

Abstract Submitted
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Dynamic Stimulation of Superconductivity with Resonant Terahertz Phonons ALAN M. KADIN, Princeton Junction, NJ, STEVEN B. KAPLAN, Estes Park, CO — Can superconductivity be induced at a temperature far above the equilibrium critical temperature T_c ? While small enhancements were observed many years ago and associated with nonequilibrium electron distributions, it is proposed here that much larger enhancements (up to a factor of two in temperature) may be possible by generation of coherent phonons at appropriate resonant frequencies comparable to the gap frequency, in the terahertz range. These phonon standing waves may induce real-space electron localization that forms the basis for superconducting coherence within a novel model of superconductivity [1,2]. This concept may be generalized to dynamic stimulation using coherent spin waves for non-phonon mediated superconductors such as the cuprates. Several experiments to test this are proposed. [1] S.B. Kaplan and A.M. Kadin (2012), “Superconductivity via Two-Phase Condensation of Localized Electrons”, http://absimage.aps.org/image/MAR12/MWS_MAR12-2011-002491.pdf [2] A.M. Kadin (2009), “Superconductivity without Pairing?,” <http://arxiv.org/abs/0909.2901> .

Alan M. Kadin
Princeton Junction, NJ

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