Abstracts

The Dependence of EM Energy Absorption Upon Human Head Modeling at 900 MHz

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In this paper the dependence of electromagnetic energy absorption at 900 MHz in the human head on its anatomy and its modeling are investigated for RF-sources operating in the very close proximity of the head. Different numerical head phantoms based on MRI scans of three different adults were used with voxel sizes down to 1 mm^3. Simulations of the absorption were performed by distinguishing the electrical properties of up to 13 tissue types. In addition simulations with modified electric parameters and reduced degrees of complexity were performed, Thus, the phantoms greatly differ from each other in terms of shape, size, and internal anatomy. The numerical results are compared with those of measurements in a multitissue phantom and two homogeneous phantoms of different shapes and sizes. The results demonstrate that size and shape are of minor importance. Although local SAR values depend significantly on local inhomogeneities and electric properties, the volume-averaged spatial peak SAR obtained with the homogeneous phantoms only slightly overestimates that of the worst-case exposure in the inhomogeneous phantoms.

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