

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).

The Conventions Center intends to provide updated versions of the Conventions in electronic form, after proper approval of the IERS Directing Board. In the mean time, work on interim versions will also be 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 2006, the work accomplished or in progress is the following.

1. Technical topics

The background work of keeping track of corrections, typos and small changes that improve the readability of the documents has continued in 2006. More technical or complex issues are first debated, *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 started, on-going or completed in 2006:

1.1 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 variation. 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 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” was released on 1 September 2006. The new section on oceanic pole tide loading was released on 1 September 2006.

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

1.2 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 and 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.

1.3 Ocean tidal loading

Section 7.1.1 has been rewritten and was released on 25 November 2006. 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, provided by Duncan Agnew (UCSD), has been selected after discussions and tests carried out within the Advisory Board. The code can be found on the web site at <http://tai.bipm.org/iers/convupdt/chapter7/hardisp.f>. In the same area, 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.

1.4 Tropospheric mapping function

A completely revised version of the chapter was released on 28 June 2007. For optical techniques, it describes a new model for zenith delay (Mendes and Pavlis, GRL 31, 2004) and a new mapping function, both adopted by the ILRS as of 1 January 2007. For radio techniques, since the recommended NMF (A. Niell JGR 1001, 1996), as well as other mapping functions cited in the Conventions (2003), have now been shown to have deficiencies, an expert panel was assembled to review the current recommendations. The VMF1 (Boehm et al., JGR 111, 2006) is now the recommended mapping function, which necessitates input coefficients determined from a numeric weather model. For users not aiming at the highest accuracy, the GMF (Boehm et al., GRL 33, 2006), which uses standard input coefficients, is provided.

Work on this topic involves mostly J. Boehm, G. Hullely, A. Niell, E. Pavlis and J. Ray.

1.5 Free Core Nutation model

Because of the variable nature of free core nutation (FCN), an FCN model was not included in the IAU 2000A Nutation model. An expert panel has been assembled to determine a suitable FCN model.

Work on this topic involves mostly S. Lambert, Z. Malkin, V. Dehant, N. Capitaine, and P. Wallace.

2. 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 continuously modified, as required by changes in the texts, routines or data files.

List of updates

The list of updates as of 26 July 2007 to the Conventions since the last IERS Conventions Annual Report follows (An updated list is available online at <<http://tai.bipm.org/iers/convupdt/listupdt.html>>):

Chapter 5: Transformation Between the Celestial and Terrestrial Systems

- 16 February 2007: Changes (provided by P. Wallace and N. Capitaine) with respect to previous version of the chapter: Revised section 5.8.3 to make the references for the planetary fundamental arguments clear.
- 22 December 2006: Correction to previous version of the chapter: Equation (14) for the Earth Rotation Angle has been corrected (noted by F. Nievinski).
- 18 October 2006: Changes (provided by N. Capitaine and P. Wallace) with respect to previous version of the chapter: Update section 5.7 to provide Table 5.4 and to make notations consistent with those in the electronic version of the table. Make the chapter's terminology consistent with the current IAU Recommendations.

Chapter 6: Geopotential

- 20 July 2006: The file `desaiscopolecoef.txt.gz` was corrected for an error in the column titles (from S. Desai and R. Gross).
- 22 March 2006: Changes with respect to previous version of the chapter: Corrections and precisions for some notations in section 6.5 "Effect of the ocean tides" (noted by F. Zhang). The file `desaiscopole2004.txt` was corrected to be consistent with the model of the Conventions (noted by M. Nitschke).
- 13 March 2006: Main changes with respect to previous version of the chapter: New section 6.3 on Oceanic pole tide (from S. Desai and J. Chen). Information on the treatment of degree 1 harmonic coefficients is given in the beginning of the chapter (from J. Ries).

Chapter 7: Displacements of reference points

- 20 June 2007:
 - The subroutine `dehanttideinel.f` has been updated. It remains under review for some other possible corrections (which effects should be < 0.05 mm).
 - The `dutc` subroutine has been corrected (from H. Manche). The effect is < 0.05 mm.
 - The `step2diu` subroutine has been corrected (from V. Tesmer). The effect may exceed 0.1 mm.

- 25 November 2006: Main changes with respect to previous version of the chapter:
 - Section 7.1.1 on Ocean loading has been rewritten (Contributors M. Bos, G. Petit, J. Ray, H.-G. Scherneck).
 - A conventional implementation of ocean tidal loading is recommended, using the program `hardisp.f` provided by D. Agnew.
- 1 September 2006: Main changes with respect to previous version of the chapter:
 - New section 7.1.5 on Oceanic pole tide loading (from S. Desai).
 - Specification of the IERS conventional mean pole as the linear model in section 7.1.4 equ 23.
 - At and around equ 24: to correct for a typo and to account for the anelastic contributions to the pole tide (from J. Wahr).
 - Subroutine `dehanttideinel.f` has been updated for leap seconds and commented (from J. Ray).

Chapter 8: Tidal Variations in the Earth's Rotation

- 28 April 2006: Changes with respect to previous version of the chapter: The caption of Table 8.2b has been correctly placed.
- 6 February 2006: Changes with respect to 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.

Chapter 9: Tropospheric Model

- 28 June 2007: Changes with respect to previous version of the chapter: Chapter 9 has been completely rewritten. The main contributors to the new writing of the chapter are J. Boehm, G. Hulley, A. Niell, E. Pavlis.

Gérard Petit, Brian Luzum