

Digitised response of the highly granular ILD hadron calorimeter to single hadrons

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Highly granular calorimeters are proposed for the calorimeter systems of multi-purpose detectors at future lepton colliders. In particular, the ILD hadron calorimeter will be assembled from scintillator tiles read out directly by silicon photomultipliers. We have measured a response of the tile-SiPM system to minimum ionising particles emulated by electrons from radioactive source. The contribution of different effects, such as light collection efficiency and electronic noise, to the response width was estimated from these experimental data. The estimated contribution is implemented in the digitisation of simulated signals from single hadrons in the cells of the ILD hadron calorimeter. We show here the impact of the experimentally measured detector effects on the simulated ILD hadron calorimeter resolution for single hadrons in the energy range from 5 to 50 GeV.

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