

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. This presentation will discuss results obtained with the AHCAL physics prototype in several testbeam campaigns with steel and tungsten absorber. It will concentrate on software compensation, its implications for the detector design as well as the use of software compensation techniques in the PandoraPFA particle flow algorithm.

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