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Multiple Metal-Insulator Transitions in LPCMO Wires[1] T.Z. WARD, S.H. LIANG, K. FUCHIGAMI, University of Tennessee and Oak Ridge National Laboratory, L.F. YIN, Oak Ridge National Laboratory, E. DAGGOTTO, E.W. PLUMMER, J. SHEN, University of Tennessee and Oak Ridge National Laboratory — The two hottest areas of research in condensed matter physics are complexity and nanoscale physics. Interestingly, these two areas have little overlap as most of the nanophysics research work is conducted using "simple" materials of metals or semiconductors instead of complex materials such as transition metal oxides (TMOs). However, due to the strong electronic correlation, it is exactly the transition metal oxides that will most likely lead to observations of striking new phenomena under spatial confinement. In this work, spatially confined $La_{.325}Pr_{.3}Ca_{.375}MnO_3$ (LPCMO) is shown to exhibit never before seen transport properties which reveal a double metal-insulator transition. These findings shine new light on the processes at play in LPCMO, as we use this novel technique to probe the material.

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