



“Gheorghe Asachi” Technical University of Iasi, Romania



ASSESSMENT OF RADIOFREQUENCY EXPOSURE LEVELS GENERATED BY WIMAX BASE STATIONS

Eduard Lunca*, Silviu Ursache, Andrei Salceanu

Technical University of Iasi, Faculty of Electrical Engineering, 21 Prof. Dimitrie Mangeron Street, 700050 Iasi, Romania

Abstract

The radiofrequency (RF) electromagnetic fields represent one of the most common and fast growing environmental influences, raising concerns about possible effects on human health. The fact that there is a continuous change and an emergence of RF communication technologies on the market also leads to a change of daily RF exposure levels for the general public. In such a context, the main objective of our study is to assess the RF exposure originating from the emerging Worldwide Interoperability for Microwave Access (WiMAX) technology, which was only rarely investigated. By adopting a frequency-selective technique, in-situ far-field measurements were conducted at 41 locations in the urban environment of the Iasi city, Romania, and its rural neighborhood, focusing on the coverage area of several WiMAX base stations operating in the licensed 3.5 GHz and 3.7 GHz frequency bands. The WiMAX downlink signals measured at each location were recorded, extrapolated to maximum data traffic and compared to the reference level specified by the International Commission on Non-Ionizing Radiation Protection (ICNIRP) for the general public. The highest electric field level was found to be 0.201 V/m (corresponding to only 0.33% of the ICNIRP exposure limit), while 86.9% of the individual measurements were below 0.1% of the limit. As for the total WiMAX exposure, it varied from 0.008 V/m (0.012% of the limit) to 0.201 V/m (0.33% of the limit), with a median value of 0.059 V/m (0.096% of the limit). No significant differences were observed between the results taken at urban and rural locations.

Key words: base station, frequency-selective measurements, radiofrequency exposure, Worldwide Interoperability for Microwave Access

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* Author to whom all correspondence should be addressed: e-mail: elunca@tuiasi.ro; Phone:+40 232278680/1246; Fax:+40 232237627