THE BAV DATABASE OF CATACLYSMIC AND ERUPTIVE VARIABLES

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Abstract

The nature of the database of the Berliner Arbeitsgemeinschaft für Veränderliche Sterne (BAV) and the procedure for accessing it are described. A summary of BAV data on some cataclysmic and eruptive variables is given.

1. The BAV Databases

The Berliner Arbeitsgemeinschaft für Veränderliche Sterne (BAV) was founded in 1950. Starting as a local observing group, the BAV has turned into an organization with almost 200 members from both parts of Germany, and from Belgium, Finland, Yugoslavia, The Netherlands, Austria, Switzerland, Spain, and Ireland. Since the end of 1986 the author has run the special section for cataclysmic and eruptive variables. Most estimates received are stored in a database running on an ATARI-ST microcomputer (1-Mb RAM, 20-Mb hard disk).

Although a general BAV database was installed several years earlier, a specialized section was needed due to different ways of analyzing observations. The initial BAV database run by Joachim Hübscher (Berlin) contains only maxima and minima of all variables observed by BAV members. While this way of collecting data is sufficient for regular variables such as eclipsing binaries, RR Lyraes, or Miras, it is unsuitable to present the behavior of irregular objects like cataclysmic and eruptive variables. To allow the latter, the author initiated a database containing single observations of each star: the BAV Database of Cataclysmic and Eruptive Variables. At this time, it includes more than 15,000 estimates made by 14 observers.

2. Building the Database

The first step in building the database was the design of a form sheet. Such a sheet has advantages for both the observer and the data collector. The observer must fill in the star name, conventional date, and observed magnitude of his/her observations. Further information (HCO number, type) is added at the keyboard during the entry process. Thanks to this program, the observer needs not calculate the Julian date. Since the form sheet and the input program were designed to support each other, the process of collecting data has become easier and faster.

After typing is finished, an ASCII file is generated (generally one per observer per month). This file is imported into the database, which is based on commercial software named "Superbase". Figure 1 shows a hard copy displaying a single observation of the dwarf nova SS Cyg by Jochen Pietz. Most fields should be familiar to variable star observers. "RA" and "DE" display the so-called HCO number. This allows the sorting of variables by their celestial position. The field "TYPE" gives the classification of the

variable according to the 4th Edition of the *General Catalogue of Variable Stars* (GCVS) (P. N. Kholopov *et al.*, 1985, Moscow). Due to the fast development in the understanding of cataclysmic binaries some variables had to be reclassified (SU UMa-type dwarf novae, nova-like variables, and peculiar objects). The field "MAGN_CODE" indicates if a variable was fainter than the given magnitude or if the estimate was uncertain. Due to the limited computer memory, not all observations received can be included into the database at present. Many negative dwarf novae estimates had to be omitted. Since they do not influence outburst light curves, this "missing mass" is kept in a separate "paper archive", in case the quiescent intervals for specific stars should be needed. It is planned to add them later on, however.

Once the estimates received are included in the database they are ready for analyzing. Light curves of exotic and/or well-observed variables are published in the *BAV Rundbrief* (the BAV's quarterly journal) or the *BAV Mitteilungen* (an irregular supplement to the *BAV Rundbrief*). Since both publications are also sent to numerous astronomical facilities around the world this is one way for amateur observers to reach professional astronomers. In several cases the author works directly with astronomers interested in BAV observations.

3. Access to the Database

Since the BAV Database for Cataclysmic and Eruptive Variables is open to everyone, estimates can be requested free, either on disk (3.5" and 5.25") or as a printout. For observers willing to send their observations via disk (everyone is invited!) the author will provide the necessary typing software, which is written in GFA-Basic (a language that runs on MS-DOS computers, ATARI-ST, and Commodore AMIGA). If someone wants to use his/her own software, the code for the ASCII input file can also be obtained on request.

Table 1. List of BAV observers

R. Geckeler (Saulgau)	G. Marekfia (Saarbrücken)
B. Hassforther (Heidelberg)	M. Möller (Timmendorfer Strand)
J. Jahn (Bodenteich)	J. Pietz (Erfstadt)
W. Kriebel (Moosburg)	P. Schmeer (Bischmisheim)
B. Koch (Neu-Ulm)	H. Strüver (Duisburg)
G. Krisch (Bockenem)	A. Thomas (Mainz-Kastel)
S. Korth (Monheim)	E. Wunder (Rückersdorf)

Table 2. Some results published on behalf of the BAV Section of Cataclysmic and Eruptive Variables

Name	*Type*	*Amplitude (mag)*	*Cycle length (days) (normal/supermax)*	*Ref.*
RX And	UGZ	10.3 - 14.1	18.3	1
DX And	UGSS	11.3 - 14.8:	300:	1
SS Aur	UGSS	10.4 - 15.0	54.4	1
Z Cam	UGZ	10.3 - 13.2	22.7	1

Table 2 (continued)

Name	*Type*	*Amplitude (mag)*	*Cycle length (days) (normal/supermax)*	*Ref.*
SS Cyg	UGSS	8.3 - 12.4	48.1	1
DO Dra	UGSS	10.4 - 15.5:	?	-
AW Gem	UGSU	13.1 - 19.4	98/410	2
IR Gem	UGSU	11.2 - 17.0	22-48/150	2
AY Lyr	UGSU	12.3 - 18.4	88-43/205	2
RU Peg	UGSS	10.1 - 12.8	64	1
UV Per	UGSU	11.9 - 17.5	360	2
SW UMa	UGSU	9.3 - 17.0	1500:	3
OS And	NA	6.3 - 17.8p	-	4
V827 Her	NA	7.5 - 18.0p	-	5
GK Per	NA	0.2 - 11.8..14.0	?	4
N Sct 1989	N	8.5 - (21	15.7 (a)	6
QV Vul	NA	7.0 - 19.0	-	5
PU Vul	NC/ZAnd	9.0 - 16p	-	4
BF Cyg	ZAnd	10.0 - 12.0	-	7
CH Cyg	ZAnd/SR	6.9 - 9.2	88/104	8
CI Cyg	ZAnd+E	10.4 - 12.1	855.25	7
AX Per	ZAnd+E	8.8 - 12.4	681.6	7

(a) Periodic oscillations during early decline.

Table References

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3) Korth, S. 1990, *BAV Rundbrief*, **39**, 64.
4) Duerbeck, H. W. 1987, *A Reference Catalogue and Atlas of Galactic Novae*, D. Reidel, Dordecht & Boston.
5) Korth, S., 1990, *Sterne und Weltraum*, **29**, 122.
6) Korth, S., Schmeer, P., 1989, *BAV Rundbrief*, **38**, 125.
7) Korth, S. 1990, *BAV Rundbrief*, **39**, 59.
8) Korth, S., Unpublished.

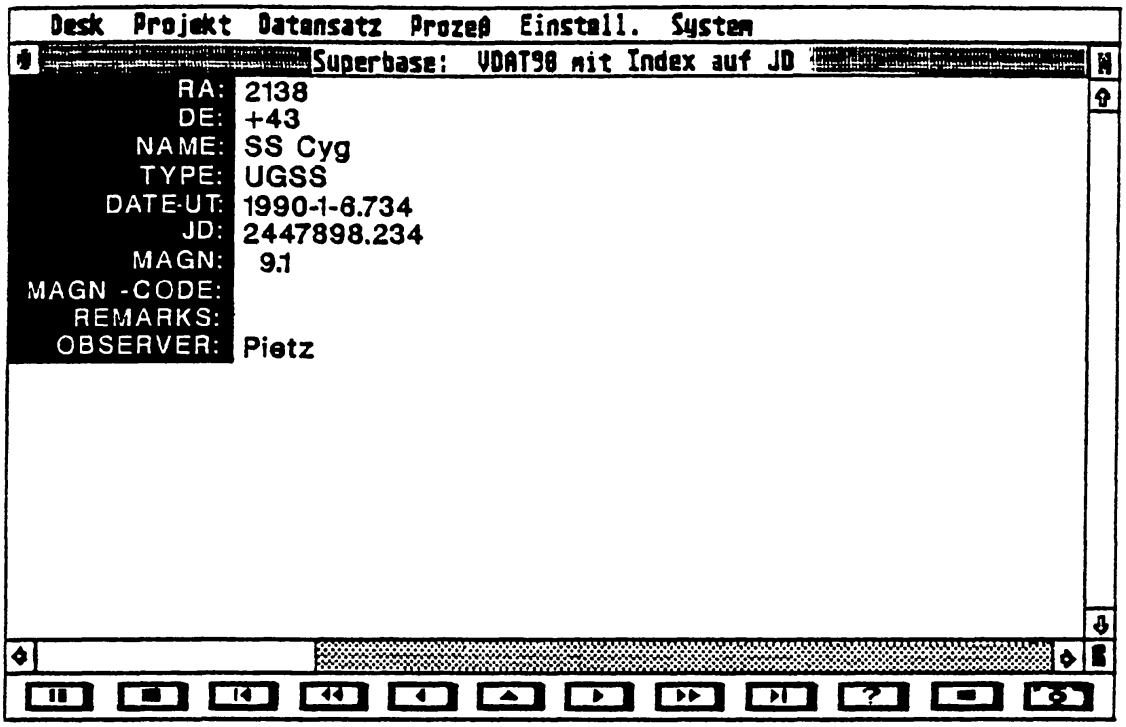

Figure 1. A typical hardcopy from the database, displaying a single observation of SS Cygni.

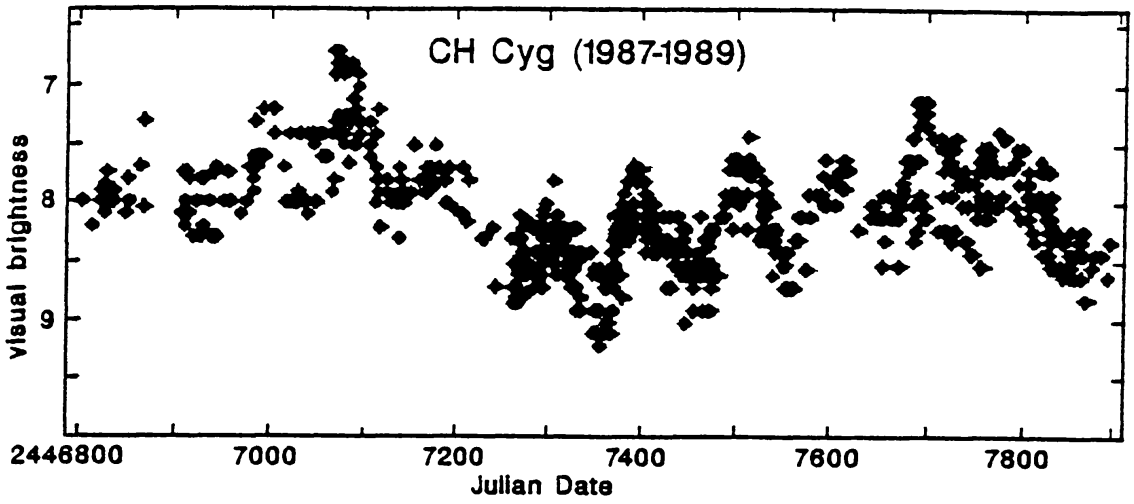

Figure 2. Visual light curve of the symbiotic variable CH Cyg, based on 699 observations taken from the BAV Database of Cataclysmic and Eruptive Variables