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Effect of uniaxial strain on graphene DUHEE YOON, HYERIM MOON, SEOUNGWOO WOO, Department of physics, Sogang University, Seoul 121-742, Korea, YOUNG-WOO SON, Korea Institute for Advanced Study, Seoul 130-722, Korea, HYEONSIK CHEONG, Department of physics, Sogang University, Seoul 121-742, Korea — Strain plays an important role in crystalline materials since it can change the electronic or mechanical properties of materials. Recently, several experimental and theoretical studies have shown the effect of strain on single layer graphene. Experimentally, Grüneisen parameters and crystallographic orientation of graphene were studied by polarized micro-Raman spectroscopy. Band gap opening and electron beam collimation of graphene were theoretically predicted. Those proposed the possibility to control the properties of graphene by strain. In this work, we investigate the effect of uniaxial strain on single layer graphene by using micro-Raman spectroscopy. We deposited graphene samples on acrylic substrates by the mechanical cleaving method. Strain was applied by bending the flexible substrates and Raman spectra were obtained as a function of the uniaxial strain. The peak position and the shape of G and 2D bands vary significantly as the strain increases. We will discuss deep into the variation of the G and 2D bands. The implications of the strain effect in terms of the band structure will be discussed.

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