

On two nonstandard mathematical models of phase segregation

PAOLO PODIO-GUIDUGLI

Dip. di Ingegneria Civile, Università di Roma TorVergata

ppg@uniroma2.it

Resumen

In [1], two mathematical models for phase segregation and diffusion of an order parameter are derived, within one and the same continuum mechanical framework. These models are, respectively, of the Allen-Cahn type and of the Cahn-Hilliard type, but differ from those in that they are based on a system of two evolution equations, rather than one.

I plan to briefly introduce both models and then concentrate on the first, which consists in a system of a partial and an ordinary differential equation. By a careful definition of maximal solution to the latter equation, I shall show how this system reduces to an Allen-Cahn equation with a memory term [2]; and I shall indicate how global existence and uniqueness of a smooth solution are proven.

Referencias

- [1] P. Podio-Guidugli, *Models of phase segregation and diffusion of atomic species on a lattice*. Ric. Mat., Volume 55 (1) (2006), 105-118.
- [2] P. Colli, G. Gilardi, P. Podio-Guidugli and J. Sprekels, *Global solution and long-time behavior for a problem of phase segregation of the Allen-Cahn type*. Preprint arXiv:0902.4741v1 [math.AP] (2009), 1-20.