

Blend of comments raised and discussed during the “Physics” WG

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- We can directly use the reweighting technique presented by Pia.
- It can be done for pA but also for pp (\leftrightarrow NNPDF - J. Rojo ?)

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$$g_D(x > 1)$$

- I discussed with Nodoka about predictions starting from counting rules
ex: $(1 - x)^5$ for gluon in p

Centrality determination

- I'm a bit lost
- Need of more discussions (at least for me)
- It may however be already useful to start a quick simulation of GEANT4 to figure out what kind of target thickness allows for a spectator measurement

Selection of important quarkonium-related observables in HIC

- Yield ratios: excited over ground states, quarkonium over Drell-Yan, quarkonium over pions ($\rightarrow N_{part}$)
- Measurements in pA ; How to emphasize the important of CNM ?
- Comover

Suggestions by Alexander

- 1) General regularities of fragment/particle production at high energy in the target kinematic region. Connection with mechanisms of nuclear reactions at low and intermediate energies.
 - a) Relation to the limiting fragmentation: Are mechanisms of particle production in the target region and mechanisms of excitation of nuclear residues universal ?
 - b) Fragment production - evaporation, fission, multifragmentation processes.
 - c) Phase transition in nuclear matter (liquid-gas type), Equation of state (EoS) of matter around normal nuclear and subnuclear densities.
 - d) Separation of processes taking place after primary hadron interactions from processes caused by electromagnetic interaction.
 - e) Applications for cosmic ray physics, space research.
- 2) Hypernuclear physics: New perspectives (in comparison with traditional hypernuclear studies).
 - a) Mechanisms of strangeness production in the target kinematic region, and its evolution with the beam energy.
 - b) Production of hypernuclei in the target and in midrapidity region. The transition from one to another regime.
 - c) Hypernuclear matter at normal nuclear and subnuclear densities: phase transitions in hypermatter, EoS of hypermatter.
 - d) Novel hypernuclei in the target region: exotic ones (like Λ -N-N), multistrange ones, nuclei around and beyond the drip lines. Dependence of their production on the beam energy and on the target isospin composition.

Single spin asymmetries

- Work on going on quarkonium+photon
- Clean probe of gluon Sivers effect
- We may need catchy cartoon to advertised the connection between the gluon Sivers effect (and possibly more exotic TMDs) and the angular momentum of the gluon \leftrightarrow proton spin

Energy ramp

- Luminosity in a given \sqrt{s} range ?
- Rates in a given \sqrt{s} range ?