Contribution ID: **90** Type: **Oral presentation**

Thermal dielectron measurements in Au+Au collisions at BES-II energies with the STAR experiment

Tuesday 24 September 2024 11:30 (20 minutes)

Dielectrons, emitted during the evolution of the hot and dense QCD medium created in relativistic heavy-ion collisions, offer an effective probe of the hot medium properties, as they do not involve strong interactions. The dielectron emission rate is proportional to the medium's electromagnetic spectral function. In the dielectron mass range from 400 to 800 MeV/c^2, the spectral function probes the in-medium ρ meson propagator which is sensitive to the medium's properties including the total baryon density and the temperature. By measuring thermal dielectron production, we can study the microscopic interactions between the electromagnetic current and the medium. The RHIC Beam Energy Scan (BES) program provides a unique opportunity to systematically study dielectron production in a collision energy range where the total baryon density and temperatures are varying substantially.

In this talk, we will report on STAR measurements of thermal dielectron produced in Au+Au collisions at $\sqrt{s_{\rm NN}}$ = 7.7, 9.2, 11.5, 14.6 and 19.6 GeV. The results will include the thermal dielectron spectra, differential/total excess yield, and the temperature extracted from the low invariant mass range, as well as their collision energy dependence. In addition, these new preliminary results will be compared to the results from STAR BES-I and theoretical model calculations for the discussions of the physics implications.

Category

Experiment

Collaboration

STAR

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Session Classification: Parallel 16: Thermal EM

Track Classification: 4. Electromagnetic and electroweak probes