

## Supporting Information

### **Tunneling transport of 2D anisotropic XC (X = P, As, Sb, Bi) with direct band gap and high mobility: A DFT coupled with NEGF study**

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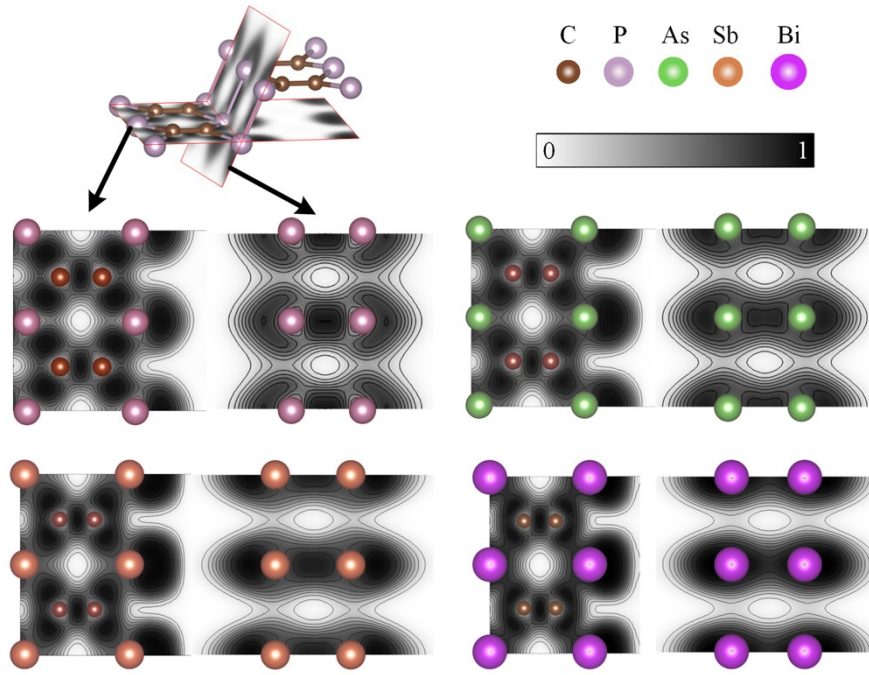


Figure S1. Electron localization function of the  $\alpha$ -XC (X = P, As, Sb, Bi) monolayers.

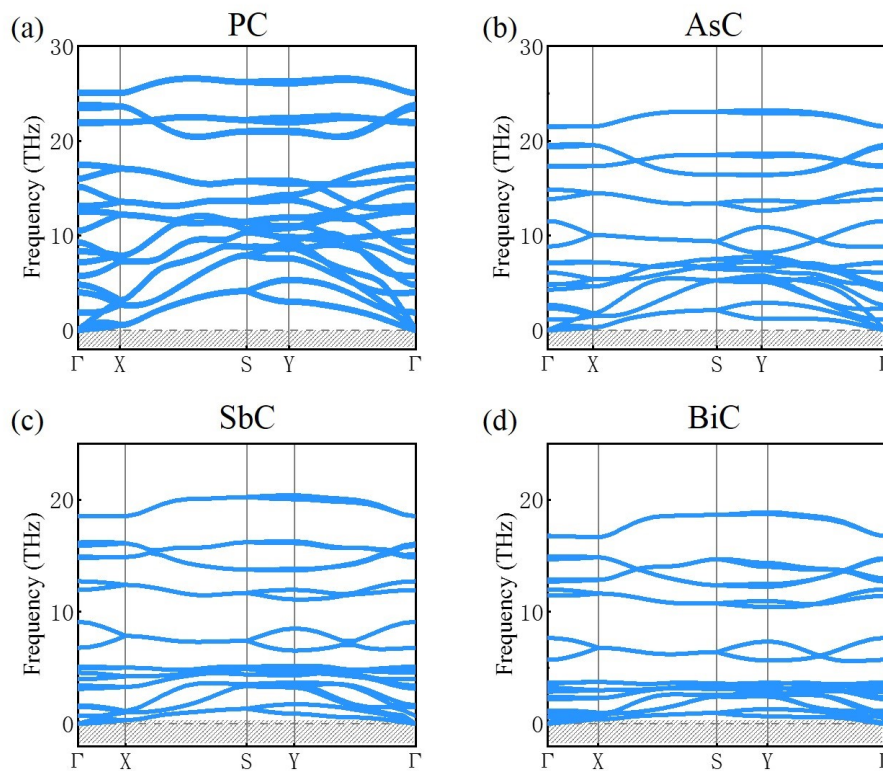


Figure S2. Phonon band dispersions of the (a) PC, (b) AsC, (c) SbC and (d) BiC monolayers, respectively.

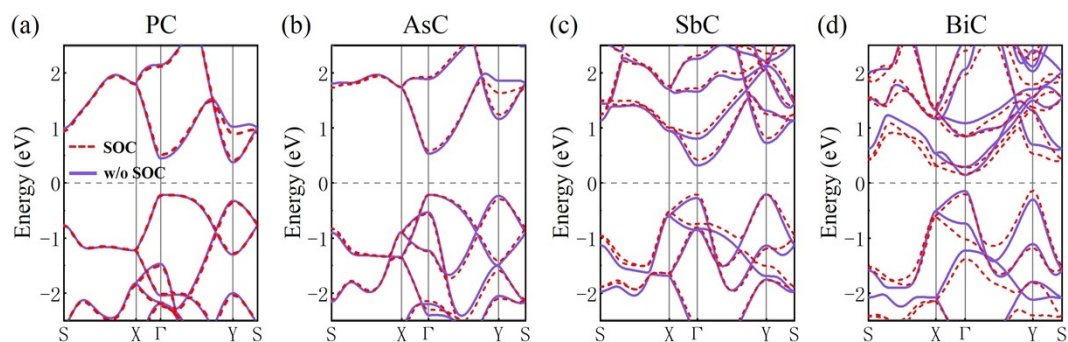


Figure S3. Band structures of (a) PC, (b) AsC, (c) SbC and (d) BiC with and without SOC, respectively.

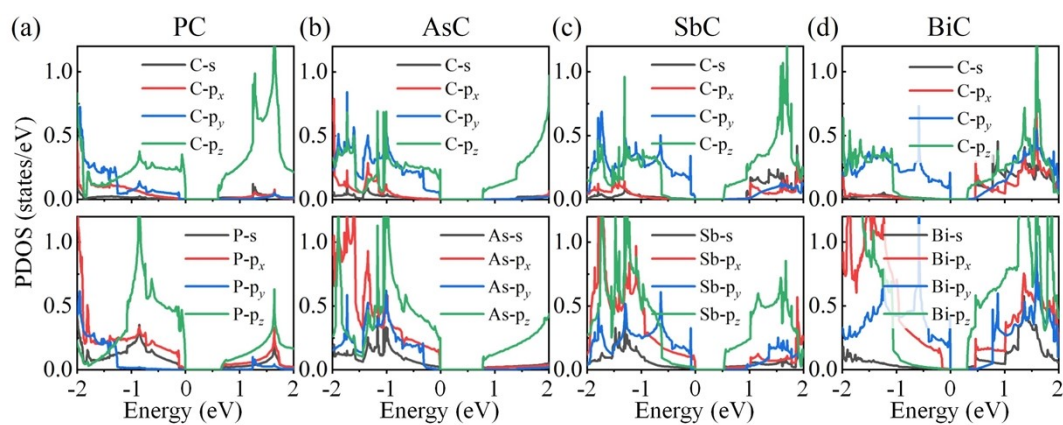


Figure S4. Projected density of states of (a) PC, (b) AsC, (c) SbC and (d) BiC monolayers, respectively.

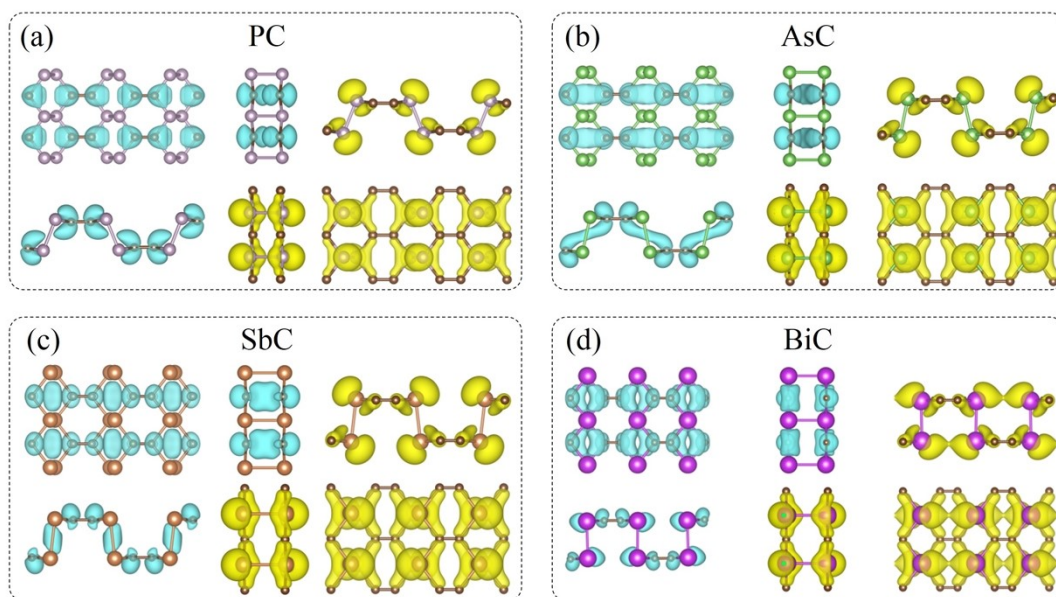


Figure S5. Iso-surfaces of partial charge densities for the VBM (yellow) and CBM (cyan) of (a) PC, (b) AsC, (c) SbC and (d) BiC monolayers, respectively.