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Ultrafast Quantum Processing at Room-Temperature in Bulk Diamond Phonons BENJAMIN SUSSMAN, PHILIP BUSTARD, National Reseach Council Canada, K.C. LEE, MICHAEL SPRAGUE, JOSHUA NUNN, NATHAN LANGFORD, X.-M. JIN, IAN WALMSLEY, University of Oxford, DOUG MOFFATT, RUNE LAUSTEN, National Reseach Council Canada — The two-level system comprised of the acoustic phonon and optical phonon of bulk diamond provides a unique opportunity for quantum processing at room-temperature with ultrafast rates. We present several applications including the generation of macroscopic non-classical states, a quantum memory for storing broad-band photons, and the generation of true random numbers from vacuum fluctuations.

[X] Prefer Oral Session
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