Ableitung aktueller 3D Information aus hochauflösenden Pleiades Stereodaten am Beispiel Eisenstadt

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INTERFACE

eodc

enveo

PARIS LODRON UNIVERSITY SALZBURG

Z_GIS

GeoSphere Austria

JOANNEUM RESEARCH

spatial services

WHERE GEOINFORMATION MEETS TECHNOLOGY

TU WIEN

DEPARTMENT OF GEODESY AND GEOINFORMATION

DSM/DTM Generation

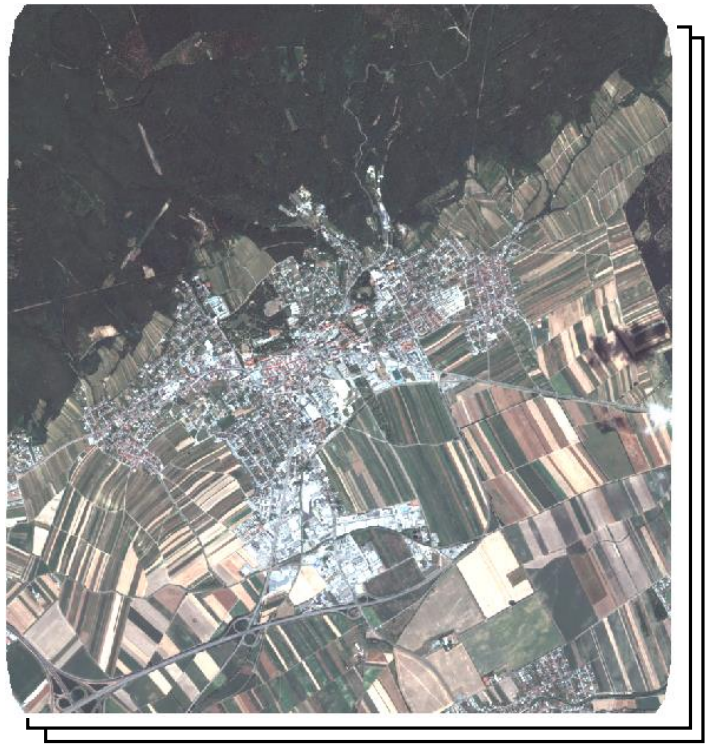
INTERFACE

- Was ist der Service?
  - Ableitung von Höheninformation über multi-Stereo basierend auf Pleiades Daten
- Wofür kann der Service verwendet werden?
  - Aktualisierung bestehender DSM/DTMs
  - True Ortho Erstellung
- Welche räumliche und zeitliche Abdeckung?
  - user defined

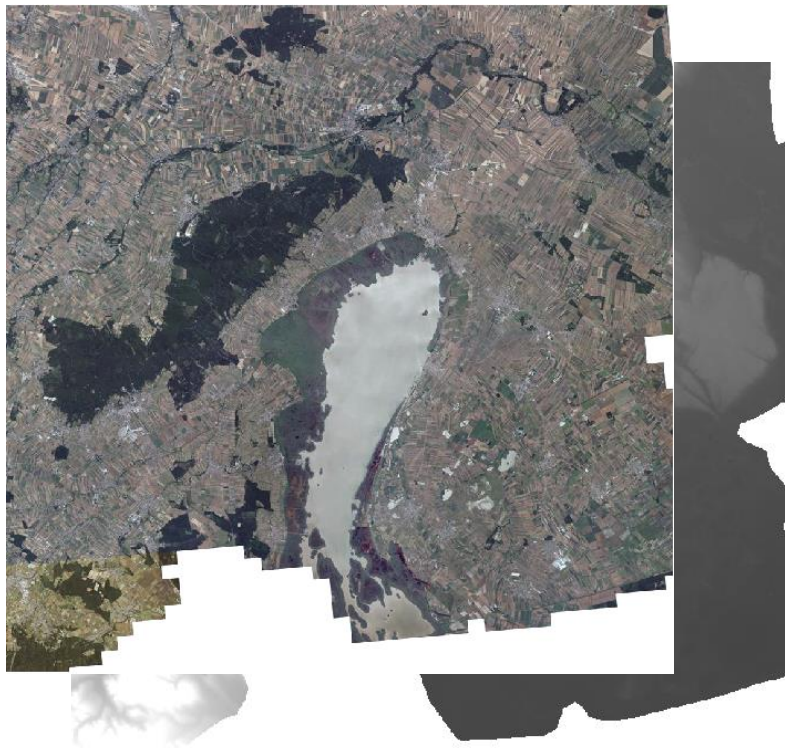
Pléiades Eisenstadt

INTERFACE

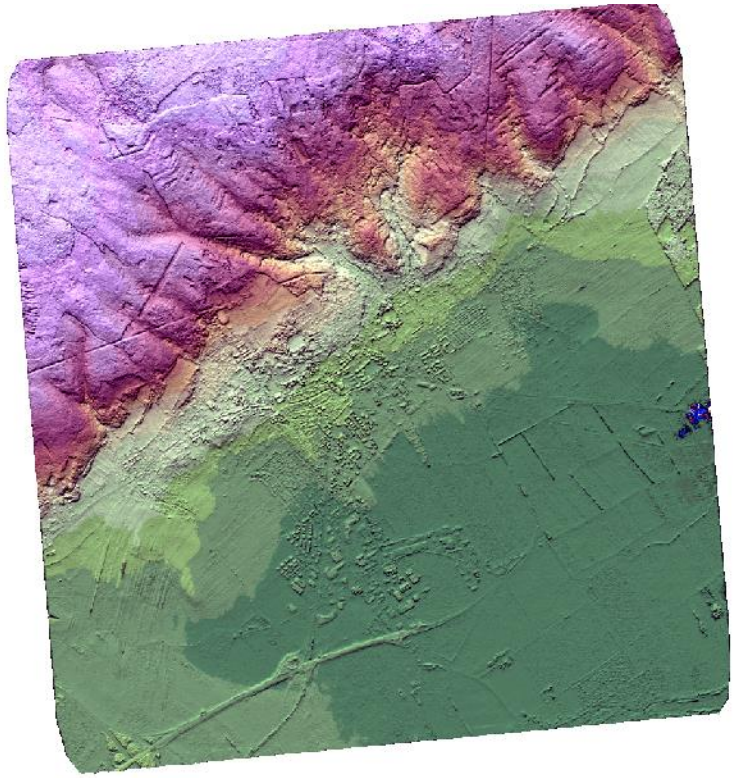
image triplet



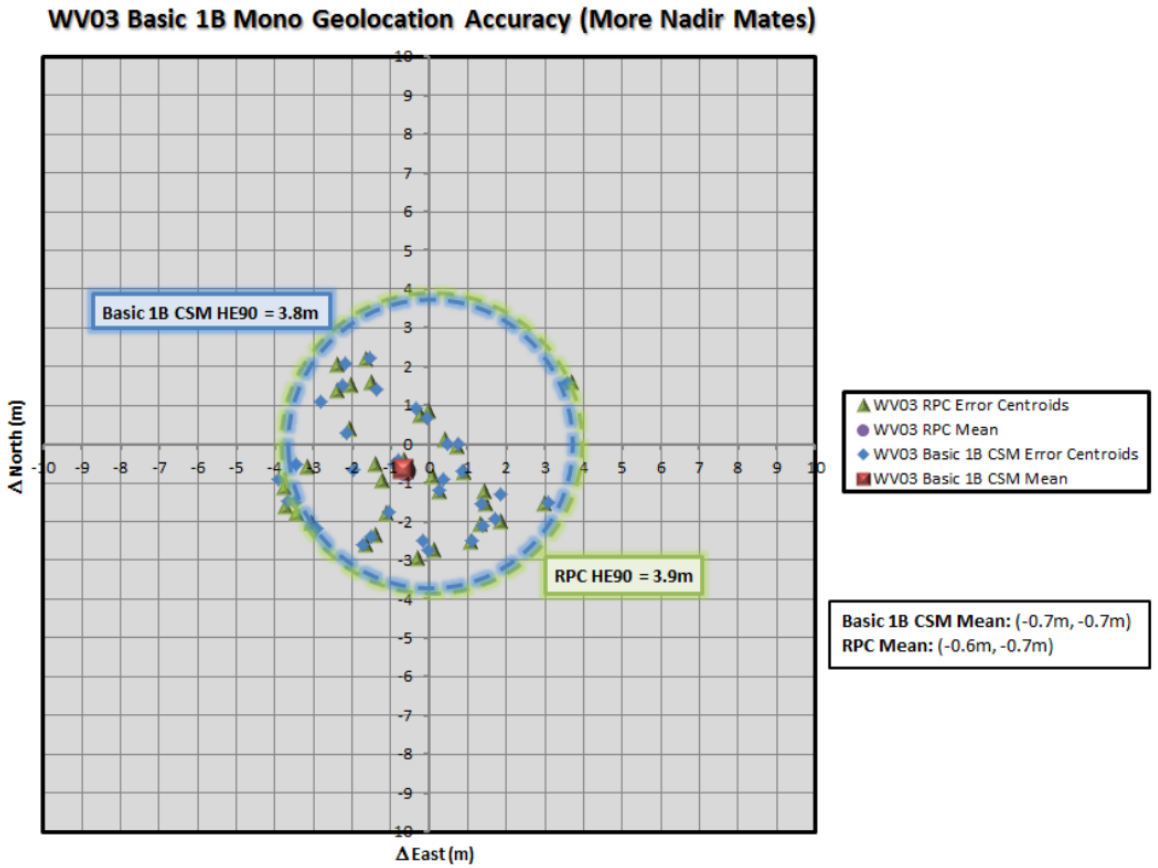
reference data
BEV: DOP and ALS DSM



digital surface model



Pleiades 2D Lagegenauigkeit



WorldView 3 Beispiel [Bresnahan, 2015]

Pléiades erreicht:

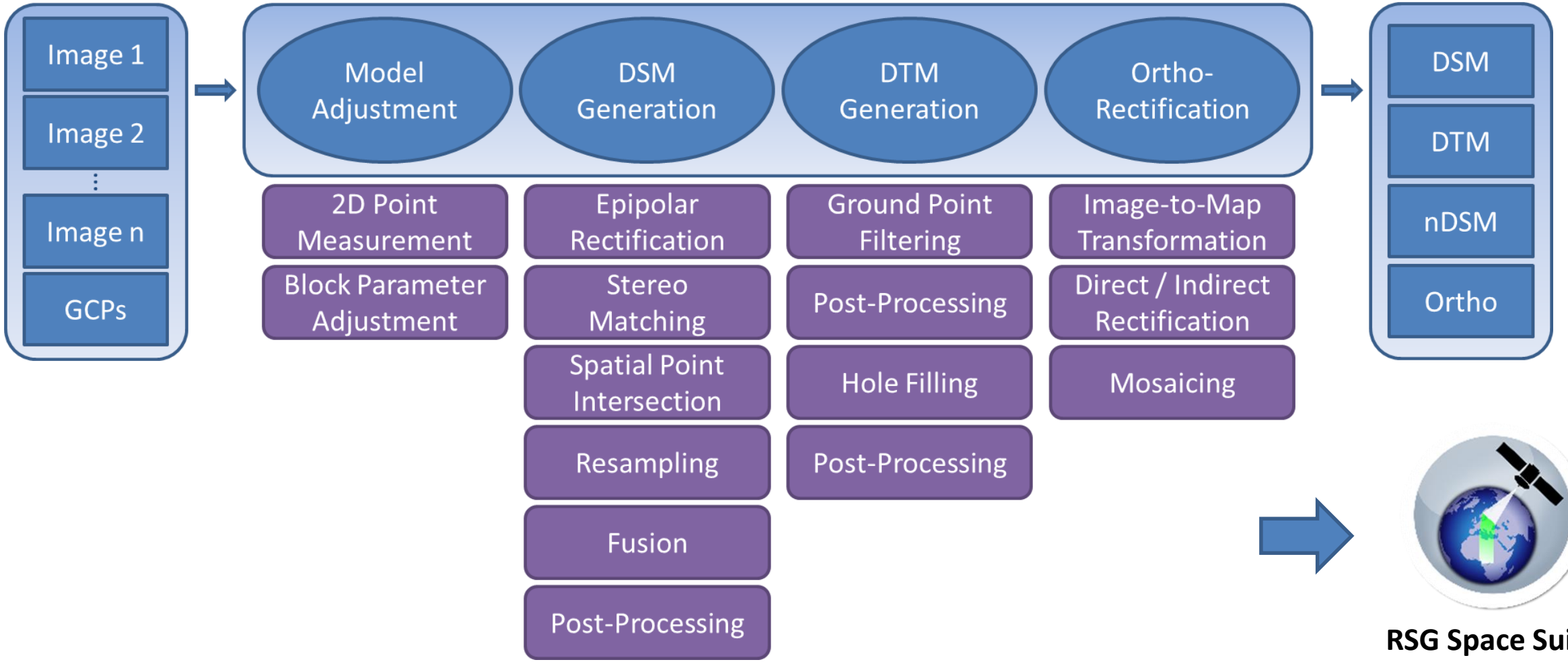
- 8.5 m CE90 @ Nadir
- 10.5 m CE90 @ 30° Off-Nadir

→ **Zu schlecht für DSM Erstellung**
(auch für Orthorektifizierung)

Passpunktmessung und Optimierung des Sensormodells notwendig!

3D Mapping Workflow

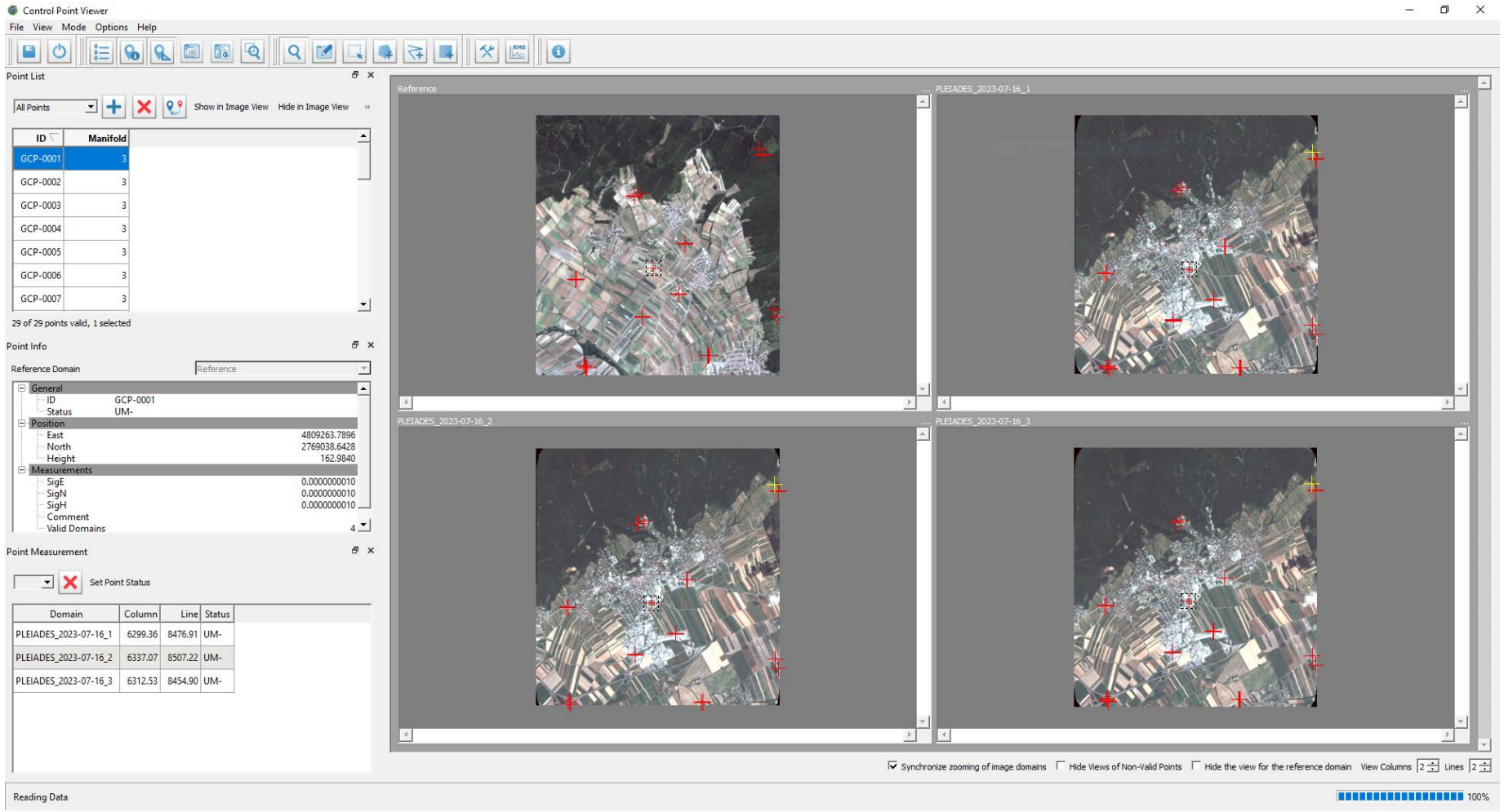
INTERFACE



RSG Space Suite

Passpunktmessung

INTERFACE



Sensormodellierung

INTERFACE

A priori 2-D Residuen [pxl]

Bild / Pnt	RMS-X	RMS-Y	Mean-X	Mean-Y
1 / 29	5.94	13.13	-5.88	13.10
2 / 29	4.14	5.81	-4.07	5.72
3 / 29	1.55	2.87	-1.37	-2.70

A priori 3-D Residuen [m]

29 Pnt	Res-E	Res-N	Res-H	Planar	Length
RMS	0.305	2.747	39.953	2.764	40.049
Mean	-0.042	2.707	39.931	2.723	40.026

A posteriori 2-D Residuen [pxl]

Bild / Pnt	RMS-X	RMS-Y	Mean-X	Mean-Y
1 / 28	0.90	0.89	0.40	-0.46
2 / 28	0.82	0.77	0.27	-0.06
3 / 28	0.73	0.91	0.09	0.53

A posteriori 3-D Residuen [m]

28 Pnt	Res-E	Res-N	Res-H	Planar	Length
RMS	0.366	0.352	2.877	0.508	2.922
Mean	-0.020	-0.002	-2.536	0.450	2.760

Pléiades Eisenstadt (1m² GSD)

INTERFACE

LiDAR reference

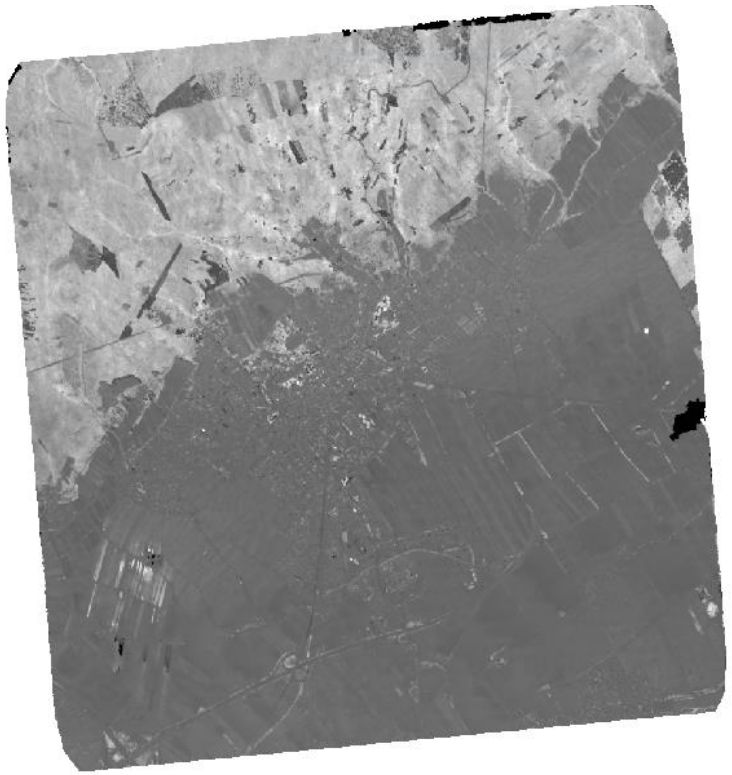
Pléiades DSM

Pléiades Ortho

Differenz zu BEV-ALS

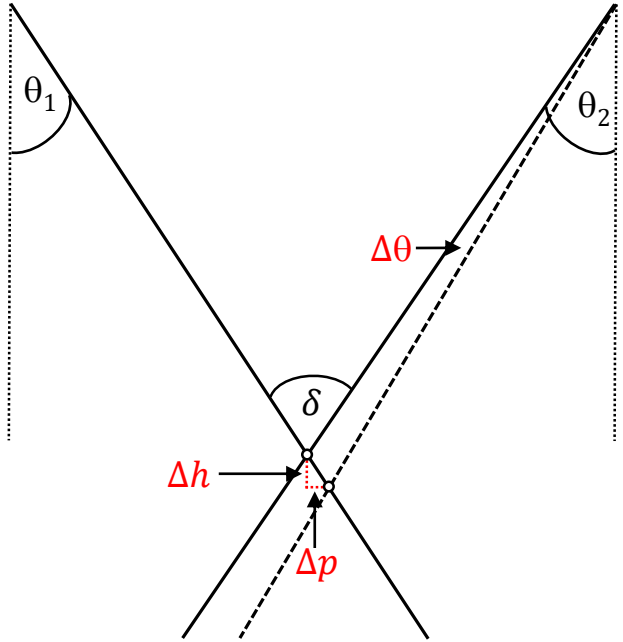
INTERFACE

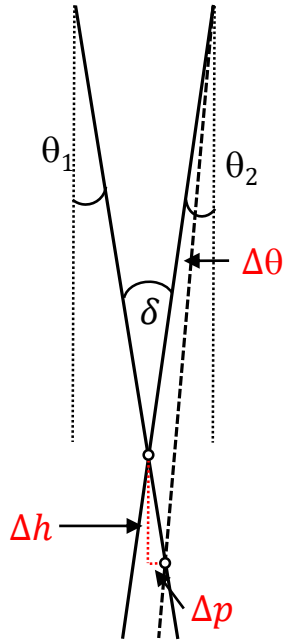
Übersicht



Zoom-In

Schnittwinkel





small intersection angle
(small B/H ratio)

Δθ: angle error
Δh: height error
Δp: planimetric error

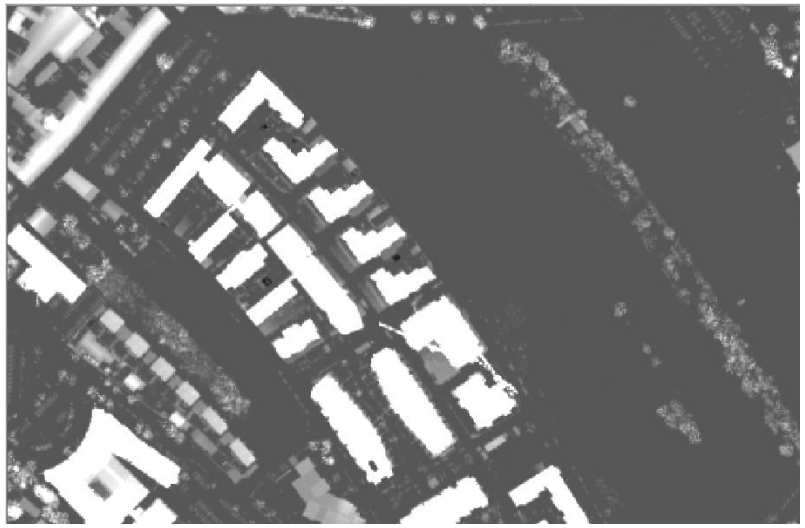
θ_1, θ_2: look angles
δ: intersection angle

Note: The same angle error Δθ causes larger height error Δh, with decreasing intersection angles. ⇨ Height accuracy of DSM decreases with decreasing intersection angles.

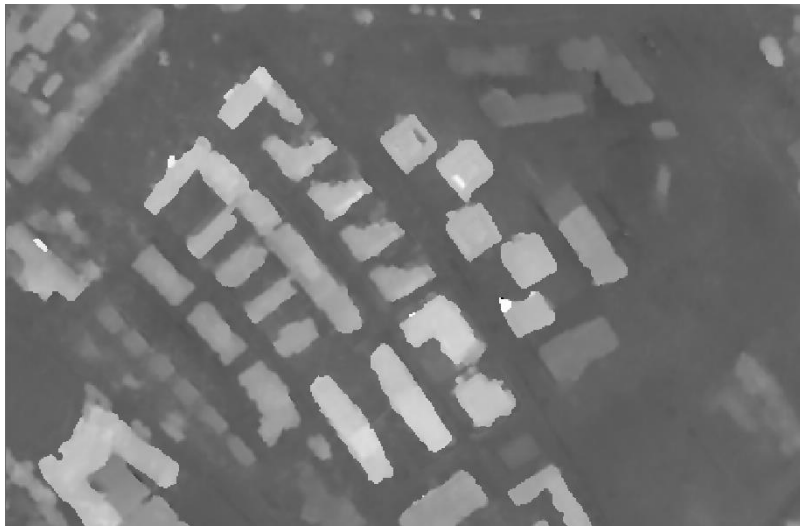
Differenz zu BEV-ALS

INTERFACE

BEV-ALS nDSM



Pléiades DSM



BEV DOP

Danke für ihre Aufmerksamkeit

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