

Impedance Matching of Axial Mode Helical Antennas

Authors : Hossein Mardani, Neil Buchanan, Robert Cahill, Vincent Fusco

Abstract : In this paper, we study the input impedance characteristics of axial mode helical antennas to find an effective way for matching it to 50 Ω . The study is done on the important matching parameters such as like wire diameter and helix to the ground plane gap. It is intended that these parameters control the matching without detrimentally affecting the radiation pattern. Using transmission line theory, a simple broadband technique is proposed, which is applicable for perfect matching of antennas with similar design parameters. We provide design curves to help to choose the proper dimensions of the matching section based on the antenna's unmatched input impedance. Finally, using the proposed technique, a 4-turn axial mode helix is designed at 2.5 GHz center frequency and the measurement results of the manufactured antenna will be included. This parametric study gives a good insight into the input impedance characteristics of axial mode helical antennas and the proposed impedance matching approach provides a simple, useful method for matching these types of antennas.

Keywords : antenna, helix, helical, axial mode, wireless power transfer, impedance matching

Conference Title : ICAP 2021 : International Conference on Antennas and Propagation

Conference Location : New York, United States

Conference Dates : June 03-04, 2021