Active Use of Piezoelectric Film for Identification of Cracks

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Abstract

The passive electric potential CT (computed tomography) method was proposed for detecting and identifying cracks in structure members subjected to mechanical load. In this method piezoelectric film was pasted on the cracked member to be inspected. The electric potential distribution on the piezoelectric film was obtained without applying electric current. The passively obtained distribution was used for the identification of cracks. The piezoelectric film can be used as an actuator and transducer for the ultrasonic inspection. In this paper the active use of the piezoelectric film for crack detection was examined. A smart layer which works both as the sensor for the passive electric potential CT method and as ultrasonic transducer was developed. Experiments demonstrated the applicability of the layer for the detection of cracks.