

FROM THE EDITOR

This issue of the journal TASK Quarterly includes eleven scientific contributions dealing with hypoplastic constitutive law formulated within a continuum mechanics to describe the behaviour of granular bodies.

Hypoplastic constitutive models are an alternative to elasto-plastic formulations for modelling of granular materials. They describe the mechanical rearrangement of so-called simple grain skeletons assuming that the macroscopic state can be sufficiently characterised by mean values of stress and void ratio. In contrast to elasto-plastic models, a decomposition of deformation into elastic and plastic parts is not made. Yield surfaces, plastic potentials, flow rules and hardening and softening rules are not needed. Advantages of the models are their simplicity and an easy procedure for determination of material constants with standard laboratory experiments. They hold for a wide range of densities and pressures. First hypoplastic constitutive model was proposed by D. Kolymbas at the Institute for Soil and Rock Mechanics of the Karlsruhe University in Germany and next developed by G. Gudehus and his co-workers at the same Institute.

The papers have been prepared by scientists who worked or still work at the Institute for Soil and Rock Mechanics of the Karlsruhe University. The five papers (written by G. Gudehus, D. Kolymbas, E. Bauer, I. Herle, A. Niemunis *et al.*) discuss some mathematical and physical aspects of hypoplastic constitutive laws. In two papers (written by E. Bauer and W. Huang, and J. Tejchman) two different boundary value problems including shear localisation (shearing of an infinite planar layer between two boundaries and plane strain compression) are numerically analysed with a hypoplastic law with polar extensions. The application of a hypoplastic law to practical engineering problems is shown by V. Osinow and R. Cudmani, P. Kudella, P. Kudella and P.M. Mayer, J. Wehr and J. Tejchman.

Jacek Tejchman

Gdansk, 17 June 2000