

Abstract Submitted
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Transverse Plasmon Wakes in the Electron Gas ZACHARY LEVINE, NIST, ERIC COCKAYNE, NIST — Relativistic electrons have transverse electric fields comparable in magnitude to the longitudinal fields. We determine the relative effects of transverse and longitudinal fields of a moving point charge on the dielectric response of a uniform electron gas, using Lindhard's longitudinal and transverse dielectric functions and, separately, the Drude dielectric function. In the direction of motion, the transverse wake fields are approximately $-v^2/c^2$ times the longitudinal wake fields. The stopping power, as determined by applying Poynting's theorem, is reduced. Perpendicular to the direction of motion, the transverse wake fields are small compared to the longitudinal fields. Electromagnetic fields of a moving point charge are given in Fourier space for the Lorentz, Hamiltonian, and Coulomb gauges.

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