CURRICULUM VITAE

&

MEMORANDUM OF SCIENTIFIC ACTIVITY

CHATZIATHANASIOU VASILEIOS

Assistant Professor

School of Electrical and Computer Engineering

Faculty of Engineering

Aristotle University of Thessaloniki

Thessaloniki, June 2014

Table of Contents

1. General Biography

1.1. Personal Data

Surname/name	Chatziathanasiou Vasileios
Date and birth place	30/10/1954 Dafnoudi, Serres
Affiliation	Assistant Professor, School of Electrical and Computer Engineering, Aristotle University of Thessaloniki. Research topic: «*Thermal problems in Production, Transmission and Use of Electric Energy*».
Phone number	2310 99 6295
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1.2. Studies

1978	Diploma in Electrical and Mechanical Engineering (1978) - Aristotle University of Thessaloniki, School of Electrical and Mechanical Engineering, Greece.
1989	PhD in Electrical Engineering (1989) - Aristotle University of Thessaloniki, School of Electrical and Computer Engineering. PhD Thesis Title: *"Non-uniform feedback effects on the detector field of view"*. Research topic: Nuclear technology

1.3. Employment History

5/2/1980 - present	School of Electrical and Computer Engineering, Faculty of Engineering, Aristotle University of Thessaloniki, Greece. Analytically:
5/2/1980–30/6/1983	Scientific Researcher at the Wireless Telecommunication Chair
1/7/1983 - 4/9/1990	Scientific Researcher at the Electric Power Division
4/9/1990 - 6/10/1994	Lecturer at the Electric Power Division. Research topic: "*Electric*

	energy production. Fault Analysis and Dynamics".
6/10/1994 - present	Assistant Professor at the Electric Power Division. Research topic: "*Thermal problems in Production, Transmission and Use of Electric Energy*".
1981 - 1983	Part-time professor at Higher State Schools of Mercantile Marine
1983 - 1988	Safety and maintenance engineer, DERMPOLAST SA. Kalochori, Thessaloniki, Greece

2. Teaching Activities

2.1. Teaching of undergraduate courses

1990 – present	Applied Thermodynamics (2nd Sem.) Heat Transfer (6th Sem.)
1994 – present	Power plants (7th Sem.)
1980 - 1983	Tutorials to the courses: • Wireless Telecommunication I • Wireless TelecommunicationII Lab: • Microwaves
1983 – 1990	Tutorials to the courses: • Applied Thermodynamics • Heat Transfer • DC Electric Machines • Nuclear Technology • Introduction to Nuclear Technology Applications
1981 – 1983	Electronics and Marine Instruments at Higher State Schools of Mercantile Marine

2.2. Teaching of Postgraduate Courses

2005 – 2011	Simulation of Thermal Power Plants Operation

2012 - 2014	Advances In Production, Transmission, Distribution and Use of Electric Energy

2.3. Supervision of Diploma Thesis

School of Electrical and Computer Engineering	Since 2000 till today: • Completed under my supervision: 45 dissertations • In progress under my supervision: 4 dissertations

3. Research Activities

3.1. Supervision of PhD Theses

Supervisor	• PhD thesis of Mrs. C. Athanasopoulou, entitled "*Improving control of electric power plants methods of artificial intelligence*." Completed (16/2/2009) • PhD thesis of Mr. I. Papagiannopoulos, entitled "*Electrothermal analysis of integrated inductors*". In the writing stage. Joint supervision with Professor Gilbert De Mey, University of Ghent. • PhD thesis of Mrs. I. Theodosoglou, entitled "*Dynamic electrothermal analysis of electrical devices*". • PhD thesis of Mr. P. Chatzipanagiotou, entitled "*Measurements thermal impedance and dynamic thermal modeling of electrical devices*".

3.2. Member of PhD Dissertations (Thesis) Committees

PhD Examination Committees	Member of seven (7) PhD examination committees, of M. Alexiou, G. Andreou, N. Ziogos, I. Baxtsevanos, A. Dagoumas, M. Gazela, andM. Alexiadis

3.3. Research Projects

PENED 2003 Greek Secretary General of Research and Technology	*"Generalized framework and applications for agent intelligence evaluation and behavior improvement in multi-agent systems".*

(SGRT) NSRF 2007-2013 Action: Cooperation 2009	*"Design and implementation of an integrated control system for wind turbines which produces increased power through minimization of electric generator losses and extension of the exploitable wind speed region towards the lower wind speeds".*

4. Administrative Experience

2004 – 2008	Head of Electric Machines Lab, School of Electrical and Computer Engineers, Aristotle University of Thessaloniki (SECE – AUTh)
2013 – present	Deputy coordinator ECTSSECE – AUTh Deputy coordinator ERASMUS-MUNDUSSECE – AUTh Member of Engineering Committee of Campus Europae Member of the Interdepartmental Committee of the Interdepartmental Program "*Protection, Conservation and Restoration of Cultural Monuments*" (Faculty of Engineering)
2003 - 2005	Scientifically responsible of training program for the students of the School
1990 – 2014	Member in the following committees of SECE – AUTh • Study Program • Library • Regulation of Diploma Thesis • Electronic Evaluation of Students Performance

5. Reviewer in Scientific Journals

Reviewer in the Journals	• Applied Thermal Engineering (Elsevier) • Electric Power Systems Research (Elsevier) • International Journal of Electrical Power & Energy Systems (Elsevier)

6. Member of Scientific Committees of Conferences

International Conference on Modern Power Systems (MPS)	Organized by: • Technical University of Cluj-Napoca • Transelectrica Romanian TSO Company • Transilvania Nord Electricity Distribution Company
International Conference of the Carpathian Euro-Region Specialists in Industrial Systems	Organized by: • Technical University of Cluj-Napoca, North University Center of Baia Mare, Faculty of Engineering Supported by: • Romanian Technical Academy of Science • Transilvania Nord Electricity Distribution Company

7. Erasmus Coordinator

Erasmus coordinator between AUTh and the Universities	• Gent University, Belgium • UPEC. Paris, France • Federico II, Napoli, Italy • Technical University of Cluj-Napoca, Romania • Technical University of Lodz, Poland • AGH University of Science and Technology, Kraków, Poland

8. Professional affiliations

Technical Chamber of Greece (TCG) (Organization of all the qualified Engineers of all specialties, graduated of highest educational institutions)	• 1984-1996: Member of the General Assembly of the Central Macedonia Department • 1991-1996: Member of the Executive Committee of the Central Macedonia Department • 1991-1993: Responsible of the Environmental Committee of the Department
Mechanical – Electrical Engineers Union of Northern Macedonia	• 1982-1991: Member of the Executive Board of the Union • 1986-1991: President of the Union

9. Other Activities

Organization of Thessaloniki Planning (2007-2010)	Member of the work group of the project "*Updating the Master Plan of Thessaloniki*".
TELECOMMUNICATION '82, Blagoevgrad	Participation in the conference as a representative of the Technical Chamber of Greece / Central Macedonia Department (TCG/CMD).
Preconference: "Industry in Greece" (TCG/CMD)	Member of the following work groups: • Industry in Central Macedonia. • Industry and highest technical education. • Technology in Greece: current state-prospects.

10. Published work

10.1. PhD Thesis

10.1.1. V. Chatziathanasiou, *"Non-uniform feedback effects on the detector field of view"*, AUTh Publications Service, Thessaloniki 1989.

10.2. Books– Notebooks – Book chapters

10.2.1. V. Chatziathanasiou, "*Introduction to Heat Transfer*", pp. 252, Sofia Publishers, Thessaloniki, 2009

10.2.2. V. Chatziathanasiou, "*Electric Power Plants*", pp.193, AUTh Publications Service, 1994

10.2.3. V. Chatziathanasiou, "*Heat Transfer*", pp. 207, AUTh Publications Service, 1998

10.2.4. C. Athanasopoulou, V. Chatziathanasiou, '*An agent-based prototype for optimizing power plant operation*', Chapt.9 in Agent-Based Ubiquitous Computing, Editor Eleni Mangina, Javier Carbó and Jose Manuel Molina, Atlantis Press, Amsterdam-Paris, 2009.

10.3. Papers in International Journals with Reviewers

10.3.1. M. Antonopoulos-Domis and V. Chatziathanasiou, *"Effects of space dependent feedback on the detector field of view."* Progress in Nuclear Energy, 1985, Vol. 15, pp.643-650

10.3.2. M. Antonopoulos-Domis and V. Chatziathanasiou, *"Investigation of boiling and pressure feedback on neutron noise.*" Progress in Nuclear Energy, 1988, Vol. 21, pp. 271-278

10.3.3. V. Chatziathanasiou and D. Labridis, *"Coupled magneto-thermal field computation in three-phase gas insulated cables-Part 1: Finite Element Formulation*," Archiv fur Electrotechnic, May 1993, Vol. 76, No. 4, pp. 285-292.

10.3.4. V. Chatziathanasiou and D. Labridis, *"Coupled magneto-thermal field computation in three-phase gas insulated cables-Part 2: Calculation of Ampacity and Losses*," Archiv fur Electrotechnic, June 1993, Vol. 76, No. 5, pp. 397-404.

10.3.5. V. Chatziathanasiou, J. Xypteras, G. Archontoulakis, *"Electrical - thermal calculation of an asynchronous machine"* Archiv fur Electrotechnic, January 1994, Vol. 77, No. 2, pp. 117-122.

10.3.6. D. Labridis and V. Chatziathanasiou, *"Finite element computation of field, forces and inductances in underground SF_6 insulated cables using a coupled magneto-thermal formulation*," IEEE Transactions on Magnetics, July 1994, Vol. 30, No. 4, pp. 1407-1415.

As Assistant Professor

10.3.7. J. Xypteras and V. Chatziathanasiou, *"Thermal analysis of an electrical machine taking into account the iron losses and the deep-bar effect*" IEEE Transactions on Energy Conversion, December 1999, Vol. 14, No. 4, pp. 996-1003.

10.3.8. C. Athanasopoulou, V. Chatziathanasiou, *"Intelligent system for identification and replacement of faulty sensor measurements in Thermal Power Plants (IPPAMAS: Part 1)* Expert Systems With Applications, Volume:36, Issue: 5, pp: 8750-8757, 2009.

10.3.9. M. Kałuża, B. Więcek, A. Hatzopoulos, V. Chatziathanasiou, I. Papagiannopoulos, G. De Mey, *"Thermal measurements of silicon integrated spiral inductors*", PAK, vol. 55, nr 11, 2009, pp. 954-957.

10.3.10. G. De Mey, B. Wiecek, I. Papagiannopoulos, V. Chatziathanasiou, "*Geometrical effects on the wall temperature in buildings: modelling and thermographic measurements*", PAK, Vol. 57, nr 10, 2011, pp. 1180-1182.

10.3.11. G. A. Bakirtzis, P. N. Biskas, V. Chatziathanasiou, *"Generation Expansion Planning by MILP considering mid-term scheduling decisions",* Electric Power Systems Research (EPSR)*,* Vol. 86, May 2012, pp. 98–112.

10.3.12. G. De Mey V. Chatziathanasiou, *"A theoretical model for effective thermal conductivity of multicore power cables",* Electric Power Systems Research (EPSR)*,* Vol. 87, June 2012, pp. 10–12.

10.3.13. G. Rata, M. Rata, C. Prodan, V. Chatziathanasiou, "*Using Reconfigurable System - CompactRIO in the Acquisition and Processing of Signals from Deformed Consumers",* International Review of Electrical Engineering (I.R.E.E.), 2012, Vol. 7, No. 6, pp. 6290-6295.

10.3.14. I. Papagiannopoulos, V. Chatziathanasiou, L. Exizidis, G. Andreou, G. De Mey and B. Wiecek, *"Behavior of the thermal impedance of buried power cables",* International Journal of Electrical Power & Energy Systems (IJEPES), 2013, Vol.44, pp.383-387.

10.3.15. I. Papagiannopoulos, V. Chatziathanasiou, A. Hatzopoulos, M. Kałuża, B. Wiecek and G. De Mey, *"Thermal Analysis of Integrated Spiral Inductors",* Infrared Physics and Technology (2013), Vol. 56, pp. 80-84.

10.3.16. I. Papagiannopoulos, G. De Mey and V. Chatziathanasiou, *"Current distribution in circular planar coil",* Engineering Analysis with Boundary Elements*,* Vol. 37, Issue 4, April 2013, pp. 747–756.

10.3.17. V. Chatziathanasiou, P. Chatzipanagiotou, I. Papagiannopoulos, G. De Mey and B. Wiecek, "*Dynamic Thermal Analysis of Underground Medium Power Cables Using Thermal Impedance, Time Constant Distribution And Structure Function",* Applied Thermal Engineering, Vol. 60, Issues 1–2, 2 October 2013, pp. 256-260.

10.3.18. B. Wiecek, M. Strakowska, G. De Mey, V. Chatziathanasiou, P. Chatzipanagiotou, "*Application of thermal impedance to inverse heat transfer modeling of power cables*", PAK, Vol. 59, nr 9, 2013, pp. 946-949.

10.3.19. C. Prodan, D. Cernomazu, V. Chatziathanasiou, *"Contributions Concerning the Oscilloscopic Method, for Checking the Clock-Hour Figure of the Vector Group of a Three Phase, 50 VA Electric Transformer",* Elektronika ir elektrotechnika (Electronics and Electrical Engineering), Vol. 19, No 8, 2013, pp. 29-32.

10.3.20. B. Wiecek, G. De Mey, V. Chatziathanasiou, A. Papagiannakis and I. Theodosoglou, *"Harmonic analysis of dynamic thermal problems in high voltage overhead transmission lines and buried cables",* International Journal of Electrical Power & Energy Systems (IJEPES), 2014, Vol.58, pp. 199-205.

10.3.21. G. De Mey, P. Xynis, I. Papagiannopoulos, V. Chatziathanasiou, L. Exizidis, B. Wiecek, *"Optimal Position of Buried Power Cables",* Elektronika ir elektrotechnika (Electronics and Electrical Engineering), Vol. 20, no. 5, 2014, pp. 37-40.

10.3.22. L. Exizidis, I. Papagiannopoulos, V. Chatziathanasiou, De Mey and B. Wiecek, "*Evaluation of a buried power cable's thermal behavior using phase diagrams and calculation of the phase difference between temperature and power*", Applied Thermal Engineering 70 (2014) 770-775.

The following table shows the Impact Factors of the journals according to Thomson Reuters. (Publications as Assistant Professor)

Table 1.Journals' Impact Factors

Περιοδικό	**2012 Impact Factor**	**5 Year Impact Factor**
IEEE Transactions on Energy Conversion	2.467	3.461
Expert Systems With Applications (Elsevier)	1.854	2.339
Electric Power Systems Research (Elsevier)	1.694	2.021
International Journal of Electrical Power & Energy Systems (Elsevier)	3.432	3.111
Infrared Physics and Technology (Elsevier)	1.364	1.165
Engineering Analysis with Boundary Elements (Elsevier)	1.596	1.625
Applied Thermal Engineering (Elsevier)	2.128	2.488
Elektronika ir elektrotechnika (Electronics and Electrical Engineering)	0.411	0.318

10.4. International Conferences with Reviewers and Minutes

10.4.1. M. Antonopoulos-Domis and V. Chatziathanasiou, *"On the structure of neutron noise coherences in the low frequency range."* 19th Informal Meeting on Reactor Noise (IMORN), Rome, 4-6 June, 1986.

10.4.2. D. Labridis and V. Chatziathanasiou, "*Coupled magneto-thermal finite element computation of losses and ampacity in underground SF6 insulated cables*," 2nd International Workshop on Electric and Magnetic Fields: From Numerical Methods to Industrial Applications, pp. 107-110, Leuven, Belgium, May 17-20, 1994.

As Assistant Professor

10.4.3. C. Athanasopoulou, C. Vasilopoulos, C. Xanthopoulakis, S. Kadi, V. Chatziathanasiou, "*Development of educational software for teaching of Applied Thermodynamics and Heat Transfer*" International Conference for Open and Distance Learning (ICODL 2005), Greek Open University, November 11-13 2005 Patras, Greece.

10.4.4. C. Athanasopoulou, V. Chatziathanasiou, M. Komninou, Z. Petkani, "*Applying Knowledge Engineering And Data Mining For Optimization Of Control Monitoring Of Power Plants"*, Proceedings of the Sixth IASTED International Conference on European Power and Energy Systems (EuroPES 2006), Pages: 190-195, June 26-28, 2006, Rhodes, Greece.

10.4.5. C. Athanasopoulou, V. Chatziathanasiou, V. Kamariari, C. Piliou, "*Multi agent system for identification and reconstruction of sensor fault: a Thermal Power Plant case study*", Acta Electrotehnica, Vol. 47, Num.4, Pages 131-134, 2006, Special issue, Selected papers from the 1st International Conference on Modern Power Systems, MPS 2006, November 8 - 11, 2006, Cluj-Napoca, Romania.

10.4.6. C. Athanasopoulou, V. Chatziathanasiou, I. Petridis, *"Utilizing data mining algorithms for identification and reconstruction of sensor faults: a Thermal Power Plant case study"*, IEEE PowerTech'07, July 1-5,2007, Lausanne, Switzerland, 2007 IEEE Lausanne Powertech, Vols 1-5, Pages: 2082-2087, 2007.

10.4.7. C. Athanasopoulou, V. Chatziathanasiou, *"A theoretical framework for an agent-based application for optimizing Power Plant operation"*, Agent-based ubiquitous computing workshop (ABUC 2007), AAMAS 2007, May 14-18, 2007, Honolulu, Hawaii.

10.4.8. C. Athanasopoulou, V. Chatziathanasiou, G. Athanasopoulos, F. Kerasidis, *"Reduction of NOx emissions by regulating combustion parameters based on models extracted by applying data mining algorithms"* MedPower 2008, Sixth Mediterranean Conference on Power Generation, Transmission and Distribution, November 2-5,2008, Thessaloniki, Greece.

10.4.9. V. Chatziathanasiou, G.T. Andreou, O. Gkaitatzi, O. Otuzbir, D. P. Labridis, *"Thermal Analysis of an Installation Fault Concerning a Ripple Control Transformer"* Proceedings of the 9th International Conference on Quantitative Infrared Thermography, QIRT 2008, Pages 39-44, July 2-5, 2008 Krakow, Poland.

10.4.10. V. Chatziathanasiou, G.T. Andreou, D.P. Labridis, "*A Finite Element Approach for the Thermal Analysis of Parallel Routed LV Power Distribution Cables*," Acta Electrotehnica, Proceedings of the 2nd International Conference on Modern Power Systems (MPS 2008), Pages 125-128, November 12-14, Cluj-Napoca, Romania, 2008.

10.4.11. G. De Mey, V. Chatziathanasiou, *"Effective thermal conductivity of multicore power cables"*, Acta Electrotehnica, Proceedings of the 2nd International Conference on Modern Power Systems (MPS 2008), Pages 125-128, November 12-14, Cluj-Napoca, Romania, 2008.

10.4.12. C. Athanasopoulou, V. Chatziathanasiou, *"Enhancing Agent Intelligence through Data Mining: A Power Plant Case Study"*, 4th International Workshop on Agents and Data Mining Interaction, May 10-15, 2009 Budapest Hungary, Agents and Data Mining Interaction, Volume: 5680 Pages: 126-138, 2009.

10.4.13. V. Chatziathanasiou, A. Hatzopoulos, I. Papagiannopoulos, *"Thermal behavior of integrated inductors: a case study"* 16th International Conference on Thermal Engineering and Thermogrammetry (THERMO), Budapest, Hungary, 1-3 July, 2009.

10.4.14. A.Antoniadis, G.T. Andreou, V. Chatziathanasiou, S. Kadi, *"Temperature Field Analysis in the Vicinity of Underground Cables – A Finite Element Approach*" Acta Electrotehnica, Vol. 51, Num.5, Pages 15-19, 2010, Special issue, Selected papers from the 3rd International Conference on Modern Power Systems, MPS 2010, May 18-21, 2010, Cluj-Napoca, Romania.

10.4.15. M. Kaluza, I. Papagiannopoulos, B. Wiecek, V. Chatziathanasiou, A. Hatzopoulos, G. De Mey, "*Thermal Characterization of silicon integrated spiral inductors by thermal impedance using transient thermography – first approach",* Proceedings of the 10th International Conference on Quantitative Infrared Thermography, QIRT 2010, Pages 555-559, Universite Laval, Quebec – Canada, July, 27-30, 2010.

10.4.16. S. Rogotis, V. Chatziathanasiou, S. Kadi, "*Digital analysis of thermal images" ,* Proceedings of the 10th International Conference on Quantitative Infrared Thermography, QIRT 2010, Pages 527-531, Universite Laval, Quebec – Canada, July, 27-30, 2010.

10.4.17. C. Munteanu, V. Topa, L. Grindei, I. T. Pop, Gh. Visan, C. Diaconu, , J. Deconick, V. Chatziathanasiou, L. Bortels, "*3D Numerical Computation of the Induced Potential Distribution on Buried Pipelines by Neighbour HV Lines Working on Normal and Fault Conditions*", 2010 Cigre Session, Paris, France, August, 22-27, 2010.

10.4.18. T. Nikolopoulou, A. Boier, G. T. Andreou, V. Chatziathanasiou, S. Kadi, *"Thermal Modeling of a Buried Single Phase Low Voltage Cable"* Acta Electrotehnica, Proceedings of the 4nd International Conference on Modern Power Systems (MPS 2011), Pages 344-347, May17-21, Cluj-Napoca, Romania, 2011.

10.4.19. C. Athanasopoulou, V. Chatziathanasiou, and G. Athanasopoulos, *"Control of flue gas emissions based on models derived from historical plant operation data".*2011 International Conference on Clean Electrical Power (ICCEP), Ischia, Italy, June 14-16, 2011.

10.4.20. G. Rata, V. Chatziathanasiou, E. Bobric, M. Rata, *"Reconfigurable system for power quality analysis",* 4th International Symposium on Electrical Engineering and Energy Converters (ELS2011), Suceava, Romania, September 22 - 23, 2011, Buletinul AGIR, nr. 4/2011, pp. 231-234.

10.4.21. V. Chatziathanasiou, K. Papakostas, "*Refrigeration cycles – Heat pumps*", 9th Conference on Thermography and Thermometry in Infrared (TTP 2011), Ustron, Poland, October 19-21, 2011.

10.4.22. A. Papagiannakis, V. Chatziathanasiou, I. Papagiannopoulos, G. De Mey, B. Wiecek, "*Electrothermal Analysis of Overhead Power Lines*", IEEE International Conference on Industrial Technology (ICIT 2012), Athens, Greece, March 19-21, 2012.

10.4.23. M. R Milici, C. Ungureanu, V.Chatziathanasiou, D. Cernomazu, L.D Milici, "*Experimental Study of Volatile Liquid Influence on Behaviour of an Electromechanic Actuator with Volatile Liquid*" Recent Researches in Circuits, Systems, Multimedia and Automatic Control, Rovaniemi, Finland, April 18-20, 2012.

10.4.24. I. Papagiannopoulos, V. Chatziathanasiou, G. De Mey B. Wiecek M. Kaluza, *"Thermographic Measurements of Planar Inductors"*, 19th International Conference MIXED Design of Integrated Circuits and Systems (MIXDES-2012), Warsaw, Poland, May 24-26, 2012.

10.4.25. M. Kaluza, I. Papagiannopoulos, G. De Mey, V. Chatziathanasiou, A. Hatzopoulos, B. Wiecek, *"Thermographic measurement of integrated spiral inductors"*, 11th International Conference on Quantitative Infrared Thermography, QIRT 2012, Napoli, Italy, June 11-14, 2012.

10.4.26. G. Rata, V. Chatziathanasiou, V. Popa, M. Rata, *"Virtual instrument for calculation of unbalance factors through formulas given in international standards and regulations",* 9th World Energy System Conference (WESC 2012), Suceava, Romania, June 28-30, 2012, Buletinul AGIR, nr. 2/2012, pp. 15-22.

10.4.27. M. Rata, G. Rata, D. Cernomazu, L. Mandici, V. Chatziathanasiou, I. Nitan, *"Vibromotors based on magnetostriction effect",* 9th World Energy System Conference (WESC 2012), Suceava, Romania, June 28-30, 2012, Buletinul AGIR, nr.4/2012, pg. 265-269.

10.4.28. L. D. Milici, L. N. Luchian, M.R. Milici, V. Chatziathanasiou, K. Papakostas, *"Study concerning the implementation of some kinds of ultrasonic motors in positioning systems of solar panels",* 9th World Energy System Conference (WESC 2012), Suceava, Romania, June 28-30, 2012, Buletinul AGIR, nr.2/2012, pg. 207-212.

10.4.29. M. Milici, C. Ungureanu, L. D. Milici, V. Chatziathanasiou, *"Experimental analysis of transient regime of an electromechanical actuator with volatile liquid using the unit step response",* 9th World Energy System Conference (WESC 2012), Suceava, Romania, June 28-30, 2012, Buletinul AGIR, nr.2/2012, pg. 355-359.

10.4.30. G. De Mey, B. Wiecek and V. Chatziathanasiou, *"Thermal impedance: a logical extension of thermal resistance",* IX International conference "Methods and Instruments of Physical Quantities Measurement", Temperature-2012, Lviv, Ukraine, September 25-28, 2012.

10.4.31. I. Theodosoglou, P. Chatzipanagiotou, V. Chatziathanasiou, A. Boier, M. Rata, *"Measurement and calculation of thermal characteristics of an overhead power line"* Acta Electrotehnica, Proceedings of the 5th International Conference on Modern Power Systems (MPS 2013), Pages 474-478, May 28-31, Cluj-Napoca, Romania, 2013.

10.4.32. G. Rata, A. Graur, V. Chatziathanasiou, M. Rata, E. Graur, *"The study of the deforming regime of three-phase rectifiers using programmable automation controller – compactrio",* 17th International Symposium on Power Electronics - Ee 2013, Novi Sad, Serbia, October 30th – November 1st, 2013.

10.4.33. M. Rata, A. Jurale, G. Rata, L. Mandici, V. Chatziathanasiou, C. Afanasov, "*Variable - frequency drive with mc3phac*", 5th International Symposium on Electrical Engineering and Energy Converters (ELS2011), Suceava, Romania, September 26- 27, 2013, Buletinul AGIR, (2013), nr: 4, pp. 219-223.

10.4.34. I. Theodosoglou, P. Chatzipanagiotou, V. Chatziathanasiou, M. Rata, G. De Mey, *"Thermal characterization of an overhead transmission line: thermal impedance, time constant distribution and structure functions",* 18th International Conference ELECTRONICS 2014, Palanga, Lithuania, June 16-18, 2014.

10.4.35. I. Papagiannopoulos, M. Kaluza, , G. De Mey, V. Chatziathanasiou, B. Wiecek, A. Hatzopoulos, *"Thermal measurements of integrated inductors in CMOS technology and simple 1D analytical model of heat conduction",* 12th International Conference on Quantitative Infrared Thermography, QIRT 2014, Bordeaux, France, July 7-11, 2014.

10.5. International Workshops

10.5.1. V. Chatziathanasiou, A. Hatzopoulos, I. Papagiannopoulos, *"Simulation and measurements of the thermal behavior of integrated inductors*", 4th European Advanced Technology Workshop on Micropackaging and Thermal Management, La Rochelle, France, February, 4-5, 2009.

10.5.2. V. Chatziathanasiou, I. Papagiannopoulos, A. Hatzopoulos, B. Wiecek, G. De Mey, "*Thermal Measurements of integrated Inductors in CMOS technology*", 5th European Advanced Technology Workshop on Micropackaging and Thermal Management, La Rochelle, France, February, 3-4, 2010.

10.5.3. I. Papagiannopoulos, V. Chatziathanasiou, G. De Mey, M. Kaluza, B. Wiecek, "*Thermographic Measurements of Planar Inductor*", 6th European Advanced Technology Workshop on Micropackaging and Thermal Management, La Rochelle, France, February, 2-3, 2011.

10.5.4. M. Strakowska, B. Wiecek, V. Chatziathanasiou, G. De Mey, "*Application of thermal impedance for multilayer structure investigations*", 8th European Advanced Technology Workshop on Micropackaging and Thermal Management, La Rochelle, France, February, 6-7, 2013.

11. Analysis of Published Work (in brief)

11.1. PhD Thesis

11.1.1. V. Chatziathanasiou, *"Non-uniform feedback effects on the detector field of view"*, AUTH Publications Service, Thessaloniki 1989.

This thesis discusses the effects of space dependent feedback on the field of view of a neutron detector, positioned in the heart reactor. The cases of feedback due to boiling and pressure are considering. In summary:

In the first chapter of the state of the art is presented.

The model that will be used to the study the feedback effects is developed in the second chapter. The model refers to a homogeneous, infinite dimensions, plate reactor. The feedback is introduced into the equation of flow variations through thermohydraulic model resulting from the energy balances of fuel and coolant. The relative to the feedback term that appears in the equation of flow variations is a space dependent one also. Consequently, the feedback effects can then be studied as space dependent also.

In the third chapter the definition of the detector's field of view and its correlation with the Green is presented. The necessary condition between the excitation frequency and the reactor size so that the point model is valid, is formulated.

The study of the feedback effects on the detector field of view are presented in the fourth chapter. The cases of uniform and non-uniform feedback are considering. The problem is solved initially numerically (by finite differences method) and then, after the discharge of the space function due to negligible influence, analytically. The conclusions of both solutions are the same. Finally the coherence function, in the case of considering only the only the feedback from boiling, is examined.

In the fifth chapter the feedback between the pressure and its control system is introduced and the influence to the coherence function is examined. Then a comparison of the effects that the two feedbacks, boiling and pressure, cause to the coherence function is made. The sixth chapter presents the conclusions of the thesis.

11.2. Books– Notebooks – Book chapters

11.2.1. V. Chatziathanasiou, "*Introduction to Heat Transfer*", pp. 252, Sofia Publishers, Thessaloniki, 2009.

Introduction to the Heat Transfer mechanisms. Analytical description of conduction, convection and radiation. Transient Conduction. Fins and Heat Exchangers.

11.2.2. V. Chatziathanasiou, *"Electric Power Plants",* pp.193, AUTH Publications Service, 1994.

Basic Types of Power Plants. Fuels, Combustion, Steam generators and their Auxiliaries. Rankine and Brayton cycles.

11.2.3. V. Chatziathanasiou, "*Heat Transfer*", pp.207, AUTH Publications Service, 1998

As 11.2.1

11.2.4. C. Athanasopoulou, V. Chatziathanasiou, '*An agent-based prototype for optimizing power plant operation*', ch.9 in Agent-Based Ubiquitous Computing, Ed. Eleni Mangina, Javier Carbó and Jose Manuel Molina, Atllantis Press, Amsterdam-Paris, 2009.

In this chapter, an integrated framework for the development of "ubiquity" and context-aware applications for power plants is implemented. The technology of software agents is combined with data mining techniques in order to create a system that aspires to work as an assistant engineer. Although the application was originally designed based on the needs of the staff of a power plant, the model can respond equally to other industrial areas, whereas the requirements for the information flow are similar.

This chapter briefly describes the application area of the system and gives a small part of the model of knowledge engineering used to complete the specifications. It describes the architecture of the proposed system and lists the tools chosen for the implementation. It outlines the simulation experiments that were conducted to evaluate the model. This chapter ends with some conclusions and recommendations for possible future extensions of the system.

11.3. Papers in International Journals with Reviewers

11.3.1. M. Antonopoulos-Domis and V. Chatziathanasiou, "*Effects of space dependent feedback on the detector field of view*." Progress in Nuclear Energy, 1985, Vol. 15, pp.643-650.

A 1-D mode1 of space dependent feedback in BWR' S is presented. Equations are solved numerically with the method of finite difference approximation to derivatives. It was found that feedback will, in general, reduce the detector field of view at low frequencies, in agreement with previous investigations , but the coupling of different feedback mechanisms may reverse this effect. The mode1 is then modified to a form amenable to analytical solution and it is concluded that space dependent feedback may increase, decrease or even displace the detector field of view.

11.3.2. M. Antonopoulos-Domis and V. Chatziathanasiou, *"Investigation of boiling and pressure feedback on neutron noise.*" Progress in Nuclear Energy, 1988, Vol. 21, pp. 271-278.

Boiling and pressure feedback effects on neutron noise in BWR's are investigated with a 1-D reactor model and compared with experimental measurements. It is concluded that the structure of neutron noise coherences at low frequencies can be explained by either pressure or/and boiling feedback.

11.3.3. V. Chatziathanasiou and D. Labridis, *"Coupled magneto-thermal field computation in three-phase gas insulated cables-Part 1: Finite Element Formulation*," Archiv fur Electrotechnic, May 1993, Vol. 76, No. 4, pp. 285-292.

A numerical procedure employing the finite element technique is developed for the computation of the coupled magneto-thermal field in three-phase gas insulated cables. The finite element formulation of both the electromagnetic and temperature field problems, the iterative procedure and the effective thermal conductivity of the insulation gas needed for the solution of the problem are presented here. Calculations made with the proposed method are presented in Part 2.

11.3.4. V. Chatziathanasiou and D. Labridis, *"Coupled magneto-thermal field computation in three-phase gas insulated cables-Part 2: Calculation of Ampacity and Losses*," Archiv fur Electrotechnic, June 1993, Vol. 76, No. 5, pp. 397-404.

The calculation of ampacity and losses of three-phase gas insulated cables based on the FEM formulation which was developed in Part I is presented. Limitations of the common mesh for both problems (electromagnetic and thermal) are also presented. Comparisons with existing calculation are made. Results concerning the sensitivity of cable ampacity and losses to variation of design and environmental parameters (burial depth, ambient temperature, soil thermal conductivity, cable emissivities, heat transfer coefficient, sheath radius) are finally presented.

11.3.5. V. Chatziathanasiou, J. Xypteras, G. Archontoulakis, *"Electrical - thermal calculation of an asynchronous machine"* Archiv fur Electrotechnic, January 1994, Vol. 77, No. 2, pp. 117-122.

The temperature field over the whole cross section of an asynchronous electric machine (windings, stator and rotor core, insulation, air gap) is calculated under both steady-state and transient conditions. Thermal sources (copper losses) depend on rotor slip, deep-bar effect and windings temperature. All these quantities are, in the transient condition, functions of time. The thermal part of this coupled electro-thermal process is solved by the finite element method (FEM), while the electromagnetic part is dealt with by the equivalent circuit of the asynchronous machine. The air-gap problem is specially treated. The

presented method can be applied to other electric machines having negligible axial thermal heat flow.

11.3.6. D. Labridis and V. Chatziathanasiou, *"Finite element computation of field, forces and inductances in underground SF_6 insulated cables using a coupled magneto-thermal formulation*," IEEE Transactions on Magnetics, July 1994, Vol. 30, No. 4, pp. 1407-1415.

A finite element (FE) iterative formulation has been used for the computation of the coupled magneto – thermal field in underground SF6 insulated high voltage cables. The formulation takes into account the real geometrical and physical properties of the involved materials. Using the field distributions, the cable ampacity and losses, the forces and the inductances have been calculated for both isolated phase and three – conductor arrangements. The influence of the operating parameters on these quantities is examined.

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As Assistant Professor

11.3.7. J. Xypteras and V. Chatziathanasiou, *"Thermal analysis of an electrical machine taking into account the iron losses and the deep-bar effect*" IEEE Transactions on Energy Conversion, December 1999, Vol. 14, No. 4, pp. 996-1003.

The temperature distribution over the cross-section of an asynchronous squirrel cage machine is calculated by taking into account the copper losses and the iron losses at the steady-state condition. At the transient conditions the deep-bar effect in the rotor is taken into account. Due to the deep bar effect, the current densities and thermal sources in the bar change and as a consequence the resistances, the leakage reactances, the currents and the thermal sources in the stator copper are also altered. Resistances depend upon temperatures.

11.3.8. C. Athanasopoulou, V. Chatziathanasiou, *"Intelligent system for identification and replacement of faulty sensor measurements in Thermal Power Plants (IPPAMAS: Part 1)* Expert Systems with Applications, Vol. 36, Issue: 5, pp: 8750-8757, 2009.

This paper describes a procedure of identifying sensor faults and reconstructing the erroneous measurements. Knowledge discovery in databases is successfully applied for deriving models that estimate the value of one variable based on correlated others. The estimated values can then be used instead of the recorded ones of a measuring instrument with false reading. The aim is to reassure the correctness of data entered to an optimization software application that was developed for the Thermal Power Plants of Western Macedonia, Greece. The architecture of the application follows the Multi-Agent System approach in order to cope with its complexity and distributed nature. The application was tested on a case study and proved to be efficient.

11.3.9. M. Kałuża, B. Więcek, A. Hatzopoulos, V. Chatziathanasiou, I. Papagiannopoulos, G. De Mey, *"Thermal measurements of silicon integrated spiral inductors*". PAK, vol. 55, nr 11, 2009, pp. 954-957.

The goal of the research was to investigate the thermal behavior of silicon integrated spiral inductors under current stress. In the introduction, on overview of spiral inductors is presented, including their typical geometries, dimensions and applications. The second chapter of the article presents the problems of silicon integrated spiral inductor modeling. Next, in the third chapter are presented the results of temperature measurements of one of the spiral inductors integrated in a test circuits. A MWIR camera with a cooled InSb 640x512 pixel detector matrix was used. The measurements are compared with simulation results.

11.3.10. G.De Mey, B. Wiecek, I. Papagiannopoulos, V. Chatziathanasiou, "*Geometrical effects on the wall temperature in buildings: modelling and thermographic measurements*", PAK, Vol. 57, nr 10, 2011, pp. 1180-1182.

Thermographic measurements on a wall of a building shows clearly a decrease of temperature in the neighborhood of a corner. The same problem has been modelled numerically by taking thermal conduction inside the wall and convection on both sides into account. The modelling confirms the experimental measurements. A simple physical explanation is that a corner provides more "material" for thermal conduction than a flat wall so that the temperature at the inside will be lower. The opposite phenomenon is observed at the outside of a building.

11.3.11. G. A. Bakirtzis, P. N. Biskas, V. Chatziathanasiou, *"Generation Expansion Planning by MILP considering mid-term scheduling decisions",* EPSR*,* Vol. 86, May 2012, pp. 98–112.

This paper presents a mixed-integer linear programming model for the solution of the centralized Generation Expansion Planning (GEP) problem. The GEP objective is the minimization of the total present value of investment, operating and unserved energy costs net the remaining value of the new units at the end of the planning horizon. Environmental considerations are modeled through the incorporation of the cost of purchasing emission allowances in the units' operating costs and the inclusion of annual renewable quota constraints and penalties. A monthly time-step is employed, allowing mid-term scheduling decisions, such as unit maintenance scheduling and reservoir management, to be taken along with investment decisions within the framework of a single long-term optimization problem. The proposed model is evaluated using a real (Greek) power system. Sensitivity analysis is performed for the illustration of the effect of demand, fuel prices and CO_2 prices uncertainties on the planning decisions.

11.3.12. G. De Mey V. Chatziathanasiou, *"A theoretical model for effective thermal conductivity of multicore power cables",* EPSR*,* Vol. 87, June 2012, pp. 10–12.

An interesting aspect in thermal analysis of multicore power cables is the estimation of the temperature distribution in the interior of the cables. In order to do this the knowledge of the thermal conductivity is necessary. In this paper a simple theoretical formula for the calculation of the effective thermal conductivity is proposed. The method is verified by numerical simulations and experimental results.

11.3.13. G. Rata, M. Rata, C. Prodan, V. Chatziathanasiou, "*Using Reconfigurable System - CompactRIO in the Acquisition and Processing of Signals from Deformed Consumers",* International Review of Electrical Engineering (I.R.E.E.), 2012, Vol. 7, No. 6, pp. 6290-6295.

Industrial development, technology modernization and automation advent, had not only beneficial but also adverse effects such as pollution harmonic of power systems and their consumers. Deforming regime is one of the very important aspects that influence power quality in power systems. Since the emergence of the harmonics in power systems, large companies producing measurement instruments made significant efforts to develop equipment for deformed consumers monitoring, which thus become more complex. An equipment that can be successfully used in the acquisition and processing of signals from deformed consumers is CompactRIG (cRIG), produced by National Instruments. This article presents an example of using a cRIG system to analyze the deforming regime generated by a three-phase consumer. Both hardware configuration and software application in LabVIEW Real-Time for cRIG programming were made.

11.3.14. I. Papagiannopoulos, V. Chatziathanasiou, L. Exizidis, G. Andreou, G. De Mey and B. Wiecek, *"Behaviour of the thermal impedance of buried power cables",* IJEPES, 2013, Vol. 44, pp.383-387.

The ampacity of power cables depends heavily on their ability to diffuse their resistive heating to their environment. This ability however depends in turn on the characteristics of the material surrounding the power cable. In this work, the concept of thermal impedance is utilized in order to determine the thermal properties of a power cable buried in earth with respect to the burial depth. To that purpose, a theoretical analysis is conducted concerning the calculation of the thermal impedance for the problem under study. Moreover, an experimental setup is used in order to test the remarks obtained by the theoretical analysis concerning the thermal behavior of the cable.

11.3.15. I. Papagiannopoulos, V. Chatziathanasiou, A. Hatzopoulos, M. Kałuża, B. Wiecek and G. De Mey, *"Thermal Analysis of Integrated Spiral Inductors",* Infrared Physics and Technology (2013), Vol. 56, pp. 80-84

This paper presents the thermal analysis results of integrated spiral inductors. Inductors, often used in analog integrated circuits for wireless applications, have very small

dimensions, thus even a low power dissipation can give rise to elevated temperatures in circuits containing these elements. The thermal analysis is divided into two parts. First, the inductors thermal behavior is investigated using infrared thermography. Next, a theoretical model is developed and compared with the experimental measurements and numerical simulations.

11.3.16. I. Papagiannopoulos, G. De Mey and V. Chatziathanasiou, *"Current distribution in circular planar coil",* Engineering Analysis with Boundary Elements*,* Volume 37, Issue 4, April 2013, pp. 747–756.

The current distribution over the cross section of a planar circular coil is calculated by a Fredholm integral equation technique. An external applied current source is driving the current. The integral equation technique is applied over a two-dimensional cross section of the coil while considering infinitesimally thin windings. The coil windings are divided into equally size one-dimensional elements. The resulting algebraic system is solved numerically. For low frequencies, the current distribution follows the1/r behavior. As the frequency increases, the influence of the proximity effect is taken into account. Different cases are studied examining the intensity of these effects on the current distribution as the number of turns, the width of the windings, and the spacing between the turns are varying.

11.3.17. V. Chatziathanasiou, P. Chatzipanagiotou, I. Papagiannopoulos, G. De Mey and B. Wiecek, "*Dynamic Thermal Analysis of Underground Medium Power Cables Using Thermal Impedance, Time Constant Distribution And Structure Function" ,* Applied Thermal Engineering, Volume 60, Issues 1–2, 2 October 2013, pp. 256-260.

The thermal behavior of a laboratory model for an underground cable has been investigated experimentally. Temperatures are recorded as a function of time so that the dynamic thermal properties could be investigated. The results are represented by thermal impedances. Two new representations, the thermal time constant distribution and the structure functions, will be introduced as well. It will be shown that with the help of a simple analytical model a lot of new information can be gained.

11.3.18. B. Wiecek, M. Strakowska, G. De Mey, V. Chatziathanasiou, P. Chatzipanagiotou, "*Application of thermal impedance to inverse heat transfer modeling of power cables*", PAK, vol. 59, nr. 9, 2013, pp. 946-949.

This paper presents the inverse heat transfer modeling in applications to the power cables. In order to simplify the calculations, the inverse modeling implements thermal simulations in frequency domain. Due to the cylindrical summery of the power cable this model has an analytical solution what simplifies using Bessel functions. The inverse model allows to estimate the thermal parameters of the material, the cable is made of. It can be applied for defect detection and aging of the cable. The model was made in Matlab, and compared with the results obtained from COMSOL simulation software.

11.3.19. C. Prodan, D. Cernomazu, V. Chatziathanasiou, *"Contributions Concerning the Oscilloscopic Method, for Checking the Clock-Hour Figure of the Vector Group of a Three Phase, 50 VA Electric Transformer",* Elektronika ir elektrotechnika (Electronics and Electrical Engineering), vol. 19, No 8, 2013, pp. 29-32.

The wiring diagrams, the vector groups and the clock hour figures of the vector group, are interesting aspects for designing, manufacturing and operating of, especially the power transformers. The achievement of a device for identifying the clock-hour figure for the three-phase transformer, built on the principles of oscilloscopic method and compensation method, represent the authors' contributions. The proposed solution leads to a major simplification of the oscilloscopic method, which, even if it bears the name used in the literature, does not use an oscilloscope, device considered expensive and complicated. This new approach leads to a higher precision of measurements, limiting the risk of errors, which can occur in case of small phase displacements.

11.3.20. B. Wiecek, G. De Mey, V. Chatziathanasiou, A. Papagiannakis and I. Theodosoglou, *"Harmonic analysis of dynamic thermal problems in high voltage overhead transmission lines and buried cables",* IJEPES, 2014, vol.58, pp.199-205.

In this contribution a dynamic thermal analysis of an overhead transmission line and a buried power cable is presented. The temperature is calculated as a function of time using a realistic power input obtained from field data measurements. For both the temperature and the power a harmonic analysis is performed. The phase shift between the Fourier components corresponding to a one day period turns out to be a good indication of the temperature delay time with respect to the power peaks. In order to validate and assess the proposed method a lab experiment has been conducted.

11.3.21. G. De Mey, P. Xynis, I. Papagiannopoulos, V. Chatziathanasiou, L. Exizidis, B. Wiecek, *"Optimal Position of Buried Power Cables",* Elektronika ir elektrotechnika (Electronics and Electrical Engineering), vol. 20, no. 5, 2014, pp. 37-40.

The optimum position of parallel underground cables will be calculated numerically. The criterion is how much joule losses should be dissipated in each cable so that the temperature increases of all cables are equal. A simple analytical formula is also given.

11.3.22. L. Exizidis, I. Papagiannopoulos, V. Chatziathanasiou, De Mey and B. Wiecek, "*Evaluation of a buried power cable's thermal behavior using phase diagrams and calculation of the phase difference between temperature and power*", Applied Thermal Engineering 70 (2014) 770-775.

As most of the studies about thermal behavior of cables perform the steady state thermal analysis, a dynamic analysis of these problems can be proved very interesting. In the

current study, a dynamic thermal analysis of an underground cable which operates under a continuously changing load and thus continuously changing Joule losses is carried out. With the Joule losses as the input signal it is proved that the thermal time constants in the range up to several hours are possible. It is also observed that the dynamic analysis, presented in this work, indicates an increase on the peak value of the cable's temperature that can reach up to 81%. This increase proves the importance of a dynamic analysis. Furthermore, the comparison between the steady state and dynamic analysis resulted in the conclusion that it is practically impossible to achieve steady state condition for power losses other than the mean value, thus steady state analysis cannot determine the instantaneous temperature of the cable. The analysis is based on the Temperature-Power (T-P) phase diagrams which are proved to be a more suitable representation method of the results comparing to the Temperature-Time plots. Lastly, the phase difference between the power and the temperature vectors is calculated.

11.4. International Conferences with Reviewers and Minutes

11.4.1. M. Antonopoulos-Domis and V. Chatziathanasiou, *"On the structure of neutron noise coherences in the low frequency range."* 19th Informal Meeting on Reactor Noise (IMORN), Rome, 4-6 June, 1986.

Parts of work 11.3.1

11.4.2. D. Labridis and V. Chatziathanasiou, "*Coupled magneto-thermal finite element computation of losses and ampacity in underground SF6 insulated cables*," 2nd International Workshop on Electric and Magnetic Fields: From Numerical Methods to Industrial Applications, pp. 107-110, Leuven, Belgium, May 17-20, 1994.

Parts of work 11.3.6 and applications of the method in new problems.

As Assistant Professor

11.4.3. C. Athanasopoulou, C. Vasilopoulos, C. Xanthopoulakis, S. Kadi, V. Chatziathanasiou, "*Development of educational software for teaching of Applied Thermodynamics and Heat Transfer*" International Conference for Open and Distance Learning (ICODL 2005), Greek Open University, November 11-13 2005 Patras, Greece.

In the paper the design effort and implementation of a software application that will serve as an educational tool accompanying the courses of Applied Thermodynamics and Heat Transfer is described. The procedure of solving problems in these two courses usually requires the determination of thermodynamic properties using linear interpolation in tables and charts. In addition, recursive procedure is following many times to these solutions. These factors make the entire process laborious and shift the weight from the physical meaning to the calculations. The aim of the application is to provide education through

experimentation in an user friendly environment. The application combines a graphical environment with appropriate algorithms and a database that includes data in accordance with the latest standards of relevant international associations (IAPWS). The application was implemented in Java language.

11.4.4. C. Athanasopoulou, V. Chatziathanasiou, M. Komninou, Z. Petkani, "*Applying Knowledge Engineering And Data Mining For Optimization Of Control Monitoring Of Power Plants"*, Proceedings of the Sixth IASTED International Conference on European Power and Energy Systems (EuroPES 2006), Pages: 190-195, June 26-28, 2006, Rhodes, Greece.

As the electric power generation industry enters a new deregulated era, plants are seeking ways to improve efficiency with the minor possible cost. This paper describes research into the application of data mining algorithms for deriving new control monitoring patterns that can improve the plant's performance. It proposes the use of a knowledge engineering methodology, CommonKADS, as a tool for completing the Knowledge Discovery in Databases phases that precede data mining. The application of data mining classification algorithms resulted in new control monitoring rules, which improve performance without demanding installation of new equipment. The derived rules can also be used to trace a possible malfunction of a measurement instrument and even more to replace the recording values with those resulting from the data mining algorithms.

11.4.5. C. Athanasopoulou, V. Chatziathanasiou, V. Kamariari, C. Piliou, "*Multi agent system for identification and reconstruction of sensor fault: a Thermal Power Plant case study*", Acta Electrotehnica, Vol. 47, Num.4, Pages 131-134, 2006, Special issue, Selected papers from the 1st International Conference on Modern Power Systems, MPS 2006, November 8- 11, 2006, Cluj-Napoca, Romania.

As the need for reliable operation of a power plant is becoming even more urgent it is difficult for a human operator to detect and cope with operational problems in real-time. This paper describes the design and development of a Multi-Agent System that identifies sensors faults and fires appropriate alarms. Data mining algorithms are applied for deriving models that estimate the value of one variable based on other correlated variables. The estimated values can be used to replace the recorded values of a measurement instrument.

11.4.6. C. Athanasopoulou, V. Chatziathanasiou, I. Petridis, *"Utilizing data mining algorithms for identification and reconstruction of sensor faults: a Thermal Power Plant case study"*, IEEE PowerTech'07, July 1-5,2007, Lausanne, Switzerland, 2007 IEEE Lausanne Powertech, Vols 1-5, Pages: 2082-2087, 2007.

This paper describes a procedure of identifying sensor faults and reconstructing the erroneous measurements. Data mining algorithms are successfully applied for deriving models that estimate the value of one variable based on correlated others. The estimated

values can then be used instead of the recorded ones of a measuring instrument with false reading. The aim is to reassure the correctness of data entered to an optimization software application under development for the Thermal Power Plants of Western Macedonia, Greece.

11.4.7. C. Athanasopoulou, V. Chatziathanasiou, *"A theoretical framework for an agent-based application for optimizing Power Plant operation"*, Agent-based ubiquitous computing workshop (ABUC 2007), AAMAS 2007, May 14-18, 2007, Honolulu, Hawaii.

Continuous evolution of computing capabilities and mobile devices has made processing power available wherever the user needs it, thus ubiquitous. This paper concerns an innovative software application (Intelligent Power Plant engineer Assistant Multi Agent System - IPPAMAS) aiming to facilitate the control of a power plant by the personnel, who routinely move around the premises. Multi Agent Systems (MAS), which are well suited for developing complex, distributed systems, are adopted to represent the various tasks that constitute the control operation procedure. The application aspires to form an intelligent system that will function as an engineer assistant by embedding data mining techniques to the agents. The IPPAMAS comprises of off-line pre-processing and processing of data, on-line monitoring and an off-line re-training procedure. The MAS is structured in three layers: Sensor Layer, responsible for the identification and reconstruction of sensor faults, Condition Monitoring Layer, responsible for the safe operation of the Thermal Power Plant and its optimization, and Engineer Assistant Layer, which distributes the information to the appropriate users. The WEKA data-mining suite is used for the application of the algorithms and the Java Agent Development Framework for the deployment of the agents.

11.4.8. C. Athanasopoulou, V. Chatziathanasiou, G. Athanasopoulos, F. Kerasidis, *"Reduction of NOx emissions by regulating combustion parameters based on models extracted by applying data mining algorithms"* MedPower 2008, Sixth Mediterranean Conference on Power Generation, Transmission and Distribution, November 2-5, 2008, Thessaloniki, Greece.

In recent years there has been a remarkable evolvement in flue gas control technologies aiming at reducing NO_x emissions to the lower and lower levels required by latter legislation. This paper introduces an innovative method to estimate and reduce NO_x emissions. Data mining algorithms are applied for deriving new control monitoring patterns. Multi Agent Systems, which are well suited for developing complex, distributed systems, are adopted to represent the various tasks that constitute the control operation procedure. The proposed approach does not require the installation of any new equipment and is easily adaptable to any thermal power plant.

11.4.9. V. Chatziathanasiou, G.T. Andreou, O. Gkaitatzi, O. Otuzbir, D. P. Labridis, *"Thermal Analysis of an Installation Fault Concerning a Ripple Control Transformer"* Proceedings of the 9th International Conference on Quantitative Infrared Thermography, QIRT 2008, Pages 39-44, July 2-5, 2008 Krakow, Poland.

The Greek Public Power Company utilizes Ripple Control by the use of three single phase infusion current transformers. Recently a problem occurred in one of the transformers, when its feeding cable blew. The cable was replaced with a new one, which again blew after some time. This paper deals with the analysis of the reasons that led to this problem. A theoretical study is presented, along with an infrared thermography depiction of the problematic transformer. Finally, thermal analysis is also used on an experimental setup for the better comprehension of the incident.

11.4.10. V. Chatziathanasiou, G.T. Andreou, D.P. Labridis, "*A Finite Element Approach for the Thermal Analysis of Parallel Routed LV Power Distribution Cables*," Acta Electrotehnica, Proceedings of the 2nd International Conference on Modern Power Systems (MPS 2008), Pages 125-128, November 12-14, Cluj-Napoca, Romania, 2008.

The usage of parallel cables is a common practice in industrial installations for the distribution of high currents. However, the uneven distribution of the currents among cables of the same phase may result in overloading and destruction of one or more of the cables used for this purpose. In this work, a finite element approach is used for the thermal analysis of this problem. The finite element approach is implemented on a real case of multiple parallel low voltage cables feeding an industrial installation. Moreover, the thermal analysis of an optimum cable rearrangement is also conducted using the same approach, aiming to evaluate the advantages of the latter solution to the given problem.

11.4.11. G. De Mey, V. Chatziathanasiou, *"Effective thermal conductivity of multicore power cables"*, Acta Electrotehnica, Proceedings of the 2nd International Conference on Modern Power Systems (MPS 2008), Pages 125-128, November 12-14, Cluj-Napoca, Romania, 2008.

Work 10.3.12

11.4.12. C. Athanasopoulou, V. Chatziathanasiou, *"Enhancing Agent Intelligence through Data Mining: A Power Plant Case Study"*, 4th International Workshop on Agents and Data Mining Interaction, May 10-15, 2009 Budapest Hungary, Agents and Data Mining Interaction, Volume: 5680 Pages: 126-138, 2009.

In this paper, the methodology for an intelligent assistant for power plants is presented. Multiagent systems technology and data mining techniques are combined to enhance the intelligence of the proposed application, mainly in two aspects: increase the reliability of input data (sensor validation and false measurement replacement) and generate new

control monitoring rules. Various classification algorithms are compared. The performance of the application, as tested via simulation experiments, is discussed.

11.4.13. V. Chatziathanasiou, A. Hatzopoulos, I. Papagiannopoulos, *"Thermal behavior of integrated inductors: a case study"* 16th International Conference on Thermal Engineering and Thermogrammetry (THERMO), Budapest, Hungary, 1-3 July, 2009.

The topic of this paper is the investigation of the thermal behavior of integrated inductors, based on simulation and infrared thermography. The samples were integrated planar inductors. Using a commercial software package, a number of electro-thermal simulations were carried out. For the infrared thermography measurements, various techniques of surface treatment were applied. Covering with soot was proved to be quite satisfactory. The simulation results were compared with the temperature maps recorded during the infrared thermography, in order to study the heat transfer throughout the IC's borders.

11.4.14. A. Antoniadis, G.T. Andreou, V. Chatziathanasiou, S. Kadi, *"Temperature Field Analysis in the Vicinity of Underground Cables – A Finite Element Approach*" Acta Electrotehnica, Vol. 51, Num.5, Pages 15-19, 2010, Special issue, Selected papers from the 3rd International Conference on Modern Power Systems, MPS 2010, May 18-21, 2010, Cluj-Napoca, Romania.

In this work, the temperature field in the vicinity of three medium voltage power cables buried in earth is studied concerning their long term operation. The study involves the time dependent simulation of these cables by the use of a finite element approach. The output of the simulation consists of the temperature field in the problem geometry, i.e. the cable arrangement and the ground surrounding it. Since the problem of heat removal aggravates when the cables are in an environment of elevated temperature, the simulations were considered to take place during consecutive summer days. Apart from that, additional simulations were also performed in order to account for special phenomena, such as a number of consecutive days with excessive heat conditions (a usual case scenario in Greece during summer), as well as overloading and short-circuit conditions. In each case, results are presented considering the effect of each phenomenon on the temperature field of both the cable and the ground surrounding it.

11.4.15. M. Kaluza, I. Papagiannopoulos, B. Wiecek, V. Chatziathanasiou, A. Hatzopoulos, G. De Mey, "*Thermal Characterization of silicon integrated spiral inductors by thermal impedance using transient thermography – first approach",* Proceedings of the 10th International Conference on Quantitative Infrared Thermography, QIRT 2010, Pages 555-559, Universite Laval, Quebec – Canada, July, 27-30, 2010.

IR thermography was used for thermal characterisation of the heating and cooling process of the silicon integrated spiral inductors. Four different inductors were powered and their temperature response to a heat step function was measured using an infrared camera.

Based on these measurement results, for each of the spirals their complex thermal impedance was calculated to evaluate if there is a difference in the heat removal from the device to the substrate and environment.

11.4.16. S. Rogotis, V. Chatziathanasiou, S. Kadi, "*Digital analysis of thermal images" ,* Proceedings of the 10th International Conference on Quantitative Infrared Thermography, QIRT 2010, Pages 527-531, Universite Laval, Quebec – Canada, July, 27-30, 2010.

The aim of this paper is the digital analysis of thermal images of a material with abnormalities lying beneath its surface focusing on the search of the image's feature that gives the best information about the abnormalities. The process followed observes the change of thermal images with time and by the use of certain algorithms, information concerning the abnormalities, like the depth from the surface is gathered.

11.4.17. C. Munteanu, V. Topa, L. Grindei, I. T. Pop, Gh. Visan, C. Diaconu, , J. Deconick, V. Chatziathanasiou, L. Bortels, "*3D Numerical Computation of the Induced Potential Distribution on Buried Pipelines by Neighbour HV Lines Working on Normal and Fault Conditions*", 2010 Cigre Session, Paris, France, August, 22-27, 2010.

The paper proposes a field-based method for the analysis of the electromagnetic disturbances produced on pipeline networks by the neighbor High Voltage (HV) power lines that works on normal or fault conditions. In order to perform the numerical computations, a particular 3D numerical code was developed. The computation algorithm is based on a hybrid Finite Elements (FEM) – Boundary Elements (BEM) numerical technique. The governing equations for the interior of the pipeline are modeled using a 1D – FEM model based on dividing the pipes in multiple elements, whereas the outer space is modeled by 3D – BEM integral equations. The outcome of the numerical analysis is the potential distribution along the pipelines. The computation results are compared with the CatProAC® [1] software developed by Elsyca [2] that solves the same problem by using the circuit approach based on the Transmission Lines Method (TLM). In the first part of the paper the computation mathematical background is outlined. It follows details regarding the numerical implementation using the combined BEM-FEM technique. In the second part of the paper the numerical module computation validation is done through several relevant cases. In the last part of the paper a computation example for a practical case is presented and discussed.

11.4.18. T. Nikolopoulou, A. Boier, G. T. Andreou, V. Chatziathanasiou, S. Kadi, *"Thermal Modeling of a Buried Single Phase Low Voltage Cable"* Acta Electrotehnica, Proceedings of the 4th International Conference on Modern Power Systems (MPS 2011), Pages 344-347, May17-21, Cluj-Napoca, Romania, 2011.

In this work, an experimental setup is presented, designed to offer temperature measurements for a single phase Low Voltage cable buried in soil. The experimental setup is designed for a sufficient range of amperage levels and thermal boundary conditions (e.g. existence or not of solar radiation), and its aim is to serve as a basis for the development of a respective simulation model. To that purpose, a finite element model has been also developed for the determination of the thermal properties of the cable under study. More specifically, the experimental setup is modeled using a commercial finite element software package. The model is based on a thermal finite element formulation, and it is validated with the measurements acquired from the experimental setup.

11.4.19. C. Athanasopoulou, V. Chatziathanasiou, and G. Athanasopoulos, *"Control of flue gas emissions based on models derived from historical plant operation data",* 2011 International Conference on Clean Electrical Power (ICCEP), Ischia, Italy, June 14-16, 2011.

Although the last decade there is a remarkable trend towards green energy, thermal power plants still cover most of the energy production and will continue to do so in the near future. Consequently, it is important to apply methods reducing the gas emissions. Towards this goal, an innovative software application that improves the regulation of combustion parameters is presented in this paper. Data mining techniques are used to process historical data and extract models on which regulation rules are based, rather on the thermodynamic theory. Multi Agent Systems are adopted to represent the various tasks that constitute the control operation procedure. The statistical analysis suggest that a reduction of NO_x and CO emissions should be expected.

11.4.20. G. Rata, V. Chatziathanasiou, E. Bobric, M. Rata, *"Reconfigurable system for power quality analysis",* 4th International Symposium on Electrical Engineering and Energy Converters (ELS2011), Suceava, Romania, September 22 - 23, 2011, Buletinul AGIR, nr. 4/2011, pp. 231-234.

The power quality monitoring is a particularly important process by which raw data from measurement are collected, analyzed and interpreted to obtain useful information. Recent advances in signal processing made possible the design and implementation of intelligent systems to analyze and interpret automatically the raw data into useful information. This paper presents the benefits of a reconfigurable intelligent system to monitor and analyze power quality.

11.4.21. V. Chatziathanasiou, K. Papakostas, "*Refrigeration cycles – Heat pumps*", 9th Conference on Thermography and Thermometry in Infrared (TTP 2011), Ustron, Poland, October 19-21, 2011.

The basic concepts of thermodynamic cycles are presented in this work. Especially the basic concepts of reverse Carnot cycle, ideal and real vapor-compression refrigeration cycles are analyzed. A presentation of the most common refrigeration systems (refrigerators and heat pumps), their coefficient of performance and their heat sources and sinks is following. The work is closed with a short reference to refrigerants.

11.4.22. A. Papagiannakis, V. Chatziathanasiou, I. Papagiannopoulos, G. De Mey, B. Wiecek, "*Electrothermal Analysis of Overhead Power Lines*", IEEE International Conference on Industrial Technology (ICIT 2012), Athens, Greece, March 19-21, 2012.

In this work a complete coupled electrothermal analysis of overhead power lines is presented. The electromagnetic field problem is solved analytically for both the AAC and ACSR cases. The Joule losses thus computed are input to the thermal problem yielding the analytical expression of the thermal impedance. A subsequent novel dynamic thermal analysis of the almost periodic load variations during an extended time period allows the prediction of temperature fluctuations (value and delay) and the prevention of the line expansion and/or overheating.

11.4.23. M. R Milici, C. Ungureanu, V. Chatziathanasiou, D. Cernomazu, L.D Milici, "*Experimental Study of Volatile Liquid Influence on Behaviour of an Electromechanic Actuator with Volatile Liquid*" Recent Researches in Circuits, Systems, Multimedia and Automatic Control, Rovaniemi, Finland, April 18-20, 2012.

This paper presents an experimental study of the physicochemical processes occurring inside an electromechanical actuator with volatile liquid. In the introduction are described: the working principle of electromechanical actuators with volatile liquid, physicochemical processes that occur in these actuators. Are then presented the used experimental stands, the results of the studies accomplished (the influence of the volatile liquid's type, quantity and temperature) and the conclusions drawn from studies.

11.4.24. I. Papagiannopoulos, V. Chatziathanasiou, G. De Mey B. Wiecek M. Kaluza, *"Thermographic Measurements of Planar Inductors"*, 19th International Conference MIXED Design of Integrated Circuits and Systems (MIXDES-2012), Warsaw, Poland, May 24-26, 2012.

Heating of circuits in electronics is an important design and operational aspect. Furthermore, there is an increasing need to check and evaluate temperature measurements acquired with the use of thermographic equipment. In other works, surface temperature distributions were captured and presented in an attempt to visualize the way

heat is dissipated in the case of an integrated inductor. The aim of this paper is to interpret the thermograms captured with an infrared cooled image system during temperature measurements of Printed Circuit Board inductors.

11.4.25. M. Kaluza, I. Papagiannopoulos, G. De Mey, V. Chatziathanasiou, A. Hatzopoulos, B. Wiecek, *"Thermographic measurement of integrated spiral inductors"*, 11th International Conference on Quantitative Infrared Thermography, QIRT 2012, Napoli, Italy, June 11-14, 2012.

The aim of this paper is the measurement of small scale spatial temperature differences over the surface of integrated spiral inductors. In this current work the surface temperature distribution of spiral planar inductors on silicon substrate was measured. The measurements were conducted with the use of thermal infrared camera. Special care was taken in order to increase the spatial resolution of the thermographs. In order to verify the experimental results, measurements were compared with numerical simulations results.

11.4.26. G. Rata, V. Chatziathanasiou, V. Popa, M. Rata, *"Virtual instrument for calculation of unbalance factors through formulas given in international standards and regulations",* 9th World Energy System Conference (WESC 2012), Suceava, Romania, June 28-30, 2012, Buletinul AGIR, nr. 2/2012, pp. 15-22.

Power quality is a complex problem, by big actuality in the power systems. Knowledge of power quality indicators, methods for their determination, knowledge of the limits allowed under the standards, are essential to ensure quality energy. This paper presents a virtual instrument for calculation of unbalance factors through formulas given in international standards and regulations. This instrument allows the comparison between different methods for calculating of unbalanced factors and choosing the optimal method.

11.4.27. M. Rata, G. Rata, D. Cernomazu, L. Mandici, V. Chatziathanasiou, I. Nitan, *"Vibromotors based on magnetostriction effect*" , 9th World Energy System Conference (WESC 2012), Suceava, Romania, June 28-30, 2012, Buletinul AGIR, nr.4/2012, pp. 265-269.

One of the most performing magnetostrictive materials is currently TERFENOL-D, which is use in construction of the actuators and as sensors for vibration control. Due of their properties this material can be used also to build of unconventional motors, namely the vibromotors. In this paper has been presented some constructive variants of magnetostrictive vibromotors which permit to reverse speed direction, to adjust the rotor speed and improve the torque at low speed.

11.4.28. L. D. Milici, L. N. Luchian, M.R. Milici, V. Chatziathanasiou, K. Papakostas, "*Study concerning the implementation of some kinds of ultrasonic motors in positioning systems of solar panels"*, 9th World Energy System Conference (WESC 2012), Suceava, Romania, June 28-30, 2012 , Buletinul AGIR, nr.2/2012, pg. 208-212.

This paper aims the studying, modeling and testing of models of linear motors which use ultrasonic waves to achieve the movement. The studied motors are characterized by the positioning accuracy, small inertia, wide speed control (does not require gears and gearboxes), easy control, high torque per unit weight, miniaturization, simple structure, low noise, decreasing time-speed characteristic. Theme is nature trans-disciplinary work, addressing elements of the electrical machines and electronics, electrical materials, mechanics, waves, computer and numerical methods, modeling of electromechanical systems..

11.4.29. M. Milici, C. Ungureanu, L. D. Milici, V. Chatziathanasiou, "*Experimental analysis of transient regime of an electromechanical actuator with volatile liquid using the unit step response*", 9th World Energy System Conference (WESC 2012), Suceava, Romania, June 28-30, 2012 Buletinul AGIR, nr.2/2012, pg. 355-359.

The objective of this paper is analysis of transient regime of an electromechanical actuator with volatile liquid, based on the unit step response determined experimentally. Measurements have done for two volatile liquids with different volatility and for different operating positions of the actuator. Based on the measurements done concerning actuator elongation, the actuator unit step responses were determined, its transient behavior being analyzed.

11.4.30. G. De Mey, B. Wiecek and V. Chatziathanasiou, *"Thermal impedance: a logical extension of thermal resistance",* IX International conference "Methods and Instruments of Physical Quantities Measurement", Temperature-2012, Lviv, Ukraine, September 25-28, 2012.

Resistances and impedances are well known quantities in electrical engineering. In thermal engineering only the quantity thermal resistance is known but still not widely used. In this paper the extension to thermal impedance will be given. With the help of some typical examples it will be shown that a thermal impedance is quite useful especially to represent thermal dynamic properties.

11.4.31. I. Theodosoglou, P. Chatzipanagiotou, V. Chatziathanasiou, A. Boier, M. Rata, *"Measurement and calculation of thermal characteristics of an overhead power line"* Acta Electrotehnica, Proceedings of the 5th International Conference on Modern Power Systems (MPS 2013), Pages 474-477, May 28-31, Cluj-Napoca, Romania, 2013.

The thermal behavior of a laboratory model for an overhead transmission line has been investigated experimentally. Temperatures were recorded as a function of time so that dynamic thermal properties as thermal impedance, thermal time constant distribution and structure functions could be estimated. Additionally, is developed a detailed theoretical analysis and the results which obtained are compared with the experimental ones.

11.4.32. G. Rata, A. Graur, V. Chatziathanasiou, M. Rata, E. Graur, *"The study of the deforming regime of three-phase rectifiers using programmable automation controller – compactrio",* 18th International Symposium on Power Electronics - E 2013, Novi Sad, Serbia, October 30th – November 1st, 2013

The deforming regime is one of the most significant power quality problems. Up to date research on deformed consumers show that the number of these consumers is growing which brought about increased negative consequences. An equipment that can be used in the analysis of deforming regime is CompactRIO (cRIO), produced by National Instruments. This paper presents an example of using a cRIO system to study the deforming regime generated by the three-phase rectifiers in full wave or half wave bridge topology, that can be uncontrolled or controlled. Both hardware configuration and software application in LabVIEW Real-Time for cRIO programming were made.

11.4.33. M. Rata, A. Jurale, G. Rata, L. Mandici, V. Chatziathanasiou, C. Afanasov, "Variable - f*requency drive with mc3phac"*, 5th International Symposium on Electrical Engineering and Energy Converters (ELS2013), Suceava, Romania, September 26- 27, 2013,Buletinul AGIR, (2013), nr: 4, pp. 219-223,

The Induction motors with squirrel-cage rotors are the most used in industry because of their main proprieties: low cost and rugged construction. The most used solution to speed adjusts of induction motors in industry applications (i.e. fans, pumps and compressors) is variable-frequency drive. This paper presents a solution of low-cost variable-frequency drive using an intelligent motor controller (MC3PHAC) and an application specific intelligent power module (PS12017).

11.4.34. I. Theodosoglou, P. Chatzipanagiotou, V. Chatziathanasiou, M. Rata, G. DeMey, *"Thermal characterization of an overhead transmission line: thermal impedance, time constant distribution and structure functions",*18th International Conference ELECTRONICS 2014, Palanga, Lithuania, June 16-18, 2014.

The thermal behavior of a laboratory model for an overhead transmission line has been investigated experimentally. Temperatures were recorded as a function of time in two ways (by a thermal camera and by a thermocouple) so that dynamic thermal properties as the thermal impedance, the thermal time constant distribution and the structure functions could be estimated. Additionally, a detailed theoretical analysis is developed and the results which obtained are compared with the experimental ones.

11.4.35. I. Papagiannopoulos, M. Kaluza, , G. De Mey, V. Chatziathanasiou, B. Wiecek, A. Hatzopoulos, *"Thermal measurements of integrated inductors in CMOS technology and simple 1D analytical model of heat conduction",* 12th International Conference on Quantitative Infrared Thermography, QIRT 2014, Bordeaux, France, July 7-11, 2014.

In this study, infrared thermography is used to measure the temperature response of integrated on silicon spiral inductors to a unit step electrical signal used to excite the samples. The measurements are performed with the use of high speed infrared equipment. The thermal impedance is then extracted from the transient temperature response. Finally, an attempt is made to model the thermal network of the spiral inductors based on the experimental measurements. A one-dimensional analytic thermal modeling approach is applied. Simple geometric structures are modeled in order to understand the complexity of the heat flow throughout the volume of the device under test.

11.5. Διεθνή Workshop

11.5.1. V. Chatziathanasiou, A. Hatzopoulos, I. Papagiannopoulos, *"Simulation and measurements of the thermal behavior of integrated inductors*", 4th European Advanced Technology Workshop on Micropackaging and Thermal Management, La Rochelle, France, February, 4-5, 2009.

Part of work 11.4.13

11.5.2. V. Chatziathanasiou, I. Papagiannopoulos, A. Hatzopoulos, B. Wiecek, G. De Mey, "*Thermal Measurements of integrated Inductors in CMOS technology*", 5th European Advanced Technology Workshop on Micropackaging and Thermal Management, La Rochelle, France, February, 3-4, 2010.

Part of work 10.3.9

11.5.3. I. Papagiannopoulos, V. Chatziathanasiou, G. De Mey, M. Kaluza, B. Wiecek, "*Thermographic Measurements of Planar Inductor*", 6th European Advanced Technology Workshop on Micropackaging and Thermal Management, La Rochelle, France, February, 2-3, 2011.

Part of work 11.4.24

11.5.4. M. Strakowska, B. Wiecek, V. Chatziathanasiou, G. De Mey, "*Application of thermal impedance for multilayer structure investigations*", 8th European Advanced Technology Workshop on Micropackaging and Thermal Management, La Rochelle, France, February, 6-7, 2013.

Part of work 10.3.18

APPENDIX

Citations

The citations that are presented in this section are derived from source Scopus and the last update at 18th of June 2014. At the end of the module are given data for the number of citations found in Google Scholar and ISI Web of Science.

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[2] Aggregated Presentation

The total number of citations according to **Scopus**, and without consideration of references from participants in each task, is **129.** According to these data, the corresponding **h-index** is 5**.**

In the following table there is a confrontation of these data with the corresponding data obtained from the source **Google Scholar** and **ISI Web of Science**, again without taking into account references from participants in each task.

Table 2. Citations

Source	Citations	h-index
Google Scholar	193	6
Scopus	129	5
ISI Web of Science	59	6