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Quantum Hall Effect of CVD Graphene

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Graphene shows unusual electronic properties, such as carrier mobility as high as 10,000 cm^2/Vs at room temperature and quantum electronic transport, due to its electronic structure. Carrier mobility of graphene is ten times higher than that of Silicon device. On the one hand, quantum mechanical studies have continued on graphene. One of them is quantum Hall effect which is observed in graphene when high magnetic field is applied under low temperature. This is why two dimension electron gases can be formed on Graphene surface. Moreover, quantum Hall effect can be observed in room temperature under high magnetic field and shows fractional quantization values. Quantum Hall effect is important because quantized Hall resistances always have fundamental value of h/e^2 ~ 25,812 Ohm and it can confirm the quantum mechanical behaviors. The value of the quantized Hall resistance is extremely stable and reproducible. Therefore, it can be used for SI unit.

We study to measure quantum Hall effect in CVD graphene. Graphene devices are made by using conventional E-beam lithography and RIE. We measure quantum Hall effect under high magnetic field at low temperature by using He4 gas closed loop cryostat.

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