

Quantum interference in showering: LPM effect for sequential bremsstrahlung

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High-energy particles passing through matter lose energy by showering via hard bremsstrahlung and pair production. At very high energy, the quantum duration of each splitting process, known as the formation time, exceeds the mean free time for collisions with the medium, leading to a significant reduction in the splitting rate, known as the Landau-Pomeranchuk-Migdal (LPM) effect. In the QCD case, there are important and potentially important corrections to the usual treatment of the LPM effect, arising from cases where the coherence lengths of two consecutive splitting processes overlap. I will discuss the computation of such corrections beyond leading-log approximation.

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