Detailed Technical Program for EHE 2014



Thursday, 24th April 2014					
09.30h - 10.00h	Opening Ceremony				
Chairperson: Professor Carlos Lemos Antunes (Portugal)					
 Welcome adress by Professor Carlos Lemos Antunes, Portugal, General Chairman of EHE2014 					
10.00h - 10.30h	Coffee Break				
10.30h - 11.15h	Invited Lecture PL1				

Chairperson: Professor Carlos Lemos Antunes (Portugal)

Scientific Basis of the Compliance Assessment of Portable Wireless Communication Devices

The amount of radio frequency field energy absorbed in the human body is characterized by Specific Absorption Rate (SAR), which is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio frequency (RF) field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. In compliance testing of cell phones with safety limits, the relevant quantity is the peak spatial average SAR (psSAR) integrated over a cubical or a contiguous volume of 10g of tissue. Both define a limit of the psSAR of 2 W/kg. The psSAR is measured in the Specific Anthropometric Mannequin (SAM) defined in the above mentioned standards. For the compliance testing of wireless communication devices operating close to the body, so called "flat phantom" which is filled by tissue simulating liquid is used.

All portable wireless devices have to comply with RF exposure limits before putting them in the market. Compliances standards for the portable RF wireless devices were developed by International Electrotechnical Commission (IEC) and IEEE. The objective of this plenary talk is to provide the scientific basis of compliance assessment of portable wireless communication devices operating close to the head or human body which are the basis of IEC and IEEE RF exposure assessment standards.

Keynote presentation by Dr. Jafar Keshvari

EMF Research and Standards, Nokia Corporation Chairman of the International Electrotechnical Commission MT1 Committees Adjunt Professor of Bio-electromagnetics at Aalto University, Espoo-Finland



11.	15h	- 12.45h	
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Oral Session OA.1

Electromagnetic Fields Modelling Measurement & Simulation

Chairperson: **Professor Dan Micu** (Romania)

OA.1.1 Characterization of Personal Exposition to Radiofrequency Electromagnetic Fields using Multiple Exposimeters

Jesús Gonzalez Rubio¹, Enrique Arribas Garde², José Manuel Villalba Montoya¹, Alberto Nájera Lopéz¹

¹ Faculty of Medicine, University of Castilla - La Mancha, Spain ² Superior School of Computer Engineering, University of Castilla - La Mancha, Spain

OA.1.2 Realistic Exposure Levels due to WLAN Signals Indoor Environments: Experimental Outcomes from Currently Applied Methodologies

Simona Miclaus¹, Paul Bechet¹, Dimitros Stratakis²

¹ Land Forces Academy, Romania ² Technological Educational Institute of Creete, Grece

OA.1.3 Electromagnetic Fields: The experience of EDP Distribuição in Smart Grids

Luis Silvestre Bernardo¹, António Claro Ferreira¹, Roberto Barros¹,

¹ Labelec, Lisbon, Portugal EDP Distribuição, Lisbon, Portugal

OA.1.4 Response of Personal Exposimeters for Exposure Assessment in the GSM900 Downlink Band

Arno Thielens¹, Sam Agneessens¹, Gunter Vermeeren¹, Hendrik Rogier¹, Luc Martens¹, Wout Joseph¹

¹ Department of Information Technology, Gent University, Belgium



 13.00h - 14.30h
 Lunch Time

 14.30h - 15.15h
 Invited Lecture PL2

Chairpersons: Professor Nesrin Seyhan (Turkey) Dr. Paulo Alexandre Almeida (Portugal)

Effects of Electromagnetic Fields on Cancer Therapy - Minimally Invasive Applications

Keynote presentation by **Dr. Belarmino Gonçalves** Angiography Section Chief Interv. Radiology, IPO Porto - Portugal Fellow in Interventional Radiology, Univ. Klinikum, Munich - Germany

Electromagnetic waves applications to the human body are now used worldwide with an increasing rate especially in the treatment of solid tumors. Those oncologic applications are now the mainstream of minimally invasive local or regional therapies using different wavelengths and frequencies of the electromagnetic spectrum. One of the first that has been used was an electric current with a radio wave frequency (RF - Radiofrequency). In this procedure the human body is integrated into an electrical circuit (alternating current of 460 kHz) after the application of return electrodes and connected to a generator. This radiofrequency current is delivered by a noninsulated tip of an electrode that concentrates energy in a precise area of the tumor. This provokes intracellular molecular agitation, causing friction, which leads to a local temperature rise (50-100 °C) and irreversible cell damage (ablation). A RF generator is connected to an electrode, which is inserted into the lesion to be treated. A necrotic area is created destroying cells around the electrode. This technique is applied in primary or secondary lesions of the liver, bones (osteoid osteoma and metastases), renal cell carcinoma and lung tumors. Investigational and alternative applications of this technique are being experimented for other tumors than solid such as ductal tumor lesions (in tubular organs). Limitations RF ablation lead to recent development of other electrical devices with different wavelengths and wave frequencies such as microwaves and other electrical current frequencies (irreversible electroporation). This talk pretends to show the application of those techniques in our comprehensive cancer reference center, including advantages, technical considerations, patient management, technical limitations, clinical outcomes, investigational studies. Future directions are all pointing for a better efficacy in the power and wavelength control, electrode performance, new interactions between tissues and electromagnetic fields and applications to new organs.

15.15h - 15.45h

Coffee Break



15.15h - 16.45h PPS - Plenary Poster Session

Chairpersons: Professor Mladen Trlep (Slovenia); Dr. Claudio Pioli (Italy) Professor Dan Micu (Romania); Professor Chiyoji Ohkubo (Japan)

PS.1 Mapping Power Frequency Magnetic Field in Health Care Facilities

Adolfo Escobar¹, Cristian Guarnizo², Maria E Moncada¹

¹ Instituto Tecnológico Metropolitano, Medellín, Colombia

PS.2 Evaluation of High Frequency Electric Fields in Health Care Facilities

Adolfo Escobar¹, Cristian Guarnizo², Maria E Moncada¹

¹ Instituto Tecnológico Metropolitano, Medellín, Colombia

PS.3 Controlling Space-Time Propagation

Luiz Cesar Martini¹

¹ University of Campinas - SP, Brazil

PS.4 Evaluation of EM Radiation Levels in Bogota, Colombia

Andrés Navarro¹, Daniel Rosas¹

¹ Universidad ICESI, TES America, Colombia

PS.5 A Simplified Method for Calculation of High Voltage Power Substation Electric Fields

O. Okun¹, L. Korpinen²

¹ National Technical University, Ukraine

² Tampere University of Technology, Finland



PS.6 **Pratical Implementation and analysis of Measures for Reducing the Electric** Field Strength in the Vicinity of the 400KV Overhead Power Line

Maja Grbic¹, Aleksandar Pavlovic¹

¹ Electrical Engineering Institute Nitola Tesla, Republic of Serbia

PS.7 Power Lines Magnetic Field in the Worst Case Condition

T. Lisewski¹, J. Luszcz²

¹ Electrotechnical Institute Gdansk, Poland ² Gdansk University of Technology, Poland

PS.8 Calculation of Ion Flows Fields of HVDC Transmission Lines by Using Flux Tracing Methods to Determine Initial Values

Jianghua Mo¹, Bo Zhang¹, Han Jin¹

¹ Electrical Engineering Department, Tsinghua University, P. R. China

PS.9 Numerical Simulation of the Distributed Parameter Process of Heating the Emulsion from an Industrial Tank

V. Muresan¹, Dan D. Micu², M. Abrudean², T. Colosi¹

¹ Technical University of Cluj-Napoca, Automation. Dept, Romania ² Technical University of Cluj-Napoca,, Electrical Engineering Dept, Romania

PS.10 Transient Analysis of a Grounding System as Time Dependent Nonlinear Problem

Mladen Trlep¹, Marko Jesenik¹, Anton Hamler¹

¹ University of Maribor, Faculty of Electrical Engineering and Computer Science, Slovenia



PS.11 Exposure Assessment in an Airport Area

R. de Seze¹, J. Martin¹, P. Cagnon¹,

¹ INERIS, France

PS.12 Effects of 2.5GHz Non-thermal Radiofrequency Radiation on the Root Meristeme Tissues of Zea Mays

Mihaela Racuciu¹, Cora Iftode², Simona Miclaus³

¹ University Lucian Blaga, Romania ² Politechnica University, Romania ³ Land Forces Academy, Romania

PS.13 Experimental Studies on Tympanic Temperature During the Exposure to Electromagetic Fields Emitted by Cellular Phone

Elzbieta Gadzicka¹, Wieslaw Szynczak¹, Marek Zmyslony¹, Alicja Borthiewicz¹

¹ Nofer Institute of Occupational Medicine, Poland

PS.14 Methodological Problems in Analysis of the Impact of EMF on the Cardiovascular Function

Alicja Borthiewicz¹, Marek Zmyslony¹, Wieslaw Szynczak¹, Elzbieta Gadzicka¹

¹ Nofer Institute of Occupational Medicine, Poland



PS.15 Ionizing radiation its Effects on Cell Cycle and Radiosensivity on two Human Tumour Cell Lines: p53 Levels Dependence

Fernando Mendes^{1,2,3}, Tiago Sales^{1,4}, Susana Schugk^{1,4}, Ana Margarida Abrantes^{1,3}, Ana Cristina Gonçalves^{3,6}, Mafalda Laranjo¹, João Casalta^{1,7}, Paulo César⁷, Paula Soares⁷, Ana Bela Sarmento Ribeiro⁶, Maria Filomena Botelho^{1,3}, Manuel Santos Rosa⁸

¹ University of Coimbra, IBILI, Faculty of Medicine, Portugal

² Polytechnic Institute of Coimbra, Coimbra Health, Portugal

³ University of Coimbra, CIMAGO, Faculty of Medicine, Portugal

⁴ University of Coimbra, FCTUC, Portugal

⁵ University of Gothenburg, Sweden

⁶ Clinical University of Hematology, Faculty of Medicine, Portugal

⁷ Hospital and University Center of Coimbra, Portugal

⁸ University of Coimbra, Immunology Institute, Faculty of Medicine, Portugal

PS.16 External Electrostatic Field Induced Changes of Rat Erythrocyte Membranes

Sahakyan G.¹, Artsruni G.¹, Poghosyan G. A.¹,

¹ Yerevan State Medical University, Yerevan, Armenia

PS.17 Safety Model for Reducing Occupational Exposure to Electromagnetic Fields in the Welding Industry

S. F. Raphela¹, C. Weyers², K. Shale²

¹ Central University of Technology, Free State Dept. Clinical Sciences, R. South Africa ² Central University of Technology, Free State Dept. Life Sciences, R. South Africa

PS.18 Fluctuations on Natural Magnetic Field Affecting Human Well-being

Tarmo Koppel¹

¹ Tallinn University of Technology, Estonia



PS.19 The New Directive 2013/15/EU on Occupational Exposure to Electromagnetic Fields and Electrical Workers Exposure at 100kV Substations in Finland

L. Korpinen¹, R. Paakkonen²

¹ Tampere University of Technology, Tampere, Finland

² Finnish Institute of Occupational Health, Tampere, Finland

PS.20 Examples of the Teaching of the Health Issues of Electromagnetic Fields at Tampere University of Technology in Finland

L. Korpinen¹, R. Paakkonen²

¹ Tampere University of Technology, Tampere, Finland ² Finnish Institute of Occupational Health, Tampere, Finland

PS.21 The Effect of MRET Polymer Compound on SAR Values of RF Phones

Igor Smirnov¹

¹ Global Quantech Inc., USA

PS.22 The Effects of Extremely Low Frequency Electromagnetic Fields on Mutation Induction in Mice

James W. Wilson¹, Zenon Sienkiewicz², Jackie Gillan², Yuri Dubrova¹,

¹ University of Leicester, Dept. Genetics, U.K ² Health Protection Agency, Didcot, U.K

PS.23 Co-operation between Industry, Authorities and Research Institutes in Environmental and Occupational Exposure to Electric and Magnetic Field Questions in Finland

R. Paakkonen¹, L. Korpinen²

¹ Finnish Institute of Occupational Health, Finland ² Tampere University of Technology, Finland



PS.24 Breathalyzer Electronic Controlled by Arduino Uno Platform

Cleymisom Q. Trindade¹, Daniel V. D. Ferreira¹, Carlos A. T. Junior¹, Samuel F. Souza¹, Júlio S. Teixeira¹, Wilson S. Peternele¹, Ciro J. E. Montero¹

¹ Universidade Federal de Rondonia, Brazil



16.45h - 18.15h

Oral Session OB.1

Bioeffects of Electromagnetic Fields and Health Implication

Chairperson: **Dr. René de Seze** (France)

OB.1.1 Magnetophosphene Perception and EEG Response in Humans Exposed to 50 and 60Hz Magnetic Fields of up to 50mT

A. Legros^{1,2,3,4}, J. Modolo^{1,2,3}, D. Goulet⁵, M. Plante⁵, M. Souques⁶, F. Deschamps⁷, G. Ostriguy⁵, J. Lambrozo⁶, A. Thomas^{1,2,3}

¹Lawson Health Research Institute, Canada

- ²Department of Medical Biophysis, Western University, Canada
- ³Department of Medical Imaging, Western University, Canada
- ⁴ School of Kinnesiology, Western University, Canada

⁵Hydro-Quebec, Canada

⁶Service des Études Médicales, EDF, France

⁷Service Environment Réseaux, RTE, France

OB.1.2 Power Frequency Magnetic Fields Affect the Adipogenic Differentiation of Stem Cells Derived from Human Fat Tissue

Maria Antonia Martinez¹, Carlos Paíno², Maria Angelez Trillo¹, Alejandro Ubeda¹

¹ Investigación - BEM, Hospital Ramón y Cajal, Spain ² Investigación - Neurobiologia, Hospital Ramón y Cajal, Spain

OB.1.3 The Environmental Exposure of Young People to Electromagnetic Fields -Personal Dosimetric Evaluation

O. Osina¹, T. Vasicko¹, H. Habinakova¹, D. Spinguthova¹, D. Osinova¹, V. Jakusova¹ J. Jakus¹

¹ Jessenius Faculty of Medicine in Martin, Comenius University in Bratislava, Slovak Republic

OB.1.4 Cell Phones Exposure and Children's Health

C. Giliberti¹, I. F. Talamanca², F. Giordano², S. Salerno³

¹ INAIL, Rome, Italy



OB.1.5 Removal of Bacterial Biofilms by Applying Extremely Low Frequency Electromagnetic Fields

H. Kahraman¹, T. Karaguler²

¹ Istanbul Technical University, Dept. of Molecular Biology and Genetics, Turkey ² Beykent University, Dept. of Energy Systems Engineering, Turkey

19.00 - 20.30

Break

20.30

Welcome Reception

- Welcome Reception will take place at **Porto Cálem Cellars**.



Friday, 25th April 2014

09.00h - 10.30h Oral Session OA.2
Electromagnetic Fields Modelling, Measurement & Simulation

Chairperson: Professor Mladen Trlep (Slovenia)

OA.2.1 Electromagnetic Interference Analysis in Underground Medium Voltage Power Cables

Levente Czumbil¹, Dan Doru Micu¹, Denisa Stet¹,

¹ Dept. of Electromagnetics and Mesurements, Technical University of Cluj-Napoca, Romenia

OA.2.2 Reducing the Impact of ELF Electromagnetic Fields of HV Power Cables on the Enviroment by Modeling the Cable Acessories

Nebojsa Raicevic¹, Nikola Raicevic¹

¹University of NIS, Faculty of Electronic Engineering, Serbia

OA.2.3 Exposure to Electromagnetic Fields from 4th Generation of Mobile Phone Technology - LTE

Blaz Valic¹, Tomaz Trcek¹, Peter Gajsek¹

¹ Institute of Nonionizing Radiation (INIS), Slovennia

OA.2.4 EMI testing Procedures: Increase of Measurement Speed versus Accuracy, a contradiction?

Volker Janssen¹

¹ Rohde & Schwarz, Germany



10.30h - 11.00h	Coffee Break
11.00h - 11.45h	PL3 - Plenary Oral Session

Chairperson: **Professor Filomena Botelho** (Portuga)

Recent Findings of GAZI Biophysics and GNRK on RF

Gazi Biophysics is located in Ankara at the Medical Faculty of Gazi University and has been carrying out in vivo, in vitro and clinical research studies on the biological impacts of Static, Extremely Low Frequency (ELF) and Microwave (MW) electromagnetic fields (EMF) since 1989. Our laboratory includes: physicists, biologists, electrical engineers, all of whom are studying how living systems respond to EMF. Our research team includes physicists, biologists, electrical engineers, electrical engineers, electrical engineers, biologists, electrical engineers, electrical

Gazi Biophysics is Academic Representative to NATO Science and Tecnology Organisation (NATO STO HFM) since 2007, International Advisory Committee member of EMF and Health to WHO since 2001, and Scientific Secreteriat Member of International Commission for Electromagnetic Safety (ICEMS) since 2007.

We do expose animals and cell cultures to Radiofrequency (RF) EMF including mobile phones and we do clinical research. We also measure all kinds of EMF sources between 5 Hz – 60 GHz, including cellular phones, base stations, transformers, high power lines, TV and radio antennas, microwave ovens, Diathermy units, Wi-Fi's, MRI's and Radars under Gazi Nonionizing Radiation Protection Center (GNRK). GNRK has been founded by Gazi Biophysics in July, 2004.

Gazi Biophysics & GNRK published 70 articles on biological effects of EMF. Some of them are on DNA, Thyroid tissue, Oxidative Stress, Blood Lymphocytes, Mitochondrial Membrane Potential of Breast Fibroblast cells and Breast Cancer (MCF-7) cells studies. Basic details related with these studies will be given.

Keynote presentation **Prof. Dr. Nesrin Seyhan**

Chairperson, Biophysics Dept., Medical Faculty of Gazi University, Turkey

Director, Gazi Non-Ionizing Radiation Protection Center (GNRK) Advisory Committee member, WHO EMF Panel Member, NATO STO HFM



11.45h - 13.00h

Oral Session OD.1

Electromagnetic Fields Modelling, Measurement & Simulation and Bioeffects of Electromagnetic Fields and Health Implication

Chairperson: Dr. Jafar Keshvari (Finland)

OD.1.1 Improved Coil Design for Repetitive Magnetic Stimulation of the Spinal Cord

Mihaela Cretu¹, Dan D. Micu¹

¹ Technical University of Cluj-Napoca, Romania

OD.1.2 Modelling Thermal Damage During Bone Electrostimulation

Juan Vanegas Acosta¹, V. Lancellotti¹, P. Zwamborn²

¹ Eindhoven University of Technology, Dept. of Electrical Engineering, The Netherlands

OD.1.3 Modelling of a Bipolar Stent-Based Eletrode for Thermal Radio Frequency Ablation of Tumors located in Hollow Organs

Tony R. Almeida¹, Carlos L. Antunes²

¹Electrical and Computer Engineery Dept., University of Coimbra, Portugal ²Rianda Research, Portugal

OD.1.4 An Investigation of the Influence of Electric Fields on Biological Cells Based on Numerical Simulation

Steven Hundertmark¹, Sven Beilmann¹, Lars Ole Fichte¹, Marcus Stiemer¹

¹Helmut Schmidt University, Germany



13.90h - 15.00h

Lunch Time

 15.00h
 16.30h
 Oral Session OC.1

 Electromagnetic Fields, Risk Assessment and Policies

Chairperson: Professor Chiyoji Ohkubo (Japan)

OC.1.1 EMF Risk Communication in Japan

Chiyoji Ohkubo¹

¹Japan EMF Insformation Center, Japan

OC.1.2 Mobile Application for Monitoring the EMF in the Environment

Peter Gajsek¹, Blaz Valic¹

¹Institute of Non Ionizing Radiation (INIS), Slovenia

OC.1.3 Risk Communication in LMAT.EMF-ELF_WEBMONIT System for ELF Electromagnetic Fields Monitoring

Carlos L. Antunes¹

¹ Rianda Research, Portugal

OC.1.4 Assessing the Cumulative Solar Radiation Exposure Among Outdoor Workers: Presentation of a Method for Epidemiological Studies

Modenese A¹, Bisegna F.¹, Borra M.¹, Grandi C.¹, Gugliermetti F.¹, Militello A.¹, Gobba F.¹

¹ University of Modena and Reggio Emilia, Italy

16.30h - 17.00h

Coffee Break

17.00h - 18.30h Oral Session OB.2 Bioeffects of Electromagnetic Fields and Health Implication

Chairperson: Dr. Claudio Pioli (Italy)

OB.2.1 Home Measurements of RF Exposure in the French Comop Program

René de Seze¹, Patrice Gagnon¹, Georges Thuroczy¹, Samuel Mauger¹, Paul Mazet¹, Jean-Benoit Aguani¹, François Gaudaire¹, Julien Caudeville¹, Brahim Selmaoui¹

¹ INERIS _ Toxi, France

OB.2.2 Exposure to Radiofrequencies during Embryo Life Childhood or Adulthood: Developmental and Functional Effects on the Immune System

Carmela Marino¹, Rosanna Pinto¹, Vanni Lopresto¹, Claudio Pioli¹

¹ ENEA, University of Radiation Biology and Human Health, Italy

OB.2.3 Alpha Band of Resting Electroencephalogram Perturbed by Radio Frequency Exposure

Ghosn R^{.1,2}, Hugueville L. ^{3,4,5}, Drecorps A. ^{3,4,5}, Lemaréchal J. ^{3,4,5}, Yahia-Cerif L. ^{3,4,5}, Thuroczy G.⁶, de Seze R. ^{1,2}, Selmaoui B. ^{1,2}

¹ INERIS, France

² DERITOX, INERIS, France

³ Université Pierre et Marie Curie, France

⁴ National Research Institute for Radiobiology, Hungary



OB.2.4 Behavioral and Biochemical Effects of GSM 900MHz in Neuroinflammation and Gestational Inflammation Models

N. Petitdant¹, A. S. Villegier¹, A. Lecomte¹, F. Robidel¹

¹INERIS, France

OB.2.5 The in-vitro Influence of External Electrostatic Field on the Lipid-Protein Interactions in Membranes of Rat Erythrocytes

Artsruni G.¹, Sahakyan G. V.¹, Poghosyan G. A.¹

¹Yerevan State Medical University, Yerevan, Armenia

18.30h - 19.00h	Closing Ceremony

Chairperson: Professor Carlos Lemos Antunes (Portugal)

- Closing remarks by Professor Carlos Lemos Antunes, Portugal, General Chairman of EHE2014.
- Time for next Conference EHE 2016.

19.00h - 20.30h

Break

20.30h -

Gala Dinner

- Gala Dinner will take place at Hotel The Yeatman.