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NLS GNSS SOFAMESA

GNSS Position Solution Analysis Software of the National Land Survey of Finland
Beta Version 0.2
2019-07-10

Measurement Report of the File:

20190524-A-90M9180-METHOD1-1

Timespan: 09:21:14 - 09:29:36

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Thank you for the help: Topi Rikkinen, Marko Ollikainen, Antti Laaksonen, Hannu Koivula, Octavian Andrei, Mikael Kauhava, Timo Sallinen and Ari Huvinen.

Statistics Behind the Figures

Parameter	Value
Total Number of Measurements (No Outliers Removed)	499
Timespan (No Outliers Removed)	09:21:14 - 09:29:36
Solution Percentages (No Outliers Removed), Fixed; Float; Code Diff; Standalone; Other	99.6%; 0.0%; 0.0%; 0.4%; 0.0%
Number of All Satellites Mean (No Outliers Removed)	19.0
Number of All Satellites (No Outliers Removed), Min; Max	14; 27
Number of GPS Satellites Mean (No Outliers Removed)	11.0
Number of GLONASS Satellites Mean (No Outliers Removed)	7.9
Number of GALILEO Satellites Mean (No Outliers Removed)	0.0
Number of BEIDOU Satellites Mean (No Outliers Removed)	0.0
Mean of HDOP Values (No Outliers Removed)	0.6
Mean of VDOP Values (No Outliers Removed)	1.2
Mean of PDOP Values (No Outliers Removed)	1.3
Mean of TDOP Values (No Outliers Removed)	nan
Mean of GDOP Values (No Outliers Removed)	1.5
User-Defined Tolerance Values, North (m) and East (m); Height (m)	0.1; 0.2
Number of Measurements Above the Set Tolerance Values	2
Above Tolerance Values Percentage	0.4%
Timespan (Outliers Removed)	09:21:14 - 09:29:36
Solution Percentages (Outliers Removed), Fixed; Float; Code Diff; Standalone; Other	100.0%; 0.0%; 0.0%; 0.0%; 0.0%
Number of All Satellites Mean (Outliers Removed)	19.0
Number of All Satellites (Outliers Removed), Min; Max	14; 19
Number of GPS Satellites Mean (Outliers Removed)	11.0
Number of GLONASS Satellites Mean (Outliers Removed)	8.0
Number of GALILEO Satellites Mean (Outliers Removed)	0.0
Number of BEIDOU Satellites Mean (Outliers Removed)	0.0
Mean of HDOP Values (Outliers Removed)	0.6
Mean of VDOP Values (Outliers Removed)	1.2
Mean of PDOP Values (Outliers Removed)	1.3
Mean of TDOP Values (Outliers Removed)	nan
Mean of GDOP Values (Outliers Removed)	1.5

Parameter	Precision*	Accuracy**
Horizontal RMSE* ± (m)**	0.006	0.008
Vertical RMSE** ± (m)**	0.019	0.076
Horizontal 2dRMSE* ± (m)**	0.013	0.016
Vertical 2dRMSE** ± (m)**	0.037	0.153
North Coordinate Std ± (m)	0.0047	
East Coordinate Std ± (m)	0.0044	
Height Std ± (m)	0.0187	
North Coordinate Mean (m)	6687768.387	
East Coordinate Mean (m)	394444.8174	
Height Mean (m)	25.056	
North Coordinate Median (m)	6687768.387	
East Coordinate Median (m)	394444.817	
Height Median (m)	25.056	

* The precision of the measurements = inner accuracy.

** The accuracy of the measurements = outer accuracy.

*** Horizontal RMSE is 63-68% of the measurements and it depends on the shape of the distribution. Horizontal 2dRMSE is 95-98% of the measurements and it also depends on the shape of the distribution.

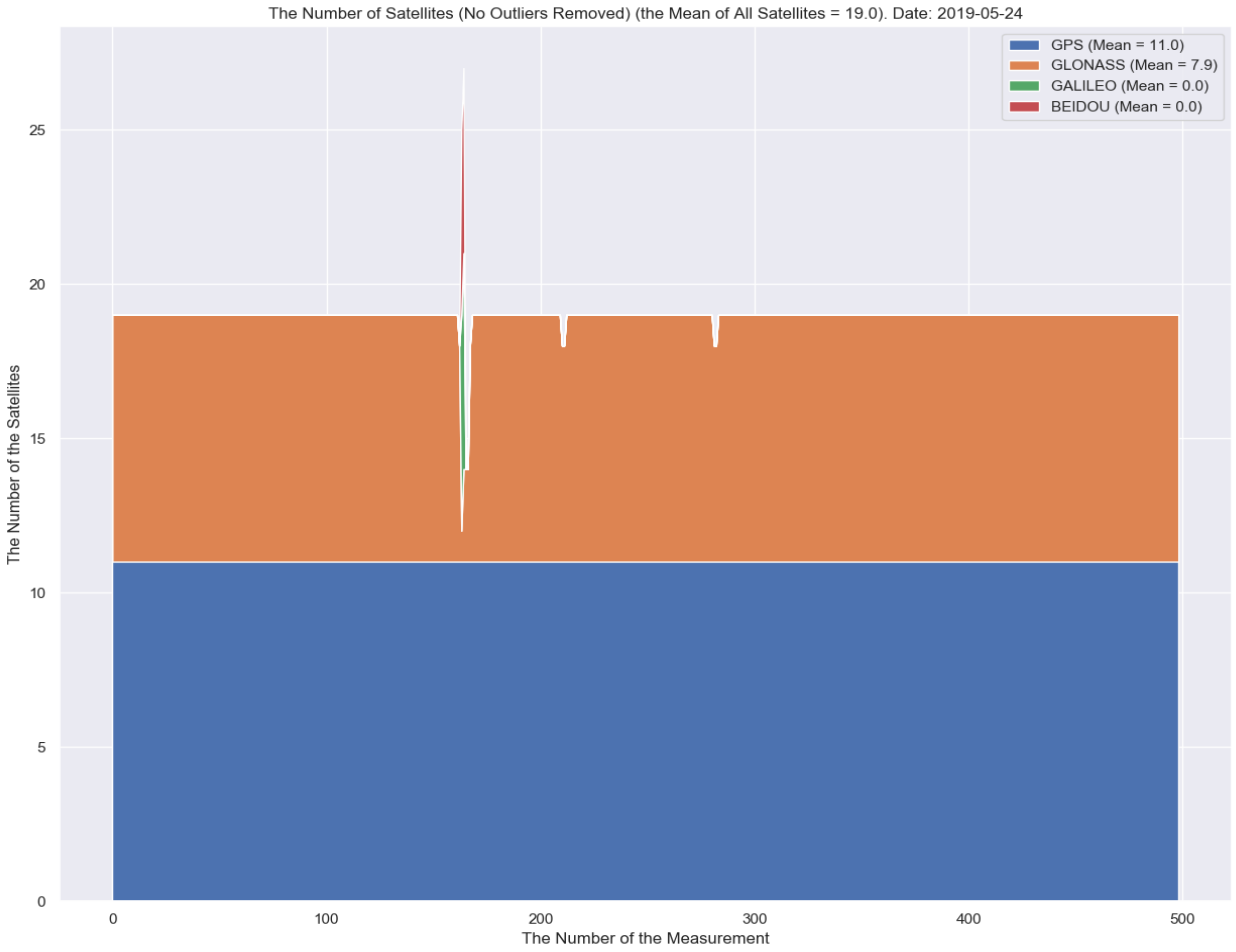
**** Vertical RMSE is 63-68% of the measurements and it depends on the shape of the distribution. Vertical 2dRMSE is 95-98% of the measurements and it also depends on the shape of the distribution.

Figures

Please find the figures, which NLS GNSS SOFAMESA produces, on the upcoming pages.

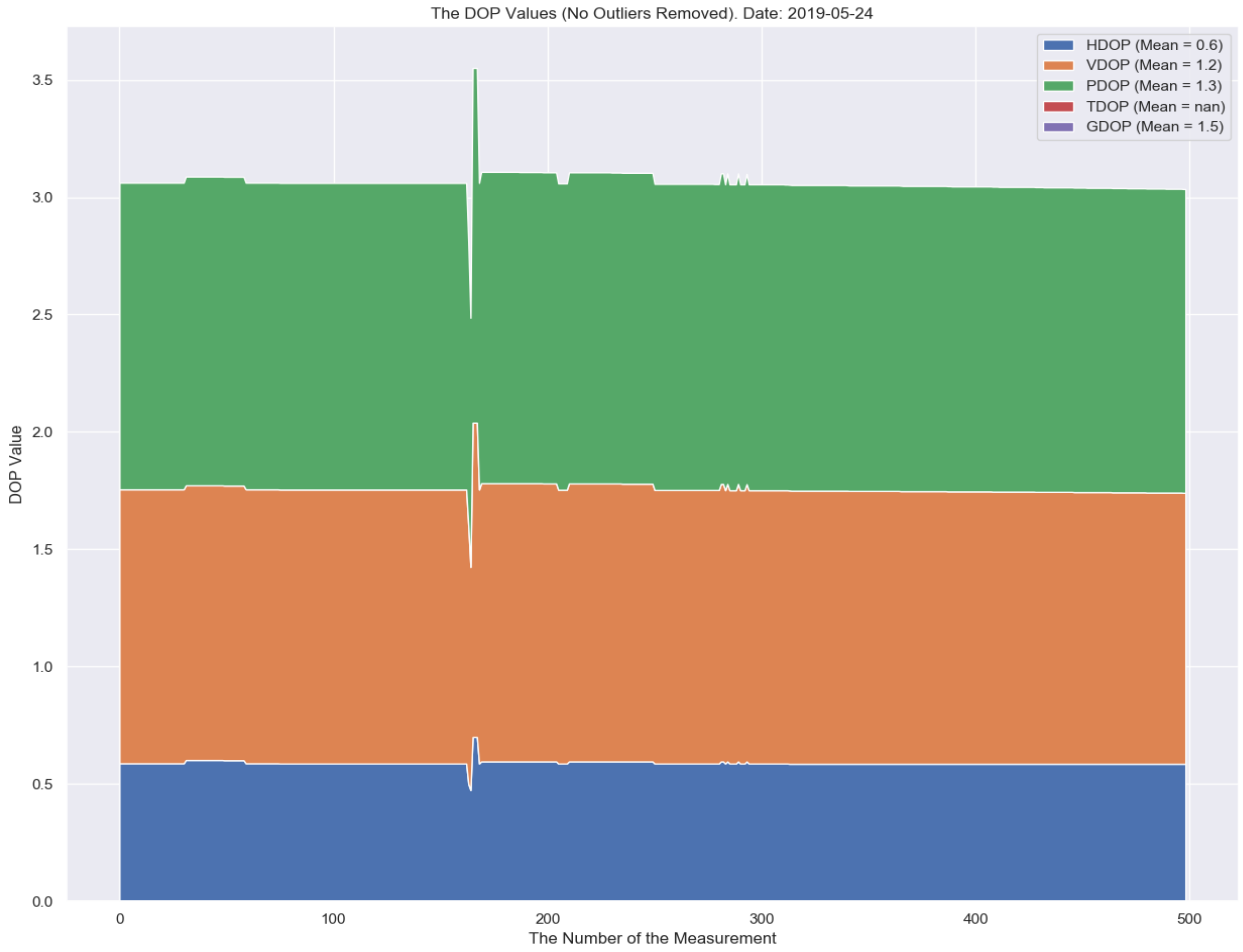
The Number of Satellites (No Outliers Removed)

METHOD1



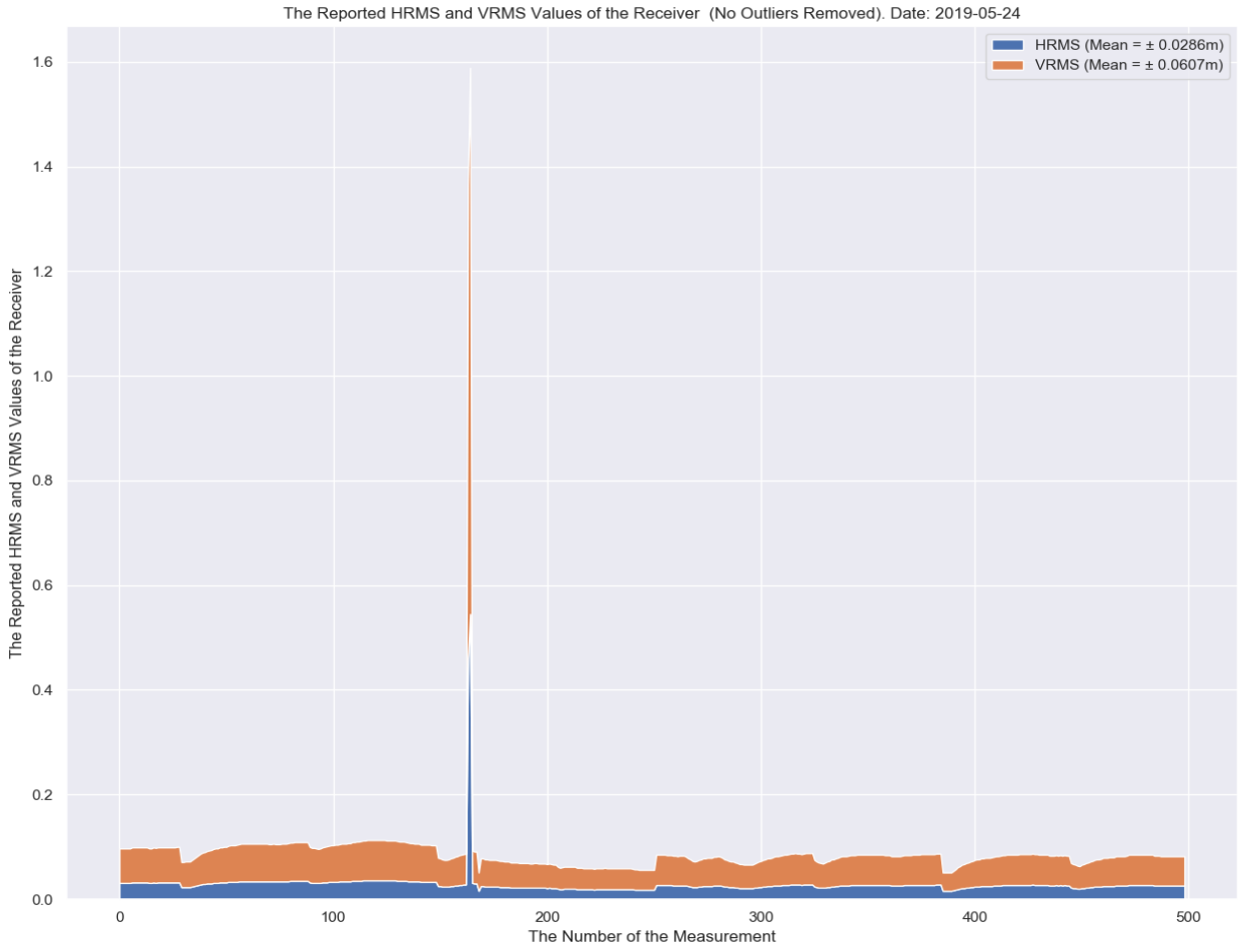
The DOP Values (No Outliers Removed)

METHOD1



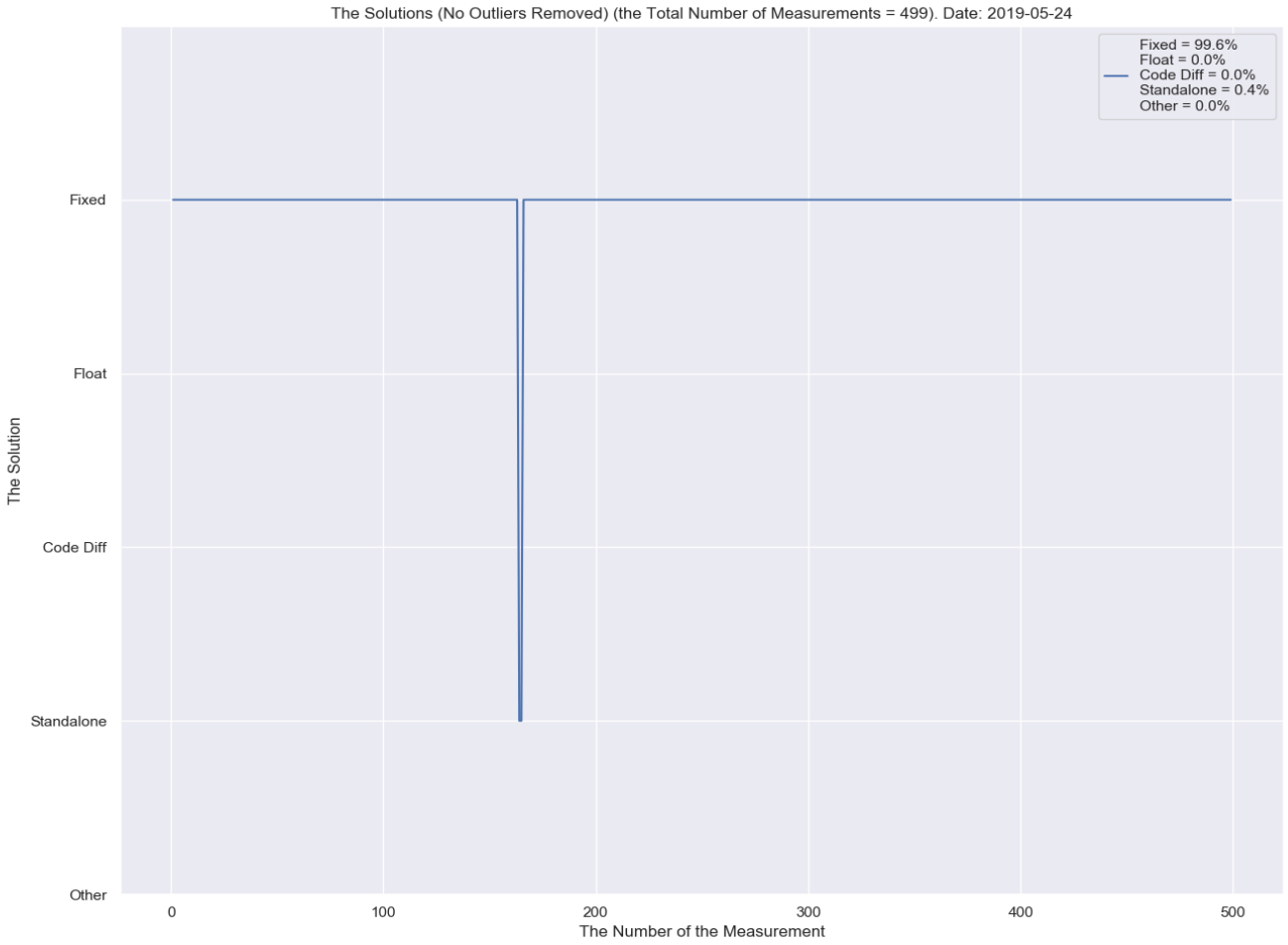
The Reported HRMS and VRMS Values of the Receiver (No Outliers Removed)

METHOD1



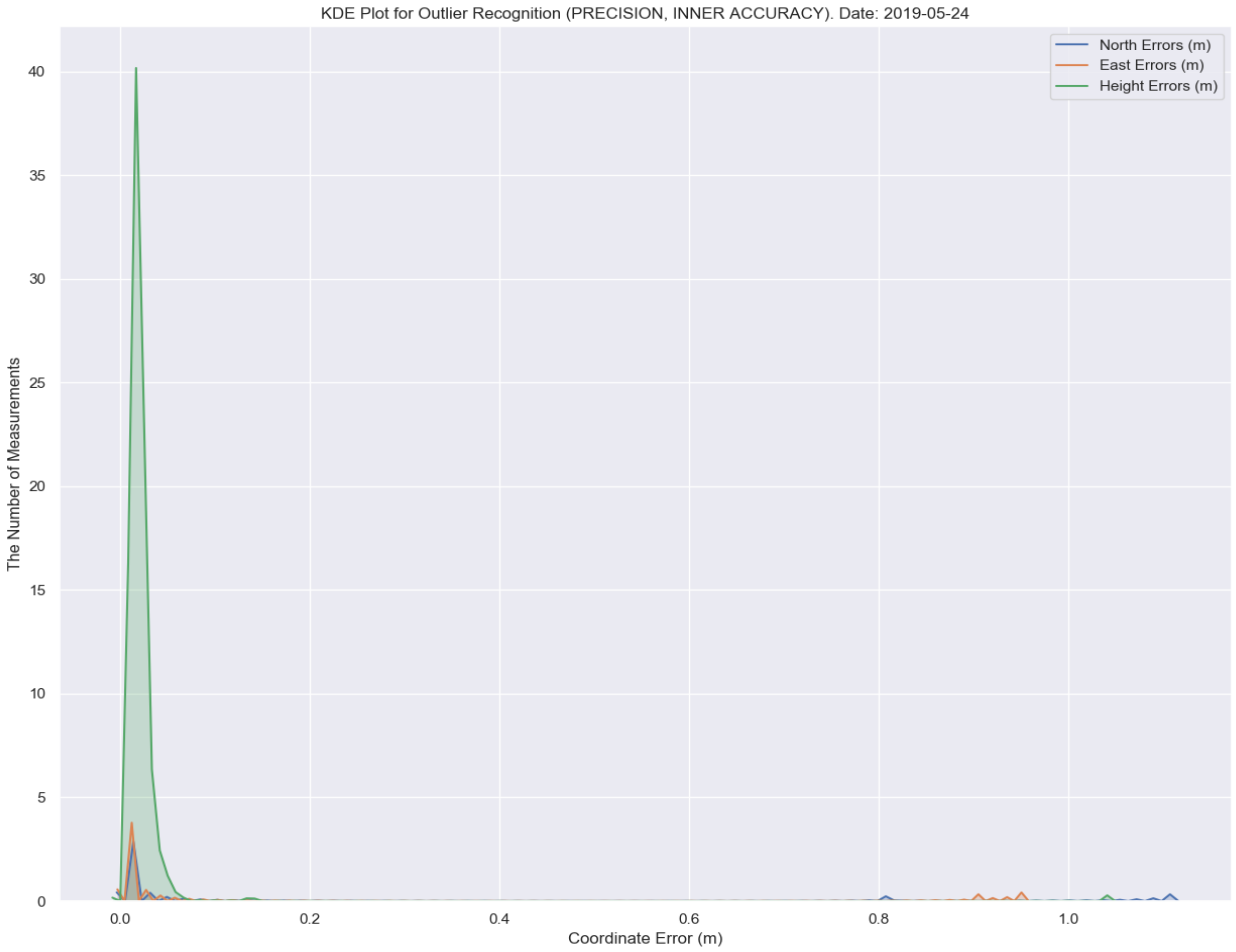
The Solutions (No Outliers Removed)

METHOD1



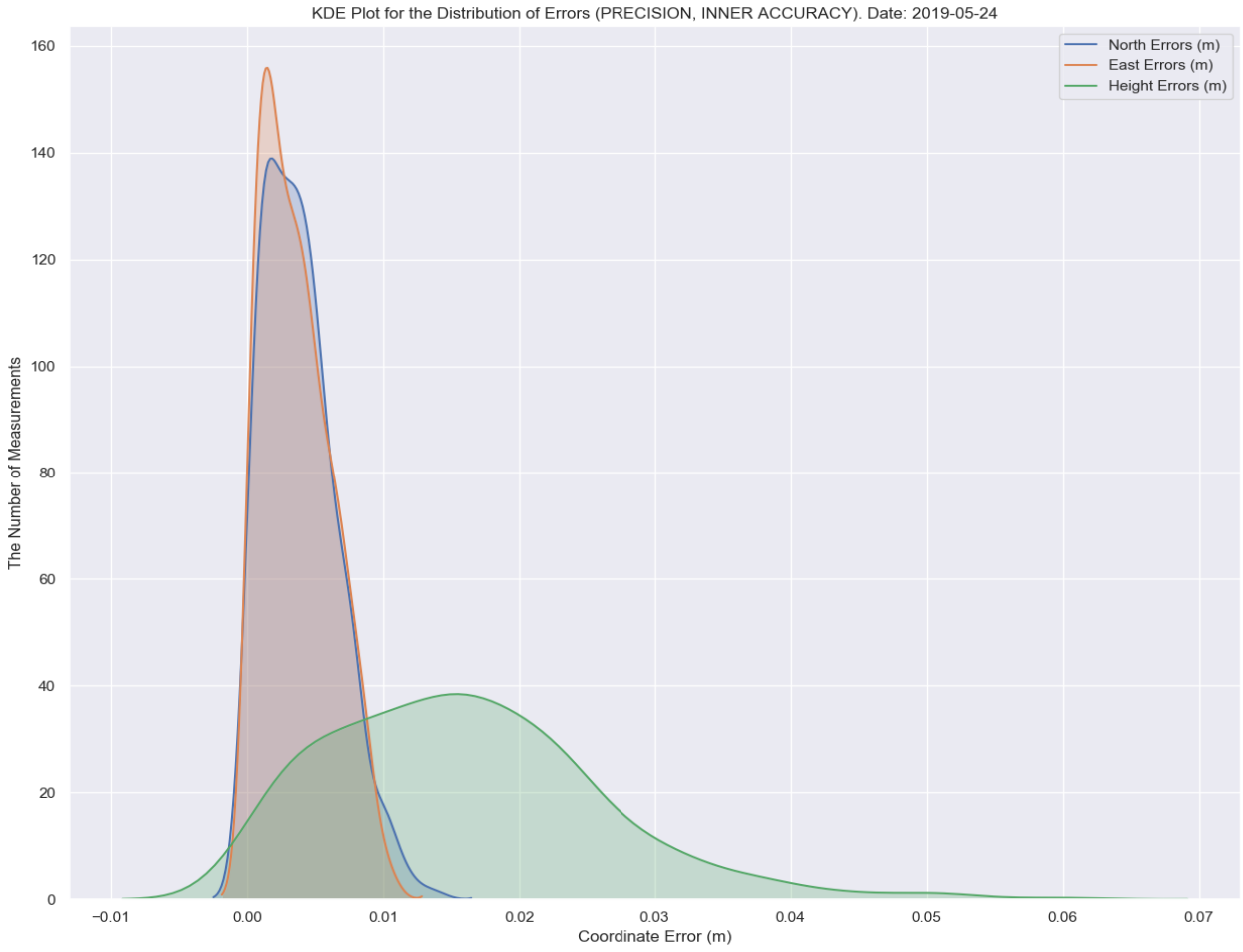
KDE Plot for Outlier Recognition (PRECISION, INNER ACCURACY)

METHOD1



KDE Plot for the Distribution of Errors (PRECISION, INNER ACCURACY)

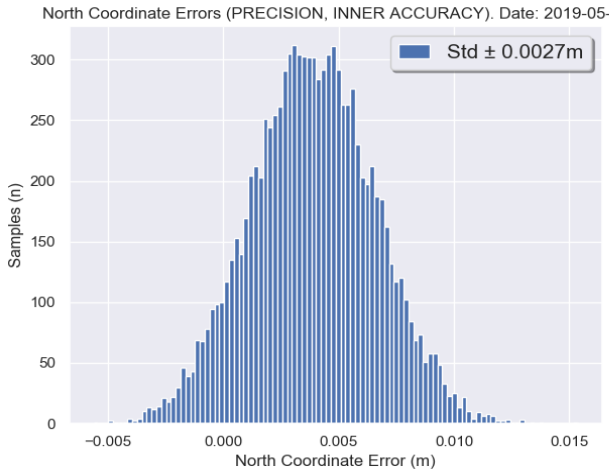
METHOD1

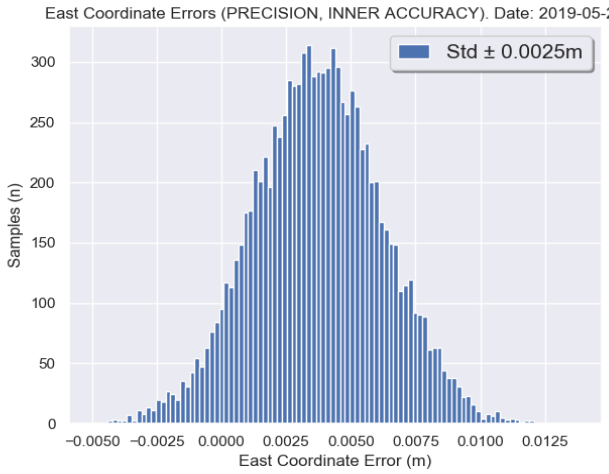


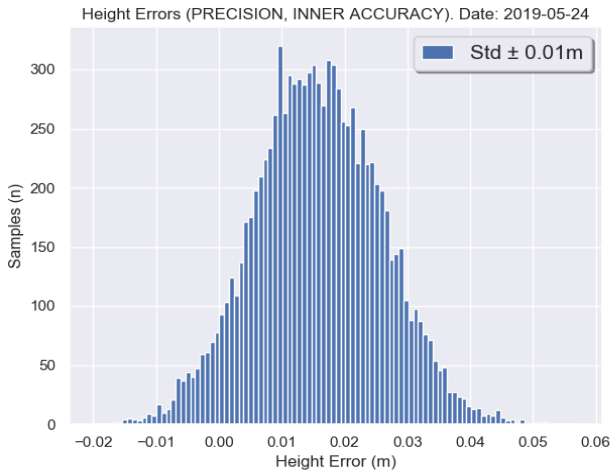
Gaussian Distribution Models for the Distributions of Errors
(PRECISION, INNER ACCURACY)

METHOD1

Gaussian Distribution Models for North and East Coordinate Errors, and Height Errors. Precision (Inner Accuracy):
User-Defined Sample Size (n): 10000

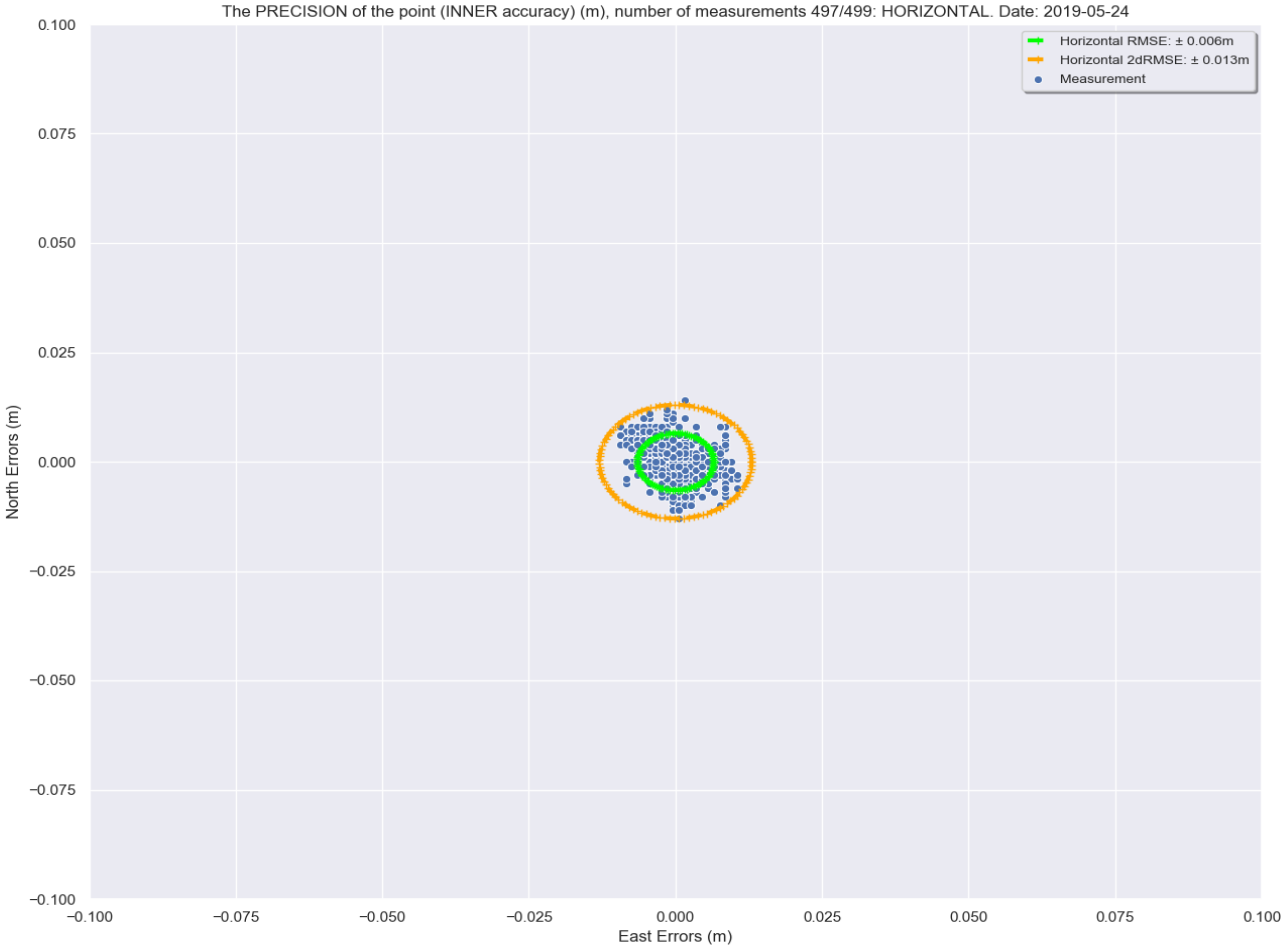






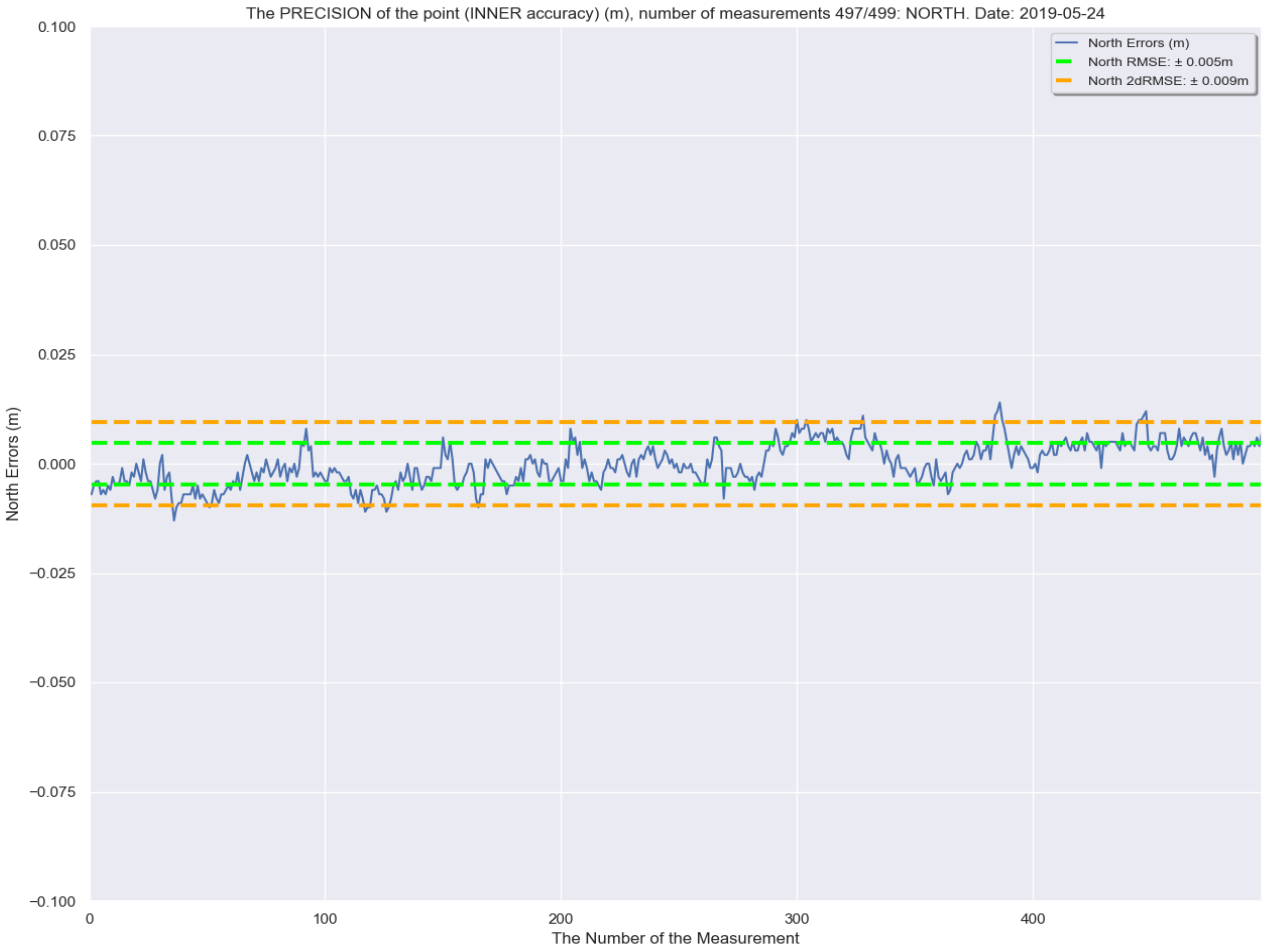
The PRECISION of the point (INNER accuracy) (m) HORIZONTAL

METHOD1



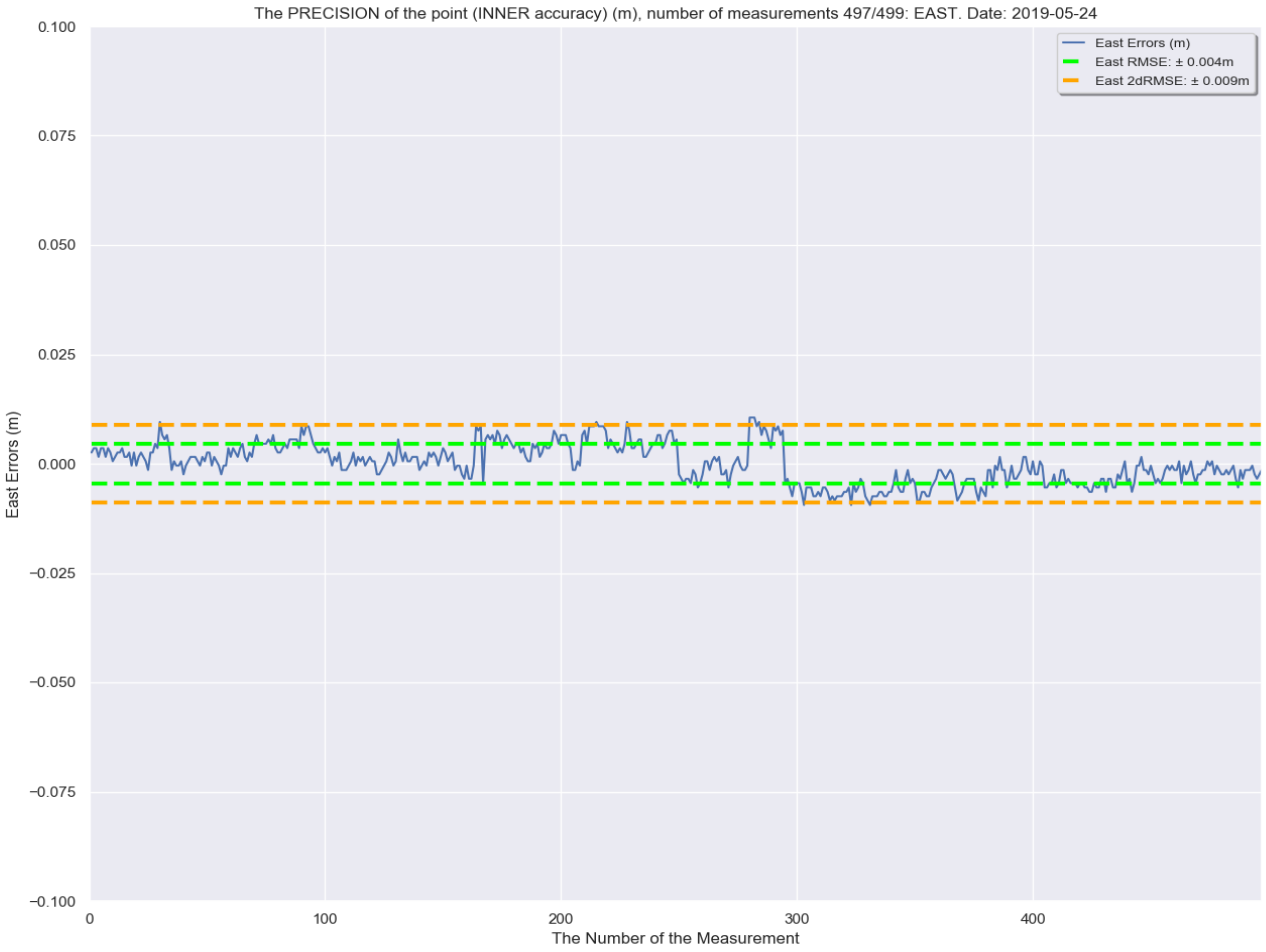
The PRECISION of the point (INNER accuracy) (m) NORTH

METHOD1



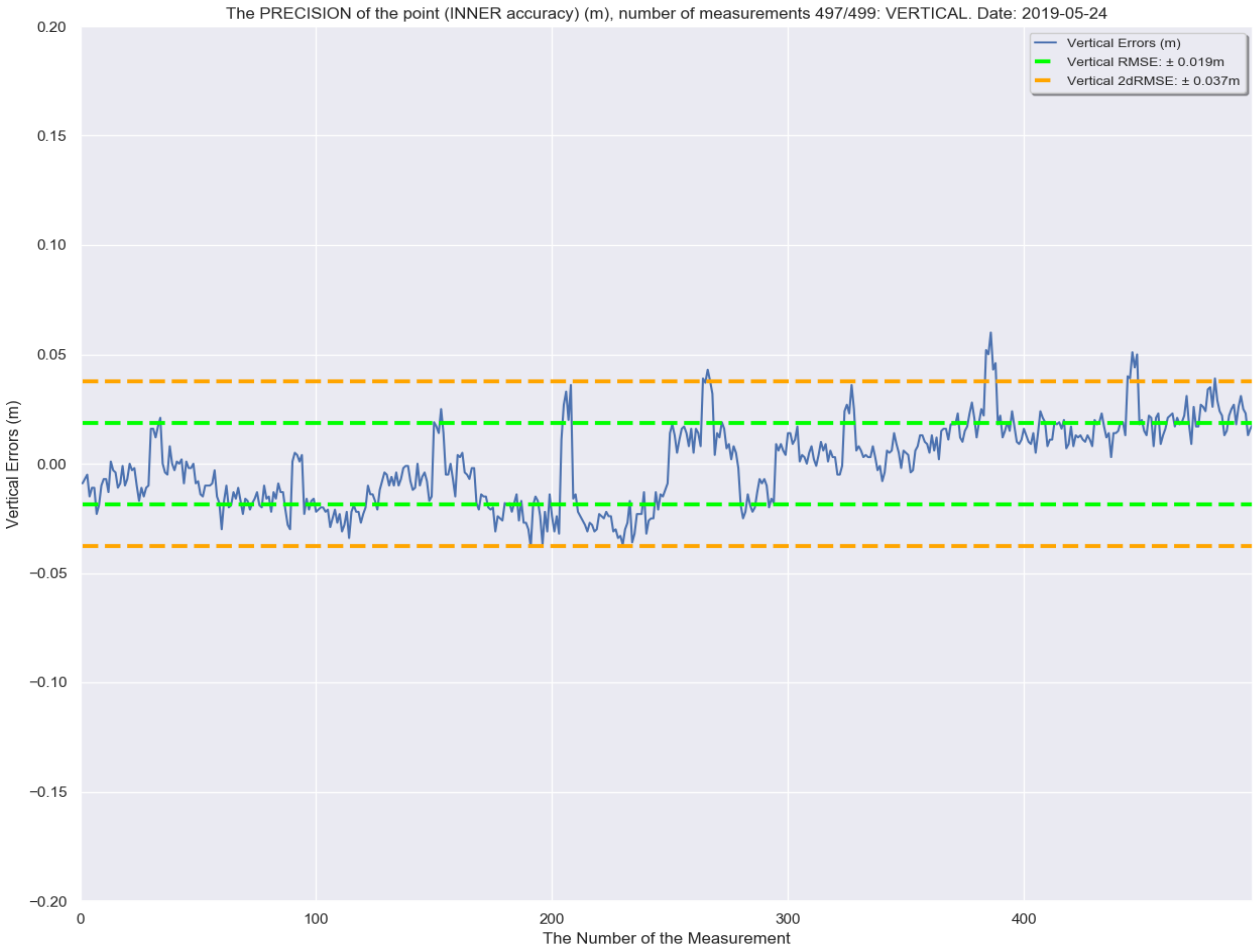
The PRECISION of the point (INNER accuracy) (m) EAST

METHOD1



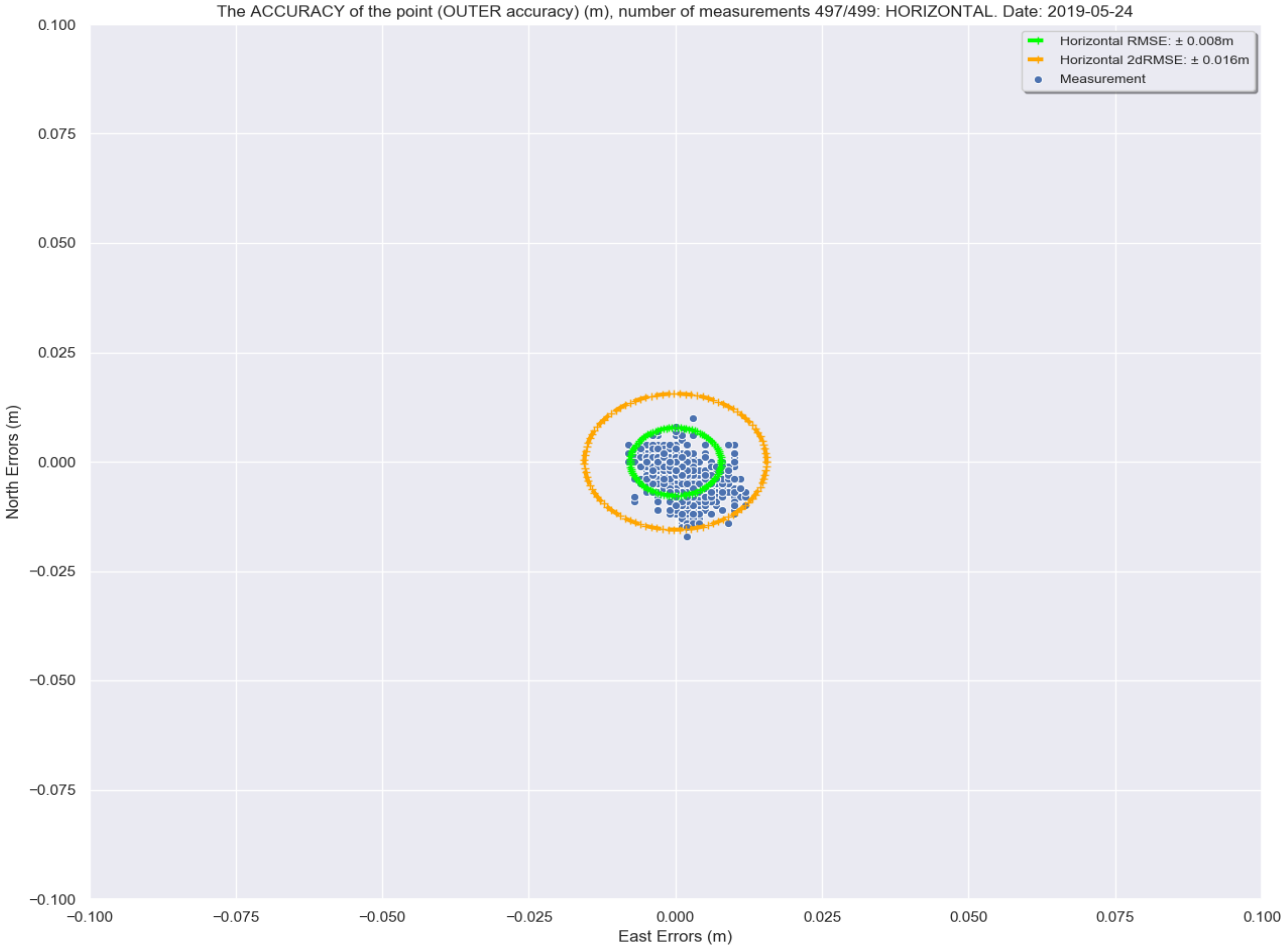
The PRECISION of the point (INNER accuracy) (m) VERTICAL

METHOD1



The ACCURACY of the point (OUTER accuracy) (m) HORIZONTAL

METHOD1

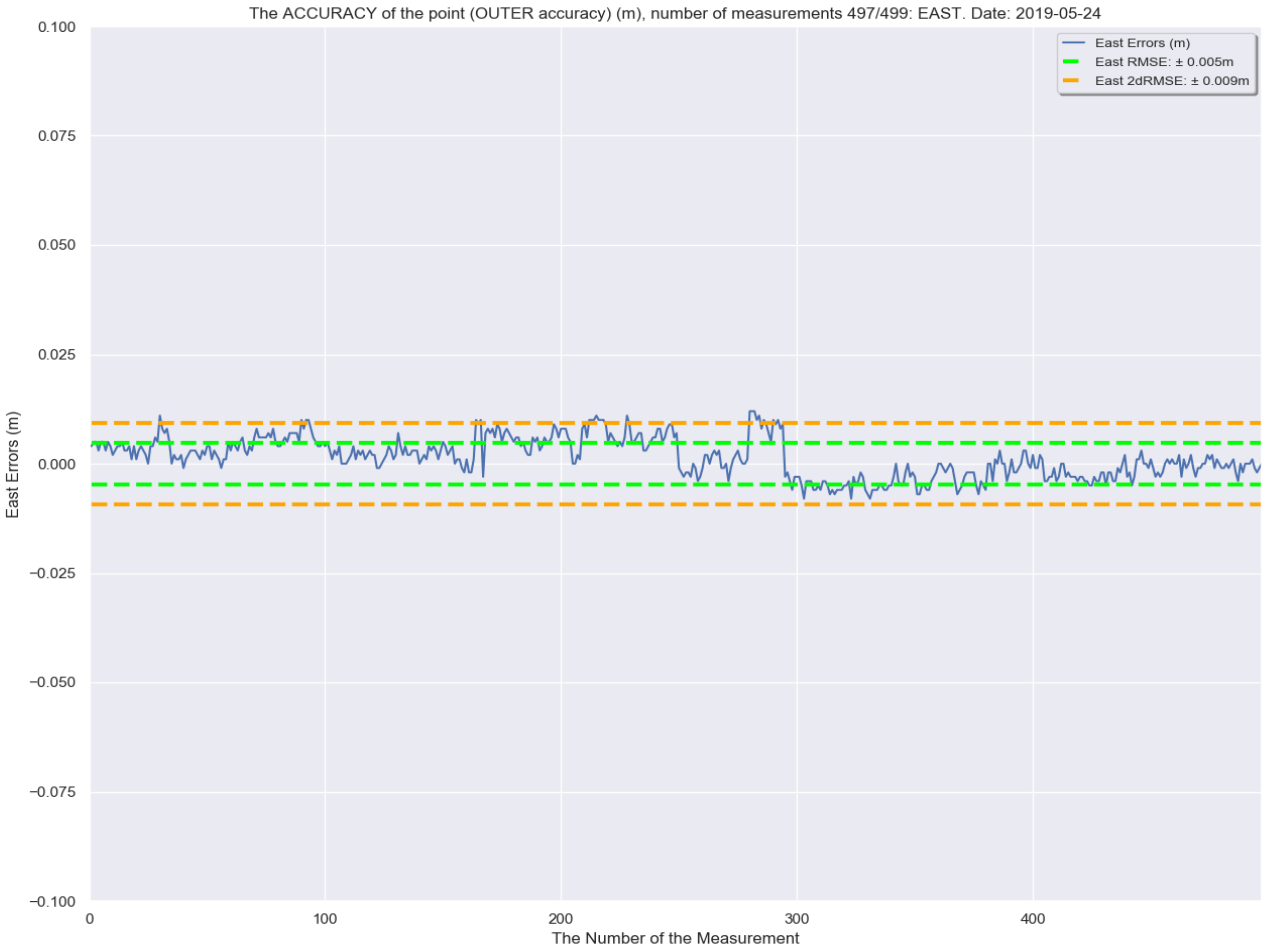


The ACCURACY of the point (OUTER accuracy) (m) NORTH

METHOD1

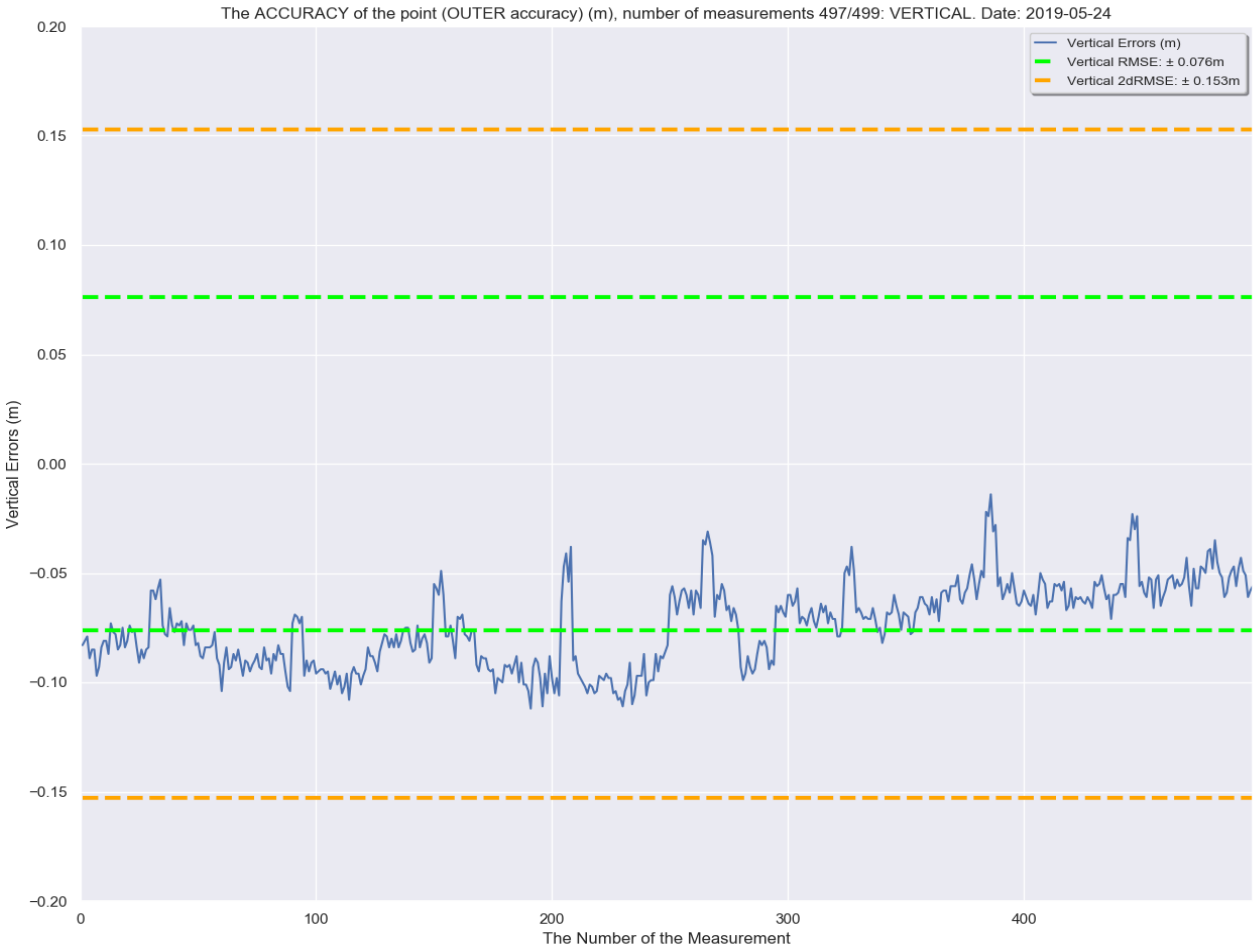
The ACCURACY of the point (OUTER accuracy) (m) EAST

METHOD1



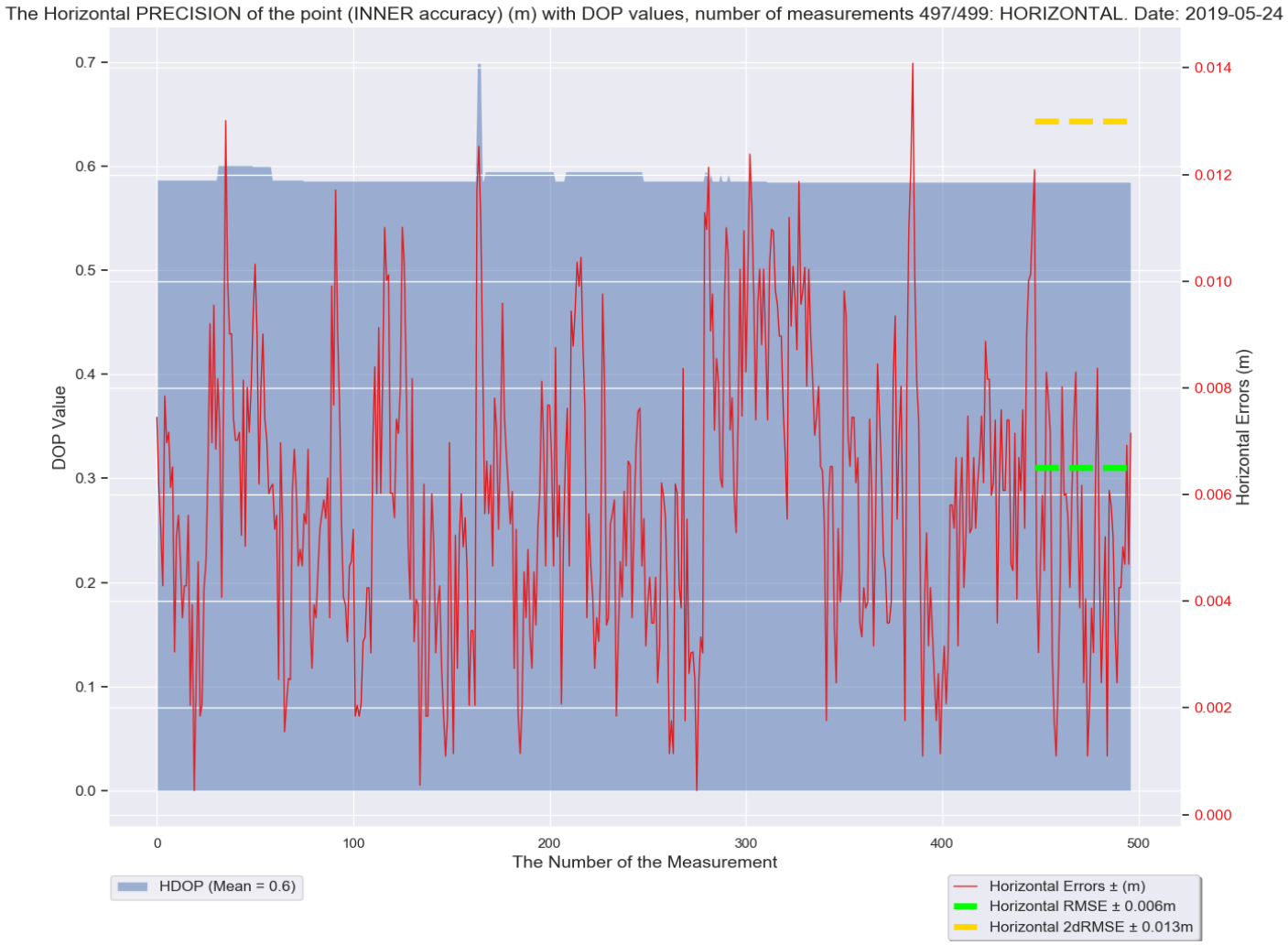
The ACCURACY of the point (OUTER accuracy) (m) VERTICAL

METHOD1



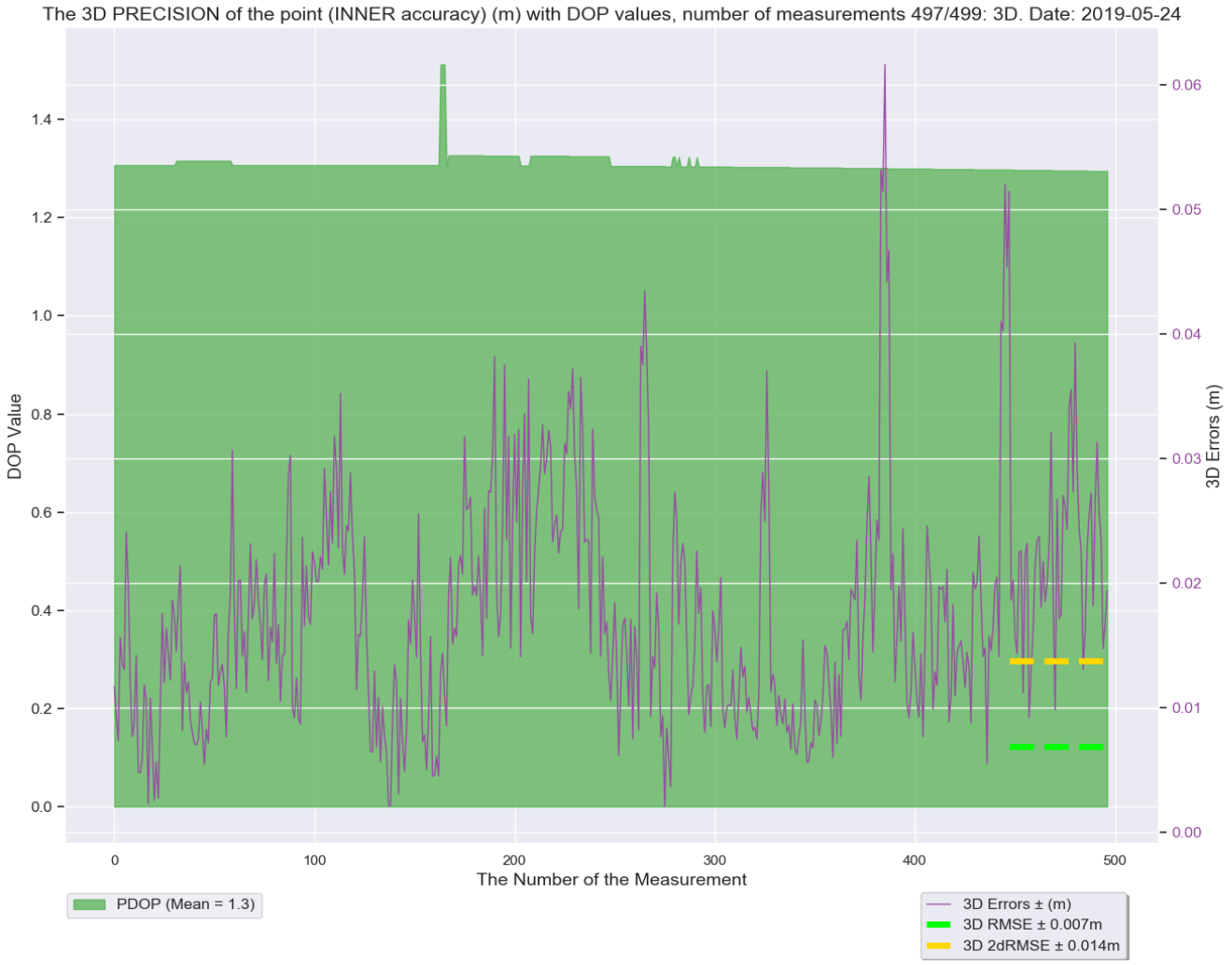
The Horizontal PRECISION of the point (INNER accuracy) (m) with DOP values

METHOD1



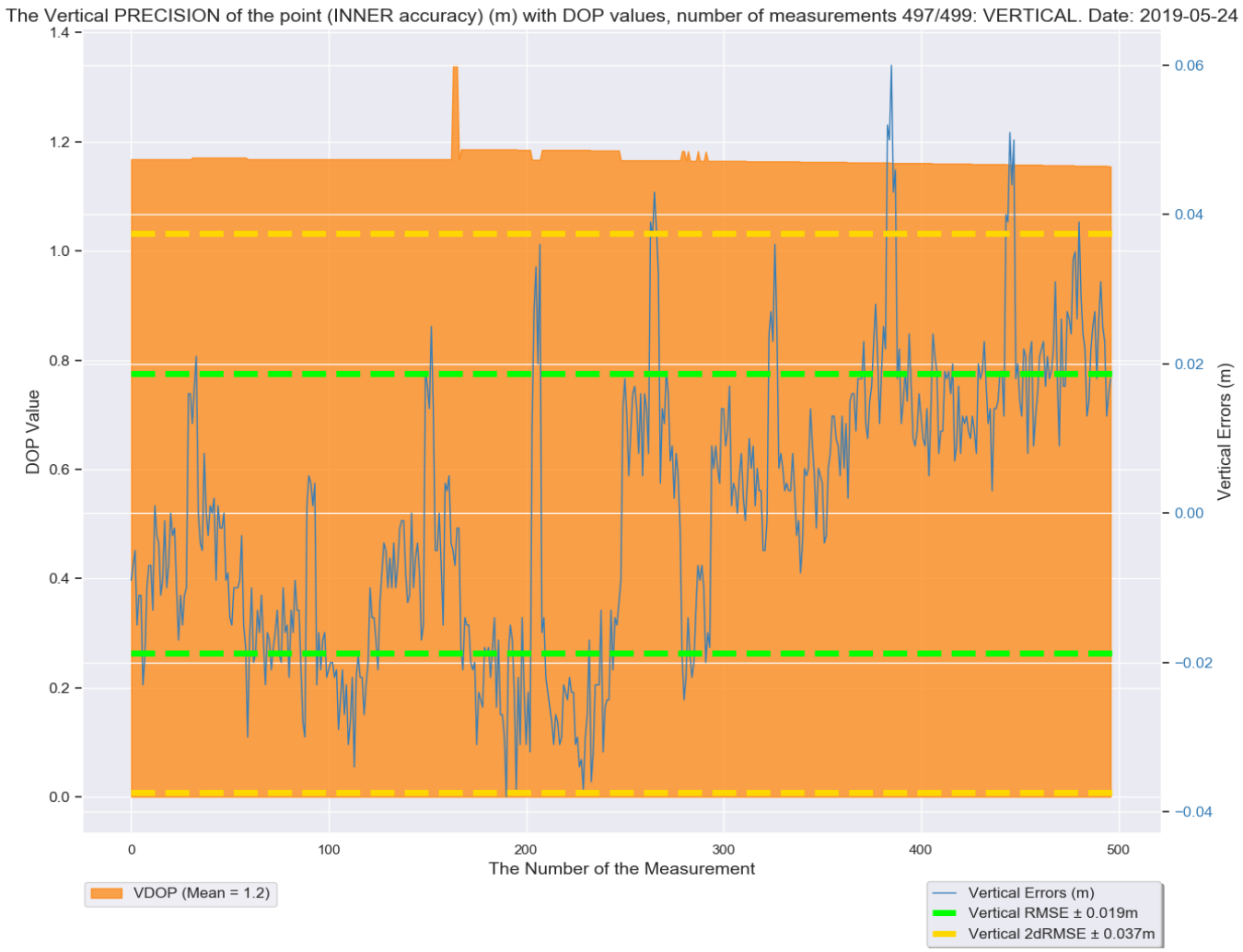
The 3D PRECISION of the point (INNER accuracy) (m) with DOP values

METHOD1



The Vertical PRECISION of the point (INNER accuracy) (m) with DOP values

METHOD1



Conclusions

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