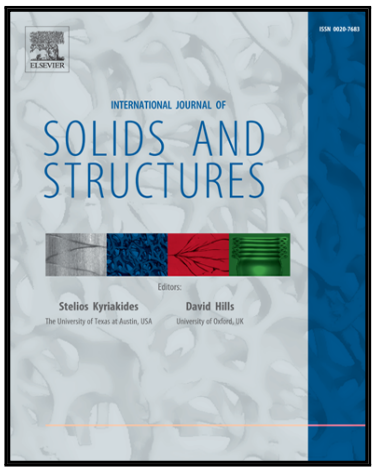

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Effect of Thermomechanical Loading on Fracture Properties of Brittle Materials

A Fully-Coupled Transient Thermoelastic Analysis Using a Lattice Approach

Amir Mohammadipour · Kaspar Willam

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Abstract The influence of simultaneous thermomechanical loadings on the fracture behavior of linear thermoelastic brittle materials with a propagating crack and transient temperature diffusion is investigated. A planar two-way coupled thermoelastic lattice with a brittle erosion algorithm, implemented in *MATLAB*, is used in the context of LEFM to study two well-known classic fracture problems in Mode I, i.e., center and double-edge crack configurations, under thermal, mechanical, and thermomechanical loadings for a brittle crystalline Silicon, as an example. The approach can also be applied to other brittle materials like brick

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