

Report San Lorenzo MERGED CHUNK

Processing Report
08 July 2019



Survey Data

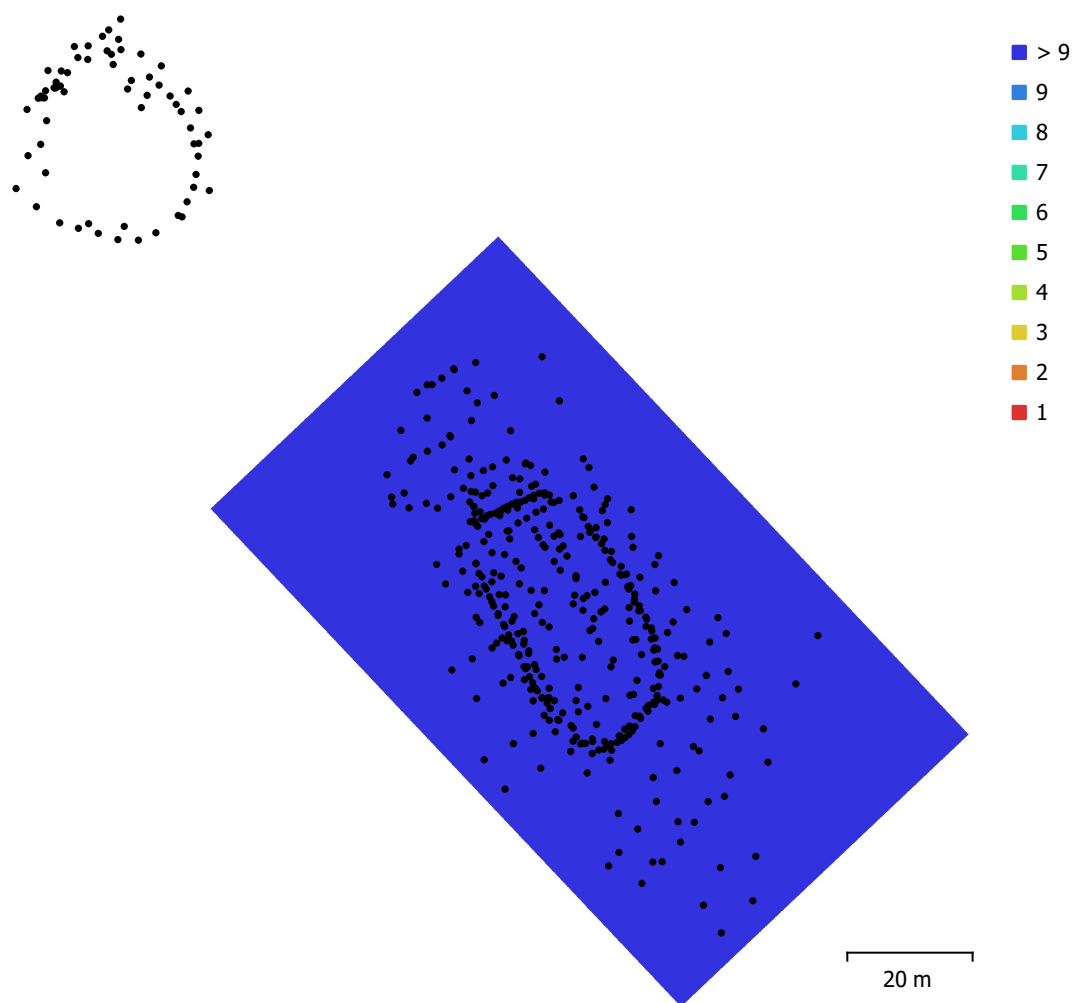


Fig. 1. Camera locations and image overlap.

Number of images:	611	Camera stations:	462
Flying altitude:	20.6 m	Tie points:	619,953
Ground resolution:	2.98 mm/pix	Projections:	2,129,894
Coverage area:	6.91e+003 m ²	Reprojection error:	1.42 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
FC1102 (4.49mm)	3968 x 2976	4.49 mm	1.57 x 1.57 μm	No
Canon EOS 5DS R (20mm)	8688 x 5792	20 mm	4.24 x 4.24 μm	No

Table 1. Cameras.

Camera Calibration



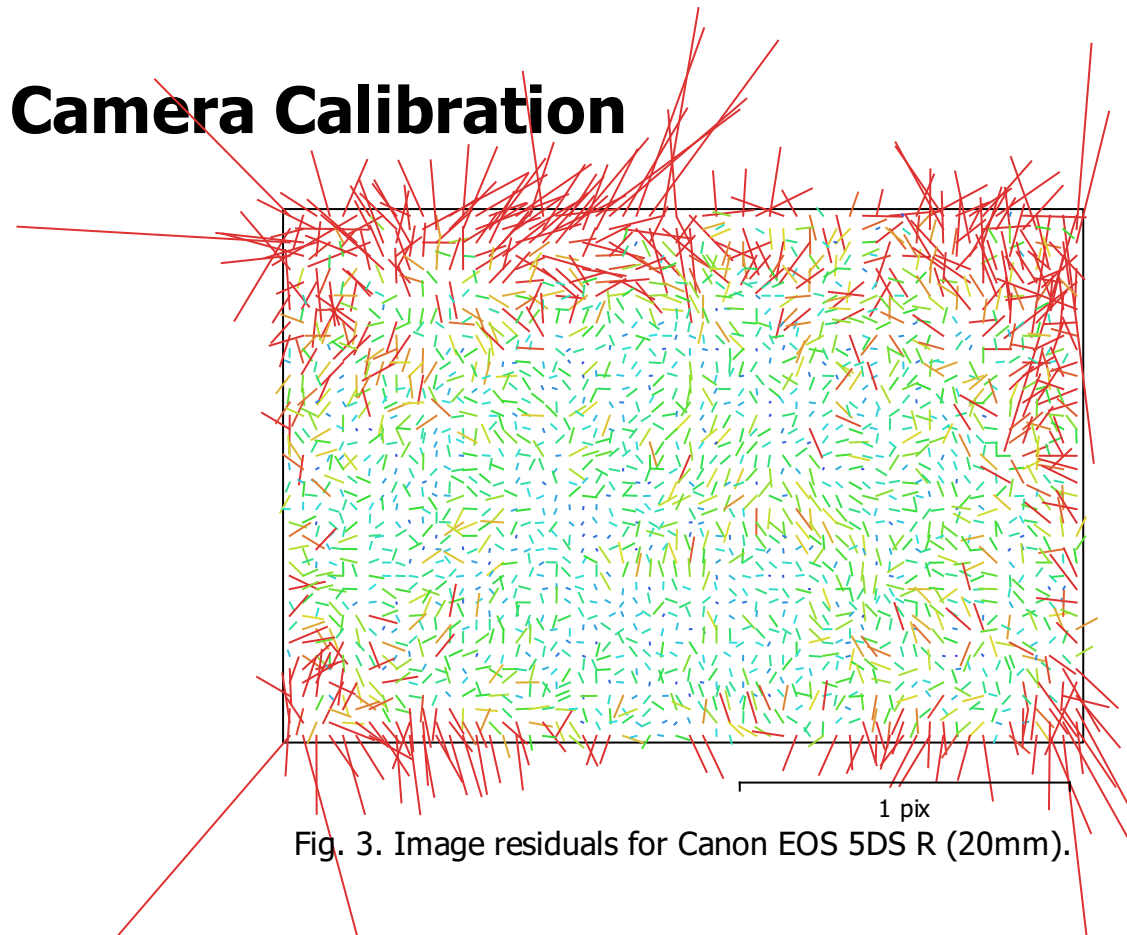
Fig. 2. Image residuals for FC1102 (4.49mm).

FC1102 (4.49mm)

327 images

Type	Resolution	Focal Length	Pixel Size
Frame	3968 x 2976	4.49 mm	1.57 x 1.57 μm
F:	2883.43		
Cx:	-28.8379	B1:	0.185439
Cy:	-12.802	B2:	-0.11199
K1:	0.142834	P1:	-0.000133562
K2:	-0.338417	P2:	-0.000454236
K3:	0.178133	P3:	0
K4:	0	P4:	0

Camera Calibration



Canon EOS 5DS R (20mm)

142 images

Type
Frame

Resolution
8688 x 5792

Focal Length
20 mm

Pixel Size
4.24 x 4.24 μm

	Value	Error	F	Cx	Cy	B1	B2	K1	K2	K3	K4	P1	P2	P3	P4
F	4936.21	0.065	1.00	-0.02	-0.70	-0.91	0.16	-0.12	0.13	-0.12	0.11	-0.03	0.07	-0.02	0.02
Cx	-48.8773	0.067		1.00	0.05	0.01	0.29	-0.05	0.05	-0.05	0.04	0.70	0.08	-0.07	0.06
Cy	-35.5094	0.041			1.00	0.67	-0.16	-0.01	-0.01	0.01	-0.01	0.03	0.46	0.01	-0.01
B1	3.52986	0.068				1.00	-0.17	-0.02	0.02	-0.01	0.01	0.02	-0.10	0.01	-0.01
B2	-0.29666	0.031					1.00	-0.04	0.03	-0.02	0.02	0.23	0.01	-0.07	0.06
K1	-0.0860633	2.7e-005						1.00	-0.97	0.92	-0.86	-0.02	-0.02	0.04	-0.04
K2	0.0823512	0.00011							1.00	-0.99	0.95	0.01	-0.01	-0.05	0.06
K3	-0.0299402	0.00016								1.00	-0.99	-0.01	0.01	0.06	-0.07
K4	0.00799733	8.2e-005									1.00	0.01	-0.01	-0.07	0.08
P1	-0.000258681	2.8e-006										1.00	-0.21	0.58	-0.49
P2	5.00235e-005	9.9e-007											1.00	-0.34	0.28
P3	0.246589	0.023												1.00	-0.95
P4	0.309835	0.016													1.00

Table 2. Calibration coefficients and correlation matrix.

Ground Control Points

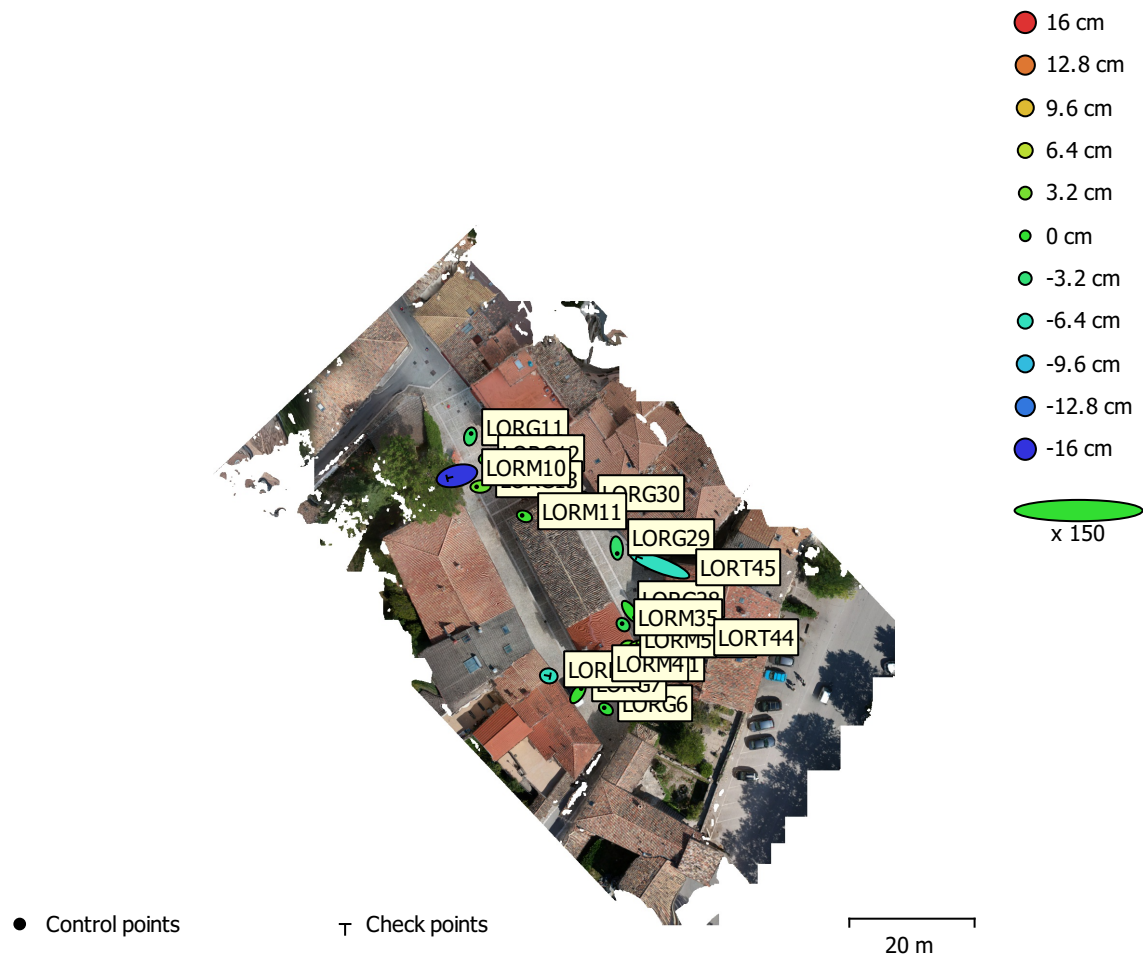


Fig. 4. GCP locations and error estimates.

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)
12	0.562708	0.64195	1.68023	0.853663	1.88465

Table 3. Control points RMSE.

Count	X error (cm)	Y error (cm)	Z error (cm)	XY error (cm)	Total (cm)
6	3.55452	1.0536	9.04096	3.70739	9.77158

Table 4. Check points RMSE.

Label	X error (cm)	Y error (cm)	Z error (cm)	Total (cm)	Image (pix)
LORG1	0.337243	-0.272202	1.89689	1.94577	1.272 (18)
LORG6	-0.374153	0.261597	-0.38934	0.600007	1.167 (17)
LORG7	0.70339	1.01648	0.362483	1.28817	1.923 (30)
LORG11	0.158084	0.622687	-2.55074	2.6304	0.536 (28)
LORG12	-0.307668	-0.0370826	1.14935	1.19039	0.768 (35)
LORG13	-0.850616	-0.0557956	2.59444	2.73089	0.726 (20)
LORG28	0.891017	-1.25593	-0.11708	1.54434	1.650 (35)
LORG29	0.114599	-1.16439	-2.62425	2.87326	0.724 (22)
LORM4	-0.988102	0.585484	-1.12812	1.6099	0.114 (21)
LORM5	-0.36789	-0.112263	2.033	2.06907	0.117 (21)
LORM11	-0.49407	0.193236	0.450205	0.695795	0.071 (18)
LORM35	-0.212533	0.226486	-1.71161	1.73956	0.131 (14)
Total	0.562708	0.64195	1.68023	1.88465	1.054

Table 5. Control points.

Label	X error (cm)	Y error (cm)	Z error (cm)	Total (cm)	Image (pix)
LORG27	-0.26308	-0.417955	7.59129	7.60733	0.719 (13)
LORG30	0.00591624	-1.65557	-9.44593	9.58992	0.532 (44)
LORM1	0.29316	-0.0542855	-6.4719	6.47877	0.147 (12)
LORM10	-2.09119	-0.527475	-15.7847	15.9314	0.124 (6)
LORT44	-6.93144	-0.0805315	2.91348	7.51929	0.433 (15)
LORT45	-4.82023	1.85935	-6.63696	8.41077	5.244 (30)
Total	3.55452	1.0536	9.04096	9.77158	2.657

Table 6. Check points.

Digital Elevation Model

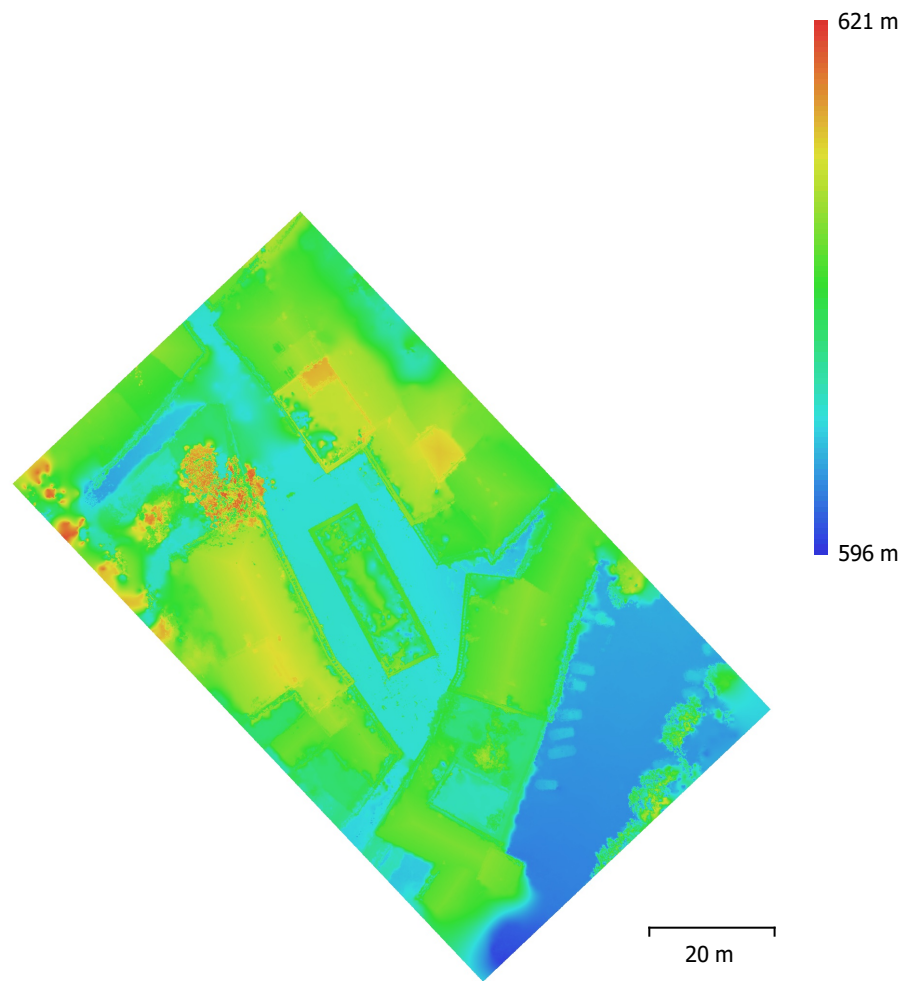


Fig. 5. Reconstructed digital elevation model.

Resolution: 5.96 mm/pix
Point density: 2.81 points/cm²

Processing Parameters

General

Cameras	611
Aligned cameras	462
Markers	18
Coordinate system	Local Coordinates (m)
Rotation angles	Yaw, Pitch, Roll

Point Cloud

Points	619,953 of 710,993
RMS reprojection error	0.175951 (1.41894 pix)
Max reprojection error	2.07207 (76.6069 pix)
Mean key point size	7.87732 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	3.6939

Dense Point Cloud

Points	295,147,711
Point colors	3 bands, uint8
Reconstruction parameters	
Quality	High
Depth filtering	Moderate

Model

Faces	19,129,261
Vertices	9,662,965
Vertex colors	3 bands, uint8

Reconstruction parameters

Surface type	Arbitrary
Source data	Dense
Interpolation	Enabled
Quality	High
Depth filtering	Moderate
Face count	19,129,261
Processing time	3 hours 31 minutes

DEM

Size	20,318 x 20,623
Coordinate system	Local Coordinates (m)
Reconstruction parameters	
Source data	Dense cloud
Interpolation	Enabled
Processing time	1 minutes 40 seconds

Orthomosaic

Size	40,370 x 40,976
Coordinate system	Local Coordinates (m)
Colors	3 bands, uint8

Reconstruction parameters

Blending mode	Mosaic
Surface	DEM
Enable hole filling	Yes
Processing time	48 minutes 55 seconds

Software

Version	1.5.1 build 7618
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General

Platform

Windows 64