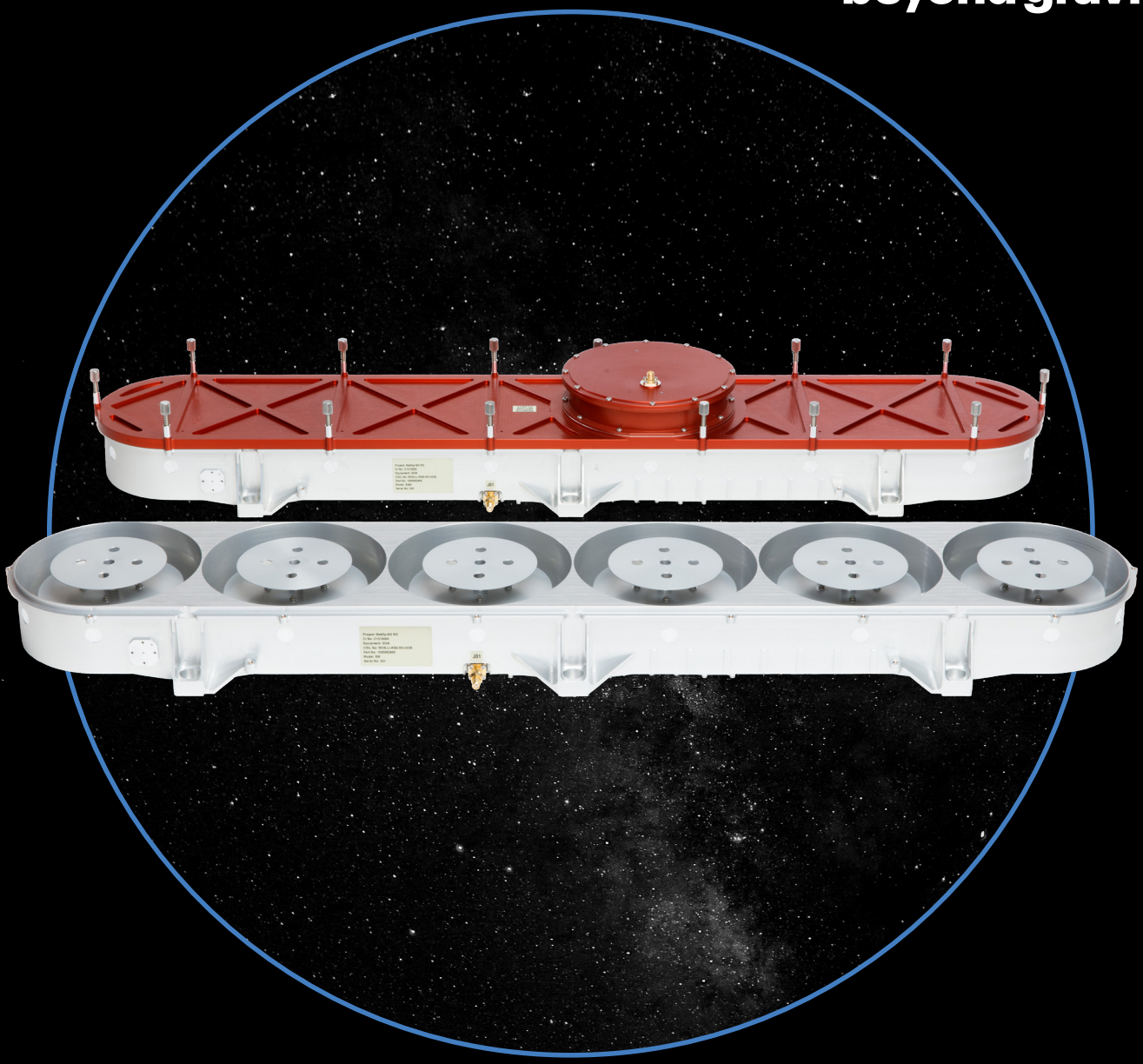
beyond gravity



Array Antennas

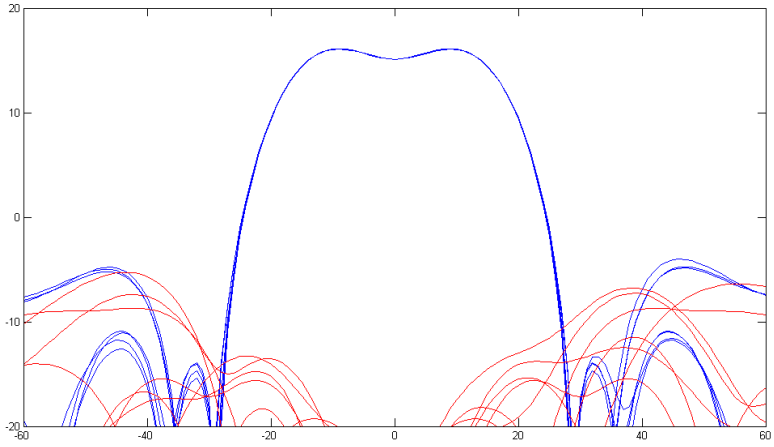
Through more than three decades, Beyond Gravity Space has provided high performance array designs for space applications in the areas of earth observation and mobile communications. With the introduction of more applications, the product portfolio ranges from customer integrated array elements to complete arrays for L-/S-/C-band and upwards.

World class arrays

The Beyond Gravity Space array portfolio covers a wide range of frequencies – from L-band GNSS, over L- and S-band mobile communications to C-band SAR and scatterometry, and even up to millimeter waves. High performance combined with cost effieciency makes a good proposition.

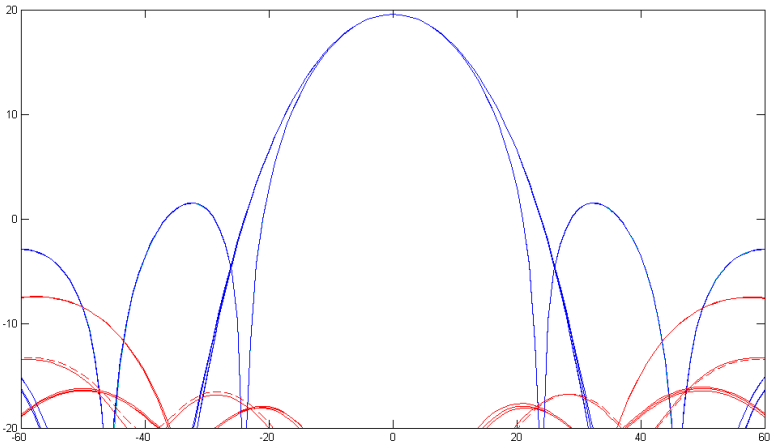
GNSS/GPS navigation transmit antennas

Upcoming generations of L-band navigation signal transmit antennas need to be wide band, PIM free, and withhigh power capability. Based on our heritage in L-band mobile communication antennas for space, we have developed array elements and arrays that are compliant with the latest GPS and Galileo signal definitions.



Satellite based augmentation system (SBAS) transmit antennas

SBAS systems are instrumental in achieving increased accuracy, integrity, and availability for space-based navigation systems. Utilizing array antennas with global or regional coverage from e.g. geostationary orbit, the antenna elements need to be wide band, PIM free, and with high power capability. Based on our heritage in L-band mobile communication and navigation antennas for space, we have developed array elements and arrays that are compliant with e.g. EGNOS and WAAS signal definitions.



Link-16 antennas

Link 16-systems are developed for new space-based systems. Utilizing array antennas, higher gain is realized. The antenna elements need to be wide band, PIM free, and with high power capability. Based on our heritage in L-band mobile communication and navigation antennas for space, we have developed array elements and arrays that are for Link-16 use.

Mobile communication arrays

Beyond Gravity Space has developed array elements for L- and S-band mobile communication satellite systems.
The array elements provide excellent performance in terms of low mass, high aperture efficiency, low losses, as well as excellent high power handling and PIM performance. The element design enables a cost efficient roduct, suitable for large scale production.
Beyond Gravity Space has a significant heritage, having delivered close to 4000 elements through the years.

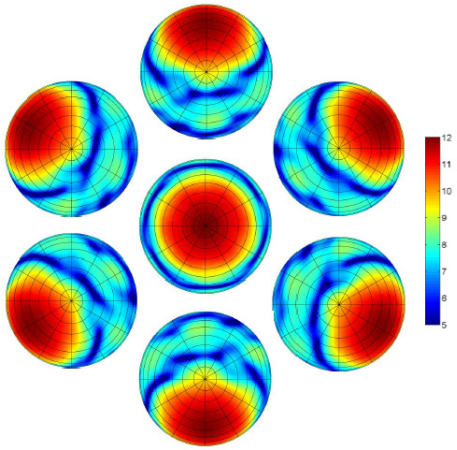
Feed array elements

Feed elements for either focal plane or direct radiating at the side are currently under development. The picture besides shows a Ku-band sub-array quadruplet of dual-polarized feeds with integrated filter functions.

User/mission multiple beam antennas

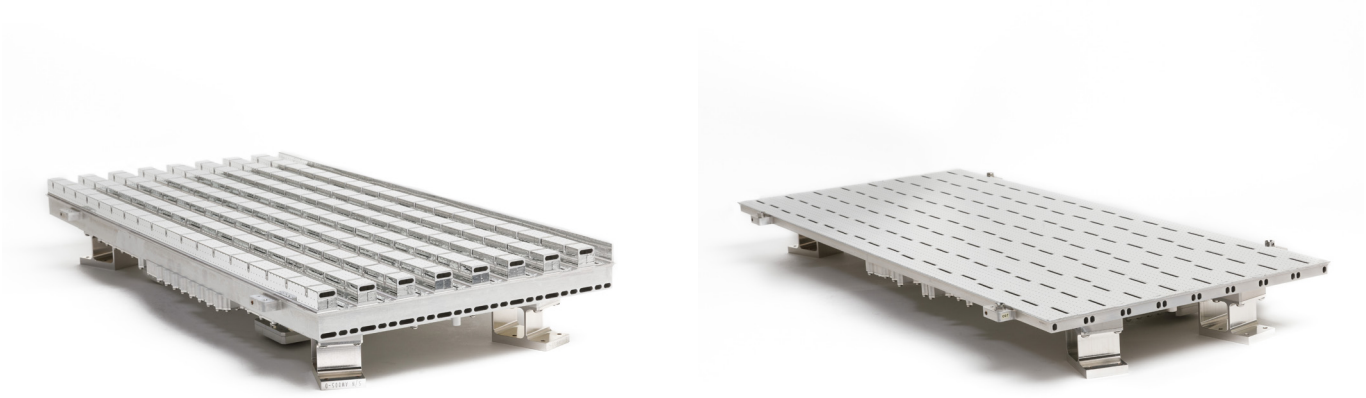
To enable multiple beam coverage in LEO constellation systems, we can provide antenna arrays for L-, S- or C-band, with either simultaneous or switchable beam footprints.

The C-band medium gain multi-beam antenna array shown below provides a seven-beam footprint on Earth rom LEO, where the beams are either simultaneous or switchable.
A compact global coverage C-band array antenna developed, is shown at the side.



Slotted waveguide array technology

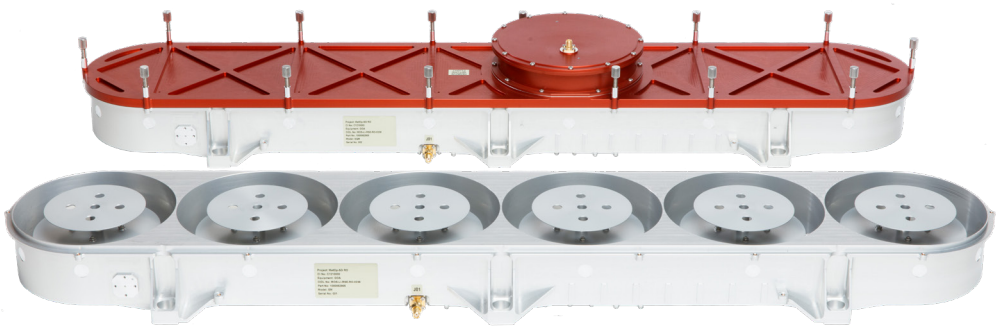
C-band synthetic aperture radar (SAR) antennas have been used for weather forecasts since the path-breaking ERS-1 ESA mission. Our synthesis and design methods and innovative concepts for slotted waveguide arrays enable us to design and build arrays with very high performance in terms of beam shape and side-lobe control.
Currently, our technology is used for the scatterometer instrument on the upcoming MetOp-SG B-satellites, where the instrument is made up of six antenna systems comprising four sub-array panels each. Four antenna systems are single polarized and two dual polarized.



A breadboard of the scatterometer antenna is used by the NOAA's famous hurricane hunter aircraft "Miss Piggy" to improve wind velocity measurements.

Radio occultation array technology

GNSS/GPS radio occultation (RO) is a growing field for weather forecasting and monitoring of climate changes. We have provided antennas to the MetOp GRAS instrument as well as for the upcoming MetOp-SG GRAS-2. For the GRAS-2 instrument, the antenna system constitutes two standalone GNSS antennas and one GNSS antenna array.
The antennas can be used independently of each other as well as in combination with other RO instruments. The antennas are compatible with the GPS, Galileo, BeiDou, QZSS, and GLONASS systems. The array provides an wEarth limb coverage beam with a small and well-defined group delay variation.



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