HIPPARCOS EXTRAGALACTIC LINK

Preliminary Bonn, Potsdam and Kiev solutions

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Hipparcos proper motions contain an unknown angular velocity ω relative to a non-rotating system. The basic equations for its derivation are:

$$\begin{aligned} \Delta\mu_\alpha \cos\delta &= -\omega_1 \cos\alpha \sin\delta - \omega_2 \sin\alpha \sin\delta + \omega_3 \cos\delta \\ \Delta\mu_\delta &= +\omega_1 \sin\alpha - \omega_2 \cos\alpha \end{aligned} \quad (1)$$

where $\Delta\mu_\alpha$ and $\Delta\mu_\delta$ are absolute minus Hipparcos proper motions.

	Bonn	Potsdam	Kiev
photographic plates	astrograph	Schmidt	astrograph
m link fields	8	10	183
n link stars	33	104	1015
galaxies per field	1 to 5	300 to 2000	3 to 5
base line [years]	70 to 90	20 to 40	20 to 40
random p.m. error per star [mas/yr]	0.5 to 1.5	3 to 5	5 to 12
syst. abs. p.m. error per field [mas/yr]	1.0 to 1.5	~ 2	~ 4
rms of solution of (1) [mas/yr]	5	8	14
$\omega_1 \pm \sigma(\omega_1)$ [mas/yr]	$+1.2 \pm 1.0$	$+0.8 \pm 1.0$	-1.5 ± 0.7
$\omega_2 \pm \sigma(\omega_2)$ [mas/yr]	$+3.2 \pm 0.7$	-0.7 ± 1.0	-2.0 ± 0.5
$\omega_3 \pm \sigma(\omega_3)$ [mas/yr]	$+0.0 \pm 1.1$	$+0.5 \pm 1.0$	$+1.2 \pm 0.5$

The Table describes three different absolute proper motion programmes and shows preliminary link results with H 30 data. The number of Bonn and Potsdam link fields will be increased (to 15 and 50, respectively) so that the influence of possible systematic effects - not represented by the formal errors $\sigma(\omega_i)$ - can be further reduced. We expect to provide an accuracy of the final link of the Hipparcos proper motions of better than 1 mas/yr, competitive with other link programmes (Lick/Yale, VLBI, HST).

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