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Transition of Growth Mode in Homoepitaxy on Metal Surface

WU Li-Li, LU Hang-Jun, and WU Feng-Min

College of Mathematics and Physics, Information Engineering, Zhejiang Normal University, Jinhua 321004, China
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Abstract: The process of the multilayer growth of Pt on Pt (111) is studied by using a Monte Carlo model with realistic physical parameters. The effects of the substrate temperature, the ES barrier, and the deposition rate on the growth mode have been investigated. Gradual transitions of the surface roughness from oscillatory to non-oscillatory behavior and then back to oscillatory behavior are observed while increasing the substrate temperature from 270 K to 620 K. It is found that the growth mode depends strongly on ES barrier over the whole temperatures and the deposition rate of atoms effectively affects the growth mode. The simulation results are consistent with many experimental observations for homoexpitaxy on a Pt (111) substrate.

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