

A nonlocal model H with nonconstant mobility

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In a recent joint work with Sergio Frigeri and Maurizio Grasselli, we consider a diffuse interface model for incompressible isothermal mixtures of two immiscible fluids with matched constant densities. This model consists of the Navier-Stokes system coupled with a convective nonlocal Cahn-Hilliard equation with non-constant mobility. We first prove the existence of a global weak solution in the case of non-degenerate mobilities and regular potentials of polynomial growth. Then we extend the result to degenerate mobilities and singular (e.g. logarithmic) potentials. In the latter case we also establish the existence of the global attractor for the corresponding semiflow in dimension two. Using a similar technique, we show that there is a global attractor for the convective nonlocal Cahn-Hilliard equation with degenerate mobility and singular potential in dimension three.

References

- [1] *S. Frigeri, M. Grasselli, E. Rocca*: A diffuse interface model for two-phase incompressible flows with nonlocal interactions and nonconstant mobility. Preprint arXiv:1303.6446v1 (2013), 1–45.