

Quality Report



Generated with Pro version 2.1.39



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	fligth 4 pc
Processed	2016-04-02 19:18:41
Average Ground Sampling Distance (GSD)	20 cm / 7.87 in
Time for Initial Processing (without report)	02m:48s

Quality Check



Images	median of 3176 keypoints per image	
Dataset	89 out of 89 images calibrated (100%), all images enabled	
Camera Optimization	0.03% relative difference between initial and optimized internal camera parameters	
Matching	median of 1105.54 matches per calibrated image	
Georeferencing	yes, no 3D GCP	

Calibration Details



Number of Calibrated Images	89 out of 89
Number of Geolocated Images	89 out of 89



Initial Image Positions



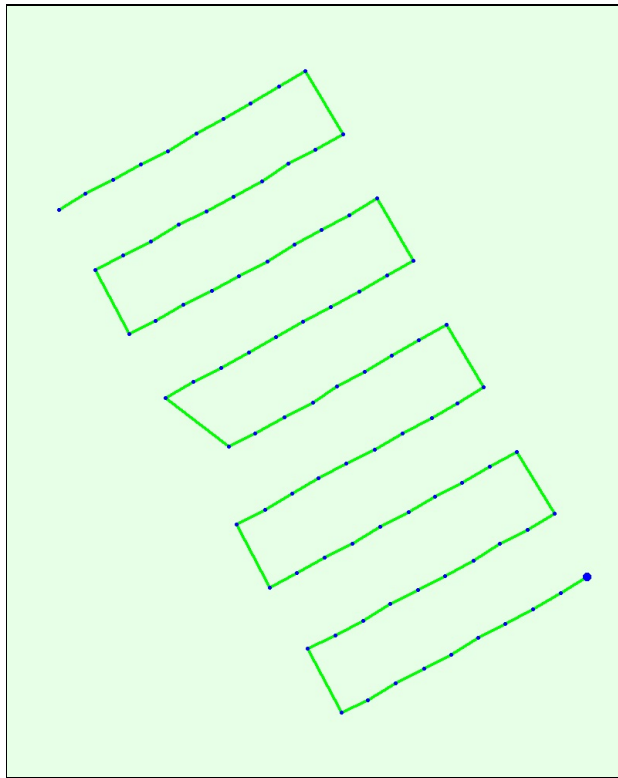


Figure 2: Top view of the initial image position. The green line follows the position of the images in time starting from the large blue dot.

? Computed Image/GCPs/Manual Tie Points Positions



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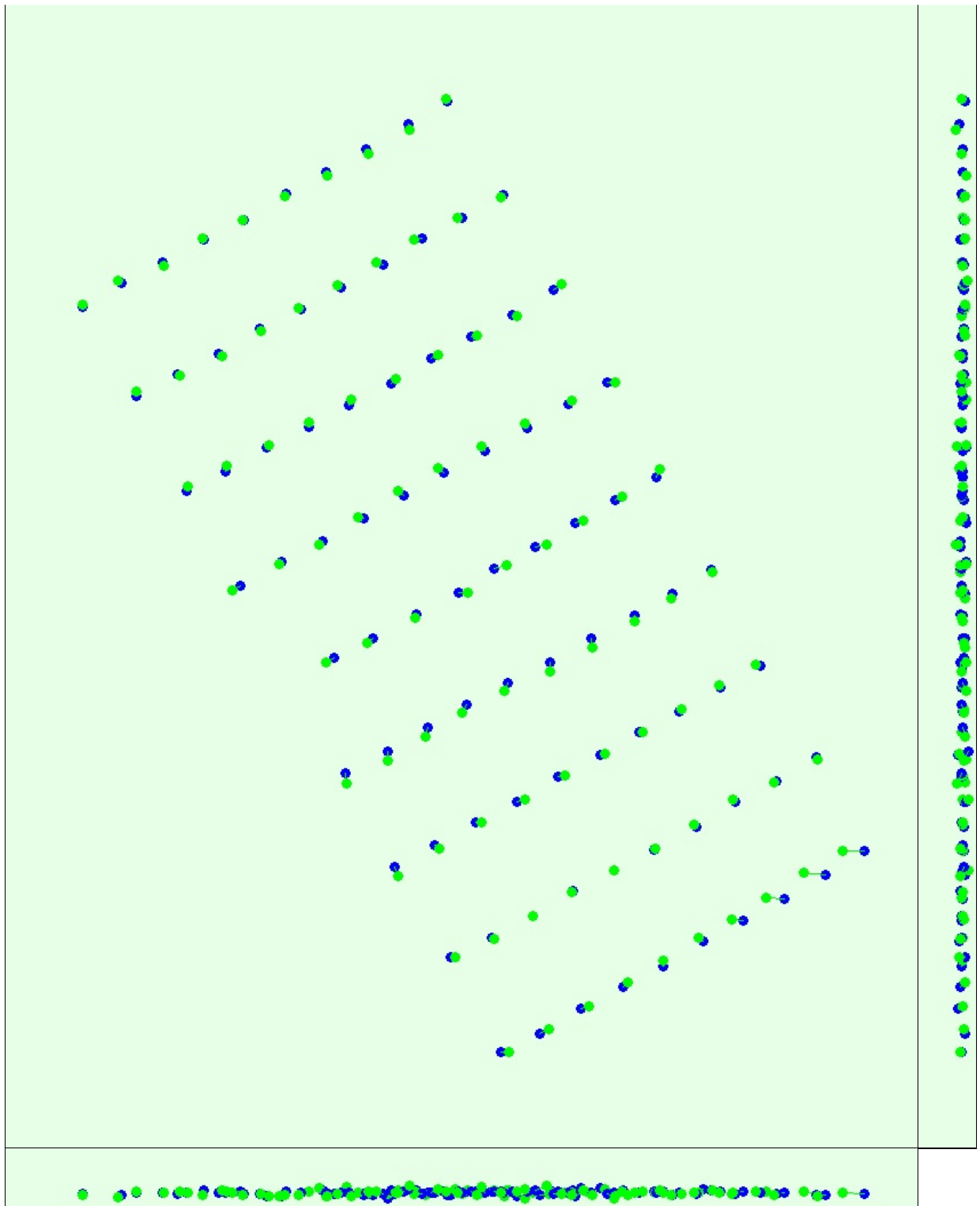


Figure 3: Offset between initial (blue dots) and computed (green dots) image positions as well as the offset between the GCPs initial positions (blue crosses) and their computed positions (green crosses) in the top-view (XY plane), front-view (XZ plane), and side-view (YZ plane).

Bundle Block Adjustment Details



Number of 2D Keypoint Observations for Bundle Block Adjustment	96424
Number of 3D Points for Bundle Block Adjustment	33746
Mean Reprojection Error [pixels]	0.105285

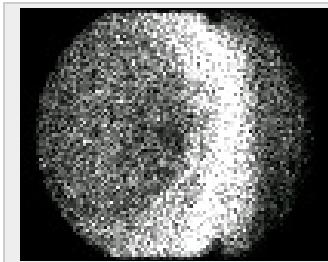
Internal Camera Parameters

Bebop2_1.8_4096x3320 (RGB). Sensor Dimensions: 5.734 [mm] x 4.648 [mm]



EXIF ID: Bebop2_1.8_4096x3320

	Poly[0]	Poly[1]	Poly[2]	Poly[3]	Poly[4]	c	d	e	f	Principal Point x	Principal Point y
Initial Values	0.000000	1.000000	-0.056111	0.035056	-0.095315	2203.93	0.00	0.00	2203.93	2048.00	1660.00
Optimized Values	0.000000	1.000000	-0.067653	0.053243	-0.105855	2218.94	0.00	0.00	2218.94	2046.06	1651.52



The number of Automatic Tie Points (ATPs) per pixel averaged over all images of the camera model is color coded between black and white. White indicates that, in average, more than 16 ATPs are extracted at this pixel location. Black indicates that, in average, 0 ATP has been extracted at this pixel location. Click on the image to see the average direction and magnitude of the reprojection error for each pixel. Note that the vectors are scaled for better visualization.

2D Keypoints Table



	Number of 2D Keypoints per Image	Number of Matched 2D Keypoints per Image
Median	3176	1106
Min	2838	606
Max	3722	1499
Mean	3203	1083

3D Points from 2D Keypoint Matches



	Number of 3D Points Observed
In 2 Images	22400
In 3 Images	5678
In 4 Images	2360
In 5 Images	1172
In 6 Images	705
In 7 Images	417
In 8 Images	302
In 9 Images	183
In 10 Images	125
In 11 Images	77
In 12 Images	60
In 13 Images	52
In 14 Images	33
In 15 Images	33
In 16 Images	19
In 17 Images	10
In 18 Images	12
In 19 Images	17
In 20 Images	11
In 21 Images	8

In 22 Images	7
In 23 Images	3
In 24 Images	4
In 25 Images	3
In 26 Images	5
In 28 Images	6
In 29 Images	1
In 30 Images	3
In 31 Images	5
In 32 Images	7
In 33 Images	5
In 35 Images	5
In 36 Images	2
In 37 Images	5
In 38 Images	4
In 39 Images	3
In 40 Images	2
In 44 Images	1
In 47 Images	1

2D Keypoint Matches

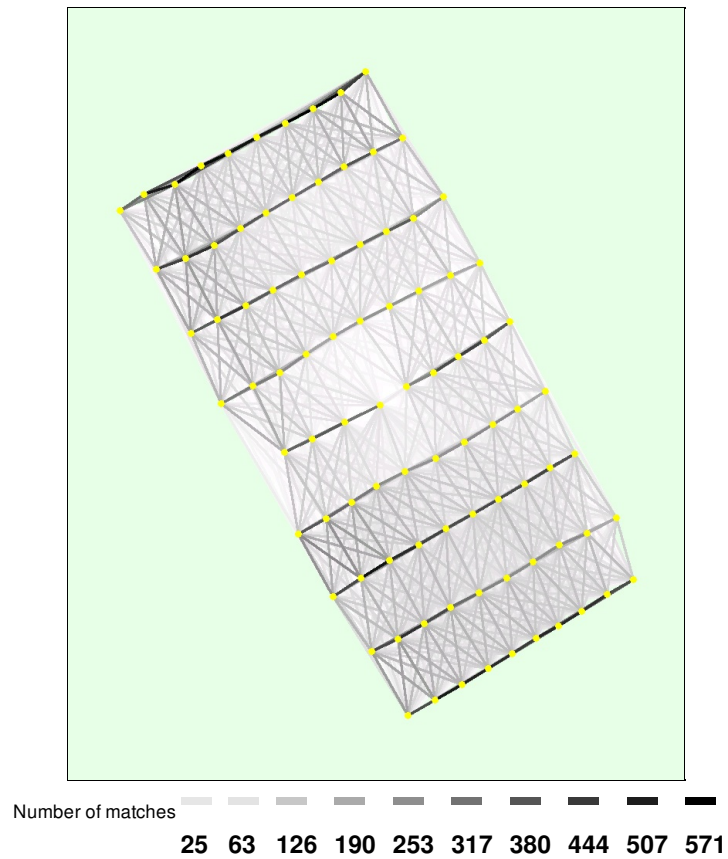


Figure 5: Top view of the image computed positions with a link between matching images. The darkness of the links indicates the number of matched 2D keypoints between the images. Bright links indicate weak links and require manual tie points or more images.

Geolocation Details



? Absolute Geolocation Variance



0 out of 89 geolocated and calibrated images have been labeled as inaccurate.

Min 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	0.00
-3.00	0.00	53.93	57.30	46.07
0.00	3.00	44.94	42.70	53.93
3.00	6.00	1.12	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]		-0.000023	0.000009	0.000042
Sigma [m]		0.863596	0.579256	0.341824
RMS Error [m]		0.863596	0.579256	0.341824

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
Sigma of Geolocation Accuracy [m]		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	47.252336
Phi	38.074516
Kappa	86.357727

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

Processing Options



Hardware	CPU: Intel(R) Xeon(R) CPU E5-2670 0 @ 2.60GHz RAM: 60GB GPU: Cirrus Logic GD 5446 (Driver: unknown)
Operating System	Linux 3.13.0-49-generic x86_64
Camera Model Name	Bebop2_1.8_4096x3320 (RGB)
Image Coordinate System	WGS84 (egm96)
Output Coordinate System	WGS84 / UTM zone 29N (egm96)
Detected template:	3d-models-rapid-cloud*
Keypoints Image Scale	Rapid, Image Scale: 0.25
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	multiscale, 1/2 (Half image size, Default)
Point Density	Low (Fast)
Minimum Number of Matches	3
3D Textured Mesh Generation	yes, Maximum Number of Triangles: 1000000, Texture Size: 4096x4096
Advanced: Matching Window Size	9x9 pixels
Advanced: Image Groups	group1
Advanced: Use Processing Area	yes
Advanced: Use Annotations	yes
Advanced: Limit Camera Depth Automatically	yes
Time for Point Cloud Densification	04m:27s
Time for 3D Textured Mesh Generation	01m:24s

Results



Number of Generated Tiles	1
Number of 3D Densified Points	1171262
Average Density (per m ³)	0.65