



## Hadron Phenomenology

## A Universal Evolution Equation for Elastic Scattering: Bridging Saturation and Small-x Dynamics >> Anderson Kohara – ESME Lyon, France

Elastic hadronic scattering remains a key subject for understanding the dynamics of strong interactions at high energies. In this seminar, I will present our recent work: a novel universal evolution equation for the differential cross section do/dt in hadron-hadron collisions. Inspired by the logistic equation, this approach captures the energy evolution of elastic distributions using established models as initial conditions. The equation involves two fundamental physical parameters: an effective coupling and an effective mass. A central contribution of this work is the identification of a formal

analogy with the BK and JIMWLK equations from small-x physics and the Color Glass Condensate (CGC) framework. This connection highlights surprising links between saturation phenomena in elastic scattering and gluon dynamics at small-x. Finally, I will discuss the implications of these results for forward elastic scattering, dispersion relations, and the analytic structure of scattering amplitudes.



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