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**Itinerant magnetism in quantum critical  $\text{YFe}_2\text{Al}_{10}$**  WENHU XU, WEIGUO YIN, ROBERT KONIK, ALEXEI TSVELIK, Brookhaven Natl Lab, GABRIEL KOTLIAR, Rutgers University — The absence of magnetic order and the scaling laws in thermodynamical and transport properties in layered compound  $\text{YFe}_2\text{Al}_{10}$  suggest competition among different types of collective quantum states. Measurements on magnetic susceptibility have demonstrated a Curie-Weiss (CW) behavior with a reduced fluctuating Fe moment of  $0.45\mu_B$  and  $T_{CW} \simeq -28\text{K}$ . Using first principle methods, we show that the correlation in  $\text{YFe}_2\text{Al}_{10}$  is moderate and the Fe magnetism is itinerant. Competing ground states include a paramagnetic state, an in-plane antiferromagnetic ordering (G-type) state and an in-plane collinear ordering (C-type) state. Although a bulk ferromagnetic order is not favored in total energy, both the G-type and C-type ground state prefer ferromagnetic inter-layer coupling.

Wenhu Xu  
Brookhaven Natl Lab

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