

Abstract Submitted
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Microscopic model of the nonlocal response of metamaterial plasmonic structures JIANTAO KONG, KRZYSZTOF KEMPA, Boston College — Nonlocal effects are generally omitted in typical approaches to calculating the electromagnetic response of the metamaterial plasmonic structures. In some situations, however, where the electron momenta far exceed those of photons, nonlocal corrections are essential. In this work, we investigate simple models of the nonlocal dielectric functions, based on the d-function formalism of Feibelman [1,2], and assess their validity by comparing with experiments. We show, that the applicability of the commonly used hydrodynamic approximation is very limited, since it often strongly overestimates the nonlocal response. [1] Feibelman, Prog. Surf. Sci. 12, 287 (1982); Phys. Rev. B 40, 2752 (1989) [2] Liebsch, Phys. Rev. B 48, 15 (1993)

Jiantao Kong
Boston College

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