Abstracts

A Method of Solution for a Class of Inverse Problems Involving Measurement Errors and its Application to Medical Microwave Radiometry

Retrieval of temperature-versus-depth profiles in a biological tissue structure from multi-frequency microwave radiometric measurement data constitutes a typical inverse problem in which the data involve relatively large measurement errors. Meaningful solutions to such a problem ought to include effects of the statistical fluctuation in the measured data. We have developed a method of solution for a class of problems of this type. The method gives solutions in terms of the confidence interval and level. It also has a built-in capability of assessing the degree of fit of solutions to unknown actual source distributions. An agar phantom experiment and computer simulation based on a five-band (1-4 GHz) radiometry were made to test the method and the results are presented.

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