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Imaging the Electron-Boson Coupling in Superconducting FeSe[1]

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— Scanning tunneling spectroscopy has been used to reveal signatures of a bosonic mode in the local quasiparticle density of states of superconducting FeSe films. The mode appears below T_c as a 'dip-hump' feature at energy $\Omega \sim 4.7 k_B T_c$ beyond the superconducting gap Δ. Spectra on strained regions of the FeSe films reveal simultaneous decreases in Δ and Ω. This contrasts with all previous reports on other high-T_c superconductors, where Δ locally anti-correlates with Ω. A local strong coupling model is found to reconcile the discrepancy well, and to provide a unified picture of the electron-boson coupling in unconventional superconductors.

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