

An Evaluation of Spectral Characteristics of Hybrid Flying-Capacitor-Half-Bridge 5-Level Inverter

In this paper, a novel flying-capacitor-half-bridge 5-level inverter is studied which is composed of a half-bridge capacitor-clamp inverter and a conventional half-bridge inverter connected to a common split-capacitor power supply. Analysis of a modulation technique for the inverter, which incorporates square-wave synthesis in conjunction with the PWM subharmonic method, is illustrated. According to the proposed control technique, new configuration permits faster devices and higher voltage devices operating together. In order to estimate spectra accurately, the mathematic models of the modulation process with three carrier dispositions will be built, at the same time rigorous analytic solution of spectra is derived from an extension of Bennet's method. We illustrate and sum up spectral feature of output waveform covering all operation conditions. In order to verify the proposed approach simulation validation is carried out.