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[\[PDF \(428K\)\]](#) [\[References\]](#)**IMPACT FORCE IDENTIFICATION OF ALUMINUM PLATES USING STRAIN SENSORS**Satoshi MATSUMOTO¹⁾, Masanori TAJIMA²⁾ and Hisao FUKUNAGA¹⁾

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This paper proposes a reliable method identifying both a location and a history of an impact force acting on a plate using multiple sensor responses. First, a fundamental relationship between an impact force and the strain responses is formulated based on the finite element method. The impact force history is precisely identified by the least-squares method containing a penalty term on derivative of force history. The location of impact force is determined by minimizing an error vector between measured strain responses and analytically evaluated ones. An application of proposed method to aluminum plates equipped with sensors is developed to discuss the validity of the present method.

Key Words: impact force identification, aluminum plate, strain sensors, PZT sensors, strain gauges, finite element method

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