Twenty Eighth Meeting of the Hipparcos Science Team

Copenhagen, 24-25 June 1991

Attendance:

HST: Prof. P.L. Bernacca, Prof. F. Donati, Dr. M. Grenon, Prof. M. Grewing, Prof. E. Høg, Prof. J. Kovalevsky, Dr F. van Leeuwen, Dr L. Lindegren, Dr H. van der Marel, Mr C.A. Murray, Mr R.S. Le Poole, Dr H. Schrijver, Dr C. Turon.

Dr M. Crézé was unable to attend

ESTEC: M.A.C. Perryman

ESOC: D. Heger, A. McDonald, O. Ojanguren

Invited: C. Petersen, S. Söderhjelm, J. Storm

The agenda given in Annex I was adopted.

Actions agreed at the meeting are included as Annex II.

1. Satellite Status

Ojanguren reported on the satellite status, including useful data fraction, an overview of the operations, future activities, and the status of consumables (Annex III).

McDonald reported on the development of the on-board attitude control in the absence of gyro 4/5 (Annex IV). Implementation was due in early July. Difficulties are still expected near to occultations, at perigee, and through eclipses. Donati suggested that consideration be given to running OGAR continuously on-ground, with semi-regular updating of the attitude, to take account of the many situations expected when the attitude will be lost.

2. Calibration Report

Schrijver summarised the recent results from the Utrecht processing (Annex V). The evolution of the basic angle had slowed to an almost constant value, while the scale factor and grid rotation were still changing. The FAST mass-processing results were in generally good agreement with the Utrecht first-look data (see the solid curve on the attached plots). Note that there is a difference between the Utrecht M1/M2 weighting and the current FAST (0.8:0.2) values). A sudden drop in the M1 and M2 values for the FFOV for the last two first-look tapes had not been seen in the ESOC monitoring (and was not confirmed by subsequent Utrecht processing, reported after the meeting).

3. NDAC Report

Van Leeuwen reported that RGO Had completed implementation of the attitude reconstruction solution across jet-firing intervals. New gyro calibration values had recently been communicated to ESOC (and were uplinked to the satellite on 4-7-91). Work on the reconstruction of torques was still ongoing. IDT/SM photometry work was still going on to try to eliminate the remaining 0.002 mag discrepancies. Difficulties remain in the OTF modelling, where solutions for the colour and position dependence are satisfactory, but poor chi-squared values are found for the 3-parameter model. 8 sets of nominal mission data (8.5 months) have now been received from ESOC and converted to optical disc format. Concerning the IFOV pointing checks, van Leeuwen reported that every frame is checked for the difference between the actual star and IFOV position. The acceptable thresh-hold is presently set to 5 arcsec in NDAC and 10 arcsec in FAST, but this will be reviewed at the time of the first iteration (Action 1).

Lindegren reported on the Copenhagen activities. The instrument and RGC residuals are still being studied. Otherwise the RGC processing and sphere solution are in good shape, and ready for mass production. However, significant power has been found in the sphere results up to the 36th harmonic, although this may disappear as the Input Catalogue effects become suppressed. The double star treatment in Lund is now giving results in good agreement with the sphere solutions, and new double stars have been discovered. The following features were still unexplained: existence of spin-phase update anomalies, and the difference between the sphere solution results using the geometric/smoothed attitude.

4. FAST

Kovalevsky reported on the FAST progress. Mass processing had started, and 60 RGC's had been treated so far. The results from the sphere solution (solving only for positions) gave 4 milli-arcsec on the RGC origins, and some 20 milli-arcsec on the positions. There was not much new work to report on photometry, although problems still appear to exist for faint (> 10.5 mag) stars. Plans are in hand to study RGC results using the first/second harmonic phases alone.

4. TDAC

Høg gave an overview of the Tycho processing status. Present reduction time is about half of real time. The results of the astrometric processing (including calibration results) was presented (Annex VI). He reported that results of the HOC/TOC comparison at the RGC level for the vertical slits was expected in about 1 month. However, mass processing will not start for 1-2 years (until the final attitude is available). The final photometry will also require TICR (currently TDAC uses NDAC attitude for TICR, but plans to use the FAST attitude finally).

Grewing summarised the detection/photometry status. Version 4 of the s/w had been frozen since May, although some work on the data management system is still ongoing. Photometry processing is likely to start in about 2-3 months. Before then, it was agreed that a report summarising the level of agreement on photometry between TDAC/RGO would be presented by Snijders (Action 2).

4. INCA Status

Turon reported on the delay of the Input Catalogue publication, due to the lateness of the updated information on double stars. A draft of the Double Star Annex is attached (Annex VII). Turon summarised the problems of the Input Catalogue ordering (Annex VIII). HST approved Turon's recommendation not to renumber, and to order in terms of Hipparcos running number at epoch 2000.

Grenon reported on the problems resulting from the discovery that the red transmission of the main detector was considerably higher than the pre-launch predictions (Annex IX). A report would be written, and the effects on the data processing, and Input Catalogue construction would be studied.

7. Comparisons

(a) Star mapper: van Leeuwen distributed a comprehensive report on his star mapper comparison analysis (RGO/NDAC 91.03). The conclusions would be carefully reviewed by FAST, TDAC and Utrecht (Action 3). Van Leeuwen is continuing work on the SSRF comparisons: some of the discrepancies could be explained by the use of different data intervals, colour dependence, Poisson weighting. After the meeting, a report was distributed by Schrijver (4 July) which throws some further light on the problem.

(b) Attitude: Donati presented results of his work on RGC 110-114 (see report). van Leeuwen explained his catalogue updating procedure, which was then considered acceptable. Petersen communicated the new RGO/CUO reduced data to Donati, who will verify whether the discontinuities around jet firing intervals have been improved (Action 4).

Kovalevsky would also investigate whether FAST intends to send new data to Donati (Action 5).

(c) GCR: van der Marel distributed his report on the RGC 110-114 results. Results for the FAST analysis using the 1st harmonic, 2nd harmonic, and weighted phases, show that there are still problems with the instrumental description (3rd or 4th order polynomial, colour dependence, POS, etc). van der Marel plans to continue with the 3rd-order instrumental representation for the first years reduction, meanwhile further studies can be made in parallel. This was agreed as a baseline also for NDAC. Petersen showed his residual maps for the 18 data sets. Lindegren and Kovalevsky would continue to reflect on the use of M1, M2 and weighted phase, phase difference, and SM geometry and their inter-relationship, and would continue to exchange views via e-mail (Action 6).

(d) Timing: Perryman invited Lindegren and Kovalevsky to review how best to carry out a comparison of timing. Lindegren considered that the comparison of minor planet results could be a key to this problem (Action 7).

7. Astronomy and Astrophysics Papers

The details of the papers, conclusions on those to be retained, updated, on finalised authorship, and on the schedule etc, were discussed (details sent separately to all authors). The following conclusions were reached: (i) the minor planet paper by Morando would be postponed until further results were available. A paper on NDAC photometry by Evans et al. would be added; (ii) the paper on methods for attitude comparison would be placed after paper A3 on the data reductions (iii) one paper from Grenon was missing due to the need to update the photometry calibration details: if available it would be included in the final collection, but submission of the collection would not be held up by the absence of this paper; (iv) all papers would be submitted in TeX (Donati to send his version to Lindegren for conversion); (v) the wording on a by-line for data based on the satellite observations was agreed; (vi) authors to refer to the A& A guidelines (sent out by Perryman on 4 July) for details of conventions to be used; (vii) HST members to send comments directly to first authors immediately after the meeting; (viii) first authors will submit their finalised papers to M. Grewing by 15 July, with paper copy (including figures) to perryman; (ix) after editorial comments had been received, authors would send e-mail versions to Perryman for 'unification'. Perryman would FAX edited copies back to authors for final approval before submission.

4. Miscellaneous

(a) USSR activities: Høg reported on the work ongoing in Pulkovo/Moscow. He asked HST members to consider how a scientific and/or hardware collaboration could be furthered (Annex X).

(b) ISO Agreement: a draft agreement had been drawn up by the ISO project (M. Anderegg) including comments received by all parties. Turon raised the question of whether they should not expect some data return from the ISO project. Perryman requested that such discussions are taken up directly between interested parties and the ISO Project Scientist (M. Kessler).

(c) Letter to proposers: Perryman had circulated a draft information letter to the Consortia Leaders intended for distribution to the Proposal Principal Investigators. The letter was approved and would be sent out after the meeting.

(d) ESLAB 1992: Perryman noted the possibility of holding an ESA sponsored meeting in 1992 or early 1993 (Annex XI). HST members were invited to reflect on the objectives, participants, location, date, etc (Action 8).

(e) HST FGS calibration: Turon reported on the studies carried out on the field of NGC 2516, recently requested by M. Lattanzi. Perryman was asked to reply to Lattanzi, explaining the difficulties (impact on the accuracy, and time-scale of expected results), and try to understand why the small-field relative accuracies claimed by the Flagstaff 61-inch telescope were not considered adequate for these purposes.

(f) IAU JD Programme: Turon presented the status of the main and poster papers for the forthcoming IAU General Assembly in Buenos Aires.

(g) Extension of operations: Perryman presented some arguments for extension of mission operations beyond end 1992 (Annex XII). HST members were invited to add to these arguments, and DRC leaders were invited to comment on whether their teams would support the data reduction activities beyond the nominal mission duration. The schedule for presenting the case to the ESA advisory bodies would be early 1992 (Action 9).

7. DDRT Business

(a) Publications in A& A: see above.

(b) Double star coordination and publication of photometric results: no specific proposals had been made for consideration by the DDRT, and no discussions were therefore held on these topics.

(c) Schedule for internal proposals: in view of the late publication of the Input Catalogue catalogue, HST recommended to put back the schedule for the internal proposals (outline and final proposals by 6 months). Thus the outline proposals should be submitted by 30 June 1992, and the final proposals should be submitted by 31 December 1992 (NB: the HST/DDRT should confirm this proposal).

(d) Annex to the Agreement: following the previous DDRT discussions, Perryman had made the following proposal which was acceptable to all parties: (i) persons appearing in

the Annex must be active consortium members. Changes proposed by the consortia should reflect this requirement; (ii) for all internal proposals the first named author (PI) must be contained in the Annex. The proposal will be assessed by the DDRT on the basis of the contribution of this first author. As a result the following changes were proposed to the Annex: within France, Kovalevsky requested that the names of Lacroute and Pieplu be removed, and replaced by F. Gazengel and A. Guerry. Within France, Bernacca proposed that the names of Delaney, Galligani, Sanso and Scaltriti be removed. He proposed that M. Badiali and A. Ferrari be added, leaving two further places to be added at a future stage. The HST saw no difficulties in implementing these changes. Perryman proposed that the formal changes be made at the next DDRT meeting, when NDAC and INCA should also present any proposed changes to their respective lists.

8. Next Meeting

21-22 November, Tubingen (at the invitation of M. Grewing). The location was confirmed after the meeting. The present meeting was concluded rather hurriedly, but Perryman wishes to record his thanks in the minutes to E. Høg for the local arrangements made for the meeting.

M.A.C. Perryman

5 July 1991

Distribution: HST and ESOC Participants

Twenty Eighth Meeting
of the
HIPPARCOS SCIENCE TEAM

ANNEX I

Tycho Brahe Planetarium
Copenhagen, 24-25 June 1991
Start of meeting: 09.00

AGENDA

1. Satellite status (Heger/Ojanguren/McDonald/Perryman):
   - consumables and tank changeover (Heger/Ojanguren)
   - ACS improvements status (McDonald)
   - results from inclusion of RGO-updated star catalogue (McDonald)
   - nominal mission data tapes and future policy (Perryman)
   - solar array status (Perryman)

2. Calibration report (Schrijver)

3. NDAC progress report (van Leeuwen/Lindegren)

4. FAST progress report (Kovalevsky)

5. TDAC progress report (Hoeg/Grewing)

6. Comparison activities:
   - IDT comparisons (Perryman)
   - SM and SSRF (van Leeuwen)
   - attitude (Donati)
   - GCR, abscissae and instrument representation (van der Marel)
   - photometry (van Leeuwen/Kovalevsky)

7. Oustanding issues in need of further study (see note below)

8. INCA aspects and schedule (Turon)

9. Miscellaneous:
   - publications in A&A
   - FGS calibration assistance (Lattanzi)
   - IAU General Assembly - papers and posters (Turon)
   - USSR activties (Hoeg)
   - ESLAB Symposium 1992
   - information letter to proposers
   - next HST meeting: date and place

10. DDRT:
   - Agreement Annex I
   - any other business

Note on Item 7:

The various DRC's are now starting on their mass processing, but with the knowledge that their are certain topics where a full agreement or understanding has not yet been reached. I have attempted to summarise such topics below, so that they can be monitored. Please suggest other topics where you consider that further work is needed:

- SM timing and velocity discrepancies (NDAC/CERGA/Utrecht)
- SSRF discrepancies
- RGC instrument representation (3rd/4th order, etc)
- RGC end-point selection, and tests on depointing of IFOV
- anomalous spin-phase updates in NDAC GCR processing
- timing (in general, including propagation delays)
- photometry
- Tycho verification at RGC level

ANNEX II: Actions

1. NDAC and FAST to review choice of IFOV depointing cut-off at time of first RGC iterations.

2. TDAC (Snijders) to summarise TDAC/RGO photometry comparison results before start of TDAC photometry mass processing.

3. FAST, TDAC and Utrecht to review conclusion of van Leeuwen's star mapper comparison report.

4. Donati to perform attitude comparisons using new RGO/CUO data.

5. Kovalevsky to investigate whether FAST intends to send new attitude data to Donati for comparisons.

6. Lindegren and Kovalevsky to continue to reflect on the use of M1, M2 and weighted phase, phase difference, and SM geometry and their inter-relationship.

7. Lindegren and Kovalevsky to review how best to carry out a comparison of timing (e.g. via minor planet comparisons).

8. HST members to reflect on the objectives, participants, location, date, etc of an ESLAB meeting.

9. HST members to reflect on arguments for an extension of mission operations beyond end 1992.

Other actions outstanding:

10. Høg: identify reason for error in TDAC PGC minor planet transit time

11. Høg to consider Tycho verification at RGC level

12. Double Stars comparisons:

(i) Lindegren proposed to intercompare, for a subset of well-defined double stars with favourable separation (0.3-5 arcsec), relative parameters. For these observations there would be independent checks from the star mapper and from the ground.

(ii) Kovalevsky proposed a comparison of flags at RGC level to indicate which of the stars are considered double by both groups (Cerga could consider taking the responsibility for these comparisons).

(iii) Perryman proposed that, at sphere level (e.g. after the first 9 months of data processing) a comparison (for a range of INCA numbers) of which stars are single, double, multiple or uncertain, could be carried out, and parameters of these cases compared.

Ojaigwen ANNEX III

HIPPARCOS

S/C STATUS REPORT

MARCH - JUNE 1991

SYSTEM STATUS
(21 June 1991)

- The spacecraft remains fully operational but with its redundancy severely curtailed. Gyro 4 was turned off on March 01.
- Science data collection has been, on average, 77.75% during the reporting period. (March-June 91).
- Five anomalies have been raised during the period. The most important have been: AR48 (SPURIOUS UNDERVOLTAGE) and AR50 (LOSS OF ATTITUDE).
- None of the anomalies is currently affecting science data collection.
- Non-Z Gyro back-up system. Design and testing are progressing at a good pace. Uplinking of the new filter code will take place during the first week of July.

HIPPARCOS MAINTENANCE

ROUTINE

TYPE	PERIODICITY
REFOCUSSING (2 STEPS)	3 MONTHS
GYRO 3 DESTORAGES	MONTHLY
ISPA	BIWEEKLY
SOLAR PANELS TESTS	WEEKLY
GRM CALIBRATIONS	DAILY

OPERATIONS SUMMARY

MARCH-JUNE 91

MARCH

- Gyro#4 switch off. (Add. 5 to AR.35)
- Torque model parameters updated for single z-axis gyro configuration.
- High solar activity. CBS reload (AR.47).
- One week later,still with very high solar activity the S/C experienced an Spurious undervoltage (AR.48).

APRIL

- Problems with all 3 ground stations (equipment and links).

MAY

- Due to memory error,(TMxxx01; 4287dec and later 3176dec) , CBS halted and reloaded.(AR.49) .

JUNE

- Triggered by high solar activity LOSS OF ATTITUDE (AR.50)
- Gas tanks swop.

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D/S= 0 /SRCE=SRCA/GDGT/OPT= DP SC FS LI FI VA AL PKT.ID=HHR .HK / 0

ID	DESCRIPTION	VALUE	UNIT	MIN	MAX	LINE
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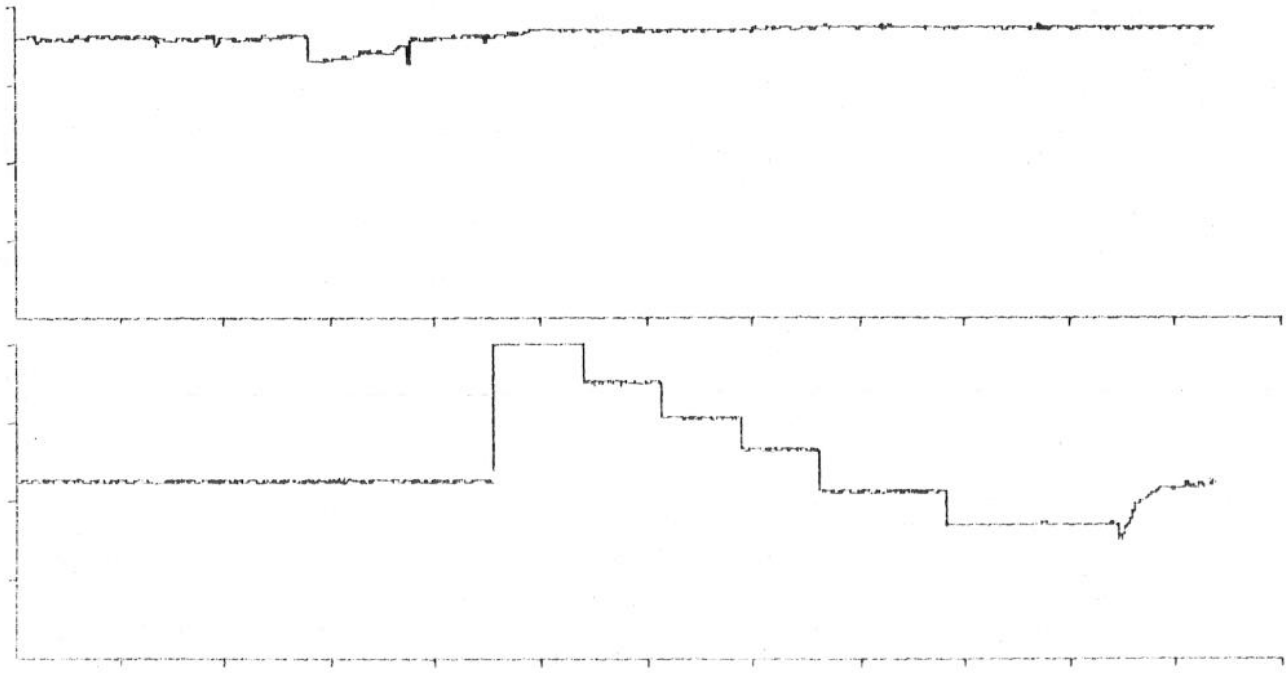
Y033	CGB L.PRESS EQIA	1.523	BAR	1.300	1.700	————



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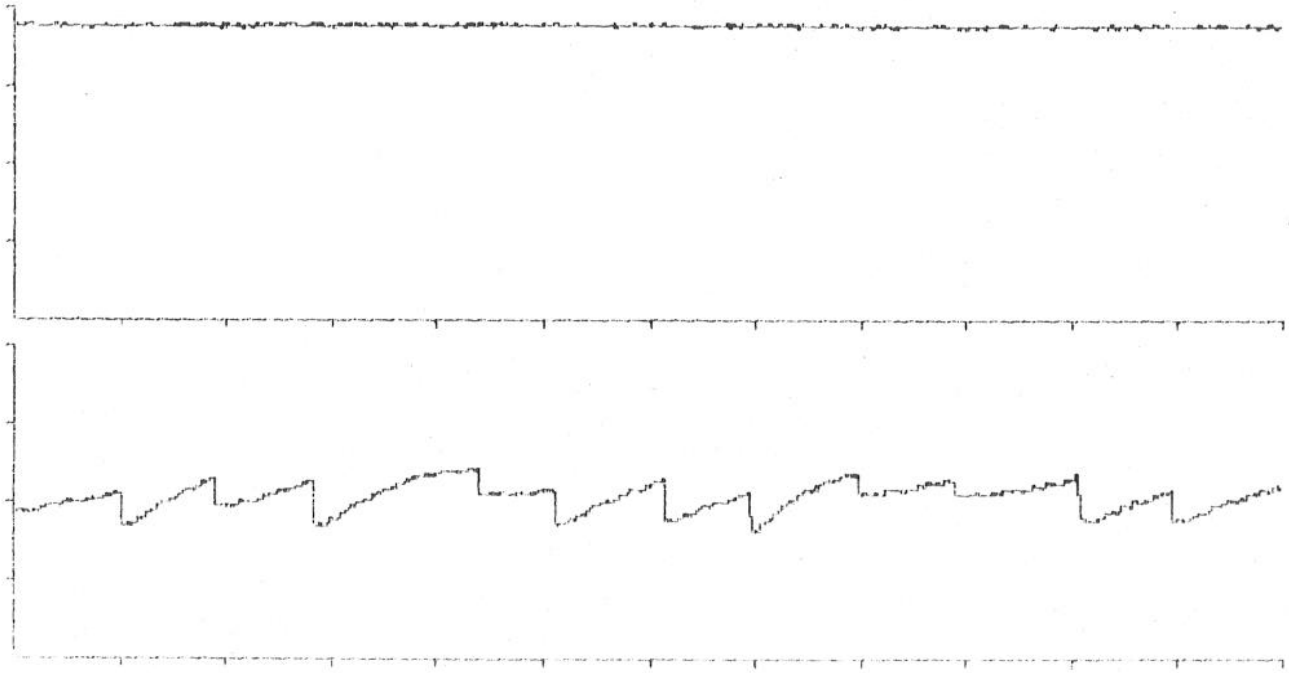

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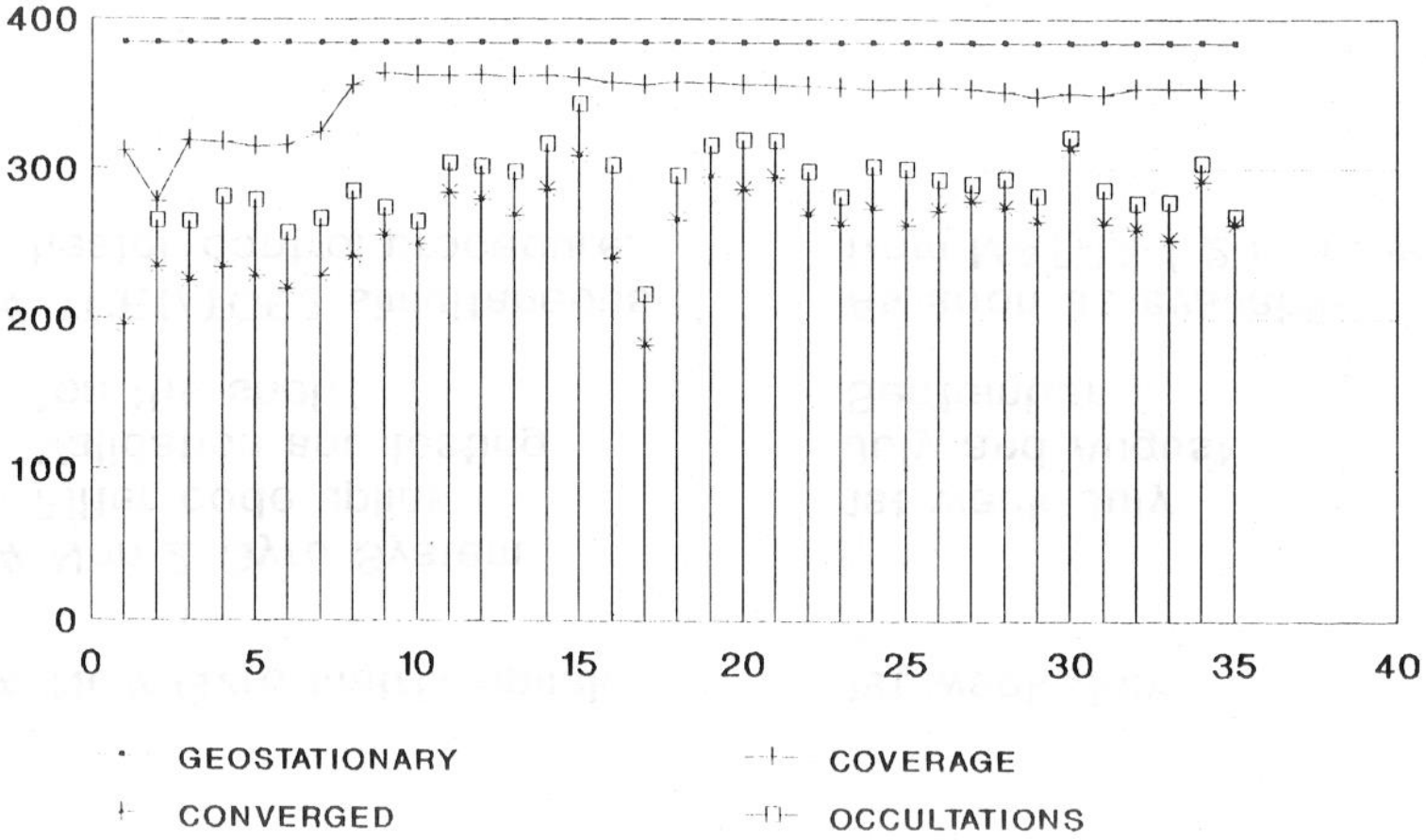
HIPPARCOS R/T USAGE



REP#1(330-345/89) - REP#35(144-159/91)

FUTURE ACTIVITIES

# New Gyro matrix uplink	1st week July
# Non Z Gyro System	
- Filter code uplink	1st week July
- Validation and testing	July and August
- "on the shelf"	September
# TCE1/TCE2 simultaneous heater control procedure.	As soon as available from MATRA (2 months)

CONSUMABLES

Tank A.....27.60 bars
Tank B.....234.63 bars

Total (19/6/91).....262.23 bars

Usage rate (1/1-19/6).....0.2492 bars/day

262.23 * 4 = 1000 days (+/- 5%)

SPES•HIPP03•GPD•DIS 91/06/20 09.20.18

GPD: CGPR cold gas tank pressure DsId: TM OwnerId: PRIVAT

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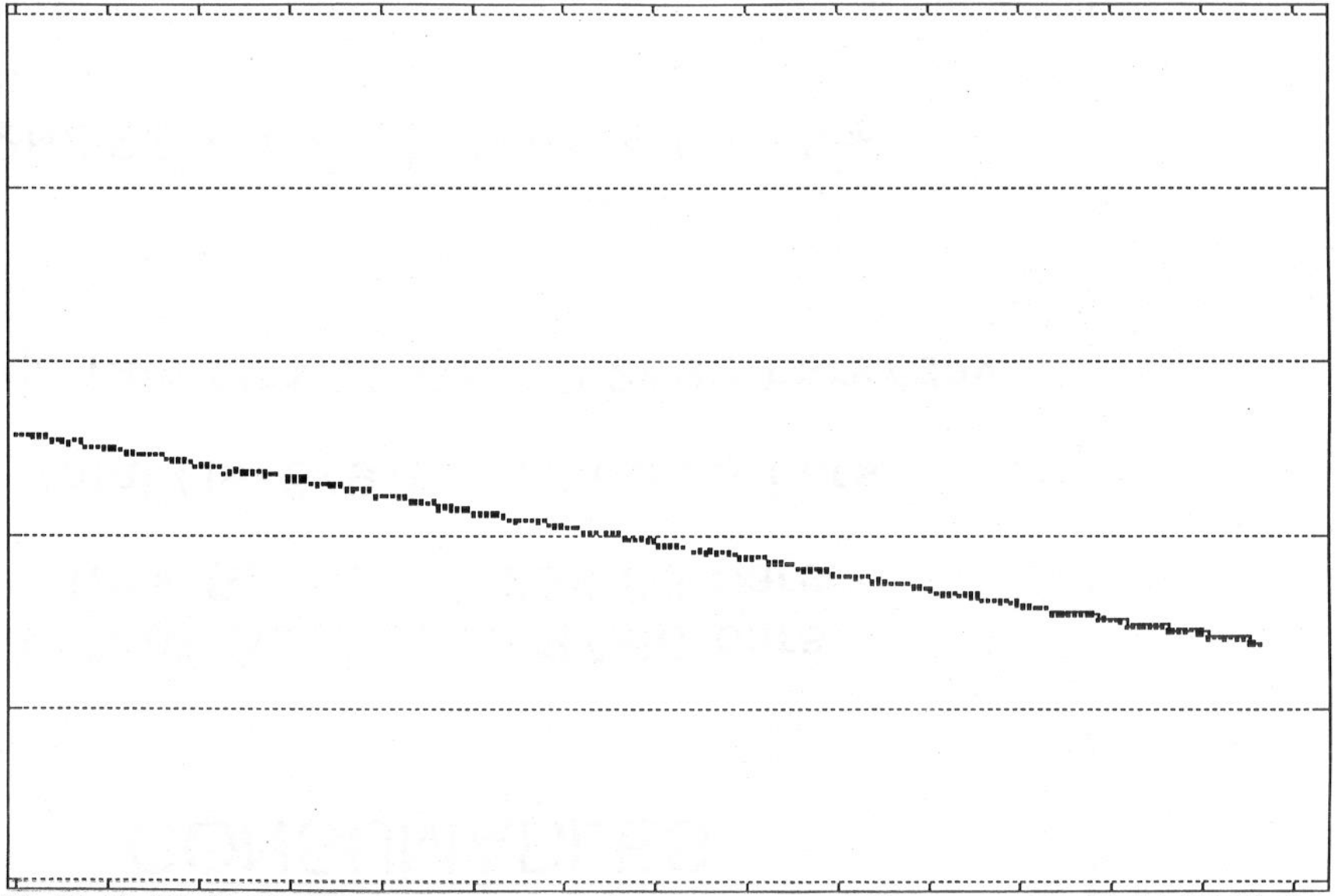

91/03/16 07.00.07 TIME T=7 DAYS 91/06/24 07.00.07

SPES•HIPP03•GPD•DIS 91/06/19 17.30.52

GPD: cgpr cold gas tank pressure DsId: TM OwnerId: PRIVAT

SYMBOLS	ID	DESCRIPTION	TICKS	GRIDS	MINIMUM	MAXIMUM	UNIT
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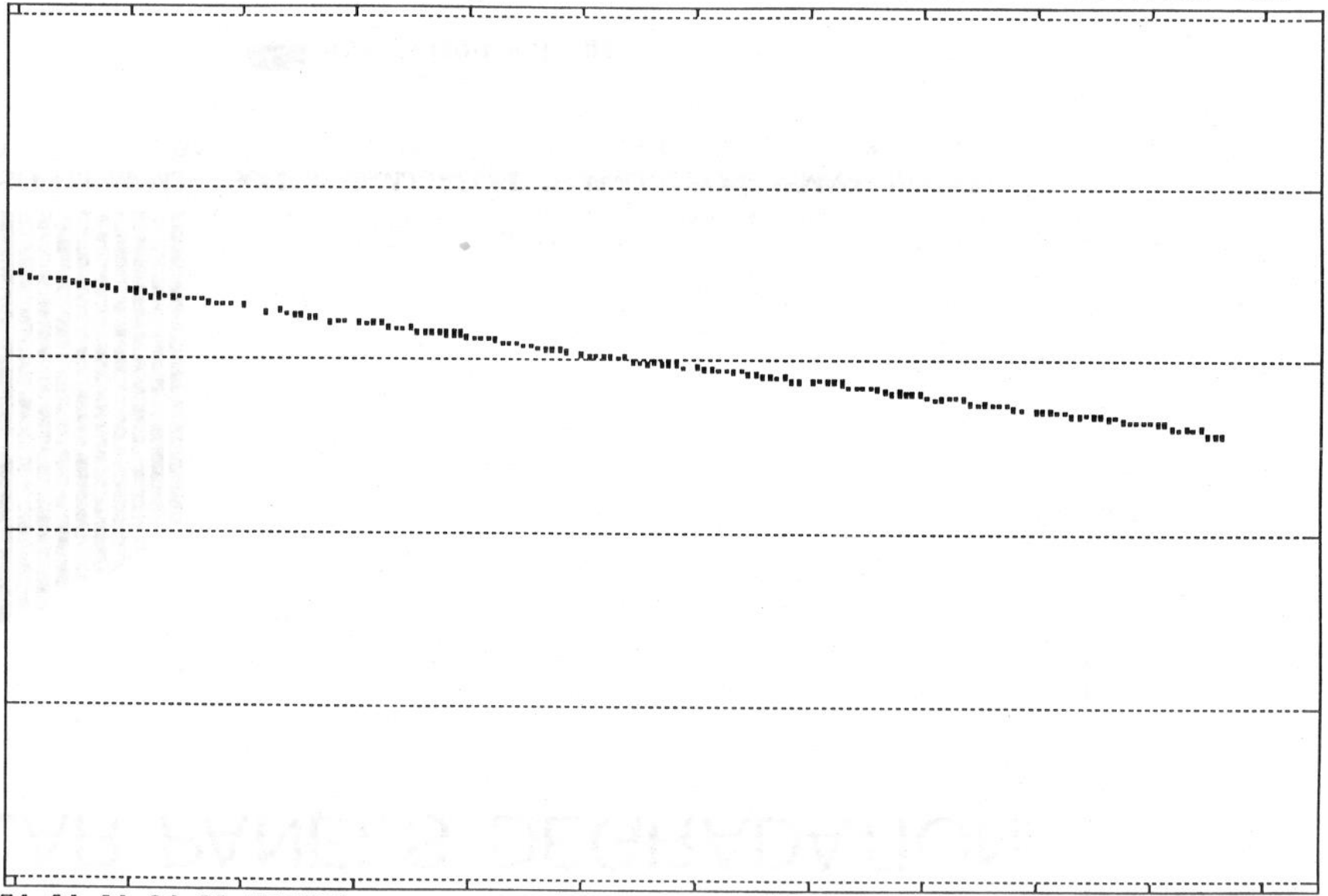

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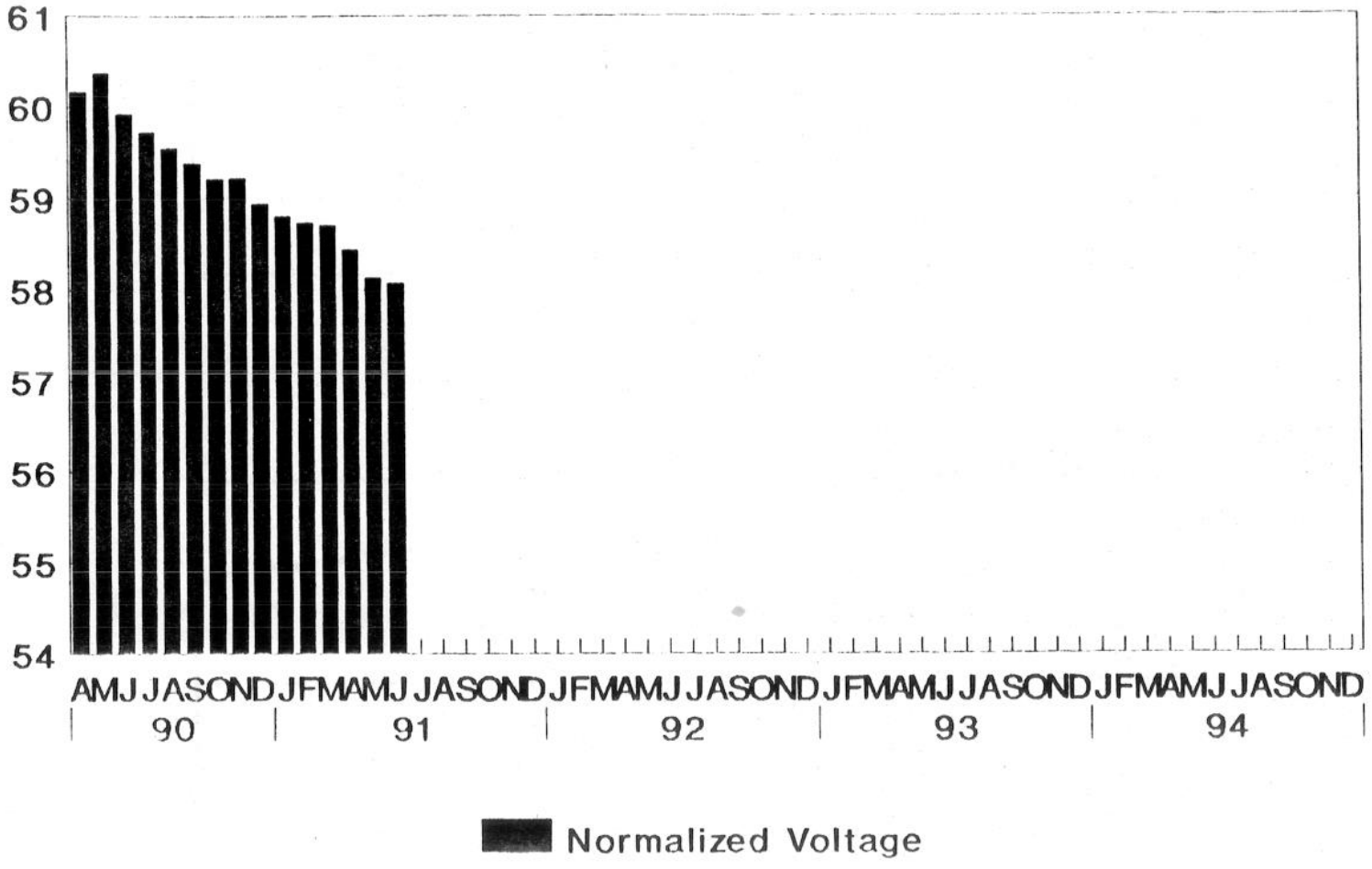
SOLAR PANELS DEGRADATION



POSSIBLE LIFE-TIME EXTENSION USING NON Z-GYRO OPERATION CONCEPT

Current situation
- Tank 1: 650 gr (28 bar)
- Tank 2: 5020 gr (234 bar)
- Average total fuel usage/day: 5.5 gr

- Predicted life time: › 1000 days

Non Z-gyro operation
- Average Z-axis fuel consumption/day: 1.1 gr

- Non Z-gyro operation saves (?) 1100 gr in 1000 days

- Predicted Z-axis thruster firing needs about 550 gr
  thus life time extends by 111 days to 1111 days

- Initialisation of RTAD after perigee a minimum of 1 (1.5)
  hour needed. (including generation of PSF)
  (2 orbits/ day* 1111 days) giving a total 92 days (138)

- Actual gain of science data : 19 days (-27)

- operational risks involved are not known

Conclusion:
As long as Z-axis gyro is operational
the Non Z-axis operation is not recommended

RTAD Control without z-gyros

On-board RTAD

Software development completed.

New RTAD algorithm is capable of running in parallel with current operational version, allowing on-board performance assessment. (Non-z-gyro RTAD will be run in a monitoring mode outside the control loop).

On-ground verification indicates accuracies in occultation free periods within +/- 10 arcsecs.

More studies to be performed to assess how long new RTAD can survive without star-mapper updates during occultations.

1.3 Processing requirements :

wx, wy, wz, sin 3wdt, cos 3wdt are computed from the scanning law parameters and the nominal orbital oscillator.

Gyro processing :

gz = rT where r= wz (wz = Scanning Law z rate, z error-rate effect is negligeable)
gx = a1*g1 + b1*g2 + c1*g3 + d1*gz
gy = a2*g1 + b2*g2 + c2*g3 + d2*gz

where gi (i=1,2,3) are gyro increments over T=16/15s for X,Y plane gyros.
The coefficients of non selected gyro shall be set to zero by TC.

Attitude prediction :

psi-d = Ad cos 3wd t + Bd sin 3wd t

$$\begin{vmatrix} phi \\ theta \\ dx \\ dy \end{vmatrix}_{(k+1)} = \begin{vmatrix} 1 & wzT & -T & 0 \\ -wzT & 1 & 0 & -T \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 \end{vmatrix} \begin{vmatrix} phi \\ theta \\ dx \\ dy \end{vmatrix}_{(k)} + \begin{vmatrix} gx - wxT - gy*psi \\ gy - wyT + gx*psi \\ 0 \\ 0 \end{vmatrix}$$

$$\begin{vmatrix} psi1 \\ psi2 \\ dz \\ gamma \end{vmatrix}_{(k+1)} = \begin{vmatrix} 1 & 0 & T & 0 \\ 0 & 1 & 0 & T**2/2 \\ 0 & 0 & 1 & T \\ 0 & 0 & 0 & 1 \end{vmatrix} \begin{vmatrix} psi1 \\ psi2 \\ dz \\ gamma \end{vmatrix}_{(k)} + \begin{vmatrix} -gx*theta \\ 0 \\ 0 \\ 0 \end{vmatrix} \quad (1)$$

(1)

psi = psi1 + psi2 + psi-d

rate(k+1) = (attitude(k+1) - attitude(k)) /T

In case of actuation, at cycle following the actuation, correctives terms are to be added to (1) such that :

psi1(k+1) = psi1(k) + dz(k)T - gx(k+1)*theta(k) + gam-th*TONz (T - TONz/2)
dz(k+1) = dz(k) + gamma(k)*T + gam-th*TONz

where gam-th is the mean thruster acceleration over actuation,
TONz is the applied thruster on-time.
Gam-th*TOnz is an algebraic value.

Attitude updating :

Measurement extrapolation and innovation computation are similar to the first filter except that we use the new filter state estimates.

Attitude update is similarly computed as :
X-new (+) = X-new + I-new* KG-new (slit, quality)

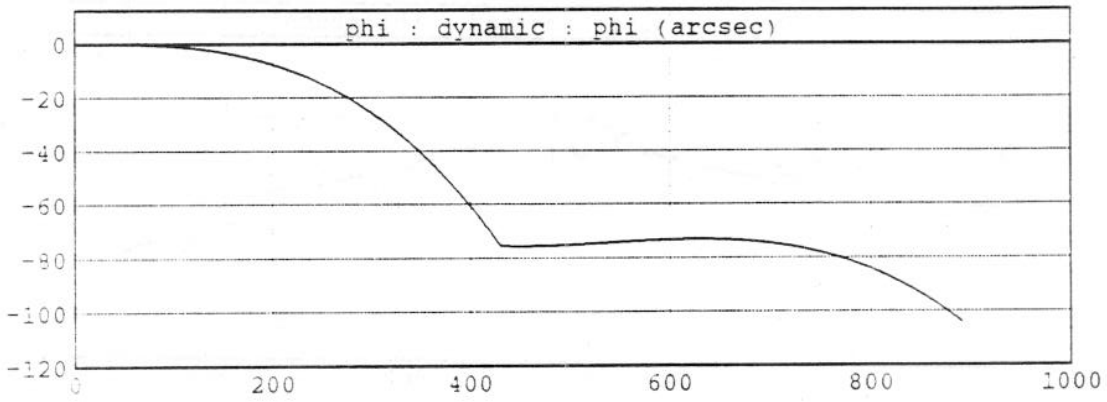
where X-new = (phi, theta, psi, dx, dy, dz, gamma)

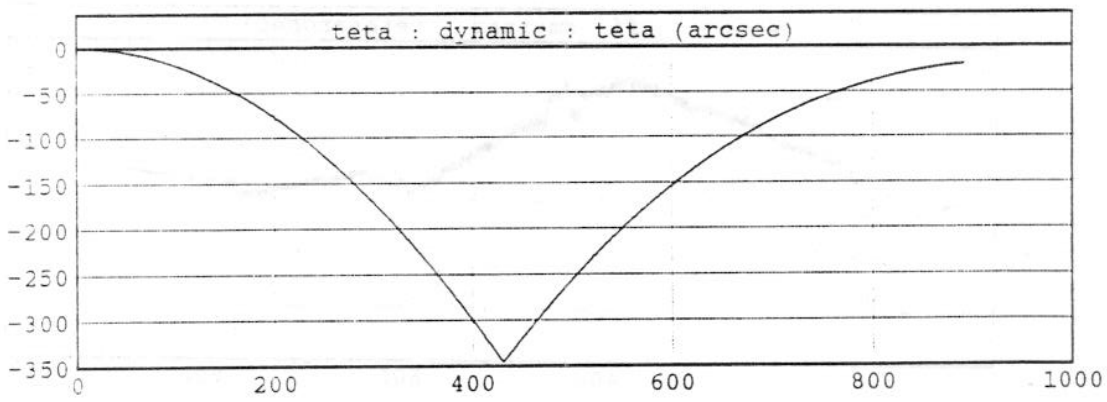
psi1(+) = psi(+) - psi-d
psi2(+) = 0

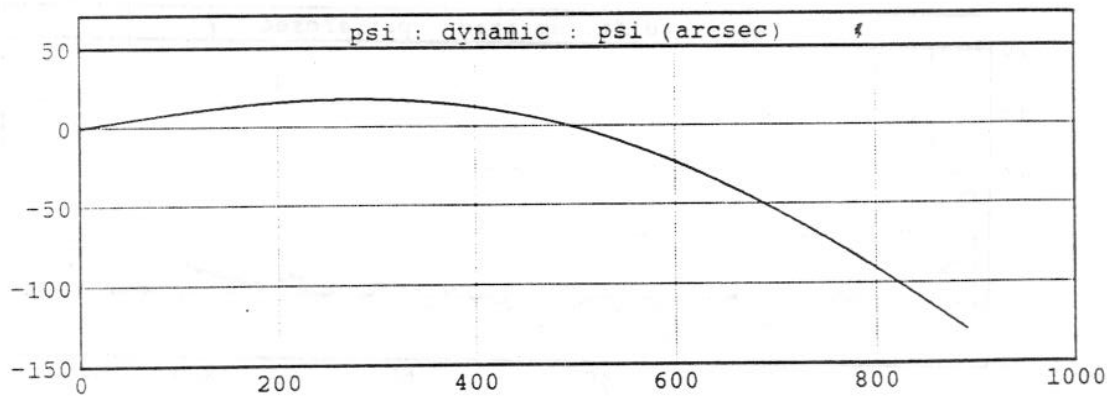
Modified attitude for OBC extrapolation on cycles around actuation are as for first filter.

aocs * hipparcos

results file : mnfss123may



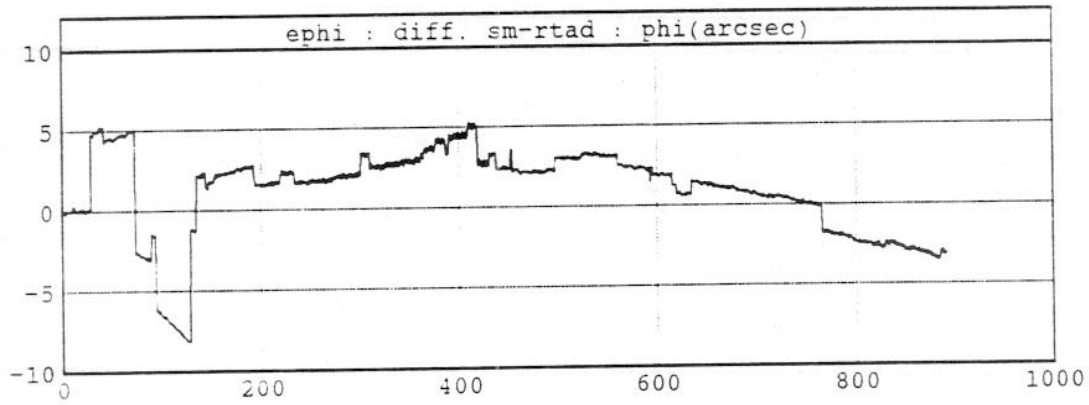


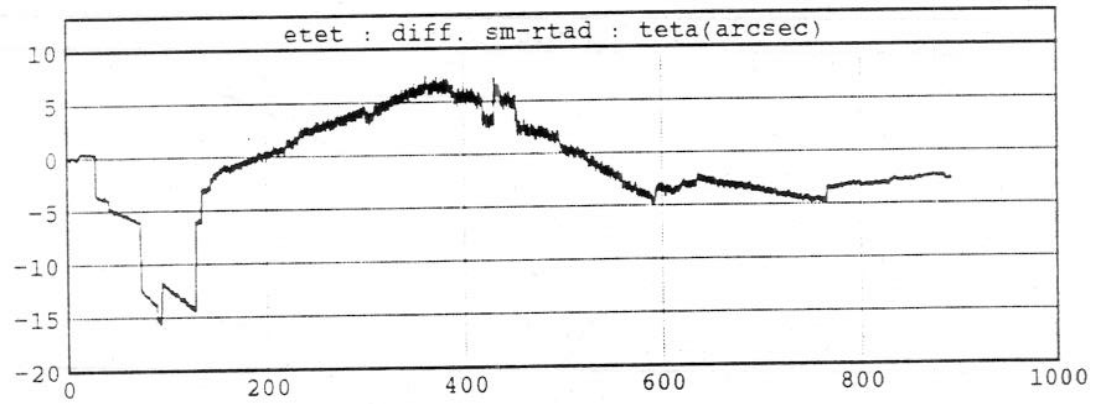


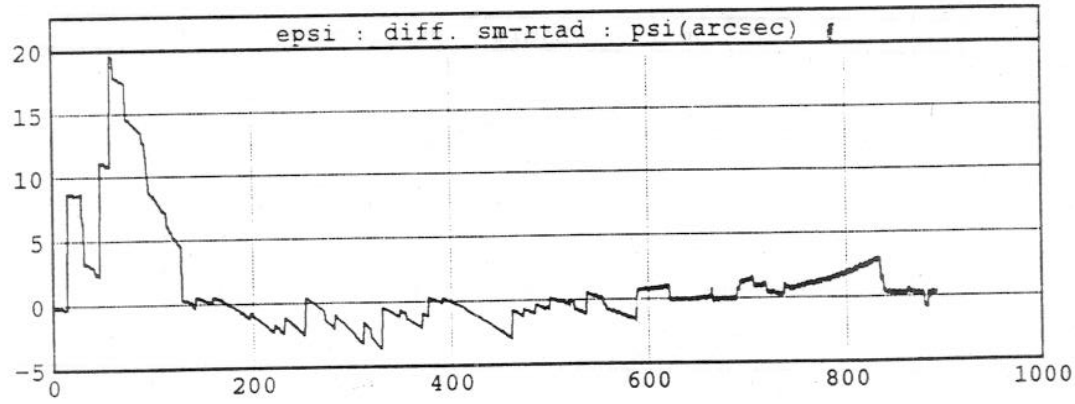
23may91 11h44 nm hipparco tos sst

aocs * hipparcos

results file : nmnfss123may







23may91 11h44 nm hipparco tos sst

On-ground support

The following activities are foreseen:

1. **Suspend NM controlled z thruster firings around perigee**

2. **Uplink time-tagged commands to fire z-thrusters to control z-rate. Number and duration of firings will depend on ability to predict behaviour in previous passes.**

   Accumulated on-times being studied for predictability. Extrapolation techniques give prediction error as 10 ″/s on average, but sometimes as high as 30 ″/s.

3. **GRTAD must therefore initially estimate rate followed by direct thruster command to counteract remaining scan-rate error.**

4. **Fine accuracy spin-rate determination required for ground RTAD. Performed using single star mapper transits calculating the distance between the two outer peaks.**

5. **Revised on-ground star pattern matching implemented**

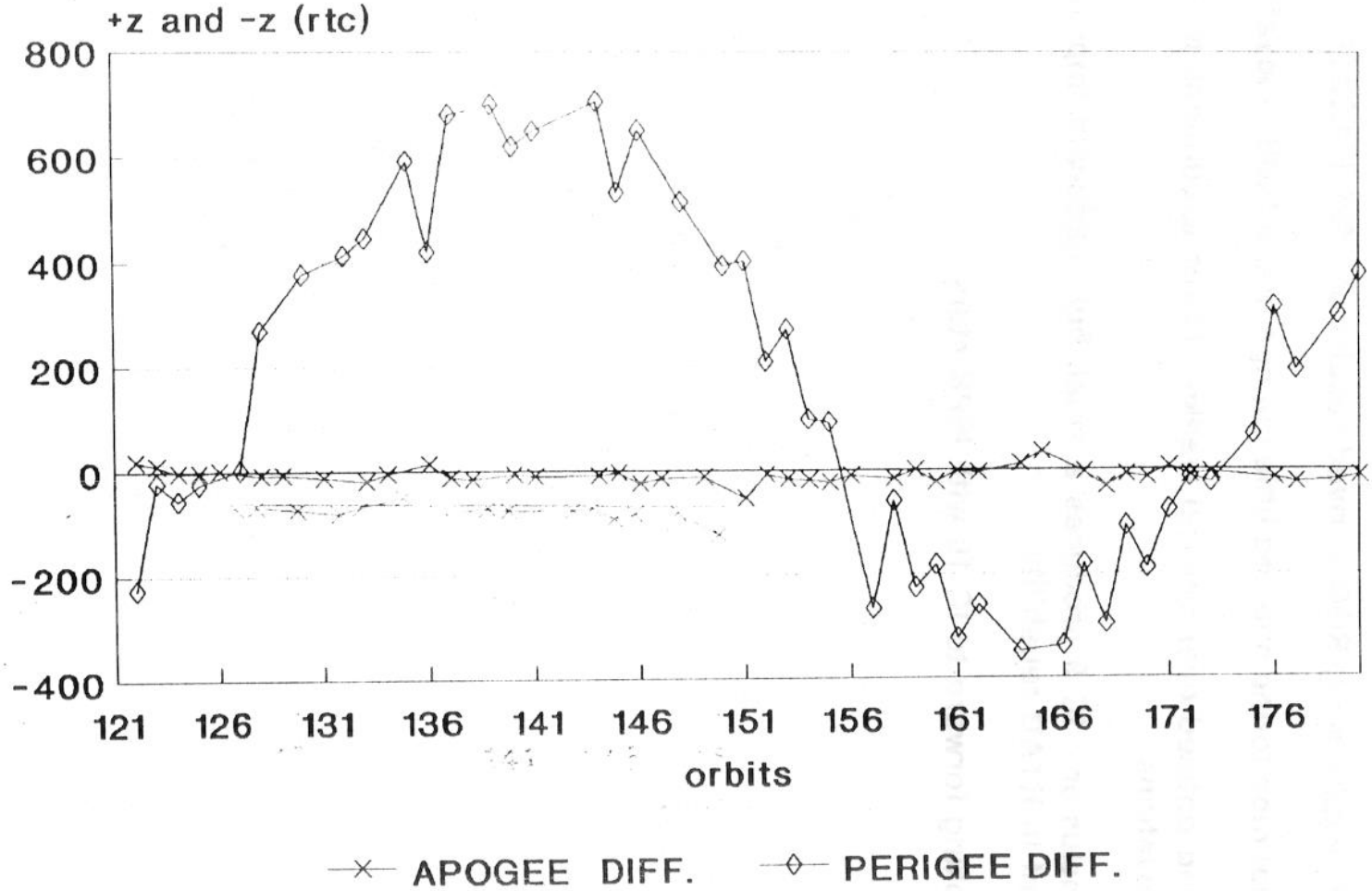
6. **Revised Kalman filter for determination of eight element state vector.**

7. **Support for on-board harmonic oscillator**

Initial results of testing

- scan-rate determination can be derived with RMS error less than 0.1 ″/s.
- GRTAD spin-rate determination has been tested at simulated scan-rates up to 30 ″/s from nominal rate.
- Attitude estimation accuracy is within +/- 10 ″/s on any axis. Further parameter optimisation is being performed.
- Errors in scan-rate estimation will lead to larger errors on up-link. Verification of on-board convergence is best achieved using the new software on-board in monitoring mode.

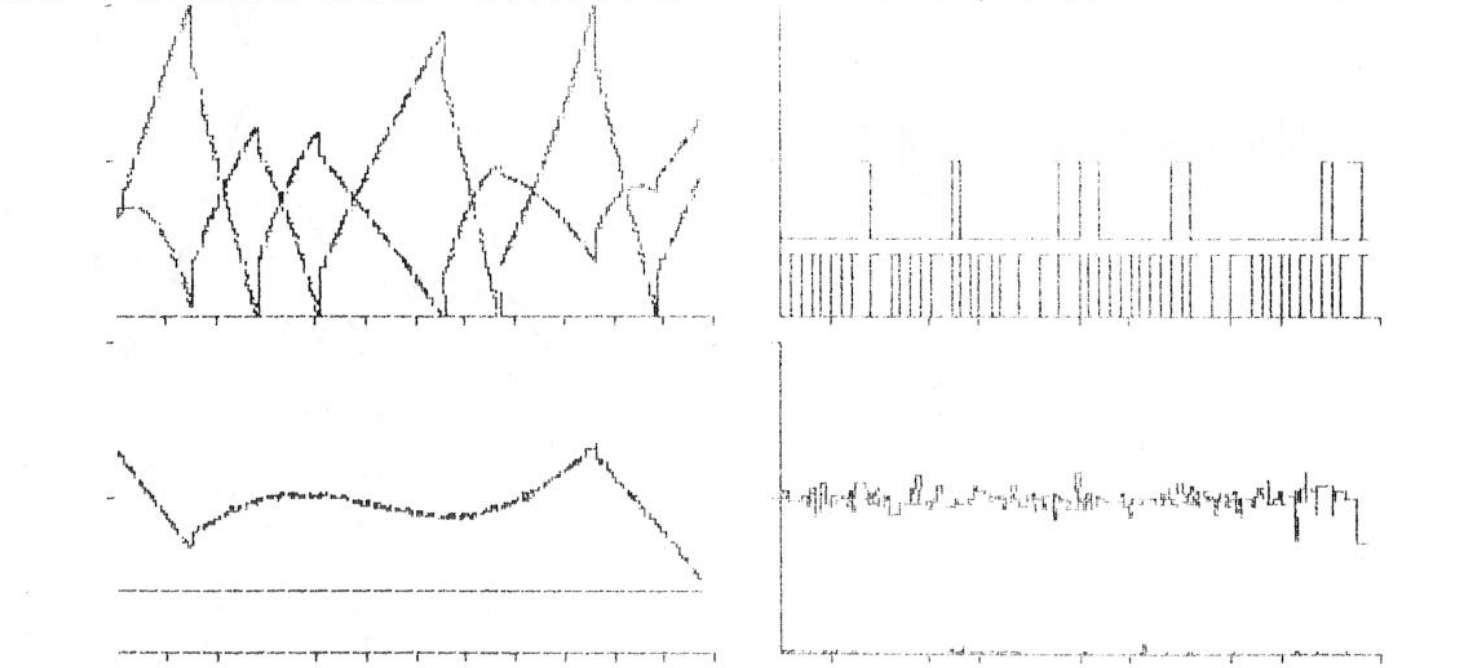
Fuel consumption on +Z and -Z



starting from day 60 gyro 4 switch off

IC 9 Implementation

- **PSF began using RGO-derived results on 1991.111.20.00**
- **Initial monitoring showed little change in the RMS innovation**
- **Trend noticed over several weeks - fewer excursions in the innovations.**
- **Conclusion : IC 9 produces a small but significant improvement in RTAD reliability.**
- **Looking forward to IC 10 with ISPR stars**

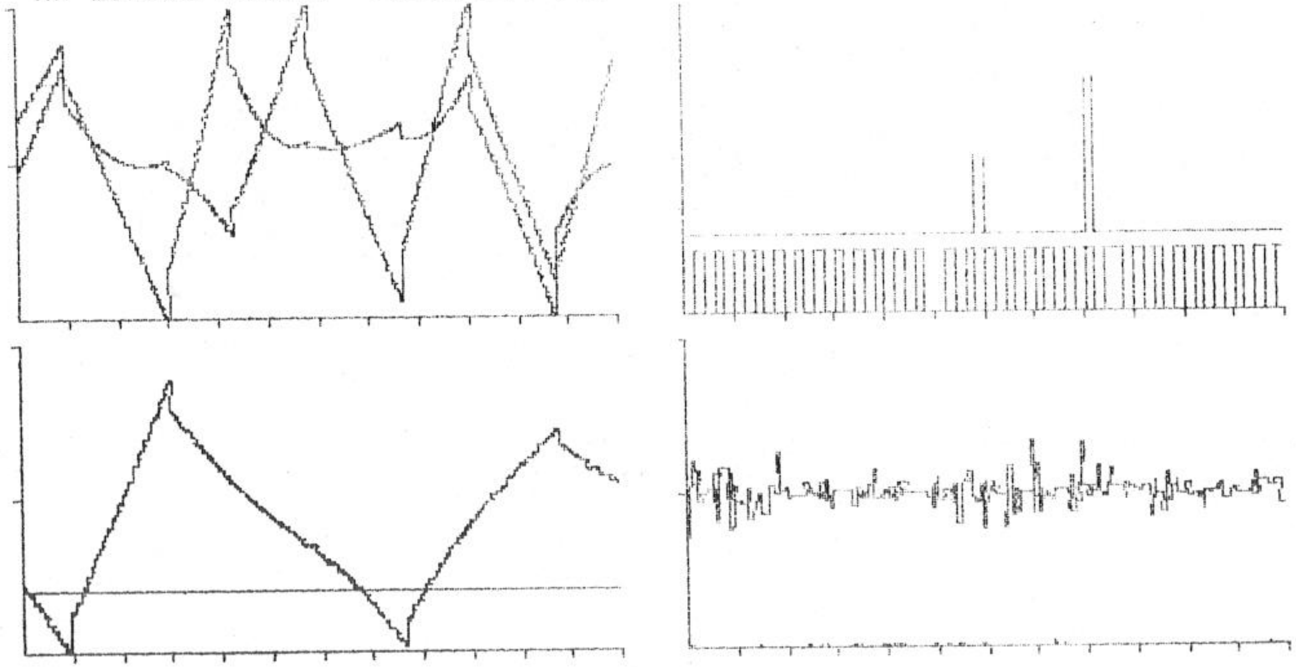


91.085.13.22.45 TIME 91.085.14.22.45

PRINTOUT 1 14:21:30

HOCS 0 1 STATUS=USER NAME=USER [illegible] 23 15 21 47
9999 /AOCS CNTR & RTAD MONITORING [illegible] 91.085.15.21.40.34
D/S= 0 /SRCE=SRCA GDGI OPT= [illegible] 01 0

ID	DESCRIPTION	VALUE	UNIT	MIN	MAX	LINE
E042	NM XERROR SIGNAL	.00129901	RAD	[illegible]	[illegible]	
E043	NM YERROR SIGNAL	-.00007774	RAD	[illegible]	[illegible]	
N407	IDTS QUALITY	0		1	4	
N404	IDTS FOV	1		[illegible]	[illegible]	
F203	OVERALL BACKGRND	8		0	2000	
B031	INNOVATION	-.00000399	RAD	[illegible]	[illegible]	
K251	MDE2 TYC2SHUTTER	2		0	10	
E044	NM ZERROR SIGNAL	.00024335	RAD	[illegible]	[illegible]	

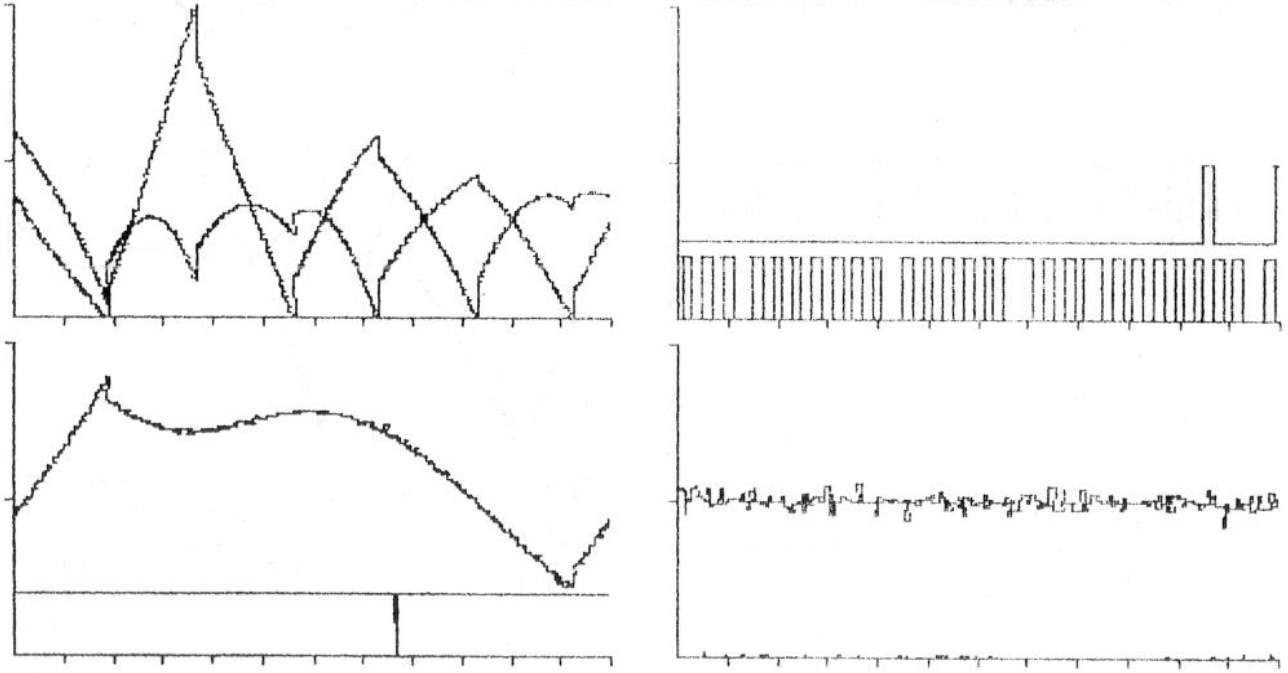


91.085.14.21.41 TIME 91.085.15.21.41

SCHD_DSP D104 Job AUTO_1....2 dispatched to process SFS_BATCHSE 15:10:00

HDCS 0.1 STATUS=USER NAME=USER2 S/C=HIPPARCO 172:12:31:30
9999 /AOCS CNTR & RTAD MONITORING REALT PKT TIME 172.12.31.10.743
D/S= 0 /SRCE=SRCA/GDGT/OPT= DP SC FS LT RT VA AL PKT ID=HHR .HK / 0

ID	DESCRIPTION	VALUE	UNIT	MIN	MAX	LINE
E042	NM XERROR SIGNAL	-.00043274	RAD	-.00200000	.00200000	
E043	NM YERROR SIGNAL	-.00077198	RAD	-.00200000	.00200000	
N407	IDTS QUALITY	1		-1	3	
N404	IDTS FOV	0		0	5	
F203	OVERALL BACKGRND	5		0	2000	
B031	INNOVATION	.00000021	RAD	-.00005000	.00005000	
K251	MDE2 TYC2SHUTTER	2		0	10	
E044	NM ZERROR SIGNAL	-.00030008	RAD	-.00270000	.00270000	

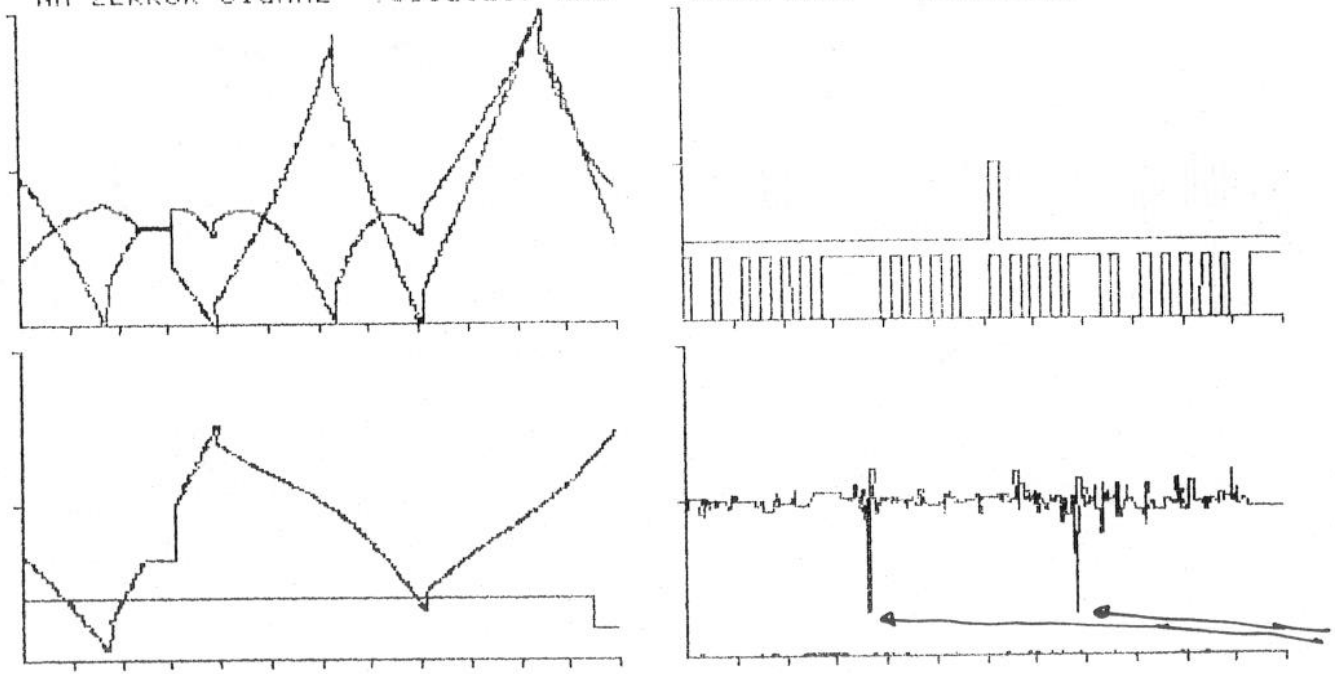


91.172.11.31.17 TIME 91.172.12.31.17

TLM_PROC PR06 Out Of Limits Generation for packet: FF87 12:30:46

HDCS 0.1 STATUS=USER NAME=USER2 S/C=NIPPARCO 170:16:17:41
9999 /AOCS CNTR & RTAD MONITORING REALT PKT TIME 170 16.17.18.995
D/S= 0 /SRCE=SRCA/GDGT/OPT= DP SC FS LI FI VA AL PKT.ID=AOCS.AF2/ 0

ID	DESCRIPTION	VALUE	UNIT	MIN	MAX	LINE
E042	NM XERROR SIGNAL	-.00086624	RAD	-.00200000	.00200000	
E043	NM YERROR SIGNAL	-.00026393	RAD	-.00200000	.00200000	
N407	IDTS QUALITY	0		-1	3	
N404	IDTS FOV	1		0	5	
F203	OVERALL BACKGRND	9		0	2000	
B031	INNOVATION	-.00000215	RAD	-.00005000	.00005000	
K251	MDE2 TYC2SHUTTER	1		0	10	
E044	NM ZERROR SIGNAL	.00128237	RAD	-.00270000	.00270000	

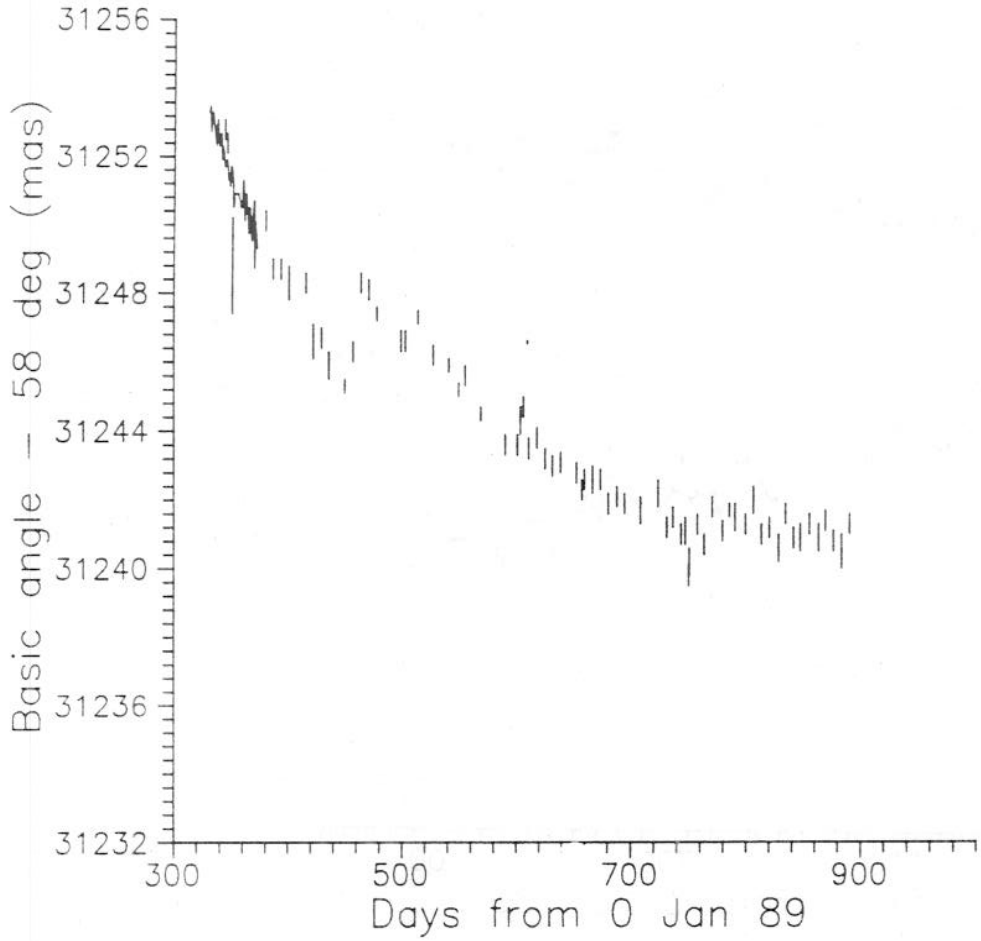


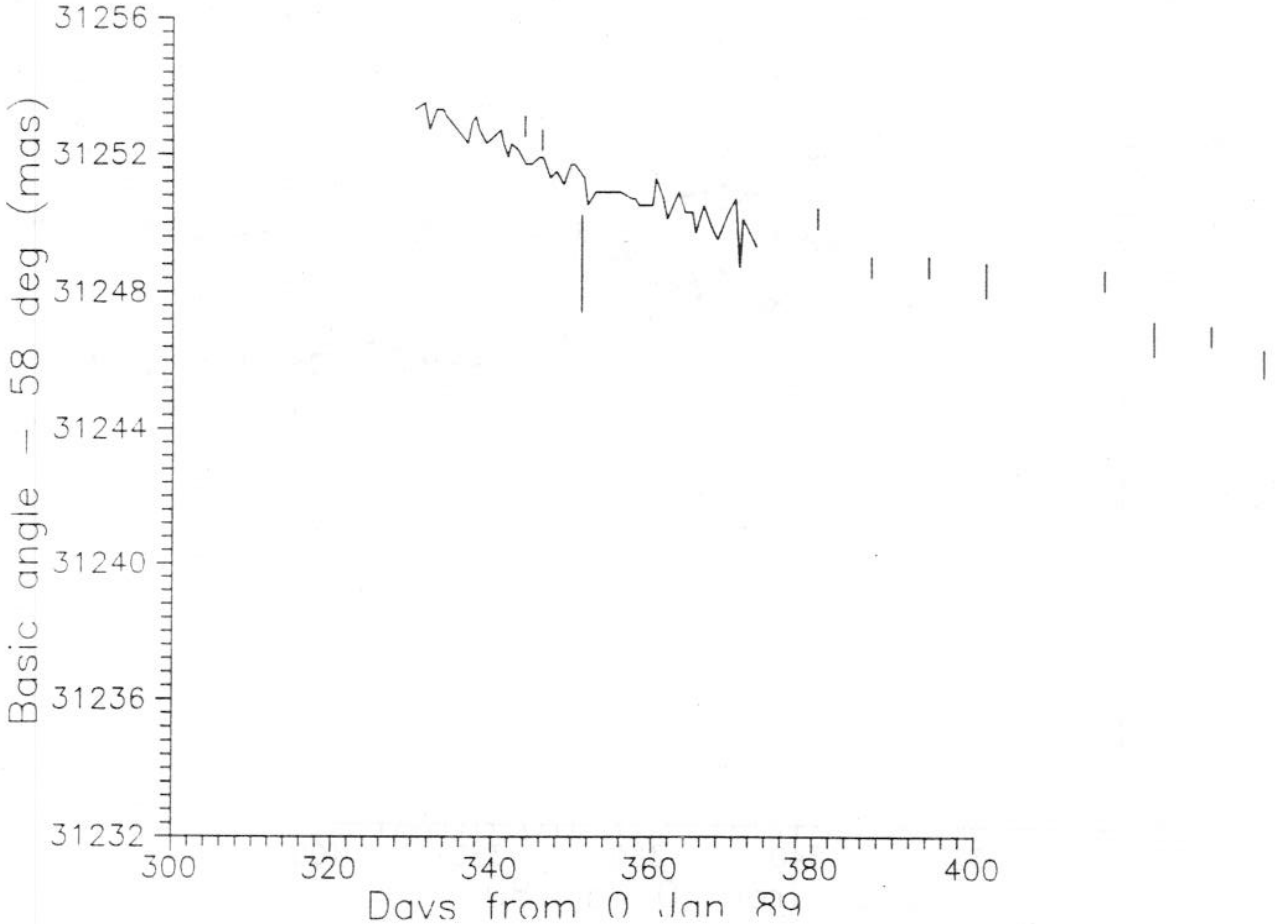
Ic 120008, bad ref. star

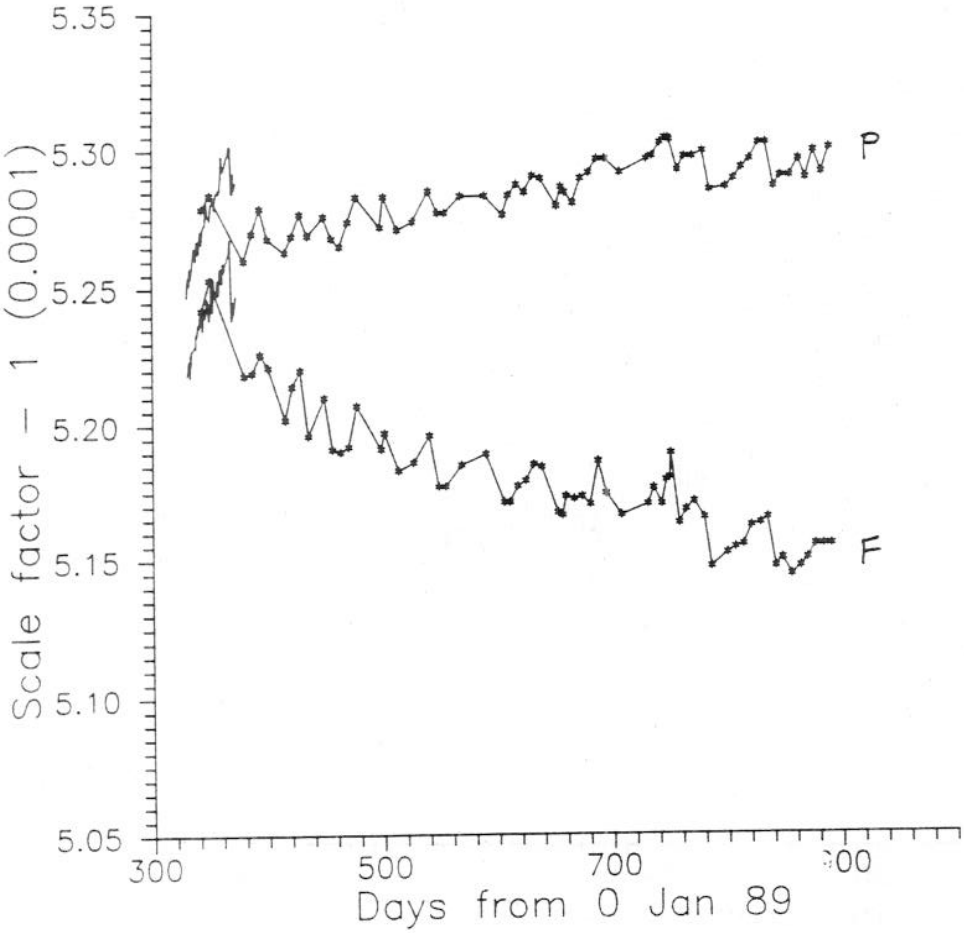
91.170.15.17.27 TIME 91.170.16.17.27
16:17:37

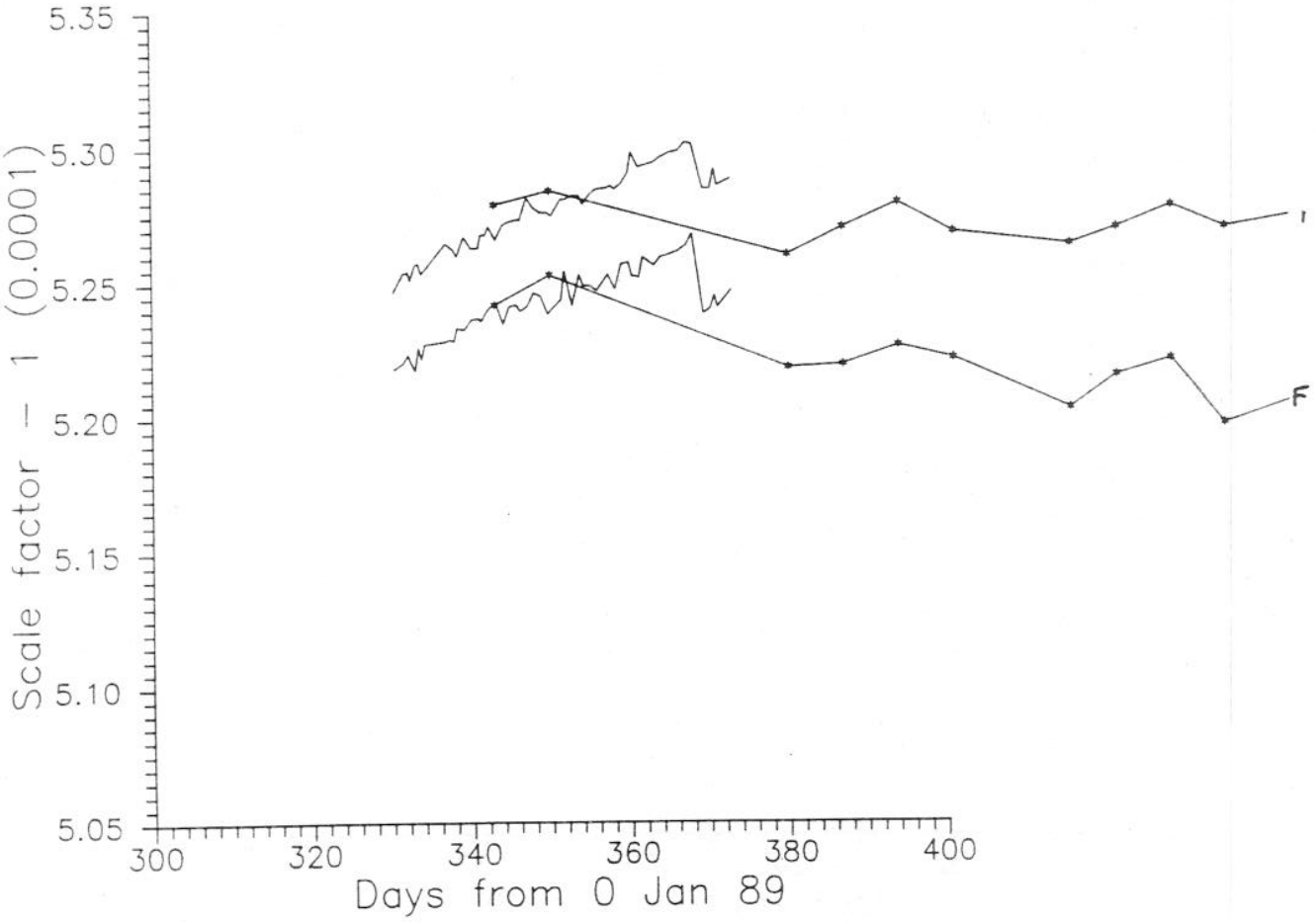
SCHDULER HSCH PSF commanding disabled

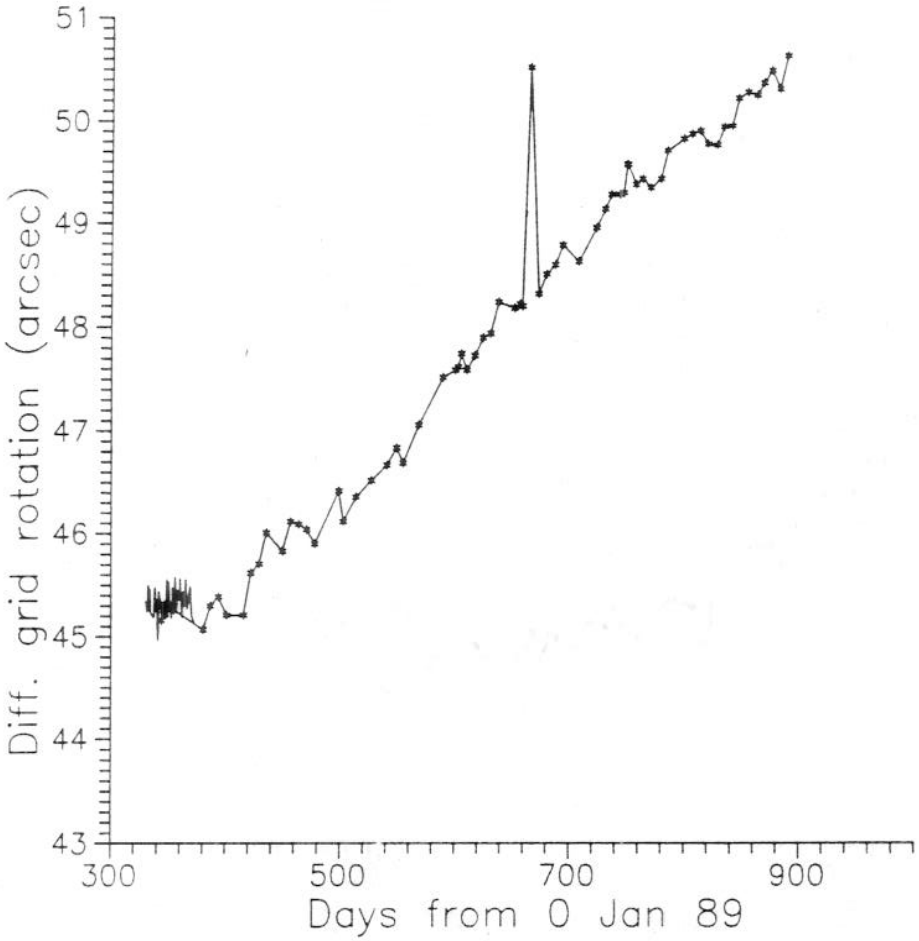
ANNEX V

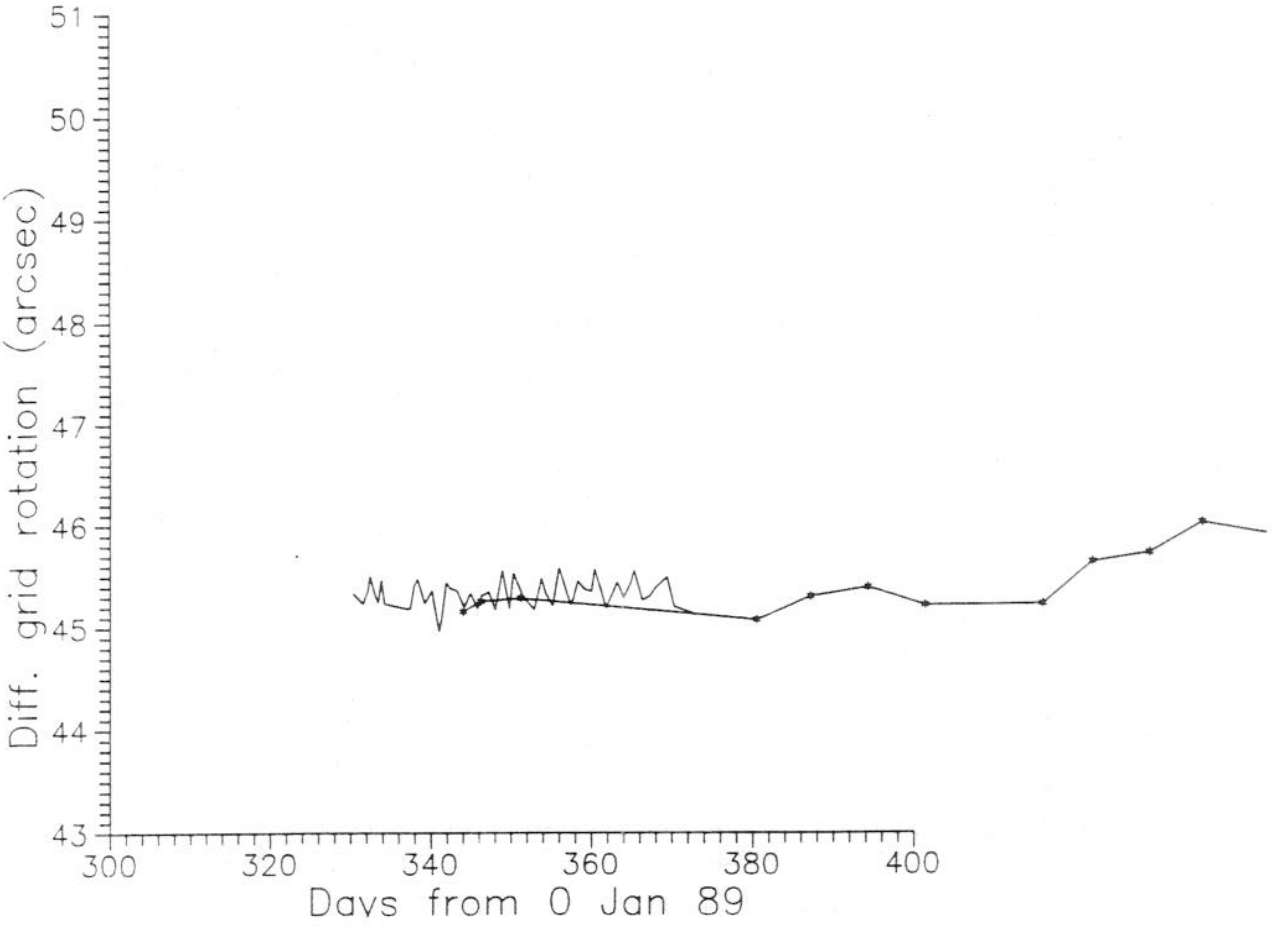

31256
31252
31248
31244
31240
31236
31232
Basic angle - 58 deg (mas)
300
500
700
900
Days from 0 Jan 89

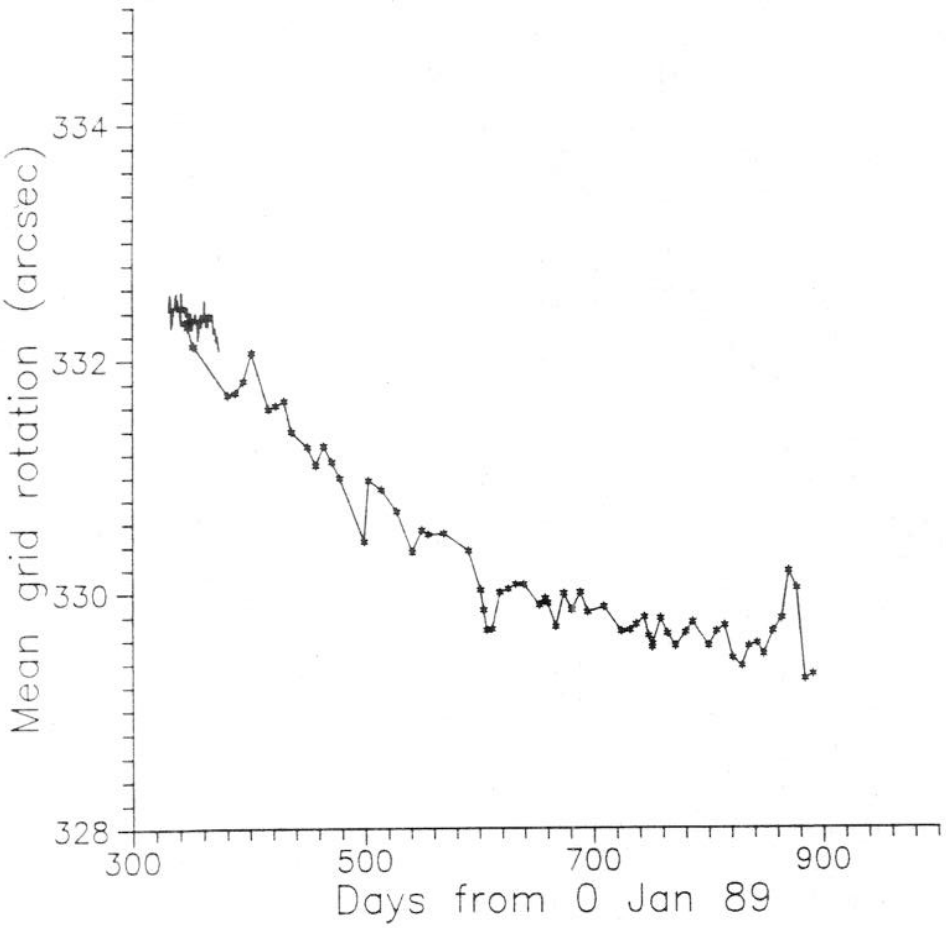

31256
31252
31248
31244
31240
31236
31232
Basic angle - 58 deg (mas)
300
320
340
360
380
400
Days from 0 Jan 89

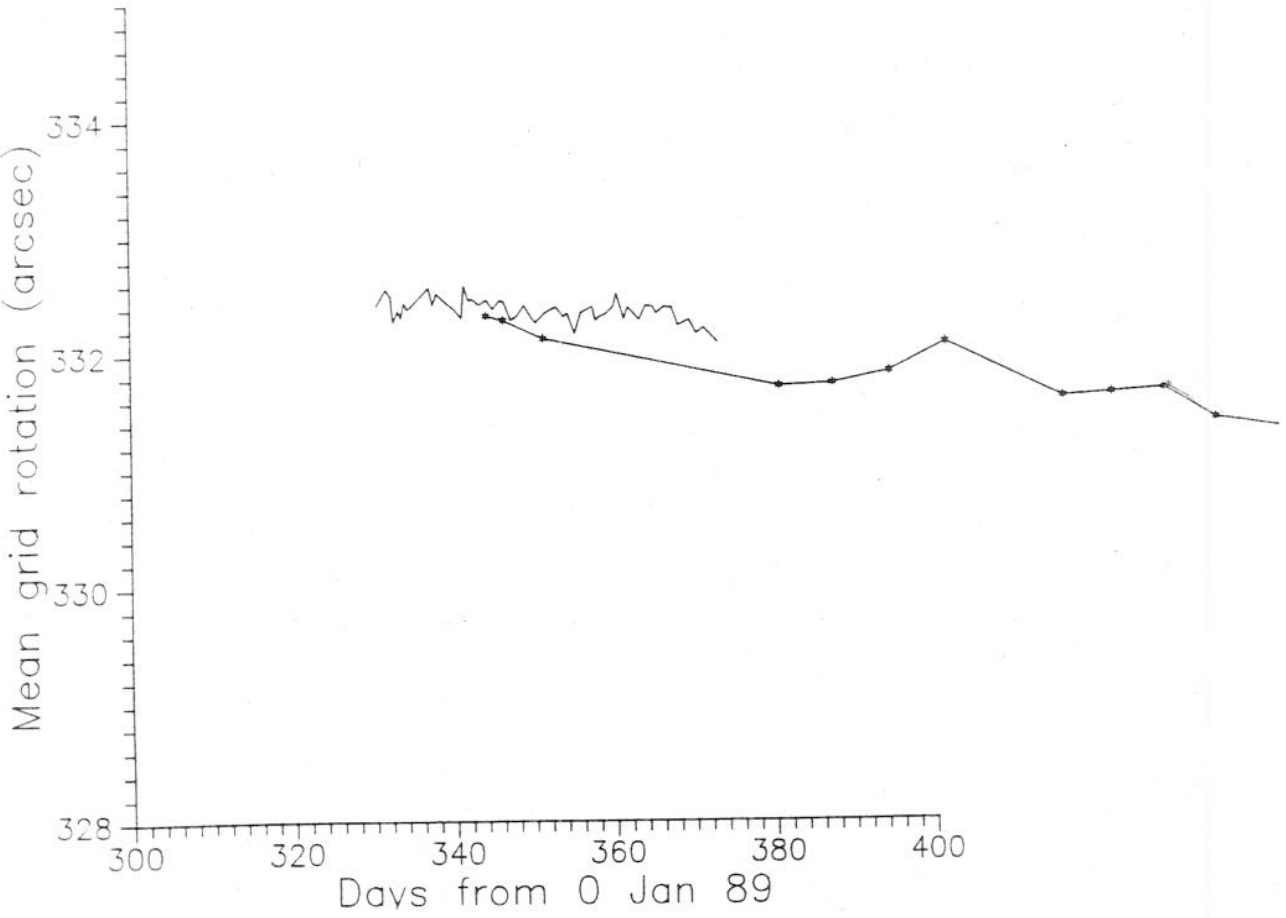

5.35
5.30
5.25
5.20
5.15
5.10
5.05
Scale factor − 1 (0.0001)
300
500
700
Days from 0 Jan 89
P
F

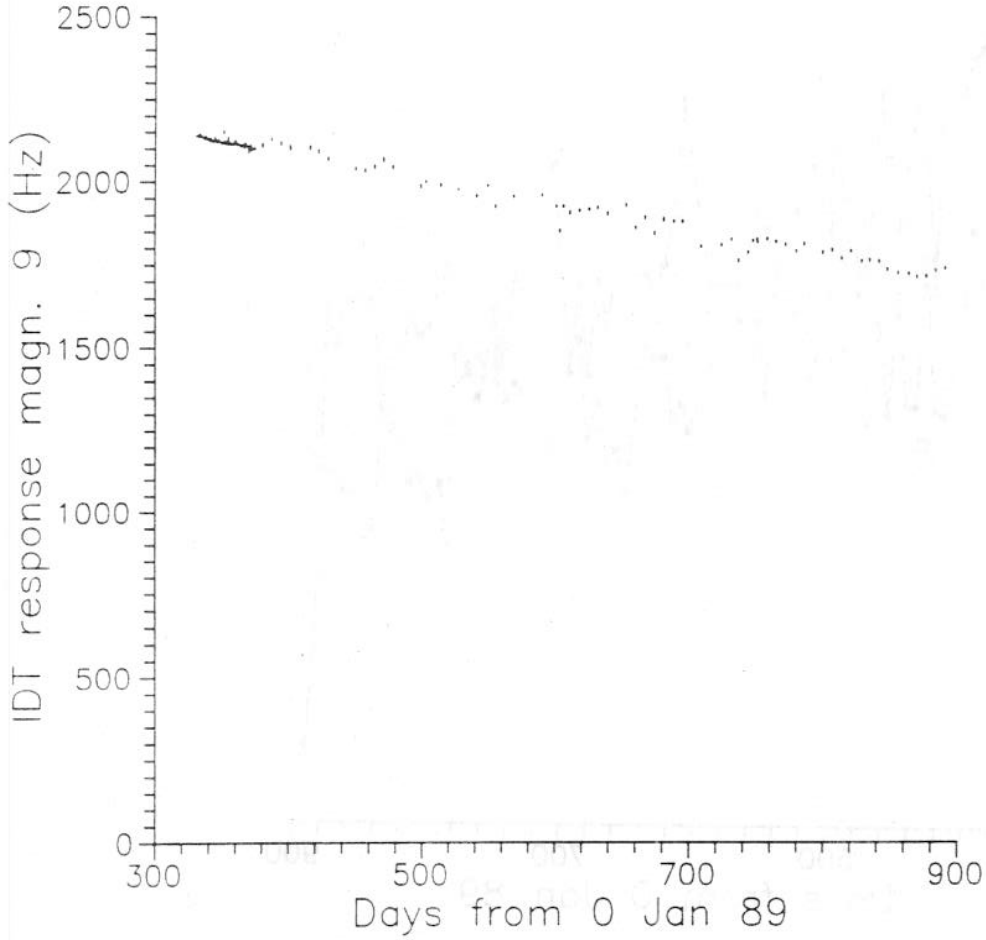

5.35
5.30
5.25
5.20
5.15
5.10
5.05
Scale factor − 1 (0.0001)
300
320
340
360
380
400
Days from 0 Jan 89
F

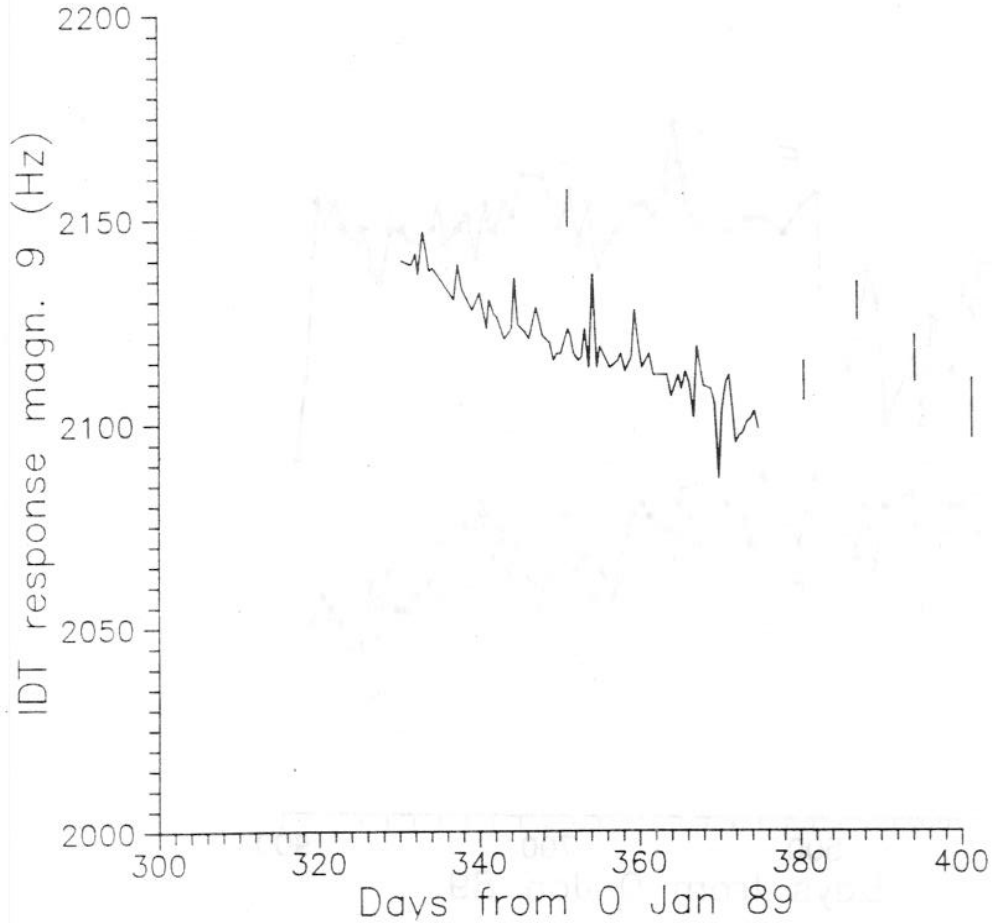

Diff. grid rotation (arcsec)
51
50
49
48
47
46
45
44
43
300
500
700
900
Days from 0 Jan 89

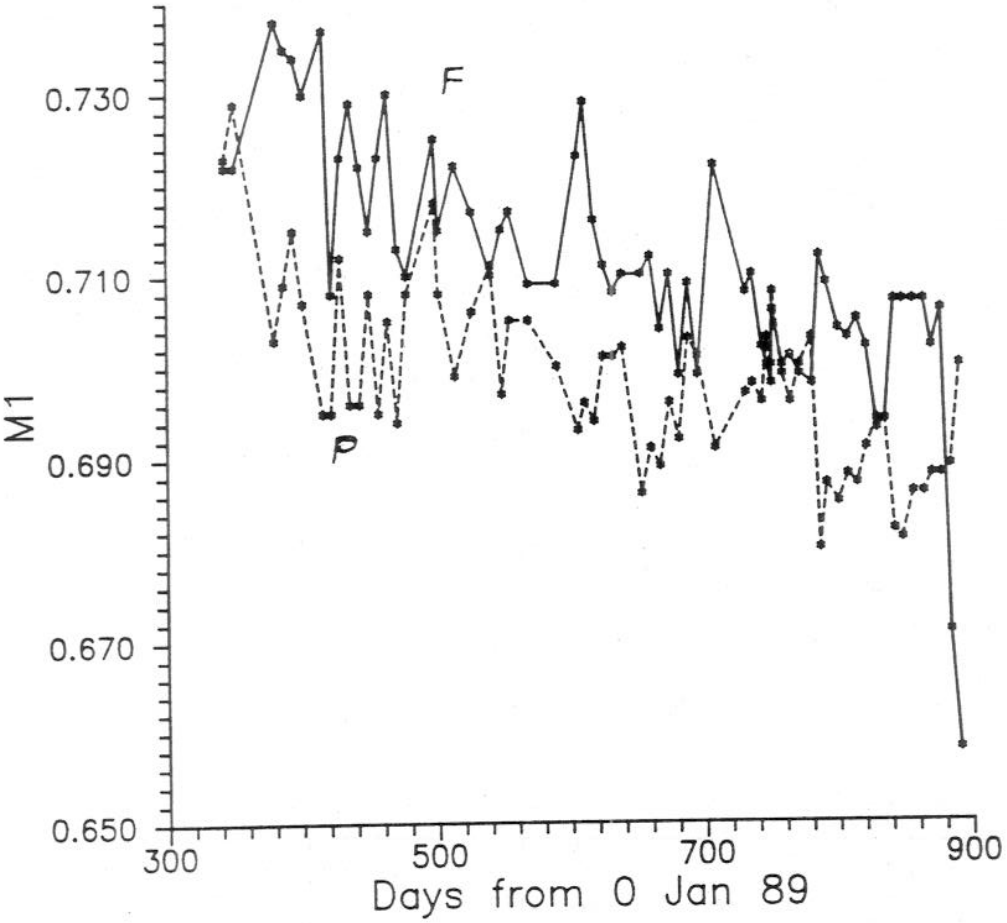

Diff. grid rotation (arcsec)
51
50
49
48
47
46
45
44
43
300
320
340
360
380
400
Days from 0 Jan 89

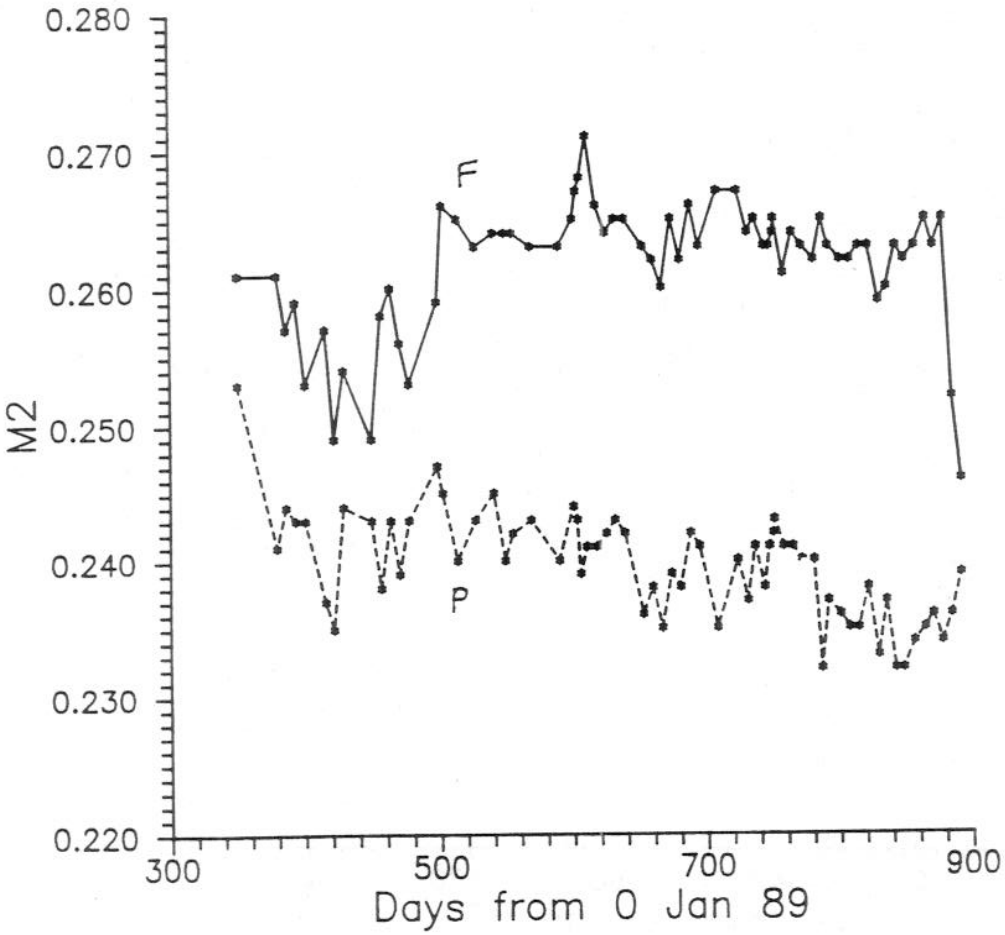

Mean grid rotation (arcsec)
334
332
330
328
300
500
700
900
Days from 0 Jan 89


Mean grid rotation (arcsec)
334
332
330
328
300
320
340
360
380
400
Days from 0 Jan 89


2500
2000
1500
1000
500
0
IDT response magn. 9 (Hz)
300
500
700
900
Days from 0 Jan 89


2200
2150
2100
2050
2000
IDT response magn. 9 (Hz)
300
320
340
360
380
400
Days from 0 Jan 89


M1
0.730
0.710
0.690
0.670
0.650
F
P
300
500
700
900
Days from 0 Jan 89


M2
0.280
0.270
0.260
0.250
0.240
0.230
0.220
F
P
300
500
700
900
Days from 0 Jan 89

ANNEX VI

TDAC report to HST, June 1991
Status of processing
==========

Prediction and Detection:
PT completed; NM started
Reduction time ~ 0.5 x real time

Updating with OGAR from NDAC:
PT near completed

Recognition:
80 hours (PT6) discussed for A&A

Transit Identification:
PT6+9+8 completed

Photometry:
80 hours on 8 weeks discussed for A&A
NME = 1.15 at V= 8 - 11 mag

Astrometry:
20 days obs. discussed for A&A
Calibration
TOC versus HOC (=21000 stars NDAC sphere)

Some actions
==========

Prediction:
Compare apparent positions with RGO

Detection:
Check FAST plots, but more inform. required!!!

Updating:
0.5 sample error in NDAC times
NM to start in October

Recognition:
TICR; a piece in July; all in 1992
Limiting magnitude? 1 million stars?

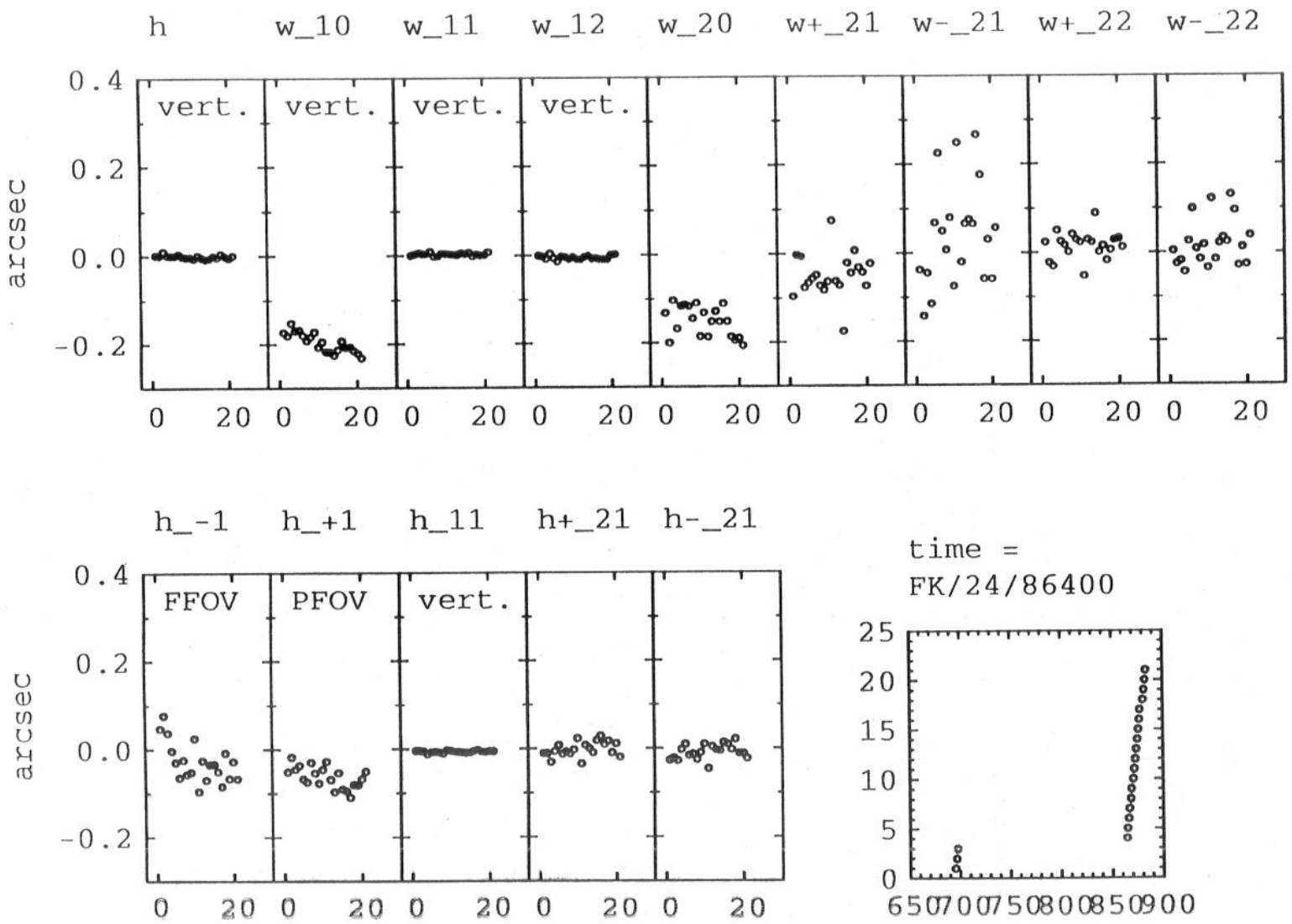
Transit Identification:
Verify effect of parasite recording

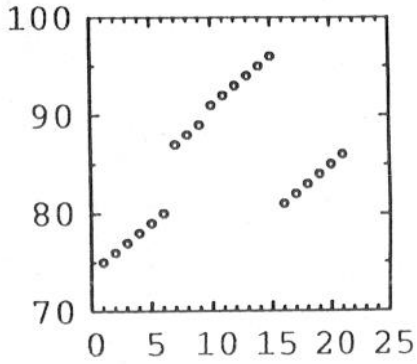
Photometry:
Implement T mag (B+V)
Comparison with NDAC, but input missing!!!

Astrometry:
Compare vertical slits with HOC
versus abscissa, +- 10 mas
Calibration; drift of offset?
Data management

Calibration parameters as function of set number.

Set number as function of time (days after start of mission).

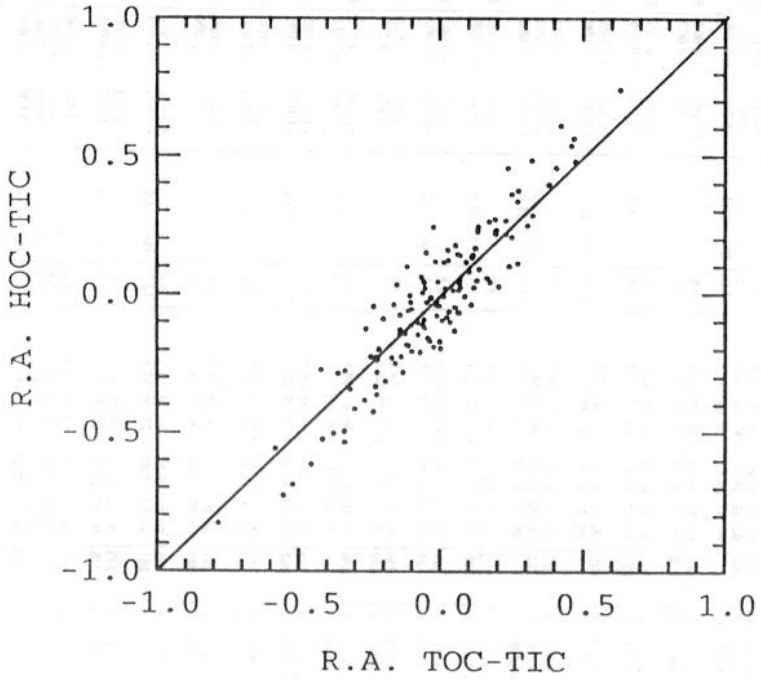


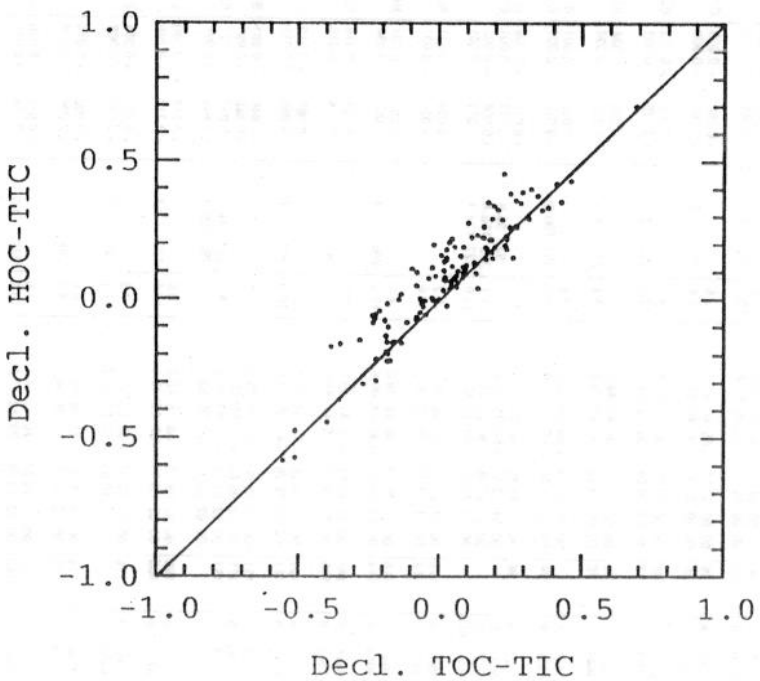


nobs > 9 (1991 June 04)

0.0001 < sigma_x < 0.1

0.0001 < sigma_y < 0.1





Double Star Annex
Draft 1

ANNEX VII

CCDM (2000) 1	2	HIC 3	Position (J2000, ep.2000) Epoch α 4	δ 5	6	m 7	Θ 8	ρ 9	Orb. 10	15 $\mu_\alpha \cos\delta$ 11	μ_δ 12	DM 13	HD 14	AGK3/SAO 15	IDS Index Cat.1900 16	ADS 17	Variable star name 18	Cluster or other id. 19
00000	+3852 A	3	00 00 01.16	+38 51 33.5		6.6				−0.005	−0.001	BD +38 5108	224699	+38 2462	23549 N 3819 A	17157		
00000	+3852 B	3	00 00 01.70	+38 51 31.5		11.4	107	6.7		−0.005	−0.001				23549 N 3819 B			
00003	−4417 A	25	00 00 18.97	−44 17 24.9		6.8				+0.058	−0.105	CD −44 15420★	224750	231888	23552 S 4451 A			
00003	−4417 B	25	00 00 18.97	−44 17 24.9		7.3	292	.5	O	+0.058	−0.105				23552 S 4451 B			
00004	+2655 A	34	00 00 23.86	+26 55 05.4		6.4				+0.044	−0.052	BD +26 4727a	224758	+26 2844	23552 N 2622 A			
00004	+2655 B	34	00 00 23.86	+26 55 05.4					OA	+0.044	−0.052				23552 N 2622 B			
00005	+6713 A	40	00 00 28.43	+67 12 55.9	1950	10.8						BD +66 1669			23554 N 6640 A	17160		NGC 7822 11
00005	+6713 B	40	00 00 27.44	+67 12 50.3	1908	11.1	224	8.2							23554 N 6640 B			NGC 7822 12
00005	−7212 A	45	00 00 32.09	−72 12 09.9		10.0				−0.042	−0.004	CPD −72 2794	224766		23553 S 7246 A			
00005	−7212 B	45	00 00 32.09	−72 12 09.9		12.0	244	2.8		−0.042	−0.004				23553 S 7246 B			
00006	−5306 A	50	00 00 34.11	−53 05 50.8		6.8				+0.043	−0.010	CPD −53 10565	224782	248097	23554 S 5339 A			
00006	−5306 B	50	00 00 34.11	−53 05 50.8		10.3	312	1.9		+0.043	−0.010				23554 S 5339 B			
00006	−6641 A	55	00 00 37.81	−66 40 57.0		7.6				+0.168	−0.009	CPD −67 3997	224783	255620	23554 S 6714 A			
00006	−6641 B	55	00 00 37.20	−66 40 57.1		9.4	267	3.7		+0.168	−0.009				23554 S 6714 B			
00007	+0013 A	56	00 00 39.05	+00 13 22.6		8.1				+0.035	+0.002	BD −00 4603	224785	−00 3013	23555 S 0020 A			
00007	+0013 B	56	00 00 39.05	+00 13 22.6		13.5	332	2.7		+0.035	+0.002				23555 S 0020 B			
00008	+3647 A	71	00 00 49.70	+36 46 48.2		8.7				−0.025	−0.024	BD +35 5153	224803	+36 2457	23557 N 3613 A	17164		
00008	+3647 B	70	00 00 48.70	+36 46 39.2		9.4	235	15.0		−0.025	−0.024				23557 N 3613 B			
00011	+6935 A		00 01 04.69	+69 34 32.2		7.8				+0.020	−0.001	BD +68 1418		+69 1055	23560 N 6901 A			
00011	+6935 B	86	00 01 02.60	+69 36 12.6		8.0	353	100.9		+0.020	+0.007	BD +68 1417	224836	+69 1054	23560 N 6901 B			
00013	+6021 A	99	00 01 15.89	+60 21 19.5		7.6				+0.018	+0.006	BD +59 2810	224855	+60 1618	23561 N 5948 A		WZ Cas	
00013	+6021 B		00 01 23.57	+60 21 19.6		8.7	93	56.9		−0.012	−0.001	BD +59 2812	224869	+60 1621	23561 N 5948 B			
00013	+6021 P		00 01 03.35	+60 23 24.5		11.1	322	155.8		+0.004	−0.003				23561 N 5948 P			
00013	+6021 BQ		00 01 37.64	+60 19 55.0		11.0	127	134.3		−0.012	−0.001				23561 N 5948 Q			
00014	+3937 A	110	00 01 23.73	+39 36 39.1		9.2				−0.024	−0.031	BD +38 5112	224873	+39 2540	23563 N 3905 A	17178		
00014	+3937 B	110	00 01 23.73	+39 36 39.1		9.6				−0.024	−0.031				23563 N 3905 B			
00015	+3044 A	114	00 01 29.23	+30 44 09.0		8.2				+0.001	−0.034	BD +29 5046	224882	+30 2691	23564 N 3011 A	17167		
00015	+3044 B	114	00 01 29.23	+30 44 09.0		10.2	208	.9		+0.001	−0.034				23564 N 3011 B			
00018	−2548 A	146	00 01 49.52	−25 47 49.7		9.8				−0.124	−0.310	CD −26 16876★	224927	192327	23567 S 2621 A	17173		
00018	−2548 B	146	00 01 49.52	−25 47 49.7		10.2	340	.1		−0.124	−0.310				23567 S 2621 B			
00019	−4137 A	151	00 01 56.26	−41 36 49.6		7.9				+0.085	−0.019	CD −42 16567	224937	231903	23568 S 4210 A			
00019	−4137 B	151	00 01 56.26	−41 36 49.6		10.9	340	.7		+0.085	−0.019				23568 S 4210 B			
00021	+2706 A	171	00 02 09.66	+27 05 05.3		5.8				+0.846	−0.991	BD +26 4734	224930	+26 2848	23569 N 2633 A	17175		
00021	+2706 B	171	00 02 09.66	+27 05 05.3		11.0				+0.846	−0.991				23569 N 2633 B			
00021	+2706 C	162	00 02 03.17	+27 07 05.9		8.6	323	148.5		−0.012	−0.027	BD +26 4735		+26 2847	23569 N 2633 C			
00021	+2706 D		00 02 02.27	+27 05 53.5		13.0	293	109.9		+0.846	−0.991				23569 N 2633 D			
00021	−6817 A	169	00 02 08.19	−68 16 48.0		9.6				+0.218	−0.260	CPD −68 3594	224953		23570 S 6850 A			
00021	−6817 B	169	00 02 08.79	−68 16 49.4		10.6	120	3.7		+0.218	−0.260				23570 S 6850 B			
00022	+5958 A	174	00 02 12.37	+59 57 55.1		9.3				+0.014	+0.008	BD +59 2815	240475	+59 1672	23571 N 5925 A			
00022	+5958 B		00 02 10.83	+59 57 50.2		12.1	249	12.5		+0.014	+0.008				23571 N 5925 B			
00023	−2708 A	178	00 02 16.00	−27 08 05.6		8.6				+0.096	+0.014	CD −27 16522	224989		23571 S 2742 A	17177		
00023	−2708 B	178	00 02 15.76	−27 08 04.6		8.9	288	3.3		+0.096	+0.014				23571 S 2742 B			
00023	−2943 A	183	00 02 19.93	−29 43 14.1		5.0				+0.018	+0.010	CD −30 19790	224990		23572 S 3017 A			Blanco 1 18
00023	−2943 B	183	00 02 19.78	−29 43 11.8		13.0	320	3.0		+0.018	+0.010				23572 S 3017 B			
00024	+1047 A	190	00 02 25.37	+10 46 36.2		9.2				−0.038	−0.104	BD +09 5314	224994	+10 3290	23573 N 1013 A	17180		
00024	+1047 B	190	00 02 25.37	+10 46 36.2		9.9	245	.3		−0.038	−0.104				23573 N 1013 B			
00024	+1047 C	185	00 02 21.63	+10 47 08.5		8.4	298	63.8		−0.043	−0.108	BD +09 5313	224984	+10 3289	23573 N 1013 C			
00026	+6606 A	207	00 02 35.87	+66 05 56.8		6.0				−0.020	+0.017	BD +65 1987	225009	+65 1	23575 N 6532 A	1		
00026	+6606 B	209	00 02 38.37	+66 06 02.0		7.5	73	16.0		−0.001	+0.020	BD +65 1988	225010	+65 2	23575 N 6532 B			
00026	+6606 C		00 02 20.77	+66 06 30.6		10.8	287	97.7		−0.010	+0.019				23575 N 6532 C			
00026	−0829 A	210	00 02 38.99	−08 29 16.1		9.5				+0.007	+0.002	BD −09 6310	225015	128549	23575 S 0903 A	4		
00026	−0829 B	210	00 02 38.99	−08 29 16.1		9.5				+0.007	+0.002				23575 S 0903 B			
00028	+8017 A	221	00 02 46.13	+80 16 56.2		7.9				+0.035	+0.025	BD +79 799	225020	+80 1	23576 N 7943 A	5		
00028	+8017 B	227	00 02 48.76	+80 17 11.7		9.8	24	16.8		+0.035	+0.025			+80 2	23576 N 7943 B			
00028	+3549 A	220	00 02 46.01	+35 48 55.8		7.3				+0.001	+0.006	BD +35 5159	225023	+35 1	23576 N 3516 A	8		
00028	+3549 B		00 02 47.96	+35 48 57.1		12.3	89	23.7		+0.001	+0.006				23576 N 3516 B			
00028	+0208 A	223	00 02 47.09	+02 07 48.9		7.8				+0.054	−0.092	BD +01 4820	225028	+01 1	23576 N 0135 A	9		
00028	+0208 B	223	00 02 47.09	+02 07 48.9		11.0	179	1.5		+0.054	−0.092				23576 N 0135 B			
00028	+0208 C		00 02 45.99	+02 08 19.8		11.7	330	35.0		+0.054	−0.092				23576 N 0135 C			
00029	+7122 A	233	00 02 55.73	+71 21 30.5		8.5				−0.003	−0.008	BD +70 1342	225044	+71 1	23578 N 7048 A			
00029	+7122 B	235	00 02 56.78	+71 22 05.1		9.1	8	34.9		−0.003	+0.006			+71 2	23578 N 7048 B			
00029	+4715 A	229	00 02 51.45	+47 15 07.9		8.8				+0.025	+0.003	BD +46 4244	225034	+46 2	23577 N 4642 A	10		
00029	+4715 B	229	00 02 51.45	+47 15 07.9		8.8	290	1.5		+0.025	+0.003				23577 N 4642 B			
00030	+0323 A	239	00 02 58.41	+03 22 54.4		8.6				+0.020	−0.015	BD +02 4748	225058	+03 3	23578 N 0250 A			
00030	+0323 B	239	00 02 58.41	+03 22 54.4						+0.020	−0.015				23578 N 0250 B			
00030	−0054 A	236	00 02 57.05	−00 53 38.0		8.0				+0.006	−0.013	BD −01 4520	225059	−01 1	23579 S 0129 A			
00030	−0054 B		00 02 58.86	−00 53 32.2		13.4	80	27.7		+0.006	−0.013				23579 S 0129 B			
00031	+2929 A	252	00 03 07.11	+29 29 09.3		10.7				+0.020	+0.003	BD +28 4694		+29 2	23580 N 2856 A	15		
00031	+2929 B	252	00 03 07.36	+29 29 05.1		13.2	143	5.3		+0.020	+0.003				23580 N 2856 B			
00031	+0816 A	248	00 03 03.79	+08 16 15.5		9.0				−0.037	−0.030	BD +07 5123		+07 5	23579 N 0743 A			
00031	+0816 B	247	00 03 03.74	+08 15 41.8		10.0	181	33.7		−0.025	−0.032		225057	+07 4	23579 N 0743 B			
00033	−0409 A	267	00 03 20.49	−04 08 44.8		8.0				−0.027	−0.006	BD −04 6013	225086	128557	23582 S 0442 A			
00033	−0409 B	267	00 03 20.49	−04 08 44.8		12.3	76	1.5		−0.027	−0.006				23582 S 0442 B			
00033	−2337 A	261	00 03 16.91	−23 36 54.1		9.0				+0.012	−0.013	CD −24 17962	225089	166019	23582 S 2410 A	16		
00033	−2337 B	261	00 03 17.02	−23 36 57.4		12.5	156	3.6		+0.012	−0.013				23582 S 2410 B			
00034	−2900 A	275	00 03 25.86	−29 00 01.1		9.9				−0.008	+0.005	CD −29 18941	225099	166021	23583 S 2933 A	18		Blanco 1 58
00034	−2900 B	275	00 03 25.86	−29 00 01.1		10.1	307	.5		−0.008	+0.005				23583 S 2933 B			
00039	+5723 A	303	00 03 52.64	+57 22 41.7		8.0				+0.038	+0.006	BD +56 3138	225137	+57 4	23587 N 5650 A			
00039	+5723 B		00 03 50.20	+57 22 59.5		11.8	310	26.5		+0.038	+0.006				23587 N 5650 B			
00039	+5723 C		00 03 56.10	+57 22 45.7		12.1	84	28.1		+0.038	+0.006				23587 N 5650 C			
00039	+5723 D	303	00 03 52.64	+57 22 41.7		14.0	160	.0		+0.038	+0.006				23587 N 5650 D			
00039	−5750 A	306	00 03 54.02	−57 49 49.4		9.6				+0.173	−0.059	CPD −58 8128	225158	231912	23588 S 5823 A			
00039	−5750 B	306	00 03 54.02	−57 49 49.4		9.6	96	.6		+0.173	−0.059				23588 S 5823 B			

ANNEX VIII

Numbering problems for the Input Catalogue.

1. Perturbations due to change from epoch 1990 to epoch 2000.

4,221 * are moving by at least 1 step.

But : mean value of "1 step" = $0^s.75$
mean $\Delta\alpha$ between a "moved" star and the previous star = $0^s.17$

28 * with $\Delta\alpha \geq 3^s$
maximum "mouvements" −12 steps
+17 "
no change of page.

2. 93 * suppressed

3. Stars with 120 xxx numbers

316 such numbers from IC6 to IC8

But only
183 suffered Δposition $\geq 15''$
(new rule for giving 120 xxx numbers from IC8).

Proposed : come back of the original IC numbers for the other (316 − 183) stars.

		α		δ		
	1	00 00 00.119	+01	05	20.38	-0.026
	2	00 00 01.113	-19	29	55.88	0.217
	3	00 00 01.206	+38	51	33.93	0.007
	4	00 00 02.145	-51	53	36.46	0.070
	5	00 00 02.394	-40	35	28.32	0.001
	6	00 00 04.491	+03	56	47.38	0.233
	7	00 00 05.240	+20	02	11.99	-0.216
	8	00 00 06.560	+25	53	11.44	99.999
	9	00 00 08.482	+36	35	09.27	-0.007
	10	00 00 08.826	-50	52	01.37	0.051
	11	00 00 09.018	+46	56	24.79	0.016
	12	00 00 09.824	-35	57	36.99	-0.001
	13	00 00 10.011	-22	35	41.03	0.009
	14	00 00 11.641	-00	21	37.34	0.066
	15	00 00 12.090	+50	47	28.19	0.014
	16	00 00 12.463	-54	54	50.87	0.212
*	17	00 00 12.315	-40	11	32.63	-0.022
	18	00 00 12.682	-04	03	13.54	-0.133
	19	00 00 12.817	+38	18	14.59	0.007
	20	00 00 15.151	+23	31	45.48	0.040
	21	00 00 15.938	+08	00	25.92	0.065
	22	00 00 16.834	-49	21	08.21	-0.006
	23	00 00 17.912	+13	18	44.20	0.058
	24	00 00 18.381	-23	27	09.77	0.149
	25	00 00 19.159	-44	17	24.92	0.074
	26	00 00 20.141	-13	23	36.18	-0.121
	27	00 00 20.664	-41	17	50.92	0.142
	28	00 00 20.947	-43	21	42.58	-0.006
	29	00 00 22.161	-49	06	28.57	0.031
	30	00 00 23.064	+42	08	29.19	-0.011
	31	00 00 23.542	+02	40	31.54	-0.002
	32	00 00 23.626	+51	56	22.39	-0.005
	33	00 00 23.806	-10	27	44.86	-0.004
	34	00 00 23.899	+26	55	05.56	0.042
	35	00 00 24.690	-14	29	25.66	0.160
	36	00 00 24.863	+12	16	01.68	0.064
	37	00 00 25.285	-47	10	46.80	-0.011
	38	00 00 27.109	-79	03	42.63	0.162
*	39	00 00 26.946	-16	41	48.87	0.168
	40	00 00 27.940	+67	12	53.10	99.999
	41	00 00 27.984	+54	18	07.70	0.006
	42	00 00 30.093	+25	50	40.84	0.018
	43	00 00 30.925	+59	33	35.09	-0.076
	44	00 00 31.868	-03	18	22.95	0.016
	45	00 00 31.961	-72	12	10.26	-0.050
	46	00 00 32.305	-25	37	19.78	0.016
	47	00 00 32.429	-56	50	06.84	-0.026
	48	00 00 32.520	-40	41	25.78	0.012
	49	00 00 33.479	+16	40	08.73	0.019
	50	00 00 34.414	-53	05	51.21	0.063
*	51	00 00 34.374	+01	03	57.62	-0.002
	52	00 00 35.218	-77	01	12.55	0.027
	53	00 00 35.353	-29	15	47.64	99.999
	54	00 00 36.634	+17	58	08.09	0.391
	55	00 00 38.083	-66	40	57.00	0.162
	56	00 00 39.095	+00	13	22.46	0.039
	57	00 00 40.280	-69	40	33.12	-0.040
	58	00 00 41.605	+62	10	33.53	-0.051
	59	00 00 41.886	+55	43	20.93	0.003
	60	00 00 42.107	-64	27	57.27	0.003
	61	00 00 42.347	+53	49	19.95	0.040
	62	00 00 43.211	-45	25	21.78	0.007
	63	00 00 43.710	+45	15	12.47	0.029
	64	00 00 44.280	-27	54	27.16	-0.005
	65	00 00 44.740	-54	49	49.43	-0.255
	66	00 00 45.137	-72	19	05.90	-0.014

Ordered by HIC ?

$\Delta\alpha = 0^s.15$

$\Delta\alpha = 0^s.16$

$\Delta\alpha = 0^s.04$

*	56998	11 41 02.458	-44	24	21.58	-0.651
	56999	11 41 05.756	+10	48	32.24	-0.123
	57000	11 41 05.989	+60	50	33.15	-0.044
	57001	11 41 08.387	-29	11	49.05	-0.319
	57002	11 41 09.233	+75	28	21.98	0.013
	57003	11 41 09.711	-17	42	20.36	0.033
	57004	11 41 10.549	-61	08	27.54	-0.031
	57005	11 41 10.835	-16	40	59.23	0.001
	57006	11 41 11.993	-50	11	36.74	-0.051
	57007	11 41 13.096	+13	47	07.93	0.010
	57008	11 41 14.060	+24	48	21.47	0.003
	57009	11 41 16.680	-33	42	33.34	99.999
	57010	11 41 18.535	-50	12	12.57	-0.044
	57011	11 41 18.695	-01	46	40.71	-0.064
	57012	11 41 18.817	-34	29	58.88	-0.010
	57013	11 41 19.788	-43	05	44.63	-0.082
	57014	11 41 20.533	+44	00	27.03	0.014
	57015	11 41 22.050	+68	57	04.96	0.011
	57016	11 41 22.547	-35	36	13.43	-0.051
*	57017	11 41 22.494	-26	40	02.49	-0.209
	57018	11 41 25.124	-56	43	21.04	-0.018
	57019	11 41 25.172	+58	55	56.50	-0.215
	57020	11 41 25.802	+58	55	26.00	-0.200
	57021	11 41 26.237	-41	01	05.10	0.164
	57022	11 41 27.863	+00	57	01.82	0.004
	57023	11 41 29.407	+52	51	55.08	0.014
	57024	11 41 31.123	+27	37	37.05	-0.012
	57025	11 41 31.685	+51	58	55.31	-0.015
	57026	11 41 32.518	+42	53	05.23	0.025
	57027	11 41 32.608	-77	03	15.98	0.020
	57028	11 41 33.343	+03	51	01.74	-0.110
	57029	11 41 34.263	+31	44	45.50	-0.353
	57030	11 41 34.633	+19	31	50.81	0.001
	57031	11 41 36.533	+56	42	43.06	0.004
	57032	11 41 37.675	-67	54	51.52	-0.044
	57033	11 41 38.005	-63	49	45.88	-0.013
	57034	11 41 38.230	+04	35	25.45	-0.019
	57035	11 41 38.404	+28	51	18.89	-0.001
	57036	11 41 39.515	+20	24	20.87	-0.006
	57037	11 41 48.156	-88	03	44.00	0.190
*	57038	11 41 40.131	+44	11	41.97	0.000
	57039	11 41 40.402	-23	11	56.95	99.999
	57040	11 41 40.416	+09	43	59.63	99.999
	57041	11 41 41.248	-58	44	26.59	-0.011
	57042	11 41 42.033	+00	59	36.93	0.015
	57043	11 41 42.340	-71	30	22.96	-0.013
	57044	11 41 43.087	+56	27	13.08	-0.058
	57045	11 41 43.499	+55	10	19.44	-0.019
	57046	11 41 43.604	-07	13	17.24	-0.020
	57047	11 41 44.008	-32	29	57.90	-0.002
	57048	11 41 44.431	+65	41	15.46	-0.035
	57049	11 41 44.685	-09	04	36.91	-0.204
*	57050	11 41 44.604	+42	45	07.93	-0.598
	57051	11 41 45.032	-06	41	04.13	-0.242
	57052	11 41 45.288	-50	37	32.19	-0.076
	57053	11 41 46.341	+41	14	15.71	0.042
	57054	11 41 47.505	-57	33	58.15	-0.025
	57055	11 41 48.407	+58	49	39.76	-0.453
	57056	11 41 49.073	-22	39	09.20	-0.024
	57057	11 41 49.403	-63	24	52.45	-0.005
	57058	11 41 49.606	+05	08	31.13	0.236
*	57059	11 41 49.310	-40	34	25.19	-0.308
	57060	11 41 49.995	+42	27	02.81	-0.015
	57061	11 41 51.999	+25	55	35.77	0.098
	57062	11 41 52.705	-06	56	32.89	0.014

Worst case.

$\delta = -88°$

17 stars, $\Delta\alpha = 8^s$

Present use of IC numbers

- within INCA
  exchanges INCA - ESOC
  INCA - DRCs
  2130 (even outside INCA)

- more than half the identification charts for open clusters are ready.

- identification charts for individual stars prepared with these numbers.

Proposed

- epoch 2000
- not renumber the stars
- explain clearly in the introduction why the HIC numbers are not strictly ordered by α_{2000}
- put a mark on stars not strictly ordered by α.
- give small additional tables with
  - suppressed stars 93 *
  - 120 xxx stars 183 *
  - ? stars moved by more than 10 steps 10 *
    5 steps 20 *
- enter 120 xxx stars at their right place in α_{2000}.

ANNEX IX

PROPOSAL

24.06.91

1. Determine empirical response at epoch 1991.3

   from : FAST, NDAC matrices & Mirce

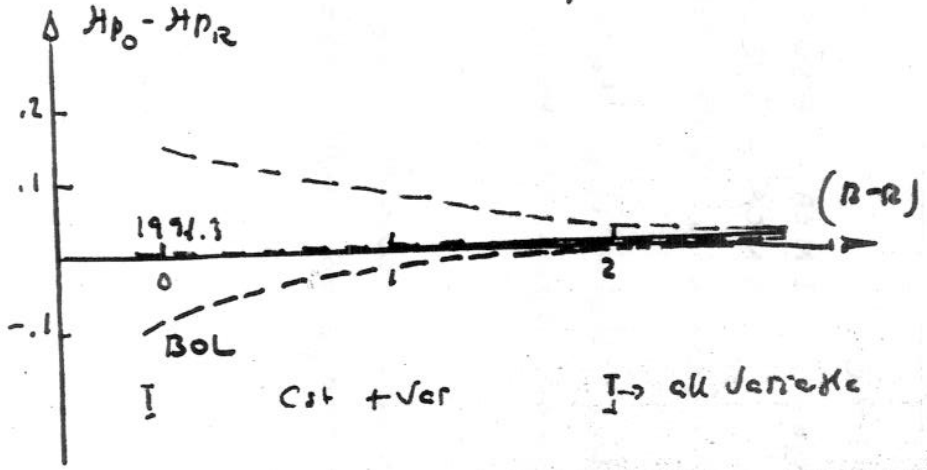
2. Recompute ageing effects in case of IR-sensitive detector

3. Adopt (B-R) index. In order to avoid spurious magnitude drifts for red stars (B-V > 1.5)

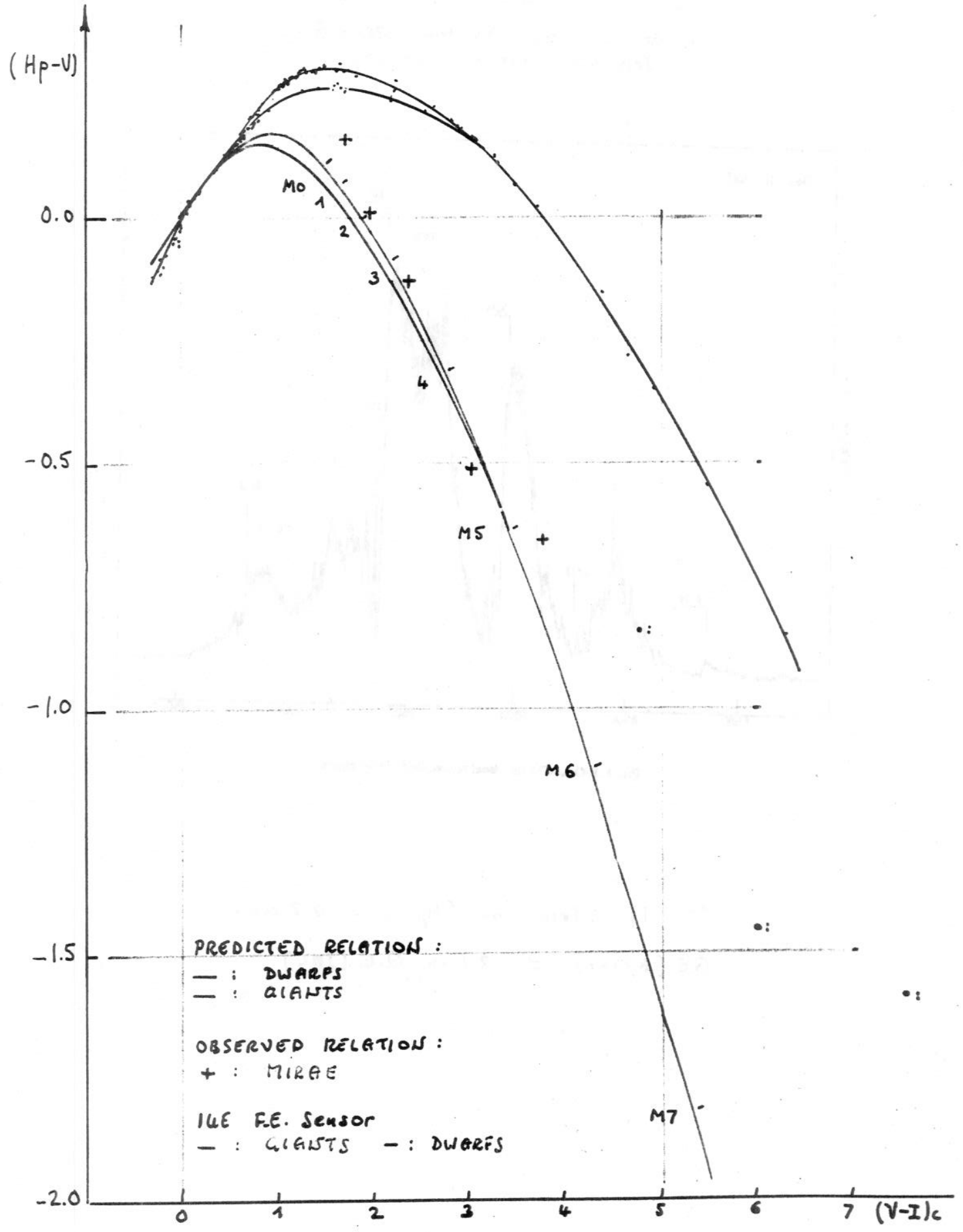
4. Recompute all Hp magnitudes, in the new system, of the I.C.

5. Compute (B-R) colour from : existing data VRI photometry spectral types

6. Use of an empirical relation instead of a theoretical relation



→ Resides Catalogue → End of August 1991


(Hp-V)
0.0
-0.5
-1.0
-1.5
-2.0
0
1
2
3
4
5
6
7
(V-I)c
Mo
1
2
3
4
M5
M6
M7
PREDICTED RELATION :
— : DWARFS
— : GIANTS
OBSERVED RELATION :
+ : MIRAE
IUE F.E. Sensor
— : GIANTS — : DWARFS

22.06.81

THE LATE M-TYPE GIANTS

A test of the $\lambda\lambda$ 7000 - 7600 Å detector quantum efficiency

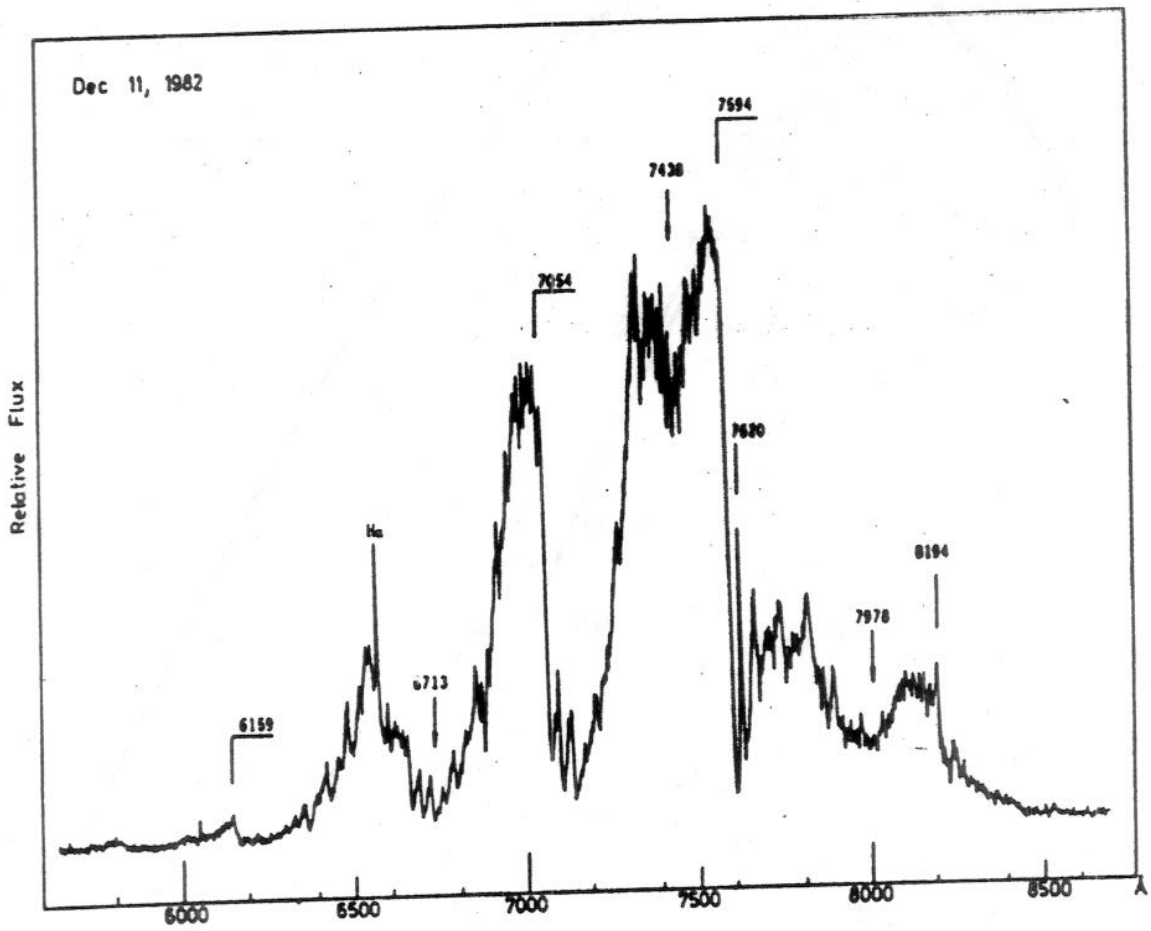


FIG. 8. R Oct, M7e; (a), visual region, (b), infrared region.

At M7 Error on $(Hp - V) \simeq 0.8$ mag

QE (λ7400) $\simeq$ 2.1 × Q.E [IAL]

Inconsistencies

1. Light curves of Mirae incorrect at minimum

   more stars could have been observed

   [illegible] mag. brighter at min.

2. Hp overestimated for late dM, M stars

   more stars " " " "

   [illegible] brighter at Hp

3. Standard less accurate internally
   not dramatic $(B-V) \leq 1.5$

4. Quality of photometric reduction degraded

   [illegible]

   [illegible]

   $\sigma Hp_R \simeq 0.003$ for $\sigma_{B-V} = 0.04$!

5. Ageing effects incorrectly estimated
   for late type stars

   [illegible]

   $(B_T - V_T) \simeq$ cst for M giants

   [illegible] at $B-V = 0.85$
   [illegible] for M stars

   → [illegible] Hp [illegible]

   A correction $f(V-R)$ to be introduced !

IAU GA

24 June 1991

(1) - degradation of I_0 - e folding 7 yr
+
- degradation of M_1/M_2 - e folding 37 yrs
} ⇒ astrometric weight e folding time of 6 yr (LL)

(2) extension to fill gaps in p.m. caused by 4-day RTAD gaps early on (Creze)

EXTENSION OF OPERATIONS BEYOND END 1992

- Minor planets 4 years → orbit
- hibernation to $\Delta = 6$ months, technology expt - no guarantee

Discussions somewhat premature, but:
- indoctrination must begin slowly - smaller useful
- full case to be presented to AWG / ~~[illegible]~~ / [illegible] the foreseen

Rationale:

(1) consumables limited to $\Delta \sim 2$ yrs (~end '94) max.
DRC are prepared to process data?

(2) costs ~ 6 + 3.4 MAU per year

(3) improvements (3 → 5 yr):
positions $\propto t^{-1/2}$ ⇒ $\times 0.77$
p.m. $\propto t^{-3/2}$ ⇒ $\times 0.46$
parallaxes $\propto t^{-1/2}$ but
"astrophysical weight" $\propto \pi^{-3}$ = $\times 2.15$

(4) better disentangling of:
veiling glare
double star info.
grid step (?)
accidental errors
global terms incl. 6th harmonic
Tycho

penalty of revised missio

Hibernation ??

(4b) Minor planets ⇒ orbital average in ~4 years

(5) better info. on departure from linear orbital motion for double star systems (e planets around stars ??)

(6) variability info from Hip / Tycho photometry

(7) extragalactic link with HST / COSTAR schedule

(8) New INCA stars for extended mission ??