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## Design and optimize microstrip patch antenna array using the active element pattern technique (Article) (Open Access)

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### Abstract

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Microstrip patch antennas are widely used in modern day communication devices due to their light weight, low cost and ease of fabrication. In this paper, we have designed and fabricated two Microstrip Patch Antennas (slotted-ring and truncated-slotted ring) and array at 2.4 GHz for Wireless Local Area Network (WLAN) applications using Computer Simulation Technology, CST. The antenna design consists of rectangular radiating patch on Rogers RT5880 substrate and is excited by using coaxial probe feeding technique. The truncated-slotted ring has been designed on top of the radiating patch to improve bandwidth. The simulation and measurement results of the both antennas are in close agreement with each other. Due to the good agreement of simulation and measurement results of truncated-slotted ring antenna in comparison with slotted-ring antenna, it has been selected for antenna array design. The simulated and measured S11 of truncated-slotted ring antenna shows -21dB and -15.6 dB at 2.4 GHz respectively. Then, the antenna has been formed into 1x4 array in order to observe its beamforming capability. The proposed antenna array is suitable for 802.11b/g/n Wi-Fi standard which is proposed to be used for IoT. © 2019 Institute of Advanced Engineering and Science. All rights reserved.

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