

Abstract Submitted  
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**Capture zone area distributions for homogeneous nucleation and growth of islands during deposition**<sup>1</sup> JIM EVANS, YONG HAN, Iowa State University, MAOZHI LI, Renmin University — The size distribution of islands formed by homogeneous nucleation and growth during deposition is known to encode information about the nucleation mechanism. The same was recently proposed for the distribution,  $g(A)$ , of areas,  $A$ , of capture zones (CZ) surrounding islands [1], where most atoms landing within a CZ aggregate with the associated island. We have developed a precise theory for  $g(A)$  whose evolution is driven by the nucleation of new islands [2].  $g(A)$  has a complicated form controlled by details of the spatial aspects of nucleation. However, it is reasonably approximated by a Generalized Gamma distribution,  $g(A) \sim A^\beta \exp[-cA^n]$ . For compact 2D islands, one has  $n \sim 1.5$ , and  $\beta \sim 3(i+2)/2$  for critical size  $i$ . Here,  $\beta$  follows from analysis of the creation of new small capture zones between nearby pairs of islands, and  $n$  from analysis of the likelihood that a new CZ overlaps an existing large CZ.

[1] Pimpinelli & Einstein, PRL 99 (2007) 226102; 104 (2010) 149602;

[2] Li, Han & Evans, PRL 104 (2010) 149601.

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