



Automated Dynamic Displacement Estimation using Accelerometer for a Railway Bridge

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ABSTRACT

Dynamic displacements of railroad bridges during operation are critical to assess the safety of the bridge. Nevertheless, measuring displacement is a difficult and expensive task because of the need of a static reference. Some methods have been developed to estimate the dynamic displacement from measured accelerations, which are easier to obtain. However, these methods do not consider the non-linear nature of the dynamic system bridge-railroad. This presentation shows a new type of adaptive filter that updates constantly to the time-varying dynamic properties of the system. This filter achieves better results in these type of systems demonstrated by numerical simulations and lab experiments.

KEYWORDS: *Reference-free displacement, FIR filter, LTV system*