Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

**Magnetoluminescence study of $WS_2$ monolayers**[1] T. SCRACE, Y. TSAI, B. BARMAN, L. SCHWEIDENBACK, A. PETROU, SUNY Buffalo, G. KIOSEOGLOU, Department of Materials Science and Technology, University of Crete, Greece, P. HAWRYLAK, Quantum Theory Group, Emerging Technologies Division, National Research Council, Ottawa, Canada — We have studied the photoluminescence (PL) spectra[2] from $WS_2$ monolayers in the 5-150 K temperature range in magnetic fields up to 7 tesla applied along the normal to the sample plane. The luminescence was excited by a 488nm linearly polarized laser beam. The PL spectra have two features identified as the neutral ($X$) and negatively charged ($X^-$) exciton. At zero magnetic field the $X^-$ feature has a large (as high as 30%), laser power-dependent circular polarization, in contrast to the small polarization of $X$that does not depend on laser power. The application of an external magnetic field has a profound effect on the circular polarization of the charged exciton. Its polarization increases by 10% at 7 tesla for any laser-power while its energy exhibits a small magnetic splitting (2meV at 7 tesla). On the other hand, the emitted circular polarization of the free exciton is not affected by the external magnetic field.

[1]This work has been supported by ONR.
[2]W. Zhao, et al., ACS nano, **7**, 791 (2013).

Thomas Scrace
SUNY Buffalo

Date submitted: 15 Nov 2013 Electronic form version 1.4