

反应堆工程

# 基于自适应AR模型的核电站松动件报警方法

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**摘要** 为能快速准确地检测到核电站一回路零部件的松动或脱落, 提出1种基于自适应AR (auto-regressive) 模型的松动件报警方法。该方法利用自适应AR模型跟踪一回路中背景噪声的变化, 先对信号进行白化处理, 再计算白化后信号的短时均方根 (RMS), 设置RMS动态阈值实现报警。采用秦山核电站一号机组背景噪声和松动件碰撞信号叠加进行了仿真试验, 结果表明, 该方法能够在低信噪比和噪声复杂变化的条件下快速检测出松动件碰撞信号。

**关键词** [自适应AR模型](#) [松动件](#) [报警](#)

分类号

## Alarming Method of Loose Parts in Nuclear Power Plant Based on Adaptive Auto-regressive Model

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**Abstract** In order to rapidly and accurately detect loose parts in the nuclear power plant, an alarming method for detecting the loose parts based on adaptive auto-regressive (AR) model was presented. Use of adaptive AR model tracks the change of background noise and then whitens the signal, thereby enhancing the SNR (signal to noise ratio), and then calculating the RMS of the whitened signal and according dynamic threshold to alarm. Tests were taken by the use of impact signal and noise of Qinshan Nuclear Power Plant. The test results show that the impact signal can be fast detected by using the method when the SNR is low and the noise changes over time.

**Key words** [adaptive](#) [AR](#) [model](#) [loose](#) [parts](#) [alarm](#)

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