

Global View

abbreviation NAU
 country Ukraine
 site Laboratory satellite systems
 version 4.8.2
 program Pegasus
 comment Konin V., Shyshkov F. InsideGNSS, Jan-Feb 2015,
 P.50 - 54
 city Kiev
 date 29/01/2016

SBAS Messages

start: 11:32:15.129 19.01.2016 (week: 1880 sec: 214335.129)
end: 15:47:38.129 19.01.2016 (week: 1880 sec: 229658.129)
duration: 04:15:23 ..

quality

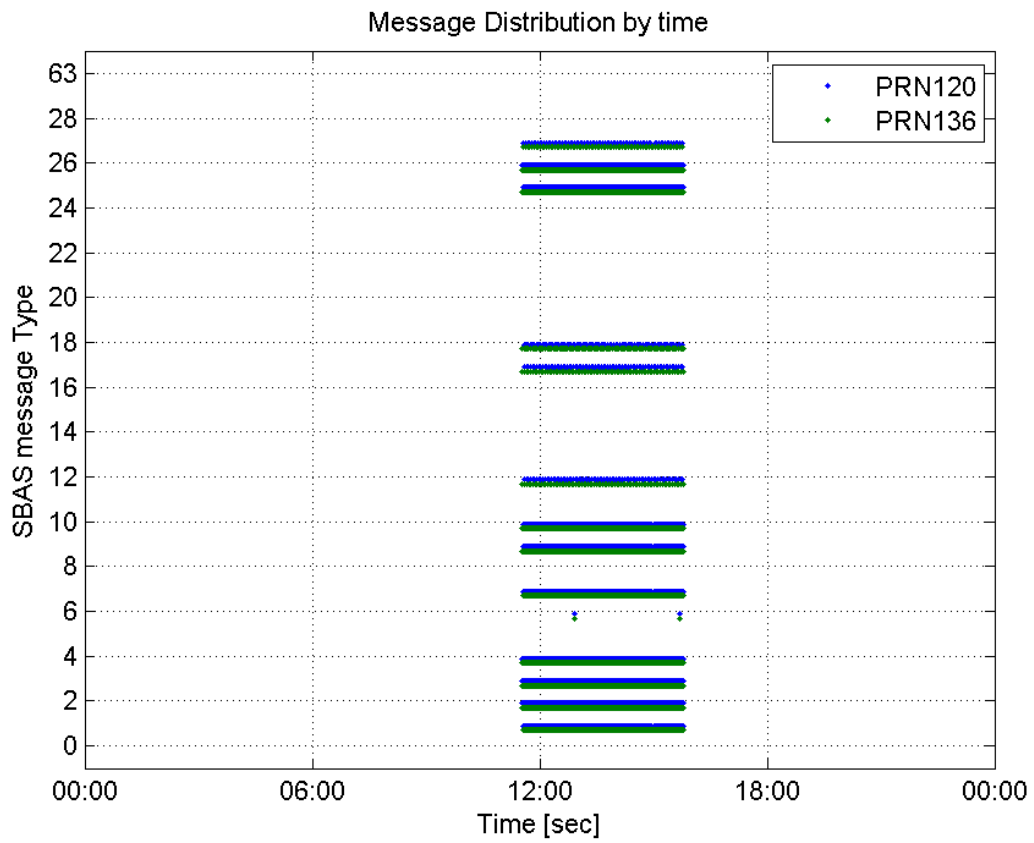
valid samples 30516
total samples 30516
number of SBAS PRNs 2

SBAS SIS Overview

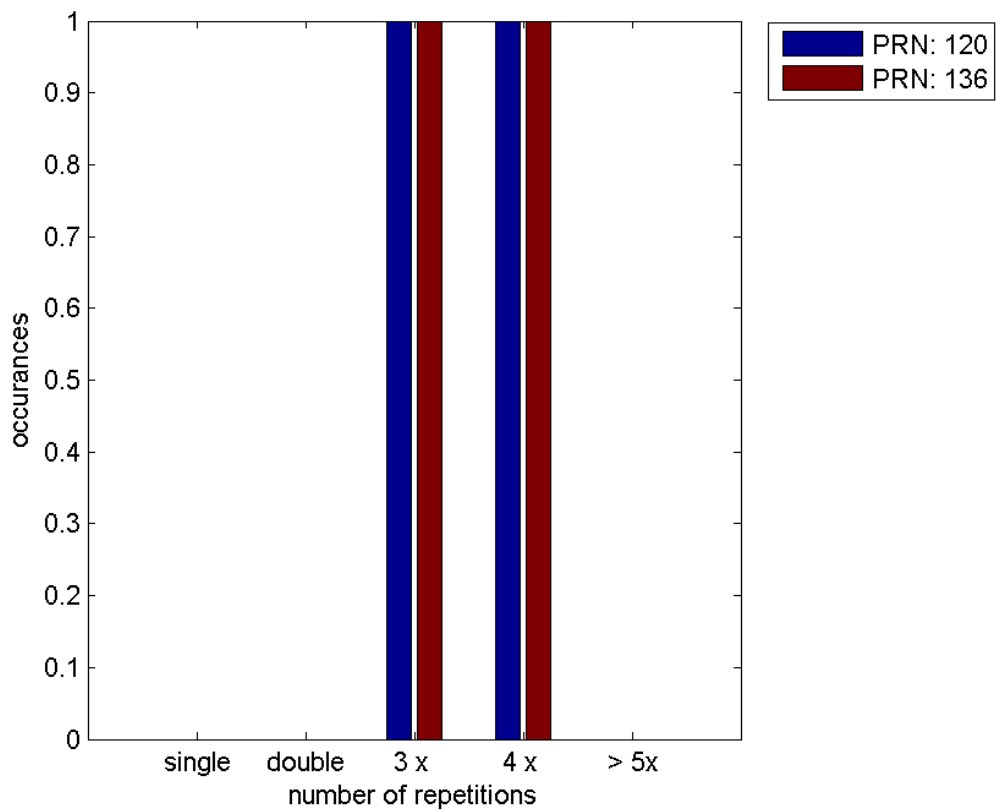
Message Type 6 repetitions :

| | single | double | 3 x | 4 x | > 5x |
|----------------|--------|--------|-----|-----|------|
| PRN 120 | 0 | 0 | 1 | 1 | 0 |
| PRN 136 | 0 | 0 | 1 | 1 | 0 |

Message Distribution by time:



Message Type 6 repetitions:



Broadcast SBAS Messages :

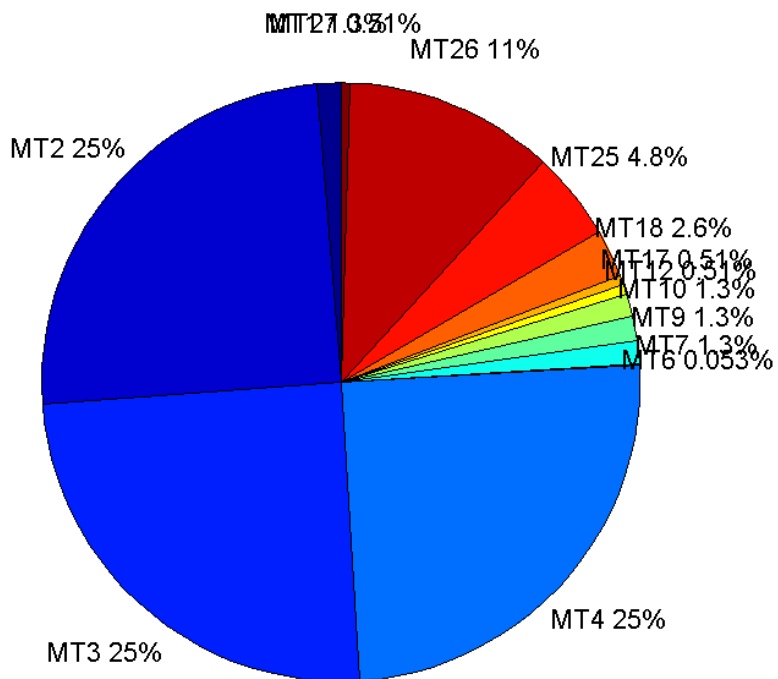
| | number of messages | % |
|--------------|--------------------|-----------|
| MT 0 | 0 | 0 |
| MT 1 | 192 | 1.26382 |
| MT 2 | 3781 | 24.8881 |
| MT 3 | 3781 | 24.8881 |
| MT 4 | 3781 | 24.8881 |
| MT 5 | 0 | 0 |
| MT 6 | 8 | 0.0526593 |
| MT 7 | 193 | 1.27041 |
| MT 9 | 192 | 1.26382 |
| MT 10 | 192 | 1.26382 |
| MT 12 | 78 | 0.513428 |
| MT 17 | 78 | 0.513428 |
| MT 18 | 388 | 2.55398 |
| MT 24 | 0 | 0 |
| MT 25 | 733 | 4.82491 |
| MT 26 | 1718 | 11.3086 |
| MT 27 | 77 | 0.506846 |
| MT 28 | 0 | 0 |
| MT 62 | 0 | 0 |
| MT 63 | 0 | 0 |
| Total | 15192 | 100 |

Update intervals :

| | Minimum [s] | Maximum [s] | Mean value | Exceed Max update | Exceed NPA timeout | Exceed PA timeout |
|-------|-------------|-------------|------------|-------------------|--------------------|-------------------|
| MT 0 | -- | -- | -- | -- | -- | -- |
| MT 1 | 74 | 159 | 79.4346 | 1 | 0 | 0 |
| MT 2 | 4 | 101 | 4.04365 | 3 | 1 | 1 |
| MT 3 | 4 | 101 | 4.04365 | 3 | 1 | 1 |
| MT 4 | 4 | 102 | 4.04365 | 3 | 1 | 1 |
| MT 5 | -- | -- | -- | -- | -- | -- |
| MT 6 | 1 | 9940 | 1420.86 | 1 | 1 | 1 |
| MT 7 | 76 | 155 | 79.3958 | 1 | 0 | 0 |
| MT 9 | 74 | 160 | 79.4136 | 0 | 0 | 0 |
| MT 10 | 75 | 235 | 79.8377 | 1 | 0 | 0 |
| MT 12 | 184 | 201 | 195.065 | 77 | 0 | 0 |
| MT 17 | 184 | 201 | 195.013 | 0 | 0 | 0 |
| MT 18 | 4 | 185 | 38.8811 | 0 | 0 | 0 |
| MT 24 | -- | -- | -- | -- | -- | -- |
| MT 25 | 1 | 139 | 20.8538 | 0 | 0 | 0 |
| MT | 4 | 123 | 8.90215 | 0 | 0 | 0 |

| | | | | | | |
|-------|-----|-----|---------|----|----|----|
| 26 | | | | | | |
| MT 27 | 186 | 393 | 197.513 | 0 | 0 | 0 |
| MT 28 | -- | -- | -- | -- | -- | -- |
| MT 62 | -- | -- | -- | -- | -- | -- |
| MT 63 | -- | -- | -- | -- | -- | -- |

Message Distribution PRN 120:



SBAS SIS Analysis

PRN 136

Broadcast SBAS Messages :

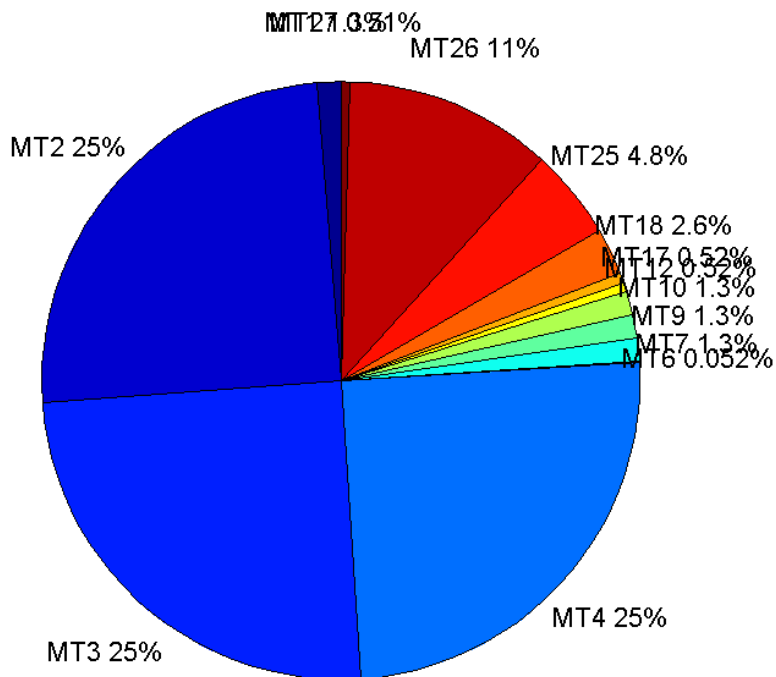
| | number of messages | % |
|-------|--------------------|-----------|
| MT 0 | 0 | 0 |
| MT 1 | 194 | 1.26599 |
| MT 2 | 3816 | 24.9021 |
| MT 3 | 3816 | 24.9021 |
| MT 4 | 3815 | 24.8956 |
| MT 5 | 0 | 0 |
| MT 6 | 8 | 0.0522057 |
| MT 7 | 193 | 1.25946 |
| MT 9 | 194 | 1.26599 |
| MT 10 | 194 | 1.26599 |

| | | |
|--------------|-------|----------|
| MT 12 | 79 | 0.515531 |
| MT 17 | 79 | 0.515531 |
| MT 18 | 391 | 2.55155 |
| MT 24 | 0 | 0 |
| MT 25 | 741 | 4.83555 |
| MT 26 | 1726 | 11.2634 |
| MT 27 | 78 | 0.509005 |
| MT 28 | 0 | 0 |
| MT 62 | 0 | 0 |
| MT 63 | 0 | 0 |
| Total | 15324 | 100 |

Update intervals :

| | Minimum [s] | Maximum [s] | Mean value | Exceed Max update | Exceed NPA timeout | Exceed PA timeout |
|-------|-------------|-------------|------------|-------------------|--------------------|-------------------|
| MT 0 | -- | -- | -- | -- | -- | -- |
| MT 1 | 76 | 80 | 79.0415 | 0 | 0 | 0 |
| MT 2 | 4 | 8 | 4.01599 | 2 | 0 | 0 |
| MT 3 | 4 | 8 | 4.01599 | 2 | 0 | 0 |
| MT 4 | 4 | 8 | 4.01599 | 2 | 0 | 0 |
| MT 5 | -- | -- | -- | -- | -- | -- |
| MT 6 | 1 | 9940 | 1420.86 | 1 | 1 | 1 |
| MT 7 | 74 | 81 | 79.0729 | 0 | 0 | 0 |
| MT 9 | 74 | 81 | 79.0984 | 0 | 0 | 0 |
| MT 10 | 74 | 81 | 79.0777 | 0 | 0 | 0 |
| MT 12 | 188 | 201 | 195.41 | 78 | 0 | 0 |
| MT 17 | 188 | 201 | 195.462 | 0 | 0 | 0 |
| MT 18 | 4 | 160 | 39.0923 | 0 | 0 | 0 |
| MT 24 | -- | -- | -- | -- | -- | -- |
| MT 25 | 1 | 54 | 20.6649 | 0 | 0 | 0 |
| MT 26 | 3 | 32 | 8.87942 | 0 | 0 | 0 |
| MT 27 | 188 | 201 | 195.416 | 0 | 0 | 0 |
| MT 28 | -- | -- | -- | -- | -- | -- |
| MT 62 | -- | -- | -- | -- | -- | -- |
| MT 63 | -- | -- | -- | -- | -- | -- |

Message Distribution PRN 136:



Parameters

System

| Name | Section | Value |
|------------|---------|--|
| Name | System | Convertor |
| Version | System | 4.3 |
| Inputfile | System | D:/PegasusDateGob/job/2016_01_19_EGNOS/01_User/01_User |
| Outputfile | System | D:/PegasusDateGob/job/2016_01_19_EGNOS/02_Convertor/02_Convertor |

Configuration

| Name | Section | Value |
|-----------------|---------------|---------------|
| Receiver | Configuration | Novatel OEM4 |
| Leap_Seconds | Configuration | 17 |
| Correction_mode | Configuration | SBAS MODE 0/2 |
| Dual_Frequency | Configuration | no |

Range Domain

start: 11:32:16 19.01.2016 (week: 1880 sec: 214336)
end: 15:47:38 19.01.2016 (week: 1880 sec: 229658)
duration: 04:15:23 ..

quality

valid samples 15323
total samples 15323

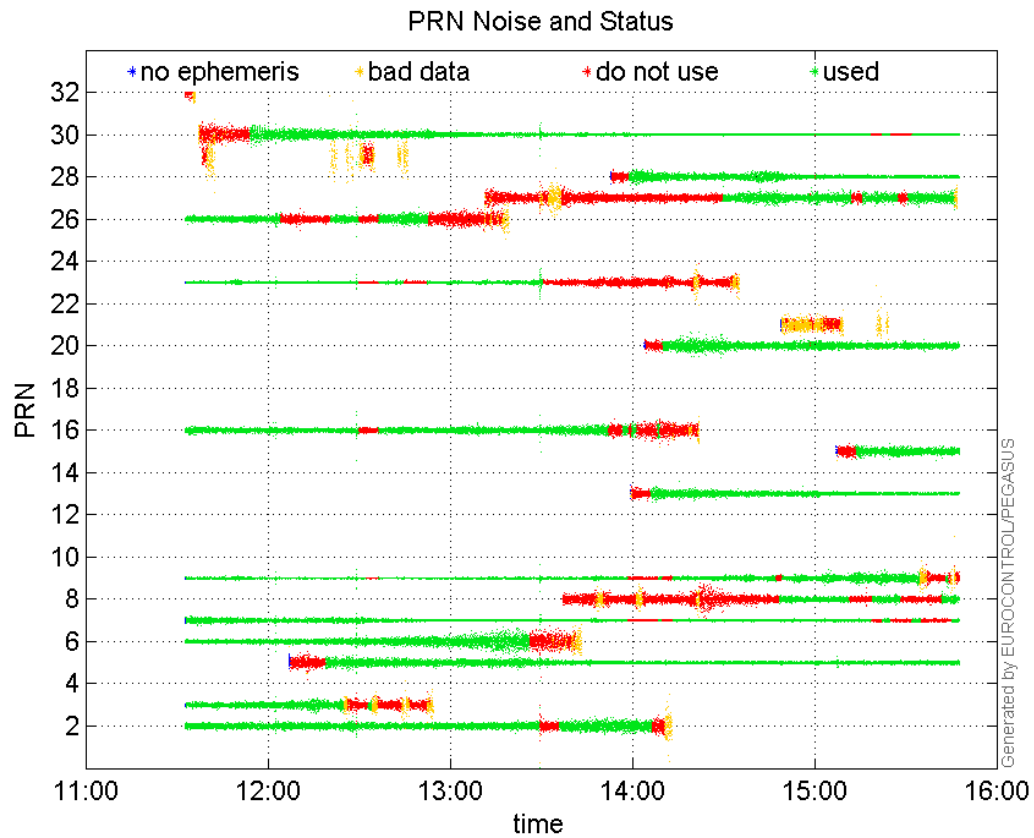
PRN overview

Number of Visible GPS Satellites 19

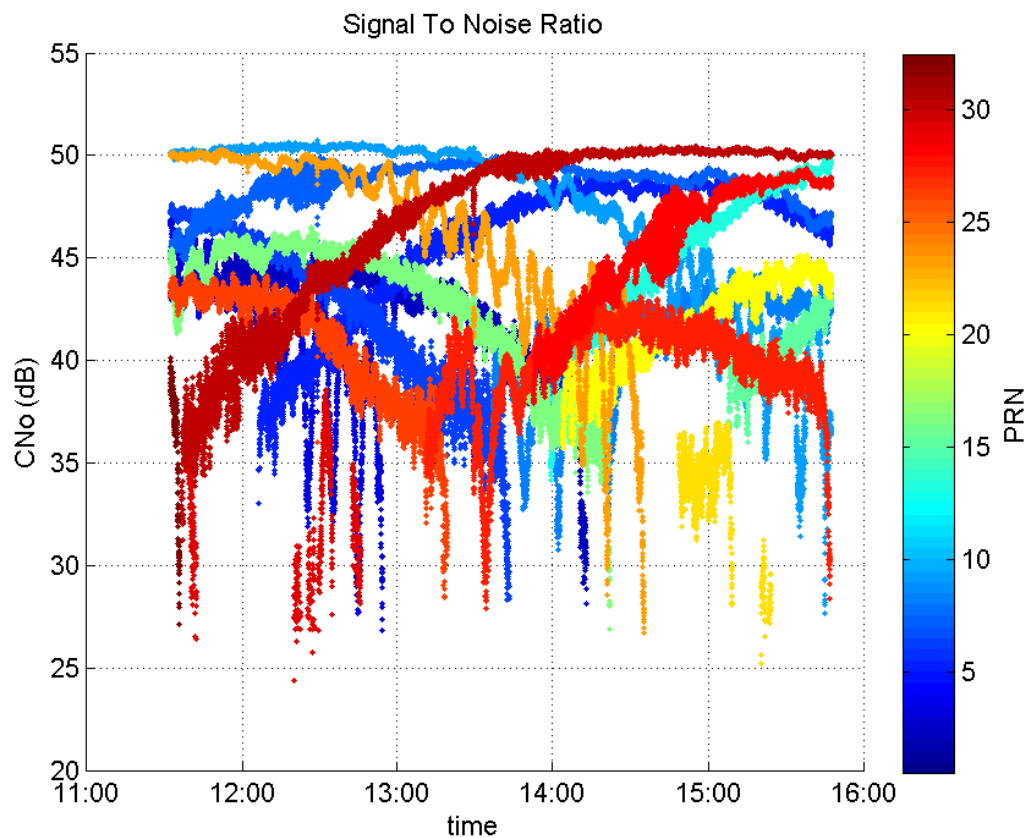
Number of Visible SBAS Satellites 2

signal quality and status

PRN Noise and Status:



Signal To Noise Ratio:



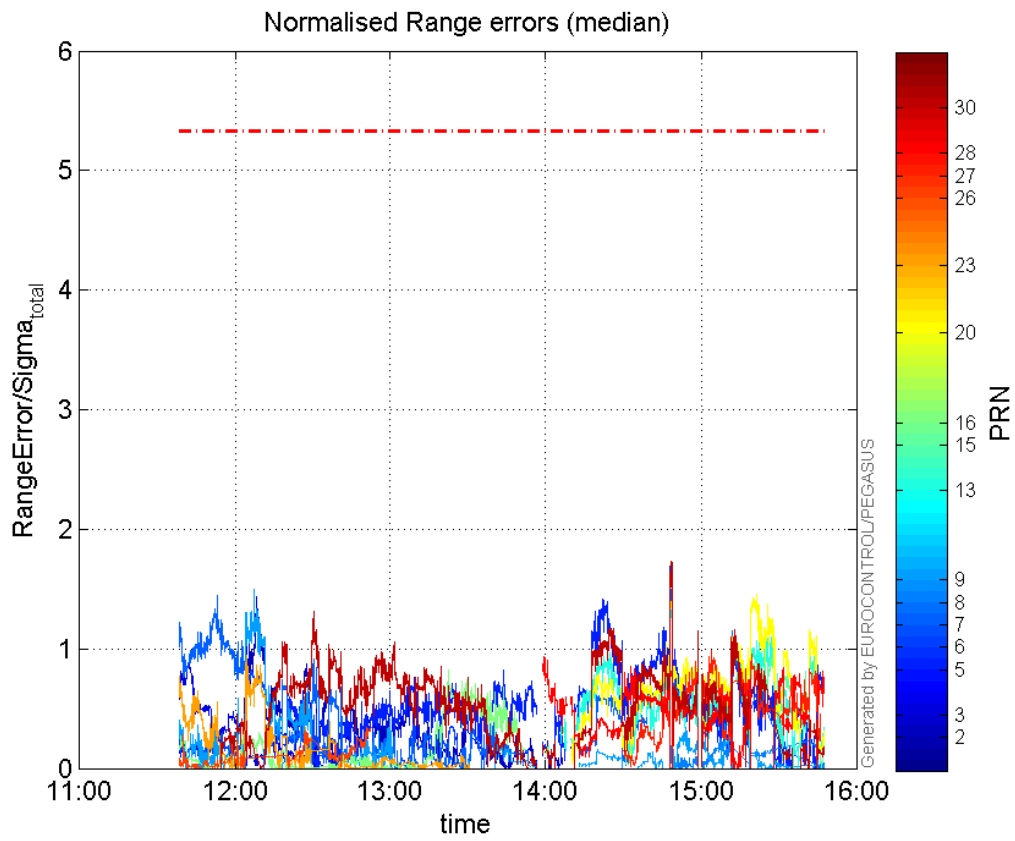
range errors

Number of Overbounding Norm Errors 0

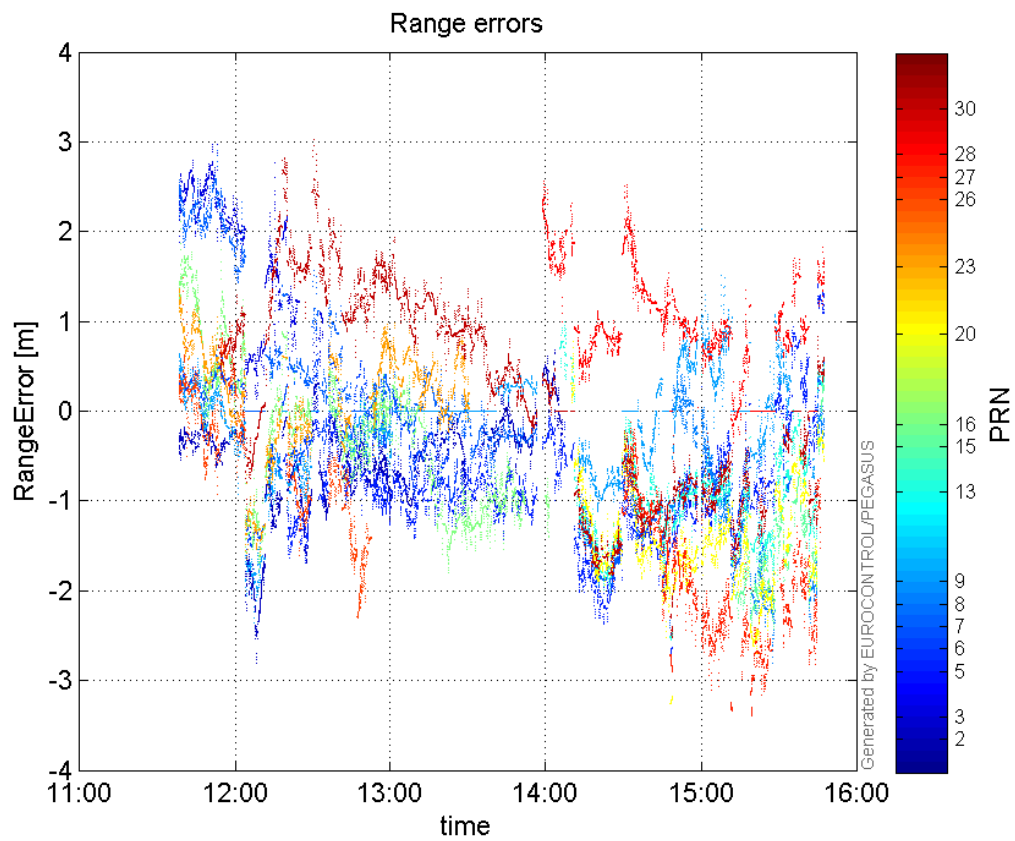
Max Norm Errors :

| GPS Week | GPS Second | PRN | Norm Error | Range Error | Sigma |
|----------|------------|-----|------------|-------------|---------|
| 1880 | 216507 | 2 | 1.43488 | -2.80411 | 1.95424 |
| 1880 | 214911 | 3 | 0.87797 | 2.53559 | 2.88801 |
| 1880 | 226088 | 5 | 1.69324 | -2.71707 | 1.60465 |
| 1880 | 216258 | 6 | 0.846986 | -1.60395 | 1.89372 |
| 1880 | 226104 | 7 | 1.49647 | -2.5169 | 1.68189 |
| 1880 | 229337 | 8 | 0.24735 | -2.35152 | 9.50683 |
| 1880 | 216431 | 9 | 1.49307 | -2.36075 | 1.58114 |
| 1880 | 226104 | 13 | 1.32394 | -2.53929 | 1.91798 |
| 1880 | 228493 | 15 | 1.0322 | -2.42742 | 2.35169 |
| 1880 | 220938 | 16 | 0.823259 | -1.79923 | 2.1855 |
| 1880 | 228090 | 20 | 1.45358 | -2.67059 | 1.83725 |
| 1880 | 216258 | 23 | 0.949977 | -1.65275 | 1.73978 |
| 1880 | 219048 | 26 | 0.340371 | -1.70964 | 5.02289 |
| 1880 | 227530 | 27 | 1.02825 | -3.3346 | 3.24299 |
| 1880 | 223161 | 28 | 0.938838 | 2.56643 | 2.73362 |
| 1880 | 226117 | 30 | 1.73536 | -2.44062 | 1.40641 |

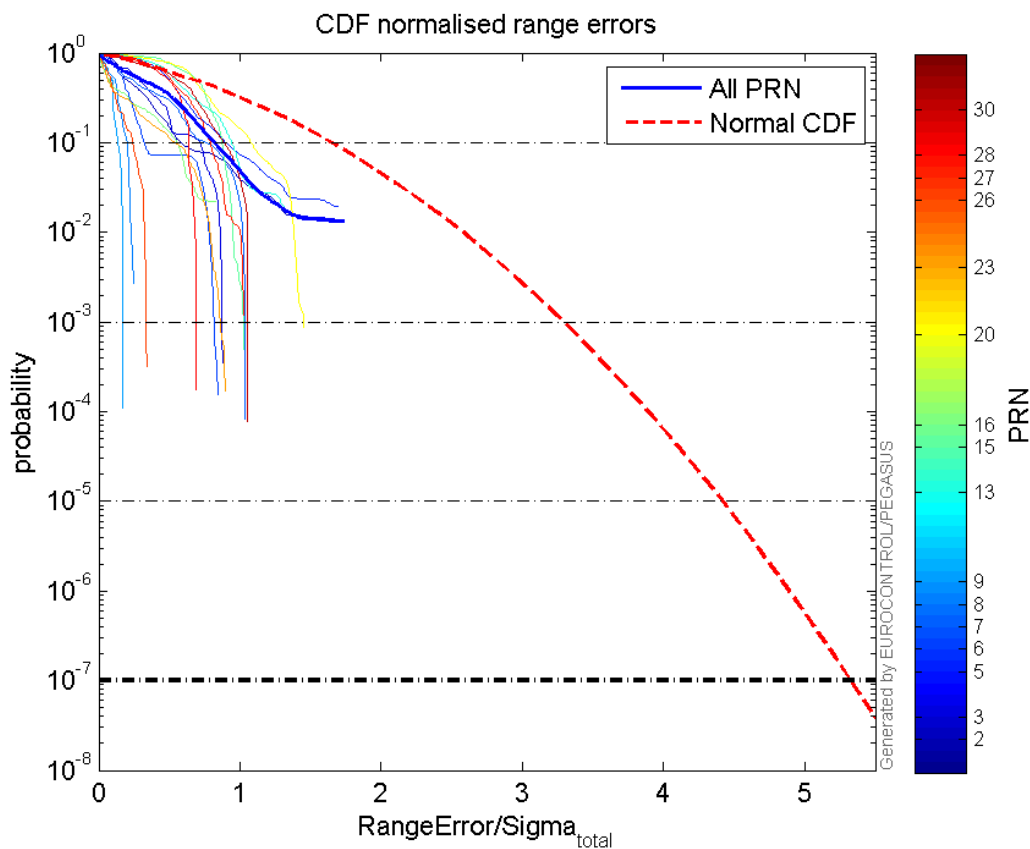
Normalised Range errors (median):



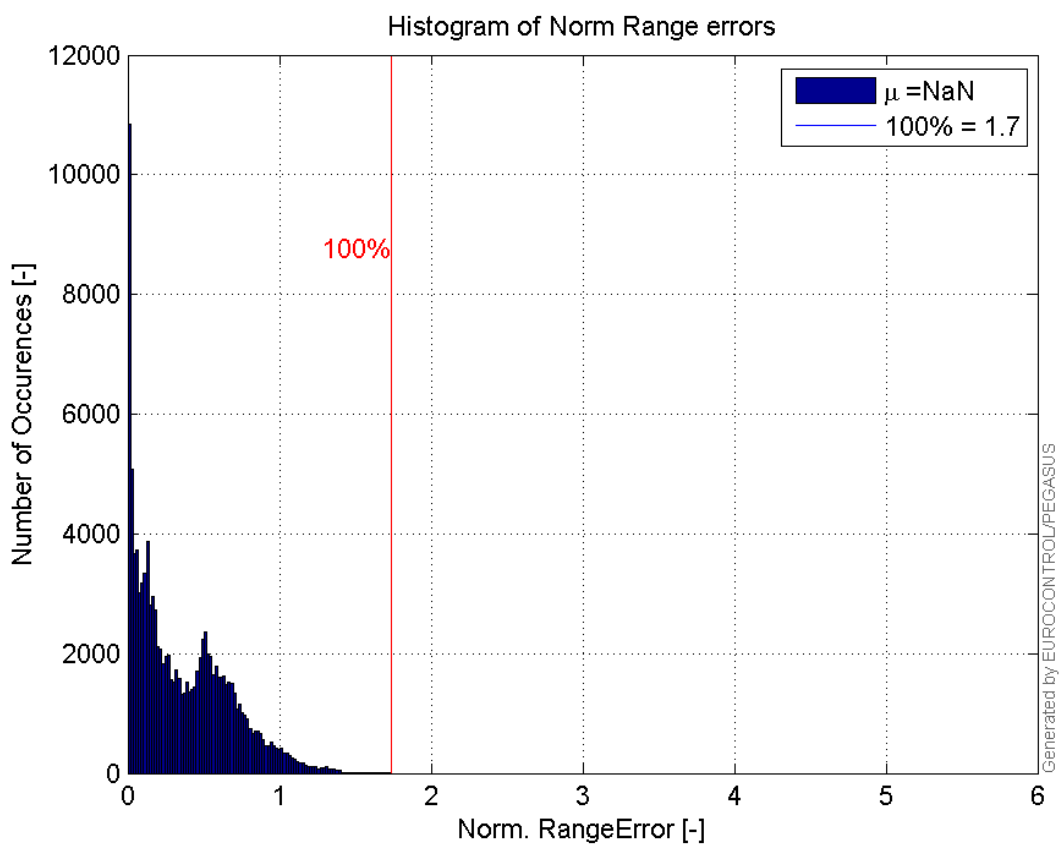
Range errors:



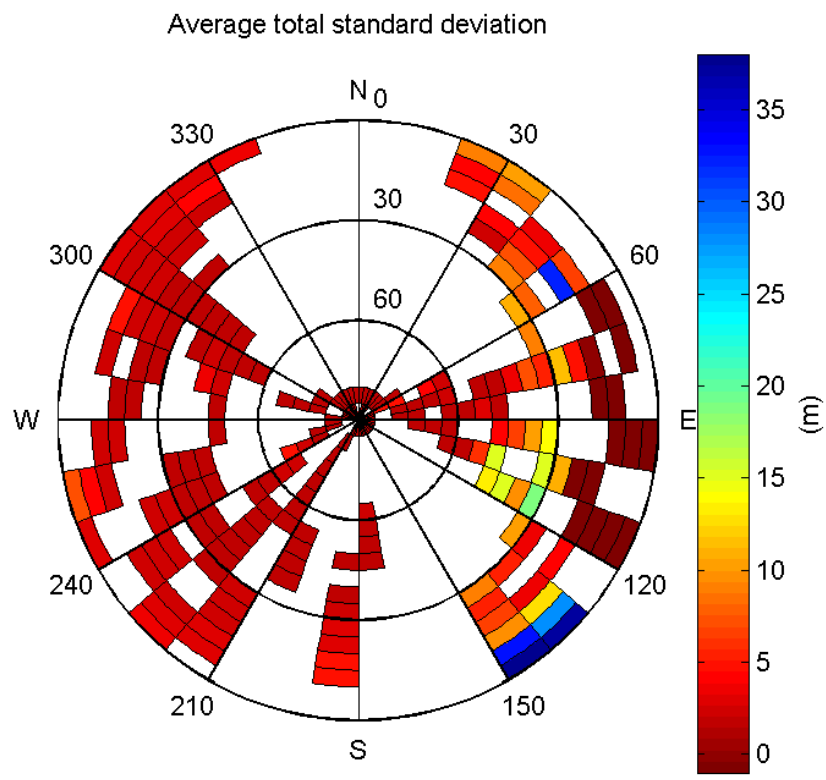
CDF normalised range errors:



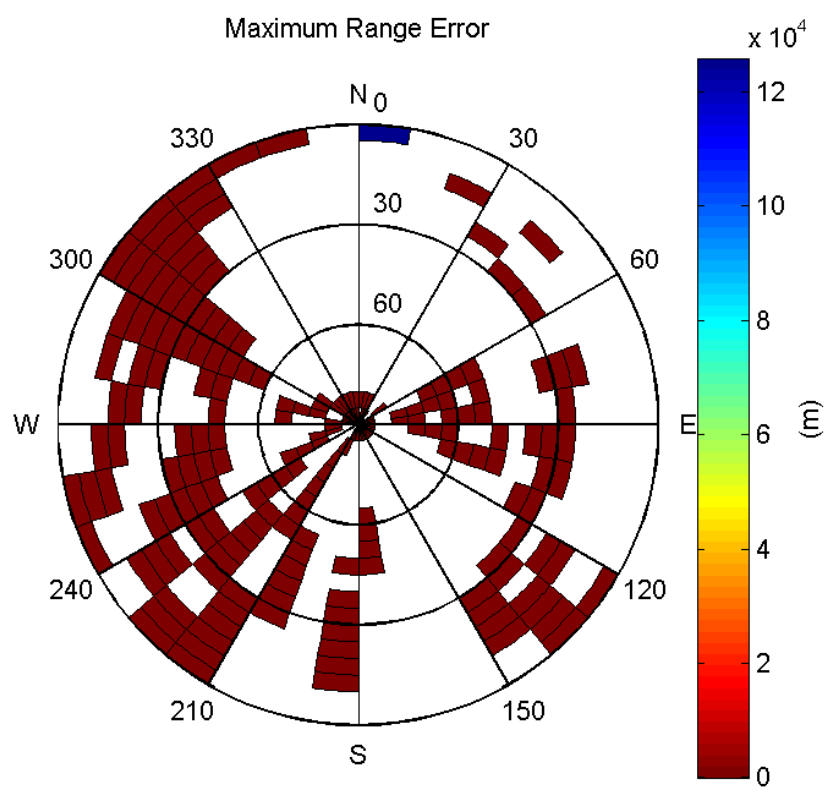
Histogram of Norm Range errors:



Sigma Sky Plot:

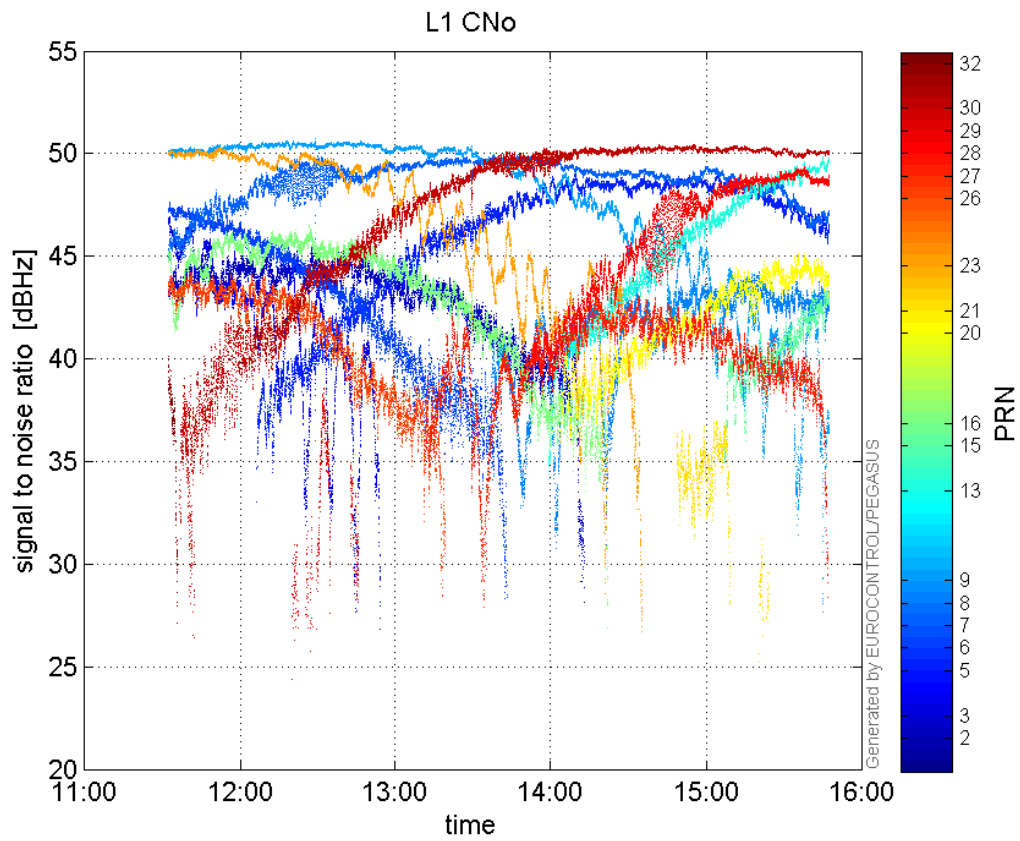


Norm Error Sky Plot:

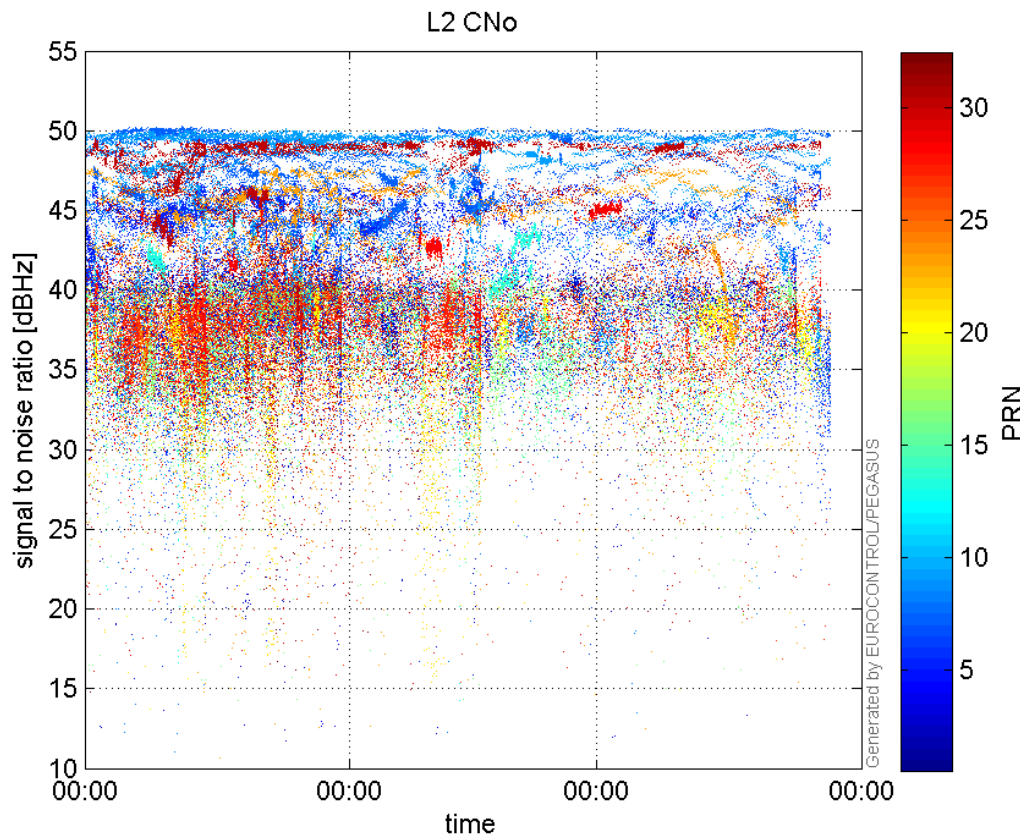


signal quality

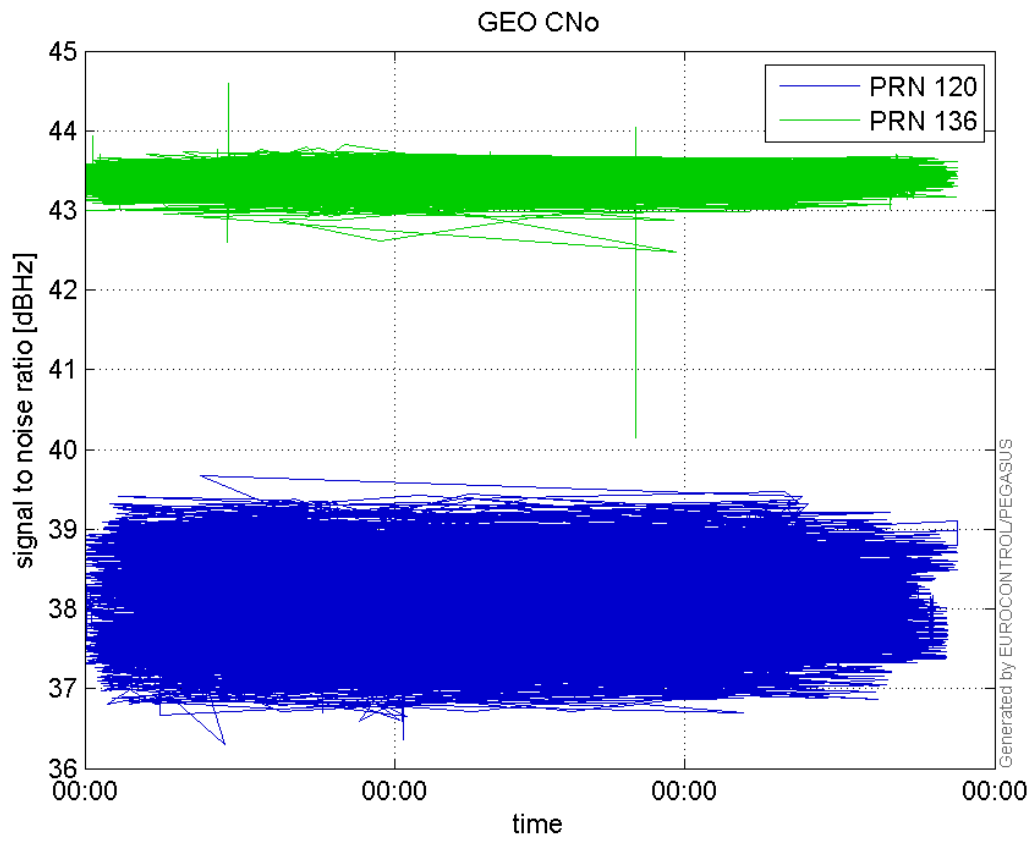
L1 CNo:



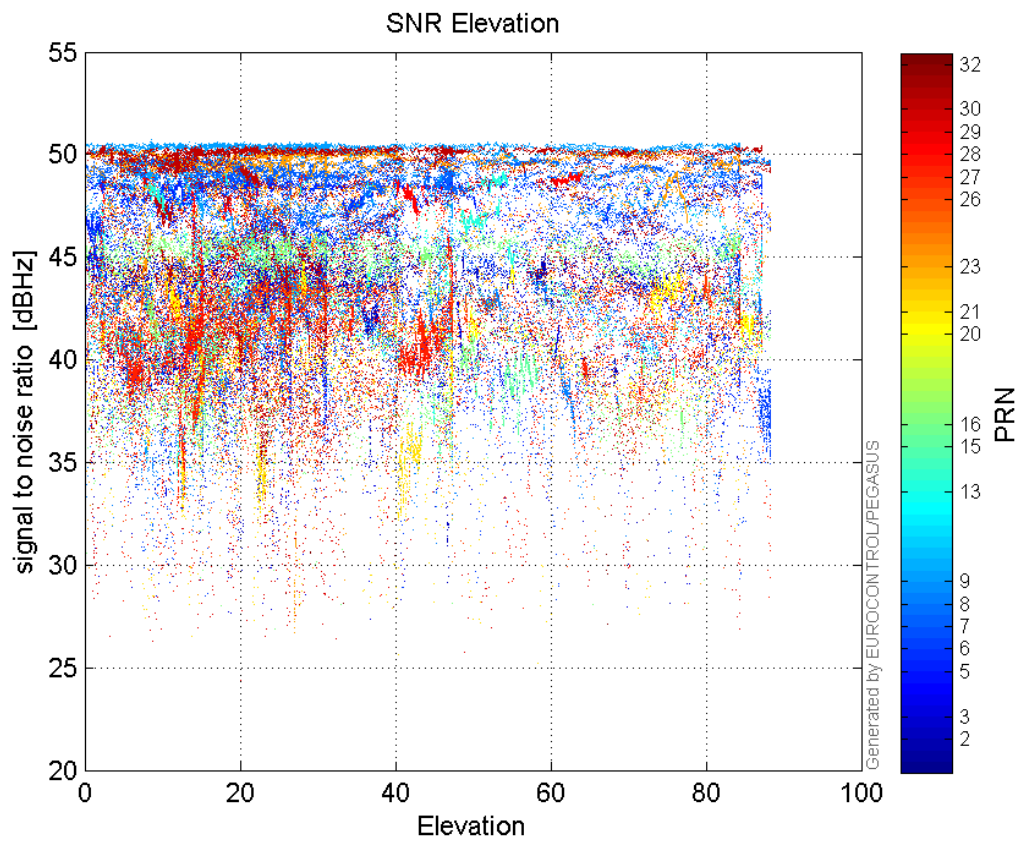
L2 CNo:



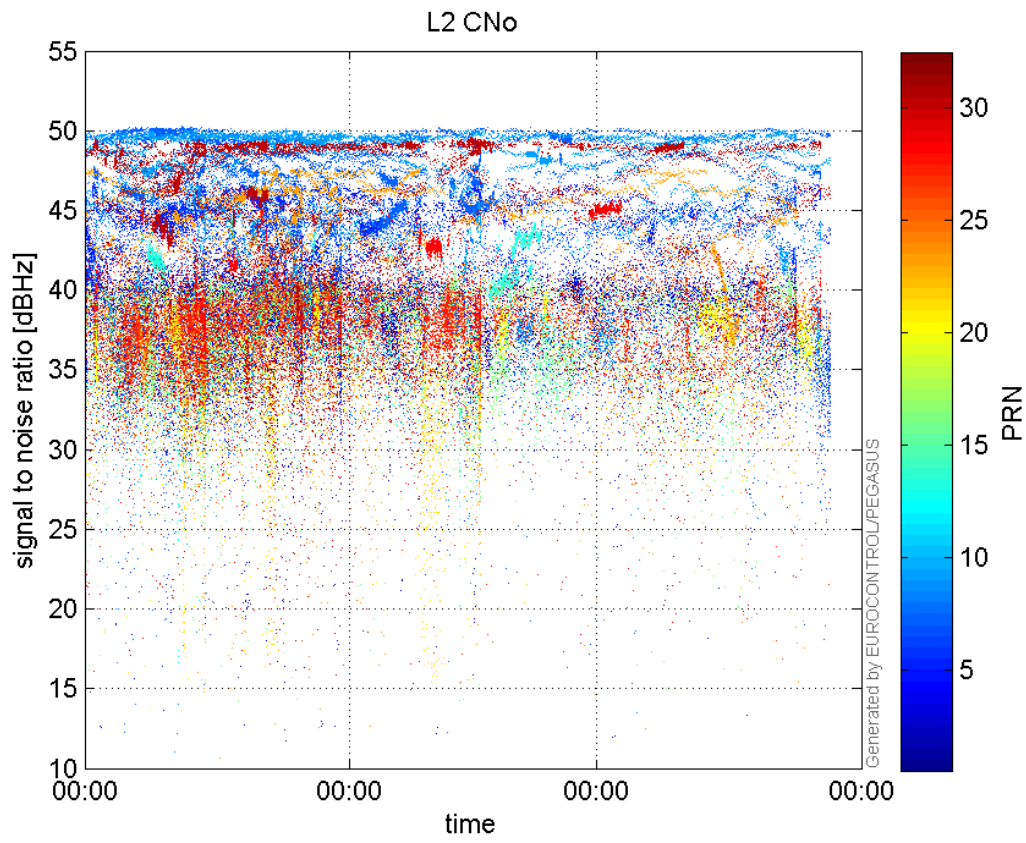
GEO CNo:



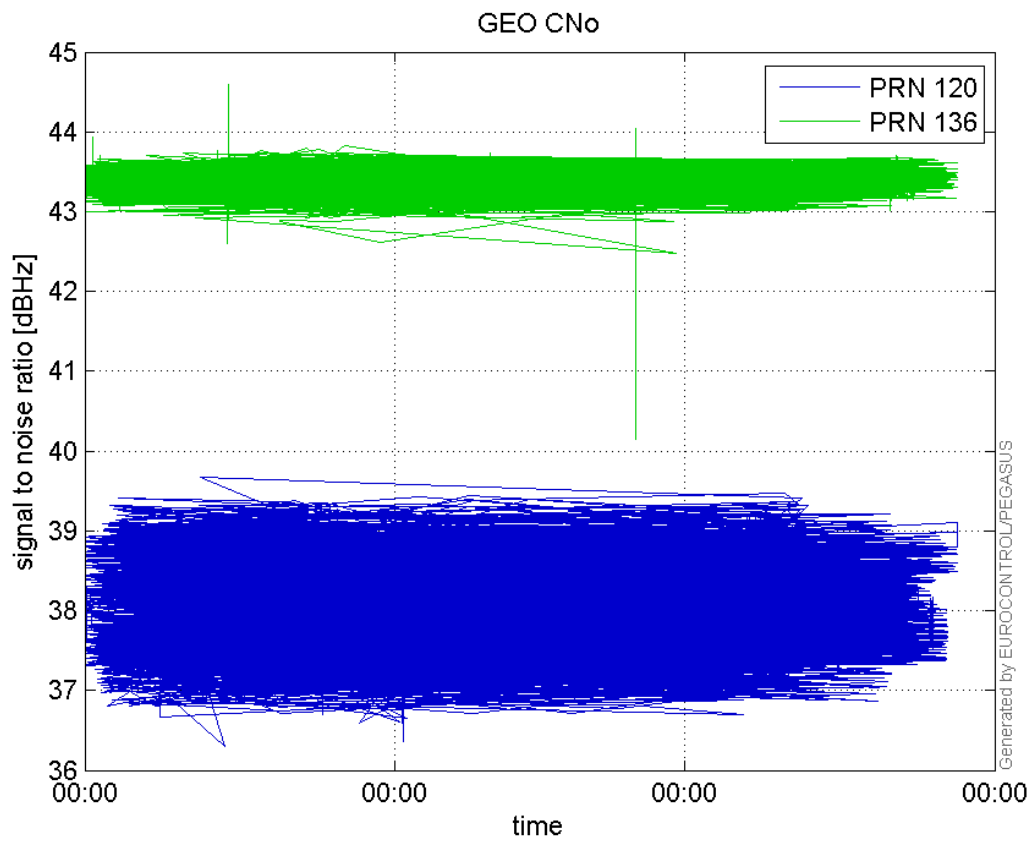
SNR Elevation:



L2 CNo:

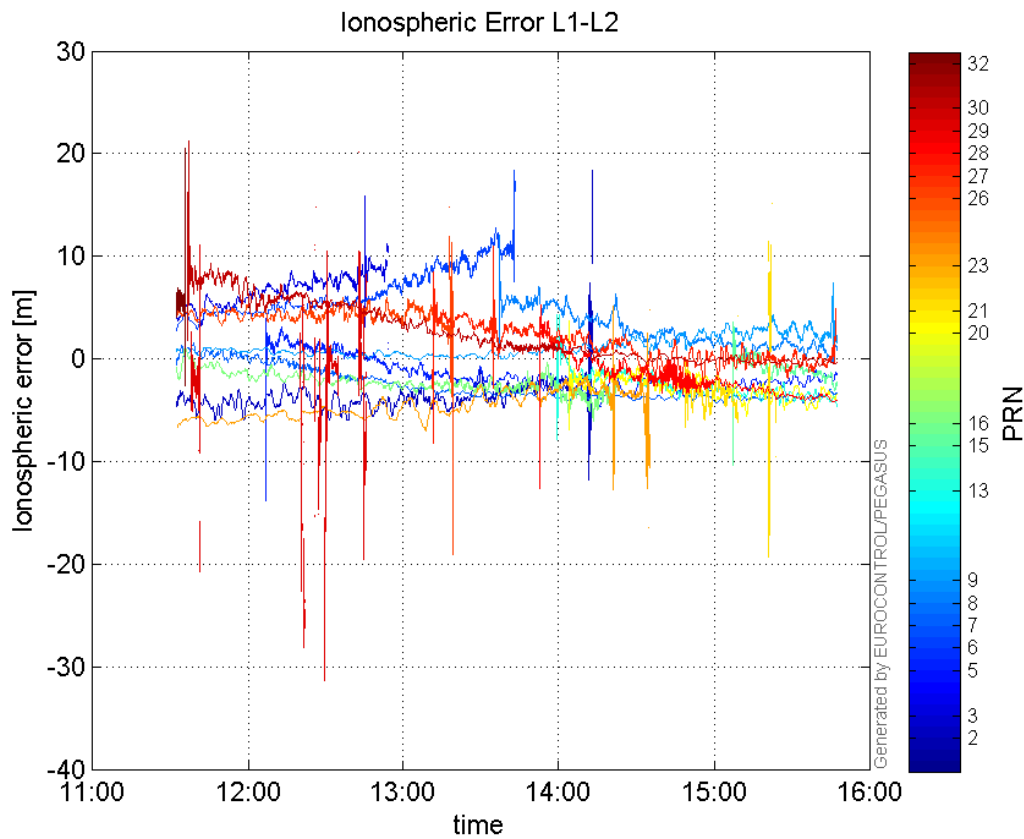


GEO CNo:



dual frequency

Ionospheric Error L1-L2:



Parameters

system

| Name | Section | Value |
|---------------|---------|--|
| name | system | GNSS_Solution |
| version | system | 4.8.2.1 |
| input_prefix | system | D:/PegasusDateGob/job/2016_01_19_EGNOS/02_Convertor/02_Convertor |
| output_prefix | system | D:/PegasusDateGob/job/2016_01_19_EGNOS/03_GNSS_Solution/03_GNSS_Solution_sol |

settings

| Name | Section | Value |
|--------------------------|----------|---------|
| ref_lat | settings | 50.439 |
| ref_lon | settings | 30.4297 |
| ref_alt | settings | 215.271 |
| smoothing | settings | yes |
| smoothing_constant | settings | 100 |
| smoothing_max_gap | settings | 10 |
| smoothing_max_divergence | settings | 3 |
| min_elevation | settings | 5 |
| aad_model | settings | a |
| output_range_file | settings | yes |
| sbas_prn | settings | 120 |
| gnss_mode | settings | sbas |

results

| | | |
|--|--|--|
| | | |
|--|--|--|

| Name | Section | Value |
|------------|---------|----------|
| init_lat | results | 50.4392 |
| init_lon | results | 30.4297 |
| init_alt | results | 266.5493 |
| mi_numbers | results | 0 |

Position Domain

start: 11:32:16 19.01.2016 (week: 1880 sec: 214336)

end: 15:47:38 19.01.2016 (week: 1880 sec: 229658)

duration: 04:15:23 ..

quality

valid samples 14962

total samples 15323

Event tables

Position discontinuity events type all
APV-I discontinuity events type all
APV-35m discontinuity events type all
LPV-200 discontinuity events type all
CAT-I discontinuity events type nothing

extremes :

| | Epoch | HPE | HPL | HPE/HPL | VPE | VPL | VPE/VPL |
|--------------------|--------|---------|---------|-----------|------------|---------|------------|
| max normHor | 226145 | 2.29067 | 10.5892 | 0.216321 | 1.63631 | 17.1508 | 0.0954074 |
| max normVer | 224518 | 1.70573 | 21.3454 | 0.079911 | 2.32015 | 17.0155 | 0.136355 |
| max HPE | 223662 | 19.3619 | 560.367 | 0.0345522 | -2.95777 | 141.559 | 0.0208942 |
| max VPE | 218044 | 3.18256 | 44.6518 | 0.0712751 | 3.87448 | 42.6626 | 0.0908167 |
| min HPL | 227533 | 1.5656 | 9.32842 | 0.167831 | -0.0219269 | 17.3874 | 0.00126108 |
| min VPL | 227633 | 1.44128 | 10.6215 | 0.135694 | 0.555266 | 15.4961 | 0.0358326 |

Position discontinuity events :

| # | Epoch | duration | stable period |
|---|--------|----------|---------------|
| 1 | 222985 | 130 | 8288 |
| 2 | 223684 | 103 | 569 |
| 3 | 226716 | 90 | 2929 |

APV-I discontinuity events :

| # | Epoch | duration | stable period |
|---|--------|----------|---------------|
| 1 | 217934 | 13 | 3237 |
| 2 | 217969 | 192 | 22 |
| 3 | 222789 | 382 | 4628 |
| 4 | 223281 | 688 | 110 |
| 5 | 226716 | 94 | 2747 |

APV-35m discontinuity events :

| # | Epoch | duration | stable period |
|---|--------|----------|---------------|
| 1 | 217781 | 380 | 3084 |
| 2 | 222789 | 382 | 4628 |
| 3 | 223281 | 688 | 110 |
| 4 | 226716 | 94 | 2747 |

LPV-200 discontinuity events :

| # | Epoch | duration | stable period |
|---|--------|----------|---------------|
| 1 | 217781 | 380 | 3084 |
| 2 | 222789 | 382 | 4628 |
| 3 | 223281 | 688 | 110 |
| 4 | 226716 | 94 | 2747 |

First Glance analysis

| | |
|---|--------|
| Duration | 15323 |
| Number of Samples | 15323 |
| Number of invalid sample | 361 |
| Number of no position solution samples | 323 |
| Number of missing sample | 0 |
| Logging Loss | 0 |
| Processing Loss | 2.3559 |
| Number of Misleading Information | 0 |
| Data gaps | 0 |
| Discontinuities | 3 |

Number of Samples :

| Valid | APV-1 | LPV-200 | CAT-1 | APV-35m |
|-------|-------|---------|-------|---------|
| 14639 | 13593 | 13418 | 0 | 13418 |

Accuracy statistics :

| | Valid | APV-1 | LPV-200 | CAT-1 | APV-35m |
|---------------------|---------|---------|---------|-------|---------|
| HPE 95% | 2.30032 | 2.16421 | 2.119 | NaN | 2.119 |
| HPEScale 95% | NaN | 6.92449 | 6.92827 | NaN | 6.92827 |
| VPE 95% | 2.12844 | 2.05543 | 2.02827 | NaN | 2.02827 |
| VPEscale 95% | NaN | 5.5081 | 3.85998 | NaN | 3.85998 |

Availability :

| | Valid | APV-1 | LPV-200 | CAT-1 | APV-35m |
|------------------------|----------|----------|----------|-------|----------|
| Signal in Space | 0.978412 | 0.908502 | 0.896805 | 0 | 0.896805 |
| measurements | 0.955361 | 0.887098 | 0.875677 | 0 | 0.875677 |
| Operational | 0.955361 | 0.887098 | 0.875677 | 0 | 0.875677 |

Discontinuity events :

| | Valid | APV-1 | LPV-200 | CAT-1 | APV-35m |
|--------------------|-------|-------|---------|-------|---------|
| All | 3 | 5 | 4 | -- | 4 |
| Long | 3 | 5 | 4 | -- | 4 |
| Independent | 3 | 5 | 4 | -- | 4 |

| | | | | | |
|-----------------|------------|------------|------------|-----|------------|
| P(disc.) | 0.00307398 | 0.00551755 | 0.00447161 | NaN | 0.00447161 |
| P(slide) | 0.00307398 | 0.00551755 | 0.00447161 | NaN | 0.00447161 |

Integrity events :

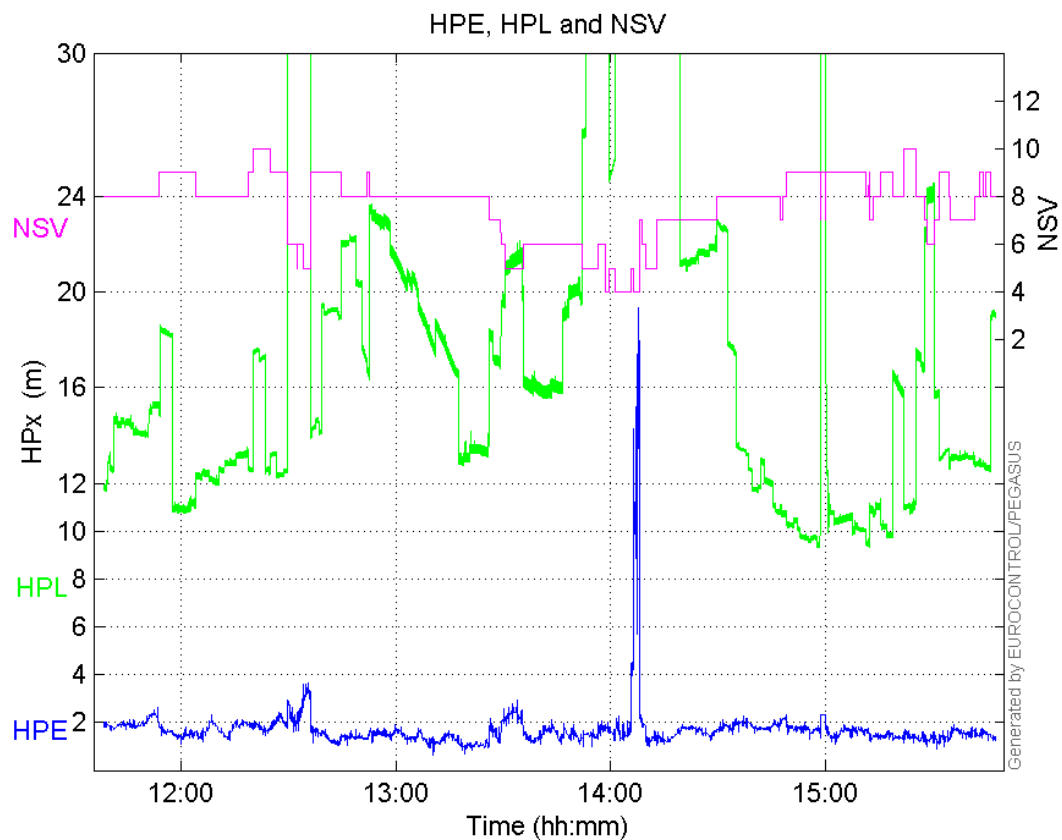
| | MI | HMI APV-1 | HMI LPV-200 | HMI CAT-1 | HMI APV-35m |
|-------------------|----|-----------|-------------|-----------|-------------|
| Total | 0 | 0 | 0 | 0 | 0 |
| Horizontal | 0 | 0 | 0 | 0 | 0 |
| Vertical | 0 | 0 | 0 | 0 | 0 |

Performance Summary :

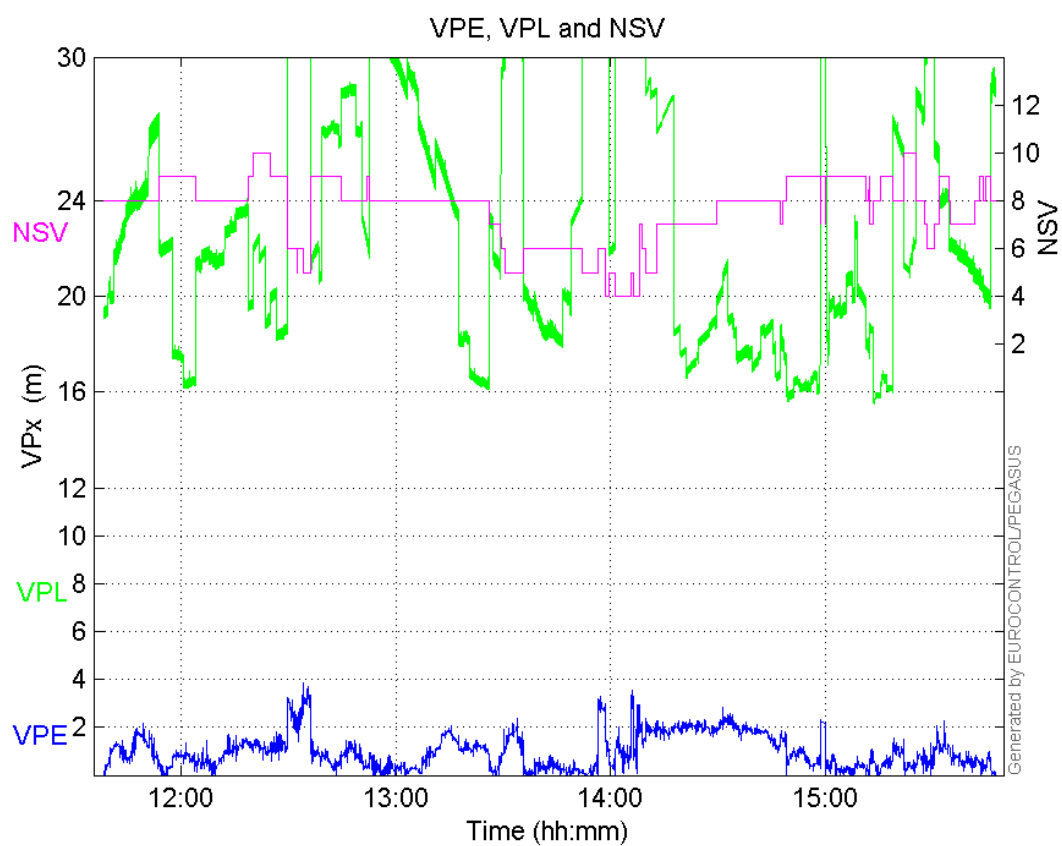
| | Valid | APV-1 | LPV-200 | CAT-1 | APV-35m |
|---|------------|------------|------------|-------|------------|
| Samples | 14639 | 13593 | 13418 | 0 | 13418 |
| SIS Availability | 0.978412 | 0.908502 | 0.896805 | 0 | 0.896805 |
| Local Availability | 0.955361 | 0.887098 | 0.875677 | 0 | 0.875677 |
| Operational Availability | 0.955361 | 0.887098 | 0.875677 | 0 | 0.875677 |
| HPE 95% | 2.30032 | 2.16421 | 2.119 | NaN | 2.119 |
| HPEScale 95% | NaN | 6.92449 | 6.92827 | NaN | 6.92827 |
| VPE 95% | 2.12844 | 2.05543 | 2.02827 | NaN | 2.02827 |
| VPEscale 95% | NaN | 5.5081 | 3.85998 | NaN | 3.85998 |
| All Discontinuity Events | 3 | 5 | 4 | -- | 4 |
| Long Discontinuity Events | 3 | 5 | 4 | -- | 4 |
| Independent Discontinuity Events | 3 | 5 | 4 | -- | 4 |
| P(discontinuity) | 0.00307398 | 0.00551755 | 0.00447161 | NaN | 0.00447161 |
| P(sliding window) | 0.00307398 | 0.00551755 | 0.00447161 | NaN | 0.00447161 |
| All Integrity Events | 0 | 0 | 0 | 0 | 0 |
| Horizontal Integrity Events | 0 | 0 | 0 | 0 | 0 |
| Vertical Integrity Events | 0 | 0 | 0 | 0 | 0 |

Time Series

HPE, HPL and NSV:

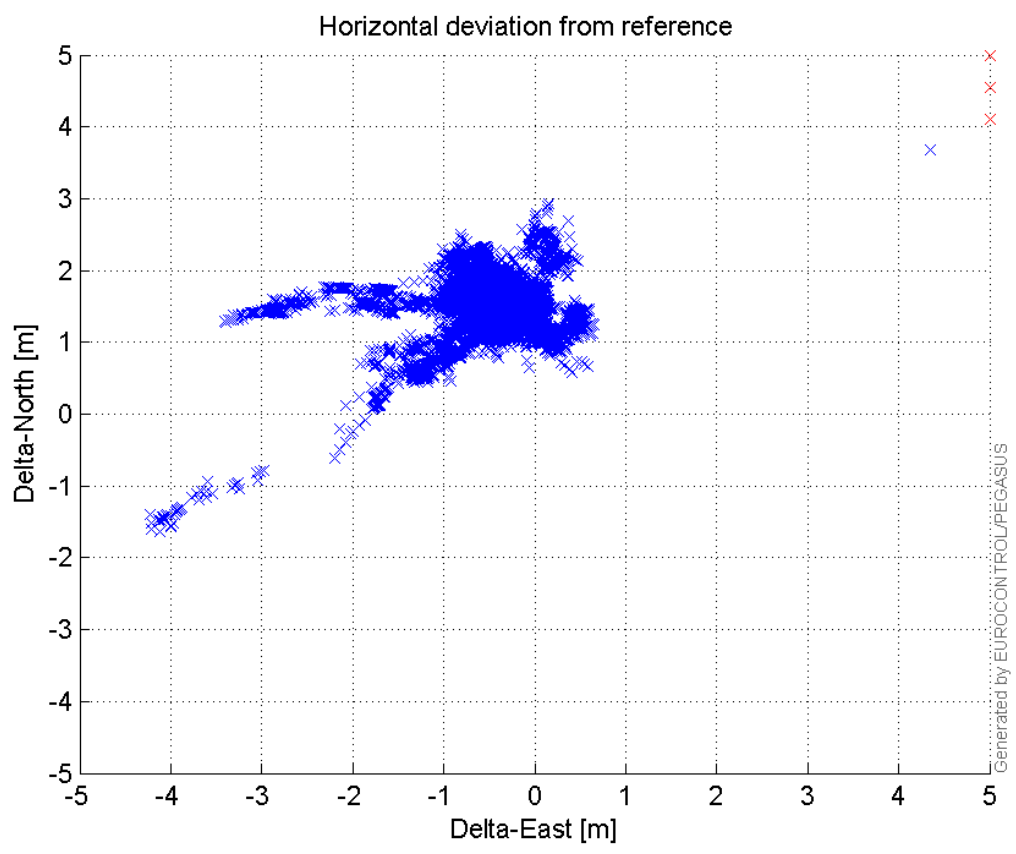


VPE, VPL and NSV:



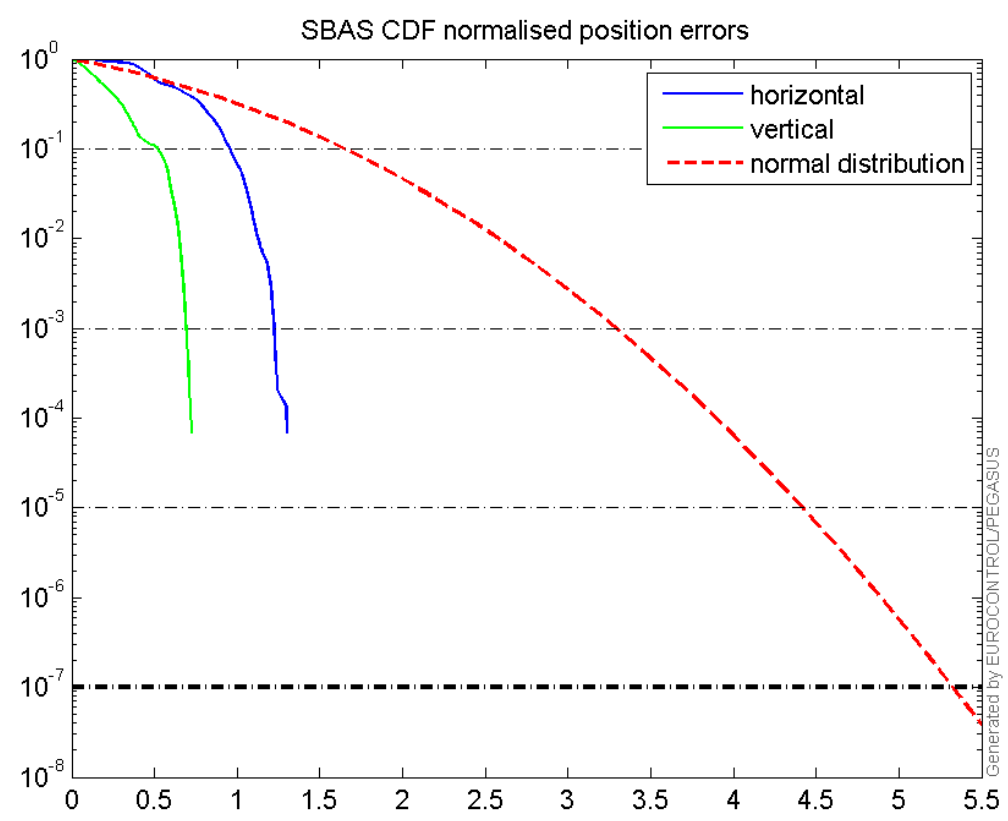
Horizontal deviation

Horizontal deviation from reference :



CDF position

SBAS CDF position domain:



Statistics

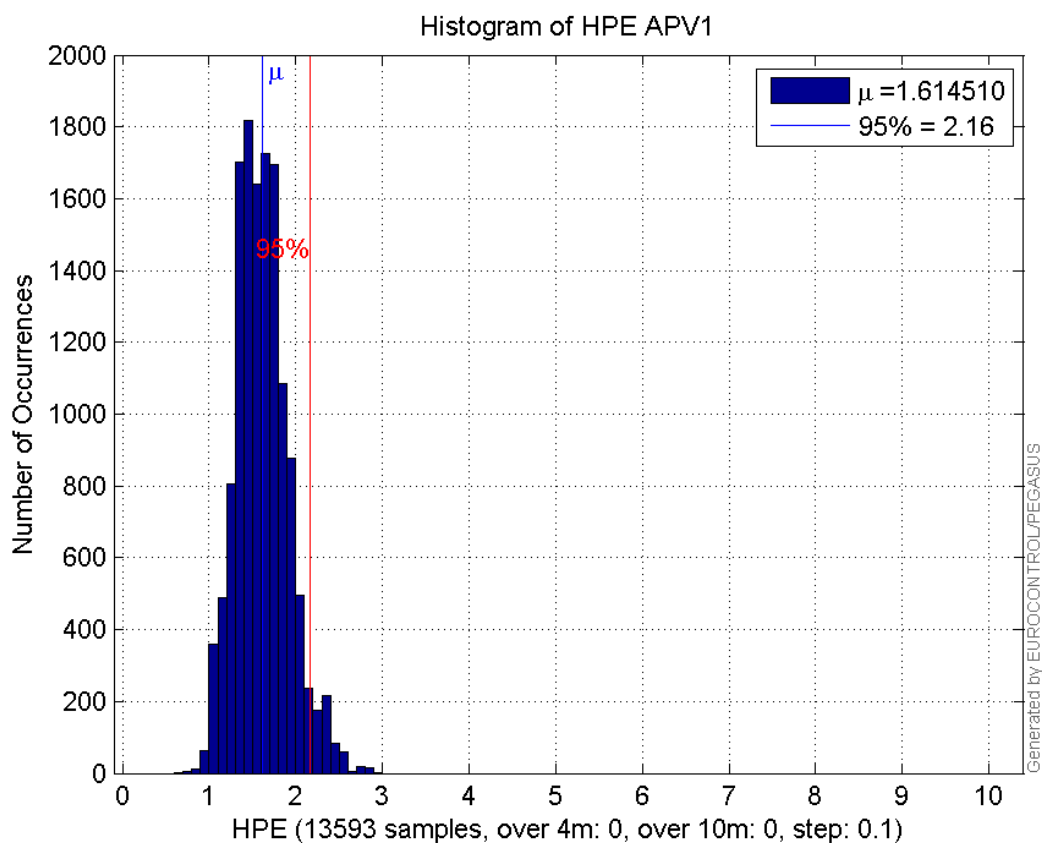
| | |
|------------------|------------|
| number | 13593 |
| sum | 21946.03 |
| sum2 | 36682.876 |
| prctile95 | 2.1642058 |
| prctile99 | 2.4381707 |
| number | 13593 |
| sum | 12750.202 |
| sum2 | 17470.718 |
| prctile95 | 2.05543 |
| prctile99 | 2.413679 |
| number | 13593 |
| sum | 223487.09 |
| sum2 | 4103781.5 |
| prctile95 | 25.3324 |
| prctile99 | 35.446094 |
| number | 13593 |
| sum | 304215.78 |
| sum2 | 7126853.3 |
| prctile95 | 31.4597 |
| prctile99 | 38.223827 |
| number | 13593 |
| sum | 1475.547 |
| sum2 | 180.07911 |
| prctile95 | 0.17311219 |
| prctile99 | 0.18864216 |
| number | 13593 |
| sum | 597.69216 |
| sum2 | 39.917631 |
| prctile95 | 0.11016196 |
| prctile99 | 0.12200838 |
| number | 13418 |
| sum | 21554.734 |
| sum2 | 35787.006 |
| prctile95 | 2.1189958 |
| prctile99 | 2.3923477 |
| number | 13418 |
| sum | 12310.925 |
| sum2 | 16330.242 |
| prctile95 | 2.0282694 |
| prctile99 | 2.2729126 |
| number | 13418 |
| sum | 217214.25 |
| sum2 | 3878858.6 |
| prctile95 | 23.81032 |
| prctile99 | 34.958264 |
| number | 13418 |
| sum | 297382.73 |
| sum2 | 6859674.2 |
| prctile95 | 30.9773 |
| prctile99 | 32.1084 |
| number | 13418 |

sum 1464.6044
sum2 179.37522
prctile95 0.17320667
prctile99 0.18883398
number 13418
sum 586.43585
sum2 39.167967
prctile95 0.11028508
prctile99 0.12204952

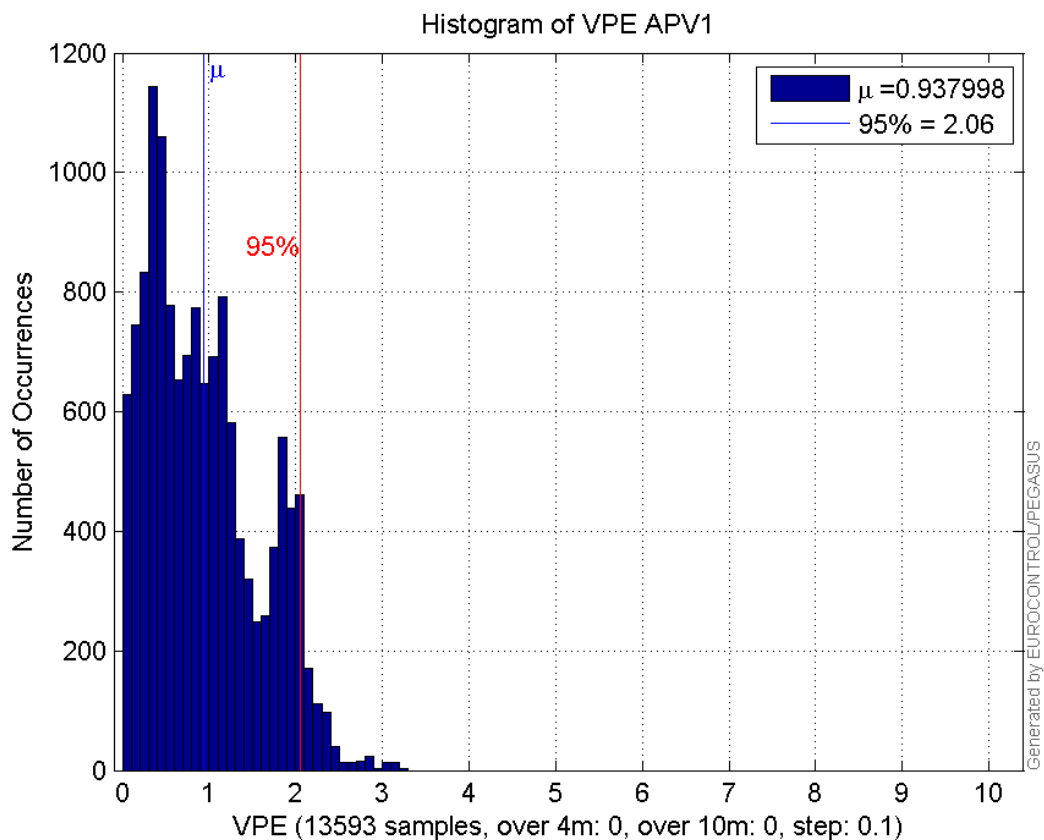
Error and XPL Statistics :

| | Mean Value | Standard Deviation | 50% Value | 95% Value | 99% Value | RMS Value |
|------------|------------|--------------------|-----------|-----------|-----------|-----------|
| HPE | 1.61451 | 0.303355 | 1.5921 | 2.16421 | 2.43817 | 1.64276 |
| HPL | 16.4413 | 5.62039 | 14.9746 | 25.3324 | 35.4461 | 17.3754 |
| VPE | 0.937998 | 0.63676 | 0.831173 | 2.05543 | 2.41368 | 1.1337 |
| VPL | 22.3803 | 4.84003 | 21.5066 | 31.4597 | 38.2238 | 22.8977 |

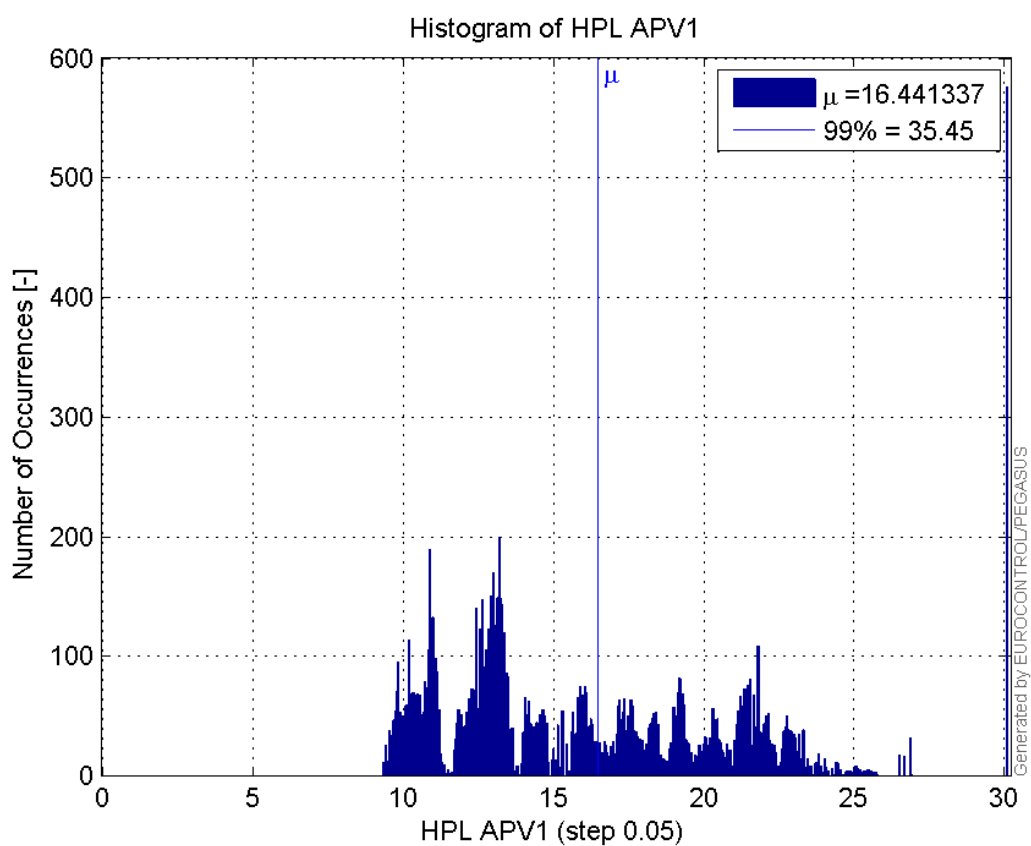
Histogram of HPE APV1:



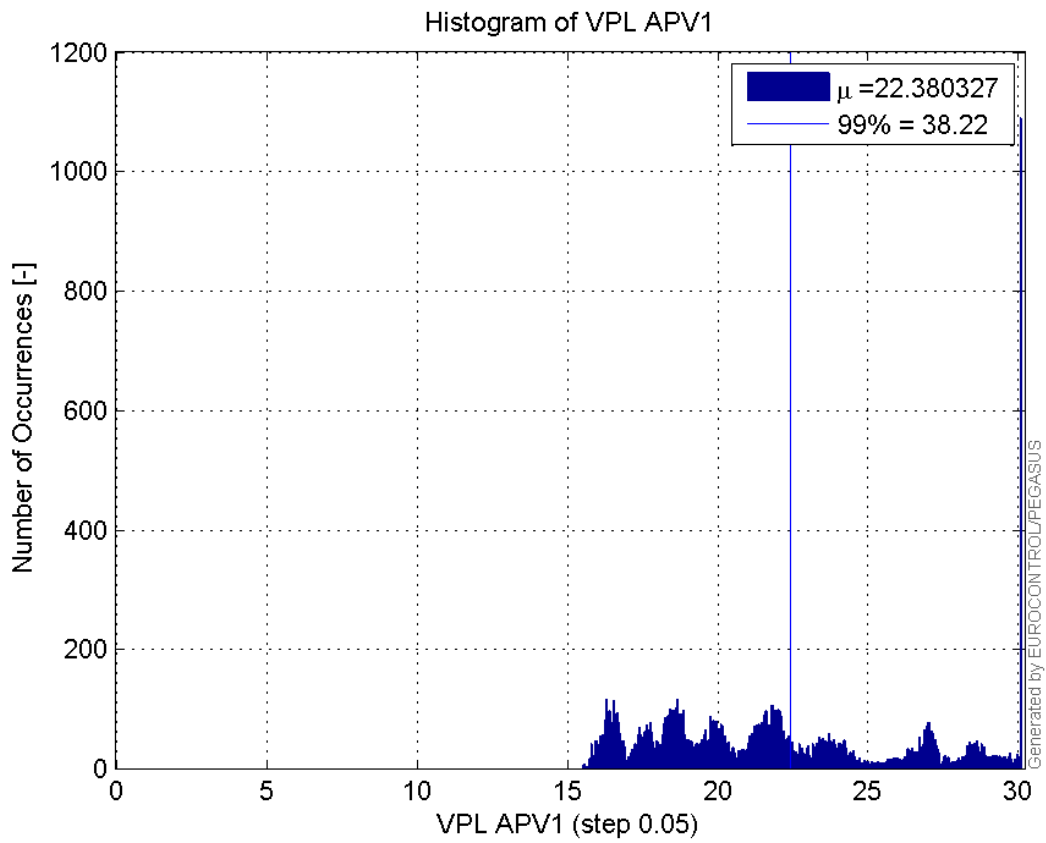
Histogram of VPE APV1:



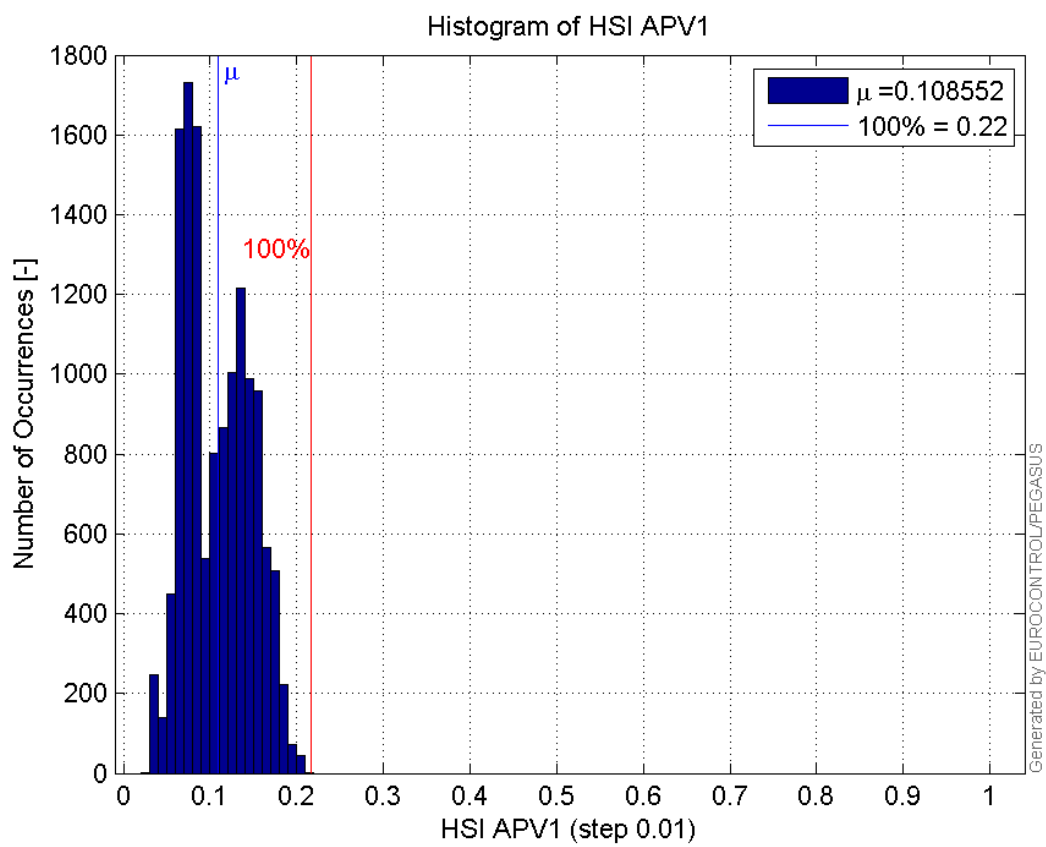
Histogram of HPL APV1:



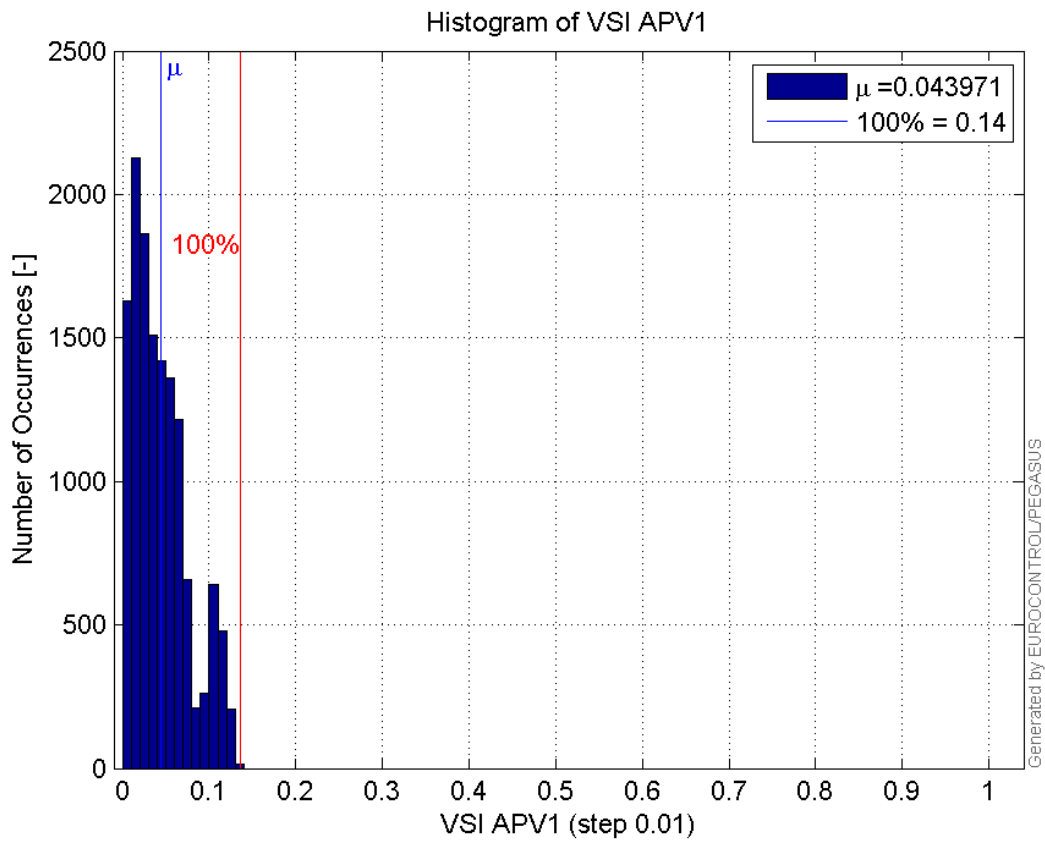
Histogram of VPL APV1:



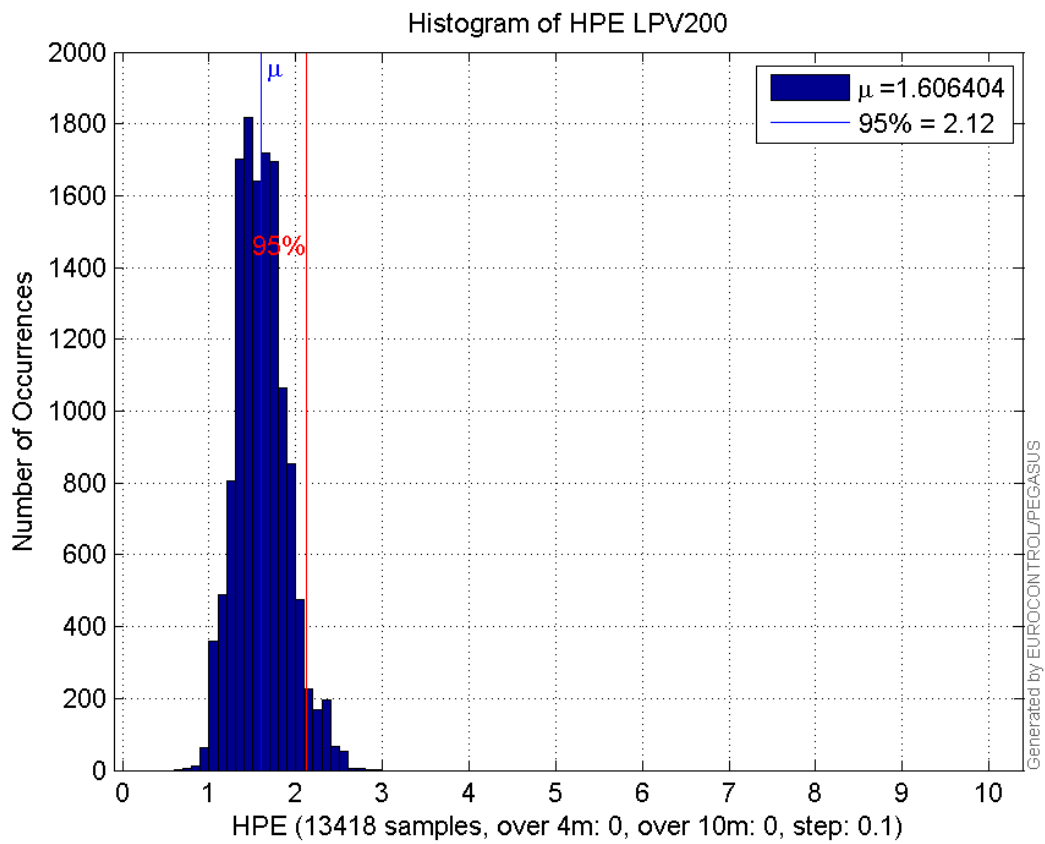
Histogram of HSI APV1:



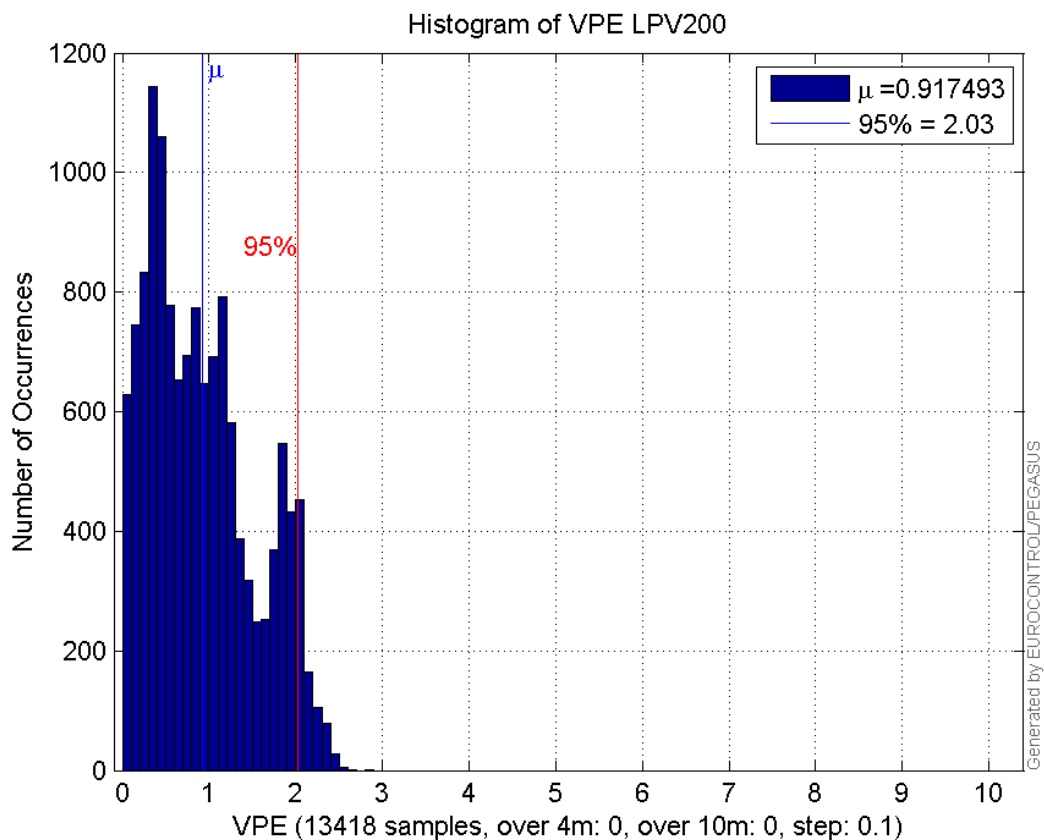
Histogram of VSI APV1:



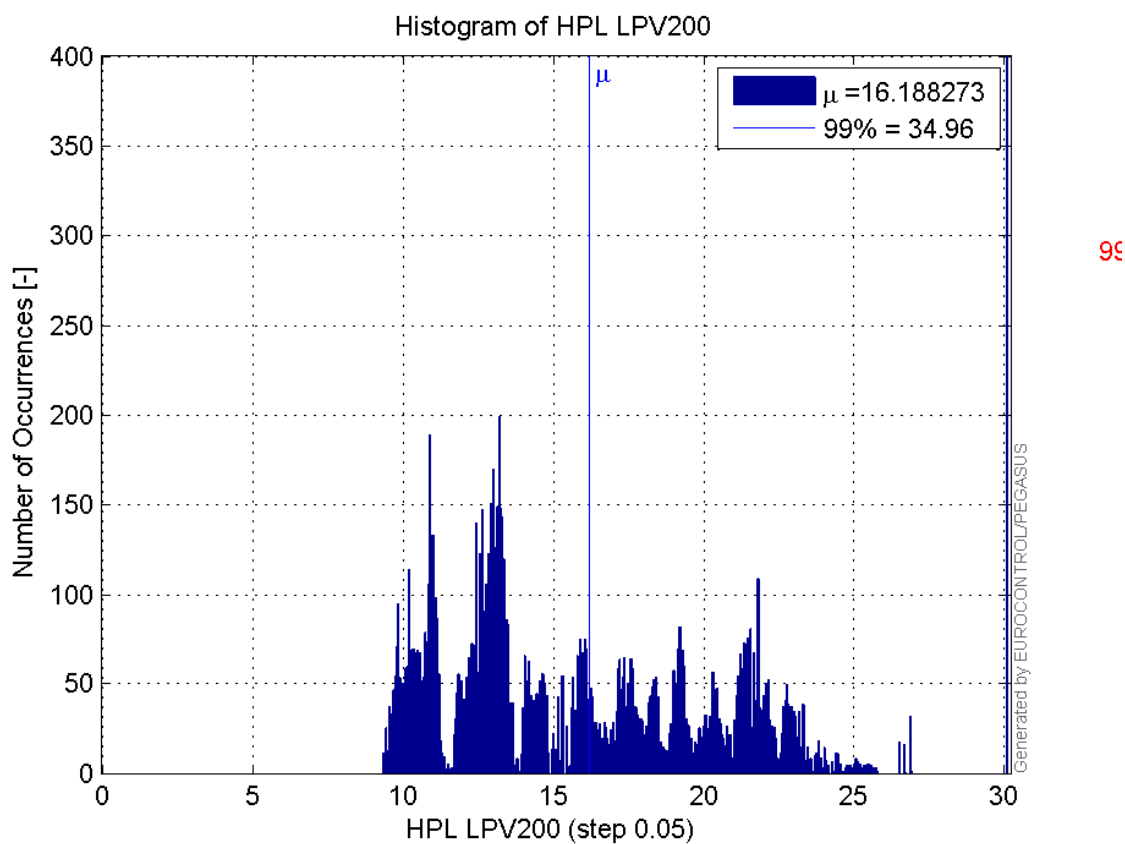
Histogram of HPE LPV200:



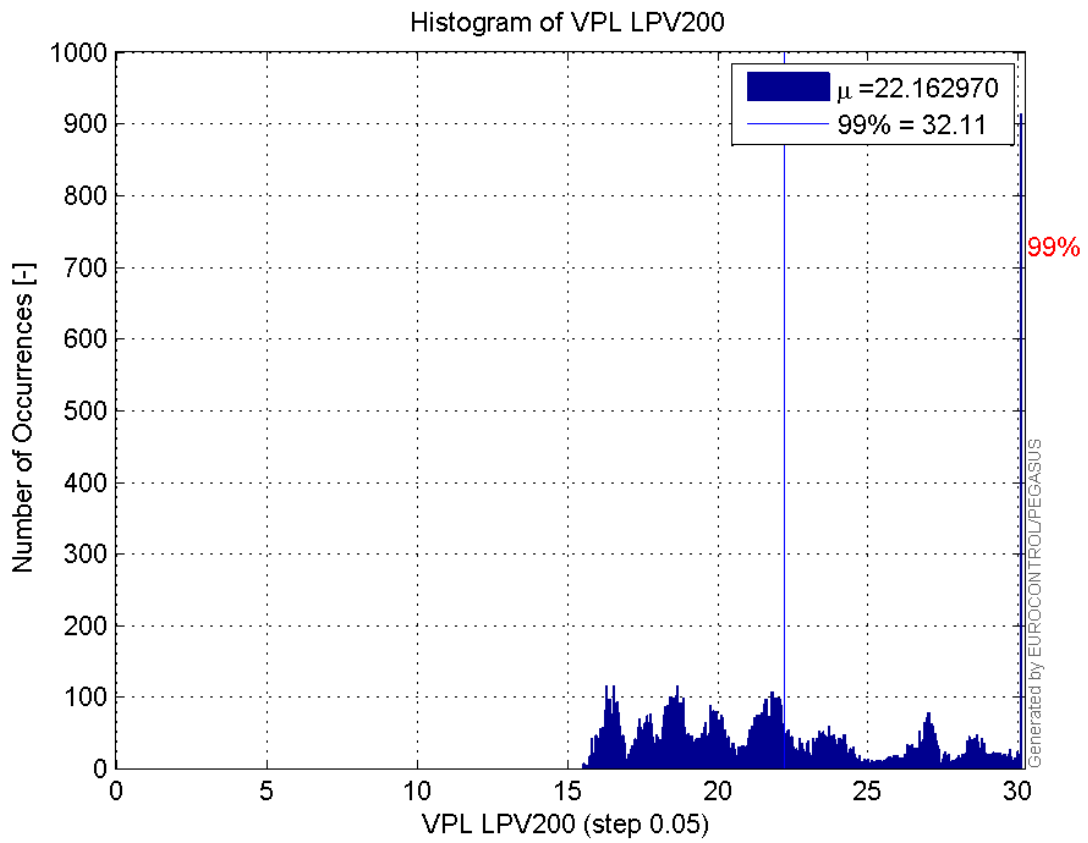
Histogram of VPE LPV200:



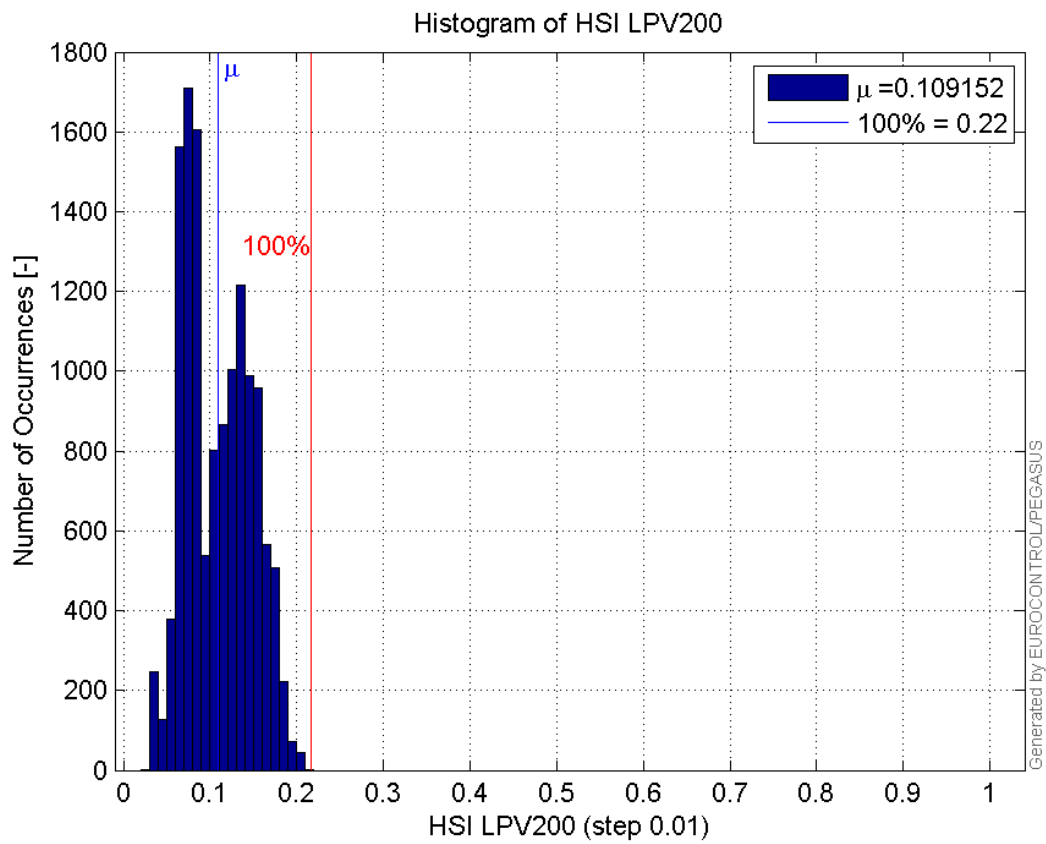
Histogram of HPL LPV200:



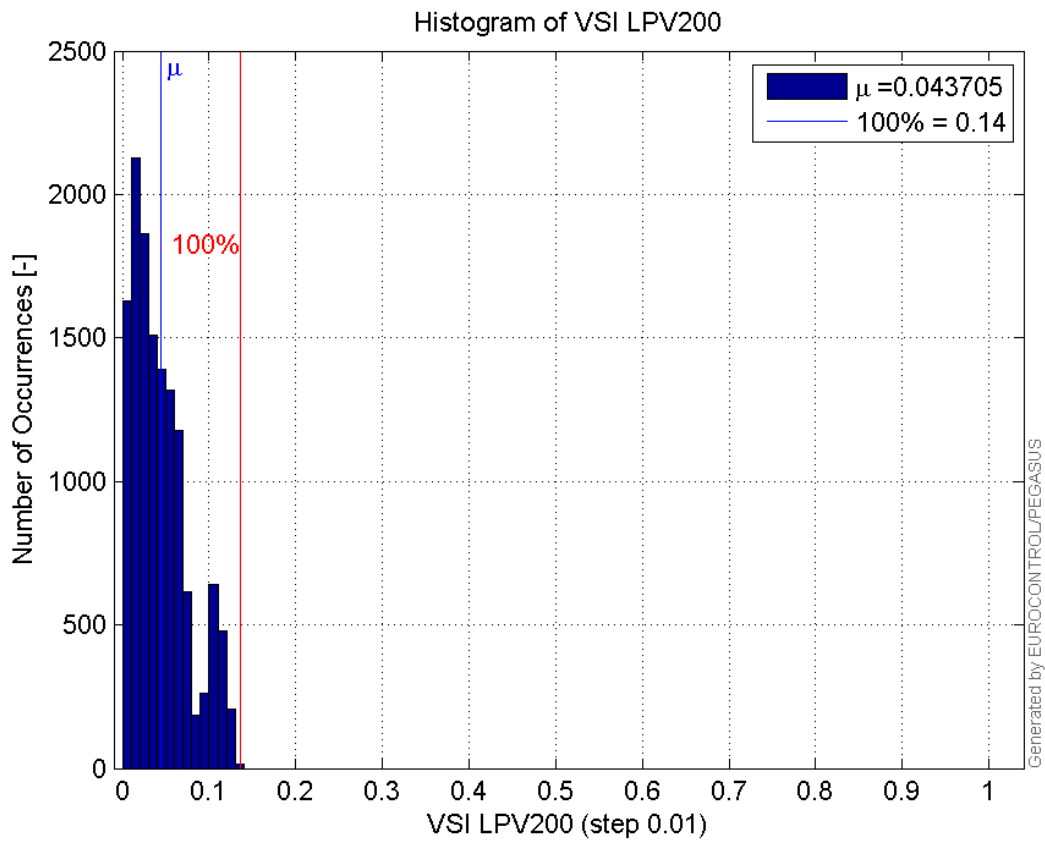
Histogram of VPL LPV200:



Histogram of HSI LPV200:

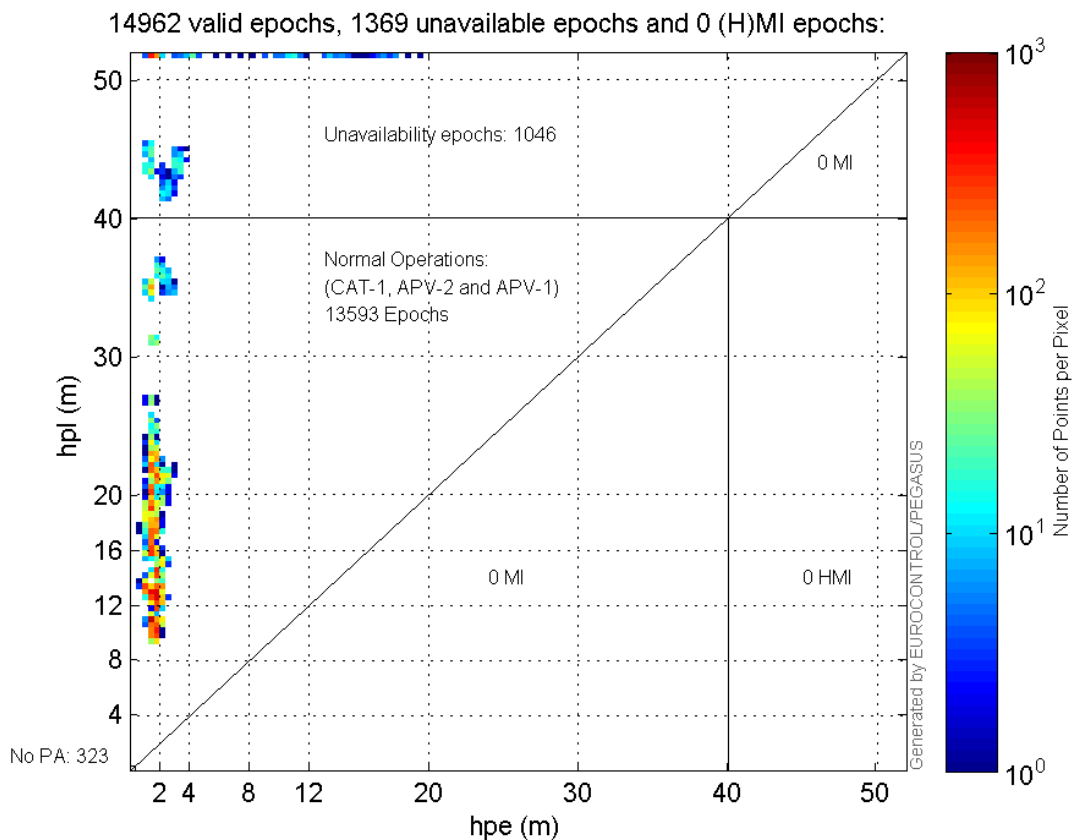


Histogram of VSI LPV200:

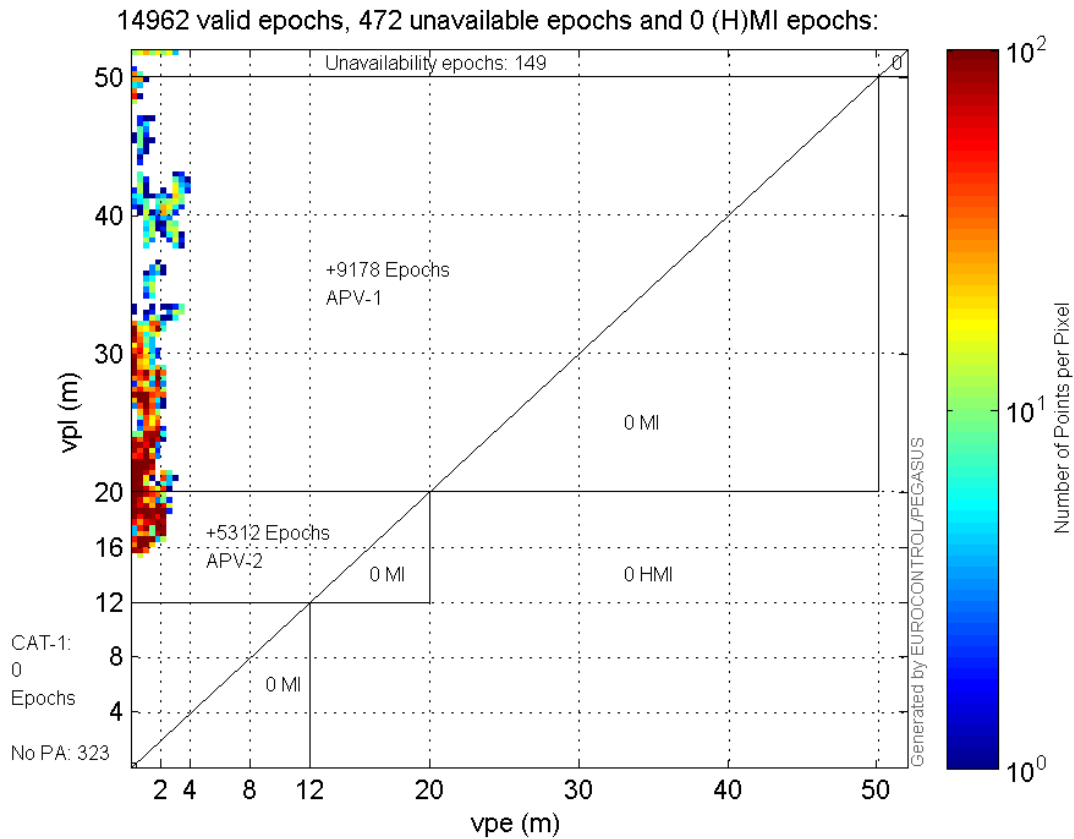


Stanford Plots

Horizontal_Stanford_Plot_SBAS:



Vertical_Stanford_Plot_SBAS:



Parameters

system

| Name | Section | Value |
|---------------|---------|--|
| name | system | GNSS_Solution |
| version | system | 4.8.2.1 |
| input_prefix | system | D:/PegasusDateGob/job/2016_01_19_EGNOS/02_Convertor/02_Convertor |
| output_prefix | system | D:/PegasusDateGob/job/2016_01_19_EGNOS/03_GNSS_Solution/03_GNSS_Solution_sol |

settings

| Name | Section | Value |
|--------------------------|----------|---------|
| ref_lat | settings | 50.439 |
| ref_lon | settings | 30.4297 |
| ref_alt | settings | 215.271 |
| smoothing | settings | yes |
| smoothing_constant | settings | 100 |
| smoothing_max_gap | settings | 10 |
| smoothing_max_divergence | settings | 3 |
| min_elevation | settings | 5 |
| aad_model | settings | a |
| output_range_file | settings | yes |
| sbas_prn | settings | 120 |
| gnss_mode | settings | sbas |

results

| | | |
|--|--|--|
| | | |
|--|--|--|

| Name | Section | Value |
|------------|---------|----------|
| init_lat | results | 50.4392 |
| init_lon | results | 30.4297 |
| init_alt | results | 266.5493 |
| mi_numbers | results | 0 |