Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Resonant Higher Order Scattering in Double Perovskites

JAKOB ANDREASSON, JOAKIM HOLMLUND, MIKAEL KÄLL, LARS BÖRJESSON,
Dept. of Applied Physics, Chalmers Univ. of Tech. and Göteborg Univ., SE-41296, Göteborg, Sweden, STEFAN NALER, JOAKIM BÄCKSTRÖM¹, MIKAEL RÜBHAUSEN, Institut für Angewandte Physik, Univ. Hamburg, Jungiusstraße 9, D-20355 Hamburg, Germany, ABUL K. AZAD, STEN ERIKSSON, Studsvik Neutron Research Lab., Uppsala Univ., 61812 Nyköping, Sweden and Dept. of Inorg. Chem., Göteborg Univ., 41296 Göteborg, Sweden — Resonant and non-resonant higher order Raman scattering in the double perovskites La$_{2-x}$Sr$_x$FeCrO$_6$ (x = 0, 0.33, 0.66,1) and Ba$_2$(Sr$_2$)FeWO$_6$ is investigated. The B-site disordered compound La$_2$FeCrO$_6$ displays an exceptional series of resonant higher order excitations for \(-514\) nm (2.42 eV). This feature is attributed to defects, in the form of oxygen vacancies, resulting in a localized resonant electron-phonon coupling effect similar to the Franck-Condon effect predicted in the perovskite structured manganites. The resonant state is critically sensitive to Sr doping and . Higher energy excitations in the compounds Ba$_2$(Sr$_2$)FeWO$_6$are shown to be of non-resonant multiphonon character.

¹Present address:Permascand AB, Box 42, SE-84010 Ljungaverk

Jakob Andreasson
Chalmers University of Technology

Date submitted: 04 Dec 2004

Electronic form version 1.4