Dielectron Measurements from the STAR BES-II Program: Status and Future Opportunities

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Dileptons are excellent probes of the hot and dense QCD matter created in relativistic heavy-ion collisions because of their negligible interactions with the medium. Dileptons are emitted from the early to final stages of the collision. Among these, thermal dileptons from the hot QCD medium are of particular interest. In the intermediate-mass range (IMR, $M_\phi < M_{ll} < M_{J/\Psi}$), thermal dileptons can reveal the temperature of the deconfined QCD matter (Quark-Gluon Plasma); in the low mass range (LMR, $M_{ll} < M_\phi$), the in-medium ρ meson spectra can probe the temperature of the QCD matter at hadronic phase and the effects of chiral symmetry restoration. Additionally, measurements in the very low mass range could provide access to direct virtual photons.

Large datasets of Au+Au collisions at center-of-mass energies between 3-19.6 GeV have been recorded by the STAR experiment in the Beam Energy Scan Phase-II (BES-II) program. Improved detector capabilities will not only benefit the LMR & IMR measurements, but also provide a very first opportunity to seek other physics measurements such as medium electrical conductivity. In this talk, we will discuss the current status and prospects of the dielectron analysis using BES-II datasets..