

Abstract Submitted
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Spin-density wave in polycrystalline Cr films from infrared reflectivity¹ ZOE BOEKELHEIDE, ERIK HELGREN, FRANCES HELLMAN, University of California, Berkeley — The spin-density wave properties of polycrystalline chromium thin films were determined by using infrared reflectivity to determine the gap energies. The incommensurate spin density wave of bulk chromium is highly sensitive to perturbations from stress, disorder, and finite size effects, such as those found in polycrystalline films. Films prepared under various conditions display three different types of spin density wave behavior: incommensurate, commensurate, and mixed. Unexpectedly, the mixed phase includes the incommensurate spin density wave and two different forms of commensurate spin density wave. A phenomenologically determined low temperature phase diagram is created to describe the spin density wave in chromium in the stress-disorder plane. The effects of stress and disorder on the spin density wave of chromium films are analogous to the effects of dilute alloying in bulk chromium. In this case, tensile stress has a similar effect to Mn impurities while disorder has a similar effect to Al.

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