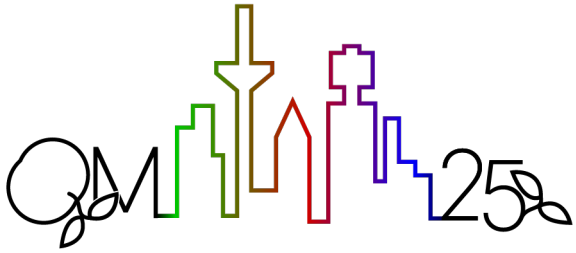

Contribution ID: **32** Type: **Oral**

Perturbative high-energy evolution in the IP-Glasma initial state

We include the perturbative JIMWLK energy evolution into the IP-Glasma initial state description used to simulate the early-time dynamics in heavy ion collisions. By numerically solving the JIMWLK equation on an event-by-event basis, we obtain the energy (Bjorken-x) dependent structure of the colliding nuclei. This enables us to predict how the initial state evolves when moving from RHIC to LHC energies. [1]

Previously, the energy dependence in IP-Glasma was introduced through a Bjorken-x dependent saturation scale extracted from fits to DIS structure data. In contrast, in our work we move beyond this parametrized approximation by providing a method to directly calculate the energy dependence. The energy-dependent initial state description is then coupled to relativistic hydrodynamics in the quark-gluon plasma phase and to the UrQMD hadronic afterburner, enabling us to simulate the full space-time evolution in heavy ion collisions. We demonstrate that incorporating the JIMWLK evolution significantly affects various flow observables.

The JIMWLK evolution applied in this work is constrained by the available J/ψ production data from HERA and from Ultra Peripheral Collisions at the LHC [2]. In addition to the JIMWLK-evolved initial state description, we determine an effective energy-dependent parametrization describing the energy-dependent nucleon structure, which can approximate the effect of JIMWLK evolution in IP-Glasma, enabling faster simulations.

References:
[1] H. Mäntysaari, B. Schenke, C. Shen, W. Zhao, in preparation.
[2] H. Mäntysaari, B. Schenke, F. Salazar, Phys.Rev.D 106 (2022) 7, 074019, arXiv:2207.03712 [hep-ph].

Category

Theory

Collaboration (if applicable)

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