

# Optical positions and proper motions of radio stars

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**Abstract.** The optical positions of 31 radio stars were obtained with the 40 cm astrograph at Zô-Sè Section, Shanghai Observatory from 1985 to 1988. The observational positions and the proper motions of these radio stars in the FK5 system are given in this paper.

**Key words:** astrometry — radio continuum: stars — reference systems

## 1. Introduction

From 1985 to 1988, the 40 cm astrograph ( $f = 6.9$  m) at Zô-Sè Section, Shanghai Observatory was used to observe the radio stars (Xu et al. 1990). The radio stars were selected by (1) the Working Group on the identification of the radio/optical astrometric sources of the IAU Commission 24 and (2) the Hipparcos Input List of the radio stars. The reference catalogues used were the AGK3 for the observations in the northern hemisphere and the SAOC for the observations in the southern hemisphere, respectively. Now these observational results have been reprocessed in the FK5 system.

Among these there are 31 radio stars found in the AGK3 and SAOC catalogues. The proper motions of these radio stars were obtained from a comparison between the positions observed and that of the AGK3, SAOC catalogues.

The results have also been compared with those given in the PPM and CAMC catalogues.

## 2. Reductions of the optical positions and the proper motions

The reductions of the observational positions were performed as described in Xu et al. (1990). In the process, the different systematic differences (FK5-reference catalogues) were added to the positions of the reference catalogues with the aim of reducing the reference catalogues used in the FK5 system. The systematic differences (FK5-AGK3/SAOC) were taken using the method of

Bien et al. (1978). The results were given in detail by Lu et al. (1996a).

The reduction procedure of the proper motions was as same as described in Lu et al. (1996b).

## 3. Results

The observational positions and proper motions for 31 radio stars are presented in Table 1: in Col. 1 is the serial number, in Col. 2 the name of the radio stars, in Col. 3 the magnitude, in Cols. 4 and 6 are the right ascension and declination for the observational epoch and equinox J2000.0, in Cols. 5 and 7 are the mean square error in right ascension and in declination, respectively, in Cols. 8 and 9 are the proper motion per year in right ascension and its mean square error, in Cols. 10 and 11 are the proper motion per year in declination and its mean square error, in Col. 12 is the mean epoch of observation and in Col. 13 is the serial number of the Hipparcos Input Catalogue.

Some of these radio stars are also found in the PPM (Röser et al. 1989) and CAMC (CAMC 1989) catalogues. In Figs. 1a and 1b the differences of the proper motions both (Shanghai-PPM) and (Shanghai-CAMC) in right ascension and declination are shown respectively. In Figs. 2a and 2b the differences of the proper motions respectively between PPM and CAMC in right ascension and declination are given. The comparison between Figs. 1 and 2 indicates that our results of the proper motions coincide in general with those of the PPM and CAMC catalogues. But for the proper motion in right ascension of the radio star R COM, there is possibly a few deviations between the PPM and the CAMC or ours.

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Table 1. Observational positions and proper motions of 31 radio stars

No	Name	Mag (m)	R.A (J2000.0)		S.A (ms)	DEC (J2000.0)			S.D (0".01)	PMA (0.1ms)	SPMA (0.1ms)	PMD (0".001)	SPMD (0".001)	Epoch (1900+)	Hip	
			h	m		s	°	'								"
1	UV PSC	9.1	01	16	55.034	6	06	48	41.79	11	57	2	18	3	86.91	5980
2	O CET	7.3	02	19	20.796	13	-02	58	36.76	9	-1	2	-243	2	86.78	10826AP
3	S PER	10.6	02	22	51.682	4	58	35	11.40	8	-3	3	-1	4	86.32	11093A
4	YY ERI	8.5	04	12	08.917	26	-10	28	08.82	22	-82	4	-120	5	86.93	19610
5	T TAU	10.8	04	21	59.415	5	19	32	06.18	8	7	2	-16	3	86.03	20390
6	RU CNC	10.3	08	37	30.136	4	23	33	41.46	10	-14	2	-1	3	86.03	42303
7	RL MIN	10.8	09	45	34.281	11	34	30	42.77	10	2	3	-3	2	86.10	47886
8	AD LEO	10.0	10	19	36.773	6	19	52	12.23	11	-350	2	-48	3	86.18	
9	R CRT	9.2	11	00	33.974	8	-18	19	29.51	14	-18	2	2	3	87.10	53809A
10	R COM	12.1	12	04	15.177	11	18	46	55.96	7	-8	2	-11	3	88.36	58854
11	RT VIR	8.3	13	02	37.960	7	05	11	08.65	13	26	2	-7	3	86.42	63642
12	RS CVN	8.1	13	10	36.959	8	35	56	04.91	18	-35	2	10	4	87.10	64293
13	V CVN	7.9	13	19	27.818	7	45	31	37.87	5	-32	2	-11	3	88.29	65006
14	FK COM	8.2	13	30	46.852	11	24	13	57.90	7	-37	2	-19	3	88.32	65915C
15	S VIR	10.8	13	33	00.116	9	-07	11	41.28	21	-20	2	1	3	86.81	66100
16	ZZ BOO	6.9	13	56	09.617	4	25	55	07.11	16	-66	3	-6	4	88.28	68064
17	RV LIB	9.1	14	35	48.493	22	-18	02	11.35	15	-9	4	-15	4	88.30	71380
18	S CRB	11.1	15	21	23.961	8	31	22	02.43	17	-6	3	-20	4	86.43	75143
19	S SER	11.9	15	21	39.514	7	14	18	52.84	7	-5	2	5	3	88.30	75170
20	R SER	11.2	15	50	41.702	6	15	08	02.28	12	-1	2	-32	3	88.52	77615
21	U HER	11.0	16	25	47.478	12	18	53	32.87	13	-4	3	-6	4	86.43	80488
22	RY SCT	9.4	18	25	31.517	12	-12	41	23.63	15	6	3	1	4	85.58	90303
23	R AQL	9.7	19	06	22.249	4	08	13	48.67	5	5	2	-65	2	87.72	93820A
24	CYG X-1	8.8	19	58	21.681	6	35	12	06.02	14	1	2	-2	3	85.58	98298
25	CYG OB2-5	9.1	20	32	22.421	6	41	18	18.89	6	-2	2	-7	3	85.63	101341AB
26	RT LAC	9.4	22	01	30.681	6	43	53	25.19	9	52	3	21	5	85.64	108728
27	TW PEG	6.6	22	03	59.516	4	28	20	54.35	6	12	2	-4	3	85.78	108928
28	DM-21 6267	9.1	22	38	45.130	19	-20	37	15.04	24	319	6	-95	7	86.91	111802A
29	DM+54 2846	8.8	22	44	07.469	8	55	35	21.74	12	9	2	5	3	86.77	112247
30	EV LAC	10.3	22	46	51.527	9	44	20	22.07	10	4	2	-4	2	86.68	112460A
31	R PEG	11.4	23	06	39.173	5	10	32	36.29	8	8	2	-11	2	87.71	114114

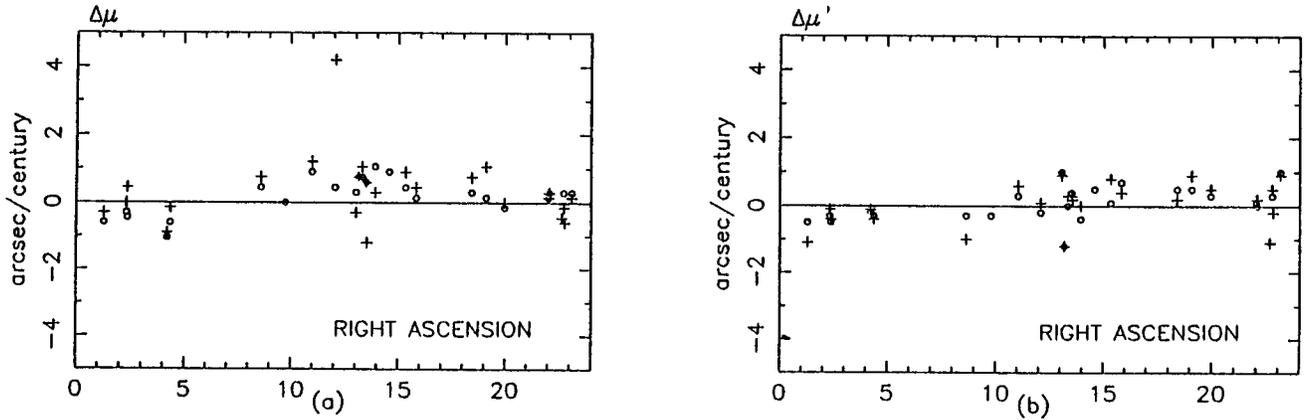


Fig. 1. Differences of the proper motions in right ascension a) and declination; b) o (Shanghai-CAMC); +: (Shanghai-PPM)

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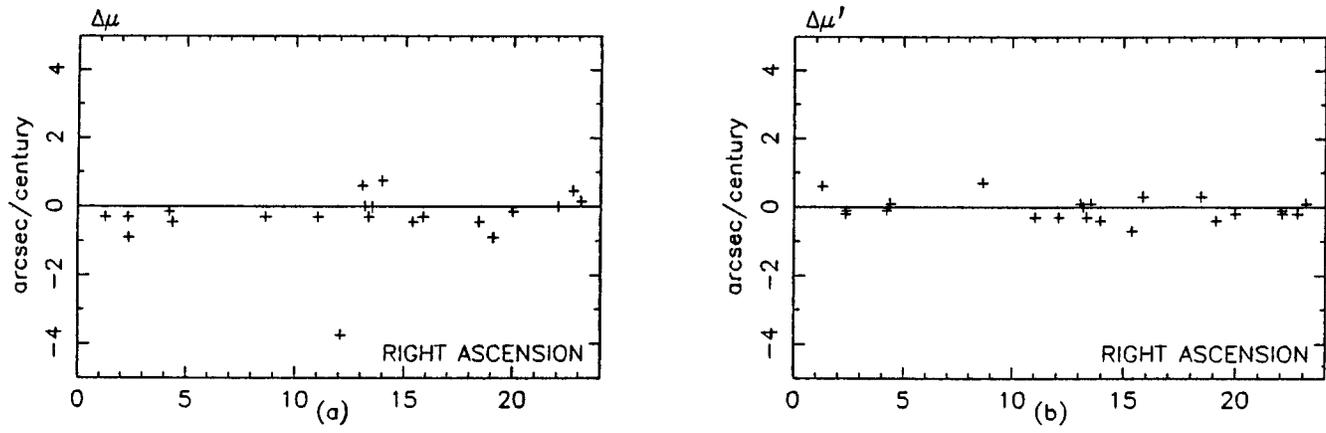


Fig. 2. Differences of the proper motions in right ascension a) and declination; b) (PPM-CAMA)