

## Report from NESC meeting on Thursday 15<sup>th</sup> February 2024

The NESC held a meeting on 15<sup>th</sup> February on Microsoft Teams with **36** participants online.

### *Omni-SLR First Returns*

**Toshimich Otsubo** presented a new SLR system design called Omni-SLR and showed the first returns from Saral and Swarm-C recorded from the rooftop of the National Institute of Polar Research, Tachikawa, Tokyo. Omni-SLR is designed to be transported by car and made at low cost with commercially available components. The laser is 532nm and fires 6 $\mu$ J, 1.3ns pulses at 10 kHz with a 10 arcsec divergence. The telescope is 20cm, the detector is a Hamamatsu SPAD and a Swabian TimeTagger Ultra records the epochs. Toshi estimates the link budget to be about 1% of the Herstmonceux SLR system and anticipates LAGEOS returns in the future. It will be installed in Ishioka under a sliding roof dome, collocated with GNSS, VLBI and gravimeters. It has been given 'Engineering Station' status by the ILRS and has been assigned the Monument ID 7317. A future experiment is planned alongside the Simosato SLR station and an Omni-SLR system will be installed in Syowa in Antarctica.

### *Automatic determination of the SLR reference point at Côte d'Azur multi-technique geodetic observatory*

Determining the reference invariant point at the intersection of the telescope axes is a problem that every SLR station has faced and monitoring it over time is also difficult. **Julien Barnéoud** presented the recent work of his team in Grasse ([see here](#)) to determine this point using an automated total station and retro-reflectors mounted to maximise their visibility. Previously, local tie vectors were determined once a year, which was a time-consuming and specialist operation. The new approach uses an elevation retro mounted with a counter weight and an azimuth cube that rotates to face the total station using a stepper motor and arduino controller. The data collected is analysed using IGN software called Comp3D. More regular measurements to verify the SLR reference point position will be taken throughout the year.

### *Galileo 4 Science - Discussion*

The Galileo 4 Science campaign began on Jan 20<sup>th</sup> and the ILRS network will provide enhanced tracking support to the Galileo 201 and 202 plus 12 more Galileo satellites. Stations were asked how they have approached this campaign and the responses included increasing the scheduling priority, motivating observers and monitoring tracking rates. The website provided to support the campaign was discussed, <https://g4s-duepuntozero.iaps.inaf.it/>, which has a lot of information but not the 'quick-look' table or graphic that an observer could use to inform their scheduling decisions. **Van Husson** has been working on what useful charts might look like, he showed tables for the number of passes and normal points for each station and satellite. He also showed a second chart that displayed the support provided by the network as a whole for each satellite for different days. These charts could be useful to the observer when making a choice on which satellite to track.

### WESTPAC

**Matt Wilkinson** described an old ILRS target called WESTPAC which was launched in 1998 in to a sun synchronous orbit with 98 degrees inclination and at a height of 835km. It is unique in its construction in that it has tubes in front of each retro to ensure that only one is visible to a SLR station at any one time. Tracking ended in 2002 due to a weak data set and not much scientific research being conducted. Since then, CPF predictions have become the new improved standard and the new kHz stations are more capable. The WESTPAC data set was analysed in a 2018 Journal of Geodesy paper by Mathis Bloßfeld et al <https://doi.org/10.1007/s00190-018-1166-7>. It was proposed that volunteer stations should assess the suitability of this target for resumed ILRS

support. The satellite Stella is in an orbit similar to WESTPAC and so the question is whether this would add anything to the analysis taking place. An extra satellite does offer the potential for more data. Such high inclination satellites would support SLR stations positioned at high latitudes. It was also mentioned that having a zero-signature target is useful for station calibration.

The presentation slides from the meeting will be available here

[https://ilrs.gsfc.nasa.gov/network/newg/newg\\_activities.html](https://ilrs.gsfc.nasa.gov/network/newg/newg_activities.html)

The date for the next NESC meeting was set as **Thursday 25th April 2024 at 1300 UTC**

**If you missed the meeting** and would like to catch up, please send me an email ([matwi@nerc.ac.uk](mailto:matwi@nerc.ac.uk)) and I can provide the recording.