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First results on 3D pixel sensors interconnected to RD53A readout chip after high energy proton irradiation

In this presentation results obtained in beam test experiments with 3D columnar pixel sensors interconnected with the RD53A readout chip are reported. RD53A is the first prototype in 65nm technology issued from RD53 collaboration for the future readout chip to be used in the upgraded pixel detectors. The interconnected modules have been tested on hadron beam at CERN before and after irradiation, in the CERN IRRAD facility, to an equivalent fluence of 1E16 neq/cm2 (1MeV equivalent neutrons). All results are obtained in the framework of the CMS R&D activities in view of the pixel detector upgrade for the High Luminosity phase of the LHC at CERN (HL-LHC). The sensors were made in FBK foundry in Trento, Italy, and their development was done in collaboration with INFN (Istituto Nazionale di Fisica Nucleare, Italy). Preliminary analysis of collected data shows hit detection efficiencies around 97% measured after high energy proton irradiation.

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