

ILRS Governing Board Meeting

Westin Hotel Market Street
San Francisco, CA

Tuesday, December 06, 2011
07:00-09:30 p.m.

Attendees:

Governing Board members:

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| G. Appleby | P. Bianco |
| C. Luceri | J. McGarry |
| C. Noll | E. Pavlis |
| M. Pearlman | F. Pierron |
| B. Schutz | |

Invited guests:

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| B. Donovan | J. Horvath |
| J. LaBrecque | S. Merkwowitz |
| T. Otsubo | J. Park |
| M. Torrence | S. Wetzel |

Opening Remarks

G. Appleby welcomed everyone and thanked all for coming. Attendees were introduced.

CB Report (M. Pearlman)

Thirty-five stations operated during the last year. Data is now flowing from Arkhyz and Komsomolsk in Russia; additional Russian SLR stations (co-located with VLBI) at Svetloe, Zelenchukskaya, and Badari are in testing. Network data yield continues to increase as stations in repair or upgrade come back in operation and new satellites are added to the roster. Some stations are still marginal or non-participants in network operations. The ILRS has a strong slate of upcoming new missions to support in the next few years. Transition to CRD format continues; we are trying to target a full transition in March or April 2012.

It had been proposed during the ILRS Workshop in Koetzing that we hold an ILRS technical workshop on retroreflectors in 2012 in Frascati, Italy. We await word from Simone Dell'Agnello on the practicality of this event.

It does not appear the Russian SLR stations are providing much data on the GLONASS satellites, which is a little surprising. Some of the ILRS stations are tracking many of the GLONASS satellites, indicating that we have plenty of excess tracking capacity in the network. This is also borne out by the chart of tracking

minutes per year by each station. But we need some guidance in assigning priorities, or we will have each station marching to its own drummer.

A subcommittee is working on an amendment to the Normal Point definition to accommodate the higher data rates from the kHz stations. This will help stations complete normal points more quickly and thereby acquire more satellites passes.

GGOS Report (M. Pearlman)

The main task for the GGOS Networks and Communication Bureau is the development of the core network of co-located VLBI, SLR, GNSS and DORIS. Next generation systems are under development at some stations and this will hopefully help set the pace for the evolution of the network. The GGOS site requirements document is available (http://cddis.gsfc.nasa.gov/docs/GGOS_SiteReqDoc.pdf). GGOS has issued the Call for Participation for GGOS sites; a number of responses have been received and more are expected. Agencies with sites hosting co-located techniques or planning to implement co-located sites are urged to respond. Responses received thus far cover new technology under development, legacy sites, legacy sub-core sites, stations plans, and agencies offering land for new stations.

The site requirements document recommends locating GGOS Core stations away from plate boundaries in stable geologic area. The likelihood of finding a sufficient number of the “ideal” sites in proper geographic location is very low; therefore, we need to determine how much motion can be modeled and what compromises can be made.

NASA Space Geodesy Project (S. Merkowitz)

The NASA Space Geodesy Project (see slides) is a two-year GSFC/JPL joint activity for development of the next-generation prototype core site with SLR, VLBI, GNSS and DORIS and comprehensive ground survey monitoring. The site is being built at GSFC along side of the legacy systems for comparison; the program also includes updates to multi-technique analysis and an implementation plan to guide a possible follow-on phase with deployment of production version of the systems to other sites.

Mission Items (G. Appleby)

Over the last year several new satellites have been added to the roster. The Galileo-101 and -102 satellites have ILRS standard arrays and tracking quickly became routine. For example, the Herstmonceux station is averaging a 5-10% return rate on the new Galileo satellites, comparable to Compass. Both Galileo and Compass have arrays that approximate the ILRS GNSS retroreflector standard. RadioAstron proved and still proves to be more challenging. F. Pierron presented slides detailing the Grasse experience in ranging to RadioAstron, tracked so far only by the Grasse station.

G Appleby suggested that the ILRS may want to think of levels of mission support, differentiating between those missions needing full, ongoing support (e.g., LAGEOS, Jason, etc.) from those requiring only localized geographic support (e.g. geosynchronous orbits) or those requiring only short bursts of tracking (e.g., RadioAstron). There was also the question of whether ILRS-supported missions should be required to make some or all of their data available for general use in exchange for ILRS support. It was recognized that raw data may not be the issue, but rather the user level products coming out of the mission.

J. LaBrecque suggested that the ILRS should encourage India and its emerging SLR activities to participate in GGOS as a mechanism for our support of the INRSS mission.

The consensus was that there should an expectation that a mission supported by the ILRS should make every effort to make its data available to the global community.

J. McGarry reported that there have been over 1600 hours of LRO-LR ranging since the satellite launch. There have also been three four-way simultaneous sessions and multiple occurrences of simultaneous tracking with two and three stations.

Analysis Working Group (E. C. Pavlis)

The report described the status of ongoing AWG Pilot Projects and the plans for the next six-month period. All ACs are now contributing regularly to the official and pilot products. Once the new CoM models are implemented and validated by all ACs (~end of 2011), the DAILY product will become the official product and the WEEKLY solution will become the test-bed for new modeling (atmospheric gravity and loading) that is expected to improve our contribution to ITRF. Past meetings were reviewed briefly and the date and location of the next AWG workshop were announced (EGU, Vienna, Saturday, April 21, 2012). It was noted for the record that the JCET/GSFC AC/CC was to relocate during the Christmas holidays and a disruption of operations over one month was possible. The status of the ILRS special issue of JoG was briefly discussed and the delay in progress due to ECP's busy schedule. The need to identify a lead author to replace Scott Wetzel on one of the papers was stressed. The upcoming launch of LARES is now set for early 2012, according to ESA. An example of the impact of recent ILRS data flow problems was presented.

CRD Update (C. Noll/R. Ricklefs)

Format conversions are always very difficult and our CRD experience has been no exception. We are finally at the stage where we should be able to provide all data in both CRD and legacy formats starting January 01, 2012 to allow all users to test their software. Full transition is scheduled for March 01, 2012; data centers will no longer provide data in the legacy formats (historic data in old formats will remain available

of course). Stations not yet converted to CRD will be forward converted by the Operations Centers for a short period while conversion is completed. Some stations have been delayed due to upgrading activities.

Data Flow Issues (C. Noll)

Some data flow issues have been encountered causing data flow delays and outages among EDC, ITT, and CDDIS, resulting in archive disruptions and problems in the routine generation of ILRS products. The new NASA contractor, ITT, has taken several steps to diagnose and address the issues but some of the problems persist and are being examined.

Appleby expressed the board's gratitude on behalf of the ILRS Community for the CB's considerable efforts in mitigating the problems that had occurred.

LaBrecque requested a letter from the ILRS GB detailing the performance and impact to users during the changeover.

Action: The CB will prepare a letter for NASA HQ regarding the SLR data flow problems. (Noll and Pearlman); *this probably should be written by the NASA Program Manager with ILRS help.*

Center of Mass Developments (G. Appleby)

There has been a limitation on the accuracy of ranging to LAGEOS and other spherical satellites due to the fact that stations have different configurations and operating parameters, which can lead to differing satellite center of mass corrections. Historically we have used a single correction for each satellite. Graham Appleby and Toshi Otsubo have developed station configuration corrections for LAGEOS and Etalon that can be applied to data according to station configuration time history. The time-histories of the corrections for each station have been posted for use by the analysis centers. A pilot project is underway to determine the effect of the new models; initial results indicate improvement in the vicinity of a mm or so, with lower energy systems showing less systematic effects.

ARGO (J. Park)

The new co-location site at Sejong, South Korea is being built. The laser systems are being integrated and tested at the Korean Astronomical and Space Science Institute (KASI) in Sejong (see slides). G. Kirchner worked at KASI for a week in early November to help get the systems operational. After tests at the Institute, the SLR system will be moved to the site (about 20 kilometers away) for installation. A VLBI system is also under construction at the site. Operations are scheduled for late 2012 after extensive field testing and procedures are completed for the installation of the radar system for aircraft safety.

The launch of KOMPSAT-5 has been delayed until first half of 2012.

LLR (M. Pearlman/J. Mueller)

Although some data were taken on Lunokhod 1 and 2 in 2010, data in 2011 were limited to Apollo 11, 14, and 15. The Apollo site had an impressive operation in 2010, but data in 2011 has been limited to MLRS and the newly operational Grasse site (see slides). Data from APOLLO will be added to the ILRS data centers as they become available. The Matera and Wettzell sites plan to participate in lunar tracking shortly. Additional lunar retroreflectors are being proposed and data and scientific analysis continues at JPL, Paris Observatory Lunar Analysis Center (POLAC), the Institute of Geodesy (IfE), and other specialized centers.

ILRS Website Redesign (C. Noll)

C. Noll gave a demonstration of the new ILRS website. They are working toward a release in the second half of 2012.

18th International Workshop on Laser Ranging (T. Ostubo)

The 18th International Workshop on Laser Ranging is planned for the Tokyo area in the fall of 2013. The local organizing committee has had its first meeting. H. Kunimori has requested a letter of support from the ILRS.

Action: The CB will prepare the letter of support for the next laser ranging workshop and circulate through the GB for approval. (Noll and Pearlman)

Other Business (M. Pearlman)

Each of the IAG services will be requested to address the issue of intersystem vectors for co-location measurement. We need to ensure that all stations are relating the measurements to a proper reference point and that processes used are sufficiently accurate to support co-locations and their instruments for the derivation of the reference frame. It should be noted that the real issue here is the extrapolation of the survey measurements to the individual instrument reference points, which may not be accessible. As mentioned above, intersystem vector measurements may be a good topic for an upcoming ILRS technical workshop.

The next ILRS Governing Board meeting will be held in Vienna Austria during the EGU, April 22-27, 2012.