CALL FOR PAPERS

International Journal of RF and Microwave Computer-Aided Engineering

SPECIAL ISSUE ON THE USE OF ACCURATE TISSUE AND BODY MODELS IN RF AND MW MEDICAL APPLICATIONS

Medical applications of electromagnetic fields are emerging as new options for diagnosis and therapy of several diseases. Examples are microwave imaging for the diagnosis of cancer disease, which looks for tumours based on the different dielectric properties of the diseased tissue with respect to the healthy one, or thermal therapies for the minimally invasive treatment of tumours. Additionally, electromagnetic fields are used in microwave resonance imaging, UWB radars for the detection and monitoring of the respiratory or cardiac activities. Furthermore, miniaturized sensors and antennas to be implanted inside the human body have been pivotal for ground-breaking medical telemetry and telemedicine. Within therapeutic scenarios, Radio Frequency and Microwave Ablation have been proven successful in a broad range of clinical treatments.

Great enthusiasm and expectations were posed on these emerging applications, but their positive aspects and advancements with respect to the already well-established techniques need to be proved. In this respect, accurate models of the human anatomy including the target tissue are needed and should be developed and validated. Accurate modelling assumes a fundamental role in supporting experimental studies, boosting confidence of the medical community towards emerging technologies and supporting therapeutics with reliable pre-treatment planning.

This special issue focuses on the current state of the art of tissue and body modelling to support emerging biomedical applications where RF or microwave energy is used for diagnosis and/or therapy.

Papers treating software and hardware engineering, implementational aspects and practical applications are solicited. Suitable topics include but are not limited to:

- Multiphysics modelling
- Dielectric properties of biological tissues
- In-vivo / ex-vivo measurements
- Biological signals monitoring
- Antenna design, optimization and characterization for in-body scenarios
- Microwave imaging
- UWB radar monitoring
- Optimization for inverse electromagnetic problems
- Ablation modelling
- Automated design optimization using electromagnetic simulators
- Optimization techniques for pre-clinical assessment
- Use of supercomputers, massively parallel and heterogeneous workstations
- Approaches to global optimization: evolutionary algorithms, particle swarm optimization, etc.
- Neural network approaches

This special issue will appear in **March 2018**. Manuscripts should conform to the requirements for regular papers to the journal. Authors wishing to have their contribution considered for this issue should submit their contribution in pdf format before **June 1, 2017**, using the following Scholar One "online" address:

http://mc.manuscriptcentral.com/mmce

In the "Author-Supplied Data" block, the contact author is advised to enter "yes" in the Special Issue column as well as the title. Any further enquires may be made to the Guest Editors:

Dr. Giuseppe Ruvio, PhD
BioInnovate
National University of Ireland
Galway, Ireland
Tel: +353 872818598
E-mail: giuseppe.ruvio@nuigalway.ie

Prof. Marta Cavagnaro, PhD
Dept. Information Eng., Electronics, Telecommunication
Sapienza University of Rome
Rome, Italy
Tel: +39 06 44584565
Email: cavagnaro@diet.uniroma1.it