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Shape fluctuations of small Pb(111) islands at low temperatures.[1]
M. HUPALO, M.C. TRINGIDES, Iowa State University and Ames Laboratory of US-DOE — With STM we have measured shape fluctuations of monolayer Pb(111) islands grown on top of Pb mesas of controllable height to determine their step energy. Islands as small as 10nm in diameter were used to test the limit of the thermodynamic analysis. It found that the mean square deviations of the fluctuations obey a linear relation on RT where R is the island radius and T the temperature in agreement with the standard analysis.The extracted step energy 140eV/atom is in good agreement with the one obtained in the literature on islands of much larger sizes[1]. Fluctuation magnitude of bilayer island grown on top of 5-layer isladn(which corresponds to a magic 7-layer height) are much lower and the corresponding step free energy is three times higher than for monatomic steps.

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