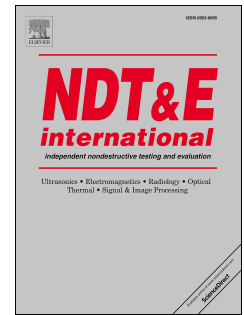


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Visualization of subsurface damage in woven carbon fiber-reinforced composites using polarization-sensitive terahertz imaging

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Abstract

Polarization-sensitive terahertz imaging is applied to characterize subsurface damage in woven carbon fiber-reinforced composite laminates in this study. Terahertz subsurface spectral imaging based on terahertz deconvolution is tailored and applied to detect, in a nondestructive fashion, the subsurface damage within the first ply of the laminate caused by a four-point bending test. Subsurface damage types, including matrix cracking, fiber distortion/fracture, as well as intra-ply delamination, are successfully characterized. Our results show that, although the conductivity of carbon fibers rapidly attenuates terahertz propagation with depth, the imaging ca-

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