Laser photoacoustic technique in the non-destructive evaluation (NDE) of ceramics and metals.

The physics of the scanning photoacoustic microscopy (SPAM) has been developed. SPAM has been applied to NDE problems in high performance ceramics, and has been shown to be potentially useful for NDE in other solids, such as metals and semiconductors.
FINAL REPORT

R. L. THOMAS

OCTOBER 25, 1981

U. S. ARMY RESEARCH OFFICE

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WAYNE STATE UNIVERSITY

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In the course of this study, we have developed the gas-filled cell of the device optimized and verified the relevant experimental conditions for the data collection, processing and display.

We have performed an extensive and theoretical investigation of the physics of the generation and scattering which is responsible for the UCA technique as a means of evaluating subsurface flaws. We have also applied the UCA technique to various materials problems and experimental conditions of subsurface flaws at depths ranging from 0.1 to over 1 cm thick, and with lateral resolution of about 1 mm subsurface flaws.

The results of these studies have been sufficiently encouraging that Shell Oil Company and the U.S. Army Laboratory have adopted the technique for their own investigations. Technical details of the method are presented in the following list of publications. Part 6 of this
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