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Different Signal Processing Techniques for Predicting the Condition of Journal Bearings

ABSTRACT

• Journal bearings are used to support shafts.
• Vibration condition monitoring is to detect, diagnose and prognosis faults [1].
• Show the differences between the time domain, frequency domain and time-frequency analysis (STFT) of Journal bearing vibration signal.

Theoretical Background

• Time domain analysis gives the behaviour of the signal over time which allows predictions and regression models for the signal [2].
• Frequency-domain data are obtained by converting time-domain data using a mathematical technique referred to as Fast Fourier Transform (FFT) [2].

Results and Discussion

• The time domain and frequency domain of journal bearings at high speed, high radial load and low viscosity oil.

Conclusion

• Time-frequency not only presents the frequency content of the signal but also shows when it occurs.
• STFT Narrow window means good time resolution, poor frequency resolution.
• STFT wide window means good frequency resolution, poor time resolution.

References