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Charge transport studies in graphene devices: a focus on mobility behavior[1] ARCHANA VENUGOPAL, WILEY KIRK, LUIGI COLOMBO, ERIC VOGEL, University of Texas at Dallas — Graphene has been the subject of extensive electrical characterization since 2004. As in semiconductor based FETs, mobility (μ) is used as the parameter to gauge and compare the device performance. Typically reported is the effective mobility, μ_{eff}, extracted from $I_d - V_g$ characteristics or the channel mobility (μ_H) extracted from Hall measurements, which can be especially illuminating when more than one carrier type is participating in the charge transport process. The dependence of the mobility on parameters such as applied field, dielectric type, underlying oxide thickness, channel dimensions and temperature is not well understood. A study of μ_H and the accompanying magnetoresistance as a function of the above mentioned parameters in low to moderate magnetic fields was performed, as well as μ_{eff} on the same devices, the results of which will be compared and presented. The dependence on graphene type (grown vs. exfoliated) will also be discussed.

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