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P2.2026 Effect of Schott term in Lorentz-Abraham-Dirac equation

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See the full abstract here
http://ocs.ciemat.es/EPS2019ABS/pdf/P2.2026.pdf

Laser focused intensity has been increasing since its invention, and is going to reach 1024 W/cm2 and beyond. These intense fields open the new regime of laser-matter interactions. One of the effect playing an important role in laser-matter interaction in this regime is a radiation reaction effect which is a back reaction of the radiation emission from an accelerating electron onto the motion of the electron itself. Numerical investigations on the laser-plasma interactions including radiation reaction effect showed that high energy photons are emitted from laser-generated plasma, resulting in a possibility of generating an intense and collimated laser-driven -ray source. In order to correctly describe the motion of electrons under these strong electromagnetic fields, the radiation reaction effect should be taken into account in the equation of motion. One of the candidate for the equation of motion of the radiating electron is the LorentzAbraham-Dirac (LAD) equation [1], which is a Lorentz covariant expression including the self-force derived by Lorentz, and relativistically generalized by Abraham. The LAD equation, however, leads to unphysical solutions such as a run-away solution, or a solution with pre-acceleration. In this work, we pay attention to the Schott term in the LAD equation, which is the third time derivative with respect to the proper time, and plays an important role in the behavior of the solution. We investigate the effect of the Schott term on the behavior of the solution, and its role in the energy dissipation and exchange with fields.
[1] P.M.Dirac, Proc. R. Soc. A 167, 148 (1938).

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