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Lamellar phase separation and dynamic competition in La_{0.23}Ca_{0.77}MnO₃ JING TAO, Department of Material Science and Engineering, MRL, University of Illinois at Urbana-Champaign, DARIO NIEBIESKIK-WIAT, Department of Physics, MRL, University of Illinois at Urbana-Champaign, MYRON SALAMON, Department of Physics, MRL, University of Illinois at Urbana-Champaign, JIAN-MIN (JIM) ZUO, Department of Material Science and Engineering, MRL, University of Illinois at Urbana-Champaign — Lamellar charge ordered (CO) and charge disordered (CD) phase separation at low temperatures in La_{0.23}Ca_{0.77}MnO₃ was firstly revealed using transmission electron microscopy (TEM). The in-situ TEM observations showed the evolution of the CO-CD phase separation with changed temperatures. Electron diffraction found the different crystal structures of CO and CD phases. Magnetism measurements in La_{0.23}Ca_{0.77}MnO₃ indicate two magnetic phase transitions that interestingly coincide with two transition temperatures found in the resistivity relaxation curves. The TEM dark field images observed the dynamic competition between CO and CD phases and the observation is consistent with that in transport properties. The finding here suggests that the CO-CD phase coexistence in this manganite at certain temperature range is driven by magnetoelastic effects rather than being dictated by disorder.

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