Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Cu-NMR and magnetization in disordered nFL system UCu_4Ni[1] O.O. BERNAL, A. VALDEZ, M. CHIANG, Department of Physics and Astronomy, California State University, Los Angeles, CA 90032, D.E. MACLAUGHLIN, Department of Physics and Astronomy, University of California, Riverside, CA 92125, G.R. STEWART, J.S. KIM, Department of Physics, University of Florida, Gainesville, FL 32611 — We present a study of the NMR spectra in a random powder of UCu_4Ni as a function of frequency (40-70 MHz) and temperature (5-300 K). Two types of spectral lines for each of the two isotopes of naturally abundant Cu in the material are clearly evident in the spectra. Their behavior is followed for temperature and field variations and compared/contrasted with the more studied case of UCu_4Pd, where only one type of Cu-NMR line has been observed clearly. Unlike in UCu_4Pd, the appearance of two types of signal from Cu nuclei in the Ni compound is unambiguous evidence of site disorder in UCu_4Ni. This alone is indication that the amount of site disorder in the Ni sample is larger than in the Pd system; however, the NMR line intensities reveal that the Ni ions do not seem to go completely randomly in the two available crystallographic sites of the underlying crystal structure as would be expected from ionic-size considerations alone. The NMR parameters for both types of spectral lines, together with complementary measurements of magnetic susceptibility performed on the same powder samples, will be discussed from the point of view of magnetic disorder and non-Fermi liquid behavior.

Oscar Bernal
Department of Physics and Astronomy,
California State University, Los Angeles, CA 90032

[1]Work supported by NSF/DMR-0604015 and DE-105380

Date submitted: 26 Nov 2011 Electronic form version 1.4