

## **Finite Element Modeling of Transient Eddy Currents in Multilayer Aluminum Structures**

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Transient eddy current (TEC) technique is being developed for detection of flaws located at depth within multilayer aluminum structures such as aircraft wings. It uses a transient signal to induce eddy currents, which interact with flaws in a conducting structure to produce an output signal that provides information about the flaw. The technique involves designing of a transmit/receive probe, which is essentially a pair of two concentric coils, to produce an output signal that depends on various parameters, such as number of turns, spacing between the coils, length of the core, etc. The present work involves finite element modeling using COMSOL3.4 Multiphysics software to simulate different types of probes by changing some of these parameters in an attempt to generate an output signal of optimum magnitude and shape. Some of the modeled results are compared with experimental results from an identical probe configuration and there is, in general, a good agreement. The modeling has also contributed towards understanding of the TEC phenomenon.