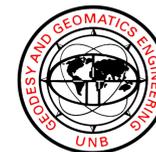


The Precise Point Positioning Software Centre: An Insight Into Online PPP Services



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PURPOSE

Nowadays, precise point positioning (PPP) is gaining more and more popularity in the GNSS scientific community. Several software products implementing a PPP processing strategy have been developed recently by government agencies, universities, industries and individuals. Some online PPP services are also available, and GNSS users might wonder if those services provide similar results.

Having a simple and efficient means of comparing solutions provided by each PPP service then becomes a desirable outcome. With this idea in mind, the Precise Point Positioning Software Centre has been created under the auspices of the Geomatics for Informed Decisions Network of Centres of Excellence (GEOIDE). It allows for:

- An easy comparison of PPP solutions provided by different online PPP services
- An increased reliability for users by giving access to independent PPP solutions
- An insight into the performance of different implementation strategies
- A means of validation for potential PPP software developers
- An opportunity to share information on PPP and identify its strengths and limitations

HOW DOES IT WORK?

STEP #1

Send an email to ppp@unb.ca containing, as an attachment, your GPS observation file in RINEX format.

STEP #2

Your RINEX file will be processed simultaneously by:

- CSRS-PPP (NRCan)
[http://www.geod.nrcan.gc.ca/products-produits/ppp_e.php]
- GAPS (University of New Brunswick)
[<http://gaps.gge.unb.ca>]
- APPS (Jet Propulsion Laboratory)
[<http://apps.gdgps.net>]
- magicGNSS (GMV)
[<http://magicgnss.gmv.com/ppp>]

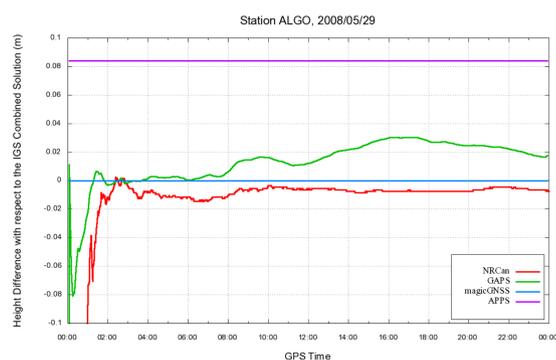
STEP #3

A report will automatically be generated comparing the solutions from all PPP services. This report, along with the outputs from all PPP services, is put on an anonymous FTP server for retrieval by the user.

* Please visit <http://gge.unb.ca/Resources/PPP> for additional details *

SOME PROBLEMATIC ISSUES

ISSUE #1: Occasional height bias (< 10 cm) in APPS solution

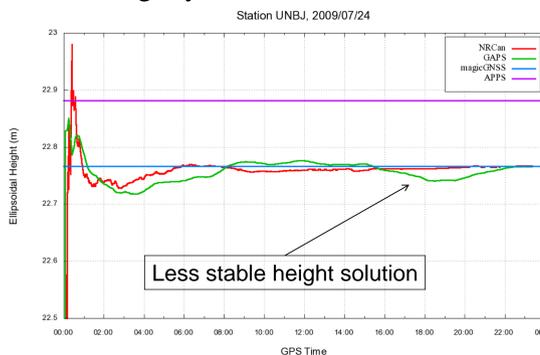
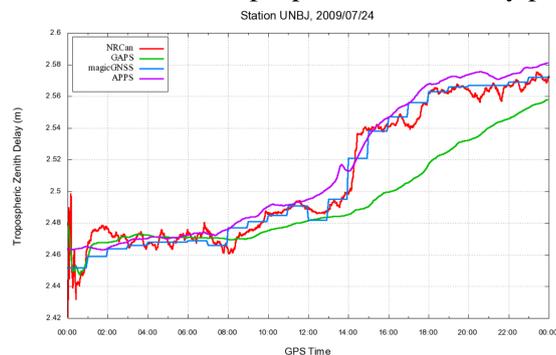


▪ This height offset is not observable in all data sets processed.

▪ The ellipsoidal coordinates in the APPS output refer to a different ellipsoid than WGS84. The values plotted on this graph were obtained by converting the ITRF2005 Cartesian coordinates to ellipsoidal coordinates using the same ellipsoid for all software (WGS84).

▪ The antenna height has been taken into consideration as well.

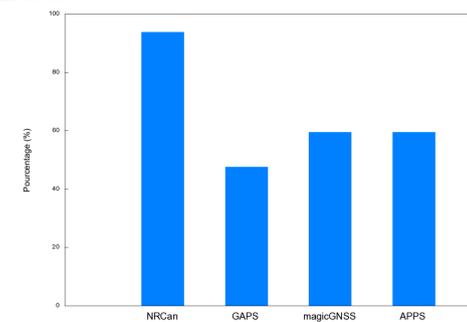
ISSUE #2: Tropospheric zenith delay parameter too tightly constrained in GAPS



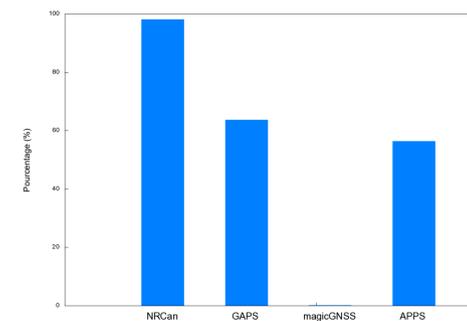
ISSUE #3: Online PPP services do not currently provide reliable results for spaceborne receivers (e.g. CHAMP).

PROCESSING SUCCESS RATE

Static Data



Kinematic Data



▪ The “processing success rate” is a measure of the capacity of PPP software to provide a solution when receiving a processing request, and does not take into account the quality of the solution.

▪ Sensitivity to the RINEX header formatting is one of the main causes of file rejection by a software.

▪ These results were obtained from 1 July 2009 to 25 August 2009.

ACKNOWLEDGEMENTS



Geomatics for Informed Decisions Network of Centres of Excellence (GEOIDE)
[<http://www.geoide.ulaval.ca>]