A model for radiofrequency electromagnetic field predictions at outdoor and indoor locations in the context of epidemiological research

JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)

ID 524374
Author(s) Bürgi, Alfred; Frei, Patrizia; Theis, Gaston; Mohler, Evelyn; Braun-Fahrländer, Charlotte; Fröhlich, Jürg; Neubauer, Georg; Egger, Matthias; Röösli, Martin
Author(s) at UniBasel Braun-Fahrländer, Charlotte ; Mohler, Evelyn ; Frei, Patrizia ; Röösli, Martin ;
Year 2010
Title A model for radiofrequency electromagnetic field predictions at outdoor and indoor locations in the context of epidemiological research
Journal Bioelectromagnetics
Volume 31
Number 3
Pages / **Article-Number** 226-36
Mesh terms Architecture; Electromagnetic Fields; Environment; Epidemiologic Methods; Housing; Models, Theoretical; Radio Waves; Switzerland; Urban Population
We present a geospatial model to predict the radiofrequency electromagnetic field from fixed site transmitters for use in epidemiological exposure assessment. The proposed model extends an existing model toward the prediction of indoor exposure, that is, at the homes of potential study participants. The model is based on accurate operation parameters of all stationary transmitters of mobile communication base stations, and radio broadcast and television transmitters for an extended urban and suburban region in the Basel area (Switzerland). The model was evaluated by calculating Spearman rank correlations and weighted Cohen's kappa (kappa) statistics between the model predictions and measurements obtained at street level, in the homes of volunteers, and in front of the windows of these homes. The correlation coefficients of the numerical predictions with street level measurements were 0.64, with indoor measurements 0.66, and with window measurements 0.67. The kappa coefficients were 0.48 (95%-confidence interval: 0.35-0.61) for street level measurements, 0.44 (95%-CI: 0.32-0.57) for indoor measurements, and 0.53 (95%-CI: 0.42-0.65) for window measurements. Although the modeling of shielding effects by walls and roofs requires considerable simplifications of a complex environment, we found a comparable accuracy of the model for indoor and outdoor points. Bioelectromagnetics, 2009 (c) 2009 Wiley-Liss, Inc
Publisher Wiley-Liss
ISSN/ISBN 1521-186X
edoc-URL http://edoc.unibas.ch/dok/A5842790
Full Text on edoc No;
Digital Object Identifier DOI 10.1002/bem.20552
PubMed ID http://www.ncbi.nlm.nih.gov/pubmed/19834920
ISI-Number WOS:000276052600007
Document type (ISI) Journal Article