

## Asymptotic analyses of singular phase field models

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Recently, some singular phase field systems have been introduced in order to model phase transitions processes (cf., e.g., [E. Bonetti, P. Colli, M. Frémond, M3AS (2003)], [E. Bonetti, P. Colli, M. Fabrizio, G. Gilardi, DCDS (2006)]). In particular, a re-formulation of the internal energy balance in terms of the entropy of the system has been used. This approach leads to some advantages, but also brings new difficulties in the mathematical analysis, introducing singular terms in the resulting PDE's system. In this talk we will discuss how to perform some asymptotic analyses on the solutions of some singular PDE's system with memory deduced within this framework.