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电力系统

降阶快速傅里叶变换算法在电力系统谐波分析中的应用

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摘要：

在电力系统谐波分析中，国际IEC关于谐波测量的最新标准推荐算法是标准快速傅里叶变换(fast Fourier transform，FFT)，并要求对于50 Hz系统必须连续采样10周期。为了得到良好的精度，FFT算法要求时域采样点数N足够大，但N越大计算量也越大。利用FFT降阶运算减少了计算，并解决了如果在10周期内采样点数不是2的幂无法用FFT运算的问题。另外失步时对于多周期多点FFT，用三角窗比用Hanning窗精度高，最后运用算例进行了Matlab仿真验证。

关键词：

Application of Order-Reducing Fourier Transform Algorithm in Power System Harmonics Analysis

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Abstract:

In power system harmonic analysis, the up-to-date algorithm for harmonic measurement, which is recommended by IEC, is the standard fast Fourier transform (FFT) and it is specified that the continuous sampling of the system with frequency of 50 Hz should be performed during ten periods. To obtain satisfied accuracy, FFT algorithm demands enough sampling points, however the more the amount of sampling points, the heavier the calculation burden. Utilizing order-reduction operation of FFT, the calculation amount is reduced, and the problem that the FFT operation cannot be utilized while the number of sampling points during ten periods is not the power of 2 is solved, by the way, during asynchronous sampling including the sampling of interharmonics, the sampling precision obtained by triangle window is better than that obtained by Hanning window. Finally, the effectiveness of the proposed method is verified by case simulation based on Matlab.

Keywords:

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