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Temperature measurement via thermal dileptons in Au+Au collisions at 27 and 54.4 GeV with the STAR experiment

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Due to the minimal interactions with the medium constituents, thermal dileptons emitted throughout the medium evolution are suggested as excellent probe of the hot QCD medium created in relativistic heavy-ion collisions. The invariant mass distribution of thermal dileptons can reveal the temperature of their emitting source without suffering from the blue-shift effect. By analyzing the invariant mass distributions of thermal dileptons in the in-medium ρ meson dominant region and the QGP thermal radiation dominant region, we can extract the temperatures of hot QCD matter averaged over the dense hadronic phase and the deconfined partonic phase (QGP), respectively.

In this talk, we will present the latest measurements of the dielectron mass spectra and the extracted medium temperature in Au+Au collisions at $\sqrt{s_{NN}} = 27$ GeV and 54.4 GeV with the STAR experiment. The dependencies of medium temperature on the collision centralities and the collision energies will be discussed together with the NA60 and HADES measurements.

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