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Development of an integrated readout electronics system for a highly granular scintillator-tungsten calorimeter prototype for the CEPC

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An electromagnetic calorimeter (ECAL) based on scintillator and SiPMs is one of the high-granularity calorimetry options developed within the CALICE collaboration for future lepton colliders, e.g. the Circular Electron Positron Collider (CEPC). A dedicated SiPM-readout electronics system was developed for an ECAL prototype with 6720 scintillator strips individually read out by SiPMs. The complete front-end electronics system with a feature of low power consumption (about 8mW per channel) was successfully integrated into the prototype. Two calibration systems were implemented in the prototype to calibrate the front-end electronics and SiPMs respectively. Besides, a temperature monitoring system with the bias-voltage feedback strategy has been integrated to compensate the SiPM gain variations due to the environment. The talk will cover the design and performance evaluation of the electronics system, as well as highlights of the ECAL prototype long-term commissioning with cosmic muons.

TIPP2020 abstract resubmission?

No, this is an entirely new submission.

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