Abstracts

Bowtie patch antennas and simple arrays for wireless indoor communications

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Several bowtie patch-antenna configurations are studied for their suitability for use in broad-band indoor wireless communications. A microstrip bowtie antenna (MBA), based on the design of equilateral triangular patches, is first designed and tested. The same design is used to realize a coplanar-waveguide bowtie antenna (CPWBA) with finite ground plane. The CPWBA is coax-fed from its apex and matched in C-band. The resonant slot length of this antenna is around three times that of the guided wavelength. The measured gain for the CPWBA antenna is 8.1 dB. The same MBA is also used in the realization of (1/spl times/2)-, (2/spl times/1)-, and (2/spl times/2)-element MBA arrays. The MBA and resultant arrays use microstrip feed networks matched to the input impedance at around 10 GHz. The gain of the MBA is 6.2 dB; the gains for the arrays vary within 13.7 and 17.3 dB. The 2:1 voltage standing-wave ratio bandwidths lie in the 9.7%-10.8% range for the realized antennas. The radiation patterns can be optimized to fit the required diversity for the specific indoor wireless communication environment; the beamwidths are demonstrated to vary between 15/spl deg/ and 85/spl deg/, which allow for multipath minimization and radiation diversity within the premises, thereby providing interference-free illumination.

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