



XXIV QUARK MATTER DARMSTADT 2014

Contribution ID: 172

Type: **Contributed Talk**

The upgrade of the ALICE Inner Tracking System

Wednesday 21 May 2014 12:10 (20 minutes)

The long term plan of ALICE (A Large Ion Collider Experiment) is a detailed investigation and characterization of the Quark-Gluon Plasma (QGP) in order to fully exploit the scientific potential of the LHC with heavy ions at high luminosity after the Long Shutdown 2 (LS2) scheduled in 2018-2019. The study will focus on high precision measurements of rare probes over a wide range of momenta, which would require high statistics and are not satisfactory or even possible with the present experimental set up. To improve its physics capabilities, ALICE has formulated an upgrade strategy of several detectors to be installed during LS2 under the assumption that the LHC will progressively increase its luminosity with Pb beams eventually reaching an interaction rate of about 50 kHz. Within this upgrade strategy, the Inner Tracking System (ITS) upgrade forms an important cornerstone, providing precise measurements for heavy-flavour interactions with the QGP medium and for the production of thermal photons and low-mass dileptons by highly improved tracking and vertexing capabilities. These new measurements would provide an insight to the study of, in particular, the thermalization of heavy quarks in the QGP and the in-medium energy loss, and to assess the initial temperature and degrees of freedom of the system, respectively. The new ITS has a barrel geometry consisting of seven layers of Monolithic Active Pixel Sensors (MAPS) with high granularity, which would fulfil the material budget, readout and radiation hardness requirements for the upgrade. The layout and the properties of the new ITS are optimized for high tracking efficiency, both standalone and in combination with the outer Time Projection Chamber (TPC). In this contribution, the performance of the new ITS will be presented and compared to the current setup. An overview of the technical developments for the detector elements and of the construction procedures will also be presented.

On behalf of collaboration:

ALICE

Author: SIDDHANTA, Sabyasachi (Universita e INFN (IT))

Presenter: SIDDHANTA, Sabyasachi (Universita e INFN (IT))

Session Classification: Future experimental facilities, upgrades, and instrumentation

Track Classification: Future Experimental Facilities, Upgrades, and Instrumentation