Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Anisotropic properties of aligned weak-ferromagnetic superconductor $RuSr_2GdCu_2O_8$ H.C. KU, B.C. CHANG, C.H. HSU, Y.F. CHEN, M.F. TAI, Department of Physics, National Tsing Hua University, Hsinchu 300, Taiwan, Republic of China, SUPERCONDUCTIVITY AND MAGNETISM LABORATORY TEAM — The *ab*-plane aligned powder in epoxy matrix for the tetragonal $RuSr_2GdCu_2O_8$ weak-ferromagnetic superconductor was achieved using a field powder alignment method with *ab*-plane parallel to the applied magnetic field. The *c*-axis aligned powder can also be obtained using the field-rotation method where *c*-axis is perpendicular to the applied magnetic field and along the rotation axis. The temperature dependence of magnetic moment m (T) for the aligned powder provides the desired anisotropic properties where larger magnetic moment along the *ab*- plane was observed. The field-cooled (FC) and zero-field-cooled (ZFC) data in low applied field (1 G) for both directions indicate a weak-ferromagnetic (canted-antiferromagnetic) transition of Ru moment at T_N(Ru) = 131 K and a superconducting transition in the CuO_2 plane at T_c = 39 K. The low temperature antiferromagnetic ordering of the rare earth Gd moment is observed at T_N(Gd) = 2.5 K. Diamagnetic superconducting shielding signal is much weaker than bulk sample due to small powder diameter (1-10 μm), long penetration depth λ and the two-dimensional (2D) character of CuO_2 plane. Low temperature, low field magnetization data m(B_a,T) will be discussed.

H. C. Ku
Department of Physics, National Tsing Hua University,
Hsinchu 300, Taiwan, Republic of China

Date submitted: 05 Nov 2007 Electronic form version 1.4