

SELECTIVE HARMONIC ELIMINATION IN MULTILEVEL CONVERTER BY USING BIO- INSPIRED INTELLIGENT ALGORITHMS

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ABSTRACT

Multilevel inverters are powerful electronic devices that are used for the conversion of DC input voltage into AC output voltage and mostly used in medium and high voltage operations. In these operations pulse width modulation (PWM) frequency distorted because of electromagnetic interference (EMI) and switching losses caused by dv/dt stress. To achieve a pure sinusoidal waveform at output of multilevel converter is a primary purpose so that less number of harmonic content produce. Selective harmonic elimination PWM technique is used in cascaded multilevel inverter for the mitigation of lower harmonics by solving non-linear transcendental equations and maintains the required fundamental voltage. An objective function is derived from SHE problem to calculate switching angles. For the solution of objective function, optimization approach such as bio-inspired intelligent algorithms are used. In this thesis, Genetic Algorithm (GA), Particle Swarm Optimization (PSO) and Bee Algorithm (BA) are used to determine the optimum switching angles for cascaded multilevel inverters to get low total harmonic distortion in output voltage. These computed angles are analysed in MATLAB simulation model to authenticate the results. And there will be direct comparison among these algorithms.