Organisational Information

Sign up at: www.ecpe.org/events

Registration Deadline:

20 June 2024

Participation Fee:

€ 720,– *   for industry

€ 525,– *   for universities/institutes

€ 180,– *   for students/PhD student
(limited spaces; copy of students ID required)

* plus VAT

➢ The on site participation fee includes dinner, lunches, coffee/soft drinks and digital proceedings. The reduced (PhD) students fee includes all except for dinner (can be booked for an extra fee of € 50,-*)

➢ The online participation includes remote access via the meeting software Webex and digital proceedings.

➢ Digital proceedings will be provided by download link latest one day before start of the event. A printed handout is available on request.

➢ 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).

06/05/24

Organisational Information

Organiser	ECPE e.V. Ostendstrasse 181 90482 Nuremberg, Germany www.ecpe.org
Technical Chair	Prof. Francesco Iannuzzo, Aalborg University, Denmark Dr. Stefan Mollov, Infineon Technologies Austria Dr. Wolfgang Wondrak, Germany
Technical Contact	Dr. Chris Gould, ECPE e.V. chris.gould@ecpe.org
Organisation	Ingrid Bollens, ECPE e.V. +49 911 81 02 88 – 10 ingrid.bollens@ecpe.org
Venue	NH Hotel Villa de Bilbao Gran Vía 87 48011 Bilbao, Spain

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Source graph front page: ECPE e.V.

Hybrid Event

ECPE Workshop

Condition & Health Monitoring in Power Electronics

27 - 28 June 2024
Bilbao, Spain / hybrid

in cooperation with

ECPE Hybrid Workshop

Condition & Health Monitoring in Power Electronics

27 - 28 June 2024
Bilbao, Spain / hybrid

Condition and Health Monitoring (CHM) is an effective means of improving the availability of power electronic components, converters and systems, whilst also controlling the life-time cost considering maintenance and repair. Many solutions have been developed, but their adoption in industrial applications still requires significant development.

Advanced CHM techniques that open new possibilities for industrialisation will be presented and discussed. Their potential, limitations and implementation will be outlined and critically reviewed with the goal to benefit both industrial applications and research.

A significant part of the workshop is dedicated to CHM for semiconductor power devices and modules, including topics such as prognostics-based qualification for power electronics. Prognostic Health Management (PHM) necessitates technologies to predict the future failure rate of the products by employing deterministic remaining useful lifetime methods. This will also lead to significant sustainability improvements with cost and environmental benefits spanning the entire product lifecycle.

In-situ methods for estimation of junction temperature and use of Temperature Sensitive Electrical Parameters (TSEPS) will be reviewed. The CHM of other key materials and components, such as capacitors and substrate technologies will also be addressed.

This planned two-day Hybrid Workshop intends to incorporate all of the above issues using industrially motivated research and speakers from the automotive, industrial and renewable drives sectors, in order to provide a system level description of techniques and best practices.

The workshop is chaired by:

Prof. Francesco Iannuzzo, Aalborg University, Denmark

Dr. Stefan Mollov, Infineon Technologies Austria

Dr. Wolfgang Wondrak, Germany

All presentations and discussions will be in English.

Draft Programme

Thursday, 27 June 2024

09:00 Registration & Welcome Coffee / Webex started

09:30 Welcome, Opening and Introduction into the Topic
Technical Chairs, Chris Gould, ECPE

Introduction

10:00 Keynote: Development of CHM/PHM (TBC)
Stefan Mollov, Infineon Technologies Austria (AT)

CHM/PHM of Power Devices and Modules

10:30 In-situ Junction Temperature Measurement and Condition Monitoring – State of the art and new approaches
Marco Denk, University of Applied Science Coburg (DE)

11:00 A Case for Multi-Chip Temperature Data
Nick Baker, The University of Alabama (US)

11:30 Break

12:00 Challenges related to WBG Power Devices at High Frequencies
Bernado Cogo, IRT Saint Exupéry (FR)

12:30 Data-driven Health Monitoring of Power Modules Using Generated Data for Traction Inverters
Elena Blazhevska, Virtual Vehicle Research GmbH (AT)

13:00 Thick-film Thermocouples for Close-to-chip Temperature Measurements in Power Modules
Henry Barth, Fraunhofer IKTS (DE)

13:30 Lunch Break

CHM/PHM for Industrial Drives and Renewable Power

14:30 Sensorless Condition Monitoring by AI-based Analysis of Controller Value
Marc Hiller, Karlsruher Institute for Technology (DE)

15:00 CHM for Industrial Drives (TBC)
TBC

15:30 Condition Monitoring for Electronics in Renewable Energy Applications
Daniel Clemens, SMA (DE)

16:00 Break

16:30 CHM for Wind Energy (TBC)
TBC

17:00 TBC
TBC

17:30 End of 1st Day

20:30 Dinner -

Draft Programme

Friday, 28 June 2024

08:30 Webex started

CHM/PHM on System Level

09:00 Physics-Based Condition Monitoring: Training Surrogate Models with Thermo-Mechanical Finite Element Simulations for Degradation Analysis
Tobias Daniel Horn, Fraunhofer ENAS (DE)

09:30 Thermal Precision for Enhanced Semiconductor Health
Varaha Satya Bharath Kurukuru, Silicon Austria Labs (AT)

10:00 Towards Self-healing Converters – Capitalising on CHM Techniques
Stefan Mollov, Infineon Technologies Austria (AT)

10:30 Break

CHM for eMobility

11:00 Condition & Health Monitoring for Power Electronics Railway Systems: Needs, Opportunities and Challenges
Emmanuel Batista, Michel Piton, Alstom Group (FR)

11:30 Condition Monitoring of Automotive Power Modules
Evgeny Kusmenko, Infineon Technologies (DE)

12:00 From Auto-Grade to EV-Grade: New Concepts and Qualification Methods for Extended Mission Profiles
Denis Dutey, STMicroelectronics (FR)

12:30 TBC
TBC

13:00 Lunch Break

Reliable Useful Lifetime Modelling

14:00 CHM-Enhanced Reliable Useful Lifetime Modelling (TBC)
Johannes Jaeschke, Fraunhofer IZM (DE)

14:30 Remaining Useful Life Prediction in Condition & Health Monitoring: Case Studies and Challenges
Shuai Zhao, Aalborg University (DK)

15:00 Life-time modelling (TBC)
TBC, Infineon Technologies Austria (AT)

15:30 Open Discussion: Opportunities, Limits and Obstacles Related to CHM
All

16:30 End of Workshop