

P81 A Schematic Procedure for Parameter Estimation of a UHPC Material Model in Penetration Analysis Utilizing the Clustering Variable Method

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Abstract:

As a result of an extended research effort the K&C concrete (KCC) material model for conventional concrete material has been modified in order to consider UHPC. Following the improvement of the constitutive model up to a level sufficient to include material behaviors by the identification technique, the estimation of parameters is required to evaluate the appropriateness of the suggested model. Due to the large numbers of variables in the material model and complex interaction with the resultant behavior, the evaluation as an integrated domain is not only complicated but inaccurate due to interactive coupling behaviors between variables.

Many of the parameters of the KCC material model can be easily selected using basic materials tests however, there are several for which no simple tests are available. The process for selecting appropriate values for these parameters presented in this paper are parameter identification and estimation methods.

The full parameter domain, in which single parameters are considered as a variable, is a straightforward method for parameter estimation but it's impractical due to the large number of variables and their interaction. In this paper, clustering parameters to reduce the variable domain is suggested for a more practical reduction methodology and application to UHPC penetration simulations is included to validate the proposed methodology.

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