World Academy of Science, Engineering and Technology
International Journal of Mathematical and Computational Sciences
Vol:14, No:12, 2020

Investigation of the Effects of Sampling Frequency on the THD of 3-Phase Inverters Using Space Vector Modulation

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Abstract : This paper presents the simulation results of the effects of sampling frequency on the total harmonic distortion (THD) of three-phase inverters using the space vector pulse width modulation (SVPWM) and space vector control (SVC) algorithms. The relationship between the variables was studied using curve fitting techniques, and it has been shown that, for 50 Hz inverters, there is an exponential relation between the sampling frequency and THD up to around 8500 Hz, beyond which the performance of the model becomes irregular, and there is an negative exponential relation between the sampling frequency and the marginal improvement to the THD. It has also been found that the performance of SVPWM is better than that of SVC with the same sampling frequency in most frequency range, including the range where the performance of the former is irregular.

Keywords : DSI, SVPWM, THD, DC-AC converter, sampling frequency, performance
Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development
Conference Location : Chicago, United States
Conference Dates : December 12-13, 2020