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INFLUENCE OF RANDOM FATIGUE LOADING NON-PROPORTIONALITY ON DAMAGE

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ABSTRACT

The aim of the present paper is to evaluate the effect of the loading non-proportionality on damage accumulation. Such an analysis is performed at material macro-level by means of numerical simulations concerning random bending-torsion loading. A wide group of random bending and torsion input signals is generated by varying (a) the spectral content and variance of the above signals, and (b) the value of the cross correlation coefficient. The spectral criterion by Carpinteri et al. is applied to compute the expected damage. A linear relationship between damage ratio and cross correlation coefficient is proposed for signals characterised by variance ratio equal to 1.0.

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