A Modified Controller for Three-Level Three-Phase Voltage Source Inverter based on Laguerre Functions

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Abstract

The three-phase voltage source inverter has been widely used in a number of industries in the recent years. Although the control technique of the three-phase voltage source inverter has been growing toward maturity, research into obtaining a better steady-state performance is still a hotspot. In this paper, a modified controller is proposed to control the three-level, three-phase voltage source inverter with a resistive-inductive load. The controller uses Laguerre functions to modify the model predictive control in order to reduce the computation burden and obtain more precise results. Then the required reference voltage can be calculated by the modified model predictive control with the voltage detection of the load and the current compensation. The required reference voltage will be used to determine the switching sequences by space vector pulse width modulation. Extensive experiments demonstrate that the modified controller can help a three-level, three-phase voltage source inverter with resistive-inductive load to achieve low total harmonic and better steady-state performance.
References

controller with offset band, 2016 7th India International Conference on Power Electronics (IICPE), Patiala, pp. 1-6.


Index Terms

Computer Science

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Keywords

Three-level three-phase, voltage source inverter, Laguerre functions, model predictive control, space vector pulse width modulation.