

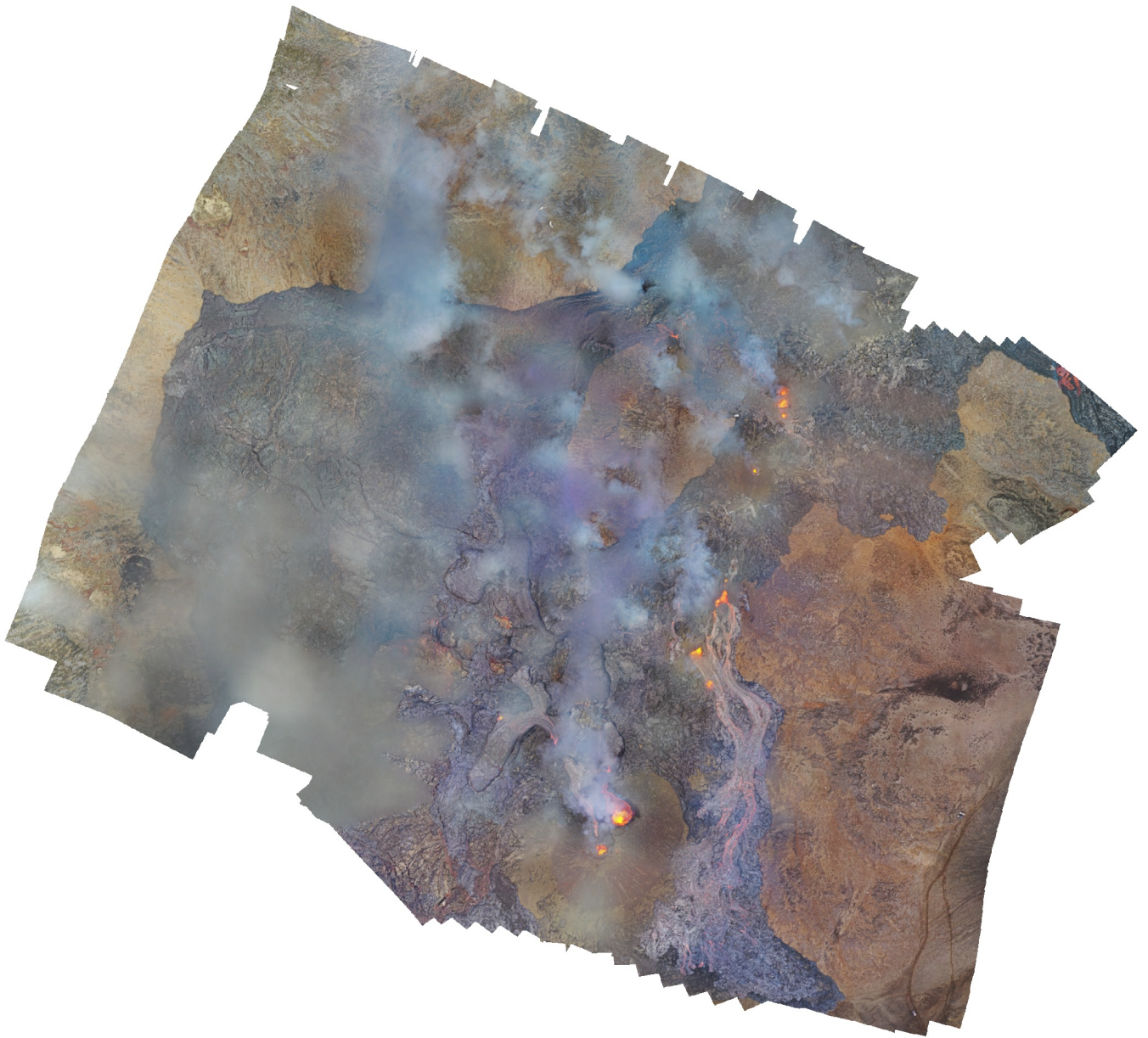
2021_04_13_Report_Vent

Processing Report

April 13, 2021

Fagradalsfjall Vent Merged Model

03 June 2022



Survey Data

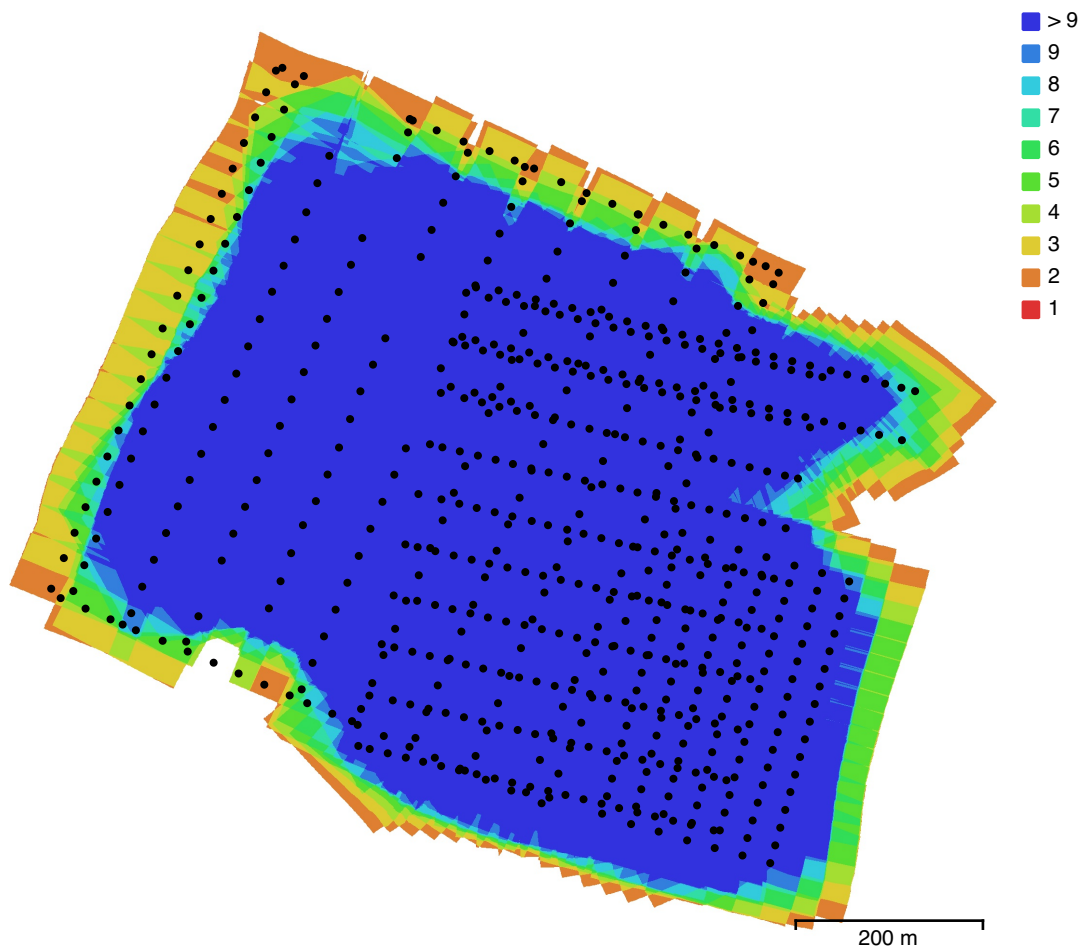


Fig. 1. Camera locations and image overlap.

Number of images:	654	Camera stations:	638
Flying altitude:	124 m	Tie points:	1,266,876
Ground resolution:	2.85 cm/pix	Projections:	3,865,838
Coverage area:	0.607 km ²	Reprojection error:	0.376 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
Test_Pro (10.26mm)	5472 x 3648	10.26 mm	2.41 x 2.41 μ m	No
Test_Pro (10.26mm)	5472 x 3648	10.26 mm	2.41 x 2.41 μ m	No
Test_Pro (10.26mm)	5472 x 3648	10.26 mm	2.41 x 2.41 μ m	No
Test_Pro (10.26mm)	5472 x 3648	10.26 mm	2.41 x 2.41 μ m	No

Table 1. Cameras.

Camera Calibration

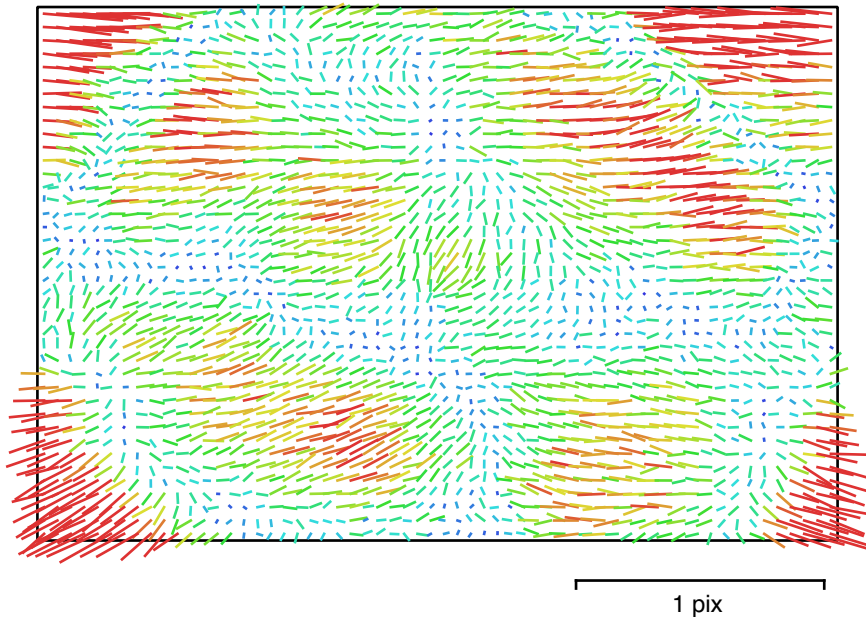


Fig. 2. Image residuals for Test_Pro (10.26mm).

Test_Pro (10.26mm)

271 images

Type	Resolution	Focal Length	Pixel Size
Frame	5472 x 3648	10.26 mm	2.41 x 2.41 μm

	Value	Error	F	Cx	Cy	B1	B2	K1	K2	K3	K4	P1	P2
F	4345.26	0.11	1.00	-0.07	-0.29	-0.31	-0.08	-0.07	0.10	-0.09	0.08	0.01	-0.11
Cx	-6.95488	0.05		1.00	0.03	0.03	0.19	-0.00	0.00	-0.00	0.00	0.55	0.05
Cy	2.21648	0.051			1.00	0.05	-0.07	-0.01	-0.00	0.00	0.00	-0.05	0.54
B1	-20.1627	0.021				1.00	-0.01	0.01	-0.02	0.02	-0.02	-0.07	0.03
B2	2.16519	0.014					1.00	-0.01	0.01	-0.01	0.01	-0.01	-0.07
K1	-0.00766833	5.4e-05						1.00	-0.96	0.91	-0.86	-0.00	-0.04
K2	0.0151667	0.00036							1.00	-0.99	0.95	0.00	0.00
K3	0.00286019	0.00096								1.00	-0.99	-0.00	-0.00
K4	-0.0330389	0.00087									1.00	0.00	0.00
P1	0.000814517	2.1e-06										1.00	0.00
P2	-0.00147451	2.8e-06											1.00

Table 2. Calibration coefficients and correlation matrix.

Camera Calibration

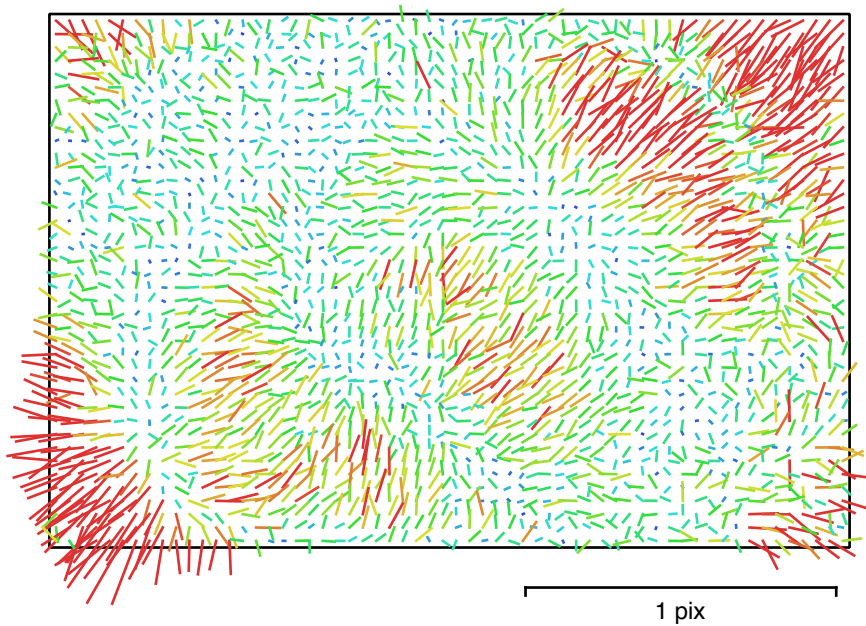


Fig. 3. Image residuals for Test_Pro (10.26mm).

Test_Pro (10.26mm)

210 images

Type	Resolution	Focal Length	Pixel Size
Frame	5472 x 3648	10.26 mm	2.41 x 2.41 μm

	Value	Error	F	Cx	Cy	B1	B2	K1	K2	K3	K4	P1	P2
F	4357.38	0.32	1.00	0.00	0.10	0.07	0.05	-0.05	0.04	-0.03	0.01	0.01	-0.06
Cx	-2.92809	0.086		1.00	0.09	0.05	-0.00	-0.01	0.01	-0.01	0.01	0.45	0.02
Cy	-9.62731	0.08			1.00	0.07	0.17	-0.00	-0.00	0.00	-0.00	0.04	0.22
B1	-1.18223	0.012				1.00	-0.01	-0.00	-0.01	0.01	-0.01	-0.04	-0.25
B2	-0.0241042	0.012					1.00	0.00	-0.00	0.00	-0.01	0.36	0.08
K1	-0.00523315	6.4e-05						1.00	-0.97	0.92	-0.87	-0.02	0.00
K2	0.00841977	0.00044							1.00	-0.99	0.96	0.01	-0.00
K3	0.0209515	0.0012								1.00	-0.99	-0.01	0.01
K4	-0.0506898	0.0012									1.00	0.01	-0.01
P1	0.000556377	3.1e-06										1.00	0.06
P2	-0.00178019	1.9e-06											1.00

Table 3. Calibration coefficients and correlation matrix.

Camera Calibration

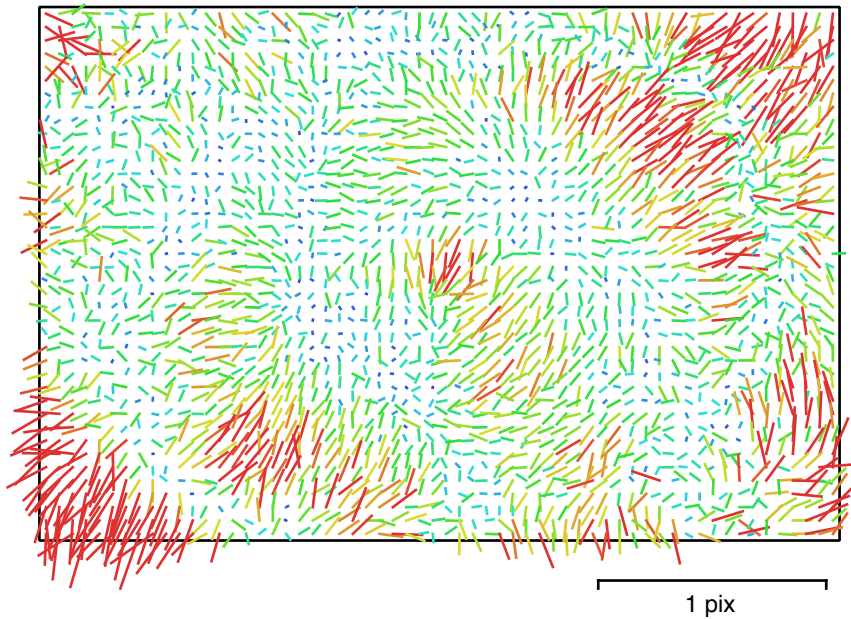


Fig. 4. Image residuals for Test_Pro (10.26mm).

Test_Pro (10.26mm)

55 images

Type	Resolution	Focal Length	Pixel Size
Frame	5472 x 3648	10.26 mm	2.41 x 2.41 μm

	Value	Error	F	Cx	Cy	B1	B2	K1	K2	K3	K4	P1	P2
F	4360.85	0.35	1.00	0.13	-0.05	0.06	0.13	-0.06	0.05	-0.04	0.02	0.01	-0.03
Cx	-5.67242	0.12		1.00	0.02	0.00	0.20	0.01	-0.01	0.01	-0.01	0.54	0.05
Cy	-6.68956	0.11			1.00	-0.12	-0.01	0.00	-0.00	0.00	-0.00	0.05	0.24
B1	-0.140608	0.019				1.00	0.04	0.00	-0.02	0.01	-0.01	-0.01	-0.09
B2	-0.787001	0.019					1.00	-0.00	-0.00	0.00	-0.00	0.23	0.12
K1	-0.00333578	9.5e-05						1.00	-0.97	0.92	-0.87	0.02	-0.01
K2	0.00515038	0.00067							1.00	-0.99	0.96	-0.01	0.01
K3	0.0291271	0.0019								1.00	-0.99	0.01	-0.01
K4	-0.0576445	0.0018									1.00	-0.01	0.01
P1	0.000643971	5.3e-06										1.00	0.08
P2	-0.0019337	3.3e-06											1.00

Table 4. Calibration coefficients and correlation matrix.

Camera Calibration

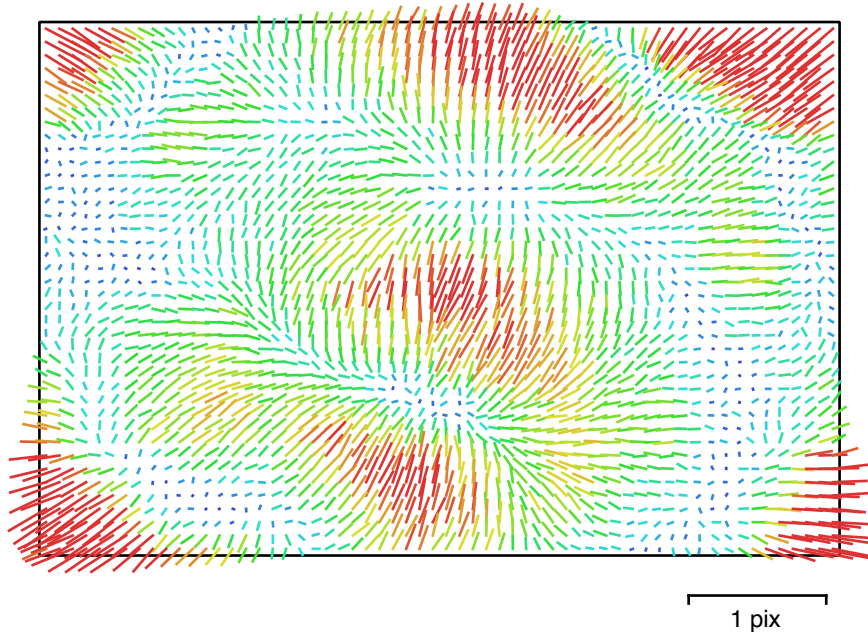


Fig. 5. Image residuals for Test_Pro (10.26mm).

Test_Pro (10.26mm)

118 images

Type	Resolution	Focal Length	Pixel Size
Frame	5472 x 3648	10.26 mm	2.41 x 2.41 μm

	Value	Error	F	Cx	Cy	B1	B2	K1	K2	K3	K4	P1	P2
F	4350.4	0.44	1.00	-0.46	0.51	-0.03	-0.01	-0.04	0.04	-0.02	-0.02	0.08	-0.21
Cx	2.90601	0.024		1.00	-0.18	0.09	0.02	-0.02	0.01	-0.02	0.03	0.43	0.04
Cy	-5.9029	0.02			1.00	-0.04	0.07	-0.01	0.02	-0.01	-0.01	0.11	0.22
B1	1.56324	0.017				1.00	-0.08	-0.00	-0.01	0.01	-0.01	-0.02	-0.01
B2	-2.12029	0.016					1.00	0.01	-0.00	0.00	-0.00	-0.01	-0.01
K1	-0.00652472	4.3e-05						1.00	-0.96	0.92	-0.87	-0.04	-0.00
K2	0.017511	0.00029							1.00	-0.99	0.96	0.03	0.01
K3	-0.00447051	0.00076								1.00	-0.99	-0.02	-0.01
K4	-0.0271002	0.00069									1.00	0.01	0.02
P1	0.000658528	1.2e-06										1.00	-0.06
P2	-0.00190836	9.3e-07											1.00

Table 5. Calibration coefficients and correlation matrix.

Ground Control Points

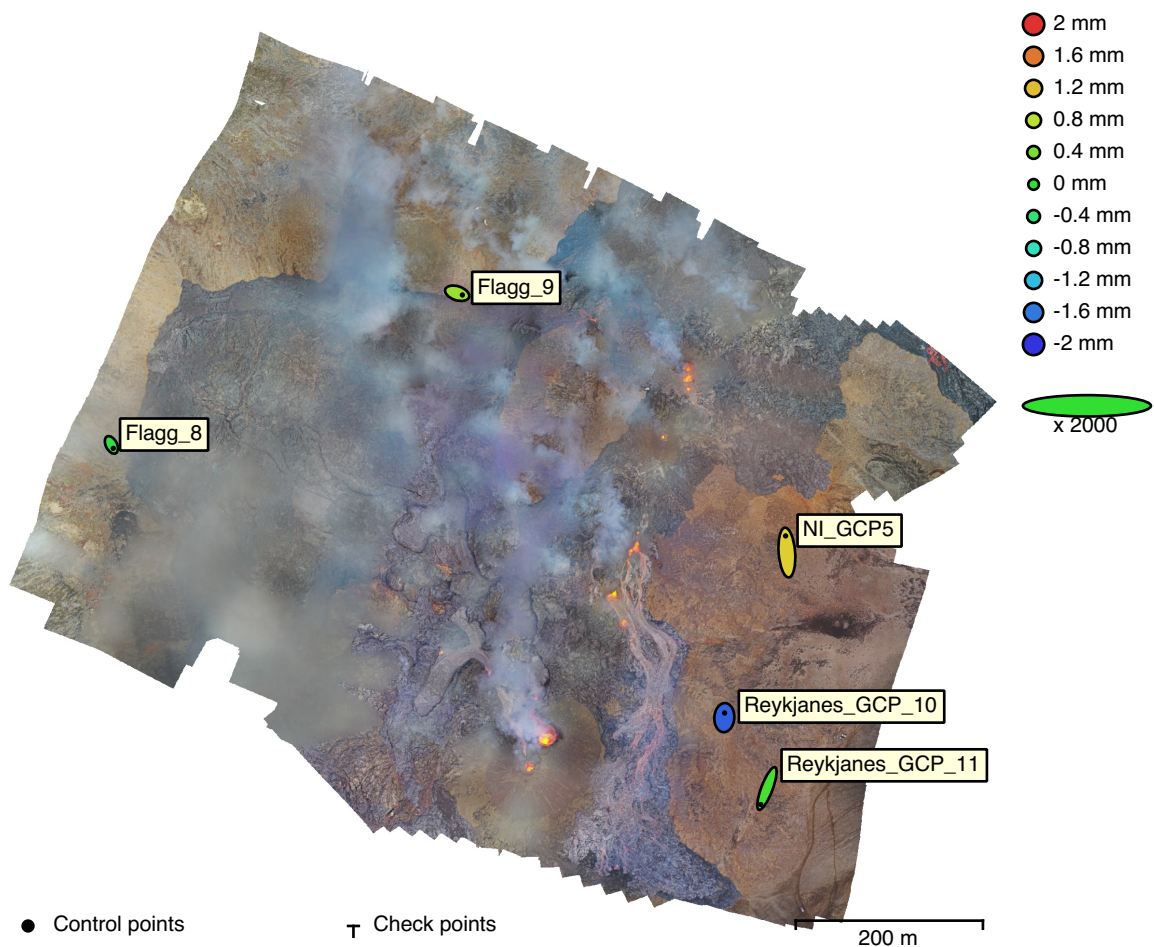


Fig. 6. GCP locations and error estimates.
Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.
Estimated GCP locations are marked with a dot or crossing.

Count	X error (cm)	Y error (cm)	Z error (cm)	XY error (cm)	Total (cm)
5	0.39947	1.14006	0.0960499	1.20802	1.21183

Table 6. Control points RMSE.
X - Easting, Y - Northing, Z - Altitude.

Label	X error (cm)	Y error (cm)	Z error (cm)	Total (cm)	Image (pix)
Flagg_8	0.192598	-0.370637	-0.00893863	0.417787	1.118 (7)
Flagg_9	0.562393	-0.185392	0.0613012	0.595326	0.955 (29)
NI_GCP5	-0.136192	1.77657	0.109295	1.78513	1.719 (13)
Reykjanes_GCP_10	0.0330159	0.49105	-0.173775	0.521937	1.568 (40)
Reykjanes_GCP_11	-0.651814	-1.7116	0.0121171	1.83155	0.594 (25)
Total	0.39947	1.14006	0.0960499	1.21183	1.259

Table 7. Control points.
X - Easting, Y - Northing, Z - Altitude.

Digital Elevation Model

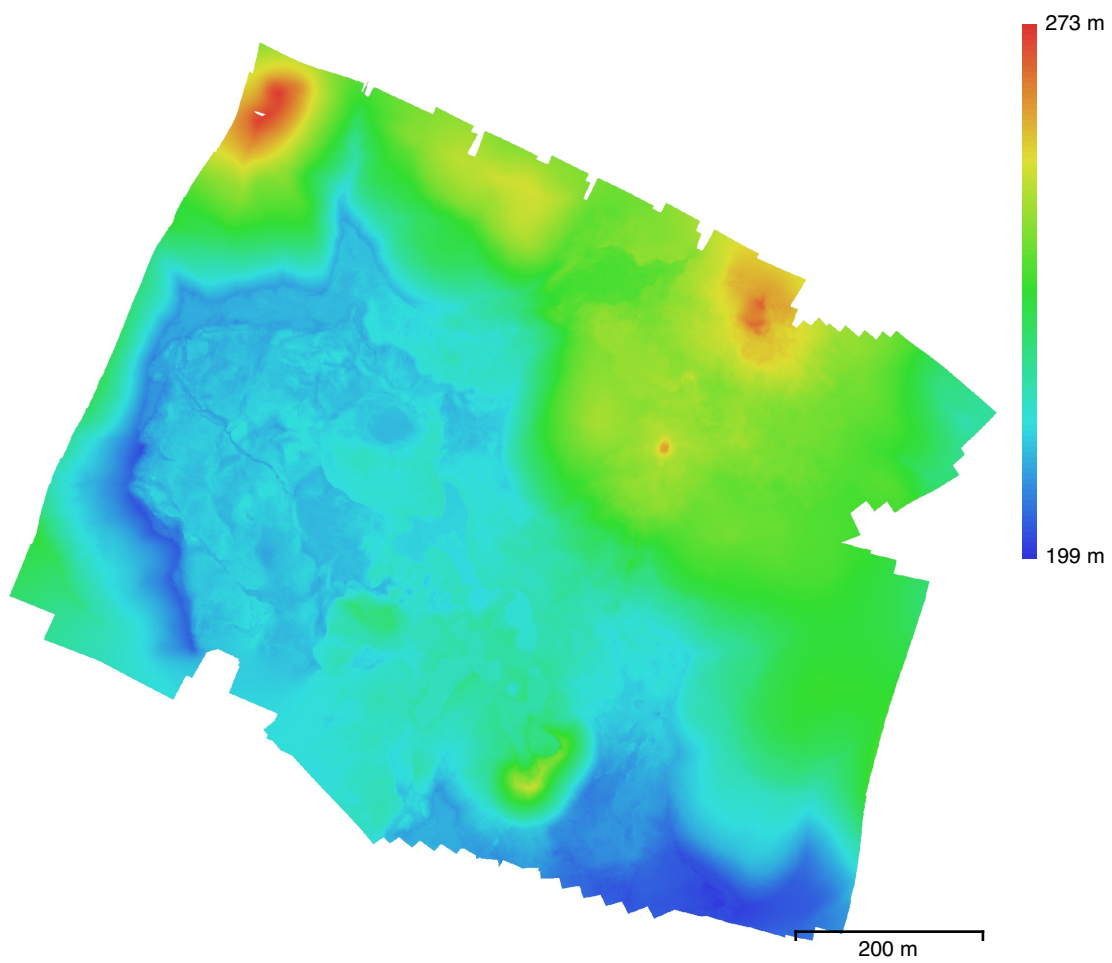


Fig. 7. Reconstructed digital elevation model.

Resolution: 5.7 cm/pix
Point density: 307 points/m²

Processing Parameters

General

Cameras	654
Aligned cameras	638
Markers	108
Coordinate system	WGS 84 / UTM zone 27N (EPSG::32627)
Rotation angles	Yaw, Pitch, Roll

Point Cloud

Points	1,266,876 of 3,613,415
RMS reprojection error	0.150569 (0.376461 pix)
Max reprojection error	0.781522 (2.43796 pix)
Mean key point size	2.47107 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	3.73789

Alignment parameters

Accuracy	High
Generic preselection	Yes
Reference preselection	Source
Key point limit	60,000
Key point limit per Mpx	1,000
Tie point limit	0
Exclude stationary tie points	Yes
Guided image matching	No
Adaptive camera model fitting	No
Matching time	34 minutes 9 seconds
Matching memory usage	88.32 MB
Alignment time	37 minutes 35 seconds
Alignment memory usage	751.08 MB

Optimization parameters

Parameters	f, b1, b2, cx, cy, k1-k4, p1, p2
Adaptive camera model fitting	No
Optimization time	18 seconds
Date created	2022:05:26 19:43:30
Software version	1.8.1.13915
File size	245.51 MB

Depth Maps

Count	636
Depth maps generation parameters	
Quality	High
Filtering mode	Moderate
Max neighbors	16
Processing time	1 days 13 hours
Memory usage	1.07 GB
Date created	2022:05:28 12:36:52
Software version	1.8.1.13915
File size	4.19 GB

Dense Point Cloud

Points	191,103,540
Point colors	3 bands, uint8

Depth maps generation parameters

Quality	High
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Filtering mode	Moderate
Max neighbors	16
Processing time	1 days 13 hours
Memory usage	1.07 GB
Dense cloud generation parameters	
Processing time	3 hours 12 minutes
Memory usage	12.50 GB
Date created	2022:05:28 15:49:25
Software version	1.8.1.13915
File size	3.72 GB
DEM	
Size	34,561 x 33,962
Coordinate system	WGS 84 / UTM zone 27N (EPSG::32627)
Reconstruction parameters	
Source data	Dense cloud
Interpolation	Enabled
Processing time	4 minutes 0 seconds
Memory usage	331.69 MB
Date created	2022:05:30 17:05:51
Software version	1.8.1.13915
File size	737.89 MB
Orthomosaic	
Size	36,983 x 33,679
Coordinate system	WGS 84 / UTM zone 27N (EPSG::32627)
Colors	3 bands, uint8
Reconstruction parameters	
Blending mode	Mosaic
Surface	DEM
Enable hole filling	Yes
Enable ghosting filter	No
Processing time	28 minutes 41 seconds
Memory usage	4.09 GB
Date created	2022:05:30 17:30:05
Software version	1.8.1.13915
File size	14.52 GB
System	
Software name	Agisoft Metashape Professional
Software version	1.8.1 build 13915
OS	Mac OS 64 bit
RAM	64.00 GB
CPU	
GPU(s)	None