

Geoscience Australia Analysis Center 2015-2016 Biennial Report

Oleg Titov

Abstract This report gives an overview of the activities of the Geoscience Australia IVS Analysis Center during 2015-2016.

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 Years

Several celestial reference frame (CRF) solutions have been prepared using the OCCAM 6.3 software. The latest solution (ICRF3 prototype) was released in September 2016. VLBI data from 4,725 daily sessions observed from December 1983 to June 2016 have been used to compute several global solutions with different sets of reference radio sources. This includes 7,690,017 observational delays from 3,966 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.

In 2015-2016, 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. The AuScope network runs some special sessions in addition to the routine activities of the regular IVS programs. In particular, three sessions were organized in 2014-2016 (19 Oct 2014, 9 Jan 2015, and 8 Oct 2016) to observe reference radio sources near the Sun. Data from the first two sessions were successfully correlated and reduced, and the third session is in progress.

Acknowledgements

This report has been published with the permission of the CEO, Geoscience Australia.

Geoscience Australia

GA Analysis Center

IVS 2015+2016 Biennial Report