simulations of Neutron Background in a TPC Using GEANT4"
10. Cecile Rimbault "Status of Beam-Beam Simulations"
11. John Carter "2-mrad Extraction Line Backgrounds"
12. Frank Jackson "Collimation Depths and Performance for 2 and 20-mrad BDS Collimation"