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Density dependent anisotropic phases in a two-dimensional hole system

MICHAEL MANFRA, Bell Laboratories

Anisotropic charge transport is observed in a two-dimensional (2D) hole system in a perpendicular magnetic field at filling factors ν=7/2, ν=11/2, and ν=13/2 at low temperature. In stark contrast, the transport at ν=9/2 is *isotropic* for all temperatures. Our results for a 2D hole system differ substantially from 2D electron transport where no anisotropy has been observed at ν=7/2, and the strongest anisotropy occurs at ν=9/2. Isotropic hole transport at ν=13/2, 11/2 and 7/2 is restored for sufficiently low 2D densities. The density dependence of the observed anisotropies suggests that strong spin-orbit coupling in the hole system contributes to the unusual transport behavior.