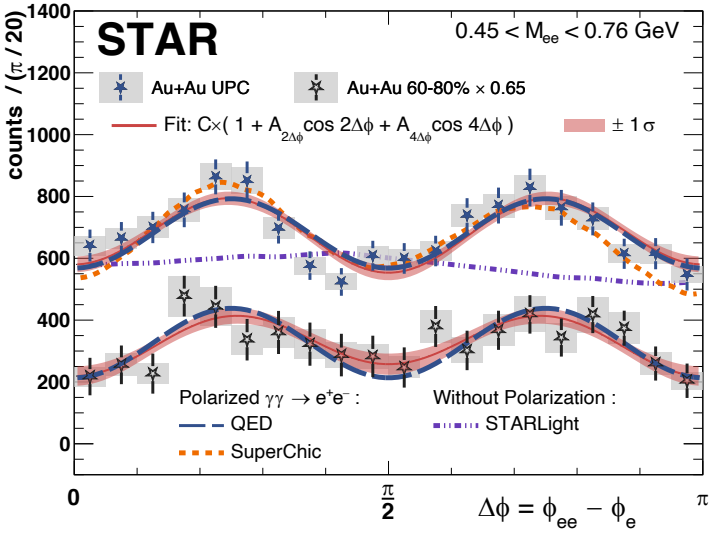
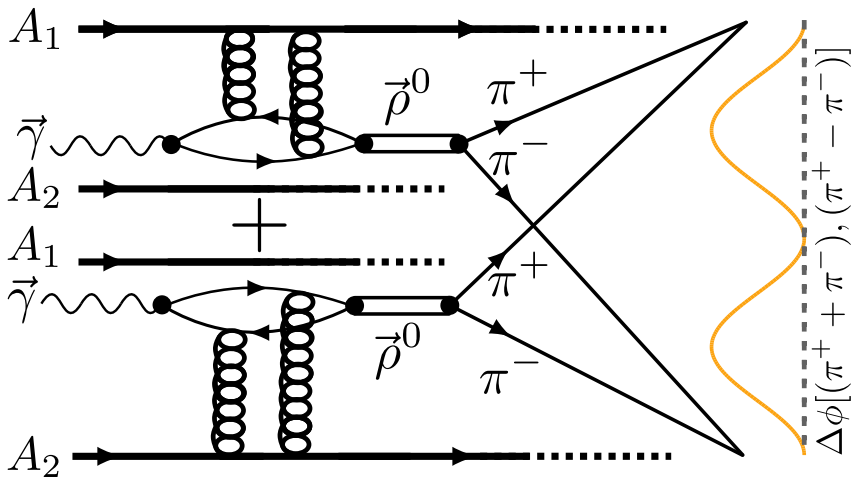
Highlights I : Polarized Photon-Gluon Collisions

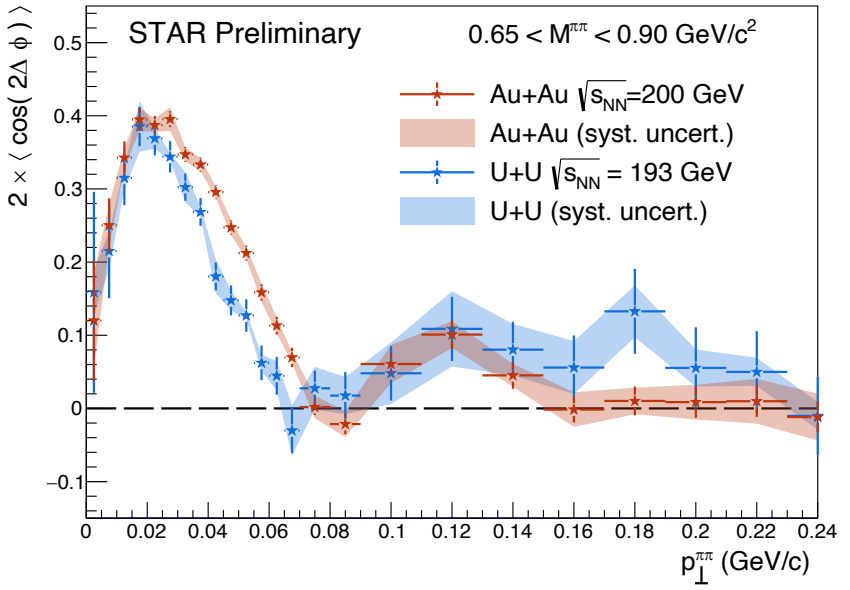
Significant $\cos 4\Delta\phi$ modulation in $\gamma\gamma \to e^+e^-$ process: Experimental demonstration of linear polarization of quasi-real photons



Two source interference in VM production → $\cos 2\Delta\phi$ modulation in $\rho^0 \to \pi^+\pi^-$



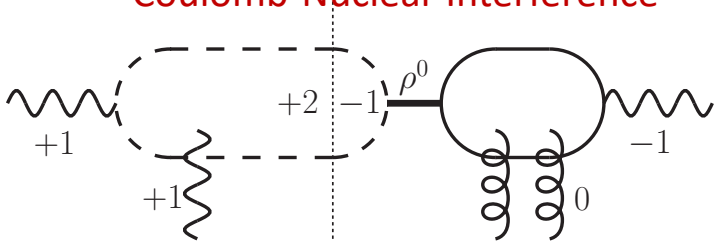
Interference shows rich structure vs. P_T



New Interference pattern observed in diffractive photo-nuclear interactions

- Experimental demonstration of sensitivity to gluon distribution and that incoherent does not contribute to interference pattern
- New measurement possibilities:
  - J/ψ, which provides hard scale for theoretical calculations,
  - Measurements in non-UPC, comparison of $\rho^0 \to \pi^+\pi^-$ vs. $J/\psi \to l^+l^-$ to see if interference exists in both
  - Differential measurements w.r.t. mass, rapidity to test interference characteristics
  - Observation of Coulomb-Nuclear Interference

Coulomb-Nuclear Interference



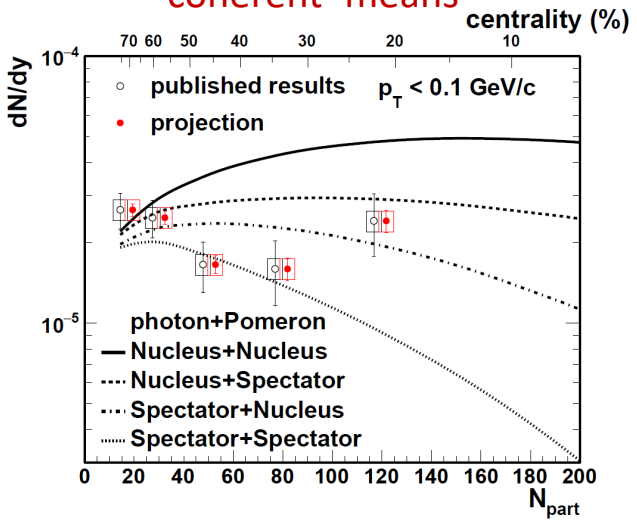
Highlights II : Theory Questions and EIC

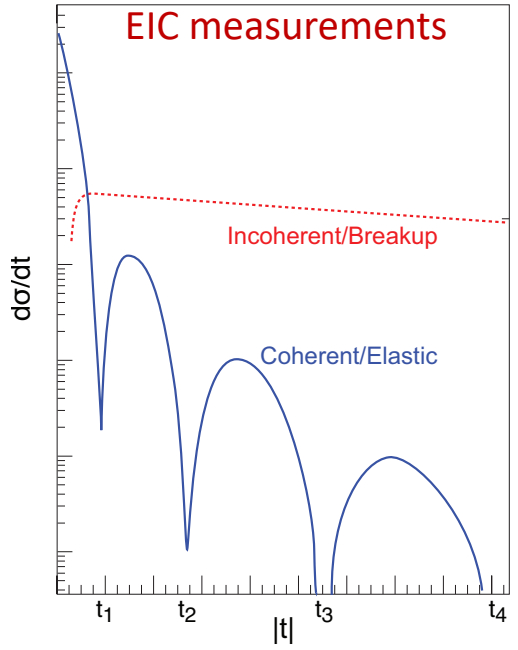
Separation of coherent vs. incoherent is the essential experimental challenge for EIC measurements

Theory Wish List:

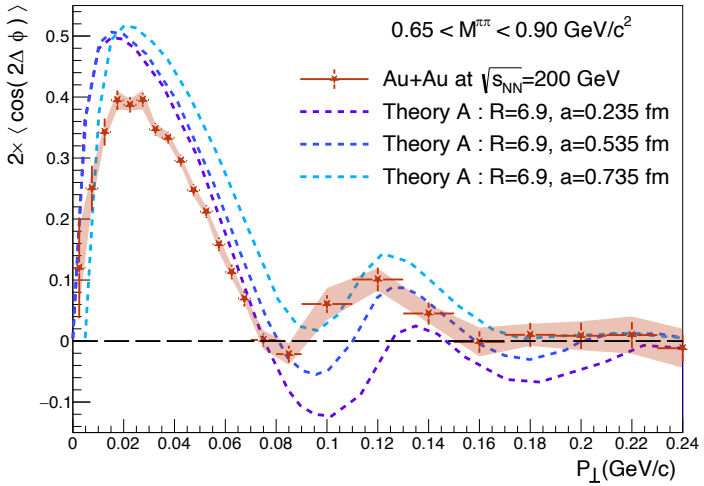
- Full calculations for J/ψ etc.
- Predictions for U+U considering deformation
- Rapidity and mass dependence
- Pursue calculations for EIC case – do correlations exist and if so, what can we learn?
- Quantify effects of saturation/ modified gluon distribution?

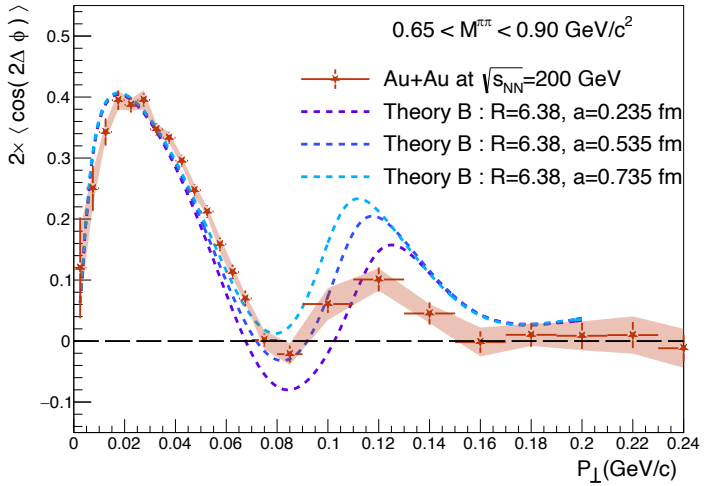
Gain a deeper understanding of what 'coherent' means





- Continue to pursue theory – gain quantitative agreement





Why are we sensitive primarily to the 'long'-axis