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The combination of newton-raphson method and curve-fitting method for PWM-based inverter (Article)

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Abstract

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This paper presents the combination of two different methods to perform the waveform analysis for PWM-operated inverter. The two techniques are Newton-Raphson method and Curve-Fitting as a PWM concept to operate PWM-based inverter, the proper solutions of switching angles can valuate the initial values by using the Newton-Raphson method with the wide-step calculation of modulation indices. The solutions are then compared using a curve in order to study the behavior. Then, the Curve-Fitting method is used to estimate the missing solutions between any points of wide-step calculation. This combination method can estimate the probable solutions that cannot be solved by Newton-Raphson method in a wide-ranging of the modulation index and reduce the calculation time. PWM-based inverter, which is obtained the switching angles by Newton-Raphson method and the combination of two different methods, is verified by the simulation results showing faster performance with improved Total Harmonic Distortion (THD) than both methods alone when compared the same values of switching angles. © 2017 Institute of Advanced Engineering and Science. All rights reserved.

Author keywords

Curve-fitting Inverter Newton-raphson SHEPWM

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