

Non-Linear smooth PWM control of power electronic installation with two stator windings of induction motor

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Abstract

This publication presents the results of a study of two-inverter electric drive with two stator windings of an electric motor, regulated on the basis of modified algorithms of synchronous pulsewidth modulation (PWM), which provide a nonlinear relationship between the voltage on the motor windings and the frequency of the system (V/F) in the process of regulation. Therefore, such nonlinear V/F control dependences can provide effective operation of ac drives with some specific control regimes and loads. Thus, the modified algorithms of feedforward multi-zone PWM provide synchronization and symmetries of the base voltages for any control modes of operation of systems including modes with a fractional ratio between the switching frequency of inverters and fundamental frequency of system. Behavior of systems with some typical linear and non-linear V/F control modes is analyzed and simulated.

Keywords: voltage source inverter, induction motor drive, modulation strategy, voltage spectrum

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