

Spectral Analysis of Hybrid Capacitor-Clamp Cascade 13-Level Inverter

This paper presents a novel hybrid capacitor-clamp cascade 13-level inverter. The inverter is based on the series connection between two inverter modules with different dc bus voltage. It is the fact of a hybrid control scheme that higher voltage devices and faster devices operate in synergism. Subharmonic PWM method is employed in lower voltage module. In the case of three carrier dispositions, mathematic models of the modulation process are constructed. The rigorous analytic solution is derived, which facilitates the evaluation of spectra accurately. Spectral characteristics of output waveforms including all operation conditions were studied. The proposed inverter is also verified by simulation to confirm the feasibility of the proposed approach.

