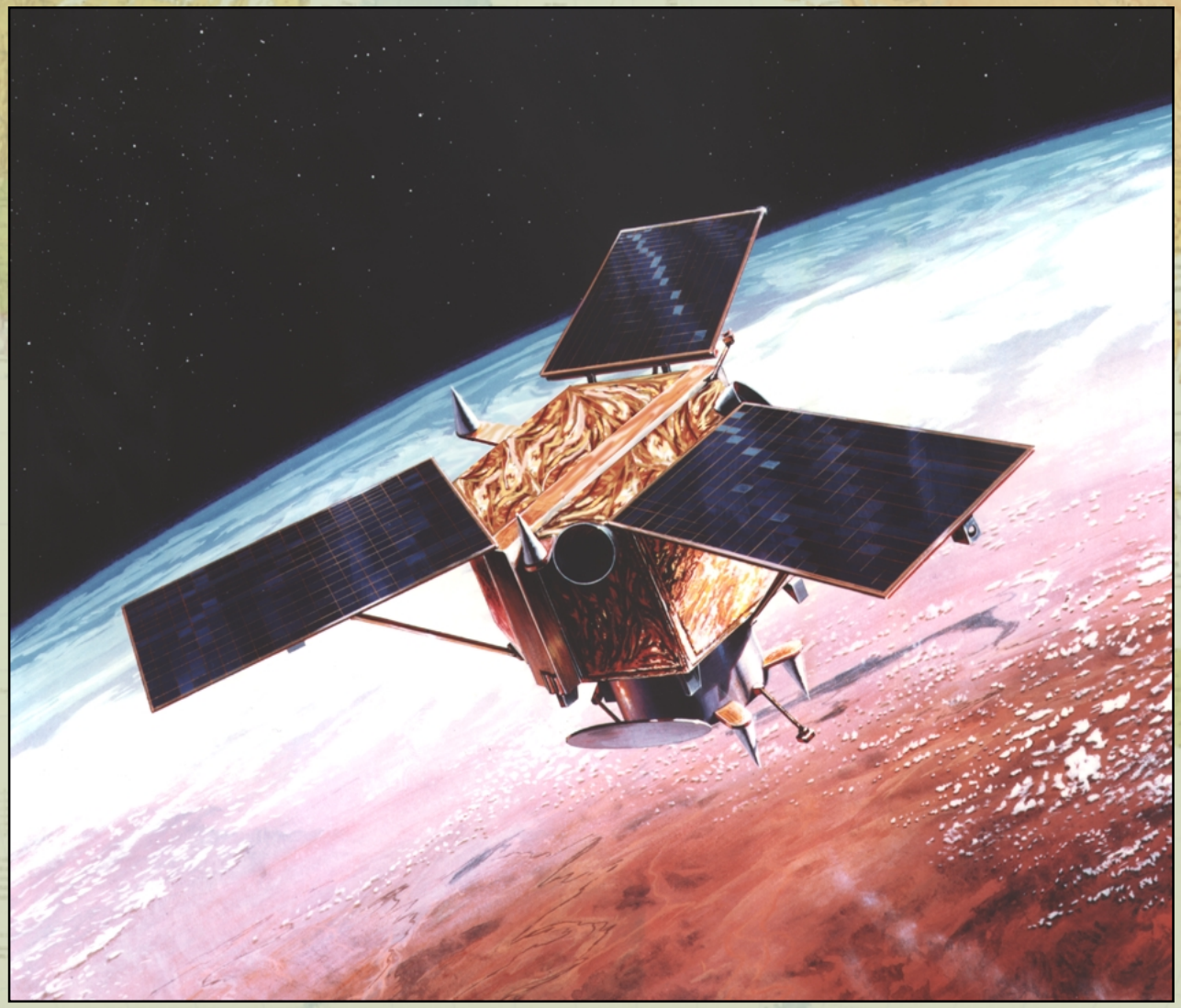
SPACE IMAGING

IKONOS Metric Accuracy



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Horizontal Accuracy

Product	CE90	RMS	NMAS[1]
Geo [2]	50.0 m	23.3 m	1:100,000
Reference	25.4 m	11.8 m	1:50,000
Map	12.2 m	5.7 m	1:24,000
Pro	10.2 m	4.8 m	1:12,000
Precision	4.1 m	1.9 m	1:4,800
Precision Plus	2.0 m	0.9 m	1:2,400

Notes:
(1) Meets National Map Accuracy Standard for scale shown. Pixel size remains 1m.
(2) Geo products are not orthorectified; accuracy values do not include effect of terrain displacement.

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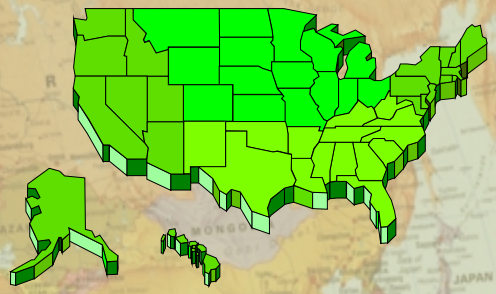
Metric Accuracy With GCP's

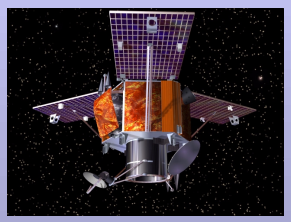
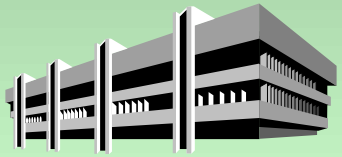


Mapping (1:2,400)

- 2 meter Horizontal Accuracy
- 1 meter GSD

Requires

- Mono image within 10° of nadir
- GCP every 6km along image strip
- Stereo image (or 3m LE90 DEM)

Precision Camera	Relative Attitude Knowledge	Ground Processing
		

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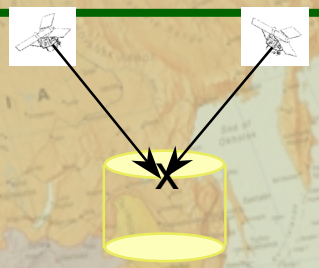
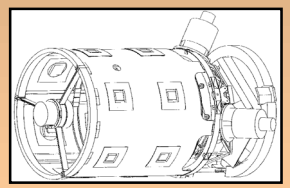
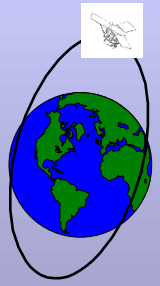
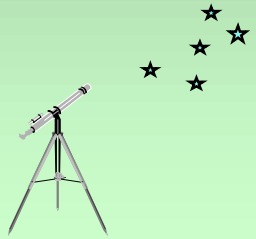
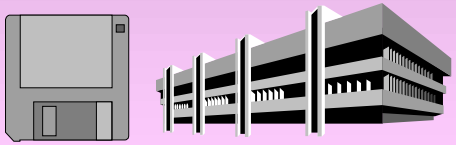
Metric Accuracy Without GCP's



Requirements:

- **25.4 meter CE90 Horizontal accuracy with 1 stereo pair**
- **22.0 meter LE90 Vertical accuracy with 1 stereo pair**
- **12.2 meter CE90 Horizontal accuracy with 3 stereo pairs**
- **10.0 meter LE90 Vertical accuracy with 5 stereo pairs**

Stable Optical Platform	Ephemeris	Absolute Attitude Knowledge - PAD	Ground Processing
			

Verification by On-Orbit Acceptance Test and periodic retest.

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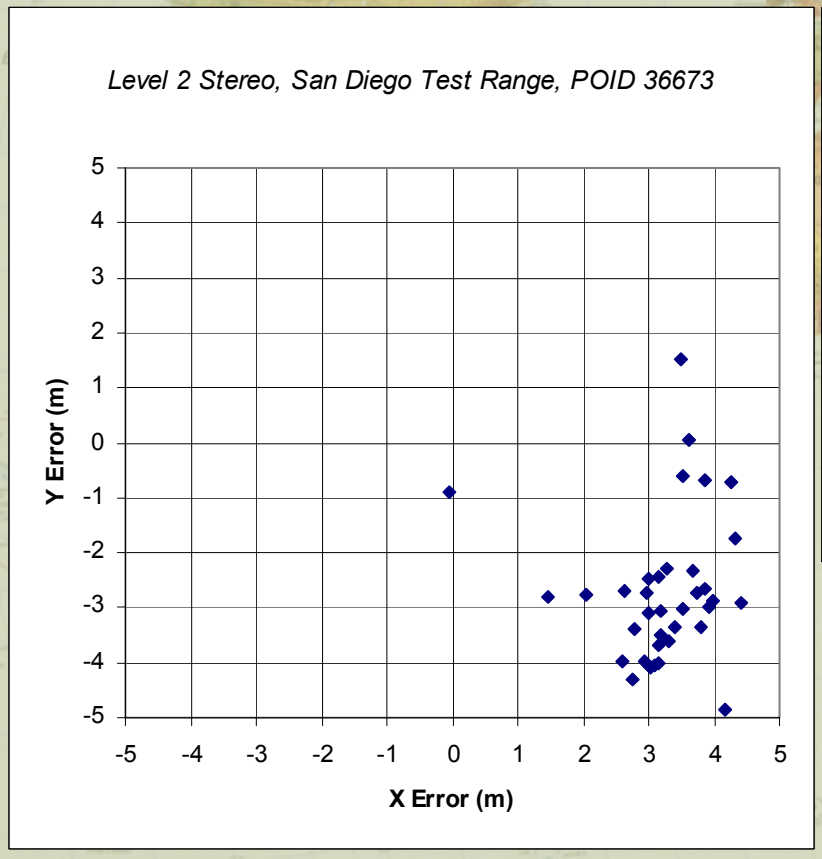
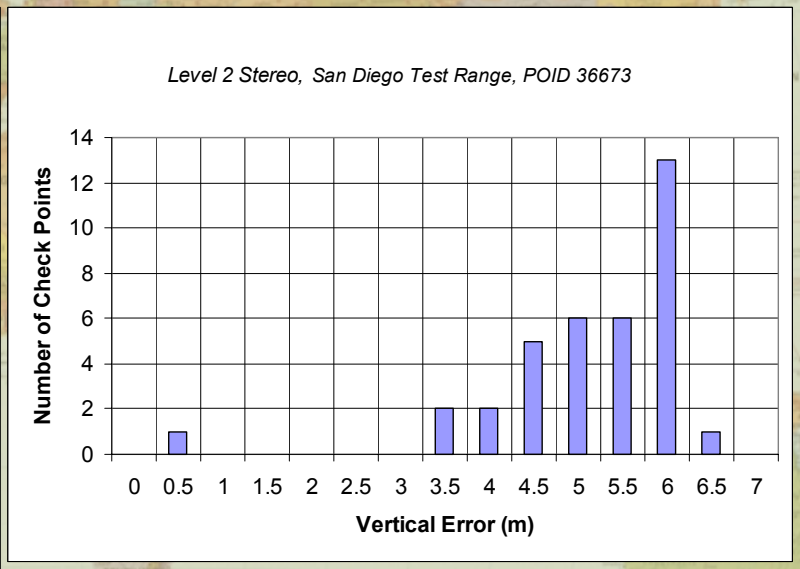
OOAT: Stereo w/o GCP





- **Level 2 Stereo is without GCP**
- **Required accuracy for level 2 stereo**
  - **25m CE90 horizontal**
  - **22m LE90 vertical**

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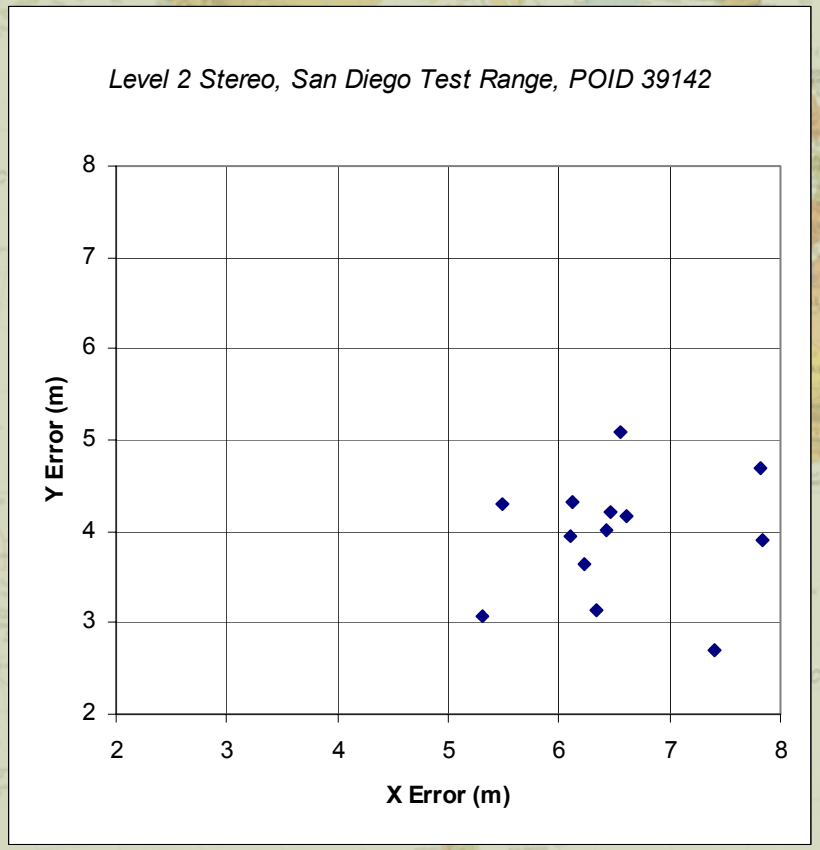
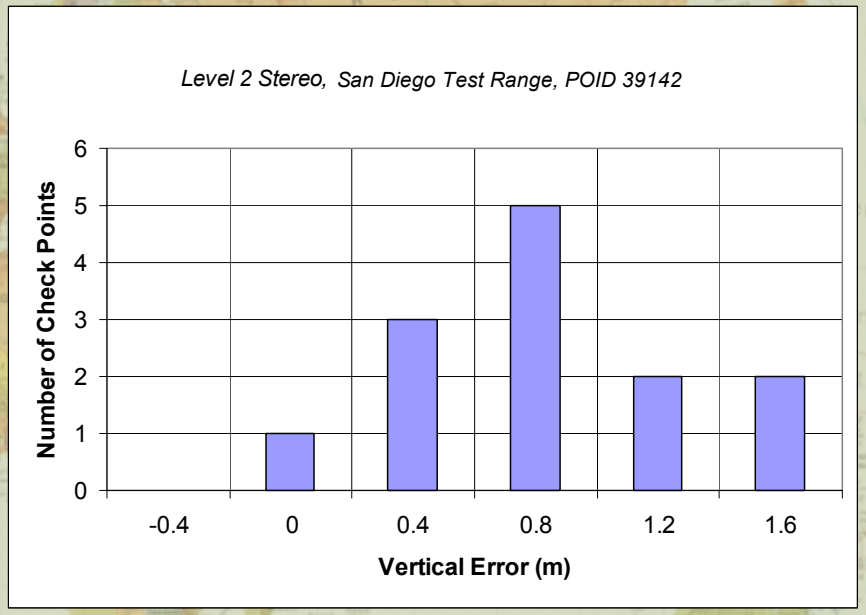
OOAT: Stereo w/o GCP





- Level 2 Stereo is without GCP
- Required accuracy for level 2 stereo
  - 25m CE90 horizontal
  - 22m LE90 vertical

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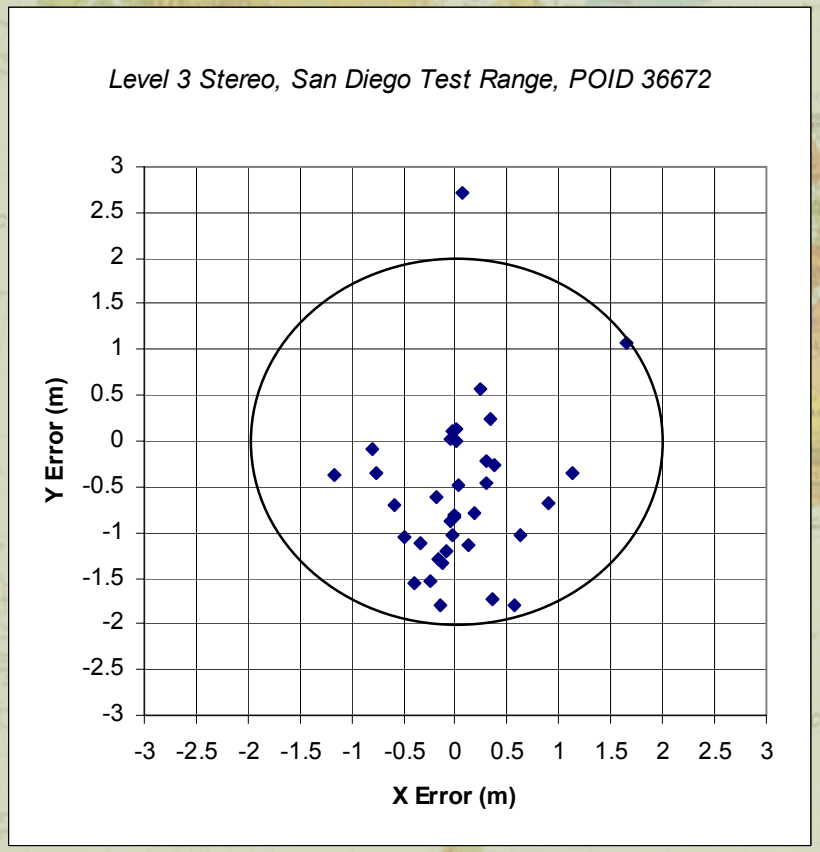
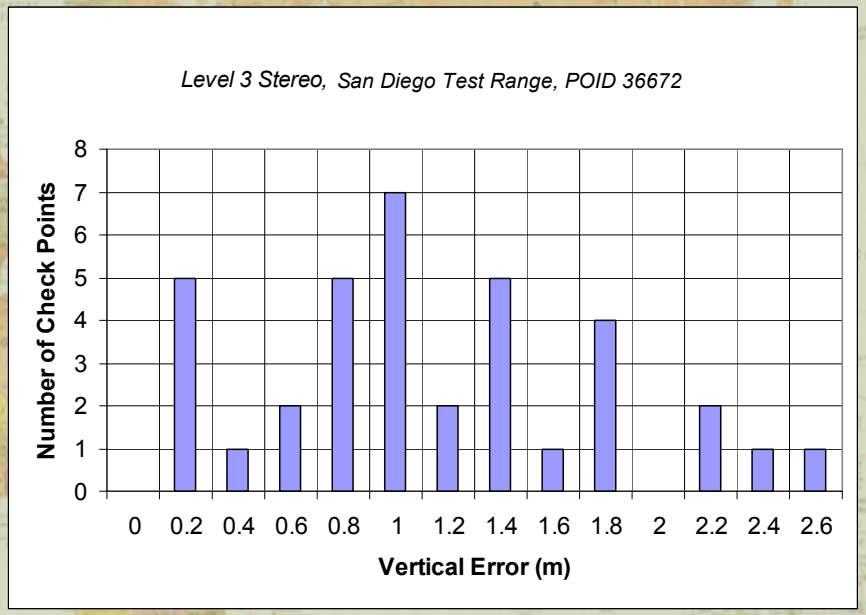
OOAT: Stereo with GCP





- **Level 3 Stereo uses GCP**
- **Required accuracy**
  - **2m CE90 horizontal**
  - **3m LE90 vertical**

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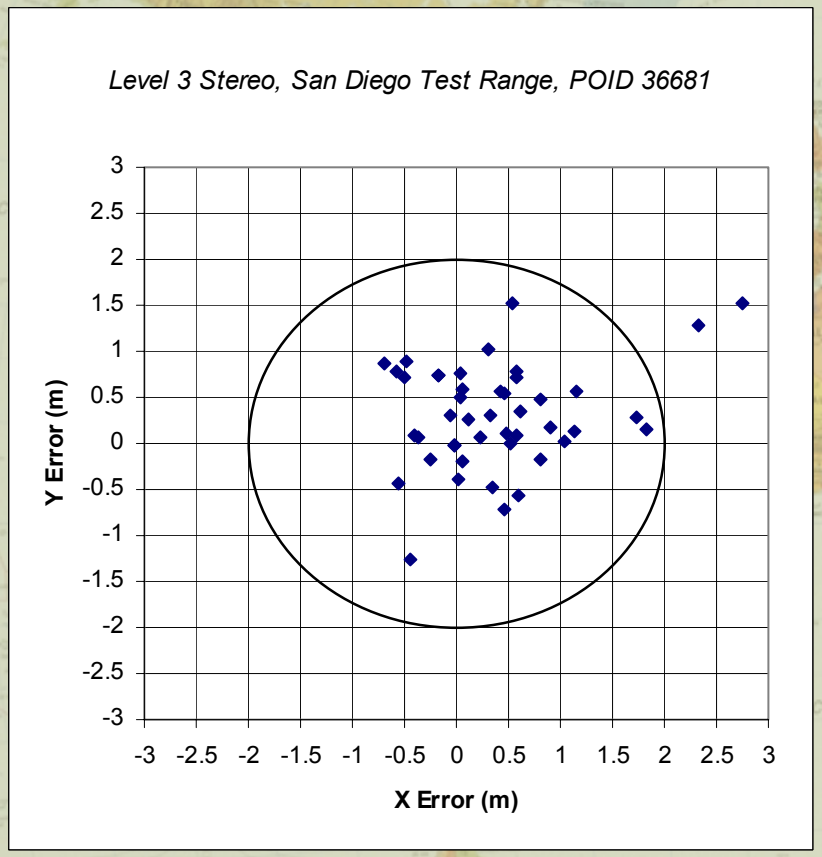
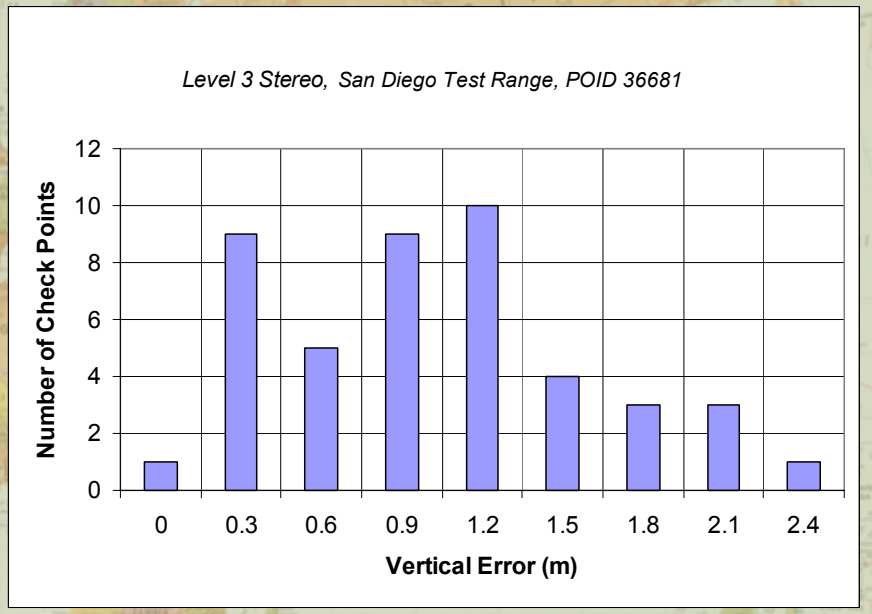
OOAT: Stereo with GCP





- **Level 3 Stereo uses GCP**
- **Required accuracy**
  - **2m CE90 horizontal**
  - **3m LE90 vertical**

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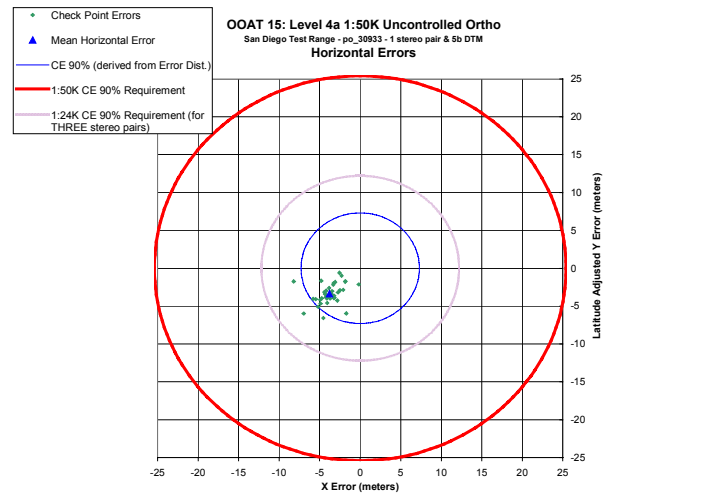
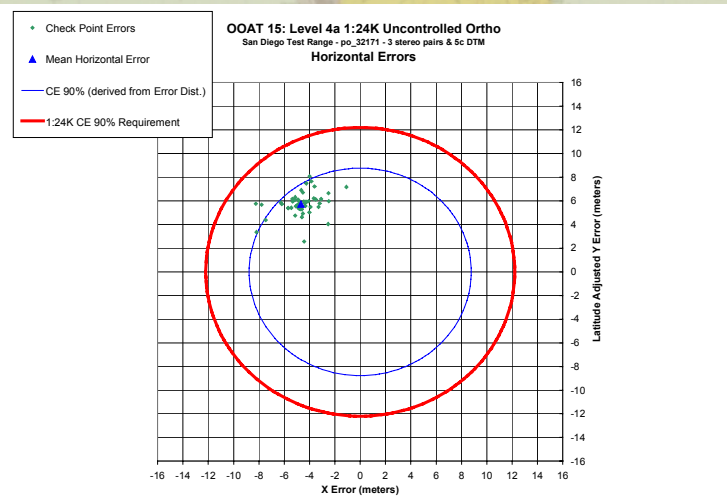
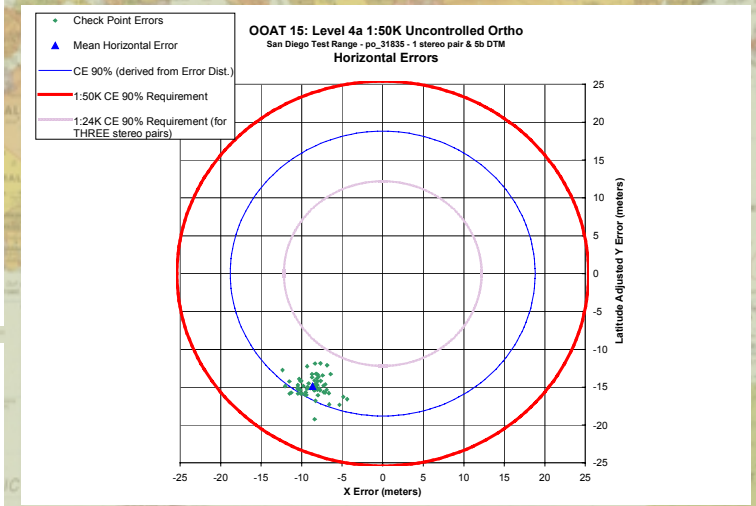
Level 4a: Ortho w/o GCP

- **Required accuracy - 25m CE90**







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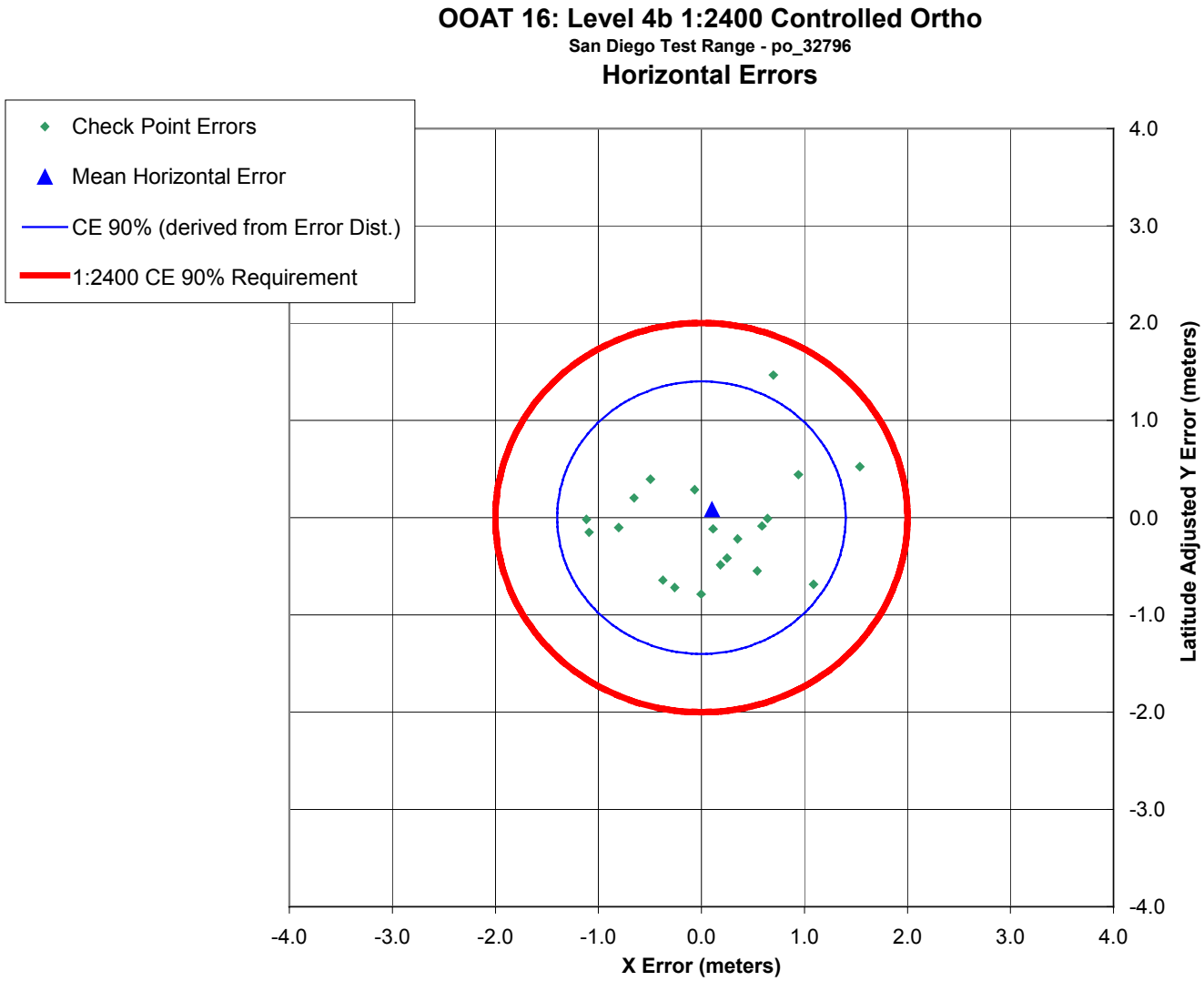
Level 4b: Ortho with GCP



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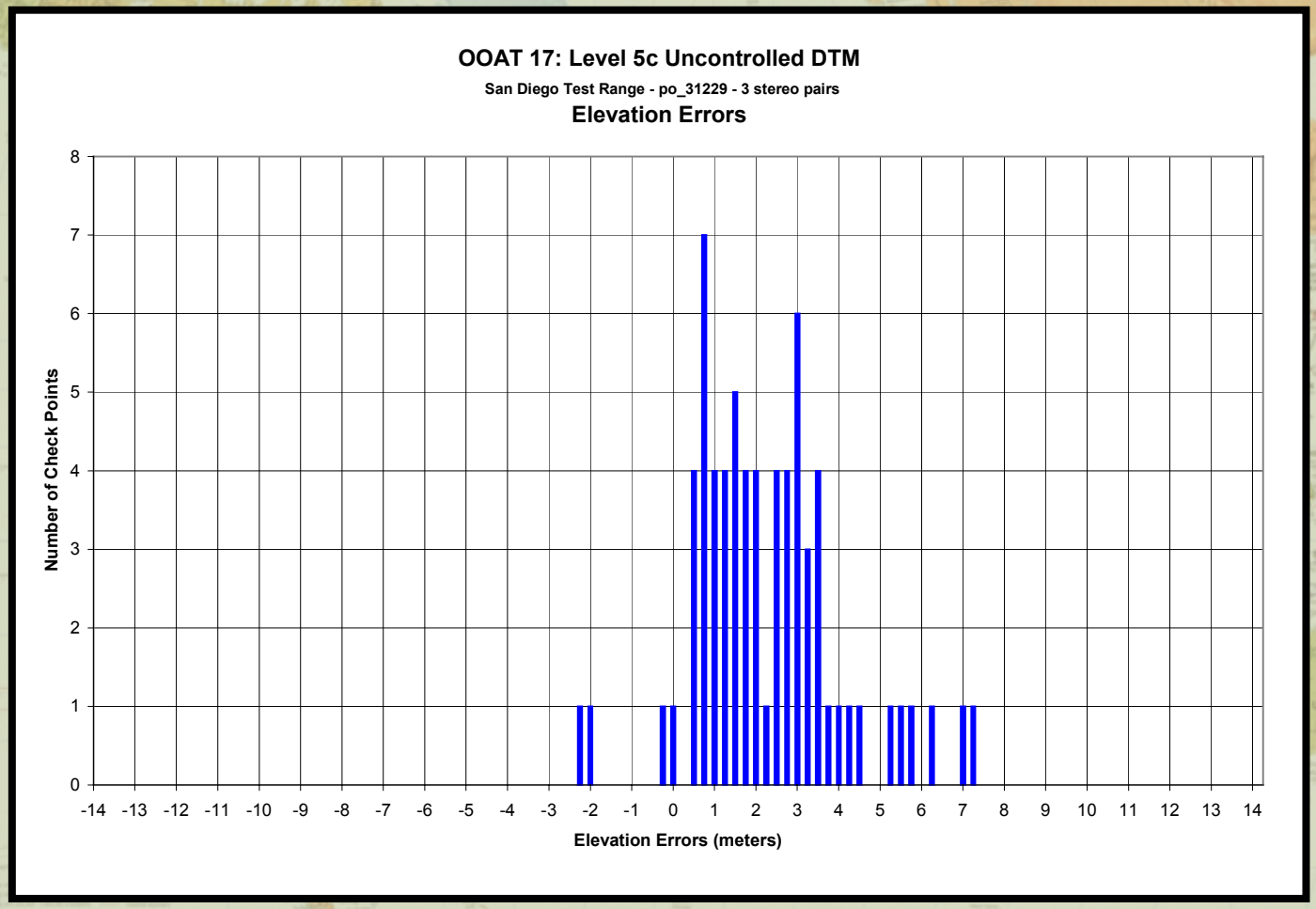
Level 5c: DTM w/o GCP



•Required Accuracy - 12m LE90

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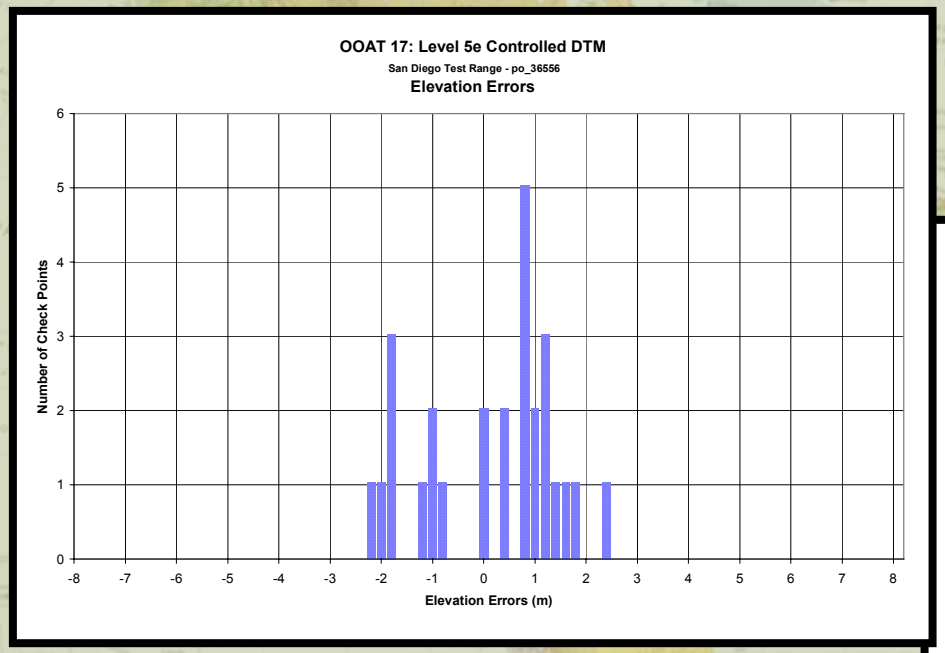
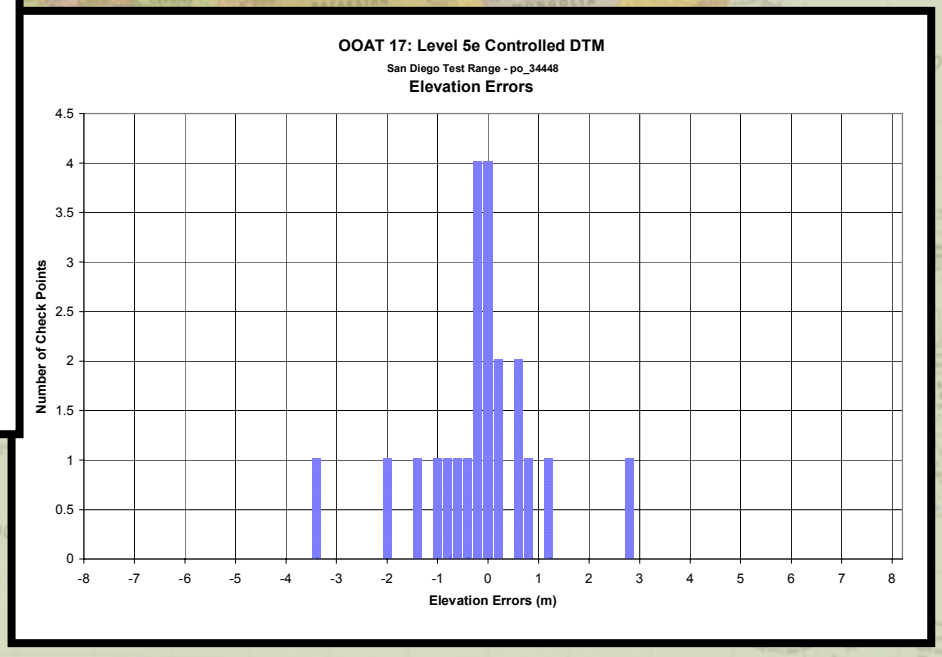
Level 5e: DTM with GCP



•**Required Accuracy - 3m LE90**



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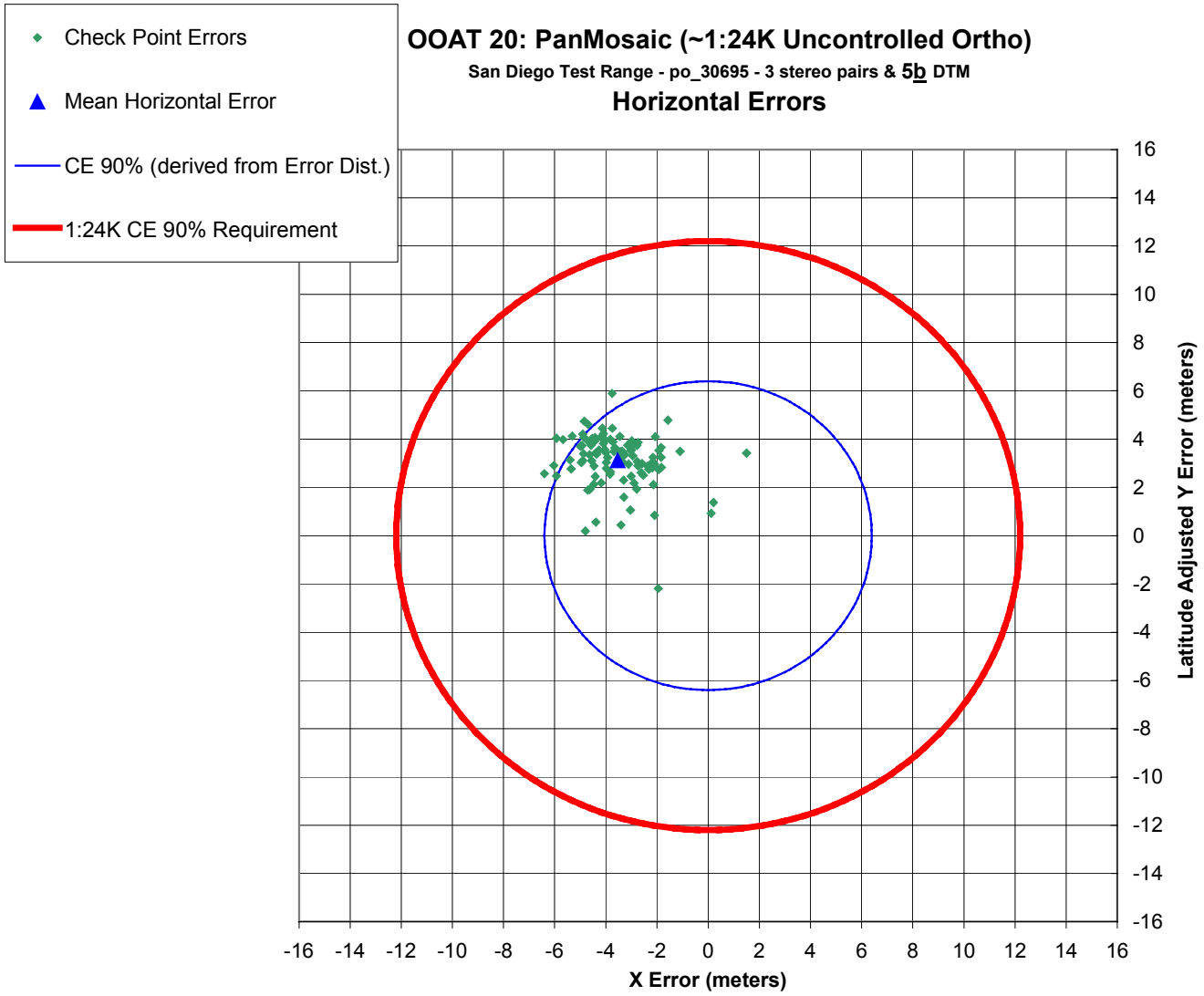
Ortho mosaic w/o GCP



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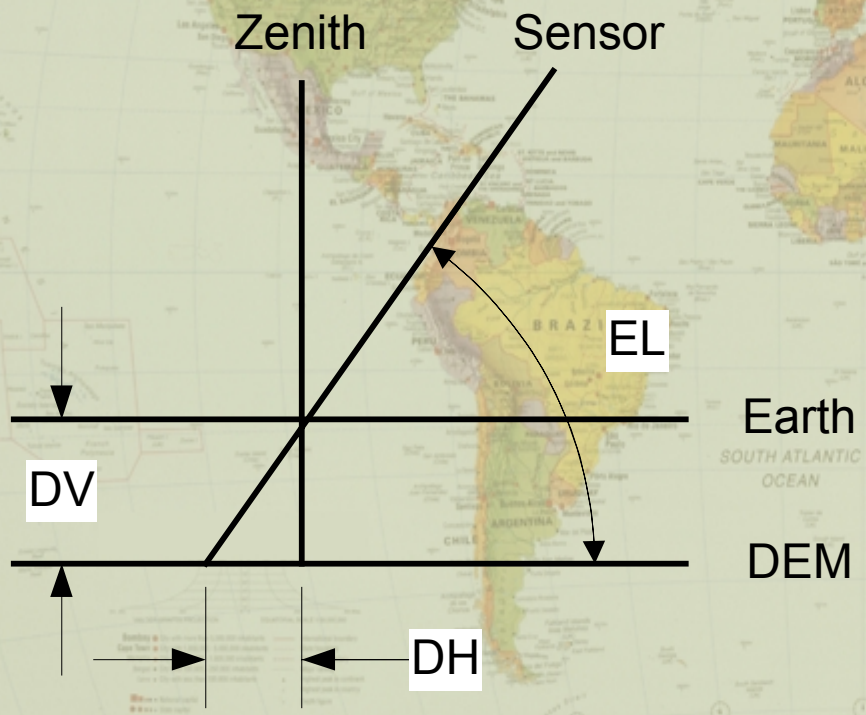
Terrain Displacement

Terrain Displacement is horizontal position shift caused by elevation model error during orthorectification.



- **Georectification Error**
  - DV=100m (Terrain)
  - EL = 50° (Geo Spec)
  - DH = 84m (Displacement)
- **Orthorectification Error**
  - DV=15m (Conus 1” DEM)
  - EL = 75° (Ortho Spec)
  - DH= 4m (Ortho Error)
- **Building Layover**
  - DV=20m (Building)
  - EL = 75° (Ortho Spec)
  - DH= 5m (Layover)

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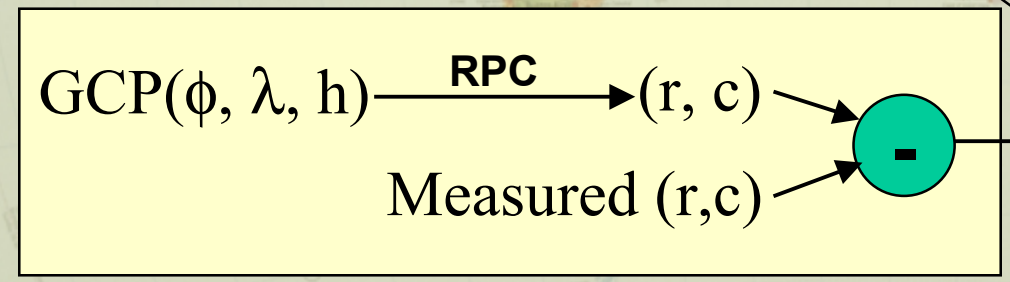
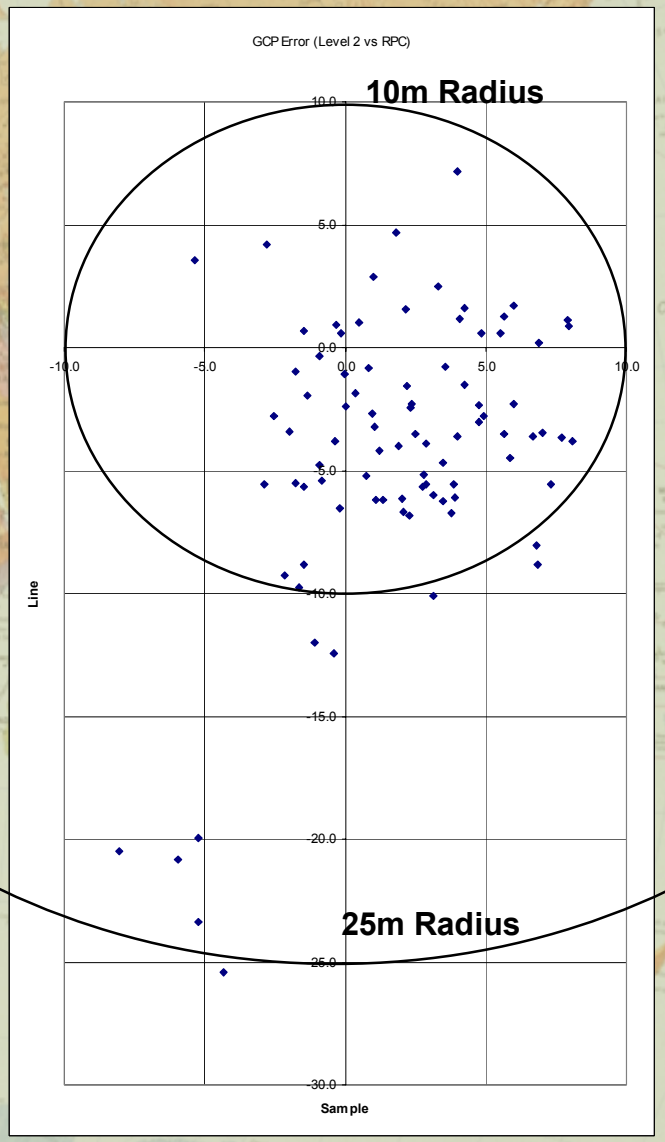
RPC Accuracy w/o GCP

- RPC (Rational Polynomial Coefficients) convert object (ϕ,λ,h) to image (r,c)
- 4 GCP measured in each of 20 images
- Surveyed GCP provides true (ϕ,λ,h).
- RPC calculated (r,c) compared to image.
- 4m RMS between images
- 1m RMS within image
- <0.05 pix RMS difference between RPC & Camera Model.





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