

电机电工

基于瞬时功率变换的介损监测数字化算法

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摘要

在目前电气设备介质损耗因数的数字化算法中, 普遍存在着必须严格满足同步采样条件、计算分辨率低等局限性。为此, 基于瞬时功率变换, 提出一种提高介质损耗因数监测准确度的数字化新算法, 并给出算法的理论基础。该算法无需同步采样, 可以跟踪电网频率并实现电阻性电流和电容性电流的分解。仿真结果表明, 该算法受采样数据长度、频率跟踪误差的影响较小, 在非同步采样的情况下具有良好的应用特性, 能够较好地解决实际信号量测中存在的非同步采样问题。

关键词 [介质损耗因数](#) [在线监测](#) [数字化算法](#) [瞬时功率变换](#)

分类号 [TM726](#); [TM835](#)

Development of a Digital Algorithm Based on Instantaneous Power Transform for On-line Monitoring of the Dielectric Loss Factor

Abstract

Among the digital algorithms presently available for on-line monitoring of the dielectric loss factor of power apparatus, there are unavoidable limitations that most of them must meet strictly the synchronous sampling criterion, simultaneously with a low calculating resolution. Based on instantaneous power transform, this paper presents a new digital algorithm to improve monitoring accuracy of the dielectric loss factor, and theoretical basis of the algorithm is also deduced. The algorithm can accurately track the power frequency and decompose the current signals orthogonally into resistive and capacitive components, without recurring to synchronous sampling. Simulation results show that, with very little influence from the sampled data length and frequency tracking error, the proposed algorithm renders good application performance when the sampled data length is not exactly an integer fold of a power cycle, which demonstrates the algorithm can effectively solve the issues incurred from asynchronous sampling.

Key words [dielectric loss factor](#) [on-line monitor](#) [digital algorithms](#) [instantaneous power transform](#)

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