Supplementary Materials for "Large valley polarization and valley-dependent Hall effect in TiTeBr monolayer"

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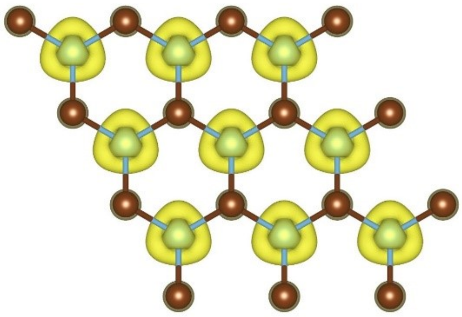

Fig. S1. Spin-polarized charge density of TiTeBr monolayer.

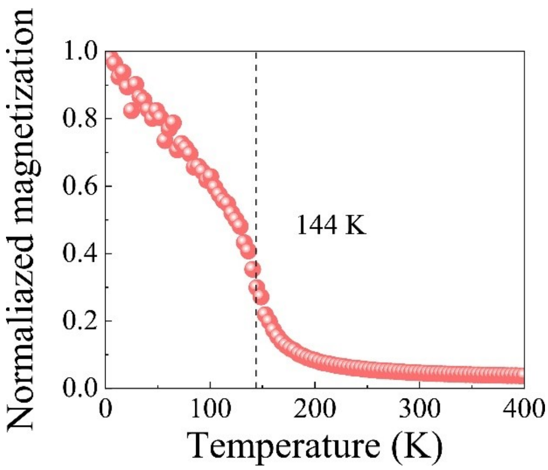

Fig. S2. Normalized magnetic moment as a function of temperature by Monte carlo

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simulations for TiTeBr monolayer at 5% tensile strain.

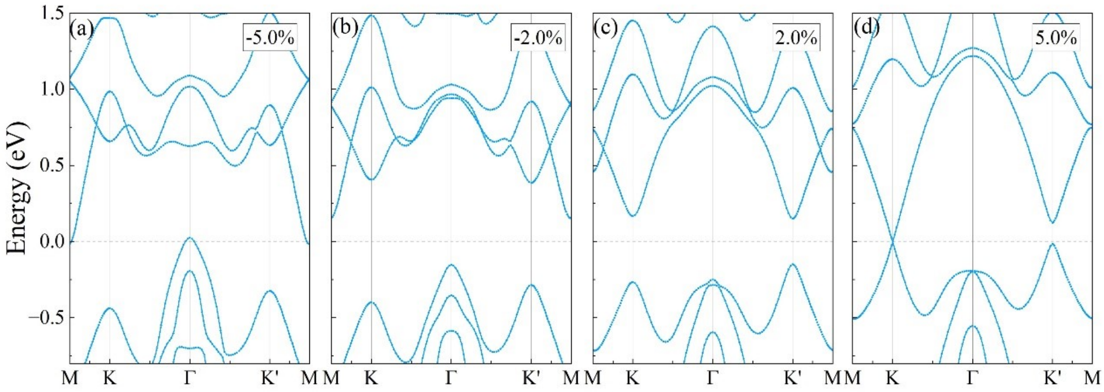

Fig. S3. Band structure of TiTeBr monolayer at (a) -5%, (b) -2%, (c) 2%, and (d) 5% strain. The magnetization is set along the +z direction.

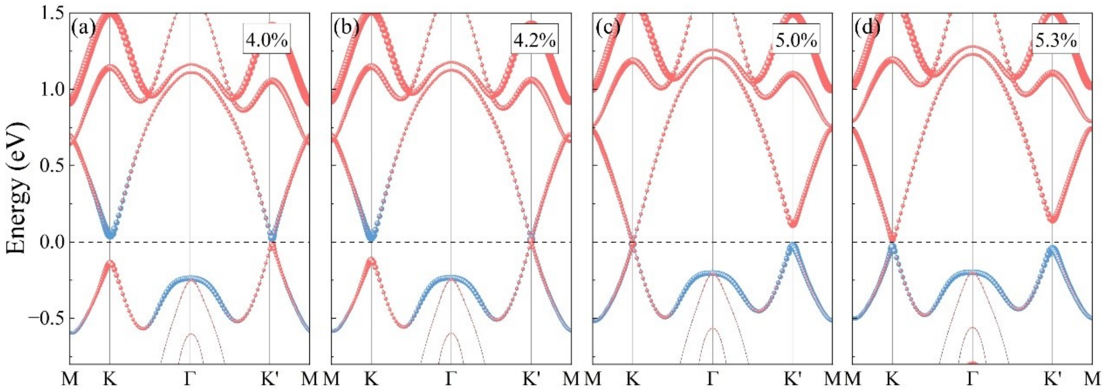

Fig. S4. Orbital-resolved band structure of TiTeBr monolayer at (a) 4.0%, (b) 4.2%, (c) 5.0% and (d) 5.3% tensile strain. The magnetization is set along the +z direction. Red and blue ball represent the $E(d_{xy}, d_{x^2-y^2})$ orbital and $A_1(d_{z^2})$ orbital, respectively.

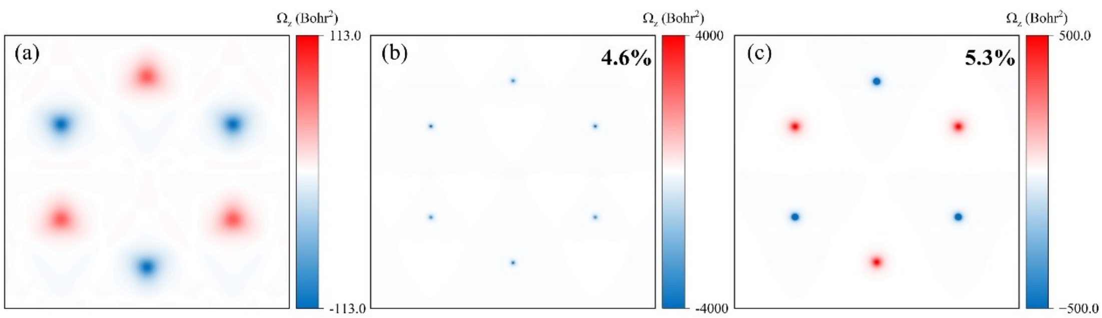

Fig. S5. Berry curvature of TiTeBr monolayer at different tensile strain. (a) is the no strain case. (b) and (c) correspond to 4.6% and 5.3% strain, respectively.

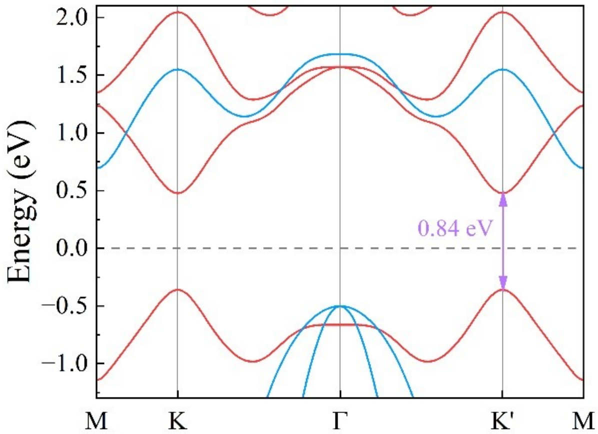

Fig. S6. Spin-resolved band structure of TiTeBr monolayer without SOC at the HSE06 level. Red and blue lines represent the spin-up and spin-down channel, respectively.

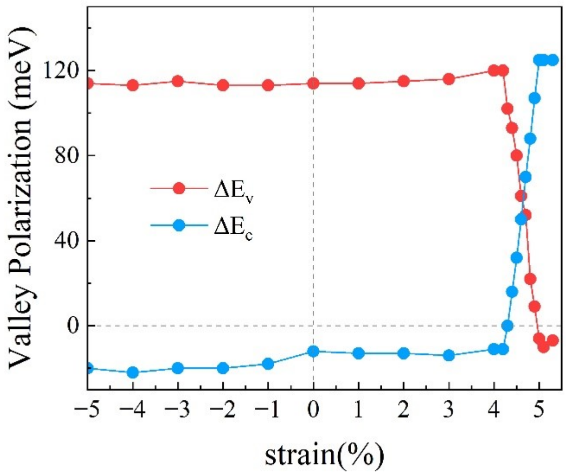

Fig. S7. Valley polarization of TiTeBr monolayer at different strain. Red and blue lines represent the valley polarization of the valence band and the conduction band, respectively.