Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Davydov splitting and resonance Raman studies of few-layer $MoSe_2$ KANGWON KIM, JAE-UNG LEE, DAHYUN NAM, HYEONSIK CHEONG, Sogang Univ — We conducted Raman investigation of few-layer $MoSe_2$ with eight different excitation energies. New peaks that appeared only near resonance with various exciton states were analyzed, and the modes were assigned. We observed splitting of intralayer A_{1g}, E_{1g}, and A_{2u} modes for some excitation energies near resonances. This splitting is called 'Davydov splitting' and caused by interlayer interaction. By ?tting the spectral positions of interlayer shear and breathing modes and Davydov splitting of intralayer modes to a linear chain model, we extracted the strength of the interlayer interaction. We found that the second-nearest-neighbor interlayer interaction amounts to about 30% of the nearest-neighbor interaction for both in-plane and out-of-plane vibrations. In addition, we investigated resonance effects of each Raman mode. The resonance pro?les of the Raman peaks re?ected the joint density of states for optical transitions, but the symmetry of the exciton wave functions leads to selective enhancement of the A_{1g} mode at the A exciton energy and the shear mode at the C exciton energy.

Kangwon Kim
Sogang Univ

Date submitted: 10 Nov 2016 Electronic form version 1.4