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Collective modes in gapped bilayer graphene¹

CHRISTOPHER TRIOLA, ENRICO ROSSI, Department of Physics,
College of William and Mary, Williamsburg, VA 23188, USA — We calculate the polarizability of gapped bilayer graphene using the four-band continuum model. In the presence of a gap the four-band model and the simplified two-band model return bands that are qualitatively different especially at low energies. We find that because of these differences the static polarizability obtained using the four-band model is qualitatively different from the one obtained using the two-band model. We also find that the differences between the two-band model and the four-band model profoundly affect the dynamical dielectric function, and therefore the properties of the plasmon modes. In addition, we study the effect of trigonal warping and find that it qualitatively modifies the density response function.

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- Prefer Oral Session
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Christopher Triola
ctriola@email.wm.edu
Department of Physics, College of William and Mary,
Williamsburg, VA 23188, USA

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