

A TEM CELL DESIGN TO STUDY ELECTROMAGNETIC RADIATION EXPOSURE FROM CELLULAR PHONES

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ABSTRACT

A transverse electromagnetic (TEM) cell was designed and fitted with a double ended monopole antenna as a signal leader in order to couple electromagnetic radiation from GSM 900 and 1800 commercial cellular phones into a usable area of the cell. The double-ended monopole antenna acts as a signal leader for incoming and outgoing signals between the TEM cell's outer surfaces. Biological subjects can be placed at the usable area for biological effects of electromagnetic radiation studies.

The amplitudes of the forward and backward travelling mode excitation and the input impedance of the signal leader were analyzed in the study. It showed good agreement with known results from other experiments and lab simulations. The electric field distribution was studied with such varying parameters as the cellular phone position, polarization, dialing type, and dialing frequency. Analysis showed that the electric field uniformity can be improved with either the use of a shorter signal leader or by reducing the dimensions (size) of the TEM cell.