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COMPARATIVE ANALYSIS OF BOOSTED DC VOLTAGE SOURCE INVERTER AND Z-SOURCE INVERTER FOR STAND ALONE DC SOURCE

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Abstract

Standalone DC sources are vital parts of Solar Energy Conversion Systems. Regulation of DC output voltage with voltage boosting is traditionally obtained by Boosted DC Voltage Source Inverter (BDCVSI). Recently heavy stress is given on Z-Source topology in inverters (ZSI) because of its buck-boost capability and less power conversion stages. In this paper, the comparative analysis of BDCVSI and ZSI is performed. With the help of mathematical model of ZSI a simple and effective PWM technique is developed which incorporates desirable and controllable shoot-through condition. Subjecting both the circuit topologies to the same input and same load perturbations, their performances are compared on the basis of total harmonic distortion (THD) of output voltage and current, voltage and current stresses on switches of inverter and time required to reach the output quantities at steady state. The results are obtained by developing Simulink model incorporating all the datasheet parameters of the components.

Keywords : Boosting factor, Z-source inverter, VSI

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