



Fig. 1. Thermal anisotropy of black P (a) Illustration of opto-thermal resonance spectromicroscopy. (a) A black P drumhead resonator $d=9\mu\text{m}$, and $t\sim 80\text{nm}$ with known crystal orientation (scale bar $10\mu\text{m}$). (c) f_{res} along during measurement along AC and ZZ direction. (d) Simulation results of f_{res} along AC and ZZ direction during laser heating with extracted thermal conductivities ($\kappa_{\text{AC}}=15\text{Wm}^{-1}\text{K}^{-1}$ and $\kappa_{\text{ZZ}}=55\text{Wm}^{-1}\text{K}^{-1}$).