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Transient Mobility on Submonolayer Island Growth: An Exploration of Asymptotic Effects in Modeling JOSUE MORALES-CIFUENTES, THEODORE L. EINSTEIN, University of Maryland, College Park, ALBERTO PIMPINELLI, Rice University — In studies of epitaxial growth, modeling of the smallest stable cluster (i+1 monomers, with i the critical nucleus size), is paramount in understanding growth dynamics. Our previous work has tackled submonolayer growth by modeling the effect of ballistic monomers, *hot-precursors,* on diffusive dynamics [1]. Different scaling regimes and energies were predicted, with initial confirmation by applying to para-hexaphenyl submonolayer studies [2]. Lingering questions about the applicability and behavior of the model are addressed. First, we show how an asymptotic approximation based on the growth exponent, α ($N \propto F^{\alpha}$) allows for robustness of modeling to experimental data; second, we answer questions about non-monotonicity by exploring the behavior of the growth exponent across realizable parameter spaces; third, we revisit our previous para-hexaphenyl work and examine relevant physical parameters, namely the speed of the hot-monomers. We conclude with an exploration of how the new asymptotic approximation can be used to strengthen the application of our model to other physical systems.

[1]J. R. Morales-Cifuentes, T. L. Einstein, and A. Pimpinelli. Phys. Rev. Lett. 113, 246101 (2014)
[2]L. Tumbek A. Winkler, Surf. Sci. 606, L55 (2012)

Josue Morales-Cifuentes
University of Maryland, College Park

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