On a system of nonlinear PDE’s for phase transitions with vector order parameter

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Abstract
The present paper deals with a class of phase transition models with vector order parameter where the hysteresis and diffusive effects in the kinetics of interface are taken into account. The system under consideration consists of nonlinear parabolic equations one of which includes the subdifferential of the indicator function of a polygon. Results for boundedness and existence of solutions for the system under consideration are obtained. Using the method of Yosida approximation we prove that there exists at least one solution of the system in the case when the diffusion coefficient in the equation for the kinetics of the order parameter is sufficiently small.