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PHOTOMETRY OF OW Gem

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Variability of the long period eclipsing binary OW Geminorum (= HDE 258878 = BD+17°1281, spectral type F2 Ib-II, $V_{\max}$=8$^{\rm m}$.22) was discovered by Kaiser in 1988 while conducting a photographic nova patrol (Kaiser et al. 1988). Kaiser (1988) also determined the system's long period of 1258 days. Williams (1989) discovered the high eccentricity. Griffin and Duquennoy (1993) have given a thorough report based on radial velocity studies.

Four primary eclipses have occurred since discovery; three have published observations, either visual or photometric (Williams and Kaiser 1991; Pravec 1992; Hanzl et al. 1993; Hager 1996; Derekas et al. 2002). Unfortunately, coverage was sparse due to longitudinally limited observing sites or solar conjunction. The secondary eclipse has had

Table 1. Standard magnitudes and color indices, Henden

Star	GSC	V	$B-V$	$U-B$	$V-R_c$	R_c-I_c
var max	1332.0490	8.217	0.689	0.437	0.418	0.433
var primary min	1332.0490	9.673	1.005	0.619	0.589	0.595
var secondary min	1332.0490	8.317	0.646	0.420	0.390	0.409
comp	1332.0564	9.004	0.239	0.065	0.148	0.158
check	1332.0578	9.900	0.325	0.006	0.204	0.206

Table 2. Observers and equipment used

Observer	Telescope	CCD/Photometer	Filter(s)	Campaign
DHK	0.35-m	ST-9E	BVR_c	'95 p, '02 ps
AAH	1.00-m	SITe Tektronix	$UBV(RI)_c$	'02 ps
SD	0.20-m	ST-9E	V	'02 s
EGM	0.20-m	Starlight Express	V	'02 p
JGF	0.10-m, 0.41-m	Starlight Express	V	'02 ps
JAH	0.45-m	ST-9E	V	'02 p
RAK	0.25-m	ST-6	$BV(RI)_c$	'02 p
PK	0.35-m	FLI	V	'02 p
GCL	0.27-m	ST-9E	$V(RI)_c$	'02 p
ACP	0.27-m	ST-6	$BV(RI)_c$	'02 p
DT	0.40-m, 0.60-m	Photometrics CCD, ST-8	V	'95 p, '02 p
DW	0.20-m	ST-9E	V	'02 ps
REZ	0.60-m	Photometrics CCD	$BV(RI)_c$	'95 ps, '02 p
DBW	0.90-m	SSP-3	V	'95 p
BM	0.20-m	Lynxx	V	'95 p
GWW	0.40-m	Photometrics CCD	V	'95 p

extremely little coverage published, consisting of three photoelectric observations from Williams (Williams 1989).

The AAVSO's eclipsing binary team has conducted a multi-filtered international campaign on OW Gem covering the primary and secondary eclipses in 1995 and 2002. Henden used the USNO 1.0-m telescope with a SITe 1024 × 1024 thinned, backside illuminated CCD and standard Johnson-Cousins standard $UBV(RI)_c$ filters along with Landolt standards to determine standard magnitudes for the variable and the comparison stars. These data are in Table 1 with all errors under 0.01 mag. GSC 1332.0564 was used as the comparison and GSC 1332.0578 as the check star for all four eclipses. Derekas et al. (2002) reported possible variability in GSC 1332.0564, although we do not see this in our data.

Photometric data about all stars within 5 arcmin of the variable are available at `ftp://ftp.nofs.navy.mil/pub/outgoing/aah/sequence/owgem.dat`. Sixteen observers from two continents participated in the campaigns, see Table 2.

Results of the campaigns are listed in Table 3. Primary times of minimum were determined with the software *AVE* (Barbera 2000) based on the Kwee and Van Woerden method (Kwee-van Woerden 1956). Using a Fourier curve-fitting technique, Nelson determined the time of secondary minimum. Light curves for all eclipses are found in Figures 1-4.

The primary minima are consistent with the light elements given below, which are from Williams and Kaiser (1991). The secondary minimum occurs at phase 0.232 using the same elements. A full model of OW Geminorum will be published elsewhere.

$$\text{Min. I} = \text{HJD } 2415779.0 + 1258\overset{\text{d}}{.}59 \times E.$$

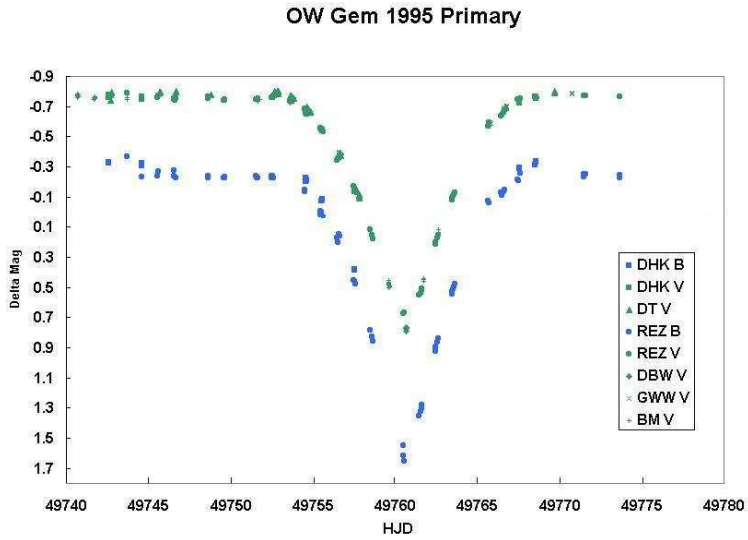

Figure 1.

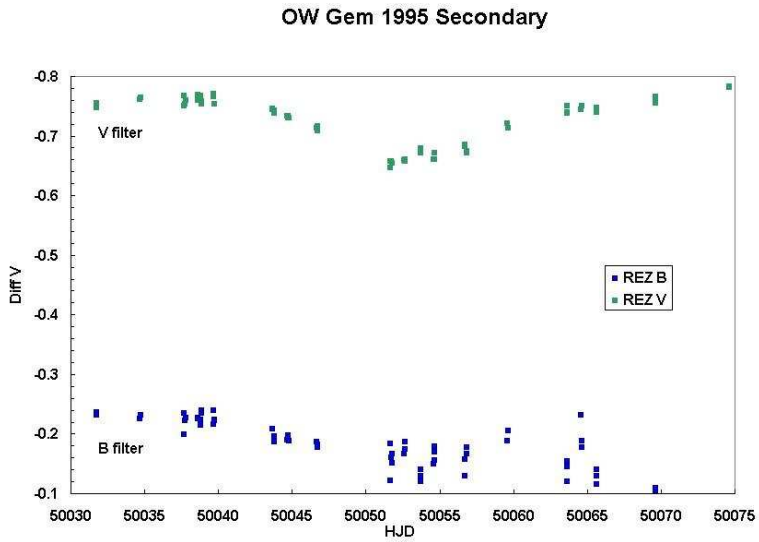

Figure 2.

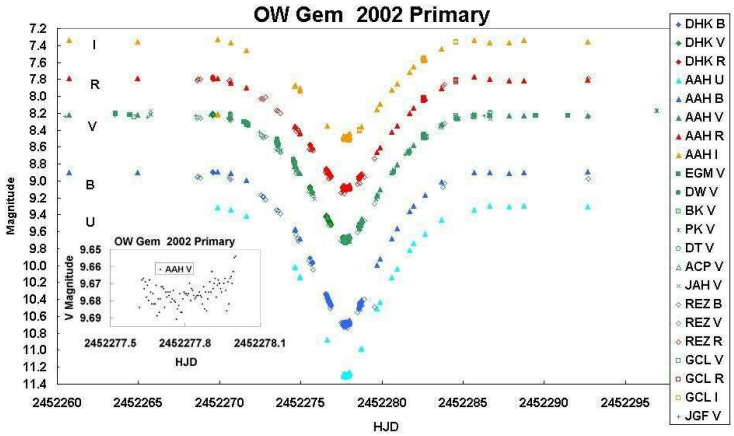

Figure 3.

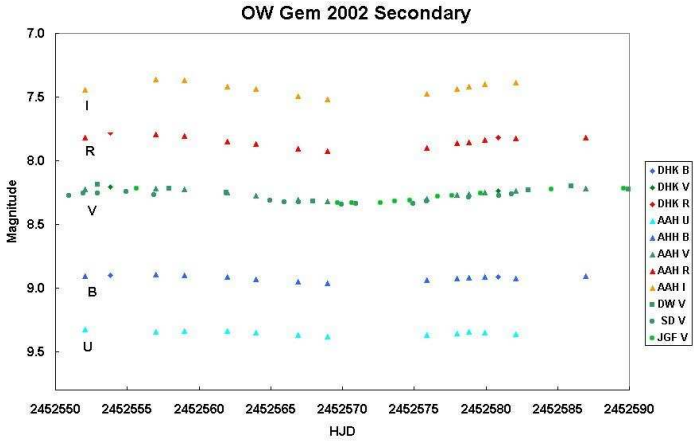

Figure 4.

Table 3. Times of minimum

Eclipse	Time of minimum (error)
1995 primary	2449760.59 (2)
1995 secondary	2450053.2 (2)
2002 primary	2452277.77 (1)
2002 secondary	2452570.9 (1)

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