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Quasi-static galvanic coupling intra-body communication modeling

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Intra-body communication (IBC) is a near-field "wireless" technology. The action of the body is equivalent to a coaxial transmission lines, with different dielectric layer impedance corresponding to hierarchical transmission of physiological signals. Although the research of current coupling is in its infancy, it has been increasingly important because of the stability and reliability. The existing research, like the human electromagnetic model, shows that human body is abstracted into a coaxial cylinder, however, in view of the human anatomy, human body complies with the characteristic of multilayered confocal elliptical structures. Accordingly, a new abstract electromagnetic model established and each layer inside gets analyzed in various boundary conditions. By comparing with the data measured in the same humane tissue, the maximum deviation is 8%, and the coincidence rate between model analysis and experiment results reaches 90%. This indicates the stability of model due to the achievements of coaxial cylindrical.

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