EMF Project Advisory Committee meeting 2020

Germany - National Report

Activities with regard to RF fields by mobile networks / Special topic 5G

The expansion of mobile networks including the introduction of 5G technology continues to be of substantial interest to German public and politics. In November 2019, the Federal Governments has issued its Mobile Networks Strategy principally aimed at improving mobile networks coverage by state funding of new installations otherwise not economically feasible for operators. One important action in this strategy is the establishment of an integrated communications initiative on mobile networks on behalf of several Federal government departments, covering a wide range of topics including technology, applications, and EMF/health concerns. The strategy also foresees an improved and continuous funding of EMF basic research.

The network expansion also includes an increased deployment of small cells below an EIRP of 10 W. These stations are sometimes installed in public spaces such as city centre squares. Currently, the German legal field limits (ICNIRP 1998 reference levels) are only established for higher power base stations. To ensure EMF protection of the public, the Federal Government has received and accepted a voluntary self-commitment by German operators in April 2020 to apply the same limit regime for small cells.

5G is initially used in frequency bands in which wireless communication is already operating today and existing research data on health-related effects can be largely transferred to 5G. As the use of higher frequency bands in which research data are sparse or even missing, are also planned in a next step, the following projects are initiated in view of future technical developments:

- Effects of exposure with centi- and millimeter waves (5G frequencies) on cells of the body surface. - At frequencies above 20 GHz (27 and 41 GHz) gene expression and DNA methylation changes in human skin cells will be studied.
- Smart Cities: Estimation of the overall exposure of humans by additional 5G mobile communication technologies. - Exposure scenarios shall be developed in an interdisciplinary approach of futurology, modelling and computer simulations.
- Consideration of current cellular antenna technology during RF-EMF exposure assessment. – Measurements in the vicinity of mobile phone base stations that use adaptive antennas with beam forming and beam steering to provide a detailed picture about the possible maximum exposure contribution of such base stations.

New “Competence Center for Electromagnetic Fields”

As a consequence of increasing demands a BfS-associated “Competence Center for Electromagnetic Fields” (KEMF) was founded in February 2020. The new entity will be located in Cottbus, south of Berlin. The Center will intensify ongoing BfS activities with a special focus on new dialogue and communications formats. The foundation was initiated/supported by the German Federal Governement and will serve as contact point for all questions on EMF protection issues as raised by citizens as well as by different stakeholders.

EMF Research Activities

Together with the Federal Office for Radiation Protection (BfS) research projects are initiated when gaps in knowledge have to be filled in order to provide a basis for national regulations

and a high level of radiation protection of the general population. The focus of current research projects is on static and ELF fields in connection to the ongoing expansion of the national power grid and on wireless communication.

Completed ELF Projects

- Assessment of feasibility and preparation of a pooling study on the relationship between amyotrophic lateral sclerosis (ALS) and exposure to magnetic fields. http://nbn-resolving.de/urn:nbn:de:0221-2020011721003
- What significance do magnetic fields have in the public perception of the extension of the high-voltage power grid? http://nbn-resolving.de/urn:nbn:de:0221-2019121120809
- Investigation of presentation formats for results of low-frequency field measurements and their relevance to risk communication. http://nbn-resolving.de/urn:nbn:de:0221-2020060822215
- 6th International Workshop on the Causes of Childhood Leukemia, Munich, 20.-22. November 2020

Completed RF Project

- Effect of high frequency electromagnetic fields on brain activity, sleep and cognitive performance in elderly men. http://nbn-resolving.de/urn:nbn:de:0221-2019101519604

Completed EMF Project (static, ELF and RF fields)

- International Workshop: Environmental effects of electric, magnetic and electromagnetic fields: Flora and fauna. , Munich, 5 -7 November 2020 http://nbn-resolving.de/urn:nbn:de:0221-2020050821802, https://www.bfs.de/DE/bfs/wissenschaft-forschung/ergebnisse/emf-umwelt/emf-umwelt.html

Ongoing ELF projects (selection):

- Childhood leukaemia - Influence of the immune system on the development of the disease (experimental study in an animal model)
- Evaluating the possibility of implementing multipliers in local authorities for risk communication in connection with the power grid expansion
- Evaluative literature study on the occurrence and distribution of corona ions
- Testing, advancement and validation of novel metrology for static and low frequency electric and magnetic fields

Ongoing RF projects (selection):

- Detailed comparative analysis of age and gender related effects of radiofrequency electromagnetic fields from mobile telephony devices on brain activity, sleep and cognitive performance
- The use of mobile phones and the development of glioma incidence since 1979

Application of NIR on humans

In December 2018 the “Ordinance on the protection against harmful effects of non-ionising radiation when applying to humans” was declared. It will enter into force end of 2020. This Ordinance shall apply to the operation of devices for the application of non-ionising radiation on humans such as laser devices and intense light sources, ultrasound and electromagnetic fields, which are used commercially or within the framework of other economic undertakings for cosmetic or other non-medical purposes. From the end of 2021, persons operating such devices will require a special education. The legal framework of this education is currently being elaborated by the BMU.