

INASAN Analysis Center Status Report

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List of INASAN products provided to the IDS (May 2011)

Product	Latest version	Span
Sinex weekly free network solutions	inawd07	1993.0 - 2011.0
Geocenter	ina10wd01	1993.0 - 2011.0
EOP-series	ina10wd01	1993.0 - 2011.0
STCD-series	ina10wd01	1993.0 - 2010.8

INASAN AC fully reprocessed all DORIS data for 1993.0-2011.0 with the new models

Old models:

- 1) elevation cutoff angle = 15 degrees**
- 2) the gravity field is GGM01C (120x120)**
- 3) solar radiation pressure coefficients were estimated**
- 4) Lanyi tropospheric mapping function was used**
- 5) atmospheric density model DTM94 as a priori**
- 6) estimating atmospheric drag every 6 hrs for SPOT's and every 24 hrs for TOPEX**
- 7) polar motion rates were estimated**

New models:

- 1) elevation cutoff angle = 15 degrees and data downweighting at low elevation were applied**
- 2) the gravity field is GGM02C (120x120)**
- 3) fixing daily coefficients for solar radiation pressure models**
- 4) Niell tropospheric mapping function was used**
- 5) atmospheric density model DTM2000 as a priori**
- 6) estimating atmospheric drag every 1 hr**
- 7) polar motion rates were not estimated**

1) At the moment we use GIPSY-OASIS II software developed by JPL with updated DORIS part of GIPSY developed by IGN/JPL (Linux version 5.0)

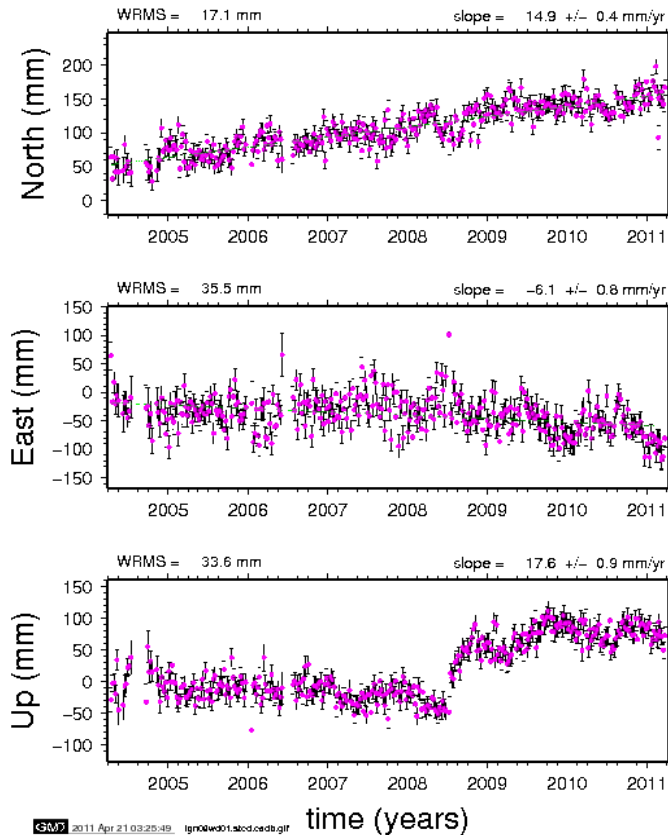
2) satellites used – SPOT4, SPOT5, ENVISAT

3) there are no some stations in our STCD time series (RILB, CRQB, CIDB, AMSB, AMVB, MSOB)

SPOT5/SAA effect for CADB station

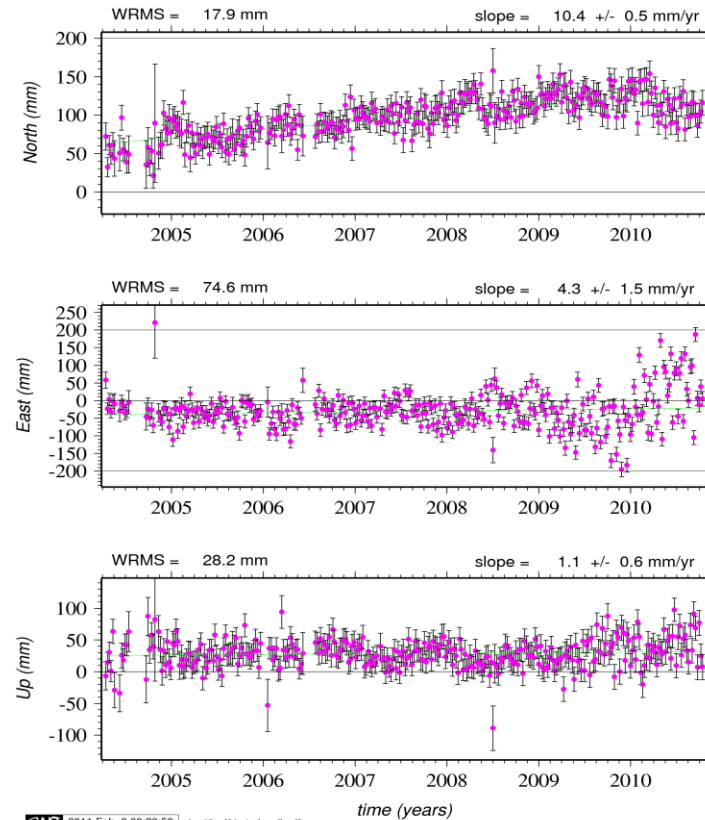
DORIS weekly solutions – IGN/JPL Analysis Center

ign09wd01 CADB



DORIS weekly solutions - INASAN Analysis Center

ina10wd01 CADB



Dynamic regression modeling (DRM method)

- **Trend-stability estimation**
- **Estimation and removal of trend component**
- **Estimation of harmonic components (spectral and wavelet analysis)**
- **Development GARCH model for the residuals from previous step**
- **Application of Kalman's filter**

Two time series were compared:

DORIS

- <ftp://cddis.gsfc.nasa.gov/pub/doris/products/geoc/ina05wd01.geoc.Z> (1993.0 - 2007.0)

GPS

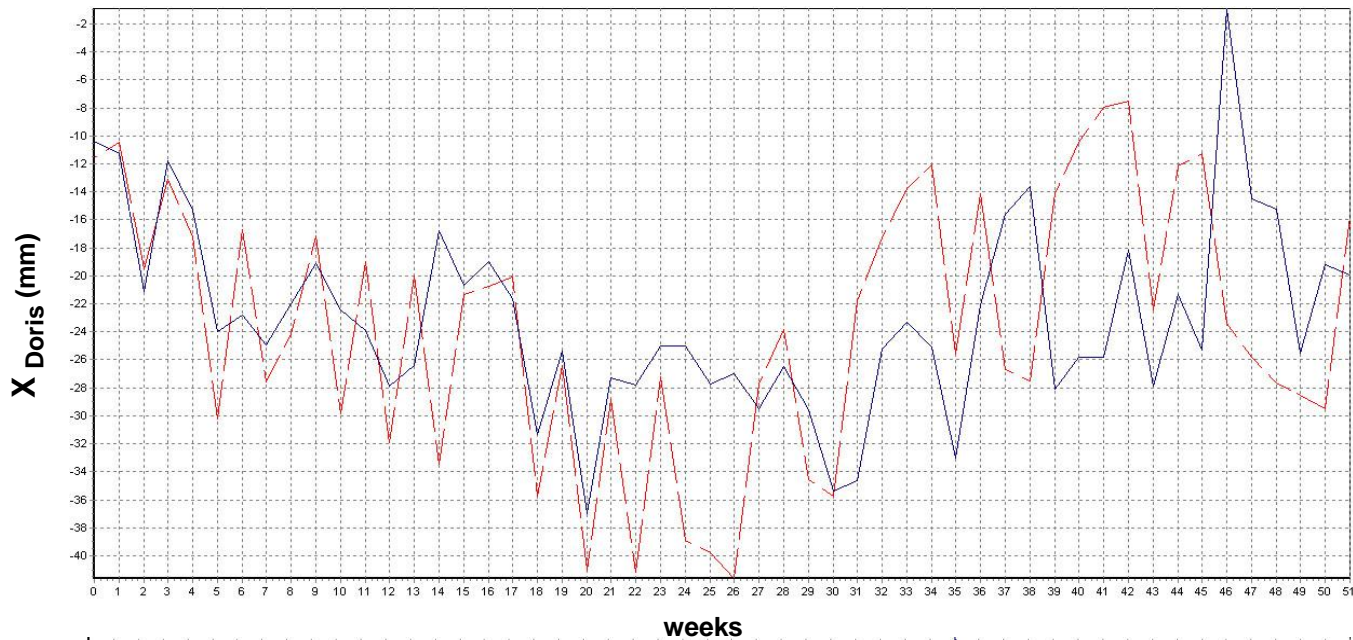
- <ftp://sideshow.jpl.nasa.gov/pub/usrs/mbh> (1993.0 - 2007.0)

Results of DRM analysis (DORIS)

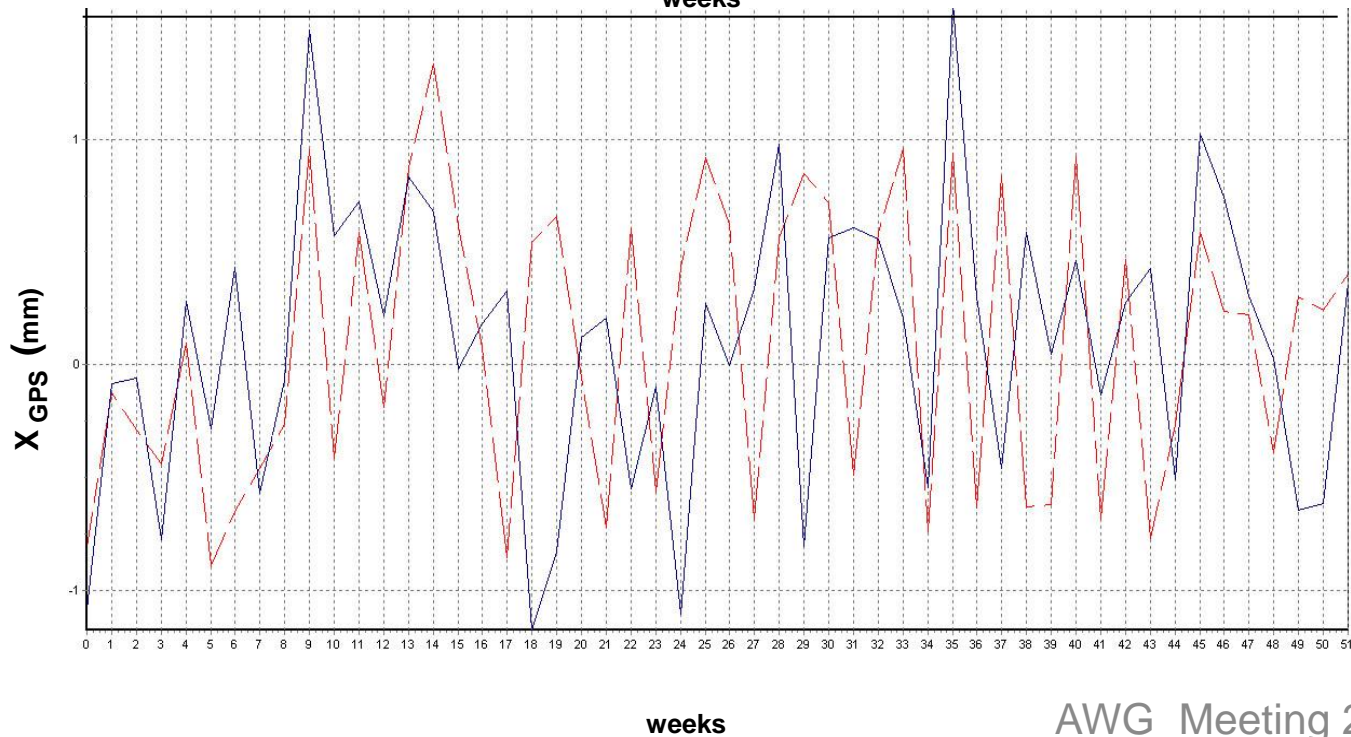
Periods		Weeks								
X	The whole time series		8	13	17		25		52	170
	Interval 1	4		13	19		25		57	
	Interval 2	3,5			18	21	25		57	
	Interval 3	3,5	10	12	17	22			55	
Y	The whole time series	3	8				25	40	52	75
	Interval 1	4	8				25		57	
	Interval 2				16		25		57	
	Interval 3	3,5	10	13					55	
Z	The whole time series		7,8,10		17				52	226
	Interval 1	3	8,10		18				57	
	Interval 2	4	8,10	13				29	57	
	Interval 3	2,5	10				24		55	

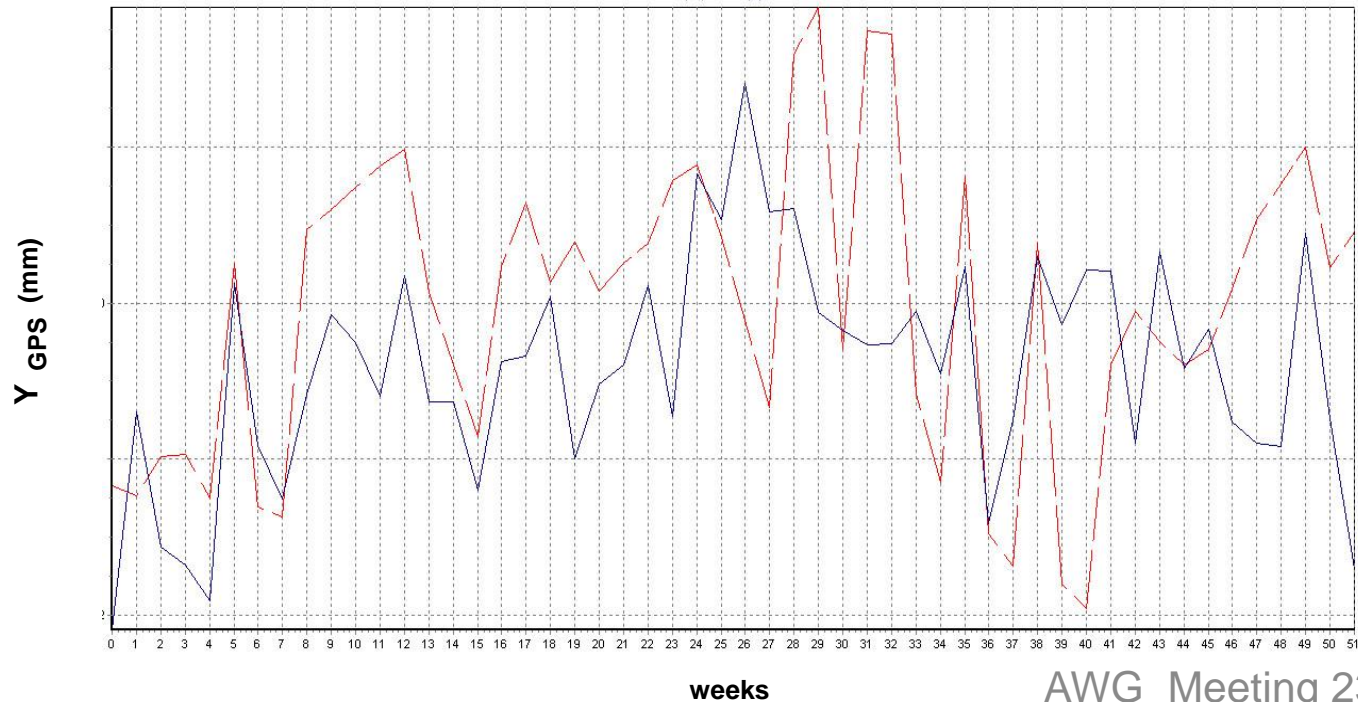
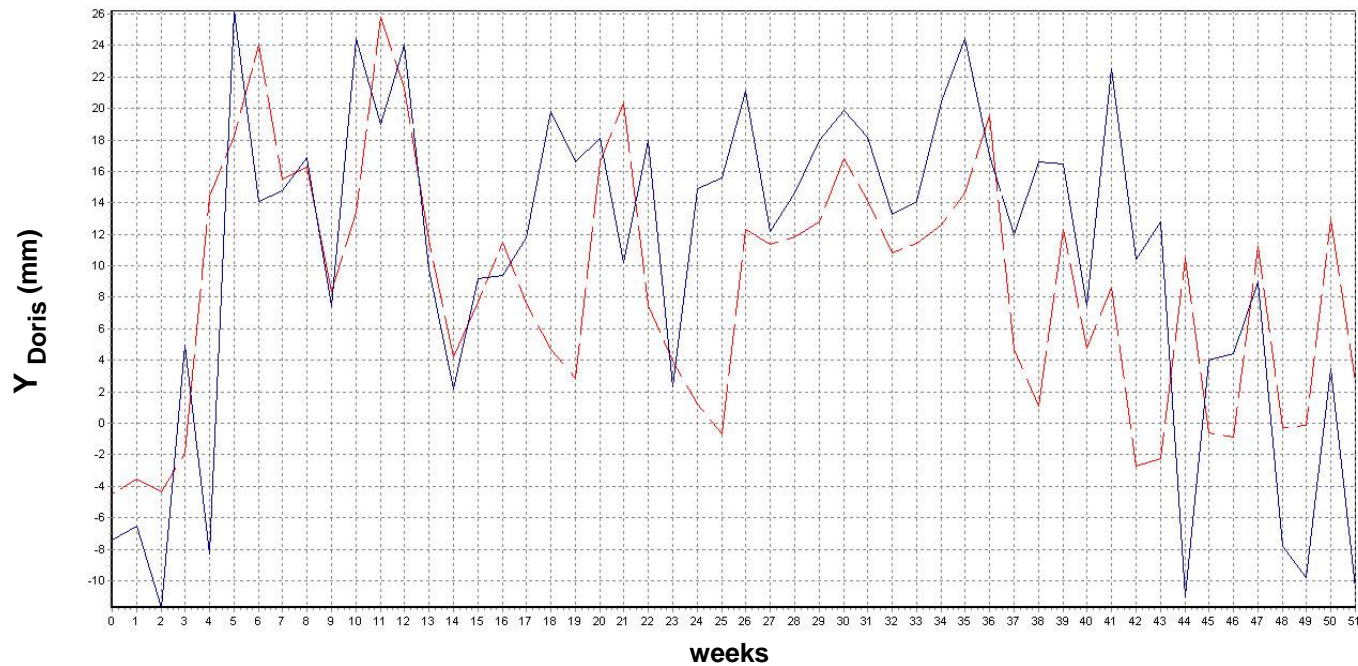
Results of DRM analysis (GPS)

Periods		Weeks								
X	The whole time series	4	8				26		48	170
	Interval 1	4	10						48	
	Interval 2	3,5				23		29	57	
	Interval 3	2,6				22		28	55	
Y	The whole time series			11,13		21	25		52	
	Interval 1	4		11		23			52,57	
	Interval 2				16		25		57	
	Interval 3	4	8					31	55	
Z	The whole time series		7,10		16,17				52	
	Interval 1		10		16				52	
	Interval 2	2	10					29		
	Interval 3	3	7,10	12	16	22			55	

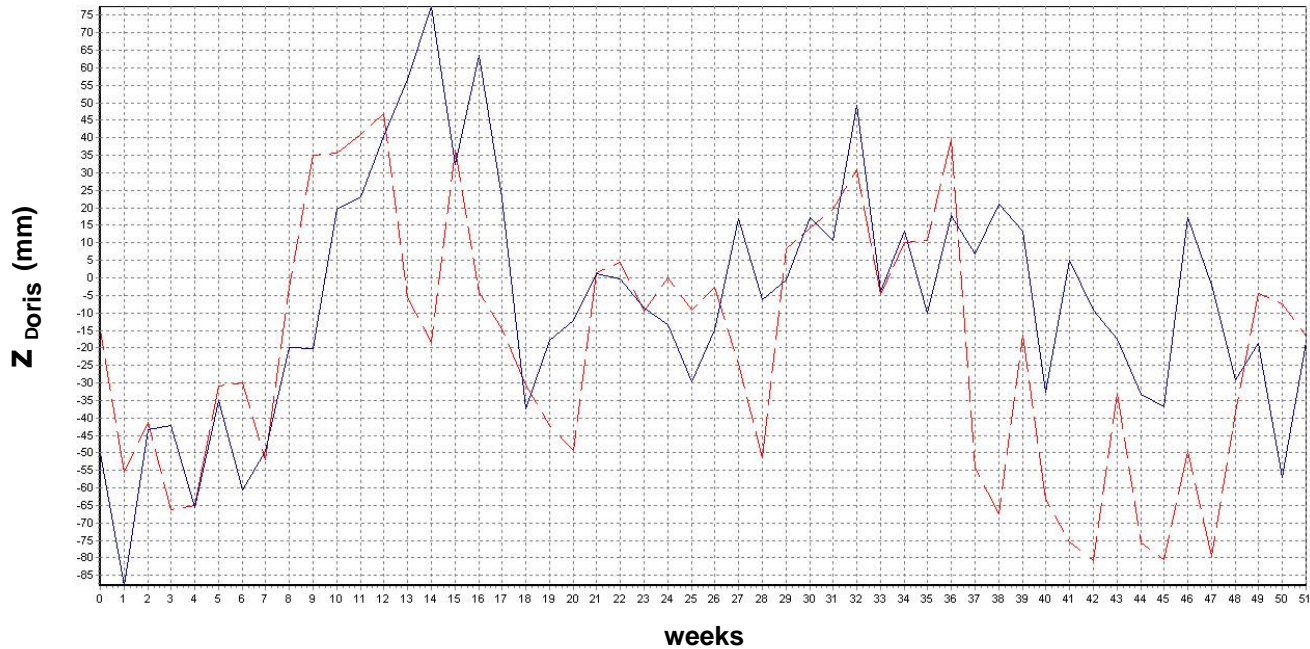


DRM forecasting model of the weekly geocenter positions for 2006 (X-component). Blue line – evaluated, red line –simulated.

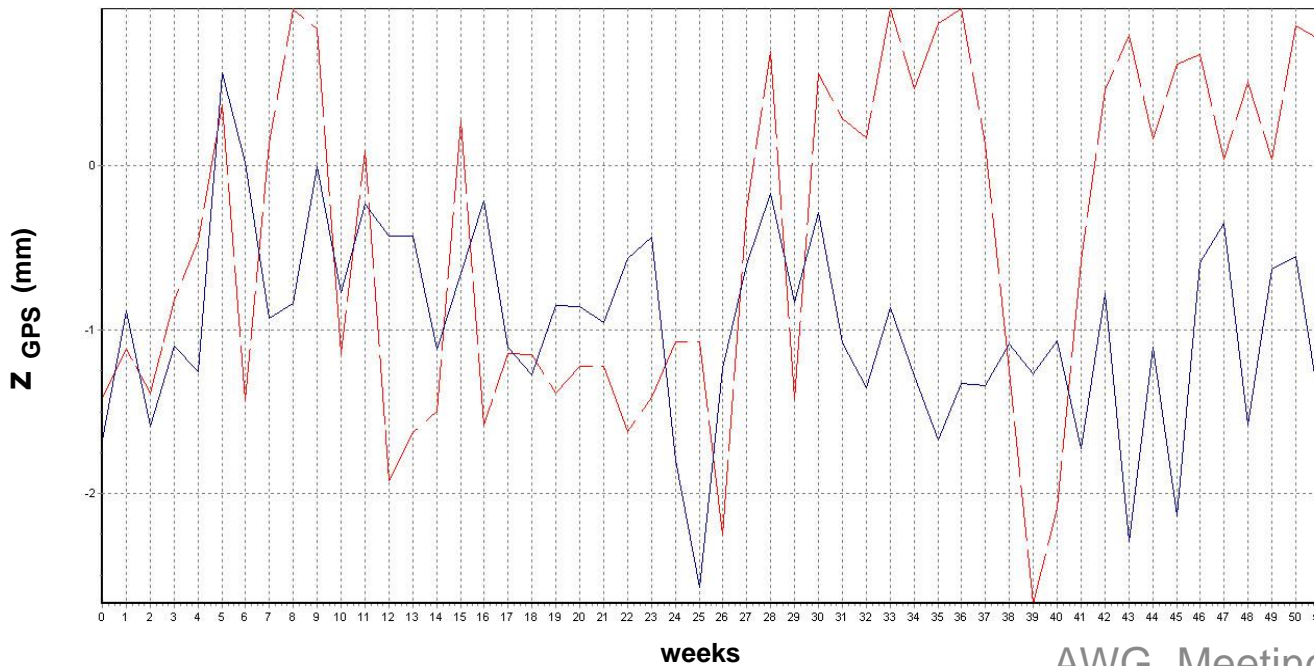




DRM forecasting model of the weekly geocenter positions for 2006 (Y-component). Blue line – evaluated, red line –simulated.



DRM forecasting model of the weekly geocenter positions for 2006 (Z-component). Blue line – evaluated, red line –simulated.



Correlation coefficients between observations and predictions for geocenter motion

Component	Weeks						
	52	25	15	10	8	6	4
	<i>DORIS</i>						
X	0,375	0,772	0,640	0,868	0,868	0,943	0,970
Y	0,540	0,609	0,772	0,741	0,721	0,627	0,951
Z	0,450	0,614	0,640	0,675	0,298	0,387	0,488
	<i>GPS</i>						
X	0,220	0,232	0,753	0,797	0,448	0,722	0,923
Y	0,375	0,765	0,789	0,745	0,661	0,786	0,409
Z	0,0583	0,327	0,422	0,616	0,718	0,740	0,972

Conclusions (future plans)

- **We just installed the latest Gipsy version (Linux 6.0) and planning to reprocess all Doris data with the new models and all satellites.**
- **DRM model may be used for predictions of the geocenter motion during the next 10 - 25 weeks for DORIS and 6 – 25 weeks for GPS.**
- **Further investigations with DRM model DORIS, GPS and SLR time series of geocenter motion are planned.**