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Magnetic phase separation in electron-doped Bi1-xCaxMnO3 systems YUHAI QIN, TREVOR A. TYSON, New Jersey Institute of Technology, KENJI SHIMIZU, Toyama University — The manganite system Bi1-xCaxMnO3 possesses intriguing properties in the low bismuth doping region. In this electron doped region ($0.6<x<1$), a ferromagnetic (FM) moment of $\sim$1.2 Bohr magnetons per Mn site is found for $x\sim0.875$. The magnetic moment per Mn site maintains a value $\sim1/3$ the theoretical limit even in fields a high as 60 T. The physical origin of this high moment region is not well understood. Various models including canted ferromagnetism and ferromagnetic clusters hosted by an antiferromagnetic background have been proposed. In our previous work, we have conducted small-angle neutron scattering (SANS) on Bi0.125Ca0.875MnO3 polycrystalline samples as has revealed existence of FM clusters embedded in an AFM background. New 55Mn NMR results give more evidence supporting of this heterogeneous phase model: resonance signals from both AFM and FM phases were identified. More progress from multiple-temperature Bi-L3 edge XAFS measurements will be presented as well. This work is supported by NSF DMR-0209243 and NSF DMR-0512196.

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