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Study of phase separated manganites by DC transport and infrared spectroscopy A. ZIMMERS, T. WOLF, J. LESUEUR, R.P.S.M. LOBO, Laboratoire Photons Et Matiere, ESPCI, 10 rue Vauquelin, 75231 Paris Cedex 05, France, A. KUSHWAHA, R.C. BUDHANI, Department of Physics, Indian Institute of Technology Kanpur, Kanpur 208016, India — We present confined geometry measurements of manganites $La_{0.325}Pr_{0.3}Ca_{0.375}MnO_3$ (LPCMO) and $La_{2/3}Sr_{1/3}MnO_3$ (LSMO). As reported previously, due to electronic phase separation, LPCMO microwires show a step-like metal insulator transition as temperature is lowered and as magnetic field is sweped. We will show how this feature evolves as a function of the width and shape of the microwires. On the contrary, LSMO microwires are found to have a smooth transition in all wire sizes down to a width of $140nm$. We have created extra disorder in the LSMO sample by irradiating it using 150keV oxygen ions with a dose of 2 x 10^{14} ions/cm^2. As expected, the microwires T_{MI} transitions are lowered by 120K but the transitions remain stepless. The fact that the electronic homogeneity in LSMO sample is robust, even when irradiated, enabled us start an optical study of artificially phase separated highly correlated materials. We will show preliminary results comparing reflectivity spectra of micropatterned samples to effective medium approximation models.

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