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DESIGN OF WAVEGUIDE ARRAYS TO PRODUCE LOW SIDE LOBES

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ABSTRACT

Antenna is a radiating element which radiates in all directions into space. The antenna is used in wireless communication systems for the transmission and reception .single antenna element is not sufficient to produce required gain and bandwidth. That is the reason why arrays are designed by researchers.

Array is nothing but a group of elements arranged in rows (linear) or rows and columns (planar) which provides more gain and bandwidth. In an array system the main beam width is reduced by increasing number of elements, hence the gain and directivity is increased. The side lobe level of a linear array is -13.5 dB which is most advisable for point to point communication. In the present work by using standard amplitude distribution is used to reduce the side lobe level is reduced up to -22.0 dB and which is compared with the uniform linear array. Plots are drawn for small and large arrays from N=10, 20and 40.

In the present work the practical element arrays are designed for small and large arrays .the results are compared with the ideal arrays which came with good agreement. The practical element used in the present work is waveguide. The standard rectangular waveguide are used in this work to produce narrow beams and high gain, by neglecting inter element interference the designed wave guide arrays for N=10,20,40 by adopting standard amplitude distribution to these arrays side lobe level are also reduced and are compared with the isotropic arrays. The results come up with good agreement.

KEYWORDS: Antenna Array, Array Synthesis, Waveguide Array, Parabolic Amplitude Distribution, Pattern Multiplication