GNSS session B: ILRS Network Performance and Improvement

Chairs: G Bianco, Zhang Zhongping, F Koidl, G Appleby
Introduction to GNSS Session B

• In Session GNSS-A yesterday, all the GNSS operators and several analysts set out their requirements for laser support
• Overall, the message was ‘need more Normal Points’ on all satellites;
• Specifically-
• Long-term, likely that all GPS vehicles will need SLR support at a level TBD;
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• The Galileo mission is using SLR to significantly improve SRP models and to quantify clocks’ behaviour
  – GNSS-based POD benefits
  – The mission “needs higher priority for SLR tracking of the Galileo satellites”
  – If “increase in ILRS priority, then more tracking will follow”
  – Interesting test of gravitational redshift – may need full coverage of passes of two vehicles
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• GLONASS – clear need for SLR tracking for POD, force model improvement
  – The LARGE campaigns showed high potential in SLR, but “need 2x current number of NPs”
  – To exploit *full* potential, need more NPs per ‘arc’

• BeiDou – GEO, Inclined GEO, up to 24 MEO
  – Testing SRP models and POD, time transfer

• QZS – some specific ILRS stations particularly important within the programme
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• Overall, geodetic community (GGOS) aim is for all satellites to be accurately referred to ITRF
  – Allow wide dissemination of the frame
• The challenge now for ILRS stations is clear.
• In this Session-B we will hear how the ILRS has responded and will respond to the higher demands both through existing data-yield and from stations’ extra efforts;
• Plus efforts to improve the LRAs on future SV
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• We want to stimulate the continuing discussion between the ‘providers’ (ILRS) and ‘users’ (Missions, scientists)

• How best can (limited) resources both rise to the challenges and be ‘recognised’ for having made the effort to do so
  – Very important scientifically and financially
Are we Getting Overloaded by Tracking Requests?

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2015 ILRS Technical Workshop, 26–30 October, 2015, Matera, Italy
Are we Getting Overloaded?

Hard to say!

Single Station Perspective (Zimmerwald):

- **Status:**
  - Among most productive stations
  - 20% optical observations
  - xx% space debris tracking, different experiments
  - 20% overhead due to switching between optical and SLR observations and between SLR satellites

- **Possible Improvements**
  - Reduce switching overhead (including s/w and h/w improvements and more sophisticated scheduling)
  - Improve scheduling when partially clouded (use information from all-sky camera)

→ ~20% (?) more productive observation time
Are we Getting Overloaded?

Open Issues:

- **Load balancing?**
  - Simple priorities may not be sufficient
  - Elaborate requirements for GNSS tracking, e.g. several tracks per pass (begin, mid, end, …)?
    → will require sophisticated scheduling!

- **Performance Metrics?**
  - Number of normal points?
  - Well balanced between requests and priorities?
    - ...

- **Future?**
  - Load balancing in the network?
    - Taking into account capabilities, geographical distribution, etc.
  - Require requesting parties to perform simulations in order to justify/optimize tracking requests (“as much as possible” is not enough)