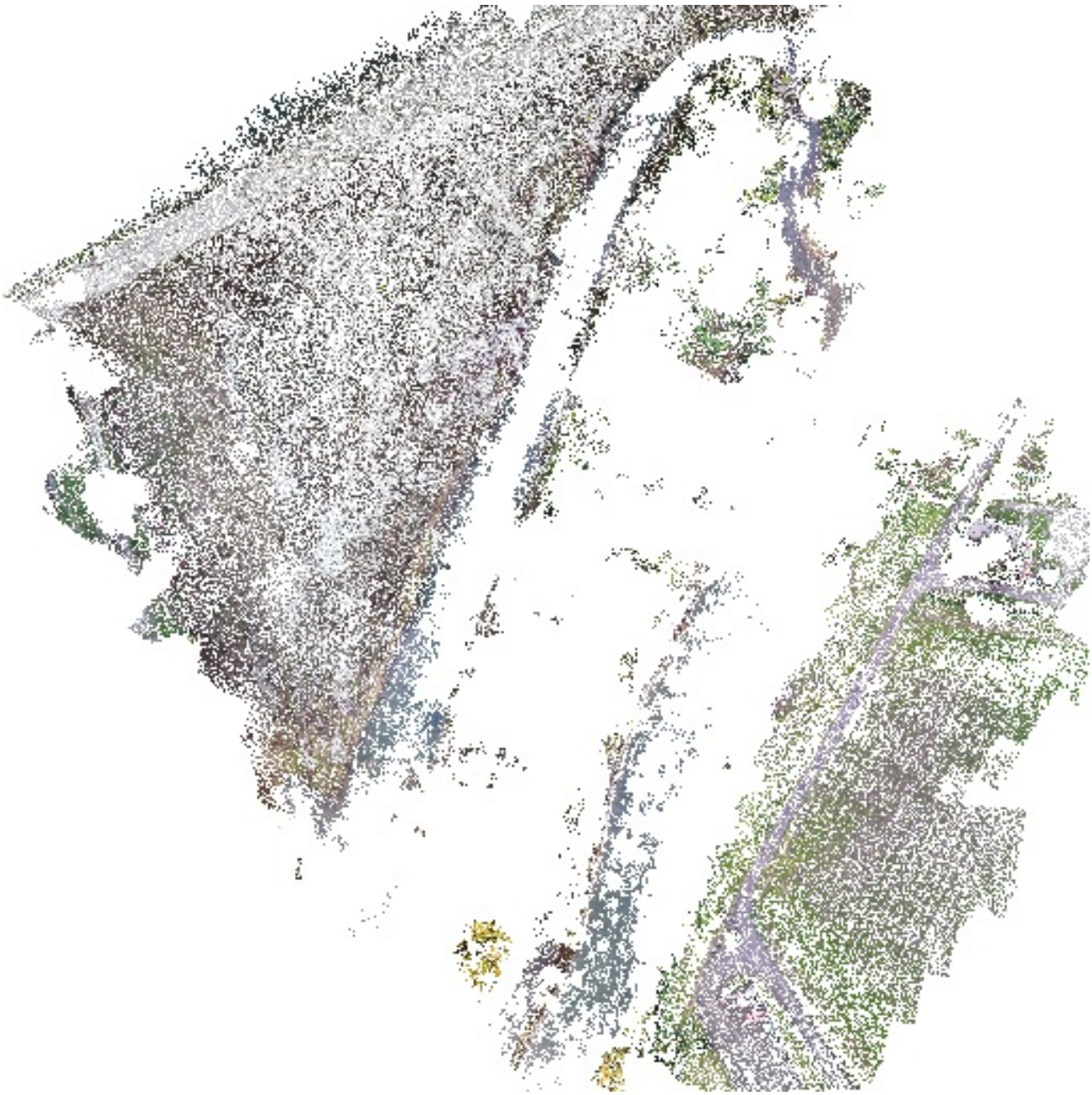
LAB06_LAST

LAB06_REPORT_CALIBRATION41

10 January 2023



Survey Data

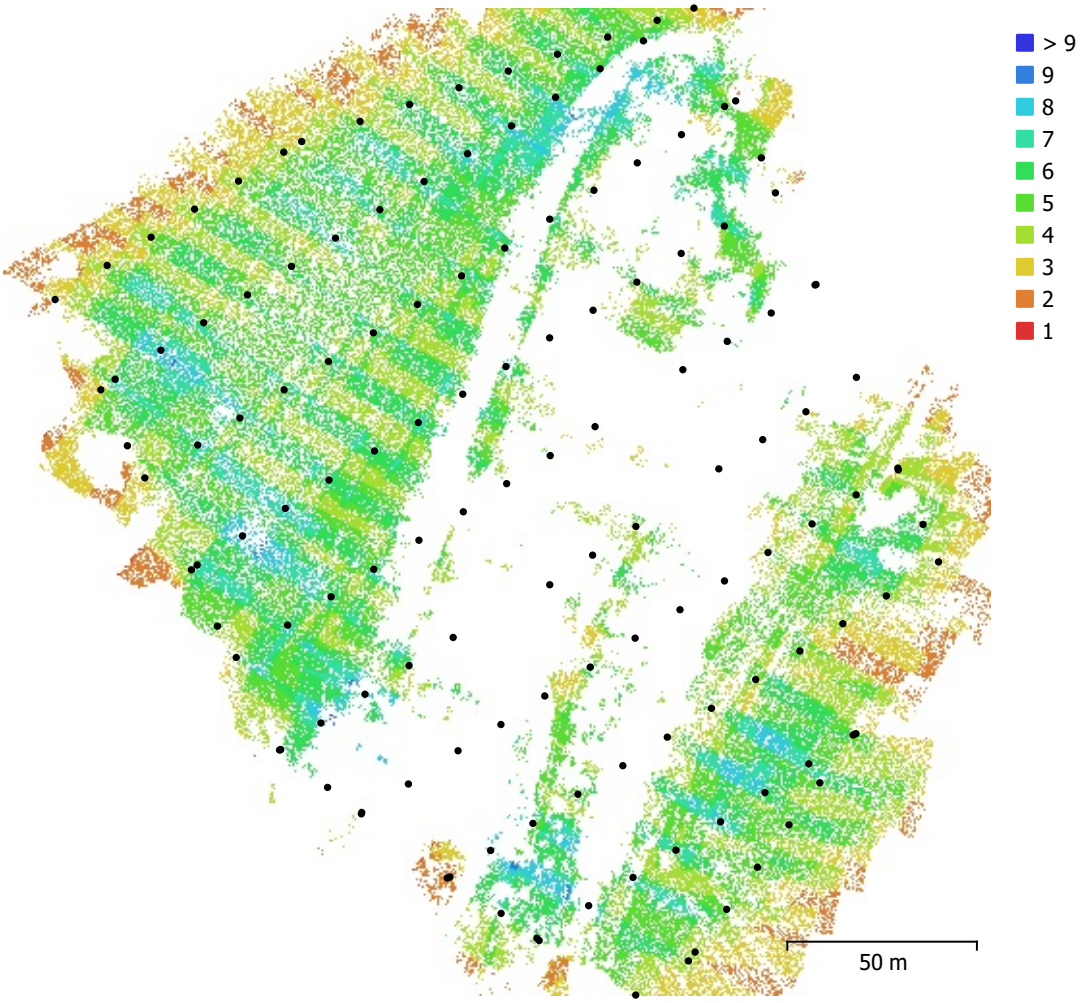


Fig. 1. Camera locations and image overlap.

Number of images:	141	Camera stations:	137
Flying altitude:	45.9 m	Tie points:	118,573
Ground resolution:	1.01 cm/pix	Projections:	351,330
Coverage area:	0.0173 km²	Reprojection error:	1.16 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
FC6520, DJI MFT 15mm …	5280 x 2970	15 mm	3.57 x 3.57 µm	Yes

Table 1. Cameras.

Camera Calibration

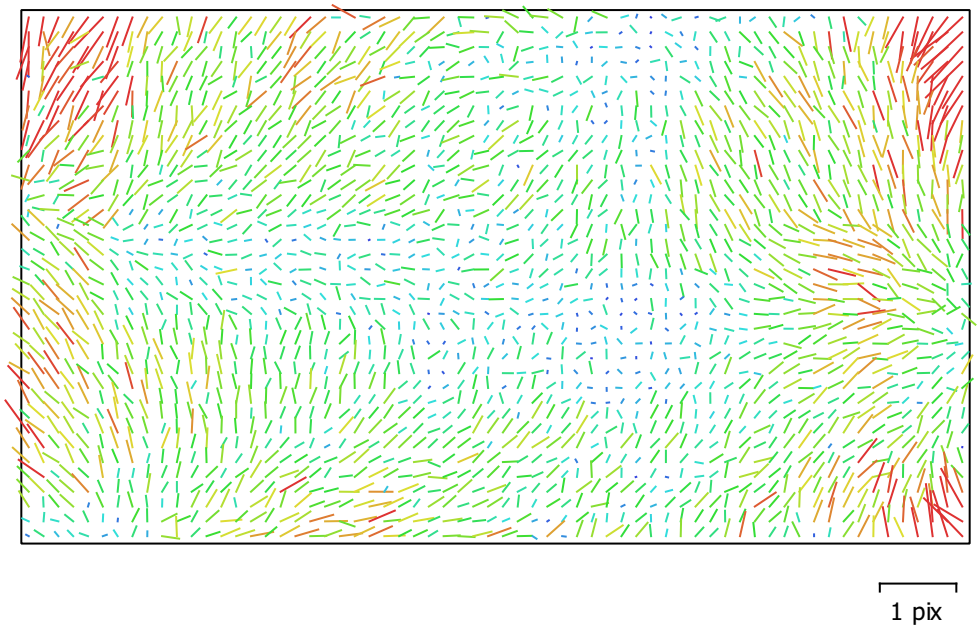


Fig. 2. Image residuals for FC6520, DJI MFT 15mm F1.7 ASPH (15mm).

FC6520, DJI MFT 15mm F1.7 ASPH (15mm)

141 images, precalibrated

Type	Resolution	Focal Length	Pixel Size
Frame	**5280 x 2970**	**15 mm**	**3.57 x 3.57 µm**

F:	4548.77		
Cx:	41.2121	B1:	-14.0636
Cy:	-10.5279	B2:	-0.0214569
K1:	-0.217264	P1:	2.6023e-06
K2:	0.0804349	P2:	-9.6102e-05
K3:	0.0816947	P3:	0
K4:	-0.0960674	P4:	0

Fixed parameters: All

Ground Control Points

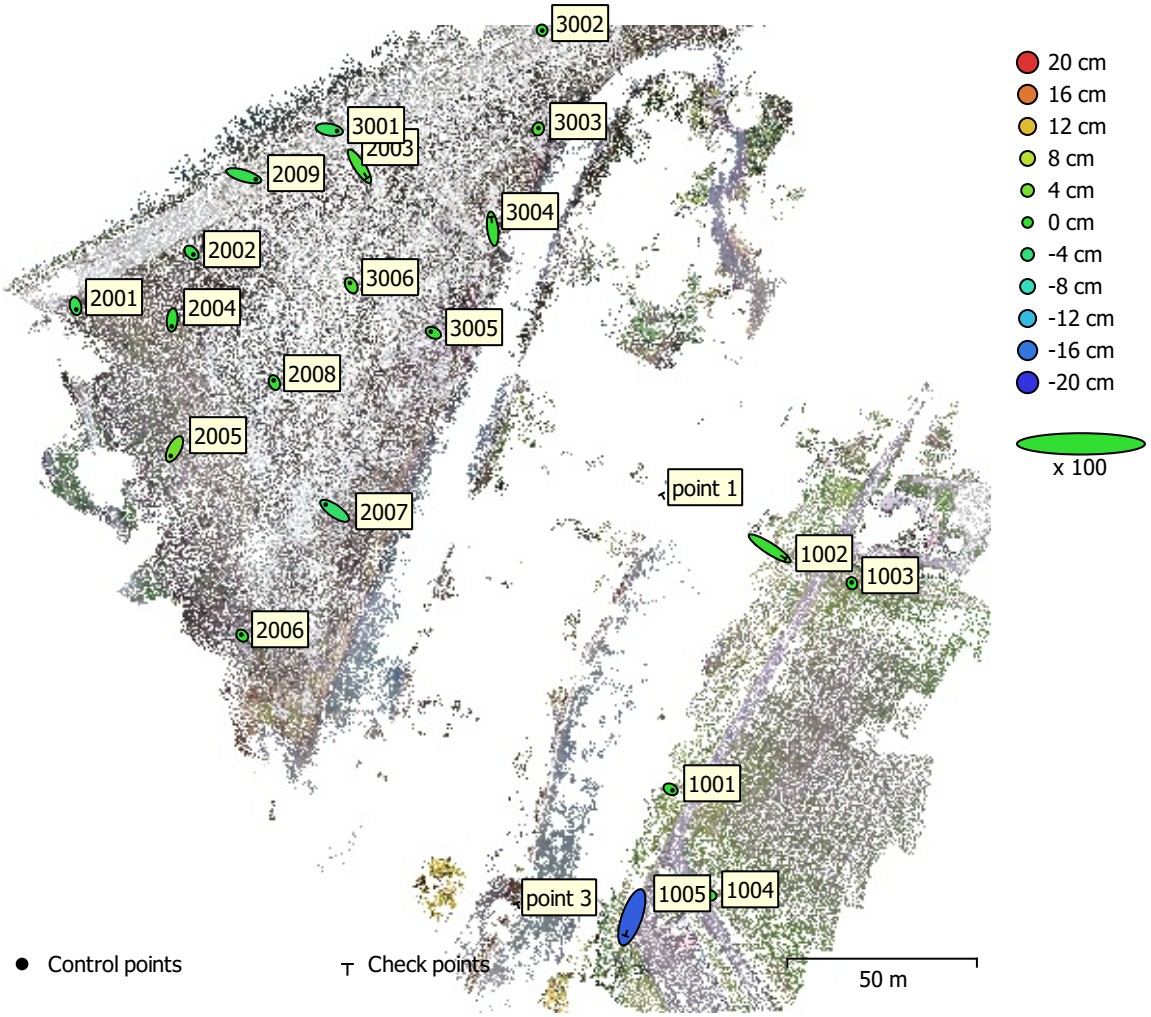


Fig. 3. GCP locations and error estimates.
Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.
Estimated GCP locations are marked with a dot or crossing.

Count	X error (cm)	Y error (cm)	Z error (cm)	XY error (cm)	Total (cm)
16	2.34983	1.72603	1.56744	2.91562	3.31025

Table 2. Control points RMSE.
X - Easting, Y - Northing, Z - Altitude.

Count	X error (cm)	Y error (cm)	Z error (cm)	XY error (cm)	Total (cm)
4	5.03405	7.11129	8.76291	8.71275	12.3572

Table 3. Check points RMSE.
X - Easting, Y - Northing, Z - Altitude.

Label	X error (cm)	Y error (cm)	Z error (cm)	Total (cm)	Image (pix)
1001	1.02395	-0.534744	-0.110385	1.16044	0.806 (4)
1003	-0.148354	0.464952	-0.029838	0.488957	0.433 (6)
1004	-0.945338	0.140315	0.0835801	0.959343	0.323 (4)
2001	0.392596	-1.76943	-1.38581	2.28156	0.994 (4)
2002	1.00875	-0.981028	-0.947242	1.69625	2.452 (4)
2004	-0.270546	-3.33247	-0.21105	3.35008	1.255 (6)
2005	-1.92626	-3.63693	3.76724	5.57941	2.626 (5)
2006	-0.454848	0.512745	-0.0602928	0.688062	1.097 (4)
2007	-4.69499	3.28023	-3.20952	6.56535	1.638 (6)
2008	-0.412726	1.13812	0.138826	1.21858	0.584 (5)
2009	6.32153	-1.89794	-1.47789	6.76373	2.387 (3)
3001	4.08629	-0.709913	-2.14525	4.66946	1.983 (4)
3002	0.088961	-0.185127	-0.257158	0.329114	2.886 (3)
3003	0.142514	0.432852	1.68916	1.74955	2.232 (6)
3005	-1.35611	0.645237	0.00278923	1.50179	4.108 (5)
3006	-0.693201	1.2871	1.48529	2.08404	0.794 (5)
Total	**2.34983**	**1.72603**	**1.56744**	**3.31025**	**1.924**

Table 4. Control points.

X - Easting, Y - Northing, Z - Altitude.

Label	X error (cm)	Y error (cm)	Z error (cm)	Total (cm)	Image (pix)
1002	8.51908	-5.48731	0.385732	10.1407	0.347 (4)
1005	-3.41763	-9.74712	-17.4822	20.3055	0.503 (5)
2003	4.06247	-6.2201	1.12147	7.51339	0.873 (6)
3004	-0.779819	6.20282	0.349003	6.26138	0.693 (6)
point 1					0.032 (3)
point 3					0.701 (6)
Total	**5.03405**	**7.11129**	**8.76291**	**12.3572**	**0.662**

Table 5. Check points.

X - Easting, Y - Northing, Z - Altitude.

Digital Elevation Model

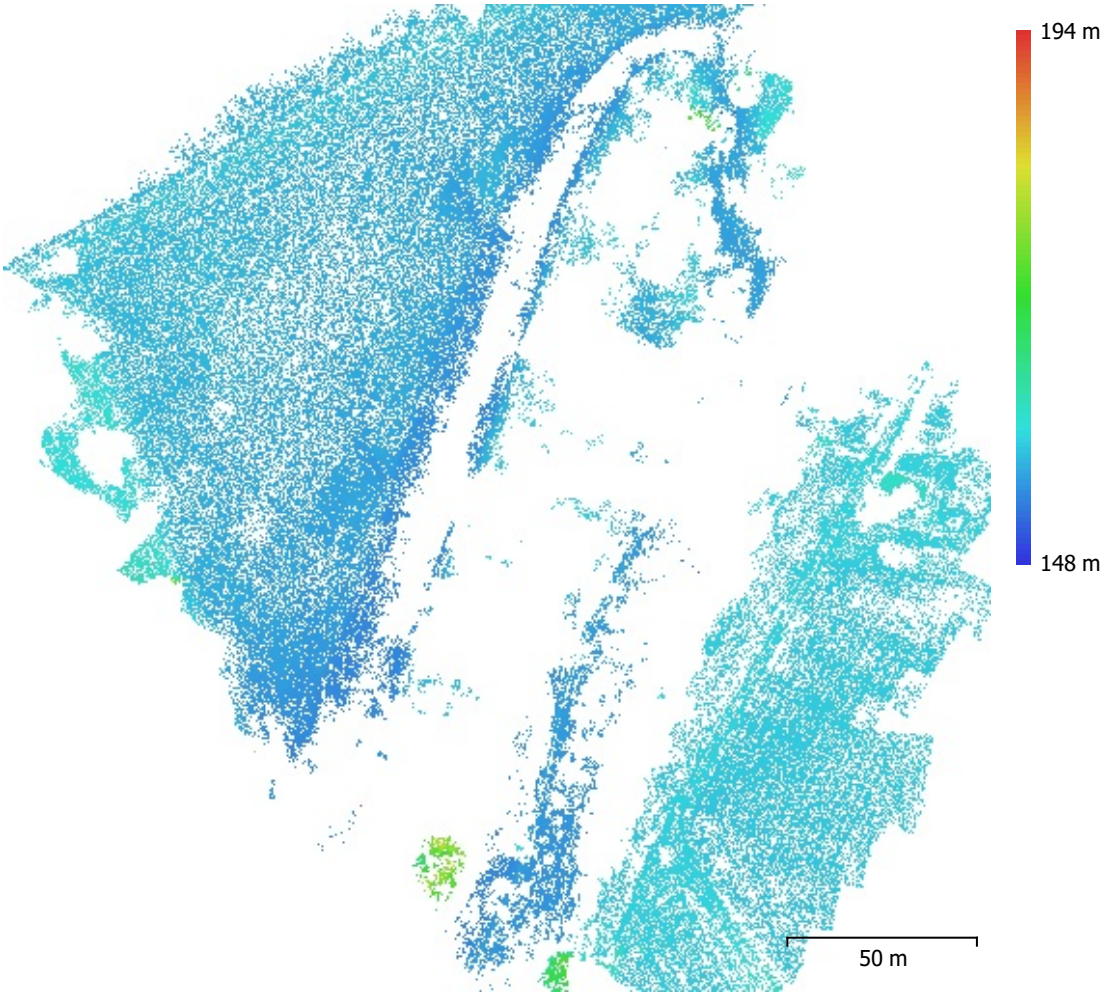


Fig. 4. Reconstructed digital elevation model.

Resolution:	unknown
Point density:	unknown

Processing Parameters

General	
Cameras	141
Aligned cameras	137
Markers	23
Coordinate system	WGS 84 / UTM zone 32N (EPSG::32632)
Rotation angles	Yaw, Pitch, Roll
Point Cloud	
Points	118,573 of 135,039
RMS reprojection error	0.140996 (1.16278 pix)
Max reprojection error	0.499901 (35.9175 pix)
Mean key point size	7.76968 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	2.9479
Alignment parameters	
Accuracy	Medium
Generic preselection	Yes
Reference preselection	No
Key point limit	40,000
Key point limit per Mpx	1,000
Tie point limit	4,000
Exclude stationary tie points	Yes
Guided image matching	No
Adaptive camera model fitting	No
Matching time	1 minutes 8 seconds
Matching memory usage	245.37 MB
Alignment time	30 seconds
Alignment memory usage	28.60 MB
Optimization parameters	
Adaptive camera model fitting	No
Optimization time	0 seconds
Date created	2022:12:20 17:24:41
Software version	1.8.4.14856
File size	9.19 MB
System	
Software name	Agisoft Metashape Professional
Software version	1.8.4 build 14856
OS	Windows 64 bit
RAM	15.78 GB
CPU	Intel(R) Core(TM) i7-10700 CPU @ 2.90GHz
GPU(s)	Quadro P1000