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Transverse momentum broadening of jets in the weak field limit of the glasma

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The seeds of jets are highly energetic partons, which are produced from hard scatterings in heavy ion collisions. As such, they might be affected by the precursor state of the quark-gluon plasma, the so-called glasma, via strong classical color fields. Starting from the glasma initial conditions, the Yang-Mills equations are solved analytically to leading order within the weak-field approximation of the color glass condensate framework. In this talk I show how the transverse momentum of a parton is related analytically to the initial longitudinal flux tubes of the glasma in the weak field limit [1]. We find interesting features such as an anisotropy in transverse momentum broadening. This analytic treatment allows for a better understanding of the physical mechanisms behind momentum broadening in the glasma. Furthermore, it facilitates the interpretation of numerical results from lattice simulations, which are able to deal with non-perturbatively strong color fields required for realistic models of heavy ion collisions.

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

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