

A Unified Fitting Method for the Set of Unified Constitutive Equations for Modelling Microstructure Evolution in Hot Deformation

Authors : Chi Zhang, Jun Jiang

Abstract : Constitutive equations are very important in finite element (FE) modeling, and the accuracy of the material constants in the equations have significant effects on the accuracy of the FE models. A wide range of constitutive equations are available; however, fitting the material constants in the constitutive equations could be complex and time-consuming due to the strong non-linearity and relationship between the constants. This work will focus on the development of a set of unified MATLAB programs for fitting the material constants in the constitutive equations efficiently. Users will only need to supply experimental data in the required format and run the program without modifying functions or precisely guessing the initial values, or finding the parameters in previous works and will be able to fit the material constants efficiently.

Keywords : constitutive equations, FE modelling, MATLAB program, non-linear curve fitting

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