

EPE Newsletter July 2008

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➤ **1. 2nd EPE Wind Energy Chapter Seminar, The Royal Institute of Technology, Stockholm, Sweden, 23 and 24 April 2009, Call for papers**

Aim of the Seminar

As wind has become the most technically and commercially advanced as well as most promising source of renewable energy, the European Power Electronics and Adjustable Speed Drives Association (EPE) dedicated a special chapter on this issue: the EPE Wind Energy Chapter. After the successful gathering at the 1st EPE Wind Energy Chapter Seminar held in Delft on 27 and 28 March 2008, it has been decided to organize a second EPE Wind Energy Chapter seminar where experts can discuss various electrotechnical aspects related to the development of wind energy. This seminar will take place on 23 and 24 April 2009 in Stockholm, Sweden. The aim is to meet, discuss and get acquainted with the latest development of this fast developing technology, in an informal and friendly atmosphere.

Organisation and venue

The seminar will take place on 23 and 24 April 2009 at the KTH, Stockholm, Sweden. Plenary sessions, lecture and dialogue sessions will be organized in the best EPE tradition to provide maximum networking opportunities. Worldwide experts in the field are expected to take part in the event to exchange best practice and learn from experience with a special focus on industry and technology.

List of topics

1. Wind Energy Conversion Technologies

- 1.a. Permanent magnet generators for large turbines (also offshore)
- 1.b. MW-class wind generator-converter technology (also offshore applications)
- 1.c. MW low-speed generator solutions
- 1.d. Small wind turbine systems for standalone and grid-connected applications
- 1.e. Geared and gear-less solutions for wind energy conversion. Gear-box issues.

2. Grid Compliance and wind power technology

- 2.a. Interconnection standards for distribution and transmission levels
- 2.b. Interconnections issues for wind turbines
- 2.c. Grid Interface: Grid connection for large wind farms. Reactive power/Voltage control

- 2.d. Ride Through Standards and Technical Solutions for Offshore Wind Farms
- 2.e. Ride-through capability of wind turbines with power electronic systems
- 2.f. Certification of Low Voltage Ride Through LVRT
- 2.g. Laboratory tests of LVRT
- 2.h. Stability analyses: small signal stability, transient stability, stability margin
- 2.i. Frequency control, active power control, runback schemes
- 2.j. Standardisation of simulation models for stability studies
- 2.k. Grid synchronization under grid disturbances
- 2.l. Active and reactive power control issues during grid disturbances

3. Energy storage technologies

- 3.a. Short term: flywheel, super capacitors, batteries
- 3.b. Long term: pumped storage, dispatchable generation
- 3.c. Other storage

4. Wind System Coordination

- 4.a. Wind Farm Control
- 4.b. Real time information exchange required for harmonious operation of wind farms
- 4.c. Planning and configuration of wind farm power systems
- 4.d. Operation and control of doubly fed induction generator systems for wind turbines
- 4.e. Coordination between power electronic conversion characteristics and standard protection equipment characteristics
- 4.f. Fault monitoring and predictive maintenance of power electronic based wind turbine systems

5. Power electronics for integration and control of wind turbines in power systems

- 5.a. Power electronic interface including control for permanent-magnet and field excited synchronous generators
- 5.b. Topologies of Power Electronics Converters for wind turbines
- 5.c. Modelling and simulation of power electronic systems with wind turbines and wind farms
- 5.d. Protection of power electronic systems for wind turbines
- 5.e. Control of power converters for future dispersed generators with high degree of wind integration
- 5.f. Dedicated HVDC for wind power transmission

6. Future trends of wind energy conversion and power electronic applications

- 6.a. Reinforcement of power system for tapping wind power: FACTS, FACDS
- 6.b. Offshore wind turbines: floating and fixed
- 6.c. Power collection and integration of offshore wind farms

Presentations from companies supplying wind turbines, wind turbine equipment, developers, utilities, etc.. are most welcome.

Deadlines

Intending authors should note the following deadlines:

Receipt of synopses

November 2008

Notification of provisional acceptance

February 2009

Receipt of full typescript IEEEExplore ready, ppt or pdf presentation

on-site

Secretariat

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➤ **2. EPE-PEMC 2008, Poznan, 1-3 September 2008 – !!On-line registration open !! New tutorial organised**

On-line registration is available on <http://www.epe-pemc2008.put.poznan.pl>

Two tutorials are organized:

"Newest SHARCs and rapidly prototyped high precision drives"
by M. Gwozdz and Z.Krzeminski.

and newly announced:

"Predictive Control in Power Electronics and Drives"

Authors: Ralph Kennel, Marian Kazmierkowski, Josu Rodriguez, Patricio Cortus, Patryk Antoniewicz

Motivation and Objectives

Cascaded control is state of the art in power electronics and drives since several decades. We do not expect serious changes within a short time, because cascaded control is easy to realize, easy to implement and robust in operation. Furthermore, industry seems to be satisfied with the performance of cascaded control ľ there is no strong pressure to improve performance from that side. There are, however, serious drawbacks of cascaded control: its linear concept, the need of an extremely fast operating inner loop, etc. Academics should look out for a better concept to have it available, when the demand for better performing control schemes occurs again from industry.

Predictive control is a strong candidate for that ľ the proposed tutorial will show that, gives an overview over predictive control schemes and their advantages and show several examples in detail.

Outline (3.5 hrs)

1. Introduction
2. Predictive Control Methods (Kennel)
3. Trajectory Based Predictive Control (Kennel)
4. Hysteresis Based Predictive Control (Kennel)
5. Long-Range Predictive Control (Kennel)
6. Predictive Control of 3phase AC/DC Converters (Kazmierkowski)
7. Constant Switching Frequency Predictive Control (Kazmierkowski)
8. Model Predictive Control with continuous states (Rodriguez/Cortes)
9. Model Predictive Control with Finite States (Rodriguez/Cortes)
 - a. Background
 - b. Current control of a three-phase inverter
 - c. Power control of an AFE
 - d. Predictive Torque Control
 - e. Control of a matrix converter
 - f. Spectrum Control
 - g. Voltage Control of an UPS
 - h. Control of a NPC converter
 - i. Control of a flying capacitor converter
10. Some Implementation Issues (Rodriguez/Cortes)
11. Predictive Control versus Cascaded Control (Kennel)
12. Conclusions/Discussion

Author's Biographies (shortened)

Ralph M. Kennel received the Diploma and Dr. Ing. (Ph.D.) degrees from the University of Kaiserslautern, Kaiserslautern, Germany, in 1979 and 1984, respectively. He held several positions within Robert BOSCH GmbH, Germany; he was responsible for the development of servo drives. He was one of the main supporters of VECON and SERCOS interface. Furthermore, he actively took part in the definition and release of new standards with respect to CE marking for servo drives. Since 1999, he has been a Professor of electrical machines and drives with Wuppertal University, Wuppertal, Germany. His main interests today are sensorless control of ac drives, predictive control of power electronics, and high-speed drives.

Dr. Kennel is a Fellow of the Institution of Electrical Engineers, the Vice President for Meetings of the IEEE Power Electronics Society, and a Chartered Engineer in U.K.

Marian P. Kazmierkowski received the M.Sc., Ph.D. and Dr. Sc. degrees in electrical engineering from the Institute of Control and Industrial Electronics (ICIE), Warsaw University of Technology, Warsaw, Poland, in 1968, 1972, and 1981, respectively. Since

1987, he has been a Professor and Director of Institute of Control and Industrial Electronics, Warsaw University of Technology. He was a Visiting Professor at many universities.

He was a Coordinating Professor of the International Danfoss Professor Program from 1996 to 2000 at the Aalborg University, Denmark. From 1996 to 2004 he was an elected member of the State Committee for Scientific Research in Poland. He was also Director of the Centre of Excellence on Power Electronics and Intelligent Control for Energy Conservation; PELINCEC 2003 - 2006 (European Framework Program V) at ICIE, Warsaw University of Technology, Poland.

He is the author or co-author of over 300 technical papers and reports, as well as 13 books and textbooks. He is engaged in experimental research and theoretical work on electric drives and industrial electronics.

Professor Kazmierkowski was the recipient of an Honorary Doctorate degree from Aalborg University in 2004, an MISTRZ Grant of the Foundation of Polish Science - FNP (2001-2003), and the Dr Eugene Mittelmann Achievement Award by the IEEE Industrial Electronics Society in 2005. In 2007 he received SIEMENS Research Award.

He was Chairman of the 1996 IEEE International Symposium on Industrial Electronics held in Warsaw, Poland. He has served as Vice-President for Publication, in the IEEE Industrial Electronics Society (1999 to 2001). He was the Editor-in-Chief of the IEEE TRANSACTIONS ON INDUSTRIAL ELECTRONICS

(2004-2006) as well as member of many IEEE Committees, Conference Organizing Committees. In 2007 he was General Co-Chair of the IEEE EUROCON 2007 conference held in Warsaw. Currently, he is Past-Chairman of the IEEE Poland Section.

José Rodriguez received the Dr.-Ing. degree in electrical engineering from the University of Erlangen, Erlangen, Germany, in 1985. Since 1977, he has been with the Universidad Tecnica Federico Santa Maria, where he is currently a Professor and the President. He has a large consulting experience in the mining industry, particularly in the application of large drives like cycloconverter-fed synchronous motors for SAG mills, high-power conveyors, controlled drives for shovels, and power quality issues. He has authored or coauthored more than 130 refereed journals and conference papers and contributed to one chapter in the Power Electronics Handbook (Academic Press, 2006). His research interests are mainly in the area of power electronics and electrical drives. In the last years, his main research interests are in multilevel inverters and new converter topologies.

Patricio Cortès received the Engineer and M.Sc. degrees in electronic engineering from the Universidad Tecnica Federico Santa Maria (UTFSM), Valparaiso, Chile, in 2004. He is currently working toward the Ph.D. degree at the same university. In 2003, he joined the Department of Electronics Engineering, UTFSM, as a Research Assistant. His main research interests are control of power converters and adjustable speed drives.

Patryk Antoniewicz received M.Sc. degree in electrical engineering from the Institute of Control and Industrial Electronics, Warsaw University of Technology (WUT), Warsaw, Poland in 2004. He is currently a Ph.D. student with the Institute of Control and Industrial Electronics, WUT. His research activities include predictive control of rectifiers, active filters, and DSP applications.

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➤ **3. EPE 2009: 8-10 September 2009 Barcelona, Spain – Call for papers –**

Deadline for synopses: 3 November 2008

<http://www.epe2009.com>

➤ **4. 8th International Symposium on Advanced Electromechanical Motion Systems - ELECTROMOTION 2009 - EPE Chapter “Electric Drives” Joint Symposium - July 1 – 3, 2009 - Lille, France**

Announcement and Call for Papers

www.electromotion2009.fr

DEADLINES

- Receipt of full papers : **December 15, 2008**
- Acceptance notification : **January 31, 2009**
- Receipt of registration fees and final papers : **March 15, 2009**

Information: www.electromotion2009.fr

➤ **5. 3rd European Symposium on Supercapacitors and Applications (ESSCAP'08), 6-7 November 2008, Roma, Italy – Call for Papers**

Contact: Prof. Fabio Giulii Capponi, ESSCAP'08 General Chair
University of Roma "La Sapienza"
Ph. ++39-06-44585308; Fax. ++39-06-4883235

e-mail: esscap08@uniroma1.it
web: <http://w3.uniroma1.it/esscap08>

➤ **6. Industrial/PhD Course in Switch-mode audio power amplifiers (class-D) August 18-22, 2008**

<http://www.elektro.dtu.dk/English/research/au/peg.aspx>

Organizer and further information

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➤ **7. Faculty of Engineering Science and Technology/Faculty of Information Technology, Mathematics and Electrical Engineering, Professorship/Associate Professorship in Ocean Energy Engineering**



Statkraft, the third largest producer of electrical energy in the Nordic countries, is developing renewable energy technologies and is sponsoring a professorship under its Ocean Energy University Programme at the Norwegian University of Science and Technology (NTNU).

The professorship is in Ocean Energy, being energy conversions from offshore wind including floating wind turbines, waves and tidal currents. The professor will have a demonstrated interest and a background in several of the following topics and scientific merits in at least one of them:

- hydro- and/or aerodynamics
- light weight materials
- operations and maintenance
- electrical power (from generator to grid)
- cybernetics

In these areas there is a pool of several renewable energy programmes with a total of about 30 PhD students. The professor is expected to establish and participate in interdisciplinary research and teaching programmes that are suited to meet the challenges of technological development in renewable energies.

More information can be found on

<http://www.ntnu.no/vacancies>

Or by contacting Professor Johan E. Hustad, email: johan.e.hustad@ntnu.no or

Professor Lars R. Saetran, email lars.saetran@ntnu.no.

Application deadline: 15 September 2008.

There will soon be another call at <http://www.ntnu.no/vacancies> for a Post.Doc in Electric Power Engineering including Power Electronics; in Offshore Wind Energy. Please contact Professor Tore Undeland, email Tore.Undeland@elkraft.ntnu.no

➤ 8. Professorship in High Power Electronics and the Technology of Electrical Power Systems



Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

The Department of Information Technology and Electrical Engineering (www.ee.ethz.ch/en/home.html) at ETH Zurich invites applications for a full professor position in High Power Electronics and the Technology of Electrical Power Systems. The responsibilities of this position include research and teaching in the area of power electronics converter systems and technologies with the long-term goal of a fundamental transformation of the existing infrastructure for transmission and distribution of electrical energy into a highly stable, highly efficient and extremely secure system, integrating a large share of renewable energy sources and storage capabilities. The focus will be on the theoretical and experimental analysis of high power converter systems and on the physically well-founded, multi-domain modelling and simulation of the circuits, thermal and electromagnetic properties at different levels of abstraction. Further research topics include the technological basics of new concepts for the transmission of very large quantities of electrical power as well as the simultaneous distribution of different energy carriers, i.e. multi-carrier systems.

Candidates must hold a PhD degree and should have established an internationally recognized research record in the area. Furthermore, they should present evidence of their leadership in a research team and of their ability to successfully collaborate with other faculties as well as with the industry. He or she will be expected to teach undergraduate level courses (German or English) and graduate level courses (English).

Applications should include a curriculum vitae, a list of publications, a list of research activities, a research statement, and the names of at least three referees and should be submitted to the President of ETH Zurich, Prof. Dr. Ralph Eichler, Raemistrasse 101, 8092 Zurich, Switzerland, no later than October 15, 2008. With a view toward increasing the number of female professors, ETH Zurich specifically encourages qualified female candidates to apply.

➤ 9. Call for papers for EPE journal, included in ISI and Compendex

EPE Journal is included in the Science Citation Index as well as in the Compendex. Send your best technical papers for publication to bsnevers@vub.ac.be (pdf file, without any mention of authors, full coordinates in the mail message)

<http://www.epe-association.org>

➤ 10. Technically sponsored conferences

3rd European Symposium on Supercapacitors and Applications (ESSCAP'08)

6-7 November 2008, Roma, Italy

Contact:

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2nd EPE Wind Energy Seminar

The Royal Institute of Technology

23-24 April 2009

Stockholm, Sweden

<http://etec.vub.ac.be/EPE/03-EPE-WE-Seminar-2009.htm>

ELECTROMOTION 2009

Lille, France

1-3 July 2009

Information: www.electromotion2009.fr

September 8-10, 2009 Barcelona, Spain

EPE 2009

Call for papers

Deadline for receipt of synopses: 3 November 2008

<http://www.epe2009.com>

➤ **11. ECPE Calendar of Events 2008**

Full programmes are available from http://www.ecpe.org/education/seminars_e.php

Date	Location	Event	Topic
7-8 Oct. 2008	Stuttgart (D)	ECPE Seminar	Automotive Power Electronics (w. EC Projects) Dissemination Workshop of the European HOPE Project on High Density Power Electronics for Hybrid Traction Techn. Chairman: Dr. M. Maerz (Fraunhofer IISB) Co-Chairman: Prof. E. Wolfgang (ECPE)
20 – 21 November 2008	TBD	ECPE Workshop	Advanced Cooling Techniques (1 st day) Techn. Chairman: Prof. E. Wolfgang (ECPE) Power PCBs and Busbars (2 nd day) Techn. Chairman: NN
4 - 5 Dec. 2008	Nuremberg (D)	ECPE Tutorial	Power Semiconductor Devices & Technologies Course instructor: Prof. D. Silber (Univ. Bremen)
12 Dec. 2008	Zurich (CH)	ETH Workshop	Megawatt Power Electronics and Smart Grids ETH Zurich, Prof. J.W. Kolar; Dr. J. Biela

Further Power Electronics Events of the Bavarian Cluster: www.cluster-bayern-leistungselektronik.de (in German language).