

Abstract Submitted  
for the MAR05 Meeting of  
The American Physical Society

**Ballistic magnon transport in the antiferromagnet Nd<sub>2</sub>CuO<sub>4</sub>**

LOUIS TAILLEFER, SHIYAN LI, University of Sherbrooke, Canada, C.H. WANG, X.H. CHEN, University of Science and Technology of China — The in-plane thermal conductivity of the antiferromagnetic insulator Nd<sub>2</sub>CuO<sub>4</sub> was measured down to 50 mK. In zero magnetic field, the system is in a noncollinear state with gaps in all magnon branches so that only phonons carry heat. In an in-plane field of 10 T, a spin-flop transition causes the system to be in a collinear state, in which significant magnon transport has been observed above 2 K. We show that below 0.5 K these magnons travel ballistically, with a thermal conductivity that varies as  $T^3$  which confirms the existence of acoustic magnons and allows us to extract their velocity. At higher temperature, we can extract the temperature dependence of: 1) magnon scattering of acoustic phonons; 2) phonon scattering of acoustic magnons.

Louis Taillefer  
University of Sherbrooke

Date submitted: 30 Nov 2004

Electronic form version 1.4