

Analysis and Design of Characteristic Calibrator for SAR Measurement Probes

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ABSTRACT

In the recent years, SAR (Specific Absorption Rate) has become an important issue between mobile communications and human health due to the rising development of wireless communication technologies. The measurement system mostly used the E-Probe to measure the values of SAR. However the E-Probe which we employ to perform the SAR measurement will gradually lose its precision and accuracy. Consequently, we must send it back to the original manufacturer for calibration to ensure the accuracy of the E-Probe. In view of this, in order to save the time and the huge expense of calibration, we try to research a calibration system so that we can calibrate the E-Probe ourselves in our country. In this thesis, we calibrate the SAR Probe under two circumstances. One condition is that we calibrate the probe in the air and the other is in the tissue equivalent liquid. Before we implement these two calibrations, we have to fabricate a waveguide which is at desired operating frequency. When calibrating in the air, we put the E-Probe in the center of the waveguide aperture and gradually extend it inwardly. Then we have to record the measured SAR values. Nevertheless, when calibrating in the tissue equivalent liquid, we put a Teflon container filled with the tissue equivalent liquid on the top of the interior of the waveguide. Then we place the E-Probe in the center of the Teflon container and rise the E-Probe from the bottom of the container slowly. The following work is to estimate and record the SAR values the E-Probe measured. Up to the present , we have finished the measurement of electric fields within the waveguide and the inner electric fields after the Teflon is added to the waveguide. In the future, we will go on calibrating the E-Probe in anechoic chamber and calibrate it after the Teflon container is filled with the tissue equivalent liquid and so on. Eventually we will aim for using numerical methods to verify the accuracy of our simulated and measured result.

Keywords : SAR ; E-Probe

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