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Exciton Formation in Coulomb Drag Measurements of Electron-Hole Bilayers J.A. SEAMONS, C.P. MORATH, J.L. RENO, M.P. LILLY, Sandia National Laboratories — Since it was predicted over two decades ago, there has been intense interest in exciton condensation in coupled-well bilayer systems. While exciton condensation effects have been evident in optically-generated indirect excitons and quantum Hall bilayers, transport experiments in electron-hole bilayers in the regime of exciton condensation have proven to be extremely difficult. Results of Coulomb drag (ρ_{DRAG}) measurements at zero magnetic field on new undoped electron-hole bilayer devices formed in GaAs/$Al_{0.9}Ga_{0.1}$As double quantum well heterostructures are presented. For devices with 30 nm barriers ρ_{DRAG} demonstrates T^2 behavior consistent with two Fermi liquids. In 20 nm barrier devices a dramatic upturn in the 2DHG Coulomb drag voltage occurs below T=1K. This upturn signals an increase in inter-layer coupling consistent with exciton formation. This work has been supported by the Division of Materials Sciences and Engineering, Office of Basic Energy Sciences, U.S. Department of Energy. Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy under Contract No. DE-AC04-94AL85000.

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