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Development of a MAPS Upstream Tracker for the LHCb Upgrade II

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The Upstream Tracker (UT) is a crucial component in the LHCb tracking system. The UT, currently being integrated in the LHCb Upgrade I detector, is a silicon microstrip detector that speeds up track reconstruction, reduces the rate of ghost tracks, and optimizes LHCb capabilities of reconstructing long-lived particles. LHCb is planning another major upgrade to be installed during Long-Shutdown 4 to fully exploit the potential of HL-LHC. This upgrade aims at increasing the peak luminosity by a factor of 7.5. This implies the need to cope with higher event pile-ups and occupancy beyond the ones envisaged for the current UT. In addition, the pattern recognition challenges are more severe, and the detector needs to withstand higher radiation fluences. A MAPS-based Upstream Tracker has been proposed for Upgrade II to meet these challenging specifications. The design of the UT for Upgrade II will be presented. In particular, we will discuss the sensor technology options, and the simulation work undertaken to optimize the design.

Collaboration

LHCb

Role of Submitter

The presenter will be selected later by the Collaboration

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