# 2023-24(II) Semester Report: Antenna and RIS Research

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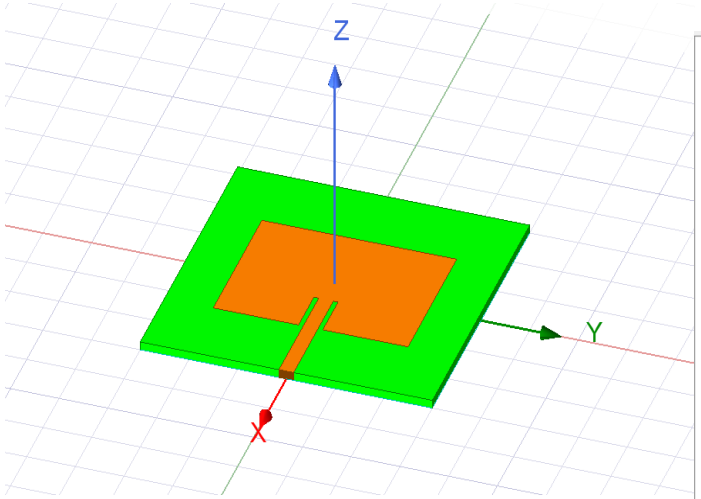
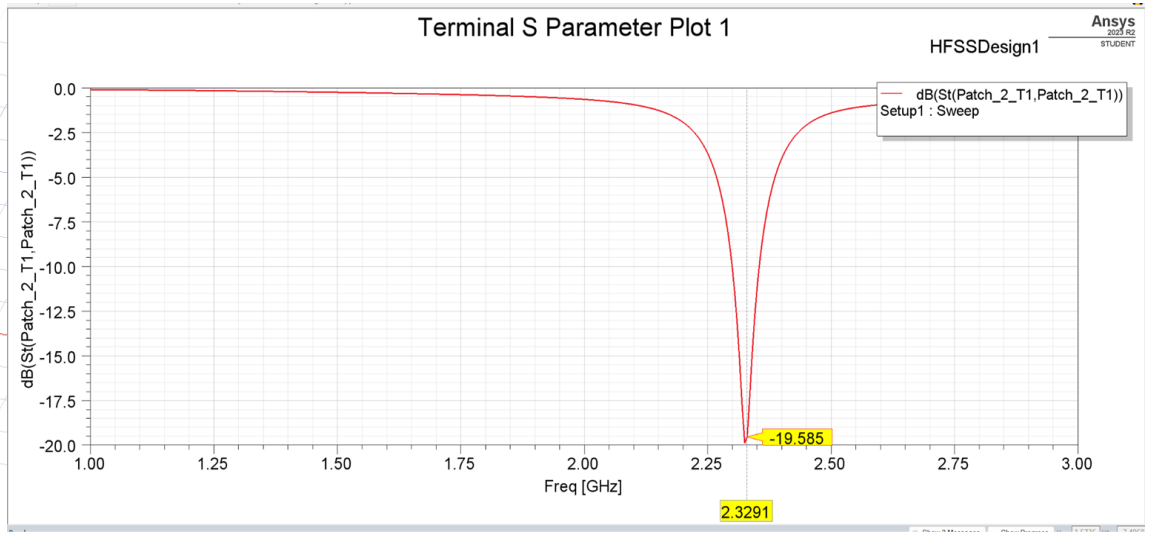
# Overview of Work Done

1. Covering Antenna Fundamentals from Slides
2. Microstrip Patch Antenna Simulation to understand HFSS
3. X/Ku/Ka Band Antenna Research Paper Implementation

# Microstrip Patch Antenna

Using ANSYS HFSS simulated a 30mm X 40 mm Patch to operate at 2.4GHz.
As shown in the results it is matched at -19.5dB at 2.32GHz.

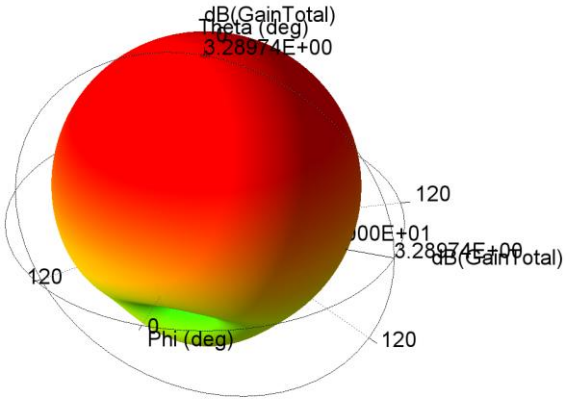


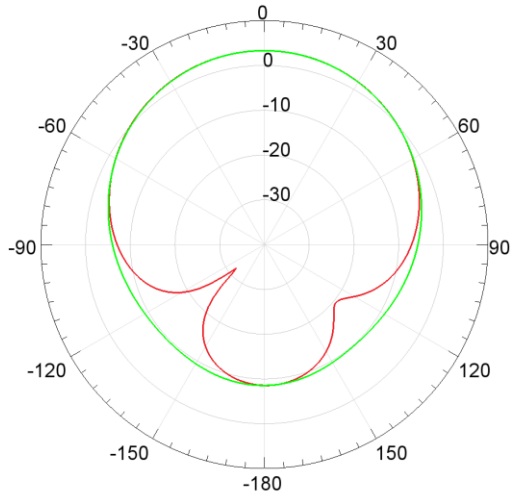
# Microstrip Patch Antenna

Using ANSYS HFSS simulated a 30mm X 40 mm Patch to operate at 2.4GHz. Here are the Gain Plots.

Gain Plot 1

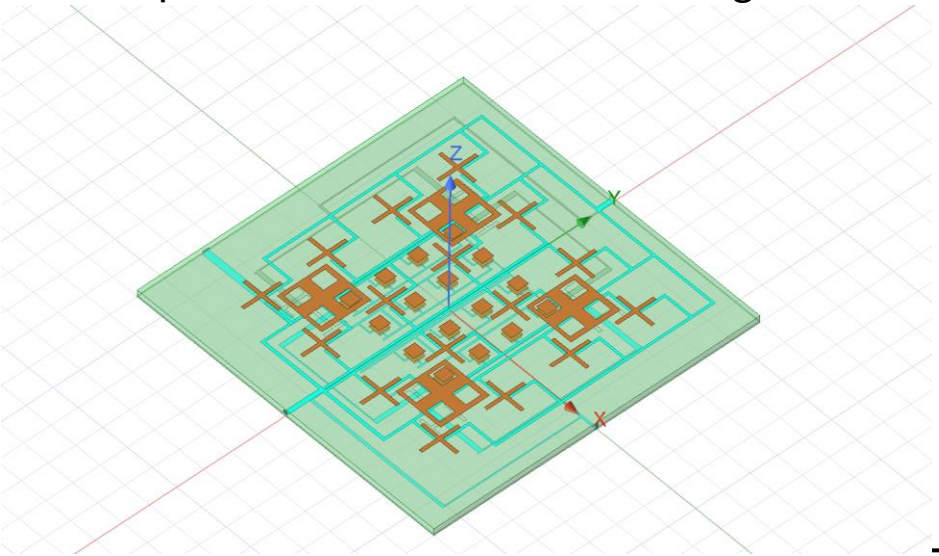


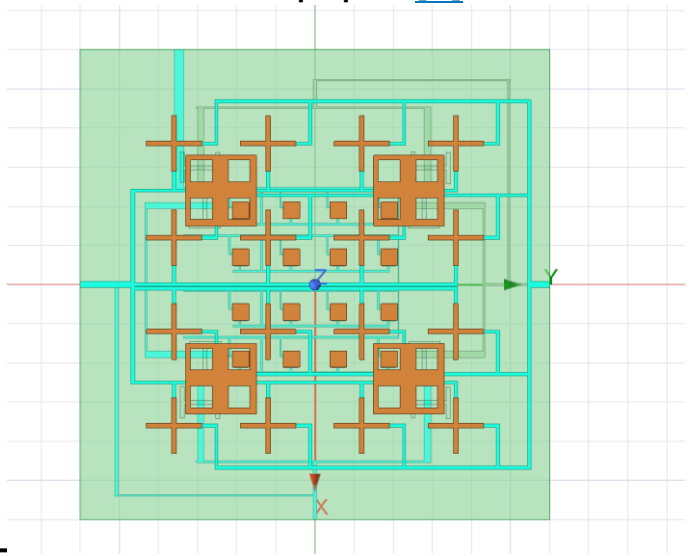

Gain Plot 2



# X/Ku/Ka-Band Dual-Polarized Array With Shared Aperture

Completed the replicating the design of the Patch Elements, Ground plane with slots and the feeding networks in the Research paper [1]



# References


- EE340 and EE642 Slides by Prof. Raghvendra Kumar
- C. -X. Mao, S. Gao, Q. Luo, T. Rommel and Q. -X. Chu, "Low-Cost X/Ku/Ka-Band Dual-Polarized Array With Shared Aperture," in IEEE Transactions on Antennas and Propagation, vol. 65, no. 7, pp. 3520-3527, July 2017,[1]
- S. Y. Miao and F. H. Lin, "Light-Controlled Large-Scale Wirelessly Reconfigurable Microstrip Reflectarrays," in IEEE Transactions on Antennas and Propagation, vol. 71, no. 2, pp. 1613-1622, Feb. 2023,[2]
- David Cheng, Field, and Wave Electromagnetics.
- C. A. Balanis, Antenna Theory: Analysis and Design

# Thank You