

Abstract Submitted
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Growth and Atomic Structure of Periodically Striped Ag Films on a One-dimensional Surface Reconstruction TAKASHI UCHIHASHI¹, Nanomaterial Laboratory, National Institute for Materials Science, 1-1, Namiki, Tsukuba, Ibaraki, 305-0044, Japan, CHIGUSA OHBUCHI, SHIGERU TSUKAMOTO, TOMONOBU NAKAYAMA — We report the growth behavior of Ag thin films formed on the Si (111)4x1-In reconstruction, which is composed of periodic indium atomic chain arrays on a silicon surface. We use a two-step growth method, i.e., low temperature (100K) deposition of a Ag film followed by annealing up to room temperature. Scanning tunneling microscope (STM) and low energy electron diffraction (LEED) measurements clarify that Ag films have stripe structures with a periodicity equal to that of the Si (111)4x1-In reconstruction (= 1.33 nm), thus demonstrating its viability of an atomic-scale geometrical template. The stripe structure persists up to the film thickness as large as 30 monolayers (ML), contrary to the expectation that strained films should relax rapidly. We attribute this stability to a coincidental matching of the transverse periodicity and the corrugation amplitude between the stripe structure and the substrate, which is realized by periodic insertion of stacking faults into the Ag fcc lattice.

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