DUAL FREQUENCY ACTIVE AMPLIFIER TRANSMITTING ANTENNA WITH RESISTIVE EQUALIZATION

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Multifrequency antennas are taking great importance nowadays due to the great increase of the mobile frequency spectrum. For that reason multiple antennas for double or triple band behaviour have been studied during last years. One option to obtain dual frequency or broad bandwidth with patch antennas is to set a parasitic patch over the main patch to increase the bandwidth or to achieve a second resonant frequency. This behaviour can also be modelled by some displacements or asymmetries in the position of the upper or parasitic patch [1].

Other topic that must be considered is the antenna efficiency and the EIRP transmitted by the antenna. These two topics yield to the concept of active transmitting antenna. The problem of constructing amplifier transmitting antennas has been frequently addressed [2]. However these active antennas have been designed to work in only one frequency band. It would be interesting to design active dual frequency antennas.

To do this, it has been proposed the usage of resistive equalized broadband amplifiers [3]. The reason for this is double fold: using resistive equalisation allows to obtain broadband amplifiers; besides the equalisation resistance can be used to equalise both frequencies of the antenna at the same time. This idea has been followed to design and construct a dual frequency active amplifier transmitting antenna for the band from 1.2 to 2.5 GHz. Besides, the equalisation effect can also help to improve the matching in some dual frequency antennas that do not exhibit a second resonant frequency completely matched.

[1] Bandwidth Enhancement in Non-Centered Stacked Patches; E. Rajo-Iglesias, D. Segovia-Vargas, J.L. Vázquez-Roy, V. González-Posadas y C. Martín-Pascual; Microwave and Optical Technology Letters, October 2001; pp. 53-56

[2] Microstrip antenna design handbook, Grag et all, Artech House Chapter 11 devoted to active antennas.

[3] Broadband amplifier with resistive equalisation, F. Pérez, V. Ortega, IEEE Trans. On MTT, april 1984.