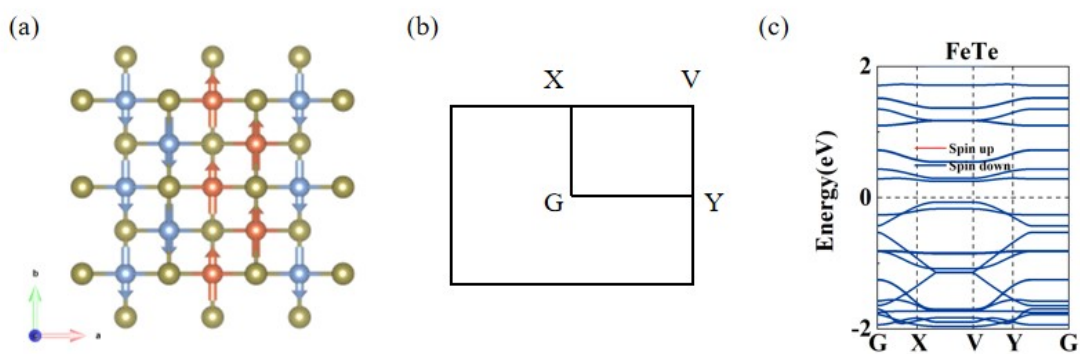
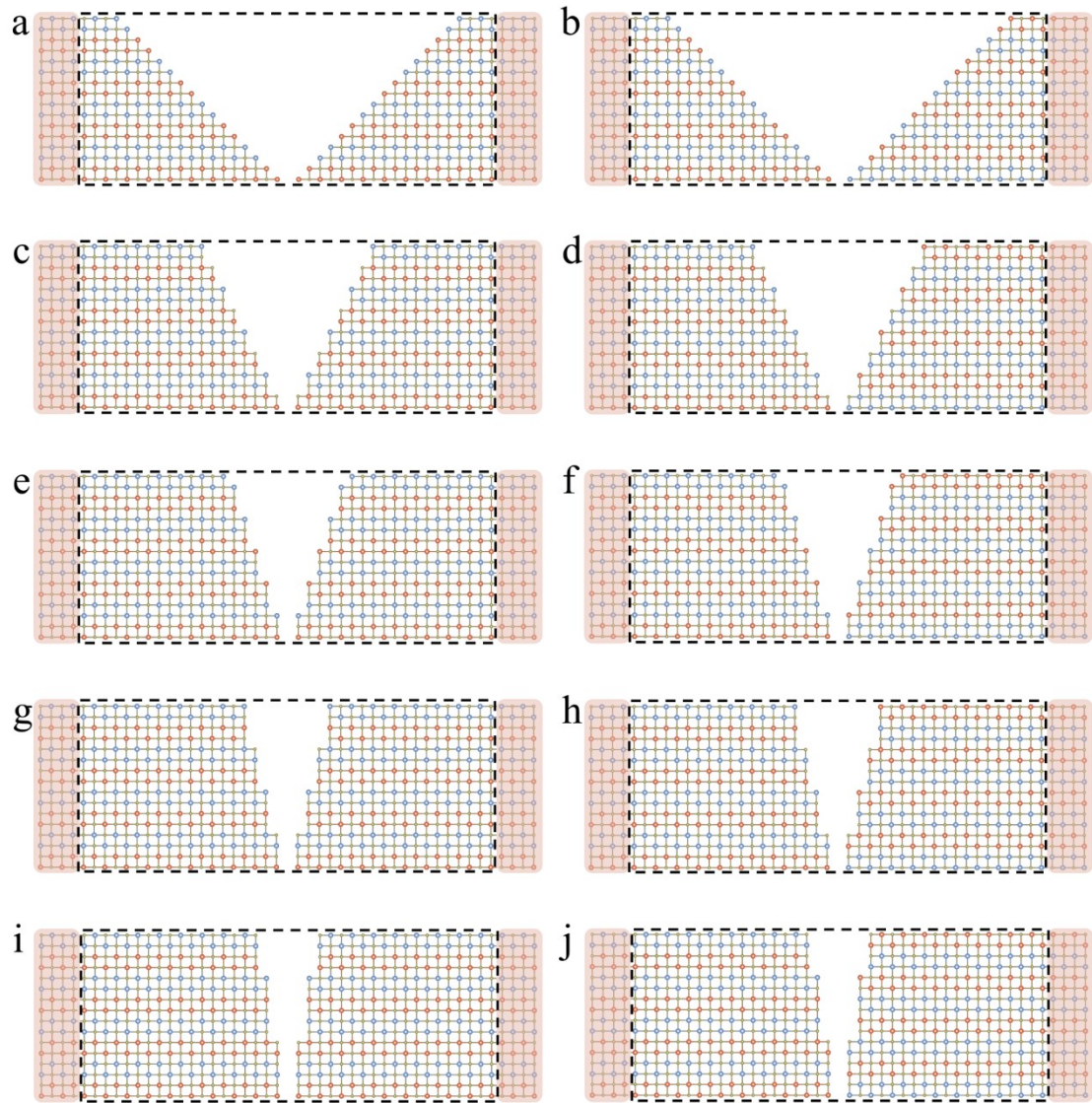


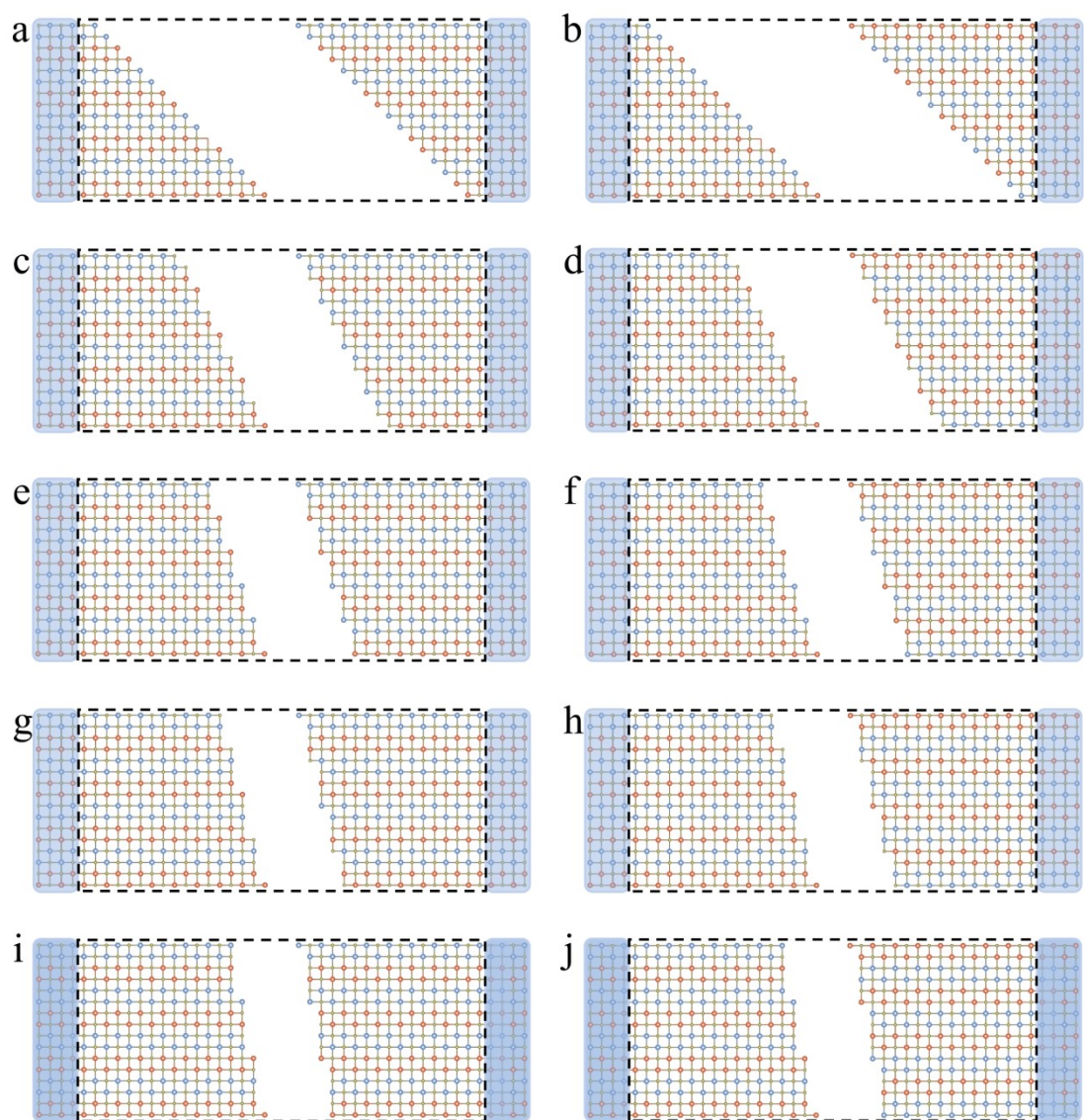
**Figure S1.** Schematic diagram of  $\theta$  and the magnetization direction of the electrodes on both sides. (a) The magnetization directions of the electrodes on the left and right sides are parallel, and the system is in the P state, with  $\theta$  equal to  $0^\circ$ . (b) The magnetization directions of the electrodes on the left and right sides are anti-parallel, and the system is in the AP state, with  $\theta$  equal to  $180^\circ$ .



**Figure S2.** Structure and electronic properties of 2D FeTe. (a) Schematic diagram of atomic structure and magnetic arrangement. (b) Path in the first Brillouin zone. (c) Band structure of FeTe.

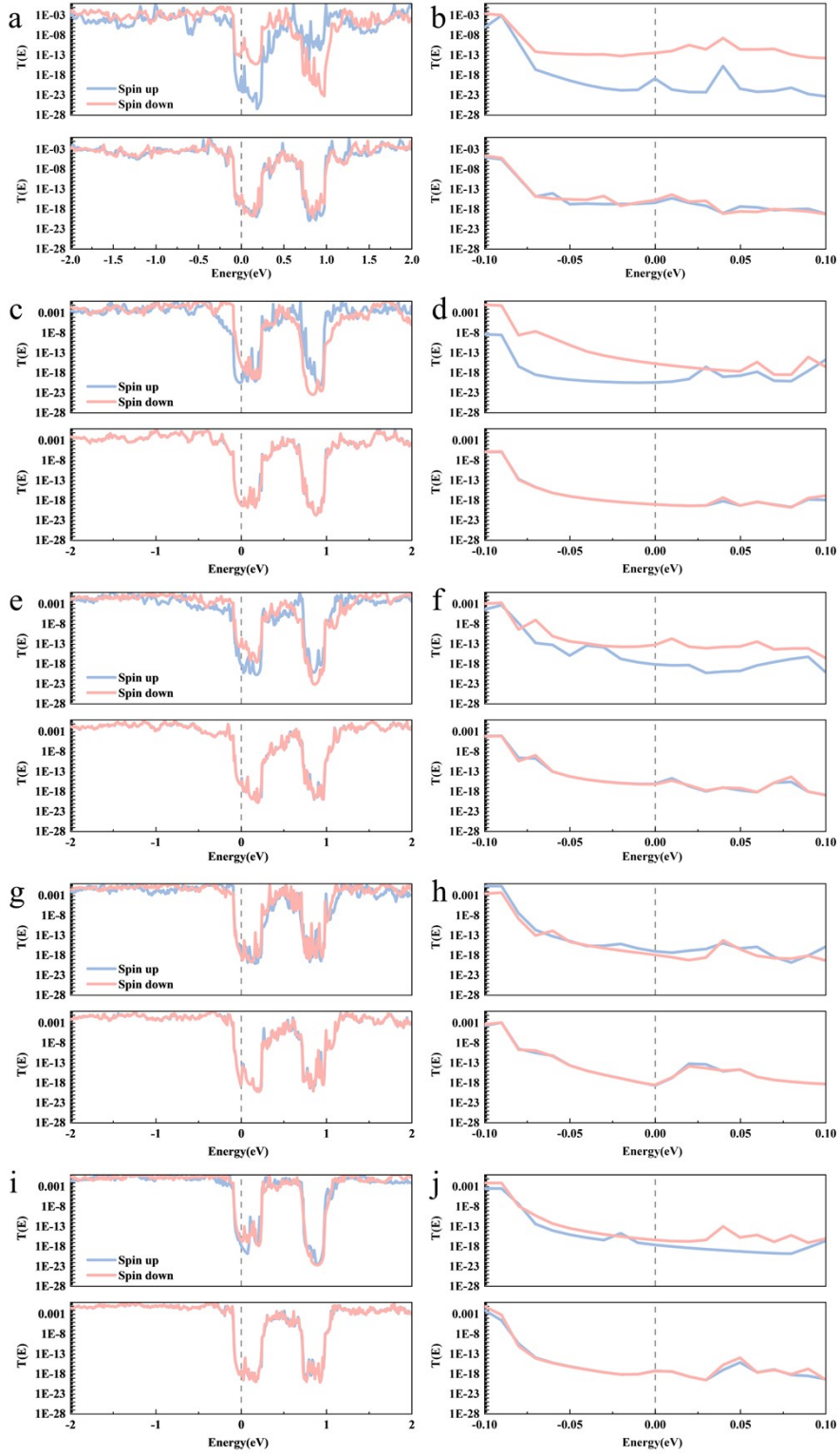


**Figure S3.** Schematic diagram of the device structure when the tunneling interface is trapezoidal. Among them, (a), (c), (e), (g), (i) represent the parallel state (left), and (b), (d), (f), (h), (j) represent the antiparallel state (right). The absolute value of  $\alpha$  exhibits a gradual decline from the upper region to the lower region.

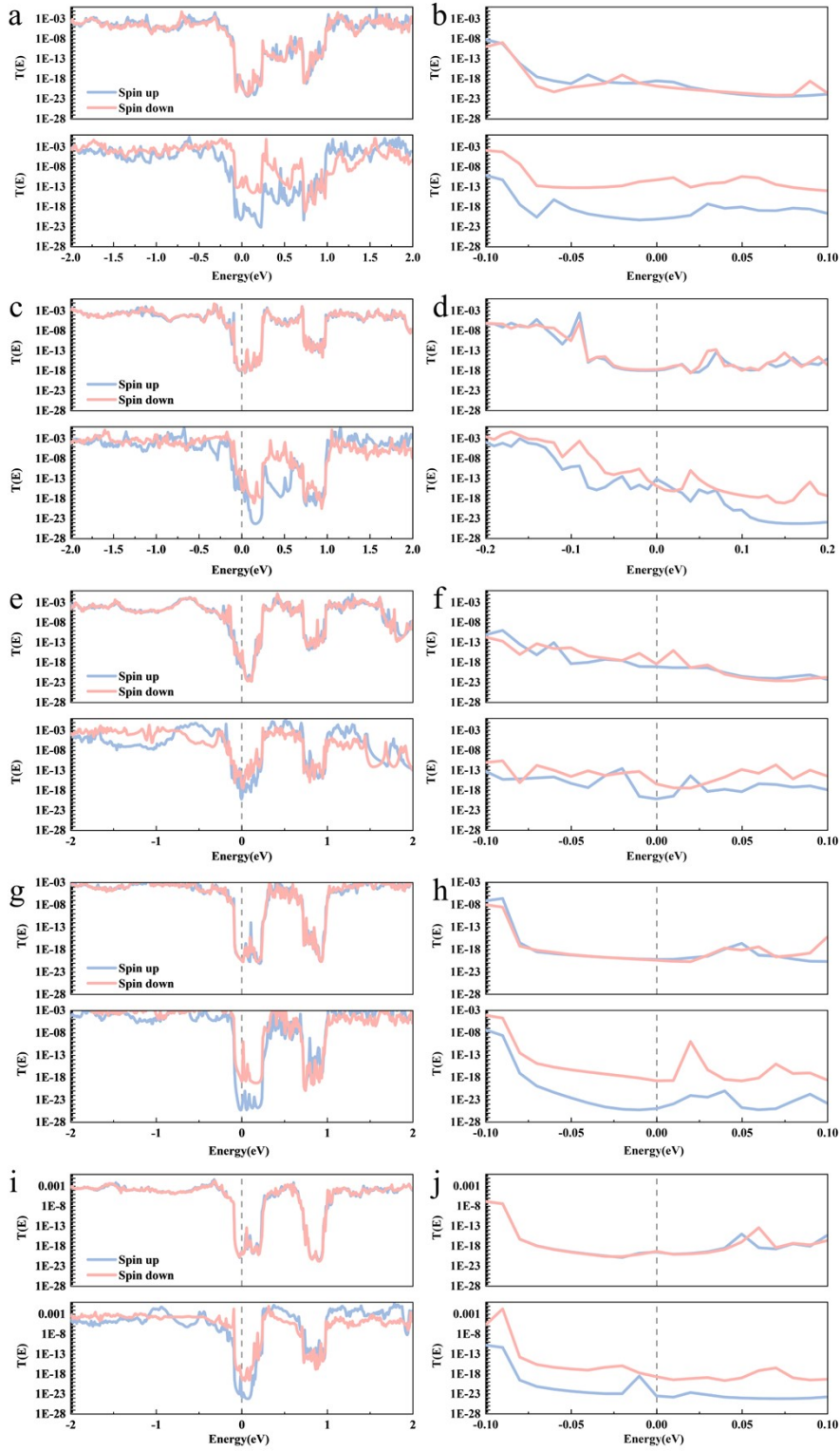


**Figure S4.** Schematic diagram of the device structure when the tunneling interface is a parallelogram. Among them, (a), (c), (e), (g), (i) represent the parallel state (left), and (b), (d), (f), (h), (j) represent the antiparallel state (right).  $\alpha$  decreases gradually from the top to the bottom.





**Figure S5.** When the tunneling interface is trapezoidal, the transmission coefficient graphs of the device are shown, with the upper part of each small graph representing the parallel state and the lower part representing the antiparallel state. Among them, (a), (c), (e), (g), (i) represent the transmission coefficients in the energy range from -2 to 2 eV (left), and (b), (d), (f), (h), (j) represent the transmission coefficients near the Fermi level (right). The tilt angle decreases from top to bottom. The absolute value of  $\alpha$  exhibits a gradual decline from the upper region to the lower region.



**Figure S6.** When the tunneling interface is a parallelogram, the transmission coefficient graphs of the device are shown, with the upper part of each small graph representing the parallel state and the lower part representing the anti-parallel state. Among them, (a), (c), (e), (g), (i) represent the transmission coefficients in the energy range from -2 to 2 eV (left), and (b), (d), (f), (h), (j) represent the transmission coefficients near the Fermi level (right). The inclination angle decreases from top to bottom.  $\alpha$  decreases gradually from the top to the bottom.