

## Joint Discussion 16

### NOMENCLATURE, PRECESSION AND NEW MODELS IN FUNDAMENTAL ASTRONOMY. APPLICATIONS AND SCIENTIFIC CONTRIBUTION TO ASTRONOMY

*Tuesday 22 (full day) & Wednesday 23 (a.m.) August 2006, Room Club H*

Organized by Division I; Participating Division/Commissions: X/4, 5, 7, 8, 19, 31

*Scientific Organizing Committee:* A. Brzezinski (Poland), M. Calabretta (Australia), N. Capitaine (France, Co-Chair), V. Dehant (Belgium), T. Fukushima (Japan), J. Hilton (USA, Co-Chair), K. Johnston (USA), I. Kumkova (Russia), A. Milani (Italy), R. Nelson (USA), K. Seidelmann (USA), M. Soffel (Germany), J. Vondrák (Czech Rep., Co-Chair)

*Chair, Local Organizing Committee:* C. Ron

#### *Tuesday 22 August (a.m.)*

9:00 Introduction to the Joint Discussion N. Capitaine

**Session 1. State of the art of the implementation of the IAU Resolutions and the ICRS** Chair, J. Vondrák

9:10 Present status of the celestial reference system and frame (Invited) C. Ma

9:30 Tools for implementing the recent IAU resolutions: (Invited) G. Kaplan  
USNO Circular 179 and the NOVA software package & J. Bangert

9:55 Selecting highly-compact radio sources for the definition of the celestial reference frame P. Charlot et al.

10:05 Véron & Véron based optical extragalactic reference - progress report A. Andrei et al.

10:15 Problems of the reference radio source selection O. Titov

10:30 *Coffee break*

**Session 2. Precession and the Ecliptic** Chair, T. Fukushima

11:00 Review on the work of the "Precession and ecliptic" Working Group (Invited) J. Hilton

11:20 Long-term solution for the insolation quantities of the Earth (Invited) J. Laskar

11:45 Using the P03 precession model P. Wallace & N. Capitaine

11:55 Long-periodic precession parameterization J. Vondrák

12:05 Numerical theory of rotation of the deformable Earth with the fluid core: fitting to VLBI data and deriving corrections to IAU 2000 theory G. Krasinski

12:20-12:30: *Short poster review*

12:30-13:00: *Poster session*

13:00-14:00: *Lunch*

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*Tuesday 22 August (p.m.)*

**Session 3. High accuracy models for reducing astronomical observations**

*Chair, J. Hilton*

- 14:00 Models for high precision spacecraft and planetary ephemerides (Invited) M. Standish & J.G Williams
- 14:20 Relativistic aspects of the Earth's rotation (Invited) S. Klioner & M. Soffel
- 14:45 The dynamical model of the planet motions and EPM ephemerides E. Pitjeva
- 14:55 INPOP06: A new planetary ephemeris A. Fienga et al.
- 15:05 Accurate harmonic development of lunar ephemeris LE-405/406 S. Kudryavstev
- 15:15 The solar quadrupole moment from planetary ephemerides: present state of the art S. Pireaux et al.
- 15:30 *Coffee break*

**Session 4. New terminology in fundamental astronomy, time and relativity**

*Chair, M. Soffel*

- 16:00 Proposed terminology in fundamental astronomy based on IAU 2000 Resolutions (Invited) N. Capitaine et al.
- 16:20 Implementation of the new nomenclature in The Astronomical Almanac (Invited) C. Hohenkerk
- 16:45 TDB or TCB: does it make a difference? S. Klioner
- 16:55 From atomic clocks to coordinate times G. Petit
- 17:05 Pulsars as barycenter coordinate clocks V. Zharov et al.
- 17:15 General relativity theory: tests through time Ya. Yatskiv
- 17:30: *Poster session (continuation)*

*Wednesday 23 August (a.m.)*

**Session 5. Scientific applications of high accuracy astronomy** *Chair, V. Dehant*

- 9:00 Accurate optical reference catalogs (Invited) N. Zacharias
- 9:20 Scientific potential of the future space astrometric missions (Invited) L. Lindgren
- 9:45 Space astrometry with the milli-arcsecond pathfinder survey (MAPS): mission overview and science possibilities Gaume et al.
- 9:55 Astrometric science with SIM planetQuest M. Shao
- 10:05 Does the magnetic field in the fluid core contribute a lot to Earth nutation? C.-L.Huang et al.
- 10:15 Retrieving diurnal and semidiurnal signals in polar motion and UT1 from analysis of the routine VLBI observations A. Brzezinski & S. Bolotin
- 10:30 *Coffee break*

**Session 6. General Discussion and educational efforts** *Chair, N. Capitaine*

- 11:00 Education in astrometry (Invited) W. van Altena
- 11:20 The 3D representation of the new transformation from the terrestrial to the celestial system (Invited) V. Dehant et al.
- 11:45 The small telescopes still useful for astrometry M. Stavinschi
- 11:55 Discussion
- 12:20 Concluding remarks J. Vondrák

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### Poster papers

#### **Session 1. State of the art of the implementation of the IAU Resolutions and the ICRS**

Searching candidate radio sources for the link with the future GAIA frame	P. Charlot et al.
New data of linking optical and radio reference frames	Z. Aslan et al.
Systematic errors and combination of the individual CRF solutions in the framework of the IVS ICRF pilot project	J.R. Sokolova
Kinematic control of the inertiality of the ICRS/Tycho-2 system on the base of the Tycho-2 and UCAC2 star proper motions	V.V. Bobylev & M. Yu Khovrich
VLA Radio Star Measurement of the Rotation of the Hipparcos Frame with Respect to the ICRF	D. A. Boboltz et al.
Deep Astrometric Standards	I. Platais et al.
Better accuracy of Hipparcos proper motions in declination for stars observed with 10 photographic zenith tubes	G. Damjanovic & J. Vondrák
TOPP in the CNS	R.L. Smart et al.
The influence of choice of fundamental catalogue on calculated apparent places of stars	M.S. Sekowski
Connection between ICRS and ITRS consistent with IAU 2000 Resolutions	I. Kumkova & M. Stepashkin
Earth orientation catalogue EOC-3 - An improved optical reference frame	V. Stefa & J. Vondrak
Catalogue of reference stars for observation of extragalactic radio sources of the northern sky	V. Ryl'kov et al.
Estimation of CRF and TRF from VLBI observations by the least square collocation method	S. L. Kurdubov
Computation of the veritable inclination between FK5 and Hipparcos equators: a critical discussion	M.J. Martínez Usó et al.
The Russian astronomical yearbooks and IAU 2000 Resolutions	N.I. Glebova et al.

#### **Session 2. Precession and the Ecliptic**

Precession/nutation solution consistent with the general planetary theory	V.A. Brumberg & T.V. Ivanova
New expressions for the celestial coordinates of the CIP	M. Folgueira et al.
Comparison of the nutation theories with the VLBI observations	V. Zharov & S. Pasynok
Selected sets of nutation parameters for estimation over limited observation spans	Ya. Chapanov
Variations of the main nutation terms according the precession-nutation model IAU 2000A	Ya. Chapanov
Comparison of nutation series from GPS and VLBI observations using IAU1980 and IAU2000 nutation models	K. Snajdrova et al.
To determination and explanation of the secular change of inclination of the Earth equator to ecliptic	Yu. Barkin

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#### **Session 3. High accuracy models for reducing astronomical observations**

Limitations on some physical parameters from position observations of planets	E. Pitjeva
About mechanism of variations of the Earth rotation and natural processes with hour periods	Yu.V. Barkin
Geodetic rotation of the Sun, major planets, and the Moon	V.I. Eroshkin & V.V. Pashkevich
Model of atmospheric radiation for large field radioastronomical data reduction	S. Rys & M. Urbanik
Relativistic ray tracing applied to a rotating optical system	G. Anglada-Escude et al.
VLBI antenna thermal deformation	E. Skurikhina

#### **Session 4. New terminology in fundamental astronomy, time and relativity**

About the reference axis of the rotation of the Earth	R.O. Vicente
Stability of pulsar time scale	M.V. Sazhin & M.S. Pshirkov
Relativistic angular distance using Synge's world function	C. Le Poncin-Lafitte & P. Teyssandier
Positioning systems and relativity	J.-F. Pascual-Sánchez

#### **Session 5. Scientific applications of high accuracy astronomy**

Ten years timing of millisecond pulsars at Kalyazin	Yu. Ilyasov & V. Oreshko
The Parkes Pulsar Timing Array	R N Manchester
Preliminary results in asteroid mass determinations in Nikolaev Observatory	Z. Aslan et al.
Evidences of correlations between masses and minor planets elements. analysis of the error sources	F.J. Marco Castillo et al.
On geophysical excitation of prograde diurnal polar motion	M. Kudryashova et al.
Atmospheric excitation of UT1 variations during CONT05 campaign	Y. Masaki
High frequency variability in Earth rotation from VLBI and GNSS data	S. English et al.
Optimum parameterization in estimating sub-diurnal Earth rotation parameters with Very Long Baseline Interferometry	P.J. Mendes Cerveira et al.
Variations of the second order harmonics of geopotential from the analysis of the Lageos and Etalon SLR data for 1988-2003	T.V. Ivanova & N.V. Shuygina
Comparison of velocity field and baseline length variations for the European stations derived from GPS and VLBI data	N. Panafidina et al.
Hydrological excitation of polar motion	J. Nastula, B. Kolaczek
CONT05: High-frequency Earth rotation variations from VLBI observations	E. Skurikhina
Estimation of Earth interior parameters from a Bayesian inversion of nutation data in the time domain	L.Koot et al.