Abstracts

A model for predicting electromagnetic interference of implanted cardiac pacemakers by mobile telephones

Jianqing Wang, O. Fujiwara and T. Nojima. "A model for predicting electromagnetic interference of implanted cardiac pacemakers by mobile telephones." 2000 Transactions on Microwave Theory and Techniques 48.11 (Nov. 2000, Part II [T-MTT] (Special Issue on Medical Application and Biological Effects of RF/Microwaves)): 2121-2125.

A prediction of the electromagnetic interference (EMI) of pacemakers due to mobile phones is significant in improving the immunity of pacemakers. The Pacemaker Committee of Japan recently conducted immunity tests of pacemakers for mobile phones, and consequently concluded that the connector between the pacemaker housing and the lead wire of the electrode plays a major role for the EMI due to mobile phones. Based on this finding, a computer model for predicting the EMI level has been presented, in which the internal impedance seen from the connector was considered as a load, and the metal portions consisting of the pacemaker housing and the lead wire of the electrode were considered as two elements of a receiving antenna. Interference voltages induced through the connector were analyzed by using the finite-difference time-domain method in conjunction with a torso and mobile phone model. The modeling was validated by comparison with previously reported experimental results.

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