

THE PERFORMANCE OF THE HIPPARCOS INPUT CATALOGUE AS COMPARED WITH THE FIRST RESULTS OF THE HIPPARCOS MISSION*

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1 Introduction

The ESA satellite Hipparcos was launched in August 1989 and is now observing from November 1989. A series of papers describing the satellite, the various aspects of the observing programme preparation and of the data reduction, and some early results were published in *Astronomy and Astrophysics* 258, 1.

The observing programme, established under the responsibility of the INCA Consortium (Turon *et al.* 1992a), is composed of 118 000 stars, 1 QSO (3C273), 48 minor planets, and 3 satellites of major planets (Europa, Iapetus and Titan). The various stellar data given in the Hipparcos Input Catalogue (HIC, Turon *et al.* 1992c) are systematically compared with the results (positions, magnitudes, data on double and variable stars, parallaxes) obtained from the analysis of one year of Hipparcos data by each of the Data Reduction Consortium (FAST and NDAC). The reduction scheme of each consortium are respectively described in Kovalevsky *et al.* (1992) and Lindegren *et al.* (1992).

2 Positions

The sources of positions given in the HIC and the methods used to obtain them and to reduce them to a unique system (FK5) are described in Jahreiss *et al.* (1992).

*Based on observations made with the ESA Hipparcos satellite

A first comparison was made with very preliminary star mapper data (Turon *et al.* 1992a). The distributions obtained for $\Delta\alpha \cos\delta$ and $\Delta\delta$ were nearly symmetrical, with respective means of -0.01 and 0.05 arcsec and widths of about 0.3 arcsec (0.27 for single stars, 0.53 for double stars).

The results obtained from the comparison of HIC positions with the FAST Consortium one year sphere solution are given in Table 1 for all stars and for different sources. These results should be compared with the rms positional difference between the one year sphere solutions of FAST and NDAC: about 2 milliarcsec (Froeschlé 1992, Lindegren 1992).

Table 1: Mean and rms (arcsec) of distribution of differences between FAST and INCA in $\alpha \cos\delta$ and δ

	$\alpha \cos\delta$		δ	
	mean	rms	mean	rms
all stars	-0.00	0.24	0.05	0.23
FK5 + ext.	+0.04	0.09	0.04	0.11
Meridian circles	-0.00	0.15	0.03	0.16
SRS	+0.01	0.18	0.07	0.19
PPM North	+0.05	0.24	0.03	0.24
SSSC	-0.22	0.21	0.12	0.21
Plate measurements	-0.01	0.27	0.04	0.29

3 Magnitudes

The profiles of the Hipparcos H_p and Tycho B_T and V_T bands, the sources of the magnitudes given in the HIC, and the methods used to obtain them are described in Grenon *et al.* (1992). The results obtained from the comparison of HIC and NDAC magnitudes are given in Table 2 for all stars and for different sources.

Table 2: Mean and rms (mag) of distribution of differences between NDAC and INCA in H_p , V_T and B_T

	H_p		V_T		B_T	
	mean	rms	mean	rms	mean	rms
all stars	+0.01	0.19	+0.01	0.17	+0.02	0.21
photoelectric B & V	-0.01	0.07	-0.00	0.05	-0.02	0.07
photoelectric V	-0.03	0.07	-0.03	0.07	+0.00	0.20
heterogeneous V	+0.05	0.26	+0.05	0.25	+0.05	0.27

4 Double and variable stars

About 7000 new variable stars and 6000 new double stars have been recognized from the one year sphere solution. The result of the comparison between INCA and FAST separations for known double stars is an rms difference of about 0.15 arcsec. The difference between FAST and interferometric measurements is 10 times smaller (Mignard 1992).

5 Parallaxes

The rms differences between NDAC one year solution and ground-based parallaxes estimated from photometric or spectroscopic parallaxes for stars further than 500pc, from open clusters and Magellanic Clusters distances, are within the range 2.2 to 2.9 milliarcsec (Arenou 1992).

The comparison with ground-based trigonometric parallaxes gives the following results : for 2231 stars common with the provisional version of the New General Catalog of Trigonometric Parallaxes (van Altena *et al.*), mean difference of -2.3 milliarcsec, rms width of 11.2 milliarcsec; for 57 stars with CCD measurements from the USNO (Harrington *et al.*), mean difference of +0.5 milliarcsec, rms width of 4.0 milliarcsec (Lindegren 1992).

These results should be compared with an rms difference between NDAC and FAST one year sphere solutions for parallaxes of about 2.5 milliarcsec (Lindegren 1992, Froeschlé 1992).

6 References

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