

1113-35-200

Joseph L Shomberg* (jshomber@providence.edu), Providence College, 1 Cunningham Square, 212 Howley Hall, Providence, RI 02918. *Well-posedness and asymptotic behavior for non-isothermal viscous nonlocal Cahn-Hilliard equations*. Preliminary report.

We examine a variation of the phase separation model of spinodal decomposition governed by the non-isothermal viscous Cahn-Hilliard equation. Here, we employ a variant motivated by the work of Giacomin and Lebowitz (1996-98) where the gradient term in the free energy functional is replaced with a nonlocal version. The nonlocal term accounts for long-range interactions which arise from a more satisfactory derivation of the Cahn-Hilliard equation based on statistical mechanics. Well-posedness results are obtained via a Faedo-Galerkin approximation method for regular (nonsingular) potentials. The asymptotic behavior of the solutions to the nonlocal Cahn-Hilliard equation is also examined. In particular, we show the existence of a bounded absorbing set and a global attractor. We also examine the regularity properties of the weak solutions and the global attractor. (Received August 21, 2015)