The 22nd International Conference on
Strangeness in Quark Matter
22-27 March, 2026, Los Angeles, CA

Contribution ID: **176** Type: **Poster Presentation**

Measurement of thermal radiations in Au+Au collisions at 200 GeV by PHENIX

Tuesday, 24 March 2026 19:03 (1 minute)

Dileptons, being electromagnetically decoupled from the strongly interacting medium, are key probes of the thermal and chemical evolution of the Quark-Gluon Plasma (QGP) and the hadronic matter. In the intermediate mass range ($m_{\phi} < m_{ee} < m_{J/\psi}$), they primarily originate from the thermal radiation of the QGP and semi-leptonic decays of heavy flavor mesons. Disentangling these sources in the dilepton mass spectrum is essential for understanding the dynamics of thermal radiation and constraining theoretical models of QCD matter. In this talk, using the Silicon Vertex Detector and high-statistics Au+Au data at 200 GeV from 2014, PHENIX presents the first measurements of the dielectron mass spectrum at mid-rapidity, as well as an empirical approach to separate the thermal and heavy-flavor components via the distance-of-closest-approach. A good signal-to-background ratio is achieved using a boosted decision tree classifier for electron/hadron separation, along with precise hit-to-track matching and photon conversion rejection. The measured invariant mass spectrum agrees with expectations from hadronic decays based on previous PHENIX results and shows excess contributions consistent with expectations from heavy-flavor decays and thermal production. The achieved resolution in pair transverse distance-of-closest-approach, which reflects the spatial separation between electron and positron tracks, allows statistically separating prompt thermal radiation from heavy-flavor decay sources.

Author: MITRANKOVA, Mariia (Stony Brook University)

Presenter: MITRANKOVA, Mariia (Stony Brook University)

Session Classification: Poster Session