

Report from NESC meeting on Thursday 16th November 2023

The NESC held a meeting on 16th November on Microsoft Teams with 29 participants online.

Millimeter Accuracy SLR Bias Determination Using Independent Multi-LEO DORIS and GPS-based Precise Orbits

The NESC welcomed guest speaker **Eléonore Saquet** who presented her recently [published work](#). SLR ranges are used to validate the radial component of Earth observation satellite orbits generated using GNSS and DORIS. In the resulting range residuals it is possible to determine station range biases. The satellites used in this study were Jason-2, CryoSat-2, Saral/AltiKa, Jason-3, Sentinel-3A/B, Swarm-A/B/C and GRACE Follow-On 1-2. Two approaches were made, the first with a 50° elevation cut-off and the second solving for station coordinates. Bias comparisons were made between different orbit determination software packages, CNES, PTIM and AIUB. The results showed general agreement for individual stations for different providers over different years.

Changing the Dome of the ZIML station - Some Episodes of a Long Story...

Thomas Schildknecht presented the problems faced at the Zimmerwald SLR station that began with the changing of the dome from an open all-sky dome to a slit dome to protect the telescope from direct sunlight. On installation it was found that the opened dome could not be fully rotated past a nearby rooftop. This led to a significant delay until the new dome was finally fitted in June 2022. In addition, a new air conditioning unit was installed and a new UPS power distribution. The station had been inoperative for over 6 months and restarting the system was not straight forward. The Zimmerwald team had to fix the rotating shutter, change the master frequency from the failed maser and deal with failures in the new air con system and the laser cooling unit. The oscillator in the laser was serviced because there was no laser output. Then finally the power unit on the laser pulse distribution was replaced and the system was recovered. Zimmerwald is now operating and has been released from quarantine. The laser is still not working at full power and so not all target passes can be observed yet.

LAGEOS Signature - Alternative to ILRS Method

David Arnold discussed an alternative method to calculate a satellite response signature in the cases where there is a thermal gradient. This would model the signal using a dihedral angle offset equivalent to the beam divergence due the thermal gradient of the corner cubes.

Questions to the NESC

Matt Wilkinson posed some questions to the NESC regarding the detections of range bias or time bias at stations and overall station performance. It was agreed that the NESC would work with **Mike Pearlman** and the ILRS CB to identify stations that are not performing well and help determine the reasons why and to work on a plan to improve the situation.

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 15th February 2024 at 1400 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.