Workshop Committee

- Yacine Mehtar-Tani (chair)
- Megan, Connors
- Brian Page
- Felix Ringer
- Konrad Tywoniuk
- Marta Verweij

2018 Workshop on Probing Quark-Gluon Matter with Jets

Yacine Mehtar-Tani, BNL

@ Inaugural Symposium and the first review of the CFSN

Simons Centre and Stony Brook University

November 28 - 30, 2018

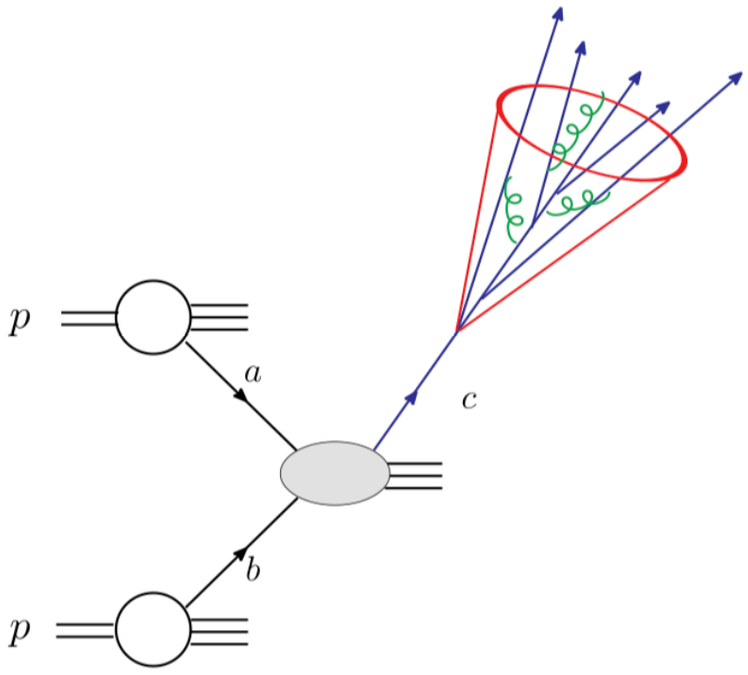
- Jets in pp: precision test of QCD, BSM search

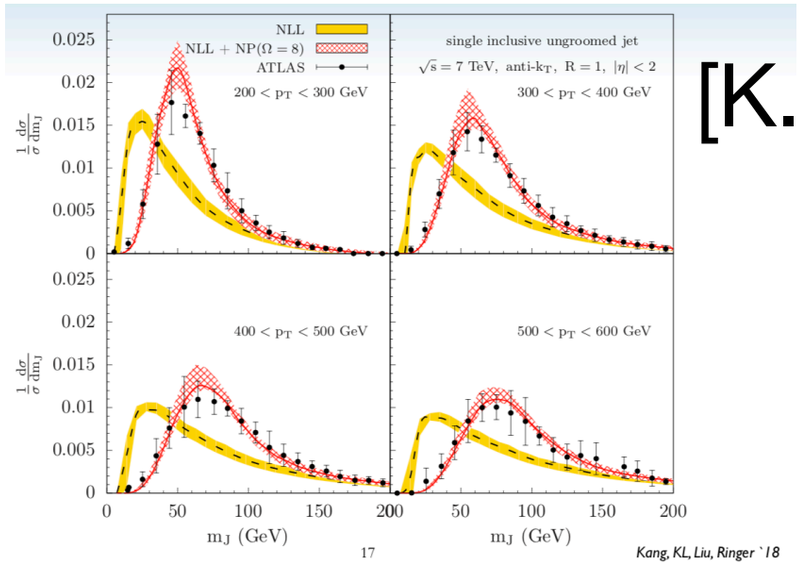
- Jets in heavy ion collisions: probe hot QCD matter, non-equilibrium dynamics and thermalization

- Jets in ep and eA: probe cold quark and gluon matter

Jets in pp

High precision calculations (NLO +NLL)





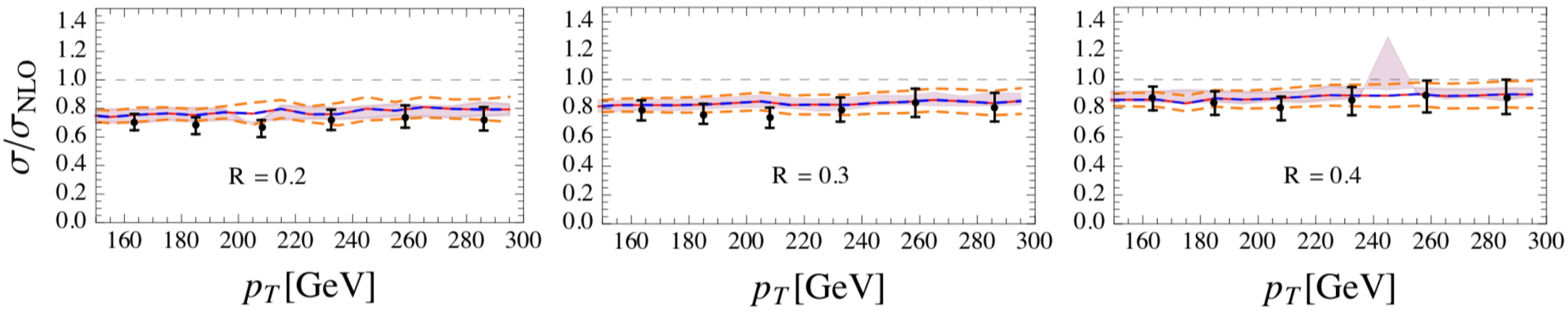
[K. Lee]

Jet mass: NLL + NP

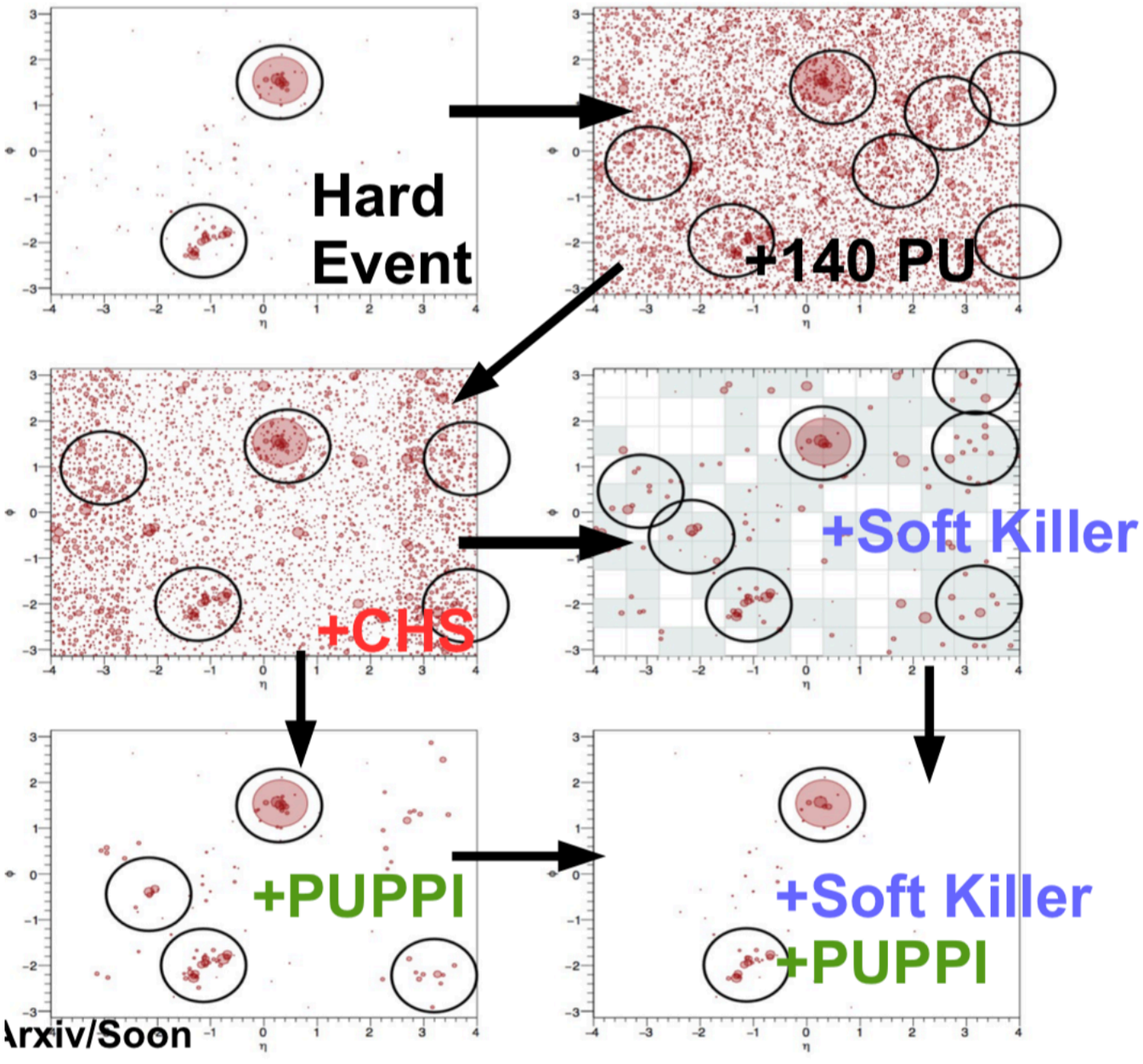
Inclusive jet production [X. Liu]

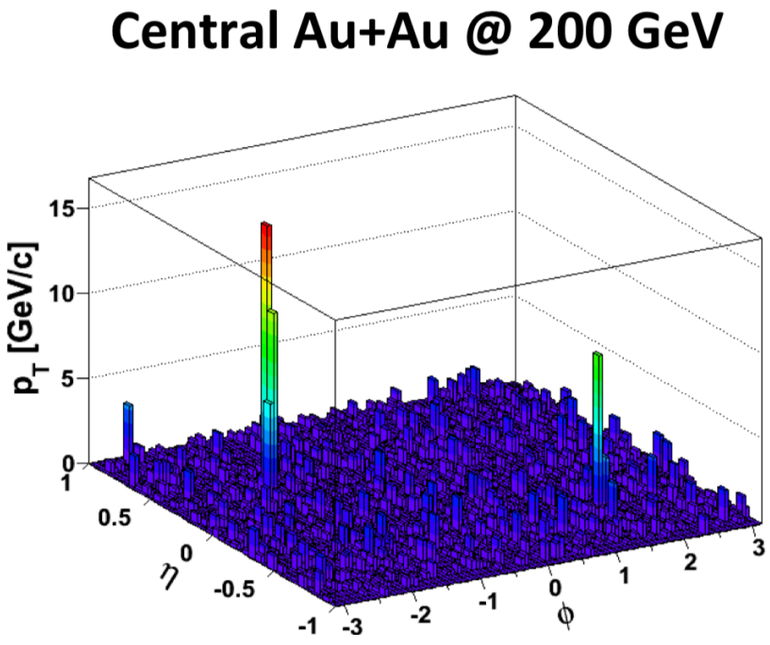
- compare with 2.76 TeV LHC data

with NLO CT10 PDF sets
NP effects included



Dealing with large background (P. Harris, R. Reed)





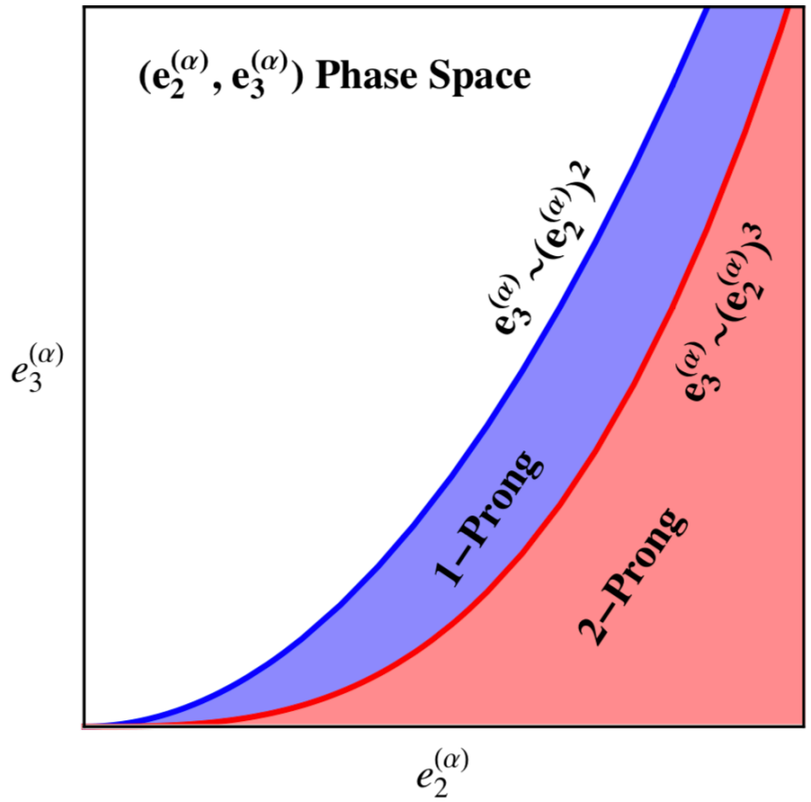
Contamination from pile-up, underlying events, HI background

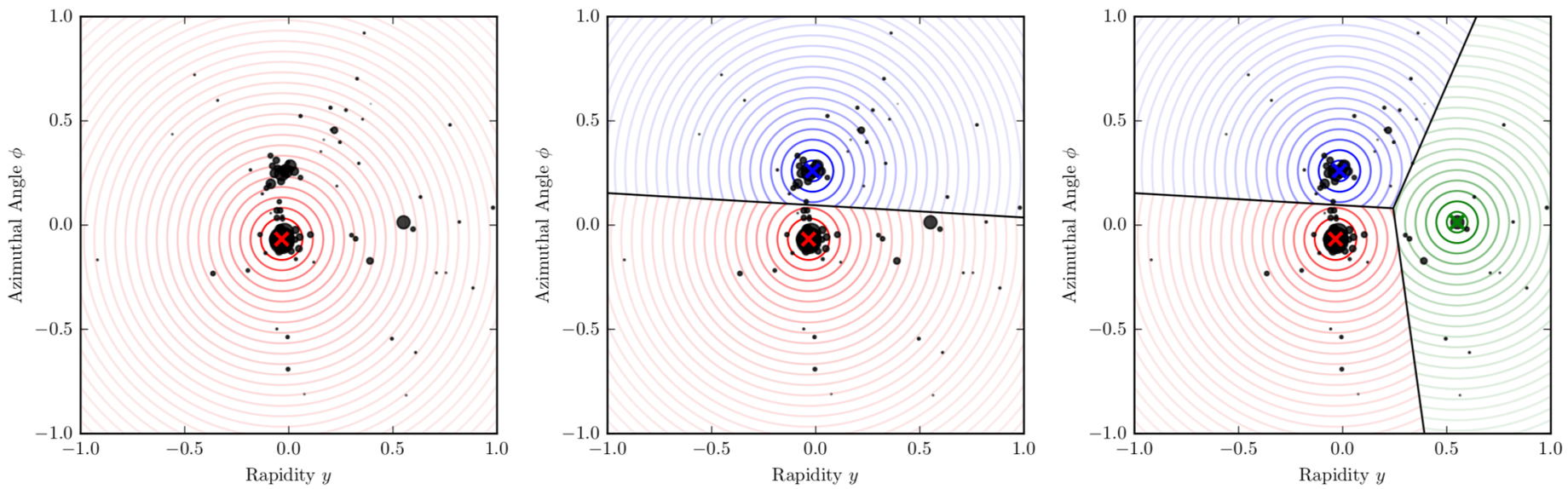
Novel jet substructure techniques

[D. Neil]

- Grooming techniques: mitigate soft contamination from underlying events

- Telescoping deconstruction and energy correlation functions: study subjet structure

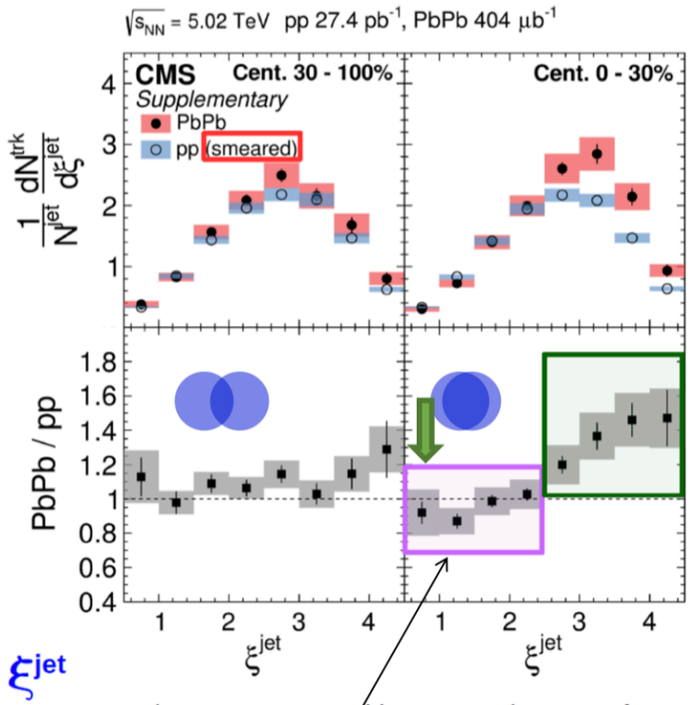




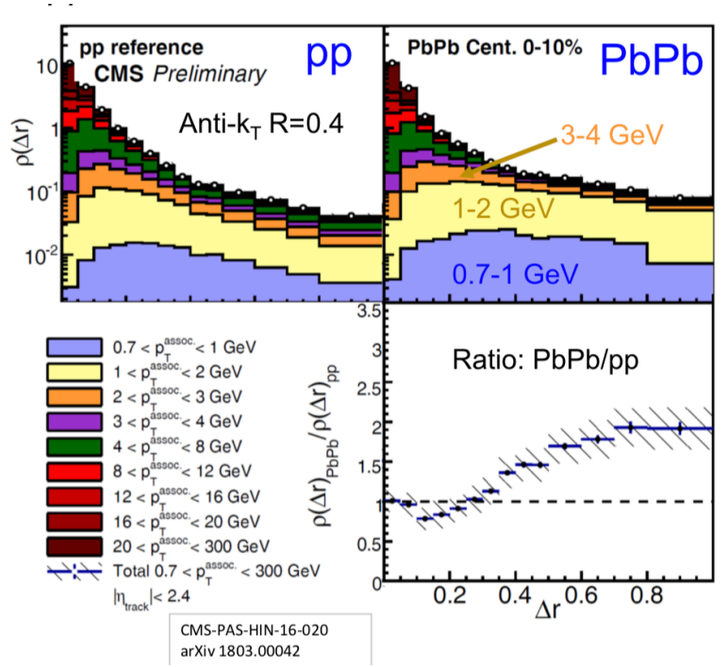
[Y. Chien]

Jets in Heavy Ion Collisions

Jet modification: Many new measurements

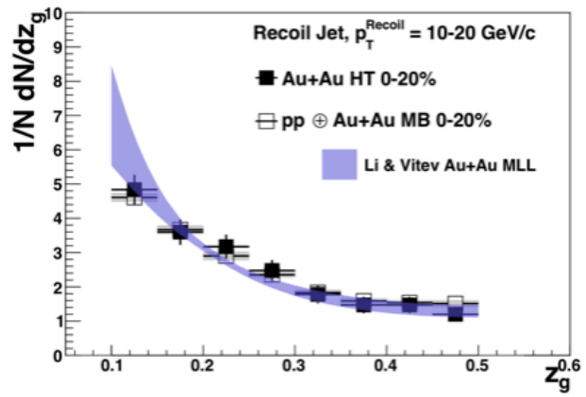


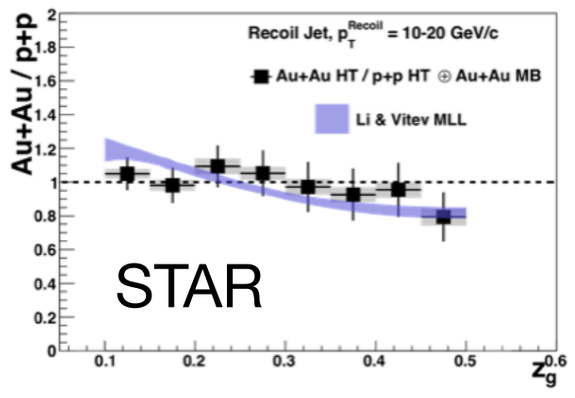
Fragmentation functions



Jet shape

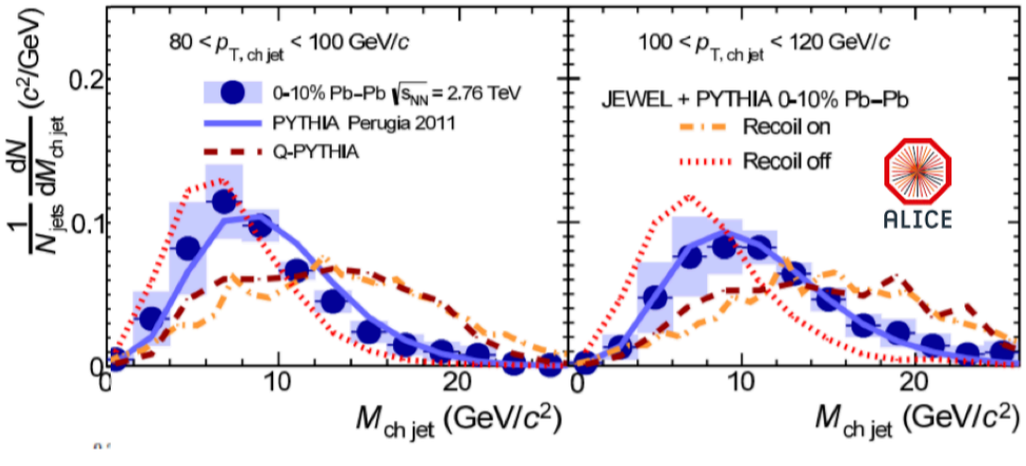
[K. Kauder]

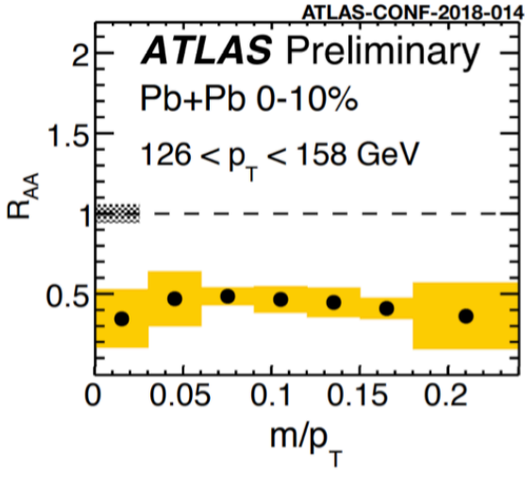




Li & Vitev
arXiv: 1801.0008

[Y. Lee]



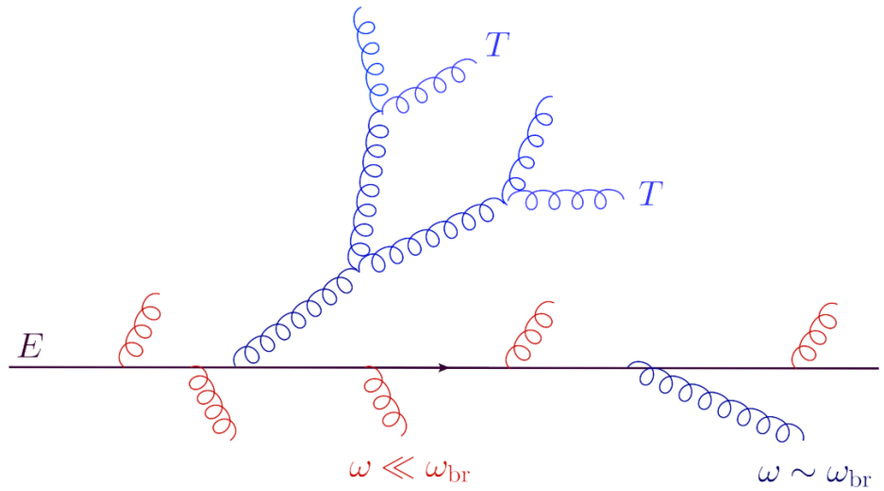


Jet mass and RAA

"Splitting function"

Towards a complete understanding of jet fragmentation in dense QCD matter

- New type of QCD evolution: turbulent transport of energy to large angle, relation to thermalization



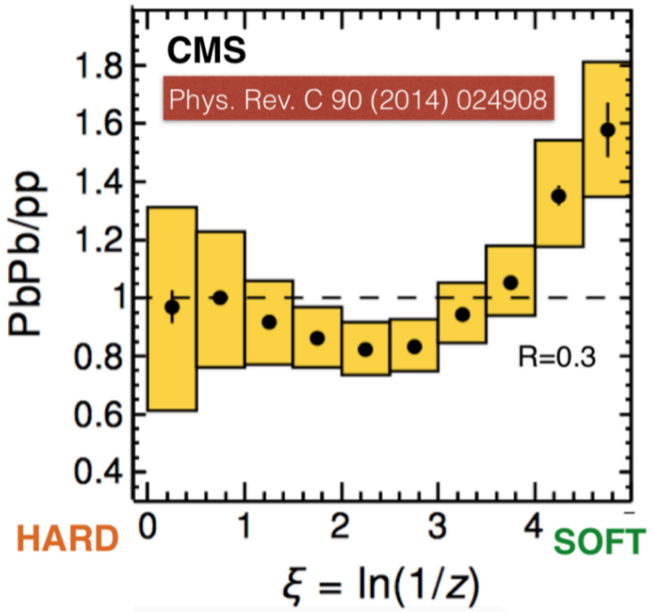
- Higher order corrections to the jet quenching parameter

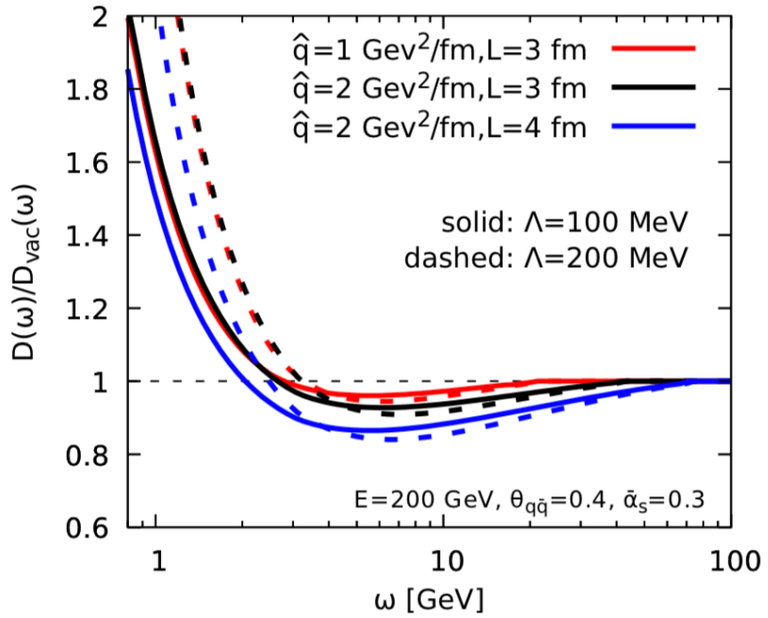
$$\hat{q} \longrightarrow \hat{q}\left(1 + \frac{\bar{\alpha}}{2}\ln^2\frac{L}{\tau_0}\right)$$

[J.-P. Blaizot]

Progress in Monte Carlos Event Generators

- MARTINI [S. Jeon]
- JETSCAPE [C. Shen]





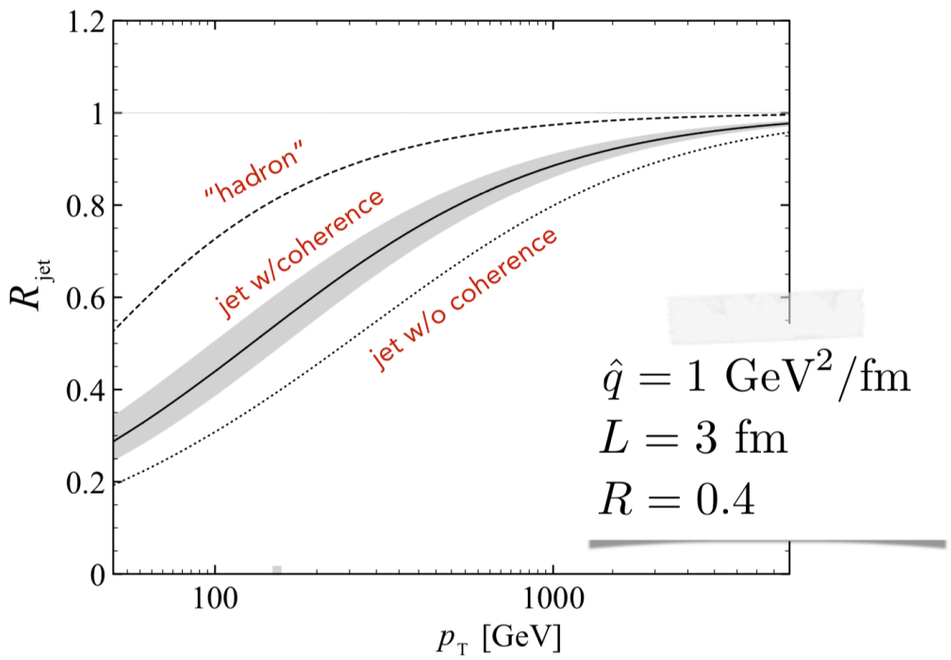
[E. Iancu]

- In-medium fragmentation function at DLA. Soft enhancement might be due to color decoherence

Other source: medium response [X.-N. Wang]

- Higher order corrections to jet quenching: Sudakov suppression and color decoherence

[K. Tywoniuk]

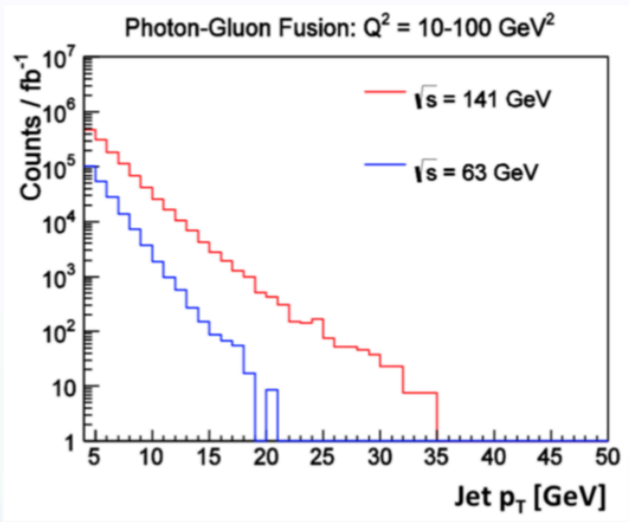


Jets in ep and eA

Jets in ep, eA

It was realized only recently that jet measurements are possible at EIC

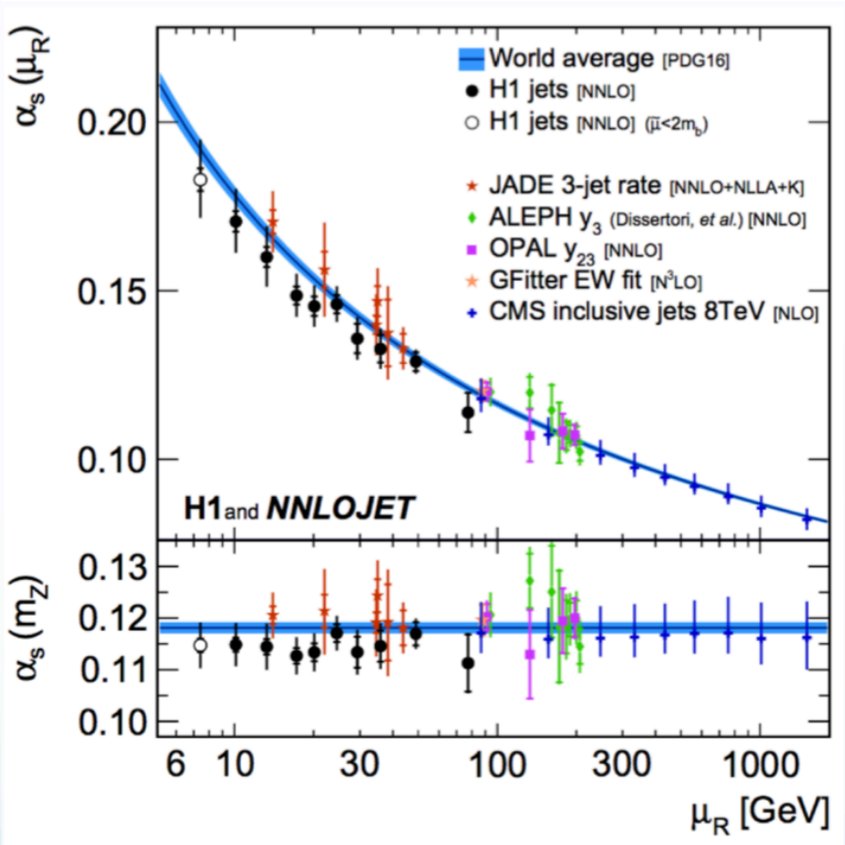
- EIC white paper does not contain study on jet physics: arXiv:1212.1701 (recently updated on Nov. 30, 2014)



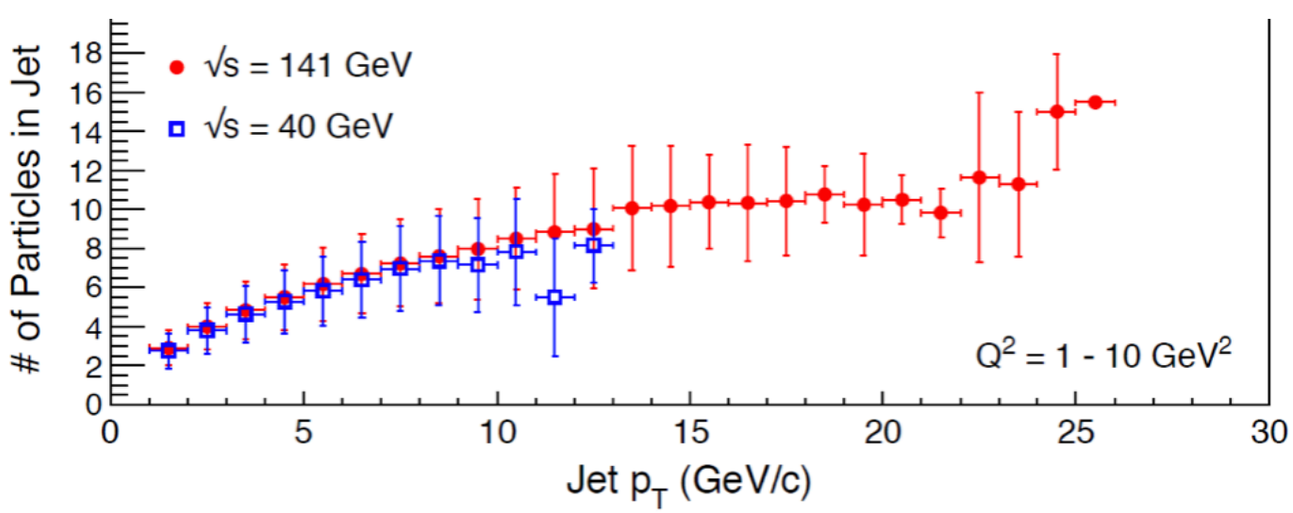
Brian Page, Santa Fe Jets and Heavy Flavor Workshop 2016

[Z. Kang]

Jets at HERA (NNLO)



[R. Zlebcik]



[B. Page]

Jets at EIC: physics questions

- Probe cold nuclear matter: Saturation, TMD's, etc
- Understand soft physics in eA: transport of quantum numbers from UV to IR: spin, color, charge, flavor.
- Transition between weakly interacting partons to strongly bound hadrons