

Final Report

ECE431 | Antenna Theory and Design

Group 4

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Topic

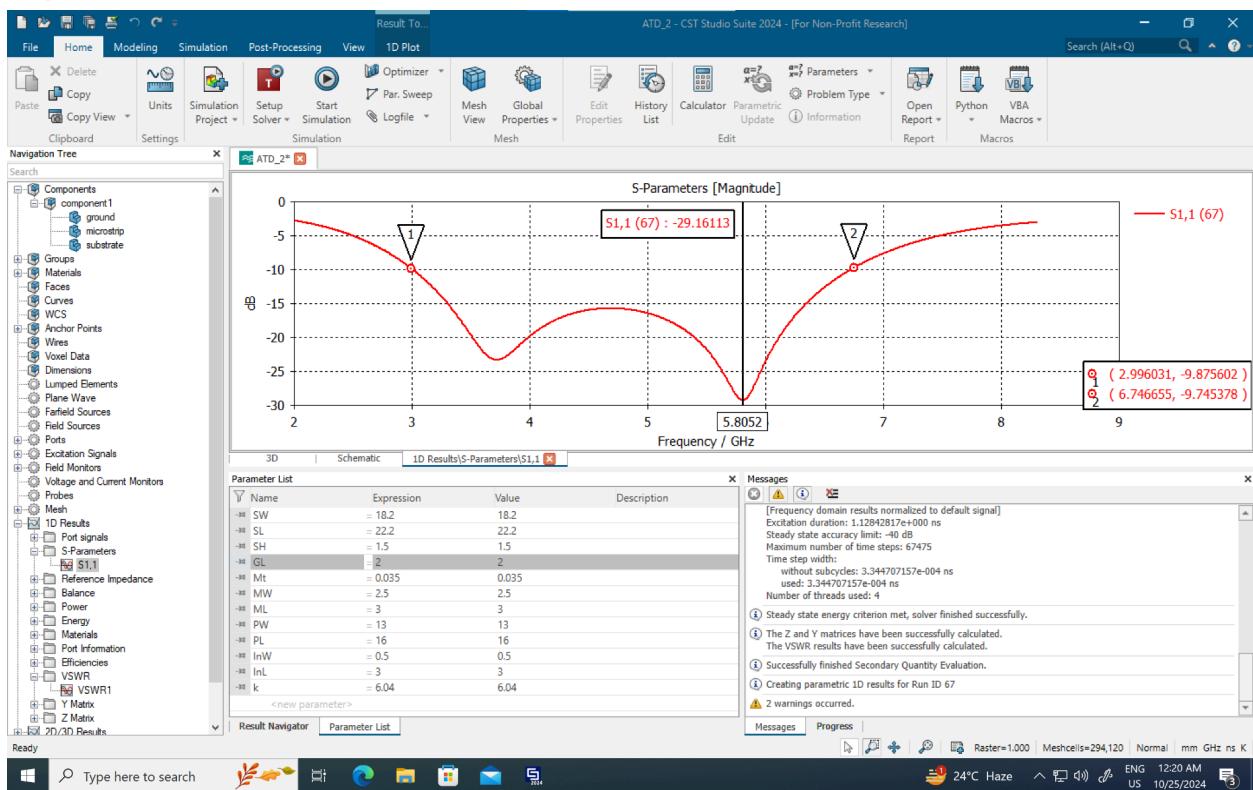
Design a patch antenna with a resonant frequency of **5.8 GHz**.

Optimize for wide bandwidth (BW>70%).

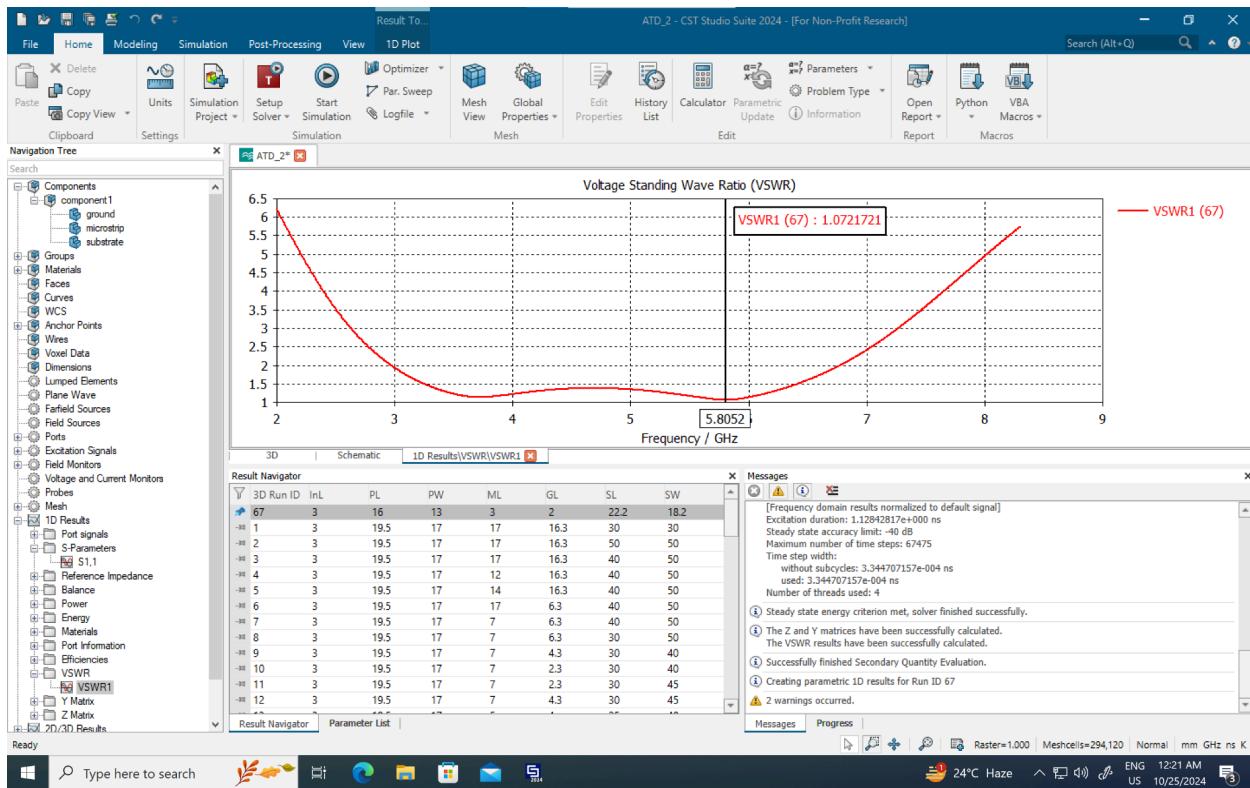
We have managed to design a patch antenna with resonant frequency of around 5.8032 GHz and a Bandwidth of nearly 70% using principles of partial grounding, adding insets, and tweaking the substrate material dielectric constant.

Material of the substrate is Rogers -RO 3003 (lossy) [Epsilon =3]

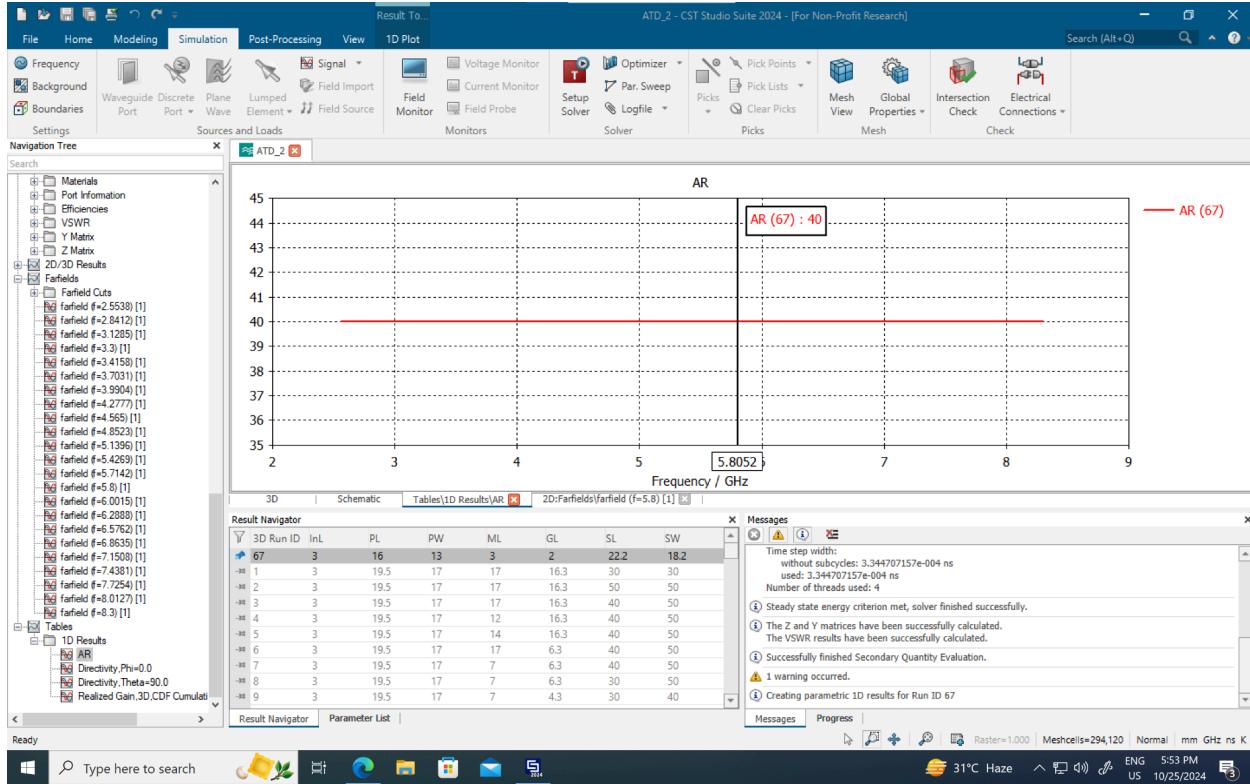
Impedance Bandwidth



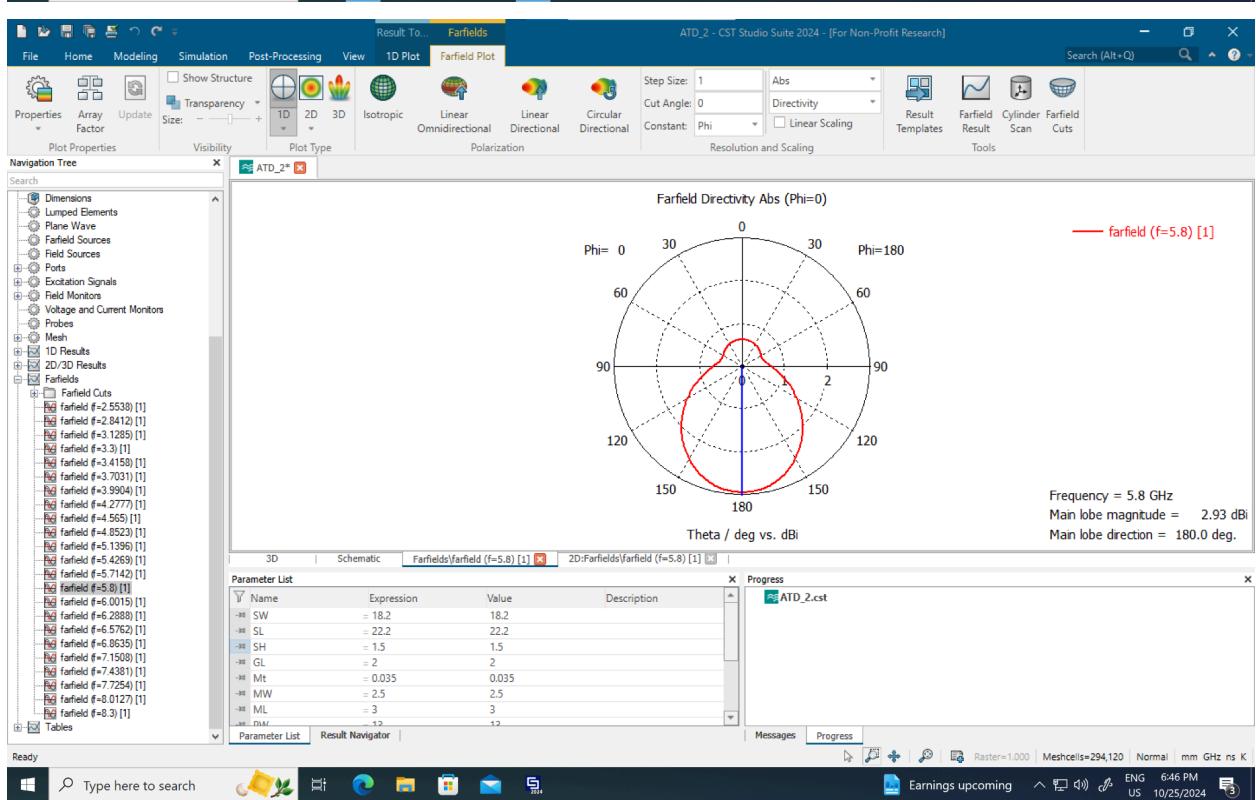
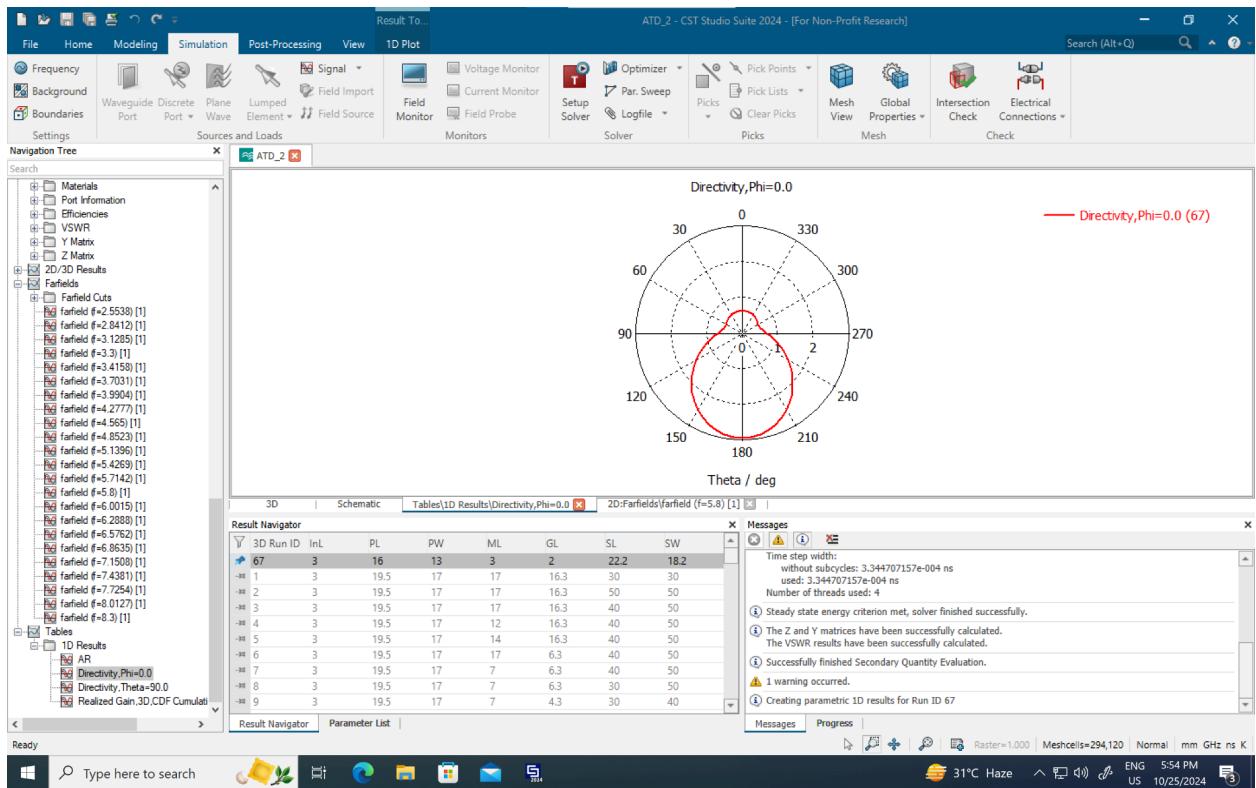
VSWR

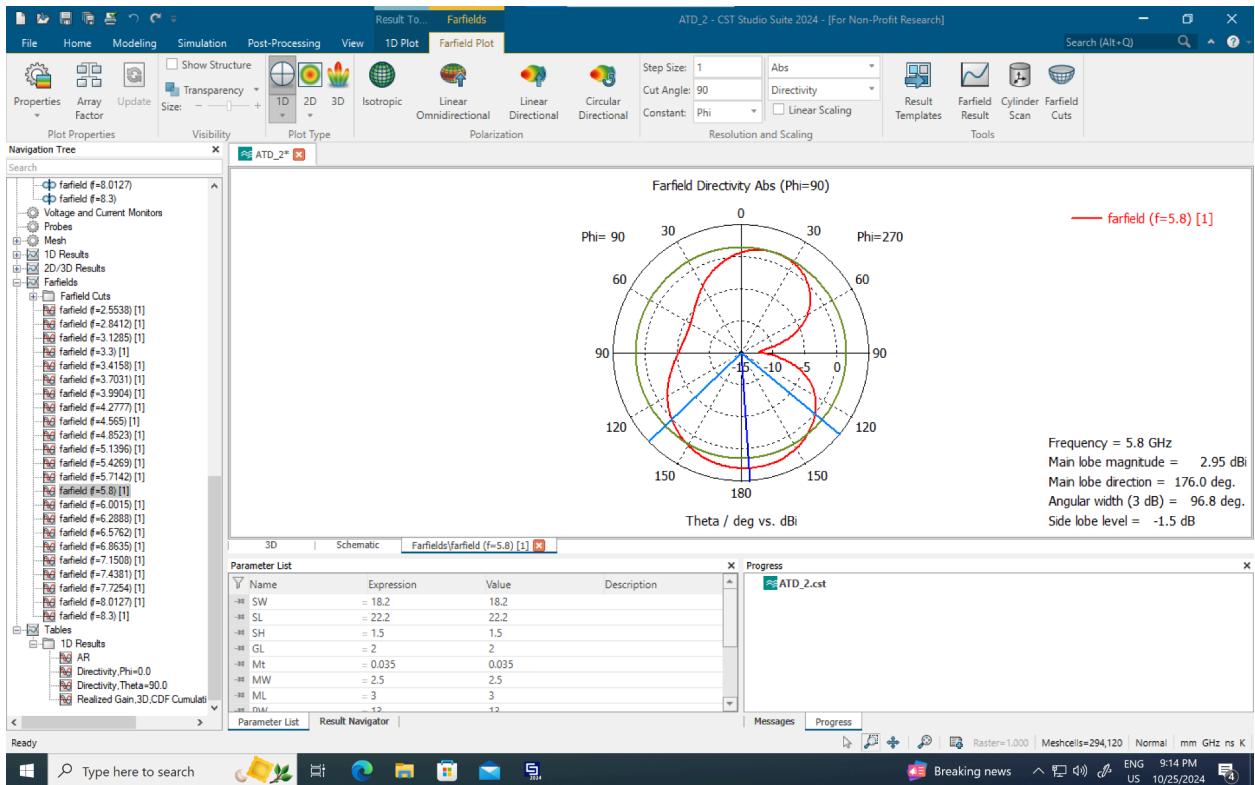


Axial Ratio as a function of frequency

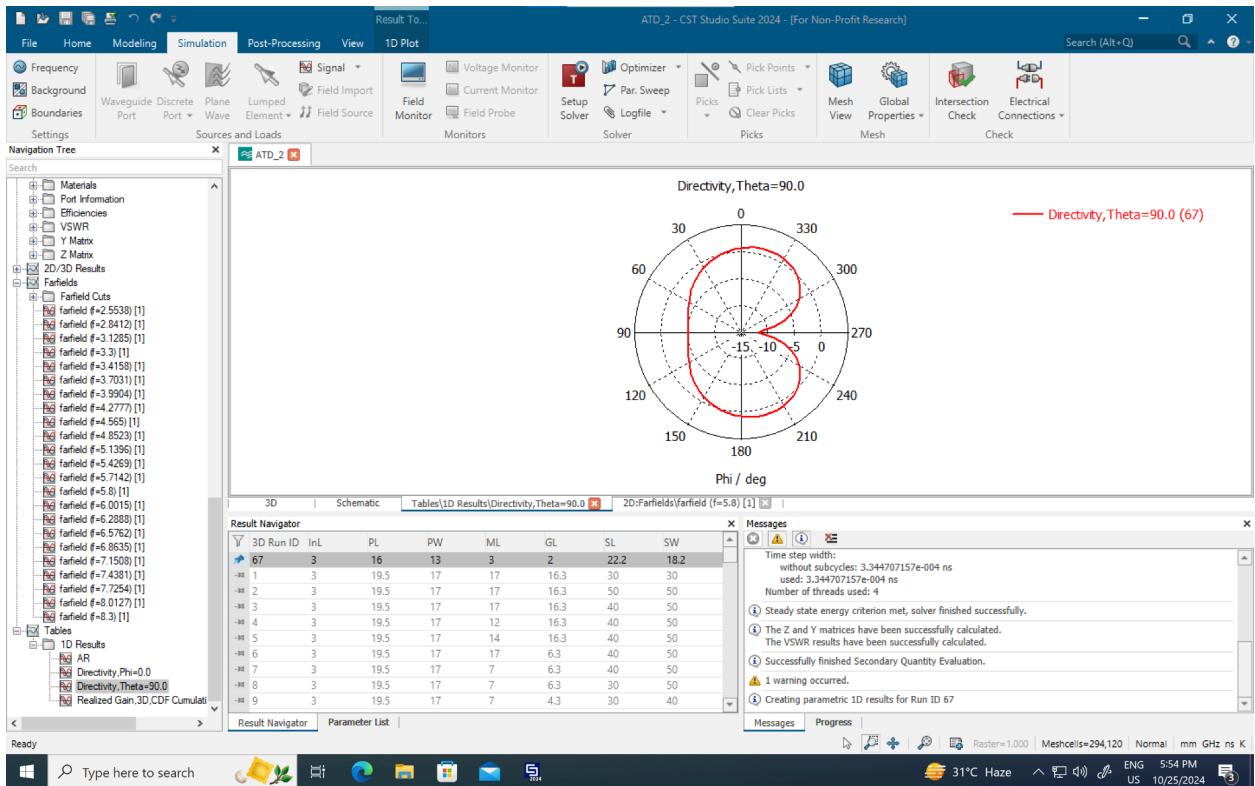


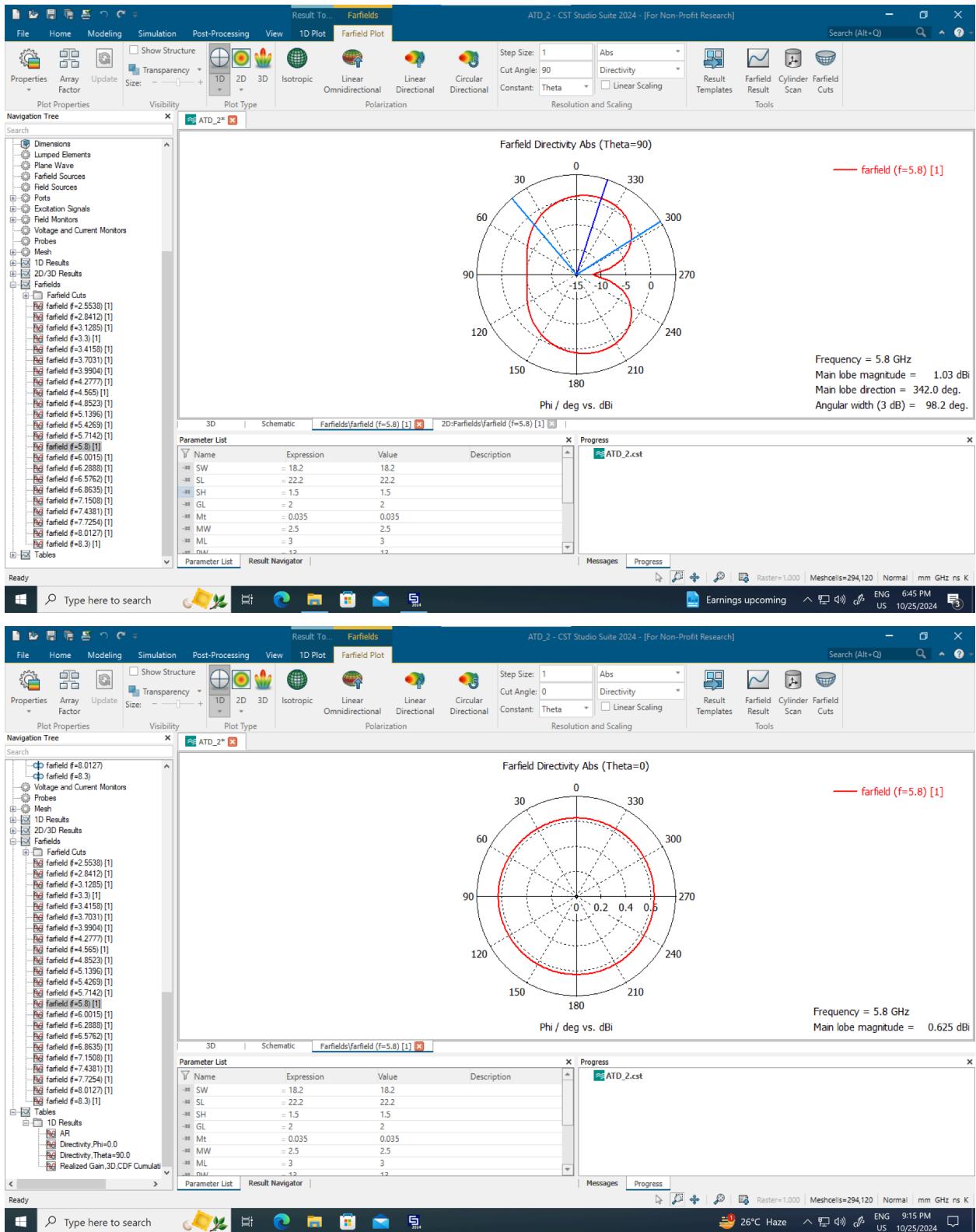
2-D polar plot for Elevation radiation pattern at design frequency



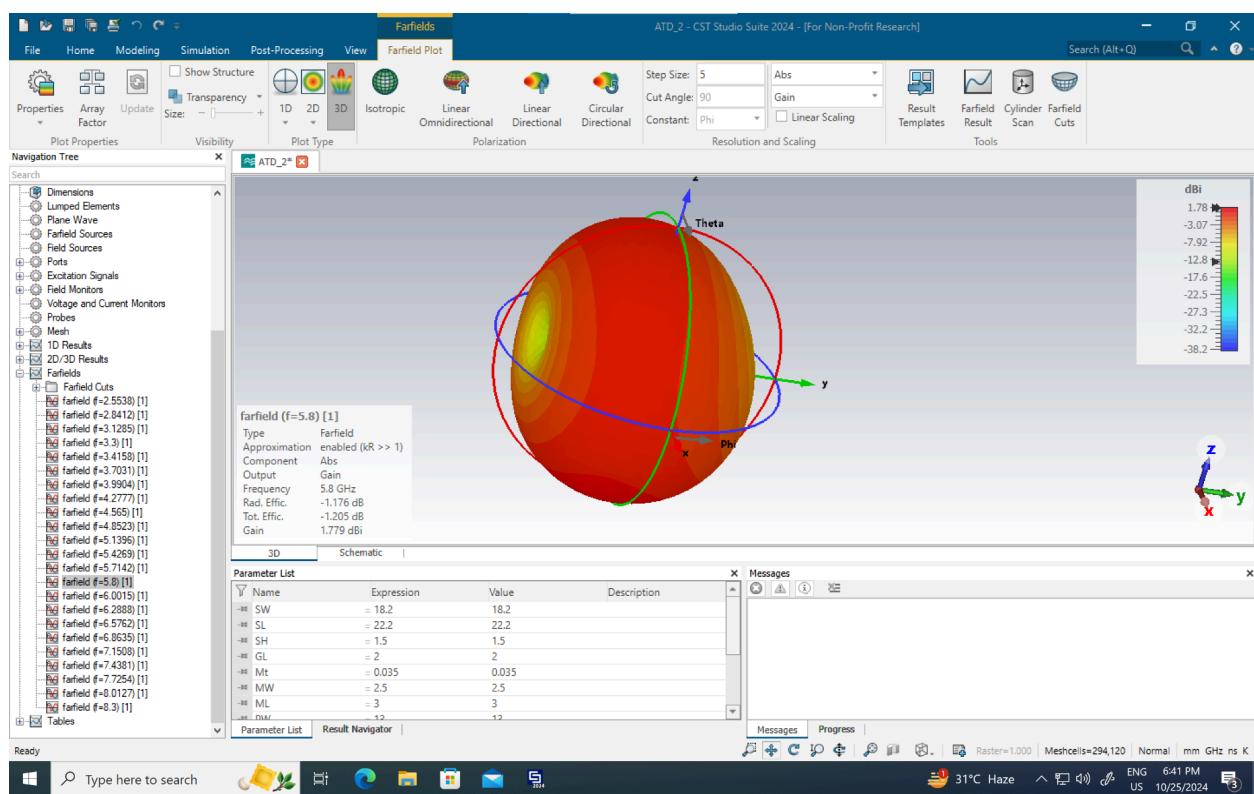
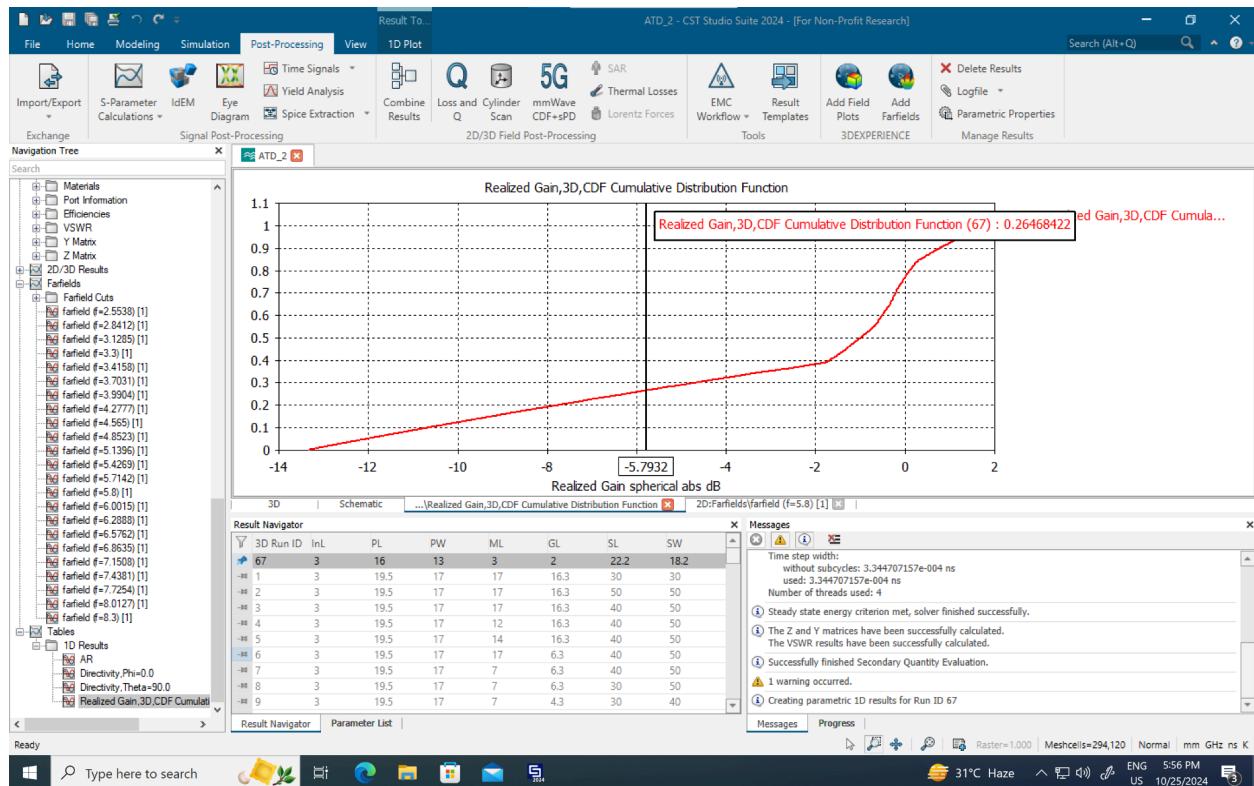


2-D polar plot for Azimuth radiation pattern at design frequency

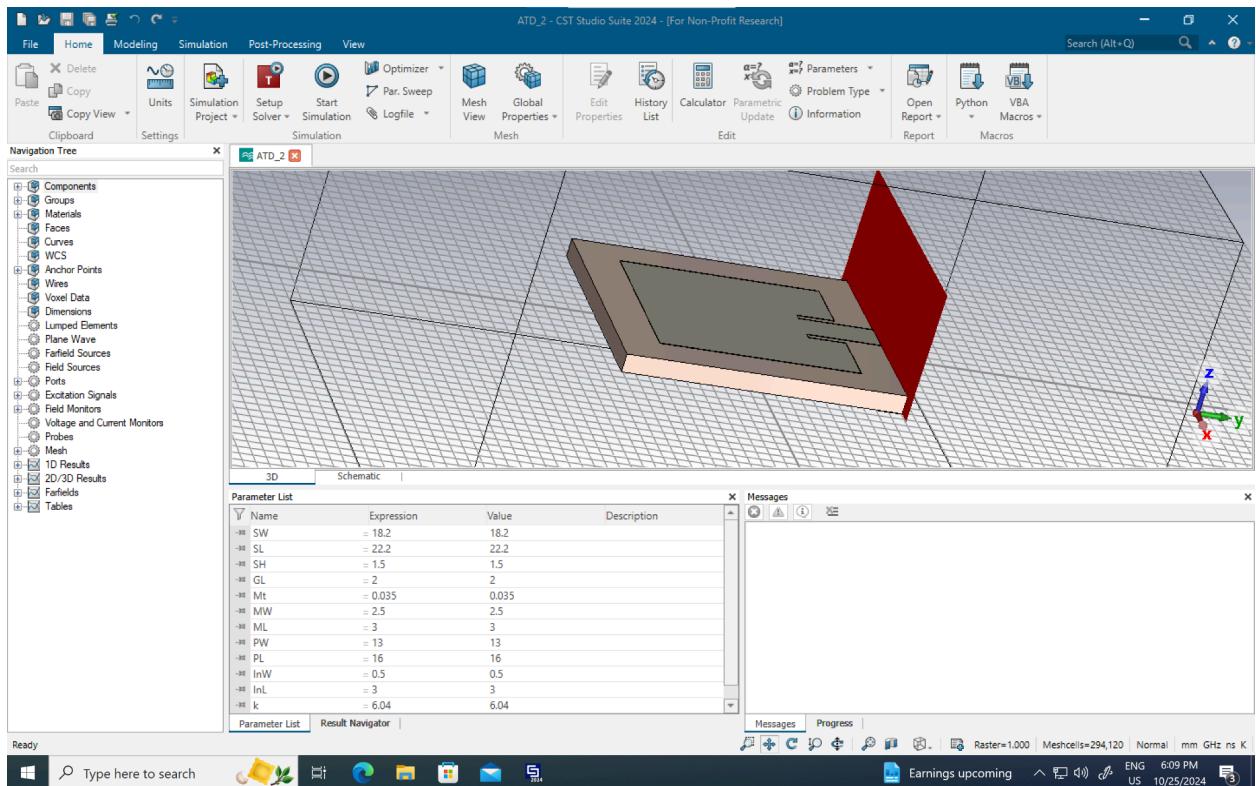




3-D radiation pattern indicating realized gain



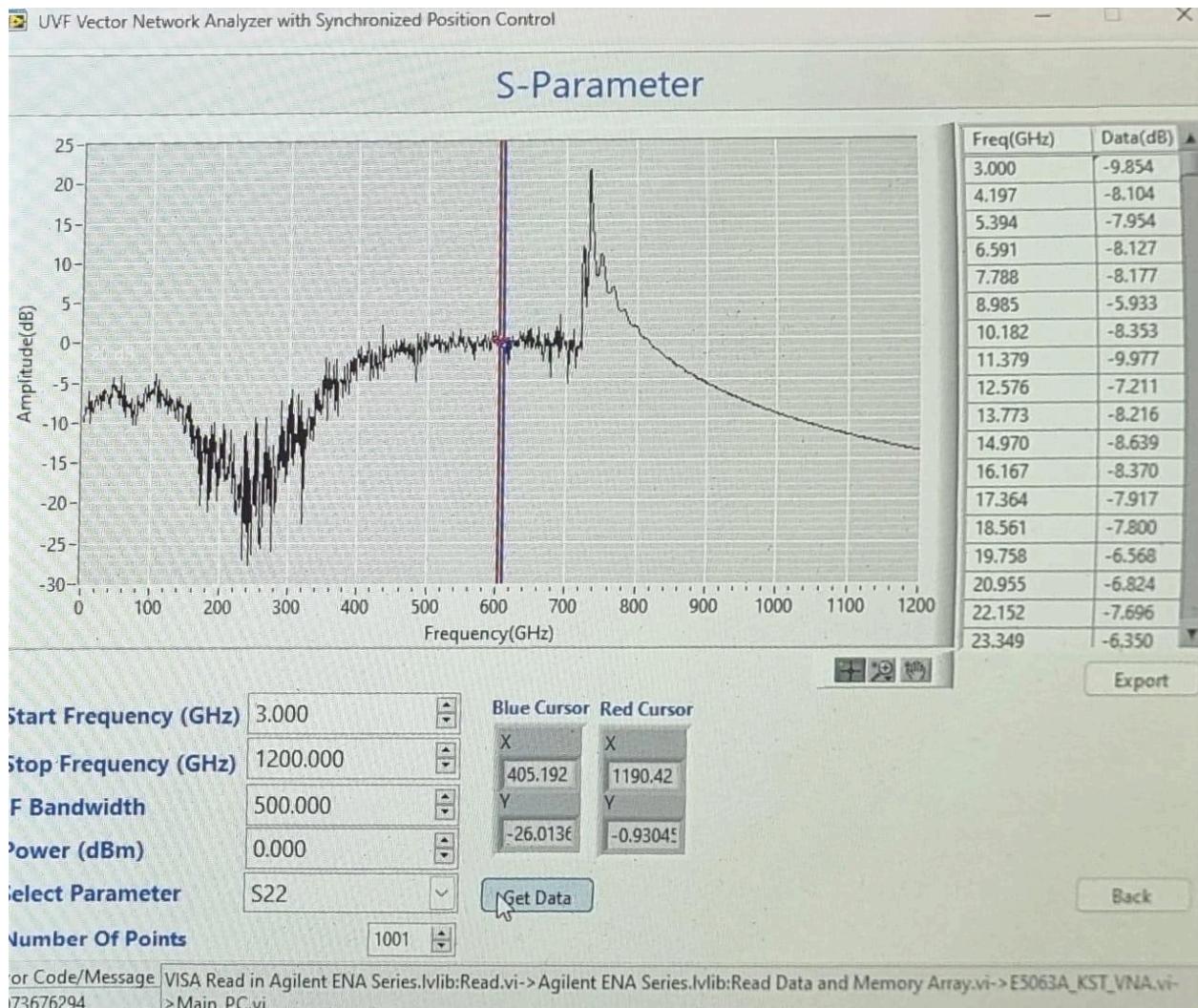
Antenna (with all parameters)

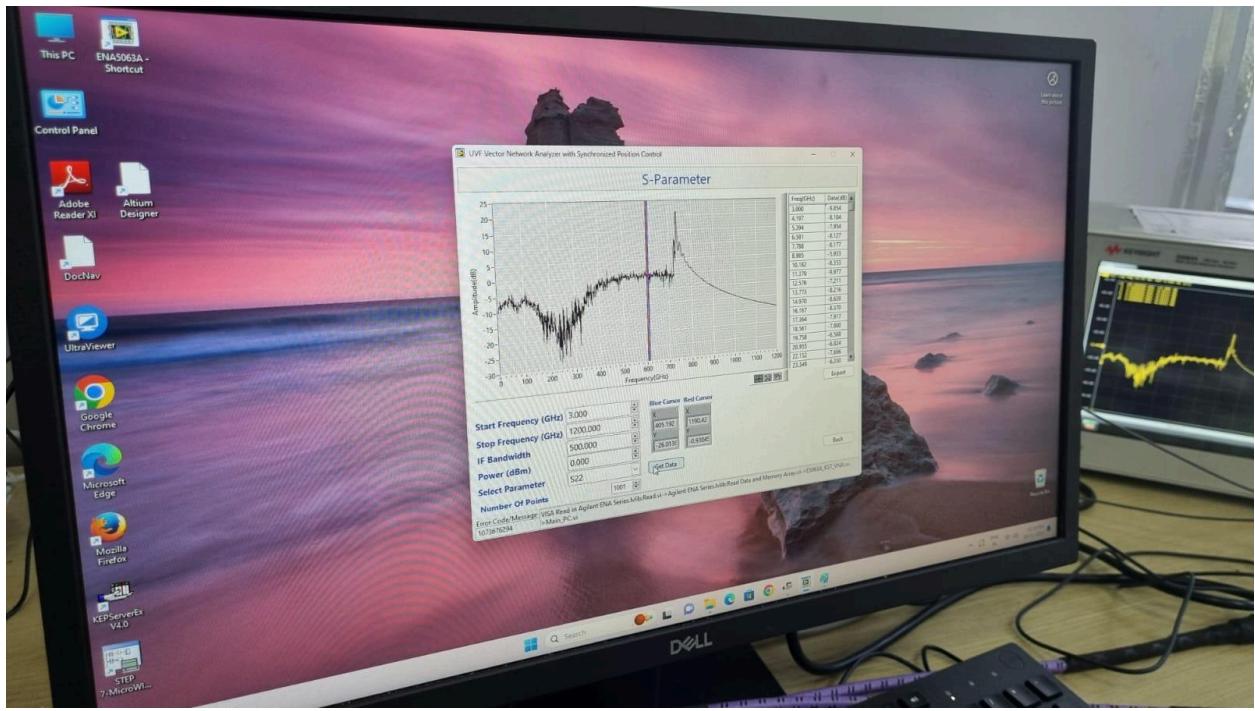


- **Axial Ratio = Major Axis/MinorAxis**
- **Bandwidth = [(F_high - F_low)/F_centre]x100**
- **VSWR = (1 + |r|) / (1-|r|)**

Measurement Results

S11 results:





Azimuth Pattern:

