

## Supporting information

### Anisotropy of thermal transport in phosphorene: A comparative first-principles study using different exchange-correlation functional

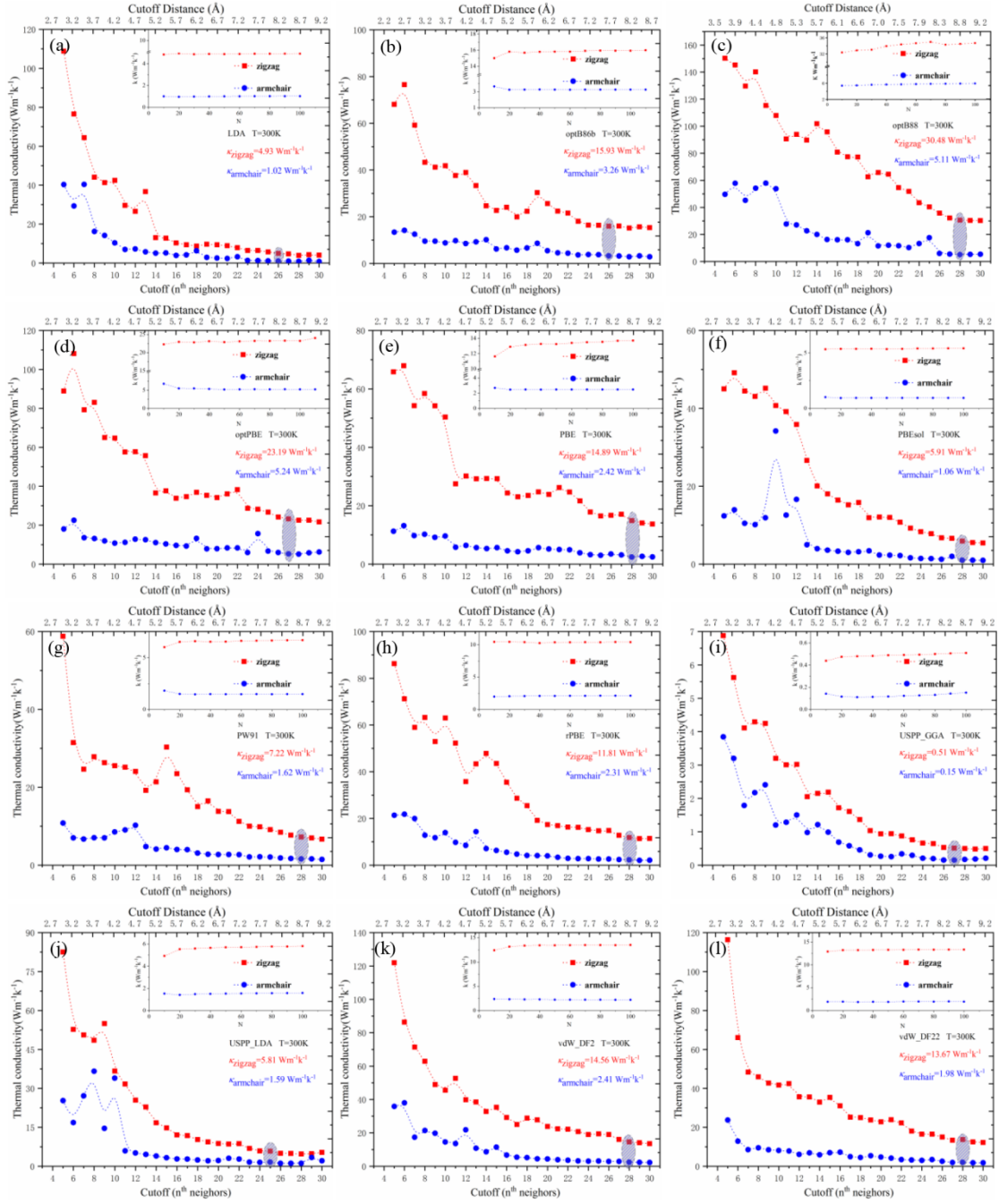
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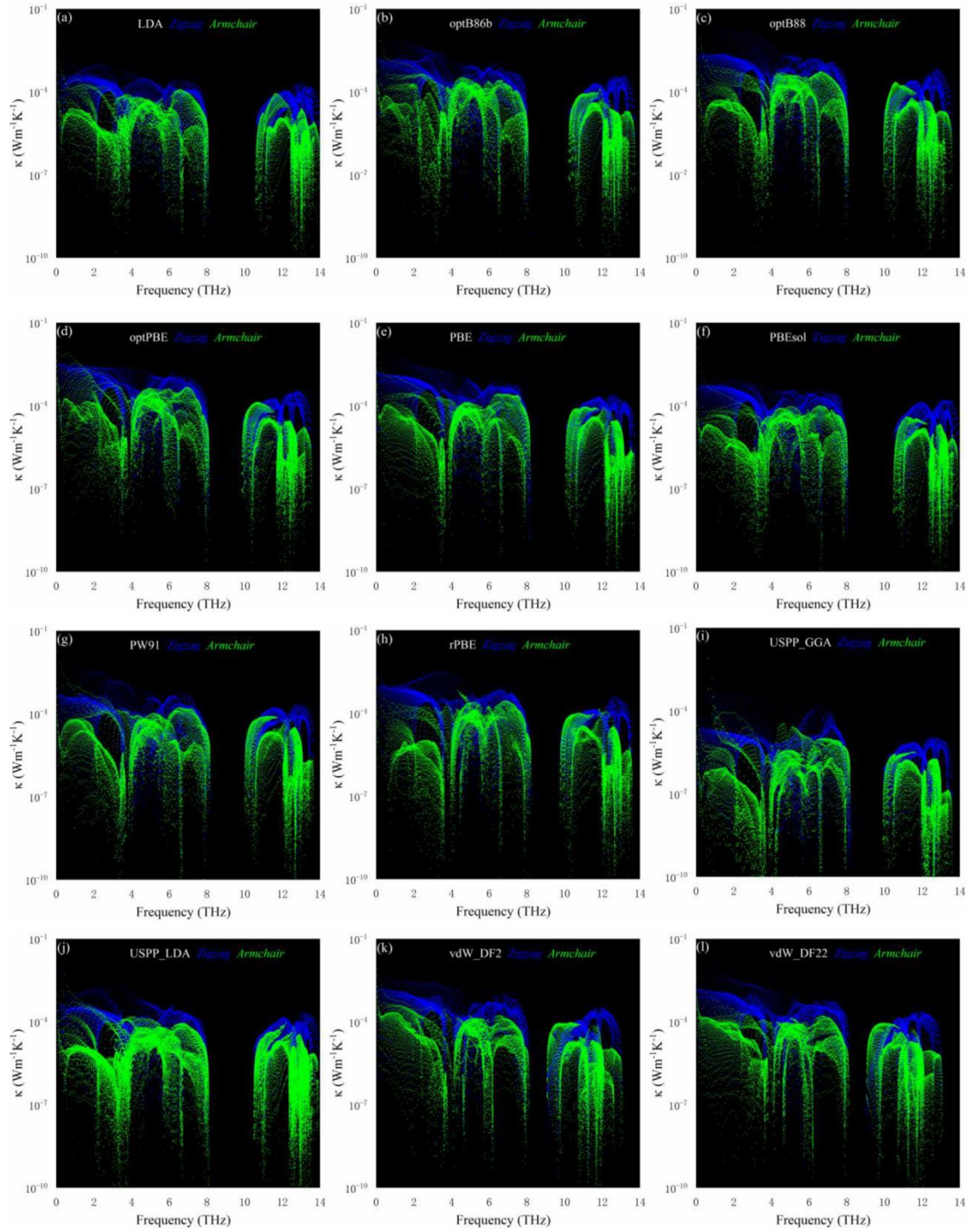
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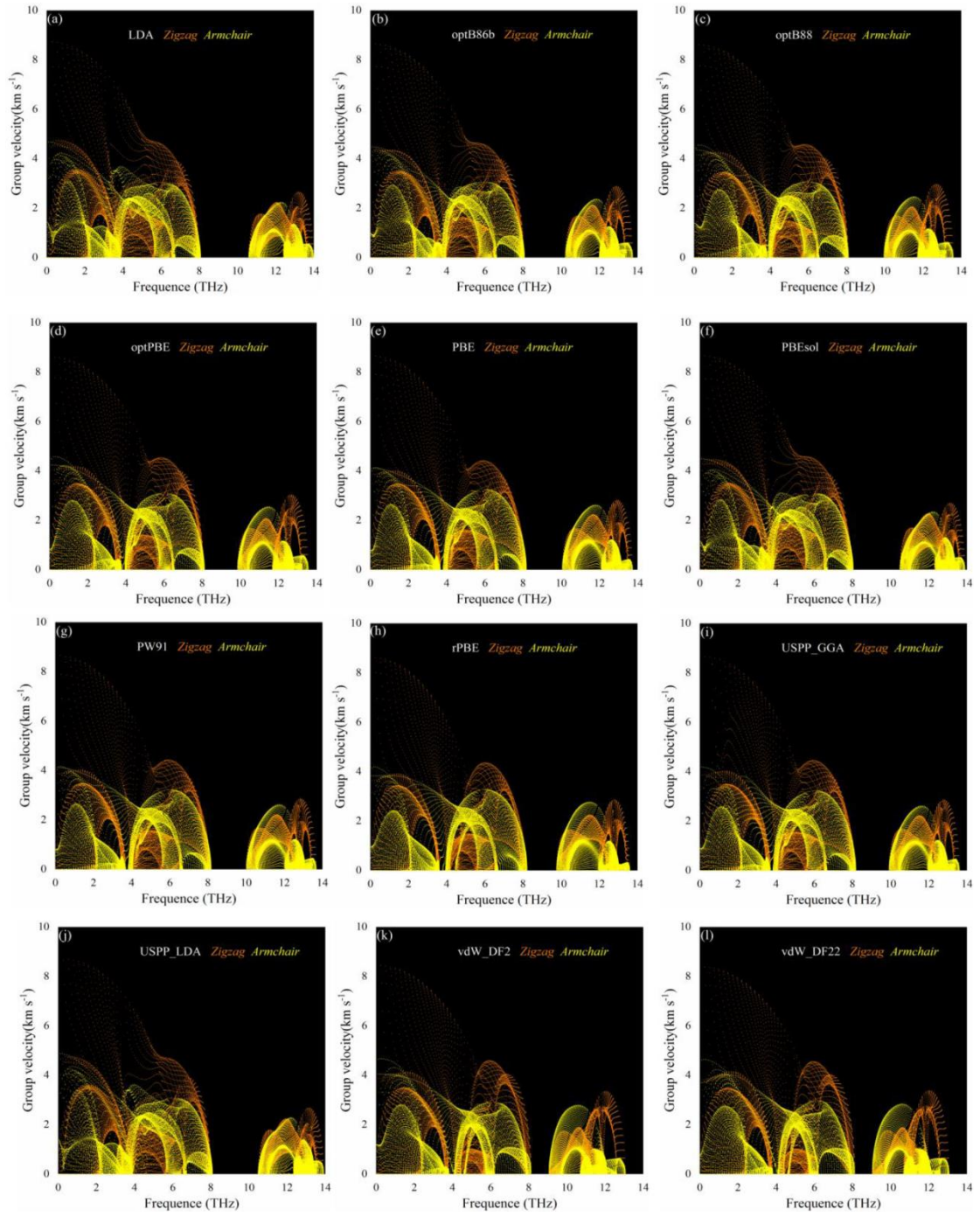
*\*Email: liangding@hit.edu.cn; gzqin@hnu.edu.cn*



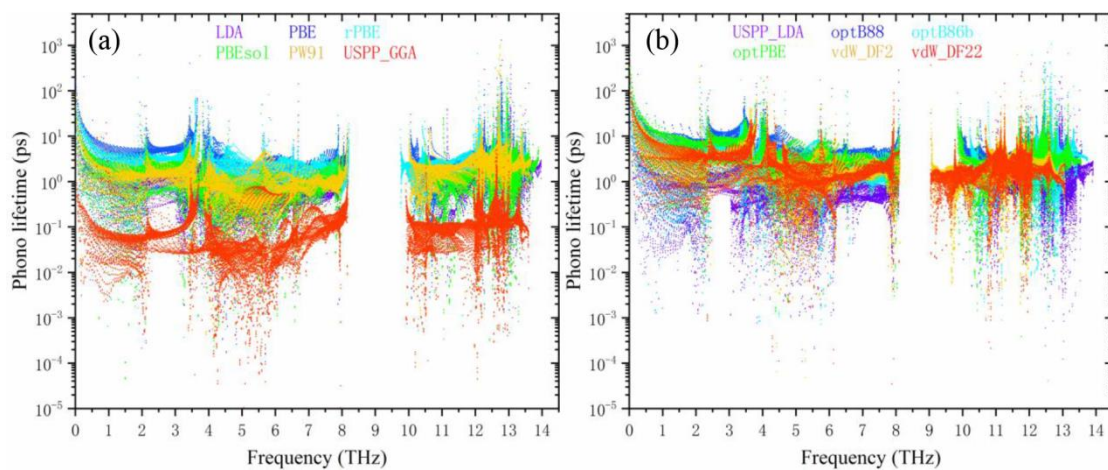
**Fig. S1.** Different XC functionals calculate the cut-off radius and the convergence behavior of Q lattice to the thermal conductivity of phosphorus lattice ( $\kappa$ )



**Fig. S2.** The relationship between phonon frequency and thermal conductivity under 300K using different XC functionals

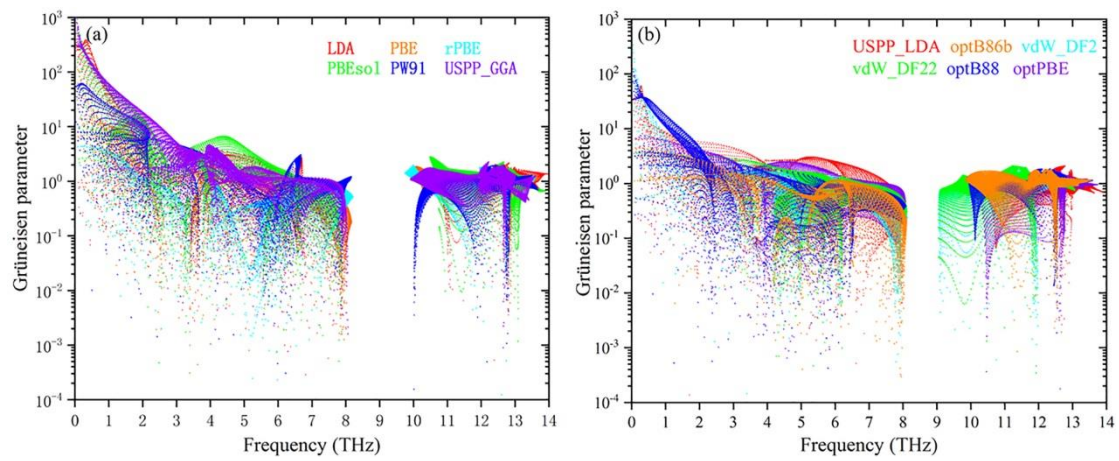


**Fig. S3.** The relationship between phonon frequency and group velocity under 300K using different XC functionals

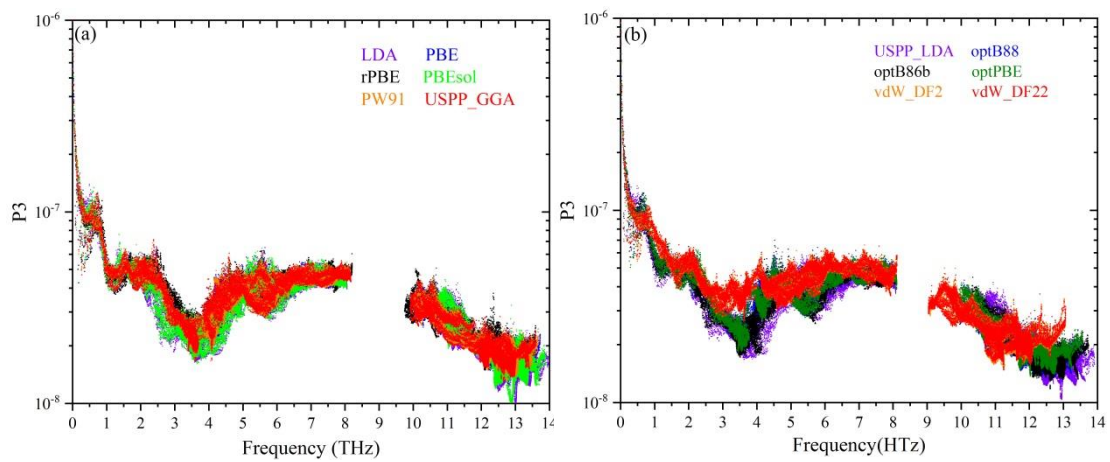


**Fig. S4.** The relationship between phonon frequency and phono lifetime under 300K using different XC functionals





**Fig. S5.** The relationship between phonon frequency and Gruneisen parameter under 300K using different XC functionals



**Fig. S6.** The relationship between phonon frequency and Scattering phase space (P3) under 300K using different XC functionals