

Software compensation and particle flow

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The Particle Flow approach to calorimetry requires highly granular calorimeters and sophisticated software in order to reconstruct and identify individual particles in complex event topologies. Within the CALICE collaboration, several concepts for highly granular calorimeters are studied. The Analog Hadron Calorimeter (AHCAL) concept is a sampling calorimeter of tungsten or steel absorber plates and plastic scintillator tiles read out by silicon photomultipliers (SiPMs) as active material. The high calorimeter granularity can also provide a discrimination of the electromagnetic sub-showers in hadron showers. This discrimination can be utilised in an offline weighting scheme, the so-called software compensation technique, to improve the energy resolution for single particles.

The software compensation techniques developed on the CALICE AHCAL data have been applied to full jet reconstruction using the PandoraPFA particle flow algorithm in simulated events for the ILD detector concept for the ILC. The impact of software compensation in the HCAL on PFA performance, and the dependence of this performance on the granularity of the detector will also be discussed.

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