

A Study on the Necessity to Define of Measurement Interval for Installation Compliance of 5G Base Station

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5G new radio (NR) service, the 5th generation mobile communication service, began commercialization in Korea for the first time in the world in early 2019 [1]. The Korean government is required to measure and report the level of electromagnetic field in order to protect the human body from electromagnetic fields generated by radio stations (BS) [2]. For installation compliance evaluation, first, the maximum exposure point should be found from the 5G BS, and then the spatial average should be measured in the region. The IEC 62232 standard specified a handheld sweep method as determining the RF field strength to find the maximum exposure point [3]. To determine the point of the maximum RF field strength using the handheld sweep method, the measurement antenna shall be moved smoothly throughout the region. Fig. 1 shows the results of measuring the 3 times each at different speeds using the handheld sweep method. The results were normalized to the maximum E field to determine the maximum points. Base on Fig. 1, it appears that the maximum exposure position is different each time, even at different speeds or repeated measurements. That is, we cannot find the maximum position according to the handheld sweep method by the IEC 62232.

The meaning of moving smoothly is ambiguous to find the point of the maximum RF field strength in installation compliance test for 5G BS. Especially, the movement of a measurement probe can cause difficulties in the Synchronization Signal Block (SSB) signal detection for maximum power extrapolation since the new technologies used for 5G communications, e.g., the beamforming technique and flexible numerology. Hence, the define of measurement interval needs to be clearly defined for EMF installation compliance assessments of a 5G BS. In future studies, a study on the appropriate measurement interval to find the maximum exposure point is planned.



Figure 1. The measurement results of at different speeds using the handheld sweep method.

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References

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