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| **Title:** | Spin Coated Multi-Walled Carbon Nanotube Patch Antenna for Breast Cancer Detection | | |
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| **Abstract:** |  |
| Early detection of breast cancer can be a life-saving measure for many patients. The inaccessibility of X-rays, magnetic resonance imaging (MRI), and other medical facilities in many resource-constrained areas hinders the early detection of breast cancer. In this paper, the use of a rectangular patch antenna for breast cancer detection is proposed by using multiwall carbon nanotubes (MWCNTs) as patch material. The proposed antenna is designed by CST software which is (30 × 40 × 1.66) mm in dimension. A breast model is designed including tumor and cancerous tumors by specific tissue properties for observing the antenna performance in different cases. In free space, the return loss of the designed antenna is observed at −33.414 dB. Moreover, the S11 is examined in a normal breast, a breast including a normal tumor, and a breast including a cancerous tumor is −32.641 dB, −34.94 dB, and −35.22 dB respectively. It can be utilized on a human body phantom model due to its adaptability and reduced radiation properties. The proposed antenna is miniature in size, cost-effective, easily portable, and eco-friendly. It can be used as a first screening tool for breast cancer patients, particularly in resource-constrained regions. | |