
Soo Yeon Lim

Hyeonsik Cheong

Department of Physics, Sogang University, 04107, Seoul, South Korea

hcheong@sogang.ac.kr

Photoluminescence excitation study on interlayer interaction in WSe₂/MoSe₂ heterostructure

Conventional photoluminescence (PL) measurements on transition metal dichalcogenides (TMDs) can easily identify the ground state energy of their excitons. However, the excited states of exciton should be investigated to understand the exciton structure and the electronic band structures in TMDs. Photoluminescence excitation (PLE) study make it possible to determine not only the ground state but also the excited states [1]. We fabricated monolayer WSe₂ and MoSe₂ and their heterostructures on SiO₂/Si substrate using dry the transfer method. Each monolayer and the heterostructure are encapsulated by thick h-BN. We observed the interlayer exciton signal in the PL measurements, which can be an evidence of interlayer interaction between the two different monolayers. We carried out PLE and reflectance spectroscopy to investigate the ground state and the excited exciton states of the heterostructure. We used a collimated broadband light combined with a wavelength selector as the excitation source.

References

- [1] Heather M. Hill et al., Nano Lett., 15 (2015) 2992.

Figures

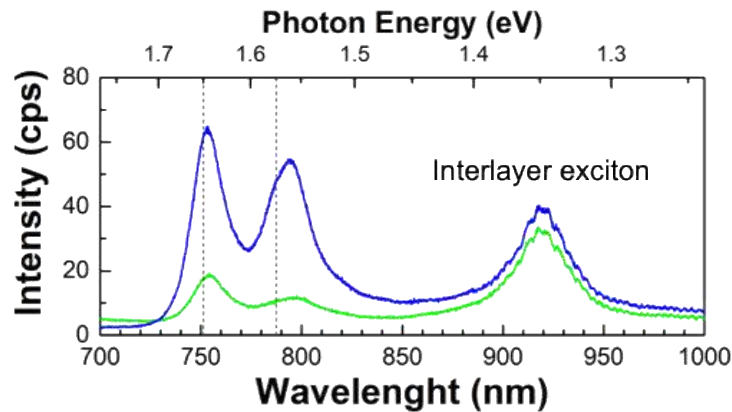


Figure 1: Interlayer exciton PL signal in the WSe₂/MoSe₂ heterostructure