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Controlling competing electronic orders *via* non-equilibrium acoustic phonons MICHAEL SCHUETT, University of Minnesota, PETER ORTH, Iowa State University, ALEX LEVCHENKO, University of Wisconsin-Madison, RAFAEL FERNANDES, University of Minnesota — The interplay between multiple electronic orders is a hallmark of strongly correlated systems displaying unconventional superconductivity. While doping, pressure, and magnetic field are the standard knobs employed to assess these different phases, ultrafast pump-and-probe techniques opened a new window to probe these systems. Recent examples include the ultrafast excitation of coherent optical phonons coupling to electronic states in cuprates and iron pnictides. In this work, we demonstrate theoretically that non-equilibrium acoustic phonons provide a promising framework to manipulate competing electronic phases and favor unconventional superconductivity over other states. In particular, we show that electrons coupled to out-of-equilibrium anisotropic acoustic phonons enter a steady state in which the effective electronic temperature varies around the Fermi surface. Such a momentum-dependent temperature can then be used to selectively heat electronic states that contribute primarily to density-wave instabilities, reducing their competition with superconductivity. We illustrate this phenomenon by computing the microscopic steady-state phase diagram of the iron pnictides, showing that superconductivity is enhanced with respect to the competing antiferromagnetic phase.

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