UPSWING THE BANDWIDTH AND DIMINISH THE SIZE OF RECTANGULAR FLAT PANEL DIRECTIONAL DEVICE WITH METAMATERIAL COVER

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ABSTRACT

Rectangular flat panel directional device with putative metamaterial cover at resonating frequency 2.292 GHz shows impressive increment in bandwidth and reduction in size as compared to lone flat panel directional device. Putative metamaterial cover improves bandwidth by 193%, cut down size by 32% and reduces return loss by 200%. Double negative left handed metamaterial structure was introduced as a cover to the rectangular flat panel directional device at a height of 3.2mm from the ground plane.

The purpose of this work is to design a compact and efficient directional device with simultaneous negative permittivity and permeability or so-called LH MTM. Nicolson-Ross-Weir approach has been used for verifying the double-negative properties of the suggested double negative metamaterial cover.

KEYWORDS: Rectangular Flat Panel Directional Device (RFPDD), Left-Handed Metamateria (LH-MTM), Permittivity and Permeability, Nicolson-Ross-Weir (NRW)