

An Improved Method for Gear Fault diagnosis

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Abstract : Envelope analysis is especially suitable for fault diagnosis inducing periodic shocks or amplitude modulations such as gears and bearings and has been applied widely for mechanical fault detections over the last few decades. However, a critical limitation of this technique is that it requires a prior knowledge on filtering band. Due to this drawback, detecting machine defects at the incipient stage when defect-characteristic components are weak in amplitude and without a distinctive spectral pattern poses a challenge to the conventional enveloping spectral analysis technique .In order to overcome this limitation, this work gives a new signal processing approach for gear faults diagnosis based on Hilbert Transform (HT) and Fast Fourier Transform (FFT). It is applied on real measurement signals collected from an experimental vibration system. The monitoring results indicate that the proposed method improves the gear faults diagnosis relatively to other common techniques.

Keywords : Vibration signal Analysis, gear Fault diagnosis, Hilbert Transform (HT), Envelope Analysis (EA), Fast Fourier Transform (FFT).