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Individually Contacted Electron-Hole Bilayers of InAs/GaSb RUIYUAN LIU, LINGJIE DU, RUI-RUI DU, Rice Univ, GERALD SULLIVAN, Teledyne Scientific & Imaging — Electron-hole bilayers made of InAs/GaSb semiconductors are promising quantum structures in realizing novel condensed phases of excitons. Using low temperature transport we have measured a InAs/GaSb composite quantum well with a AlGaSb tunneling barrier between the layers, and have been able to adjust the Fermi energy of the electron or hole layers independently by double gates. In order to study the interactions between the two layers, we processed devices with a flip-chip technique, where gates were placed on both sides of the wafer within a micrometer distance from respective layers. Additional gates placed on top of the contact leads to facilitate independent contacts to the individual layer. We will present preliminary data for standard and flip-chip devices measured by low temperature transport. The work in Rice is supported by a grant of DOE-BES.

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