SOME VARIABLE STARS OBSERVED BY THE SCANDINAVIAN VARIABLE STAR OBSERVERS

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Abstract

Visual data on nine long period variables and two irregular variables are described.

1. Introduction

In the 1960's Mr. Gunnar Darsenius, then the leader of the variable star section of the Swedish Astronomical Association, began to observe several neglected variables. Gradually many of these stars have also been adopted also by the AAVSO, but 11 of them are probably observed only by the Scandinavian Variable Star Observers (SVSO).

The variables were first observed using the Argelander step method utilizing comparison stars marked with letters. Because of computer restrictions, the letters were later changed to fixed magnitude values on the basis of visual estimations of several observers.

2. Results

Figures 1-3 give typical light curves for the long period variables of this study. The curves are averages, combined from many periods of our limited data.

The times of maxima were plotted against the numbers of epochs and least square lines were fitted. The results are given in Table 1. For comparison, certain information is also cited from *General Catalogue of Variable Stars* (Kholopov *et al.* 1985) (GCVS).

3. Discussion

The observed ranges of the variables are generally in harmony with those given in the GCVS. The observed epochs and periods are about the same as in the GCVS. The most remarkable exceptions are as follows:

1. AZ And remains fairly bright (magnitude 14.5) at minimum and can be seen with amateur telescopes.

2. SW Cam on the contrary is fainter (magnitude 14.8) at minimum.

3. UZ Cam is brighter at maximum than reported in GCVS.

4. Our periods for SW Cam and UZ Cam (253.5 and 230.8 days, respectively) are nearer the values of 254.2 and 231 days reported in the earlier editions of GCVS.

5. The form of the light curve of WZ Dra varies much from cycle to cycle. This is perhaps why the type has been changed from M to SRa. The length of the period however, keeps its value well which is somewhat longer than reported in the GCVS.

6. GM Aur was occasionally observed in the 1970's and it was always at constant brightness.

7. V786 Cyg can nearly always be seen. Perhaps its brightness has permanently increased.

Table 1. Data on Variable Stars

Design.	Name	Type	Range GCVS		This Study	Epoch GCVS 2400000+	This Study	Period GCVS	This Study	Rem
2313+48	AI And	M	11.5 -	15.3p	11.5 - (14.5	42492	42498	326.4	327.0	
2313+46	AO And	M	11.2 -	14.0V	11.5 - 14.5	42536	42536	334.2	335.7	
2259+48	AZ And	M	11.2 -	(16.7p	11.0 - 14.5	42448	42460	195.0	195.6	
0752+73	SW Cam	M	9.8 -	13.3:V	9.8 - 14.8	43419	43417	252.8	253.7	1)
1422+81	UZ Cam	M	12.4 -	(14.5p	11.0 - (14.5	43773	43790	225.64	230.8	2)
2304+70	UZ Cep	M	11.3 -	(15p	11.3 - (14.5	44609	44605	303.5	303.2	3)
2009+54	V558 Cyg	M	11.2 -	(17.5p	11.2 - (14.5	44197	44196	344.65	344.6	
1732+54	SY Dra	M	10.5 -	(14.0V	10.5 - (13.5	42850	42858	391.38	390.0	
1657+52	WZ Dra	SRa	8.5 -	14.0V	9.8 - 14.0	43135	43141	401.7	404.6	4)
0448+30	GM Aur	Inst	13.1 -	13.9p	13.1					
2012+59	V786 Cyg	*	13.5 -	16.0p	13.1 - (13.7					5)

Remarks

1) GCVS:	Period varies, before 2437600 p = 254.2 d.
2) GCVS:	Period varies?, before 2428700 p = 231.0 d.
3) GCVS:	Period varies, before 2442000 p = 297.68 d.
SVSO:	On one occasion UZ Cep reached magnitude 9.6.
4) GCVS:	Amplitude varies strongly.
5) GCVS:	Usually in minimum brightness, with rapid brightenings by 0.5-1.0 m, in September 1934 the brightness was magnitude 13.5.

References

Kholopov, P. N. *et al.* 1985, *General Catalogue of Variable Stars*, Fourth Ed., Moscow.
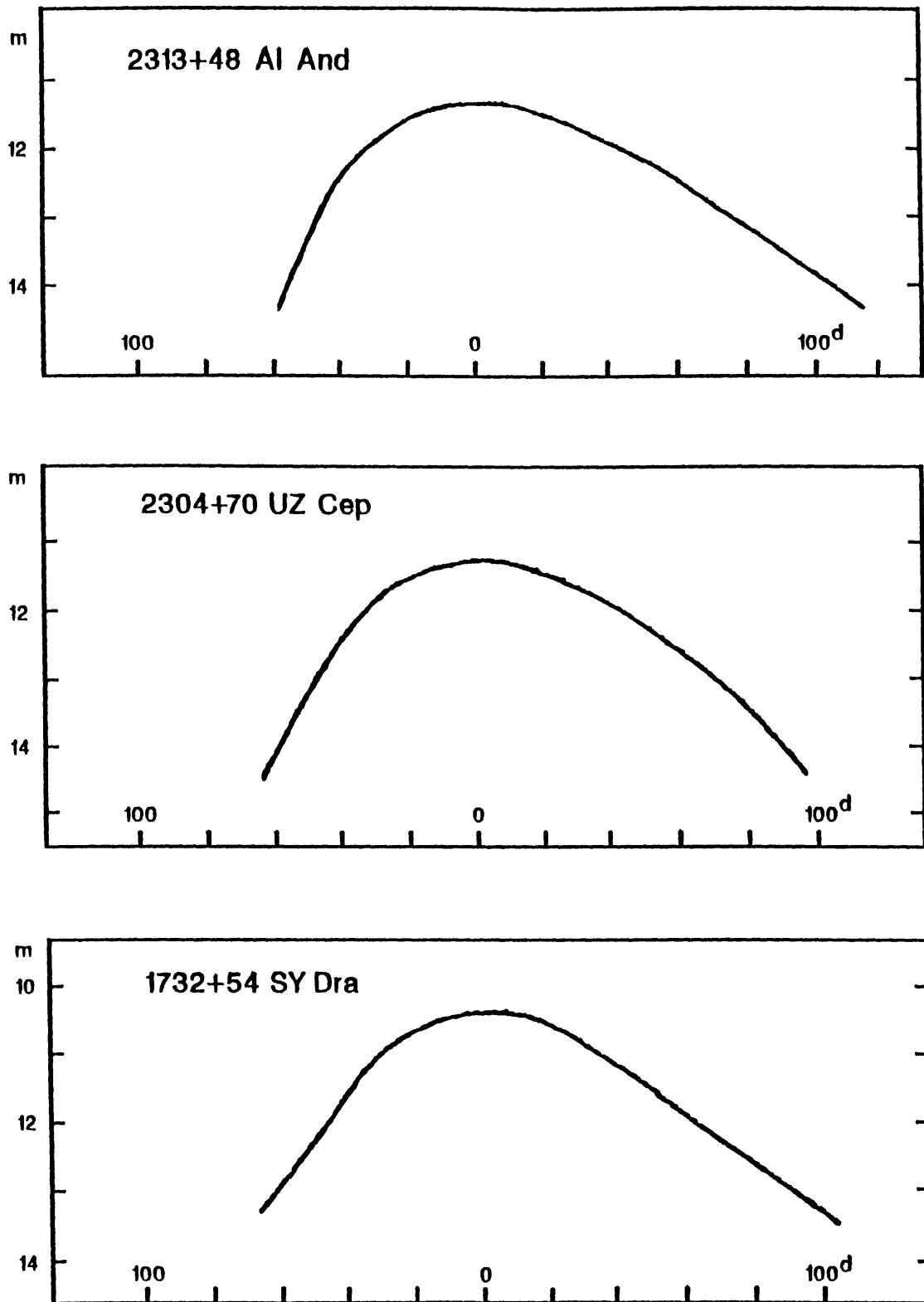
Figure 1. Light curves of AI And, UZ Cep, and SY Dra, typical long-period variables of this study. The curves are averages, combined from many periods of our limited data.
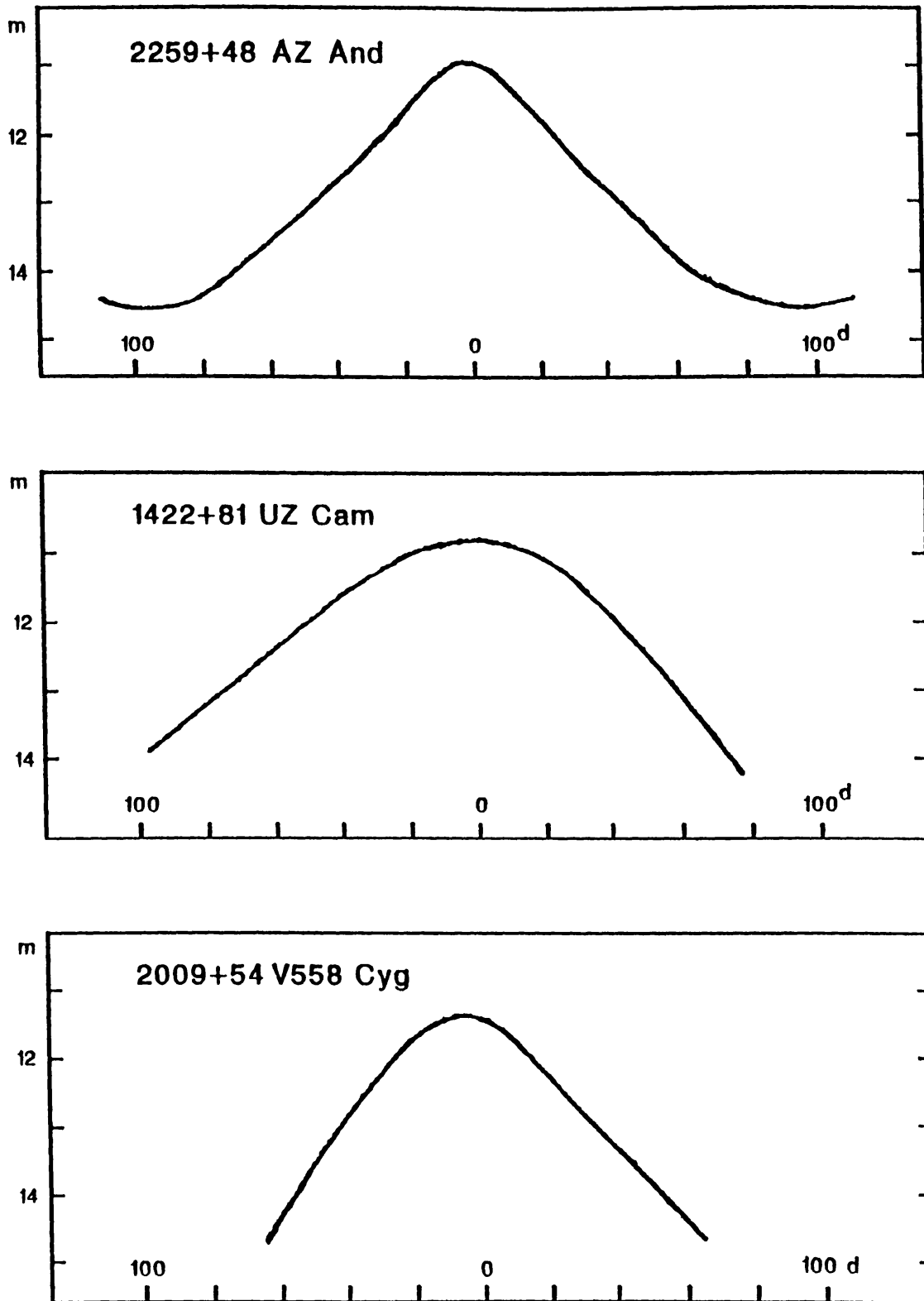
Figure 2. Light curves of AZ And, UZ Cam, and V558 Cyg, typical long-period variables of this study. The curves are averages, combined from many periods of our limited data.
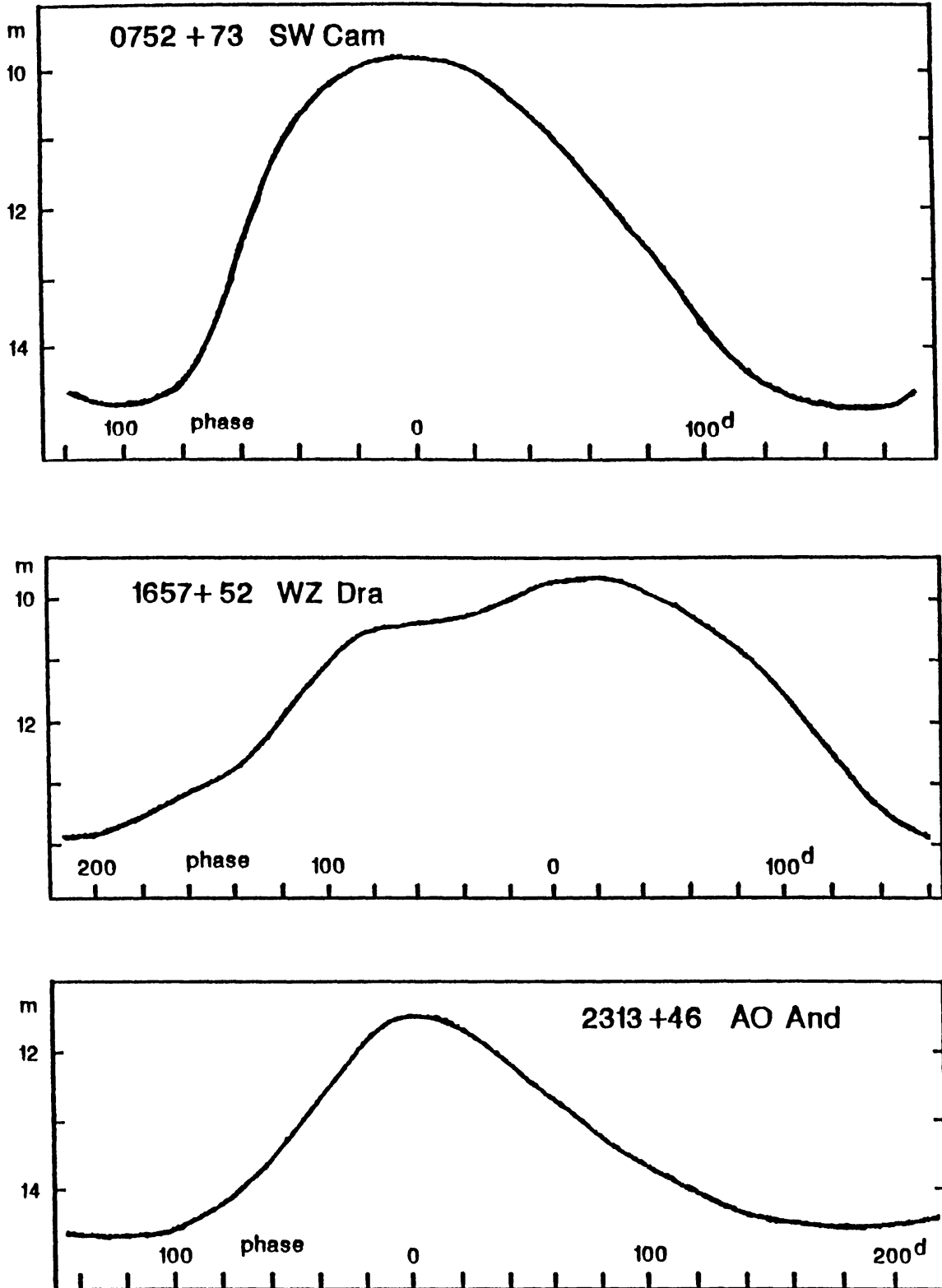
Figure 3. Light curves of SW Cam, WZ Dra, and AO And, typical long-period variables of this study. The curves are averages, combined from many periods of our limited data.