1 Research topic

Investigation of coupled thermo-mechanical problems for rubber like materials

1.1 Field of the project

- Nonlinear elasticity, viscoelasticity
- Mechanical behavior of rubber like materials
- Numerical solution of coupled thermo-mechanical problems
- Finite element method

1.2 Project information

1.2.1 Short description of the topic

- The mechanical and thermo-mechanical behavior of rubber like materials are investigated in this research topic. Attention is focused on the constitutive equations and the thermodynamically consistent description of the problem. A series of simple numerical examples (simple shear, stretching of a rubber band, etc.) demonstrates the efficiency of the developed methods and good agreement with other solutions from the literature.

1.2.2 Publications

- **B. Pere,** I. Páczelt: *Solution of Coupled Thermo-mechanical Contact Problem Using the hp-version of the Finite Element Method*, Book of abstracts, Numerical Methods and Computational Mechanics, July 15-19, 2002, University of Miskolc, Hungary, Miskolc, p. 212-214.
- **B. Pere**: *Investigation of an Axisymmetric Contact Problem Using the p-version of the Finite Element Method*, 6th European Solid Mechanics Conference, CD-ROM, 2 pages, 28 August - 1 September, 2006, Budapest, Hungary
- **B. Pere**: *On the Modeling of Self Heating of Viscoelastic Materials Under Finite Strains*, XXII. microCAD International Scientific Conference, University of Miskolc, Section F: Applied Mechanics, Miskolc, 20-21 March 2008, p. 45-48.
- **B. Pere**: *Heat Generation Caused by Cyclic Finite Deformation in Viscoelastic Solids*, XXIII. microCAD International Scientific Conference, University of Miskolc, Section F: Applied Mechanics, Miskolc, 19-20 March 2009, p. 37-41.

1.3 Short term goals

- On the basis of the adequate theoretical method a finite element code is planned to develop, which can highly support the further numerical analysis of the coupled thermo-mechanical problems.

1.4 Contact information

Contact person: Balázs Pere PhD
E-mail address: perebal@sze.hu
Phone number: (96) 503400 / 3274