**Helicopter** **transmission gearbox fault detection using an enhanced minimum entropy deconvolution adjusted method**

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**Abstract**

Blind deconvolution (BD) has a very successful application on impulse extracting from amplitude anomalies in vibration recordings for machinery health monitoring and diagnostics. In this paper, we investigate the effect of an exponential transformation on the improvement of the performance of the minimum entropy deconvolution adjusted (MEDA) method for the extracting of periodic fault impulse trains. Meanwhile, based on the exponential transformation, a new varimax norm is defined as criterion for BD. The modified MEDA method is compared to the classical minimum entropy deconvolution (MED), the MEDA, the optimal minimum entropy deconvolution adjusted (OMEDA) on both simulated and experimental signals. The experimental data is from the seeded fault test of H-60 helicopter transmission gearbox. The results show that the modified MEDA performs considerably better than other comparison methods in the extracting of periodic fault impulse trains especially for incipient faults.

**Keywords:** Fault detection; helicopter gearbox; blind deconvolution; minimum entropy deconvolution adjusted; exponential transformation

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