

Curriculum Vitae

Luigi Rubino

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Personal data

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Nationality Italiana

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<http://www.diii.unina2.it/OldSite/it/dipartimento/persone/docenti-elenco/ricercatori-a-t-d/rubino>

Current Employment

Luigi Rubino is time limited Assistant Professor at Engineering Department of Università della Campania "Luigi Vanvitelli".

Study

degree: **Dottorato di Ricerca in Conversione dell'Energia – XXV ciclo**

Date: 5/12/2012

University: Seconda Università degli studi di Napoli

Thesis title: **Analysis and design of a resonant LLC converter for a Parallel Multicell Converter**

Object:

Study and realization of a bi-directional DC-DC converter for aeronautics based on the resonant converter theory. The study was focused on the reduction of weight and volume by increasing the switching frequency up to 300kHz. The study included the magnetics design. The study was funded by Airbus.

degree: **Master degree (according with D.M. 509/99).**

Date: 27/05/2008

Università: Seconda Università degli studi di Napoli
(oggi Università della Campania Luigi Vanvitelli)

Thesis title: **Progetto e Realizzazione di un convertitore DC-DC Full-Bridge Isolato**

Object:

Study and realization of a bi-directional DC-DC converter for aeronautics based on conventional theory (boost-full bridge). The work was used for the MOET project, funded by the European community.

TEACHING ACTIVITY

Università della Campania, Luigi Vanvitelli

- 2014-2015, **Laboratory of Power Electronic and Electrical Drives** (48 hours, master's degree course, Electronic Engineering).
- 2015-2016, **Static Power Converters for Electrical Energy** (48 hours, master's degree course, Electronic Engineering).
- 2016-2017, **Static Power Converters for Electrical Energy** (48 hours, master's degree course, Electronic Engineering).
- 2017-2018, **Static Power Converters for Electrical Energy** (48 hours, master's degree course, Electronic Engineering).
- 2018-2019, **Static Power Converters for Electrical Energy** (48 hours, master's degree course, Electronic Engineering).
- 2018-2019, **Power Electronic and Electrical Drives** (48 hours, master's degree course, Electronic Engineering)
- 2019-2019, **Electrical Drivers and Electrical Installations** (24 hours, three-year degree course, Mechanical Engineering)

Università degli Studi di Napoli Federico II

- 2014-2015, **Control system design** (48 hours, master's degree course, Automation engineering)
- 2015-2016, **Control system design** (48 hours, master's degree course, Automation engineering)
- 2016-2017, **Control system design** (48 hours, master's degree course, Automation engineering)

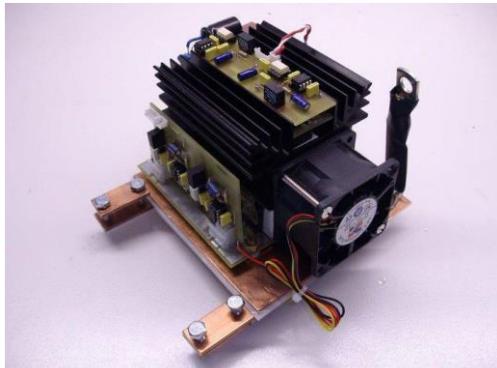
RESEARCH ACTIVITY

POWER CONVERTER DESIGN

Luigi Rubino during his research activity, has been involved in several national and international projects. Hereafter will be reported the main projects.

1 – MOET project.

This activity started during the Master thesis activity and continued for another year with temporary contracts. The aim of the work was the project, design, the manufacturing and tests of a dc/dc bi-directional converter for aeronautical applications. The role of Luigi Rubino was power electronic designer, manufacturer and tester.



(a)



(b)



(c)



(d)

FIGURE 1 BBCU CONVERTER MADE IN THE FRAME OF THE MOET PROJECT. (A) FULL-BRIDGE WITH ACTIVE CLAMP PROPRIETARI (B) SINGLE CELL WITH SUPERVISOR AND CONTROL BOARD (c) BBCU (D) BBCU UNDER TEST IN THE SAFRAN IRON BIRD (2016)

2 – I-PRIMES

The I-PRIMES project, funded by the European Community, allow to study innovative energy management techniques. The role of Luigi Rubino was power electronic designer, manufacturer and tester.



FIGURE 2 I-PRIMES



FIGURE 3 MEETING “CLEAN SKY GRA ANNUAL REVIEW”, AT CIRA RESEARCH CENTER (CENTRO ITALIANO RICERCHE AEROSPAZIALI) DI CAPUA. CLEAN SKY – 12 GIUGNO 2014

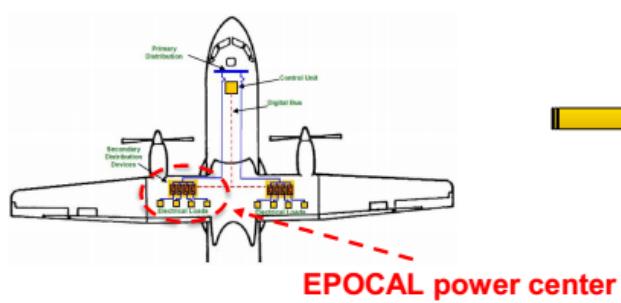


FIGURA 4 FARNBOROUGH AIRSHOW 2014 CLEAN SKY – 14 LUGLIO 2014

3- Epochal

Epochal project, funded by EU, is an innovative distribution power center for aeronautical applications. The equipment successfully passed all “permit to fly” tests (more than 40) and was also tested in a flying laboratory. The role of Luigi Rubino was power electronic designer, manufacturer and tester.

Example of decentralized EPDS



Implementation and rig installation

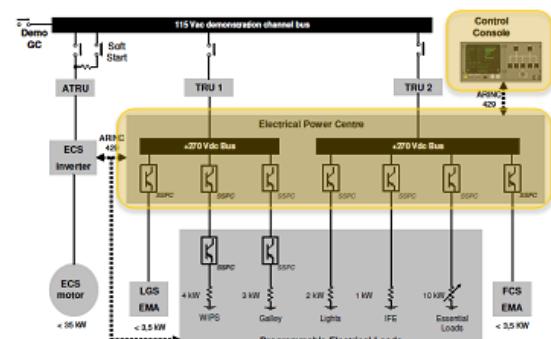


FIGURA 5 ESEMPIO DI UTILIZZO DI EPOCHAL POWER CENTER SU UN AEREO REGIONALE E INTEGRAZIONE NEL SISTEMA ELETTRICO DI BORDO



FIGURA 6 EPOCHAL CONSTRUCTION AND DETAILS



FIGURA 7 EPOCAL TESTS

4- ASPIRE

ASPIRE project, funded by EU, is an innovative smart grid for aeronautical applications. The smart grid is in charge to guarantee that critical loads are always supplied by changing physical connections and power flow.

The role of Luigi Rubino is the Energy Management algorithm design, the code generation and tests. Luigi Rubino is also scientific coordinator for the activities in charge to Unicampania.

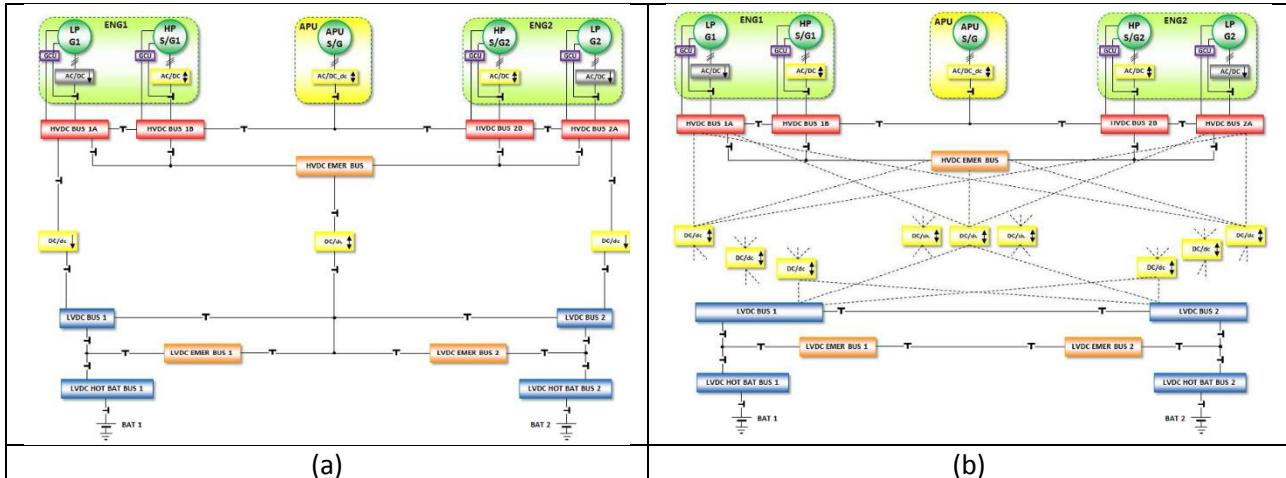


FIGURA 8 PROGETTO ASPIRE (a) ARCHITETTURA INIZIALMENTE STUDIATA IN CLEAN SKY 1 BASATA SU SISTEMI CLASSICI RIDONDANTI, (b) ARCHITETTURA PROPOSTA BASATA SU SMART GRID

RESONANT CONVERTERS

This research activity started during the phd study and continue over years by improving the method design, modulation and control.

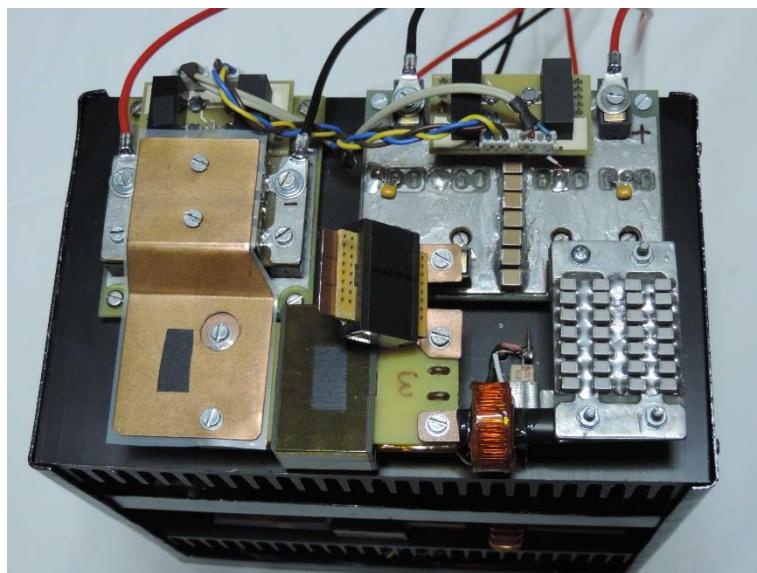


FIGURE 9 RESONANT CONVERTER PROTOTYPE

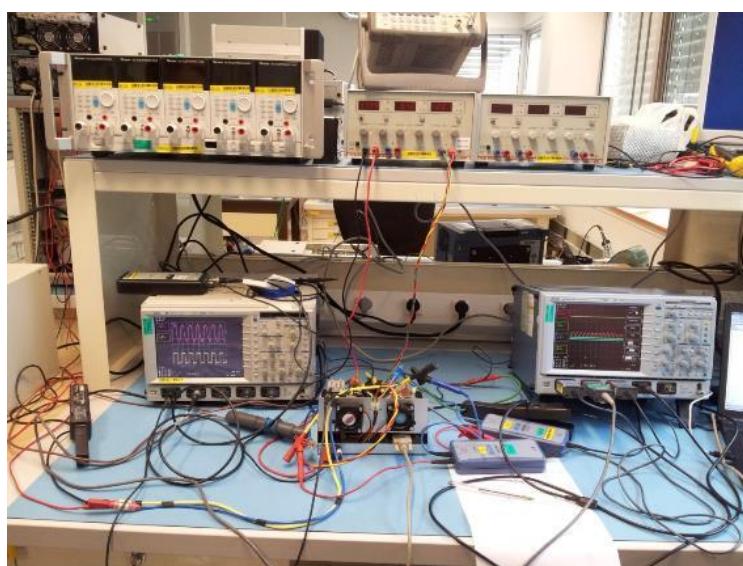


FIGURE 10 RESONANT CONVERTER TEST IN THE POWER ELECTRONIC LABORATORY – ARBUS (TOULOUSE)

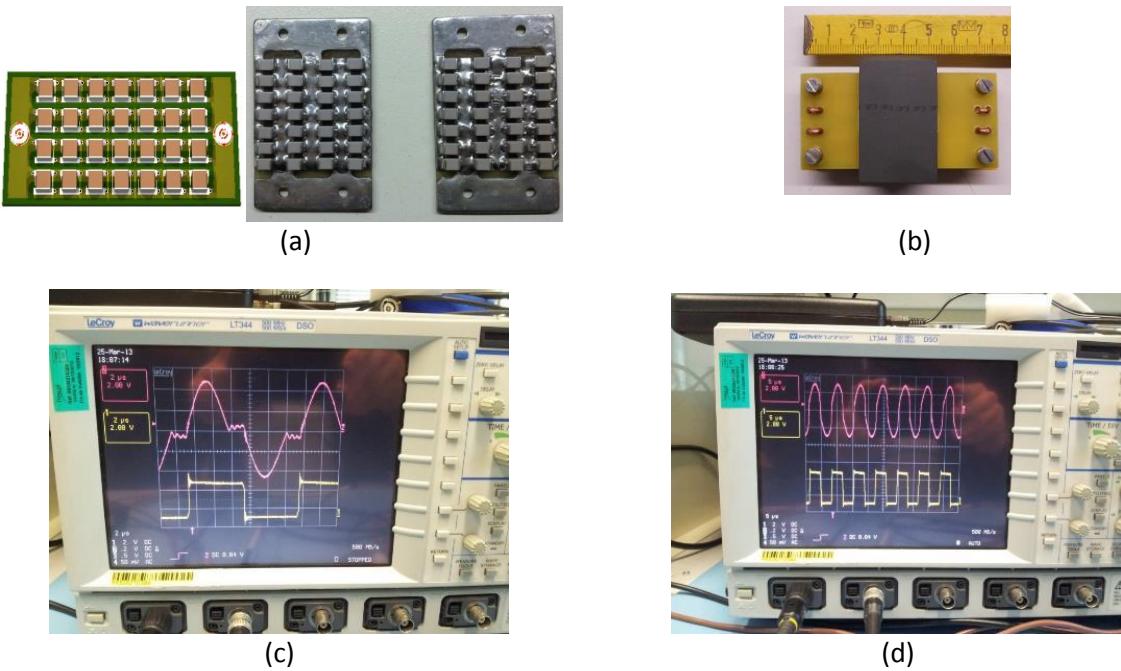


FIGURA 11 RESONANT CONVERTER DETAILS

WIRELESS POWER TRANSMISSION FOR BIKE-SHARING

Started as research activity between the university of Naples and Unicampania, the inductive power transfer project introduce innovative modelling and modulation technique allowing to reduce the number of components for application of few hundreds of Watt. The role of Luigi Rubino wad power electronic designer, manufacturer and tester.

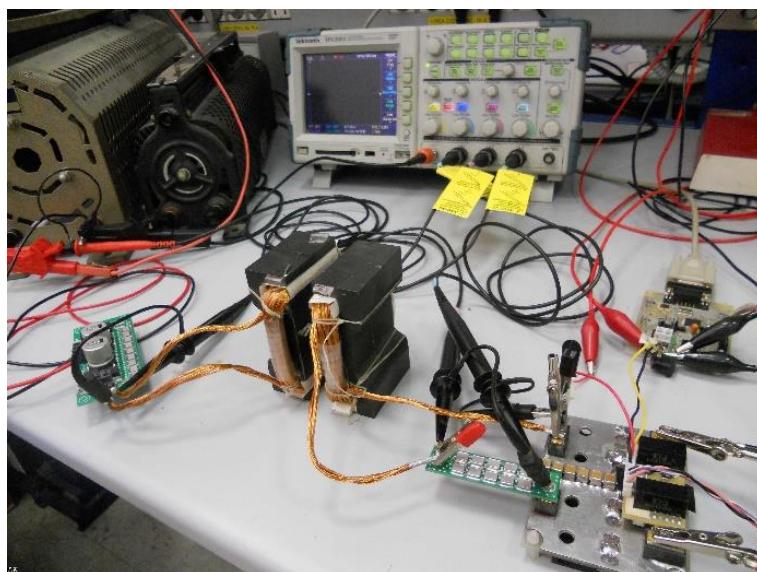


FIGURE 12 TESTS

MEDIUM VOLTAGE ELECTRICAL TRANSFORMER

Research activity involves also the study of medium voltage transformer with high frequency transformer

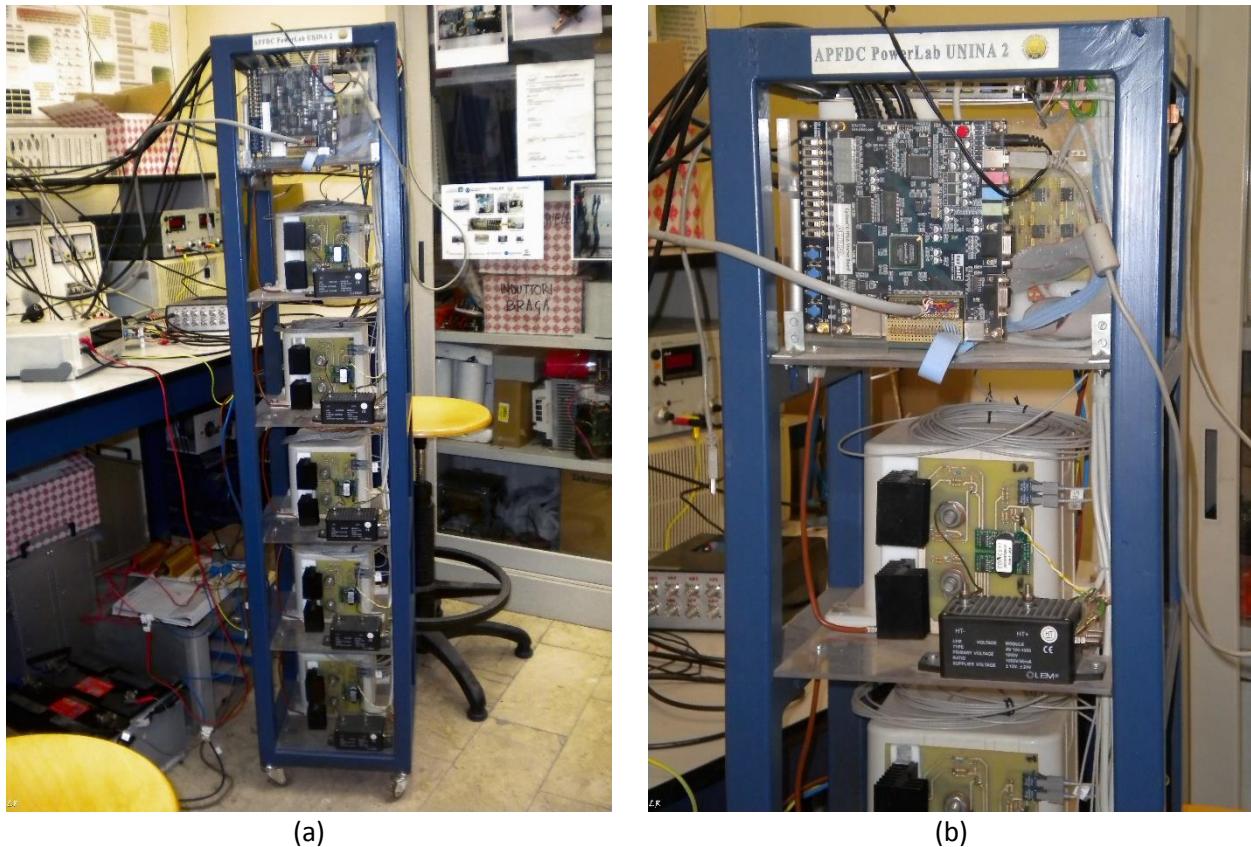


FIGURE 13 MULTILEVEL LEG USED FOR PRELIMINARY TESTS

STAIRCASE MODULATION FOR MMC

This research activity was performed at the INP ENSEEIHT, LAPLACE laboratory – Toulouse (FR). The aim of the activity is to found a modulation method that allow to reduce the switching frequency and consequently the switching losses.

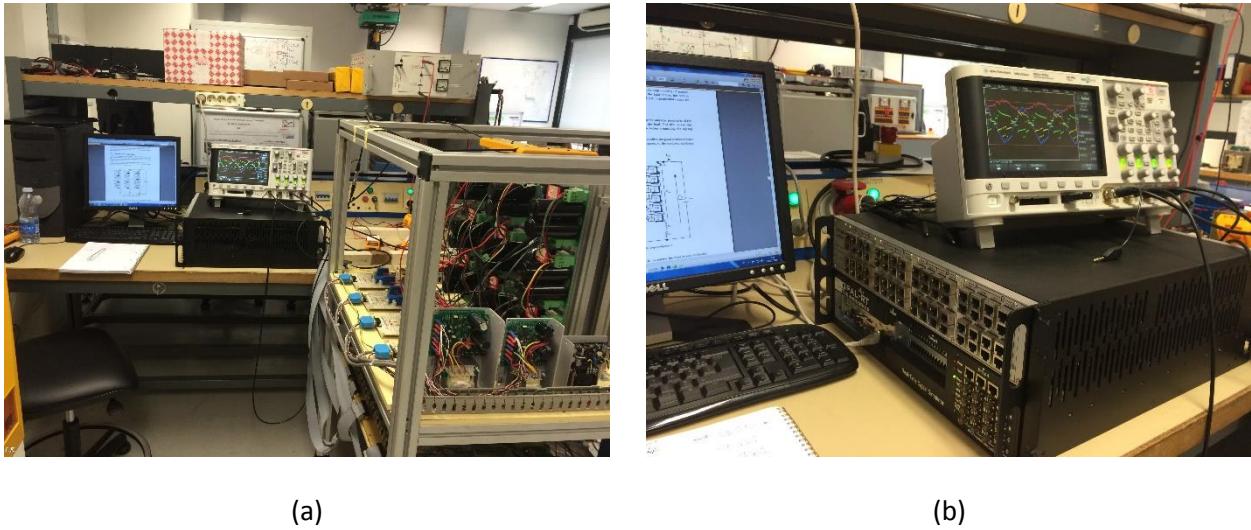


FIGURA 14 MMC CONVERTER AT LAPLACE – TOLOSA

CIRCUIT BREAKER FOR AERONAUTICAL APPLICATION

This work, funded by Airbus, was studied to make an universal circuit breaker able to emulate all protection circuits used onboard. Luigi Rubino is the scientific coordinator of this activity and was also in charge of theoretical studies and firmware development.

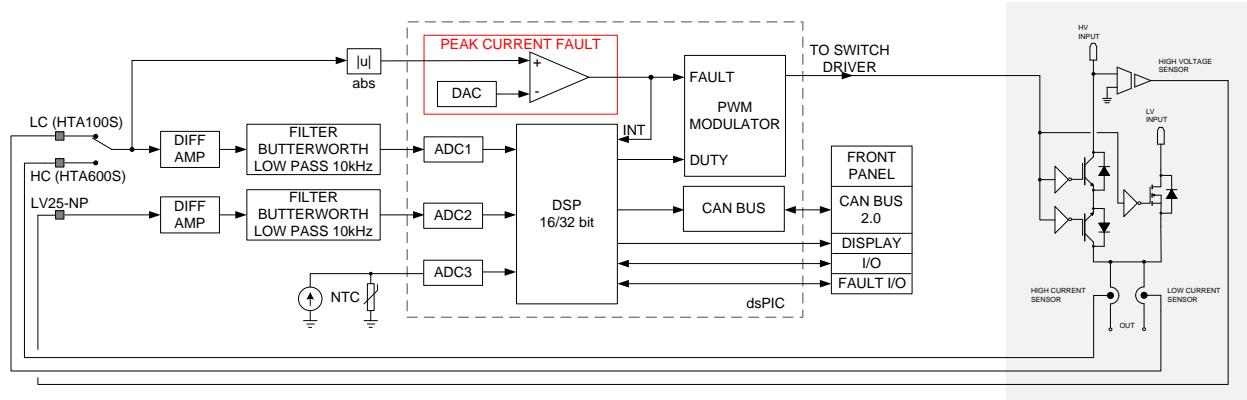


FIGURA 15 SINGLE CHANNEL TO LEVEL SCHEMATIC



FIGURA 16 SINGLE CHANNEL WITH DSP BOARD

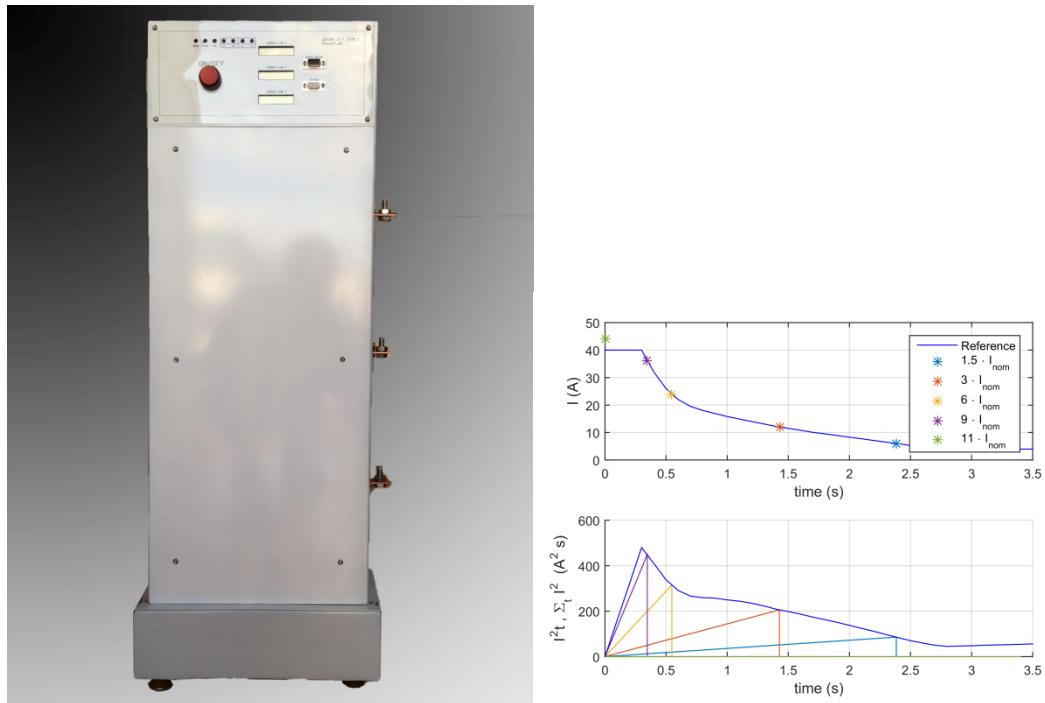


FIGURA 17 PROTOTYPE WITH TESTS

Research project (Peer Review)

	Project	Durata (mesi)	Role
1	Clean Sky 2 – Regional ITD – Project 717091 (ASPIRE) “ADVANCED SMART-GRID POWER DISTRIBUTION SYSTEM” Call Identifier: H2020-CS2-CFP02-2015-01 Topic: JTI-CS2-CFP02-REG-01-01	36	Coordinator and PI of the Energy Management activity for Unicampania
2	Clean Sky - I-PRIMES: an Intelligent Power Regulation using Innovative Modules for Energy Supervision From 2012-06-01 to 2014-12-31 Topic: JTI-CS-2011-3-ECO-02-012 - Intelligent Load Power Management Rig Module Call Identifier: SP1-JTI-CS-2011-03	36	Research member
3	Clean Sky - EPOCAL: an Electrical Power Center for Aeronautical Loads From 2013-03-01 to 2015-07-31 Call Identifier: SP1-JTI-CS-2012-01 Topic: JTI-CS-2012-1-GRA-03-010 - Control Consolle and Electrical Power Center per Flight Demo	36	Research member
4	Progetto di Ricerca NEMBO	36	Research member

	Studio e sperimentazione di sistemi iNnovativi “EMBedded” caratterizzati da elevata efficienza per applicazioni ferrOvarie Ammesso al finanziamento con Decreto 07.03.2014 (Protocollo n. 811) PONPE_00159		
5	“MICCA: Microgrid Ibride in Corrente Continua ed in corrente Alternata” Decreto Direttoriale 713/ric del 29/10/2010 del MIUR - Distretto ad Alta Tecnologia SMART POWER SYSTEM Scarl CAMPANIA LINEA PROGETTUALE - IV	36	Research member

Patents

- B1. Anastasio Vincenzo, Di Donna Laura, Marino Pompeo, Cavallo Alberto, Guida Beniamino, Rubino Luigi, “Buck-boost mode switching method for a DC-DC converter, and DC-DC converter” EP2393196
- B2. Anastasio Vincenzo, Di Donna Laura, Marino Pompeo, Cavallo Alberto, Guida Beniamino, Rubino Luigi “DC-DC Converter and associated driving method” EP2393195

PAPERS

Journal

Source Scopus (EXPORT DATE: 12 Mar 2018)

- R1 Rubino, L., Capasso, C., Veneri, O.
Review on plug-in electric vehicle charging architectures integrated with distributed energy sources for sustainable mobility
(2017) Applied Energy.
DOI: 10.1016/j.apenergy.2017.06.097
ISSN: 03062619
CODEN: APEND
- R2 Celentano, L., Iannuzzi, D., Rubino, L.
Detailed continuous and discrete-time models and experimental validation to design a power charging station for e-bike clever mobility
(2017) Electric Power Systems Research, .
DOI: 10.1016/j.epsr.2017.01.031
ISSN: 03787796
CODEN: EPSRD
- R3 Balato, M., Costanzo, L., Marino, P., Rubino, G., Rubino, L., Vitelli, M.
Modified TEODI MPPT Technique: Theoretical Analysis and Experimental Validation in Uniform and Mismatching Conditions
(2017) IEEE Journal of Photovoltaics, .
DOI: 10.1109/JPHOTOV.2016.2634327

ISSN: 21563381

- R4 Iannuzzi, D., Rubino, L., Di Noia, L.P., Rubino, G., Marino, P.
Resonant inductive power transfer for an E-bike charging station
(2016) Electric Power Systems Research, .
DOI: 10.1016/j.epsr.2016.05.010
ISSN: 03787796
CODEN: EPSRD
- R5 Pierno, A., Di Noia, L.P., Rubino, L.
Ancillary services provided by PV power plants
(2016) Leonardo Electronic Journal of Practices and Technologies, .
ISSN: 15831078
- R6 Cavallo, A., Guida, B., Rubino, L.
Boost full bridge bidirectional DC/DC converter for supervised aeronautical applications
(2014) International Journal of Aerospace Engineering, .
DOI: 10.1155/2014/808374
ISSN: 16875966
- R7 Rubino, L., Rubino, G., Marino, P., Di Noia, L.P.
Smart solid state circuit breaker for photo voltaic power plants
(2017) International Review of Electrical Engineering, 12 (5), pp. 409-423.
DOI: 10.15866/iree.v12i5.13982
ISSN: 18276660

conferences

Source Scopus (EXPORT DATE: 26 Feb 2018)

- C1 Rubino, L., Rubino, G., Marino, P., Di Noia, L.P., Rizzo, R.
Universal Circuit Breaker for PV power plants
(2017) 2017 6th International Conference on Clean Electrical Power: Renewable Energy Resources Impact, ICCEP 2017, .
DOI: 10.1109/ICCEP.2017.8004775
- C2 Celentano, L., Iannuzzi, D., Rubino, L.
Controller design and experimental validation of a power charging station for e-bike clever mobility
(2017) Conference Proceedings - 2017 17th IEEE International Conference on Environment and Electrical Engineering and 2017 1st IEEE Industrial and Commercial Power Systems Europe, EEEIC / I and CPS Europe 2017, .
DOI: 10.1109/EEEIC.2017.7977601
- C3 Marino, P., Rubino, G., Rubino, L., Boyer, S., Mercadal, H., Raimondo, G.
Universal circuit breaker for aeronautic testing application
(2017) 2016 International Conference on Electrical Systems for Aircraft, Railway, Ship Propulsion and Road Vehicles and International Transportation Electrification Conference, ESARS-ITEC 2016.
DOI: 10.1109/ESARS-ITEC.2016.7841362
- C4 Rubino, L., Rubino, G.
Electrical Power Center with energy management capability for aeronautical applications
(2016) 2016 International Symposium on Power Electronics, Electrical Drives, Automation and Motion, SPEEDAM 2016.
DOI: 10.1109/SPEEDAM.2016.7525944

- C5 Rubino, L., Rubino, G., Marino, P.
High step down multilevel resonant buck converter with high voltage ratio
(2016) 2016 International Symposium on Power Electronics, Electrical Drives, Automation and Motion, SPEEDAM 2016, .
DOI: 10.1109/SPEEDAM.2016.7525973
- C6 Langella, R., Marino, P., Rubino, G., Rubino, L., Testa, A., Liccardo, F.
Supervision of ancillary services for distributed active front-end in a small industrial AC microgrid
(2016) 2016 International Symposium on Power Electronics, Electrical Drives, Automation and Motion, SPEEDAM 2016, .
DOI: 10.1109/SPEEDAM.2016.7526032
- C7 Rubino, L., Iannuzzi, D., Rubino, G., Coppola, M., Marino, P.
Concept of energy management for advanced smart-grid power distribution system in aeronautical application
(2016) 2016 International Conference on Electrical Systems for Aircraft, Railway, Ship Propulsion and Road Vehicles and International Transportation Electrification Conference, ESARS-ITEC 2016.
DOI: 10.1109/ESARS-ITEC.2016.7841322
- C8 Balato, M., Costanzo, L., Marino, P., Rubino, L., Vitelli, M.
Dual implementation of the MPPT technique TEODI: Uniform and mismatching operating conditions
(2015) 5th International Conference on Clean Electrical Power: Renewable Energy Resources Impact, ICCEP 2015, .
DOI: 10.1109/ICCEP.2015.7177658
- C9 Balato, M., Costanzo, L., Marino, P., Rubino, G., Rubino, L., Vitelli, M.
High performance non isolated interleaved switched inductance converter for PV sources
(2015) 5th International Conference on Clean Electrical Power: Renewable Energy Resources Impact, ICCEP 2015, .
DOI: 10.1109/ICCEP.2015.7177595
- C10 Ladoux, P., Serbia, N., Marino, P., Rubino, L.
Comparative study of variant topologies for MMC
(2014) 2014 International Symposium on Power Electronics, Electrical Drives, Automation and Motion, SPEEDAM 2014, .
DOI: 10.1109/SPEEDAM.2014.6872073
- C11 Marino, P., Rubino, L., Brando, G., Del Pizzo, A.
Different topologies of active front ends for high power induction motor drives
(2014) IEEE International Symposium on Industrial Electronics, .
DOI: 10.1109/ISIE.2014.6864711
- C12 Fioretto, M., Rubino, L., Serbia, N., Marino, P., Rubino, G.
Harmonic and interharmonic currents compensation in DC line
(2014) 2014 International Symposium on Power Electronics, Electrical Drives, Automation and Motion, SPEEDAM 2014, .
DOI: 10.1109/SPEEDAM.2014.6872074
- C13 Rubino, G., Rubino, L., Serbia, N., Ladoux, P., Marino, P.

- LLC resonant converters in PV applications comparison of topologies considering the transformer design
(2013) 4th International Conference on Clean Electrical Power: Renewable Energy Resources Impact, ICCEP 2013.
DOI: 10.1109/ICCEP.2013.6586962
- C14 Feola, L., Fioretto, M., Langella, R., Rubino, G., Rubino, L., Serbia, N., Marino, P., Testa, A. Supervision and control of inverters for ancillary services in MV distribution networks
(2013) 4th International Conference on Clean Electrical Power: Renewable Energy Resources Impact, ICCEP 2013, .
DOI: 10.1109/ICCEP.2013.6586980
- C15 Fioretto, M., Rubino, G., Rubino, L., Serbia, N., Marino, P. Active parallel filter for DC bus and DC feeding line
(2013) Proceedings of the IEEE International Conference on Industrial Technology, .
DOI: 10.1109/ICIT.2013.6505716
- C16 Fioretto, M., Rubino, G., Rubino, L., Serbia, N., Ladoux, P., Marino, P. The efficiency in interleaved structures based on VSI topologies
(2013) IEEE AFRICON Conference, .
DOI: 10.1109/AFRCON.2013.6757848
- C17 Fioretto, M., Langella, R., Raimondo, G., Rubino, G., Rubino, L., Serbia, N., Testa, A., Marino, P. Design criteria for AC link reactors in active front end converters for renewable energy applications in smart grids
(2012) 2012 IEEE International Energy Conference and Exhibition, ENERGYCON 2012, .
DOI: 10.1109/EnergyCon.2012.6348207
- C18 Feola, L., Langella, R., Marino, P., Raimondo, G., Rubino, L., Serbia, N., Testa, A. On the effects of interharmonic distortion on grid connected three-phase PV inverters
(2012) Proceedings of International Conference on Harmonics and Quality of Power, ICHQP, .
DOI: 10.1109/ICHQP.2012.6381246
- C19 Rubino, L., Marino, P. Unified supervised soft start-up and digital PI control for boost full-bridge converters
(2012) IEEE International Symposium on Industrial Electronics, .
DOI: 10.1109/ISIE.2012.6237150
- C20 Fioretto, M., Raimondo, G., Rubino, L., Serbia, N., Marino, P. Evaluation of current harmonic distortion in wind farm application based on synchronous active front end converters
(2011) IEEE AFRICON Conference, .
DOI: 10.1109/AFRCON.2011.6072064
- C21 Fioretto, M., Ladoux, P., Marino, P., Raimondo, G., Rubino, L., Serbia, N. Considerations on boost inductor design in back-to-back converters for renewable energy
(2011) 3rd International Conference on Clean Electrical Power: Renewable Energy Resources Impact, ICCEP 2011, .
DOI: 10.1109/ICCEP.2011.6036327
- C22 Langella, R., Marino, P., Raimondo, G., Rubino, L., Serbia, N., Testa, A. On the effects of interharmonic distortion on static converters controlled by means of PLL systems

(2010) ICHQP 2010 - 14th International Conference on Harmonics and Quality of Power, .
DOI: 10.1109/ICHQP.2010.5625392

C23 Guida, B., Rubino, L., Marino, P., Cavallo, A.
Implementation of control and protection logics for a bidirectional DC/DC converter
(2010) IEEE International Symposium on Industrial Electronics, .
DOI: 10.1109/ISIE.2010.5637109

C24 Rubino, L., Guida, B., Liccardo, F., Marino, P., Cavallo, A.
Buck-boost DC/DC converter for aeronautical applications
(2010) IEEE International Symposium on Industrial Electronics, .
DOI: 10.1109/ISIE.2010.5637138

C25 Rubino, L., Guida, B., Marino, P., Cavallo, A.
On the selection of optimal turns ratio for transformers in isolated DC/DC boost full bridge converter
(2010) SPEEDAM 2010 - International Symposium on Power Electronics, Electrical Drives, Automation and Motion, .
DOI: 10.1109/SPEEDAM.2010.5542153

C26 Fioretto, M., Raimondo, G., Rubino, L., Serbia, N., Marino, P.
Power losses analysis in AC/DC conversion based on Active Front End systems
(2010) SPEEDAM 2010 - International Symposium on Power Electronics, Electrical Drives, Automation and Motion, .
DOI: 10.1109/SPEEDAM.2010.5542199

C27 Fioretto, M., Liccardo, F., Marino, P., Raimondo, G., Rubino, L., Torre, G.
Multilevel harmonics current active compensator for DC feeding line
(2009) IEEE AFRICON Conference, .
DOI: 10.1109/AFRCON.2009.5308121