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Electrical Resistance of Sputtered Chromium Thin Films Z. BOEKELHEIDE, D. COOKE, F. HELLMAN, University of California - Berkeley, D. J. SMITH, Arizona State University, M. J. CAREY, Hitachi Global Storage Technologies — We have measured a large variation in the electrical resistivity of magnetron sputtered chromium thin films. The resistivity ranges from anomalously high (up to 20 times the bulk value) to comparable with the bulk value, and depends strongly on the deposition parameters, in particular the sputtering gas pressure. The range of sputtering gas pressure was 0.75 mTorr to 8 mTorr, with the resistivity increasing with pressure. We have also measured the structure and composition of the films, and the high resistivity does not appear to be caused by exotic structural phases, gross impurities, or grain size effects. The impact on the antiferromagnetism of sputtered chromium films and their role in magnetic multilayers will be discussed.

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