

Abstract Submitted
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Piezoresistance and Metal Insulator Transition of Composite Fermions at $\nu = 3/2$ TAYFUN GOKMEN, MEDINI PADMANABHAN, MAN-SOUR SHAYEGAN, Dept. of Electrical Engineering, Princeton University, Princeton, NJ 08544 — In the composite fermion (CF) picture, at the Landau level filling factor $\nu = 3/2$ the particle-flux CF quasi-particles are analogous to electrons at zero perpendicular magnetic field. Here we report piezoresistance measurements of CFs at $\nu = 3/2$ in AlAs quantum wells. In this system, the electrons occupy two conduction band valleys with elliptical Fermi contours, and the valley occupation of electrons can be controlled via the application of uniaxial, in-plane strain. The system's response to strain at $\nu = 3/2$ is qualitatively very similar to that of the electrons at zero perpendicular magnetic field, and consistent with the picture of CFs with a valley degree of freedom. Temperature dependent studies also show that CFs, like their counterpart electrons, go through a metal-insulator transition as they become valley polarized.

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