Supplementary Information for

Tensile strains give rise to strong size effects for thermal conductivities of silicene, germanene and stanene

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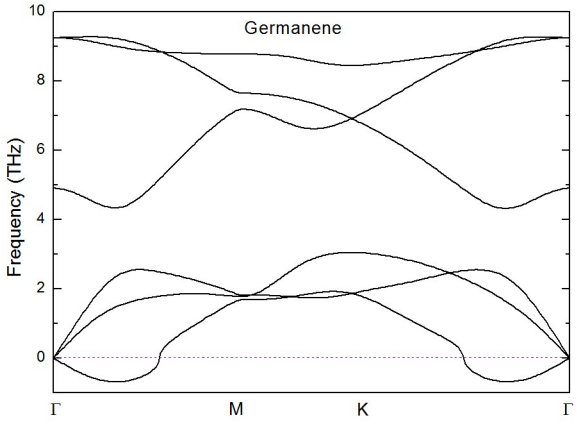

Figure S1. Calculated phonon dispersion of unstrained germanene (*d*-electron included in valence). The ground state was determined by full geometrical optimization based on

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the following setup: plane wave cutoff 560 eV, 28×28 k-mesh, energy convergence tolerance of 1.0×10^{-9}, force convergence precision 1.0×10^{-6} eV/Å and a vacuum layer thickness 1.6 nm using the VASP package. We obtain an equilibrium lattice constant of 3.954 Å and a buckling height of 0.638 Å. The harmonic IFCs are calculated using a 7×7 supercell without additional neighbor cutoff, a 4×4 k-mesh and the same plane wave cutoff, energy convergence tolerance and vacuum layer thickness as those used for the optimization. Note the soft (imaginary) out-of-plane acoustic modes at low frequency.

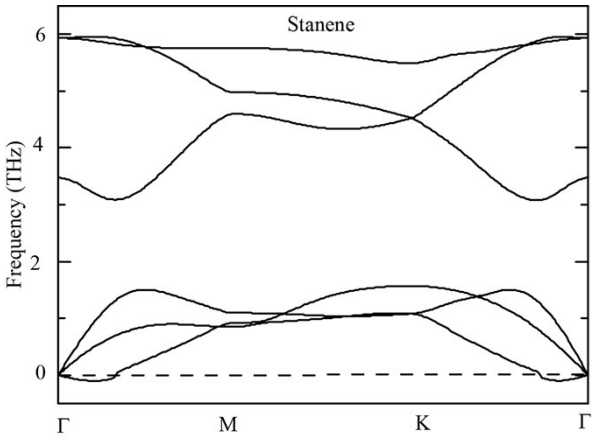

Figure S2. Phonon dispersion of unstrained stanene based on the setups of fast Fourier transformations (FFT) grid densities NGX=360 and NGY=360 respectively for two vertical in-plane directions and NGZ=90 for the out-of-plane direction. In the manuscript the phonon dispersion of unstrained stanene (Figure 1c), the corresponding FFT grid densities are NGX=180, NGY=180 and NGZ=90. No significant difference in the ZA phonon dispersion is seen with increasing FFT grid density.

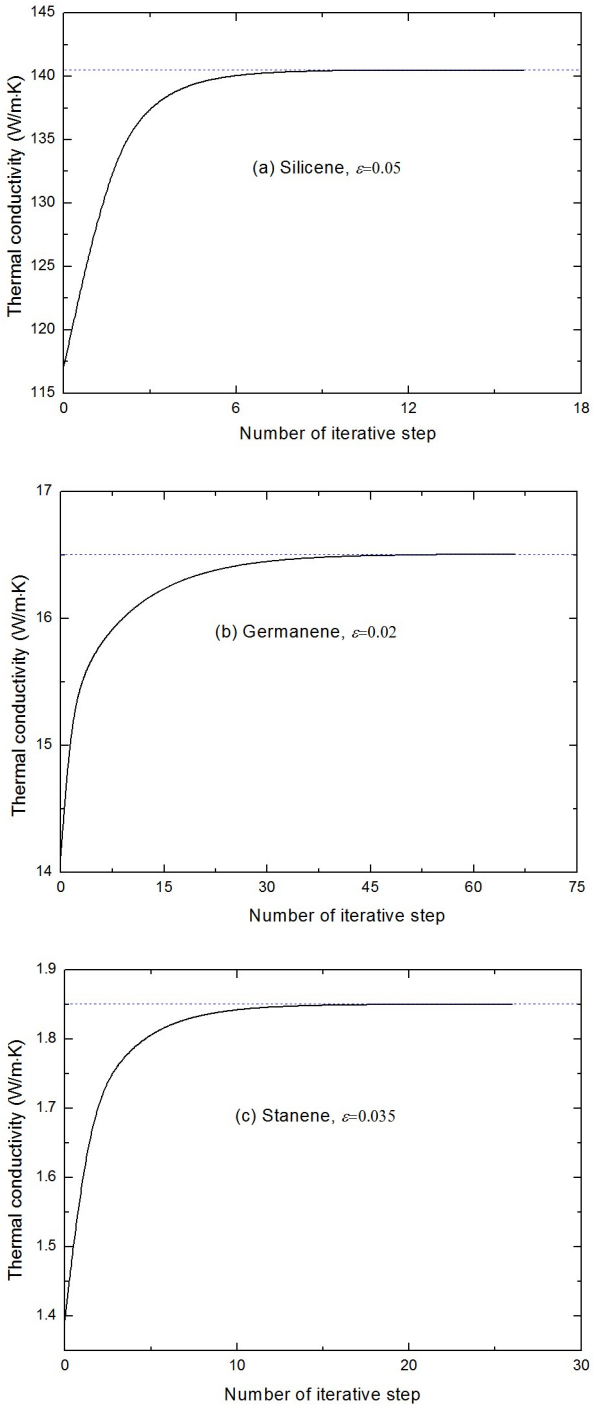

Figure S3. The thermal conductivity as a function of iterative step for silicene at ε=0.05, germanene at ε=0.02 and stanene at ε=0.035 corresponding to q-point grid density N_1=301. Good convergence is achieved after 16，64 and 27 iterations using convergence precision 1×10^{-5} for silicene, germanene and stanene, respectively.