

GPS—VLBI CLOCK DIFFERENCES

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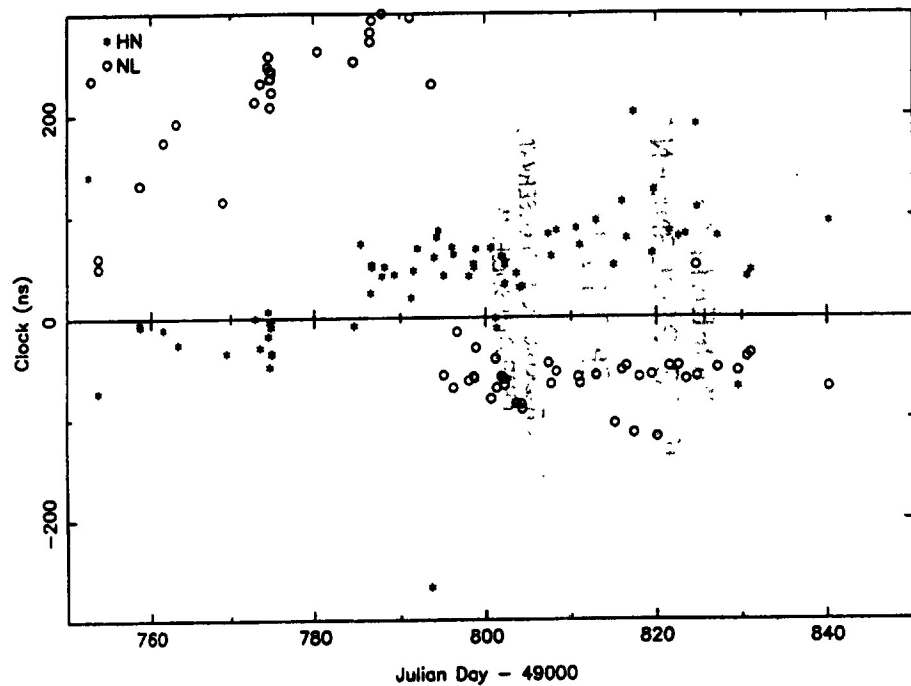
I have used the sniffer output from all experiments sniffed by the analysts for the last few months to investigate the difference between the clocks as determined by GPS and those determined by fringe fitting VLBI data. The hope was to find some systematic offsets that could then be used as corrections to the GPS data to allow better estimates of clocks for correlation. I wrote a program (CLOCKHIST) that reads the "datafile.lis" files on terminus2 for all observations and collects the amplitude, delay, and rate for the point with the highest amplitude for each baseline for each experiment. The delays are then corrected to a common reference antenna. These data will be very non-uniform. There is a mixture of BBC's, bandwidths, and RF frequencies. However, if a clear trend shows up, that is a good sign that we can make useful corrections without taking all these confusing factors into account.

The data are shown on the attached plots which show the VLBI delay offset of each station with respect to Los Alamos. The GPS comparison occurs in the sense that the observations were processed using the GPS clocks, so the VLBI residuals are just the differences between GPS and VLBI. Note that, within a single experiment, it is common for the single band delays to vary up to about 50 ns between baseband channels. Therefore, a scatter of at least that amount is expected. In fact, for the last couple of months, this can account for a significant fraction of the scatter seen in the plots. It really does look like we can make useful corrections. Below, I list the corrections implied by these data and suggest that they be used on a test experiment. If that is ok, they could be applied routinely.

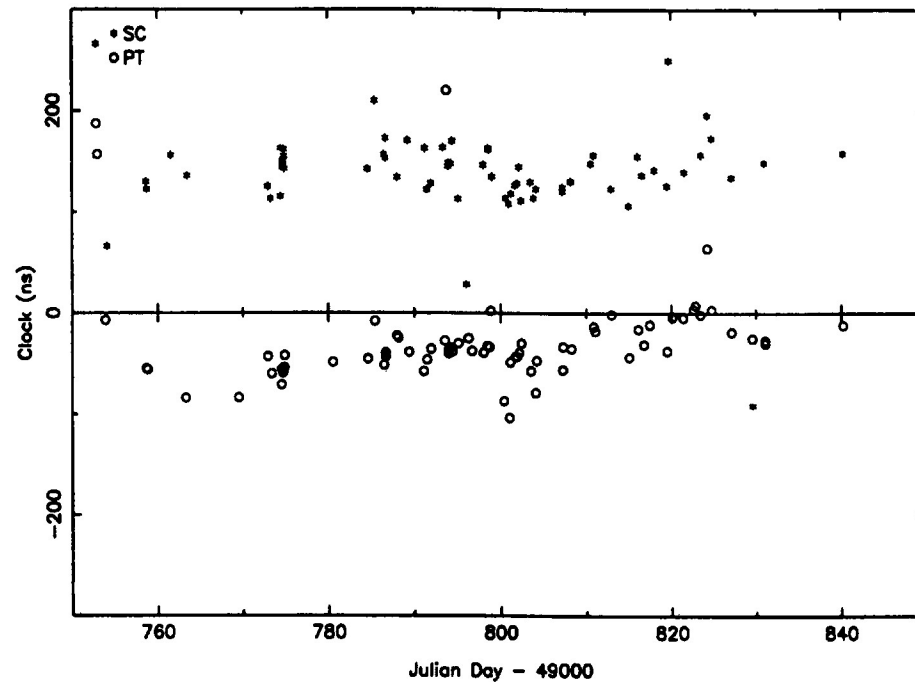
I have talked to Larry Beno and it is not clear, at this time, what causes the differences between sites. Certainly, if we use these corrections for processing, we have to watch carefully to catch any changes when they occur.

VLBI Delay wrt LA	
Station	VLBI Delay (ns)
SC	140
HN	70
NL	-50
FD	20
PT	-20
KP	-40
OV	130
BR	80
MK	-70

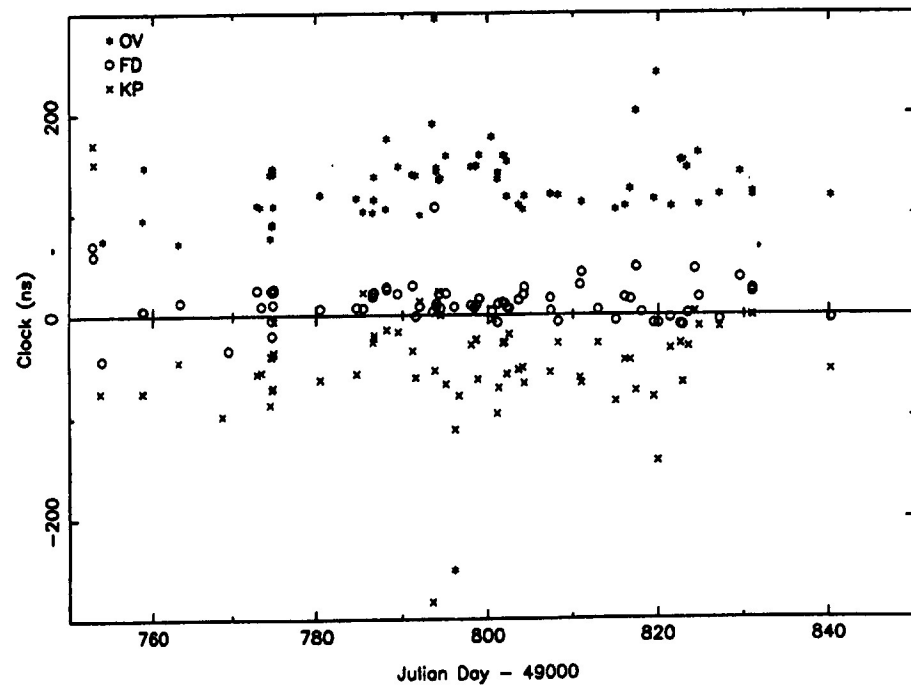
Sniffer Clocks - Referenced to LA



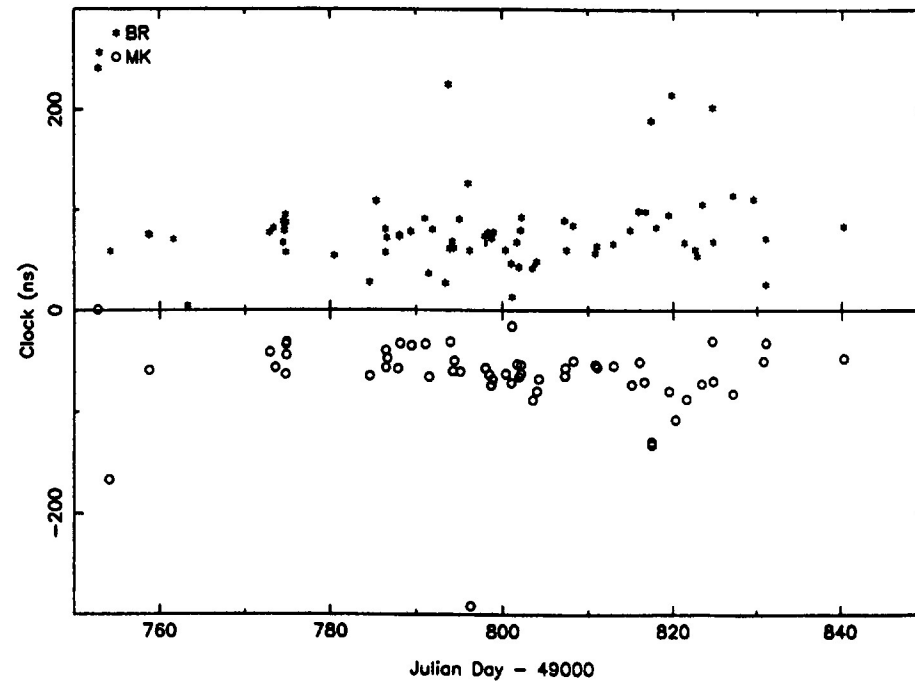
Sniffer Clocks - Referenced to LA



Sniffer Clocks - Referenced to LA



Sniffer Clocks - Referenced to LA



VLBA TEST COORDINATION MEMOS

Memo No.	Series	Cross Ref	Author	Title	Date
10	Test		Walker	Summary of First VLBA Test Mtg.	8709
11	Test		Walker	Test Coord Mtg for Oct. and Nov.	8712
12	Test		Walker	Test Coordination Mtg for December	8712
13	Test		Walker	Test Coordination Mtg for January	8802
14	Test		Walker	Test Coordination Mtg for February	8802
15	Test		Walker	Test Coordination Mtg for March	8803
16	Test		Rhodes	Temperature Stability Tests	8804
17	Test		Walker	Test Coordination Mtg for April	8804
18	Test		Rhodes	Remote Observing	8806
19	Test		Walker	Test Coordination Mtg for May-July	8807
20	Test		Ray, et al	Report on Pie Town in ATD-5	8907
21	Test		Walker	Lessons from 3/27/89 CDP Observ	8907
22	Test		Walker	Pointing, Gains & System Temp - I	8911
23	Test		Walker	Pointing Histories	8912
24	Test		Walker	Pointing Improvements - I	9104
25	Test		Walker	Summary of Pointing & Gain Results	9107
26	Test		Walker	Summary of Results of Focus-Rotation Tests at 1.3CM	9112
27	Test		Biretta	Frequency Dependence of VLBA System Temperatures and Gains	9112
28	Test		Walker	Focus vs. Elevation on VLBA Antenna	9201
29	Test		Rogers	Choice of Phase Cal Frequencies for Processing on Haystack MKIII Corr	9201
30	Test		Walker	An Example of What Rain/Snow can do to 4cm Sensitivity with Dichroic Sys	9201
31	Test		Walker	VLBA Geodesy Experiment	9203
32	Test		Walker	Los Alamos Phase CAL Variations	9204
33	Test		Walker	VLBA Gains & System Temperatures	9205
34	Test		Walker	New Pointing Equations for VLBA	9205
35	Test		Walker	Phase Cal Variations	9206
36	Test		Bagri	Status of PhaseCal Stability	9208
37	Test		Beasley	VLBA Antenna Horizons	9208
38	Test		Bagri	90 & 50 cm System Status	9208
39	Test		Bagri	Phasecal Phase stability with the Pulsecal Generator at Pie Town	9209
40	Test		Walker	VLBA Sensitivities	9301
41	Test		Walker	Focus and Rotation	9301
42	Test		Bagri	Pulsecal Phase Stability	9303
43	Test		Walker	Calibrator Flux Densities	9304
44	Test		Beasley	VLBA Antenna Horizons - MK	9305
45	Test		Janes /Martin	Relative Humidity Measurements at VLBA, VLA, and AOC Sites	9308
45a	Test		Janes	Addendum to VLBA Test Memo No.45	9309
46	Test		Walker	VLBA System Temperatures & Effic	9312

47Test	Weimer	Test & Repair of AOC PBD	9312
48Test	Janes/ Ross	Problems with Internet at Kitt Peak VLBA From RFI	9406
49Test	Brundage /Oty	Front-end/IF Passband Measurements at St Croix	9505
50Test	Walker	GPS-VLBI Clock Differences	9505
51Test	Hronek/ Walker	Wide Band Sensitivity Measurements on the VLBA	9509
52Test	Romney	Mark 4 Format Test	9603
53Test	Ulvestad	VT006-MkIV Test Results at the VLBA Correlator	9701
54Test	Leppanen	Calibrating the Electric Vector Position Angle with the VLBA Pulse Calibration System	9701
55Test	Ulvestad	Phase Response of VLBA 16 MHz IF Bands	9702
56Test	Thunborg	Investigation of VLBA Azimuth Wheel Bearing Failures	9707
57Test	Butler	Options for VLBA Antenna Surface Measurement	9803
58Test	Kogan	Time interval where pulse cal tones can demonstrate curious cross correlation	9804
59Test	Butler	Astigmatism on VLBA Antennas	9810
60Test	Markowitz Wurnig	VLBA Fringe-Finder Survey	9812
61Test	Walker	Pointing Improvements Using Rail Height Information	9901
62Test	Butler	Simulations of some types of holography errors for VLBA antennas	9904
63Test	Ruff	Azimuth Drive Wheels	9911
64Test	Walker	Checking VLBA Polarization Using the Squint	0105
65Test	Walker	Results of a VLBA PN3DB Test	0105
66Test	Briskin	Fixing the 0.7 VLBA pointing Wobble	0108

67Test	Walker	Focus on the VLBA	0110
68Test	Ulvestad	The need for ionospheric corrections at 5 GHz	0111

1/22/97

