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Effect of gate-induced doping on the Raman spectra of disordered graphene ISAAC CHILDRES, LUIS A. JAUREGUI, YONG P. CHEN, Purdue University, PURDUE UNIVERISTY, YONG P. CHEN GROUP TEAM —
We report a Raman spectroscopy study of graphene field-effect transistors (GFET) after exposure to electron-beam irradiation, used to introduce a controlled amount of defects in graphene. Raman spectra are taken over a range of temperatures (4-300 K), back gate voltages and electron-beam exposures. We observe that the intensity ratio between Raman "D" and "G" peaks,I_D/I_G, commonly used to determine the amount of disorder in graphene, not only changes with the irradiation dosage, but also with gate-induced doping. At low temperature (4 K), we observe a peak in the plot of I_D/I_G versus back gate voltage at the Dirac point of the GFET. As the temperature increases, the back gate voltage at which this peak occurs decreases relative to the Dirac point. Our findings may be valuable for understanding the Raman spectra and electron-phonon physics in doped and disordered graphene.

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