

Model Predictive Control for Three-Phase Split-Source Inverter

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Abstract

This paper proposes a new topology of three-phase split-source inverter (SSI) with only one auxiliary power electronic switch inserted into the three-phase full-bridge inverter. Split-source inverter is a single stage topology, which combines the boosting stage with the DC/AC converter stage. The proposed three-phase SSI has fewer passive components than impedance source converters (like ZSI). Switching states of the conventional three-phase VSI can be used with the SSI to control the output voltage. An independent control for both DC link voltage and output AC voltage is achieved using model predictive control. The DC link voltage can be controlled via duty cycle obtained by a maximum power point tracker or by fixed duty cycle as used in this paper. Simulation results show that the proposed control achieves low THD of the AC output voltage (good performance) with both normal loading condition and sudden load change condition.