

Fatigue reliability based on residual strength model with hybrid uncertain parameters

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Abstract

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Abstract The aim of this paper is to evaluate the fatigue reliability with hybrid uncertain parameters based on a residual strength model. By solving the non-probabilistic set-based reliability problem and analyzing the reliability with randomness, the fatigue reliability with hybrid parameters can be obtained. The presented hybrid model can adequately consider all uncertainties affecting the fatigue reliability with hybrid uncertain parameters. A comparison among the presented hybrid model, non-probabilistic set-theoretic model and the conventional random model is made through two typical numerical examples. The results show that the presented hybrid model, which can ensure structural security, is effective and practical.

Keywords: fatigue reliability residual strength random model non-probabilistic set-theoretic model hybrid model

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