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Muon Spin Rotation Study of Field Induced Magnetism in Overdoped $La_{2-x}Sr_xCuO_4$ G.J. MACDOUGALL, J. RODRIGUEZ, C.R. WIEBE, G.M. LUKE, McMaster University, A.T. SAVICI, P.L. RUSSO, Y.J. UEMURA, Columbia University, S. WAKIMOTO, R.J. BIRGENEAU, University of Toronto — The interplay between magnetism and superconductivity in the cuprates has been a topic of extensive research over the last two decades. Muon spin rotation (μSR) is an ideal probe of these properties because it is a volume sensitive local probe of magnetism and superconductivity. A rich diversity of phenomena has been discovered and explored using this technique in different parts of the electronic phase diagram. Unfortunately, such studies have not been extended to the highly overdoped region, largely due to the lack of high quality single crystals. Our group has recently obtained a series of highly overdoped crystals of $La_{2-x}Sr_xCuO_4$ and performed transverse muon spin rotation (TF-μSR) studies as a function of magnetic field. A large, field-induced signal relaxation was seen with unusual temperature and doping dependences, extending well into the non-superconducting regime.

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