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基于EMD多尺度特征熵的水轮机尾水管涡带信息提取

Dynamic characteristic extraction of the draft tube vortex based on EMD multi-scale feature entropy

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中文关键词: [信号处理](#) [特征识别](#) [动态](#) [熵](#) [水轮机](#)

英文关键词: [The key of hydroturbine fault diagnosis is to extract fault feature from monitoring signal. According to signal feature extraction and index energy was used to extract the dynamic characteristic of d](#) [the combination method of empirical mode decomposition](#)

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作者	单位
薛延刚	1. 西安理工大学水利水电学院, 西安 710048
罗兴铸	1. 西安理工大学水利水电学院, 西安 710048
王 瀚	1. 西安理工大学水利水电学院, 西安 710048; 2. 中国水电顾问集团西北勘测设计研究院, 西安 710076

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中文摘要:

水机组故障诊断的关键是从状态信号中提取故障特征,因此采用经验模态分解和指标能量相结合的方法,进行水轮机尾水管动态特征信息提取。首先,对信号进行经验模态分解,然后,根据得到的本征模式分量函数计算指标能量,最后,建立基于指标能量的多尺度特征熵,并以此熵值作为故障模式识别的特征向量。以原型水轮机尾水管压力脉动信号为例,进行了应用检验。结果表明,该方法准确性高,并具有良好的水轮机特征向量提取能力,适合分析复杂而特殊的水轮机动态特征信息。

英文摘要:

The key of hydroturbine fault diagnosis is to extract fault feature from monitoring signal. According to signal feature extraction, the combination method of empirical mode decomposition and index energy was used to extract the dynamic characteristic of draft tube. First, the signal was processed by EMD. Then, the index energy of IMF components were computed. Finally, based on the index energy, the multi-scale feature entropy as the characteristic vector of fault pattern recognition was established. The application of this theory was tested with an example of dynamic signal of prototype hydroturbine in non-optimal operating condition. The results showed that the developed method was more convenient and effective in extracting true characteristic parameters of hydroturbine. In addition, this method was appropriate for the analysis of complex and particular dynamic characteristics of hydroturbine.

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