Further Developments in Characterizing Capture Zone Distributions (CZD) in Island Growth T.L. EINSTEIN[1], Physics & CMTC, U. of Maryland, ALBERTO PIMPINELLI, Rice Quantum Institute, DIEGO LUIS GONZÁLEZ, Univ. del Valle, Cali, Colombia — As argued previously, analysis of the distribution of the areas of capture zones (i.e. proximity polygons [or Voronoi tesselations] with respect to island centers) is often the best way to extract the critical nucleus size in studies of epitaxial growth. For non-Poisson deposition (i.e. when island nucleation is not fully random) the areas of these Voronoi cells can be well described by the generalized Wigner distribution (GWD), particularly in the central region around the mean area where the distribution is largest. We discuss several recent applications to experimental systems, catelogued in a recent minireview,[2] showing how this perspective leads to insights about the critical nucleus size. In contrast, several (but not all) studies have shown that the GWD may not describe the numerical data from painstaking simulations in both tails.[2] We discuss some refinements that have been proposed, as well as scaling forms. Finally, we comment on applications to social phenomena. Emphasis is on very recent developments.

Theodore Einstein
University of Maryland, College Park

Date submitted: 15 Nov 2013   Electronic form version 1.4