MICROWAVE NONDESTRUCTIVE TESTING OF COMPOSITE MATERIALS (8 GHz TO 12 GHz) USING A FREE-SPACE TECHNIQUE

Thesis presented in partial fulfilment for the award of the Advanced Diploma in Electrical Engineering of INSTITUT TEKNOLOGI MARA

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ABSTRACT

The main objective of this experiment is to get the power absorption coefficients (PAC) when the reflection coefficients, $|S_{11}|^2$ and transmission coefficients, $|S_{21}|^2$ is obtained from the reflection measurements and transmission measurements. Using transmission and return loss (reflection) measurements, we have developed a method for microwave nondestructive testing of several composite materials in the frequency range of 8 - 12 GHz (X-band). The key components of the measurement system are scalar network analyzer and horn antennas. The dielectric constants and the loss tangents for each samples are formerly known.

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