

自动化

电能质量监测网录波数据压缩方法

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摘要:

为满足电能质量监测网存储与传输海量录波数据的需要,提出了提升格式的2维离散小波变换、多级树集合分裂(set partitioning in hierarchical tree, SPIHT)编码、算术编码相结合的数据压缩方法。为了有效降低数据的冗余度,该方法将采集的1维电能质量数据按整数倍周期排列为2维矩阵;采用提升格式的2维离散小波变换对数据进行压缩,然后对小波系数进行SPIHT编码,实现了对压缩性能的控制;最后采用算术编码进一步提高了压缩比。对几类常见的电能质量扰动数据进行了压缩实验,证明该方法具有较好的压缩性能。在不同压缩码率下对ATP-EMTP仿真模型得到的扰动数据进行了压缩实验,验证了该方法能通过控制压缩码率实现对压缩性能的控制。

关键词:

Method for Compressing Recorded Data From Power Quality Monitoring Network

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Abstract:

To meet the requirement of storing and transmitting massive recorded data from power quality monitoring network, a data compression method, which integrates two-dimension discrete wavelet transform (DWT) in lifting format and set partitioning in hierarchical tree (SPIHT) coding with arithmetic coding, is proposed. To reduce the redundancy in data effectively, the proposed method arranges the acquired one dimension periodical power quality data as two-dimensional matrix according to the integral multiples of period; then by means of two-dimension DWT in lifting format the acquired data is compressed, and then the SPIHT coding is applied to wavelet coefficients to implement the control of compression performance; finally, the compression ratio is further increased. The compression experiments of several kinds of frequent power quality disturbance data are performed and experimental results show that the proposed compression method possesses better compression performance. Under different compression bit-rates the compression experiments of the disturbance data from ATP-EMTP simulation model are carried out to validate that the proposed method can control data compression performance through controlling compression bit-rate.

Keywords:

收稿日期 2009-06-29 修回日期 2009-08-24 网络版发布日期 2010-04-14

DOI:

基金项目:

国家自然科学基金项目

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扩展功能

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