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**Interaction-Enhanced Coherence in Graphene and Topological Insulator Bilayers**[1] INTI SODEMANN, DMYTRO PESIN, ALLAN MACDONALD, University of Texas at Austin — We analyze the interlayer coherence properties of graphene and topological insulator electron-hole bilayers by solving imaginary-axis Dirac-model gap equations in the random phase approximation. By accounting self-consistently for the dynamical screening of Coulomb interactions in the gapped phase, we find that the gap can rise to values of the order of the Fermi energy in the strong interactions regime. For graphene, we comment on the supportive role of remote bands not included in our two-band Dirac model.

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