



Combination of digital signal processing methods towards an improved analysis algorithm for structural health monitoring.

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Abstract

In Structural Health Monitoring (SHM) is of great importance to reveal valuable information from the recorded SHM data that could be used to predict or indicate structural fault or damage in a building. In this work a combination of digital signal processing methods, namely FFT along with Wavelet Transform is applied, together with a proposed algorithm to study frequency dispersion, in order to depict non-linear characteristics of SHM data collected in two university buildings under natural or anthropogenic excitation. The selected buildings are of great importance from civil protection point of view, as there are the premises of a public higher education institute, undergoing high use, stress, visit from academic staff and students. The SHM data are collected from two neighboring buildings that have different age (4 and 18 years old respectively). Proposed digital signal processing methods are applied to the data, presenting a comparison of the structural behavior of both buildings in response to seismic activity, weather conditions and man-made activity.

Acknowledgments

This work was supported in part by the Archimedes III Program of the Ministry of Education of Greece, through the Operational Program "Educational and Lifelong Learning", in the framework of the project entitled «Interdisciplinary Multi-Scale Research of Earthquake Physics and Seismotectonics at the front of the Hellenic Arc (IMPACT-ARC) » and is co-financed by the European Union (European Social Fund) and Greek National Fund.