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Investigation of fermi-liquid-like specific heat and spin-density-wave signatures in the distorted kagome compound Volborthite, $Cu_3V_2O_7(OH)_2{\cdot}2H_2O$ TYLER DODDS, YONG BAEK KIM, University of Toronto — The distorted kagome compound Volborthite shows signatures of spin-density-wave magnetic order and Fermi-liquid specific heat at low temperatures and magnetic fields. A recent density functional study [O. Janson *et al.*, Phys. Rev. B **82**, 104434 (2010)] suggests that Volborthite can be viewed as coupled frustrated Heisenberg spin chains, a model we approach using a slave-fermion representation of the spins. For a certain range of couplings, our mean-field theory finds a Fermi surface of spinons, a portion of which contains nesting. We investigate whether the coexistence of a U(1) spin liquid with a spinon Fermi surface, along with a spinon spin-density-wave, may describe the aforementioned features of the low-field phase. Furthermore, at higher fields, conventional magnetically ordered states are found. We examine if higher magnetic fields can lead to the destruction of the fermi surface, prompting a spinon confinement transition into such a conventionally magnetically ordered state.

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