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Analytical formulation of generalized incremental theorems for 2D no-tension solids (Article)

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Abstract

In this paper, an original variational formulation is set up for incremental solutions in masonry-like no-tension (NT) solids. After reformulating some incremental theorems originally introduced with reference to elastic-plastic continua, the analytical developments allow to identify some extremum properties of a suitably defined functional of the response variables (in terms of fracture strains) for NT solids, which are verified within each time step of the loading process. The final problem consists of a constrained optimization, where the objective functional is represented by a quadratic semi-positive definite function of the fracture multiplier and the constraints are imposed by the material admissibility conditions. © 2015, Springer-Verlag Wien.

Indexed keywords

Engineering controlled terms: Fracture; Functions

Analytical formulation; Extremum property; Fracture strain; Incremental solutions; Loading process; Positive definite function; Time step; Variational formulation

Engineering main heading: Constrained optimization

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