

ILRS

Governing Board Meeting

April 16, 2007

17:30 - 20:00



Austria Center Vienna
Room S.M.5, Red Level
Vienna, Austria

ILRS Governing Board Meeting

Austria Center Vienna
Splinter Meeting Room 5 Red Level

Monday, April 16, 2007
17:30 – 20:00

Agenda

- | | |
|---|------------------------|
| 1. Opening Remarks (5 min.) | W. Gurtner |
| 2. ILRS Status/Action Items (15 min.) | M. Pearlman/C. Noll |
| 3. ITRF2005 Issues (5 min) | E. Pavlis/W. Gurtner |
| 4. Working Group Briefs and Recommendations (5-10 min each) | WG Chairs |
| a. Analysis | E. Pavlis/C. Luceri |
| b. Missions | G. Appleby |
| c. Data Formats and Procedures | W. Seemueller |
| d. Networks and Engineering | G. Kirchner |
| e. Transponders | |
| 5. Galileo Support (5 min.) | W. Gurtner |
| 6. Site Ties Study Group (10 min.) | G. Bianco |
| 7. Laser Retroreflector Recommendation (10 min.) | M. Pearlman |
| 8. Stanford Counter Tests (5 min) | G. Appleby/G. Kirchner |
| 9. ILRS Letter of Support for Simosato (5 min.) | W. Gurtner/M. Pearlman |
| 10. Fall 2007 Workshop (5 min) | M. Pearlman |
| 11. GGOS Activities (5 min.) | M. Pearlman |
| 12. New Business | W. Gurtner/WG Chairs |
| 13. Other Business | W. Gurtner |



ILRS Governing Board

Ex-Officio Members:

Director, Central Bureau:	Mike Pearlman
Secretary, Central Bureau:	Carey Noll
President of IAG Commission I:	Hermann Drewes

Members Appointed or Elected by Organizations:

EUROLAS Network Representatives:	Giuseppe Bianco Werner Gurtner, Chair
NASA Network Representatives:	David Carter Jan McGarry
WPLTN Representatives:	Yang Fumin Hiroo Kunimori
IERS Representative:	Bob Schutz

Members Elected by their International Peers:

Analysis Representatives:	Erricos Pavlis Vincenza Luceri
Data Center Representative:	Wolfgang Seemueller
LLR Representative:	Juergen Mueller
At-Large Representatives:	Georg Kirchner Graham Appleby

Former Members:

Francois Barlier (former At-Large Member, 1998-2000)
Gerhard Beutler (former CSTG President, 1998-1999)
John Bosworth (former Director, ILRS Central Bureau, 1998-2001)
John Degan (former Chairman and NASA Network Representative, 1998-2002)
Richard Eanes (former Analysis Center Representative, 1998-2000)
Yang Fumin (former WPLTN Network Representative, 1998-2002)
Ben Greene (former WPLTN Network Representative, 2002-2006)
John Luck (former At-Large Member, 1998-2002)
Ron Noomen (former Analysis Center Representative, 1998-2006)
Wolfgang Schlueter (former EUROLAS Network Representative, 1998-2002)
Ulrich Schreiber (former At-Large Member, 2002-2006)
Peter Shelus (former LLR Representative, 1998-2006)

ILRS Governing Board ILRS Status Review

Network Items:

- EUROLAS
 - FTLRS
 - New laboratory built at Grasse to house FTLRS for system improvements
 - Working with colleagues at Canberra and Hobart universities to collaborate on FTLRS occupation in Tasmania for Jason-1 calibration/validation (occupation in ~11/2007-04/2008)
 - Herstmonceux
 - System upgrades led to recalibration; data between 10/01/1994 and 02/10/2007 require correction
 - 2 KHz operation being implemented
 - Borowiec
 - System building improved; operational since 03/17/2007
- WPLTN
 - SALRO
 - Interest in joint activity with IGN to include DORIS beacon and site survey
 - Wuhan
 - Off-line since 12/18/2005
 - TROS
 - System upgrade by Institute of Seismology, China Earthquake Administration (IOSCEA)
 - 3+-month tracking campaign in Korea planned for 2007
 - Simosato
 - GPS receiver (SMST) to join IGS
 - San Juan
 - CB contacted station regarding requirement for GPS receiver; under consideration
- NASA
 - CPF operational at MOBLAS-5 and -7, other NASA systems later this year (MOBLAS before TLRS)
 - Haleakala
 - TLRS-4 now operational (since 11/07/2006); re-dedication held on 01/31/2007
 - System down due to laser failure from 12/20/2006-02/12/2007
 - Survey of new location completed 10/2006; preliminary data released
 - Working on restricted tracking capability
 - Arequipa
 - TLRS-3 now operational (since 10/01/2006); re-dedication held on 02/12/2007
 - Site survey scheduled for 04/2007
 - NGSLR (Next Generation SLR, formerly SLR2000)
 - Schedule presented to NASA HQ has co-location of NGSLR with MOBLAS-7 in early summer 2008
 - NGSLR has tracked LAGEOS (several passes) with eyesafe laser
 - LRO-LR lasers have been delivered and are being characterized in lab
 - Radar for use with LRO-LR laser is being installed
 - Closed-loop tracking is remaining NGSLR technical challenge to solve

Analysis and Data Issues:

- Benchmark evaluation on GA and GRGS solutions underway
- Analysis of early LAGEOS data underway for ILRS product submission for reference frame
- Application from Hitotsubashi University (T. Otsubo) for AAC status

Site Surveys:

- Analysis of survey data from Hawaii, Arequipa, and GSFC in process
- Closeout survey of Haleakala performed by HTSI in late 2004; report released 05/2006
- South African and Shanghai survey reports completed by IGN

ILRS Status Review (continued)

Mission Items:

- ETS-8
 - Launched 12/16/2006
 - Tracking by WPLTN only; Yarragadee observed 76 out of the 114 passes required
- Galileo
 - GIOVE-A
 - Second SLR tracking campaign October-December 2006; 91 passes total
 - ESA requests six additional monthly campaigns (June 2006 to March 2008)
 - GIOVE-B (GSTB v2/B) launch scheduled for late 2007
- GPS satellites
 - Dialog with various agencies continues on reflectors on GPS-III satellites (see below)
 - Study underway at GSFC on hollow cube technology; D. Arnold working on array performance studies
 - Draft specification document created
- GLONASS
 - GLONASS-99 replaced GLONASS-87 in ILRS tracking roster (01/2007)
- ANDE-RR
 - Launch from Space Shuttle on 12/21/2006
 - NRL working to improve presently poor predictions
- MicroSCOPE reflector array cancelled; mission support request cancelled
- TerraSAR-X
 - Tracking request approved by Governing Board (12/2006)
 - Launch scheduled for May 2007
- LRO-LR
 - Launch scheduled for March 2008
 - Support from selected stations (including SLR2000)
 - No mission support request submitted yet
- T2L2
 - Instrument on Jason-2; launch planned for June 2008
 - No mission support request submitted yet
- PROBA-2
 - Tracking request approved by Governing Board (02/2007)
 - Launch December 2007

Retroreflectors for GNSS Satellites

- Dialog continues with relevant agencies on the importance of including reflectors on GPS-III satellites
- Specification document for GNSS array created for GB consideration
- Study underway at GSFC on hollow cube technology
 - Will shortly order multiple 1.5" hollow cubes from PLX for testing (in-house at GSFC and in INFN-LNF, Italy); are procuring several aluminum and several pyrex
 - Budget for this work was presented to NASA HQ (and agreed to by LaBrecque)
 - Have added some new members to team within GSFC: new thermal engineer, new mechanical engineer (who will be taking over as technical lead); also expect to add an optical engineer to the team
 - Working to get a preliminary design by fall 2007 with final design in 2008

ILRS Web Site:

- Added new ILRS product description and links to on-line archive (see below)
- Developed retroreflector information form (required for new missions)
- CoM pages continue to be updated (new values for GLONASS and Galileo)

ILRS Status Review (continued)

Meetings:

- April 14-20, 2007: EGU, Vienna Austria
 - AWG (04/14/2007)
 - DFPWG (04/16/2007)
 - GB (04/16/2007)
- July 2-13, 2007: IUGG General Assembly, Perugia, Italy
 - IAG activities first week
- September 25-28, 2007: Fall ILRS Workshop, Grasse France
- December 10-14, 2007: Fall AGU, San Francisco CA
 - Combined IAG Services Analysis Meeting (12/05-07/2007)
- September 22-26, 2008: 16th International Workshop on Laser Ranging, Posnan Poland

Reports:

- ILRS 2005-2006 report
 - Assembling and editing submissions; some contributions still missing (see TOC below)
 - Publish early summer 2007

Predictions:

- Status of CPF implementation
 - Several stations still have not converted to CPFs
 - Recommend discontinuing TIRVs by end of 2007
- Status of manual and sample code
 - Bug fix sample code v1.01a released
 - Manual is being corrected and update
 - Sample code being updated for transponders
- LRO predictions
 - To be produced by Goddard Flight Dynamics Facility (FDF)
 - Available for testing in June, 2007
 - Will include light-travel-time-corrected outbound leg and no relativistic corrections, due to loose accuracy requirements (several msec in range)

Other Items:

- GGOS
 - Ground Networks and Communications Working Group is actively working on network designs
 - Status report to be given at GN&C WG on April 18 at EGU

Remaining Governing Board Action Items

EGU, Vienna Austria (April 26, 2005):

1. CB will contact the IAG Outreach to suggest that the IAG make its participants aware of the issue of service recognition issue in publications, papers, reports, and presentations.
 - IGS, IVS, ILRS, and IDS continue to work on a joint activity to:
 - Jointly request that the IAG take positive action (Web site notice, messages to the community, etc) to activate its community;
 - Consider contacting relevant journals and journal referees to help enforce this citation.
2. CB will check if the local ties have been measured for the Riyadh and Changchun SLR stations. *(Done)*
 - Noll contacted both stations in January and September 2005; Changchun reports plans made but no survey yet
 - Survey activity under consideration in Riyadh in conjunction with a possible DORIS installation
3. CB should browse all existing mission Web sites and search for references to the service and information about the role of SLR for the mission; if not found, have webmasters add it.
 - Webmasters contacted; summary of results provided separately here
4. A subgroup of technology and science representatives should write a white paper on the future vision for SLR. *(assigned 04/2005)*
5. Appleby will provide station signal strength regimes to the CB for placement in the site logs with perhaps a separate table automatically updated/extracted and linked to the CoM pages on the ILRS Web site. The information is not in the site log now so the format will have to be modified. *(assigned 04/2005)*
6. An ILRS orbit product committee should be formed to develop a plan for the new product (Noomen). *(assigned 04/2005)*
7. Review data analysis/station feedback capabilities within the ILRS. *(assigned 04/2005)*
 - DGFI will propose a procedure to incorporate inputs from analysis groups, assess quality of stations, provide feedback to the station on a best-possible epoch station position and velocity (to be included in the site log, by the station), and report on plans in Canberra
 - ASI will use the combination results to develop a review process and develop a simple report which gives an overview of (LAGEOS) data production and their use for the pos+eop product, for submission to stations and managers *(Noomen, Luceri, Gurtner)*.

Eastbourne UK (October 10, 2005):

1. Examine the issue of the internal SLR reference frame. (Noomen) *(assigned 11/2005)*
2. Examine the eccentricity files to see if they could serve as a source for the list of key information. (Noomen) *(assigned 11/2005)*
3. Consolidate the presentations to Geoscience Australia into a 1 hour talk *(assigned 11/2005)*

Vienna, Austria (April 26, 2006):

1. Establish the ILRS Special Issue editorial board. (Noomen) *(assigned 04/2006)*

Canberra, Australia (October 19, 2006):

1. Draft an objection statement to the IERS, requesting a revisit on the ITRF2005 and a better definition of the ITRF selection process. (Gurtner) *(assigned 10/2006; done)*
2. Check with DGFI on the status of a data performance feed back system for the stations. (Pearlman) *(assigned 10/2006)*
3. The Central Bureau will develop the outline and schedule for the 2005-2006 ILRS report and assign writing tasks. (Noll) *(assigned 10/2006; done)*

ILRS 2005-2006 Report Table of Contents

- ✓Preface, Acknowledgement, Dedication
- Introduction (H. Drewes)
- ✓Chairperson's Remarks (W. Gurtner)
- ✓Section 1 – ILRS Organization
- †Section 2 – ILRS Tracking Network (SLR network, LLR network, network performance, surveys)
- ✓Section 3 – ILRS Missions and Campaigns (new missions in 2005/6; future missions)
- ✓Section 4 – Infrastructure
- ✓Section 5 – Tracking Procedures and Data Flow (priorities, CPF, CRD, restricted tracking, data flow)
- ✓Section 6 – Emerging Technologies (kilohertz systems, inter-planetary ranging, automation and remote operations, multi-wavelength ranging)
- ✓Section 7 – Analysis Activities
- †Section 8 – Modeling (satellite center-of-mass, refraction)
- Section 9 – Science Coordination
- †Section 10 – Meetings
- Section 11 – Bibliography
- †Section 12 – AC and AAC Reports

<ul style="list-style-type: none"> AC Reports ✓ASI/CGS ✓BKG ✓DGFI ✓GFZ JCET ✓NSGF 	<ul style="list-style-type: none"> Lunar AAC Reports ✓FESG/IFE ✓JPL ✓POLAC ✗U. Texas LLR 	
<ul style="list-style-type: none"> AAC Reports ✓CLG/BAS ✓CODE CSR ✓DUT ✓ESA/ESOC ✓FFI ✓GAOUA ✓Geoscience Australia ✗Graz 	<ul style="list-style-type: none"> AAC Reports (continued) IAA ✗IMVP INASAN ✓JAXA ✓MCC ✓Newcastle University ✓NICT ✓OCA/GEMINI ✓Shanghai 	<ul style="list-style-type: none"> ✓Kiev Koganei ✗Komsomolsk Kunming Lviv ✗Maidanak ✓Matera ✓McDonald ✗Mendeleev ✓Metsähovi Monument Peak ✓Mount Stromlo ✓Potsdam
- †Section 13 – Station Reports

<ul style="list-style-type: none"> Arequipa ✓Beijing ✓Borowiec ✓Changchun ✓Concepción ✓Grasse and FTLRS ✓Graz Greenbelt Haleakala ✓Hartebeesthoek ✓Helwan ✓Herstmonceux Katzively 	<ul style="list-style-type: none"> ✓Riga ✓Riyadh ✓San Fernando San Juan ✓Shanghai Simeiz ✓Simosato Tahiti ✓Tanegashima ✓Wetzell Wuhan ✓Yarragadee ✓Zimmerwald
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- †Appendix – ILRS Information

† Partial
 ✓ Complete
 ✗ Will not submit

ILRS Prediction Centers

Satellite	Prediction Provider (3-character code)										
	CNES	COD	ESA	GFZ	GSF	HTS	JAX	MCC	NRL	SGF	UTX
Current Satellites											
Ajisai						P	B			B	
ALOS							P				
ANDE									P		
Apollo 11/14/15											P
Beacon-C						P				B	
CHAMP				P							
Envisat			P			B				B	
ERS-2			P			B					
Etalon-1/-2						P				B	
ETS-VII							P				
GFO-1					P	B				B	
GIOVE-A			P			B					
GLONASS		P				B					
GPS-35/-36		P				B					
GRACE-A/-B				P							
ICESat											P
Jason-1	P					B				B	
LAGEOS-1/-2						P	B			B	
Larets						P		B		B	
Luna 17/21											P
OICETS							P				
Starlette						P				B	
Stella						P				B	
Future Satellites											
Galileo			P								
GIOVE-B			P								
Jason-2	P					B				B	
LRO-LR						P					
PROBA-2			P?								
TerraSAR-X				P							

Notes: All centers providing predictions in CPF and some continue TIRV format
 P=primary prediction source; B=backup prediction source
 TIRV prediction generation to continue indefinitely
 CNES will soon provide Jason-1 predictions in CPF

ILRS CPF Implementation Status April 2007

Location	Station	Not Started	Coding Started	Testing	Production	All Targets?	Comments
Arequipa	7403	X					
Beijing	7249				X	X	
Borowiec	7811				X	X	
Changchun	7237				X	X	
Concepcion	7405				X	X	
FTLRS	-				X	X	
Grasse	7845				X	X	
Graz	7839				X	X	
Greenbelt	7105				X	X	
Haleakala	7119	X					
Hartebeesthoek	7501		X				
Helwan	7831		X	X			
Herstmonceux	7840				X	X	
Katzively	1893						No response
Kiev	1824				X	X	
Koganei	7308						No response
Lviv	1831				X	X	
Maidanak	1864						No response
Matera	7941				X	X	
McDonald	7080				X	X	
Metsahovi	7806	X					Sys. upgrades
Monument Peak	7110		X				
Mt. Stromlo	7825				X	X	
Potsdam	7841				X	X	
Riga	1884		X				
Riyadh	7832				X	X	
San Fernando	7824				X	X	
San Juan	7406				X	X	
Shanghai	7821				X	X	
Simeiz	1873				X	X	
Simosato	7838				X	X	
Tahiti	7124		X				
Tanegashima	7358				X	X	
TROS	-						No response
Wetzell	8834				X	X	
Wuhan	7231	X					Sys. problems
Yarragadee	7090				X	X	
Zimmerwald	7810				X	X	

ILRS Satellite Tracking Priorities January 2007

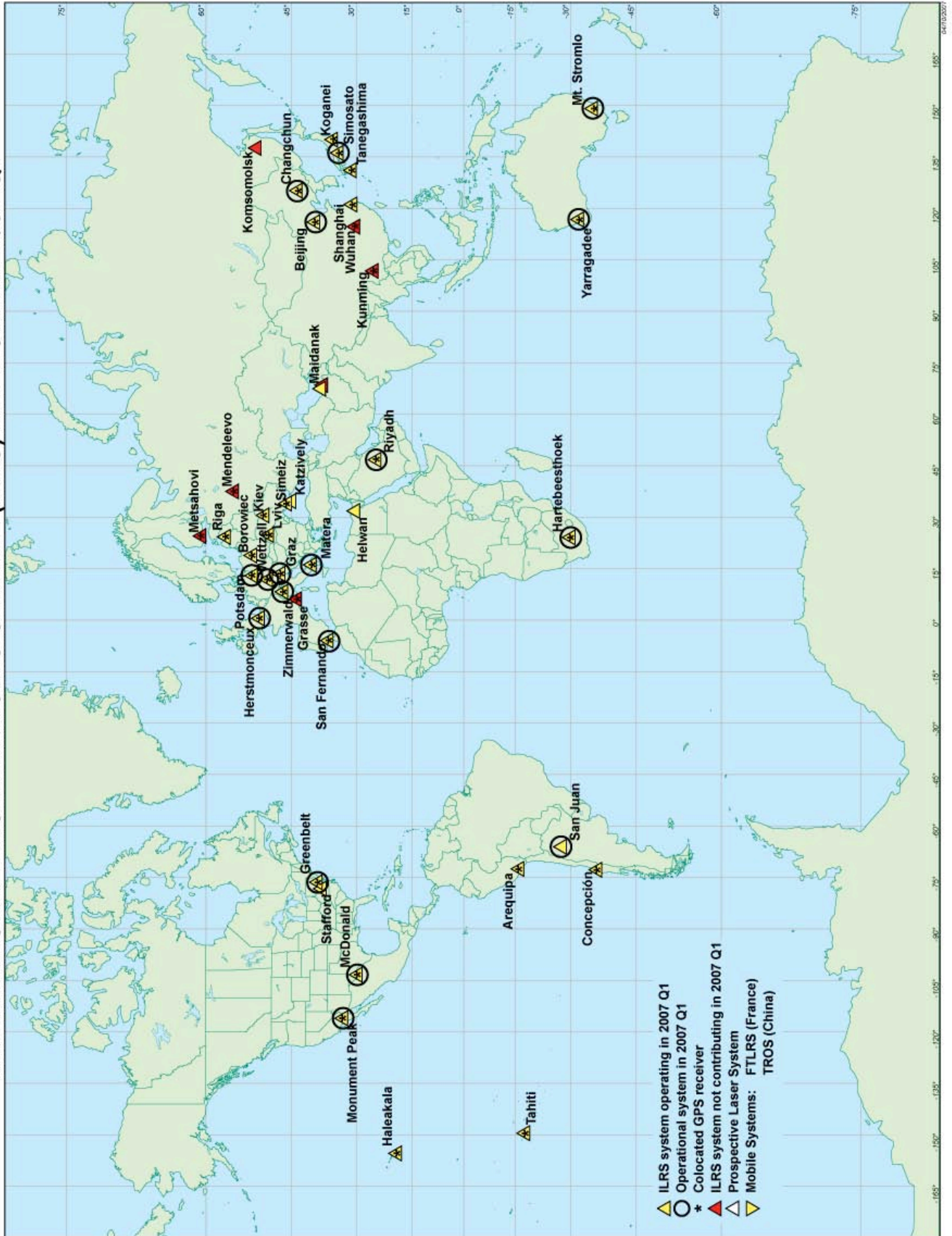
1. Priorities decrease with:
 - a. increasing orbital altitude; and
 - b. increasing orbital inclination (at a given altitude).
2. Priority of some satellites may then be increased to intensify support for:
 - a. active missions (such as altimetry);
 - b. special campaigns (such as IGLOS); or
 - c. post-launch intensive tracking phases; and
3. Some slight reordering may be done to give higher priority missions with increased importance to the analysis community.

Priority	Mission	Sponsor	Altitude (km)	Inclination (degrees)	Comments
1	GRACE-A, -B	GFZ/JPL	485-500	89	Tandem mission
2	CHAMP	GFZ	429-474	87.3	
3	GFO-1	US Navy	790	108.0	Altimetry/no other tracking technique
4	Envisat	ESA	796	98.6	Tandem with ERS-2
5	ERS-2	ESA	800	98.6	Tandem with Envisat
6	Jason-1	NASA/CNES	1,350	66.0	
7	ANDE-RR Active	NRL	400	51.6	
8	ANDE-RR Passive	NRL	400	51.6	
9	Larets	IPIE	691	98.2	
10	Starlette	CNES	815-1,100	49.8	
11	Stella	CNES	815	98.6	
12	Ajisai	NASDA	1,485	50	
13	LAGEOS-2	ASI/NASA	5625	52.6	
14	LAGEOS-1	NASA	5850	109.8	
15	Beacon-C	NASA	950-1,300	41	Upgraded from campaign to ongoing mission (Jan-02)
16	Etalon-1	Russian Federation	19,100	65.3	
17	Etalon-2	Russian Federation	19,100	65.2	
18	GLONASS-89	Russian Federation	19,100	65	Replaced GLONASS-86 on 03/20/2003
19	GLONASS-99	Russian Federation	19,100	65	Replaced GLONASS-87 on 01/12/2007
20	GLONASS-95	Russian Federation	19,100	65	Replaced GLONASS-84 on 08/26/2005
21	GPS-35	US DoD	20,100	54.2	
22	GPS-36	US DoD	20,100	55.0	
23	GIOVE-A	ESA	29,601	56	

Lunar Tracking Priorities

Priority	Retroreflector Array	Sponsor	Altitude (km)
1	Apollo 15	NASA	356,400
2	Apollo 11	NASA	356,400
3	Apollo 14	NASA	356,400
4	Luna 21	Russian Federation	356,400
5	Luna 17	Russian Federation	356,400

INTERNATIONAL LASER RANGING SERVICE (ILRS) NETWORK IN 2007 Q1



ILRS Quarterly Report Card (Table 1a, 04/01/2006-03/31/2007)

Site Information		Data Volume									Data Quality		
Column 1	2	3	4	5	6	7	8	9	10	11	12	13	14
Location	Station Number	LEO pass Tot	LAGEOS pass Tot	High pass Tot	Total passes	LEO NP Total	LAGEOS NP Total	High NP Total	Total NP	Minutes of Data	Cal. RMS	Star RMS	LAG RMS
Baseline		1000	400	100	1500								
Yarragadee	7090	9048	1996	1368	12412	176336	26510	13753	216599	85814	4.8	8.4	9.4
Zimmerwald_423	7810	5448	1184	860	7492	89862	15996	5740	111598	41355	11.9	14.9	16.8
Zimmerwald_846		5415	1202	820	7437	89751	18098	5809	113658	43478	24.5	24.3	25.8
San_Juan	7406	4806	1171	1178	7155	66823	13458	6047	86328	39337	6.5	9.2	11.9
Mount_Stromlo_2	7825	5154	1403	578	7135	68060	15755	4626	88441	39664	3.4	6.4	9.1
Graz	7839	5200	855	572	6627	103813	9597	4863	118273	32220	2.4	3.9	8.0
Riyadh	7832	4279	1093	821	6193	56690	9971	4628	71289	29563	9.5	19.4	18.7
Wetzell	8834	4523	990	555	6068	56898	8095	3158	68151	24616	5.0	13.5	18.6
Monument_Peak	7110	4378	945	341	5664	86396	10532	3312	100240	27591	4.9	13.2	14.4
Herstmoncex	7840	3833	985	419	5237	61558	12960	2017	76535	23582	7.9	12.1	15.1
Changchun	7237	3607	510	393	4510	45778	4292	2068	52138	14885	9.2	12.9	14.1
Matera_MLRS	7941	2586	864	199	3649	35622	9961	1599	47182	19581	1.8	4.4	5.7
Hartebeesthoek	7501	2455	681	200	3336	37645	7186	1883	46714	17495	5.1	7.9	9.5
Simosato	7838	2023	515	7	2545	38577	7705	67	46349	12745	5.3	5.6	8.6
Potsdam_3	7841	2055	313		2368	39130	3902		43032	6856	12.4	17.2	20.6
San_Fernando	7824	2002	316		2318	30735	2558		33293	5646	6.0	11.2	15.4
Greenbelt	7105	1840	315	66	2221	38709	3339	399	42447	7580	4.8	9.3	9.5
McDonald	7080	1253	419	291	1963	14328	3911	1226	19465	8637	12.6	12.0	12.5
Beijing	7249	1386	199	66	1651	17614	1797	425	19836	5427	13.2	34.0	20.3
Shanghai_2	7821	1314	123	10	1447	16316	1201	69	17586	3288	15.1	25.7	33.6
Maidanak_1	1864	757	191	234	1182	7771	1688	909	10368	5256		63.0	69.7
Riga	1884	1061	93	8	1162	20409	1113	44	21566	2360	7.3	10.6	12.2
Katzively	1893	761	105	30	896	12693	839	178	13710	2693	32.2	44.1	41.6
Borowiec	7811	642	94	4	740	9808	932	15	10755	1981	19.1	20.8	24.2
Papeete	7124	518	131		649	7679	1168		8847	1993	4.4	7.6	
Koganei	7308	406	104	108	618	6364	1205	762	8331	4478	8.9	11.8	14.6
Simeiz	1873	477	108	2	587	5595	982	13	6590	1796		98.6	54.5
Arequipa	7403	390	42		432	3524	301		3825	819	5.4	7.4	5.0
Haleakala	7119	264	46		310	3915	437		4352	990	4.8	11.5	9.6
Tanegashim	7358	204	23	19	246	2723	220	78	3021	755	2.9	4.0	5.5
Concepcion_423	7405	122	33		155	1320	304		1624	626	4.2	10.3	11.5
Concepcion_847		1647	766	149	2562	22747	8953	1128	32828	16562	7.3	31.9	61.7
Lviv	1831	47			47	738			738	101			
NRL	7865	9			9	131			131		19.5		
Helwan	7831	9			9	92			92	4			
Kiev	1824	1			1	12			12	4	47.4		

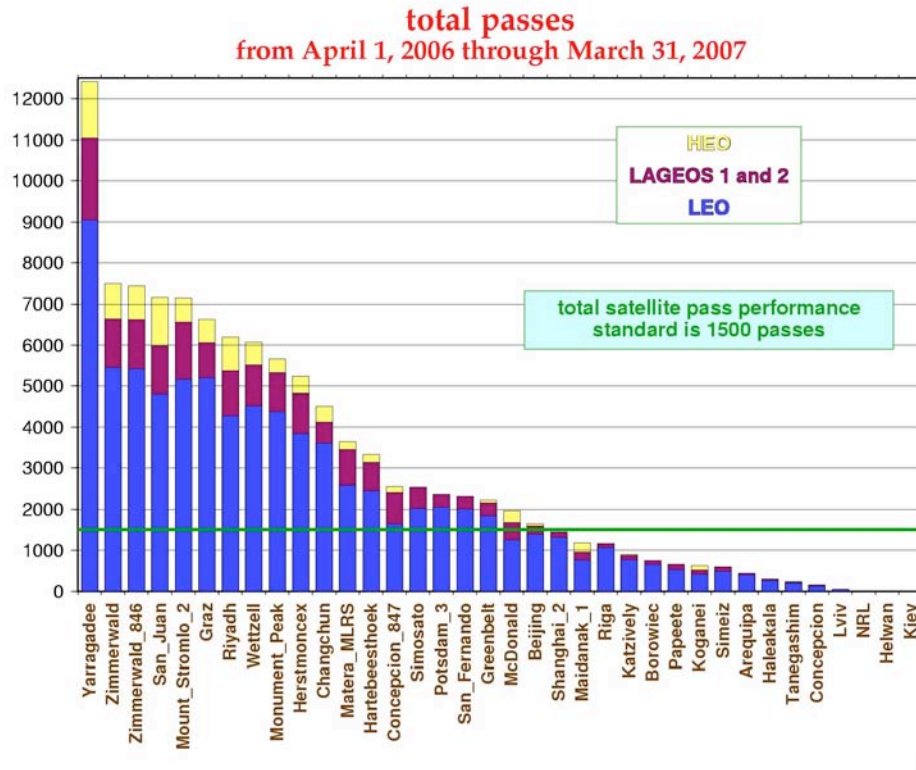
ILRS Quarterly Report Card (Table 1b Lunar, 04/01/2006-03/31/2007) (continued)

Site Information		Data Information			
Column L1	L2	L3	L4	L5	L6
Location	Station Number	num nights tracking last 12 mon	num npt last 12 mon	num npts last 3 mon	ave npt rms last 3 mon
McDonald	7080	72	116	26	61.4

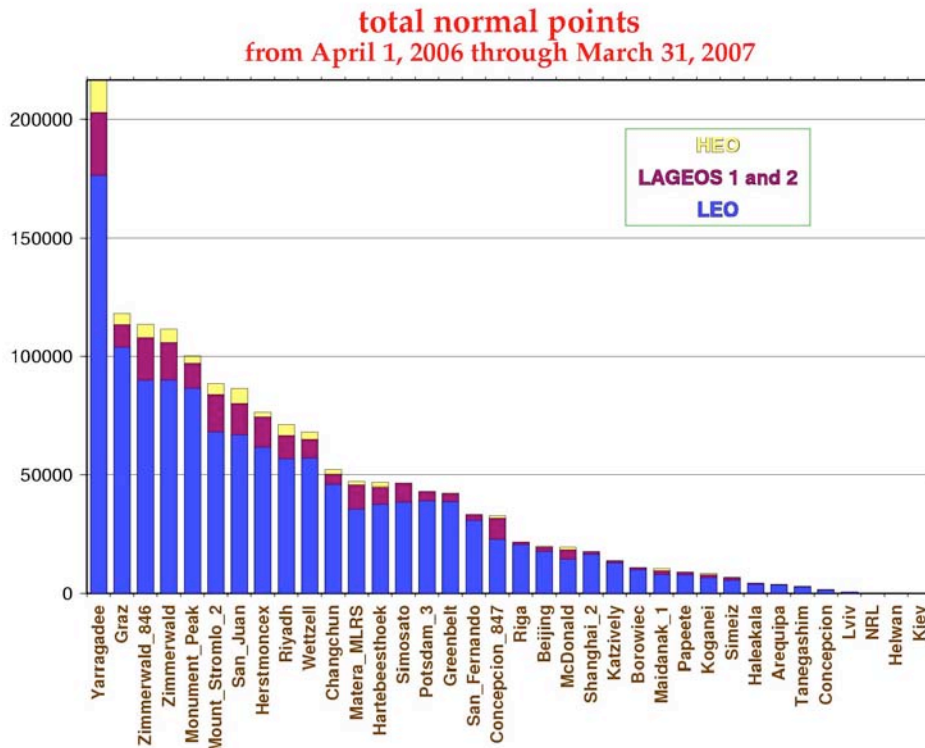
ILRS Quarterly Report Card (Table 2, 04/01/2006-03/31/2007)

Site Information		NICT Orbital Analysis				MCC Orbital Analysis				SHAO Orbital Analysis			
Station Location	Station Number	LAG NP RMS (mm)	short term (mm)	long term (mm)	% good LAG. NP	LAG NP RMS (mm)	short term (mm)	long term (mm)	% good LAG. NP	LAG NP RMS (mm)	short term (mm)	long term (mm)	% good LAG. NP
Baseline		10.0	20.0	20.0	95	10.0	20.0	20.0	95	10.0	20.0	20.0	95
Yarragadee	7090	2.0	9.1	1.3	100.0	2.3	12.6	6.8	98.5	2.2	16.1	2.0	95.2
Zimmerwald_423	7810	2.7	9.7	3.3	99.9	3.2	8.1	10.4	96.2	2.9	11.3	2.6	94.2
Zimmerwald_846		3.7	5.8	2.9	100.0					3.1	11.0	3.2	94.1
San_Juan	7406	2.6	19.7	13.2	98.8	3.8	11.9		99.5	2.7	23.6		95.6
Mount_Stromlo_2	7825	3.8	12.3	1.5	98.7	4.3	18.1	3.1	92.8	3.5	17.9	2.2	94.6
Graz	7839	1.2	5.3	2.9	100.0	1.8	5.7	5.1	99.2	1.3	11.3	2.0	95.7
Riyadh	7832	2.7	12.2	3.6	99.8	3.7	13.9	4.8	96.6	3.0	21.8	3.7	95.8
Wetzell	8834	3.3	11.4	3.7	100.0	3.1	14.6	9.2	97.1	3.3	15.7	3.1	96.3
Monument_Peak	7110	2.0	11.2	1.5	100.0	2.2	14.1	3.5	98.4	2.1	13.5	2.6	95.7
Herstmoncex	7840	1.6	7.3	1.6	100.0	2.7	9.8	3.8	98.7	2.2	11.7	3.1	96.6
Changchun	7237	7.0	22.0	6.9	99.9	7.1	19.9	17.3	96.0	6.0	27.6	8.1	96.1
Matera_MLRS	7941	2.7	13.9	7.5	100.0	2.4	15.3	10.3	97.7				
Hartebeesthoek	7501	2.2	10.5	4.5	100.0	2.1	10.2	3.7	97.5	3.3	15.8	4.3	98.0
Simosato	7838	3.0	13.0	8.4	99.8	4.8	13.1	9.8	99.6	5.0	19.1	9.2	95.5
Potsdam_3	7841	4.1	12.8	4.2	99.5	5.0	15.5	13.1	90.0				
San_Fernando	7824	2.6	14.1	9.2	100.0	3.9	14.9	15.1	99.6	3.7	19.1	14.8	95.2
Greenbelt	7105	1.7	8.5	5.5	100.0	2.0	15.7	10.8	98.7	2.2	15.1	3.9	94.8
McDonald	7080	2.3	10.2	4.7	99.9	3.0	11.7	7.6	96.7	2.2	15.4	6.4	94.9
Beijing	7249	9.9	21.3	7.6	91.8	13.8	16.8	18.4	88.3	8.9	23.1	9.4	85.9
Shanghai_2	7821	9.9	25.2	12.0	100.0	11.2	22.6		98.9	9.6	29.4	18.2	95.8
Maidanak_1	1864	22.9	24.7	11.3	90.0	21.9	32.6	9.2	80.4	25.1	24.5	10.2	69.8
Riga	1884	6.5	25.8	23.8	100.0	6.8	29.7	27.4	94.2	5.1	14.8	21.4	94.0
Katzively	1893	7.0	21.9	7.3	98.9	6.7	23.4	8.9	94.5	7.6	26.5	28.0	92.9
Borowiec	7811	9.9	11.5	5.8	100.0								
Koganei	7308	3.3	18.8	18.1	99.9	4.8	21.7	13.4	97.8	4.2	22.7	17.9	95.8
Simeiz	1873	73.1	48.4	46.0	95.0	44.5	50.9	48.3	78.1	37.6	27.3	28.3	70.4
Haleakala	7119	1.8	11.1		100.0								
Concepcion_423	7405									2.6	23.3		96.4
Concepcion_847		2.1	11.3	4.2	99.9	3.3	14.4	6.7	99.4				

ILRS Quarterly Report Card Plots (04/01/2006-03/31/2007)



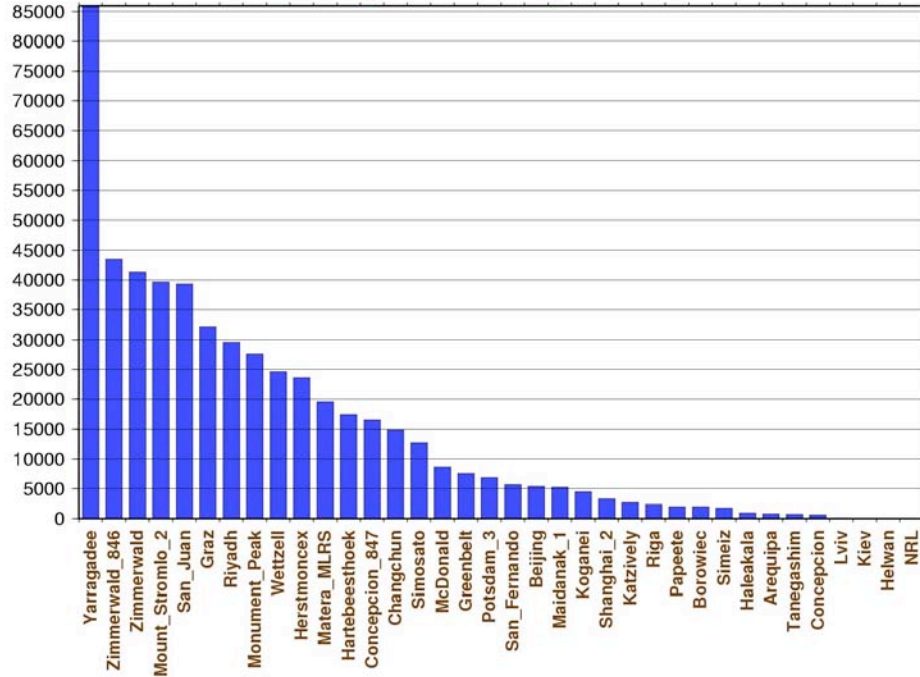
20070403



20070403

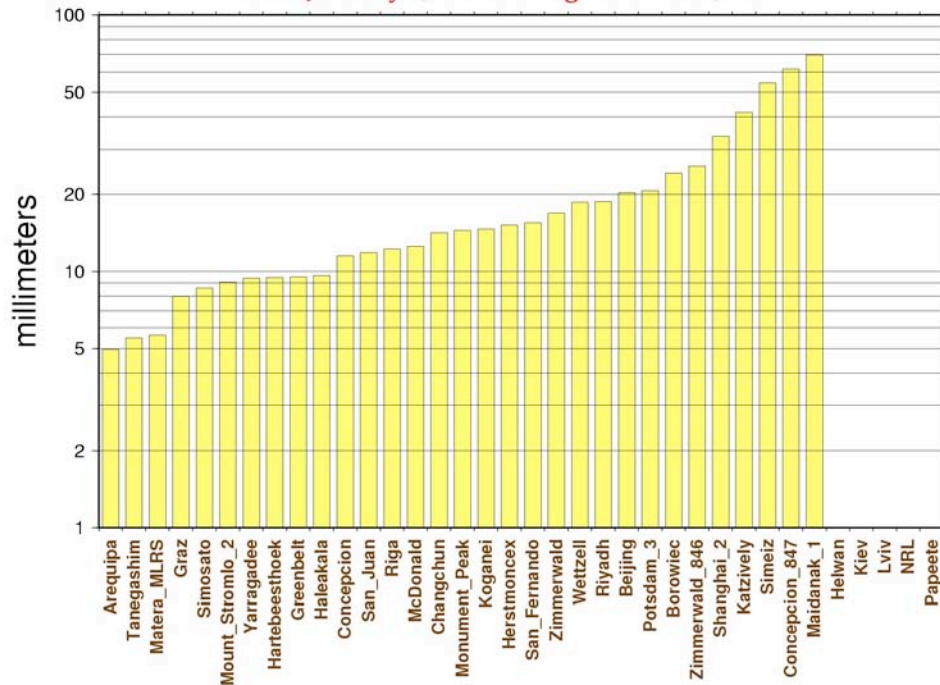
ILRS Quarterly Report Card Plots (04/01/2006-03/31/2007) (continued)

minutes of data
from January 1, 2007 through March 31, 2007



20070403

LAGEOS RMS
from January 1, 2007 through March 31, 2007



20070403

New ILRS Product Webpages

ILRS Home → Data & Products → Official ILRS Products

Official ILRS Products

Official ILRS Products Description

Normal Point Data

Full-Rate Data

Consolidated Laser Ranging Data (CRD) Format

Data Corrections Predictions

Official Satellite Names

Restricted Tracking Information

Site Positions and Velocities

Data Flow

FTP Archives

ILRS Products

Official ILRS products consist of solutions for station coordinates and Earth Orientation Parameters (EOPs). The ILRS generates weekly, unconstrained solutions for station coordinates (valid for the mid-point of each 7-day interval) and EOPs (x-pole, y-pole and Length-Of-Day (LOD), all at 1-day intervals). These results are stored in subdirectories "pos+eop/YMMD", where "YMMD" is the date (YY=2 digit year, MM=2 digit month, and DD=2 digit day) of the end of each 7-day interval. Within each subdirectory, are the solutions from the combination centers and individual analysis centers.

click on the thumbnail to view a larger image of the location of the tracking data, click on the links to download the solution file via ftp

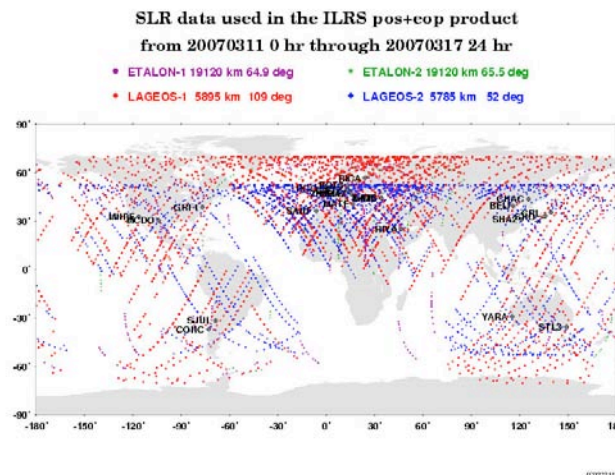
Solution end date, gps week, and data location	combination solution *	analysis center contributions						
		asi	bkg	dgfi	ga	gfc	icet	ngsf
20070317 1418	pos+eop eop sum snx snx	snx	snx	snx	snx	snx	snx	snx
20070310 1417	pos+eop eop sum snx snx	snx	snx	snx	snx	snx	snx	snx
20070303 1416	pos+eop eop sum snx snx	snx	snx	snx	n/a	snx	snx	snx
20070224 1415	pos+eop eop sum snx snx	snx	snx	snx	snx	snx	snx	snx
20070217 1414	pos+eop eop sum snx snx	snx	n/a	snx	snx	snx	snx	snx

* [pos+eop](#): Summary file assessing the quality of solution and a SiNEX format solution file for combination Position and Earth Orientation Parameter solution
[eop](#): a SiNEX format solution file for the EOP combination product

The official primary ILRS combination products are formed by [ASI Space Geodesy Center](#). The ILRS's official backup combination center is [Deutsches Geodätisches Forschungsinstitut \(DGFI\)](#). The combination products, and the individual ILRS analysis center contributions to the official combination pos+eop and eop product can be downloaded from the ILRS ftp archive labeled as:

<ftp://oddis.gsfc.nasa.gov/pub/pub/slr/products/pos+eop/YMMD/CENTER.pos+eop.YMMD.vN.sum>
<ftp://oddis.gsfc.nasa.gov/pub/pub/slr/products/pos+eop/YMMD/CENTER.pos+eop.YMMD.vN.snx>
<ftp://oddis.gsfc.nasa.gov/pub/pub/slr/products/pos+eop/YMMD/CENTER.eop.YMMD.vN.snx>

Plot of Data Used in Products



New ILRS Station Performance Webpages

ILRS Home → Stations → Site Listing → Yarragadee

Sites can be sorted by: Name OR PAD ID

Active Sites

- [Arequipa \(AREL\)](#)
- [Beijing \(BEIL\)](#)
- [Borowiec \(BORL\)](#)
- [Changchun \(CHAL\)](#)
- [Concepcion \(CONL\)](#)
- [Golosiiv \(GLSL\)](#)
- [Grasse \(LLR\) \(GRSM\)](#)
- [Graz \(GRZL\)](#)
- [Greenbelt \(GODL\)](#)
- [Haleakala \(HA4T\)](#)
- [Hartebeesthoek \(HARL\)](#)
- [Helwan \(HLWL\)](#)
- [Herstmonceux \(HERL\)](#)
- [Katsively \(KTZL\)](#)
- [Koganei \(CRL\) \(KOGC\)](#)
- [Komsomolsk \(KOML\)](#)
- [Kunming \(KUNL\)](#)
- [Lviv \(LVIL\)](#)

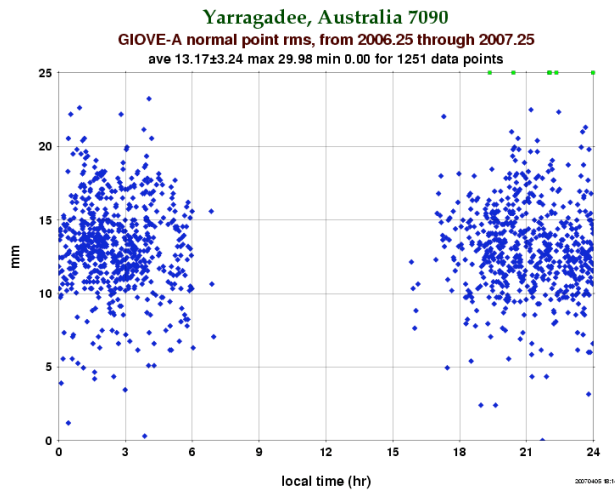
General | **Met Data** | **Performance** | **Site Log** | **performance 2**

Yarragadee, Australia satellite information as a function of local time and satellite range timespan begins April 1, 2006 and ends March 31, 2007

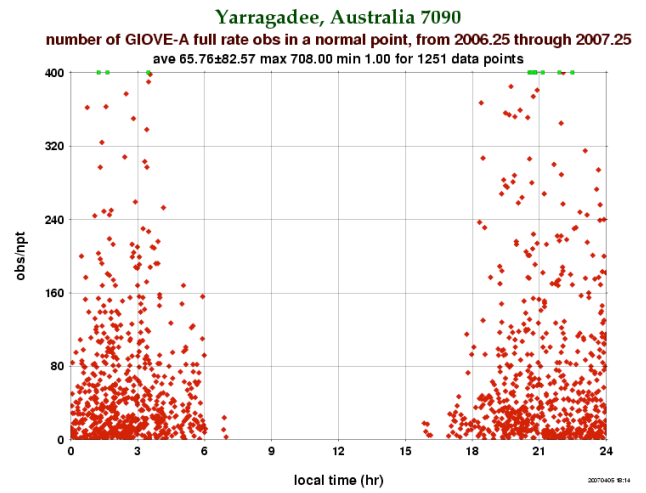
satellite	local time		range		satellite	local time		range	
	npt rms	numFR /npt	npt rms	numFR /npt		npt rms	numFR /npt	npt rms	numFR /npt
ANDE-Act 5 sec					Jason-1 15 sec				
ANDE-Pas 5 sec					Ajisai 30 sec				
CHAMP 5 sec					LAGEOS-2 120 sec				
GRACE-A 5 sec					LAGEOS-1 120 sec				
GRACE-B 5 sec					Etalon-1 300 sec				
ICESat 5 sec					Etalon-2 300 sec				
Larets 30 sec					GLONASS-89 300 sec				
ALOS 15 sec					GLONASS-95 300 sec				
ERS-2 15 sec					GLONASS-99 300 sec				
Envisat 15 sec					GPS-36 300 sec				
GFO-1 15 sec					GPS-35 300 sec				
Starlette 30 sec					GIOVE-A 300 sec				
Stella 30 sec					ETS-8 300 sec				
Beacon-C 15 sec									

Note: For a larger view, please select a thumbnail.

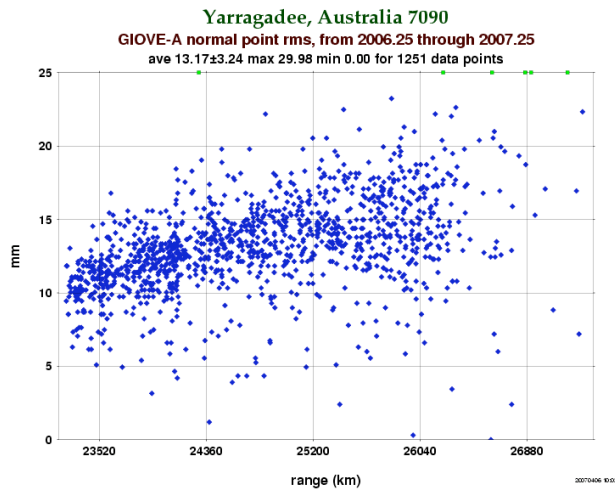
New ILRS Station Performance Webpages



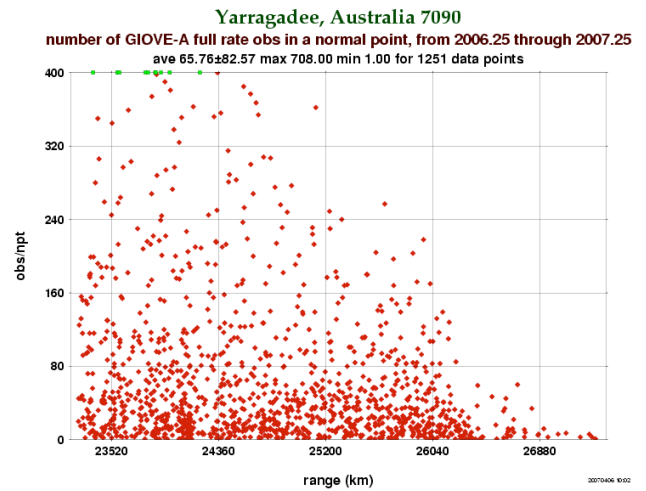
Yarragadee GIOVE-A NPT RMS (Local Time)



Yarragadee GIOVE-A No. FR/NPT (Local Time)



Yarragadee GIOVE-A NPT RMS (Range)



Yarragadee GIOVE-A No. FR/NPT (Range)

GGOS Ground Networks and Communications Working Group

(Joint Meeting with IERS Working Group 2)

Seminar Room (SEM124)
Room-Number CB0308, 3rd floor.
Vienna University of Technology
Institute of Geodesy and Geophysics
Advanced Geodesy (128-1)
Gusshausstr. 27-29, 1040 Wien
April 18, 18:00 – 21:30 hours

Agenda

1. Simulation activities to scope the future network
 - a. John Ries - bias and center-of-mass offset issues, and their impact on the TRF Scale (15 min.)
 - b. Dan MacMillan - VLBI simulations (15 min.)
 - c. Erricos Pavlis – SLR Simulations and combination simulations (15 min.)
2. Progress on GNSS retroreflectors - Mike Pearlman (5 min.)
3. Five minute Services briefs (IVS, ILRS, IDS, IGS, IGFS, IERS) - (30 min.)
4. Ground Survey techniques to monitor co-location vectors (joint activity with IERS WG-2/Gary Johnston) – (2 hours)
 - a. Chopo Ma - Leica visit and demonstration at GFSC
 - b. Yoaz Bar-Sever - a GPS concept for local survey control
 - c. Peter Sperber - Ground System network survey control
 - d. Heribert Kahmen - Engineering Geodesy/ IAG Sub-Commission 4.2
 - e. Gary Johnston – Recent network control activity in Australia
 - f. Mike Pearlman – A low cost micrometer

We have a considerable amount of material to cover. We must start item 4 by 19:30 hours.

Sandwiches, refreshments and drinks will be served at a modest charge.