

Parameter Identification of Chaboche Material Model Using Indantation Test Data and Inverse Approach

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ABSTRACT

In this paper genetic algorithm and sensitivity analysis are used to identify 6 parameters of Chaboche kinematic hardening model using repeated Finite element (FE) simulations of indentation test. Five of them are material constants of Chaboche kinematic hardening model itself. The last one represents the stiffness of the foundation and the indenter. To obtain experimental data indentation test under cyclic loading on universal tensile testing machine was performed. Because for sensitivity analysis to obtain all possible combinations of parameters and its values large number of simulation have to be performed supercomputer Anselm hosted by IT4Innovation has been used. Advantage of using supercomputer is that every simulation could use multiple cores which will reduce computational time. Moreover, since each simulation is independent, computational time could be further reduced by performing multiple simulations at the same time. It is clear from the comparison of both methods that the genetic algorithm is very good choice for the parameter estimation.