Abstracts

Temperature rise for the human head for cellular telephones and for peak SARs prescribed in safety guidelines (2001 Vol. I [MWSYM])

O.P. Gandhi, Qing-Xiang Li and Gang Kang. "Temperature rise for the human head for cellular telephones and for peak SARs prescribed in safety guidelines (2001 Vol. I [MWSYM])." 2001 MTT-S International Microwave Symposium Digest 01.1 (2001 Vol. I [MWSYM]): 147-150 vol.1.

The bioheat equation is solved for an anatomically-based model of the human head with resolution of 3/spl times/3 mm to study the thermal implications of exposure to EM fields typical of cellular telephones both at 835 and 1900 MHz. Up to 4.5/spl deg/C temperature elevation may be caused for some locations of the pinna by a cellular telephone warmed by electronic circuitry to temperatures as high as 39/spl deg/C, with temperature increases for the internal tissues such as the brain and the eye that are no more than 0.1-0.2/spl deg/C higher than the basal values. Another objective was to study the thermal implications of the SAR limits for the occupational exposures of 8 W/kg for any 1-g, or 10 W/kg for any 10-g of tissue suggested in the commonly used safety guidelines. Such SARs would lead to temperature elevations for the electromagnetically exposed parts of the brain up to 0.5/spl deg/C, with 10 W/kg for any 10-g of tissue resulting in somewhat higher temperatures for larger volumes.

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