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High resolution structural and compositional mapping of the $SrTiO_3/LaFeO_3$ interface using chromatic aberration corrected energy filtered imaging[1] BERND KABIUS, Pacific Northwest National Laboratory, LOTHAR HOUBEN, CHRISTIAN DWYER, Research Center Juelich, ROBERT COLBY, SCOTT A. CHAMBERS, Pacific Northwest National Laboratory, RAFAL DUNIN-BORKOWSKI, Research Center Juelich — Interfaces between insulating polar perovskites have demonstrated a wealth of electronic and magnetic properties. Understanding and predicting the properties of a specific interface requires atomic level knowledge of interface structure and chemistry. Electron microscopy is capable of this task, and has been frequently applied to oxide interfaces using a combination of high-angle angular dark field scanning transmission electron microscopy (HAADF-STEM) and electron energy-loss spectroscopy (EELS). Energy-filtered TEM (EFTEM) captures a full image for a given energy losses, allowing a larger field of view than typical for STEM-EELS in far less time. However, EFTEM has not, to date, demonstrated the spatial resolution of STEM-EELS due to the limits set by chromatic aberration C_c. This study of $LaFeO_3/SrTiO_3$ demonstrates that C_c correction enhances the resolution of EFTEM for elemental mapping, allowing a unit cell-by-unit cell analysis of the concentration gradients across the $SrTiO_3/LaFeO_3$ interface. The charge distribution at the interface will be discussed.

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