

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Cyclotron Resonance in the Hidden-Order Phase of Ultraclean URu₂Si₂ Single Crystals T. SHIBAUCHI, K. HASHIMOTO, K. IKADA, S. TONEGAWA, H. SHISHIDO, Department of Physics, Kyoto University, Y. HAGA, T. D. MATSUDA, Advanced Science Reserach Center, Japan Atomic Energy Agency, Y. ONUKI, Advanced Science Reserach Center, Japan Atomic Energy Agency, and Graduate School of Science, Osaka University, H. YAMAGAMI, Department of Physics, Kyoto Sangyo University, Y. MATSUDA, Department of Physics, Kyoto University — In the heavy fermion compound URu₂Si₂, the hidden-order transition occurs at 17.5 K, whose origin is still an enigma. Of primary importance is elucidating the electronic structure of the hidden-order phase. Here we report the first observation of cyclotron resonance in the ultraclean crystals of URu₂Si₂ with residual resistivity ratio $RRR = 670$. The magnetic-field dependence of the microwave surface impedance in the Azbel'-Kerner geometry shows clear cyclotron resonance lines whose line width has characteristic temperature dependence consistent with the transport measurements. In addition to the bands which have been previously identified in the quantum oscillation measurements, we newly find the missing band with the heaviest mass, which can account for the large specific heat coefficient in the hidden-order phase of URu₂Si₂.

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Date submitted: 21 Nov 2008

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