

# Diagnosis of blade fault based on wavelet scalogram and blade pass vibration signature analysis

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## Abstract

Blade faults detection under field conditions is often conducted using vibration spectrum analysis. However, this method is inherently less effective for blade faults diagnosis and classification due to information loss during signal transformation. This paper intends to explore more detailed vibration analysis methods to address this shortfall. A hybrid method which comprised of Rotor Dynamic Wavelet Scalogram (RDWS) and Blade Pass Vibration Signature (BPVS) analysis were thus formulated. An experimental study was conducted to validate the viability of the proposed hybrid method. Experimental results showed that RDWS offers a new perspective to envisage the different mechanisms of blade faults in the rotor (i.e. creep and rotor eccentricity induced rubbings) and thus enable blade faults classification to be undertaken. Meanwhile, BPVS analysis provides a quantitative approach to diagnose blade faults (i.e. to estimate the quantity and position of faulty blades) and to determine its severity. The hybrid method provides a more comprehensive tool to diagnose different types of blade faults via both qualitative and quantitative approaches, which could be used to complement the shortfall of vibration spectrum analysis. © Krishtel Emaging Solutions Pvt. Ltd.