

Abstract Submitted
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Strongly-Driven Coarsening of Height-Selected Pb Islands on Si(111) MAOZHI LI, Ames Laboratory and Department of Physics and Astronomy, Iowa State University, J. W. EVANS, Ames Laboratory and Department of Mathematics, Iowa State University, C. Z. WANG, M. HUPALO, M. C. TRINGIDES, T.-L. CHAN, K. M. HO, Ames Laboratory and Department of Physics and Astronomy, Iowa State University — A rapid coarsening behavior was observed experimentally for Pb islands grown on Si(111) surface. It was found that quantum size effects lead to the breakdown of the classical Gibbs-Thomson analysis for this novel behavior. Here we propose a rate equation model where quantum size effects are incorporated by introducing an appropriate dependence of the chemical potential of Pb islands on their heights as well as on their curvatures. The evolution of the chemical potential of the wetting layer between islands is also incorporated. It is shown that rate equations predict evolution of the island density and height distribution in good agreement with experiments.

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