

Abstract Fröhlich C2012-01

Assessment of personal exposure to radiofrequency electromagnetic fields (RF-EMF) will become much more complex in the future due to the introduction of new communication technologies (e.g. 4th generation mobile phone networks, powerlines) and due to a general tendency of building smaller network structures (e.g. public W-LANs, mobile phone femto cells, etc). Thus, there is a need to develop appropriate EMF exposure monitoring tools that will help decision-makers to handle and communicate EMF exposure issues and policies. Further, such tools are required for conducting and interpreting studies on health effects of RF-EMF.

In general, the contribution to the personal exposure can be divided into near-field (NF) and far-field (FF) sources with respect to the human body. NF sources, such as cell phones, are operating in the close vicinity of the body and are usually controlled by the user. They can temporarily cause highly localized exposure, whereas FF sources, such as radio base stations, are usually further away and thus lead to lower but rather continuous exposure levels. For a comprehensive study of potential health effects from RF-EMF exposure, the knowledge about the contribution of different RF-EMF sources to the total personal exposure dose is required for different organs, body tissues and for the whole body.

In the proposed project, the hardware of the exposure measurement system shall be further extended and improved, to allow more variable measurement protocols. Further, we aim to develop software applications for the smartphone (Apps) collecting additional exposure relevant data on the use of close-to-body devices. The exposure measurement system shall be validated by laboratory measurements and applied in an epidemiological cohort study on adolescents to collect validation data from real-world environments.

Together with the external data evaluation software it is expected to provide a versatile and flexible device for future epidemiological studies and relevant data and components for the development of concepts for monitoring the exposure to electromagnetic fields in everyday environments.