COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 3519

Konkoly Observatory
Budapest
17 September 1990
*HU ISSN 0374 - 0676*

# UNUSUAL PHOTOMETRIC CHARACTER OF THE S-CEPHEID FF Aql

Photoelectric observations of the s-Cepheid FF Aql were obtained in October 1988 in Abastumany Astrophysical Observatory. The data was obtained by using the 0.48-m AZT-14 reflector with a UBV photoelectric photometer. HR 7260 was the comparison star (V=6.146, B-V=0.769, U-V=0.995) (Arellano Ferro 1984).

During seven observational nights there were obtained 18 V, B-V and U-V estimates. Phases were calculated according to Arellano Ferro (1984): HJD(max)=2444862.617+4$^{d}$.470916 · E. Observational data are tabulated in Table I, light and colour curves are represented in Figure 1.

It is seen from Fig. 1, that most of the obtained V and B-V estimates are in good agreement with light and colour curve from Arellano Ferro's (1984) work. The agreement in the U-V observations is noticeably less. Some V, B-V and U-V estimates are quite unexpected. So, in the night of October 22/23 (HJD 2447454), the first two estimates (noted as points 1 and 2 , respectively) are in good agreement with the light curve. Then, an almost 0$^{m}$.1 (point 3) brightness increase occurred in V followed by an 0$^{m}$.4 (point 4) fading. B-V and U-V curves showed contrary change, at first decreasing, then increasing colour indices. Abrupt dimming of FF Aql's light was observed in the night of October 6/7 (HJD 2447441) manifesting in slight change of B-V and U-V estimates (points 5 and 6). It is interesting, that U-V estimates in points 5 and 6 are in the best agreement with U-V curve by Arellano Ferro (1984).

For the sake of clarity, the present V, B-V, and U-V observations were compared with the previously published ones. As we know, the pulsational period of FF Aql, in principle, is almost unvariable for all observations of this Cepheid. Small changes of the pulsational period are explained by presence of a blue companion B8 V (Balona 1977, Usenko 1990), with an orbital period of 1400$^{d}$-1435$^{d}$ (Abt 1959, Szabados 1977). Therefore, V, B-V and U-V measurements by Arellano Ferro (1984), Mitchell et al. (1964), Szabados (1977) were adduced for epoch HJD 2444862.617 and plotted in Fig. 1. It is

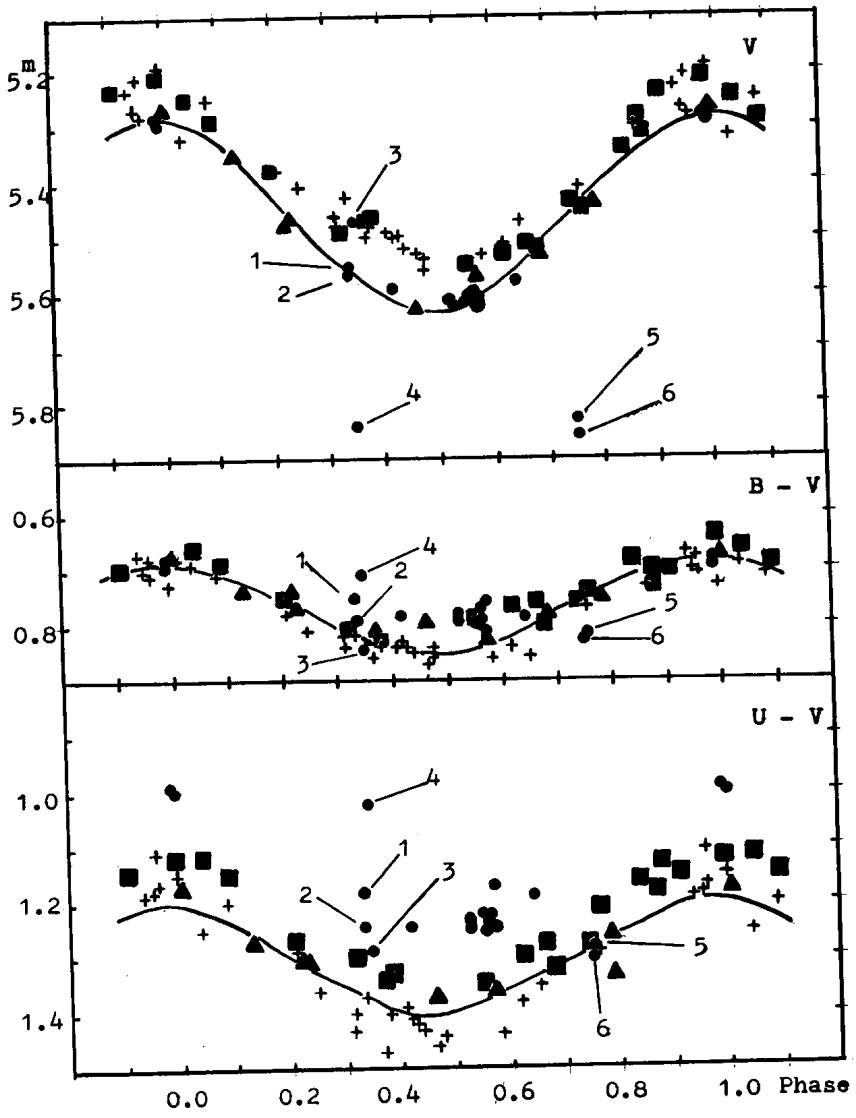


Figure 1

FF Aql light and colour curves. The symbols are: circles: this work, triangles: Arellano Ferro (1984), crosses: Mitchell et al. (1964), squares: Szabados (1977). Light and colour curves plotted according Arellano F. (1984).

Table I.

| HJD 2447400+ | V | B-V | U-V | Phase |
|---|---|---|---|---|
| 40.1997 | 5.616 | 0.784 | 1.250 | 0.522 |
| 40.2034 | 5.622 | 0.789 | 1.239 | 0.523 |
| 41.2156 | 5.832 | 0.826 | 1.301 | 0.750 |
| 41.2167 | 5.858 | 0.818 | 1.287 | 0.750 |
| 44.2055 | 5.590 | 0.786 | 1.249 | 0.418 |
| 45.1954 | 5.579 | 0.789 | 1.189 | 0.640 |
| 51.2227 | 5.285 | 0.692 | 0.995 | 0.988 |
| 51.2327 | 5.292 | 0.684 | 0.999 | 0.990 |
| 57.2477 | 5.556 | 0.753 | 1.187 | 0.335 |
| 57.2516 | 5.561 | 0.797 | 1.247 | 0.336 |
| 57.2980 | 5.469 | 0.847 | 1.292 | 0.347 |
| 57.3016 | 5.841 | 0.710 | 1.024 | 0.347 |
| 58.2093 | 5.618 | 0.795 | 1.223 | 0.550 |
| 58.2138 | 5.611 | 0.799 | 1.254 | 0.551 |
| 58.2480 | 5.602 | 0.790 | 1.237 | 0.559 |
| 58.2513 | 5.618 | 0.775 | 1.227 | 0.560 |
| 58.2897 | 5.623 | 0.759 | 1.172 | 0.568 |
| 58.2930 | 5.612 | 0.817 | 1.248 | 0.569 |

seen, that FF Aql's light curve is separated on two curves. It is interesting, that the V-estimate on point 3 lies on the upper curve well. On B-V plane this separation is not noticed. Large scatter of estimates at U-V curve by Arellano Ferro (1984) is observed, that characterises Cepheids with obvious or suspected blue companions (Lloyd Evans 1968).

This unusual separation of FF Aql's light curve may be explained by its possible amplitude modulation from the companion's perturbation. This amplitude modulation is known in V473 Lyr (HR 7308). If it is true, so it is a good confirmation of the hypothesis about possible duplicity of V473 Lyr (companion B7-B8 V according Usenko, 1990). It is important to note, that it is necessary to obtain more careful observations of FF Aql, that can give more thorough information about this binary system.

IGOR A. USENKO

Astronomical Observatory of Odessa
State University. Odessa, USSR

References:

Abt, H.A.: 1959, Astroph. J. 130, 769.
Arellano Ferro, A.: 1984, M.N.R.A.S. 209, 481.
Balona, L.A.: 1977, M.N.R.A.S. 178, 231.
Lloyd Evans, T.: 1968, M.N.R.A.S. 141, 109.
Mitchell, R.I., Iriarte, B., Steinmetz, D., Johnson, H.L.: 1964, Tonantzintla Bol. 3, 153.
Szabados L.: 1977, Budapest Mitt. No. 70.
Usenko, I.A.: 1990, Kinemat. i Fizika Nebesn. Tel. 6, No. 3, 91.