

5th COL Working Group Meeting



Combination at the
Observation Level
IERS Working Group

DORIS GRGS contribution to the COL campaigns CONT08 and CONT11

CNES/CLS Analysis Center

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We provides 6 weekly normal equations (grgAADDdw01.n7)

CONT08 (weeks 1492 1493 1494) spot-2, spot-4, spot-5, envisat, jason-2

CONT11 (weeks 1653 1654 1655) cryosat-2, spot-4, spot-5, envisat, jason-2

Weekly normal equation content:

- X,Y,Z coordinates for all stations: weekly parameters, epoch Wednesday 12:00
- X-pole, Y-pole, UT1UTC: 3h-parameters (piece-wise linear polygon)
- Nutation angles X, Y: 12h-parameters at 00:00 and 12:00
- Wet part of zenithal Troposphere Delays (1 biais per pass for all the stations, but passes of all satellites in the same hour are stacked; no gradients)

What's new in our DORIS processing?

We use GINS 12.3 version including:

- satellite maneuver thrusts taken into account
- CNES new phase law for STAREC antennas applied (*)
- 3h a priori values of the EOPs (two files provided by Daniel Gambis from Paris Observatory, one for CONT08 campaign and one for CONT11 campaign).
- NRO with Lagrangian interpolation
- Ray-Ponte atmospheric tide model (truncated at degree 10)

Data processed on 1-day arcs

() reference point and 2 GHz phase center not changed; the law should have been applied a 2GHz PC 1.7cm below the conventionnal PC.
A new phase law provided by CNES in April 2013 to be applied to the conventionnal PC*

Summary of standard changes for the last processings

	COL 2011	COL 2012 S1	COL 2012 S2
Polar tides	N/A	N/A	maree_polaire/desai2002
Gravity field	.champgtp.gin/data/potentiel/ EIGEN-GRGS.RL02MF	.lemoine.GRACE/COL20XX. GRAVITY_FIELD	.lemoine.GRACE/COL20XX. GRAVITY_FIELD
Atm. pressure	presatm/default	.biancale.gin.data.pression_ nulle	.biancale.gin.data.pression_ nulle
Atm. tides	marees_atm/ecmwf	.biancale.gin.data.marees.at mo_ray_ponte	marees_atm/ray_ponte_10
EOP	.geodexp.gin/data/pole/eop97 c04_itrf2008g	.geodexp.gin/data/pole/eop9 7c04_nro_itrf2008g	.loyer.COL_EXP/2012/POLE /c04_3h.dX_dY_2011.gins
Loading	charge/ocean/load_fes2004_i trf2005	.biancale.gin.data.charge.sc herneck	.biancale.gin.data.charge.sc herneck
	lkle9=501 ikle11=0	lkle9=21 ikle11=-1 DOR_PHASE_WIND_UP ON SYSREF NROXY LINEAR	lkle9=21 ikle11=-1 DOR_PHASE_WIND_UP ON SYSREF NROXY LAGRAN

	CONT08		CONT11	
SPOT2 : COL 2012 S2	21 arcs	0.377 mm/s	-	-
<i>COL 2012 S1</i>	<i>6 arcs</i>	<i>0.381</i>	-	-
<i>COL 2011</i>	<i>6 arcs</i>	<i>0.381</i>	-	-
SPOT4 : COL 2012 S2	20 arcs	0.368 mm/s	21 arcs	0.377 mm/s
<i>COL 2012 S1</i>	<i>7 arcs</i>	<i>0.370</i>	<i>6 arcs</i>	<i>0.385</i>
<i>COL 2011</i>	<i>7 arcs</i>	<i>0.387</i>	-	-
SPOT5 : COL 2012 S2	21 arcs	0.339 mm/s	21arcs	0.344 mm/s
<i>COL 2012 S1</i>	<i>6 arcs</i>	<i>0.335</i>	<i>6 arcs</i>	<i>0.348</i>
<i>COL 2011</i>	<i>6 arcs</i>	<i>0.353</i>	-	-
ENVISAT : COL 2012 S2	21 arcs	0.381 mm/s	20	0.378 mm/s
<i>COL 2012 S1</i>	<i>7 arcs</i>	<i>0.365</i>	<i>7 arcs</i>	<i>0.376</i>
<i>COL 2011</i>	<i>7 arcs</i>	<i>0.364</i>	-	-
JASON2 : COL 2012 S2	21 arcs	0.315 mm/s	21 arcs	0.315 mm/s
<i>COL 2012 S1</i>	<i>6 arcs</i>	<i>0.307</i>	<i>7 arcs</i>	<i>0.312</i>
<i>COL 2011</i>	<i>6 arcs</i>	<i>0.319</i>	-	-
CRYOSAT2 : COL 2012 S2	-	-	21 arcs	0.354 mm/s
<i>COL 2012 S1</i>	-	-	<i>6 arcs</i>	<i>0.338</i>

List of DORIS stations

Code	Domes
TLSB	10003S005 Toulouse
REZB	10202S003 Reykjavik
SPJB	10317S005 Ny-Alesund
METB	10503S015 Metsahovi
KIUB	12334S006 Kitab
BADB	12338S002 Badary
KRBB	12349S002 Krasnoyarsk (CONT11)
DIOB	12602S012 Dionysos
EVEB	21501S001 Everest (CONT11)
JIUB	21602S005 Jiufeng
MANB	22006S002 Manille
MALB	22901S002 Male (CONT08 & 11)
CICB	23101S002 Cibirong → CIBD 23101S003 (CONT11)
HBMB	30302S008 Hartebeesthoek
MATB	30313S003 Marion-Island
ASDB	30602S004 Ascension → ASEB 30602S005 (CONT11)
HEMB	30606S004 St-Helena
PDMB	31906S002 Ponta-Delgada
LICB	32809S004 Libreville
SALB	39601S002 Sal
MAHB	39801S005 Mahe
DJIB	39901S003 Djibouti
STJB	40101S002 St-Johns
YEMB	40127S009 Yellowknife
FAIB	40408S005 Fairbanks (CONT08)
KOLB	40424S009 Kauai
GREB	40451S176 Greenbelt
MOOB	40497S009 Monument Peak (CONT08)
SODB	40503S004 Socorro (CONT08)

Code	Domes
RIQB	41507S006 Rio-Grande
CADB	41609S002 Cachoeira
EASB	41703S009 Easter-Island
SANB	41705S009 Santiago
ARFB	42202S007 Arequipa
THUB	43001S005 Thule
COBB	49804S004 Cold Bay (CONT11)
MIAB	49914S003 Miami
YASB	50107S011 Yarragadee
MSPB	50119S004 Mount-Stromlo
CHAB	50207S001 Chatam
BETB	50305S001 Betio (CONT08 & 11)
SYPB	66006S003 Syowa
ROUB	66007S003 Rothera → ROVB 66007S004 (CONT11)
BEMB	66018S002 Belgrano
KETB	91201S005 Kerguelen
CRPB	91301S002 Crozet → CRQB 91301S003 (CONT11)
AMUB	91401S004 Amsterdam-Island → AMVB 91401S003 (CONT11)
ADFB	91501S003 Terre-Adelie → ADGB 91501S004 (CONT11)
PATB	92201S010 Papeete → PAUB 92201S010 (CONT11)
RIKB	92301S002 Rikitea (CONT08) → RIMB 92301S004 (CONT11)
NOWB	92701S003 Noumea → NOXB 92701S004 (CONT11)
FUTB	92902S001 Futuna
KRVB	97301S004 Kourou → KRWB 97301S006 (CONT11)
REUB	97401S002 La-Reunion

same DOMES number!!

BACK SLIDES

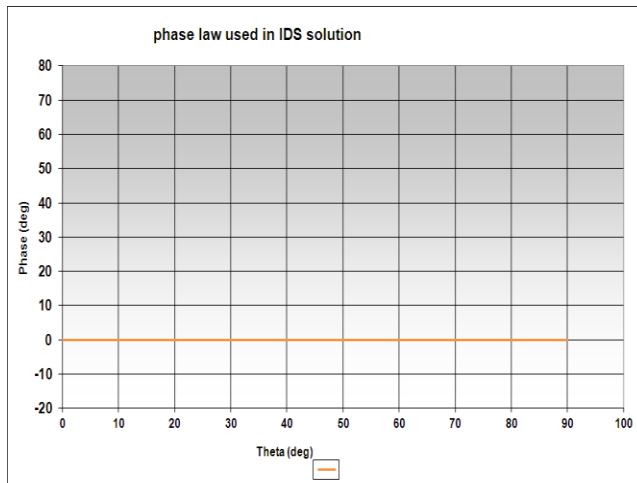
STAREC ground antennas RF characterization

CNES Latest analyses

3 characterizations are available/used

IDS characterization : C_IDS

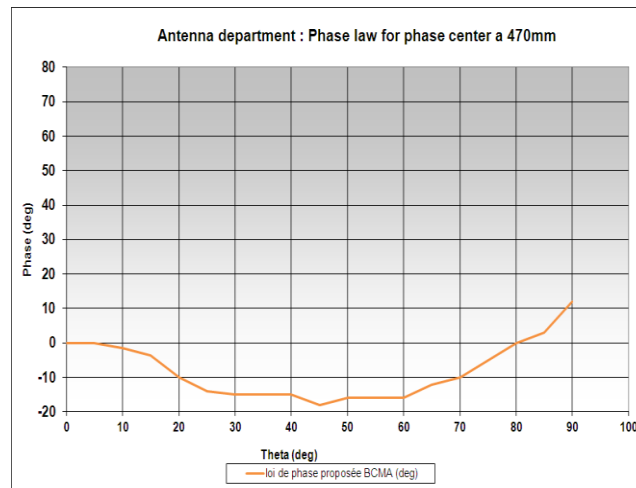
- ◆ Phase center position : 487 mm
- ◆ Phase law :



Phase law never has been applied by ACs

2011 antenna department characterization : C_ant_1:

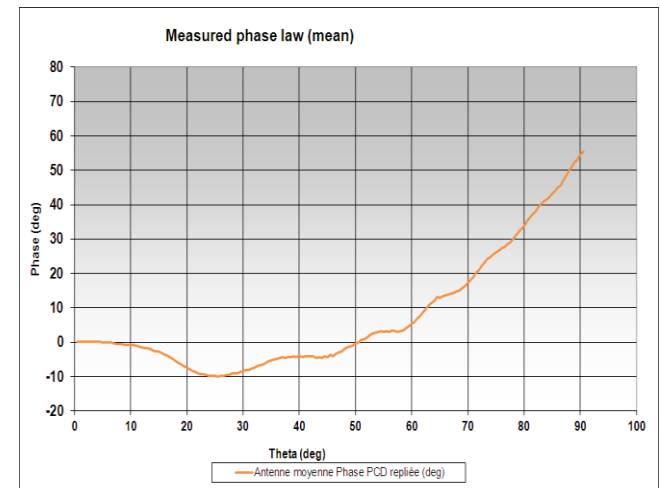
- ◆ Phase center position : 470 mm
- ◆ Phase law :



Phase law similar to manufacturer's PL but to be applied at PC 17 mm below conventionnal PC *

Latest characterization TBC : C_ant_2:

- ◆ Phase center position : 487 mm
- ◆ Phase law :



Different from manufacturer's PL but to be applied at conventionnal PC position (To Be Tested)

* NB: Manufacturer's PL designed from prototype antennas with PC ~10mm above PC of installed antennas

Summary of standard differences between IDS current processing and last processing for COL (2012 S2)

	IDS	COL 2012 S2
Polar tides	N/A	maree_polaire/desai2002
Gravity field	.doris.EIGEN-6S_c20corrected	.lemoine.GRACE/COL20XX.GRAVITY_FIELD
Atm. pressure	presatm/default	.biancale.gin.data.pression_nulle
Atm. tides	marees_atm/ecmwf	marees_atm/ray_ponte_10
EOP	. gnsexp.gin/dat/pole/POLE_NRO.dat	.loyer.COL_EXP/2012/POLE/c04_3h.dX_dY_2011.gins
Loading	. charge/ocean/load_fes2004_itrf2008	.biancale.gin.data.charge.scherneck
	Ik1e9=501 SYSREF NROXY LINEAR	Ik1e9=21 SYSREF NROXY LAGRAN