ID contributo: **427** Tipo: **Poster**

Study of irradiated 3D pixel sensors from CNM

martedì 24 maggio 2022 09:09 (1 minuto)

The High Luminosity upgrade of the Large Hadron Collider will force the experiments to cope with harsh radiation environments. The CMS experiment is considering the option of installing 3D pixel sensors in the innermost layer of its tracking system where a fluence up to 2e16 neq/cm2 is expected. This pixel technology should maintain high detection efficiency and manageable power dissipation at such unprecedented expected fluences. Results from beam test experiments with pixelated 3D sensors fabricated at IMB-CNM and bump-bonded to RD53A readout chips are presented. The irradiation with protons of 400MeV-momentum to fluences of roughly 1.3-2.0e16 neq/cm2, as well as the measurement of these sensors in a test beam have been both performed at Fermilab.

Collaboration

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Classifica Sessioni: Solid State Detectors - Poster session