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: Iononsphere 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			amc2
	ADE1 50109S001			areq
	ADE2 50109S001			artu
	ADIS 31502M001			auck
	ALBH 40129M003			bjfs
	ALGO 40104M002			bogt
	ALIC 50137M001			bor1
	ALRT 40162M001			braz
	AMC2 40472S004			cas1
	ANKR 20805M002			cedu
	AREQ 42202M005			chat
	ARTU 12362M001			cic1
	AUCK 50209M001			cnmr
	BAKO 23101M002			coco
	BDOS 43401M001			cro1
	BHR1 24901M002			darw
	BHR2 24901M002			dav1
	BJFS 21601M001			dgar
	BOGO 12207M002			drag
	BOGT 41901M001			fair
	BOR1 12205M002			gmas
	BRAZ 41606M001			gold
	BRMU 42501S004			graz
	BRST 10004M004			guam
	BRUS 13101M004			guug
	BUE1 41505S007			hers
	BUE2 41505S007			hob2
	CAGL 12725M003			hrao
	CAGZ 12725M004			iisc
	CAS1 66011M001			irkt

CCJM 21732S003	ispa
CEDU 50138M001	jab1
CHAT 50207M001	jplm
CHPI 41609M003	karr
CHTI 50242M001	kerg
CHUR 40128M002	kokb
COCO 50127M001	kour
CONZ 41719M002	kunm
CRAR 66001M004	lae1
CRO1 43201M001	lpgs
DAEJ 23902M002	mac1
DARW 50134M001	mad2
DAV1 66010M001	mali
DAVR 66010M001	mate
DGAR 30802M001	maw1
DRAO 40105M002	mcm4
DUBO 40137M001	mdo1
EIL1 49805S001	mets
EIL2 49805S001	mkea
FAA1 92201M012	ntus
FAIR 40408M001	nyal
FLIN 40135M001	pert
GANP 11515M001	petp
GLSV 12356M001	pimo
GODE 40451M123	pol2
GODZ 40451M123	pots
GOLD 40405S031	quin
GOPE 11502M002	ramo
GOUG 30608M001	rbay
GRAS 10002M006	reun
GRAZ 11001M002	rio2
GUAM 50501M002	sant
GUAT 40901S001	sey1
HARB 30302M009	stjo
HERS 13212M007	suth
HERT 13212M010	syog
HOB2 50116M004	thti

HOFN 10204M002	tidb
HOLM 40148M001	tow2
HRAO 30302M004	tro1
HRM1 13235S001	urum
HRM2 13235S001	usn3
HYDE 22307M001	usno
IISC 22306M002	usud
INVK 40150M001	vill
IRKJ 12313M002	whit
IRKT 12313M001	wsrt
ISPA 41703M007	wuhn
JAB1 50136M001	yakt
JOZ2 12204M002	yibl
JOZE 12204M001	yssk
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	

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

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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
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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

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