Recent Minima of 161 Eclipsing Binary Stars

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Abstract This paper continues the publication of times of minima for eclipsing binary stars from observations reported to the AAVSO Eclipsing Binary Section. Times of minima from observations made from March 2009 through August 2009, along with a few unpublished times of minima from older data, are presented.

1. Recent observations

The accompanying list contains times of minima calculated from recent CCD observations made by participants in the AAVSO's eclipsing binary program. This list will be web-archived and made available through the AAVSO ftp site at ftp://ftp.aavso.org/public/datasets/jsamoj381.txt. This list, along with eclipsing binary data from earlier AAVSO publications, is also included in the Lichtenknecker database administrated by the Bundesdeutsche Arbeitsgemeinschaft für Veränderliche Sterne e.V. (BAV) at http://www.bav-astro.de/LkDB/index.pho?lang=en. These observations were reduced by the observers or the writer using the method of Kwee and Van Woerden (1956). The standard error is included when available.

The linear elements in the *General Catalogue of Variable Stars* (GCVS, Kholopov *et al*. 1985) were used to compute the O–C values for most stars. For a few exceptions where the GCVS elements are missing or are in significant error, light elements from another source are used: CD Cam (Baldwin and Samolyk 2007), CW Cas (Samolyk 1992a), DV Cep (Frank and Lichtenknecker 1987), DF Hya (Samolyk 1992b), EF Ori (Baldwin and Samolyk 2005), and GU Ori (Samolyk 1985). O–C values listed in this paper can be directly compared with values published in recent numbers of the AAVSO *Observed Minima Timings of Eclipsing Binaries* series.

The number of observations used for determination of each time of minimum is given under *N* when available.

References

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Table 1. Recent times of minima of stars in the AAVSO eclipsing binary program.

Star	*HJD(min) 2400000+*	*Cycle*	*O–C*	*N*	*Type*	*Observer**	*Standard Error*
RT And	55058.8316	22128	–0.0097	90	CCD	SAH	0.0001
UU And	55056.8102	9020	0.0803	72	CCD	SAH	0.0001
WZ And	54788.2731	20004	0.0485	110	CCD	OYE	0.0001
AB And	55050.8067	57070.5	–0.0235	168	CCD	MZK	0.0001
BD And	55058.8557	43414	0.0152	82	CCD	SAH	0.0001
BX And	55062.8103	30378	–0.0512	80	CCD	SAH	0.0004
OO Aql	55011.6746	32357.5	0.0442	84	CCD	SAH	0.0001
OO Aql	55060.5795	32454	0.0440	132	CCD	MZK	0.0001
V346 Aql	55058.6473	11877	–0.0101	83	CCD	SAH	0.0001
V417 Aql	55056.3893	32529	0.0656		CCD	OYE	0.0001
WW Aur	54905.6327	8697	0.0012	128	CCD	SAH	0.0002
HL Aur	54892.2435	47074	–0.0215	94	CCD	OYE	0.0001
TU Boo	54939.7427	67451	–0.1302	66	CCD	SAH	0.0002
TY Boo	54933.8403	64491.5	0.0844	61	CCD	SAH	0.0003
TY Boo	54939.7067	64510	0.0836	63	CCD	PRX	0.0002
TY Boo	54983.3093	64647.5	0.0784	94	CCD	OYE	0.0001
TY Boo	54983.4673	64648	0.0778	62	CCD	OYE	0.0001
TY Boo	54994.4101	64682.5	0.0790	137	CCD	OYE	0.0002
TY Boo	55005.6731	64718	0.0833	72	CCD	SAH	0.0001
TZ Boo	54938.6886	51506.5	0.0722	58	CCD	SAH	0.0004
TZ Boo	55005.7001	51732	0.0737	84	CCD	SAH	0.0003
TZ Boo	55007.3298	51737.5	0.0690	152	CCD	OYE	0.0001
VW Boo	54894.8426	69295.5	–0.1662	55	CCD	MZK	0.0002
VW Boo	54938.6590	69423.5	–0.1675	81	CCD	SAH	0.0003
VW Boo	54945.6780	69444	–0.1661	62	CCD	PRX	0.0004
VW Boo	54982.6468	69552	–0.1685	85	CCD	SAH	0.0003
VW Boo	55000.2712	69603.5	–0.1738	142	CCD	OYE	0.0001
AC Boo	55011.3202	82952	0.1631	148	CCD	OYE	0.0001
AD Boo	54939.6199	13056	0.0272	89	CCD	SAH	0.0002
EF Boo	54970.3321	5874	0.0025	57	CCD	OYE	0.0002
SV Cam	54905.6112	20758	0.0500	126	CCD	SAH	0.0002
AL Cam	54893.6144	21442	–0.0323	102	CCD	SAH	0.0001
AN Cam	54955.6932	1378.5	5.6531	157	CCD	SAH	0.0007
CD Cam	54933.7449	2841	–0.0010	178	CCD	SAH	0.0006

Table 1 continued on following pages

Table 1. Recent times of minima of stars in the AAVSO eclipsing binary program, cont.

Star	*HJD(min) 2400000+*	*Cycle*	*O–C*	*N*	*Type*	*Observer**	*Standard Error*
UU CMa	54895.6039	4753	–0.1075	82	CCD	SAH	0.0003
RW CMi	54889.4443	392	0.0065	122	CCD	CLZ	0.0001
TX CMi	54890.4652	47023	–0.0928	110	CCD	CLZ	0.0001
TY Cap	55043.7825	7201	0.0685	117	CCD	SAH	0.0002
TV Cas	55055.6686	5767	–0.0236	106	CCD	SAH	0.0007
AB Cas	54781.3221	8828	0.0975	67	CCD	OYE	0.0002
CW Cas	55056.6313	42101	–0.0512	74	CCD	SAH	0.0001
CW Cas	55066.6755	42132.5	–0.0512	91	CCD	SAH	0.0002
DZ Cas	55058.6882	33921	–0.1758	101	CCD	SAH	0.0004
IR Cas	55018.6854	18591	0.0091	115	CCD	SAH	0.0001
IR Cas	55058.8457	18650	0.0090	64	CCD	SAH	0.0001
PV Cas	55074.8554	8482	–0.0344	160	CCD	MZK	0.0001
V364 Cas	55056.6785	13430	–0.0227	96	CCD	SAH	0.0004
V375 Cas	55045.8217	13848	0.1408	65	CCD	MZK	0.0005
V375 Cas	55045.8247	13848	0.1438	84	CCD	SAH	0.0003
U Cep	54937.7766	4170	0.1654	181	CCD	SAH	0.0002
SU Cep	55055.8268	31873	0.0045	81	CCD	SAH	0.0002
WZ Cep	54986.6771	64550	–0.0892	77	CCD	SAH	0.0003
DK Cep	54987.7220	21703	0.0324	111	CCD	SAH	0.0002
DK Cep	55062.6516	21779	0.0331	89	CCD	SAH	0.0001
DV Cep	54986.6449	7077	–0.0038	73	CCD	SAH	0.0002
EG Cep	54912.6532	22618	0.0141	99	CCD	SAH	0.0001
EG Cep	54980.7311	22743	0.0143	84	CCD	SAH	0.0001
EK Cep	55066.7656	3628	0.0100	142	CCD	SAH	0.0001
IO Cep	55073.4594	19699	0.0114		CCD	OYE	0.0001
RW Com	54912.7687	62737	–0.0173	102	CCD	SAH	0.0002
RW Com	54916.6844	62753.5	–0.0178	68	CCD	PRX	0.0001
RW Com	54933.6551	62825	–0.0174	80	CCD	SAH	0.0002
RW Com	54964.2664	62954	–0.0237	80	CCD	OYE	0.0001
RZ Com	54933.7184	59367.5	0.0413	78	CCD	SAH	0.0001
SS Com	54930.8131	72500.5	0.6840	112	CCD	SAH	0.0004
SS Com	54959.7104	72570.5	0.6858	72	CCD	PRX	0.0003
CC Com	54913.6353	69692	–0.0159	30	CCD	MZK	0.0001
CC Com	54930.6285	69769	–0.0156	109	CCD	SAH	0.0001
CC Com	54946.6278	69841.5	–0.0160	40	CCD	SAH	0.0001
CC Com	54956.6703	69887	–0.0148	42	CCD	PRX	0.0003
U CrB	54939.7975	11063	0.1224	88	CCD	SAH	0.0004
RW CrB	54951.6187	19548	–0.0015	197	CCD	MZK	0.0001
RW CrB	54996.6565	19610	–0.0013	117	CCD	SAH	0.0002

Table 1 continued on following pages

Table 1. Recent times of minima of stars in the AAVSO eclipsing binary program, cont.

Star	HJD(min) 2400000+	Cycle	O–C	N	Type	Observer*	Standard Error
TW CrB	54911.5452	28891	0.0395	201	CCD	VJA	0.0001
W Crv	54891.7955	39280.5	0.0205	72	CCD	SAH	0.0002
W Crv	54912.7508	39334.5	0.0194	41	CCD	HES	0.0003
W Crv	54952.7236	39437.5	0.0199	81	CCD	PRX	0.0002
RV Crv	54905.7815	18570	–0.0740	56	CCD	SAH	0.0004
RV Crv	54938.6581	18614	–0.0765	94	CCD	SAH	0.0005
V Crt	54939.6060	19290	–0.0027	71	CCD	SAH	0.0002
SW Cyg	55074.7252	2888	–0.3034	149	CCD	SAH	0.0001
WW Cyg	55055.7773	4424	0.0812	111	CCD	SAH	0.0001
ZZ Cyg	55043.7086	15977	–0.0533	109	CCD	MZK	0.0001
ZZ Cyg	55043.7088	15977	–0.0531	126	CCD	SAH	0.0002
AE Cyg	54980.7565	10725	–0.0050	92	CCD	SAH	0.0003
AE Cyg	55047.6320	10794	–0.0034	74	CCD	MZK	0.0002
BR Cyg	54987.7031	10092	0.0003	150	CCD	SAH	0.0001
CG Cyg	54989.7525	24661	0.0622	119	CCD	MZK	0.0001
DK Cyg	54980.7713	36077	0.0845	110	CCD	SAH	0.0003
DK Cyg	55062.6703	36251	0.0834	78	CCD	SAH	0.0001
KR Cyg	55018.7782	30660	0.0141	146	CCD	SAH	0.0001
KV Cyg	54976.7977	8985	0.0512	127	CCD	MZK	0.0003
KV Cyg	54996.6722	8992	0.0527	120	CCD	SAH	0.0003
V346 Cyg	55018.7984	7047	0.1401	130	CCD	SAH	0.0002
V387 Cyg	55009.6803	42186	0.0196	67	CCD	SAH	0.0002
V388 Cyg	55022.6435	15214	–0.0858	167	CCD	MZK	0.0001
V388 Cyg	55030.3727	15223	–0.0879	153	CCD	OYE	0.0001
V456 Cyg	54949.7867	11264	0.0448	79	CCD	MZK	0.0001
V466 Cyg	55011.6815	18854.5	0.0059	127	CCD	SAH	0.0001
V466 Cyg	55059.6905	18889	0.0058	138	CCD	MZK	0.0001
V477 Cyg	54987.7441	4601	–0.0236	116	CCD	SAH	0.0001
V477 Cyg	55074.5823	4638	–0.0240	443	CCD	MZK	0.0001
V499 Cyg	55058.3477	35009	0.0462	—	CCD	OYE	0.0001
V548 Cyg	55011.7105	5847	0.0173	99	CCD	SAH	0.0002
V704 Cyg	55009.7667	29911	0.0304	63	CCD	SAH	0.0002
V704 Cyg	55045.7197	29974	0.0290	81	CCD	MZK	0.0002
V841 Cyg	52418.7078	23372	0.0082	40	CCD	DKS	0.0003
V841 Cyg	55042.3394	26819	0.0035	165	CCD	OYE	0.0002
V1034 Cyg	54996.7148	12343	–0.0035	115	CCD	SAH	0.0005
V1034 Cyg	54999.6466	12346	–0.0025	118	CCD	MZK	0.0004
W Del	55074.6869	2444	0.0290	148	CCD	SAH	0.0002
TY Del	55044.6723	10146	0.0539	69	CCD	SAH	0.0001

Table 1 continued on following pages

Table 1. Recent times of minima of stars in the AAVSO eclipsing binary program, cont.

Star	*HJD(min) 2400000+*	*Cycle*	*O–C*	*N*	*Type*	*Observer**	*Standard Error*
TY Del	55069.6861	10167	0.0540	141	CCD	MZK	0.0001
YY Del	55055.7648	15252	0.0106	88	CCD	SAH	0.0002
FZ Del	55058.7646	30304	–0.0390	84	CCD	SAH	0.0001
RZ Dra	55045.7930	19729	0.0483	88	CCD	SAH	0.0002
TW Dra	54925.8446	3844	0.0297	139	CCD	SAH	0.0001
TW Dra	55043.7303	3886	0.0279	163	CCD	SAH	0.0001
UZ Dra	54954.6709	4104	0.0029	143	CCD	SAH	0.0001
AR Dra	52332.6721	14003	0.0082	24	CCD	DKS	0.0001
AR Dra	54912.3465	17820	0.0108	91	CCD	OYE	0.0001
CM Dra	54970.2679	9521	–0.0025	35	CCD	OYE	0.0001
QW Gem	54544.3743	5708	–0.0010	250	CCD	SFV	0.0001
Z Her	55018.7701	10502	–0.0309	136	CCD	SAH	0.0003
SZ Her	54942.4034	15986	–0.0209	157	CCD	VJA	0.0001
SZ Her	55008.6693	16067	–0.0209	72	CCD	SAH	0.0001
SZ Her	55062.6636	16133	–0.0211	79	CCD	SAH	0.0001
TT Her	54913.8512	16356	0.0370	182	CCD	MZK	0.0002
TT Her	54987.7285	16437	0.0362	98	CCD	SAH	0.0002
TU Her	54933.8055	4796	–0.1909	105	CCD	SAH	0.0001
TU Her	54983.6776	4818	–0.1928	156	CCD	MZK	0.0001
UX Her	54996.7584	9894	0.0788	125	CCD	SAH	0.0003
CC Her	54986.7347	8834	0.1855	103	CCD	SAH	0.0001
CC Her	55059.5650	8876	0.1875	72	CCD	MZK	0.0001
CT Her	55009.6965	6990	0.0046	122	CCD	SAH	0.0003
LT Her	54945.7970	13090	–0.1219	202	CCD	MZK	0.0002
WY Hya	54932.6618	20058	0.0279	76	CCD	SAH	0.0004
WY Hya	54946.6225	20077.5	0.0265	44	CCD	SAH	0.0003
DF Hya	54904.7758	36651	–0.0128	84	CCD	SAH	0.0001
DF Hya	54939.6540	36756.5	–0.0134	81	CCD	SAH	0.0002
SW Lac	55043.7617	30458	–0.1032	140	CCD	SAH	0.0001
CM Lac	55066.6948	17474	–0.0022	140	CCD	SAH	0.0001
CM Lac	55074.7168	17479	–0.0037	522	CCD	MZK	0.0001
Y Leo	54905.5831	5616	–0.0167	112	CCD	GHS	0.0001
Y Leo	54915.6988	5622	–0.0176	61	CCD	PRX	0.0003
UV Leo	54904.6844	27436	0.0320	123	CCD	SAH	0.0001
WZ Leo	54905.7266	16894	–2.4730	97	CCD	SAH	0.0002
XY Leo	54908.4031	34614.5	0.0404	43	CCD	CLZ	0.0003
AP Leo	50538.602	25565	–0.032	1	CCD	CK	—
AP Leo	51610.619	28056	–0.036	1	CCD	CK	—
AP Leo	52644.7667	30459	–0.0374	38	CCD	DKS	0.0002

Table 1 continued on following pages

Table 1. Recent times of minima of stars in the AAVSO eclipsing binary program, cont.

Star	*HJD(min) 2400000+*	*Cycle*	*O–C*	*N*	*Type*	*Observer**	*Standard Error*
AP Leo	54940.2878	35793	–0.0438	80	CCD	OYE	0.0001
CE Leo	54977.2843	32725.5	–0.0139	75	CCD	OYE	0.0001
RT LMi	52351.5523	19602	–0.0050	47	CCD	DKS	0.0001
RT LMi	52354.5517	19610	–0.0050	31	CCD	DKS	0.0002
RT LMi	52403.6660	19741	–0.0049	18	CCD	DKS	0.0001
RT LMi	52689.7270	20504	–0.0064	34	CCD	DKS	0.0010
RT LMi	52964.9170	21238	–0.0062	34	CCD	DKS	0.0001
RT LMi	54912.4204	26432.5	–0.0143	110	CCD	OYE	0.0001
SS Lib	54980.7001	9614	0.1244	86	CCD	SAH	0.0002
RY Lyn	54912.5950	8380	–0.0474	99	CCD	SAH	0.0002
UZ Lyr	54982.7043	5971	–0.0265	103	CCD	HES	0.0002
EW Lyr	54933.7527	14591	0.2384	113	CCD	HES	0.0001
EW Lyr	55011.7016	14631	0.2384	96	CCD	SAH	0.0001
EW Lyr	55050.6767	14651	0.2390	51	CCD	MZK	0.0001
FL Lyr	55045.6128	7724	–0.0043	382	CCD	MZK	0.0002
FL Lyr	55058.6838	7730	–0.0022	116	CCD	SAH	0.0002
AT Mon	54932.6277	13960	0.0085	50	CCD	SAH	0.0004
EP Mon	54905.7105	19177	0.0342	150	CCD	GHS	0.0006
V508 Oph	54987.7142	28728	–0.0171	155	CCD	SAH	0.0001
V508 Oph	55013.3950	28802.5	–0.0233	83	CCD	OYE	0.0001
V508 Oph	55030.2914	28851.5	–0.0217	55	CCD	OYE	0.0001
V508 Oph	55074.6009	28980	–0.0180	62	CCD	SAH	0.0001
V839 Oph	54982.7072	35536	0.2366	106	CCD	SAH	0.0002
V1010 Oph	55005.6669	24293	–0.1271	75	CCD	SAH	0.0003
EF Ori	54887.4659	1566.5	0.0095	130	CCD	CLZ	0.0009
FL Ori	54904.5815	6162	0.0342	67	CCD	SAH	0.0001
FL Ori	54904.5818	6162	0.0345	87	CCD	GHS	0.0001
FZ Ori	54891.6364	27169	–0.0578	75	CCD	GHS	0.0003
FZ Ori	54912.6342	27221.5	–0.0593	81	CCD	SAH	0.0003
GU Ori	54905.6039	25146	–0.0435	98	CCD	SAH	0.0002
U Peg	54786.2599	48761	–0.1261	47	CCD	OYE	0.0001
U Peg	54792.2558	48777	–0.1267	140	CCD	OYE	0.0001
U Peg	54803.3116	48806.5	–0.1269	52	CCD	OYE	0.0003
BB Peg	55022.7710	31143.5	–0.0031	115	CCD	MZK	0.0001
BB Peg	55044.8219	31204.5	–0.0038	48	CCD	SAH	0.0004
GP Peg	55062.7882	14170	–0.0454	77	CCD	SAH	0.0002
IK Per	54880.2727	40653	–0.1694	175	CCD	OYE	0.0001
IU Per	54895.5985	10833	0.0096	50	CCD	SAH	0.0005
AV Pup	54901.6674	42642	0.1330	67	CCD	PRX	0.0002

Table 1 continued on following pages

Table 1. Recent times of minima of stars in the AAVSO eclipsing binary program, cont.

Star	*HJD(min) 2400000+*	*Cycle*	*O–C*	*N*	*Type*	*Observer**	*Standard Error*
U Sge	54996.7204	11201	–0.0081	126	CCD	SAH	0.0002
U Sge	55067.7131	11222	–0.0084	146	CCD	SAH	0.0001
V505 Sgr	55044.6829	8947	–0.0596	113	CCD	SAH	0.0002
V1968 Sgr	55008.7890	30516	–0.0139	82	CCD	SAH	0.0002
AO Ser	54939.6925	23661	–0.0115	104	CCD	SAH	0.0001
AO Ser	54968.7113	23694	–0.0112	97	CCD	HES	0.0001
AU Ser	52452.4111	20000	–0.0806	21	CCD	BAMA	0.0003
AU Ser	53078.9254	21621	–0.0842	38	CCD	DKS	0.0001
AU Ser	55013.3426	26626	–0.1038	138	CCD	OYE	0.0001
CC Ser	54933.8224	33820	0.9227	65	CCD	SAH	0.0004
CC Ser	55009.6808	33967	0.9282	96	CCD	SAH	0.0003
TY Tau	54895.5573	31283	0.2502	51	CCD	SAH	0.0004
WY Tau	54925.6374	25295	0.0557	107	CCD	HES	0.0002
WY Tau	54925.6380	25295	0.0563	68	CCD	SAH	0.0003
X Tri	55056.8244	12922	–0.0745	71	CCD	SAH	0.0001
W UMa	54903.6751	27389	–0.0606	207	CCD	MZK	0.0001
TY UMa	54903.7848	43355	0.2673	85	CCD	MZK	0.0001
TY UMa	54904.6719	43357.5	0.2681	71	CCD	PRX	0.0002
TY UMa	54938.7095	43453.5	0.2699	106	CCD	SAH	0.0002
UX UMa	54912.7689	88879	0.0018	47	CCD	SAH	0.0001
UX UMa	54933.6158	88985	0.0015	51	CCD	SAH	0.0001
UX UMa	54953.6762	89087	0.0015	52	CCD	SAH	0.0003
UX UMa	54970.3893	89172	–0.0025	25	CCD	OYE	0.0002
UX UMa	54975.3057	89197	–0.0029	82	CCD	OYE	0.0002
UX UMa	55004.4181	89345	0.0022	38	CCD	OYE	0.0001
VV UMa	54865.3333	13166	–0.0483	92	CCD	OYE	0.0001
VV UMa	54908.6375	13229	–0.0490	71	CCD	PRX	0.0002
VV UMa	54911.3795	13233	–0.0565	140	CCD	OYE	0.0001
VV UMa	54912.7628	13235	–0.0480	115	CCD	SAH	0.0002
XZ UMa	54912.8045	7154	–0.0988	89	CCD	SAH	0.0001
ZZ UMa	54945.6687	8261	–0.0022	86	CCD	MZK	0.0001
AF UMa	54982.6946	5361	0.5422	130	CCD	SAH	0.0004
BM UMa	54887.5962	64667	0.0092	100	CCD	CLZ	0.0001
BM UMa	54946.3095	64883.5	0.0032	55	CCD	OYE	0.0002
BM UMa	54964.3473	64950	0.0048	59	CCD	OYE	0.0002
KM UMa	54940.3492	6935	–0.0029	70	CCD	OYE	0.0001
KM UMa	54951.2574	6966	–0.0024	60	CCD	OYE	0.0001
W UMi	54895.5959	12470	–0.1624	66	CCD	SAH	0.0007
RU UMi	54912.6509	25368	–0.0129	124	CCD	HES	0.0001

Table 1 continued on following page

Table 1. Recent times of minima of stars in the AAVSO eclipsing binary program, cont.

Star	HJD(min) 2400000+	Cycle	O–C	N	Type	Observer*	Standard Error
RU UMi	54913.7005	25370	–0.0132	83	CCD	PRX	0.0002
RU UMi	54934.6974	25410	–0.0133	80	CCD	PRX	0.0001
VV Vir	54891.8051	53057	–0.0384	92	CCD	SAH	0.0001
AG Vir	54914.7267	14755	0.0003	271	CCD	MZK	0.0002
AG Vir	54934.6502	14786	0.0016	192	CCD	MZK	0.0003
AH Vir	54905.7824	22308.5	0.2152	91	CCD	SAH	0.0002
AH Vir	54939.8099	22392	0.2147	81	CCD	SAH	0.0004
AH Vir	54986.6748	22507	0.2147	65	CCD	SAH	0.0004
AK Vir	54933.6824	10353	–0.0467	95	CCD	SAH	0.0001
AW Vir	54938.6532	28011.5	0.0226	98	CCD	SAH	0.0001
AW Vir	54938.6532	28011.5	0.0226	98	CCD	PRX	0.0001
AW Vir	54977.5933	28121.5	0.0231	70	CCD	MZK	0.0001
AW Vir	54989.6294	28155.5	0.0233	74	CCD	MZK	0.0001
AW Vir	54998.2966	28180	0.0175	123	CCD	OYE	0.0001
AZ Vir	54904.7801	31253.5	–0.0184	66	CCD	SAH	0.0003
AZ Vir	54924.7101	31310.5	–0.0193	50	CCD	MZK	0.0002
AZ Vir	54924.7101	31310.5	–0.0193	—	CCD	PRX	0.0002
AZ Vir	54937.6478	31347.5	–0.0192	86	CCD	MZK	0.0002
BH Vir	54934.7379	14328	–0.0075	86	CCD	MZK	0.0001
BH Vir	54943.7225	14339	–0.0085	76	CCD	PRX	0.0002
Z Vul	54939.8200	4885	–0.0103	87	CCD	SAH	0.0004
AW Vul	55017.7063	10828	–0.0146	69	CCD	SAH	0.0003
AX Vul	55066.6453	5044	–0.0306	95	CCD	SAH	0.0002
AY Vul	55017.7260	5112	–0.0790	71	CCD	SAH	0.0003
BE Vul	55074.7077	9641	0.0705	108	CCD	SAH	0.0001
BO Vul	55062.8061	9802	–0.0328	75	CCD	SAH	0.0001
BS Vul	55005.6791	24653	–0.0235	93	CCD	SAH	0.0002
BT Vul	55005.7164	17178	0.0028	73	CCD	SAH	0.0003
BT Vul	55011.4193	17183	–0.0003	84	CCD	OYE	0.0001
BT Vul	55061.6364	17227	0.0040	121	CCD	MZK	0.0001
BU Vul	55058.7044	37830	0.0162	87	CCD	SAH	0.0001
CD Vul	55008.7330	12739	0.0004	100	CCD	SAH	0.0001
CD Vul	55069.5860	12828	0.0001	97	CCD	MZK	0.0001
GR Vul	55063.2953	16018	–0.0355	—	CCD	OYE	0.0002
HS Vul	55073.2919	55151	–0.0117	—	CCD	OYE	0.0001

**Observers: BAMA, L. Baldinelli and A. Maitan; CK , S. Cook; CLZ, L. Corp; DKS, S. Dvorak; GHS, H. Gerner; HES, C. Hesseltine; MZK, K. Menzies; OYE, Y. Ogmen; PRX, R. Poklar; SAH, G. Samolyk; SFV, F. Salvaggio; VJA, J. Virtanen.*