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Technical session **T1 – Inverters**

Chair: Jian Sun

Nº	Page	Authors	Title	Time
T1.1	1	Florian Reissner, Vincenzo Mallemaci, Fabio Mandrile, Radu Bojoi and George Weiss	Virtual Friction: Experimental Validation in a Microgrid of 3 Virtual Synchronous Machines	10:50
T1.2	7	Iker Oraa Iribarren, Javier Samanes Pascual, Jesus Lopez Taberna and Eugenio Gubia Villabona	Control Strategy for a Droop-Controlled Grid-Connected DFIG Wind Turbine	11:10
T1.3	14	Jian Sun and Christoph Buchhagen	Self-Adaptive Detection and Damping of Power System Resonances Involving Converters	11:30
T1.4	22	Kaustuva Acharya, Sudip K. Mazumder and Muhammad Tahir	A RF-Communication Based Circulating-Current Controller for Parallel VSIs	11:50
T1.5	30	Moria Sassonker Elkayam and Alon Kuperman	Simplified Design of Phase Compensated Multi-Resonant Controllers for Grid-Connected Inverters	12:10

Lunch – 12:30-13:30, Dan Panorama Hotel

Technical session **T2 – Modeling & Control 1**

Chair: Pablo Zumel

Nº	Page	Authors	Title	Time
T2.1	36	Janko Celikovic, Angel Arguello, Wisam Al-Hoor, John Kesterson, Siamak Abedinpour, Luca Corradini and Dragan Maksimovic	Digital Autotuning for Integrated Switched-Mode Battery Chargers	13:30
T2.2	42	Eric Stolt, Weston Braun and Juan Rivas Davila	Forward-Zero Cycle Closed-Loop Control of Piezoelectric Resonator DC-DC Converters	13:50
T2.3	48	Tom Urkin and Mor M. Peretz	Hybrid PFM-PWM Digital Controller for Miniaturized High-Frequency LLC Converters Integrated in Advanced IoT Devices	14:10
T2.4	55	Ksenija Josipovic, Aleksandar Prodic, Giacomo Calabrese and Florian Neveu	Universal Single-Mode Minimum Deviation Controller	14:50

Social Event – 15:30 – 22:00

Visit to “Machne Yehuda Market (Shuk)” Jerusalem

Wednesday, June 22

Technical session **T3 – DC-DC 1**

Chair: Tim McRae

Nº	Page	Authors	Title	Time
T3.1	62	Chandan Suthar, Inder Kumar Vedula, Montu Doshi, Vahid Yousefzadeh and Dragan Maksimovic	A Family of Two-Module Composite DC-DC Converters	09:00
T3.2	70	David Menzi, Zheyuan Yu, Jonas Huber and Johann Walter Kolar	Comparative Evaluation of Ultra-Lightweight Buck-Boost DC-DC Converter Topologies for Future eVTOL Aircraft	09:20
T3.3	78	Eli Hamo, Michael Evzelman and Mor Peretz	High-Conversion Ratio Multi-Phase VRM Realized with Stacking of Generic Series-Capacitor-Buck Converter Cells	09:40
T3.4	84	Nameer Khan, Gerard Villar Pique, John Pigott, Henk Jan Bergveld, Alaa El Sherif and Olivier Trescases	An Auxiliary-Assisted Dual-Inductor Hybrid DC-DC Converter with Adaptive Inductor Slew Rate for Fast Transient Response in 48-V Automotive PoL Applications	10:00
T3.5	90	Niklas Fritz, David Heidenberger, Carsten Fronczek, David Bündgen and Rik W. De Doncker	An Ultrafast DC-DC Converter Design Methodology Combining Piecewise-Linear Analytical Modelling and Genetic Algorithms	10:20

Coffee Break – 10:40-11:00

Technical session **T4 – Components & Magnetics**

Chair: Juan Rivas Davilla

Nº	Page	Authors	Title	Time
T4.1	98	Jiarui Zou, Nathan Brooks, Samantha Coday, Nathan Ellis and Robert Pilawa-Podgurski	On the Size and Weight of Passive Components: Scaling Trends for High-Density Power Converter Designs	11:00
T4.2	105	Rachel Yang, Andrew Nadler, Charles Sullivan and David Perreault	Permanent Magnet Hybrid Core Inductors for High Saturation Capability	11:20
T4.3	113	Michael Halamicek and Aleksandar Prodic	High Frequency Isolated Class-E Resonant Converter with Thin-Film Microtransformer	11:40
T4.4	121	Diego Serrano, Haoran Li, Thomas Guillod, Shukai Wang, Min Luo, Charles Sullivan and Minjie Chen	Neural Network as Datasheet: Modeling B-H Loops of Power Magnetics with Sequence-to-Sequence LSTM Encoder-Decoder Architecture	12:00
T4.5	129	David Elizondo, Ernesto L. Barrios and Pablo Sanchis	Toroidal Inductor Design in Multilevel DC-DC Electric Vehicle Battery Charger Including High-Frequency Effects	12:20

Lunch – 12:40-13:30

Poster Session **P1**

Chairs: Zeev Rubinshtein

Nº	Page	Authors	Title
P1.1	137	Lukas Stefanski, Benedikt Schmitz-Rode, Rüdiger Schwendemann, Niklas Weis, Andreas Liske and Marc Hiller	Power Hardware-in-the-Loop Test Bench for Permanent Magnet Synchronous Machines Based on a Parallel Hybrid Converter
P1.2	145	Lars Leister, Alexis Kalk, Benedikt Schmitz-Rode, Lukas Stefanski, Dennis Braeckle and Marc Hiller	Hardware-in-the-Loop Setup for a Modular Multilevel Converter with Integrated Batteries
P1.3	152	Nathan Brooks, Rahul Iyer, Roderick Bayliss III and Robert Pilawa-Podgurski	Fundamental State-Space Modeling Methodology for the Flying Capacitor Multilevel Converter
P1.4	159	Ping Wang, Daniel Zhou, David Giuliano, Minjie Chen and Yenan Chen	Multistack Switched-Capacitor Architecture with Coupled Magnetics for 48V-to-1V VRM
P1.5	166	Emeric Perez, Yasser Moursy, Sami Oukassi and Gaël Pillonnet	Silicon Capacitors Opportunities for Switched Capacitor Converter
P1.6	172	Duo Li and Aleksandar Prodic	Exponential Flying Capacitor Converter
P1.7	178	Ganesh Marasini, Zhihua Qu, Nan Xue and Mohammad Safayet Hossain	Grid-Forming Control Using TAPAS Software Defined Inverters
P1.8	185	Biqi Wang, Rolando Burgos and Bo Wen	An Analytical Assessment of Inverter-based Distributed Energy Resources Impacts on the Distribution Network Fault Current Profile
P1.9	193	Hang Yin, Jyun Lin, Zeev Kustanovich and George Weiss	Attenuation of power system oscillations by using virtual damper windings
P1.10	199	Luke Woolcock and Robert Schmid	Small-Signal Stability Analysis of Grid-Following Converter via Inner/Outer SISO Feedback Loops
P1.11	206	Ibai Urtasun, Andoni Urtasun, Mikel Muguiro and Luis Marroyo	Dynamic Enhancement of the Droop Control for Grid-Forming Inverters

P1.12	213	Michael Solomentsev, Abhijeet Bendapudi and Alex Hanson	QuickSHiFT: Rapid High-Frequency Transformer Simulation and Optimization
P1.13	220	Hongbo Zhao, Shaokang Luan, Yang Yang, Rui Wang, Zhan Shen, Yicheng Liao, Wu Chen and Stig Munk-Nielsen	Negative Impedance Characteristics in Passive Inductors
P1.14	226	Tim McRae, Andrija Stupar and Thierry Meynard	Multi-Objective Optimization of EE-core Transformers using Geometric Programming
P1.15	234	Francesca Giardine, Nathan Brooks, Kelly Fernandez and Robert Pilawa-Podgurski	Utilizing Harmonic Injection to Reduce Energy Storage and Required Capacitance in an Active Series-Stacked Energy Buffer for Single-Phase Systems
P1.16	241	Jianghui Yu and Rolando Burgos	Capacitor Voltage Control in Medium-Voltage Converters based on Integrated Capacitor Blocked Transistor (ICBT) Cells
P1.17	247	Tobias Merz, Nils Hellmann, Eduard Specht and Marc Hiller	Target Current Modulation as a Novel Approach for Active Balancing in Automotive MMSPCs
P1.18	255	Boran Fan, Dushan Boroyevich, Rolando Burgos, Jayesh Motwani and Yu Rong	Dual switching-cycle balancing control for the modular multilevel converters
P1.19	259	Bar Halivni, Daniel Beniaminson, Naor Amsalem, Michael Evzelman and Mor Mordechai Peretz	High-Gain Transformer-less Multiphase Hybrid Boost SMPS with Digital Per-Phase Current-Programming
P1.20	264	Marium Rasheed, Hongjie Wang and Regan Zane	Analysis of a Five-Port Differential Power Processing Triple Active Bridge Converter for Active Cell Balancing in Lithium-ion Battery Packs
P1.21	272	Sounak Maji, Dheeraj Etta and Khurram Afridi	Design and Comparison of Power Combining Architectures for Capacitive Wireless Power Transfer Systems
P1.22	278	Min Jeong and Biela Juergen	Extending Stable Parameter Range of LCL-filters for Grid-Connected Converters by Inherent Damping of Model Predictive Control (MPC)

Technical session **T5 – DC-DC 2**

Chair: Alon Cervera

Nº	Page	Authors	Title	Time
T5.1	286	Margaret E. Blackwell, Sahana Krishnan, Nathan Miles Ellis and Robert C. N. Pilawa-Podgurski	Direct 48 V to 6 V Automotive Hybrid Switched-Capacitor Converter with Reduced Conducted EMI	15:00
T5.2	294	Brooks Maughan, Hongjie Wang, Asif Mustafa and Regan Zane	Hot Swapping Analysis and System Operation of Series Connected Converters in Active Battery Reconditioning Systems for Second Life Battery Applications	15:20
T5.3	300	Mausamjeet Khatua and Khurram Afridi	Design and Control of a Dual-Bridge Series Resonant Converter based Onboard EV Charger	15:40
T5.4	306	Roderick Bayliss III, Nathan Brooks and Robert Pilawa-Podgurski	On the Role of Switch Output Capacitance on Passive Balancing within the Flying Capacitor Multilevel Converter	16:00

Coffee Break – 16:20-16:40

Technical session **T6 – Rectifiers**

Chair: Ilan Aharon

Nº	Page	Authors	Title	Time
T6.1	312	Francisco J. Azcondo, Alberto Pigazo, Paula Lamo and Christian Brañas	Envelope-based Modeling for Single-Phase Grid-Connected Converters	16:40
T6.2	318	Daifei Zhang, Danqing Cao, Jonas Huber and Johann Walter Kolar	Advanced Synergetic Charge Control of Three-Phase PFC Buck-Boost Current DC-Link EV Chargers	17:00
T6.3	326	Alvaro Iribarren, Ernesto Barrios, Harkaitz Ibaiondo, Alain Sanchez-Ruiz, Joseba Arza, Pablo Sanchis and Alfredo Ursúa	Modelling and operation of 6-pulse thyristor rectifiers for supplying high power electrolyzers	17:20
T6.4	334	Yarden Oren, Eliav Dahan, Aaron Shmaryahu and Ilan Aharon	T-type Buck-Boost PFC Rectifier in Discontinuous Conduction Mode	17:40

Thursday, June 23

Technical session **T7 – SCC**

Chair: Robert Pilawa-Podgurski

Nº	Page	Authors	Title	Time
T7.1	339	Nathan Brooks, Samantha Coday, Margaret Blackwell, Rose Abramson, Nathan Ellis and Robert Pilawa-Podgurski	Operation of Flying Capacitor Multilevel Converters At and Above Resonance	09:00
T7.2	346	Chandan Suthar, Inder Kumar Vedula and Dragan Maksimovic	Estimator-Based Time-Optimal Control of Flying Capacitor Multi-Level (FCML) Converters	09:20
T7.3	352	Daniel Zhou, Youssef Elasser and Minjie Chen	Balancing Limits of Flying Capacitor Voltages in Coupled Inductor FCML Converters	09:40
T7.4	360	Ivan Petric, Rahul Iyer, Nathan Brooks and Robert Pilawa-Podgurski	A Real-time Estimator for Capacitor Voltages in the Flying Capacitor Multilevel Converter	10:00
T7.5	368	Kishalay Datta, Prescott McLaughlin and Jason Stauth	High-Frequency Resonant Switched-Capacitor Converters with Multi-Winding Current Ballasting: Analysis and Optimization	10:20

Coffee Break – 10:40-11:00

Technical session **T8 – Modeling & Control 2**

Chair: Bar Halivni

Nº	Page	Authors	Title	Time
T8.1	376	Feifan Chen, Liang Zhao, Lennart Harnefors and Xiongfei Wang	Impedance Modeling for Quadrature-Axis Active Damping of PLL Dynamics	11:00
T8.2	383	Alberto Pigazo, Francisco J. Azcondo, Paula Lamo and Christian Branas	Frequency Estimation in DSOGI cells by means of the Teager Energy Operator	11:20
T8.3	388	Jayesh Kumar Motwani, Boran Fan, Yu Rong, Jianghui Yu, Dong Dong, Dushan Boroyevich and Rolando Burgos	Asymmetrical DC-DC Modular Multilevel Converter Using Switching Cycle Control	11:40
T8.4	396	Vadim Sidorov, Andrii Chub and Dmitri Vinnikov	Input Source Identification Algorithm For Isolated Buck-Boost DC-DC Converter	12:00
T8.5	402	Sergio Toledano-Dus, Cristina Fernandez and Pablo Zumel	Modeling of Dual Active Half Bridge (DAHB) converter based on discrete time techniques	12:20

Awards Lunch – 12:40-14:00

Poster Session **P2**

Chairs: Al-Thaddeus Avestruz

Nº	Page	Authors	Title
P2.1	408	Nir Tzhayek, Aaron Shmaryahu and Ilan Aharon	New Topology of DC - DC Quasi-Resonant Flyback Converter
P2.2	412	Logan Horowitz and Robert Pilawa-Podgurski	On Decoupling Capacitor Size in GaN-Based Power Converters
P2.3	417	Pavel Strajnikov and Alon Kuperman	Improving the Dynamic Performance of the Commercial PFC Rectifiers by Compensation Network Redesign
P2.4	423	Nissim Amar, Aaron Shmaryahu and Ilan Aharon	Synopsis on Electronic Capacitor for Grid-Tied Converters
P2.5	430	Andrii Chub, Vadim Sidorov and Dmitri Vinnikov	Implementation of Burst Control based on Sigma-Delta Modulation in Low-Cost Microcontroller
P2.6	436	Veronica Contreras, Xiaofan Cui, Wentao Xu and Al-Thaddeus Avestruz	High-Speed Digital Control in a Switching-Synchronized Sampled-State Space for Variable Frequency Multi-Phase Buck Converters
P2.7	443	Ying Pang	Revisit the Transient Response of AC Current Control Strategies in 3-Phase Inverters by Pole Analysis of Complex Transfer Functions
P2.8	449	Yongjie Han, Zhihong Wu and Deliang Wu	Comparative Evaluation of the Boost-Buck-Inverter and the Boost-Voltage-Source-Inverter
P2.9	456	Mohammad Shawkat Zaman, Ramgopal Varma Ramaraju, Seyed Amir Assadi, Sanjeev Chandra and Olivier Trescases	Compact 3D-Printed Jet-Impingement Nozzle for Top-Side-Cooled GaN Power Devices
P2.10	460	Skye Reese, John Haddon, Thomas Byrd and Dragan Maksimovic	An Approach to DC-DC Converter Optimization using Machine Learning-based Component Models
P2.11	468	Bawar Jalal, Valon Blakaj and Paul Evans	Real-Time Electromagnetic Visualisation for Large 3D Accelerated Models
P2.12	475	Yoni Mehlman, Sharon Levin, Shye Shapira, Nassim Haiek and Nir Nirnberg	Performance Enhancements of Low-Voltage LDMOS Power Switches by In-chip Integration of a Microcrystalline Diamond Substrate

			integration of microcrystalline diamond substrate
P2.13	480	Vladimir Mitrovic, Boran Fan, Yuliang Cao, Yijie Bai, Rolando Burgos and Dushan Boroyevich	Distributed communication and control architecture for an Intelligent Power Stage
P2.14	488	Bo Wen, Boran Fan, Yu Rong, Qing Lin and Rolando Burgos	Control of a Modular Scalable SiC-based AC-AC Converter with Small Arm Inductance and DC Capacitance
P2.15	494	Guy Bar Sovik, Bar Halivni, Michael Evzelman and Mor Mordechai Peretz	Electromagnetic Propulsion System with Rapid Current Discharge Circuit for Enhanced Projectile Acceleration
P2.16	N/A	Gopikrishna Togi and Sridhar P.	A Virtual HIL Approach for the Optimization of Three Phase Grid Connected Converter
P2.17	500	Pushkar Saraf, Chenmin Deng and Alex Hanson	Describing Function Analysis of Nonlinear Decentralized Control Scheme for Modular Power Sharing
P2.18	508	Eliav Dahan, Yarden Oren, Ilan Aharon and Aaron Shmaryhu	T-type Buck-Boost PFC Rectifier in Continuous Conduction Mode
P2.19	513	Vikas Kumar Rathore, Michael Evzelman and Mor Mordechai Peretz	Non-Isolated High Conversion Ratio Boost Extender Based on Back-end Series Capacitor Stacking

Remote Recorded Session **R1***

R1.1	520	Yu Zhou and Jungwon Choi	Design of High-frequency, Paralleled Resonant Inverter to Control Output Power for Plasma Generation
R1.2	527	Minki Kim, Minoh Jeong, Martina Cardone and Jungwon Choi	Characterization of a Quality Factor in Spiral Coil Designs for High-Frequency Wireless Power Transfer Systems using Machine Learning
R1.3	535	Juan Carlos Rodriguez, Regina Ramos, Alvaro Morales, Hadrien Carbonnier, Pedro Alou, Jesús Oliver and Christophe Delepaut	Discrete Modelling of Peak and Valley Current Control

*This session is available as a multimedia recorded presentation of the authors in the conference supplemental materials.

Technical session **T9 – Applications**

Chair: Nathan Brooks

Nº	Page	Authors	Title	Time
T9.1	542	Joshua Stewart, Jayesh Motwani, Jianghui Yu, Igor Cvetkovic and Rolando Burgos	Improved Power Density of a 6 kV, 1 MW Power Electronics Building Block Through Insulation Coordination	15:20
T9.2	549	Frederik Stallmann and Axel Mertens	Frequency-Supporting Control of a Solid State Transformer	15:40
T9.3	557	Rüdiger Schwendemann, Lukas Stefanski and Marc Hiller	Comparison of different Interface Algorithms for a highly dynamic grid Emulator based on a Series Hybrid Converter	16:00
T9.4	N/A	Omer Zehavi, Matty Katz, Alex Puzev, Florian Reissner, Pietro Lorenzetti and Yin Hang	Synchronverter inertial response evaluation in Typhoon HIL SW simulated power grid	16:20

Coffee Break – 16:40-17:00

Technical session **T10 – WPT**

Chair: Khurram Afridi

Nº	Page	Authors	Title	Time
T10.1	565	Dheeraj Etta, Sounak Maji, Mausamjeet Khatua and Khurram Afridi	Impedance Control Network-Based Inverters for High-Frequency Capacitive Wireless Power Transfer Systems	17:00
T10.2	572	Shay Borenstein and Yoash Levron	Maximum Efficiency Point Tracking for Wireless Power Transfer Systems Using Additional Winding	17:20
T10.3	577	Yan Zeltser, Ilya Zeltser, and Mor Peretz	A computer-assisted EMF emission assessment workflow for capacitive-based wireless power transfer systems	17:40