Abstracts

An Empirical Formula for Broad-Band SAR Calculations of Prolate Spheroidal Models of Humans and Animals

An empirical relation for calculating approximate values of the average specific absorption rate (SAR) over a broad-frequency range for any prolate spheroidal model is derived for E-polarized incident plane waves. This formula provides a simple and inexpensive method for calculating the SAR for human and animal models, which otherwise requires complicated and expensive methods of calculation. The formula satisfies the f^2 SAR behavior at lower frequencies, the resonance characteristic at intermediate frequencies, the $1/f$ behavior past resonance, and the dependence on the dielectric constant at the geometrical optics limits. An expression for the resonance. frequency f_0 in terms of the dimensions of the model is also derived. The unknowm expansion coefficients were determined by curve-fitting all the data available in the second edition of the Radiofrequency Radiation Dosimetry Handbook. Numerical results obtained from the empirical relations are generally in good agreement with those calculated by other methods. Limitations of the formula and suggestions for its improvement are also discussed.

❑ Return to main document.