Contribution ID: **1** Type: **not specified**

Precise determination of the Pomeron intercept via a scaling entropy analysis

Thursday 24 July 2025 10:45 (40 minutes)

(ONLINE)
Recent high-energy scattering data reveal that entropy-based observables offer a powerful new lens on the dynamics of hadron structure and particle production. In this talk, I present a unified framework in which **scaling entropy** derived from charged hadron multiplicity distributions and partonic transverse momentum fluctuations exposes a universal behavior across deep inelastic scattering and proton–proton collisions at the LHC. By analyzing entropy as a function of Bjorken-x, we determine the growth rate parameter λ, which is directly linked to the **Pomeron intercept** in Regge-inspired QCD evolution. This approach not only provides a precise extraction of the intercept but also demonstrates the breakdown of traditional KNO scaling in favor of a more fundamental **diffusion scaling** associated with gluon dynamics. We find that the entropy growth is consistent across experiments and energy scales, supporting its interpretation as a robust initial-state observable.

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Session Classification: Morning session 5

Track Classification: Theoretical models of diffraction: Phenomenological models