A. Ferrari (Uppsala University)

Post-collision extraction line studies: status report

Two on-going studies within EUROTeV:

1. **Particle tracking code benchmarking in collaboration with O. Dadoun (LAL) and R. Appleby (Daresbury):**

   Comparison of particle trajectories and beam distributions obtained with DIMAD and BDSIM at various points of the ILC extraction lines (with 2 and 20 mrad crossing angles) using the cs11 input beam (ILC 500 GeV nominal). EUROTeV note in preparation.

2. **Beam losses in the 20 mrad extraction line of a TeV linear collider:**

   Computation of the power losses along the 20 mrad extraction line with a CLIC beam and four ILC configurations (cs21, cs25, cs26, cs27) at 1 TeV: disrupted beam, beamstrahlung photons and coherent pairs are considered. EUROTeV note in preparation.

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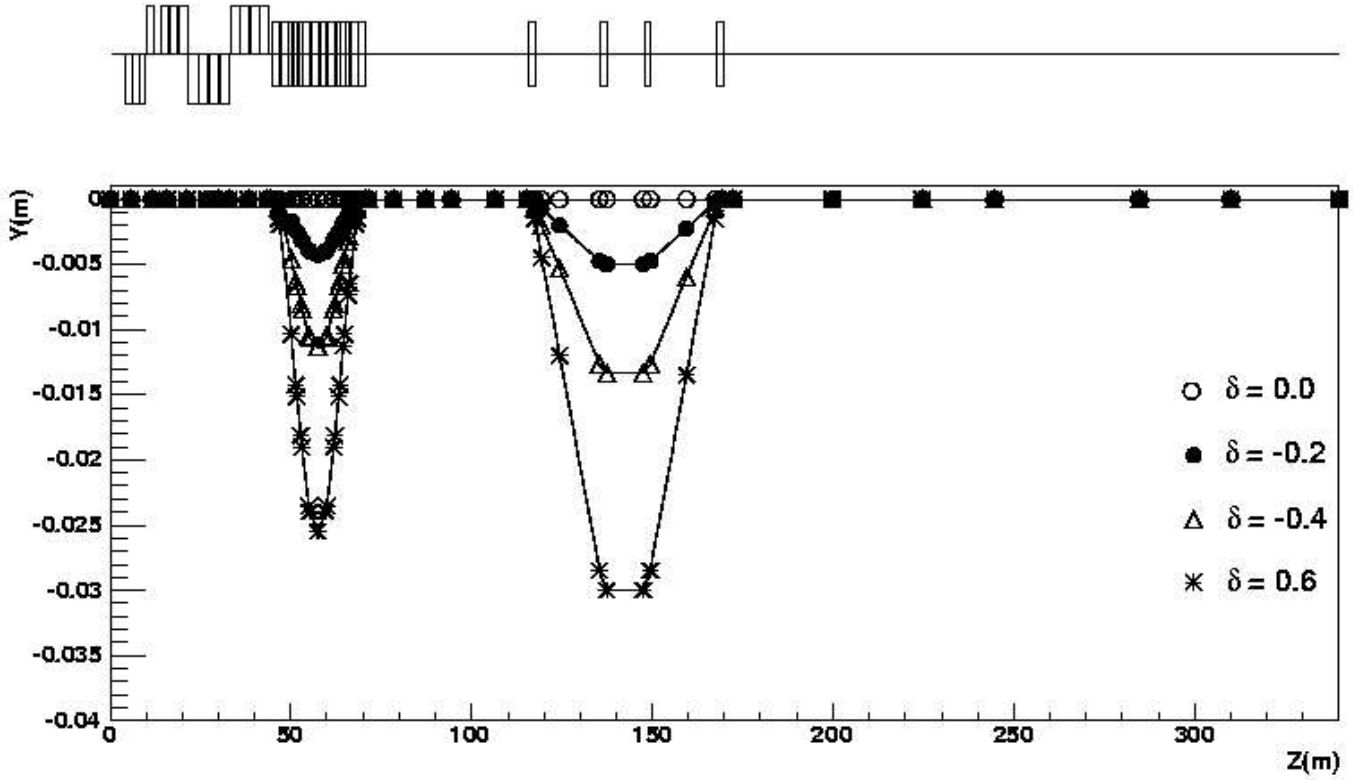
Particle tracking code benchmarking:

Comparison of beam trajectories in the 20 mrad extraction line (BDSIM and DIMAD give the same result).



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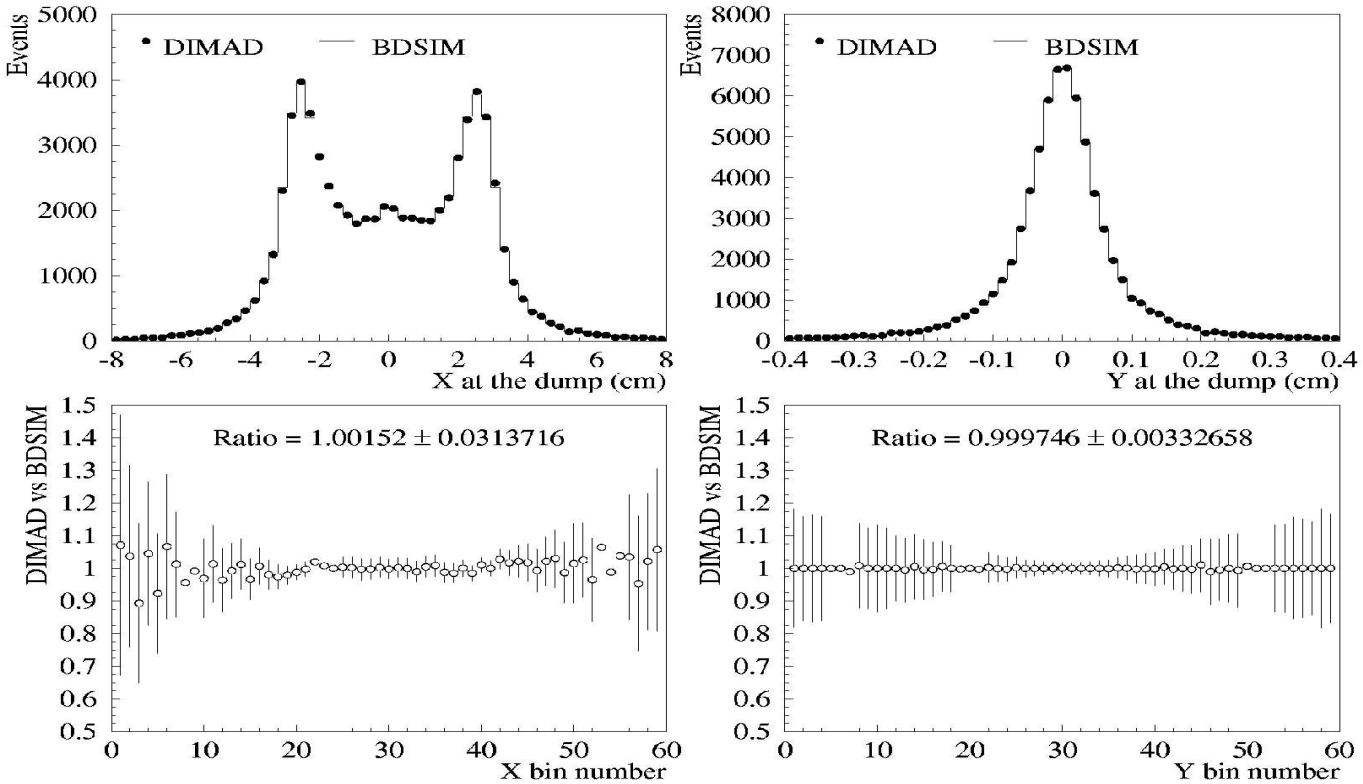
Particle tracking code benchmarking:

Comparison of transverse distributions at the end of the 20 mrad extraction line (BDSIM and DIMAD give the same result).



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Particle tracking code benchmarking:

A comparison of the transverse distributions at the 2nd focal point (MEXFOC) of the 20 mrad extraction line showed that there are still some discrepancies. It seems that the vertical bends are not yet correctly treated in BDSIM: investigations are being performed by O. Dadoun!

Once this problem is solved, we will publish a EUROTeV report...

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Beam losses in the 20 mrad extraction line of a TeV linear collider:

Five cases are being considered:

- ***CLIC at 1 TeV (one configuration only)***
- ***ILC at 1 TeV (four configurations referred to as cs21 (nominal), cs25 (high luminosity), cs26 and cs27 (new).***
- ***GUINEA-PIG was used to produce the outgoing (disrupted) beam distributions, beamstrahlung photons and coherent pairs. DIMAD was used to track particles in the 20 mrad extraction line and estimate power losses.***

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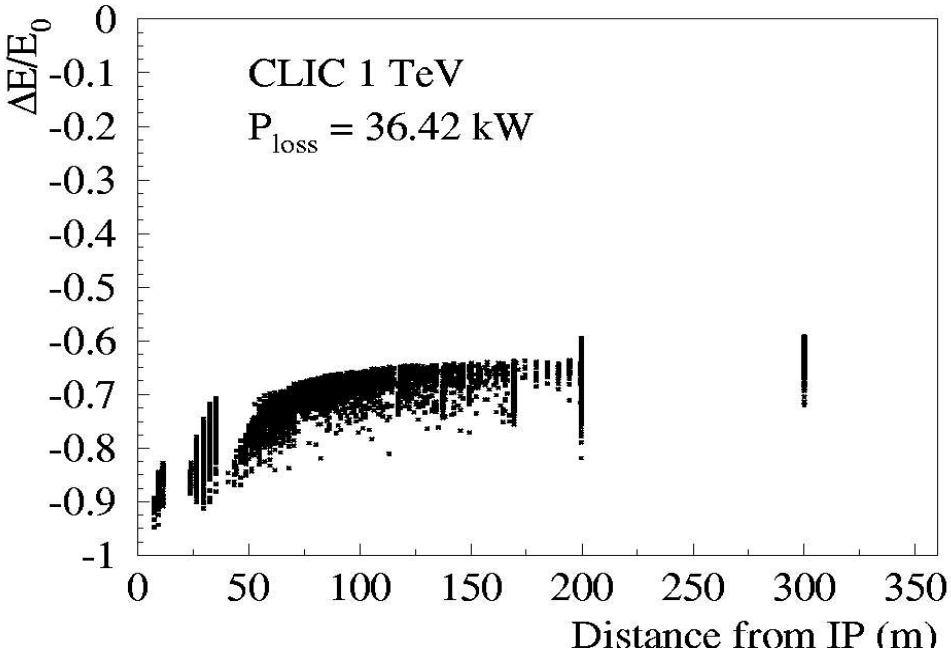
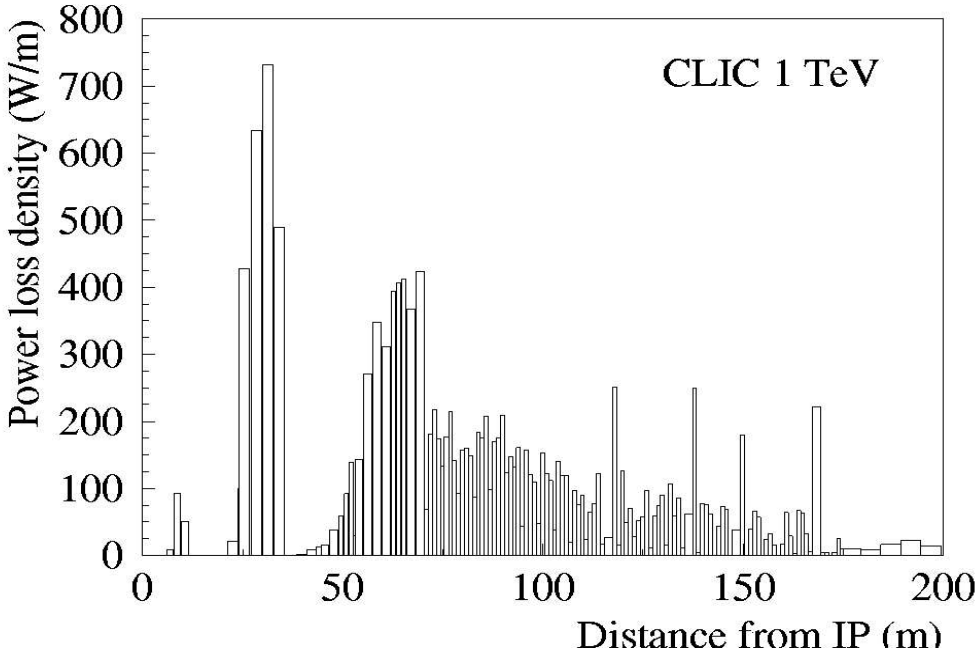
Beam losses in the 20 mrad extraction line of a TeV linear collider:

Disrupted beam losses were studied for all configurations. Here we show the energy spread as a function of the loss position, as well as the loss density upstream of the collimators, for CLIC at 1 TeV:





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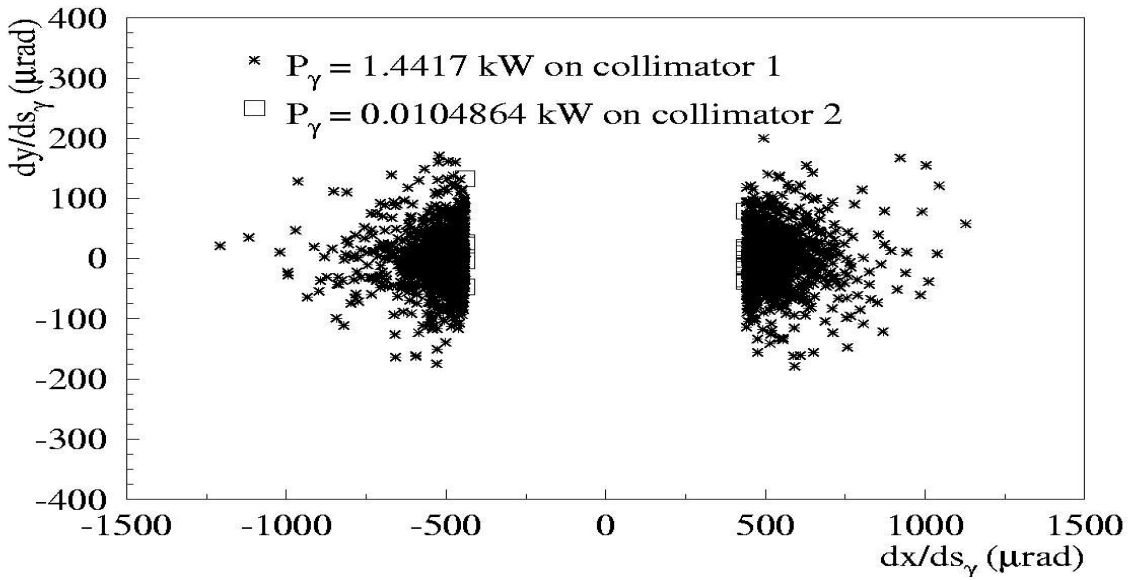
Beam losses in the 20 mrad extraction line of a TeV linear collider:

Beamstrahlung photons only lead to significant losses in the ILC cs25 case, and they mostly occur in the first collimator.



Losses due to coherent pairs can always be neglected.

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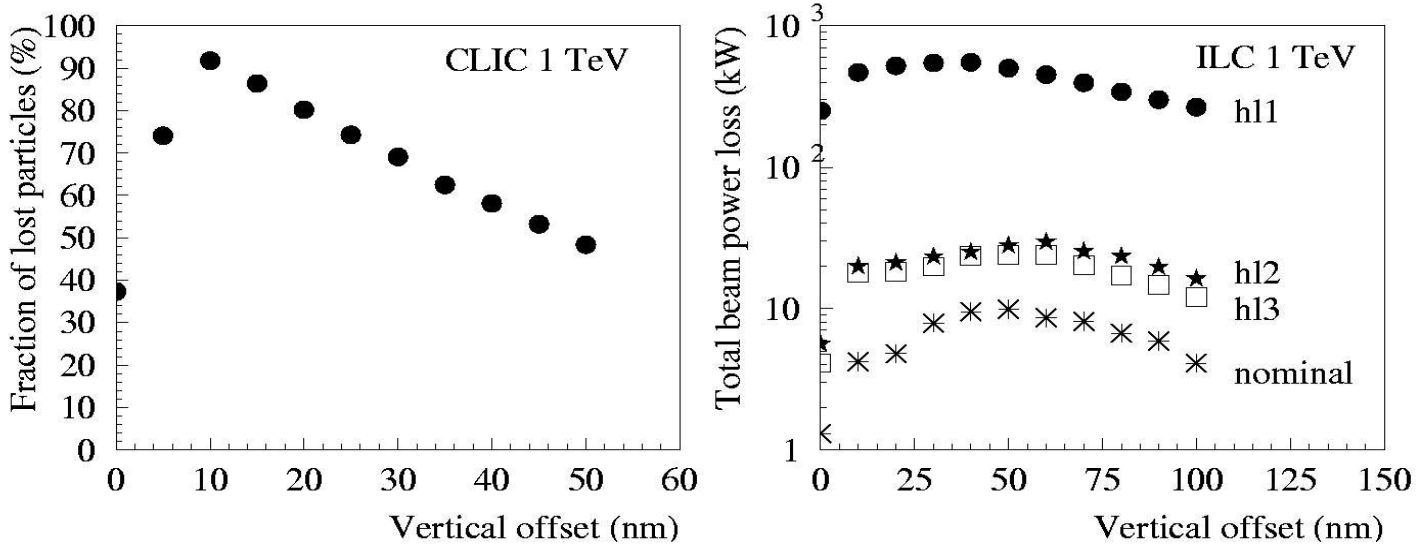
Post-collision extraction line studies: status report

Beam losses in the 20 mrad extraction line of a TeV linear collider:

Beam losses were also studied as a function of a vertical position offset.



A study of the effect of an angular offset is currently performed. A EUROTeV report is in preparation.