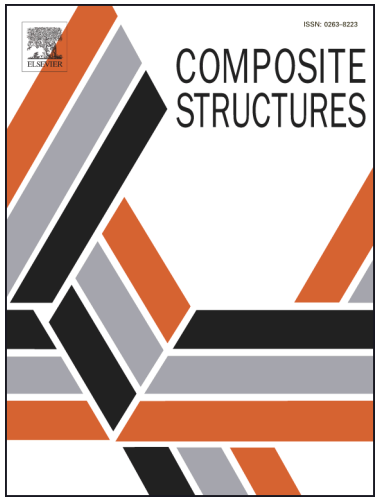

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Probabilistic sensitivity analysis to understand the influence of micromechanical properties of wood on its macroscopic response

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Abstract

This paper investigates the influence of the uncertainty in different micromechanical properties on the variability of the macroscopic response of cross-laminated timber plates, by means of a probabilistic sensitivity analysis. Cross-laminated timber plates can be modelled using a multiscale finite element approach which although suitable, suffers from high computational cost. Investigating parametric importance can incur considerable time penalty since conventional sensitivity analysis relies on a large number of code evaluations to produce accurate results. In order to address this issue, we build a statistical approximation to the code output and use it to perform sensitivity analysis. We investigate the effect of a collection of parameters on the density and Young's moduli of wood. Additionally, the influence on the response of cross-laminated timber plates subject to bending, in-plane shear

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