

ATLAS IBL: a challenging first step for ATLAS Upgrade at the sLHC

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With the LHC collecting data at 7 TeV, plans are already advancing for a series of upgrades leading eventually to about five times the LHC design luminosity some 10 years from now in the high luminosity LHC (HI-LHC) project. The upgrades for the ATLAS detector will be staged in preparation for HI-LHC. The first upgrade for the pixel detector will be the construction of a new pixel layer which will be installed during the first shutdown of the LHC machine foreseen 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 3.2 cm. The IBL will require 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. Two different and promising silicon sensor technologies, planar n-in-n and 3D, are currently under investigation for the IBL. An overview of the IBL module design and the qualification for these sensor technologies with particular emphasis on irradiation and beam tests will be presented. This talk will also summarize the improvements expected to the ATLAS detector at the HI-LHC.

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