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Magnetic Soft Mode Behavior of the Field-Dependent Specific Heat of $SrIrO_3$[1] LANCE DE LONG, DAHENG HE, VINAYAK BHAT, GANG CAO, University of Kentucky — Previous work[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 μ_B/Ir at μ_oH = 7.0 T and T = 1.7 K) at applied fields μ_oH $\approx$ 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 $<$ μ_oH $<$ 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 Δ(H,T)/k_B = T* that decreases from 7.5 to 2 K as μ_oH increases from 0 to 8 T. The Schottky peak field increases as μ_oH* = 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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[2]Cao et al., Phys. Rev. B **76**, 100402(R),(2007)

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