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| **Title:** | Multiwalled Carbon Nanotube-Based On-Body Patch Antenna for Detecting COVID-19-Affected Lungs | | |
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| **Abstract:** |  |
| A novel rectangular patch antenna based on multiwall carbon nanotubes has been designed and developed for assisting the initial detection of COVID-19-affected lungs. Due to their highly conductive nature, each nanotube echoes electromagnetic waves in a unique manner, influencing the increase in bandwidth. The proposed antenna operates at 6.63, 7.291, 7.29, and 7.22 GHz with a higher bandwidth classified as an ultrawide band and can be used on a human body phantom model because of its flexibility and decreased radiation qualities. Flame retardant 4 is chosen as a substrate with a uniform thickness of 1.62 mm due to its inexpensive cost and excellent electrical properties. The maximum specific absorption rate of the proposed antenna is obtained as 1.77 W/kg for 10 g of tissues. For testing purposes, a model including all the known features of COVID-19-affected lungs is developed. The designed antenna exhibits excellent performance in free space, normal lungs, and affected lung environments. It might be utilized as a first screening device for COVID-19 patients, especially in resource-constrained areas where traditional medical equipment such as X-ray and computerized tomography scans are scarce. | |