

New Concept for Real Time Selective Harmonics Elimination Based on Lagrange Interpolation Polynomials

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Abstract : A variety of methods for selective harmonics elimination pulse width modulation have been developed, the most frequently used for real-time implementation based on look-up tables method. To address real-time requirements based in modified carrier signal is proposed in the presented work, with a general formulation to real-time harmonics control/elimination in switched inverters. Firstly, the proposed method has been demonstrated for a single value of the modulation index. However, in reality, this parameter is variable as a consequence of the voltage (amplitude) variability. In this context, a simple interpolation method for calculating the modified sine carrier signal is proposed. The method allows a continuous adjustment in both amplitude and frequency of the fundamental. To assess the performance of the proposed method, software simulations and hardware experiments have been carried out in the case of a single-phase inverter. Obtained results are very satisfactory.

Keywords : harmonic elimination, Particle Swarm Optimisation (PSO), polynomial interpolation, pulse width modulation, real-time harmonics control, voltage inverter

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