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Simulation of RF Patch Antenna Sensor for Biological Applications

(Conference Paper)

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Abstract

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Diabetes affects hundreds of millions of people globally, and is a leading cause of death and disability worldwide. Patients must regularly monitor their blood glucose concentration to manage the disease. A non-invasive way of glucose monitoring using biosensor has emerged as an alternative technique. This work describes a contemporary approach of using patch antenna sensor in estimating the glucose level in blood. Focus of this work is to perform the simulation of sensor design using finite element analysis software, CST Microwave Studio. The geometry of sensors have been simulated where the results show the optimal design of feedline length was 11.25 mm at 1.98 GHz. The optimal design was then simulated in COMSOL Multiphysics for evaluating frequency shift in different medium permittivity of air, water and blood. The increase of permittivity will result in decrease of resonance frequency. © 2018 IEEE.

SciVal Topic Prominence ⓘ

Topic: Biosensors | Dielectric spectroscopy | Glucose

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Blood glucose monitoring COMSOL CST Non-invasive Patch antenna Simulation

Indexed keywords

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Engineering uncontrolled terms: Biological applications Blood glucose concentration Blood glucose monitoring COMSOL Finite element analysis software Non-invasive Resonance frequencies Simulation

Engineering main heading: Microstrip antennas

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