PAINEL 1

PRECISE OPTICAL POSITIONS FOR ICRF SOURCES USING THE 0.6M AND 1.6M LNA TELESCOPES

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Precise positions of ICRF extragalactic radio sources derived in the Hipparcos Celestial Reference System (HCRS) allow one to access the relative orientation between the HCRS and the ICRF. In this context, a long term observational program is being carried out at three distinct instruments: the Valinhos CCD Meridian Circle, the 0.6m and the 1.6m Cassegrain telescopes at Laboratório Nacional de Astrofísica, Brazil (LNA). The list consists of 409 ICRF radio sources distributed between $+20^o < \delta < -80^o$ in the sky. Here, we present pilot, comprehensive results for a set of sources representative of the whole program. Reduction of the 0.6m CCD frames (10'x 10', 1 pixel=0".6) are referred to the UCAC catalog and to Tycho2-based star positions derived from the Valinhos Meridian Circle. Reduction of the 1.6m CCD frames (5'x 5', 1 pixel = 0".3) are referred to the positions of intermediary brightness, secondary stars derived from the 0.6m reductions. These CCD frame reductions furnish optical ICRF source positions. An investigation of the astrometric performance of all these instruments and the UCAC catalog in the scope of obtaining precise positions for the optical counterparts of the ICRF sources was carried out. The average optical minus radio position offsets for the 0.6m telescope were +4mas ±8mas(41mas) and +4mas ±8mas(42mas) for R.A. and Dec. respectively, using the UCAC in the reductions. Using the Valinhos positions, the offsets were +90mas ±30mas (71mas) and -31mas ±29mas (72mas). The errors of the mean values (plus/minus) and the standard deviations about the mean (parenthesis) are given. For the 1.6m, the results regarding the UCAC were -11mas ±9mas(45mas) and +7mas ±9mas(46mas) in the same sense as before. Plots against R.A., Dec., magnitude (V and R) and color (V-R) show no dependences. We conclude that the astrometric performance of the 0.6m telescope rivals that of the 1.6m for the bright objects, and that the UCAC furnishes the best representation of the HCRF for our set of CCD observations.

PAINEL 2

SOLAR DIAMETER VARIATIONS IN 2001/2002

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Results are presented for the astrometric observations of the variation of the solar diameter, relative to the 2001 and 2002 campaigns made at Observatório Nacional (Φ= -22° 53 42). They give continuity to the series pursued as from 1997, with the solar astrolabe equipped with a variable zenith distance front prism. The series covers the activity cycle 23, for which the presented results follow the beginning of its fall. The observational strategy has been kept of obtaining a detailed coverage of heliolatitudes and a wide span of zenith distances. In so, 4878 independent measurements are here considered, evenly divided on time, and about the meridian transit. Upon the raw results are applied observational corrections (depending on the temperature, the temperature gradient, the Fried's parameter, and on the standard deviation of the adjusted limb) and instrumental corrections (for instability of the front prism and for leveling). All corrections were independently calculated by year and by the part of the day of the observing session. Alike values are obtained. The corrections are also alike to those derived from the earlier years of the series. The combined amplitude does not reach 50mas. The observed variations of the solar semidiameter tend to follow the sunspots count for the period. There is a sharp fall on the earliest of 2001 followed by a noisy increase, while it diminishes since the beginning of 2002. The mean value for the observed solar semidiameter in the period is 959".199 ± 0".007, to a standard deviation of 0".553.

PAINEL 3

ASTROMETRY FOR OPTICAL COUNTERPARTS OF ICRF SOURCES

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Astrometric positions for an evenly distributed group of 76 southern ICRF sources are presented. The positions were obtained on different representations of the Hipparcos system, namely on the ACT, the Tycho2, the UCAC-S1, and on the USNO-B1.0 frames. All optical counterparts were imaged in 5arcmin^2 CCD frames from the 1.6m telescope at the Laboratório Nacional de Astrofisica, in Brazil. In general three frames per source were taken. For the USNO-B1.0 based reductions, the reference stars within the frames had their catalog coordinates corrected by proper motion towards the observation date. For the ACT, Tycho2, and UCAC1 based reductions, the reference stars were picked up from the USNO-A.20 catalog and placed on the base catalogs frame by a third degree polynomial adjustment, made on a 4deg^2 neighborhood. In these cases, since the A2.0 does not contain proper motions, the base catalog frame was astrometically corrected by applying the corresponding proper motions, either towards the A2.0 plate or the observation dates. It is shown that, in the first case just a system correction, from the A2.0 frame to the base catalog

frame, is achieved. Beyond this, in the second case, also the local, average proper motions of the A2.0 reference stars are modeled. The main conclusions highlight the usefulness of modeling the systematic parts of the reference stars proper motions (20mas for the Tycho2 reductions), the high quality of the astrometry made at the LNA 1.6m telescope (5mas centering error), and the accuracy that can be envisaged from the UCAC catalog (better than 100mas, using the A2.0 for the local frame stars). The results suggest a misalignment of the B1.0 from the Hipparcos system ($\Delta\delta$=+72±26mas).