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Spin-Orbit Interaction and Rashba Effect in the 2D metal dichalcogenides MOHAMMAD MAHDI VALIZADEH, SHANAVAS K. VEEDU, SASHI SATPATHY, Department of Physics, University of Missouri, Columbia, MO 65211 — The monolayer metal dichalcogenides such as MoS₂ and WS₂ are currently an emerging class of 2D materials owing to their possible applications in 2D electronics including spintronics. The Rashba effect which describes the momentum-dependent spin-splitting of the band structure originates from the spin-orbit interaction and inversion symmetry breaking. The effect is expected to be much stronger in the dichalcogenides with high-Z elements such as WS₂, WO₂, etc. Here, we study the Rashba effect in WS₂ from a tight-binding model as well as from density-functional calculations. We find a strong Rashba effect leading to the possibility of applications in spintronics such as spin-valves.

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