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Heavy quark measurements and the new Silicon Tracker (HFT) in STAR experiment at RHIC

The HFT is a new central silicon upgrade for the STAR experiment at RHIC. It is replacing the decommissioned silicon drift detector with active pixel technology in order to achieve about an order of magnitude better track pointing (DCA) resolution. This will allow for a direct and full topological reconstruction of charmed meson decays (e.g.\ D^0 etc.)
and a better determination of B - meson spectra. Key measurements are D^0 elliptic flow determination, especially in the lower transverse momenta (p_T) region and detailed identified heavy quark suppression studies at high p_T (R_{CP}/R_{AA}).

Summary

Due to their large masses, heavy flavor (c and b) quarks are produced in the early stages of heavy ion collisions where the full initial energy is available for particle production.
Radiative energy loss in dense partonic matter is thought to be inversely proportional to the quark mass. Early measurements of heavy flavor energy loss at RHIC using the decay-electron spectra of D and B mesons showed a suppression similar to that of light quarks.
This puzzling result lead theorists to re-speculate the cause of this effect. Experimentally it is difficult to separate the charm and bottom contributions in the electron spectra.
The two major experiments at RHIC, PHENIX and STAR both decided to upgrade their silicon vertex detectors in order to be able to improve their measuring capabilities.
The STAR approach and goal is to obtain
a precise measurement of heavy flavor production by identifying the decay of charmed mesons using direct topological reconstruction and thus disentangling the c and b contributions.
In this talk we will present a brief report on the current status of measurements and future prospects.

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