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Demonstrators of the ATLAS HGTD

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The high-luminosity (HL) phase of the Large Hadron Collider (LHC) will start in 2029 and will be able to deliver an integrated luminosity up to 4000 fb-1 A direct consequence of this update will be to deal with high event rate i.e within the same bunch crossing, an average of 200 proton-proton collisions is estimated (against 50 in Run3) with 1.44 vertices/mm. Distinguishing between collisions occurring very close in space but separated in time will be one of the biggest challenges.

In order to improve the performance of the ATLAS detector in the forward region, the High Granularity Timing Detector (HGTD) is being constructed. Located between the tracker (ITk) and the end-cap calorimeters, it will provide a time resolution of 30ps (50ps) per track at the beginning (end) of the HL-LHC.

During the R&D phase, a set of intermediate prototypes are constructed which will, later, be regrouped into a realistic demonstrator in order to validate some aspects of the integration. In this talk, the current demonstrators will be shown : one investigates the mechanics and cooling aspects while the second one focuses on the electronics and data acquisition (DAQ) aspects.

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