

Report from NESC meeting on Thursday 20th June 2024

The NESC held a meeting on 20th June on Microsoft Teams with **42** participants online.

MPD - Leading the way in photon-counting technology and applications

Fabio Signorelli from Micro Photon Devices (www.micro-photon-devices.com) presented their single SPAD chip and multi-chip CMOS array detectors. MPD are located in Bolzano and Milan in Italy, where they manufacture their own silicon for their devices. Detectors are available for visible wavelengths using silicon and also for longer infrared wavelengths using InGaAs. The detector suited for SLR is the Photon Detection Module (PDM). This is available with active area diameters of 20 μm , 50 μm and 100 μm and exhibits very low dark noise. It has timing resolution of 35ps, a QE of 49% @ 550nm and can operate at more than 10MHz. It is also available with a fibre coupling. An alternative device uses custom focusing optics to increase the equivalent active area by 100 times, with a much reduced tail in the signal profile, but increased timing jitter. A cooled InGaAs/InP SPAD device can detect wavelengths up to 1700nm, with a QE of 25% @ 1550nm. MPD also offers imaging cameras using arrays of SPAD pixels. The 'Argo' device uses a 7x7 SPAD array with timing jitter < 150ps FWHM.

Improvements in the last 6 months at SFEL station

Manuel Angel Sánchez Piedra updated the SC on progress on the upgrades to the San Fernando SLR station. The goal is to improve the capability to laser track collaborative and debris targets. The main building is undergoing maintenance to fix water leaks, air conditioning, electrics and to install a new floor in the dome. The current major project is the replacement of the telescope mount. The previous mount had problems with tracking accuracy, vibrations, relative encoders and wearing of gears. The new mount will have an accuracy of < 1 arcsec and is capable of high speeds and accelerations. The invariant point is defined to < 1mm. Further station upgrades include the new Eventech ESST7 timer, new emitter and finder telescopes and new software development. Future plans include a new telescope, new laser and a new dome. Van Husson suggested that the new mount would result in a change in the reference point and so will require a new station number and new site vector ties.

WESTPAC

Matt Wilkinson returned to the subject of the old ILRS target WESTPAC, which is being reassessed as a feasible ILRS target. The NORAD number changed from 25394 to 25398, yet some uncertainty remained. Rob Sherwood was able to show that the semi-major axis in the TLE history had changed much less for the 25398 target, as expected for a smaller spherical target. Matt converted older TLEs to CPFs and full-rate Merit II to CRD to process the data. By calculating the satellite range to stations it was possible to identify the corresponding TLE with the SLR data. By doing this for a number of passes it was possible to determine that the WESTPAC NORAD number changed to 25398 in December 1998. Van Husson asked if the COSPAR ID would also change. He also showed that some stations had high pass RMS compared to their calibration.

NESC @IWLR23

There will be an in-person NESC meeting at the ILRS Workshop in Kunming, China, which takes place on Oct 20th–26th, 2024. Matt asked for any suggestions on how we should hold this meeting compared to the online meetings and previous meetings. In particular, how many speakers should be invited and what topics should be covered.

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 5th September 2024 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.