

*Supplementary Information for*

**Resonance-enhanced excitation and relaxation dynamics of coherent phonons in Fe<sub>1.14</sub>Te**

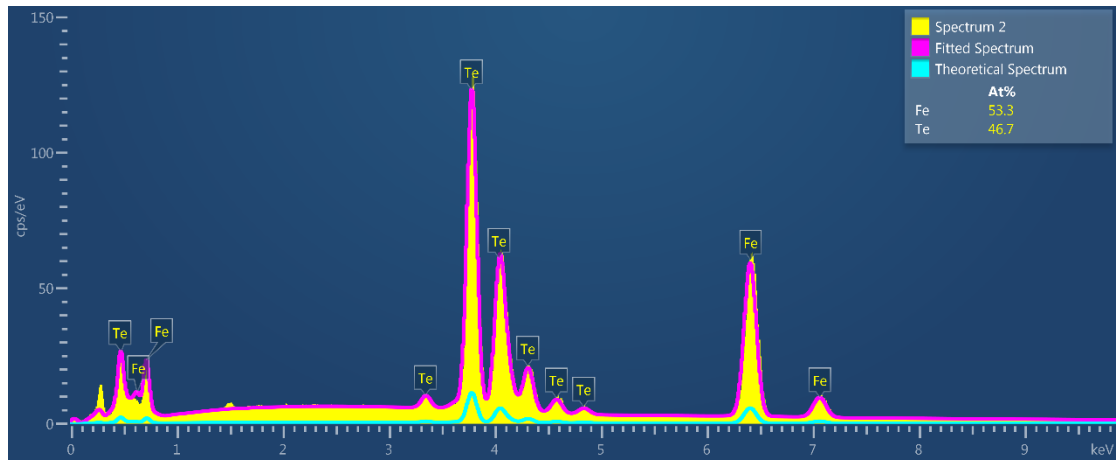
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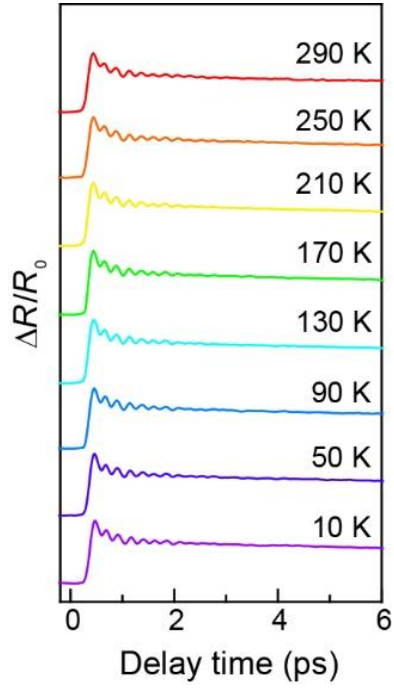
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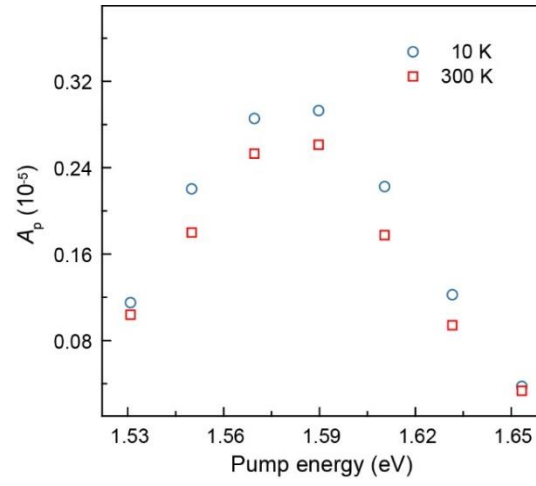
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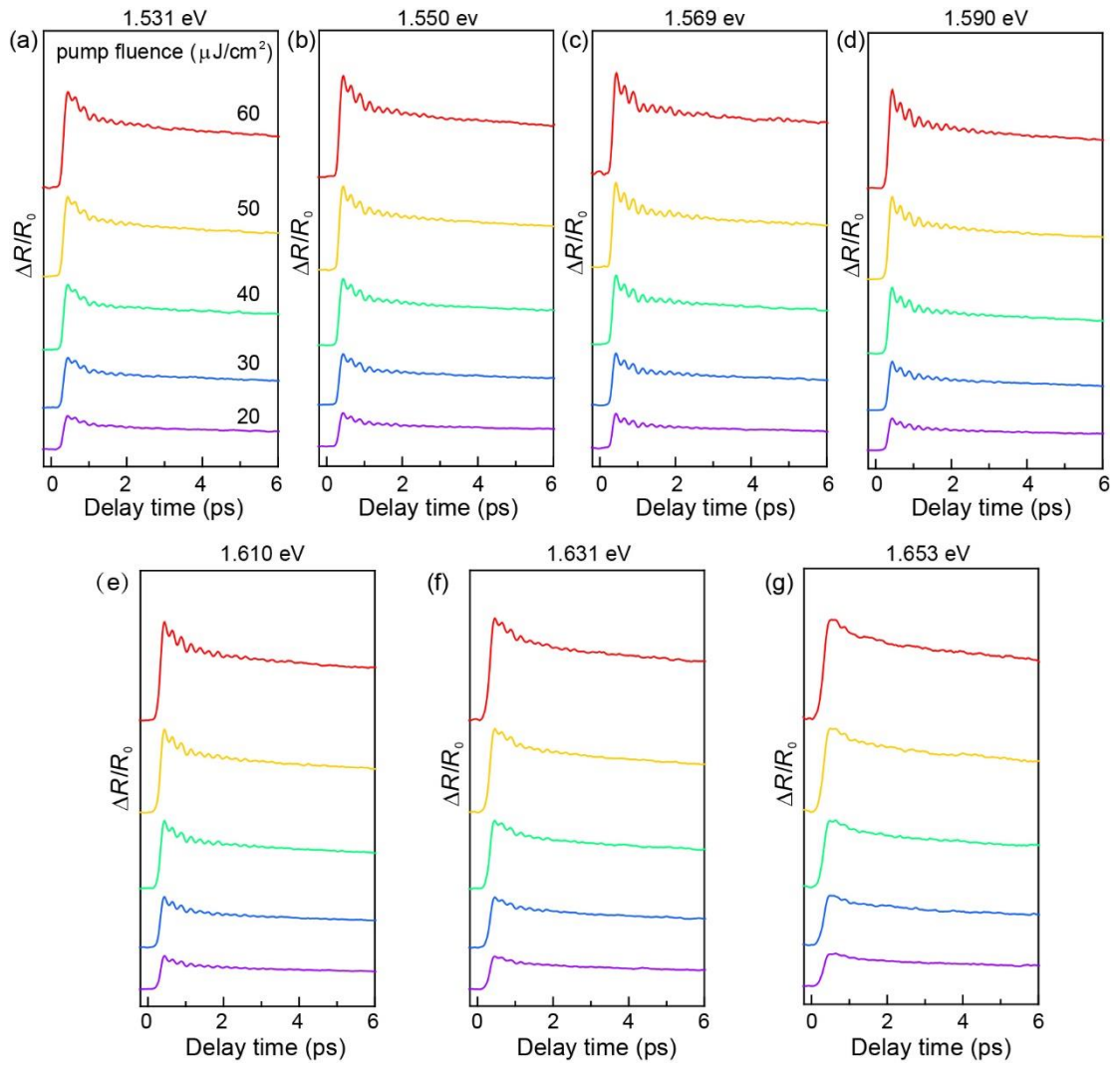
**Fig. S1.** EDS characterization of the synthesized sample, revealing the Fe/Te composition ratio of 1.14:1.



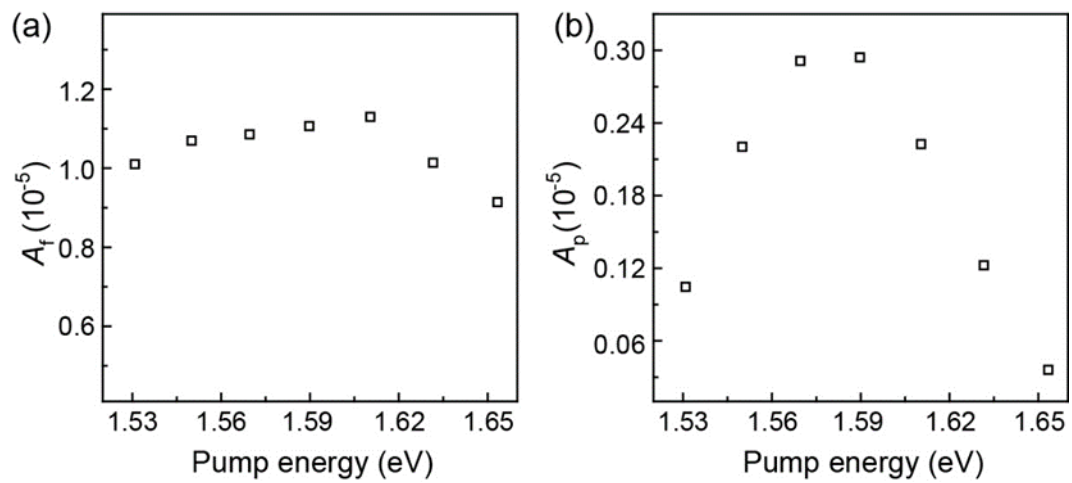
**Fig. S2.**  $\Delta R(t)/R_0$  time series of single-crystal  $\text{Fe}_{1.14}\text{Te}$  collected at different temperature under 1.569-eV excitation.



**Fig. S3.**  $A_p$  of the  $A_{1g}$  phonons as a function of pump photon energy at 10 K and 300 K.



**Fig. S4.**  $\Delta R(t)/R_0$  time series at different pump fluence with photon energy varying from 1.531 eV to 1.653 eV.



**Fig. S5.**  $A_f$  and  $A_p$  as a function of pump photon energy obtained from Fig. 4(a).