24th International Conference on Electrical Machines (ICEM'2020)
Gothenburg, Sweden, August 23rd-26th, 2020

Tutorial-1: Sunday, 23rd August 2020, 09:00-11:30 CET.

Click to joining this on-line tutorial

Development Technology of High Efficiency and High Power Density for High-Speed Motor

Name: **Masato ENOKIZONO**
Institution: (1) Vector Magnetic Characteristic Technical Laboratory (Vector-MAGTEC); (2) Nippon Bunri University; (3) Oita University. Japan.
E-mail: enoki@oita-u.ac.jp, http;//www.vector-magtec.jp/

Tutorial Abstract:
This paper describes the necessary technical issues for the development of high efficiency and high-speed motors with high power density. Especially, it aims at high efficiency by reducing core loss. Its key point is the necessary magnetic properties of materials for high speed motor iron core, its vector magnetic characteristics and magnetic characteristics analysis of the magnetic circuit design.

The analysis problems of electrical machines are usually inverse, as electrical machines have high power factor. The voltage is given, and the problem is to evaluate the current. On the other hand, in the case of the magnetic field measurements in the magnetic material, the magnetic field strength is given, and the problem is to evaluate the magnetic flux density. This constitutes a forward problem.

In order to properly analyze the core loss in electrical machines, it is necessary to consider the vector magnetic characteristics of iron parts by taking into account the phase shift between local magnetic field strength and flux density values.

Biography:

Prof. Masato Enokizono graduated from Kyushu University, School of Engineering and obtained Dr. Eng degree in 1978, Japan. He was appointed as researcher to the, Faculty of Engineering, Oita University in 1980. Then he was Professor of Faculty of Engineering, Oita university during 1985-2014.In 1986-1987 and 2006, he worked in PTB (Physikalisch-Technische Bundesanstalt) in Germany as researcher. He acted as a conference chairman of the 15th Biennial IEEE conference on Electromagnetic Field Computation (CEFC 2012 in Oita). He was president of Japanese Society of Applied Electromagnetics and Mechanics (JSAEM), 2009-2012. He was a special researcher of Technology Research Association of Magnetic Materials for High-Efficiency Motors (MagHEM) of Japanese government NEDO project, 2013-2017. In 2014 he founded Vector Magnetic Characteristic Technical Laboratory. He is a Research Professor of Nippon Bunri University and also an Emeritus Professor of Oita University.