Abstract Submitted
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Thermodynamics of itinerant metamagnetic transitions ANDREW BERRIDGE, University of St Andrews — Itinerant metamagnetic transitions may be driven by features in the electronic density of states. These features produce signatures in the entropy and specific heat near to the transition. We study these signatures for a variety of different cases, identifying the key features which differ from naive expectations, such as enhanced critical fields and 'non-Fermi liquid' temperature dependencies above the transition. We will consider the generic case of a logarithmically divergent density of states, as caused by a van Hove singularity in 2D. We also study a specific model for the bandstructure of $Sr_3Ru_2O_7$, a material with a well-studied metamagnetic transition and quantum critical endpoint. We consider how far the behaviour of the system can be explained by the density of states rather than quantum fluctuations, and the distinctive features of this mechanism. The most intriguing feature of $Sr_3Ru_2O_7$ is an unusual phase with a higher entropy than its surroundings, we consider how this may arise in the context of a density of states picture and find that we can reproduce the observed thermodynamic behaviour and first-order phase transitions.

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