Multiple Interactions and Diffractive Final States

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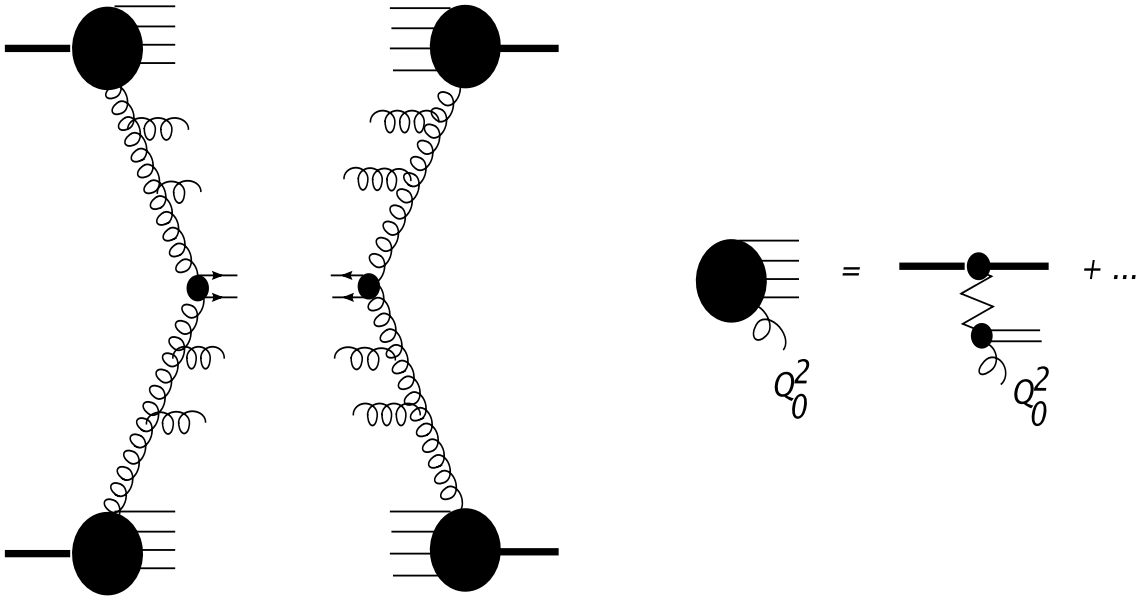
Hamburg, May 3, 2010

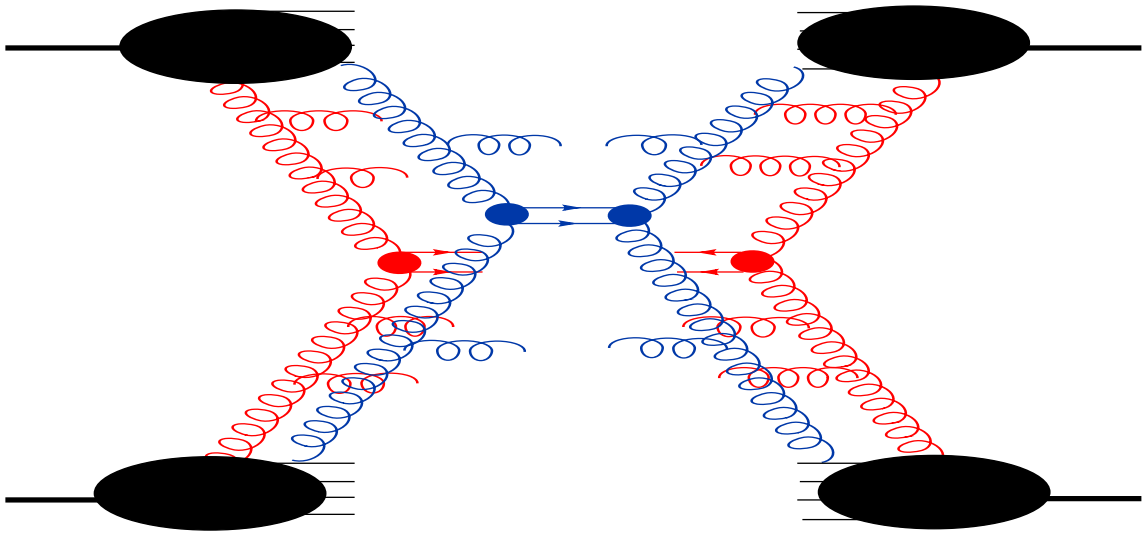
Introduction

Present status: (soft) diffractive final states are contained in the initial conditions to DGLAP evolution:



Included are diffractive final states only up to scale Q_0^2.

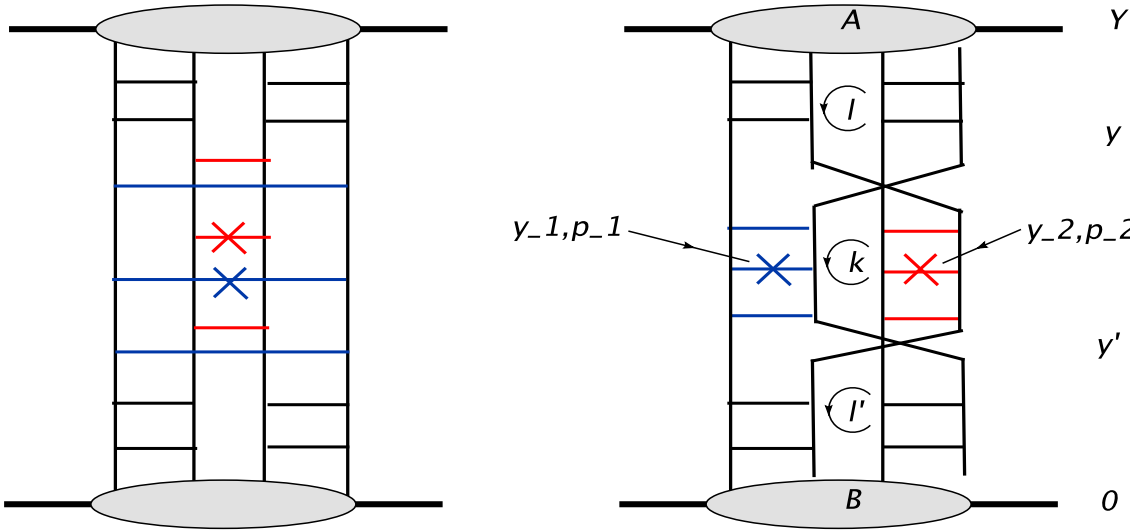
The same in two-chain events:



By construction: each chain is 'normal chain'

- zero momentum transfer
- color singlet
- no large rapidity gap between successive emissions
- soft Diffraction only in initial conditions, below scale Q_0^2.

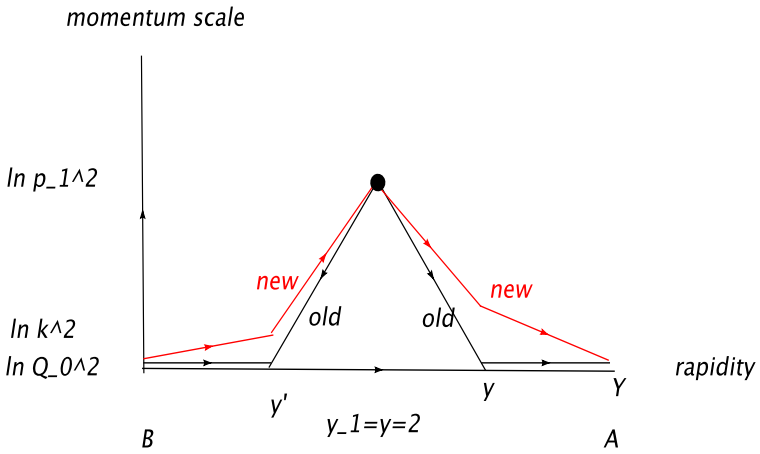
(Semi-)Hard diffraction needs two gluons in t-channel color singlet state.
Minimal mechanism: 'reconnection', 'switch'.

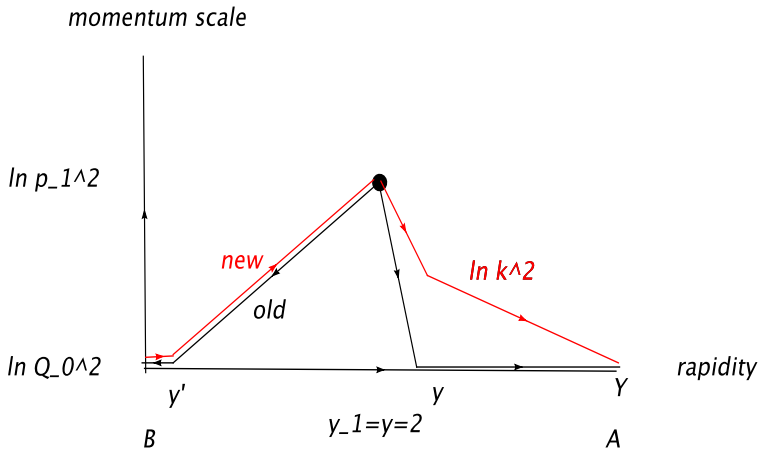


Characteristic features:

- three additional loop momenta
- evolution paths

Paths of evolution in rapidity and momentum scale:





For intermediate y, y: momentum scale k small, back to soft diffraction.
For y close to y_1, y_2: scale k^2 moves up, allows for harder diffraction.

'Reconnection' consistent with existing models of multiple interactions, but it enlarges the possibilities: allows for semihard diffraction.
Color suppression competes with combinatorics in multichain configurations.

To be done:

- numerical estimate
- Final states: color reconnection
- multiple reconnections
- consistency with initial and final state interactions: AGK rules.
- Triple pomeron vertex....