

**NONDESTRUCTIVE CHARACTERIZATION OF ADHESIVE BONDS  
FROM GUIDED WAVE DATA**

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**ABSTRACT**

The critical role played by interface zones in the fracture and failure of composites and other bonded materials is well known. The existing nondestructive evaluation methods are generally not capable of yielding useful quantitative information on the strength of an interface. However, several ultrasonic techniques have been developed in recent years, that can yield very accurate estimates of the thickness and the elastic moduli of adhesively bonded joints nondestructively. One of these techniques uses guided waves launched in a direction parallel to the bonded surfaces and is based on the fact that certain properties of these waves are strongly affected by the properties of the interface. We have carried out a coordinated theoretical and experimental program of research in an effort to determine the nature of the relationship between the interracial properties and the measurable properties of the guided waves and have been able to demonstrate that a careful analysis of guided wave data can give highly accurate estimates of some of the interface properties in a variety of bonded systems. The results of our recent research in this area will be reported in this paper.