

Abstract Submitted  
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**The crossover from collective motion to periphery diffusion for small adatom-islands on Cu(111) and Ag(111)**<sup>1</sup> ALTAF KARIM, ABDELKADER KARA, AHLAM AL-RAWI, Kansas State University, OLEG TRUSHIN, Academy of Science, Russia, TALAT RAHMAN, Kansas State University — The diffusion of two dimensional adatom islands (containing 2-100 atoms) on Cu(111) and Ag(111) has been studied, using the newly developed self-learning Kinetic Monte Carlo (SLKMC) method [Phys. Rev. B 72, 115401, 2005]. A variety of multiple and single atom processes are revealed in the simulations and the size dependence of the diffusion coefficients and effective diffusion barriers are calculated. From the tabulated frequencies of events found in the simulation, we show a crossover from diffusion due to the collective motion of the island to a regime in which the island diffuses through the periphery dominated mass transport. This crossover occurs for island sizes of 8 to 11 atoms. For islands containing 19 to 100 atoms the scaling exponent is 1.5, which is in good agreement with previous work. The diffusion of islands containing 2 to 10 atoms can be explained primarily on the basis of a linear increase of the barrier for the collective motion with the size of the island.

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