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| **Title:** | Design and performance analysis of a microstrip line-fed on-body matched flexible UWB antenna for biomedical applications | | |
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| **Abstract:** |  |
| A novel design of a microstrip line-fed flexible on-body matched Ultra-Wideband (UWB) antenna is proposed in this study. Small and flexible design along with noteworthy performance of this proposed antenna upholds its strong position amongst previous antennas of similar type and can be used for various biomedical applications. The antenna is designed to operate in the UWB (3.1-10.6GHz) frequency range where resonant frequency is at 5.93GHz. The main notability of this design refers to its subtle dimension, lower sensitivity to angular misalignments and higher fidelity that makes it perfectly fit for biomedical applications, especially in Wireless Body Area Network (WBAN). Both flexible and rigid conditions of the antenna are studied here as it needs to be tested in different mediums which will more effectively corroborate future practical implementation. Several types of calculations and performance measurements of this antenna have been completed by using CST MW studio while maintaining all the dielectric properties of human tissue. With overall dimension of 40mm × 40mm × 1.44mm, the antenna is placed upon a three-layered human phantom model to run simulation process where FR4 is used as substrate and copper is used as patch material. Performance analysis of the designed antenna is evaluated in terms of return loss, bandwidth, radiation pattern, directivity, gain, total efficiency and power analysis. Finally, Specific Absorption Rate (SAR) distribution of the antenna is analyzed to make it perfectly biocompatible for practical use. | |