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Examining the AF>FM transition in Fe-Rh thin films through specific heat, photoemission, and Mossbauer spectrometry measurements[1] DAVID COOKE, University of California at Berkeley, CATHERINE BORDEL, FRANCES HELLMAN — Iron-rhodium alloys near equiatomic composition undergo a metamagnetic antiferromagnetic-to-ferromagnetic (AF>FM) transition at just above room temperature. This material has been proposed as an exchange layer in thermally-assisted magnetic recording, using the ferromagnetic phase to reduce the switching field of a high-anisotropy storage layer, so clearly being able to control this transition is crucial to implementation. However, theoretically there is still much debate as to the precise mechanism of the AF>FM transition, primarily centered on the contributions of electronic and magnetic entropy differences in the two phases. Through thermodynamic measurements on epitaxially- grown ferromagnetic and antiferromagnetic Fe-Rh alloy films, we test two different thermal fluctuation models of the transition. We also discuss complementary photoemission and Mossbauer spectrometry data above and below the transition to examine the magnetic behavior and electronic densities of state in the two phases and compare these to theoretical calculations.

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