

Commission K

Electromagnetics in Biology and Medicine (from static fields to optical radiation)

Chairman: Prof. Dr. **Norbert LEITGEB**

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Scope

- Physical interaction of electromagnetic fields with biological systems;
- Biological effects of electromagnetic fields;
- Mechanisms underlying the effects of electromagnetic fields;
- Experimental electromagnetic fields exposure systems;
- Assessment of human exposure to electromagnetic fields;
- Medical applications of electromagnetic fields.

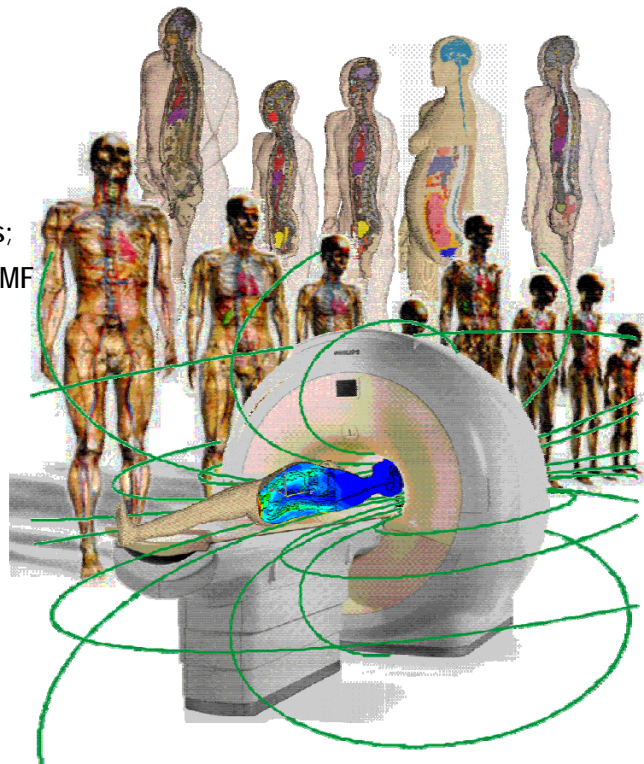


Commission K

Exposure assessment

Human Modeling

- assessment of intracorporal 3D-distribution of EMF-induced current densities and electric fields;
- assessment of intracorporal distribution of RF-EMF energy absorption rates (SAR);
- thermal modelling of RF-EMF heating;
- risk assessment of medical EMF applications (e.g. defibrillation, diathermy, MRI);
- assessment of risk from EMF sources (e.g. electrical appliances, automotive systems, RFID gates, mobile phones, WLAN, radar);

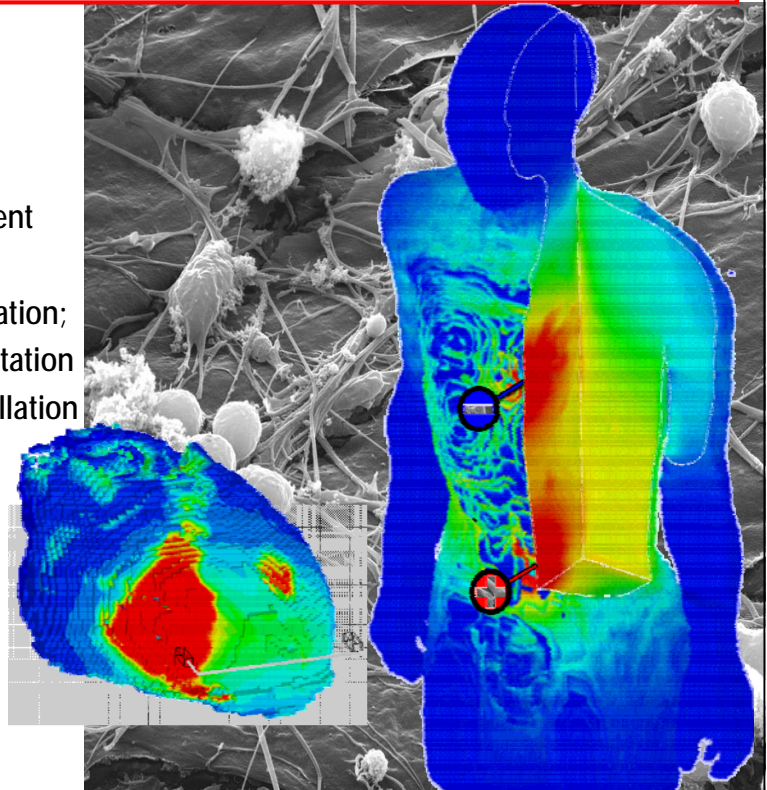


virtual patients

Exposure assessment *Biologic Modeling*

- intracorporal 3D- exposure assessment of heart and brain;
- numerical modeling of cellular excitation;
- numerical modeling of cardiac excitation
- numerical modeling of cardiac fibrillation

virtual cells
virtual heart



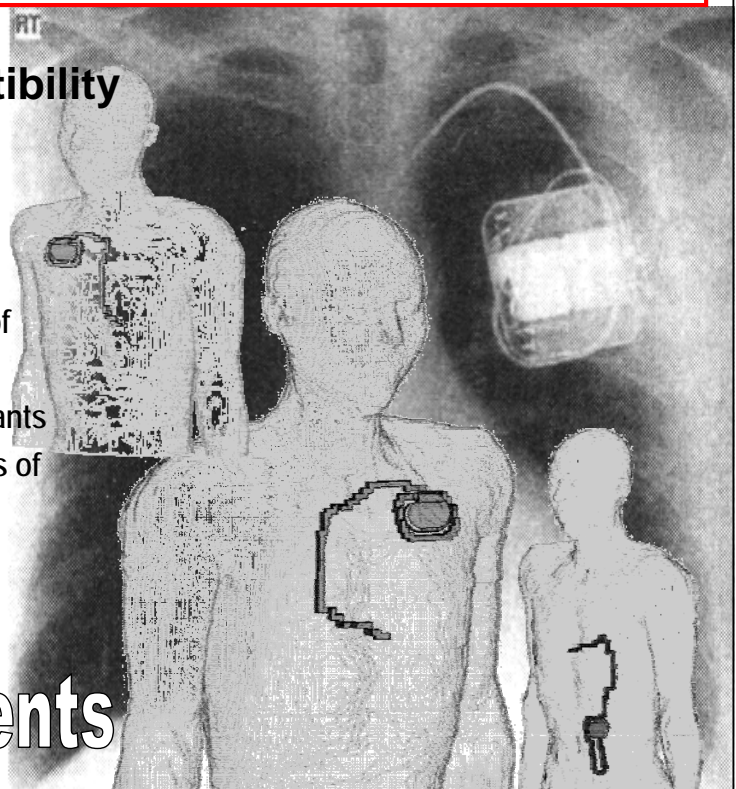
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Electromagnetic Compatibility *medical implants*

- modeling of exposure scenarios (e.g. power lines, RFID gates, MRI)
- calculation of interference voltages of electronic implants
- SAR-related aspects of metallic implants
- thermal risks due to metallic implants of EMF-exposed persons
- risk assessment

virtual
pacemaker patients

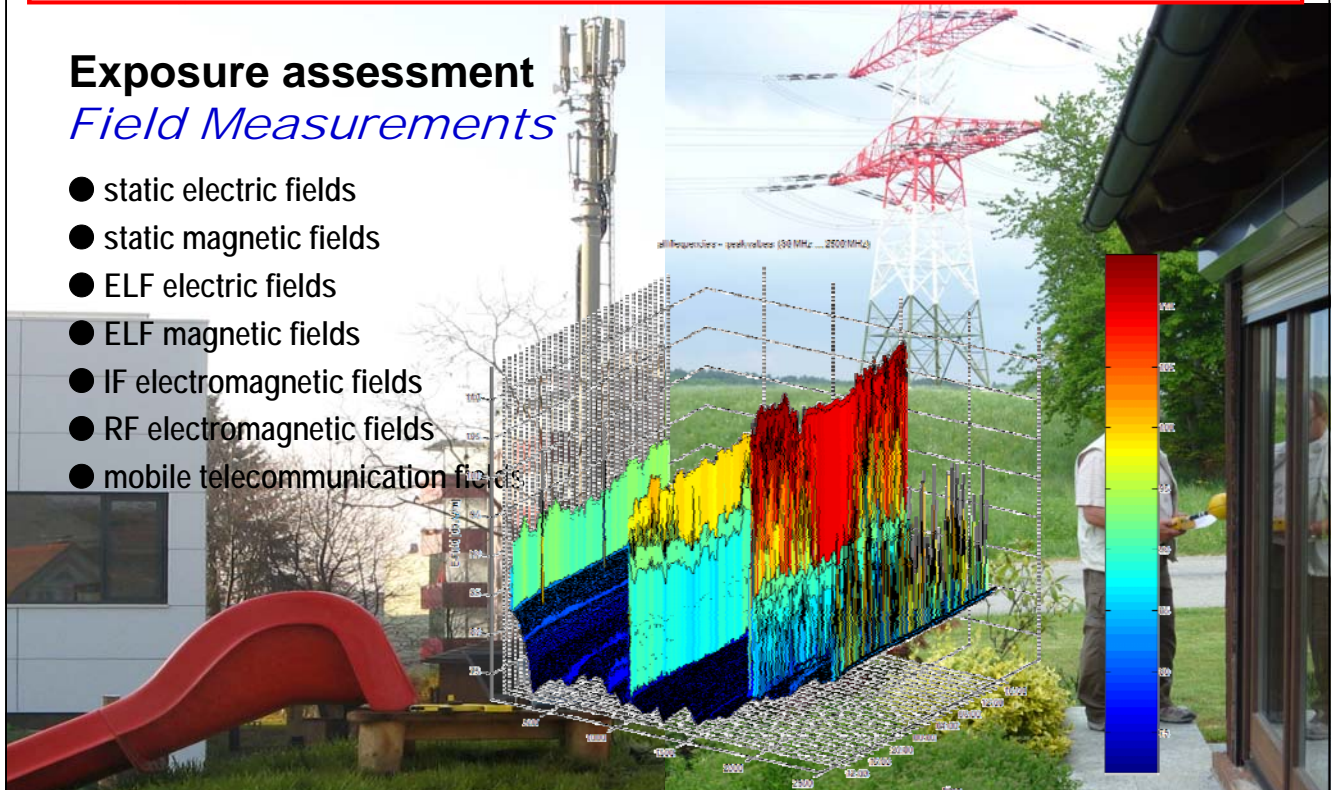


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Exposure assessment *Field Measurements*

- static electric fields
- static magnetic fields
- ELF electric fields
- ELF magnetic fields
- IF electromagnetic fields
- RF electromagnetic fields
- mobile telecommunication fields



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