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Theoretical study on polarization effect in resonant x-ray emission spectroscopy for $3d$ systems TAKAYUKI UOZUMI, Graduate School of Engineering, Osaka Prefecture University — The $3d$ systems show a rich variety of fascinating phenomena, such as superconductivity and magnetism, caused by strong correlation among $3d$ electrons. X-ray spectroscopy, such as x-ray photoemission spectroscopy (XPS) and resonant x-ray emission spectroscopy (RXES), has been a powerful technique to investigate the electronic state of the $3d$ systems. Especially, recent experimental progress in the energy resolution and in the use of incident-photon polarization has enabled us to observe the spectral fine features in the $2p$ XPS and $2p$-$3d$-$2p$ RXES, which are reflecting intrinsic characters of the correlated valence electrons. Concerning the analysis of the $2p$ XPS, we have developed a theoretical framework based on the impurity Anderson model considering dynamical mean field (EPL, **114** (2016) 27003). In this presentation, we treat mainly the $2p$-$3d$-$2p$ RXES, paying attention on the polarization dependence. Actually, we show the RXES results for typical $3d$ systems, such as TiO_2, $LaMnO_3$ and NiO, and discuss the possibility of experimental determination of final-state multiplet characters from the polarization dependence, based on the RXES function decomposed into the excitation paths with an irreducible tensor form for single- and polycrystals.

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