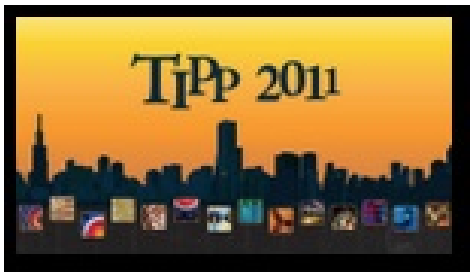

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Calibration, operation and performance of the ALICE Silicon Drift Detectors in pp and PbPb collisions

Saturday 11 June 2011 09:10 (20 minutes)

The two intermediate layers of the ALICE Inner Tracking System (ITS) are instrumented with Silicon Drift Detectors.
The detector calibration and monitoring procedures as well as their performance over almost two years of data taking, both with pp
and PbPb collisions, will be presented.
In particular, the techniques for measuring the drift velocity and its stability over time will be described. The latter, which varies sensitively with the ambient temperature, has to be periodically calibrated with an accuracy in the order of 0.1%, in order to allow the position along the drift axis (perpendicular to the beam) to be determined within the design resolution of about 35 microns.
Owing to their superior resolution (˜35 micron) the SDD were used as a reference for ITS detectors alignment along beam direction. The ITS alignment strategy and the results obtained with different sets of data will be shown.
The ITS features also particle identification in the low transverse momentum region (up to 500 MeV for p/K separation and up to 1.2 Gev/c for p/K separation), by measuring the energy loss in the outermost four layers, SDD and Silicon Strip Detectors (SSD). The calibration of the energy loss within each and among all the 260 modules, together with its dependence on the drift distance, were carefully studied. Dedicated Quality Assurance (QA) procedures analyze all acquired physics data and generate a set of plots that allows verifying the uniformity and stability of the SDD key parameters. Data sets tagged as bad by the QA procedures will be excluded from the subsequent physics analysis. The QA procedures guarantee the data quality uniformity, excluding data sets tagged as bad from the following analyses.
The contribution of the SDD to physics analyses which require high resolution on vertex reconstruction and particle identification at low transverse momenta will also be discussed, showing as examples the analysis of identified hadron spectra and the exclusive reconstruction of heavy flavoured hadrons via hadronic decays.

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