

**Thermodynamically consistent Stefan problems with variable
surface tension**

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Abstract:

A thermodynamically consistent two-phase Stefan problem with temperature-dependent surface tension and with or without kinetic undercooling is studied. It is shown that these problems generate local semiflows in well-defined state manifolds. If a solution does not exhibit singularities, it is proved that it exists globally in time and converges towards an equilibrium of the problem. In addition, stability and instability of equilibria are studied, and in particular, it is shown that multiple spheres of the same radius are unstable if surface heat capacity is small, however, if kinetic undercooling is absent, they are stable if surface heat capacity is sufficiently large.

Preprints:

Relevant preprints on arXiv.org: 1109.452, 1101.3763, 0807.1539