Electronic and magnetic properties of single-crystalline UNi$_{0.5}$Sb$_2$.

B. K. DAVIS, M. S. TORIKACHVILI, Dep. of Physics, San Diego State U., E. D. MUN, J. C. FREDERICK, G. J. MILLER, S. THIMMAIAH, S. L. BUD’KO, P. C. CANFIELD, Ameslab and Iowa State U., G. M. SCHMIEDESHOFF, Dep. of Physics, Occidental C. — We studied the electronic and magnetic properties of antiferromagnetic UNi$_{0.5}$Sb$_2$ ($T_N \approx 161$ K) by means of measurements of magnetic susceptibility, thermal expansion, and electrical resistivity ($\rho$) at ambient pressure, and $\rho$ under hydrostatic pressures up to 20 kbar, in the temperature range from 1.9 to 300 K. The value of $d\rho/dT$ changes drastically from positive below $T_N$ to negative above it, reflecting the loss of spin-disorder scattering in the ordered phase. Two small features in the $\rho$ vs $T$ data centered near 40 and 85 K, which are quite hysteretic in temperature, correlate well in temperature with features in the magnetic susceptibility, and thermal expansion. The effect of pressure is to suppress the amplitude of the small features in $\rho$ vs $T$ at lower temperatures, and to raise $T_N$ at the rate of $\approx 0.76$ K/kbar.

Support from NSF Grant Nos. DMR-0306165 (SDSU), and DMR-0305397 (OC), and USDOE Contr. DE-AC02-07CH11358 (Ames and ISU) are gratefully acknowledged.

Milton Torikachvilli
Dep. of Physics, San Diego State University

Date submitted: 27 Nov 2007

Electronic form version 1.4