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# Individual Particle Reconstruction

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The International Linear Collider (ILC) promises to provide electron-positron collisions at unprecedented energy and luminosities. The relative democracy with which final states are produced at these high energies places a premium on the efficiency and resolution with which events can be reconstructed. In particular, the physics program places very demanding requirements on the dijet invariant mass resolution. Collider detectors have successfully improved their jet energy resolutions by augmenting the calorimeteric measurements with the momenta of charged particles measured in their trackers
a posteriori.

We present studies which apply this paradigm to the design of ILC detectors, proposing to achieve the requisite performance by measuring the charged particle contribution to the jet energy using the track momenta and only using calorimetric information for neutral particles. Designing detectors to implement this algorithm requires a combined approach to the detector as a whole, but since the crux of this technique is the ability to uniquely identify and assign energy depositions to individual particle showers, the calorimetry is emphasized. In this talk, we present results based on a flexible simulation and analysis framework (slic & org.lcsim). We describe a templated approach to the reconstruction which allows various clustering and track-cluster association algorithms to be quickly and efficiently implemented and compared. We demonstrate the performance of the reconstruction on a number of detector models with different choices of calorimeter absorber, active media and readout segmentation as well as overall detector parameters such as the strength of the magnetic field, magnet bore, aspect ratio, hermeticity, etc.

## Summary

We present studies of ILC detector designs based on individual particle reconstruction.

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