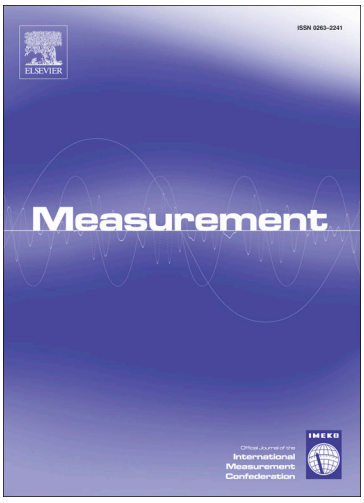

The UNISA Folded Pendulum: a very versatile class of low frequency high sensitive sensors

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The UNISA Folded Pendulum: a very versatile class of low frequency high sensitive sensors

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Abstract

An effective evaluation of the static and dynamic structural status of historical monuments for health evaluation and long term preservation requires the analysis of their low frequency dynamic behavior ($< 1\,Hz$). The UNISA folded pendulum class of sensors [1], based on the Watt's linkage, developed at the University of Salerno and already successfully applied to the monitoring of large infrastructures and buildings, including historical monuments, can provide this information with the accuracy required for an effective tuning of numerical simulation models. In fact, the low frequency region, curiously yet generally unexplored, contains a large quantity of information very useful for understanding and anticipating structural dynamical changes of the infrastructures that will occur and manifest at higher frequencies also after long periods of time, enabling to schedule well in advance all the interventions necessary to prevent structural damages, and reducing, at the same time, the risks for the population. In this paper, after a description of the mechanical architecture, characteristics and performances of this class of sensors, the attention is focused on UNISA folded pendulum implementations in connection with applications to large infrastruc-

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