Please read the information below before using the whole-body model.

This voxel-based model is brought to you by Bioelectromagnetics Lab., Department of Electrical and Computer Engineering, University of Tehran.

This model is based on Zubal's whole-body (arms down) fantom, available at http://noodle.med.yale.edu/zubal/data.htm/.

All thermal, physical, and dielectric properties are taken from IT'IS database, available at http://www.itis.ethz.ch/.

According to IT'IS, dielectric parameter values are reported based on numbers published in the tissue dielectric property database generated by Gabriel et al., 1996 [50], for which dielectric properties were calculated over a frequency spectrum ranging from single Hz to several GHz. This spectral range contains four dispersion regions, and the values can be fit by means of a 4-cole-cole dispersion model. However, the Gabriel et al. database covers only a limited number of organs and tissues; for tissues not addressed by Gabriel et al., IT'IS uses reported dielectric values for an organ of similar function and/or tissue composition. Most other work published about measurements of dielectric properties of biological tissues are restricted to a specific frequency range and cannot be described by a 4-cole-cole expression, and are thus not included in this database.

The IT'IS dielectric parameter values for frequencies between 10 Hz and 20 GHz are based on the work of Gabriel et al., 1996 [50]. However, these authors state that: "The predictions of the model can be used with confidence for frequencies above 1 MHz. At lower frequencies, where the literature values are scarce and have larger than average uncertainties, the model should be used with caution in the knowledge that it provides a 'best estimate' based on present knowledge." In 2009, Gabriel and colleagues [55] published measurements of the dielectric properties of several pig tissues at frequencies below 1 MHz, and provided as well a comprehensive review of the most recent literature on the topic. The compilation presented on IT'IS webpage is based on property values for frequencies from 0 – 120 Hz, as reported in the more recent publication of Gabriel et al., 2009 [55]. Whenever possible, IT'IS accounts for the anisotropy of the tissues. To be able to include studies in which tissue anisotropy is not taken into consideration, additionally the mean of all reported values are calculated independent of the direction of measurement. To assure highest accuracy, values considered unreliable by Gabriel et al., 2009 [55] are excluded, and information on the uncertainties in the calculated values in the form of standard deviations and ranges is provided.

The following list covers some of the problems that arose during the compilation of the material parameter database:

· There is no data available in the literature for the dielectric properties of urine over the frequency spectrum of single Hz to a few GHz mandatory for fitting to the 4-cole-cole dispersion model. Therefore, for the dielectric parameter values of urine, IT'IS has chosen the values for the urinary bladder wall, and for the thermal properties, the mean value of bladder wall and urine is calculated.

· The dielectric properties database generated by Gabriel et al., 1996 [50] contains values for only a few endocrine tissues: thyroid, testes, and ovaries. For all reproductive organs, the values reported for testes and, for all other glands, those of thyroid is used.

· The contents of the stomach and intestines depend on the diet of the subject. For the thermal properties, an average of water and muscle corresponding to a diet of 50/50 water and meat is calculated. For the dielectric properties, IT'IS has chosen the values for muscle only.

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