

Dual-Band Array using Fracton-Mode Microstrip Antennas based on Sierpinski Fractal

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Fractal technology has been demonstrated as a viable application to design miniature, multifrequency, and high-directivity antennas [C.Puente, “Fractal Antennas”, Ph.D. Dissertation at the Dept. of Signal Theory and Communications, Universitat Politècnica de Catalunya, Spain, July 1997], [C.Borja, “Fractal microstrip patch antennas with fractal perimeter and self-affine properties, Ph.D. Dissertation at the Dept. of Signal Theory and Communications, Universitat Politècnica de Catalunya, Spain, July 2001], [J.Anguera, “Fractal and broadband techniques on miniature, multifrequency, and high-directivity microstrip patch antennas, Ph.D. Dissertation at the Dept. of Signal Theory and Communications, Universitat Politècnica de Catalunya, Spain, July 2003], [J.Soler, “Novel Multifrequency and Small Monopole Antenna Techniques for Wireless and Mobile Applications ”, Ph.D. Dissertation at the Dept. of Signal Theory and Communications, Universitat Politècnica de Catalunya, Spain, April 2005].

In this paper, the authors show the application of fractal technology to obtain multifrequency microstrip patch array antennas, in particular, a dual-band array antenna. This invention makes use of a radiating element excited at different fracton modes [J.Anguera, C.Puente, C.Borja, R.Montero, and J.Soler, “Small and High Directivity Bowtie Patch Antenna based on the Sierpinski Fractal”, Microwave and Optical Technology Letters, vol.31, n°3, pp.239-241, Nov 2001.]. When the antenna element is excited at a fracton mode, a broadside radiation pattern is obtained. The purpose of the invention is to obtain dual-band operation having a frequency ratio of two and having in both bands a broadside radiation pattern [“Undersampled Microstrip Array Using Multilevel and Space-Filling Shaped Elements”, patent app. N° PCT/EP02/07835].