HELIX TECHNOLOGIES LTD

NEXTGEN GNSS Antenna Overview

ESA NAVISP Industry Days, ESTEC

17th & 18th January 2019

Dielectrically loaded antenna technology

- unique construction process
- built around a ceramic dielectric core
- electromagnetic fields are intensified within the dielectric core and reduced in the surrounding space
- reduces the density of electromagnetic near-fields
- maintains the ability of the antenna to radiate to the far-field.

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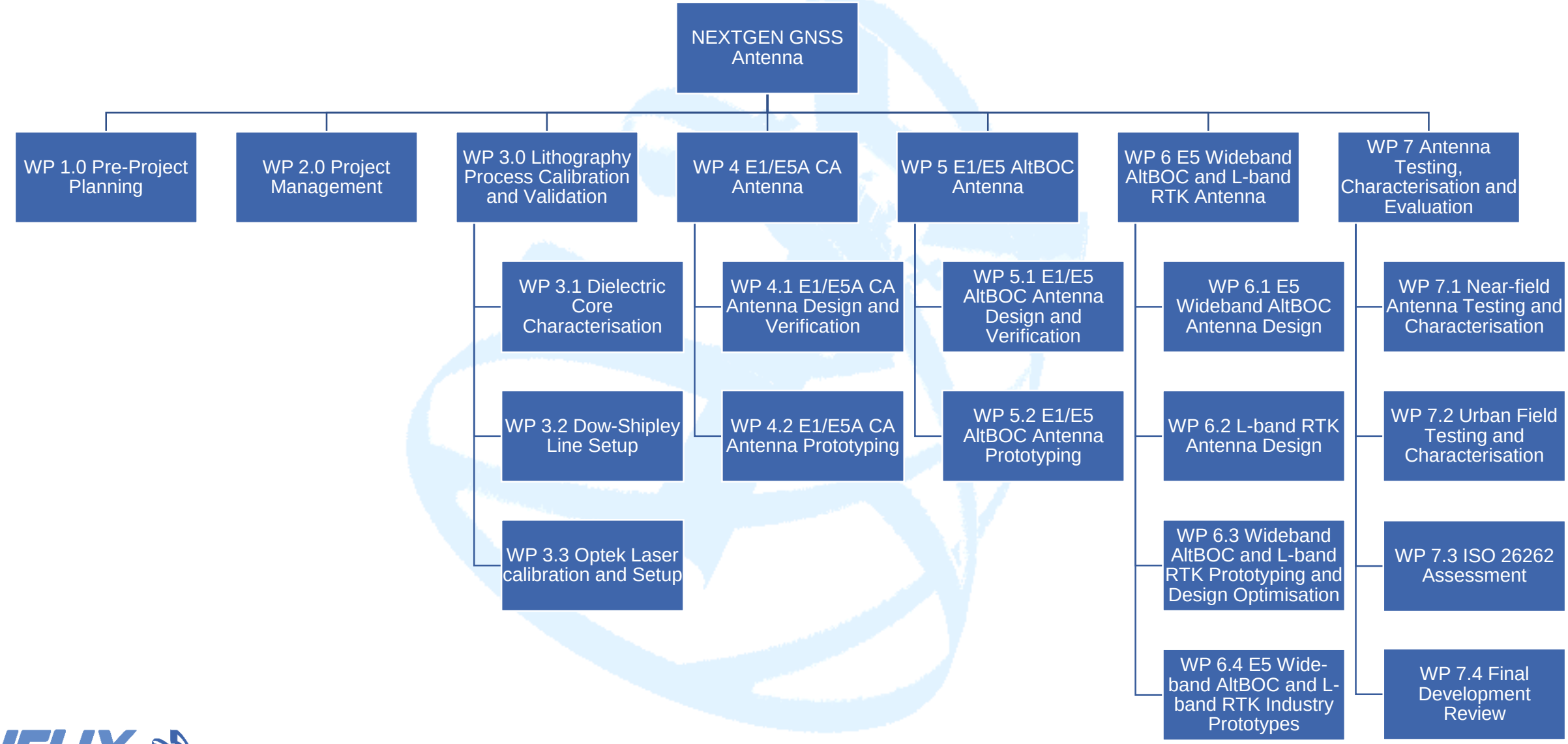

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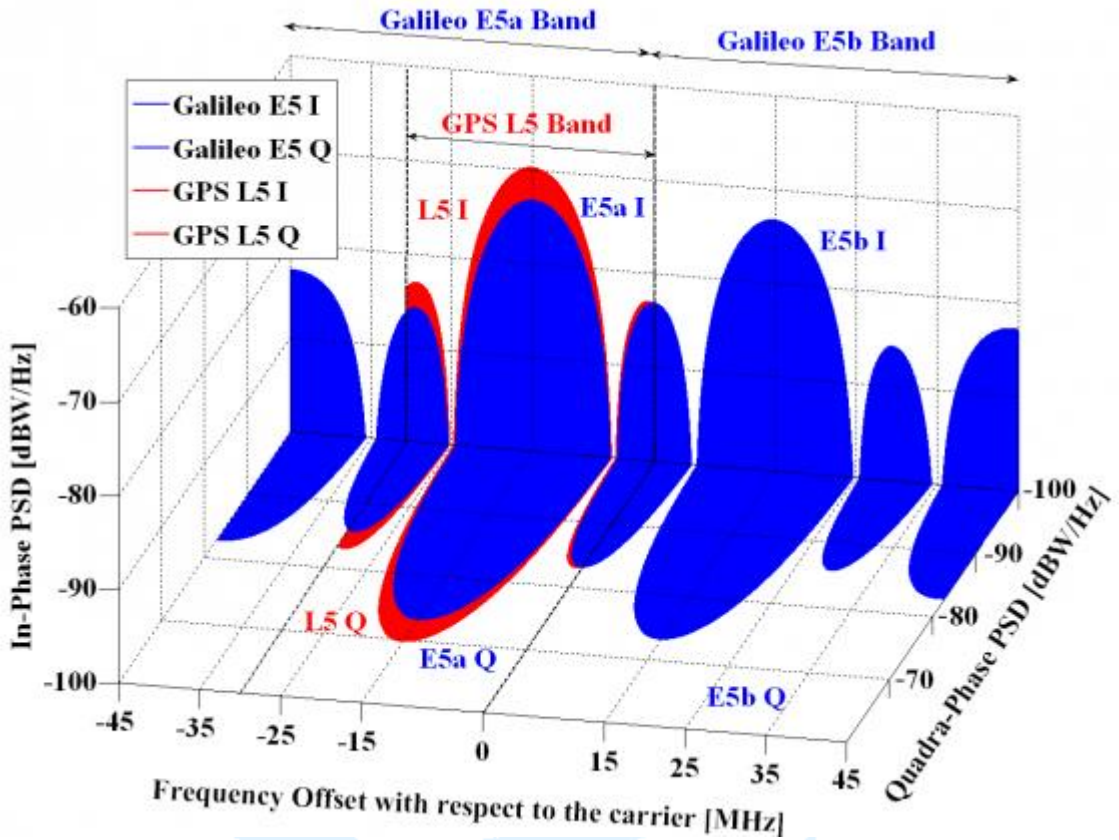
NEXTGEN Multi-frequency GNSS Antenna

- Multi-frequency response optimised for both Galileo E1/E5 and GPS L1/L5 GNSS BOC waveforms
- Targetted at automotive sector – driverless cars
- Cross-polarisation isolation of the order of 30dB
- Stable phase centre
- Physically 13 mm diameter × 33 mm long
- Operation without a ground plane
- Beam-width of the order of 120°
- Improves accuracy and reliability of GNSS systems when used in urban environments with significant multi-path interference
- Field testing programme needs to be established with suitable multi-frequency GNSS module

Galileo E5 Alt-BOC Waveform



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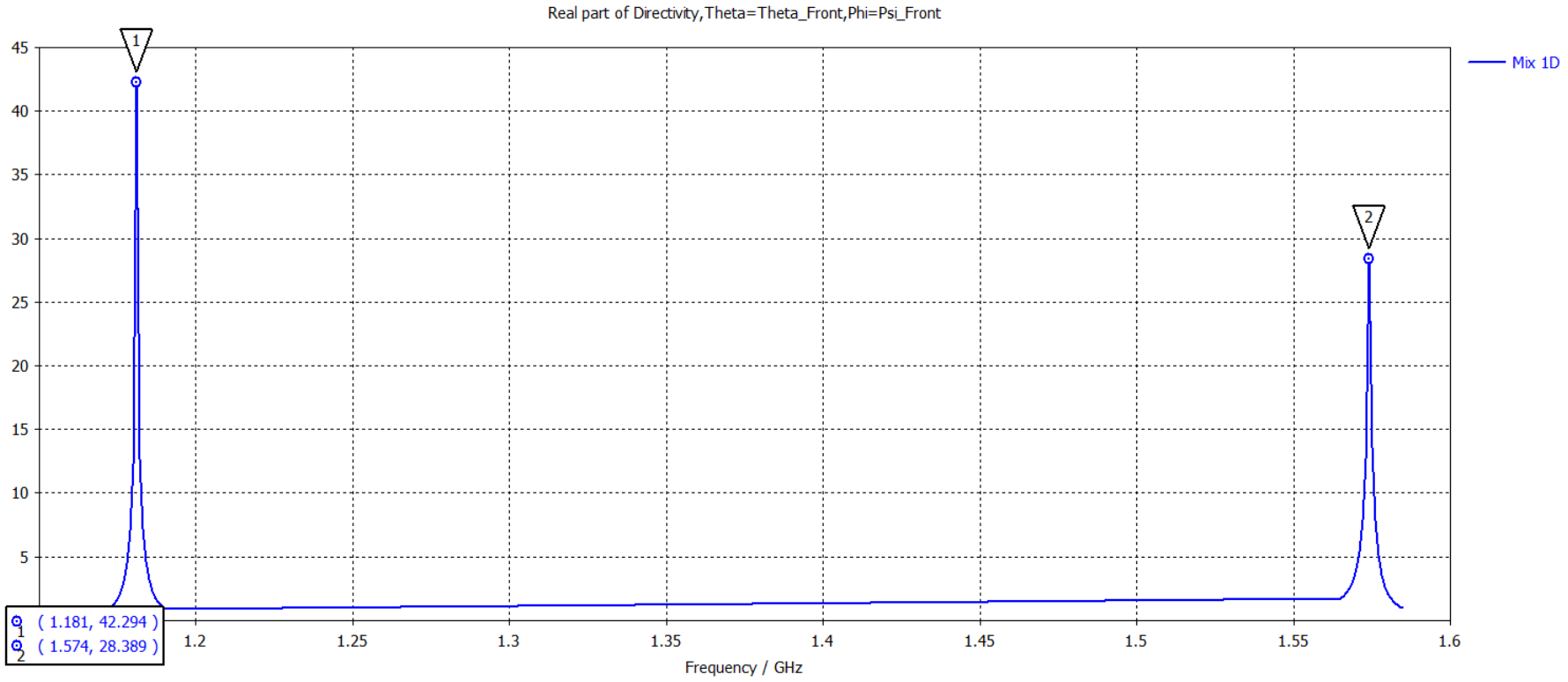
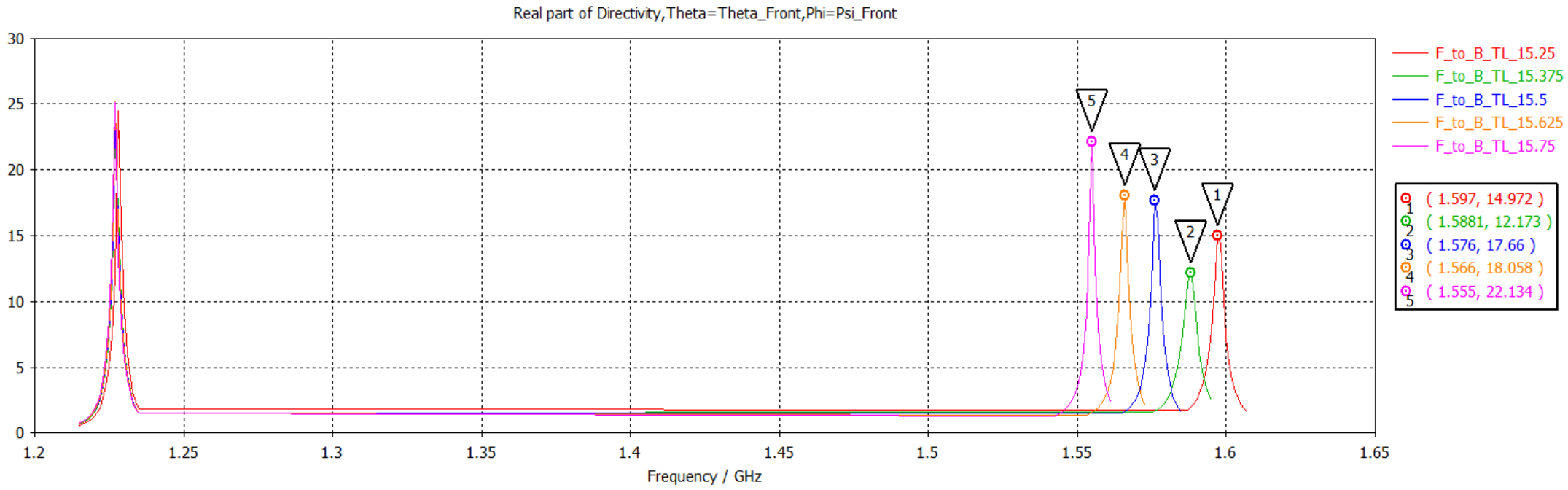
Excellent Front-to-Back Ratio Predicted at 1.181GHz and 1.574GHz



Frequency Domain Simulations: Front-to-Back Responses for Different Helix Lengths



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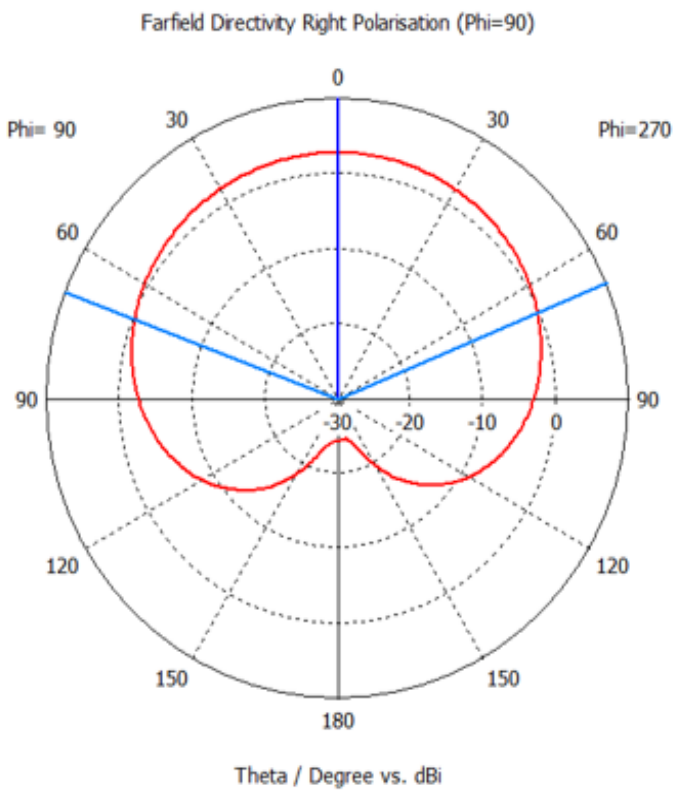
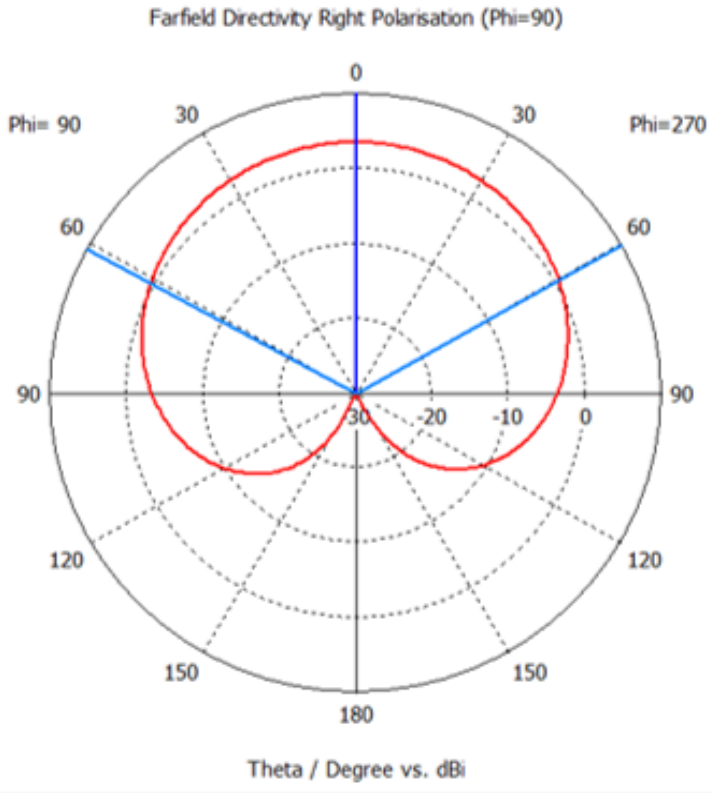
Simulated RH circular polarised patterns at GPS L1 and GPS L2





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Imaging Process Steps

Bare ceramic

Copper plated

Photo-resist coated (and image exposed) ceramic

Developed

Etched

Stripped

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Helix Technologies believes that the dielectric-loaded, multi-filar helix antenna provides significant performance advantages over incumbent antenna technologies for next-generation GNSS applications

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Thank-you!

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