

Minutes 14/11 2018 by Peter

There will be a COST workshop and school in Lund from (new date) Monday 25/2-Friday 1/3, 2019. The topic will be the interplay between hard and soft QCD for collective phenomena in HI collisions.

We managed to cover the talk from Leif (whiteboard) and most of the talk by Peter (slides). The rest of the talk by Peter will be covered next time.

Leif started by stressing that in addition to Angantyr, it will be important to take advantage of the Jewel++ and Shrimps UE generators that Korinna will work on.

He then went through the basic elements of Angantyr under development: CR/swing, ropes, shoving.

The ongoing work is to extend these effects from local (inside one proton-proton collision) to global effect: full final state in AA. (Harsh is working on CR, Smita with shoving).

Once this is implemented we will have to understand if we can separate such a picture from an AA inspired picture.

Leif then pointed out additional goals:

- Jet quenching

A lot of the above string interactions could affect jet production and result in jet hadronization modifications especially for low p_T hadrons. In particular CR could mean that jets attach to partons closer in rapidity and so the low p_T constituents would get closer to the jet axis, possibly making the jets narrower.

Smita is working on this and this seems very related to what Tuva can study experimentally.

Christian Bierlich made two comments:

- One could study this maybe already with ropes and see if one gets jet chemistry changes relevant for Tuva's analysis
- In a very gluon dense environment a gluon jet will CR to nearby gluons and then becomes much more likely to be electric charge neutral. Some studies were done at LEP. One could likely extend this here, maybe even by studying jets in isotropic events.

Peter thinks that all of this also goes well with the jet quenching studies foreseen in pp collisions on the experimental side of CLASH.

Nuclear shadowing: a new direction is to check how semi-hard physics is coming out in pA collisions where in Angantyr only 1 collision is inelastic and the rest are single-diffractive or similar.

There was a discussion about N_{coll} scaling. It would be good to check this for the MB case.

Reference to Nuclear pdfs (EPPS16):

<https://www.jyu.fi/science/en/physics/research/highenergy/urhic/npdfs/epps16-nuclear-pdfs>

(there is also an article)

Reference to CMS dijet studies in p-Pb:

<https://arxiv.org/abs/1401.4433>

For MB studies, Fig. 5, the EPS09 nPDFs does a good job.

For biased studies one likely needs a generator to implement the multiplicity selection a la Rivet (the observed effect is likely a bias induced by how multiplicity is measured).

Other ideas are:

- Bose-Einstein correlations
- Rivet/tuning
- eA where there could be an interesting overlap with sPHENIX/eRHIC and Stefan Prestel
- Cosmic rays (or forward physics in general, e.g., LHCb)
 - Need to get forward tuning under control

Most of the comments on Peter's talks focused on slide 9 where it was stressed that it will be important to try to understand if the proton suppression is a baryon effect or not, e.g., by summing up the total baryon yield.

Reference to a paper on proton-antiproton annihilation:

<https://arxiv.org/abs/1203.5302>

One could try to see what PYTHA's rescattering model will do.