Lecoq, Nicolas; **Zapolsky, Helena**; **Galenko, P. K.**

Numerical approximation of the Cahn-Hillard equation with memory effects in the dynamics of phase separation. (English) Zbl 1306.65266

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Summary: We consider the modified Cahn-Hilliard equation for phase separation suggested to account for spinodal decomposition in deeply supercooled binary alloy systems or glasses. This equation contains, as additional term, the second-order time derivative of the concentration multiplied by a positive coefficient τ_d (time for relaxation). We consider a numerical approximation scheme based on Fourier spectral method and perform numerical analysis of the scheme. We present results of numerical simulations for three spatial dimensions, and examine the stability and convergence of the scheme.

MSC:

65M70	Spectral, collocation and related methods for initial value and initial-boundary value problems involving PDEs	Cited in **1** Document
65M12	Stability and convergence of numerical methods for initial value and initial-boundary value problems involving PDEs	
65M22	Numerical solution of discretized equations for initial value and initial-boundary value problems involving PDEs	
80A22	Stefan problems, phase changes, etc.	

Keywords:

Cahn-Hilliard equation; spinodal decomposition; memory effects; numerical analysis

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