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P1.2022 A novel approach to the study of electron dynamics in colliding laser fields

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See the full abstract here:
http://ocs.ciemat.es/EPS2019ABS/pdf/P1.2022.pdf

We show that the proper choice of canonical variables and effective time, such that the new Hamiltonian is conserved for electrons in a dominant laser field, greatly simplifies analytical treatment of the problem. For example, for the case of counter propagating planar laser beams and dominant laser with relativistic intensity, a>1, such approach allows an exhaustive analytic analysis of electron dynamics. We find that for the amplitude a1 of a weaker laser (a_1 <a) exceeding the threshold value a_th, a_th~a^-3«a, stochastic acceleration of electrons becomes possible within some range of electron kinetic energy. Maximum electron kinetic energy, which could be gained under stochastic acceleration, significantly exceeds the ponderomotive scaling for the dominant laser when the ratio, k1, of perturbative to dominant laser frequencies is relatively small, k1a (in this case, energetic electrons move in the direction of the propagation of the dominant laser beam) and for large k_1, $such that k_1 > a^2 > 1, providing that (a^2/k1)4/3 < a\_1/a < 1 (where energetic electrons move in the direction of the propagation of the perturbative laser beam). The results of numerical solu stationary electromagnetic fields, in intense laser and Langmuir waves, etc.$

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