Analysis of Coupling Calibration for Electric Field Probe Applied to SAR Measurement Using a Adjustable Open-ended Waveg

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ABSTRACT

In the recent years, （Specific Absorption Rate）SAR has become an important issue concerning health hazard due to the rising usage of wireless communication technologies. The measurement system mostly used the E-Probe to measure the SAR values. However the E-Probe offer extended usage will gradually degrade in term of precision and accuracy. Since, to date, there exists no Laboratories in this country to perform the calibration, it would be of interest to design such a calibration scheme. The implementation of the local calibration will not only save time but also the huge expenses of sending the E-Probe to the original manufacturer for recalibration. In this thesis, to design of system for the calibration of SAR probe is carried not under two environments, namely, in air and tissue. A waveguide operating in the desired calibration frequency was designed. The fabricated waveguide was constructed with an adjustable short-circuited termination. For the calibration in air, the E-Probe was placed in the center of the waveguide aperture and gradually extended inwardly. To record the measured SAR values. However, when calibrating in the tissue equivalent-liquid, a Teflon container filled with the tissue equivalent liquid was placed on the top of the interior of the waveguide. The E-Probe was then positioned in the center of the Teflon container and raises the E-Probe from the bottom of the container slowly. In this study, we have utilized electromagnetic numerical simulation method to compare the measurement values to verify the accuracy of the result. We focused on the analysis and comparison related to the E-field distribution at 900MHz and 1800MHz.

Keywords : SAR, waveguide, E-Probe, tissue equivalent liquid

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