Bull. Astron. Belgrade № 155 (1997), 63 – 70

UDC 524.33-13
Original scientific paper

THE VARIABILITY OF THE OPTICAL POLARIZATION OF 44i Boo?

S. Nikolić, J. Arsenijević and S. Marković

Astronomical Observatory, Volgina 7, 11000 Belgrade, Yugoslavia

(Received: November 18, 1996)

SUMMARY: Linear optical observational polarisation of 44i Boo (HD 133640) measured with the Belgrade polarimeter in the period 1983-1990. is presented. We detected the polarization with the polarization percentage range between 0.01% and 0.19% and polarization angle with almost all values between 0 and 180 degrees. Fourier analysis of polarization percentage data fails to give clear evidences of time dependent polarisation. On the other hand, statistical test (Pfeiffer, 1977.) for Q and U Stokes parameters leads to strong time variation of parameter Q, but not of U.

1. INTRODUCTION

The triple system 44i Bootis is the well known visual binary ADS 9494 with orbital period $\sim$ 225 years (Hill *et al.* 1989). The distance to this system, obtained as the mean of the measurements reported by Eggen (1967) and Gliese (1969) is 12.2±0.3pc. The spectral type of the primary ADS 9494A (44i Boo A) is F5 V, while the secondary of the system, close binary 44i Boo BC (ADS 9494BC) is the MK spectral type G2V+G. Close binary 44i Boo is of W UMa type eclipsing star with the visual magnitude V=$4^m.76$. This late-type contact binary has the following physical parameters for the primary and secondary components respectively: $m/m_\odot$ 0.98 ± 0.04 and 0.55 ± 0.02; $R/R_\odot$ 0.87 ± 0.02, 0.66 ± 0.1; T_e(° K) 5300 ± 65, 5035 ± 120 and mass ratio (primary/secondary) 1.79 ± 0.03 (Hill *et al.* 1989). The period of eclipsing is $\sim$0.2678 days and many various analyses of the period (Bergeat *et al.* 1972, Duerbeck, 1978, Hill *et al.* 1989 and references therein) lead to even contradictory results. From a recent detailed analysis of Hill *et al.* (1989) it is clear that there were several small period changes between 1920. and 1985. and we accepted their result because *rms* of each fit is gratifyingly small (less than 0.003 days) and the rate of change of the period is free of the light-time effects that vitiate some earlier spurious estimates. The light-curve analysis (in U, B and V) is also difficult due to light contribution of the brighter visual component A because the brightness variation (between primary minimum and primary maximum) of the variable (44i BC) is only $0.^m17$ in blue (Al-Naimiy *et al.* 1989).

In other spectral domains it is interesting to mention X-ray light curve obtained with EXOSAT on January, 10th 1985. (Vilhu and Heise, 1986) also an X-ray survey of contact binaries using the *Einstein Observatory* (Cruddace and Dupree, 1984). The EXOSAT curve shows no clear orbital modulation resembling the change in the binary system's visible area and the observed dips could be interpreted as due to cool absorbing clouds above the localized X-ray regions. Also there was evidence that the binary's neck region is a site of X-ray emitting hot gas. The coronae looked highly structured (in temperature and geometry) and variable (Vilhu and Heise, 1986). On the other hand, Crudacce and Dupree (1984) proposed the dominant source of X-ray emission in late-type contact binary stars appears to be a hot corona. Two pieces of evidence favour this view: first, IUE spectra of a number of these systems reveal strong chromospheric and transition region emission lines, and second, the X-ray spectra of 44i Boo and VW Cep (Fig. 1. in Crudacce and Dupree, 1984) have been fitted satisfactorily only by models containing hot, optically thin plasmas. They are, maybe, not strong enough to exclude models which consider other possible sources of X-ray emission, such as colliding shock waves or the impact of gas streams with the stellar surface. The emission region appears to be distributed over a major fraction of the stellar surface and to extend to a significant distance above the photosphere, instead of being concentrated in some local emission volume.

In UV domain the intrinsic stellar hydrogen Lyman α (Ly_α 1216) emission flux was determined from low-resolution IUE spectra (Vilhu *et al.* 1989). The observations covered the entire 6.4h orbital cycle and the clear correlation between stellar Ly_α emission and variation of the C II and C IV emission fluxes was found. It shows orbital modulation in phase with the visual light curve. The composite profile of Ly_α indicates that both components of this binary have equally active chromospheres and transition regions. In 1989. 44i Boo was observed by IUE (International Ultraviolet Explorer) over several binary periods. Large modulations in the intensities of the features found in the spectra were seen (Barstow *et el.*, 1990). The EUV spectrum observed with the EUVE spectrometers during May, 2-7, 1994. has shown strong emission from highly ionized Fe (Brickhouse and Dupree, 1996). The light curve obtained with the EUVE Deep Survey (DS) instrument during the 6-day observation (about 20 continuous epochs) shows variability with orbital phase with a single EUV light minimum near the phase 0.5. According to the authors, that observation demonstrates for the first time that coronal emission has a rotational component.

Intrinsic linear polarization is now well established as due to scattering from circumstellar material in the majority of cases (Zellner and Serkowski, 1972). After polarization observations of 17 eclipsing variables between the few possible mechanisms of origin of polarization of the radiation of close binary systems, the scattering of the light of the star in a gas envelope is found as most effective if the star has an envelope (Shakhovskoj, 1964). The revealing of time-dependent polarization is a proof that the observed polarization contains an intrinsic component (Zellner and Serkowski, 1972). Unfortunatelly, polarimetric observations of 44i Boo were rare and incomplete, those of Pfeiffer (1977) being an example. Four other polarimetric observations were listed in a review article by Koch (1990). Two of them reported zero polarization. In our measurements it was not possible to separate brighter component of the system 44i Boo A from our variable 44i Boo BC. This might cause uncertain amount of depolarization of light from the star, but does not have any effect on time-variability of polarization.

2. OBSERVATIONS

The observations have been carried out with the Zeiss equatorial having a lens of 65cm aperture, in the visual spectral domain V, using the Belgrade Observatory's polarimetar. Any individual measure is a result of a 8-minute integration of photoelectric signal modulated by a continously rotating polaroid, its full turn taking 1 minute. During the entire time period the characteristics of the instrument and the polarimeter were controlled on the basis of observation of polarimetric standards as well as of stars with zero polarization. Total of 166 observations obtained between the years 1983. and 1990. are listed in Table 1.

In Fig. 1. polarization percent versus time in JD is given. The majority of observations (about 87.5%) was obtained in the years 1983. and 1990.

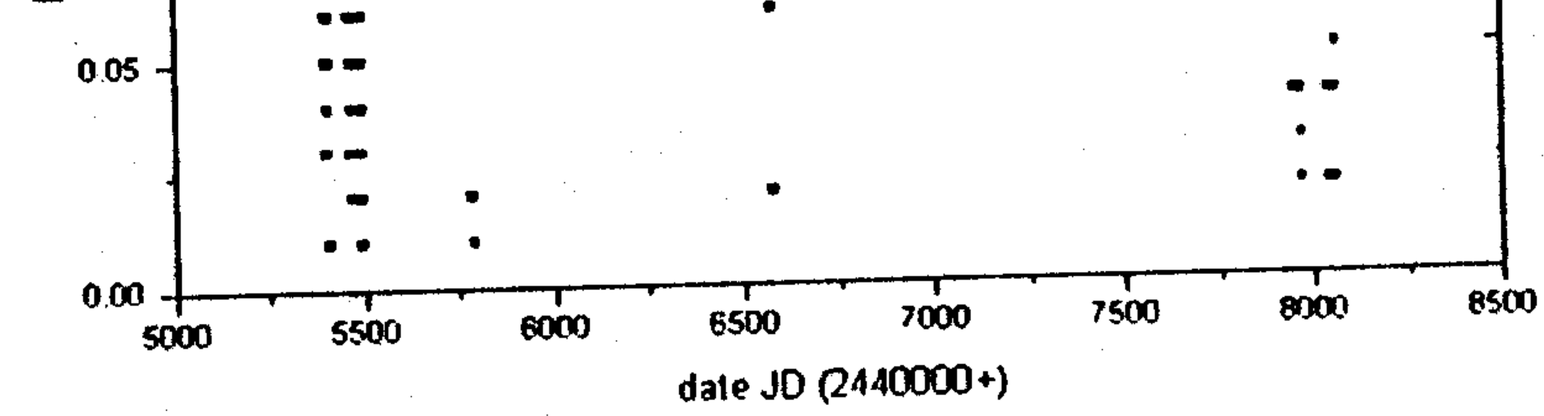

Fig. 1. The observed polarization percentage of 44i Boo in V filter in the period 1983-1990.

Table 1. The observations of the polarization parameters of 44 i Boo in the V spectral region

No	Date (y/m/d)	JD (2440000+)	p (%)	angle (°)	Q (%)	U (%)
1	830309	5402.653	0.05	23.1	0.038	0.04
2	830309	5402.662	0.03	170.9	0.034	-0.012
3	830309	5402.671	0.14	108.8	-0.116	-0.09
4	830310	5403.587	0.1	52.5	-0.028	0.101
5	830310	5403.607	0.05	92	-0.055	-0.004
6	830310	5403.617	0.05	117.9	-0.029	-0.043
7	830310	5403.625	0.06	144.5	0.02	-0.06
8	830312	5405.588	0.13	137.8	0.013	-0.137
9	830312	5405.606	0.05	171.1	0.048	-0.016
10	830312	5405.615	0.07	131.2	-0.011	-0.076
11	830312	5405.624	0.04	31	0.022	0.043
12	830313	5406.628	0.05	65.7	-0.04	0.044
13	830313	5406.647	0.04	139	0.006	-0.044
14	830314	5407.585	0.1	139.3	0.015	-0.103
15	830314	5407.646	0.16	4.2	0.166	0.025
16	830314	5407.656	0.1	166.3	0.092	-0.048
17	830315	5408.599	0.01	155.2	0.012	-0.015
18	830315	5408.619	0.05	125	-0.02	-0.055
19	830315	5408.628	0.11	138.9	0.015	-0.117
20	830315	5408.638	0.15	129.5	-0.03	-0.156
21	830316	5409.577	0.06	158.7	0.048	-0.045
22	830316	5409.597	0.17	159.6	0.134	-0.116
23	830316	5409.615	0.15	154.9	0.101	-0.122
24	830316	5409.623	0.13	90	-0.139	-0.001
25	830317	5410.599	0.08	142.7	0.023	-0.087
26	830317	5410.617	0.06	140.9	0.013	-0.065
27	830317	5410.626	0.15	132	-0.017	-0.158
28	830317	5410.635	0.1	103.1	-0.094	-0.047
29	830318	5411.569	0.17	94.5	-0.175	-0.028
30	830416	5440.510	0.08	127.2	-0.024	-0.087
31	830417	5441.523	0.08	36.2	0.026	0.082
32	830417	5441.552	0.1	149	0.047	-0.089
33	830417	5441.560	0.13	118.5	-0.073	-0.112
34	830507	5461.472	0.06	90.7	-0.066	-0.002
35	830510	5464.444	0.15	124	-0.057	-0.14
36	830510	5464.452	0.09	154.1	0.058	-0.075
37	830510	5464.460	0.03	104.5	-0.032	-0.018
38	830510	5464.477	0.1	141.7	0.025	-0.106
39	830512	5466.448	0.11	115.9	-0.069	-0.088
40	830512	5466.472	0.1	5.8	0.101	0.02
41	830512	5466.526	0.03	77.2	-0.032	0.014
42	830512	5466.537	0.07	55.1	-0.027	0.072
43	830513	5467.422	0.09	15.3	0.08	0.048
44	830513	5467.442	0.11	112.3	-0.085	-0.084
45	830513	5467.453	0.16	149.7	0.078	-0.14
46	830513	5467.472	0.09	113	-0.069	-0.072
47	830513	5467.485	0.18	141	0.039	-0.183
48	830513	5467.504	0.15	129.3	-0.03	-0.148
49	830514	5468.431	0.09	58	-0.041	0.083

Table 1. (continued)

No	Date (y/m/d)	JD (2440000+)	p (%)	angle (°)	Q (%)	U (%)
50	830514	5468.447	0.02	166.8	0.018	-0.01
51	830514	5468.456	0.05	50.1	-0.011	0.057
52	830514	5468.464	0.13	120.4	-0.065	-0.117
53	830514	5468.472	0.04	9.5	0.038	0.013
54	830514	5468.481	0.02	23.2	0.019	0.02
55	830514	5468.489	0.04	148.7	0.02	-0.041
56	830514	5468.497	0.05	129.6	-0.01	-0.05
57	830515	5469.426	0.16	98.1	-0.155	-0.045
58	830516	5470.425	0.14	9.6	0.132	0.046
59	830516	5470.451	0.07	121.1	-0.035	-0.067
60	830516	5470.468	0.07	6.2	0.069	0.015
61	830516	5470.483	0.12	141.1	0.025	-0.119
62	830516	5470.5	0.11	149.3	0.055	-0.101
63	830517	5471.464	0.12	60.2	-0.062	0.105
64	830517	5471.472	0.17	128.2	-0.041	-0.17
65	830517	5471.5	0.17	111.7	-0.131	-0.124
66	830517	5471.508	0.16	157.3	0.117	-0.119
67	830517	5471.542	0.15	112.6	-0.109	-0.111
68	830518	5472.443	0.03	162.4	0.026	-0.019
69	830518	5472.472	0.09	137	0.007	-0.098
70	830518	5472.48	0.13	35.6	0.043	0.127
71	830518	5472.49	0.14	135.8	0.004	-0.142
72	830518	5472.5	0.03	119.3	-0.02	-0.032
73	830607	5492.371	0.06	16.3	0.055	0.036
74	830607	5492.415	0.07	55.7	-0.027	0.067
75	830607	5492.424	0.12	159.9	0.096	-0.082
76	830607	5492.436	0.03	89	-0.034	0.001
77	830607	5492.459	0.04	41	0.005	0.041
78	830608	5493.342	0.07	119.7	-0.04	-0.067
79	830608	5493.353	0.08	21.2	0.061	0.056
80	830608	5493.372	0.03	1.3	0.036	0.001
81	830608	5493.381	0.09	114.7	-0.062	-0.072
82	830608	5493.389	0.09	86.4	-0.093	0.011
83	830608	5493.397	0.14	171.9	0.137	-0.04
84	830608	5493.431	0.01	116.1	-0.006	-0.008
85	830608	5493.44	0.13	89.6	-0.138	0.001
86	830609	5494.351	0.09	21	0.068	0.061
87	830609	5494.359	0.04	167.6	0.042	-0.02
88	830609	5494.386	0.06	98.2	-0.059	-0.018
89	830609	5494.397	0.1	128.5	-0.024	-0.103
90	830609	5494.407	0.06	173.7	0.059	-0.014
91	830609	5494.425	0.05	54.1	-0.016	0.047
92	830609	5494.434	0.06	162.2	0.05	-0.037
93	830609	5494.449	0.07	17	0.06	0.041
94	830609	5494.469	0.13	124.3	-0.05	-0.127
95	830609	5494.478	0.18	135.2	0.001	-0.186
96	830609	5494.497	0.06	144.3	0.02	-0.061
97	830609	5494.506	0.07	127.9	-0.018	-0.069

Table 1. (continued)

No	Date (y/m/d)	JD (2440000+)	p (%)	angle (°)	Q (%)	U (%)
98	830609	5494.526	0.02	137.6	0.001	-0.021
99	830609	5494.547	0.06	153.8	0.04	-0.053
100	840327	5786.562	0.15	51.6	-0.037	0.154
101	840327	5786.581	0.1	152.3	0.058	-0.085
102	840327	5786.589	0.02	139.6	0.004	-0.026
103	840331	5790.553	0.01	50.4	-0.003	0.011
104	840331	5790.587	0.19	152.7	0.113	-0.159
105	840331	5790.601	0.18	140.3	0.033	-0.179
106	840331	5790.613	0.11	116.3	-0.07	-0.092
107	840331	5790.624	0.15	119.4	-0.079	-0.131
108	860526	6576.421	0.12	151.3	0.066	-0.104
109	860526	6576.433	0.16	61	-0.086	0.137
110	860526	6576.446	0.07	167.5	0.066	-0.031
111	860526	6576.47	0.06	179.6	0.064	-0.001
112	860526	6576.482	0.17	107	-0.143	-0.097
113	860526	6576.494	0.13	148.6	0.061	-0.119
114	860526	6576.506	0.11	162.5	0.097	-0.069
115	860526	6576.518	0.02	129.2	-0.005	-0.023
116	860526	6576.531	0.09	9.1	0.094	0.031
117	860526	6576.542	0.09	147.2	0.041	-0.09
118	860527	6577.396	0.02	136.1	00	-0.021
119	870430	6915.47	0.09	49.6	-0.016	0.095
120	900225	7947.641	0.04	14.6	0.036	0.02
121	900225	7947.65	0.09	95.5	-0.098	-0.02
122	900321	7971.585	0.04	127.1	-0.014	-0.047
123	900321	7971.596	0.02	168.6	0.022	-0.01
124	900321	7971.604	0.03	71	-0.029	0.021
125	900530	8041.401	0.04	37.7	0.01	0.039
126	900530	8041.41	0.02	94.8	-0.024	-0.005
127	900530	8041.437	0.06	56.4	-0.025	0.057
128	900530	8041.445	0.07	48.9	-0.01	0.069
129	900530	8041.452	0.13	135.9	0.004	-0.138
130	900530	8041.463	0.08	58.6	-0.04	0.077
131	900530	8041.47	0.13	170.6	0.128	-0.044
132	900619	8061.402	0.07	13.5	0.069	0.035
133	900619	8061.419	0.05	15.6	0.044	0.027
134	900619	8061.428	0.06	104.7	-0.059	-0.034
135	900619	8061.436	0.05	19.4	0.043	0.035
136	900619	8061.444	0.04	41.8	0.005	0.046
137	900619	8061.453	0.07	174.2	0.069	-0.015
138	900619	8061.461	0.07	170.2	0.07	-0.025
139	900619	8061.469	0.07	158.8	0.057	-0.053
140	900619	8061.478	0.11	84.6	-0.113	0.02
141	900619	8061.487	0.16	132.8	-0.013	-0.168
142	900619	8061.505	0.02	29.6	0.011	0.02
143	900619	8061.514	0.14	124.3	-0.054	-0.139
144	900620	8062.356	0.19	111.8	-0.14	-0.134
145	900620	8062.365	0.05	125.2	-0.019	-0.054
146	900620	8062.373	0.06	128.5	-0.016	-0.068
147	900620	8062.382	0.1	44.6	0.001	0.101

Table 1. (continued)

No	Date (y/m/d)	JD (2440000+)	p (%)	angle (°)	Q (%)	U (%)
148	900620	8062.391	0.06	85.1	-0.064	0.01
149	900620	8062.399	0.09	135.8	0.002	-0.092
150	900620	8062.408	0.08	92.6	-0.09	-0.009
151	900620	8062.416	0.11	115	-0.073	-0.087
152	900628	8070.346	0.15	157.4	0.109	-0.11
153	900628	8070.39	0.19	2.6	0.19	0.017
154	900728	8100.371	0.07	165	0.064	-0.038
155	900728	8100.382	0.15	162.5	0.127	-0.089
156	900728	8100.396	0.14	107.3	-0.122	-0.085
157	900728	8100.406	0.07	49.5	-0.013	0.075
158	900728	8100.427	0.08	156	0.058	-0.066
159	900728	8100.437	0.08	115.3	-0.056	-0.069
160	900728	8100.447	0.07	74.4	-0.067	0.04
161	900819	8122.299	0.06	58.8	-0.029	0.053
162	900819	8122.311	0.08	149.9	0.039	-0.07
163	900819	8122.321	0.19	10.5	0.179	0.068
164	900819	8122.344	0.08	72.1	-0.066	0.047
165	900819	8122.353	0.19	2.6	0.196	0.018
166	900819	8122.362	0.16	137.1	0.012	-0.166

In Fig. 2. variation of polarization angle is given and in Fig. 3. Stokes parameters U versus Q are plotted.

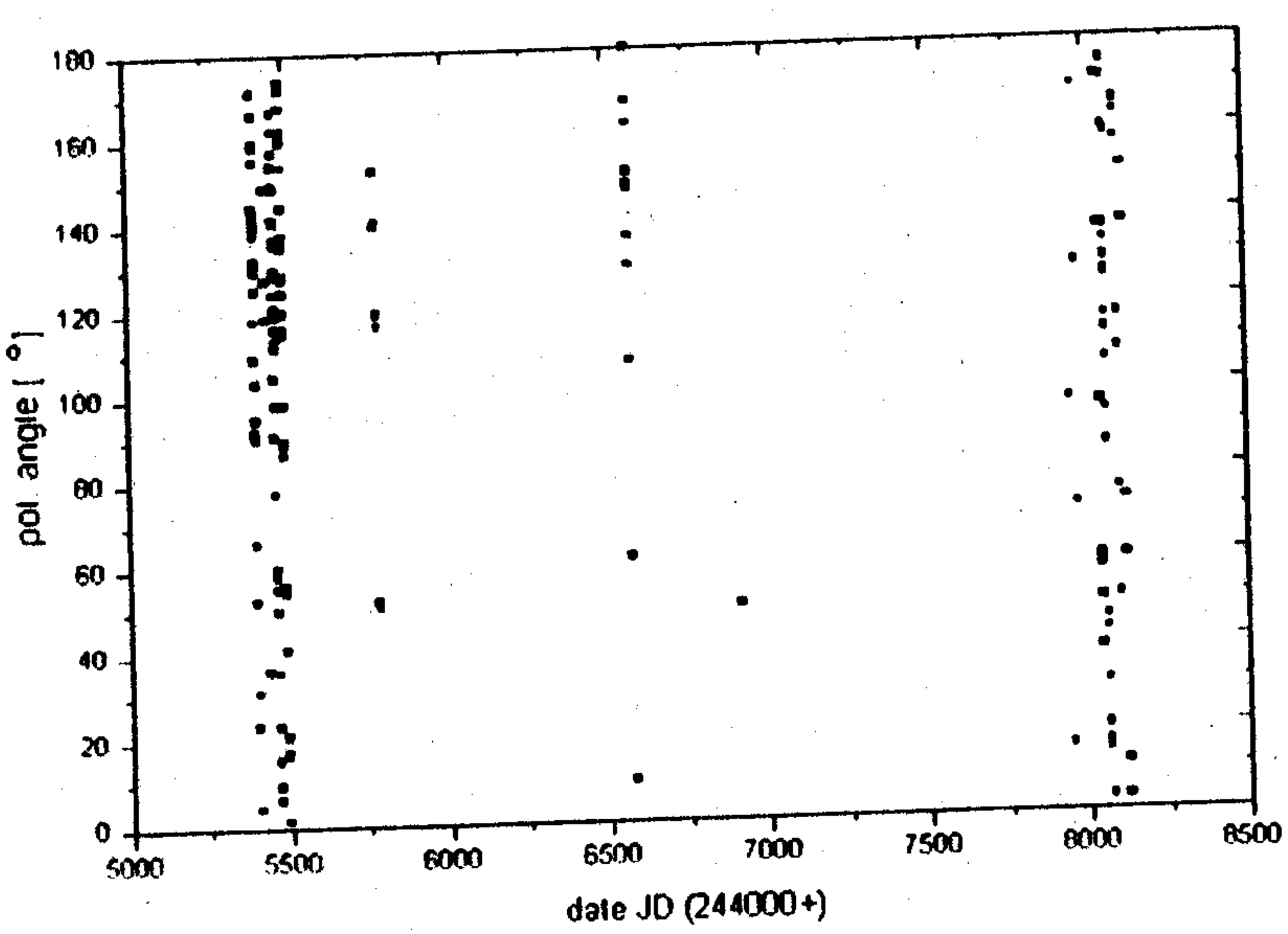

Fig. 2. The position angle of the observed polarization of 44i Boo in V filter in the period 1983-1990.

3. ANALYSIS

From Figs. 1. and 2. it is obvious that there is no noticeable systematic long-term changes in the polarization percentage or in the polarization angle. We might, however take this statement reservedly, because of the poor data coverage between 1983. and 1990.

We adopted the ephemeris for the primary minimum $J.D.hel. 2442450.5734 + 0.26780761E$ (Hill *et al.*, 1989). Because of the small period, heliocentric correction of the time of observation was made. No clear variation of the polarisation angle with the time can be seen. The obtained result concerning polarisation percentage is given in Fig. 4.

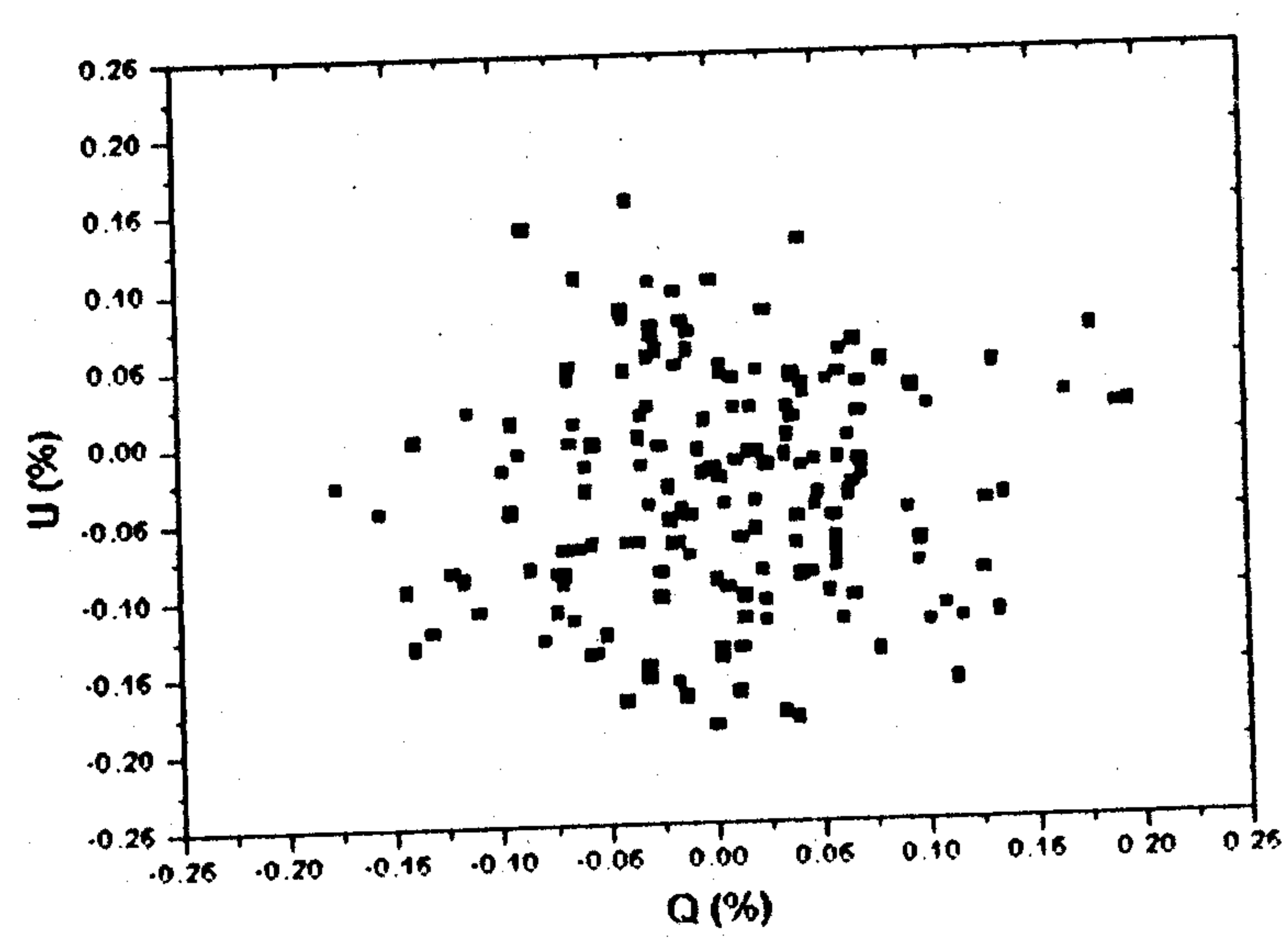

Fig. 3. The observed polarization, Stokes parameters Q and U of 44i Boo in the period 1983-1990.

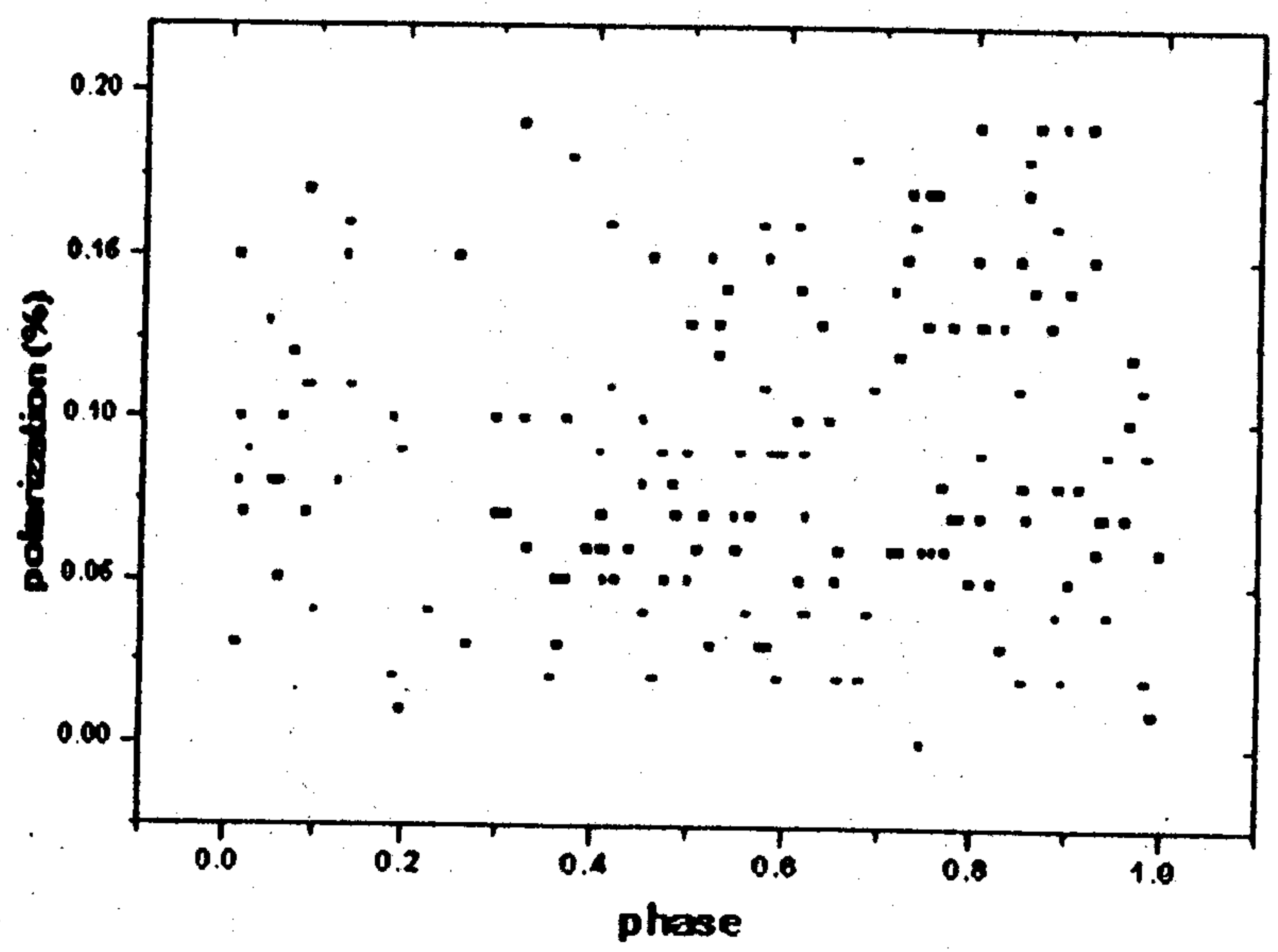

Fig. 4 The observed polarization percentage of 44i Boo in V filter versus phase (the ephemeris *J.D.hel.* $2442450.5734 + 0.26780761E$ (Hill *et al.*, 1989).

Although this distribution may seem almost random, small periodic change seems to appear. Two things were done in the attempt to check this: averaging data across 0.02, 0.05 and 0.1 phases and Fourier analysis of the rough data.

In Fig. 5. the averaged polarisation percetage over 0.02 phase is given as an example. A polynomial approximation usually leads to the fourth degree polynomial which has acceptable residuals (e.g. solid curve in Fig. 5). Free hand curve may be drawn across all averaged data and it always exibits sinusoidal change with a small amplitude (close to the polarimeter's internal error).

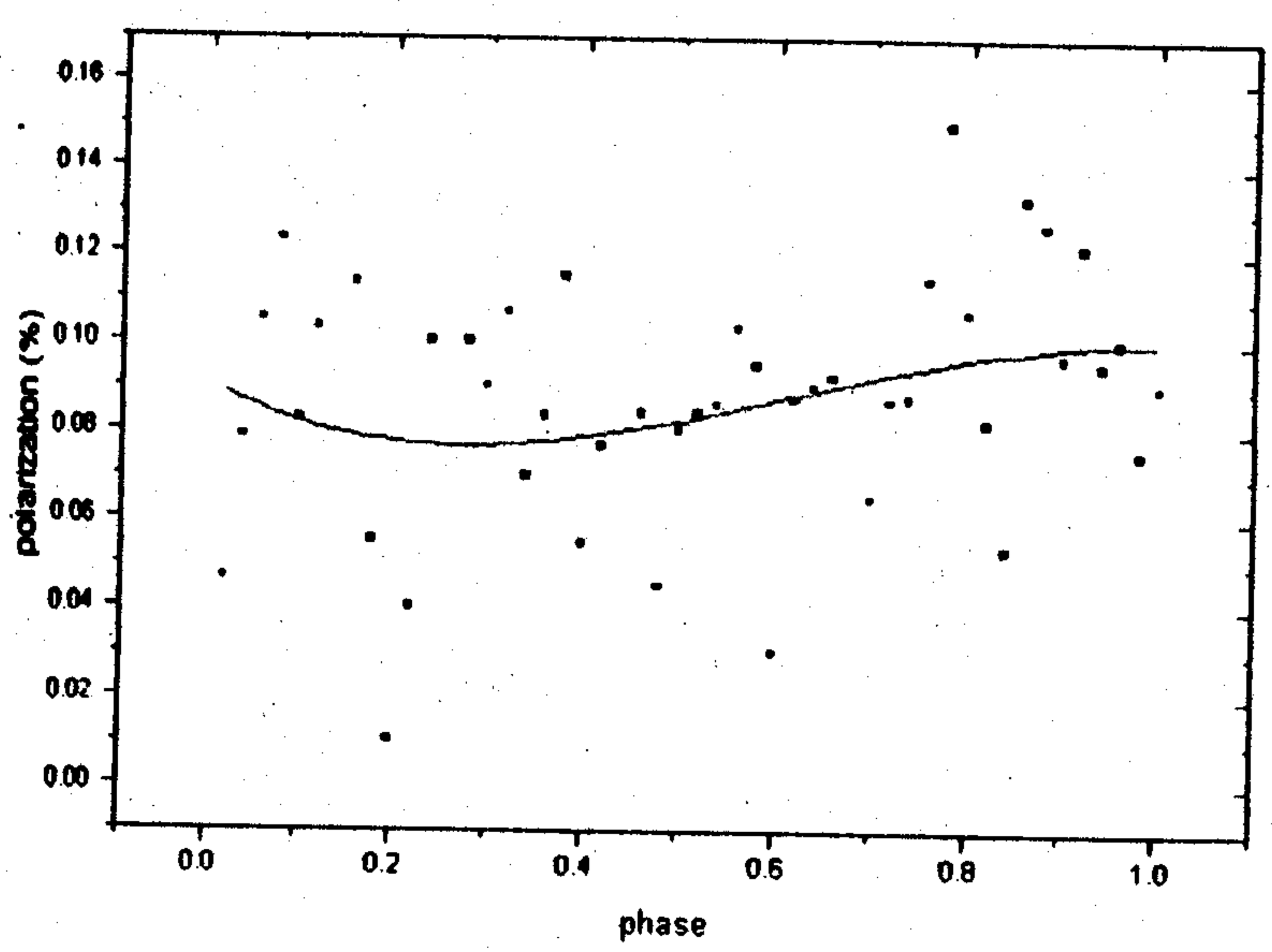

Fig. 5. The observed polarization percentage of 44i Boo in V filter averaged across 0.02 phase.

Fourier analysis of the data was made through the program package of MUFRAN ('MUlty FRequency ANalyse', Kolláth, 1990.) that deals with unequally spaced, gapped data. The Fourier spectrum shows plenty of peaks, but almost none has been high enough for further analysis. A proper check specially for frequencies that may lead to photometric (Duerbeck, 1978) and also polarisation percetage change was made. Unfortunately, the least square method used to find the best fit parameters (amplitude and phase) for those frequencies gave too small level of significance.

To avoid different quality of the observational data, days with more single observations were analysed. The existence of a time-dependent polarization can be established for a set of observations by a statistical test. For this research, a chi-squared test has been used (Pfeiffer, 1977). This test compares the scatter from the mean of polarisation observations for a program star with the scatter from the mean of the observations for a group of control stars. The control stars were both unpolarized and polarised standards from the list of Belgrade Observatory's Polarimetric Standards. The appropriate statistics is given by

$$\chi^2 = (N-1)\frac{s^2}{\sigma^2},$$

where N is the number of observations for a particular program star, s is standard deviation of an observation of unit weight from weighted mean of the N observations and σ is standard deviation of an observation of unit weight from weighted mean of the observations for control stars. The weight of all observations for the program star is assumed to be equal.

The χ^2 test has been applied to the mean values of the Q and U parameters for each measurement. This choice of parameters is preferred since Q and U result directly from the least-squares reduction of the measurements comprised by an observation. A probability grater than 0.99 is regarded as definite evidence for time variation in polarization observations.

Table 2. presents our results. In the first column the date of observation is given, in the second column is the number of single measurements of 44i Boo during that night, in the third column is the name of the standard star with at least two measurements per night ('0' in superscript means the standard with zero polarisation, and 'P' in superskript denotes the polarized standard) and in fourth and fifth column are obtained probabilities for Q and U Stokes parameters, respectively. If probability is less than 0.50 it is omitted.

Table 2.

Date d/m/y	num. obs.	standard star	$P\chi^2$ (Q)	$P\chi^2$ (U)
9. 06. '83.	14	ηAqu^P	0.99	/
30. 03. '90.	9	HD 154445^P	0.68	/
19. 06. '90.	12	βAql^0	0.99	/
28. 07. '90.	8	βAql^0	0.99	0.90
19. 08. '90.	7	ιPeg^0	/	0.99

The results indicate a high probability that the Q parameter is time dependent, but less strong evidence exists for a time dependence of the U parameter.

According to Pfeiffer (1977) no time dependent polarisation is found, with a remark that there were too few observations and phase coverage was too sparse to make any definite conclusions. Compared with his data, our data set is more complete and we believe that there is good evidence of time dependence of polarisation for this star.

4. CONCLUSIONS

44i Boo was observed with Belgrade Observatory's polarimeter between the years 1983. and 1990. Detected polarization which percent ranges between 0.01% and 0.19%, is possibly due to scattering of star light in the stellar envelope. The evidence for the chromospheres around both components were found in low-resolution IUE spectra (Vilhu *et al.*, 1989). The Fourier analysis of the presented data could not give clear changes in polarization percentage with the period. On the other hand, the applied statistical test, according to Pfeiffer (1977), established a strong evidence for time-dependent variation of Stokes parameters. We may conclude, based on our data analysis, that there is a high probability for time-dependent variation of the observed polarization. Only new observations, of better quality, may give a definite answer.

Acknowledgements – This work is a part of the project "Astrometrical, Astrodynamical and Astrophysical investigations", supported by Ministry of Science and Technology of Serbia.

REFERENCES

Al-Naimiy, H.M.K., Fleyeh, H.A., Al-Sikab, A.O., Al-Razzaz, J.M.: 1989, *Astrophys. Space Sci.*, **151**, 135.
Barstow, M.A., Bromage, G.E. and Holberg, J.B.: 1990, in *ESA, Evolution in Astrophysics; IUE Astronomy in the Era of New Space Missions*, 375.
Bergeat, J., Lunel, M., Sibille, F., Veer, F.: 1972, *Astron. Astrophys.* **17**, 215.
Brickhouse, N.S., Dupree, A.K.: 1996, Bull. American Astron. Soc., **188**, #71.04.
Cruddace, R.G., Dupree, A.K.: 1984, *Astrophys. J.*, **277**, 263.
Duerbeck, H.W.: 1978, *Astron. Astrophys. Suppl.* **32**, 361.
Eggen, O.J.: 1967, *Mem. R.A.S.*, **70**, 111.
Gliese, W.: 1969, *Catalogue of Nearby Stars, Veroff. Astr. Rechen Inst,. Heidelberg*, No 22.
Hill, G., Fisher, W.A., Holmgren, D.: 1989, *Astron. Astrophys.* **211**, 81.
Koch, R.H.: 1990, it Bull. Inform CDS, **38**, 175.
Kolláth, Z.: 1990, *private communication.*
Pfeiffer, R.J.: 1977, *Astron. J.* **82**, 734.
Shakhovskoy, M.M.: 1964, *Astron. Zh.* **41**, 1042.
Vilhu, O., Heise, J.: 1986, *Astrophys. J.* **311**, 937.
Vilhu, O., Heff, J.E., Rahunen, T.: 1989, *Astron. Astrophys.* **208**, 201.
Zellner, B., Serkowski, K.: 1972, *Publ. Astron. Soc. Pac.*, **84**, 619.

ВАРИЈАЦИЈЕ ОПТИЧКЕ ПОЛАРИЗАЦИЈЕ 44i Boo?

С. Николић, Ј. Арсенијевић и С. Марковић

Астрономска опсерваторија, Волгина 7, 11000 Београд, Југославија

УДК 524.33–13
Оригинални научни рад

У периоду од 1983. до 1990. на полариметру Београдске опсерваторије прикупљено је 166 мерења поларизације тесног двојног система 44i Boo (HD 133640). Проценат поларизације се налази у опсегу од 0.1% до 0.19%, док угао поларизације има скоро све вредности између 0 и 180 степени. Фуријерова анализа није дала јасне доказе о временској променљивости процента поларизације. Примењен статистички тест (Pfeiffer, 1977) на Стоксове параметре Q и U, са друге стране, јако указује на временску зависност за параметар Q. За Стоксов параметар U индиције нису убедљиве.