Supplementary Information

Nucleation pathway and kinetics of phase-separating active Brownian particles

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I. BASIN A AND FIRST INTERFACE

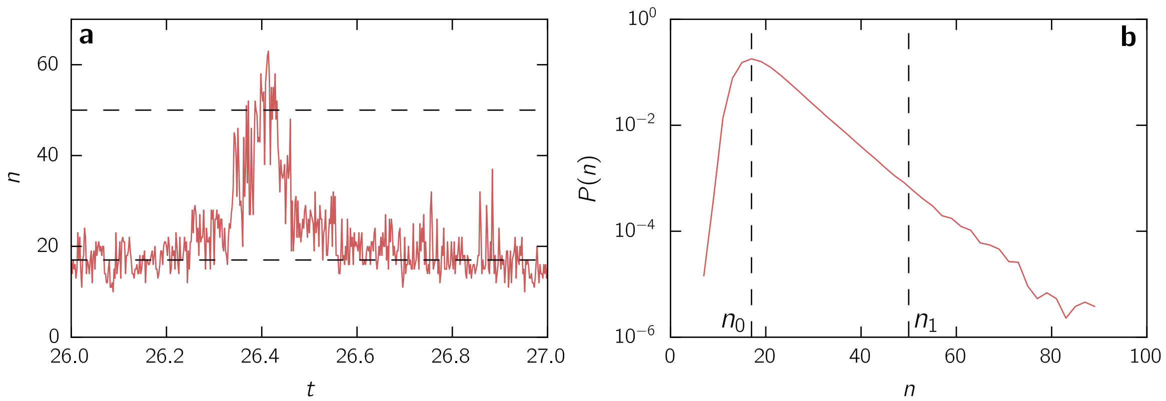

FIG. 1: Procedure to determine n_0 and n_1. (a) Typical behavior of the order parameter n as a function of time t for one crossing event of the first interface. (b) Probability distribution $P(n)$ in the homogeneous phase and associated interface positions n_0 and n_1 for $\phi \simeq 0.23$. The position n_0 corresponds to the peak of the distribution whereas n_1 is determined by the probability to reach $\simeq 10^{-3}$.

II. CRITICAL NUCLEI SIZE

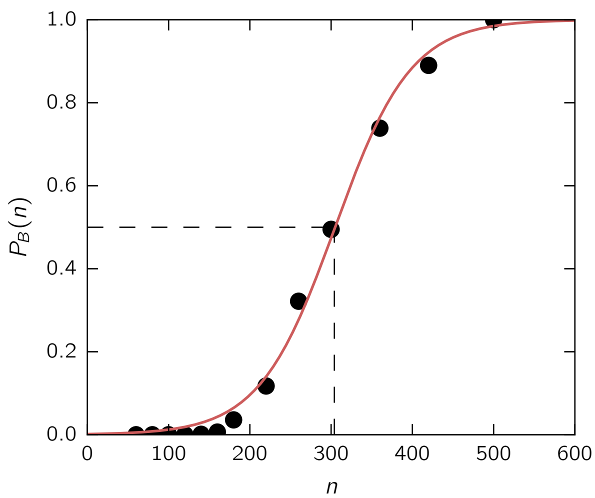

FIG. 2: Procedure to determine the size n_* of critical nuclei from the FFS data. Evolution of the forward transfer probability $P_j = \prod_{i=j}^{M-1} P(n_{i+1}|n_i)$ for one FFS run at $\phi \simeq 0.25$. The red solid line is a fit to the function $P(n) = \frac{1}{2}[1 + \tanh(cn + d)]$. The black dashed lines correspond to the TSE with $P_\mathrm{B} = 1/2$ $(r_* = 0)$ yielding $n_* = -d/c$.

ϕ	c	d	n_*
0.29	0.0145	-3.519	243
0.27	0.0125	-3.336	267
0.25	0.0120	-3.610	301
0.23	0.0114	-3.863	339

TABLE I: Parameters c and d extracted from FFS transfer probabilities (see Fig. 2) averaged over three independent runs.

III. LIKELIHOOD

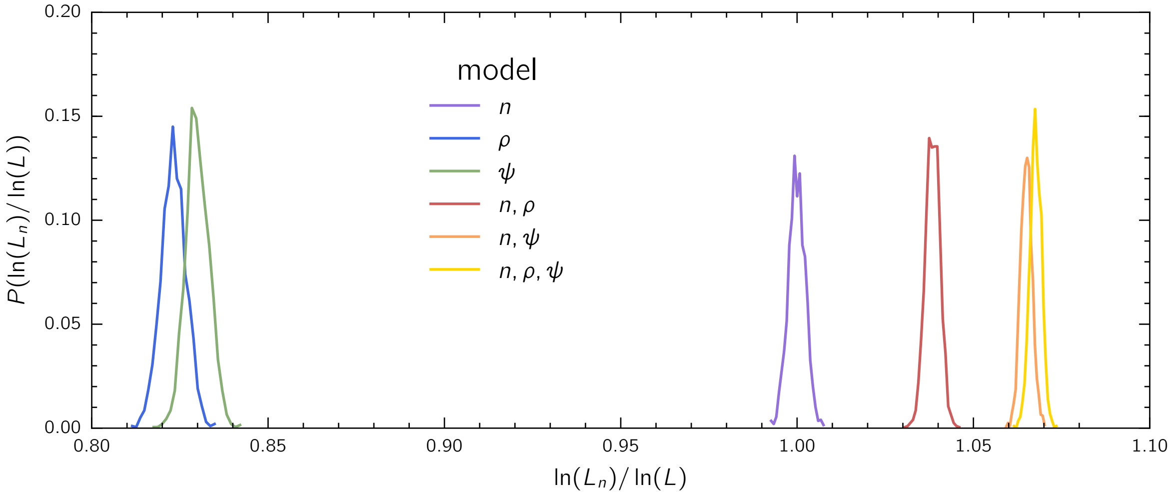

FIG. 3: Uncertainty of the log-likelihood. Distributions of $\ln(L_n)/\ln(L)$ extracted by the bootstrap method for the six different models. The procedure to evaluate an error of the maximum log-likelihood consists of resampling our data (each $P_{\rm B}$) with an added Gaussian noise. The new set of $P_{\rm B}$ gives us a new log-likelihood, and this procedure is repeated 2000 times to get a distribution of $\ln(L)$. The variance of the noise is chosen to be equal to the variance of the residual $P_{\rm B}(r_i) - P_{\rm B}^{\rm m}(r_i)$ computed between the data and the initial set of model parameters extracted from the likelihood maximization.