Contract Nonr-2326(00)

FINAL REPORT

by

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To: Office of Naval Research

From: R. S. Alexander, Director
ONR Research in Photoelectric Photometry
Crane Observatory, Washburn University
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Subject: Contract No. Nonr-2326(00)
Final Report

Washburn University was awarded Contract No. Nonr-2326(00) on 3 April, 1957. The contract was extended for the fiscal year 1958, and again for 1959. During the summer of 1960 the telescope was moved into new quarters, and observations were not resumed until late in the Spring of 1961.

Between 1 July, 1957 and 30 June 1961 4737 photoelectric observations were obtained of eclipsing binary systems. This required 526 hours of observation and approximately 800 hours for the reduction of the observations. The systems of stars observed, and the observations obtained are indicated in the table below.

System	No. of Nights	No. of Observations Yellow	Blue	Total No.	Points of interest
From 1 July, 1957 to 30 June 1958					
AC Leonis	4	122	118	240	Not an eclipsing system
AQ Cas.	6	154	153	307	Light curve; several Min.
TX Her.	3	56	55	111	
TX Leo.	6	65	64	129	
EO Aur.	2	36	36	72	
VW Cep.	7	142	139	281	Light curve:, 6 min. obs.
From 1 July 1958 to 30 June, 1959					
AQ Ca.	1	34	34	68	Minimum observed.
BD+44°1718	5	172	170	342	L.C. obtained; RR Lyrae system
V839 Oph.	1	20	20	40	
V502 Oph	2	46	46	92	2 minima observed
TX Leo.	6	133	128	261	
BD+27°3952	8	214	214	428	Light curve variable
EO Aur.	8	148	148	296	Light curve erratic
VW Cep.	2	48	48	96	1 good minimum
From 1 July, 1959 to 30 June 1960					
BD+44°1718	1	50	49	99	Check on earlier L. C.
V502 Oph	4	120	120	240	3 minima observed
TX Her.	4	108	107	215	
EO Aur.	1	40	40	80	Light curve erratic
VW Cep	12	551	551	1102	See Note 1.
From 1 July, 1960 to 30 June, 1961					
V502 Oph.	2	120	118	238	2 Minima observed, see Note 2.

Note 1. The 1959 observations of VW Cephei were made during the international cooperative program on this system. The program was coordinated by K. H. Kwee of the Leiden (Holland) Observatory. All observations were

reduced at Crane Observatory and sent to Dr. Kwee to be published in the Leiden Observatory Annals. Dr. Kwee's illness has delayed the appearance of the publications of the coordinated program on VW Cephei.

Note 2. Subsequent observations on the system V502 Ophiuchi have yielded a complete light curve, four additional times of minima, and an improved period. It appears that there was an abrupt change in the period between July 9 and July 17, 1961. Observations in the process of being reduced will verify this conclusion, or not, as the case may turn out.

The light curve of V502 Ophiuchi is essentially complete and an analysis toward obtaining orbital elements will proceed at once. It is expected that publication of the results on this system will be possible before the end of the calendar year 1961.

A note concerning the nature of BD+44°1718 and the light curve is in preparation for publication.

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Observation of Eclipsing Binary
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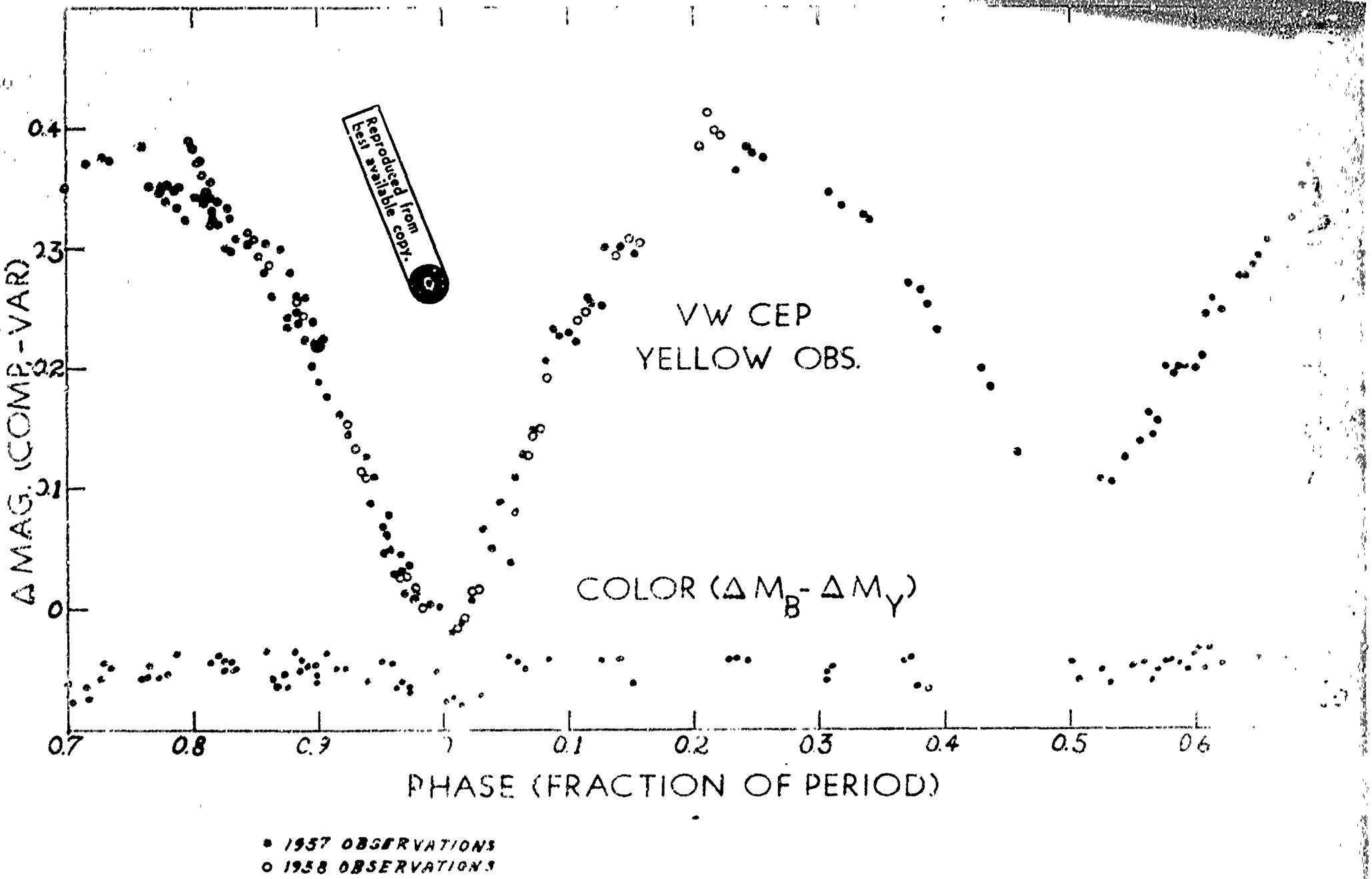
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VW CEP
YELLOW OBS.
COLOR ($\Delta M_B - \Delta M_Y$)
Δ MAG. (COMP.-VAR)
0.4
0.3
0.2
0.1
0
0.7
0.8
0.9
0.1
0.2
0.3
0.4
0.5
0.6
PHASE (FRACTION OF PERIOD)
• 1957 OBSERVATIONS
○ 1958 OBSERVATIONS