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On the asymptotic behaviour of parton distribution functions at small and large x

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The behaviour of parton distribution functions (PDFs) at sufficiently small and large values of momentum fractions is expected to be governed by a power law, as a result of Regge theory and spectator counting rules respectively. I investigate in which regions of momentum fraction and energy such an asymptotic behaviour emerges, based on recent determinations of PDFs from a global analysis of experimental data. I discuss how these compare with theoretical expectations provided by perturbative and non-perturbative quantum chromodynamics (QCD) and models of nucleon structure. I examine how much the latter can be discriminated by the data, and I comment on how these are related to our first-principle understanding of QCD.

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