Abstract Submitted
for the DAMOP18 Meeting of
The American Physical Society

Self-phase Modulation of MoS_2 Nanoflakes TIKARAM NEUPANE, DULITHA JAYAKODIGE, BAGHER TABIBI, FELIX JAETAE SEO, Hampton University, HAMPTON UNIVERSITY TEAM — The third-order nonlinear optical property of molybdenum disulfide (MoS_2) atomic layers was characterized by the spatial self-phase modulation (SSPM) which arises from an intensity-dependent refractive index change. The diffraction ring of SSPM was distorted along the vertical direction after the MoS_2 nanoflakes was exited by a laser pulse at 532 nm, ~6 ns temporal pulse width, and 10 Hz repetition rate. The nonlinear refractive index and the third-order susceptibility was estimated a series of concentric circles of SSPM diffraction ring patterns. The nonlinear refractive index and the third-order susceptibility of MoS_2 nanoflakes were estimated to be ~2.09 x 10^{-10} cm^2/W and ~1.68x10^{-16} m^2/V^2 respectively at the peak intensity ~$0.3 GW/cm^2$. Acknowledgment: This work is supported by ARO W911NF-15-1-0535, NSF HRD-1137747, and NASA NNX15AQ03A

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Date submitted: 26 Jan 2018 Electronic form version 1.4