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IGS Tracking Data: Availability and Completeness as Good as Possible?

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MOTIVATION

Timely availability of GNSS tracking data is a basic condition for generation of best possible analysis products. The overall latency for IGS hourly observation files is still suboptimal. Problems are highlighted concerning availability and completeness with the main focus on all-in-view (AIV) tracking (of all active GNSS satellites). CODE provides high-quality analysis products with regard to all transmitting GNSS satellites. This includes all satellites marked unhealthy or unusable, brand new satellites, and GPS satellites being repositioned. In all mentioned cases, GNSS tracking data without interruption is desired. Furthermore, the availability of new observation types (L2C/C2, L5C/C5, etc.) is indispensable for studying characteristics of modern GNSS signals.

A TRACKING OF UNHEALTHY SATELLITES

The tracking situation has been compared for two GPS satellites permanently marked unhealthy: PRN01/SVN49 (G01) and PRN25/SVN62 (G25). The number of stations tracking G01, or G25 is listed for each receiver type (top) and for specific receiver groups (bottom). If the percentage of stations tracking one of these particular satellites exceeds 10% then the corresponding receiver type, or group is considered to be able to track in AIV mode.

PRN01 is no longer in the broadcast almanac (since around 21 May 2010). Some receivers (in particular of the LEICA GRX1200 group) therefore refuse to track it even if instructed to track unhealthy satellites. This is obviously the reason for the difference between G01 and G25 tracking. A list of stations tracking just one of these unhealthy satellites is given in the rightmost table.

ftp://ftp.unibe.ch/aiub/igsdata/tracking_aiv_g01.txt
ftp://ftp.unibe.ch/aiub/igsdata/tracking_aiv_g25.txt

B INCOMPLETE TRACKING OF THE OPERATIONAL GNSS CONSTELLATIONS

There are IGS stations unable to provide tracking data for specific operational satellites of the GPS and GLONASS constellation.

Concerning GPS: There are still stations unable to sample PRN32. This includes ASHTECH Z18 (green) and TRIMBLE NETRS (red).

Concerning GLONASS: The ASHTECH Z18 receiver model (green) is unable to sample negative (or zero) frequency channels (two affected stations remaining: mtka, unfe). The R10/R14 tracking problem is a well known LEICA/NOV receiver firmware issue (still affected are (red): bako, cpxf, iddr, ilha, rcmn). A R18/R22 tracking anomaly is visible for JPS/TPS (black): mdvj, spt0, urum.

ftp://ftp.unibe.ch/aiub/igsdata/odata_gps_incomplete.txt
ftp://ftp.unibe.ch/aiub/igsdata/odata_glonass_incomplete.txt
ftp://ftp.unibe.ch/aiub/igsdata/tracking_g32.txt

C TRACKING OF OTHER SATELLITES

A survey over CODE's RINEX database revealed that 17 stations provide regularly tracking data with respect to a total of 8 GEO satellites (S20,S24, S26, S29, S33, S35, S37, S38).

ftp://ftp.unibe.ch/aiub/igsdata/odata_geo.txt
ftp://ftp.unibe.ch/aiub/igsdata/odata_aux_full.txt
ftp://ftp.unibe.ch/aiub/igsdata/odata_aux_incorrect.txt

D P1&C1 AND P2&C2 GNSS TRACKING DATA FOR DIRECT GPS/GLONASS DIFFERENTIAL CODE BIAS (DCB) RETRIEVAL

The first table (top) lists all stations providing P2&C2 observations for at least one GNSS. 9 of 29 stations provide P2&C2 for both GPS (G) and GLONASS (R). They are all equipped with a TPS NETG3 receiver model (indicated in red). For completeness, the table also describes whether P1&C1 is available (for G and R) or not (-), and, moreover, whether L5 and/or C5 observations are available (X).
Note: L5&C5 observations are available with respect to G01 (not yet for G25).
The second table (bottom) gives the percentage of receivers for each receiver type which is providing P1&C1 in case of GLONASS. It is worth mentioning that this percentage differs from 100% for the following receiver groups: ASHTECH Z18 (0%), LEICA/NOV (0%), TRIMBLE NETR5 (31%!).

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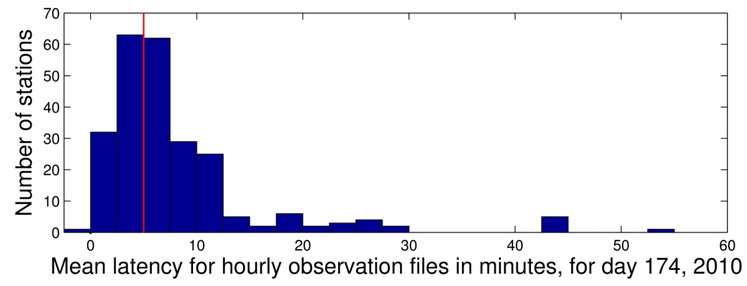
IGS HOURLY DATA FLOW

For NRT processing, the hourly file latency is a crucial factor. There is actually no reason why not all, or at least a significant fraction of the IGS hourly observation files should become available within few minutes after the end of each hour (the more so because exclusively stations are involved that are fully automatically operated). A maximum delay of 5 minutes would be desirable (namely for all IGS stations which do not have explicit restrictions in communication).



ftp://ftp.unibe.ch/aiub/igsdata/nrtdata_0d.txt
ftp://ftp.unibe.ch/aiub/igsdata/nrtdata_0d_top.txt

A

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Tracking Situation Concerning PRN01/SVN49 (G01)
===============================================
AOA BENCHMARK ACT   :  91.7% AIV ( 11 of  12) +  1
AOA SNR-12 ACT      : 100.0% AIV (  2 of   2)
AOA SNR-8000 ACT    : 100.0% AIV (  4 of   4)
ASHTECH UZ-12       :  36.2% AIV ( 21 of  58) + 37
ASHTECH Z-XII3      :  31.1% AIV ( 14 of  45) + 31
ASHTECH Z-XII3T     :  15.4% AIV (  2 of  13) + 11
ASHTECH Z18         :  50.0% AIV (  1 of   2) +  1
BLACKJACK           : 100.0% AIV (  1 of   1)
JAVAD TRE_G3T DELTA : 100.0% AIV (  1 of   1)
JPS EGGDT           :   0.0%     (  0 of   5)
JPS EUROCARD        :   0.0%     (  0 of   1)
JPS E_GGD           :  14.3% AIV (  1 of   7) +  6
JPS LEGACY          :  81.8% AIV ( 18 of  22) +  4
LEICA GRX1200+GNSS  :   0.0%     (  0 of   4)
LEICA GRX1200GGPRO  :   0.0%     (  0 of  49)
LEICA GRX1200PRO    :  16.7% AIV (  1 of   6) +  5
LEICA RS500         :   0.0%     (  0 of   1)
NOV OEM4-G2         :   0.0%     (  0 of   1)
NOV OEMV3           :   0.0%     (  0 of   3)
NOV OEMV3-RT2       :   0.0%     (  0 of   1)
ROGUE SNR-8000      :  66.7% AIV (  2 of   3) +  1
ROGUE SNR-8100      : 100.0% AIV (  1 of   1)
SEPT POLARX2        :  25.0% AIV (  2 of   8) +  6
TPS EGGDT           : 100.0% AIV (  1 of   1)
TPS EUROCARD        :   0.0%     (  0 of   1)
TPS E_GGD           :  66.7% AIV (  6 of   9) +  3
TPS GB-1000         :   0.0%     (  0 of   4)
TPS LEGACY          :  50.0% AIV (  1 of   2) +  1
TPS NET-G3          : 100.0% AIV (  1 of   1)
TPS NETG3           :  92.9% AIV ( 13 of  14) +  1
TPS ODYSSEY_E       :  50.0% AIV (  2 of   4) +  2
TRIMBLE 4000SSE     : 100.0% AIV (  1 of   1)
TRIMBLE 4000SSI     :   0.0%     (  0 of   7)
TRIMBLE 4700        :   0.0%     (  0 of   3)
TRIMBLE 5700        :   0.0%     (  0 of   4)
TRIMBLE NETR5       :  43.3% AIV ( 13 of  30) + 17
TRIMBLE NETR8       :  83.3% AIV (  5 of   6) +  1
TRIMBLE NETRS       :  20.7% AIV (  6 of  29) + 23
-----------------------------------------------
Total               :  35.8% AIV (131 of 366)
-----------------------------------------------
Total (possible)    :  77.0% AIV (282 of 366)

AOA BENCHMARK ACT   :  91.7% AIV ( 11 of  12) +  1
AOA SNR-            : 100.0% AIV (  6 of   6)
ASHTECH UZ-12       :  36.2% AIV ( 21 of  58) + 37
ASHTECH Z-XII3      :  27.6% AIV ( 16 of  58) + 42
ASHTECH Z18         :  50.0% AIV (  1 of   2) +  1
BLACKJACK           : 100.0% AIV (  1 of   1)
JAVAD               : 100.0% AIV (  1 of   1)
JPS                 :  54.3% AIV ( 19 of  35) + 16
LEICA GRX1200       :   1.7%     (  1 of  59)
LEICA RS            :   0.0%     (  0 of   1)
NOV                 :   0.0%     (  0 of   5)
ROGUE SNR-          :  75.0% AIV (  3 of   4) +  1
SEPT                :  25.0% AIV (  2 of   8) +  6
TPS                 :  66.7% AIV ( 24 of  36) + 12
TRIMBLE 4000SSE     : 100.0% AIV (  1 of   1)
TRIMBLE 4000SSI     :   0.0%     (  0 of   7)
TRIMBLE 4700        :   0.0%     (  0 of   3)
TRIMBLE 5700        :   0.0%     (  0 of   4)
TRIMBLE NET         :  36.9% AIV ( 24 of  65) + 41
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Total               :  35.8% AIV (131 of 366)
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Total (possible)    :  78.4% AIV (287 of 366)
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Tracking Situation Concerning PRN25/SVN62 (G25)
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AOA BENCHMARK ACT   : 100.0% AIV ( 12 of  12)
AOA SNR-12 ACT      : 100.0% AIV (  2 of   2)
AOA SNR-8000 ACT    : 100.0% AIV (  4 of   4)
ASHTECH UZ-12       :  36.2% AIV ( 21 of  58) + 37
ASHTECH Z-XII3      :  31.1% AIV ( 14 of  45) + 31
ASHTECH Z-XII3T     :  15.4% AIV (  2 of  13) + 11
ASHTECH Z18         :   0.0%     (  0 of   2)
BLACKJACK           : 100.0% AIV (  1 of   1)
JAVAD TRE_G3T DELTA : 100.0% AIV (  1 of   1)
JPS EGGDT           :   0.0%     (  0 of   5)
JPS EUROCARD        :   0.0%     (  0 of   1)
JPS E_GGD           :   0.0%     (  0 of   7)
JPS LEGACY          :  77.3% AIV ( 17 of  22) +  5
LEICA GRX1200+GNSS  :  25.0% AIV (  1 of   4) +  3
LEICA GRX1200GGPRO  :  42.9% AIV ( 21 of  49) + 28
LEICA GRX1200PRO    :   0.0%     (  0 of   6)
LEICA RS500         :   0.0%     (  0 of   1)
NOV OEM4-G2         :   0.0%     (  0 of   1)
NOV OEMV3           :   0.0%     (  0 of   3)
NOV OEMV3-RT2       :   0.0%     (  0 of   1)
ROGUE SNR-8000      : 100.0% AIV (  3 of   3)
ROGUE SNR-8100      : 100.0% AIV (  1 of   1)
SEPT POLARX2        :  25.0% AIV (  2 of   8) +  6
TPS EGGDT           : 100.0% AIV (  1 of   1)
TPS EUROCARD        :   0.0%     (  0 of   1)
TPS E_GGD           :  66.7% AIV (  6 of   9) +  3
TPS GB-1000         :   0.0%     (  0 of   4)
TPS LEGACY          :  50.0% AIV (  1 of   2) +  1
TPS NET-G3          : 100.0% AIV (  1 of   1)
TPS NETG3           : 100.0% AIV ( 14 of  14)
TPS ODYSSEY_E       :  50.0% AIV (  2 of   4) +  2
TRIMBLE 4000SSE     :   0.0%     (  0 of   1)
TRIMBLE 4000SSI     :   0.0%     (  0 of   7)
TRIMBLE 4700        :   0.0%     (  0 of   3)
TRIMBLE 5700        :   0.0%     (  0 of   4)
TRIMBLE NETR5       :  40.0% AIV ( 12 of  30) + 18
TRIMBLE NETR8       :  66.7% AIV (  4 of   6) +  2
TRIMBLE NETRS       :  27.6% AIV (  8 of  29) + 21
-----------------------------------------------
Total               :  41.3% AIV (151 of 366)
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Total (possible)    :  87.2% AIV (319 of 366)

AOA BENCHMARK ACT   : 100.0% AIV ( 12 of  12)
AOA SNR-            : 100.0% AIV (  6 of   6)
ASHTECH UZ-12       :  36.2% AIV ( 21 of  58) + 37
ASHTECH Z-XII3      :  27.6% AIV ( 16 of  58) + 42
ASHTECH Z18         :   0.0%     (  0 of   2)
BLACKJACK           : 100.0% AIV (  1 of   1)
JAVAD               : 100.0% AIV (  1 of   1)
JPS                 :  48.6% AIV ( 17 of  35) + 18
LEICA GRX1200       :  37.3% AIV ( 22 of  59) + 37
LEICA RS            :   0.0%     (  0 of   1)
NOV                 :   0.0%     (  0 of   5)
ROGUE SNR-          : 100.0% AIV (  4 of   4)
SEPT                :  25.0% AIV (  2 of   8) +  6
TPS                 :  69.4% AIV ( 25 of  36) + 11
TRIMBLE 4000SSE     :   0.0%     (  0 of   1)
TRIMBLE 4000SSI     :   0.0%     (  0 of   7)
TRIMBLE 4700        :   0.0%     (  0 of   3)
TRIMBLE 5700        :   0.0%     (  0 of   4)
TRIMBLE NET         :  36.9% AIV ( 24 of  65) + 41
-----------------------------------------------
Total               :  41.3% AIV (151 of 366)
-----------------------------------------------
Total (possible)    :  93.7% AIV (343 of 366)
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Stations Sampling Just G01, or G25
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ajac:      G25  LEICA GRX1200GGPRO
alic:      G25  LEICA GRX1200GGPRO
ban2:      G25  AOA BENCHMARK ACT
barh:      G25  LEICA GRX1200GGPRO
bogo:      G25  TPS EUROCARD
brft: G01       LEICA GRX1200PRO
brst:      G25  LEICA GRX1200GGPRO
conz:      G25  LEICA GRX1200GGPRO
darw:      G25  LEICA GRX1200GGPRO
dav1:      G25  LEICA GRX1200GGPRO
hert:      G25  LEICA GRX1200GGPRO
hob2:      G25  LEICA GRX1200GGPRO
irkt:      G25  ROGUE SNR-8000
jplv:      G25  JPS EGGDT
kir0:      G25  JPS EGGDT
kosg:      G25  LEICA GRX1200GGPRO
lpal:      G25  LEICA GRX1200GGPRO
mar6:      G25  JPS E_GGD
maw1:      G25  LEICA GRX1200GGPRO
metz:      G25  JPS EUROCARD
mtka: G01       ASHTECH Z18
nano:      G25  LEICA GRX1200GGPRO
nico:      G25  LEICA GRX1200GGPRO
nurk:      G25  TPS NETG3
ohi3:      G25  LEICA GRX1200GGPRO
onsa:      G25  JPS E_GGD
orid:      G25  LEICA GRX1200GGPRO
park:      G25  JPS E_GGD
pfa2:      G25  TPS E_GGD
roth:      G25  LEICA GRX1200+GNSS
sele: G01       TRIMBLE 4000SSE
ske0:      G25  JPS E_GGD
sofi:      G25  LEICA GRX1200GGPRO
spt0:      G25  JPS E_GGD
strl:      G25  LEICA GRX1200GGPRO
sydn:      G25  JPS E_GGD
thu2:      G25  JPS LEGACY
tow2:      G25  LEICA GRX1200GGPRO
vil0:      G25  JPS EGGDT
vis0:      G25  JPS EGGDT
wes2:      G25  LEICA GRX1200GGPRO
wroc:      G25  LEICA GRX1200GGPRO
wtzr:      G25  LEICA GRX1200GGPRO
wuh2:      G25  AOA BENCHMARK ACT
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B

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Stations with Unobserved Operational GPS Satellites
===================================================
amu2: G02 G03 G04 G05 G06 G07 G08 G09 G10 G11 G12 G13 G14 G15 G16 G17 G18 G19 G20 G21 G22 G23 G24 G26 G27 G28 G29 G30 G31      TRIMBLE NETRS       1.1-5
azco: G02 G03 G04 G05 G06 85% G08 G09 G10 G11 G12 G13 G14 G15 G16 G17 G18 G19 G20 G21 G22 G23 G24 G26 G27 G28 G29 G30 G31 G32  TPS LEGACY          3.3 JUL,10,2008 P4
ccj2: G02 G03 G04 G05 G06 G07 G08 G09 G10 G11 G12 G13 G14 G15 G16 G17 G18 G19 G20 G21 G22 G23 G24 G26 G27 G28 G29 G30 G31      TRIMBLE NETRS       1.1-3
coyq: G02 G03 G04 G05 G06 G07 G08 G09 G10 G11 G12 G13 G14 G15 G16 G17 G18 G19 G20 G21 G22 G23 G24 G26 G27 G28 G29 G30 G31      TRIMBLE NETRS       1.1-1
guao: 76% G03 76% 71% G06 G07 G08 G09 G10 G11 G12 G13 G14 G15 G16 G17 G18 G19 G20 G21 G22 G23 G24 G26 G27 G28 G29 G30 G31 G32  ASHTECH UZ-12       CJ00 0A16
irkt: G02 G03 G04     G06 G07 G08 G09 G10 G11 G12 G13 G14 G15 G16 G17 G18 G19 G20 G21 G22 G23 G24 G26 G27 G28 G29 G30 G31 G32  ROGUE SNR-8000      98.12.27 / 1.7
isba: G02 G03 G04 G05 G06 G07 G08 G09 G10 G11 78% G13 G14 G15 G16 G17 G18 G19 G20 G21 G22 G23 G24 G26 G27 G28 G29 78% G31 G32  TRIMBLE NETR5       NP 4.14 / SP 4.17
kgni: G02 G03 G04 G05 G06 G07 G08 G09 G10 G11 G12 G13 G14 G15 G16 G17 G18 G19 G20 G21 G22 G23 G24 G26 G27 G28 G29 G30 G31      TRIMBLE NETRS       NP 1.15 / SP 0.00
ksmv: G02 G03 G04 G05 G06 G07 G08 G09 G10 G11 G12 G13 G14 G15 G16 G17 G18 G19 G20 G21 G22 G23 G24 G26 G27 G28 G29 G30 G31      TRIMBLE NETRS       NP 1.15 / SP 0.00
mtka: G02 G03 G04 G05 G06 G07 G08 G09 G10 G11 G12 G13 G14 G15 G16 G17 G18 G19 G20 G21 G22 G23 G24 G26 G27 G28 G29 G30 G31      ASHTECH Z18         0065      ZT16
obe3: G02 G03 G04 G05 G06 G07 G08 G09 G10 G11 85% G13 G14 G15 G16 G17 G18 G19 G20 G21 G22 G23 G24 G26 G27 G28 G29 G30 G31 G32  AOA BENCHMARK ACT   3.3.32.2N
ramo: G02 G03 G04 G05 G06 G07 G08 G09 G10 G11 G12 G13 G14 G15 G16 G17 G18 G19 G20 G21 G22 G23 G24 G26 G27 84% G29 G30 G31 G32  LEICA RS500         5.10
ssia: G02 G03 G04 G05 G06 G07 G08 G09 G10 G11 G12 G13 G14 G15 G16 G17 G18 G19 G20 G21 G22 G23 G24 G26 G27 G28 G29 G30 G31      TRIMBLE NETRS       1.1-3
suwn: G02 G03 G04 G05 G06 G07 G08 G09 G10 G11 G12 G13 G14 G15 G16 G17 G18 G19 G20 G21 G22 G23 G24 G26 G27 G28 G29 G30 G31      TRIMBLE NETRS       VERSION 1.15
tsk2: G02 G03 G04 G05 G06 G07 G08 G09 G10 G11 G12 G13 G14 G15 G16 G17 G18 G19 G20 G21 G22 75% G24 78% G27 G28 G29 G30 G31 G32  TRIMBLE 5700        1.24
unfe: G02  9% G04 G05  9% G07 G08 G09 G10  9% G12 G13 G14 G15 G16 G17 G18 G19 G20 G21 G22 G23 G24 G26 G27 G28 G29 G30 G31      ASHTECH Z18         0065      ZT17
yibl: G02 G03 G04 G05 G06 G07 G08 G09 G10 G11 G12 G13 G14 G15 G16 G17 G18 G19 G20 G21 G22 G23 G24 G26 G27 G28 G29 G30 G31      TRIMBLE NETRS       1.1-5

Stations with Unobserved Operational GLONASS Satellites
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afkb: R01 R02 R03 R04 R05 R07 R08 33% R11 R13 R14 R15 R17 R18 R19 R20 R21 R22 R23 R24  LEICA GRX1200GGPRO  7.50/3.014
bako: R01 R02 R03 R04 R05 R07 R08     R11 R13     R15 R17 R18 R19 R20 R21 R22 R23 R24  LEICA GRX1200GGPRO  6.02/3.015
cpxf: R01 R02 R03 R04 R05 R07 R08     R11 R13     R15 R17 R18 R19 R20 R21 R22 R23 R24  LEICA GRX1200GGPRO  6.02/3.015
iddr: R01 R02 R03 R04 R05 R07 R08     R11 R13     R15 R17 R18 R19 R20 R21 R22 R23 R24  LEICA GRX1200GGPRO  5.62/3.014
ilha: R01 R02 R03 R04 R05 R07 R08 28% R11 R13 28% R15 R17 R18 R19 R20 R21 R22 R23 R24  LEICA GRX1200GGPRO  5.62
mdvj: R01 R02 R03 R04 R05 R07 R08 R10 R11 R13 R14 R15 R17 78% R19 R20 R21 82% R23 R24  TPS NETG3           3.4 DEC,12,2009 P2
mtka: R01     R03 R04 R05 R07 R08                     R17     R19 R20 R21     R23 R24  ASHTECH Z18         0065      ZT16
rcmn: R01 R02 R03 R04 R05 R07 R08     R11 R13     R15 R17 R18 R19 R20 R21 R22 R23 R24  LEICA GRX1200GGPRO  7.53/3.014
spt0: R01 R02 R03 R04 R05 R07 R08 R10 R11 R13 R14 R15 R17     R19 R20 R21  3% R23 R24  JPS E_GGD           2.6.1 JAN,10,2008
unfe: R01     R03 R04 R05 R07 R08                     R17     R19 R20 R21     R23 R24  ASHTECH Z18         0065      ZT17
urum: R01 R02 R03 R04 R05 R07 R08 R10 R11 R13 R14 R15 R17 35% R19 R20 R21 28% R23 R24  TPS NETG3           3.3
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C

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Tracking Situation Concerning GEO Satellites
============================================================================
abmf:                 S33 S35     S38  TRIMBLE NETR5       4.03
cnmr:           S29         S37       TRIMBLE NETR5       4.03
cont: S20             S33 S35     S38  SEPT POLARX2        2.6.0
lmmf:                 S33 S35     S38  TRIMBLE NETR5       4.03
mizu:           S29         S37       SEPT POLARX2        2.5.0
nist:                 S33 S35     S38  NOV OEM4-G2         2.200-L1L2W
ous2:           S29   S33 S35 S37       SEPT POLARX2        2.5.0
piel:           S29   S33 S35 S37       SEPT POLARX2        2.5.0
pots: S20 S24 S26                       SEPT POLARX2        2.5.0
unb3: S20             S33 S35     S38  TRIMBLE NETR5       Version 4.15
unbn:                 S33 S35     S38  NOV OEMV3           3.620
unbt: S20             S33 S35     S38  TPS NET-G3          3.4 Nov,05,2009  p2b
unsa: S20             S33 S35     S38  SEPT POLARX2        2.7.0
wab1: S20 S24                           SEPT POLARX2        3.2.0
wab1: S20 S24 S26                       SEPT POLARX2        3.2.0
yell: S20             S33 S35     S38  SEPT POLARX2        2.7.0
zwe2: S20 S24 S26                       SEPT POLARX2        2.6.0
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Interestingly, a long list of inexistent satellites (G33, G34, G38, G42, G43, G50, G58, G61, G62, R35, R47, R50, R62, R63, E01, E02, E03, E13, E16, E17, E20, E26, E28, E39, E48, E50, E59, E61, E63, S25, S28, S29, S30, S35, S39, S42, S45, S53, S56, S65, S68, S74, S80, S81, S82) sporadically appears in the observation files collected by alic, cas1, darw, dav1, hob2, maw1, str1, xmis (all equipped with a LEICA GRX1200GGPRO model).

D

A routine process has been set up at CODE for direct P2-C2 (and P1-C1) GNSS code bias retrieval:

Old: GPS P1C1 for satellites
New: GPS P1C1 for satellites and receivers
GLO P1C1 for satellites and receivers
GPS P2C2 for satellites and receivers
GLO P2C2 for satellites and receivers

Note: P2C2 monthly files are available starting with year-month 10-01.

ftp://ftp.unibe.ch/aiub/CODE/P2C2.DCB
ftp://ftp.unibe.ch/aiub/CODE/P2C2_LEICA.DCB
ftp://ftp.unibe.ch/aiub/CODE/P2C2_TPS.DCB
ftp://ftp.unibe.ch/aiub/CODE/P2C2_TRIMBLE.DCB
ftp://ftp.unibe.ch/aiub/CODE/P2C2_TRIMBLE_NETR5.DCB
ftp://ftp.unibe.ch/aiub/CODE/P2C2_TRIMBLE_NETR8.DCB
ftp://ftp.unibe.ch/aiub/CODE/P2C2_TRIMBLE_NETRS.DCB

Monthly P2C2 DCB combinations for year-month (YYMM):
ftp://ftp.unibe.ch/aiub/CODE/2010/P2C2YYMM.DCB.Z
ftp://ftp.unibe.ch/aiub/CODE/2010/P2C2YYMM_*.DCB.Z

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Stations Observing P2&C2 for GPS/GLONASS (and L5&C5 for GPS)
============================================================
Station name     Receiver type          P1&C1   P2&C2   L5/C5
------------------------------------------------------------
ABMF 97103M001   TRIMBLE NETR5           -/R     G/-
AZGB             TRIMBLE NETR5           -/R     G/-
BAKE 40152M001   TPS NETG3               G/R     G/R
COCO 50127M001   TRIMBLE NETR5           -/R     G/-
DUBO 40137M001   TPS NETG3               G/R     G/R
ETAD             TRIMBLE NETR5           -/R     G/-
ETDD             TRIMBLE NETR5           -/R     G/-
ETJI             TRIMBLE NETR5           -/R     G/-
FRDN 40146M001   TPS NETG3               G/R     G/R
GANP 11515M001   TRIMBLE NETR8           -/R     G/-     X  X
GOPE 11502M002   TPS NETG3               G/R     G/R
GRAS 10002M006   TRIMBLE NETR5           G/R     G/-
IQAL 40194M001   TPS NETG3               G/R     G/R
KARR 50139M001   TRIMBLE NETR8           G/R     G/-     X  X
LMMF 97205M001   TRIMBLE NETR5           -/R     G/-
PGC5 40129M007   TRIMBLE NETRS           -/-     G/-
REUN 97401M003   TRIMBLE NETR5           -/R     G/-
ROSA             TRIMBLE NETR5           -/R     G/-
SCH2 40133M002   TPS NETG3               G/R     G/R
TID1 50103M108   TRIMBLE NETR8           -/R     G/-
TLSE 10003M009   TRIMBLE NETR5           -/R     G/-
TORI 12724M002   LEICA GRX1200+GNSS      -/-     G/-
UCLU 40140M001   TRIMBLE NETRS           -/-     G/-
UNB3 40146M002   TRIMBLE NETR5           -/R     G/-
UNBT             TPS NETG3               G/R     G/R
VALA 13463M002   LEICA GRX1200+GNSS      -/-     G/-
VALD 40156M001   TPS NETG3               G/R     G/R
WHIT 40136M001   TPS NETG3               G/R     G/R
ZIM2 14001M008   TRIMBLE NETR5           -/R     G/-

Receivers not Providing P1&C1 for GLONASS
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Receiver type          P1&C1   Remark
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ASHTECH Z18              0%    P1=C1
JAVAD TRE_G3T DELTA    100%
JPS EGGDT              100%
JPS EUROCARD           100%
JPS E_GGD              100%
JPS LEGACY             100%
LEICA GRX1200+GNSS       0%    C1
LEICA GRX1200GGPRO       0%    C1
NOV OEMV3                0%    C1
TPS EGGDT              100%
TPS EUROCARD           100%
TPS E_GGD              100%
TPS GB-1000            100%
TPS LEGACY             100%
TPS NETG3              100%
TPS ODYSSEY_E          100%
TRIMBLE NETR5           31%    C1 or P1&C1 (C1&C2 for BNDY!)
TRIMBLE NETR8          100%
```