CONTO8 COL campaign 2008/08/10-2008/08/30	VLBI	VLBI
Analysis Center		
Name	**IVS AC DGFI**	**Observatoire Bordeaux**
Contact	heinkelmann@dgfi.badw.de	geraldine.bourda@obs-u.bordeaux1.fr
Software		
Name and version	OCCAM 6.1 LSM (LINUX)	GINS v 9.3
Satellite		
satellites included in weekly SINEX	no	VLBI sessions: IVS-R1, IVS-R4, CONT08
Arc cut		
Arc lengths	no	1 day
Handle of Manoeuvers	no	-
Handle of Data lacks	no	-
Additional margins	no	-
Reference System		
Polar motion and UT1 a priori	ICRF2	ICRF2
Polar motion and UT1 approach	IERS EOP 05 C04	IERS bulletin C04 consistent with ITRF2005, use of IERS 2003 Conventions
Nutation	offset + rate / day	piece wise linear polygon
Station coordinates and velocities	VTRF2008	ITRF2005
Displacement of reference		
Earth tides	IERS Conventions 2003	Wahr model (IERS Conventions 2003)
Atmospheric loading	Petrov&Boy (2004)	ECMWF-derived 3D pressure field at 6 hr interval
Ocean loading	FES2004	FES 2004 (all principal constituents, with admittance)
Hydrology loading	no	none

Pole tides	yes, linear mean pole	Solid Earth Pole tide from IERS2003
Satellite reference		
Mass and center of gravity	no	-
Satellite center of mass - antenna phase center correction	no	-
Attitude Model	no	-
Gravity		
Gravity field (static)	no	-
Gravity field (time varying)	no	-
Earth tides	no	IERS 2003 Solid Earth tides
Pole tide	no	Solid Earth Pole tide from IERS2003
Ocean tides	no	FES 2004 (all principal constituents, with admittance)
Atmospheric tides	no	derived from ECMWF model
Atmospheric gravity	no	-
Third bodies	no	Sun, Moon and major planets
Surface forces and		
Radiation Pressure model	no	-
Earth radiation	no	-
Atmospheric density model	no	-
Empirical forces	no	-

Measurements		

Troposphere correction	IERS Conventions 2003	ECMWF
Frequency	ionosphere dual band correction	1 tropospheric delay per hour + 1 clock break per hour
Relativity	IAU1997	Schwarzschild model + Lense-Thirring + geodetic precession
Weight	original weight from NGS file + data snooping	A priori: Troposheric delay variation < 10 cm; Clock break variation < 10 µs
Elevation angle cutoff	Tesmer (2004)	?
Downweighting law	Tesmer (2004)	-
vector from center of mass to center of phase	no	-
Datation bias (to compensate for along track inconsistency	no	-

Reduced Parameters		
Orbital elements	no	-
Clocks	yes	1 clock break per hour
Frequency	no	-
Troposphere	yes	-
Solar Radiation Pressure	no	-
Earth Radiation Pressure	no	-
Drag coefficients	no	-
empirical bias	no	-
empirical periodic	no	-

Parameters in SINEX		

Orbital elements	no	-
Clocks	no, pre-reduced	-
Frequency	no	-
Troposphere	no, but possible	1 zenithal tropospheric bias adjusted per hour
Solar Radiation Pressure	no	-
Earth Radiation Pressure	no	-
Drag coefficients	no	-
1/rev empiricals	no	-
Station Positions	yes	weekly X,Y,Z on Wednesday at 12:00
Station Velocities	no	-
Range biases	yes	Xp, Yp per 6hrs (0:00, 6:00, 12:00, 18:00)
Polar Motion	yes	UT1 per 6hrs (0:00, 6:00, 12:00, 18:00)
UT1	yes	Nutation per 12hrs (0:00, 12:00)
Nutation	no, but possible	-
Quasar coordinates	no	-
Gravity field		

	HARTRAO	7232	
List of Stations (DOMES and site, e.g. 10000M000 AAAA or 9999)	KOKEE	7298	
	MEDICINA	7230	
	NYALES20	7331	
	ONSALA60	7213	
	SVETLOE	7380	

TIGOCONC	7640
TSUKUB32	7345
WESTFORD	7209
WETTZELL	7224
ZELENCHK	7381

CONTO8 COL campaign 2008/08/10-2008/08/30	DORIS (+SLR from ENVISAT and JASON-2)	DORIS
Analysis Center		
Name	**ESA / ESOC**	**CNES/CLS**
Contact	Michiel Otten	laurent.soudarin@cls.fr
Software		
Name and version	NAPEOS 3.4.1	GINS v 9.2
Satellite		
satellites included in weekly SINEX	SPOT-2, -4, and -5, ENVISAT, JASON-2	Spot-2,-4,-5, Envisat, Jason-2
Arc cut		
Arc lengths	7-day	3.5 days nominally (minimum 1 day)
Handle of Manoeuvers		half day containing manoeuver not taken into account
Handle of Data lacks		half day containing data lacks higher than 3hrs not taken into account
Additional margins		3h
Reference System		
Polar motion and UT1 a priori	IERS2003 IAU2000A + dX and dY from Bulletin A	satellite orbite
Polar motion and UT1 approach	IERS2003 diurnal/semidiurnal variations (ortho_eop.f), and prograde diurnal polar motion (Pmsdnut.f).	IERS bulletin C04 consistent with ITRF2005, with IERS 1996 sub-daily corrections
Nutation	UT1 fixed. Other 5 estimated	piece wise linear polygon
Station coordinates and velocities	LPOD2005v15	DPOD2005 v1.4
Displacement of reference		
Earth tides	IERS2003 (dehanttideinel.f routine)	Wahr model (IERS Conventions 2003)
Atmospheric loading	No	ECMWF-derived 3D pressure field at 6 hr interval
Ocean loading	IERS2003 Chapter 7 (using hardips.f) FES2004 + CMC values from Ocean Loading service	FES 2004 (all principal constituents, with admittance)

Hydrology loading	No	none
Pole tides	IERS2003 using mean pole (Chapter 7 eqn 23a and 23b)	Solid Earth Pole tide from IERS2003
Satellite reference		
Mass and center of gravity		Post-Launch values + variations generated by Control Center
Satellite center of mass - antenna phase center correction		applied from CDDIS data files
Attitude Model		Nominal law for Jason2 and ENVISAT; SPOT satellites orientation is geocentric
Gravity		
Gravity field (static)	EIGEN-GLO5C 120x120	EIGEN-GL04S up to degree 99
Gravity field (time varying)	None in EIGEN-GLO5C, C21 and S21 according to IERS2003 p.57	Drift+Annual+Semiannual 50x50 from EIGEN-GL04S-ANNUAL
Earth tides	IERS2003 Chapter 6.1 anelastic Earth Tables 6.1, 6.3a, 6.3b, and 6.3c implemented	IERS 2003 Solid Earth tides
Pole tide	IERS2003 Chapter 6.2	Solid Earth Pole tide from IERS2003
Ocean tides	IERS2003 Chapter 6.4 using FES2004 spherical harmonics Same order/degree as gravity field	FES 2004 (all principal constituents, with admittance)
Atmospheric tides	No	derived from ECMWF model
Atmospheric gravity	Yes, from 6 hourly AGRA files from NCEP	ECMWF-derived 3D pressure field at 6 hr interval over land, inverted barometer model over the ocean
Third bodies	JPL DE405 Sun, Moon, and all planets	Sun, Moon, Venus, Mars, Saturn, Uranus, Neptune and Jupiter
Surface forces and empiricals		
Radiation Pressure model	Tailored model for ENVISAT Box-wing for all others	Thermo-optical coefficient from pre-launch box and wing model, with smoothed Earth shadow model

Earth radiation	Both Direct and IR modeled	Albedo and IR pressure values interpolated from ECMWF 6hr grids
Atmospheric density model	MSIS-90	DTM 94, with best available solar activity
Empirical forces	6 parameters per day: Ac, As, Cs, Cc Drag: 10 per day for Spot and Envisate. 4 per day for Jason-2	1/rev normal to the orbital plan ; 1/rev along track

Measurements		
Troposphere correction	Apriori: GPT + 0% humidity + Saastamoinen for Zenith delay. GMF-dry mapping function Estimation: Zenith delay every pass. GMF-wet mapping function	ZTD: derived from ECMWF; Mapping Function: Guo&Langley
Frequency		1 frequency bias per pass
Relativity		Schwarzschild model + Lense-Thirring + geodetic precession
Weight	0.5 mm/s for DORIS 50 mm for one-way SLR ranges	models: 0.3 mm/s; measurements: derived from observation standard deviation in data files
Elevation angle cutoff	10	12 degrees
Downweighting law	None	weight=weight*(elevation_in_degrees)**2/400
vector from center of mass to center of phase	Station Specific	none
Datation bias (to compensate for along-track inconsistency of Doris orbits wrt SLR/GPS measurements)	TBD	none

Reduced Parameters		

Orbital elements	Yes, free of constraints	initial position (X,Y,Z) and velocity (Vx, Vy,Vz) in J2000 inertial frame
Clocks		-
Frequency		1 frequency bias adjusted per pass
Troposphere	Yes, free of constraints	-
Solar Radiation Pressure	Yes, free of constraints	one scale coefficient adjusted per arc
Earth Radiation Pressure		
Drag coefficients	Yes, free of constraints	Adjusted; Spots, Envisat: 1 coef/4 hours ; Topex,Jason: 1 coef/half day
empirical bias	Yes, free of constraints	-
empirical periodic	Yes, free of constraints	2 coeff cos-sin at the orbital period in normal direction per day; 2 coeff cos-sin at the orbital period in tangential direction per day

Parameters in SINEX		
Orbital elements		-
Clocks		-
Frequency		-
Troposphere		1 zenithal tropospheric bias adjusted per pass
Solar Radiation Pressure		-
Earth Radiation Pressure		-
Drag coefficients		-
1/rev empiricals		-
Station Positions	Yes	weekly X,Y,Z on Wednesday at 12:00
Station Velocities		-

Range biases	Yes	Xp, Yp per 6hrs (0:00, 6:00, 12:00, 18:00)
Polar Motion	Yes	UT1 per 6hrs (0:00, 6:00, 12:00, 18:00)
UT1		Nutation per 12hrs (0:00, 12:00)
Nutation		-
Quasar coordinates		-
Gravity field		
List of Stations (DOMES and site, e.g. 10000M000 AAAA or 9999)	**Will be provided when processing is done**	

CONTO8 COL campaign 2008/08/10-2008/08/30	GPS / GLONASS	GNSS (+SLR from GNSS targets)	GNSS	GNSS

Analysis Center				
Name	**Astronomical Institute, University Bern (AIUB)**	**ESA / ESOC**	**CNES/CLS**	**GFZ German Research Centre for Geosciences**
Contact	Daniela Thaller,	Tim Springer	sylvain.loyer@cls.fr	Rolf Koenig, koenigr@gfz-
Software				
Name and version	Bernese GPS Software,	NAPEOS 3.4.1	GINS v 9.2	EPOS-OC 06.61
Satellite				
satellites included in weekly SINEX	GPS and GLONASS	All GPS and GLONASS	GPS satellites	GRACE-A, GRACE-B, GPS-1 to GPS-32
Arc cut				
Arc lengths	3-day	1-day	1 day	1 d
Handle of Manoeuvers	arc split		going through or eliminate the satellite	
Handle of Data lacks	no special handling		going through or eliminate the satellite	
Additional margins			3 h	
Reference System				
Polar motion and UT1 a priori	IERS C04 linearly interpolated for PM and UT1R (sub-daily model: IERS2003)	IERS2003 IAU2000A + dX and dY from Bulletin A	satellite orbite	
Polar motion and UT1 approach	piece-wise linear polygon	IERS2003 diurnal/semidiurnal variations (ortho_eop.f), and prograde diurnal polar motion (Pmsdnut.f). Aprior values from Bulletin A.	IERS bulletin C04 consistent with ITRF2005, use of IERS 2003 Conventions	EOP05C04

Nutation	IAU2000A (w/o free-core nutation)	UT1 fixed. Other 5 estimated	piece wise linear polygon	Piece-wise linear and continuous
Station coordinates and velocities	a priori: IGS05	IGS05P23 and ESA internal values	ITRF2005	ITRF2000/IGS2000
Displacement of				
Earth tides	IERS Conventions 2003	IERS2003 (dehanttideinel.f routine)	Wahr model (IERS Conventions 2003)	IERS Conventions 2003
Atmospheric loading	not applied	No	None	not applied
Ocean loading	FES2004	IERS2003 Chapter 7 (using hardips.f) FES2004 + CMC values from Ocean Loading service	FES 2004 (all principal constituents, with admittance)	not applied
Hydrology loading	not applied	No	none	not applied
Pole tides	IERS Conventions 2003	IERS2003 using mean pole (Chapter 7 eqn 23a and 23b)	Solid Earth Pole tide from IERS2003	IERS Conventions 2003
Satellite reference				
Mass and center of gravity			No variations	see SINEX
Satellite center of mass - antenna	igs05.atx	From igs05.atx	ANTEX05	igs05.atx
Attitude Model	not used	Nominal	Nominal	GPS: standard. GRACE-A/-B: measured
Gravity				
Gravity field (static)	JGM3 up to degree/order 12 (additionally: C21, S21)	EIGEN-GLO5C 12x12	EIGEN-GL04S up to degree 12	EIGEN-GL04C (120x120)
Gravity field (time varying)	C20	None in EIGEN-GLO5C, C21 and S21 according to IERS2003 p.57	Drift+Annual+Semiannual 12x12 from EIGEN-GL04S-ANNUAL	AOD1B GRACE RL04
Earth tides	TIDE2000	IERS2003 Chapter 6.1 anelastic Earth Tables 6.1, 6.3a, 6.3b, and 6.3c implemented	IERS 2003 Conventions	IERS Conventions 2003
Pole tide	IERS Conventions 2003	IERS2003 Chapter 6.2	IERS 2003 Conventions	IERS Conventions 2003

Ocean tides	CSR3.0	IERS2003 Chapter 6.4 using FES2004 spherical harmonics Same order/degree as gravity field	FES 2004 (all principal constituents, with admittance)	FES2004
Atmospheric tides	not applied	No		Bode&Biancale 2003
Atmospheric gravity	not applied	No		AOD1B GRACE RL04
Third bodies	Sun, moon, Jupiter, Venus, Mars according to JPL DE405	JPL DE405 Sun, Moon, and all planets	Sun, Moon and major planets	Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptun; JPL DE405
Surface forces and				
Radiation Pressure model	CODE model	None	B&W model	GPS: standard. GRACE-A/-B: accelerometer measurements
Earth radiation	not applied		Albedo and IR pressure values interpolated from ECMWF 6hr grids	GPS: non. GRACE-A/-B: accelerometer measurements
Atmospheric density model	not applied	n/a	None	GPS: non. GRACE-A/-B: accelerometer measurements
Empirical forces	estimated: constant for D, Y, X; once-per-rev for X	5 Bernese parameters per day: D0, Y0, B0, Bc, Bs	Y-bias + 1/rev in the perpendicular plane + stochastics pulses for eclipsing satellites	applied

Measurements				

Troposphere correction	apriori model: Saastamoinen-based hydrostatic (using GPT) mapped with the dry-GMF; estimation: zenith delay (every 2h) using wet GMF mapping function; horizontal gradients (every 24 h)	Apriori: GPT + 0% humidity + Saastamoinen for Zenith delay. GMF-dry mapping function Estimation: Zenith delay piece wise linear every 2 hours. GMF-wet mapping function	ZTD: derived from ECMWF; Mapping Function: Guo&Langley	GMF, scaling factors estimated
Frequency	ionosphere-free		1 ambiguity per pass (if not fixed), 1 clock per epoch per rec. and emitter	GPS: Ionosphere free L3, all clocks estimated
Relativity	Periodic, dynamical (IERS 2003) and Shapiro		Schwarzschild model + Lense-Thirring + geodetic precession	applied
Weight	6 mm for double-differenced ionosphere-free phase observation at zenith	10 mm for carrier phase Zenith observations 1 m for pseudo range Zenith observations 50 mm for one-way SLR ranges	phase 3.5 mm / code 35 cm	Ground code 1.000 m, ground phase 0.010 m, onboard code 0.700 m, onboard phase 0.007 m
Elevation angle cutoff	3 degree	10	10 degrees	10 deg
Downweighting law	elevation-dependent: 1 / cos(z)**2	Observation sigma increases with decreasing elevation using: sigma = sigma0 / sin(Elevation)	Elevation dependant for range only	
vector from center of mass to center of phase	igs05.atx	Station specific antenna heights + igs05.atx		
Datation bias (to compensate for along-track inconsistency of Doris orbits wrt SLR/GPS measurements)	-	n/a		

Reduced				
Orbital elements	yes	Yes, free of constraints	initial position (X,Y,Z) and velocity (Vx, Vy,Vz) in J2000 inertial frame	yes
Clocks	yes	Yes, with 1 microsecond constraint (300 meter)	1 clock per epoch per rec. and emitter	yes
Frequency			-	
Troposphere		Yes, free of constraints	-	yes
Solar Radiation Pressure	yes	Yes, free of constraints	one scale coefficient adjusted per arc	yes
Earth Radiation Pressure			-	
Drag coefficients			-	
empirical bias	yes	Yes, free of constraints	1 ambiguity per pass (if not fixed)	yes
empirical periodic	yes	Yes, free of constraints	Empirical forces	yes

Parameters in				
Orbital elements				
Clocks				
Frequency				
Troposphere	yes		1 zenithal tropospheric bias adjusted per pass	
Solar Radiation Pressure				
Earth Radiation Pressure				
Drag coefficients				
1/rev empiricals				
Station Positions	yes	Yes	weekly X,Y,Z on Wednesday at 12:00	yes
Station Velocities				
Range biases		Yes		yes
Polar Motion	yes	Yes	Xp, Yp per 6hrs (0:00, 6:00, 12:00, 18:00)	yes
UT1	yes		UT1 per 6hrs (0:00, 6:00, 12:00, 18:00)	

Nutation	yes		Nutation per 12hrs (0:00, 12:00)	
Quasar coordinates				
Gravity field				

List of Stations (DOMES and site,	**223 sites**	**Will be provided when processing is done**		

ABPO 33302M001
ADE1 50109S001
ADE2 50109S001
ADIS 31502M001
ALBH 40129M003
ALGO 40104M002
ALIC 50137M001
ALRT 40162M001
AMC2 40472S004
ANKR 20805M002
AREQ 42202M005
ARTU 12362M001
AUCK 50209M001
BAKO 23101M002
BDOS 43401M001
BHR1 24901M002
BHR2 24901M002
BJFS 21601M001
BOGO 12207M002
BOGT 41901M001
BOR1 12205M002
BRAZ 41606M001
BRMU 42501S004
BRST 10004M004
BRUS 13101M004
BUE1 41505S007
BUE2 41505S007
CAGL 12725M003
CAGZ 12725M004
CAS1 66011M001

amc2
areq
artu
auck
bjfs
bogt
bor1
braz
cas1
cedu
chat
cic1
cnmr
coco
cro1
darw
dav1
dgar
drag
fair
gmas
gold
graz
guam
guug
hers
hob2
hrao
iisc
irkt

CCJM 21732S003
CEDU 50138M001
CHAT 50207M001
CHPI 41609M003
CHTI 50242M001
CHUR 40128M002
COCO 50127M001
CONZ 41719M002
CRAR 66001M004
CRO1 43201M001
DAEJ 23902M002
DARW 50134M001
DAV1 66010M001
DAVR 66010M001
DGAR 30802M001
DRAO 40105M002
DUBO 40137M001
EIL1 49805S001
EIL2 49805S001
FAA1 92201M012
FAIR 40408M001
FLIN 40135M001
GANP 11515M001
GLSV 12356M001
GODE 40451M123
GODZ 40451M123
GOLD 40405S031
GOPE 11502M002
GOUG 30608M001
GRAS 10002M006
GRAZ 11001M002
GUAM 50501M002
GUAT 40901S001
HARB 30302M009
HERS 13212M007
HERT 13212M010
HOB2 50116M004

ispa
jab1
jplm
karr
kerg
kokb
kour
kunm
lae1
lpgs
mac1
mad2
mali
mate
maw1
mcm4
mdo1
mets
mkea
ntus
nyal
pert
petp
pimo
pol2
pots
quin
ramo
rbay
reun
rio2
sant
sey1
stjo
suth
syog
thti

HOFN 10204M002
HOLM 40148M001
HRAO 30302M004
HRM1 13235S001
HRM2 13235S001
HYDE 22307M001
IISC 22306M002
INVK 40150M001
IRKJ 12313M002
IRKT 12313M001
ISPA 41703M007
JAB1 50136M001
JOZ2 12204M002
JOZE 12204M001
JPLV
KARR 50139M001
KELY 43005M002
KERG 91201M002
KHAJ 12361M001
KIR0 10422M001
KIT3 12334M001
KOKB 40424M004
KOSG 13504M003
KOUR 97301M210
KUNM 21609M001
LAMA 12209M001
LHAZ 21613M002
LPAL 81701M001
LPGS 41510M001
MAC1 50135M001
MAL2 33201M003
MALI 33201M001
MANA 41201S001
MAS1 31303M002
MAT1 12734M009
MATE 12734M008
MAW1 66004M001

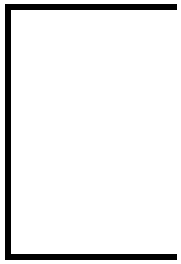
tidb
tow2
tro1
urum
usn3
usno
usud
vill
whit
wsrt
wuhn
yakt
yibl
yssk

MBAR 33901M001
MCCJ
MCM4 66001M003
MDO1 40442M012
MEDI 12711M003
METS 10503S011
METZ 10503M005
MIZU 21702M002
MKEA 40477M001
MOBJ 12365M002
MONP 40497M004
MORP 13299S001
MTKA 21741S002
NICO 14302M001
NISU 49507M001
NKLG 32809M002
NLIB 40465M001
NOT1 12717M004
NOVM 12367M002
NRC1 40114M001
NRIL 12364M001
NRMD 92701M005
NSSP 12312M001
NTUS 22601M001
NYA1 10317M003
OHI2 66008M005
OHI3 66008M006
ONSA 10402M004
OPMT 10001S006
OSN1 23904S001
PADO 12750S001
PARK 50108M001
PDEL 31906M004
PENC 11206M006
PERT 50133M001
PETP 12355M002
PIE1 40456M001

PIMO 22003M001
POL2 12348M001
POTS 14106M003
PRE1 30310S001
PRE2 30310S001
PTBB 14234M001
QAQ1 43007M001
QUI1 42003S003
QUI2 42003S003
QUIN 40433M004
RABT 35001M002
RAMO 20703S001
RBAY 30315M001
RCMN 33203M001
RESO 40149M001
REUN 97401M003
REYK 10202M001
RIO2 41507M006
RIOP 42006M001
SANT 41705M003
SCH2 40133M002
SCUB 40701M001
SELE 12352M001
SEY1 39801M001
SFER 13402M004
SHAO 21605M002
SIMO 30307M001
SOFI 11101M002
SSIA 41401S001
STJO 40101M001
STR2 50119M001
SUNM 50143M001
SUTH 30314M002
SUWN 23903M001
SYDN 50124M003
SYOG 66006S002
TAH1 92201S011

TAH2 92201S011
THTI 92201M009
THU2 43001M002
THU3 43001M002
TIDB 50103M108
TIXI 12360M001
TIXJ 12360M002
TLSE 10003M009
TOW2 50140M001
TRO1 10302M006
TSKB 21730S005
TWTF 23603S002
UNB3 40146M002
UNBJ 40146M002
UNBN 40146M002
UNBT 40146M002
UNSA 41514M001
USNO 40451S003
USUD 21729S007
VESL 66009M001
VILL 13406M001
WDC3 40451S008
WDC4 40451S008
WEL1 50208S003
WEL2 50208S003
WES2 40440S020
WHIT 40136M001
WILL 40134M001
WSRT 13506M005
WTZJ 14201M012
WTZL 14201M022
WTZR 14201M010
WTZZ 14201M014
WUHN 21602M001
YAKT 12353M002
YAR2 50107M004
YAR3 50107M008

YELL 40127M003
YIBL 25001M001
YSSK 12329M003
ZECK 12351M001
ZIM2 14001M008
ZIMJ 14001M006
ZIMM 14001M004
ZWE2 12330M003



CONTO8 COL campaign 2008/08/10-2008/08/30	SLR	SLR	SLR	SLR	SLR
Analysis Center					
Name	**AIUB and BKG**	**ESA / ESOC**	**DGFI**	**OCA**	**GFZ German Research Centre for Geosciences**
Contact	Daniela Thaller, thaller@aiub.unibe.ch	Tim Springer Michiel Otten	mueller@dgfi.badw.de	florent.deleflie@obs-azur.fr	Rolf Koenig, koenigr@gfz-potsdam.de
Software					
Name and version	Bernese GPS Software, SLR	NAPEOS 3.4.1	DOGS-OC 5.0	GINS v 9.2	EPOS-OC 06.61
Satellite					
satellites included in weekly SINEX	Lageos-1 and -2	Lageos-1 and -2, Etalon-1, and -2	Lageos-1/2, Etalon-1/2	LA1, LA1 (ET1, ET2, STA, STE)	GRACE-A, GRACE-B, GPS-5, GPS-6
Arc cut					
Arc lengths	7-day	7-day	7 days	7days	1 d
Handle of Manoeuvers	-		n.a.	N.A.	
Handle of Data lacks	no special handling		use stations with min. 10 obs. Only	N.A.	
Additional margins				1day	
Reference System					
Polar motion and UT1 a priori	IERS C04 linearly interpolated for PM and UT1R (sub-daily model: IERS2003)	IERS2003 IAU2000A + dX and dY from Bulletin A		satellite orbite	

Polar motion and UT1 approach	piece-wise linear polygon	IERS2003 diurnal/semidiurnal variations (ortho_eop.f), and prograde diurnal polar motion (Pmsdnut.f).	IERS 05 C04, USNO finals daily	IERS bulletin C04 consistent with ITRF2005 use of IERS 2003 Conventions	EOP05C04
Nutation	IAU2000A (w/o free-core nutation)	UT1 fixed. Other 5 estimated	pole offsets, LOD (per day)	piece wise linear polygon	Piece-wise linear and continuous
Station coordinates and velocities	a priori: SLRF2005	LPOD2005v15	SLRF2005	ITRF2005 (SLR rescaled)	ITRF2000
Displacement of					
Earth tides	IERS Conventions 2003	IERS2003 (dehanttideinel.f routine)	IERS Conventions 2003	Wahr model (IERS Conventions 2003)	IERS Conventions 2003
Atmospheric loading	not applied	No	no	None	not applied
Ocean loading	FES2004	IERS2003 Chapter 7 (using hardips.f) FES2004 + CMC values from Ocean Loading service	GOT00b (Scherneck)	FES 2004 (all principal constituents, with admittance)	not applied
Hydrology loading	not applied	No	no	none	not applied
Pole tides	IERS Conventions 2003	IERS2003 using mean pole (Chapter 7 eqn 23a and 23b)	applied, linear mean pole	Solid Earth tide from IERS2003	IERS Conventions 2003
Satellite reference					
Mass and center of gravity			acc. ILRS table	No variations	see SINEX
Satellite center of mass - antenna phase center correction	station-dependent CoM values for both Lageos	Lageos = 0.251 m (for HERS/7840 0.245 m) Etalon = 0.576 m	acc. ILRS table	ILRS AWG recommendations	

Attitude Model	-	None	no	N.A.	GPS: standard. GRACE-A/-B: measured
Gravity					
Gravity field (static)	EIGEN-GL04C up to degree/order 50	EIGEN-GLO5C 20x20	GGM02S, up to 30/30	EIGEN-GL04S up to degree 40	EIGEN-GL04C (120x120)
Gravity field (time varying)	C20, C30, C40 according to EIGEN specs	None in EIGEN-GLO5C, C21 and S21 according to IERS2003 p.57	J2	Drift+Annual+Semiannual 40x40 from EIGEN-GL04S_annual	AOD1B GRACE RL04
Earth tides	TIDE2000	IERS2003 Chapter 6.1 anelastic Earth Tables 6.1, 6.3a, 6.3b, and 6.3c implemented	Wahr model	IERS 2003 Conventions	IERS Conventions 2003
Pole tide	IERS Conventions 2003	IERS2003 Chapter 6.2	applied	IERS 2003 Conventions	IERS Conventions 2003
Ocean tides	CSR4.0	IERS2003 Chapter 6.4 using FES2004 spherical harmonics	GOT.00b	FES 2004 (all principal constituents, with admittance)	FES2004
Atmospheric tides	not applied	No		N.A.	Bode&Biancale 2003
Atmospheric gravity	not applied	No		N.A.	AOD1B GRACE RL04
Third bodies	Sun, moon, Jupiter, Venus, Mars according to JPL DE405	JPL DE405 Sun, Moon, and all planets	Sun,Moon, Planets to Jupiter, JPL DE405	Sun, Moon, and major planets (de421)	Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptun; JPL DE405
Surface forces and empiricals					

Radiation Pressure model	apriori: Cr = 1.13; constant correction estimated	Lageos Cr = 1.13 Etalon-1 Cr = 1.25 Etalon-2 Cr = 1.28	applied	spherical model	GPS: standard. GRACE-A/-B: accelerometer measurements
Earth radiation	not applied		Knocke CSR	Albedo and IR pressure values interpolated from ECMWF 6hr grids	GPS: non. GRACE-A/-B: accelerometer measurements
Atmospheric density model	not applied	n/a		N.A.	GPS: non. GRACE-A/-B: accelerometer measurements
Empirical forces	estimated: along-track (constant, once-per-rev), cross-track (once-per-rev)	Lageos 5 parameters per week: A0, Ac, As, C0, Cc, Cs Etalon 3 parameters per week: A0, Ac, As	along-, cross track	Radial direction: 1 bias + 1/rev, Normal direction: 1 bias / arc	applied

Measurements					
Troposphere correction	Mendes-Pavlis model; using meteorology data delivered within quicklook files	Mendis-Pavlis with meteo data from SLR quicklook data	Mendes-Pavlis	Mendes-Pavlis correction - **ZTD ?**	Mendes-Pavlis 2004
Frequency	according to stations			Station bias: ILRS AWG recommendation	no
Relativity	Periodic, dynamical (IERS 2003) and Shapiro		IERS Conventions 2003	Schwarzschild model + Lense-Thirring + geodetic precession	applied
Weight	1 cm	50 mm for one-way SLR ranges		N.A. **(1 cm ?)**	0.010 m

Elevation angle cutoff	3 degree	10	not used	10 degrees	10 deg
Downweighting law	no	None	no	N.A.	
vector from center of mass to center of phase	ILRS specifications	Station Specific	acc. ILRS table	N.A.	
Datation bias (to compensate for along-track inconsistency of Doris orbits wrt SLR/GPS		n/a		N.A.	

Reduced Parameters					
Orbital elements	yes	Yes, free of constraints	x	initial position (X,Y,Z) and velocity (Vx, Vy, Vz) in J2000 inertial frame	yes
Clocks				N.A.	
Frequency				N.A.	
Troposphere				N.A.	
Solar Radiation Pressure	yes		x	one scale coefficient adjusted per arc	
Earth Radiation Pressure				N.A.	
Drag coefficients				N.A.	
empirical bias	yes	Yes, free of constraints	x	Radial direction: 1 bias + 1/rev, Normal direction: 1 bias	

empirical periodic	yes	Yes, free of constraints	x	N.A.	

Parameters in SINEX					
Orbital elements					
Clocks					
Frequency					
Troposphere				**?**	
Solar Radiation Pressure					
Earth Radiation Pressure					
Drag coefficients					
1/rev empiricals					
Station Positions	yes	Yes	x	weekly X,Y,Z on Wednesday at 12:00	yes
Station Velocities					
Range biases	yes	Yes	x	Xp, Yp per 6hrs (0:00, 6:00, 12:00, 18:00)	yes
Polar Motion	yes	Yes	LOD	UT1 per 6hrs (0:00, 6:00, 12:00, 18:00)	yes
UT1	yes			Nutation per 12hrs (0:00, 12:00)	
Nutation					
Quasar coordinates					

Gravity field		

List of Stations (DOMES and site, e.g. 10000M000 AAAA or 9999)	25 sites	Will be provided when processing is done		ILRS AWG recommendations	
	1831 12368S001		10002S002		1873
	1884 12302S002		11001S002		1893
	1893 12337S006		12000S000		7080
	7090 50107M001		12205S001		7090
	7105 40451M105		12302S002		7105
	7110 40497M001		12337S003		7237
	7119 40445M004		12337S006		7501
	7124 92201M007		12340S002		7810
	7237 21611S001		12341S001		7832
	7308 21704S002		12356S001		7839
	7403 42202M003		12368S001		7840
	7405 41719M001		12372S001		7941
	7406 41508S003		12734S008		8834
	7501 30302M003		13212S001		
	7810 14001S007		13402S007		
	7811 12205S001		14001S007		
	7821 21605S010		14106S011		
	7824 13402S007		14201S018		
	7825 50119S003		20101S001		
	7832 20101S001		21601S004		
	7839 11001S002		21605S010		
	7840 13212S001		21609S002		
	7841 14106S011		21611S001		
	7941 12734S008		21704S002		
	8834 14201S018		21726S001		
			21749S001		
			30302M003		

40442M006
40445M004
40451M105
40497M001
41508S003
41719M001
42202M003
50107M001
50119S003
92201M007