

Abstract Submitted
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Low energy magnetic excitation in lightly electron doped LaCo_{1-y}Ni_yO₃ JUAN YU, DANIEL PHELAN, DESPINA LOUCA — We investigated the magnetic excitations in lightly doped LaCo_{1-y}Ni_yO₃ ($y=0.005, 0.01$) via inelastic neutron scattering measurements (INS). The substitution of Ni³⁺ (3d⁷) for Co³⁺ (3d⁶) nominally introduces an electron in the system. At 4 K, a low energy magnetic excitation is present with a characteristic energy of 1.2 meV. On warming above 30 K, the excitation smears out due to the appearance of the more intense 0.6 meV excitation previously observed in pure LaCoO₃, the latter associated with single ionic transitions within the excited state manifold. The new excitation is associated with dynamic ferromagnetic correlations as measured from INS measurements on single crystals. The effective magnetic moment is estimated to be about 12 μ_B /Ni for the $y = 0.005$ sample at 10 K. The magnetic field dependence of the 1.2 meV excitation yielded an estimate for the value of g to be about 10 for the $y = 0.01$ sample. The large magnetic moment and g value at low temperatures may be an indication of the existence of a magnetic ground state of the Co³⁺ ions where the Ni³⁺ and Co³⁺ ions engage in ferromagnetic coupling.

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