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Magnetic properties of the off-stoichiometric Heusler alloys $Ni_{50-x}Co_xMn_{40}Sn_{10}$ using ^{55}Mn NMR as a local probe[1] SHAOJIE YUAN, National High Magnetic Field Laboratory, Florida State Univ, PHILIP KUHNS, MICHAEL HOCH , NHMFL, JAMES BROOKS, NHMFL,FSU, ARNEIL REYES, NHMFL, VIJAY SRIVASTAVA, DANIEL PHELAN, RICHARD JAMES, CHRIS LEIGHTON, U. Minnesota — The off-stoichiometric Heusler-type alloys $Ni_{50-x}Co_xMn_{40}Sn_{10}$ have interesting properties and a rich phase diagram, stemming from the interplay between magnetic order, martensitic transformations, and ferroelasticity. Previous magnetization and small angle neutron scattering (SANS) measurements suggest that at low temperatures ferromagnetic (F) nanoscale clusters and antiferromagnetic (AF) regions coexist. As the temperature is raised above 50-100 K the F regions undergo superparamagnetic blocking while the AF matrix is thought to persist to higher temperatures. We have applied zero and low field nuclear magnetic resonance as a local probe to determine the temperature and field dependent behavior of the F and AF components for samples with x = 0, 7 and 15. For x = 7 evidence is obtained for two distinct Mn electronic environments which are characterized by different hyperfine fields. In addition, detailed information has been obtained on the evolution with temperature of the F and AF components. Results obtained for the x = 0 and x = 15 samples help to determine the nature of the ground state in these systems. A model which can account for the magnetic properties of the material will be presented, together with a modified phase diagram.

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