QUARK MATTER 2015
Sep. 27 – Oct. 3, 2015 Kobe, Japan

Contribution ID: **290** Type: **Contributed talk**

System-size and energy dependences of dielectron excess invariant-mass spectra at STAR

Wednesday, 30 September 2015 11:10 (20 minutes)

Dilepton measurements play an essential role in the study of hot and dense nuclear matter, created in heavy-ion collisions. Dileptons are produced in the whole evolution of the system and escape with minimum interaction with the strongly interacting medium. Thus, they provide information about the various stages of the system during the evolution. In the low mass region ($M_{ee} < 1.1\ GeV/c^2$), they retain information about the in-medium modifications of vector mesons which are considered as a link to chiral symmetry restoration. Recently, it is found in a model calculation that the charged particle multiplicity normalized dilepton excess yield in the low mass region is proportional to the lifetime of the hot, dense medium created in heavy-ion collisions at $\sqrt{s_{NN}}$ = 6-200 GeV [1]. The energy density created in U+U collisions at $\sqrt{s_{NN}}$ = 193 GeV is expected to be higher by about 20% and the medium created might have a longer lifetime compared with the Au+Au collisions at $\sqrt{s_{NN}}$ = 200 GeV. Thus it would be interesting to compare the normalized dielectron excess yields in U+U and Au+Au collisions.

In this talk, we will present the invariant mass, transverse momentum, and centrality dependent measurements of dielectron production in U+U collisions at $\sqrt{s_{NN}}$ = 193 GeV. With the acceptance correction applied, we will report the invariant dielectron excess mass spectra in U+U collisions at $\sqrt{s_{NN}}$ = 193 GeV and in Au+Au at $\sqrt{s_{NN}}$ = 27, 39, and 62.4 GeV. Comparisons with the NA60 results and the STAR measurements in Au+Au collisions at $\sqrt{s_{NN}}$= 19.6 and 200 GeV will be shown. System-size and energy dependences of low mass excess yield will be discussed together with model comparisons.

[1] R. Rapp and H. van Hees, arXiv: 1411.4612.

On behalf of collaboration:

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Session Classification: Electromagnetic Probes II

Track Classification: Electromagnetic Probes