Instytut Sterowania i Elektroniki Przemysłowej,
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ZEP – Zakład Elektroniki Przemysłowej

IEEE, Sekcja Polska,
Joint Industrial Electronics/Power Electronics Chapter (IES/PELS)
IEEE THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS,

Zapraszamy

na

Seminarium

„Recent trends in Multilevel topologies for drives - an alternate approach"

Prof. K. Gopakumar
Centre for Electronics Design and Technology-Indian Institute of Science, Bangalore,INDIA

Czas i miejsce:

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Organizatorzy:

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CHAPTER
POWER ELECTRONICS / INDUSTRIAL ELECTRONICS
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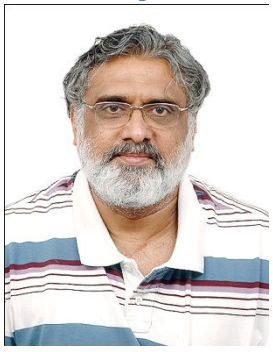
Abstract:

Multilevel converters started gaining attention after the introduction of the three-level NPC inverter by Nabae et al .The current topologies for multilevel converters that are most popular include the Neutral Point Clamped (NPC) converter, Flying Capacitor (FC) converter and the Series Connected H-Bridge (SCHB) converter. Although the 3-level NPC structure can be extended to higher number of levels, but is not much popular for levels more than three, because of higher losses and uneven distribution of losses in the outer and inner devices . On the other hand, the SCHB converter is well suited for high power applications because of the modular structure and shifting of the carrier frequency harmonics to the higher frequency side. But it requires large number of isolated dc sources, which are to be fed from isolation transformers; however this has been effectively used to improve the input power factor of this converter. The flying capacitor topology is limited to application
requiring high switching frequency (e.g. greater than 1200 Hz), since the capacitors need to maintain the voltage balance preferably in each switching period. Another interesting addition in inverter topology in recent times is the use of open-end winding induction motor drives. In order to produce the same air-gap flux in the machine, the magnitude of the dc sources required from both sides of the stator becomes half in an open-end motor. This automatically reduces the device ratings and dv/dt stress on the machine and the inverter. Many additional advantages of open-end induction motor drive like common mode elimination and capacitor voltage balancing has been reported recently. The use of asymmetric dc sources together with an open-end winding has produced a new space vector structure, called the 12-sided polygonal space vector. It acts as a harmonic filter to the voltage fed to the motor, since all the 6n±1 harmonics, n=odd, are absent throughout the modulation index in
cluding over-modulation region. Since the 12-sided polygon is closer to a circle than a hexagon, hence the linear modulation range is also extended. A detailed study of multilevel 12-sided polygonal voltage space vector structure generation for drives will be presented in this seminar.

Życiorys prelegenta:

Prof. K. Gopakumar



K. Gopakumar (M' 94 – SM'96) received his B.E., M.Sc.(Engg.) and Ph.D. degrees from Indian Institute of Science in 1980, 1984 and 1994 respectively. He was with the Indian Space Research Organization from 1984 to 1987. He is currently Associate Professor at CEDT, Indian Institute of Science, Bangalore, INDIA. He is a Fellow of Institution of Electrical and Telecommunication Engineers (IETE), India. Fellow of Indian national academy of engineers (INAE). He currently serves as an associate editor for IEEE Transactions on Industrial Electronics. His fields of interest are Power Converters, PWM Techniques and AC Drives