

# Visualization of Ultrasound Propagation in the Glass with a Crack Possessing Residual Inner Stress

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Visualization of 1 MHz ultrasonic burst pulse propagation around a crack in a glass sample is carried out by the strobo-photoelastic method to explore the propagation properties in the ultrasonic wave field under existing residual stress. Imaging results of ultrasonic wave are captured by the C-MOS camera and they were processed with integration, subtraction and normalization to enhance the contrast of the images. In the glass sample, the crack was introduced to make a distribution of static residual stresses. Residual stress was preliminary imaged by the commercial tint color strain detector to identify and to locate the distribution of stress. In the experiments for the ultrasonic wave propagation around the crack tip, wavefront was clearly visualized and its brightness was affected by the birefringence of residual stress. As the results, dynamic compressive stress by the ultrasonic wave was successfully visualized and illuminous in the static residual stress field.

**Key Words** : ultrasonic wave, crack, residual stress, strobe photo-elastic method