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Spin polarized transport in MoS2 ANDRÉ DANKERT, PARHAM PASHAEI, VENKATA KAMALAKAR MUTTA, SAROJ PRASAD DASH, Chalmers University of Technology, SPINTRONIC SPD TEAM — The two-dimensional (2D) semiconductor MoS2 possesses a high potential for spintronic devices due to a rich spin-valley physics and large spin-orbit coupling. While there have been significant advances in studying the spin and valley dynamics in MoS2 using optical spectroscopy techniques, electronic spin transport in semiconducting MoS2 or its heterostructures have not yet been demonstrated. Here we report the electronic and spin transport properties in MoS2 employing ferromagnetic electrodes in a vertical device geometry. Such vertical devices with MoS2 channel length defined by the thickness of the 2D layer allow to investigate the spin injection, transport and detection. We observe a magnetoresistance effect over a large temperature range up to 300 K and investigate the temperature and bias dependence behavior. Using magnetotransport data and calculations we extract spin parameters in the MoS2 spin valve devices. These findings can open new avenues for exploring spin functionalities in 2D semiconductor heterostructures for spin logic applications.

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