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An Identification Algorithm for the Absolute Axial Force of a Beam Member with Uncertain Boundary Conditions

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Aiming to the application for diagonal braces, tie-bars and short thick cables, this work proposes a new algorithm to identify the absolute axial force of a two-dimensional Euler-Bernoulli beam member. Bending stiffness effects are taken into account. On the basis of the dynamic measurements from at least five sensors, the proposed method is capable of estimating the absolute axial force as well as the in-plane translational and rotational stiffnesses at both beam ends. Given some specific end constraints like a hinged or fixed end, the required number of sensors can be reduced with a trade-off value. The effective vibration length is able to be determined accurately regarding various boundary conditions. A lab experiment is then conducted to confirm the feasibility and accuracy of the proposed method.

Ключевые слова:

Содержание.

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