

# Agisoft Metashape

Processing Report

27 June 2024



# Survey Data

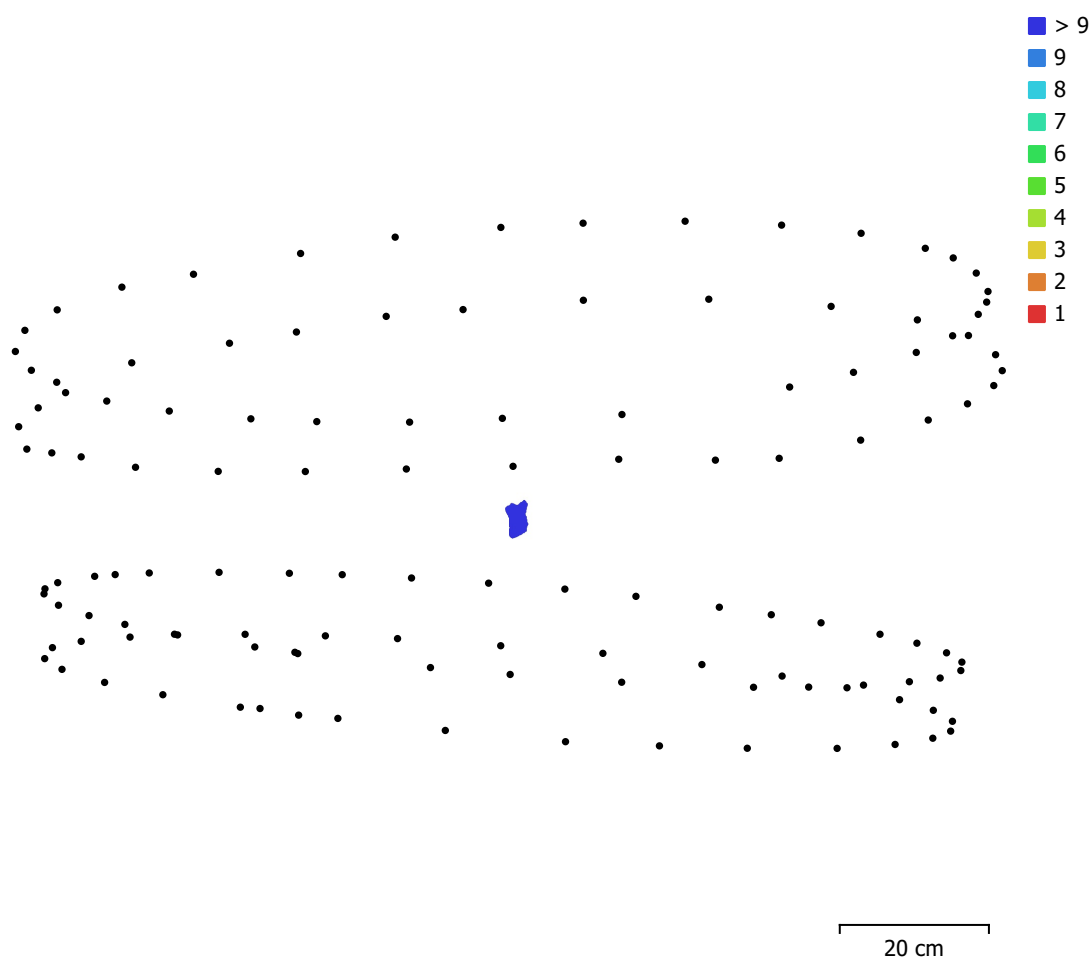


Fig. 1. Camera locations and image overlap.

|                    |                      |                     |           |
|--------------------|----------------------|---------------------|-----------|
| Number of images:  | 128                  | Camera stations:    | 128       |
| Flying altitude:   | 64 cm                | Tie points:         | 185,156   |
| Ground resolution: | 0.042 mm/pix         | Projections:        | 452,471   |
| Coverage area:     | 11.2 cm <sup>2</sup> | Reprojection error: | 0.475 pix |

| Camera Model  | Resolution  | Focal Length | Pixel Size     | Precalibrated |
|---------------|-------------|--------------|----------------|---------------|
| DMC-G7 (60mm) | 4592 x 2584 | 60 mm        | 3.79 x 3.79 μm | No            |
| DMC-G7 (60mm) | 4592 x 2584 | 60 mm        | 3.79 x 3.79 μm | No            |

Table 1. Cameras.

# Camera Calibration

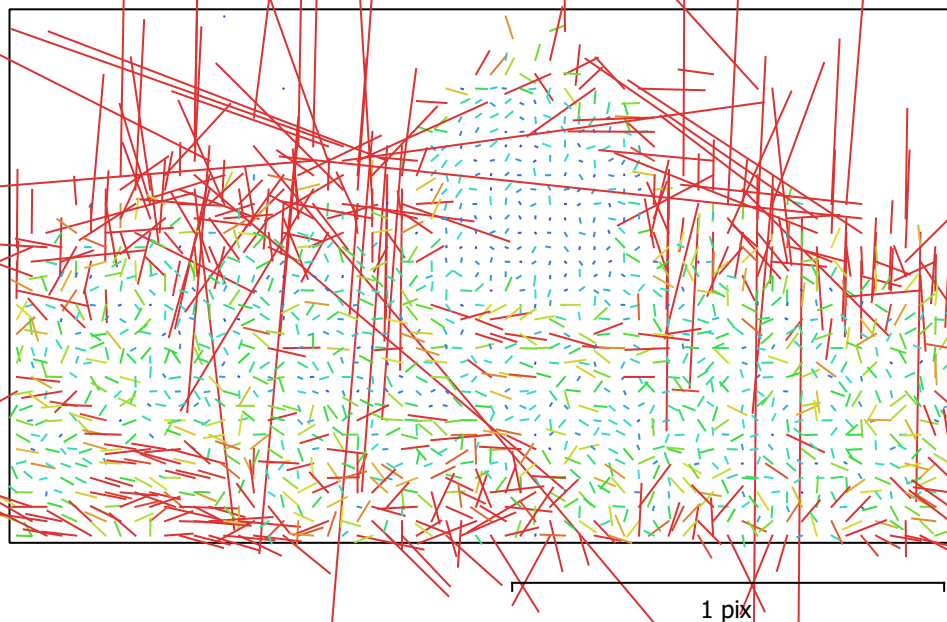


Fig. 2. Image residuals for DMC-G7 (60mm).

## DMC-G7 (60mm)

67 images

Type

Resolution

Focal Length

Pixel Size

Frame

**4592 x 2584**

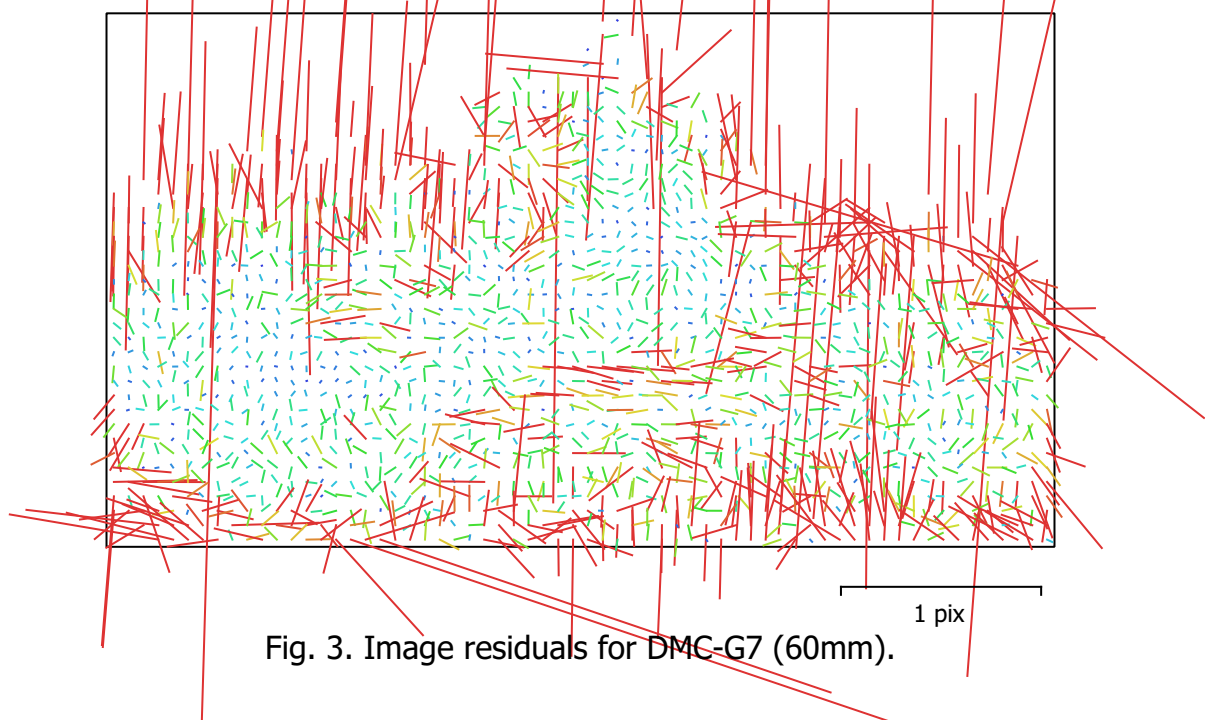
**60 mm**

**3.79 x 3.79  $\mu$ m**

|           | Value              | Error   | F    | K1    | K2    | P1    | P2    |
|-----------|--------------------|---------|------|-------|-------|-------|-------|
| <b>F</b>  | <b>15521.2</b>     | 4       | 1.00 | -0.44 | 0.21  | 0.31  | 0.24  |
| <b>K1</b> | <b>0.231206</b>    | 0.0048  |      | 1.00  | -0.89 | -0.27 | -0.38 |
| <b>K2</b> | <b>-4.99351</b>    | 0.12    |      |       | 1.00  | 0.09  | 0.20  |
| <b>P1</b> | <b>0.00063731</b>  | 7e-05   |      |       |       | 1.00  | 0.03  |
| <b>P2</b> | <b>-0.00191619</b> | 0.00016 |      |       |       |       | 1.00  |

Table 2. Calibration coefficients and correlation matrix.

# Camera Calibration



## DMC-G7 (60mm)

61 images

|              |                    |              |   |
|--------------|--------------------|--------------|---|
| Type         | Resolution         | Focal Length | Pixel Size                                  |
| <b>Frame</b> | <b>4592 x 2584</b> | <b>60 mm</b> | <b>3.79 x 3.79 <math>\mu\text{m}</math></b> |

|           | Value             | Error   | B1   | B2   | K1    | K2    | P1    | P2    |
|-----------|-------------------|---------|------|------|-------|-------|-------|-------|
| <b>F</b>  | <b>15831.7</b>    |         |      |      |       |       |       |       |
| <b>B1</b> | <b>1326.58</b>    | 5.1     | 1.00 | 0.15 | -0.19 | 0.17  | -0.13 | 0.39  |
| <b>B2</b> | <b>182.225</b>    | 1.9     |      | 1.00 | -0.15 | 0.06  | -0.44 | -0.05 |
| <b>K1</b> | <b>-0.271943</b>  | 0.0083  |      |      | 1.00  | -0.92 | 0.03  | -0.27 |
| <b>K2</b> | <b>12.1033</b>    | 0.29    |      |      |       | 1.00  | 0.06  | 0.12  |
| <b>P1</b> | <b>0.00315542</b> | 0.00024 |      |      |       |       | 1.00  | -0.02 |
| <b>P2</b> | <b>0.00471833</b> | 0.00041 |      |      |       |       |       | 1.00  |

Table 3. Calibration coefficients and correlation matrix.

# Scale Bars

| Label               | Distance (m) | Error (m)          |
|---------------------|--------------|--------------------|
| target 15_target 16 | 0.0499909    | -9.14159e-06       |
| target 19_target 20 | 0.0500091    | 9.13817e-06        |
| <b>Total</b>        |              | <b>9.13988e-06</b> |

Table 4. Control scale bars.

# Digital Elevation Model

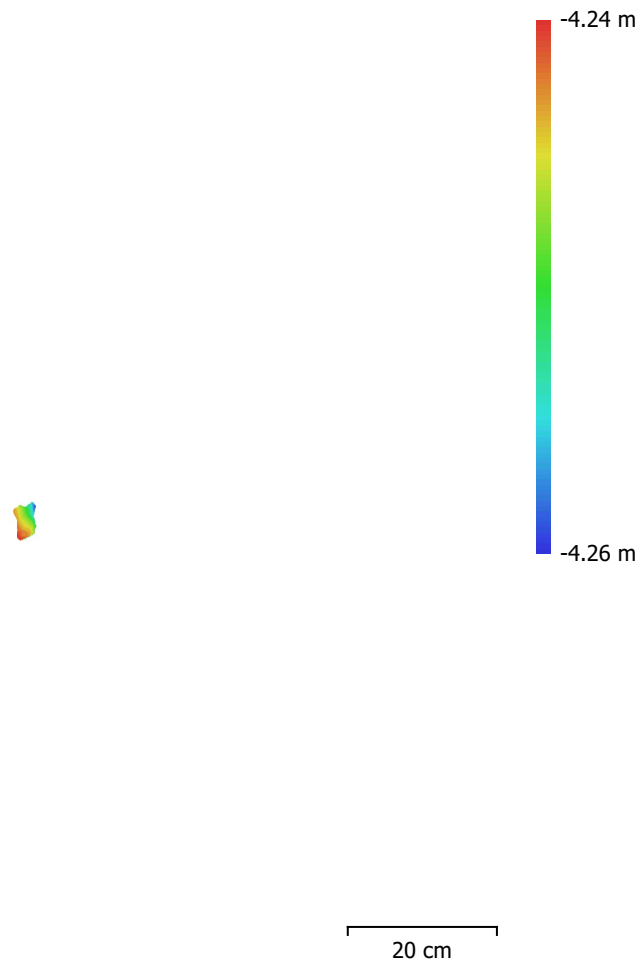


Fig. 4. Reconstructed digital elevation model.

Resolution: 0.113 mm/pix  
Point density: 78.3 points/mm<sup>2</sup>

# Processing Parameters

## General

|                   |                       |
|-------------------|-----------------------|
| Cameras           | 128                   |
| Aligned cameras   | 128                   |
| Markers           | 8                     |
| Scale bars        | 2                     |
| Coordinate system | Local Coordinates (m) |
| Rotation angles   | Yaw, Pitch, Roll      |

## Point Cloud

|                                |                         |
|--------------------------------|-------------------------|
| Points                         | 185,156 of 428,131      |
| RMS reprojection error         | 0.196634 (0.474946 pix) |
| Max reprojection error         | 3.45066 (15.0977 pix)   |
| Mean key point size            | 2.04688 pix             |
| Point colors                   | 3 bands, uint8          |
| Key points                     | No                      |
| Average tie point multiplicity | 3.34848                 |
| File size                      | 27.35 MB                |

## Depth Maps

|   |                      |
|---|----------------------|
| Count                                   | 127                  |
| <b>Depth maps generation parameters</b> |                      |
| Quality                                 | High                 |
| Filtering mode                          | Moderate             |
| Max neighbors                           | 16                   |
| Processing time                         | 2 minutes 18 seconds |
| Memory usage                            | 2.63 GB              |
| Date created                            | 2024:06:27 14:59:05  |
| Software version                        | 1.8.4.14671          |
| File size                               | 18.53 MB             |

## Dense Point Cloud

|  |                      |
|--|----------------------|
| Points                                   | 574,211              |
| Point colors                             | 3 bands, uint8       |
| <b>Depth maps generation parameters</b>  |                      |
| Quality                                  | High                 |
| Filtering mode                           | Moderate             |
| Max neighbors                            | 16                   |
| Processing time                          | 2 minutes 25 seconds |
| Memory usage                             | 2.51 GB              |
| <b>Dense cloud generation parameters</b> |                      |
| Processing time                          | 1 minutes 36 seconds |
| Memory usage                             | 4.14 GB              |
| Date created                             | 2024:06:27 14:46:35  |
| Software version                         | 1.8.4.14671          |
| File size                                | 8.21 MB              |

## Model

|               |                                     |
|---------------|-------------------------------------|
| Faces         | 399,932                             |
| Vertices      | 199,980                             |
| Vertex colors | 3 bands, uint8                      |
| Texture       | 16,000 x 16,000 x 2, 4 bands, uint8 |

## Texturing parameters

|               |         |
|---------------|---------|
| Mapping mode  | Generic |
| Blending mode | Mosaic  |

|                           |                      |
|---------------------------|----------------------|
| Texture size              | 16,000               |
| Enable hole filling       | Yes                  |
| Enable ghosting filter    | Yes                  |
| UV mapping time           | 36 seconds           |
| UV mapping memory usage   | 414.75 MB            |
| Blending time             | 1 minutes 19 seconds |
| Blending memory usage     | 13.28 GB             |
| Blending GPU memory usage | 11.91 GB             |
| File size                 | 188.12 MB            |

#### **System**

|                  |   |
|------------------|---|
| Software name    | Agisoft Metashape Professional            |
| Software version | 1.8.4 build 14671                         |
| OS               | Windows 64 bit                            |
| RAM              | 127.71 GB                                 |
| CPU              | Intel(R) Core(TM) i9-10940X CPU @ 3.30GHz |
| GPU(s)           | Quadro RTX 5000                           |