Jets as mult-scale probes of QCD matter

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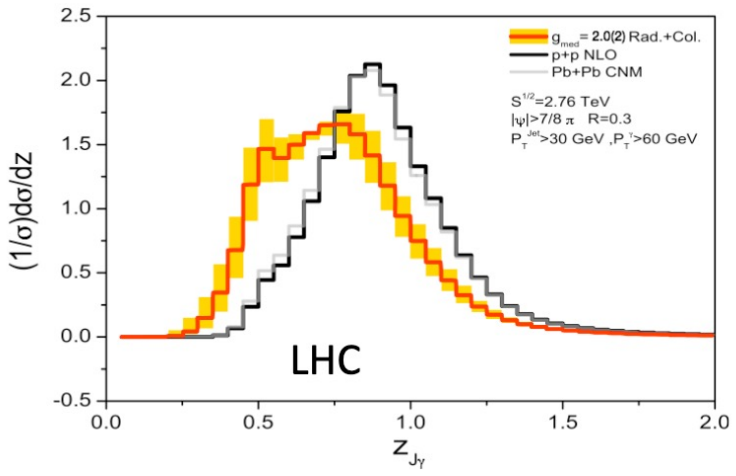
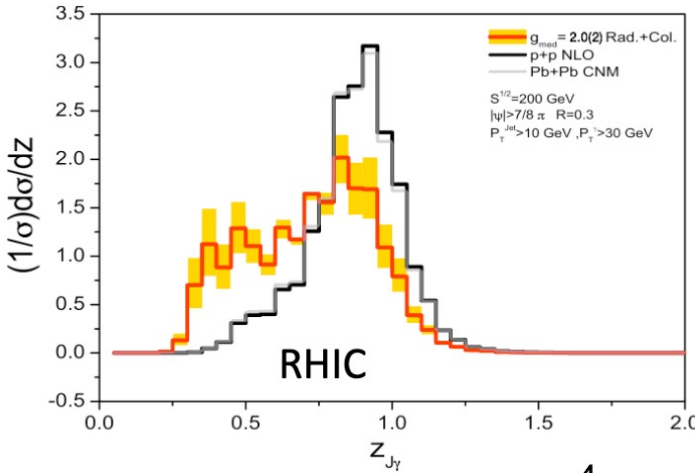
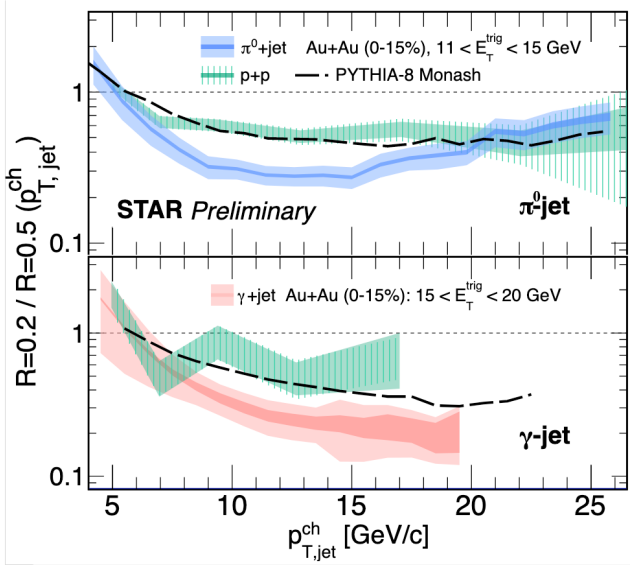
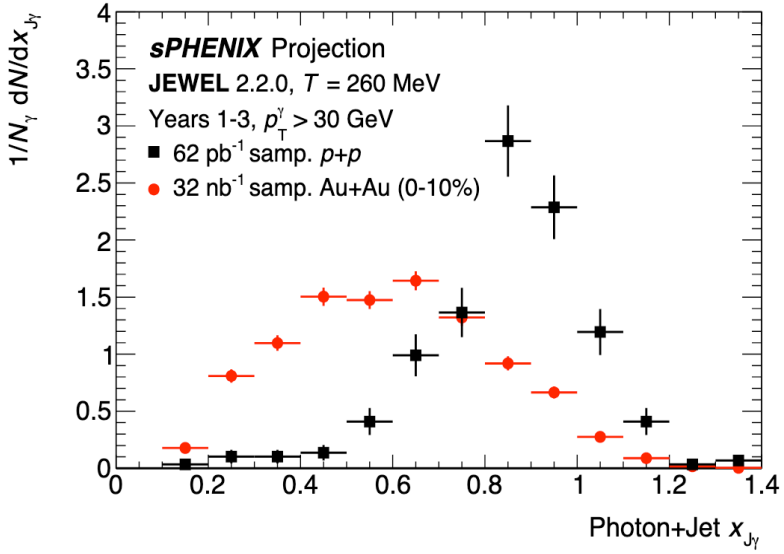
Photon-Jet correlations





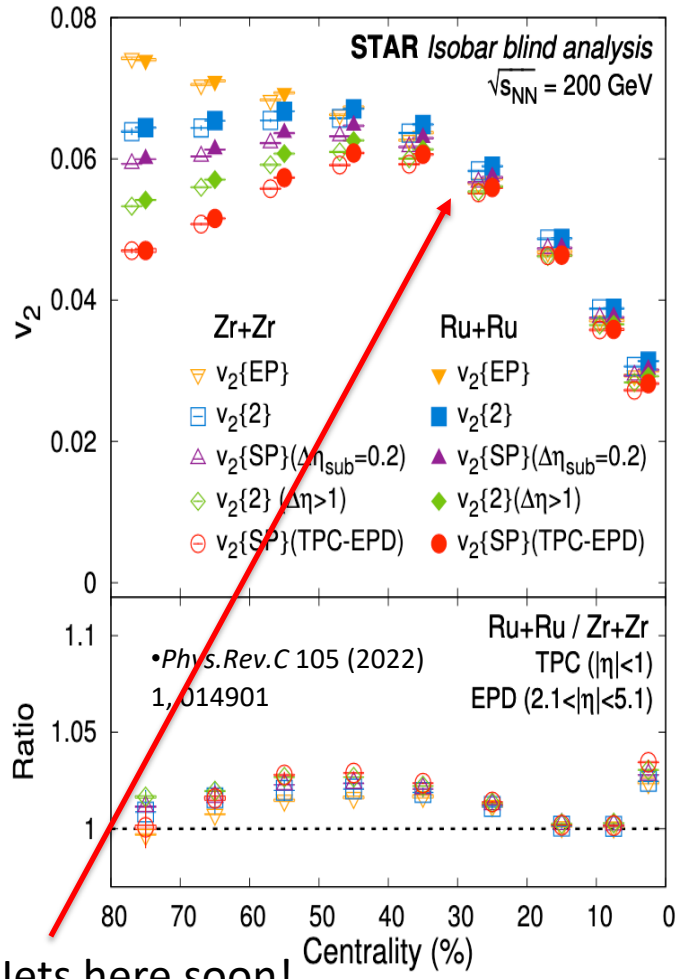




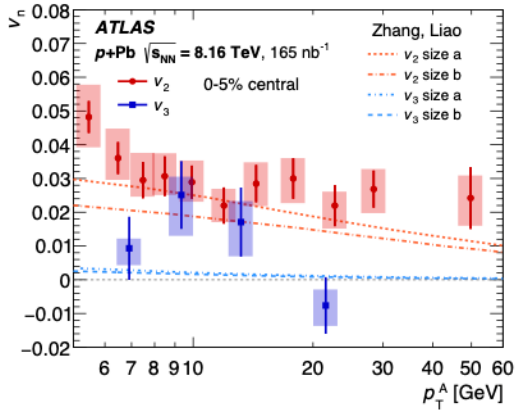
Photon-jet correlations represent one of the best ways to untangle the ambiguities in HI jet analyses

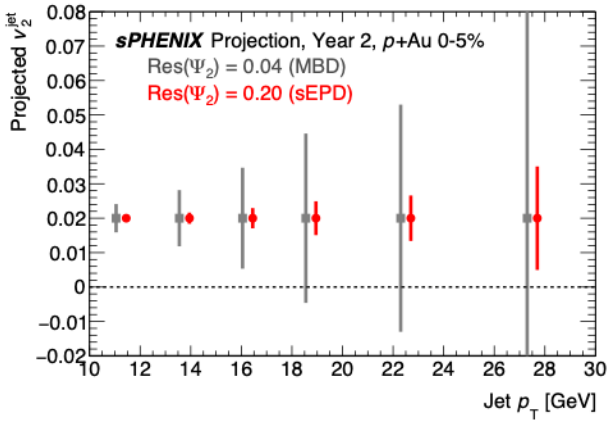
- Statistics hungry
- Run 23+ will give us the recorded luminosity to truly exploit these measurements
- Needed to truly do jet tomography of the QGP
  - Photons do not interact or fragment → parton kinematics are better correlated
- Lower p_T jets at RHIC allow a better sampling of the medium

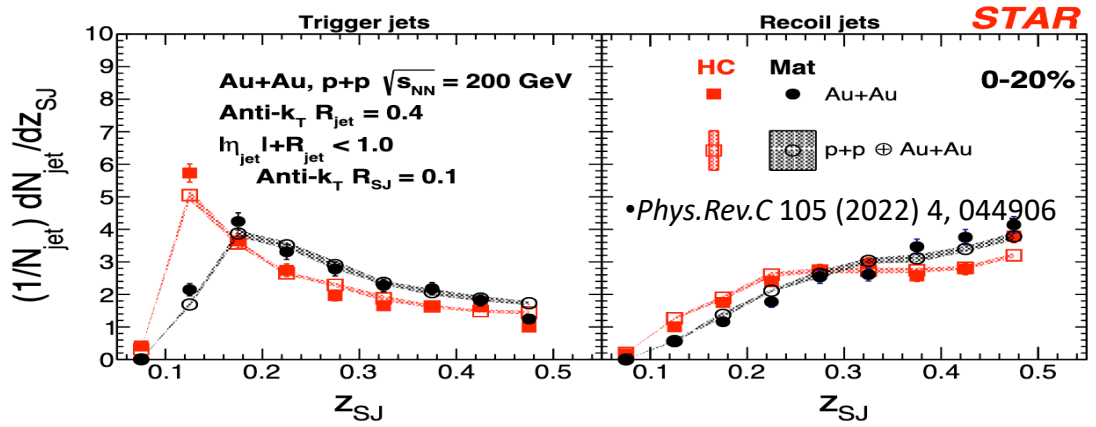
Jet vs geometry and jet structure



Jets here soon!







$$z_{\mathrm{SJ}} = \frac{\min(p_{\mathrm{T,SJ1}}, p_{\mathrm{T,SJ2}})}{p_{\mathrm{T,SJ1}} + p_{\mathrm{T,SJ2}}}$$

Path-length dependence of jet quenching allows better constraint on the models

- Tomography
- v_2 in small systems?
- Needs the statistics and upgrades of RHIC in 2023+

Jet structure gives us a unique QCD laboratory, and allows us to study modification of the splitting function

Ability to measure lower momentum jets at RHIC allows better jet ←→ medium interactions than LHC (Complementarity)

LRP recommendation → Need to support the computational AND personpower needs to finish this part of the RHIC Science mission!