Abstracts

Induced EM Field in a Layered Eccentric Spheres Model of the Head: Plane-Wave and Localized Source Exposure

N.C. Skaropoulos, M.P. Ioannidou and D.P. Chrissoulidis. "Induced EM Field in a Layered Eccentric Spheres Model of the Head: Plane-Wave and Localized Source Exposure." 1996 Transactions on Microwave Theory and Techniques 44.10 (Oct. 1996, Part II [T-MTT] (Special Issue on Medical Application and Biological Effects of RF/Microwaves)): 1963-1973.

The induced electromagnetic (EM) field in a layered eccentric spheres structure is determined through a concise analytical formulation based on indirect mode-matching (IMM). The exact analytical solution is applied to a six-layer model of the head. This model allows for eccentricity between the inner and outer sets of concentric spherical layers which simulate brain and skull, respectively. Excitation is provided by a nearby localized source or by an incident plane wave. The numerical application provides information about the total absorbed power, the absorption in each layer, and the spatial distribution of the specific absorption rate (SAR) at frequencies used by cellular phones. The effects of excitation frequency, eccentricity, exposure configuration, and antenna-head separation are investigated.

❑ Return to main document.