Report from NESC meeting on Thursday 19th May 2022

The NESC held a meeting on Thursday 19th May on Microsoft Teams with **49** participants online.

End-of-Life Service by Astroscale Demonstration (ELSA-d) - Status Update

David Antal-Wokes and **Sharon Sara Saji Mira** from Astroscale were invited to present an update on this space debris recovery demonstration mission. The mission consists of a chaser (server) spacecraft and a target (client). The target can be released and recaptured by the chaser. The mission has achieved some of its aims but unfortunately, 4 out of 8 of the chaser thrusters have failed and its ability to manoeuvre under control needs to be reassessed.

Laser ranging is used in the orbit determination, but some bias is seen in the range residuals. The spacecraft are being manoeuvred regularly and this might explain some of the poor orbit predictions. Recently the chaser was positioned to within 160 metres of the target (https://astroscale.com/astroscales-elsa-d-mission-successfully-completes-complex-rendezvous-operation), which is close enough to allow the relative, close-proximity navigation system to take over. It was suggested that the ELSA-d team could provide a short report for ILRS tracking stations. There is also interest in SLR observations to a tumbling object. This was a very useful and enlightening talk and NESC is available to continue these conversations.

Introducing the filtering tool chain at ESA's IZN-1, Tenerife

Julia Kirchner demonstrated the data reduction tool developed and in use at the new IZN-1, Tenerife station. The method is mostly automatic but some passes require manual adjustment. The operator gets a report of ‘Success’, ‘Warning’ and ‘Fail’ for each pass as well as a page of data plots. It is possible to adjust non-flat residuals with a polynomial fit before forming normal points. Some residuals should be improved with an update to the orbitNP.py software.

IRNSS campaign

Mike Pearlman reported on the IRNSS campaign which ran from 17th-30th April, during which stations concentrated tacking efforts on IRNSS 1C, 1D and 1I. Some stations were successful in obtaining a significant number of normal points. However, others made attempts but could not provide any ranges. The new IZN-1 station was able to track IRNSS-1I. This experience will inform a future IRNSS campaign that will include 2 new SLR stations in India. **David Arnold** questioned the performance of the satellite LRAs and suggested that they could be suffering from some thermal effects. This data could be shared with the team at the SCF Lab in Frascati who performed thermo-optical vacuum testing on a IRNSS LRA (https://www.sciencedirect.com/science/article/pii/S0273117717303411).

CRD v2 Implementation Status

Randy Ricklefs reported that 30 stations are now provided CRD-v2 and these are being checked by Erricos Pavlis and Van Husson. For the remaining stations that are not providing CRD-v2 format, the CRD-v1 data will be converted by EDC until such time that they can provide v2 themselves.

Daniel Kucharski sent his apologies and could not give his presentation ‘GLONASS tracking statistics’. The plot he provided shows clearly the drop in GLONASS normal points available from the CDDIS data server. An animation is also available here: https://orion.camp/np_glonass.html.

The presentation ‘Station Barometric Comparisons using the Vienna Mapping Function (1993 to 2019)’ by Van Husson was postponed to the next meeting.

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 **Thursday 7th July at 1300 UTC**

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.