**SUPPORTING INFORMATION**

Diagram

Description automatically generated

**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.

A picture containing schematic

Description automatically generated

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

Chart, line chart

Description automatically generated

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

![Chart, line chart

Description automatically generated]()

**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.

Chart

Description automatically generated

**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.