Abstracts

A Nonlinear Analysis of the Effects of Transient Electromagnetic Fields on Excitable Membranes

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The transmembrane voltage produced by a transient electromagnetic field has been determined using a nonlinear model of the cellular membrane. The influence on the membrane voltage of the various parameters characterizing the incident field, such as wave-shape, time-width, and amplitude, has been analyzed. In particular, the amplitude of the incident field for which the cell's behavior can be assumed as linear and the threshold level for exciting action potentials on the membrane have been determined. Potential hazards for humans exposed to transient fields are examined in light of this interaction mechanism.

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