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Magnetic Anisotropy and Magnetic Phase Diagram in the Ferromagnetic States of $\text{La}_{1-x}\text{Sr}_x\text{MnO}_3$ for $0.1 < x < 0.2$ ATSUHIRO KOTANI, HIROSHI NAKAJIMA, Osaka Prefecture Univ, KEN HARADA, Osaka Prefecture Univ, RIKEN CEMS, YUI ISHII, SHIGEO MORI, Osaka Prefecture Univ — Magnetic textures such as magnetic vortices, magnetic bubbles and magnetic stripe domains have been found in magnetic materials such as helical magnets without the inversion symmetry by neutron scattering and Lorentz microscopy (LM) observation. On the contrary, it has been reported that compounds having the inversion symmetry such as $\text{La}_{0.875}\text{Sr}_{0.125}\text{MnO}_3$ exhibited magnetic textures in the ferromagnetic phase. Thus, we investigated formation processes of magnetic textures as functions of temperature and strength of magnetic fields by using LM and small-angle electron diffraction experiments. *In-situ* LM observations revealed that magnetic bubbles are formed by applying magnetic field perpendicular to thin plate having periodic magnetic stripe domains in the ferromagnetic metallic phase of $\text{La}_{1-x}\text{Sr}_x\text{MnO}_3$ for $0.1 < x < 0.2$. In addition, we constructed phase diagram of magnetic textures such as magnetic bubbles[1]. It is revealed that magnetic bubbles in $\text{La}_{1-x}\text{Sr}_x\text{MnO}_3$ should be formed by high magnetocrystalline anisotropy in the orthorhombic and monoclinic structures. [1]A. Kotani, *et al. Phys. Rev. B* 94, 02407 (2016).

Atsuhiko Kotani
Osaka Prefecture Univ

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