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Current-induced persistent ferromagnetic metallic state in an Fe-doped manganite HIDEAKI SAKAI, YOSHINORI TOKURA[1], Department of Applied Physics, University of Tokyo — A persistent ferromagnetic metallic state has been observed to be induced by excitation of an electric current for a single crystal of 7% Fe-doped $(La_{0.7}Pr_{0.3})_{0.65}Ca_{0.35}MnO_3$, a typical "relaxor ferromagnet"[1] with coexisting clusters of the ferromagnetic metal and charge- orbital-ordered insulator. According to the simultaneous measurement of the resistance and magnetization, the induced ferromagnetic state is likely to form a filamentary pathway, where the increase in magnetization is estimated to be ~ 0.4 μ_B per Mn. Distinguishing the current heating effect, which tends to conversely decrease the ferromagnetic fraction, from the intrinsic effect, we have successfully demonstrated the reproducible switching of both the resistance and magnetization by changing the magnitudes of the applied voltages.
[1] H. Sakai *et al.*, Phys. Rev. B **76**, 155112 (2007).

[1]Also at CERC-AIST and ERATO-MF

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