

# Tracking Electromagnetic Interference in an Urban Environment on the World Wide Web

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**Abstract**— Electromagnetic radiation stemming from base stations and high voltage power lines in the vicinity of houses is considered as one of the most concerning source. That is the reason why the study of “Tracking Electromagnetic Interference from base stations via GPS coordinates on the world wide web” is carried in Nilufer municipality in Turkey to inform public. Thanks to this project[1], the public living in Bursa-Nilufer municipality can go into web platform to see how many base stations are present in the neighborhood and to follow the present electromagnetic radiation density.

**Keywords**- electromagnetic radiation; web; base station; analysis

## I. INTRODUCTION

High speed data transfer need in mobile communication has triggered planning and installation of new base stations; as a result of which electromagnetic radiation exposure is on rise. The studies illustrating exact findings of health effects of electromagnetic radiation due to mobile base stations and radio-television transmitters are not completed yet, due to the fast developing mobile communication technologies and the relatively slow enhancements in scientific research. That is why people have become more concerned and started to demand information about electromagnetic radiation sources and density levels in their neighborhood.

## II. MEASUREMENTS

In this study, more than two hundred measurement analyses have been carried out to assess electromagnetic radiation levels near houses, schools, offices and children playing fields of high daily occupation in the city. For radiofrequency signals, Narda NBM550 broadband field meter with EF0691 isotropic E-field probe and Narda SRM3006 selective radiation meter with 27MHz-3GHz isotropic E-field probe are used, whereas for ELF band magnetic field measurements, Narda ELT400 with 1Hz-400kHz field probe is used. Figure 1 illustrates a sample continuous and long duration measurement in a house which is across a base station. The study also focuses on the development of the web system enabling public to reach electromagnetic radiation density stemming from base stations. People logging their location in web will be able to see measurement results on Google maps, all base stations and their distances in 300 meters radius. Furthermore, system enables to get antenna directions, base station EMF values and measurement dates, as shown in Figure 2.

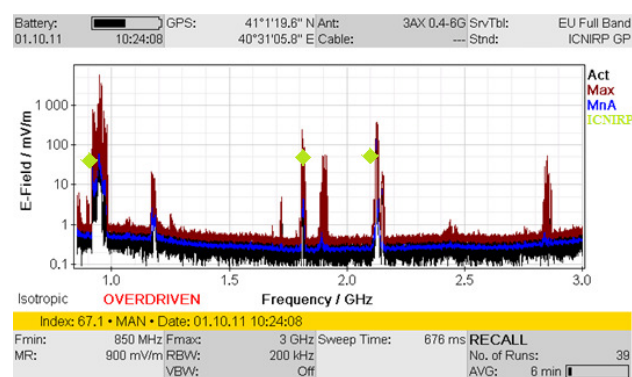


Figure 1. EMR density with respect to frequencies in a house across a base station

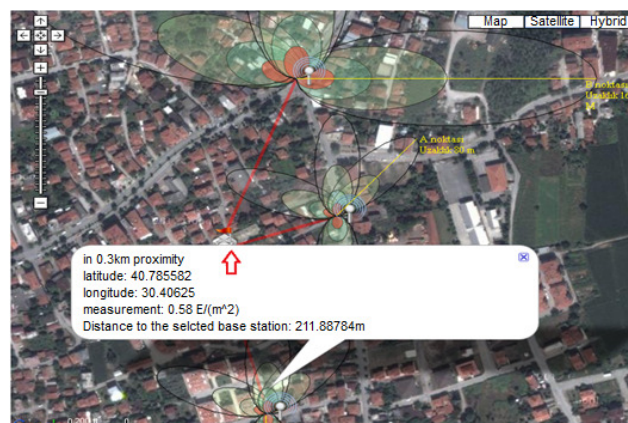


Figure 2. Representation of base stations in the web application

## III. FINDINGS AND DISCUSSION

In this study, measurements for 228 base stations located in Nilufer/Bursa municipality with population around 300,000 have presented that 95% of indoor electric fields are found to be below 3V/m, which is much lower than the maximum ICNIRP safety limits (42V/m for 900MHz, 58V/m for 1800MHz, and 61V/m for 2100MHz).

When the measurements are repeated in the following year, it has been found out that EM radiation levels have considerably increased due to new base station installations in specific areas. These long duration onsite measurements, which are also disclosed in the web, contribute to public information and conscious.

## REFERENCES

- [1] O. Cerezci, Nilufer Municipality Electromagnetic Pollution Report, Nilufer Municipality Publications, 2012.