

Analysis of Planar and 3D Pixel Sensors Testbeam Data

Due to high occupancy and large radiation dose, the performance of the inner-most layer of the Pixel Detector is expected to degrade with the integrated luminosity. ATLAS will install a new pixel layer in 2013, the Insertable B Layer (IBL). The IBL will be mounted onto a new, smaller radius, beam pipe. It will be equipped with two different pixel sensor technologies: classical planar and newly developed 3D sensors.

The sensors went in 2011 through a qualification process involving several irradiation campaigns and beam tests. Another beam test is being done at CERN using 180 GeV pion beam. The project will involve working on the analysis of the testbeam data, in particular measuring the hit efficiency (ability to detect a track passing through the sensor) of the sensors for various beam incident angles. The hit efficiency is a key parameter of pixel sensors. More specific work will involve running the offline analysis code, tune cuts, correct for possible mis-alignment of the sensors, and plot meaningful quantities with ROOT.