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Effect of tunable superlattice on quantum Hall effect in graphene
SUDIPTA DUBEY, MANDAR DESHMUKH, Tata Institute of Fundamental Research — We have studied quantum Hall effect in tunable superlattice in graphene created using combination of back gate and an array of top-gates pinned to the same potential. In our device we are in the regime when superlattice period is larger than the magnetic length and superlattice amplitude can be tuned to be larger than Landau level spacing. We observe robust plateaus when charge carrier in adjacent region is of the same polarity. However when we have a series of p-n junction, the high superlattice amplitude leads to large local electric field in p-n junction causing collapse of Landau level and hence incomplete equilibration. We have also studied charge transport at low magnetic field where we have higher number of edge states circulating within a strip of back-gated or top-gated region.

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