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PHOTOMETRY OF STARS IN THE FIELD OF BF CYGNI

SKIFF, BRIAN A.

Lowell Observatory, 1400 West Mars Hill Road, Flagstaff AZ 86001-4499, USA (bas@lowell.edu)

The symbiotic variable BF Cygni ( $19^{\text{h}}23^{\text{m}}53^{\text{s}}.51$ ;  $+29^{\circ}40'29''.2$  [2000]) lies a few arcminutes from the fifth-magnitude star 2 Cygni in a crowded region of the southern Cygnus starcloud with numerous other variables. Monitoring of the star by visual observers has been hampered by poor comparison sequences. The original BAA sequence simply did not reach faint enough to cover the minimum observed in 1995, when the star faded to  $m_v \sim 12.5$ , and fainter still in more recent years. The AAVSO chart goes fainter, but is based on photographic photometry that clearly has a zero-point error. At the request of Gary Poyner (British Astronomical Association Variable Star Section) I verified and extended the comparisons to reach past the level of the 1995 faint episode. I worked from the AAVSO preliminary (d)-scale chart last revised in September 1988 (AAVSO 2000). For stars fainter than AAVSO ‘125’ (which has  $V = 12.2$ ), I chose stars closer to the variable than the ones labelled on the chart. The results were originally distributed via the ‘vsnet’ list-server (Skiff 1996).

The observations were made with the Lowell 53-cm photometric telescope on the UT dates 26 October and 13 November 1995, and 5 August 1996 using a 29" diaphragm and Strömberg  $b$  and  $y$  filters. About ten primary and secondary standards were observed each night for adjustment to the standard system. The field was observed at low airmass, so mean extinction values (Lockwood & Thompson 1986) were applied in the reductions. The per-star residuals in the linear fits to the standards averaged between  $0^{\text{m}}006$  and  $0^{\text{m}}010$  in both  $V$  and  $b - y$ .

Table 1 shows the results for the stars in order of decreasing brightness. An asterisk by the star name indicates a note following the table. The positions are from Tycho-2 (Høg *et al.* 2000) or the GSC-ACT (Gray 1999). The *rms* scatter of the magnitudes and colors are given in the second line of each entry. These new data have been incorporated onto the revised BAA chart (Poyner 1995). Benson & Salter (1999) provide BVRI photometry for two additional stars in this field that complement the present set.

Table 1: Photometry of stars in the field of BF Cygni

| Name           | RA (2000)   | Dec          | $V$    | $b - y$ | $n$ | spec | Remarks       |
|----------------|---|--------------|--------|---------|-----|------|---------------|
| BD+29°3579     | 19 <sup>h</sup> 23 <sup>m</sup> 11 <sup>s</sup> .33 | +29°30′09″.6 | 9.742  | 1.202   | 3   | K2   |               |
|                |   |              | .033   | .016    |     |      |               |
| BD+29°3586*    | 19 24 37.35   | +29 34 17.1  | 10.522 | 0.259   | 3   |      | GSC 2137-0298 |
|                |   |              | .014   | .004    |     |      |               |
| GSC 2137-1762  | 19 24 12.68   | +29 35 04.3  | 10.987 | 0.783   | 2   |      |               |
|                |   |              | .025   | .018    |     |      |               |
| GSC 2136-0649  | 19 23 35.51   | +29 39 18.8  | 11.312 | 0.822   | 3   |      |               |
|                |   |              | .019   | .017    |     |      |               |
| GSC 2136-0027* | 19 23 27.69   | +29 41 27.7  | 12.208 | 0.680   | 3   |      |               |
|                |   |              | .013   | .017    |     |      |               |
| GSC 2136-0778  | 19 23 41.06   | +29 37 04.7  | 12.888 | 0.760   | 2   |      |               |
|                |   |              | .023   | .023    |     |      |               |
| GSC 2137-1408* | 19 23 52.35   | +29 43 57.5  | 13.40  | 0.49    | 2   |      |               |
|                |   |              | .05    | .01     |     |      |               |

## Notes

GSC 2136-0027 star  $\sim 20''$  north excluded, but two very faint companions included.

GSC 2137-1408 very faint close companion on northeast.

## References:

AAVSO, 2000, [http://charts.aavso.org/PRELIM/CYG/BF\\_CYG](http://charts.aavso.org/PRELIM/CYG/BF_CYG)

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