

Pulkovo IVS Analysis Center (PUL) 2010 Annual Report

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Abstract

This report briefly presents the PUL IVS Analysis Center activities during 2010 and plans for the coming year. The main topics of the investigations of PUL staff in the report period were ICRF related studies, computation and analysis of EOP series, celestial pole offset (CPO) modeling, and VLBI2010 related issues.

1. General Information

The PUL IVS Analysis Center (AC) was organized in September 2006 and is located at and sponsored by the Pulkovo Observatory of the Russian Academy of Sciences. It is a part of the Pulkovo EOP and Reference Systems Analysis Center (PERSAC) [1]. The main topics of our IVS related activities are:

- Improvement of the International Celestial Reference Frame (ICRF).
- Computation and analysis of the Earth rotation parameters (EOP).
- Modeling of the celestial pole offset (CPO) and free core nutation (FCN).
- Comparison of VLBI products with other space geodesy techniques.
- Computation and analysis of observation statistics.

The PUL AC's Web page http://www.gao.spb.ru/english/as/ac_vlbi/ is supported. The homepage contains the following sections:

- *General Information on the PUL AC*: brief history, activity overview, staff.
- *VLBI data analysis*: CPO/FCN series, UT1 Intensives series, mean Pole coordinates. Data are updated daily.
- *Data files used in analysis*: station information adapted to the SINEX SITE/ID format, a database name/experiment code cross-reference table including the number and list of actually observed stations based on the IVS master file, average meteorological parameters for stations based on information from databases.
- *OCARS catalog*: The latest version of the catalog of optical characteristics of astrometric radio sources (OCARS) [2].
- *Approaches and occultations*: forthcoming mutual events of planets and astrometric radio sources [3, 4].
- *Publications and presentations*.
- *Links to the VLBI World*.
- *Contact information*.

2. Scientific Staff

The PUL team in 2010 included:

1. Zinovy Malkin (70%) — team coordinator, EOP and CRF computation and analysis;
2. Natalia Miller (5%) — EOP analysis;
3. Elena Popova (100%) — CPO analysis (until July).

3. Activities

The main activities of the PUL IVS Analysis Center during 2010 included:

- Regular processing of the Intensive sessions and submission of results to IVS was started in October 2010.
- ICRF related research was continued, mainly in the framework of the IAG Working Group 1.4.1 “Theoretical Aspects of the Celestial Reference System and Systematic Effects in the CRF Determination”. The main directions of this activity were comparison and combination of radio source catalogs, as well as investigation of their stochastic and systematic errors.
- The work on the OCARS catalog was continued. The catalog is updated several times per year. The latest version is available at the PUL Web page.
- A catalog of the occultations of astrometric radio sources by planets through the year 2050 was computed [4].
- Investigations of CPO modeling and its impact on data processing were continued. The main results obtained in 2010 were the following:
 - PUL CPO and FCN series were computed and updated daily.
 - Comparison of CPO models was performed, and recommendations on the choice of an optimal model for VLBI data processing were developed [5].
 - The CPO prediction accuracy for different models was investigated [6], and its impact on UT1 Intensive results was studied [7].
- PUL archive of VLBI data and products was supported. At present, all available databases and NGS cards have been stored along with the main IVS and IERS products. These archives are updated daily.
- Development of algorithms and software for data processing and analysis was continued.
- PUL staff members participated in activities of several IERS, IAG, and IVS projects, committees, and working groups.

4. Outlook

Plans for the coming year include:

- Continuing VLBI related studies.
- Continuing UT1 Intensives processing.

- Continuing development of algorithms and software for data processing.
- Continuing support of the PUL archives of data and products.

References

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- [4] L'vov V., Malkin Z., Tsekmeister S. Forthcoming Occultations of Astrometric Radio Sources by Planets. In: D. Behrend, K. D. Baver (Eds.), *IVS 2010 General Meeting Proc.*, NASA/CP-2010-215864, 2010, 320–324.
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- [7] Malkin Z. CPO Prediction: Accuracy Assessment and Impact on UT1 Intensive Results. In: D. Behrend, K. D. Baver (Eds.), *IVS 2010 General Meeting Proc.*, NASA/CP-2010-215864, 2010, 261–265.