Wavelength dependence of suspended single layer graphene Raman spectra

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Graphene is a perfect 2D covalent crystal and forms the basis of all graphitic structures. Due to its inherent properties and the great variety of possible applications graphene has attracted a lot of interest from both experimentalists and theoreticians. Although during the last years a lot of work has been made on supported graphene, there is a lack of experimental research on suspended one. In the present work suspended, mechanically exfoliated, single-layer graphene (SLG) was fabricated. Raman Spectroscopy, a non destructive optical technique, was employed to produce detailed Raman maps of the sample. Raman maps of the frequency distribution and the full width at half maxim of the graphene typical G and 2D peaks, with spatial resolution down to 0.1 μm, are presented. No D-line was observed revealing the good crystal quality The effect of charge doping and strain on Raman spectra is investigated[1]. Furthermore, the observed spectral shifts and peak profile changes are discussed. The 2D line for suspended graphene found here to have a bimodal profile, as referenced in the literature [2,3]. Three different excitation wavelengths, 488nm, 514.5nm and 785 nm, were used to examine its spectral characteristics dependence on wavelength.

References

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