

Pixel Sensor Test Beam and Analysis

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Pixel Detectors in ATLAS are closest to the intense particle interactions at the LHC so that they need to be tolerant to the high radiation dose and provide high precision tracking at high occupancy. The progressive increase in LHC luminosity demands continuous effort to retain the performance of the pixel detectors and building upgrade pixel detectors with more advanced technology in order to meet the challenge. A key experimental tool for this endeavor is with test beams where sensors are placed in well controlled environment to enable studies of specific characteristics of the pixel sensors with the aid of precision beam telescope. The SLAC End Station A test Beam (ESTB) is a recently revived facility with 5-13 GeV electrons, which is of sufficient high momentum to allow high resolution tests. A major ATLAS silicon tracking test beam campaign is scheduled for the first half of May/2014 at SLAC ESTB, and with several subsequent follow up test runs expected in the months to follow. Variety of sensors of different designs and some are after significant radiation doses are expected to participate in these test beams runs to enable studies of radiation hardness of sensors and general performance of upgrade designs etc. The participating student is expected to take part in subsequent followup test beam data taking and the data analyses to assess sensor performance from the test beam data.

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