Abstract Submitted
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Plasmon dispersion and Coulomb drag in low-density electron bi-layers[1] S. M. BADALYAN, Yerevan State University, C. S. KIM, Chonnam National University, G. VIGNALE, University of Missouri, G. SENATORE, University of Trieste — We investigate the effect of exchange and correlation (xc) on the plasmon spectrum and the Coulomb drag between spatially separated low-density two-dimensional electron layers. We adopt a new approach, which employs dynamic xc kernels in the calculation of the bi-layer plasmon spectra and of the plasmon-mediated drag, and static many-body local field factors in the calculation of the particle-hole contribution to the drag. We observe that both optical and acoustical plasmon modes are strongly affected by xc corrections and shift in opposite directions with decreasing density. This is in stark contrast with the tendency observed within the random phase approximation (RPA). We find that the introduction of xc corrections results in a significant enhancement of the transresistivity and qualitative changes in its temperature dependence. In particular, the large high-temperature plasmon peak that is present in the RPA is found to disappear when the xc corrections are included. Our numerical results are in good agreement with the results of recent experiments by M. Kellogg *et al.*, Solid State Commun. **123**, 515 (2002).

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