

Measurement of Single Event Upset rates in single pixels of ATLAS IBL

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Techniques have been developed to determine the single upset rates in individual pixels in the innermost layer of the ATLAS pixel detector, called IBL. Single pixel SEU cannot be observed directly through error reporting of the pixels as there is no such function, nor is there real time monitoring of configuration during operation. Through analysis of cluster data from physics running and time-over-threshold value distributions the upset rates of individual bits have been extracted and compared to expectation from early beam tests of individual devices. The upset rate is large enough to impact precision measurements, such as luminosity determination from cluster rates, which has a 1% target precision. Corrections for SEU must be developed in order to make such measurements.

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