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Beam Tests of the SiPM-on-Tile front-end for the CMS High Granularity Calorimeter

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For the upcoming high-luminosity LHC, the endcap calorimeters of the CMS experiment will be replaced by the high-granularity calorimeter (HGCAL). HGCAL is a sampling calorimeter using both silicon and scintillator as active materials in different regions depending on the radiation dose. The scintillator-based front-end of HGCAL has been tested in Summer 2024 in a test beam campaign at CERN's north area facility. For the first time, the full pre-series readout chain of HGCAL's scintillator modules has been tested in a particle beam. Initial results demonstrate stable operation in a 3T magnetic field, synchronization of two scintillator tile modules, as well as a good understanding of the relation between trigger and DAQ readout data with properly calibrated modules. As a next step, a stainless steel absorber stack instrumented with eight scintillator tile modules has recently been exposed to electrons with up to 6 GeV at the DESY II test beam facility, with the goal to study the calorimetric and timing performance. This contribution will give an overview of the measurement campaigns in the past year and showcase the quality of the recorded data.

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