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Effect of Thermomechanical Loading on Fracture Properties of Brittle Materials

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- ¹ Effect of Thermomechanical Loading on Fracture
- ² Properties of Brittle Materials
- ³ A Fully-Coupled Transient Thermoelastic Analysis Using a
- 4 Lattice Approach
- 5 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 9 thermoelastic lattice with a brittle erosion algorithm, implemented in MATLAB, 10 is used in the context of LEFM to study two well-known classic fracture prob-11 lems in Mode I, i.e., center and double-edge crack configurations, under thermal, 12 mechanical, and thermomechanical loadings for a brittle crystalline Silicon, as an 13 example. The approach can also be applied to other brittle materials like brick 14 Amir Mohammadipour Department of Civil and Environmental Engineering, University of Houston, 4726 Calhoun Road, Room N107, Houston, TX 77204-4003, USA E-mail: amohammadipour@uh.edu Kaspar Willam

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