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The electronic structure and phase separation of $LuFeO_3$ SHI CAO, Univ of Nebraska - Lincoln, XIAOZHE ZHANG, Univ of Nebraska - Lincoln,Department of Physics, Xi'an Jiaotong University, Xi'an 710049, China, KISHAN SINHA, Univ of Nebraska - Lincoln, WENBIN WANG, Laboratory of Advanced Materials, Fudan University, Shanghai 200433, China, JIAN WANG, Canadian Light Source, Inc., 44 Innovation Boulevard, Saskatoon, Saskatchewan S7N 2V3, Canada, PETER DOWBEN, XIAOSHAN XU, Univ of Nebraska - Lincoln —
The conduction band electronic structure of hexagonal and orthorhombic $LuFeO_3$ thin films have been measured using x-ray absorption spectroscopy (XAS) at iron L edge and oxygen K edge. Dramatic differences in both the spectral features and the linear dichroism are observed. These differences in the spectra can be explained using the differences in crystal field splitting of the metal (Fe and Lu) electronic states and the differences in O 2p-Fe 3d and O 2p-Lu 5d hybridization. Segregation of the hexagonal and orthorhombic phases has been identified by X-ray Photo-electron Emission Microscopy (X-PEEM) indicating that the hexagonal to orthorhombic phase transition includes co-existence of phases at room temperature.

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