

France

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Research activities in France

ELF: Extremely low frequency magnetic fields

Projects funded by EDF-RTE¹

Ongoing projects in 2015 (all of them lasting several years):

- CHAMMA (Isabelle Lagroye): ELF magnetic fields and Alzheimer's disease – behavioural study of aged rodents exposed to 50 Hz magnetic fields. The 30-month-long CHAMMA research project is on-going at the IMS laboratory in Bordeaux. It focuses on the potential effects of exposure of mice to 50 Hz magnetic fields during aging. The tested hypothesis is that exposure can affect the development of neurodegenerative diseases such as Alzheimer's disease (AD) and dementia in the elderly. The study endpoints are memory performance, specific molecular biomarkers, and reactivity of cerebral vessels in mice, exposed for three months at the end of their life. No result has been published yet.
- Magnetophosphenes threshold (Alexandre Legros): clinical study of acute effects of high strength ELF magnetic fields (up to 50 mT) on the central nervous system. Co-funding from Canada, USA and UK. Some results have been published, the project will continue until 2018.
- *In vitro* tests and electromagnetic compatibility modelling of active implanted medical devices and electric field (50 and 60 Hz) (Mustapha Nadi).
- EXPERS: assessment of personal exposure to ELF magnetic fields. 24 hours measurements – 2000 volunteers randomly selected over mainland France. A first publication should be submitted before the end of 2015.
- Agreement with RTE retired workers to follow their health status (mortality and 30 Long Term Illness).

Project funded by Anses²

Each year, Anses is funding research projects in the topics of environmental and occupational health. In 2014, apart from questions regarding chemical, biological, nutritional risks, three topics regarding exposure characterization to ELF fields (power lines and new technologies for energy: smart grids, electric vehicles etc.) and understanding of potential mechanisms explaining epidemiological results on different pathologies have been granted.

RF: Radiofrequency fields

Anses call for research projects on radiofrequency fields

Since 2010, the main research funding for radiofrequency fields health effects in France comes from a tax on network operators. Two millions euros are gathered each year. The French Agency for Food, Environment and Occupational Health & Safety (Anses) is in charge of organizing annual calls for research projects on this topic.

The projects funded in 2015, resulting of the 2014 call for projects, are the following:

- ASTRO-RF (Anne-Sophie Villégier): study of the evolution of the astrocytic tumours under the effect of radiofrequency electromagnetic fields from mobile phones.
- AUPREMO (Christian Pautot): automatic recording of a mobile phone uplink power.
- CREOM (Christophe Lemoine): reverberating chamber for millimetre wave exposure.
- DEMETER (Nicolas Foray): molecular definition of electrosensitivity and risk assessment.
- PRESENSE (Anne Perrin): preliminary study for the design of a sensitivity exploration space in a controlled electromagnetic environment.

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- BEMAM (David Rondeau): research of action mechanisms of millimetre waves at the cellular level by a metabolomic approach.
- REDHEM (Daniel Benamouzig): research on the electrohypersensitivity definition.
- EPIRADIOMEM (Anne Pereira De Vasconcelos): brain sensitivity to electromagnetic waves (4G) at different ages in rats: persistent memory and epigenetic mechanisms involved.
- DEVIN (Serge Bories): portable measuring device for close EM field sources in uplink.

Ongoing projects in 2015:

Apart from the new projects funded in 2015, several studies are ongoing, that has been funded in the previous years. A special emphasis was made on ElectroHyperSensitivity in the Anses call for projects in 2013. The study of self-reported symptoms in a French population group hypersensitive to electric and magnetic fields, coupled to the study of the endocrine, immune and sympathetic nervous systems (SENSI-RF – Brahim Selmaoui), at Ineris, is ongoing, as well as the ELSE feasibility study on EHS (Anke Huss).

The study of the sensory system of electromagnetic hypersensitive subjects (HSEM-Sensi, Pierre Celsis) is still ongoing, as well as the evaluation of a specialized therapeutic management of patients with idiopathic environmental intolerance syndrome attributed to electromagnetic fields (IEI-EMF, Dominique Choudat).

Other projects explore possible impacts of RF exposure on autonomic nervous system, physiological adaptive responses from rats or neurotransmission.

UV: Ultraviolet radiation

Project funded by Anses

In its 2014 call for research projects, Anses raised questions regarding health impacts from UV radiation. The following project has been funded: UV-LED (Alicia Torriglia): visual risks from new LEDs.

Risk assessment activities

Following its opinion on radiofrequency health effects published in October 2013, Anses started a risk assessment review of knowledge on electrohypersensitivity that should be released at the end of 2015. The specific work on potential health effects of radiofrequency devices dedicated to children should be ready for open public consultation before mid 2015.

In December 2014, the Ministries in charge of Health, environment, labour and consumer protection asked Anses to make an update of its previous risk assessment of LED lamps. This time, questions are focused on the phototoxicity of LEDs used for lighting but also in devices (screens, etc.), with possible impacts on sleep disorders due to circadian disruption.

Information for the general public

ELF:

- RTE (electrical transmission system operator over France mainland) regularly updates EMF exposure measurements in the vicinity of power lines, on the website “La clef des champs”³.

RF:

- The Ministry of Environment has issued in 2014 a leaflet summarizing Operational committee COPIC activities.
- Governmental information is available on the web site: www.radiofrequences.gouv.fr
- A mobile version of Cartoradio is available on AppStore and GooglePlay (<http://www.cartoradio.fr>).

Regulations

EMF:

The work for the transposition of the European Directive on workers exposure (2013/35/UE) has been engaged by the Ministry of Labour.

The National cancer plan (2014-2019), in his occupational aspects, raised, through its target n°12 focused on cancer prevention in occupational and environmental fields, two actions:

- Action 12.1: Strengthen primary prevention in the workplace to reduce exposure to carcinogens

³ <http://www.clefdeschamps.info/Carte-de-mesures>

- (biological, physical, chemical);
- Action 12.8: Reduce exposure to artificial and natural ultraviolet radiation.

The third national environmental health plan has raised actions focused on EMF and UV.

ELF:

Since the publication of a regulatory text (April 23rd 2012), the electricity transmission system operator (RTE) mandates independent accredited laboratories to perform EMF measurements in the vicinity of power lines above 50 kV, when population exposure is expected. The results of those measurements are given to Anses, and set public. A web site administered by RTE gives a user-friendly access to the measurement results⁴. Each year, until 2017, RTE will give Anses the results of the past year measurements (between 500 and 1000 per year). Besides, this regulation enables any city, some associations, and through them any citizen to have a free exposure measurement performed.

RF:

29 January 2015: Adoption of the law on sobriety, transparency, information and consultation for exposure to electromagnetic fields (Law No. 2015-136 of 9 February 2015).

This law sets a target of sobriety regarding radiofrequencies exposure. It establishes a consultation procedure based on COPIC operational committee conclusions before antennas implementation. It implements an annual census of places where the exposure level substantially exceeds that generally observed nationally and a resorption procedure (6 months granted to operators for processing). It also improves users' information thanks to:

- SAR display for devices intended to be used close to the body using RF (not only mobile phones),
- Provision of instruction describing how to turn Wi-Fi off on radio terminal equipment.
- Mention of Wi-Fi access provision in buildings.
- Tightening of mobile phones advertising rules.

The law entrusts new missions to ANFR (national frequencies agency). It defines the atypical points for which the level of public exposure substantially exceeds those generally observed at the national level. ANFR shall identify and verify their resorption.

The law aims at improving public information on terminal equipment and oversees the use of wireless internet access. Especially in nurseries, the installation of fixed terminal equipment with wireless internet access is prohibited in areas dedicated to reception, rest and activities of children under three years. The publication of the law is the result of a two-year process.

UV:

Publication of two orders under the decree on artificial ultraviolet radiation published in December 27th 2013⁵. One order specifies information and warnings to operators and users of tanning devices:

This order is intended to define the mandatory warning messages to alert users of tanning devices on the health risks associated with exposure to artificial ultraviolet. It sets especially the content and presentation of the warning on the health hazards that must appear on all advertising of tanning equipment, during the sale of such equipment or for the provision of services including the use of a tanning apparatus.

The second order concerns the traceability of tanning devices. It fixes the rules for inspecting them and conditions of accreditation of control bodies. This order is intended to enhance the security of using tanning equipment. It sets the initial and periodic inspections of tanning devices and institutions making these devices available to the public. Accredited inspection institutions carry out the controls.

This order defines also the content and presentation of mandatory tanning devices statements.

Risk management activities

RF:

- Fund for *in situ* exposure measurements (home and public areas), with new procedures⁶: 5 000 measurements in 2014.
- Exposure measurement campaign launched by the Ministry in charge of Environment in 2014:

⁴ <http://www.clefdeschamps.info/>

⁵ <http://www.legifrance.gouv.fr/affichTexte.do?dateTexte&categorieLien=id&cidTexte=JORFTEXT000028398316>

⁶ <http://www.service-public.fr/actualites/002936.html>

1076 outdoor measures in front of city halls, 250 indoor measures in train stations before and after Wi-Fi implementation.

Statements from NGOs, institutions, etc. (not exhaustive).

Statement of the Academies

The National Medicine Academy disagrees with public funding of “anti-wave” devices. It published a statement following a decision of a local service for disabled people to refund “anti-waves” devices paid by an EHS person (<http://www.academie-medecine.fr/le-5-mai-2014-communique-de-presse-electrosensibilite/>).