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The role that varying nanocrystallinity plays in the thermodynamics of CoO films DANIEL QUEEN, FRANCES HELLMAN, University of California, Berkeley, YUNJUN TANG, University of California, San Diego — Understanding the phase stability of nanocrystalline materials is a necessary step in developing a clear picture of mesoscopic physics. These materials are known to show excess specific heat at low temperatures similar to that seen in glassy and amorphous systems. The entropy associated with this excess specific heat can greatly effect the stability of these nanostructured materials. A systematic study of the thermodynamics of these systems over a wide temperature range has yet to be done. Thin films offer a novel way to explore the contributions of particle size and surface areas. We present results of heat capacity measurements on CoO thin films and CoO/MgO multilayers from 2K to 500K. Recent results show an increase in excess specific heat with decreasing particle size. Thanks to DOE for support.

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