

A damage detection strategy that identifies damage sensitive features associated with nonlinearities is implemented. Some nonlinearities are caused by discontinuities introduced into the data by certain types of damage. These discontinuities may also exist because of noise in the measured dynamic response data or because of random excitation applied to the system. To detect the discontinuities, the Holder Exponent, which is a measure of the degree to which a signal is differentiable, is extracted from the wavelet transform of the acceleration signal. By studying the Holder Exponent as a function of time, a statistical model is developed that classifies changes in the Holder Exponent that are associated with damage-induced discontinuities.