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## **The Silicon Micro-strip Upstream Tracker for the LHCb Upgrade**

*Monday 8 August 2016 18:30 (2 hours)*

A comprehensive upgrade of the LHCb detector is foreseen for Long Shutdown 2 of the LHC.

As part of the upgrade, the existing TT tracking station in front of the LHCb dipole magnet will be replaced by a new silicon micro-strip detector, the Upstream Tracker (UT).

Similar to the TT, the UT will consist of four planar detection layers covering the full acceptance of the experiment. In total, the detector will use about 1000 silicon sensors. Most of these sensors will have 10 cm long readout strips with a pitch of  $180\mu\text{m}$ , a total width of 10 cm, and are foreseen to be produced in p-in-n technology. Sensors for the region of highest particle density in the centre of each detection layers will be produced in n-in-p technology and will have strips with a pitch of  $90\mu\text{m}$  and a length of 10 cm or 5 cm. Measurements on unirradiated and irradiated prototypes at test beams and in laboratory setups will be discussed.

A new radiation-hard front end readout chip for the UT is being developed in  $0.13\mu\text{m}$  TSCM technology. It will incorporate 128 input channels with pre-amplifier, shaper and 6-bit ADC, will perform pedestal and common-mode subtraction, cluster finding and zero-suppression as well as data serialization. Measurements on an eight-channel prototype chip are ongoing and first results from these tests will be shown.

**Presenter:** ARTUSO, Marina (Syracuse University (US))

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