APR05-2005-020033

Abstract for an Invited Paper
for the APR05 Meeting of
the American Physical Society

Heavy Flavor Production at RHIC

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The measurement of charm and beauty production in relativistic heavy ion collisions is both an extreme experimental challenge and rich with physics information. While charmonium production was measured in great detail at the CERN-SPS, the level and dynamics of charm production itself remained unknown. For the first time, the high center-of-mass energy provided by the Relativistic Heavy-Ion Collider (RHIC) at BNL moves the study of heavy quark production in heavy ion collisions into the realm of possibility. The study of heavy flavor production in conjunction with the measurement of charmonia allows us to infer information about the conditions (temperature, density, pressure) in the early phase. Final state effects, such as charmonium suppression, heavy quark energy loss in the medium and initial state effects such as shadowing can be studied by comparison of their yields and spectra in pp, pA and AA collisions. At RHIC quarkonia and open charm production can be measured in various way: open charm and beauty through the measurement of single lepton spectra, the direct measurement of charm mesons (D) through their hadronic decay channels, and hidden charm and beauty through the study of charmonium and bottonium via their decay into dimuons and dielectrons. In this talk I will summarize the current status of heavy flavor measurements at RHIC. Although these studies are just starting they already hint at exciting and novel physics.