Abstracts

Simulation of human interaction with mobile telephones using hybrid techniques over coupled domains

M.A. Mangoud, R.A. Abd-Alhameed and P.S. Excell. "Simulation of human interaction with mobile telephones using hybrid techniques over coupled domains." 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)): 2014-2021.

An approach to hybridization of the method of moments and the finite-difference time-domain method is investigated in this paper. This hybrid method is capable of analyzing a system of multiple discrete regions by employing the principle of equivalent sources to excite their coupling surfaces. The case of multiple sources in the presence of scattering objects is discussed. To develop the approach and test its validity, some examples are given using the same numerical method in multiple regions: the results compare well with other available data. The theory of the heterogeneous hybrid method is then developed and validated. It is shown that this technique has the great advantage of accurately modeling complex and arbitrarily oriented mobile telephone handset antennas in the proximity of a detailed voxel representation of the human head, as required for safety and radiation pattern assessments.

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