

17TH BRAZILIAN POWER ELECTRONICS CONFERENCE
8TH IEEE SOUTHERN POWER ELECTRONICS CONFERENCE

26 - 29 NOVEMBER
FLORIANOPOLIS, BRAZIL

PROGRAM



WELCOME TO COBEP/SPEC 2023



The Power Electronics Institute (INEP) team from the Federal University of Santa Catarina (UFSC) and collaboration Institutions are proud to hold the 8th Southern Power Electronics Conference and the 17th Brazilian Power Electronics Conference (SPEC / COBEP 2023).

This event is a result of the collaborative efforts of the Brazilian Power Electronics Society (SOBRAEP), the Power Electronics Society (PELS) of the Institute of Electrical and Electronics Engineers (IEEE), and the Federal University of Santa Catarina (UFSC).

As we gather here in Florianopolis, it is worth reflecting on the rich history that precedes us. The first COBEP took place in Florianopolis in 1991, marking the beginning of a tradition that has grown and flourished over the years. We are thrilled to witness the 17th edition unfold in this setting three decades later.

Similarly, the Southern Power Electronics Conference (SPEC) embarked on its journey in Fortaleza in 2015. In 2019, it graced the city of Santos, and we are delighted to announce its return to Florianopolis for yet another edition. As we commence COBEP 2023 and SPEC 2023, let us embrace the spirit of inquiry, collaboration, and progress. May these conferences serve as catalysts for new ideas, meaningful connections, and breakthroughs to contribute to the future of power electronics.

In this atmosphere, I am pleased to offer you our Program. On the following pages, you will find a fantastic technical program with oral and poster presentations, extraordinary keynotes, enthusiastic invited talks, and a rich social event schedule involving a welcome reception, PELS Young Professional reception, Social Event Banquet, PELS Women in Engineering coffee break and Award Luncheon. Enjoy each part of our Program!

As you immerse yourselves in the enriching sessions and activities presented in this Program, we sincerely hope you also take the time to explore and savor the charms of Florianopolis. May the next few days be filled with insightful discussions and the joy of discovering the unique beauty and culture our city has to offer.

I want to thank the Master sponsors, CAPES (Coordination of Superior Level Staff Improvement) and FAPESC (Foundation for Support of Research and Innovation in the State of Santa Catarina); the Diamond sponsors, WEG S.A. and Typhoon Hill; the Gold sponsors Supplier, Ohmini Power Electronics, Magmattec, Okk, Rohde and Schwarz, Nidec Global Appliance, Chroma Systems Solutions, Signum Technologies, and Chipus; and the Silver sponsors, Inergiae, JL Power Electronics, DeLorenzo of Brazil, Tektronix, Altair, Yokogawa, Opal RT Technologies, Life Augmented, Starter Energy Solutions, and HBK.

I also invite you to visit our Expo, which brings interesting Exhibition Stands and where you can meet our main sponsors.

I also need to thank our team. All the professors and students in our group worked hard to make this great event. I am very proud and grateful to everyone. Together, we are a fantastic and strong team! Thank you!

Our team and I wish you a memorable experience at the SPEC/COBEP 2023 and in the captivating city of Florianopolis!

Welcome!



Telles Brunelli Lazzarin

General Chair COBEP/SPEC 2023

PROGRAM

Sunday November 26th, 2023

07:30

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Morning
Tutorials

Lunch on
your own

Afternoon
Tutorials

15:00

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22:00

Afternoon
Tutorials

COBEP/SPEC
Welcome Reception

Monday November 27th, 2023

07:30	Opening Ceremony	15:00	Technical Sessions
07:45		15:15	
08:00	Keynote 1	15:30	
08:15		15:45	
08:30		16:00	
08:45		16:15	Coffee Break
09:00		16:30	Technical Sessions Poster
09:15	Keynote 2	16:45	RAP Session and Prof. Maurício Aredes Moment
09:30		17:00	
09:45		17:15	
10:00		17:30	
10:15		17:45	
10:30	Coffee Break	18:00	SOBRAEP Meeting
10:45	Technical Sessions	18:15	
11:00		18:30	
11:15		18:45	
11:30		19:00	
11:45		19:15	
12:00	Lunch by COBEP/SPEC	19:30	PELS Young Professionals Reception
12:15		19:45	
12:30		20:00	
12:45		20:15	
13:00		20:30	
13:15	20:45		
13:30	Invited Talk 1	21:00	
13:45	Invited Talk 2	21:15	
14:00		21:30	
14:15	Technical Sessions	21:45	
14:30		22:00	
14:45			

PROGRAM

Tuesday November 28th, 2023

07:30		15:00	Industrial and Technical Sessions	Typhoon HIL Tutorial
07:45		15:15		
08:00	Keynote 3	15:30		
08:15		15:45		
08:30		16:00		
08:45		16:15	Coffee Break	
09:00	Keynote 4	16:30	Technical Session (Poster)	
09:15		16:45	PELS WiE	
09:30		17:00	Coffee Break	
09:45	Coffee Break	17:15	Sponsor Presentations	
10:00		17:30		
10:15	Technical Sessions	17:45		
10:30		18:00		
10:45		18:15		
11:00		18:30		
11:15		18:45		
11:30		19:00	Social Event Banquet	
11:45		19:15		
12:00		19:30		
12:15		19:45		
12:30	Lunch by COBEP/SPEC and Prof. Marcelo Villalva Moment	20:00		
12:45		20:15		
13:00		20:30		
13:15		20:45		
13:30	Invited Talk 3	21:00		
13:45		21:15		
14:00	Industrial and Technical Sessions	21:30		
14:15		21:45		
14:30		22:00		
14:45				

Wednesday November 29th, 2023

07:30		15:00	Technical Sessions
07:45		15:15	
08:00	Keynote 5	15:30	
08:15		15:45	
08:30		16:00	Coffee Break
08:45		16:15	Technical Session (Poster)
09:00	16:30		
09:15	16:45		
09:30	Keynote 6	17:00	Closing Ceremony
09:45		17:15	
10:00	Coffee Break	17:30	
10:15	Technical Sessions	17:45	
10:30		18:00	
10:45		18:15	
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12:30		Lunch by COBEP/SPEC (Award Luncheon)	20:00
12:45	20:15		
13:00	20:30		
13:15	20:45		
13:30	Invited Talk 4	21:00	
13:45		21:15	
14:00	Technical Sessions	21:30	
14:15		21:45	
14:30		22:00	
14:45			

TUTORIALS

Sunday Morning | November 26th, 2023

08:30 – 10:30

10:30 – 12:30

Room 1

Tutorial 1

Direct Current Transformer for MVDC Applications

Drazen Dujic and
Renan P. Barcelos

Room 2

Tutorial 3

Digital-Twin Enabled Smart Battery Management Systems and Novel Design and Trends in Integrated Fast Charging

Sheldon Williamson and
Akash Samanta

Room 3

Tutorial 6

Adaptive Control Applied to Power Electronics

Rodrigo V Tambara

Tutorial 7

Model Predictive Control: Basic concepts, Applications, Advances and Trends

Cristian Garcia, Jose Rodriguez,
Margarita Norambuena,
MokhtarAly
and Fernanda Carnielutti

Sunday Afternoon | November 26th, 2023

14:00 – 16:00

16:00 – 18:00

Tutorial 2

Room 1

**Electromagnetic Compatibility of
Switched-Mode Power Supplies**

Günter Keller

Tutorial 4

Room 2

**New Advances and Trends on
Model Predictive Control for
Power
Electronics and Electrical
Drives**

Marco Rivera, Patrick Wheeler
and Sergio Toledo

Tutorial 5

Matrix Converters

Marco Rivera, Patrick Wheeler
and Sergio Toledo

Tutorial 8

Room 3

**Partial Power Processing
Converters:
A Way to go Beyond the
Limits**

Petar J. Grbovic

Tutorial 9

**Resonant Power Converter
Fundamentals**

Maikel F. Menke

Tuesday | November 28th, 2023

14:00 - 16:00

Room 6

Tutorial 10

**xEV Powertrain Control Software Development & Testing
with HIL**

Typhoon HIL

17:30 – 18:00

18:00 – 18:30

Room 3

Sponsor Presentation 1

**Extending Power converter
Analysis with Multiphysics
Simulations**

Altair

Room 4

Sponsor Presentation 2

**Large Motors Starting with
Pony-Converters**

WEG

Sponsor Presentation 3

**Using Oscilloscopes to Perform
Comprehensive Double Pulse
Testing on Wide Bandgap (SiC/
GaN) Power Devices**

OKK

Room 5

Sponsor Presentation 4

**The Semiconductor industry
and the Panorama in Brazil**

Chipus

Room 6

Sponsor Presentation 5

**Advanced HIL for Electric
Powertrain Testing:
Continuous Testing for
Software Defined Vehicles**

Typhoon HIL

EVENTS

IEEE Young Professionals (YP) Reception



**YP
RECEPTION**

Join us for a happy hour!

**MONDAY
27 NOVEMBER
8:00 p.m.
Porto 45**

Rua das Gaivotas, 850 Ingleses

Register here:
(Limited spots)



All COBEP/SPEC 2023 attendees are welcome.



IEEE Women in Engineering (WIE) Coffee Break



WIE
Coffee Break

Join us for a coffee break discussion at **COBEP/SPEC 2023**

WHEN
4 p.m. - 28 November 2023

WHERE
Oceania Park Hotel & Convention Center

Register here:



All COBEP/SPEC 2023 attendees are welcome



KEYNOTE PLENARY SESSIONS

Monday | November 27th, 2023



MEDIUM VOLTAGE DIRECT CURRENT TECHNOLOGIES

Prof. Drazen Dujic

Ecole Polytechnique Federale de Lausanne (EPFL), CH



GaN/SiC MONOLITHIC BIDIRECTIONAL SWITCHES – DRIVERS OF A NEXT WAVE OF POWER ELECTRONICS INNOVATIONS

Prof. Johann W. Kolar

ETH Zurich, CH

Tuesday | November 28th, 2023



UNLOCKING THE POTENTIALS OF MULTI-TERMINAL HVDC GRIDS IN FUTURE POWER SYSTEMS

Prof. Maryam Saedifard

Georgia Institute of Technology, US



TRENDS AND CHALLENGES FOR PROPULSION SYSTEMS IN THE ELECTRIFICATION OF AIRCRAFT AND ROAD VEHICLES

Prof. Patrick Wheeler

University of Nottingham, UK

Wednesday | November 29th, 2023



HIGH POWER-DENSITY AND HIGH-EFFICIENCY POWER ELECTRONICS DRIVES FOR ELECTRIC AND HYBRID ELECTRIC VEHICLES USING WBG DEVICES

Prof. Bulent Sarlioglu

University of Wisconsin-Madison, US



IMPACT OF POWER ELECTRONICS USE ON RESOURCE EFFICIENCY OF ENERGY SUPPLY

Prof. Peter Zacharias

University of Kassel, Germany

NOTES

INVITED TALK

Monday | November 27th, 2023



IMPROVED OPERATION OF POWER CONVERTERS TO MANAGE THEIR REMAINING USEFUL LIFETIME

Prof. Jose I. Leon
University of Seville, ES



DESIGNING HIGH STEP-DOWN CONVERTERS USING QUADRATIC CONVERTERS

Prof. Brad Lehman
Northeastern University, US

Tuesday | November 28th, 2023



PREDICTIVE CONTROL - A SIMPLE AND POWERFUL METHOD TO CONTROL POWER CONVERTERS AND DRIVES

Prof. Ralph M. Kennel
Technical University of Munich, DE

Wednesday | November 29th, 2023



PARADIGM OF THE BRAZILIAN ELECTRIC SYSTEM OF THE FUTURE: A REFLECTION ON THE OPTIMIZATION OF THE SOUTH/SOUTHEAST ENERGY SECTOR

Prof. Denizar C. Martins
Federal University of Santa Catarina, BR

Monday Morning | November 27th, 2023

D - Power Electronics for Utility Interface | Room 1

Chair: Edson Hirokazu Watanabe
Co-chair: Pablo Acuña

10:15 | Consensus Algorithm-Based Distributed Generator Sharing for Isolated Heterogeneous Microgrids [#89]

Paulo Fernando Silva; Diego T. Rodrigues; José de Arimatéia Olimpio Filho; Luis De Oro Arenas; Jakson Paulo Bonaldo; Helmo Kelis Morales Paredes
São Paulo State University; Federal University of Mato Grosso

10:35 | Third harmonic circulating current injection effects on optimum silicon area of Delta-CHB STATCOM [#93]

Dayane do Carmo Mendonca; Joao Victor Guimaraes Franca; Heverton Augusto Pereira; Seleme Isaac Seleme Junior; Allan Fagner Cupertino
Federal University of Minas Gerais; Federal University of Viçosa; Federal University of Juiz de Fora

10:55 | Improved Operation of MMC Based Braking Choppers [#109]

Viktor Hofmann; Patrick Hofstetter
Innomotics GmbH

11:15 | Advanced Battery Energy Storage System Employing Cloud-based Platform [#139]

Diuary Goncalves; Joao Marcus Soares Callegari; Rodrigo Cassio de Barros; Allan Fagner Cupertino; Heverton Augusto Pereira
Federal Center of Minas Gerais; Federal University of Minas Gerais; Federal University of Viçosa; Federal University of Juiz de Fora

11:35 | Open-Loop Response of Classical and Multirate Modulators for Multicell Active Power Filters [#221]

Tiago de Sá Ferreira; Lenin Martins Ferreira Moraes;Guilherme Monteiro de Rezende;Thiago Ribeiro de Oliveira; Israel Divan Lopes da Costa;Clodualdo Venicio de Sousa
Federal University of Itajubá; Federal University of Minas Gerais

11:55 | A Solid State Transformer Based on a Single-Stage Three-Phase AC-DC T-Type Converters [#270]

Robério Oliveira Rodrigues; Luan Carlos dos Santos Mazza;Welton da S. Lima; Demercil de Souza Oliveira Júnior; Luiz H. Silva Colado Barreto; Dalton de Araújo Honório
Federal Institute of Ceara; Federal University of Ceara,

F - Devices and Components | Room 2

Chair: Humberto Pinheiro
Co-chair: Fernanda Carnielutti

10:15 | Silicon IGBT Power Semiconductor for 400V Traction Inverters [#61]

Fabian Hohmann; Stefan Hain; Ben Quinones; Paul Moore
ZF Friedrichshafen AG; Pakal Technologies

10:35 | Assessment of a Dual Active Bridge Converter with Variable Transformer by Means of Orthogonal Pre-Magnetization for Wide Voltage Operation and Enhanced Efficiency at Light-Load Conditions [#114]

Camilo Suarez; Wilmar Martinez
KU Leuven - EnergyVille

10:55 | Fully Integrated Overcurrent Protection Method During SiC MOSFET Conduction [#132]

Haifeng Zhang; Dibo Zhang; Katsuhiko Hata; Keiji Wada; Kan Akatsu; Ichiro Omura; Makoto Takamiya
The University of Tokyo; Tokyo Metropolitan University; Yokohama National University; Kyusyu Institute of Technology

11:15 | Accuracy Analysis of Core Loss Measurements for High-Quality Factor Inductors [#171]

Renato Amorim Torres; Bulent Sarlioglu
University of Wisconsin-Madison

11:35 | Dynamic Characterization of 650V GaN HEMT Transistors [#190]

Grigorios Sergentanis; Yales Romulo de Novaes; Liliana de Lillo; Lee Empringham; Mark C. Johnson
University of Nottingham; Santa Catarina State University

11:55 | Analysis of the Impact of Semiconductor Losses in High-Density Power Inverters [#340]

Paulo Henrique; Leonardo A. Viera; R. Camponogara; C. Rech; H. Pinheiro; R. P. Vieira
Federal University of Santa Maria

G - Modeling, Simulation and Control | Room 3

Chair: Patrick Wheeler
Co-chair: Moacyr Aureliano Gomes de Brito

10:15 | Robust Direct Adaptive Control: A case study applying a current tracking of switched reluctance motor [#16]

Gustavo X. Prestes; Paulo H. A. S. e Silva; Wagner B. da Silveira; Rodrigo P. Vieira; Hilton A. Grundling
Federal University of Santa Maria

10:35 | Disturbance Rejection Analysis of Grid-Connected VSCs Controlled in the stationary reference frame under Voltage Harmonic Disturbances [#45]

Andre G. P. Alves; Robson F. S. Dias; Luis G. B. Rolim
Federal University of Rio de Janeiro

10:55 | Hardware-in-the-loop Assessment of Grid-Forming Inverters for Off-Grid Application of a Fuel Cell System [#96]

Joao Marcelo Teixeira do Amaral; Janito dos Santos Ramos; Carolina Coutinho Mendonc □a de Souza; Robson Francisco da Silva Dias
Federal University of Rio de Janeiro

11:15 | Power Estimation Methods Applied to AC Microgrids Operating Under Non-Standard Conditions [#100]

Jose Raimundo Dantas Neto; Ricardo Lucio de Araujo Ribeiro; Thiago de Oliveira Alves Rocha; Denis Keuton Alves
Federal Institute of Ceara; Federal University of Rio Grande do Norte; Federal Rural University of Pernambuco

11:35 | Lyapunov-Function Based Control Approach for Single-Phase Split Source Inverter [#115]

Farzaneh Bagheri; Naki Guler; Marco Rivera; Patrick Wheeler
Antalya Bilim University; Gazi University; University of Nottingham; Universidad de Talca

11:55 | Development of a Platform for Automated Tests of Photovoltaic inverters [#188]

Luiz F. R. Menegazzo; Ricardo Jochann F. Bortolini; Anderson L. N. Severo; Catherine M. Freitas; Lucas B. Piton; Fernanda M. Carnielutti; Lucas V. Bellinaso; Leandro Michels
Federal University of Santa Maria

H - Renewable Energy Systems and Energy Storage | Room 4

Chair: Denizar Cruz Martins
Co-chair: Leonardo Poltronieri Sampaio

10:15 | Real-Time State-of-Charge Estimation in Lithium-Ion Batteries Using Extended Kalman Filter [#37]

Su len Bampi; Gierry Waltrich; Anderson Vaccari
Federal University of Santa Catarina; Vale S.A.

10:35 | Performance Comparison of Single-Phase PV Inverter Topologies Regarding Efficiency and Power Density [#43]

Aurean Belo Guimaraes Junior; Thiago Ribeiro de Oliveira
Federal University of Minas Gerais

10:55 | Analysis of Parameter Variation Effects on Proportional-Integral and Robust Predictive Controllers for Doubly-Fed Induction Generator [#50]

Simao Bernardo Fernando; Igor Oliani; Angelo Dos Santos Lunardi; Alfeu Joaozinho

11:15 | Data-Driven Analysis of Solar Photovoltaic Systems: Correlation and Distribution Patterns [#157]

Joao Lucas de Souza Silva; Michelle Melo Cavalcante; Samuel Botter Martins; Everton Josue da Silva; Tarcio Andre dos S. Barros
University of Campinas; Federal Institute of Sao Paulo

11:35 | Towards Real-time Estimation of Li-ion Battery Characteristics for BMS with Storage-Limited Processors [#233]

Zhansheng Ning; S. Azizghalehsari; P. Venugopal; G. Rietveld; T. Batista Soeiro
University of Twente

11:55 | Step Down Converter for Low Current Ripple in Electrolyzer with MPPT Control Strategy [#387]

Thiago Fonseca Rech; Tailan Orlando; Roberto Francisco Coelho; André Luis Kirsten
Federal University of Santa Catarina

H - Renewable Energy Systems and Energy Storage | Room 5

Chair: Christian A. Rojas
Co-chair: Lucas Vizzotto Bellinaso

10:15 | A Power-Based Control Approach for a Battery-Assisted Quasi-Impedance-Source Converter Applied in Photovoltaic Systems [#167]

Marcello da Silva Neves; Luis Guilherme Barbosa Rolim
Federal University of Rio de Janeiro

10:35 | Control of SCIG based on Wind Energy Conversion System with BESS [#172]

Angelo Marcilio M. dos Santos; Ricardo P. C. Pacifico; Nathanael S. Costa; Marcos V. S. de Franca; Vanessa S. de C. Teixeira; Adson B. Moreira
Federal University of Ceará

10:55 | Battery Dynamics Exploration: Insights and Implications of Relaxation Time in Electrochemical Impedance Spectroscopy [#175]

S. Azizghalehsari; Z.Ning; B. Breazu; P. Venugopal; G. Rietveld; T. Batista Soeiro
University of Twente

11:15 | Comparison and Application of Data Science Techniques for Anomaly Detection in Photovoltaic Systems [#185]

Michelle Melo Cavalcante; Joao Lucas de Souza Silva; Samuel Botter Martins; Isabelle Ferreira Silva Nunes; Andrei Carvalho Ribeiro; Tarcio Andre dos Santos Barros
University of Campinas; Federal Institute of Sao Paulo;

11:35 | Comparing Temperature Derating Test in the Laboratory with Commercial Photovoltaic Inverter Datasheet [#343]

Geyciane P. de Lima; Andrei C. Ribeiro; Francisco V. E. Lemos; João Pedro C. Silveira;

11:55 | Battery enhanced PV microinverter with ancillary service capabilities [#392]

Nicolas Muller; Miguel Gutierrez; Lorenzo Reyes-Chamorro; Carlos Fuhrhop; Diana Lopez-Caiza; Christian A. Rojas
Universidad Austral de Chile; Universidad Andres Bello; Universidad Técnica Federico Santa Maria

I - Transportation Power Electronics | Room 6

Chair: Mário Lúcio da Silva Martins
Co-chair: Tiago Davi Curi Busarello

10:15 | Control and Firmware HIL-Based Test Platform for Electric Vehicle Fast Charging Stations [#117]

Jonas M. da Rosa; Gabriel A. Salvatti; Ademir Toebe; Arthur K. de Carvalho; Alessandro L. Batschauer; Marcello Mezaroba; Rafael C. Beltrame; Cassiano Rech
Federal University of Santa Maria; Santa Catarina State University

10:35 | Analysis of the Half-bridge converter with current doubler for application in an auxiliary power module of electric vehicles [#118]

Pedro Henrique Bulegon Lobler; Ademir Toebe; Cassiano Rech; Luciano Schuch
Federal University of Santa Maria

10:55 | The ERC-AMF Power Electronics Challenges: Interdisciplinary Research Targeting an All-Electric Aircraft [#119]

Jose A. Pomilio; Gabriela T. de Carvalho Ferreira; Jose Pissolato Filho; Mateus Giesbrecht; Eduardo Lenz; Renato de Souza Mariano
University of Campinas; Embraer S.A.; Aeronautics Technological Institute

11:15 | A ZCS Cuk-Buck Converter With Low Storage Requirement [#159]

Caio Kerson O. Veras; Paulo Peixoto Praça; Demercil de S. Oliveira Jr.; Bruno Ricardo de Almeida; Samanta Gadelha Barbosa; Luiz Henrique Silva Colado Barreto
Federal University of Ceará; University of Fortaleza

11:35 | Implementation of a Model Predictive Control for IPMSM Using MTPA and Flux-Weakening Strategies in EV Traction Drive [#372]

Thiago Rafael Schlemmer; Renata Camponogara; Felipe Bruschi; Fernanda Carnielutti; Rodrigo Padilha Vieira; Humberto Pinheiro
Federal University of Santa Maria;

11:55 | A Reconfigurable Partial Power Converter with Adjustable Transformer Turns Ratio for a 6.6-kW Integrated On-Board Charger [#424]

Niwtton Gabriel Feliciani dos Santos; Mário Lúcio da Silva Martins
Federal University of Santa Maria

A - AC-DC Converters | Room 1

Chair: Johann Kolar
Co-chair: Adalberto Jose Rossa

14:30 | An Interleaved Current-Fed PFC Isolated Converter with Voltage Follower Characteristics [#21]

Édwin Augusto Tonolo; Jefferson Wilhelm Meyer Soares; Alceu André Badin.
Federal University of Technology of Paraná

14:50 | Phase-Modular Approach for Avionic Three-Phase Rectifier Applications [#113]

Giorgio Spiazzi; Simone Buso
University of Padova

15:10 | Proposal and Analysis of a Five-level Unidirectional Totem-Pole PFC Rectifier for Electric Vehicle On-board Charger [#285]

Ueliton Vinicio Batista; Adriano de Andrade Bresolin; Bruno Scortegagna Dupczak; Márcio Silveira Ortmann
Federal Institute of Santa Catarina

15:30 | Active Loss Balancing Scheme with Decision Chart for 3L-ANPC-VSCs with IGBTs for Bidirectional Energy Flow Operation [#301]

Alan H. Wilson-Veas; Alejandro Peralta; Marcelo A. Perez
Universidad Tecnica Federico Santa Maria

C - DC-AC Converters | Room 2

Chair: Antonio J. Marques Cardoso
Co-chair: Alceu Badin

14:30 | Connection of deep water oil extraction platforms to the onshore Power Electric System by a VSC-HVDC system based on Synchronverter control [#108]

Ana Carolina Cunha; Marcos Jorge Souza; Fabio Alves; Bruno Bernhardt; Maynara Aredes; Sylvia Nunes; Gustavo Leal
Federal University of Rio de Janeiro

14:50 | Parks-McClellan algorithm-based Active Damping Strategy Applied to Grid-Connected Inverters [#189]

José de Arimatéia O. Filho; Gabriel Lucas Bressanini; Tiago Davi Curi Busarello; Luis De Oro Arenas; Paulo Fernando Silva; Helmo Kelis Morales Paredes
São Paulo State University; Federal University of Santa Catarina

15:10 | Single inductor dual buck inverter classical and predictive linear voltage controller comparison [#290]

Luis David Patarroyo-Gutierrez; Nelson Nayoshi Nakamoto Yamaguti; Oscar Mauricio Hernández-Gómez; Daniel Abreu Macedo Da Silva
Universidad Pedagógica y Tecnológica de Colombia; Federal University of Santa Catarina;
Universidad Pedagógica y Tecnológica de Colombia; Federal University of Pará

15:30 | Resonance Analysis on Inverter-Populated Power Grids [#410]

Cleiton M. Freitas; Luís F. C. Monteiro; Guilherme H. C. do Nascimento
Rio de Janeiro State University

G - Modeling, Simulation and Control | Room 3

Chair: José Rodrigues
Co-chair: Edilson Mineiro Sá Junior

14:30 | Time-domain Post-Treatment Methods for PRBS-Based Impedance Identification Using Power Electronics Converters [#53]

Igor Maronni; Joel Guerreiro; Hildo Júnior; José Pomilio
State University of Campinas

14:50 | Adequacy of Time-Domain Line Modeling for Power Electronics Studies [#258]

Matheus Sotero; Gabriel S. Antero; Paulo C. R. Brandão; Felipe Dicler; Antonio C. S. Lima
Federal University of Rio de Janeiro

15:10 | Hardware-In-the-Loop Simulation of a Step-Up Converter Using the GDS Oversampling Technique in a Microcontroller [#308]

Matheus Sotero; Luís Guilherme Barbosa Rolim
Federal University of Rio de Janeiro

15:30 | FCS-MPC for Five Level Common Ground Single-Phase Multilevel Converter for Photovoltaic Application [#414]

Cristian Castillo; Jesus Moya; Cristian Garcia; Julio Lopez; Mokhtar Aly; S. Alireza Davari;
Jose Rodriguez
Universidad Arturo Prat; Universidad de Talca; Universidad San Sebastian

G - Modeling, Simulation and Control | Room 4

Chair: Sergio Vidal Garcia Oliveira
Co-chair: Paulo Peixoto Praça

14:30 | VALIDATION OF PHOTOVOLTAIC INVERTER CONTROLLERS USING AUTOMATED TESTS AND HARDWARE-IN-THE-LOOP [#149]

Joao Victor Lopes Rosa; Fernanda de Morais Carnielutti; Humberto Pinheiro; Lucas Vizzotto
Belinaso; Luiz Fernando Rissotto Menegazzo
Federal University of Santa Maria

14:50 | Frequency-Voltage-var Function for VFD in Oil and Gas Platform with Wind Power [#235]

Kassiane de Sousa Medeiros; João Marcus Soares Callegari; Lorrana Faria da Rocha; Danilo

15:10 | Multistep-finite-control-set model predictive control with variable-step prediction horizon [#312]

Cristóbal González; Alejandro Angulo

Universidad Técnica Federico Santa María

15:30 | Adaptive PLL for frequency and position estimation of electric machines [#361]

José Roberto B. de A. Monteiro; Gaspar Henrique Martins de Oliveira; Ivan Santiago

Medrano Luna; Stefan Thiago Cury Alves dos Santos; Eduardo Mateus C. S. de Oliveira

University of São Paulo

H - Renewable Energy Systems and Energy Storage | Room 5

Chair: Drazen Dujic

Co-chair: Fabricio Bradaschia

14:30 | Direct PV Array Connection With Variable Speed Drive and MPPT Control Strategy [#210]

Aimad Alili; Nicolas Flamand; Emmanuel Frappé; Al Kassem Jebai

OneSide Technologies For Schneider Toshiba Inverter Europe; Schneider Toshiba Inverter

Europe

14:50 | Enhanced Three-Phase Interleaving Phase-Shifted Full Bridge Converter with Active Clamp Using GaNFET for Green Hydrogen Production [#341]

Alexsandra Rospirski; Luiz G. Zancanaro; Leonardo S. Mai; Fernando M. de Oliveira;

Rogério L. da Silva Jr.; Filipe T. Carneiro; Sandy G. Hernández; Cezar A. Rigo; Tales G.

Jahn; Pedro Gayer de Araujo

Itaipu - Brazil; SENAI; CTG Brazil

15:10 | Energy Storage System for a MagLev Vehicle [#163]

Hugo P. Ferreira; Fábio Ferreira; Eder Luiz de Mello; Richard M. Stephan; Ruy G. Marques

Jr.

Federal University of Rio de Janeiro

15:30 | Real-time Point-to-point Parameter Tracking for Fault Prognosis of Lithium-ion Batteries using Electrochemical Impedance Spectroscopy [#351]

Latha Anekal; Akash Samanta; Uday Deshpande; Sheldon Williamson

Ontario Tech University; D&V Electronics

L - Education topics | Room 6

Chair: Danilo Iglesias Brandão

Co-chair: Lourenço Matakas Junior

14:30 | Didactic Modules for teaching Power Electronics and Digital Control [#164]

João José Ferreira Evangelista Filho; Davi Rabelo Joca; Juliano de Oliveira Pacheco; Bruno Ricardo de Almeida
University of Campinas; University of Fortaleza

14:50 | Container-mounted advanced microgrid [#196]

Joao Marcus Soares Callegari; Danilo Iglesias Brandao; Luis Guilherme Monteiro Oliveira; Sidelmo Magalhaes Silva; Braz J. Cardoso Filho
Federal University of Minas Gerais; Catholic University of Minas Gerais

15:10 | Didactic FPGA-in-the-loop Scalar Fuzzy Control Setup for Motor Drive Education [#299]

Rhuan Barbosa; Matheus Pelzl; Raymundo Cordero; Matheus Caramalac; Walter Suemitsu
Federal University of Mato Grosso do Sul; Federal University of Rio de Janeiro

15:30 | On the Estimation of the Magnetic Behavior of Sendust Cores Under Different DC-Bias Conditions [#415]

José Willamy M. de Araújo; Raimundo N. M. Oliveira; Domenico Sgró; Demercil Oliveira
Federal University of Ceará

Tuesday Morning | November 28th, 2023

A - AC-DC Converters | Room 1

Chair: Demercil de Souza Oliveira Júnior
Co-chair: Carlos Henrique Illa Font

10:15 | Current Sensorless Boost-Type Power Factor Correction by Integrating SC-PFM and Vienna Rectifier with Input Continuous Conduction [#22]

Jefferson Wilhelm Meyer Soares; Edwin Augusto Tonolo; Leonardo Gobel Fernandes; Alceu Andre Badin.
Federal Institute of Parana; Federal University of Technology of Parana

10:35 | Development of High-Power, 25 kW, PFC Circuits with High-Efficiency of 99.6% [#195]

Amir Samiee; Christian Mader; Otto Kreutzer
Deggendorf Institute of Technology

10:55 | Single-phase Bridgeless Cuk Rectifier Operating in Continuous Conduction Mode for PFC Applications [#212]

Leandro B. K. Fisch; Mateus N. Mezaroba; Anderson J. Balbino; Telles B. Lazzarin
WEG Drives & Controls; Federal University Of Santa Catarina

11:15 | High Frequency Isolated AC-DC Converter With High Power Factor Based On ZVS Push-Pull Converters [#219]

11:35 | Control oriented modeling of a three-phase interleaved T-Type converter [#315]

Ícaro de Almeida Albuquerque; Telles Brunelli Lazzarin; Marco Esteban Rivera Abarca; Mateus Nava Mezaroba
Federal University of Santa Catarina; University of Nottingham

11:55 | Third Harmonic Content Correction Technique for DCM Boost Rectifier [#317]

Valdecir Junior De Paris; Moises Carlos Tanca-Villanueva; Gierri Waltrich; Telles Brunelli Lazzarin
Federal University of Santa Catarina

D - Power Electronics for Utility Interface | Room 2

Chair: Patrick Wheeler
Co-chair: Camila Seibel Gehrke

10:15 | Third-harmonic Circulating Current Generation Mechanism in Δ -CHB STATCOM [#105]

Joao Victor Guimaraes Franca; Dayane do Carmo Mendonca; Heverton Augusto Pereira; Yu Jin; Qian Xiao; Allan Fagner Cupertino
Federal Center of Technology of Minas Gerais; Federal University of Minas Gerais; Federal University of Viçosa; Tianjin University; Federal University of Juiz de Fora

10:35 | Power Flow Analysis of a Multifunctional iUPQC Utility Interface with Storage System for Microgrids [#280]

Eduardo Brietzig dos Prazeres; Marcello Mezaroba; Matheus Montagner
State University of Santa Catarina

10:55 | Limitation of initial surge in Latching Current Limiters (LCL) [#286]

Aginaldo Vieira Dias; José Antenor Pomilio; Saulo Finco
National Institute of Space Research; University of Campinas; CTI

11:15 | FS-MPC Approach for Zero-Sequence Compensation in SEIG-Based Off-Grid Systems [#287]

Carlos Antônio Souza; Gabriel Maier Cocco; Robinson Figueiredo de Camargo; Maicon Luís Flach; Fábio Ecke Bisogno
Federal University of Santa Maria

11:35 | Static-based analytical approach to quantify the power dispatch influence on LCC-HVDCs resilience to Commutation Failure [#293]

Ana Carolina Cunha; Gustavo Leal; Maynara Aredes; Fabio Alves; Marcos Jorge Souza
Federal University of Rio de Janeiro

11:55 | Designing the control loop for Latching Current Limiters (LCL)

[#354]

Aginaldo Vieira Dias; José Antenor Pomilio; Saulo Finco
State University of Campinas;

E - Motor Drives and Inverters | Room 3

Chair: Ademir Nied
Co-chair: Rodrigo Padilha Vieira

10:15 | Analysis of a Novel High Power-Density Semiconductor-Level Interleaved Converter [#57]

Vitor H. M. Biajo; Gideon I. C. Lobato; Sidelmo M. Silva
Federal University of Minas Gerais

10:35 | A Novel Weight Function and Interpolation Method for the Field Weakening Strategy of a Synchronous Reluctance Machine [#69]

Vasken Ketchedjian; Andre Haspel; Chris Hermann; Jorg Roth-Stielow
University of Stuttgart

10:55 | Hybrid identification method of magnetic saturation in an asynchronous motor [#98]

Mohamed MROUEH; Emmanuel FRAPPE; Al-Kassem JIBAI
Schneider Toshiba Inverter Europe

11:15 | New Current Control Strategy for EESMs Based on the Magnetic Equivalent Circuit with Dynamic Decoupling of the d- and e-Axis [#129]

Stephan Goehner; Johannes Stoss; Matthias Brodatzki; Benjamin Bachowsky; Andreas Liske; Johannes Kolb; Marc Hiller
Karlsruhe Institute of Technology

11:35 | Evaluation Methodology of Current Control Techniques for Torque Ripple Reduction in Non-Sinusoidal PMSM [#278]

Lucas Rossato Rocha; Eduardo Cattani Silva; Paulo Henrique Alves Silva; Gustavo Xavier Prestes; Beatriz Cristina Reis Cordeiro; Luis Felipe Pessoa; Rodrigo Padilha Vieira
Federal University of Santa Maria

11:55 | Design and Analysis of SMC and PI Controllers Applied in DC Servo Motor [#421]

Felipe Bruschi; Lucas Rossato Rocha; Thiago Rafael Schlemmer; Eduardo Cattani Silva; Rodrigo Padilha Vieira
Federal University of Santa Catarina

H - Renewable Energy Systems and Energy Storage | Room 4

Chair: Thiago Soeiro
Co-chair: Guilherme Bonan

10:15 | A Doubly Grounded Boost Seven Level PV Inverter Topology with

Model Predictive Controller [#60]

Mokhtar Aly; Eltaib Abdeen D. Ibrahim; Fernanda Carnielutti; Margarita Norambuena; Samir Kouro; Jose Rodriguez

Universidad San Sebastian; High Institute for engineering and technology in Sohag; Federal University of Santa Maria; Universidad Tecnica Federico Santa Maria; Universidad de Seville

10:35 | On-board Micro Wind Turbine for Airborne Wind Energy with Tethered Wings [#95]

Leonardo Ferreira Pacheco Malta Martins; Alexandre Trofino Neto; Marcelo De Lellis Costa de Oliveira

SENAI Innovation Institute for Embedded Systems; Federal University of Santa Catarina

10:55 | On Reliability Assessment of a Battery Energy Storage Systems Supporting PV Plants [#150]

William Caires Silva Amorim; Allan Fagner Cupertino; Victor Flores Mendes; Renata Oliveira de Sousa; Rodrigo Cassio de Barros; Heverton Augusto Pereira

Federal University of Minas Gerais; Federal University of Viçosa; Federal University of Juiz de Fora; Federal University of Technology of Paraná; Federal University of Reconcavo of Bahia

11:15 | On dc-link capacitor reliability in photovoltaic inverters with harmonic current compensation [#257]

Rodrigo Cassio de Barros; Renata Oliveira de Sousa; William Caires Silva Amorim; Allan Fagner Cupertino; Heverton Augusto Pereira

Federal Technological University of Parana; Federal University of Juiz de Fora

11:35 | Probabilistic Analysis of Low Power Factor in a Facility with High Integration of PV Generation [#269]

Daniel Campos Pompermayer; Jussara Farias Fardin

Federal University of Espírito Santo

11:55 | Comparison of Power Injection Strategies During Voltage Sags for Adaptive Control Based on Equivalent Impedance [#368]

Gustavo P. de Pontes; Rodrigo A. Ramos; Camila S. Gehrke; Artur B. Piardi

University of São Paulo; Federal University of Paraiba

G - Modeling, Simulation and Control | Room 5

Chair: Fabrício Bradaschia

Co-chair: Moacyr Aureliano Gomes de Brito

10:15 | A simple and efficient design of 2DOF controllers with application to the speed regulation of electrical motors [#33]

Lucas C. Borin; Robert U. M. Viaro; Everson Mattos; Vinicius F. Montagner

Federal University of Santa Maria

10:35 | Robust voltage controller for Flyback converters based on genetic algorithm [#34]

10:55 | Improved performance of DC-DC converters using series-parallel controllers [#35]

Renan Medke; Lucas C. Borin; Everson Mattos; Robert U. M. Viaro; Vinicius F. Montagner;
Andre A. Ferreira
Federal University of Santa Maria; Federal University of Juiz de Fora

11:15 | Discrete-Time Higher-Order Sliding Mode Current Controller for Switched Reluctance Motor Drives [#41]

Gustavo X. Prestes; Adailton B. Junior ; Filipe P. Scalcon; Lucas R. Rocha; Wagner B. da
Silveira; Hilton A. Grundling; Rodrigo P. Vieira
Federal University of Santa Maria; McMaster University

11:35 | Speed-Sensorless Predictive Direct Speed Control for PMSM Drives [#110]

Emrah Zerdali; Marco Rivera; Patrick Wheeler; Sergio Toledo
Ege University; University of Nottingham; Universidad de Talca

11:55 | STUDY AND EVALUATION OF LIQUID COOLING HEAT SINKS FOR HIGH POWER DENSITY INVERTERS [#253]

Paulo Henrique; E Cattani, L Rossato; L Vieira, R P Vieira
Federal University of Saint Maria

SS1 - Emerging Power Conversion Technologies and Control for Microgrids | Room 6

Chair: Edivan Laercio Carvalho da Silva
Co-chair: Dmitri Vinnikov

10:15 | Model Predictive Control of Master-Slave Inverters Operating with Fixed Switching Frequency [#75]

Fernanda Carnielutti; Mokhtar Aly; Margarita Norambuena; Jiefeng Hu; Josep Guerrero;
Jose Rodriguez
Federal University of Santa Maria; Universidad San Sebastian; Universidad Tecnica Federico
Santa Maria; Federation University Australia; Aalborg University

10:35 | Multi-port i-AFE Converter for DC Energy Buildings: Design Requirements and Efficiency Evaluation [#77]

Edivan Laercio Carvalho; Andrei Blinov; Andrii Chub; Ilya Galkin; Dmitri Vinnikov
Tallinn University of Technology; Riga Technical University

10:55 | Analysis of the use of Supercapacitors and Batteries as Energy Storage Elements for Off-Grid Hybrid Photovoltaic Inverters [#91]

Ezequiel Gonschorowski; Rafael Cardoso; Edivan Laercio Carvalho; Carlos Marcelo de
Oliveira Stein; Emerson Giovanni Carati; Gustavo Weber Denardin; Jean Patric da Costa
Federal University of Technology - Parana; Tallinn University of Technology

11:15 | An Adaptive Droop Control to Reduce Steady-State Power Imbalances in DC microgrids [#104]

Beatriz Cristina Moura; Pedro Jose dos Santos Neto; Lucas Fernandes Resende Bonnas; Joao Pedro Carvalho Silveira; Gustavo Brito de Lima; Luiz Carlos Gomes Freitas
Federal University of Uberlandia; State University of Campinas

11:35 | Dynamic Reconfiguration for Wide Output Voltage Range Isolated Buck-Boost PFC Converter [#428]

Ievgen Verbytskyi; Mohammad Mahad Nadeem; Andrei Blinov; Edivan Laercio Carvalho; Andrii Chub; and Dmitri Vinnikov
Tallinn University of Technology

11:55 | Bidirectional Solid-State DC Circuit Breaker for the Protection of Residential and Commercial DC Buildings [#429]

Aditya P.; Venkata Yagna; Tharun Banoth; Andrii Chub; Edivan Laercio Carvalho; Satish Naik Banavath

Indian Institute of Technology; National Institute of Technology; Tallinn University of Technology

Tuesday Afternoon | November 28th, 2023

SS1 - Emerging Power Conversion Technologies and Control for Microgrids | Room 1

Chair: José Antenor Pomílio

Co-chair: Edivan Laercio Carvalho da Silva

14:00 | Grid Integration of DC Buildings: Standards, Requirements and Power Converter Topologies [#PJ1]

EDIVAN LAERCIO CARVALHO; ANDREI BLINOV; ANDRII CHUB; PIETRO EMILIANI; GIOVANNI DE CARNE; DMITRI VINNIKO

Tallinn University of Technology ; Institute for Technical Physics

14:20 | Bipolar DC Microgrid with Voltage Balancer: System Modelling and Hardware-in-the-loop Simulation [#234]

Mateus Pinheiro Dias; Debora Pereira Damasceno; José Carlos U. Peña; João I. Y. Ota; José Antenor Pomílio

State University of Campinas

14:40 | Centralized strategy incorporating multiple control actions applied to advanced microgrids [#260]

João Marcus Soares Callegari; Lucas Savoi Araujo; Dener A. de Lisboa Brandão; Braz J. Cardoso Filho; Danilo Iglesias Brandao

Federal University of Minas Gerais

15:00 | Electric Arcs in Photovoltaic Systems: A Comparative Analysis of IEC 63027, UL 1699B, and GB-t 39750 Standards [#307]

Josué Lopes Putzke; Leandro Michels; Lucas Vizzotto Bellinaso

Federal University of Santa Maria

15:20 | Microgrid black start capability and transition to grid-connected mode with Hardware-in-the-Loop Testing [#324]

André P. Meurer; Fábio E Bisogno; Humberto Pinheiro; Jorge R. Massing; Mário L. Martins
Federal Institute of Education; Federal University of Santa Maria

C - DC-AC Converters | Room 2

Chair: Richard Magdalena Stephan
Co-chair: Renan Pilon Barcelos

14:00 | Leakage current mitigation in transformerless grid-connected PV inverters through level modulation switching [#131]

Caique Creomenes Almeida de Carvalho; Paulo Ricardo Dutra Ribeiro da Silva; Jose Antenor Pomilio; Jose M. Araujo
University of Campinas; Federal Institute of Bahia

14:20 | A Pre-synchronization Strategy for Grid-Forming Inverters Inspired by the Phenomena of Spontaneous Synchronization of Coupled Oscillators [#367]

Armando J. G. Abrantes-Ferreira; Camila S. Gehrke; Alexandre C. Oliveira; Antonio M. N. Lima
Universidade Federal da Paraíba

14:40 | Stability Analysis of a Direct-synchronzied Single -phase Grid-tied Inverter [#376]

R. Agrawal; B.P. McGrath; C.A. Teixeira; R.H. Wilkinson
RMIT University

15:00 | Voltage Sensor Reduction Method for Modular Multilevel Converters Based on a Simple Voltage Reconstruction Approach [#418]

Wei Tian; Pengxin Shen; Gean Maia de Sousa; Ralph Kennel; Marcelo Lobo Heldwein
Technical University of Munich

15:20 | Driving Technological Advancements in Formula Student: Developing a Field-Oriented Control Voltage Source Inverter for Enhanced Motor Control [#419]

Lucas Paiva da Silva; Gierri Waltrich
Federal University of Santa Catarina

B - DC-DC Converters | Room 3

Chair: Denizar Cruz Martins
Co-chair: Gleisson Jardim França

14:00 | High Efficiency and High Gain Hybrid DC-DC Converter with Switched Capacitor [#27]

Brenna Theodora Machado Matos Rodrigues; Mauricio Albuquerque Moura; Edilson Mineiro Sa Junior; Kleber Cesar Alves de Sousa.0
Federal University of Ceara; Federal Institute of Ceara

14:20 | Prototype of a Resonant Converter for a Superconducting Magnet with 300A and 10V Output Operating in Discontinuous Conduction Mode [#67]

William Contesini; Leandro de Oliveira Porto; Bruno Edson Limeira; Felipe Santiago de Oliveira

Brazilian Center for Research in Energy and Materials

14:40 | Generalized Switch-Control Scheme for a Family of T-Type DAB GaN-based DC-DC Converters in EV Powertrain Applications [#127]

Alejandro Stowhas-Villa; Ronald Carmona; Christian A. Rojas; Alan H. Wilson-Veas; Jorge Marin

Universidad Tecnica Federico Santa Maria

15:00 | Continuous-Control-Set Model Predictive Control with Active Thermal Control in GaN-based DC-DC Converters for EV applications [#268]

Jhonattan G. Berger; Christian A. Rojas; Christoph M. Hackl; Matias Aguirre

Universidad Tecnica Federico Santa Maria; University of Applied Sciences; Seville University

15:20 | Interleaved Bidirectional DC-DC Converter with single-phase high-frequency isolation [#298]

Kassio Derek N. Cavalcante; Menaouar Berrehil El Kattel; Gabriel José Oliveira Pinheiro; João Mateus F. P. Da Costa; Edilson Mineiro Sá Junior; Fernando Luiz M. Antunes

Federal University of Ceará

15:40 | A Single-phase Dual Active Semi-bridge Converter [#416]

C. A. Teixeira; L. M. Cunico; L. D. James; R. H. Wilkinson; B. P. McGrath

RMIT University; Federal Institute of Santa Catarina

G - Modeling, Simulation and Control | Room 4

Chair: Daniel Juan Pagano

Co-chair: Gilberto da Cunha

14:00 | Investigation of the Switching Losses of OSV-MPC-Based Power Converters Through the Quantification of the Switching Frequency Profile [#44]

Thiago Cardoso Tricarico; Bernardo F. de Andrade Campos; Leonardo Francisco da Silva; Luis Guilherme Barbosa Rolim

Federal University of Rio de Janeiro

14:20 | Impact of Post-NREL Database Technologies for Photovoltaic Modules in NREL-Based Mathematical Models [#52]

Valdemar M. Cavalcante Junior; Tiago Alves Fernandes; Renato Andrade Freitas; Nayara A. de M. S. Amancio; Fabricio Bradaschia; Marcelo Cabral Cavalcanti

Federal University of Pernambuco

14:40 | Multilevel Inverter with Variable Voltage Levels for Optimized Current Ripple Emulation of Three-Phase Machines [#79]

15:00 | Sensorless BLDC Motor Control for Long Oil Pipelines Inspection Robot [#94]

Leonardo Martins; Elisiane Paixao; Anselmo da Silva; Augusto Parigot; Bruno dos Santos; Fabrizio Maziero; Joao Espolador; Leonardo Mai; Luis de Oliveira; Luis Lampert; Sebastian Martins; Tatiana Schoenfelder; Hugo Santos; Mateus Orige
SENAI Innovation Institute for Embedded Systems; Petrobras S/A; Federal University of Santa Catarina

15:20 | Predictive Direct Speed Control of PMSM Without Weighting Factors [#111]

Emrah Zerdali; Marco Rivera; Patrick Wheeler; Sergio Toledo
Ege University; University of Nottingham; Universidad de Talca

15:40 | Modelling and Control of a Non-isolated Boost DC-DC Converter Using Voltage Lift Technique [#364]

Camila M. Bandeira; Diego M. Hamilton; Valdemar M. Cavalcante Junior; Renato A. Freitas; Gustavo M. S. Azevedo; Fabrício Bradaschia; Leonardo R. Limongi
Federal University of Pernambuco

SS2 - Industry-Oriented Papers | Room 5

Chair: Joable Andrade Alves
Co-chair: Alessandro Batschauer

14:00 | An Automated Framework for Lithium Batteries State of Health (SoH) Analysis [#120]

Vinicius Matheus B. Pereira; Janisley Oliveira De Sousa; Gustavo Couto Fonseca; Ricardo Nogueira Santos
Sidia Institute of Science and Technology

14:20 | Impact Analysis on Variable-Speed Drives Under Unbalanced Grid Conditions [#181]

Leandro B. K. Fisch; Odiglei H. Goncalves; Fabricio Trentini; Carlos A. Hummelgen; Adalberto J. Rossa
WEG Drives & Controls Ltda - Automation

14:40 | Current harmonics generated by medium voltage soft-starters based on IEEE 519:2014 [#203]

Edson Pohlmann Kirschner; Joable Andrade Alves
WEG Drives & Controls Ltda - Automation

15:00 | Model Predictive Control of Cascaded H-Bridge Inverters Driving Induction Motors [#261]

Guilherme A. Pangratz; William C. A. Pereira; Yales R. Novaes; Joable A. Alves; Power Electronics, Machines and Control Centre
WEG; State University of Santa Catarina; University of Nottingham

15:20 | Medium Voltage Motor Drives operation testing by Electronic Dynamometers [#273]

Roberto Buerger; Guilherme Augusto Pangratz; Thiago Rafael Schlemmer; Allan Diego Maffezzolli ;Diogo Brum Cândido; Joable Andrade Alves
WEG - WDC

15:40 | Implementation of a smart battery based on the dc/dc boost converter [#356]

Bruno de Araujo Coutinho; Pedro Ivo de Oliveira Tironi; Heverton Augusto Pereira; Remus Teodorescu; Allan Fagner Cupertino
Federal Center for Technological Education of Minas Gerais

Wednesday Morning | November 29th, 2023

E - Motor Drives and Inverters | Room 1

Chair: José Antenor Pomilio
Co-chair: Tiago Davi Curi Busarello

10:15 | Offline optimization approach for designing a Backstepping speed observer for PMSMs [#71]

Emmanuel Adamski de Moura; Rodrigo Padilha Vieira; Cassiano Rech
Federal University of Santa Maria

10:35 | An Asymmetric Five-Level Flying Capacitor Converter with PWM Current Control for Switched Reluctance Motors [#84]

Filipe P. Scalcon; Gaoliang Fang; Cesar J. Volpato Filho; Hilton A. Grundling; Rodrigo P. Vieira; Babak Nahid-Mobarakeh
McMaster University; Federal University of Santa Maria,

10:55 | Data Acquisition for a Magnetic Levitation Vehicle [#87]

Gabriel Klajman Messer; Elkin Ferney Rodriguez Velandia; Richard Magdalena Stephan; Cesar Augusto Goncalves Amado
Federal University of Rio de Janeiro

11:15 | Enhanced Discrete-time Differentiators for State Observers of Sensorless Permanent Magnetic Synchronous Motor Drives [#309]

Tiago Davi Curi Busarello
Federal University of Santa Catarina

11:35 | Convex Control Set Model-Based Predictive Control Applied to a Permanent Magnet Synchronous Motor [#334]

Sabrina F. Dell Agnolo; Arthur G. Bartsch;Filipe Fernandes; José de Oliveira; Mariana S. M. Cavalca; Ademir Nied
State University of Santa Catarina; Federal Institute of Santa Catarina

11:55 | High-frequency switching of state-of-the-art wide band gap inverters and its impact on encoderless control schemes [#395]

Stefan Klass; Hannes Börnngen; Darshan Manoharan; Ralph Kennel; Marcelo Lobo Heldwein

G - Modeling, Simulation and Control | Room 2

Chair: Giorgio Spiazzi
Co-chair: Fabrício Bradaschia

10:15 | Effect of Optimization Algorithm Choice on Photovoltaic Module Modeling Performance [#51]

Valdemar M. Cavalcante Junior; Tiago Alves Fernandes; Renato Andrade Freitas; Nayara A. de M. S. Amancio; Fabrício Bradaschia; Marcelo Cabral Cavalcanti
Federal University of Pernambuco

10:35 | Finite Control Set - Model Predictive Control Applied to a Dual-Converter-Based Rectifier With a Floating DC-Link [#220]

Liane M. de Oliveira; Victor F. M. B. Melo; Iaryssa P. Teles; Emerson de L. Soares
Federal University of Paraíba; Federal University of Campina Grande

10:55 | Selective Harmonic Mitigation – Model Predictive Control for a Grid-Connected Seven-Level Cascaded H-Bridge Converter [#398]

Victor Cabezas; Pablo Acuna; Pablo Lezana; Ricardo P. Aguilera; Cristian Garcia
Universidad de Talca; Universidad Tecnica Federico Santa Maria; University of Technology Sydney

11:15 | An Analysis of Carrier-Based Multilevel Modulation Strategies with Different Carrier Dispositions Applied to an Open-End Winding Power Converter [#400]

Herbert O. Ramos; Hugo R. Torquato; Frederico F. V. Matos; Victor F. Mendes; Clodualdo V. Sousa
Federal University of Minas Gerais; Federal University of Itajubá

11:35 | Performance Comparison of Finite Control Set Model Predictive Control Approaches Applied to Three-Phase Two-Level Inverters [#402]

João Pedro Brunoni; Rodolfo César Costa Flesch; Julio Elias Normey-Rico; Vinícius Berndsen Peccin
Federal University of Santa Catarina; Federal Institute of Santa Catarina

11:55 | Thevenin Model based on Look-up Table to Emulate PV Panels in Power Electronics Simulation [#408]

Heverton Augusto Pereira; Ádrian Luís Soares de Oliveira; Renata Oliveira de Sousa; Victor Pellanda Dardengo; Allan Fagner Cupertino
Federal University of Viçosa; Federal University of Technology - Paraná; Federal University of Juiz de Fora

G - Modeling, Simulation and Control | Room 3

Chair: Cristian Garcia
Co-chair: Wilkley Correia

10:15 | Low Complexity Finite Control Set Model Predictive Control for Neutral-Point Clamped Converters with Switching Constraints [#223]

Dimas A. Schuetz; Fernanda Carnielutti¹, Mokhtar Aly; Margarita Norambuena;
Federal University of Ceará

10:35 | Analysis of Active Damping Stability for LCL Grid-Tied Inverter in a Multiloop Current Control Strategy [#344]

Adailton Braga Jr.; Beatriz C. R. Cordeiro; Rodrigo P. Vieira
Federal University of Santa Maria

10:55 | LQR-PID Control Design of a Buck Converter [#350]

Carlos A. Torres-Pinzón ; F. Flores-Bahamonde; H. Ramírez-Murillo; Oswaldo López-Santos; C. J. Mojica-Casallas; S. Alireza Davari
Universidad Santo Tomás; Universidad Andres Bello; Universidad de La Salle; Rovira i Virgili University

11:15 | Hierarchical Line-to-Line Voltage-based FCS-MPC Computational Cost Reduction for Multi-Level Converters [#353]

Cristian Castillo; Cristian Garcia; Pablo Acuna
Universidad de Talca

11:35 | Nonlinear-MPC-Based Cluster Energy Control of Modular Multilevel Matrix Converters [#213]

Matías Correa; Andrés Mora ; Javier Pereda; Alejandro Angulo
Universidad Tecnica Federico Santa Maria, Pontificia Universidad Catolica de Chile

11:55 | Moving Lean Instant Slope Constant Estimator for Fast Online Measurement of Derivative and Absolute Value of Oversampled Signals [#404]

Andreas Liske; Benjamin Bachowsky; Matthias Brodbeck; Marc Hiller
Karlsruhe Institute of Technology

H - Renewable Energy Systems and Energy Storage | Room 4

Chair: Andrii Chub
Co-chair: Montiê Alves Vitorino

10:15 | A Sustainable Energy Storage System for Hydro-PV Microgeneration [#14]

Valdecir Junior De Paris; Fernanda de Morais Carnielutti; Denizar Cruz Martins.
Federal University of Santa Catarina; Federal University of Santa Maria.

10:35 | Pulse-width and nearest-level modulation strategies applied to a MMC-based 12 MW direct-drive wind energy conversion system [#24]

Andrei O. Almeida; Matheus S. Paulo; Daniel P. Teixeira; Rodolfo L. Valle; Pedro M. Almeida; Pedro G. Barbosa.
Federal Center for Technological Education of Minas Gerais; Federal University of Juiz de Fora

10:55 | Current Sensorless MPPT Algorithms for PV Systems with Partial Shading [#101]

Maacyr A. G. de Brito; Guilherme M. S. Martines; Edson A. Batista; Ruben B. Godoy
Federal University of Mato Grosso do Sul

11:15 | Proposal of WECS technology with DFIG using Conservative Power Theory for ancillary services [#102]

Carlos Leonardo Ancasi Hinostrroza; Joao Pedro Carvalho Silveira; Tarcio Andre dos Santos Barros; Marcelo Vinicius de Paula; Pedro Jose dos Santos Neto; Ernesto Ruppert Filho
University of Campinas

11:35 | Comparison of State-of-Charge and State-of-Health balancing schemes through a smart battery model with online degradation [#106]

Jonathan Silva de Oliveira; Erick Matheus da Silveira Brito; Heverson Augusto Pereira; Allan Fagner Cupertino

Federal Center of Technology of Minas Gerais; Federal University of Viçosa; Federal University of Juiz de Fora

11:55 | T-type Based Cascaded H-bridge Converter Operating as a Split AC Battery and Modified State-of-Charging Hierarchical Balancing Method [#305]

Reyhaneh Eskandaria; Prasanth Venugopala; Alan Watsonb; Pat Wheelerb; Thiago Batista Soeiroa

University of Twente; University of Nottingham

I - Transportation Power Electronics | Room 5

Chair: Alessandro Batschauer

Co-chair: Mário Lúcio da Silva Martins

10:15 | Power Electronics for All-Electric Aircraft: A Review [#39]

João José Ferreira Evangelista Filho; João Pedro Souza Pascon; Joel Filipe Guerreiro; Gabriela Torlone de Carvalho Ferreira; José Antenor Pomilio

State University of Campinas; EMBRAER

10:35 | Average Model of Bidirectional DC-DC and AC-DC Converters Coupled in a DC link for Series Hybrid Electric Vehicle [#40]

Marcio V. R. Campos; Lucas Jonys R. Silva; Thales Augusto Fagundes; Rodolpho Vilela Alves Neves; Ricardo Quadros Machado; Vilma Alves Oliveira

University of Sao Paulo

10:55 | Analysis of the Phase-Shift Full-Bridge Converter in 400V and 800V DC Fast Charging Stations [#217]

Camila M. Bandeira; Nestor I. Medina G; Gustavo M. S. Azevedo; Rafael C. Neto; Leonardo R. Limongi; Marcelo C. Cavalcanti

Federal University of Pernambuco

11:15 | Independent Field Excitation Control of an In-Wheel Wound-Field Flux-Switching Machine for Micro-Hybrid Applications [#227]

Diogo Pereira Vilela Galo; Thales Alexandre Carvalho Maia; Braz de Jesus Cardoso Filho
Federal University of Minas Gerais

11:35 | Multi-loop Sliding-Mode Control for a Battery Charger Using a Quadratic Buck Converter [#252]

Oswaldo L´opez-Santos; F. Flores-Bahamonde; C. A. Torres-Pinz´on; Reham Haroun;
Hugo Valderrama-Blavi
Virgili University; Universidad Andres; Universidad Santo Tom´as; University of Lleida

11:55 | A Quasi-3-Level Active Neutral Point Clamped Converter for Onboard Chargers in Electric Vehicles [#333]

Anand Krishnamurthy Iyer; Prasanth Venugopal; Thiago Batista Soeiro
University of Twente

J - Wireless Power Transfer | Room 6

Chair: Mahinda Vilathgamuwa
Co-chair: Antonio J. Marques Cardoso

10:15 | Adaptative Termination and Control Algorithm for Resonant Arrays used in Inductive Wireless Power Transfer Systems for Vehicle Charging [#31]

Joao Dinis; Jos´e Alberto; Antonio J. Marques Cardoso.
University of Beira Interior; Lus´ofona University

10:35 | Design and control of a Series-Series and Series-Parallel Resonant Converters with Boost Capabilities for Wireless Power applications [#200]

E.Y Piedrahita-Echavarria; A. Escobar-Mejia; A. Alzate-Gomez; E. Giraldo-Suarez
Universidad Tecnologica de Pereira

10:55 | A Comparative Study Regarding Different Coil Structures for Low Power Device WPT Systems [#229]

Gabriel Alli; Pablo W. Elesbˆao; Joˆao Pedro S. Cipriani; Lucas Monteiro Ilha; Leandro Roggia;
´Alysson Raniere
Federal University of Santa Maria

11:15 | Optimized design methodology in inductive power transfer systems applied to electric vehicle charging [#254]

Leonardo A. Brum Viera; Pedro Gelati Pascoal; Cassiano Rech
Federal University of Santa Maria

11:35 | Power Supply Design for IoT Devices Using Magnetic Field Harvested Energy [#381]

Rafael da Silva Ferraz; S´ostenes G. M. Oliveira; Horacio Tertuliano Filho; Cl´audio Bastos da Silva
Federal University of Paran´a

11:55 | An Overview of Reactive Power Compensation Strategies in Inductive Power Transfer Systems [#390]

Leonardo F. Pacheco; André L. Kirsten
Federal University of Santa Catarina

Wednesday Afternoon | November 29th, 2023

B - DC-DC Converters | Room 1

Chair: Brad Lehman
Co-chair: Denizar Cruz Martins

14:00 | Modeling and Control of Single Switch Isolated SEPIC DC-DC Converter with Stacked Double Output for Photovoltaic Microinverter [#59]

Milton Luis Filipe Muhongo; Tiago Miguel Kleb Faistel; Antonio Manuel Santos Spencer Andrade; Fabio Ecke Bisogno
Federal University of Santa Maria

14:20 | High Power Density Electric Vehicle Powertrain Based on a T-Type DAB Partial Power DC-DC Converter [#165]

Ronald Carmona; Alejandro Stowhas-Villa; Christian A. Rojas; Hugues Renaudinea; Jorge Marin
Universidad Tecnica Federico Santa Maria

14:40 | An Algorithmic Approach to Optimize LLC Resonant Converter Design [#306]

Leonardo Augusto Bender; Gierry Waltrich
Federal University of Santa Catarina

15:00 | Assessing The Current Imbalance of Current Multiplier Rectifiers Stage in Isolated dc-dc Converters [#311]

Raimundo Nonato M. de Oliveira; Dalton de Araújo Honório; José Willamy M. de Araújo; Demercil de Souza Oliveira Jr.
Federal University of Ceará

15:20 | 48V to 1V Power Conversion for Data Centers with 100W Modules [#331]

Humberto de Souza Cardoso; Telles Brunelli Lazzarin
Federal University of Santa Catarina

15:40 | Three-phase DAB Converter with Reconfigurable Transformer Connection Strategy [#336]

Mateus de Freitas Bueno; Eduardo Valmir de Souza; André Luís Kirsten
Federal University of Santa Catarina; Technical University of Munich

C - DC-AC Converters | Room 2

Chair: Pablo Acuña
Co-chair: Rafael Diez

14:00 | Sizing Equations for a Square Voltage Pulse Power Supply for Dielectric Barrier Discharges [#PJ2]

Camilo Sanabria; David Florez; Hubert Piquet; Rafael Diez;
Pontificia Universidad Javeriana; Escuela de Ciencias Exactas e Ingeniería Universidad Sergio Arboleda; Université de Toulouse; Université de Toulouse

14:20 | Decoupled Level-Shifted PWM scheme for Nine-Switch converter based applications [#42]

Cristina K. Stamulis V. ; Carlos A. Reusser F.; Samir Kouro R.
Pontificia Universidad Catolica de Valparaiso; Universidad Tecnica Federico Santa Maria

14:40 | LMI-based Predictive Control Applied to the Single-phase PWM Inverter with LC Filter [#68]

Cristiano Quevedo Andrea; Edson Antonio Batista; Luis Felipe da S. C. Pereira; Moacyr Aureliano Gomes de Brito; Gustavo Vargas de Souza
Federal University of Mato Grosso do Sul; São Paulo State University

15:00 | Sigmoid Functions Applied in Proportional + Resonant Reference for Current Harmonic Sharing [#74]

Bruno Meneghel Zilli; Lucas Jonys Ribeiro Silva; Marcio Von Rondow Campos; th Cassius Rossi de Aguiar; Ricardo Quadros Machado
University of Sao Paulo; Federal University of Technology - Parana

15:20 | A Combination of a Feed-Forward and Selective Harmonic Elimination Method for Mitigation of Voltage Distortions in Single-Phase Stand-Alone Inverters Operating with Non-Linear Loads [#137]

Navid H. Golkhandan; Marco Rivera; Patrick Wheeler; Pablo Acuna; Jaime Rothen; Ali Davoudi
Universidad de Talca; University of Nottingham; Universidad del Bio; Nian Electronic Company

15:40 | Control Performance Assessment of a Zero Harmonic Distortion Grid-Forming Converter in Islanded Microgrids [#207]

Gabriel Vilkn Ramos; Thiago Morais Parreiras; Braz de Jesus Cardoso Filho
Federal University of Minas Gerais

H - Renewable Energy Systems and Energy Storage | Room 3

Chair: Wilmar Martinez
Co-chair: Lucas Vizzotto Bellinaso

14:00 | Interleaved Three-Phase Rectifier Dual Input Single Stage In Discontinuous Conduction Mode With Maximum Power Tracking Method For Application In Small Wind Generators [#32]

Guilherme Matheus Todys; Alceu A. Badin; Amauri A. Assef; Daniel Flores Cortez; Delvanei Gomes Bandeira Jr.; Eduardo F. R. Romaneli; Luis P. Custodio; Roger Gules.
Federal University of Technology of Paraná

14:20 | Mission profile emulator for battery degradation tests [#124]

Pedro Tironi; Heverton Pereira; Victor Mendes; Allan Cupertino
Federal Center of Minas Gerais; Federal University of Minas Gerais; Federal University of Viçosa; Federal University of Juiz de Fora

14:40 | Stability Analysis of a 15 MW Wind Energy Conversion System with Frequency Control Support Connected to an Isolated Microgrid System [#348]

Matheus Schramm Dall'Asta; Telles Brunelli Lazzarin
Federal University of Santa Catarina

15:00 | Synchronverter with virtual resistor-based frequency control technique applied in doubly-fed induction generator [#199]

Jose Dickson Araujo de Oliveira; Francisco Kleber de A. Lima; Carlos Gustavo Castelo Branco
Federal University of Ceará

15:20 | Evaluating the Significance of Solarimetric Data for Photovoltaic System Simulation in a Real-World Case [#202]

Joao Lucas de Souza Silva; Joao Antonio F. G. da Silva; Eslam Mahmoudi; Joao Frederico S. de Paula; Tarcio Andre dos Santos Barros; Marcelo Gradella Villalva
University of Campinas

15:40 | A Input-Parallel-Output-Series multiphase Hybrid Boost Converter Applied to Hydrogen Fuel Cells [#358]

Alfredo Renault; Julio Pacher; Marco Rivera; Marcos Gomez; Raul Gregor
Universidad Nacional de Asunción; Universidad Nacional de Asunción; University of Nottingham; Universidad de Talca

K - Other Power Electronics Applications | Room 4

Chair: José Rodrigues
Co-chair: Marco Antônio Dalla Costa

14:00 | Modular Multilevel Matrix Converter with Hybrid Energy Storage for Propulsion Systems and Grid Supply in Marine Vessels [#54]

Jose Gajardo; Javier Pereda; Andres Mora
Pontificia Universidad Catolica de Chile; Universidad Tecnica Federico Santa Maria

14:20 | Design of an Off-line LED Driver Based on the Interleaved BCM Boost PFC and the LLC converter with Active Ripple Compensation [#82]

Ruan M. Ferraz; Lucas H. G. Resende; Henrique A. C. Braga; Pedro S. Almeida; Guilherme M. Soares
Federal University of Juiz de Fora

14:40 | Magnetics Integration in a Two-Stage LED Driver [#162]

Igor B. Barboza; Guirguis Z. Abdelmessih; Maikel F. Menke; Marco A. Dalla Costa
Federal University of Santa Maria; University of Burgos

15:00 | Design Improvement of Self-Oscillating Resonant Converters Accounting for Gate Charge in High-Frequency LED Drivers [#238]

Lucas Monteiro Ilha; João Pedro Scherer Cipriani; William Guidolin da Rosa; Pablo Winkelmann Elesbão; Álysson Raniere Seidel; Maikel Fernando Menke
Federal University of Santa Maria

15:20 | Assessment of Deep Reinforcement Learning Algorithms for Three-Phase Inverter Control [#259]

Oswaldo Menéndez; Diana López-Caiza; Luca Tarisciotti; Felipe Ruiz; Fernando Auat-Cheein; José Rodríguez
Universidad Católica del Norte; Universidad Andres Bello; Heriot-Watt University; Universidad San Sebastian

15:40 | Intelligent Control of an Active Front-End Converter: Deep Reinforcement Learning Approach [#262]

Oswaldo Menendez; Diana Lopez-Caiza; Alvaro Prado; Freddy Flores-Bahamonde; José Rodríguez;
Universidad Católica del Norte; Universidad Andres Bello; Universidad San Sebastian

SS3 - Graduation Papers | Room 5

Chair: Rodrigo Padilha Vieira
Co-chair: Allan Cupertino

14:00 | Analysis of Energy Yield in Bifacial PV Plants as a Function of Installation Factors Through the View Factor Model. [#142]

Tiago Alves Fernandes; Alex M. da Silva Ferraz; Valdemar M. Cavalcante Junior; Eduardo Jose Barbosa; Marcelo Cavalcanti Cabral; Zanoni Dueire Lins
Federal University of Pernambuco

14:20 | Pulsed-current charging of smart batteries through warm redundancy scheme [#180]

Erich Francisco Rosa; Erick Matheus da Silveira Brito; Heverton Augusto Pereira; Remus Teodorescu; Allan Fagner Cupertino
Federal Center of Minas Gerais; Federal University of Viçosa; Federal University of Juiz de Fora; Aalborg University

14:40 | Parallelization of silicon-carbide MOSFET and silicon IGBT: Challenges to obtain a cost-effective hybrid switch [#183]

Pedro Henrique Gomes Vilela; Edmar Ferreira Cota; Heverton Augusto Pereira; Tomas Perpetuo Correa; Allan Fagner Cupertino
Federal Center of Minas Gerais; Federal University of Viçosa; Federal University of Juiz de Fora; Federal University of Minas Gerais

15:00 | Assessing the Effects of One-Diode Model Parameter Variations

on the I-V Curves of Photovoltaic Generators: an application [#318]

Matheus Meireles da Silva; André Luís Kirsten; Roberto Francisco Coelho
Federal University of Santa Catarina

15:20 | Can Off-Grid System be Improved to be Smart? How internet of things can change the game. [#347]

Giovani Aneres Castro; Luis Antonio Gregório Lopes; Diuary Gonçalves;Renata Oliveira de Sousa;Allan Fagner Cupertino;Heverton Augusto Pereira
Universidade Federal de Viçosa; Technology Center of Minas Gerais; Federal University of Paraná

15:40 | Evaluating Power Losses in EV Traction Inverters: A Stochastic Modeling Tool for Performance Assessment [#388]

Igor de Matos da Rosa; Lenon Schmitz
Federal University of Santa Catarina

SS3 - Graduation Papers | Room 6

Chair: Günter Keller
Co-chair: Rafael Cavalcanti Neto

14:00 | Assesment of Interface Algorithms for Real-Time Co-Simulation [#88]

Rodrigo Vasconcelos Gloria; Gabriel de Souza Antero; Joao Marcelo Teixeira do Amaral;
Robson Francisco da Silva Dias
Federal University of Rio de Janeiro

14:20 | Experimental results for the application of techniques for reducing EMI noise in a switch-mode power supply [#140]

Felipe R. Broering; Mauro Tavares Peraça; Joabel Moia; Luis C. M. Schlichting
Federal Institute of Santa Catarina

14:40 | Comparative Analysis Between Three-Phase Five-Level Inverter and Nine-Phase Two-Level Inverter [#277]

Gustavo L. B. Guedes; Braz J. Cardoso Filho; Rodrigo R. Bastos
Federal University of Minas Gerais

15:00 | Comparison Analysis of Current Controllers Applied to a Boost Power Factor Correction Converter [#282]

Iago D. F. de Melo; Gustavo A. Teixeira;Eduardo A. O. Barbosa;Rafael C. Neto;Fabrício Bradaschia; Francisco A. S. Neves
Federal University of Pernambuco

15:20 | Test Bench for Off-Grid Photovoltaic System based on Cloud Platform [#369]

Davi Caetano da Silva Junior; Rodrigo Cassio de Barros; Diuary Gonçalves; Victor Pellanda Dardengo;Allan Fagner Cupertino; Heverton Augusto Pereira
Federal University of Viçosa; Federal University of Juiz de Fora;Federal University of Recanto da Bahia; Federal Education Center of Minas Gerais

TECHNICAL SESSIONS POSTER

Monday 16:00 to 17:00 | November 27th, 2023

Chair: Fernando Antunes
Co-chair: Kleber César Alves de Souza

A - AC-DC Converters

Comparative Analysis of Loads Under AC and DC Supply [#226]

Lucas Antonio Pelike; José Antenor Pomilio
Universidade Estadual de Campinas

Seven-Level Double Flying Capacitor Inverters [#272]

Antonio Venancio M. Lacerda Filho; Edison Roberto C. da Silva; Cursino Brandão Jacobina; Reuben Palmer
Federal University of Campina Grande; Federal University of Paraiba;

Analysis Of The Single Phase Bridgeless PFC Rectifier With Hybrid Switched Capacitor Cell Operating In DCM [#328]

Chrystian Mumic; Marcus Vieira Soares; Yales Rômulo de Novaes; Alan J. Watson
Santa Catarina State University; Silicon Austria Labs; University of Nottingham

Bidirectional DC-AC Converter for Operation with Energy Storage System in an Energy Nanogrid [#380]

Lucas Ramiro da Silva; Marcello Mezaroba; Gustavo Lambert
State University of Santa Catarina; SUPPLIER Trade and Manufacture Company

Improvements on PFC boost self-control structure [#417]

Wilkley Bezerra Correia; Demercil Oliveira de Souza Júnior; Felipe José de Sousa Vasconcelos; José Willamy Medeiros
Federal University of Ceará

H - Renewable Energy Systems and Energy Storage

Modeling and Multivariable Analysis of a Two-Stage Three-Phase Grid-Connected Inverter for Photovoltaic Systems [#17]

Daniel Pinheiro Teixeira; Andrei de Oliveira Almeida; Rodolfo Lacerda Valle; Pedro Gomes Barbosa; Pedro Machado de Almeida.
Federal University of Juiz de Fora; Federal Center of Technology of Minas Gerais.

Comparison Between Predictive Current and Predictive Torque Control Applied to a Doubly-Fed Induction Generator System for Connection to DC Microgrids [#103]

Lucas Fabrício M. de Lucena; Victor Felipe Moura Bezerra Melo; Nady Rocha; Ruben da Cruz Ferreira
Federal University of Paraiba

Simple Method to Estimate Battery Lifetime of Lead-Acid and Lithium-Ion Batteries in Power Electronic Applications [#107]

Pedro C. Bolsi; Edeimar O. Prado; Romário J. Nazaré; Hamiltom C. Sartori; José R. Pinheiro
Federal University of Santa Maria; Federal University of Bahia

Challenges in Medium Voltage Microgrids Case Study: Alcântara Launch Center [#116]

Hércules Oliveira; Luiza H. S. Santos; José Gomes de Matos; Luiz Antônio de S. Ribeiro; Alexandre Cunha Oliveira; João Victor Mapurunga Caracas
Federal University of Maranhão; University of Campinas; Federal University of Campina Grande; Enova Energia

Analog One-Cycle Control Based Scheme for Battery Charging in Photovoltaic Systems [#123]

João T. de Carvalho Neto; Andrés O. Salazar
Federal Institute of Education, Science and Technology of Rio Grande do Norte; Federal University of Rio Grande do Norte

Optimization of Power Generation using the Tip Speed Ratio Method in a WECS equipped with PMSG [#136]

Denisia de Vasconcelos Mota; Alana de Oliveira Ferro; Vanessa Siqueira de Castro Teixeira; Lucas Taylan Ponte Medeiros; Leonardo Pires de Sousa Silva; Adson Bezerra Moreira
University of Ceará

A Comparative Analysis of Power Smoothing Metrics: Unveiling Limitations Through Observational Data [#152]

Ricardo M. de Souza; Felipe J. P. Ferreira; Antonio S. Neto; Rafael C. Neto; Francisco A. S. Neves; Jose F. C. Castro
Federal University of Pernambuco

Brushless Cascaded Double-Fed Induction Machine for Wind Power Plants [#154]

Allan V. S. Andrade; Richard M. Stephan
Federal University of Rio de Janeiro

Study of Hosting Capacity and the Impacts of Overvoltage in a Real Grid [#205]

Ana Carolina Brandao Gontijo; Paulo Radatz; Lucas S. Texeira; Helio M. A. Antunes; Braz de J. C. Filho; Sidelmo M. Silva
Federal University of Minas Gerais; Electric Power Research Institute; Federal University of Espirito Santo

Comparative Study of Modulation Techniques to Reduce Leakage Current in a Quadratic-Boost Split Source Inverter for Photovoltaic Systems [#225]

Carolina A. Caldeira; Antonio D. D. Almeida; Valdemar M. Cavalcante Junior; Camila M.

Bandeira; Marcelo C. Cavalcanti; Mario L. S. Martins
Federal University of Pernambuco; Federal University of Santa Maria

Integration of a Battery energy storage system in the Distribution Networks: A computational model in OpenModelica [#240]

Franz de Cassias Strobel; Raphael Paulo Braga Poubel; Allan Fagner Cupertino; Wallace do Couto Boaventura
Federal Technological Education Center of Minas Gerais; Federal University of Juiz de Fora

Simplified Electrical Modeling Of An Alkaline Electrolyzer For Application In Simulations With Power Converters [#243]

Alane Teixeira Rodrigues; Francisco W. O. da Frota; Humberto P. V. Ool de Sousa; Edilson M. Sá Júnior
Federal University of Ceara

Simplified Electrical Model of an Bipolar Alkaline Electrolyzer Considering the Bubble Effect [#244]

Humberto P. Van Ool de Sousa; F. Wilson Oliveira da Frota; Alane Teixeira Rodrigues; Edilson Mineiro Sá Jr.
Federal University of Ceara

Coordination of Protection Devices in Microgrids [#283]

Hércules Oliveira; Luiza H. S. Santos; José Gomes de Matos; Clóvis B. M. Oliveira; Luiz Antônio de S. Ribeiro; Orlando da Silva Santos; João Victor Mapurunga Caracas
Federal University of Maranhão; University of Campinas

Power Factor Correction of a Hydroelectric Plant Ancillary-Service-Grid Supplied by a PV Float Generation [#292]

Wellington Ferreira Felipe; Maurício Larroyd Lando; Rogério Gaspar de Almeida; Jefferson Rafael Pereira de Assis; Nady Rocha; Darlan Alexandria Fernandes
Federal University of Paraíba

Analysis of Green Hydrogen Generation Potential in Uruguay from Surplus Renewable Energies [#355]

Jorge Antúnez; Conrado Fleck; Jesús Hernandez Universidad de Jaén; Adrián Borche; Mauricio Mendes da Silva
Technological University; Universidad de Jaén

Comparison of Current-Voltage Curve Translation Techniques [#370]

Raphaela Goes de Lima; Cesar Ribeiro de Almeida; Allan Fagner Cupertino; Victor Pellanda Dardengo; Heverton Augusto Pereira
Federal Education Center of Minas Gerais; Federal University of Vic_osa

A comparative analysis of different DC arc models for PV systems application [#382]

Mauricio Taconelli; Luiz F. P. de Oliveira; João A. F. G. da Silva; Tarcio A. S. Barros ; Marcelo G. Villalva
University of Campinas

Islanding Detection Active Method Using PLL System and Adaptive Filter

[#403]

Vinícius Dário Bacon; Leonardo Poltronieri Sampaio; Sérgio Augusto Oliveira da Silva; Aleksander da Silva Toth; Felipe Massami Hamamoto
Federal University of Technology

Voltage Regulation in Electric Networks Using Battery Energy Storage System [#405]

Chrystiano Alves Galdino; Victor Flores Mendes
Federal University of Minas Gerais

I - Transportation Power Electronics

Bidirectional IGBT-based Battery Fast Charger [#134]

Marcelo Siqueira; Robson Gonzatti; Rondineli Pereira; Bruno Guimarães; Arnaldo Costa
Federal University of Itajubá

Dynamic Modeling and Validation of Bidirectional DC-DC Converter Non-Isolated Based on Three State Switching Cell [#160]

Felipe Joel Zimann; Robson Mayer; Menaouar Berrehil El Kattel; Sergio Vidal Garcia Oliveira
Santa Catarina State University; University of Campinas; Federal University of Ceara ;
University of Blumenau

A DC/DC Converter for 400 V and 800 V EVs Fast Charging Stations [#170]

Jhon Brajhan Benites Quispe; Marcello Mezaroba; Alessandro Luiz Batschauer; Jean Marcos de Souza Ribeiro
Sao Paulo State University; Santa Catarina State University

1.2kV SiC wirebond-less integrated low inductance module for automotive application [#174]

Massimo De Giorgio; Ke Li; Stewart Marchant; Liliana de Lillo; Lee Empringham; Dimitrios Serafianos; Jonathan Lea; Simon Brockway; Mark Jonhson
University of Nottingham; Protean Electric Ltd;

Implementation and Analysis of a Double-Tiered Switched Capacitor Series Battery Equalizer Circuit [#211]

Murilo Lucher da Silveira; Mauricio Mendes da Silva; António M. S. Spencer Andrade
Federal University of Santa Maria

Contribution to the Study of the Quality of Electric Energy on Ships [#265]

André Faria Hernandez; José Antenor Pomilio
University of Campinas

Magnetic Integration in A Soft-Switching Three- Phase Isolated DC-DC Converter [#329]

Raimundo N. M. Oliveira; José Willamy M. de Araújo; Fernando L. Tofoli; Demercil Oliveira
Federal University of Ceará

Optimal Scheduling of Electric Vehicles in Vehicle-to-Grid System with Battery Energy Storage for Cost-Efficient Integration of Distributed Photovoltaics [#426]

Gihan Denagama Vitharanage; Mahinda Vilathgamuwa; Yateendra Mishra; Paul Cory
Queensland University of Technology

L - Education topics

A Sustainable Solar Powered Wastewater Recycling System In IFBA Campus Paulo Afonso [#2]

Evandro Ailson De Freitas Nunes; Leticia Silva Oliveira Matos; Ana Julia Oliveira Marques; Abilio Texeira Lima Neto; Fernando Carlos Ferreira De Oliveira.
Federal Institute of Bahia (IFBA); Federal University of Parana (UFPR).

Proposal of a Low-Cost Didactic Dynamic Mechanical Load Emulator for Electric Machines Lab's Course [#36]

Mateus Caruso; Victor S. Monteiro; Guilherme G. Sotelo; Bruno W. França
Federal Fluminense University

Learning Transformer Modeling: A Laboratory Approach for Undergraduate Lectures [#130]

Lourenço Matakas Junior; Vinicius Negri Machado; Fernando Ortiz Martinz; Wilson Komatsu
University of São Paulo

Proposed Set of Power Quality Lectures for an Undergraduate Power Electronics Course [#153]

Vinicius Negri Machado; Fernando Ortiz Martinz; Wilson Komatsu; Lourenço Matakas Junior
University of São Paulo

Small Signal Analysis and Control Design of the Cuk Converter in Discontinuous Conduction Mode Based on the Averaged Switch Modeling [#241]

Antonio D. D. Almeida; Carolina A. Caldeira; Fabrício Bradaschia; Marcelo C. Cavalcanti; Leonardo R. Limongi
Federal University of Pernambuco

Contribution to the Teaching of Electric Power Quality Through Practical and Extension Activities [#256]

Bruno S. Dupczak; Vitor F. de Borba; Jackson Lago
Federal Institute of Santa Catarina

Active Learning Methodology Applied in Electric Machines Classes [#352]

Alana de Oliveira Ferro; Denisia de Vasconcelos Mota; Vanessa Siqueira de Castro; Adson Bezerra Moreira
Federal University of Ceará

Chair: Heverton Augusto Pereira
Co-chair: Kleber Cesar Alves de Souza

B - DC-DC Converters

A Novel Dual-Input Cuk-Based Converter: Modeling, Analysis and Design [#29]

Thales Augusto Fagundes; Guilherme H. F. Fuzato; Rafael F. Q. Magossi; Márcio V. R. Campos; Lucas J. R. Silva; Ricardo Q. Machado.
University of São Paulo; Federal Institute of São Paulo; Solar21

State of Charge balancing in primary control for DC-DC microgrids [#66]

Raphael Sauer; Lucas Jonys Ribeiro Silva; Marcio Von Rondow Campos; Cassius Rossi de Aguiar; Ricardo Quadros Machado
University of Sao Paulo; Federal University of Technology - Paraná

Zeta DC-DC Converter With Multilevel Flying Capacitor Switching Cell [#112]

Montie Alves Vitorino
Federal University of Campina Grande

Design and Control of the WCR-4SSC Boost Converter on a Test Workbench for DC-DC Converters [#144]

Dalton de A Honorio; Dayane Cynthia P. Oliveira; Emanuel de A. Mota; Ubirani Ramon A. Queiroz; Rene P. T. Bascope
Federal University of Ceará

Recharging/Discharging System for Testing High Capacity, High-Current Li-Ion Battery Cells [#176]

Welenton Maito Panisson; Gierri Waltrich; Anderson Silva Vaccari
Federal University of Santa Catarina; Vale SA

DC-DC Bidirectional SEPIC/Zeta Converter with Voltage-Doubler Concept [#186]

Vanderson Damiao Pereira; Carlos Henrique Illa Font
Federal University of Technology - Paraná

Control strategy for allowing bidirectional current converter operates with natural transition between Buck and Boost modes [#187]

Robson Scarmagnani; Arthur G. Bartsch
Federal Institute of Santa Catarina

Cuk DC-DC Converter With Multilevel Flying Capacitor Switching Cell [#218]

Vitor Freire Bezerra; Rhavél Batista Morais; Montié Alves Vitorino
Federal University of Campina Grande

High Static Gain Boost-Cuk DC-DC Converter [#314]

Cleiton Dal'Agnol; Francieli Lima de Sá; William Rafael da Silva; Samir Ahmad Mussa
Federal University of Santa Catarina; Unifacvest University Center

Algorithmic Approach for Optimal Design of DAB Converters in On-Board Chargers [#322]

Rossano Mendes Sotoriva; Mateus de Freitas Bueno; Douglas Mendes Sotoriva; Francieli Lima de Sá; Samir Ahmad Mussa
Federal University of Santa Catarina; Facvest University Center

High-gain Differential Quadratic Boost DC-DC Converter [#323]

William Rafael da Silva; Francieli Lima de Sá; Cleiton Dal'Agnol; Samir Ahmad Mussa
Federal University of Santa Catarina

Three-Port DC-DC Converter based on Ladder Switched Capacitor [#345]

Andressa Barbieri Moro; Wesley Biffe; Antônio Manuel Santos Spencer Andrade
Federal University of Santa Maria; Federal University of Rio Grande do Sul

An Interleaved High-gain DC-DC Boost Converter with Voltage Multiplier Cells and Current Balancing Control [#349]

Cicero Alisson dos Santos; Fernando Luiz Marcelo Antunes
Federal Institute of Paraíba; Federal University of Ceará

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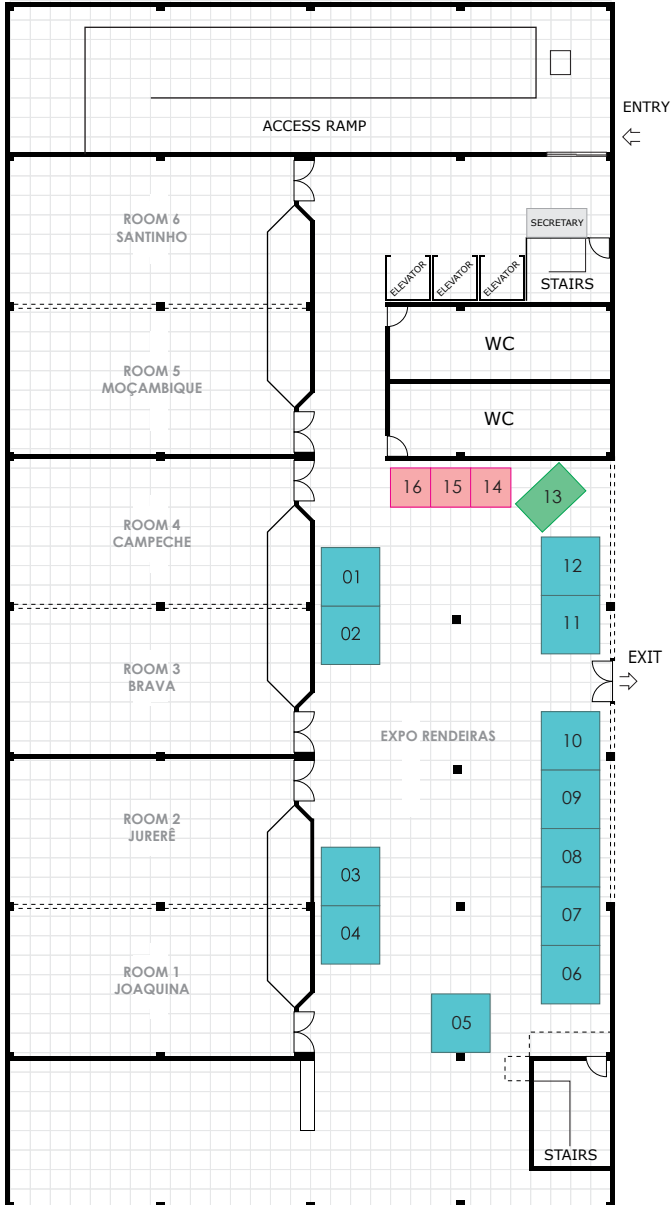
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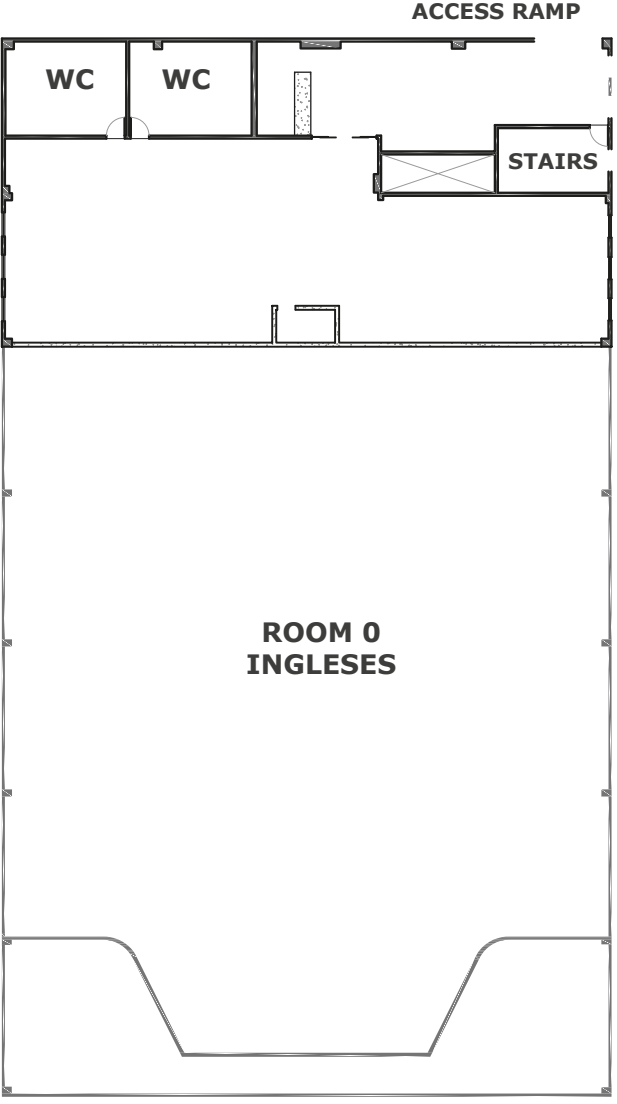
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FIRST FLOOR



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FLORIANÓPOLIS CITY

Florianópolis, also commonly known by the nicknames Floripa and Ilha da Magia (Magic Island), is the capital of the state of Santa Catarina, in the South region of Brazil. The city encompasses Santa Catarina Island and surrounding small islands, as well as part of the mainland. It has a population of 574,200, according to a preview of the 2022 IBGE (Brazilian Institute of Geography and Statistics) census, while the metropolitan area has an estimated population of 1,209,818, the 21st largest in the country. The city is known for having a high quality of life, with the country's highest Human Development Index score among all Brazilian capitals (0.847). The city has some of Brazil's most beautiful beaches and has 100 registered beaches, being a center of surfing activity. Florianopolis has become one of the most popular destinations in Brazil for people who are looking for superb beaches, beautiful scenery, interesting culture and friendly people. Recently, it has also experienced a real estate boom, with Brazilians looking for a better quality of life away from the chaos of the big cities. The city of Florianopolis is quite modern, with large shopping malls, chain and high-end restaurants and many glamorous bars and nightclubs.



Hercílio Luz Bridge



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