Heat capacity measurements of two-dimensional ^{3}He in high magnetic fields

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Monolayer ^{3}He adsorbed on a graphite surface is an ideal two-dimensional Fermion system. Recent heat capacity measurements revealed a continuous transformation from a Fermi fluid to a Mott localized phase, so called the 4/7 phase, through a new quantum state [1]. This state is characterized by the anomalous coexistence of two broad heat capacity peaks near 1 mK and a few tens of mK, which can not be explained by a conventional phase separation between the Fermi fluid and the 4/7 phase. The hole (zero-point vacancy) doped Mott localized phase and the phase separation in the momentum space (two fluid model [2]) are proposed as possible interpretations for these anomalies. To test these hypotheses, we start new heat capacity measurements in a temperature range above 10 mK in high magnetic fields up to 9 T. Magnetic field dependences of the high temperature peaks will be discussed.

[1] Y. Matsumoto *et al*., J. Low Temp. Phys. **138**, 271 (2005); Y. Matsumoto et al., to be published.
[2] M. Imada, J. Phys. Soc. Jpn. **73**, 1851 (2004).