MICHIBIKI (QZS-1) and Space Service Volume

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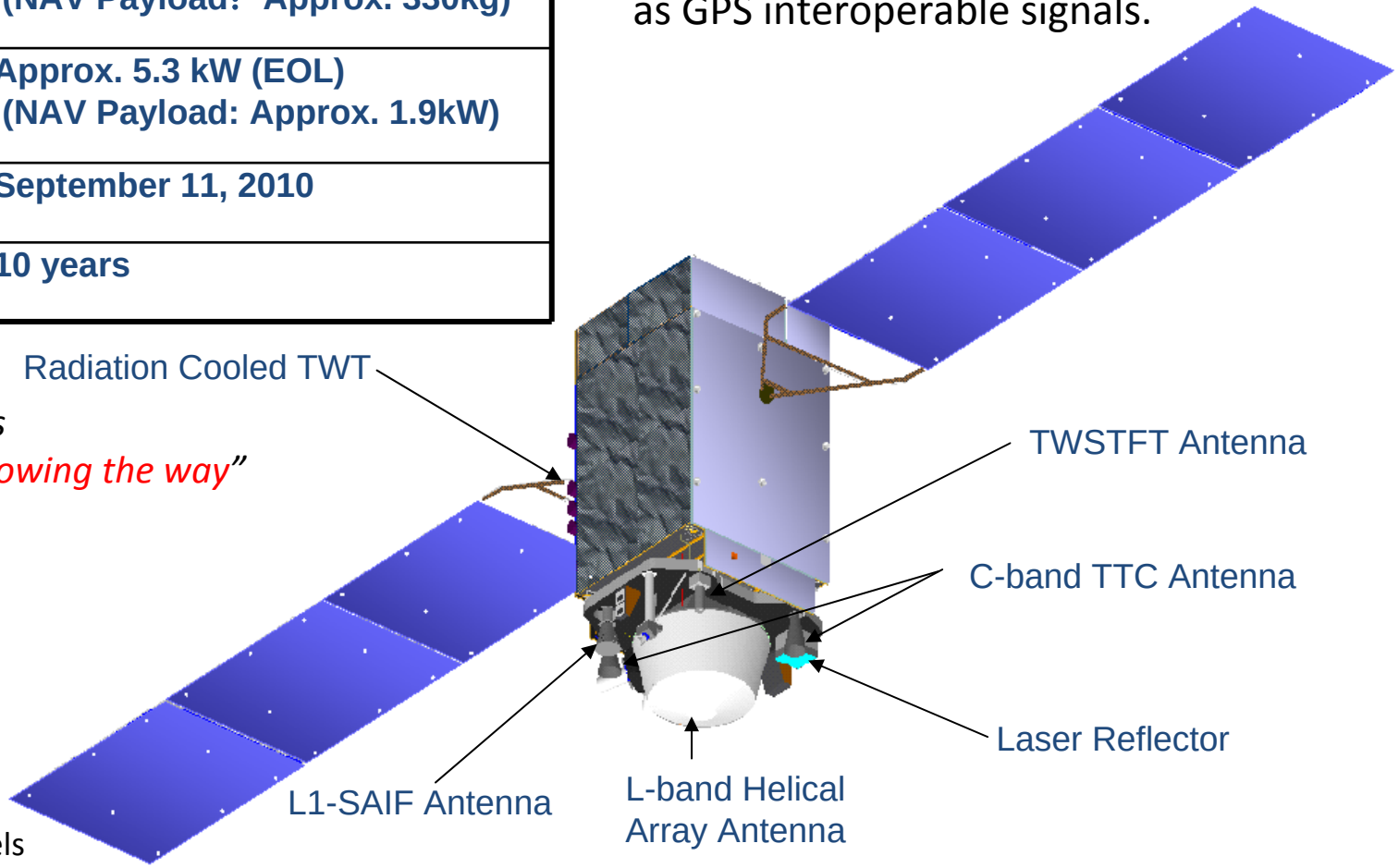
MICHIBIKI (QZS-1)

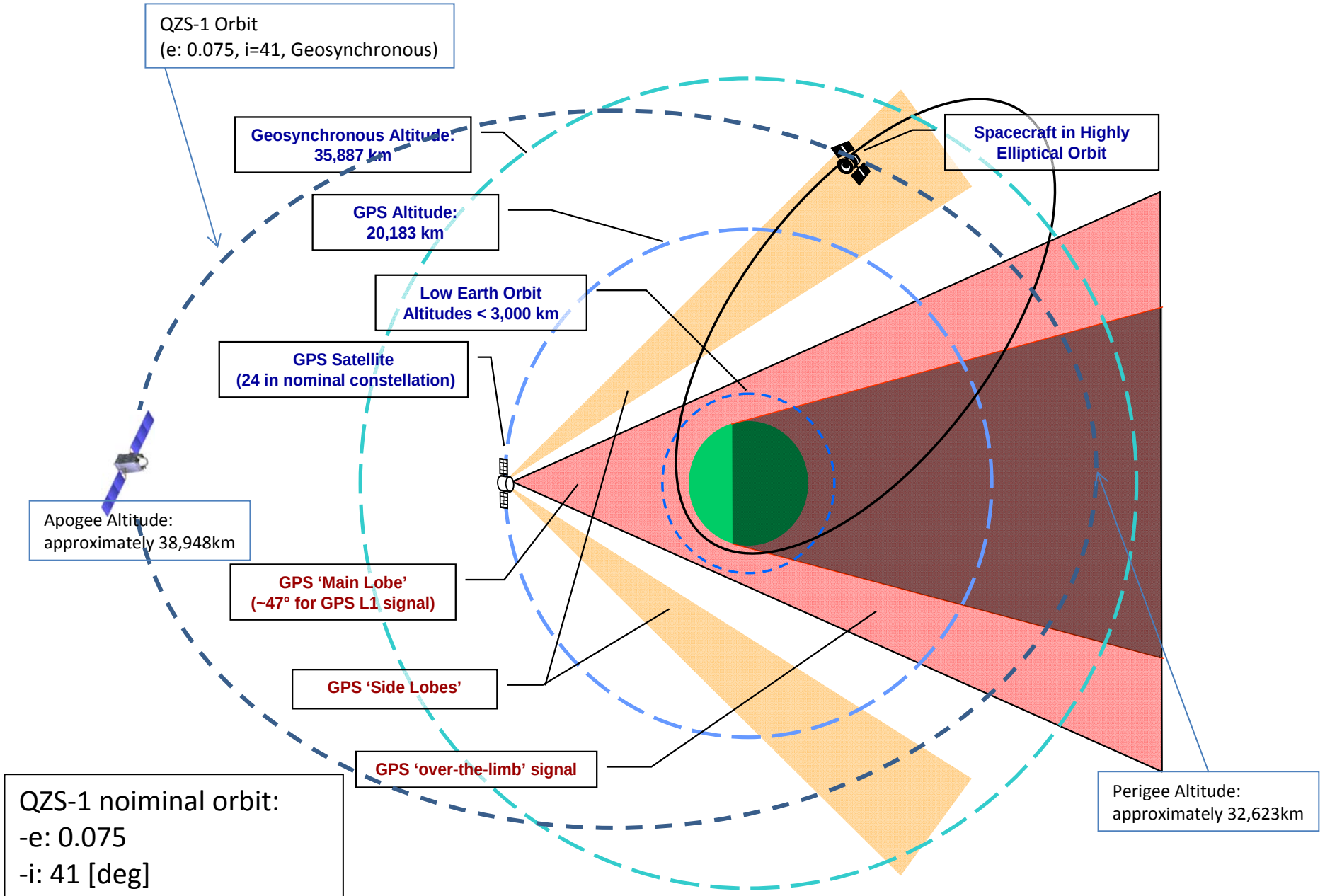
Mass	**Approx. 1.8 ton (dry)** **(NAV Payload：Approx. 330kg)**
Power	**Approx. 5.3 kW (EOL)** **(NAV Payload: Approx. 1.9kW)**
Launch	**September 11, 2010**
Design Life	**10 years**

Transmits L1C/A, L1C, L2C and L5 signals as GPS interoperable signals.

MICHIBIKI means
"Guiding" or "Showing the way"



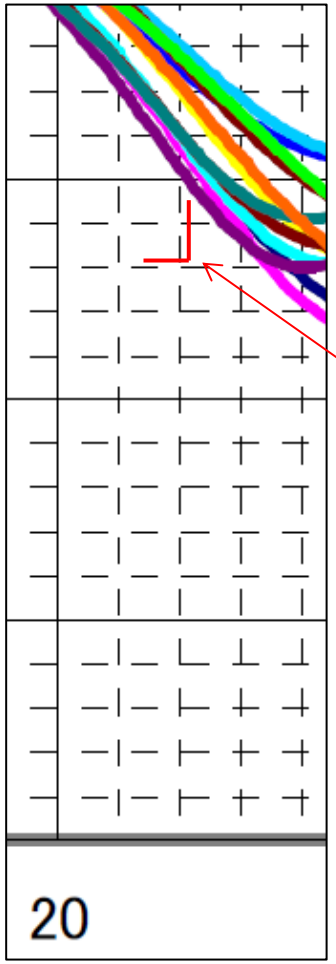
Satellite Configuration on Orbit



QZS-1 noiminal orbit:
-e: 0.075
-i: 41 [deg]
-Radius: 42164.2 [km]
(Geo-synchronous)

Reference Off-boresite Angle of MICHIBIKI

Main Robe of L1 Antenna Pattern



In our calculation, we used reference off-boresite angle at less than 22 deg (L1C/A and L1C signals) including a few mergin.

L2C: 24 deg

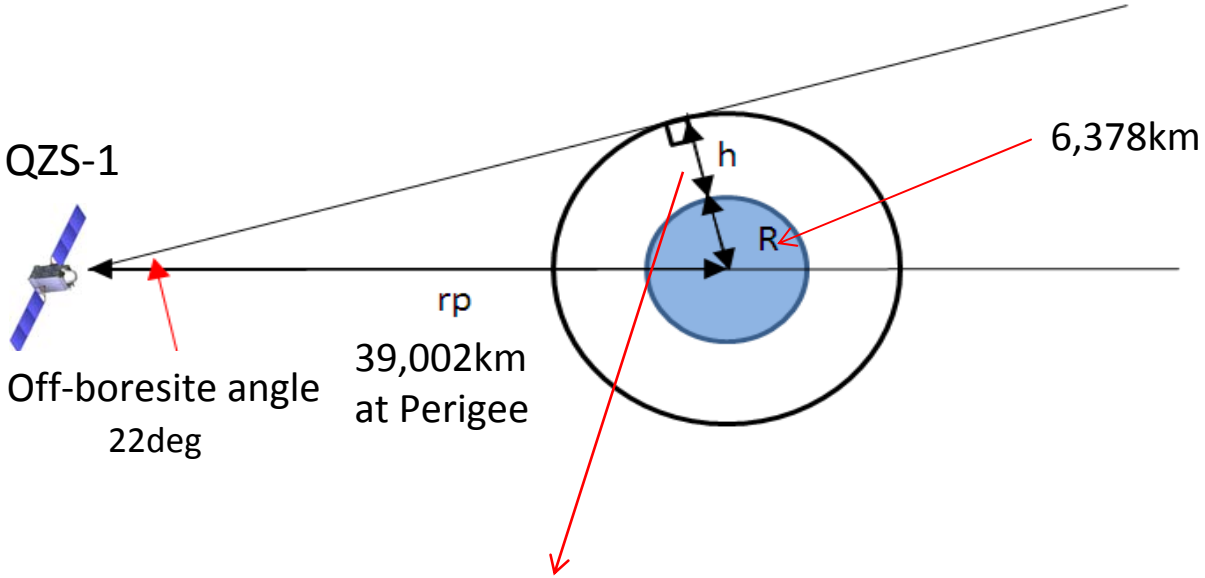
L5: 24 deg

Reference Off-boresite Angle of MICHIBIKI

From the antenna pattern of QZS-1, reference off-boresite angle of MICHIBIKI is following;

- L1C/A and L1C: 22 deg
- L2C: 24 deg
- L5: 24 deg

Lower Space Service Volume from QZS-1



Lower Space Service Volume:
Signals from QZS-1 is 100% around and beyond East Asia and Oceania Region.

The region is next page.

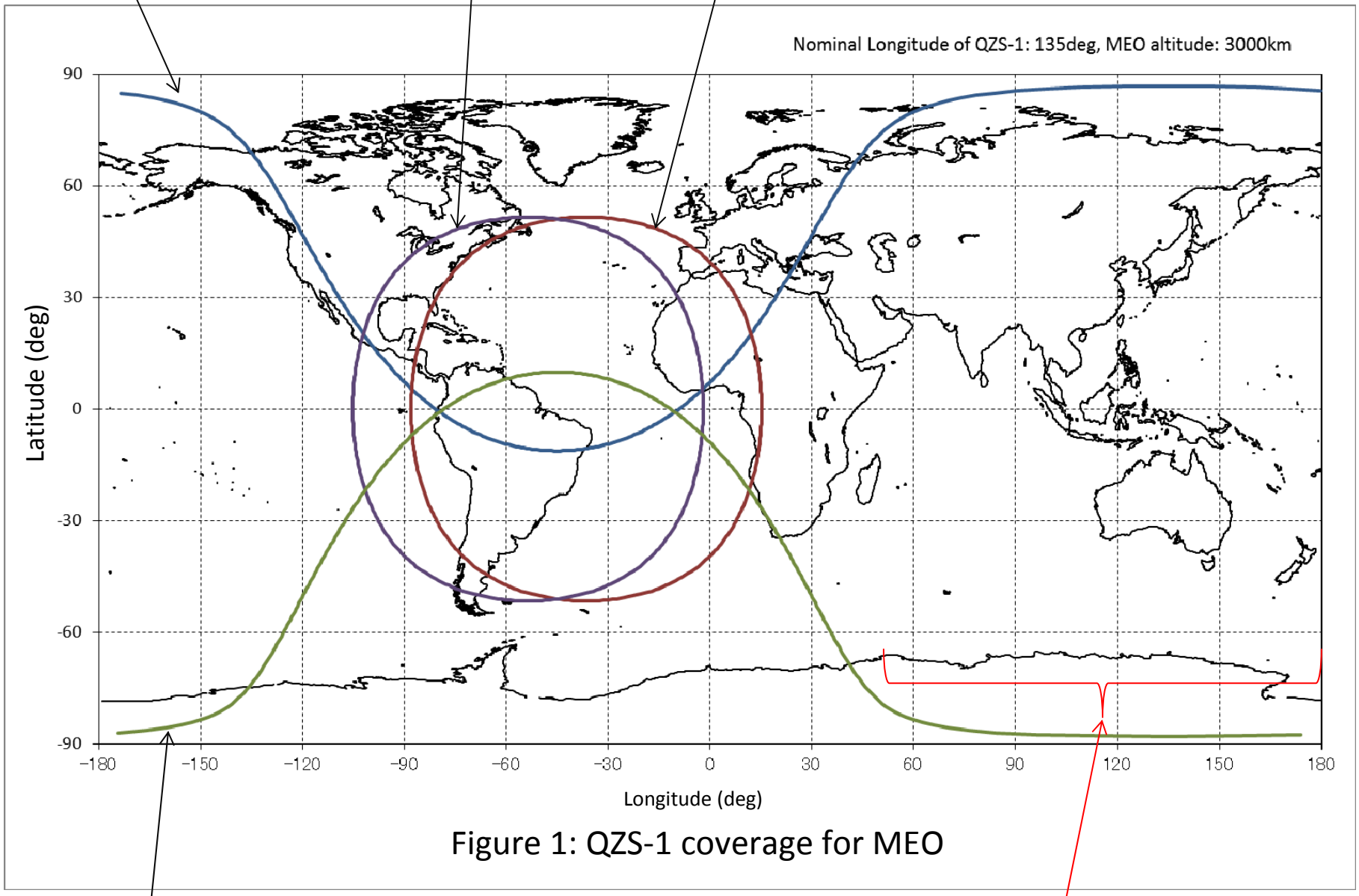
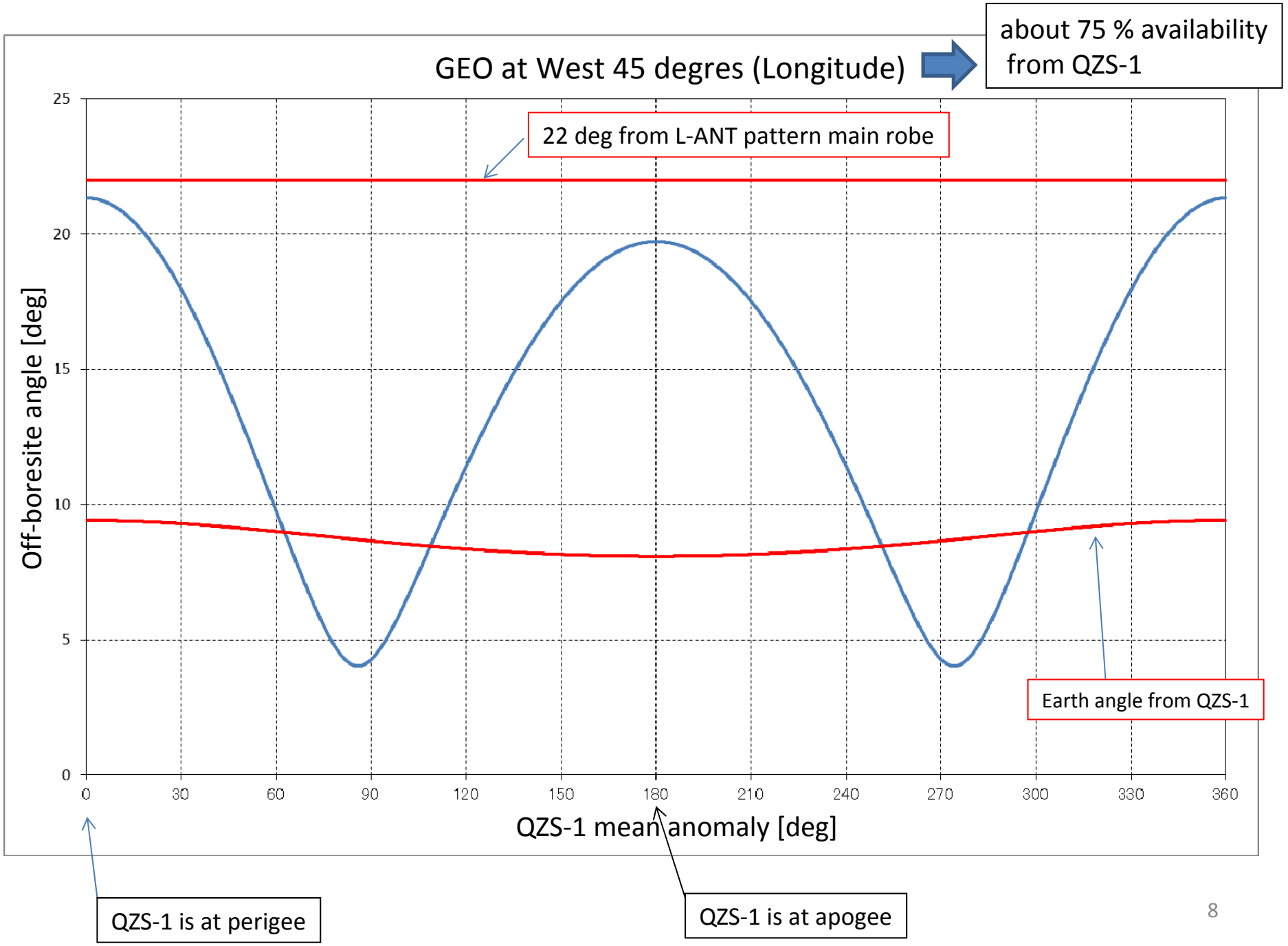
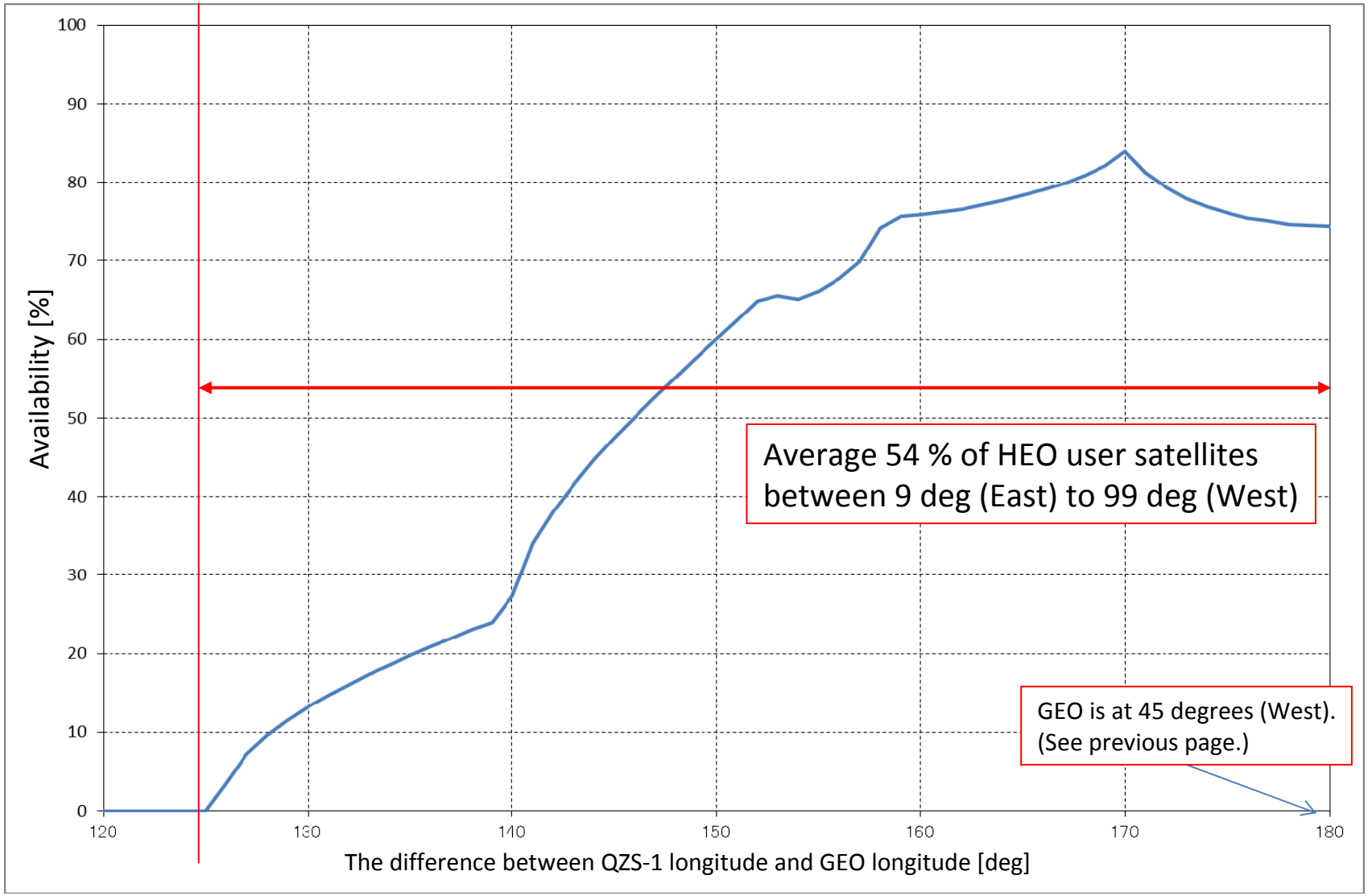


Figure 1: QZS-1 coverage for MEO


about 75 % availability from QZS-1
GEO at West 45 degres (Longitude)
22 deg from L-ANT pattern main robe
Off-boresite angle [deg]
25
20
15
10
5
0
0
30
60
90
120
150
180
210
240
270
300
330
360
QZS-1 mean anomaly [deg]
Earth angle from QZS-1
QZS-1 is at perigee
QZS-1 is at apogee

Upper Space Service Volume (GEO)



The region is next page.

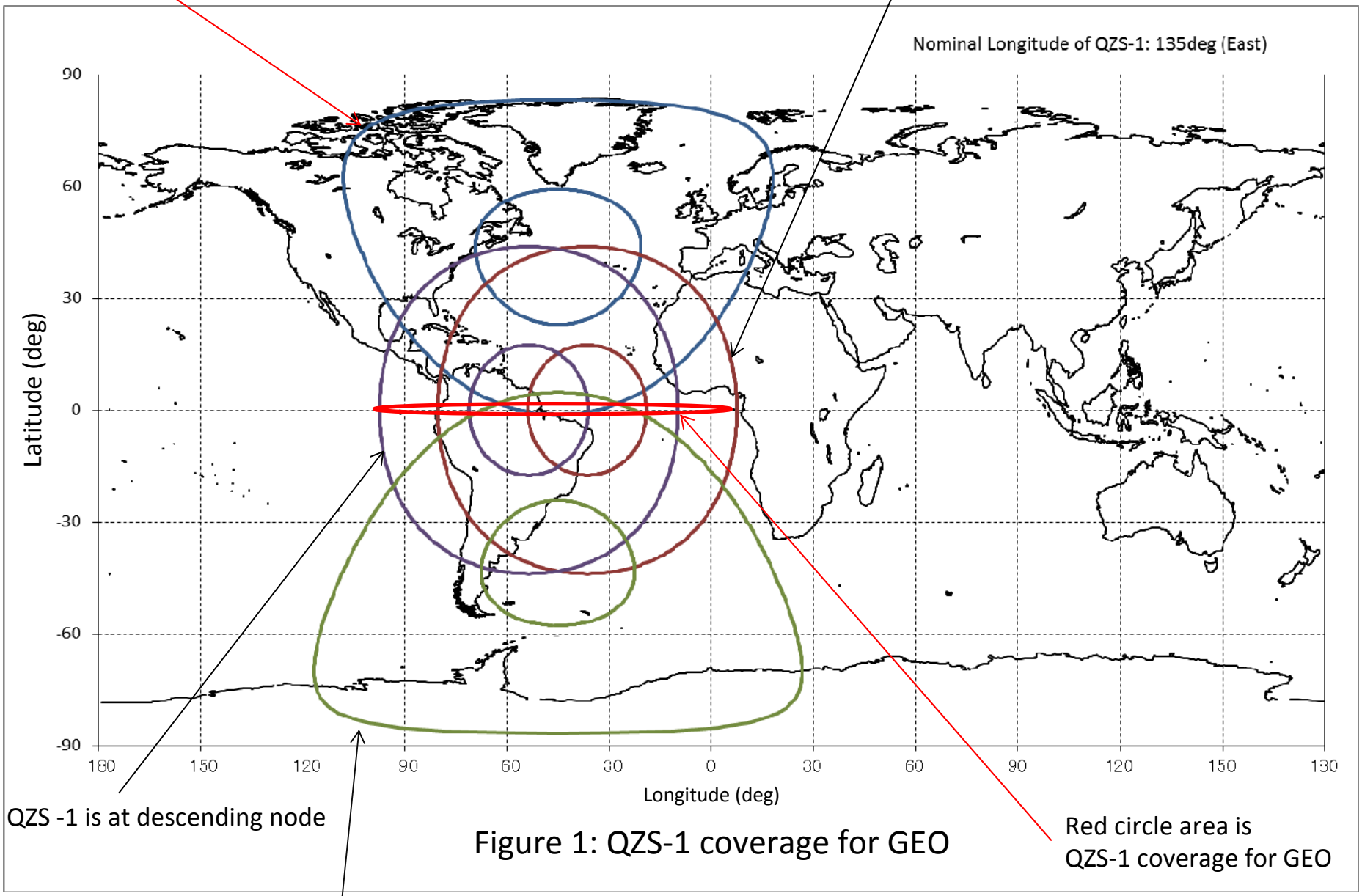


Figure 1: QZS-1 coverage for GEO

Upper Space Service Volume (GEO)
- Min Received Power using 0 dBi RCP antenna at GEO -

Minimum Received Power using 0 dBi RCP antenna at GEO from QZS-1

- L1C/A: -185.3 dBW
- L1C: -185.3 dBW
- L2C: -188.7 dBW
- L5: -180.7 dBW