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V807 Cas IS AN ECLIPSING BINARY STAR

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| | |
|---|---|
| Name of the object: | |
| V807 Cas = HIP 114552 = GSC 4010_285 | |
| Equatorial coordinates: | Equinox: |
| R.A. = 23 ^h 12 ^m 13 ^s .0 DEC. = +59°35'59".2 | 2000.0 |
| Observatory and telescope: | |
| Esteve Duran Observatory, 0.6-m Cassegrain telescope; US Naval Observatory Flagstaff Station, 1.0-m Ritchey–Chrétien telescope | |
| Detector: | CCD in both cases |
| Filter(s): | <i>B, V, R_c, I_c</i> |
| Comparison star(s): | GSC 4010_463 |

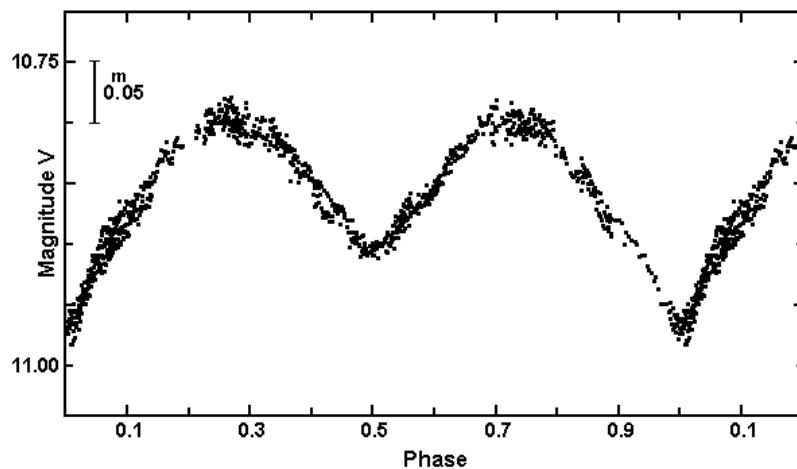


Figure 1.

| | |
|---|-----------------------------------|
| Check star(s): | GSC 4010_1201 |
| Transformed to a standard system: | Johnson–Cousins |
| Standard stars (field) used: | Landolt standards (Landolt, 1992) |
| Availability of the data: | |
| Upon request | |
| Type of variability: | EB |
| Remarks: | |
| <p>V807 Cas was discovered as a variable star by the Hipparcos mission (ESA, 1997). It was classified as a periodic variable with a 0^d97463 period, a mean V magnitude of 10^m79, and an average $B - V = 0^m340$ without specifying variability type. V807 Cas is in the center of PK110–0.1, which was initially classified as the planetary nebula We 1–12. Recent spectroscopic data by Kimeswenger (1998) indicate that V807 Cas has a B1V spectral type, and that We 1–12 is not a planetary nebula but an isolated H II region, as was also suggested by earlier works (e.g. Zijlstra et al. 1990; Kaler and Feibelman 1985). Kimeswenger also claims that V807 Cas is the only source of excitation of the H II cloud.</p> <p>Our analysis of the satellite data suggested that V807 Cas was actually an EB eclipsing binary star with a period close to twice the one given in the Hipparcos catalogue. To investigate further about the variable nature of V807 Cas, this object was observed in a collaborative program between Esteve Duran Observatory and the U.S. Naval Observatory Flagstaff Station. This star was monitored in the V band for 17 nights, from July to September 1997. Table 1 (available electronically through IBVS Web-site as 5009-t1.txt) lists the standard V magnitudes and color indices of field stars near the variable.</p> <p>Observations show that V807 Cas is in fact an EB eclipsing binary system with a period close to two days (Figure 1). The phased light curve presents a primary minimum with a depth of 0.18 magnitudes, and a secondary minimum during which the star fades 0.11 magnitudes. At maximum light, V807 Cas has a V magnitude of 10.80 ± 0.01. It was also found an average $B - V = 0.319 \pm 0.003$. After combining our data with HIPPARCOS photometry the following ephemeris was computed:</p> $\text{Min. I} = \text{HJD } 2450652.428 + 1^d949189 \times E.$ $\pm 0.006 \quad \pm 0.000015$ <p>If V807 Cas is actually the source of excitation of PK110–0.1, additional photometric and spectroscopic data might help to solve the system, and obtain a more precise measurement of the H II region distance and its properties.</p> | |
| Acknowledgements: | |
| This work made use of the SIMBAD data base, operated at CDS, Strasbourg, France. | |

References:

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Zijlstra, A., Pottasch, S., Bignell, C., 1990, *A&AS*, **82**, 273