عنوان مقاله:

Damage detection of nonlinear hysteresis structures using signal processing

محل انتشار:

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خلاصه مقاله:

Damage in civil structures causes economic loss and loss of lives. Therefore, detection of damage in structures has always been a challenging issue for structural engineers. The aim of most of the health monitoring studies is to detect damage in early stages to avoid losses and repair costs. However, damage in moment frames can spread in entire structure. Moreover, studies on structures mainly rely on elastic assumption and consider damage as change in stiffness and studies on hysteresis behavior of the structures are rare in the literature. This study focuses on detection of damage in hysteresis moment frames. Time-frequency analysis is employed in conjunction with clustering to find damage extension in a moment frame under seismic excitations using frequency, amplitude and energy damage measures. A probabilistic approach is implemented to investigate capability of the procedure for different ground motion records using incremental dynamic analysis. Results show that frequency is not an appropriate feature to detect damage in nonlinear structures

کلمات کلیدی:

damage detection; empirical mode decomposition; Hilbert-Huang transform; clustering; nonlinear moment frame