

过程系统工程

## 一种基于结构优化SRAMS的传感器故障诊断方法

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摘要

针对基于具有最大敏感性结构化残差的传感器故障检测与诊断方法 (SRAMS) 在设计影响矩阵时只考虑故障编码的可分离性, 而没有考虑故障诊断的快速性和灵敏性的缺点, 给出了故障敏感度和故障诊断灵敏度等指标, 并提出了两种影响矩阵的优化设计算法。将本文方法应用于催化裂化过程传感器故障检测与诊断, 结果验证了故障诊断效果优于原有的SRAMS。

关键词

[传感器故障诊断](#) [结构化残差方法](#) [影响矩阵设计](#)

分类号

## Sensor fault diagnosis approach based on structure optimized SRAMS

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### Abstract

Optimal design of the incidence matrix for structured residual approach with maximized sensitivity (SRAMS) is discussed in this paper, in order to overcome the shortcoming of SRAMS that ignores the speed and sensitivity of fault diagnosis while considering the isolability of fault codes in the incidence matrix design. A set of optimal design indices including fault sensitivity and fault diagnosis sensitivity were defined, based on which two design algorithms were developed. The proposed approach was tested in the sensor fault detection and diagnosis of a fluidized catalytic cracking unit, and simulation results showed that the diagnosis performance was better than original SRAMS.

### Key words

[sensor fault diagnosis](#) [structured residual approach](#) [incidence matrix design](#)

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