

Silicon Detector Technology Development in India for the Participation in International Experiments

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Abstract

A specific research and development program has been carried out in India to develop the technology for 32-strip silicon detectors for application as a preshower detector for CMS experiment at LHC, CERN. The detectors have a geometry of 63mm x 63mm and these detectors incorporate 32 P+strips with width of 1.78 mm with a pitch of 1.9 mm. The fabrication technology to produce silicon detectors with very good uniformity over a large area of $\sim 40\text{cm}^2$, low leakage currents of the order of 10nA/cm² per strip and high breakdown voltage of > 500V has been developed in India using a 4" silicon foundry. The 32-strip silicon detectors have been fabricated using standard silicon technology. The production of detectors is already underway to deliver 1000 detector modules and 90% production is completed. A strict quality control procedure is being used for qualification of detectors during the production. The performance of the silicon strip detectors produced for the CMS preshower is presented. The present status of the detector technology is discussed in view of exploring the feasibility for participation in building the detectors for the future linear collider.

Primary author: Dr TOPKAR, Anita (Bhabha Atomic Research Centre (BARC))

Co-authors: Ms AGGARWAL, Bharti (Bhabha Atomic Research Centre (BARC)); Mr GHODGAONKAR, M D (Bhabha Atomic Research Centre (BARC)); Mr SUGGESETTI, Praveenkumar (Bhabha Atomic Research Centre (BARC)); Dr KATARIA, S K (Bhabha Atomic Research Centre (BARC))

Presenter: Dr TOPKAR, Anita (Bhabha Atomic Research Centre (BARC))

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