Abstracts

Current and SAR Induced in a Human Head Model by the Electromagnetic Fields Irradiated from a Cellular Phone

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The near field finite-difference time-domain method was used to calculate the current and specific absorption rate (SAR) distributions in an inhomogeneous model of a human head exposed to the electromagnetic waves irradiated from a cellular phone. The human head was simulated by a model of 57 263 block cells with inhomogeneous dielectric constant and conductivity. The cellular phone was modeled by an equivalent dipole antenna with an equivalent resistor of 120 ohms located at the center gap between the two arms of this dipole antenna. The transmitted power of the cellular phone was assumed to be 0.6 watts at a frequency of 835 MHz. For the head near the dipole antenna in the range of 1.0 ~ 2.5 cm, the maximum currents and SAR's induced in the head were found in the ranges of 356 ~ 551 mA and 1.23 ~ 2.63 W/kg, respectively. It was also found that the maximum SAR induced in the head was below the IEEE's upper safety limit of 1.6 W/kg for the head to keep a distance from the dipole antenna by longer than 2.0 cm.

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