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FINITE DEFORMATION PLASTICITY IN 3D-SHELL MODEL

Boštjan Brank*, Adnan Ibrahimbegovic†, and Uroš Bohinc*

*University of Ljubljana, Slovenia

† Ecole Normale Supérieure de Cachan, LMT-Cachan, France

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Summary. *Constitutive behavior of a shell-like structure under static and/or dynamic loading in the inelastic setting often requires quite en ingenious procedure in order to be constructed. An exception to that can be found with a higher-order shell model, further called a 3D-shell model. The model of this kind treats a shell geometry from the point of view of a two-dimensional body, and the shell geometry can still be described in a conventional way, by its middle surface and by shell director field. However, the model builds the stress and the strain state in a shell as fully three-dimensional ones, which requires no special treatment for adapting different constitutive models to shells. As shown in [1] and [2], there are several possibilities to construct one such shell model.*

The study carried out in this work addresses an efficient implementation of complex fully three-dimensional constitutive equations into 3D-shell model. In particular, the finite strain plasticity formulation [3] is implemented within the framework of finite rotation higher-order shell formulation, based on ANS concept. Several numerical examples will be presented in order to illustrate the performance of the proposed methodologies. The examples treat both linear and nonlinear problems.

REFERENCES

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