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(57) Abstract :

The hollowed aperture pentagon model graphene slot antenna may be created with or without a cylindrical tube by concurrently shorting the feed line and bottom, both oscillate at 3.96 and 5.275 THz, respectively. Graphene is used for the patch material in the proposed antenna, while polydimethylsiloxane (PDMS), which has a low dielectric permittivity, is used for the substrate material. When the radiation parameters of the antenna without and with cylindrical tubes are evaluated, it is found that both configurations have substantial gain (at 5.275 THz and 3.96 THz, respectively) and directivity (at 10.8 dBi and 7.19 dBi). The difference between these two values is 4 dB. In comparison to more traditional antennas, these antennas have enhanced directivity, better gain, wider bandwidth, and greater radiation efficiency. The frequency multiband is made by moving the inner and exterior radii of the cylindrical shell inside the antenna that has been built. CST Studio 2016 was used to generate simulations of the predicted antennas and to run those simulations. The proposed antenna is essential for the transfer of data amongst satellites in orbit, as well as for the development of future 5G technologies and the biological detection of disease.

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