Abstracts

Effects of Water-Filled Bolus on the Precision of Microwave Radiometric Measurements of Temperatures in Biological Structures

S. Mizushina, M. Matsuda, K. Matsui, Y. Hamamura and T. Sugiura. "Effects of Water-Filled Bolus on the Precision of Microwave Radiometric Measurements of Temperatures in Biological Structures." 1990 MTT-S International Microwave Symposium Digest 90.1 (1990 Vol. I [MWSYM]): 541-544.

An assessment is made of the degradation that is caused by a water-filled bolus in the precision of tissue temperatures measured non-invasively by a five-band microwave radiometry scheme. The precision is expressed in terms of the confidence interval of tissue temperature estimated from a set of five brightness temperatures measured with an experimental instrument operating at center frequencies, 1.2, 1.8, 2.5, 2.9, 3.6 GHz, with a 0.4-GHz bandwidth. Results show that the degradation due to a bolus having a thickness of about 1 cm is small when it is filled with the deionized or distilled water. A conclusion of the present study is that the use of water-filled bolus is permissible for the microwave radiometric measurement, which bears a practical importance when the technique is used in combination with the electromagnetic heating for hyperthermic treatment of cancer.

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