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Suppression of Weak-Localization Effect in Strained CVD – grown Graphene[1] XIAOCHANG MIAO, SEFAATTIN TONGAY, ARTHUR F. HEBARD, Department of Physics, University of Florida, Gainesville, FL 32611 — We investigate the magnetic field and temperature-dependent transport properties of CVD-grown graphene subjected to different strains. The graphene is transferred to kapton substrates to which a blending force can be applied. In zero magnetic field, the prefactor to the logarithmic-in-temperature conductivity correction decreases by an approximate factor of 3 for strains as high as 0.6 %. There is also a concomitant decrease in diffusivity by a factor of 7. At 5 K we observe negative magnetoresistance for fields up to 0.2 Tesla followed by positive magnetoresistance at higher fields. We attribute the low field negative magnetoresistance to weak-localization and find that it is well described by theory. The strains resulting from the applied blending force inhibit the intervalley scattering rate more than an order of magnitude, thereby leading to a suppression of weak-localization.

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