Traveling wave solution of the Reggeon Field Theory

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We identify the nonlinear evolution equation in impact-parameter space for the Supercritical Pomeron" in Reggeon Field Theory as a 2-dimensional stochastic Fisher-Kolmogorov-Petrovski-Piscounov equation. It exactly preserves unitarity and leads in its radial form to an high energy traveling wave solution corresponding to anuniversal" behaviour of the impact-parameter front profile of the elastic amplitude; Its rapidity dependence and form depend only on one parameter, the noise strength, independently of the initial conditions and of the non-linear terms restoring unitarity. Theoretical predictions are presented for the three typical distinct regimes corresponding to zero, weak and strong noise. They have phenomenological implications for total and differential hadronic cross-sections at colliders.

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