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## sPHENIX probes of bulk properties via neutral meson production

Neutral mesons such as  $\pi^0$  and  $\eta$  are excellent probes for studying various aspects of the QGP. Their production at low  $p_T$  provides insights into hadronization and the collective dynamics of the medium evolution.

On the other hand, at high- $p_T$ , the energy loss mechanisms dominate, making these mesons unique probes that span the overall response of the medium.

The sPHENIX calorimeter system allows for high-resolution measurements of photons, electrons, jets, and hadrons over a wide rapidity range. The  $\pi^0$  and  $\eta$  mesons are reconstructed via their decay into two photons using the electromagnetic calorimeter.

This talk presents the first results on neutral mesons with the sPHENIX detector in p+p collisions at  $\sqrt{s}=200$  GeV, based on data collected in Run-24. This large dataset has sampled an integrated luminosity of over 100 pb<sup>-1</sup>, providing approximately 10 times higher statistics than the previous PHENIX Run-15 p+p data. This significant increase offers unique opportunities to measure hadrons up to very high  $p_T$  at RHIC.

The results are discussed in terms of bulk production and verification of the EM scale of the sPHENIX EMCal detector as a function of  $p_T$ .

### Category

Experiment

### Collaboration (if applicable)

sPHENIX

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