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Inelastic proton cross-section at 13 TeV with ATLAS

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The inelastic cross-section is a basic property of the proton, yet it cannot be calculated from theory. In 1973 experiments at CERN discovered that it rises with energy—as Heisenberg predicted. Today, the LHC sets the energy frontier at 13 TeV, and theory predicts an asymptotic “black-disk” limit.

I will present a recent measurement of the inelastic cross-section at 13 TeV with the ATLAS detector, extracted with independent measurements of the rate of inelastic collisions and the LHC luminosity. I will also show the connection of this result with cosmic ray experiments.

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