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P2.2014 Ponderomotive and resonant effects in the acceleration of particles by electromagnetic modes

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See the full abstract here:
http://ocs.ciemat.es/EPS2019ABS/pdf/P2.2014.pdf

In the present analysis we study the dynamics of charged particles under the action of slowly modulated electromagnetic carrier waves. With the use of a high-frequency laser mode along with a modulated static magnetic wiggler, we show that the ensuing total field effectively acts as a slowly modulated high-frequency beat-wave field typical of inverse free-electron laser schemes. This effective resulting field is capable of accelerating particles in much the same way as space-charge wake fields do in plasma accelerators, with the advantage of being more stable than plasma related methods. Acceleration occurs as particles transition from ponderomotive to resonant regimes, so we develop the ponderomotive formalism needed to examine this problem. The ponderomotive formalism includes terms that, although not discussed in the usual applications of the approximation, are nevertheless of crucial importance in the vicinity of resonant capture. The role of these terms is also briefly discussed in the context of generic laser-plasma interactions.
References
[1] I. Almansa, F.B. Russman, S. Marini, E. Peter, G.I. de Oliveira, R. A. Cairns, F.B. Rizzato. Ponderomotive and resonant effects in the acceleration of particles by electromagnetic modes. Physics of Plasmas, Accepted for Publication, 2019.
[2] S. Marini, E. A. Peter, G. I. de Oliveira, and F. B. Rizzato, Phys. Plasmas 24, 093113 (2017)

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