Robust Identification of an Augmented Gurson Model for Elasto-Plastic Porous Media

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In the paper we investigate robust identification approach to identify the material parameters in the augmented Gurson model for the elasto-plastic porous media. The model describes processes of nucleation and growth of voids in the porous body subjected to inelastic deformation. Robust identification, in contrary to the least squares approach, assumes minimization of the sum of the selected weighted differences between the measured and calculated from the model output values. The advantage of using a robust method which automatically rejects extreme observations is that it does not require a subjective decision on the part of the experimenter. The identification problem is solved by means of the global optimization method of Boender at al. In our solver we permit the use of the Hooke–Jeeves direct search method as the local minimizer that does not involve any derivatives. Identification is carried out on the basis of Fisher's data measured on the steel cylindrical specimens subjected to the uniaxial tension.

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