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Scanning Tunneling Microscopy of Bilayer $La_{2-2x}Sr_{1+2x}Mn_2O_7$ Single Crystals[1] LEUJEN CHEN, XINZHOU TAN, SEONG HEON KIM, JEE-HOON KIM, J.-S. ZHOU, J.B. GOODENOUGH, ALEX DE LOZANNE, University of Texas at Austin — We employed a spin-polarized scanning tunneling microscope to image the (001) surface topography and spectroscopy in $La_{2-2x}Sr_{1+2x}Mn_2O_7$ (x=0.32, 0.40 & 0.52) single crystals below the Curie temperature. As the doping is increased from x=0.3 to x=0.5 the spins arrange themselves in antiferromagnetic, ferromagnetic, in-plane and out-of-plane configurations. From local density of states (LDOS) maps, we observed a charge density wave with a wavelength of about 1.6 nm along the tetragonal a or b axes in the x=0.32 sample, which is known to be ferromagnetic with spins perpendicular to the surface. On the other hand, the x=0.52 crystal is expected to be type A antiferromagnetic with spins parallel to the surface, which is confirmed by our LDOS maps.

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