## MICROWAVE TESTING OF TEXTILE COMPOSITE USING FREE-SPACE MICROWAVE MEASUREMENT SYSTEM



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#### ABSTRACTS

Composites are expensive and destructive test methods are normally applied to determine their physical properties. For textile composites, a nondestructive test could save time and save cost if the physical properties such as moisture content, weave architecture, void content and fiber volume fraction, can be deduced from electrical properties. This will be useful in aeronautics and aerospace industries.

In this research, microwave nondestructive testing (MNDT) techniques such as reflection coefficients, transmission coefficients and complex permittivities are applied to characterize physical properties such as moisture content aVid fiber volume fraction. Free-space microwave measurement system is used to measure reflection and transmission coefficients of textile composites. We have measured reflection coefficients and transmission coefficients and dielectric properties of textile composites made from Kevlar, E-Glass, S-Glass and carbon fibers. For textile composites, epoxy and vinylesther are used as resins. Experimental results are reported for reflection coefficients and transmission coefficients, dielectric constants and loss tangents.

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