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MAIN SUBJECT HEADING:

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ANALYTICS	HUMAN EFFECTS	ANIMAL TOXICITY	WORKPLACE PRACTICES-ENGINEERING CONTROLS	MISCELLANEOUS

SECONDARY SUBJECT HEADINGS: AN HU AT IH M

Physical/Chemical Properties

Review

Animal Toxicology

Non-occupational Human Exposure

Occupational Exposure

Epidemiology

Standards

Manufacturing

Uses

Reactions

Sampling/Analytical Methods

Reported Ambient Levels

Measured Methods

Work Practices

Engineering Controls

Biological Monitoring

Methods of Analysis

Treatment

Transportation/Handling/
Storage/Labeling

SCHEDULE

ML 3027



ABSTRACTS OF SCIENTIFIC PAPERS



**1978 SYMPOSIUM
on
ELECTROMAGNETIC FIELDS
in
BIOLOGICAL SYSTEMS**

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**JUNE 27-30, 1978
HOLIDAY INN (CENTRE)
OTTAWA, CANADA**

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XI-B HEAD RESONANCE: NUMERICAL SOLUTIONS AND EXPERIMENTAL RESULTS
J. Hagmann, O. P. Gandhi, J. A. D'Andrea, and I. Chatterjee
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University of Utah, Salt Lake City, Utah 84112

We have previously reported numerical solutions for a realistic model of man which showed a resonance of the intact human head at a frequency of about 350 MHz. At head resonance, the absorption cross section for the head region is 3.0 times the physical cross section and greatly exceeds values reported earlier for models of the isolated human head. We contend that it is inaccurate to neglect effects of the rest of the body in numerical solutions for the head region unless the frequency is much greater than that for head resonance.

Numerical solutions which we presented earlier used a block model of man with a total of 180 cubical cells of different sizes arranged to fit the contour of the 50th percentile standard man. New results will be presented for a 312-cell model of man which differs in that 144 cells are used in the head region to provide greater detail regarding the distribution of energy deposition.

Head resonance for the laboratory rat occurs near the commercially significant frequency of 2450 MHz. We have made preliminary tests with anesthetized 450 + 30 gram Long Evans rats at 2450 MHz and have observed a value of head SAR which is approximately 2.2 times the whole-body average. Further experimental data will be presented for head resonance in the laboratory rat with both E||L and R||L orientations.

We have recently measured both the whole-body average SAR and the absorption cross section of the head for phantom models of man at frequencies near head resonance with both E||L and R||L orientations. We will present a comparison of the experimental results with numerical solutions.

We feel that the phenomenon of head resonance may be important in the study of behavioral effects, blood-brain permeability, cataractogenesis, and other microwave bioeffects.

~~hot spot near center of head~~

see notes

hot spot near center of head
similar to case of a sphere @ 350 MHz
for front to back E||L

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