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Transport studies of Graphite ARUNA RAMANAYAKA, RAMESH MANI, Department of Physics and Astronomy, Georgia State University — Transport studies of single layers of carbon, known as Graphene, have shown striking new features in two dimensional transport, arising from the linear dispersion relation and analogies to quantum electrodynamics. Highly Oriented Pyrolytic Graphite (HOPG) consists of stacked sheets of Graphene with weak interlayer interactions, which gives rise to anisotropic transport with striking differences between in-plane and perpendicular transport. In-plane transport measurements indicate plateaus in the Hall resistance (Rxy) along with Shubnikov-de Haas (SdH) oscillations in the diagonal resistance (Rxx) in three-dimensional HOPG. The transport data for graphite indicate a strong deviation from the resistivity rule proposed for canonical quantum Hall systems. The origin of this anomaly in graphite is identified here by examining the relative phases of the oscillatory diagonal and off-diagonal resistances.

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