Magnetic Soft Mode Behavior of the Field-Dependent Specific Heat of SrIrO$_3$\textsuperscript{1} LANCE DE LONG, DAHENG HE, VINAYAK BHAT, GANG CAO, University of Kentucky — Previous work\textsuperscript{2} indicates SrIrO$_3$ is a strongly exchange-enhanced paramagnet (Wilson ratio = 75) exhibiting non-Fermi liquid (NFL) behavior at low magnetic fields, and a cross-over to weak ferromagnetism ($0.025 \, \mu_B/$Ir at $\mu_o H = 7.0 \, T$ and $T = 1.7 \, K$) at applied fields $\mu_o H \approx 3 \, T$ and temperatures $T < 4 \, K$. Measurements of the specific heat performed in constant field for $1.8 < T < 4K$ have been used to extract the field dependence $C_P(H,T_o)$(constant $T_o$), which exhibits a Schottky-like peak as a function field in the range $1.0 < \mu_o H < 1.5 \, T$ at increasing temperatures $1.8 < T_o < 3.9 \, K$, respectively. Fits of $C_P(H,T_o)$ imply a nonmagnetic ground state is separated from magnetic excited states by an energy splitting $\Delta(H,T)/k_B = T^*$ that decreases from 7.5 to 2 K as $\mu_o H$ increases from 0 to 8 T. The Schottky peak field increases as $\mu_o H^* = 0.94 \, T + (0.03 \, T/K^3)T^{3.1}$. We discuss how a semi-classical two-level model reproduces the NFL-weak ferromagnet cross-over with applied field.

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\textsuperscript{2}Cao et al., Phys. Rev. B \textbf{76}, 100402(R),(2007)