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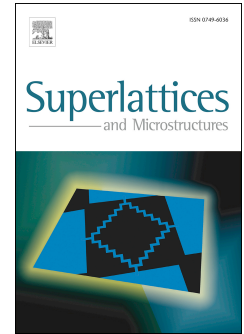
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# Velocity barrier-controlled of spin-valley polarized transport in monolayer WSe<sub>2</sub> junction

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**Abstract:** In this work, we have theoretically investigated the influence of velocity barrier on the spin-valley polarized transport in monolayer (ML) WSe<sub>2</sub> junction with a large spin-orbit coupling (SOC). Both the spin-valley resolved transmission probabilities and conductance are strong dependent on the velocity barrier, as the velocity barrier decreases to 0.06, a spin-valley polarization of exceeding 90% is observed, which is distinct from the ML MoS<sub>2</sub> owing to incommensurable SOC. In addition, the spin-valley polarization is further increased above 95% in a ML WSe<sub>2</sub> superlattice, in particular, it's found many extraordinary velocity barrier-dependent transport gaps for multiple barrier due to evanescent tunneling. Our results may open an avenue for the velocity barrier-controlled high-efficiency spin and valley polarizations in ML WSe<sub>2</sub>-based electronic devices.

**Keywords:** Spin; Valley; Polarization; WSe<sub>2</sub>; Velocity barrier

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