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Title:THz generation from plasmonic nanoparticle arrays

Authors:Polyushkin, D.K. (1); Hendry, E. (1); Stone, E.K. (1); Barnes, W.L. (1)

Author affiliation:(1) School of Physics and Astronomy, Exeter EX4 4QI, United Kingdom

Corresponding author:Barnes, W.L.(w.l.barnes@exeter.ac.uk)

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Abstract:We investigate the generation of THz pulses when arrays of silver nanoparticles are irradiated by femtosecond laser pulses, providing the first reproducible experimental evidence in support of recent theoretical predictions of such an effect. We assess our results in the context of a model where photoelectrons are produced by plasmon-mediated multiphoton excitation, and THz radiation is generated via the acceleration of the ejected electrons by ponderomotive forces arising from the inhomogeneous plasmon field. By exploring the dependence of the THz emission on the femtosecond pulse intensity and as a function of metal nanoparticle morphology, and by comparing measurements to numerical modeling, we are able to verify the role of the particle plasmon mode in this process.

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