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Spin and valley resolved Landau level crossing in tri-layer ABA stacked graphene. BISWAJIT DATTA, Tata Institute of Fundamental Research, Mumbai, India, VISHAKHA GUPTA, Birla Institute of Technology Science, Pilani, Goa campus, Tata Institute of Fundamental Research, Mumbai, India, ABHINANDAN BORAH, Tata Institute of Fundamental Research, Mumbai, India, KENJI WATANABE, TAKASHI TANIGUCHI, National Institute for Materials Science, Japan, MANDAR DESHMUKH, Tata Institute of Fundamental Research, Mumbai, India — We present quantum Hall measurements on a high quality encapsulated tri-layer graphene device. Low temperature field effect mobility of this device is around 500,000 cm^2/Vs and we see SdH oscillations at a magnetic field as low as 0.3 T. Quantum Hall measurements confirm that the chosen tri layer graphene is Bernal (ABA) stacked. Due to the presence of both mass-less monolayer like Dirac fermions and massive bi-layer like Dirac fermions in Bernal stacked tri-layer graphene, there are Landau level crossings between monolayer and bi-layer bands in quantum Hall regime. Although most of the Landau Level crossings are predominantly present on the electron sides, we also observe signatures of the crossings on the hole side. This behaviour is consistent with the asymmetry of electron and hole in ABA tri-layer graphene. We observe a series of crossings of the spin and valley resolved Landau Levels.

Mandar Deshmukh
Tata Institute of Fundamental Research

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