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Stochastic order parameter dynamics with energetics: phase coexistence under heat conduction

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We consider a material that exhibits an order-disorder transition at equilibrium. When the transition is the first order, the phase coexistence is observed at the transition temperature. Now, we study this material under heat conduction. We then ask how many degrees the interface temperature is. This question is not solved by a conventional approach. Here, following Onsager's theory, we employ a universal model called "a stochastic order parameter dynamics with energetic" (SODE). We calculate the interface temperature by analyzing SODE with special boundary conditions. Our analysis is based on the Zubarev-Mclennan representation of the stationary measure and derive a potential function of the interface position by formulating a variational principle.

This work was done in collaboration with Naoko Nakagawa.

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