

Thirty Third Meeting of the Hipparcos Science Team

ARI, Heidelberg, 28–29 October 1993

Attendance:

HST: Dr U. Bastian, Prof. P.L. Bernacca, Prof. F. Donati, Dr M. Grenon, Prof. M. Grewing (first day), Prof. E. Høg, Prof. J. Kovalevsky, Dr F. van Leeuwen, Dr L. Lindegren, Dr F. Mignard, Mr C.A. Murray, Mr R.S. Le Poole, Dr H. Schrijver, Dr C. Turon

ESTEC: M.A.C. Perryman

ESOC: D. Heger, A. McDonald (first day)

Consortia: S. Söderhjelm

Unable to attend: Dr M. Crézé, Dr H. van der Marel

Dr U. Bastian (ARI, Heidelberg) was welcomed as a new member of the HST.

The agenda attached was adopted.

Actions agreed at the meeting are included at the end of the Minutes.

1. General Project Status

Perryman gave an overview of the overall project status. Satellite operations had been terminated on 15 August. Data analysis progress was excellent, although there was much work remaining to be done. Perryman outlined the status of the main mission reductions, the status of the photometry, double star and reference frame working groups, and the activities associated with the catalogue publication (printed and CD-ROM versions) and associated documentation.

ESOC tape production of the remaining six months of satellite data had still not been completed, and was giving serious concern to all reduction teams. Actions were in place to ensure that this activity was completed rapidly. It was still ESA's intention to complete data delivery by end 1993.

Schedule: HST confirmed to target completion of all mission products (or necessary preparatory work) by end 1995, with availability of these mission products at end 1996, i.e. leaving the entire year of 1996 availability for scientific exploitation, largely unencumbered by other tasks, thus: main catalogue (merged), annexes, TBD per cent of double stars, epoch photometry, definition of data products and data formats, catalogue introduction, 3-volume technical accompanying volumes, concepts for printed version, magnetic tape, CD-ROM, inclusion within CDS data base.

Høg raised the general question of the possible global sphere solutions that might be undertaken by FAST and NDAC. Perryman noted that after the release of the final approved Hipparcos and Tycho catalogues, the intermediate data would be available for further consortia studies, and the consortia would be free to exploit these data for (for example) improved solutions. At present, Perryman did not foresee that the HST would be in place to supervise any longer-term activities. Perryman also said that it could not be considered in the spirit of the present collaboration if one or both consortia were to specifically withhold their global sphere solutions with the intention of publishing an improved catalogue (with their own name only) soon after the production of the common catalogue. This point would be followed in future meetings (Action 1).

2. TDAC Progress

Høg reported on the TDAC status, and presented TD227 indicating the schedule of the remaining Tycho processing. In astrometry, at single transit level, new modelling of the photon noise had led to NME's close to unity for vertical and inclined slits using fitted values of $\sigma_{\text{att}} = 7$ mas for vertical and 35 mas for inclined slits. Høg showed plots indicating the catalogue positions versus the 18-month solution, and described the procedure of hexagon points to search for missing objects. For the next HST meeting, further details of specific topics were requested (Actions 2-5).

3. NDAC Report

Lindgren presented the main results from the 30-month sphere solution, and indicated the progress and convergence with respect to the previous spheres. From the 18-month solution there was a discrepancy between the colour terms ($V - I$ used by FAST, $B_T - V_T$ used by NDAC), also a colour-related rotational term in the proper motion system. These effects were confirmed in the 30-month solution. Lindgren showed the mean abscissae residual versus both indices. The NDAC sphere solution had so far assumed a linear relation between colour index and residual. Possible improvements to the treatment of the colour term were discussed and would be studied by Lindgren (Action 6).

4. FAST Report

Kovalevsky reported results of the FAST 30-month solution. The selected data set contains 99950 stars, 1914 RGCs, and resulted in median errors of 1.1 mas in longitude, 0.9 mas in latitude, 1.5 mas in longitude proper motion, 1.3 mas in latitude proper motion, 1.3 mas in parallaxes. There were 4000 negative parallaxes. FAST will adopt a fourth-order polynomial for the instrument model.

5. 30-month Sphere Comparisons

Mignard presented the comparison results derived by Froeschlé. 95579 stars were in common between the FAST and NDAC solutions, giving the following rotations between the two systems (ecliptic coordinates, and with a precision of order 0.005 mas): 15.630, 8.062, -15.572, 0.903, -0.467, 3.525. Residuals were as follows: in position, mean = -0.06 mas, rms=1.16 mas; in proper motion, mean=0.00 mas, rms=1.40 mas/yr. NDAC-FAST differences for lat, long, p.m. in lat, p.m. in long, parallax were respectively (normalised s.d. in brackets): 1.03 (0.46), 1.29 (0.51), 1.45 (0.70), 1.81 (0.72), 1.45 (0.68). These indicated a high degree of correlation between the two solutions ($\rho \simeq 0.7$). Chromatic effects were very evident, and actions were identified to establish the origin of these effects (Actions 7-8).

6. Attitude and RGC Comparisons: nothing new to report.

7. Main Astrometric Catalogue Merging

Murray reported on the present status (his report had been distributed to the HST). The main features of the (transformed) variances are not yet understood: the weighting system appears to include a non-optimum scale and offset (Actions 9-10).

8. Double Stars

Short reports on the NDAC and FAST double star activities were given, based on the details presented at the meeting of the DSWG the previous day.

9. Double Star Working Group Report

Mignard reported on the results from the Double Star Working Group Meeting on 27 October (attendance Mignard, Soderhjelm, Kovalevsky, Bernstein, Dommanget, Lampens,

Lindgren, Pannunzio, Perryman). Good progress had been made at the meeting, with a series of actions identified to allow progress in the comparisons, and in the ground-based supporting observations. There was an identified problem with the double star absolute astrometry within FAST. A double star catalogue had been set up in Torino, which would act as the central data base for the a priori double star data. The format for the printed catalogue had been discussed in detail, and numerous suggestions made. See Actions 11-12.

10. Photometry Working Group Report

Van Leeuwen reported on the status after the third meeting held in CERGA on 14 October. He presented RGO/NDAC 93.05 detailing publication plans: HST agreed with these objectives, although Perryman expressed reservations concerning the data base availability, and considered that further justification or consideration of which data were to be included in the final catalogue was necessary. The HST approved the proposals to proceed with the mass photometric data processing in Geneva, along with detailed coordination of variability analysis (including ground-based observations) by RGO. Applicability to the Tycho photometric analysis was discussed (Action 13).

11. Reference Frame Working Group

Kovalevsky reported on the general status. The ERS catalogue of about 500 objects for VLBI/VLA was now available from M. Feissel. HST approved the following requests for data access: (i) by Platais for approximately 7200 stars (positions and proper motions) in N and S hemispheres; (ii) by de Vegt for approximately 40 000 objects (positions and proper motions) corresponding to about 400 plates in total. Perryman reported on the very cursory news from the HST/FGS observations of link objects (no details, no planning, no reductions yet available); no news had been received concerning the use of the Hipparcos observations of NGC2516 for the FGS calibrations. See Actions 14-15.

12. Documentation Activities

(a) Printed Catalogue format: Perryman reviewed the present status and the recommendations of both the PWG and the DSWG. A revised draft would be made in time for the DDRT meeting at the end of November (Action 16).

(b) CD-ROM preparation: Perryman presented the draft of a contract for the creation of the Hipparcos and Tycho CD-ROMs. HST views were requested by end November (Action 17).

(c) Final Documentation: Perryman presented the contents list of Volumes I-III. HST views were requested by end November (Action 18).

14. Hipparcos A&A Papers, 1994

Many different opinions on the type of papers to be included in this issue were discussed. There emerged the following consensus: (i) we could not justify having the 30-month solution available, while at the same time presenting only the 18-month solution to A&A; (ii) consequently, proposals addressing astrophysical interpretation of one or a few objects should not be considered at this time. The HST then went through the proposals received, and indicated those that fell into the second category. From the remaining list of topics, it was agreed that HST would construct a list of papers/topics that it would like to see presented. Perryman would draft a first version of such a list, with topics and authors, for discussion at the forthcoming DDRT meeting (Action 19).

15. Preparation for Internal Proposal Evaluation

HST members suggested that the meeting be extended by half a day: the meeting would now start at 09:30 on Tuesday 23 November, with a discussion of the A&A papers (for one hour), followed by the review of internal proposals, starting at 10:30 and extending until 16:00 the following day. The meeting would be conducted as follows: Turon will prepare *her* recommendation on whether the proposals should be accepted or not, based on her knowledge of the individual's contribution to the project, the subject matter, the overlap with other proposals, etc. If her position is uncontested, then no discussion will take place. If consortia leaders, or others, feel that discussion is appropriate, then they will intervene. Turon will have at hand detailed statistics of the overlap of each proposal with the others. Perryman would distribute van Leeuwen's ordering of the proposals according to subject matter.

16. Results Data Base

Schrijver presented his technical note on the contents and goals of the final data base project. HST views were requested (Action 20).

17. Miscellaneous

(a) Mk III results comparisons: Perryman/Lindgren presented first results of a comparison with the Mark III optical interferometry data recently received from USNO (Hummel). There were unexplained discrepancies, considered to lie in the USNO data.

(b) IAU General Assembly: Kovalevsky presented the status of the organisation of the workshop, and requested proposals for names of speakers by end 1993 (Action 21).

(c) Use of stereo images for February 1994 ESA Bulletin: Lindegren showed some of his stereo image pairs, and HST agreed to the inclusion of these in the February 1994 ESA Bulletin. A precise proposal would be made subsequently by Lindegren/Perryman (Action 22).

18. Next Meetings

The 34th meeting of the HST will be held on 14–15 April 1994, at Lund Observatory. A meeting of the documentation working group will probably be held on the previous day (13 April).

Dates for other meetings were as follows: (i) PWG Meeting, 10 March 1994, Bruxelles; (ii) DSWG Meeting, 11 March 1994, Bruxelles; (iii) DDRT Meeting, 23–24 November 1993, Meudon.

M.A.C. Perryman, 2 November 1993

Distribution: HST, ESOC Participants, A. Wicenec, J.L. Halbwachs

Actions

- 33.1 Include status of NDAC and FAST global sphere solutions at next HST meeting.
- 33.2 Høg to produce approx 8 months of Tycho catalogue data, and send to Lindegren one month before the next HST meeting in order to permit a sphere solution comparison to be made between the Tycho and main mission positions.
- 33.3 Høg to distribute note on calibration parameters/plots derived from Tycho astrometry in advance of next HST.
- 33.4 Bastian to liaise with Grossman (AIT) and ensure that some extracted light curves (e.g. from the SSSC) are available for the next HST meeting, preferably including comparisons with the NDAC/FAST results, in order for HST to assess the status of the photometric reductions within TDAC.
- 33.5 Bastian/Høg to prepare presentation on Tycho double star treatment and expectations for the next HST meeting: thresholds for detection, number of double systems expected, checks and feedback to main mission, etc.
- 33.6 Lindegren to report results of experiments on treatment of colours in sphere solutions.
- 33.7 Grenon to provide λ_{eff} versus (V-I) index (15 November).
- 33.8 Grenon to compute aging versus time and colour with respect to λ_{eff} for d.c. (and perhaps later for a.c.) (15 November).
- 33.9 Mignard to change σ_0 for 100 stars, for several runs, and to evaluate effect on transformed variances for the catalogue merging.
- 33.10 Lindegren to make in internal check of the NDAC weighting scheme, and to consider carrying out the same tests as those under Action 33.9.
- 33.11 Mignard to produce note on possible ground-based observations for double stars: plans and strategy.
- 33.12 Kovalevsky/Bernstein to identify problem in double star absolute astrometry.
- 33.13 Bastian/Høg/Grewing/Grenon to consider applicability of the mass processing approach to variable star analysis for the Tycho data (as being proposed by Geneva for the main mission).
- 33.14 Kovalevsky/de Vegt to report on details of plate reductions as derived from the Reference Frame Link programme undertaken by de Vegt.
- 33.15 Kovalevsky to prompt further progress within the VLA group working on the Reference Frame Link.

- ✓ 33.16 Perryman to prepare revised draft of the printed catalogue format.
- ✓ 33.17 HST views on the draft contract for the creation of the Hipparcos and TYycho CD-ROMs to be sent to Perryman by end November.
- ✓ 33.18 HST views on the contents of Volumes I-III were requested by end November.
- ✓ 33.19 Perryman to draft proposal for papers for inclusion in A&A 1994.
- ✓ 33.20 HST views on the technical paper by Schrijver on the results data base were requested by end November.
- ✓ 33.21 HST to propose names of IAU GA speakers to Kovalevsky by end 1993.
- ✓ 33.22 Perryman/Lindgren to propose details of stereo images for February 1994 ESA Bulletin.

Thirty Third Meeting
of the
HIPPARCOS SCIENCE TEAM

ARI, Heidelberg

28-29 October 1993

Start of meeting: 09.00 (28 October)

End of Meeting: 16.00 (29 October)

AGENDA

1. Introduction and overall schedule/tape production (Perryman)
2. TDAC progress report + schedule (Hoeg)
3. NDAC 30-month sphere solution and related studies (Lindegren)
4. FAST 30-month sphere solution and related studies (Kovalevsky)
5. NDAC/FAST 30-month sphere comparisons (Lindegren/Mignard/Kovalevsky)
6. Comments on related comparison activities (attitude/RGC, if appropriate)
7. Main astrometric catalogue merging: results and plans (Murray)
8. Double star status:
 - in FAST (Kovalevsky)
 - in NDAC (Lindegren)
9. Report from Double Star Working Group (Mignard)
 - results of comparison activities
 - status of ground-based preparatory programmes
10. Report from Photometry Working Group (van Leeuwen on behalf of D. Evans)
11. Report from Reference Frame Working Group + future schedule (Kovalevsky)
 - requests for data access: de Vegt + Platais
 - status of HST/FGS observations (Perryman)
12. Status of Documentation Working Group (Perryman)
 - printed catalogue contents/formats
 - status of CD-ROM preparations (HIC - Turon/HOC - Perryman)
 - contents of final documentation: Vols I-III
14. Papers for A&A 1994 issue (Perryman)
15. Preparations for Meudon DDRT meeting (Perryman)
 - criteria for evaluation (overlap, preparatory work)
 - data handling (Turon)
16. Results data base activities (Schrijver)
17. Miscellaneous:
 - Mark III comparisons
 - IAU General Assembly plans
 - intermediate data file archiving (Mignard)
 - minor planet status in FAST/NDAC (Mignard/Lindegren)
 - use of stereo images for February 1994 ESA Bulletin [HST views]
 - next HST meeting: date and place