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Transport and magnetic properties of CMR manganites with antidot arrays KAI ZHANG, KAI DU, JIEBIN NIU, WENGANG WEI, JINJIE CHEN, LIFENG YIN, JIAN SHEN, Fudan Univ — We fabricated and characterized a series of manganites thin film samples with different densities of antidots. With increasing antidot density, the samples show higher MIT temperature and lower resistivity under zero and low magnetic fields. These differences become smaller and finally vanished when the magnetic field is large enough to melt the charge ordered phase in the system, which is expected in our theoretical explanations. We believe that emerging edge states at the ring of antidotes play a significant role for observed metal-insulator transition and electrical transport properties, which are of great importance of real storage and sensor device design. Magnetic property measurements and theoretical simulation also support the conclusion. These results open up new ways to control and tune the strongly correlated oxides without introduce any new material or field.

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