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Investigation of 2D materials by wide-field Raman imaging JAE-UNG LEE, HYEONSIK CHEONG, Sogang University — Raman spectroscopy is a very useful tool to investigate 2D materials such as graphene, hBN, and MoS2. Due to the uniqueness of the Raman spectrum of each material, we can use various Raman features to distinguish the number of layers, and other external effects (strain, doping, and temperature) on the sample. To study the spatial variations of the Raman features, confocal Raman imaging technique have been used conventionally. But due to limited beam size ($\sim$ 1 μm) of confocal Raman systems, investigating a large area of the samples would consume a lot of time. In contrast to conventional confocal Raman systems, the wide-field Raman system has advantages for fast and large area investigation. A shaped laser beam with the size of few-hundred microns is shone onto a sample, and only a specific wavelength is transmitted through a tunable band pass filter and directly imaged onto an EMCCD. We exfoliated three most common 2D materials (graphene, hBN, and MoS2) on the same SiO2/Si substrates. The optical contrast images of these materials are difficult to distinguish. But in wide-field Raman system, we can characterize the samples within a few seconds. This demonstrates that the wide-field Raman system provides a useful platform to characterize 2D materials.

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