G. Karaiskos, G. Tondreau, E. Figueiredo, C. Farrar, A. Deraemaeker

Application of Modal Filters for Damage Detection in the Presence of Non-Linearities

Дрезден, Германия, 2012 год

8 стр; формат: 23,5 x 16 см; библиографический список: 13 единиц

The aim of the paper is to study the possibility of implementing modal filtering techniques for damage detection in the presence of non-linearities in the recorded signals. Initially designed for linear damage detection the method is based on the linear combination of the sensors responses, a transformation to the frequency domain, and the computation of peak indicators which are used subsequently in an outlier analysis process. The efficiency of the method to detect both linear and non- linear damage scenarios is assessed using data recorded on the three-storey frame structure previously developed and studied at Los Alamos National Labs. Experimental data consists in four acceleration records. Besides the baseline condition, both linear (mass and stiffness changes) and non-linear (bumper device) changes have been considered. The results obtained using the modal filtering approach are compared to the ones obtained based on auto-regressive models, considering either the auto-regressive parameters or the time-domain residuals.

Ключевые слова:

Содержание