Report from NESC meeting on Thursday 5th September 2024

The NESC held a meeting on 5th September on Microsoft Teams with **39** participants online.

Satellite laser ranging to BeiDou-3 satellites

Radosław Zajdel presented an overview of SLR tracking to the Beidou-3 satellites since the ILRS adopted the policy of tracking the whole constellation. This began by looking at the quantity of data achieved by the network and included a comparison with the Galileo constellation, which showed that Beidou-3 satellites were tracked less. SLR data is expected to be crucial for performing orbit validation when the satellites are included in the formation of future global reference frames. The predictions provided by Shanghai Observatory were evaluated by comparison with MGX final orbits. The predictions arrive every 3 days and the quality reaches 10 and 100 after 3 and 9 days respectively. There was no correlation found between prediction quality and number of observations. A year of tracking the full Beidou-3 constellation allowed for the identification of different groups of satellites characterised by the orbit parameters, which are not indicated in the metadata. This work was published here.

Lessons Learned: Surveying 1mm-Accurate Local Ties at McDonald Observatory

Jullian Rivera gave a detailed presentation on the methods used to survey the McDonald Observatory. The survey network included baselines of about 1 km with 120m elevation change. GGOS recommends that core sites locate instruments less that 200m apart to ensure well-defined site-ties. Nevertheless millimetre level accuracy was achieved and confirmed with GPS-derived ties. The surveying scheme used a ‘braced’ network of observations with a Leica TS-30 total station, which was placed at each of 4 corners of the cross-braced network to make a measurement to cubes at the other 3 corners. The stability and drift of the sites will be determined with repeat surveying over time. The site-tie accuracy achieved over this large site is comparable those currently in the ITRF. Future surveys will include the new SGSLR facility. This work is published here. Having a working group within the ILRS for site surveying was discussed. Such a group does exist in GGOS already. Mike Pearlman pointed out that some stations haven’t had a survey for over 10 years.

Galileo for Science

Van Husson showed the latest generated tables of the data distribution for of the Galileo satellites. The current phase of the campaign asks for higher priority tracking on the two elliptical orbit satellites Galileo-201 and 202. This is not immediately apparent in the date tables. Stations are mostly tracking all of the Galileo satellites. Randall Carman said that the elliptical satellites are more difficult targets when at apogee during the day. This progress so far in the campaign could be fed back to the G4S group for comment.

NESC @IWLR23

The next NESC meeting will be in person at the ILRS Workshop in Kunming, China on Wednesday 23rd October. Matt asked for any suggestions on how we should hold this meeting compared to the online meetings and previous meetings. Mike suggested updates from stations present would be useful. Matt encouraged members of NESC to submit abstracts to the Workshop.

Travelling Barometer

Matt asked about this project and Clément confirm that work continues and said there is a small issue with the electronics, but he is hopeful this will be fixed. Matt suggested that having more than

one travelling barometer would make it easier to cover all of the ILRS sites. NASA also has a Vaisala barometer that will visit other sites for calibration.

The presentation slides from the meeting will be available here
https://ilrs.gsfc.nasa.gov/network/newg/newg_activities.html

The date for the next NESC meeting was set as **Wednesday 23rd October in Kunming, China**

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