

High Resolution Specific Heat Measurement of ^3He near the Liquid-Gas Critical Point

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We report on high-resolution measurements of the specific heat at constant volume of ^3He near its liquid-vapor critical point. An experimental cell of small 0.05 cm vertical height was used to minimize gravity effects. Temperature resolution of 1 nK was achieved using a paramagnetic salt thermometry and SQUID detection technique. Measurements with continuous calorimetry and pulse heating were performed along the critical isochore over a wide reduced temperature range $1 \times 10^{-7} < |T/T_c - 1| < 1 \times 10^{-1}$. The measurements close to the critical point were strongly affected by gravity. A recent crossover parametric equation-of-state (CPM) model was used to calculate the average heat capacity over the finite cell height under gravity. Comparison between the model calculation and the experimental data will be presented.