

Geoscience Australia Analysis Center 2014 Annual Report

Oleg Titov

Abstract This report gives an overview of the activities of the Geoscience Australia IVS Analysis Center during 2014.

1 General Information

The Geoscience Australia (GA) IVS Analysis Center is located in Canberra within the Geodesy Section, Geodesy and Seismic Monitoring Group, Community Safety and Earth Monitoring Division (CSEMD).

2 Activities during the Past Year

Several celestial reference frame (CRF) solutions have been prepared using the OCCAM 6.3 software. The latest solution was uploaded in March 2014. VLBI data comprising 3,325 daily sessions from January 1991 to March 2014 were used to compute several global solutions with different sets of reference radio sources. This includes 5,567,029 observational delays from 2,949 radio sources having three or more observations.

Station coordinates were also estimated using No-Net-Rotation (NNR) and No-Net-Translation (NNT) constraints. The long-term time series of the station coordinates have been used to estimate the corresponding velocities for each station. The tectonic motion for the Gilcreek VLBI site after the Denali earthquake was

modeled using an exponential function typical of post-seismic deformation.

The adjustment was made by least squares collocation, which considers the clock offsets, wet troposphere delays, and tropospheric gradients as stochastic parameters with a priori covariance functions. The gradient covariance functions were estimated from GPS hourly values.

The solution, `aus2014a.crf`, was imposed by the NNR constraints, and it is consistent with the CRF solutions submitted by other Analysis Centers.

The GA Analysis Center has submitted SINEX files for ITRF2013 and ITRF2014 solutions covering the time period from 1979 to the end of 2014.

In 2014, all three new AuScope 12-meter radio telescopes were actively working in different IVS geodetic and astrometric programs. Another radio telescope, Hobart26, operated by the University of Tasmania (UTAS), participated in the geodetic VLBI programs occasionally.

A program for optical identification and spectroscopy of the reference radio sources continued in collaboration with the Australian Telescope National Facility, University of Sydney, and Nordic Optical Telescope. More observing runs at Gemini North and Gemini South (service mode) were done in 2014. A new paper on the reference radio source redshift determination is under preparation.

Acknowledgements

This report has been published with the permission of the CEO, Geoscience Australia. ©Commonwealth of Australia (Geoscience Australia) 2015.

Geoscience Australia

GA Analysis Center

IVS 2014 Annual Report