An Account of Regge Asymptotics of the Scattering Cross-Section In the Theory of Multiple Scattering in Amorphous Media

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The Bethe-Moliere theory of high-energy multiple scattering is revised. Consequences of introducing to the theory of Regge asymptotic behaviour for an elementary cross-section, $\sigma(q) \sim q^{-4+4\alpha}$, $\alpha > 0$ are analysed. It is shown, that replacing the logarithmic behaviour by a power one leads to a formula for for the distribution function in the form of a certain integral, which is positive and monotonic function of q. That can be regarded as an improvement as compared with the Bethe-Moliere expansion, which when cut off can give a negative probability. We argue, that the right way of approaching the singular point $\alpha = 0$ is from the side of positive values, and it turns out, that in this limit $\alpha \to +0$ the theory as whole does not turn into the Bethe-Moliere one. In the area of single scattering (large q) we obtain a linear growth with time, that seems more natural, then the logarithmical evolution in the Bethe-Moliere theory.

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