

Abstract Submitted
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Nucleation and Kinetic Study of Pb Quantum Size Effect Islands Grown on Si(111)¹ R. FENG, E.H. CONRAD, School of Physics, Georgia Institute of Technology, Atlanta, GA 30332, M.C. TRINGIDES, Ames Lab-USDOE, Department of Physics, Iowa State University, Ames, Iowa 50011, C. KIM, C. JEFFREY, P.F. MICELI, Department of Physics and Astronomy, University of Missouri-Columbia, Columbia, Missouri 65211 — The early stage nucleation and growth process of Pb quantum size effect islands grown on Si(111) 7X7 between 193K and 227K has been studied using in situ X-ray scattering experiments. The number density of Pb islands were measured from transverse scans across Pb(111) Bragg peak. The experiments were performed as functions of temperature, deposition rate and coverage to obtain the critical cluster size and energy barriers. Even more interesting is the rapid island coarsening observed at very low coverage (0.2ML above the wetting layer). We find a characteristic coarsening time of 10's of minutes at 208K. The implication of these results will be discussed in terms of island height and shape stability.

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