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Coherent phonon excitation in K-doped $BaFe_2As_2$ studied by trARPES HEIKE PFAU, HADAS SOIFER, Stanford University and SLAC National Accelerator Laboratory, JONATHAN SOBOTA, Stanford University, SLAC National Accelerator Laboratory, and Lawrence Berkeley National Laboratory, ALEXANDRE GAUTHIER, HARLYN SILVERSTEIN, JOHANNA PALMSTROM, COSTEL ROTUNDU, IAN FISHER, PATRICK KIRCHMANN, ZHIXUN SHEN, Stanford University and SLAC National Accelerator Laboratory — The phase diagrams of Fe-based superconductors are complex and contain magnetism, nematicity and superconductivity. To understand the emergence of superconductivity in these materials, it is crucial to study the interplay of charge, spin, orbital and lattice degrees of freedom. Here, we focus on electron-phonon coupling, which is intimately connected to the properties of the nematic phase and has been suggested to be enhanced in the presence of electronic correlations. We use time- and angle-resolved photoemission spectroscopy to study the electron-phonon coupling in K-doped $BaFe_2As_2$. The coherent response after optical excitation reveals at least four bosonic modes. One of them corresponds to the E_g-phonon mode, which is directly connected to the symmetry of the structural transition. This observation provides the opportunity to further study the interplay of electronic and lattice degrees of freedom in a nematically ordered system.

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