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Advanced Beamforming of 2D Arrays for Structural Health Monitoring Using Lamb Waves

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Monitoring of large plate structures using Lamb waves requires normally a dense network of piezoelectric sensors. Active ultrasonic arrays, due to their superior sensitivity and beam steering capability are an interesting alternative to sensor networks. In this paper we present a minimum variance distortionless response (MVDR) approach to beamforming of Lamb waves using a single transmitter and a uniform rectangular array (URA) for reception. Dispersion effects are compensated using theoretically calculated and experimentally verified dispersion curves. The combination of the MVDR approach and the 2D array allows for suppression of spurious Lamb modes. The proposed algorithm is evaluated using selected experimental data.

Ключевые слова:

Содержание.

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