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Polarization dependence of coherent LO phonon excitation in Si[1]

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— The coherent LO phonon mode excitation dependence on the angle θ between pump and probe polarizations is systematically investigated by transient electro-optic sampling measurement for both Γ_{25} and Γ_{12} symmetries[2] We find that for Γ_{25} symmetry the phonon exhibits a $\sin(2\theta)$ dependence in the amplitude, while for Γ_{12} symmetry the signal is considerably weaker and has a $\cos(2\theta)$ dependence. The LO phonon maximum amplitude for Γ_{25} is larger than the maximum amplitude for Γ_{12} by about a factor of 6. We will discuss the results in the context of coherent phonon excitation mechanisms.

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[2]M. Hase, M. Kitajima, A. M. Constantinescu, and H. Petek, *Nature* **426**, 51 (2003).

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