Contribution ID: **93**   Type: **not specified**

Numerical solution of the next to leading order BK equation

Friday 5 December 2014 18:30 (20 minutes)

"The Color Glass Condensate (CGC) effective field theory provides a consistent framework to describe high energy hadronic interactions where a small-x part of the hadron wave function is probed. In recent years it has been succesfully applied to phenomenology at leading order accuracy, see e.g. Ref. [1].

However the next to leading order corrections are potentially large, and thus an important next step to test the saturation picture of the CGC is to bring the CGC calculations to next to leading order accuracy. First steps in this direction have been taken by calculating the photon impact factor and the single inclusive cross sections at NLO [2,3].

An essential part of a fully consistent NLO CGC calculation is the solution to the NLO BK evolution equation which is derived in Ref. [4] but has not been numerically solved so far. We present the first numerical solution to the NLO BK equation in transverse coordinate space. We show that the solution has a problematic short distance behavior due to the nonconformal double logarithmic term in the kernel.

We also study the energy evolution of the so called conformal dipole whose NLO evolution equation, derived in Ref. [5], is conformally invariant except for the running of the coupling. We find that the problematic small distance behavior is only partially cured by the conformally symmetric evolution equation.

[1] T. Lappi, H. Mäntysaari, Phys.Rev. D88 (2013) 114020, arXiv:1309.6963 [hep-ph]
[2] G. A. Chirilli, B..W. Xiao, F. Yuan, Phys. Rev. D86 (2012) 054005, arXiv:1203.6139 [hep-ph]
[3] G. Beuf, Phys. Rev. D85 (2012) 034039, arXiv:1112.4501 [hep-ph]
[4] I. Balitsky, G. A. Chirilli, Phys. Rev. D77 (2008) 014019, arXiv:0710.4330 [hep-ph]
[5] I. Balitsky, G. A. Chirilli, Nucl. Phys. B822 (2009) 45, arXiv:0903.5326 [hep-ph]"

Author: Mr MÄNTYSAARI, Heikki (University of Jyväskylä)

Presenter: Mr MÄNTYSAARI, Heikki (University of Jyväskylä)

Session Classification: Sauvignon-3