Measurements of dielectron production in Au+Au collisions at $\sqrt{s_{\rm NN}} = 27$ and 54.4 GeV with the STAR experiment

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for the STAR Collaboration

Dielectron production is suggested as an excellent probe of the hot and dense medium created in relativistic heavy-ion collisions due to their minimal interactions with the partonic and hadronic medium. They can carry the information from the initial to the final stage of a collision. The study of the dielectron mass spectrum could help to disentangle various contributions. In the low mass region (LMR, $M_{ee} < M_{\phi}$), the mass spectra of vector mesons are modified due to their interaction with the medium which could provide an access to the chiral symmetry restoration. In the intermediate mass region (IMR, $M_{\phi} < M_{ee} < M_{J/\Psi}$), dielectrons from thermal radiation are predicted as a QGP thermometer, meanwhile the contributions from heavy quark semi-leptonic decays make the extraction of the thermal radiation contribution very challenging.

In this talk, we will present the latest dielectron spectra in Au+Au collisions at $\sqrt{s_{\rm NN}} = 27$ and 54.4 GeV with the STAR experiment. The 1.5 B (1.3 B) minimum-bias events of Au+Au collisions at $\sqrt{s_{\rm NN}} = 27$ (54.4) GeV taken in 2018 (2017) significantly enhance the precision of the in-medium ρ modification measurement compared to the STAR BES-I results. Lower heavy quark semi-leptonic decay contributions compared to those at top RHIC energies and the large data samples may allow the first extraction of the medium temperature with IMR dielectrons at RHIC. The physics implications of these measurements will be discussed and put into context of previous results.