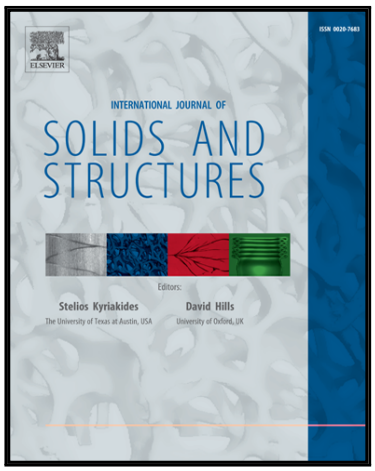

Improving full-field identification using progressive model enrichments

J. Neggers, F. Mathieu, F. Hild, S. Roux, N. Swiergiel

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Improving full-field identification using progressive model enrichments

J. Neggers[a,*], F. Mathieu[a], F. Hild[a], S. Roux[a], N. Swiergiel[b]

[a] *LMT, ENS Paris-Saclay / CNRS / Université Paris-Saclay*
61 avenue du Président Wilson, 94235 Cachan Cedex, France
[b] *Airbus Group - Innovations, 12 rue Pasteur, 92152 Suresnes Cedex, France*

Abstract

Full-field identification methods such as finite element model updating or integrated digital image correlation minimize the gap between an experiment and a simulation by iterative schemes. Within the algorithms residual fields *and* sensitivity fields are used to achieve identification. This paper discusses how these same fields can be used to assess the quality of the identification and guide toward successive enrichment of the constitutive model to progressively reduce the experiment-model gap. A cyclic experiment on a dog-bone sample made of aluminum alloy is used as an example to identify the parameters of an elasto-plastic model with exponential hardening and anisotropic yielding.

Keywords: Anisotropic plasticity, Damage, Digital image correlation, Full-Field measurements, Identification

1. Introduction

There is a constant need for calibrating the parameters of material models. Most modern engineering materials are created from mixtures of multiple materials using highly specific micro-architectures [1]. This allows them to be optimized to a high extent. The interest in these materials is often beyond their linear elastic regime [2].

*Corresponding author
Email address: jan.neggers@ens-paris-saclay.fr (J. Neggers)