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Anomalous Coulomb drag in bilayer graphene double layers XIAOMENG LIU, Harvard University, TAKASHI TANIGUCHI, KENJI WATANABE, National Institute for Material Science, PHILIP KIM, Harvard University — Bilayer graphene double-layer structure consists of two layers of bilayer graphene separated by atomically thin hexagonal boron nitride (hBN). With a perfect Fermi surface nesting and strong electron-electron interaction ($E_{Coulomb} > E_{kinetic}$), such systems offer exciting platforms to study interaction driven phenomena, such as Coulomb drag and exciton condensation. We fabricate ultra-clean encapsulated bilayer graphene double layers with dry pick-up method. Room temperature drag measurement on our devices shows the sign of drag agree with the typical Fermi liquid behavior. However, at lower temperatures, the sign of drag reversed, indicating a new drag mechanism emerges and dominates. We measure this with different geometry, temperature, bias and gating to investigate the origin of such effect and discuss the implication of the drag sign changes.

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