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Dielectron Production in Au+Au-Collisions at $\sqrt{s_{NN}} = 39 \ \& \ 62.4 \text{ GeV}$ at STAR

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In the years 2010/11, the Solenoidal Tracker At RHIC (STAR) conducted a Beam Energy Scan (BES) over a wide range of center-of-mass energies with the purpose of studying the properties of the Quark-Gluon-Plasma (QGP) as well as searching for the onset of deconfinement and the critical point of the QCD phase diagram. The installation of the Barrel Time-Of-Flight-Detector (TOF) has enabled STAR to identify electrons over a wide momentum range. Combined with its large acceptance, excellent PID, and a low material budget in the runs of 2010/11, STAR now provides unique capabilities for the study of dielectron production in heavy ion collisions.

Due to their negligible strong interaction with the dense medium created at RHIC, leptons can escape the interaction region undistorted and thus, carry direct information about the space-time evolution of the fireball created in relativistic heavy-ion collisions. In the special case of dileptons, their invariant mass (m_{ee}) serves as an additional observable: For the BES energies, later dielectron creation times are accessible in the Low-Mass-Region (LMR, $m_{ee} < 1.1 \text{ GeV}/c^2$) where the in-medium vector meson properties and its implications on the dielectron yield can be measured. Earlier creation times, on the other hand, can be studied in the Intermediate-Mass-Region (IMR, $1.1 < m_{ee} < 3 \text{ GeV}/c^2$) in which the continuum yield allows a direct measure of the effective QGP temperature. In this regard, the dependence of these observables on the collision energy is of special interest. These aspects, in particular, make dielectrons favorable as a clean penetration probe for the bulk.

The poster will present dielectron invariant mass spectra from Au+Au collisions at $\sqrt{s_{NN}}$ of 39 & 62.4 GeV and its comparisons to cocktail simulations of known hadron sources. In addition, the energy dependencies of low mass dielectron production, as well as the slope parameters of p_T distributions from IMR dielectrons will be discussed.

Primary author: Mr HUCK, Patrick (CCNU/LBNL)

Presenter: Mr HUCK, Patrick (CCNU/LBNL)

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