

EMF Exposure level from Mobile Phone Base Stations in Urban and Suburban Areas in Japan

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The new project of acquisition, accumulation, and applications of EMF exposure monitoring data in Japan was introduced last year [1]. The aim of this study is to get the comprehensive picture of exposures to EMF in real daily lives. As a first step, we measured the electric field (E-field) strength at 100 points of an area of 1 km × 1 km (10 × 10 grids) at the same locations as previous measurement in 2006 [2], i.e. two urban and two suburban areas in Japan. The frequency bands that we focus on are 700, 800, 900, 1500, 1700, 2000, 2500, and 3500 MHz which are allocated for mobile communication systems in Japan. It is noted that the 5th mobile communication system is not included. The time-averaged E-field strength was measured over 1 min. using a spectrum analyzer with a 3-axis isotropic electric field probe (SRM-3006, Narda S.T.S. GmbH) referring [3]. The RBW was set to 1 MHz. The probe was fixed by a probe holder made of Fiber Reinforced Plastics (FRP) and connected to the spectrum analyzer with a dedicated cable so as to reduce the influence of the human body of a measurement operator during measurement.

Figure 1 summarizes the E-field strength for respective frequency bandwidth, which is calculated by integrating measured E-field strength over each bandwidth, respectively. Minimum, 10th, 50th, and 90th percentile, and maximum in the graph indicates statistical analysis of 100 measurement points, respectively. The results show that the overall tendency that the E-field strength is larger in the urban area than in the suburban area. The E-field strength at 700 MHz in all areas and at 3500 MHz in suburban areas are relatively lower than the others. This seems to be outside or close to a border of a radio cell generated by a mobile base station. The maximum strength in this measurement is 125 dBμV/m (1.78 V/m) in the urban-B while median values are in between 90 and 105 dBμV/m except for those of 700 and 3500 MHz bands.

It is noted that the minimum value of the Japanese radio wave protection guideline for the corresponding frequencies is 152.9 dBμV/m (44.1 V/m), and the measured results are confirmed to be sufficiently low.

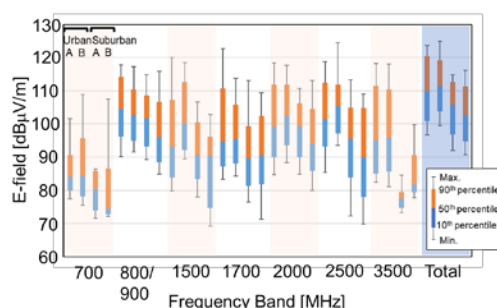


Figure 1 The E-field strength at each frequency band in 4 areas

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Reference

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