

Nonlinear Compton Scattering in Time-Dependent Electric Fields: LCFA and Beyond

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Locally constant crossed field approximation (LCFA) is a powerful tool for theoretical and numerical studies of strong-field QED processes. LCFA probabilities are implemented in all the modern codes capable of simulating laser-matter interactions at extreme intensities. Nevertheless, the validity of LCFA is yet rigorously derived only in-plane wave-like fields. This is a good model for a single laser pulse, but the list of potentially interesting field configurations is wider. In particular, the fields composed by a collision of several laser pulses are beneficial for producing QED cascades and look more like a rotating electric field. In the talk, we consider Nonlinear Compton Scattering in a time-dependent electric field (a rotating electric field is a particular example of such configuration) and discuss in detail the range of applicability of LCFA and corrections to it.