



PHOTOMOD 6.5. Productivity and new functions

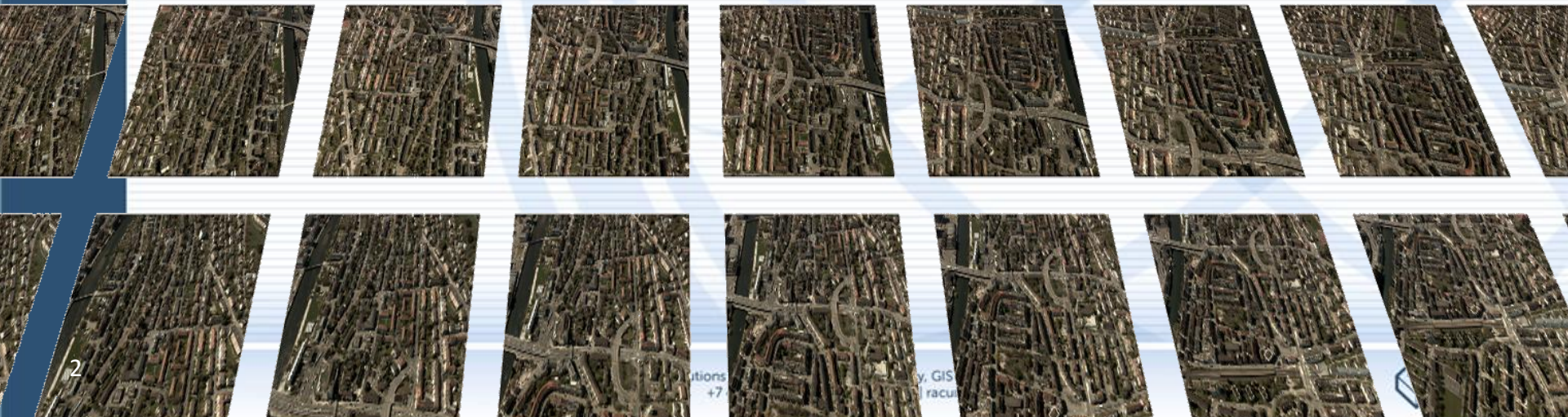
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Racurs Technical Support
department

October 28-31, 2019
Seoul, Republic of Korea



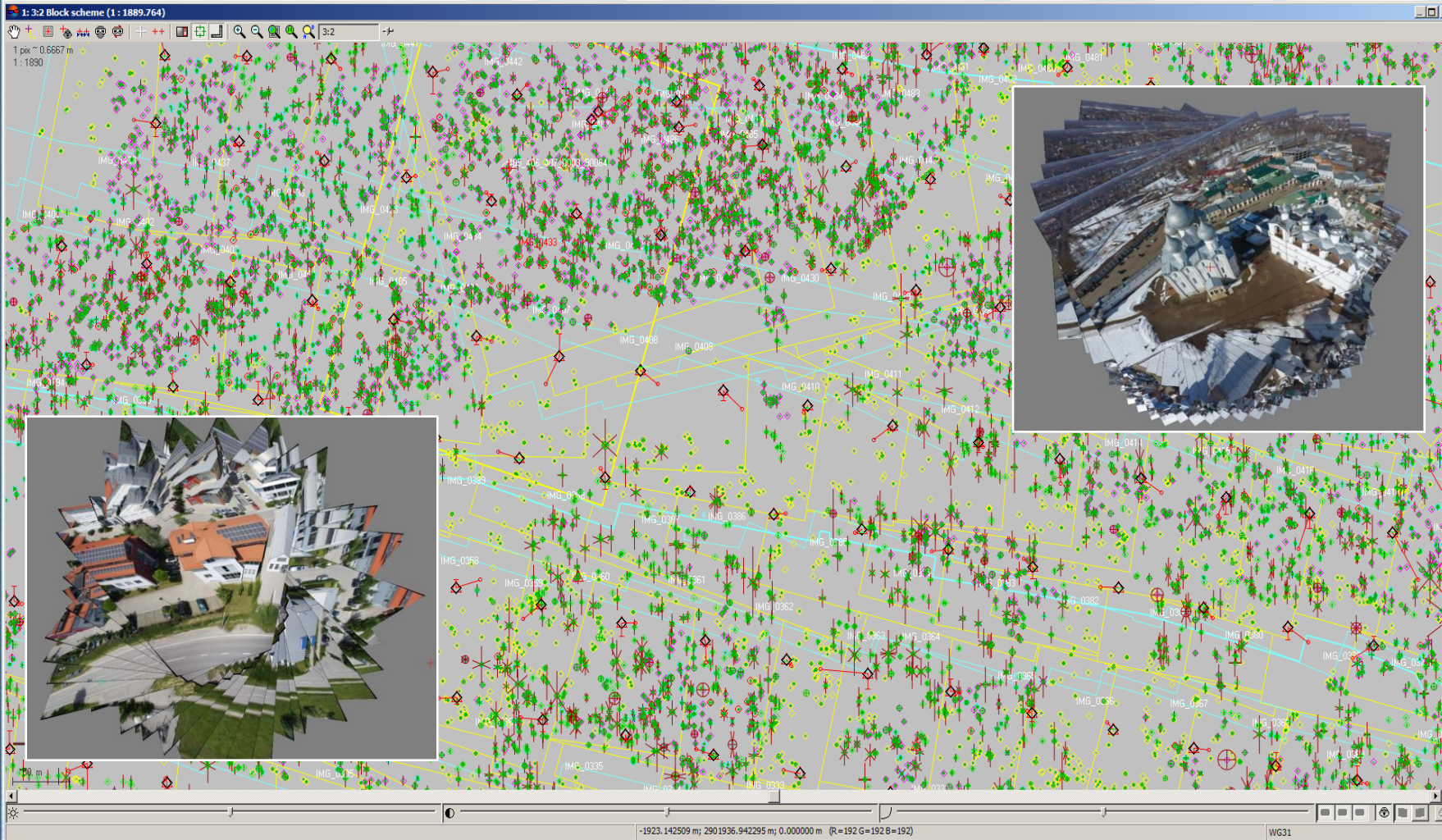
PHOTOMOD 6.5 highlights

- ✓ New algorithm for the bundle adjustment
- ✓ New distributed processing implementation
- ✓ Enhancements of the 3D-models building and visualization quality
- ✓ New 3D-feature extraction tools
- ✓ UAS AT improvements (for "bad" block layout)
- ✓ Changes in self-calibration process
- ✓ 3D modeling for satellite imagery enhancements
- ✓ PHOTOMOD Conveyor modifications
- ✓ Phase One metadata import
- ✓ Access to Airbus OneAtlas and DigitalGlobe EarthWatch satellite imagery coverages



New algorithm of the bundle adjustment

- ✓ speeding up the adjustment for "pure" block layout (big and instable orientation angle values)
- ✓ full and smart automation of detection of incorrect points
- ✓ multithread calculations support
- ✓ modifications of the self-calibration procedure



New concept of distributed processing

- ✓ increasing the reliability and resistance to local network failures
- ✓ general speeding up
- ✓ new user interface
- ✓ equal and consequent workloading of client
- ✓ more....

The screenshot shows a software interface for distributed processing of aerial imagery. The main window displays a grid of 10x10 image thumbnails. A 'Monitor' window is open, showing a table of task statistics and a detailed task list.

Monitor Window - Statistics

Field name	Field value
Start Time	09.07.2019 16:25
Finish Time	09.07.2019 18:06
Elapsed Time	01:41:09.650328
Tasks Total	190
Tasks Finished	190
Tasks Failed	0
Tasks Running	0
Tasks Paused	0
Tasks Waiting	0
Active Agents	2
Total Progress	100%

Monitor Window - Task List

Name	Progress	Status	Started at	Elapsed time	Task ID	Session ID	Agent ID	Hostname	HostPID	Multi-Threading	Update time	Priority	Executor	Created at	
Processing stereopair	100%	Success	09.07.2019 16:25	00:00:31.277	7416	7099	183	TP-NOTE	10412	1	09.07.2019 16:25	0	TP-NOTE	09.07.2019 16:25	Obliques
Processing stereopair	100%	Success	09.07.2019 16:25	00:03:06.103	7417	7100	184	TP-NOTE	10412	1	09.07.2019 16:28	0	GREG-7	09.07.2019 16:25	Obliques
Processing stereopair	100%	Success	09.07.2019 16:25	00:01:05.949	7418	7101	183	TP-NOTE	10412	1	09.07.2019 16:26	0	TP-NOTE	09.07.2019 16:25	Obliques
Processing stereopair	100%	Success	09.07.2019 16:26	00:00:47.089	7419	7102	183	TP-NOTE	10412	1	09.07.2019 16:27	0	TP-NOTE	09.07.2019 16:25	Obliques
Processing stereopair	100%	Success	09.07.2019 16:27	00:00:23.356	7420	7103	183	TP-NOTE	10412	1	09.07.2019 16:28	0	TP-NOTE	09.07.2019 16:25	Obliques
Processing stereopair	100%	Success	09.07.2019 16:28	00:00:29.197	7421	7104	183	TP-NOTE	10412	1	09.07.2019 16:28	0	TP-NOTE	09.07.2019 16:25	Obliques

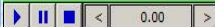
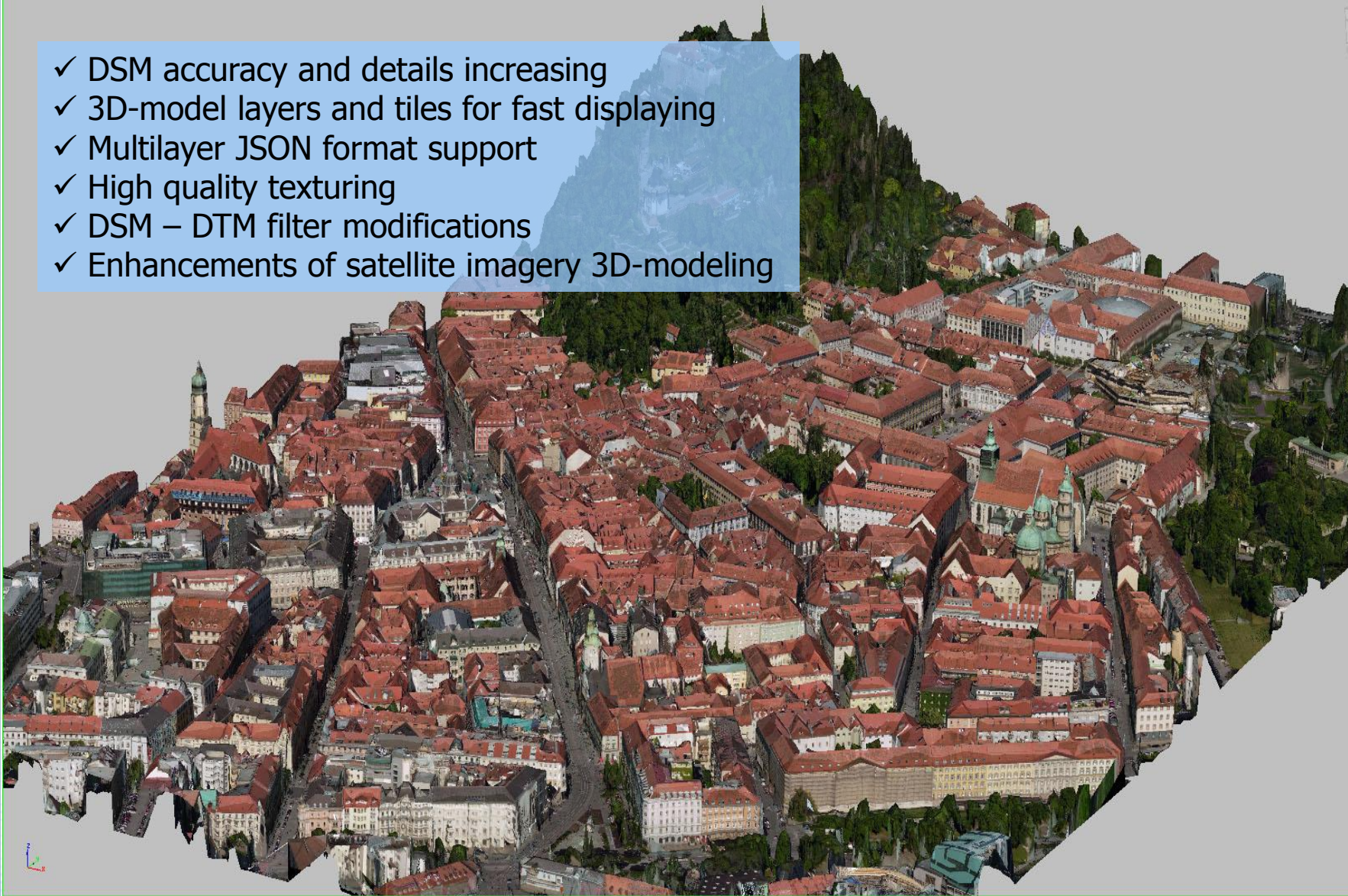
Self-calibration improvements



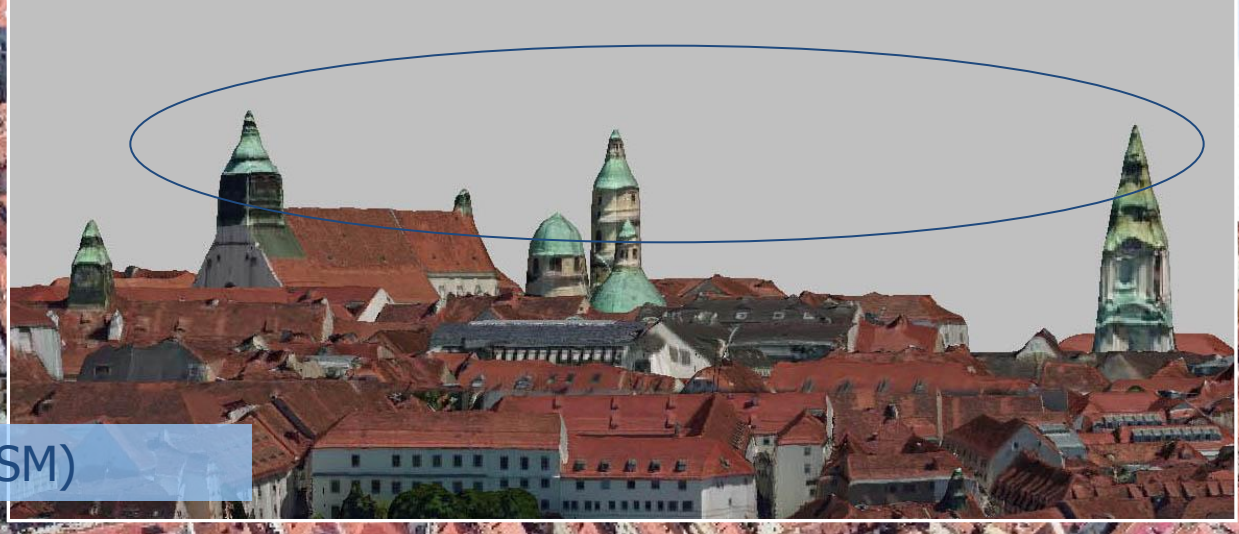
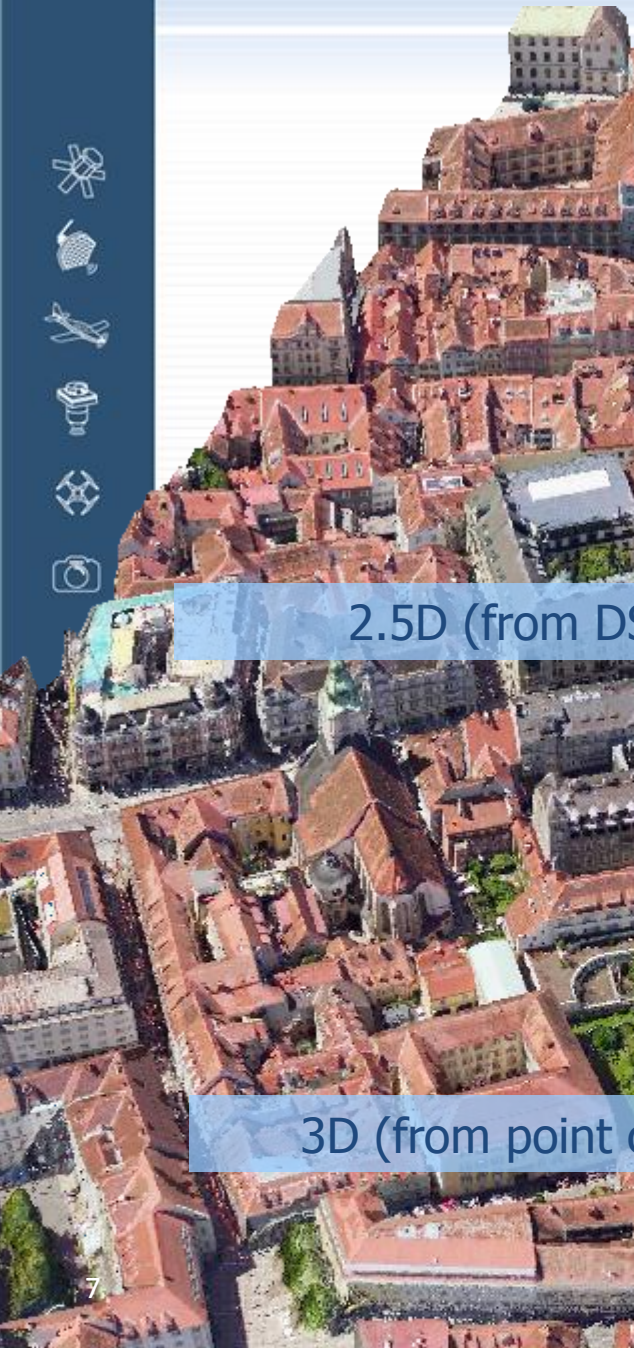
DSM / TrueOrtho / 3D model improvements

Perspective

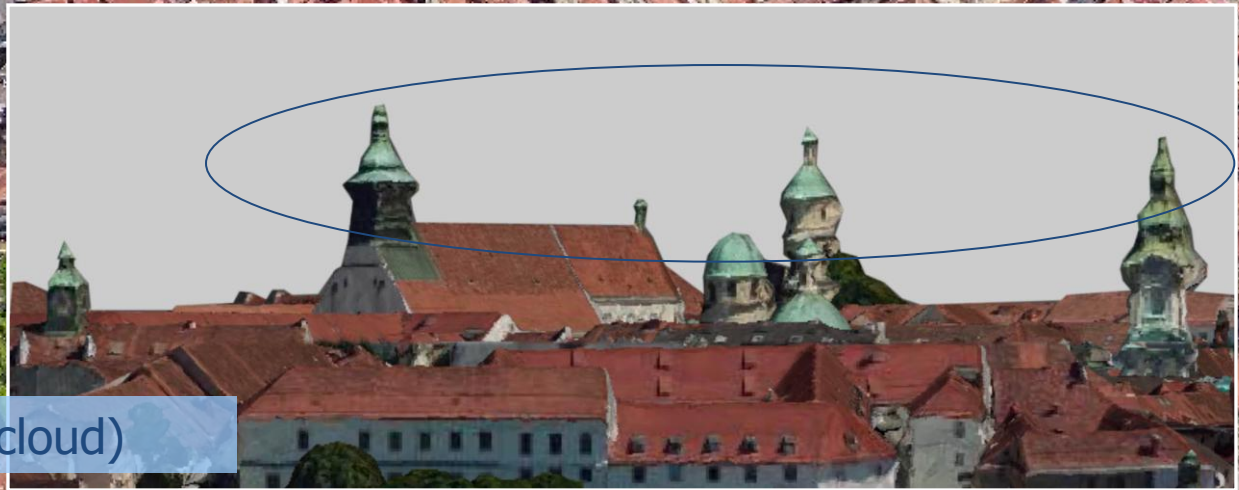
- ✓ DSM accuracy and details increasing
- ✓ 3D-model layers and tiles for fast displaying
- ✓ Multilayer JSON format support
- ✓ High quality texturing
- ✓ DSM – DTM filter modifications
- ✓ Enhancements of satellite imagery 3D-modeling



3D-model and “2.5”D-model

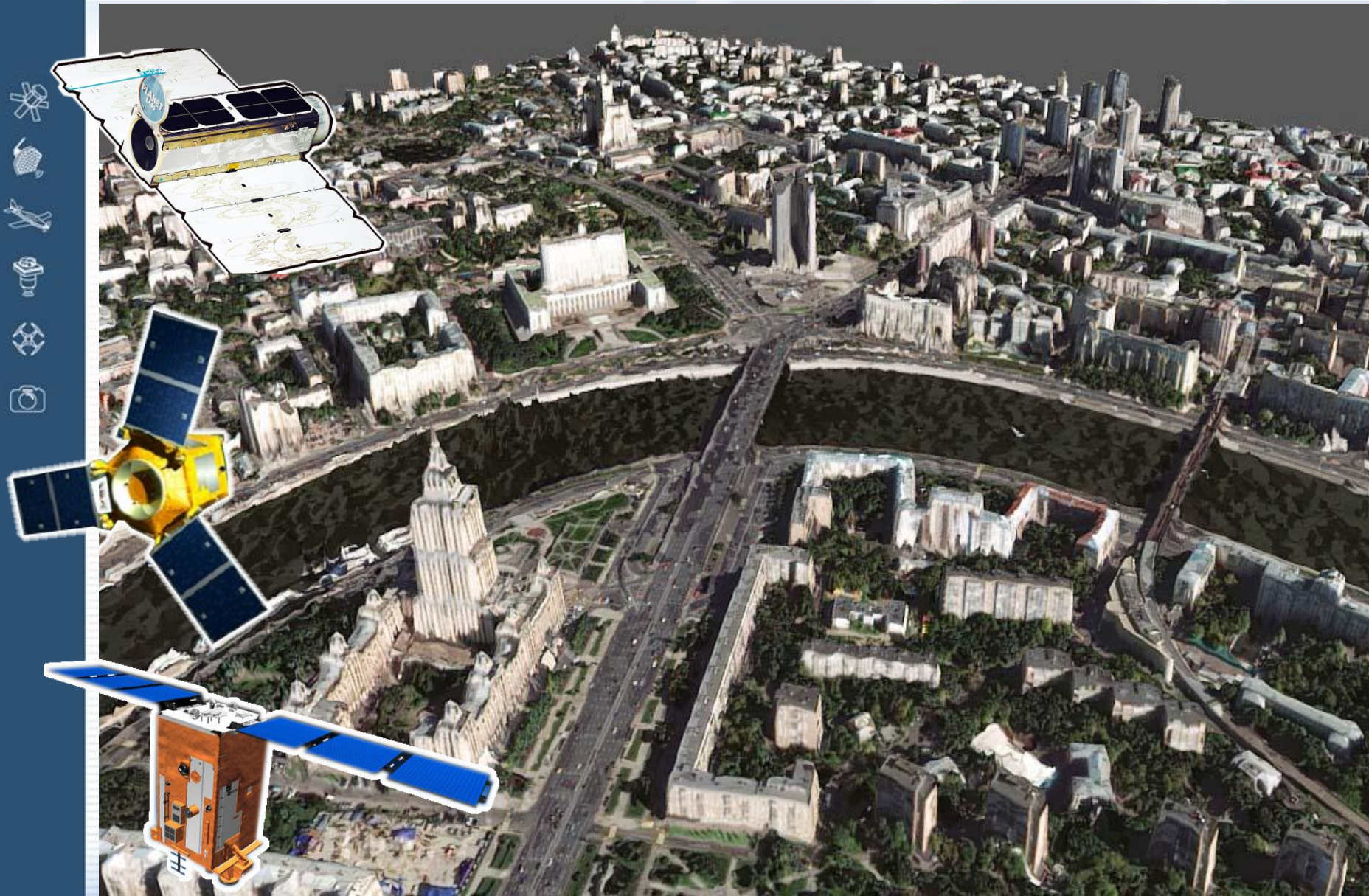


2.5D (from DSM)



3D (from point cloud)

3D models from satellite imagery





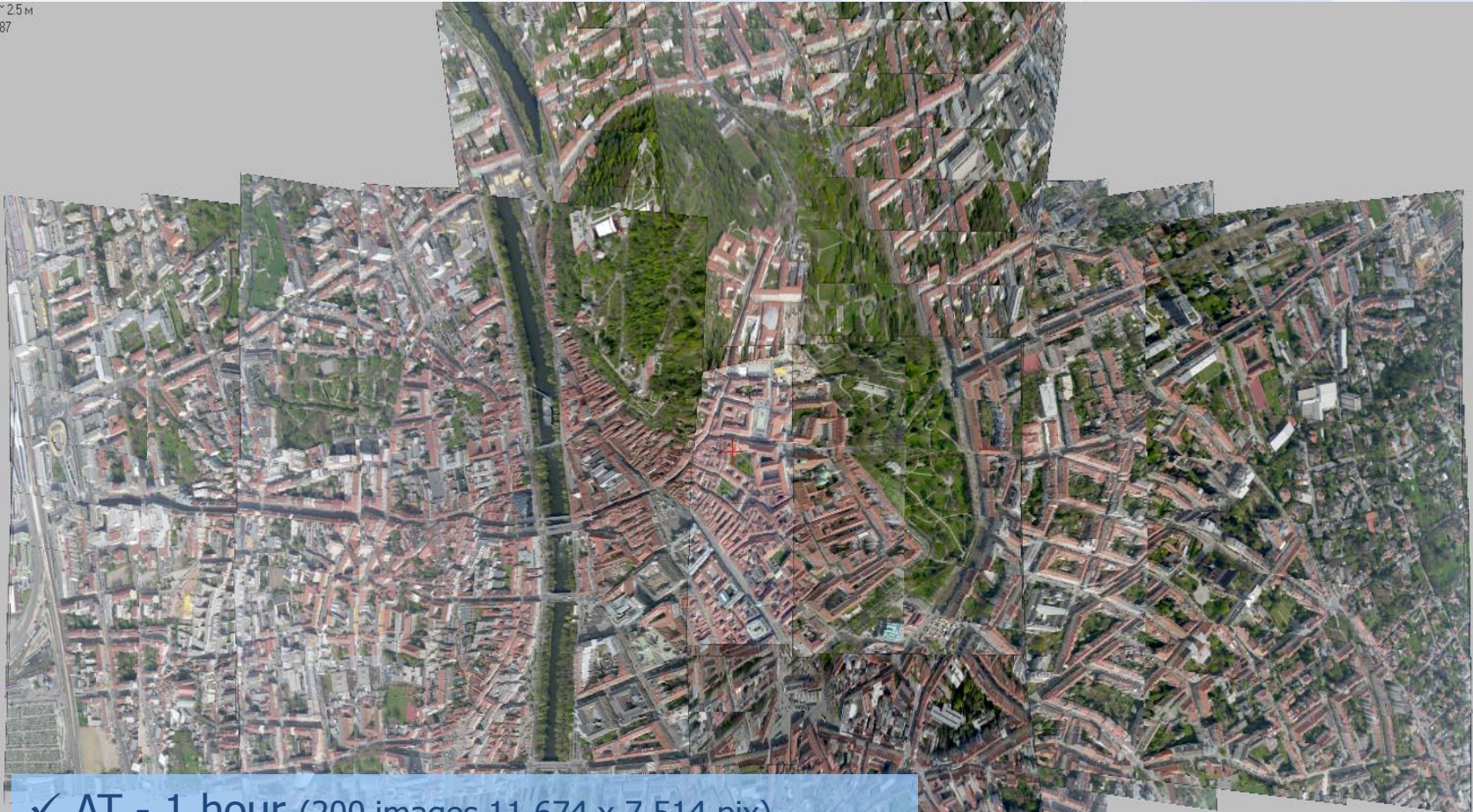






UltraCam Osprey. 200 oblique images

pix ~ 2.5 m
7087

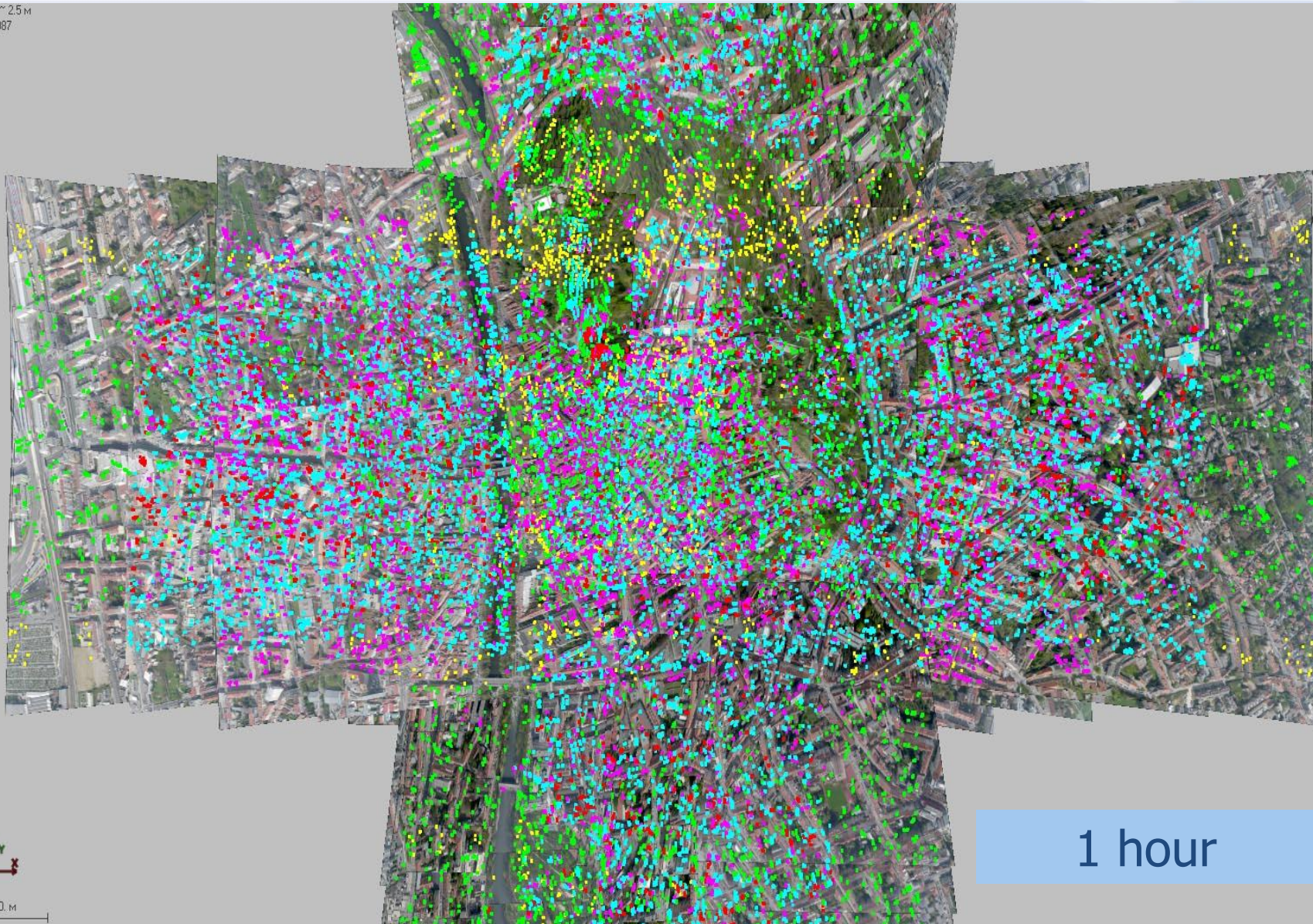


- ✓ AT - 1 hour (200 images, 11 674 x 7 514 pix)
- ✓ dDSM – 9 hours (52 500 x 51 500, GSD = 0.07 m)
- ✓ Point Cloud – 7 hours (844 000 000 points)
- ✓ TrueOrtho – 2 hours (area = 9 sq.km)
- ✓ 3D-model – 13 hours

Total: 31 hours

Aerial triangulation

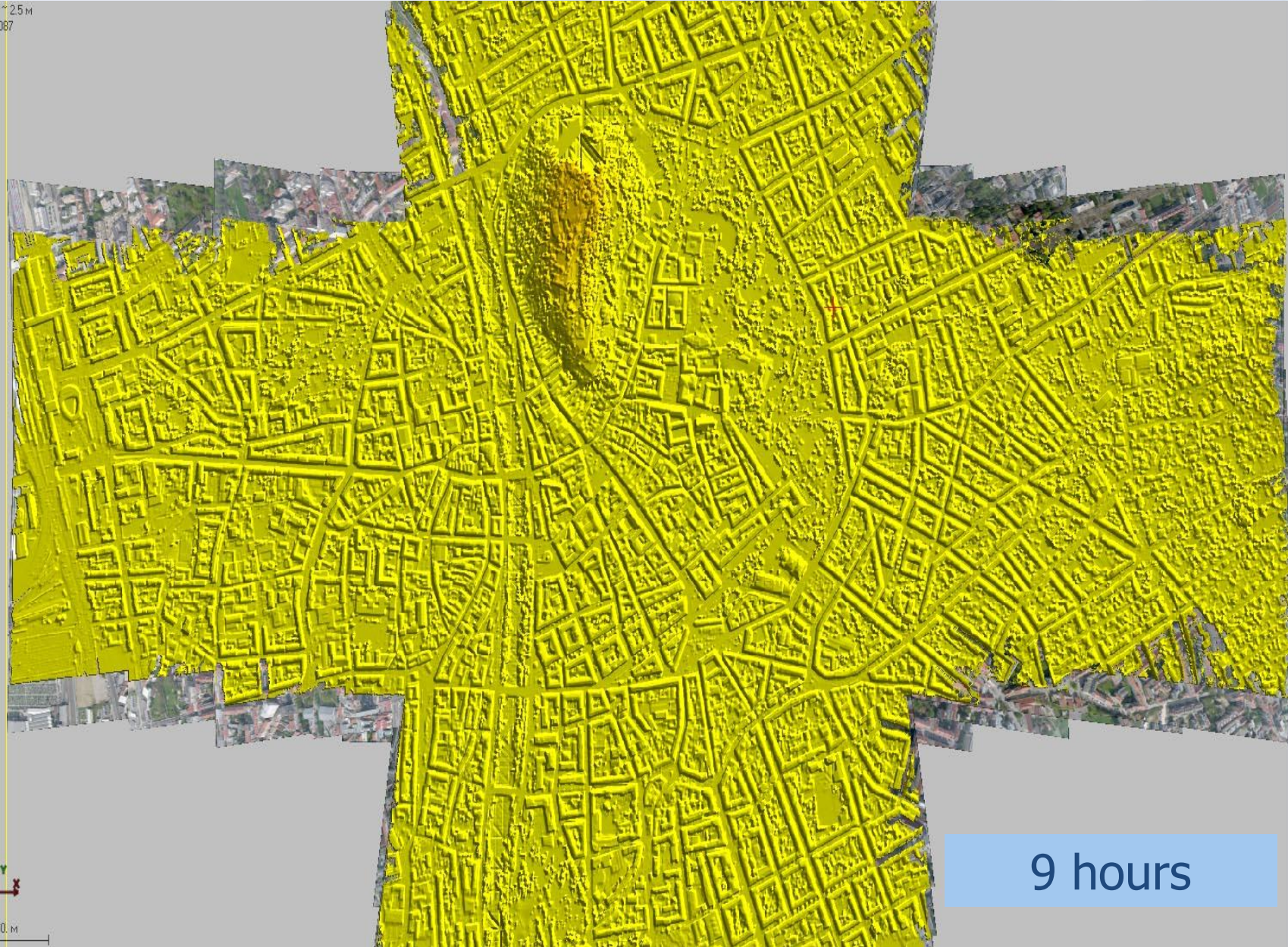
pix ~ 2,5 м
: 7087



1 hour

Digital Surface Model

W 2.5 M
7087



9 hours



True Ortho



Point cloud



7 hours



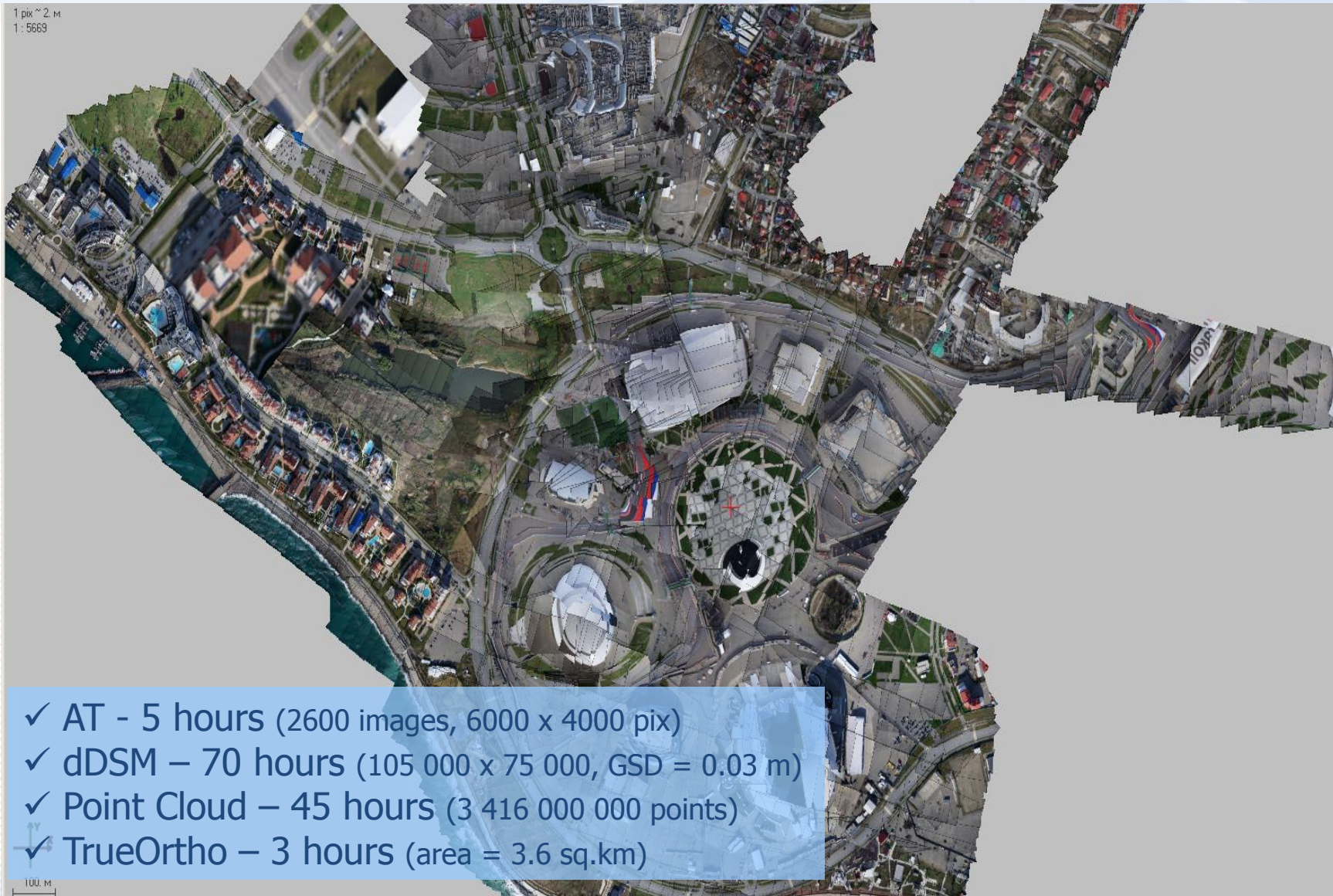
3D model



13 hours

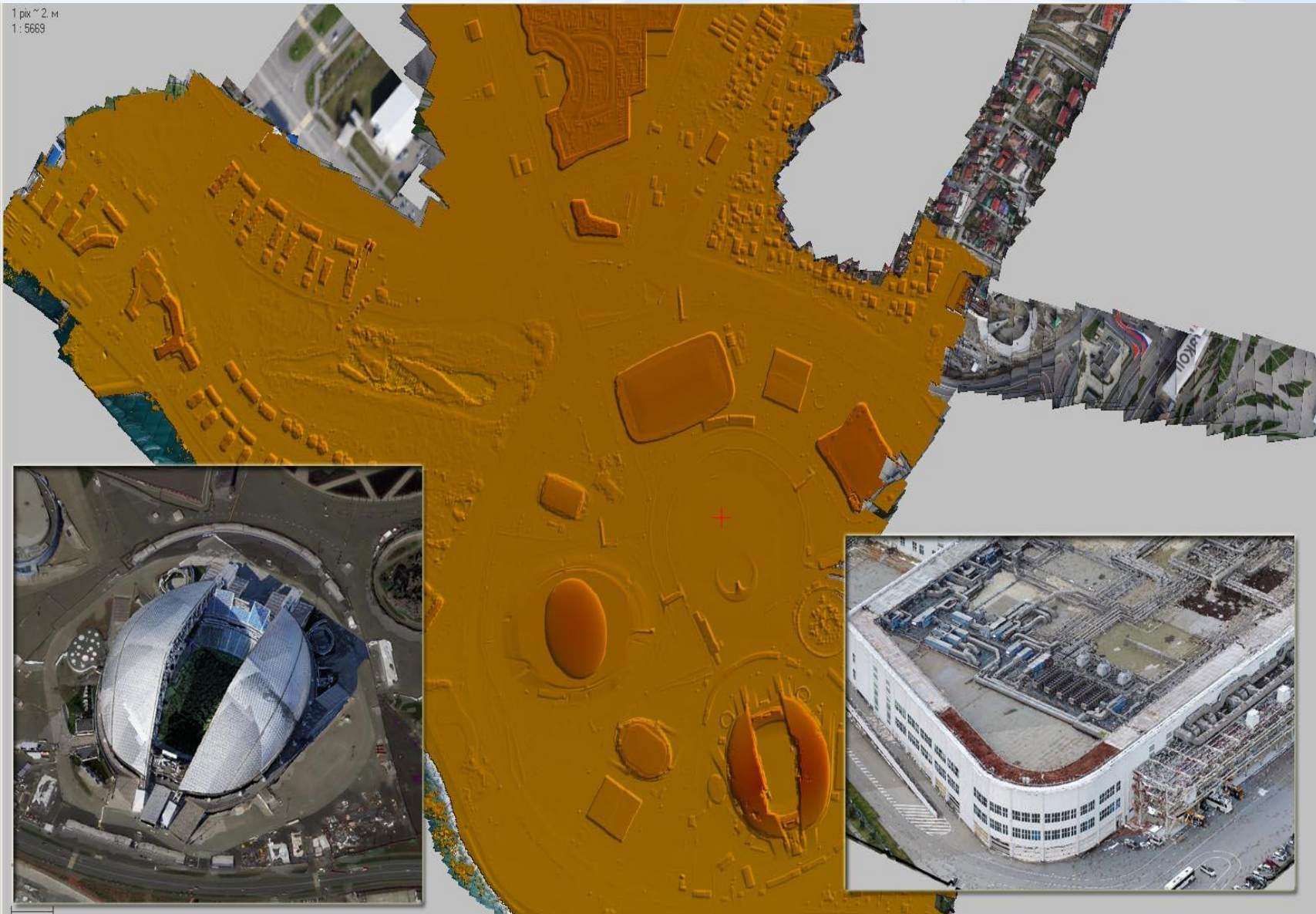


UAS. 2600 images (SONY ILCE-6000)

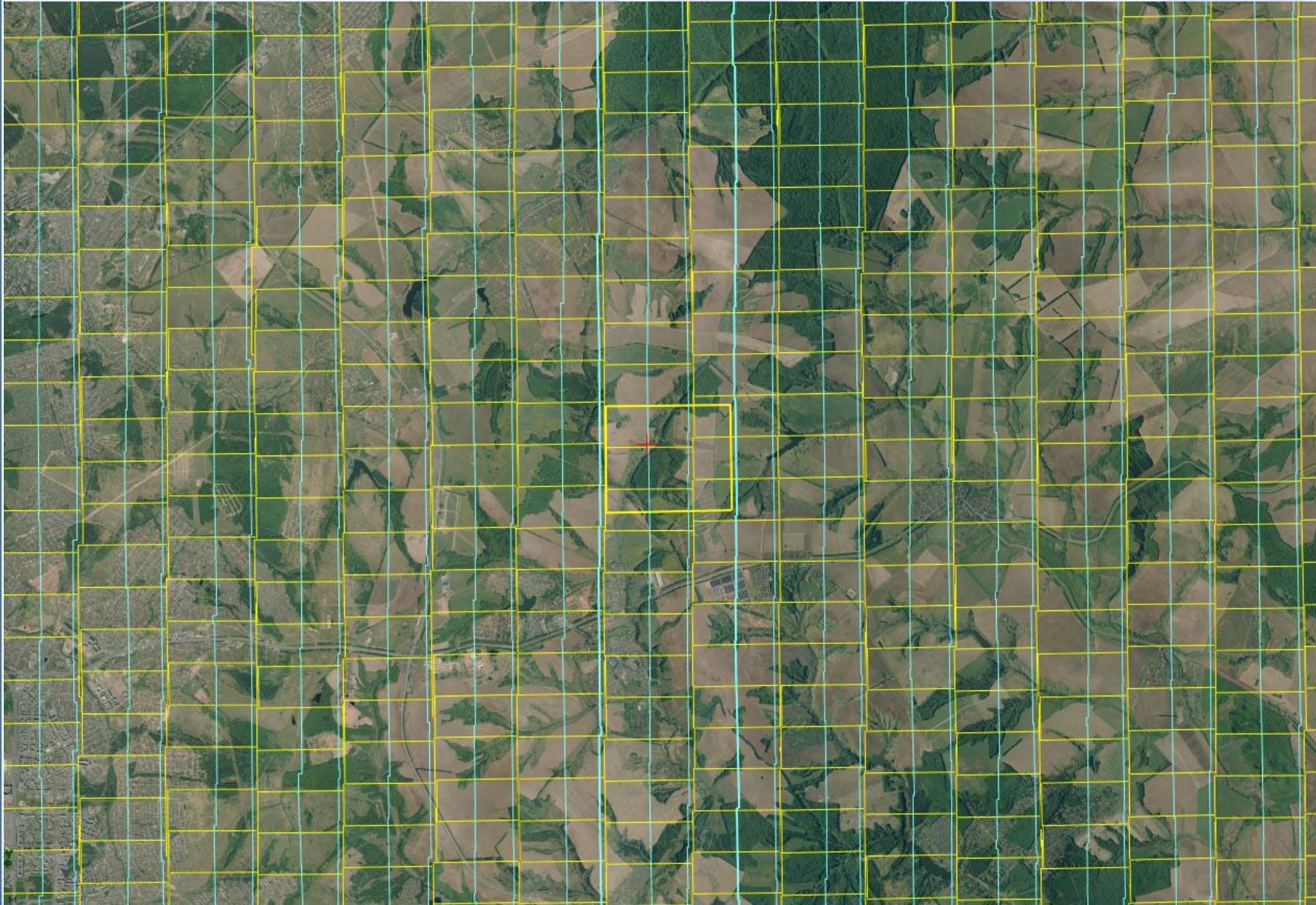


- ✓ AT - 5 hours (2600 images, 6000 x 4000 pix)
- ✓ dDSM – 70 hours (105 000 x 75 000, GSD = 0.03 m)
- ✓ Point Cloud – 45 hours (3 416 000 000 points)
- ✓ TrueOrtho – 3 hours (area = 3.6 sq.km)

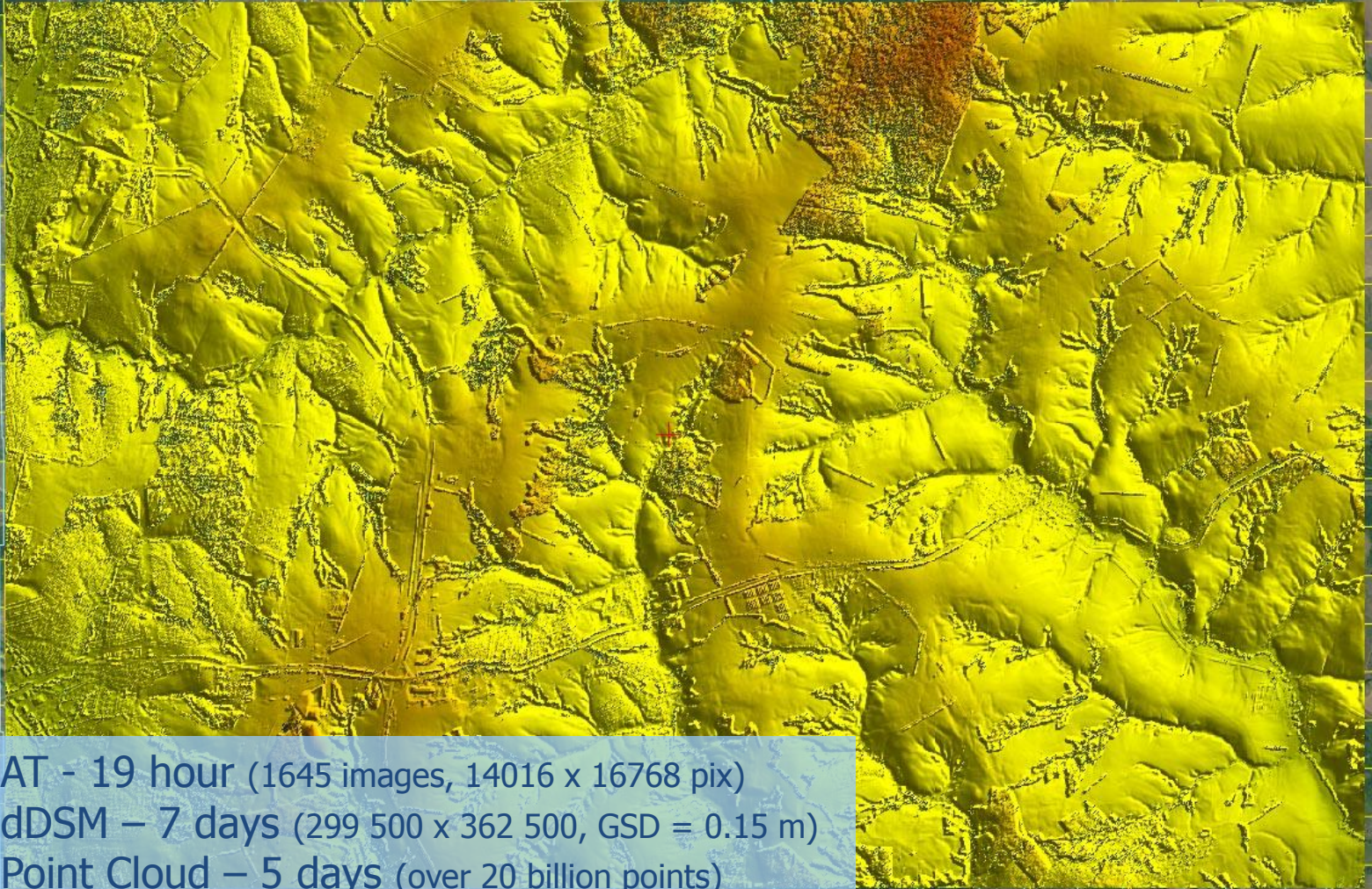
Total – 120 hours (5 days)



DMC II. 1700 images

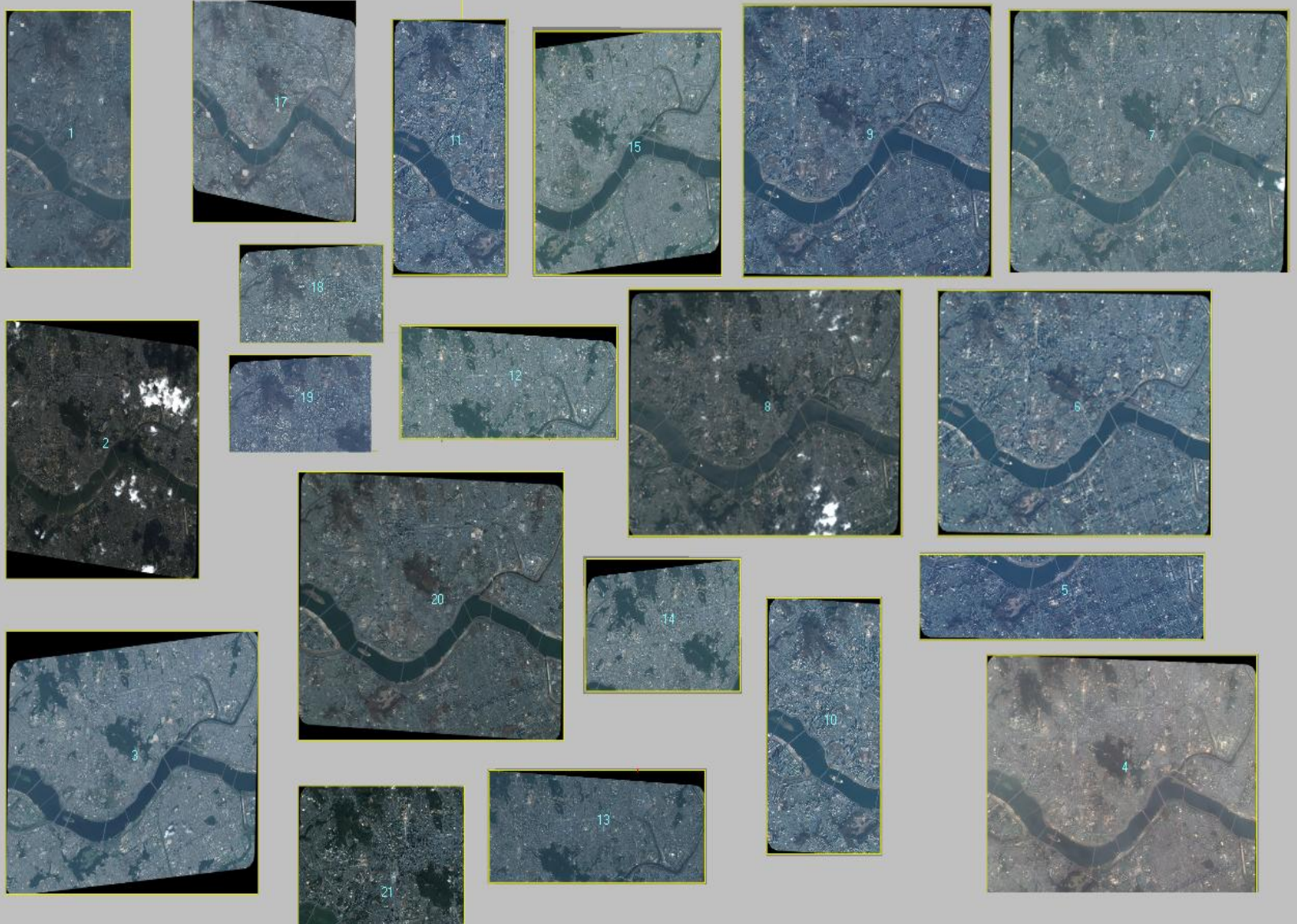


Total – 16 days

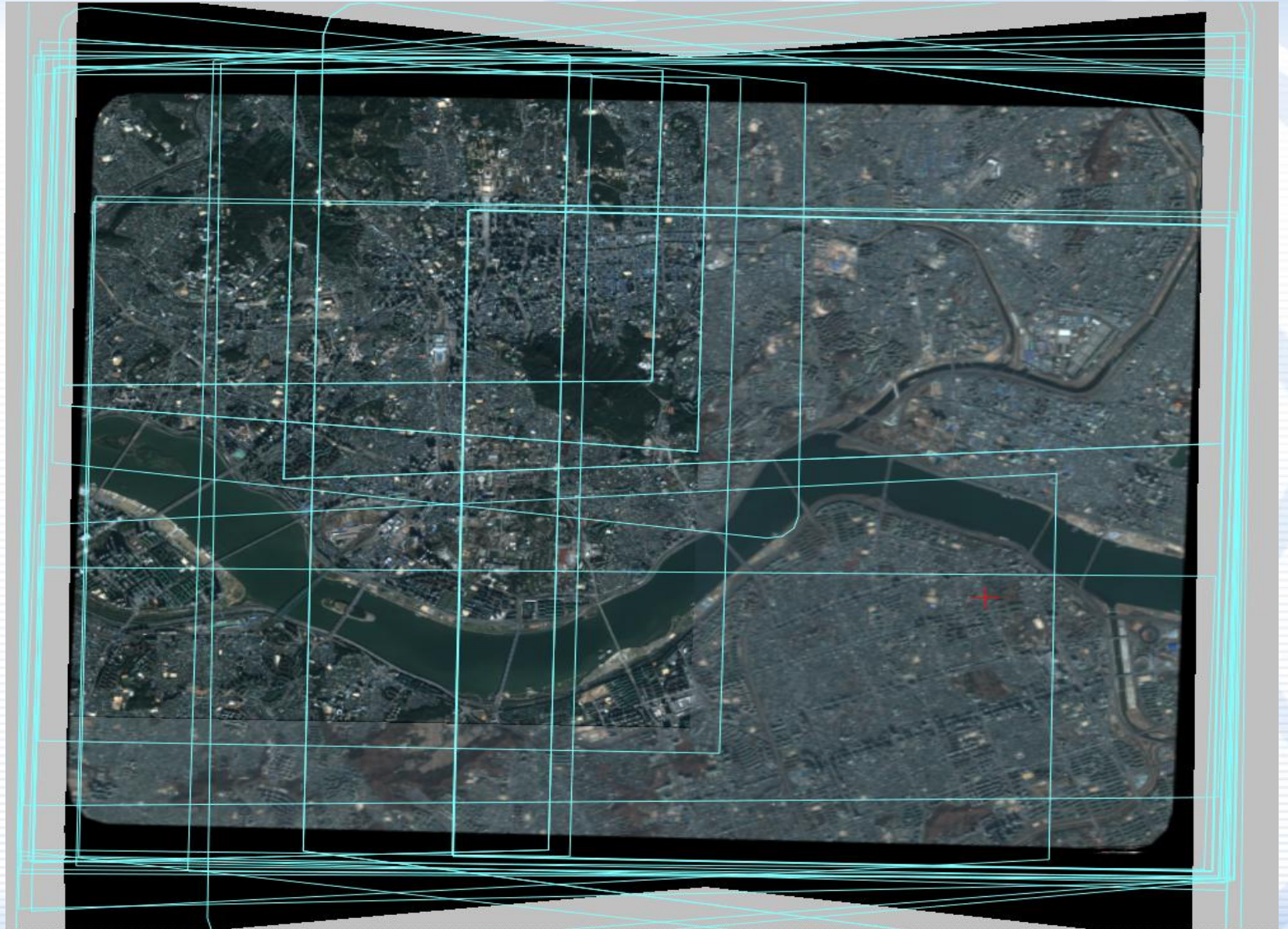


- ✓ AT - 19 hour (1645 images, 14016 x 16768 pix)
- ✓ dDSM – 7 days (299 500 x 362 500, GSD = 0.15 m)
- ✓ Point Cloud – 5 days (over 20 billion points)
- ✓ TrueOrtho – 3 days (area = 2 258 sq.km)

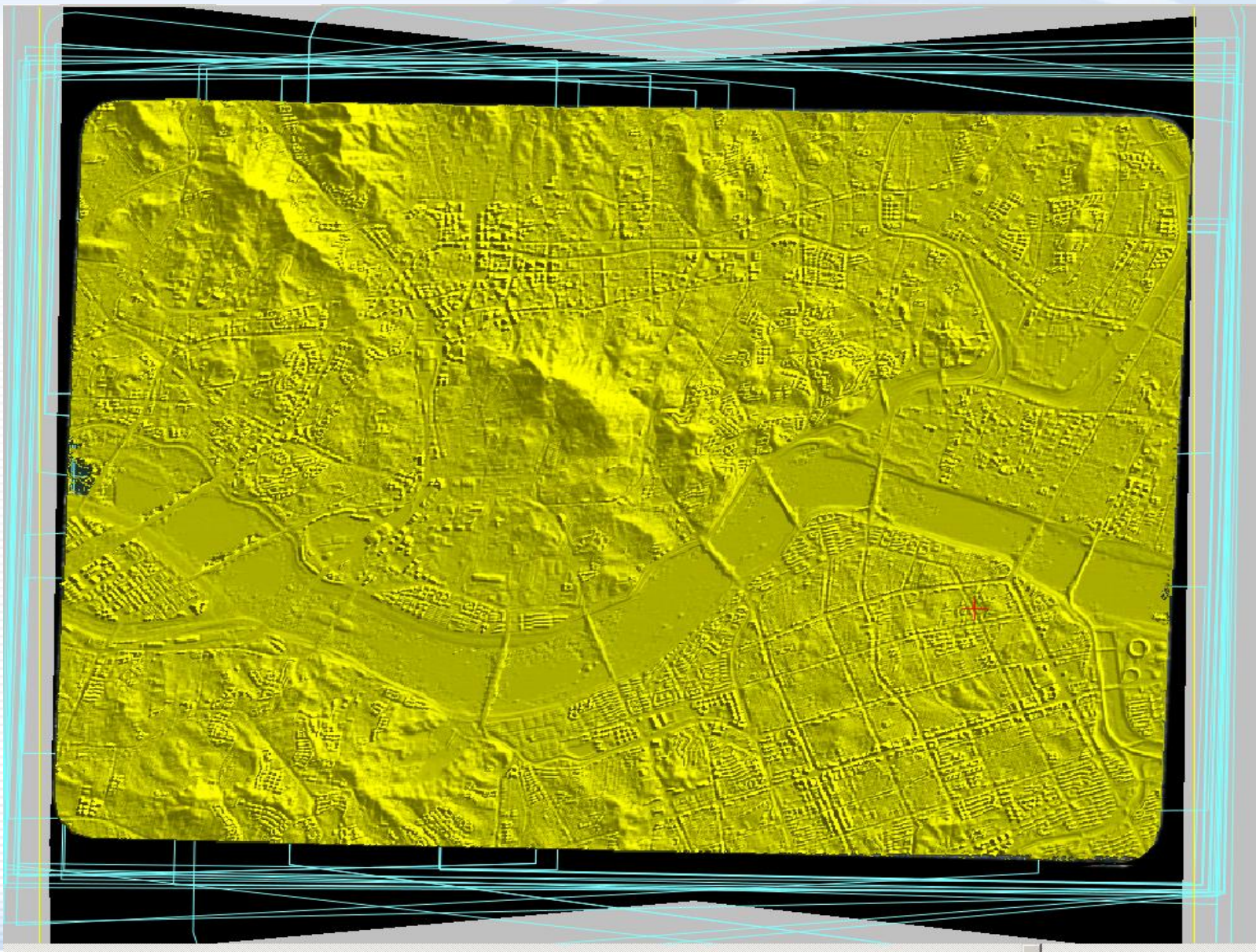
Satellite imagery. Pleiades. 28 images. Seoul, Korea



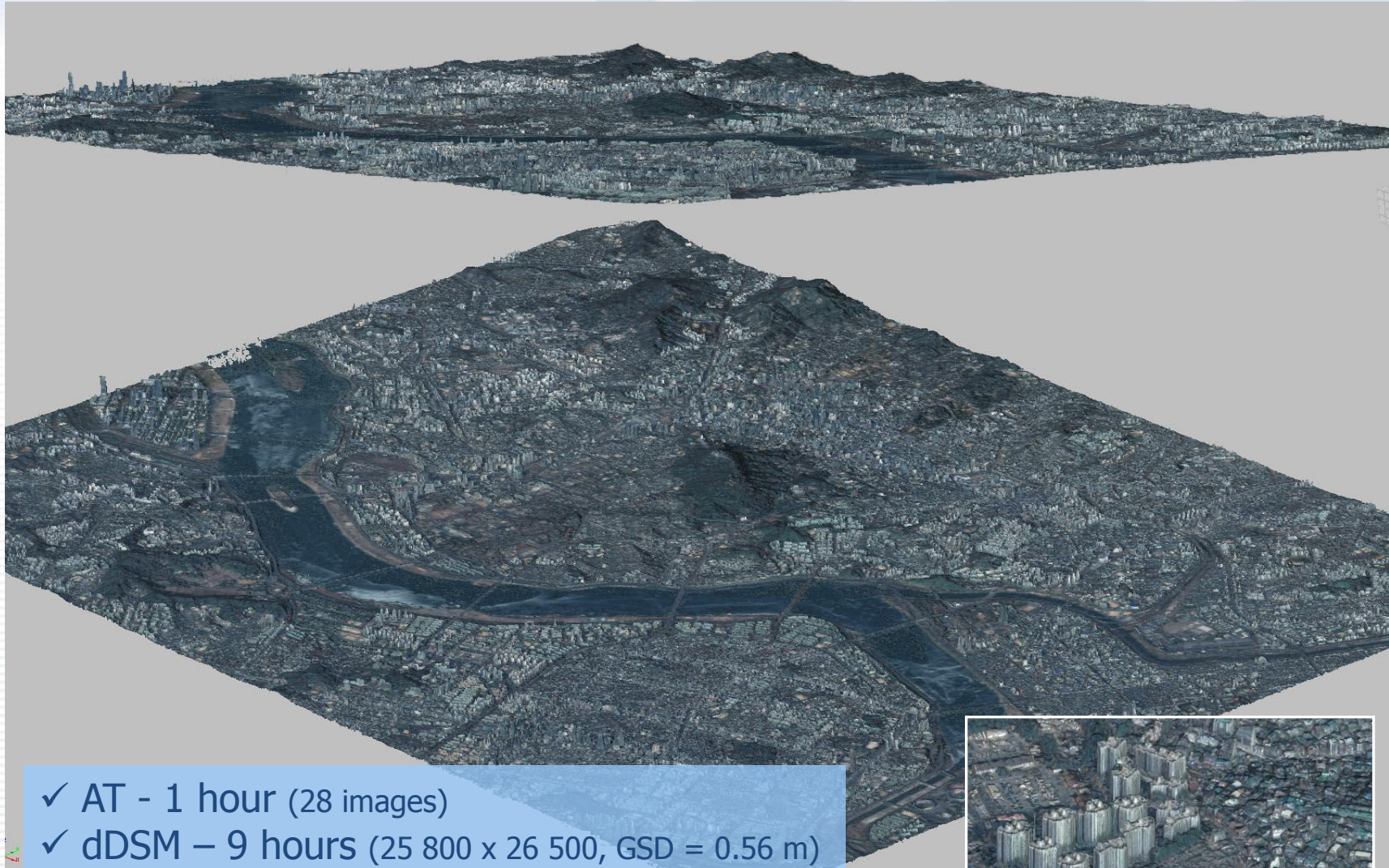
Block layout



DSM



Total -18 hours

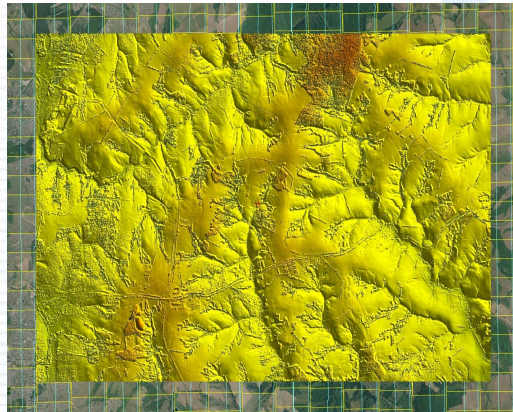


- ✓ AT - 1 hour (28 images)
- ✓ dDSM – 9 hours (25 800 x 26 500, GSD = 0.56 m)
- ✓ TrueOrtho – 1 hour (area = 194 sq.km)
- ✓ 3D-model – 7 hours





"Full" output vs just Ortho. 1700 images of DMC II



operations	all output products	ortho
AT	19 hours	19 hours
DSM	7 days (GSD = 0.15 m)	4 hours (GSD = 1.0 m)
Point cloud	5 days	----
TrueOrtho	3 days	----
DSM-DTM	----	2 hours
Ortho	----	20 hours
Mosaic	----	3 hours
total time	16 days	2 days

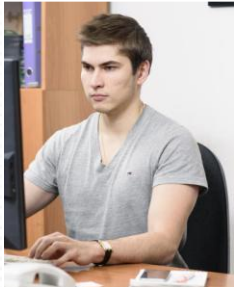
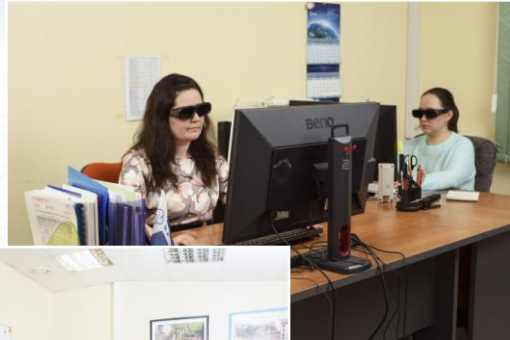
Monitor for distributed processing

Name	Progress	Status	Started	Elapsed time	Task ID	Priority	Executor	Profile
Processing stereopair 1/35 (177-378)	100%	Success	17.10.2019 12:40	00:03:02.644	8152	0	TP-NOTE	Local_Note
Processing stereopair 2/35 (178-379)	100%	Success	17.10.2019 12:40	00:03:35.712	8153	0	TP-NOTE	Local_Note
Processing stereopair 3/35 (179-380)	100%	Success	17.10.2019 12:40	00:03:49.343	8154	0	TP-NOTE	Local_Note
Final_Ascm - Fill TrueOrtho - 1/6	100%	Success	17.10.2019 13:09	00:00:03.264	8219	0	TP-NOTE	Local_Note
Final_Ascm - Fill TrueOrtho - 2/6	100%	Success	17.10.2019 13:09	00:00:07.546	8220	0	TP-NOTE	Local_Note
Final_Ascm - Fill TrueOrtho - 3/6	100%	Success	17.10.2019 13:09	00:00:08.039	8221	0	TP-NOTE	Local_Note
Final_Ascm - Fill TrueOrtho - 4/6	100%	Success	17.10.2019 13:09	00:00:10.715	8222	0	TP-NOTE	Local_Note
Final_Ascm - Fill TrueOrtho - 5/6	100%	Success	17.10.2019 13:09	00:00:15.477	8223	0	TP-NOTE	Local_Note
Final_Ascm - Fill TrueOrtho - 6/6	100%	Success	17.10.2019 13:09	00:00:18.268	8224	0	TP-NOTE	Local_Note
Final_Ascm - Fill TrueOrtho	100%	Success	17.10.2019 13:09	00:00:00	8225	0	TP-NOTE	Local_Note
Final_Ascm - Synchronization task	100%	Success	17.10.2019 13:09	00:00:00	8226	0	TP-NOTE	Local_Note
Deleting intermediate data	100%	Success	17.10.2019 13:09	00:00:01.562	8227	0	TP-NOTE	Local_Note
Compute new points - 1/4	100%	Success	22.10.2019 15:45	13:23:17.418	8228	0	TP-NOTE	Local_Note
Compute new points - 2/4	100%	Success	22.10.2019 15:45	17:25:10.911	8229	0	TP-NOTE	Local_Note
Compute new points - 3/4	100%	Success	22.10.2019 15:45	18:05:31.141	8230	0	TP-NOTE	Local_Note
Compute new points - 4/4	100%	Success	22.10.2019 15:45	15:44:34.412	8231	0	TP-NOTE	Local_Note
Transfer points between strips and filter	41%	Success	23.10.2019 9:51	00:51:51.446	8232	0	TP-NOTE	Local_Note

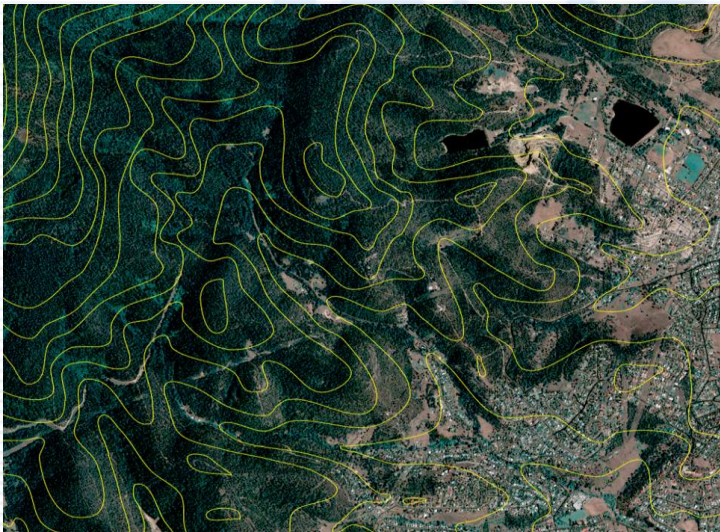
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Processing stereopair 2/35 (178-379)	100%	Success	17.10.2019 12:40	00:03:35.712	8153	0	TP-NOTE	Local_Note
Processing stereopair 3/35 (179-380)	100%	Success	17.10.2019 12:40	00:03:49.343	8154	0	TP-NOTE	Local_Note
Final_Ascm - Fill TrueOrtho - 1/6	100%	Success	17.10.2019 13:09	00:00:03.264	8219	0	TP-NOTE	Local_Note
Final_Ascm - Fill TrueOrtho - 2/6	100%	Success	17.10.2019 13:09	00:00:07.546	8220	0	TP-NOTE	Local_Note
Final_Ascm - Fill TrueOrtho - 3/6	100%	Success	17.10.2019 13:09	00:00:08.039	8221	0	TP-NOTE	Local_Note
Final_Ascm - Fill TrueOrtho - 4/6	100%	Success	17.10.2019 13:09	00:00:10.715	8222	0	TP-NOTE	Local_Note
Final_Ascm - Fill TrueOrtho - 5/6	100%	Success	17.10.2019 13:09	00:00:15.477	8223	0	TP-NOTE	Local_Note
Final_Ascm - Fill TrueOrtho - 6/6	100%	Success	17.10.2019 13:09	00:00:18.268	8224	0	TP-NOTE	Local_Note
Final_Ascm - Fill TrueOrtho	100%	Success	17.10.2019 13:09	00:00:00	8225	0	TP-NOTE	Local_Note
Final_Ascm - Synchronization task	100%	Success	17.10.2019 13:09	00:00:00	8226	0	TP-NOTE	Local_Note
Deleting intermediate data	100%	Success	17.10.2019 13:09	00:00:01.562	8227	0	TP-NOTE	Local_Note
Compute new points - 1/4	100%	Success	22.10.2019 15:45	13:23:17.418	8228	0	TP-NOTE	Local_Note
Compute new points - 2/4	100%	Success	22.10.2019 15:45	17:25:10.911	8229	0	TP-NOTE	Local_Note
Compute new points - 3/4	100%	Success	22.10.2019 15:45	18:05:31.141	8230	0	TP-NOTE	Local_Note
Compute new points - 4/4	100%	Success	22.10.2019 15:45	15:44:34.412	8231	0	TP-NOTE	Local_Note
Transfer points between strips and filter	41%	Success	23.10.2019 9:51	00:51:51.446	8232	0	TP-NOTE	Local_Note

Manual job in some cases (classic ortho and contours)



- ✓ DSM – DTM filter editing
- ✓ Bridges digitizing
- ✓ Contours smoothing



.....? total time increasing ?.....



Thank you for attention !

