

Sharp interface limit for stochastically perturbed mass conserving Allen-Cahn equation

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Abstract

In this talk, we introduce a sharp interface limit for a mass conserving Allen-Cahn equation added an external stochastic noise and derives a stochastically perturbed volume preserving mean curvature flow in the limit. The stochastic term destroys the conservation law. Our approach is the asymptotic expansion method, which extends that for deterministic equations. Differently from the deterministic case, each term except the leading term appearing in the expansions of the solution in a small parameter ε diverges as ε tends to 0, since our equation contains a noise which converges to a white noise and powers of the white noise diverge. However, each term has actually a positive power of ε as its prefactor and we can choose the noises in such a manner that they converge to the white noise and at the same time the divergence of each term except the leading one is slow enough to be controlled by the positive power of ε . This is a joint work with T. Funaki.