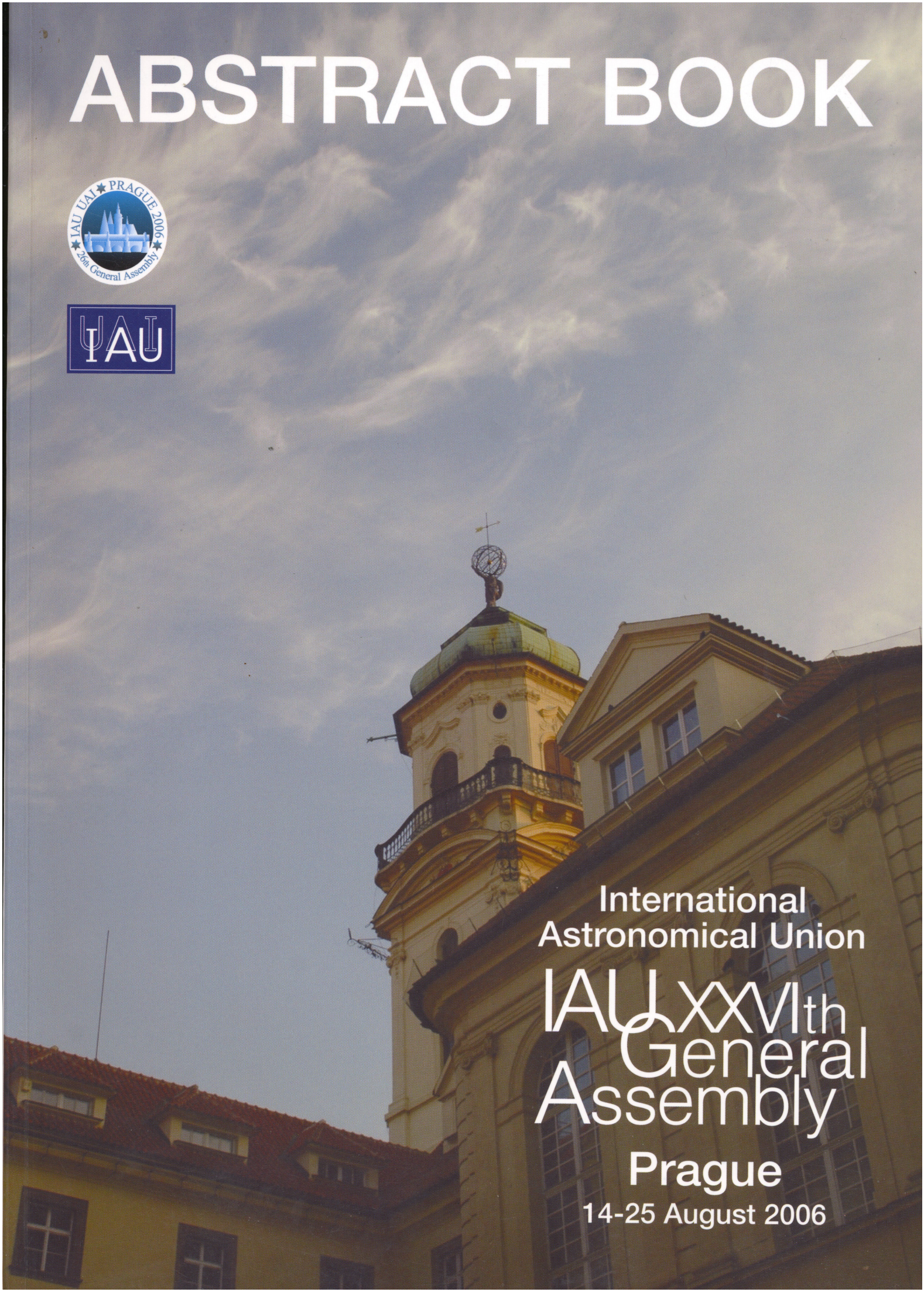
ABSTRACT BOOK



International Astronomical Union

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...s promising perspectives for new computations of the Earth's ...ions, tides, and the influence of considering a reference magnetic ...within the reference state of the Earth.

...5-29 Oral presentation

...ieving Diurnal and Semidiurnal Signals in Polar Motion and UT1 ...Analysis of the Routine VLBI Observations

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...r motion and UT1 contain physical signals within the diurnal and ...diurnal frequency bands. The dominant part (< 1 milliarcsecond - ...s) is due to the gravitationally forced ocean tides. There is also a small ...tion (< 0.1 mas) due to the direct influence of the tidal gravitation on ...triaxial structure of the Earth. The remaining part (of the order of 0.1 ...s) comprises the atmospheric and nontidal oceanic influences driven ...the daily cycle in the solar heating. The observational evidence of ...nal and semidiurnal signals in polar motion and UT1 concerns mostly ...purely harmonic ocean tide signals which are expressed by ...ventional models (IERS Conventions 2003). The intensive observation ...mpaigns, like CONT94, CONT02, CONT05, have been also organized ...estimate a less regular high frequency geophysical signals in Earth ...tion and compare them with models.

...even from the routine VLBI observations with one session in 3 to 5 ...s, it is possible to determine a quasi periodical high frequency ...physical signals. The method, proposed originally by (Herring and ...g, 1994) and further developed by (Mathews and Herring, 2000; ...zinski, 2000), relies upon the so-called complex demodulation ...nique. In the recent investigation (Bolotin and Brzezinski, Geophys. ...Abstracts, Vol.8, 2006, abstr. EGU06-A-01665) we applied the ...ware SteelBreeze to process all the available VLBI observations which ...suitable for simultaneous determinations of the celestial and terrestrial ...erence frames and the Earth orientation parameters, in order to extract ...diurnal and semidiurnal signals in polar motion and UT1. Spectral ...ysis of the demodulated time series reveals corrections to the ...ventional model of the ocean tide variations as well as the broad band ...ability with excess of power near the frequencies of the tidal lines S1 ...d S2. These time series are suitable for the time domain comparisons ...h the available subdiurnal estimates of the atmospheric and oceanic ...tation.

...16-30 Invited paper

...ucation in Astrometry

...F. van Altena

...le University, New Haven, United States

...e potential for studies of the structure, kinematics and dynamics of our ...alaxy, the physical nature of stars and the cosmological distance scale is ...thout equal in the history of astronomy. Cutting-edge areas of research ...e now accessible due to the dramatic increases in accuracy provided by ...parcos, HST and the next generation of astrometric space missions ...ch as SIM (2010) and Gaia (2011). The decadal committee in the US ...d the multinational ESA have both continuously placed SIM and Gaia at ...e top of their scientific priority list and committed to spending on the ...der of a billion dollars on each mission. Major improvements in detector ...chnology such as the orthogonal-transfer arrays have significantly ...proved our measurement precision and large ground-based facilities will ...able us to probe more deeply into the universe. These opportunities ...lige us to assume responsibilities for ensuring the success of the ...trometric missions and facilities and for educating astronomers to use ...se instruments creatively and analyze the data with rigor.

...16-31 Invited paper

...e 3D representation of the new transformation from the terrestrial ...the celestial system.

...Dehant, O. de Viron, N. Capitaine

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To study the sky from the Earth or to use navigation satellites, we need two reference systems, a celestial reference system, as fixed as possible with respect to the inertial frame, and a terrestrial reference system, rotating with the Earth. Additionally, we need a way to go from one reference system to the other. This transformation involves the Earth rotation rate, the polar motion, and the precession-nutation. This transformation is done using an intermediate system, in which the Earth rotation it-self is corrected for. Previously one used an intermediate system related to the equinox; the new paradigm involved a point, denoted the Celestial Intermediate Origin (CIO), which, due to its kinematical property of "Non Rotating Origin", allows better describing the length-of-day of the Earth. The use or not of the CIO only affects this intermediate frame. The new transformation system involving the CIO is additionally much simpler. Moreover, the use of the CIO allows an elegant separation between the polar motion, the precession nutation and the rotation rate variation. In this presentation we will show 3D representations that explain all this.

JD16-32 Oral presentation

The small telescopes still useful for the astrometry

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The XXIVth General Assembly in Manchester approved the foundation of a special working-group: "Future development of the ground-based astrometry". FDGBA is a working group of the Division 1. Its activity in the first three years has allowed that the XXVth General Assembly in Sydney determined its continuation for another three years.

Naturally, the contribution of the small telescopes raises great questions, especially when we think of astrometry which is made today by means of the space missions or of the great telescopes.

Nevertheless, there are still a series of programs for which they should continue to work, not in competition but in order to complete or prepare their activity.

There are some of its objectives still valid for the next few years:

- astrometric observations of some natural satellites, asteroids and comets with small or medium-sized telescopes;
- monitoring selected asteroids approaching the Earth;
- observations of artificial objects and space events and other natural phenomena generating hazards in the vicinity of the Earth;
- improving double star orbits;
- astrometric observations of the areas around extragalactic radiosources to extend Hipparcos system to the faint stars;
- rediscovering of recently discovered asteroids with the help of digital plate archive that we are creating now as a part of the work on the integration of our plate archive into national and international virtual observatories;
- to them are added the program "Before GAIA" or the observation of the mutual phenomena of Uranus' satellites within the campaign PHEURA 07, which begins in the autumn of this year.

Last but not least there are the educational efforts for the training of a new generation of astrometrists, now before the launching of new space specialized missions and the processing of a huge amount of data collected so far.

JD16-34 Poster

New Data of Linking Optical-Radio Reference Frames

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Results on improvement of linking optical and radio reference frames are discussed. For 300 extragalactic radio sources (ERS) fields, about 2500 CCD frames, with a mean of 6-7 frames per field were used. The analysis of optical positions of 213 ERS in the declination zone from –40° to +80° showed standard errors of 38 and 37 mas in right ascension and declination, respectively. The astrometric reductions were mainly made by using reference stars from UCAC2 and USNOB1.0 catalogues. The catalogue obtained is basic of the refinement of the mutual orientation angles between the optical and radio systems. For this purpose the positions of 142 ERS with the help of UCAC2 were used. A comparison between optical and radio positions of the ERS were made. The differences allowed us to obtain the intermediate internal estimation of link between optical and radio reference frames at an accuracy level of 5-6 mas. The angle values are: ω_x= -4.1±6.1, ω_y= 1.9±5.8, ω_z = 12.4±4.9 mas.

A comparison of the results presented with those of other investigations was made.

JD16-35 Poster

Systematic Errors and Combination of the Individual CRF Solutions in the Framework of the IVS ICRF Pilot Project

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New international Pilot Project for the redetermination of the ICRF was initiated by the International VLBI Service for Geodesy and Astrometry (IVS) in January 2005. The purpose of this project is to compare the individual CRF solutions and to analyse their systematic and random errors with focus on the selection of the optimal strategy for the next ICRF realization. Eight CRF realizations provided by the IVS Analysis Centres (GA, SHAO, DGFI, GIUB-BKG, JPL, MAO NANU, GSFC, USNO) were analyzed.

In present study, four analytical models were used to investigate the systematic differences between solutions: solid rotation, rotation and deformation, and expansion by orthogonal functions: Legendre-Fourier polynomials and spherical functions. It was found that expansions by orthogonal function describe the differences between individual catalogues better than the two former models.

Finally, the combined CRF was generated. Using the radio source positions from this combined catalogue for estimation of EOP has shown improvement of the uncertainty of universal time and nutation.

JD16-36 Poster

KINEMATIC CONTROL OF THE INERTIALITY OF THE ICRS/TYCHO-2 SYSTEM ON THE BASE OF THE TYCHO-2 AND UCAC2 STAR PROPER MOTIONS

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The kinematics of the Tycho-2 and UCAC2 stars have been tested using a linear Ogorodnikov-Milne model. The distant Tycho-2/UCAC2 stars (d≈900 pc) have been found to rotate around the Galactic y-axis with an angular velocity of M_y=-0.37±0.04 mas yr^{-1}. This value can be explained as a residual rotation of the ICRS/Tycho-2 system relatively to the extragalactic inertial frame. It is shown that the UCAC2 star proper motions have a magnitude equation in $\mu_\alpha \cos\delta$ in the range of star magnitudes 12-15^m. For stars of the north hemisphere the coefficient of the magnitude equation have been found to be -0.60±0.05 mas yr^{-1} mag^{-1}. In the proper motions of the UCAC2 stars, which are fainter than ≈11^m, a magnitude equation has not been found.

JD16-37 Poster

VLA Radio Star Measurement of the Rotation of the Hip with Respect to the ICRF

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[1]US Naval Observatory, Washington, DC, United States, [2]I Astronomy Observatory, Soccorro, New Mexico, United Stat

The Very Large Array (VLA), linked with the Pie Town Very

Long Baseline Array antenna, hase been used to determi positions of 46 radiostars in the International Celestial Ref (ICRF). Positions were obtained in the ICRF directly t referencing of the stars to nearby

ICRF quasars whose positions are accurate at the 0.25 ma star positions are estimated to be accurate at the 10 m position errors approaching a few milli-arcseconds for sor observed. The measured positions were combined measurements taken from as early as 1978 to obtain estimates for all 46 stars with average uncertainties of 1.7 compared reference frames produced from our radio star the Hipparcos Catalogue data, and find consistency in the 1-sigma level, with errors of 2.7 mas per axis for the orienta our mean epoch of 2003.78. No significant spin is found radio data frame and the Hipparcos Celestial Reference F with largest rotation rates of +0.55 and -0.41 mas/yr aroun axes, respectively, with 1-sigma errors of 0.36 mas/yr. Th are consistent with a non-rotating Hipparcos frame with r ICRF.

JD16-39 Poster

Better Accuracy of HIPPARCOS Proper Motions in De Stars Observed with 10 Photographic Zenith Tubes

Goran Damljanovic[1], Jan Vondrak[2]

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Even though HIPPARCOS astronomical satellite mission h order better positional accuracy than ground-based optical Zenith Tubes (PZT), it is possible to get more accurate prop declination of HIPPARCOS stars observed during a few PZTs because the HIPPARCOS ESA mission was less th long (not enough to obtain a satisfactory accuracy of prope some stars). Here, we used the data observed with ten Washington, 2 at Mizusawa and Richmond, 1 at Ondrejov, and Mount Stromlo) that operated during the last century different Earth rotation programmes. We calculated the com HIPPARCOS proper motions in declination, and compared corresponding values of the most recent Earth Orientatic (EOC-2). The results presented here are in good agreen EOC-2 ones.

JD16-40 Poster

TOPP in the CNS

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Introduction: We present the Torino Observatory Paral (TOPP) results for 22 candidates for the Catalog of Nearby S

Methods: Observations were made with the Torino C telescope over the period 1996-2001.

Results: For the 22 objects examined 12 are within the CNS

Discussion: We discuss at length the objects out side th which are either misclassified or objects with incorrect parallaxes.