

A novel green antenna phase-shift system with data acquisition boards

Abstract

A novel green phase shifter system is proposed in this research. The system is developed by a combination of reconfigurable beam steering antennas and data acquisition (DAQ) boards. A combination of two reconfigurable beam steering antennas, located side-by-side, forms a spatial configuration structure with a fabricated 'green' element plank of rice husk placed in between. The concept of a spatial configuration technique has been 'mutated' by shifting the structure of spiral feed line and aperture slots of first beam steering antenna by as much as 45° . The PIN diode switches connected to the DAQ boards enable the intelligent capability of the spatial antennas. The activation of certain degree radiation patterns of either the first beam steering antenna or the second beam steering antenna depends on the memory of the DAQ boards | Beam Manager. When an intruder comes from the cardinal angles of $0^\circ=360^\circ$, 90° , 180° , or 270° , its range and angles' location will be automatically detected by the first antenna through the output ports of the 1st DAQ: P1.0, P1.1, P1.2, and P1.3. The second antenna is then activated by the output ports of the 2nd DAQ: P2.0 up to P2.3, to adaptively maneuver the beam towards four different ordinal directions of 45° , 135° , 225° , and 315° .