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Towards a realistic calorimeter with SiPM readout

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Summary

The CALICE collaboration is developing highly granular electromagnetic and hadronic calorimeters for a future high energy electron positron linear collider. We present a conceptual design for a scintillator tile HCAL with SiPM readout. As a first step, a cubic-meter sized physics prototype has been constructed and operated successfully in the CERN SPS test beam; results have been submitted to this conference. In contrast to the test beam HCAL, a realistic calorimeter has to be compact and must have minimal dead zones. The design presented is based on highly integrated, ultra-low power read-out ASICs embedded in the active detector layers with minimized thickness. A scheme for integrating an optical calibration system without light transmission fibers is also proposed. Mechanical, thermal, electronics and DAQ solutions are discussed, and results for component tests are presented.

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