

Studies of Beam Loss Effect on Silicon Strip Modules in ATLAS Detector

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We are investigating the effects that LHC beam loss would have on silicon strip modules in ATLAS detector. The beam loss would cause a large flux of charged particles to go through modules, on the order of 10^7 MIP per strip. There are several areas of concern regarding vulnerability of sensors and readout ASICs to the large charges. We will report on three studies tailored to different key components: a) study of punch-through structures designed to protect sensors, where the large particle flux was modeled with a laser pulse, b) study of ASIC susceptibility to the large charge pulses, c) SPICE modeling of the electric circuit including the relevant sensor and ASIC elements, as well as cables and power supplies. We will present conclusions regarding the module vulnerability to different beam loss scenarios.

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