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CONCERNING THE RELATIVE MAGNITUDES OF THE SS CYGNI COMPONENTS

Presented here is a small sample of standardized UBV observations of SS Cygni, made with the 24-inch photometric reflector of Lick Observatory when SS Cygni was at minimum. For this sample $\overline{V}$ = 11.66; $(\overline{B-V})_{obs.}$ = +0.53 ± 0.05.

$JD_{\odot}$	V	B-V	U-B
2442550.962	11.62±0.03	0.52±0.02	-0.70±0.03
2551.935	11.70	0.50	-0.83
2577.973	11.63	0.41	-0.78
2578.977	11.60	0.53	-1.08
2579.973	11.76	0.71	-1.00

Joy (1956) states that the system consists of a dG5 star and a sdBe companion, and that the absolute magnitudes of the two stars are <u>equal</u>.

If one considers a model SS Cygni system consisting of a dG5 star with B-V = +0.70 and a white dwarf companion with B-V= -0.10, at a distance of 270 pc, with a(r) = 1 mag/kpc and R= $A_V/E(B-V)$ = 3 (giving E (B-V)= 0.09 mag),then the combined light of the two stars can give an observed (reddened) B-V of +0.53 only if the white dwarf is 1.2 magnitudes <u>fainter</u> in V than the main sequence star. With an absolute visual magnitude of +5.1 for the primary, the combined M_V = +4.8 is consistent with the value derived with the formula $M_V = m_V + 5 - 5\log(r) + A_V$,with m_V = 11.66, r = 270 pc, and A_V = 0.27 mag. An uncertainty of ±0.05 mag in the observed B-V results in an uncertainty of ±0.8 mag for the visual magnitude difference between the stars.

We may conclude that the hot component of the SS Cygni system is probably fainter in V than its main sequence companion, by about one magnitude.

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Reference:
Joy, A.H. 1956, <u>Ap. J. 124</u>, 317