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Large-filling-factor giant Shubnikov-de Haas oscillations in the ultrahigh-mobility two-dimensional GaAs/AlGaAs electron system ZHUO WANG, RAMESH.G. MANI, GEORGIA STATE UNIVERSITY, WERNER WEGSCHEIDER, ETH Zurich — The observation of microwave-induced zero-resistance states (ZRS) produced new interest in transport studies of very high filling factors in the high mobility GaAs/AlGaAs 2D electron system. In particular, there has been interest in the study of the overlap of such ZRS with high filling factor quantum Hall effect.[1] Ref. 1 reported different phase relations between oscillatory resistances at high filling factors. In an effort to clarify the observations, we examine the influence of a dc current bias on the lineshape of oscillatory resistances in the ultrahigh-mobility two-dimensional GaAs/AlGaAs electron system. With increasing dc current bias, a change is also observed in the characteristic lineshape of the SdH oscillations. To quantify the change, we carry out lineshape fits of the oscillatory resistance obtained at different dc bias. In this talk, we will summarize the results of the study. [1] R. G. Mani, W. B. Johnson, V. Umansky, V. Narayanamurti, and K. Ploog, Phys. Rev. B 79, 205320 (2009).

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