

Special Issue on “Challenge on bridge health monitoring utilizing vehicle-induced vibrations”

Preface

Large portions of bridges located on municipalities are short span bridges, but have not been maintained properly because of budget restrictions of local governments. In Japan, for example, more than 85 per cent of bridges are classified as the short span bridge with span length between 15m and 50m. Developing a rapid and cost-effective tool for bridge health monitoring (BHM) focusing on short span bridges, therefore, is an important technical issue. How to excite short span bridges is another challenge for the vibration-based BHM because short span bridges are insensitive or sometimes impassive to external dynamic sources such as wind loads, ground vibrations, etc. Of course, the normal traffic excitations are important dynamic sources, but a cautious approach is required to use traffic-induced vibrations of short span bridges because the traffic-induced vibration is a kind of non-stationary process. Despite of the non-stationary property of traffic-induced vibrations of bridges, the traffic excitation is an attractive dynamic source for the vibration-based health monitoring of short span bridges if the non-stationary feature attributable to the moving vehicle is appropriately handled.

This special issue tries to be a forum for scientists and engineers from academia and industry to present their state-of-the-art research results on utilizing vehicle-induced vibrations especially focusing on health monitoring of short span bridges: challenging approaches such as drive-by inspection, modal parameter identification from vehicle responses, effects of vehicle dynamics on condition screening of bridge structures, utilizing traffic-induced ambient vibration, etc.

High-quality contributions are solicited. Contributed papers must be the original work of the authors and should not have been published or under consideration by other journals.

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