

COMMISSION 8: POSITIONAL ASTRONOMY (ASTRONOMIE DE POSITION)

Report of Meetings, 22 and 23 August 1973

PRESIDENT: W. Fricke.

SECRETARY: W. Gliese.

I. REPORT OF THE COMMISSION

The President's Report of the Commission was discussed and approved without modification. In answer to an inquiry of the IAU General Secretary the Commission decided to request the continuation of the publication of the Reports of the Commission in the Transactions of the IAU.

II. OFFICERS OF THE COMMISSION

The Commission approved the following proposals for new officers: President: van Herk, Vice-President: Tucker, Organizing Committee: Anguita, Fricke, Klock, Lacroute, Nemiro, Schombert, Tavastsherna, Wood, Yasuda.

III. REVIEWS ON CURRENT PROBLEMS

The following reviews were presented:

(1) B. L. Klock: New Instrumentation and Techniques in Meridian Astronomy. This report was based on information provided by various observatories; it included recent progress made at Belgrade, Besançon, Bordeaux, Bucharest, Cagliari, Cape and Herstmonceux, Leiden, Mizusawa, Sao Paulo, Tokyo, and Washington.

(2) W. Fricke: Plans for the Improvement and Extension of the FK4. This paper will be published in the Proceedings of IAU Symposium No. 61, New Problems in Astrometry. The discussion in the Commission concentrated on the choice of objects to be included in the FK5. The new fundamental catalogue shall be extended to stars fainter than magnitude 7.5, it shall contain stars of all spectral types, and objects with radio emission. A supplement should also contain extragalactic radio sources in addition to stars. Contributors to the discussion were: Blaauw, Eichhorn-von Wurmb, Klock, Murray, Tucker, van Herk, and Walter. Fricke pointed out that the main criterion for the choice of fundamental stars will be the accuracy of available fundamental and differential observations to ensure very accurate positions and proper motions in a well defined system.

(3) Due to absence of M. S. Zverev who was invited to speak on 'Observations Relevant to the Improvement of the FK4 in the Southern Sky', W. Gliese summarized the information presented on this subject at IAU Symposium No. 61 'New Problems in Astrometry.'

(4) R. H. Tucker: Cape Astrolabe Catalogue Corrections. This is a report on results of observations carried out by D. V. Thomas from about 1965 to 1969 at the Cape.

(5) S. Débarbat presented a report prepared jointly with Davila, Grudler, and Sanchez on astrolabe observations of planets.

(6) G. Teleki reported on the activity of the Commission 8 – Study Group on Astronomical Refraction. The report was adopted by the Commission.

(7) Due to absence of J. L. Schombert, Chairman of the SRS Committee, the report on the SRS Programme was read by B. L. Klock. The status of the SRS Programme – 1 June 1973 is the following

Observatory	Zone	Commitment	Date started	Completed		Final results received or expected
				Obs'ns	Red'ns	
Abbadia	+ 5° to -15°	1560 × 4	62.3	100%	100%	1968.8
Bordeaux	+ 5 to -15	1560 × 4	62.5	100	100	1970.5
Bucharest	+ 5 to -10	1176 × 4	62.6	100	97	1975.0
Nicolaiev	0 to -20	5984 × 2	64.3	100	98	1974.0
San Fernando	-10 to -30	3709 × 4	63.3	100	100	1973.5
Tokyo	-10 to -30	3560 × 4	63.3	100	100	1972.7
USNO 6-in.	+ 5 to -30	8706 × 2	66.5	100	100	1973.3
		1233 × 4				
Bergedorf (Bickley)	+ 5 to -90	20495 × 4	67.9	100	95	1974.5
Cape	-30 to -40	10082 × 4	61.3	100	97	1974.3
	-40 to -52			100	100	1966.0
	-52 to -64			80	75	1974.5
	-64 to -90			—	—	—
San Juan	-40 to -90	7190 × 2	69.5	99.4	100	1974.3
Santiago- }	-25 to -47	5992 × 4	63.1	100	60	1974.0
Pulkovo }	-47 to -90	5504 × 4				
				100	75	1975.0
USNO 7-in. (El Leoncito)	+ 5 to -20	7683 × 2	68.7	100	71	1975.0
	-20 to -75	12121 × 4				
	-75 to -75SP	1382 × 4				

(8) H. Yasuda: The PZT Star Programme, The status of the Northern PZT Programme - 1 May 1973 is the following

Observatory	Date started	Completed	
		Obs'ns	Red'ns
Abbadia	July 1971	30%	15%
Beograd	- -	0	0
Besançon	- -	-	-
Bucharest	Oct. 1971	46	0
Bordeaux	Jan. 1972	50	33
Copenhagen	April 1971	75	38
Engelhardt	April 1971	68	-
Herstmonceaux	April 1972	52	0
Moscow	1967	100	75
San Fernando	Sep. 1973	0	0
Tokyo	July 1971	63	50
Uccle	- -	-	-
Washington	- -	0	0

IV. PRIORITIES

The 'Priorities' as suggested in the President's Report of the Commission were discussed and unanimously adopted.

V. RESOLUTIONS

The Commission has discussed the Resolutions submitted by IAU Colloquium No. 20 on Meridian Astronomy, held in Copenhagen, September 25-28, 1972. The President proposed a revision of some of these resolutions after consultation with members of the Commission from the Pulkovo Observatory and the U.S. Naval Observatory. Furthermore, members of the Commission proposed

additional resolutions. As the result of the discussion the following resolutions were unanimously adopted:

(1) The recommendation made by Commission 8 at the XIV General Assembly concerning the development of new instrumentation and techniques is re-affirmed. In particular, the provision of a modern transit circle for the Tokyo Astronomical Observatory is strongly recommended. It is further recommended that a Study Group be established for horizontal meridian circles.

(2) It is recommended that an improvement of the FK4 and its extension to a fainter magnitude limit, resulting in a new fundamental catalogue, the FK5, be carried out at the Astronomisches Rechen-Institut, Heidelberg; that observatories throughout the world contribute to this project by providing basic observations, on punched cards if possible; and that all information pertinent to the formation of the FK5 be transmitted to the Astronomisches Rechen-Institut with the observations.

(3) It is recommended that meridian catalogues should include, in addition to the tabular magnitude on a recognised system, an indication of the screen or screens used for each star, so that the approximate magnitude at which the star appeared to the observer can be deduced.

(4) It is recommended that programmes of observations of fundamental stars, with meridian circles and astrolabes, should include members of the solar system.

(5) The recommendation made by Commission 8 at the XI General Assembly concerning the formation of catalogues of the Southern Reference Stars (in different zones) is amended in the sense that the individual observations of the whole southern sky be made available to the US Naval Observatory and that this observatory should send all basic data to the Pulkovo Observatory and, on request, to other institutions. The discussion of all observations and the compiling of the SRS catalogue for the whole southern sky may be made at the Pulkovo Observatory and at the US Naval Observatory. Concerning the best possible system of the SRS catalogue, consultations shall take place between the Astronomisches Rechen-Institut at Heidelberg, the Pulkovo Observatory and the US Naval Observatory.

(6) The recommendations made by Commission 8 at the XIV General Assembly concerning the inclusion of a number of faint stars up to the 9th magnitude (especially of FKSZ stars) into the fundamental catalogue is re-affirmed. The inclusion of FKSZ stars in fundamental observational programmes is recommended. Of special importance are absolute and differential meridian observations of the FKSZ stars together with FK4 stars in the southern sky (declinations from $+30^\circ$ to -90°).

(7) It is recommended that the work of the Study Group on Astronomical Refraction that has been formed by Commission 8, should continue to be supported.

(8) Commission 8 re-affirms recommendations of the previous General Assemblies of the IAU on the following urgent programmes of meridian observations: 'Bright Stars' (BS), 'Double Stars' (DS), 'Latitude Stars' (LS) and 'Zodiacal Stars' (ZS). The Commission recommends also the new meridian programme: 'Reference Stars in the Areas with Galaxies of the Pulkovo Programme' (PS). The star lists for these programmes may be obtained from various observatories, as follows:

(BS), (DS), US Naval Observatory, Washington;

(LS), Sternberg Astronomical Institute in Moscow;

(ZS), Nikolajev Observatory, or, for a shorter list, Royal Greenwich Observatory, Herstmonceux.

(PS), Pulkovo Observatory.

Participation of the southern hemisphere observatories in these programmes is especially important.

(9) Commission 8 recommends the establishment of a Working Group charged with the following duties:

(i) To coordinate the various astrolabe programmes specially designed for the revision of the positions of the bright fundamental stars; and

(ii) To study the possibility of producing a homogeneous catalogue as a synthesis of existing astrolable catalogues, to be updated each time a fresh catalogue is published.

(10) Commission 8 takes the view that the provision of a stellar reference system with one star per square degree, reaching magnitude 9.5, with positions known to 0.01 arc second, would be a

major goal to reach in the future. The existence of such a reference system would have a spectacular influence on most of the astrometric programmes. Consequently the Commission recommends that detailed studies be made of all space and other astrometry projects that have the potentialities to attain this goal.

(11) The elaboration of a new international refraction table is needed. Therefore, Commission 8 concludes that the Soviet astronomers' proposals for revision of the Pulkovo Refraction Table and for active cooperation with the Commission 8 Study Group on Astronomical Refraction in this connection are very welcome, and should be accepted.

*Resolutions of the IAU Symposium No. 61 'New Problems in Astrometry'
endorsed by Commissions 8, 24, 33 and 40*

1. This Symposium recognises the inadequacy of the existing optical astrometric data to meet modern requirements for precision positions and proper motions. It therefore urges that the great accuracy of radio positions and the potentiality of new optical and space techniques should be fully exploited. Both absolute and differential observations are necessary, and it is particularly important that observations in the southern hemisphere should not be allowed to lag behind the north as they do at present in both optical and radio astrometry.

2. This Symposium urges as the first priority the compilation by 1980 of an FK5 catalogue. The new reference frame must be extended to faint stars and extragalactic objects. This requires the vigorous continuation and, in fact, completion, especially in the Southern Hemisphere, of current programmes of photographic astrometry and, in addition, the development and exploitation of new photographic, radio and space techniques.

3. This Symposium notes the existence of the Working Party established by Commission 40 to draw up a list of suitable objects for positional calibration of radio observations and urges co-operation between it and Commissions 8 and 24 to ensure as complete an integration as possible of the radio and optical astrometric fundamental programmes.

Priorities

(1) The continuation of observations of positions of stars and members of the solar system with transit circles, meridian instruments, and astrolabes is of vital importance for progress in astronomical research, space research, geodesy, and geophysics.

(2) Observations relevant to (a) the improvement of the fundamental system of positions and proper motions, (b) the establishment of a reference system to the faintest possible magnitude limit, and (c) the derivation of proper motions in general and of special objects are of immediate importance. All investigations that contribute to these goals have to be encouraged.

(3) Developments of new instrumentation and techniques have to be encouraged which endeavor to improve the measurements of positions of stars and of members of the solar system.