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Title:Resonant plasmonic effects in periodic graphene antidot arrays

Authors:Nikitin, A.Yu. (1); Guinea, F. (2); Martin-Moreno, L. (1)

Author affiliation:(1) Instituto de Ciencia de Materiales de Arag n, Departamento de F sica de la Materia Condensada, CSIC-Universidad de Zaragoza, E-50009, Zaragoza, Spain; (2) Instituto de Ciencia de Materiales de Madrid, CSIC, Cantoblanco, E-28049 Madrid, Spain

Corresponding author:Nikitin, A.Yu.(alexeynik@rambler.ru)

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Abstract:We show that a graphene sheet perforated with micro- or nano-size antidots has prominent absorption resonances in the microwave and terahertz regions. These resonances correspond to surface plasmons of a continuous sheet perturbed by a lattice. They are excited in different diffraction orders, in contrast to cavity surface plasmon modes existing in disconnected graphene structures. The resonant absorption by the antidot array can essentially exceed the absorption by a continuous graphene sheet, even for high antidot diameter-to-period aspect ratios. Surface plasmon-enhanced absorption and suppressed transmission are more efficient for higher relaxation times of the charge carriers. © 2012 American Institute of Physics.

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