SESSION 6: BIOMEDICAL ASPECTS OF MICROWAVES

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Many excellent contributions in the area of microwave hyperthermia treatment of cancer and radiation measurement techniques can now be found by scanning both the IEEE MTT transactions and the MTT meeting Proceedings. The title of this year's meeting, Biomedical Aspects of Microwaves, has been changed from Microwave Biological effects to reflect the type of paper which this meeting has attracted.

Our session this year concentrates mainly on the area of microwave hyperthermia and microwave thermography.

The session begins with two short presentations on applicators designed for local hyperthermia.

In the paper "Microstrip Antenna for Local Hyperthermia" by E. Tanabe et al., the authors describe the optimization of direct contact microstrip antenna applicators designed for local hyperthermia treatment.

In the paper "An Approach of the Slot Antenna Radiating in Muscle" Authors P. Pribetich et al., propose several models to simulate the behavior of a slot antenna radiating into muscle for local hyperthermia in cancer therapy.

These are followed by two measurement papers on absorbed energy distribution and the consequences on blood flow.

In their paper "Enhancing the Efficacy of Thermotherapy by Monitoring Changes in tumor Blood Flow", Sterzer et al. describe a simple method for monitoring changes in the blood flow in tumors being heated. Data obtained by this method can be used to enhance the efficacy of microwave thermo-therapy of malignant tumors.

In their paper "Specific Absorption Rate Distribution in a Model of Man at Various Polarizations", by A. Kraszewski et al., the authors describe a computer-based scanning system, and implantable electric field probes to obtain maps of the Specific Absorption Rate in various cross sections of a full scale model of the human body. Significant differences between the SAR calculated and that found in this work were observed.
The last two papers present two radiometric systems for measuring subcutaneous temperatures.

In the paper "A Three Band Microwave Radiometer for Noninvasive Temperature Measurement", by Shizuo Mizushina et al., the authors discuss a multifrequency radiometer having center frequencies at 1.5, 2.5, and 3.5 GHz, with a 1 GHz bandwidth. The multifrequency radiometer is designed to measure temperatures beyond the surface and inside the human body.

In the paper "Microwave and Infrared Thermograms of Hot Spots in Tissue", author G. Schaller describes a 3 GHz radiometry technique for measuring steady state temperature distribution produced by hot spots in a three dimensional model of the human body.

As for the future, it is hoped that new applications of microwaves and millimeter waves can be found in medicine, for example in areas such as microwave catheter angioplasty and monitoring systems.

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