

Abstract Submitted
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Casimir Interaction Between Graphene and Planar Systems¹

DAVID DROSDOFF, LILIA WOODS, University of South Florida — Casimir forces become increasingly important as systems become miniaturized. Such fluctuation forces are studied between graphene, a potential future substitute for silicon based electronics, and other materials. Because graphene is one atomic layer thick, the Casimir force is relatively weak. Yet its singular electronic properties give rise to an attraction between graphene layers in the order of a factor of $\alpha \approx 1/137$ times smaller than the interaction between two ideal metal plates. For the case of the interaction between graphene and metamaterials, a strong reduction in the Casimir attraction or even repulsion may be found if the metamaterial is mostly magnetic in nature. Metamaterials with strong magnetic responses in the optical range may soon be possible as the rapid development of metamaterials continue. Other graphene configurations with metals and metamaterials are also studied.

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