

Influence of the Inverter's Modulation Techniques on the Audible Noise of Electric Motors

The noise emissions of inverter-driven electric motors are highly influenced by additional electromagnetic noise generated by the current harmonics caused by the inverter's operation. The amplitude and the frequency of these harmonics depend on the modulation technique applied in the power electronic converter. Purpose of this presentation is to highlight the important role that the modulation technique plays in the noise generation in variable speed drives and analyze the different characteristics of the current harmonics as well as of the generated noise. A good understanding the available choices and their characteristics, advantages and limitations is necessary in order to optimize the acoustic design of the "motor-converter" system.

Ioannis Tsoumas was born in Athens, Greece, in November 1976. He received the Dipl.-Eng. and Dr.-Eng. degrees in electrical and computer engineering from the University of Patras, Greece, in 2000 and 2007 respectively.

He is currently with Siemens AG, Industry Sector, Drive Technologies Division, Large Drives, Nuremberg, Germany. His scientific interests include electric drive systems, power electronics, electrical machines and electric drives monitoring and fault diagnosis, as well as effects related to the interaction of the power electronic converters and the electrical machines.