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Characterizing cold nuclear matter effects through dielectrons in d+Au collisions at √NN = 200 GeV at PHENIX

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Electron-positron pairs are effective probes for investigating the hot, dense matter created in RHIC collisions because they are carry no color charge and therefore, once created, do not interact strongly with the medium. As a result, they retain characteristics of the full time evolution and dynamics of the system. Among the many features, the low mass region (m<1 GeV/c2) consists primarily of pairs from Dalitz decays of light hadrons and direct decays of vector mesons that can be modified by the medium, while the intermediate (1<m<3 GeV/c2) and high (4<m<8 GeV/c2) mass regions are dominated by pairs from mesons containing charm and bottom respectively.

The PHENIX experiment has presented dielectron continuum spectra for p+p, Cu+Cu and Au+Au collisions at √sNN=200GeV. An enhancement is observed in Au+Au in the mass range 150<m<750 MeV/c2 when compared to the expected hadronic sources scaled from p+p collisions. In addition, PHENIX has seen an enhancement in Cu+Cu collisions in the intermediate mass region, particularly in the most peripheral collisions, making the d+Au reference extremely interesting.

Recently PHENIX measured this crucial d+Au reference for heavy ion collisions. This system not only provides the benefit of identifying potential initial state effects contributing to the excesses seen in Au+Au and Cu+Cu but also is a complimentary measurement to the recent single electron RdA for open charm. The luminosity collected during the 2008 RHIC Run also allows the d+Au measurement to reach out to mass ranges where bottom and Drell-Yan dominate. The analysis of this data is in its final stage and the first results will be presented.

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