MERIDIAN & ASTROLABE OBSERVATIONS OF RADIO STARS: A CONTRIBUTION TO THE CONNECTION OF RADIO AND OPTICAL REFERENCE SYSTEMS

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ABSTRACT. Optical positions of eight radio stars observed with the Photoelectric Transit Instrument (PTI) at Torino and with the Danjon Astrolabe (AST) at Cagliari are presented here. The values of observed right ascensions have been computed at the Epoch J2000.0.

Precise positions of optical counterparts of radio sources are needed for the connection of optical and radio reference frames.

The optical counterparts of eight galactic radio sources—from the list proposed by the IAU Commission 24 Working Group on the identification of Radio-Optical Astrometric Sources—have been regularly observed with the Photoelectric Transit Instrument at Torino Observatory. The radio source HR 5110 has also been observed, at west transit only, with the Danjon Astrolabe at Cagliari Observatory.

The observations, obtained in different periods, have been reduced according to the MERIT Standards, that is, on the basis of the IAU (1976) System of Astronomical Constants, the IAU (1980) Theory of Nutation, and the FK5 System.

The optical positions of seven of the above galactic radio stars—at the epoch J2000.0—are presented in Table 1 as well as a comparison with right ascensions obtained with Carlsberg Meridian Circle at La Palma (1986).

In particular, with reference to the radio source HR 5110, the values of right ascensions, computed at Torino and Cagliari at the epoch J2000.0, are presented in Table 2 as well as a comparison with optical positions obtained with the observations for the Astrolabe General Catalogue (Billaud *et al.*, 1977), with Transit Instrument (TI) at Bratislava (Hefty *et al.*, 1987) and the Automatic Meridian Circle (AMC) at Bordeaux Observatory (Lestrade *et al.*, 1985).

Finally, a preliminary comparison with VLBI radio position of this source, measured with the NASA-JPL Deep Space Network and the US VLB Network antennas, is also presented.

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Table 1: OPTICAL POSITIONS OF GALACTIC RADIO SOURCES OBSERVED AT TORINO AND LA PALMA OBSERVATORIES

Source	DM	m	sp	α(O-C)	αobs	αcalc	δcalc	N	Ep.	Cat	
b Per	49°1150	4.56	A2	-0^s.0379	4^{h}18^{m}14^s.604	14^s.642	50°17'44".05	20	84.37	SAO	(1)
				±0.0049	14.522			7	85.11		(2)
54 Cam	57 1118	6.49	G0	-0.0193	8 2 35.809	35.828	57 16 24.67	22	83.79	SAO	(1)
				±0.0044	35.842			6	85.73		(2)
ZZ Boo	26 2508	6.80	F0	0.1076	13 56 9.505	9.397	25 55 7.41	6	82.46	SAO	(1)
				±0.0055	9.622			7	85.04		(2)
β Lyr	33 3223	3.4-4.3	Bp	0.0001	18 50 4.802	4.802	33 21 45.71	4	81.74	FK4	(1)
				±0.0059							
P Cyg	37 3871	4.77	Bp	0.0479	20 17 47.219	47.171	38 1 58.85	21	83.73	SAO	(1)
				±0.0038		47.211		6	85.69		(2)
HD 216489	16 4831	5.84	K0	-0.0056	22 53 2.291	2.297	16 50 27.86	37	83.76	FK4S	(1)
				±0.0035		2.292		6	85.52		(2)
HR 8752	56 2923	4.96	G0	0.0691	23 00 5.102	5.033	56 56 43.12	4	82.07	FK4S	(1)
				±0.0101		5.112		6	85.55		(2)

(1) Photoelectric Transit Instrument - Torino Observatory - (2) Carlsberg Meridian Circle - La Palma
N = Number of observ. Ep = Mean epoch of observ. (1980+) Cat = Optical Ref. adopted Catalogue

Table 2: OPTICAL AND RADIO POSITIONS OF RADIO SOURCE HR 5110 = DM 37 2426 = FK4 502 m=4.96 Sp. F0

Station		α(O-C)	ε	αobs	αcalc	δobs	δcalc	N	Ep.
Torino	PTI	0^s.0009+/-0^s.0020		13^{h}34^{m}47^s.803	47^s.802		37°10'56".70	19	82.67
Cagliari	AST	0.0105	0.0036	47.812	47.802		56.70	21	84.09
G.C.A.	AST	0.0021	0.0007	47.804	47.802				64.50
Bratislava	TI	0.0004	0.0035	47.802	47.802				76.20
Bordeaux	AMC	0.0090		47.695	47.686	37°10'56".92	56.92		83.32 *
VLBI Network				47.689			56.86		83.57 *

* To compute this positions, proper motions and trigonometric parallaxes have not been taken into account, between the epoch of observation and J2000.0

References

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