



K. Tachibana, H. Murayama, H. Igawa, T. Nakamura, J. Yokokawa

Measurement of Distributed Strain and Deformation and Load Identification Using Optical Fiber Strain Sensors

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We have implemented strain measurements along three sensing lines of long-length fiber Bragg grating (FBG) sensors in a wing model. The sensing system based on optical frequency domain reflectometry (OFDR) can measure strain at an arbitrary position along long-length FBG sensors with the high spatial resolution. We estimated displacement from the measured strain data by applying the beam theory. In addition, in order to investigate the applicability of the load identification method based on the inverse analysis, we applied it to a simply supported beam. In this experiment, the strain distribution along the beam was measured by the long-length FBG and the displacement distribution was also estimated from the measured strain data. Then the applied load distribution was identified by the inverse analysis using the strain or the displacement data.

Ключевые слова:

Содержание.

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