

France

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Research activities in France

Static magnetic fields

A major programme is underway near Paris to set up several high-field MRI equipments (Neurospin¹: e.g., 17.65 T for animals and 11.7 T for humans). Health effects related to the use of these fields are being investigated and a collaborative project of several French research groups is being considered.

ELF: Extremely low frequency magnetic fields

Projects funded by EDF-RTE²

- Modelling of the currents induced in the head and thorax in electricians who work on the lines (Insa, Lyon),
- Effects of ELF magnetic fields on the 5-HT_{1B} serotonin receptor (IMS, University of Bordeaux),
- Collaboration with LHRI, Hydro-Québec and Health Canada in an investigation on volunteers exposed at 1.8 mT (cognitive tests), and 3 mT (simple task performance explored by fMRI),
- EXPERS project: Assessment of 50-Hz magnetic field exposure levels of the French population (1000 adults and 1000 children; Supélec, Gif sur Yvette). Results expected in 2009.
- Assessment of the annual magnetic-field exposure near high-voltage equipment (e.g. power lines) (related to the Inserm study)
- EMC study on pacemakers including at workplace (LIEN, University of Nancy).

Project funded by AFSSET⁴

- Assessment of ELF (50 Hz – 800 Hz) magnetic field exposure levels of 17 inhabitants in Champlan (France), mapping of magnetic field levels in the town (Supélec, Gif sur Yvette)⁵.

Project funded by the Ministry of Health

- Assessment of 50-Hz magnetic field exposure level of the French population (1000 adults and 1000 children) (Supélec, Gif sur Yvette)⁶.

Project funded by Inserm⁷

- Analysis of the distribution of leukaemia as a function of location high-voltage equipment (e.g. power lines) (National registry, Inserm)

RF Radiofrequency fields

S&R Foundation: The main source of research funding in the RF range (and not only for mobile telephony) is the Foundation⁸ “Santé et Radiofréquences” (Health and RF). The foundation “Health & RF” is funding research with priorities in line with the latest WHO RF recommendations.

In the first two calls for proposals the main axes were:

- Impact of RF exposure on children
- RF exposure assessment in particular related to new usage and emerging technologies
- Risk perception and involvement of shareholders

A third call for proposals was focused on sociological issues. A 4th call is in progress.

Following this call for proposal, 17 projects are ongoing:

In vitro studies

- Effects of RF exposure on microtubule organization. *Inserm & CEA, Grenoble.*
- Karyotype of Human amniocytes exposed to GSM signals. *Medical School, University of Limoges.*
- Genomic study of exposure of human cells. *ERTAC, University of Clermont-Ferrand.*

¹ www-dsv.cea.fr/neurospin/

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⁴ Agence Française de Sécurité Sanitaire de l'Environnement et du Travail www.afsset.fr/ Contact: olivier.merckel@afsset.fr

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⁷ French Medical Research Council. Contact: denis.hemon@vif.inserm.fr

⁸ www.sante-radiofrequences.org/

- Cellular stress related to millimeter waves. CNRS, *University of Rennes*.
- Co-genotoxicity of GSM1800 signals in human cells. *CRSSA, Grenoble*,
- Effects of low-level RF exposure on an in-vitro model of the blood-brain barrier. *VigiCell - Villejuif*.

Animal studies in particular related to children.

- Effects on RFR on memory and attention in rats. *INERIS, Verneuil en Halatte*.
- Effects of RF exposure on the young animals. *IMS, University of Bordeaux*.
- Effects of the GSM1800 signal on the immature CNS. *INSERM U796, Paris*.

Exposure assessment

- Improvement of a selective EMF Dosimeter, *SATIMO, Brest*
- Occupational exposure to EMF. Medical School. University of Lyon.

Dosimetry

- Dosimetry of the foetus. *LTCL, ENST, Paris*.
- Dosimetry of the exposure system used in the Franco-Russian project. *XLIM, Limoges*.

Epidemiology

- Exposure assessment related to the Interphone study. *IARC, Lyon*.

Sociology

- Dialogue, information, and social representations. *Centre de Sociologie des Organisations, CNRS, Paris*
- Radio frequency: Identifying sources of controversy. *Télécom ParisTech, Sophia-Antipolis*
- Risk of electromagnetic fields. Perception and determinants. *Ecole de Santé Publique, Nancy*

AFSSET: Among the projects selected, the exposure assessment of a cross section of the population has been performed by two teams of epidemiologists in Besançon and Lyon (IARC) using individual exposimeters. Validation of the equipment was done by Ineris. A new call for proposal is now out.

ANR: The last call for proposals of the French Research Agency includes environmental factors such as electromagnetic fields. Proposals have been submitted in March, 2008 and will be selected in July.

INERIS-MEEDDAT: a research programme is funded by the MEEDDAT¹² about neurological effects of EMF, bearing mainly on inflammatory markers and oxidative stress, and completes the S&R Foundation project on effects of chronic exposure on memory and attention.

DGA¹³: a research programme on biological and health effects of high power microwave is funded and run by INERIS. Results will be finalized at the end of 2008.

Information for the general public

- The Ministry of Health is working on new information documents about both radiofrequencies and extremely low frequencies. These documents will inform people about health impacts realities.
- The "Health & RF" Foundation has also the mission to define, promote and fund programmes to bring information to the public and to the workers. It is organizing a "blue bus" that will travel through France to inform people about the reality of the development of mobile telephony and the health aspects. It makes also available on its Website¹⁴ fact sheets and Q&A.
- The foundation organized an open scientific meeting on 24-25 October in Paris¹⁵. On its Website¹⁶, RTE has published a specific module to explain what are ELF EMF, sources, and health effects. The conclusions of scientific expertises are given as well as regulations.
- The Non-Ionising Section of the French Radiological Protection Society (SFRP) is updating its book on biological effects of non-ionising radiation, from static fields to UV radiation¹⁷. This publication is expected to be published at the end of 2008.

Regulations

No new regulations issued during the reporting period.

¹² www.developpement-durable.gouv.fr/

¹³ Ministry of Defence (Direction Générale de l'Armement)

¹⁴ www.sante-radiofrequences.org

¹⁵ www.sante-radiofrequences.org/index.php?id=146

¹⁶ www.rte-france.com/htm/fr/environnement/champs_elec.jsp

¹⁷ Contact: aperrin@crssa.net