

Application of virtual element methods for numerical simulation of inelastic response

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The Virtual Element Method (VEM) is a novel technology for the approximate solution of partial differential equations that shares the variational background of the finite element method. VEM has the flexibility to deal with general polygonal/polyhedral meshes, including “hanging vertices” and non-convex element shape, while retaining the conformity of the method.

This allows different applications in the area of inelastic materials which include homogenization of materials with polycrystalline microstructure, thermo-mechanical responses at finite strains and impact problems. In this presentation we will discuss different aspects of the formulation of low order three-dimensional virtual elements for the class of problems mentioned above.