Elaboration de spécifications multiaxiales issues de chargements vibratoires gaussiens combinés

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Abstract
This dissertation focuses on the development of a spectral procedure for elaborating specifications dedicated to random multiaxial loads. This development aims to generalize the currently used procedures, known as "sequential cumulative" uniaxial damage procedures, which involve applying vibratory loads sequentially by loading axes. Their implementation requires the use of fatigue damage spectra and extreme response spectra. These spectra respectively describe the damage and response of a structure at a degree of freedom as a function of its natural frequency, and for a given Gaussian vibratory load. In this work, the damage and extreme response spectra are generalized to allow the characterization of environments and structures with up to six degrees of freedom. This leads to the development of a new frequency-based procedure for elaborating customized specifications for multiaxial vibratory tests, which generates a single load synthesizing the life profile of the structure while adjusting the test duration according to project needs. In addition, vibratory tests are conducted to validate the accuracy of the proposed multiaxial procedure.