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The Finite Pointset Method (FPM) and an Application in Soil Mechanics. Preliminary report.

The Finite Pointset Method (FPM) is a meshfree approach to numerically solve (coupled) PDEs occurring in computational fluid dynamics and continuum mechanics. The geometry of the domain (fluid or solid) is represented by a cloud of numerical points which carry all the necessary information and move with the velocity of the material (Lagrangian approach). FPM is a generalized finite difference method: The strong solution of the considered problem is determined by direct approximation of the occurring differential operators. One of the latest applications of FPM is the simulation of triaxial tests in soil mechanics with the material law of barodesy developed by the Division of Geotechnical and Tunnel Engineering at the University of Innsbruck. In soil mechanics the development of appropriate material laws for granular media is important for the research on their mechanical behavior and the development of suitable test procedures to classify and realistically simulate soils. (Received September 20, 2012)