

Charm and beauty production with the future upgraded Inner Tracking System for ALICE at the LHC

Wednesday, 12 October 2016 16:00 (15)

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The capabilities of detector ALICE detector (A Large Ion Collider Experiment) at the LHC, as expected after the upgrade of the Inner Tracking System (ITS), are reported. The physics motivation of new studies of open charm and beauty measurements of rare processes with charmed and beauty baryons in ALICE, accessible for the first time in heavy-ion collisions at the LHC, are discussed. The relevant requirements to the upgraded ITS and the corresponding design and construction challenges are presented. One of the most unique features is the extremely low material budget of the upgraded ALICE ITS (about 0.3% X/X_0 for 3 innermost layers). Charged particles will be reconstructed starting from a p_T of 50 MeV/c and charm and beauty mesons will be measured down to zero p_T . The currently implemented technical and detector solutions for the upgraded ITS will be also presented. They will provide both the increase of rate of ALICE data taking in Pb–Pb collisions from 1 kHz to 50 kHz and the general improvement of the impact parameter resolution by a factor of 3.

Acknowledgements. This work was supported for the SPbSU participants within the Program of Russian groups activities in the ALICE upgrade by the Ministry of Education and Science of Russian Federation, contract No14.610.21.0003, identification number RFMEFI61014X0003 (SPbSU identification number No. 11.19.1632.2014).

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Session Classification : Methods of experimental physics - parallel III

Track Classification : Methods of experimental physics