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Test Beam Performance of CALICE Electromagnetic Calorimeter Physics Prototypes

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Please give a brief summary of your poster

Prototypes of proposals for a highly granular electromagnetic calorimeter for the experimentation at the ILC have been exposed to
electron and hadron test beams at DESY, CERN and FNAL. Both prototypes comprise a large number of readout units confined in a
volume of about 18x18x30cm3. One variant, composed of Silicon and Tungsten, exhibits a signalover noise ratio of 7.5 compared with the goal of 10 as envisaged for an ILC detector. The
energy resolution of approximately 17%/sqrt{E[GeV] is well within specifications. The energy resoluion of the second variant, composed of Scintillating strips and Tungsten, was found tobe 14%/sqrt{E[GeV] with an excellent reconstruction of pi0 produced in the
test beams. With the extracted linearity of approximately 1% for both variants the proof-of-principle is given that these high granular calorimeters can be operated successfully under beam conditions. Additionally, the angular resolution and shower profiles are under study. The data will be further analysed in terms of exploiting the unprecedented high granularity which allows for instance the tracking of individual particles within hadronic cascades. The latter constitutes an important input to the tuning of existing hadronic shower models as available within the simulation toolkit GEANT4.

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