# Heat Capacity of $^3$He Solid Films on Graphite in Magnetic Fields

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A $^3$He solid film adsorbed on a graphite surface is one of the most ideal two-dimensional quantum spin systems. Its magnetic properties are thought to be results of competition of multiple spin exchange (MSE) interactions, and the competition is stronger than in bcc solid $^3$He. I present preliminary results of heat-capacity measurements of $^3$He solid films in magnetic fields up to several hundreds Oe. In the first adsorbed atomic layer, results of heat-capacity measurements show large shifts to higher temperature with increasing magnetic field as shown in FIG. 1. The amplitudes of the shifts are 20 times larger than the Zeeman energies. In the second layer, such a large shift of heat capacity has not been observed, but obvious and complicated changes were observed below 1 mK. These results should indicate that some frustrations preventing the short range ordering of the spins, or the magnitudes of MSE interactions are strongly affected by the magnetic field.

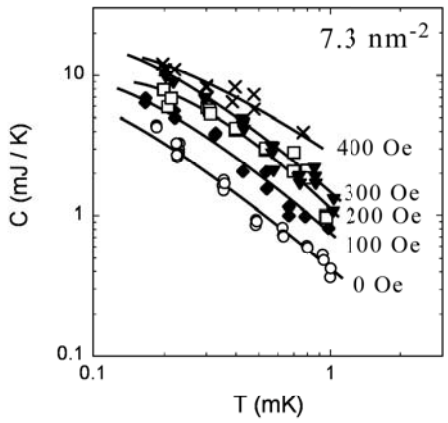


FIG.1: Measured heat capacity of the submonolayer solid $^3$He film of 7.3 nm$^{-2}$ on graphite in magnetic fields. Solid lines are guides to the eye.