



# TAOGLAS®



# Datasheet

## SuperCombo Series

Part No: MA1047.A.LBICGTT.001

## Description

7-in-1 Shark fin with GNSS, 2x 5G-4G, 2 x Wi-Fi®, 1 AM-FM / WB and 1 DAB and FAKRA Connectors with Pigtail RG-178 Cables

## Features:

Low-profile Shark fin Combination Antenna

- 1x GNSS
- 2x 5G/4G MIMO
- 2x Wi-Fi® MIMO
- 1x AM/FM / WB
- 1x DAB

IP67 Rated Enclosure

Cables: Staggered RG-178

Connectors: FAKRA Series Connectors

Dimensions: 96 x 80 x 60mm

RoHS & Reach Compliant

|           |                                |           |
|-----------|--------------------------------|-----------|
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## 1. Introduction



Introducing the Taoglas World SuperCombo MA1047 antenna, an incredibly compact, yet powerful, 7-in-1 shark fin style combination antenna. It provides multiple antenna connections in a sleek, covert enclosure and is suitable for all automotive and commercial trucking applications. The SuperCombo has been engineered to be mounted directly on the vehicle roof and is supplied with pigtail RG-316 cables and FAKRA connectors as standard.

The SuperCombo is designed with active GNSS (GPS/GLONASS/BeiDou/Galileo), 2\*5G/4G Cellular MIMO, 2\*Dual-Band Wi-Fi®, Active AM/FM and DAB. All high-performance antennas are packaged in a compact, robust, IP67 rated enclosure.

The GNSS antenna cover the GPS L1, GLONASS G1, BeiDOu B1, and Galileo E1 bands as well as SBAS. The two high-performance cellular antennas in the SuperCombo cover sub 6GHz, 5G and 5G cellular bands offering efficiencies of up to 80%. Fallback to 3G and 2G bands is also possible where 5G and 4G is not accessible. The Wi-Fi® antennas cover both the 2.4GHz and 5.8GHz Wi-Fi® bands.

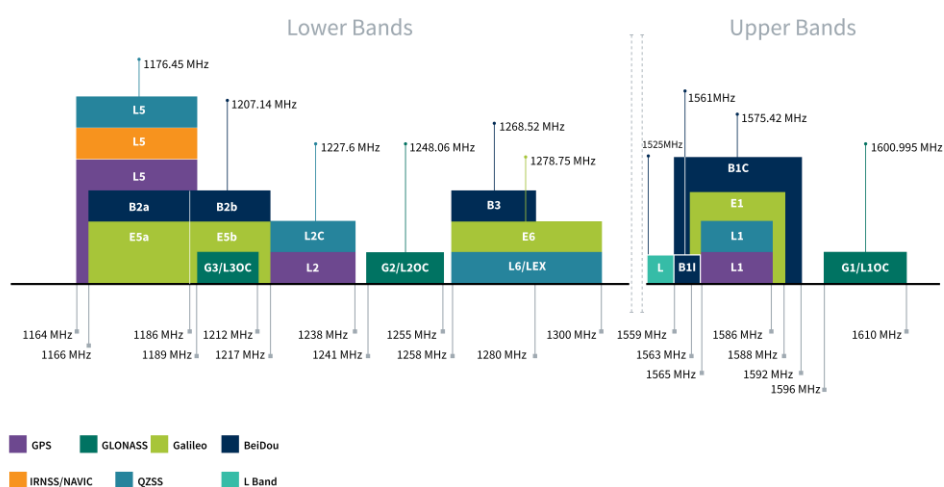
Typical Applications Include:

- Transportation and Fleet Management
- Autonomous Driving and Robotics
- FirstNet, First Responders and Emergency Services

The cables, connectors and whip are fully customizable, the antenna is supplied with two whip antennas in the package. For further information or installation instructions contact your regional Taoglas customer support team.

## 2. Specification

| GNSS Frequency Bands |                         |                           |                    |                    |                   |
|----------------------|-------------------------|---------------------------|--------------------|--------------------|-------------------|
| GPS                  | L1<br>1575.42 MHz       | L2<br>1227.6 MHz          | L5<br>1176.45 MHz  |                    |                   |
|                      | ■                       | □                         | □                  |                    |                   |
| GLONASS              | G1<br>1602 MHz          | G2<br>1248 MHz            | G3<br>1207 MHz     |                    |                   |
|                      | ■                       | □                         | □                  |                    |                   |
| Galileo              | E1<br>1575.24 MHz       | E5a<br>1176.45 MHz        | E5b<br>1201.5 MHz  | E6<br>1278.75 MHz  |                   |
|                      | ■                       | □                         | □                  | □                  |                   |
| BeiDou               | B1C<br>1575.42 MHz      | B1I<br>1561 MHz           | B2a<br>1176.45 MHz | B2b<br>1207.14 MHz | B3<br>1268.52 MHz |
|                      | ■                       | ■                         | □                  | □                  | □                 |
| L-Band               | L-Band<br>1542 MHz      |                           |                    |                    |                   |
|                      | ■                       |                           |                    |                    |                   |
| QZSS (Regional)      | L1<br>1575.42 MHz       | L2C<br>1227.6 MHz         | L5<br>1176.45 MHz  | L6<br>1278.75e6    |                   |
|                      | ■                       | □                         | □                  | □                  |                   |
| IRNSS (Regional)     | L5<br>1176.45 MHz       |                           |                    |                    |                   |
|                      | □                       |                           |                    |                    |                   |
| SBAS                 | L1/E1/B1<br>1575.42 MHz | L5/B2a/E5a<br>1176.45 MHz | G1<br>1602 MHz     | G2<br>1248 MHz     | G3<br>1207 MHz    |
|                      | ■                       | □                         | ■                  | □                  | □                 |



GNSS Bands and Constellations

| GNSS Electrical |                            |      |         |      |
|-----------------|----------------------------|------|---------|------|
| Frequency (MHz) |                            | 1561 | 1575.42 | 1603 |
| VSWR (max.)     | 60x60cm Metal Ground Plane | 4.1  | 2.4     | 2.6  |
|                 | Free space                 | 3.3  | 2.8     | 3.2  |
| Efficiency (%)  | 60x60cm Metal Ground Plane | 34.8 | 42.1    | 41.9 |
|                 | Free space                 | 35.0 | 38.9    | 26.6 |
| Avg. Gain(dB)   | 60x60cm Metal Ground Plane | -4.6 | -3.8    | -3.8 |
|                 | Free space                 | -4.6 | -4.1    | -5.8 |
| Peak Gain(dBi)  | 60x60cm Metal Ground Plane | 4.4  | 4.4     | 4.7  |
|                 | Free space                 | 1.5  | 1.5     | 1.1  |
| Polarization    |                            |      | Linear  |      |
| Impedance       |                            |      | 50Ω     |      |

| GNSS Active              |                                                |
|--------------------------|------------------------------------------------|
| Frequency (MHz)          | 1575MHz                                        |
| Gain                     | 30dB                                           |
| Noise Figure             | 2.2dB                                          |
| Current Consumption      | 39mA                                           |
| Wi-Fi/Cellular Rejection | 30dB 1538MHz, 1630MHz<br>50dB 1536MHz, 1633MHz |

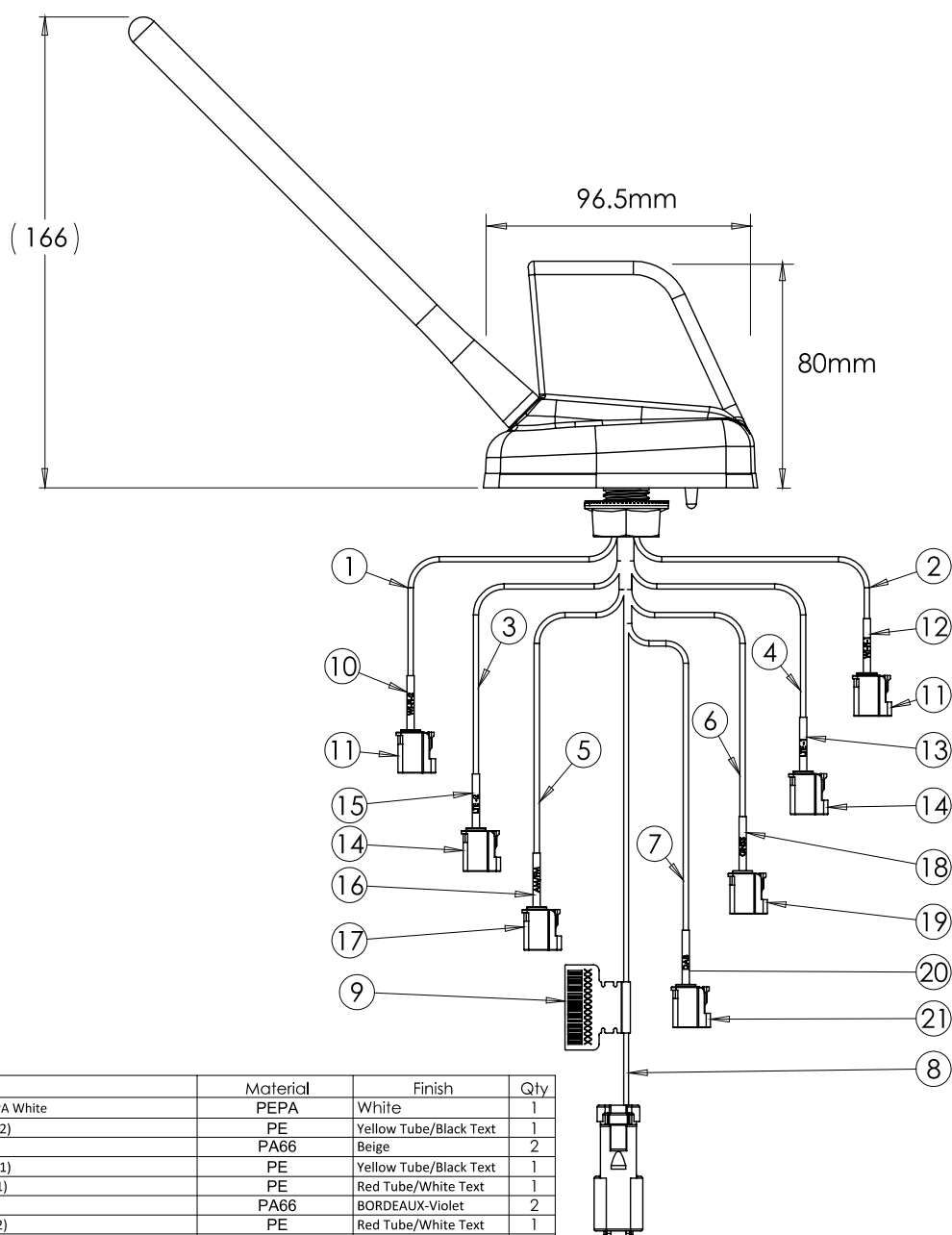
| Cellular Electrical                        |                 |                                         |                |                   |                 |           |              |                   |                  |
|--------------------------------------------|-----------------|-----------------------------------------|----------------|-------------------|-----------------|-----------|--------------|-------------------|------------------|
| Band                                       | Frequency (MHz) | Measurement                             | Efficiency (%) | Average Gain (dB) | Peak Gain (dBi) | Impedance | Polarization | Radiation Pattern | Max. input power |
| 5G NR/4G Band 71                           | 617-698         | Cellular 1 - 60x60cm Metal Ground Plane | 41.2           | -3.85             | 1.09            | 50 Ω      | Linear       | Omni directional  | 10W              |
|                                            |                 | Cellular 1 - Free Space                 | 26.1           | -5.83             | 1.12            |           |              |                   |                  |
|                                            |                 | Cellular 2 - 60x60cm Metal Ground Plane | 12.0           | -9.19             | -2.13           |           |              |                   |                  |
|                                            |                 | Cellular 2 - Free Space                 | 21.1           | -6.76             | 0.39            |           |              |                   |                  |
| 4G/3G Band 12,13,14,17,28,29               | 698-806         | Cellular 1 - 60x60cm Metal Ground Plane | 33.2           | -4.79             | 0.76            |           |              |                   |                  |
|                                            |                 | Cellular 1 - Free Space                 | 37.8           | -4.22             | 3.18            |           |              |                   |                  |
|                                            |                 | Cellular 2 - 60x60cm Metal Ground Plane | 19.6           | -7.07             | -0.26           |           |              |                   |                  |
|                                            |                 | Cellular 2 - Free Space                 | 37.4           | -4.28             | 2.79            |           |              |                   |                  |
| 4G/3G/NB-IoT/Cat M Band 5,8,18,19,20,26,27 | 824-960         | Cellular 1 - 60x60cm Metal Ground Plane | 48.0           | -3.18             | 0.95            |           |              |                   |                  |
|                                            |                 | Cellular 1 - Free Space                 | 46.3           | -3.35             | 2.88            |           |              |                   |                  |
|                                            |                 | Cellular 2 - 60x60cm Metal Ground Plane | 16.8           | -7.76             | -0.83           |           |              |                   |                  |
|                                            |                 | Cellular 2 - Free Space                 | 30.9           | -5.10             | 2.38            |           |              |                   |                  |
| 5G NR/4G Band 21,32,74,75,76               | 1427-1518       | Cellular 1 - 60x60cm Metal Ground Plane | 17.5           | -7.56             | -1.12           |           |              |                   |                  |
|                                            |                 | Cellular 1 - Free Space                 | 17.6           | -7.54             | -2.34           |           |              |                   |                  |
|                                            |                 | Cellular 2 - 60x60cm Metal Ground Plane | 20.0           | -6.99             | -1.19           |           |              |                   |                  |
|                                            |                 | Cellular 2 - Free Space                 | 20.6           | -6.85             | -0.50           |           |              |                   |                  |
| 4G/3G Band 1,2,3,4,9,23,25,35,39,66        | 1710-2200       | Cellular 1 - 60x60cm Metal Ground Plane | 35.5           | -4.50             | 3.56            |           |              |                   |                  |
|                                            |                 | Cellular 1 - Free Space                 | 41.2           | -3.85             | 1.60            |           |              |                   |                  |
|                                            |                 | Cellular 2 - 60x60cm Metal Ground Plane | 26.8           | -5.72             | 1.96            |           |              |                   |                  |
|                                            |                 | Cellular 2 - Free Space                 | 28.5           | -5.45             | 1.70            |           |              |                   |                  |
| 4G/3G Band 7,30,38,40,41                   | 2300-2690       | Cellular 1 - 60x60cm Metal Ground Plane | 21.7           | -6.63             | 3.38            |           |              |                   |                  |
|                                            |                 | Cellular 1 - Free Space                 | 19.9           | -7.02             | 1.25            |           |              |                   |                  |
|                                            |                 | Cellular 2 - 60x60cm Metal Ground Plane | 13.6           | -8.66             | 0.95            |           |              |                   |                  |
|                                            |                 | Cellular 2 - Free Space                 | 14.7           | -8.32             | -2.34           |           |              |                   |                  |
| 5G NR/4G Band 22,42,48,77,78,79            | 3300-5000       | Cellular 1 - 60x60cm Metal Ground Plane | 32.7           | -4.86             | 5.32            |           |              |                   |                  |
|                                            |                 | Cellular 1 - Free Space                 | 33.4           | -4.76             | 4.88            |           |              |                   |                  |
|                                            |                 | Cellular 2 - 60x60cm Metal Ground Plane | 6.6            | -11.82            | 0.54            |           |              |                   |                  |
|                                            |                 | Cellular 2 - Free Space                 | 6.2            | -12.07            | -1.70           |           |              |                   |                  |
| CELLULAR5200/Wi-Fi5800                     | 5150-5925       | Cellular 1 - 60x60cm Metal Ground Plane | 37.3           | -4.29             | 5.72            |           |              |                   |                  |
|                                            |                 | Cellular 1 - Free Space                 | 38.0           | -4.20             | 4.62            |           |              |                   |                  |
|                                            |                 | Cellular 2 - 60x60cm Metal Ground Plane | 5.0            | -12.98            | -1.31           |           |              |                   |                  |
|                                            |                 | Cellular 2 - Free Space                 | 5.4            | -12.66            | -0.65           |           |              |                   |                  |

| Wi-Fi Electrical |                 |                                     |                |                   |                 |           |              |                   |                  |
|------------------|-----------------|-------------------------------------|----------------|-------------------|-----------------|-----------|--------------|-------------------|------------------|
| Band             | Frequency (MHz) | Measurement                         | Efficiency (%) | Average Gain (dB) | Peak Gain (dBi) | Impedance | Polarization | Radiation Pattern | Max. input power |
| WiFi - 2GHz      | 2400-2500       | Wi-Fi1 - 60x60cm Metal Ground Plane | 43.6           | -3.60             | 4.17            | 50 Ω      | Linear       | Omni directional  | 10W              |
|                  |                 | Wi-Fi1 - Free Space                 | 47.3           | -3.25             | 2.50            |           |              |                   |                  |
|                  |                 | Wi-Fi2 - 60x60cm Metal Ground Plane | 40.7           | -3.91             | 5.66            |           |              |                   |                  |
|                  |                 | Wi-Fi2 - Free Space                 | 43.9           | -3.57             | 2.36            |           |              |                   |                  |
| WiFi - 5GHz      | 5150-5850       | Wi-Fi1 - 60x60cm Metal Ground Plane | 26.4           | -5.79             | 7.06            |           |              |                   |                  |
|                  |                 | Wi-Fi1 - Free Space                 | 29.7           | -5.27             | 3.93            |           |              |                   |                  |
|                  |                 | Wi-Fi2 - 60x60cm Metal Ground Plane | 32.2           | -4.92             | 8.21            |           |              |                   |                  |
|                  |                 | Wi-Fi2 - Free Space                 | 33.3           | -4.78             | 3.57            |           |              |                   |                  |

| Mechanical |                  |
|------------|------------------|
| Dimensions | 96.5 x 80 x 60mm |
| Material   | PC/ASA           |
| Connector  | FAKRA            |
| Cable      | Staggered RG-178 |

| Environmental         |             |
|-----------------------|-------------|
| Waterproof Rating     | IP67        |
| Operation Temperature | -40 - +85°C |
| Storage Temperature   | -40 - +85°C |

### 3. Mechanical Drawing

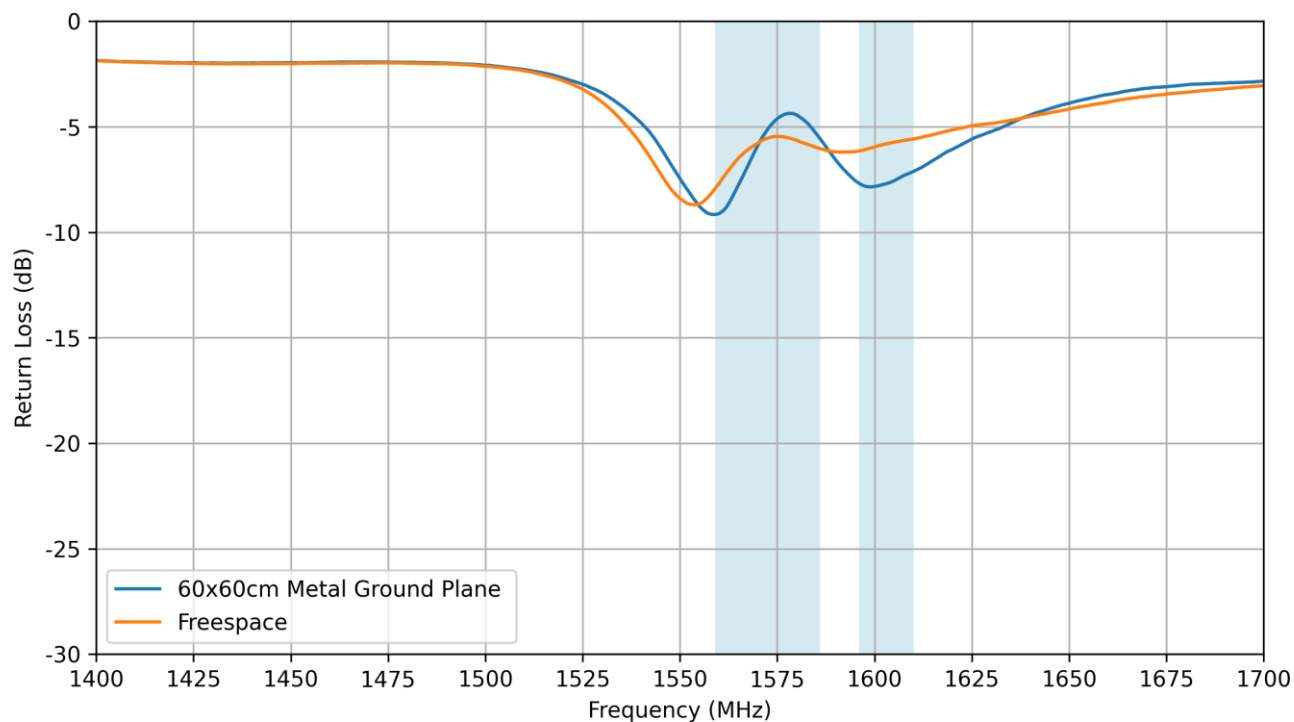


| NO | Description                    | Material | Finish                 | Qty |
|----|--------------------------------|----------|------------------------|-----|
| 9  | Empty label (48*30) PEPA White | PEPA     | White                  | 1   |
| 10 | Heat Shrink Tube (Wifi-2)      | PE       | Yellow Tube/Black Text | 1   |
| 11 | FAKRA CODE I SMB(F)            | PA66     | Beige                  | 2   |
| 12 | Heat Shrink Tube (Wifi-1)      | PE       | Yellow Tube/Black Text | 1   |
| 13 | Heat Shrink Tube (LTE-1)       | PE       | Red Tube/White Text    | 1   |
| 14 | FAKRA CODE D SMB(F)            | PA66     | BORDEAUX-Violet        | 2   |
| 15 | Heat Shrink Tube (LTE-2)       | PE       | Red Tube/White Text    | 1   |
| 16 | Heat Shrink Tube (AM/FM)       | PE       | Green Tube/WhiteText   | 1   |
| 17 | FAKRA CODE B SMB(F)            | PA66     | Cream                  | 1   |
| 18 | Heat Shrink Tube (GNSS)        | PE       | Blue Tube/White Text   | 1   |
| 19 | FAKRA CODE C SMB(F)            | PA66     | Blue                   | 1   |
| 20 | Heat Shrink Tube (DAB)         | PE       | Green Tube/WhiteText   | 1   |
| 21 | FAKRA CODE A SMB(F)            | PA66     | Jet Black              | 1   |

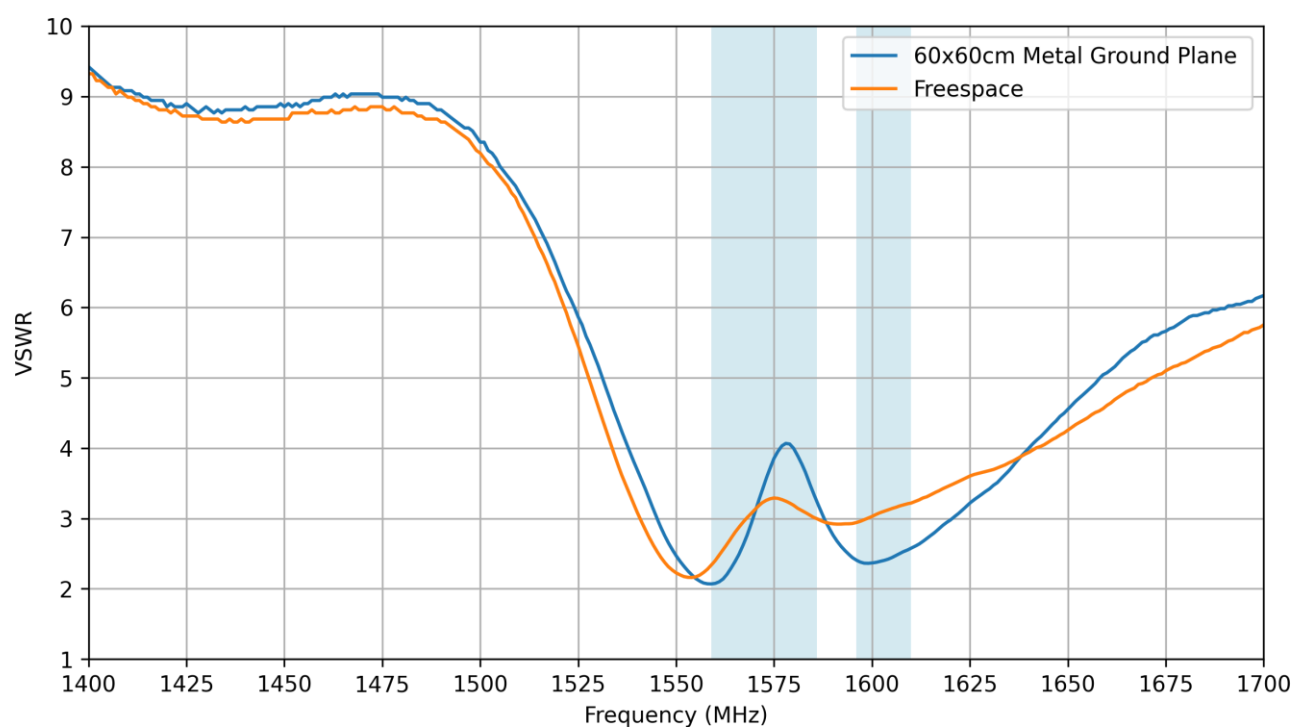
| CABLE LENGTHS FROM BASE |                                                                                  |                                   |        |
|-------------------------|----------------------------------------------------------------------------------|-----------------------------------|--------|
| ITEM NO.                | DESCRIPTION                                                                      | CABLE LENGHT FROM BASE +/- 10.0MM | CABLE  |
| 1                       | MA1146.A.LBICGT.003 WIFI-1 cable, RG-178(Brown)_Fakra 2 SMB (F) ST_Code I        | 250mm ± 15mm                      | RG 178 |
| 2                       | MA1146.A.LBICGT.003 WIFI-2 cable, RG-178(Brown)_Fakra 2 SMB (F) ST_Code I        | 225mm ± 15mm                      | RG 178 |
| 3                       | LTE-1 - MA1146.A.LBICGT.003 LTE-1 cable, RG-178(Brown)_Fakra 2 SMB (F) ST_Code D | 250mm ± 15mm                      | RG 178 |
| 4                       | LTE-2 - MA1146.A.LBICGT.003 LTE-2 cable, RG-178(Brown)_Fakra 2 SMB (F) ST_Code D | 225mm ± 15mm                      | RG 178 |
| 5                       | AM/FM - MA1146.A.LBICGT.003 AM/FM cable, RG-178(Brown)_Fakra 2 SMB (F) ST_Code Z | 325mm ± 30mm                      | RG 178 |
| 6                       | GNSS - MA1146.A.LBICGT.003 GNSS cable, RG-178(Brown)_Fakra 2 SMB (F) ST_Code C   | 300mm ± 30mm                      | RG 178 |
| 7                       | DAB - MA1047.A.LBICGT.001 DAB cable, RG-178(Brown)_Fakra 2 SMB (F) ST_Code B     | 325mm ± 30mm                      | RG 178 |
| 8                       | MA1047.A.LBICGT.001 Power cable                                                  | 450mm ± 30mm                      | 18 AWG |

## 4. Antenna Characteristics

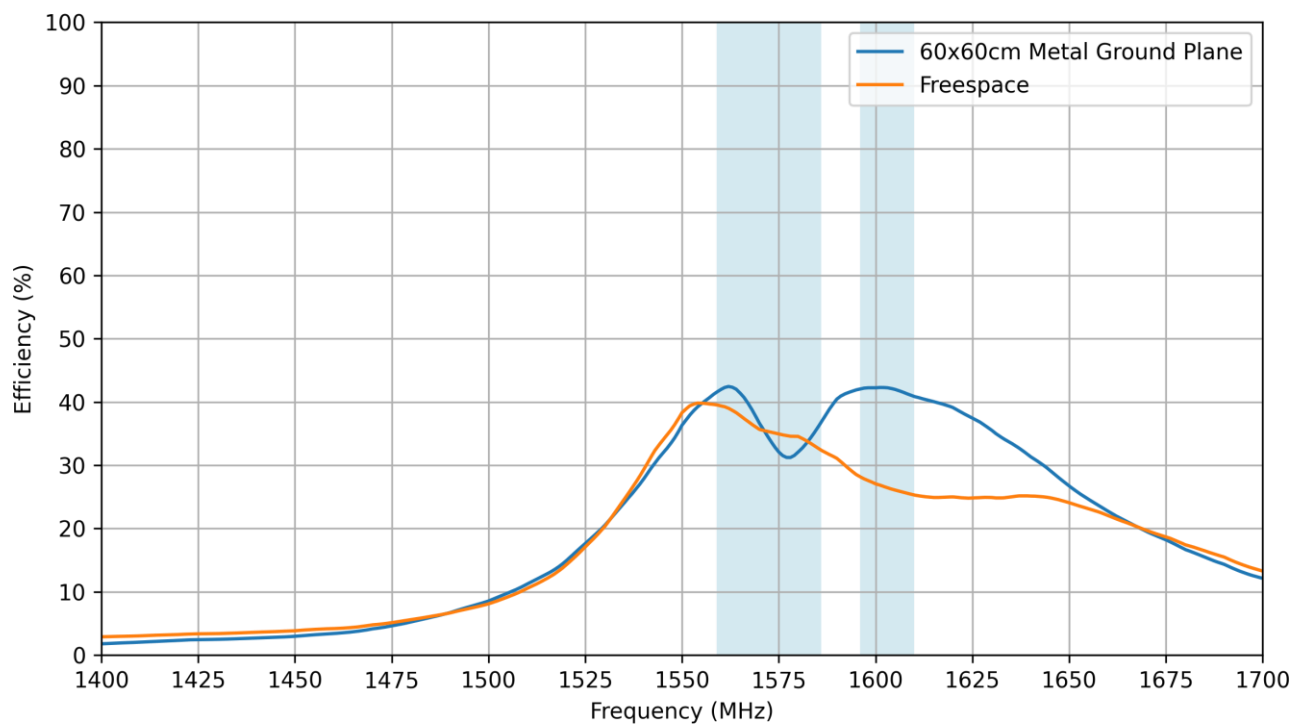
### 4.1 GNSS - Return Loss



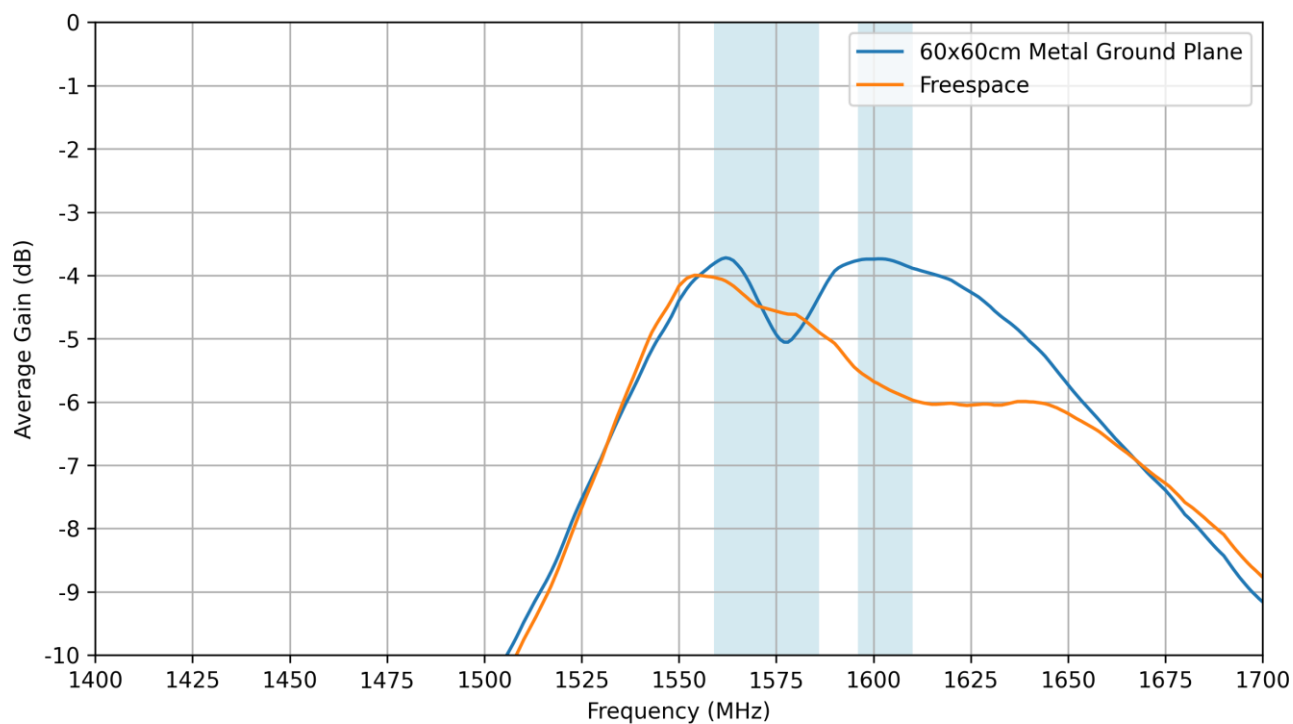
### 4.2 GNSS - VSWR



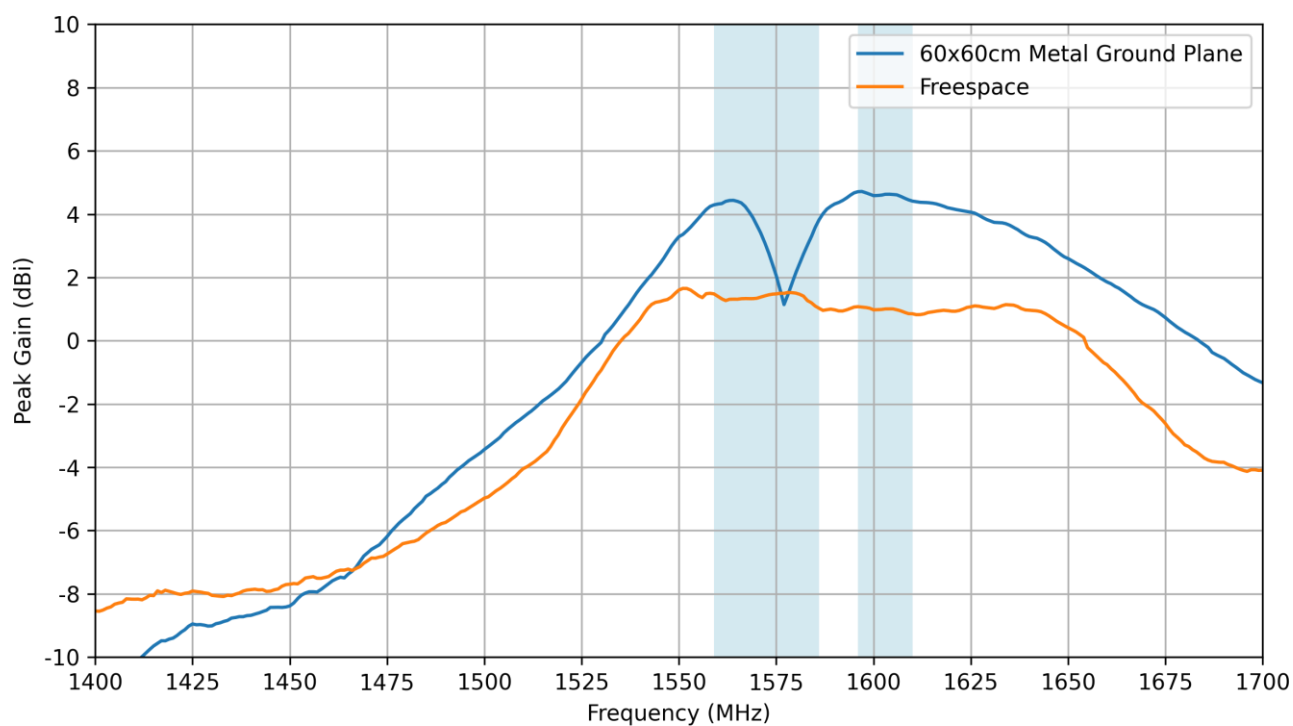
### 4.3 GNSS - Efficiency



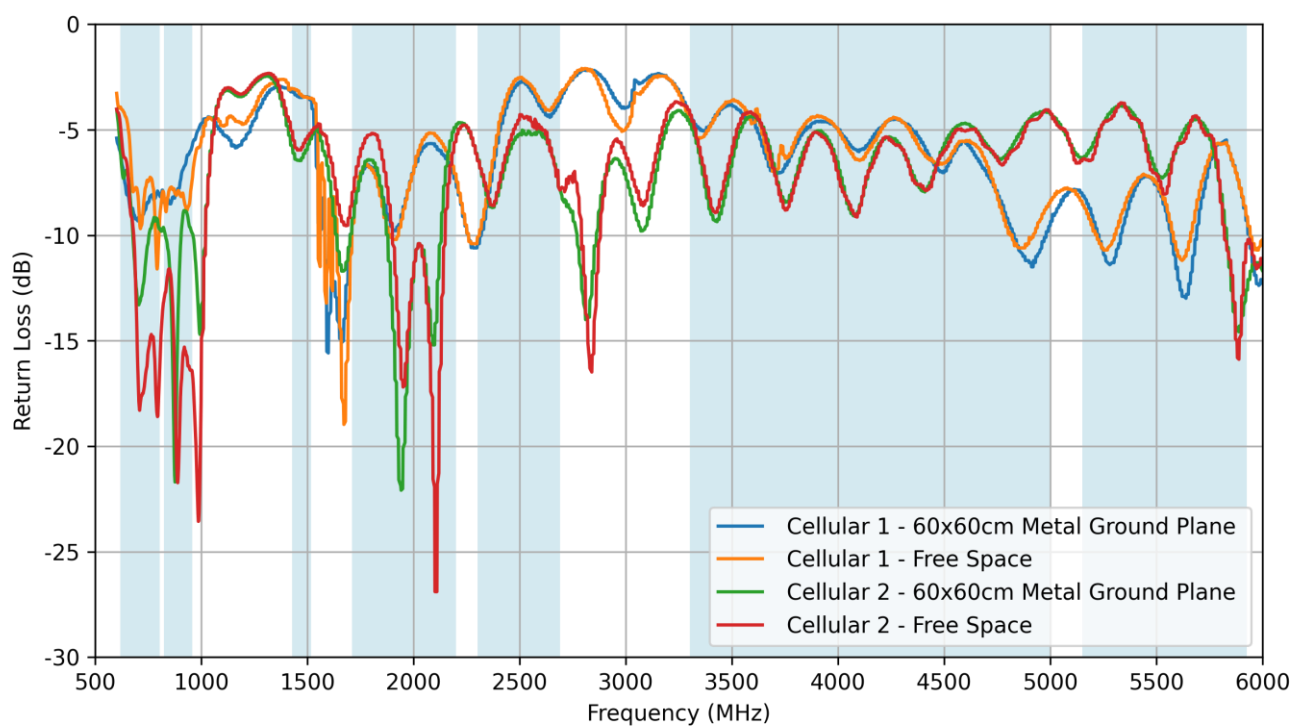
### 4.4 GNSS - Average Gain



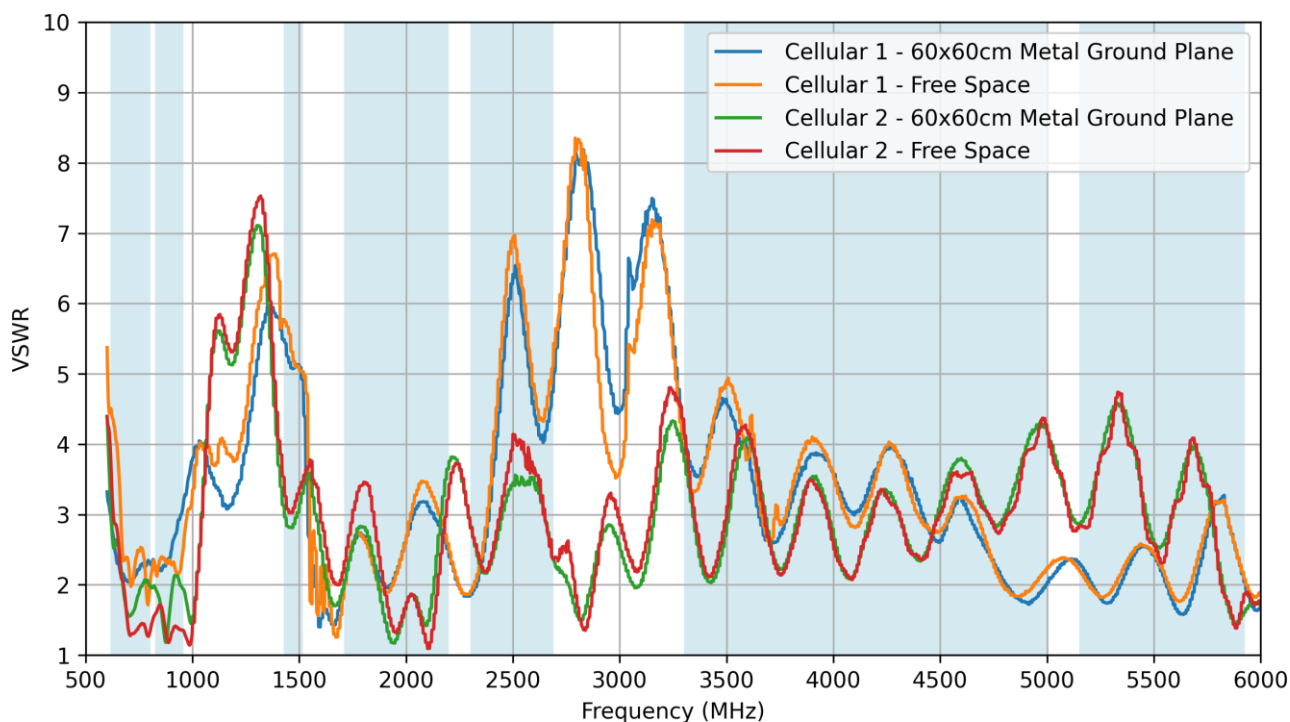
## 4.5 GNSS - Peak Gain



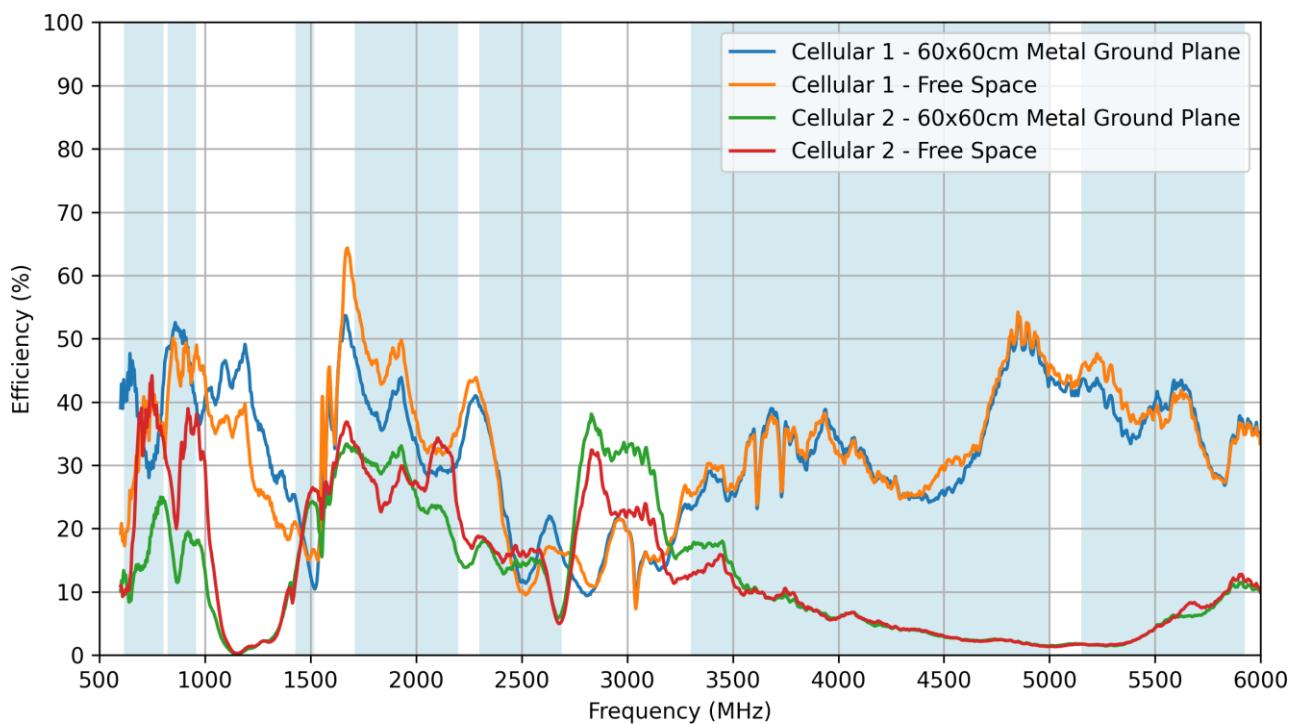
## 4.6 Cellular - Return Loss



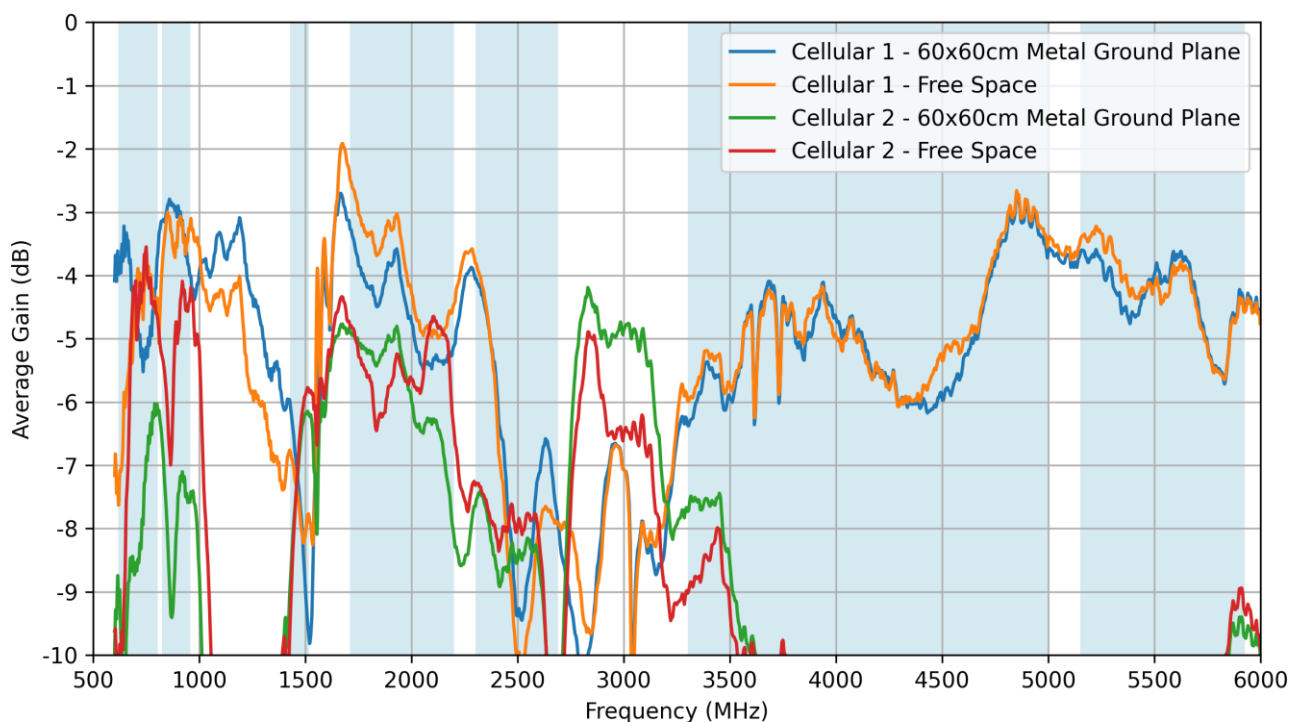
## 4.7 Cellular - VSWR



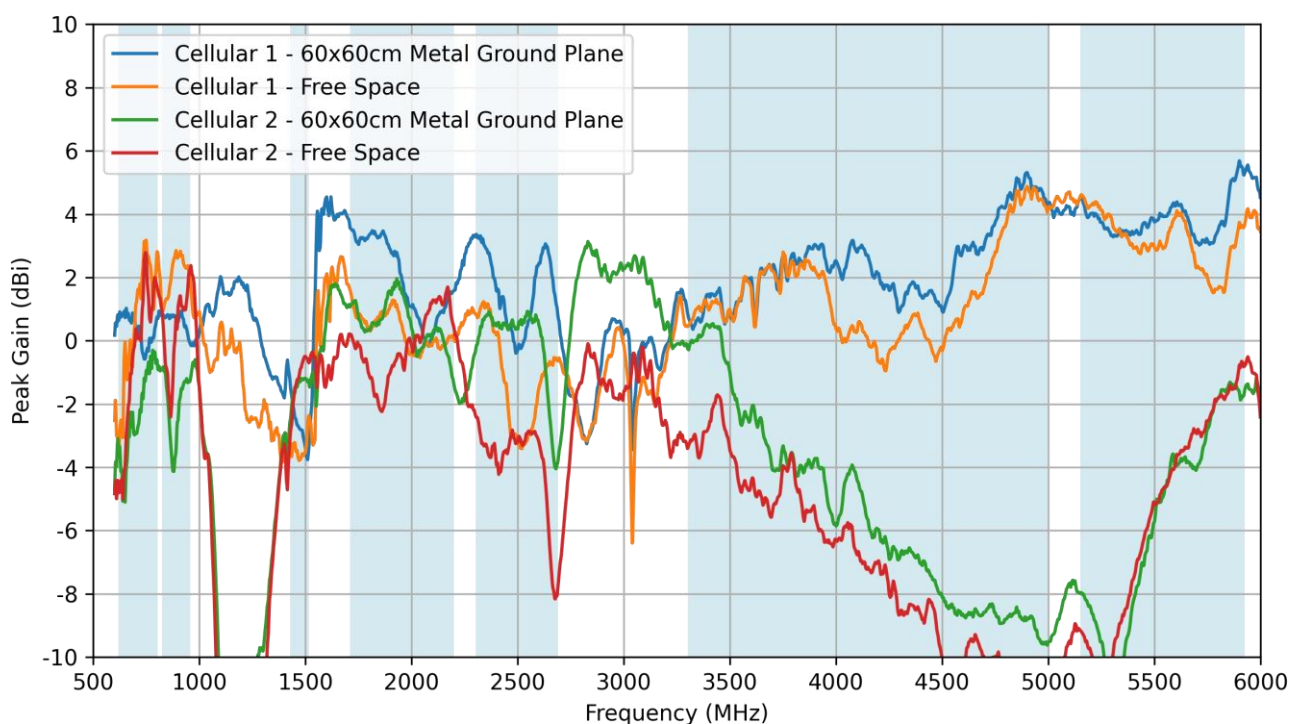
## 4.8 Cellular - Efficiency



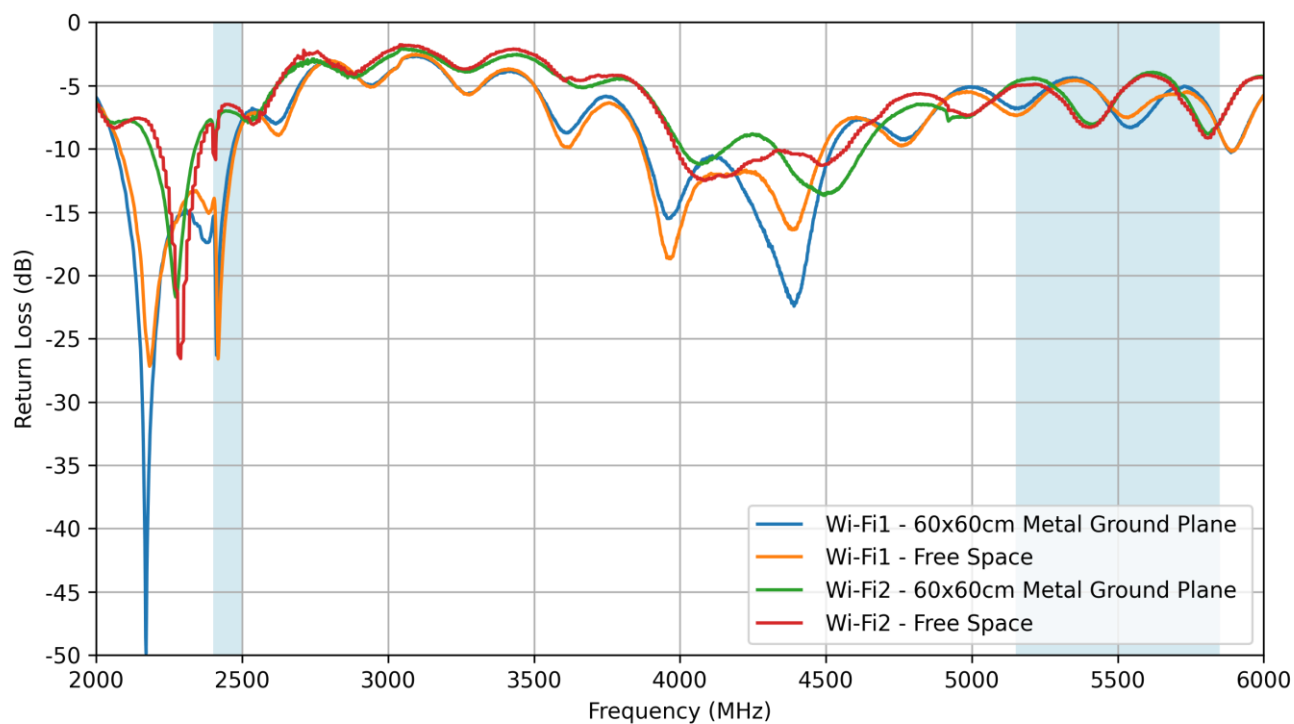
## 4.9 Cellular - Average Gain



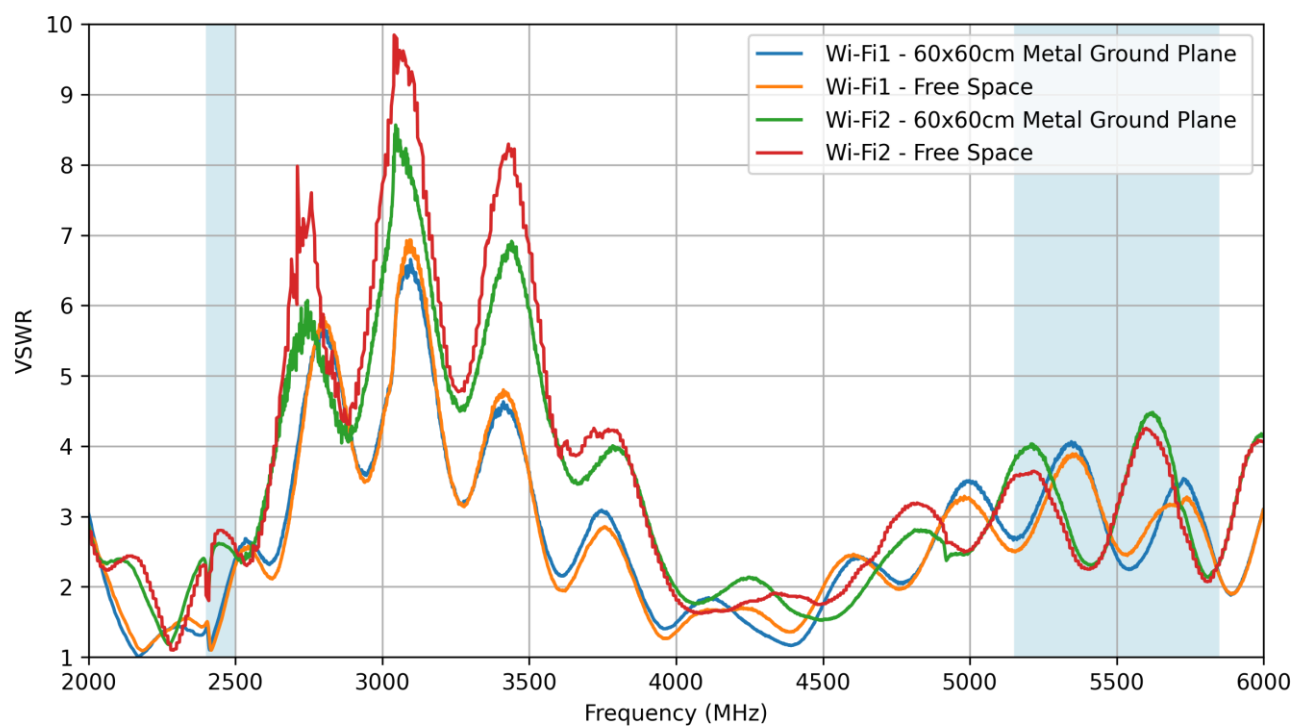
## 4.10 Cellular - Peak Gain



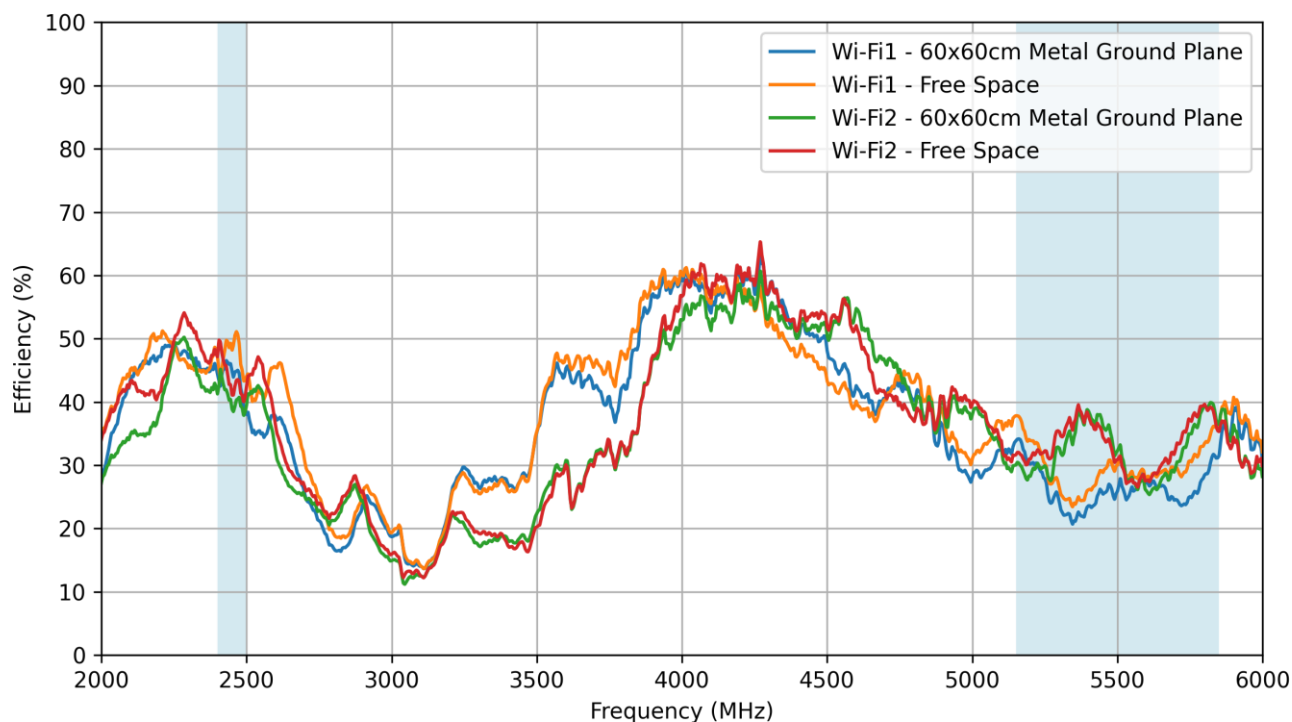
#### 4.11 Wi-Fi - Return Loss



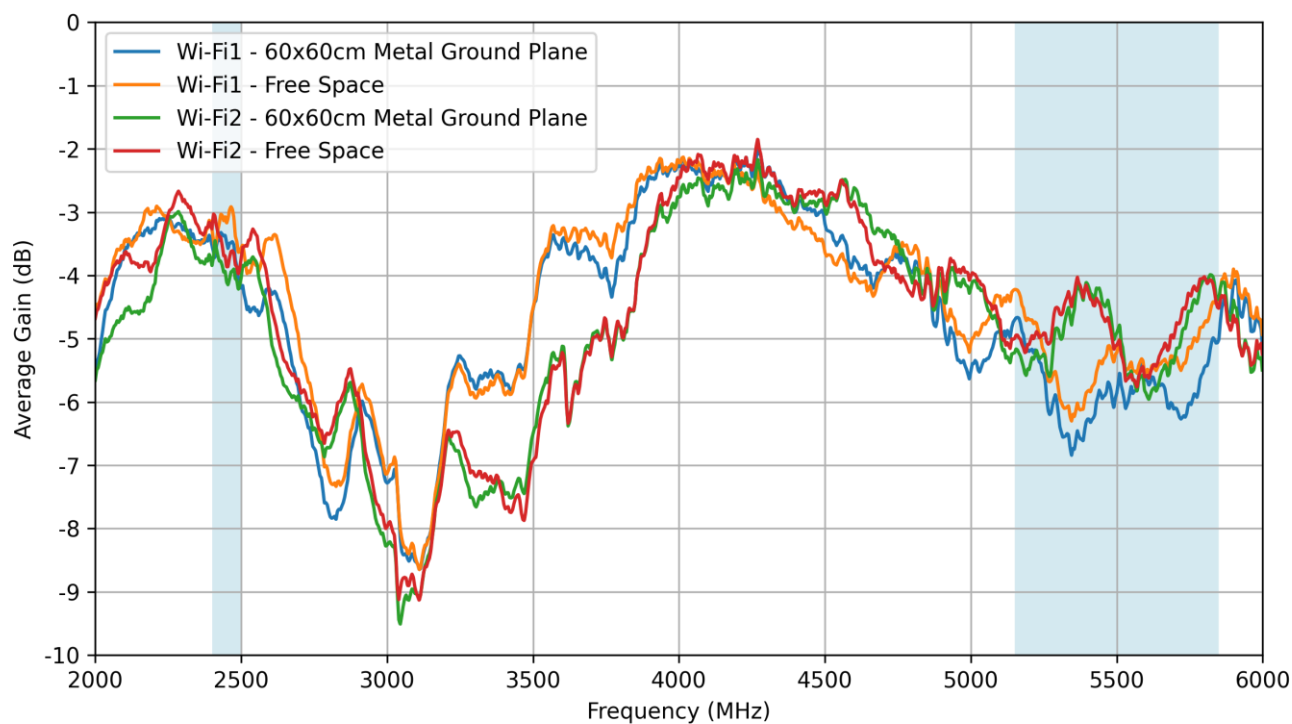
#### 4.12 Wi-Fi - VSWR



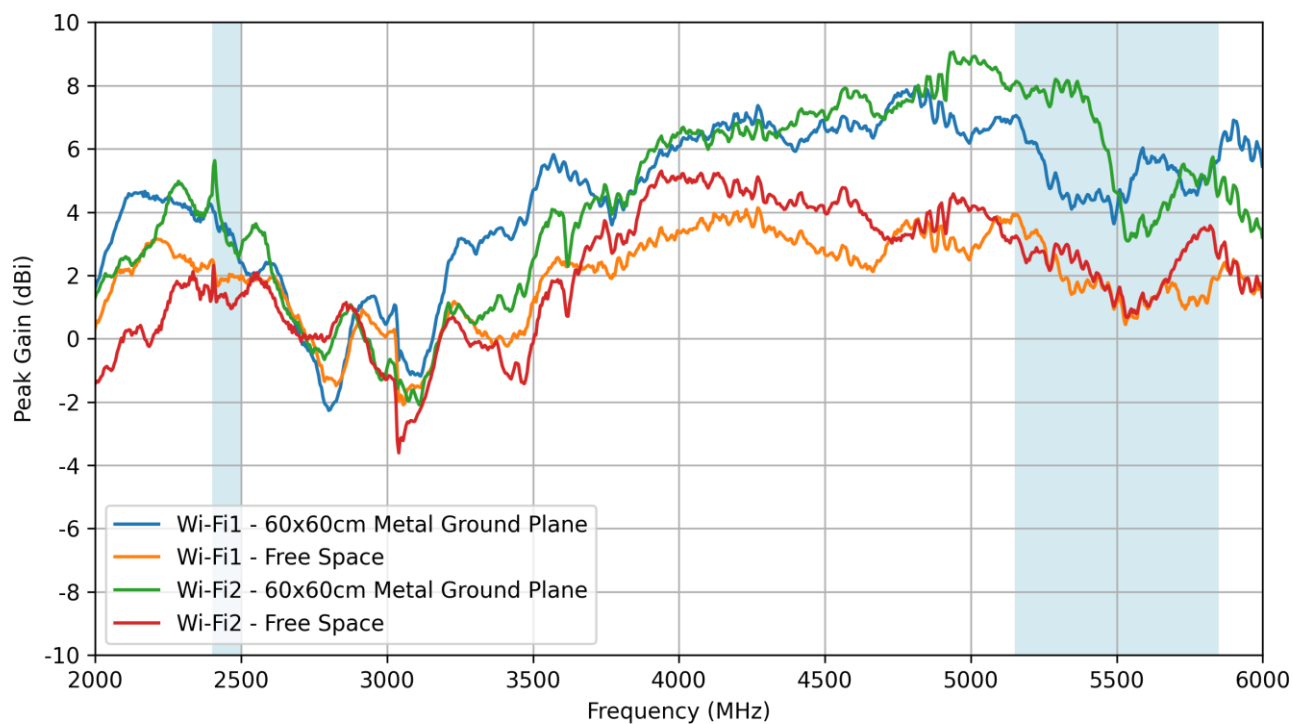
#### 4.13 Wi-Fi - Efficiency



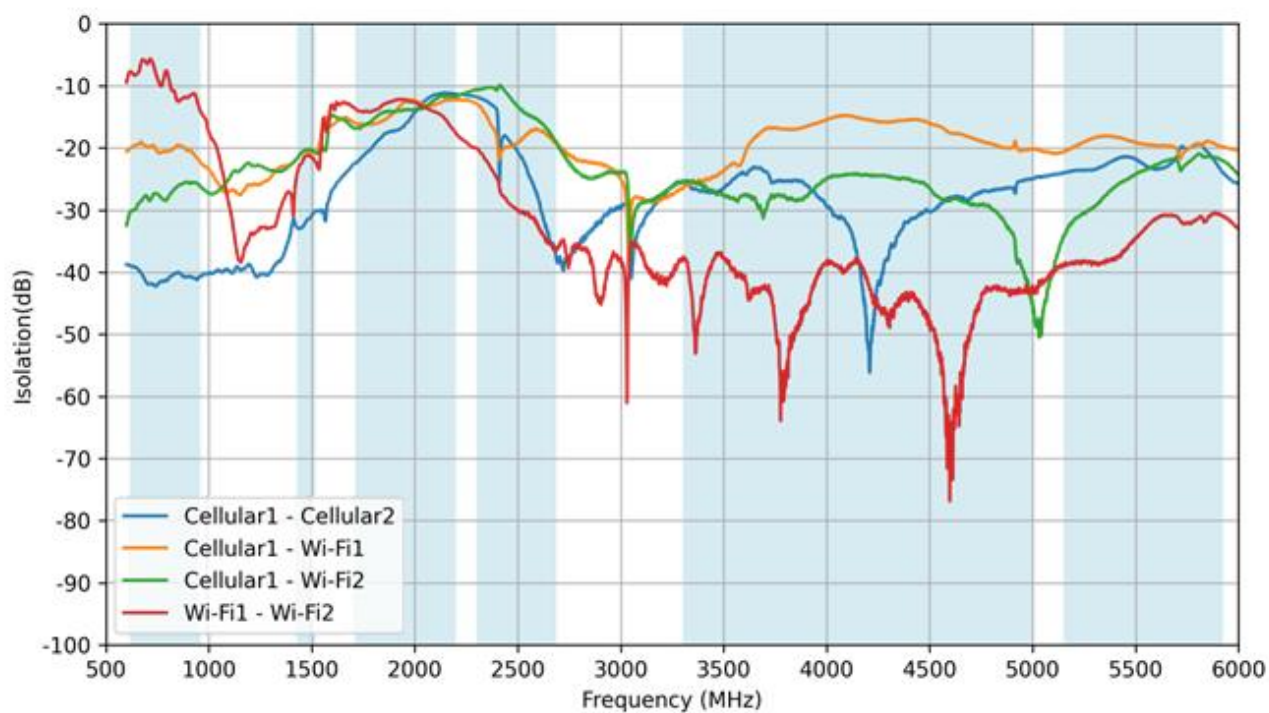
#### 4.14 Wi-Fi - Average Gain



#### 4.15 Wi-Fi - Peak Gain

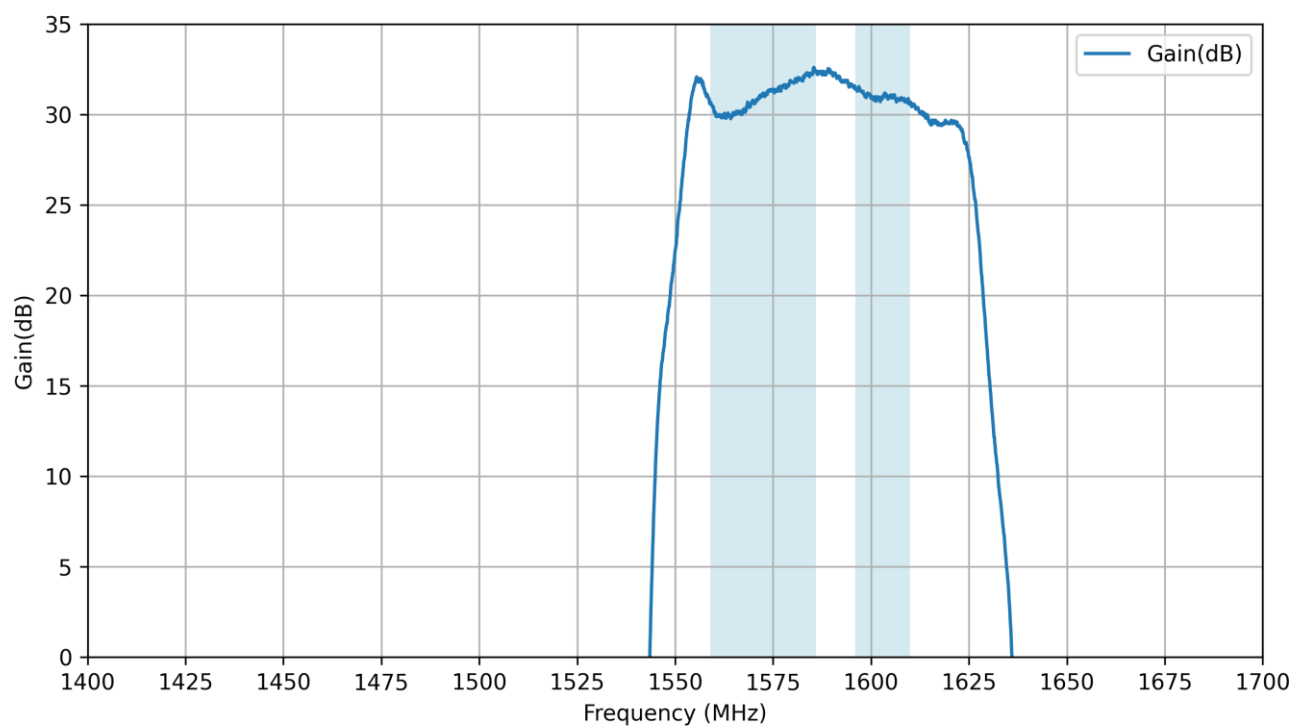


#### 4.16 Isolation



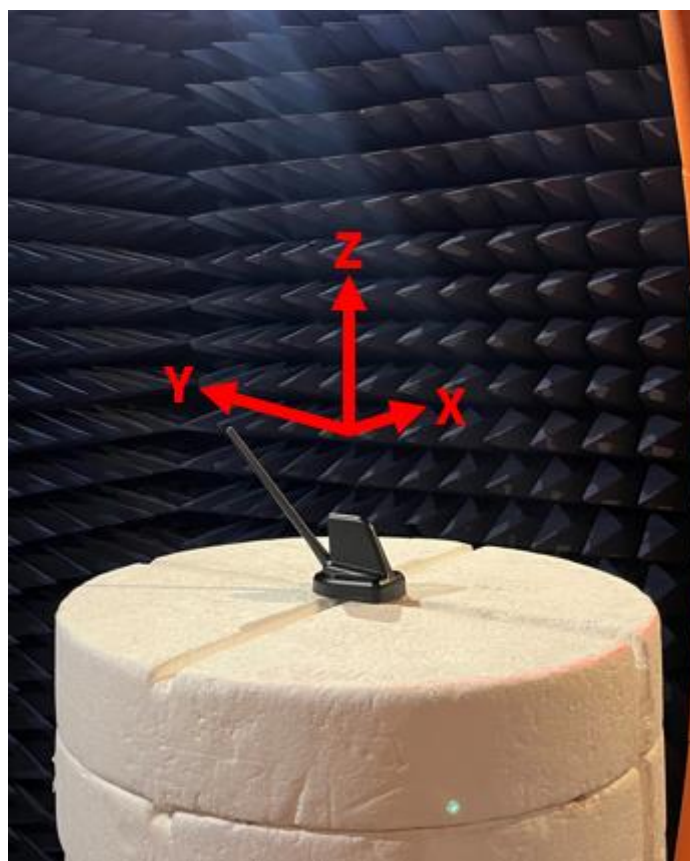
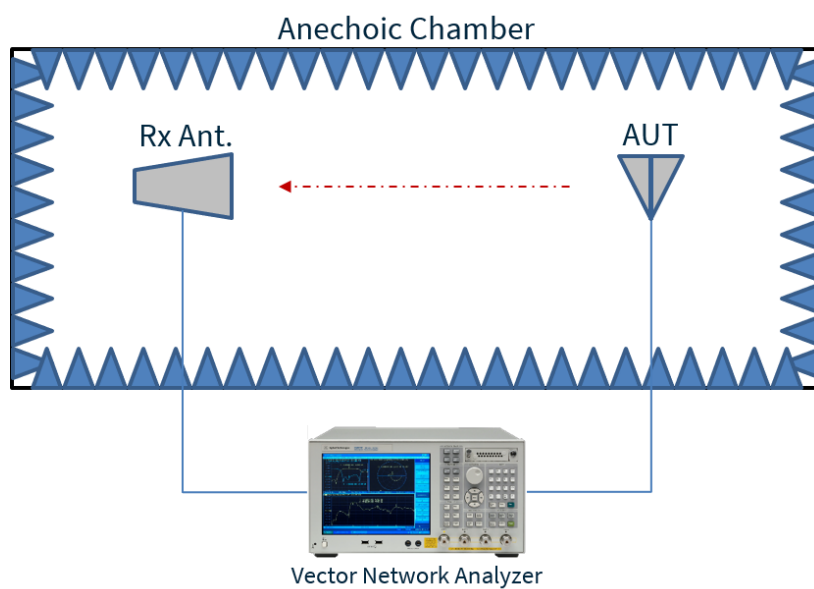
## 5. LNA Characteristics

### 5.1 LNA Gain



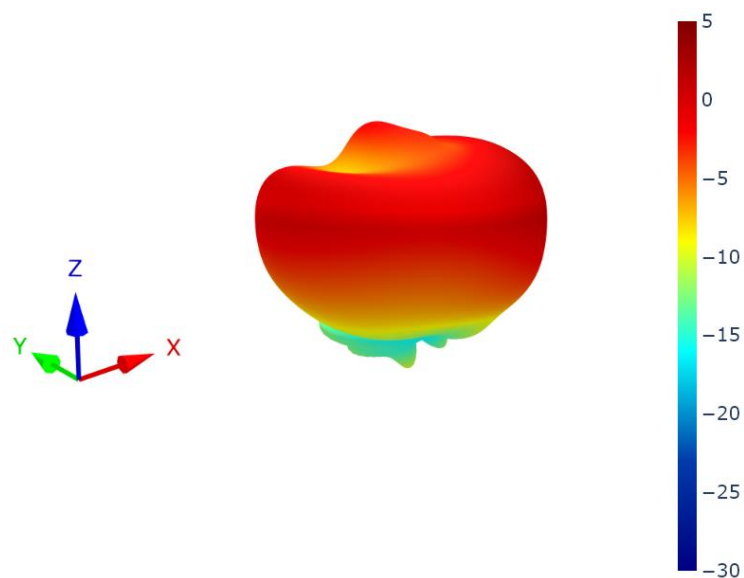
## 6. Radiation Patterns

### 6.1 Test Setup

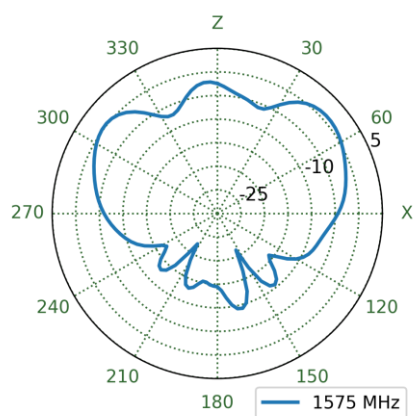


Chamber Test Set-up

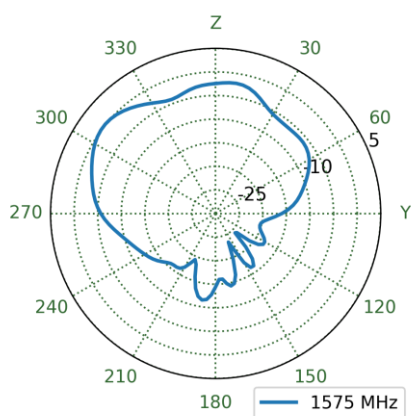
## 6.2 GNSS 60x60cm Metal Ground Plane Patterns at 1575 MHz



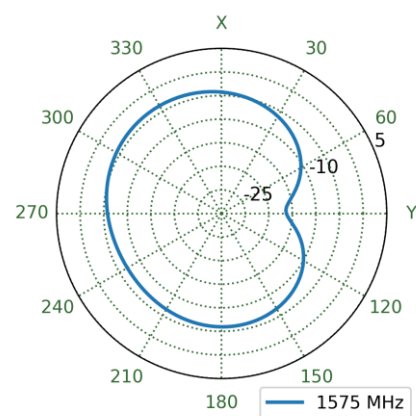
XZ Plane



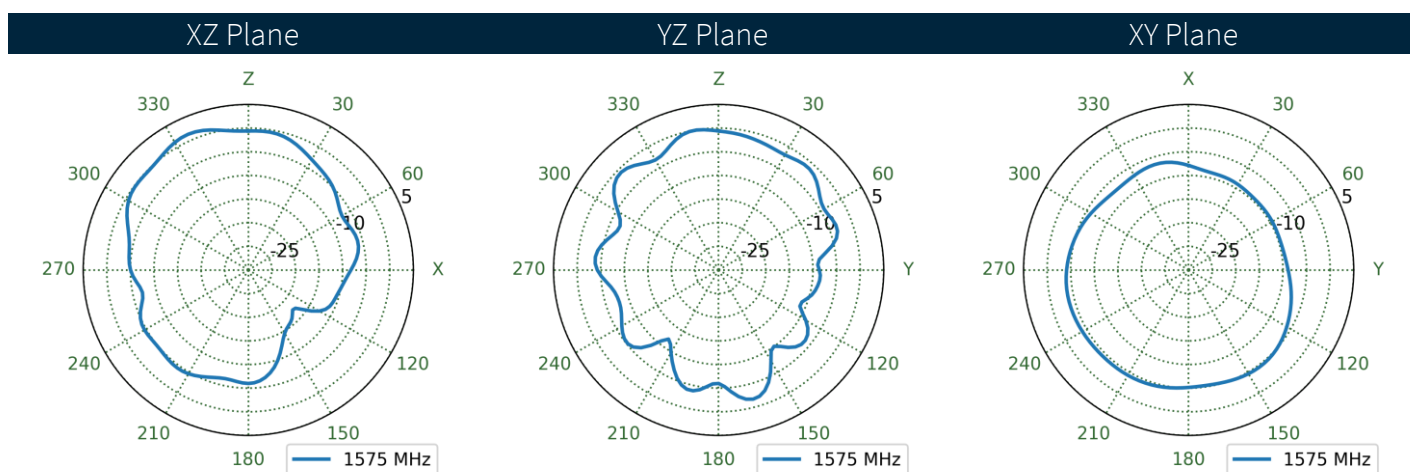
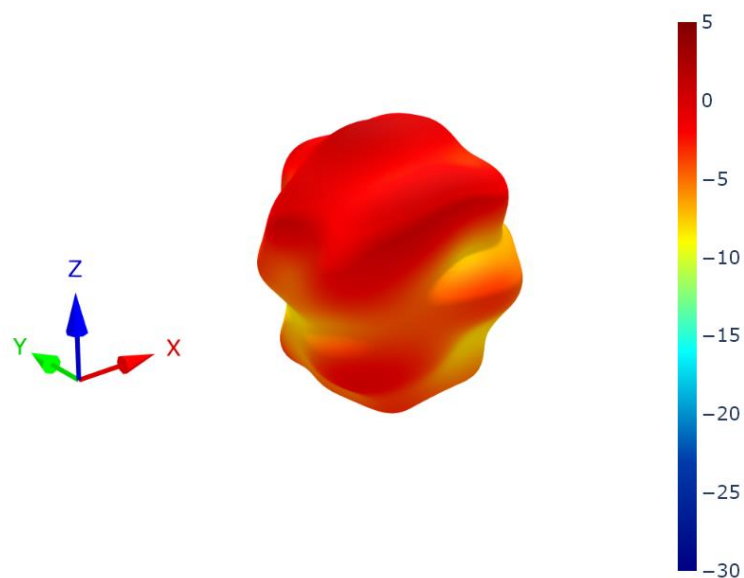
YZ Plane



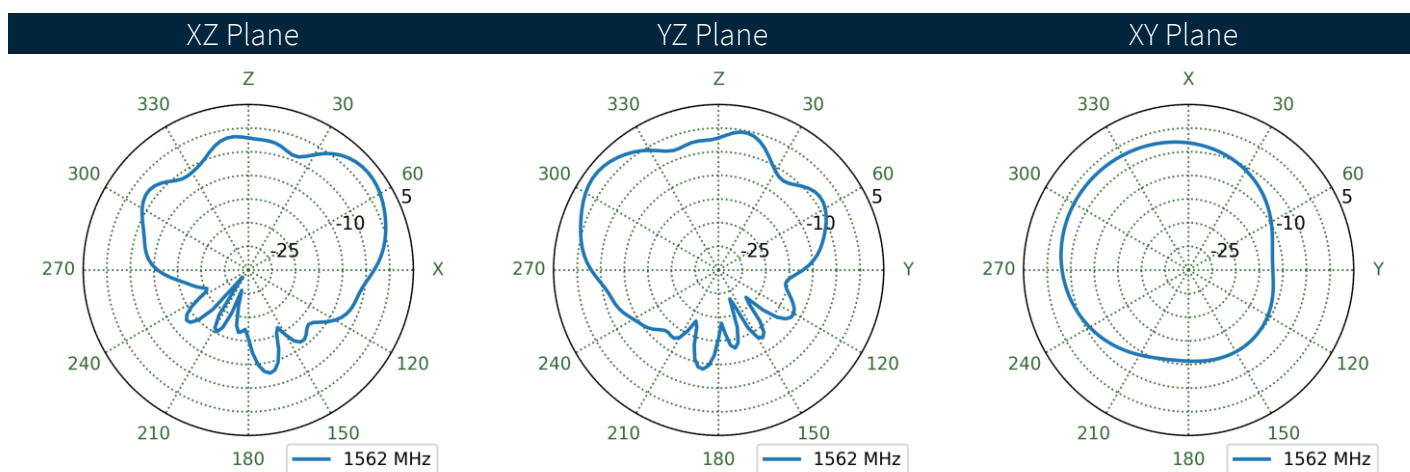
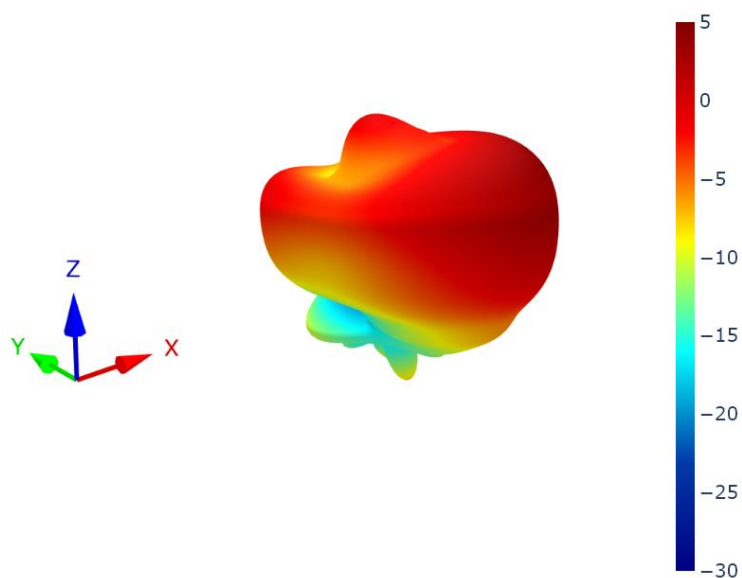
XY Plane



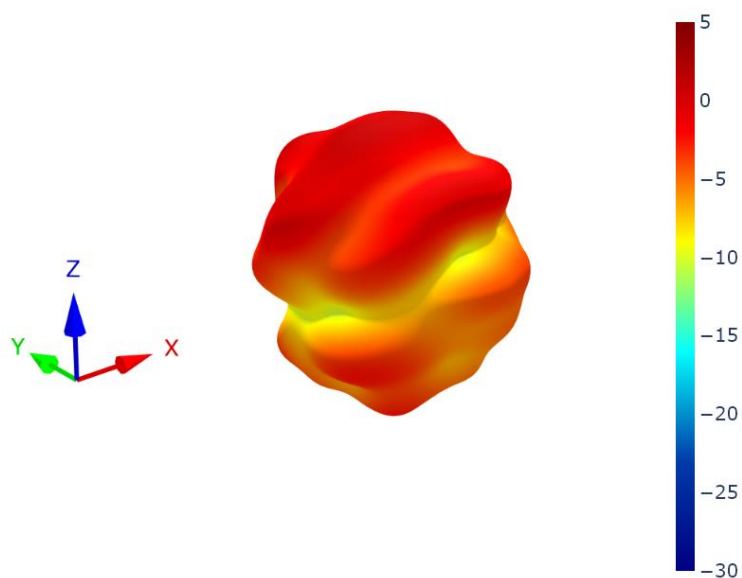
## 6.3 GNSS Free Space Patterns at 1575 MHz



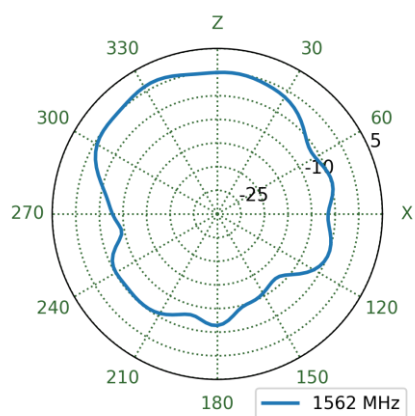
## 6.4 GNSS 60x60cm Metal Ground Plane Patterns at 1562 MHz



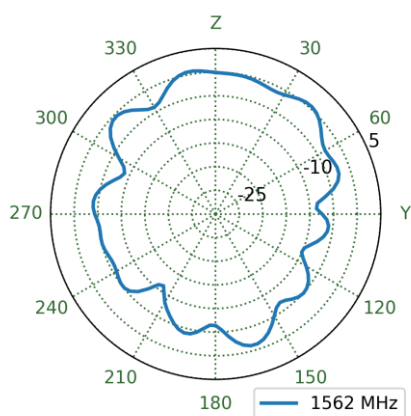
## 6.5 GNSS Free Space Patterns at 1562 MHz



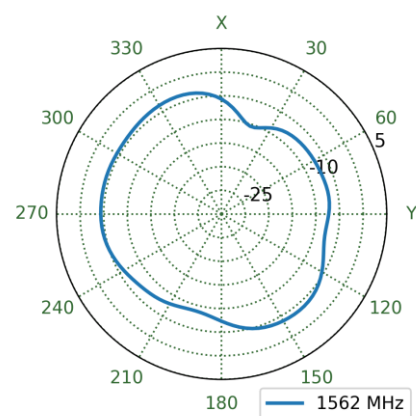
XZ Plane



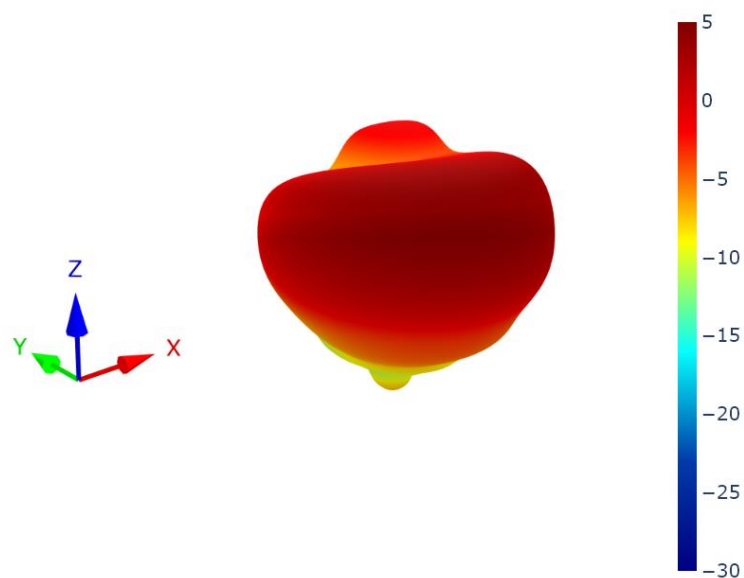
YZ Plane



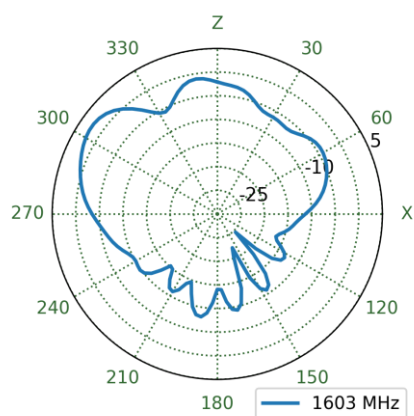
XY Plane



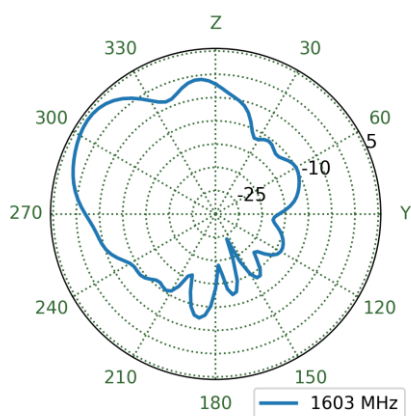
## 6.6 GNSS 60x60cm Metal Ground Plane Patterns at 1603 MHz



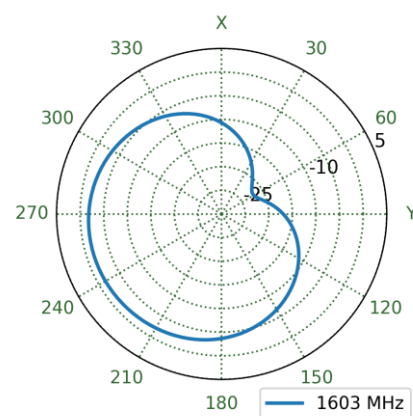
XZ Plane



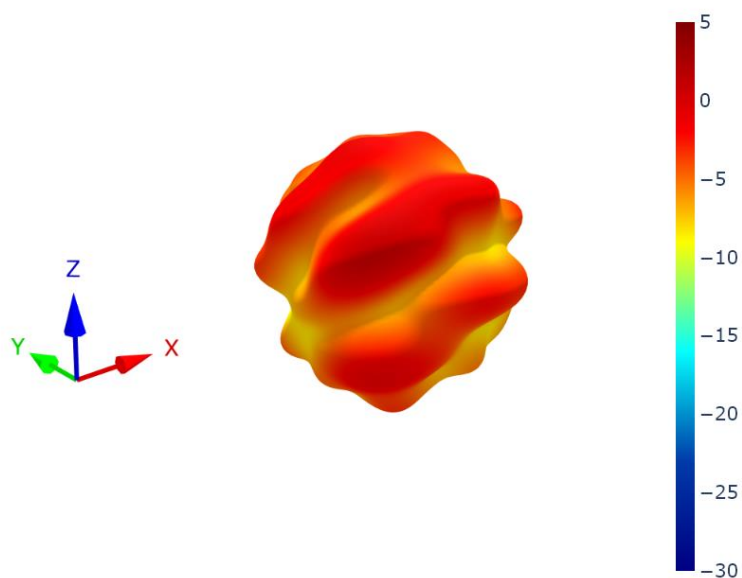
YZ Plane



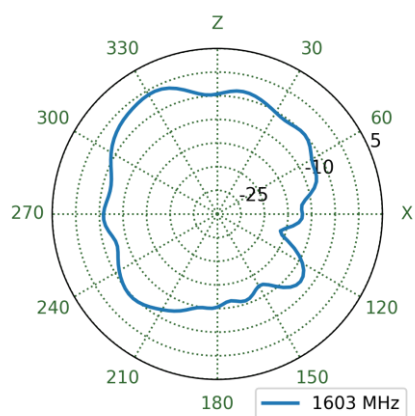
XY Plane



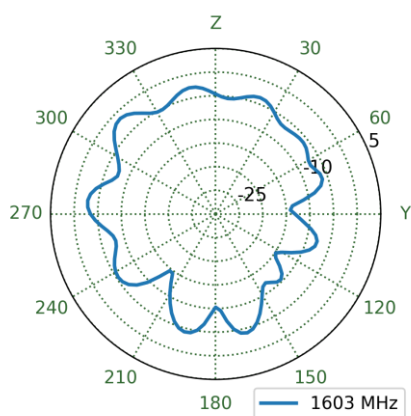
## 6.7 GNSS Free Space Patterns at 1603 MHz



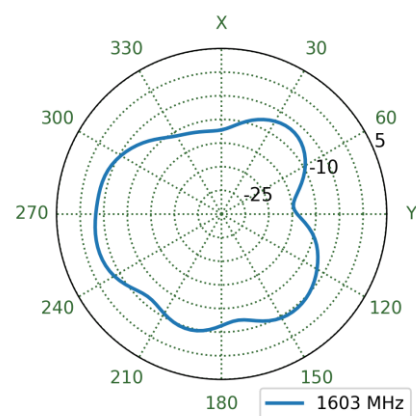
XZ Plane



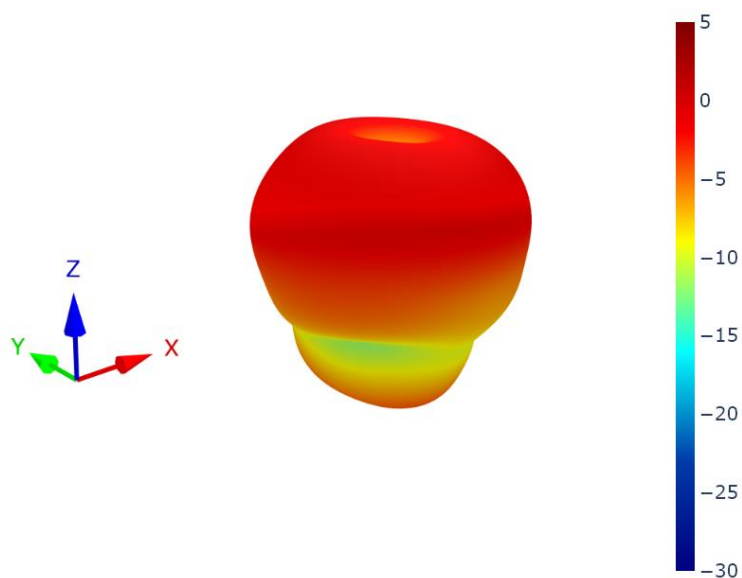
YZ Plane



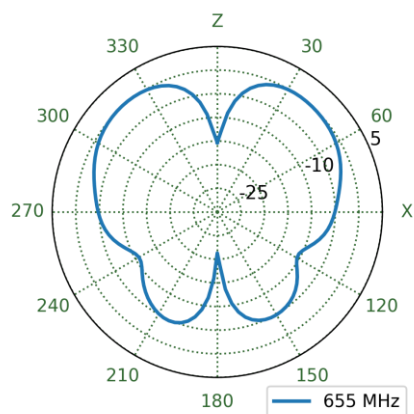
XY Plane



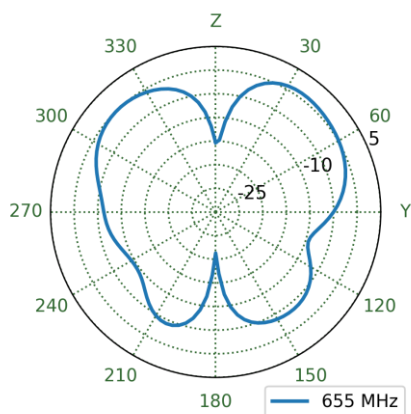
## 6.8 Cellular1 - 60x60cm Metal Ground Plane Patterns at 655 MHz



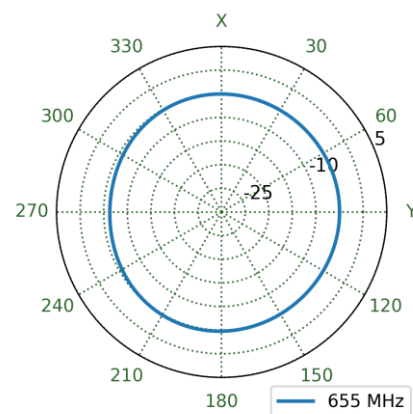
XZ Plane



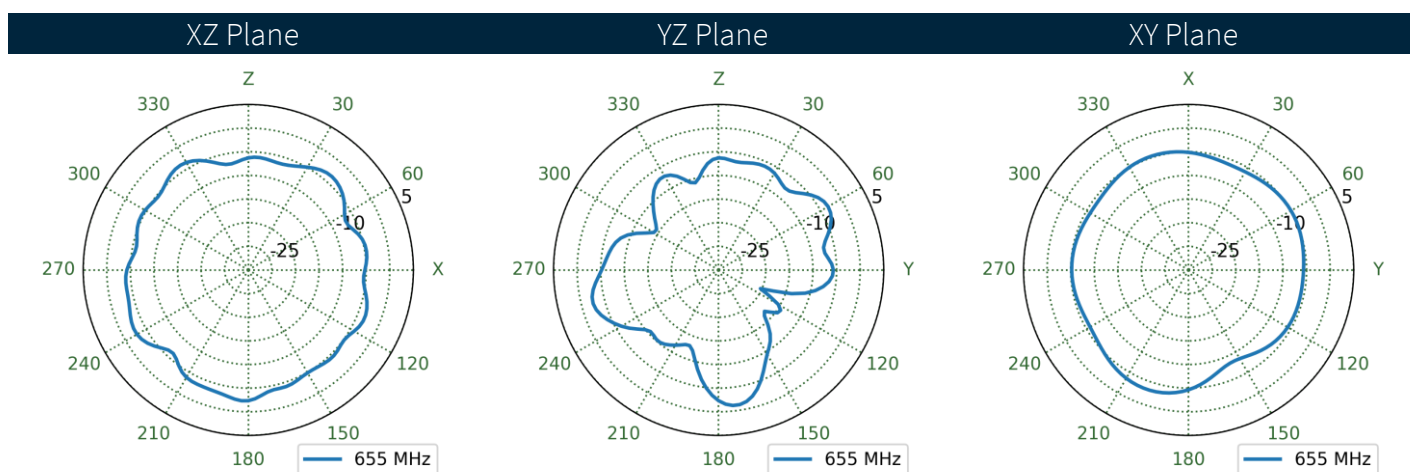
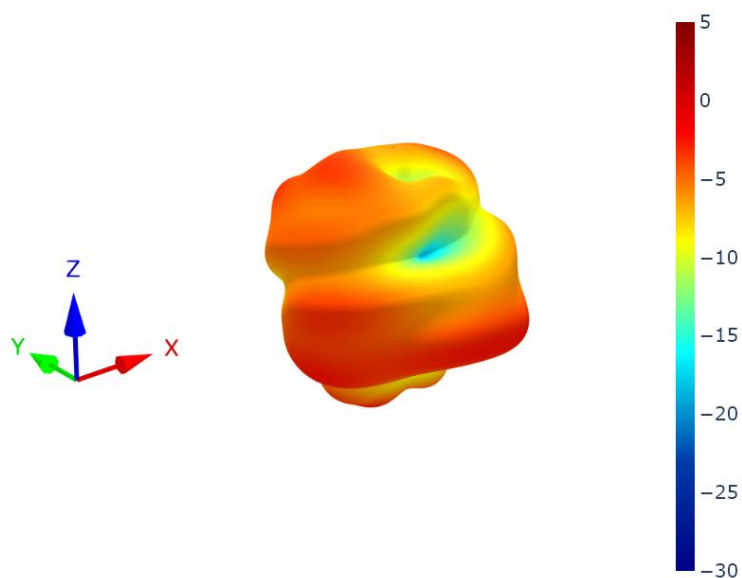
YZ Plane



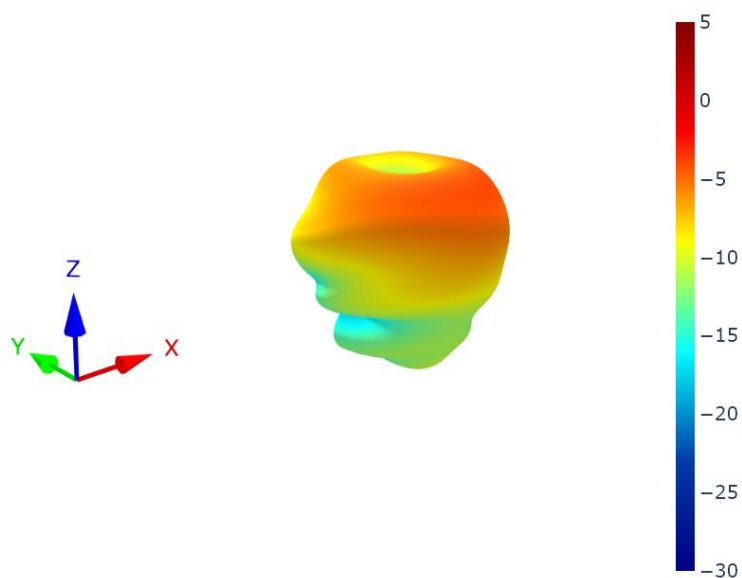
XY Plane



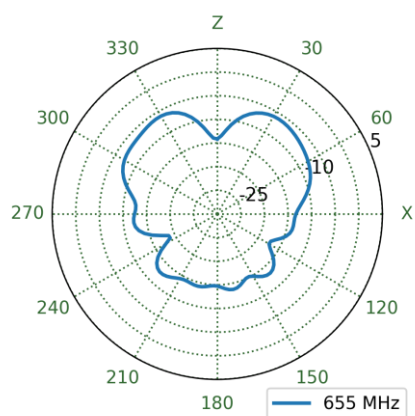
## 6.9 Cellular1 - Free Space Patterns at 655 MHz



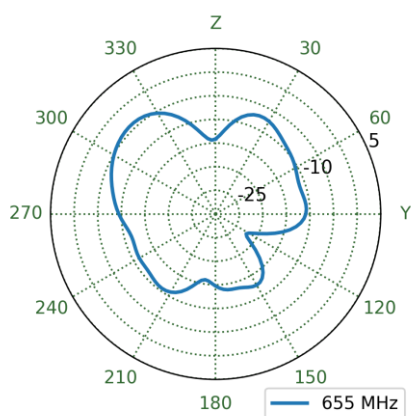
## 6.10 Cellular2 - 60x60cm Metal Ground Plane Patterns at 655 MHz



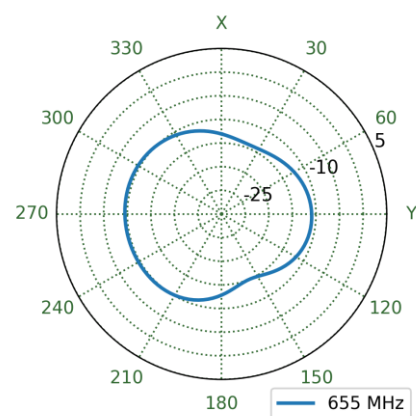
XZ Plane



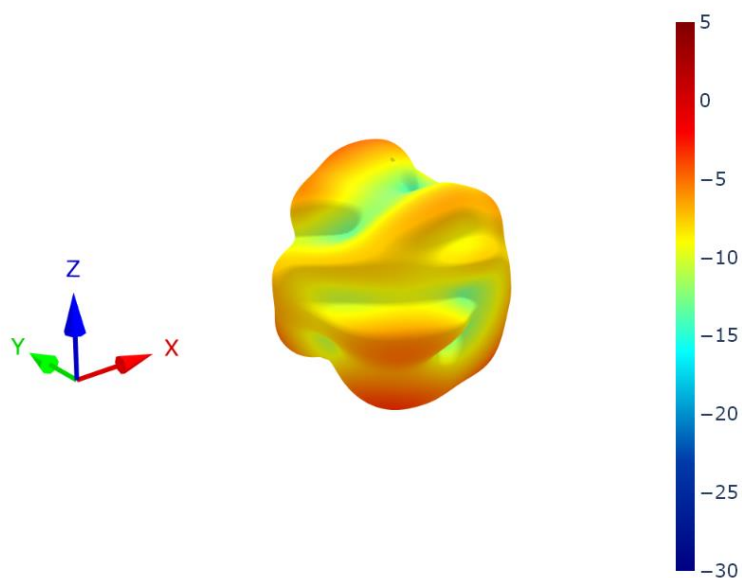
YZ Plane



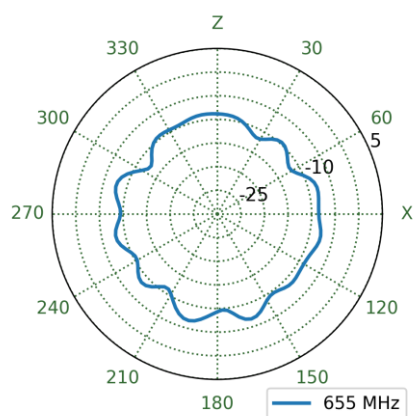
XY Plane



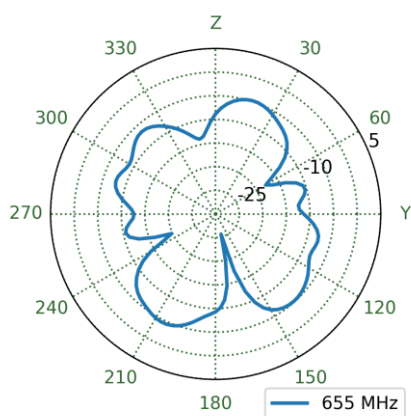
## 6.11 Cellular2 - Free Space Patterns at 655 MHz



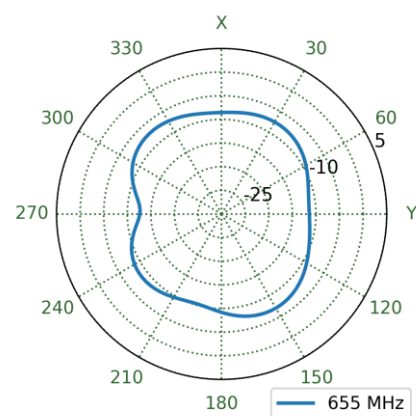
XZ Plane



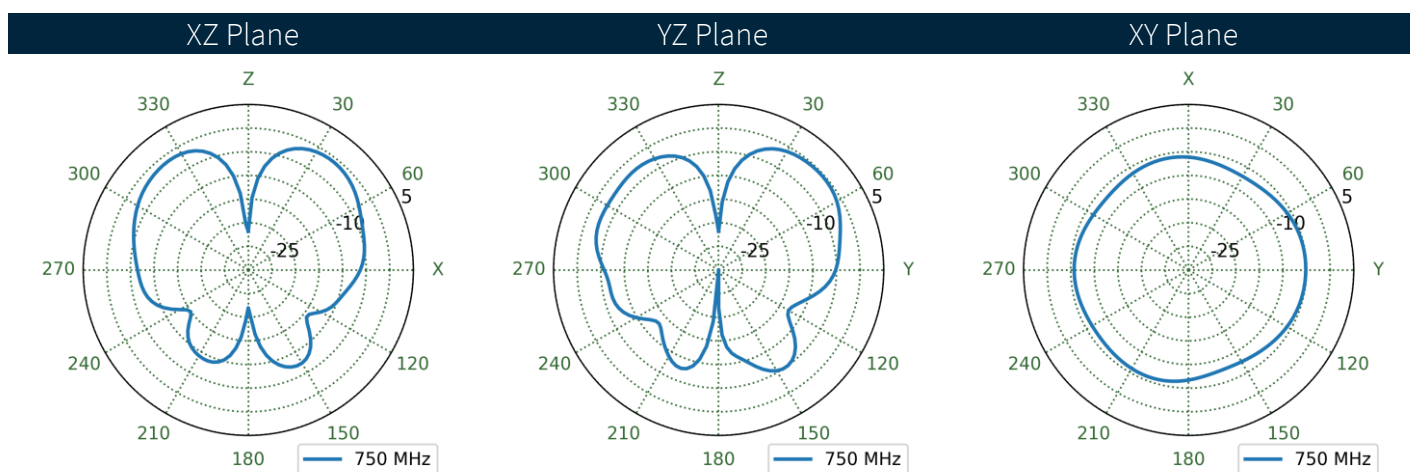
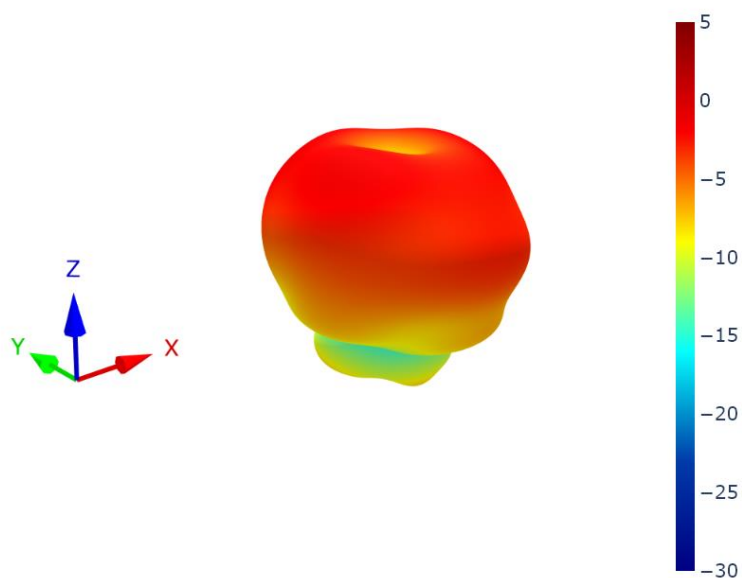
YZ Plane



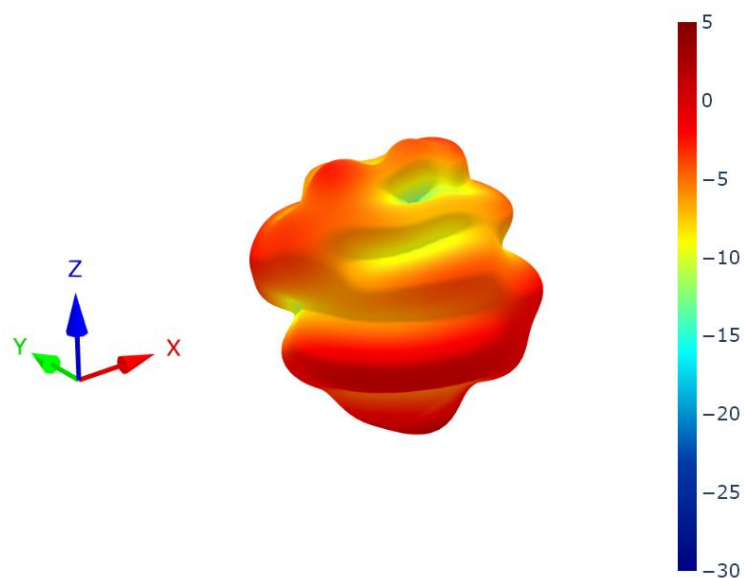
XY Plane



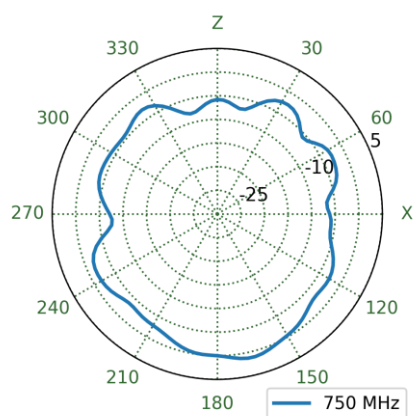
## 6.12 Cellular1 - 60x60cm Metal Ground Plane Patterns at 750 MHz



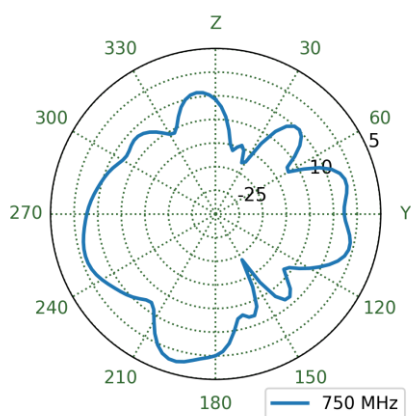
## 6.13 Cellular1 - Free Space Patterns at 750 MHz



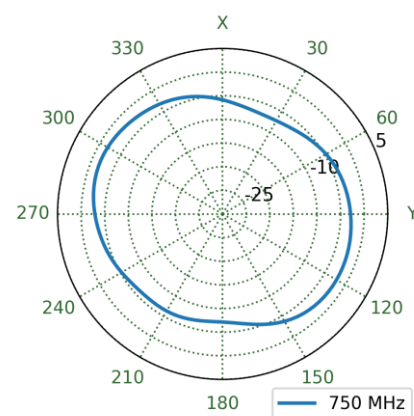
XZ Plane



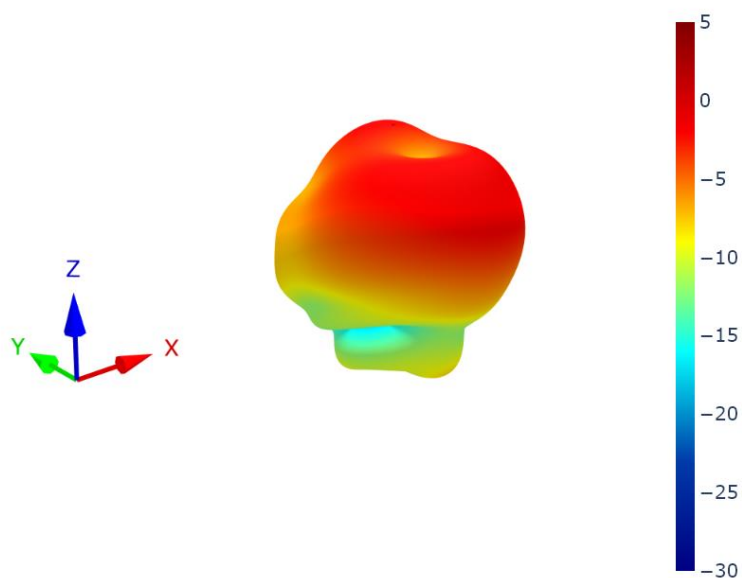
YZ Plane



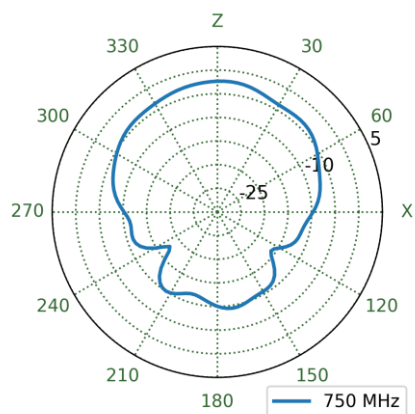
XY Plane



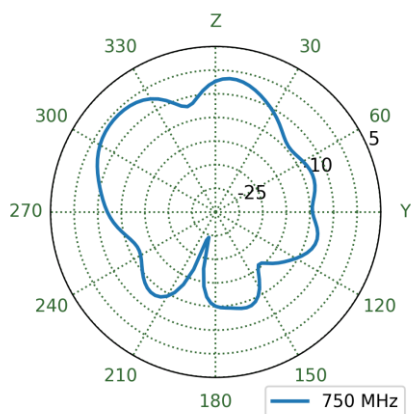
## 6.14 Cellular2 - 60x60cm Metal Ground Plane Patterns at 750 MHz



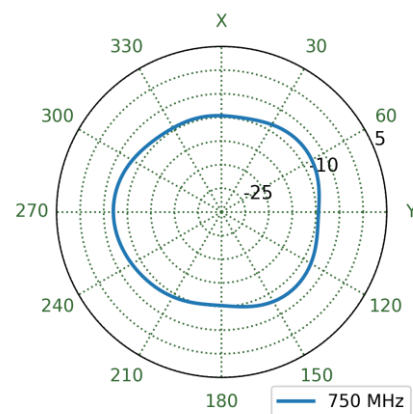
XZ Plane



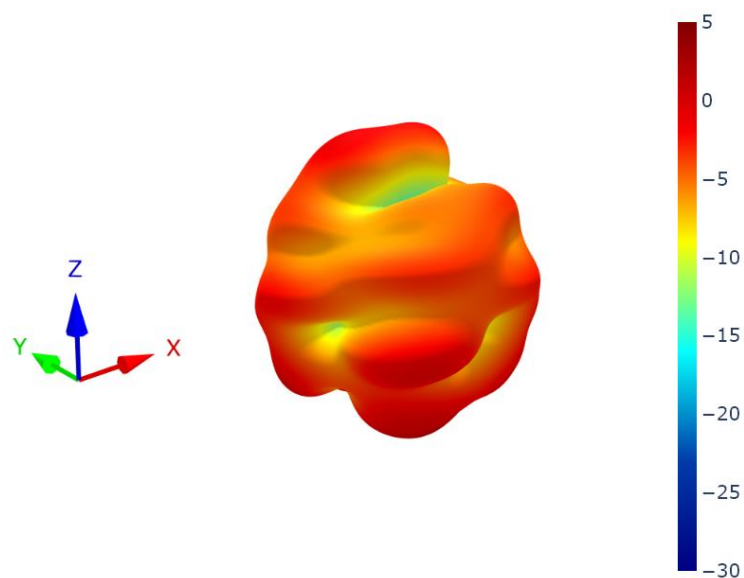
YZ Plane



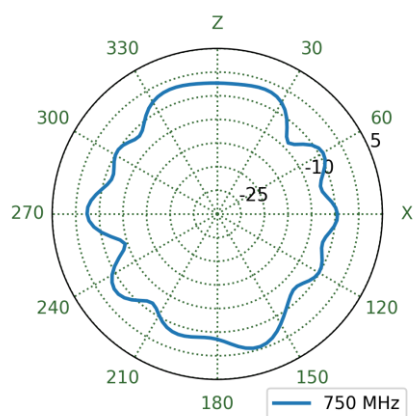
XY Plane



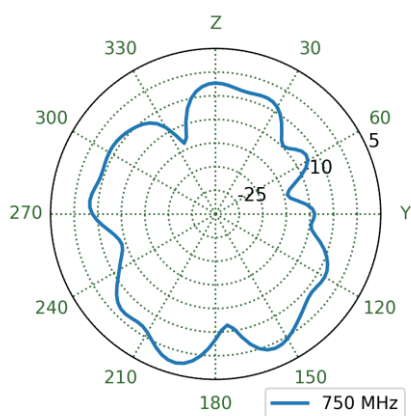
## 6.15 Cellular2 - Free Space Patterns at 750 MHz



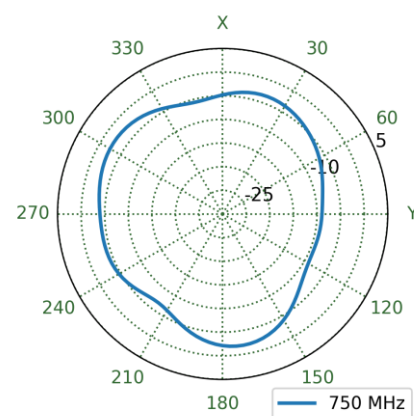
XZ Plane



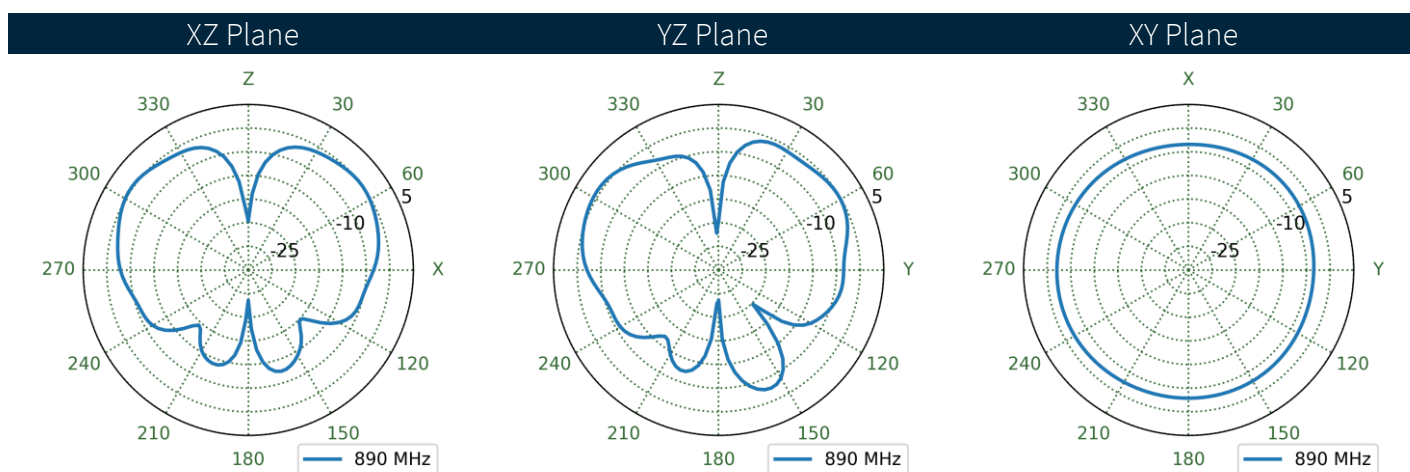
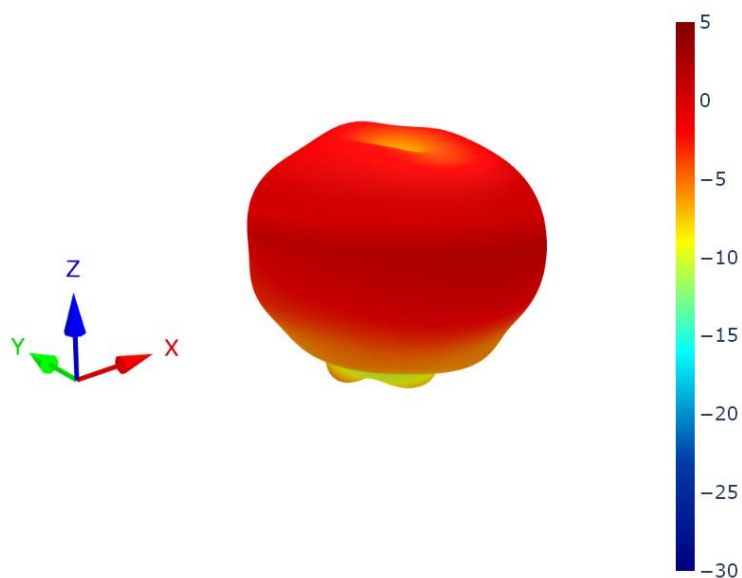
YZ Plane



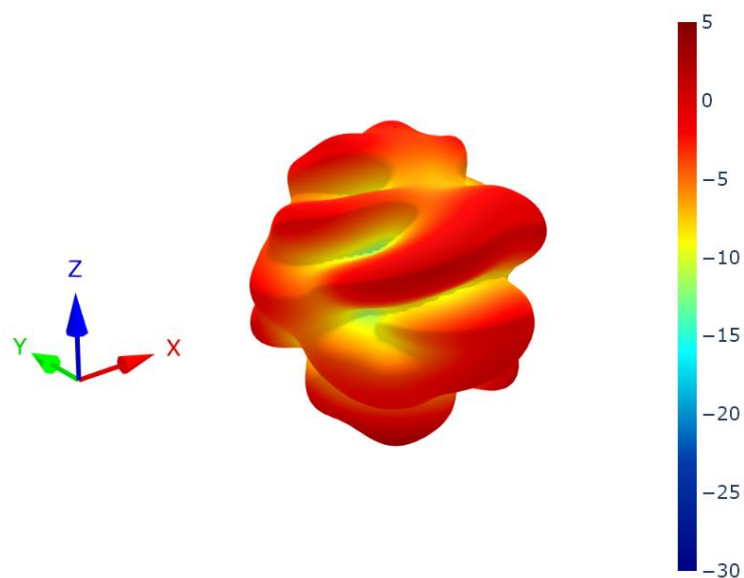
XY Plane



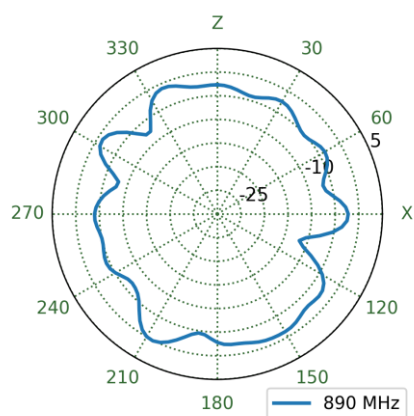
## 6.16 Cellular1 - 60x60cm Metal Ground Plane Patterns at 890 MHz



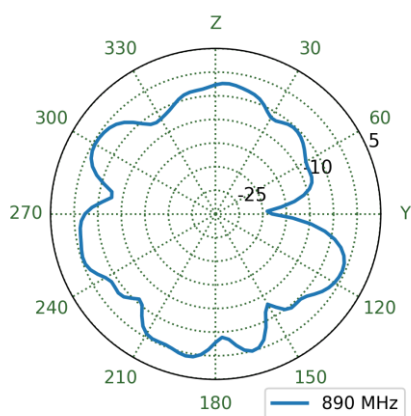
## 6.17 Cellular1 - Free Space Patterns at 890 MHz



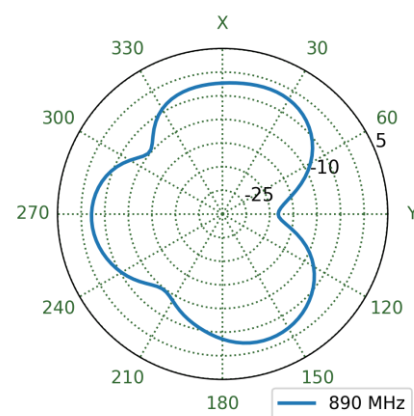
XZ Plane



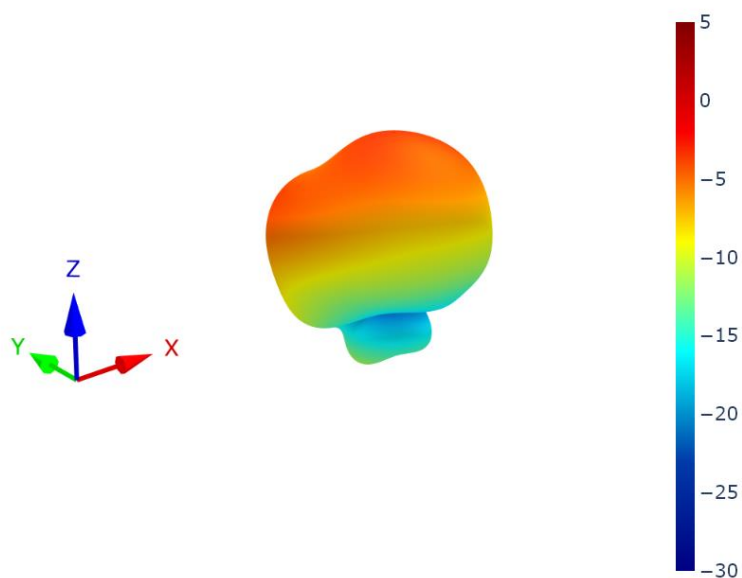
YZ Plane



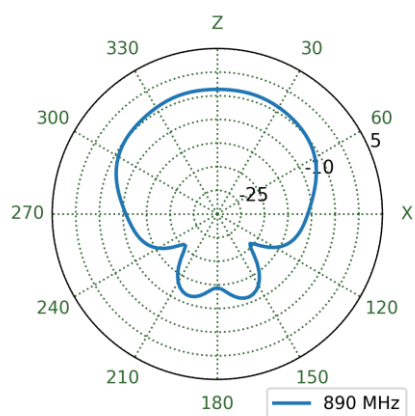
XY Plane



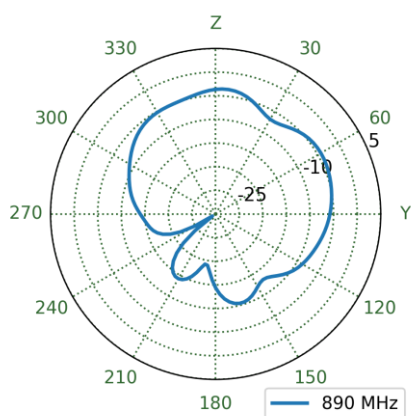
## 6.18 Cellular2 - 60x60cm Metal Ground Plane Patterns at 890 MHz



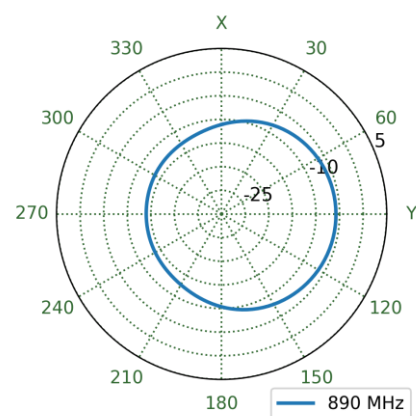
XZ Plane



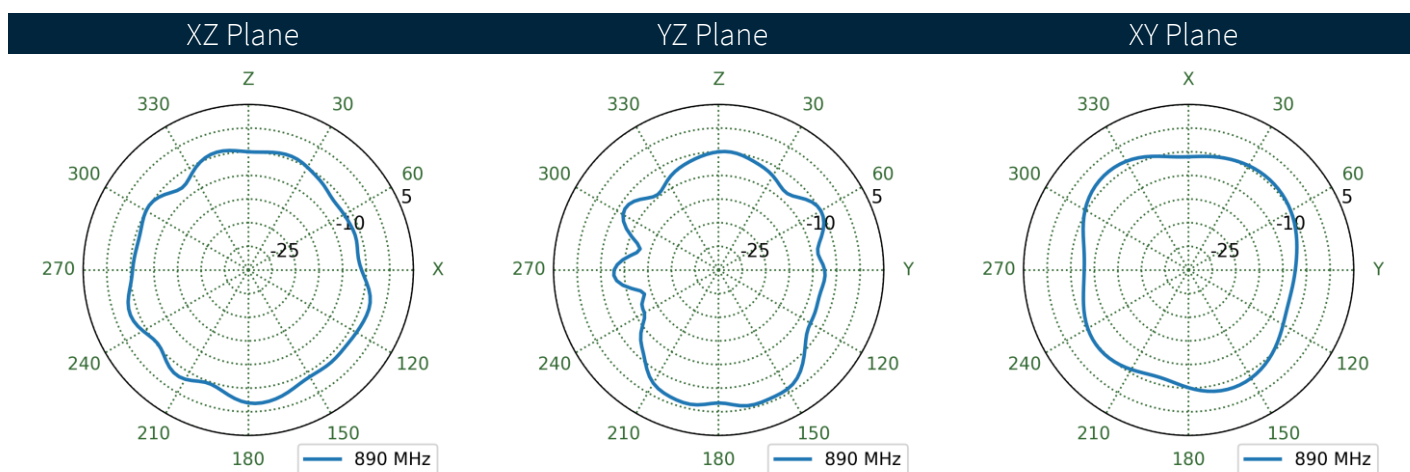
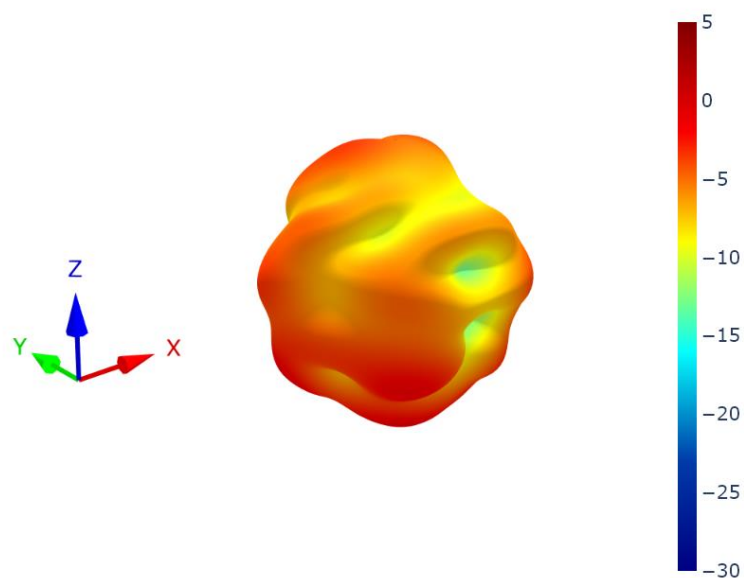
YZ Plane



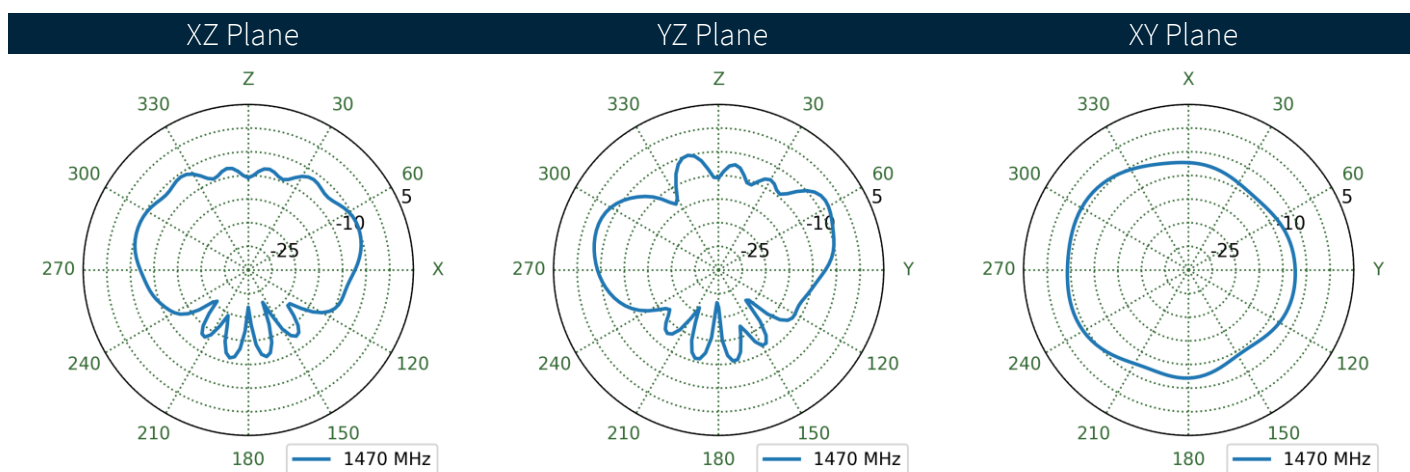
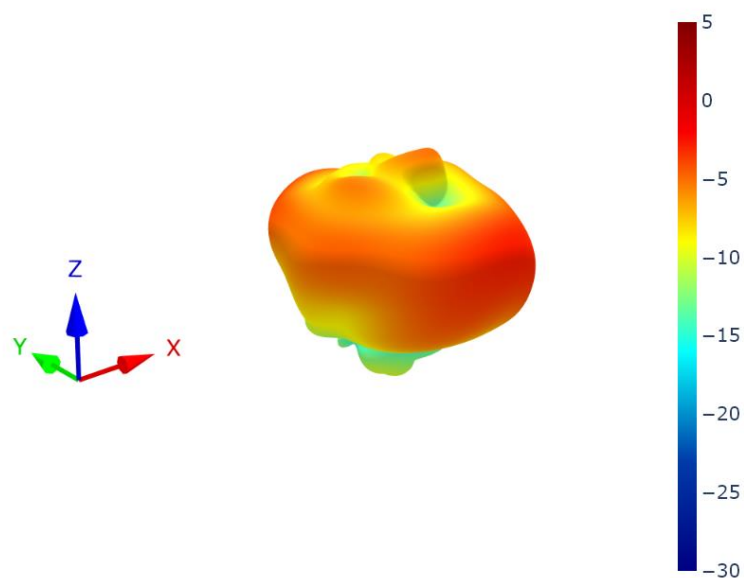
XY Plane



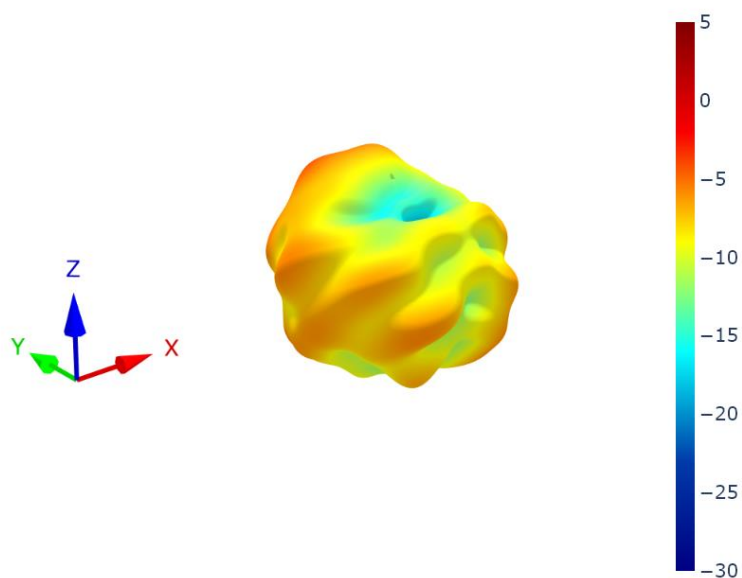
## 6.19 Cellular2 - Free Space Patterns at 890 MHz



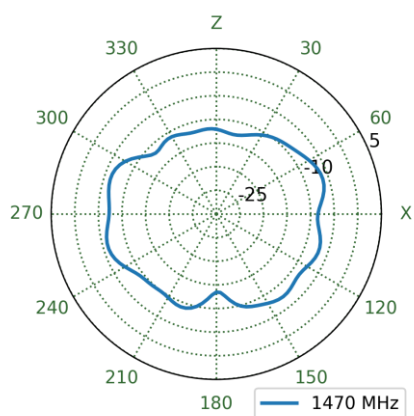
## 6.20 Cellular1 - 60x60cm Metal Ground Plane Patterns at 1470 MHz



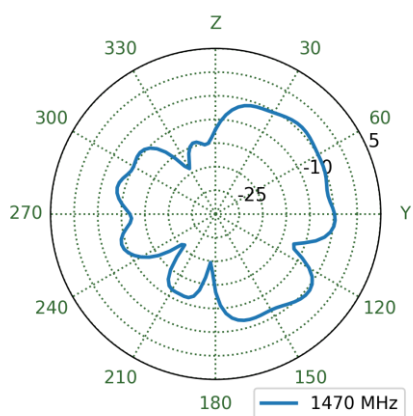
## 6.21 Cellular1 - Free Space Patterns at 1470 MHz



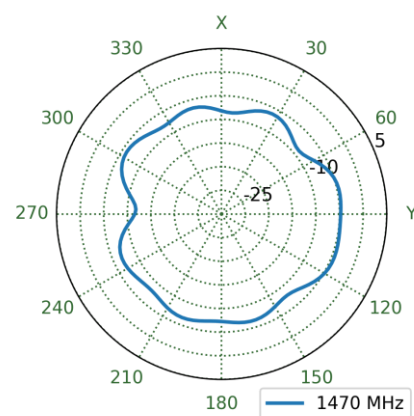
XZ Plane



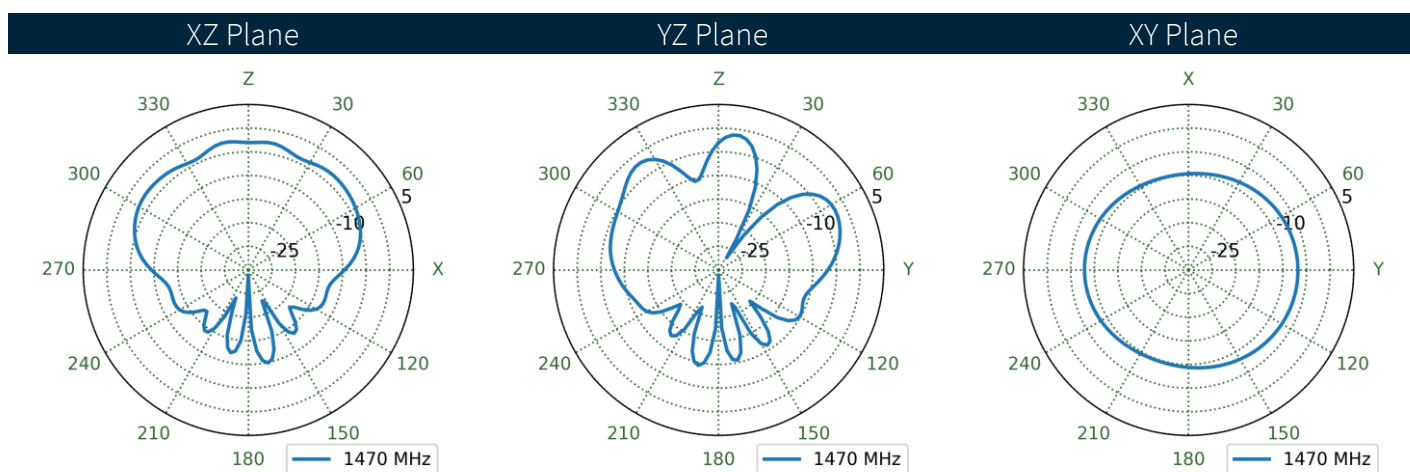
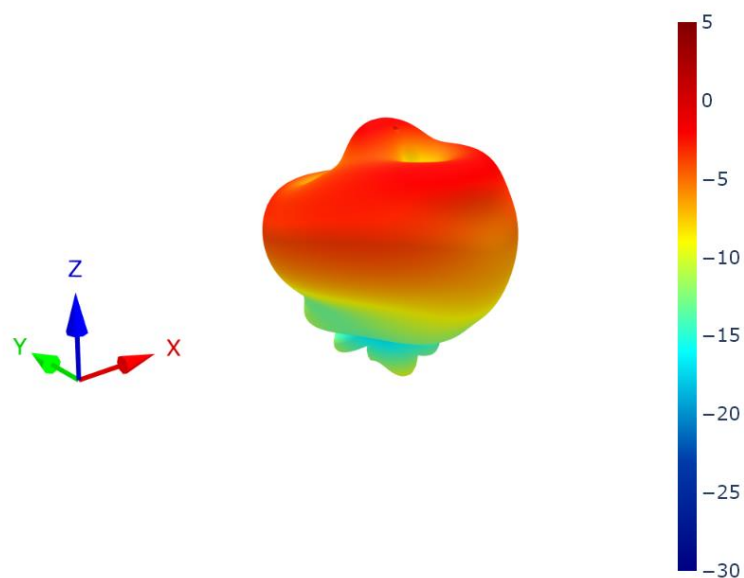
YZ Plane



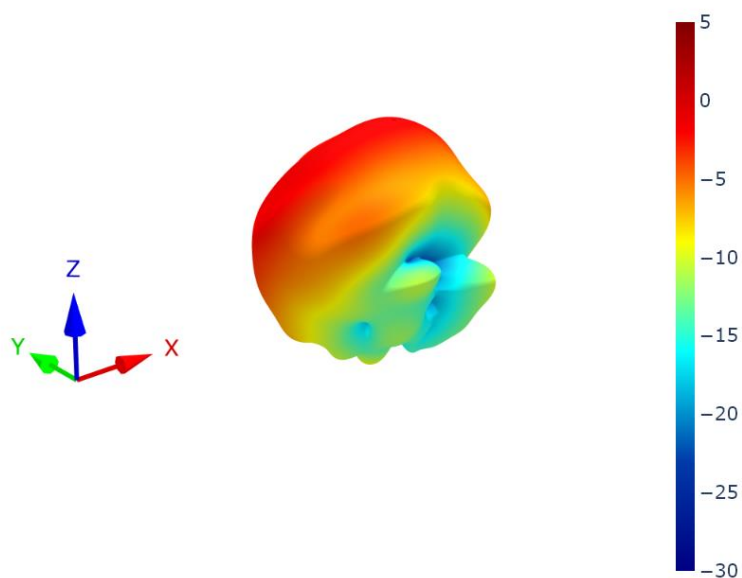
XY Plane



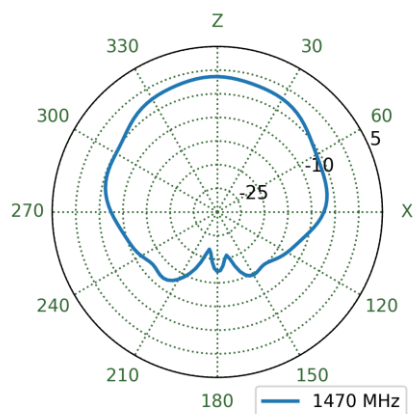
## 6.22 Cellular2 - 60x60cm Metal Ground Plane Patterns at 1470 MHz



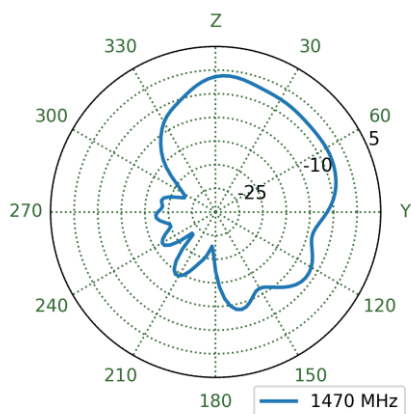
## 6.23 Cellular2 - Free Space Patterns at 1470 MHz



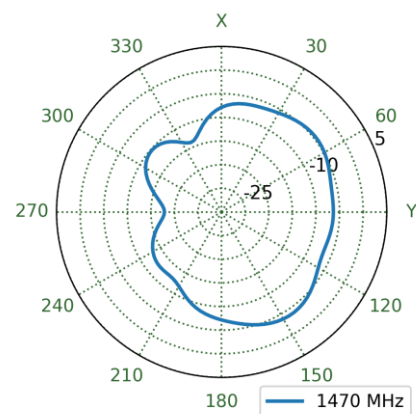
XZ Plane



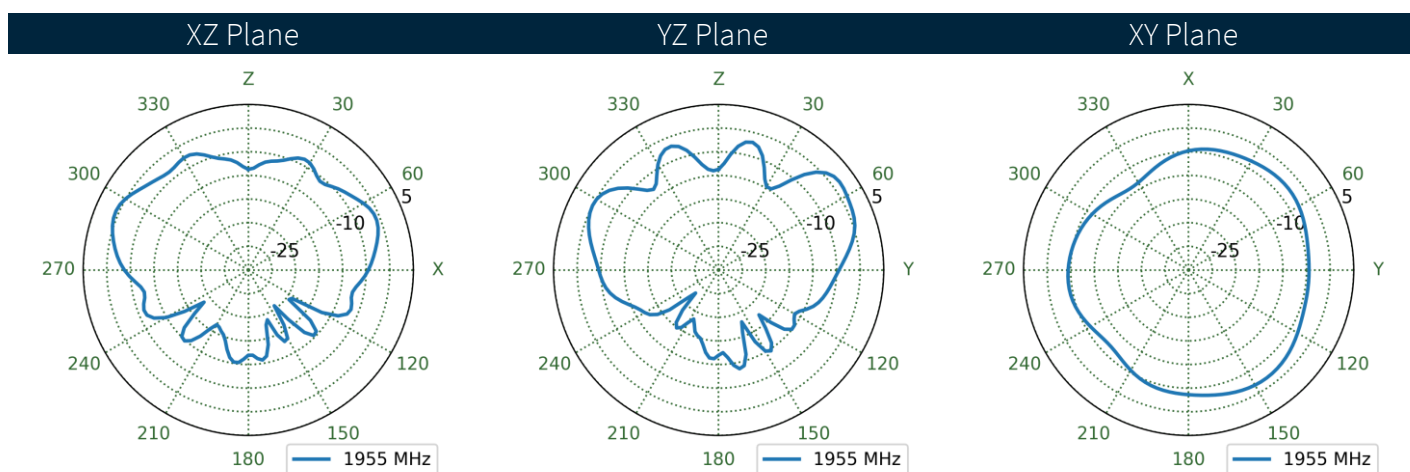
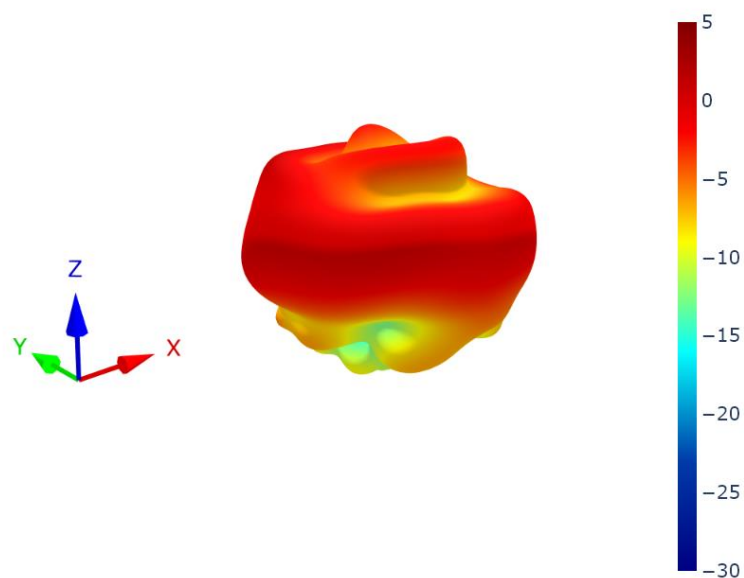
YZ Plane



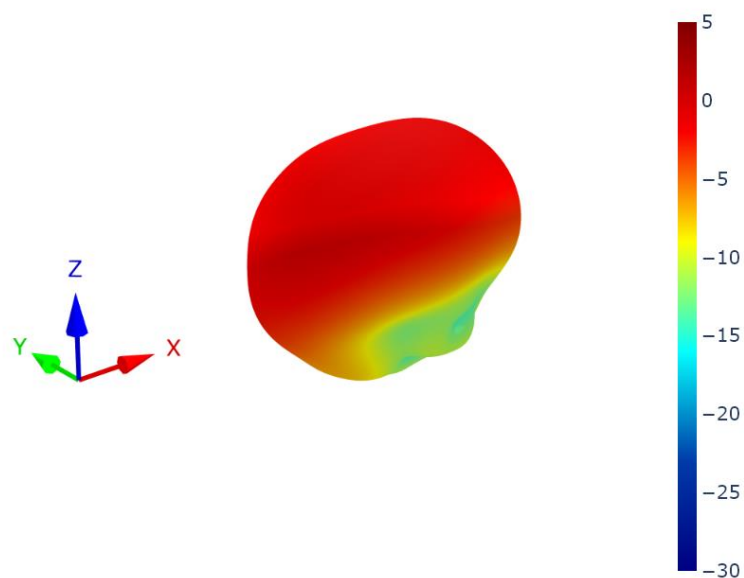
XY Plane



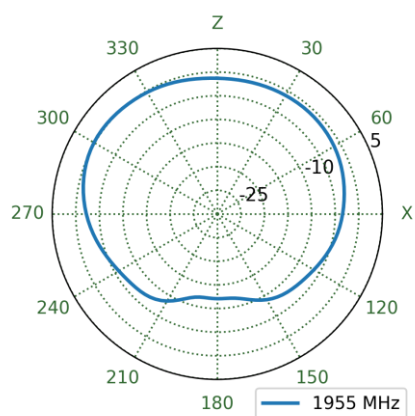
## 6.24 Cellular1 - 60x60cm Metal Ground Plane Patterns at 1955 MHz



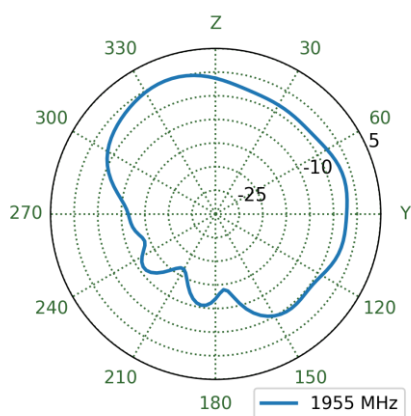
## 6.25 Cellular1 - Free Space Patterns at 1955 MHz



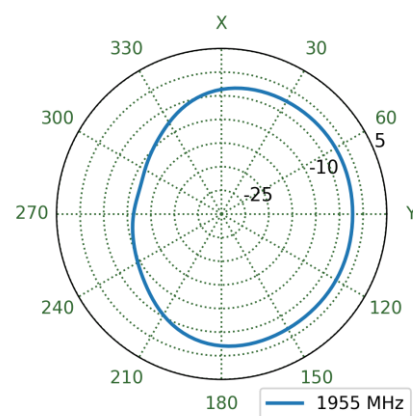
XZ Plane



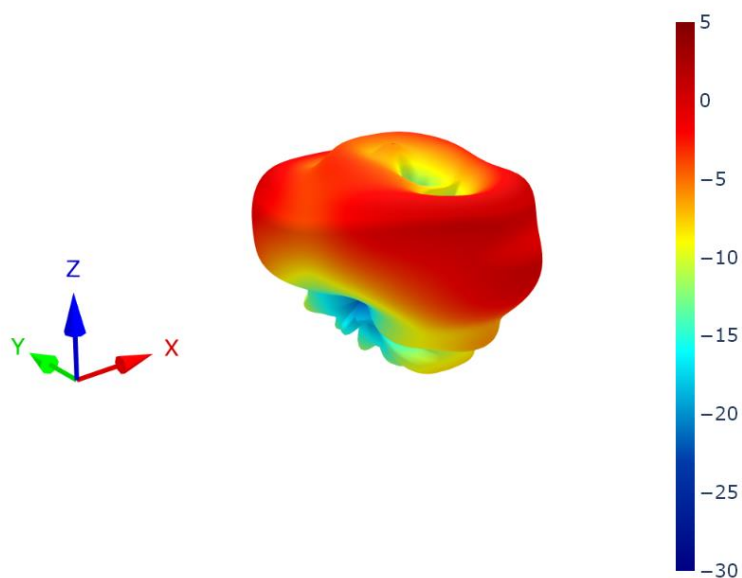
YZ Plane



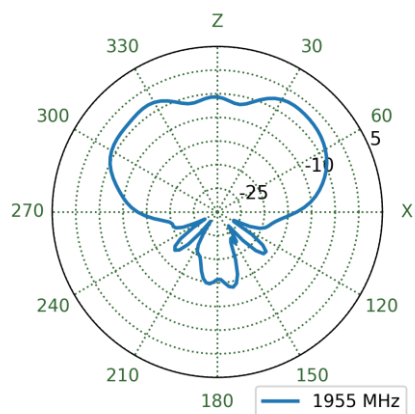
XY Plane



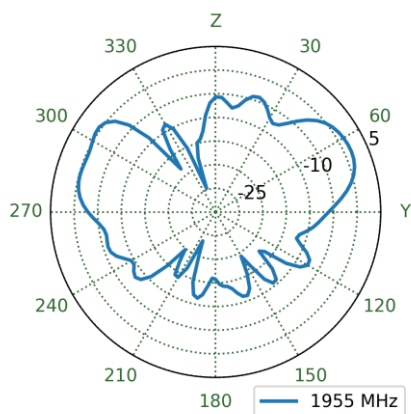
## 6.26 Cellular2 - 60x60cm Metal Ground Plane Patterns at 1955 MHz



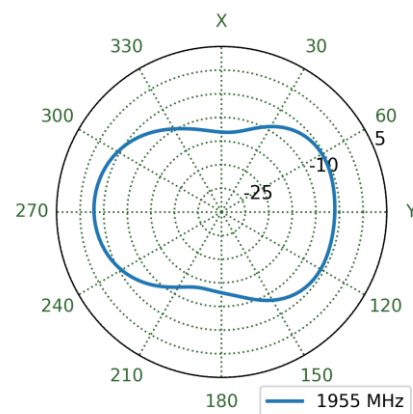
XZ Plane



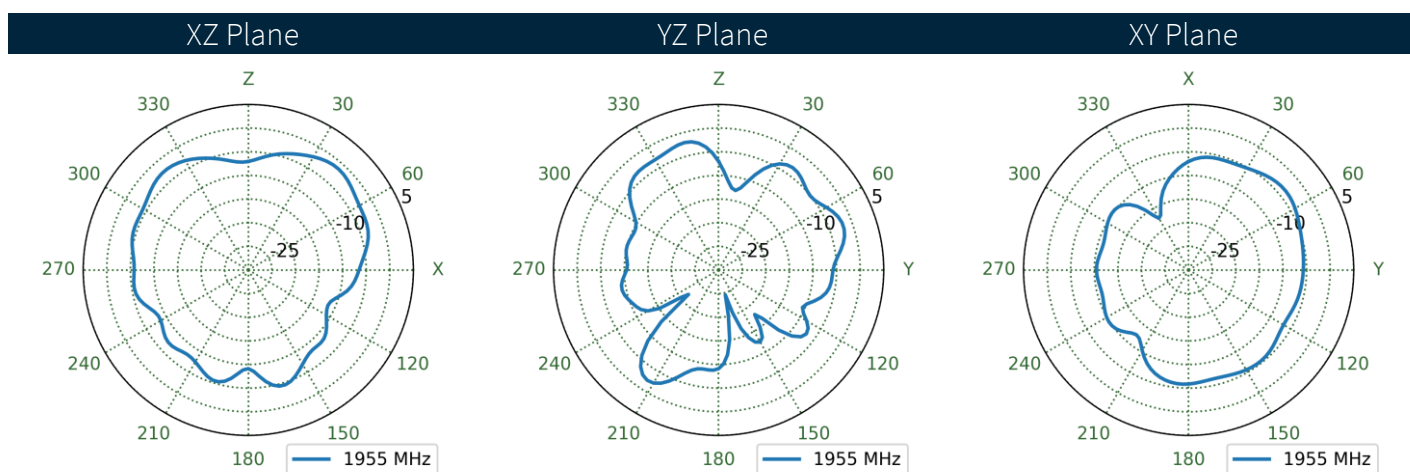
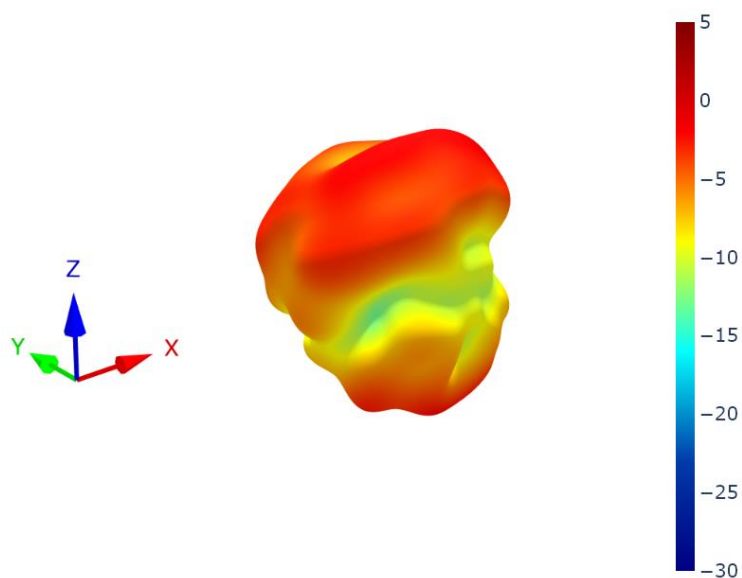
YZ Plane



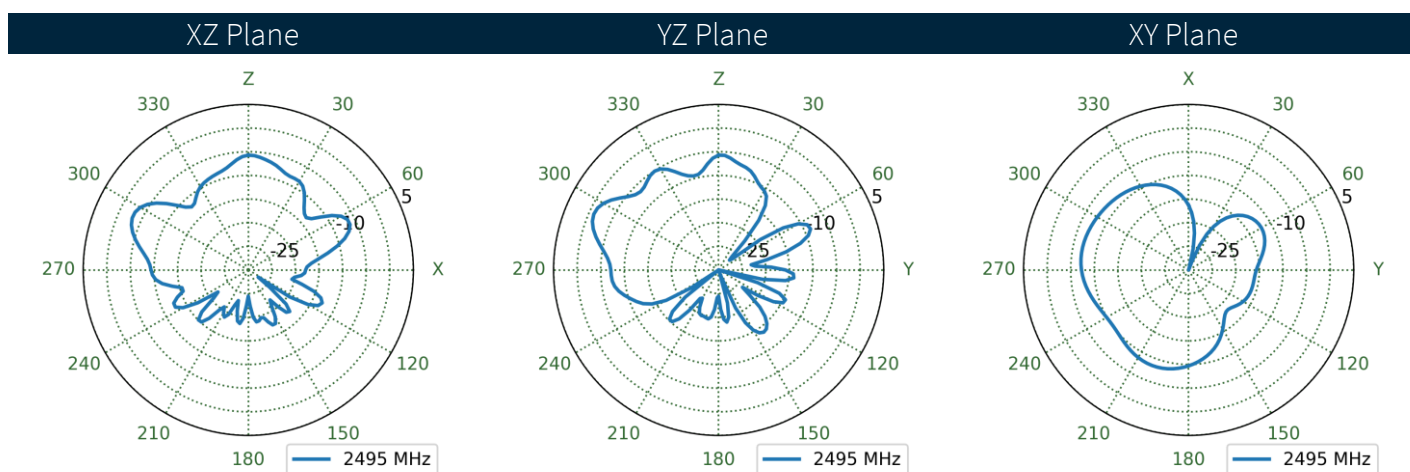
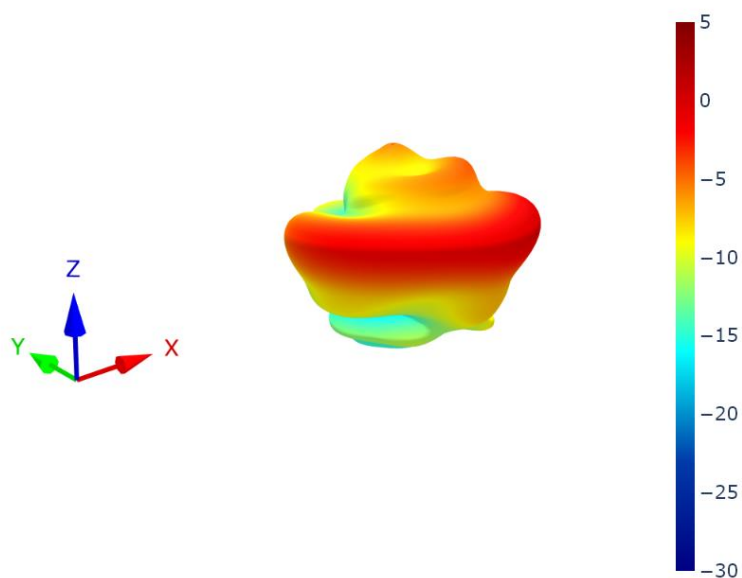
XY Plane



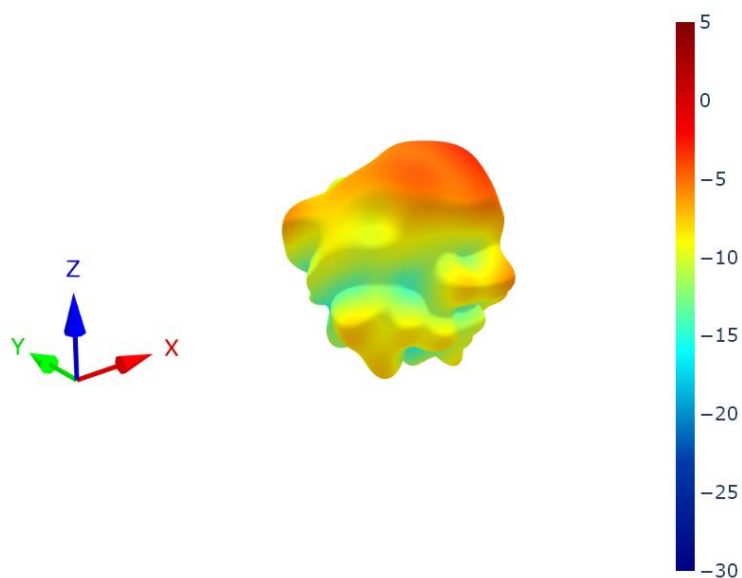
## 6.27 Cellular2 - Free Space Patterns at 1955 MHz



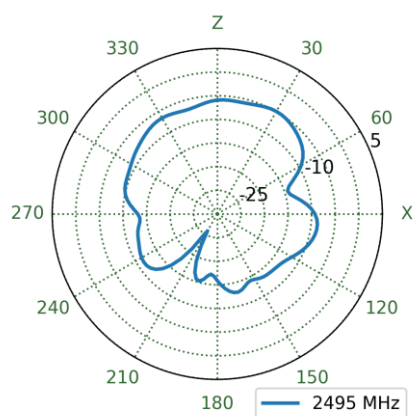
## 6.28 Cellular1 - 60x60cm Metal Ground Plane Patterns at 2495 MHz



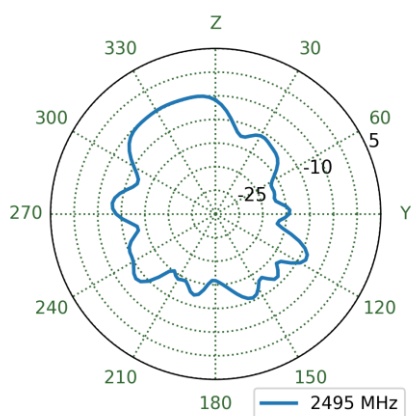
## 6.29 Cellular1 - Free Space Patterns at 2495 MHz



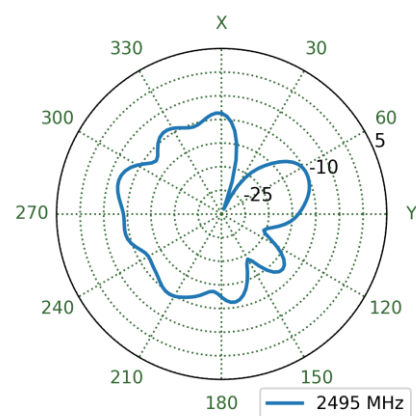
XZ Plane



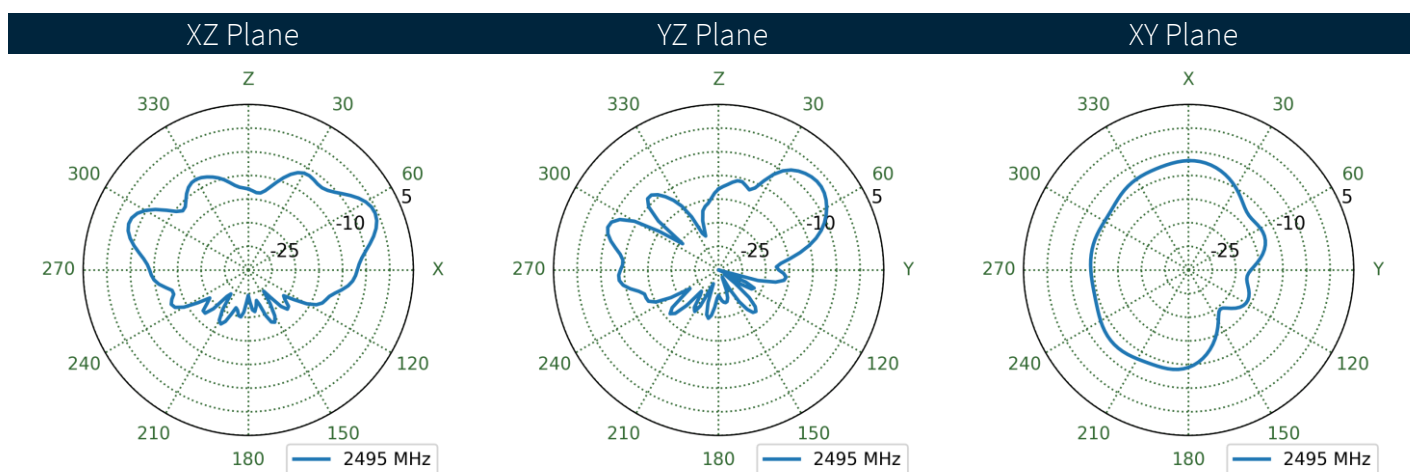
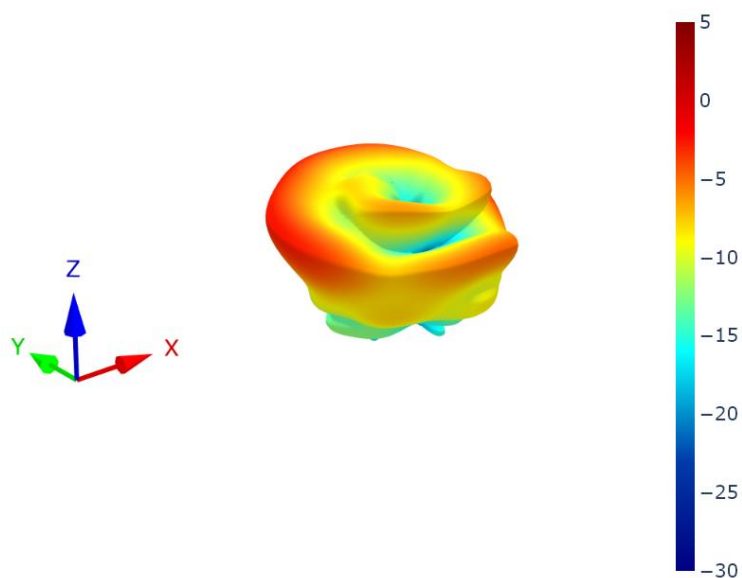
YZ Plane



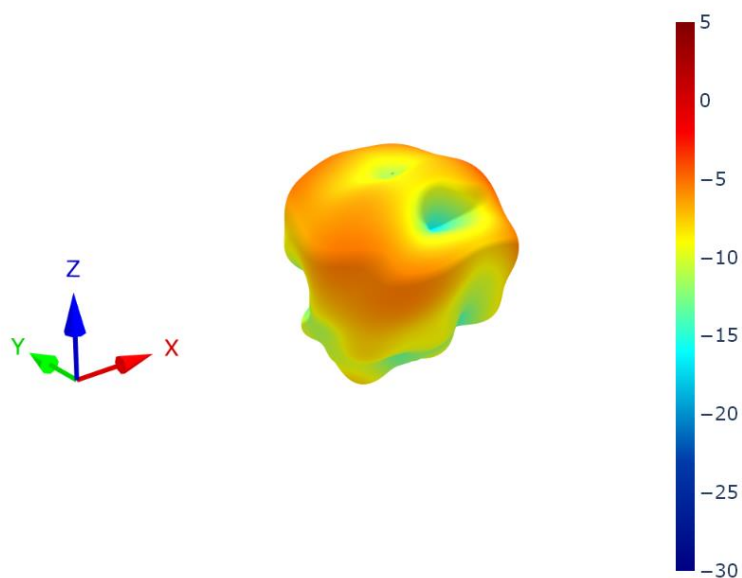
XY Plane



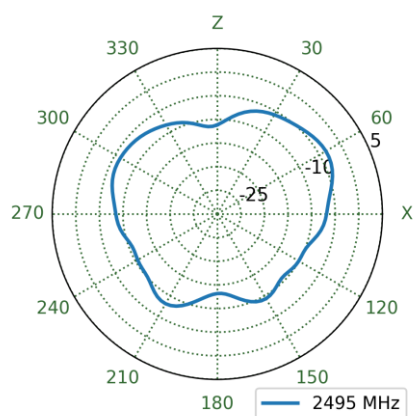
## 6.30 Cellular2 - 60x60cm Metal Ground Plane Patterns at 2495 MHz



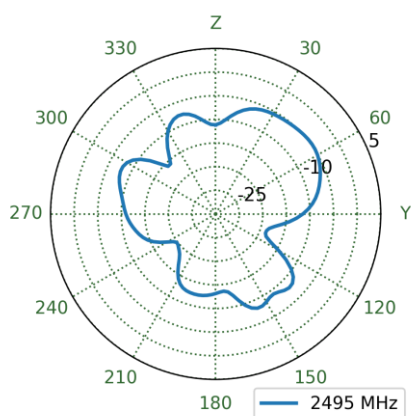
## 6.31 Cellular2 - Free Space Patterns at 2495 MHz



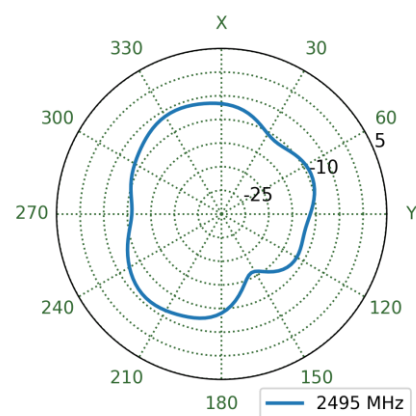
XZ Plane



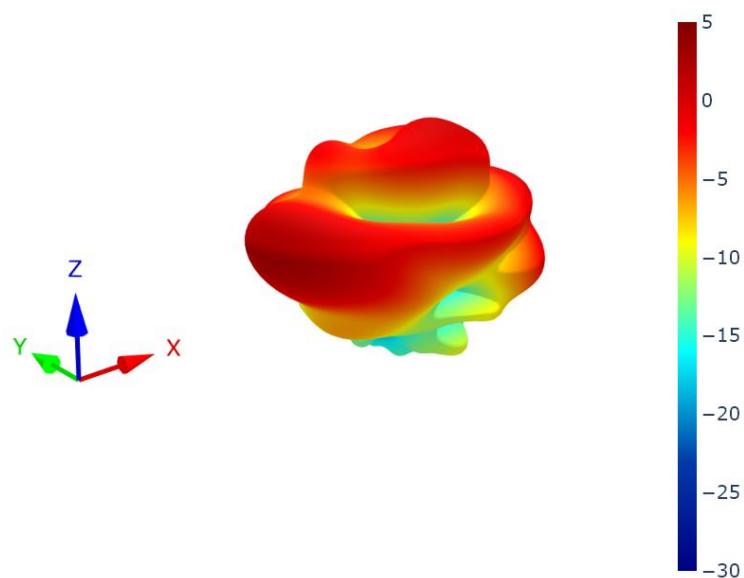
YZ Plane



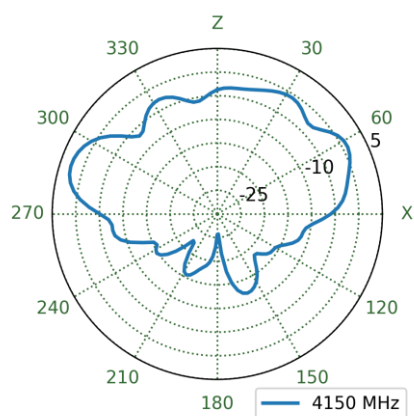
XY Plane



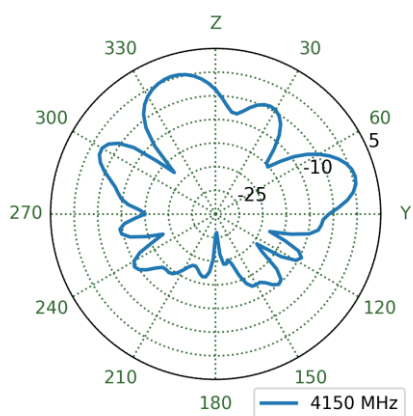
## 6.32 Cellular1 - 60x60cm Metal Ground Plane Patterns at 4150 MHz



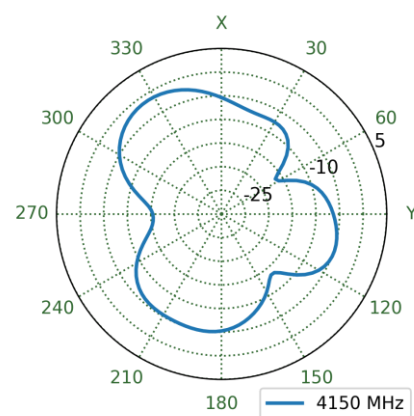
XZ Plane



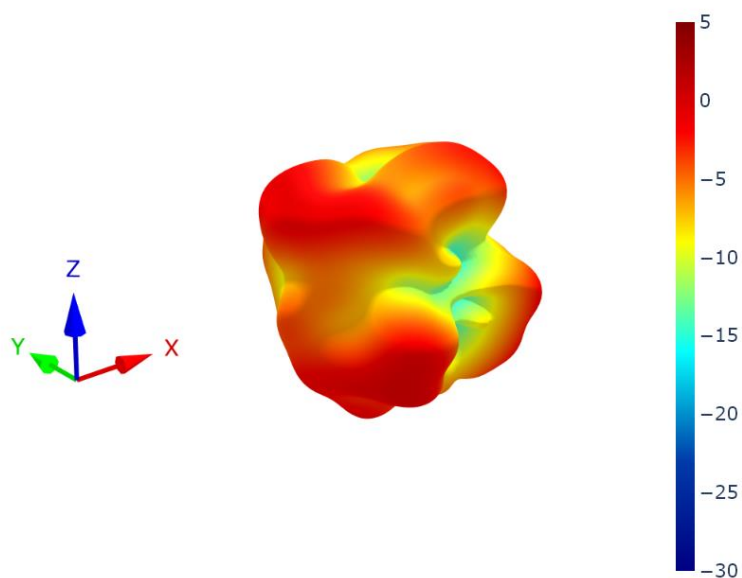
YZ Plane



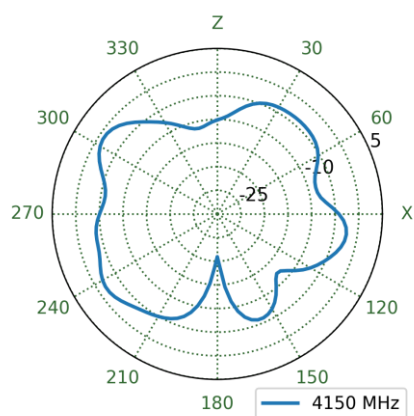
XY Plane



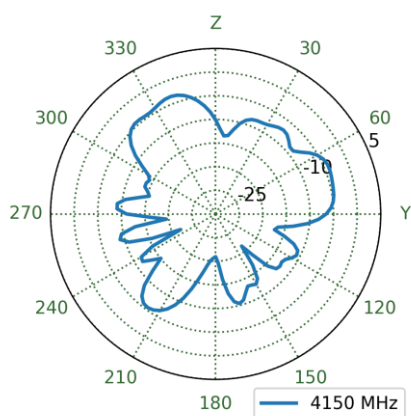
## 6.33 Cellular1 - Free Space Patterns at 4150 MHz



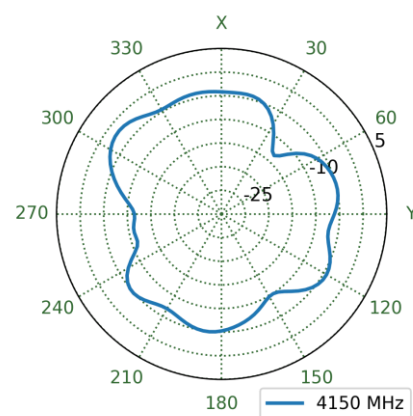
XZ Plane



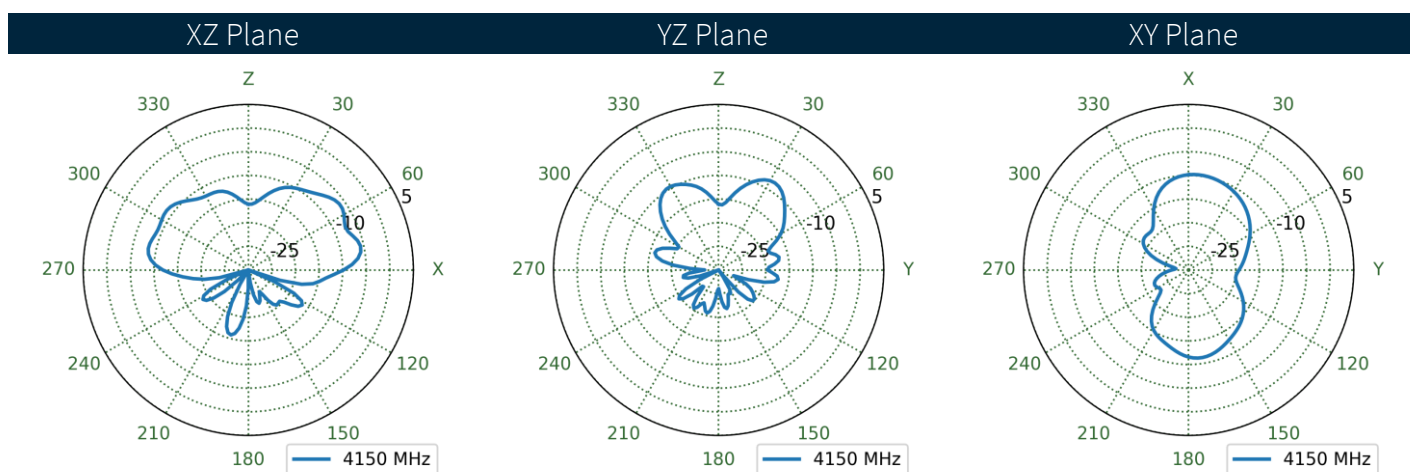
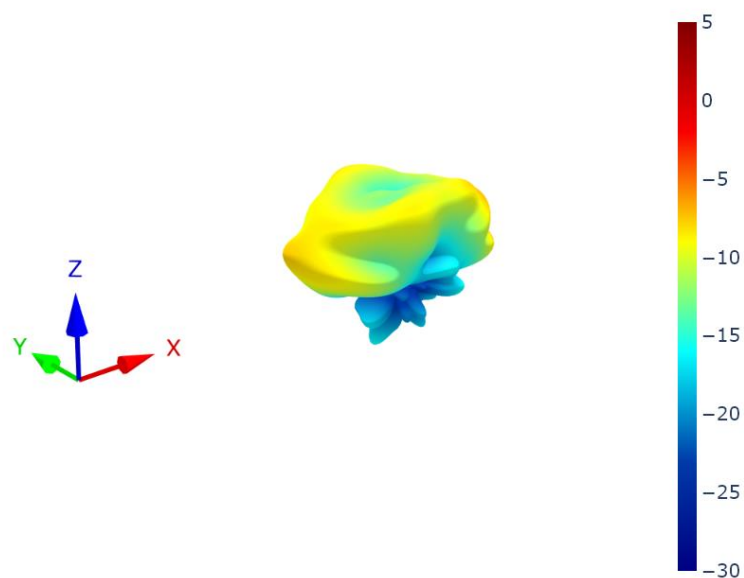
YZ Plane



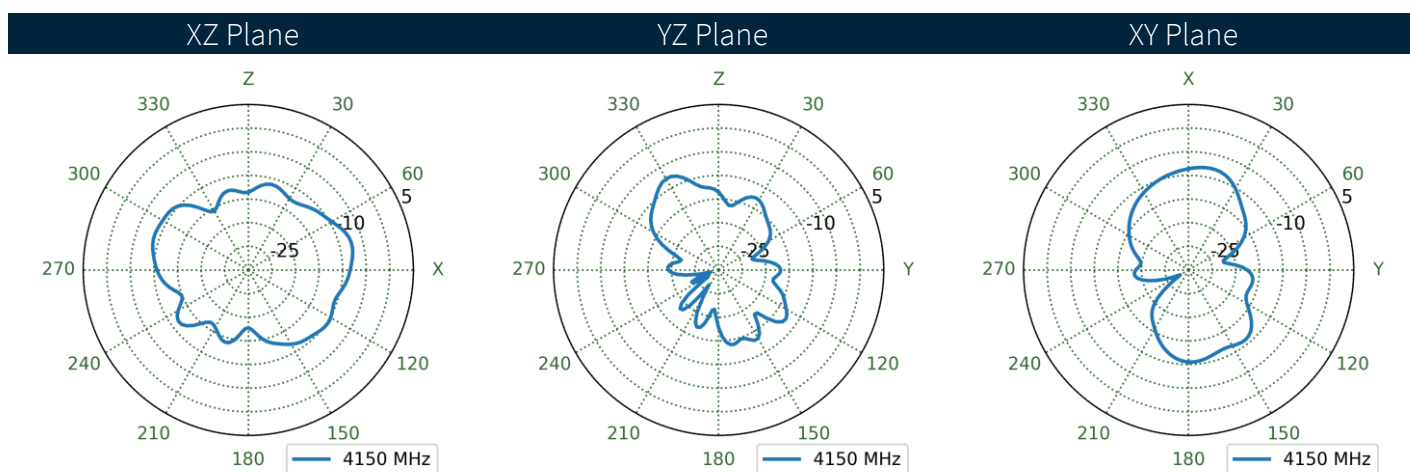
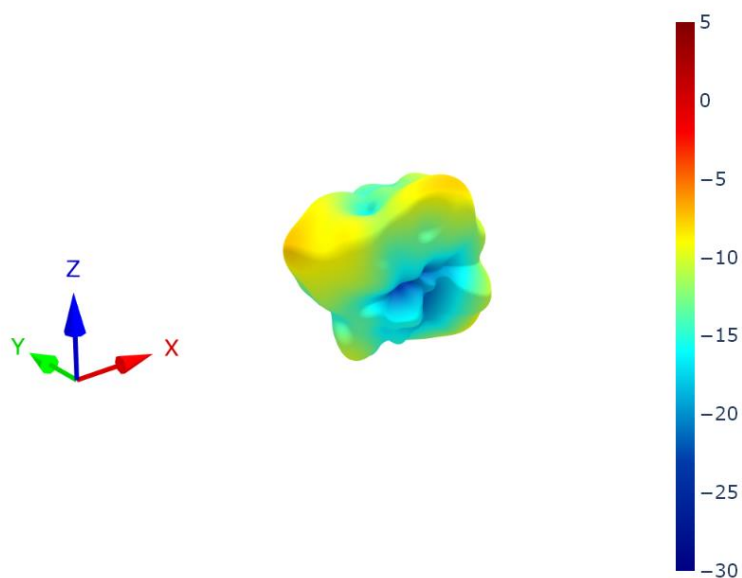
XY Plane



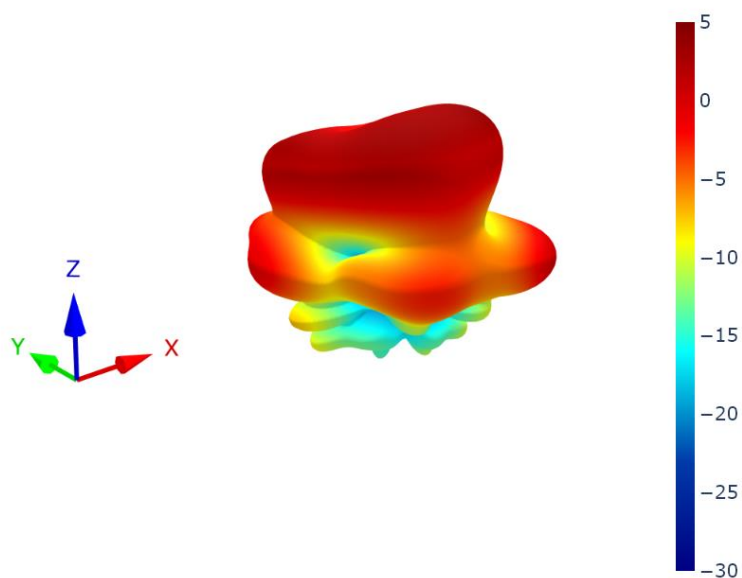
## 6.34 Cellular2 - 60x60cm Metal Ground Plane Patterns at 4150 MHz



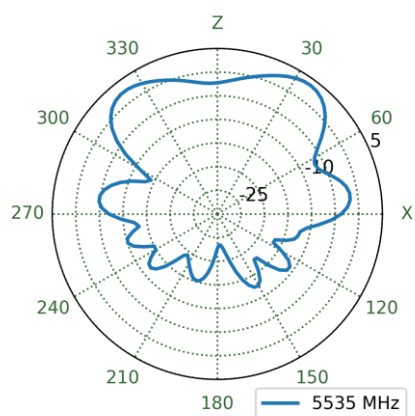
## 6.35 Cellular2 - Free Space Patterns at 4150 MHz



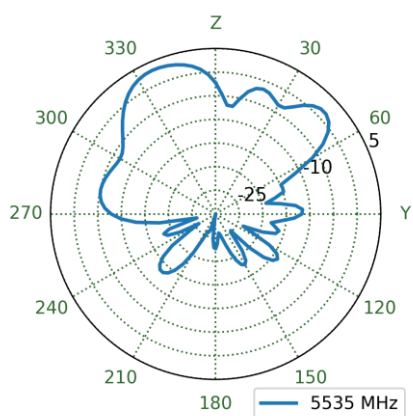
## 6.36 Cellular1 - 60x60cm Metal Ground Plane Patterns at 5535 MHz



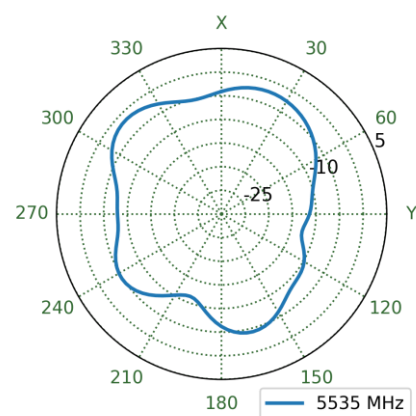
XZ Plane



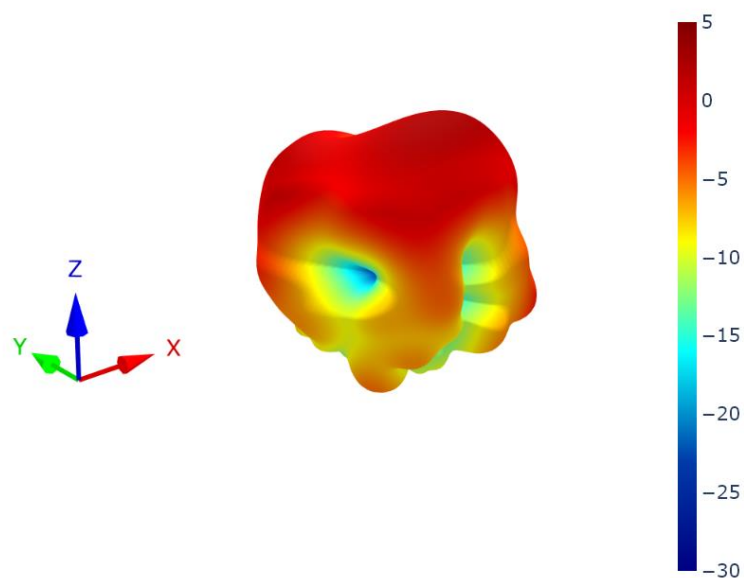
YZ Plane



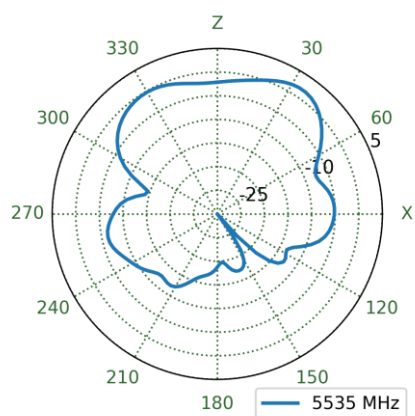
XY Plane



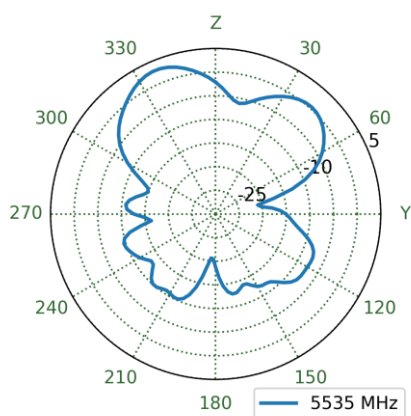
## 6.37 Cellular1 - Free Space Patterns at 5535 MHz



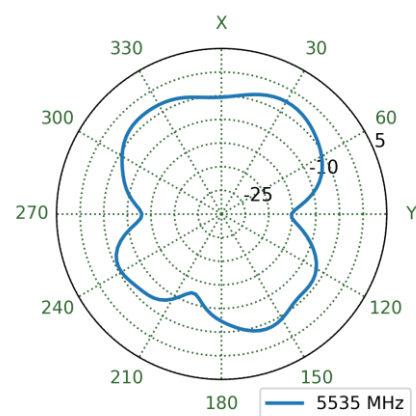
XZ Plane



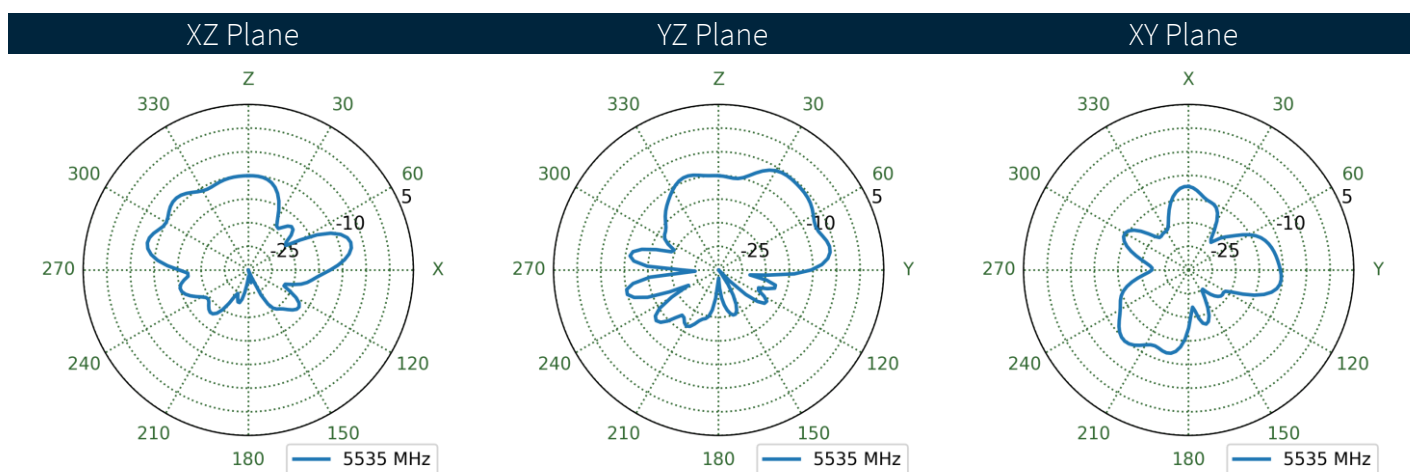
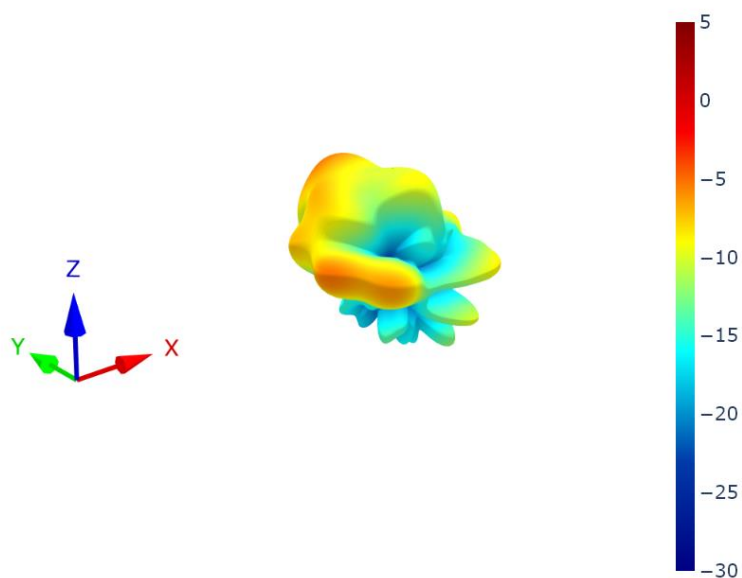
YZ Plane



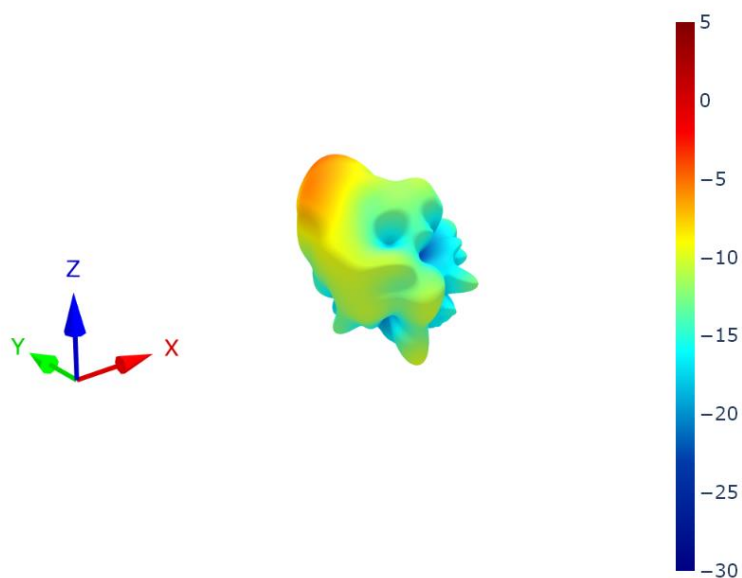
XY Plane



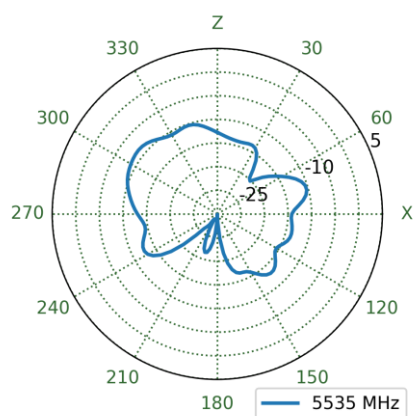
## 6.38 Cellular2 - 60x60cm Metal Ground Plane Patterns at 5535 MHz



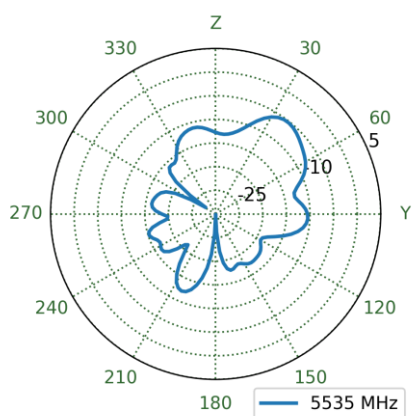
## 6.39 Cellular2 - Free Space Patterns at 5535 MHz



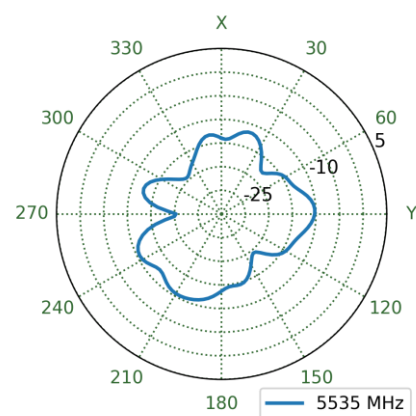
XZ Plane



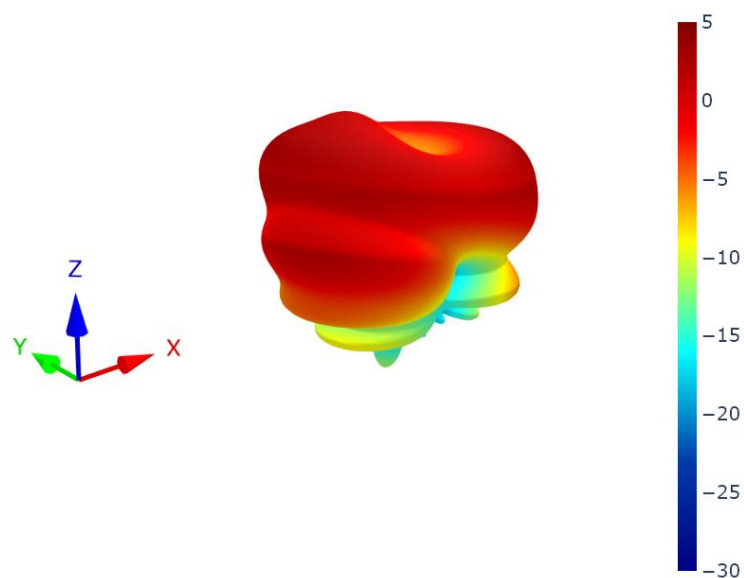
YZ Plane



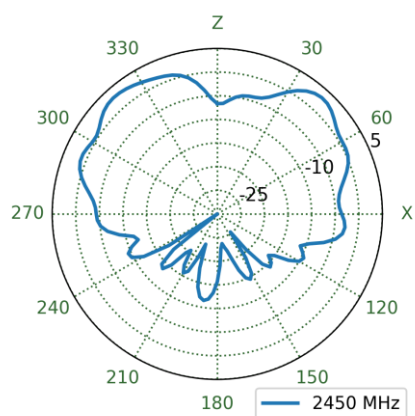
XY Plane



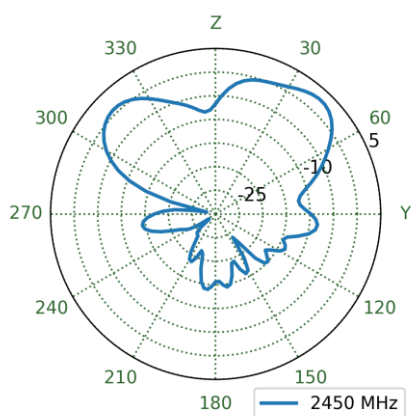
## 6.40 Wi-Fi1 - 60x60cm Metal Ground Plane Patterns at 2450 MHz



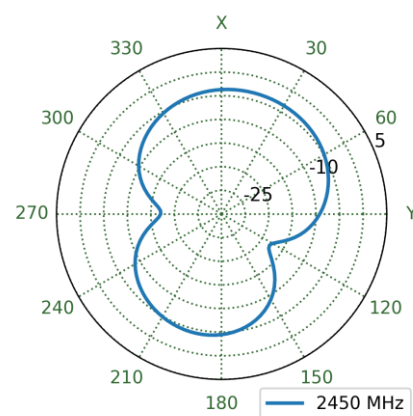
XZ Plane



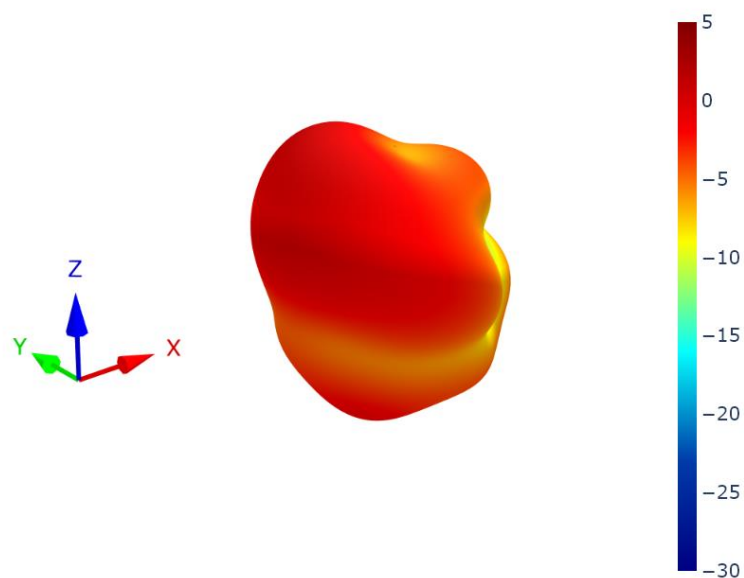
YZ Plane



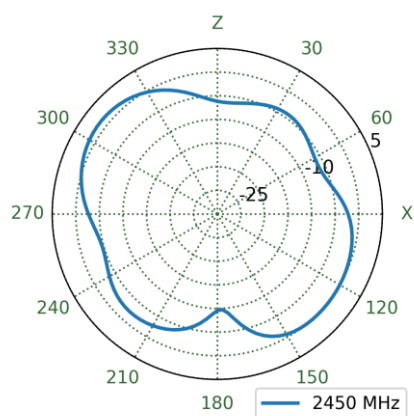
XY Plane



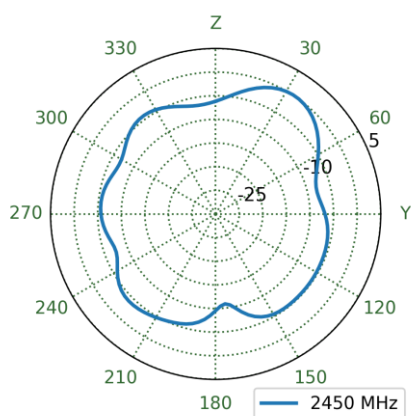
## 6.41 Wi-Fi1 - Free Space Patterns at 2450 MHz



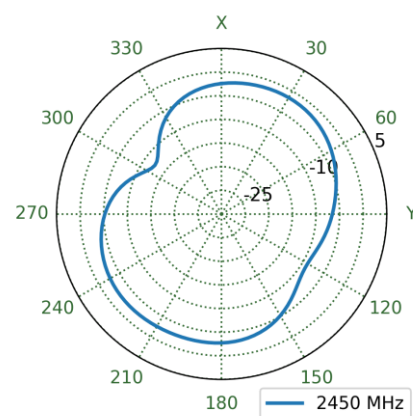
XZ Plane



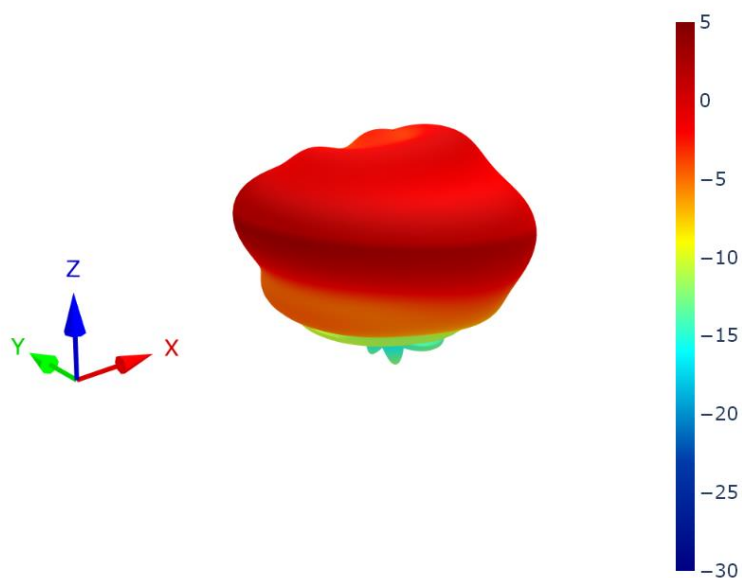
YZ Plane



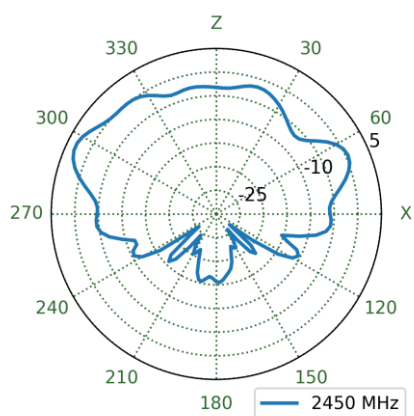
XY Plane



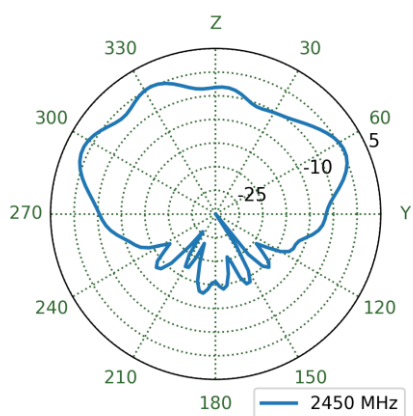
## 6.42 Wi-Fi2 - 60x60cm Metal Ground Plane Patterns at 2450 MHz



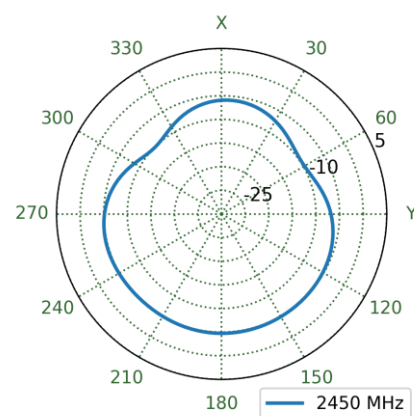
XZ Plane



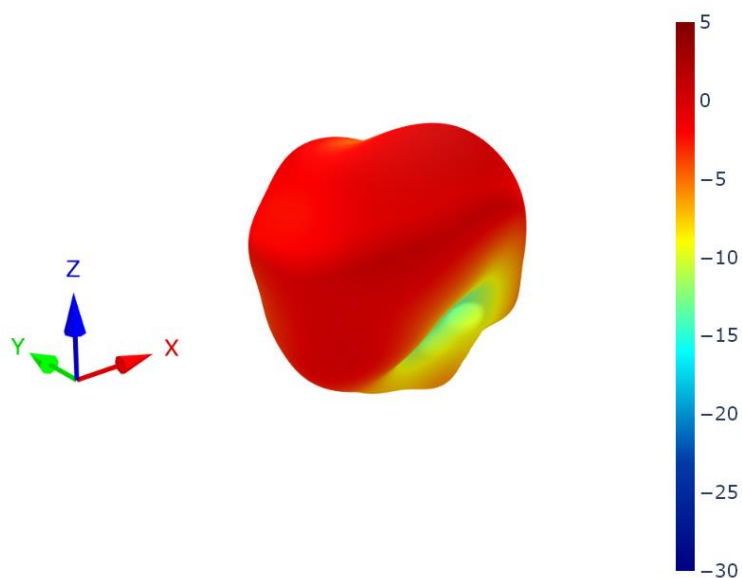
YZ Plane



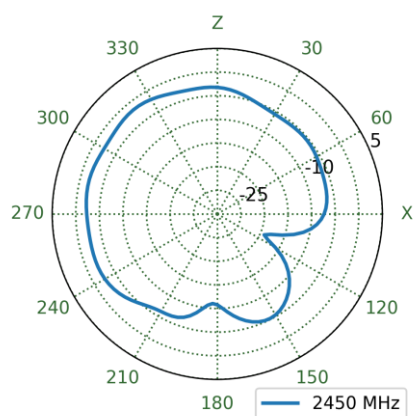
XY Plane



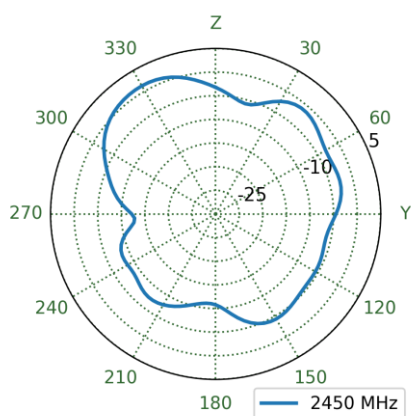
## 6.43 Wi-Fi2 - Free Space Patterns at 2450 MHz



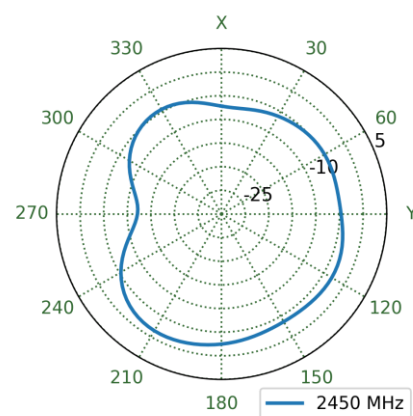
XZ Plane



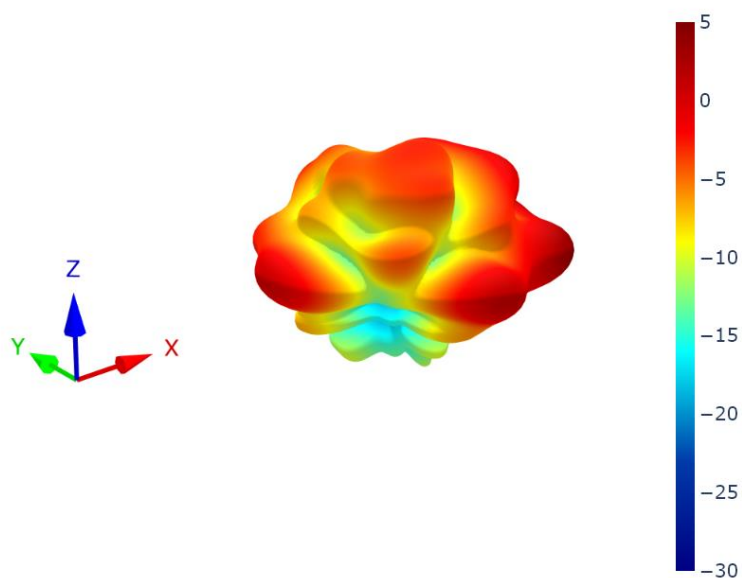
YZ Plane



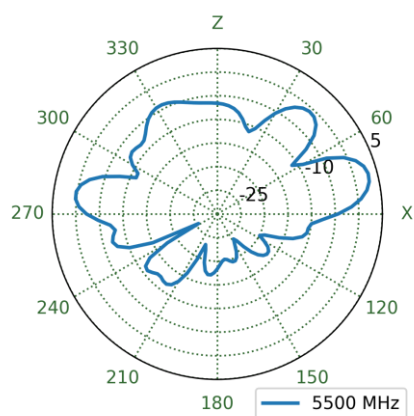
XY Plane



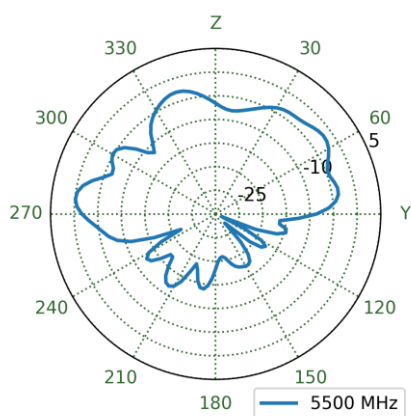
## 6.44 Wi-Fi1 - 60x60cm Metal Ground Plane Patterns at 5500 MHz



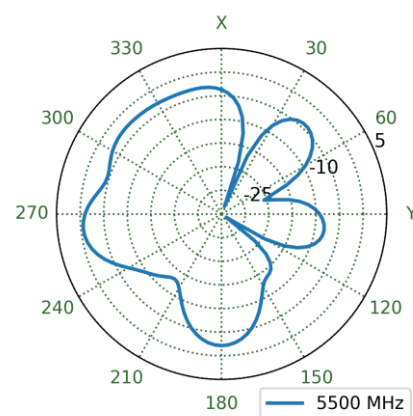
XZ Plane



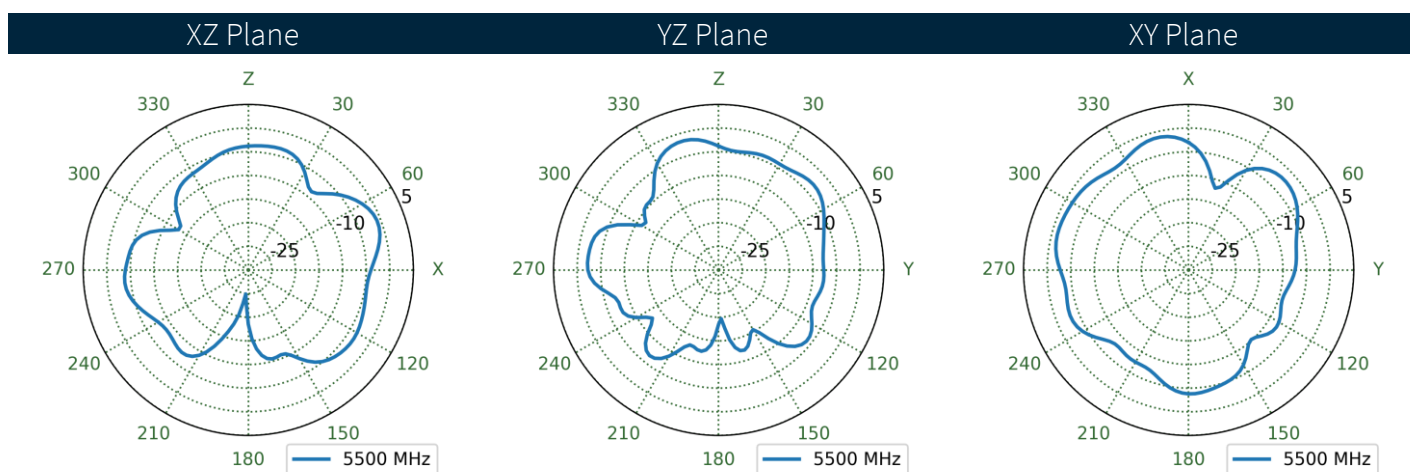
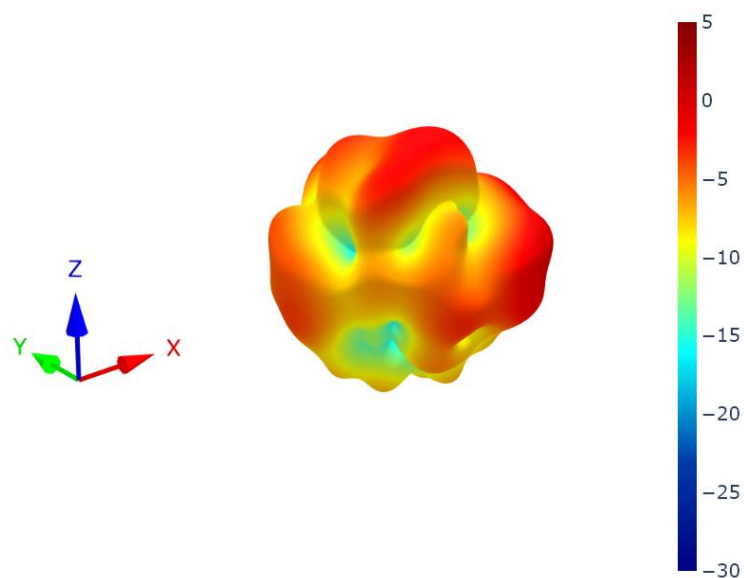
YZ Plane



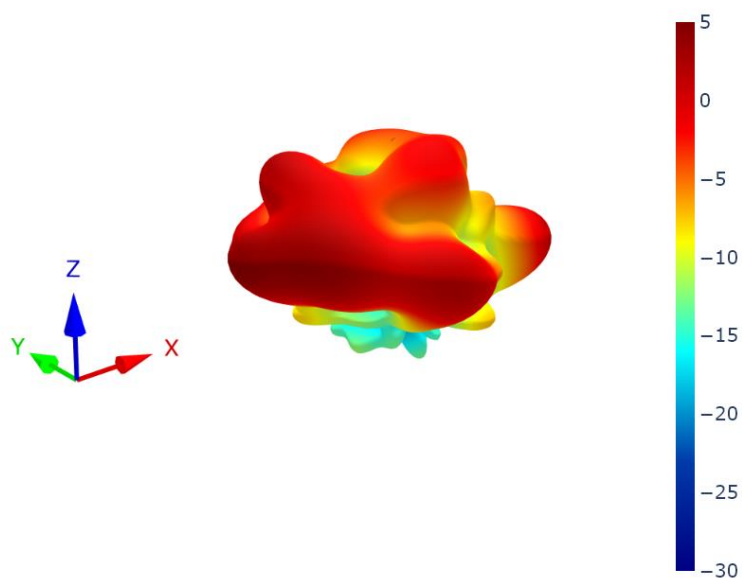
XY Plane



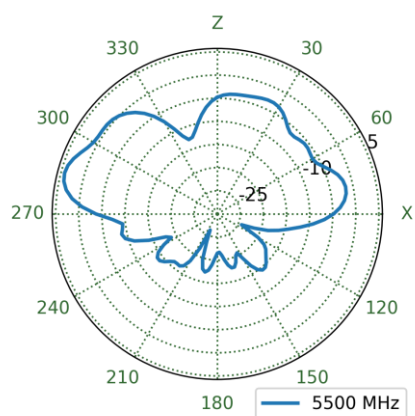
## 6.45 Wi-Fi1 - Free Space Patterns at 5500 MHz



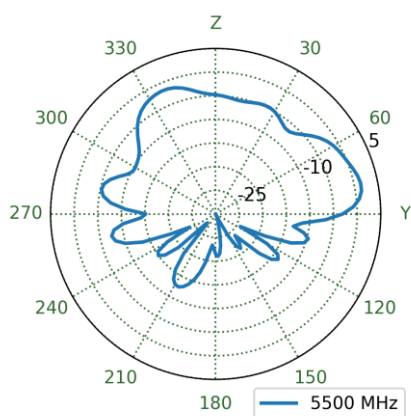
## 6.46 Wi-Fi2 - 60x60cm Metal Ground Plane Patterns at 5500 MHz



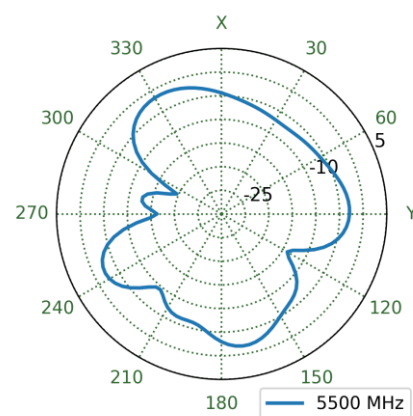
XZ Plane



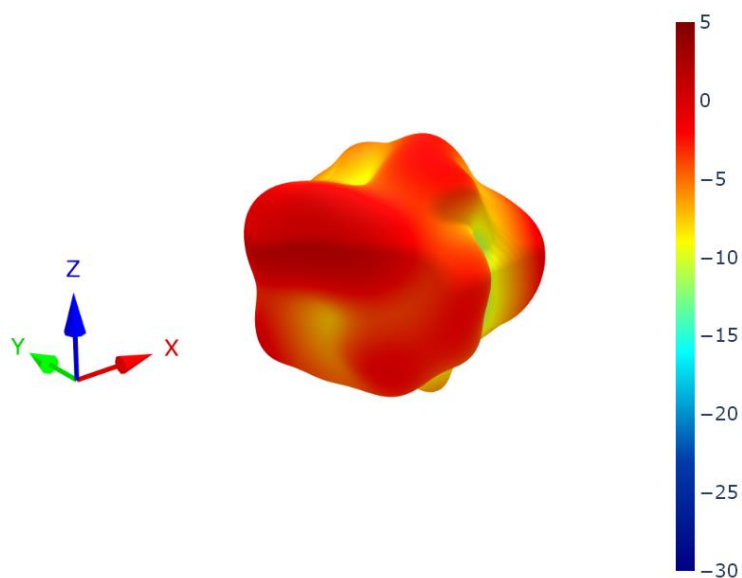
YZ Plane



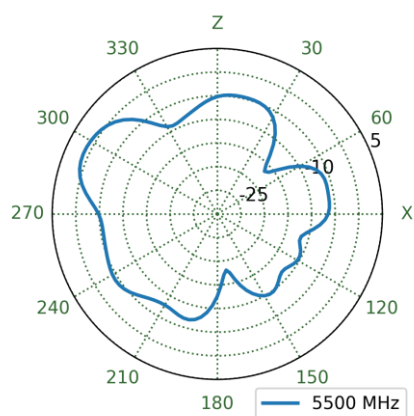
XY Plane



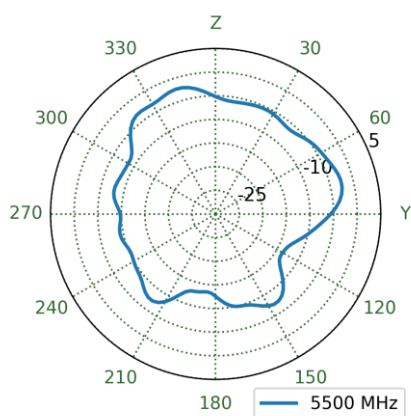
## 6.47 Wi-Fi2 - Free Space Patterns at 5500 MHz



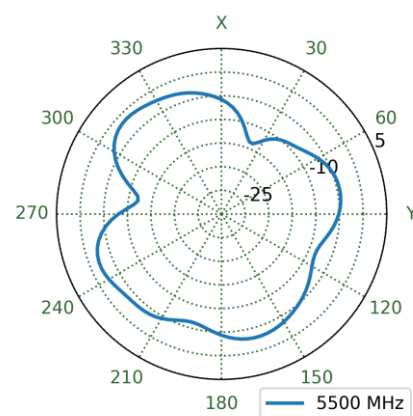
XZ Plane



YZ Plane



XY Plane



Changelog for the datasheet

SPE-24-8-285 - MA1047.A.LBICGTT.001

| Revision: A (Original First Release) |                  |
|--------------------------------------|------------------|
| Date:                                | 2024-12-18       |
| Notes:                               | Initial Release. |
| Author:                              | Gary West        |

Previous Revisions



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