



Damage Detection and Model Updating of Bridges Using Vibration Measurements

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Message from the Guest Editor

Damage detection is one of the main issues that bridge structural health monitoring (SHM) is concerned with. Another important issue is the need for model updating. The location and size of damage can be inferred by monitoring the reduction in stiffness properties of elements or substructures constituting the finite element model of the structure.

A modal-based model updating methodology was recently developed that combines available mode-shape expansion techniques with updating capabilities for predicting both the location and size of errors in the pretest finite element model of a structure. Other model updating methodologies based on various mode-shape expansions can be found in several research efforts. Applications of these methodologies were focused on structural damage detection and structural health monitoring. These techniques use the modeshape components as unknowns to be determined by the data, and have the advantage of avoiding the problem of identifying the correspondence between model and measured modes. Moreover, the computation of modal frequencies and modeshapes of the finite element model is avoided.





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