

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS

Number 2286

Konkoly Observatory
Budapest
1983 March 1
HU ISSN 0374-0676

IS BF ARAE DWARF NOVA OF SU UMa TYPE? *

Little is known about the dwarf nova BF Ara. Since the variability of this star was discovered by Shapley and Swope (1934) no further observations have been published. Its photometric maximum brightness is quoted as $13^m.6$ by Kukarkin et al. (1969). On ESO Schmidt-plates it appears as a star of roughly $17^m.5$. A chart based upon the observations to be described in this note is given by Vogt and Bateson (1982).

Photometric observations of BF Ara in the UBV colour system have been carried out on 15 September 1979 at the 1-m-telescope of the European Southern Observatory with the one-channel photometer (for details of the observations and reductions, see Bruch, 1982). A light curve of BF Ara has been measured for about 120^m with a time resolution of about 80^s . It is re-

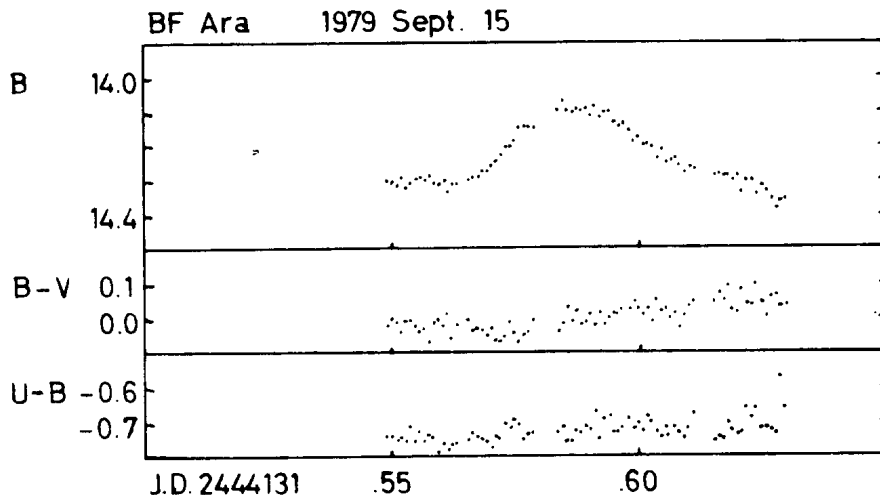


Fig. 1: Light- and colour curves of BF Ara

* Based on observations collected at the European Southern Observatory

produced in Figure 1. The mean values of brightness and colours are:

$$\begin{aligned} V &= 14.24 \pm 0.09 \\ B-V &= 0.01 \pm 0.05 \\ U-B &= -0.72 \pm 0.04 \end{aligned}$$

BF Ara was obviously observed in outburst. Most dwarf novae do not show strong variations in this phase. However, the light curve of BF Ara exhibits an outstanding hump with an amplitude of about $0^m.25$. Such a feature is well known from the light curves of SU UMa - stars in superoutburst (Vogt, 1980). The amplitudes of these so-called superhumps range between $0^m.15$ and $0^m.35$. They appear with a period a few percent longer than the orbital period of the systems.

The striking similarity between the hump in the light curve of BF Ara and the superhumps of the SU UMa - stars suggest a classification of BF Ara as SU UMa - star. This is supported by the good agreement of the colours of BF Ara with the mean colours of SU UMa - stars during superoutburst, after reasonable corrections for the interstellar reddening have been applied (see Tables 31 and 47 of Bruch, 1982).

If BF Ara is really a member of the SU UMa - subgroup of dwarf novae a lower limit of about 2^h for the orbital period can be estimated from the light curve. This is long for the period of a SU UMa - star, but it is not an extreme value. YZ Cnc (Vogt, 1980) and TU Men (Stolz and Schoembs, 1981) have even longer periods. Thus, also from this point of view BF Ara fits well among the SU UMa - stars.

A spectrum of BF Ara was taken on 16 September 1979, the night after the photometric observations, at the 1.5-m-telescope of ESO, equipped with a Boller and Chivens Cassegrain spectrograph and an EMI image tube. Like almost all outburst spectra of dwarf novae, it shows a strong blue continuum with superimposed broad and shallow absorption lines of hydrogen.

The classification of BF Ara as SU UMa - star might be premature in view of the scarce observations. Nevertheless it appears worthwhile to keep an eye on this star.

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* copies are available from the author on request