Surface structural reconstruction of SrVO₃ thin films on SrTiO₃ (001)¹  GAOMIN WANG, MOHAMMAD SAGHAYEZHIAN, LINA CHEN, HANGWEN GUO, JIANDI ZHANG, Louisiana State University — Paramagnetic metallic oxide SrVO₃ (SVO) is an itinerant system known to undergo thickness-induced metal-insulator-transition (MIT) in ultrathin film form, which makes it a prototype system for the study of the mechanism behind metal-insulator-transition like structure distortion, electron correlations and disorder-induced localization. We have grown SrVO₃ thin film with atomically flat surface through the layer-by-layer deposition by laser Molecular Beam Epitaxy (laser-MBE) on SrTiO₃ (001) surface. Low Energy Electron Diffraction (LEED) measurements reveal that there is a (\(\sqrt{2}X\sqrt{2}\)) R45 surface reconstruction independent of film thickness. By using LEED-I(V) structure refinement, we determine the surface structure. In combination with X-ray Photoelectron Spectroscopy (XPS) and Scanning Tunneling Microscopy (STM), we discuss the implication on the MIT in ultrathin films below 2-3 unit cell thickness.

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