

# PRELIMINARY SCIENTIFIC PROGRAM

MONDAY, 9 SEPTEMBER 2002

## OPPENING SESSION

Monday, 9 September 2002, 8:30-8:45

Congress Hall Ragusa

## KEYNOTE SESSION 1

Monday, 9 September 2002, 8:45-9:30

Congress Hall Ragusa

Session Chairperson: *Istvan Nagy, Budapest University of Technology and Economics, Hungary*

### **The Role of Power Electronics in Future 42V Automotive Electrical Systems**

*John G. Kassakian, The Massachusetts Institute of Technology, USA*

## ORAL SESSIONS ML1-ML4

Monday, 9 September 2002, 9:35-11:30

### ML1: Topic 1: Power Converters

Congress Hall Ragusa

Session Chairpersons: *Marian Kazmierkowski, University of Warsaw, Poland*  
*Leonid Ribickis, Riga Technical University, Latvia*

#### T1-008 Design Methodology for Shunt Active Filters

*Fabio Ronchi, Andrea Tilli, Department of Electronics, Computer and System Sciences (DEIS), University of Bologna, Italy*

#### T1-022 Active and Reactive Power Limits of Three-Phase PWM Voltage Source Inverter Connected to the Grid

*M. Chinchilla, S. Arnalte, J.C. Burgos, J. Sanz, J.L. Rodríguez, Universidad Carlos III de Madrid, Spain*

#### T1-021 The Conception of the Two-Section Direct Frequency Converter

*R.T. Shreiner, A.A. Efimov, A.I. Kalygin, K.N. Korukov, I.A. Mukhamatshin, Novouralsk State Technological Institute, Russia*

#### T1-051 Soft Commutated DC-DC Power Converter with High Frequency Transformer Secondary Side Control Scheme

*M. Rukonuzzaman, Mamun Abdullah Al, Shinji Sato, Moisseev Serguei, Mutsuo Nakaoka, Division of Electrical and Electronics Engineering, Graduate School of Science and Engineering, Yamaguchi University, Japan*

### ML1: Topic 2: Semiconductor Devices

Congress Hall Ragusa

Session Chairpersons: *Heinz Mitlehner, Siemens Company, Germany*  
*Zvonko Benčić, University of Zagreb, Croatia*

#### T2-016 From Transient Thermal Impedance Measurement to Successful Electrothermal Simulation

*Zvonko Benčić, Zeljko Jakopović, Viktor Šunde, University of Zagreb, Croatia*

#### T2-014 Single Chip Implementation of 600V IGBT and Freewheeling Diode

*Ettore Napoli, Antonio G.M. Strollo, Paolo Spirito, Dept. of Electronic Engineering, University of Naples, Italy*  
*Ferruccio Frisina, Leonardo Fragapane, Domenico Fagone, STMicroelectronics, Stradale Primosole, Italy*

#### T2-020 Application of SiC Devices in Power Supplies

*Tobias Reimann, ISLE GmbH, Germany,*  
*Juergen Petzoldt, Ilmenau Technical University, Dept. Power Electronics and Control, Germany*  
*Ilija Zverev, Infineon Technologies AG, Germany*  
*Heinz Mitlehner, Peter Friedrichs, SiCED GmbH & Co. KG, Siemens Company, Germany*

## **ML2: Topic 7, 9 and 10: Sensing and Observing, Motion Control, Mechatronic Systems**

**Salon Orlando**

Session Chairpersons: *Teresa Orłowska-Kowalska, Wrocław University of Technology, Poland*  
*Emil Levi, Liverpool John Moores University, United Kingdom*

### **T9-057 Control of A Shape Memory Alloy Driven Robot Hand**

*Péter Zsíros, Péter Baranyi, Antal Huba, Péter Korondi, Budapest University of Technology and Economics, Integrated Intelligent Systems, Japanese-Hungarian Joint Laboratory, Hungary*  
*Péter Baranyi, Budapest University of Technology and Economics, Department of Precision Mechanic and Optic, Hungary*

### **T9-030 Self-learning Impedance Control of the Robot Systems**

*F. Palis, V. Rusin, Otto-von-Guericke University of Magdeburg, Institute for Electrical Power Systems, Germany*

### **T9-072 Robust Fuzzy-Sliding Mode Position Control for Motor Drives operating with Variable Loads**

*Jesus Arellano-Padilla, G. M. Asher, M. Sumner, School of Electrical and Electronic Engineering, University of Nottingham, United Kingdom*

### **T9-018 Fuzzy Adaptive Control of an Induction Motor Drive**

*M. R. Chekkouri, J. Català, E. Aldabas, L. Romeral, Dept. of Electronic Engineering, Technical University of Catalonia, Spain*

### **T9-066 Integral Criterion-Based Adaptive PID Angular Speed Control**

*Zdenko Kovačić, Stjepan Bogdan, Mario Punčec, University of Zagreb, Faculty of Electrical Engineering & Computing, Croatia*

### **T10-001 Identification and Control of a Nonlinear Mechatronic System**

*Christian Hintz, Bernhard Angerer, Dierk Schröder, Institute for Electrical Drive Systems, Technical University Munich, Germany*

### **T7-005 Auto-tuning of permanent magnet motor drives with observer based parameter identifiers**

*Jacek Kabziński, Tomasz Sobieraj, Institute of Automatic Control, Technical University of Łódź, Poland*

## **ML3: Topic 6: Power Electronics in Electrical Energy Generation, Transmission and Distribution**

**Conference Hall Libertas**

Session Chairpersons: *Michael James Case, Vaal Triangle Technikon, Republic of South Africa*  
*Jiri Pavelka, CTU Prague, Faculty of Electrical Engineering, Czech Republic*

### **T6-028 Sliding Mode Control and Robust Analysis of Parallel Hybrid Filters**

*J. Bosche, S. Tnani, O. Bachelier, Laboratoire d'Automatique et d'Informatique Industrielle, France*

### **T6-015 A New Positive Sequence Voltage Detector for Unbalanced Power Systems**

*P. Rodríguez J. Bergas J.A. Gallardo, Universitat Politècnica de Catalunya, Spain*

### **T6-011 DSP-based Experimental Rig with the Doubly-Fed Induction Generator for Wind-turbines**

*Balduino Rabelo, Wilfried Hofmann, Chemnitz University of Technology, Germany*

### **T6-019 A D.C.-A.C. Converter for Solar Power Applications**

*S. Shirsavar, J. S. Knight, University of Reading, Department of Electronic Engineering, United Kingdom*  
*M. McCulloch, University of Oxford, Department of Engineering, United Kingdom*  
*A. Wheldon University of Reading, Department of Engineering, United Kingdom*

### **T6-020 A Low Cost 10 kW Fuel Cell Inverter for Domestic Power**

*Jody J. Nelson, Department of Electrical and Computer Engineering, University of Wisconsin-Madison, USA*  
*Andrew M. Tuckey, Powercorp Pty. Ltd., NT Australia*

### **T6-003 A Simple Maximum Power Point Tracking Control Employing Fibonacci Search Algorithm for Power Conditioners of Photovoltaic Generators**

*Masafumi Miyatake, Tooru Kouno, Motomu Nakano, Department of Electrical and Electronics Engineering, Sophia University, Japan*

### **T6-027 A Flexible Test-Bench for Power Quality Conditioning Algorithms Testing**

*I. Etxeberria-Otadui, U. Viscarret, R. Rezero, IKERLAN, Spain*  
*S. Bacha, Laboratoire d'Electrotechnique de Grenoble, France*

T6-001 Simulation Study on Enhancement of Maximum Power Transfer Capability of Long Transmission Line With Midpoint Sitting STATCOM for Voltage Support

*S. Kincic, A. Chandra, Department of Electrical Engineering, ETS, Université du Québec, Canada*

*Z. Huang, Department of Electrical and Computer Engineering, University of Alberta, Canada*

*S. Babic, École Polytechnique, Département de Génie électrique & de Génie informatique et de Génie Physique, Canada*

T6-008 Unified Power Flow Controller (UPFC) and its Effect over an Uncompensated Parallel Line

*R. León Vasquez-Arnez, Luiz Cera Zanetta, University of São Paulo, Brazil*

#### **ML4: Topic 8: Electrical Machines and Actuators**

**Salon Bobara**

Session Chairpersons: *Livio Šušnjić, University of Rijeka, Croatia*

*Miroslav Marković, Swiss Federal Institute of Technology (EPFL), Switzerland*

T8-064 Improvement of LSRM Tracking at Low Speed Operation

*Drago Dolinar, Gorazd Štumberger, Miro Milanovič, University of Maribor, Faculty of Electrical Engineering and Computer Science, Slovenia*

T8-036 Inductance Calculation in Switched Reluctance Motors

*Hansjörg Köfler, Institut für elektrische Maschinen und Antriebstechnik, Österreich*

*Irma Hajdarevic, DaimlerChrysler, Advanced Propulsion Systems, Austria*

T8-027 Neural Network and Genetic Algorithm as a New Approach in Design Optimization of Induction Machines

*Jasmin Smajic, ETH Zurich, Laboratory for Electromagnetic Fields and Microwave Electronics, Switzerland*

*Sead Berberovic, Zijad Haznadar, Faculty of Electrical Engineering and Computing in Zagreb, Croatia,*

*Vlado Madzarevic, Izudin Kapetanovic, Amir Tokic, Faculty of Electrical Engineering in Tuzla, Bosnia and Herzegovina,*

T8-028 Application, Calculation and Analysis of the Doubly Fed Longstator Linear Motor for the Wheel-on-Rail NBP Test Track

*Bo Yang, Horst Grotstollen, University of Paderborn, Institute of Power Electronics and Electrical Drives, Germany*

T8-062 Experimental Evaluation of a Two-phase Axial Flux Circumferential Current (AFCC) Permanent Magnet Machine

*Ronghai Qu, Thomas A. Lipo, Dept. of Electrical & Computer Engineering, University of Wisconsin - Madison, USA*

*Jian Luo, Eaton-Aerospace Electromechanical Systems, USA*

*Surong Huang, Department of Automation Shanghai University, China*

T8-002 The Causes and Reduction of Rotor Bar Breakages in Large Squirrel Cage Induction Motors

*G. M. J. Parsley, F'SATIE, Pretoria Technikon, Republic of South Africa*

#### **SPECIAL SESSIONS**

**Monday, 9 September 2002, 11:45-13:30**

#### **MSS1-IN: Non Linear Dynamics in Power Electronics and Drives**

**Salon Orlando**

Session Chairpersons: *Istvan Nagy, Budapest University of Technology and Economics, Hungary*

*Luis Benadero, Universitat Politècnica de Catalunya, Spain*

SSIN-01 Density aspects of chaotic DC-DC converters

*Oliver Woywode, Henry Güldner, Technische Universität Dresden, Professur Leistungselektronik, Germany*

SSIN-02 Local Bifurcation in DC-DC Converters

*Chung-Chieh Fang, Taiwan Semiconductor Manufacturing Co., Taiwan*

*Eyad H. Abed, Dept. of Electrical and Computer Eng. And the Inst. For Systems Research, University of Maryland, USA,*

SSIN-04 Bifurcation Analysis in PWM Regulated DC-DC Converters using Average Models

*Luis Benadero, Eliezer Toribio, Vanessa Moreno, Dep. Física Aplicada, Univ. Politècnica de Catalunya, Spain*

*Abdelali El Aroudi, Dep. Eng. Elèctrica, Electrònica i Automàtica, Univ. Rovira Virgili, Spain*

*Gerard Olivar, Dep. Matemàtica Aplicada, Univ. Politècnica de Catalunya, Spain*

SSIN-07 Border Collision Bifurcations in a Chaotic PWM H-Bridge Single-phase Inverter

*Robert Bruno, Lam-University of Reims Champagne-Ardenne, France*

*Robert Carl, Department of Physics, University of California at Santa Barbara, USA*

## **MSS2-TMU: Teaching and Education in Power Electronics and Drives**

**Conference Hall Ragusa**

Session Chairpersons: *Tore M. Undeland, Norwegian University of Science and Technology, Norway*  
*Frede Blaabjerg, Aalborg University, Denmark*

### **SSTMU-01 Teaching Electric Machines and Drives: A Re-examination for the New Millennium**

*Tore M. Undeland, Norwegian University of Science and Technology, Norway*  
*Ned Mohan, University of Minnesota, USA*

### **SSTMU-02 The One-year project as a method for fusion of power electronics with other studies**

*Waldemar Sulkowski, Atle-Kjell Hjertenæs, Per-Åge Ljunggren, Narvik University College, Institute of Electrical and Computer Engineering, SIEMENS AS, Norway*

### **SSTMU-03 Advanced prototyping tools for project- and problem-based learning**

*Remus Teodorescu, Michael M. Bech, Allan H. Jorgensen, Kim B. Larsen, Frede Blaabjerg, John K. Pedersen, Aalborg University, Institute of Energy Technology, Section of Power Electronics Systems, Denmark*

### **SSTMU-05 Challenges in the Teaching of Power Electronics - Motivation of New Students**

*Jorma Kyrrä, Helsinki University of Technology, Power Electronics Laboratory, Finland*

### **SSTMU-06 Advanced Research and Education in Electrical Drives by Using Digital Real-Time Hardware-in-the-Loop Simulation**

*R. Bojoi, F. Profumo, G. Griva, Politecnico di Torino, Dip. di Ingegneria Elettrica Industriale, Italy*  
*R. Teodorescu, F. Blaabjerg, Aalborg University, Dept. of Electrical Energy Conversion, Denmark*

### **SSTMU-07 Hardware and Software Environment for Self-learning in Power Electronics**

*C. Fernández, O. García, J. A. Cobos, J. Uceda, Universidad Politécnica de Madrid (UPM), División de Ingeniería Electrónica (DIE), Spain*

## **MSS3-HR: Diagnosis of Induction Motor**

**Conference Hall Libertas**

Session Chairpersons: *Hubert Razik, Université H. Poincaré, Vandoeuvre-lès-Nancy, France*  
*Gojko M. Joksimović, Technische Universität Darmstadt, Germany*

### **SSHR-01 A robust steady state detection in electromechanical system diagnosis**

*Fiorenzo Filippetti, Marcello Artioli, Department of Electrical Engineering, University of Bologna, Italy*

### **SSHR-02 A Method for the Simulation of Inter-Turn Short Circuits in Squirrel Cage Induction Machines**

*Gilles Houdouin, Georges Barakat, Brayima Dakyo, Eric Destobbeleer, GREAH, University of Le Havre, France*

### **SSHR-03 On Space Harmonics Model Of A Three Phase Squirrel Cage Induction Motor For Diagnosis Purpose.**

*G. Didier, H. Razik, A. Abed, A. Rezzoug, Groupe de Recherche en Electrotechnique et Electronique de Nancy, France*

### **SSHR-04 Detection of induction motors broken bars by electromagnetic torque estimation using kalman filtering**

*Eltabach Mario, Charara Ali, Zein Ismail, Université Technologie de Compiègne, France*

### **SSHR-05 An Approach to Dynamic Simulation of Dynamic Eccentricity in Induction Machines**

*Gojko M. Joksimović, Institut Für Elektrische Energiewandlung, Technische Universität Darmstadt, Germany*

## **MSS4-JV: Non Linear Control of AC Drives and Speed Estimation**

**Salon Orlando**

Session Chairpersons: *Ján Vittek, University of Žilina, Faculty of Electrical Engineering, Slovak Republic*  
*Stephen J. Dodds, University of East London, United Kingdom*

### **SSJV-01 Estimation of Rotor Speed for Nonlinear Control of The Induction Motor**

*Zbigniew Krzemiński, Gdansk University of Technology, Electrical and Control Engineering Faculty, Poland*

### **SSJV-02 Shaft Sensorless Direct Vector Control of Induction Motor With Forced Dynamics**

*Ján Vittek, University of Žilina, Faculty of Electrical Engineering, Slovak Republic*  
*Miroslav Rapšik, Central Slovakia Energetic Works, Slovak Republic*  
*Jozef Buday, Electrical R&D Institute Nova Dubnica, Slovak Republic*

**SSJV-03 Robust Vector Control of Electrical Drives Using Load Torque Estimation: An FPGA Implemented Synchronous Motor Application**

*Stephen J. Dodds, Roy Perryman, School of Electrical and Manufacturing Engineering, University of East London, United Kingdom*

*Sujitthe Jayasoma, Research & Development Laboratory, Control Techniques Dynamics, Wabworth Industrial Estate, United Kingdom*

**SSJV-04 Rotor Flux Observers and Speed Estimators for Sensorless Induction Motor Drives - Comparative Study**

*Teresa Orłowska-Kowalska, Wrocław University of Technology, Institute of Electrical Machines, Drives and Measurement Systems, Poland*

**SSJV-05 Sensorless Induction Motor Drive With Vector Control**

*David Vinklerek, Pavol Brandstetter, Peter Palacky, Martin Kuchar, VSB-Technical University of Ostrava, Czech Republic*

**DIALOGUE SESSION**

**Monday, 9 September 2002, 14:45-16:30**

Session Chairpersons: *Zlatko Maljković, University of Zagreb, Croatia*  
*Mutsuo Nakaoka, Yamaguchi University, Japan*

**MD1.1: Topic 1: Power Converters**

**Quiet Salon**

**T1-003 Analysis And Simultion Of Multilevel Converter with Self Voltage Balancing Based Of Flying Capacitors Topology**

*Sobhi Delfo, Heiner Jacobs, Juergen Petzoldt, Technische Universität Ilmenau, Department of Power Electronics, Germany*

*Tahar Taleb, University of Jijel, Algier*

**T1-030 Preferable Methods of Direct Frequency Conversion**

*L. Ribickis, I. Galkins, Institute of Industrial Electronics and Electrical Engineering, Riga Technical University, Latvia*

*L. Rutmanis, J. Stabulnieks, Institute of Physical Energetics, Latvian Academy of Sciences, Latvia*

**T1-038 An extended structure of NPC Three Level Converter as a Universal Power Compensator**

*Jacek Rabkowski, Mieczyslaw Nowak, Jaroslaw Matulka, Roman Barlik, Warsaw University of Technology, Institute of Control and Industrial Electronics, Poland*

**T1-047 A Novel Voltage Clamped Snubber Circuit Topology Applied for Multilevel Inverter and Its Low Power Loss Operations**

*Masayoshi Yamamoto, Shinji Sato, Mutsuo Nakaoka, Department of Electrical and Electronics Engineering, Yamaguchi University, Japan*

**T1-054 A Novel Control Technique for Multilevel Converters with Limited Output Voltage Range**

*Giuseppe Buja, Department of Electrical Engineering, University of Padova, Italy*

*Simone Castellani, Department of Electrotechnics, Electronics and Computer Science, University of Trieste, Italy*

*David Szabo, Department of Electrical Engineering, University of Padova, On research leave from the University of Budapest, Hungary*

**T1-062 A new solution to the unbalance problem of the input DC voltages of a five levels NPC-VSI by using sliding mode regulation**

*R. Chibani, E. M. Berkouk, Laboratoire de commande des processus, Ecole Nationale Polytechnique, Algerie*

*G. Manesse, Laboratoire d'Electricité, France*

**T1-004 Comparative Evaluation of High Power Factor Diode Rectifiers with Input Resonant Filters**

*J. Järvi, T. Sakkos, V. Sarv, Tallinn Technical University, Estonia*

**T1-009 A Novel Near Unity Power Factor Converter System Based on Compensated Controlled Rectifier**

*Zhemerov George, Krylov Denis, Sokol Evgen, National Technical University "Kharkov Polytechnical Institute", Ukraine*  
*Ilyina Nataliya, Kharkov Municipal Academy, Ukraine*

**T1-020 Practical Configuration of Single-Pulse Soft-Switching PFC Converter**

*Katsunori Taniguchi, Hiroki Baba, Toshimitsu Morizane, Osaka Institute of Tecnology, Department of Electrical Engineering, Japan*

T1-029 Selection criteria for the switching intervals in DC-AC converters for harmonic reduction using the Walsh transform

*Jesús Vicente Rodrigo, Rafael Pindado Rico, Inmaculada Martínez Teixidor, Universitat Politècnica de Catalunya, Campus Terrassa-Manresa, Departament d'Enginyeria Electrònica, Spain*

T1-045 Three-Phase Power Factor Correction Using Extended-Period Quasi-Resonant Boost Converters

*K. K. Law, K. W. E. Cheng, Y. P. B. Yeung, Y. Lu, Power Electronics Research Centre, Department of Electrical Engineering, The Hong Kong Polytechnic University, Hong Kong*

T1-055 Practical Evaluation of Three-Phase PWM Buck-Mode PFC Rectifier

*Yasuyuki Nishida, Shuji Nakamura, Energy Electronic Lab., Nihon Univ., Japan  
Mutsuo Ishikawa, Kiyoto Yasui, Niwa Electric Co. Ltd., Japan*

T1-060 A Single Stage Dual Block Active Power Factor Correction Scheme

*Doron Shmilovitz, Tel Aviv University, Israel*

T1-013 A Soft Switching Sinewave Pulse Modulated Inverter with Novel Pulse Regenerative Type Active Auxiliary Resonant Bridge Leg Link Snubbers

*M. Nakamura, T. Yamazaki, M. Rukonuzzaman, S. Sato, E. Hiraki, M. Nakaoka, Department of Electrical and Electronics Systems Engineering, The Graduate School of Science and Engineering, Yamaguchi University, Japan*

T1-018 A Resonant Circuit of an AC to DC Converter for Contactless Electrical Energy Transmission

*Robert Stala, University of Mining and Metallurgy in Krakow, Department of Electrical Drive and Industrial Equipment, Poland*

## **MD1.2: Topic 3: Control of Converters**

**Quiet Salon**

### **Session: Modulation Strategies**

T3-001 Hysteresis Current Regulation for the Field-Oriented-Controlled Induction Motor Drives with Matrix Converter

*V. Perelmuter, Osnabrueck, Germany*

T3-004 FPGA-Based Modulator for Five-Level Inverter Control using Pulse Patterns for Harmonic Elimination

*D. Hasenkopf, E. Weigand, J. Xie, Department of energy conversion and storage, University of Ulm, Germany*

T3-007 A Hysteresis Modulation Techniques for NPC Inverters in Digitally Controlled Induction Motor Drives

*Armando Bellini, Stefano Bifaretti, Stefano Constantini, Department of Electronic Engineering, University of Rome "Tor Vergata", Italy*

T3-010 High quality voltage source using a multi-converter strategy

*Ginot Nicolas, le Claire Jean-Claude, LARGE-GE44, France*

T3-013 A New Modulation Method to Reduce Common-Mode Voltages in Multilevel Inverters

*J. Rodriguez, J. Pontt, P. Correa, Dept. of Electronics, Universidad Técnica Federico Santa María, Chile*

T3-015 Modeling and Control of a Three-Phase Neutral-Point-Clamped Inverter by Means of a Direct Space Vector Control of Line to Line Voltages

*Bruno Francois, Laboratoire d'Electrotechnique et d'Electronique de Puissance de Lille (L2EP), Ecole Centrale de Lille, France*

*Eric Semail, ENSAM, France*

T3-029 Bandwidth and maximum switching frequency of multicell converters

*R. Ameer, M. Fadel, T. Meynard, LEEI UMR-CNRS 5828, INPT, France*

T3-033 Low Switching Frequency PWM with Selective Harmonic Elimination for Three-Phase Three-Level Inverters

*Jorge Pontt, José Rodriguez, Rodrigo Benavides, Raimundo De Solminhac, Matthias Müller, Departamento de Electrónica, Universidad Técnica Federico Santa María, Chile*

T3-037 Experimental Investigation of Overmodulation Region of Inverter-Fed AC Drives

*Sándor Halász, Alexej Zacharov, Department of Electrical Machines and Drives, Budapest University of Technology and Economics, Hungary*

*István Varjasi, Department of Automation and Applied Informatics, Budapest University of Technology and Economics, Hungary*

### **Session: Power Factor Correction**

T3-008 Generalised Voltage Control For A Multi-Purpose Switching Mode Converter

*D.V. Nicolae, Technikon Northern Gauteng, Faculty of Engineering, Republic of South Africa*

*M. J. Case, Vaal Triangle Technikon, Faculty of Engineering, Republic of South Africa*

T3-024 Reference Harmonics Reduction Method for Utility Tie Converter with Digital Controller

*Hajime Shiraishi, Junpei Baba, Katsuhiko Shutoh, Eisuke Masada, Science University of Tokyo, Japan*

*Masaaki Ohshima, Tokyo Electric Power Co., Inc, Japan*

T3-027 Compensation Of Buck Pwm Rectifier Input Current Harmonics Caused By Distorted Line Voltage

*Mieczyslaw Nowak, Jaroslaw Matulka, Jacek Rąbkowski, Roman Barlik, Warsaw University of Technology, Institute of Control and Industrial Electronics, Poland*

T3-030 A Fuzzy Current Control for Three-Phase Four-Wire Shunt Active Filters

*Antonio Dell'Aquila, Agostino Lecci, Dipartimento di Elettrotecnica ed Elettronica, Politecnico di Bari, Italy*

T3-031 Use of Resonance in the Control of a Current Source Rectifier

*X. Guillaud, P. Degobert, J.F. Glowacka, L2EP Lille, ENSAM, France*

### **Session: DSP Control Techniques**

T3-002 PC-based control hardware for 200-kW double three-level converter

*Maximilian Kail, Volker Staudt, Andreas Steimel, Ruhr-Universität Bochum, Institute for Generation of electrical Energy, Germany*

T3-014 Analyze Of Flux And Torque Control Improvement Of AC Motor Controlled By DTC Method

*Andrzej Sikorski, Marek Korzeniewski, Białystok Technical University, Dep. of Power Electronic and Electrical Drives, Poland*

T3-026 A voltage sag detection algorithm based on rectified voltage processing

*R. Chiumeo, CESI S.p.A.-Milano, Italy*

*A. Florio, Ansaldo Ricerche s.r.l.-Genova, Italy*

*A. Mariscotti, M. Mazzucchelli, Dipartimento Ingegneria Elettrica-Università di Genova-Genova, Italy*

T3-034 A Novel Control Concept of Highest Precision Accelerator Power Supplies

*Felix Jenni, Lukas Tanner, Mladen Horvat, Paul Scherrer Institute, Switzerland*

### **Session: General Section**

T3-005 Special Operating Conditions and Control Procedures of Energy Converters for Half-Wave X-ray Equipment

*Miklós Horváth, József Borka, Computer and Automation Research Institute, Hungarian Academy of Sciences, Hungary*

T3-006 Analysis of Energy Converters for DC and AC Supply Source Operated from an Accumulator Plant on Field

*Jozsef Borka, Miklós Horváth, Computer and Automation Research Institute, Hungarian Academy of Sciences, Hungary*

T3-011 DC-DC Converter With Intelligent Power Module Safety Operation Problems Of IPM

*Maciej Tondos, Stanislaw Kosiorowski, Adam Pracownik, University of Mining and Metallurgy, Poland*

T3-012 Microprocessor - Based PWM Inverter

*Piotr Michalak, Andrzej Stobiecki, Maciej Tondos, University of Mining and Metallurgy, Poland*

T3-020 Investigation of a Current Controller in Synchronous Reference Frames for Inverter-Based Active Balancing of Single-Phase Railway Loads

*D. Hasenkopf, J. Xie, Department of energy conversion and storage, University of Ulm, Germany*

T3-023 Spice Dynamic Macromodel of PWM Controller with Selfheating Taken Into Account

*Janusz Zarębski, Krzysztof Górecki, Gdynia Maritime University, Department of Marine Radioelectronics, Poland*

T3-038 Control Of AC-DC Line Frequency Resonant Converter

*Kuno Janson, Jaan Järvi, Toomas Vinnal, Tallinn Technical University, Estonia*

## MD1.3: Topic 7: Sensing and Observing

Quiet Salon

### Session: Estimation in IM drives

T7-009 Neural Network Improvement of Model Reference Adaptive System in Induction Motor Drive  
*Jerzy Jelonekiewicz, Czestochowa University of Technology, Poland*

T7-010 Effect of Equation of Motion on Low-Frequency Impedance of Induction Motors – an Approach for Rotor Flux Angle Estimation  
*Veli-Matti Leppänen and Jorma Luomi, Helsinki University of Technology, Power Electronics Laboratory, Finland*

T7-020 Study of Methods for Induction Machine Torque Monitoring  
*Novák Jaroslav, Czech Technical University in Prague, Faculty of Mechanical Engineering, Czech Republic*  
*Gregora Stanislav, Schejbal Vladimír, University of Pardubice, Jan Perner Transport Faculty, Czech Republic*

T7-015 Torque Estimation In Industrial Control Systems With Ac Slip-Ring Motors  
*Fetah Kolonic, Alen Poljungan, University of Zagreb, Croatia*  
*Alojz Slutej, ABB Ind. Systems AB, Sweden*

### Session: Estimation in sensorless drives

T7-003 Sensor-Less Speed Control Based On Fuzzy Estimator  
*J. Català, L. Romeral, A. Arias and M.R. Chekkouri, Dep. of Electronic Engineering, Technical University of Catalonia, Spain*

T7-006 Sensorless Control System of PMSM with Modified Observer Structure  
*Konrad Urbański, Krzysztof Zawirski, Poznań University of Technology Institute of Industrial Electrical Engineering, Poland*

T7-011 Neural Network Based Tuning of Speed Observer For Control System of Induction Motor  
*Mirosław Włas, Zbigniew Krzemiński, Technical University of Gdańsk, Electrical and Control Engineering Faculty, Poland*

T7-018 Adaptive Equivalent Integrator for Flux Estimation in Wide Speed Range for Sensorless Control of AC Drives  
*Gheorghe Daniel Andreescu, "Politehnica" University of Timisoara, Automation and Industrial Informatics Department, Romania*

### Session: Sensing of phenomena

T7-002 Identification and Observation of Mechatronic Systems with unknown Nonlinear Dynamic Functions  
*Stefan Hofmann, Thomas Treichl, Dierk Schröder, Institute for Electrical Drive Systems, Technical University Munich, Germany*

T7-013 Detection of Squirrel-Cage Breaks in Induction Machines  
*Stjepan Štefanko, Marijan Bogut, Ivan Kurtović, KONČAR – Institut za elektrotehniku d.d. Zagreb, Croatia*

T7-014 Signal Testing and Diagnosing in CAN Communication Based Control Networks without PC  
*D. Fodor, T. Bencze, M. Molnár, K. Horváth, T. Göndör, Institute for Information Technology and Electrical Engineering, University of Veszprém, Hungary*  
*V. Hauptmann, Continental Teves AG & Co. oHG, Hungary*

T7-017 Application of extended Kalman filter for road condition estimation  
*Jadranko Matuško, Ivan Petrović, Nedjeljko Perić, University of Zagreb, Faculty of Electrical Engineering and Computing, Department of Control and Computer Engineering in Automation, Croatia*

## MD1.4: Topic 8: Electrical Machines and Actuators

Quiet Salon

### Session: Induction Motors and Drives

T8-001 Braking Operations of Electrical Drives Including Asynchronous Motors  
*D. Iannuzzi, E. Pagano, L. Piegari, University of Naples 'Federico II', Department of Electrical Engineering, Italy*  
*O. Veneri, Istituto Motori – National Research Council (CNR), Italy*

**T8-011 Application of Newton-Raphson Method Combined with Analytical Equations for Determination of the Induction Motor Equivalent Circuit Parameters**

*Vedran Boras, POWER UTILITY "EP HZ HERCEG-BOSNA", D.O.O. MOSTAR, Bosnia and Herzegovina  
Sead Berberovic, Faculty of Electrical Engineering and Computing, University of Zagreb, Croatia,*

**T8-012 Identification of Induction Motor Parameters from Free Acceleration Test Measurements**

*Martin Jadrić, Marin Despalatović, Božo Terzić, Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture, University of Split, Croatia*

**T8-015 Analysis of Squirrel Cage Induction Motor Performance Using a Prototype Based on DSP**

*João A. Moor Neto, Nelson C. de Jesus, Samir A. Mussa, Diorge Zambra, Fabiano Salvadori, Gideon Villar, UNIJUÍ-Universidade Regional do Noroeste do Estado do Rio Grande do Sul, Brasil*

**T8-021 A Simple Way to Lower Transient  $I^2R$  Losses in Small Induction Motor Drive**

*Jerzy Zadrozny, Jaroslaw Zadrozny, Electrotechnical Institute, Poland*

**T8-026 MMF of High Phase Order Induction Motors for Different Shapes of Supply Voltages and Currents**

*Jacek Grochowalski, Technical University of Szczecin, Instytut Elektrotechniki, Poland*

**T8-034 Torque Derivative Approach to the Direct Torque Control of Induction Motor**

*Miran Rodič, Karel Jezernik, University of Maribor, Faculty of Electrical Engineering and Computer Science, Slovenia*

**T8-035 Induction machine testing using PROFIBUS industrial communication network**

*Mario Vražić, Ivan Gašparac, Zoran Šimunić, University of Zagreb, Croatia*

**T8-063 A Predictive Voltage-Vector Selection Algorithm in Direct Torque Control of Induction Motor Drives**

*D. Casadei, C. Rossi, G. Serra, A. Tani, Università Degli Studi Di Bologna, Italy*

**T8-070 A Multipole Asynchronous machines with mutually immovable windings**

*V. Pugachov, N. Levin, Latvian Academy of Sciences, Institute of Physical Energetics, Latvia  
L. Ribickis, Riga Technical University, Latvia  
M. Manonov, Ventspils Fan Factory, Latvia*

**T8-072 Induction Motor Stator Faults Diagnosis using Neural Networks**

*Czeslaw T. Kowalski, Teresa Orłowska-Kowalska, Wrocław University Of Technology, Poland*

### **Session: Linear Motors and Drives**

**T8-020 Characterisation of Kouznetsov Single-Phase Oscillating Linear Parametric Motor**

*R. Abdessamed, D. Hedjazi, V. F Tomachevitch, LEB research laboratory – Section: Linear Electromagnetic Traction, Department of Electrical Engineering, Batna University, Algeria*

**T8-030 Some Considerations on the Design Method of A Linear Parametric Motor with Double Driving Surfaces**

*Kazumi Ishikawa, Tatuya Sekimoto, Shinki Kikuchi, Tohoku Gakuin University, Japan*

**T8-032 Computation of Magnetic Force Developed by Linear Synchronous Motors Based on Finite-Element Method**

*Ferenc Tóth, Norbert Szabó, University of Miskolc, Department of Electrical and Electronic Engineering, Hungary*

**T8-044 Design of a High Power Density Electromagnetic Actuator for a Portable Braille Display**

*Tiene Nobels, Kay Hameyer, Katholieke Universiteit Leuven, Belgium  
Frank Allemeersch, SENSOTEC N.V., Belgium*

### **Session: Identification, Modeling and Simulation**

**T8-023 Nonlinear Modelling of Switched Reluctance Motor**

*V. Trifa, O. Rabulea, L. Zarnescu, Technical University of Cluj-Napoca, Romania*

**T8-024 Determination of Parameters in Jiles-Atherton Model from the Family of Hysteresis Loops**

*Zdzisław Włodarski, Jadwiga Włodarska, Technical University of Szczecin, Poland*

**T8-025 Identification of the Parameters of Induction Machine**

*Naceri Farid, Faculty of Science Engineering, University of Batna, Algeria  
Abida Lazhar, Riyadh College of Technology, Saudi Arabia*

## Session: Synchronous and Reluctance Machines

T8-009 Magnetic field determination in a motor with slots using conformal mappings

*Miroslav Marković, Marcel Jufer, Laboratory of Integrated Actuators (LAI), Institute of Production and Robotics (IPR), Swiss Federal Institute of Technology (EPFL), Switzerland*

T8-010 Design Considerations of an Axial Flux Permanent Magnet Machine with U-Shaped Stator

*E. Peeters, P. Van Tichelen, Vito-Flemish Institute for Technological Research–Energy Technology, Belgium*

T8-038 Design rules for minimum cogging torque in a permanent magnet motor

*Ekaterina Bozeva, ABB Corporate Research, Sweden*

## MD1.5: Topic 9: Motion Control

Quiet Salon

### Session: Intelligent control

T9-024 Fuzzy-Logic Based State Selector for DTC of Induction Machine

*Milan Žalman, Ivica Kuric, Department of Automation and Control, STU Faculty of Electrical Engineering and Information, Slovakia*

T9-011 Intelligent soft starters for induction motors on the base of fuzzy logic control

*Valery Chrisanov, Power Electronics Dept., State University of Telecommunications, Russia  
Ryszard Brzesinski, Integrated Power Electronics Systems Dept., Technical University of Zielona Gora, Poland*

T9-065 Estimation of Induction Motor Variables Based on Artificial Neural Network

*Martin Borbel, Jaroslava Zilkova, Jaroslav Timko, Viliam Fedák, Technical University of Košice, Slovak Republic*

T9-025 Control of DC Drive Using Artificial Neural Networks

*Martin Kuchar, Pavel Brandstetter, VSB-Technical University of Ostrava, Czech Republic*

T9-042 Amphibious-Vehicle Control Method Based on Neural Network Estimation of Underwater Running-Resistance

*Kinjiro Yoshida, Abderrahmane Nafa, Department of Electrical and Electronic Systems Engineering, Graduate School of Information Science and Electrical Engineering, Kyushu University, Japan*

### Session: Adaptive and robust control

T9-017 Design of a Robust Position Controller for IPMSM by Hybrid Fuzzy Control and Maximum Torque per Input Current

*A. Aarefi, E. Abdi J., M. R. Zolghadri, and H. Oraee, Department of Electrical Engineering, Sharif University of Technology, Iran*

T9-032 Robust control of an induction machine: comparative study of H infinity synthesis and robust pole placement

*Cédric Duval, Guy Clerc, CEGELY-UCBL, (UMR CNRS 5005), France  
Jean Marie Retif, Xuafang Linshi, CEGELY-INSA, (UMR CNRS 5005), France  
Yann Legorrec, LAGEP-UCBL, (UMR CNRS 9007), France*

T9-043 Vector Sliding Mode Control of Sinusoidal-Field Synchronous Servo Drive

*I.Schmidt, K. Vincze, K. Veszprémi, Budapest University of Technology and Economics, Department of Electrical Machines and Drives, Hungary*

T9-052 Nonlinear Feedback Robot Arm Control

*P.Ph. Robet, Ecole Centrale de Nantes, GE44-LR2EP, I.U.T de Nantes, France  
M.Gautier, Ecole Centrale de Nantes, Institut de Recherche en Cybernétique de Nantes, France*

T9-055 H. Output Feedback Controller Design for AC Motor Control

*D. Fodor, L. Szalay, Institute for Information Technology and Electrical Engineering, Department of Automation, University of Veszprém, Hungary  
K. Biro, Technical University of Cluj, Dept. of Electrical Motors, Romania*

T9-063 Autotuning Controller with Backlash Compensation

*Tomislav Jukić, Agrokor d.d., Croatia  
Nedjeljko Perić, University of Zagreb, Croatia*

## Session: Optimal control

T9-013 A New Optimisation Algorithm of Position Estimation for Zero- and Low Speed Range Using Magnetic Saliency Method

*Dobrucky B., Filka R., Abdalmula M.A.R, University of Žilina, Faculty of Electrical Engineering, Slovak Republic  
Holcek R., Electrotechnical Research and Testing Institute, Slovak Republic*

T9-026 A Fuzzy Solution of Optimal Control Problem with the Quadratic Performance Criteria

*Marian Gaiceanu, Emil Rosu, Department of Electrical Engineering, "Dunarea de Jos" University of Galati, Romania*

T9-029 Asynchronous Machine Drive System with Multivariable Optimal Direct Torque Control

*Fabiano Salvadori, Gideon V. Leandro, Mauricio de Campos, Laboratorio de Eletronica de Potencia e Acionamentos Controlados – LEPAC, Departamento de Tecnologia – DeTEC, Universidade Regional do Noroeste do Estado do RGS - UNIJUI, Brasil*

*Joao A. Moor Neto, Nelson C. de Jesus, Laboratorio de Analise da Qualidade de Energia – LAQUEE, Departamento de Tecnologia – DeTEC, Universidade Regional do Noroeste do Estado do RGS - UNIJUI, Brasil*

T9-040 Analysis and Optimization of an Electronic Throttle for Linear Operating Modes

*Joško Deur, Danijel Pavković, Faculty of Mechanical Engineering and Naval Architecture, University of Zagreb, Croatia  
Nedjeljko Perić, Faculty of Electrical Engineering and Computing, University of Zagreb, Croatia  
Martin Jansz, Ford Motor Company Ltd., Product Development Europe, Dunton Technical Centre, United Kingdom*

T9-051 Linear Quadratic Optimal Control of an Electrical Servo Drive System

*Corneliu Botan, Florin Ostafi, Stefan Dumbrava, Alexandru Onea, Technical University of Iasi, Dept. of Automatic Control and Industrial Informatics, Romania*

## MD1.6: Topic 10: Mechatronic Systems

Quiet Salon

T10-002 Silicon Electrostatic Micromotor

*Sławomir Wiak, Institute of Electrical Machines and Transformers, Technical University of Lodz, Poland  
Piotr Dumania, Institute of Electron Technology, Poland  
Zbigniew Lisik, Zbigniew Szczepaniak, Institute of Electronics, Technical University of Lodz, Poland*

T10-003 Implementation of CAN communication protocol in autonomous mobile robot control

*Štefan Szabó, Brno University of Technology, Faculty of Mechanical Engineering, Czech Republic  
Vladislav Singule, Brno University of Technology, Faculty of Mechanical, Engineering, Czech Republic*

T10-005 Bearingless Electromechanical Actuator

*Juraj Wagner, Tomáš Boroš, Ján Lorenc, Alexander Dubček University of Trenčín Slovak Republic*

**TUESDAY, 10 SEPTEMBER 2002**

**KEYNOTE SESSION 2**

**Tuesday, 10 September 2002, 8:30-9:15**

**Congres Hall Ragusa**

Session Chairperson: *Roger Bassett, Alstom Research and Technology Centre, United Kingdom*

***Linear electric actuators and their control***

*Ion Boldea, University Politehnica Timisoara, Romania*

**SPECIAL SESSIONS**

**Tuesday, 10 September 2002, 9:20-11:15**

**TSS1-IN: Non Linear Dynamics in Power Electronics and Drives Congress**

**Hall Ragusa**

Session Chairpersons: *Luis Martínez-Salamero, Universitat Rovira i Virgili, Spain*  
*Oliver Woywode, Technische Universität Dresden, Germany*

**SSIN-03 Modelling and Instability of Average Current Control**

*Chung-Chieh Fang, Taiwan Semiconductor Manufacturing Co., Taiwan*

**SSIN-08 Bifurcation Phenomena in Three-phase Space Vector Modulated Converters**

*Zoltan Suto, Department of Automation and Applied Informatics, Budapest University of Technology and Economics, Hungary*

*Istvan Nagy, Department of Automation and Applied Informatics, Budapest University of Technology and Economics, Computer and Automation Research Institute, Hungarian Academy of Sciences, Hungary,*

**SSIN-09 Low speed sensorless control of a class of electrical machine**

*A. Astolfi, Electrical Engineering Department, Imperial College, United Kingdom*

*R. Ortega, Laboratoire des Signaux et Systemes, Supélec Plateau de Moulon, France*

*M. B. Becherif, Laboratoire des Signaux et Systemes, Laboratoire de Genie Electrique de Paris, Supélec Plateau de Moulon, France*

**SSIN-10 Stability Analysis and Bifurcations of Switching Regulators with PI and Sliding Mode Control**

*Abdelali El Aroudi, Mohamed Debbat, Javier Calvente, Roberto Giral, Luis Martínez-Salamero, Departament d'Enginyeria Electrònica, Elèctrica i Automàtica, Universitat Rovira i Virgili, Spain*

*Gerard Olivar, Departament de Matemàtica Aplicada 4, Universitat Politècnica de Catalunya, Spain*

**SSIN-05 Bifurcation Phenomena in a Sliding-Mode Controlled Boost Converter**

*Gerard Olivar, Carles Batlle, Alicia Miralles, Imma Massana, Yolanda Zúñiga, Technical University of Catalonia, UPC, Spain*

**TSS2-AC: Non Model-Based Zero Speed Sensorless Control Techniques for AC Motor Drives**

**Salon Orlando**

Session Chairpersons: *Alfio Consoli, Università di Catania, Italy*

*Dušan Drevenšek, University of Maribor, Slovenia*

**SSAC-02 A Study of Sensorless Control of Induction Motor at Zero Speed Utilizing High Frequency Voltage Injection**

*Dušan Drevenšek, University of Maribor, Faculty of Electrical Engineering and Computer Science, Slovenia*

*Damir Žarko, Thomas A. Lipo, University of Wisconsin – Madison, Department of Electrical and Computer Engineering, USA*

**SSAC-03 Sensorless Rotor Position Control in a Surface Mounted PM Machine Using HF Voltage Injection**

*C. Silva, G. M. Asher, M. Sumner and K.J. Bradley, School of Electrical and Electronic Engineering, University of Nottingham, England*

**SSAC-04 Slot Geometry - an Important Design Parameter for Zero Speed Sensorless Control of Standard Induction Machines**

*Thomas M. Wolbank, Reinhard Woehrschimmel, Juergen L. Machl, Department of Electrical Machines and Drives, Vienna University of Technology, Austria*

SSAC-05 An alternative to HF current detection techniques for zero speed sensorless control of AC motor drives

*A. Consoli, G. Scarcella, A. Testa, University of Catania, Italy*

### **TSS3-JAF: Packing and Integration of Power Electronic Converters**

**Congress Hall Libertas**

Session Chairpersons: *J. A. Ferreira, Delft University of Technology, The Netherlands*

*J. D. van Wyk, Virginia Polytechnic Institute and State University, USA*

SSJAF-01 The Development Of Planar High Density Hybrid Integration Technologies For Power Electronics

*J. D. van Wyk, S. Wen, Z. Liang, J. T. Strydom, S-Y. Lee, W. G. Odendaal, D.W. Huff, National Science Foundation Engineering Research Center for Power Electronics Systems, Virginia Polytechnic Institute and State University, USA*

SSJAF-02 High Power Densities with Three Dimensional Integration

*J. A. Ferreira, Electrical Power Processing Group, IIS Faculty, Delft University of Technology, The Netherlands*

SSJAF-03 Technologies for Passive Component Integration in Power Conversion

*Terence O'Donnell, Stephen O'Reilly, Paul McCloskey, PEI Technologies, Ireland*

*Cian O'Mathuna, PEI Technologies, National Microelectronics Research Centre, Ireland*

SSJAF-04 Comparison of spray cooling with direct liquid base-plate flow convection of IGBT power modules

*G. Mitic, W. Kiffe, G. Lefranc, S. Ramming, Siemens AG, Corporate Technology Department, Germany*

*D.E. Tilton, B.A. Smetana, T.D. Weir, Isothermal Systems Research, USA*

SSJAF-05 Integrated Multidisciplinary Modeling, Analysis and Design in Power Electronics

*Dushan Boroyevich and Jonah Z. Chen, Center for Power Electronics Systems – CPES, The Bradley Department of Electrical and Computer Engineering, Virginia Polytechnic Institute & State University, USA*

### **TSS4-JB Special Session on Multilevel Converters**

**Salon Bobara**

Session Chairpersons: *Josep Bordonau, Universitat Politècnica de Catalunya, Spain*

*Nikola Celanovic, ABB Switzerland LTD, Switzerland*

SSJB-01 Medium Voltage Converters, A Cost Effective Solution for Multi Megawatt Wind Power Turbines

*Nikola Celanovic, ABB Switzerland LTD, Corporate Research, Switzerland*

*Oscar Apeldoorn, Peter K. Steimer, Jürgen K. Steinke, ABB Switzerland LTD, Automation Technology Products, Switzerland*

SSJB-02 Three-Level Front-End Converters for Distributed Power Systems

*Peter Barbosa, Francisco Canales, Seong-Jeub Jeon and Fred C. Lee, Center for Power Electronics Systems, The Bradley Department of Electrical and Computer Engineering, Virginia Polytechnic Institute and State University, USA*

SSJB-03 Control of Three-Level VSI using LQR-based Gain-Scheduling Technique for the Regulation of the DC-Link and the Output Voltages

*Salvador Alepuz, Mataro School of Engineering, Spain*

*Joan Salaet, Escola Universitària Politècnica de Manresa, Spain*

*Josep Bordonau, Juan Peracaula, Dept. of Electronic Engineering – Universitat Politècnica de Catalunya, Spain*

SSJB-04 Generalized, Versatile Sine Triangle Comparison PWM Scheme Based upon A Space Vector Scheme for Three-Level Topology

*Dognsheng Zhou, Rockwell Automation, USA*

*Vladimir Blasko, Otis Elevator Co., USA*

*Josep Bordonau, Universitat Politècnica de Catalunya, Dept. of Electronic Engineering, Spain*

## SPECIAL SESSIONS

Tuesday, 9 September 2002, 11:30-13:30

### TSS5-GA Special Session on Sliding Mode Control of Drives

Congress Hall Ragusa

Session Chairpersons: *Greg Asher, University of Nottingham, United Kingdom*  
*Stefan Brock, Poznań University of Technology, Poland*

#### SSGA-01 Sliding-Mode Torque Control and Observer Design for an Induction Machine

*Fang Chen, Matthew W. Dunnigan, Department of Computing & Electrical Engineering, Heriot-Watt University, United Kingdom*

#### SSGA-02 Sliding Mode Approach in Speed Sensorless Control of an Induction Motor

*Karel Jezernik, Gregor Edelbaher, University of Maribor, Faculty of Electrical Engineering and Computer Science, Slovenia*  
*Asif Šabanović, Sabanci University, Faculty of Engineering and Natural Sciences, Turkey*

#### SSGA-04 Integral Variable Structure Controller for a Variable Speed Induction Generator Driven by a Wind Turbine

*Daniel Sbarbaro, University of Concepción, Chile*  
*Roberto Cárdenas, Rubén Pena, University of Magallanes, Chile*

#### SSGA-05 A modified approach to the design of robust speed and position control of servo drives

*Stefan Brock, Jan Deskur, Krzysztof Zawirski, Poznań University of Technology, Faculty of Electrical Engineering, Poland*

#### SSGA-07 Shifted sliding surface for a DC motor drive

*Franck Betin, Arnaud Sivert, Daniel Pinchon, Institut Universitaire de Technologie de l'Aisne – CREA, France*

### TSS6-LS: State of the Art of Switching Power Conversion

Salon Orlando

Session Chairpersons: *Luis Martínez-Salamero, Universitat Rovira i Virgili, Spain*  
*Miro Milanović, University of Maribor, Slovenia*

#### SSLS-01 Design of a Boost Push-Pull Converter with Output Filter

*J. Calvente, E. Vidal-Idiarte, H. Valderrama, P. Garcés, L. Martínez-Salamero, Departament d'Enginyeria, Electrònica, Elèctrica i Automàtica, Escola Tècnica Superior d'Enginyeria. – Universitat Rovira i Virgili, Spain*

#### SSLS-02 Control and Small-Signal Modelling of Resonant Link Converter

*Miro Milanovic, Faculty of Electrical Engineering and Computer Sciences, University of Maribor, Slovenia*  
*Robert Kovacic, IPS d.o.o., Research and Design Department, Slovenia*

#### SSLS-03 Sliding Mode Design of Distributed Circular Chain Control Strategy for Parallel- Connected Inverters

*Rafael Ramos, Domingo Biel, Dpt. d'Enginyeria Electrònica, EUPVG. UPC., Spain*  
*Francesc Guinjoan, Dpt. d'Enginyeria Electrònica, ETSETB. UPC., Spain*  
*Enric Fossas, Institut d'Organització i Control de Sistemes, ETSEIB. UPC., Spain*

#### SSLS-04 Design of Power Converters for New Low Power Applications

*Bruno Estibals, Corinne Alonso, LAAS – CNRS, Laboratoire d'Analyse et d'Architecture des Systèmes, France*

#### SSLS-05 An overview of MPPT controls and their future developments

*Corinne Alonso, Bruno Estibals, LAAS – CNRS, Laboratoire d'Analyse et d'Architecture des Systèmes, France*  
*Hugo Valderrama-Blavi, Escola Tècnica Superior d'Enginyeria, Departament d'Enginyeria Electrònica, Elèctrica i Automàtica - Universitat Rovira i Virgili, Spain*

### TSS7-PB: Windenergy and Offshore Windparks

Salon Bobara

Session Chairpersons: *Pavol Bauer, Delft University of Technology, Netherlands*  
*Athanassios N. Safacas, University of Patras, Greece*

#### SSPB-01 Windenergy and Offshore Windparks: State of the Art and Trends

*Pavol Bauer, S. W. H. de Haan, M. Dubois, Delft University of Technology, Netherlands*

SSPB-02 Sensorless Direct Power Control of a Doubly Fed Induction Generator for Variable Speed Wind Turbines

*Santiago Arnalte, Jose Rodriguez- Amenedo, Universidad Carlos III de Madrid, Spain*

SSPB-03 Comparison of the energy yield of wind turbines with individual AC/DC/AC converters and wind turbines connected to a common AC/DC/AC converter

*Nusimovich, Polytechnic University Catalunya, Spain*

*S.W.H. de Haan, Delft University of Technology, The Netherlands*

SSPB-04 Reliability Study of The Synchronous Machine Variables at The Junction of WECS to a Weak Energy Grid Under Different Wind Velocities

*Evangelos C. Tsimplotsephanakis, Athanassios N. Safacas, Electromechanical Energy Conversion Laboratory, Department of Electrical and Computer Engineering, University of Patras, Greece*

SSPB-06 Modeling and simulation of hybrid wind-photovoltaic generating system

*Yann Pankow, Ludovic Leclercq, Benoît Robyns, Laboratoire d'Electrotechnique et d'Electronique de Puissance de Lille (L2EP), Ecole des Hautes Etudes Industrielles (HEI), France*

*Bruno François, Laboratoire d'Electrotechnique et d'Electronique de Puissance de Lille (L2EP), Ecole Centrale de Lille, France*

SSPB-05 Reliability Normalization of Autonomous System for Transforming the Wind's Energy in Electrical

*Neli G. Georgieva, Anton Sl. Georgiev, Department of Electronics, Faculty of Electronics, Technical University of Varna, Varna, Bulgaria*

*Rozalina S. Dimova, Department of Telecommunications, Faculty of Electronics, Technical University of Varna, Bulgaria*

### **TSS8-JWK Special Session on Matrix Converters**

**Congress Hall Libertas**

Session Chairpersons: *Johann Walter Kolar, ETH Zurich, Switzerland*

*Okuma Yasuhiro, Fuji Electric Corporate Research and Development LTD, Japan*

SSJWK-01 Commutation Strategies for PWM Rectifier of Converter without DC Link Components for Induction Motor Drive

*Katsuji Shinohara, Kenichi Iimori, Yoichi Matsusita, Department of Electrical and Electronic Engineering, Faculty of Engineering, Kagoshima University*

*Mitsuhiro Muroya, Kagoshima National College of Technology, Japan*

SSJWK-02 Rectifier based robust control of bidirectional switches in AC-AC matrix converters

*Marcus Ziegler, Wilfried Hofmann, Chemnitz University of Technology, Department of Electrical Machines and Drives, Germany*

SSJWK-03 Analytically Closed Calculation of the Conduction and Switching Losses of Three-Phase AC-AC Sparse Matrix Converters

*F. Schafmeister, J.W. Kolar, ETH Zurich, Power Electronic Systems Laboratory, Switzerland*

*M. Baumann, Vienna University of Technology, Dept. of Electrical Drives and Machines, Austria*

SSJWK-04 Implementation of a Matrix Converter Space Vector Control in Programmable Logic

*Jorg Weigold, Jochen Mahlein, Jens Igney, Universitat Karlsruhe (TH), Elektrotechnisches Institut, Germany*

*Olaf Simon, Siemens AG, Germany*

## DIALOGUE SESSION

**Tuesday, 10 September 2002, 14:45-16:45**

**Session Chairpersons:** *Joško Deur, University of Zagreb, Croatia*  
*Alexander Thaler, University of Leoben, Austria*

### TD2.1: Topic 1: Power Converters

Quiet Salon

T1-001 Fixed Frequency PWM High Frequency Inverter for Induction Heating using SIT

*Hiroyuki Ogiwara, Ashikaga Institute of Technology, Japan*  
*Mutsuo Nakaoka, Yamaguchi University, Japan*

T1-006 Static Sources for Railway Passenger Wagons

*Vasile Radulescu, Ioan Strainescu, Viorica Serbu, Leonard Moroianu, Florin Huzlau, Florin Bozas, Sergiu Gheorghe, Emil Tudor, Darius Vizireanu, Catalin Goia, ICPE - SAERP SA, Romania*

T1-007 Converter for Mains Supply -Low-Priced and Intelligent

*Stefan Soter, Stefan Buchhold, Faculty of Electrotechnics, University Dortmund, Germany*

T1-015 Bidirectional isolated DC/DC converter for energy storage integration in modular photovoltaic systems

*Dirk Fischer, Rudolf Mecke, Christian Rathge, Institut f. Automation u. Kommunikation Magdeburg, Germany*

T1-017 Control Strategy Of A Solar Power Inverter (Analysis of a Fifth Order System-III)

*K. H. Edlmoser, F. A. Himmelstoss, Technical University of Vienna, Institute of Electrical Drives and Machines, Austria*

T1-025 Current Fedded Full Bridge Multiresonant Converter

*Stanislaw Jalbrzykowski, Tadeusz Citko, Bialystok Technical University, Dep. of Power Electronic and Electrical Drives, Poland*

T1-027 High frequency low voltage AC Common bus to feed power converters for vehicle application

*F. Gustin, A. Berthon, L2ES/ IGE, France*

T1-032 High Voltage Pulse Generator

*Marko Petkovšek, Janez Nastran, Danijel Vončina, Peter Zajec, Damijan Miklavčič, University of Ljubljana, Faculty of Electrical Engineering, Slovenia*  
*Gregor Serša, Institute of Oncology, Department of Tumor Biology, Slovenia*

T1-040 Comparison between Hard and Soft Switched DC/AC Converters for usage in Uninterruptible Power Supplies

*Folker Renken, SiemensVDO Automotive AG, Automotive Systems Power Train, Germany*  
*Michael Patt, University of the Federal Armed Forces Germany, Power Electronics, Germany*

T1-041 A Two Level Power Conversion for High Voltage DC Power Supply for Pulse Load Applications

*N. Vishwanathan, V. Ramanarayanan, Power Electronics Group, Dept. of Electrical Engineering, Indian Institute of Science, India.*

T1-044 Comparative Consideration of Some Auxiliary Resonant DC Link Snubbers for Three Phase Soft Switching Inverter

*Yoshihiko Hirota, Eiji Hiraki, Mutsuo Nakaoka, Yamaguchi University, Japan*  
*Shigeyuki Sugimoto, Shigeaki Ogawa, Chubu Electric Power Co., Inc. Electric Power R& D Center, Japan*

T1-053 IGBT Battery Charger 150A, 24V For Tram

*Neven Čobanov, Končar – Institut za elektrotehniku d.d. Zagreb, Croatia*  
*Želimir Ivanović, ZET d.o.o. Zagreb, Croatia*

T1-058 Train-Heating Converter

*Nenad Rister, Josip Ungarov, Neven Čobanov, Boris Furčić, KONČAR - Institute of Electrical Engineering, Zagreb, Croatia*

T1-014 Analytical Power Loss Expressions for Diode Clamped Converters

*Richard Lund, Jonas Beverfjord, Sigurd Øvrebø, Roy Nilsen, Energy Conversion Group, Department of Electrical Power Engineering, Norwegian University of Science and Technology, Norway*

T1-019 Overlapping Current Commutation Inductor Snubber assisted Series Resonant Soft Switching PFM DC-DC Converter with High Frequency Transformer Link and Voltage Multiplier for Magnetron Drive

*Takeshi Myoi, Manabu Ishitobi, Mutsuo Nakaoka, Yamaguchi University, Japan*

T1-028 Power losses evaluation of the half bridge configuration parallel-loaded resonant DC-DC converter controlled with constant frequency

*Wojciech Wojtkowski, Bialystok Technical University, Poland*

T1-035 Analysis of a lossless snubber for BIFRED and BIBRED

*Vesa Tuomainen, Jorma Kyyrä, Institute of intelligent Power Electronics, Helsinki University of Technology, Finland*

T1-036 Improved switching condition for a Forward with Active Clamp

*Vesa Tuomainen, Jorma Kyyrä, Institute of intelligent Power Electronics, Helsinki University of Technology, Finland*

T1-037 Efficiency of a Voltage Sourced Inverter with Controllable Intermediate DC-Voltage

*Paulo Pinho, Jorma Kyyrä, Helsinki University of Technology, Laboratory of Power Electronics, Finland*

T1-050 Consideration of Converter Losses and Generated Harmonics in VSC-HVDC

*C. Takahashi, H. Kishibe, H. Sato, Japan, Hiroo Konishi, Hitachi Ltd, Japan*

T1-057 A Simple Power Loss Estimation Method for Soft Switching and Hard Switching Power Conversion System

*Eiji Hiraki, Mutsuo Nakaoka, Dept. of Electrical and Electronic Engineering, Yamaguchi University, Japan*

T1-023 Coupled inductors method for current ripple minimising in modular converters

*Maria Stefania Carmeli, Francesco Castelli Dezza, Gabrio Superti-Furga, Politecnico di Milano, Italy*

T1-039 A Modular High Power DC-DC Converter with Democratic Current-Sharing

*Henry Güldner, Frank Eckholz, Henrik Wolf, Jan Losansky, Dresden University of Technology, Power Electronics, Germany*

T1-061 Structure and Design of High Power Chopper for DC arc furnace

*Philippe Ladoux, Cyrille Bas, H. Foch, Laboratoire d'Electrotechnique et d'Electronique Industrielle, Unité Mixte de Recherche INPT-ENSEEIH / CNRS, France Jacques Nuns, EDF Division Recherche et Développement, France*

## **TD2.2: Topic 4: Electromagnetic Compatibility**

**Quiet Salon**

### **Session: Electromagnetic Emission**

T4-002 Conducted emissions of electronic power sources for resistance welding

*Hubert Mecke, Reinhard Doebbelin, Thoralf Winkler, Otto-von-Guericke-Universitaet Magdeburg, Institute of Electric Power Systems, Germany*

T4-006 Impact of ASD EMI Emissions on Wireless Communications

*Gordan Šišul, Drago Ban, Borivoj Modlic, University of Zagreb, Croatia*

T4-014 Magnetic Field Distribution in GMR Sensor Structure and Sensors Application Aspects

*Vladimír Áč, Marián Miller, Faculty of Mechatronics, University of Alexander Dubček in Trenčín, Slovakia*

### **Session: Electromagnetic Interference**

T4-001 The Influence of Certain PWM Methods on the Quality of Input Energy of the Asynchronous Motor and Frequency Converters Driving System

*Mihaela Popescu, Alexandru Bitoleanu, Electric Drives and Power Electronics Department, Faculty for Electromechanical Engineering, University of Craiova, Romania*

T4-009 The Wavelet Analysis of Electrical Impulse Phenomena

*Ondrej Smotlacha, Jaroslav Zacek, Czech Technical University in Prague, Faculty of Electrical Engineering, Czech Republic*

**Session: General Section**

T4-004 New Power Quality Assessment Indices for Three-Phase Four-Wire Systems Under Unbalanced and Non-Sinusoidal Conditions

*Antonio Dell'Aquila, Maria Marinelli, Vito Giuseppe Monopoli, Pericle Zanchetta, Dipartimento di Elettrotecnica ed Elettronica - Politecnico di Bari, Italy*

T4-005 Total harmonic current of a large number of non-linear single phase loads

*Jan Desmet, Isabel Sweertvaegher, Greet Vanalme, Hogeschool West - Vlaanderen, Dept. P. I. H., Belgium  
Ronnie Belmans, K. U. Leuven, Dept. ESAT/ELEN, Belgium*

T4-007 A DSP Based System for Power Quality Indexes Determination Under Non-Sinusoidal Conditions

*F. Magnago, S. Lovera, A. Costanzo, Facultad de Ingeniería - Universidad Nacional de Río Cuarto, Argentina*

T4-011 Reducing Costs for a Fuzzy Controlled Shunt Active Filter under Non-Sinusoidal Conditions

*Antonio Dell'Aquila, Agostino Lecci, Vito Giuseppe Monopoli, Dipartimento di Elettrotecnica ed Elettronica - Politecnico di Bari, Italy*

**TD2.3: Topic 6: Sensing and Observing**

**Quiet Salon**

T6-002 A Novel Stand-Alone Single-Phase Induction Generator Using a Three-Phase Machine and a Single-Phase PWM Inverter

*J. Soltani, N. R. Abjadi, Faculty of Electrical and Computer Engineering, Isfahan University of Tech., Iran*

T6-004 Investigations on the effect of field weakening on the efficiency of generators for wind turbines

*I. Nusimovich, Polytechnic University Catalunya, Spain  
S.W.H. de Haan, J.G. Sloopweg, H. Polinder, Delft University Of Technology, The Netherlands*

T6-006 Self-commutated Flicker Compensator applying Flat-packaged IGBT

*Kansuke Fujii, Shigeo Konishi, Fuji Electric Corporate Research and Development, Ltd., Japan  
Masashi Kato, Fuji Electric Co., Ltd, Japan  
Katsuya Uto, Fuji Electric Systems Co., Ltd., Japan*

T6-007 Comparison of DC/DC Converter Topologies with, and without Transformer

*M. Pavlovsky, S. W. H. de Haan, J. A. Ferreira, Delft University of Technology, Electrical Power Processing, The Netherlands*

T6-010 Results of a Novel Failure Proof Control and Power Section for Rotating System Tie Frequency Converters

*A. Schmidhofer, H. Weiss, O. Droegsler, University of Leoben, Austria*

T6-012 Active Power Filters for Suppression of Line Current and Voltage Harmonics

*Pavel Brandstetter, Tomas Mlcak, VSB-Technical University of Ostrava, Department of Power Electronics and Electrical Drives, Czech Republic*

T6-013 Three-Phase Shunt Active Power Filter Using IGBT Based Voltage Source Inverter

*Tomislav Kilić, Stanko Milun, Faculty of Electrical Engineering and Machine Engineering and Naval Architecture, University of Split, Croatia*

T6-016 Digital Control Circuit for Current-Fed Active Power Filter

*Krzysztof Sozański, Ryszard Strzelecki, University of Zielona Góra, Institute of Electrical Engineering, Poland*

T6-017 PWM Inverter Matches Generator conductance For Maximum Power Transfer In Grid-connected Photovoltaic Systems

*Franco Quarona, Federico Scapino, Filippo Spertino, Politecnico di Torino, Dept. of Electrical Engineering, Italy*

**T6-018 Selection of the Parallel Active Filter's Power Rating When it is Applied in Distribution Systems**

*Ryszard Strzelecki, Grzegorz Benysek, Institute of Electrical Engineering, Poland*

*Henryk Supronowicz, Warsaw University of Technology, Institute of Control and Industrial Electronics, Poland*

*Jacek Bojarski, University of Zielona Góra, Institute of Mathematics, Poland*

*Marius Klytta, University of Applied Sciences, Faculty of Electrical Engineering, Germany*

**T6-022 Fuzzy logic based control of a flywheel energy storage system based on an induction machine associated with wind and diesel generators**

*Ludovic Leclercq, Benoit Robyns, Laboratoire d'Electrotechnique et d'Electronique de Puissance de Lille, Ecole des Hautes Etudes Industrielles (HEI), France*

*Jean-Michel Grave, Forclum Ingenierie, France*

**T6-023 Characteristics of High-speed Phase Shifter at Demand Side during Load Fluctuation**

*Kenji Kameshima, Jumpei Baba, Katsuhiko Shutoh, Eisuke Masada, Science University of Tokyo, Japan*

**T6-024 Control Method of Power Units with Compensation for Unbalanced Load**

*Luděk Schreier, Miroslav Chomát, Jiří Bendl, Institute of Electrical Engineering ASCR, Czech Republic*

**T6-026 Excitation System with Microprocessor Based Twin-Channel Voltage Regulator for Synchronous Machines**

*Vinko Ćesić, Mladen Kajari, Siniša Marijan, Končar - Institut za elektrotehniku, d.d. Zagreb, Croatia*

*Zvonko Jurin, Marin Kolić, Končar - Elektronika i informatika, d.d. Zagreb, Croatia*

**T6-030 Single Phase Active Power Line Conditioners without Transformers**

*Meckien Grzegorz, University of Technology and Agriculture, Institute of Electrical Engineering, Poland*

*Strzelecki Ryszard, Technical University of Zielona Gora, Institute of Industrial Electrical Engineering, Poland*

**T6-032 Neural Network-Based Controller for an Active Power Filter**

*Bogoslav Swiatek, Zbigniew Hanzelka, University of Mining and Metallurgy, Poland*

**T6-046 Digital Control System Of A Synchronous Generator**

*Gorislav Erceg, Tomislav Idžoić, Nikola Tonković, University of Zagreb, Croatia*

**T6-047 An Analysis Of Voltage Sags Ride-Through Methods For Modern AC Drives**

*Vladimir Katić, Milan Hajder, University of Novi Sad, Yugoslavia*

*Dejan Raca, University of Wisconsin-Madison, USA*

**TD2.4: Topic 8: Electrical Machines and Actuators**

**Quiet Salon**

**Session: Permanent Magnet Servomotors**

**T8-003 Effects of Stator and Rotor Slotings On The Performance of A New Type of Converter-fed Synchronous Motor drive/system**

*J.Soltani, N. R. Abjadi, Faculty of Electrical and Computer Engg., Iran*

**T8-029 Implementation of Fuzzy Controller for DC-Servo Drive Using a Low-cost Microcontroller**

*Sinan Pravadalioğlu, Dokuz Eylül University, I.M.Y.O., Control Sys. Dept.*

*Eyüp Akpınar, Dokuz Eylül University, Dept. of Electrical and Electronics, Turkey*

**T8-041 Low-Noise EC Motor with External Rotor for Automotive Application**

*Michael Schier, Andrés Lelkes, ebm Werke GmbH & Co. KG, Germany*

**T8-045 Genetic algorithm based design of current controllers for a PMSM**

*P.-O. Nyman, W. Sulkowski, T. Dragset, D. Samuelsen, Narvik Institute of Technology, Norway*

**T8-050 PM Coreless type Surface Motor**

*Hiroyuki Ohsaki, The University of Tokyo, Department of Advanced Energy, Graduate School of Frontier Sciences, Japan*

**T8-053 Torque Ripple Reduction by Optimal Power Supply for Saturated Synchronous Motors**

*Guy Sturtzer, Damien Flieller, ERGE, ENSAIS, France*

T8-059 Direct Torque Control with Space Vector Modulation (DTC-SVM) for Permanent Magnet Synchronous Motor (PMSM)

*Dariusz Swierczynski, Marian Kazmierkowski, Dept. of El. Eng, University of Warsaw, Poland  
Frede Blaabjerg, Dept. of El. Eng, University of Aalborg, Denmark*

T8-060 Analysis of a Single-Sided Linear Induction Motor Drive Performance

*Rastko Fišer, Miroslav Bugeza, Faculty of Electrical Engineering, Slovenia*

T8-067 High performance permanent magnet synchronous machines for traction applications

*Franz Aschenbrenner, Peter Woditschka, Department of Electrical Engineering, Austria*

T8-068 Compact Motors and Drives for Electric Vehicles

*Gyula Knerczner, Lóránt Nagy, Budapest Polytechnic, Kandó Faculty of Electrical Engineering, Institute of Automation, Hungary  
Sándor Peresztegi, Delco Remy Hungary Kft, Hungary  
Tamás Mező, Péter Korondi, Budapest Univ. of Technology and Economics, Dept. of Automation and Applied Informatics, Hungary*

### **Session: General Section**

T8-058 Induction generator output voltage and frequency stabilization

*A. S. Zein El Din, A. E. El Sabbe, Department of Electrical Engineering, Faculty of Engineering, Shebin El Kom, Minoufiya University, Egypt*

T8-066 Electro Magnetic Variation Controlled Gear with Integrated Clutch Function

*Rudolf Surtmann, HTL–Moessingerstrasse Klagenfurt, Austria  
Alexander Thaler, University of Leoben, Department of Electrical Engineering, Austria*

T8-069 Torsional Dynamics of Generator-Units for Feeding Induction Motor Drives

*Marija Mirosevic, Mateo Milkovic, Polytechnic of Dubrovnik, Croatia  
Zlatko Maljkovic, University of Zagreb, Croatia*

### **TD2.5: Topic 9: Motion Control**

**Quiet Salon**

#### **Section: Induction Motor control**

T9-005 Direct Torque Control of Induction Motor with Stator Flux Correction

*Dubravko Krušelj, Mario Bilić, Miroslav Vučetić, Vladimir Siladi, Boris Furčić, KONČAR - Institute of Electrical Engineering, Zagreb, Croatia*

T9-021 Induction Motor Control with Parallel Speed and Stator Resistance Mras Based Estimation

*Veran Vasić, Reljić Dejan, Faculty of Engineering, Novi Sad, Yugoslavia  
Slobodan Vukosavić, Faculty of Electrical Engineering, Belgrade, Yugoslavia*

T9-038 The Analysis of Direct Torque Control Induction Drive Microtransients

*M.A.Averyanov, E.I.Barats, I.Ya.Braslavsky, Z.Sh.Ishmatov, A.V.Kostylev, Ural State Technical University, Russia*

T9-039 The Influence of the Rotor Resistance Changes on the Global Stability of Indirect Field-Oriented Drive Systems

*Marian Dubowski, Andrzej Andrzejewski, Bialystok Technical University, Dep. of Power Electronics and Electrical Drives, Poland*

T9-045 An Extended Sliding Mode Observer for Control of an Induction Motor

*X. Lin-Shi, J. M. Retif, O. Asseu, CEGELY-INSA (UMR CNRS 5005), France  
D. Duval, G. Clerc, CEGELY-UCBL (UMR CNRS 5005), France*

T9-048 Vector Control Systems of Tandem Converter Fed Asynchronous Motor for Rapid Prototyping with Module Library

*Maria Imecs, Ioan I. Incze, Csaba Szabó, Radu Munteanu, Technical University of Cluj-Napoca, Romania  
József Vásárhelyi, University of Miskolc, Hungary*

T9-073 Reduction of Secondary Saliencies for Improved Sensorless Control of Induction Machines using HF Injection

*C. Caruana, G. M. Asher, K. J. Bradley, University of Nottingham, United Kingdom*

## Session: AC drives

### T9-010 Output Power Control Algorithms in Switched Reluctance Drives

*Mikhail Bychkov, Alexander Krasovsky, Moscow Power Engineering Institute, Bauman Moscow State Technical University, Russia*

### T9-049 Introduction of Stored Energy Variation Factor (SEVF) in Switched Reluctance Motor Drive

*K. W. E. Cheng, X. D. Xue, S. L. Ho, and Y. Lu, Department of Electrical Engineering, The Hong Kong Polytechnic University, Hong Kong*

### T9-050 Exploring Zero voltage switching in SRM drive design

*Y.P.B.Yeung, K.W.E.Cheng, D.Sutanto, S.L.Ho and Y.Lu, Department of Electrical Engineering, The Hong Kong Polytechnic University, Hong Kong*

### T9-016 Application of Model Algorithmic Control to AC Servo Drives

*Ge Baoming, Wang Xiangheng, Su Pengsheng, Tsinghua University, Beijing, P.R. China  
Zheng Hongtao, Jiang Jingping, Zhejiang University, Hangzhou, P.R. China*

### T9-061 Sliding Mode Technique for AC Drive

*Sergy Ryzkin, Institute of Control Sciences, Russian Academy of Sciences, Russia*

### T9-047 Field Weakening Operation of a Sinusoidal Field Synchronous Servo Drive with d-q Current Controllers

*Dezső Bakos, I. Shmidt, K. Veszpremi, K. Vincze, Budapest University of Technology and Economics, Department of Electrical Machines and Drives, Hungary*

## Session: Sensorless control

### T9-019 Single Controller Current-Sensorless Speed Control of PMSM Using the Inverse Drive Model

*Hafedh Sammoud, Walter Schumacher, Institute of Control Engineering, Technical University Braunschweig, Germany*

### T9-046 Sensorless Control of Double Fed Machine for Wind Power Generators

*Bogalecka E., Maritime University Gdynia, Poland  
Krzemiński Z., Gdańsk University of Technology, Poland*

### T9-053 Sensorless torque control of permanent magnet synchronous machines over the whole operation range

*Jürgen Kiel, Stephan Beineke, LUST-Antriebstechnik, Germany  
Andreas Bünte, LUST-Drivetrionics, Germany*

### T9-054 Extended Kalman Filter Based Speed Sensorless AC Motor Control With Parameter Estimation

*D. Fodor, Sz. Vajda, University of Veszprém, Institute for Information Technology and Electrical Engineering, Department of Automation, Hungary  
K. Bíró, Technical University of Cluj, Dept. of Electrical Motors, Romania*

## Session: Linear drives and motion control

### T9-004 Power Supply Concept of the Longstator Linear Motor of the NBP-Test Track

*Andreas Pottharst, Markus Henke, Horst Grotstollen, University of Paderborn, Institute for Power Electronics and Electrical Drives, Germany*

### T9-069 Controlled Linear Electric Drives

*Algimantas Poška, Roma Rinkevičienė, Zita Savickienė, Vilnius Gediminas Technical University, Lithuania*

### T9-034 A Novel Approach to Step Drive Design Using a Concentrated Parameter Multi-Domain Modeling Approach Including Cogging Torques

*Haedrich Olaf, Pohl Andreas, Schulze Manfred, Zwickau University of Applied Sciences, Department of Electrical Engineering, Germany*

### T9-001 Two Reliable Methods for Estimating the Mechanical Parameters of a Rotating Three-Inertia System

*Ingo Mueller, Peter Mutschler, Department of Power Electronics and Control of Drives, Germany*

### T9-008 A Digital Speed Filter for Motion Control Drives with a Low Resolution Position Encoder

*Armando Bellini, Stefano Bifaretti, Stefano Costantini, Department of Electronic Engineering, University of Rome "Tor Vergata", Italy*

## **Session: Traction and motion control**

T9-020 Concerning designing of model of hopping apparatus

*Vladimir B. Larin, Vladimir M. Mtiyasevich, Institute of Mechanics AS, Ukraine*

T9-037 Motion Control of a Bogie with Independently Motorised Wheels

*F. Cheli, R. Corradi, F. Mapelli, M.Mauri, Politecnico di Milano, Dipartimento di Meccanica, Italy*

T9-067 Computer controlled harmonious two-coordinate positioning system

*V. Gelezevicius, G. Blaziunas, Kaunas University of Technology, Lithuania*

T9-007 Speed And Power Of Train Control System

*Vasile Radulescu, Ioan Strainescu, Emil Tudor, Florin Bozas, Sergiu Gheorghe, Doru Braslasu, Adrian Dascalu, ICPE – SAERP S.A, Romania*

T9-068 Modernization of Electrical Transport Systems in Estonia

*Juhan Laugis, Tõnu Lehtla, Jüri Joller, Vüta Boiko, Dmitri Vinnikov, Madis Lehtla, Department of Electrical Drives and Power Electronics, Tallinn Technical University, Estonia*

## **ROUND TABLE DISCUSSION 1**

**Tuesday, 10 September 2002, 17:00-18:30**

**Salon Orlando**

### **Effects of Renewable Resources, Distributed Generation and Energy Storage on a Future Supply Grid**

*Organizer: Werner Leonhard, Braunschweig, Germany*

Effects on the distribution networks used for connecting dispersed generation to the high voltage grid

*H. Weber, University of Rostock, Germany.*

Dispersed generation and renewable resources regarding their availability and compatibility with a future electrical energy system

*B. Ziemianik, EPRI, Palo Alto, USA*

Review of the present state of research and application of fuel cells and energy storage in Japan

*E. Masada, Science University of Tokyo, Japan*

## WENESDAY, 11 SEPTEMBER 2002

### EPE2003 AND EPE-PEMC2004 CONFERENCES PROMOTION

Wednesday, 11 September 2002, 8:00-8:30

Congres Hall Ragusa

### KEYNOTE SESSION 3

Wednesday, 11 September 2002, 8:30-9:15

Congres Hall Ragusa

Session Chairpersons: *Karel Jezernik, University of Maribor, Slovenia*

#### **Motion Control Taking Environmental Information Into Account**

*Kouhei Ohnishi, Keio University, Yokohama, Japan*

### ORAL SESSIONS WL1-WL4

Wednesday, 11 September 2002, 9:20-11:30

#### **WL1: Topic 5: Application of Power Electronic System**

Salon Orlando

Session Chairpersons: *Viliam Fedák, Technical University of Košice, Slovak Republic*  
*Zvonko Benčić, University of Zagreb, Croatia*

#### **T5-001 Prognosis for Integrated Starter Alternator Systems in Automotive Applications**

*John M. Miller, Ford Motor Company, USA*

*V. R. Stefanovic, VS Drives, USA*

*Emil Levi, Liverpool John Moores University, School of Engineering, United Kingdom*

#### **T5-002 Calibration of Premagnetized Linearity Correctors for CRT-Monitors**

*David Nedeljković, Vanja Ambrožič, Janez Nastran, Faculty of Electrical Engineering, Slovenia*

#### **T5-024 Multilevel Inverters Adapted to Photovoltaic Energy Conversion**

*H. Valderrama-Blavi, L. Martínez-Salamero, J. Calvente, Departament d'Enginyeria Electrònica, Elèctrica i Automàtica, Escola Tècnica Superior d'Enginyeria – Universitat Rovira i Virgili, Spain*

*C. Alonso, M. F. Shraif, A. Cid-Pastor, R. Pedrola, Laboratoire d'Analyse et d'Architecture des Systèmes Centre National de la Recherche Scientifique (CNRS), France*

#### **T5-008 Asymmetrical Duty Cycle Controlled High Frequency Soft Switching Inverter for Electromagnetic Induction Fluid Heater**

*Hideki Sadakata, Yoichi Kurose, Mutsuo Nakaoka, Yamaguchi University, Japan*

*Hidekazu Yamashita, Hideki Omori, Matsushita Electric Industrial Co., Ltd., Japan*

#### **T5-014 Battery charger for a mobile robot using a forward quasi-resonant converter with zero current switching (QRC-ZCS) with average current control mode**

*Carlos Sánchez, Fernando Ibáñez, Antonio Mocholí, Miguel Alcañiz, Santiago Alegre, Salvador Orts, Universidad Politécnica de Valencia, Spain*

#### **T5-036 Extended utilization of the inverter at photovoltaic stations**

*Oswald Droegsler, University of Leoben, Austria*

#### **T5-022 High efficiency FPGA based transconductance amplifier for AMB application**

*M. Chiaberge, C. Damilano, F. Maddaleno, Politecnico di Torino - Department of Electronics, Italy*

#### **WL2: Topic 7: Sensing and Observing, Topic 9: Motion Control**

Congres Hall Ragusa

Session Chairpersons: *Zdenko Kovačić, University of Zagreb, Croatia*  
*Manfred Schroedl, Vienna University of Technology, Austria*

#### **T9-044 Improved INFORM-measurement sequence and evaluation for sensorless permanent magnet synchronous motor drives**

*Ewald Robeischl, Manfred Schroedl, Kilian Salutt, Vienna University of Technology, Institute of Electrical Drives and Machines, Austria*

**T7-008 Sensorless Position and Speed Estimation in Induction Machines**

*Nikolas Teske, Greg Asher, School of Electrical and Electronic Engineering, University of Nottingham, United Kingdom  
Cyril Spiteri Staines, Joseph Cilia, University of Malta, Faculty of Engineering, Malta*

**T9-012 A Full State Observer for Sensorless Control of a Salient PMSM**

*G. Tadmor, Department of Electrical and Computer Engineering, Northeastern University, USA*

**T7-007 Sensorless Speed Detection of Induction Machines Using S-method**

*Aleksandar Obradovic, Momir Djurovic, Elektrotehnicki fakultet, Univerzitet Crne Gore, Yugoslavia*

**T9-070 A Speed Estimator for High Performance Sensorless Control of Induction Machines Above Base Speed**

*Emil Levi, Liverpool John Moores University, School of Engineering, United Kingdom*

*Mingyu Wang, Chongqing University, College of Electrical Engineering, China*

**T9-058 Industrial Sensorless Permanent Magnet Synchronous Motor Drives based on the INFORM® Method for High Performance Including Standstill**

*Manfred Schroedl, Ewald Robeischl, Michael Lambeck, Ulf-Helmut Rieder, Vienna University of Technology, Institute of Electrical Drives and Machines, Austria*

**T9-015 Examination of the Short Circuit Model for Sensorless PM Synchronous Motors with Respect to Torque Ripple, Measurement Period and Model Deviation**

*Ulf-Helmut Rieder, Ewald Robeischl, Manfred Schroedl, Vienna University of Technology, Institute of Electrical Drives and Machines, Austria*

**WL3: Topic 11: Industrial Drive Systems**

**Congres Hall Libertas**

Session Chairpersons: *Alojz Slutej, ABB Automation Systems, Sweden  
Antonio Brajder, Siemens AG, Germany*

**T11-017 On the Acoustic Noise Radiated by PWM AC Motor Drives**

*Stefan Laurentiu Capitaneanu, Bernard de Fornel, Maurice Fadel, LEEI, France  
Fabrice Jadot, STIE, France*

**T11-019 High Quality Sinusoidal Voltage Inverter for Variable Speed AC Drive Systems**

*R. Seliga, W. Koczara, Warsaw University of Technology, Institute of Control and Industrial Electronics, Poland*

**T11-008 Experimental Evaluation of the High Performance Vector Controlled Matrix Converter-Fed Induction Motor**

*E. Chekhet, V. Sobolev, Institute of Electrodynamics of the Ukrainian National Academy of Sciences, Ukraine  
S. Peresada, S. Kovbasa, National Technical University of Ukraine "Kiev Polytechnical Institute", Ukraine*

**T11-001 A Modified Sliding Mode Speed Controller for an Induction Motor Drive without Speed Sensor Using the Feedback Linearization Theory**

*J. Soltani, N. R. Abjadi, Isfahan University of Technology, Iran*

**T11-022 Digital Implementation of Full-Order Flux Observers for Induction Motors**

*Marko Hinkkanen, Jorma Luomi, Helsinki University of Technology, Power Electronics Laboratory, Finland*

**T11-036 Control Network as Back Bone of the Crane Motion Control System**

*Alojz Slutej, ABB Automation Systems, Sweden  
Fetah Kolonić, Faculty of Electrical Eng. and Comp., Croatia*

**WL4: Topic 3: Control of Converters**

**Salon Bobara**

Session Chairpersons: *Nedjeljko Perić, University of Zagreb, Croatia  
Wieslaw E. Bury, Polytechnic University, New York, USA*

**T3-036 Development of Embedded Control based on Simulation**

*P. Bauer, Delft University of Technology, The Netherlands  
P. J. van Duijsen, Simulation Research, The Netherlands*

**T3-018 Control of a Three-Phase Inverter Feeding an Unbalanced Load and Working in Parallel with Other Power Sources**

*Hauck Matthias, Späth Helmut, Elektrotechnisches Institut, Universität Karlsruhe, Germany*

### T3-021 H. Control of a Bi-Directional Flyback Power Converter

*Wieslaw E. Bury, Dariusz Czarkowski, Stanley Lewis, Shashi Ramamurthy, Polytechnic University, Department of Electrical Engineering, USA*

*Jerzy Dzieża, University of Mining and Metallurgy, Department of Electrical Engineering, Poland*

### T3-022 Triphase Cascaded Converters with Direct Synchronous Pulsewidth Modulation

*Valentin Oleschuk, Power Engg. Institute, Academy of Sciences of Moldova, Moldova*

*Frede Blaabjerg, Inst. of Energy Technology, Aalborg University, Denmark*

*Bimal K. Bose, Dept. of Electrical Engg., The University of Tennessee, USA*

## **WL4: Topic 4: Electromagnetic Compatibility**

**Salon Bobara**

Session Chairpersons: *Nedjeljko Perić, University of Zagreb, Croatia*

*Wieslaw E. Bury, Polytechnic University, New York, USA*

### T4-003 Conducted EMI in Four-Quadrant AC Drive System

*Adam Kempski, Robert Smolenski, Ryszard Strzelecki, University of Zielona Gora, Poland*

### T4-012 Source Detection of 100 Hz Current in a Static System Tie Converter

*Helmut Weiss, Montanuniversität Leoben, Austria*

### T4-010 A Current Control for Three-Phase Four-Wire Shunt Active Filters

*Antonio Dell'Aquila, Agostino Lecci, Dipartimento di Elettrotecnica ed Elettronica - Politecnico di Bari, Italy*

## **SPECIAL SESSIONS**

**Wednesday, 11 September 2002, 11:45-13:30**

## **WSS1-SB: Recent Advances and Trends in Electric Motors for Drives**

**Congres Hall Ragusa**

Session Chairpersons: *Silverio Bolognani, University of Padova, Italy*

*Helmut Weiss, University of Leoben, Austria*

### SSSB-01 Electric Motors for the Growth in the Drive Applications

*S. Bolognani, N. Bianchi, University of Padova, Dept. of Electrical Engineering, Italy*

*M. Zigliotto, University of Udine, Dept. of Electrical, Mechanical and Management, Engineering, Italy*

### SSSB-02 Electric Motors for Light Traction

*Jacek F. Gieras, United Technologies Research Center, USA*

*Nicola Bianchi, University of Padova, Italy*

### SSSB-03 Motors for Home Applications Development of Environment-Friendly Electric Motors

*Shigeo Morimoto, Yoji Takeda, Osaka Prefecture University, Japan*

*Hiroshi Murakami, Matsushita Electric Industrial Co., Ltd., Japan*

### SSSB-04 Electric Motors for Automotive Applications

*Tomy Sebastian, Sayeed Mir, Mohammad Islam, Delphi Corporation, USA*

### SSSB-05 Application of Soft Magnetic Composite Materials to Electric Motors

*Patricia Jansson, Hoganäs AB, Sweden*

## **WSS2-KH: Field Computations in Electrical Machines Design and Analysis**

**Salon Orlando**

Session Chairpersons: *Kay Hameyer, Katholieke Universiteit Leuven, Belgium*

*Sead Berberović, University of Zagreb, Croatia,*

### SSKH-01 Finite Element Aided Design of Electrical Machines: Achievements and Challenges

*Jan Sykulski, University of Southampton, Electrical Power Engineering Research Group, Department of Electronics and Computer Science, United Kingdom*

### SSKH-02 3D Eddy Current Calculations in Electromechanical Energy Converters

*Andrzej Demenko, Institute of Electrical Industrial Engineering, Poznan University of Technology, Poland*

*Jan K. Sykulski, Department of Electronics and Computer Science, University of Southampton, United Kingdom*

**SSKH-03 Specialized Conductor Models for Finite Element Eddy Current Simulation**

*Herbert De Gersem, Thomas Weiland, Technische Universität Darmstadt, Computational Electromagnetics Laboratory (TEMF), Germany  
Kay Hameyer, Katholieke Universiteit Leuven, Belgium*

**SSKH-04 Finite-Element Models for Electrical Machines**

*T. Busch, G. Henneberger, Department of Electrical Machines (IEM), Aachen Institute of Technology (RWTH)*

**WSS3-JWK Special Session on Matrix Converters**

**Congres Hall Libertas**

Session Chairpersons: *Johann Walter Kolar, ETH Zürich, Switzerland  
Okuma Yasuhiro, Fuji Electric Corporate Research and Development LTD, Japan*

**SSJWK-05 A Direct Power Electronic Conversion Topology allowing for Multi-Drive Applications**

*Christian Klumpner, Frede Blaabjerg, Aalborg University, Institute of Energy Technology, Denmark*

**SSJWK-06 Comparison of Losses in Voltage Source Inverters and Direct AC-AC Converters**

*Michael Bland, Patrick Wheeler, Jon Clare, Lee Empringham, School of Electrical and Electronic Engineering, The University of Nottingham, England*

**SSJWK-07 Design of Pulse Patterns for Matrix Converters**

*Olaf Simon, Manfred Bruckmann, Hubert Schierling, Siemens AG, Germany  
Jochen Mahlein, Elektrotechnisches Institut, Universitaet Karlsruhe, Germany*

**SSJWK-09 Minimization of Matrix Converter Commutation Times**

*Patrick Wheeler, Jon Clare, Lee Empringham, School of Electrical and Electronic Engineering, University of Nottingham, United Kingdom*

**WSS4-HO: Present Status of Power Devices and Future Possibility**

**Salon Bobara**

Session Chairpersons: *Hirohichi Ohashi, R&D Center, Toshiba Corporation, Japan  
Leo Lorenz, Infineon Technologies, Germany*

**SSHO-04 An Integrated Approach to Power Electronics Systems**

*F. C. LeeI, J. D. van Wykl, D. Boroyevich, P. Barbosa, Virginia Polytechnic Institute & State University, USA  
T. M. Jahns, R. D. Lorenz, University of Wisconsin-Madison, USA  
T. P. Chow, R. J. Gutmann, Rensselaer Polytechnic Institute, USA*

**SSHO-03 High Voltage MOS-gated Devices (IGBT/IEGT): Present Status and Future Possibility**

*Tsuneo Ogura, Semiconductor Co., Toshiba Corp, Japan  
Hirohichi Ohashi, R&D Center, Toshiba Corp, Japan  
Kosaku Ichikawa, Social Infrastructure Systems Co, Toshiba Corp, Japan*

**SSHO-06 High-Voltage SiC and GaN Devices for Power Electronics Applications**

*T. Paul Chow, Rensselaer Polytechnic Institute, USA*

**SSHO-01 Key Milestones in the Development of Power Semiconductor**

*Leo Lorenz, Infineon Technologies, Germany*

**SSHO-02 MOSFETS for POWER ICS: Present Status and Future Development**

*G. A. J. Amaratunga, R. Ng, K. Sheng, T. Trajkovic, F. Udrea*

**SSHO-05 Prospect of the National Project of Ultra-Low-Loss Power Device Technology in Japan**

*Kazuo Arai, National Institute of Advanced Industrial Science & Technology, Japan*

## DIALOGUE SESSION

**Wednesday, 11 September 2002, 14:45-16:45**

Session Chairpersons: *Milutin Pavlica, University of Zagreb, Croatia*  
*Andreas Schmidhofer, University of Leoben, Austria*

### WD3.1: Topic 2: Semiconductor Devices

Quite Salon

T2-001 New MOS gated triac structures for specific mains applications

*A. Bourennane, M. Breil, J-L. Sanchez, P. Austin, J. Jalade, LAAS-CNRS, France*

T2-003 Can Silicon Surge Voltage Suppressors Reach the Absorption Energy Capability of Varistors?

*Vasile V. N. Obreja, National R&D Institute for Microtechnology (IMT), Romania*

*Keith I. Nuttall, Department of Electrical Engineering and Electronics, The University of Liverpool, United Kingdom*

*Alexandru Obreja, POLICOLOR S.A. Company, Romania*

T2-004 High Current 75V MOSFET Module for 42V Automotive Systems- Sub-m $\Omega$  600A Half-bridge and 300A Full-bridge Modules

*Tetsujiro Tsunoda, Masakazu Shintome, Nobuhiro Shingai, Kazunobu Nishitani, Discrete Semiconductor Div., Semiconductor Company, Toshiba Corporation, Japan*

*Georges Tchouangue, Toshiba Electronics Europe GmbH, Germany*

T2-005 600V Trench Gate PT type IGBT Development Utilizing Ultra Thin Wafer Technology

*Shin'ichi Umekawa, Masahiro Tanaka, Takahiro Okuno, Tetsujiro Tsunoda, Nobutatsu Kimura, Sho-ichiro Kurushima,*

*Tomoko Matsudai, Akio Nakagawa, Discrete Semiconductor Div., Semiconductor Company, Toshiba Corporation, Japan*

T2-006 New Magnetic Driver for Bistable Electronic Power Switches

*J. Jalade, M. Breil, J.L. Sanchez, LAAS-CNRS, France*

*R. Pezzani, STMicroelectronics, France*

T2-007 He voids lifetime control compared with buffer-layer engineering for a 600V punch-through IGBT

*Ettore Napoli, Antonio G. M. Strollo, Paolo Spirito, Dept. of Electronic Engineering, University of Naples, Italy*

*Ferruccio Frisina, Leonardo Fragapane, Domenico Fagone, STMicroelectronics, Stradale Primosole, Italy*

T2-008 Fast Emitter Commutated Thyristor for Current-Fed Frequency Converters

*Surma A. M., All-Russian Electrotechnical Institute, Russia*

*Semenov A. Y., J.S.C. "Proton-Electrotex"*

*302027, Leskova str., Russia*

T2-009 A simple thermal conductivity measurement system

*F. Madrid, X. Jorda, P. Godignon, M. Vellvehi, J. Rebollo, Centre Nacional de Microelectronica, C.N.M. – C.S.I.C., Spain*

T2-011 Switching Characterization of the Reverse Blocking IGBTs in a Matrix Converter Structure Without Diodes

*Jean-Jacques HUSELSTEIN, Hervé BOULANT, Christian GLAIZE, Laboratoire d'Électrotechnique de Montpellier,*

*Université de Montpellier II, France*

T2-012 Low On-Resistance 40V LDMOS with A New RESURF Structure in Submicron BCDMOS

*S. K. Lee, Y. C. Choi, C. J. Kim, T. H. Kwon, H. S. Kang, C. S. Song, New Technology Development Team, Fairchild Semiconductor, Korea*

T2-013 PSPICE-Functional Models of Power Semiconductor Devices for Power Electronics Application

*Jan Deskur, Jan Pilaciński, Poznań University of Technology, Faculty of Electrical Engineering, Poland*

T2-017 Voltage source inverters in the medium voltage range

*M. Ruff, R. Sommer, G. Zaiser, Siemens AG, Automation and Drives, Germany*

T2-018 4.5kV SiC pn-Diodes With High Current Capability

*M. Braun, B. Weis, Siemens Automation and Drives, Germany*

*W. Bartsch, H. Mitlehner, SiCED GmbH, Germany*

T2-019 A Simple Evaluation Method of the Transient Thermal Response of Semiconductor Packages: Theory, Application and Identification Procedure

*N.Y.A. Shammass, M.P. Rodriguez, School of Engineering and Advanced Technology, Staffordshire University, England, U.K.*

*F. Masana, GDS-DEE Polytechnic University of Catalonia, Spain.*

## **WD3.2: Topic 5: Application of Power Electronic Systems**

**Quite Salon**

### **Session: Power Supplies and UPS Systems**

T5-005 A Novel Photovoltaic Array Maximum Power Point Tracker

*M. J. Case, M. J. Joubert, T. A. Harrison, Vaal Triangle Technikon, Department of Electronics, Faculty of Engineering, South Africa*

T5-006 Modelling a 80 kV Pulse Source for Pulsed Electric Fields (PEF)

*B. Roodenburg, J. Morren, S. W. H. de Haan, Delft University of Technology, The Netherlands  
H.A. Prins, Y. L. M. Creyghton, TNO Prins Maurits Laboratory, The Netherlands*

T5-011 Novel Power Supply Configurations for High Voltage Systems

*M. J. Case, J. F. Janse van Rensburg, Faculty of Engineering, Vaal Triangle Technikon, South Africa  
D. V. Nicolae, Technikon Northern Gauteng, Republic of South Africa*

T5-012 Pulse Density Modulated Zero Current Soft-Switching Series Resonant High Frequency Inverter for Consumer Induction-Heated Roller

*Yue Lu Feng, Hidenori Shirai, Kudryavtsev Oleg, Atsushi Okuno, Mutsuo Nakaoka, The Graduated School of Science and Engineering, Yamaguchi University, Japan*

T5-015 Voltage Sags Effects on the Operation of a Synchrotron Light Source: Experimental Analysis and Solution Project

*Roberto Visintini, Sincrotrone Trieste SCPA, Italy  
Stefano Quaia, DEEI - Università di Trieste, Italy  
Riccardo Chiumeo, CESI, Italy*

### **Session: Inductive Heating and Welding**

T5-003 The Application of The Class E Mosfet Amplifier for Dielectric Heating

*H. C. vZ. Pienaar, M. J. Case, Vaal Triangle Technikon, Dept. of Applied Electronics and Electronic Communication, South Africa*

T5-020 Design Optimization of Soft Switching PWM Inverter for Diesel Emission Control System Using Induction Heating

*Sachio Kubota, Nobuo Ogawa, Yoshihiro Shimaoka, Toba National College of Maritime Technology, Japan*

### **Session: Automotive vehicles and traction drives**

T5-013 Power Electronics In Automotive Hybrid Drives

*Zdeněk Čerovský, Stanislav Flígl, Zdeněk Halámka, Petr Hanuš, Pavel Mindl, Vladek Pavelka, Czech Technical University, Faculty of Electrical Engineering, Czech Republic*

T5-017 A step-down multi-phase converter, based on IGBT technology, for traction applications

*Marek Kowalczewski, Wojciech Mysiński, Waldemar Zajac, Technical University of Cracow, Poland*

T5-019 Install Location Study of SMES for High-Speed Railway System

*Yuuki Tsuchiide, Jumpei Baba, Katsuhiko Shutoh, Eisuke Masada, Department of Electrical Engineering, Faculty of Science & Technology, Science University of Tokyo, Japan*

T5-021 Novel control strategy of motor torque ripple in hybrid Vehicle

*Slim Tnani, Patrick Coirault, Gérard Champenois, Laboratoire d'Automatique et d'Informatique Industrielle, Ecole Supérieure d'Ingénieurs de Poitiers, France*

T5-031 Test Procedure to Determine the Energetic Model of an Electric Vehicle Through on Board Measurements

*L. Ferraris, A. Tenconi, Dept. of Electrical Engineering - Politecnico di Torino, Italy*

T5-037 Computer Modelling of a System: Supply Circuit - Locomotive with AC Motors in Order to Determine Current Harmonics

*Waldemar Zajac, Wojciech Czuchra, Cracow University of Technology, Poland*

### **Session: General Section**

T5-007 Measuring non-linear rectifier load characteristics with a controlled-current power converter

*H. D. Laird, S. D. Round, R. M. Duke, Electrical and Computer Engineering, University of Canterbury, New Zealand*

T5-025 Unconventional Power Modulators for Mono- and Three-Phase Resistive Heaters

*P. Bolognesi, D. Casini, L. Taponecco, Department of Electric Systems & Automation - University of Pisa, Italy*

T5-026 Excitation System for Piezoelectric Atomizer Characterisation

*X. Jordà, M. Lozano, E. Chico, Centre Nacional de Microelectrònica (CNM-CSIC), Spain*

*M. Lozano, LITEC (CSIC), Spain*

*H. Amaveda, F. Barreras, CPS, Universidad de Zaragoza, Spain*

T5-027 Functional Electrical Stimulator without using transformer for voltage step-up and its associated adaptive Neural Network Control for Arm Movements

*K. W. E. Cheng, L. Cao, A. B. Rad, D. Sutanto, Y. Lu, Department of Electrical Engineering, The Hong Kong Polytechnic University, Hong Kong*

*K. Y. Tong, H.K.Chow, Jockey Club, Rehabilitation Engineering Centre, The Hong Kong Polytechnic University, Hong Kong*

T5-034 Stability Analysis of Power Circuit Including Negative Inductance Produced by Variable Active-Passive Reactance (VAPAR)

*Hirohito Funato, Takashi Ogura, Utsunomiya University, Japan*

T5-038 Universal Battery Tester

*Josip Juric, University of Zagreb, Croatia*

*Branko Vukic, Matija Maticic, KUNER-ZAGREB d.o.o. Croatia*

T5-040 A Switching-Mode DC/Dc Converter for Automotive Dual Voltage Electrical Networks

*Jacek Checinski, Zdzislaw Filus, Edward Hryniewicz, Silesian University of Technology, Poland*

*Flavio Girardengo, Centro Ricerche Fiat S.C.p.A, Italy*

### **WD3.3: Topic 6: Power Electronics in Electrical Energy Generation, Transmission and Distribution**

**Quite Salon**

T6-033 Filtering Properties of The Selected Double Tuned Passive Filter Structures Designed Using Genetic Algorithm

*Ryszard Klempka, Zbigniew Hanzelka, University of Mining and Metallurgy, Poland*

T6-034 Dynamic Performance of a Power Conditioner Applied to Photovoltaic Sources

*Gabriele Grandi, Domenico Casadei, Claudio Rossi, Dept. of Electrical Engineering - University of Bologna, Italy*

T6-035 Specification Guidelines to Improve Power Quality Immunity and Reduce Plant Operating Costs

*Roger Lawrence, RGL Solutions, USA*

*Bill Moncrief, Hood-Patterson and Dewar Engineers, USA*

T6-036 On Implementing Recent Computer-Based Technologies to Develop Electric and Electronic Micro Industries

*A. M. Abdel-Hamid, Department of Electrical Engineering, Faculty of Engineering, El-Menoufia University, Egypt*

T6-037 High Voltage Multi-cellular Converters Applied to Transmission and Distribution

*D. Gerry, J. Clare, P. Wheeler, University of Nottingham, United Kingdom*

T6-038 3-Phase DSP Controlled Active Compensation Shunt System

*Michał Gwóźdź, ALFINE P.E.P., Poland*

*Ryszard Porada, Leszek Frąckowiak, Poznań University of Technology, Institute of Electrical Engineering, Poland*

T6-039 Digital control of a 1kW battery charger with a single IGBT switch in the grid

*Francisco J. Gimeno, Salvador Seguí, Salvador Orts, Rafael Masot, Fernando Ibañez, Grupo de Electrónica de Potencia, Dep. Ingeniería Electrónica, Univ. Politécnica de Valencia, España*

**T6-041 Power Quality Enhancement And Harmonic Compensation Scheme For Asymmetrical Nonlinear Loads**

*A.M. Sharaf, Pierre Kreidi, Electrical and Computer Engineering Department, The University of New Brunswick, Canada*

**T6-042 Utilisation of Renewable and Waste Energy by Turbine-Generator System in Disperse Power Plants**

*Rafael K. Járdán, István Nagy, Dezső Bereknyei, Budapest University of Technology and Economics, Faculty of Electrical Engineering and Informatics, Hungary*

*Wolf-Rüdiger Canders, Institute for Electric Machines, Technical University of Braunschweig, Hungary*

*Tamás Ruzsányi, Ganz-Transelektro Traction Electrics Ltd., Hungary*

**T6-044 Decoupling Multivariable GPC Control of UPFC-Based Power Flow Compensation**

*T. Allaoui, M. A. Denai, M. Bouhamida, University of Science and Technology of Oran, Faculty of Electrical Engineering, Algeria*

**T6-045 Simple Direct Power Control of Three-Phase PWM Rectifier Using Space Vector Modulation**

*Mariusz Malinowski, Marek Jasiński, Marian P. Kazmierkowski, Warsaw University of Technology, Institute of Control & Industrial Electronics, Poland*

**T6-051 High Voltage Multilevel Flying-Capacitor Type Inverter**

*Jiri Pavelka, CTU Prague, Faculty of Electrical Engineering, Czech Republic*

**WD3.4: Topic 8: Electrical Machines and Actuators**

**Quite Salon**

**Session: Identification, Modeling and Simulation**

**T8-031 Computer Aided Dynamic Regime Analysis Of Electric Machines**

*Gheorghe Atanasiu, Ciprian Sorandaru, "Politehnica" University of Timisoara, Romania*

**T8-048 The coaxial transformer – the influence of primary winding shape on the transformer properties**

*Bogusław Grzesik, Mariusz Stepień, Silesian University of Technology, Faculty of Electrical Engineering, Poland*

**T8-051 Development of low permeability transformer based on polymer bonded magnetic materials**

*Cheng K. W. E., Y. L. Ho, Y. Lu, Power Electronics Research Centre, Department of Electrical Engineering, The Hong Kong Polytechnic University, Hong Kong*

*D. K. W. Cheng, Power Electronics Research Centre, Department of Electronic and Information Engineering, The Hong Kong Polytechnic University, Hong Kong*

*C. Y. Tang, Power Electronics Research Centre, Department of Industrial and Systems Engineering, The Hong Kong Polytechnic University, Hong Kong*

**T8-052 On a High Force Modular Surface Motor**

*Lorand Szabo, Ioan-Adrian Viorel, Technical University of Cluj, Romania*

**T8-065 A consistent mathematical model of the PMSM using the fictitious field current**

*Alexander Thaler, University of Leoben, Department of Electrical Engineering, Austria*

*Bernd Klöckl, ETH Zurich, Swiss Federal Institute of Technology Zurich, High Voltage Laboratory, Switzerland*

**Session: Synchronous and Reluctance Machines**

**T8-040 Design Method of Reluctance Synchronous Motor with Axially Laminated Rotor**

*Valéria Hrabovcová, Pavol Rafajdus, Peter Hudák, University of Žilina, Faculty of Electrical Engineering, Slovakia*

*Marek Franko, Electrotechnical Research and Testing Institute, Slovakia*

*Jozef Mihok, Technical University of Košice, Faculty of Mechanical Engineering, Slovakia*

**T8-042 Torque Ripple Reduction in Switched Reluctance Motors by Pole Tip Shaping**

*Yusuf Ozoglu, Istanbul Univ. Vocational, Sch. of High Tech., Turkey*

*Nurdan Guzelbeyoglu, Istanbul Tech. Univ., Dept of Electrical, Turkey*

*Muhammet Garip, Yıldız Tech. Univ., Dept of Electrical Eng., Turkey*

*Erkan Mese, Kocaeli University, Technical Education Faculty, Turkey*

**T8-049 Design and Analysis of a Permanent Magnet Generator in the Steady State Load Conditions**

*Livio Šušnjić, University of Rijeka, Croatia*

*Zijad Haznadar, Drago Ban, University of Zagreb, Croatia*

**Session: Induction Motor Drives**

T11-003 Structure and Test Results of IGCT High Power Voltage Source Inverter with Heat Pipe Cooling System

*S. Januszewski, A. Jasiński, Z. Zakrzewski, K. Zymmer, Instytut Elektrotechniki, Poland*

T11-006 Indirect Adaptive Fuzzy Logic Control: Application to the Stator Field Oriented Double fed Asynchronous Motor Drive (DFAM)

*Rachid Abdessemed, A. L. Nemmour, LEB research laboratory, Department of electrical Engineering, Batna University, Algeria*

T11-010 Comparison of Several Control Strategies for Parallel Connected Dual Induction Motors

*Rosendo Peña-Eguiluz, Maria Pietrzak-David, Bernard de Fornel, Laboratoire d'Electrotechnique et d'Electronique Industrielle, Unité Mixte de Recherche INPT-ENSEEIH, France*

T11-029 A Real-time Estimator of Electrical Parameters for Vector Controlled Induction Motor using a Reduced Order Extended Kalman Filter

*Vicente Leite, Escola Superior de Tecnologia e de Gestão do Instituto, Politécnico de Bragança, Portugal  
Rui Araújo, Diamantino Freitas, Faculdade de Engenharia da Universidade do Porto, Portugal*

**Session: Other drives**

T11-007 Model Reference Adaptive Control of SRM Drives

*László Számel, Budapest University of Technology, Department of Electrical Machines and Drives, Hungary*

T11-013 Sensorless Control of High Speed Brushless DC Motor

*Wojciech Bojarczyk, Apator Control Ltd, Poland*

*Aleksandr Ivanov, Apator Electro Ltd, Russia*

*Zbigniew Krzemiński, Mirosław Włas, Gdansk University of Technology, Electrical and Control Engineering Faculty, Poland*

T11-023 Dynamics of Pulse-Width Modulated DC Motor Drive with LC-filter at Power Input Port

*Yu. V. Kolokolov, S. L. Koschinsky, Department of Design and Technology of Electronic Systems, State Technical University of Orel, Russia*

*K. H. Adjallah, Department of Industrial Engineering Systems, University of Technology of Troyes, France*

T11-030 Position Sensorless Control of Three-Phase SRM for Hydraulic Pump Unit Driven by A Newly Developed Power Converter

*Takashi Kosaka, Yoshinari Nabeya, Nobuyuki Matsui, Dept. of Elec. and Comp. Engineering, Nagoya Institute of Technology, Japan*

*Kazunobu Ohyama, Electric Engineering Laboratory, Daikin industries, LTD., Japan*

T11-037 Design Optimization Of Switched Reluctance Drives Using Artificial Neural Networks

*A. Matveev, Moscow Power Engineering Institute (Technical University), Russia*

*T. Undeland, R. Nilssen, Norwegian University of Science and Technology, Norway*

T11-039 Multi-criterion optimizer for synchronous drive system

*Roman Muszynski, Poznan University of Technology, Institute of Electrical Engineering, Poland*

**Session: General Section**

T11-011 Simulation Model of the Main Electrical Drive of the Thyristorized Locomotive

*Nenad Težak, Vinko Česić, Josip Ungarov, KONČAR - Institut za elektrotehniku d.d. Zagreb, Croatia*

T11-012 Presentation of an Efficient Design Methodology to develop IP-Core Functions for Control Systems: Application to the Design of an Antiwindup PID Controller

*L. Charaabi, I. Slama-Belkhodja, L.S.E, Ecole Nationale d'Ingénieur de Tunis, Tunis*

*E. Monmasson, LESIR-IUP GEII, France*

T11-018 Control Diagrams of Energy Controlled Current Source Inverter Drive

*Fekete, G., University of Miskolc, Department of Electrical and Electronic Engineering, Hungary*

T11-020 A Four Wheel Drive Hybrid Electric Car Configuration

*Mihai Panu, Alina Viorel, "L. Blaga" University of Sibiu, Romania*

T11-021 Digital Control System for the Traction Applications

*Siniša Marijan, Vinko Česić, Boris Furčić, Mario Bilić, Nenad Težak, Ivan Bahun, KONČAR-Institut za elektrotehniku Zagreb, Croatia*

T11-024 Analog controlled drives with PROFIBUS: experimental results

*Zoran Šimunić, Davor Gadže, Mario Vražić, University of Zagreb, Croatia*

T11-027 Cycloconverter Application in Rolling Mill Drive Systems

*Goce L. Arsov, Slobodan Mircevski, Faculty of Electrical Engineering Skopje, Republic of Macedonia*

T11-031 Multioutput Auxiliary Converter for Electric Locomotives

*Vladimir Siladi, Josip Ungarov, "KONČAR - Institute of Electrical Engineering" Zagreb, Croatia  
Jusuf Crnalić, "KONČAR - Electrical Locomotives" Zagreb, Croatia*

T11-032 Simulation of Power Trains for Hybrids and Electrical-Cars

*D. Gospodaric, A. Schmenkel, Trimerics, Germany*

T11-033 Harmonic Study Analysis in Gas Industrial Facilities Employing Large Variable Frequency Drives

*Drago Ban, Zlatko Maljković, Milivoj Puzak, University of Zagreb, Croatia  
Mijo Sobota, Drago Ružman, INA Oil Industry Inc. Zagreb, Production Division GTP Molve, Croatia*

T11-038 Power Analyse and New Loss Minimisation Possibilities of a Tram System

*Juri Joller, Madis Lehtla, Tallinn Technical University, Dept. of Electrical Drives and Power Electronics, Estonia*

### **WD3.6: Topic 12: Education and Related areas**

**Quite Salon**

T12-005 High-Frequency Pulse Width Modulation for Power Converters

*Moreau Rémy, Le Claire Jean-Claude, GE44-LARGE, France*

T12-008 The Interdependence of Education and the Future of Alternative Energy

*Jody J. Nelson, Department of Electrical and Computer Engineering, University of Wisconsin-Madison, USA  
Andrew Tuckey, Powercorp Pty. Ltd., NT Australia*

T12-011 Multilingual Web-based Teaching and Learning techniques for Power Electronics

*Cheng K. W. E., Lu Y., Department of Electrical Engineering, The Hong Kong Polytechnic University, Hong Kong*

T12-013 Development of an electronic book for Power Electronics, Machine and Drives based on the multilingual and Problem-Based Learning Techniques

*Cheng K. W. E., Lu Y., Department of Electrical Engineering, The Hong Kong Polytechnic University, Hong Kong*

T12-014 Converter Design for a Model Solar Car

*Richard Duke, Simon Round, University of Canterbury, Department of Electrical and Computer Engineering, New Zealand*

T12-016 Educational Project: A Battery charger supplied by PV energy

*V. Boitier, C. Alonso, LAAS/ CNRS, France  
H. Valderrama-Blavi, DEEEA, Rovira i Virgili University, Spain*

T12-019 Integrated Power Electronics Teaching Method

*Helmut Weiss, , University of Leoben, Austria, Austria*

T12-021 An Integral View Of AC/DC Rectifiers And Current-Source Inverters Based On Single Phase Bridge

*Viktor Sunde, Zeljko Jakopovic, Zvonko Bencic, University of Zagreb, Croatia*

T12-024 Education in Mechatronic Systems at Faculty of Electrical Engineering and Control Systems in Kaunas University of Technology

*Vidmantas Macerauskas, Romualdas Masteika, Vaclovas Kubilius, Petras Cernys, Kaunas University of Technology (KTU), Lithuania*

T12-004 Mechatronics - a New Study Field or a New Branch of Science and Engineering?

*Juhan Laugis, Tonu Lehtla, Department of Electrical Drives and Power Electronics of Tallinn Technical University, Estonia*

T12-001 A Novel and Fundamental Approach to Matrix Converter Theory

*M. J. Case, H. A. Langa, Vaal Triangle Technikon, Faculty of Engineering, South Africa*

T12-012 Teaching Energy Management on the Internet

*Orlando Manuel Soares, Henrique Nuno Gonçalves, Carla Antónia Barbosa, Escola Superior de Tecnologia e Gestão, Instituto Politécnico de Bragança, Portugal*

T12-003 Electrogeometric model simulation for lightning protection systems

*Rafael Rodrigues, Constantino Soares, DEEA – Instituto Superior de Engenharia de Lisboa, Portugal*

T12-023 Theory Of Electrical Machines For Power Electronics And Electrical Drives Applications Didactic Approach

*Mieczyslaw Ronkowski, Technical University of Gdansk, Poland*

## **ROUND TABLE DISCUSSION 2**

**Wednesday, 11 September, 2002, 17:00-18:30**

**Salon Orlando**

### **The future of Maglev and high speed rail transport**

*Organizer: E. Masada, Science University of Tokyo, Japan*

Discussants: *A. Cassat, EPFL, Switzerland*  
*V. Chrisanov, St. Petersburg State University, Russia*  
*G. Coquery, INRETS, France*  
*U. Henning, Siemens, Germany*  
*H. Ohsaki, University of Tokyo, Japan*

The magnetically levitated railway system (Maglev) is a new type of transportation system, based on the magnetic levitation to support and guide vehicles, and on the linear drives to propel them. With the contact-less operation to the rails, the system can operate up to very high speed ( $\approx 500\text{km/h}$ ), reduce the emission level of audible noise and vibration along its track and provide better riding comforts and higher safety. Its first practical utilization will start in 2004-2005 in Shanghai and Nagoya.

After a brief overview on the maglev transport and the high speed rail in the modern society, the existing state of technologies and the future prospects of applications are presented by the specialist of the maglev under developments (Transrapid, Swissmetro, HSST and JR-maglev) and of the European high speed rails. Exchange of opinion between discussants will follow on the respective application fields and competitiveness of such transportation systems, environmental views and global energy aspects, maintenance and safety matters, and especially on the role of power electronics technologies.

The objective of the discussion is to provide up-to-date information on the developments of the high speed transportation systems and their future prospects, considering the impacts from and to power electronics technologies.

## **ROUND TABLE DISCUSSION 3**

**Wednesday, 11 September, 2002, 18:30-20:00**

**Salon Orlando**

### **Forum on educational Tools for Power Electronics and Electrical Drives**

*Organizers: Johann Walter Kolar, ETH Zurich, Switzerland and Željko Jakopović, University of Zagreb, Croatia*

Discussants: *Johann Walter Kolar, ETH Zurich, Switzerland*  
*Željko Jakopović, University of Zagreb, Croatia*  
*Tore M. Undeland, Norwegian University of Science and Technology, Norway*  
*P. J. van Duijsen, Simulation Research, The Netherlands*