

Anisotropic electron-phonon coupling in MgB₂ by ARPES

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B. M. Ludbrook, Department of Physics & Astronomy, University of British Columbia, Vancouver, British Columbia V6T 1Z1, Canada

C. N. Veenstra, Department of Physics & Astronomy, University of British Columbia, Vancouver, British Columbia V6T 1Z1, Canada

G. Levy, Department of Physics & Astronomy, University of British Columbia, Vancouver, British Columbia V6T 1Z1, Canada

N. D. Zhigadlo, Laboratory for Solid State Physics, ETH Zurich, Switzerland

A. Damascelli, Department of Physics & Astronomy, University of British Columbia, Vancouver, British Columbia V6T 1Z1, Canada

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.

Primary author: LUDBROOK, Bart (Department of Physics & Astronomy, University of British Columbia, Vancouver, British Columbia V6T 1Z1, Canada)

Presenter: LUDBROOK, Bart (Department of Physics & Astronomy, University of British Columbia, Vancouver, British Columbia V6T 1Z1, Canada)

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