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The Control of Anisotropic Transport in Manganites by Stripy Domains CHANGCHENG JU, XIAOMEI LU, School of Physics, Nanjing University, YINGHAO CHU, Department of Materials Science and Engineering, National Chiao Tung University, Taiwan — Epitaxial thin film acts as a significant tool to investigate novel phenomena of complex oxide systems. Extrinsic constraint1 of uniform or certain designed buffer layer strain could be easily implanted to these materials. However, the strain distribution might be quite complicated by involving micro- or nano-lattice distortions which could partially relax the strain and determine the complex phase diagrams of thin film, meanwhile introducing structural and physical inhomogeneities. In this work , we report 71° striped ferroelectric domains created in BFO can also epitaxially lock the perovskite manganites leading to the emerge of ordered structural domain. LSMO/BFO hetero-epitaxial samples are deposited by PLD. The 71° periodic striped domains and coherent growth are demonstrated by PFM and X-ray analysis. Plan-view TEM and X-ray RSM have been used to confirm the epitaxial relationships of the functional layers and IP lattice constant. Both the simulation and structural analysis demonstrate we can create a periodic ordered stripe structural domain in LSMO. And this will leave an anisotropic distribution of structural domain walls which makes it possible to capture the anisotropic tunneling for strong electron–lattice coupling in manganites. Temperature-dependent resistivity measurements reveal a substantial anisotropic resistivities and a remarkable shift of the MI transition between the perpendicular and parallel to the stripe domain directions.

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