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Enhancement of Coulomb drag in double-layer graphene structures by plasmons and dielectric background inhomogeneity SAMVEL M. BADALYAN, FRANCOIS M. PEETERS, Department of Physics, University of Antwerp, Groenenborgerlaan 171, B-2020 Antwerpen, Belgium — The drag of massless fermions in graphene double-layer structures has been investigated over a wide range of temperatures and interlayer separations. We have shown [1] that the inhomogeneity of the dielectric background in such graphene structures, for experimentally relevant parameters, results in a significant enhancement of the drag resistivity. At intermediate temperatures the dynamical screening via plasmon-mediated drag enhances the drag resistivity and results in an upturn in its behavior at large interlayer separations. In a range of interlayer separations, corresponding to the crossover from strong to weak coupling of graphene layers, we find that the decrease of the drag resistivity with interlayer spacing is approximately quadratic. This dependence weakens below this range of interlayer spacing while for larger separations we find a cubic (quartic) dependence at intermediate (low) temperatures.

[1] S. M. Badalyan and F. Peeters, Phys. Rev. B **86**, 121405(R) (2012).

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