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The Timepix3 Telescope and LHCb Upgrade R&D measurements

The upgrade of the LHCb experiment will operate at an instantaneous luminosity of 2x10ˆ33 cmˆ-2 sˆ-1 with a fully software based trigger, allowing to read out the detector at a rate of 40MHz. The tracking system will be redesigned: the vertex locator (VELO) will be replaced by a pixel-based detector, upstream of the magnet, a silicon mico-strip detector with a high granularity and an improved acceptance coverage, called the Upstream Tracker (UT), will replace the presently installed silicon strip tracker. The tracking system downstream of the magnet will be replaced by the Scintillating Fibre tracker (SciFi), which will consist of scintillating fibres read out by silicon photo-multipliers. We will present the ongoing work on vertex pixel detector and cover sensor technology, readout chip and a novel micro-channel cooling system, designed especially for the upgraded Velo.

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