

- !** **Important:** Click on the different icons for:
- ?** Help to analyze the results in the Quality Report
 - i** Additional information about the sections

💡 Click [here](#) for additional tips to analyze the Quality Report

Summary



Project	MMC-SVA Vuelos automaticos
Processed	2020-12-14 13:29:31
Camera Model Name(s)	L1D-20c_10.3_5472x3648 (RGB)
Average Ground Sampling Distance (GSD)	1.95 cm / 0.77 in

Quality Check



? Images	median of 27610 keypoints per image	✓
? Dataset	177 out of 177 images calibrated (100%), all images enabled	✓
? Camera Optimization	1.27% relative difference between initial and optimized internal camera parameters	✓
? Matching	median of 12826.4 matches per calibrated image	✓
? Georeferencing	yes, no 3D GCP	⚠

Calibration Details



Number of Calibrated Images	177 out of 177
Number of Geolocated Images	177 out of 177

? Initial Image Positions

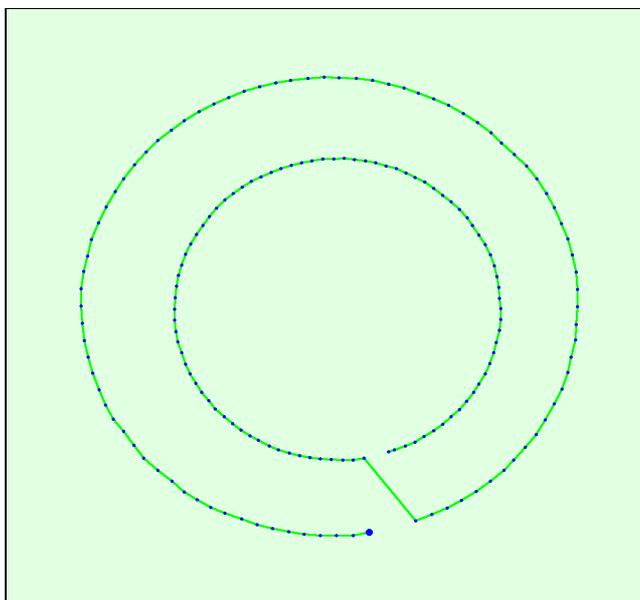
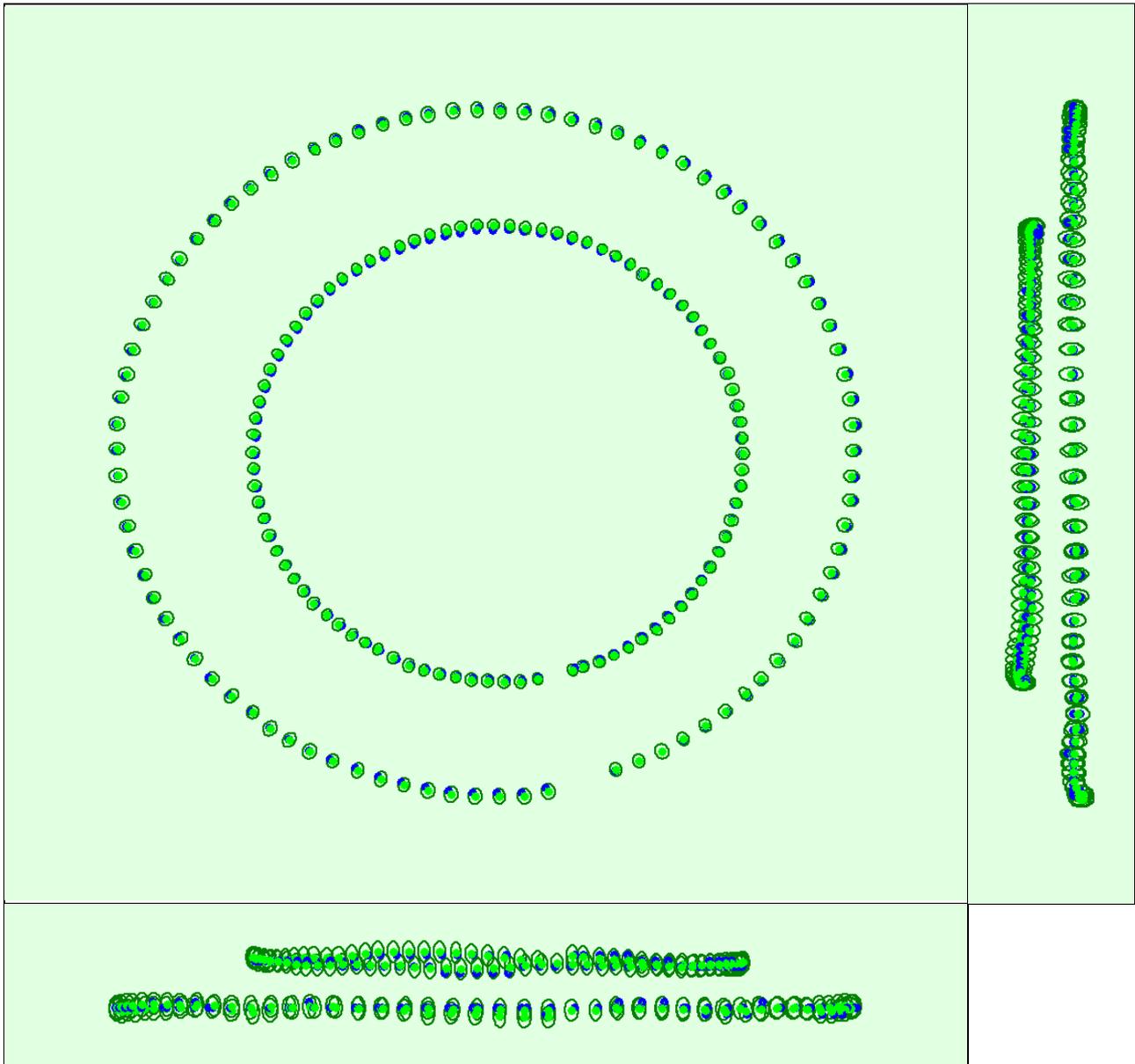


Figure 2: Top view of the initial image position. The green line follows the position of the images in time starting from the large blue dot.

Computed Image/GCPs/Manual Tie Points Positions



Uncertainty ellipses 10x magnified

Figure 3: Offset between initial (blue dots) and computed (green dots) image positions as well as the offset between the GCPs initial positions (blue crosses) and their computed positions (green crosses) in the top-view (XY plane), front-view (XZ plane), and side-view (YZ plane). Dark green ellipses indicate the absolute position uncertainty of the bundle block adjustment result.

Absolute camera position and orientation uncertainties



	X[m]	Y[m]	Z[m]	Omega [degree]	Phi [degree]	Kappa [degree]	Camera Displacement X[m]	Camera Displacement Y[m]	Camera Displacement Z[m]
Mean	0.110	0.110	0.182	0.088	0.068	0.092	0.003	0.003	0.004
Sigma	0.012	0.010	0.006	0.016	0.009	0.027	0.001	0.001	0.001

Bundle Block Adjustment Details



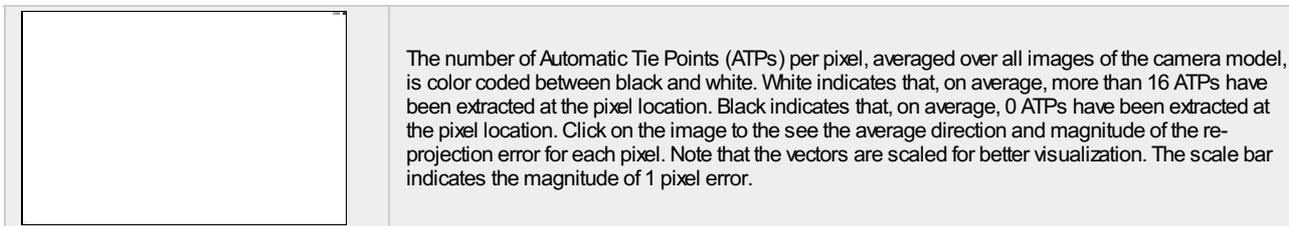
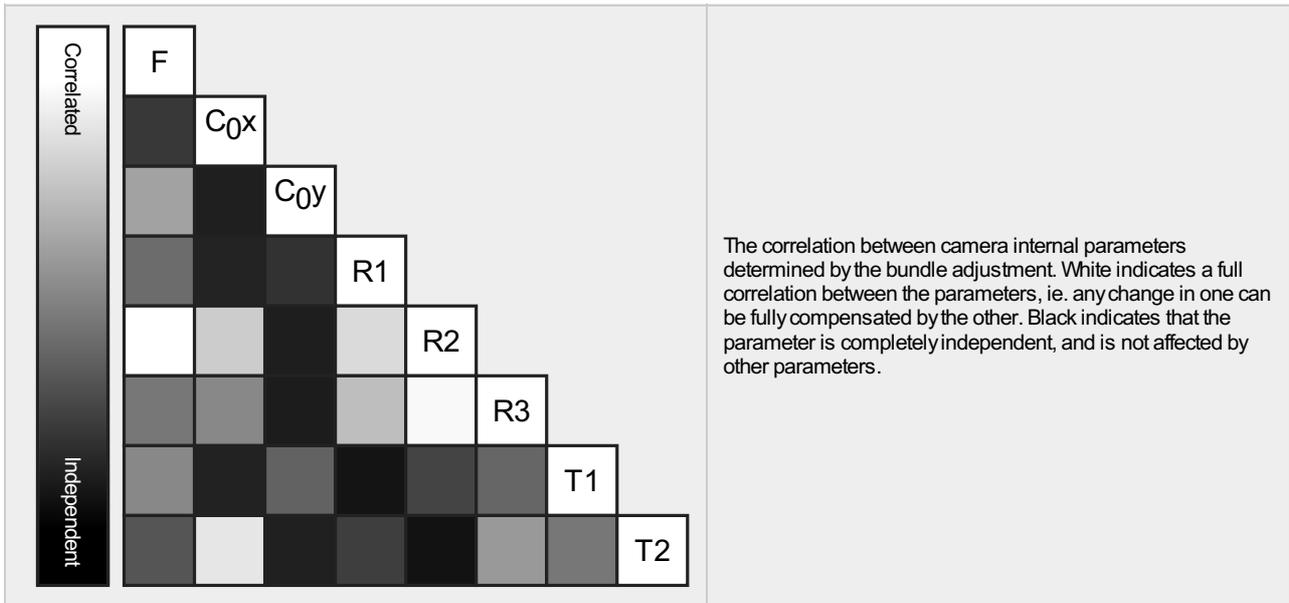
Number of 2D Keypoint Observations for Bundle Block Adjustment	2268937
Number of 3D Points for Bundle Block Adjustment	691223
Mean Reprojection Error [pixels]	0.262

Internal Camera Parameters

L1D-20c_10.3_5472x3648 (RGB). Sensor Dimensions: 12.825 [mm] x 8.550 [mm]

EXIF ID: L1D-20c_10.3_5472x3648

	Focal Length	Principal Point x	Principal Point y	R1	R2	R3	T1	T2
Initial Values	4470.830 [pixel] 10.479 [mm]	2736.000 [pixel] 6.412 [mm]	1824.000 [pixel] 4.275 [mm]	0.009	0.040	-0.050	-0.003	0.002
Optimized Values	4413.660 [pixel] 10.345 [mm]	2733.641 [pixel] 6.407 [mm]	1712.049 [pixel] 4.013 [mm]	-0.009	0.015	-0.023	-0.003	-0.000
Uncertainties (Sigma)	0.752 [pixel] 0.002 [mm]	0.166 [pixel] 0.000 [mm]	0.632 [pixel] 0.001 [mm]	0.000	0.001	0.001	0.000	0.000



2D Keypoints Table

	Number of 2D Keypoints per Image	Number of Matched 2D Keypoints per Image
Median	27610	12826
Mn	21084	9824
Max	34199	15744
Mean	27754	12819

3D Points from 2D Keypoint Matches

	Number of 3D Points Observed
In 2 Images	419872
In 3 Images	118861
In 4 Images	53098
In 5 Images	29227
In 6 Images	18108
In 7 Images	12043
In 8 Images	8633
In 9 Images	6289

In 10 Images	4685
In 11 Images	3652
In 12 Images	2780
In 13 Images	2259
In 14 Images	1828
In 15 Images	1472
In 16 Images	1217
In 17 Images	1008
In 18 Images	823
In 19 Images	698
In 20 Images	565
In 21 Images	524
In 22 Images	431
In 23 Images	338
In 24 Images	336
In 25 Images	288
In 26 Images	270
In 27 Images	203
In 28 Images	189
In 29 Images	174
In 30 Images	138
In 31 Images	97
In 32 Images	106
In 33 Images	88
In 34 Images	80
In 35 Images	77
In 36 Images	77
In 37 Images	62
In 38 Images	59
In 39 Images	38
In 40 Images	45
In 41 Images	36
In 42 Images	39
In 43 Images	26
In 44 Images	34
In 45 Images	26
In 46 Images	24
In 47 Images	18
In 48 Images	23
In 49 Images	16
In 50 Images	26
In 51 Images	15
In 52 Images	12
In 53 Images	14
In 54 Images	16
In 55 Images	17
In 56 Images	8
In 57 Images	10
In 58 Images	6
In 59 Images	11
In 60 Images	1
In 61 Images	7
In 62 Images	5
In 63 Images	6
In 64 Images	4
In 65 Images	2
In 66 Images	5
In 67 Images	4
In 68 Images	5

In 69 Images	5
In 70 Images	1
In 71 Images	7
In 72 Images	3
In 73 Images	2
In 74 Images	7
In 75 Images	3
In 76 Images	4
In 77 Images	5
In 78 Images	2
In 79 Images	1
In 80 Images	1
In 81 Images	2
In 82 Images	1
In 83 Images	1
In 84 Images	2
In 85 Images	2
In 86 Images	2
In 89 Images	2
In 92 Images	1
In 95 Images	2
In 97 Images	2
In 99 Images	1
In 102 Images	1
In 104 Images	1
In 109 Images	1
In 110 Images	1
In 113 Images	1
In 115 Images	1
In 124 Images	1
In 127 Images	1
In 128 Images	1
In 130 Images	1

 **2D Keypoint Matches**



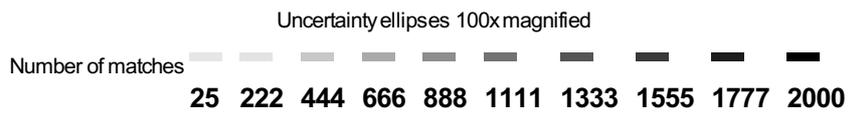
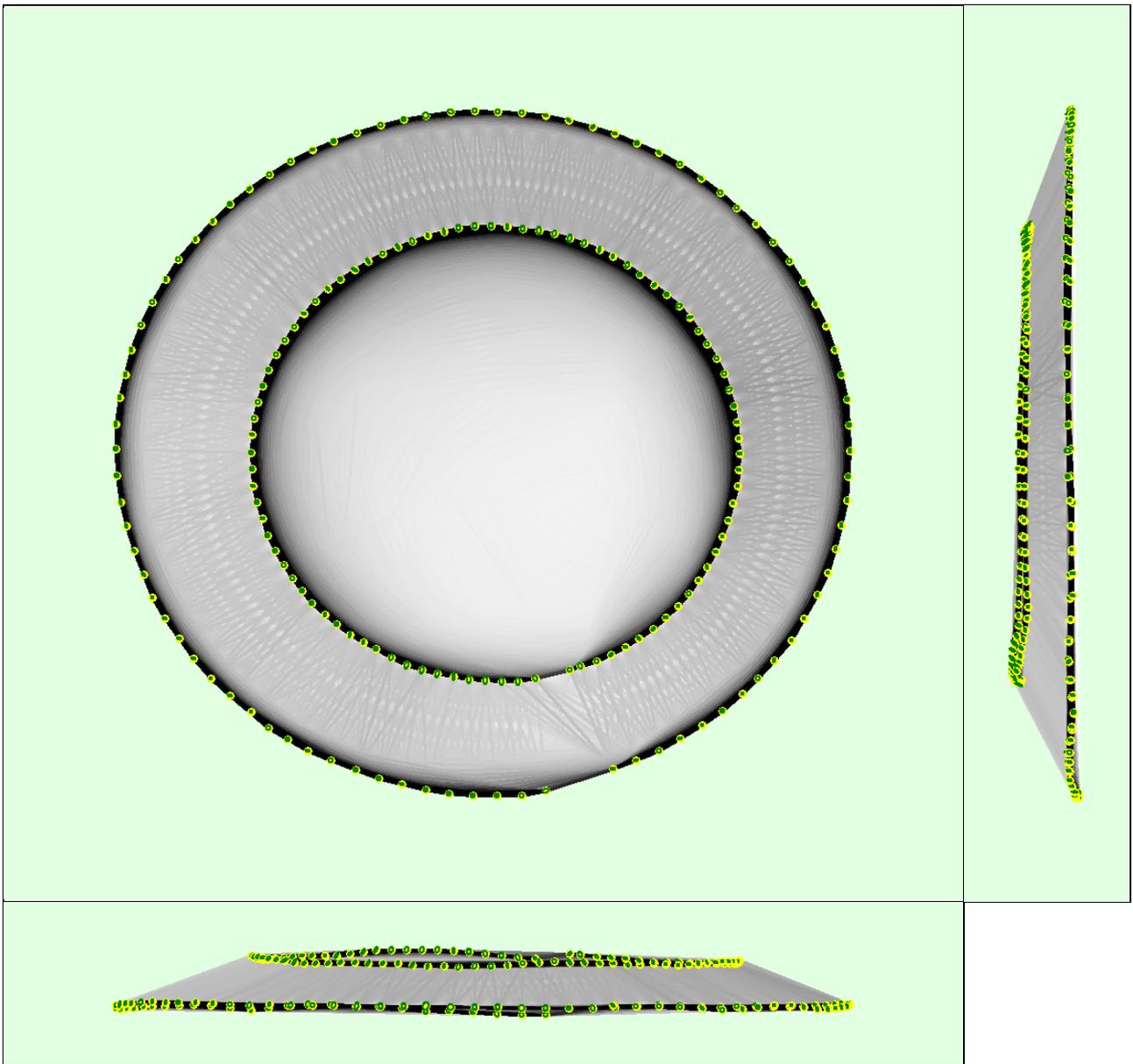


Figure 5: Computed image positions with links between matched images. The darkness of the links indicates the number of matched 2D keypoints between the images. Bright links indicate weak links and require manual tie points or more images. Dark green ellipses indicate the relative camera position uncertainty of the bundle block adjustment result.

Relative camera position and orientation uncertainties

	X[m]	Y[m]	Z[m]	Omega [degree]	Phi [degree]	Kappa [degree]	Camera Displacement X[m]	Camera Displacement Y[m]	Camera Displacement Z[m]
Mean	0.003	0.003	0.004	0.007	0.005	0.006	0.003	0.002	0.004
Sigma	0.000	0.001	0.001	0.002	0.002	0.003	0.001	0.001	0.001

Geolocation Details

Absolute Geolocation Variance

Mn Error [m]	Max Error [m]	Geolocation Error X[%]	Geolocation Error Y[%]	Geolocation Error Z[%]
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-	-15.00	0.00	0.00	0.00
-15.00	-12.00	0.00	0.00	0.00
-12.00	-9.00	0.00	0.00	0.00
-9.00	-6.00	0.00	0.00	0.00
-6.00	-3.00	0.00	0.00	0.00
-3.00	0.00	55.93	46.89	55.37
0.00	3.00	44.07	53.11	44.63
3.00	6.00	0.00	0.00	0.00
6.00	9.00	0.00	0.00	0.00
9.00	12.00	0.00	0.00	0.00
12.00	15.00	0.00	0.00	0.00
15.00	-	0.00	0.00	0.00
Mean [m]		0.000000	-0.000000	0.000000
Sigma [m]		0.297339	0.318675	0.461419
RMS Error [m]		0.297339	0.318675	0.461419

Min Error and Max Error represent geolocation error intervals between -1.5 and 1.5 times the maximum accuracy of all the images. Columns X, Y, Z show the percentage of images with geolocation errors within the predefined error intervals. The geolocation error is the difference between the initial and computed image positions. Note that the image geolocation errors do not correspond to the accuracy of the observed 3D points.

Relative Geolocation Variance

Relative Geolocation Error	Images X[%]	Images Y[%]	Images Z[%]
[-1.00, 1.00]	100.00	100.00	100.00
[-2.00, 2.00]	100.00	100.00	100.00
[-3.00, 3.00]	100.00	100.00	100.00
Mean of Geolocation Accuracy [m]	5.000000	5.000000	10.000000
Sigma of Geolocation Accuracy [m]	0.000000	0.000000	0.000000

Images X, Y, Z represent the percentage of images with a relative geolocation error in X, Y, Z.

Geolocation Orientational Variance	RMS [degree]
Omega	3.801
Phi	2.672
Kappa	4.804

Geolocation RMS error of the orientation angles given by the difference between the initial and computed image orientation angles.

Rolling Shutter Statistics

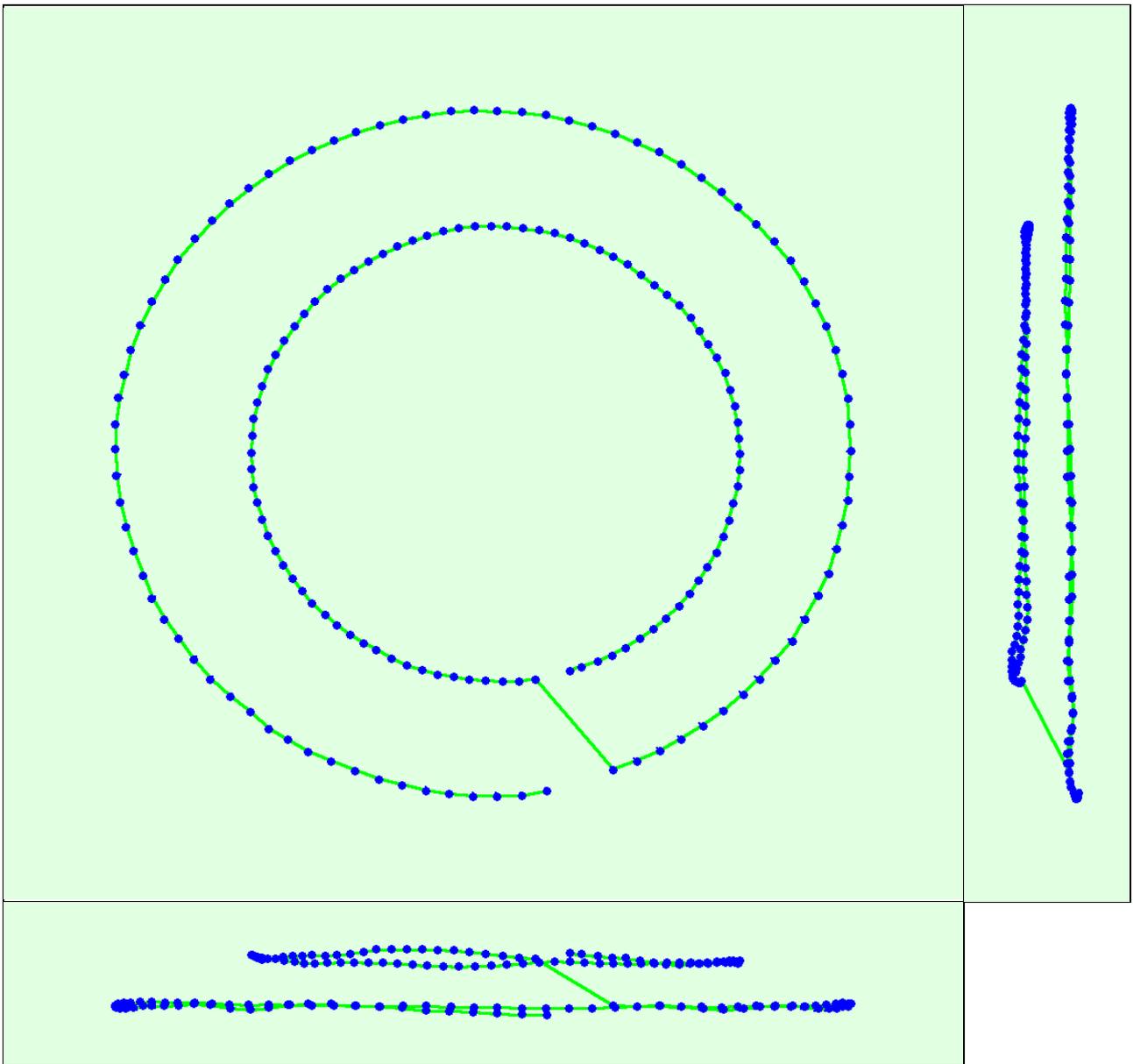


Figure 6: Camera movement estimated by the rolling shutter camera model. The green line follows the computed image positions. The blue dots represent the camera position at the start of the exposure. The blue lines represent the camera motion during the rolling shutter readout, re-scaled by a project dependant scaling factor for better visibility.

Median Camera Speed	1.4758 [m/s]
Median Camera Displacement During Sensor Readout)	0.2852 [m]
Median Rolling Shutter Readout Time	170.517 [ms]

Initial Processing Details

System Information

Hardware	CPU: Intel(R) Core(TM) i5-9500 CPU @ 3.00GHz RAM: 16GB GPU: Intel(R) UHD Graphics 630 (Driver: 26.20.100.7755)
Operating System	Windows 10 Pro, 64-bit

Coordinate Systems

Image Coordinate System	WGS 84 (EGM96 Geoid)
Output Coordinate System	WGS 84 / UTMzone 21S (EGM96 Geoid)

Processing Options



Detected Template	No Template Available
Keypoints Image Scale	Full, Image Scale: 1
Advanced: Matching Image Pairs	Free Flight or Terrestrial
Advanced: Matching Strategy	Use Geometrically Verified Matching: no
Advanced: Keypoint Extraction	Targeted Number of Keypoints: Automatic
Advanced: Calibration	Calibration Method: Standard Internal Parameters Optimization: All External Parameters Optimization: All Rematch: Auto, yes

Point Cloud Densification details



Processing Options



Image Scale	1/2 (Half image size, Default)
Point Density	Optimal
Minimum Number of Matches	3
3D Textured Mesh Generation	yes
3D Textured Mesh Settings:	Resolution: Medium Resolution (default) Color Balancing: no
LOD	Generated: no
Advanced: 3D Textured Mesh Settings	Sample Density Divider: 1
Advanced: Image Groups	group1
Advanced: Use Processing Area	yes
Advanced: Use Annotations	yes

Results



Number of Generated Tiles	1
Number of 3D Densified Points	7534845
Average Density (per m ³)	764.79