

DGS. The patch rectangular antenna is miniaturized by 10% from the initial patch, while the array patch antenna is miniaturized by 73% in the DGS model. The miniaturized patch antenna with DGS can achieve properties suitable for broadband applications.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

All the authors have contributed to this work. Riva, Yosi, and Yus designed the antenna. Riva and Yosi simulated the program and optimized the antennas' parameters. Yus analyzed the simulation and wrote the paper. Dian and Dwi analyzed the data and reviewed the paper. Yudi and Catur reviewed the paper to the final version. All the authors approved the final version of the paper.

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