Abstracts

Electromagnetic Deposition in an Anatomically Based Model of Man for Leakage Fields of a Parallel-Plate Dielectric Heater

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The three-dimensional finite-difference time-domain (FDTD) method has been used to calculate the local layer-averaged and whole-body-averaged specific absorption rates (SAR's) and internal RF currents in a 5628-cell anatomically based model of man for spatially variable electromagnetic fields of a parallel-plate applicator representative of RF dielectric heaters used in industry. Included in the calculations are the shape and dimensions of the applicator plates as well as a typical spacing of 21 cm to the human operator. The calculated leakage fields are in agreement with the experimentally measured values. The conditions of exposure of the man model considered are: isolated from ground, feet in contact with ground, and an additional grounded top plate 13.1 cm above the head to simulate screen rooms that are occasionally used for RF heaters. Also considered is the model with a separation layer of rubber (epsilon/sub r/ = 4.2) of thickness 2.62 cm between feet and ground to simulate the shoe-wearing condition. For peak E fields as high as 1000-2700 V/m that have been measured at the locations of the operator, significant internal RF currents on the order of 0.5-2.3 A are projected for the operator. Laboratory measurements of the foot currents at 27.12 and 40.68 MHz for a human subject are in agreement with the calculated values.

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