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## The ALICE Inner Tracking System Upgrade

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The major long-term goal of the ALICE experiment at the LHC is to provide precision measurements of the properties of the Quark-Gluon Plasma, the state of deconfined matter produced in high-energy heavy-ion collisions. Experiments towards the characterisation of strongly interacting matter at high density will need to focus on rare probes and the study of their collective properties and hadronization, particularly at soft momentum scales. Such considerations have motivated the development of a comprehensive upgrade strategy for ALICE to provide high rate capability (50 kHz for Pb-Pb collisions) in a near minimum bias mode by building a new Inner Tracking System and by modifying all major ALICE detectors to provide a fully pipelined read-out. This implies also a major upgrade of the data acquisition and high level trigger system. Further details of the overall ALICE upgrade strategy are described in [1]. This contribution will describe the proposed approach to upgrading the Inner Tracking System (ITS) in order to both comply with the new requirements set by the ALICE global upgrade strategy and to dramatically improve the performance for heavy-flavour detection. The ITS Upgrade will have greatly improved features in terms of: determination of the distance of closest approach (dca) to the primary vertex, standalone tracking efficiency at low pt, momentum resolution and readout capabilities. These improvements are possible as a consequence of the spectacular progress made in the field of imaging sensors over the last ten years as well as the possibility to install a smaller radius beam pipe. Moreover a tracker with the above features, in particular a high standalone tracking efficiency, creates an opportunity to perform, in combination with the TRD and TOF detectors, online event selection on the basis of topological and PID criteria. Such a new silicon tracker will allow ALICE to measure charm and beauty production in Pb-Pb collisions with sufficient statistical accuracy down to very low transverse momentum, measure charm baryons and perform exclusive measurements of beauty production. A comprehensive description of the ITS Upgrade can be found in the recent Conceptual Design Report [2].

[1] Upgrade Strategy for ALICE at High Rate, CERN-LHCC-2012-04.

[2] Conceptual Design Report for the Upgrade of the ALICE ITS, CERN-LHCC-2012-05.

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