

Abstract Submitted
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Correlated spin-density wave state formation in photo-excited pnictide superconductors¹ MARTIN MOOTZ, ILIAS E. PERAKIS, Department of Physics, University of Alabama at Birmingham, XU YANG, LIANG LUO, AARON PATZ, JIGANG WANG, Department of Physics and Astronomy, Iowa State University and Ames Laboratory, U.S. DOE — Pnictide superconductors exhibit a rich phase diagram including magnetic, superconducting, and structural order. Studying the ultrafast non-equilibrium dynamics of the competing orders is an important step to understand the microscopic interplay between the different phases and to identify new phases far away from equilibrium. We study the non-equilibrium dynamics of superconducting order competing with spin-density wave order after the ultrafast superconducting gap quenching induced by photo excitation. We present evidence for the build up of a correlated spin-density wave state that forms via Coulomb attraction between photo-excited quasiparticles in the electron- and hole-like pockets. The state is controllable by adjusting the photo-excitation intensity and shows different behavior in the under- and over-doped region of the phase diagram.

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