Organisational Information

Sign up at: www.ecpe.org/events

Registration Deadline:

14 September 2022

Participation Fee:

€ 660,– *	for industry
€ 490,– *	for universities/institutes
€ 165,– *	for students/PhD students

* plus VAT

- The regular participation fee includes dinner, lunches, coffee/soft drinks and digital presentations. The reduced (PhD) students fee includes all the above except for dinner (can be booked for an extra fee of € 50,-*)
- A printed version of the workshop handout is available on request (€ 50,-*).
- Upon receipt of registration confirmation via email you are signed-up for the event. The invoice will be sent via email.
- Three participants from each ECPE member company free of charge. Allocation in sequence of registration.
- 10% discount on university/institute fee for participants from ECPE competence centres.
- Further information (hotel list and maps) will be provided after registration and can be found on the ECPE web page.
- Cancellation policy: Full amount will be refunded in case of cancellation upon to 2 weeks prior to the event. After this date 50 % of the fee is non-refundable (replacement is possible).

02/09/22

Organisational Information

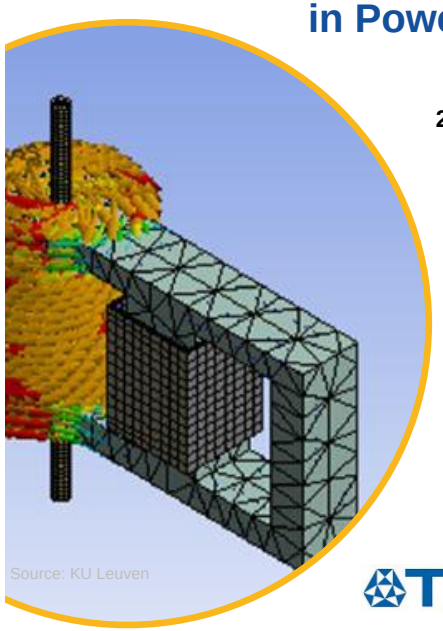
Organiser	ECPE e.V. 90443 Nuremberg, Germany www.ecpe.org
Technical Contact	Dr. Chris Gould
Technical Chair	Prof. Ziwei Ouyang, Technical University of Denmark Prof. W. Ger Hurley, National University of Ireland Dr. Stefan Weber, TDK Electronics
Organisation	Ingrid Bollens, ECPE e.V. +49 911 81 02 88 – 10 ingrid.bollens@ecpe.org
Venue	Hotel Mercure Centre Compans Boulevard Lascrosses, 8 Esp. Compans Caffarelli, 31000 Toulouse France

Source: Jour de nuit – Florian Cales – Convention Bureau Toulouse

European Center for Power Electronics e.V.

ECPE Workshop

Design, Technology, Simulation and Application Aspects of Magnetic Components in Power Electronics



Source: KU Leuven

22 - 23 September 2022
Toulouse
France

in cooperation with

TDK

Technical University of Denmark

NUI Galway OÉ Gaillimh College of Engineering and Informatics

ECPE Workshop

Design, Technology, Simulation and Application Aspects of Magnetic Components in Power Electronics

22 - 23 September 2022
Toulouse, France

The increased use of wide bandgap devices in power electronic converters enables higher switching frequencies, miniaturisation of passive components and reduced switching losses. This push towards higher energy densities has led to more pressure placed on the volume and thermal constraints of the magnetic components used for energy storage, isolation and filtering, requiring the development/selection of advanced materials and construction processes, as well as optimised design of the magnetic path, winding arrangements and cooling strategy.

Modelling and simulation techniques of electrical, mechanical and thermal parameters are now crucial to evaluate improved designs in advance of manufacture, especially for applications where a high level of integration is required.

This workshop aims to address these challenges by bringing together experts from industry and research, in order to present and discuss the wide range of topics at both component and application levels. The speakers will provide an update on the newest advances and, through discussions, jointly identify opportunities for further developments.

The workshop is aimed at a wide range of audience from beginners looking for an overview of the state-of-art of this challenging field, to experienced practitioners looking for the latest developments in materials and techniques of design, construction and modelling.

The workshop is chaired by:

Prof. Ziwei Ouyang, Technical University of Denmark (DK)

Prof. W. Ger Hurley, National University of Ireland (IE)

Dr. Stefan Weber, TDK Electronics (DE)

All presentations and discussions will be in English.

Programme

Thursday, 22 September 2022

09:30 Registration & Welcome Coffee

10:00 Welcome, Opening
Chris Gould, ECPE e.V. (DE)

Introduction & Overview of Challenges for Future Magnetic Miniaturisation and High-frequency Operation

10:15 Challenges, opportunities and trends for magnetics design
Ger Hurley, National University of Ireland (IE)

Development of Magnetic Materials

11:00 Magnetic core materials for power conversion: Overview of properties and applications
Maeve Duffy, National University of Ireland (IE)

11:30 Magnetic core material and shape developments for high power interleaved boost inductor devices inside DC/DC boost conversion circuits
Michael Freitag, Kemet – A Yageo company (DE)

12:00 Niobium nanocrystalline applications: Soft magnetic ribbon in power electronics
Teng Long, University of Cambridge & CBMM (UK&NL)

12:30 Lunch

Integration of Magnetic Components

13:45 Near 100% compensation of ripple current of a power electronic PWM converter for DC/DC or DC/AC conversion with an integrated magnetic device approach
Peter Zacharias, University of Kassel (DE)

14:15 Coupled inductors in two-phase DC-DC converters
Lukas Reißenweber, University of Applied Science Coburg (DE)

14:45 MagIC - Making Magnetic Components Disappear
Cian O'Mathuna, Tyndall National Institute (IE)

15:15 Coffee Break

15:45 High power density and efficiency magnetic components with high leakage inductance
Bernardo Cogo, IRT Saint Exupéry (FR)

16:15 Substrate-embedded 3D microinductors: Fabrication technologies and emerging applications
Hoà Thanh Lê, Lotus Microsystems (DK)

16:45 11kW 800V/400V resonant converter with PCB winding magnetics for battery charger applications
Qiang Li, CPES - Virginia Tech (USA)

17:15 End of 1st Day and optional lab tour at IRT / Laplace
Bus shuttle to be provided

20:00 Dinner at "Aux pieds sous la table",
8 Rue Arnaud Bernard 6, 31000 Toulouse

Programme

Friday, 23 September 2022

08:30 Start of 2nd Day

Applications & Special Topics

08:30 Planar matrix transformer for low-voltage high-current LLC converter in datacentre applications
Ziwei Ouyang, Technical University of Denmark (DK)

09:00 Coil design and shielding methods for inductive wireless power transfer applications
Jesús Acero, University of Zaragoza (ES)

09:30 Controllable magnetics for EV battery chargers
Wilmar Martinez, KU Leuven (BE)

Reliability and Optimisation of Magnetic Circuits and Devices

10:00 Loss measurement of magnetic components
Benedikt Kohlhepp, Friedrich-Alexander-Universität Erlangen-Nürnberg (DE)

10:30 Coffee Break

11:00 High dv/dt insulation testing for insulation systems of coil windings
Vivien Grau, RWTH Aachen University, (DE)

11:30 Aging performance of wire insulation under repetitive impulse voltage stress with high dv/dt
Albert Claudi, Univ. of Kassel and CRW-Engineering (DE)

12:00 Reduction of parasitic capacitance in medium-voltage inductors
Hongbo Zhao, Stig Munk-Nielsen, Aalborg University (DK)

12:30 Lunch

Design and Modelling of Magnetic Components

13:45 HF Transformers for resonant converters
Till Piepenbrock, Frank Schafmeister, Joachim Böcker, University of Paderborn, (DE)

14:15 Inductor design tool with finite element simulation in a few minutes
Thierry Meynard, Laplace University (FR)
Tim McRae, University of Southern Denmark (DK)

14:45 Magnetic core modelling for high performance EMI filters used in wide bandgap power electronics converters
Marcin Kacki, SMA Magnetics (PL)

15:15 Coffee Break

15:30 Concurrent design process for tightly coupled electric and magnetic circuits – SIMPLIS
Andrija Stupar, SIMPLIS Technologies (USA)

16:00 Data-driven core-loss modelling
Thomas Guillod, Dartmouth College, Thayer School of Engineering (USA)

16:30 Final Discussion

16:45 End of Workshop