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# A computational study for delamination detection in fiber-metal laminates using lamb wave propagation (Style: Article Title)

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**Abstract** (Style: Headers)

Delamination is one of the most critical damages in fiber-metal laminates (FMLs). The purpose of this study was to assess the ability of guided Lamb waves for the detection of delamination in fiber-metal laminates (FMLs) through numerical models developed using the finite element method (FEM). The developed FEM models consisted of FML samples with [Al/90/Al/90/Al] layup having delamination damage of 10, 15, 20, and 25 mm diameter between different layers, a virtual ultrasonic actuator, and several virtual sensors. The anti-symmetric Lamb wave with a frequency of 70 kHz and symmetric Lamb wave with a frequency of 400 kHz were propagated on the sample using the actuator. The sensors were then used to obtain the induced wave characteristics, including the displacement phase and amplitude at different locations along the propagation direction. The Lamb wave velocity was obtained using the measured wave characteristics. Using the velocity change in the delamination area, the sensitivity of the anti-symmetric and symmetric Lamb waves to the damage and the diameter of the delamination were determined. (Style: Text) {**Maximum 250 words**}

**Keywords:** Fiber-metal laminates (FMLs), Delamination, Guided Lamb wave, Non-destructive evaluation, Mechanical Properties. (Style: Keywords)