Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Magneto-optical Kerr effect in Transition Metal Dichalcogenides
RYUJI SUZUKI, Department of Applied Physics and Quantum Phase Electronics Center (QPEC), University of Tokyo, SANDOR BORDACS, Budapest university of technology and economics, YOSHINORI TOKURA, YOSHIHIRO IWASA, RIKEN Center for Emergent Matter Science (CEMS); Department of Applied Physics and Quantum Phase Electronics Center (QPEC), University of Tokyo — Transition-metal dichalcogenides (TMDs) are attracting a great deal of interest as beyond graphene materials because of their rich physical properties. The key of the monolayer TMDs in contrast to the bulk is the broken inversion symmetry, which results in novel valley properties, coupled with spins through their strong spin-orbit interaction. On the other hand, 3R-MoS2 is known to keep the broken inversion symmetry and thus strong valley polarization in PL spectra even in multilayers, providing new opportunities to investigate properties of monolayers with use of bulk materials and the stacking dependent properties between the 2H (centrosymmetric) and 3Rnoncentrosymmetric) [R. Suzuki *et al., Nat. Nano.* **9**, 611 (2014)]. In this presentation, we report comparative studies of 3R MoS2 and 2H series of TMDs on magnetooptical properties, with a particular focus on magneto-optical Kerr effect (MOKE) spectroscopy. We found systematic evolusion of MOKE spectra in the 2H series of TMDs, and more interestingly, that 3R polytypes displayed significant difference not only in exciton dimensionality and but also in the g values estimated from the excitons peak splitting in the MOKE spectra. Discussion will be given based on the electronic structures and the spin-orbit interactions

Ryuji Suzuki
Department of Applied Physics, the University of Tokyo

Date submitted: 13 Nov 2014 Electronic form version 1.4