Contribution ID : **666** Type : **Oral presentation**

The STAR Heavy Flavor Tracker (HFT)

Saturday, 5 July 2014 15:20 (20)

The heavy quark hadrons are suggested as a clean probe for studying the early dynamic evolution of the dense and hot medium created in high-energy nuclear collisions.
The Heavy Flavor Tracker (HFT) of the STAR experiment, designed to improve the vertex resolution and extend the measurement capabilities in the heavy flavor domain, was installed for the 2014 heavy ion run of RHIC.
It is composed of three different silicon detectors arranged in four concentric cylinders close to the STAR interaction point. The two innermost layers are based on CMOS monolithic active pixels (MAPS), featured for the first time in a collider experiment, and the two outer layers are based on pads and strips.
The two innermost HFT layers are placed at a radius of 2.7 and 8 cm from the beam line and accommodate 400 ultra-thin (50 um) high resolution MAPS sensors arranged in 10-sensor ladders to cover a total silicon area of 0.16 m2. Each sensor includes a pixel array of 928 rows and 960 columns with a 20.7 μm pixel pitch, providing a sensitive area of ~ 3.8 cm2. The sensor features 185.6 μs readout time and 170 mW/cm2 power dissipation.
The detector is air-cooled, allowing a global material budget of 0.50% radiation length per layer. A novel mechanical approach to detector insertion enables effective installation and integration of the pixel layers within an 8 hour shift during the on-going STAR Run.
After a detailed description of the design specifications and the technology implementation, the detector status and operations during the current 200 GeV Au+Au run will be presented in this talk, with a particular focus on calibration and general system operations aimed at stabilizing the running conditions.
A preliminary estimation of the detector performance meeting the design requirements will be reported.

Summary

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Session Classification : Detector RD and Performance

Track Classification : Detector RD and Performance