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Spin Pumping in Superfluid ^{3}He in High Magnetic Field[1] H. KOJIMA, Rutgers University, K. SUZUKI, Y. AOKI, A. YAMAGUCHI, H. ISHIMOTO, ISSP, U. of Tokyo — The spin flow dynamics in superfluid ^{3}He A_1 phase in magnetic field has been studied up to 13 tesla. The apparatus consists of a large reservoir of of A_1 phase in which a small enclosed chamber with a built-in differential pressure sensor is immersed. The chamber is connected to the reservoir via a superleak channel. The chamber is fabricated from Macor parts such that the residual heat leak is much reduced from those in our experiments. Our focus is on the measurement of relaxation of the induced pressure subsequent to either magnetically induced spin-polarized superflow or by electrostatic spin pumping. In general, both methods of measurement show that the relaxation time (τ) of the induced pressure tends to vanish smoothly as the transition temperature T_{c2} is approached. However, the observed dependence of τ on magnetic field is different. The measured τ by the field gradient method continues to increase up to 8 tesla. On the other hand, τ measured by the spin pumping method tends to saturate to a constant between 5 and 13 tesla. The discrepancy is unexpected and not yet understood.

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