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TIMES OF MINIMUM FOR THE ECLIPSING BINARY BP Vul

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The eclipsing binary star BP Vul ($V = 9.82$) was discovered as a variable star by Hoffmeister (1935). It has a period of 1.94 days and a spectral type listed as A7, but has been largely neglected by observers. A partial light curve obtained by the Hipparcos mission (ESA, 1997) indicates that the system is well detached, with eclipse depths in the optical of about 0.7 mag for the primary and 0.4 mag for the secondary.

Times of minimum have been recorded for the binary by a number of authors since 1929 using a variety of techniques (photographic, visual, photoelectric/CCD). We report here additional timings determined from archival plates from the Harvard College Observatory, that go as far back as 1918.

More than 400 blue-sensitive patrol plates from the AC series at the Harvard College Observatory were measured by PRG using 4 comparison stars and a sequence of steps to estimate changes in brightness. These plates span the interval 1889–1954. Additionally, some 180 plates from the Damon series were inspected, covering the period 1965–1989. Table 1 lists the dates of the low-light levels recorded in the vicinity of the eclipse phases ("Type 1" and "Type 2" for the primary and secondary minima, respectively).

Table 1. Photographic times of minimum for BP Vul.

HJD−2,400,000	Type	Year	HJD−2,400,000	Type	Year
21787.723	1	1918.529	42386.456	1	1974.925
22144.750	1	1919.506	42666.772	2	1975.693
22637.569	1	1920.856	43317.780	1	1977.475
23607.741	1	1923.512	43423.529	2	1977.765
26465.843	1	1931.337	44875.875	1	1981.741
26535.718	1	1931.528	45636.490	1	1983.823
27965.784	1	1935.444	45785.882	1	1984.232
28460.527	1	1936.798	45855.778	1	1984.424
29073.744	1	1938.477	46385.508	1	1985.874
29857.637	1	1940.623	46534.864	1	1986.283
31318.694	1	1944.623	46709.547	1	1986.761
33854.692	1	1951.567	47026.696	2	1987.630
34209.792	1	1952.539	47064.618	1	1987.733

Because of the shallower secondary eclipse in BP Vul, most of the measurements correspond to the primary minimum. We estimate the uncertainties of these timings to be roughly 0.02–0.03 days. $O - C$ diagrams for all available primary and secondary minima in addition to ours (Huth, 1965; Lacy, Marcrum, & Ibanoglu, 1999; Agerer, Dahm,

& Hübscher, 2001; Lacy, 2002; Lacy, Straughn, & Denger, 2002; Kundera, 2003) are shown in Figure 1. A complete analysis of BP Vul including new CCD and spectroscopic observations will be reported elsewhere (Lacy et al., 2003).

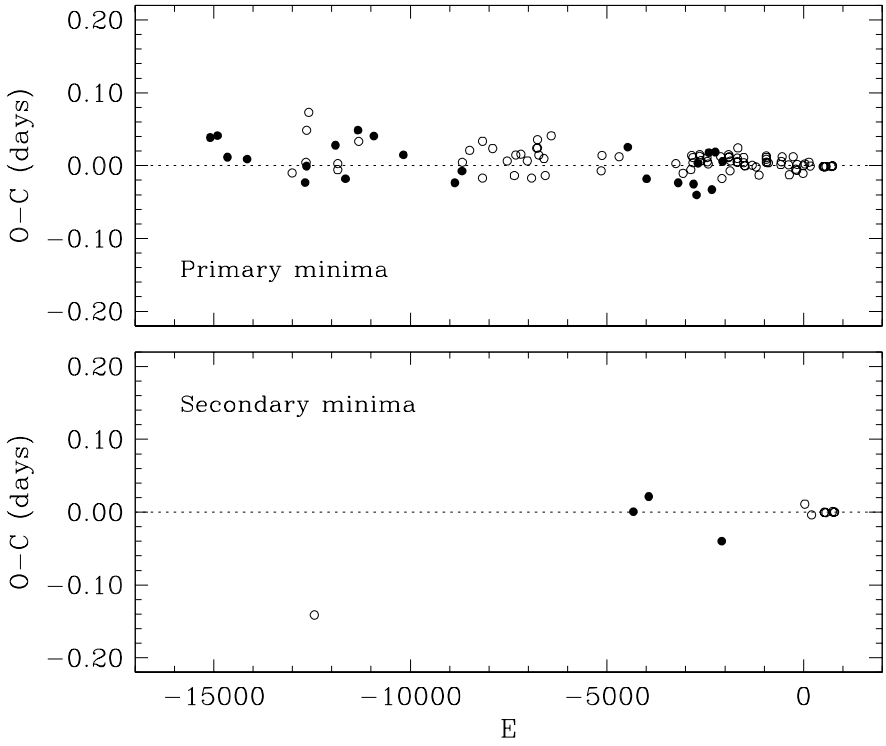

Figure 1. $O - C$ diagram based on the ephemeris by Lacy, Straughn & Denger (2002), and including all times of minimum for BP Vul. The new photographic timings from the Harvard plates, reported here, are represented by filled circles.

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References:

Agerer, F., Dahm, M., & Hübscher, J., 2001, *IBVS*, 5017
ESA, 1997, *The Hipparcos and Tycho Catalogues*, ESA SP-1200
Hoffmeister, C., 1935, *AN*, 255, 401
Huth, H., 1965, *IBVS*, 96
Kundera, T., 2003, *Eclipsing Binaries Minima Database*,
`http://www.oa.uj.edu.pl/ktt/krttk_dn.html`
Lacy, C. H. S., 2002, *IBVS*, 5357
Lacy, C. H. S., Marcrum, K., & Ibanoglu, C., 1999, *IBVS*, 4737
Lacy, C. H. S., Straughn, A., & Denger, F., 2002, *IBVS*, 5251
Lacy, C. H. S., Torres, G., Claret, A., & Sabby, J. A., in preparation