Crack Identi¯cation from Boundary Measurements

Shiro KUBO, Takahide SAKAGAMI, and Daiki SHIOZAWA
Department of Mechanical Engineering and Systems
Graduate School of Engineering, Osaka University
2-1, Yamadaoka, Suita, Osaka 565-0871 Japan
Phone: +81-6- 6879-7304, Facsimile: +81-6-6879-7305
e-mail: kubo@mech.eng.osaka-u.ac.jp

The crack identi¯cation from physical measurements can be categorized as one of the domai/boundary inverse problems [1]. The present authors proposed the electric potential CT (computed tomography) method for identifying cracks in two- and three-dimensional bodies [2-4]. This method can be categorized as an active method, since the electric potential distribution o n the surface of cracked body is computer-processed for identifying the crack. The applicability of the method for the identi¯cation of cracks in homogeneous body and bonded dissimilar bodies was demonstrated by numerical simulations and experiments.

They also proposed a passive electric potential CT method for the crack identi¯cation using the piezoelectric material [5]. In this method the piezoelectric material is attached to a cracked body subjected to mechanical loading. Due to the direct piezoelectric e®ect the strain in the cracked body induces the electric potential distribution on the surface of the piezoelectric material, which can be used for the crack identi¯cation.

These methods use boundary measurements for the identi¯cation of cracks.

Some examples of crack identi¯cation using the active and passive electric potential CT method are presented, and the applicability of the methods is discussed.

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