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PHOTOELECTRIC MINIMA OF ECLIPSING BINARIES

The following Table gives photoelectric minima obtained during the years 1972 and 1973 at the Ege University Observatory, Izmir (Turkey) and the Nürnberg Observatory (Germany). Minima of eclipsing binaries observed at both Observatories 1960 - 1971 were published in Astr.Nachr. 288, 69 (1964); 289, 191 (1966); 291, 111 (1968); IBVS 456 (1970), 530 (1971) and 647 (1972).

The Table gives besides the heliocentric minima three different O-C's, the type of filter (UBV), the abbreviations of the names of the observers and the type of the instruments used (Izmir: 48cm Cassegrain, Nürnberg: 34cm Cassegrain, both with phototube 1P21).

Abbreviations of the observers' names:

Ab - A. Alabaş	Hu - R. Hufnagel
An - H. Alkan	Ib - C. Ibanoglu
Bo - G. Bode	Ky - E. Kuyucu
By - C. Baygün	Me - M. Meier
Bz - S. Bozkurt	Ms - M. Çirak
Eb - J. Ebersberger	Od. - O. Demircan
Ek - S. Ertükel	Pl - E. Pohl
Er - A.Y. Ertan	Rk - R. Akinci
Gd - N. Güdür	Rn - R. Pekünlü
G1 - Ö. Gülmen	Sb - R. Sendelbeck
GÖ - G. Görz	Sc - H. Schellemann
Gp - G. Grampp	Sh - T. Scharold
Gr - R. Gröbel	Sr - C. Sezer
Hk - W. Huck	Tn - Z. Tunca
Hn - H. Haliçınarlı	Vo - H. Vogel
Hö - D. Hölzl	We - T. Weber
Hs - H. Karacan	Wu - J. Wunner

Remarks:

- O-C (I) : GCVS, Moscow 1969/70,  
FT Ori GCVS (1970), phase of secondary minimum  
 $\phi_S = 0,746 \cdot P$  (Cristaldi, S. 1970, Astron. Astrophys.  
5,228.)
- O-C (II) : SAC 44/45, Krakow 1972/73,
- O-C (III) : new elements :  
i Boo IBVS 209 (1967) Pohl  
VZ CVn,  $T_{\text{Min}} = 24\ 38880.5807 + 0^d 84246150 \cdot E$  (Ibanoglu,  
unpublished)  
RZ Cas Scientific Reports of the Faculty of Science,  
Ege University No. 120, Astronomy No. 12 (1971),  
A.Kizilirmak  
AK Her IBVS 369 (1969) Ibanoglu and Kurutac

The (O-C)'s for secondary minima (Min II) were calculated on the supposition that they are symmetric between primary minima (if not special data are given).

m: only the elements I or the elements II give secondary minimum.

The sign = between O-C (I) and O-C (II) indicates, that the elements (I) and (II) are equal.

The sign : means that the time of minimum is uncertain.

Star	Min.hel.	O-C (I)	O-C (II)	O-C (III)	Filt.	Obs.	Instr. cm	Rem
	2441							
RT And	619.2458	-0.0101	-0.0062			G1/An	48	
	924.2795	-0.0080	-0.0075			G1/Ms	48	
BX And	618.3634	+0.0035=	+0.0035		B, V	Rk/Hs	48	
	679.371	-0.000 =	-0.000			Hk/Sh	34	
	900.538	0.000 =	0.000			Sc/Sh/Vo	"	MinII
	951.484 :	+0.001:=	+0.001 :		B	Od/By/Ek	48	
	951.486 :	+0.003:=	+0.003 :		V	"	"	
CN And	509.4954	-0.0379			B	Gd/Hs	"	MinII
	509.4930	-0.0403			V	Gd/Hs	"	MinII
	512.5049	-0.0366			B	Gd/Rk/Rn	"	
	512.5044	-0.0371			V	Gd/Rk/Rn	"	
	567.5761	-0.0383			B	G1/Rk/Rn	"	
	567.5746	-0.0398			V	G1/Rk/Rn	"	
	568.5016	-0.0384			B	Gd/Rn	"	
	568.5012	-0.0388			V	Gd/Rn	"	
	577.5282	-0.0364			B	G1/Hs	"	MinII
	577.5278	-0.0368			V	G1/Hs	"	MinII
KO Aql	887.4717	+0.0822	-0.0080		B	Ib/Tn/Sr	"	
	887.4710	+0.0815	-0.0087		V	"	"	
KP Aql	499.3406	+0.0397	+0.0016		B	G1/Hs	"	MinII
	499.3420	+0.0411	+0.0030		V	G1/Hs	"	"
	834.4077	+0.0452	+0.0046		B	G1	"	
	834.4070	+0.0445	+0.0039		V	G1	"	
	861.3482	+0.0460	+0.0052		B	Ib/G1	"	
	861.3475	+0.0453	+0.0045		V	Ib/G1	"	
	898.3925	+0.0483	+0.0073		B	Ib/Er/Sr	"	
	898.3904	+0.0462	+0.0052		V	"	"	
	903.4416	+0.0463	+0.0051		B, V,	Ib/Er	"	MinII
OO Aql	571.3468	-0.0242	+0.0065 (m)		B	Od	"	
	571.3476	-0.0234	+0.0073 (m)		V	Od	"	
	626.331 :	-0.027:(m)	+0.004 :		B, V	Od/Hs	"	
	890.3721	-0.0256(m)	+0.0096		B	Od/Sr/Ky	"	
	890.3711	-0.0266(m)	+0.0086		V	"	"	
	922.2987	-0.0270(m)	+0.0086		B, V	Ib/Tn/Er	"	
	940.2886	-0.0283	+0.0076 (m)		B, V	Ib/G1/Tn	"	
σ Aql	911.341 :	-0.046 :=	-0.046 :		B, V	An/Sr/Ms	"	
RX Ari	661.475	+0.021			B	Rk/An	"	
	661.474	+0.020			V	Rk/An	"	
SX Aur	677.3552	+0.0200	+0.0166			Eb/Hk/Hu	34	
	691.272:	+0.021:	+0.018:		B	An/Hs	48	MinII
	691.271:	+0.020:	+0.017:		V	An/Hs	"	"
	692.4826	+0.0214	+0.0180		B	An/Hs	"	"
	692.4812	+0.0200	+0.0166		V	An/Hs	"	"
	763.275:	+0.024:	+0.021:		B, V	An/Hs	"	
	769.3249	+0.0238	+0.0204		B	An/Hs	"	
	769.3235	+0.0224	+0.0190		V	An/Hs	"	
	775.371:	+0.020:	+0.016:		B	An/Hs	"	
	775.372:	+0.019:	+0.015:		V	An/Hs	"	
	957.4884	+0.0203	+0.0169		B	Ib/G1	"	MinII
	957.4889	+0.0208	+0.0174		V	"	"	"
WW Aur	399.305	+0.001	-0.003			Hö/Hu	34	
AR Aur	941.464	+0.018 =	+0.018			Sc/Sh/Vo	"	

Star	Min.hel.	O-C (I)	O-C (II)	O-C (III)	Filt.	Obs.	Instr. cm	Rem.
	2441							
BF Aur	684.373	+0.005	+0.017			Eb/Hu/Sh	34	MinII
	752.456	+0.010	+0.022			Eb/Vo	"	"
TZ Boo	356.5277	+0.0053			B	Gd/Gl/Hs	48	MinII
	356.5284	+0.0060			V	Gd/Gl/Hs	"	"
	392.483:	+0.004:			B	Rk/Rn	"	"
	392.484:	+0.005:			V	Rk/Rn	"	"
	443.4479	+0.0060			B	Bz/Ib	"	"
	443.4479	+0.0060			V	Bz/Ib	"	"
	450.427:	+0.002:			B	Bz/Ib	"	MinII
	450.428:	+0.003:			V	Bz/Ib	"	"
	453.398:	+0.001:			B	Bz/Ib	"	"
	453.397:	+0.000:			V	Bz/Ib	"	"
	462.313	+0.001				Rk/Rn	"	"
	465.437:	+0.005:			B	Rk/Hs	"	"
	465.436:	+0.004:			V	Rk/Hs	"	"
	484.4587	+0.0086			B	Ib/Hs	"	"
	484.4574	+0.0073			V	Ib/Hs	"	"
i Boo	384.5323	+0.0148	+0.0169	+0.0125		Gl/Hs	"	MinII
	392.432	+0.014	+0.016	+0.012		Gö/Hö	34	"
	435.4166	+0.0144	+0.0168	+0.0121		Gd/Hs	48	MinII
	462.464:	+0.013:	+0.015:	+0.010:		Rk/Rn	"	"
	585.392:	+0.014:	+0.017:	+0.011:		Bc/Hk	34	"
	599.314	+0.009	+0.013	+0.007		Hö/Hk	"	"
	758.407:	+0.021:	+0.025:	+0.018:		Sh/Vo	"	"
	798.444	+0.019	+0.024	+0.017		Sh/Vo	"	"
	819.464:	+0.016:	+0.020:	+0.014:		Sc/We	"	MinII
SV Cam	681.2879	-0.0045	-0.0013			Pi/Sh	"	"
As Cam	547.5273	+0.2117			B	Bz/Gl	48	MinII
	547.5282	-0.2108			V	Bz/Gl	"	"
	578.4065	-0.2112			B	Gl/Hs	"	"
	578.4065	-0.2112			V	Gl/Hs	"	"
	580.3330	-0.0002			B	Gd/Od	"	"
	580.3338	+0.0006			V	Gd/Od	"	"
VZ CVn	327.5098	-0.0019		-0.0003	V	Ib/Rk	"	MinII
	357.418:	-0.001:		0.000:	V	Bz/Ib/Rk	"	"
RZ Cas	333.3257	-0.0043	-0.0087	+0.0013		Gö/Hö	34	"
	511.4206	-0.0013	-0.0063	+0.0024	B	Rk/Rn/Ab	48	"
	511.4206	-0.0013	-0.0063	+0.0024	V	Rk/Rn/Ab	"	"
	560.4240	-0.0030	-0.0082	0.0000		Eb/Hk	34	"
	566.4022	-0.0010	-0.0062	+0.0020		Eb/Hö	"	"
	584.3326	+0.0007	-0.0046	+0.0034	B	Rk/Hs	48	"
	584.3326	+0.0007	-0.0046	+0.0034	V	Rk/Hs	"	"
	860.4375	+0.0034	-0.0029	+0.0030		Hk/Sb	34	"
	921.394	+0.002	-0.004	+0.002		Hö/Sb	"	"
	933.346	+0.002	-0.005	+0.001	B	Ob/By/Ek	48	"
	933.345	+0.001	-0.006	0.000	V	"	"	"
	934.5418	+0.0024	-0.0042	+0.0017		Eb/Sc	34	"
TV Cas	595.3586	-0.0062	+0.0010			Hk	34	"
TW Cas	671.301	-0.014	-0.017		B	Od/Hs	48	"
	671.300	-0.015	-0.018		V	Od/Hs	"	"
DO Cas	936.3666	+0.0024=	+0.0024		B,V	Gl/Sr	"	"
	960.331:	+0.003:=	+0.003:			Sh/Vo	34	"
MN Cas	656.5043	-0.0053	+0.0170		B	Rk/An	48	"
	656.5032	-0.0064	+0.0159		V	Rk/An	"	"
	682.384	-0.004 (m)	+0.018			Eb/Hk/Hu	34	"

Star	Min.hel.	O-C (I)	O-C (II)	O-C (III)	Filt.	Obs.	Instr. cm	Rem.
	2441							
PV Cas	666.2908	+0.0652	+0.0043		B	Od	48	
	666.2907	+0.0651	-0.0044		V	Od	"	
	855.341:	+0.066:	-0.005:		B,V	Ib	"	
	924.4506	+0.0319	-0.0010		B	Gl/Ms	"	MinII
	924.4501	+0.0314	-0.0015		V	"	"	
U Cep	395.361	+0.023	+0.019			Me/Wu	34	
VW Cep	596.364	-0.071	+0.007			Hk	"	
	678.327	-0.072	+0.006			Eb/Hu	"	MinII
	698.419:	-0.071:	+0.008:			Sh/Vo	"	"
	814.426	-0.071	+0.010			Sc/Sh/Vo	"	"
	829.456	-0.070	+0.011			Eb/Sc	"	"
	989.344	-0.076	+0.007			Sc/Sh/Vo	"	
RW Cet	952.4322	-0.0344	-0.0043		B	Tn/Er/Ms	48	
	952.4315	-0.0351	-0.0050		V	"	"	
KR Cyg	528.4524	-0.0083	+0.0100			Od/Ab	"	
	627.331	-0.013	+0.006		B	Od/Hs	"	
	627.333	-0.011	+0.008		V	Od/Hs	"	
MR Cyg	674.242	-0.006	-0.002			Eb/P1	34	
	839.429:	-0.006:	-0.002:		B	Od	48	MinII
	839.432:	-0.003:	+0.001:		V	Od	"	
477 Cyg	931.4592	-0.0129	+0.0052			Bo/Hö	34	
836 Cyg	492.3348	-0.0017	-0.0034			Rk/Rn/Ab	48	
	521.408:	-0.005:	-0.007:		V	Rk	"	MinII
	525.321:	-0.013:	-0.014:			Rk/Rn	"	"
	854.327:	+0.001:	-0.001:		B,V	Gl	"	
	881.446:	+0.003:	+0.002:		B,V	Od/By/Ek	"	MinII
TW Dra	503.4655	-0.0248	+0.0018			Gr/Hk	34	
	764.500:	-0.029:	+0.001:			Gp/Gr	"	
TZ Dra	519.3351	+0.0054	+0.0057			Od/Ab/Hs	48	
UJZ Dra	570.2834	+0.0014=	+0.0014		B	Od	"	
	570.2829	+0.0009=	+0.0009		V	Od	"	
WW Dra	918.503:	+0.126:=	+0.126:			Eb	34	
AI Dra	463.4384	+0.0075	+0.0083			Gd/Rn	48	
	529.3737	+0.0081	+0.0088			Od/Ab	"	
	831.4739	+0.0073	+0.0080			Eb/We	34	
	849.4561	+0.0072	+0.0080			Sc/Sh/Vo	"	
BS Dra	461.4252	+0.0542=	+0.0542		B	Gl/Hs	48	
	461.4252	+0.0542=	+0.0542		V	Gl/Hs	"	
	471.5166	+0.0536=	+0.0536		B	Rk/Hs	"	
	471.5163	+0.0533=	+0.0533		V	Rk/Hs	"	
	488.3335	+0.0505=	+0.0505		B	Rk/Rn	"	
	488.3319	+0.0489=	+0.0489		V	Rk/Rn	"	
	493.3817	+0.0527=	+0.0527		B	Gl/Rk	"	MinII
	493.3838	+0.0548=	+0.0548		V	Gl/Rk	"	"
	826.4196	+0.0546=	+0.0546		B,V	Ib/Gl	"	
UX Eri	922.5394	-0.0232	+0.0395			Ib/Tn/Sr	"	MinII
YY Eri	680.3167	-0.0066	-0.0006			Eb/Sh/Vo	34	
	928.5125	-0.0059	+0.0022		B	Ib/Tn	48	
	928.5116	-0.0068	+0.0013		V	"	"	
RX Her	524.3530	+0.0004	-0.0002			Gd/Hs	"	

Star	Min.hel.	O-C (I)	O-C (II)	O-C (III)	Filt.	Obs.	Instr. cm	Rem.
	2441							
SZ Her	931.389	+0.023	+0.013		B,V	Od/By	48	
TX Her	455.3767	-0.0086	+0.0011			Rk/Rn	"	MinII
	492.453:	-0.009:	+0.001:			Rk/Rn/Ab	"	"
	768.4670	-0.0095	+0.0002		B	Ib/An	"	"
	768.4677	-0.0088	+0.0009		V	Ib/An	"	"
AK Her	512.445	-0.017=	-0.017	+0.002		Gr/Hk	34	
	786.436	-0.018=	-0.018	+0.003	B	Ob/Hs	48	
	786.433	-0.021=	-0.021	0.000	V	Ob/Hs	"	
	832.3795	-0.0203=	-0.0203	+0.0004	B	Od	"	
	832.3802	-0.0196=	-0.0196	+0.0011	V	Od	"	
	853.456	-0.020=	-0.020	+0.001		Sc/Sh/Vo	34	
338 Her	945.3359	+0.0736	+0.0197		B,V	Tn/Er	48	
AI Hya	411.368:	-0.542:				Bz/Ib	"	
SW Lac	598.3161	-0.0354	-0.0380		B	Od/An	"	
	598.3154	-0.0361	-0.0387		V	Od/An	"	
	683.3055	-0.0390	-0.0416			Ed/Hu	34	
AR Lac	513.393:	-0.022:	-0.023:		B	Rk/Ab	48	MinII *
	513.391:	-0.024:	-0.025:		V	Rk/Ab	"	"
UV Leo	390.441	-0.007	+0.005			Gp/Me	34	
	466.3544	-0.0042	+0.0072			Rk/Hs	48	
	766.3971	-0.0042	+0.0077			Eb/Sh/Vo	34	
AM Leo	386.4876	-0.0004	-0.0241			Gd/Hs	48	
FL Lyr	959.2641	-0.0014	+0.0049		B,V	Gl/Tn/Er	"	
U Oph	494.4387	-0.0059	-0.0026		B	Rk/Hs	"	
	494.4392	-0.0054	-0.0021		V	Rk/Hs	"	
451 Oph	527.3779	+0.0120			B	Rk/Rn	"	MinII
	527.3772	+0.0113			V	Rk/Rn	"	"
456 Oph	897.5343	+0.1710			B	Od/By/Ek	"	
	897.5340	+0.1707			V	"	"	
	951.3835	+0.1729			B	"	"	
	951.3830	+0.1724			V	"	"	
502 Oph	491.3772	+0.0036=	+0.0036			Hs	"	MinII
	888.320:	+0.001:=	+0.001:		B	Od/By/Ek	"	
	888.321:	+0.002:=	+0.002:		V	"	"	
566 Oph	479.4702	+0.0093=	+0.0093		B	Rk/Hs	"	
	479.4704	+0.0095=	+0.0095		V	Rk/Hs	"	
	845.489	+0.014 =	+0.014			Sc/Sh/Vo	34	MinII
	851.4283	+0.0134=	+0.0134		B,V	Ib/An	48	
	895.468	+0.017 =	+0.017			Sc/Sh/Vo	34	
ER Ori	626.416	-0.016=	-0.016		B	Od/Hs	48	
	626.415	-0.017=	-0.017		V	Od/Hs	"	
	664.3099	-0.0163=	-0.0163		B,V	Od/An	"	MinII
FT Ori	575.5135	+0.0120	+0.0229		B	Gl/Rn	"	
	575.5136	+0.0121	+0.0230		V	Gl/Rn	"	
	675.5048	-0.0094			B	Ib/Gl	"	MinII
	675.5047	-0.0095			V	Ib/Gl	"	"
AT Peg	661.2728	-0.0478	-0.0042		B	Rk/An	"	
	661.2729	-0.0477	-0.0041		V	Rk/An	"	

Star	Min.hel.	O-C (I)	O-C (II)	O-C (III)	Filt.	Obs.	Instr. cm	Rem.
	2441							
AG Per	673.385	-0.009	-0.004			Eb/Gr/Hk	34	
DM Per	609.496	+0.044 =	+0.044			Bo/Hk	"	
	920.4575	+0.0449=	+0.0449		B, V	Er/Ms	48	
IZ Per	332.440	+0.017 =	+0.017			Hk/Me	34	
$\beta$ Per	647.3510	-0.0428	-0.0041			Eb/Hö	"	
UV Psc	888.4944	+0.0145 =	+0.0145		B	Od/By/Ek	48	
	888.4939	+0.0140 =	+0.0140		V	"	"	
525 Sgr	939.339:	+0.001: =	+0.001:		B, V	Od/By	"	
RS Sct	922.3702	+0.0188	+0.0031		B, V	Ib/Tn/Sr	"	
	958.239	+0.019	+0.003		B, V	Od/By/Ek	"	
CD Tau	576.4704	+0.0053	-0.0113		B	Gd/Hs	"	MinII
	576.4709	+0.0058	-0.0108		V	Gd/Hs	"	"
	619.4068	+0.0025	-0.0139		B	G1/An	"	
	619.4073	+0.0030	-0.0134		V	G1/An	"	
	660.6300	+0.0041	-0.0125		B	Ib/G1	"	
	660.6307	+0.0046	-0.0118		V	Ib/G1	"	
	662.3462	+0.0027	-0.0143		B	Rk/An	"	MinII
	662.3458	+0.0023	-0.0147		V	Rk/An	"	"
	674.373	+0.007	-0.010			Eb/Me	34	
X Tri	320.3701	-0.0071	-0.0212		B	Ib/Hs	48	
	320.3707	-0.0065	-0.0206		V	Ib/Hs	"	
	321.3422	-0.0065	-0.0206		B	G1/Hs	"	
	321.3422	-0.0065	-0.0206		V	G1/Hs	"	
	357.289:	-0.006 :	-0.021 :		B	Bz/Ib/Rk	"	
	357.289:	-0.006 :	-0.021 :		V	Bz/Ib/Rk	"	
	572.4850	-0.0050	-0.0204		B	Gd/Rn	"	MinII
	572.4836	-0.0064	-0.0218		V	Gd/Rn	"	"
	575.3965	-0.0081	-0.0235		B	G1/Rn	"	"
	575.3965	-0.0081	-0.0235		V	G1/Rn	"	"
	593.3692	-0.0088	-0.0243		B	Ib/An	"	
	593.3702	-0.0078	-0.0233		V	Ib/An	"	
W UMa	401.4263	-0.0690	-0.0029			Eb/Hu	34	
	708.374	-0.076	-0.002			Eb/Hk/Hu	"	
TX UMa	717.4200	-0.0022	-0.0020			Eb/Sh/Vo	"	
	815.4459	:-0.0001 :	+0.0002 :			Sc/Sh/Vo	"	
VV UMa	776.267 :	+0.020 :	-0.015 :		B, V	Od	48	
AG Vir	391.427	+0.031	-0.006			Hu/Me	34	
AH Vir	765.4077:	+0.0150:=	+0.0150 :			Me/Sh/Vo	"	
	859.3401	+0.0136 =	+0.0136		B	G1	48	
	859.3405	+0.0140 =	+0.0140		V	G1	"	
BE Vul	944.3450	+0.0101	0.0000		B, V	Od/Ek	"	
DR Vul	509.344 :	+0.009 :	-0.020 :			Gd/Hs	"	

Correction for Bulletin Nr.647

The minima for iBoo ends with J.D. 2441 141.4886: From 2441 047.3915 to  
.... 125.320 minima of the star VZ CVn are given.

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