

Abstract Submitted  
for the MAR10 Meeting of  
The American Physical Society

**Temperature-dependence of the lattice dynamics of Cr across its magnetic transitions** RUQING XU, University of Illinois at Urbana-Champaign, MARY UPTON, AHMET ALATAS, BOGDAN LEU, Argonne National Laboratory, TAI-CHANG CHIANG, University of Illinois at Urbana-Champaign — Chromium is a classic spin-density-wave system. Its phonon dispersion relations at room temperature show a number of anomalies, which can be related to the details of the spin-dependent electronic structure. As the temperature is varied, Cr undergoes two magnetic transitions, one at 311 K, and the other at 123 K, and the elastic constants are known to change abruptly across these transitions. Thus far, there has been very limited information about the behavior of the phonon dispersion relations across these transitions, but large changes appear likely. We have employed high-resolution inelastic x-ray scattering to address this question. The experiment was carried out at Sector 3 of the Advanced Photon Source. Surprisingly, we have found no obvious abrupt changes in the phonon dispersion relations across the magnetic transitions. The phonon frequencies remain largely the same for sample temperatures down to 30 K.

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Date submitted: 25 Nov 2009

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