



PE:Region Newsletter - April 2019

UPCOMING EVENTS 2019



CPE-POWERENG 2019



13th IEEE International Conference on Compatibility, Power Electronics
and Power Engineering

23 -25 April 2019 at Alsion in Sønderborg, Denmark

[Programme and registration](#)

SDU Electrical Engineering and Centre for Industrial Electronics are proud to announce that 100 delegates and 8 exhibiting companies are taking part in this year's IEEE CPE-POWERENG 2019 held at Alsion in Sønderborg during the week after Easter. In total 107 papers have been submitted, involving more than 285 authors from more than 30 countries, and 87 are now finally accepted for publication for the conference.



We look very much forward to the event!

Danish-German PE:Region Seminar

Fachhochschule Kiel

Thursday 27 June 2019 at 11.30 - 15.00 in Kiel

Demonstrator Development for Intelligent Grid Integration,
High Speed Drives and Battery Charging

This summer's biannual PE:Region demonstrator workshop will take place at FhK in Kiel, where the status of the 3 project demonstrators will once again be presented and followed up by fruitful discussions and a guided tour to the laboratories of FhK.

The demonstrators developed in close cooperation with industrial network partners are all progressing as planned:

- #1 - Intelligent grid integration of wind and sun (CAU)
- #2 - Energy efficient, reliable and compact high speed drive (CAU)
- #3 - High power onboard bidirectional battery charger (SDU)

Conference/Workshop Participation



PCIM 2019

7 - 9 May in Nürnberg

The PCIM Europe is the world's leading exhibition and conference for power electronics, intelligent motion, renewable energy, and energy management.



PE:Region will be represented by FhK, who will have their own booth in hall 6 (no. 252), whereas SDU as a member of the ECPE (European Center for Power Electronics) will be represented by two persons from CIE at the ECPE booth 237 in hall 7.



New Energy Days

21 - 22 March 2019 in Husum, Germany

PE:Region was attending the newly established "New Energy Days 2019" on Friday 22 March with the session "Cross-Border Power Electronics" where individual project partners presented their capabilities in the project and in the field of power electronics. The present topics covered the intelligent grid integration of wind and sun, topologies for high speed drives, the development of efficient, reliable and compact high speed drives, a 20 kV high efficiency transformer for an on-board bidirectional battery charger, and the approach for a new power module with a novel substrate approach.



Additionally, the attendance at the fair was a good opportunity to get in contact with other actors in the field of renewable energy and the so-called energy transition "Energiewende", and also to interact with public visitors. The solutions based on power electronics are integral components to achieve the goal of a climate friendly and energy efficient society.

Accepted papers



The paper "Mitigation of Disturbances by Means of Smart Transformer-based Storage Systems" has been accepted for the CPE-POWERENG 2019. The study considers different smart transformer interfaced storage technologies to mitigate the disturbances. The characteristics of different technologies, including response time, power rating etc, are summarized. The application to remedy different types of disturbance is analyzed. The storage technologies are not only able to effectively adopt the extra energy generation from the solar and wind power - the analysis also shows that the storage technologies can support the grid stability and enhance the integration capability of renewable energy.

(Authors: Xiang Gao, Giovanni De Carne, Rongwu Zhu, Markus Andresen, Marco Liserre)

A paper entitled "Loss Comparison for Different Technologies of Semiconductors for Electrical Drive Motor Application" will be presented at the CPE-POWERENG 2019. It includes the comparison of different semiconductor materials for a high frequency three-phase inverter. *(Authors: G. Kapino and W. – T. Franke)*

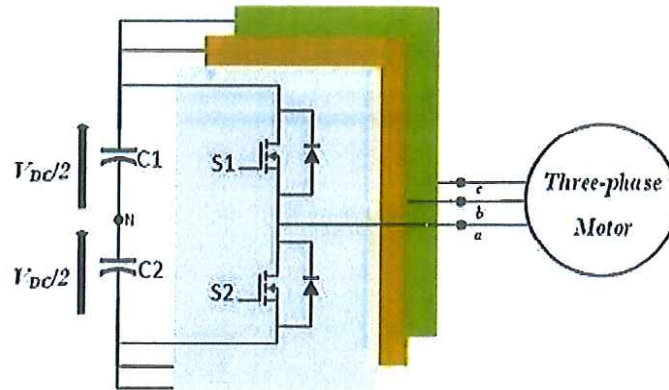


Fig. 1 - Three-phase Inverter

Another topic of research was the comparison of different inverter topologies. Based on the results of the previous paper, a comparison between different inverter topologies was performed in regards to efficiency, using Silicon Carbide (SiC) MOSFETs. The losses were verified by means of simulations.

A second paper has been accepted for publication at IEEE's EPE conference in Genova, Italy, in September 2019. The title is "Comparison of Three-Phase Voltage Source Converter Topologies for Electric High-Speed Drives Application". (Authors: G. Kapino and W. – T. Franke)

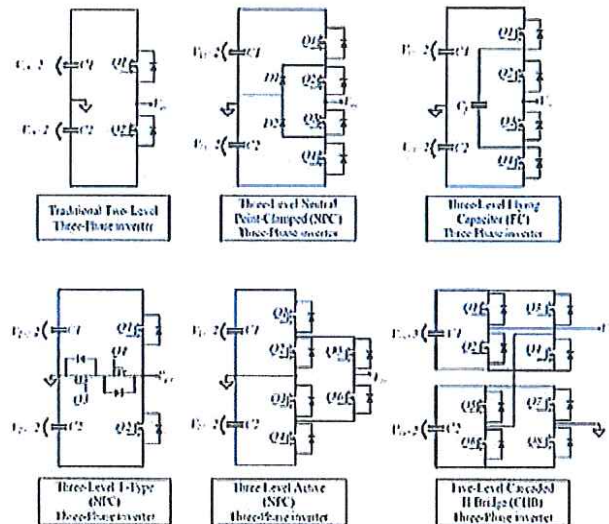


Fig. 2 - The phase legs of different inverter topologies for electrical motor drive applications

Wai Keung Mo, Kasper M. Paasch and Thomas Ebel, "Hybrid Magnetic EMI filter design for low Voltage DC distribution (LVDC) network", ICDCM2019, Matsue, Japan, 2019

Wai Keung Mo and Kasper M. Paasch, "Parasitic couplings of 3-phase EMI filter design for 1kW 3-phase boost converter", EPE'19 ECCE Europe, September 2019, Genova, Italy



We should like to take the chance to inform you about an interesting project initiative dealing with the electrification of maritime propulsion systems. One out of three cases consists of a hybrid solution with an energy generator (eg. a fuel cell) and a supply system (electricity storage) for the electric drive. To

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