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Local Matrix-Cluster Interactions In La_{1-x} Sr_xCoO_3. SEAN GIBLIN, CCLRC-Rutherford Appelton Lab, UK, IAN TERRY, Durham University, UK, ANDREW BOOTHROYD, DHARMALINGIAM PRABHAKARAN , University of Oxford, UK, JING WU, CHRIS LEIGHTON, CEMS, University of Minnesota, USA — Magneto-electronic phase separation plays an integral part in many recent advances in the understanding of correlated electron systems. We have studied the magnetically phase separated material La_{1-x} Sr_xCoO_3 and the parent compound $LaCoO_3$, using muon spectroscopy and magnetic susceptibility measurements. The muon as a local magnetic probe is sensitive to the magnetic field distribution in $LaCoO_3$ in the LS state, which is a direct consequence of magnetic excitons. We believe that these excitons are interacting with the Co ions undergoing the known thermally induced spin transition. By directly comparing the results of the parent compound with La_{1-x} Sr_xCoO_3we can observe the hole-rich ferromagnetic clusters interacting with the neighboring hole poor matrix for low x. This mechanism, detected here for the first time, may play an important role in the rich electrical and magnetic properties of La_{1-x} Sr_xCoO_3.

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