User's Guide for the
Frequency Domain Algorithms
in the LIFE2 Fatigue Analysis Code

by

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ABSTRACT

The LIFE2 computer code is a fatigue/fracture analysis code that is specialized to the analysis of wind turbine components. The numerical formulation of the code uses a series of cycle count matrices to describe the cyclic stress states imposed upon the turbine. However, many structural analysis techniques yield frequency-domain stress spectra and a large body of experimental loads (stress) data is reported in the frequency domain. To permit the analysis of this class of data, a Fourier analysis is used to transform a frequency-domain spectrum to an equivalent time series suitable for rainflow counting by other modules in the code. This paper describes the algorithms incorporated into the code and their numerical implementation. Example problems are used to illustrate typical inputs and outputs.