BUNDLE ADJUSTMENT REPORT

May 8, 2022

Project Overview

Project Name	Sample CPC Project Tasmania
Creation Date	2022-05-09 01:18:52.506646
Number of Images Uploaded	11 (32.5 MB)
Ground Control Points / Checkpoints	2 / 0
Average GSD	0.007 m
Orbital Dataset	False
Total Project Area	0.00 hectares

Coordinate System

Coordinate System	UTM zone 55S (EPSG:32755)
Earth Model	WGS 84
Output Unit Of Measure	Meters

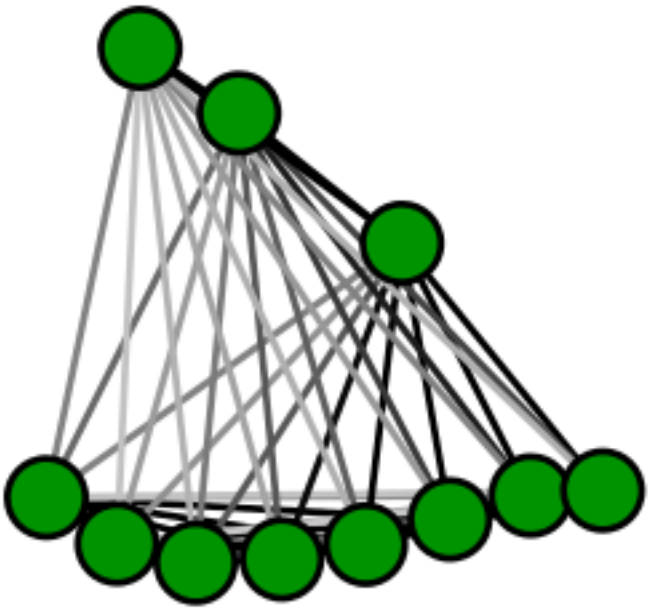
Accuracy Check

Cameras Reconstructed	11 / 11	
Residual (error)	0.39 pixels	
Mean Absolute Camera Error	0.096 m	
Camera Error Standard Deviation	0.104 m	
Mean Absolute GCP Position Error	0.013 m	
GCP Error RMSE	0.017 m	

Camera Parameters

Camera Model	CANON EOS 550D
Original Focal length (mm)	20.000
Adjusted Focal Length (mm)	20.208
Original Focal length (pixels)	4699.600
Adjusted Focal Length (pixels)	4699.600
Original Radial Distortion Values (inverse focal length units)	0.000, 0.000, 0.000
Adjusted Radial Distortion Values (inverse focal length units)	-0.080, 0.045, 0.027
Original Principal Point Offset (mm)	0.000, 0.000
Adjusted Principal Point Offset (mm)	-0.051, 0.025
Original Principal Point Offset (pixels)	0.000, 0.000
Adjusted Principal Point Offset (pixels)	-11.860, 5.750

Image Connectivity Graph



Legend

- Less than **0.5** pixel reprojection error
- Between **0.5** and **1.0** pixel reprojection error
- Greater than **1.0** pixel reprojection error
- **Darker** lines indicate stronger connectivity between surrounding images

Bundle Adjustment Results

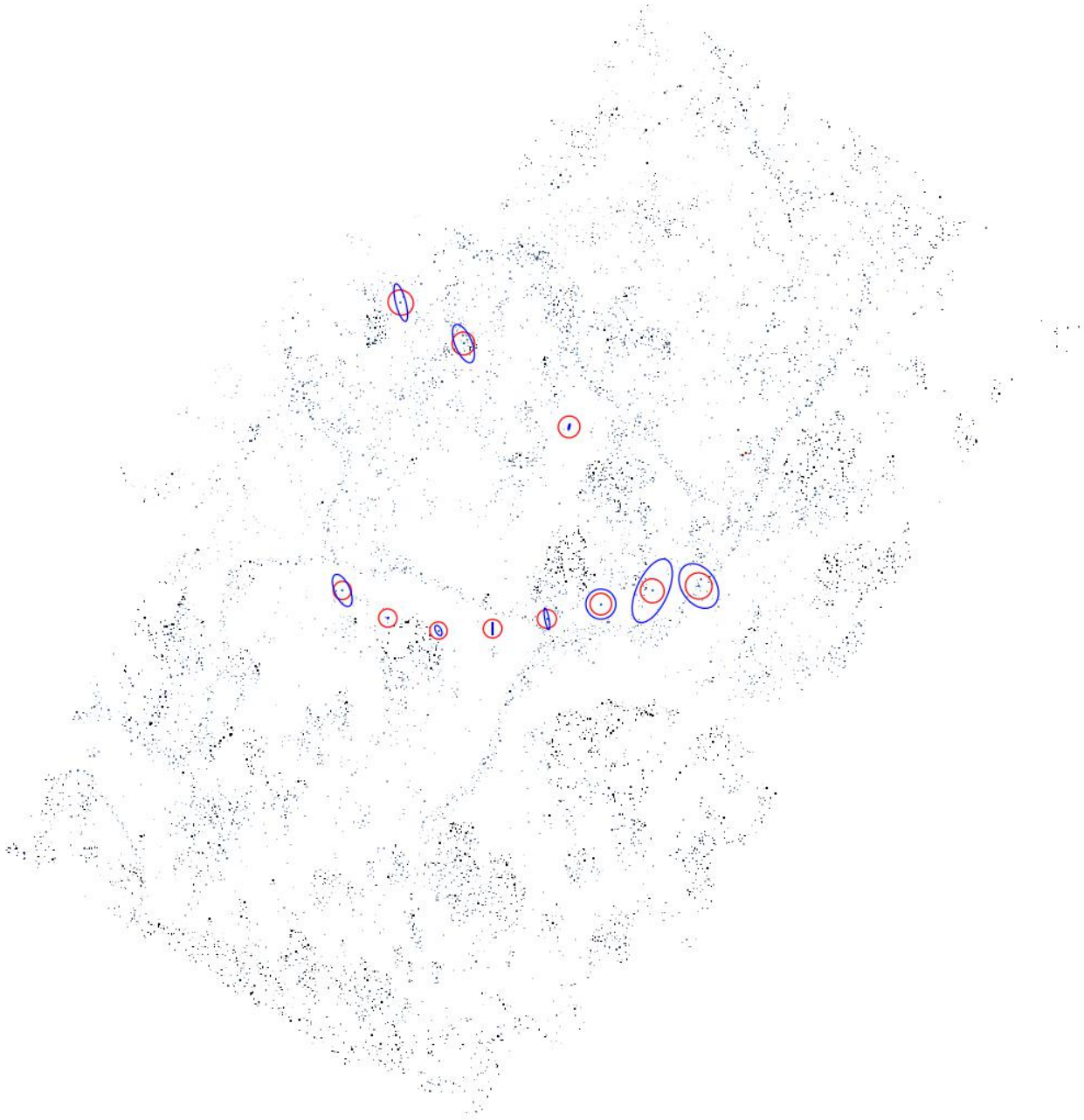


Figure 1: Indvidual Camera Error is represented by error ellipses.

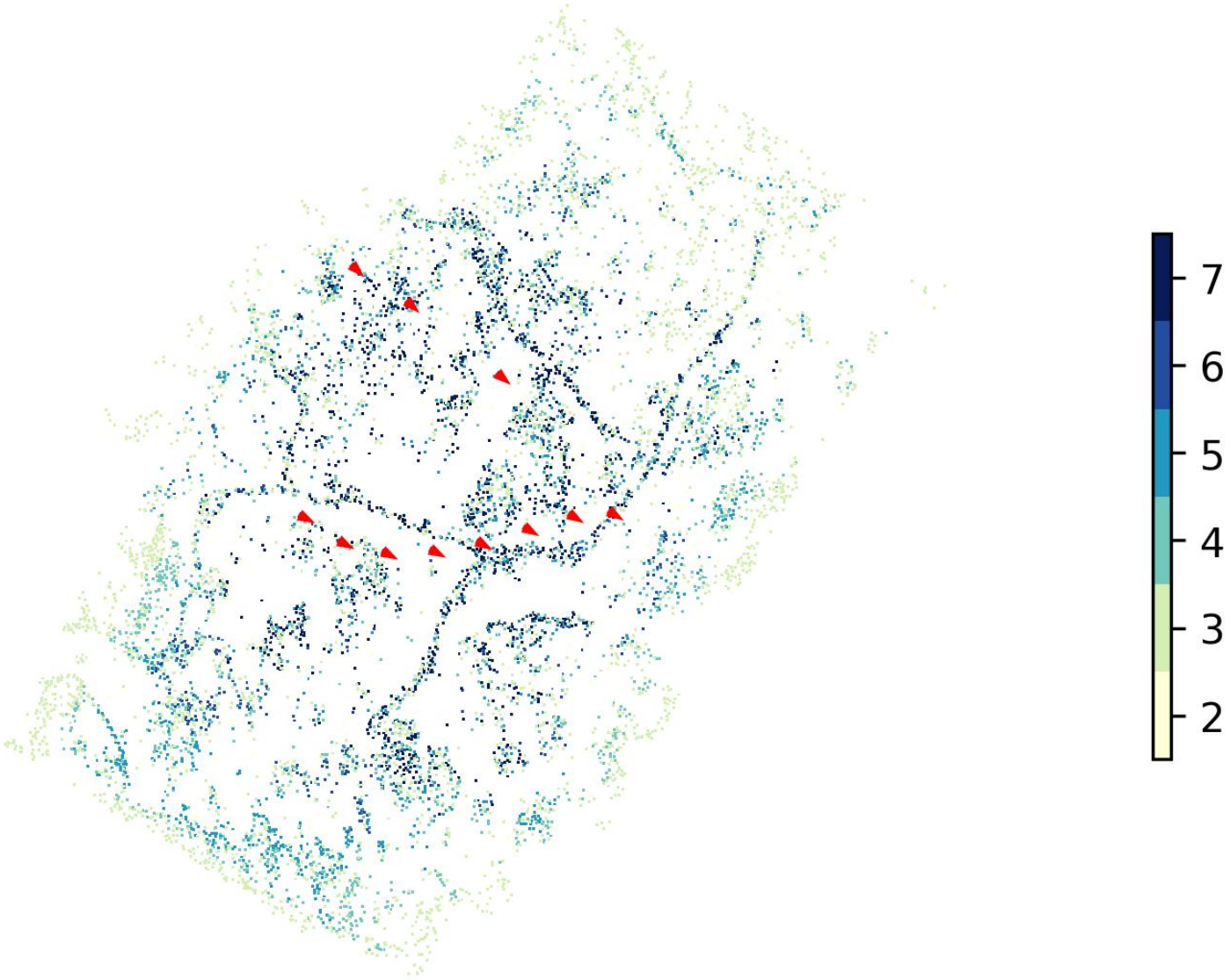


Figure 2: The number of camera views per 3D point is a good indication of bundle block rigitity. Areas with low tiepoint densities and low camera views per 3D point could indicate weak areas in the image block (e.g. dense forest)

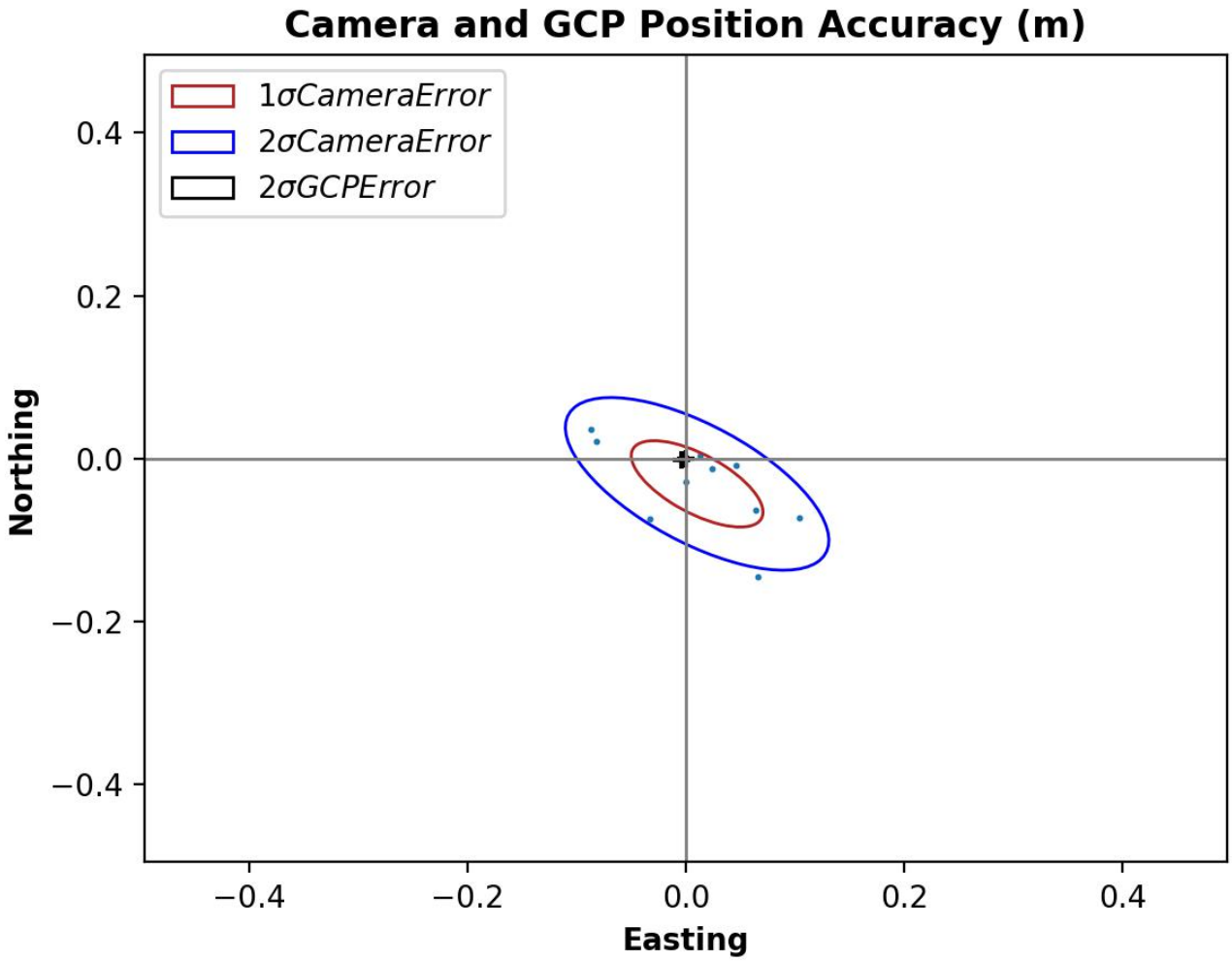


Figure 3: Camera and GCP error (adjusted vs observed) are represented by blue circles and black crosses, respectively. A red error ellipse indicates the overall expected error of the camera positions.

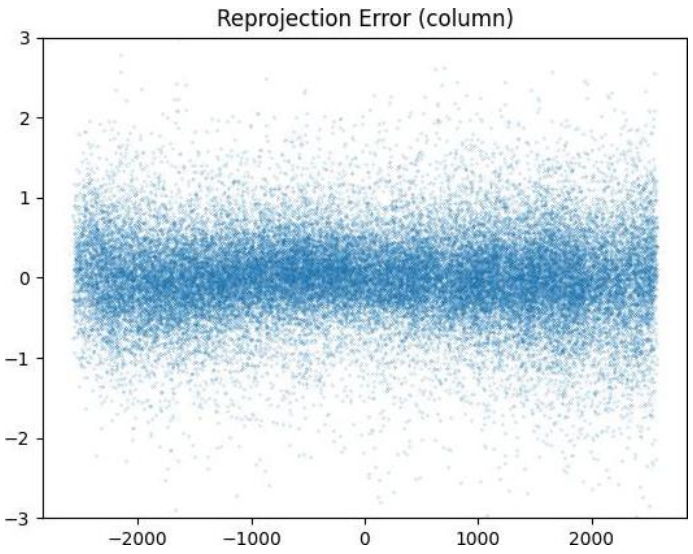


Figure 4: Reprojection Error of pixels along the x-axis of the image. Error mean and variablilty should be evenly distributed throughout the image.

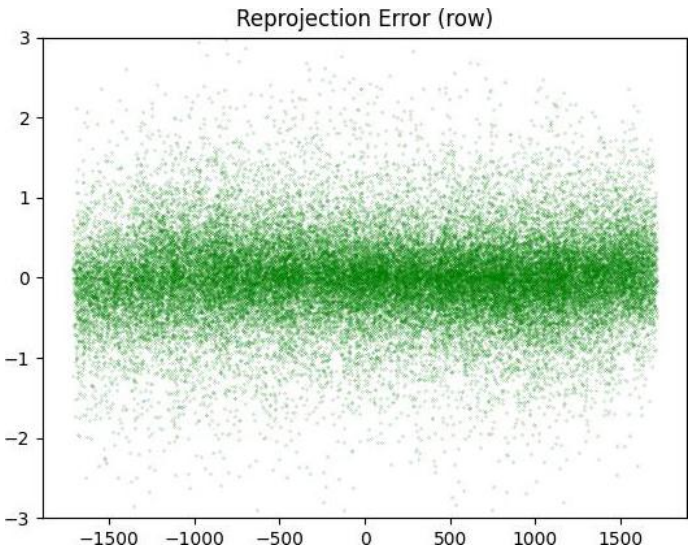


Figure 5: Reprojection Error of pixels along the x-axis of the image. Error mean and variablilty should be evenly distributed thoughout the image.

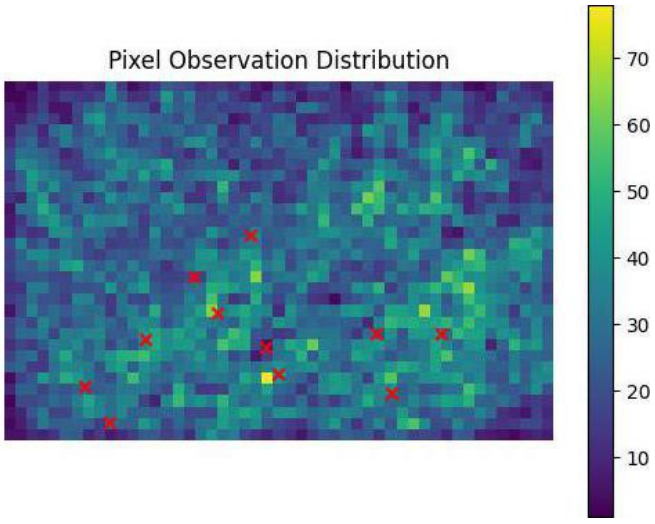


Figure 6: Pixel Observation Distribution of all tiepoint measurements in the image. The distribution density should be evenly distributed throughout the image. High radial lens distortion can lead to lower density near the image boundaries.

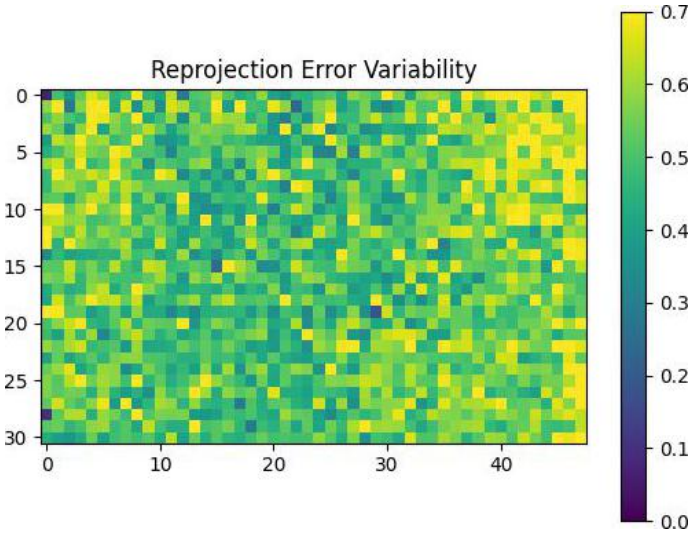


Figure 7: Reprojection Error Variability is shown as the standard devitation of error across the image plane. High variabilty is undesirable.

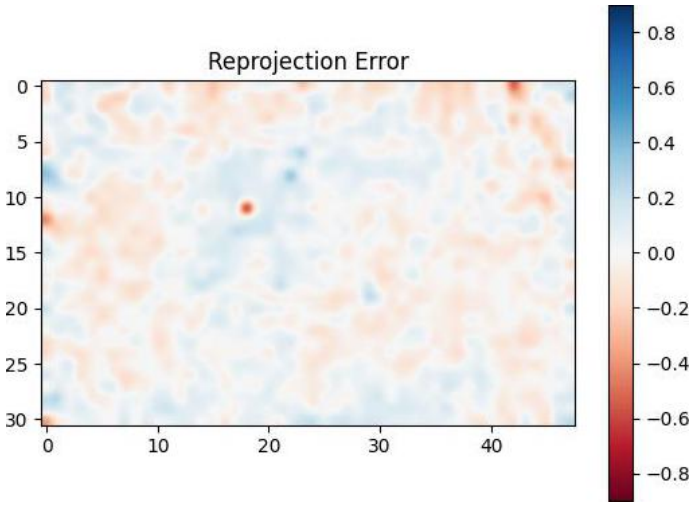


Figure 8: Reprojection Error visualized across the full camera frame.

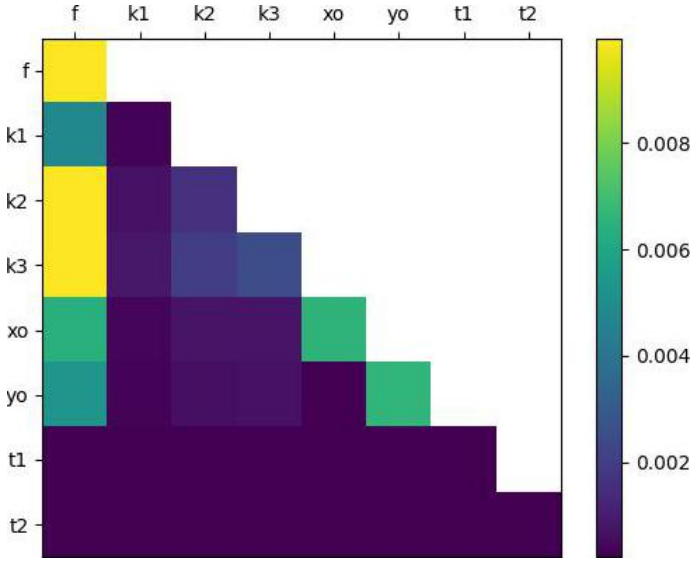


Figure 9: Covariance matrix of the adjusted interior orienation parameters. High values indicate correlation between indididual parameters.

Reference Point Error Review

Point Image	Original Positions	Adjusted Positions	Error	Point Type	Warning Level
 **ANYTHING**	**X:** 466807.81 m **Y:** 5274006.56 m **Z:** 1008.52 m	**X:** 466807.81 m **Y:** 5274006.56 m **Z:** 1008.50 m	**X:** 0.00 m **Y:** -0.00 m **Z:** -0.03 m	Ground Control	
 **WHATS UP**	**X:** 466805.04 m **Y:** 5274015.26 m **Z:** 1009.99 m	**X:** 466805.04 m **Y:** 5274015.26 m **Z:** 1010.01 m	**X:** 0.00 m **Y:** 0.00 m **Z:** 0.02 m	Ground Control