

Ultrasonic Wave Propagation in Thick, Layered Composites Containing Degraded Interfaces

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The United States Navy is increasingly looking to advanced fiber-reinforced plastic composites for their unique performance capabilities. Reliable and effective nondestructive evaluation methods are required for post-fabrication and in service characterization of these materials. The ultrasonic wave propagation of thick, layered composites containing degraded bonds is investigated in order to improve ultrasonic inspection of composite structures. A theoretical one-dimensional model of three attenuating viscoelastic layers containing two imperfect interfaces is introduced. Parametric analysis via the mass-spring-dashpot lattice model numerical method reveals a procedure for the nondestructive characterization of interlaminar bond quality.