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On the character of the coherent and incoherent excitations of electron-doped $SrTiO_3$ YUKIAKI ISHIDA, RITSUKO EGUCHI, MASAHARU MATSUNAMI, KOJI HORIBA, MUNETAKA TAGUCHI, ASHISHI CHAINANI, RIKEN SPring-8 Center, Japan, YASUNORI SENBA, HARUHIKO OHASHI, JASRI/SPring-8, Japan, HIROMICHI OHTA, Nagoya Univ., Japan, SHIK SHIN, Riken SPring-8 Center, Japan and Univ. of Tokyo, Japan — Lightly-electron-doped $SrTiO_3$ shows little sign of electron correlation effects in the transport and thermodynamic properties, but photoemission spectra show not only coherent excitations from the Fermi level but also broad incoherent excitations positioned $\sim$1.5 eV below the Fermi level [1]. We have investigated the near-E_F electronic structures of Nb-doped $SrTiO_3$ thin film [2] by performing resonant photoemission at the Ti $2p$ and O $1s$ absorption edges. Both the coherent and incoherent excitations showed giant resonances at the Ti $2p$ edge, while at the O $1s$ edge, resonance occurred mainly in the incoherent excitations. This indicates that the coherent excitations have mainly Ti $3d$ character, while the incoherent excitations have mixed character of Ti $3d$ and O $2p$ states. We attribute the incoherent and coherent excitations to locally and non-locally screened final states, respectively, similar to that argued in $Ca_{1-x}Sr_xVO_3$ [3]. [1] A. Fujimori *et al.*, Phys. Rev. B **46,** 9841 (1992). [2] S. Ohta, H. Ohta *et al.*, Appl. Phys. Lett. **87**, 092108 (2006). [3] R.J.O. Mossanek, M. Abbate, and A. Fujimori, cond-mat/0606253.

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