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| **Title:** | Performance Evaluation of Meander Line Implantable Antenna integrated with EBG Based Ground for Anatomical Realistic Model | | | |
| **Author(s) Name:** | Sultana, S., and **Basak, R.** | | | |
| **Contact Email(s):** | rinku@aiub.edu | | | |
| **Published Journal Name:** | AIUB Journal of Science and Engineering (AJSE) | | | |
| **Type of Publication:** | Journal | | | |
| **Volume:** | 18 | | Issue | 1 |
| **Publisher:** | AIUB Office of Research and Publication | | | |
| **Publication Date:** | May 2019 | | | |
| **ISSN:** | | 2520-4890, 1608-3679 (Print) | | |
| **DOI:** |  | | | |
| **URL:** | <https://doi.org/10.53799/ajse.v18i1.16> | | | |
| **Other Related Info.:** | Pages 1-10 | | | |
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| **Abstract:** |  |
| A unique design and meander line implantable antenna is examined in this paper which satisfies the requirements of ultra-wide band. The designed antenna is integrated with the electromagnetic band gap (EBG) structure based ground plane to enhance the performance. Rectangular electromagnetic band gap (EBG) structures are represented here to evaluate the antenna performance. This compact and efficient MLA antenna is applied to improve the antenna performance for numerous implantable scenarios and biomedical applications. The proposed antenna with EGB ground plane is designed for both the simplified model and anatomical realistic models for the human body and executed the performance in bio-environment. To approve the results of implantable antennas more correctly, simulation is analyzed using anatomical realistic human models. The ultimate design has the whole dimension is 15.2 x 8.8 m2. The thickness of the antenna is about 0.8 mm. FR4 is chosen as the substrate material and Copper is chosen as the patch material. The antenna is enclosed biocompatible material with silicon inside the tissue in order to protect patient safety. Significant parameters such as S11 parameter, Far field (radiation pattern), VSWR, Efficiency, Directivity, Gain of the proposed antenna have calculated and measured the performance both the simplified and realistic human models. Comparison Analysis of S11 parameter for different substrate materials and patch materials have observed. The radiation mechanism and modified design of the implantable antenna reducing Specific Absorption Rate (SAR) for safety issues. All the simulation results and measurements are obtained from CST Microwave Studio to validate the design. | |