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Isotropic superconducting gap and electron-boson coupling in MgB2 multiband superconductor DAIXIANG MOU, RUI JIANG, VALENETIN TAUFOUR, REBECCA FLINT, SERGUEI BUD'KO, PAUL CANFIELD, ADAM KAMINSKI, Division of Materials Science and Engineering, Ames Laboratory, U.S. DOE — MgB_2 is a prototype multiband BCS/Elishberg superconductor with high transition temperature T_C ∼39K. In this talk, we will present electronic properties of this compounds measured by tunable laser ARPES. Momentum dependent gap structure on two σ Fermi surface around Γ is nearly isotropic with Δ_0∼7meV, directly proving its s-wave pairing symmetry. Our data reveals a strong renormalization of the dispersion (kink) at ∼65 meV, which is caused by coupling of electrons to E_{2g} phonon mode. In contrast to cuprates, the 65 meV kink in MgB_2 does not change significantly across T_C. More interestingly, we observe strong coupling to a second, low energy collective mode at 10 meV. This excitation vanishes above T_C and is likely a signature of the elusive Leggett mode.

Daixiang Mou
Division of Materials Science and Engineering, Ames Laboratory, U.S. DOE

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