

EXPLORING 3D PRINTED ANTENNA DESIGN OPPORTUNITIES

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This presentation outlines the innovative work being conducted by Black Art Technologies (BAT) in the field of antenna design using 3D printing technologies. The paper reviews how 3D printers are being utilised in tandem with materials like dielectric 3D printer filament from companies like Rogers [1]. However, the focus of BAT's research is not on using plastic as a fundamental part of antenna design, but on exploring the structural and electrical potentials that 3D printing offers other than the plastic dielectric itself.

A key aspect of this technology is its ability to simplify design cycles through rapid prototyping and to enable the production of complex, traditionally expensive machine components at a lower cost using plastic. This advancement is particularly beneficial for small businesses, which often face resource limitations. The presentation will showcase a WiFi 6E dish with a spiral feed as a case study, delving into the lessons learned and upcoming challenges. These challenges include understanding 3D printer buzzwords, selecting the appropriate plastic, building large antennas, and methods for metallising plastic. This work represents a significant stride in antenna technology, making advanced development more accessible and opening new avenues for innovation.

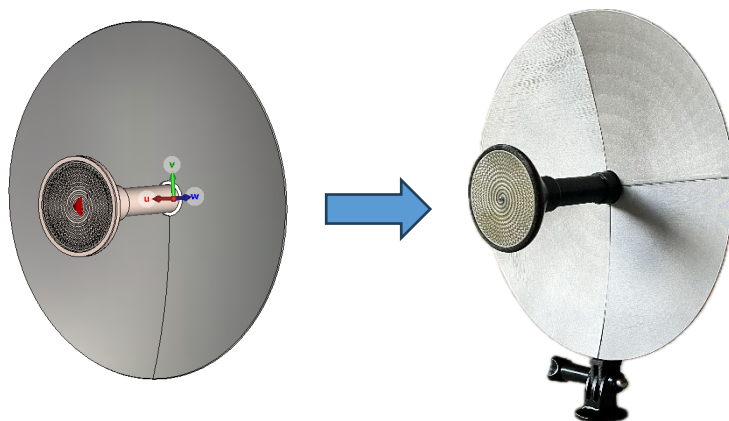


Fig. 1: Simulated and assembled 3D Printed WiFi 6E Dish Antenna

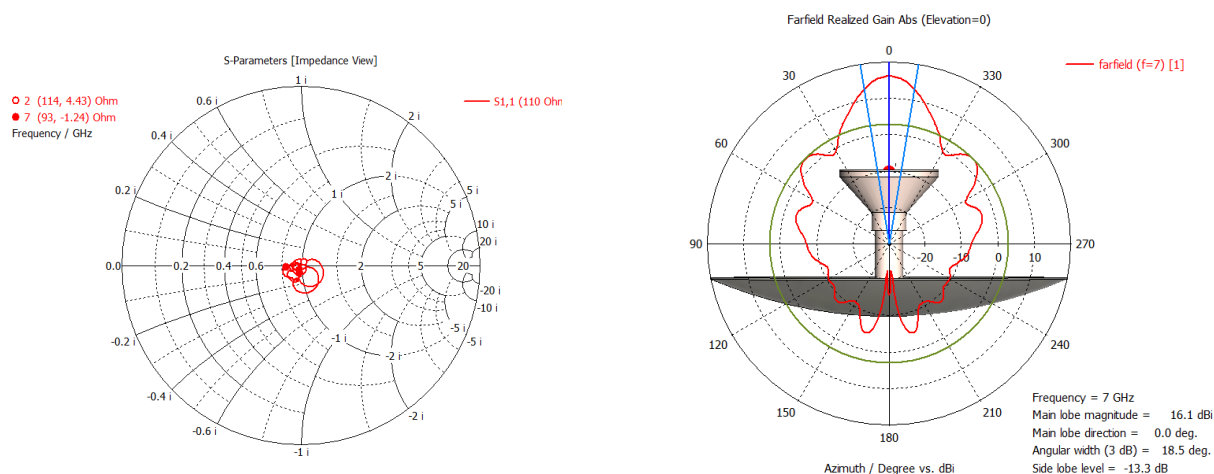


Fig. 2: Simulated Impedance response and 2D 7GHz radiation pattern

[1] <https://rogerscorp.com/advanced-electronics-solutions/radix-printable-dielectric>