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Doping variation of orbitally-induced anisotropy in electronic structure of the perovskite-type vanadium oxides JUN FUJIOKA, SHIGEKI MIYASAKA, Dept. of Appl. Phys., Univ. of Tokyo, YOSHINORI TOKURA, Dept. of Appl. Phys., Univ. of Tokyo, ERATO-SSS, AIST-CERC — Recently, the perovskite-type vanadium oxide $LaVO_3$ has been attracting much attention. In this system, the anisotropic charge dynamics due to the one-dimensional orbital exchange interaction is observed. In addttion, the filling control insulator-metal transition (FC-IMT) concomitant with the orbital ordering-disordering transition can be achieved in the hole doped system $La_{1-x}Sr_xVO_3$[1]. In this study, the variation of anisotropic charge dynamics in the course of FC-IMT in the perovskite-type vanadium oxide has been investigated by measurements of optical conductivity spectra with focus on the role of t_{2g}-orbital degree of freedom. The orbitally-induced anisotropic feature of the Mott-gap excitation as well as of the doping-induced mid-infrared excitation is suppressed with increasing the hole concentration, and instead the isotropic and incoherent dynamics of the doped hole dominates over the low-energy excitation near and above the IMT point.

[1] S.Miyasaka et al., Phys.Rev.Lett. 85,5388(2000)

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