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Dynamics of multiple phases in manganite as revealed by dielectric spectroscopy¹ ZHIGAO SHENG, CERG, ASI-RIKEN, Japan, MASAO NAKAMURA, CERG & CMRG ASI-RIKEN, Japan, MASASHI KAWASAKI, YOSHINORI TOKURA, CERG & CMRG ASI-RIKEN, Japan; University of Tokyo, Japan — Phase separation is a very important feature in correlated electron oxides. The coexistence and competition of multiple phases give rise to gigantic response to tiny stimuli, producing dramatic changes in magnetic, transport, and other properties in these compounds [1]. It is crucial to probe the physical properties of each phase separately for a comprehensive understanding of correlated electron oxide materials and their phase separation, but it is difficult due to their nano-scale distribution. Here we report dynamic properties of multiple phases in manganite thin films by using dielectric spectroscopy with a unique p - N junction configuration. The multiple dielectric relaxations have been detected and we distinguished their corresponding multiple phases. The activation energy and dielectric properties of different phases have been deduced separately. We also elucidated their phase evolution with changing of temperature or applied magnetic field from viewpoint of dielectric response. These results provide a guideline to explore the electronic phase separation phenomena in correlated electron oxides.

[1] Y. Tokura et al. Rep. Prog. Phys. 69, 797 (2006).

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