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Anisotropic Local Distortion of $\text{La}_{1.2}\text{Sr}_{1.8}\text{Mn}_2\text{O}_7$ Through the Ferromagnetic Transition Temperature T. A. O'BRIEN, L. M. DOWNWARD, D. LARSON, C. DOWNS, F. BRIDGES, University of California, Santa Cruz, J. F. MITCHELL, H. ZHENG, Argonne National Laboratory — In previous temperature-dependent EXAFS studies of the quasi-cubic manganite, $\text{La}_{1-x}\text{Ca}_x\text{MnO}_3$, excess broadening of the Mn-O pair-distribution function has been observed near and above the Curie temperature, $T_c=120$, attributed to the appearance of Jahn-Teller polarons. A similar, yet anisotropic, broadening is expected in the bilayer system, $\text{La}_{2-2x}\text{Sr}_{1+2x}\text{Mn}_2\text{O}_7$. We report a temperature-dependent, polarized EXAFS study at the Mn-K edge for the $x=0.4$ sample. This analysis shows similar broadening for Mn-O pairs in both the ab-plane and the c-axis, but the magnitude of the distortion in the ab-plane is about 4 times greater than along the c-axis. The data also show a small excess of broadening below T_c as well, indicating that polaron distortions are present even at 100K where the magnetization becomes constant. Analysis of further Mn neighbors is currently underway. Details of the analysis and a discussion of the implications for CMR in the bilayer manganites will be presented. Support: NSF DMR 0301971.

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