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## Measurements of neutral meson production and collective flow in Au+Au collisions at 200 GeV with sPHENIX at RHIC

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sPHENIX is a next-generation, state-of-the-art particle detector at the Relativistic Heavy-Ion Collider (RHIC) that has recently taken its first dataset of 200 GeV Au+Au collisions during a commissioning run in 2023. From this inaugural dataset, the anisotropic flow ( $v_n$ ) of neutral pions ( $\pi^0$ 's) has been measured for the first time in the sPHENIX detector using the scalar product method. Anisotropic flow is a hallmark signature of the formation of a Quark-Gluon Plasma in ultra-relativistic nucleus-nucleus collisions, and the use of  $\pi^0$ 's as the species of interest offers an important opportunity to benchmark the performances of both the sPHENIX Electromagnetic Calorimeter (EMCal) and Minimum Bias Detector (MBD). This talk will present the measurement of  $\pi^0 v_2$  in different centrality classes with a comparison to previous experimental results at RHIC. Additionally, the status of measuring eta meson production in sPHENIX, important for the further calibration of the EMCal, as well as the charged hadron  $v_n$  measured via tracklets reconstructed in the Intermediate Silicon Tracker (INTT), will be reported.

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