Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.

Supplementary Information for

"$FeCl_2/MoS_2/FeCl_2$ van der Waals junction for spintronic applications"

Yulin Feng,[a] Xuming Wu,[a] Lei Hu[a] and Guoying Gao[*ab]

[a] School of Physics, Huazhong University of Science and Technology, Wuhan 430074, China

[b] Wuhan National High Magnetic Field Center, Huazhong University of Science and Technology, Wuhan 430074, China

*E-mail: guoying_gao@mail.hust.edu.cn

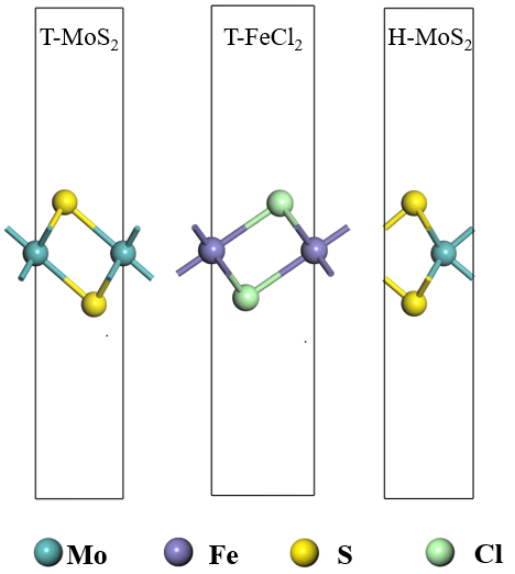

Fig. S1 The side views of monolayer 1T-MoS_2, 1T-$FeCl_2$ and 2H-MoS_2.

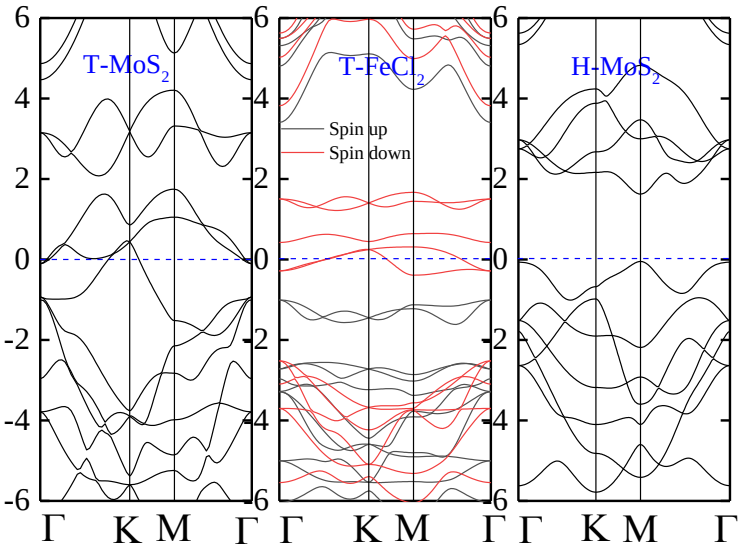

Fig. S2 Spin-dependent band structures of monolayer 1T-MoS_2, 1T-$FeCl_2$ and 2H-MoS_2.

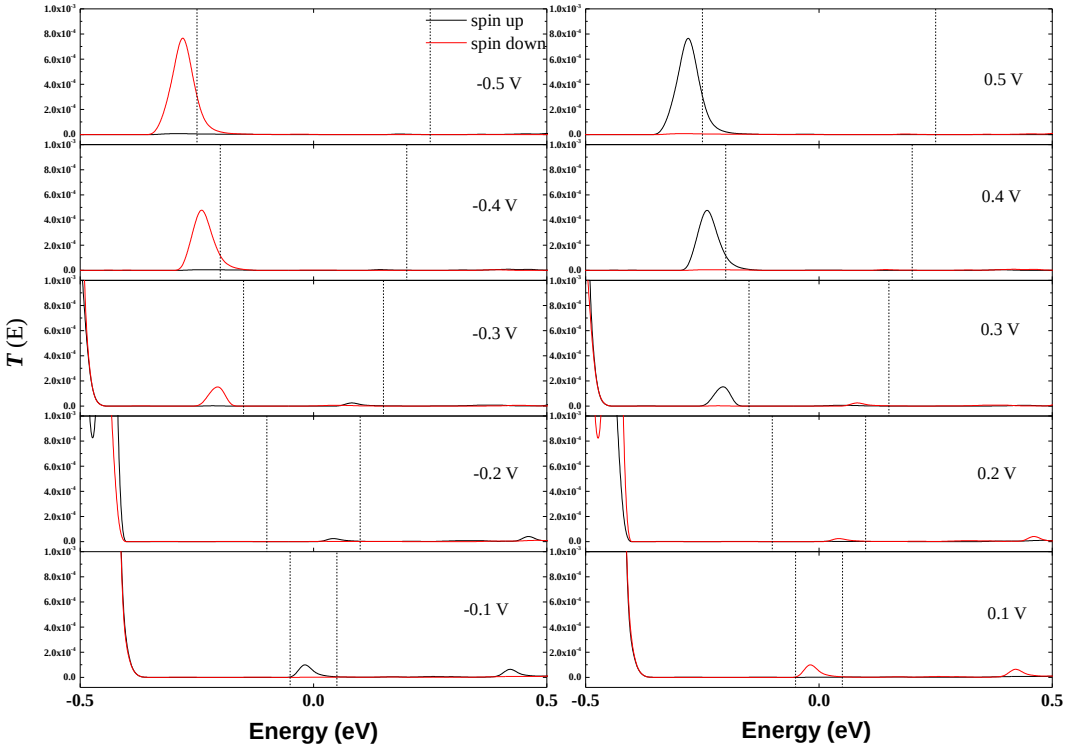

Fig. S3 Spin-dependent transmission spectra within the applied bias voltages of ±0.1, ±0.2, ±0.3, ±0.4 and ±0.5 V for the van der Waals magnetic tunnel junction of 1T-MoS_2/1T-$FeCl_2$/2H-MoS_2/1T-$FeCl_2$/1T-MoS_2 in the magnetic antiparallel configuration.

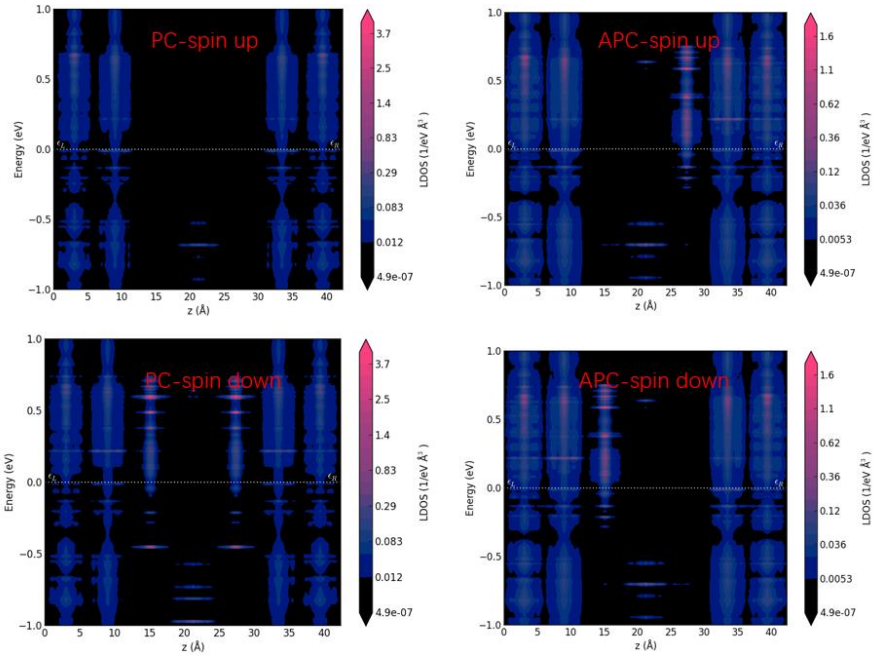

Fig. S4 Spin-dependent local density of states of 1T-MoS_2/1T-$FeCl_2$/2H-MoS_2/1T-$FeCl_2$/1T-MoS_2 in magnetic parallel configuration (PC) and antiparallel configuration (APC) at zero bias voltage.

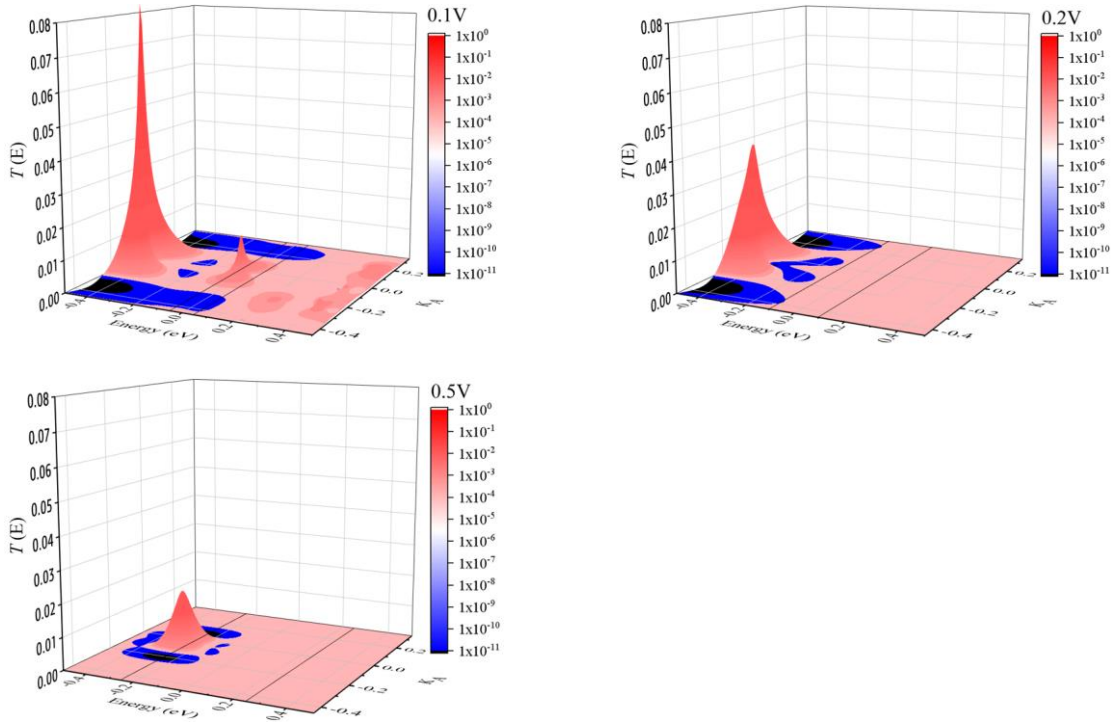

Fig. S5 Spin-down transmission spectrum as a function of energy and momentum component k_A within the applied bias voltage V_b of 0.1, 0.2 and 0.5 V for the van der Waals magnetic tunnel junction in the magnetic parallel configuration. The two black lines represent the energy levels of $-V_b/2$ and $V_b/2$, which are the boundary of bias window.