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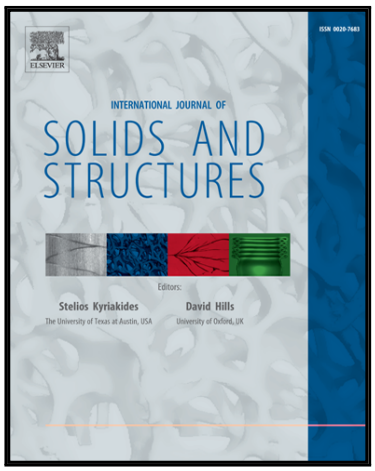

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A Hyperelastic Fractional Damage Material Model with Memory

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ABSTRACT

In this paper a scalar damage model for hyperelastic materials is considered. The novelty of the proposed approach lies in the evolution law for the damage variable that is formulated with the application of fractional calculus. In this way damage evolution includes the memory, or in other words the current intensity of damage evolution, which is based on information from the past - whose length is included in the fractional operator. Based on illustrative examples, the flexibility of the model to mimic experimentally observed material behaviour is presented.

1 Introduction

Continuum damage mechanics (CDM) has reached a high level of its maturity nowadays. Herein on should mention the first concepts proposed by Kachanov [1] and Rabotnov [2], to-

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