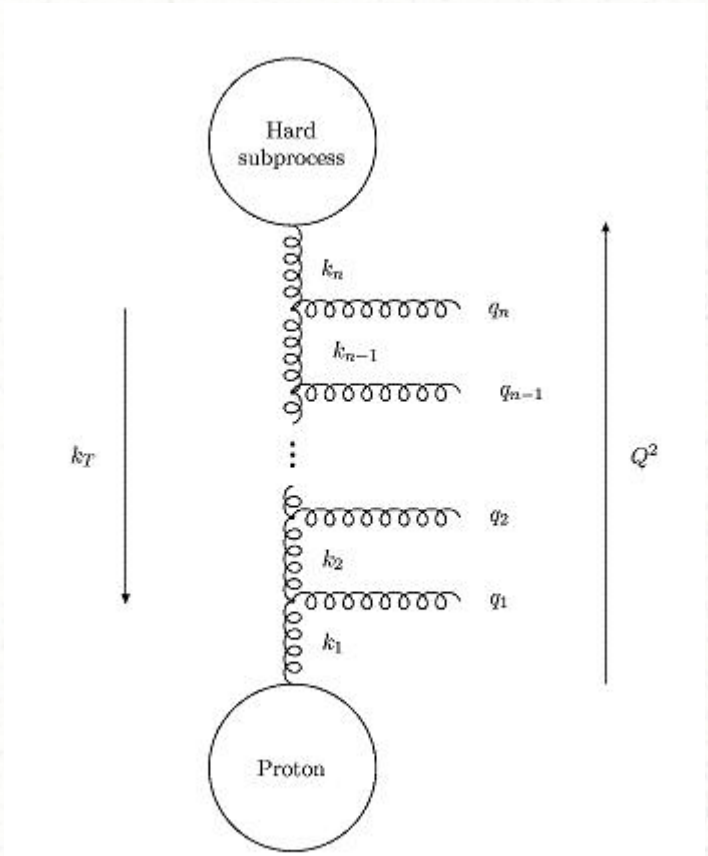
The kt-factorization phenomenology in the HRJRG-III

Artem Lipatov

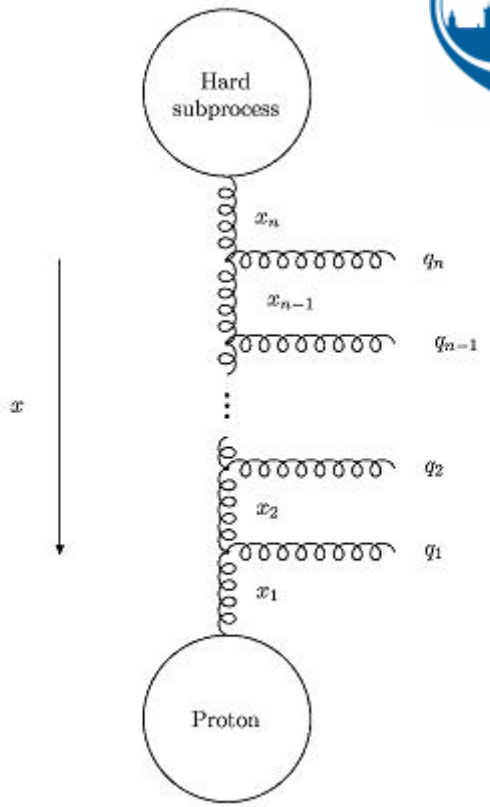
SINP MSU, Moscow, Russia

DGLAP



- strong ordering in Q^2
- resummation of the terms ~ $\ln Q^2$
- no kt of incoming partons
- on-shell hard matrix elements

BFKL



- no ordering in kt
- resummation of the terms ~ $\ln 1/x$
- non-zero kt of incoming partons
- unintegrated (kt-dependent) parton densities
- off-shell hard matrix elements

Our main goals in HRJRG-III

- to obtain the correct predictions of kt-factorization approach for high-energy QCD processes
  - off-shell matrix elements calculations for specific processes
  - studying of theoretical uncertainties

- to compare the predictions with the LHC data

- to implement new processes to the Monte-Carlo CASCADE

All studies will be processed in strong collaboration with Nikolai Zotov, Sergei Baranov, Maksim Malyshev, Hannes Jung and Mira Kraemer

Recent activities with kt-factorization

- Heavy flavour production at Tevatron and parton shower effects
  H. Jung, M. Kraemer, A.V. Lipatov, N.P. Zotov, 2010
- Prompt photon production at HERA (photo-production and DIS)
  S.P. Baranov, A.V. Lipatov, N.P. Zotov, 2010
- Inclusive W/Z boson production at Tevatron and LHC
  S.P. Baranov, A.V. Lipatov, N.P. Zotov, 2008 - 2009
- Prompt photon hadro-production at Tevatron (both inclusive and in association with the heavy quarks or their decay muons)
  S.P. Baranov, A.V. Lipatov, N.P. Zotov, 2008 - 2009
- Higgs + bb and Higgs + tt production at Tevatron and LHC
  A.V. Lipatov, N.P. Zotov, 2009

Our topics in HRJRG-III

- Heavy quarkonium (J/Ψ, Upsilon) production and their polarization properties at the Tevatron and LHC
- Inclusive and jet associated prompt photon production at the LHC
- Drell-Yan pair production at the Tevatron and LHC
- Charm & beauty production at the LHC
- Top production at the Tevatron and LHC