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Performance for the reconstruction of B mesons with the ALICE inner tracker upgrade

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The installation of an upgraded Inner Tracking System (ITS) in the ALICE central barrel is planned during the second long shutdown of the LHC in 2019. The design of the new ITS presents 7 layers of silicon pixel detectors, starting from a radius of 2.24 cm from the beam line. The single hit resolution will be of about 4 μm and the material thickness will be as low as 0.3% of the radiation length for the three innermost layers. The readout rate capability of the ALICE central barrel of up to 50 kHz in Pb-Pb collisions will allow new and unique measurements in the heavy-quark sector. In this poster we focus on the performance of full kinematic reconstruction in the channel $B^+ \rightarrow \bar{D}^0 \pi^+$, and $\bar{D}^0 \rightarrow K^+ \pi^-$ with branching ratios of 0.5% and 3.9% respectively. The study was based on a detailed simulation of the new inner tracker and of the ALICE apparatus with Pb-Pb collisions at $\sqrt{s_{NN}} = 5.5$ TeV. An outlook on the feasibility as well as an estimate on the physics performance will be presented.

On behalf of collaboration:

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