

# 11th Beam Telescopes and Test Beams Workshop



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## Testing of Pre-Series Tile Modules at DESY II for the CMS HGCAL Upgrade

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For the HL-LHC phase, the calorimeter endcap of the CMS detector will be upgraded with a High Granularity Calorimeter (HGCAL), a sampling calorimeter that will use silicon sensors as well as scintillator tiles read out by silicon photomultipliers (SiPMs) as active material (SiPM-on-tile). The design of the SiPM-on-tile section was inspired by the CALICE AHCAL. The complete HGCAL will be operated at  $-30^{\circ}\text{C}$ . The basic detector unit in the SiPM-on-tile section is the tile module, consisting of a PCB with one or two HGCROC ASICs, reading out up to 96 SiPM-on-tiles. About 50 tile modules will be produced at DESY and at Fermilab in 2023, in an effort to validate all production and quality control steps, and to construct a small stack as well as two active layer cassette prototypes. Two such tile boards were produced and were tested with electron beams at DESY II. These tile modules contain the latest readout chip (HGCROCv3) and SiPMs with custom made radiation hard packaging produced specifically for the CMS HGCAL. The progress of these beam tests will be presented.

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