

基于 WT-LMD 滚动轴承故障的判别及检测

摘 要

随着社会的进步，社会变得更加一体化和自动化。因此，旋转机械成为了社会进步的重要支撑，而旋转机械中的滚动轴承是特别容易发生故障的一部分。因此，必须能够及时检测滚动轴承是否有故障，以便旋转机械能够可靠，安全地运行。本文研究了采集的滚动轴承振动信号的信号分析，故障特征信息提取和初步检测。

由于滚动轴承的早期故障信号一般较弱，本文首先采用小波变换的方法来降低原始信号的噪声，然后利用局部均值分解（LMD）及时分析滚动轴承的振动信号。并通过频域提取故障特征频率，以检测和识别故障。利用美国西部储备大学轴承数据中心的数据进行仿真实验，并使用 MATLAB 软件，将所得结果与理论数据进行比较，得出最终结论，以验证本文所提方法的有效性。

关键词：滚动轴承, 故障检测, 小波变换, 局部均值分解

ABSTRACT

As society advances, it becomes more integrated and automated. Therefore, the use of rotating machinery is more and more extensive, rolling bearing is a part of the rotating machinery, but rolling bearing is also one of the parts particularly prone to failure. Therefore, it is necessary to be able to timely detect whether there is a fault in the rolling bearing, so that the rotating machinery can operate reliably and safely. In this design, I analyzed the signal of the bearing and explored the information extraction and other content.

In this design, this heat considers that in the early days, the fault signal is often weaker, so the transformation method is first used to reduce the presence of noise, and then according to the LMD method, To parse. The characteristic frequency of the response was extracted to identify the fault, and then the data was simulated to carry out the experimental work and the results were compared with the theoretical data by using MATLAB software, and the final conclusion was drawn to verify the effectiveness of the method proposed in this paper.

Keywords : Rolling bearing, wavelet transform, local mean decomposition, fault detection

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