Computational Plasticity based on the Virtual Element Method

P. Wriggers[1], B. Hudobivnik [1] and F. Aldakheel [1]

[1] Institute for Continuum Mechanics, Leibniz Universität Hannover
e-mail: wriggers@ikm.uni-hannover.de

Abstract

Virtual elements (VEM) were developed during the last decade and applied to various problems in solid mechanics. The method includes elements that can have arbitrary shape including non convex polyhedra. This flexibility with respect to the geometry can be explored and utilized within engineering applications which include plasticity.

This lecture will cover several applications of the virtual element method to solids with inelastic materials. One example is related to micro-mechanics of materials. Here virtual elements can directly be used to model polycrystals and investigate processes at micro-mechanical level at finite strains. Another application relates to fracture and damage behaviour of solids where virtual elements can be efficiently employed to model crack propagation.