

A mesoscopic model of shape-memory alloys

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A continuum-mechanical description of the stored energy in shape-memory alloys at large strain will be presented, with its multi-well character giving rise to a microstructure described, with a certain approximation, by special gradient Young measures, namely by sequential laminates. A rate-independent phenomenological dissipation is then considered to model a hysteretic response. Mathematical analysis of existence of A. Mielke's energetic solution of this rate-independent model will be outlined. Isothermal computer simulations of M. Kružík of superelastic behaviour during a cubic-to-tetragonal (resp. cubic-to-orthorhombic) phase transformation in NiMnGa (resp. CuAlNi) single crystals will be presented, too.