

EXPERIMENTAL VALIDATION OF A WIDEBAND HYBRID MONOPOLE

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ABSTRACT

This presentation will discuss experimental and simulation results on improving a wideband linear monopole antenna with distributed resistive loading (T. P. Montoya and C. M. Winkler, "Improved Monopole with Discrete Inductive and Distributed Resistive Loading," USNC/URSI National Radio Science Meeting, Denver, CO, paper WE-UB.1P.7, July 10-15, 2022.). The original wideband antenna is a monopole constructed on a copper-clad planar microwave substrate. It was comprised of a copper trace running from the feed to near the mid-point with a 610 Ω resistive trace from there to the open end with an overall length of approximately 140 mm. This monopole had a nearly constant input impedance over a range of frequencies from 700 to 1300 MHz. Our research seeks to improve the wideband impedance performance of the antenna, e.g., flattening the resistance and minimizing the reactance, while maintaining acceptable radiation patterns, by incorporating discrete inductive loading near the feed. To validate the results of numerical simulations, we constructed the monopole(s) using a series of Coilcraft® 0603HP Series chip inductors. For the experimental measurements, the monopoles were mounted on a 91.4 × 101.6 cm copper ground plane and connected to a Keysight E5063A Network Analyzer. The numerical and experimental results will be presented and discussed during the presentation.