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| **­Press release** | 10.05.2022 |
| **Embargo 10 May 2022, 10 a.m.**Awards of the PCIM Europe Conference 2022 announced  | Vineeta ManglaniTel. +49 711 61946-297Vineeta.Manglani@mesago.com[pcim-europe.com](http://www.pcim-exhibition.com/) |

**New award concept of the PCIM Europe Conference: Three Best Paper Award winners, one Young Engineer Award winner as well as one Young Researcher Award winner were honored during the opening event in Nuremberg on 10 May 2022.**

The annual award ceremony at the PCIM Europe Conference has traditionally been honoring outstanding contributions and promoting young talents in the power electronics industry since 2008. This year, the award-winning submissions will be presented personally by the winners during the PCIM Europe Conference from 10.05.2022 to 12.05.2022.

Throughout the two-year break of the PCIM Europe Conference, the concept of the Awards has been developed. For the first time, three Best Paper Awards will be presented, one Young Engineer Award, as well as the new Young Researcher Award in addition.

The PCIM Europe advisory board, chaired by Prof. Dr. Leo Lorenz, ECPE, Germany, selected the five winners from over 300 submissions. The awards were given on the basis of topicality and relevance of the subject matter as well as the quality of the practice-related papers submitted.

The Best Paper Award recognizes the top three submissions overall. Engineers aged 30 or younger can also apply for the Young Engineer Award. For the first time this year, the Young Researcher Award honors an author from academia and research institutions aged 30 or younger. The winners of each award will receive prize money of 1,000 euros.

The winners of the three **PCIM Europe Best Paper Awards** are:

**Matthias Kasper, Infineon Technologies, Austria**

Next Generation GaN-Based Architectures: From 240W USB-C Adapters to 11kW EV On-Board Chargers with Ultra-High Power Density and Wide Output Voltage Range

**Mario Schweizer, ABB, Switzerland**

Frequency Control and Inertia Provision with UPS

**Nikolina Djekanovic, Power Electronics Laboratory, EPFL, Switzerland**

Design Optimization of a MW-level Medium Frequency Transformer

The winner of the **PCIM Europe Young Engineer Award** is:

**Fabian Nehr, SEMIKRON Elektronik, Germany**

Consequences of Temperature Imbalance for the Interpretation of Virtual Junction Temperature Provided by the VCE(T)-Method

The winner of the **PCIM Europe Young Researcher Award** is:

**Salvatore Race, ETH Zurich, Switzerland**

Towards Digital Twins for the Optimization of Power Electronic Switching Cells with Discrete SiC Power MOSFETs

**PCIM Europe 2022 Best Paper Abstracts:**

**Next Generation GaN-Based Architectures: From 240W USB-C Adapters to 11kW EV On-Board Chargers with Ultra-High Power Density and Wide Output Voltage Range**

Matthias Kasper, Jon Azurza Anderson, Gerald Deboy, Infineon Technologies, A; Michael Haider, Power Electronic Systems Laboratory, CH

The inherent advantages of GaN devices compared to their Silicon counterparts, i.e. absence of reverse recovery charge, lower output and gate charges, etc., enable the operation of power electronic systems based on GaN devices at considerably higher switching frequencies. This facilitates the design of systems with power densities far beyond the limits of state-of-the-art Si systems, which is demonstrated in this paper with two very different examples: a 240 W mobile charger with two USB-C output ports covering very wide output voltages of 5-48 V, and a three-phase 11 kW on-board charger with an output voltage range of 250-1000 V.

**Frequency Control and Inertia Provision with UPS**

Mario Schweizer, Nicola Notari, ABB, CH; Silvio Colombi, ABB Industrial Solutions, CH; Ivan Furlan, University of Applied Sciences and Arts of Southern Switzerland, CH

In several countries, grid operators have started to introduce novel reserve market products that are technology-open and allow power electronic converter interfaced assets, such as BESS or UPS systems, to provide ancillary services. In this paper, the provision of frequency control and virtual inertia with a double conversion UPS is demonstrated. A novel control algorithm is presented that emulates inertia accurately without calculation of the frequency derivative. The algorithm is tested in the laboratory on a 250 kW unit of ABBs recently launched modular UPS system MegaFlex.

**Design Optimization of a MW-level Medium Frequency Transformer**

Nikolina Djekanovic, Drazen Dujic, Power Electronics Laboratory, EPFL, CH

Nowadays, with the increased interest in applications dealing with high-power medium-voltage conversion, there is a strong need to master the design of medium-frequency transformers, which are one of the key components of modern DC transformers. The paper presents the design and development of a 1 MW, 5 kHz core-type transformer prototype, which combines oil-immersed windings, realized as hollow copper conductors with internal deionized water cooling, and nanocrystalline magnetic core material. The design is achieved with the help of a model-based optimization tool, built around elaborate analysis and modeling of medium-frequency transformer speciﬁc phenomenon concerning its electrical operation. Moreover, the paper discusses some technical challenges connected to the prototype realization.

**PCIM Europe 2022 Young Engineer Award Abstract:**

**Consequences of Temperature Imbalance for the Interpretation of Virtual Junction Temperature Provided by the VCE(T)-Method**

Fabian Nehr, Uwe Scheuermann, SEMIKRON Elektronik, D

The VCE(T)-method is the favored approach to determine the temperature of IGBTs by utilizing the almost linear temperature dependence of forward voltage drop at small constant collector current. The method provides a virtual temperature value reflecting an average of the lateral temperature distribution across the IGBT. The present study reveals that averaging is strongly affected, when the lateral temperature gradient is enlarged by reduced load pulse duration and imbalanced heating of paralleled chips. This should be taken into account for interpretation of the virtual temperature value, especially when device aging by power cycling is considered.

**PCIM Europe 2022 Young Researcher Award Abstract:**

**Towards Digital Twins for the Optimization of Power Electronic Switching Cells with Discrete SiC Power MOSFETs**

Salvatore Race, Ulrike Grossner, Ivana Kovacevic-Badstuebner, Michel Nagel, Thomas Ziemann, ETH Zurich, CH

Layout optimization of power electronic switching cells is highly important for the design of high-efficiency fast-switching power converters. The aim of this paper is to identify PCB layout design parameters leading to an improved layout design with respect to low switching losses and low electromagnetic interference. A digital twin of the switching cells containing discrete silicon carbide power devices was developed and verified by double-pulse measurements. The results identify and quantify the non-negligible influence of the layout parasitic capacitances on the optimization of switching losses. The observed modeling challenges point towards the need for more accurate EM modeling techniques for power electronics applications and for standardization of SiC power MOSFET Spice models.

Further information about the conference is available at [pcim-europe.com](http://www.pcim-europe.com/).

**About Mesago Messe Frankfurt**

Mesago, founded in 1982 and located in Stuttgart, specializes in exhibitions and conferences on various topics of technology. The company belongs to the Messe Frankfurt Group. Mesago operates internationally and is not tied to a specific venue. With 150 members of staff Mesago organizes events for the benefit of more than 3,300 exhibitors and over 110,000 trade visitors, conference delegates and speakers from all over the world. Numerous trade associations, publishing houses, scientific institutes and universities work with Mesago closely as advisers, co-organizers and partners. ([mesago.com](https://www.mesago.de/en/Mesago/home.htm))

**Background information on Messe Frankfurt**

The Messe Frankfurt Group is the world’s largest trade fair, congress and event organiser with its own exhibition grounds. The Group employs approximately 2,450 people at its headquarters in Frankfurt am Main and in 29 subsidiaries around the world. The company generated annual sales of approximately €257 million in 2020 after having recorded sales of €736 million the previous year. Even in difficult times caused by the coronavirus pandemic, we are globally networked with our industry sectors. We have close ties with our industry sectors and serve our customers’ business interests efficiently within the framework of our Fairs & Events, Locations and Services business fields. One of the Group’s key USPs is its closely knit global sales network, which extends throughout the world. Our comprehensive range of services – both onsite and online – ensures that customers worldwide enjoy consistently high quality and flexibility when planning, organising and running their events. We are expanding our digital expertise with new business models. The wide range of services includes renting exhibition grounds, trade fair construction and marketing, personnel and food services. Headquartered in Frankfurt am Main, the company is owned by the City of Frankfurt (60 percent) and the State of Hesse (40 percent).

For more information, please visit our website at: [www.messefrankfurt.com](http://www.messefrankfurt.com)