

Metastable patterns for three or more different phases

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Resumen

We consider a generalization of the semilinear phase field model from [1], using a more general density function which describe the phase separation of mixtures of three or more components, instead the binary mixtures. The main objective of this work is to prove the existence of metastable solutions that evolve very slowly in time, for this general model.

Next, we show several numerically experiments to obtain these metastable patterns in bough cases, for the model with two different phases and for more of two different phases.

Finally we consider a general enthalpy function which allows to study more general couplings between a diffusion field and a phase-field. For instance, the phase field can be seen as the density of bacterial collony or the mass of growing tumor. Analogously, the diffusion field can stand for the density of nutrient. In this case we prove also the existence of the metastable solutions of the generalized system.

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Referencias

- [1] A. Jiménez-Casas, A. Rodríguez-Bernal, *Linear stability analysis and metastable solutions for a phase-field model*, Proceeding of the Royal Society of Edimburgh, **129A**, 571-600, (1999).