

Pulkovo IVS Analysis Center (PUL) 2009 Annual Report

Zinovy Malkin, Natalia Miller, Elena Popova

Abstract

This report briefly presents the PUL IVS Analysis Center activities during 2009 and plans for the coming year. The main topics of the investigations of PUL staff in that period were ICRF related studies, computation and analysis of EOP series, and VLBI2010 related issues.

1. General Information

The PUL IVS Analysis Center was organized in September 2006 and is located at the Central Astronomical Observatory at Pulkovo of Russian Academy of Sciences (Pulkovo Observatory). It is a part of the Pulkovo EOP and Reference Systems Analysis Center (PERSAC). The main topics of our IVS related activity are:

- Improvement of the International Celestial Reference Frame (ICRF), including investigations of stochastic and systematic errors of radio source catalogs, construction of combined catalogs, investigation of the ICRF stability, and investigation of radio source position time series.
- Computation and analysis of EOP, station position, baseline length, and zenith troposphere delay time series.
- Investigation of the Free Core Nutation (FCN).
- Comparison of VLBI results with other space geodesy techniques.
- 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: brief history, activity overview, staff.
- 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 of actually observed stations based on the IVS master file, average meteo parameters for stations based on information from databases, and a catalog of optical characteristics of astrometric radio sources (OCARS).
- Observation statistics based on the PUL archive of NGS cards mainly obtained from the IVS Data Center: session statistics, global statistics, station/date statistics, and problems (duplicate observations, mixed baselines, absent or suspicious meteo data, etc.)—updated with every new database.
- Results of analysis: currently only two FCN series and mean Pole coordinates are available. These are updated daily.
- Publications and presentations.
- Links to the VLBI World.
- Contact information.

2. Scientific Staff

The PUL team in 2009 includes:

1. Zinovy Malkin (70%) — team coordinator, EOP and CRF computation and analysis;
2. Natalia Miller (10%) — EOP and zenith troposphere delay analysis;
3. Julia Sokolova — CRF computation and analysis; on leave of absence at the Curtin University of Technology since November;
4. Elena Popova (100%) — radio source velocities and EOP analysis.

3. Activities

The main activities of the PUL IVS Analysis Center during 2009 included:

- ICRF related research was continued, mainly in the framework of the IERS/IVS Working Group on the Second Realization of the ICRF. The main directions of this activity were comparison and combination of radio source catalogs, investigation of their stochastic and systematic errors, investigation of the systematic differences between catalogs obtained with different analysis options, and source position time series analysis. The main results obtained in 2009 are the following:
 - Source position time series submitted in the framework of the ICRF2 activity were analyzed with respect to the selection of defining and non-stable sources [1].
 - Systematic effects in the source motions were studied using the same source position time series [2].
 - The work on the catalog of optical characteristics of geodetic radio sources (OCARS) and its use in data analysis was continued [3]. The first results of the determination of the redshifts of selected geodetic sources were obtained [4].
- Relativistic effects which can be observed during the occultations of and close approaches to geodetic radio sources by planets were re-visited, and a new catalog of the forthcoming close approaches and occultations through the year 2050 was computed [5].
- Investigations of the empiric FCN models were continued [6]. Regular computation of two refined FCN series was continued.
- VLBI2010 related studies were conducted in two directions: participation in the IVS VLBI2010 Committee and participation in the development of a Russian VLBI network in accordance with the VLBI2010 specifications.
- PUL archive of VLBI data and products is supported. At present, all available databases and NGS cards have been stored along with the main IVS and IERS products.
- 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, Working Groups, and Committees.

4. Outlook

Plans for the coming year include:

- Continuation of the IVS related studies.
- Development of algorithms and software used for data processing.
- Support of the PUL archive of data and products.

References

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