

Pomeron weights in QCD processes at high energy and the S -matrix unitarity constraint

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(ONLINE)

In this talk, I explore the fundamental nature of pomeron exchanges in high-energy hadronic collisions. Although various unitarization schemes of the elastic scattering amplitude satisfy the S -matrix unitarity constraint, I will argue that rational unitarization—such as the U -matrix, is more optimum for describing QCD processes at high energies than eikonal-like schemes. I will present results showing that the U -matrix scheme leads to enhanced fluctuations and stronger higher-order pomeron correlations, with a significant impact on multi-parton interactions, particularly double parton scattering. These features contrast with the more independent pomeron exchanges observed in the eikonal case. Crucially, I will show that the pomeron distribution is determined by the unitarization scheme used, and that this choice is not arbitrary if one seeks to model hadronic observables realistically at high and ultra-high energy.

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