



Contribution ID: 281

Type: Poster

Test-beam studies of diamond sensors for SLHC

Thursday, 24 May 2012 13:31 (0 minutes)

Diamond sensors are studied as an alternative to silicon sensors to withstand the high radiation doses that are expected in future upgrades of the pixel detectors for the SLHC. Diamond pixel sensors are intrinsically radiation hard and are considered as a possible solution for the innermost tracker layers close to the interaction point where current silicon sensors cannot cope with the harsh radiation environment.

An effort to study possible candidates for the upgrades is undergoing using the Fermilab test-beam facility, FTBF, where diamonds and 3D silicon sensors have been studied. Using a CMS pixel-based telescope built and installed at the FTBF facility we are studying charge collection efficiencies for unirradiated and irradiated devices bump-bonded to the CMS PSI46 pixel readout chip. A description of the test-beam effort and preliminary results on diamond sensors will be presented.

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Session Classification: Solid State Detectors - Poster Session

Track Classification: P5 - Solid State Detectors