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Design	Frequency Range (GHz)	Bandwidth (GHz)	Peak Gain (dBi)
Single Patch Antenna with no airgap	8.36-8.58	0.22	4.4
Single Patch Antenna with airgap and stacked patch	7.76-9.46	1.7	8.2
Array Antenna with airgap and stacked patch	7.5-9.8	2.3	12.5

CONCLUSION

In this project, we have come to the conclusion that the air gap between the substrates can improve antenna gain. To compare the proposed antenna performance with other substrate materials, the antenna is built with materials such as FR4. For proper comparison between all the horns, When comparing the performance of a stick, it is observed that the advantage of a pole designed using a 2x2 patch rod with air space, due to its low dielectric value does not change. From the analysis, it can be concluded that substrate materials with a fixed dielectric will provide high gain, but patch size will be high, and substrate materials with high dielectric will always provide low gain, but patch size. will below. Therefore, when a more efficient antenna is needed, low-density dielectric substrate materials may be used, and when low-profile antenna is required, high-density dielectric substrate materials may be used.

From this particular design, it can be concluded that a single airless antenna antenna has a maximum frequency of 8.58 GHz and a single air gap with a maximum frequency of 9.46 GHz but a 2x2 patch antenna has a very high frequency. 9.8 GHz which is the maximum of three.

In terms of bandwidth, you have a total bandwidth of 2.3 GHz and the advantage of the most important feature. The 2x2 patch array antenna has the advantage of all three which is 12.5 dB which is much higher than 4.4 and 8.2 GHz. Therefore, the proposed design is a complete development of antenna parameters.

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