

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Phonons and solid-state qubits for quantum technology Ö.O. SOYKAL, RUSKO RUSKOV, University of Maryland, College Park, MD 20742, CHARLES TAHAN, Laboratory for Physical Sciences, College Park, MD 20740 — Phonons in the context of quantum information processing are traditionally negatives. They induce relaxation or decoherence of or between qubit states. Learning to control phonons for positive purposes, both as supporting technology for quantum information processing, and for other quantum devices is of great possible interest. Already, acoustic waves are used as a supporting technology in microelectronics and optoelectronics (e.g. their slow speed can be useful in certain contexts). Here we consider some methods for making phonons useful and describe the physics of such systems in several potential solid-state systems including silicon. Our results may also be of interest to the optomechanics community.

Oney Soykal
University of Maryland

Date submitted: 20 Dec 2010

Electronic form version 1.4