Abstract Submitted
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Anisotropic Fermi Contour of (001) GaAs Holes in Parallel Magnetic Fields[1] DOBROMIR KAMBUROV, MANSOUR SHAYEGAN, LOREN PFEIFFER, KENNETH WEST, KIRK BALDWIN, Princeton University, ROLAND WINKLER, Northern Illinois University — We demonstrate tuning the dispersion anisotropy in a high-mobility (001) GaAs two-dimensional hole system through the application of an in-plane magnetic field. We employ surface-strain-induced commensurability oscillations to probe directly the anisotropy and the size of the Fermi contours. The experimental data are in semi-quantitative agreement with the results of a parameter-free energy band model. We find a severe spin-dependent anisotropy of the 2D hole Fermi contours stemming from the combined effect of the strong coupling of the parallel field to the orbital motion, the large spin-orbit interaction in the GaAs valence band, and heavy hole-light-hole coupling.

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