

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Magnetic and Higher Order Lattice Excitations in LaFe(1-x)Cr(x)O(3) Perovskites JAKOB ANDREASSON, JOAKIM HOLMLUND, MIKAEL KÄLL, LARS BÖRJESSON, Dept. of Applied Physics, Chalmers Univ. of Tech., Göteborg, Sweden, CHRISTOPHER S. KNEE, Dept. of Inorganic Chemistry, Göteborg University, Göteborg, Sweden, BENJAMIN SCHULZ, MICHAEL RÜBHAUSEN, Institut für Angewandte Physik, Universität Hamburg, Hamburg, Germany, STEN G. ERIKSSON, Dept. of Environmental Inorganic Chemistry, Chalmers Univ. of Tech., Göteborg, Sweden — The resonance behavior of the oxygen breathing mode at 700 cm^{-1} and its higher orders is studied between 1.8 eV (676 nm) and 4.2 eV (300 nm) in the perovskite LaFe(0.5)Cr(0.5)O(3). The Franck-Condon induced higher order scattering present in the $x=0.1$, 0.5 and 0.9 compounds dominates the Raman spectrum in the visible energy region while a feature in the 1400 cm^{-1} energy region dominates using UV lasers. The energy location of this peak coincides both with the second order Franck-Condon mode as well as similar feature seen in the $x=0$ and 1 compounds (and to some extent in the low doping compounds ($x=0.02$, 0.04, 0.06 and 0.08)) using the 2.41 eV ($\lambda=514$) laser, believed to be a two-magnon caused by a spin-flip excitation in the AFM spin-state. Thus the complex magnetism in the Fe/Cr perovskite is likely to be influenced by the competition between the magnetically ordered state and the lattice dynamics through the resonant Franck-Condon effect.

Jakob Andreasson
Dept. of Applied Physics, Chalmers Univ. of Tech., Göteborg, Sweden

Date submitted: 04 Jan 2007

Electronic form version 1.4