

Time-frequency Analysis for Validating Prognostics Algorithms of Rolling Element Bearings

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Abstract—This study employed the time-frequency analysis to compute some of the XJTU-SY bearing datasets and aimed at the investigation of spectrogram of the raw data of the datasets. The methods of this study are divided into 4 parts: (1) spectrogram, (2) XJTU-SY bearing datasets, (3) equipment and, (4) 2D correlation. The results show the dominant reasons of malfunction of the machine occur in the duration of the 75th to 100th minutes. Both 2D correlation coefficients of the spectrograms of horizontal and vertical vibrations in the 100th and 123th minutes are larger than 0.8 because rotation of the roller entered a distinguished state of malfunction in the 100th minute. The inner damage is enhanced step by step. The interpretation of VEs and HEs is helpful to detect the fault diagnosis of the roller. The further studies will test more data, and add more algorithms for the accurate diagnosis.

Keyword—spectrogram, correlation coefficient, episode



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