

# Technical Sessions Programme

**Wednesday, 5<sup>th</sup> October**

## **AEE Technical Sessions**

***Capri Congress Center 11,30-13,30***

### **Session A1.1 - Renewable Energy Sources, New configuration of Electricity Systems and their management**

Chairperson: Domenico Villacci – Università del Sannio

#### **Validation of combined simulation tool of grid connected photovoltaic power plants**

A. Ukar - PI – Photovoltaik Institut Berlin, Germany, H.-G. Holtorf, N. Mohamed - Carl von Ossietzky University of Oldenburg, Germany

#### **Use of Hidden Inertia from Wind Generation for Frequency Support in Power Grids**

F. Bassi, L. Caciolli, G. Giannuzzi - Terna Rete Italia, N. Corsi, A. Giorgi - University of Florence

#### **PV and Building Energy Efficiency Measures Impact on the Grid in a Middle East Case Study**

P. Lazzeroni, S. Olivero, F. Stirano - Istituto Superiore sui Sistemi Territoriali per L'Innovazione (SiTI), M. Repetto - Politecnico di Torino, C. Micono, P. Montaldo, G. Zanzottera - Ai Engineering

#### **Effects of Average Power Factor Management in Distribution Systems with Dispersed Generation**

F. Bignucolo, A. Savio, R. Caldon - University of Padova, A. Cerretti - Enel Distribuzione

#### **Contribution of MV Static Distributed Generation to Voltage Unbalance Mitigation**

A. Savio, F. Bignucolo, R. Caldon - University of Padova

#### **Impact on Residential Peak Consumption of an Electrochemical Storage System**

R. Urban, D. Moneta, M. Gallanti - RSE – Ricerca sul Sistema Energetico

***Capri Congress Center 14,30-16,30***

### **Session A1.2 - Renewable Energy Sources, New configuration of Electricity Systems and their management**

Chairperson: Roberto Caldon – AEE AEIT

#### **Smart Distribution Management System**

C. Arrigoni, M. Bigoloni, I. Rochira - Siemens, C. Bovo, M. Merlo, V. Ilea - Politecnico di Milano, R. Bonera - Freelance Senior Analyst and Developer

**Independent energetic grids for a smart island: model and design of a microgrid for a small Italian island**

G. Graditi, R. Ciavarella, M. Valenti - ENEA Centro Ricerche Portici, M. Ippolito, D. La Cascia, G. Zizzo - University of Palermo

**Exploiting distributed energy storage to increase network hosting capacity with a Multi-agent control system**

S. Mocci, N. Natale, F. Pilo, S. Ruggeri - University of Cagliari  
Cagliari, Italy

**Development of the Control Strategy for a Direct Current Microgrid: a Case Study**

R. Lazzari - RSE, D. Ronchegalli - Eldor

**Analysis of Active Power Curtailment Strategies for Renewable Distributed Generation**

M. Rossi, G. Viganò, D. Moneta, D. Clerici, C. Carlini - RSE

**Measurements Placement in Active Distribution Networks for Centralized Control Systems**

G. Viganò, M. Rossi, C. Carlini, D. Moneta - RSE

***Sala Cerio 11,30-13,30***

**Session A2.1 - Methods, Components and Technologies for the transmission and distribution of electricity**

Chairperson: Roberto Caldon - AEE AEIT

**Modelli stocastici per la previsione del profilo di assorbimento aggregato di carichi termostatici residenziali**

F. Conte, S. Massucco, F. Silvestro - Università di Genova, E. Ciapessoni, D. Cirio, A. Pitto - RSE

**Valutazione probabilistica della Net Transfer Capacity mediante power flow probabilistico**

F. Adinolfi, S. Massucco, M. Saviozzi, F. Silvestro - Università di Genova, E. Ciapessoni, D. Cirio, A. Pitto - Ricerca sul RSE

**Integrating Forecasting Models in Cyber Physical Power Systems**

A. Andreotti - University of Naples "Federico II", E.M. Carlini - Terna Rete Italia, A. Vaccaro, D. Villacci - University of Sannio

**Improving Power Quality and Efficiency in Electrical Plants using a Three-Phase Series Hybrid Passive Filter**

F. Grasso, A. Luchetta, S. Manetti - University of Firenze, S. De Giorgis, F. Cenghialta, E. D'Antuono - Energia Europa

**Applicazione del teorema di Boucherot per l'analisi di Load Flow su Reti Elettriche Radiali**

P.A. Scarpino - Università degli Studi di Firenze

**Innovative Technologies for Modelling and Measuring Electrical Discharges**

A. Villa, L. Barbieri, M. Gondola, R. Malgesini - Research on Energy System - RSE, A.R. Leon-Garzon - Politecnico di Milano

***Sala Cerio 14,30-16,30***

**Session A2.2 - Methods, Components and Technologies for the transmission and distribution of electricity**

Chairperson: Alfredo Testa – Università di Napoli Federico II

**Enhance Available Battery Energy by Means of a New Management System Control Strategy**

L. Pellegrino, E. Micolano - RSE

**Natural Esters Distribution Transformers: a Solution for Environmental and Fire Risk Prevention**

M. Pompili, L. Calcara - University of Roma "La Sapienza", A. Sturchio, F. Catanzaro - E-distribuzione

**Sodium-Nickel Chloride (NaNiCl<sub>2</sub>) Experimental Transient Modelling**

R. Benato, S. Dambone Sessa - University of Padova, A. Necci, F. Palone - Terna Rete Italia

**Sodium-chloride (Na-NiCl<sub>2</sub>) Battery Safety Tests for Stationary Electrochemical Energy Storage**

R. Benato, S. Dambone Sessa - University of Padova, G. Crugnola, M. Todeschini, A. Turconi, N. Zanon, S. Zin - Fiamm Sonick

**Equivalent Circuit Models for the Analysis of a Commercial Ultracapacitor Module**

M. Andriollo, M. Caramanna, A. Tortella - University of Padova

**Finite Element Model of a 3 m long Three-core Armoured Submarine Cable**

R. Benato, S. Dambone Sessa, M. Forzan, F. Gentilin - University of Padova, M. Marelli, D. Pietribiasi - Prysmian Power Link

**Measurement of short circuit impedance with EDG**

U. Corbellini - Corbellini srl Engineering Company, M. La Rosa - RAI – Radiotelevisione Italiana, G.L. Amicucci, F. Fiamingo - INAIL

**Accurate Prediction of the Corona Noise Produced by Overhead Transmission Lines**

A. Donini, R. Spezie - Terna Rete Italia, R. Cortina - Consultant, E.A. Piana - University of Brescia, R. Turri - University of Padova

***Sala Hotel Syrene 11,30-13,30***

**Session A3.1 Mobility and Transports - Suburban and Urban Applications**

Chairperson: C. Carganico - Italferr

**Installazione in un nodo ferroviario di sistemi di accumulo per il recupero di energia in frenata dai convogli in arrivo**

M. Ceraolo, G. Lutzemberger – Università di Pisa

**A Simulation Model to Estimate Touch Voltage in DC Railway Systems**

C. Spalvieri - Rete Ferroviaria Italiana, R. Lamedica, F.M. Gatta, A. Ruvio, L. Pantalone - Sapienza University of Rome

**Innovative Protection System for Separation Section between 15 kV a.c. and 3 kV d.c. Railway Networks**

G. Guidi Buffarini, G. Trezza, R. Consalvi - Italferr, R. Lamedica, A. Ruvio, S. Muzi - Sapienza University of Rome

**Intervento di up-grade della Linea di Contatto per l'aumento della velocità nel tratto in curva posto tra il km 31 ed il km 50 della linea AV Milano-Bologna**

E. Fedeli, P. Fellini, C. Spalvieri - RFI, M. Porreca - SATFERR, G. Ricci - G.C.F. Generale Costruzioni Ferroviarie

**Processo di certificazione e prove del V300 Zefiro ETR 1000 per velocità commerciali fino a 350 km/h**

C. Carganico, L. Bocciolini, C. Zappacosta - Italcertifer

**Delay Tolerant Network for Smart City: Exploiting Bus Mobility**

C. Giannini, P. Calegari, C. Buratti, R. Verdone - University of Bologna

**A Method for Optimizing Railway Speed Profiles Basing on the Maximization of the Coasting**

A. Guastafierro, G. Lauro - Ansaldo STS, M. Pagano - Università di Napoli Federico II

**Increasing of Subway Lines Capability through Moving Block Signaling Systems: Modeling and Simulation**

M. Brenna, F. Foadelli, M. Longo, D. Zaninelli - Politecnico di Milano, P. Bellini, M. Sicurello - Azienda Trasporti Milanese

**Sala Hotel Syrene 14,30-16,30**

**Session A3.2 Mobility and Transports – Naval Power Systems and Electrical Propulsion for Aircraft**

Chairperson: D. Lauria, A. Del Pizzo – Università di Napoli Federico II

**Introduction**

Prof. Antonio Moccia - Direttore del Dipartimento di Ingegneria Industriale dell'Università di Napoli Federico II

**Cost/Benefit Analysis of Alternative Systems for Feeding Electric Energy to Ships in Port from Ashore**

T. Coppola, M. Fantauzzi, S. Miranda, F. Quaranta - University of Naples "Federico II"

**Zero Emission Sustainable Craft for Coastal Marine Protected Areas**

E. Begovic, C. Bertorello - Università di Napoli Federico II

**Main Issues with the Design of Batteries to Power Full Electric Water Busses**

F. Balsamo, D. Lauria - University of Naples Federico II, G. Pede - National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA), C. Capasso, O. Veneri - Istituto Motori - National Research Council Naples

**Analysis of a Five Phase Electrical Drive for the propulsion of All Electric Aircraft Vehicles**

A. Del Pizzo, L.P. Di Noia, A. Pizza - University of Naples Federico II

**Design Considerations of Energy Storage System for Electric Aircraft Propulsion**

A. Del Pizzo, L.P. Di Noia, F. Marulo - University of Naples Federico II

**Impact of Safe Return to Port Rules on Passenger Ships Power Systems Design**

A. Vicenzutti, V. Bucci, G. Sulligoi - University of Trieste, R. Pelaschiar - Fincantieri Italian Shipyards

**ASTRI Technical Sessions**

**11,30-13,30 – 14,30-16,30**

***Sala Vanalesti 11,30-13,30***

**Session C1 Machines and Electrical Drives**

Chairperson: Rosario Miceli – Università di Palermo

**An Extended Library of Models of Railway Vehicles for Fast Simulation and Optimization of Regenerative Braking and Energy Management**

A. Frilli, E. Meli, D. Nocciolini, S. Panconi, L. Pugi, A. Rindi - University of Firenze

**Integrated Design of an Hydraulic Servo-System Fed by Vehicle Regenerative Braking**

B. Allotta, M. Pagliai, A. Nocentini, L. Pugi - University of Florence, G. Lutzemberger - University of Pisa, A. Pretto - PRETTO

**Analysis of Outer Rotor Synchronous Reluctance Motor**

F.N. Jurca, C. Martis - Universitatea Tehnică din Cluj-Napoca, Romania

**Double and Single Sided Tubular Linear Permanent Magnets Generator for the Wave Energy Conversion**

A. Musolino, R. Rizzo, L. Sani - University of Pisa, G. Bracco, G. Mattiazzo - Politecnico di Torino

**Loss Analysis in Soft Ferrite Cores for Arbitrary Input Waveforms**

M. Marracci, B. Tellini - University of Pisa

**Determination of Differential Leakage Factors in Electrical Machines with Non-Symmetrical Full and Dead-coil Windings**

A.O. Di Tommaso, F. Genduso, R. Miceli, G. Ricco Galluzzo - University of Palermo

**Cogging Torque Comparison of IPMSMs with different Stator Windings**

M. Caruso, A.O. Di Tommaso, F. Genduso, R. Miceli, G. Schettino, F. Viola - Università degli Studi di Palermo

***Sala Vanalesti 14,30-16,30***

**Session C2 Automation and Control**

Chairperson: Angelo Raciti – Università di Catania

**Secure SCADA Systems for Oil Industry in Gulf Cooperation Council Countries**

S. Alshaya - Majmaah University, Saudi Arabia, D. Giuli, F. Paganelli, T. Pecorella - Università di Firenze, F. Hadi - EWADY LLC, Saudi Arabia

## **Towards a Comprehensive Strategy in Industrial Control System Security**

S. Alshaya - Majmaah University, Saudi Arabia, D. Giuli, F. Paganelli, T. Pecorella - Università di Firenze, F. Hadi - EWADY LLC, Saudi Arabia

## **Automation solution for the emergency electrical network activation through the use of early warning**

A. Gambadoro, B. Azzerboni - University of Messina

## **Session C3 Electromagnetism and Electromagnetic Compatibility**

Chairperson: Ermanno Cardelli – Università di Perugia

### **3D ELF Magnetic Field Strength Modeling through Fully Connected Cascade Networks**

S. Coco - University of Catania, A. Laudani, G.M. Lozito, F. Riganti Fulginei, A. Salvini - University of Roma Tre

### **Identification of a FEM Based Model through CFSO<sup>3</sup> Algorithm**

A. Laudani, G.M. Lozito, F. Riganti Fulginei, A. Salvini - University of Roma Tre

## **Session C4 Education and Representation**

Chairperson: Giovanni Cancellieri – Università Politecnica delle Marche

### **Implementing Fuzzy Analysis for Creating Virtual Training Methods In Lifelong Learning**

D. Dintsis - Specialist Center of Computer Training, Russia

## **Session C5 Measurements**

Chairperson: Stefano Pirani – Università Politecnica delle Marche

### **Measuring Magnetic Losses in Si-Fe Alloys with rotating polarization**

M. Pompei, S. Quondam Antonio - University of Perugia

### **Numerical Methods to Achieve Robust Relaxometry Mapping in Multi-Echo Chemical Shift-Based MRI**

G. Siracusano, A. La Corte - University of Catania, M. Gaeta - University of Messina, M. Carpentieri - Politecnico of Bari, F. Siracusano – Independent Reseracher, G. Finocchio - University of Messina

***Sala Vanalesti 16,30-18,30***

**AMES/AICT Technical Sessions**

**Session B1 IOT & Network**

Chairperson: Maurizio Mayer - AEIT

**L'«Internet delle cose» e la legge applicabile alla protezione dei dati personali nell'Unione Europea**

P. Piroddi - Studio legale Piroddi

**Physical Layer Security for IoT Devices Configuration and Key Management - a Proof of Concept**

L. Brilli, T. Pecorella, L. Mucchi - Università di Firenze

**Next Generation M2M Cellular Networks: LTE-MTC and NB-IoT Capacity Analysis for Smart Grids Applications**

S. Persia, L. Rea - Fondazione Ugo Bordoni

**The Effect of Video Caching on Network Resource Planning - A Real-Case Study**

L. Brilli, R. Fantacci, T. Pecorella - Università di Firenze, T. Ionta - Telecom Italia

**Exploiting White Space Communication for Increasing GNSS Reliability in Maritime Transportation**

E. Bonetto, D. Brevi, R. Scopigno - Istituto Superiore Mario Boella

**Thursday, 6<sup>th</sup> October**

**AEE Technical Sessions**

***Sala Cerio 9,30-11,00***

**Session A1.3 - Renewable Energy Sources, New configuration of Electricity Systems and their management**

Chairperson: Stefano Massucco – Università di Genova

**Ancillary services by DG and distribution storage devices**

M. Coppo, F. Cappelletto, R. Caldon, R. Turri - University of Padova, N. Natale, F. Pilo, G. Pisano, G.G. Soma - University of Cagliari

**Distribution System Participation to the Italian Ancillary Service Market**

N. Natale, F. Pilo, G. Pisano, G. G. Soma - University of Cagliari

**NanoGrids for Home Application in a Power Cloud Framework**

D. Menniti, A. Pinnarelli, N. Sorrentino, A. Burgio, G. Brusco, V. Frascà, L. Mendicino, M. Mercuri - Università della Calabria

**Active Distribution Grids: a MatLab-Simulink Tool for Energy Performance Analysis**

E. Ciancamerla, M. Minichino - ENEA Casaccia, M.C. Falvo, L. Martirano - University of Rome Sapienza

**Infrastruttura di ricarica per i veicoli elettrici in Italia: linee guida per l'installazione e punti aperti nell'implementazione**

F. Colzi, S. Celaschi - Ricerca sul Sistema Energetico – RSE

***Sala Hotel Syrene 9,30-11,00***

**Session A2.3 - Methods, Components and Technologies for the transmission and distribution of electricity**

Chairperson: Massimo La Scala – Politenico di Bari

**Phase-to-Ground Fault Location Methods in Unearthed Sub-Transmission Networks: a Review**

M. Baù, R. Benato, S. Dambone Sessa - Università degli Studi di Padova, M. Poli, C. Quaciari - Terna Rete Italia

**Impact of Protective Structures on EHV Cable Transient Behaviour: Comparison between FEM, EMTP and Measurements**

R. Benato, S. Dambone Sessa, N. Viafora - Università degli Studi di Padova, F. Palone - Terna Rete Italia

**Incorporation of Flow-Based Grid Modeling in Multinational Transmission Expansion Planning**

L. Amellem, M. Korpas, M. Kristiansen - Norwegian University of Science and Technology (NTNU)



**Valutazione di sicurezza in linea del sistema elettrico considerando le incertezze: l'approccio iTESLA**

E. Ciapessoni, D. Cirio, A. Pitto - Ricerca sul Sistema Energetico - RSE, N. Omont - Réseau de Transport d'Électricité - RTE , C. Bagnasco - TechRain

**Monitoring of Frequency Disturbances in the European Continental Power System**

S. Canevese, E. Ciapessoni, A. Gatti, M. Rossi - RSE

**Nuovo elettrodotto in doppia terna a 380 kV Sorgente-Rizziconi**

F. De Salvo, C. Silvestri - Lombardi ingegneria, G. Carletti, R. De Zan, M. Rebolini, P. Sylos Labini - TERNA Rete Italia, M. Bacchini - Prysmian Powerlink

**Il collegamento di Capri alla Rete Elettrica Nazionale: affidabilità e resilienza**

F. Palone, V. Iuliani, M. Rebolini, L. Avellino, R. Cirrincione - Terna Rete Italia

***Sala Cerio 11,00-12,00***

**Session A4 Electricity Markets**

Chairperson: Michele Antonio Trovato - Politenico di Bari

**Forecasting Italian Electricity Market Prices Using a Neural Network and a Support Vector Regression**

F. Davò, M.T. Vespucci - University of Bergamo, A. Gelmini, P. Grisi, D. Ronzio - RSE - Ricerca Sistema Energetico

**A Future Scenario Analysis of the Impact of EU ETS on the Pan-European Power System**

D. Siface, A. Zani, A. Gelmini, A. L'Abbate, M. Benini - Ricerca sul Sistema Energetico - RSE

**Islamic finance and renewable energy: an innovative model for the sustainability of investments**

D. Morea, L.A. Poggi - University of Rome Tor Vergata

***Sala Hotel Syrene 11,00-12,00***

**Session A5 Regulations and Standards**

Chairperson: Roberto Napoli - Politecnico di Torino

**Power Transformer Energy Performance: Landscape of Market Surveillance Testing Avenues**

F. Bua, A. Marra - ECD, A. Baggini - Università degli Studi di Bergamo

**The Role of Electrical Energy Meters in Legal Ascertainments**

A. Ferrero, V. Scotti - Politecnico di Milano

## **AMES/AICT Technical Sessions**

### ***Sala Vanalesti 9,30-11,00***

#### **Session B2 Networks**

Chairperson: Pietro Erratico – AMES AEIT

##### **Adaptive Network-Coding MIMO Schemes for Reliable Multicast Green Communications**

F. Chiti, R. Fantacci, L. Pierucci - University of Florence

##### **Software Defined Network Approach Driven by the mPlane Measurement Plane**

E. Tego, A. Rufini, A. Valenti, F. Matera - Fondazione Ugo Bordoni, M. Mellia, S. Traverso - Politecnico di Torino

##### **Efficient coordinated beamforming and scheduling approaches for heterogeneous networks**

G. Bartoli, R. Fantacci, D. Marabissi - University of Florence

##### **75GHz Indoor Radio Channels Propagation Measurements**

M. Celidonio, E. Fionda, L. Pulcini - Fondazione Ugo Bordoni, R. Dal Molin, E.R. Restuccia - Istituto Superiore delle Comunicazioni e delle Tecnologie dell'Informazione (Ministry of Economic Development)

##### **Outdoor-Indoor Radio Propagation Measurements on Two Candidate 5G Millimeter Wave Bands**

M. Celidonio, E. Fionda, L. Pulcini - Fondazione Ugo Bordoni, M. Ferrante, E.R. Restuccia - Istituto Superiore delle Comunicazioni e delle Tecnologie dell'Informazione (Ministry of Economic Development)

### ***Sala Vanalesti 11,00-13,30***

#### **Session B3 Energy Efficiency & EMI Techniques**

Chairperson: Angelo Raciti - AEIT

##### **Coppia Differenziale CMOS per applicazioni a bassa tensione di alimentazione**

A. Imbruglia - STMicroelectronics, A.D. Grasso, S. Pennisi - University of Catania, G. Scotti, A. Trifiletti - Sapienza University of Rome

##### **Optimized Design of High Power Density EMI Filters for Power Electronic Converters**

G. Ala, G.C. Giaconia, G. Giglia - Università degli Studi di Palermo, M.C. Di Piazza, M. Luna, G. Vitale - ISSIA - Consiglio Nazionale delle Ricerche (CNR), Palermo, P. Zanchetta - University of Nottingham, United Kingdom

##### **Three-Phase Inrush Prediction and Control in Switching Power Supplies**

M. Pompei, S. Quondam Antonio - University of Perugia

##### **A 500W Fully Digital Switch Mode Power Supply**

M. Cacciato, G. Scarcella, G. Scelba - University of Catania, R. Attanasio, I. Massimiani - STMicroelectronics

**Analysis of the Current Harmonics Injected into the Power Grid by Dimmable LED Lamps**

S. Di Mauro, S. Musumeci, A. Raciti, G. Vasta - University of Catania

**Design and Performance Evaluation of a PFC Front-end for LED Drivers with Ultra-low Input Current Distortion**

C. Adragna - STMicroelectronics

**Design of Operational Transconductance Amplifiers for Voltage to Current Conversion in Gas Sensing Applications**

Z. Hijazi - University of Genova and Lebanese University, Lebanon, D. Caviglia - University of Genova, H. Chible - Lebanese University, Lebanon, M. Valle - University of Genova

**Materials Characterization by Inverse Neural Network Approach**

S. Carcangiu - University of Cagliari, E. Cardelli, A. Faba - University of Perugia, A. Fanni, A. Montisci - University, S. Quondam - University of Perugia

**Experimental Characterization of Ruthenium-based Dye Sensitized Solar Cells and Study of Light-soaking Effect Impact on Performance**

A. Parisi, R. Pernice, A. Andò, G. Adamo, A.C. Cino, A.C. Busacca - University of Palermo

***Sala Vanalesti 14,30-15,30***

**Session B4 Air Measurements & Control**

**Novel Laser Analyzers for Measurements and Mapping of Natural Gas Leaks While Driving**

J.B. Leen, J. Savee, M. Gupta, A. Gardner, D. Baer, N. Bonavita - ABB

**Time of Flight Measurements via Two LiDAR Systems with SiPM and APD**

G. Adamo, A. Busacca - Università degli Studi di Palermo

**Using Drones for Automatic Monitoring of Vehicular Accident**

D. Brevi, G. Gavilanes, R. Scopigno, A. Sheikh - Istituto Superiore Mario Boella, A. Molino - CSP-ICT Innovation, E. Bagalini - Politecnico di Torino