

3.5.3 Conventions Centre

The Conventions Center is provided jointly by the Bureau International des Poids et Mesures (BIPM) and the U.S. Naval Observatory (USNO). As of May 2005, Brian Luzum replaced Dennis McCarthy as the USNO principal scientist.

The Conventions Center provides updated versions of the Conventions in electronic form, after approval of the IERS Directing Board. In the mean time, work on interim versions is also available by electronic means. In addition to the electronic releases, printed versions of the Conventions will be provided at less frequent intervals or when major changes are introduced.

In 2005, the work accomplished or in progress is the following.

1. Advisory Board for the IERS Conventions update

Following the request of the IERS Directing Board at its 39th meeting, the Conventions center has created an "Advisory Board for the IERS Conventions update". The Board began its work in February 2005 under the chairmanship of Jim Ray and has a membership of about 20, representing all IERS components. Initial goals for the work of the Board were described in its first newsletter as

- eliminate ambiguities including effects in the conventional displacements of station positions and provide suitable models for all recognized effects;
- provide a model for the oceanic pole tide deformation;
- provide a model for diurnal and semidiurnal atmospheric pressure loading;
- clarify treatment of geocenter motions and provide a model for the diurnal and semidiurnal effects of ocean tides;
- develop an updated model for diurnal and semidiurnal EOP variations;
- specify protocols for handling technique-specific effects;
- enforce SINEX documentation of models applied in data analyses;
- ensure full availability of software routines.

The Board held an open meeting during the EGU General Assembly in Vienna on 26 April 2005, and worked by e-mail. It started, or helped the Conventions Center start, small groups of experts working on different topics, whose work is reported in the technical items below.

2. Technical topics

The background work of keeping track of corrections, typos and small changes that improve the readability of the documents has continued in 2005. More technical or complex issues are first discussed, e.g. through the Advisory board or on the discussion forum (<<http://tai.bipm.org/iers/forum>>), where topics are being identified

as needing investigation and possible new developments for future versions of the Conventions. Several such topics concern contributions to the difference between the instantaneous position of a site and its adopted position, such as the effects of geocenter motion or atmospheric loading. It is expected that all effects (such as station displacement) that are periodic and have a consistent and accurate *a priori* model, expressed in closed form, should be included in the IERS Conventions. Models for long-term or non-periodic effects, which have an impact on the definition of reference frames, are also to be studied, although their inclusion as conventional effects will need to be discussed.

Work on the following major topics was on-going or started in 2005:

2.1 Ocean pole tide

The ocean pole tide is generated by the centrifugal effect of polar motion on the oceans. Polar motion is dominated by the 14-month Chandler wobble and annual variations. At these long periods, the ocean pole tide is expected to have an equilibrium response, where the displaced ocean surface is in equilibrium with the forcing equipotential surface. The equilibrium model from S. Desai (*JGR* **107**, 2002) is now proposed as the conventional model. The updated Chapter 6 „Geopotential“ was released on 13 March 2006. To compute the pole tide, a conventional mean pole needs to be defined. This change to Chapter 7 „Displacement of reference points“ is being prepared. Also a model for the associated station displacement (loading effect) is being prepared.

Work on this topic involves mostly J. Chen, S. Desai, J. Ray, J. Ries and J. Wahr.

2.2 Atmospheric tidal loading

The diurnal heating of the atmosphere induces surface pressure oscillations at mostly diurnal S1 and semidiurnal S2 harmonics, which produce station displacement due to loading that can have an amplitude of 1.5 mm. Using the Ray and Ponte (*Annales Geophysicae* **21**, 2003) tidal model, a model is proposed to compute the station displacement as grid values along with an interpolation program. These can be found at <<http://www.ecgs.lu/atm>>. Implementation in Chapter 7 „Displacement of reference points“ is not ready yet.

Work on this topic involves mostly T. van Dam and R. Ray.

2.3 Ocean tidal loading

As no conventional routine was available to implement the recommendations of section 7.1.1 of the IERS Conventions 2003 concerning local site displacements due to ocean tidal loading, a new Fortran routine has been written by Duncan Agnew (UCSD). The code can be found on the web site at <<ftp://tai.bipm.org/iers/convupdt/chapter7/hardisp.f>>. Regarding these matters, users should also

note that Hans-Georg Scherneck has recently added the new TPXO.7.0 and FES2004 ocean models to his web site <<http://www.oso.chalmers.se/~loading/>>.

Work on this topic involves mostly D. Agnew, M. Bos, U. Hugentobler, J. Ray, and H.-G. Scherneck.

2.4 Tropospheric mapping function

Since the recommended NMF (A. Niell *JGR* **101**, 1996), as well as other mapping functions cited in the Conventions (2003), have now been shown to have deficiencies, work is starting to determine which version of the recently developed mapping functions should be recommended.

Work on this topic involves mostly J. Boehm, A. Niell, H. Schuh and J. Ray.

3. Dissemination of information

The Conventions web site (<<http://tai.bipm.org/iers/>>), including the discussion forum (<<http://tai.bipm.org/iers/forum/>>), has been maintained. The web pages for the Conventions updates (<<http://tai.bipm.org/iers/convupdt/convupdt.html>>) are continually modified, as required by changes in the texts, routines or data files.

The list of updates to the Conventions published as of 15 March 2006 is the following (An updated list is available online at <<http://tai.bipm.org/iers/convupdt/listupdt.html>>):

Chapter 5: Transformation Between the Celestial and Terrestrial Systems.

- 19 September 2005: Subroutine PMsdnut.for has been added and section 5.4.2 of the previous version of the chapter has been updated.
- 5 November 2004: The corrections (provided by N. Capitaine) with respect to the previous version of the chapter have been implemented. The header of Table 5.3b in the text and in the corresponding file has been updated. The use of equation (23) has been clarified. Note 1 has been added. Information on the new web sites in the notes has been added.

Chapter 6: Geopotential.

- 13 March 2006: The main changes with respect to the previous version of the chapter: A new section 6.3 on Oceanic pole tide (from S. Desai and J. Chen) has been introduced. Information on the treatment of degree 1 harmonic coefficients has been added in the beginning of the chapter (from J. Ries).
- 23 September 2005: The corrections with respect to the previous version of the chapter: In section 6.3, the reference epoch for value C20 has been corrected (noted by E.C. Pavlis).

- 18 November 2004: The corrections with respect to the previous version of the chapter: The caption of Table 6.3b has been corrected (from S. Bettadpur and V. Dehant). The unnumbered equations at end of section 6.2 have been corrected (noted by S.Y. Zhu).

Chapter 8: Tidal Variations in the Earth's Rotation.

- 6 February 2006: The changes with respect to the previous version of the chapter: The second paragraph provides some recommendations for users and the last paragraph corrects errors in past publications. The caption of Table 8.1 has been expanded.
- 21 April 2005: The corrections with respect to the previous version of the chapter: The last paragraphs have been modified to provide further information on the subroutine interp.f by Ch. Bizouard.
- 15 November 2004: The corrections with respect to the previous version of the chapter: The last paragraph of the chapter has been expanded to provide information (provided by Ch. Bizouard) on the available subroutines and on Tables 8.2 and 8.3.

Chapter 10: General Relativistic Models for Space-time Coordinates and Equations of Motion.

- 15 October 2004: The correction of equation (1) in section 10.2 to remove an ambiguity.
- 24 June 2004: The archive containing the Time Ephemeris TE200 and TE405 and associated software and test data (provided by A.W. Irwin). See the README file.

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