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Influence of diffusion on submonolayer island growth during hyperthermal deposition onto Cu(100) and Cu(111) MIKA JAHMA, MARKO RUSANEN, Laboratory of Physics, Helsinki University of Technology, ISMO KOPONEN, Department of Physical Sciences, University of Helsinki, TAPIO ALANISSILA, Laboratory of Physics, Helsinki University of Technology — We consider the influence of realistic island diffusion rates to homoepitaxial growth on metallic surfaces using a recently developed rate equation model [1] which describes growth in the submonolayer regime with hyperthermal deposition. To this end, we incorporate realistic size and temperature-dependent island diffusion coefficients for the case of homoepitaxial growth on Cu(100) and Cu(111) surfaces [2]. We demonstrate that the generic features of growth remain unaffected by the details of island diffusion, thus validating the generic scenario of high density of small islands found experimentally and theoretically for large detachment rates. However, the details of the morphological transition and scaling of the mean island size are strongly influenced by the size dependence of island diffusion. This is reflected in the scaling exponent of the mean island size, which depends on both temperature and the surface geometry.
[1] I.T. Koponen et. al, Phys. Rev. Lett. **92**, 086103 (2004)
[2] M.O. Jahma et. al, Surface Science, in press

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