Abstract Submitted for the MAR11 Meeting of The American Physical Society

Growth of SrTiO3(110) film with oxide molecule beam epitaxy¹ JIANDONG GUO, ZHIMING WANG, FANG YANG, JIAGUI FENG, FENGMIAO LI, Institute of Physics, Chinese Academy of Sciences — In the past decade, a tremendous amount of evidence has shown that thin films, superlattices and heterointerfaces of oxides display a rich diversity of glamorous properties that is related, but not identical to that in the bulk. To understand the underlying physical mechanism, it is essential to construct the oxide heterostructures under control with atomic precision. We have studied the SrTiO₃(110) surface that bears intrinsic instability of reconstruction in addition to the broken symmetry due to the surface polarity, which provides us an additional degree to tune the properties of the epitaxial material by manipulating the termination layer of the substrate. Beyond the termination, we are able to tune the stability of a series of surface reconstructions and realize the reversible phase transitions between them. By applying the knowledge to the homoepitaxy, we develop an easy method to coordinate the metal evaporation sources with required flux rate ratio precisely during the oxide MBE growth. We further simplify the growth by controlling the shutter of the Sr source. The atomically well defined grown surface is characterized by scanning tunneling microscopy.

 1 This work was supported by Chinese NSF (10704084) and MOST (2006CB921300 and 2007CB936800).

Jiandong Guo Institute of Physics, Chinese Academy of Sciences

Date submitted: 18 Nov 2010 Electronic form version 1.4