

Abstract Submitted
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Excitation of frustrated translation and nonadiabatic adatom hopping induced by inelastic tunneling¹ KAI LIU, Institute of Physics, Chinese Academy of Science, SHIWU GAO, Institute of Physics, Chinese Academy of Sciences, and Department of Physics, Goteborg University — The dynamics of lateral manipulation for cobalt/Cu(111) has been investigated combining the model of vibrational heating and first-principles density functional calculations [1]. The frustrated translational mode responsible for lateral excitation is identified as a vibrational resonance involving a concerted motion between the adatom and surface phonons. The calculated frequency shows good agreement with the onset energy for adatom hopping induced by inelastic tunneling. Simulation of the power law, compared with experiment, suggests that the atom hopping overcomes a nonadiabatic barrier due to the nonequilibrium local heating of the translational mode.

[1] Kai Liu and Shiwu Gao, Phys. Rev. Lett. 95, 226102 (2005)

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