

# Recent Minima of 193 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 CCD observations received by the author from November 2015 through January 2016 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/gsam2j441.txt>. This list, along with the eclipsing binary data from earlier AAVSO publications, is also included in the Lichtenknecker database (Kreiner 2011) administrated by the Bundesdeutsche Arbeitsgemeinschaft für Veränderliche Sterne e. V. (BAV) at: <http://www.bav-astro.de/LkDB/index.php?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. Column F indicates the filter used. A "C" indicates a clear filter.

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), AC CMi (Samolyk 2008), CW Cas (Samolyk 1992), EF Ori (Baldwin and Samolyk 2005), GU Ori (Samolyk 1985).

The light elements used for QX And, EK Aqr, TY CMi, BB CMi, BH CMi, CZ CMi, VY Cet, XY Cet, YY CrB, LS Del, BC Her, EF Her, V338 Her, V899 Her, V1033 Her, V1034 Her, V1054 Her, WZ Leo, V423 Oph, V913 Oph, ZZ Peg, V351 Peg, V404 Peg, CP Psc, DZ Psc, V1121 Tau, V1123 Tau, V1223 Tau, V1234 Tau, and MS Vir are from Kreiner (2004).

The light elements used for DD Aqr, GK Aqr, MU Aqr, OS Aqr, V1542 Aql, BM Ari, BN Ari, V410 Aur, V641 Aur, XY Boo, DN Boo, GH Boo, GM Boo, GP Boo, IK Boo, CX CMi, GZ Gem, V1057 Her, V1065 Her, V1092 Her, V474 Hya, XX Leo, CE Leo, GU Leo, GV Leo, HI Leo, DZ Ori,

FF Ori, KV Peg, VZ Psc, V1332 Tau, V1370 Tau, BU Tri, BV Tri, HN UMa, QT UMa, GR Vir, IR Vir, and NN Vir are from Paschke (2014).

The light elements used for V562 Aur, V388 Gem, EU Hya, V409 Hya, V723 Per, V725 Per, V737 Per, V1047 Per, and V391 Vir are from the AAVSO VSX site (Watson *et al.* 2014). O–C values listed in this paper can be directly compared with values published in the AAVSO EB monographs.

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

| <i>Star</i> | <i>JD (min)</i><br><i>Hel.</i> | <i>Cycle</i> | <i>O–C</i><br><i>(day)</i> | <i>F</i> | <i>Observer</i> | <i>Error</i><br><i>(day)</i> | <i>Star</i> | <i>JD (min)</i><br><i>Hel.</i> | <i>Cycle</i> | <i>O–C</i><br><i>(day)</i> | <i>F</i> | <i>Observer</i> | <i>Error</i><br><i>(day)</i> |
|-------------|--------------------------------|--------------|----------------------------|----------|-----------------|------------------------------|-------------|--------------------------------|--------------|----------------------------|----------|-----------------|------------------------------|
|             | 2400000+                       |              |                            |          |                 |                              |             | 2400000+                       |              |                            |          |                 |                              |
| RT And      | 57335.5555                     | 25748        | –0.0106                    | V        | G. Samolyk      | 0.0001                       | AB And      | 57358.2724                     | 64023        | –0.0380                    | V        | L. Corp         | 0.0001                       |
| TW And      | 57333.7179                     | 4442         | –0.0546                    | V        | G. Samolyk      | 0.0001                       | AD And      | 57388.5585                     | 18643.5      | –0.0345                    | V        | G. Samolyk      | 0.0002                       |
| WZ And      | 54117.6513                     | 19040        | 0.0406                     | V        | V. Petriew      | 0.0002                       | BX And      | 57344.6137                     | 34118        | –0.0792                    | V        | K. Menzies      | 0.0001                       |
| XZ And      | 57336.5492                     | 24578        | 0.1790                     | V        | G. Samolyk      | 0.0001                       | BX And      | 57388.5403                     | 34190        | –0.0809                    | V        | G. Samolyk      | 0.0001                       |
| XZ And      | 57355.5510                     | 24592        | 0.1789                     | V        | G. Samolyk      | 0.0001                       | DS And      | 57347.6409                     | 20984.5      | 0.0039                     | V        | K. Menzies      | 0.0001                       |
| AB And      | 57328.5677                     | 63933.5      | –0.0384                    | V        | G. Samolyk      | 0.0002                       | DS And      | 57390.5873                     | 21027        | 0.0033                     | V        | N. Simmons      | 0.0001                       |
| AB And      | 57334.5425                     | 63951.5      | –0.0376                    | V        | N. Simmons      | 0.0001                       | QX And      | 57390.6496                     | 11865.5      | –0.0013                    | V        | N. Simmons      | 0.0002                       |

Table continued on following pages

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

| <i>Star</i> | <i>JD (min)</i><br><i>Hel.</i><br><i>2400000+</i> | <i>Cycle</i> | <i>O-C</i><br><i>(day)</i> | <i>F</i> | <i>Observer</i> | <i>Error</i><br><i>(day)</i> | <i>Star</i> | <i>JD (min)</i><br><i>Hel.</i><br><i>2400000+</i> | <i>Cycle</i> | <i>O-C</i><br><i>(day)</i> | <i>F</i> | <i>Observer</i> | <i>Error</i><br><i>(day)</i> |
|-------------|---|--------------|----------------------------|----------|-----------------|------------------------------|-------------|---|--------------|----------------------------|----------|-----------------|------------------------------|
| RY Aqr      | 57347.6074  | 8402         | -0.1294                    | V        | S. Cook         | 0.0004                       | V380 Cas    | 57333.6873  | 23347        | -0.0704                    | V        | G. Samolyk      | 0.0002                       |
| CX Aqr      | 57319.7305  | 37530        | 0.0134                     | C        | G. Frey         | 0.0002                       | SS Cet      | 57392.6456  | 5024         | 0.0612                     | V        | G. Samolyk      | 0.0001                       |
| DD Aqr      | 56953.6766  | 12659        | 0.0046                     | C        | G. Frey         | 0.0001                       | TT Cet      | 57342.6575  | 51027        | -0.0748                    | V        | E. Primucci     | 0.0001                       |
| DD Aqr      | 57299.7597  | 13139        | 0.0028                     | C        | G. Frey         | 0.0001                       | TT Cet      | 57358.6946  | 51060        | -0.0743                    | C        | G. Frey         | 0.0001                       |
| EK Aqr      | 52581.5925  | 266          | -0.0120                    | V        | G. Samolyk      | 0.0006                       | TW Cet      | 57333.6688  | 47215.5      | -0.0301                    | V        | G. Samolyk      | 0.0002                       |
| EK Aqr      | 55115.7963  | 8533.5       | 0.0005                     | V        | G. Samolyk      | 0.0009                       | TW Cet      | 57357.5901  | 47291        | -0.0311                    | V        | E. Primucci     | 0.0001                       |
| EK Aqr      | 57335.6484  | 15775.5      | 0.0021                     | C        | G. Frey         | 0.0002                       | TX Cet      | 57355.6740  | 19266        | 0.0114                     | V        | G. Samolyk      | 0.0001                       |
| EX Aqr      | 56912.7158  | 4961         | 0.0107                     | C        | G. Frey         | 0.0001                       | VY Cet      | 57327.7764  | 14165        | 0.0009                     | C        | G. Frey         | 0.0001                       |
| EX Aqr      | 57282.7036  | 5377         | 0.0147                     | C        | G. Frey         | 0.0002                       | XY Cet      | 56978.7001  | 1610         | 0.0014                     | C        | G. Frey         | 0.0001                       |
| GK Aqr      | 56958.7347  | 31502        | 0.0124                     | C        | G. Frey         | 0.0001                       | XY Cet      | 57042.6625  | 1633         | 0.0074                     | C        | G. Frey         | 0.0002                       |
| GK Aqr      | 57289.7561  | 32513        | 0.0172                     | C        | G. Frey         | 0.0006                       | YY CrB      | 54198.8140  | 4511         | 0.0016                     | V        | V. Petriew      | 0.0002                       |
| MU Aqr      | 56898.7169  | 19966        | 0.0094                     | C        | G. Frey         | 0.0001                       | YY Del      | 57263.7332  | 18036        | 0.0103                     | C        | G. Frey         | 0.0001                       |
| MU Aqr      | 57238.7218  | 21215        | 0.0122                     | C        | G. Frey         | 0.0001                       | DM Del      | 57256.7316  | 15101        | -0.1090                    | C        | G. Frey         | 0.0002                       |
| OS Aqr      | 56944.7084  | 8371         | -0.0098                    | C        | G. Frey         | 0.0001                       | LS Del      | 57329.6247  | 13273        | 0.0002                     | C        | G. Frey         | 0.0003                       |
| KP Aql      | 57336.5799  | 5030.5       | -0.0174                    | V        | S. Cook         | 0.0004                       | YY Eri      | 57329.8483  | 48984        | 0.1549                     | V        | G. Samolyk      | 0.0001                       |
| V417 Aql    | 57297.7116  | 38584.5      | 0.0729                     | C        | G. Frey         | 0.0001                       | WW Gem      | 54124.6865  | 22734        | 0.0342                     | V        | V. Petriew      | 0.0014                       |
| V1542 Aql   | 57230.7352  | 12259        | 0.0081                     | C        | G. Frey         | 0.0001                       | AL Gem      | 57331.9031  | 22286        | 0.0866                     | V        | K. Menzies      | 0.0002                       |
| V1542 Aql   | 57283.7647  | 12386        | 0.0104                     | C        | G. Frey         | 0.0002                       | GZ Gem      | 54106.6961  | 15205        | 0.0003                     | V        | V. Petriew      | 0.0002                       |
| RX Ari      | 57336.5468  | 18393        | 0.0661                     | V        | G. Samolyk      | 0.0003                       | HR Gem      | 54143.6805  | 22287        | 0.0141                     | V        | V. Petriew      | 0.0003                       |
| RX Ari      | 57340.6640  | 18397        | 0.0648                     | C        | G. Frey         | 0.0002                       | V388 Gem    | 57044.6467  | 9070         | 0.0069                     | C        | G. Frey         | 0.0007                       |
| SS Ari      | 57335.7195  | 45093.5      | -0.3479                    | V        | G. Samolyk      | 0.0001                       | AK Her      | 57170.7405  | 35548        | 0.0161                     | C        | G. Frey         | 0.0002                       |
| SS Ari      | 57336.7311  | 45096        | -0.3513                    | V        | S. Cook         | 0.0003                       | BC Her      | 56868.7447  | 1415         | -0.0054                    | C        | G. Frey         | 0.0001                       |
| BM Ari      | 57334.6827  | 12106        | -0.0007                    | C        | G. Frey         | 0.0001                       | BC Her      | 56902.7065  | 1426         | -0.0034                    | C        | G. Frey         | 0.0001                       |
| BN Ari      | 57395.6270  | 19607.5      | -0.0197                    | V        | K. Menzies      | 0.0001                       | BC Her      | 57291.7084  | 1552         | 0.0039                     | C        | G. Frey         | 0.0002                       |
| SX Aur      | 57335.8103  | 14192        | 0.0166                     | V        | K. Menzies      | 0.0001                       | CC Her      | 57164.7295  | 10090        | 0.2690                     | C        | G. Frey         | 0.0001                       |
| WW Aur      | 57392.7771  | 9682         | 0.0017                     | V        | G. Samolyk      | 0.0001                       | EF Her      | 56834.7656  | 916          | 0.0159                     | C        | G. Frey         | 0.0004                       |
| AP Aur      | 57331.8376  | 26148.5      | 1.5607                     | V        | K. Menzies      | 0.0001                       | V338 Her    | 57171.6912  | 3577         | 0.0025                     | C        | G. Frey         | 0.0002                       |
| AR Aur      | 57388.5789  | 4592         | -0.1237                    | V        | G. Samolyk      | 0.0001                       | V899 Her    | 57226.7714  | 11222        | -0.0004                    | C        | G. Frey         | 0.0005                       |
| CL Aur      | 57330.8473  | 19579        | 0.1728                     | V        | G. Samolyk      | 0.0001                       | V1033 Her   | 57161.7305  | 15640        | -0.0042                    | C        | G. Frey         | 0.0001                       |
| EP Aur      | 54106.8641  | 47034        | 0.0118                     | V        | V. Petriew      | 0.0001                       | V1034 Her   | 56869.7549  | 5359         | -0.0016                    | C        | G. Frey         | 0.0002                       |
| EP Aur      | 57327.8611  | 52484        | 0.0152                     | V        | G. Samolyk      | 0.0001                       | V1034 Her   | 57231.7448  | 5803         | -0.0011                    | C        | G. Frey         | 0.0001                       |
| IM Aur      | 54159.6236  | 10939        | -0.0939                    | V        | V. Petriew      | 0.0004                       | V1054 Her   | 56809.7603  | 6648         | 0.0045                     | C        | G. Frey         | 0.0002                       |
| V410 Aur    | 54389.8633  | 16076.5      | -0.0430                    | V        | V. Petriew      | 0.0002                       | V1054 Her   | 56833.7438  | 6685         | 0.0044                     | C        | G. Frey         | 0.0002                       |
| V562 Aur    | 57407.6608  | 11155        | 0.0219                     | V        | K. Menzies      | 0.0002                       | V1054 Her   | 57218.7753  | 7279         | 0.0011                     | C        | G. Frey         | 0.0005                       |
| V641 Aur    | 57391.7913  | 12116        | -0.0015                    | V        | K. Menzies      | 0.0001                       | V1057 Her   | 56860.7730  | 5898         | -0.0028                    | C        | G. Frey         | 0.0001                       |
| XY Boo      | 57153.7457  | 46415        | 0.0056                     | C        | G. Frey         | 0.0001                       | V1057 Her   | 57195.7204  | 6253         | -0.0056                    | C        | G. Frey         | 0.0002                       |
| AC Boo      | 54196.8134  | 80641        | 0.1207                     | V        | V. Petriew      | 0.0001                       | V1065 Her   | 57189.7492  | 14813        | -0.0050                    | C        | G. Frey         | 0.0001                       |
| DN Boo      | 57154.6796  | 5038         | -0.0016                    | C        | G. Frey         | 0.0002                       | V1092 Her   | 57224.7169  | 12497        | -0.0044                    | C        | G. Frey         | 0.0002                       |
| GH Boo      | 57173.6866  | 8967         | -0.0029                    | C        | G. Frey         | 0.0008                       | EU Hya      | 57089.6768  | 29508        | -0.0347                    | C        | G. Frey         | 0.0001                       |
| GM Boo      | 57186.7187  | 14359        | 0.0110                     | C        | G. Frey         | 0.0002                       | V409 Hya    | 57145.6957  | 8451         | 0.0514                     | C        | G. Frey         | 0.0004                       |
| GP Boo      | 57168.7335  | 7218         | -0.0088                    | C        | G. Frey         | 0.0002                       | V474 Hya    | 57062.7020  | 9233         | -0.0081                    | C        | G. Frey         | 0.0001                       |
| IK Boo      | 57190.6827  | 12563        | -0.0148                    | C        | G. Frey         | 0.0001                       | SW Lac      | 57328.5928  | 37582        | -0.0878                    | V        | G. Samolyk      | 0.0001                       |
| Y Cam       | 57361.6819  | 4356         | 0.4544                     | V        | N. Simmons      | 0.0002                       | DG Lac      | 57335.7433  | 5813         | -0.2258                    | V        | G. Samolyk      | 0.0002                       |
| CD Cam      | 57329.8383  | 5976.5       | -0.0075                    | V        | G. Samolyk      | 0.0003                       | UU Leo      | 57333.8940  | 7106         | 0.1992                     | V        | N. Simmons      | 0.0001                       |
| CD Cam      | 57398.6157  | 6066.5       | -0.0067                    | V        | G. Samolyk      | 0.0003                       | UV Leo      | 57411.8484  | 31614        | 0.0418                     | V        | G. Samolyk      | 0.0001                       |
| VZ CVn      | 54211.6954  | 18198        | -0.0018                    | V        | V. Petriew      | 0.0002                       | VZ Leo      | 57087.6706  | 23785        | -0.0596                    | C        | G. Frey         | 0.0001                       |
| TU CMi      | 57406.7178  | 26981        | -0.0096                    | V        | G. Samolyk      | 0.0002                       | VZ Leo      | 57392.8478  | 24065        | -0.0561                    | V        | G. Samolyk      | 0.0001                       |
| TY CMi      | 57133.6681  | 3566         | -0.0096                    | C        | G. Frey         | 0.0002                       | WZ Leo      | 57106.7141  | 3271         | 0.0004                     | C        | G. Frey         | 0.0001                       |
| YY CMi      | 57107.6789  | 26585        | 0.0182                     | C        | G. Frey         | 0.0001                       | WZ Leo      | 57355.9607  | 3448         | -0.0010                    | V        | G. Samolyk      | 0.0002                       |
| AC CMi      | 57105.7403  | 5912         | 0.0048                     | C        | G. Frey         | 0.0001                       | XX Leo      | 57097.7259  | 8657         | -0.0122                    | C        | G. Frey         | 0.0001                       |
| AK CMi      | 57375.8475  | 25224        | -0.0230                    | V        | G. Samolyk      | 0.0002                       | AM Leo      | 54170.7483  | 31923        | 0.0089                     | V        | V. Petriew      | 0.0001                       |
| BB CMi      | 57092.6674  | 5792         | -0.0118                    | C        | G. Frey         | 0.0002                       | AM Leo      | 57390.8634  | 40726        | 0.0095                     | V        | R. Sabo         | 0.0003                       |
| BH CMi      | 57071.6610  | 8174         | -0.0013                    | C        | G. Frey         | 0.0002                       | BL Leo      | 54121.0377  | 33598        | -0.0226                    | V        | V. Petriew      | 0.0001                       |
| CX CMi      | 57096.7303  | 4586         | 0.0154                     | C        | G. Frey         | 0.0002                       | CE Leo      | 57152.7215  | 31220        | -0.0047                    | C        | G. Frey         | 0.0001                       |
| CZ CMi      | 57103.7242  | 10796.5      | -0.0062                    | C        | G. Frey         | 0.0001                       | GU Leo      | 57073.7071  | 13241        | 0.0055                     | C        | G. Frey         | 0.0002                       |
| TV Cas      | 57348.5968  | 7032         | -0.0289                    | V        | S. Cook         | 0.0004                       | GV Leo      | 57102.6941  | 16302        | -0.0207                    | C        | G. Frey         | 0.0001                       |
| TW Cas      | 57328.5956  | 10726        | 0.0051                     | V        | G. Samolyk      | 0.0001                       | GV Leo      | 57121.7674  | 16373.5      | -0.0186                    | C        | G. Frey         | 0.0001                       |
| ZZ Cas      | 57330.6394  | 19214        | 0.0166                     | V        | G. Samolyk      | 0.0002                       | HI Leo      | 57110.7238  | 14025        | 0.0081                     | C        | G. Frey         | 0.0001                       |
| AB Cas      | 57330.5747  | 10693        | 0.1305                     | V        | G. Samolyk      | 0.0001                       | T LMi       | 54130.7820  | 2892         | -0.0934                    | V        | V. Petriew      | 0.0001                       |
| AB Cas      | 57334.6747  | 10696        | 0.1298                     | V        | N. Simmons      | 0.0001                       | T LMi       | 57334.8514  | 3953         | -0.1220                    | V        | G. Samolyk      | 0.0001                       |
| CW Cas      | 54347.8062  | 39878        | -0.0414                    | V        | V. Petriew      | 0.0001                       | Z Lep       | 57335.9367  | 30101        | -0.1895                    | V        | G. Samolyk      | 0.0002                       |
| CW Cas      | 54347.9650  | 39878.5      | -0.0420                    | V        | V. Petriew      | 0.0001                       | RR Lep      | 57356.6156  | 29472        | -0.0404                    | V        | E. Primucci     | 0.0002                       |
| CW Cas      | 57335.6701  | 49248.5      | -0.0935                    | V        | K. Menzies      | 0.0001                       | RY Lyn      | 54124.7867  | 7831         | -0.0473                    | V        | V. Petriew      | 0.0001                       |
| OX Cas      | 57334.6350  | 6453.5       | 0.0264                     | V        | G. Samolyk      | 0.0003                       | UU Lyn      | 54115.8573  | 20155        | -0.0054                    | V        | V. Petriew      | 0.0001                       |
| V364 Cas    | 57329.6155  | 14903        | -0.0249                    | V        | G. Samolyk      | 0.0002                       | UU Lyn      | 54117.7309  | 20159        | -0.0056                    | V        | V. Petriew      | 0.0002                       |
| V375 Cas    | 57329.6562  | 15398        | 0.2296                     | V        | G. Samolyk      | 0.0001                       | $\beta$ Lyr | 57233.90  | 637          | 1.96                       | B        | G. Samolyk      | 0.02                         |

Table continued on next page

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

| <i>Star</i> | <i>JD (min)</i><br><i>Hel.</i><br><i>2400000+</i> | <i>Cycle</i> | <i>O-C</i><br><i>(day)</i> | <i>F</i> | <i>Observer</i> | <i>Error</i><br><i>(day)</i> | <i>Star</i> | <i>JD (min)</i><br><i>Hel.</i><br><i>2400000+</i> | <i>Cycle</i> | <i>O-C</i><br><i>(day)</i> | <i>F</i> | <i>Observer</i> | <i>Error</i><br><i>(day)</i> |
|-------------|---|--------------|----------------------------|----------|-----------------|------------------------------|-------------|---|--------------|----------------------------|----------|-----------------|------------------------------|
| $\beta$ Lyr | 57233.90  | 637          | 1.96                       | V        | G. Samolyk      | 0.03                         | V737 Per    | 57393.6912  | 15979        | 0.0565                     | V        | K. Menzies      | 0.0001                       |
| $\beta$ Lyr | 57233.98  | 637          | 2.03                       | R        | G. Samolyk      | 0.02                         | V1047 Per   | 57328.9085  | 1472.5       | -0.0199                    | V        | S. Cook         | 0.0009                       |
| $\beta$ Lyr | 57240.40  | 637.5        | 1.99                       | B        | G. Samolyk      | 0.03                         | V1047 Per   | 57329.8595  | 1473         | -0.0240                    | V        | S. Cook         | 0.0007                       |
| $\beta$ Lyr | 57240.44  | 637.5        | 2.02                       | V        | G. Samolyk      | 0.02                         | VZ Psc      | 57304.6685  | 51567.5      | 0.0037                     | C        | G. Frey         | 0.0002                       |
| $\beta$ Lyr | 57240.44  | 637.5        | 2.03                       | R        | G. Samolyk      | 0.02                         | VZ Psc      | 57328.3122  | 51658        | 0.0035                     | R        | L. Corp         | 0.0004                       |
| EP Mon      | 57333.9332  | 1292         | 0.0269                     | V        | G. Samolyk      | 0.0001                       | CP Psc      | 57305.7071  | 7025         | 0.0016                     | C        | G. Frey         | 0.0002                       |
| V423 Oph    | 56838.7850  | 3604         | -0.0235                    | C        | G. Frey         | 0.0001                       | DZ Psc      | 57295.7185  | 13098        | 0.0097                     | C        | G. Frey         | 0.0001                       |
| V456 Oph    | 56829.7003  | 14697        | 0.0221                     | C        | G. Frey         | 0.0004                       | RW Tau      | 57390.5741  | 4228         | -0.2668                    | V        | G. Samolyk      | 0.0001                       |
| V456 Oph    | 56893.7090  | 14760        | 0.0229                     | C        | G. Frey         | 0.0001                       | RZ Tau      | 57328.9136  | 47278        | 0.0781                     | V        | K. Menzies      | 0.0002                       |
| V456 Oph    | 57214.7675  | 15076        | 0.0255                     | C        | G. Frey         | 0.0001                       | RZ Tau      | 57359.6749  | 47352        | 0.0795                     | C        | G. Frey         | 0.0001                       |
| V456 Oph    | 57277.7603  | 15138        | 0.0264                     | C        | G. Frey         | 0.0001                       | TY Tau      | 57041.6624  | 33275        | 0.2631                     | C        | G. Frey         | 0.0003                       |
| V501 Oph    | 57268.6719  | 27230        | -0.0125                    | C        | G. Frey         | 0.0007                       | TY Tau      | 57375.6471  | 33585        | 0.2676                     | V        | G. Samolyk      | 0.0001                       |
| V506 Oph    | 57237.7109  | 13466        | 0.0327                     | C        | G. Frey         | 0.0001                       | WY Tau      | 57330.9012  | 28767        | 0.0623                     | V        | K. Menzies      | 0.0001                       |
| V913 Oph    | 56830.7831  | 2258         | 0.0428                     | C        | G. Frey         | 0.0004                       | AC Tau      | 57330.8456  | 5723         | 0.1292                     | V        | G. Samolyk      | 0.0001                       |
| V913 Oph    | 57225.7731  | 2464         | 0.0468                     | C        | G. Frey         | 0.0001                       | AH Tau      | 57343.7202  | 78999.5      | 0.0218                     | C        | G. Frey         | 0.0001                       |
| DZ Ori      | 57065.7959  | 17330        | 0.0014                     | C        | G. Frey         | 0.0002                       | CD Tau      | 54133.6167  | 3643         | 0.0051                     | V        | V. Petriew      | 0.0001                       |
| EF Ori      | 57375.7451  | 3103         | 0.0078                     | V        | G. Samolyk      | 0.0003                       | EQ Tau      | 54388.8184  | 41528        | -0.0263                    | V        | V. Petriew      | 0.0001                       |
| ET Ori      | 57334.8369  | 32232        | -0.0024                    | V        | N. Simmons      | 0.0001                       | EQ Tau      | 54388.9893  | 41528.5      | -0.0261                    | V        | V. Petriew      | 0.0001                       |
| FF Ori      | 57067.6643  | 13726        | 0.0037                     | C        | G. Frey         | 0.0001                       | EQ Tau      | 57338.7461  | 50170        | -0.0322                    | C        | G. Frey         | 0.0001                       |
| FH Ori      | 57061.6589  | 14486        | -0.4319                    | C        | G. Frey         | 0.0001                       | EQ Tau      | 57344.7189  | 50187.5      | -0.0329                    | V        | K. Menzies      | 0.0001                       |
| FH Ori      | 57334.8501  | 14613        | -0.4380                    | V        | G. Samolyk      | 0.0002                       | EQ Tau      | 57375.6100  | 50278        | -0.0339                    | V        | G. Samolyk      | 0.0001                       |
| FL Ori      | 57362.8770  | 7747         | 0.0407                     | V        | R. Sabo         | 0.0002                       | V1121 Tau   | 57365.7217  | 10756        | -0.0094                    | C        | G. Frey         | 0.0001                       |
| FR Ori      | 57088.6805  | 33093        | 0.0358                     | C        | G. Frey         | 0.0001                       | V1123 Tau   | 54420.8149  | 4802.5       | 0.0003                     | V        | V. Petriew      | 0.0003                       |
| FR Ori      | 57390.7222  | 33435        | 0.0360                     | V        | G. Samolyk      | 0.0002                       | V1123 Tau   | 57344.6378  | 12113        | 0.0063                     | C        | G. Frey         | 0.0002                       |
| FZ Ori      | 57344.7740  | 33302        | -0.0381                    | V        | K. Menzies      | 0.0001                       | V1223 Tau   | 57369.6776  | 11422        | -0.0018                    | C        | G. Frey         | 0.0001                       |
| GU Ori      | 57375.7239  | 30394        | -0.0574                    | V        | G. Samolyk      | 0.0003                       | V1234 Tau   | 57037.6486  | 12191        | -0.0189                    | C        | G. Frey         | 0.0004                       |
| V648 Ori    | 57059.6628  | 19098        | 0.0670                     | C        | G. Frey         | 0.0001                       | V1332 Tau   | 57375.6294  | 13571        | 0.0139                     | C        | G. Frey         | 0.0003                       |
| U Peg       | 57328.5566  | 55544.5      | -0.1593                    | V        | N. Simmons      | 0.0001                       | V1370 Tau   | 57391.6485  | 20045        | -0.0007                    | V        | K. Menzies      | 0.0001                       |
| U Peg       | 57335.3025  | 55562.5      | -0.1594                    | V        | L. Corp         | 0.0002                       | V1370 Tau   | 57415.5849  | 20126        | -0.0012                    | V        | K. Menzies      | 0.0001                       |
| TY Peg      | 57294.6991  | 5447         | -0.4073                    | C        | G. Frey         | 0.0001                       | RV Tri      | 54365.8193  | 11056        | -0.0253                    | V        | V. Petriew      | 0.0001                       |
| TY Peg      | 57390.5530  | 5478         | -0.4122                    | V        | G. Samolyk      | 0.0001                       | BU Tri      | 54365.7706  | 1239.5       | 0.0015                     | V        | V. Petriew      | 0.0003                       |
| ZZ Peg      | 56913.7217  | 6613         | -0.0017                    | C        | G. Frey         | 0.0002                       | BU Tri      | 54365.9219  | 1240         | 0.0050                     | V        | V. Petriew      | 0.0003                       |
| ZZ Peg      | 57272.7652  | 7151         | 0.0020                     | C        | G. Frey         | 0.0001                       | BV Tri      | 54365.9189  | 739.5        | 0.0054                     | V        | V. Petriew      | 0.0005                       |
| AT Peg      | 57332.7567  | 10569        | 0.0190                     | C        | G. Frey         | 0.0001                       | W UMa       | 57335.8589  | 34679        | -0.0941                    | V        | G. Samolyk      | 0.0001                       |
| BB Peg      | 57330.5856  | 37527.5      | -0.0179                    | V        | N. Simmons      | 0.0001                       | TY UMa      | 54191.6681  | 41346.5      | 0.2414                     | V        | V. Petriew      | 0.0001                       |
| BG Peg      | 57330.5784  | 6043         | -2.2266                    | V        | G. Samolyk      | 0.0003                       | UX UMa      | 54116.0531  | 84828        | 0.0014                     | V        | V. Petriew      | 0.0001                       |
| BN Peg      | 57239.7563  | 32726        | -0.0001                    | C        | G. Frey         | 0.0001                       | UX UMa      | 54175.6448  | 85131        | 0.0016                     | V        | V. Petriew      | 0.0001                       |
| BO Peg      | 56923.7015  | 19488        | -0.0433                    | C        | G. Frey         | 0.0001                       | UX UMa      | 54197.6719  | 85243        | 0.0016                     | V        | V. Petriew      | 0.0001                       |
| BO Peg      | 57255.7059  | 20060        | -0.0449                    | C        | G. Frey         | 0.0001                       | VV UMa      | 54105.7766  | 12061        | -0.0501                    | V        | V. Petriew      | 0.0001                       |
| BO Peg      | 57309.6846  | 20153        | -0.0463                    | C        | G. Frey         | 0.0001                       | XY UMa      | 54134.8980  | 39496        | 0.0266                     | V        | V. Petriew      | 0.0001                       |
| BX Peg      | 57351.4801  | 46916        | -0.1193                    | V        | K. Menzies      | 0.0001                       | XY UMa      | 54196.6906  | 39625        | 0.0290                     | V        | V. Petriew      | 0.0001                       |
| DI Peg      | 56955.7049  | 16520        | 0.0034                     | C        | G. Frey         | 0.0001                       | XZ UMa      | 54104.8624  | 6493         | -0.0874                    | V        | V. Petriew      | 0.0001                       |
| DI Peg      | 57308.7680  | 17016        | 0.0053                     | C        | G. Frey         | 0.0001                       | AF UMa      | 57390.7187  | 5819         | 0.6062                     | V        | G. Samolyk      | 0.0005                       |
| DI Peg      | 57390.6267  | 17131        | 0.0051                     | V        | R. Sabo         | 0.0001                       | BM UMa      | 54145.8066  | 61932        | 0.0082                     | V        | V. Petriew      | 0.0001                       |
| EE Peg      | 56967.7273  | 4339         | 0.0142                     | C        | G. Frey         | 0.0003                       | HN UMa      | 54186.6435  | 14862        | -0.0163                    | V        | V. Petriew      | 0.0015                       |
| EE Peg      | 57306.7620  | 4468         | 0.0093                     | C        | G. Frey         | 0.0002                       | HN UMa      | 54199.6483  | 14896        | -0.0202                    | V        | V. Petriew      | 0.0015                       |
| GP Peg      | 57351.5802  | 16516        | -0.0530                    | V        | K. Menzies      | 0.0001                       | QT UMa      | 57415.7038  | 12357        | 0.0036                     | V        | K. Menzies      | 0.0001                       |
| KV Peg      | 57326.6913  | 20892        | -0.0154                    | C        | G. Frey         | 0.0002                       | AG Vir      | 57108.7276  | 18169        | -0.0085                    | C        | G. Frey         | 0.0002                       |
| KV Peg      | 57337.6779  | 20916        | -0.0156                    | C        | G. Frey         | 0.0002                       | AW Vir      | 57174.6802  | 34328        | 0.0279                     | C        | G. Frey         | 0.0001                       |
| V351 Peg    | 56924.7168  | 14200        | 0.0156                     | C        | G. Frey         | 0.0002                       | AZ Vir      | 57162.7371  | 37711        | -0.0239                    | C        | G. Frey         | 0.0001                       |
| V351 Peg    | 57290.7793  | 14817        | 0.0207                     | C        | G. Frey         | 0.0002                       | BF Vir      | 57159.7063  | 17311        | 0.1150                     | C        | G. Frey         | 0.0001                       |
| V404 Peg    | 57284.6954  | 11414        | -0.0318                    | C        | G. Frey         | 0.0001                       | BH Vir      | 57160.7084  | 17053        | -0.0122                    | C        | G. Frey         | 0.0001                       |
| V404 Peg    | 57336.6771  | 11538        | -0.0288                    | C        | G. Frey         | 0.0001                       | GR Vir      | 57187.7353  | 34790.5      | 0.0051                     | C        | G. Frey         | 0.0001                       |
| RT Per      | 57326.6982  | 28197        | 0.0991                     | V        | S. Cook         | 0.0004                       | IR Vir      | 56780.7548  | 18829        | 0.0048                     | C        | G. Frey         | 0.0001                       |
| RT Per      | 57355.5790  | 28231        | 0.1003                     | V        | G. Samolyk      | 0.0001                       | IR Vir      | 57140.7084  | 19803.5      | -0.0024                    | C        | G. Frey         | 0.0001                       |
| XZ Per      | 57355.8055  | 12025        | -0.0722                    | V        | G. Samolyk      | 0.0001                       | MS Vir      | 57184.7150  | 14994        | 0.0006                     | C        | G. Frey         | 0.0002                       |
| DZ Per      | 54341.8010  | 34442        | 0.0162                     | V        | V. Petriew      | 0.0004                       | NN Vir      | 57180.7612  | 18058        | 0.0070                     | C        | G. Frey         | 0.0001                       |
| IT Per      | 54103.5381  | 16118        | 0.0004                     | V        | V. Petriew      | 0.0004                       | V391 Vir    | 56771.7148  | 15557        | 0.0128                     | C        | G. Frey         | 0.0005                       |
| V432 Per    | 57335.8584  | 66750.5      | 0.0619                     | V        | G. Samolyk      | 0.0002                       | V391 Vir    | 56777.7382  | 15574        | 0.0128                     | C        | G. Frey         | 0.0002                       |
| V723 Per    | 57399.5528  | 7467.5       | 0.1317                     | V        | K. Menzies      | 0.0002                       | V391 Vir    | 57126.7247  | 16559        | -0.0020                    | C        | G. Frey         | 0.0001                       |
| V725 Per    | 57394.6364  | 667          | 0.0919                     | V        | K. Menzies      | 0.0002                       | BO Vul      | 57335.5901  | 10970        | -0.0238                    | V        | G. Samolyk      | 0.0001                       |
| V737 Per    | 57393.5073  | 15978.5      | 0.0559                     | V        | K. Menzies      | 0.0001                       |             |   |              |                            |          |                 |                              |