THE BRITISH ASTRONOMICAL ASSOCIATION VARIABLE STAR SECTION

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Abstract

A description is given of the Variable Star Section of the British Astronomical Association (BAAVSS), its database with observations going back to 1888, observing programs covering visual, photoelectric, and CCD observations, and the issuing of charts.

1. Introduction

The Variable Star Section of the British Astronomical Association (BAAVSS) was formed in 1891 with the aim of collecting and analyzing observations of variable stars. At that time there were few observers, few stars observed, and hence few observations! Nowadays, there are over 900 objects in the database observed by over 900 observers. The total number of observations exceeds two million, although only about 1.3 million have been converted to machine readable form (Figure 1). However, this process is ongoing and it is hoped that the backlog will be dealt with in the not too distant future. Finance and equipment from professional sources has greatly aided the continuation of this project.

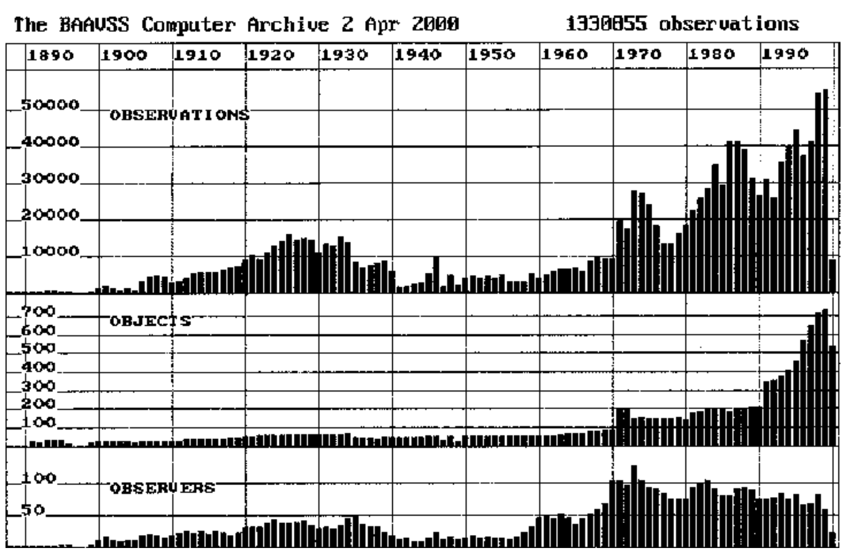

Figure 1. Histogram of BAAVSS computer archive as of 2 April 2000, containing 1,330,855 observations.

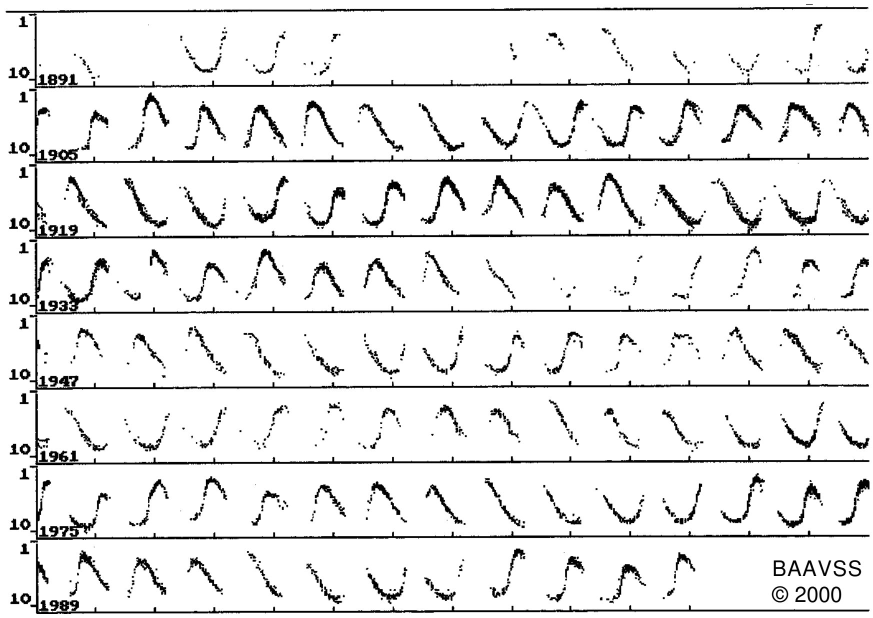

Figure 2. Plot of BAAVSS visual observations of o Ceti, 1891–2000 (15,163 observations).

The database features some 8 stars with observations going back over 100 years and some 30 stars with more than 10,000 observations each. These include o Ceti and SS Cygni (Figures 2 and 3).

2. Discussion

The observational work of the BAAVSS can be broken down into the following programs:

a) Telescopic Program, which consists mainly of Mira stars and cataclysmic variables (CVs) and which has been the mainstay of the Section's work since about 1910.
b) Binocular Program, consisting mainly of red semiregular stars.
c) Recurrent Objects Program, which aims to monitor otherwise under-observed CVs with periods in excess of one year.
d) Eclipsing Binary Program, which aims to determine the times of minima of a large number of these objects.
e) Nova/Supernova Search Programs, which are run in conjunction with the BAA Deep Sky Section and *The Astronomer* magazine. In the last three years five UK amateurs have discovered 23 supernovae.
f) The Eclipsing Dwarf Novae (DNe) Project, which was set up at the end of 1999 and aims to detect eclipses in these objects where none has been seen to date.
g) The "New" Variable Star Program, which consists of a photographic survey to attempt to discover new variables.

The programs are monitored regularly and amended as observations suggest.

Feedback to members is through the VSS *Circulars*, published four times a year, the BAA *Journal*, and the World Wide Web.

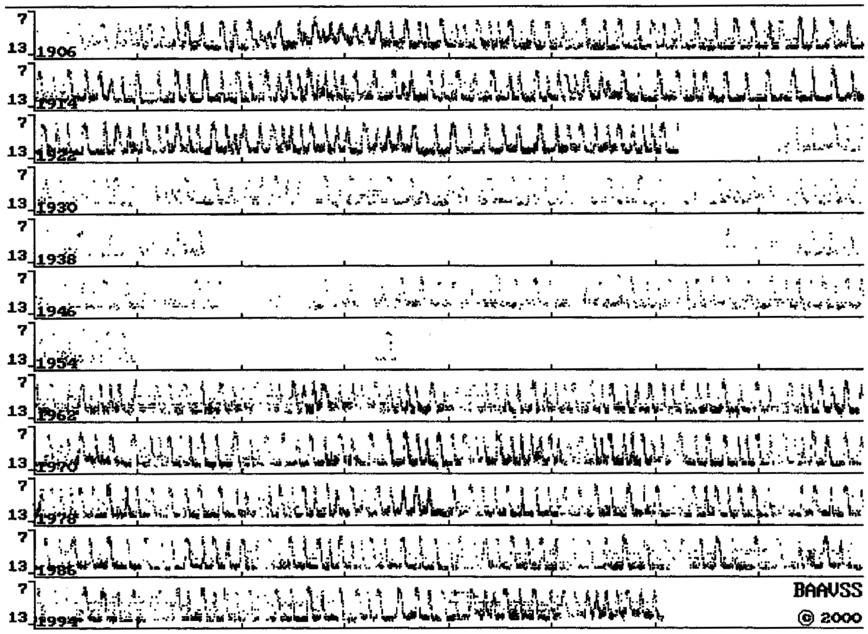

Figure 3. Plot of BAAVSS visual observations of SS Cygni, 1906–2000 (41,214 observations).

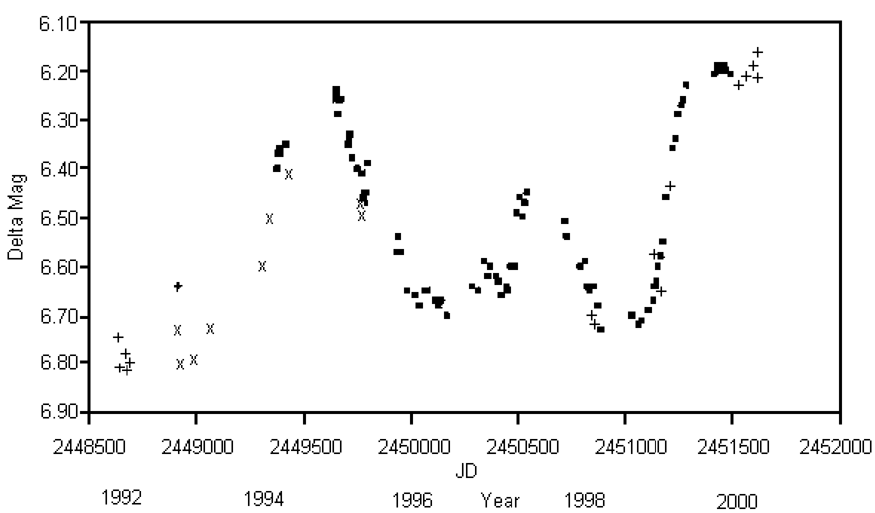

Figure 4. BAAVSS photoelectric photometry (V) observations of X Persei by K. West (squares), the Jack Ells APT (x), and R. Pickard (+).

Whilst most observations have been carried out using the eye, the Section does have photoelectric photometry records going back some 15 years. The best example of this has been the long term coverage of the Be star X Per (Figure 4).

Observers with CCDs are also actively encouraged to make useful observations and it is hoped this will be most aptly demonstrated in the Eclipsing DNe program. This program will combine the skills of the visual observer to detect an outburst and the CCD observer to continue monitoring it to see if any eclipses exist. Some eclipses can be detected visually, however, when the star is bright enough and the observer highly skilled (Figure 5).

CCDs are also being used to determine the time of minima of RS CVn stars as part of a program organized by Professor James Sowell of Georgia Tech (Figure 6)—a true international venture.

The BAAVSS has an extensive Web Page (www.telf-ast.demon.co.uk/) including articles from the *Circulars* and the *Journal*. Some recent articles include:

a) "Red Comparison Stars—Future Policy," by J. Toone.
b) "Modern catalogues for variable-star comparisons," by J. Greaves.
c) "Amateur Use of a 2 Metre Robotic Telescope," by R. Pickard.

Details of the Eclipsing DNe program can also be found here as well as a great deal of other information.

The Section has always maintained close links with other organizations, notably:

a) *The Astronomer*, a monthly magazine that aims to publish new observations in all fields of astronomy.
b) The Society for Popular Astronomy (formerly the JAS), which encourages beginners to astronomy of all ages and whose variable star section has a program that includes several bright variables that are logged in the BAAVSS database.
c) The Royal Astronomical Society of New Zealand collates and coordinates southern hemisphere observations. By a long-standing reciprocal agreement, the RASNZ and BAAVSS exchange observational data on selected Northern/ Southern hemisphere variables.

The BAAVSS produces many charts, a number with sequences that are different from those of the AAVSO or other groups. We are currently actively engaged in discussions with the AAVSO and The Astronomer, and hopefully in due course other groups, to produce a more homogeneous set of international charts and sequences.

As well as helping to monitor the activity of hundreds of variables and produce their light curves, the BAAVSS database enables the Section to supply records to professional and amateur astronomers for analysis. Anyone interested in Section data for analysis should contact the Director (Telephone: 01732 850663 (Int: +441732850663); E-mail: rdp@star.ukc.ac.uk).

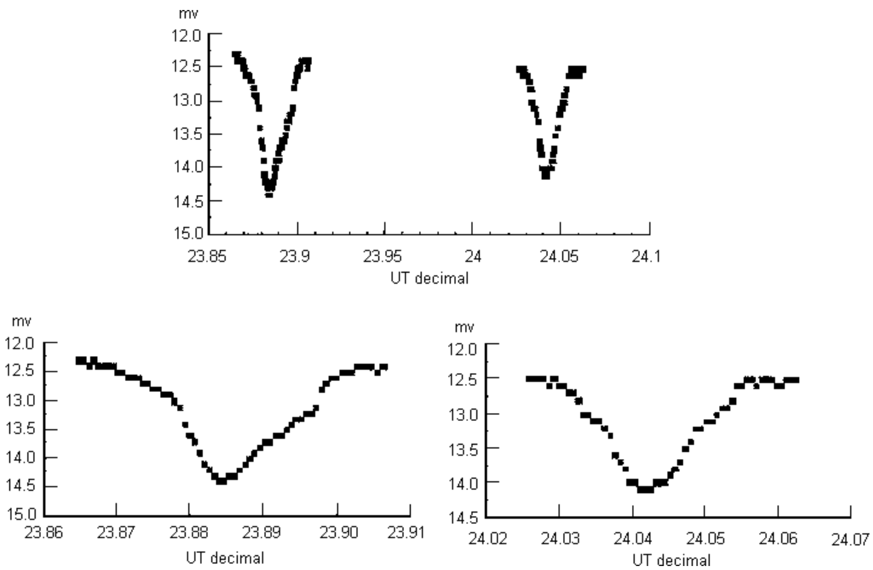

Figure 5. Visual observations of eclipses of the dwarf nova IP Pegasi in outburst, by G. Poyner, October 23–24, 1998.

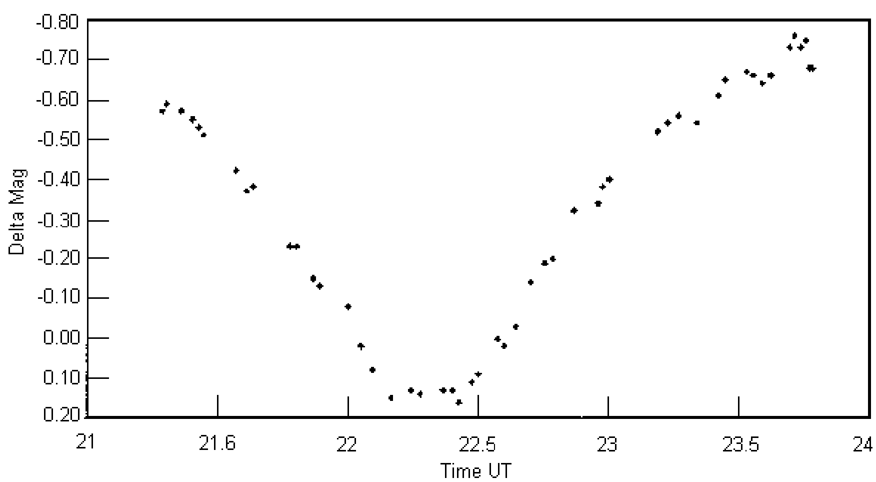

Figure 6. CCD(B) observations of the RS CVn star RT Andromedae on December 19, 1999, by R. Pickard using a 16" Newtonian and SX CCD B filter.