# Abstracts

## Analysis of Thermal Radiation from an Inhomogeneous Cylindrical Human Body Model

*N.K. Uzunoglu, P.G. Cottis and P.S. Papakonstantinou. "Analysis of Thermal Radiation from an Inhomogeneous Cylindrical Human Body Model." 1987 Transactions on Microwave Theory and Techniques 35.8 (Aug. 1987 [T-MTT]): 761-768.*

The thermal radiation from a cylindrical human body model at microwave frequencies is treated analytically. The human body model is taken to be a homogeneous cylinder at temperature T having a localized internal thermal inhomogeneity at temperature T + Delta T. The mean energy density for the near field outside the cylinder is determined by employing the dyadic Green's function of the homogeneous cylinder and the fluctuation-dissipation theorem. Analytical results are derived for the contributions of the homogeneous cylinder and the inhomogeneity region. Numerical results are presented for several geometries at low microwave frequencies where a reasonable transparency of tissues is expected. The possibility of using microwave radiometry techniques to measure temperature distributions in depth is discussed in relation to hyperthermia and the development of noninvasive diagnostic techniques. It is shown that the emission from surrounding tissues limits the detectability of thermal inhomogeneities inside the body and that by using low microwave frequencies (~1 GHz), temperature measurement at depths up to 2 cm can be performed.

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