

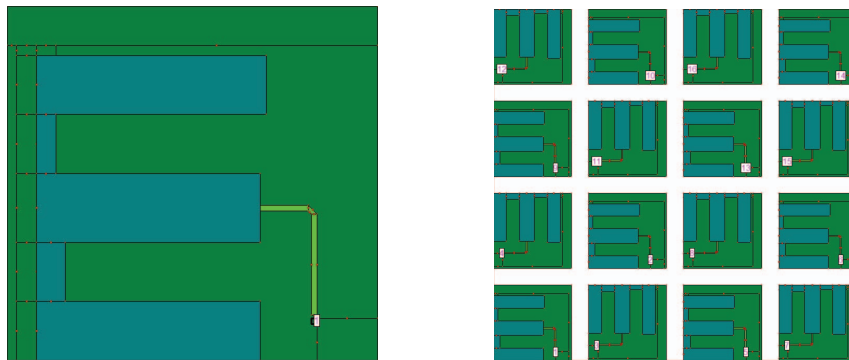
Enhanced Bandwidth 4x4 Antenna Array consisting of E-shaped Elements

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Regarding the increasing demand for bandwidth, as well as the need for reliable communications in terms of gain and polarization, an antenna array consisting of 16 E-shaped elements is proposed. The frequency band, in which the array operates, is allocated for aeronautical and maritime radio-navigation, radiolocation, satellite-conducted earth exploration and fixed satellite communications, namely from 9 to 11 GHz.

Previous work exploiting E-shaped antenna elements focused in lower frequency bands (Jiang Xiong, Zhinong Ying, and Sailing He, "A Broadband Low Profile Patch Antenna of Compact Size With Three Resonances", *IEEE Transactions on Antennas and Propagation*, Vol. 57, No. 6, June 2009), achieving a simulated fractional bandwidth of 16.5%. The proposed array operates in higher frequencies, while simultaneously counters polarization issues, offering both horizontal and vertical polarization, and also exhibits a pretty much constant gain value throughout the bandwidth of interest.

The proposed array sizes 42x42 mm. It consists of 16 E-shaped elements, each of them lying above a 9.5x9 mm ground plane, using air as dielectric. The elements are 5.9x7.75mm and are probe-fed from a Butler matrix. The array demonstrates a fractional bandwidth of 20% around the central frequency of 10 GHz, notable gain of about 10 dBi throughout the bandwidth of interest and polarization diversity due to the relative perpendicular position of the antenna elements. Return Loss, Current Distribution, Input impedance, VSWR and Radiation Pattern results are available, they display compensatory behaviour and will be presented at the conference.



Single E-shaped element and 4x4 element array.