Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Measurements of penetration depth anisotropy in MgB_2 J. FLETCHER, A. CARRINGTON, H.H. Wills Physics Laboratory, University of Bristol, Tyndall Avenue, BS8 1TL, United Kingdom., S.M. KAZAKOV, J. KARPINSKI, Laboratorium für Festkörperphysik, ETH Zürich, CH-8093 Zürich, Switzerland. —
The presence of multiple gaps in MgB_2 leads to a temperature dependent anisotropy of both superconducting length scales, the London penetration depth, λ, and the Ginzberg-Landau coherence length, ξ. Using a sensitive rf technique, the temperature dependence of both λ_a and λ_c is measured in single crystals of MgB_2. The temperature dependent anisotropy of the penetration depth, $\gamma_\lambda(T) = \lambda_c/\lambda_a$, calculated from measurements is in approximate agreement with that expected from calculations based on the measured superconducting gaps and band structure calculations. Torque and specific heat measurements are used to determine the anisotropy in H_{c2} and the predicted convergence in the anisotropy of λ and ξ near T_c is examined.

Jon Fletcher
H.H. Wills Physics Laboratory, University of Bristol
Tyndall Avenue, BS8 1TL, United Kingdom.

Date submitted: 04 Dec 2004 Electronic form version 1.4