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Track Reconstruction at the ILC

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One of the key requirements for Higgs physics at the International Linear Collider ILC is excellent track reconstruction with very good momentum and impact parameter resolution. ILD is one of the two detector concepts at the ILC.

Its central tracking system comprises of a highly granular TPC, an intermediate silicon tracker and a pixel vertex detector, and it is complemented by silicon tracking discs in the forward direction.

Large hit densities from beam induced incoherent electron-positron pairs at the ILC pose an additional challenge to the pattern recognition algorithms.

We present the ILD tracking algorithms that are using clustering techniques, cellular automata and Kalman filter based track extrapolation. The performance of the tracking reconstruction is evaluated using a realistic Geant4 simulation including dead material, gaps and imperfections, that recently has been used for a large Monte Carlo production for the Detailed Baseline Design of the ILD detector concept.

The algorithms are written to a large extent in a framework independent way, with the eventual goal of providing a generic tracking toolkit. Parallelization techniques for some of the algorithms are under investigation.

Summary

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