The 38th International Symposium on Lattice Field Theory

LATTICE 21

JULY 26-30 2021, ZOOM/GATHER@MIT

Contribution ID: **219** Type: **Oral presentation**

# Transverse momentum broadening in real-time lattice simulations of the glasma

*Thursday, 29 July 2021 05:15 (15 minutes)*

The study of jets in heavy ion collisions provides important information about the interaction of partons with the medium that they traverse. The seeds of jets are highly energetic partons, which are produced from hard scatterings during the collision event. As such, they are affected by all different stages of the medium's time evolution, including the glasma, which is the pre-equilibrium precursor state of the quark-gluon plasma. I will report on our numerical lattice simulations of partons traversing the boost-invariant, non-perturbative glasma as created at the early stages of collisions at RHIC and LHC [1]. We find that partons quickly accumulate transverse momentum up to the saturation momentum during the glasma stage. Furthermore, we observe an interesting anisotropy in transverse momentum broadening of partons with larger broadening in the rapidity than in the azimuthal direction. Its origin can be related to correlations among the longitudinal color-electric and color-magnetic flux tubes in the initial state of the glasma. I will compare these observations to the semi-analytic results [2] obtained by a weak-field approximation, where we also find such an anisotropy in a parton's transverse momentum broadening.

[1] A. Ipp, D. I. Müller, D. Schuh, Phys. Lett. B 810 (2020), arXiv:2009.14206
https://doi.org/10.1016/j.physletb.2020.135810

[2] A. Ipp, D. I. Müller, D. Schuh, Phys. Rev. D 102 (2020), arXiv:2001.10001
https://doi.org/10.1103/PhysRevD.102.074001

**Primary author:** SCHUH, Daniel (Vienna University of Technology)

**Co-authors:** IPP, Andreas (TU Wien); Dr MUELLER, David (TU Wien)

**Presenter:** SCHUH, Daniel (Vienna University of Technology)

**Session Classification:** QCD at nonzero Temperature and Density

**Track Classification:** QCD at nonzero Temperature and Density