Dielectron Production in Au+Au Collisions at $\sqrt{s_{\rm NN}} = 27$ GeV with the STAR Experiment

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Dielectron production is suggested as an excellent probe of the hot, dense and strongly interacting medium (QGP) created in relativistic heavy-ion collisions due to their minimal interactions with the medium and the final state hadrons. Dielectrons can be produced at different evolution stages of the collision system. Different invariant mass ranges are sensitive to different physics processes. In the low mass region ($M_{ee} < M_{\phi}$), dielectron production is sensitive to the in-medium modifications of vector mesons which could provide an access to the chiral symmetry restoration. In the intermediate mass region ($M_{\phi} < M_{ee} < M_{J/\psi}$), the dielectron production from the medium thermal radiation is sensitive to the medium temperature, thus can serve as a thermometer of the medium. However, the dominant source in this mass region, semi-leptonic decays of open heavy flavor hadrons, makes the extraction of the thermal radiation contribution very challenging.

In this talk, we will present the results ($y^{ee} < 1$, $0 < p_T^{ee} < 5$ GeV/c) from the 1.5×10^9 minimum-bias events taken in 2018 Au+Au collisions at $\sqrt{s_{\rm NN}} =$ 27 GeV. This data sample is more than 10 times larger than that from the STAR Beam Energy Scan phase I program and allows a much more precise measurement of the in-medium modification of ρ mesons. The much lower open charm production rate at this energy compared to RHIC top energies greatly reduces their contributions to the dielectron spectrum at the intermediate mass region, providing a better opportunity to extract the medium temperature. The results will be compared to the measurements from other collision energies and the theoretical model calculations.