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Inter-digital sensor for non-invasive blood glucose monitoring (Conference Paper)

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Abstract

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This paper is to describe a contemporary approach of microwave spectroscopy by adapting the interdigital capacitor sensor in estimating the glucose levels in blood through the electromagnetic properties change. Interdigital capacitor configuration has been implemented in various field of applications nowadays such surface acoustic wave (SAW) equipment, microwave devices, chemical and biological sensors. Such a wide area of applications has proven it to be a reliable device, which can be applied in non-invasive blood glucose monitoring system. Focus of this ongoing work is to study the analytical expression for calculating the capacitance and electric field changes of the suggested inter-digital capacitor structure. This also involves the study of parameters, which affect the frequency response changes in the proposed configuration and to present a model of biological tissue. Moreover, the dependency of the capacitance on the geometrical properties of interdigital capacitor structure, electrical properties of the structure as well as those of the human biological tissue are being examined in this project. Production of a sensor based on capacitive sensing, which can be used for the non-invasive approach of blood glucose monitoring is the main target of this paper. The results include reporting changes in parameters such as relative permittivity because of blood sugar. © 2018 IEEE.

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Topic: Biosensors | Dielectric spectroscopy | Glucose

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Author keywords

Antenna Blood glucose monitoring Interdigital capacitor Microwave sensor
Non-invasive blood glucose monitoring Sensor

Indexed keywords

Engineering controlled terms:

Acoustic surface wave devices Acoustic waves Antennas Blood Capacitance
Capacitive sensors Chemical equipment Electric fields Frequency response Glucose
Microwave acoustics Microwave devices Microwave spectroscopy Sensors Tissue

Engineering uncontrolled terms

Analytical expressions Blood glucose monitoring Chemical and biological sensors
Electric field change Electromagnetic properties Inter-digital capacitors Relative permittivity
Surface acoustic wave (SAW)

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