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Towards improved measurements with the upgrade of the ALICE Inner Tracking System in LS3

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During the second LHC shutdown (LS2) the Inner Tracking System (ITS) of ALICE will be upgraded by replacing the current ITS with seven layers of CMOS Monolithic Active Pixel Sensors (MAPS). However, the latest innovations in the silicon imaging technology allow for the construction of large, ultra thin silicon wafers which can further improve the capabilities of the ALICE tracker. A proposal for a further upgrade of the ALICE ITS, regarding the construction of a novel vertex detector, is under consideration. The installation of the new ITS, ITS3, is planned for the third LHC shutdown (LS3) during which the three innermost layers of ITS2 will be replaced by three cylindrical layers of large curved CMOS wafers. The next ITS upgrade (ITS3) will improve further the impact parameter resolution and the tracking efficiency of low momentum particles. The innermost ITS layer will be positioned closer to the interaction point and the material budget will be reduced down to $0.05\% X_0$ per layer.

Monte Carlo simulations of a simplified ITS3 geometry within the ITS2 design indicate an improvement in the impact parameter resolution and the tracking efficiency. Based on these MC simulations the significance of measuring the Λ_b particle with the ITS3 was calculated and compared to the value obtained for the ITS2. This contribution will focus on the analysis results of the Λ_b measurement, which reflect the substantially improved performance of the next ALICE tracker.

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