Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Giant blue shifted photoluminescence peak from the edges of CVD grown monolayer MoS_2 ALEXANDER YORE, WENDY CRUMRINE, San Francisco State Univ, KIRBY SMITHE, ERIC POP, Stanford University, BIN WANG, University of Oklahoma, AKM NEWAZ, San Francisco State Univ — To probe the electronic and optical properties of direct band-gap monolayer transition metal dichalcogenides, such as band structure and excitons, microphotoluminescence spectroscopy has become an attractive and standard tool. Here, we present our experimental work on spatial scanning of photoluminescence of monolayer MoS_2 grown by chemical vapor deposition (CVD) using an ultrasmall blue laser (wavelength 405 nm) beam spot with beam diameter as small as $\sim$ 200 nm. We have observed a giant blue shift, as large as $\sim$ 40 nm or $\sim$ 100 meV, of the A-excitonic peak in the photoluminescence spectra from the edges when compared to luminescence from the inside. This giant blue shift may result from the following: (i) compressive strain at the edges; (ii) the enhanced dielectric screening caused by the increased electron density at the metallic Mo-edges; and (iii) chemical impurities.

Akm Newaz
San Francisco State Univ

Date submitted: 02 Nov 2015 Electronic form version 1.4