PhD Position in BioElectromagnetics

(IETR, Rennes, France)

STUDY OF ANTENNAS ON COMMUNICATING TEXTILES AND INTERACTION WITH THE HUMAN BODY

Key words:

Wireless communications, numerical modeling and dosimetry, communicating textiles, bioelectromagnetics.

Context:

Progress in fabrication of clothes and textiles makes them not only more comfortable and lighter, but also communicating and smart. The development of the near-future body-centric wireless networks requires the implementation of multiple antennas whose radiation characteristics strongly depend on the coupling with the human body. In this context, it is crucial not only to design new antennas corresponding to the needs of emerging wireless communications, but also to study interactions between these radiating structures with the human body in order to minimize potential impact on the biological tissues and ensure biocompatibility of these systems.

Position description:

The main purposes of this PhD research project will consist in studying, developing, and characterizing the performance of next-generation antennas printed on textiles (small antennas, metameterial-based antennas, etc.).

The main research directions are the following:

- Development of antennas on textiles;
- Electromagnetic dosimetry for the different parts of the human body exposed to on-body antennas (microwave propagation in biological tissues, computation of the electromagnetic field and SAR distribution, attenuation and absorption of the waves in the biological media);
- Optimization of the antenna performance (positioning of the antenna on the body, minimization of the interaction "antenna / body", evaluation of the mutual coupling among antennas);
- Study of the conformity of the antennas with international standards and recommendations.

These studies will be carried out in the framework of the national METAVEST project.

Duration: 3 years, starting from October 2009

Candidate:

Required education level: MS or equivalent degree.
Main research field: electromagnetics.
Languages: French and / or English.

Fellowship:

1300 € net / month

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