

国家重点基础研究项目

基于经验模态分解的电能质量扰动信号定位方法

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摘要:

提出了一种基于经验模态分解(empirical mode decomposition, EMD)的方法来对电能质量扰动信号进行定位。在EMD方法分解过程中,异常数据会在其第1个固有模态分量中引起局部高频突变信号,此高频突变信号具有幅值相对于无扰动时明显增大的特点。利用此特点,对含有电能质量扰动的电网电压进行EMD分解后得到的第1个固有模态分量求取一阶导数,然后对一阶导数进行阈值处理来确定扰动发生及终止的时刻。仿真结果表明,此方法对多种电能质量扰动信号信号有较好的定位效果。

关键词:

A Method to Locate Power Quality Disturbing Signal Based on Empirical Mode Decomposition

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Abstract:

An empirical mode decomposition (EMD) based method to locate power quality disturbing signal is proposed. During the decomposition by EMD, abnormal data will cause local high-frequency abrupt signal in its first intrinsic mode function (IMF) component, and the amplitude of the abrupt signal is evidently higher than that of normal signals. Utilizing this character, at first the EMD is applied to power network voltage containing power quality disturbance; then the obtained first IMF component is derived to get its first-order derivative; and then the first-order derivative is dealt with by adaptive threshold pulse extraction method to determine the position where the disturbance happened and the moments when the disturbance occurred and ended. Simulation results show that the proposed method can locate multi power quality disturbance signals.

Keywords:

收稿日期 2009-09-08 修回日期 2009-12-11 网络版发布日期 2010-05-13

DOI:

基金项目:

基金项目: 国家863高技术基金项目(2007AA04Z197); 国家自然科学基金资助项目(50767001); 广西自然科学基金资助项目(桂科自0640028); 广西高校百名中青年学科带头人资助计划(RC20060808002); 广西壮族自治区教育厅科技计划项目(200808MS150); 广西壮族自治区研究生教育创新计划资助项目(105930901001, 105930904068)。

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