Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Photoluminescence and photocurrent measurement in monolayer $MoTe_2$ YA-QING BIE, GABRIELE GROSSO, DMITRI EFETOV, EFREN NAVARRO-MORATALLA, DIRK ENGLUND, PABLO JARILLO-HERRERO, Massachusetts Inst of Tech-MIT — 2D transition metal dichalcogenides (2D-TMD), such as MoS_2, WS_2, WSe_2, $MoSe_2$, have been verified with many remarkable physical properties including the indirect to direct band transition and valley dependent spin polarization. As one of the 2D-TMD family member, monolayer 2H-$MoTe_2$ is proved to be a direct bandgap semicoductor with strong spin orbital interaction and a significantly low bandgap $\sim$ 1.10eV. However, the effect of the enhanced coulomb interaction arising from reduced dielectric screening in monolayer $MoTe_2$ has yet to be experimentally demonstrated. Here we employ the near infrared (NIR) photoluminescence and photocurrent measurement to study the quasi-particle interactions at different carrier concentration. This study sheds light on manipulating excitons in $MoTe_2$ and designing highly efficient NIR optoelectronic devices.

Ya-Qing Bie
Massachusetts Inst of Tech-MIT

Date submitted: 13 Nov 2014 Electronic form version 1.4