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First physics measurements in Au+Au collisions from sPHENIX at RHIC

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sPHENIX, the first new detector to be built at the Relativistic Heavy-Ion Collider (RHIC) in over two decades, will bring unprecedented measurement capabilities at RHIC energies.

sPHENIX collected its first data during the inaugural RHIC commissioning run in 2023 with Au+Au collisions. The data allow for a partial commissioning of multiple key sub-systems of the detector, including the hermetic electromagnetic and hadronic calorimetry (unique at RHIC), elements of the four-component charged-particle tracking system, and the global/forward detectors.

This talk reports the first measurements of a number of “standard candle” properties of heavy ion collisions in commissioning data, including the charged-particle pseudorapidity density, the total transverse energy production, and the production and azimuthal modulation of neutral pions.

The results are compared with theoretical expectations and previous measurements at RHIC, and the lessons learned for the physics data-taking in 2024 are discussed.

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