

Quality Report



Generated with Pix4Dmapper version 4.5.6



Important: Click on the different icons for:



Help to analyze the results in the Quality Report



Additional information about the sections



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

Summary



Project	ML_20200721 Doble grilla
Processed	2020-07-22 02:24:31
Camera Model Name(s)	FC220_4.7_4000x3000 (RGB)
Average Ground Sampling Distance (GSD)	1.41 cm / 0.55 in
Time for Initial Processing (without report)	10h:04m:44s

Quality Check



Images	median of 31794 keypoints per image	
Dataset	1123 out of 1123 images calibrated (100%), all images enabled	
Camera Optimization	1.83% relative difference between initial and optimized internal camera parameters	
Matching	median of 9283.29 matches per calibrated image	
Georeferencing	yes, no 3D GCP	

Calibration Details



Number of Calibrated Images	1123 out of 1123
Number of Geolocated Images	1123 out of 1123

Initial Image Positions

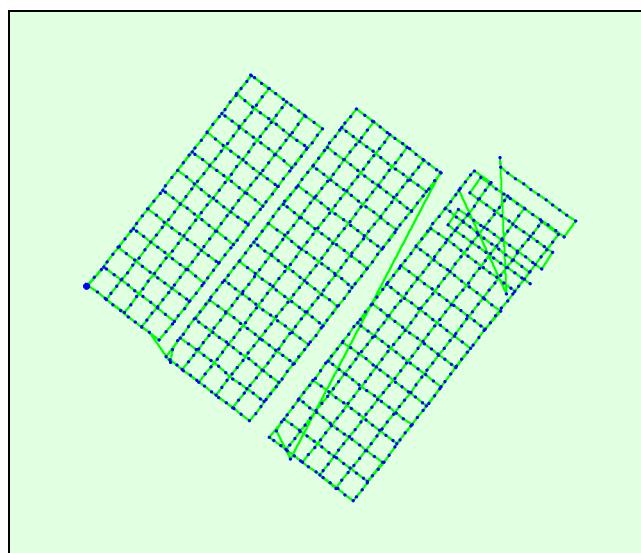
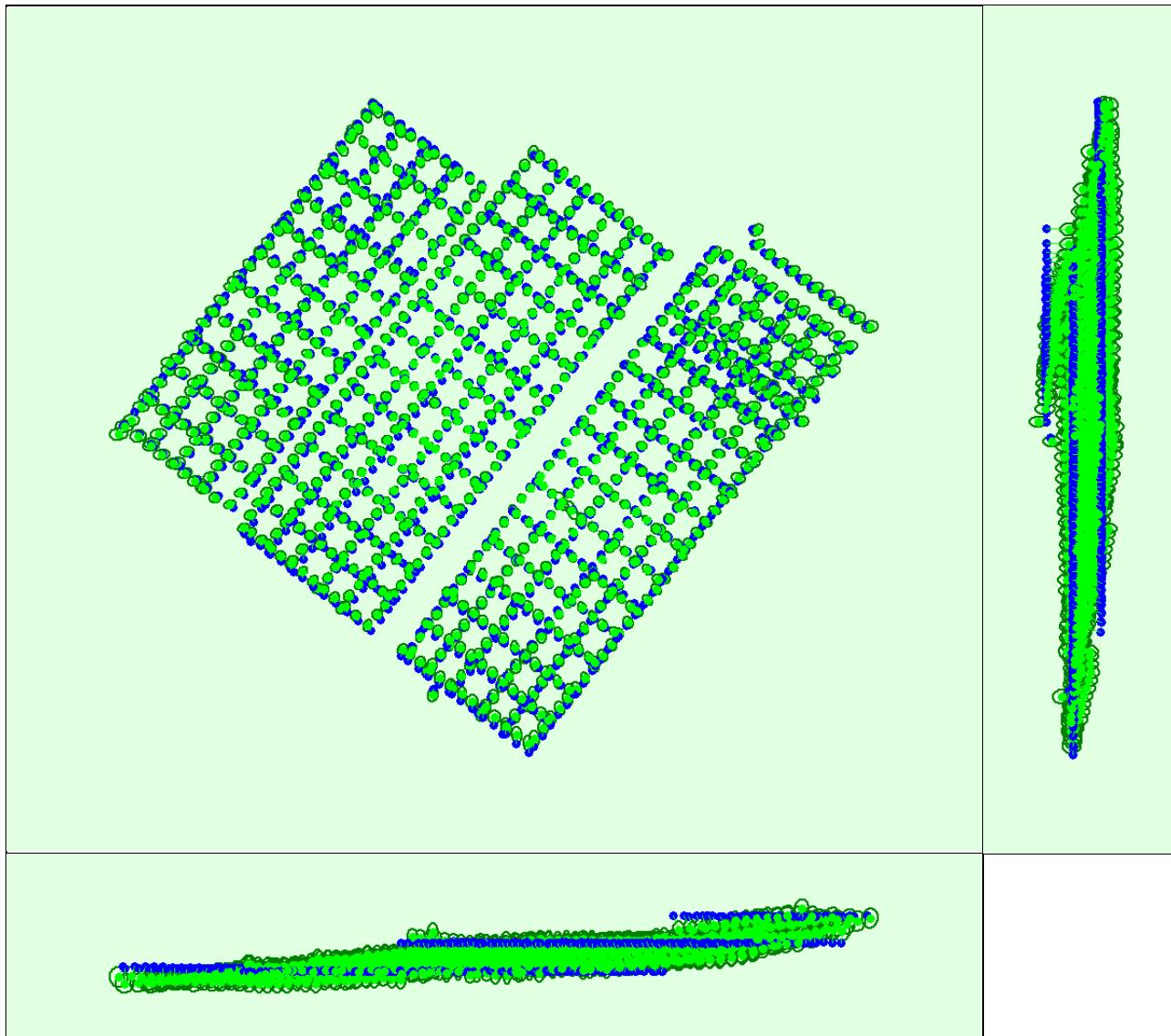


Figure 2: Top view of the initial image position. The green line follows the position of the images in time starting from the large blue dot.

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	0.086	0.083	0.140	0.080	0.050	0.066	0.004	0.004	0.007
Sigma	0.015	0.012	0.004	0.009	0.008	0.011	0.002	0.002	0.004

Bundle Block Adjustment Details



Number of 2D Keypoint Observations for Bundle Block Adjustment	10093465
Number of 3D Points for Bundle Block Adjustment	3167319
Mean Reprojection Error [pixels]	0.192

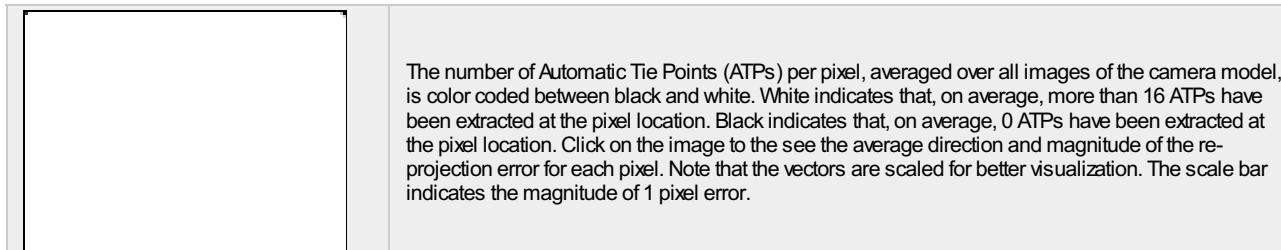
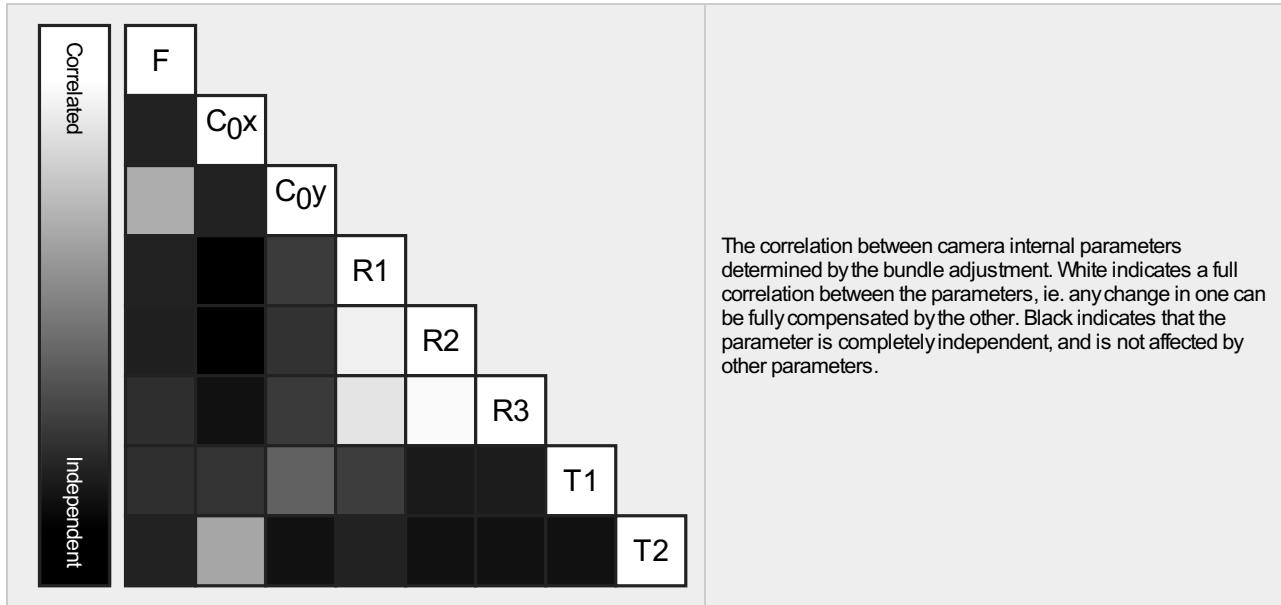
💡 Internal Camera Parameters

📝 FC220_4.7_4000x3000 (RGB). Sensor Dimensions: 6.327 [mm] x 4.745 [mm]



EXIF ID: FC220_4.7_4000x3000

	Focal Length	Principal Point x	Principal Point y	R1	R2	R3	T1	T2
Initial Values	3073.410 [pixel] 4.861 [mm]	1917.790 [pixel] 3.033 [mm]	1485.800 [pixel] 2.350 [mm]	0.033	-0.086	0.078	0.000	-0.001
Optimized Values	3016.991 [pixel] 4.772 [mm]	1987.046 [pixel] 3.143 [mm]	1520.633 [pixel] 2.405 [mm]	0.061	-0.156	0.146	0.000	0.000
Uncertainties (Sigma)	0.369 [pixel] 0.001 [mm]	0.231 [pixel] 0.000 [mm]	0.470 [pixel] 0.001 [mm]	0.000	0.000	0.000	0.000	0.000



💡 2D Keypoints Table



	Number of 2D Keypoints per Image	Number of Matched 2D Keypoints per Image
Median	31794	9283
Mn	17101	364
Max	54952	15462
Mean	32973	8988

💡 3D Points from 2D Keypoint Matches



	Number of 3D Points Observed
In 2 Images	1767970
In 3 Images	628568
In 4 Images	301709
In 5 Images	165459
In 6 Images	98052
In 7 Images	61792
In 8 Images	40757
In 9 Images	27696

In 10 Images	19478
In 11 Images	14063
In 12 Images	9733
In 13 Images	6893
In 14 Images	4837
In 15 Images	3721
In 16 Images	2953
In 17 Images	2240
In 18 Images	1822
In 19 Images	1526
In 20 Images	1242
In 21 Images	1022
In 22 Images	825
In 23 Images	718
In 24 Images	551
In 25 Images	526
In 26 Images	427
In 27 Images	328
In 28 Images	268
In 29 Images	219
In 30 Images	193
In 31 Images	168
In 32 Images	182
In 33 Images	154
In 34 Images	146
In 35 Images	118
In 36 Images	95
In 37 Images	95
In 38 Images	85
In 39 Images	76
In 40 Images	66
In 41 Images	66
In 42 Images	53
In 43 Images	44
In 44 Images	41
In 45 Images	37
In 46 Images	30
In 47 Images	25
In 48 Images	28
In 49 Images	24
In 50 Images	18
In 51 Images	24
In 52 Images	24
In 53 Images	15
In 54 Images	6
In 55 Images	12
In 56 Images	9
In 57 Images	9
In 58 Images	8
In 59 Images	2
In 60 Images	9
In 61 Images	4
In 62 Images	4
In 63 Images	3
In 64 Images	3
In 65 Images	6
In 66 Images	5
In 67 Images	4
In 68 Images	5

In 69 Images	2
In 70 Images	4
In 71 Images	3
In 72 Images	1
In 74 Images	2
In 75 Images	3
In 76 Images	3
In 77 Images	1
In 78 Images	1
In 79 Images	1
In 82 Images	2
In 83 Images	1
In 86 Images	1
In 88 Images	1
In 98 Images	1
In 149 Images	1

💡 2D Keypoint Matches

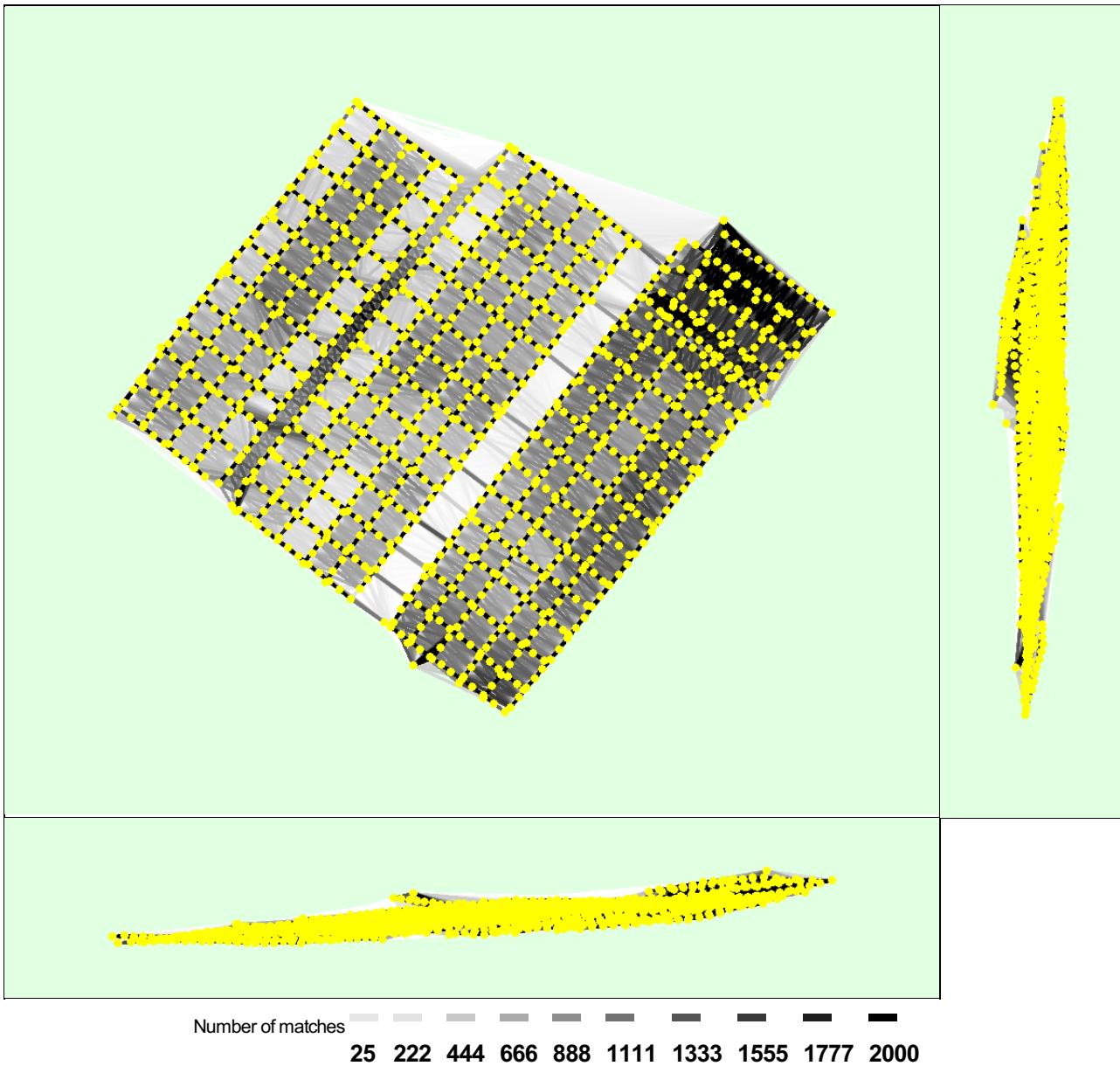


Figure 5: Computed image positions with links between matched images. The darkness of the links indicates the number of matched 2D keypoints between the images. Bright links indicate weak links and require manual tie points or more images.

Geolocation Details



⚠ Absolute Geolocation Variance



Mn Error [m]	Max Error [m]	Geolocation Error X[%]	Geolocation Error Y[%]	Geolocation Error Z[%]
-	-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	5.52
-3.00	0.00	49.96	46.84	42.74
0.00	3.00	50.04	53.16	48.35
3.00	6.00	0.00	0.00	3.38
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]		-0.000002	0.000001	0.000042
Sigma [m]		0.418735	0.592014	1.661694
RMS Error [m]		0.418735	0.592014	1.661694

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	5.338
Phi	5.555
Kappa	5.981

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

⚠ Rolling Shutter Statistics



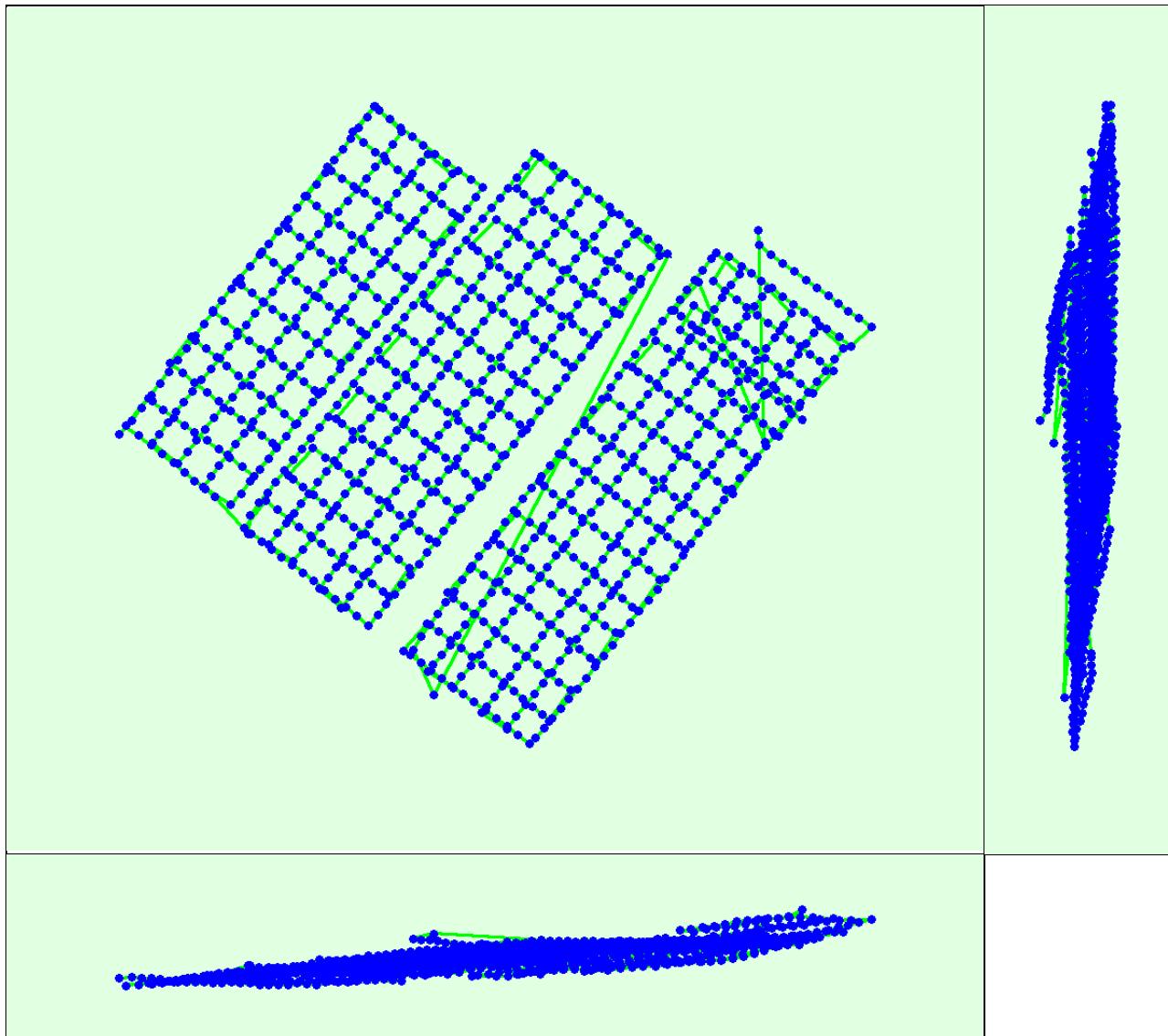


Figure 6: Camera movement estimated by the rolling shutter camera model. The green line follows the computed image positions. The blue dots represent the camera position at the start of the exposure. The blue lines represent the camera motion during the rolling shutter readout, re-scaled by a project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

Median Camera Speed	1.0558 [m/s]
Median Camera Displacement During Sensor Readout)	0.1018 [m]
Median Rolling Shutter Readout Time	107.6643 [ms]

Initial Processing Details

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System Information

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Hardware	CPU: Intel(R) Xeon(R) CPU E5-2630 v3 @ 2.40GHz RAM: 16GB GPU: RDPUDD Chained DD (Driver: unknown)
Operating System	Windows Server 2012 R2 Standard, 64-bit

Coordinate Systems

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

Processing Options

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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, no

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	no
LOD	Generated: no
Advanced: Image Groups	group1
Advanced: Use Processing Area	yes
Advanced: Use Annotations	yes
Time for Point Cloud Densification	05h:20m:57s
Time for Point Cloud Classification	NA
Time for 3D Textured Mesh Generation	NA

Results



Number of Processed Clusters	141
Number of Generated Tiles	4
Number of 3D Densified Points	43130806
Average Density (per m ³)	1134.25