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Jet momentum broadening in real-time lattice simulations of the glasma

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The study of jets in heavy ion collisions provides important information about the interaction of partons with the quark-gluon plasma. Originating from hard scatterings among partons of the colliding nuclei, jets are affected by the entire space-time evolution of the medium, including the pre-equilibrium stage. I report on our numerical lattice simulations of jets traversing the boost-invariant, non-perturbative glasma as created at the early stages of collisions at RHIC and LHC [1]. We find that during the glasma stage, quark jets quickly accumulate transverse momentum up to the saturation momentum. Additionally, we observe a peculiar anisotropy in transverse momentum broadening of jets with more efficient broadening along rapidity compared to azimuthal broadening. The origin of this momentum broadening anisotropy can be traced back to correlations among the longitudinal color-electric and color-magnetic flux tubes in the initial state of the glasma.

[1] A. Ipp, D. I. Müller, D. Schuh, Phys. Lett. B 810 (2020), arXiv:2009.14206
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