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Title:Terahertz coherent acoustic experiments with semiconductor superlattices

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Abstract:We demonstrate the generation, propagation, and detection of coherent acoustic waves at 1 THz. We performed picosecond ultrasonics experiments in an acoustic transmission geometry, which allows a total decoupling of the phonon generation and detection processes, occurring in two different superlattices grown on opposite sides of a substrate, respectively. We show that a 1 ns burst of monochromatic terahertz coherent acoustic waves could be generated on one side of a substrate, propagated over a large distance and detected on the opposite side. We also measured the lattice dispersion owing to the time delay between the terahertz burst and much lower frequency acoustic waves.

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