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Abstracts of Short Communications and Posters

Section:

16. Applications

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Phase Transitions in Shape Memory Alloys

A thermodynamically consistent Landau–Ginzburg model describing phase transitions in shape memory alloys is developed. We compare our numerical investigations to the experiments performed by I. Müller and his co–workers. We establish existence results and we present our numerical simulations:
Displacement, strain and temperature evolution show the experimentally observed phenomena: phase transitions, changes of temperatures and latent heats, nucleation processes, propagation of phase boundaries.
Size and shape of our simulated hysteresis loops are independent of discretization and we find quantitative agreement with the experiments. The model is even capable of reproducing experimentally observed interior hysteresis loops.
Reference: N. Bubner, Landau–Ginzburg Model for a Deformation–Driven Experiment on Shape Memory Alloys, *Cont. Mech. Thermodyn.* **8** (1996), 293–308.