

Abstract Submitted
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Volume Sensitivity and Effect of Fluctuations on the Frustrated Magnetism in YMn_2 BRIAN P. NEAL, WARREN E. PICKETT, UC Davis — Cubic Laves phase (C15) YMn_2 with its highly frustrated pyrochlore type sublattice of Mn sites, is one of a small but growing class of ordered magnets that lie close to a quantum critical point at stoichiometry. Its ground state displays long-spiral helical magnetic order that is highly sensitive to volume, disappearing due the substitution of 3% Sc for the larger Y atom (chemical pressure), or by application of just 0.4 GPa pressure. The large change of volume (5%) upon ordering ($T_N = 100$ K) argues for itinerant magnetism, and in recent years there have been developments in modeling magnetic fluctuations in itinerant magnets near the ordering point. We extend earlier results of Terao and Yamada on the first principles based energetics versus volume, and quantify the sensitivity of the magnetic state to pressure. The effects of fluctuations within an itinerant picture will be discussed.

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