Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

The de Haas–van Alphen effect in the superconducting state of MgB_2. A. CARRINGTON, J. FLETCHER, 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 de Haas-van Alphen (dHvA) signal arising from orbits on the π Fermi surface sheet of the two-gap superconductor MgB_2 has been observed in the vortex state below H_{c2}. An extra attenuation of the dHvA signal, beyond those effects described in the conventional Lifshitz-Kosevich expression, is seen due to the opening of the superconducting gap. Our data show that the π band gap is still present up to H_{c2}. Using current theories of dHvA oscillations in the superconducting state we extract estimates for the evolution of the π band gap with magnetic field. Contrary to results for other materials, we find that the most recent theories dramatically underestimate the damping in MgB_2.

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Date submitted: 04 Dec 2004 Electronic form version 1.4