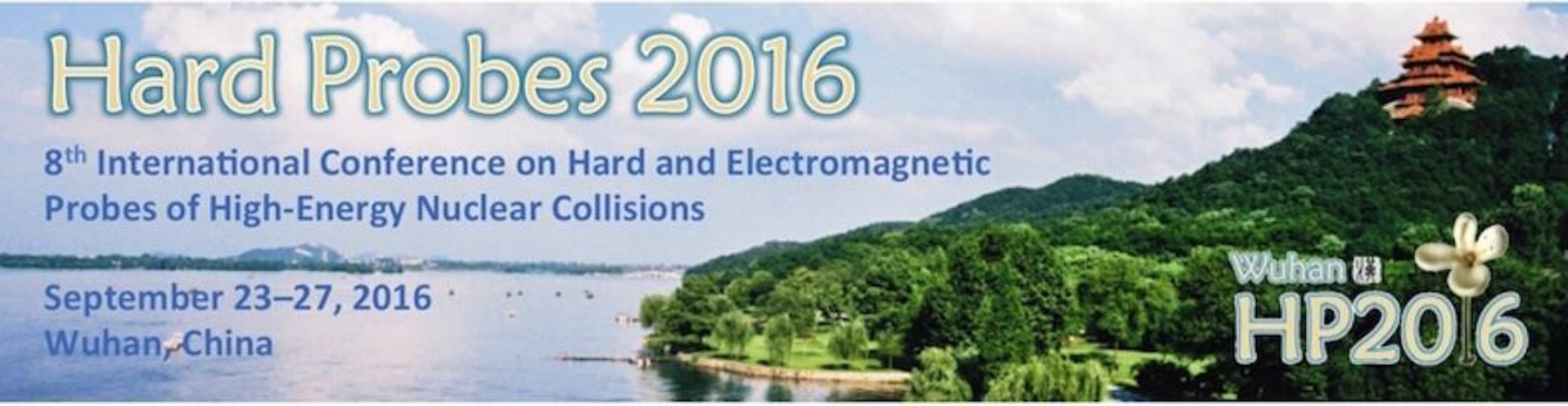

Effect of collisional energy loss on particle correlations in AMPT

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Based on Terrence Edmonds, Qingfeng Li, FW, arXiv:1609.06222 [nucl-th]

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Jet quenching

- Theoretical:
  - Partonic energy loss in medium
  - Radiative and collisional energy loss
  - Perturbative QCD at high p_T.
    Non-perturbative effects difficult to calculate.

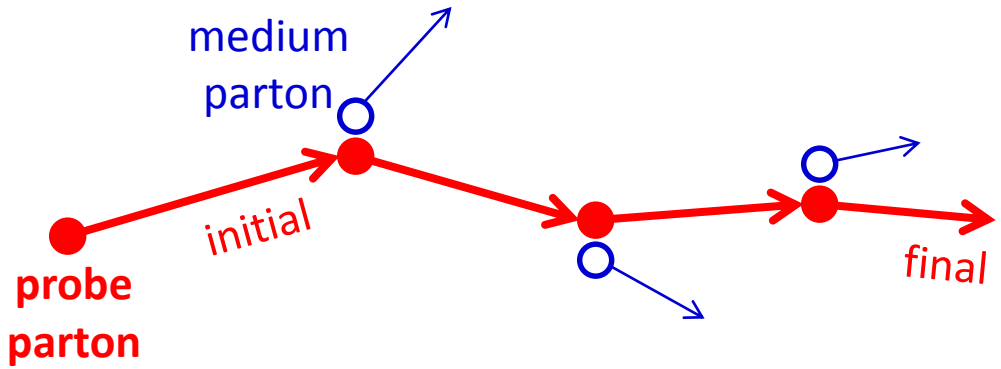
- Experimental:
  - Suppression of high p_T particles
  - Jet structure modification

Collisional energy loss

- Theoretical calculations focus on energy loss
- Effects of collisional energy loss on correlations less explored
- This talk focuses on effects on correlations using transport model AMPT

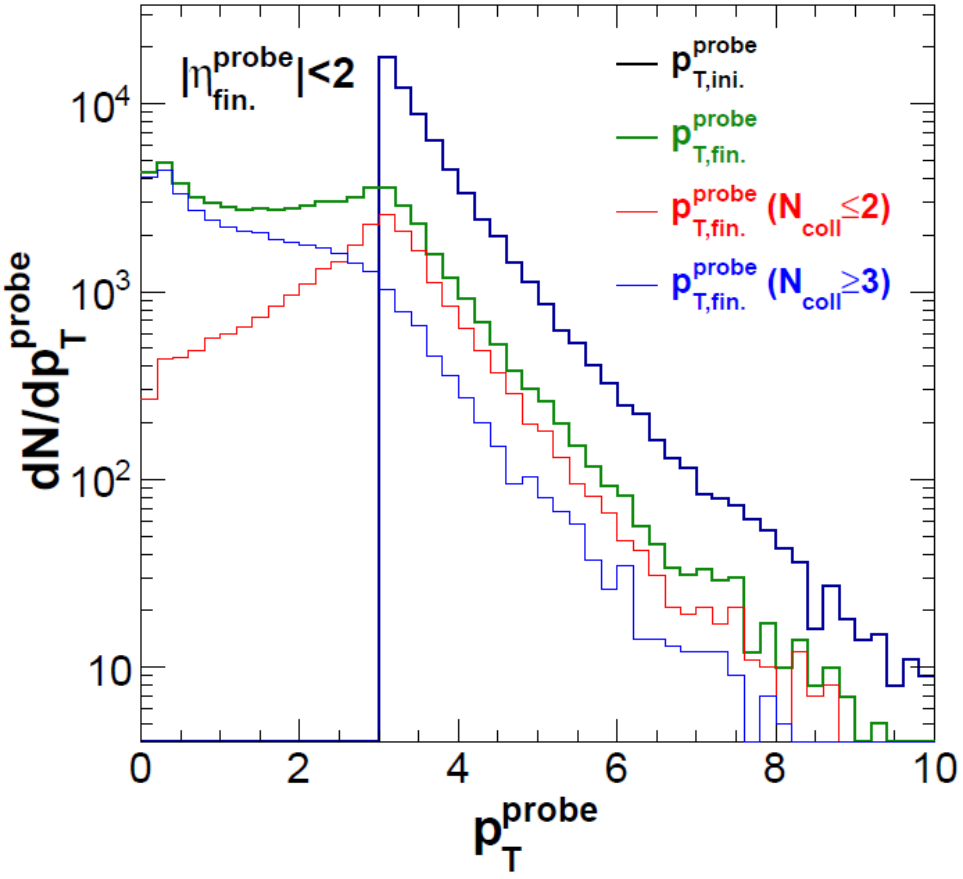
A Multi-Phase Transport (AMPT)

- Initial condition from HIJING
- Jets are destroyed, no dijet correlations
- String fragmentation
- No radiative energy loss,
  only collisional

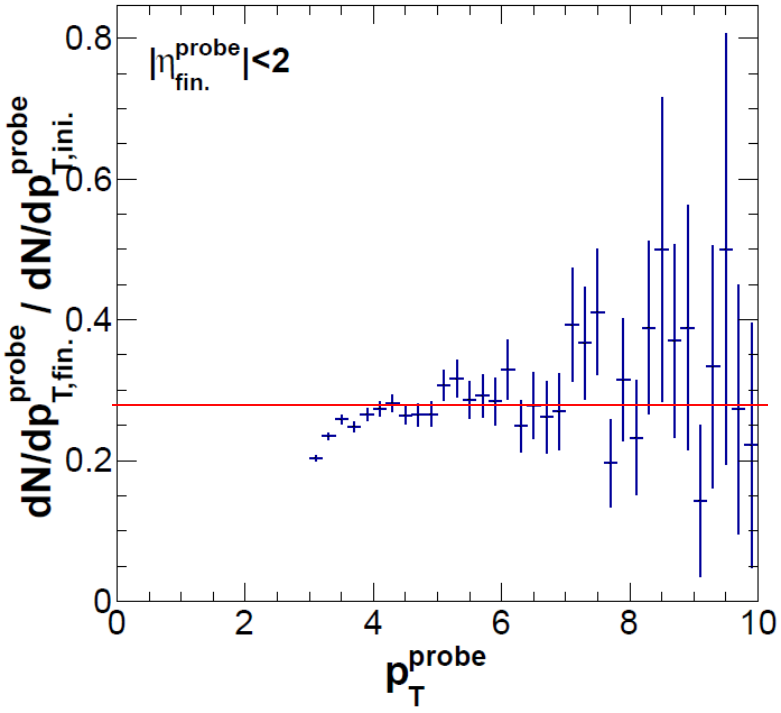


- Coalescence
- This talk focuses on only partons

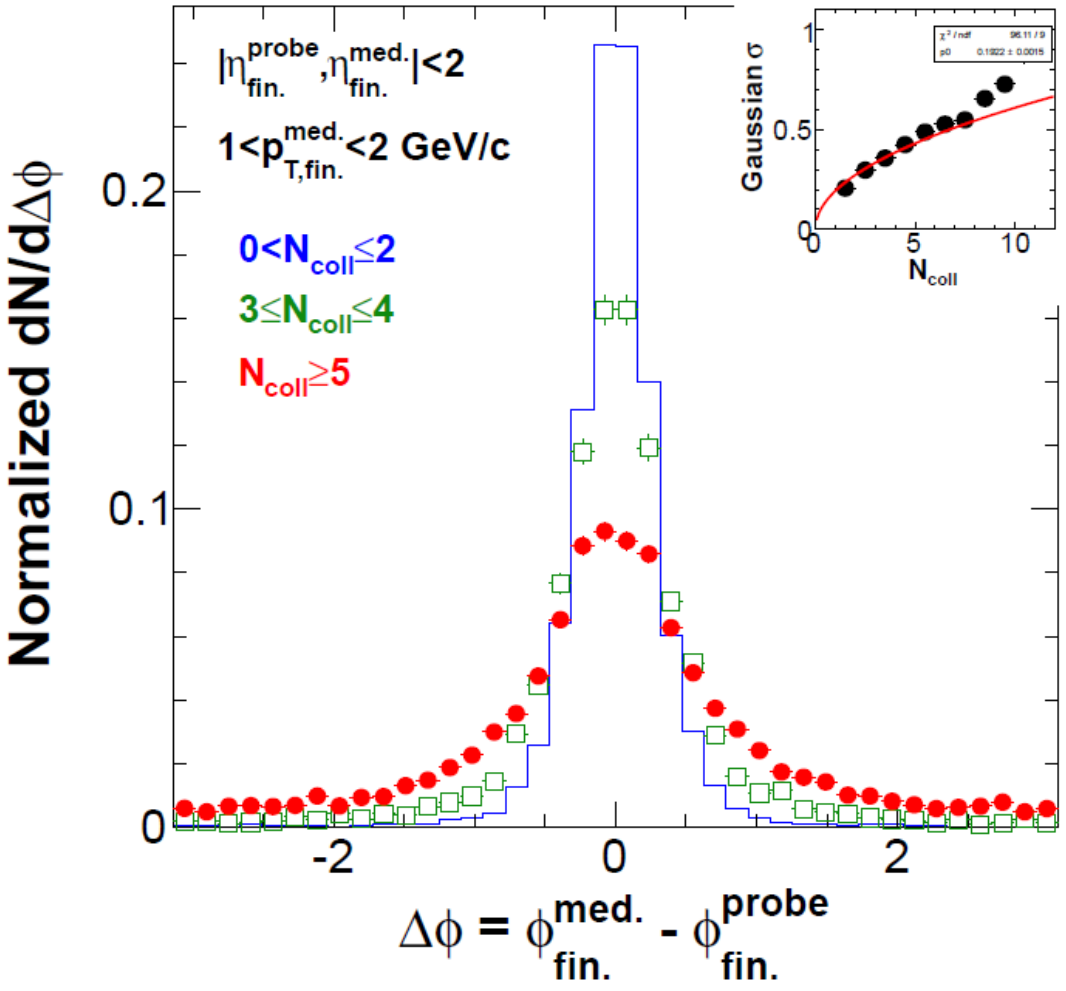
Collisional energy loss



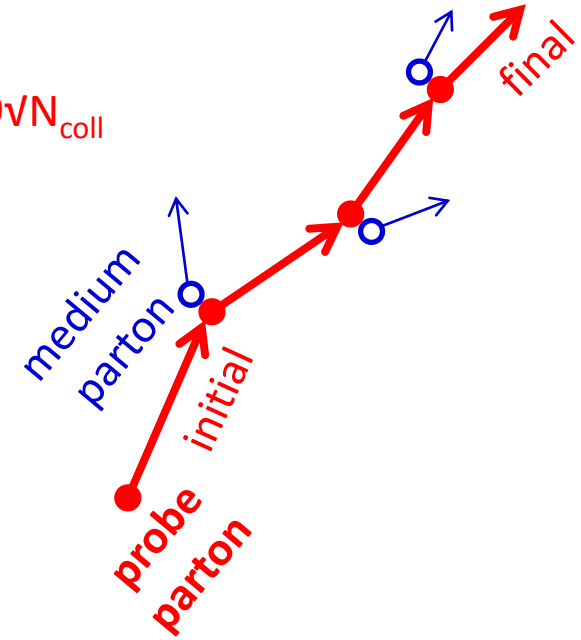
"R_{AA}"



Probe parton angle deflection

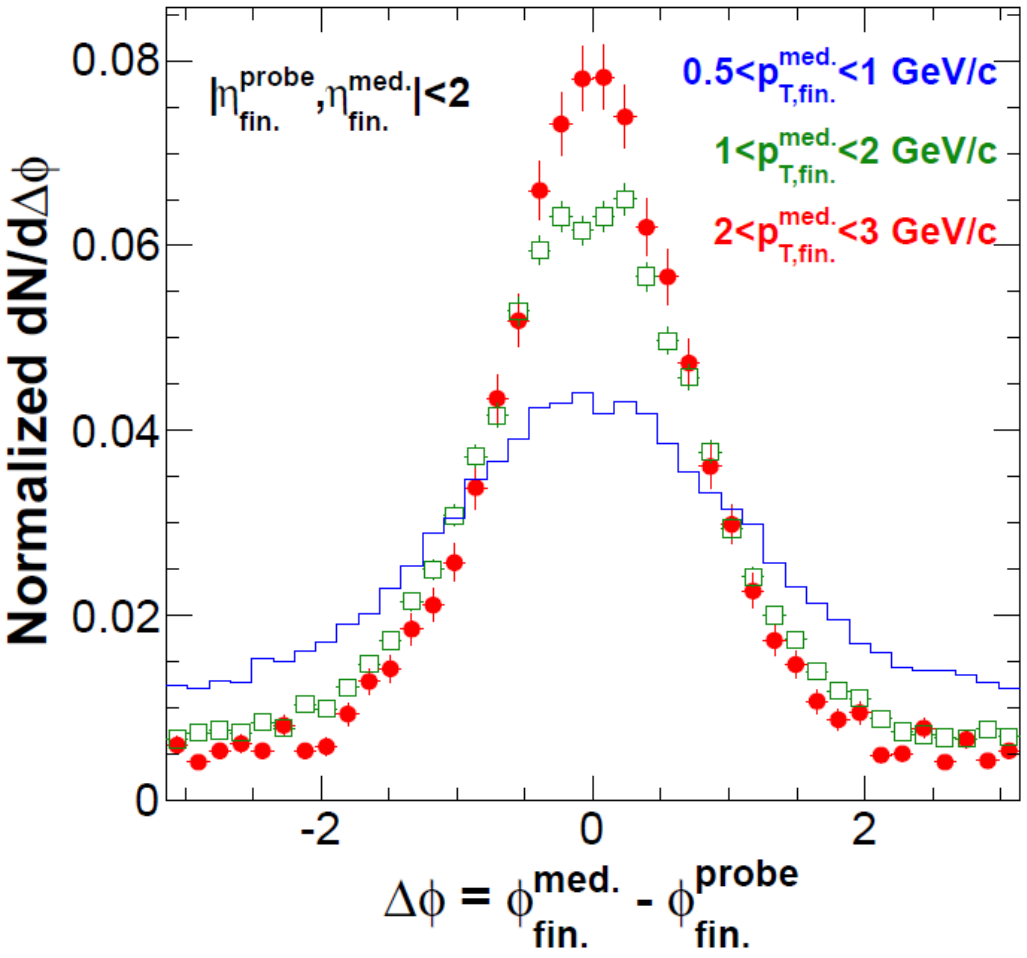


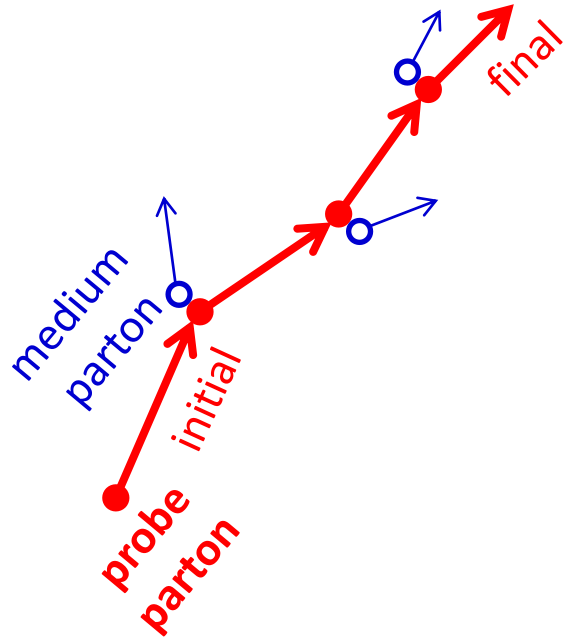
$0.19\sqrt{N_{coll}}$



Each collision deflects ~10°

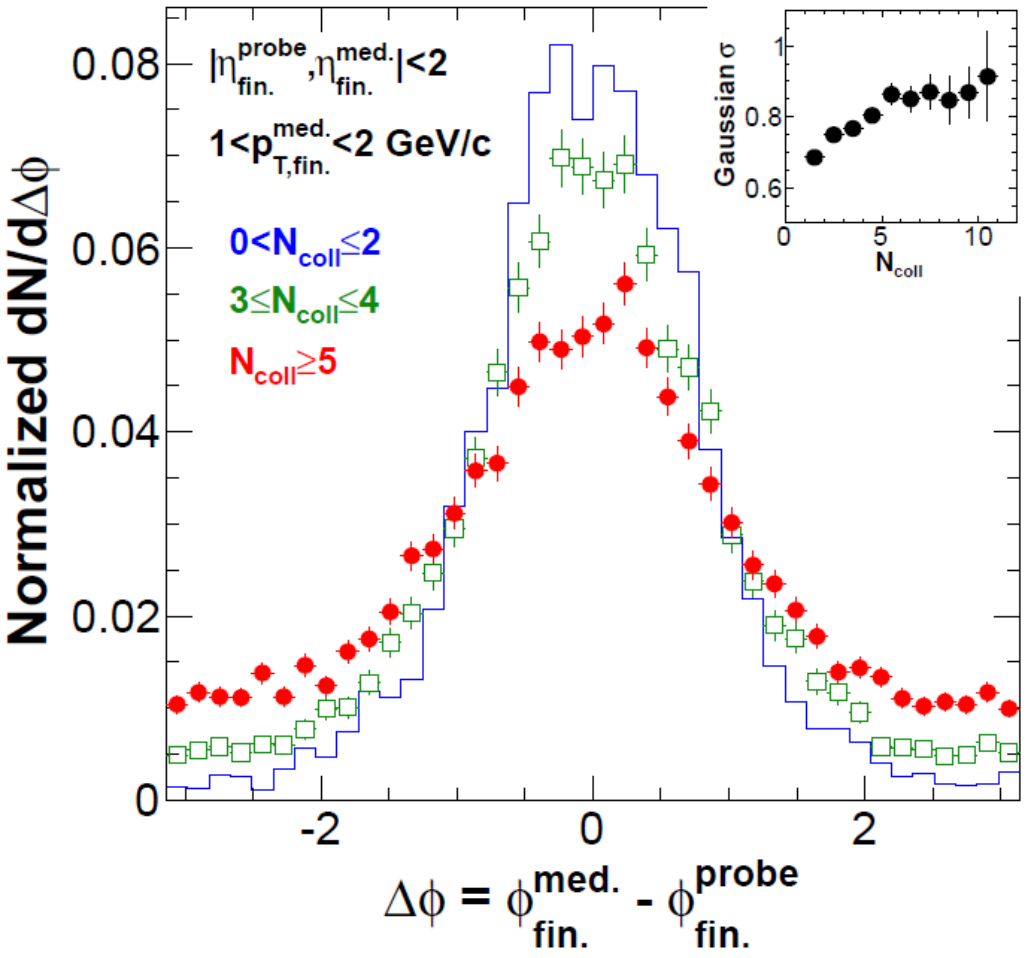
Trigger-assoc. $\Delta\phi$ width vs p_T^{assoc}

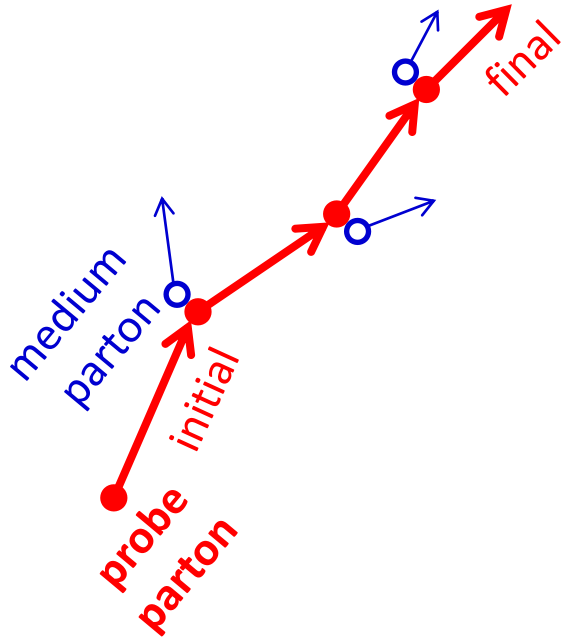




The lower the p_T, the larger angle kick

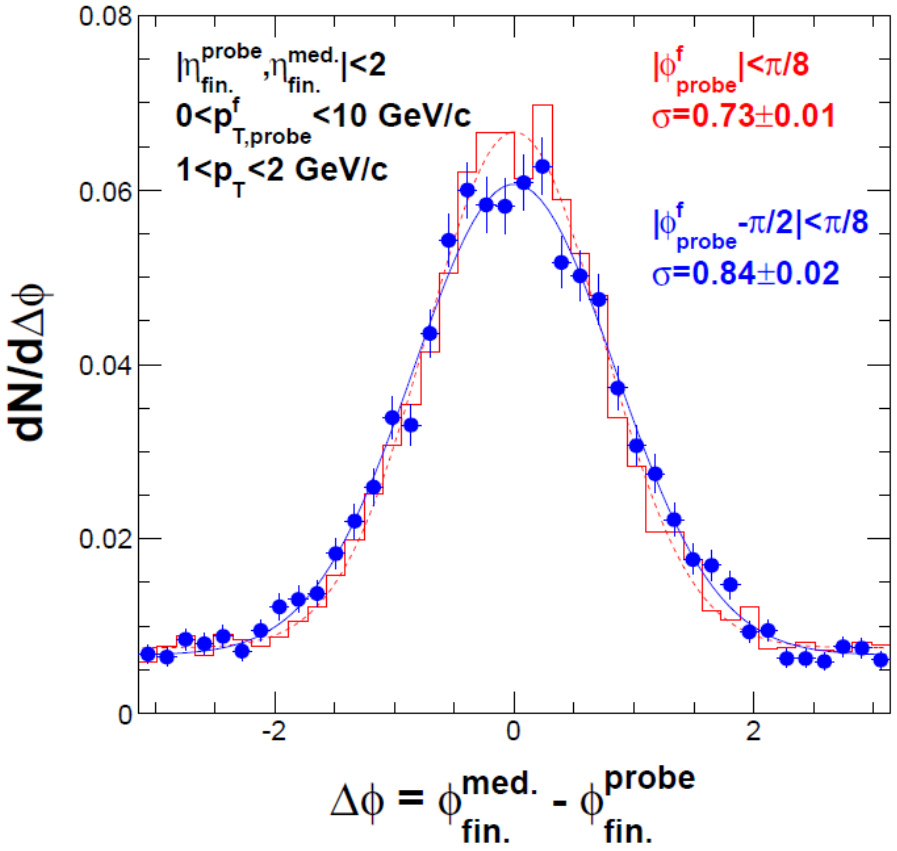
Trigger-assoc. $\Delta\phi$ width vs N_{coll}

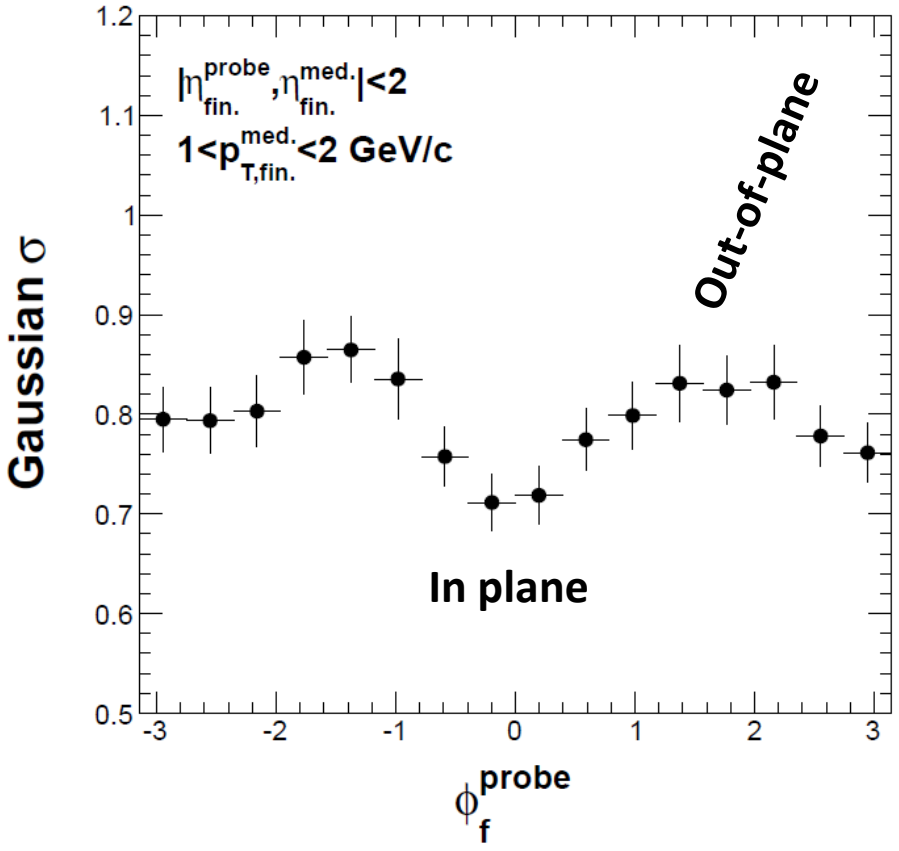




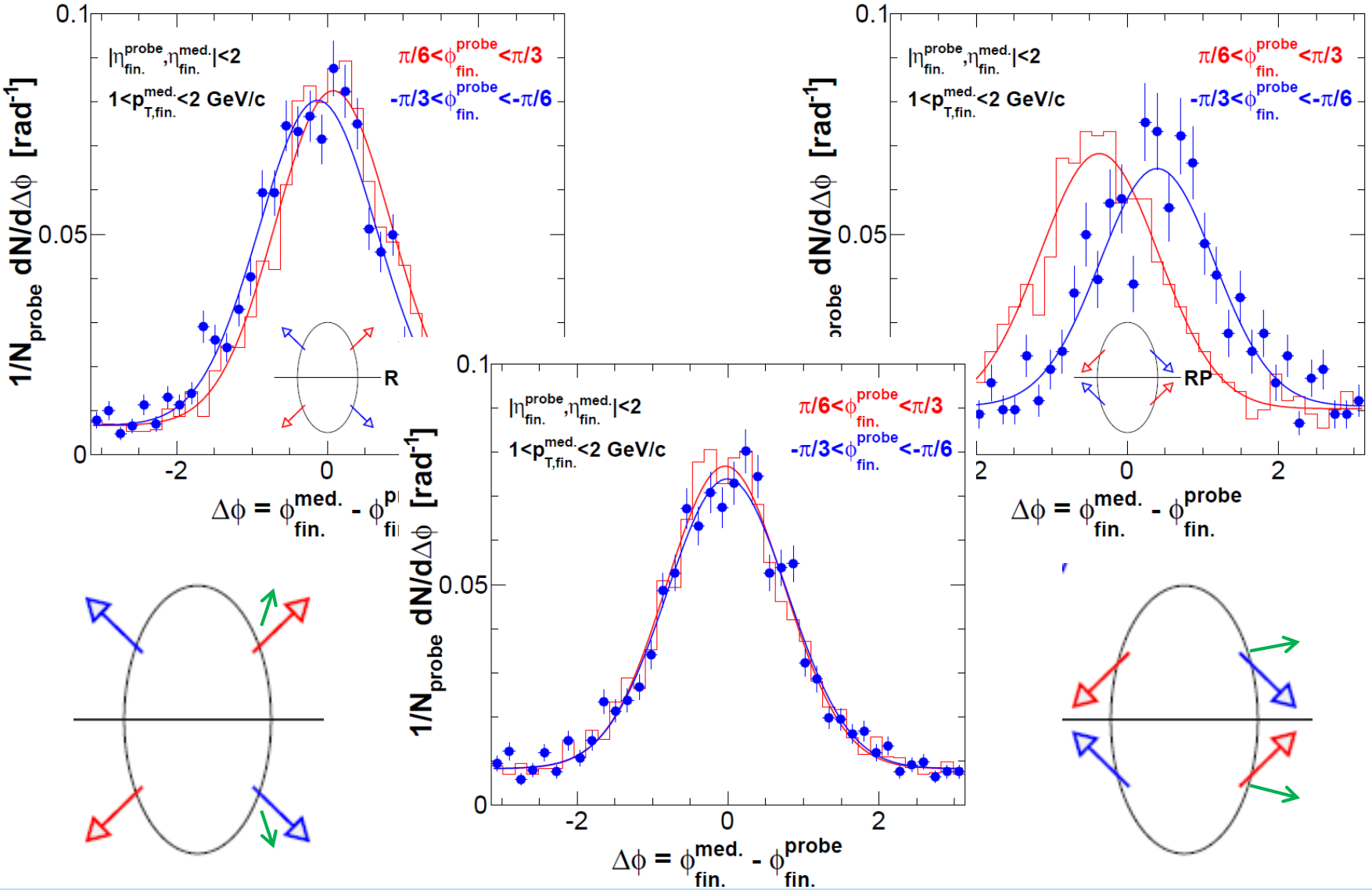
The more collisions, the larger angle kick

RP dependent Δϕ broadening

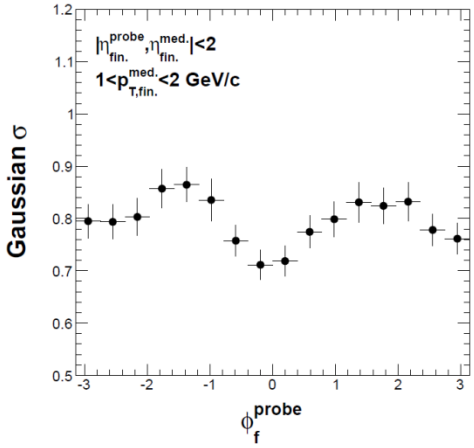


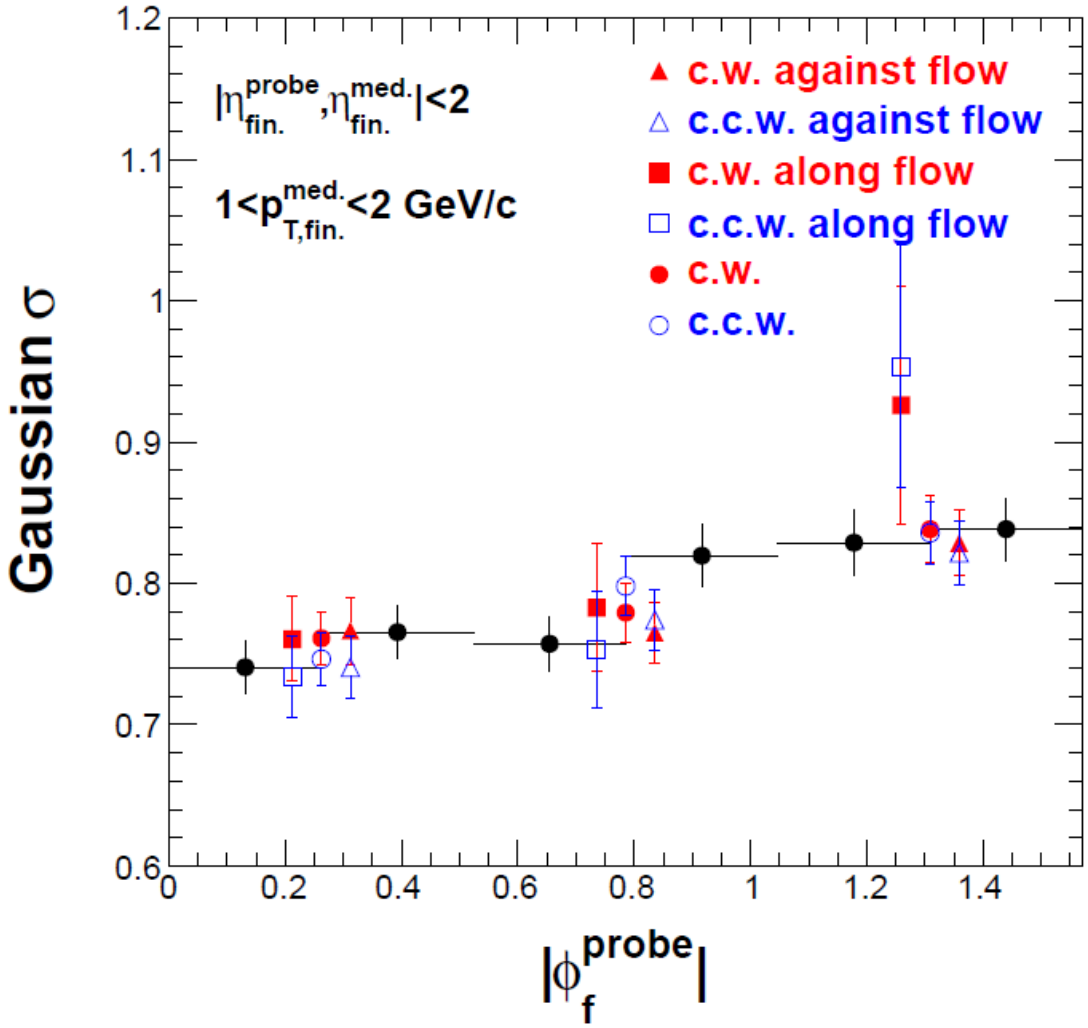


Orientations relative to medium flow



Collisional broadening





Summary

- Effects of collisional energy loss on jetlike correlations are studied using AMPT
- Broadening increases with N_{coll} and from in-plane to out-of-plane
- Effect of relative orientations between probe parton and medium flow clearly seen in AMPT, but maybe experimentally hard to detect.
- Useful benchmark in the study of jet-medium interactions

Longitudinal flow effect