

**Validation of Natural Frequency Identification Method for
Individual Bridges and Viaducts, Excluding the Effects of Adjacent Structures**

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The natural frequency of railway bridges and viaduct groups is used as an integrity assessment index for substructures. However, this may include the effects of vibrations of adjacent structures, and there is a possibility that the vibration characteristics cannot always be evaluated clearly. From this reason, the authors theoretically derived a method for identifying the natural frequency of individual bridges and viaducts, using the natural frequency and natural mode of the entire structure evaluated by microtremor observation. In this paper, we verified the applicability of the proposed method to railway bridges and viaducts by conducting a 3D dynamic analysis based on real structures and measurements. The result showed that the natural frequency of the substructure could be identified with an error of about 10%. Therefore, by identifying the natural frequency of the substructure using the proposed method, it is possible to improve the integrity assessment of structures after an earthquake.