Electrical engineering of topological magnetism in two-dimensional heterobilayers

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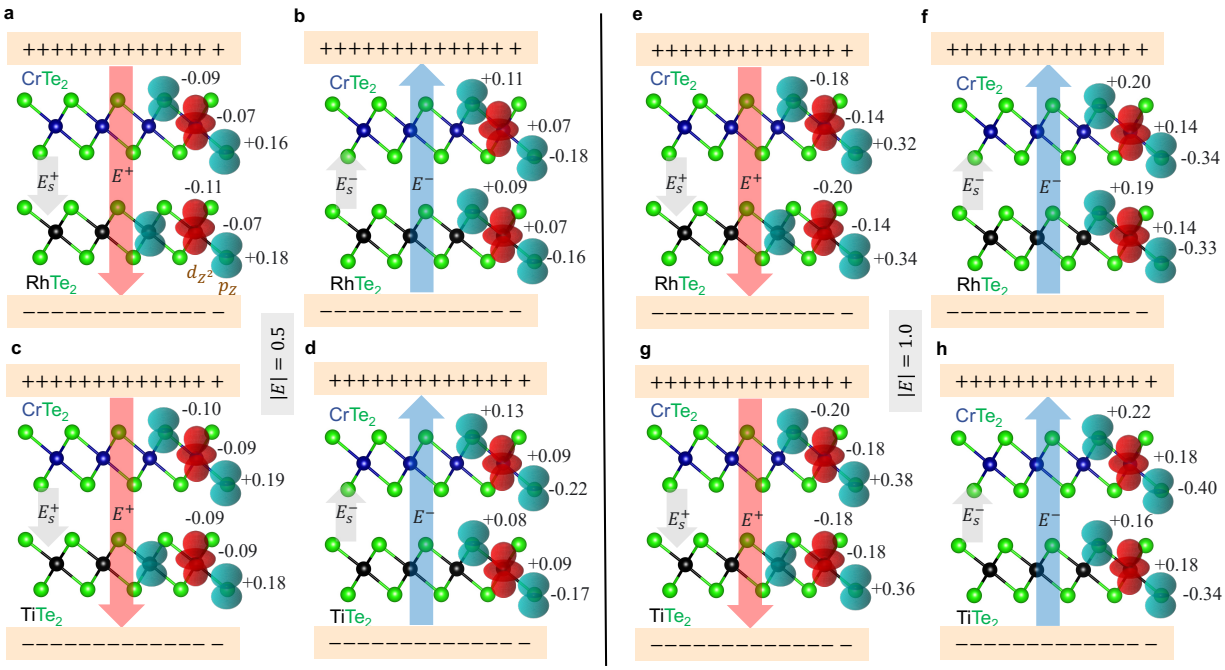
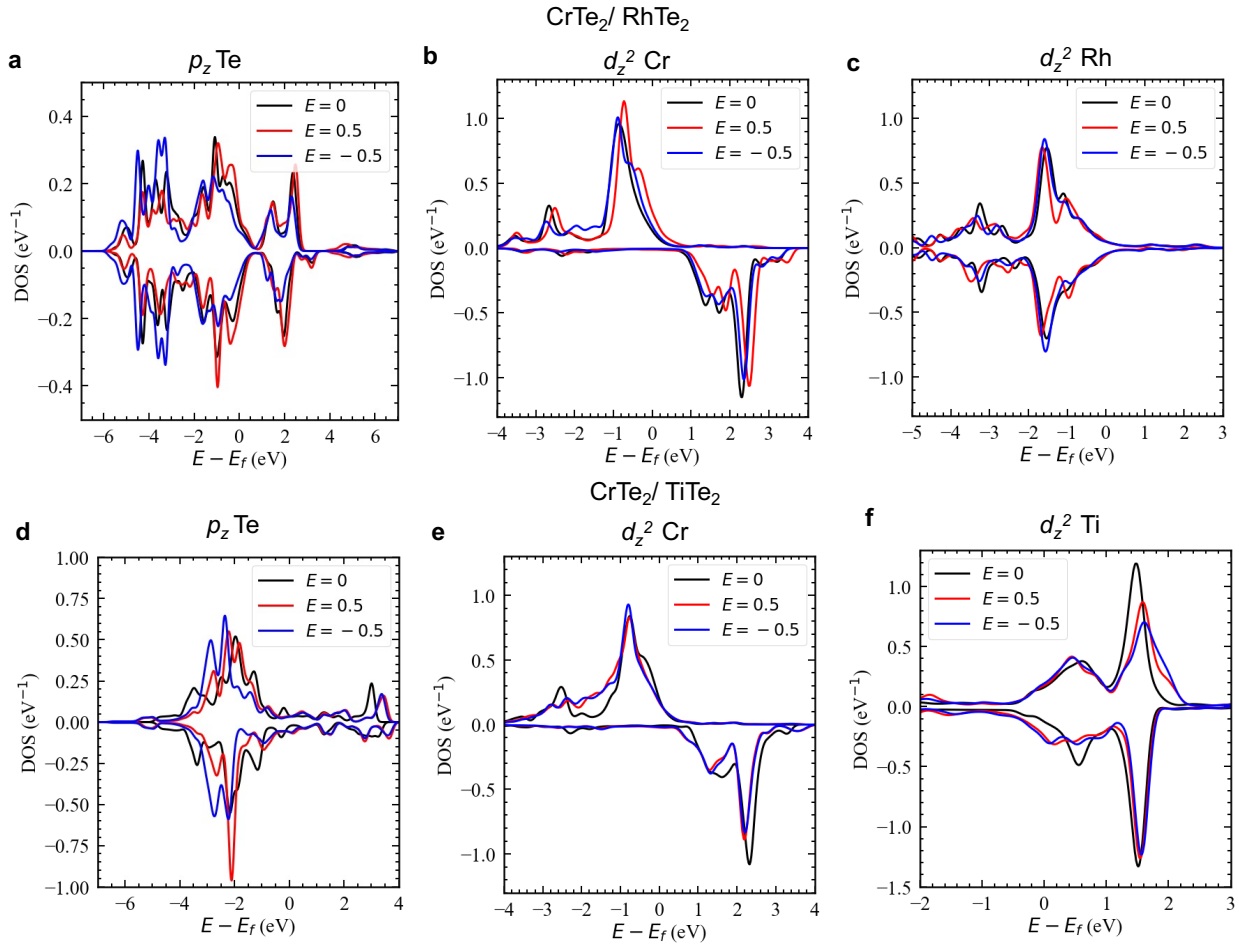
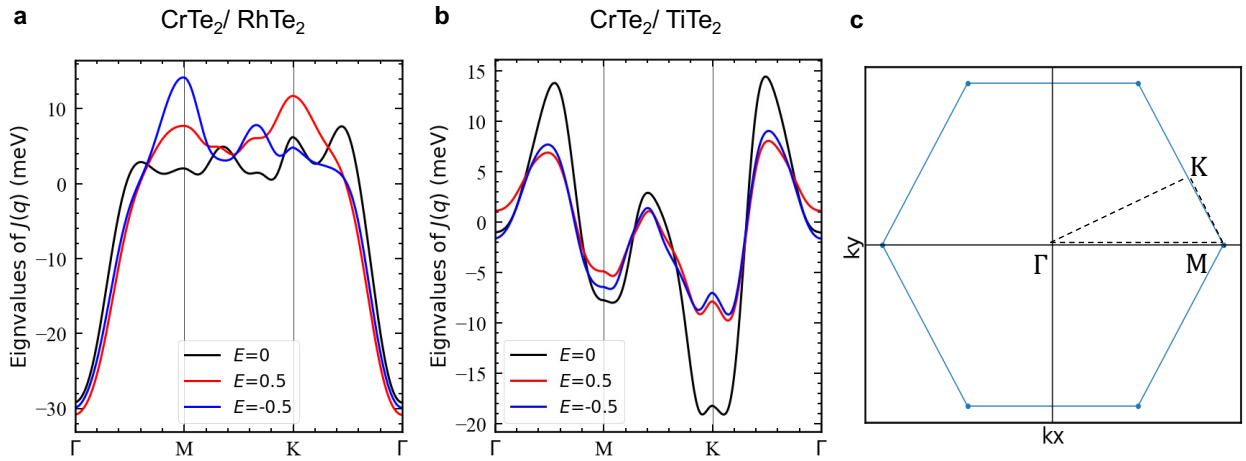


Supplementary Figure 1: **Charge accumulation with respect to the perpendicular (both positive and negative) electric field.** $|E| = 0.50\,\mathrm{V/Å}$: (a-b) $CrTe_2$/$RhTe_2$ heterobilayer. (c-d) $CrTe_2$/$TiTe_2$ heterobilayer. $|E| = 1.0\,\mathrm{V/Å}$: (e-f) $CrTe_2$/$RhTe_2$ heterobilayer and (g-h) $CrTe_2$/$TiTe_2$ heterobilayer. E_s^+ (E_s^-) are the screened electric fields due to the positive (negative) external fields.



Supplementary Figure 2: **Selected orbital contributions to the local density of states**. (a-c) $CrTe_2$/$RhTe_2$ heterobilayer. (d-f) $CrTe_2$/$TiTe_2$ heterobilayer. We plot the atom-projected contributions with p_z-orbital symmetry for Te, and with d_{z^2}-orbital symmetry for the transition metal atoms.



Supplementary Figure 3: **Energetics of magnetic states for the heterobilayers based on the computed exchange interactions**. (a,b) Eigenvalues of the Fourier-transformed exchange interactions as a function of q at different values of the electric field in $CrTe_2$/$RhTe_2$ and $CrTe_2$/$TiTe_2$ heterobilayers, respectively. (c) The hexagonal first Brillouin zone.