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Surface diffusion in homoepitaxial $SrTiO_3$ thin films. CHANG-SU WOO, KANGHYUN CHU, Department of physic, KAIST, JONG-HYUN SONG, Department of Physics, Chungnam National University, CHAN-HO YANG, Department of physic, KAIST, CHARM LAB TEAM, NANO SPINTRONICS LAB COLLABORATION — The development of growth techniques such as molecular beam epitaxy (MBE) and pulsed laser deposition (PLD) has facilitated growths of complex oxide thin films at the atomic level ...[1-3]. Systematic studies on surface diffusion process of adatoms using theoretical and experimental methods allow us to understand growth mechanism enabling atomically flat thin film surface. In this presentation, we introduce the synthesis of homoepitaxial $SrTiO_3$ thin films using a PLD equipped with reflection of high energy electron diffraction (RHEED). We determine the surface diffusion time as a function of growth temperature and extract the activation energy of diffusion on the surface by in-situ monitoring the RHEED intensity recovery during the film deposition. From the extracted experimental results, we discuss the microscopic mechanism of the diffusion process .References 1. Cui, D.-F., et al., *Crystallographic and microstructural studies of BaTiO3 thin films grown on SrTiO3 by laser molecular beam epitaxy.* Journal of Vacuum Science & Technology A, 1997. 15(2): p. 275-278. 2. Jiang, J.C., et al., *Abrupt PbTiO3/SrTiO3 superlattices grown by reactive molecular beam epitaxy.* Applied Physics Letters, 1999. 74(19): p. 2851-2853. 3. Ohtomo, A. and H.Y. Hwang, *A high-mobility electron gas at the LaAlO3/SrTiO3 heterointerface.* Nature, 2004. 427(6973): p. 423-426.

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