Harmonic Estimation Base on Center Frequency Shift Algorithm

Y Xu, Y Liu*, Z Li, Z Li and Q. Wang
College of Electrical Engineering and New Energy, Hubei Key Laboratory of Cascaded Hydropower Stations Operation and Control, China Three Gorges University, Yichang 443002, Hubei Province, China
*Corresponding author, E-mail: 7146201@qq.com
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Abstract: Harmonic pollution has been a key issue affecting the safe operation of power system. But the traditional harmonic analysis methods are easy to be affected by the environmental factors. In order to reduce the impact of these disturbances, a novel harmonic analysis method based on center frequency shift is presented. The harmonic spectral lines located at the half frequency points is need for frequency shift in time domain. However, to considering the harmonic spectral lines after frequency shift will not be just in the ideal position, an offset factor is proposed for modifying the position of the harmonic spectral lines. At the same time, the corresponding formulas to estimate the magnitude, phase angle and frequency are deduced. The simulation results show that the FFT harmonic parameter estimation algorithm based on center frequency shift is effective. The parameters of harmonic signals can be accurately estimated by the algorithm. And the interference factors can also be suppressed.

Keywords: Harmonic analysis; Fast Fourier transformation; Center frequency shift; Offset factor; Parameter estimation