Abstracts

An efficient RF exposure system with precise whole-body average SAR determination for in vivo animal studies at 900 MHz

Q. Balzano, C. Chou, R. Cicchetti, A. Faraone and R.Y.-S. Tay. "An efficient RF exposure system with precise whole-body average SAR determination for in vivo animal studies at 900 MHz." 2000 Transactions on Microwave Theory and Techniques 48.11 (Nov. 2000, Part II [T-MTT] (Special Issue on Medical Application and Biological Effects of RF/Microwaves)): 2040-2049.

A radial electromagnetic cavity has been designed and optimized for the in vivo whole-body exposure of mice to 900-MHz RF fields. Parallel circular plates shorted around the perimeter form the cavity, which is fed at the center in order to excite a cylindrical TEM wave. Plastic housings allow the insertion and equidistant positioning from the exciter of 40 mice, with the electric field parallel to the body axis. The resulting exposure system is highly efficient, featuring more than 80% of the incident power dissipated in the mice. The whole-body average SAR can be determined with remarkable precision by means of straightforward power balance since the RF power leakage from the cavity is extremely low. Fairly uniform exposure of the mice, individually and collectively, has been achieved by means of the symmetric arrangement. This exposure system has been adopted in a replication study on transgenic mice currently being carried out in South Australia, and is being considered for upcoming animal studies in Europe.

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