Abstract Submitted
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Magneto-photoconductivitity of atomically thin transition metal dichalcogenides[1] M. EGINLIGIL, C. ZOU, N. PEIMYOU, B. CAO, X. SHEN, J. SHANG, C. CONG, T. YU, Nanyang Technological University — Photoinduced effects of two-dimensional (2D) transition metal dichalcogenides (TMDs) are of great interest since the bandgap of these materials corresponds to visible range of spectrum. For instance, in molybdenum disulphide (MoS_2) – a 2D semiconductor TMD and a non-centrosymmertic crystal, inherent broken inversion symmetry in monolayers leads to a large spin-orbit interaction which splits the valence band (VB) by 160 meV and gives rise to strong excitonic transitions due to the direct band gap at low energy $\boldsymbol{K}$ and $-\boldsymbol{K}$ valleys. The same broken inversion symmetry together with time reversal symmetry is responsible for spin-valley coupling in monolayer MoS_2 and similar TMDs (such as tungsten disulphide, WS_2). Spin-valley coupled band edges in TMDs result in different localization behaviors for different scattering mechanisms. In this work, we present our magneto-photoconductivity studies of mono- and bilayer field-effect transistor devices of MoS_2 and WS_2, and discuss our results in terms of localization effects.

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