Supporting information for

Prediction of topological phase transition in X2-SiGe monolayers

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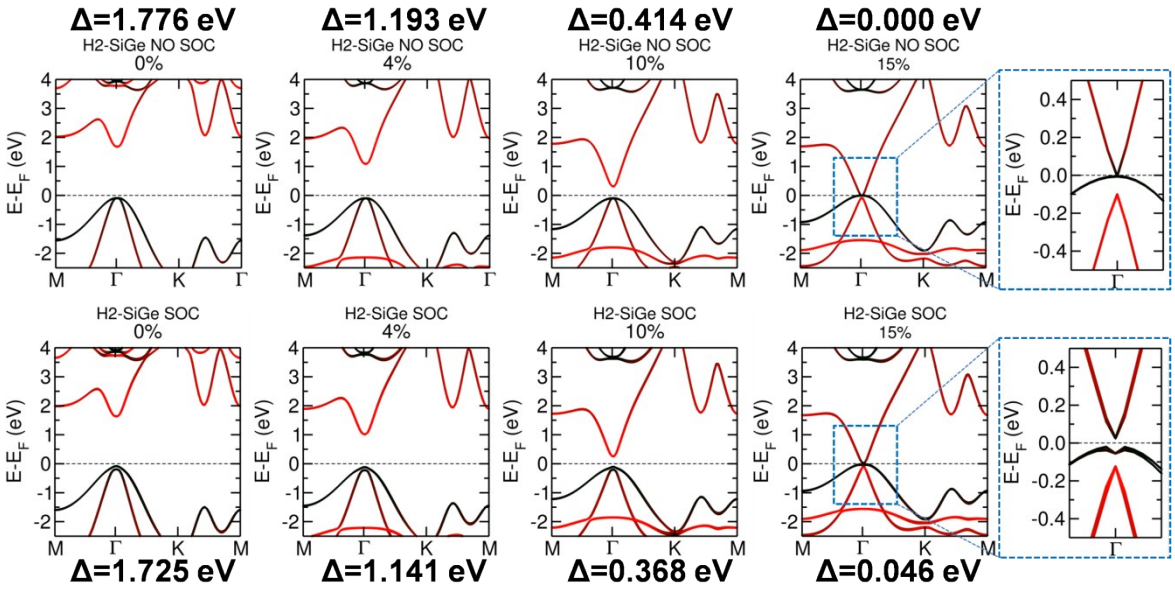

Figure S1. Evolution of the band structure of a H2-SiGe monolayer under strain. The band structures are calculated without (upper) and with (lower) SOC. The zoomed-in of the closest bands to the Fermi level for the 15%-strained H2-SiGe monolayer are shown right-most plots. Δ stands for the band gap at each percentage of strain. The color gradient

indicates the contribution of the *s*, p_x, and p_y orbitals to each of the bands along the k-path – red for *s*, and dark blue for p_x, and p_y.

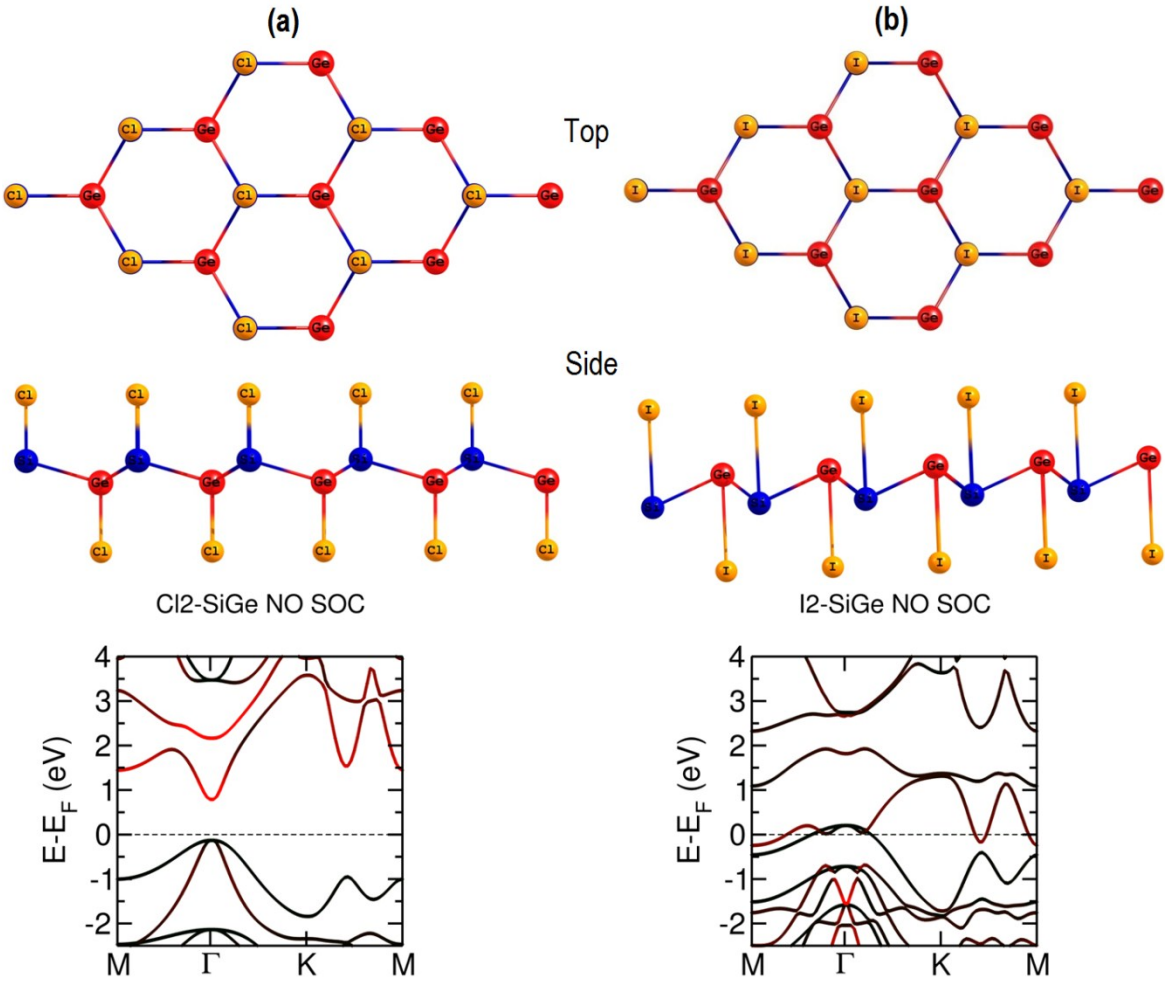

Figure S2. Top and side views of the optimized **(a)** Cl2-SiGe and **(b)** I2-SiGe structures with their corresponding band structure. The calculated bond distances for I2-SiGe are $d_{Si\text{-}I}$ =3.196Å, $d_{Ge\text{-}I}$ =3.160Å, $d_{Si\text{-}Ge}$ =2.522Å, while for Cl2-SiGe are $d_{Si\text{-}Cl}$ =2.080 Å, $d_{Ge\text{-}Cl}$ = 2.188 Å, $d_{Si\text{-}Ge}$ =2.451 Å. The color gradient in the plots indicates the contribution of the *s*, p_x, and p_y orbitals to each of the bands along the k-path – red for *s*, and dark blue for p_x, and p_y.