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Resonant soft x-ray scattering study on antiferromagnetic ordering of $LaSr_2Mn_2O_7$ J.-S. LEE, J. KOO, H. JANG, K.-T. KO, H. J. LEE, Y. H. JEONG, K.-B. LEE, J.-H. PARK, eSSC and Dept. of Physics, POSTECH, J.-Y. KIM[1], Y. BANG, Dept. of Physics, Chonnam National University, T. KIMURA, Y. TOKURA, Dept. of Applied Physics, University of Tokyo — Resonant soft x-ray scattering experiments at the Mn $L_{2,3}$- edge and O K-edge have been performed to probe the magnetic structure of $LaSr_2Mn_2O_7$ which is well known as the A-type antiferromagnetic (AFM) phase. At the low temperature, strongly resonant intensity of (001) AFM reflection was found. The temperature dependences of AFM resonance at both the Mn $L_{2,3}$- and O K-edge were relatively different, in which the order parameter at Mn $L_{2,3}$-edge showed an anomalous transition above Néel temperature (170 K). This feature could be regarded as the mixed valence state (Mn^{3+} and Mn^{4+}) phenomenon, and besides, it could be supported by theoretical calculation and bulk measurement on magnetism. Detailed description will be discussed in presentation.

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