

Overview of the ATLAS Insertable B-Layer (IBL) Project

Monday 3 September 2012 11:20 (30 minutes)

The upgrades for the ATLAS Pixel Detector will be staged in preparation for high luminosity LHC. The first upgrade for the Pixel Detector is the construction of a new pixel layer which will be installed during the first shutdown of the LHC machine, in 2013-14. The new detector, called the Insertable B-layer (IBL), will be installed between the existing Pixel Detector and a new, smaller radius beam-pipe at a radius of 3.3 cm. The IBL has required the development of several new technologies to cope with increased radiation and pixel occupancy and also to improve the physics performance through reduction of the pixel size and a more stringent material budget. The IBL presents several changes to the design of the present hybrid pixel system: two different and promising silicon sensor technologies, planar n-in-n and 3D, will be used for the IBL. A new read-out chip FE-I4 has been designed in 130 nm technology, the material budget is minimized by using new lightweight mechanical support materials and a CO₂ based cooling system has been developed. An overview of the IBL project, of the module design and the qualification for these sensor technologies with particular emphasis on irradiation and beam tests will be presented.

Author: ROHNE, Ole (University of Oslo (NO))

Presenter: ROHNE, Ole (University of Oslo (NO))

Session Classification: Session1

Track Classification: Particle physics applications - High Energy Physics