Global View

site	Laboratory satellite systems
abreviation	NAU
country	Ukraine
city	Kiev
comment	Konin V., Shyshkov F. InsideGNSS, Jan-Feb 2015, P.50 - 54
program	Pegasus
version	4.8.4
date	17/04/2016

SBAS Messages

start: 05:10:31.129 14.04.2016 (week: 1892 sec: 364231.129)
end: 12:25:59.129 14.04.2016 (week: 1892 sec: 390359.129)
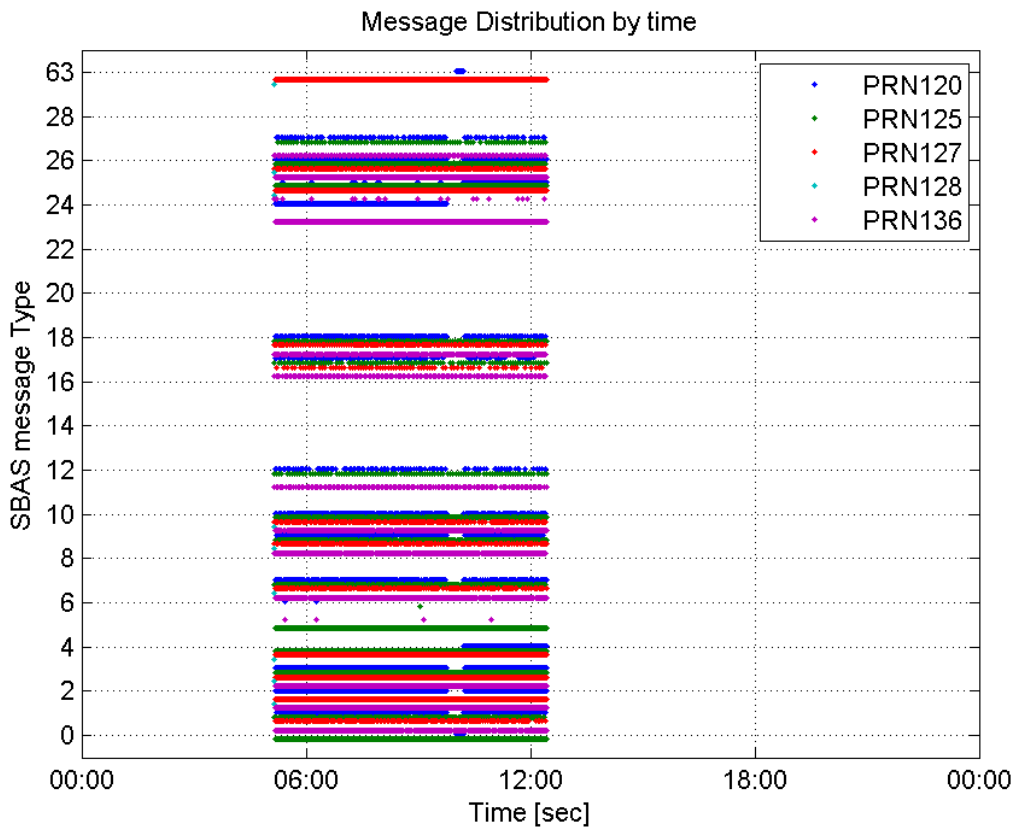**duration:** 07:15:28 ..

quality	
valid samples	83729
total samples	83729
number of SBAS PRNs	5

SBAS SIS Overview

Message Type 6 repetitions :

	single	double	3 x	4 x	> 5x
PRN 120	0	0	1	1	0
PRN 125	0	0	1	0	0
PRN 127	0	0	0	0	0
PRN 128	0	0	0	0	0
PRN 136	2	1	0	2	0

Message Distribution by time:

Message Distribution by time

Message Type 6 repetitions:

PRN 120
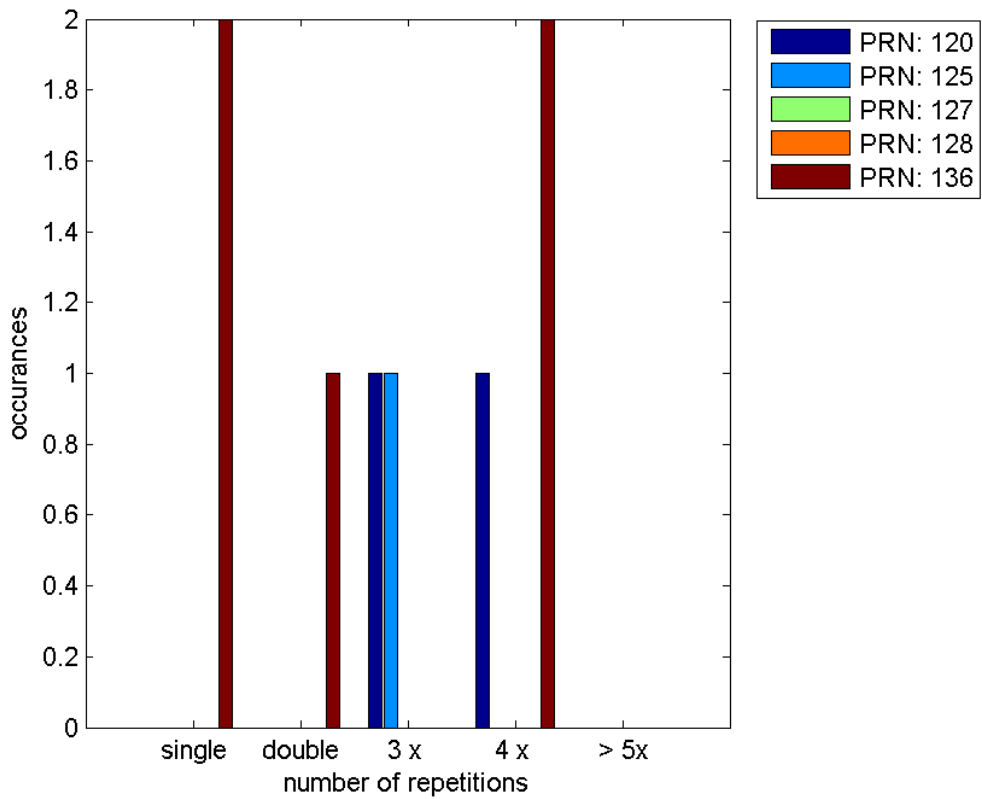
Broadcast SBAS Messages :

	number of messages	%
MT 0	83	0.459808
MT 1	260	1.44036
MT 2	4410	24.4308
MT 3	4380	24.2646
MT 4	1215	6.73093
MT 5	0	0
MT 6	8	0.0443189
MT 7	275	1.52346
MT 9	253	1.40158
MT 10	271	1.5013
MT 12	103	0.570606
MT 17	104	0.576145
MT 18	504	2.79209
MT 24	3100	17.1736
MT 25	256	1.4182
MT 26	2283	12.6475
MT 27	102	0.565066
MT 28	0	0
MT 62	0	0
MT 63	444	2.4597
Total	18051	100

Update intervals :

	Minimum [s]	Maximum [s]	Mean value	Exceed Max update	Exceed NPA timeout	Exceed PA timeout
MT 0	6	24	8.41463	22	0	0
MT 1	1	1650	100.278	79	1	1
MT 2	3	1692	5.92447	1265	21	99
MT 3	3	1677	5.96689	1320	21	80
MT 4	3	24	6.55272	577	13	47
MT 5	--	--	--	--	--	--
MT 6	1	2982	426.857	1	1	1
MT 7	61	1753	95.2409	63	2	5
MT 9	61	1763	102.127	0	0	0
MT 10	64	1670	96.3593	68	1	7
MT 12	156	1842	255.304	102	15	26
MT 17	156	2382	241.447	0	0	0
MT 18	1	1686	51.7555	2	0	0
MT 24	4	36	5.3272	0	0	0
MT 25	1	3961	99.7137	0	0	0
MT 26	1	1657	11.4514	0	0	0
MT						

27	156	1780	256.079	0	0	0
MT 28	--	--	--	--	--	--
MT 62	--	--	--	--	--	--
MT 63	1	6	1.55305	0	0	0

Message Distribution PRN 120:
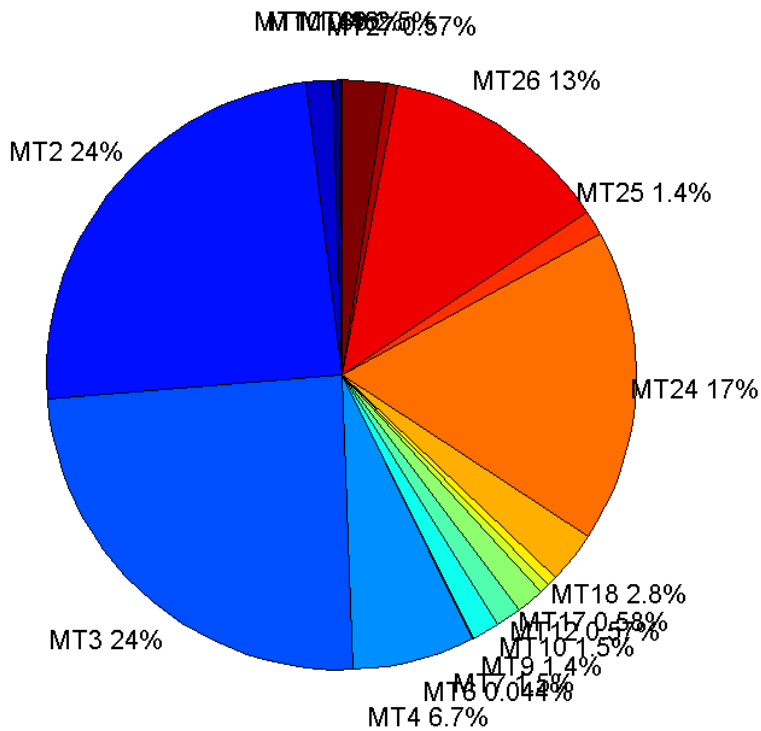
SBAS SIS Analysis

PRN 125

Broadcast SBAS Messages :

	number of messages	%
MT 0	4640	18.9064
MT 1	237	0.965691
MT 2	0	0
MT 3	4663	19.0001
MT 4	4620	18.8249
MT 5	4650	18.9471
MT 6	4	0.0162986
MT 7	239	0.973841
MT 9	241	0.98199
MT 10	241	0.98199
MT 12	99	0.40339
MT 17	97	0.395241

MT 18	690	2.81151
MT 24	0	0
MT 25	1572	6.40535
MT 26	2453	9.99511
MT 27	96	0.391166
MT 28	0	0
MT 62	0	0
MT 63	0	0
Total	24542	100

Update intervals :

	Minimum [s]	Maximum [s]	Mean value	Exceed Max update	Exceed NPA timeout	Exceed PA timeout
MT 0	5	25	5.63246	267	0	0
MT 1	99	303	110.199	19	0	0
MT 2	--	--	--	--	--	--
MT 3	5	26	5.60425	252	2	24
MT 4	5	20	5.65555	295	1	25
MT 5	5	22	5.62013	250	6	36
MT 6	1	1	1	0	0	0
MT 7	96	303	109.714	20	0	1
MT 9	98	202	108.746	0	0	0
MT 10	98	204	108.867	19	0	0
MT 12	239	502	267.694	98	7	97
MT 17	242	750	273.271	0	0	0
MT 18	1	225	38.074	0	0	0
MT 24	--	--	--	--	--	--
MT 25	1	71	16.6314	0	0	0
MT 26	1	81	10.6325	0	0	0
MT 27	243	754	270.979	0	0	0
MT 28	--	--	--	--	--	--
MT 62	--	--	--	--	--	--
MT 63	--	--	--	--	--	--

Message Distribution PRN 125:

MT27 0.39% MT26 10%
MT25 6.4%
MT0 19%
MT18 2.8%
MT17 0.4%
MT12 0.4%
MT10 0.98%
MT9 0.98%
MT7 0.97%
MT1 0.97%
MT6 0.016%
MT3 19%
MT5 19%
MT4 19%
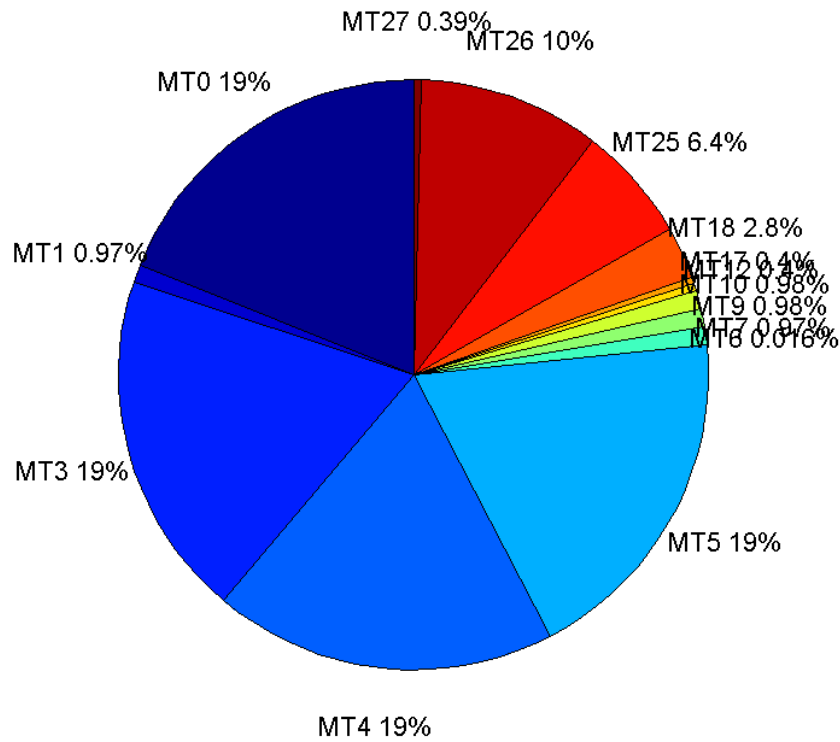
SBAS SIS Analysis

PRN 127

Broadcast SBAS Messages :

	number of messages	%
MT 0	0	0
MT 1	212	1.25548
MT 2	3095	18.3288
MT 3	3096	18.3347
MT 4	3048	18.0505
MT 5	0	0
MT 6	0	0
MT 7	199	1.17849
MT 9	209	1.23771
MT 10	205	1.21402
MT 12	0	0
MT 17	73	0.432311
MT 18	226	1.33839
MT 24	0	0
MT 25	1764	10.4465
MT 26	552	3.26898
MT 27	0	0
MT 28	0	0
MT 62	0	0
MT 63	4207	24.9141
Total	16886	100

Update intervals :

	Minimum [s]	Maximum [s]	Mean value	Exceed Max update	Exceed NPA timeout	Exceed PA timeout
MT 0	--	--	--	--	--	--
MT 1	36	599	123.18	59	0	0
MT 2	6	66	8.43956	842	93	275
MT 3	6	54	8.44071	862	77	268
MT 4	6	42	8.57368	895	85	291
MT 5	--	--	--	--	--	--
MT 6	--	--	--	--	--	--
MT 7	30	551	131.909	54	3	24
MT 9	66	426	126.01	0	0	0
MT 10	48	553	127.853	56	5	17
MT 12	--	--	--	--	--	--
MT 17	242	1073	355.528	0	0	0
MT 18	1	445	116.138	5	0	0
MT 24	--	--	--	--	--	--
MT 25	1	85	14.8236	0	0	0
MT 26	1	240	47.3902	0	0	0
MT 27	--	--	--	--	--	--
MT 28	--	--	--	--	--	--
MT 62	--	--	--	--	--	--
MT 63	1	47	6.21255	0	0	0

Message Distribution PRN 127:

MT1 1.3%

MT2 18%

MT63 25%

MT3 18%

MT26 3.3%

MT25 10%

MT18 1.3%
MT17 0.33%
MT10 0.2%
MT9 0.2%
MT7 1.2%

MT4 18%
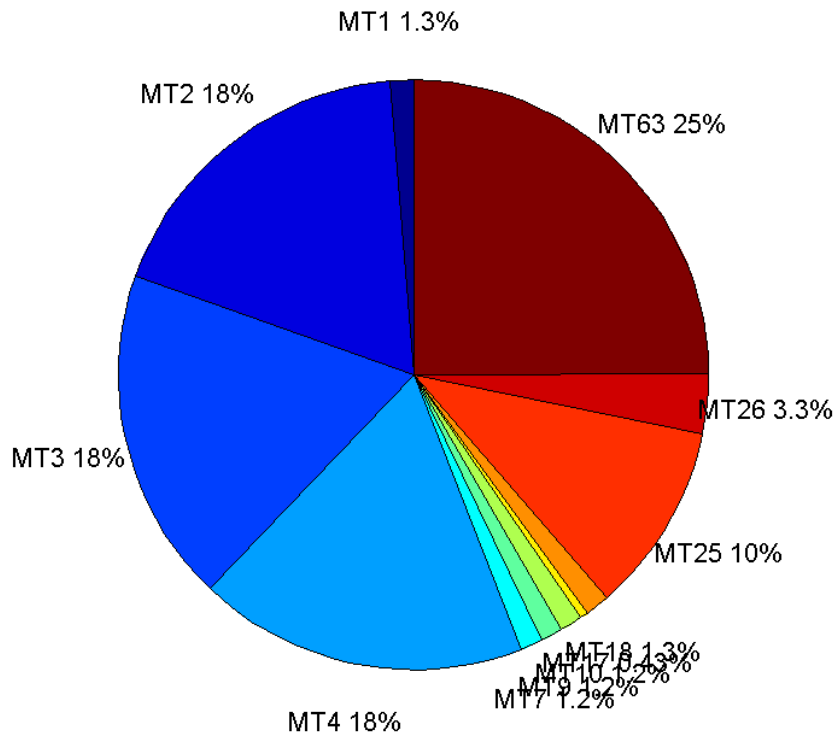
SBAS SIS Analysis

PRN 128

Broadcast SBAS Messages :

	number of messages	%
MT 0	0	0
MT 1	0	0
MT 2	1	11.1111
MT 3	1	11.1111
MT 4	1	11.1111
MT 5	0	0
MT 6	0	0
MT 7	1	11.1111
MT 9	1	11.1111
MT 10	1	11.1111
MT 12	0	0
MT 17	0	0
MT 18	0	0
MT 24	0	0
MT 25	1	11.1111
MT 26	1	11.1111
MT 27	0	0
MT 28	0	0
MT 62	0	0
MT 63	1	11.1111
Total	9	100

Update intervals :

	Minimum [s]	Maximum [s]	Mean value	Exceed Max update	Exceed NPA timeout	Exceed PA timeout
MT 0	--	--	--	--	--	--
MT 1	--	--	--	--	--	--
MT 2	--	--	--	--	--	--
MT 3	--	--	--	--	--	--
MT 4	--	--	--	--	--	--
MT 5	--	--	--	--	--	--
MT 6	--	--	--	--	--	--
MT 7	--	--	--	--	--	--
MT 9	--	--	--	--	--	--
MT 10	--	--	--	--	--	--
MT 12	--	--	--	--	--	--
MT 17	--	--	--	--	--	--
MT 18	--	--	--	--	--	--
MT 24	--	--	--	--	--	--
MT 25	--	--	--	--	--	--
MT 26	--	--	--	--	--	--
MT 27	--	--	--	--	--	--
MT 28	--	--	--	--	--	--
MT 62	--	--	--	--	--	--
MT 63	--	--	--	--	--	--

Message Distribution PRN 128:
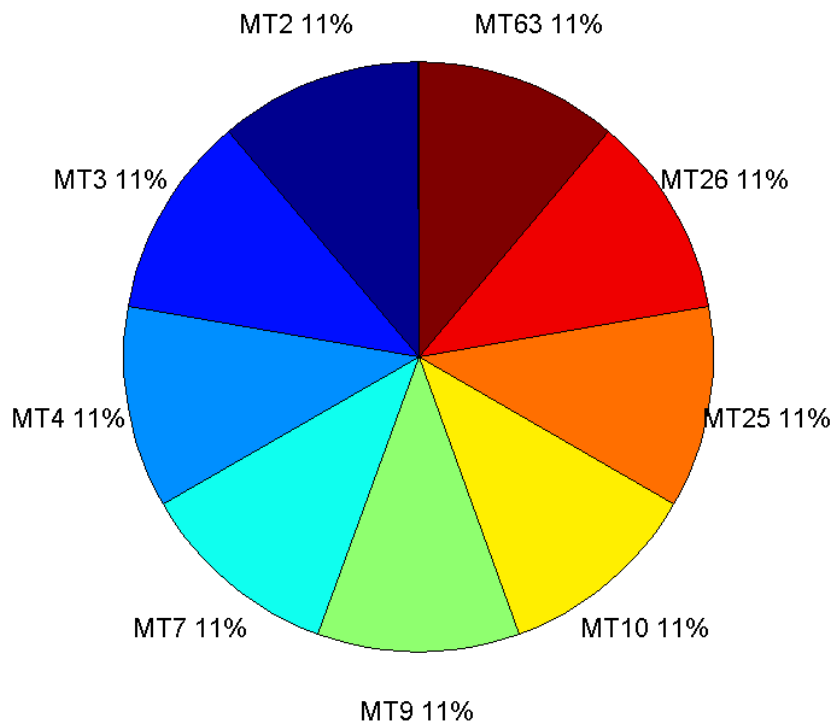
SBAS SIS Analysis

PRN   136

Broadcast SBAS Messages :

	number of messages	%
MT 0	0	0
MT 1	374	1.54284
MT 2	6047	24.9453
MT 3	6080	25.0815
MT 4	0	0
MT 5	0	0
MT 6	12	0.0495029
MT 7	378	1.55934
MT 9	377	1.55522
MT 10	382	1.57584
MT 12	151	0.622912
MT 17	150	0.618786
MT 18	765	3.15581
MT 24	6034	24.8917
MT 25	21	0.0866301
MT 26	3314	13.6711
MT 27	156	0.643538
MT 28	0	0
MT 62	0	0
MT 63	0	0
Total	24241	100

Update intervals :

	Minimum [s]	Maximum [s]	Mean value	Exceed Max update	Exceed NPA timeout	Exceed PA timeout
MT 0	--	--	--	--	--	--
MT 1	64	192	70.1019	31	0	0
MT 2	4	16	4.32104	413	0	10
MT 3	4	20	4.29824	373	3	13
MT 4	--	--	--	--	--	--
MT 5	--	--	--	--	--	--
MT 6	1	10295	1799.36	3	3	3
MT 7	64	256	69.3581	26	0	1
MT 9	64	192	69.3723	0	0	0
MT 10	64	192	68.4619	24	0	0
MT 12	157	480	174.32	150	1	12
MT 17	156	327	175.49	0	0	0
MT 18	4	148	34.2251	0	0	0
MT 24	4	20	4.33052	0	0	0
MT 25	69	3961	1303.8	0	0	0
MT 26	4	52	7.88651	0	0	0
MT 27	160	321	168.723	0	0	0
MT 28	--	--	--	--	--	--
MT 62	--	--	--	--	--	--
MT 63	--	--	--	--	--	--

Message Distribution PRN 136:
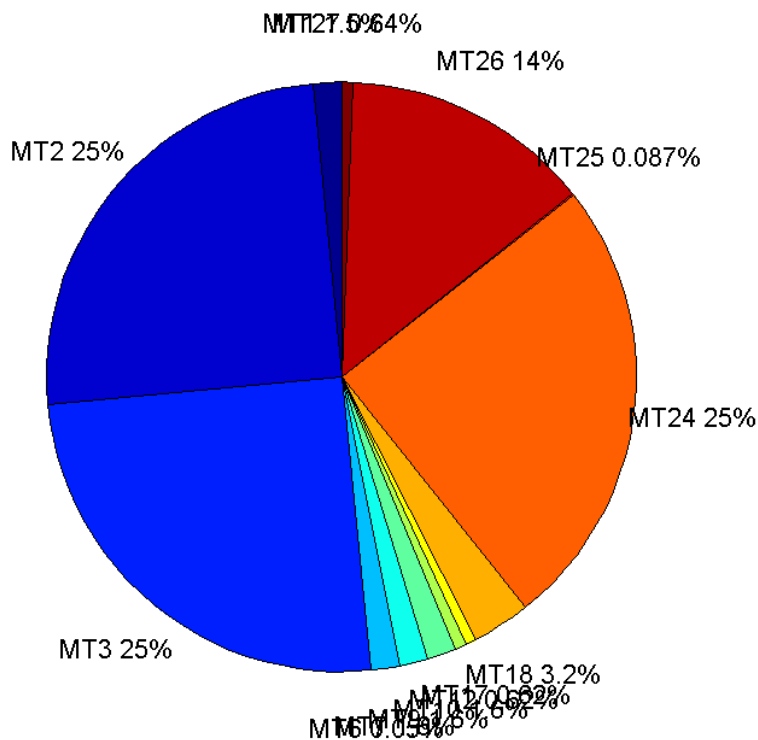
Parameters

System

Name	Section	Value
Name	System	Convertor
Version	System	4.3
Inputfile	System	D:/PegasusDateJob/job/2016_04_14EGNOS615/01_User/01_User
Outputfile	System	D:/PegasusDateJob/job/2016_04_14EGNOS615/02_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

Position Domain

start: 05:10:33.5   14.04.2016 (week: 1892 sec: 364233.5)
end: 12:26:00   14.04.2016 (week: 1892 sec: 390360)
duration: 07:15:28   ..

quality

valid samples	86653
total samples	87863

Event tables

Position discontinuity events type	too many (54)
APV-I discontinuity events type	too many (97)
APV-35m discontinuity events type	too many (96)
LPV-200 discontinuity events type	too many (96)
CAT-I discontinuity events type	nothing

extremes :

	Epoch	HPE	HPL	HPE/HPL	VPE	VPL	VPE/VPL
max normHor	368359	1.61075	9.15744	0.175896	-0.141497	15.1627	0.00933189
max normVer	369079	1.88055	17.1372	0.109735	3.28646	22.2691	0.147579
max HPE	375488	43.525	988.333	0.0440388	14.5799	283.973	0.0513426
max VPE	377594	9.71596	478.487	0.0203056	-16.4264	681.556	0.0241013
min HPL	368239	1.12757	9.12246	0.123604	0.494947	15.2073	0.0325466
min VPL	384257	0.661907	9.86686	0.0670838	1.24344	13.1071	0.0948678

First Glance analysis

Duration	26128
Number of Samples	87863
Number of invalid sample	1210
Number of no position solution samples	10569
Number of missing sample	-9479
Logging Loss	-12.093
Processing Loss	1.3771
Number of Misleading Information	0
Data gaps	59
Discontinuities	240

Number of Samples :

Valid	APV-1	LPV-200	CAT-1	APV-35m
76084	67084	64761	0	64761

Accuracy statistics :

	Valid	APV-1	LPV-200	CAT-1	APV-35m
HPE 95%	1.7394	1.60758	1.57647	NaN	1.57647
HPEscale 95%	NaN	4.8503	4.86789	NaN	4.86789
VPE 95%	1.78197	1.70308	1.71395	NaN	1.71395
VPEscale 95%	NaN	4.24723	2.99962	NaN	2.99962

Availability :

	Valid	APV-1	LPV-200	CAT-1	APV-35m
Signal in Space	0.878031	0.774168	0.74736	0	0.74736
measurements	0.865939	0.763507	0.737068	0	0.737068
Operational	2.91197	2.56751	2.47861	0	2.47861

Discontinuity events :

	Valid	APV-1	LPV-200	CAT-1	APV-35m
All	192	345	399	--	399

Long	63	120	137	--	137
Independent	54	97	96	--	96
P(disc.)	0.0106461	0.0216892	0.0222356	NaN	0.0222356
P(slide)	0.0350435	0.0687906	0.076184	NaN	0.076184

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	76084	67084	64761	0	64761
SIS Availability	0.878031	0.774168	0.74736	0	0.74736
Local Availability	0.865939	0.763507	0.737068	0	0.737068
Operational Availability	2.91197	2.56751	2.47861	0	2.47861
HPE 95%	1.7394	1.60758	1.57647	NaN	1.57647
HPEscale 95%	NaN	4.8503	4.86789	NaN	4.86789
VPE 95%	1.78197	1.70308	1.71395	NaN	1.71395
VPEscale 95%	NaN	4.24723	2.99962	NaN	2.99962
All Discontinuity Events	192	345	399	--	399
Long Discontinuity Events	63	120	137	--	137
Independent Discontinuity Events	54	97	96	--	96
P(discontinuity)	0.0106461	0.0216892	0.0222356	NaN	0.0222356
P(sliding window)	0.0350435	0.0687906	0.076184	NaN	0.076184
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:

HPE, HPL and NSV
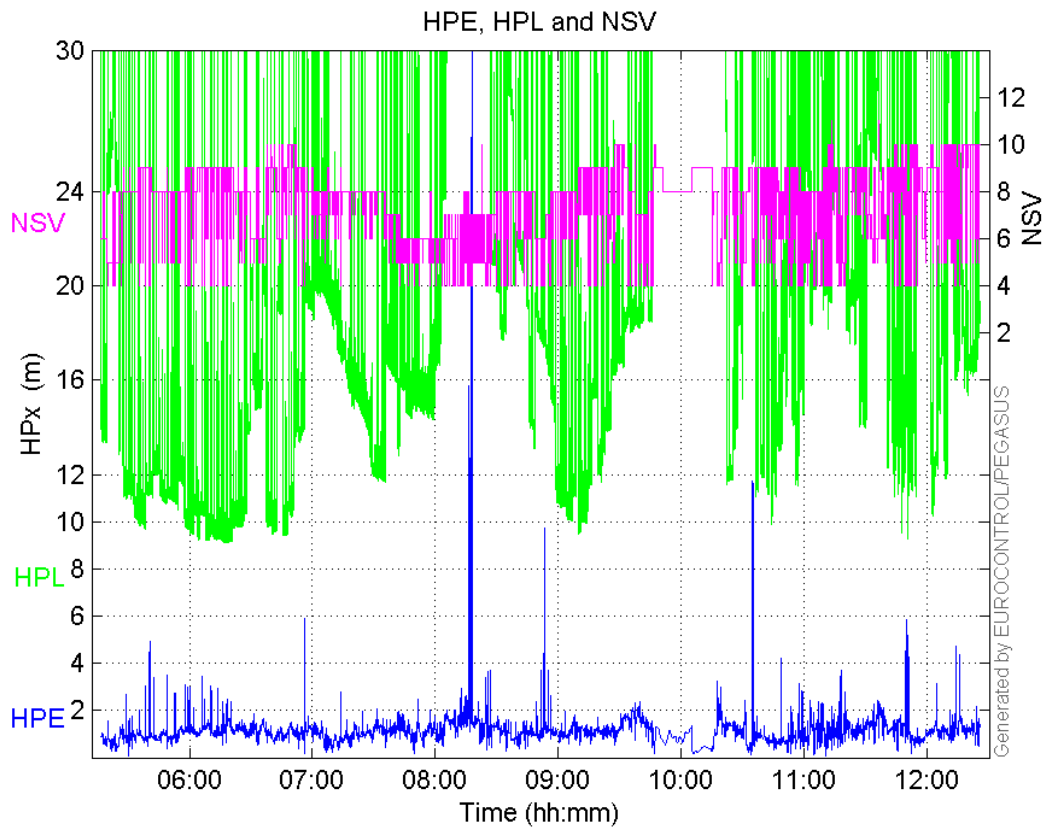
VPE, VPL and NSV:

VPE, VPL and NSV
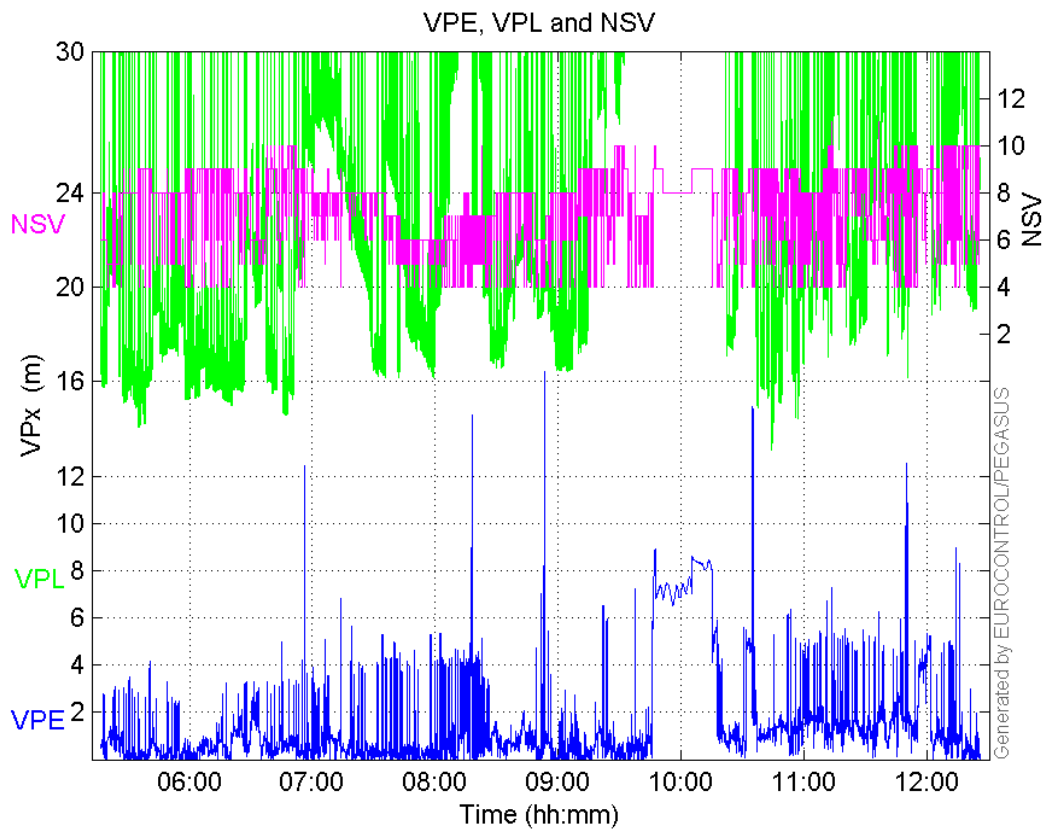
Horizontal deviation

Horizontal deviation from reference SBAS:

Horizontal deviation from reference SBAS
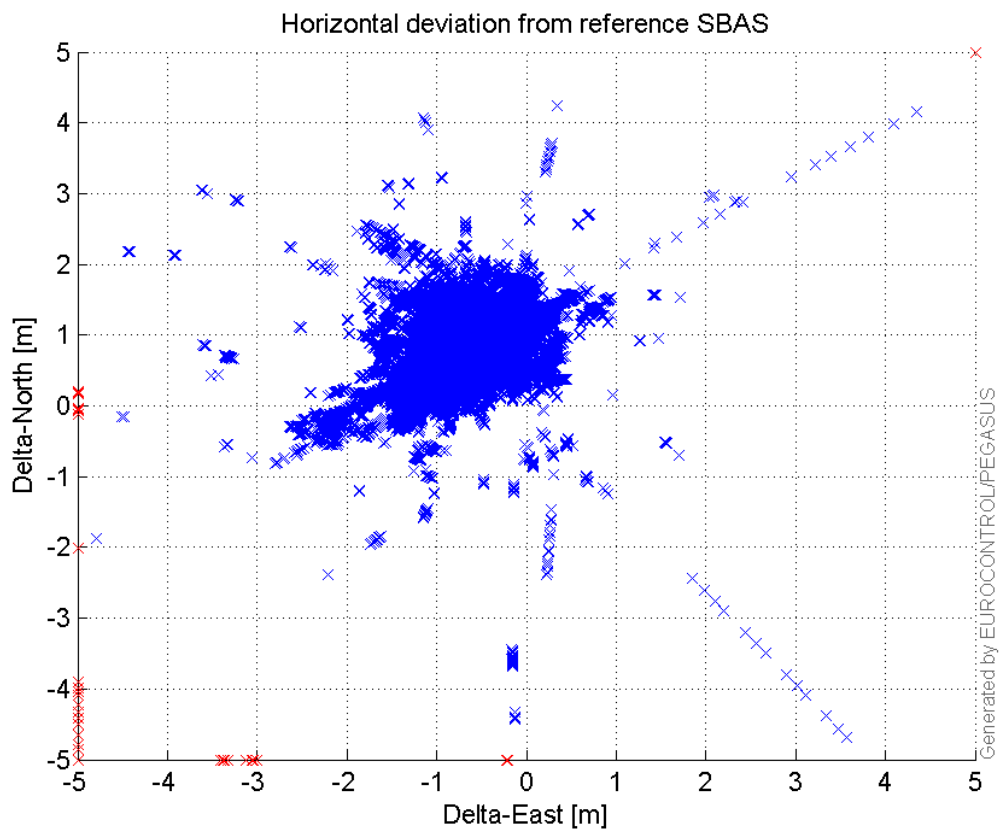
CDF position

SBAS CDF position domain:

SBAS CDF normalised position errors
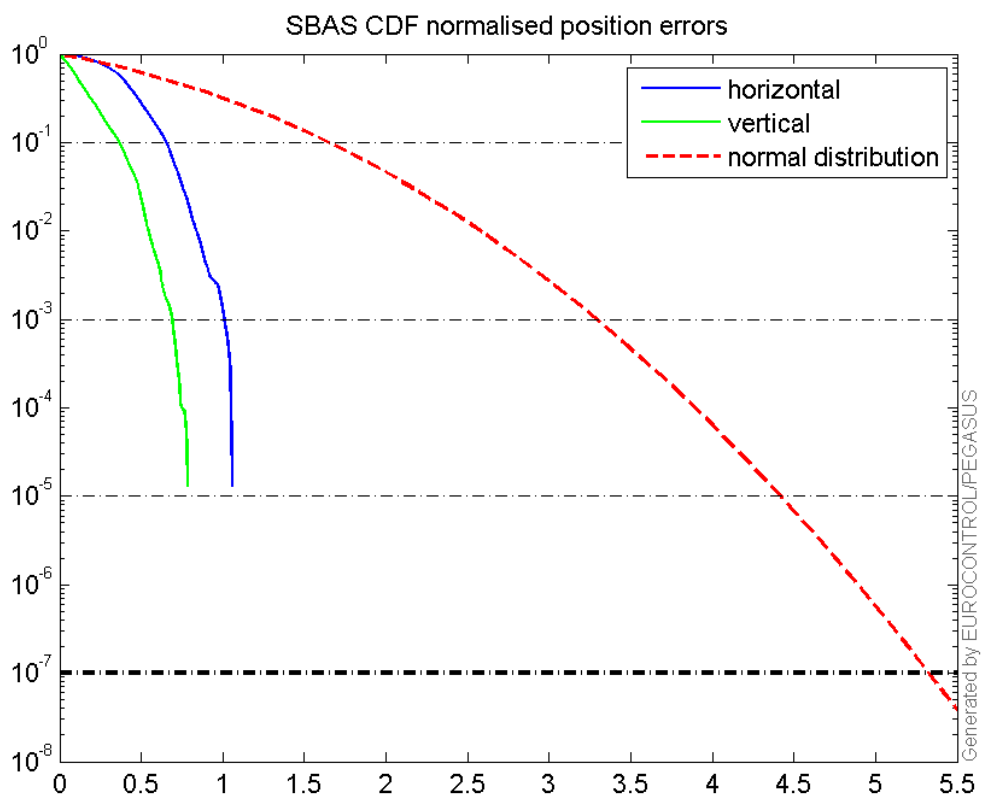
Statistics

number	67084
sum	73985.62
sum2	87279.614
prctile95	1.6075829
prctile99	1.9113531
number	67084
sum	44259.299
sum2	48186.65
prctile95	1.7030768
prctile99	2.1870076
number	67084
sum	1130458
sum2	21673931
prctile95	29.30121
prctile99	37.770394
number	67084
sum	1466124.3
sum2	34213064
prctile95	33.55599
prctile99	41.46157
number	67084
sum	4863.6765
sum2	402.91801
prctile95	0.12125748
prctile99	0.14147754
number	67084
sum	2085.2554
sum2	109.53334
prctile95	0.084944521
prctile99	0.10351209
number	64761
sum	70923.995
sum2	83016.68
prctile95	1.5764725
prctile99	1.9113563
number	64761
sum	42382.034
sum2	46271.132
prctile95	1.7139482
prctile99	2.195104
number	64761
sum	1073252.5
sum2	20109235
prctile95	27.669115
prctile99	37.626545
number	64761
sum	1376192.4
sum2	30704976
prctile95	31.566925
prctile99	34.005289
number	64761
sum	4726.4582
sum2	393.86734

prctile95 0.12169731
prctile99 0.14188231
number 64761
sum 2036.9125
sum2 108.27331
prctile95 0.085703529
prctile99 0.10383828

Error and XPL Statistics :

	Mean Value	Standard Deviation	50% Value	95% Value	99% Value	RMS Value
HPE	1.10288	0.291043	1.09215	1.60758	1.91135	1.14064
HPL	16.8514	6.25444	15.7922	29.3012	37.7704	17.9746
VPE	0.659759	0.532001	0.51357	1.70308	2.18701	0.847528
VPL	21.8551	5.68863	20.3611	33.556	41.4616	22.5833

Histogram of HPE APV1:
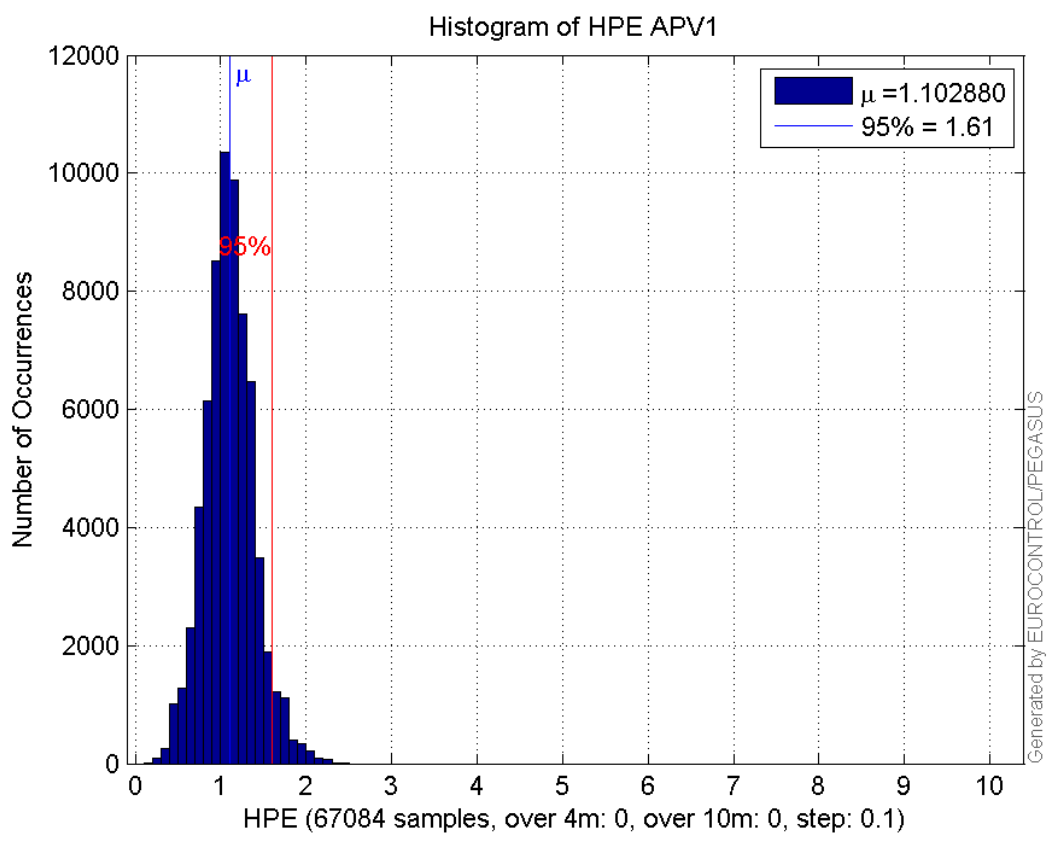
Histogram of VPE APV1:

Histogram of VPE APV1

Legend:
- μ =0.659759
- 95% = 1.70

VPE (67084 samples, over 4m: 0, over 10m: 0, step: 0.1)
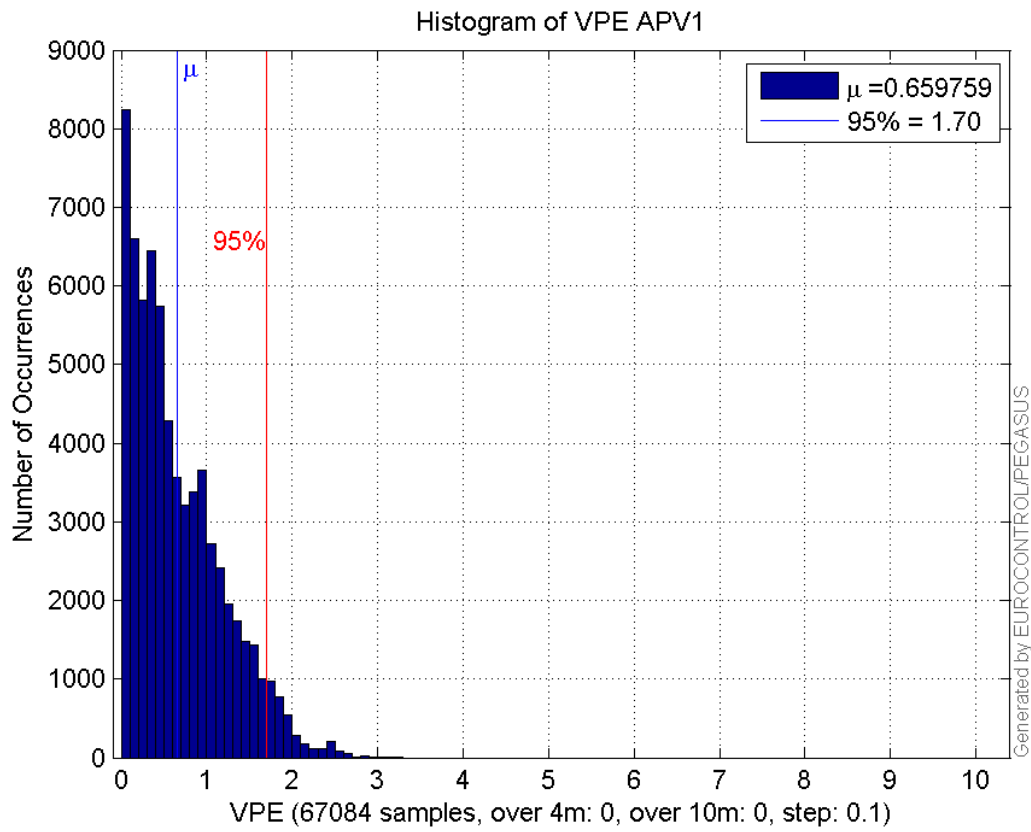
Histogram of HPL APV1:

Histogram of HPL APV1

Legend:
- μ =16.851380
- 99% = 37.77

HPL APV1 (step 0.05)

Histogram of VPL APV1:

Histogram of VPL APV1

Histogram of HSI APV1:
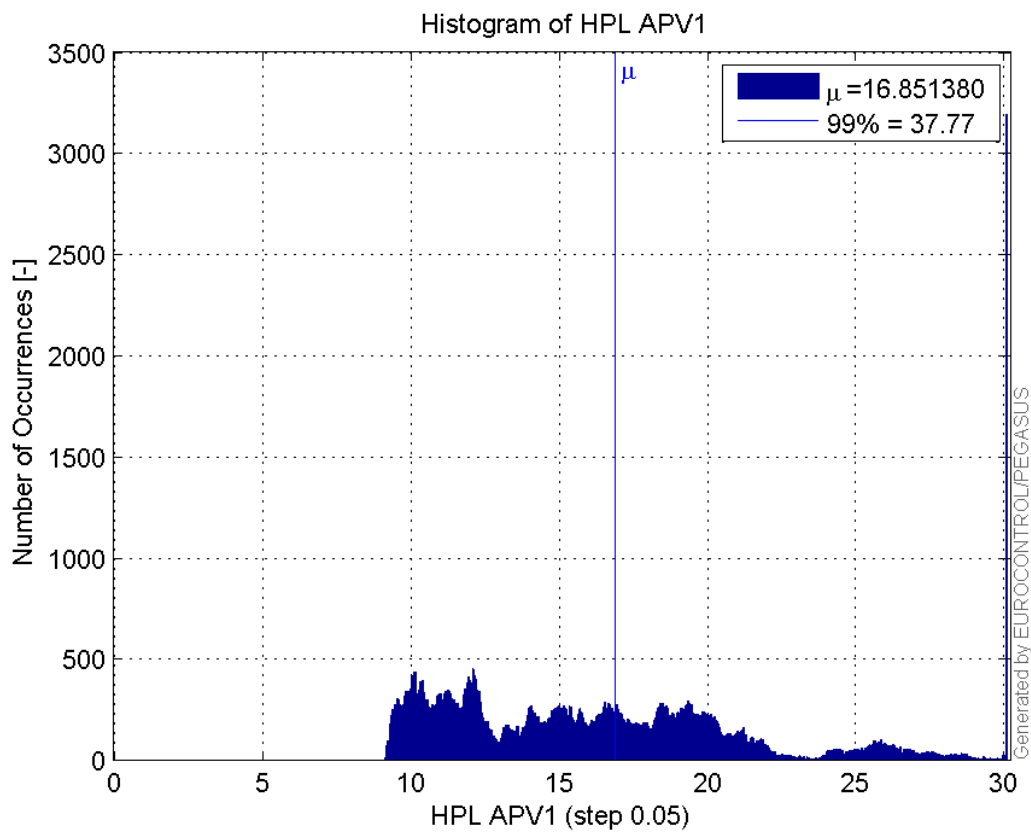
Histogram of HSI APV1
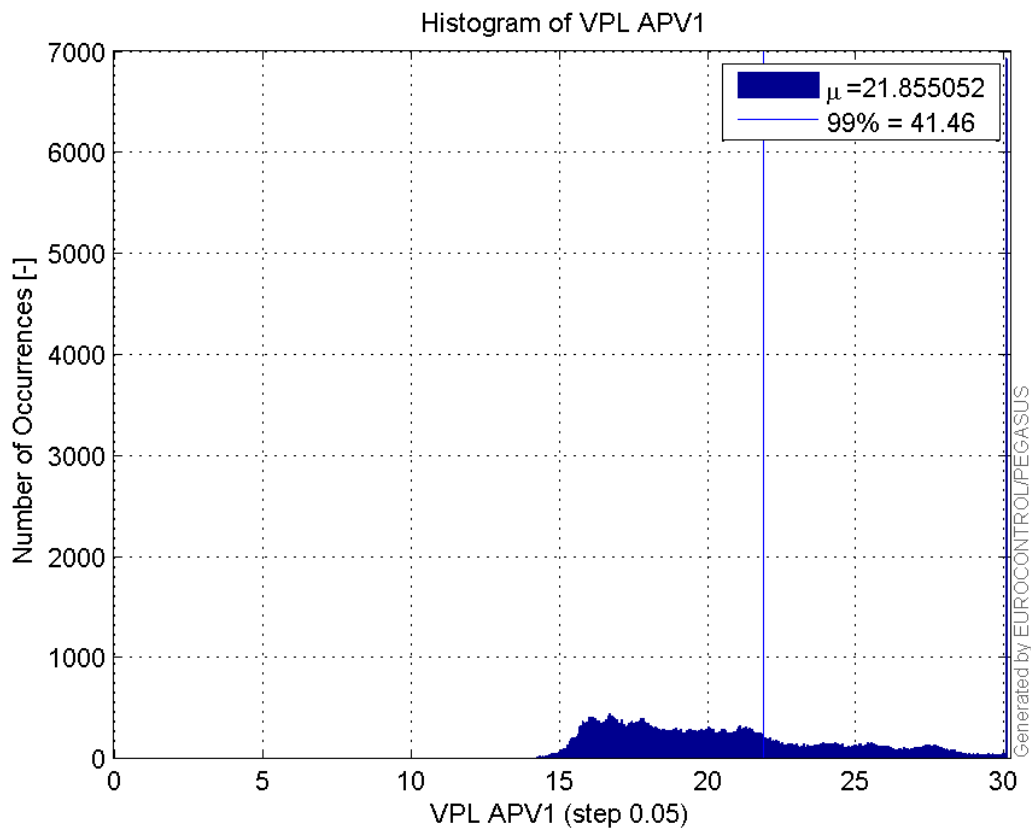
Histogram of VSI APV1:
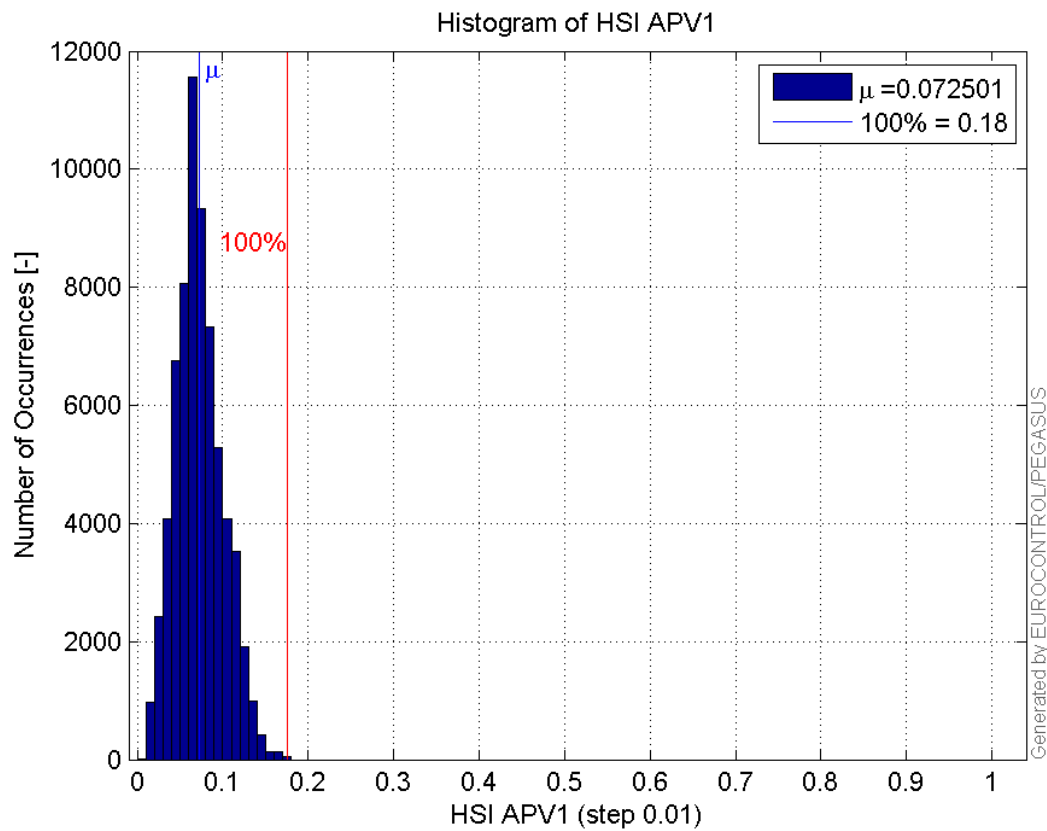
Histogram of VSI APV1

Histogram of HPE LPV200:
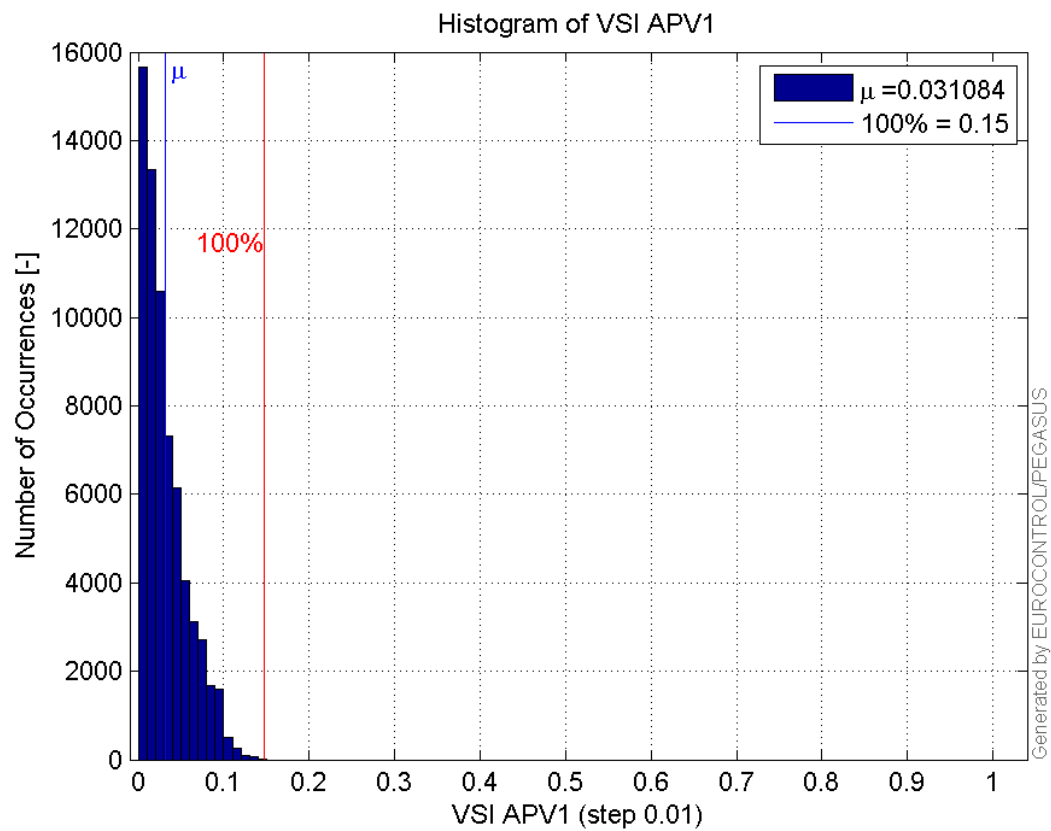
Histogram of HPE LPV200
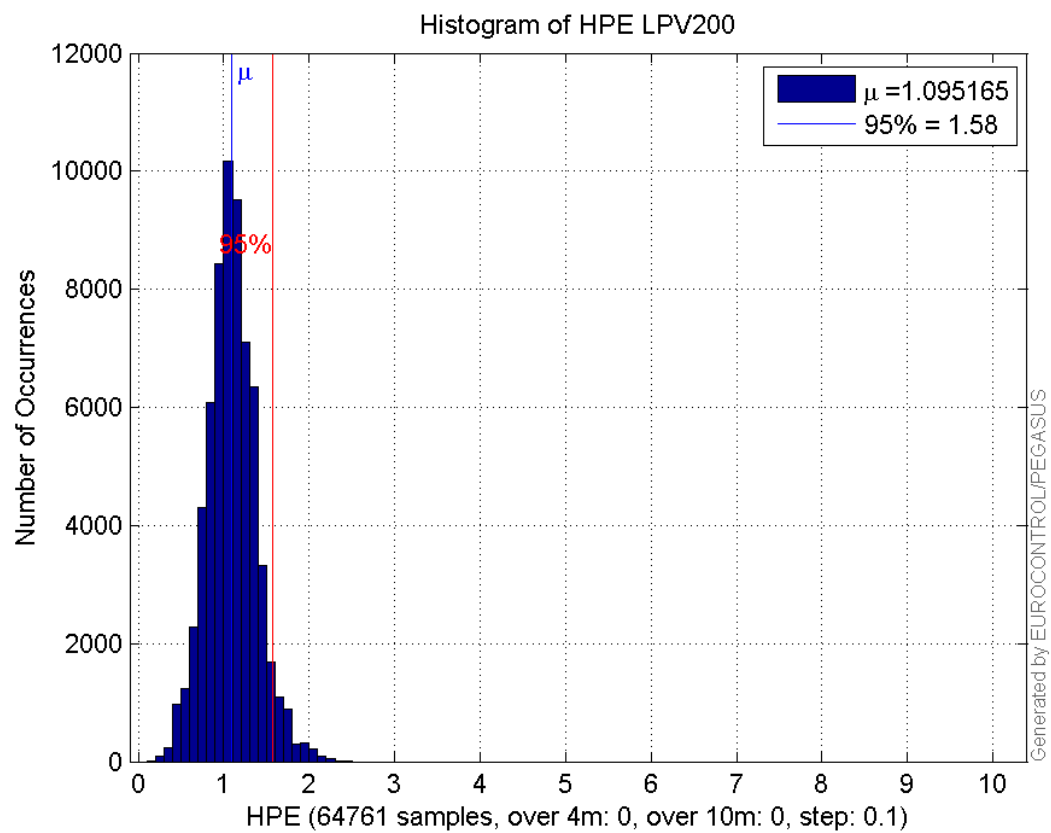
Histogram of VPE LPV200:

Histogram of VPE LPV200

Legend: μ =0.654438; 95% = 1.71

X-axis: VPE (64761 samples, over 4m: 0, over 10m: 0, step: 0.1)
Y-axis: Number of Occurrences

Generated by EUROCONTROL/PEGASUS

Histogram of HPL LPV200:

Histogram of HPL LPV200

Legend: μ =16.572513; 99% = 37.63

X-axis: HPL LPV200 (step 0.05)
Y-axis: Number of Occurrences [-]

Generated by EUROCONTROL/PEGASUS

Histogram of VPL LPV200:

Histogram of VPL LPV200

Histogram of VPL LPV200, with legend μ =21.250326 and 99% = 34.01

Histogram of HSI LPV200:

Histogram of HSI LPV200

Histogram of HSI LPV200, with legend μ =0.072983 and 100% = 0.18
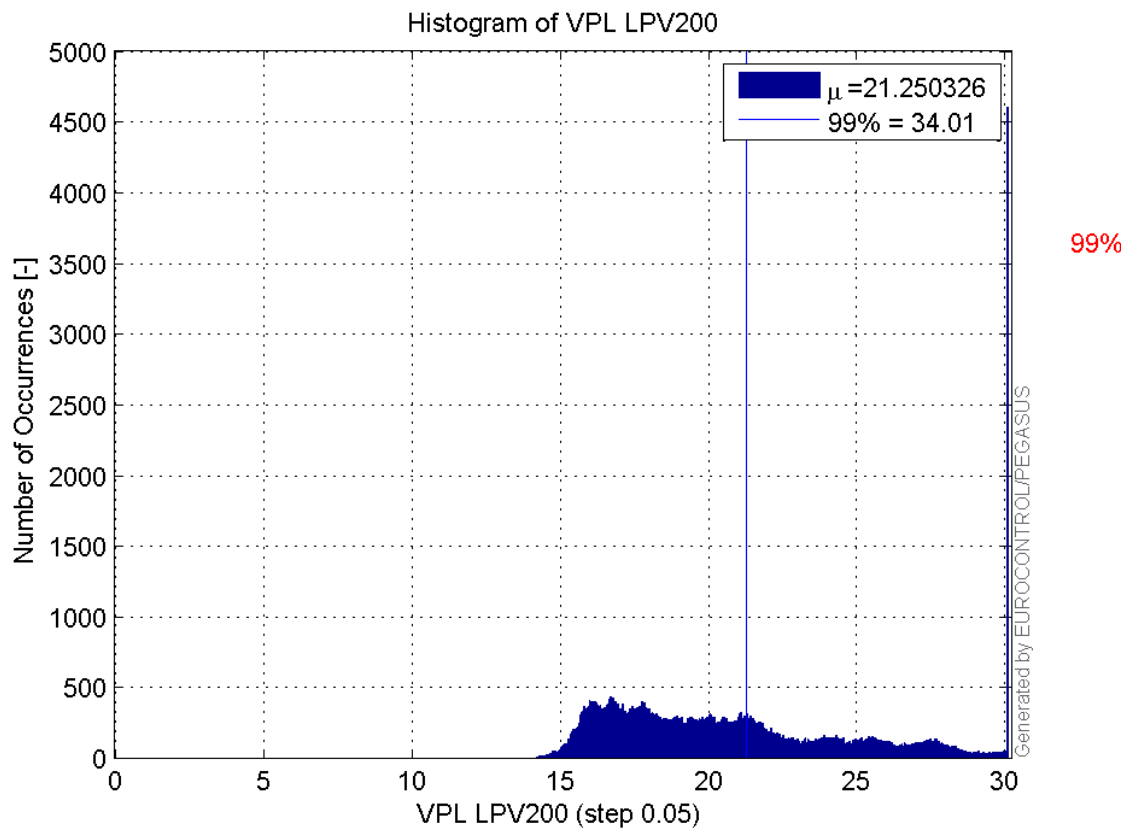
Histogram of VSI LPV200:
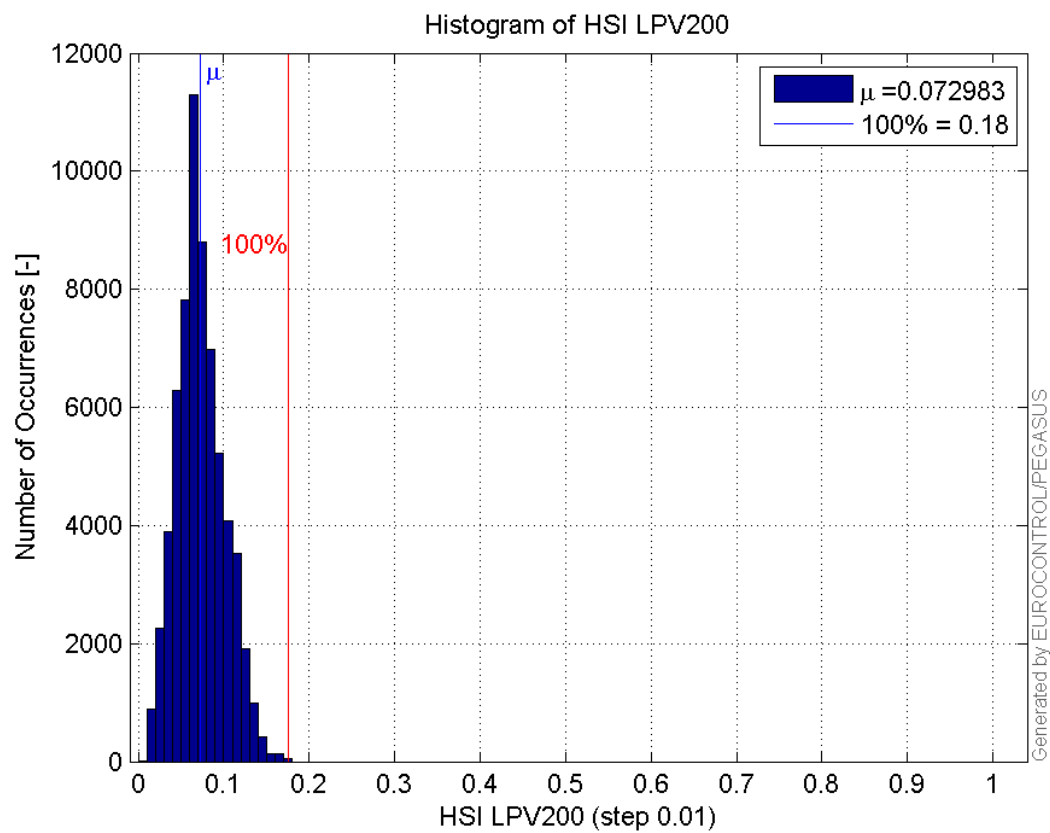
Histogram of VSI LPV200
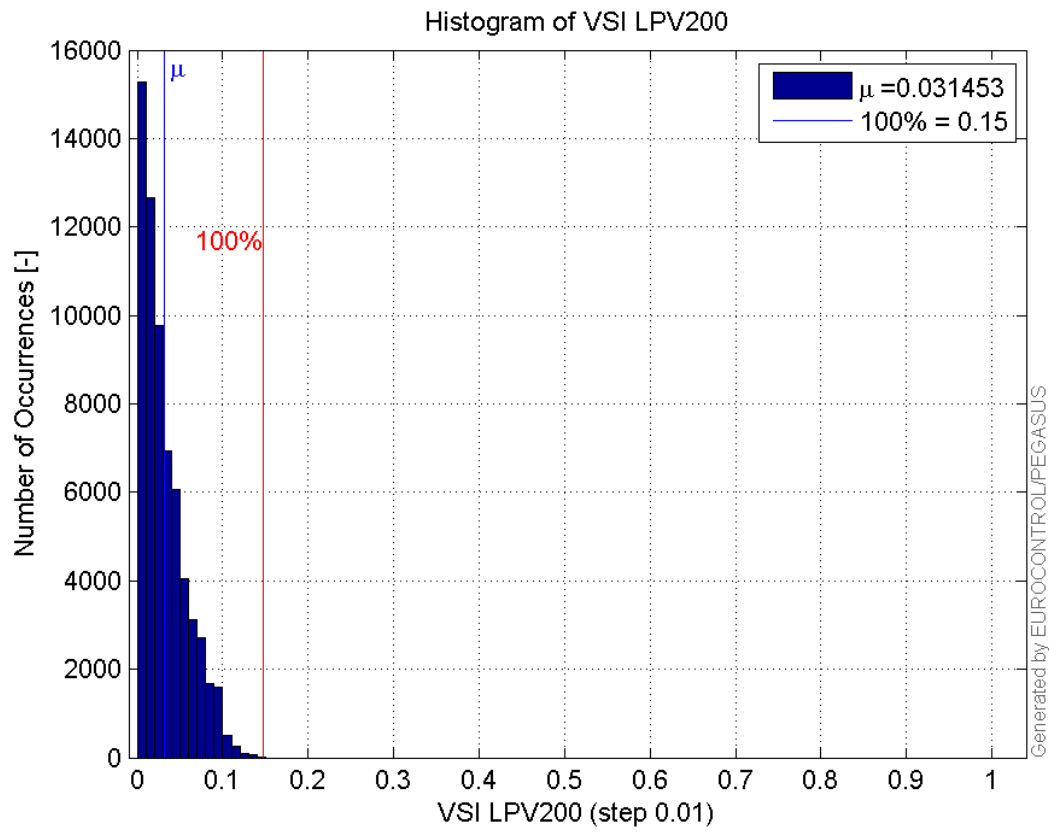
Stanford Plots

Horizontal_Stanford_Plot_SBAS:

86653 valid epochs, 18350 unavailable epochs and 0 (H)MI epochs:
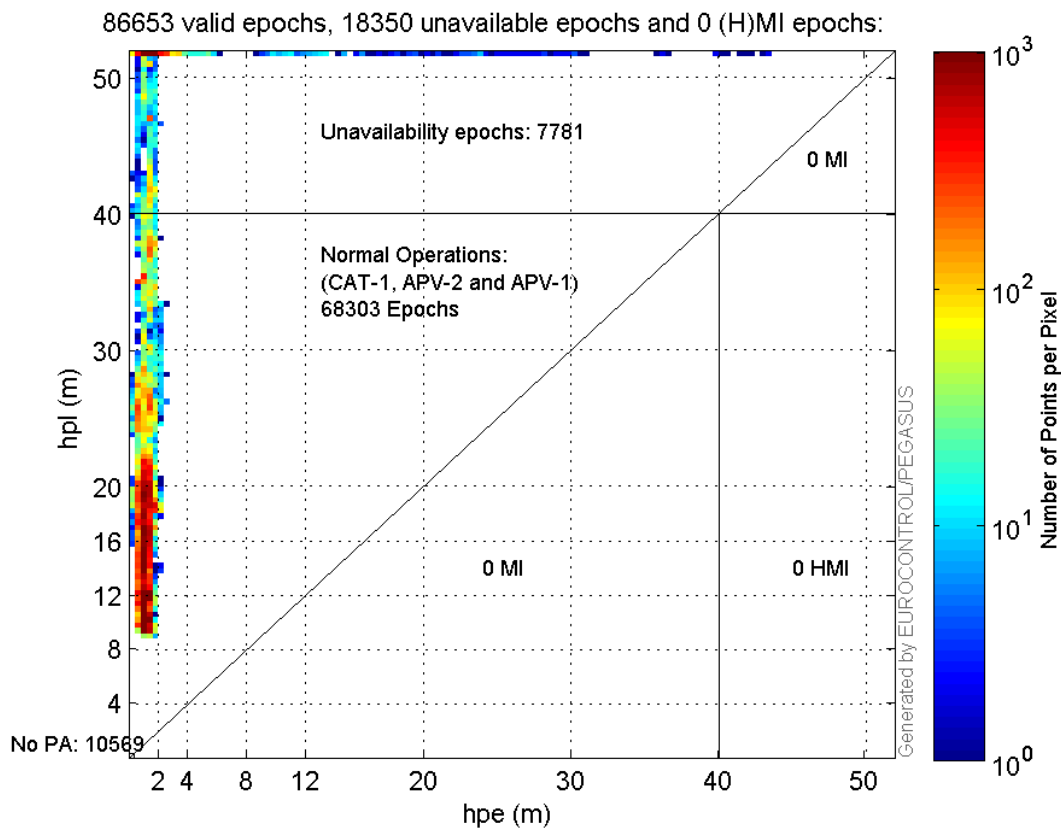
Vertical_Stanford_Plot_SBAS:

86653 valid epochs, 16323 unavailable epochs and 0 (H)MI epochs:

Parameters

system

Name	Section	Value
name	system	GNSS_Solution
version	system	4.8.4.0
input_prefix	system	D:/PegasusDateJob/job/2016_04_14EGNOS615/02_Convertor/02_Convertor
output_prefix	system	D:/PegasusDateJob/job/2016_04_14EGNOS615/03_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	50.439

init_lon	results	30.4297
init_alt	results	227.0497
mi_numbers	results	0

Range Domain

start: 05:10:33.5 14.04.2016 (week: 1892 sec: 364233.5)
end: 12:26:00 14.04.2016 (week: 1892 sec: 390360)
duration: 07:15:28 ..

quality	
valid samples	87863
total samples	87863

PRN overview	
Number of Visible GPS Satellites	26
Number of Visible SBAS Satellites	4

signal quality and status

PRN Noise and Status:

Signal To Noise Ratio:
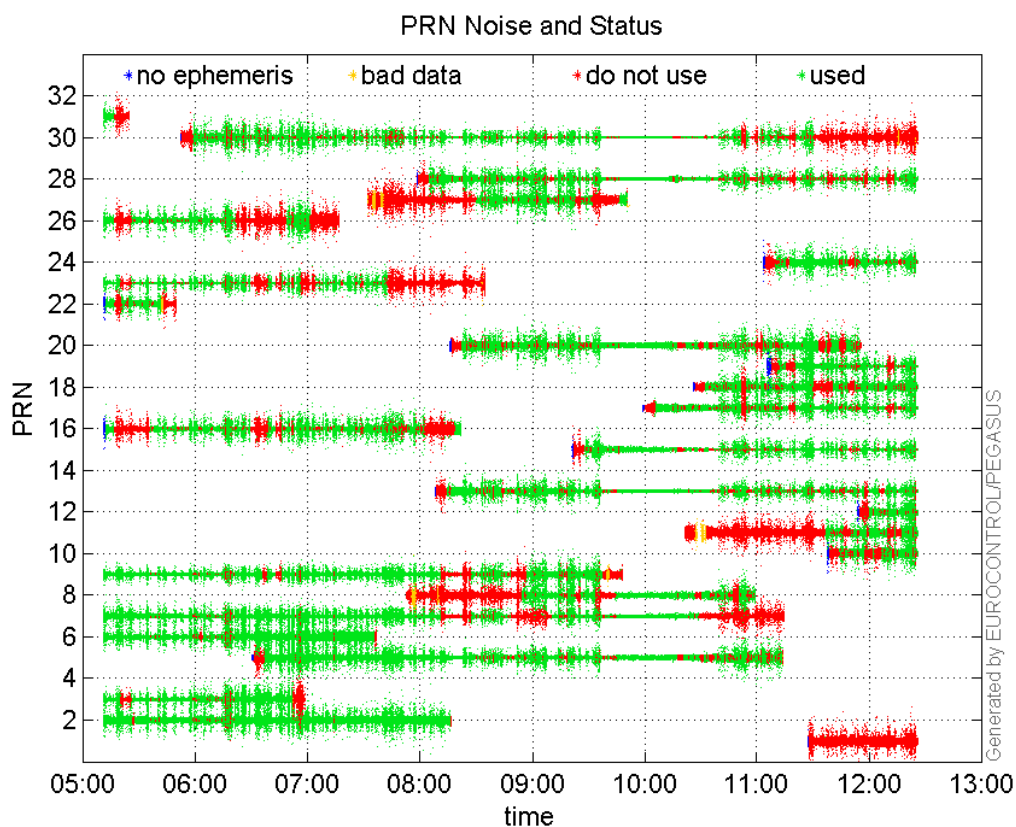
Signal To Noise Ratio
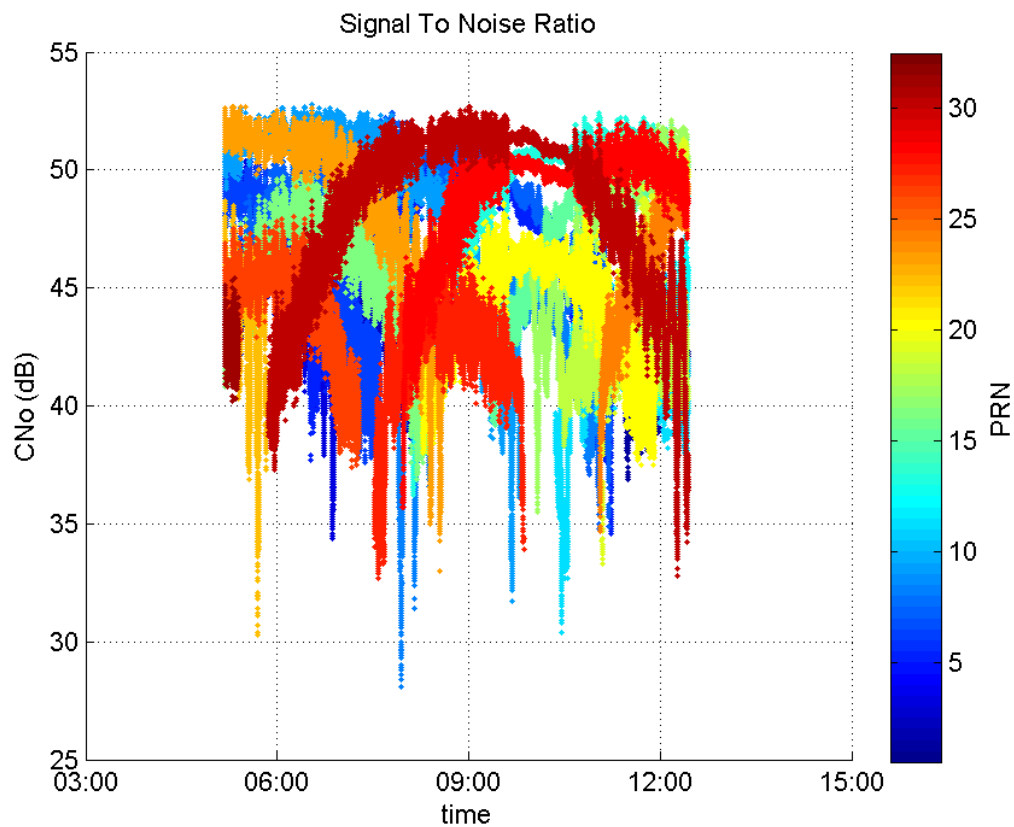
range errors

Number of Overbounding Norm Errors 0

Max Norm Errors :

GPS Week	GPS Second	PRN	Norm Error	Range Error	Sigma
1892	368340	2	0.796097	-1.41864	1.78199
1892	368716	3	1.08139	2.7017	2.49837
1892	378234	5	1.0366	-1.59835	1.54191
1892	372695	6	0.907692	2.47631	2.72814
1892	373882	7	1.06631	1.78612	1.67504
1892	383835	8	0.635417	-1.99507	3.13979
1892	371820	9	1.17881	1.94406	1.64918
1892	390243	10	0.958666	-2.63008	2.74347
1892	388469	11	0.216366	1.01568	4.69427
1892	389136	12	0.578553	1.50271	2.59737
1892	380739	13	1.14246	-1.85703	1.62546
1892	380343	15	1.0738	-2.27167	2.11554
1892	373349	16	0.837587	-2.06545	2.46595
1892	388213	17	0.963088	-1.64254	1.70549
1892	389782	18	0.901149	-2.28573	2.53646
1892	387956	19	1.12982	2.6138	2.31348
1892	380737	20	1.2981	-2.36902	1.82499
1892	365342	22	0.285854	2.77147	9.6954
1892	367748	23	0.929953	1.38256	1.48669
1892	386952	24	0.819362	-1.63534	1.99588
1892	368407	26	0.458084	-1.7402	3.79888
1892	378234	27	0.958922	-2.32466	2.42424

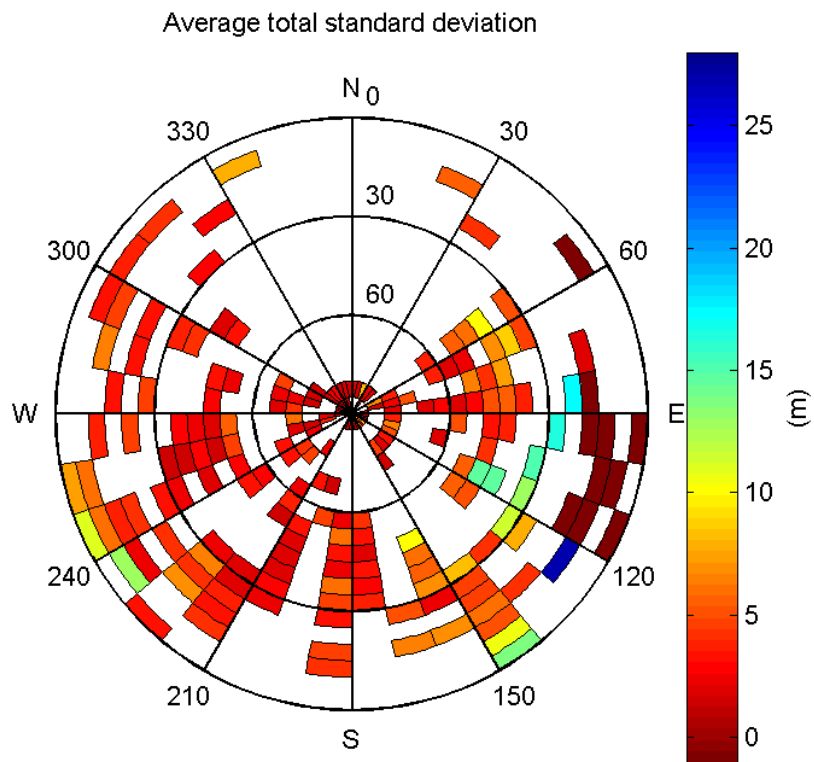| 1892	388213	28	1.19113	-2.08743	1.75249
1892	371820	30	1.35788	2.11664	1.55878

Normalised Range errors (median):
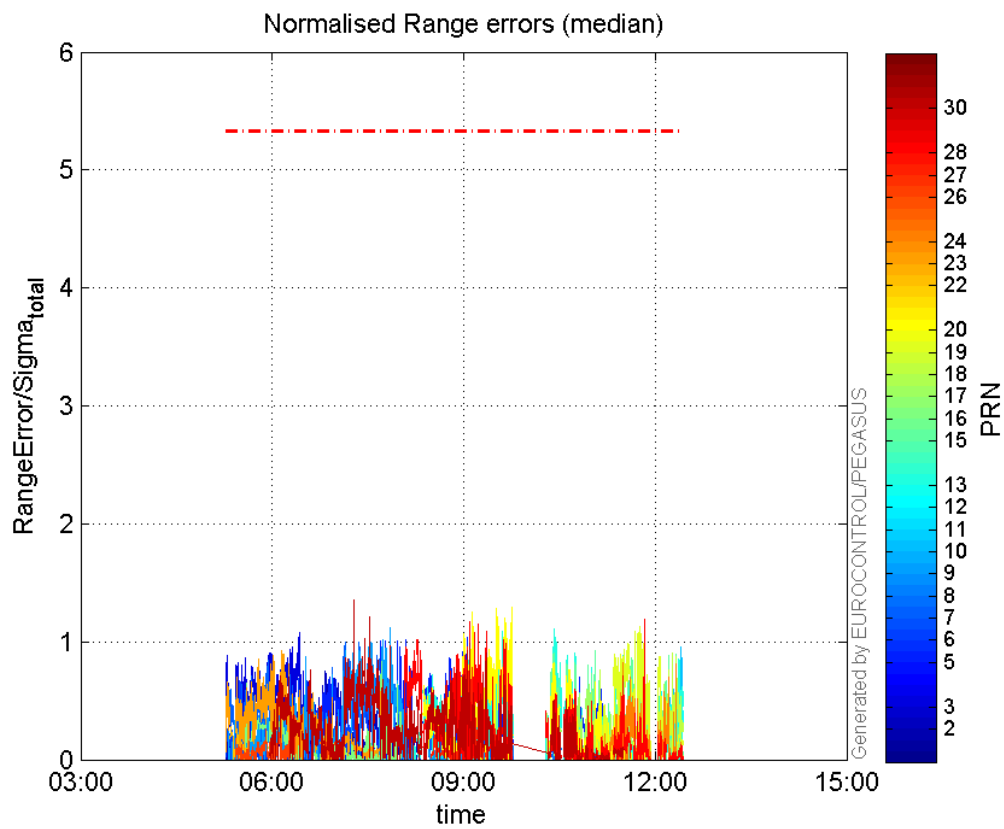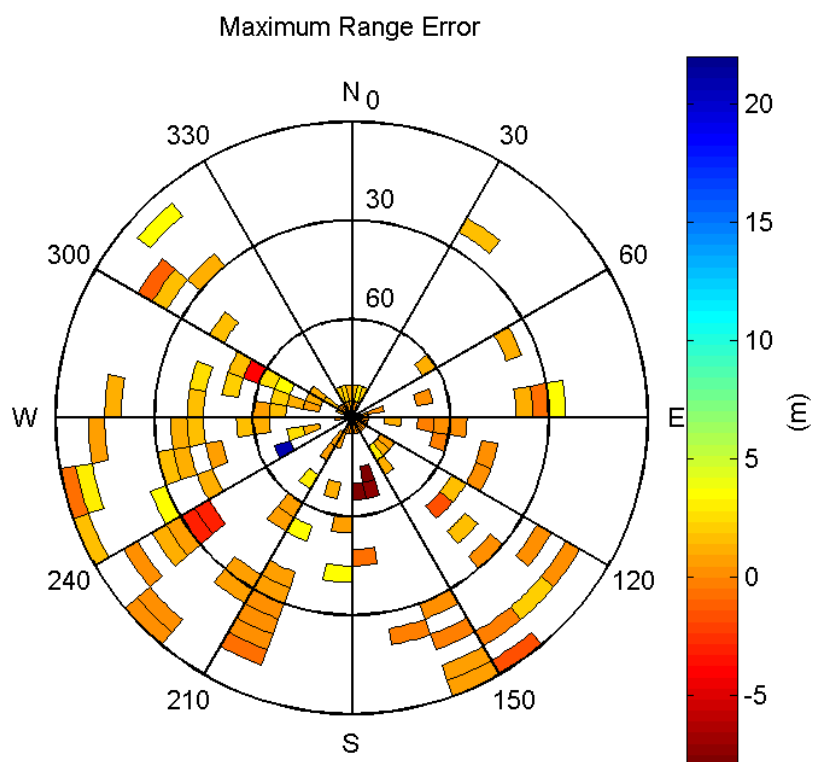

Range errors:
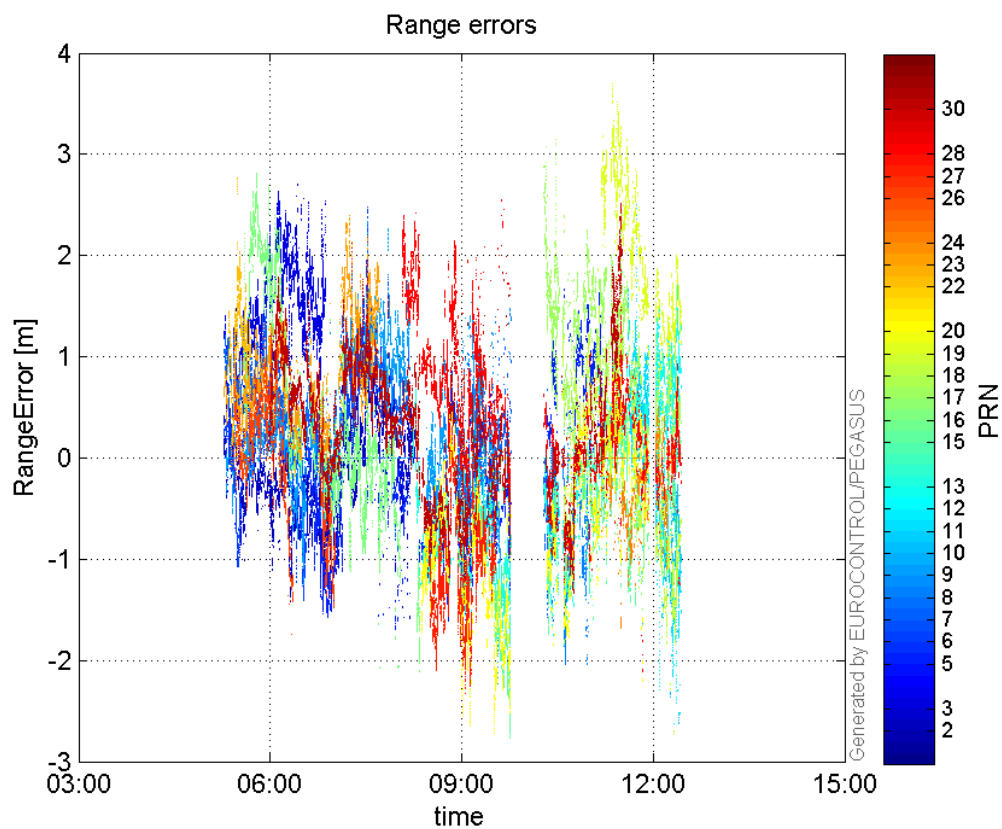
CDF normalised range errors:
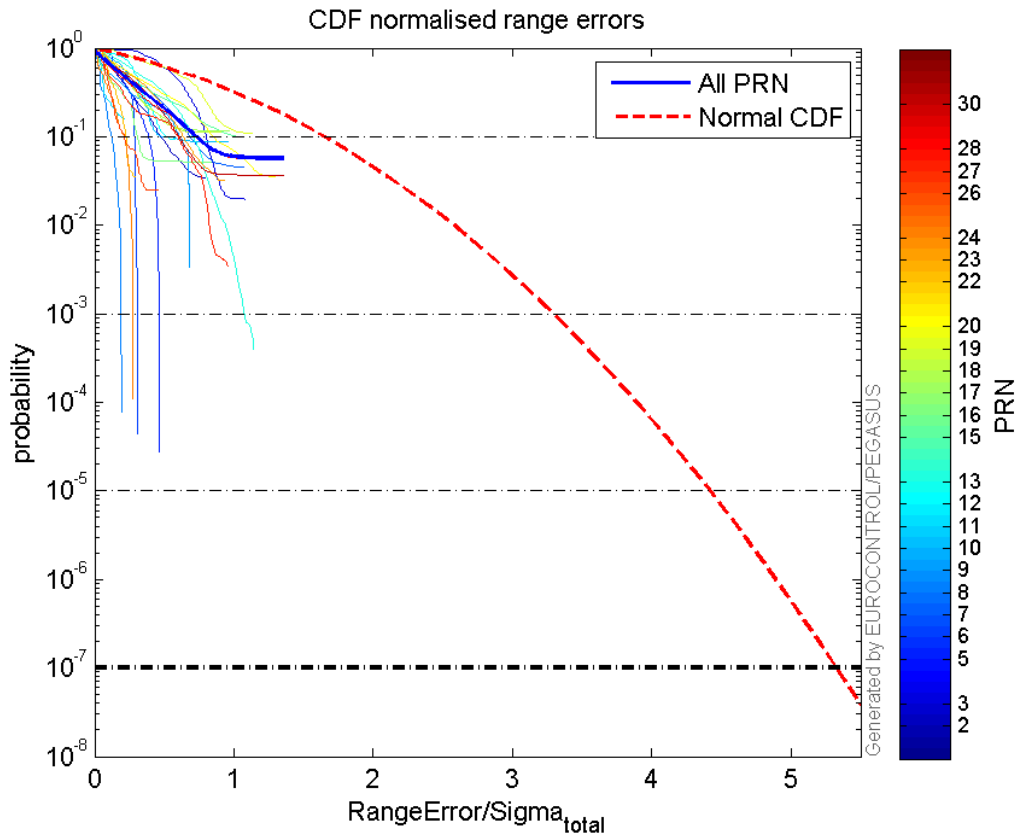
Histogram of Norm Range errors:
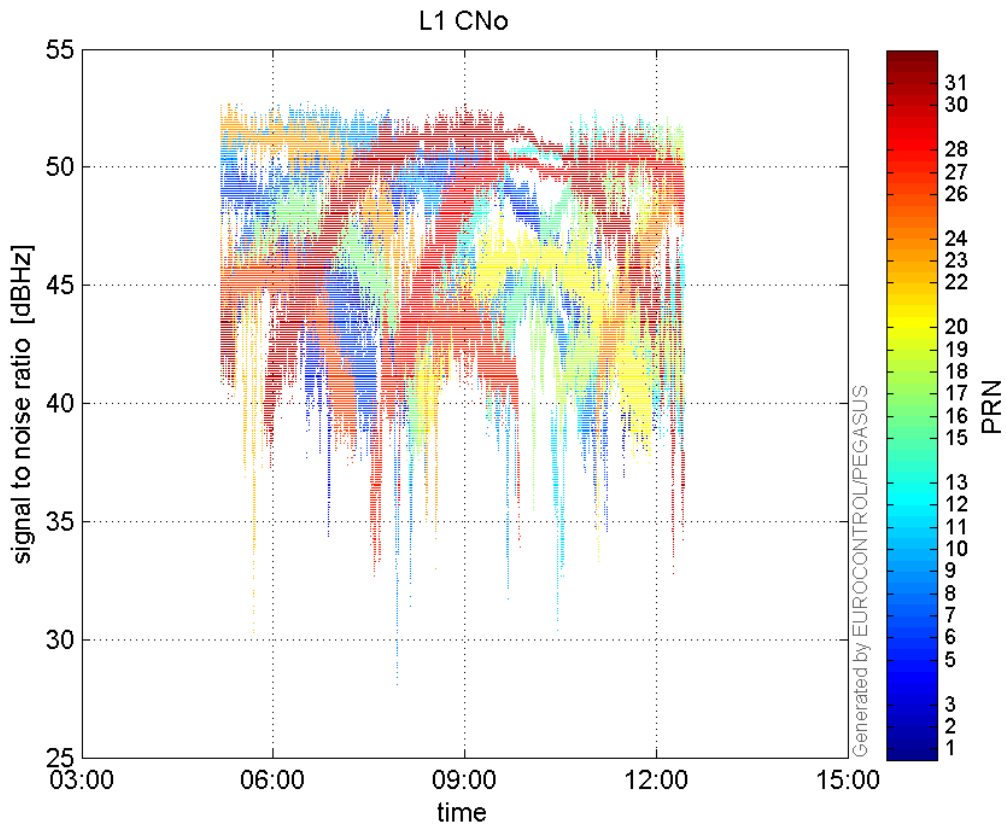

Sigma Sky Plot:

Average total standard deviation

Norm Error Sky Plot:

Maximum Range Error
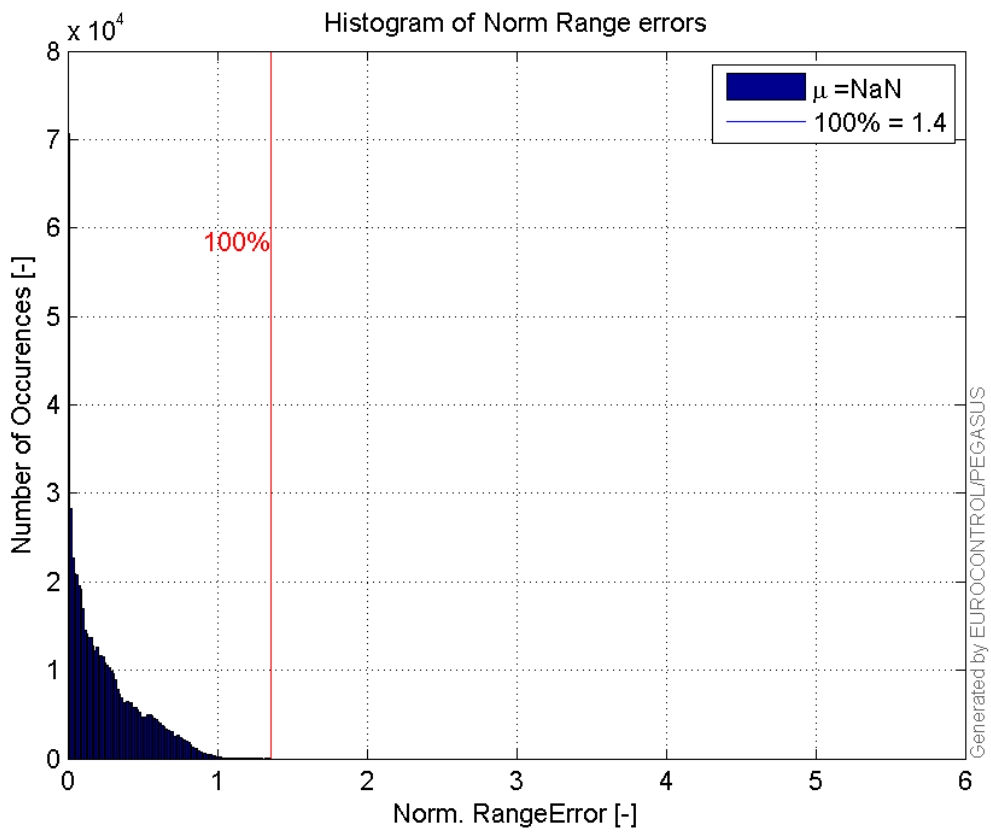
signal quality

L1 CNo:

L1 CNo

L2 CNo:

L2 CNo

GEO CNo:
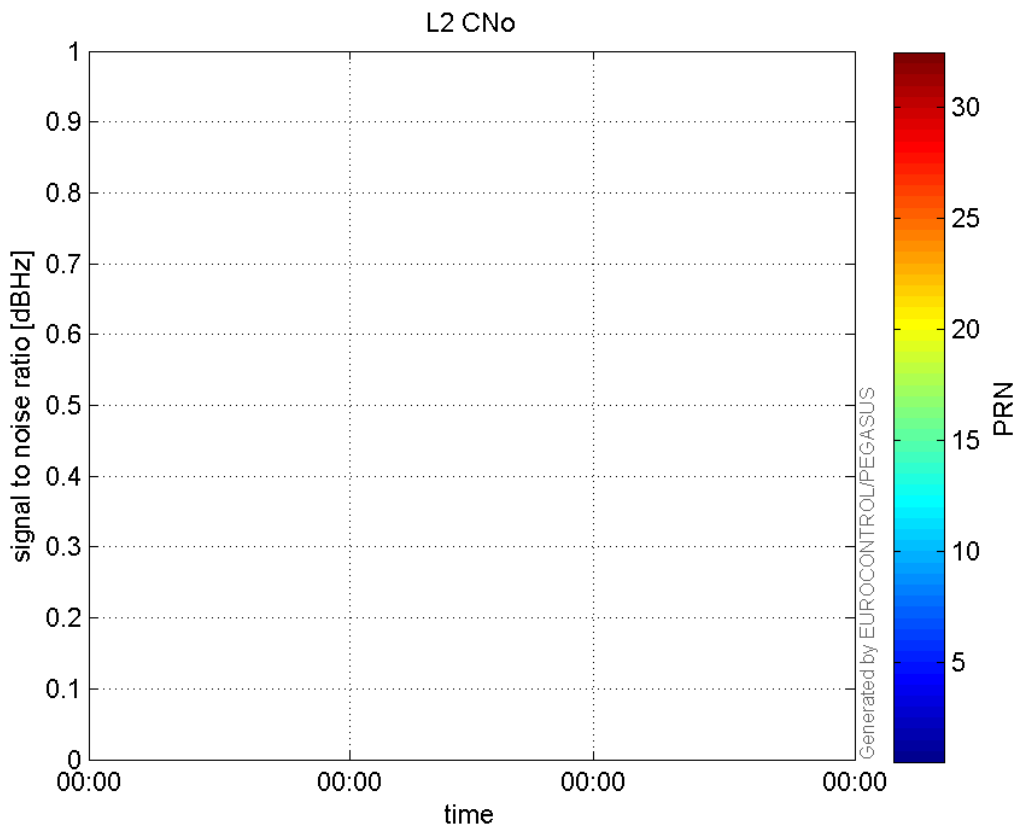
GEO CNo
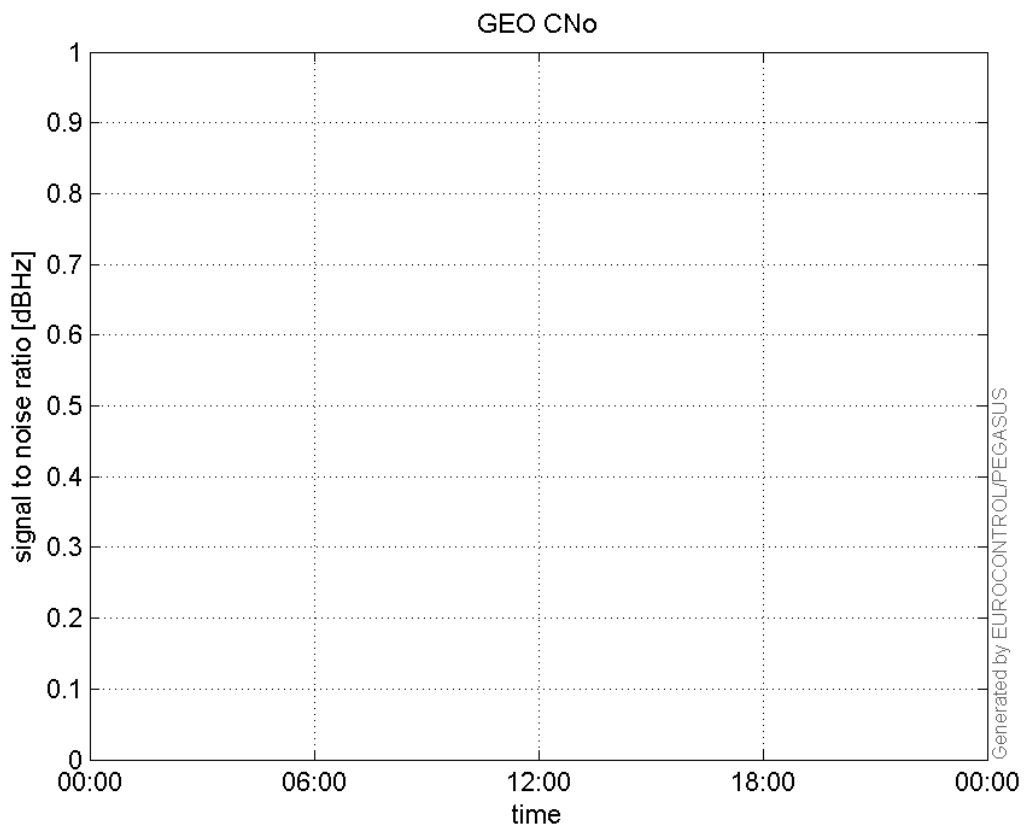
SNR Elevation:

SNR Elevation
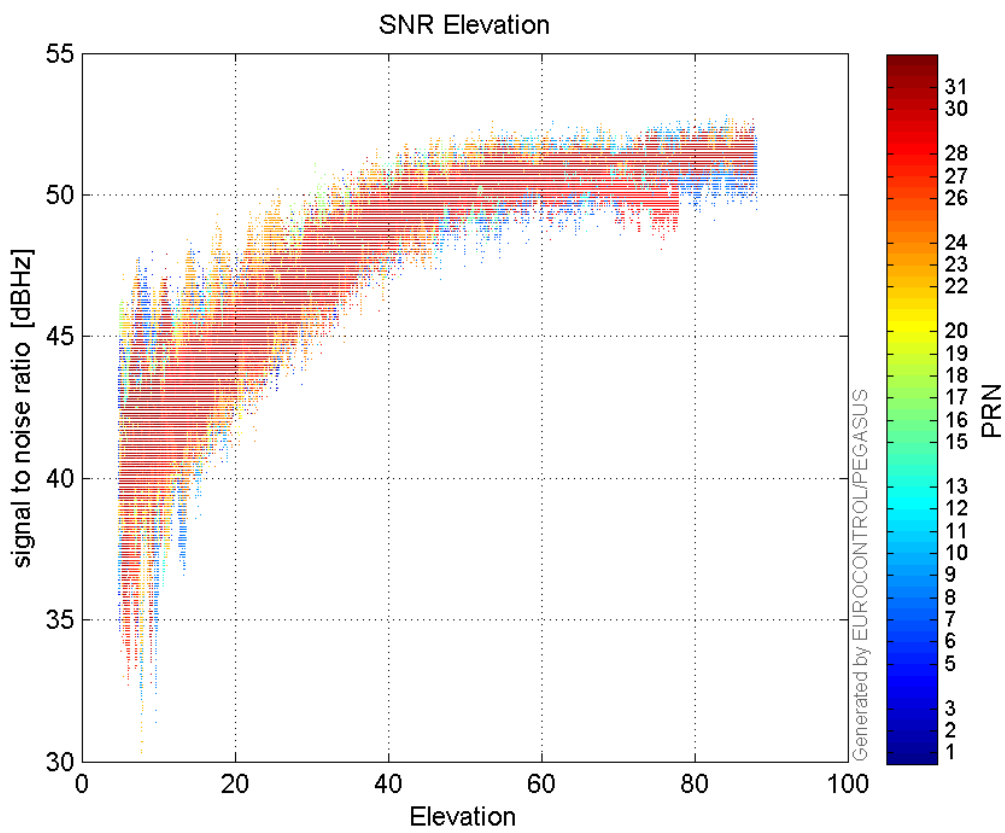
L2 CNo:

L2 CNo
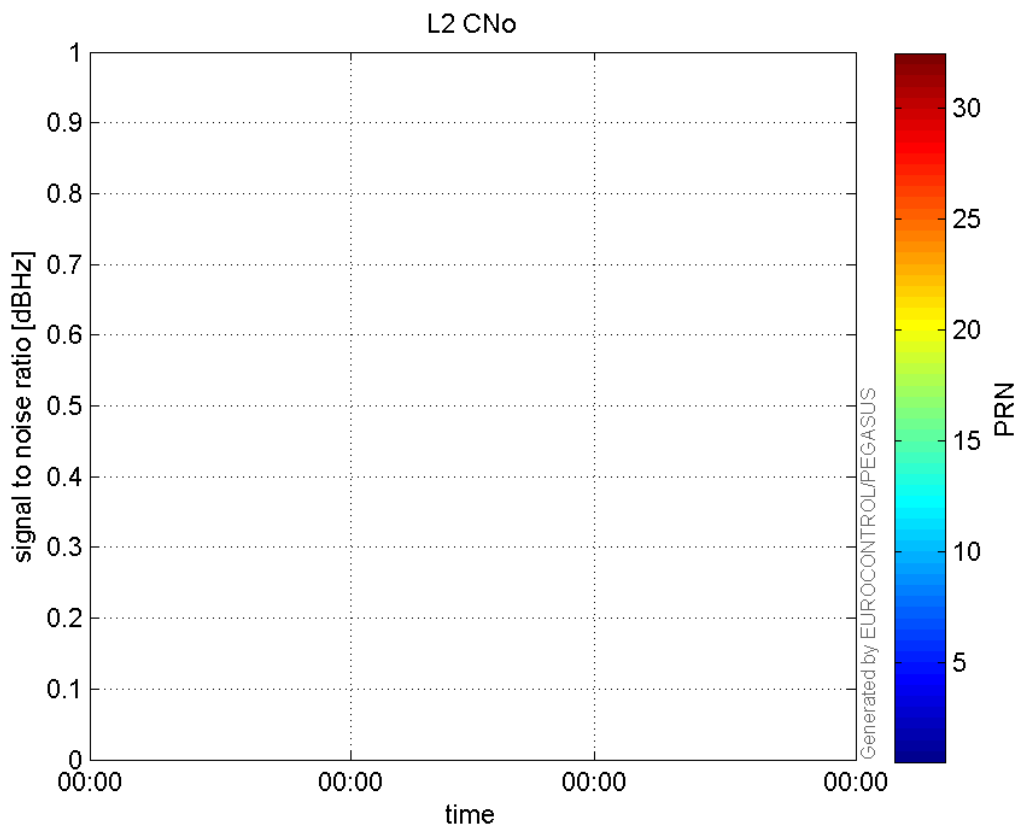
GEO CNo:

GEO CNo
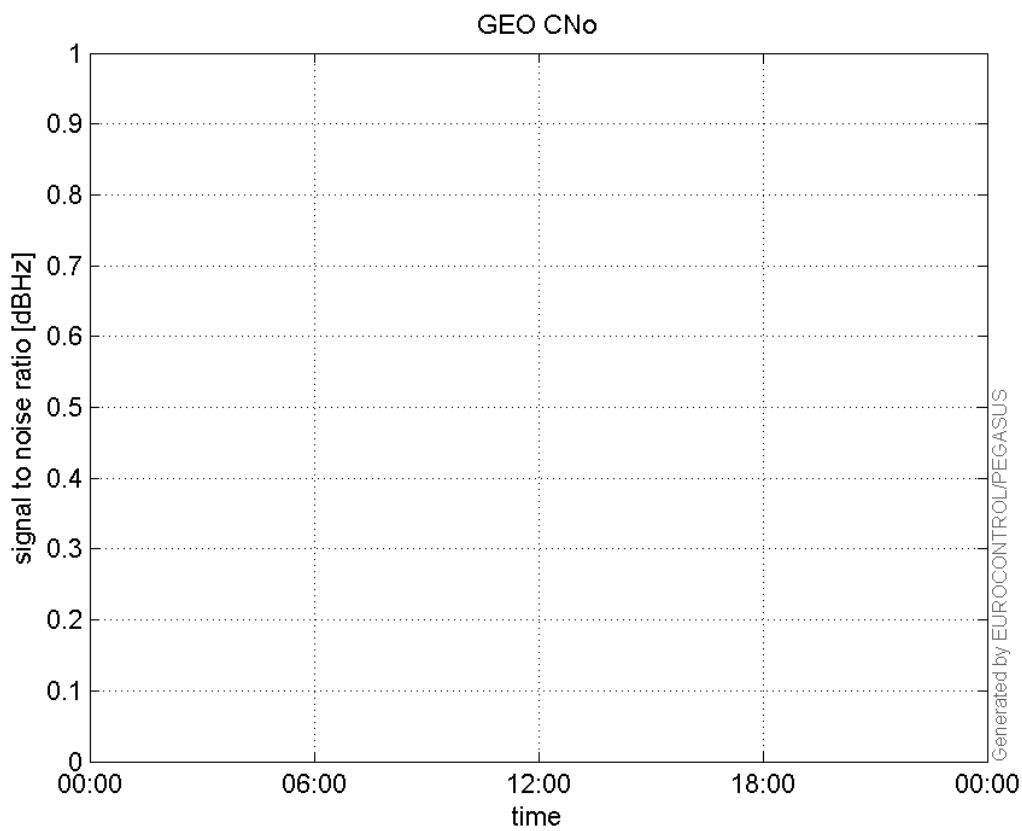
dual frequency

Ionospheric Error L1-L2:

Ionospheric Error L1-L2

Parameters

system

Name	Section	Value
name	system	GNSS_Solution
version	system	4.8.4.0
input_prefix	system	D:/PegasusDateJob/job/2016_04_14EGNOS615/02_Convertor/02_Convertor
output_prefix	system	D:/PegasusDateJob/job/2016_04_14EGNOS615/03_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
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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	50.439

Global View

init_lon	results	30.4297
init_alt	results	227.0497
mi_numbers	results	0