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Invariant Expansion of Monolayer MoS_2 electron states at the K point EDWARD ARIS DIAZ FAJARDO, ROLAND WINKLER, Northern Illinois University — Using group theory, we derive the invariant expansion for the Hamiltonian of the electron states at the K points of monolayer Molybdenum Disulfide (MoS_2), a transition metal dichalcogenide (TMDC). Unlike monolayers of graphite known as graphene, TMDCs provide a wider variety of physical phenomena due to the strong spin-orbit coupling attributed to the higher atomic number of the metal atoms. Our results also include the effects of external electric and magnetic fields. The low-order terms in the derived Hamiltonian are consistent with previous studies on the same material.

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