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Magneto Transport in Three Dimensional Carbon Nanostructures TIMIR DATTA, LEI WANG, University of South Carolina, JAN JAROSZYNSKI, National High Magnetic Field Lab, MING YIN, Benedict College, DHEYAA ALAMERI, University of South Carolina — Electrical properties of self-assembled three dimensional nanostructures are interesting topic. Here we report temperature dependence of magneto transport in such carbon nanostructures with periodic spherical voids. Specimens with different void diameters in the temperature range from 200 mK to 20 K were studied. Above 2 K, magnetoresistance, MR = [R(B) – R(0)] / R(0), crosses over from quadratic to a linear dependence with the increase of magnetic field [Wang et al, APL 2015; DOI:10.1063/1.4926606]. We observe MR to be non-saturating even up to 18 Tesla. Furthermore, MR demonstrates universality because all experimental data can be collapsed on to a single curve, as a universal function of B/T. Below 2 K, magnetoresistance saturates with increasing field. Quantum Hall like steps are also observed in this low temperature regime. Remarkably, MR of our sample displays orientation independence, an attractive feature for technological applications.

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