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Experimental Analysis of Vibro-Acoustic Modulations in Nonlinear Acoustics Used for Fatigue Crack Detection

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The paper investigates experimentally nonlinear vibro-acoustic modulations. Simultaneous high-frequency ultrasonic and low-frequency modal excitations are applied to a cracked aluminium plate. This results in nonlinear wave modulations of the ultrasonic wave. Modal and crack divergence analyses together with vibrothermography are used in these investigations. The study reveals two modulation mechanisms related to nonlinear elasticity and a clear link to coupled thermo-elastic behaviour. The results show that the opening-closing crack movement is not needed when nonlinear acoustic is used for crack detection.

Ключевые слова:

Содержание.

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