Diffractive (dijet) production from the shock-wave method

LowX2016

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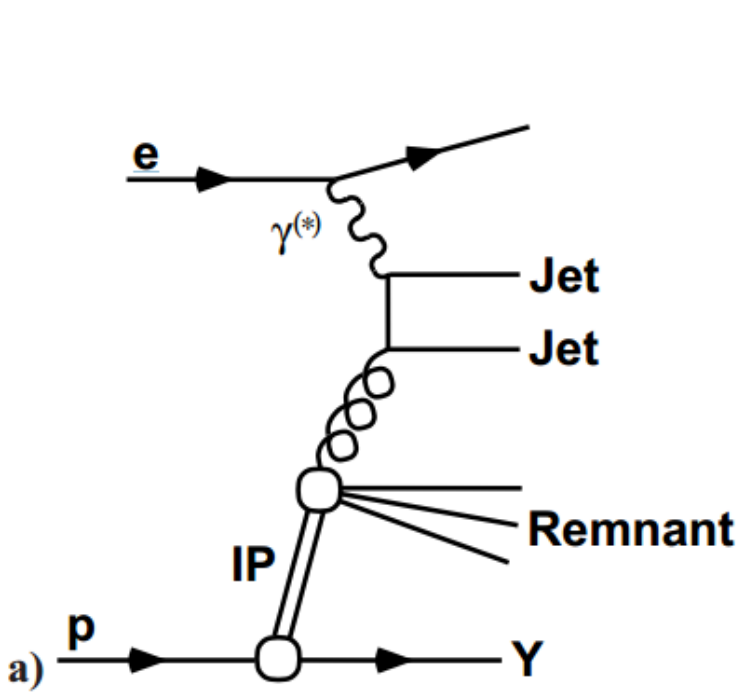
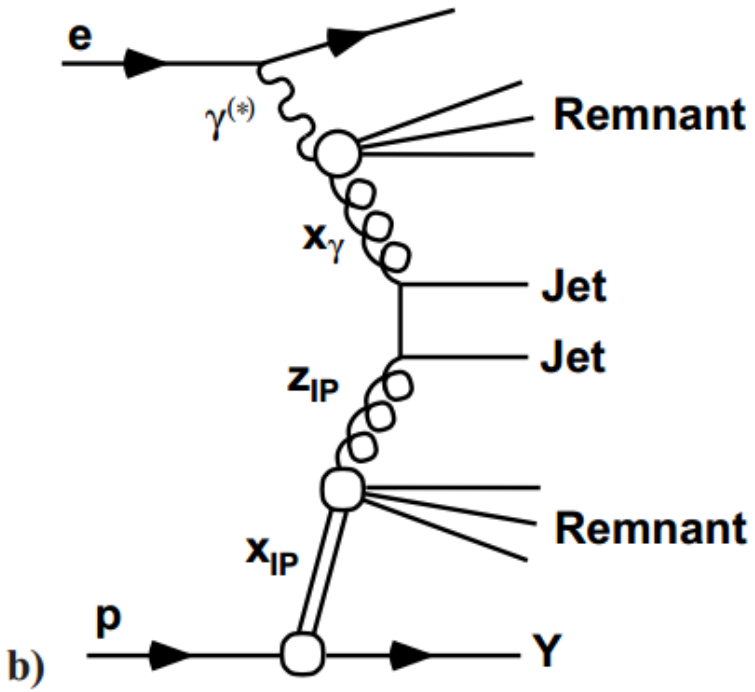
Theoretical approaches for DDIS using pQCD

Collinear factorization approach



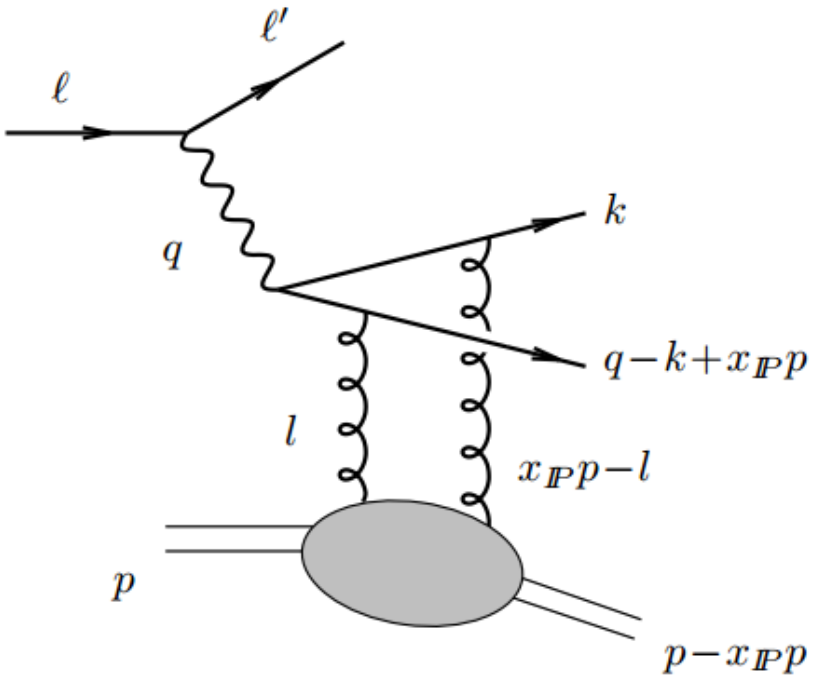
Direct



Resolved

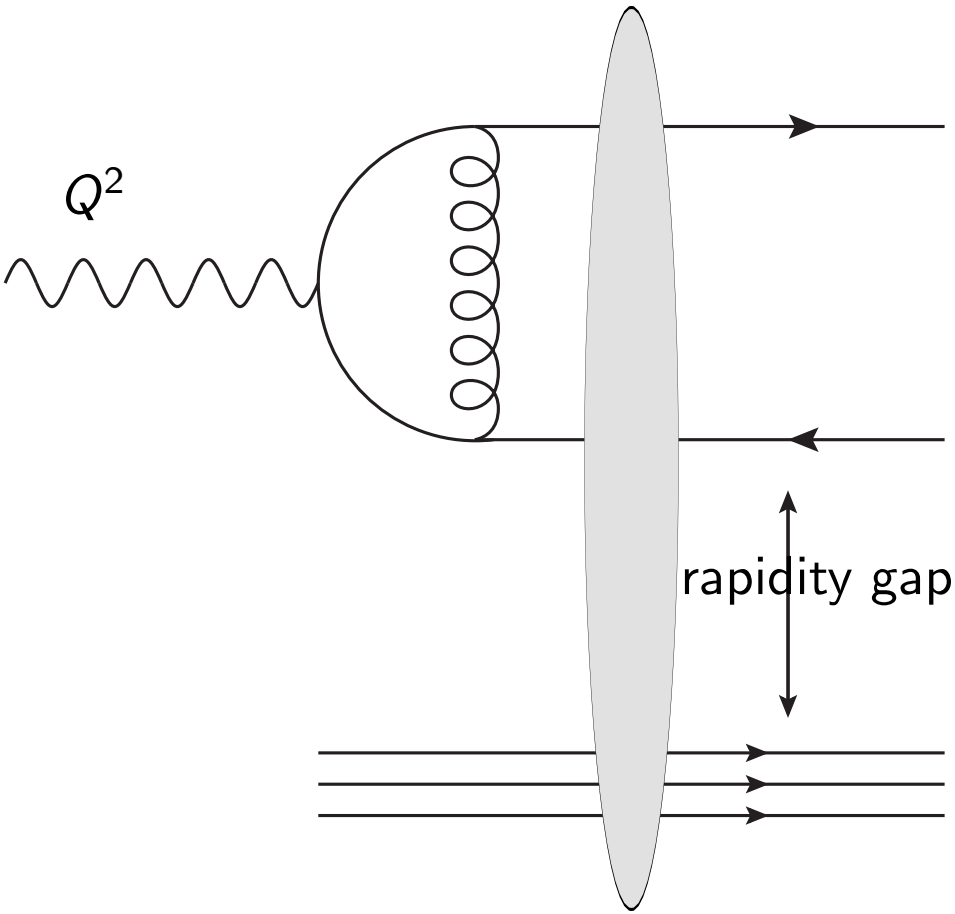
Theoretical approaches for DDIS using pQCD

k_T-factorization approach : two gluon exchange



Bartels, Ivanov, Jung, Lotter, WÃ¼sthoff
Braun and Ivanov developed a similar model in collinear factorization

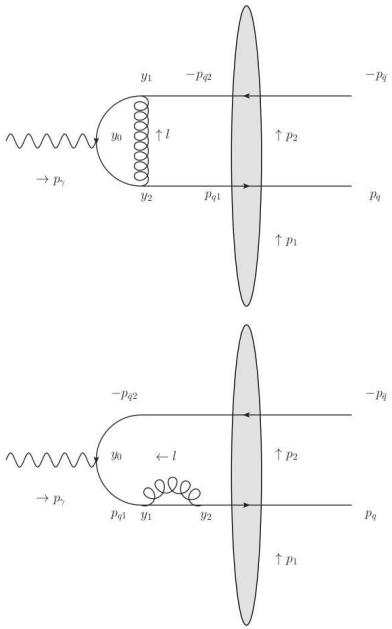
General amplitude

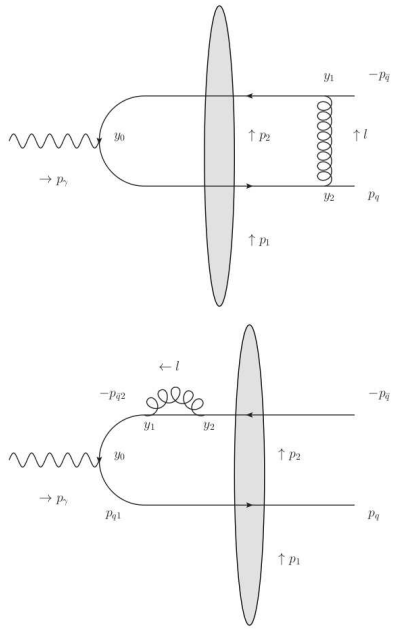


- Most general kinematics
- The hard scale can be Q^2, t or m^2 in the (future) massive extension of our computation.
- The target can be either a proton or an ion
- One can study ultraperipheral collision by tagging the particle which emitted the photon, in the limit $Q^2 \to 0$.

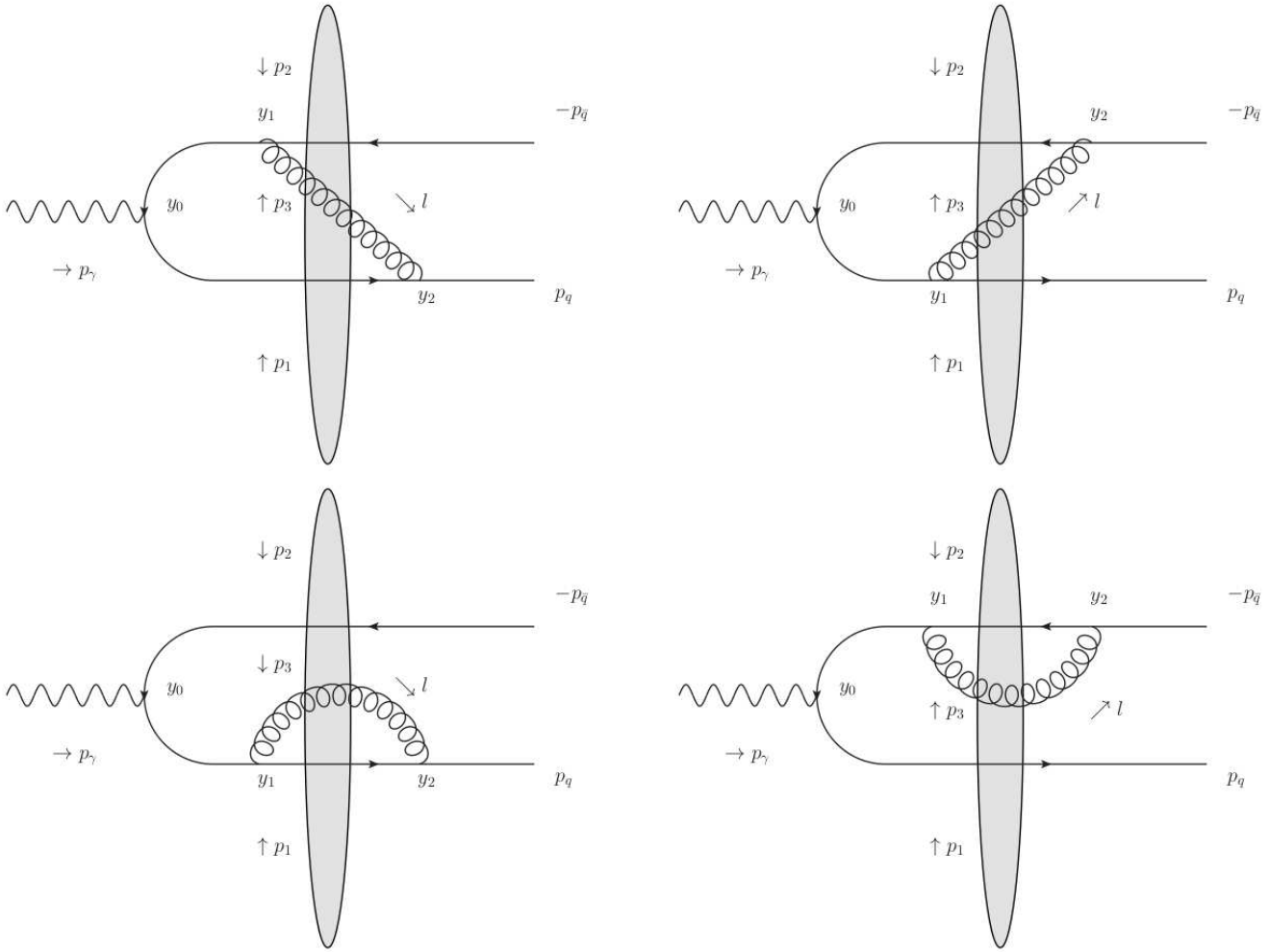
Figure: The general amplitude

First kind of virtual corrections

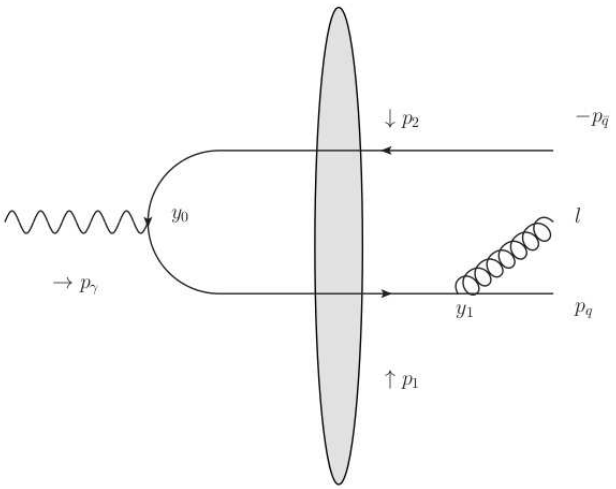


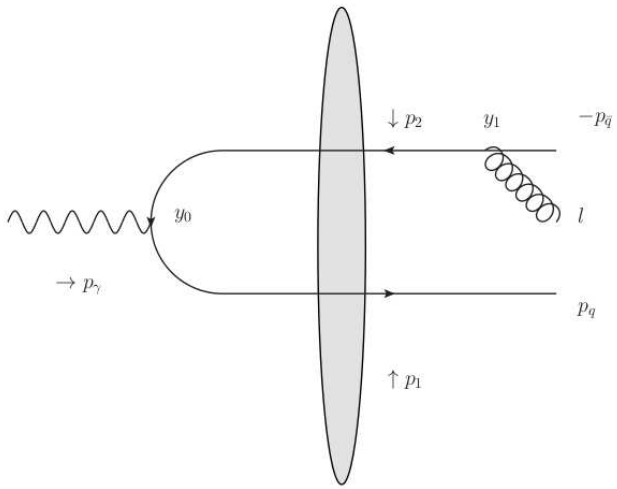


Second kind of virtual corrections

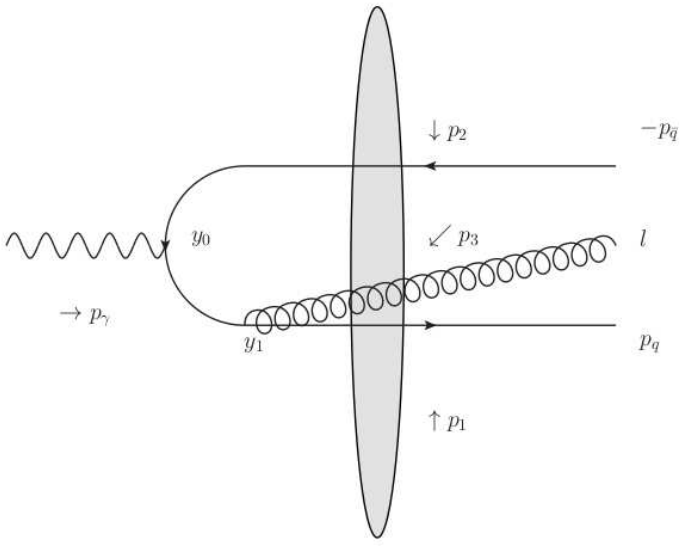


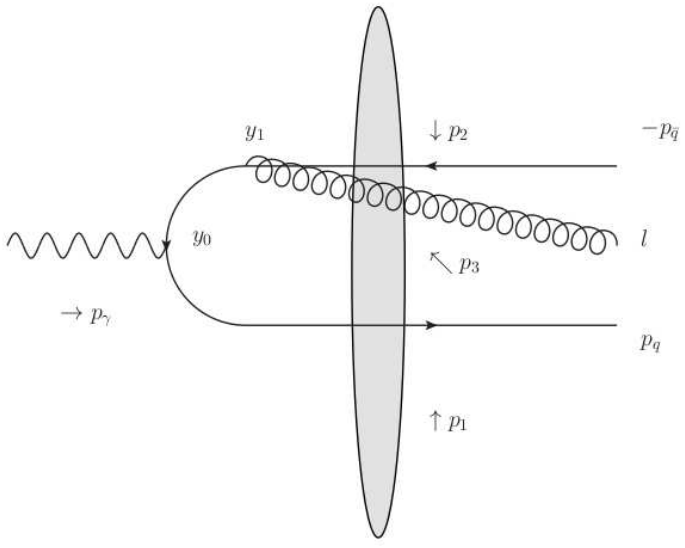
First kind of real corrections





Second kind of real corrections





Diffractive production of 2 jets

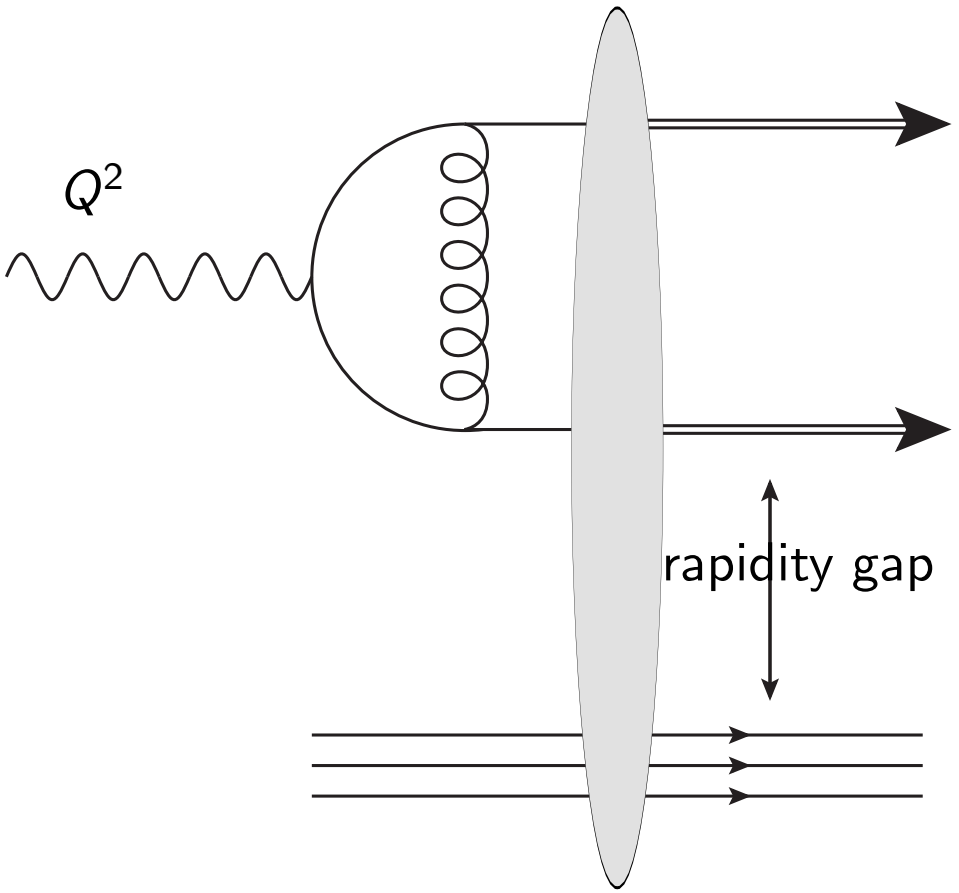


Figure: Amplitude for diffractive dijet production

Diffractive production of 3 jets (with LO accuracy)

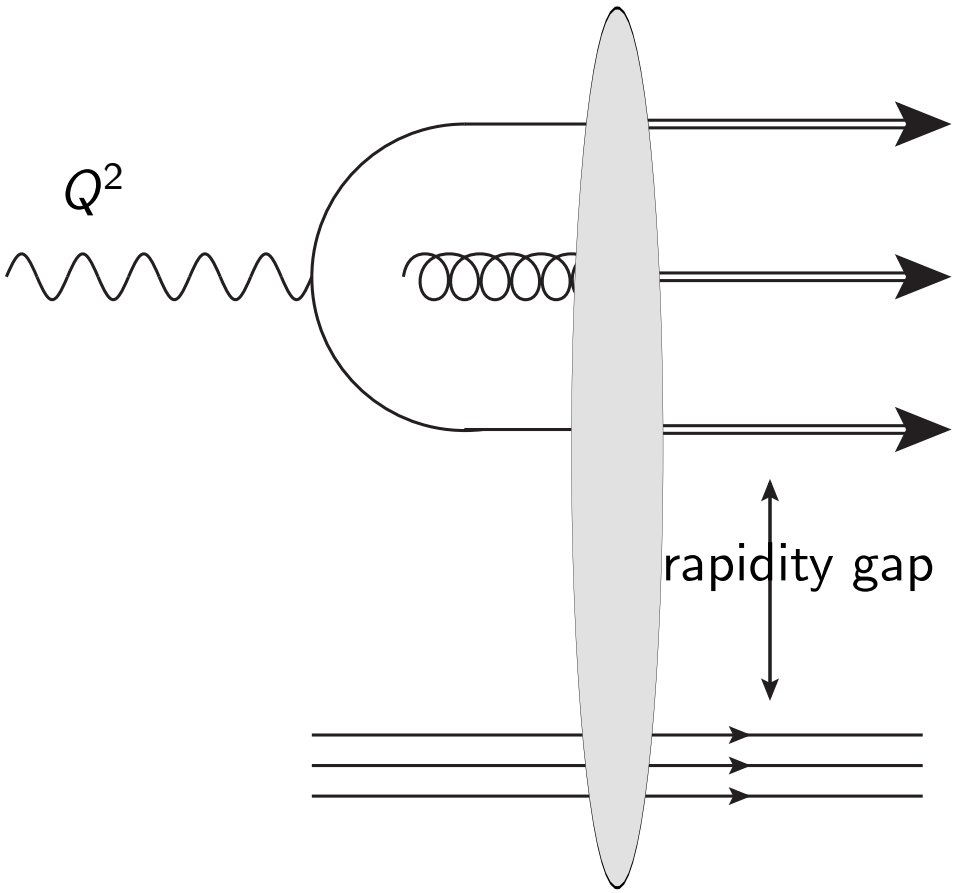


Figure: Amplitude for diffractive trijet production

NLO DIS

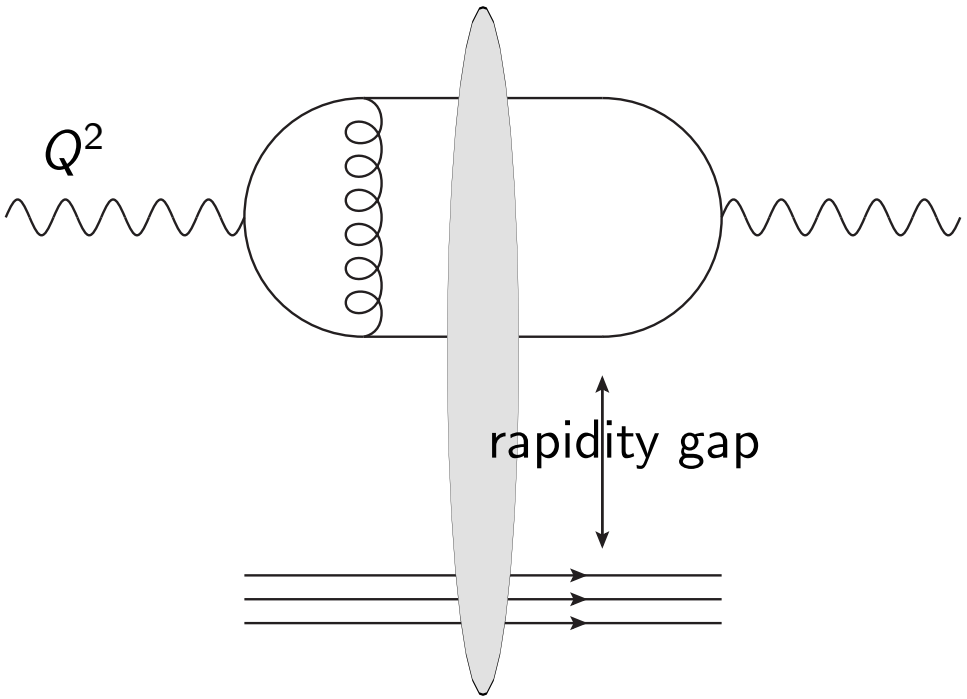


Figure: NLO DIS cross section

Diffractive production of a ρ meson

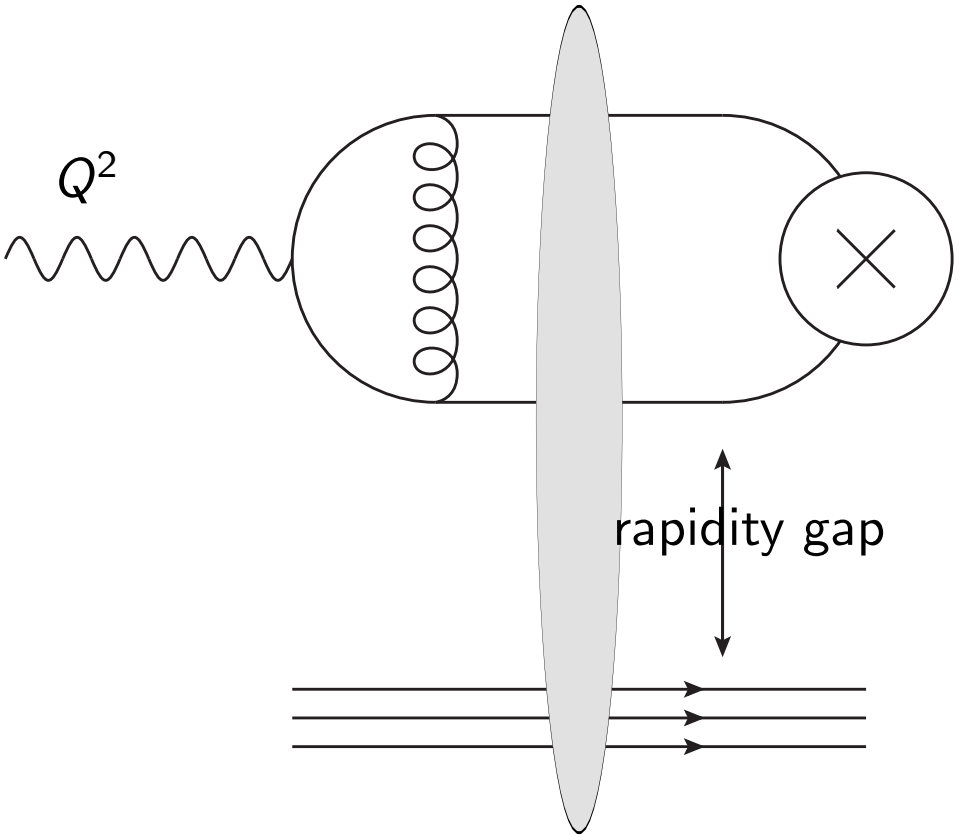


Figure: Amplitude for diffractive ρ production

With an added mass

- Open charm production (straightforward)
- Heavy charmonium production (in the Color Evaporation formalism)

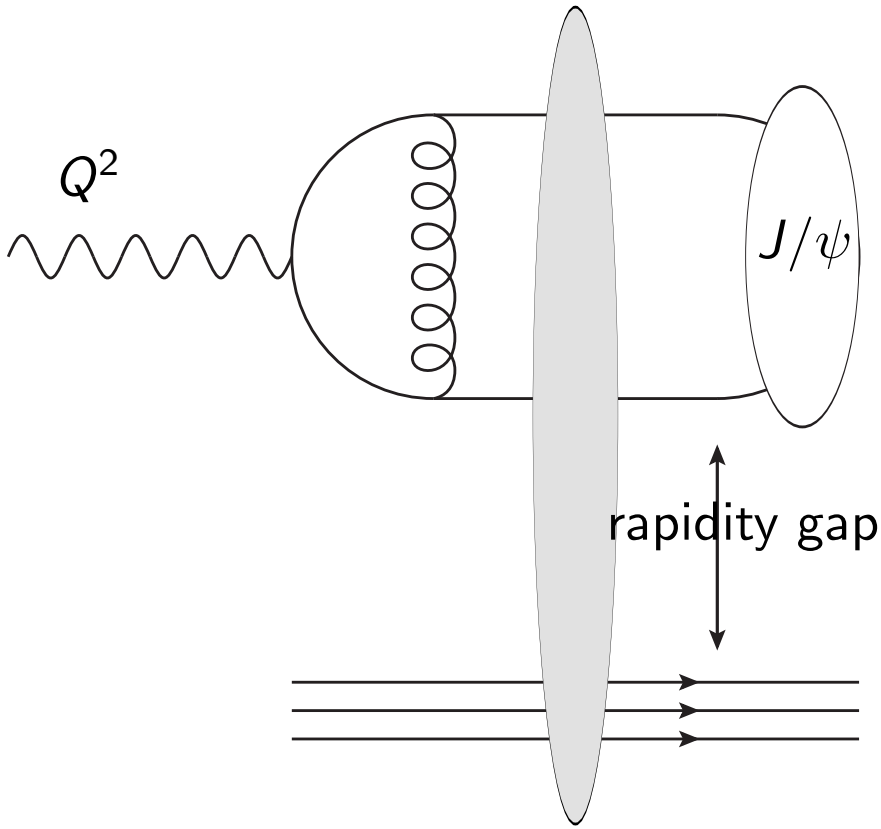


Figure: Amplitude for diffractive dijet production