**SUPPORTING INFORMATION**



**Figure** **S1.** Schematic diagram for the time-resolved transient reflection measurement system. BS: beam-splitter; HWP: half-wave plate; DM: dichroic mirror; SP: Silicon photodiode detector; G-T: Glan-Taylor prism.



**Figure S2.** (a)–(d) AFM images and height profiles for NbTe2 samples with different thicknesses.



**Figure S3.** Tauc plots of NbTe2 flakes with different thicknesses.



**Figure S4.** (a)–(d) Peak amplitudes of the Δ*R* curves as a function of the pump power for NbTe2 flakes with different thicknesses. The black solid squares represent the experimental data, and the red solid line is the linear fit.



**Figure S5.** Polarization-resolved transmission of 520 nm pump light in NbTe2 sample. *T* and *T0* are measured transmissions for the sample and quartz substrate, respectively.