研 究 論 文

PMMA中に存在する微小領域の残留応力と超音波位相との関係

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Relationship between Residual Stress and Ultrasonic Phase of Small Area Present in PMMA Sample

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Laser light probing method is introduced in the ultrasonic measurement system to detect and identify the properties of residual stress around small area in solid material. PMMA (Polymethyl methacrylate) sample introduced 1.0mm slit and compression or tension stress is used to demonstrate the usefulness of the method. The laser beam light via the avalanche photo diode (APD) and vector signal analyzer (VSA) analyzed the phase changes including in the ultrasonic wave affected by the residual stress in the PMMA sample. Ultrasonic phase varied around the residual stress and rapid variation area of ultrasonic phase changes are revealed. Possibility of an evaluation technique for the small area residual stress by the laser light probing is demonstrated.

Keywords : Laser light, small area, residual stress, ultrasonic phase change, retardation, phase slope