

The Directed-Tree clustering algorithm for Particle Flow Reconstruction

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We present the status of particle-flow algorithm development at Northern Illinois University. A key element in our approach is the calorimeter-based “Directed Tree” clustering algorithm. We have attempted to identify and tackle the essential challenges and analyze the effect of several different approaches to the reconstruction of jet energies and the Z-boson mass. A number of possibilities have been studied, such as analog vs. digital energy measurement, hit density-based clustering and the use of single or multiple energy thresholds (the so-called “semi-digital” approach). We plan to use this PFA-based reconstruction to compare some of the proposed detector technologies and geometries.

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