IDS, IGS, ILRS, IVS & COL standards to get ready for the GRGS contribution to ITRF2013

Gravitational Dynamic	DORIS	GNSS	SLR	VLBI	COL
Geopotential	EIGEN-6S2 up to degree 95 including time variable terms up to degree 50 (bias & drift per yr from 2002 to 2012, periodic 18.6, 1, 0.5 yrs)	EIGEN-6S2 up to degree 12	EIGEN-6S2 up to degree 30 (for LAGEOS)		Static gravity field model is based on EIGEN-GRGS.RL02, tide-free, complete to degree and order 2 up to 160 ftp://hpiers.obspm.fr/iers/eop/grgs/Models/Gravity_Field/
Third-body	JPL DE421	JPL DE421	JPL DE421	JPL DE421	JPL DE405
Solid Earth Tides	IERS 2010 standards	IERS 2010 standards	IERS 2010 standards		IERS 2010 standards
Ocean Tides	FES 2012 (32 principal waves, + 60 admittance waves) up to degree 50	FES 2012 (32 principal waves, + 60 admittance waves) up to degree 12	FES 2012 (32 principal waves, + 60 admittance waves) up to degree 20		FES 2004 ftp://hpiers.obspm.fr/iers/eop/grgs/Models/Ocean_Tide_Loading/
Atmospheric gravity	3hr ERA-interim / ECMWF up to degree 50	3hr ERA-interim / ECMWF up to degree 12	3hr ERA-interim / ECMWF up to degree 20		none (integrated into the geopotential)
Non tidal oceanic gravity	TUGO R12 up to degree 50	TUGO R12 up to degree 12	TUGO R12 up to degree 20		none (integrated into the geopotential)
Atmospheric tides	none (considered through the ECMWF atmospheric data)	none	none		Ray & Ponte 2003 ftp://hpiers.obspm.fr/iers/eop/grgs/Models/Atmospheric_Tide/
Earth pole tide	IERS2010 standards	IERS2010 standards	IERS2010 standards		IERS2010 standards
Ocean Pole Tide	Desai 2002 up to degree 12	Desai 2002 up to degree 12	Desai 2002 up to degree 12		Desai 2002 up to degree 12

Non Gravitational Dynamic	DORIS	GNSS	SLR	VLBI	COL
Atmospheric drag	DTM2012 (with Am indices) Spots, Envisat, Cryosat2, HY-2A: one coef/4 hrs (one/1hr in high solar activity periods) ; Topex, Jasons: one coef/half day		DTM2012 None for Lageos		JB2008
Solar radiation pressure	one coef/day strongly constrained (1.e-4) to: 0.98 for Topex; 1.15 for Spot-2; 1.16 for Spot-3/-4; 1.17 for Spot-5; 1.29 for Envisat; 0.97 for Jason-2; 0.85 for Cryosat-2; 1.13? for HY-2A	one coefficient adjusted per day?	one scale coefficient adjusted per arc		applied
Albedo + infra-red	interpolated from grids issued from ECMWF 6hr 4.5°grids	interpolated from grids issued from ECMWF 6hr 9°grids	interpolated from grids issued from ECMWF 6hr 9°grids		applied
Satellite emissivity	none	none	none		none
Relativity	Schwarzschild model + Lense-Thirring + geodetic precession	Schwarzschild model + Lense-Thirring + geodetic precession	Schwarzschild model + Lense-Thirring + geodetic precession	IERS 2010 standards	Schwarzschild model + Lense-Thirring + geodetic precession
Hill/empirical	once/rev along-& cross-track per x day		once/rev along-& cross-track per x day		

Geometry	DORIS	GNSS	SLR/LLR	VLBI	COL
Earth reference system	DPOD2008	Set of 50-60 station coordinates & velocities from ITRF2008 & IGb08	ITRF2008 (SLRF2008)	VTRF2008	ITRF 2008
Celestial reference system	inertial J2000	inertial J2000	inertial J2000	J2000, ICRF2	J2000, ICRF2
Pole & UT1	daily EOPC04_i08	daily EOPC04_i08	daily EOPC04_i08	daily EOPC04_i08	EOPC04 initial values interpolated (Lagrange polynomial method) with 3hr time intervals
Precession / Nutation	IERS 2010 using NRO origin	IERS 2010 using NRO origin (+ nutation rates)	IERS 2010 using NRO origin	IERS 2010 using NRO origin	IAU2000A - IAU2006 a-priori set to zero
Solid Earth tidal displacement	IERS 2010 standards	IERS 2010 standards	IERS 2010 standards	IERS 2010 standards	IERS 2010 standards
Ocean loading	FES2012	FES2012	FES2012	FES2012	Ocean tide loading models per stations are obtained from Scherneck's ocean loading site and provided in the BLQ format according to the IERS Standards 2010
Tidal atmospheric loading	S1/S2 Ray & Ponte (2003)	S1/S2 Ray & Ponte (2003)	S1/S2 Ray & Ponte (2003)	S1/S2 Ray & Ponte (2003)	none
Non tidal atmospheric loading	none	none	none	none	none
Solid pole tide displacement	IERS 2010 standards	IERS 2010 standards	IERS 2010 standards	IERS 2010 standards	IERS 2010 standards
Ocean pole tide displacement	none	none	none	none	none

Propagation & Systems	DORIS	GNSS	SLR/LLR	VLBI	COL
Troposphere	GPT/GMF modelling from Boehm et al. (2006). One zenith delay/pass + one daily tropospheric gradient per station in North & East directions	GPT/GMF modelling from Boehm et al. (2006). One zenith delay/2hr in PWL mode + one daily tropospheric gradient per station in North & East directions	Mendes-Pavlis: (zenith delay & mapping Function)	GPT/GMF modelling from Boehm et al. (2006). One zenith delay/2hr + one daily tropospheric gradient per station in North & East directions	GPT/GMF for radio-electrical waves and Mendes-Pavlis for SLR. One zenith delay/2hr or pass + one daily tropospheric gradient per station in North & East directions
Ionosphere	2nd order corrections using IGS TEC values and igrf2011 magnetic field model	2nd order corrections using IGS TEC values and igrf2011 magnetic field model			none
Satellite system	Centre of mass / Phase centre vector from macro model + attitude law No phase law applied	Centre of mass offsets / Phase centre corrections from file: igs08_wwww.atx	Centre of mass corrections from G. Appleby		
Ground system	Phase centre / reference point vector from manufacturer values Phase law applied	Absolute elevation/azimuth dependent phase centre corrections are applied according to igs08_www.atx		Antenna thermal expansion: Nothnagel (2008) Antenna axes offset: IVS files	
Elevation cut-off	12 degrees Down weighting law for elevation <= 20°; Weight of the observation is multiplied by the factor elevation**2/400 with elevation in degrees)	10 degrees	10 degrees	12 degrees	