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MICROMECHANICAL MODELING IN FATIGUE ANALYSIS OF STEEL SPECIMENS AT LOW TEMPERATURES

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Abstract

Fatigue behaviour of steel specimens at low temperatures is treated in present paper. Micromechanical modeling with running wave approach together with parallel processing technique and back-propagation neural network is used for numerical analysis of the problem. Numerical treatment of the non-linear problems appearing is made using updated Lagrange formulation of motion. Each step of the iteration approaches the solution of the linear problem. Specified are non-linear pseudo-forces with updated back propagation control. Numerical and experimental assessment is submitted in order to demonstrate the efficiency of approaches suggested.

Keywords and phrases: fatigue, FETM-technique, low temperature, micromechanical string, neural networks, parallel processing, pseudo-force technique, running wave approach, steel specimen.