



Australian Government

Geoscience Australia

Status of DORIS Data Processing

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Global DORIS Data Used

Spot-2	040104 – 071230	Weekly Arcs
Spot-5	070401 – 071230	Weekly Arcs
Jason-1	040104 – 071230	Weekly Arcs
Envisat	040104 - 071230	Weekly Arcs
Spot-4	040104 - 050327	Weekly Arcs
Spot-4	050403 - 051230	Daily Arcs

Computation Standards

Reference Frame:

- ITRF2005 apriori
- IERS2003 Precession and Nutation
- IERS2003 model for Solid Earth Tides
- Ocean Loading based on GOT99 Ocean Tide Model
- DE1403 (GSFC) Planetary Ephemeris
- EOP05-C04 apriori EOPs

Computation Standards

Orbit Modelling:

- 7-day arc
- GGM02C Earth Gravity Field
- Time varying gravity ([2,0];[1,1];[21])
- Annual Time Varying Gravity [20X20]
- Atmospheric Gravity [50X50; NCEP 6 hr data – compiled by Petrov]
- Ocean Tides – GOT00 [Ray]
- Atmospheric Density – MSIS

Computation Standards

- Satellite specific macro-model for SRP
- Solar Radiation Pressure scale factor 1/arc constrained
- Satellite mass changes and satellite centre of mass offset changes applied as per http://ids.cls.fr/html/analysis_coord/documents.html
- Elevation Cutoff 12 degrees

Computation Standards

Estimated Parameters:

- Arc Set
 - Satellite state vector
 - Drag: Envisat and Jason 8-hourly
 - Drag: Spot-2, Spot-4, Spot-5 6-hourly
 - General Acceleration – 2/arc – along and cross track 1/rev
 - Range rate measurement biases for all satellite/site combinations pass-by-pass
 - Troposphere scale factor pass-by-pass

Computation Standards

Estimated Parameters:

- Global Set
 - Station Coordinates
 - Xpole, Ypole (daily at noon)

Computation Standards

- Constraints for SINEX:
 - All global parameters 1m equivalent (station coordinates, pole)
- Data Weighting:
 - Range Rate 2 mm/sec

Results: Average WRMS of Orbit Fits

	Period of weekly solutions	Number Arcs**	Average WRMS mm/sec
Spot-2	040104 - 071230	225	0.10 (?)
Spot-5	040104 - 071230	209	0.43
Jason-1	040104 - 071230	180	0.46
Envisat	040104 - 071230	193	0.42

** Excludes Poor/arcs with manoeuvres

IDS Submission Status

- SINEX files provided for testing:
 - Period 050102 to 080501 in weekly arcs
 - Typically 4-satellite combination Spot-2, Spot-4, Jason-1 and Envisat
 - 3-satellite combination if poor orbit arc due to manoeuvres

Outstanding Issues

- Re-analysis of the poorly determined arcs – mainly due to manoeuvres
- Complete backward data processing from 2002
- Respond to IDS Combination Centre feedback for re-processing
- Compare with SLR orbits for Jason-1 and Envisat (preliminary processing completed)

Suggestion:

- Refer ITRF coordinates to reference mark instead of base of antenna in next ITRF

ITRF2008 DORIS Contribution

- Provide DORIS SINEX files for the period 2002 to 2008 at the
- IDS agreed computation standards for arc-length, reference frame, orbit and measurement modelling, parameter set, etc.
- Can meet the IDS/ITRF2008 submission dates as decided.
- This submission is in addition to SLR (ILRS official submission from 1983 – 2007). 1993 – 2007 re-processing completed.
- Additional SLR submission for stella/starlette satellites