

Anisotropic electron-phonon coupling in MgB₂ by ARPES

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We present high-quality angle-resolved photoemission measurements on the superconductor MgB₂. The renormalization of the sigma bands due to the electron-phonon coupling is clearly visible for the first time. Using a self-consistent fitting procedure we determine the self-energy, extract the bosonic 'glue', and calculate the momentum-dependent coupling parameter. The large values of $\lambda \sim 1.6$ measured at specific momenta in the Brillouin zone are in agreement with ab-initio theoretical estimates. Comparison of these values with the Fermi surface average value of $\lambda \sim 0.7$ is a direct demonstration of the strong electron-phonon coupling anisotropy, thought to be the origin of the large T_c in this material.

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