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Friedrich-Alexander-Universität Erlangen-Nürnberg

Seminar über Fragen der Mechanik

zu folgendem Vortrag wird herzlich eingeladen

Montag, 15.02.2010, 14:15 Uhr, Egerlandstr. 5, Raum 0.044

Stress-induced phase transformations in shape-memory polycrystals

Prof. Dr. Anja Schlömerkemper

Department Mathematik, FAU Erlangen-Nürnberg

Above the phase transformation temperature, shape-memory alloys show a superelastic behaviour upon an applied stress. This is due to a phase transformation induced by the applied stress. It is interesting to know the onset of stress-induced transformation from a general perspective as well as with respect to applications.

In this talk I will present joint work with K. Bhattacharya [1] in which we determine and study the onset of phase transformation mathematically within the framework of energy minimization and homogenization theory.

We study a model case of scalar materials and consider specific examples of four variant materials with special textures. We characterize the onset of phase transformation. Moreover we give bounds on the stress-strain curve by using an approach of Milton and Serkov [2], which was developed to bound currents in nonlinear conduction composites.

- [1] Bhattacharya, K. & Schlömerkemper, A., Stress-induced phase transformations in shapememory polycrystals, accepted for publication in *Arch. Rational Mech. Analysis*, available online
- [2] Milton, G. W. & Serkov, S. K., Bounding the current in nonlinear conduction composites. J. Mech. Phys. Solids 48, 1295-1324 (2000)

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Prof. Dr.-Ing. P. Steinmann Lehrstuhl für Technische Mechanik Universität Erlangen-Nürnberg Egerlandstraße 5, 91058 Erlangen Dipl.-Math. techn. G. Possart Tel. +49 9131 8528506 possart@ltm.uni-erlangen.de