



TECHNICAL MEETING OF IEEE IAS/PELS BENELUX CHAPTER ON MAGNETICS IN POWER ELECTRONICS

Eindhoven University of Technology is hosting the technical meeting of Industry Applications/Power Electronics Society joint chapter of the IEEE Benelux Section on magnetics in power electronics. IEEE members of these societies and interested members and non-members are cordially invited to attend this meeting.

Date: October 1, 2003
Time: 13h00
Place: Eindhoven University of Technology
Auditorium, lecture room 4
Den Dolech 2, Eindhoven
Route: http://www.tue.nl/tue-algemeen/index_route.htm

Preliminary programme:

- 13h00 – 13h20 Coffee
- 13h20 – 13h30 Introduction by Jan Melkebeek
- 13h30 – 13h55 Uwe Mandler (Philips Power Solutions): “Mains Insulated Switched Mode Transformers”
- 14h05 – 14h30 Alex Van den Bossche (U Gent): “Design of inductors with both DC and HF components”
- 14h40 – 15h05 Braham Ferreira (TU Delft): “Packaging magnetics in power electronics”
- 15h15 – 15h35 Coffee break
- 15h35 – 16h00 Johan Driesen and Kay Hameyer (KU Leuven): “Field Computations for Magnetic Components in Power Electronic Systems”
- 16h10 – 16h35 Johan Gyselink (U Liège) “Material modelling and iron losses calculation in finite element simulations of electromagnetic devices with power electronic supply”
- 16h45 – 17h10 Lieven Vandevelde (U Gent): “Finite element simulation of electromagnetic devices and power electronic supplies”
- 17h20 – Cocktails

If you wish to attend this event, please fill in the form below and send it back to the chapter secretary. Alternatively, you can send this information in an email to ieeip@esat.kuleuven.ac.be or to h.polinder@ewi.tudelft.nl, so we can estimate how many people will attend this event.

Other activities:

- November 13, 14, 2003: Joint Chapter meeting of the Benelux and German chapter at Philips Aachen.
- March 18,19, 2004: Second Young Researchers Symposium on Intelligent Energy Conversion in Delft.
- June 21-23, 2004: Conference on Electricity Storage Systems for Stationary Applications in Oostende.

Further information on the chapter is posted on our homepage: <http://www.esat.kuleuven.ac.be/~ieeip>

cut below

No. of persons that will attend the Technical Meeting of the IEEE
Benelux IAS/PELS chapter on 1/10/2003 in Eindhoven:

Name:

Address:

.....

e-mail:

send back to:

Henk Polinder
IEEE Benelux IAS/PELS chapter
EPP Delft University of Technology
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Program IEEE IAS & PELS Benelux chapter Magnetics in power electronics

13h30 Uwe Mandler (Philips P2 Power Solutions): “Mains Insulated Switched Mode Transformers”

Abstract: First an introduction into the safety standards, like EN60950 and EN60065 will be given. Clearance and creepage distances will be treated. The relation to peak and rms voltage across the insulation barrier is given. Several possible implementations of the safety standards for transformers, used in switched mode power supplies, will be shown. The electrical, mechanical and thermal pro's and con's of the transformer constructions will be discussed.

Uwe Mandler was born in 1959 and graduated as 'Diplom Physiker' at the university of Gießen (Germany). Currently he is working within Philips, as specialist for inductive components, in a group which develops switched mode power-supplies.

14h05 Alex Van den Bossche (U Gent): “Design of inductors with both DC and HF components”

Abstract: In power electronics, AC inductors are usually best realized with litz wire. For pure DC inductors, a design with full wires to decrease the DC resistance and improve the internal heat transfer. A single air gap design is proposed where the AC current is mainly conducted by litz wire, and the DC current is mainly conducted by full wires. Mixing both winding types reduces the losses of the total component, and thus reduces the total size requirement.

14h40 Braham Ferreira (TUDelft): “Packaging magnetics in power electronics”

Abstract: Magnetic components form an integral part of any energy processing system albeit a DC/DC converter powering a DVD player or a multi-kilowatt converter linking DC and AC networks. Furthermore, they consistently comprise of a significant portion of the systems volume. Since the need for magnetics is unavoidable, the interfacing of these components to their local environment, or their packaging becomes very important. The component packaging has a direct influence over the component volume and operating temperature. As the trend in power electronics continues to reduce systems volumes, the reduction in the volume of magnetic components offers significant advantages. A few examples are considered to illustrate this.

15h35 Johan Driesen and Kay Hameyer (KU Leuven): “Field Computations for Magnetic Components in Power Electronic Systems”

Abstract: The behaviour of passive components, whether discrete or parasitic, in electronic circuits is governed by the laws of electromagnetics. Unfortunately, the electromagnetic fields are described by non-linear equations, due to the complicated material characteristics hidden behind the coefficients in Maxwell's laws and the interaction with other physical fields such as temperature and motion or equations describing electric circuits and control laws. Also the time dimension - or reversely the frequency content - of the described phenomena gives rise to complications in the computation process. It is of importance that the computations that try to capture this behaviour are efficient to allow transient computations or optimisations. This lecture briefly outlines the state-of-the-art approaches to these problems based on finite element computation methods (FEM) and is illustrated with examples from applications involving power electronics.

16h10 Johan Gyselinck (U Liège): “Material modelling and iron losses calculation in finite element simulations of electromagnetic devices with power electronic supply”

This lecture gives an overview of existing methods for characterising the material in finite element models of electromagnetic devices, ranging from a pragmatic a-posteriori iron losses calculation using simple empirical formulas to the direct inclusion of complicated vector hysteresis models in the finite element calculation. This is particularized for devices with power electronic supply.

Johan Gyselinck graduated in Electrical and Mechanical Engineering at the Ghent University in 1991 and received the Ph.D. degree from the same university in March 2000. Since July 2000 he is a Postdoctoral Researcher and "Maître de Conférences" at the Department of Electrical Engineering, University of Liège. His research mainly concerns the finite element modelling of static and rotating electrical machines, and the development of dedicated numerical tools. He teaches the course "Conversion d'Energie Electrique".

16h45 Lieven Vandeveldde (Ugent): “Finite element simulation of electromagnetic devices and power electronic supplies”

Abstract: In this lecture the finite element simulation of electromagnetic devices in combination with power electronic supplies is discussed. In particular the coupling of finite element models with electrical circuits is dealt with. Some practical applications, e.g. a switched reluctance motor and its converter and a transformer-rectifier combination, are presented.

Lieven Vandeveldde graduated in Electrical and Mechanical Engineering at Ghent University in 1992 and received the Ph.D. degree from the same university in 1997. Since 1992 he is member of the Electrical Energy Laboratory (EELAB) of Ghent University, at present as Postdoctoral Fellow of the Fund for Scientific Research - Flanders (Belgium) (F.W.O. - Vlaanderen). His research interests mainly concern noise and vibrations of rotating electrical machines and transformers, magnetostriction and magnetic forces, and finite element analysis of electrical machines.