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The design and layout of the Phase-II upgrade of the Inner tracker of the ATLAS experiment

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In the high luminosity era of the Large Hadron Collider (HL-LHC), the instantaneous luminosity is expected to reach unprecedented values, resulting in about 200 proton-proton interactions in a typical bunch crossing. To cope with the resultant increase in occupancy, bandwidth and radiation damage, the ATLAS Inner Detector will be replaced by an all-silicon system, the Inner Tracker (ITk), aiming to provide tracking coverage up to $|\eta|<4$. The Technical Design Reports (TDR) for the strip and pixel subsystems were published in 2017 and 2018 respectively. Since their publication, the ITk design has undergone further refinement, in particular for the pixel subsystem, addressing the then-pending design choices in several areas and accommodating updated engineering requirements. In addition, the simulation model of the detector has become more realistic, leading to updated estimates of the material budget. In this presentation an overview of the updated layout is presented and the resultant expected tracking performance discussed.

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