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Temperature and coverage-dependent height distribution of Ag nano-islands on Si(111)7x7¹ P. F. MICELI, YIYAO CHEN, M. W. GRAMLICH, S. T. HAYDEN, University of Missouri — The height distribution of Ag(111) nano-islands on Si(111)7x7 exhibits an unusual minimum height that is imposed by the quantum confinement of the conduction electrons. Here we report an investigation of this system by in situ x-ray reflectivity. For different coverages as well as different growth and annealing temperatures, the island height distribution was observed to exhibit a variance that is less than the mean by a constant amount. These results suggest Poisson-like statistics except that there is a constraint for the minimum island height. Motivated by this observation, a modified Poisson statistics model is presented and shown to provide a good description of the experimentally measured island height distributions. The dependence on deposition and annealing temperature is discussed in terms of mobility that leads to islands that are taller than the minimum height.

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