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Non-equilibrium ballistic phonon transport in microstructures OBAFEMI OTELAJA, JARED HERTZBERG, RICHARD ROBINSON[1], Cornell University — A non-thermal spectral distribution of phonon modes may be excited in silicon microstructures by using the decay of quasiparticles injected into an adjacent superconducting film. [1] We demonstrate generation, ballistic transport and detection of phonons of frequency of order 100 GHz in microstructures of dimension 10 to 50 microns. We describe the fabrication process for the superconducting transducers, the measurement procedure, and plans to extend these techniques to build a nanoscale phonon spectrometer. This work is supported by KAUST (KUS-C1-018-02), NSF (DMR 0520404), and DOE (DE-SC0001086).

[1] W. Eisenmenger, A. H. Dayem, Phys. Rev. Lett. 18, 125 (1967).

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