An Improved Method for Bearing Faults diagnosis

A.boudiaf, S.Ziani, Z.Mentouri, S.Taleb, D.Idiou

Abstract : Envelope analysis is especially suitable for faultdiagnosis inducing periodic shocks or amplitude modulations suchas gears and bearings and has been applied widely for mechanicalfault detections over the last few decades. However, a criticallimitation of this technique is that it requires a prior knowledge onfiltering band. Due to this drawback, detecting machine defects atthe incipient stage when defect-characteristic components areweak in amplitude and without a distinctive spectral pattern posesa challenge to the conventional enveloping spectral analysistechnique .In order to overcome this limitation, this work gives anew signal processing approach for bearing faults diagnosis basedon Hilbert Transform (HT) and Fast Fourier Transform (FFT). Itis applied on real measurement signals collected from anexperimental vibration system. The monitoring results indicatethat the proposed method improves the bearing faults diagnosisrelatively to other common techniques.

Keywords : Vibration analysis, bearing Fault diagnosis, Hilbert Transform (HT), Envelope Analysis (EA), Fast Fourier Transform (FFT)