

3 Reports of IERS components

3.1 Directing Board

The IERS Directing Board (DB) met twice in the course of the year 2007. Summaries of these meetings are given below.

Meeting No. 44 April 15, 2007, Technical University of Vienna, Vienna, Austria

Introduction and approval of agenda

The agenda was adopted with a slightly changed order of items and the Minutes of the IERS Directing Board meeting # 43 were approved.

Formalities

The Chair, Chopo Ma, reported about his participation in the GGOS retreat in Oxnard, California on February 19 – 21, 2007. To prepare the retreat a questionnaire was distributed to collect the contributions and the expectations of the IAG services with respect to GGOS. As a sidelight it was estimated that all IERS activities total ~ 35 person-years.

On January 1, 2007 the lead of the Conventions Centre switched from G. Petit to B. Luzum.

**ITRF 200X
Convergence of ITRF solutions**

Z. Altamimi visited Munich on April 2, 2007 to start an intensive discussion on the combination processes used at IGN and DGFI. It is planned to meet four times a year.

He continued that there has been an extensive exchange of test combinations including input data, cumulative solutions per technique, selection of local ties and their weighting, and multi-technique combinations including all residuals. IGN provided the ITRF2005 ties and their sigmas. DGFI recently provided technique residuals of a new combination but not yet the tie residuals.

H. Drewes explained in his presentation the two different strategies and the possible difficulties. In the DGFI solution the scale might be affected by technique specific effects whereas the IGN solution network deformations might enter into the datum. There is always the danger that a real global change will be absorbed in the parameters. For the next ITRF it has to be discussed if the datum parameters will be derived from the definition (geocentric, metric) or from the (deforming) network realization (centre & scale of the network). H. Drewes stated that the intra-technique solutions are already in agreement at the sub-millimetre level.

Scenario for generation of the next ITRF

To generate the next ITRF new data need to be included, especially the results from the IGS and ILRS reprocessing. Z. Altamimi asked for more separate GPS co-locations with VLBI and with SLR because they are essential to strengthen the connection between VLBI and SLR, which have only 7 co-locations. The GPS Absolute

Phase Centre variation (APCV) might affect the GPS vertical component estimate. More past SLR data (1980 – 1992) are necessary for monitoring the scale and the origin, and effects of the range bias estimation and the new modelling of the troposphere / mapping function have to be studied. In total the scale difference between VLBI and SLR might be changed.

G. Gendt described the status of the IGS reprocessing activities. The reprocessing is performed by six analysis centres and three combination centres. The reprocessing will last at least one year. The IGS reprocessing will benefit from AC's software improvements, improved models (absolute antenna models, ocean loading, troposphere – GMF, GPT), improved tables of discontinuities, completion of IGS data archives. In the first run no higher order ionospheric effects or atmospheric and ocean loading effects will be considered. The reprocessing will provide weekly SINEX files incl. ERP back to 1994 (new for 1994 to 1999) and orbits & compatible sat-clocks (5-minute) with high consistency back to 1994.

Chopo Ma reiterated that the co-location sites should be included in the reprocessing. Prompted by A. Nothnagel G. Gendt explained that activities are going on to calibrate radomes, but there are many different kind of radomes as well as behaviour different under specific environmental effects.

E. Pavlis reported about the status of the ILRS network developments: 32 global stations providing tracking data regularly, Haleakala, HI station reactivated (November 2006), Arequipa, Peru station reactivated (October 2006), highly productive San Juan, Argentina station, operational since March 2006 (Argentine/Chinese cooperation), new missions; the analysis activities: ILRS official products (station coordinates and EOP) issued weekly, seven ILRS Analysis Centres (ASI, DGFI, BKG, GA, GFZ, NASA GSFC/JCET, and NERC) contributing to the official products, combination and combination back-up centres at ASI and DGFI, analysis of early LAGEOS (1976–1993) data underway for ILRS product submission to the next reference frame, POD products for geodetic satellites (initially) to be routinely available in mid-2007; the GNSS retro reflector activities, and the technical developments. The new combined solutions will be available in July.

A. Nothnagel stated that the IVS is doing the reprocessing as well and noted that there is still an inconsistency in the definition and handling of the pole tide.

F. Lemoine demonstrated that the application of the new gravity fields and atmospheric loading slightly improved the DORIS solutions, especially the annual signal.

M. Rothacher as IERS Analysis Coordinator summarized the discussion and focused in his presentation on the time table for the next generation, the input data, the models relevant for more than

one technique, the list of parameters, the standards for parameterisation and the ITRS Combination Centres.

In the general discussion H. Drewes proposed a meeting of all Analysis Centres at the IUGG in Perugia. He suggested an ITRF 2007 conducted in 2008. It should include a minimum set of common parameters and models. Chopo Ma asked the Analysis Coordinators of the IERS TCs if it would be possible to meet in Perugia: IDS agreed, IGS maybe too early, IVS reprocessing maybe not possible before Perugia, ILRS agreed. M. Rothacher and Z. Altamimi should make the arrangements.

Decision process for the selection of the next ITRF

Z. Altamimi suggested the following procedure: wait for IGS and ILRS reprocessing, work in a more cooperative way between ITRF CCs (e.g. regular meetings, test combination exchanges), and submission of a unique ITRF solution to the TCs and others for evaluation.

M. Rothacher completed the previous comments by more details on the planning, the generation of the input series, the combination and the evaluation procedures. The proposed approval phase and steps were not in common consensus with Z. Altamimi.

Examination of co-location site discrepancies

Z. Altamimi pointed out that the examination of the co-location site discrepancies is very problematic and that most local ties have their own epochs. He emphasised the application of the complete set of local ties but stated that the application of the APCV degrades the solution in the combination. H. Drewes proposed to write a letter to the station managers asking for yearly local tie measurements.

M. Rothacher recommended the local ties as analysis tool because the local tie discrepancies are possibly hints for systematic effects in the space geodetic techniques. The list of some of the critical systematic effects shows that especially the mapping functions and the higher order ionospheric terms affect the height component.

New EOP series Report from Earth Orientation Centre

D. Gambis presented the new approach for a combined solution C04(05). With the release of ITRF 2005 he sees the chance to renew the C04 series. Reasons are the extended time series, new algorithms (new models for nutation and UT1/LOD tidal variations, new approach for combination of LOD (GPS) and UT1–UTC determined by VLBI, and estimation of the formal errors. The EOC is planning to do its own combination independent of developments in the ITRF and ICRF. The EOC is ready for implementation.

W. Wooden analysed the proposed new C04(05) series. He noted major inconsistency concerns, displayed in his presentation. It was proposed that the heads of the EOC and of the RSPC as well as

the IVS analysis coordinator should meet in person to understand the details of the new C04(05) series.

The ACs of the IERS TCs were asked how the C04 is used in the operational work. The ILRS use the rapid values as basic input for orbit determination, the IGS only Bulletin A, IVS Bulletin A, and IDS does not see any problem.

Chopo Ma noted the continued lack of an implementation plan and asked the EOC to set up such a plan that clearly states at what level the various users are affected. G. Petit suggested a Technical Note to give more details on the new series.

Future visions from the Rapid Service/Prediction Centre

W. Wooden reported about the recent efforts at the Rapid Service/Prediction Centre. One of the main topics are the coordination with the Earth Orientation Centre to give feedback on the new C04(05) series, to ensure the quality of the new system and to change the RSPC bias and rate to match the C04(05) system.

New versions of the combination as well as of the prediction programs were installed and updated input series were incorporated. In the near future there will be a transition to a new operational machine as well as investigations how the IGS Ultra-Rapids can be used in the combination solution; possibly the IGS Rapid pseudo-points currently being used can be replaced.

The RSPC launched a user survey to study user behaviour and requirements. For the evaluation the 71 user responses are divided in five classes: academic users, engineers, operational, operational scientific and pure scientific users.

Here are the major results:

- Polar Motion Accuracies: Most users want accuracies of 1 milliarcsec or better.
- UT1–UTC Accuracies: Almost two thirds of all users want accuracies of 0.1 millisecond or better.
- EOP Prediction Length: There seem to be two classes of users – those who need predictions of less than 30 days and those who would like predictions of 1 year (~25%).
- EOP Data Spacing: Majority of users prefer data at 1-day intervals.
- EOP Update Frequency: Operational/Scientific users prefer predictions to be updated daily.
- EOP Data Formulation: Majority of users prefer tabular data.

There will be a WG session at the Paris Observatory during the Journées in September 2007.

Review of IERS WG on Combination and of the Combination Pilot Project (CPP)

M. Rothacher reviewed the status of the WG on Combination and of the CPP for resuming the activities after the release of ITRF2005, drawing the attention to a short meeting of the IERS WG on Combination, IERS CPP, and IERS CRCs during EGU 2007 and a meet-

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ing of the interested groups in June 2007. The intra-technique combined SINEX files are routinely generated with delays of 18 days (ILRS) up to 46 days (IDS). A complete list is available at <<http://iers1.bkg.bund.de/info/listFileCPP.php>>. The Technique Services will continue producing weekly combined SINEX files including the parameters coordinates, xp, yp, xpr, ypr, lod in the case of IGS and ILRS, coordinates, xp, yp, UT1, xpr, ypr, lod, de, dp in the case of IVS, coordinates, xp, yp, xpr, ypr in the case of IDS and the combined GRGS solution coordinates, xp, yp, de, dp. Weekly inter-technique solution will be produced by DGF1, ASI might begin in mid 2007, but IGN has not made a decision. The next steps for the Technique Services will be the change to generate routine SINEX files for the IERS CPP according to the standards used for the generation of the ITRF2005 time series. The Inter-Technique combination and validation centres should study different combination strategies. M. Rothacher suggested a daily rapid IERS EOP product based on the combination of VLBI Intensive Sessions (e-VLBI) with GPS rapid products to obtain highly precise rapid EOP solutions.

Workshop on Conventions and report on the Conventions update process

B. Luzum gave an overview about the ongoing work done under the lead of the Conventions Centre. Some changes were introduced in Chapter 5 (Transformation). For Chapter 5 (Transformation), Chapter 7 (Site Displacement), Chapter 8 (Tidal Variations in Earth Rotation), and Chapter 9 (Troposphere) work is in progress. Details can be found at <<http://tai.bipm.org/iers/convupdt/convupdt.html>>.

The IERS Workshop on Conventions will be held at the BIPM on 20–21 September 2007. The goals of the meeting are to discuss recent advances in the Conventions' models, topics without a consensus opinion and future directions for the Conventions. Discussing the presented topics loading was seen as an important point. Pre-registration is possible at the BIPM web site.

A. Nothnagel asked for a consistent use of either UT1–TAI or UT1–UTC. This could also be a subject of the CPP.

Unified Workshop on Analysis (IERS as lead organizer)

M. Rothacher suggested a unified workshop on analysis which will involve GGOS, IERS, IGS, IVS, ILRS, IDS, IGFS. The workshop will focus on problems of the individual techniques and problems common to more than one technique. Also the common understanding of all techniques for each individual technique should increase as they contribute to GGOS. There is a positive feedback from all services for this two and a half day workshop. It will be held in the San Francisco area and scheduled before the AGU 2007 Meeting probably Wednesday to Friday evening. The IERS will be the lead organizer.

Service Analysis Coordinators and Chairs were asked for ideas concerning common research projects. M. Rothacher presented a

list of possible common research projects. Concrete cases could be a GGOS troposphere combination project, a GGOS portal meta data project and/or a daily rapid IERS EOP product. M. Rothacher reported about the German GGOS project funded by the Ministry for Science and Technology.

Report of IERS Working Group on the Second Realization of the ICRF

R. Gaume gave a short report on the first meeting of the ICRF-2 working group, which was held at the Vienna University on April 12, 2007. The meeting attended by 18 participants dealt mostly with organisational aspects. After the introduction the milestones and a tentative meeting schedule was discussed. The goal is to have the ICRF-2 presented and adopted at the IAU XXVII General Assembly in Rio de Janeiro in 2009. Starting with source categorization, the methods of time series generation were considered. At the IAU Symposium No. 248 "A Giant Step: from Milli- to Micro-arcsecond Astrometry", Shanghai, October 15–19, 2007 Chopo Ma will give an invited talk on ICRF-2. There is a limited opportunity for oral presentations but posters are still solicited.

Report of IERS Working Group on Site Survey and Co-location

Reflecting the goals of the WG on Site Survey and Co-location G. Johnston underlined the importance of the local tie surveys. Recent achievements were the completion of the user guide for the Axis software, a survey planning visit to Syowa / Antarctica, and the planned survey in Tahiti (GPS, SLR, DORIS) by IGN. Afterwards he presented the list for the site co-location SINEX files some technical issues were considered. Summarising he stated that only 40% of the ties are updated. It was recommended by the IERS DB that the WG leader together with the IERS CB and the IERS ITRS Centre should write a letter to those stations which have a deficit in their surveying tasks.

Status and future of the GGFC

M. Rothacher presented some general ideas on IERS products and specific ones for the GGFC. He described the present situation where new requests for products will emerge, that not all SBs of GGFC are producing operational products and that the role of IERS and GGFC is of vital importance in the framework of GGOS. On the other hand the present structure is not flexible enough to include new institutions and / or products.

He proposed a change in the Terms of Reference to allow the establishment of new product centres. The timeline should be seen in two phases. Phase A will be the submission of the proposal, the evaluation by the IERS DB and the start of a test phase. In Phase B the institution demonstrates its capability to produce operational products, which will be evaluated. At the end the institution is accepted or not as an IERS product centre.

After considerable discussion the DB accepted this general idea which should be applied for the renewing of the GGFC. T. van Dam

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should lead the effort for the renewal of the GGFC according to the proposed procedures. The process is steered by the IERS demands and offers but should also include the ideas of the IERS TCs.

Report on GGOS (Oxnard retreat) and GEO (GEO III, Architecture III)

M. Rothacher reported about GGOS activities since the last IERS DB meeting, which were mainly done by telecons of the Executive Committee. The Workshop 2007 and the meeting at the IUGG in Perugia have been prepared. The IAG / GGOS representatives in GEO committees joined some GEO meetings to support the GEO task AR-07-03 "Geodetic Reference Frames". Letters of support were initiated by GGOS to encourage GGOS Troposphere Products ("GGOS – Atmosphere"), laser retro-reflectors for GNSS satellites, and WMO Recommendation for Reference Frames (WGS-84/EGM96).

During the GGOS retreat the various IAG components (Commissions, Services, GGOS WGs, GEO representatives) gave their reports and comments on the planned GGOS2020 reference document. Lists of the next major steps as well as the next meeting events concluded this review.

B. Richter continued by giving a short overview about the IAG/ GGOS GEO activities. At the Architecture and Data Committee (ADC) meeting in Geneva on February 28 / March 1, 2007 a status review of all ADC tasks took place, with a focus on the Architecture core Tasks (AR-07-01 (interoperability) and AR-07-02 (clearinghouse) and to discuss the input of ADC to the preparation of the Ministerial Summit. Among these tasks a new task "Global Geodetic Reference Frames" initiated by GGOS has been included in the GEO Work Plan 2007–2009. Also comments and modifications for the GEO Work Plan 2007–2009 were submitted and partly included. It has been discussed whether the Reference Frame task can be presented as an early achievement at the Ministerial Summit in South Africa in November this year.

Interoperability arrangements for services are a key principal of the GEOSS Architecture and the main focus of the ADC. GEO sent out a call for participation for clearinghouse applications as an important part of the dissemination portion of GEOSS. The GEOSS Clearinghouse will need to be a client to community catalogue servers implemented in accordance with multiple catalogue service standards. At a minimum these include ISO 23950 and OGC Catalogue Service – Catalogue Service for the Web (CSW). The IERS Data and Information Service follows these developments actively by being part of the German Geoportal Bund (Government).

Reports of the Unions (IAU/FAGS, IAG/IUGG)

N. Capitaine informed the DB that IAU Information Bulletin 99 (January 2007) contains all the official information from the XXVIth IAU GA (IAU Resolutions, Composition of Divisions, Commissions, WGs, etc.). Her presentation included the agendas of the upcoming

Journées 2007 with 4 sessions dealing with the themes Plans for the new ICRF, Models and Numerical Standards in Fundamental astronomy, Relativity in Fundamental Astronomy, and Prediction of Earth Orientation as well as the IAU Symposium 248 “A Giant Step: From Milli- to Microarcsecond Astrometry”.

Concerning the development in FAGS (Federation of Astronomical and Geophysical Services) N. Capitaine described the planned white paper, which is intended to provide the views of the current FAGS/ICSU interdisciplinary body on the prospects for a future federation in the framework of the new arrangements within ICSU for data coordination.

In order to achieve the recommendations of the Priority Area Assessment (PAA) on Scientific Data and Information, ICSU established the „Ad hoc Strategic Committee on Information and Data“ (SCID) according to the ICSU Strategic Plan 2006–2011. Three member of this committee are representatives of FAGS.

Report of the Central Bureau

Due to lack of time the report was reduced to announcing the call for the Annual Report 2006. The call will be sent out although the Annual Report 2005 is still missing two inputs.

Progress has been achieved by including the IERS Data and Information system into a catalogue service for the WEB (CSW).

Meeting No. 45

December 11, 2006, San Francisco Marriott Hotel, San Francisco, CA, USA

Introduction and approval of agenda

The agenda was adopted and the minutes of the IERS Directing Board meeting # 44 were approved.

Formalities

C. Ma welcomed the new member J. Ray, who was elected by the IGS as the new delegate to the IERS Directing Board as well as D. Angermann and J. Dawson who represented the ITRS CC Munich and the WG on Co-location, respectively.

ITRS/ITRF issues

Interaction between IERS and IAG Commission 1

Z. Altamimi, as the newly elected chair of IAG Commission 1 informed the DB about its present status. The slide with the objectives highlighted the goals and in the following slides the structure with its sub-commissions and the steering committee as well as the chairpersons and members were shown. Several inter-commission study groups and working groups reflect the broad spectrum of Commission 1 and its link to the other IAG commissions and IAG services. Relevant for the IERS are IC-SG 1.1: Theory, implementation and quality assessment of geodetic reference frames, chaired by A. Dermanis (Greece), IC-WG1.1: Environment Loading: Modelling for Reference Frame and positioning applications, chaired by

Tonie van Dam (Luxembourg) and Jim Ray (USA), and IC-WG1.4: Site Survey and Co-locations, chaired by Gary Johnston (Australia).

Report from the ITRS Centre

At the ITRS/ITRF web page more information (updated DOMES number database, ITRF2005 solution and products, local ties in tables and SINEX format, co-location survey reports) have been added and new features installed: ITRF networks can be displayed per ITRF solution, networks can be displayed per technique, ITRF velocity fields can be displayed.

To study the impact of local ties Z. Altamimi performed some experiments. Based on local ties used in the ITRF2005 (22 GPS-SLR vectors, 29 GPS-VLBI vectors) and an appropriate weighting (45% of the ties are in SINEX with known measurement epoch, the others are with unknown variance) he showed that the tie residuals mainly in the up component exceed 10 mm. In an approach of fixed versus weighted ties the normalized residuals increase unevenly. In other experiments he added a 10 mm offset in height for all ties. As a result the tie residuals increased by 10 mm in the up component for GPS and changed the scale by 0.71. Repeating the same for the east and north component one can see effects in the rotation of the z-axis, respectively a shift in the z-axis and in the scale. But also changes in only one of the GPS-VLBI ties by 50 resp. 10 mm show remarkable effects on the ITRF2005. Finally he presented a list of “dubious” ties where dubious means a disagreement between local survey and geodetic space technique estimated ties.

After the IVS recognized the missing mean pole tide corrections the VLBI scale shifted by -0.5 ppb with respect to the ITRF2005. Comparisons with the SLR and Doris scales were shown.

In the final part of the presentation Z. Altamimi presented his thoughts about an ITRF2008. The basis will be new, improved and extended data series from the IERS techniques services. Data should be collected till the end of 2008 and the analysis will start at the beginning of 2009. It might be that for IGS only one reprocessed solution is available at the end of 2008.

Progress in understanding ITRF solution differences

On behalf of H. Drewes D. Angermann illustrated in his presentation the differences in the ITRF computation strategies of IGN and DGFI and their effects on the ITRF solution. He concluded that:

- The differences in the ITRF solutions can (mostly) be explained by the different computation strategies.
- The fact that the ITRF solutions are computed with different strategies and software has also some advantages, e.g.:
 - Identification of remaining problems
 - More realistic assessment of the ITRF accuracy
- The understanding of remaining differences should be further improved in close cooperation between IGN and DGFI.

- Important issues for the future are:
 - to improve the SLR and VLBI networks and the co-locations
 - to understand (and reduce) biases between techniques
 - to get homogeneously (re-)processed series from the services
 - to compute the next ITRF in close cooperation between ITRS CCs

The DB asked the ITRS CCs to generate a new ITRF with extended and/or improved data sets from IVS and ILRS together with old and new reprocessed GPS series. The ITRS/ITRF web page should have links to other survey reports.

Report of IERS Working Group on Site Co-location

John Dawson reviewed the activities of the IERS Working Group on Co-location and presented the recent achievements and technical issues to be taken into account. Repeated measurements at Monte Stromlo reflect the present day accuracy. He ended by stating that only 40% of the local ties are updated. To encourage the other 60% of observatories the IERS DB asked the ITRS Centre, the IERS WG on Co-location, and the IERS Central Bureau to write a letter to observation stations to encourage local surveys or to provide survey information.

This agenda item was complemented by a short report describing the co-location survey at Tahiti in October 2007. A significant difference of 14 mm was found in the x-direction between the Station and SLR marker.

ICRS/ICRF issues

R. Gaume, chair, in consensus with the co-director, J. Souchay, proposed a slight modification of the tasks of the ICRS Centre. In 2000 ten tasks were set up assigned to USNO and Observatoire de Paris (OP). Task 2 has now a more specific subject "Investigation of future VLBI realizations of the ICRS" and the old Task 2 "Investigation of future realizations of the ICRS" becomes "Investigation of future non VLBI realizations of the ICRS". Task 6 "Linking the ICRF to frames at various wavelengths" becomes "Investigation concerning the ICRF objects at various wavelengths" and a new Task 9 is inserted: "Maintenance of the link to the solar system dynamical reference frame through observations of asteroids". In total there are now 12 tasks handed by USNO and OP. The IERS DB accepted the changes in general but asked R. Gaume to submit the modified proposal for the IERS ICRS Centre.

Earth orientation products

Status and function of current Earth Orientation products

D. Gambis explained the upgrades of the C04 solution. The current solution is described in the IERS Annual Report, a paper in the Journal of Geodesy (Gambis 2004), and a technical note by Bizouard and Gambis (2007) published only at the Earth Orientation Centre

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web page. The 05C04 solution is among others aligned to the ITRF2005, the IAU2000 nutation model implemented; the solution is achieved in one run over the 20 years available. D. Gambis informed the IERS DB that the EO Centre is the official centre for prediction for CNES.

W. Wooden started his status report by pointing out the distinction between the IERS Rapid Service/Prediction Centre and the EO Centre. The RS/PC is “responsible for providing Earth orientation parameters on a rapid turnaround basis, primarily for real-time users and others needing the highest quality EOP information sooner than that available in the final series published by the IERS EOC.” Based on the requirements he gave details about the current products, the standard data files, updated weekly on Thursday, the daily files updated at 17:05 UTC and Delta T values only for low accuracy users. For the combination and prediction process 16 input data sets are used, the products are disseminated via ftp, web sites and email.

Improvement of current products

D. Gambis reviewed the history of the Bulletins B, C, D, and the C01, C02, C03 series and the relation of the current Bulletin B and 05C04 products as well as the update procedure of 05C04. Finally he proposed to discontinue Bulletin B, to update 05C04 twice a week, to stop C02, C03 and IERS 96P01 but to maintain the long term C01.

The IERS DB asked D. Gambis to prepare a plan how to proceed with the proposal to change the EO products and distribution.

W. Wooden stated that currently, data produced by the RS/PC appear to meet most needs of users of near-real time, real-time, and predicted EO information. However, user needs are constantly changing (more stringent accuracy, more timely, finer resolution). The RS/PC must try to anticipate necessary changes. He discussed possible concerns about data quality, data spacing, data format, frequency of solutions, latency of information, methods of delivery, new analyses, new products, and new information. He concluded that more resources have been allocated to the RS/PC, the data latency will be reduced as the data pipeline becomes more automated (e.g., e-VLBI), and he expects additional improvements from the IERS Working Group on Prediction.

The IERS DB asked the directors of the EO Centre and the RS/PC to investigate and resolve discrepancies in UT1 between the EO Centre and the RS/PC.

New products for the future

As new products of the EO Centre D. Gambis proposed a more extended web service running under Windows and LINUX to compute Earth orientation parameters for any epoch and the matrix of Earth orientation parameters to link the ICRF with the ITRF.

M. Rothacher gave a more general outlook concerning new EO products. All future EO products should be based on the intra-technique combinations of the IERS Technique Services. Four different product types should be generated: multi-year solutions, weekly solutions, daily solutions and predictions. Considering the present status he proposed refinements especially for a combination of VLBI Intensive Sessions (e-VLBI) with GPS rapid products to obtain highly precise rapid EOP solutions. At the Unified Analysis Workshop the generation of daily SINEX files and their combination was suggested. A pilot phase under the lead of the IERS analysis coordinator will start mid to end of 2008.

Role of CRCs

M. Rothacher went over to the list of CRCs and their current activities. 80% of the work is done in relation with combination activities. Even though the CRCs need to be reviewed to see if they fulfil the proposed tasks, the questions remain whether they are visible enough and do they go for real products. The CB is asked to contact FESG, IAA and FFI about what their contribution will be in the future. The AC proposed to create a “Working group on combination at observation level”. The CB will contact R. Biancale that he should draft a charter, a list of members and a schedule for the IERS working group. A final decision was postponed.

Future of the GGFC structure

M. Rothacher gave some perspectives about possible new products of the GGFC. More input is expected from GRACE groups and for the propagation delay from the TU Vienna. Later he repeated a possible procedure to change the status of the Special Bureaus. T. van Dam, as GGFC chair, went through a proposal to the IERS DB to restructure the GGFC. The following discussion was quite controversial. The IERS DB decided that T. van Dam should not go ahead with the call for a new structure at the moment but for clarification she should draw a list of user requirements and available and/or necessary products for the next DB meeting.

Report on Workshop on Conventions

G. Petit and B. Luzum presented a short report on the IERS Conventions workshop held at BIPM, Sèvres, France, September 20–21, 2007. The main conclusions of the workshop were among others the classification of models (Class 1 – reduction, Class 2 – conventional, Class 3 – useful), the criteria for choosing models for conventional station displacements, the treatment of non-tidal loading effects, existing and proposed new models for S1/S2 atmospheric loading, the troposphere, a conventional model for the effect of ocean tides on geopotential, a model for diurnal and semidiurnal EOP variations, and recommendations for handling technique-dependent effects. It is planned that the next edition of the IERS Conventions will be published in 2009. The chairs of the Conventions

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Centre are asked to compare the recommendations of the Unified Analysis Workshop with the IERS Conventions to achieve consistency.

Report on and consequences of the Unified Analysis Workshop

By invitation experts from GGOS, IERS, IGS, IVS, ILRS, IDS, and IGFS came together to hold the first Unified Analysis Workshop, which took place at the Beach Resort Monterey, California on December 5 – 7, 2007. In his presentation M. Rothacher summarized the main subjects of the workshop. The participants were selected by the individual services (5–6 per service), and position papers were put together by the chairs and co-chairs of the sessions (one co-chair from each Service). The participants decided the following action items and recommendations:

- Extension of the SINEX format for other parameter types and representations
- Tests on atmospheric loading: application on the observation or solution level?
- Generation of daily SINEX files (IVS Intensives and IGS Rapids)
- Parameterization and modeling for the next ITRF
- Benchmark tests for models common to several techniques
- Documentation of AC modeling standards and parameterization
- Definition of meta data standards (e.g. SINEX meta data block)

All presentations, the position papers and the action items are available at the IERS web pages <<http://www.iers.org/MainDisp.csl?pid=66-1100207>>.

Report of IERS Working Group on the Second ICRF

R. Gaume gave a short overview about the activities of the Joint IAU/IERS working group to prepare a proposal for a ICRF-2. In conclusion the ICRF-2 working group schedule has slipped a little, but is still on-track for IAU General Assembly in 2009.

Report on GGOS and GEO

In his status report M. Rothacher went through the activities of GGOS since the IUGG General Assembly held in Perugia, Italy, July 2007. For the new components of GGOS – GGOS Coordinating Office, GGOS Communications and Network “Bureau”, GGOS Conventions, Models & Analysis “Bureau”, GGOS Space and Satellite Mission “Bureau” – calls for proposals will be prepared for the GGOS retreat 2008.

Reports of the Unions (IAU/FAGS, IAG/IUGG)

Due to a lack of time C. Wilson and N. Capitaine were not able to give their presentations on IAG, IAU and FAGS activities, but there slides were distributed in written form. For additional information N. Capitaine sent in a note to inform the IERS DB about some issues

that are relevant to the IERS plans for the near future. It will be discussed during the next DB meeting.

Change of Terms of Reference

The present ToR states that:

“The Directing Board consists of the following members appointed for four-year terms, renewable once”.

Because the ToR were created in 2000 and came into force in 2001, some of the directors of the IERS centres would have to finish their term. After discussion the IERS DB decided that the relevant passage in the ToR should be changed as follows:

“The Directing Board consists of the following members”.

Report of the Central Bureau

Organisation

Because it came more and more difficult to arrange the IERS DB meeting in conjunction with the AGU fall meeting alternatives were discussed. A decision will be made at the next spring IERS DB meeting.

According to the ToR working groups are limited to a term of two years with a possible one-time re-appointment. Decisions have to be made whether and how to continue with

- Working Group on Site Survey and Co-location (established in Feb. 2004),
- Working Group on Combination (established in Jan. 2004).

The Working Group on Prediction was established in Dec. 2005.

Annual Report of IERS

The Annual Report (AR) 2005 was printed and distributed in October and November 2007. The status of the AR 2006 was given. To accelerate the completion and to keep the AR close to the reported year the IERS DB decided that the final deadline for the AR 2006 will be January 15, 2008. Contributions not available at the due date will be marked in the AR as “not available”. The deadline for the AR 2007 will be May 31, 2008.

Bernd Richter, Wolfgang R. Dick