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过程系统工程

节点与测量数据组合检测的数据协调及应用

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摘要

提出一种新型的节点与测量数据组合检测的稳态数据协调方法。该方法通过节点检测法和测量检测法共同检测可能存在显著误差的可疑节点，以及与可疑节点相连的最可疑测量变量，并通过调整量检测法融合领域专家的先验知识判断最可疑测量变量是否存在显著误差，最终实现稳态数据协调和显著误差同步检测。该组合方法融合测量检测和节点检测方法的各自优点且克服各自的缺点。仿真研究与实际应用表明，该组合方法对有多个显著误差的系统也能给出准确的显著误差检测结果，且优于迭代测量检测方法。

关键词

数据协调 显著误差检测 节点检测 测量数据检测

分类号

Data reconciliation method containing nodal and measurement test and its application

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Abstract

A novel combined method based upon nodal test and measurement test (NT-MT) was proposed for gross error detection and steady-state data reconciliation.In NT-MT, nodal test and measurement test were used together to find the suspicious nodes with gross error and to further find the most suspicious measurement variable connected to one of the found suspicious nodes.Then, adjustment test, which was able to consider the known knowledge obtained by expert, was introduced to determine whether the most suspicious measurement variable had gross error or not.This method took advantage of both nodal test and measurement test and overcame their disadvantages.The results of a simulation and an industrial application showed that the proposed method could get accurate results for the system with more than one gross error and was superior to iteration measurement test (IMT).

Key words

data reconciliation gross error detection nodal test measurement test

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