

عنوان مقاله:

A New Approach to Synthesis of a Quasi Non-Uniform Leaky Wave Antenna

محل انتشار:

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خلاصه مقاله:

Background and Objectives: In this paper, a closed-form mathematical formula has been presented using of the proposed periodic structure E-field distribution, that helps designers to calculate the width of the slots in Quasi Non-Uniform Leaky Wave Antenna (QNULWA). **Methods:** This method is based on two steps. In the first step, some important parameters for the proposed antenna design will be extracted using simulation. In the second step, by solving a discrete differential equation, a general relation will be obtained for these types of antennas. This method has been investigated in the case of slot LWA families. **Results:** A Leaky wave antenna has been synthesized in the ۱۵.۵- ۱۸ GHz frequency range for Gaussian radiation pattern. The results of simulation and antenna design will be very close to each other in ۲.۵ GHz Bandwidth (۱۵.۵ - ۱۸ GHz), which shows the accuracy of this formula. Also, By changing the frequency range ۲-۵ GHz, the main lobe direction of the antenna will scan the space approximately ۱۰ degrees (from ۶۳ to ۷۳ degree). The antenna has an SLL value of about -۲۵ dB and ۱۳ dB Gain at whole band ۱۵.۵-۱۸ GHz. **Conclusion:** The obtained formula helps the antenna designers to calculate the dimensions this type of antenna for any pattern distribution.

کلمات کلیدی:

Leaky Wave Antenna (LWA), Quasi Uniform LWA, Quasi Non ULWA, Waveguide Antenna

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