3.2 Central Bureau

General activities

The IERS Central Bureau (CB), hosted and funded by Bundesamt für Kartographie and Geodäsie (BKG), organized and documented the IERS Directing Board (DB) Meetings No. 50, May 1, 2010, at Technical University Vienna, Austria, and No. 51, October 10, 2010, at Observatoire de Paris, France. Between the meetings the CB coordinated the work of the DB.

The CB represented the IERS at the following meetings: European Geosciences Union General Assembly, IAG Commission 1 Symposium 2010 (Reference Frames for Applications in Geosciences – REFAG2010); Statusseminar DFG Forschergruppe FOR 584 “Erdrotation und globale dynamische Prozesse”, AGU 2010 Fall Meeting.

IERS components maintain individually about 20 separate web sites. The central IERS site <www.iers.org>, established by the CB, gives access to all other sites, offers information on the structure of the IERS, its products and publications and provides contact addresses as well as general facts on Earth rotation studies. It contains also electronic versions of IERS publications, a list of meetings related to the work of the IERS, and an extended link list for IERS, Earth rotation in general and related fields. Throughout 2010 the web site was regularly updated, several new pages and documents were added.

The IERS Annual Report 2007 and the IERS Technical Note No. 35 “The Second Realization of the International Celestial Reference Frame by Very Long Baseline Interferometry” appeared in print and were distributed to libraries and subscribers. The CB continued to prepare the IERS Annual Report 2008 and started work on the report for 2009 for publication. The Directing Board decided to combine both reports. Along with the reports of the IERS components, the Annual Reports contain information on the IERS compiled by the CB. The CB gave technical support for editing the IERS Technical Note No. 36 “IERS Conventions (2010)” and published it electronically at the IERS web site.

The digitization of the IERS Technical Notes Nos. 1 – 28, published between 1989 and 2000, was finished. These publications are now available in PDF format at the IERS web site. Each page consists of two layers: the visible image of the scanned page and the searchable text, obtained with OCR, in background, related to each other with high precision.

During the year 2010, 24 IERS Messages (Nos. 156 – 179) were edited and distributed. They include news from the IERS and of general type as well as announcements of conferences.

Address and subscription information has regularly been updated in the IERS user database. There were about 2500 users in

2010 with valid addresses who subscribed to IERS publications for e-mail and regular mail distribution. A concept for migration this database into a new system was developed. The improved database should allow easier and automated maintenance and use.

Many questions from IERS users and journalists concerning IERS publications and products as well as Earth rotation and reference frames in general were answered or forwarded to other specialists. Several German radio stations and newspapers reported about the work of IERS based on information from the CB.

IERS Data and Information System (DIS)

The IERS Data and Information System (IERS DIS), which was developed by the Central Bureau between 2002 and 2005, is in the operational mode since 2006. The system is continuously being adapted and extended by new components in order to fulfill the requirements for a modern data management and for the access to the data by the users. In this context international and interdisciplinary projects like the Global Geodetic Observing System (GGOS) or the Global Earth Observation System of Systems (GEOSS) are demanding special requirements with respect to the standardization of the data and applications on the data.

Besides routine work like maintenance of the data bases of users, products and web pages, in 2010 further developments of the IERS DIS concentrated on the following aspects:

- acquisition of data from IERS services and institutions,
- conversion of the data into uniform formats as well as extraction and creation of ISO 19115-conform metadata,
- integration of new data sources,
- development of tools for the visualization of time series,
- updating the data structure, e.g. by adopting to the new structure of the Global Geophysical Fluids Center.

Many of these developments were made in close cooperation with another research project at BKG, the project ERIS. The aim of ERIS (Earth Rotation Information System) as a part of the research unit FOR 584 “Earth Rotation and Global Dynamic Processes” was the development of a virtual Earth rotation system for geodetic and geoscience applications. The central part of the electronic infrastructure of the research unit is the common Web portal <http://www.erdrotation.de>. The project provided an information, communication, and database system as a central interface between the research partners and their applications and fields of interest.

During the year 2010 the focus was on the improvement and development of tools for the visualization of time series. The data analysis tool, developed in previous years, was improved and enlarged. It provides methods like spectral analyses, different

filters and approximations, which may be applied to existing time series from IERS as well as to user data. The interaction between the different methods was considerably improved. The results are provided in standardized data formats and in graphic form. All intermediary steps and the final results may now be exported in XML format. A connection was made with the IERS plot tool developed at BKG, which allows improved graphical displaying. These tools together with instructions can be found at <http://www.erdrotation.de/ida>.

Also a simulation tool was developed during 2010. It allows to combine different model data on Earth rotation, to analyze them and to compare with observed Earth rotation parameters. Currently selected models of excitation functions of the atmosphere, oceans and hydrology are available. For this, existing and tested methods, functions and structures of the data analysis tools could be used. The simulation will be finally tested and made available at the ERIS web portal.

Because of the close cooperation between ERIS and the IERS Central Bureau, ERIS has direct access to the data archive of the IERS and to applications developed for the IERS. In return, techniques and software developed in ERIS will be used after a phase of testing also by the IERS. One of the most important tasks in both projects deals with the data preparation and data networking. To ensure interoperability all data series are transformed into standardized data formats. Based on the XML versions developed for the IERS the XML schemata and the transformation routines are revised to harmonize the data structure and to enhance the machine readability.

Additionally metadata are stored to describe the content of the series, how the data are produced, the authorship, the availability of the data, parameterization etc. To ensure interoperability of the metadata with respect to international and interdisciplinary metadata catalogues, the IERS and ERIS specific metadata are conform to the ISO 19115 “Geographic Information – Metadata” profile. Routines have been established for automatic generation of metadata.

Staff

Dr. Bernd Richter, *Director*
Sabine Bachmann*, scientist (since March 1, 2010)*
Dr. Wolfgang R. Dick, *scientist*
Carola Helbig, *secretarian*
Alexander Lothhammer, *technician (until 31 January 2011)*
Anja Niederhöfer, *scientist*
Peter von Rappard, *technician (until 31 December 2010)*
Sandra Schneider-Leck, *technician (on leave until 31 Dec. 2010)*
Dr. Wolfgang Schwegmann, *scientist (until March 31, 2010)*

Publications

Nothnagel, A.; Angermann, D.; Börger, K.; Dietrich, R.; Drewes, H.; Görres, B.; Hugentobler, U.; Ihde, J.; Müller, J.; Oberst, J.; Pätzold, M.; Richter, B.; Rothacher, M.; Schreiber, U.; Schuh, H.; Soffel, M.: Space-time reference systems for monitoring global change and for precise navigation; Mitteilungen des Bundesamtes für Kartographie und Geodäsie, Nr. 44, Verlag des Bundesamtes für Kartographie und Geodäsie, 2010, 142 p., ISBN 978-3-89888-920-9

Rothacher, Markus; Drewes, Hermann; Nothnagel, Axel; Richter, Bernd: Integration of Space Geodetic Techniques as the Basis for a Global Geodetic-Geophysical Observing System (GGOS-D): An Overview. In: F. Flechtner et al. (eds.), System Earth via Geodetic-Geophysical Space Techniques (Advanced Technologies in Earth Sciences), Berlin, Heidelberg: Springer, 2010, p. 529–537, DOI: 10.1007/978-3-642-10228-8_43

Schwegmann, Wolfgang; Richter, Bernd: GGOS-D Data Management – From Data to Knowledge. In: F. Flechtner et al. (eds.), System Earth via Geodetic-Geophysical Space Techniques (Advanced Technologies in Earth Sciences), Berlin, Heidelberg: Springer, 2010, p. 539–544, DOI: 10.1007/978-3-642-10228-8_44

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