

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

^3He Spin Pump¹ A. YAMAGUCHI, H. ISHIMOTO, Institute for Solid State Physics, University of Tokyo, H. KOJIMA, Rutgers University — The superfluid component of ^3He A₁ phase is spin-polarized. The process of forcing the superfluid component through a spin filtering structure, in a manner of mechanomagnetic effect, can be used to increase the spin polarization beyond the equilibrium under a given applied magnetic field. We have constructed a test cell in which a glass capillary array acts as the spin (and entropy) filter and an electrostatically actuated diaphragm forces the superfluid flow through it. Preliminary results show that a maximum relative increase of polarization by 50 % could be achieved. The maximum increase in polarization appears to be limited by the critical superfluid flow through the channels in the glass capillary array. The dependence of the observed effects on temperature, pressure and magnetic field will be presented.

¹Research supported in part by the U.S. NSF grant DMR-0704120, JSPS and MEXT of Japan.

Haruo Kojima
Rutgers University

Date submitted: 20 Nov 2008

Electronic form version 1.4