

Small-particle limits in a regularized Laplacian random growth model

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In 1998 Hastings and Levitov proposed a one-parameter family of models for planar random growth in which clusters are represented as compositions of conformal mappings. This family includes physically occurring processes such as diffusion-limited aggregation (DLA), dielectric breakdown and the Eden model for biological cell growth. In the simplest case of the model (corresponding to the parameter $\alpha=0$), James Norris and I showed how the Brownian web arises in the limit resulting from small particle size and rapid aggregation. In particular this implies that beyond a certain time, all newly aggregating particles share a single common ancestor. I shall show how small changes in α result in the emergence of branching structures within the model so that, beyond a certain time, the number of common ancestors is a random number whose distribution can be obtained.

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