Sensitive and Noise-immune Vibration Discriminants for Instability Phenomena Detection Caused by Incipient Machinery Deterioration

Ph. Dr. Asja SOKOLOVA
Head of Machinery Vibrodiagnostics Department, Machinery Engineering Research Institute of Russian Academy of Science,

Ph. Dr. Felix BALITSKY
Leading Scientific Researcher, Moscow Scientific Industrial Association SPECTRUM.

ABSTRACT

The paper outlines a new type of vibration stochastic features to be applied for the revelation of machinery instability, caused by any kind of deterioration arisen, and for the fault detection long before a critical situation becomes irreversible. These characteristics are based on a specific vibration processing algorithms, using amplitude clipping technique, which make it possible to get rid of any uninformative noise appropriate to a normally operating machine, and to magnify the symptom sensitivity to outstanding amplitude glitches resulting from machinery instability, caused by incipient faults appearance.

Case histories and outcomes of study of vibration processing algorithms performance for detecting a critical situation at early stage are introduced.

Keywords: Vibration Amplitude Discriminants, Incipient Fault Detection.