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| **Title:** | Design of an On-Body Rectangular Microstrip Patch Antenna for the Diagnosis of Breast Cancer using S-Band | | |
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| **Abstract:** |  |
| A common cause of death of women is Breast Cancer and Tumors, and it is difficult to detect both of these at the early stage due to their minimal structure. Microwave Imaging is one of the effective techniques among the current and past methods. In this paper, a compact size microstrip patch antenna has been designed in CST Studio Suite Software for microwave imaging to diagnose breast cancer using the FR-4 (Lossy) substrate material with a resonant frequency of 2.3 GHz (S-band), varying from 1.5 GHz to 3 GHz. A feedline fed the antenna’s radiating patch, which is rectangular in size. The breast model with tumors was designed in the CST consisting of skin, fat, glandular, and cancer affected tissues. A Return Loss (S1,1) value of −37.28 dB and −45.72 dB were obtained in free space and after applying the antenna in the cancer affected breast phantom, respectively. Other obtained output parameter values such as Directivity (2D and 3D), Radiation Efficiency, Polar Radiation, etc., are also presented in this paper, showing that the antenna model would be a better option for breast cancer diagnosis. | |