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Surface Structural Phases of $Ca_{2-x}Sr_xRuO_4$[1] R.G. MOORE, V.B. NASCIMENTO, Univ of TN, Knoxville, TN 37996, JIANDI ZHANG, Florida Intl Univ, Miami, FL 33199, ISMAIL NLS, R. JIN, D. MANDRUS, E.W. PLUMMER, Oak Ridge Natl Lab, Oak Ridge, TN 37831 and Univ of TN, Knoxville, TN 37996
— Surface structural phases of $Ca_{2-x}Sr_xRuO_4$ (CSRO) are investigated using Low Energy Electron Diffraction (LEED-IV). The surface structure and phases are compared to the bulk phases in this layered material. Normally at a crystal surface the reduced atomic coordination enhances electron-electron correlations, if there is not a reconstruction, and stabilizes the Mott-insulating phase resulting in higher MIT temperatures than in the bulk. Surprisingly, $Ca_{1.9}Sr_{0.1}RuO_4$ exhibits an unusual surface MIT 20K lower than the bulk. The properties of CSRO are extremely sensitive to the RuO_6 octahedral orientation. LEED-IV shows no symmetry change associated with the MIT, but small distortions of the RuO_6 octahedral that drive the surface MIT. In addition, the tetragonal-to-orthorhombic surface phase transition near the Quantum Critical Point at x=0.5 is investigated and contrasted with the bulk phase transition.

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