COMMISSION 8: POSITIONAL ASTRONOMY

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1. Introduction
The scope of this report continues in the same vein as those made previously for Commission 8: wide-angle, optical astrometry with astrometry involving photographic techniques still being the province of Commission 24. However, the successes of new instrumentation and techniques, in particular Hipparcos and ground-based astrometry with CCD’s, now require a more integrated approach. It is with this in mind that plans are underway to combine Commissions 8 and 24, and it is hoped that by the General Assembly in the year 2000 this integration will be achieved.

2. Meetings, Symposia, Colloquia
Journées Systemes de reference spatio-temporels:

3. Ground Based Astrometry
ARGENTINA. The San Fernando Automatic Meridian Circle (CMASF) was installed at the Astronomical Station Carlos Ulrrico Cesco of the Observatorio Astronomico Felix Aguilar (el Leoncito) in June 1996. It will be operated jointly by the Departamento Circulo Meridiano of San Juan and the Real Instituto y Observatorio de la Marina en San Fernando, Spain.
CHINA. This report covers the scientific research done under the Committee of Catalogs and Astronomical Constants which is part of the Chinese Astronomical Society.
   For the extension of the optical frame and its linkage to the radio frame four new instruments have been under preparation. These are:
   - The Photo-electric Astrolabe Type III of Beijing Observatory was being adjusted and the experimental observations are being carried out. The precision of observation for a single star is \( \theta \approx ”18. \)
   - The automated Horizontal Meridian Circle fabricated by Shaanxi Observatory and Copenhagen Observatory has been put into operation. A photoelectric moving-slit micrometer is installed to record the signals. The errors of the instrument and the signal detectors were analyzed (Publ. Shaanxi Obs., 18, 92).
   - The Low Latitude Meridian Circle of Yunnan Observatory was adjusted. By December 1996 it will be installed at the Yunnan Observatory (Publ. Yunnan Obs., 3, 43).
The prototype Optical Interferometer was manufactured. The software of the control system is being investigated and will be completed in the end of 1996 (Publ. Shaanxi Obs., 16, 44).

The instrument and the system software of the PDS microdensitometer of the Purple Mountain Observatory has been revised for the improvement of positional accuracy (Publ. Purple Mt. Obs., 12, 197 & 205).

Utilizing the observations and the old plates of the double astrograph at Zô-Sé section of Shanghai Observatory, the proper motions of 924 stars in the central region of Praesepe and a catalog of reference stars for the astrometric standard region Pleiades on the system of FK5/J2000.0 were produced (A&AS, 113, 419).

There are two VLBI stations in China: Shanghai and Urumqi. The radio astrometry is one part of the work of these VLBI stations. The contributions of Shanghai VLBI station for the radio reference frame in southern hemisphere was discussed. Two experiments for determining the precise positions of radio compact sources were carried out in Feb. 1994 and June 1995 (Ann. Shanghai Obs., 16, 75). Based on differential VLBI techniques, two observational plans of the radio stars and extragalactic sources were proposed (Publ. Purple Mt. Obs., 13, 32).

A series studies on the improvement and maintenance of the radio reference frame were undertaken. These include the identification and correction of relative deformations between frames, the selection of primary sources, the maintenance of the orientation of frames and the compilation of combined radio source catalogs (A&A, 303, 276). For the linkage between the radio reference frame and the dynamic reference frame a method of predicting occultations of point sources (star or radio source) by planets and the Moon was proposed. A catalog of optical positions of extragalactic radio sources was compiled and compared with the IERS radio celestial reference frames. A tie of the optical and radio frames resulted (Li, J. & Jin, W., A&AS, in press).

DENMARK, GREAT BRITAIN & SPAIN. The Carlsberg Automatic Meridian Circle (CAMC) continued in regular use at the international observatory of the Roque de los Muchachos on the island of La Palma in the Canaries. It was operated jointly by Copenhagen University Observatory, the Royal Greenwich Observatory and the Real Observatorio y Instituto de la Armada en San Fernando.

Carlsberg Meridian Catalogue La Palma Number 8 (CMC8) was published in 1994. It is the first catalogue of the series to be observed regularly using the smallest section of the scanning slits (12 arcsec long) which improved the signal to noise ratio. The standard error of a single observation in the zenith was improved from 0'.' 15 to 0'.' 12 by night-to-night smoothing of observed star positions. This did not alter the system of the catalogue.

CMC8 contains 18 145 positions and magnitudes, and 16 896 proper motions of stars north of declination -40°. The bulk of the stars comprise IRS (~2000) and stars in a global net with \( V \approx 12 \) (~7500). CMC8 also contains 2143 positions of Solar System objects.

Observation of CMC9 began in January 1994 and ended in April 1995, when a new computer-control system based on PC486s was introduced. It is being prepared for publication on a CD-ROM. Four major new observational programs were introduced in CMC9: (i) a dense net of reference stars with \( V \approx 12.5 \) straddling the equator, to be used in investigating magnitude equations in Schmidt plates, (ii) reference stars in the fields of Veron-Cetty galaxies, (iii) Luyten NLTT stars with \( 11 < V < 14 \) and \( \mu > 0'.'3/yr \), (iv) variable (GCVS) stars with \( 12 < V < 14 \).

A series of CAMC positions and magnitudes of novae and supernovae were issued occasionally in IAU Circulars in the range Nos.5767-6233.

CMC5-7 were used to test the accuracy of the PPM catalogue (north) (Proc. 2nd Int. W/S, Valencia, 1993, p.249). A substantial magnitude equation was found in right ascension for stars south of +30°. Improving proper motions by re-observing stars with the CAMC was discussed [61.041.037]. CAMC observations were used to provide an astrometric grid for the Galactic center [63.041.005].


The San Fernando Automatic Meridian Circle (CMASF), having been equipped with the same moving-slit micrometer and control system as the Carlsberg Automatic Meridian Circle, was tested during 1995. A small catalogue was formed and the accuracy of a single observation was found to be 0.2 arcsec which was satisfactory, given the bad seeing at San Fernando. The instrument was then dismantled and shipped to Argentina in April 1996 under an intergovernmental agreement between Spain and Argentina to operate the instrument in the Southern hemisphere at Leoncito.