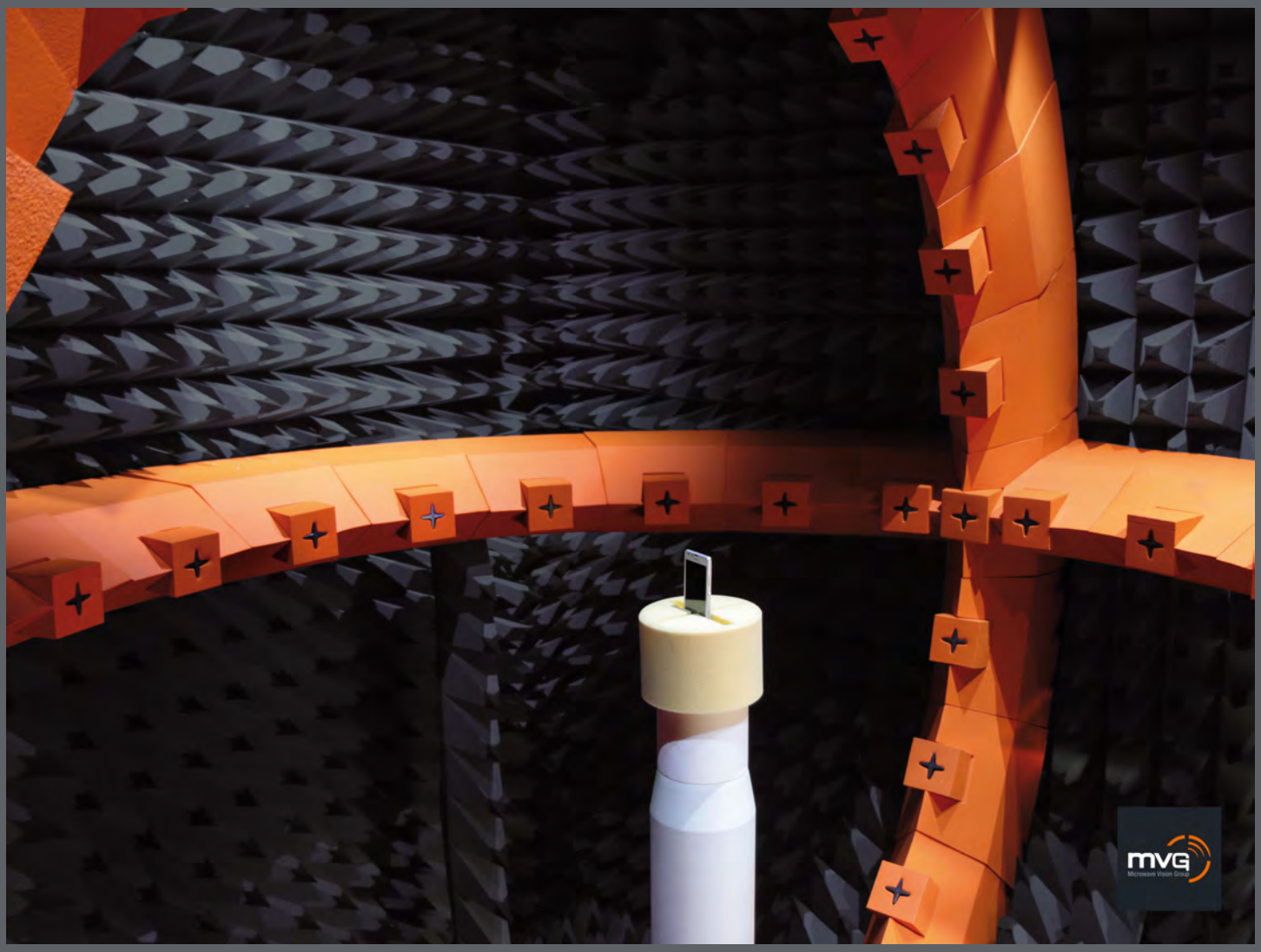


Maintenance Report

Sonos - ATL2427S

Microwave Vision Group

Summary:

This document presents the results of the acceptance tests performed on the system.

This document has been automatically generated by the software:

- Acceptance Report Generator - version = 5.0.3 (GIT-DFD4976A3)

Diffusion List :

- Application department
- Production manager
- Project manager
- Maintenance manager
- Quality manager

Applicable documents :

- TD.188.2.14.SATF.x - Acceptance_SG_NPAC_Switched.pdf
- MA.I.4.D Orthomodal Calibration Procedure.pdf

	Name	Function	Date	Signature
Prepared by	Chandler Kirkland	Field Service Engineer	20-Oct-2022	
Checked by	Fabien Henry	Associate Director	20-Oct-2022	

Table of Contents

Introduction

1.1 PASS/FAIL CRITERIA

The specifications for each test in this document were developed to be a stringent assessment of each parameter's performance. MVG utilized the NIST approach to define the pass/fail criteria or yield for passing results. This is a statistical approach and assumes a normal distribution.
The pass/fail criteria has a k-factor of 2 or 95% confidence and where the statistical population is based on the total number of points sampled for a given test. MVG uses a simplified approach in which 95% total number points sampled must pass the specified value(s) for the specific parameter evaluated.
Throughout this report and after each individual test, the total number of points passing the spec are presented in green font. If a given test parameter fails because there are more than 5% of the points below the specification, then the font is changed to red and the total percent of failed points is presented.

1.2 ACCEPTANCE SPECIFICATION LINE LOGIC

Angular limitation:

1. Horn type antenna: -120 to 120°elevation
2. Dipole type: -180 to 180°elevation
3. Monopole type: -90 to 90°elevation

Level limitation:

1. Pattern level must be higher than the minimal specified pattern level error.
2. Reference level must be higher that the minimal reference pattern level error.
3. Resulting plotting. Assuming here that the last specification is given for 20 dBp both on reference and measurement
   - If $r\_level > -20dBp$ and $m\_level > -20dBp$:
     - Measurement uncertainty is plotted
     - Reference uncertainty is plotted
     - Area in common is plotted
   - If $r\_level > -20dBp$ and $m\_level < -20dBp$:
     - Measurement uncertainty is not plotted
     - Reference uncertainty is plotted
     - Area in common is plotted and is equal to the reference uncertainty
   - If $r\_level < -20dBp$ and $m\_level > -20dBp$:
     - Measurement uncertainty is plotted
     - Reference uncertainty is not plotted
     - Area in common is plotted and is equal to the measurement uncertainty
   - If $r\_level < -20dBp$ and $m\_level < -20dBp$:
     - Measurement uncertainty is not plotted
     - Reference uncertainty is not plotted
     - Area in common is not plotted

System description

2.1 SYSTEM INFORMATION

System type :

- StarLab

Arch Radius :

- 0.45 m

Mast Position Error :

- 1.04 mm

Active mode option :

- No

Hard drive ID : 0ACD7F40

Probe array(s) :

- 0.65 - 10 GHz :
  - Polarization 1 angle : 90°
  - Polarization 2 angle : 0°
  - Measurement probe electrical length : 47.004 m
  - Reference probe electrical length : 43.492 m

2.2 SOFTWARE LIST

Software	Version
MVG Products	22.3.1
Acceptance Report Generator	5.0.3
MAC 23 Controller	1.13
Demux Ethernet Configurator	1.7.1

2.3 MOTORS CONFIGURATION

Azimuth :

- Supplier : MAC23
- Index : 0
- Reduction ratio : -30

Elevation :

- Supplier : MAC23
- Index : 1
- Reduction ratio : -1219.96
- N/A

System measurements - Probe array 0.65 - 10 GHz

All the measurements describes in this chapter have to be done **before the calibration**.

3.1 REFERENCE PROBE FREQUENCY RESPONSE

3.1.1 Purpose of the test

A reference probe is a probe included in the arch without any antenna. With this configuration, the reference probe is not affected by the AUT, nevertheless it is subjected to the same environment conditions (temperature, ...) than the other probes.
Using a reference probe gives the possibility to cancel the drift due to temperature variation or a long term variation. This test allows to check the good functioning of the reference probe.

3.1.2 Test set-up

The measurement test is performed with a horn installed on the mast.

3.1.3 Measurement procedure

This test consists of a measurement with the following settings :

- AUT : Horn (with 6 dB attenuation)
- Reference probe measurement
- Signal direction : Transmit through probes
- Frequencies : Min : 650 MHz || Max : 10000 MHz || Step : 10 MHz

3.1.4 Test results

The following figure (Figure 3.1) shows the result of the reference probe frequency response.

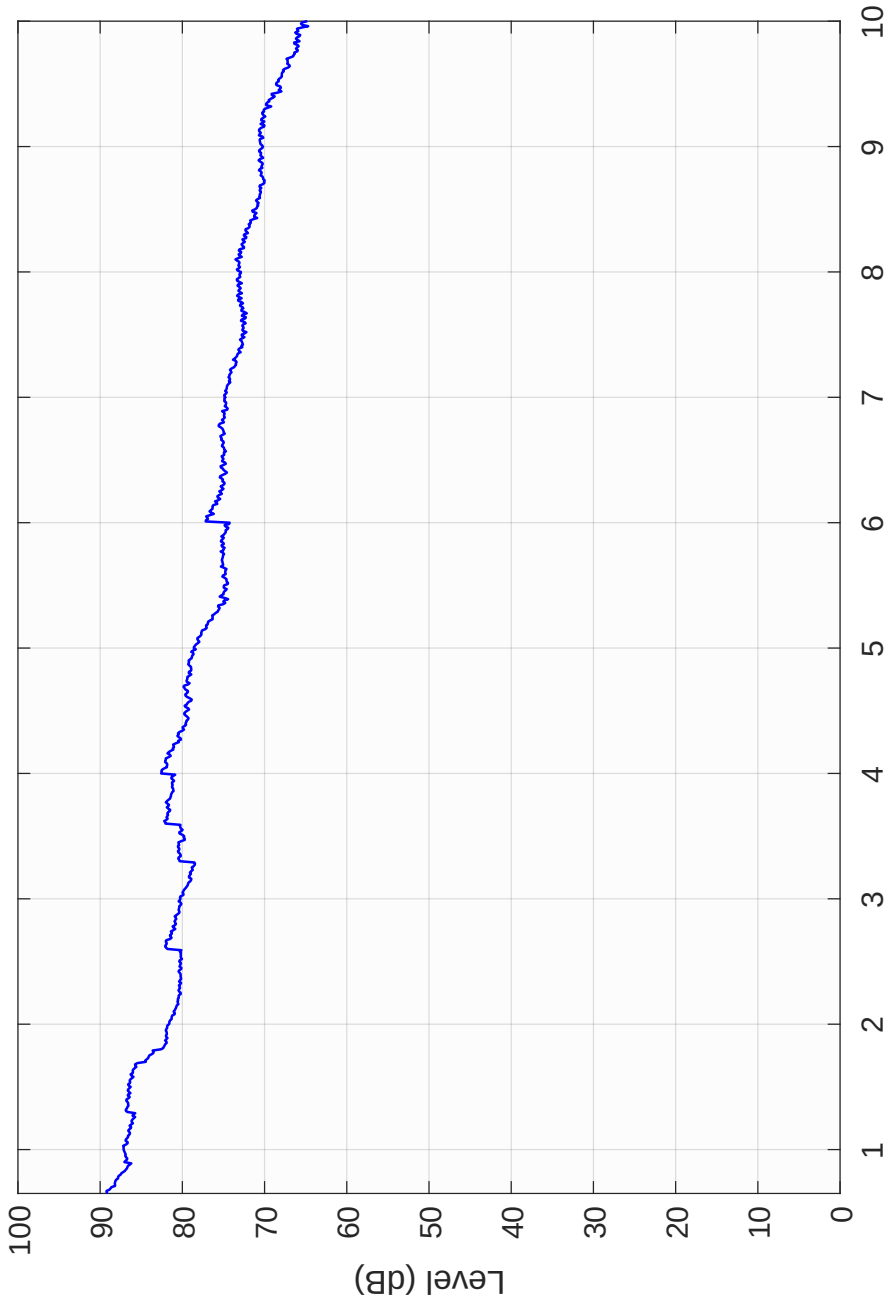


Figure 3.1: Reference probe frequency response

3.2 DYNAMIC RANGE

3.2.1 Purpose of the test

One of the main characteristics of MVG systems is the dynamic range, these measurements have to be performed very carefully. The more dynamic the system has and the more it will be able to measure low signals.

3.2.2 Test set-up

The dynamic range definition is given by the difference between the maximum which can be measured and the lower signal that can be detected.

3.2.3 Measurement procedure

The test consists of a measurement with the following settings :

- AUT : 50 Ohm load
- "No Probe" measurement
- Signal direction : Transmit through probes
- Frequencies : Min : 650 MHz || Max : 10000 MHz || Step : 10 MHz

3.2.4 Test results

The following figure (Figure 3.3) shows the result of the dynamic range measurement.

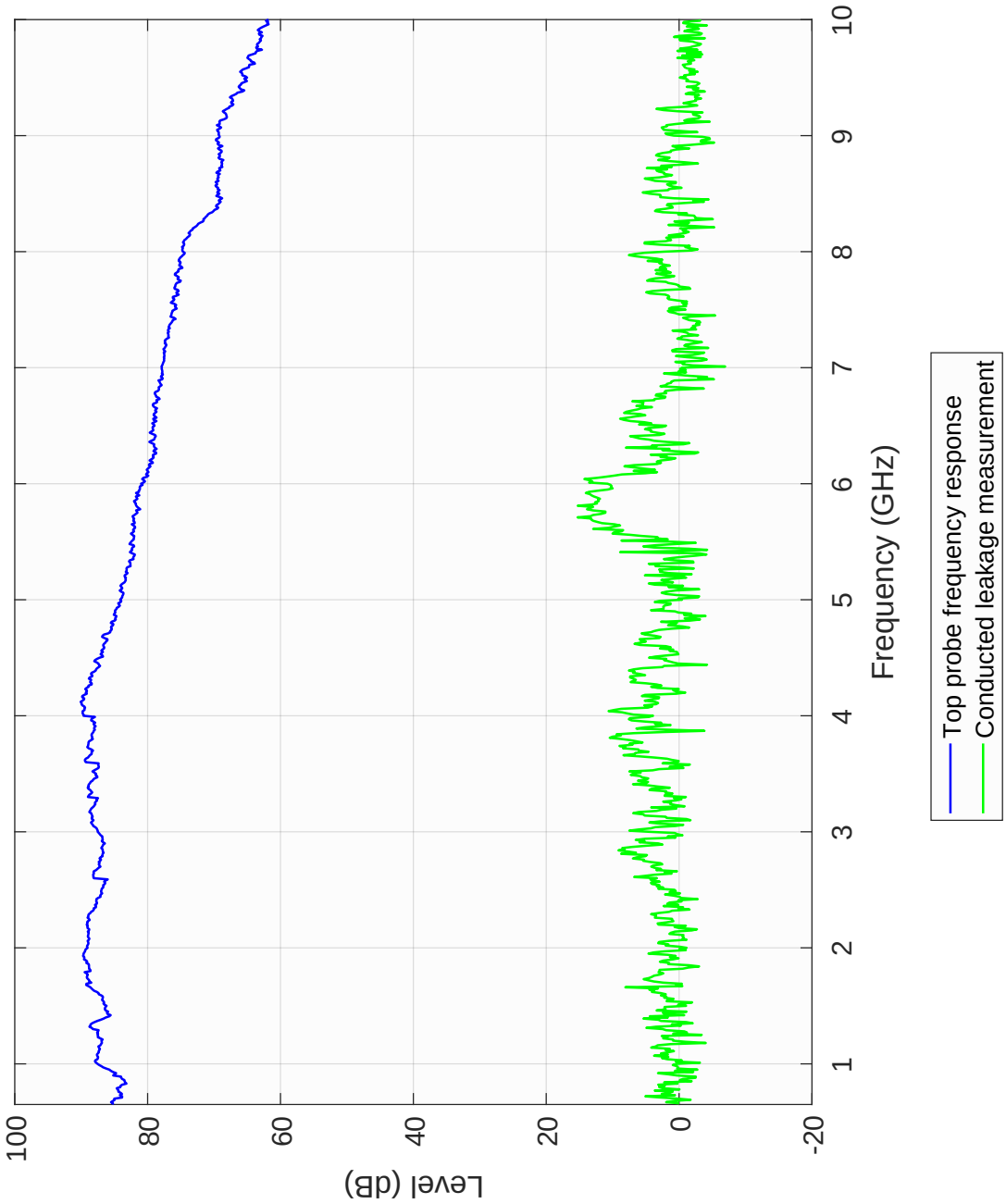


Figure 3.2: Absolute dynamic (1/2)

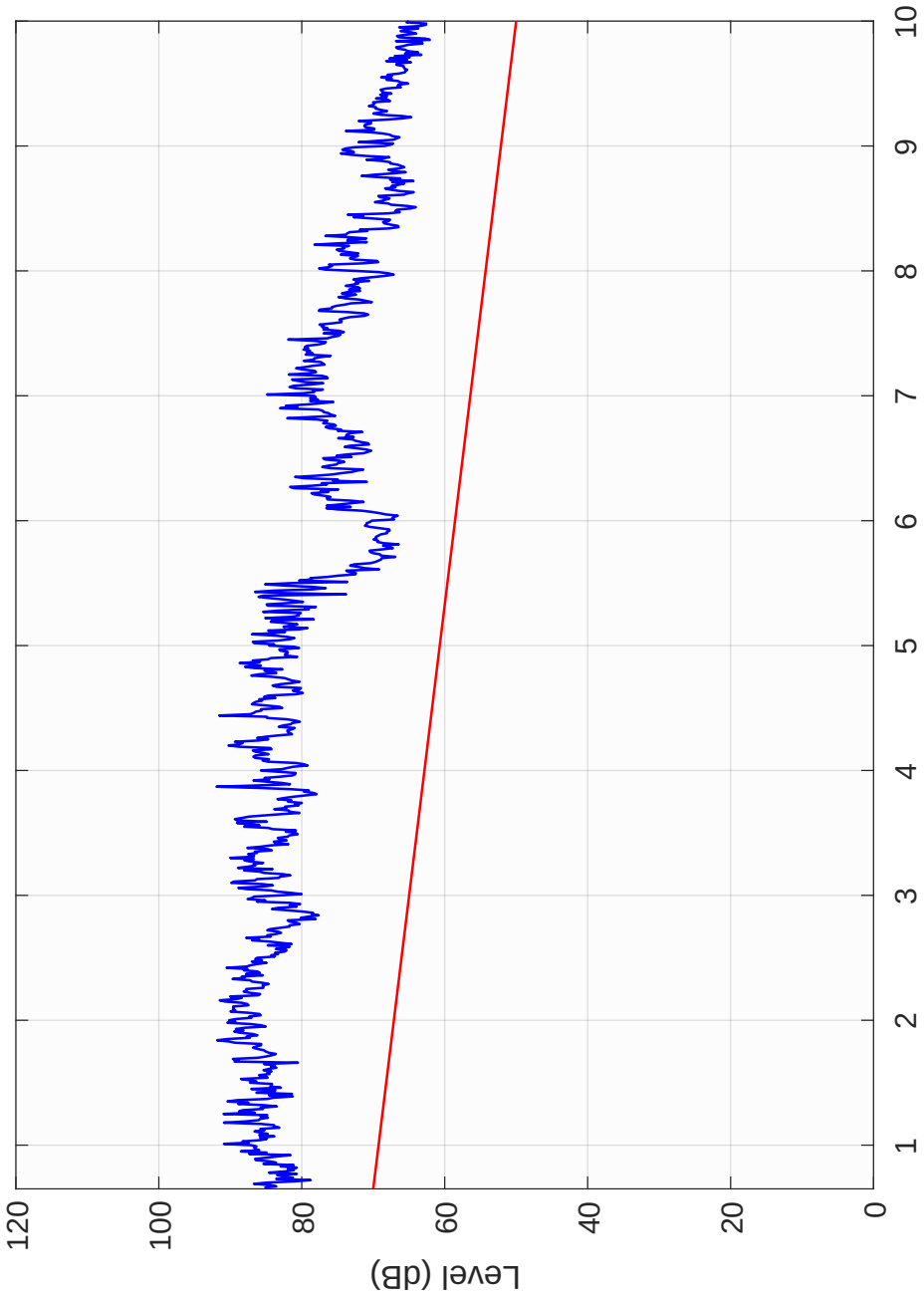


Figure 3.3: Absolute dynamic (2/2)

3.2.5 Acceptance criteria

Every points respect MVG typical specifications.

3.3 STABILITY

3.3.1 Purpose of the test

A short stability is done to check the repeatability of the system.

3.3.2 Test set-up

The measurement test is performed with a horn installed on the mast.

3.3.3 Measurement procedure

The test consists of a measurement with the following settings :

- AUT : Horn antenna (with 6 dB attenuation)
- The measurement is performed 100 times
- Top or reference probe measurement
- Frequencies : Min : 650 MHz || Max : 10000 MHz || Step : 10 MHz
- Signal direction : Receive by Probes

3.3.4 Test results

The following figure (Figure 3.4) shows the result of the stability.

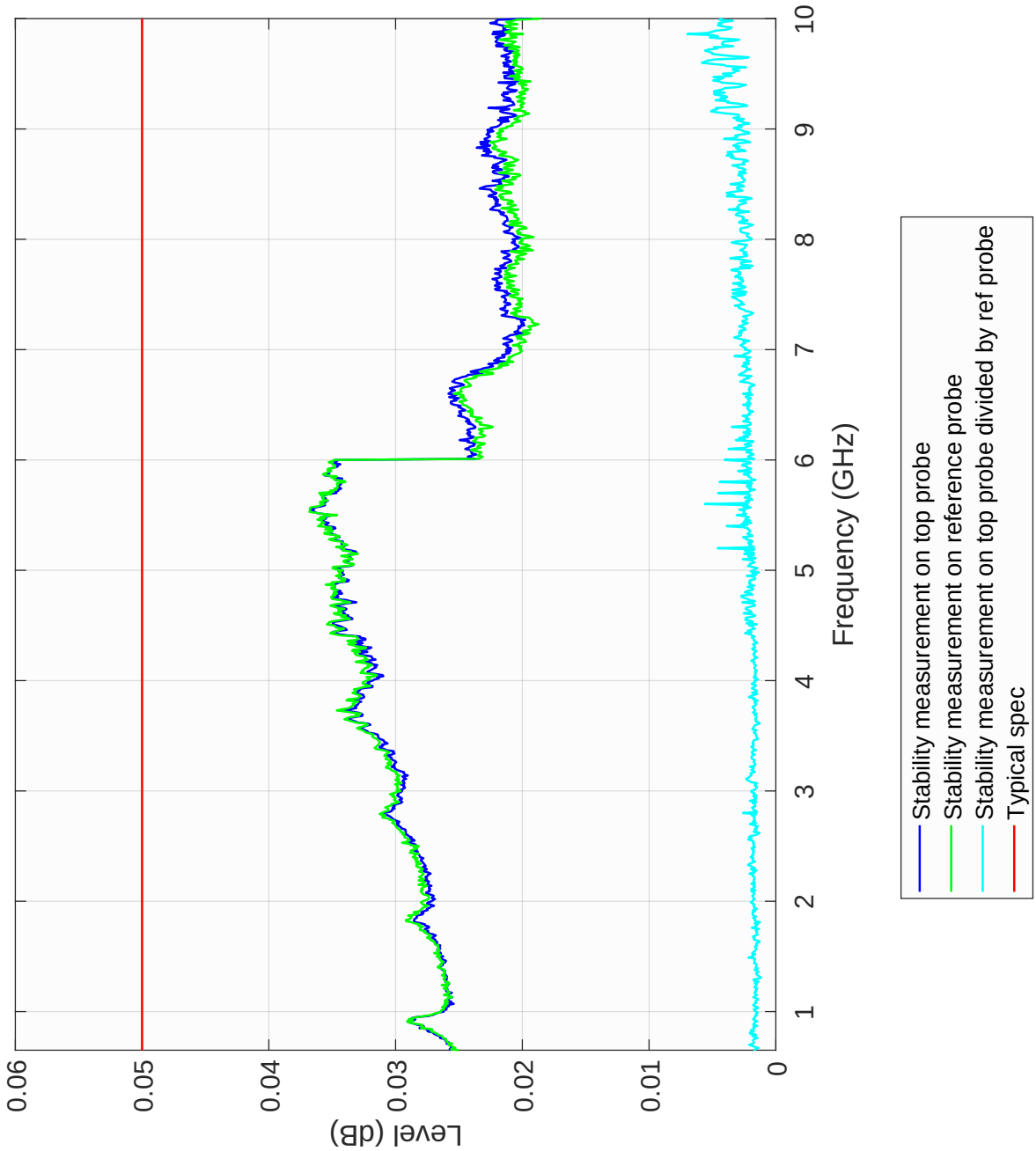


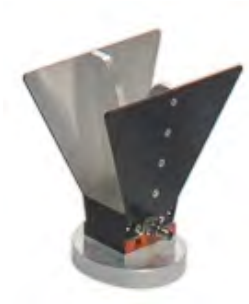
Figure 3.4: Stability measurement

3.3.5 Acceptance criterion

Every points respect MVG typical specifications. Every points respect MVG typical specifications. Every points respect MVG typical specifications.

Calibration results

4.1 EQUIPMENT USED DURING THE CALIBRATION



SH2000-419

Calibration interface for SH2000/SH4000 - Vertical

Calibration interface for SH2000/SH4000 - Horizontal

4.2 SYSTEM CALIBRATION 0.65 - 10 GHZ

The following figure (4.1) shows the confidence level of the system calibration for each probes on the whole frequency band.
These coefficients are between 0 and 1 with 1 corresponding to the better result.

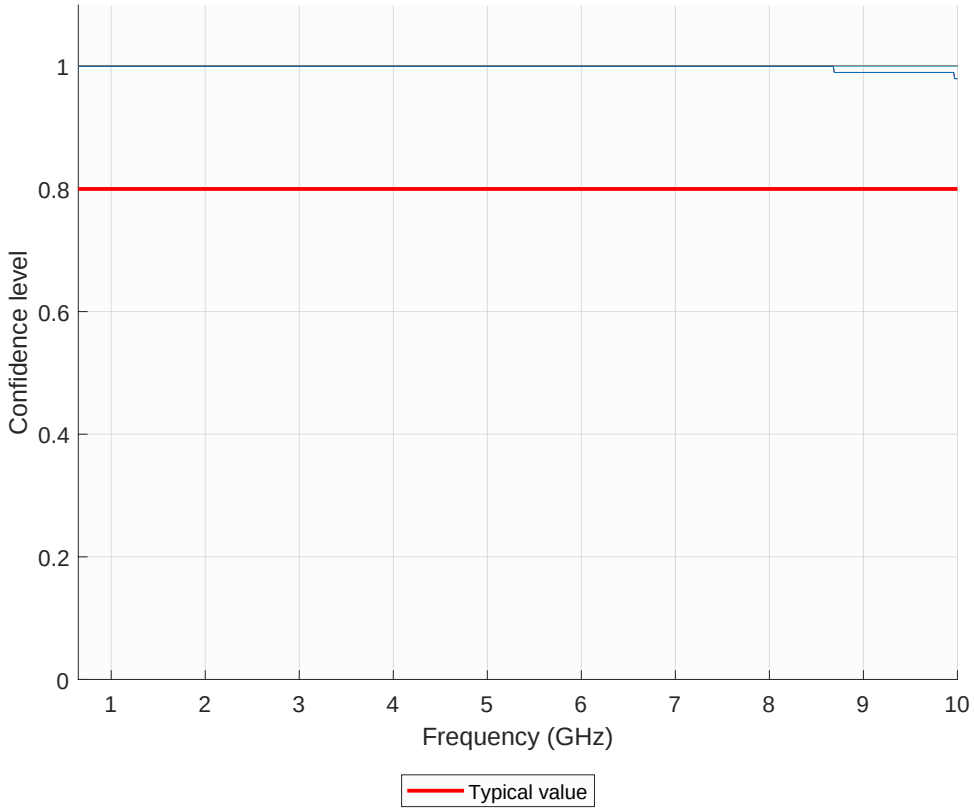


Figure 4.1: Calibration confidence level

4.2.1 Acceptance criterion

Every points respect MVG typical specifications.

Measurement tests - Passive mode

5.1 SH600 - 165

5.1.1 General information

Measurement file	SH600.mat
Reference file	SH600-prod.mat
Measured antenna type	SH600
Measured antenna serial number	165
Measurement device type	STARLAB_2
Measurement device serial number	ATL2427S
Measurement mode	Standard180
Mast type	Styrofoam
Measurement array	LF
Measurement date	2022-10-19

5.1.2 Boresight directivity

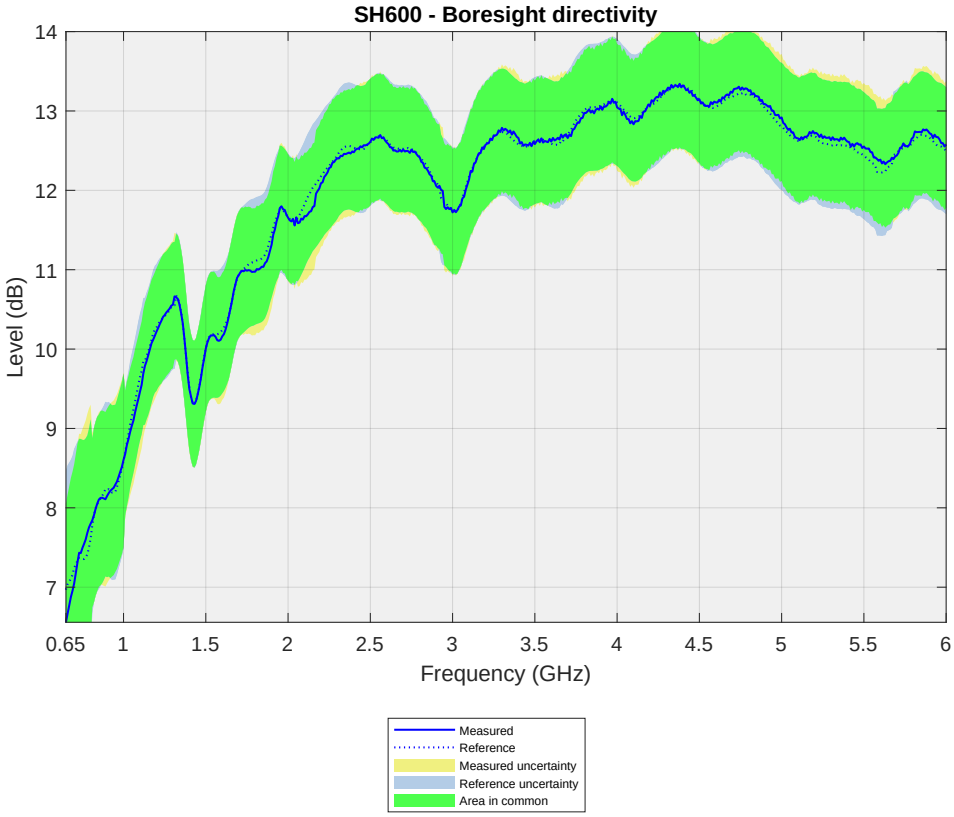


Figure 5.1: Boresight directivity

==> Ok, all points inside the masks

5.1.3 Boresight gain

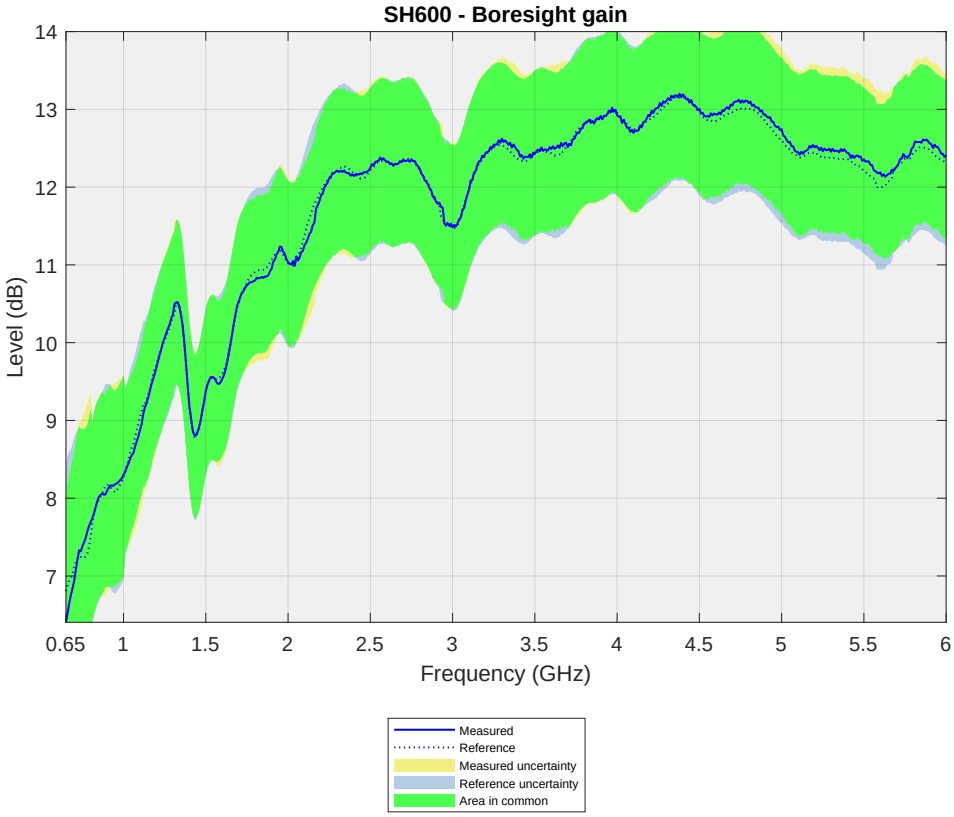


Figure 5.2: Boresight gain

==> Ok, all points inside the masks

5.1.4 Efficiency

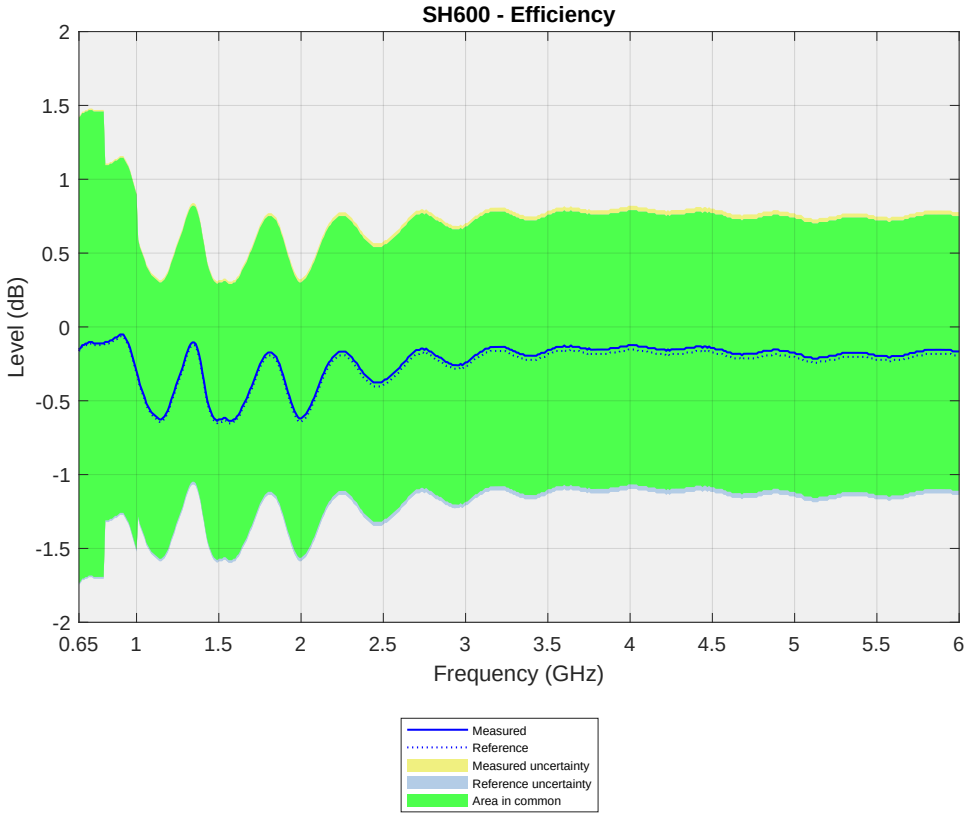


Figure 5.3: Efficiency

==> Ok, all points inside the masks

5.1.5 Elevation cuts

FREQUENCY = 0.650 GHZ, AZIMUTH = 0.00°

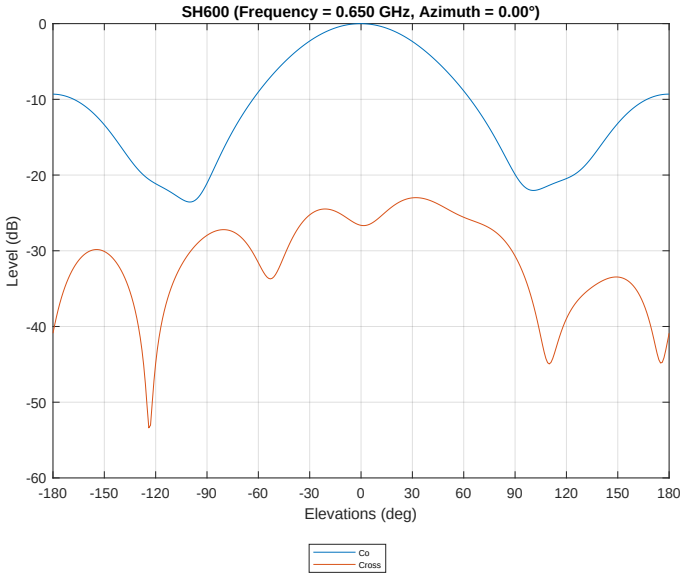


Figure 5.4: Frequency = 0.650 GHz, Azimuth = 0.00° (co + cross)

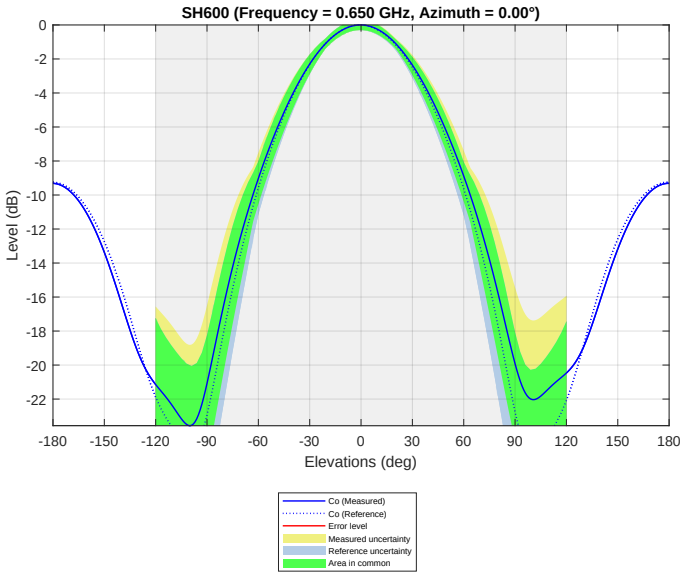


Figure 5.5: Frequency = 0.650 GHz, Azimuth = 0.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 0.650 GHZ, AZIMUTH = 45.00°

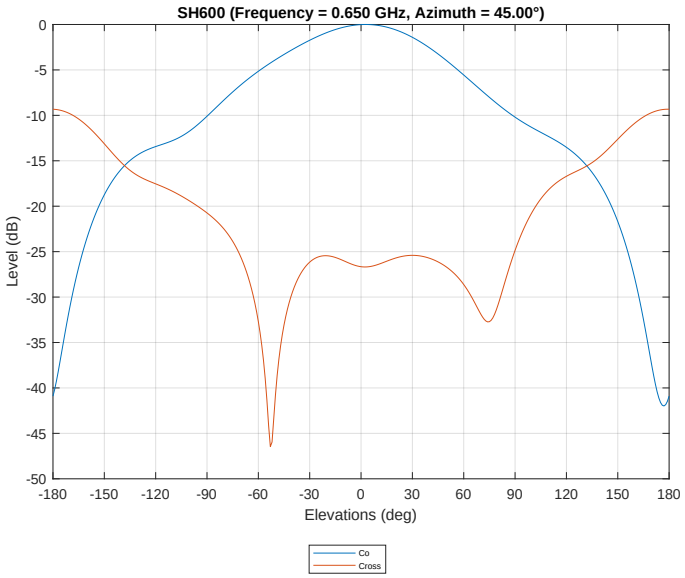


Figure 5.6: Frequency = 0.650 GHz, Azimuth = 45.00° (co + cross)

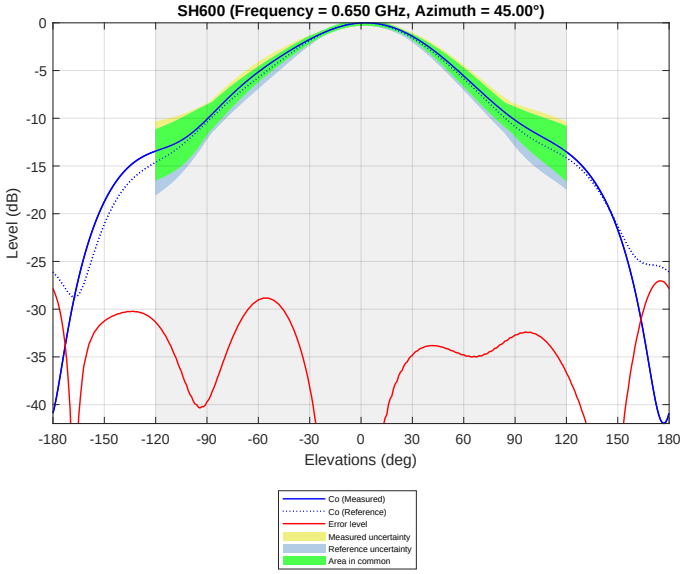


Figure 5.7: Frequency = 0.650 GHz, Azimuth = 45.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 0.650 GHZ, AZIMUTH = 90.00°

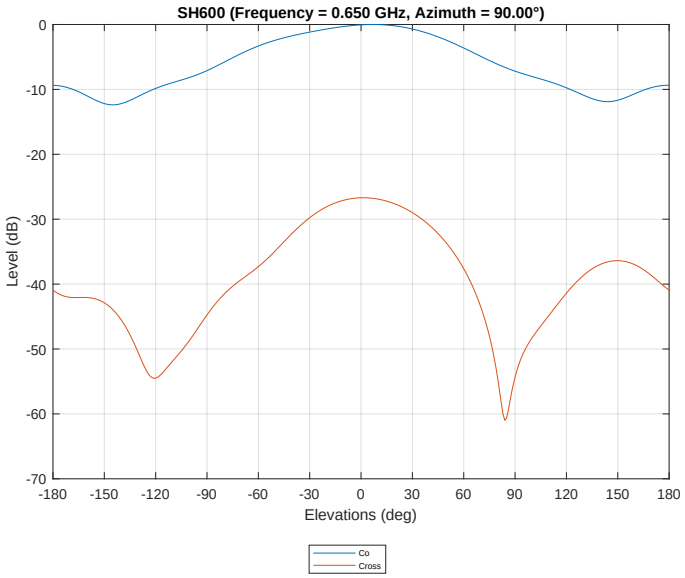


Figure 5.8: Frequency = 0.650 GHz, Azimuth = 90.00° (co + cross)

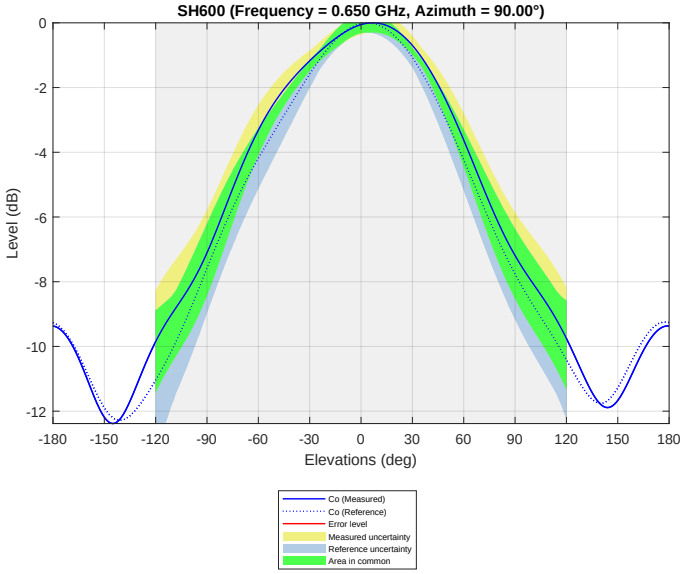


Figure 5.9: Frequency = 0.650 GHz, Azimuth = 90.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 0.650 GHZ, AZIMUTH = 135.00°

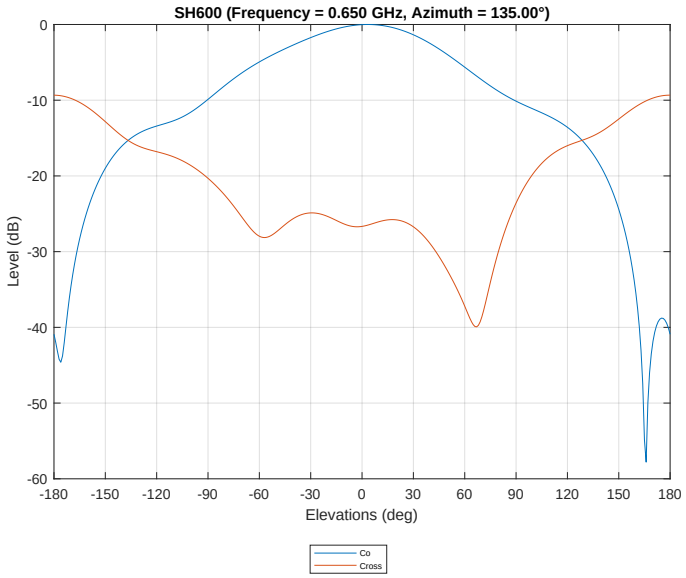


Figure 5.10: Frequency = 0.650 GHz, Azimuth = 135.00° (co + cross)

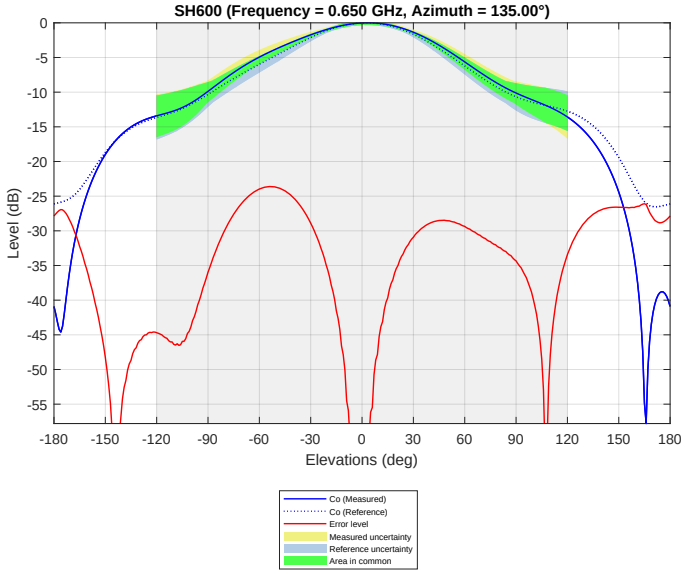


Figure 5.11: Frequency = 0.650 GHz, Azimuth = 135.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 1.000 GHZ, AZIMUTH = 0.00°

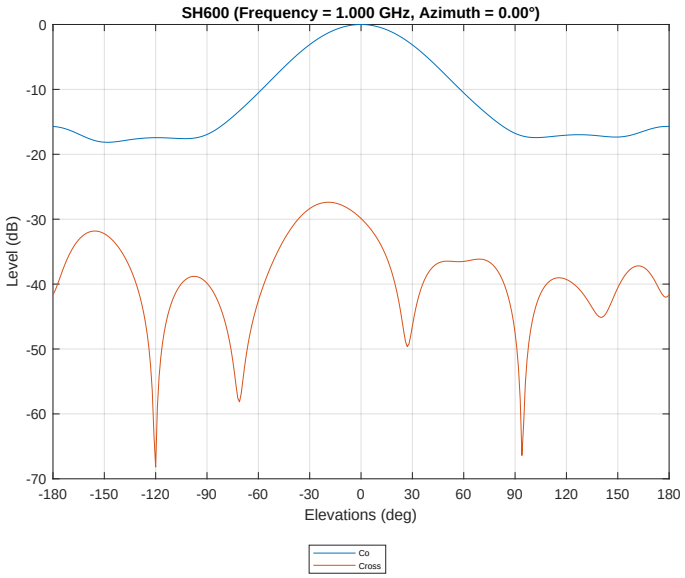


Figure 5.12: Frequency = 1.000 GHz, Azimuth = 0.00° (co + cross)

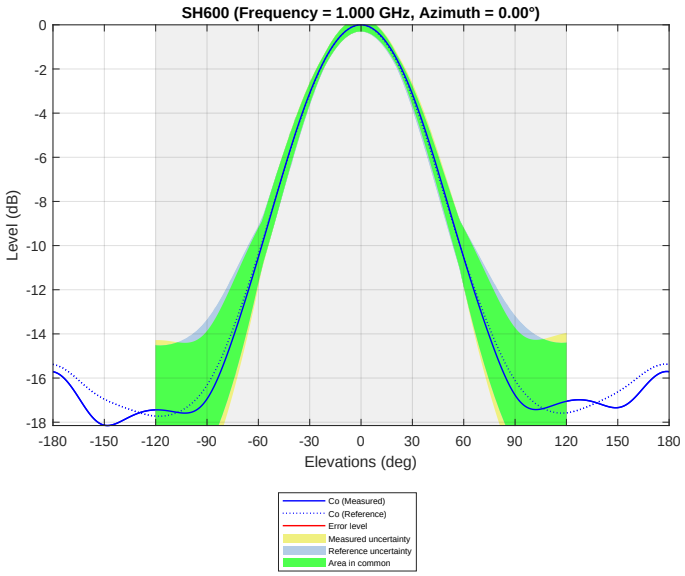


Figure 5.13: Frequency = 1.000 GHz, Azimuth = 0.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 1.000 GHZ, AZIMUTH = 45.00°

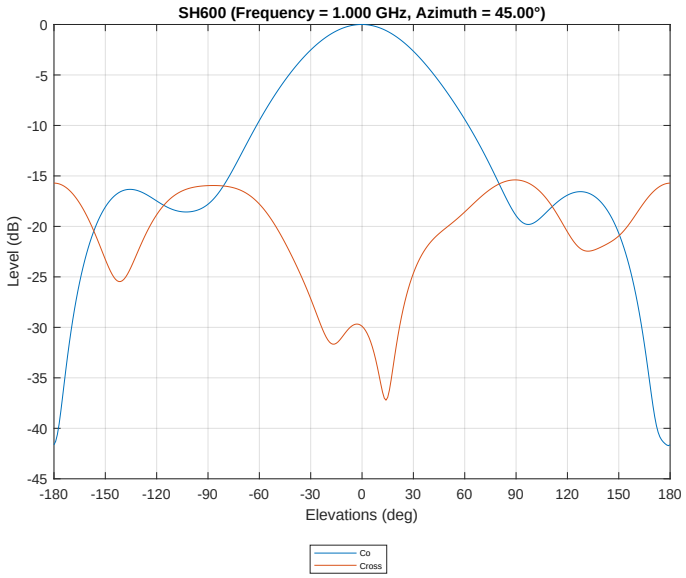


Figure 5.14: Frequency = 1.000 GHz, Azimuth = 45.00° (co + cross)

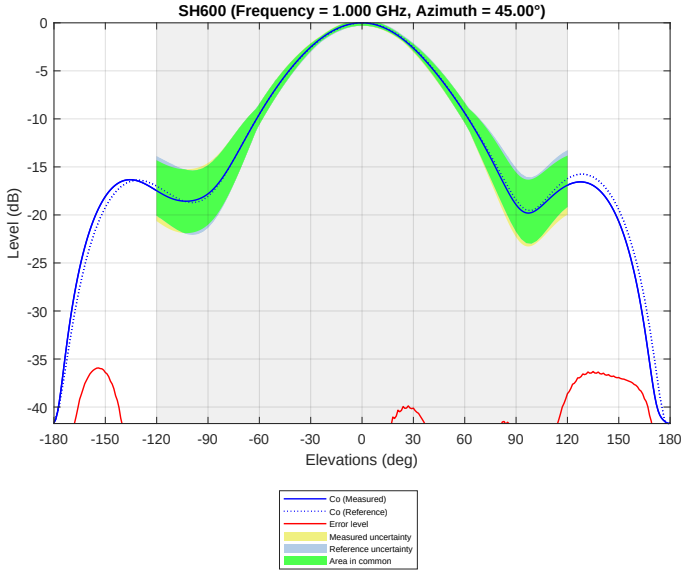


Figure 5.15: Frequency = 1.000 GHz, Azimuth = 45.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 1.000 GHZ, AZIMUTH = 90.00°

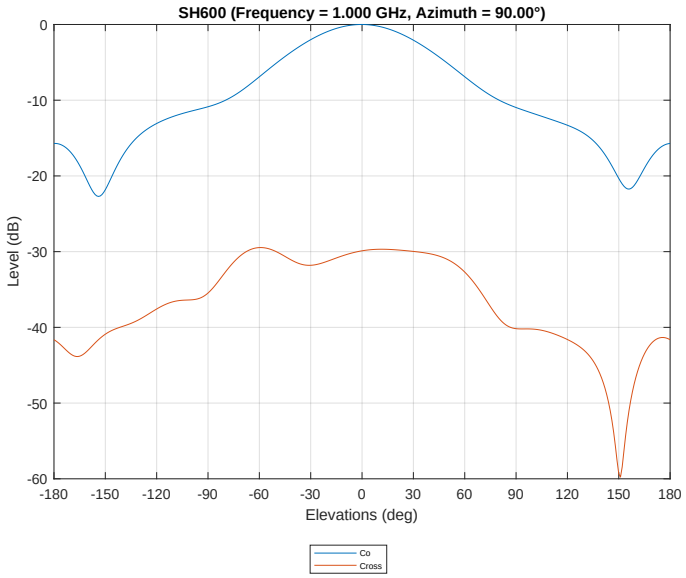


Figure 5.16: Frequency = 1.000 GHz, Azimuth = 90.00° (co + cross)

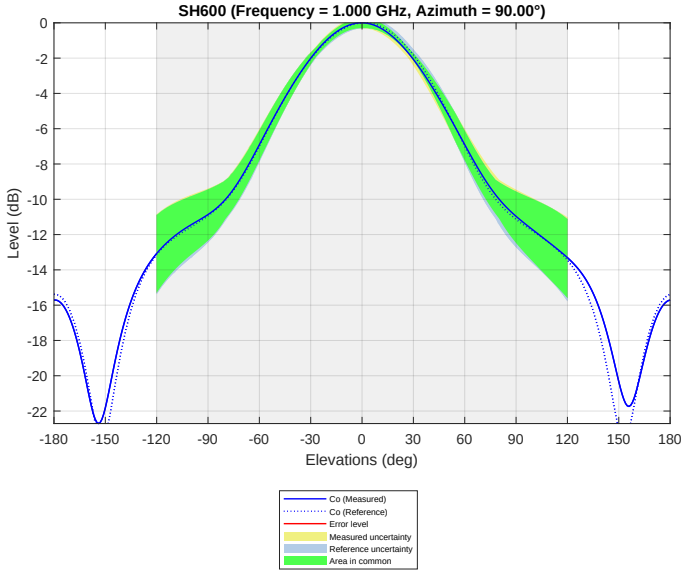


Figure 5.17: Frequency = 1.000 GHz, Azimuth = 90.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 1.000 GHZ, AZIMUTH = 135.00°

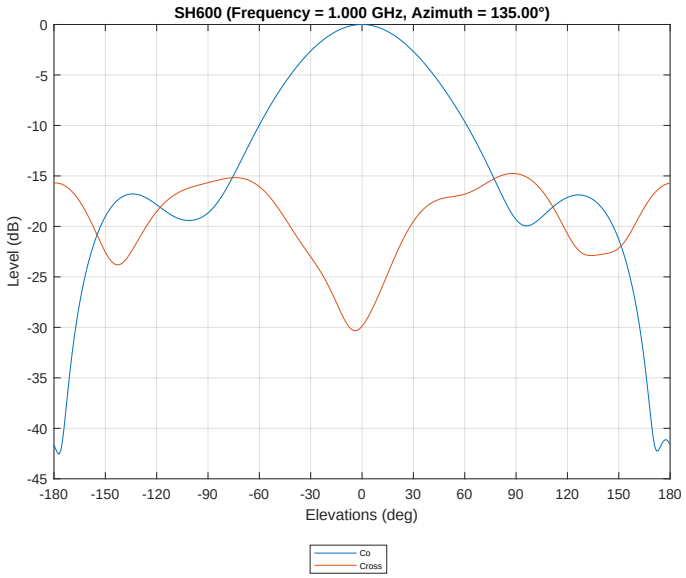


Figure 5.18: Frequency = 1.000 GHz, Azimuth = 135.00° (co + cross)

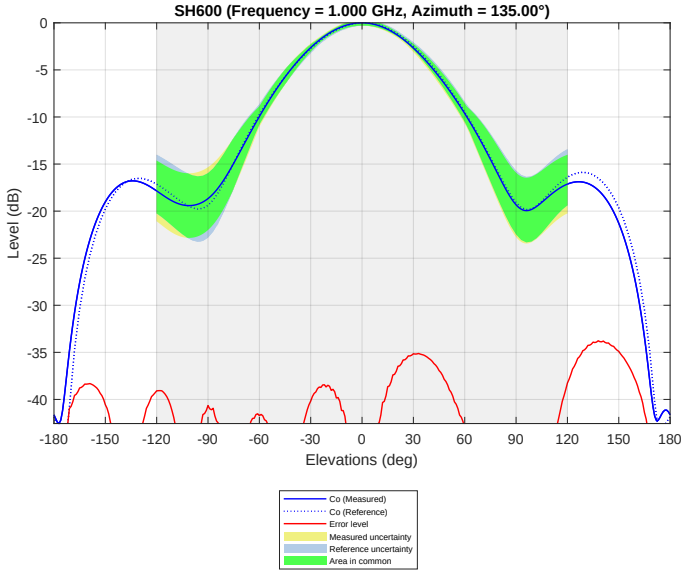


Figure 5.19: Frequency = 1.000 GHz, Azimuth = 135.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 1.500 GHZ, AZIMUTH = 0.00°

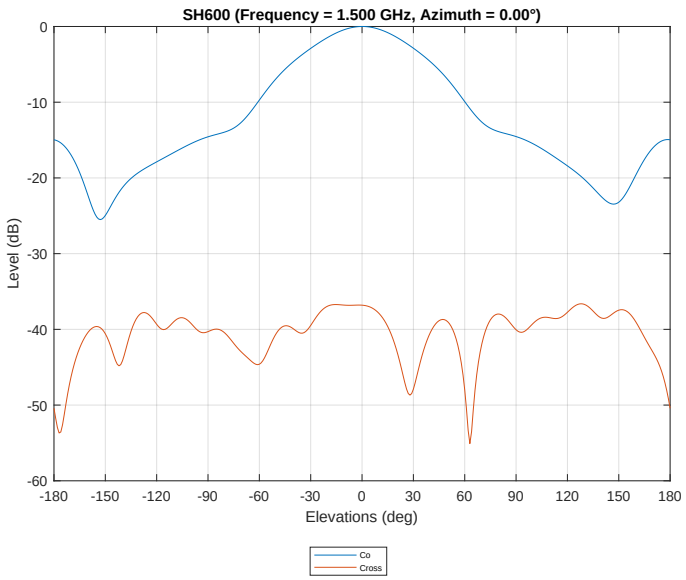


Figure 5.20: Frequency = 1.500 GHz, Azimuth = 0.00° (co + cross)

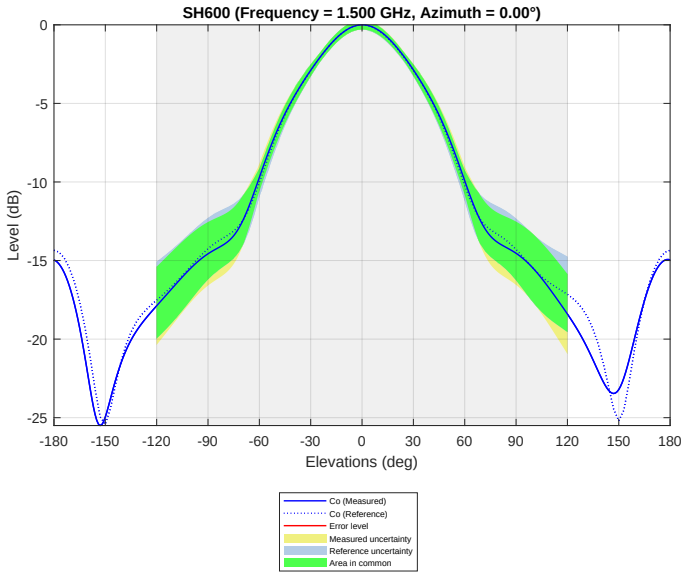


Figure 5.21: Frequency = 1.500 GHz, Azimuth = 0.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 1.500 GHZ, AZIMUTH = 45.00°

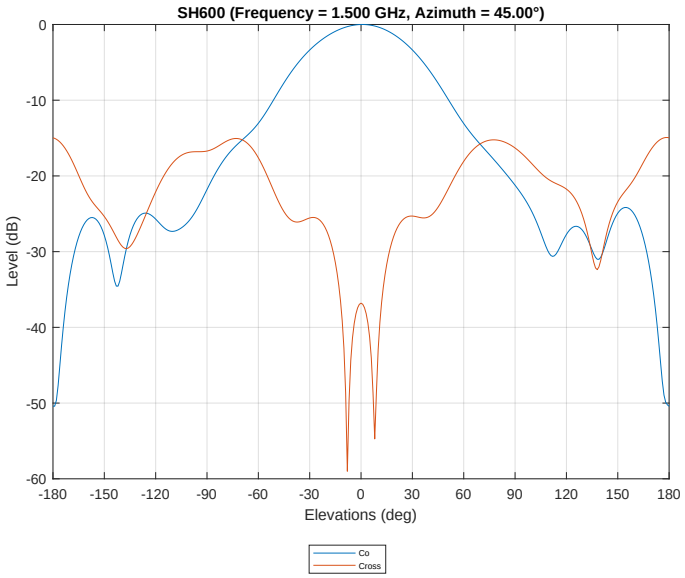


Figure 5.22: Frequency = 1.500 GHz, Azimuth = 45.00° (co + cross)

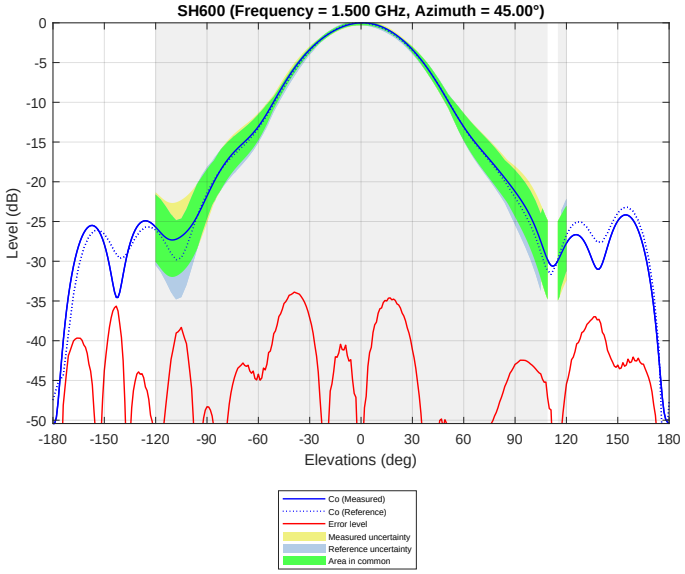


Figure 5.23: Frequency = 1.500 GHz, Azimuth = 45.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 1.500 GHZ, AZIMUTH = 90.00°

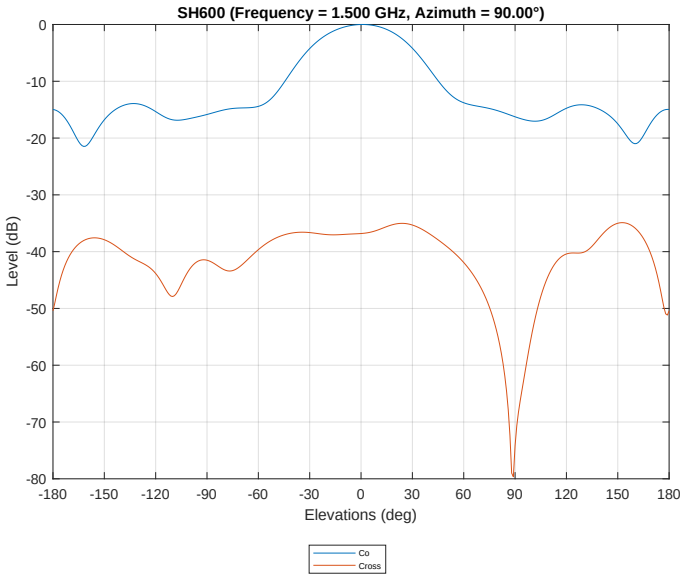


Figure 5.24: Frequency = 1.500 GHz, Azimuth = 90.00° (co + cross)

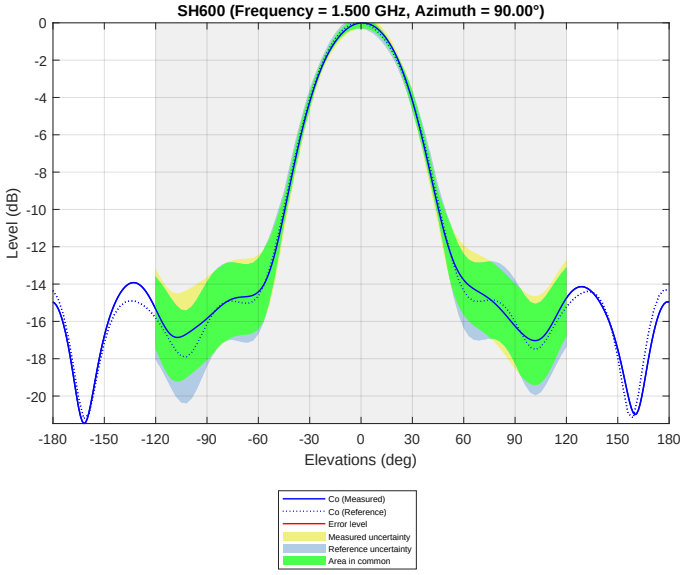


Figure 5.25: Frequency = 1.500 GHz, Azimuth = 90.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 1.500 GHZ, AZIMUTH = 135.00°

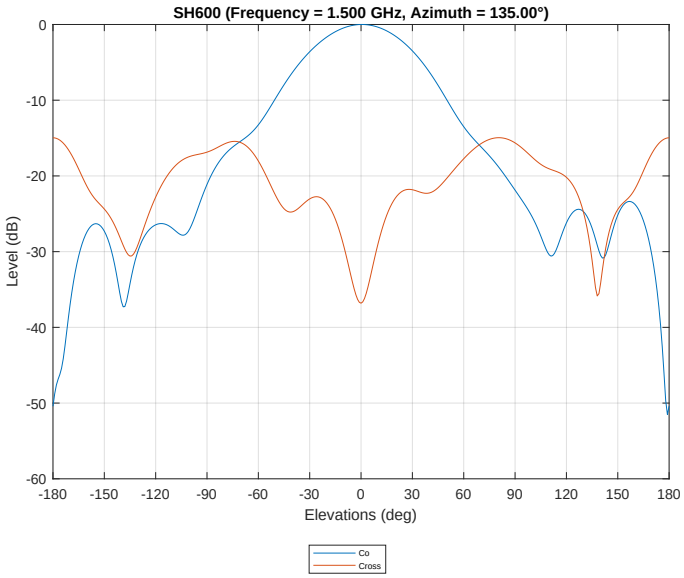


Figure 5.26: Frequency = 1.500 GHz, Azimuth = 135.00° (co + cross)

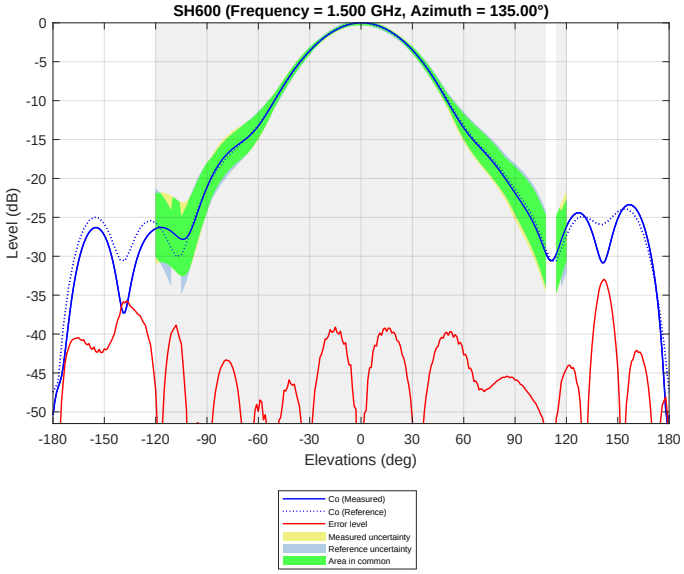


Figure 5.27: Frequency = 1.500 GHz, Azimuth = 135.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 2.000 GHZ, AZIMUTH = 0.00°

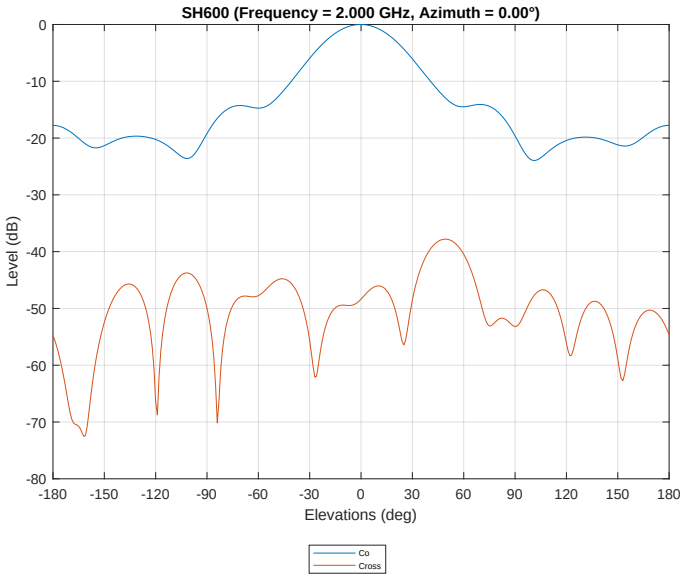


Figure 5.28: Frequency = 2.000 GHz, Azimuth = 0.00° (co + cross)

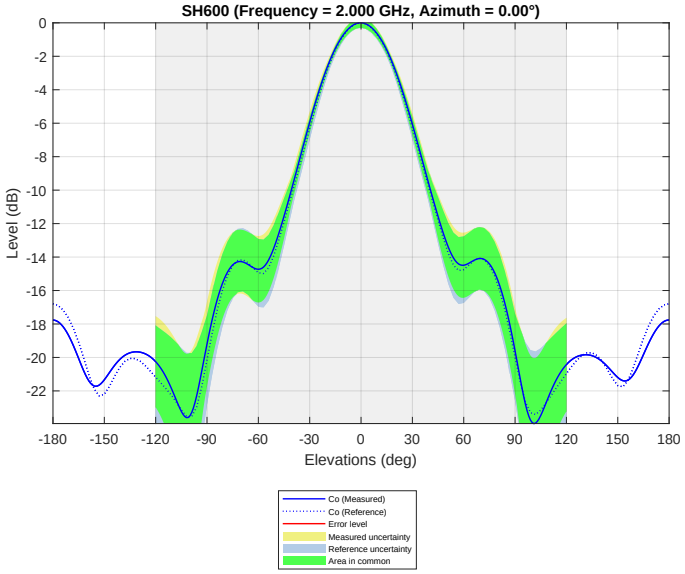


Figure 5.29: Frequency = 2.000 GHz, Azimuth = 0.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 2.000 GHZ, AZIMUTH = 45.00°

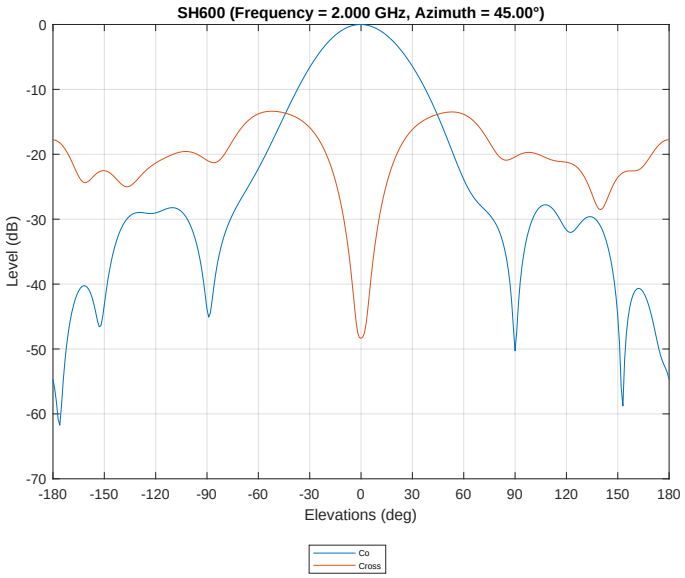


Figure 5.30: Frequency = 2.000 GHz, Azimuth = 45.00° (co + cross)

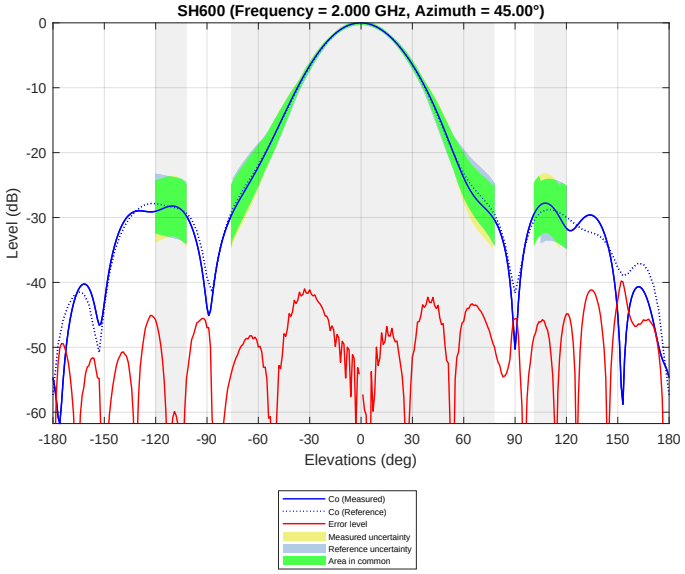


Figure 5.31: Frequency = 2.000 GHz, Azimuth = 45.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 2.000 GHZ, AZIMUTH = 90.00°

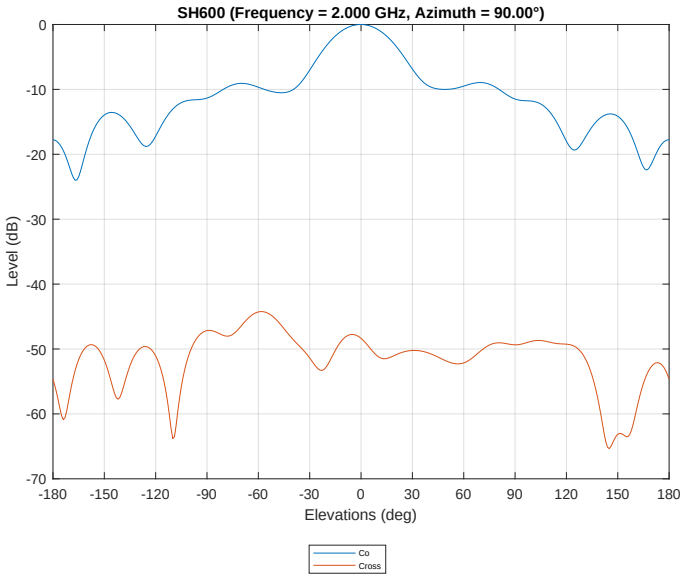


Figure 5.32: Frequency = 2.000 GHz, Azimuth = 90.00° (co + cross)

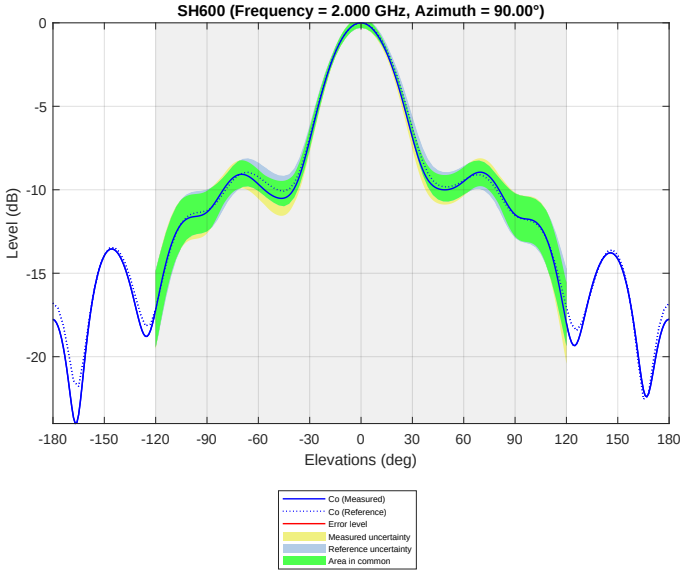


Figure 5.33: Frequency = 2.000 GHz, Azimuth = 90.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 2.000 GHZ, AZIMUTH = 135.00°

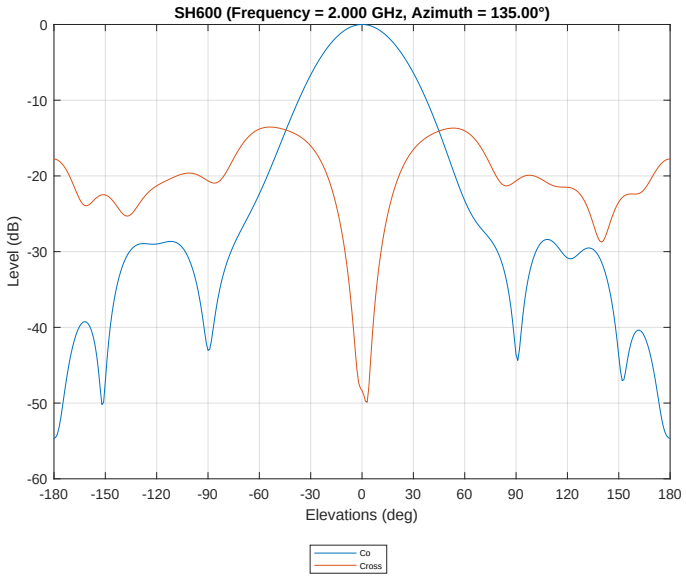


Figure 5.34: Frequency = 2.000 GHz, Azimuth = 135.00° (co + cross)

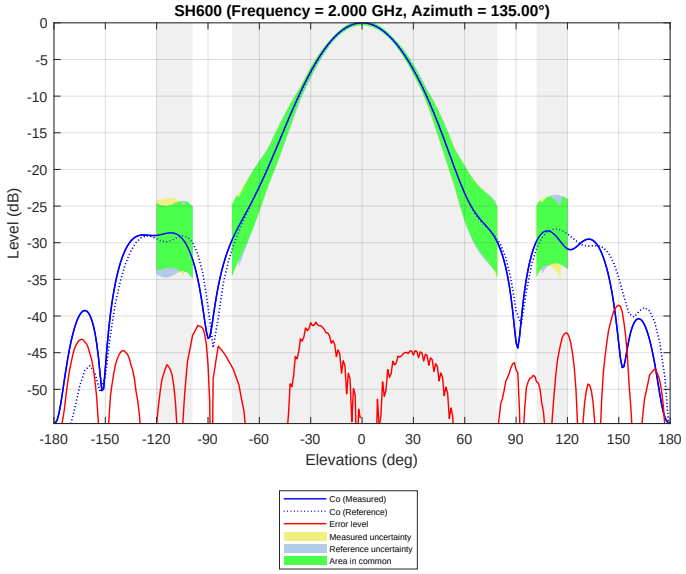


Figure 5.35: Frequency = 2.000 GHz, Azimuth = 135.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 2.500 GHZ, AZIMUTH = 0.00°

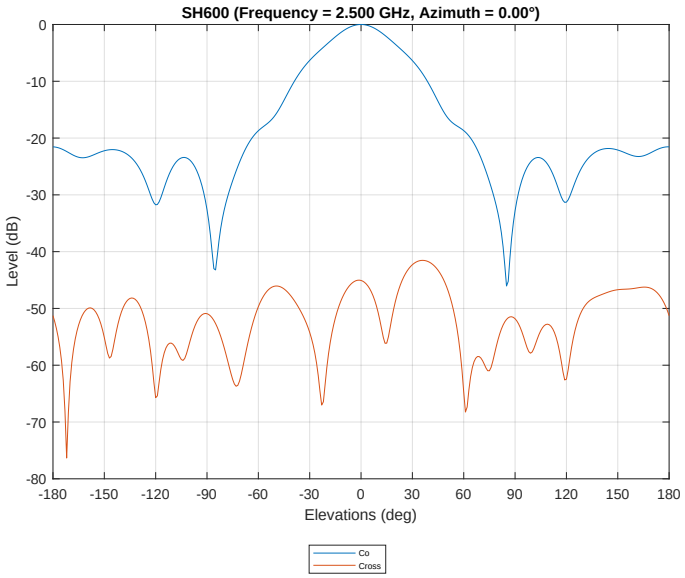


Figure 5.36: Frequency = 2.500 GHz, Azimuth = 0.00° (co + cross)

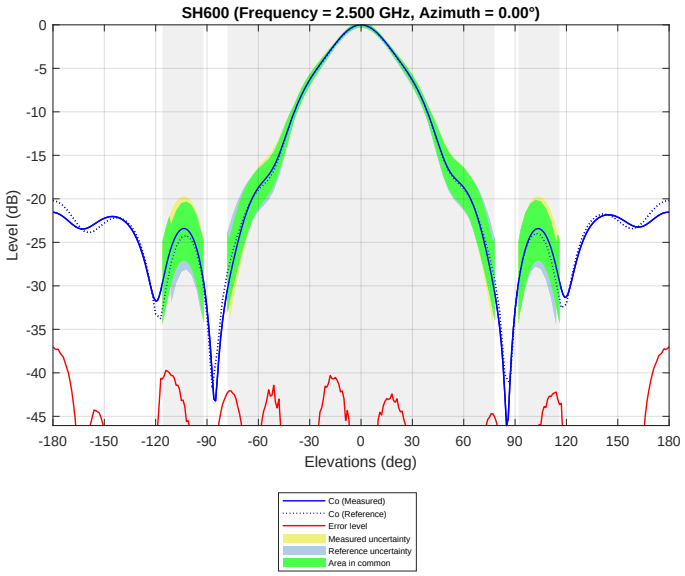


Figure 5.37: Frequency = 2.500 GHz, Azimuth = 0.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 2.500 GHZ, AZIMUTH = 45.00°

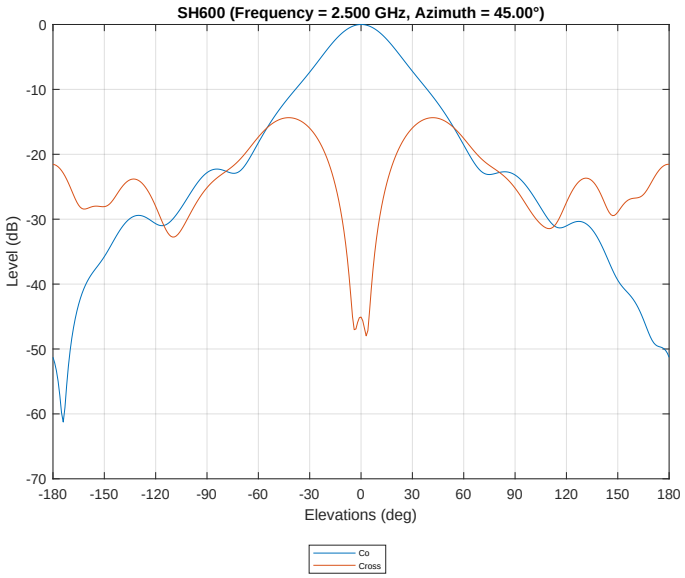


Figure 5.38: Frequency = 2.500 GHz, Azimuth = 45.00° (co + cross)

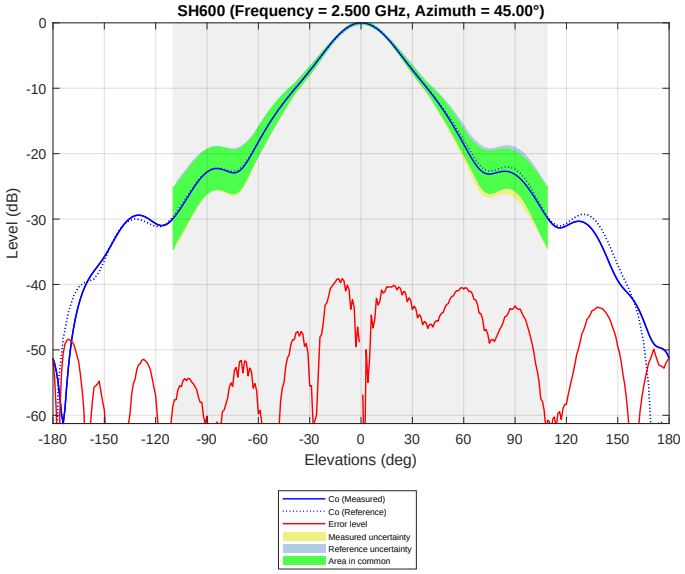


Figure 5.39: Frequency = 2.500 GHz, Azimuth = 45.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 2.500 GHZ, AZIMUTH = 90.00°

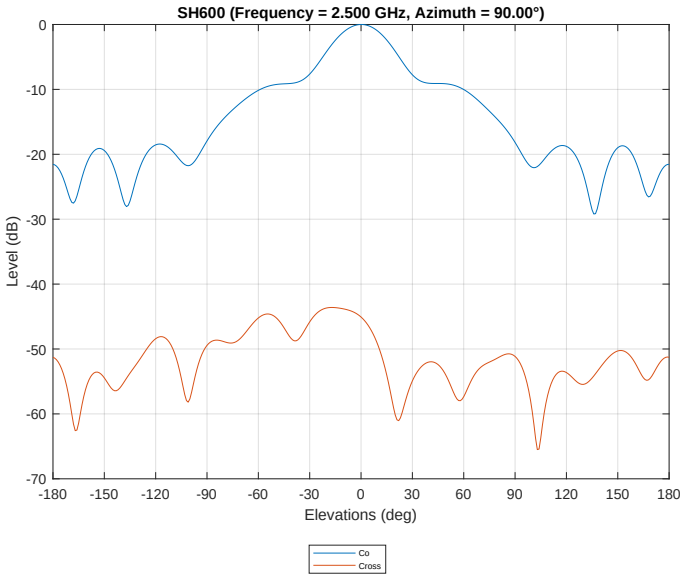


Figure 5.40: Frequency = 2.500 GHz, Azimuth = 90.00° (co + cross)

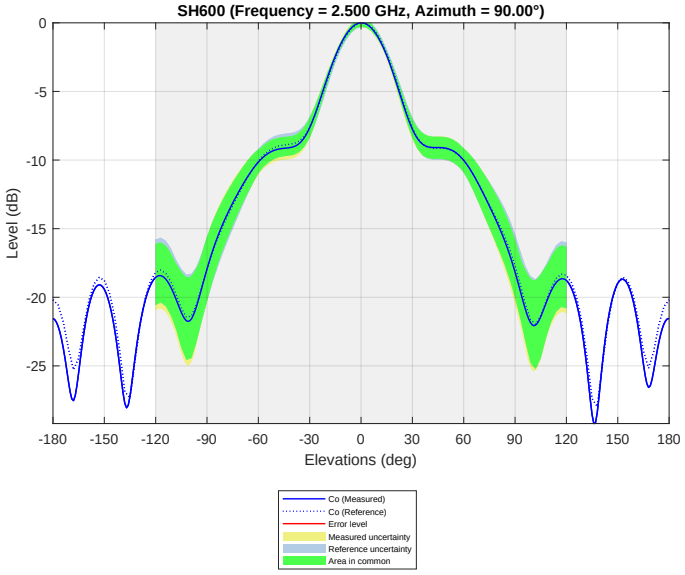


Figure 5.41: Frequency = 2.500 GHz, Azimuth = 90.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 2.500 GHZ, AZIMUTH = 135.00°

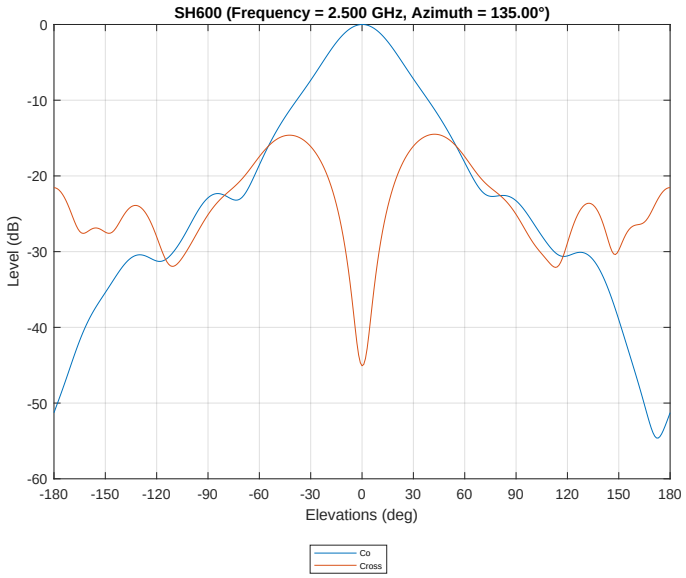


Figure 5.42: Frequency = 2.500 GHz, Azimuth = 135.00° (co + cross)

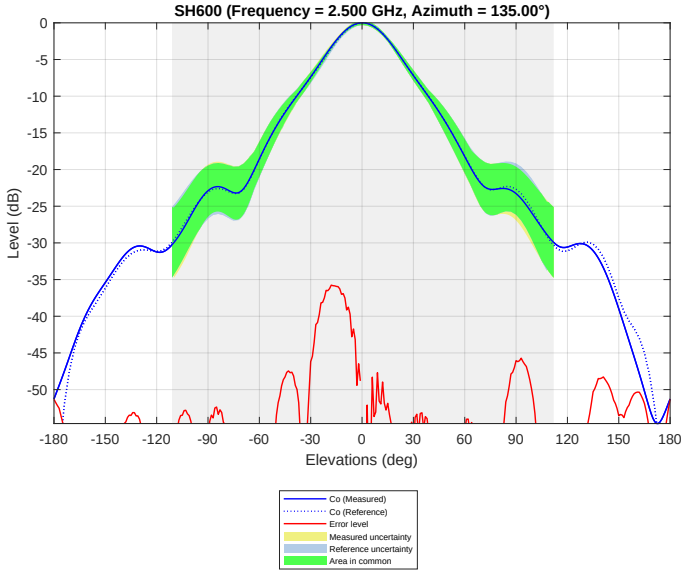


Figure 5.43: Frequency = 2.500 GHz, Azimuth = 135.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 4.000 GHZ, AZIMUTH = 0.00°

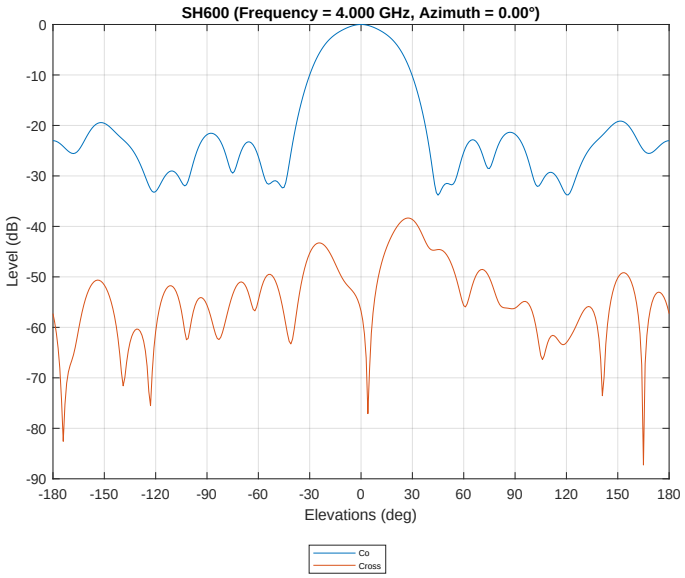


Figure 5.44: Frequency = 4.000 GHz, Azimuth = 0.00° (co + cross)

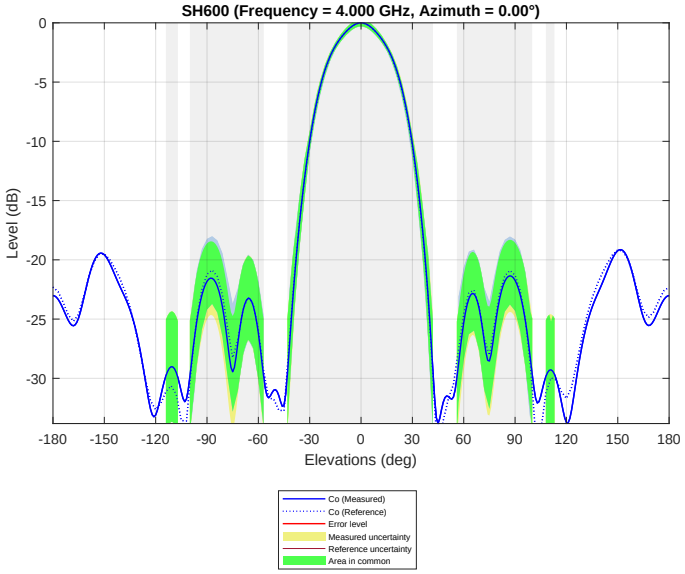


Figure 5.45: Frequency = 4.000 GHz, Azimuth = 0.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 4.000 GHZ, AZIMUTH = 45.00°

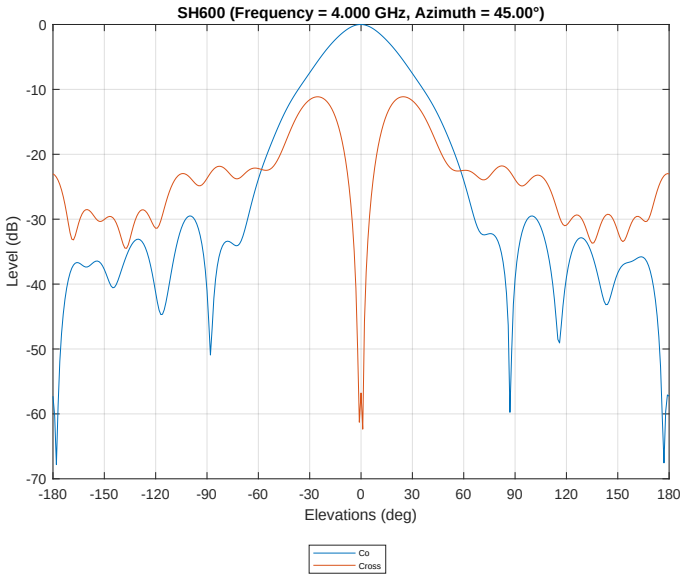


Figure 5.46: Frequency = 4.000 GHz, Azimuth = 45.00° (co + cross)

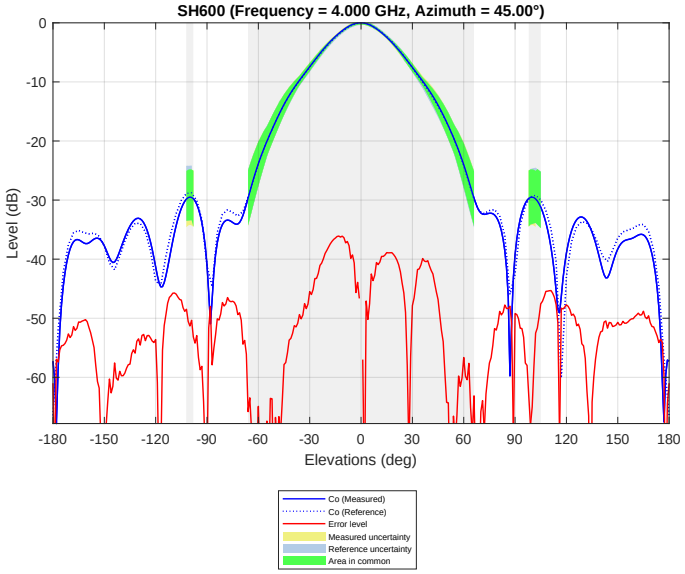


Figure 5.47: Frequency = 4.000 GHz, Azimuth = 45.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 4.000 GHZ, AZIMUTH = 90.00°

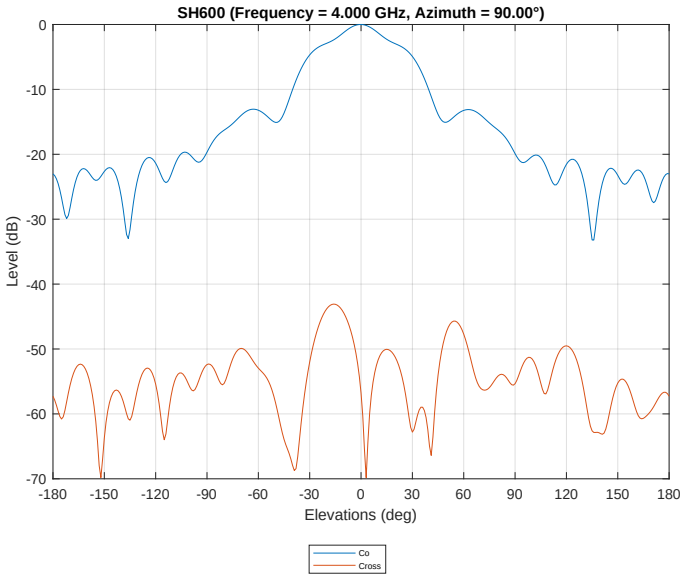


Figure 5.48: Frequency = 4.000 GHz, Azimuth = 90.00° (co + cross)

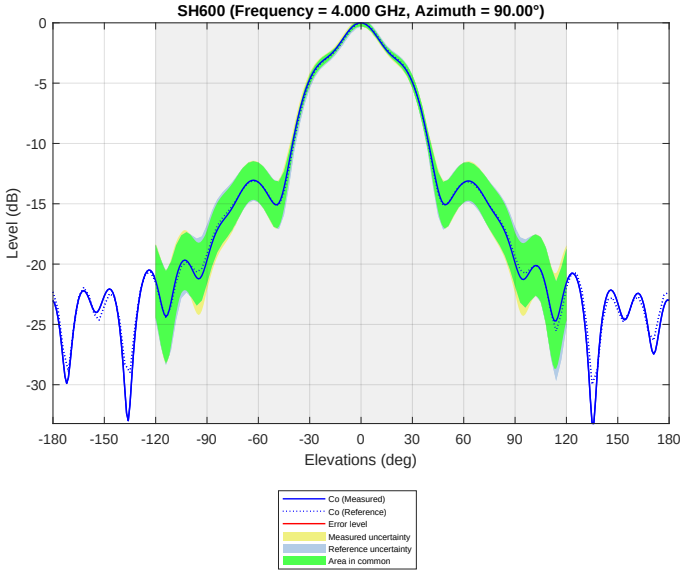


Figure 5.49: Frequency = 4.000 GHz, Azimuth = 90.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 4.000 GHZ, AZIMUTH = 135.00°

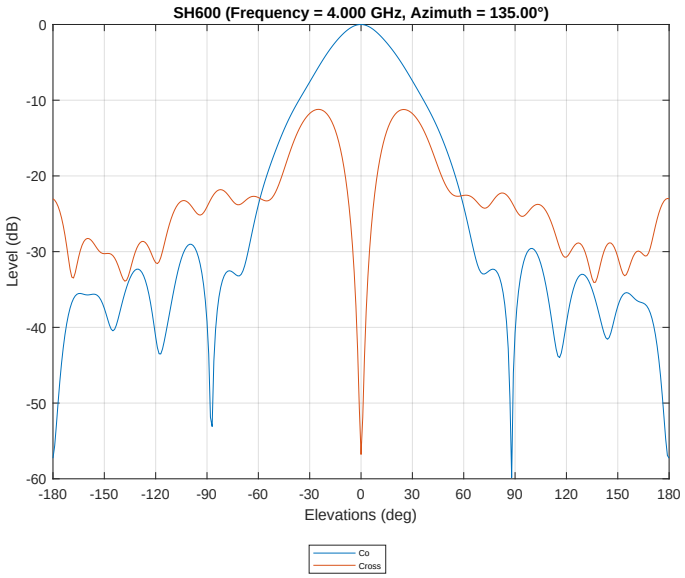


Figure 5.50: Frequency = 4.000 GHz, Azimuth = 135.00° (co + cross)

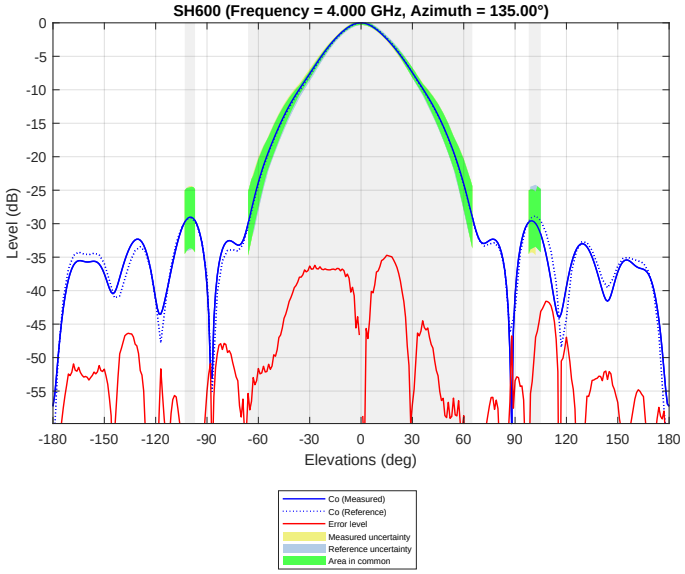


Figure 5.51: Frequency = 4.000 GHz, Azimuth = 135.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 6.000 GHZ, AZIMUTH = 0.00°

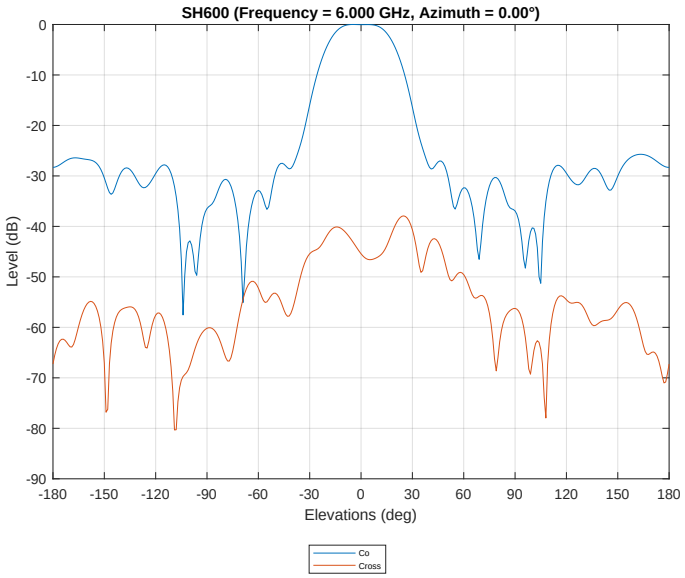


Figure 5.52: Frequency = 6.000 GHz, Azimuth = 0.00° (co + cross)

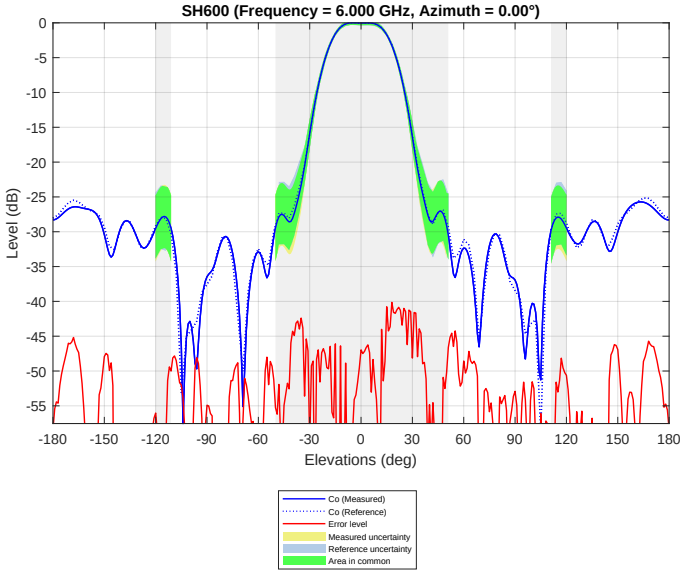


Figure 5.53: Frequency = 6.000 GHz, Azimuth = 0.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 6.000 GHZ, AZIMUTH = 45.00°

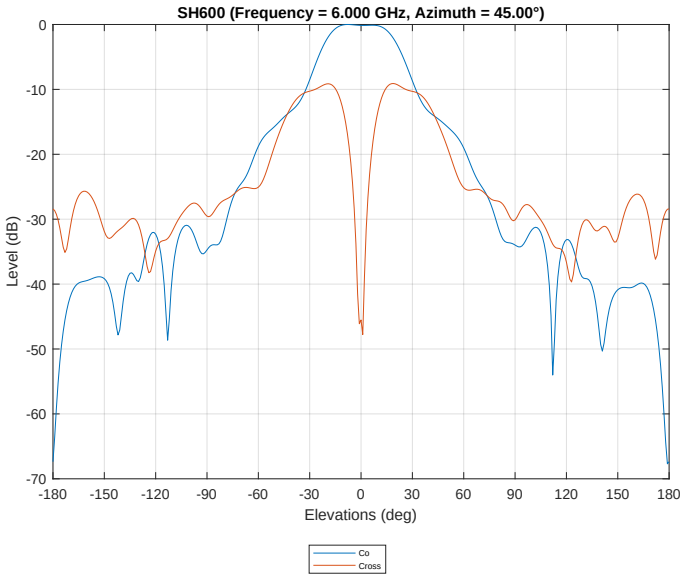


Figure 5.54: Frequency = 6.000 GHz, Azimuth = 45.00° (co + cross)

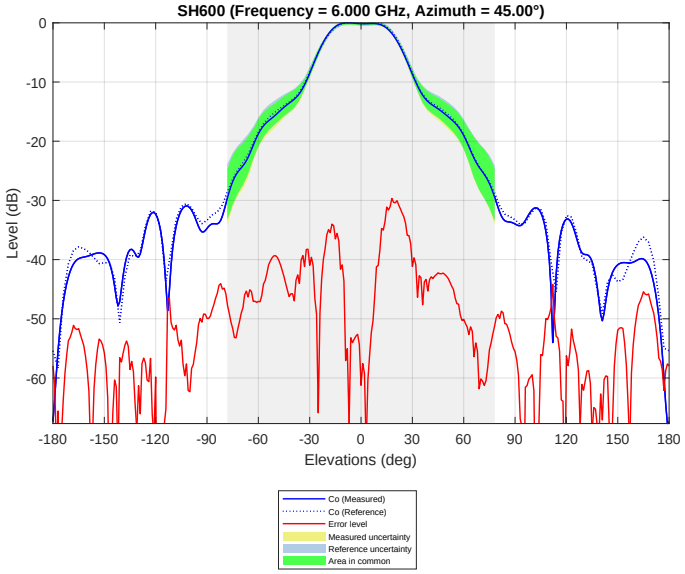


Figure 5.55: Frequency = 6.000 GHz, Azimuth = 45.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 6.000 GHZ, AZIMUTH = 90.00°

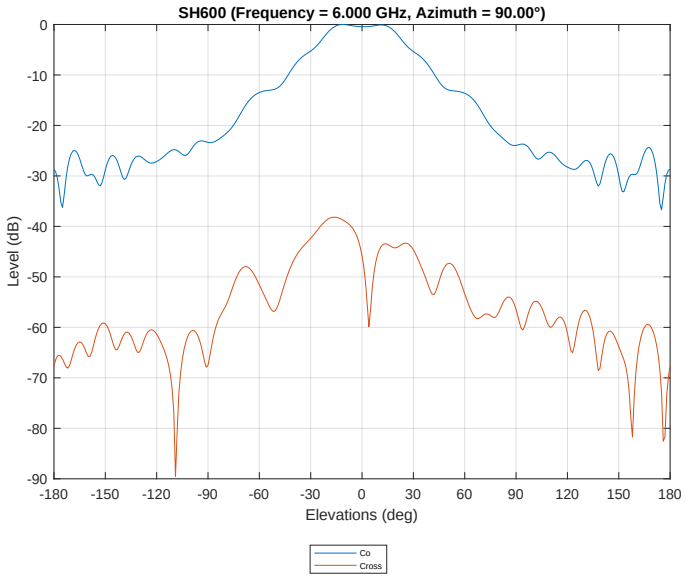


Figure 5.56: Frequency = 6.000 GHz, Azimuth = 90.00° (co + cross)

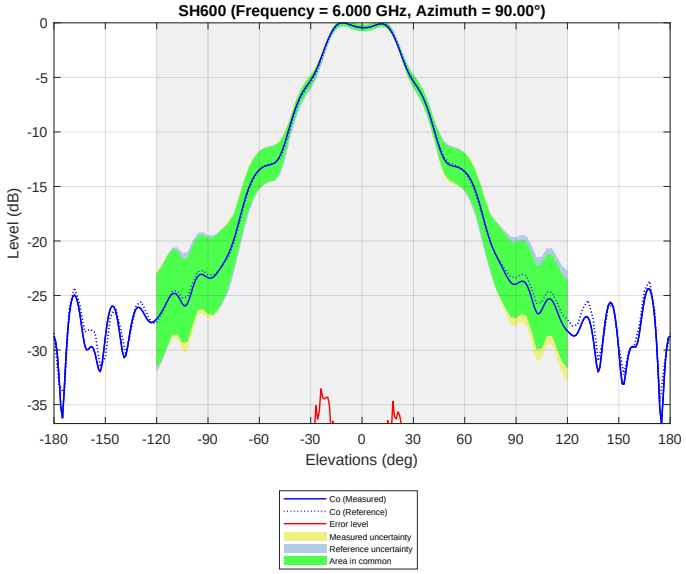


Figure 5.57: Frequency = 6.000 GHz, Azimuth = 90.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 6.000 GHZ, AZIMUTH = 135.00°

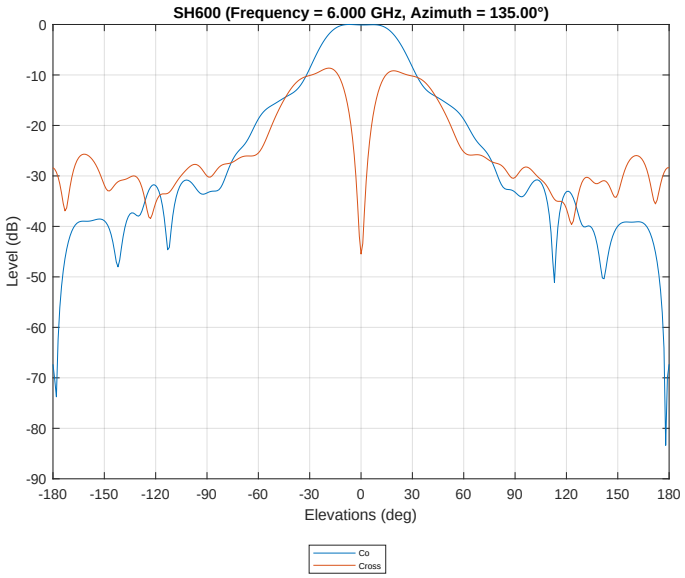


Figure 5.58: Frequency = 6.000 GHz, Azimuth = 135.00° (co + cross)

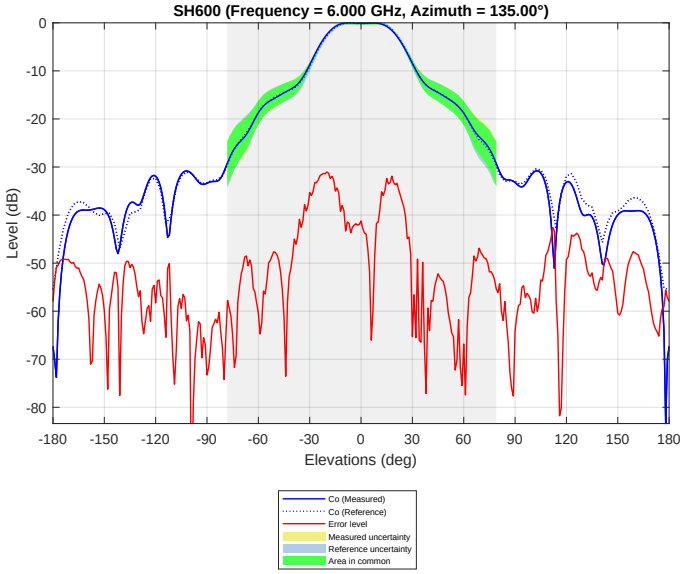


Figure 5.59: Frequency = 6.000 GHz, Azimuth = 135.00° (co + mask)

==> Ok, all points inside the masks

5.2 SH2000 - 419

5.2.1 General information

Measurement file	SH2000.mat
Reference file	SH2000-prod 0.65 to 6GHz.mat
Measured antenna type	SH2000
Measured antenna serial number	419
Measurement device type	STARLAB_2
Measurement device serial number	ATL2427S
Measurement mode	Standard180
Mast type	Styrofoam
Measurement array	LF
Measurement date	2022-10-19

5.2.2 Boresight directivity

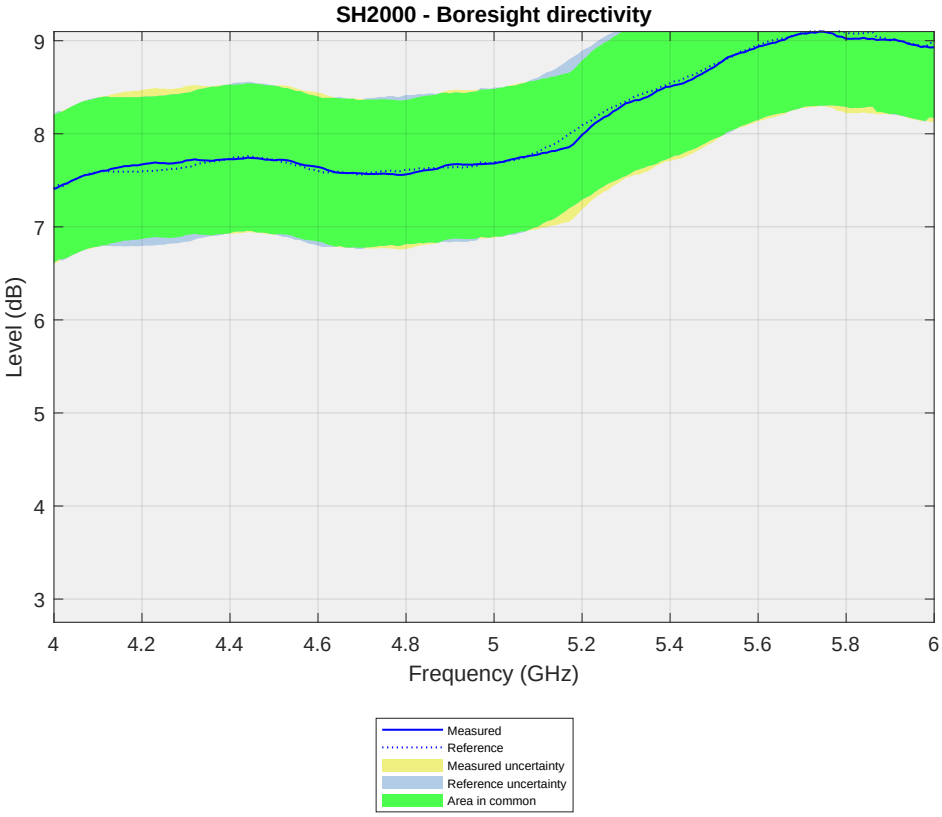


Figure 5.60: Boresight directivity

==> Ok, all points inside the masks

5.2.3 Boresight gain

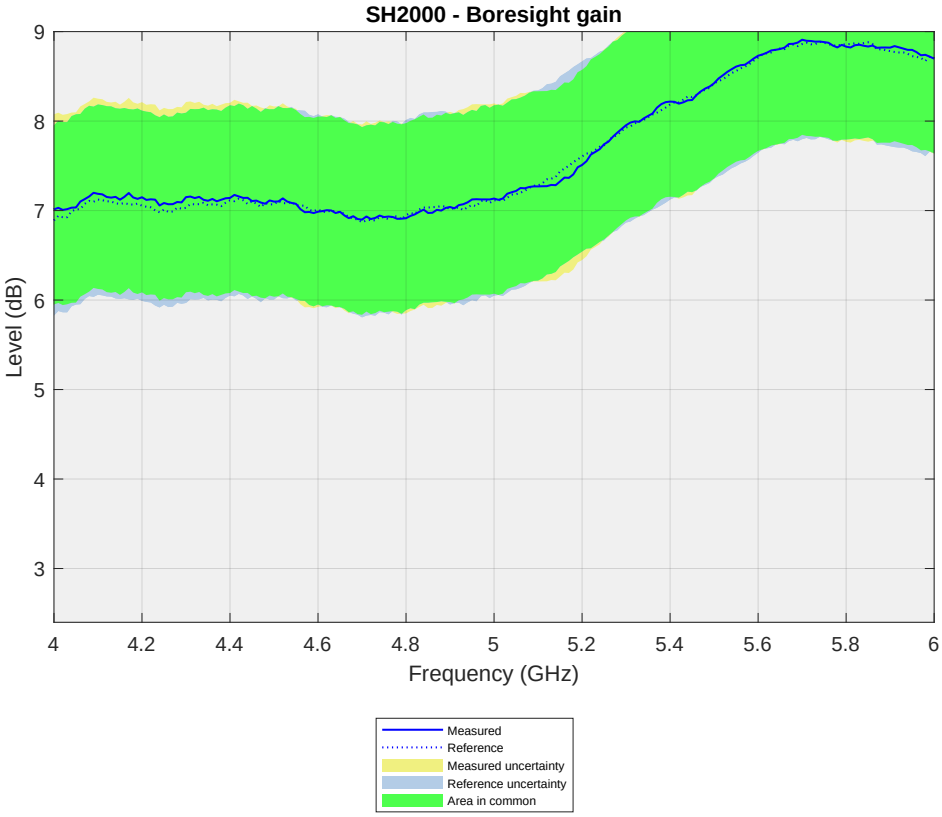


Figure 5.61: Boresight gain

==> Ok, all points inside the masks

5.2.4 Efficiency

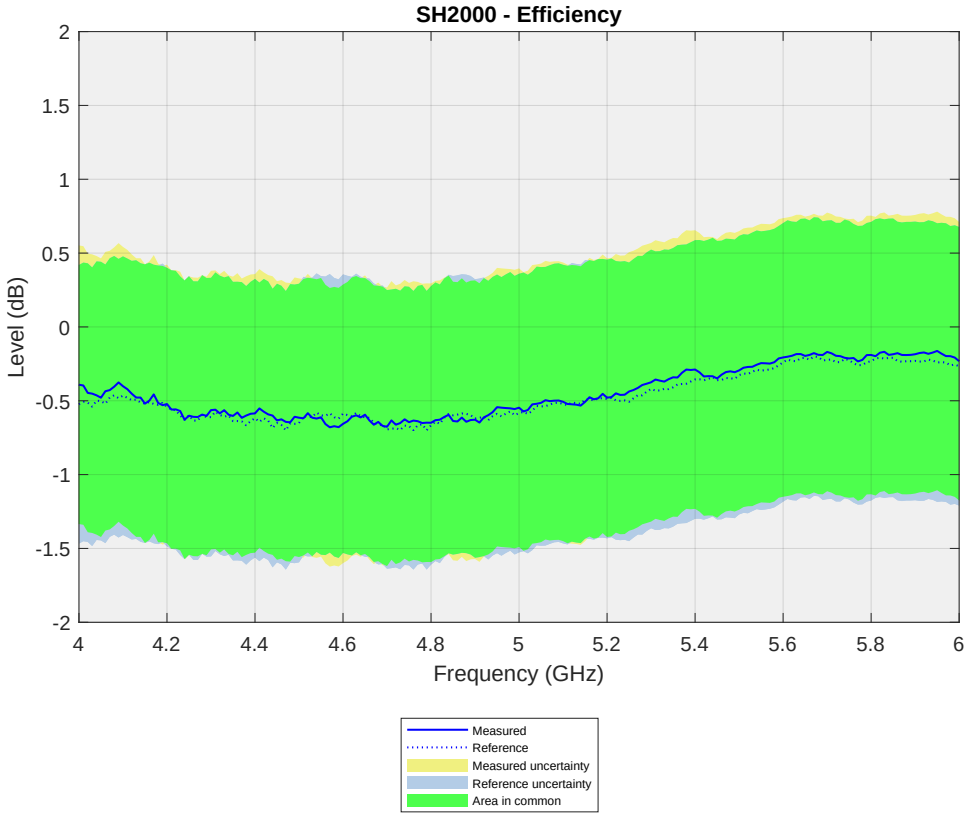


Figure 5.62: Efficiency

==> Ok, all points inside the masks

5.2.5 Elevation cuts

FREQUENCY = 4.000 GHZ, AZIMUTH = 0.00°

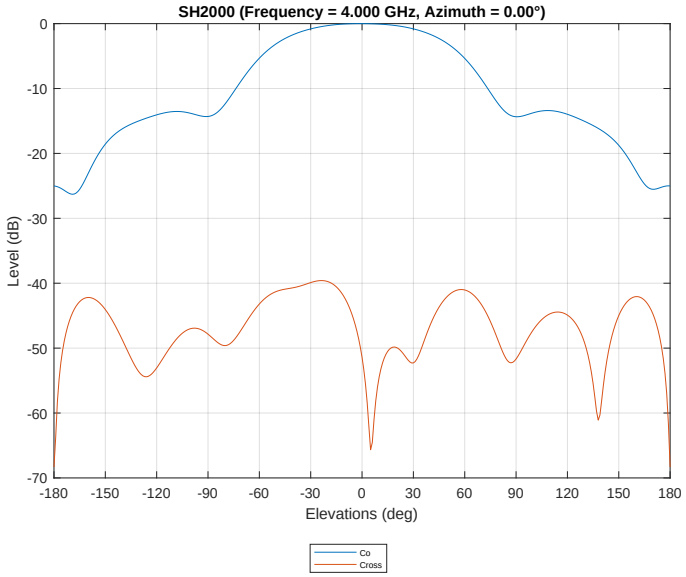


Figure 5.63: Frequency = 4.000 GHz, Azimuth = 0.00° (co + cross)

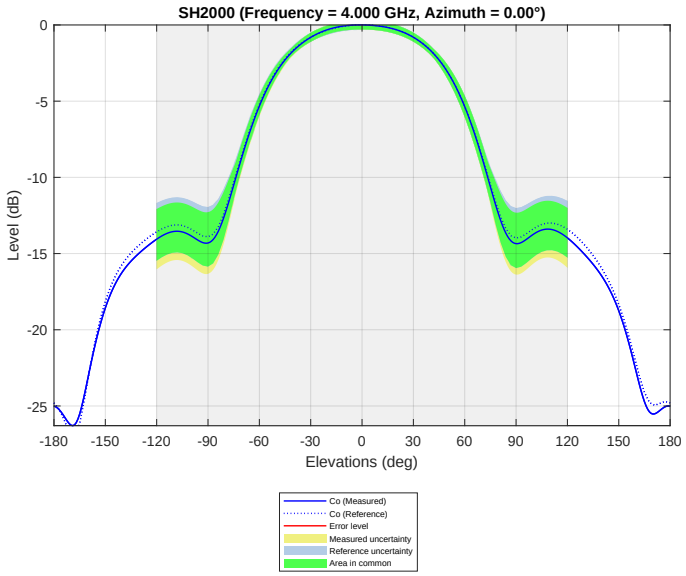


Figure 5.64: Frequency = 4.000 GHz, Azimuth = 0.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 4.000 GHZ, AZIMUTH = 45.00°

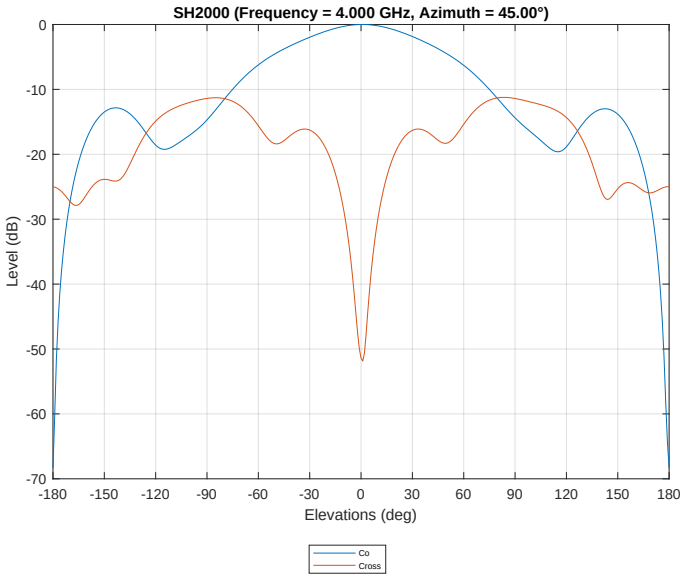


Figure 5.65: Frequency = 4.000 GHz, Azimuth = 45.00° (co + cross)

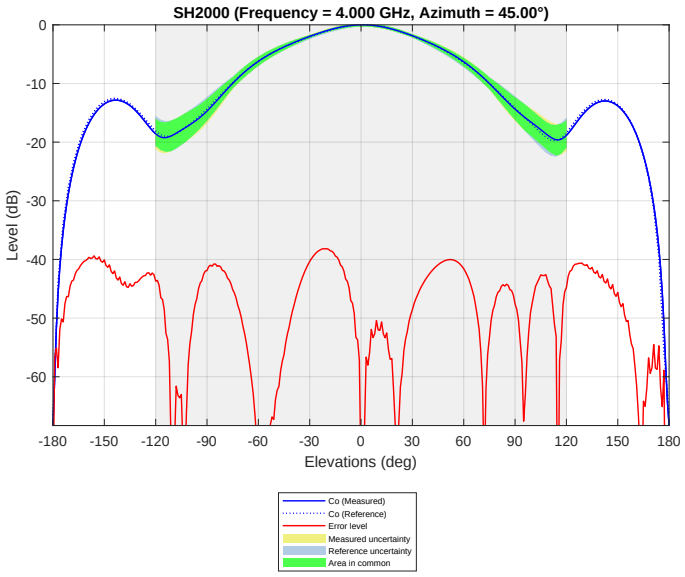


Figure 5.66: Frequency = 4.000 GHz, Azimuth = 45.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 4.000 GHZ, AZIMUTH = 90.00°

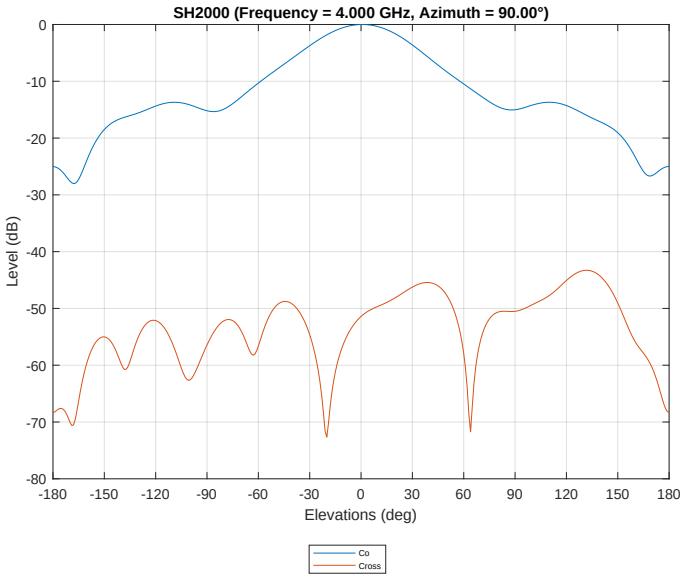


Figure 5.67: Frequency = 4.000 GHz, Azimuth = 90.00° (co + cross)

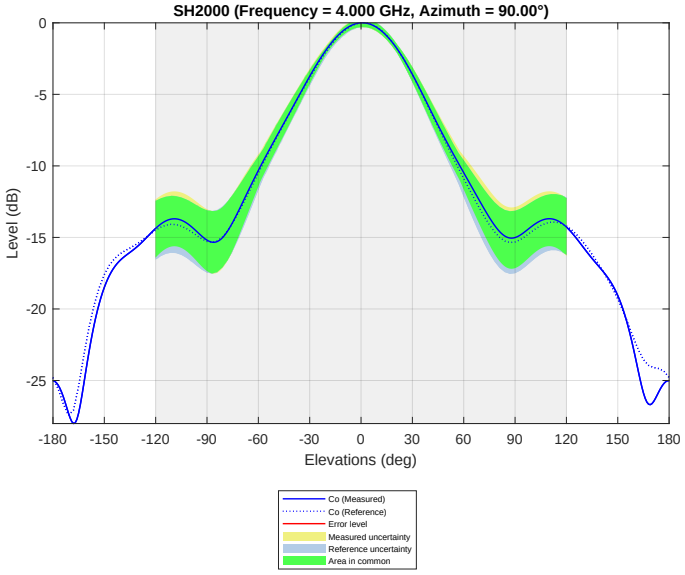


Figure 5.68: Frequency = 4.000 GHz, Azimuth = 90.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 4.000 GHZ, AZIMUTH = 135.00°

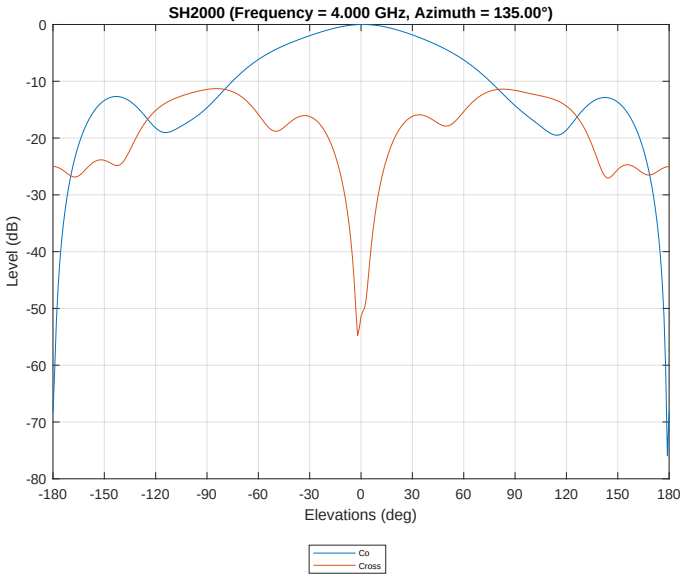


Figure 5.69: Frequency = 4.000 GHz, Azimuth = 135.00° (co + cross)

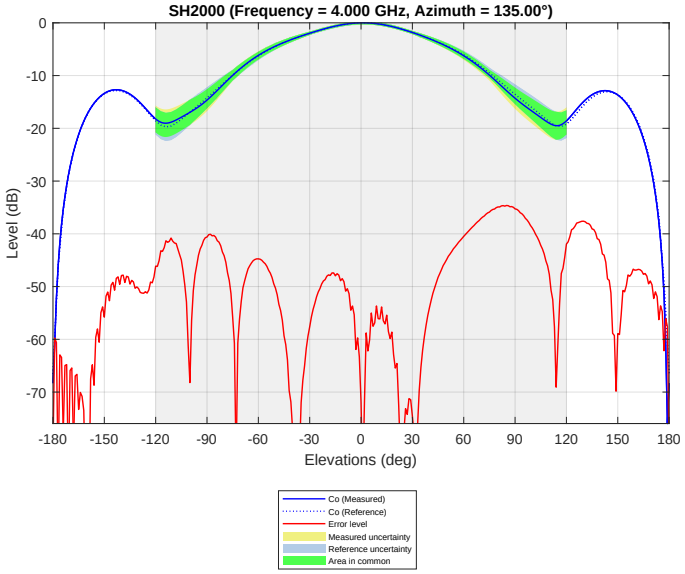


Figure 5.70: Frequency = 4.000 GHz, Azimuth = 135.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 5.000 GHZ, AZIMUTH = 0.00°

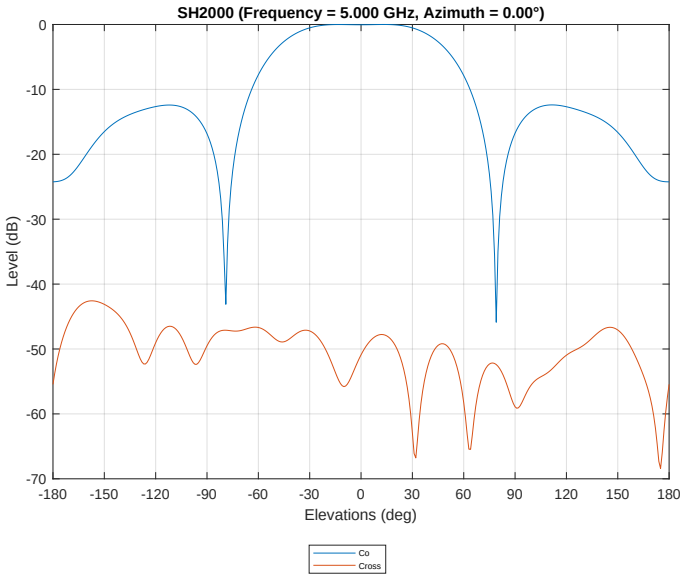


Figure 5.71: Frequency = 5.000 GHz, Azimuth = 0.00° (co + cross)

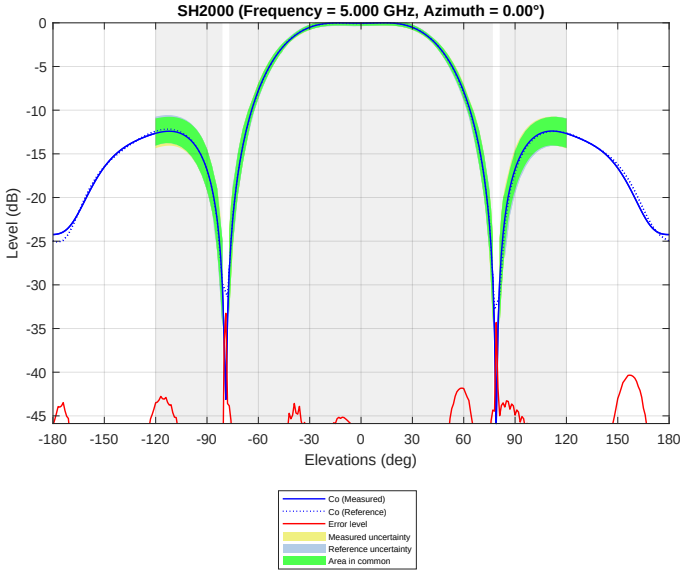


Figure 5.72: Frequency = 5.000 GHz, Azimuth = 0.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 5.000 GHZ, AZIMUTH = 45.00°

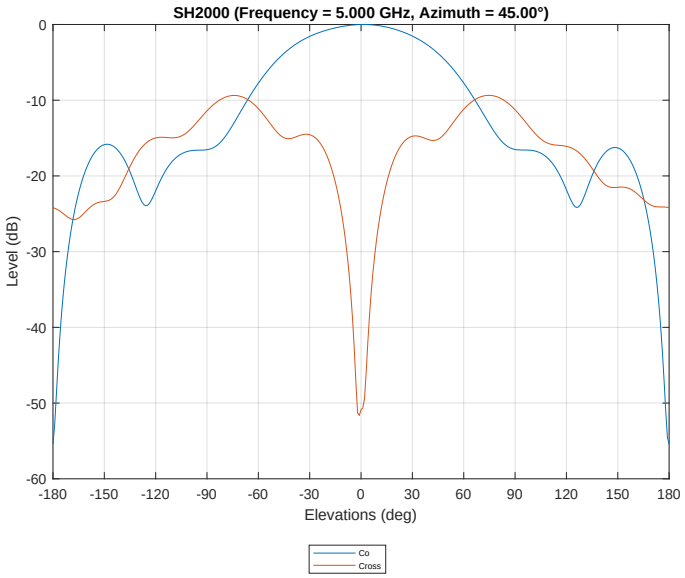


Figure 5.73: Frequency = 5.000 GHz, Azimuth = 45.00° (co + cross)

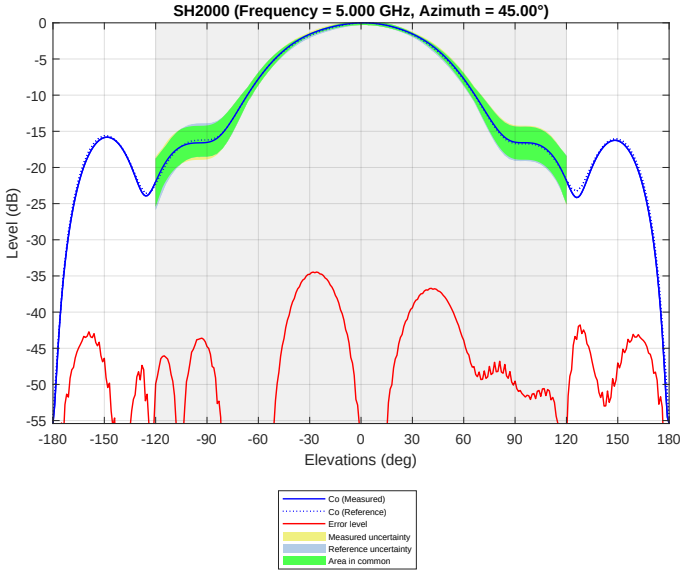


Figure 5.74: Frequency = 5.000 GHz, Azimuth = 45.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 5.000 GHZ, AZIMUTH = 90.00°

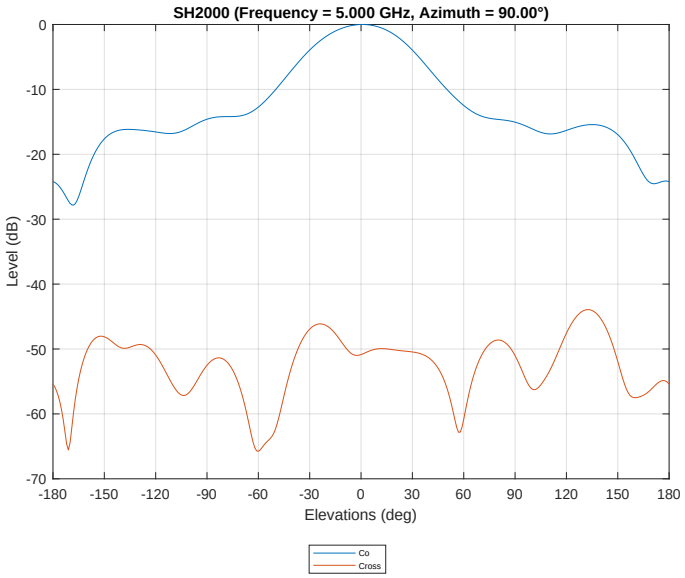


Figure 5.75: Frequency = 5.000 GHz, Azimuth = 90.00° (co + cross)

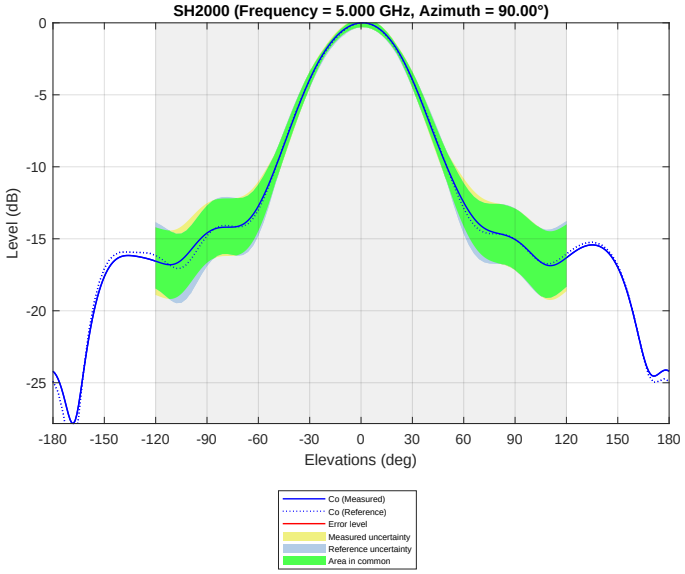


Figure 5.76: Frequency = 5.000 GHz, Azimuth = 90.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 5.000 GHZ, AZIMUTH = 135.00°

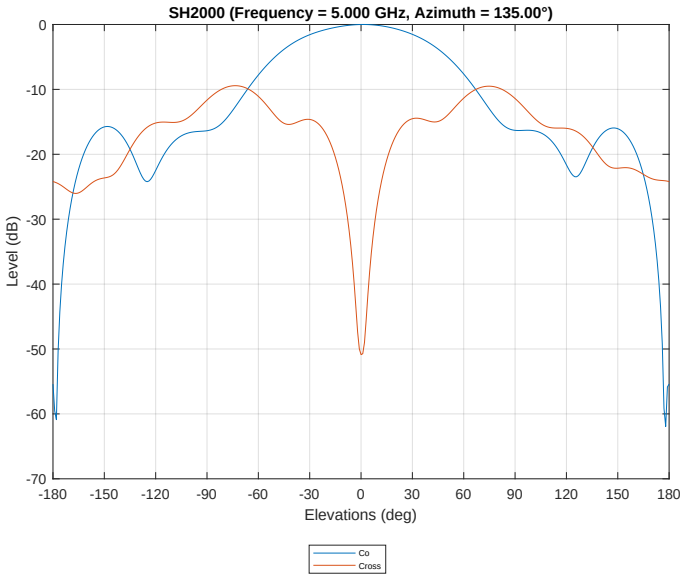


Figure 5.77: Frequency = 5.000 GHz, Azimuth = 135.00° (co + cross)

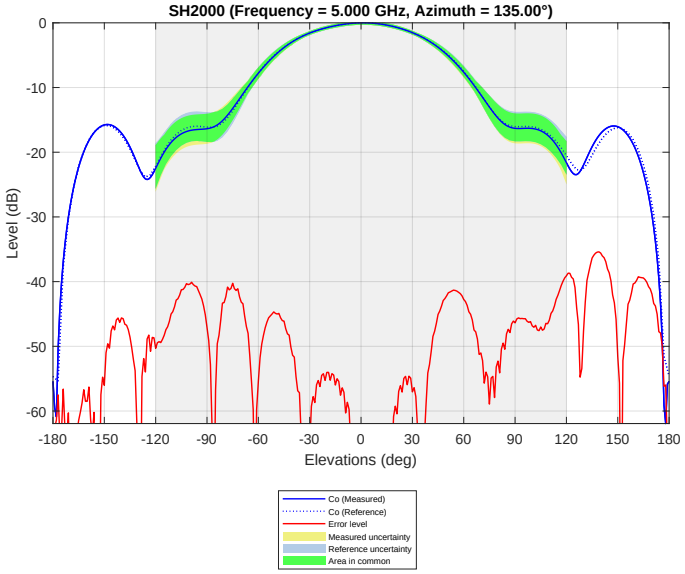


Figure 5.78: Frequency = 5.000 GHz, Azimuth = 135.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 6.000 GHZ, AZIMUTH = 0.00°

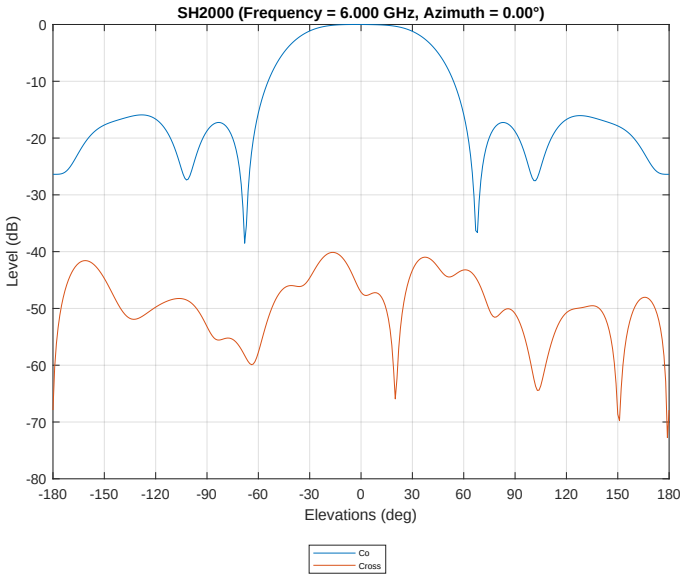


Figure 5.79: Frequency = 6.000 GHz, Azimuth = 0.00° (co + cross)

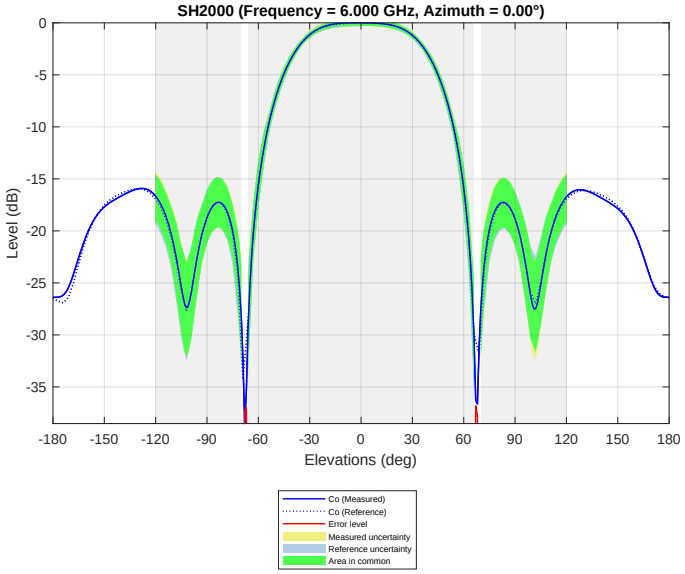


Figure 5.80: Frequency = 6.000 GHz, Azimuth = 0.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 6.000 GHZ, AZIMUTH = 45.00°

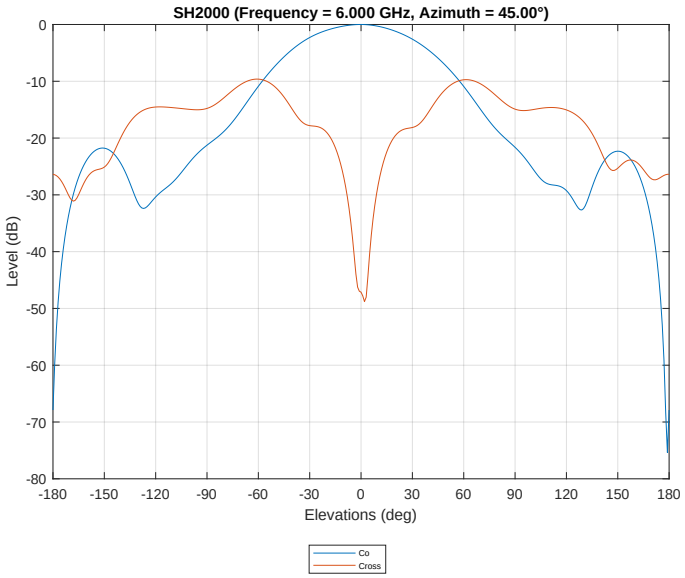


Figure 5.81: Frequency = 6.000 GHz, Azimuth = 45.00° (co + cross)

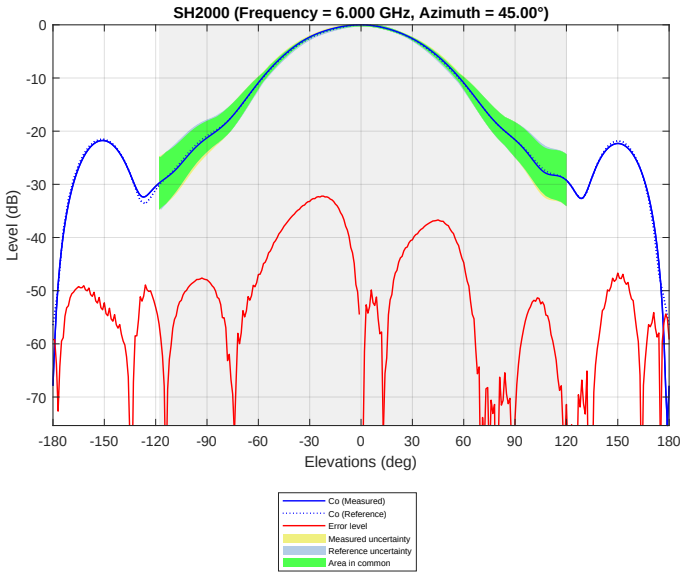


Figure 5.82: Frequency = 6.000 GHz, Azimuth = 45.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 6.000 GHZ, AZIMUTH = 90.00°

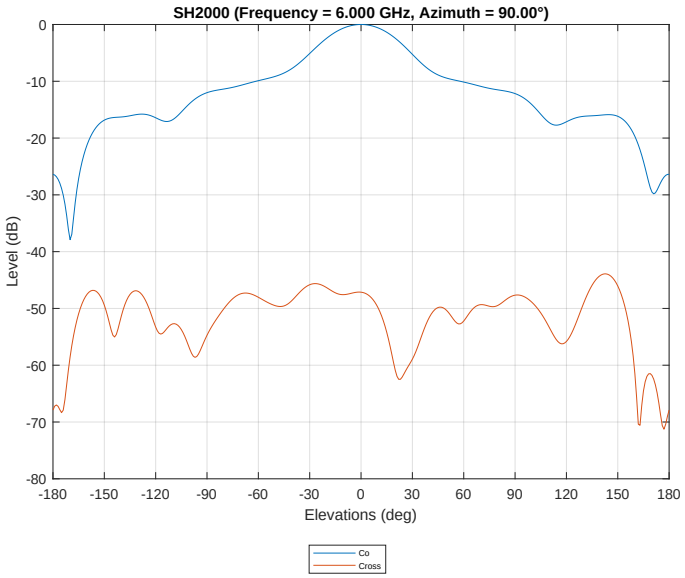


Figure 5.83: Frequency = 6.000 GHz, Azimuth = 90.00° (co + cross)

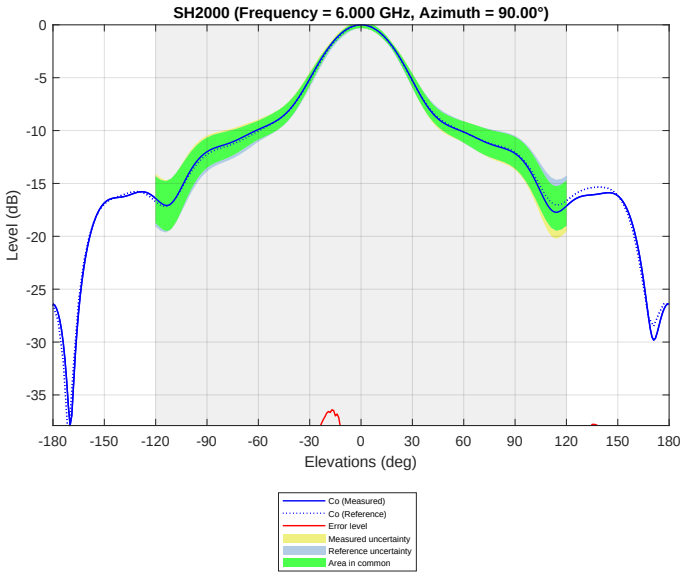


Figure 5.84: Frequency = 6.000 GHz, Azimuth = 90.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 6.000 GHZ, AZIMUTH = 135.00°

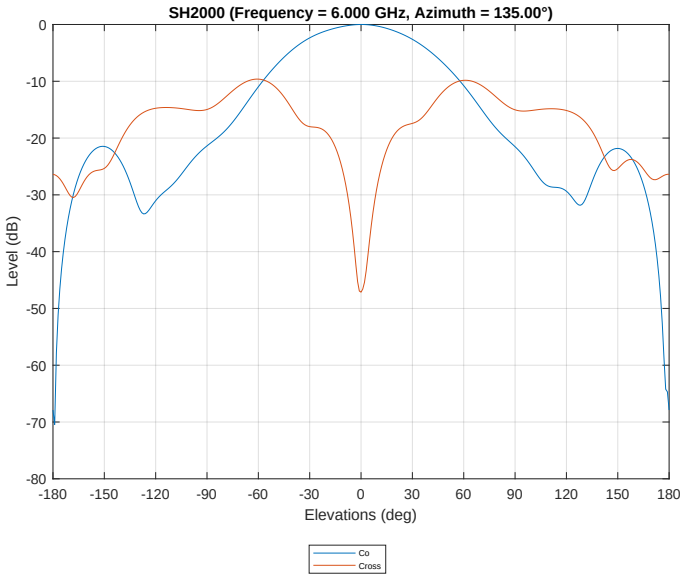


Figure 5.85: Frequency = 6.000 GHz, Azimuth = 135.00° (co + cross)

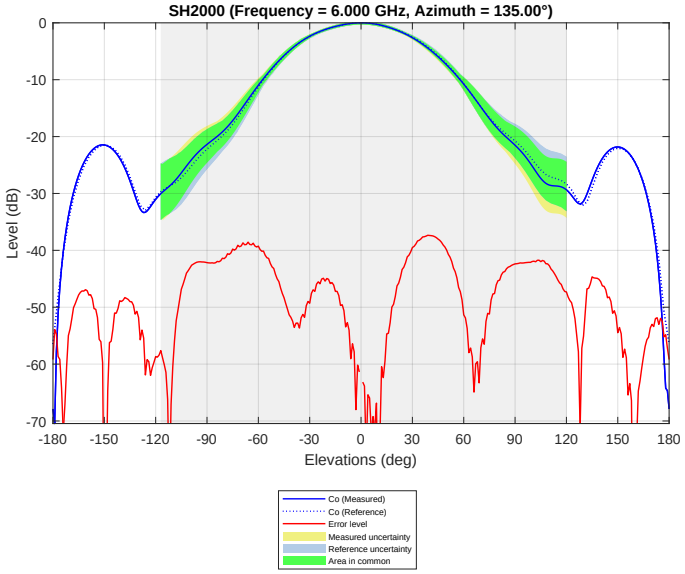


Figure 5.86: Frequency = 6.000 GHz, Azimuth = 135.00° (co + mask)

==> Ok, all points inside the masks

5.3 SH2000 - 419

5.3.1 General information

Measurement file	SH2000[6-10GHz].mat
Reference file	SH2000 Styrofoam Mast Plastic interface 6-18.mat
Measured antenna type	SH2000
Measured antenna serial number	419
Measurement device type	STARLAB_2
Measurement device serial number	ATL2427S
Measurement mode	Standard180
Mast type	Styrofoam
Measurement array	HF
Measurement date	2022-10-19

5.3.2 Boresight directivity

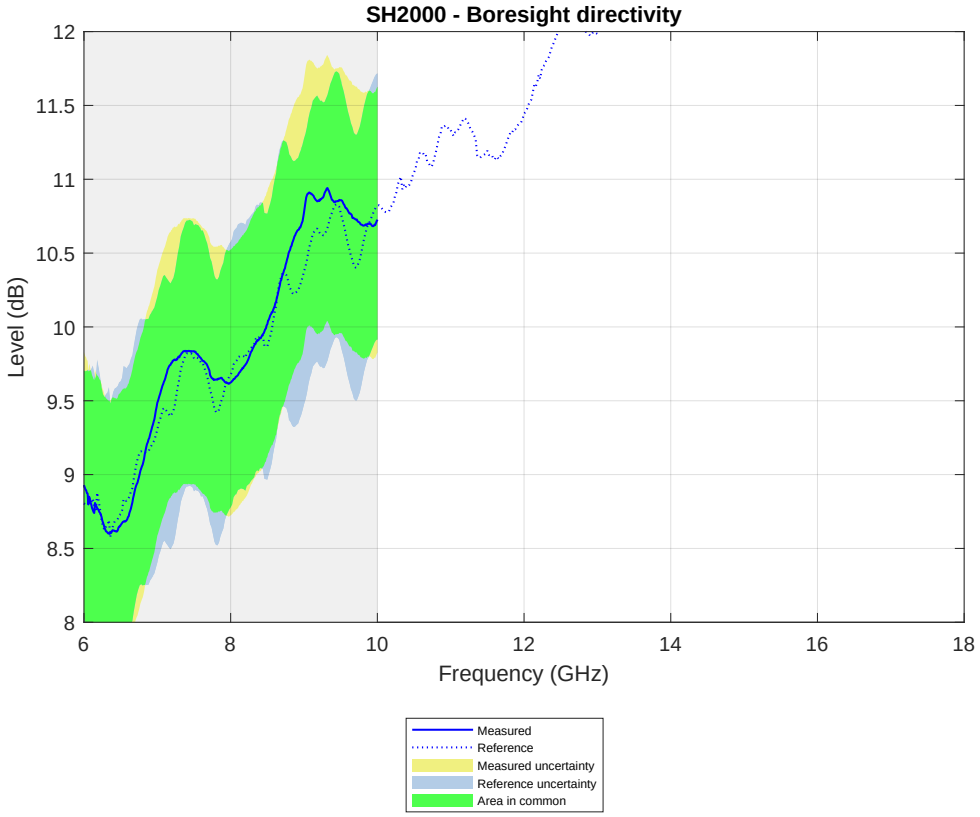


Figure 5.87: Boresight directivity

==> Ok, all points inside the masks

5.3.3 Boresight gain

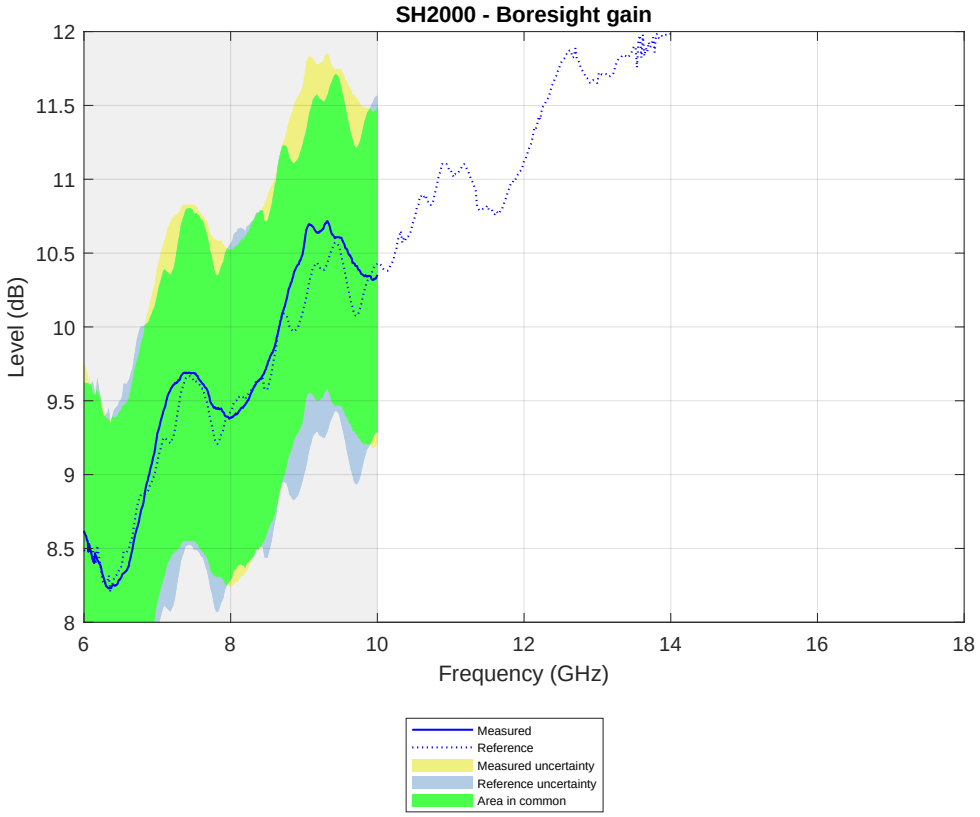


Figure 5.88: Boresight gain

==> Ok, all points inside the masks

5.3.4 Efficiency

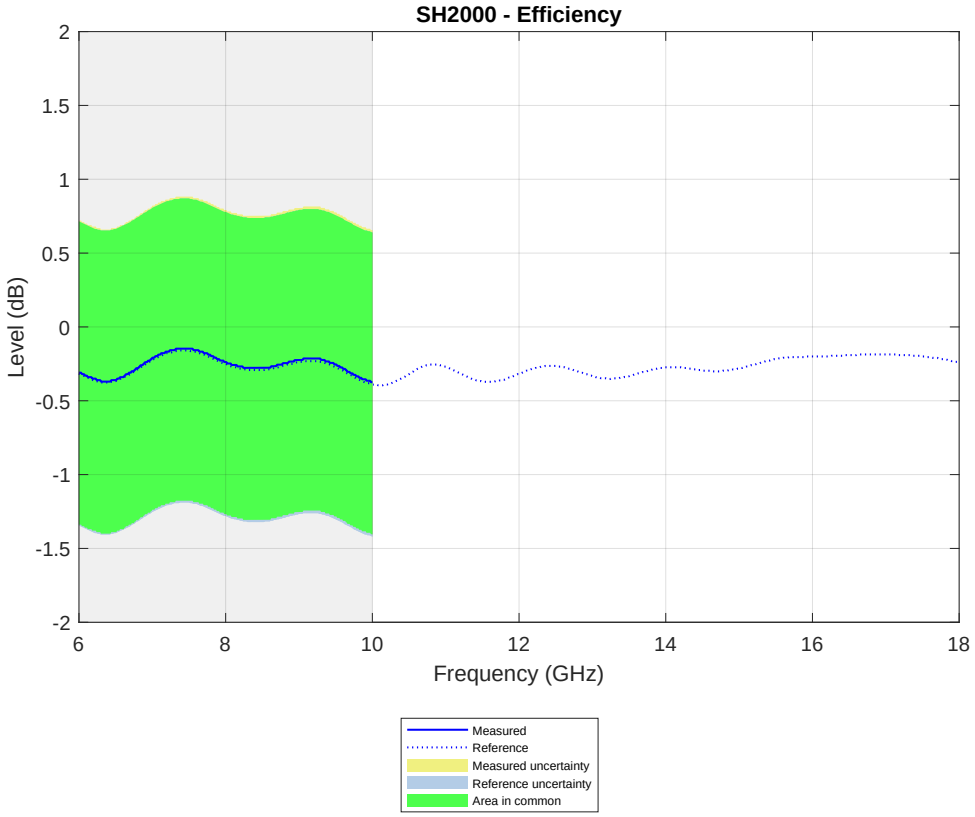


Figure 5.89: Efficiency

==> Ok, all points inside the masks

5.3.5 Elevation cuts

FREQUENCY = 6.000 GHZ, AZIMUTH = 0.00°

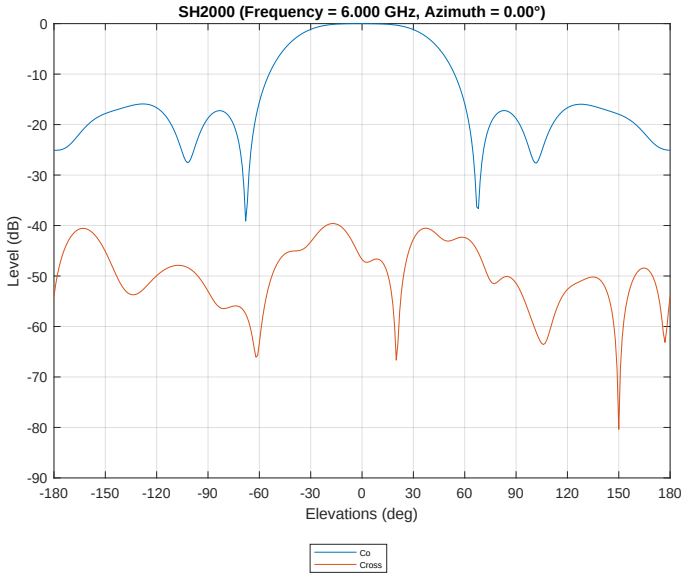


Figure 5.90: Frequency = 6.000 GHz, Azimuth = 0.00° (co + cross)

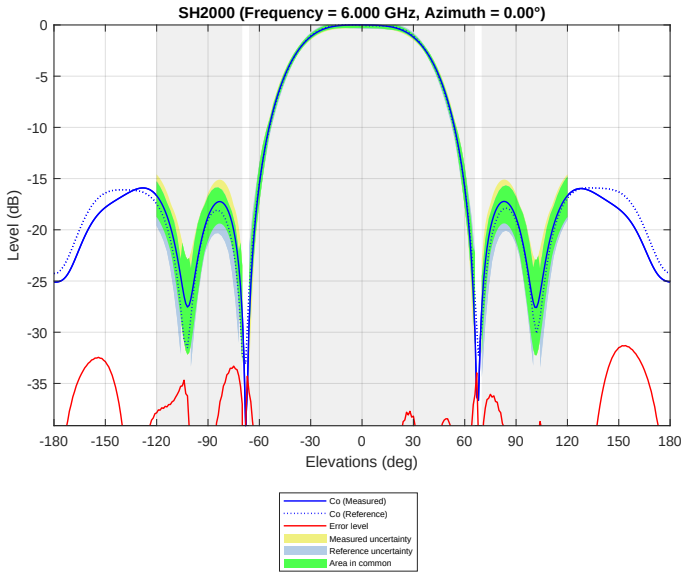


Figure 5.91: Frequency = 6.000 GHz, Azimuth = 0.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 6.000 GHZ, AZIMUTH = 45.00°

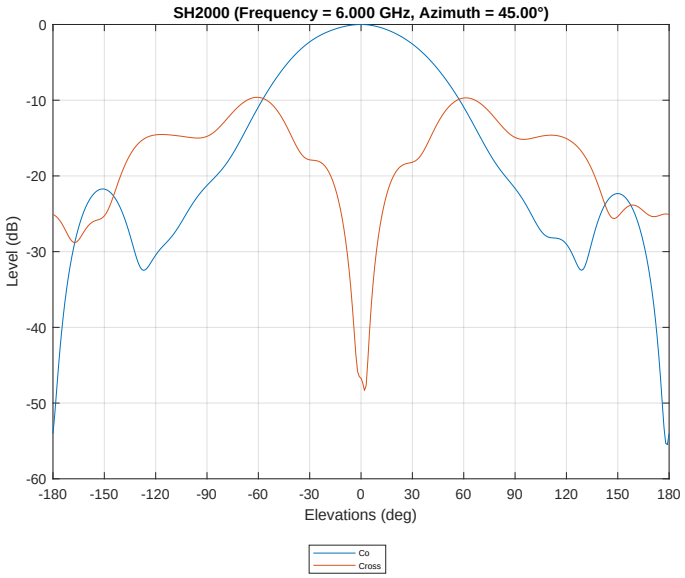


Figure 5.92: Frequency = 6.000 GHz, Azimuth = 45.00° (co + cross)

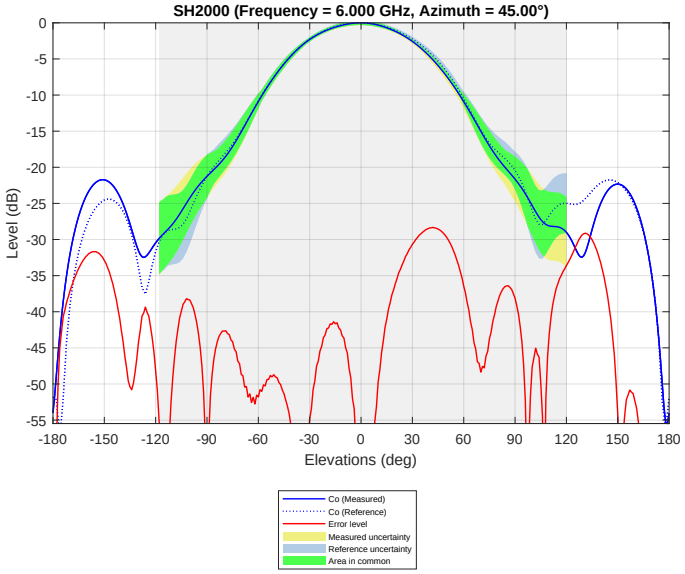


Figure 5.93: Frequency = 6.000 GHz, Azimuth = 45.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 6.000 GHZ, AZIMUTH = 90.00°

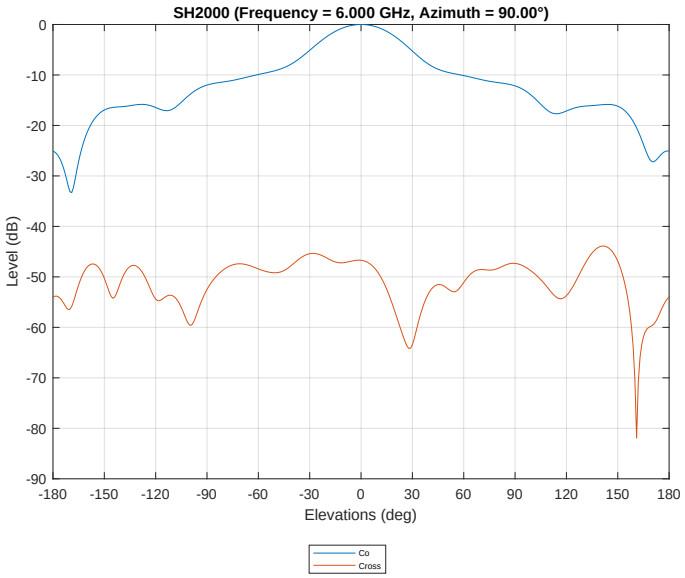


Figure 5.94: Frequency = 6.000 GHz, Azimuth = 90.00° (co + cross)

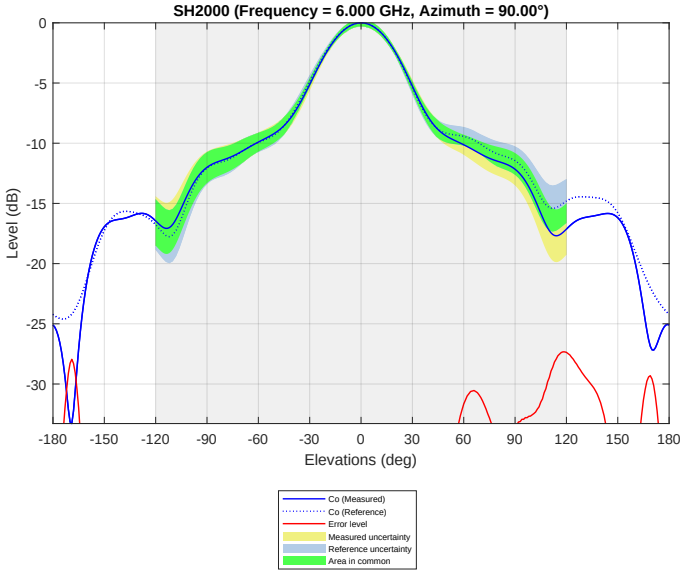


Figure 5.95: Frequency = 6.000 GHz, Azimuth = 90.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 6.000 GHZ, AZIMUTH = 135.00°

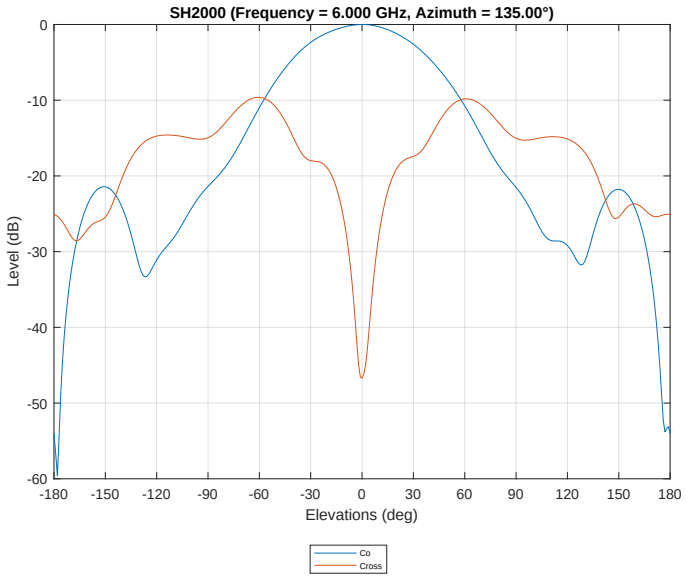


Figure 5.96: Frequency = 6.000 GHz, Azimuth = 135.00° (co + cross)

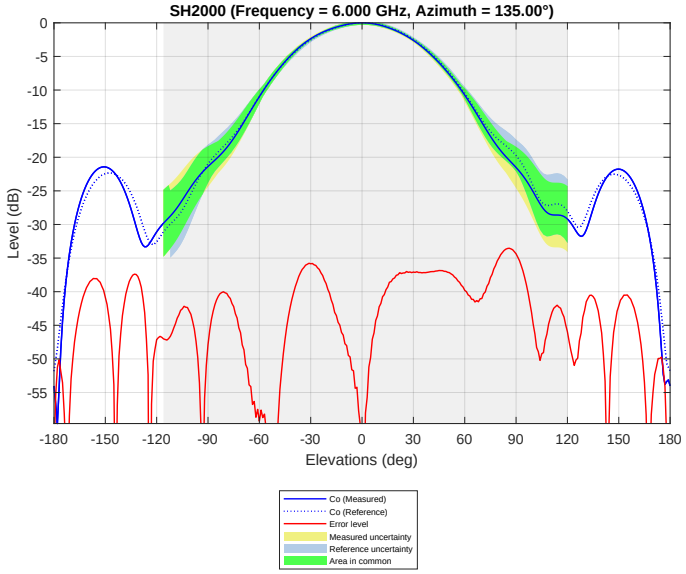


Figure 5.97: Frequency = 6.000 GHz, Azimuth = 135.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 8.000 GHZ, AZIMUTH = 0.00°

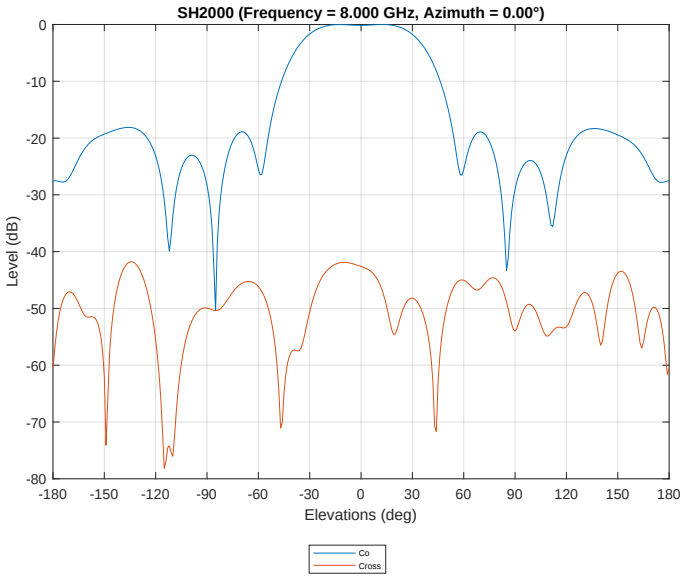


Figure 5.98: Frequency = 8.000 GHz, Azimuth = 0.00° (co + cross)

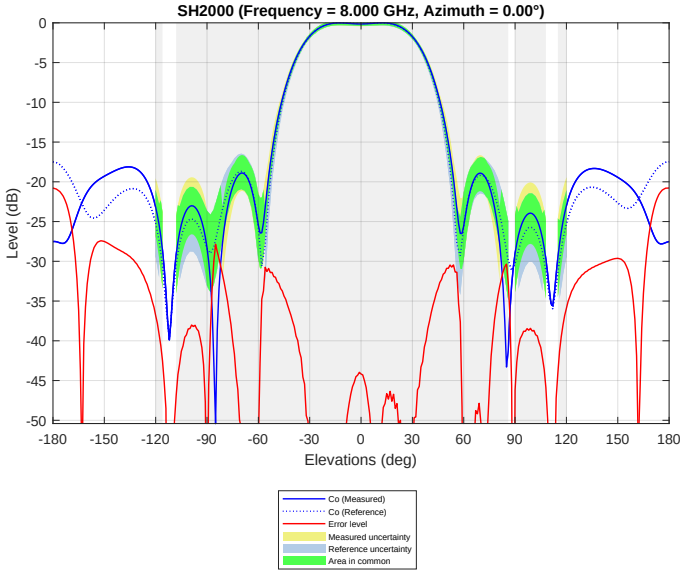


Figure 5.99: Frequency = 8.000 GHz, Azimuth = 0.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 8.000 GHZ, AZIMUTH = 45.00°

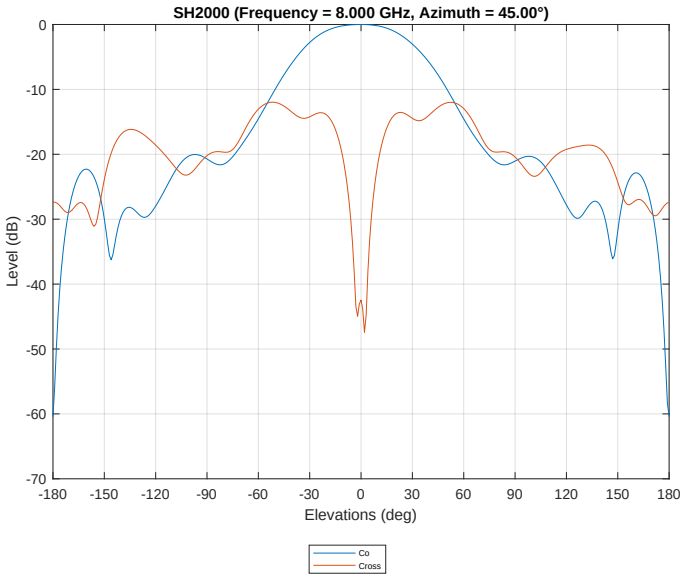


Figure 5.100: Frequency = 8.000 GHz, Azimuth = 45.00° (co + cross)

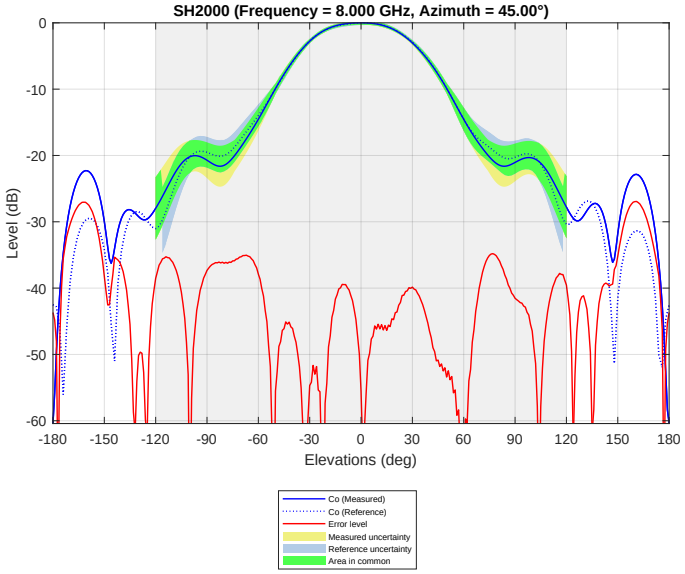


Figure 5.101: Frequency = 8.000 GHz, Azimuth = 45.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 8.000 GHZ, AZIMUTH = 90.00°

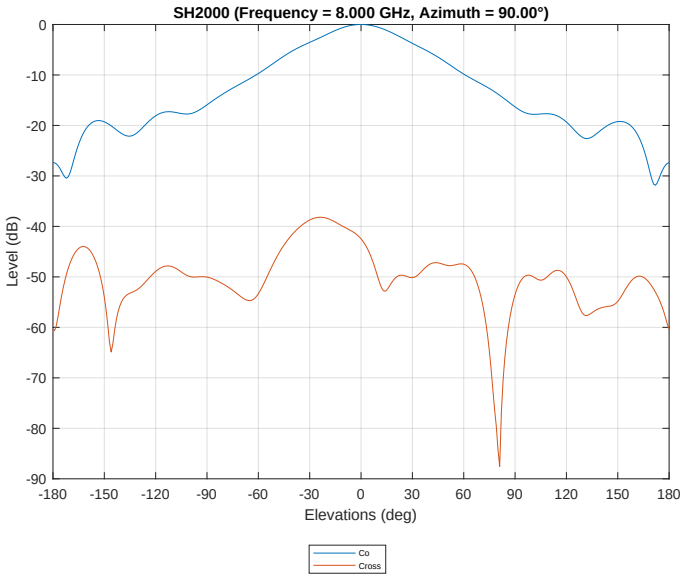


Figure 5.102: Frequency = 8.000 GHz, Azimuth = 90.00° (co + cross)

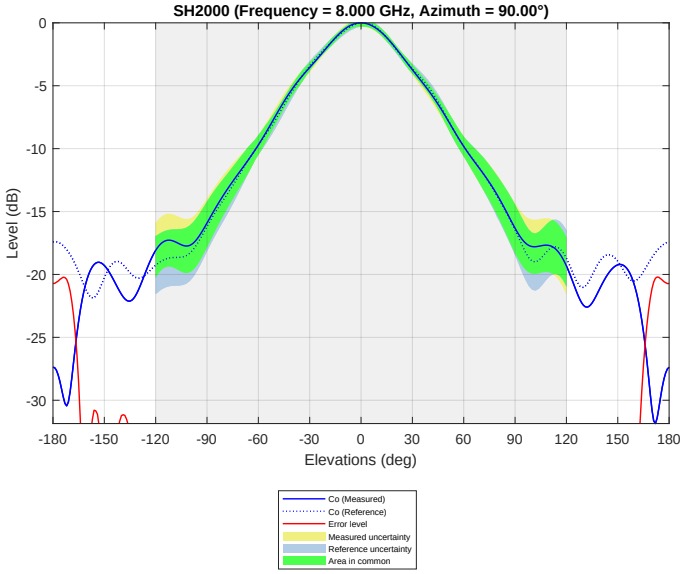


Figure 5.103: Frequency = 8.000 GHz, Azimuth = 90.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 8.000 GHZ, AZIMUTH = 135.00°

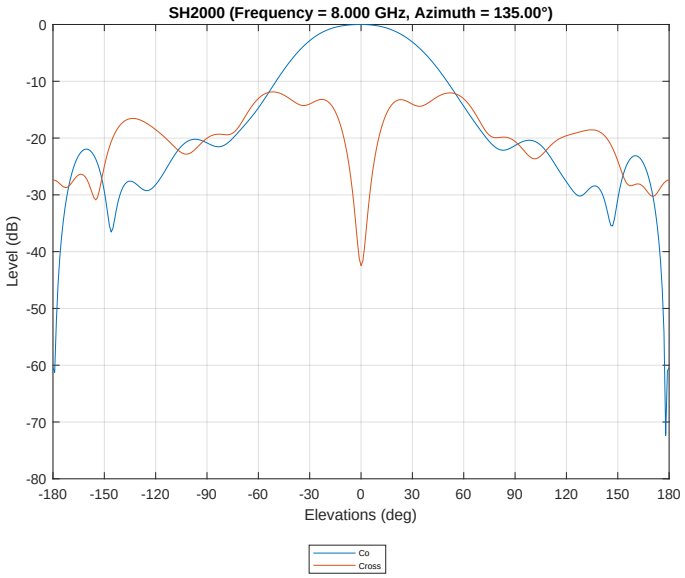


Figure 5.104: Frequency = 8.000 GHz, Azimuth = 135.00° (co + cross)

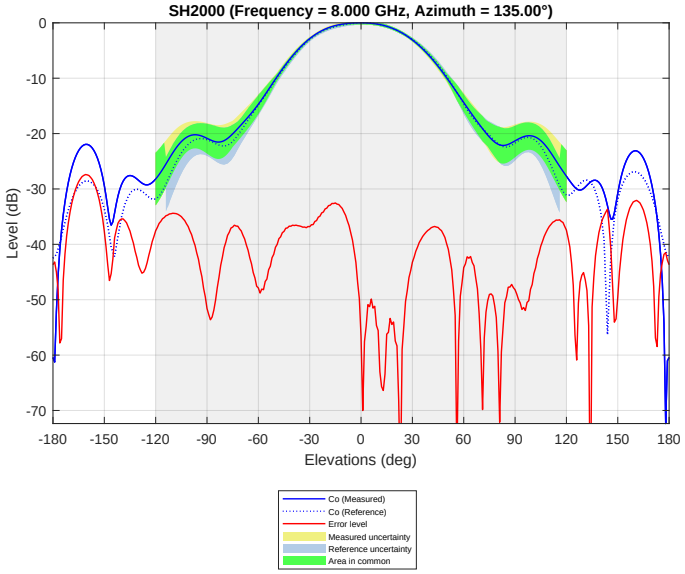


Figure 5.105: Frequency = 8.000 GHz, Azimuth = 135.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 10.000 GHZ, AZIMUTH = 0.00°

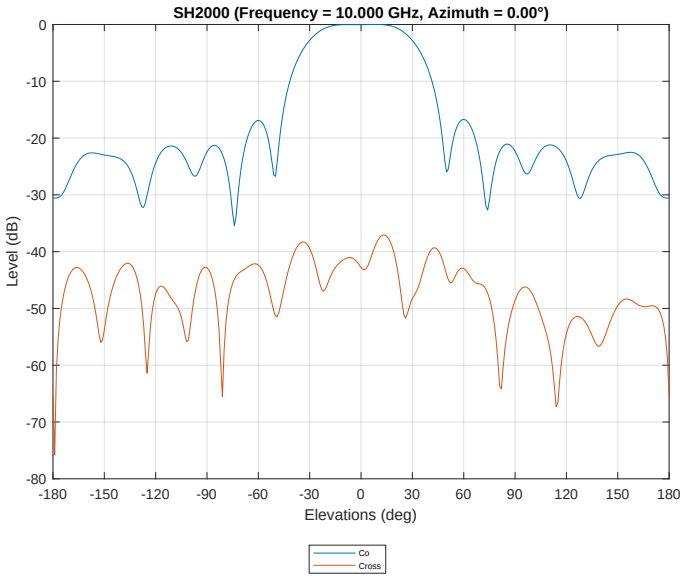


Figure 5.106: Frequency = 10.000 GHz, Azimuth = 0.00° (co + cross)

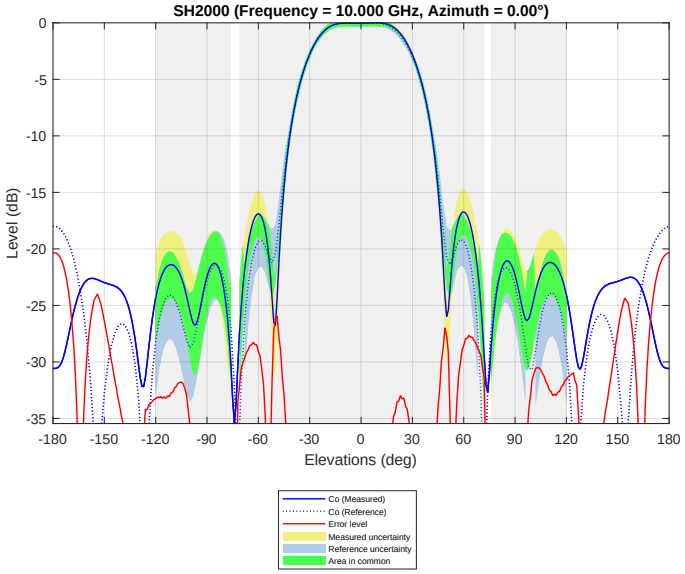


Figure 5.107: Frequency = 10.000 GHz, Azimuth = 0.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 10.000 GHZ, AZIMUTH = 45.00°

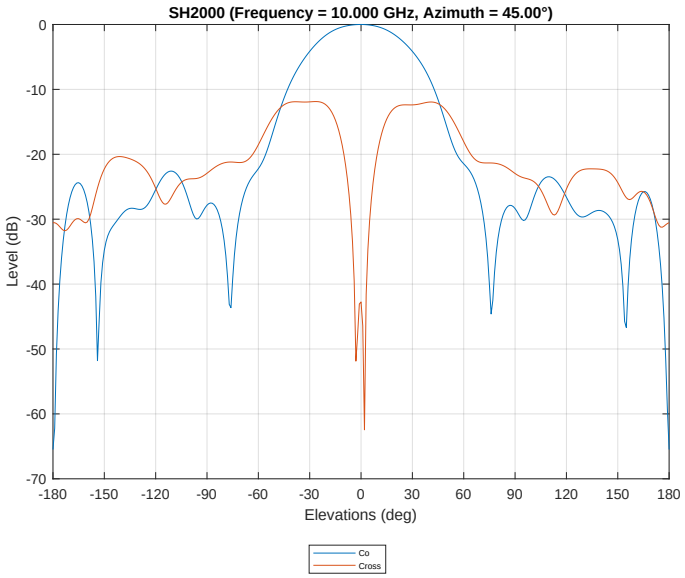


Figure 5.108: Frequency = 10.000 GHz, Azimuth = 45.00° (co + cross)

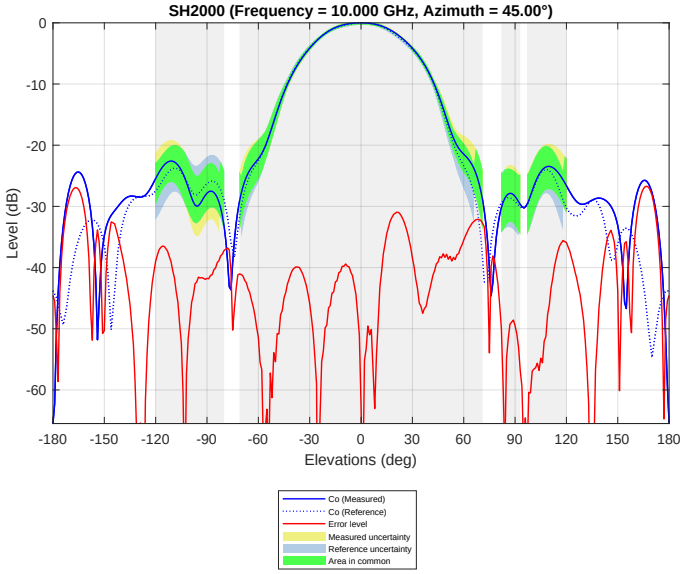


Figure 5.109: Frequency = 10.000 GHz, Azimuth = 45.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 10.000 GHZ, AZIMUTH = 90.00°

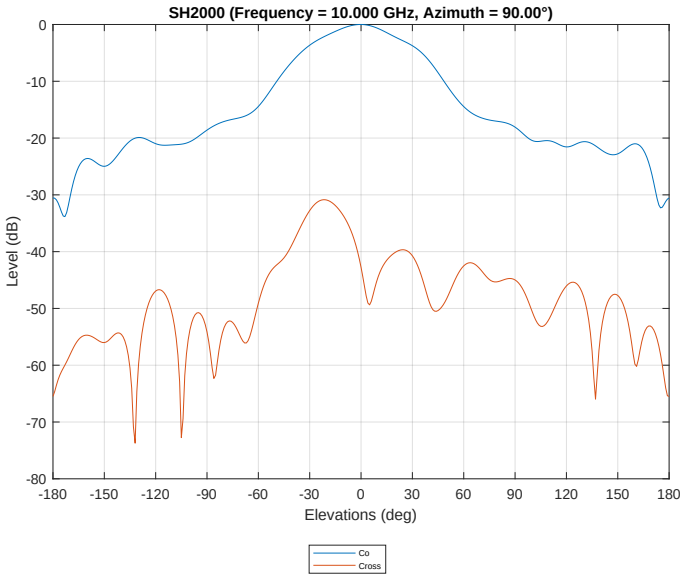


Figure 5.110: Frequency = 10.000 GHz, Azimuth = 90.00° (co + cross)

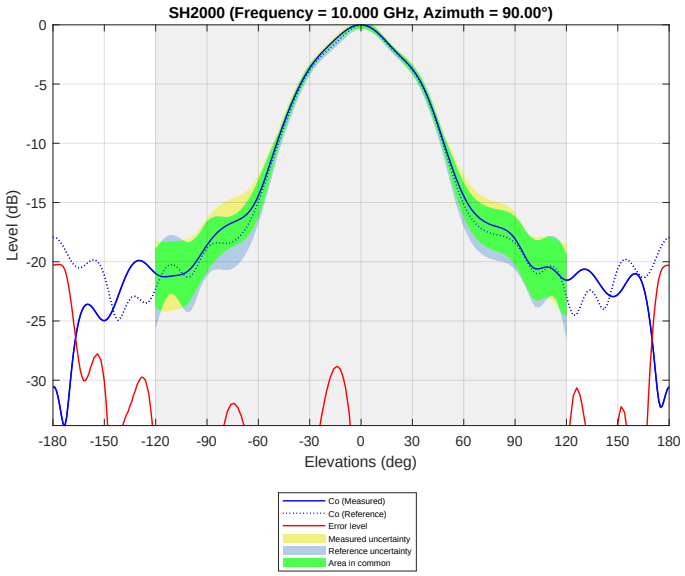


Figure 5.111: Frequency = 10.000 GHz, Azimuth = 90.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 10.000 GHZ, AZIMUTH = 135.00°

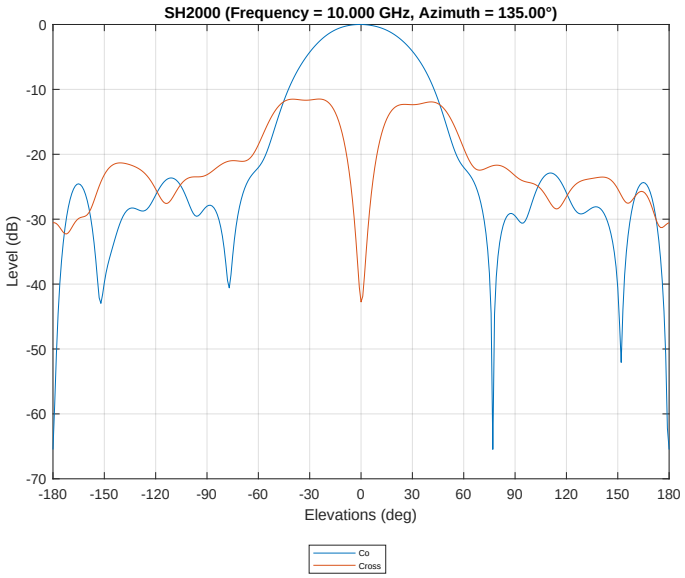


Figure 5.112: Frequency = 10.000 GHz, Azimuth = 135.00° (co + cross)

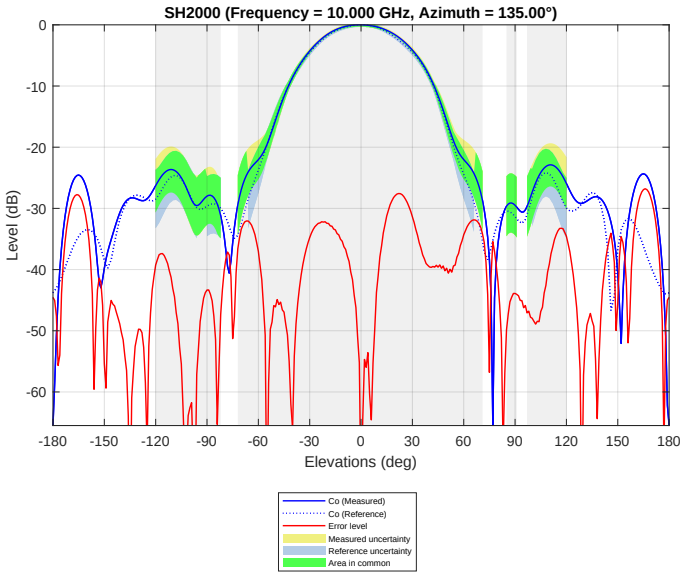


Figure 5.113: Frequency = 10.000 GHz, Azimuth = 135.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 10.000 GHZ, AZIMUTH = 0.00°

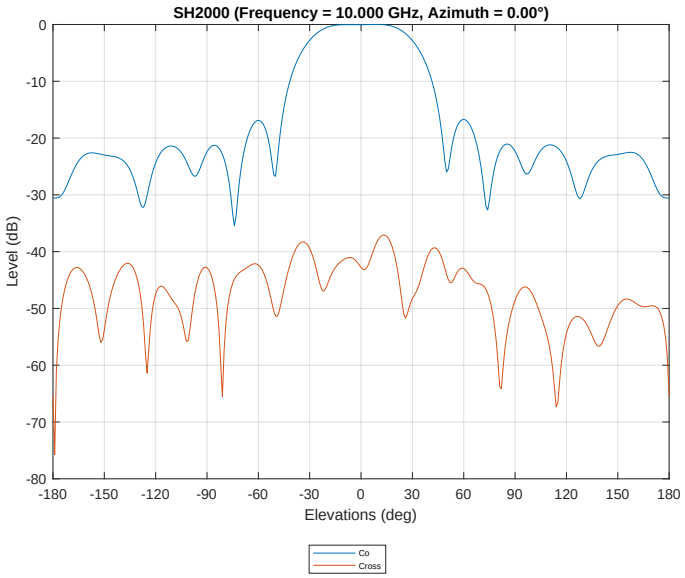


Figure 5.114: Frequency = 10.000 GHz, Azimuth = 0.00° (co + cross)

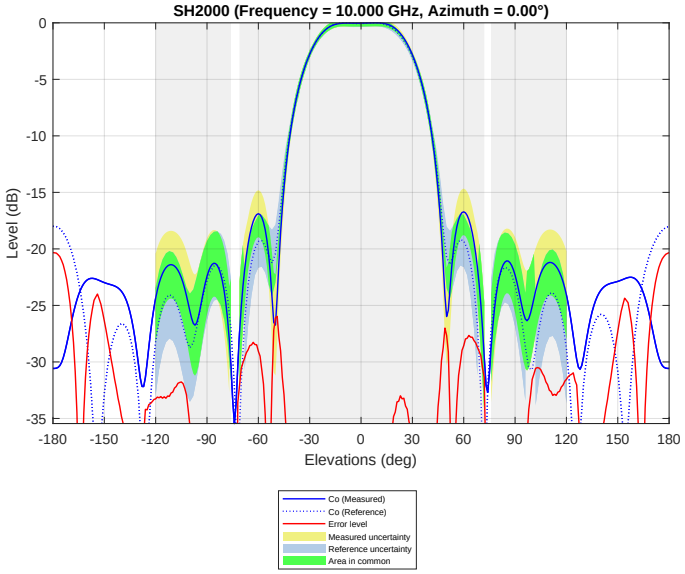


Figure 5.115: Frequency = 10.000 GHz, Azimuth = 0.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 10.000 GHZ, AZIMUTH = 45.00°

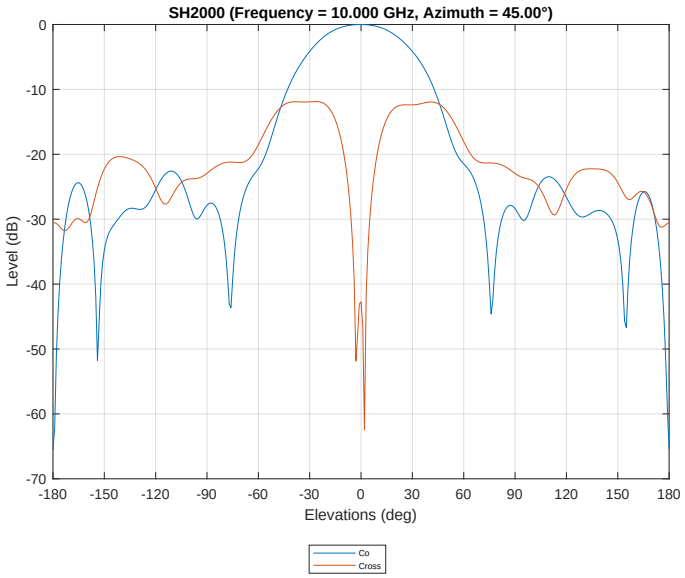


Figure 5.116: Frequency = 10.000 GHz, Azimuth = 45.00° (co + cross)

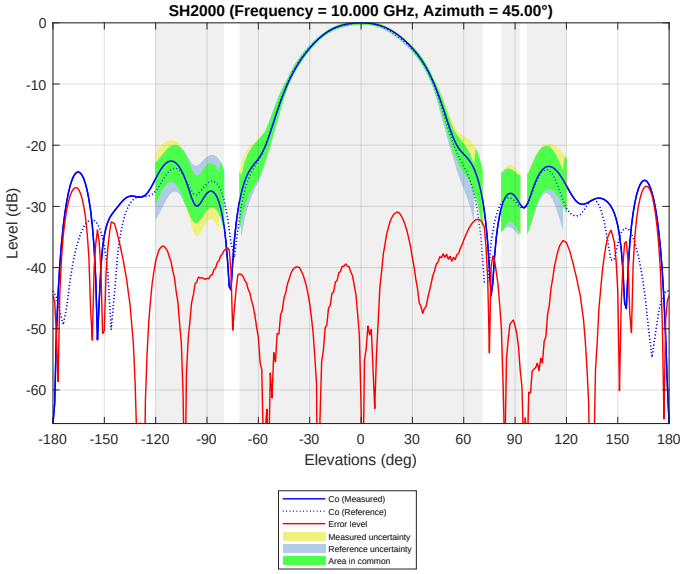


Figure 5.117: Frequency = 10.000 GHz, Azimuth = 45.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 10.000 GHZ, AZIMUTH = 90.00°

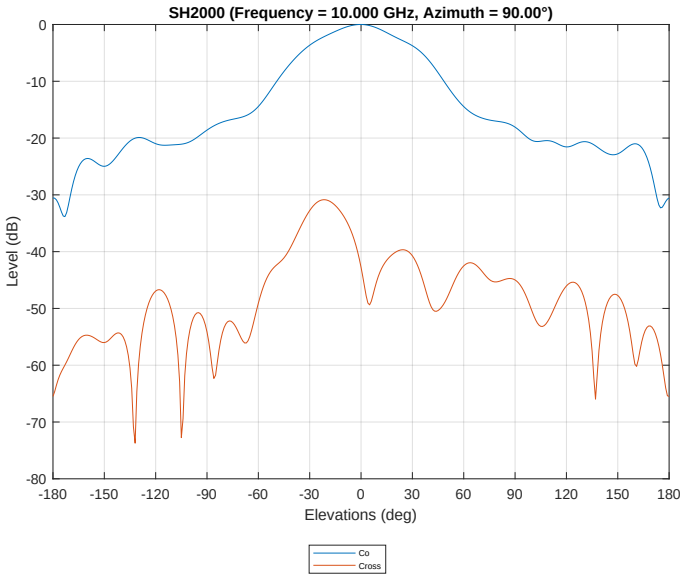


Figure 5.118: Frequency = 10.000 GHz, Azimuth = 90.00° (co + cross)

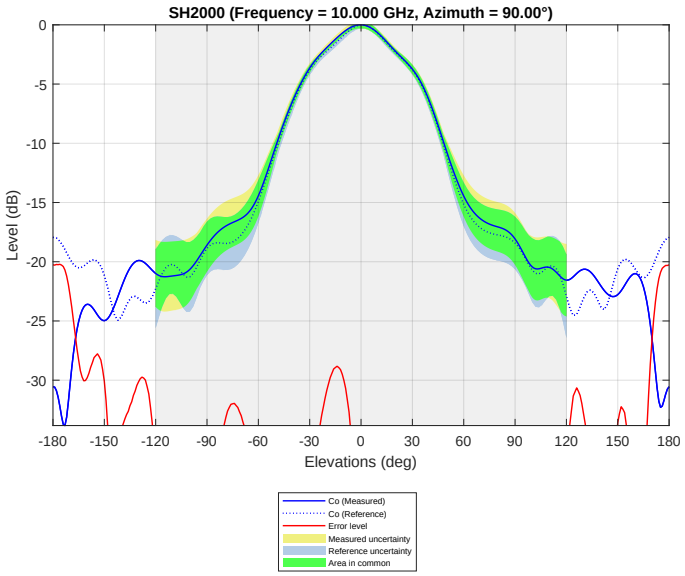


Figure 5.119: Frequency = 10.000 GHz, Azimuth = 90.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 10.000 GHZ, AZIMUTH = 135.00°

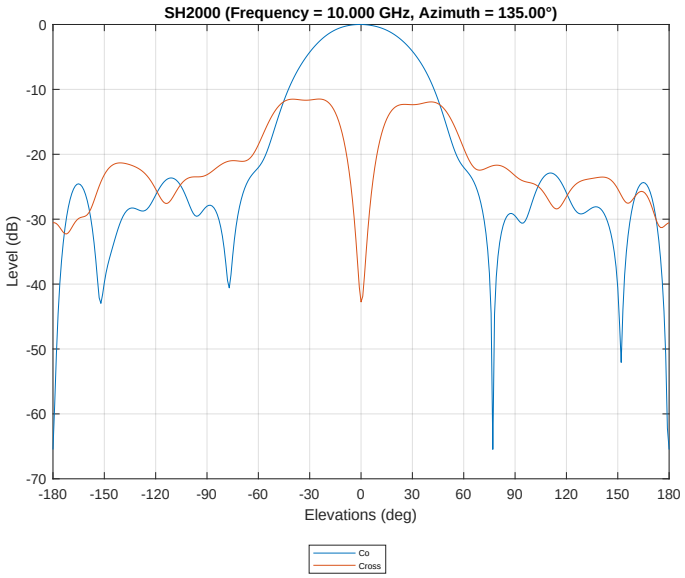


Figure 5.120: Frequency = 10.000 GHz, Azimuth = 135.00° (co + cross)

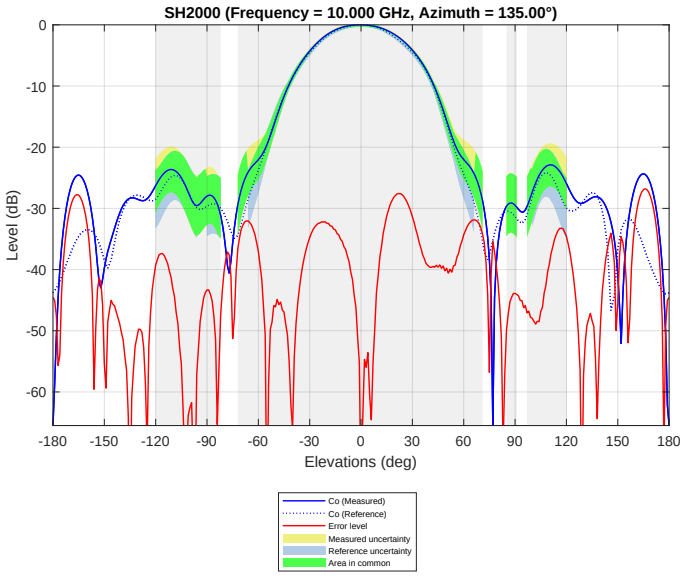


Figure 5.121: Frequency = 10.000 GHz, Azimuth = 135.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 10.000 GHZ, AZIMUTH = 0.00°

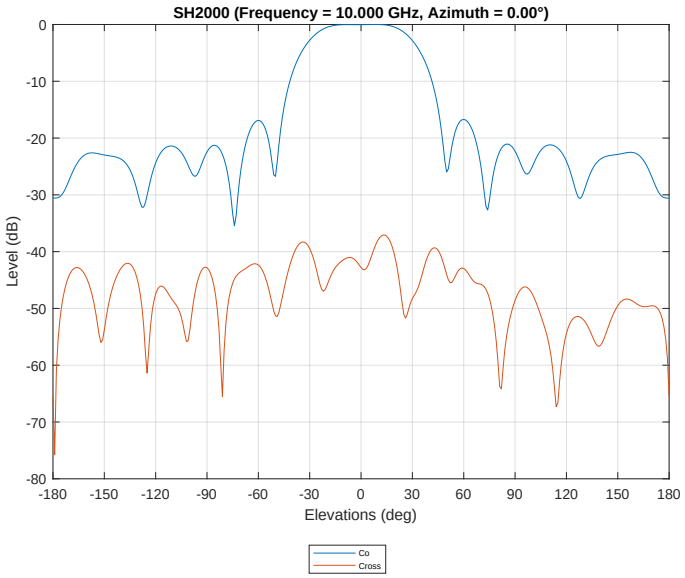


Figure 5.122: Frequency = 10.000 GHz, Azimuth = 0.00° (co + cross)

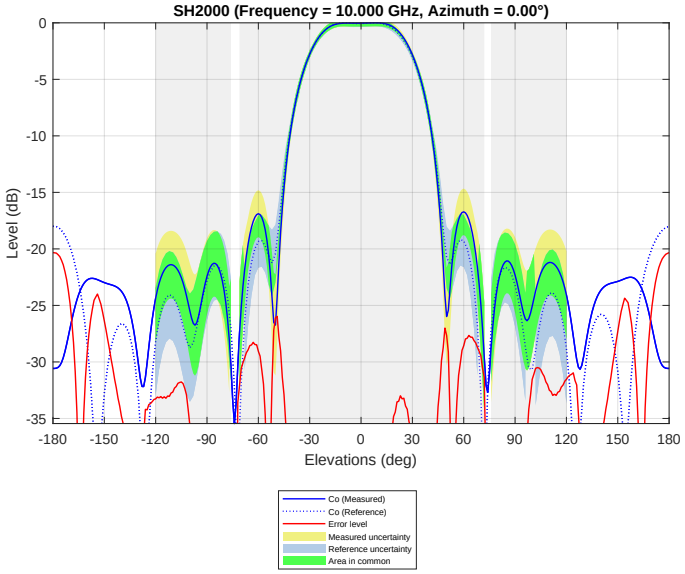


Figure 5.123: Frequency = 10.000 GHz, Azimuth = 0.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 10.000 GHZ, AZIMUTH = 45.00°

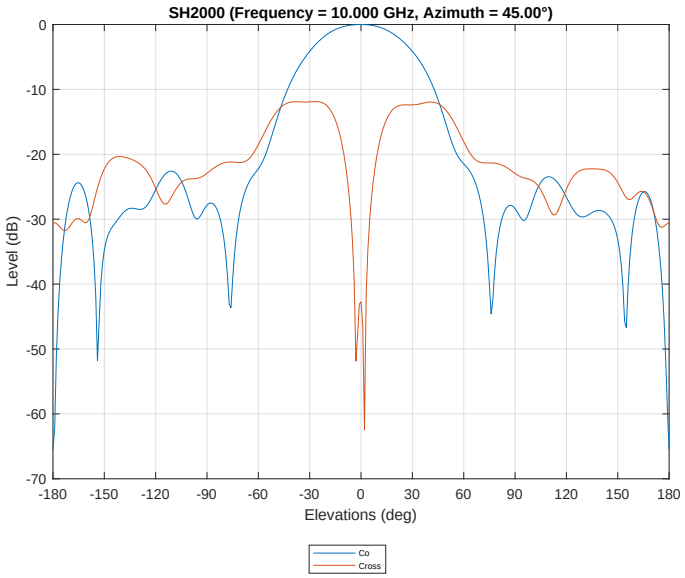


Figure 5.124: Frequency = 10.000 GHz, Azimuth = 45.00° (co + cross)

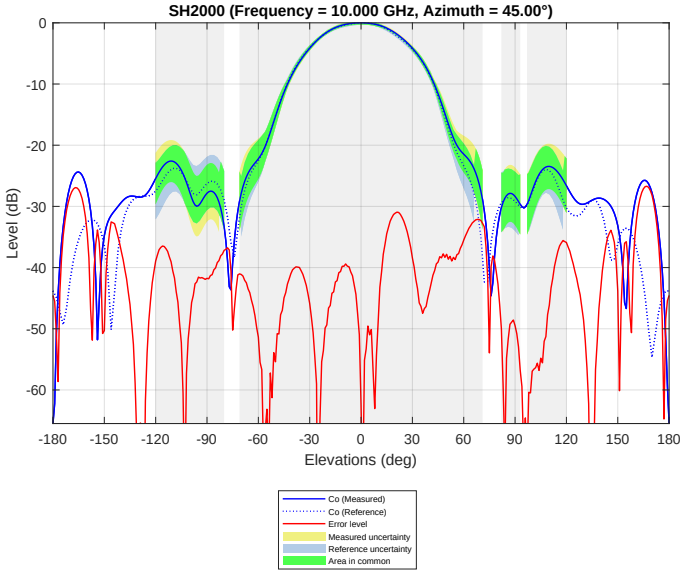


Figure 5.125: Frequency = 10.000 GHz, Azimuth = 45.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 10.000 GHZ, AZIMUTH = 90.00°

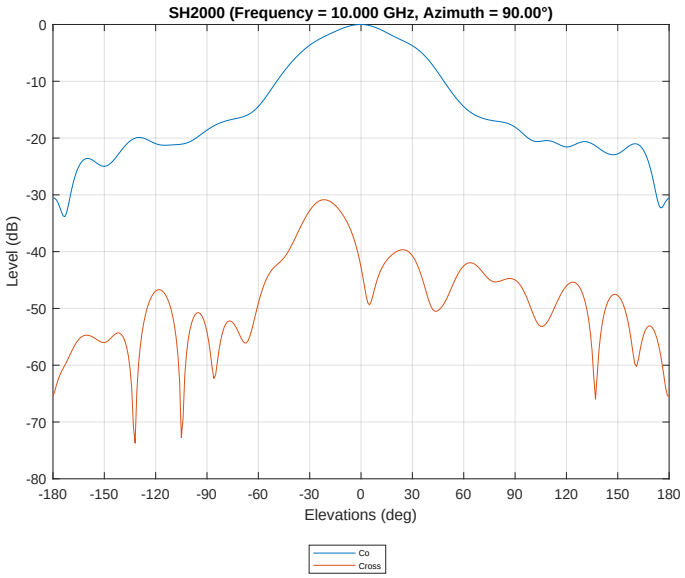


Figure 5.126: Frequency = 10.000 GHz, Azimuth = 90.00° (co + cross)

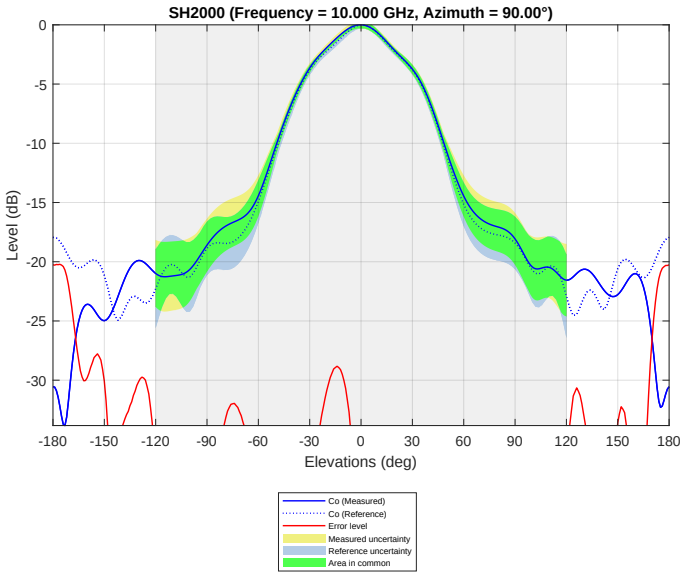


Figure 5.127: Frequency = 10.000 GHz, Azimuth = 90.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 10.000 GHZ, AZIMUTH = 135.00°

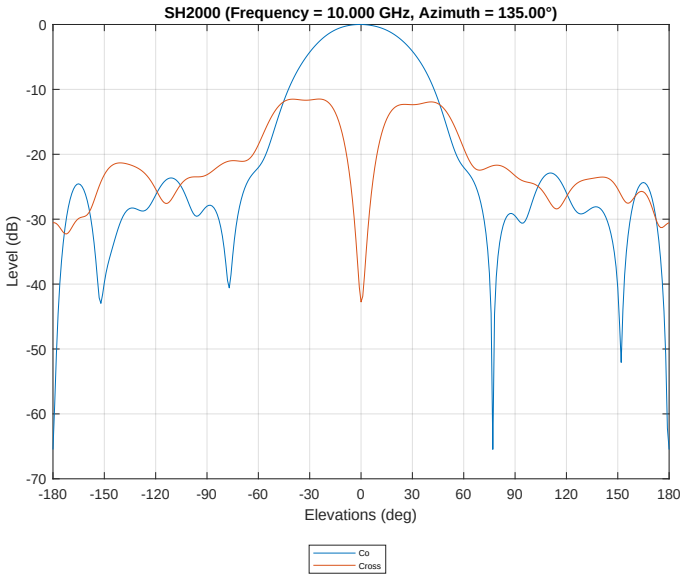


Figure 5.128: Frequency = 10.000 GHz, Azimuth = 135.00° (co + cross)

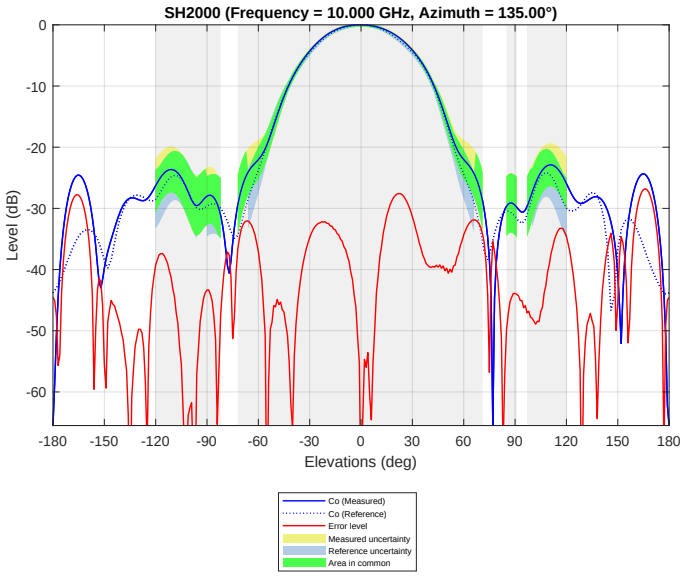


Figure 5.129: Frequency = 10.000 GHz, Azimuth = 135.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 10.000 GHZ, AZIMUTH = 0.00°

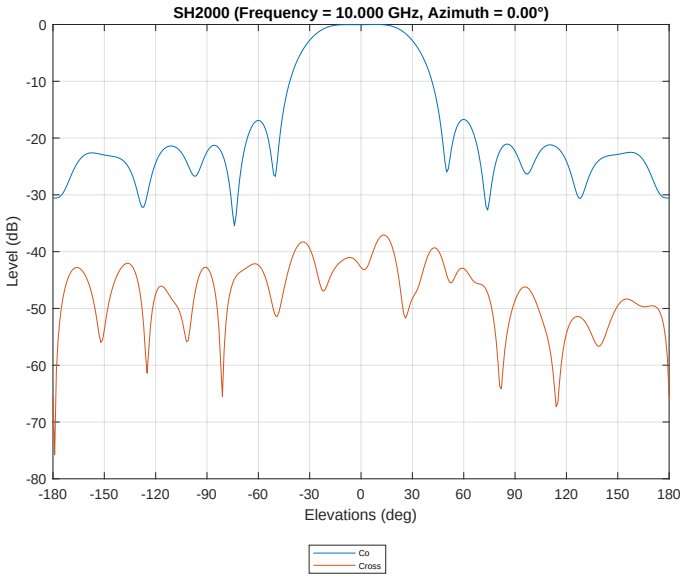


Figure 5.130: Frequency = 10.000 GHz, Azimuth = 0.00° (co + cross)

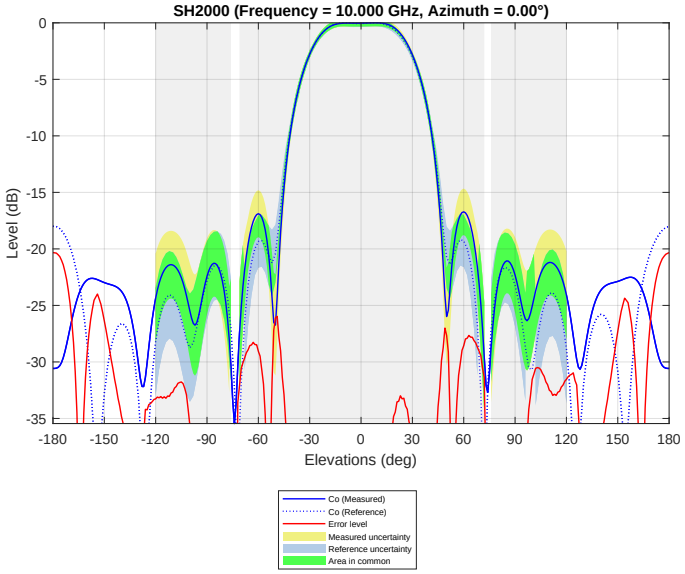


Figure 5.131: Frequency = 10.000 GHz, Azimuth = 0.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 10.000 GHZ, AZIMUTH = 45.00°

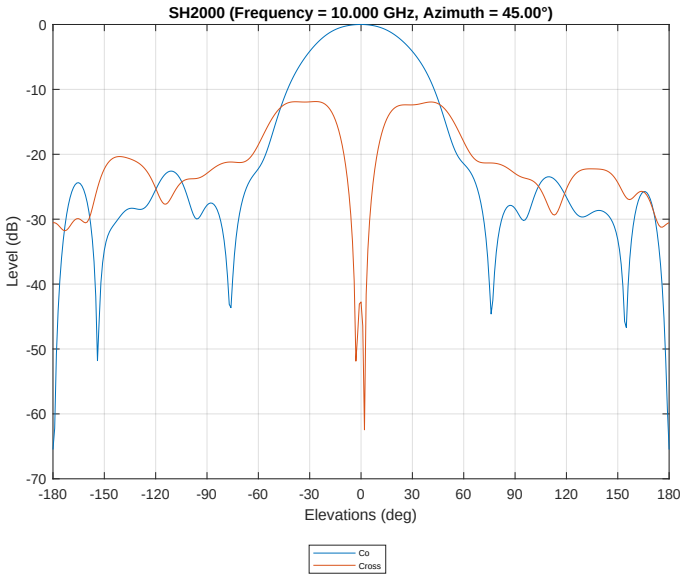


Figure 5.132: Frequency = 10.000 GHz, Azimuth = 45.00° (co + cross)

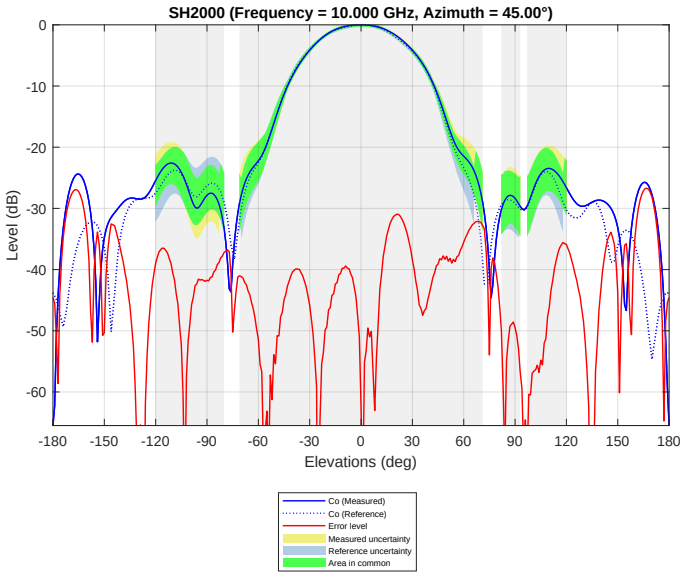


Figure 5.133: Frequency = 10.000 GHz, Azimuth = 45.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 10.000 GHZ, AZIMUTH = 90.00°

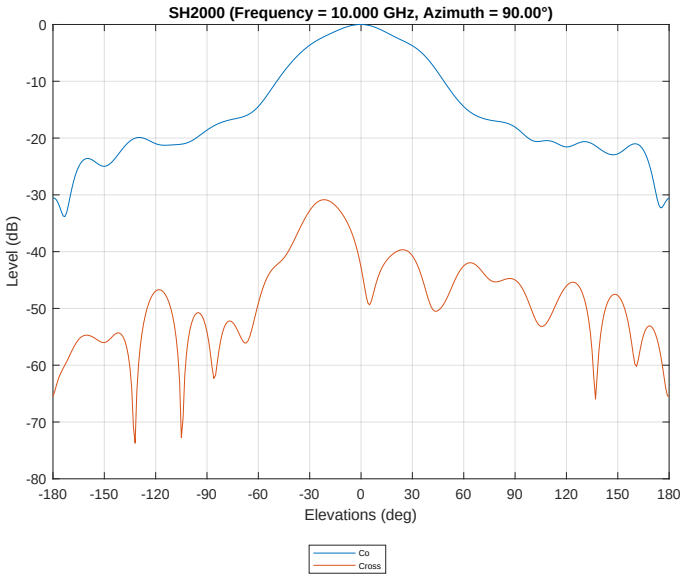


Figure 5.134: Frequency = 10.000 GHz, Azimuth = 90.00° (co + cross)

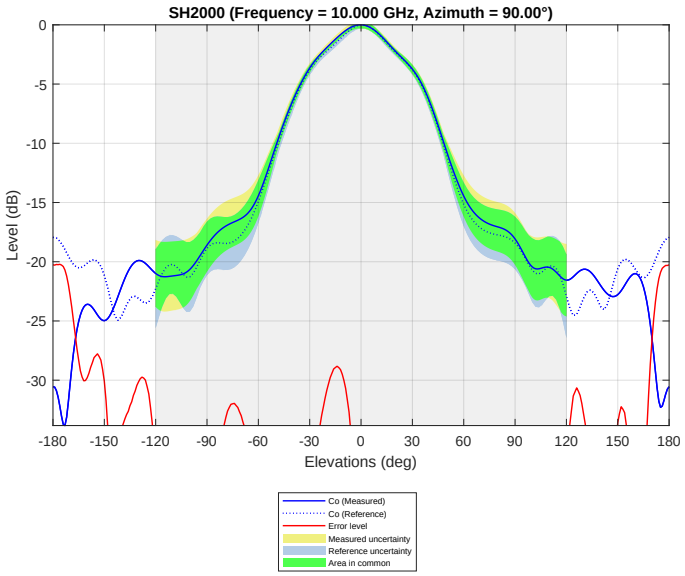


Figure 5.135: Frequency = 10.000 GHz, Azimuth = 90.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 10.000 GHZ, AZIMUTH = 135.00°

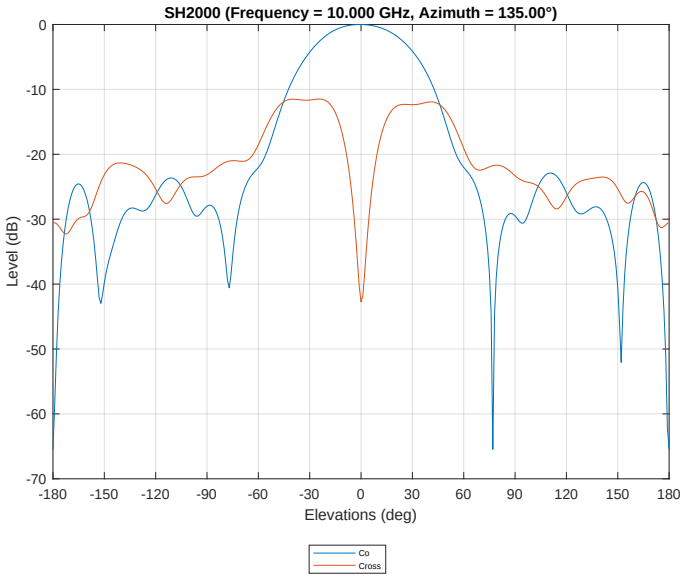


Figure 5.136: Frequency = 10.000 GHz, Azimuth = 135.00° (co + cross)

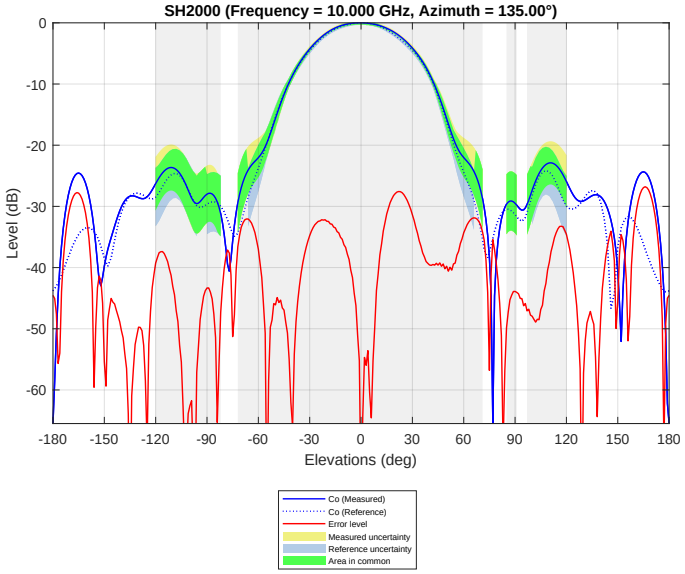


Figure 5.137: Frequency = 10.000 GHz, Azimuth = 135.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 10.000 GHZ, AZIMUTH = 0.00°

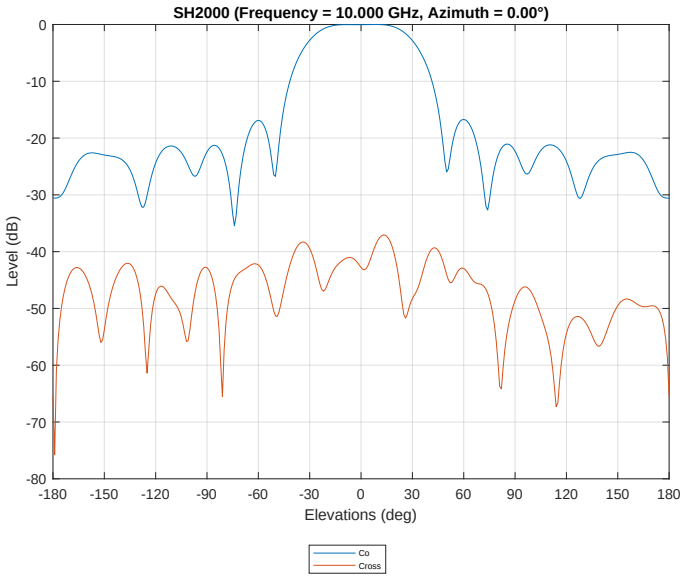


Figure 5.138: Frequency = 10.000 GHz, Azimuth = 0.00° (co + cross)

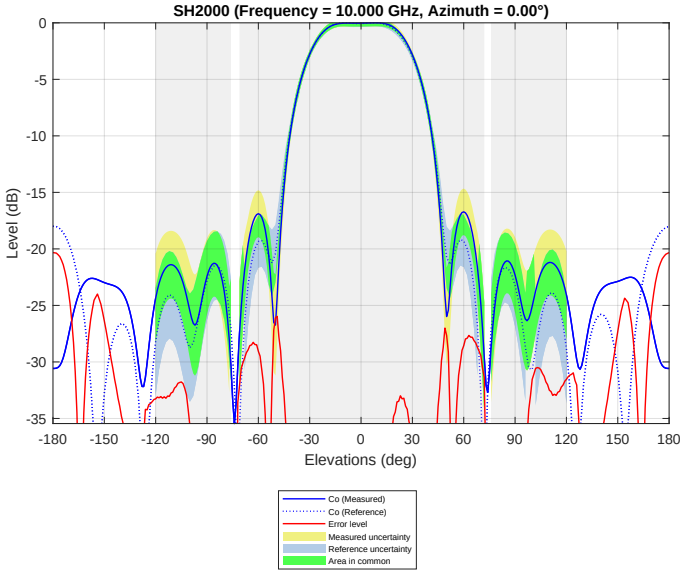


Figure 5.139: Frequency = 10.000 GHz, Azimuth = 0.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 10.000 GHZ, AZIMUTH = 45.00°

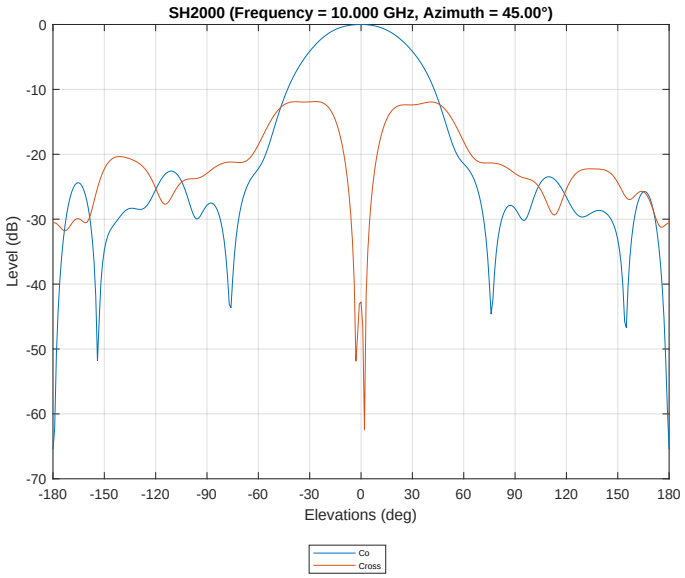


Figure 5.140: Frequency = 10.000 GHz, Azimuth = 45.00° (co + cross)

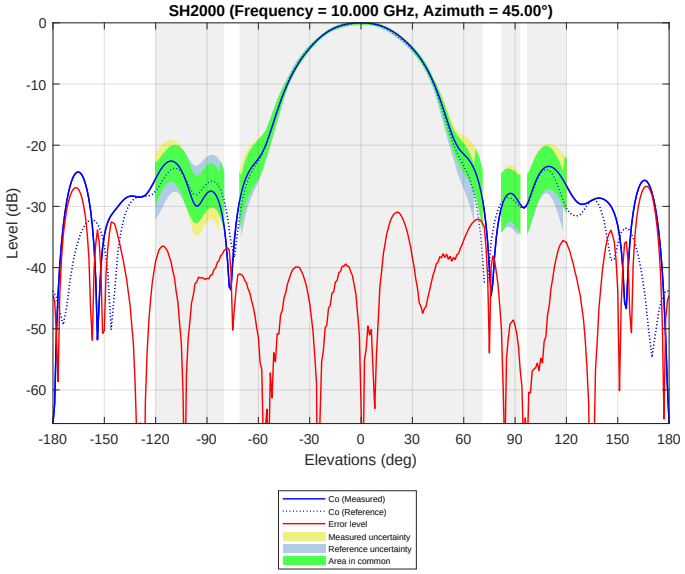


Figure 5.141: Frequency = 10.000 GHz, Azimuth = 45.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 10.000 GHZ, AZIMUTH = 90.00°

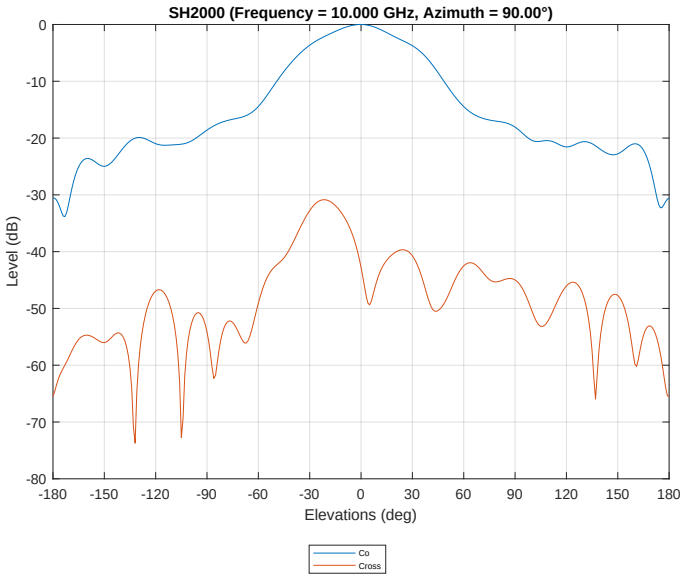


Figure 5.142: Frequency = 10.000 GHz, Azimuth = 90.00° (co + cross)

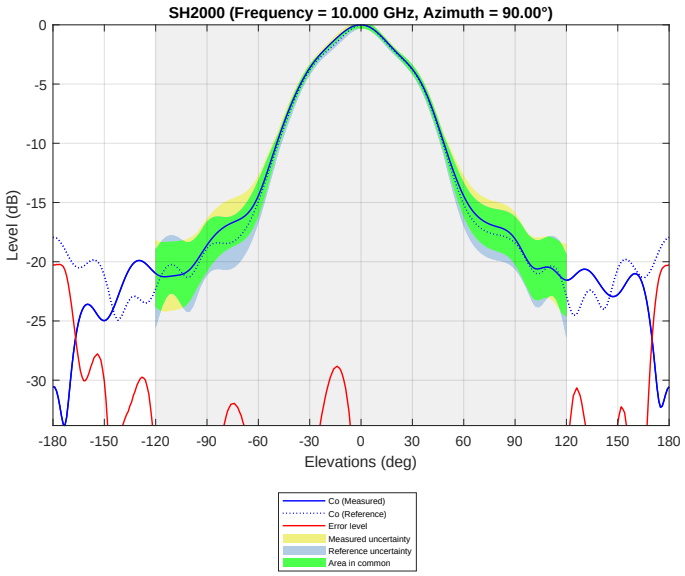


Figure 5.143: Frequency = 10.000 GHz, Azimuth = 90.00° (co + mask)

==> Ok, all points inside the masks

FREQUENCY = 10.000 GHZ, AZIMUTH = 135.00°

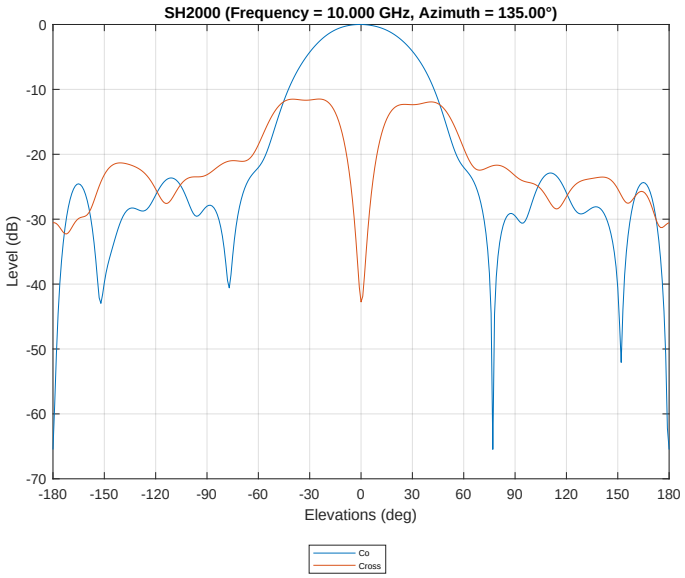


Figure 5.144: Frequency = 10.000 GHz, Azimuth = 135.00° (co + cross)

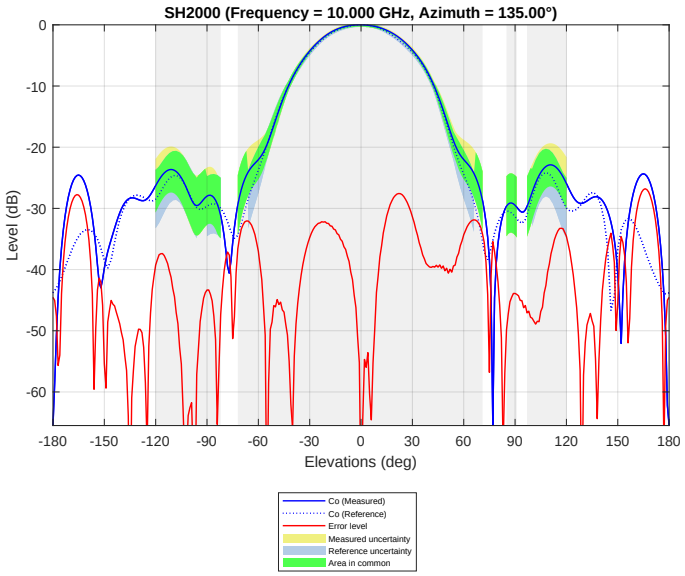


Figure 5.145: Frequency = 10.000 GHz, Azimuth = 135.00° (co + mask)

==> Ok, all points inside the masks

5.4 SD1800 - 99

5.4.1 General information

Measurement file	SD1800.mat
Reference file	SD1800-prod.mat
Measured antenna type	SD1800
Measured antenna serial number	99
Measurement device type	STARLAB_2
Measurement device serial number	ATL2427S
Measurement mode	Standard180
Mast type	Styrofoam
Measurement array	LF
Measurement date	2022-10-19

5.4.2 Peak directivity

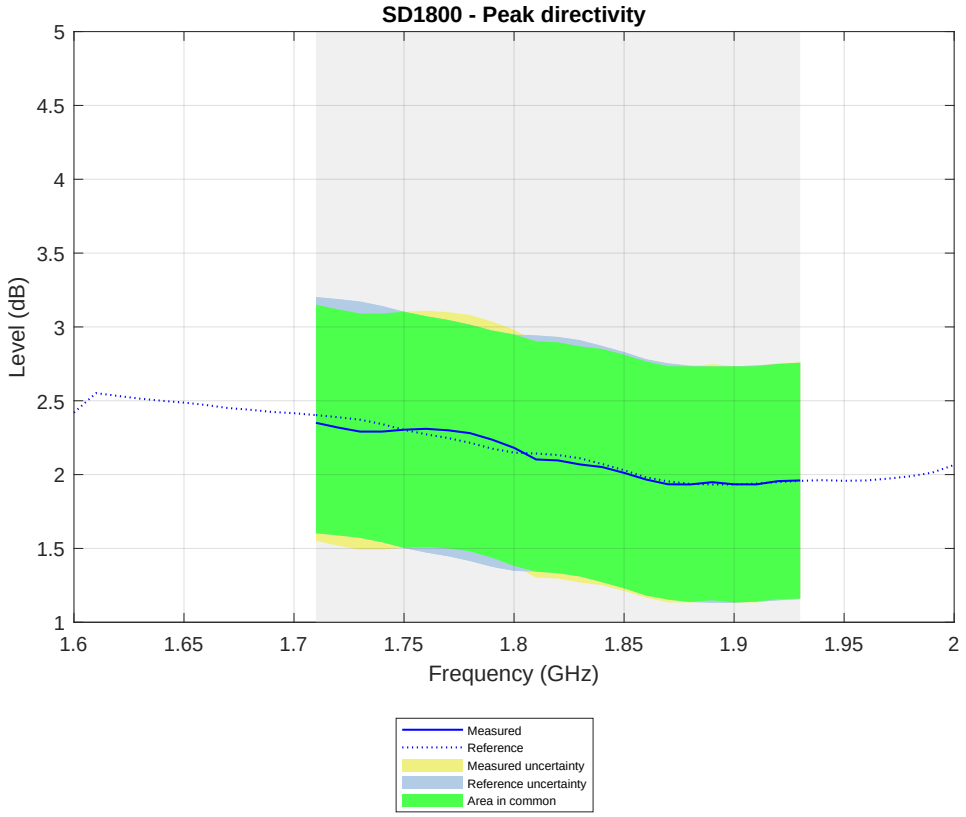


Figure 5.146: Peak directivity

==> Ok, all points inside the masks

5.4.3 Peak gain

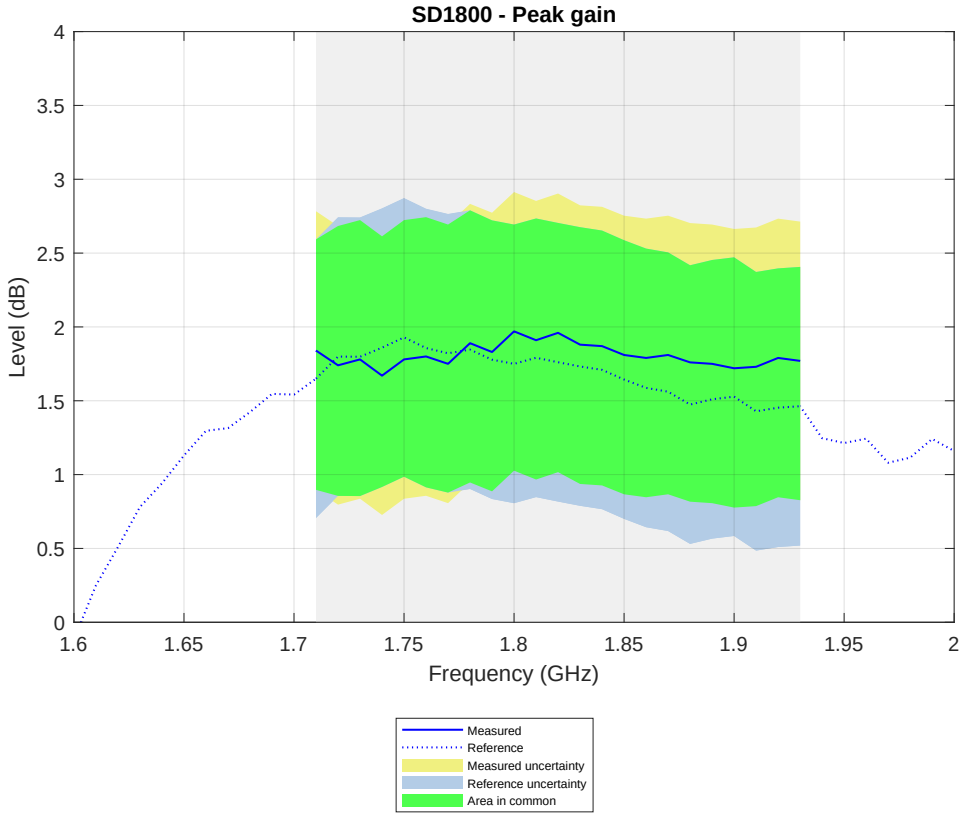


Figure 5.147: Peak gain

==> Ok, all points inside the masks

5.4.4 Efficiency

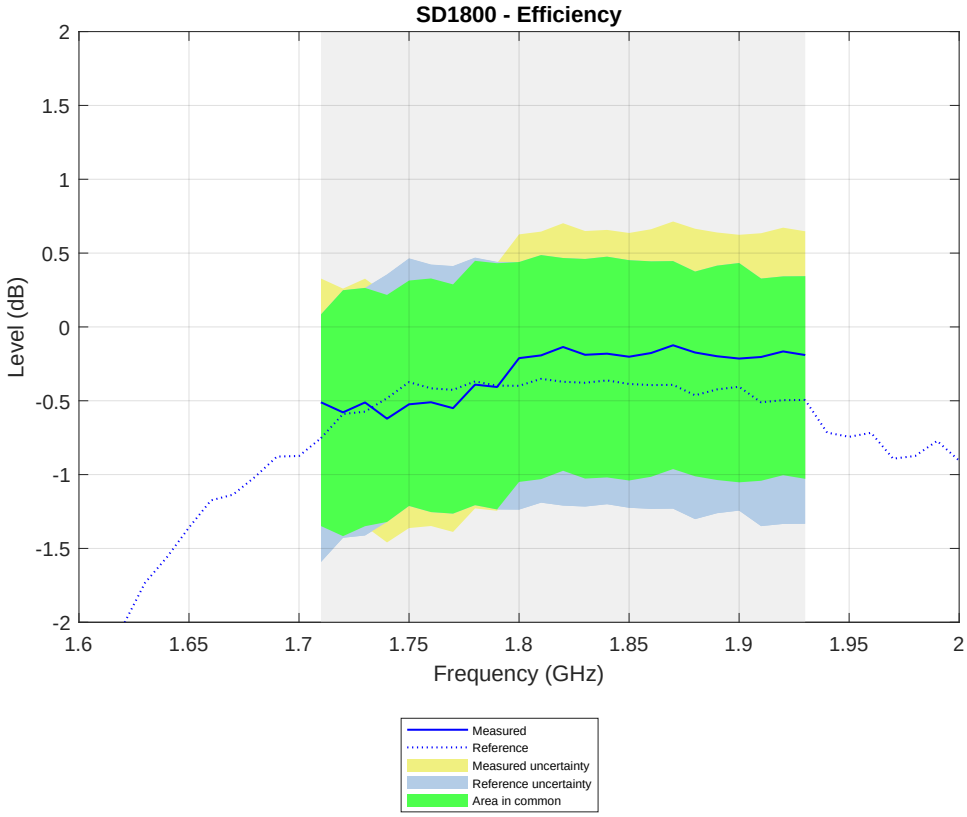


Figure 5.148: Efficiency

==> Ok, all points inside the masks

5.4.5 Elevation cuts

FREQUENCY = 1.800 GHZ, AZIMUTH = 0.00°

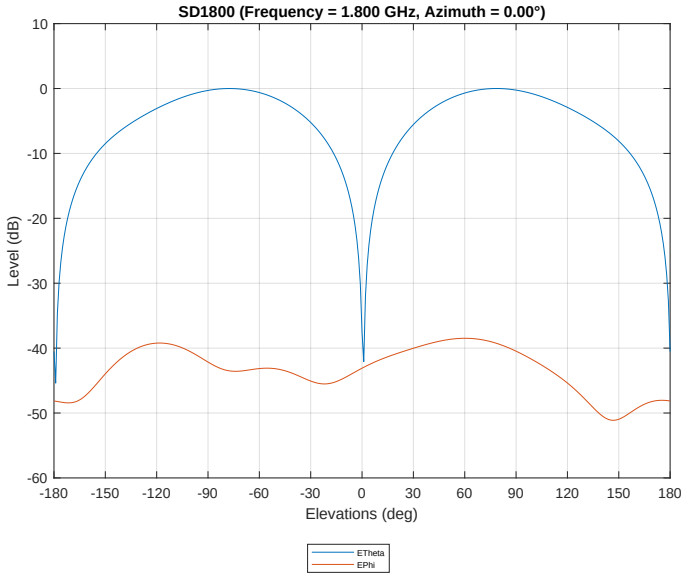


Figure 5.149: Frequency = 1.800 GHz, Azimuth = 0.00° (co + cross)

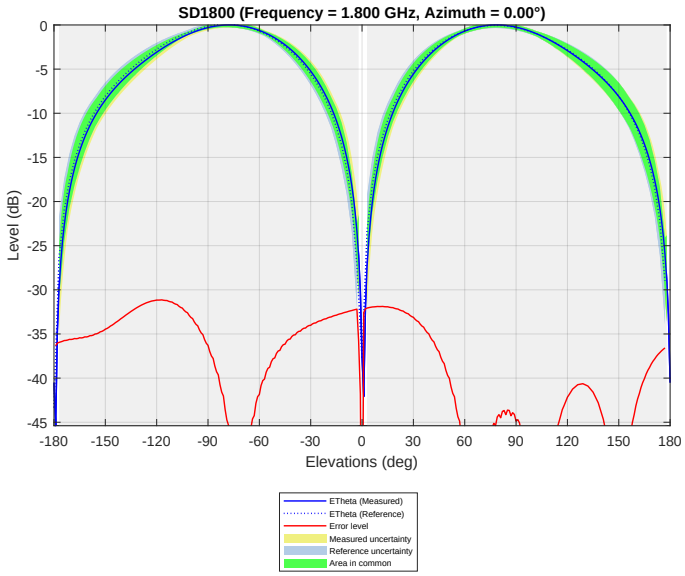


Figure 5.150: Frequency = 1.800 GHz, Azimuth = 0.00° (co + mask)

==> Ok, all points inside the masks

5.4.6 Azimuth cuts

FREQUENCY = 1.800 GHZ, ELEVATION = 90.00°

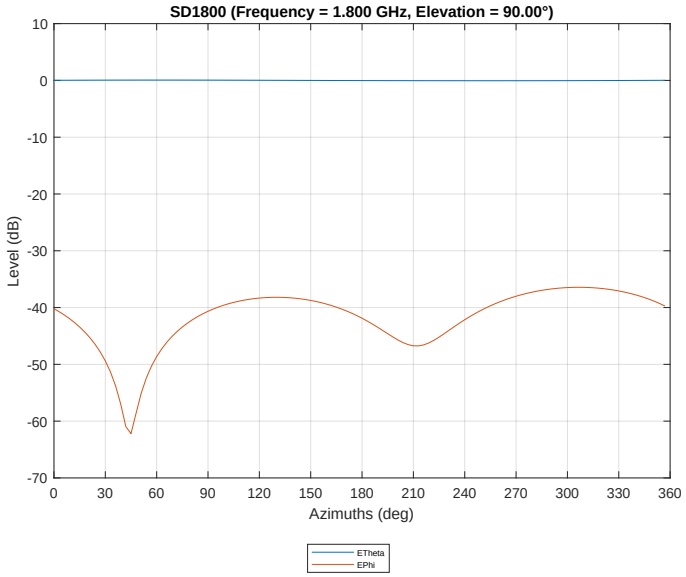


Figure 5.151: Frequency = 1.800 GHz, Elevation = 90.00° (co + cross)

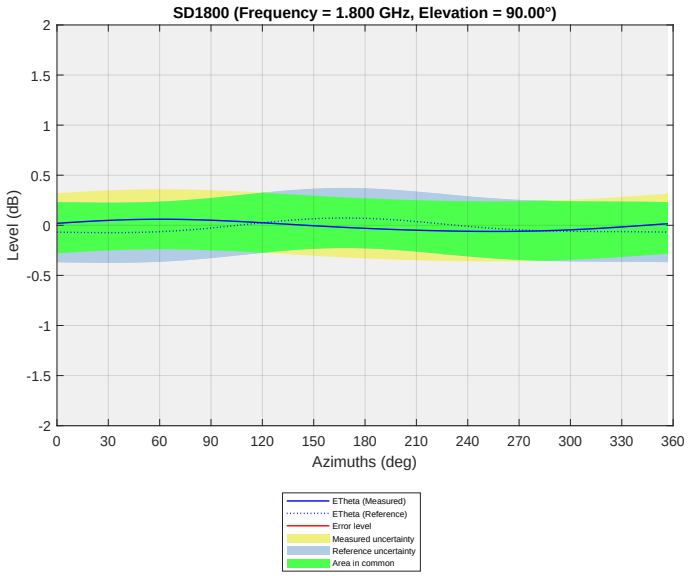


Figure 5.152: Frequency = 1.800 GHz, Elevation = 90.00° (co + mask)

==> Ok, all points inside the masks

5.5 SD2450 - 92

5.5.1 General information

Measurement file	SD2450.mat
Reference file	SD2450-prod.mat
Measured antenna type	SD2450
Measured antenna serial number	92
Measurement device type	STARLAB_2
Measurement device serial number	ATL2427S
Measurement mode	Standard180
Mast type	Styrofoam
Measurement array	LF
Measurement date	2022-10-19

5.5.2 Peak directivity

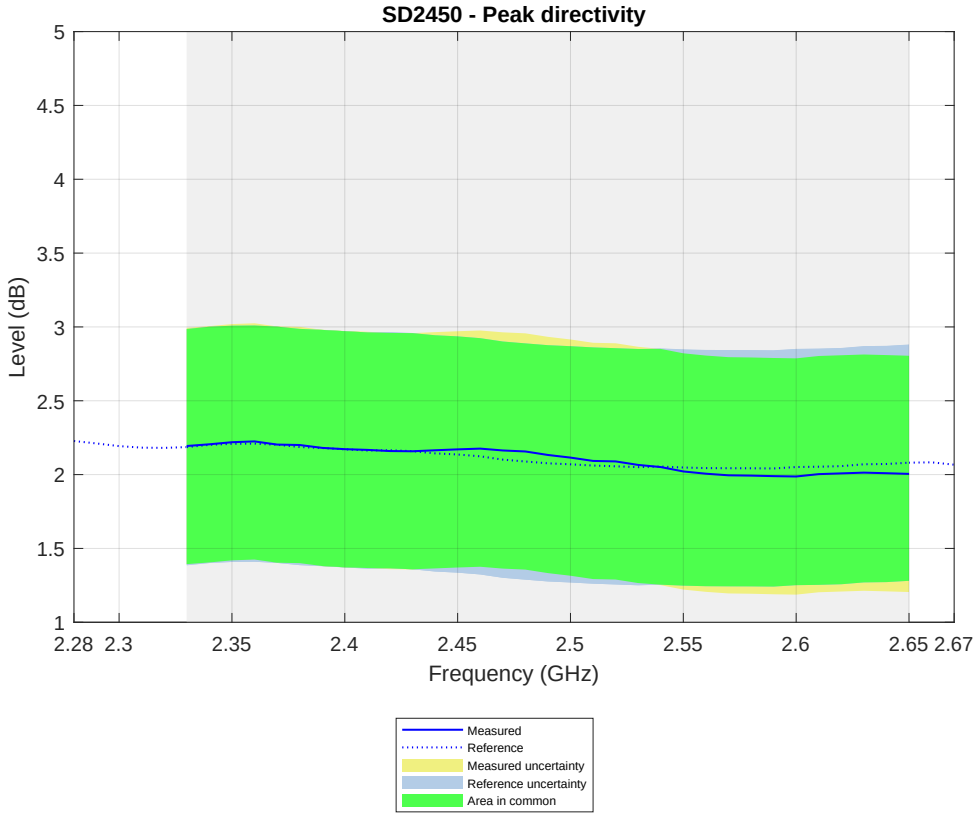


Figure 5.153: Peak directivity

==> Ok, all points inside the masks

5.5.3 Peak gain

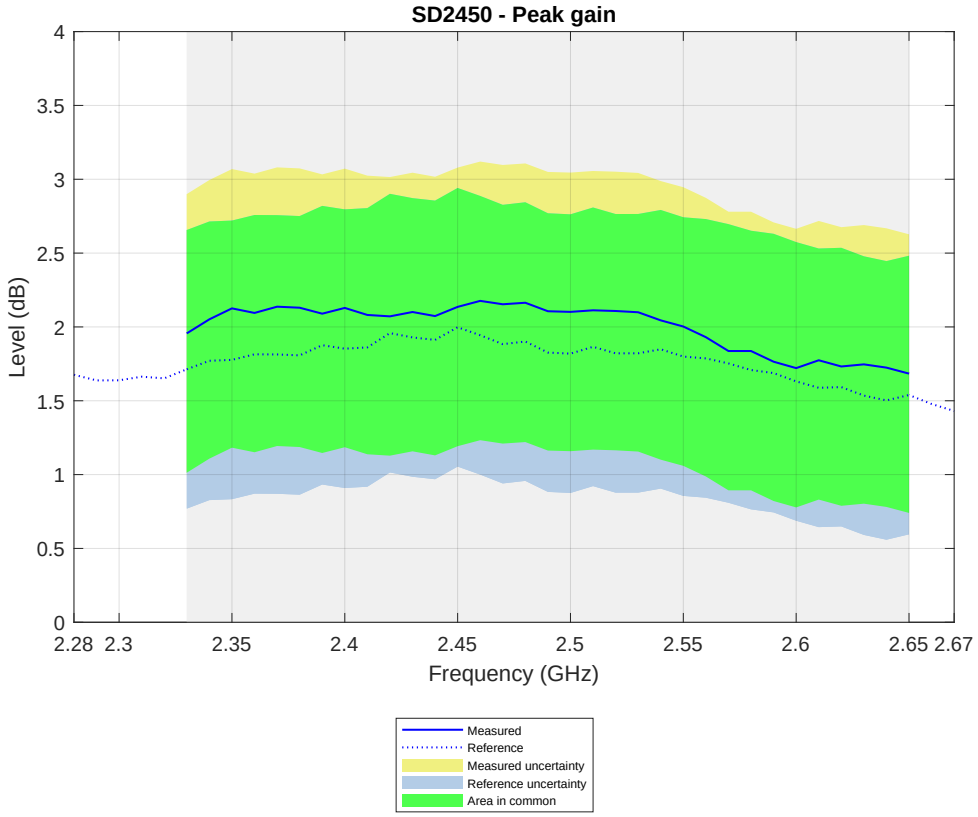


Figure 5.154: Peak gain

==> Ok, all points inside the masks

5.5.4 Efficiency

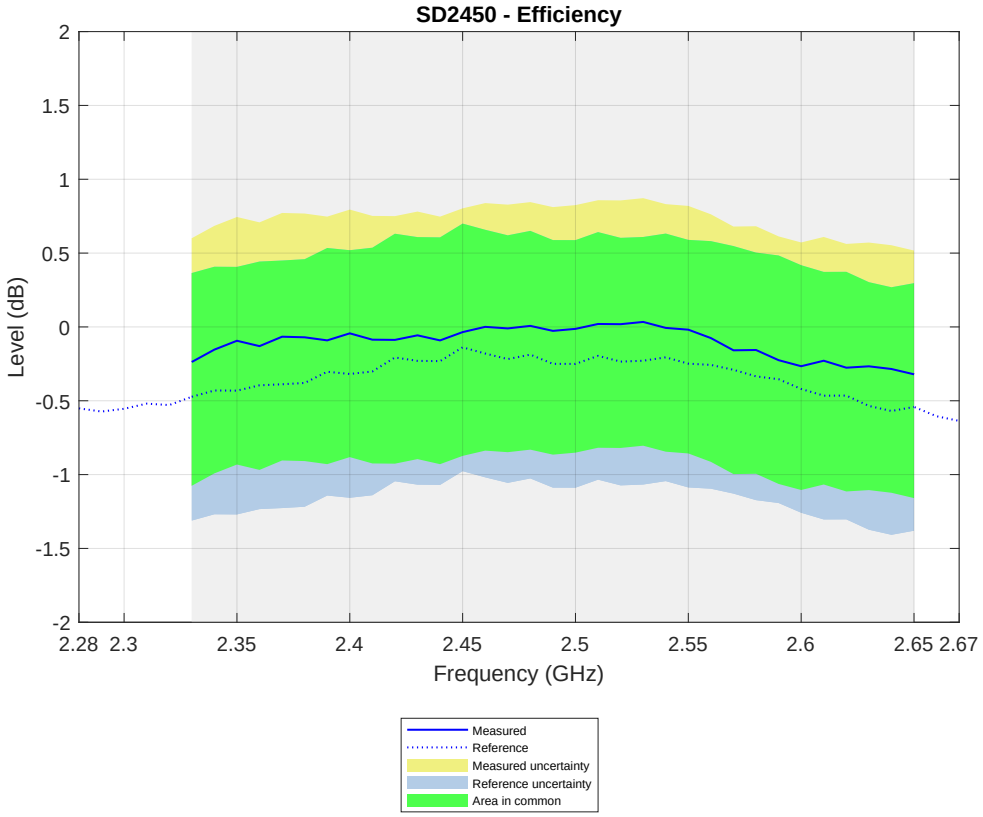


Figure 5.155: Efficiency

==> Ok, all points inside the masks

5.5.5 Elevation cuts

FREQUENCY = 2.450 GHZ, AZIMUTH = 0.00°

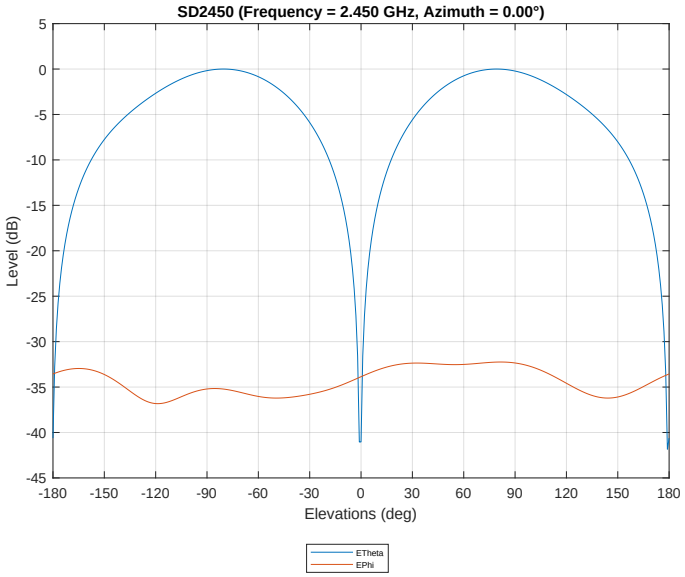


Figure 5.156: Frequency = 2.450 GHz, Azimuth = 0.00° (co + cross)

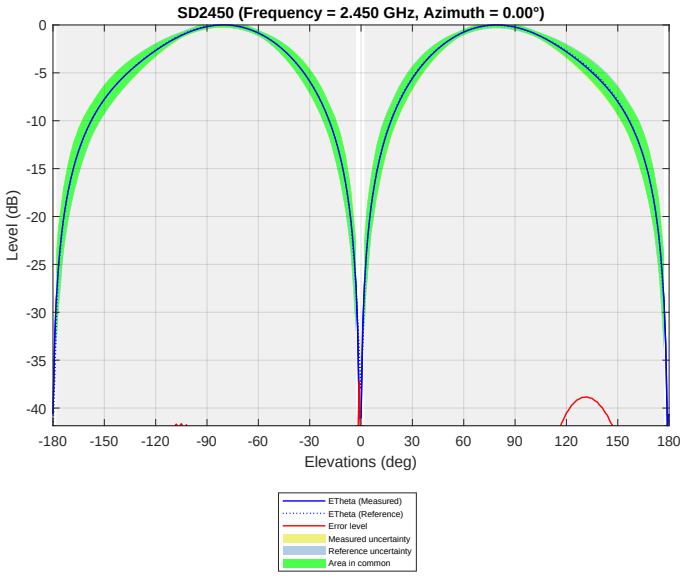


Figure 5.157: Frequency = 2.450 GHz, Azimuth = 0.00° (co + mask)

==> Ok, all points inside the masks

5.5.6 Azimuth cuts

FREQUENCY = 2.450 GHZ, ELEVATION = 90.00°

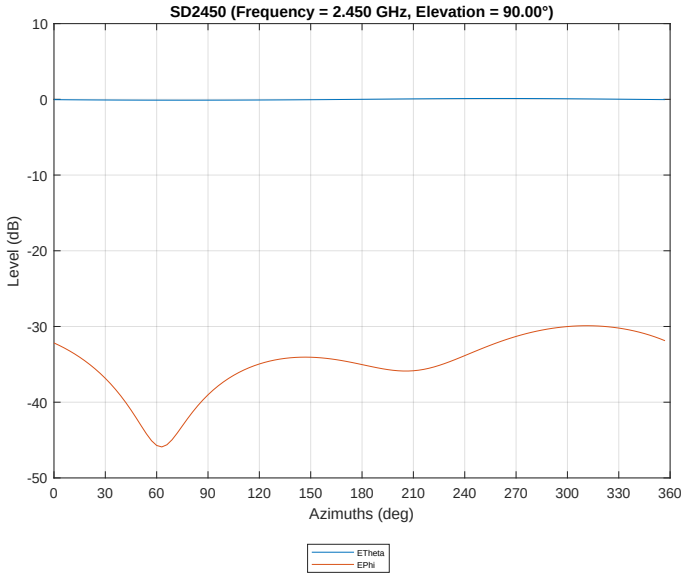


Figure 5.158: Frequency = 2.450 GHz, Elevation = 90.00° (co + cross)

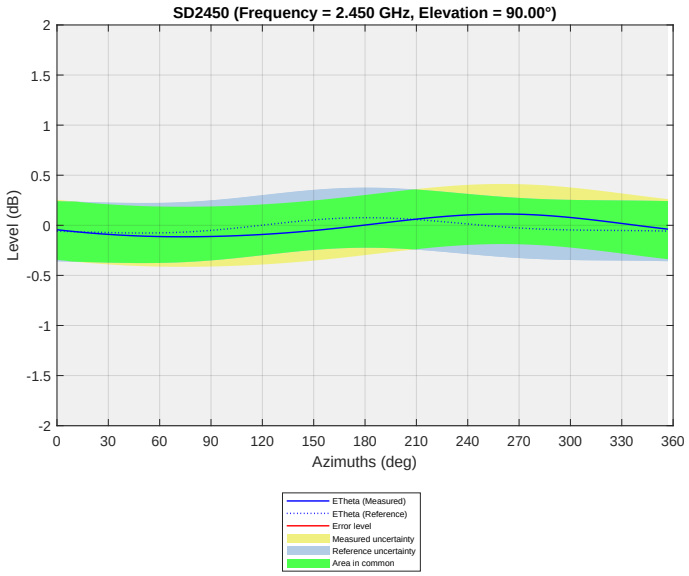


Figure 5.159: Frequency = 2.450 GHz, Elevation = 90.00° (co + mask)

==> Ok, all points inside the masks

Conclusion

6.1 MAINTENANCE CONTRACT INFORMATIONS

Period covered by the current maintenance contract:
From: 06 July 2022
To: 31 August 2023

6.2 CUSTOMER SATISFACTION QUESTIONNAIRE

https://mvg-world.typeform.com/to/JoylzG

6.3 CONCLUSION

System has been calibrated to MVG specifications