

RIGHT ASCENSIONS OF 200 DOUBLE STARS

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Abstract. This catalogue contains the results of observations of 200 double stars made at Odessa with the Repsold transit circle. The mean epoch of observations is 1986.25, the coordinates are reduced to equinox 2000.0 without taking into account the proper motions. The mean error of catalogue position of R.A. is 0.010^s . The catalogue corresponds to the FK5 system of stellar places.

Key Words: Astrometry: Catalogue, positional observations, meridian circle.

In the present work the right ascensions are given for 200 double stars (DS) observed with the Odessa meridian circle during the period 1985-1988. The meridian circle was also used for observing RRS1 and HLS stars at this time.

The Resolution No.17b adopted at the X-th IAU General Assembly recommends the meridian observations of the double stars unsuitable for photographic observations. Most of the stars from the DS program were not included in the AGK3 and other photographic catalogues. There is also a very little number of visual observations too. However, investigation of DS' proper motions is important for stellar astronomy, thus the above mentioned recommendation remains valid.

The working list was compiled at the Pulkovo observatory by M.S.Zverev (1960). It was improved and extended by F.P.Scott (1967). Our observational list contains 200 double stars for the zone from 0^o to -10^o in declination. For each DS only the brighter component or a preceding one in R.A. is to be observed. The observations were started in April 1985 and finished in May 1988. The total number of observational nights is 98. The author has made about 2600 observations of right ascensions by using a differential method. Specific difficulties of observations of double stars with the meridian circle should be noted, particularly of those optically close. In connection with this and due to irregular distribution of the program stars in the sky, we have observed a large number of reference stars. Approximately 70% of all the observations are attributed to reference stars selected from "Apparent places of fundamental stars" (1984-1988).

The observations were carried out with the meridian Repsold circle ($D = 135$ mm, $F = 198$ cm, magn.200, d of circles = 980mm) described by V.V.Konin (1953), B.V.Novopashenny (1959), M.Yu.Volyanskaia et al.(1984). Adopted position of the instrument:

Longitude	$2^h 3^m 02.3^s$ E,
Astronomical latitude	$46^o 28' 37.4''$ N,
Height	55 meters above sea level.

The observations were mainly made following the "Instruction for observations of Faint Stars" (1954). The observations were made with help of a hand-driven impersonal micrometer. The star was bisected all the time of observation (6 central screw rotations). The visual brightness of bright stars was decreased to 7.5-8 magnitude by using a reduction screen mounted in front of the tube objective. Meridian transit of a star is registered with an electron system designed and constructed by I.I.Genovsky (1984) in the Astronomical observatory of the Odessa State University. The system modification was performed simultaneously with observations, thus somewhat complicating and hindering the observations run. During the observations the readings of thermometer were registered each 30 minutes, and those of a barometer-aneroid each hour. Before the observations according to the given program, the author together with A.P.Chelombitko made an examination of pivot errors with contact methods. Pivots had been recently regrinded. It gave no evidence of the existence of any significant errors in the figure of the pivots. No pivot-error corrections have been applied in the compiling of this catalogue. We used the Bessel's expression for calculating R.A. from the observations. In reduction of observations of right ascensions the value of one screw rotation of an ocular micrometer was determined from observations and adopted to be equal to 3.350^s . Periodically the zero contact value was determined which was used in collimation calculation. The error of collimation was measured with the aid of horizontal collimating telescopes locating outside the pavilion. The OAO meridian circle observations have shown that the collimation value is stable for many years and changes slowly. Therefore we determined collimation, constructed a plot of its variations with time, and took the collimation readings for each observation evening from this plot. The azimuth's error-" n " value was determined from all pairs of reference stars close in time with a large declination difference. Since the night observing time in this programme did not exceed 3 hours, we could frequently use ' n -average'. During these time intervals no major alternations were made to the instrument.

The list of the corrections have been applied in right ascensions:

R.A. Micrometer Reading of standard contact: from regular determinations.

Line of Collimation: from collimators.

Diurnal Abberation: computed. Applied as additional collimation correction.

Azimuth Error: from observations of reference stars.

The following corrections were the subject for investigations, and some of the results will be reported later. The corrections are not included in the reported catalogue places. Corrections investigated but not applied:

Personal equation in observation of stellar transits.

Annual variation in correction to collimation.

Corrections assumed to be negligible: Pivot errors.

Apparent place was computed for each star observed by using a modification of the computer code elaborated by Dr. E.V.Chrutskaia (Pulkovo). The probable error of one observation was found to be $0.019''$ on average for the zone. In general there are four observations per star, so that the accidental probable error of a catalogue position may be estimated at $0.010''$.

Catalogue positions. - The catalogue positions were obtained by adding the mean (O-C) calculated for the star to the 2000.0 position used to compute the apparent place. The positions are for the epoch of observations.

The catalogue is on the FK5 system of stellar places.

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Description of Catalogue.

Column	1	Serial number
	2	DS number
	3	DM number
	4	Magnitude of each component or total
	5	Right Ascension
	6	Declination
	7	Epoch of Observation (1900+) for R.A.
	8	Number of observations in R.A.

Because of technical reasons the Catalogue will be published in the next issue.