Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Tuning the trion photoluminescence polarization in monolayer WS_2[1] A.T. HANBICKI, K.M. MCCREARY, M. CURRIE, Naval Research Laboratory, G. KIOSEOGLOU, University of Crete, C.S. HELLBERG, A.L. FRIEDMAN, B.T. JONKER, Naval Research Laboratory — Monolayer transition metal dichalcogenides (TMDs) such as MoS_2 or WS_2 are semiconductors with degenerate, yet inequivalent k-points labeled K and K that define the direct gap. The valence band maximum in each valley has only one spin state of opposite sense for K and K. Consequently, one can selectively populate each valley independently with circularly polarized light, and determine the valley populations via the polarization of emitted light. Optical emission is dominated by neutral and charged exciton (trion) features, and changes in emitted polarization provide insight into the fundamental processes of intervalley scattering. We prepare single-layer WS2 films such that the photoluminescence is from the negatively charged trion and observe a room temperature optical polarization in excess of 40

[1]This work was supported by core programs at NRL and the NRL Nanoscience Institute, and by the Air Force Office of Scientific Research AOARD 14IOA018-134141.

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Date submitted: 06 Nov 2015 Electronic form version 1.4