

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Thermodynamic measurements of iron-rhodium alloys DAVID COOKE, FRANCES HELLMAN, University of California at Berkeley, Berkeley, CA — Iron-rhodium alloys undergo a unique metamagnetic AF>FM transition at just above room temperature, making it ideal for thermally-assisted storage applications. The details of this transition, however, are still much debated. Here we have measured the specific heat of equiatomic and slightly Fe-rich thin films grown on our unique microcalorimeters in order to shed light on this subject. Our data will be presented in the context of the thermal fluctuation model proposed by Gruner et al., *Phys. Rev. B* **67**, 064415 (2003). In this model, the Fe-rich films where the transition is suppressed exhibit a Schottky-like two-state anomaly at a temperature far below the transition due to a competition between the magnetic and non-magnetic Rh states. Because the J_{Fe-Rh} interaction responsible for this close competition in free energy cancels at the Rh atom in the equiatomic alloys, it does not exhibit this anomaly. Complementary work including magnetization data and magnetic x-ray microscopy imaging through the transition will be briefly discussed as well.

David Cooke
University of California at Berkeley, Berkeley, CA

Date submitted: 20 Nov 2009

Electronic form version 1.4