

Homework Exercises for QCD and Collider Physics

2005/2006

Exercises for Lecture 8 (11. Jan 2006)

Calculation for small x evolution equations:

- calculate non-Sudakov form factor without imposing the consistency constraint. Use the arguments of KMS in PRD 52 (1995) 1445. (Repeat from Lecture 6)

Calculation for Matrix Elements:

- calculate BGF diagram using massless quarks and $g_{\mu\nu}$ for the polarization sum of gluons and photons (but keeping photon virtual).
- repeat calculation of BGF, but now for off-shell (virtual) gluons. Use polarization vectors as given in lecture. What is the difference of ME compared to using $g_{\mu\nu}$?
- compare your result for off-shell BGF with the result in NPB 366 (1991) 135 on page 178ff for the photoproduction case.
- Calculate trace for virtual corrections (vertex and self energy), as shown in lecture. Compare your results with the ones in R. Field, Applications of Perturbative QCD, p31ff