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Magnetotransport through a graphene quantum ring DAMIEN CABOSART, SEBASTIEN FANIEL, FREDERICO MARTINS, THANH NHAN BUI, CRISTIANE NASCIMENTO SANTOS, VINCENT BAYOT, BENOIT HACKENS, Universite catholique de Louvain, IMCN/NAPS, Belgium, JESSICA CAMPOS DELGADO, Universite catholique de Louvain, ICTEAM/ELEN, Belgium
— We report on four-leads electrical resistance measurements in graphene quantum rings (QRs) at low temperature. Our samples were fabricated by exfoliating natural graphite on SiO_2 to form graphene monolayers. The graphene sheets have been located and characterized by optical contrast and Raman spectroscopy. The QRs were patterned by e-beam lithography and oxygen plasma etching. The graphene devices were electrically contacted thanks to Ti/Au (5nm/60nm) pads, obtained after lithography and lift-off. The measurements were performed down to 20 mK in the coherent and diffusive regime of electron transport. A back gate allowed us to manipulate the carrier concentration in the graphene layer. We measured Universal Conductance Fluctuations (UCFs) by tuning the back gate voltage as well as the magnetic field applied perpendicular to the ring. Analyzing the UCFs, we obtain invaluable information on the dynamics of phase coherent transport inside our QRs.

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