



Contribution ID: 143

Type: Talk

Silicon pad array detector development for high energy electromagnetic calorimeter application

Thursday 15 December 2022 15:30 (15 minutes)

Silicon (Si) detectors are commonly used in nuclear and particle physics experiments due to their capability to precisely measure the energy, position, and time of the particles produced during the experiment. There are different types of silicon detectors fabricated (Si pads, Si pixels, Si strips, MAPs type etc.) based on the need of its applications in nuclear, particle and medical physics. The silicon detectors are mainly used in particle tracking and vertex detectors. A sandwich structure of a pad array coupled with high Z material such as tungsten, if arranged in layers, could be used as an electromagnetic calorimeter for measuring the energy and shower profile of high-energy electrons and gamma rays produced in collider experiments. In this context, pad detectors are being fabricated on a 6-inch silicon wafer at Bharat Electronics Limited (BEL), Bangalore. It will be an array of 8 cm x 9 cm, consisting of 72 pad cells each with an active area of 1 cm x 1 cm. During this presentation the design, fabrication, and test results of Si pad detectors will be reported.

Session

Future Experiments and Detector Development

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Session Classification: WG4-Future Experiments and Detector Development