

# U.S. Naval Observatory VLBI Analysis Center

*David A. Boboltz, Alan L. Fey, David M. Hall, Kerry A. Kingham*

## Abstract

This report summarizes the activities of the recently resurrected VLBI Analysis Center at the United States Naval Observatory for the period from April 2001 through December 2001. The report also describes activities planned for the 2002 calendar year.

## 1. Introduction

The USNO VLBI Analysis Center is supported and operated by the United States Naval Observatory in Washington, DC. During the 2001 year, USNO personnel worked to restore lost USNO VLBI analysis capabilities. USNO Analysis Center personnel now produce quarterly global TRF and CRF solutions. All NEOS-A experiments are analyzed within 24 hours of their correlation for use in USNO global solutions. Updated Earth orientation parameters (EOP) are derived from the weekly NEOS-A sessions, and EOP-S estimates (polar motion, UT1, and nutation) are submitted to the IVS within 24 hours of correlation. In addition to operational VLBI analysis, USNO personnel engage in research aimed at developing the next generation ICRF. Information on USNO VLBI analysis activities may be obtained at:

<http://rorf.usno.navy.mil/vlbi/>.

## 2. Current Activities

During the period from April 2001–December 2001 USNO analysis center personnel performed the following analysis activities:

- Transferred all databases of geodetic VLBI observations previously maintained by the EO department at USNO to computers maintained by the Fundamental Reference Frame division at USNO.
- Installed and verified the latest version of the GSFC Calc/Solve software and updated all databases for use with the new version.
- Began analyzing weekly NEOS-A VLBI sessions for use in internal USNO global solutions.
- Began producing quarterly global TRF solutions for use in estimating Earth orientation parameters. Global TRF solutions (USNO 2001c and 2001d) can be found at: <http://rorf.usno.navy.mil/solutions/>.
- Compared EOP-S estimates obtained from the quarterly TRF solutions to those obtained from the GSFC quarterly solutions and with the IERS-C04 time series. Comparisons of pole position estimates from the USNO 2001d solution and from the IERS-C04 time series are shown in Figure 1.
- Assumed scheduling, analysis, and IVS data submission responsibilities for all CRF experiments, which are designed to densify the ICRF in the Southern Hemisphere.

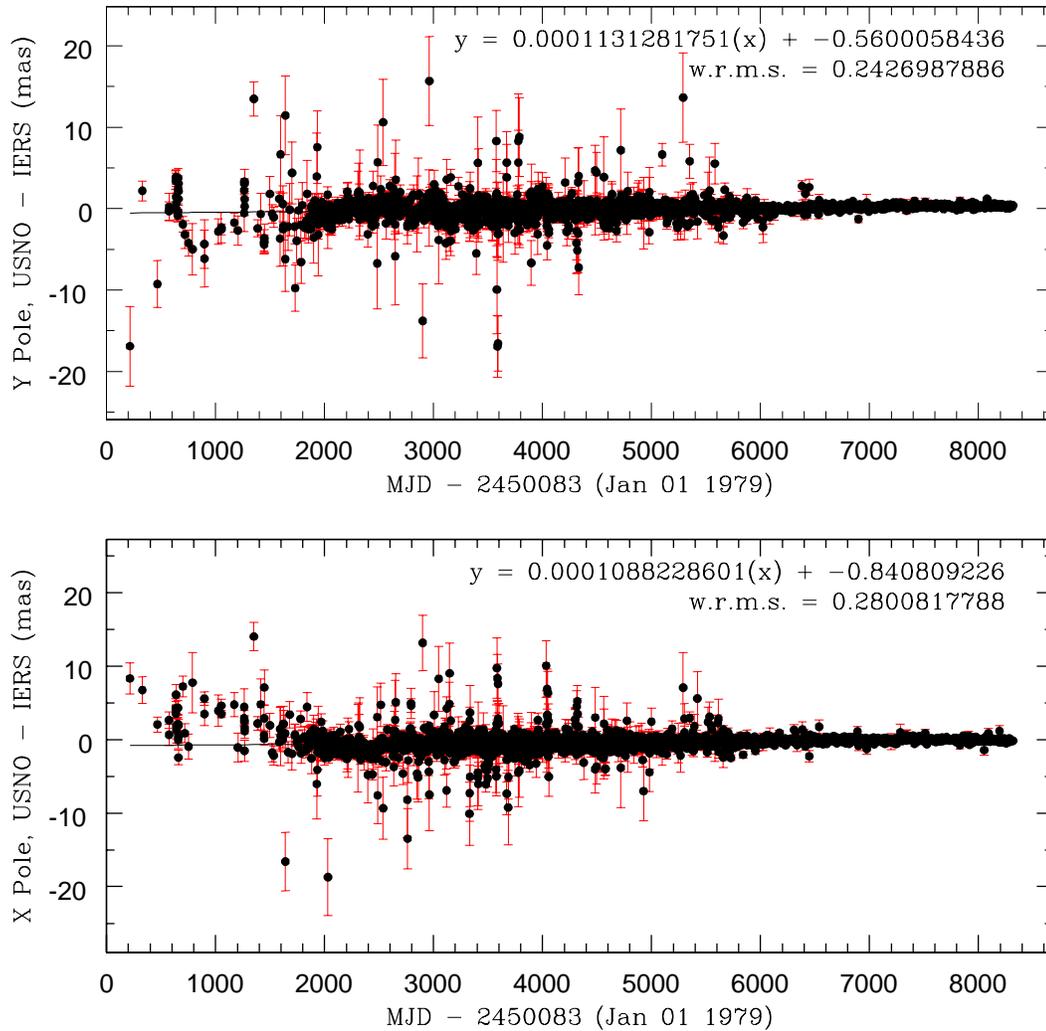
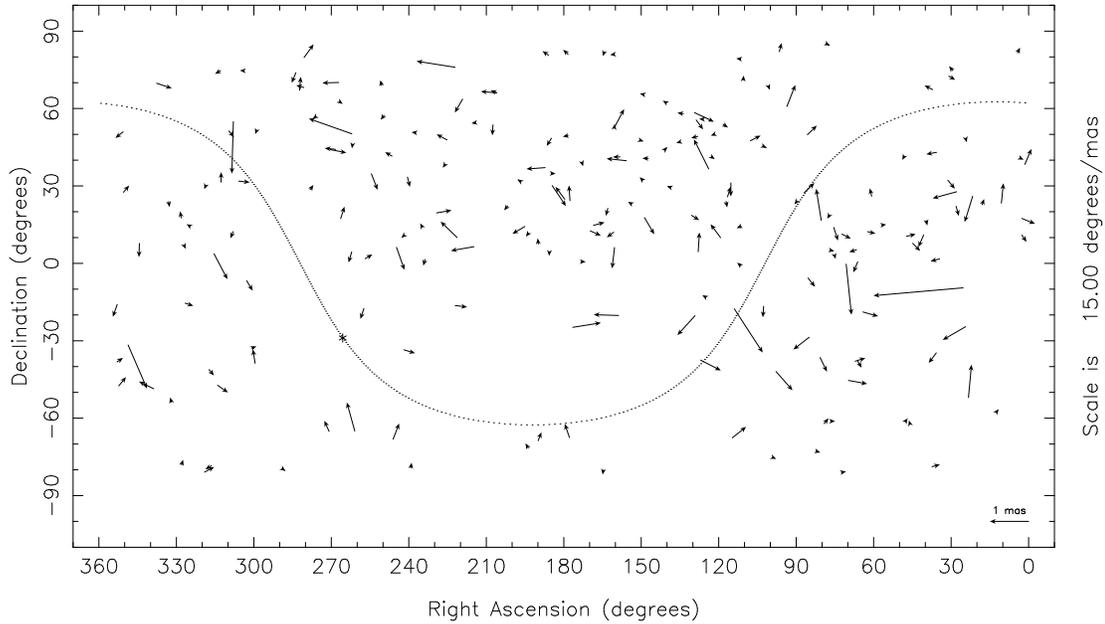


Figure 1. Differences between pole positions estimated from the USNO 2001d TRF solution and the IERS-C04 time series. A weighted least squares linear fit to the data and the weighted RMS are shown in the upper right corner of each plot.

- Began producing quarterly global CRF solutions designed to reproduce and extend the current generation ICRF.
- Compared source positions derived from USNO CRF2001a with those of ICRF Extension 1. Position differences for the 212 ICRF defining sources are shown in Figure 2.
- In collaboration with the group at the Australia Telescope National Facility (ATNF), conducted two 24-hr astrometric observing sessions, CRF-MS5 and CRF-MS6, for the explicit purpose of densifying the ICRF in the Southern Hemisphere.



afey 23-Jan-2002 15:21

Figure 2. Differences in the source positions as derived from the USNO CRF2001a solution and the ICRF Extension 1 solution. Plotted are the 210 of the 212 defining sources of the ICRF. The dotted line represents the galactic equator.

- Conducted investigations of the effects of VLBA RDV data on astrometric position estimation and Earth orientation parameter estimation. Results can be found at: [http://rorf.usno.navy.mil/vlba\\_rdv/](http://rorf.usno.navy.mil/vlba_rdv/).

### 3. Staff

The staff of the VLBI Analysis Center is drawn from individuals who work at the USNO. The staff and their responsibilities are:

Name	Responsibilities
David A. Boboltz	Quarterly global TRF solutions, solution comparisons, web page design and administration, VLBI data analysis.
Alan L. Fey	Quarterly global CRF solutions, solutions comparisons, web page design and administration, VLBI data analysis.
David M. Hall	VLBI data analysis, IVS EOP-S weekly submission.
Kerry A. Kingham	Correlator interface, VLBI data analysis

#### 4. Future Activities

The following activities are planned for the upcoming year January 2002–December 2002:

- Continue processing of weekly NEOS-A/IVS-R4 experiments for use in internal USNO global solutions.
- Begin processing of weekly IVS-R1 experiments for use in internal USNO global solutions.
- Continue analysis and database submission for all IVS-CRF experiments.
- Continue production of quarterly global TRF solutions and submission of EOP-S estimates (polar motion, UT1, and nutation) to the IVS updated bi-weekly with IVS-R1 and IVS-R4 experiments.
- Continue production of quarterly global CRF solutions.
- Make additional astrometric observations in the Southern Hemisphere in collaboration with ATNF partners.