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Anisotropy change of the magnetization-direction dependence of the density of states as a function of the electron energy in $\mathbf{La_{2/3}Sr_{1/3}MnO_3}$[1] SHINOBU OHYA, LE DUC ANH, NOBORU OKAMOTO, KENTO TAKESHIMA, TATSUYA MATOU, MASAAKI TANAKA, The Univ. of Tokyo — Recent studies of the tunnel anisotropic magnetoresistance for single-crystal ferromagnetic materials have shown that the magnetic-field direction dependence of the density of states (DOS) is related to the electronic structure via the spin-orbit interaction and can largely change depending on the electron energy. This fact will provide us a novel way to control the magnetic anisotropy. Here, we have investigated the magnetic-field direction dependence of dI/dV in a tunnel diode consisting of $La_{2/3}Sr_{1/3}MnO_3$ (LSMO, 40 uc)/ $LaAlO_3$ (4 uc) grown on a Nb-doped $SrTiO_3$(001) substrate by molecular beam epitaxy. We applied an in-plane magnetic field of 1 T and a voltage V to the LSMO electrode with respect to the substrate at 4 K. At V ranging from –0.2 to +0.4 V, dI/dV showed two-fold symmetries along the [100] and [110] axes in addition to a weak four-fold symmetry along the <110>axes. However, when V was decreased from –0.2 V to –0.4 V, these symmetries were gradually rotated by 90 degrees. This large change of the anisotropy is probably induced by the emergence of the t_{2g} state just below the Fermi level.

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