SLAC Control Network

Campaign 1 – 12/13/01,12/17/01

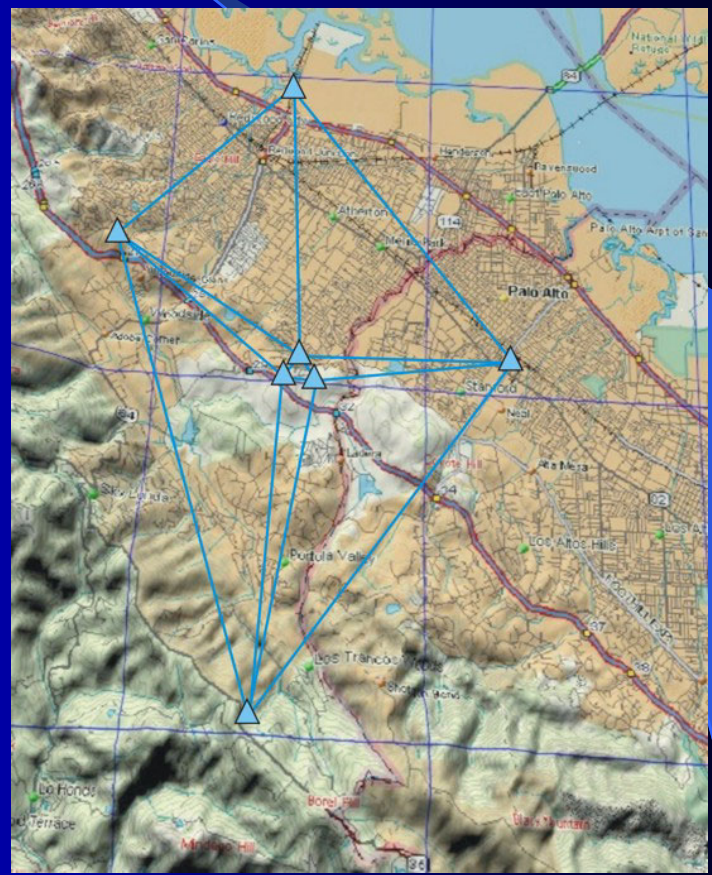
01/18/02

Purpose

- To tie SLAC control points to existing coordinate system & datum. (ie. NAD 83 CA State Plane Zone 3, UTM Zone 10, WGS84)

Network Design

- 3 Leica SR530 Receivers
- 7 Network Points
  - 4 NGS Control Points
    - Established by GPS observations
  - 3 SLAC Points
    - Surround SLAC campus
- 14 Independent Baselines
- 7 Independent Sessions



Observation Sequence

Day	Session	Receiver		
		Red	White	Blue
1	1	M33	AA1874	AA5496
	2	M36	AA1874	AA5496
	3	M39	AA1874	AB7680
2	4	M33	AH7470	AA5496
	5	M39	AH7470	AB7680
	6	M39	AB7680	M33
	7	M39	M36	M33

Data Management

- Observation Data and Precise Ephemeris can be located at:

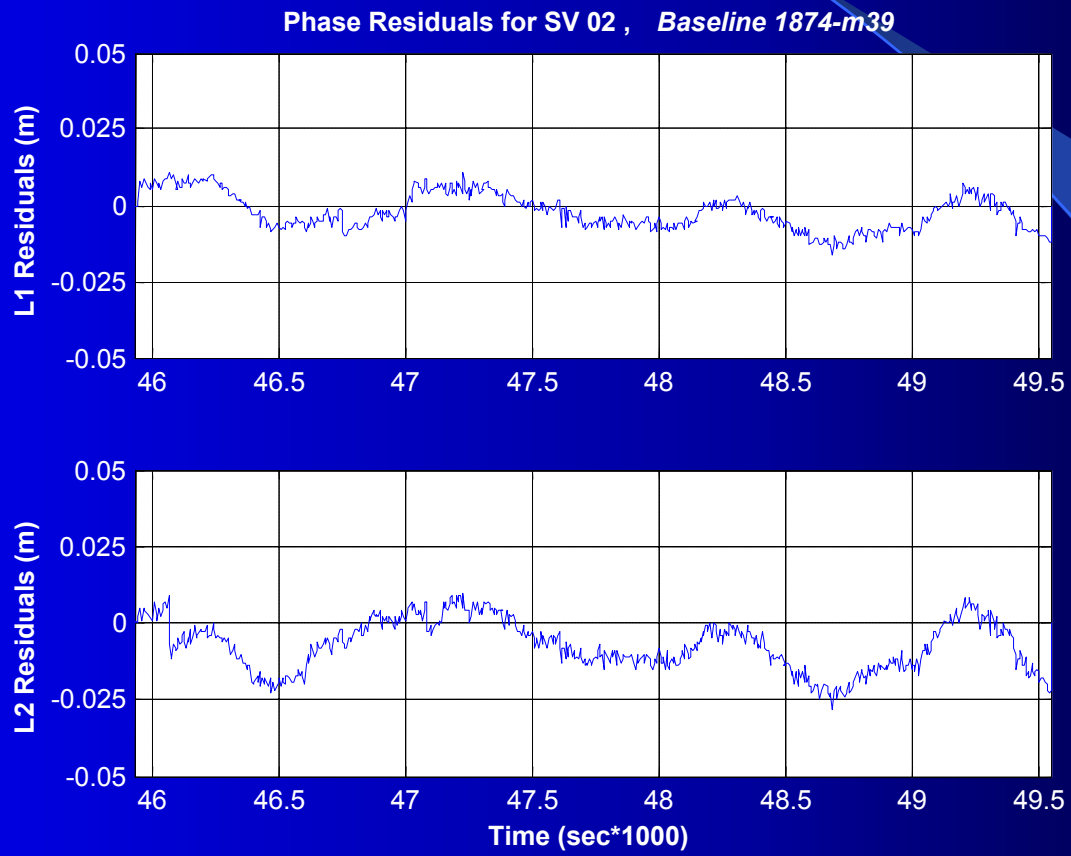
\\Mfd-hub\Align\PUBLIC\GPS\Control\External\Day1

\\Mfd-hub\Align\PUBLIC\GPS\Control\External\Day2

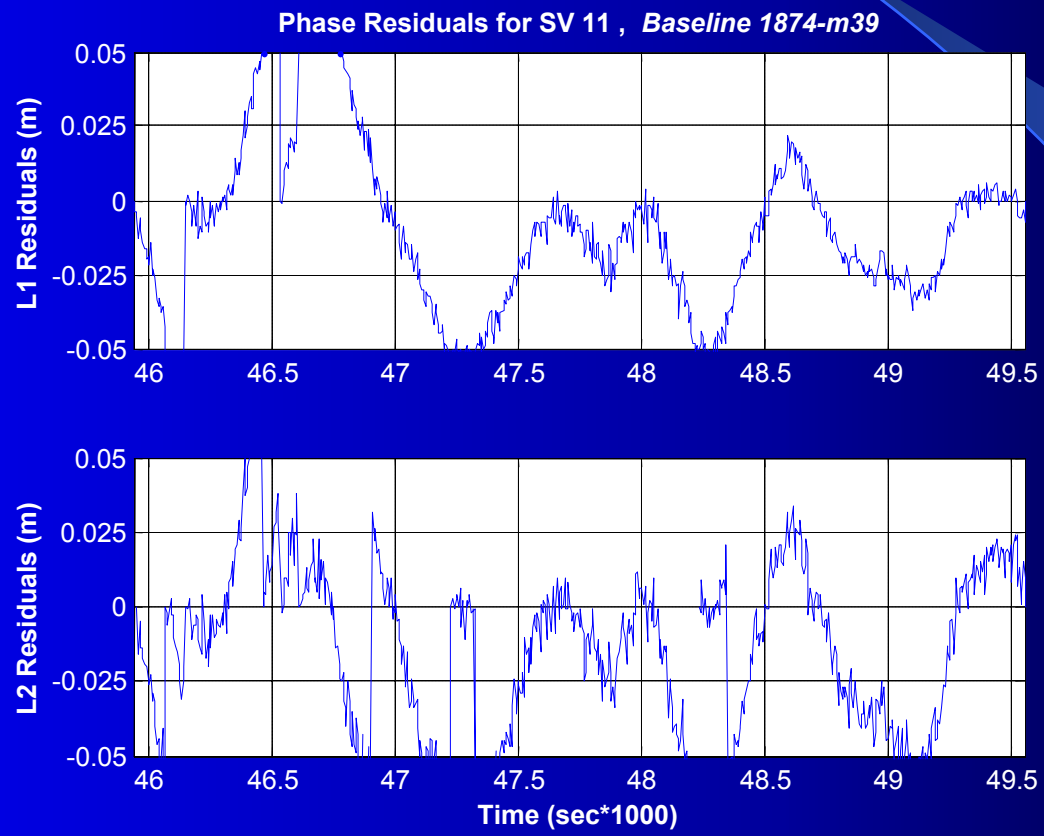
Baseline Processing

- General Parameters
  - 15 deg Cut-Off Angle
  - 10 sec measurement rate
  - Broadcast/Precise Ephemeris
  - Code/Phase Observable Data
- Empirical Analysis by plotting of individual baseline residuals

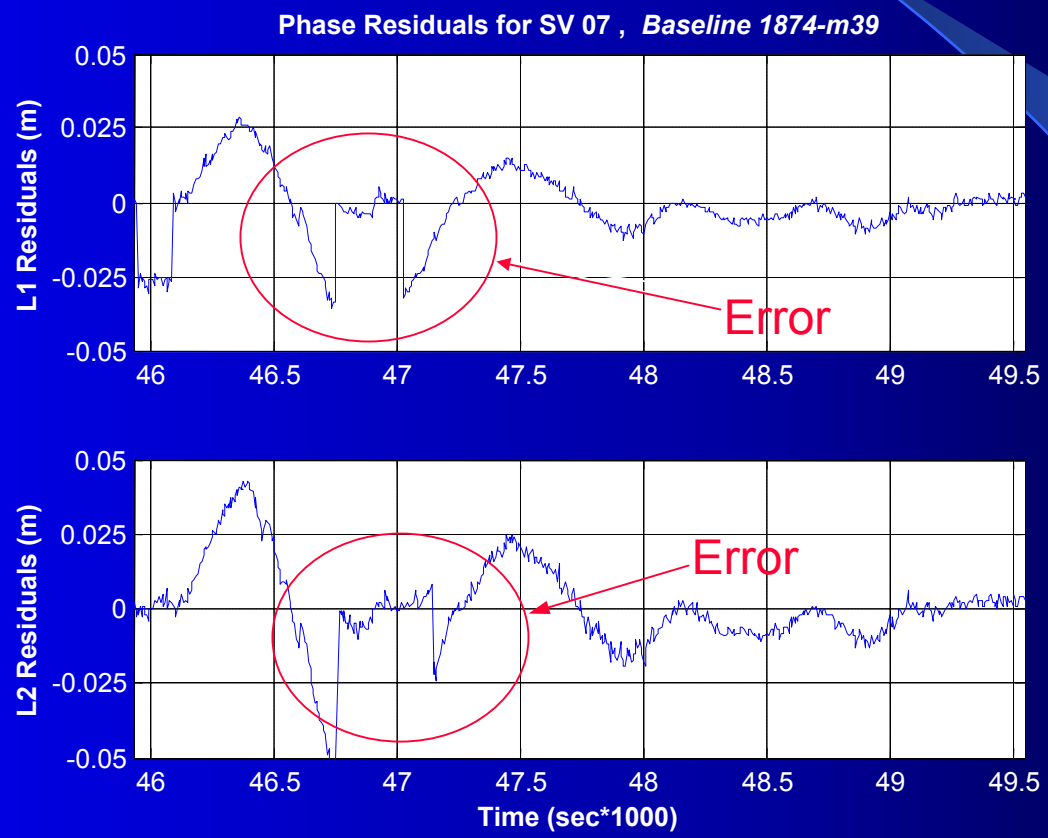
Baseline Residuals (1 of 3)



Baseline Residuals (2 of 3)



Baseline Residuals (3 of 3)



Free Network Results

Station	X (m)	Y (m)	Z (m)
AH7470	-2700279.252	-4286169.228	3862249.792
AB7680	-2706916.045	-4287192.756	3856793.576
AA1874	-2706686.583	-4297416.319	3846518.055
AA5496	-2699263.013	-4291901.447	3856656.486
M33	-2702685.953	-4291641.253	3854659.139
M36	-2702427.574	-4292210.435	3854250.469
M39	-2703091.986	-4292029.612	3853945.332

*WGS84 Cartesian Coordinates

Free Network Results

Station	λ	φ	Hae
AH7470	37°30’28.75830”N -0.141m	122°12’39.08619”W 0.069m	-29.013 m -0.003m
AB7680	37°26’41.35071”N 0.097m	122°16’05.33120”W -0.116m	148.004 m -0.056m
AA1874	37°19’28.64140”N 0.145m	122°12’15.77755”W -0.142m	683.052 m -0.048m
AA5496	37°26’39.72108”N -0.131m	122°09’59.80266”W 0.064m	-11.868 m -0.048m
M33	37°25’16.67195”N	122°12’03.27692”W	46.947m
M36	37°24’59.36448”N	122°11’42.05109”W	71.811m
M39	37°24’47.54156”N	122°12’08.83282”W	46.080m

*WGS84 Coordinates

Quality Control

Station ID	Order	Date Adjusted
AH7470	Horiz Order A	APR 2000
AA5496	Horiz Order A	APR 2000
AB7680	Horiz Order 1st	OCT 1996
AA1874	Horiz Order 1st	SEP 1994

Conclusion

- Problems Encountered
  - Problem with baseline 5496-M36
    - Baseline Residuals look good….???
  - Varying antenna height on piller points
  - Data was observed on two different Meterological days

Conclusion

- Resolutions
  - New Homogenous base plate for pillers
  - Longer session for longer baselines
  - Sessions closer together in time
  - Evaluate NGS point quality
- Additional Tasks
  - Fully Constrained Adjustment
  - Internal SLAC Network