Optimum Design of Low-Cost Dual-Mode Beam-Steerable Arrays for Customer-Premises Equipment Applications

ABSTRACT

Two novel designs of dual-mode beam-steerable array antennas are proposed for customer-premises equipment applications. To obtain the optimal distribution of excitations for the arrays, the gain and front-back ratio of the array systems are optimized by using the method of maximum power transmission efficiency. The first design operates at 2.45GHz and uses four folded monopoles of height <1/10 wavelength and a sleeve of height of 1/4 wavelength underneath the monopoles. The peak gain and the front-to-back ratio are 6.7 dBi and 7.8 dB respectively. The second design operates at 830MHz and uses four Yagi monopoles as elements with a common reflector and four directors. The peak gain and the front-to-back ratio for the second design are 6.0 dBi and 16.8 dB respectively. The proposed antennas have advantages including: low cost and compact size; dual-mode operation including the modes of omnidirectional radiation and directional radiation; and in the mode of directional radiation, the beam can be electronically steered to achieve the full coverage of the azimuthal plane. It achieves higher gain than the traditional electronically steerable passive array radiator antenna.

EXISTING SYSTEM

- a new single-anchor indoor localization concept employing ESPAR antenna with a simple fingerprinting algorithm has been proposed.
- In an ESPAR array, only one driven element is connected to the RF port while other elements are parasitic elements with reactive or resistive loads which can be electronically controlled by changing the DC voltages of the varactors, etc.

PROPOSED SYSTEM

- Two novel designs will be investigated to demonstrate the advantages of the method.
- Our first design is a four-element folded monopole array antenna operating at 2.45 GHz, in which the height of the elements is less than wavelength/10 with a copper sleeve as ground.
- The four-element folded monopole array is capable of beam scanning in the horizontal plane and has a direct ional gain of 6.7 dBi, which is 2.7dB higher than the seven-element ESPAR antenna of

SYSTEM REQUIREMENTS

HARDWARE REQUIREMENTS:

- Processor - intel core i3
- RAM - 2GB
- Hard Disk - 20 GB

SOFTWARE REQUIREMENTS:

- Ansoft HFSS(High Frequency Structure Stimulator)

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