In situ measurements of RF electromagnetic field exposure in France from 2008 to 2013.

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Introduction

ANFR is the French governmental spectrum management agency. An important mission of the agency is to ensure the compliance with limit values of radiofrequency (RF) electromagnetic field (EMF) exposure of general public in France.

Since 2001, ANFR is maintaining a protocol of in situ measurements of RF EMFs induced by radio electrical sources. Since then, between 2000 and 3000 measurements per year have been performed. Until 2013, the measurements of RF electromagnetic field were paid directly by operators and therefore the proximity of a base station was probably the main motivation of the demands. Since 2014, a new measurement and surveillance process has been put in place to reinforce the transparency of the process. The whole process is now managed by ANFR. A communication effort is led to inform general public on the possibility to ask for free for a measurement in residential areas and in any place accessible to the general public (parks shops, schools and so on…). As the process to demand for a RF measurements has changed in 2014, we are focusing on the period from 2008 to 2013.

The locations of measurements are not randomly selected and the results are therefore biased. However the large number of measurements makes the analysis interesting especially from the time point of view. This paper aims at showing the trends of the global exposure measured in France from 2008 and 2013.

Material

The in situ measurements protocol ANFR DR-15 is a methodology of measurements of the RF electromagnetic field exposure induced by fixed base stations emitting in the frequency range from 100 kHz to 300 GHz. It is intended to ensure the compliance with the French regulatory limits indicated in the decree number 2002-775 dated May 3rd, 2002.

Between 2008 and 2013, more than 16 000 results of RF EMF exposure measurements, performed following the ANFR DR-15 protocol, have been collected. There is an almost equally split between indoor and outdoor environments.
The metropolitan territory is well covered as illustrated on the figure on the right. The density of number of measurements per department is well correlated to the density of population (Person correlation coefficient is 0.97).

Conclusion

The results of the measurements are always under the regulatory limits. The trend observed between 2008 and 2013 is a slight increase of the global exposure as expected in view of the development of the telecommunication networks. On the other hand, no evolution of the highest values is observed. The statistical analysis of the measurement results will be presented.