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Metallic state in La-doped $YBa_2Cu_3O_y$ thin films with n-type charge carriers[1] S.W. ZENG, X. WANG, W.M. LV, Z. HUANG, M. MOTAPOTHULA, Z.Q. LIU, Y. L. ZHAO, A. ANNADI, S. DHAR, T. VENKATESAN, - ARIANDO, NUSNNI-Nanocore, National University of Singapore, Singapore — Through substitution of La for Ba and reduction of oxygen, we successfully doped n- and p-type charge carriers into La-doped $YBa_2Cu_3O_y$ thin films synthetized by pulsed laser deposition technique. The n-type samples demonstrated metallic behaviors and in-plane resistivity exhibited a quadratic temperature dependence within the metallic regime, and then evolved into a ln T-dependence insulating-like state. Furthermore, the doping evolution of temperature with minimum resistivity (T_{min}) and electron-electron rate were investigated and showed asymmetry between p- and n-side. The present results suggest the potential of obtaining n-type superconductivity in La-doped $YBa_2Cu_3O_y$ and investigating n-p asymmetry (symmetry) in cuprates with the same crystallographic structure.

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