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Electronic structure modifications in Cu doped Ni₂MnGa SUJOY

ROY, R. QIAO, P.-A. GLANS, Advanced Light Source, Lawrence Berkeley National Laboratory, USA, A. PATHAK, I.S. DUBENKO, N. ALI, Dept. of Physics, Southern Illinois University Carbondale, USA, E. BLACKBURN, Dept. of Physics and Astronomy, University of Birmingham, UK, W. YANG, Advanced Light Source, Lawrence Berkeley National Laboratory, USA — Ni₂MnGa Heusler alloy is a multifunctional ferromagnetic alloy that exhibits various interesting properties. The compounds typically exhibit a high temperature magnetic and a low temperature martensitic transition. Stoichiometry changes or elemental substitution makes it possible to merge the two transitions to a unique magnetostructural one. We have used resonant inelastic x-ray scattering to study the effects of $d-d$ interactions and charge transfer effects in 25% Cu doped Ni₂MnGa. We find distinct charge transfer effects in the Ni absorption and inelastic x-ray spectrum that are significantly modified by Cu doping. Mn on the other hand shows $d-d$ interaction effects but no charge transfer. Multiplet calculations have been performed and will be compared to the experimental data. These results provide an insight into the origin of multifunctional properties of Ni based Heusler alloys. Work at LBNL is supported by U.S DOE.

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