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Plasmon Enhanced Drag Measurements at Low Densities YUKO SHIROYANAGI, GOKUL GOPALAKRISHNAN, SANGHUN AN, SARAH PARKS, THOMAS GRAMILA, Ohio State University, LOREN PFEIFFER, KEN WEST, Bell Labs, Lucent Technologies — The plasmons of the two-dimensional electron gas(2DEG) can provide valuable information about electronic many-body correlation effects, while electron drag provides a unique method to probe electron-electron scattering processes in a double layer 2DEG system. An enhancement of electron drag by plasmons was predicted[1] and subsequently observed[2,3]. Experimental studies of the strength of the plasmon enhancement as a function of relative density, however, revealed that the maximum enhancement occurred for mis-matched layer densities, in disagreement with theoretical expectation. It has been argued that this results from correlation effects, in particular the presence of multi-particle excitations. We report new measurements of plasmon enhanced drag, which examine lower overall electron densities than had been reported earlier. Since correlation effects are stronger for lower densities, these measurements provide a means to test the role of correlations in determining the dependence of plasmon enhanced drag on relative densities. [1] K.Flensberg and B.Y.K.Hu, PRL 73, 3572(1994). [2] N.P.R.Hill et.al. PRL 78, 2204(1997). [3] H.Noh, S.Zelakiwicz, X.G.Feng, and T.J.Gramila PRB 58, 12621(1998).

Yuko Shiroyanagi
Ohio State University

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