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Localized plasmons around impurities in graphene HARI DAHAL, Los Alamos National Lab, RODRIGO MUNIZ, STEPHAN HAAS, Department of Physics and Astronomy, University of Southern California , ALEXANDER BALATSKY, Theoretical Division and Center for Integrated Nanotechnology, Los Alamos National Laboratory — We explore the collective plasmonic excitations in graphene, in particular localized modes around impurities. We show that the impurity can be used to tune the dielectric response of graphene, thus making it a natural plasmonic material. We focus on the dependence of spatial modulation and frequency of localized plasmons on the electronic filling and impurity strength and show that these parameters can be tuned to control some targeted features of the plasmonic modes. It is possible to verify our predictions through scanning tunneling microscope experiments.

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