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Peer Review

Review of: "Terahertz-Induced Second-Harmonic Generation in Quantum Paraelectrics: Hot-Phonon Effect"

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In this manuscript, the authors propose an alternative explanation for the origin of the long-lived non-oscillatory SHG signal, which was previously attributed to terahertz field–induced ferroelectric order in ref. 9. To test their hypothesis, they use paraelectric $KTaO_3$ as a model system and compare experimental results of terahertz-induced time-resolved SHG with numerical simulations based on the nonequilibrium hot-phonon effect. Their numerical results from the hot-phonon model quantitatively agree with the experimental data. I believe this work provides valuable insight and has the potential to prompt a reevaluation of previous interpretations of terahertz field–induced order, making it worthy of publication.

To further strengthen the manuscript, I suggest the authors perform numerical simulations for $SrTiO_3$ using both the hot-phonon and transient ferroelectric models and compare the results with experimental data published in ref. 9.

Declarations

Potential competing interests: No potential competing interests to declare.

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