

反应堆工程

基于盲源分离算法的压水堆松动件信号提取方法

曾复¹; 方力先²

1.杭州电子科技大学 机械工程学院, 浙江 杭州310018 2.杭州电子科技大学 自动化学院, 浙江

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摘要 压水堆一回路松动件状态监测系统的关键环节在于如何从复杂背景噪声中提取松动件冲击信号。利用基于最大信噪比的盲源分离算法, 将压水堆背景噪声和松动件冲击信号从观测到的混合信号中分离, 并利用相似系数对该算法的分离效果进行了评估。根据该算法, 当分离信号之间关系均独立时, 信噪比函数取得最大值。研究结果表明, 该算法可高效、准确地实现压水堆一回路松动件冲击信号和背景噪声信号的分离。

关键词 [压水堆一回路](#) [松动件](#) [最大信噪比](#) [盲源分离算法](#)

分类号

Approach to Extracting Loose Parts Impact Signal From Pressurized Water Reactor Based on Blind Source Separation Algorithm

ZENG Fu¹; FANG Li-xian²

1. School of Mechanical Engineering, Hangzhou Dianzi University, Hangzhou 310018, China; 2. School of Automation, Hangzhou Dianzi University, Hangzhou 310018, China

Abstract The key problem of the loose parts monitoring system for primary loop of pressurized water reactor is how to extract loose parts impact signal from complex background noise. A blind source separation algorithm based on maximum signal to noise ratio was used to extract loose parts impact signal and background noise of power water reactor from complex mixed-signal, and an evaluate method using similarity coefficients was used to evaluate the separation effect of the algorithm. The maximum value of signal to noise ratio function was obtained according to the algorithm when separated signals were independent. The research results show that loose parts impact signal and background noise from primary loop of pressurized water reactor can be separated efficiently and accurately with the algorithm.

Key words [primary loop of pressurized water reactor](#) [loose parts](#) [maximum signal to noise ratio](#) [blind source separation algorithm](#)

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