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Dileptons in d+Au Collisions at sqrt(s)=200 GeV measured by PHENIX and its implications on heavy flavor

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The dielectron mass spectrum is a unique probe to directly access the different stages of a heavy-ion collision. The low mass region (m_ee < 1 GeV/c^2) reflects the Quark Gluon Plasma (QGP) temperature and thermalization phase, while the low vector meson resonances probe chiral symmetry restoration. The intermediate (1< m_ee<3 GeV/c^2) and high (4<m_ee<8 GeV/c^2) mass regions are dominated by semi-leptonic decays of open charm and beauty respectively and so provide information about the heavy flavor dynamics.

The PHENIX experiment at RHIC has studied the dielectron mass spectrum in different collision systems, ranging from p+p to d+Au to Cu+Cu to Au+Au at sqrt(s) = 200 GeV. While the mass spectrum in p+p collisions is well understood in terms of expectations from various sources and serves as a baseline for other collision systems, the low mass excess seen in the Au+Au mass spectrum is still a challenge to theory. The d+Au data thus serves as a control experiment to isolate any cold nuclear matter effects coming from the intial state of the collision.

PHENIX collected a large data set of d+Au collisons in 2008, reaching to high mass (m_ee< 14 GeV/c^2) and high transverse momentum (p_T< 8 GeV/c). The large range in mass and p_T covers the phase space dominated by heavy flavor and so can be used to test next-to-leading order pQCD calculations for such processes. This talk will summarize the d+Au dielectron mass spectrum studied as a function of p_T and centrality. We will also show the charm and
beauty cross-section extracted using several models, utilizing a
double differential fit in mass and p_T.

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