Assessments of Incident Power Density at 28 GHz Using a Near-Field Reconstruction Algorithm for Compliance Assessment of Wireless Devices to Exposure Limits

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With expansion of technologies using quasi-millimeter wave and millimeter wave, e.g., 5G system, in general environment, the public concern on human exposure to electromagnetic field (EMF) increases. It is essential to assess human exposure to EMF from these wireless systems. Spatially-averaged power density incident into a human body is used as a metric of reference levels for local exposure to electromagnetic fields above 6 GHz in the International Commission on Non-Ionizing Radiation Protection (ICNIRP) guidelines [1]. Wireless devices, such as mobile phones, are used near by a human body, therefore power densities at proximity to the devices are required to be evaluated for the compliance assessment to the reference levels.

We have focused on the measurement method using a near-field reconstruction algorithm based on the plane-wave expansion technique [2]. A feature of this technique is to back-transform/-project the electric and magnetic fields using measured electric field at some wavelength away from the radiation source. One of the benefits in this technique is that conventionally available measurement methods [3], such as the system with a waveguide probe (Fig.1), is applicable.

This presentation summarizes the measured results of the incident power density radiated from phased array antennas at 28 GHz. Furthermore, the results were compared with those obtained from a different measurement system [4].

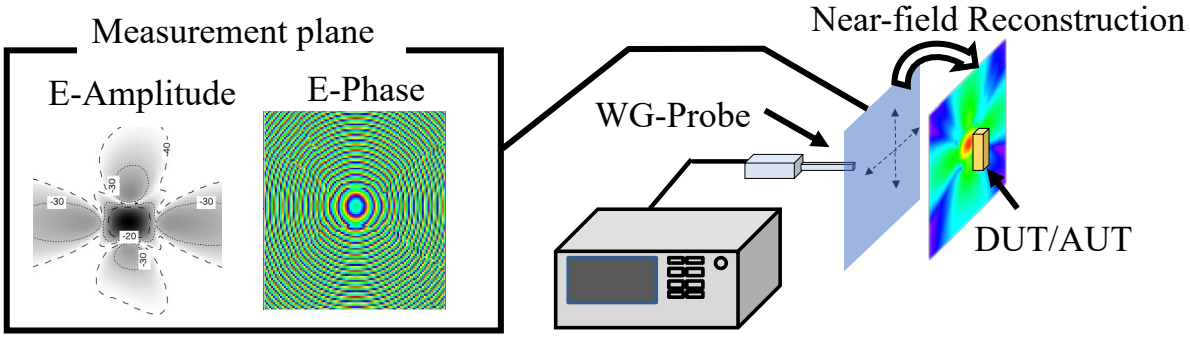

Figure 1. An example of measurement setup with a waveguide probe.

Acknowledgement

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References

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