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Spin Transport in Single Layer Transition Metal Dichalcogenides¹

MICHAEL PHILLIPS, VIVEK AJI², Univ of California - Riverside — Inversion symmetry breaking and strong spin orbit coupling in two dimensional transition metal dichalcogenides leads to interesting new phenomena such as the valley hall and spin hall effects. The nontrivial Berry curvature of the bands yields transverse spin currents in applied field. In this talk we characterize the spin transport in hole-doped systems. Due to the large spin-splitting, time-reversal invariance, and the large separation of hole pockets in momentum space, spin flip scattering involves intervalley processes with large momentum. As such, one expects large spin life times and a large spin hall angle. We analyze the robustness of the phenomena to various scattering processes and explore the viability of transition metal dichalcogenides for spintronic applications.

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Michael Phillips Univ of California - Riverside

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