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Island-Size Distribution and Capture Numbers in 3D Nucleation and Growth FENG SHI, Y. SHIM, J.G. AMAR, University of Toledo — The scaling of the island-size distribution (ISD) in irreversible 3D growth is studied using a simple point-island model on a cubic lattice. Our model is a 3D analog of submonolayer nucleation and may also be viewed as a simple model of the early stages of vacancy cluster nucleation and growth under irradiation. The scaling of the monomer and island densities and ISD, capture number distribution (CND), and capture zone distribution (CZD) is studied as a function of the fraction of occupied sites (coverage) and ratio D/F of the monomer hopping rate D to the monomer creation rate F. While mean-field behavior is not observed, the scaled ISD still diverges with increasing D/F, while the scaled CND depends only weakly on the island-size. The weak dependence of the CND on island-size is due to the decreased influence of correlations and fluctuations in 3D as compared to 2D. A comparison of our simulation results with self-consistent rate-equation calculations is also presented.

Feng Shi
University of Toledo

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