

Abstract Submitted
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Strength modulation of quantum-well states in Pb islands with periodic distortions S.M. LU, M.C. YANG, W.B. SU, C.L. JIANG, C.S. CHANG, TIEN T. TSONG, Institute of Physics, Academia Sinica, Taiwan, R.O.C. — We use scanning tunneling microscopy and spectroscopy to revisit the system of three-atomic-layer Pb islands with two types of patterns grown on Si(111) surface. Our results demonstrate that the pattern on the island surface appears as the superposition of geometric corrugation and local variation of the electronic structure. The former originates from two kinds of interface relaxations, resulting in two types of periodic distortions in the Pb island. The latter is due to the periodic strength modulation of quantum-well states in Pb islands, causing inhomogeneity in the integration of the density of states, and the pattern is bias-dependent. This strength modulation of the quantum-well states can be correlated to the electronic screening effect induced by the lattice distortion in Pb islands.

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