

Unitarity effects in high-energy elastic scattering

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Abstract We investigate the high-energy behavior of the elastic scattering amplitude within two distinct unitarization frameworks: the eikonal and the U-matrix schemes. Our analysis begins with a purely Pomeron-based formalism, incorporating pion-loop insertions in the Pomeron trajectory to account for the nearest singularity imposed by t -channel unitarity. We then extend the framework to include the contribution of an Odderon. Particular attention is given to the existing tension between TOTEM and ATLAS measurements of the total cross section $\sigma_{tot}(s)$ and the differential cross section $d\sigma/dt$ at 7, 8, and 13 TeV. We explore the implications of these discrepancies for the structure and properties of both the Pomeron and the Odderon.

Presenter: LUNA, Emerson

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