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Effects of Multiple Scattering and Target Structure on Photon Emission *

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Abstract

The Landau-Pomeranchuk-Migdal effect is the suppression of Bethe-Heitler radiation caused by multiple scattering in the target medium. The quantum treatment given by S. D. Drell and the author for homogeneous targets of finite thickness will be reviewed. It will then be extended to structured targets. In brief, it is shown that radiators composed of separated plates or of a medium with a spatially varying radiation length can exhibit unexpected structure, even coherence maxima and minima, in their photon spectra. Finally, a functional integral method for performing the averaging implicit in multiple scattering will be briefly discussed and the leading corrections to previous results evaluated.

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