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The front-end electronics of the Mu2e electromagnetic calorimeter

The main goal of Mu2e experiment at Fermilab is to found a Charged Lepton Flavor Violation (CLFV) in the neutrinoless, coherent conversion of a negative muon into an electron in the Coulomb field of nucleus.The Mu2e electromagnetic calorimeter setup is designed for powerful μ/e particle identification.

The calorimeter will be built from ~1400 CsI scintillation crystals with sizes 3.4x3.4x20cm3. To collect optical signal from crystals, 2 arrays of 6 UV-extended SiPMs with front-end electronics (FEE) are placed at the end of each crystal. The FEE is a multi-layer, double-sided, discrete board directly connected to photosensor. It provides amplification stage and regulation of the SiPMs bias voltage with custom digitally controlled low-dropout regulator (LDO).

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