

IDS GB meeting

Lisbon, IDS Workshop,
October 22, 2010

AGENDA:

- P. Ferrage : Update on DORIS instruments and satellites
- B. Garayt : Network status
- L. Soudarin : Central Bureau & IDS web
- C. Noll : Data centers: DORIS data, products
- F. Lemoine : IDS combination
- P. Willis : DORIS Special Issue
- P. Willis : DPOD2008
- P. Ferrage, L. Soudarin : Calendar for the IDS annual report 2010
- F. Lemoine : Joint Analysis with IVS of DORIS signals at an IVS site
- F. Lemoine : Possibility/necessity/feasibility of measuring or determining a phase center map for the DORIS beacons, and the DORIS receivers on the satellites
- J. Ries, L. Soudarin : Proposition of a Working group to elaborate a tutorial for novice users in DORIS data processing
- M. Pearlman, F. Lemoine, L. Soudarin : Report of the Working Group on IDS Terms of Reference
- L. Soudarin : Review of previous list of actions
- Other points:
GGOS and WG
Renew of IAG GB : what about the IDS representative to IAG ?
next IDS GB et AWG meeting

MAIN DECISIONS :

ATTENDEES:

Pascale Ferrage, Bruno Garayt, Frank Lemoine, Michiel Otten, Laurent Soudarin, Pascal Willis
Invited : Guilhem Moreaux (CLS), Cédric Tourain (CNES), Steven Hosford (CNES)



Excused

<p>Update on DORIS instruments and satellites</p>	<p>HY-2A: planning OK.</p> <p>Contacts (P. Willis) with people of Wuhan Institut of Geodesy and Geophysics, implied in HY-2A and interested in processing DORIS data (Gipsy/Oasis)</p> <p>See also Pascale Ferrage's presentation at the Workshop (http://ids-doris.org/report/meeting-presentations/ids-workshop-2010.html)</p>	
<p>Network status</p>	<p>-Bruno will provide DORIS-GPS ties computed with absolute phase center maps. Time table: end March 2011.</p> <p>-IGN "Worldwide networks and services" unit is working on increasing the number of GPS collocations by integrating non-IGS stations to the IGS network.</p> <p>See also Jérôme Saunier's presentation at the Workshop (http://ids-doris.org/report/meeting-presentations/ids-workshop-2010.html)</p>	
<p>CB news and IDS web</p>	<p>-New web site since February 2010. Migration to a new editor.</p> <p>-Domain ids-doris.org adopted for the web (http://ids-doris.org) and ftp sites (ftp://ftp.ids-doris.org/pub/ids/), and the mailing lists (xxx@ids-doris.org).</p> <p>-New mailing list dorisstations@ids-doris.org to provide information on data gaps and discontinuities.</p>	



International DORIS Service

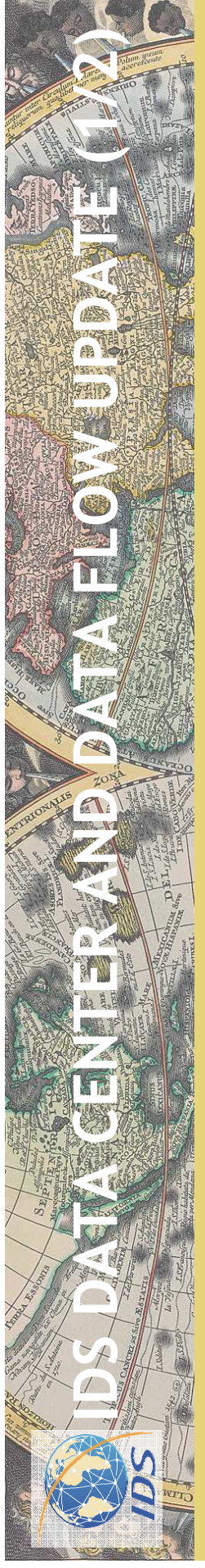
<p>Data Centers</p>	<p>-Cryosat-2 data archived in DORIS and RINEX formats</p> <p>-re-issue of Spot-4 data (05/98-01/99; offset correction) on 21-September 2010 and DORISmail issued</p> <p>-re-issue of Jason-2 data (ionospheric correction for RINEX 2.2 format) early March 2010 and DORISmail issued</p> <p>-POE orbits (SP3c format) from CNES-SSALTO for SPOT, Envisat, Jason and Cryosat since May 2010</p> <p>-SINEX series product description files: CB contacted ACs. A few descriptions have recently been submitted. Solution-specific files still missing (gau, ssa; selected series of ign, ina)</p> <p>-approximately 22000 DORIS-related files (25 Gb) downloaded from CDDIS each month.</p> <p>See Carey Noll's report in annexe</p>	
<p>IDS combination</p>	<p>Largely discussed during the AWG meeting, before this GB meeting. See Frank Lemoine's forthcoming report.</p> <p>Two objectifs:</p> <ol style="list-style-type: none"> 1. Routine combination. ACs asked to deliver SINEX including all possible satellites (except Jason-1), according to the schedule in Darmstadt. Next delivery: Dec. 20, Sinex of Jul-Aug-Sep. 2. Analyse of the single satellite campaign to be continued (EOP...). SPOT-4 and Envisat to be investigated. <p>Action: retrieve IDS-3 files from Z. Altamimi.</p>	<p style="text-align: right;">Frank Lemoine</p>
<p>DORIS special issue 2009 in Advances in Space Research</p>	<p>The second volume will be printed in December 2010. Articles will be available on the journal website few weeks before.</p> <p>Next DORIS special issue: not before 3 years</p>	
<p>DPOD2008</p>	<p>Need to derive a new DPOD2008 reference frame from ITRF2008 for POD. Plan similar to DPOD2000 and DPOD2005. Objectif: Feb./March 2011</p>	<p style="text-align: right;">Pascal Willis</p>
<p>Analysis of DORIS signals at IVS sites</p>	<p>Does DORIS really perturb the VLBI measurements? Need to methodically analyse the DORIS signals at VLBI sites. H. Schuh (IVS) agrees to lead an experiment at an IVS site. Cédric Tourain proposes to do it in Greenbelt (VLBI 2010 station, DORIS 3.0 beacon), using the beacon with a second antenna that may be moved, in order to keep the IDS reference point of GREB.</p> <p>Action: answer H. Schuh</p> <p>See Frank Lemoine's slides in annexe</p>	<p style="text-align: right;">Pascal Willis, Frank Lemoine</p>
<p>DORIS phase center map</p>	<p>Concerning the possibility/necessity/feasibility of measuring or determining a phase center map for the DORIS beacons, and the DORIS receivers on the satellites, the GB answers that there is no need. But the vertical offsets between Starec and Alcatel antennas must be looked at. There could be a correlation between the scale errors and the numbers of Alcatel antennas.</p>	
<p>IDS activity report 2010</p>	<p>A call for contribution will be sent on early December. The objective is to finalize the report on January 2011.</p> <p>As the previous IDS activity report, the document will be printed and sent to a large list of people: all IDS components (representatives and heads), DORIS host organisms, IAG, IERS, GGOS, IGS, IVS, ILRS...</p> <p>The GB will be keep informed of the progress status by the end of December.</p>	<p style="text-align: right;">Central Bureau</p>

		<p>Lisbon</p> <p>October 22, 2010</p> <p>Page 3</p>
<p>Working Group on tutorial for novice users</p>	<p>Proposition to form a small working group to elaborate a tutorial for novice users in DORIS data processing. J. Ries agrees to helping in this task. The Central Bureau may help providing with the existing documents. It is suggested to provide full output files (Sinex, orbit, station positions, EOP, residuals, empirical accelerations...) for a selection of arcs (e.g. Jan. 2005).</p>	<p>J. Ries, L. Soudarin</p>
<p>Working Group on IDS Terms of Reference</p>	<p>A WG was formed to update the IDS Terms of Reference. It is chaired by M. Pearlman. A chart is presented and a revised version of the ToR is submitted to the GB. Major issues: election process for GB members, some rewording for clarification and timeliness, addition of a DORIS System representative to the GB.</p> <p>The proposed version will be reviewed by the GB within the next two weeks. The final version will be presented for approval at the next GB meeting.</p>	
<p>Next IDS Meetings: AWG, GB</p>	<p>The next IDS Analysis Working Group meeting is scheduled in May 2011, in Paris, probably at Bureau des Longitudes. Pascal Willis will confirm the date and place.</p> <p>The next GB meeting will take place in Paris, jointly with the AWG meeting.</p>	
<p>Review of actions</p>	<p>See updated xls file "IDS actions_2010_11_30" (sent to GB members on Dec 2th 2010)</p>	

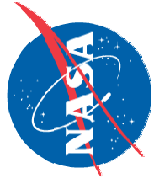


ANNEXE 1

Data Centers report (C. Noll presentation)

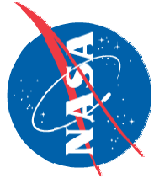


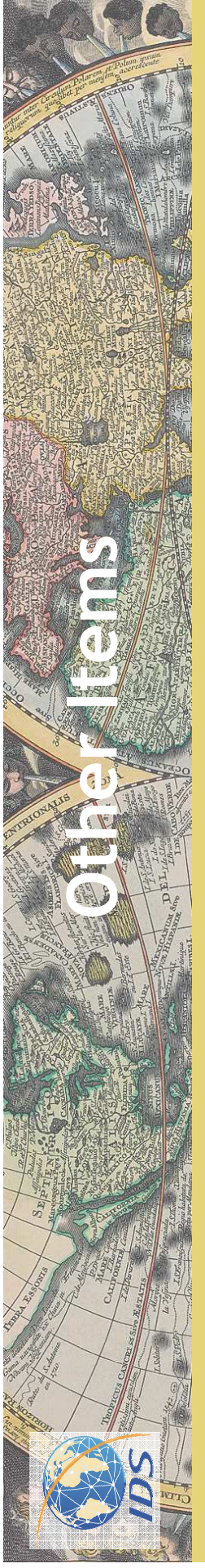
- ◆ Main directory structure at data centers:
 - /doris/data: data in DORIS and RINEX formats
 - /doris/products: all derived products
 - /doris/ancillary: other information to help in use of data
 - Quaternions (Jason-1 since 2001, Jason-2 since 2008)
 - Other TBD
 - /general: data summaries, general information
 - /doris/cb_mirror: copy of files from IDS CB ftp site



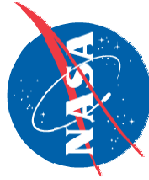


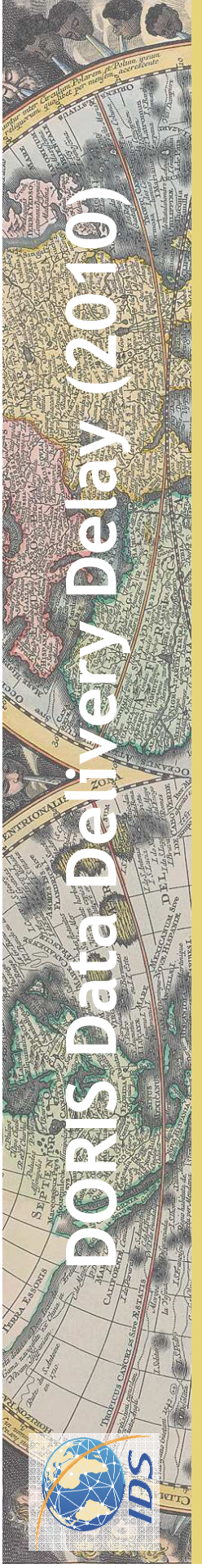
- ◆ **New satellite data (DGXX instrument):**
 - Jason-2 and CryoSat-2 (delivery began Jul-2010)
 - Data archived in DORIS and RINEX formats
- ◆ **Jason-2 data reissue:**
 - Error in ionospheric correction field for RINEX 2.2 format
 - Data reissued early Mar-2010 and DORISmail issued
 - Error in phase center position header record; re-issue required for data from 2008 through mid-2010
- ◆ **SPOT-4 data reissue:**
 - Data from 05/98-01/99 contain an erroneous offset correction (Pascal, et al, 2005)
 - Data reissued 21-Sep-2010 and DORISmail issued
- ◆ **POE orbits (in SP3 format) from CNES-SSALTO for SPOT, Envisat, Jason, and CryoSat since May-2010**



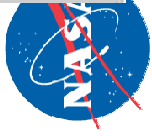
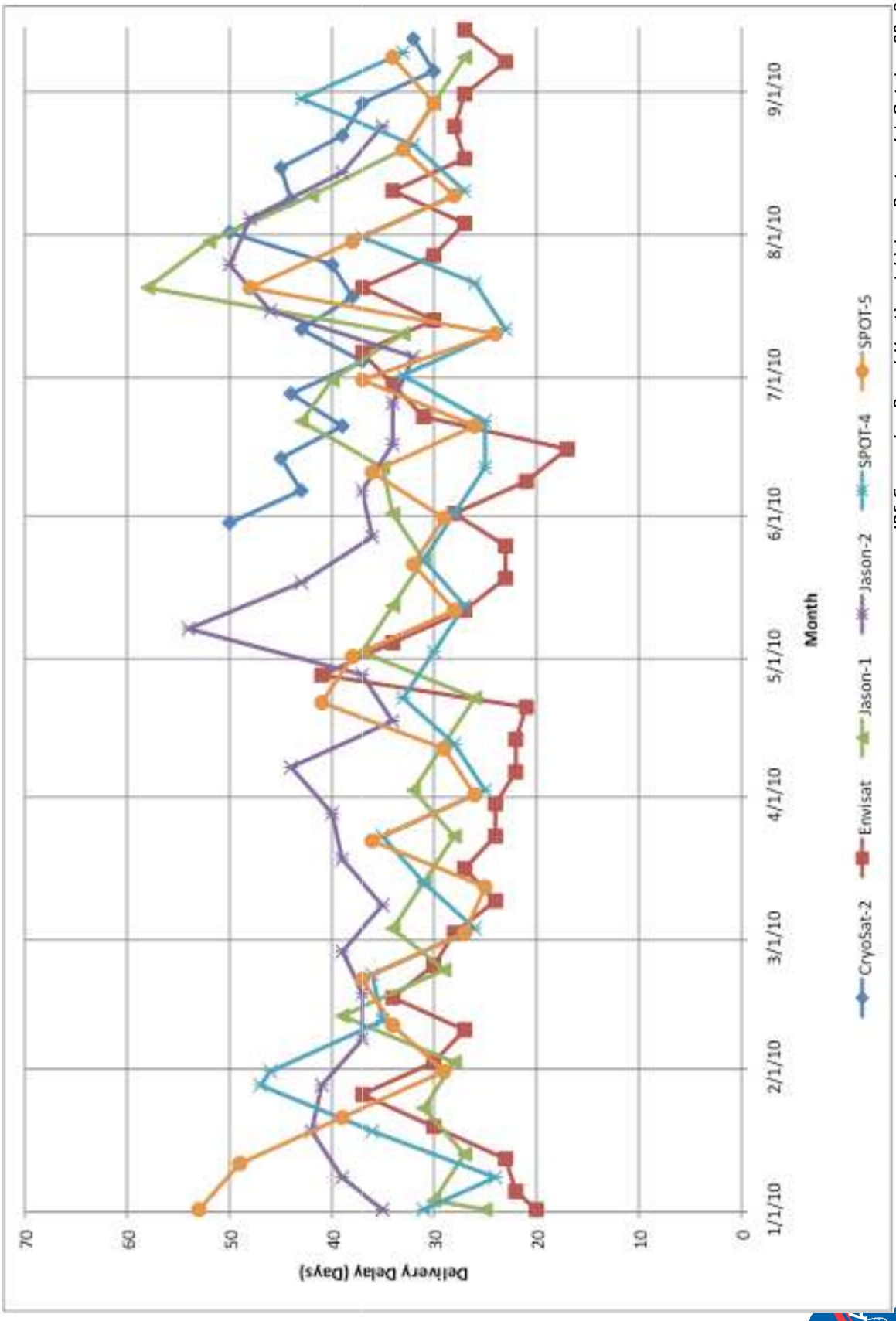


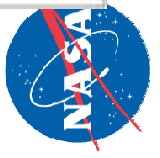
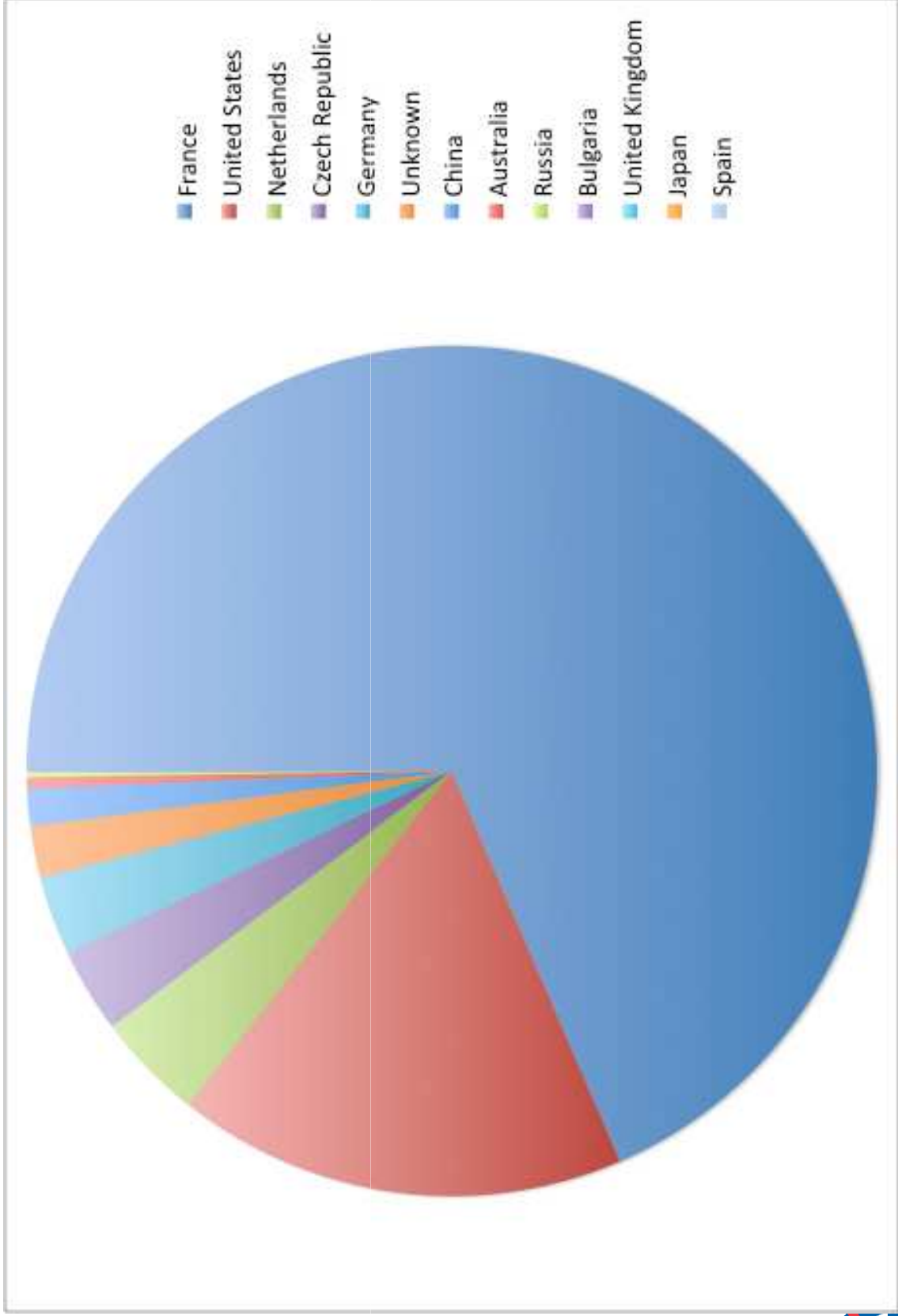
- ◆ Action: SINEX series product description files
 - CB contacted ACs
 - A few descriptions have recently been submitted (gop); esa, gau, gsc still missing
 - Solution-specific files still missing (gau, ssa; selected series of ign, ina)
- ◆ Approximately 22K DORIS-related files (25Gb) downloaded from CDDIS each month





DORIS Data Delivery Delay (2010)







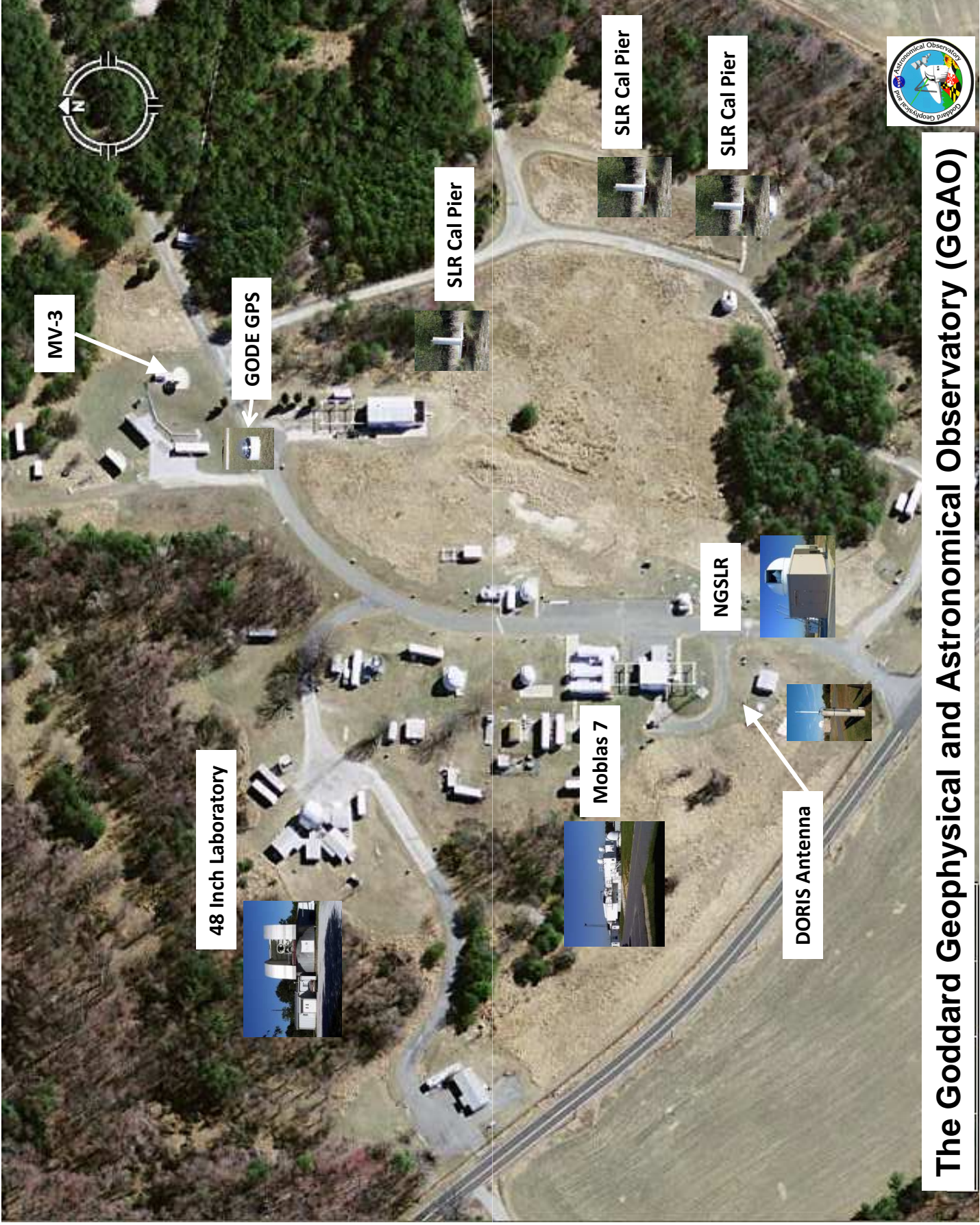
Lisbon

October 22, 2010

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ANNEXE 2

Analysis of DORIS signals at IVS sites (F. Lemoine presentation with contribution of C. Beaudoin, MIT Haystack Observatory)



The Goddard Geophysical and Astronomical Observatory (GGAO)

Overload Analysis of VLBI2010 Broadband Front- end at GGAO

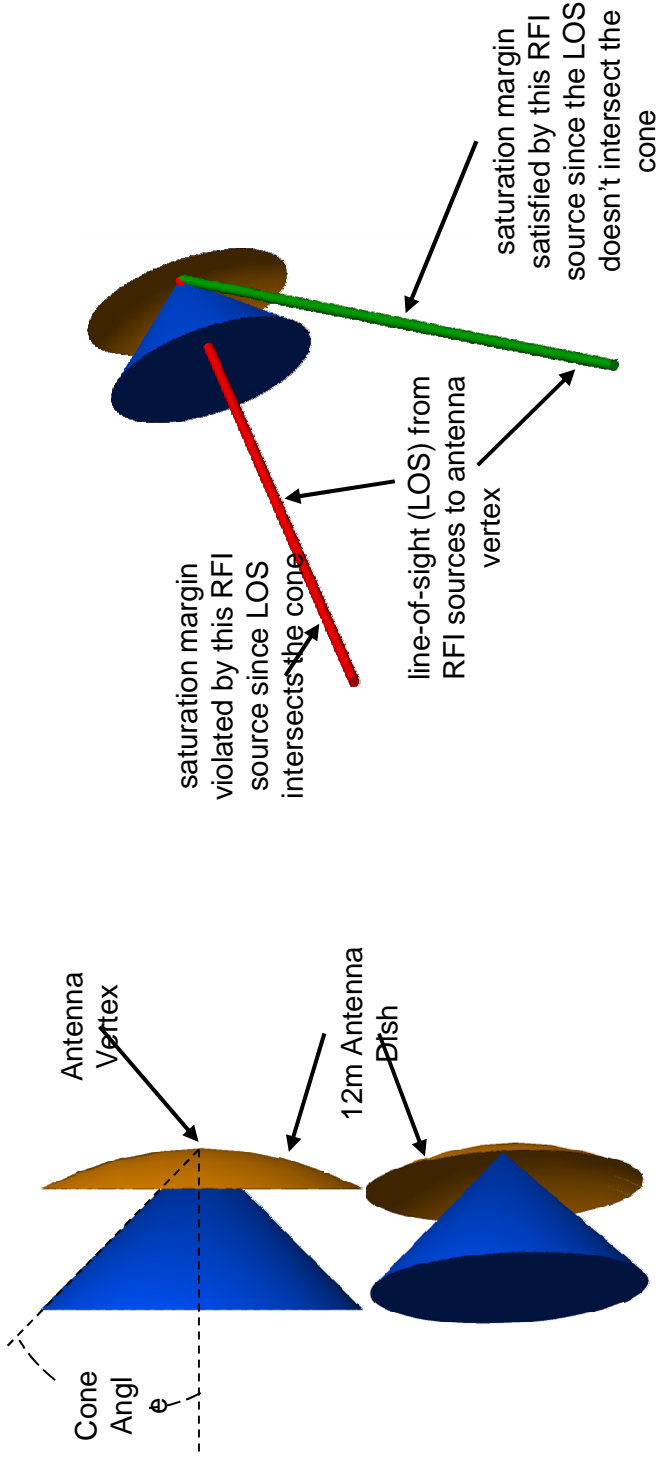
Christopher Beaudoin
MIT Haystack Observatory

Background

- I consider the potential of the following three transmitters to saturate the VLBI2010 front-end to be installed on the Patriot 12m antenna:
 - DORIS
 - MOB LAS7 SLR radar
 - NGSLR radar
- The location of each transmitter:
 - Locations determined from Google Earth and height measurement of each source above the ground
 - DORIS: 39°01' 12.22" N. Latitude 76°49' 40.41" W. Longitude 51.0m Altitude
 - MOB LAS7: 39°01' 14.19" N. Latitude 76°49' 40.00 " W. Longitude 57.7m Altitude
 - NGSLR: 39° 01' 12.66" N. Latitude 76° 49' 38.83" W. Longitude 55.9m Altitude
- Source frequencies within operating band of the broadband receiver
 - DORIS: 2.03625 GHz
 - MOB LAS7/NGSLR: 9.4 GHz
- Peak transmit power level of each source
 - DORIS: 40 dBm
 - MOB LAS7/NGSLR: 101.2 dBm
- Minimum operating elevation angle of the SLR radar is 10°
- Broadband front-end saturation power level: -40 dBm

Background

- For a given location of the 12m antenna, a pointing cone angle is calculated outside which the 12m must operate in order to provide the specified saturation margin (see assumptions slide)
- The cone angle requirement is derived for the following area within the GGAO site:
 - Latitude: 39°01' 09.40" to 39°01' 21.00" N.
 - Longitude: 76°49' 29.50" to 76°49' 48.40" W.
- The cone angle requirement as a function of location is referred to as the cone angle map



Assumptions

- **Antennae are pointed at one another azimuthally**
 - This only applies to the radar antennae since the DORIS beacon has an azimuthally symmetric radiation pattern. The likelihood of the two antennae being pointed at each other within the cone angle should probably also be considered but will not be here.
- **Transmitter and receiver are at the same altitude**
 - The cone angle is very insensitive to this assumption since the distances under consideration within the GGAO site are relatively short
- **Line-of-sight reception between SLR radars and 12m antenna**
 - This serves to overestimate the cone angle requirement when blockage is present
 - DORIS does not have line-of-sight to the currently proposed site but measurements have been taken to estimate the losses due to blockage by the buildings, trailers and domes etc. located in this direction. These blockage losses will not be addressed here but will appear in another set of slides.

Assumptions

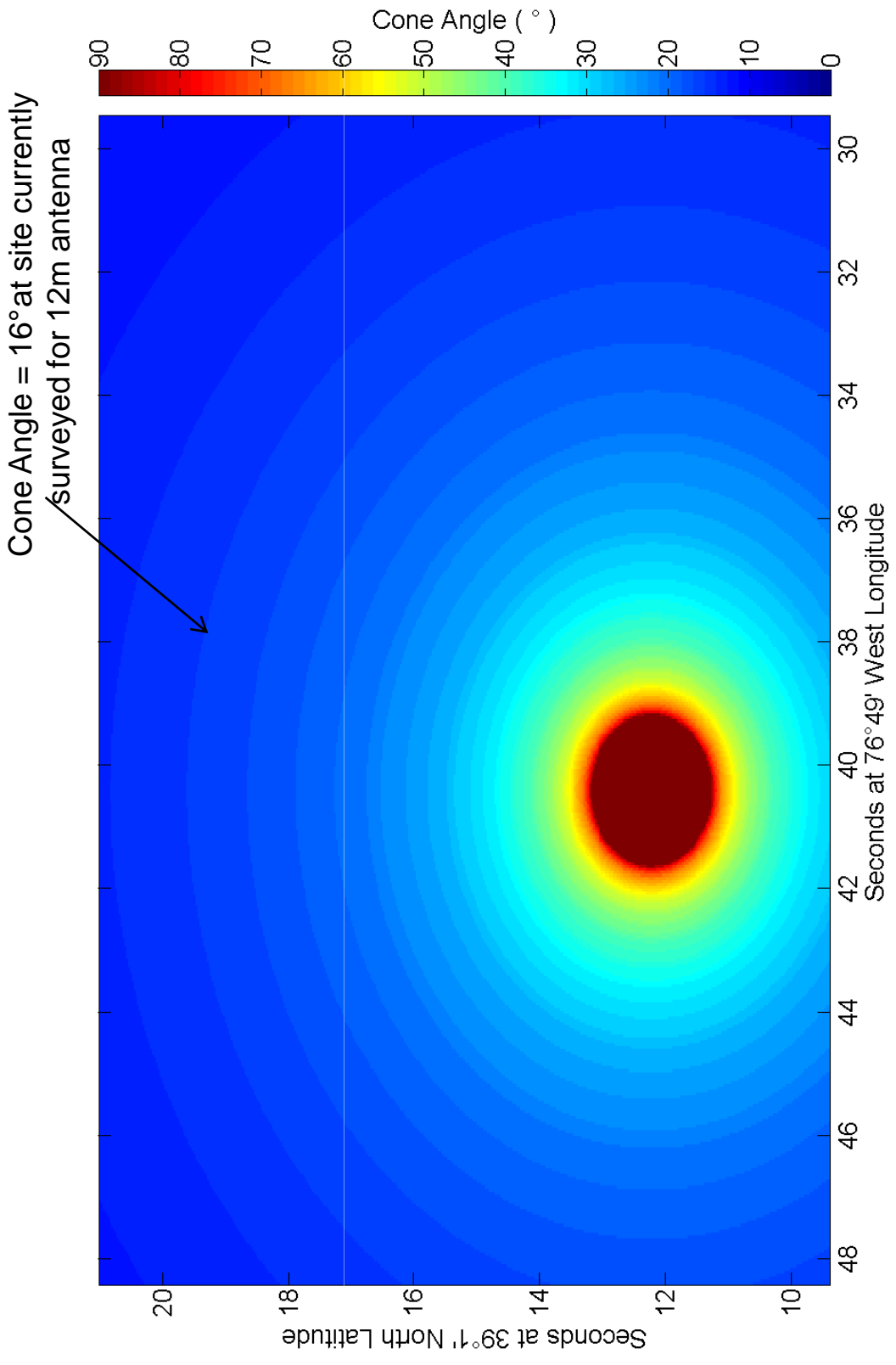
- **10 dB of saturation margin (overhead)**
 - Total received power (**TRP**) requirement is the saturation level (-40 dBm) less the overhead spec (10 dB) so the TRP requirement is -50 dBm.
- **No consideration of wavefront curvature across the 12m antenna**
 - This also serves to overestimate the cone angle requirement since nearfield curvature across the 12m aperture will result in power levels lower than those expected of a planar wavefront.
- **The receiving pattern of the 12m antenna is modeled as a uniformly illuminated aperture with 100% efficiency.**
 - This results in an Airy receiving pattern which is common to both azimuth and elevation dimensions and further overestimates the received power level since the aperture efficiency will undoubtedly (and unfortunately) not be 100%.
 - A uniformly illuminated aperture also possesses the worst-case sidelobe levels. There will undoubtedly be a taper across the 12m aperture and this will increase the magnitude of the rate at which the sidelobe levels decrease as a function of angle. Therefore the uniform aperture assumption also results in a conservative estimate of the cone angle.

Analysis

1. Calculate the source's Effective Isotropic Radiated Power (EIRP) in the direction of the 12m antenna
2. Given the EIRP, the boresight gain of the 12m antenna, and the sidelobe envelope of the assumed Airy receiving pattern, the total received power is determined as a function of azimuth/elevation angle.
3. The azimuth/elevation angle relative to the source at which the received power level meets the TRP specification is defined as the cone angle.
4. Outside the cone angle the received power level is below the TRP specification and this defines the range of angles relative to the source at which the broadband receiver is safe to operate
5. This process is repeated for each location in the specified area at GGAO and a map is generated to graphically represent the results

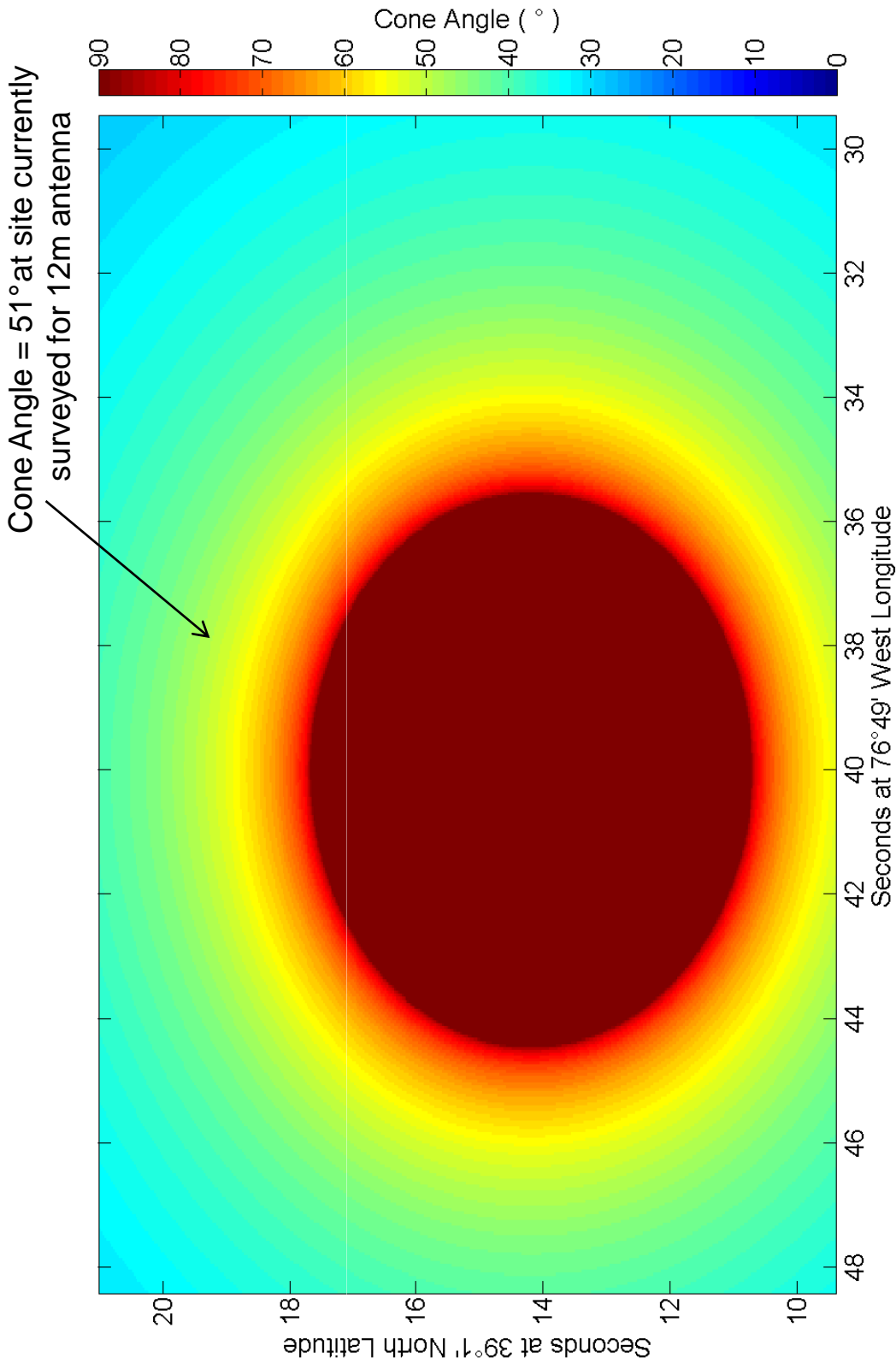
Results

-DORIS-



Results

-MOBLAS7 Radar-



Results

-NGSLR Radar-

