

Test Beam Performance of the CALICE SiW Electromagnetic Calorimeter Physics Prototype

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A prototype of a highly granular SiW electromagnetic calorimeter composed of approximately 10000 cells contained in a volume of $18 \times 18 \times 30 \text{ cm}^3$ for an ILC detector has been examined in test beam campaigns conducted by the CALICE collaboration. Within the test beam environment a signal over noise ratio has been found to be 7.5 compared with the goal of 10 as envisaged for an ILC detector. The energy resolution of approximately $17\%/\sqrt{E[\text{GeV}]}$ is well within specifications. With the extracted linearity of approximately 1% the proof-of-principle is given that these high granular calorimeters can be operated successfully under beam conditions. 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.

Summary (Additional text describing your work. Can be pasted here or give an URL to a PDF document):

<http://arxiv.org/abs/0805.4833>

http://arxiv.org/PS_cache/arxiv/pdf/0811/0811.2354v1.pdf

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