

Reassessment of the Legacy Geodetic Satellite Westpac for ILRS Tracking

Matthew Wilkinson¹, Graham Appleby², Van Husson³, Randall Carmen⁴, Peiyuan Wang⁵, Robert Sherwood¹, Michael Steindorfer⁵, Andreja Susnik¹

1. NERC BGS Space Geodesy Facility
2. BGS, Honorary Research Associate
3. Peraton/NASA Greenbelt
4. Geoscience Australia
5. Space Research Institute, Austrian Academy of Sciences

The geodetic target Westpac was launched on 10th July 1998 into a sun synchronous orbit with 98 degrees inclination, 0.0 eccentricity and a perigee of 835km. It has a unique design that uses baffle tubes to narrow the acceptance angle for each retro-reflector so that at any time only a single cube can be observed by satellite laser ranging. This results in a zero-signature SLR target.

ILRS support for Westpac ended in December 2002 because the data set was weak and was not being used in the analysis community.

In the intervening years, there were improvements to satellite predictions with the Consolidated Prediction Format (CPF) and new generation, high performance kHz stations began operations.

Discussions in the ILRS Networks & Engineering Standing Committee asked whether the current network could better support this target. This led to a subset of SLR stations volunteering to restart tracking of the Westpac satellite to assess how difficult it is. CPF predictions, using the acquired SLR data, would be provided by the SGF, Herstmonceux.

The satellite was first acquired by the Yarragadee SLR station. However, there was a period of uncertainty in knowing the correct NORAD number for the target. By looking at the TLE orbit archive, this was confirmed to be 25398. Over the last 6 months Westpac has been tracked by 13 SLR stations.

This report will assess the tracking results so far, the prediction quality achieved and the suitability of Westpac for ILRS support.