

KIC 003631985

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
003631985-01	OBS	No	4.560527	132.026788	8.1	19.919	7.2	3.3	1.32	6627	0.43	917.35
003631985-02	OBS	No	126.957570	133.100780	130.0	12.168	10.5	8.9	1.32	6627	1.75	10.87
003631985-03	OBS	No	137.684361	192.319484	115.3	12.440	10.0	7.8	1.32	6627	1.55	9.76
003631985-04	OBS	No	510.471188	499.727737	148.5	5.818	9.2	8.6	1.32	6627	1.84	1.70
003631985-05	OBS	No	52.982172	175.171808	95.5	4.252	9.2	8.7	1.32	6627	1.48	34.86
003631985-07	OBS	No	424.406935	192.591667	163.7	10.410	9.1	8.3	1.32	6627	1.89	2.17
003631985-08	OBS	No	44.050048	148.961830	76.7	11.194	8.9	7.9	1.32	6627	1.30	44.59
003631985-09	OBS	No	428.258732	222.123753	150.7	10.780	9.0	8.9	1.32	6627	1.74	2.15
003631985-10	OBS	No	579.371898	339.223546	119.6	18.051	8.8	6.7	1.32	6627	1.69	1.44

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003631985-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
003631985-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED
003631985-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—CENT_SATURATED
003631985-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_SATURATED
003631985-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
003631985-07	OBS	FP	0.01	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED
003631985-08	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
003631985-09	OBS	FP	0.00	1	0	0	0	ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED
003631985-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

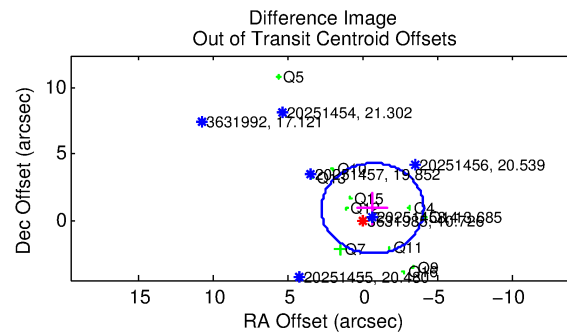
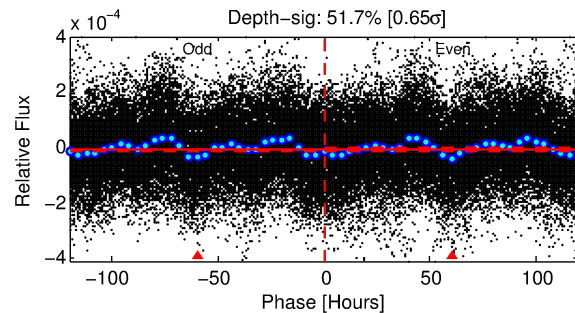
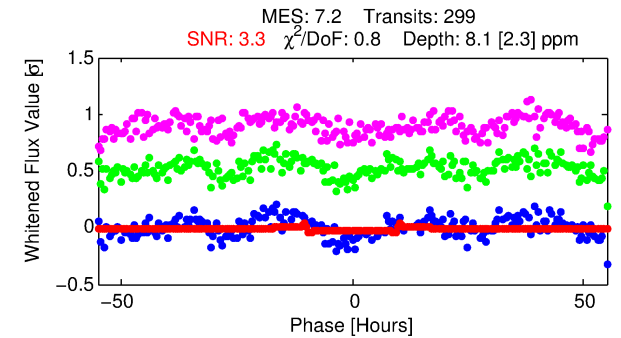
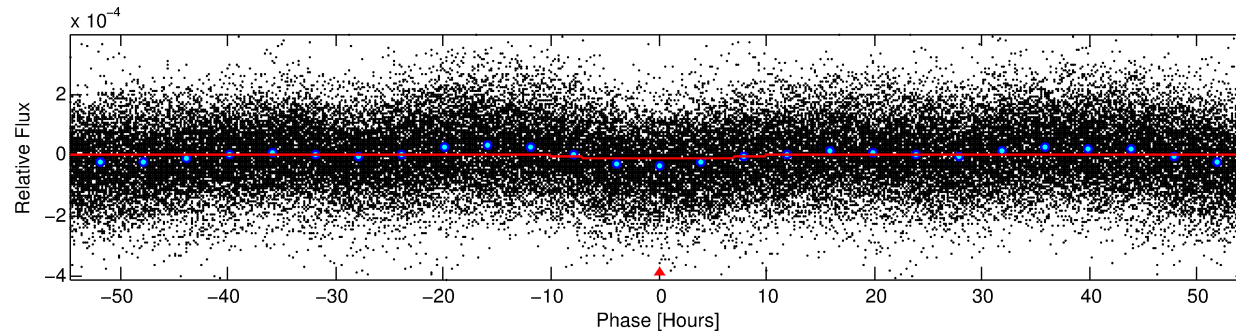
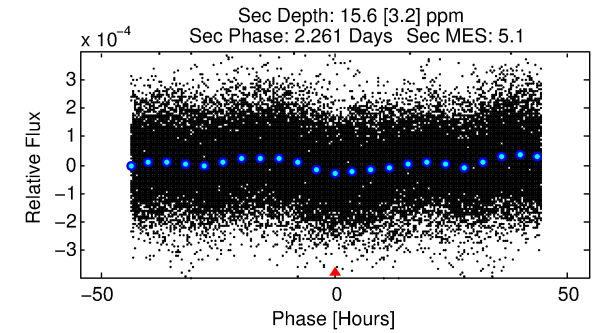
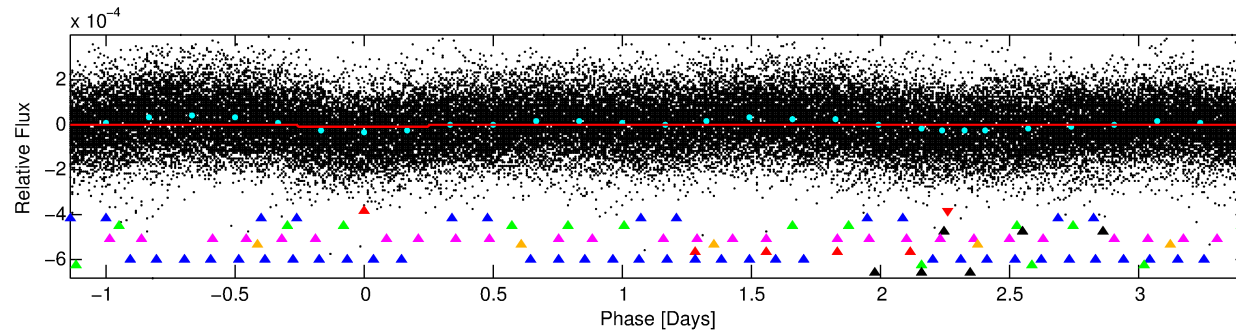
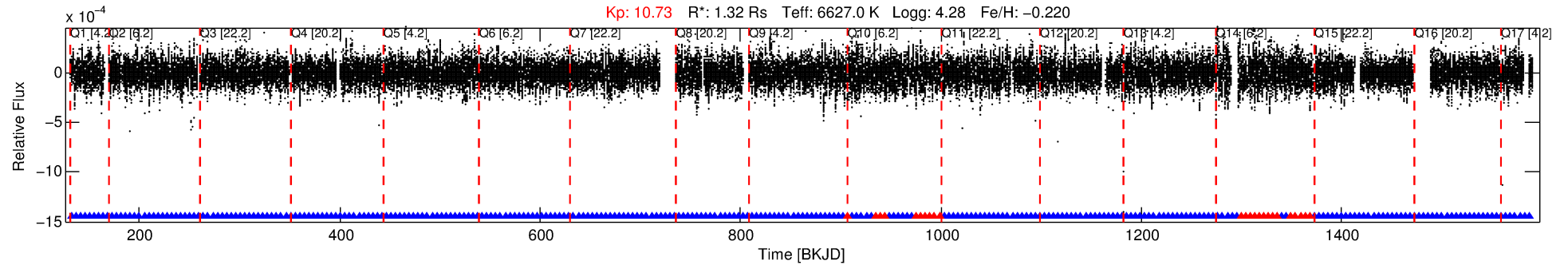
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 003631985-01

No Significant Match Found

DV One-Page Summary

KIC: 3631985 Candidate: 1 of 10 Period: 4.561 d



DV Fit Results:

Period = 4.56053 [0.00011] d
Epoch = 132.0268 [0.0148] BKJD
 $R_p/R^* = 0.0030$ [0.0006]
 $a/R^* = 1.27$ [0.43]
 $b = 0.87$ [0.25]
 $S_{\text{eff}} = 917.35$ [352.75]
 $T_{\text{eq}} = 1403$ [135] K
 $R_p = 0.43$ [0.16] R_e
 $a = 0.0572$ [0.0144] AU
 $A_g = 154.25$ [91.54] [1.67σ]
 $T_{\text{eff}} = 7646$ [959] K [6.45σ]

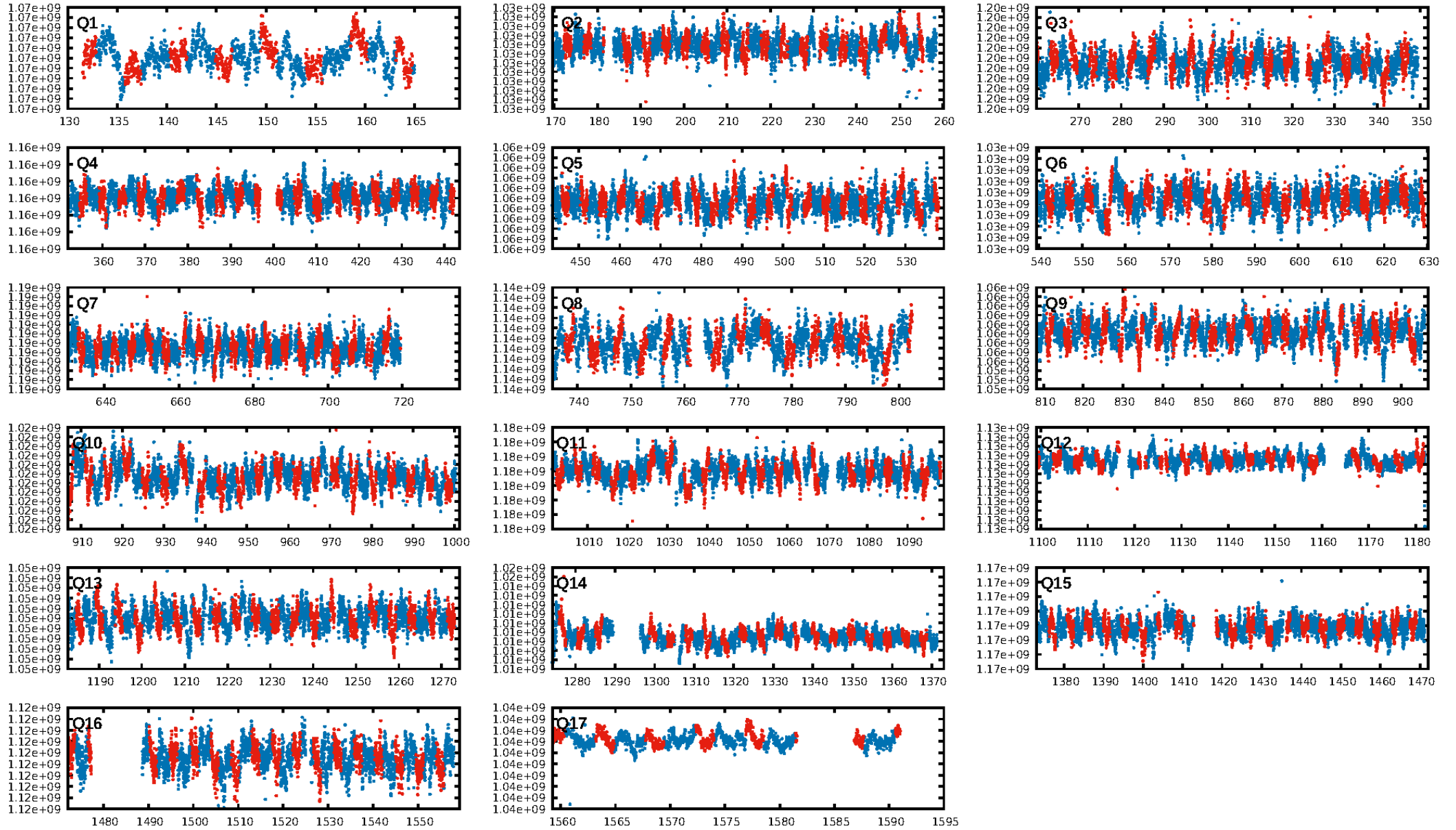
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [41.48σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.92 [260/284]
GhostDiagnostic-chr: 2.446
Centroid-sig: 0.0%
Centroid-so: 9.878 arcsec [2.92σ]
OotOffset-rm: 1.155 arcsec [1.01σ]
KicOffset-rm: 1.134 arcsec [1.00σ]
OotOffset-st: 2/3/3/3 [11]
KicOffset-st: 2/3/3/3 [11]
DiffImageQuality-fgm: 0.45 [5/11]
DiffImageOverlap-fno: 1.00 [17/17]

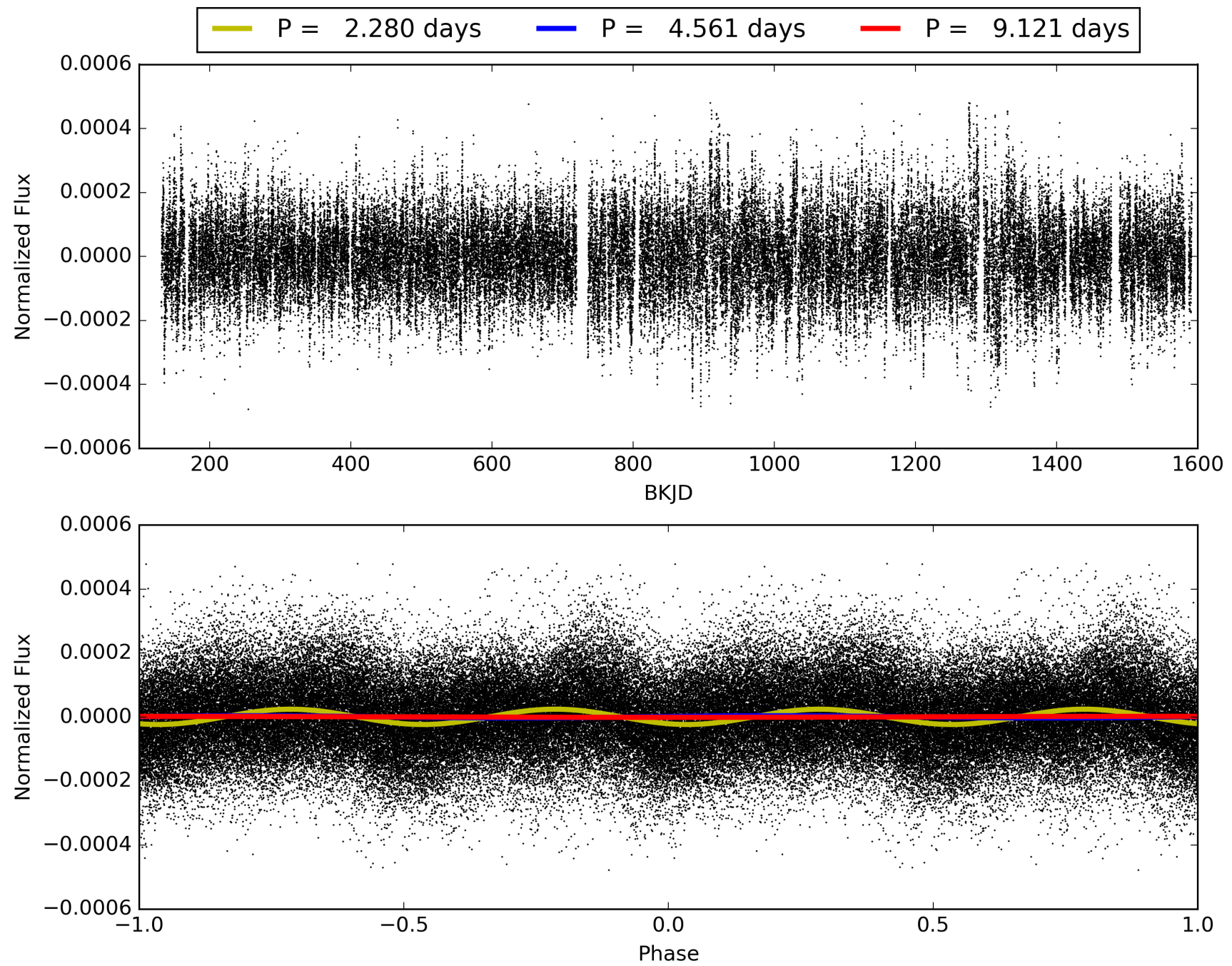
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 18:55:11 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 003631985-01, PDC Light Curves

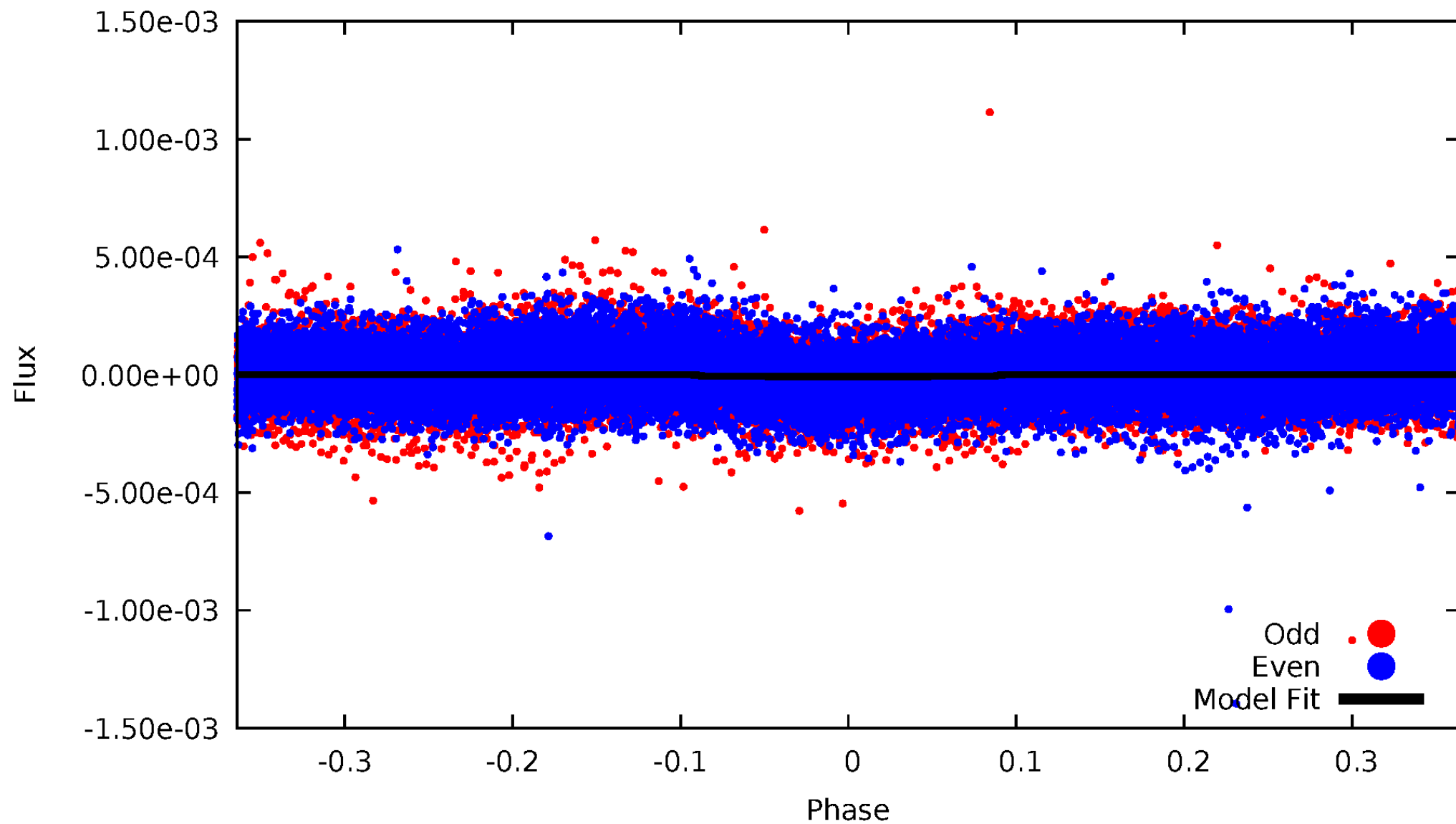


TCE 003631985-01



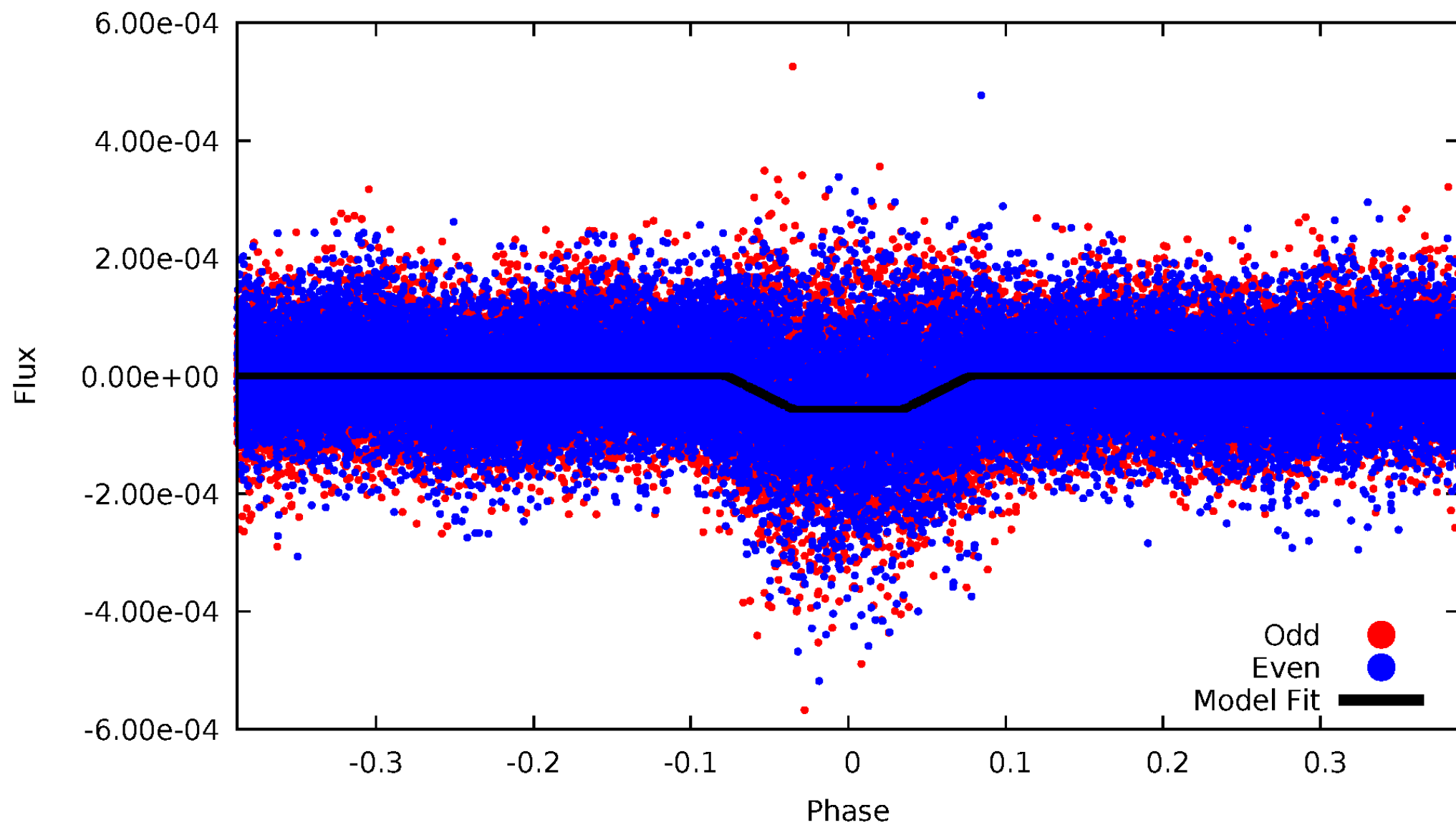
DV Odd/Even

TCE 003631985-01

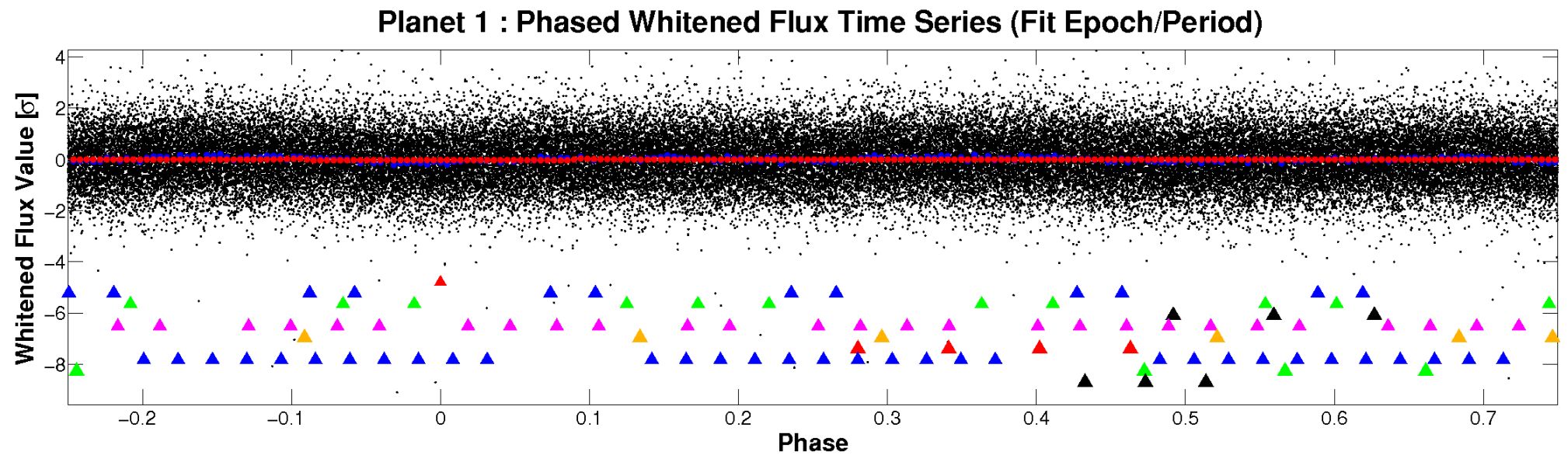
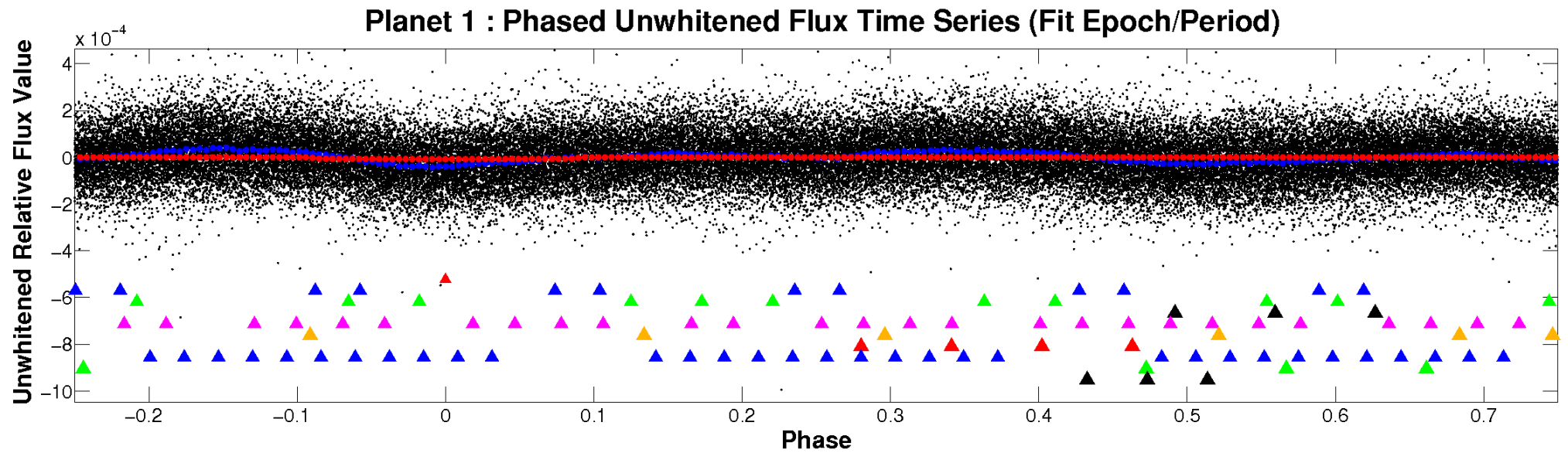


ALT Odd/Even

TCE 003631985-01

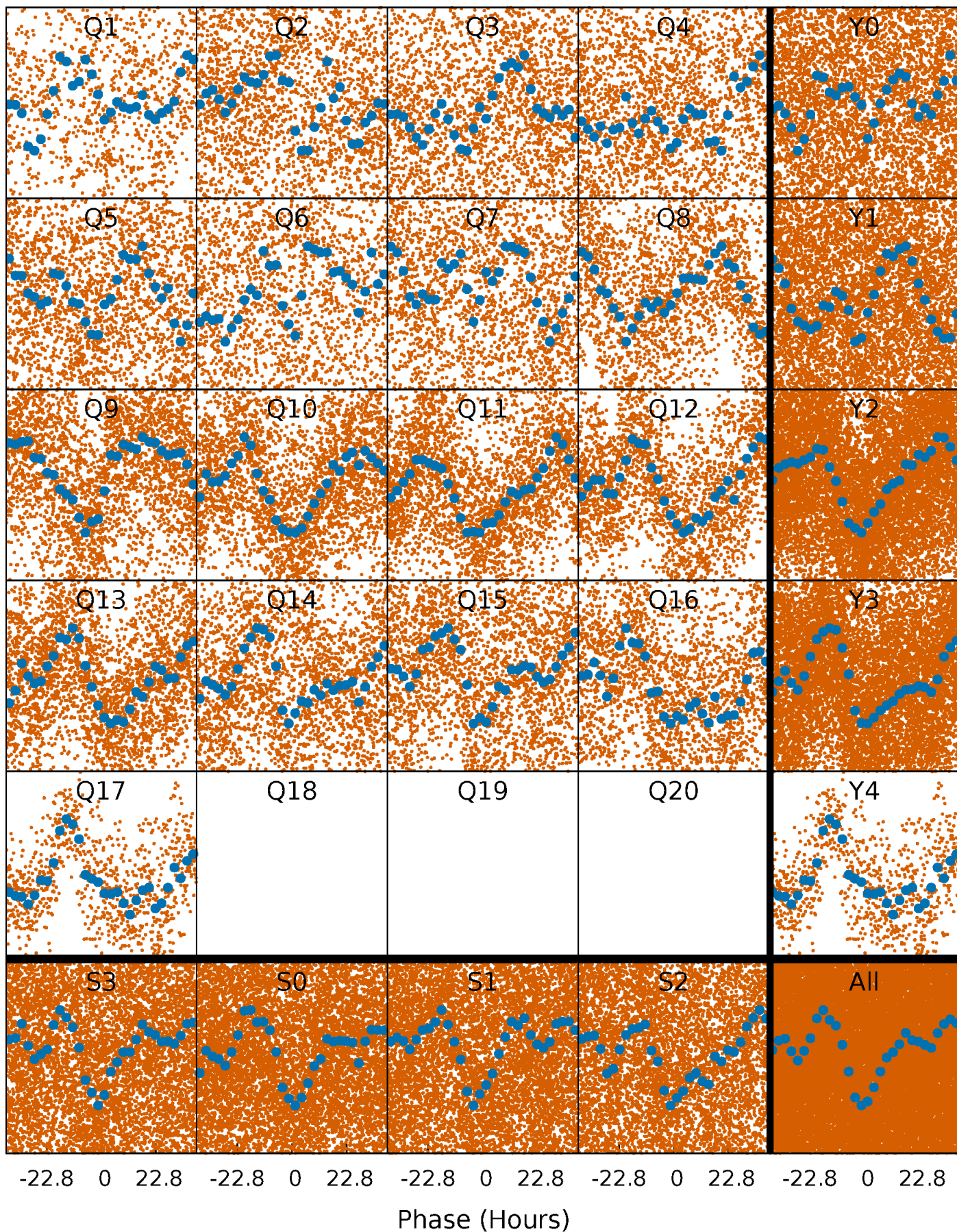


Non-Whitened Vs. Whitened Light Curve



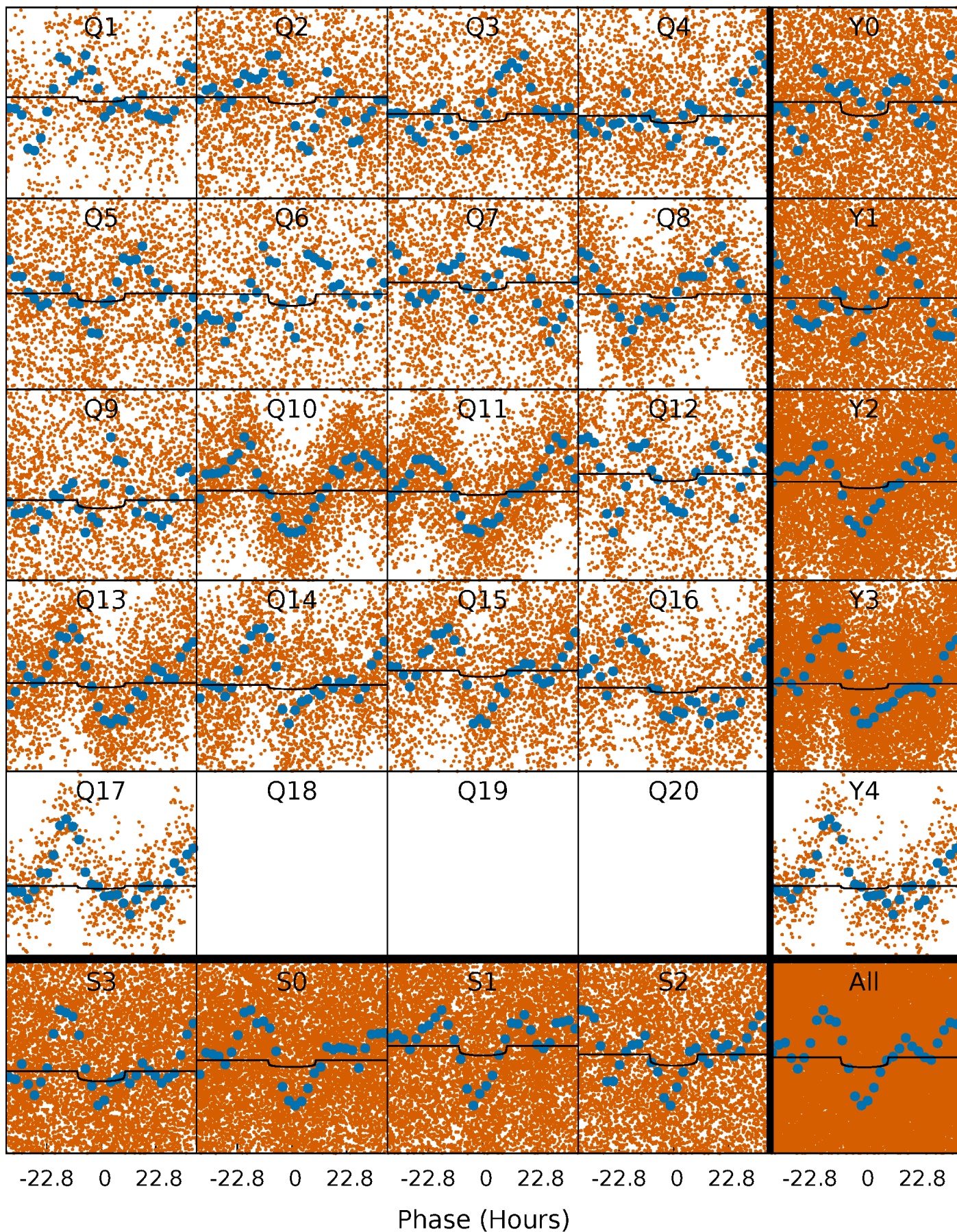
PDC Quarter-Phased Transit Curves

TCE 003631985-01 P= 4.560527 Days $T_0=132.026789$ (BKJD)



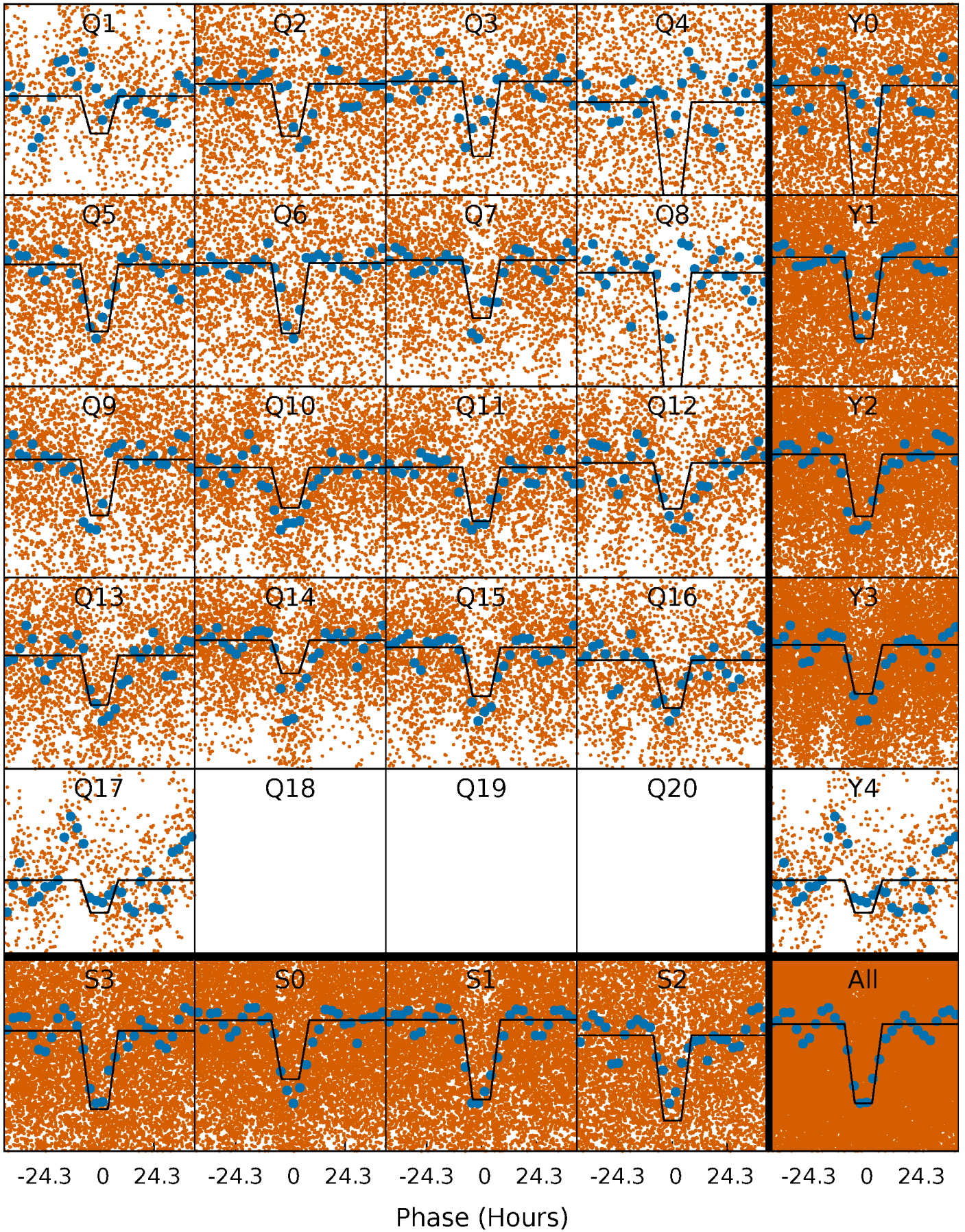
DV Quarter-Phased Transit Curves

TCE 003631985-01 P= 4.560527 Days $T_0=132.026789$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

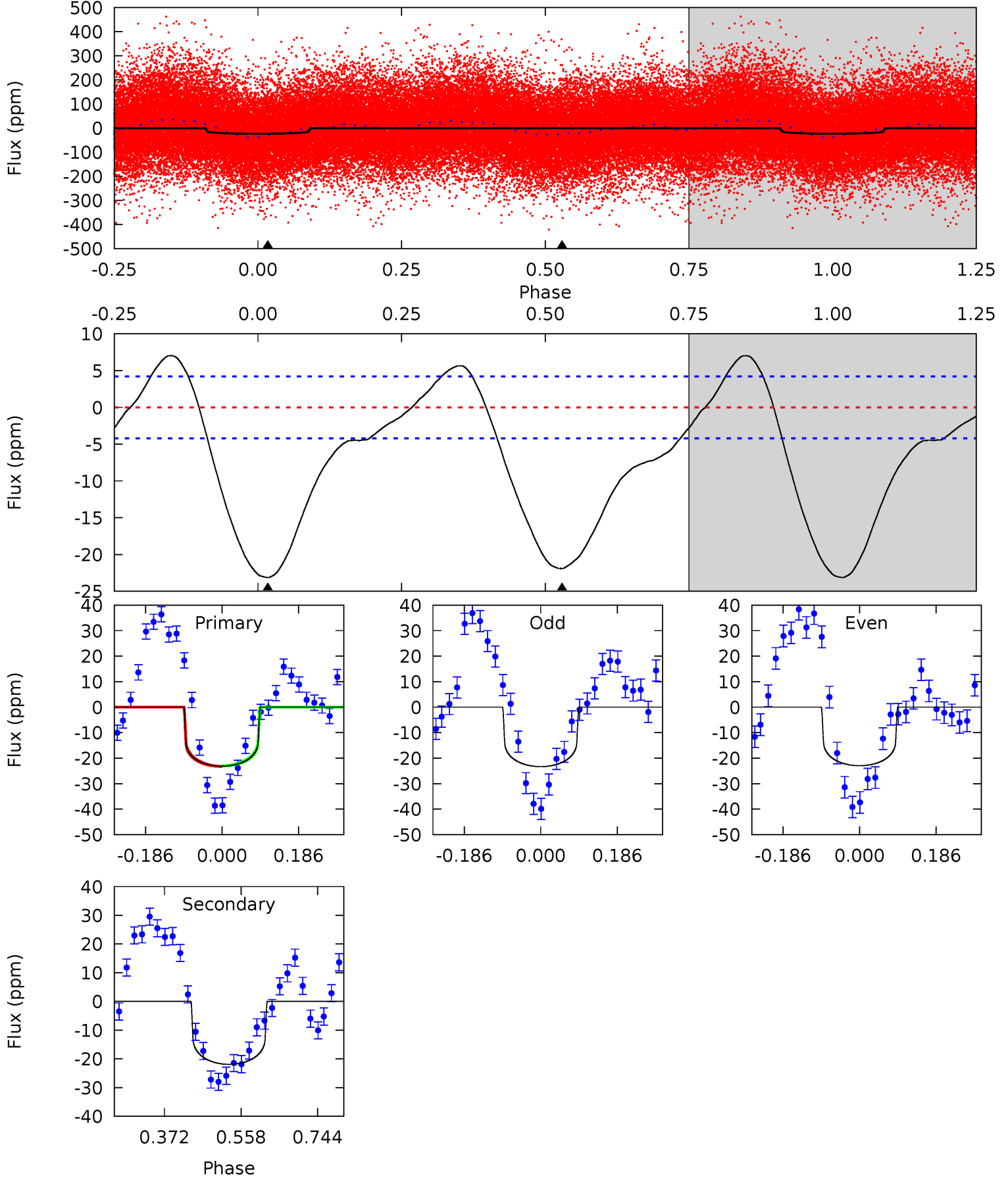
TCE 003631985-01 P= 4.560270 Days $T_0=132.024108$ (BKJD)



DV Model-Shift Uniqueness Test

003631985-01, P = 4.560527 Days, E = 127.466262 Days

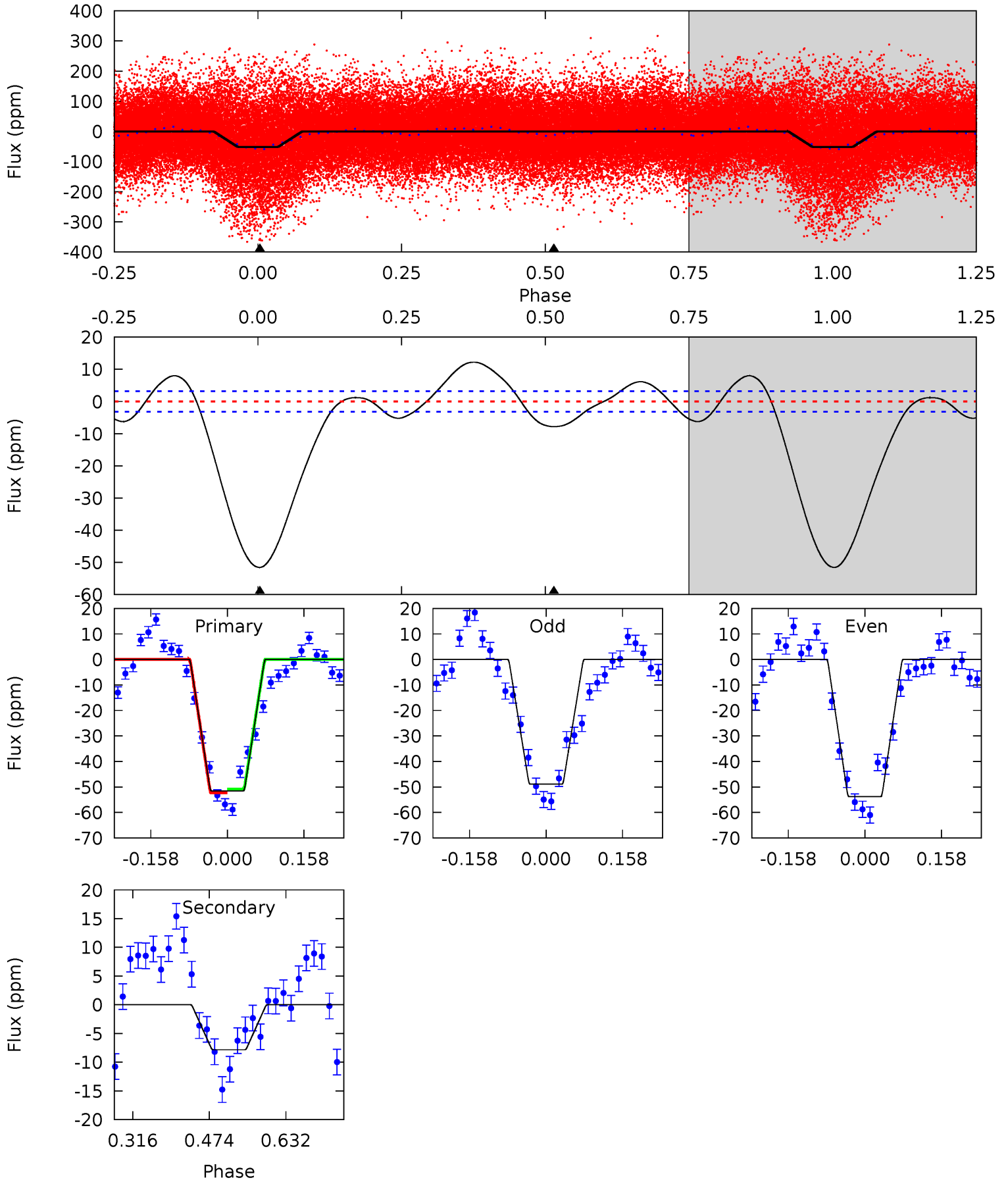
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
24.3	23.0	0	0	4.43	1.32	3.36	24.3	24.3	23.0	23.0	0.19	0.99	0.23	0.12



Alt Model-Shift Uniqueness Test

003631985-01, P = 4.560270 Days, E = 127.463838 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
71.9	10.9	0	0	4.47	1.41	6.31	71.9	71.9	10.9	10.9	3.37	1.29	0.19	1.02



Stellar Parameters For KIC 003631985

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6627^{+186}_{-255}	$4.277^{+0.124}_{-0.186}$	$-0.220^{+0.250}_{-0.300}$	$1.317^{+0.408}_{-0.220}$	$1.204^{+0.183}_{-0.183}$	$0.742^{+0.432}_{-0.369}$
	+3%/-4%	+3%/-4%	+114%/-136%	+31%/-17%	+15%/-15%	+58%/-50%
Source	PHO54	PHO54	PHO54	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 003631985-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-22 ± 1	$0.43^{+0.12}_{-0.10}$	1968^{+138}_{-122}	8685^{+1571}_{-1115}	213^{+151}_{-82}
Alt.	-8 ± 1	$1.08^{+0.20}_{-0.15}$	1962^{+156}_{-121}	4245^{+192}_{-175}	12^{+4}_{-3}

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{obs} \gg T_{max}$ AND $A_{obs} \gg 1.0$

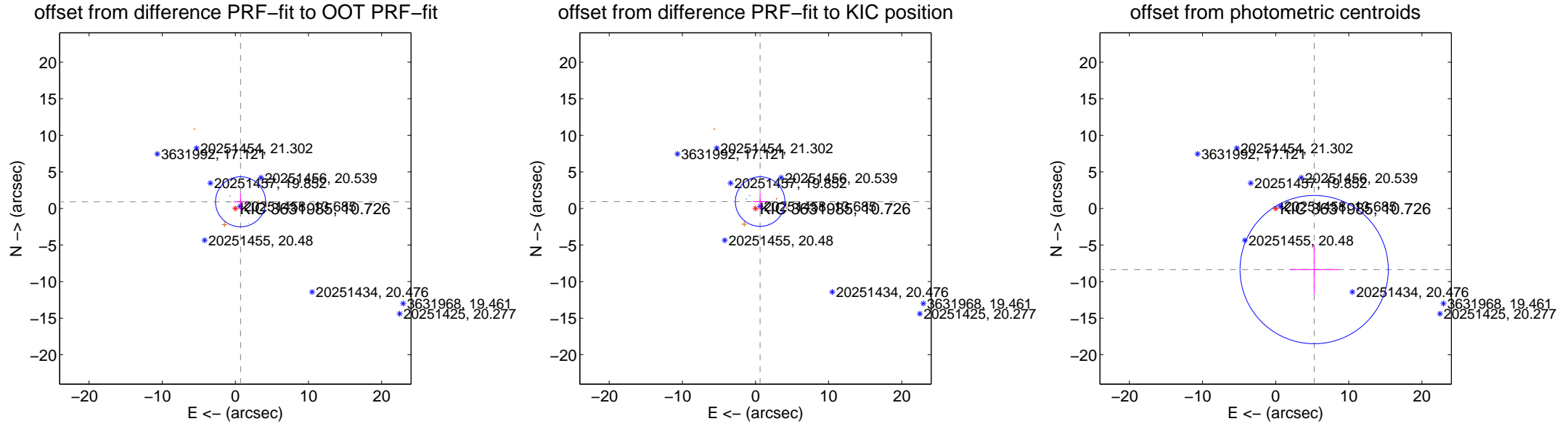
DV Centroid Data

Supplemental centroid analysis for 003631985-01. **Kepler magnitude: 10.73.** Transit SNR 3.29

There are 5 quarters with good PRF difference image offsets

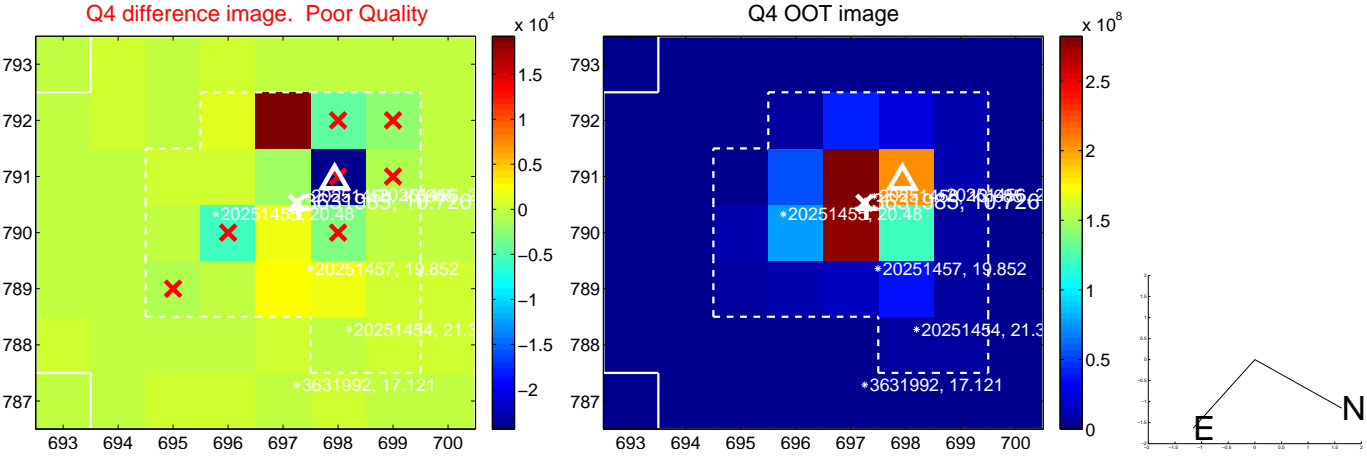
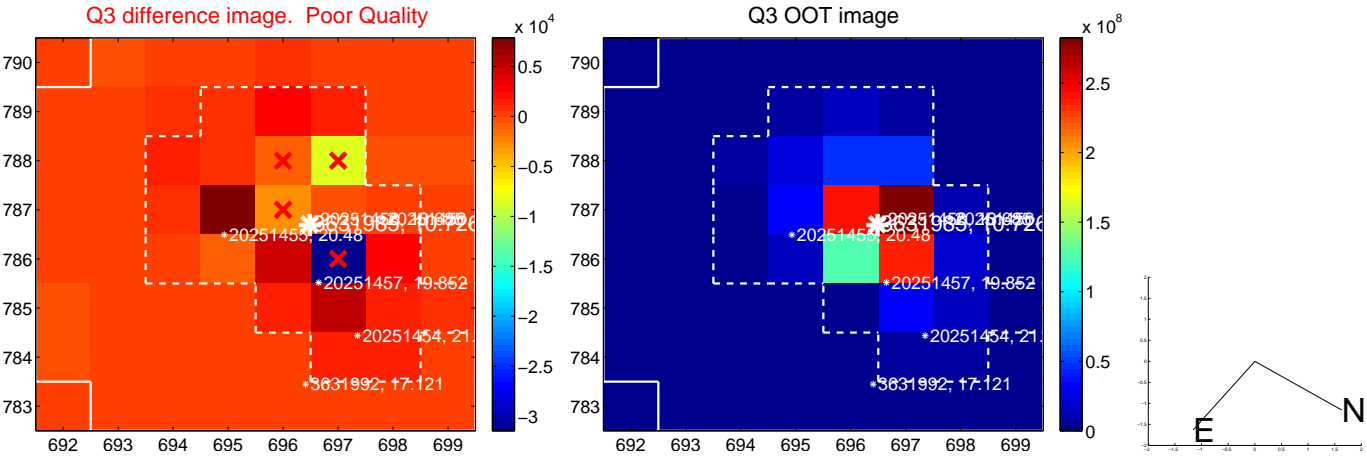
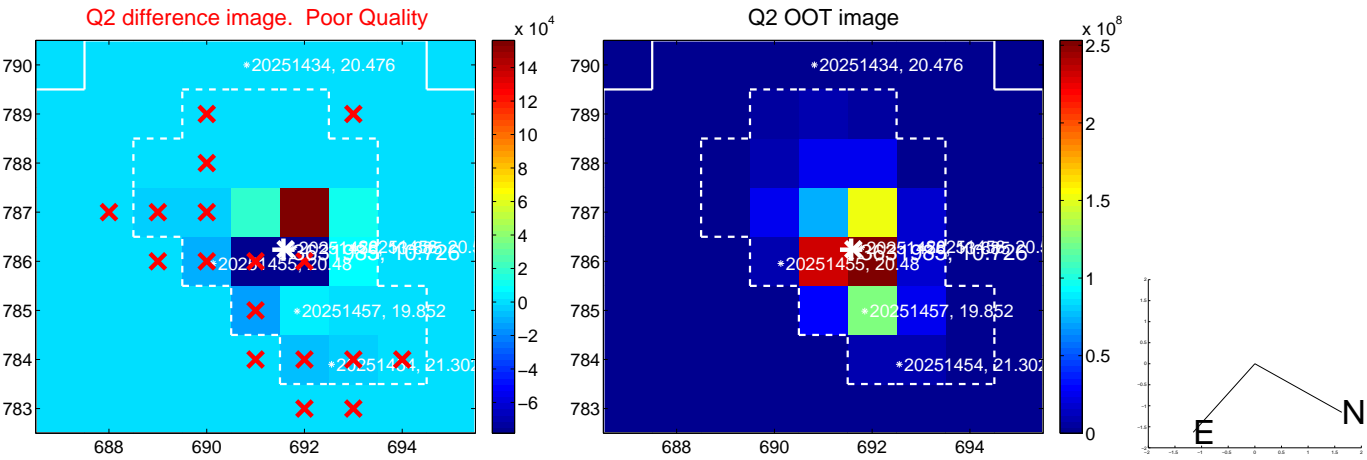
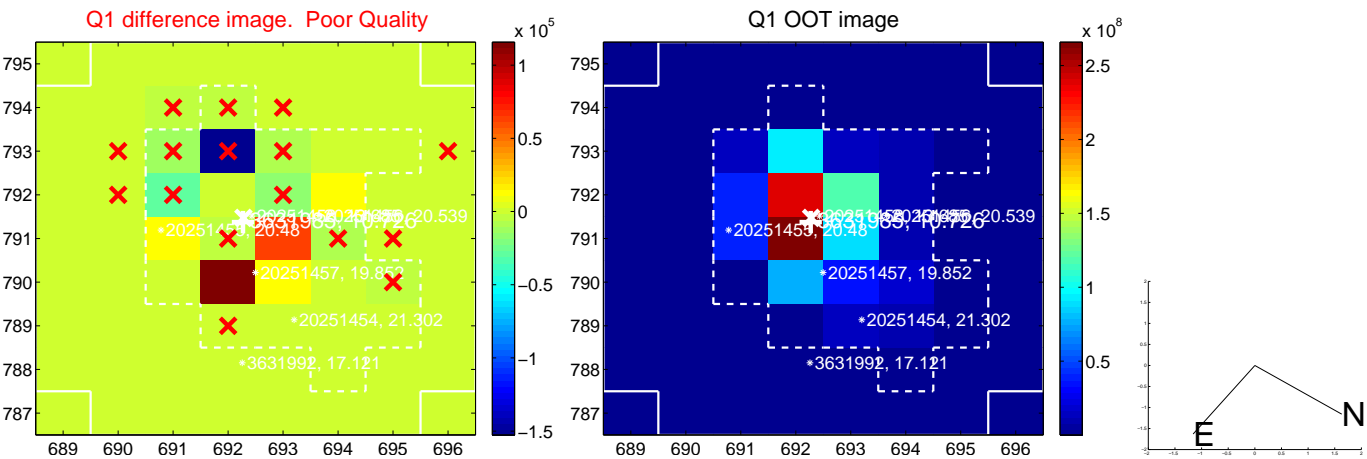
The direct PRF centroid is offset from the target star catalog position by about 0.24 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.155 ± 1.140	1.01	-0.711 ± 0.993	0.910 ± 1.221
PRF-fit source offset from KIC position	1.134 ± 1.129	1.00	-0.634 ± 0.991	0.940 ± 1.186
photometric centroid source offset	9.88 ± 3.38	2.92	-5.27 ± 3.36	-8.36 ± 3.39

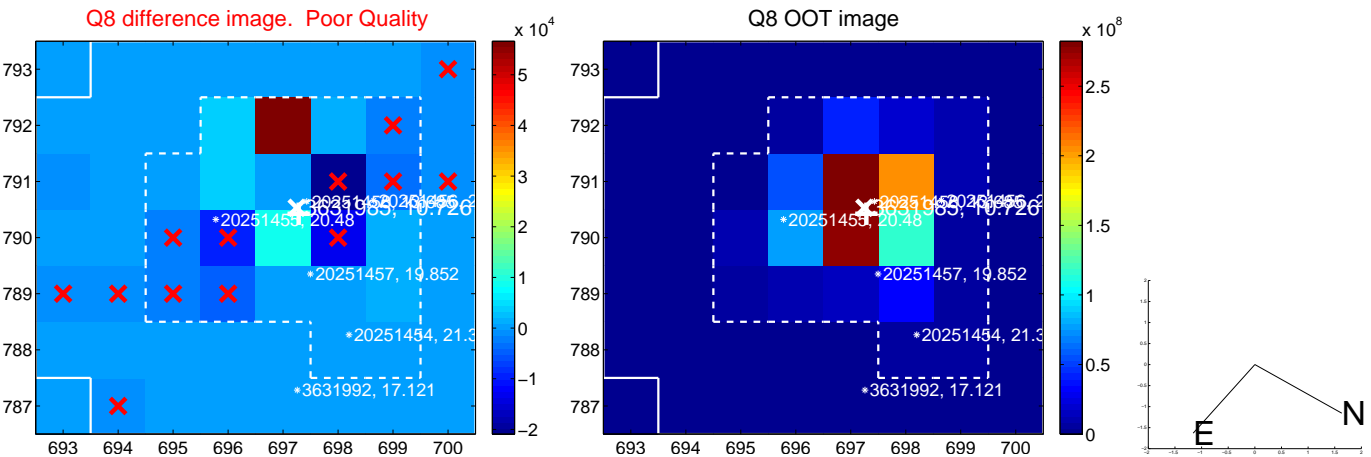
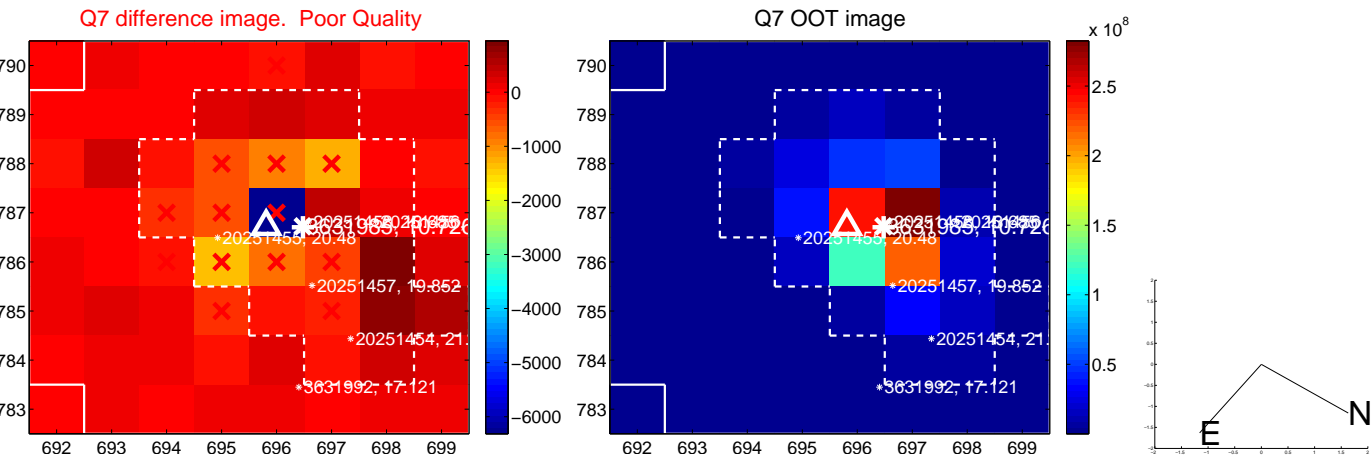
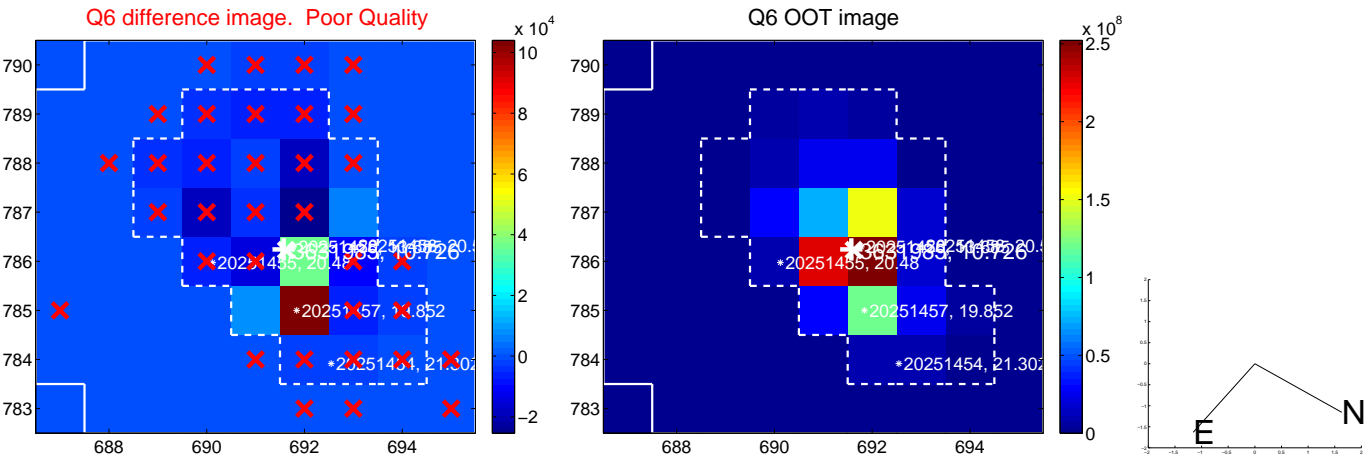
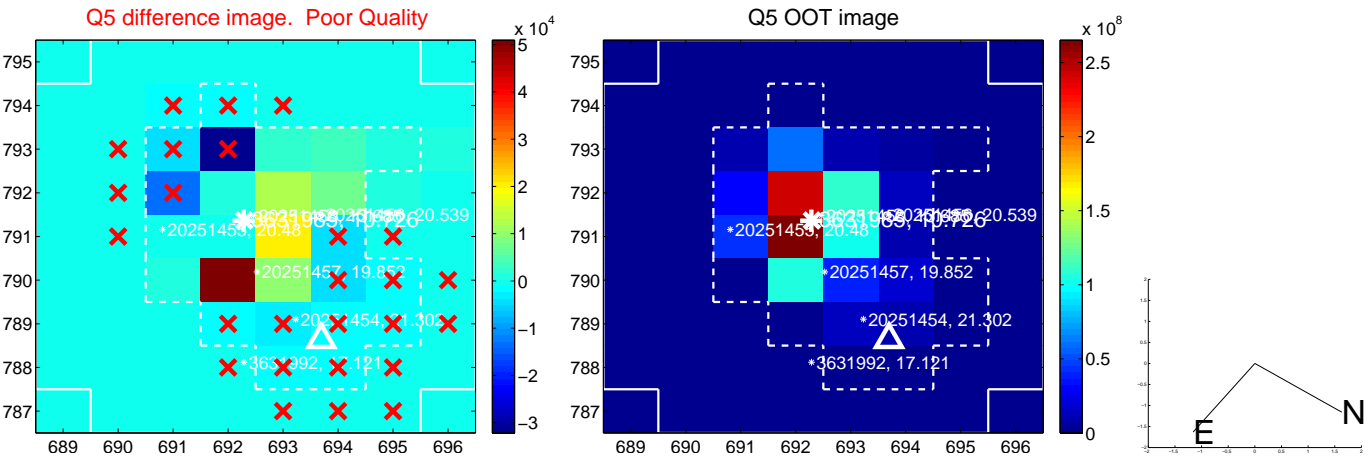


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

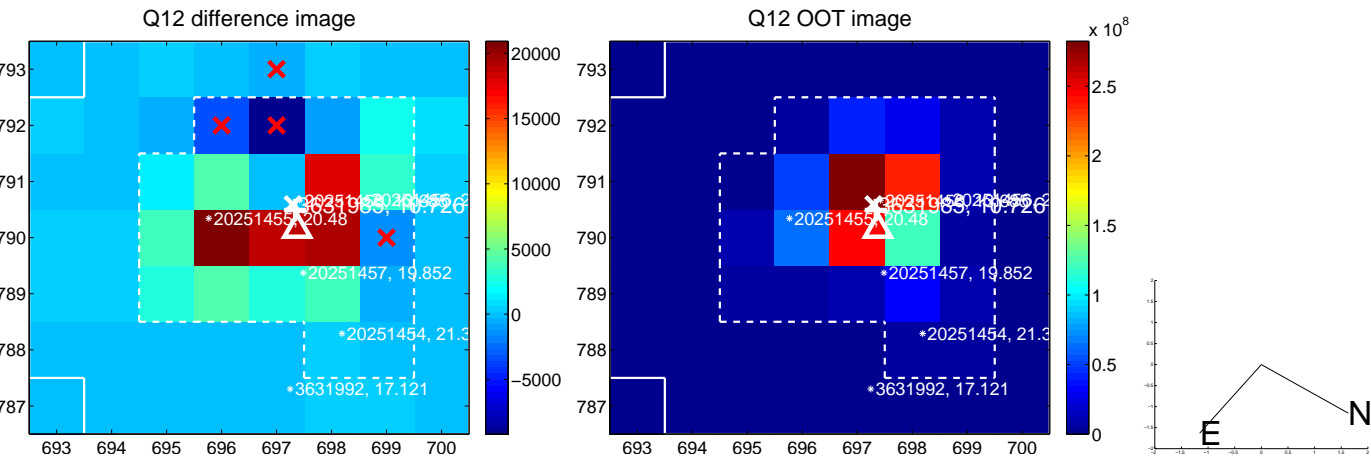
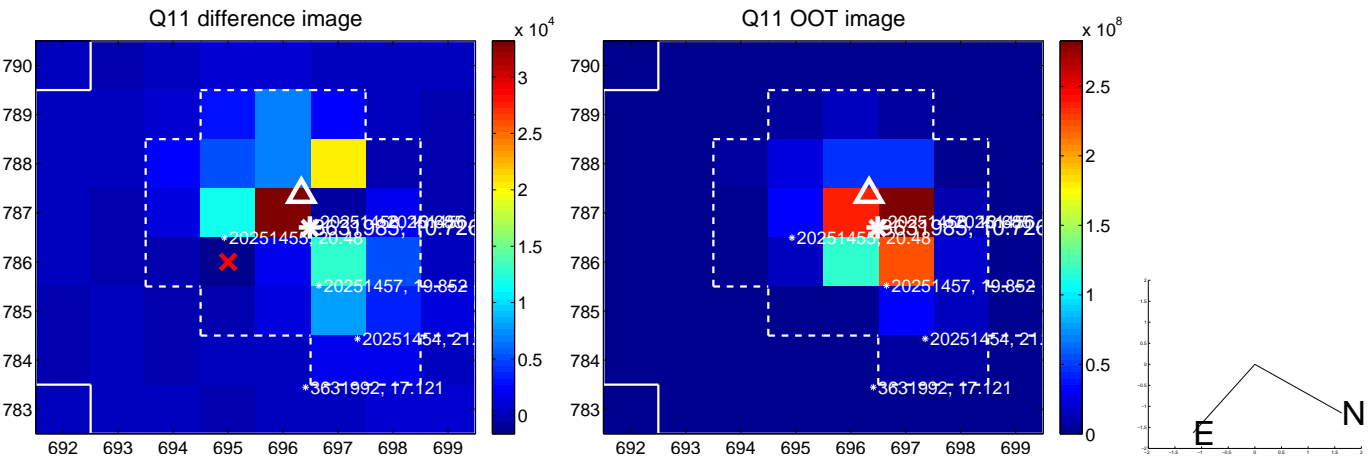
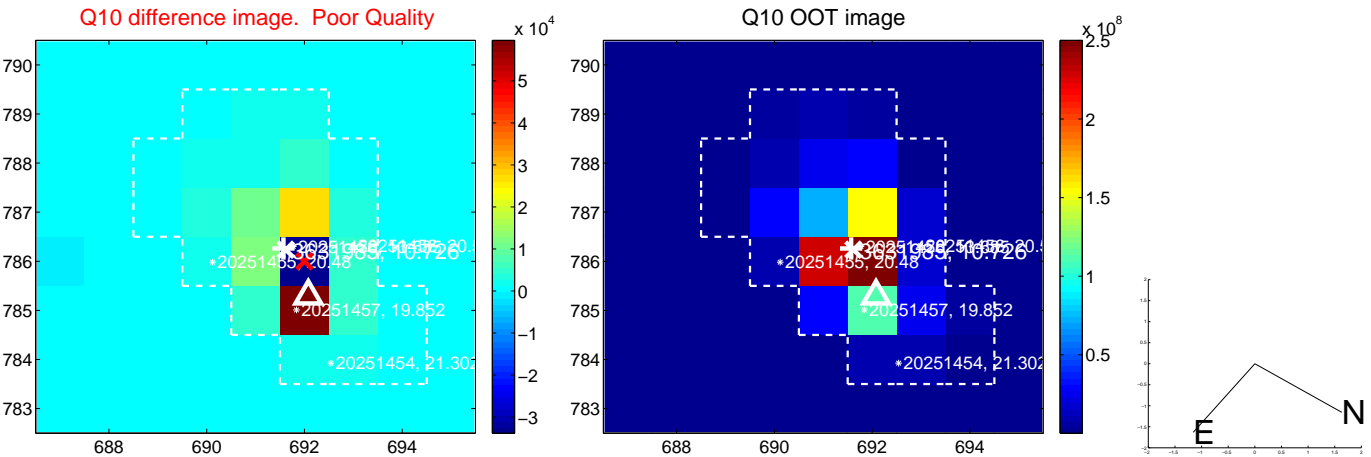
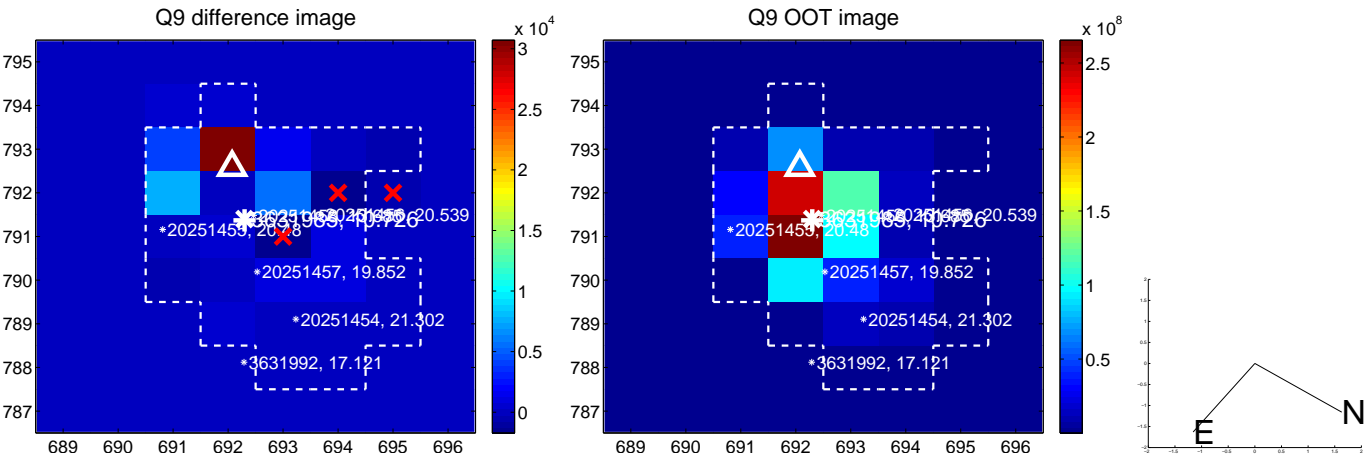
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



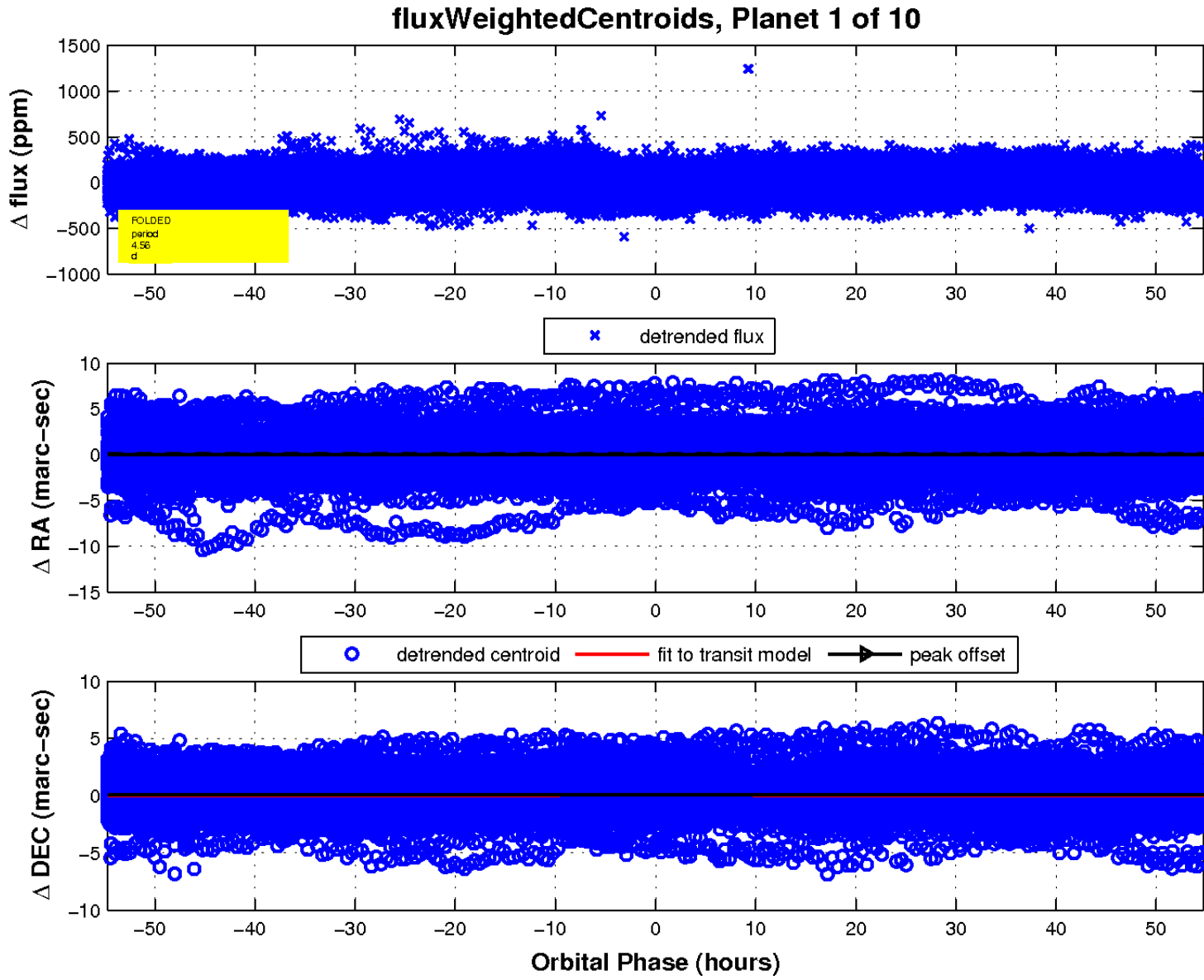
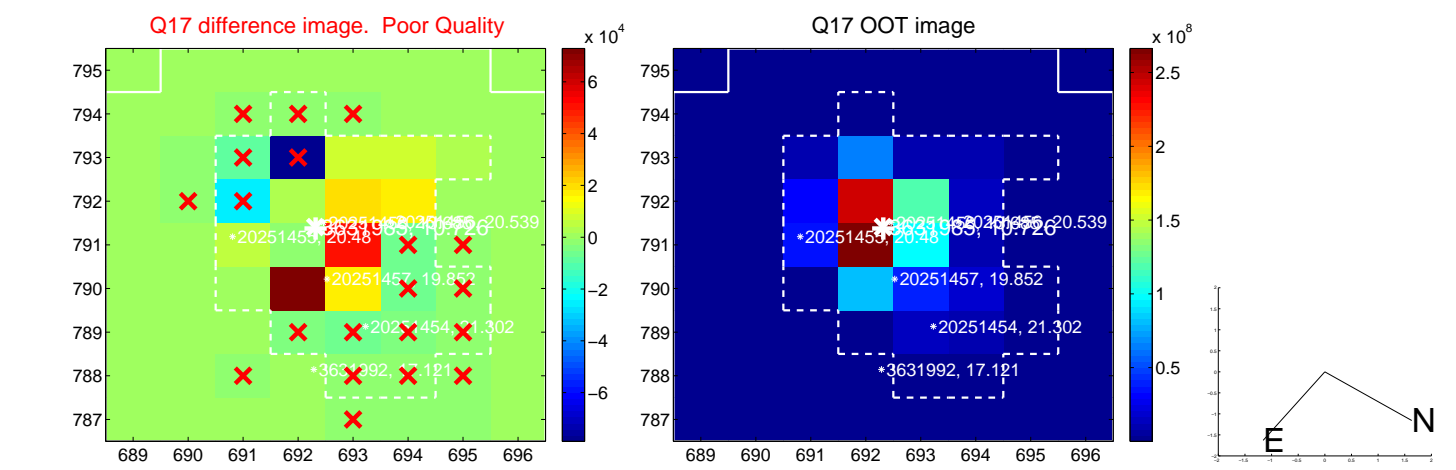
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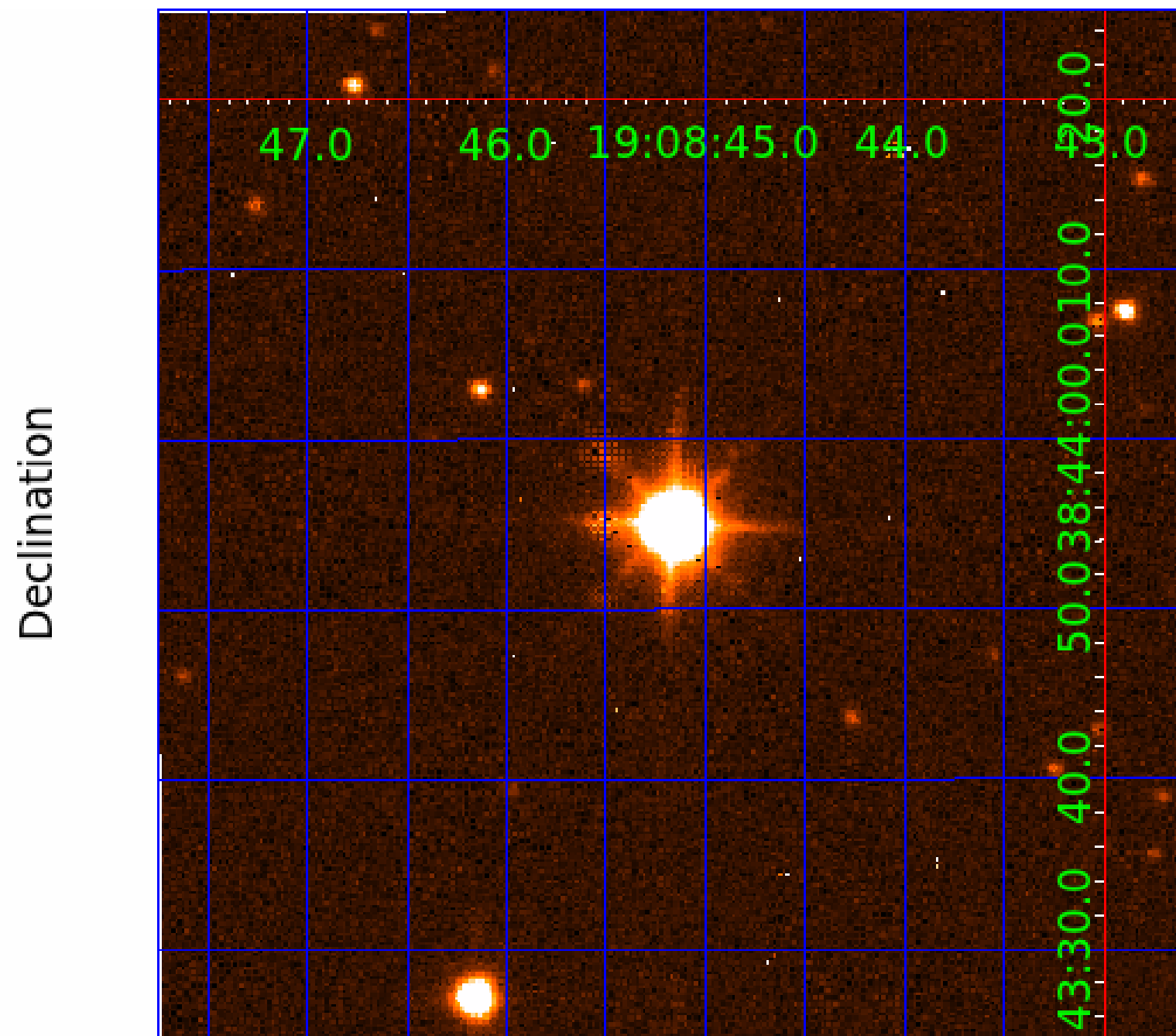
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UKIRT Image



KIC 003631985

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003631985-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—CENT_SATURATED
003631985-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_SATURATED
003631985-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
003631985-07	OBS	FP	0.01	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED
003631985-08	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
003631985-09	OBS	FP	0.00	1	0	0	0	ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED
003631985-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

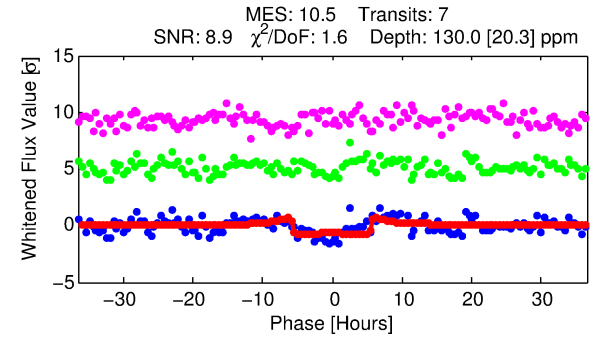
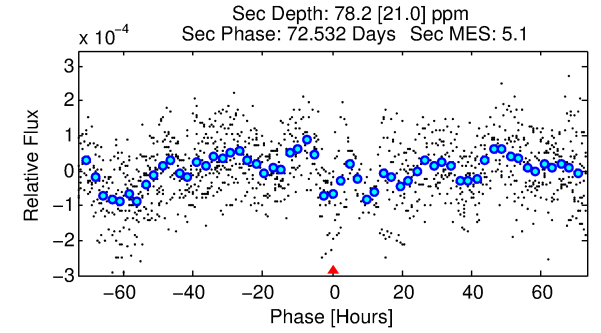
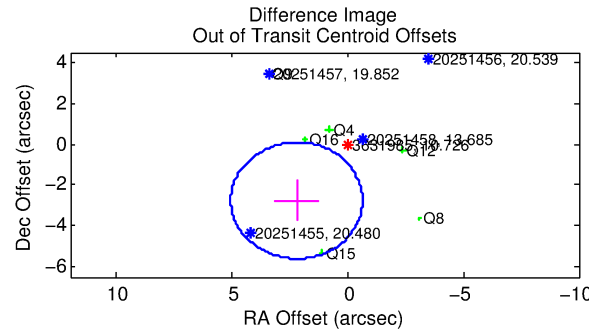
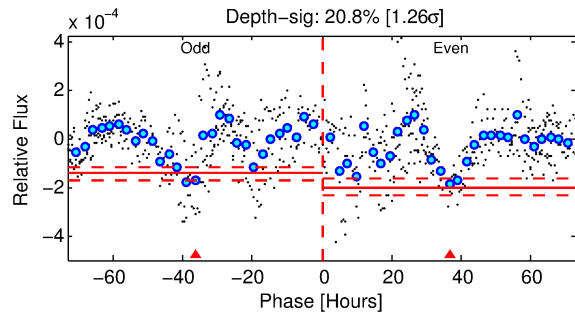
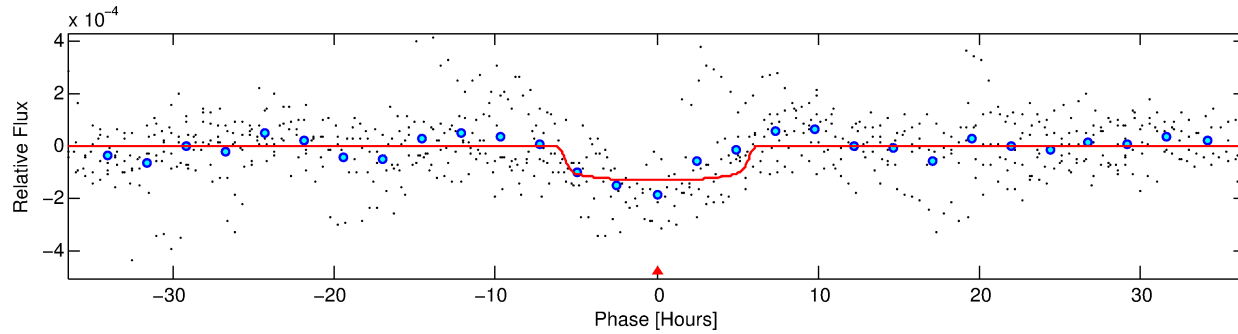
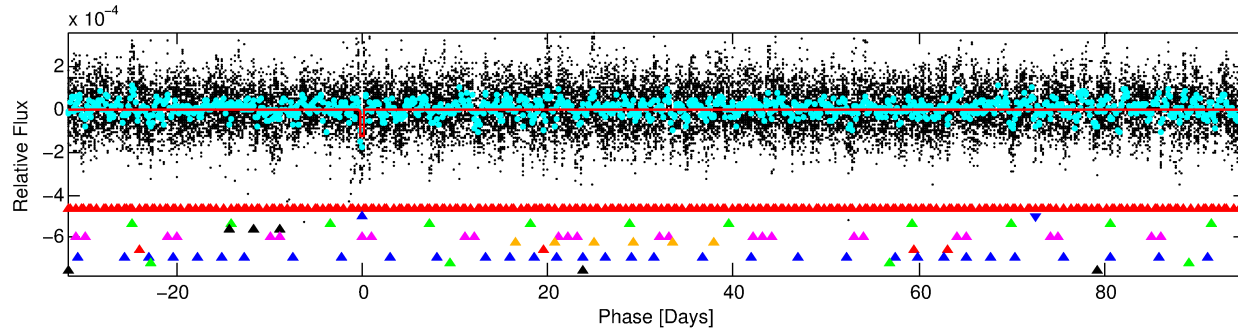
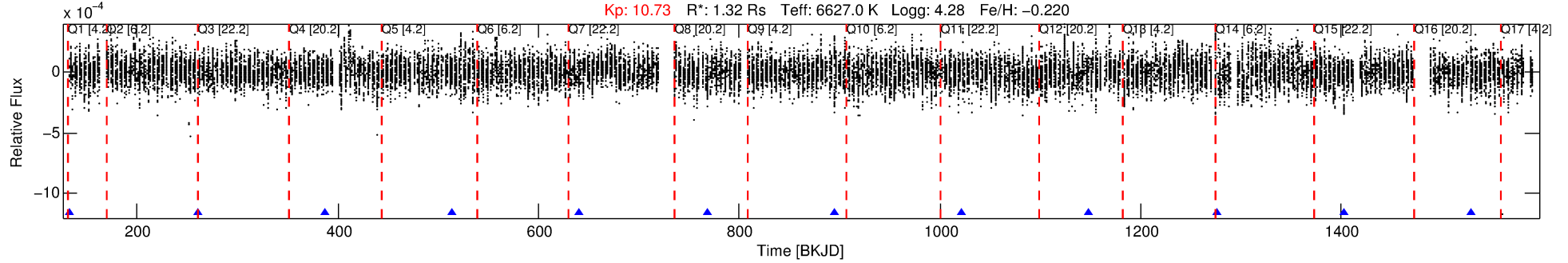
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 003631985-02

No Significant Match Found

DV One-Page Summary

KIC: 3631985 Candidate: 2 of 10 Period: 126.958 d



DV Fit Results:

Period = 126.95757 [0.00197] d
Epoch = 133.1008 [0.0147] BKJD
Rp/R* = 0.0122 [0.0015]
a/R* = 36.66 [18.11]
b = 0.90 [0.10]
Seff = 10.87 [4.18]
Teq = 463 [45] K
Rp = 1.75 [0.58] Re
a = 0.5250 [0.1318] AU
Ag = 3859.62 [1957.37] [1.97 σ]
Teffp = 5643 [558] K [9.25 σ]

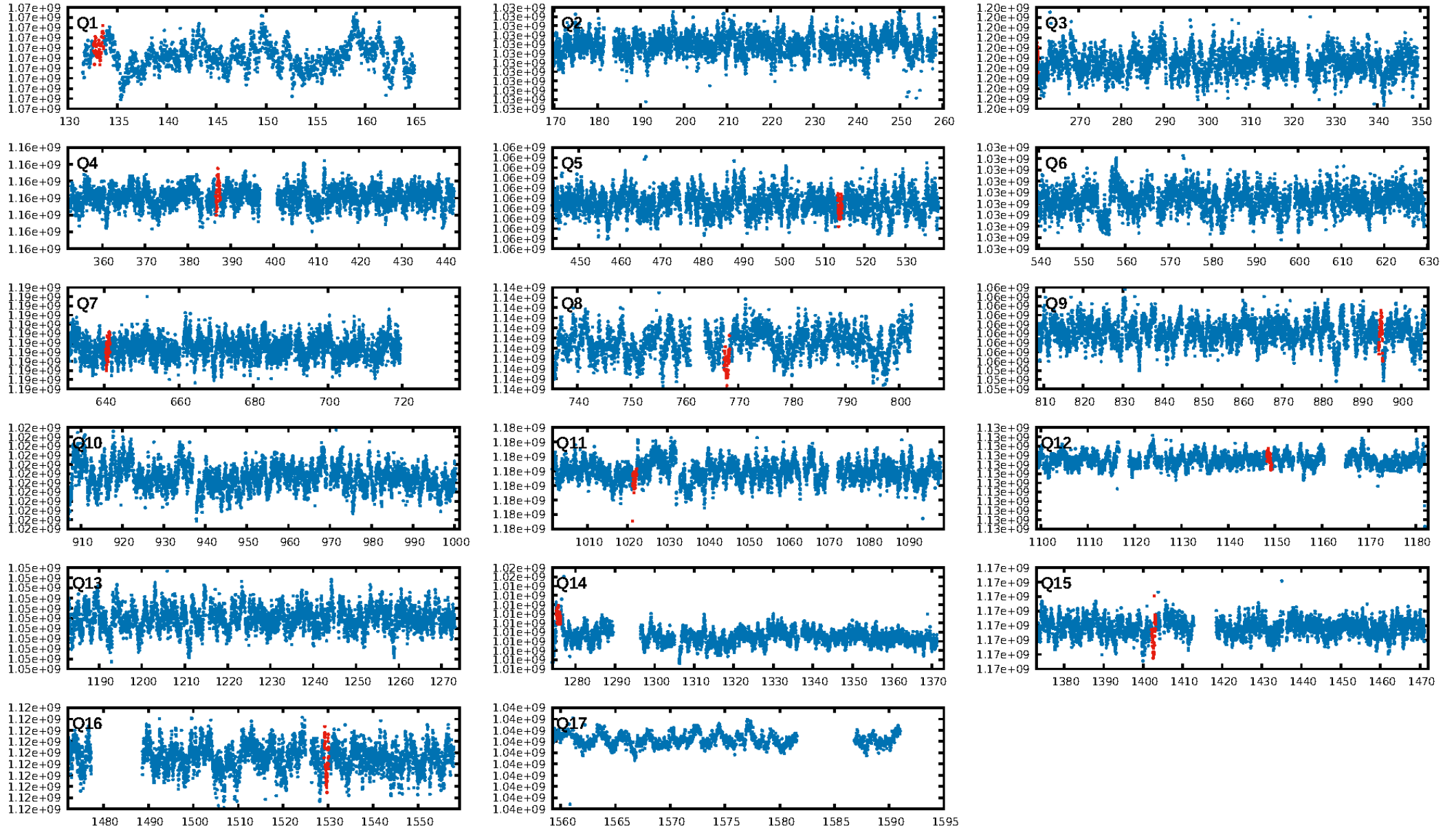
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [137.74 σ]
LongPeriod-sig: 100.0% [14.79 σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 99.2%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [6/6]
GhostDiagnostic-chr: 3.104
Centroid-sig: 0.9%
Centroid-so: 2.054 arcsec [2.15 σ]
OotOffset-rm: 3.535 arcsec [3.72 σ]
KicOffset-rm: 3.488 arcsec [3.63 σ]
OotOffset-st: 0/1/4/1 [6]
KicOffset-st: 0/1/4/1 [6]
DiffImageQuality-fgm: 0.33 [2/6]
DiffImageOverlap-fno: 0.44 [4/9]

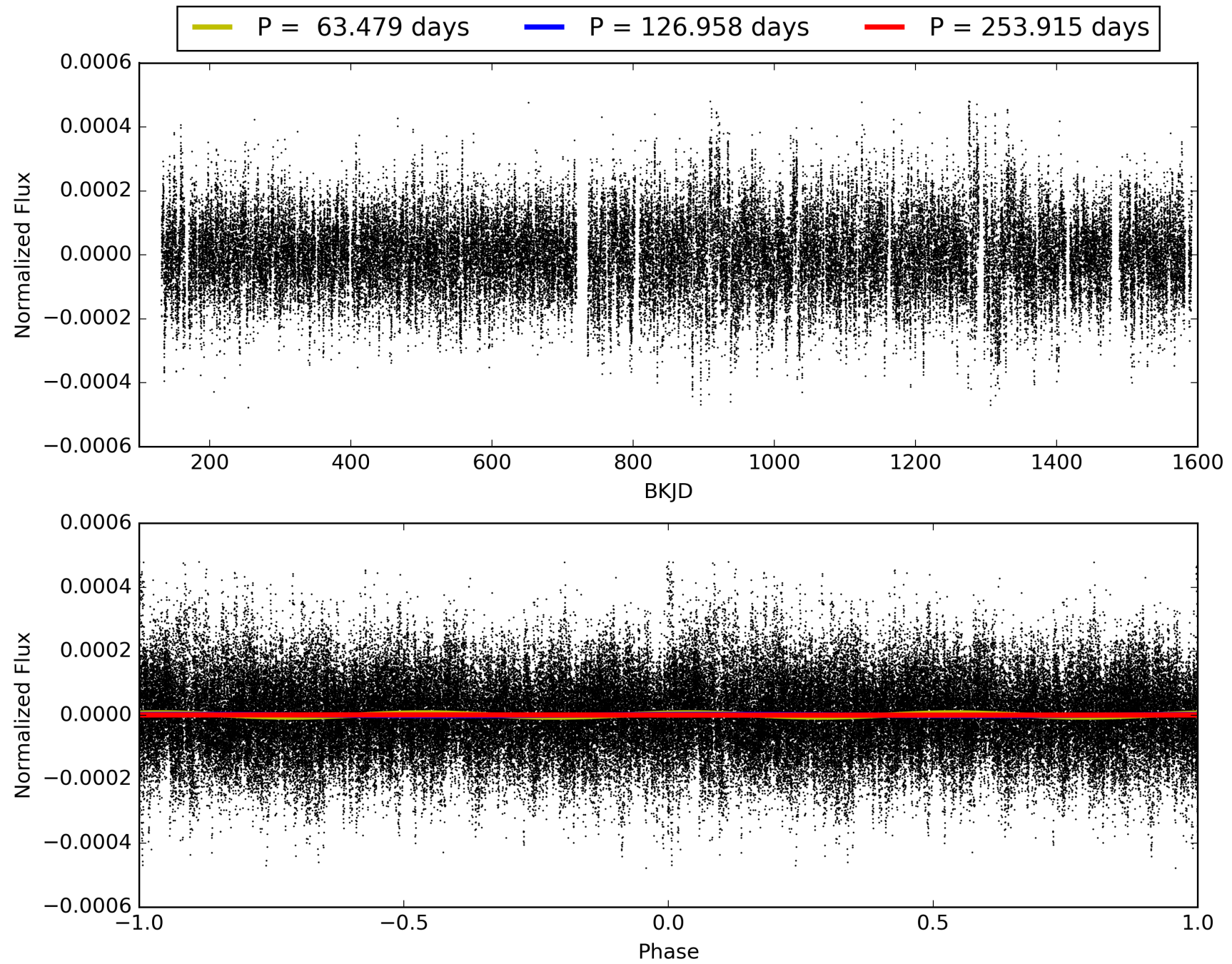
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 18:55:21 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 003631985-02, PDC Light Curves

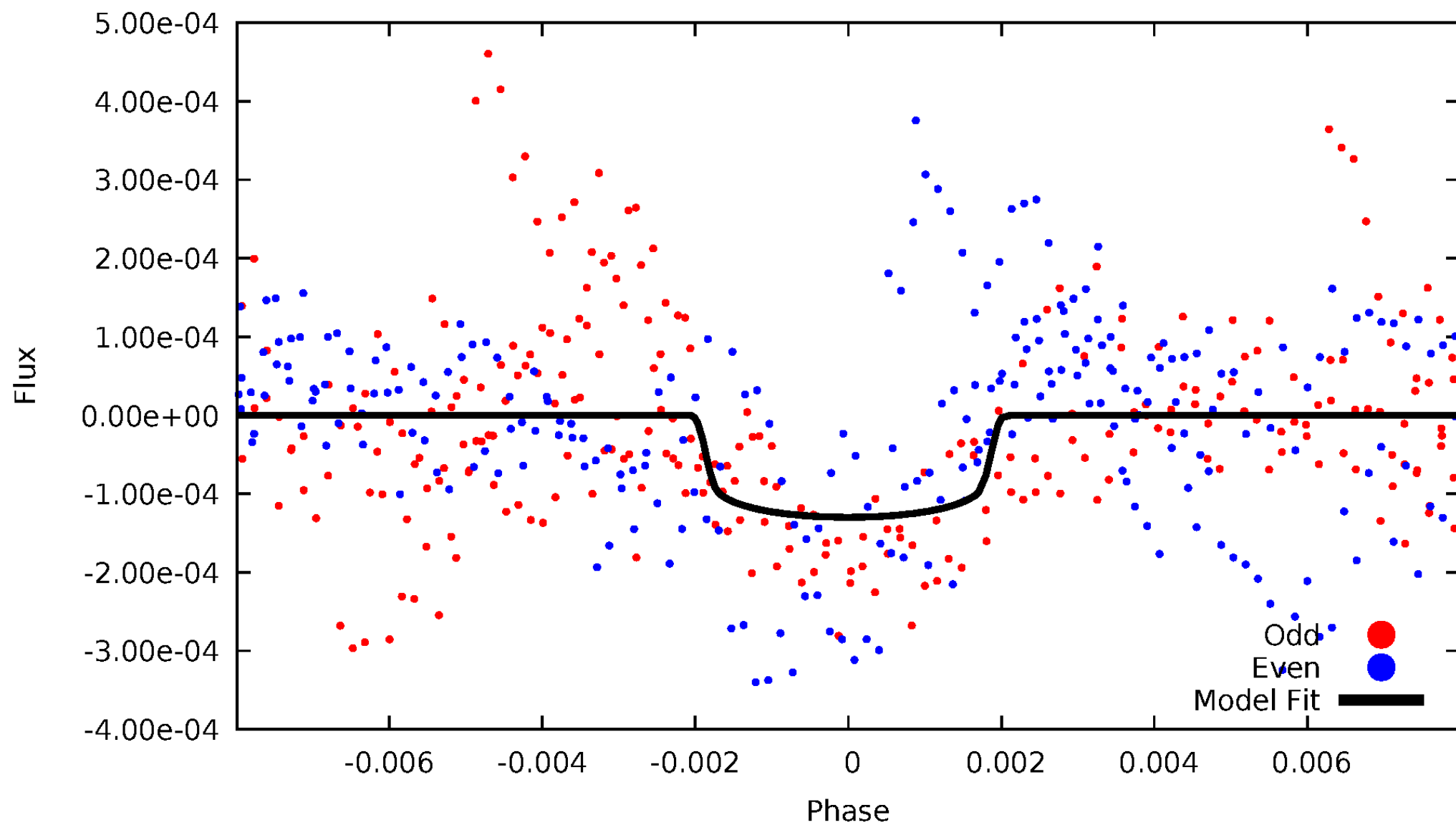


TCE 003631985-02



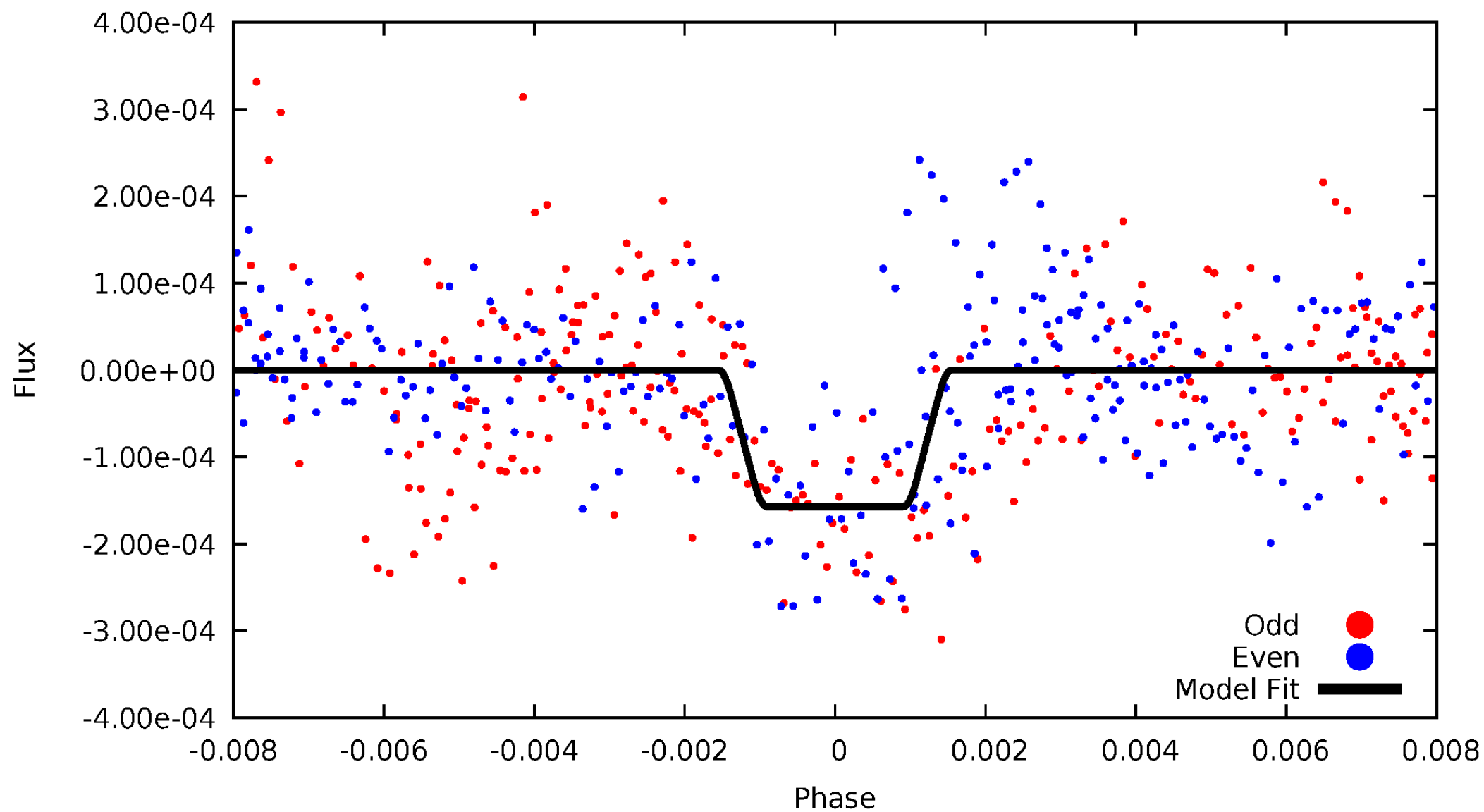
DV Odd/Even

TCE 003631985-02



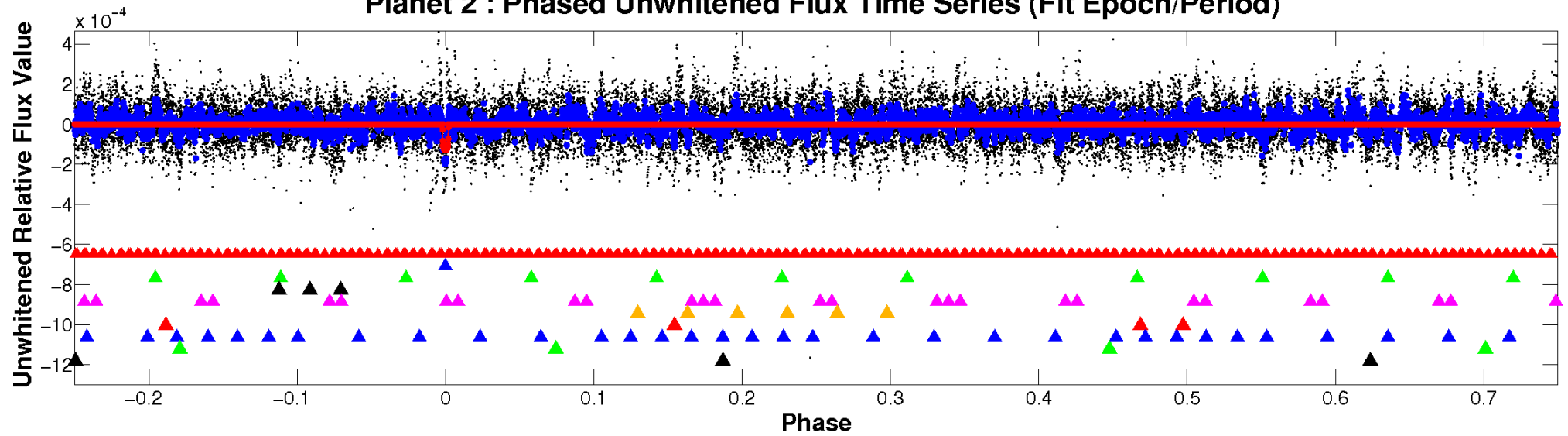
ALT Odd/Even

TCE 003631985-02

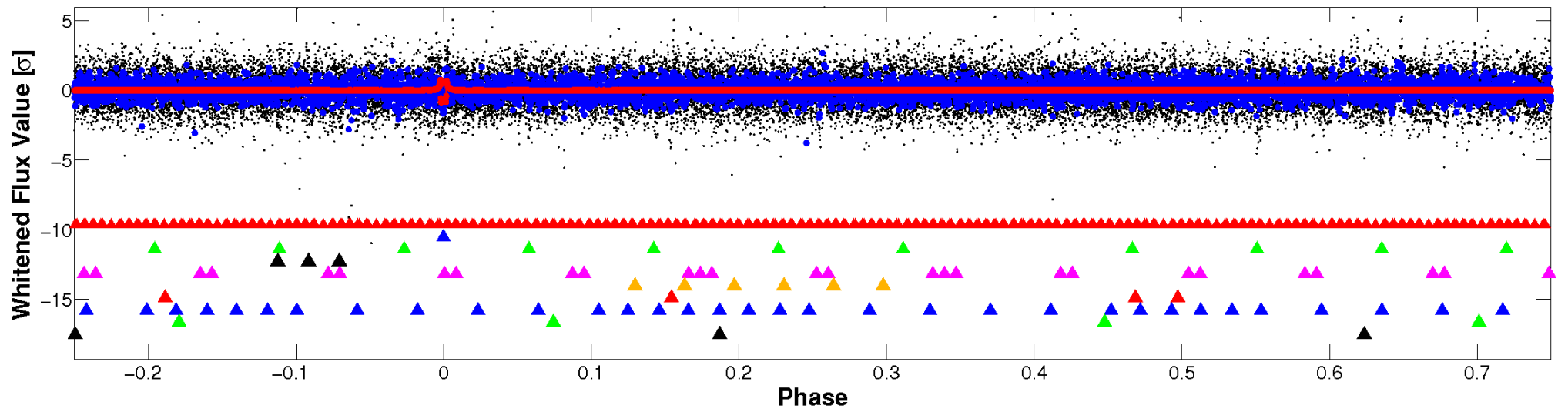


Non-Whitened Vs. Whitened Light Curve

Planet 2 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

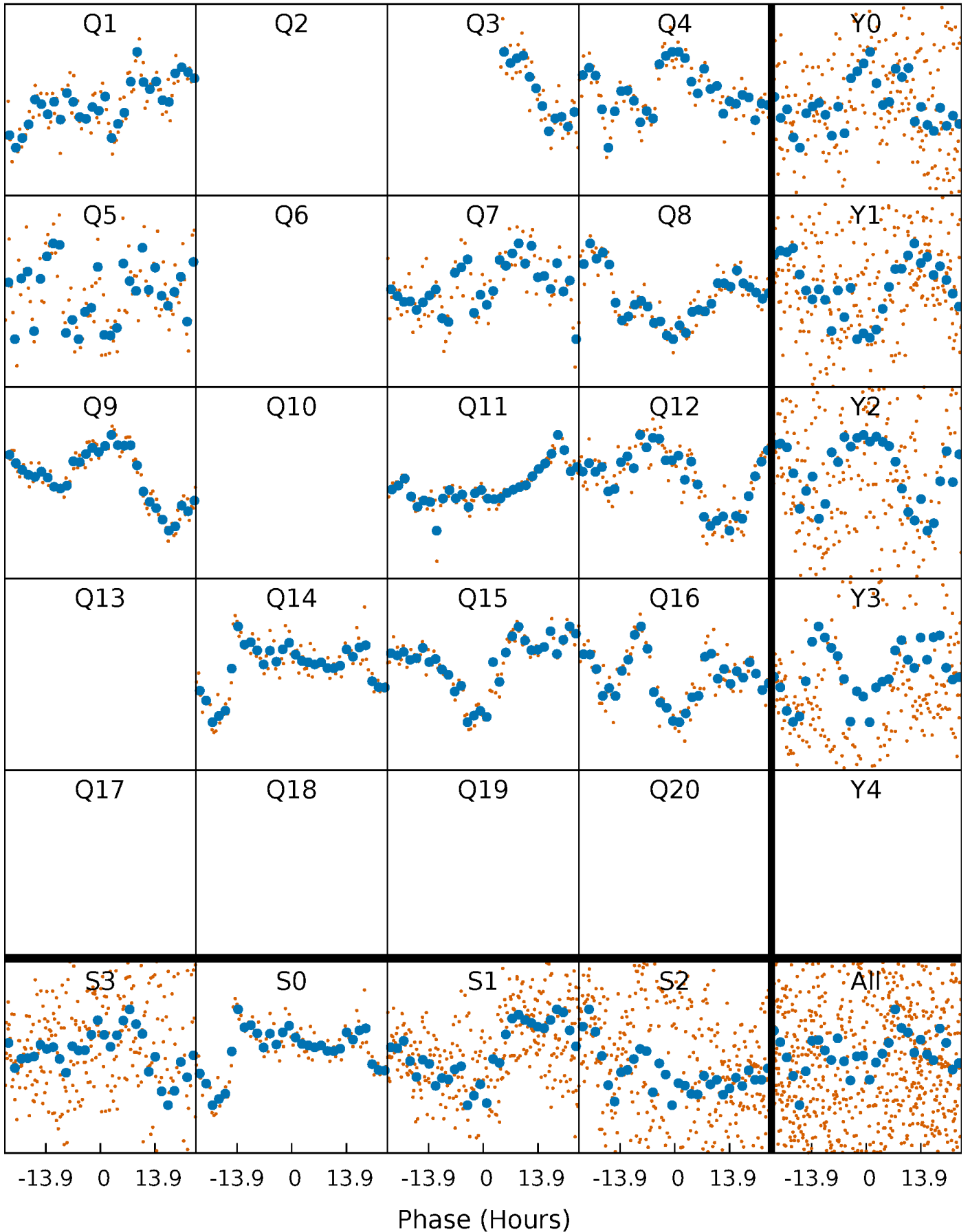


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



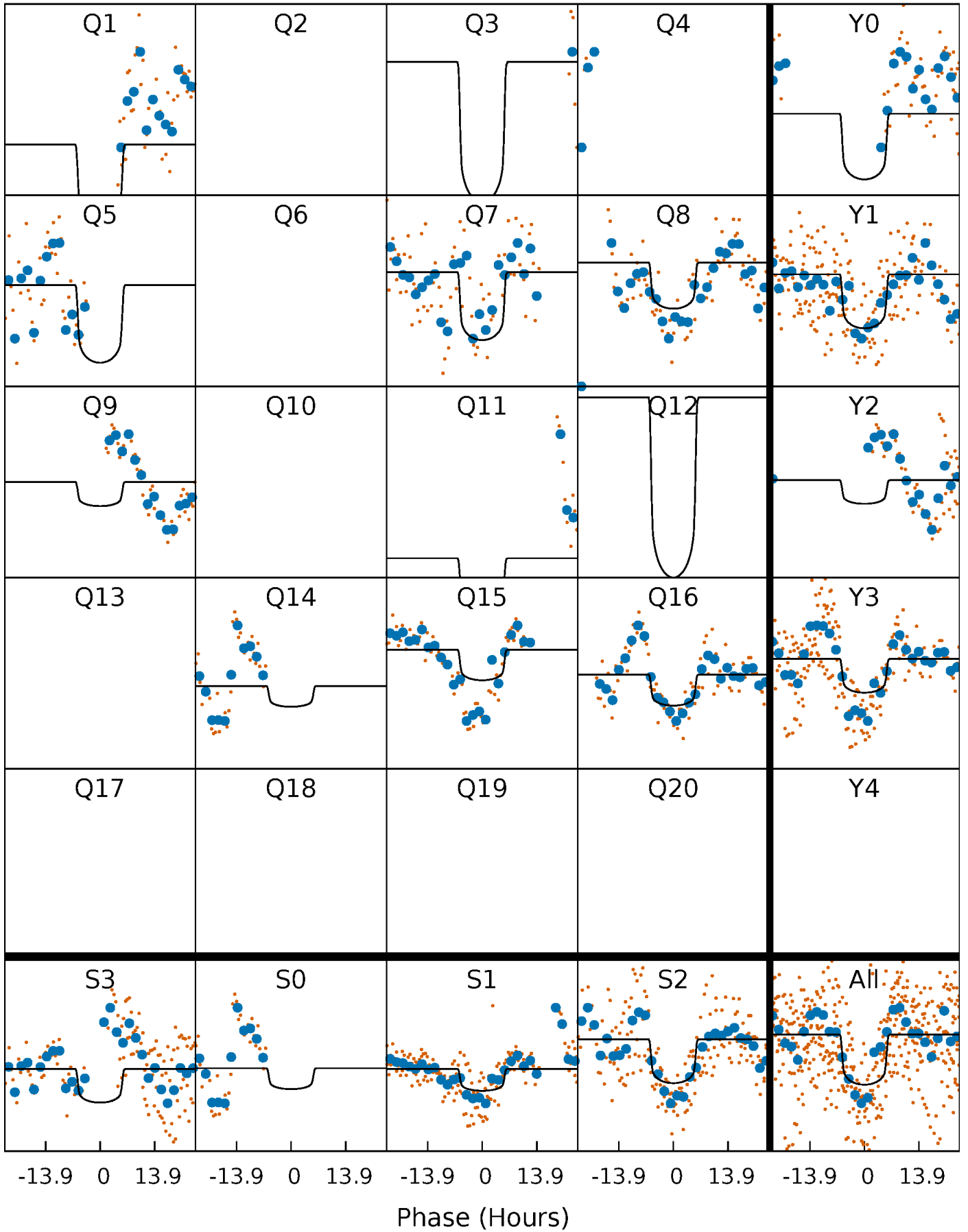
PDC Quarter-Phased Transit Curves

TCE 003631985-02 P=126.957570 Days $T_0=133.100780$ (BKJD)



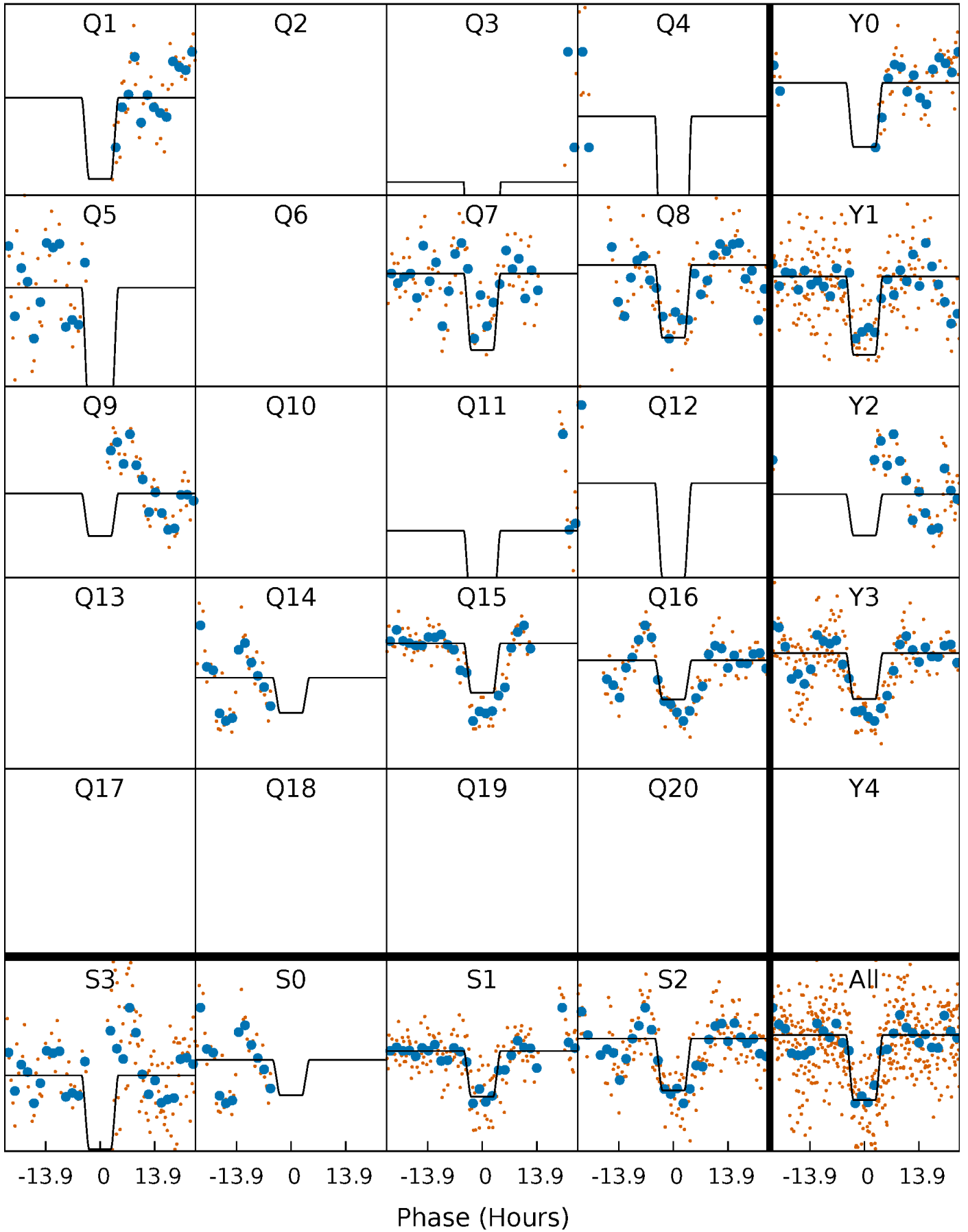
DV Quarter-Phased Transit Curves

TCE 003631985-02 $P=126.957570$ Days $T_0=133.100780$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

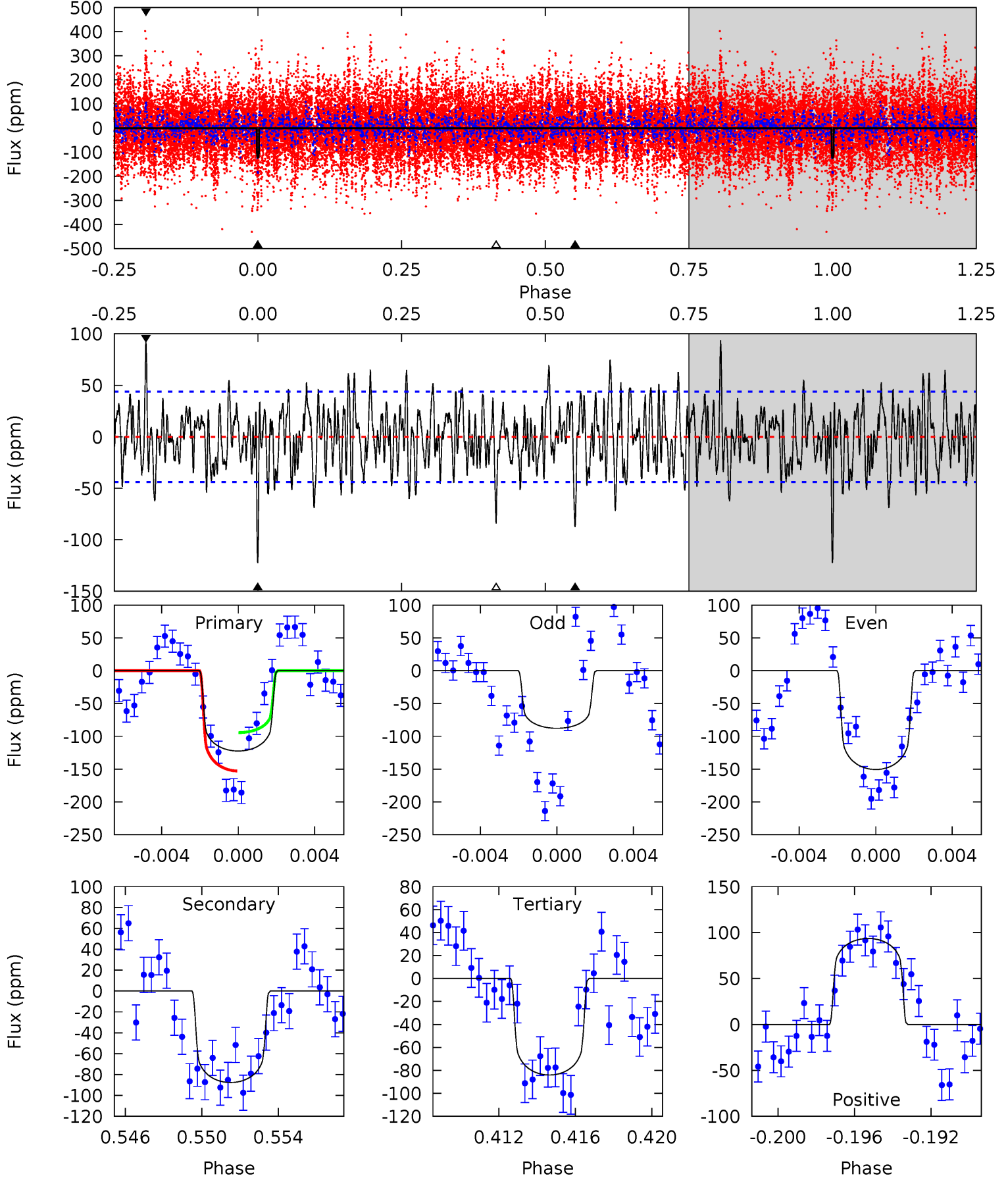
TCE 003631985-02 P=126.945646 Days $T_0=133.157891$ (BKJD)



DV Model-Shift Uniqueness Test

003631985-02, P = 126.957570 Days, E = 133.100780 Days

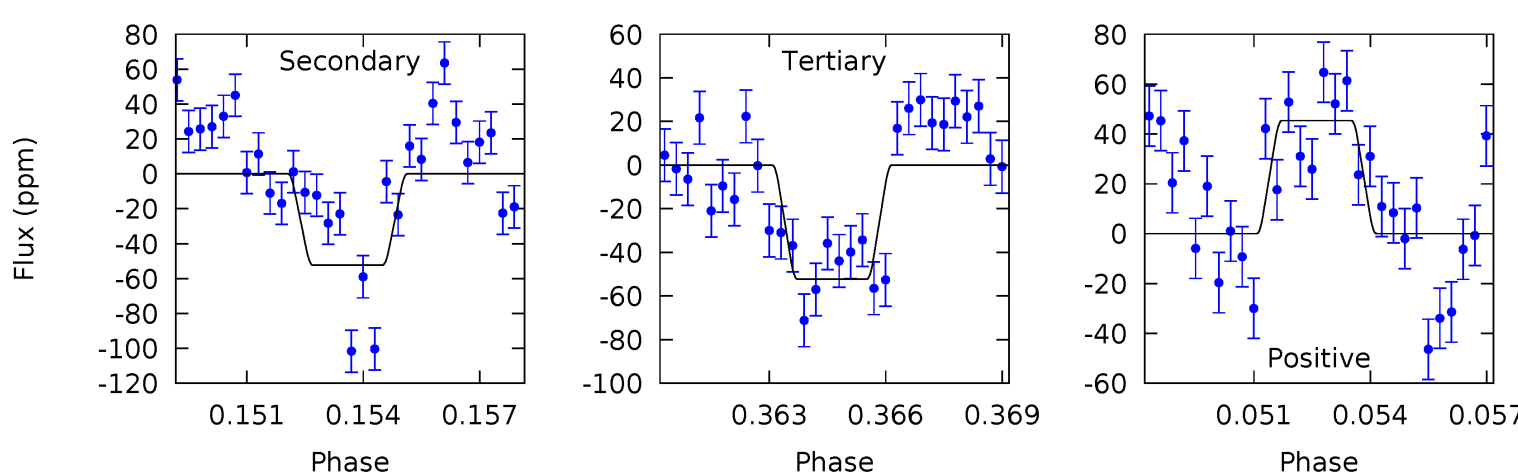
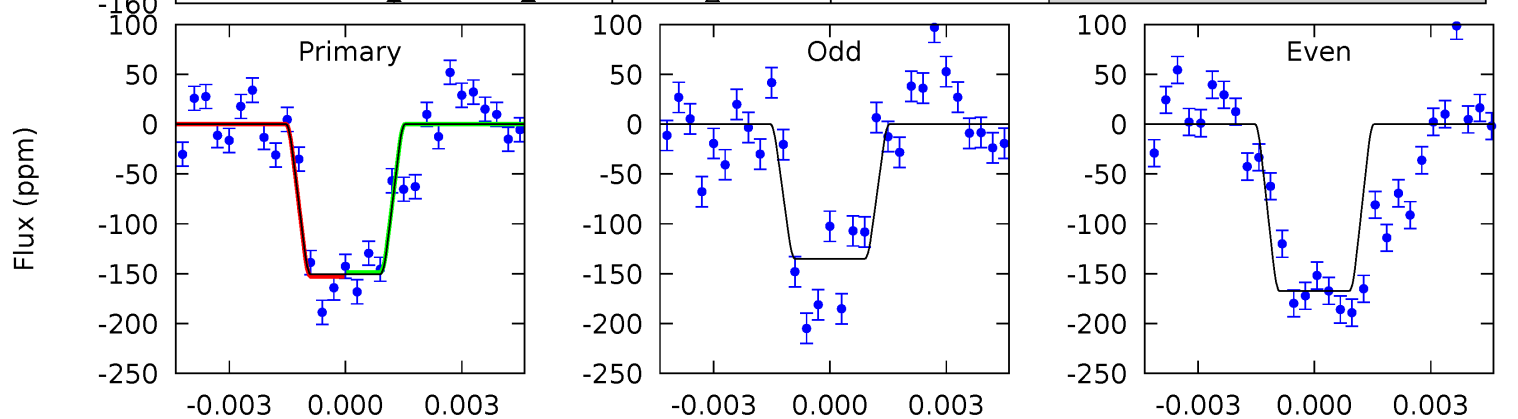
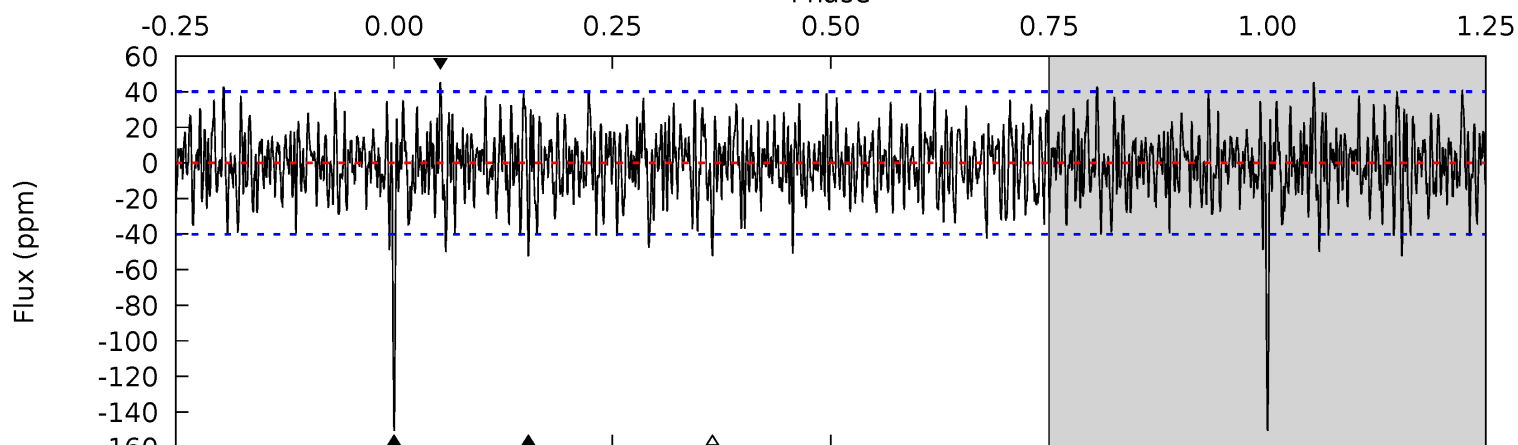
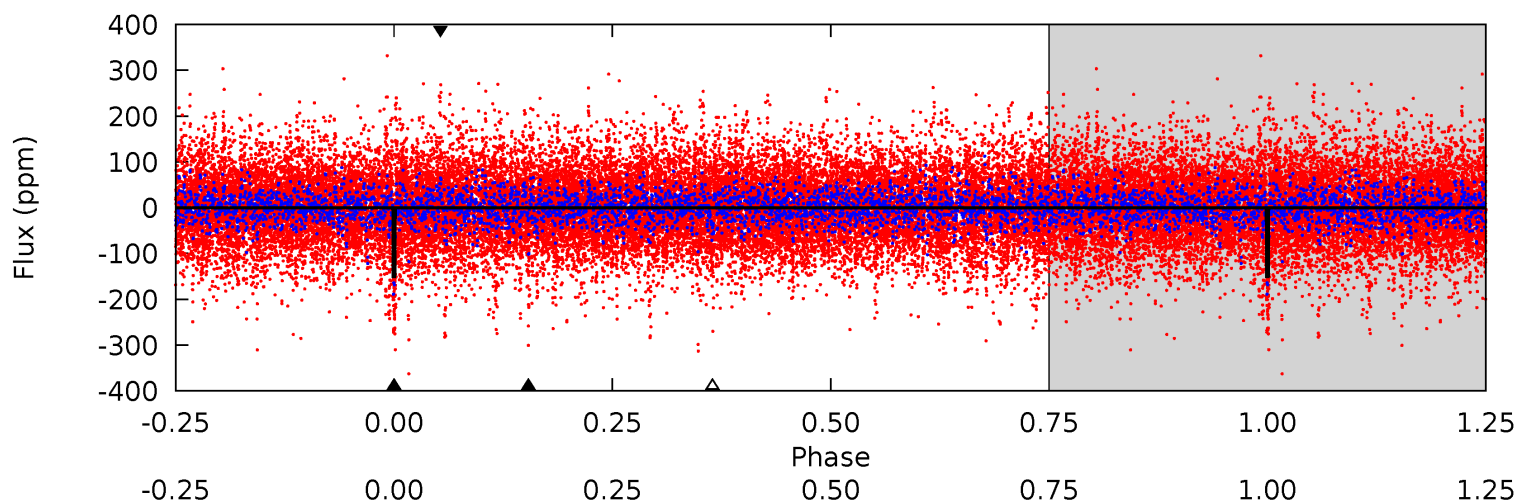
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.5	10.4	9.94	11.1	5.20	2.87	2.99	4.54	3.42	0.43	-0.70	3.73	1.02	0.43	3.47



Alt Model-Shift Uniqueness Test

003631985-02, P = 126.945646 Days, E = 133.157891 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.7	6.86	6.84	5.94	5.25	2.97	2.09	12.9	13.8	0.02	0.92	2.11	0.67	0.23	0.29



Stellar Parameters For KIC 003631985

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6627^{+186}_{-255}	$4.277^{+0.124}_{-0.186}$	$-0.220^{+0.250}_{-0.300}$	$1.317^{+0.408}_{-0.220}$	$1.204^{+0.183}_{-0.183}$	$0.742^{+0.432}_{-0.369}$
	+3%/-4%	+3%/-4%	+114%/-136%	+31%/-17%	+15%/-15%	+58%/-50%
Source	PHO54	PHO54	PHO54	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 003631985-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-88 ± 8	$1.79^{+0.36}_{-0.29}$	651^{+49}_{-41}	5773^{+445}_{-376}	4088^{+1672}_{-1263}
Alt.	-52 ± 8	$1.82^{+0.34}_{-0.29}$	646^{+51}_{-39}	5082^{+343}_{-343}	2346^{+1044}_{-719}

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{obs} \gg T_{max}$ AND $A_{obs} \gg 1.0$

DV Centroid Data

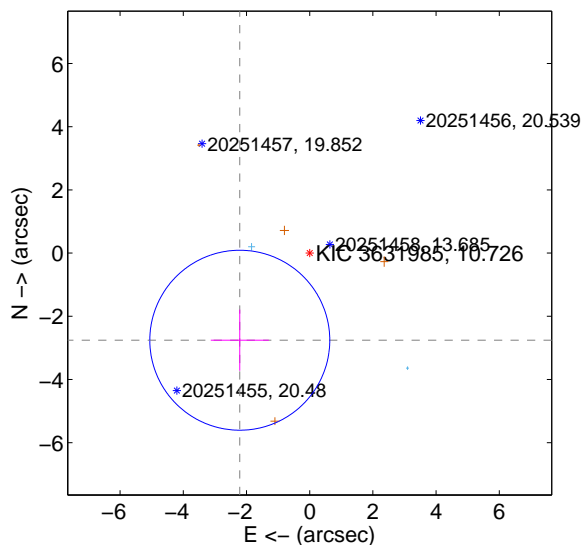
Supplemental centroid analysis for 003631985-02. **Kepler magnitude: 10.73.** Transit SNR 8.87

There are 2 quarters with good PRF difference image offsets

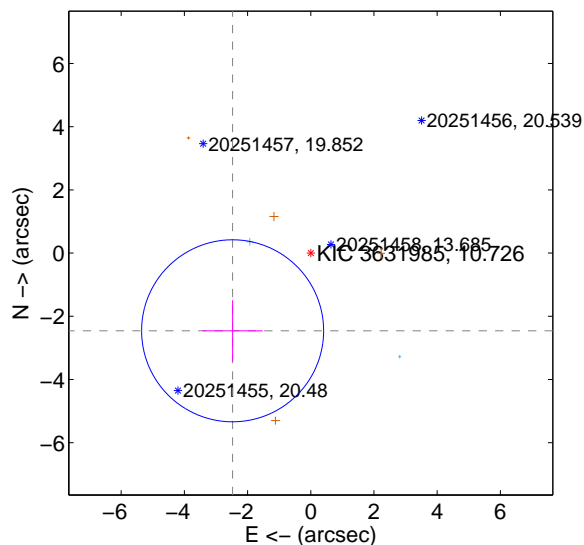
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.535 ± 0.949	3.72	2.211 ± 0.918	-2.757 ± 0.968
PRF-fit source offset from KIC position	3.488 ± 0.960	3.63	2.473 ± 0.954	-2.459 ± 0.966
photometric centroid source offset	2.05 ± 0.96	2.15	1.83 ± 0.95	0.93 ± 0.96

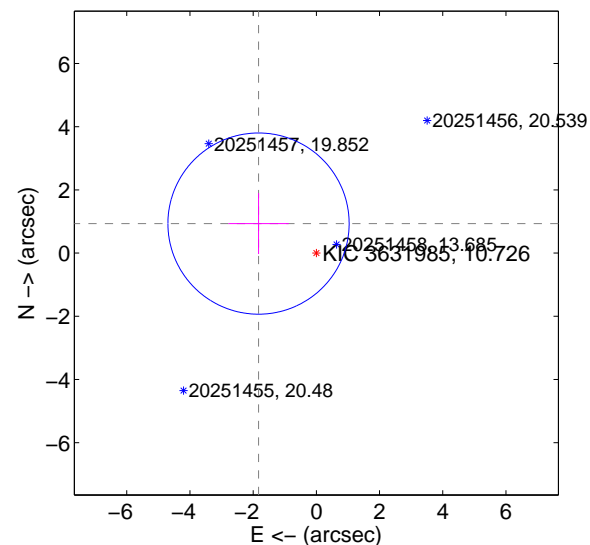
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

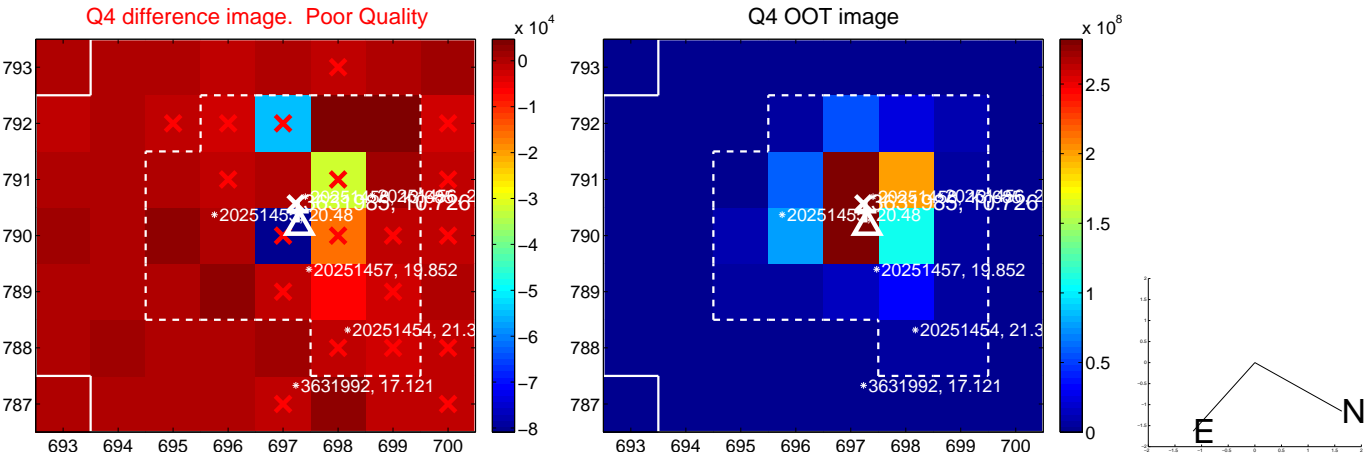
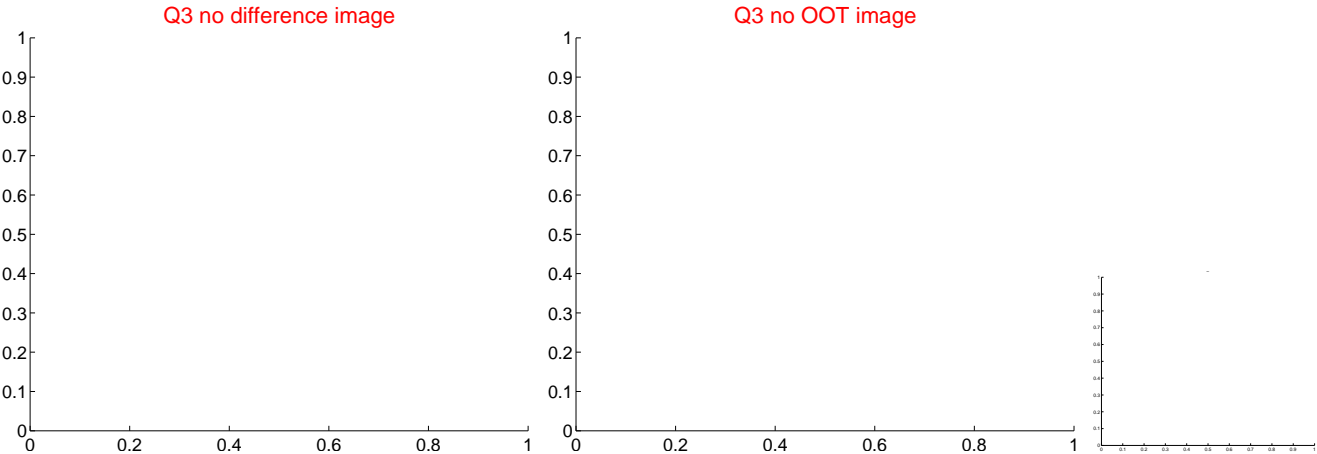
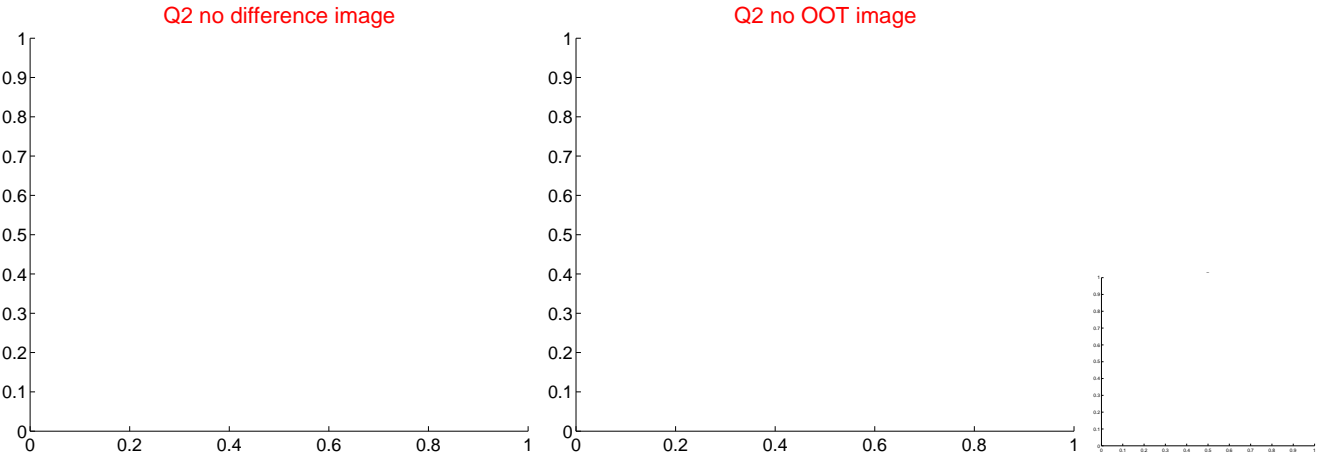
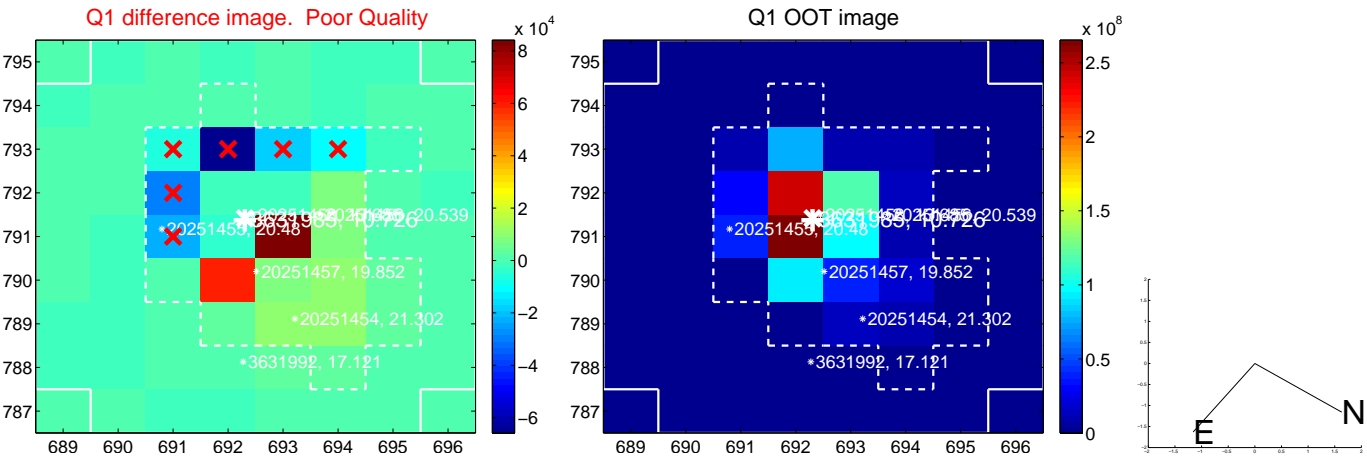


offset from photometric centroids

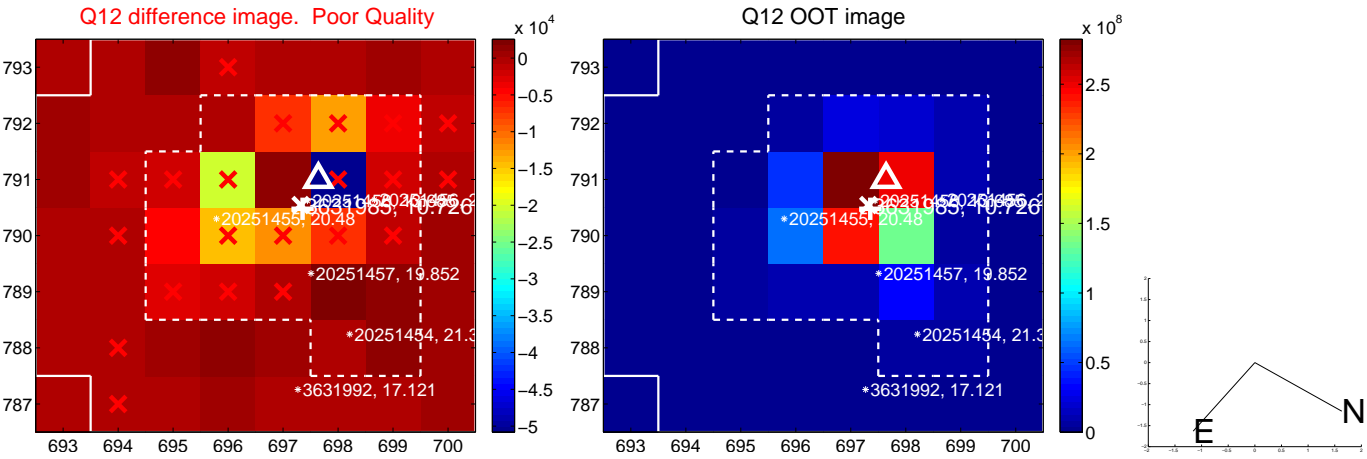
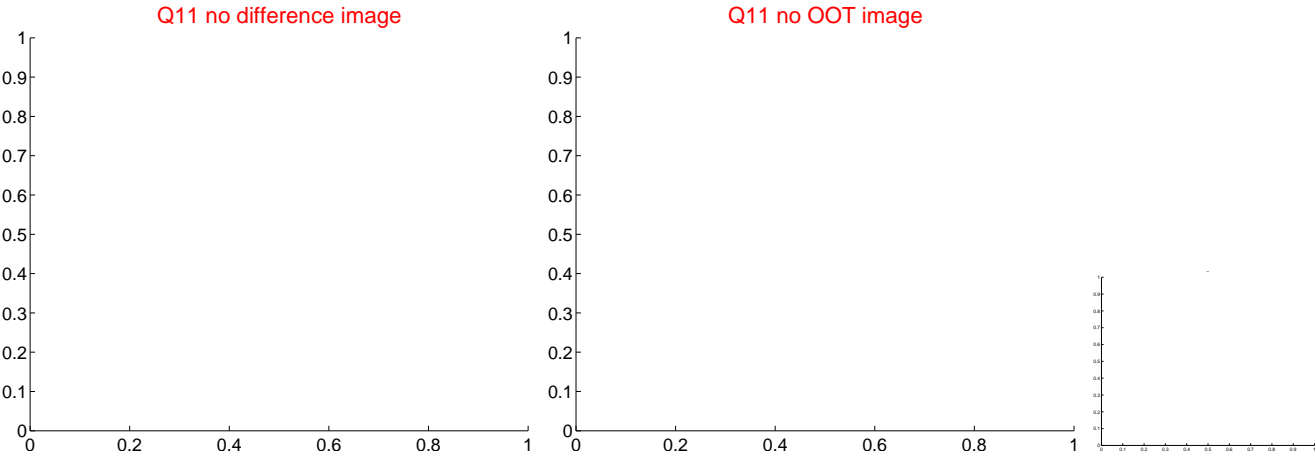
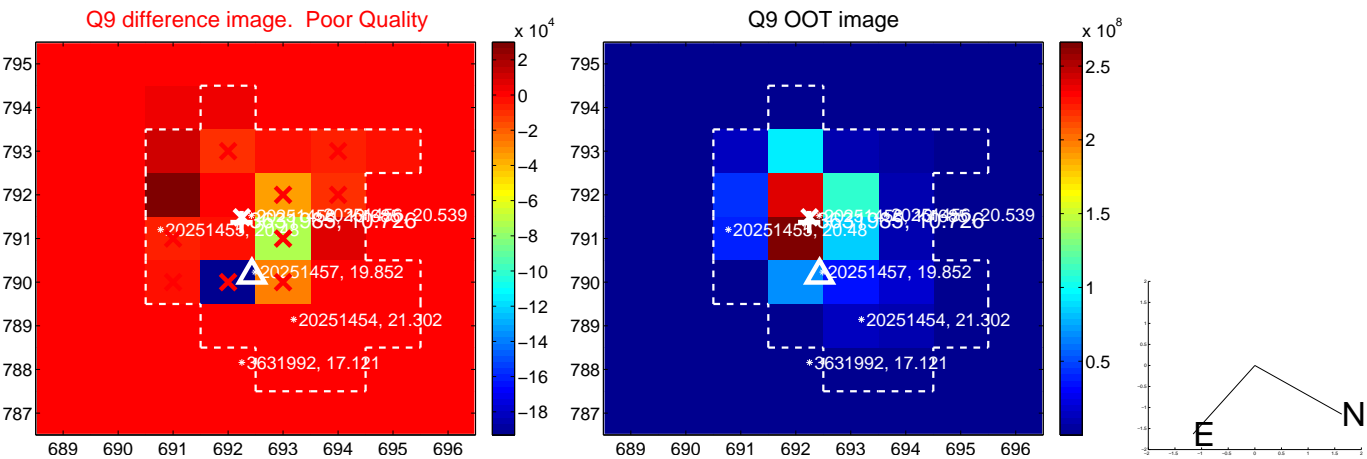


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

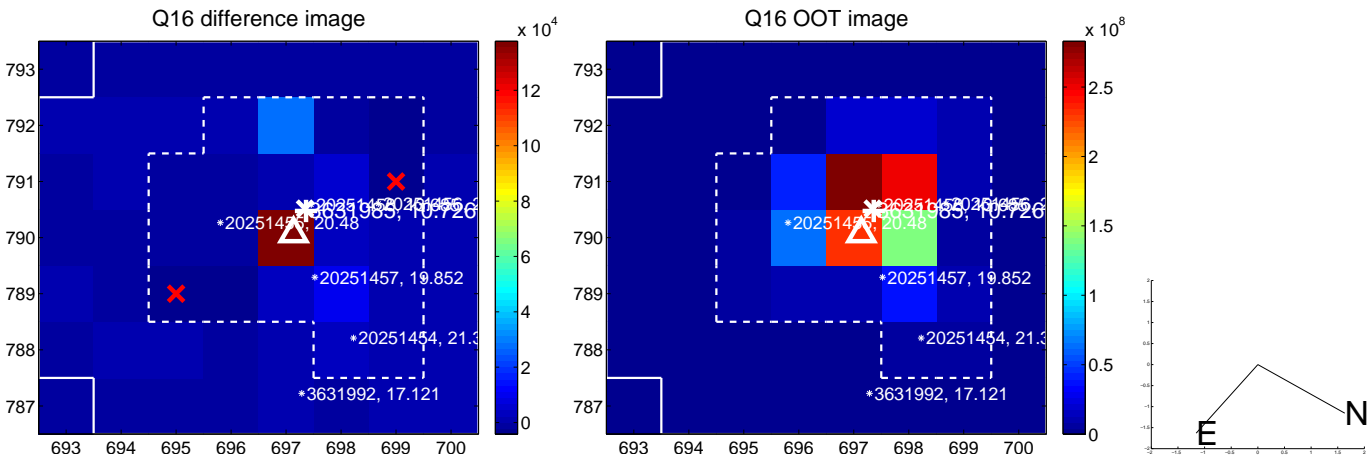
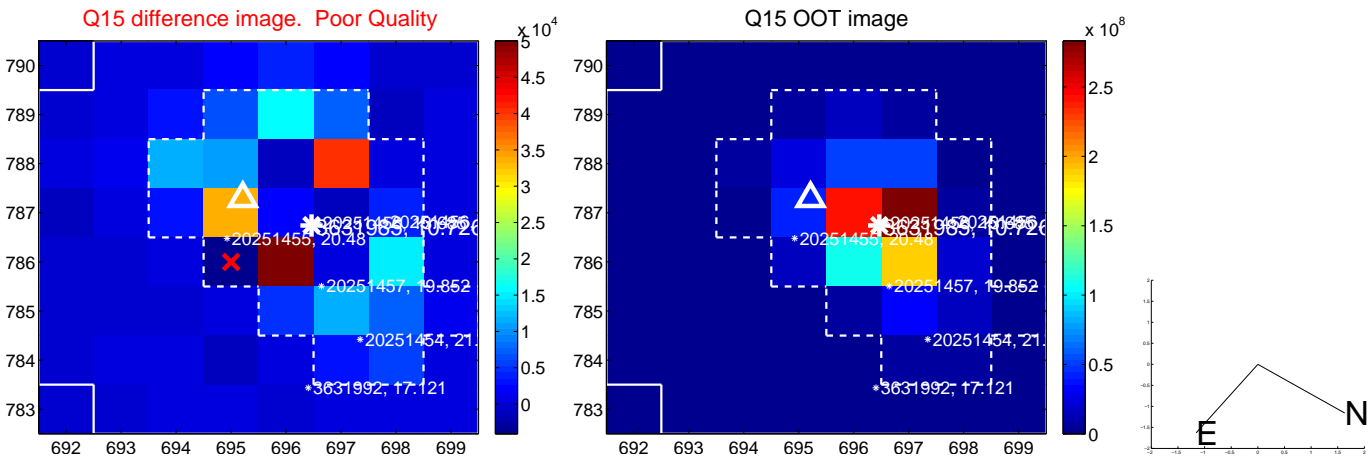
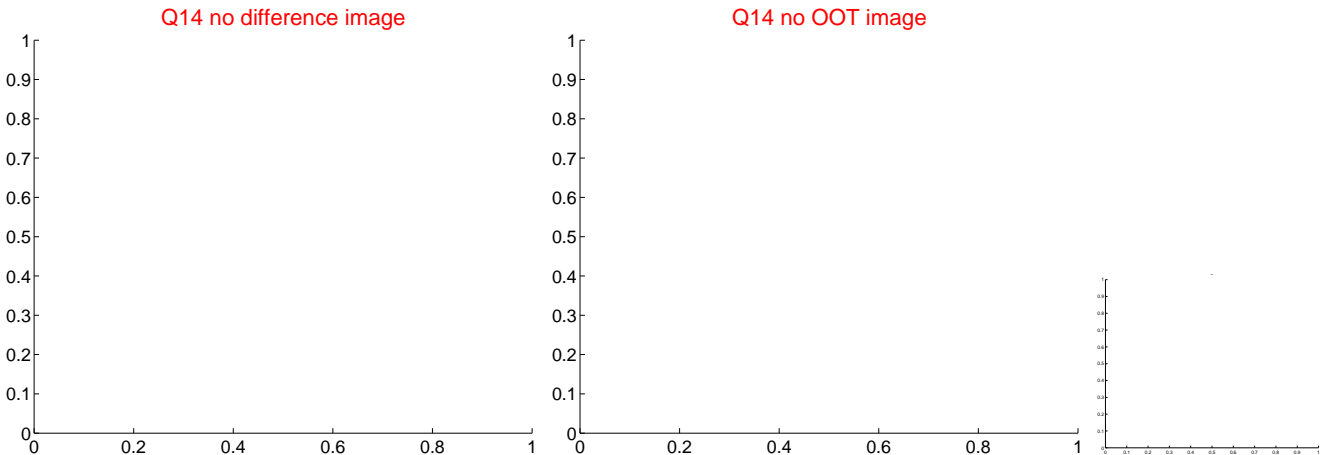
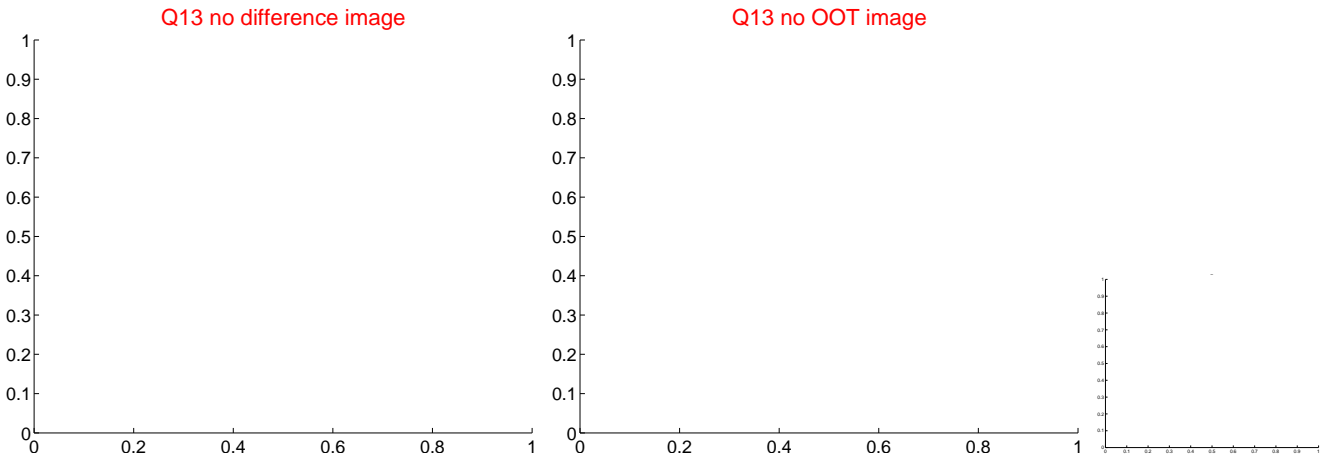
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



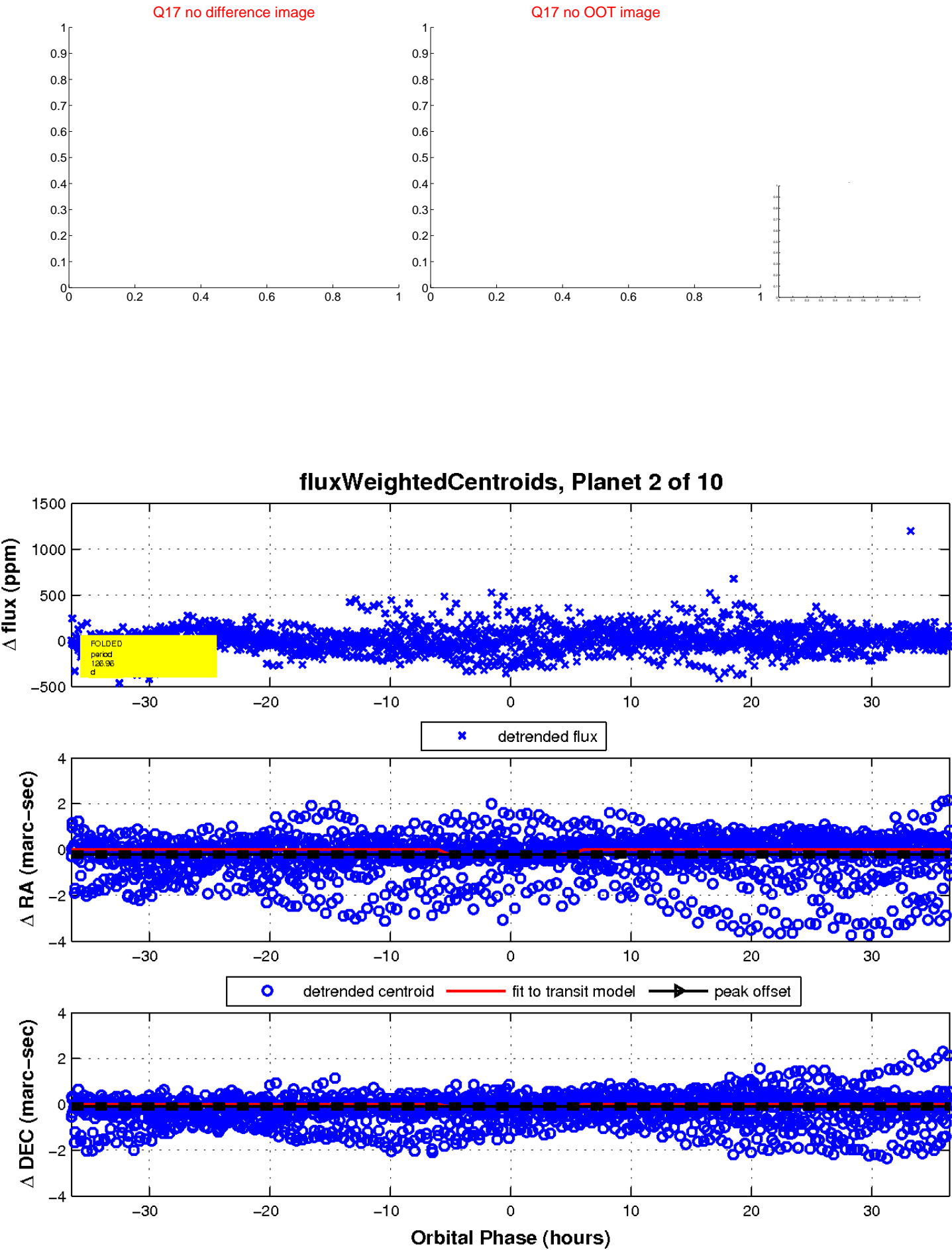
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value

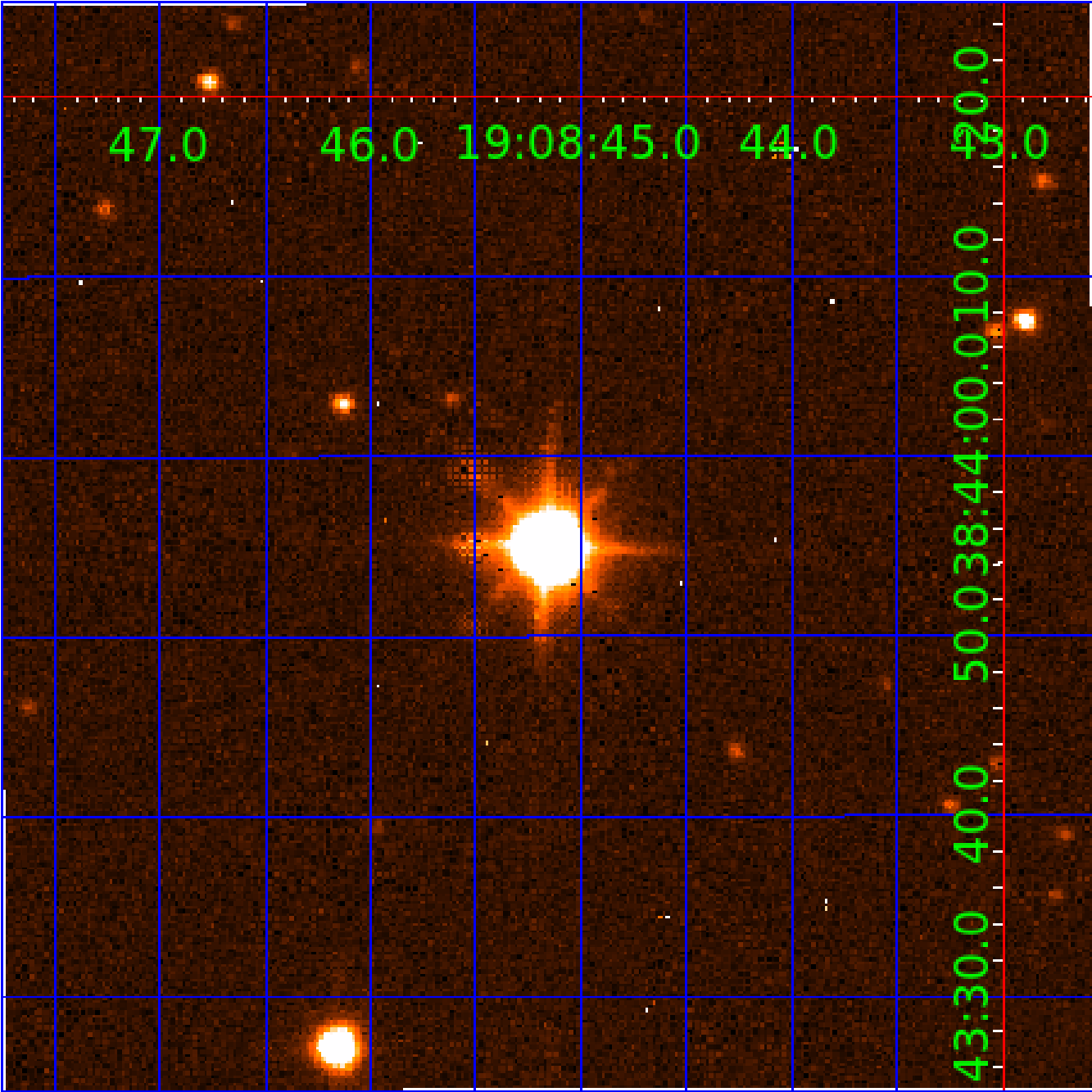


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 003631985

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
003631985-01	OBS	No	4.560527	132.026788	8.1	19.919	7.2	3.3	1.32	6627	0.43	917.35
003631985-02	OBS	No	126.957570	133.100780	130.0	12.168	10.5	8.9	1.32	6627	1.75	10.87
003631985-03	OBS	No	137.684361	192.319484	115.3	12.440	10.0	7.8	1.32	6627	1.55	9.76
003631985-04	OBS	No	510.471188	499.727737	148.5	5.818	9.2	8.6	1.32	6627	1.84	1.70
003631985-05	OBS	No	52.982172	175.171808	95.5	4.252	9.2	8.7	1.32	6627	1.48	34.86
003631985-07	OBS	No	424.406935	192.591667	163.7	10.410	9.1	8.3	1.32	6627	1.89	2.17
003631985-08	OBS	No	44.050048	148.961830	76.7	11.194	8.9	7.9	1.32	6627	1.30	44.59
003631985-09	OBS	No	428.258732	222.123753	150.7	10.780	9.0	8.9	1.32	6627	1.74	2.15
003631985-10	OBS	No	579.371898	339.223546	119.6	18.051	8.8	6.7	1.32	6627	1.69	1.44

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003631985-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
003631985-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED
003631985-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—CENT_SATURATED
003631985-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_SATURATED
003631985-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
003631985-07	OBS	FP	0.01	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED
003631985-08	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
003631985-09	OBS	FP	0.00	1	0	0	0	ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED
003631985-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

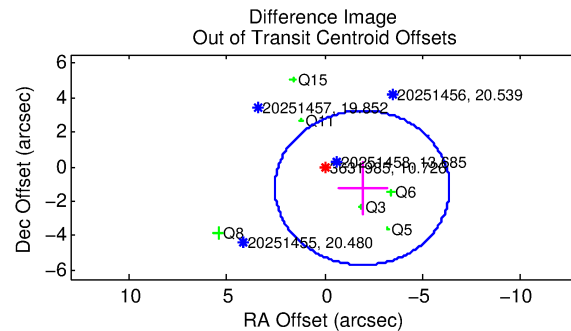
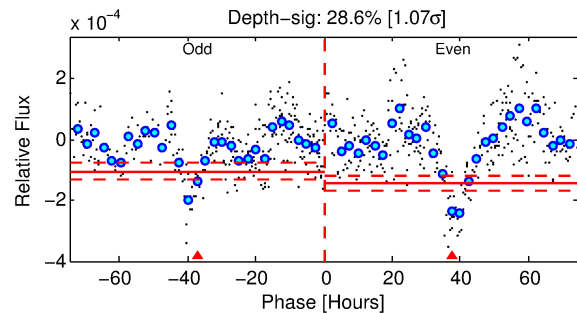
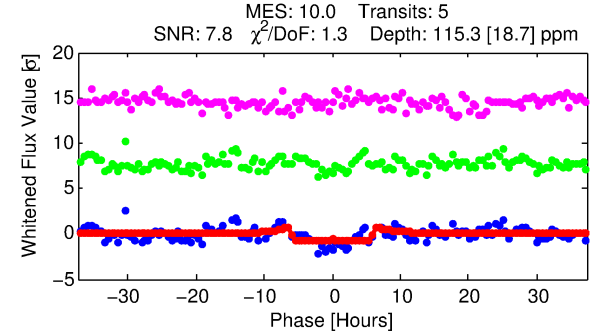
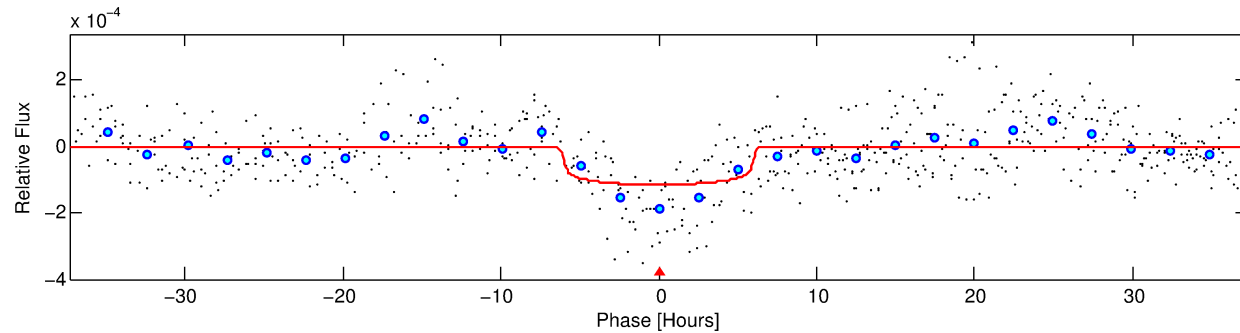
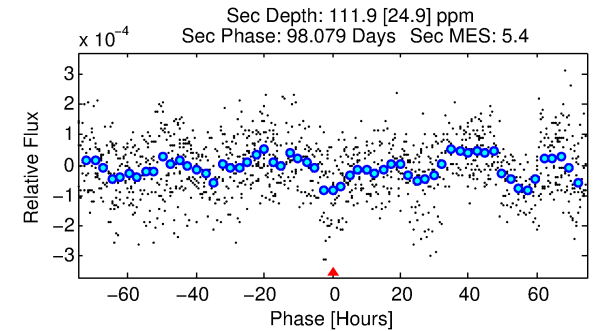
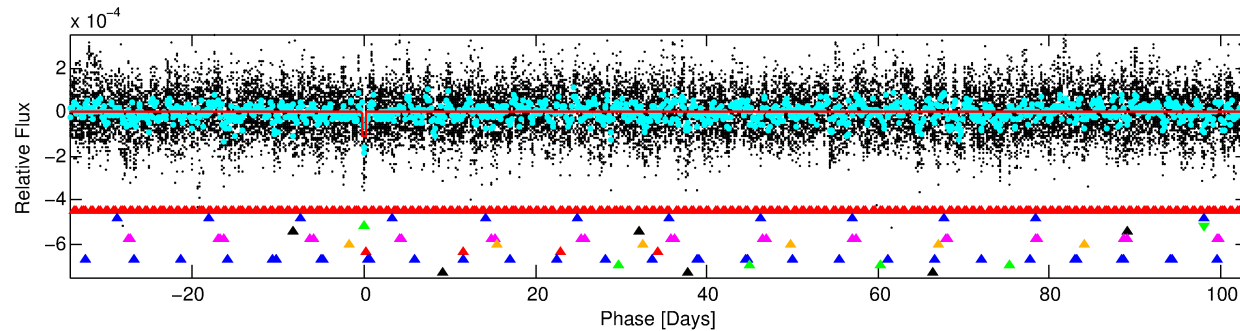
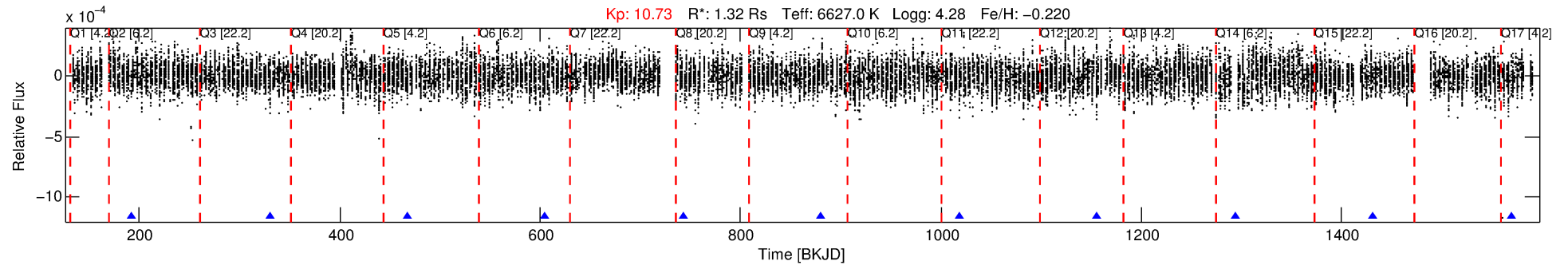
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 003631985-03

No Significant Match Found

DV One-Page Summary

KIC: 3631985 Candidate: 3 of 10 Period: 137.684 d



DV Fit Results:

Period = 137.68436 [0.00236] d
Epoch = 192.3195 [0.0101] BKJD
 R_p/R^* = 0.0108 [0.0025]
 a/R^* = 53.50 [64.15]
 b = 0.79 [0.58]
 Seff = 9.76 [3.75]
 T_{eq} = 451 [43] K
 R_p = 1.55 [0.60] R_e
 a = 0.5542 [0.1391] AU
 A_g = 7829.94 [4900.27] [1.60σ]
 T_{effp} = 6555 [884] K [6.89σ]

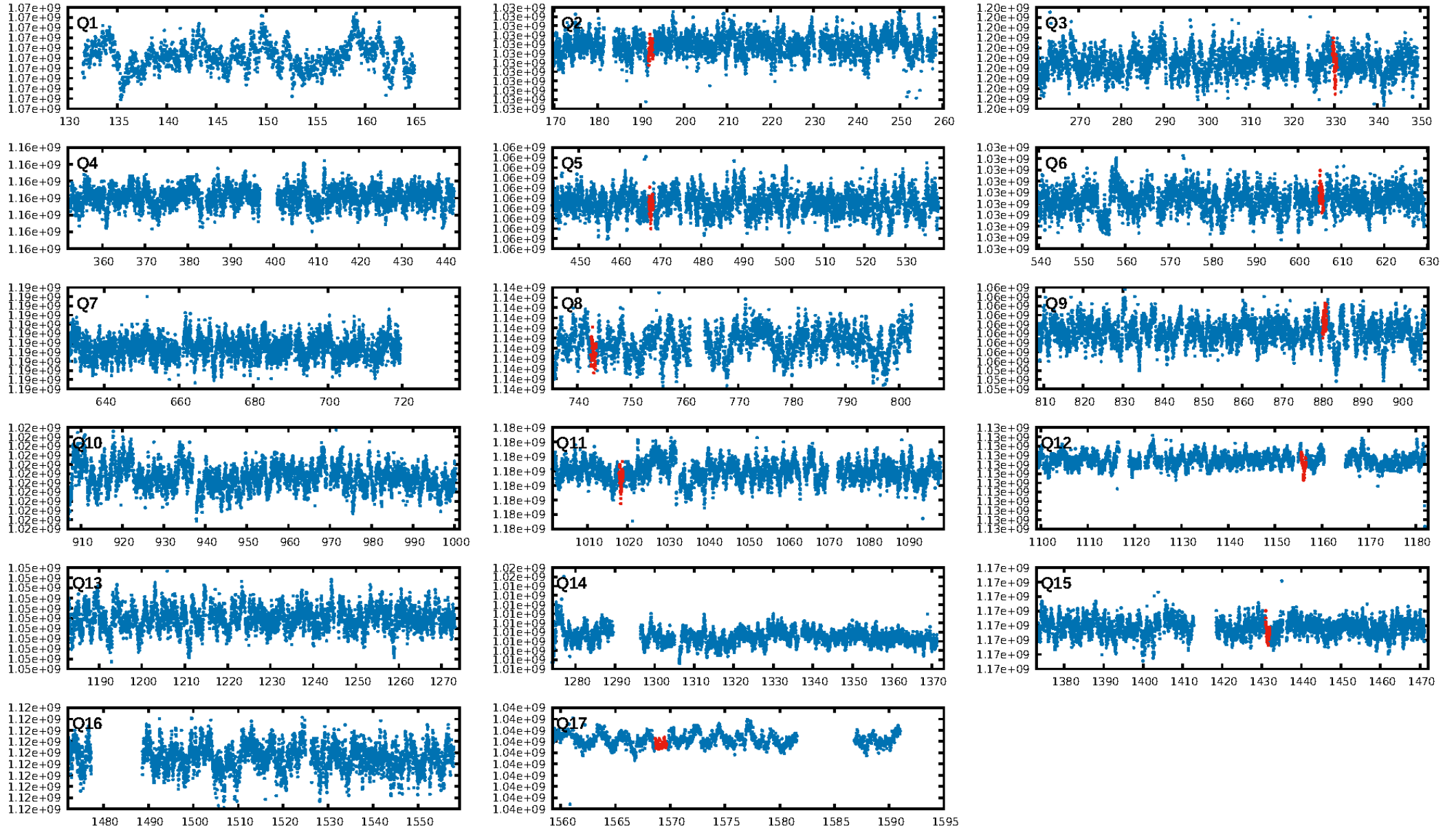
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [14.79σ]
LongPeriod-sig: 100.0% [140.16σ]
ModelChiSquare2-sig: 86.9%
ModelChiSquareGof-sig: 94.9%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: -1.728
Centroid-sig: 9.0%
Centroid-so: 1.709 arcsec [1.44σ]
OotOffset-rm: 2.283 arcsec [1.54σ]
KicOffset-rm: 2.331 arcsec [1.73σ]
OotOffset-st: 1/3/1/1 [6]
KicOffset-st: 1/3/1/1 [6]
DiffImageQuality-fgm: 0.33 [2/6]
DiffImageOverlap-fno: 0.33 [3/9]

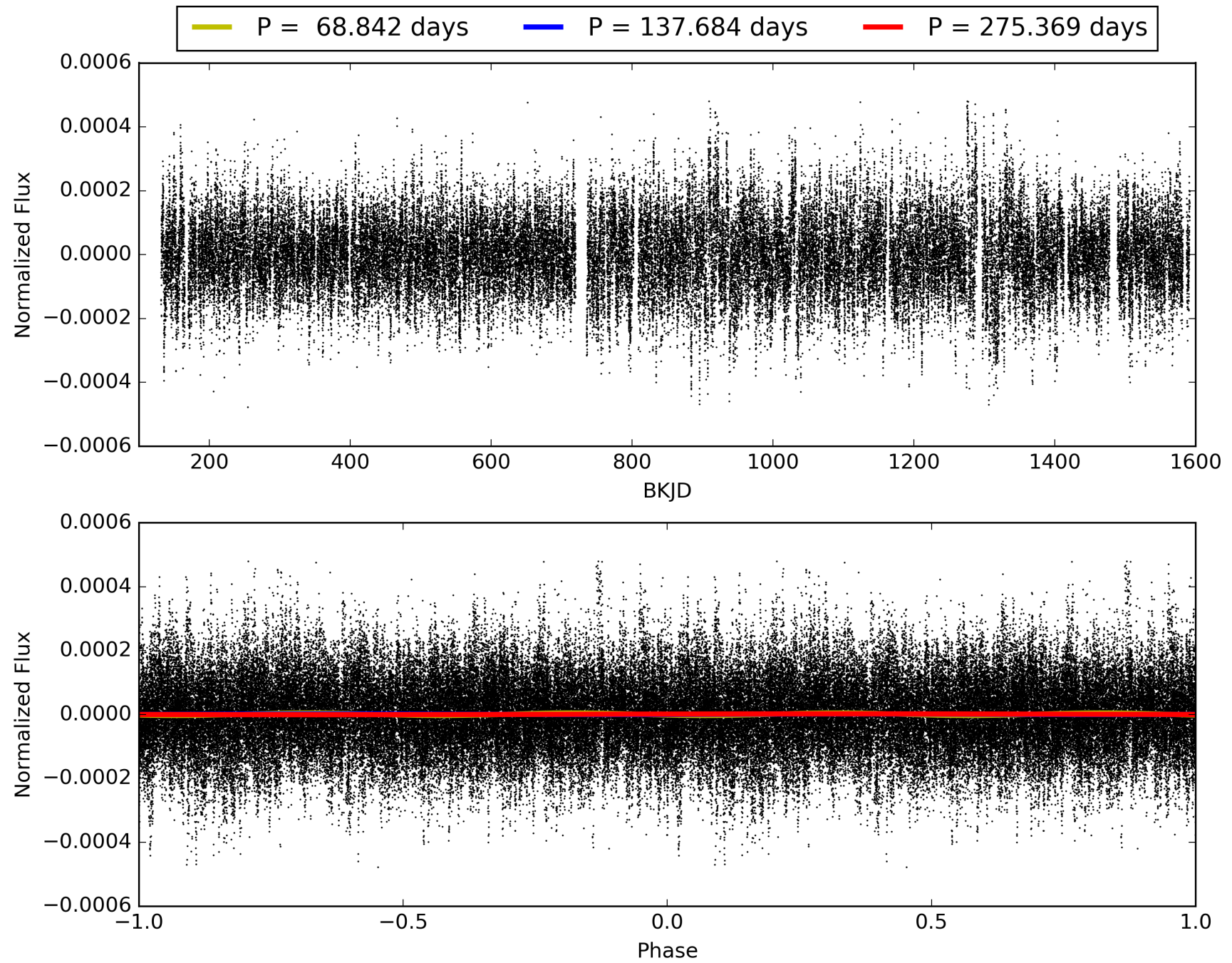
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 18:55:26 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 003631985-03, PDC Light Curves

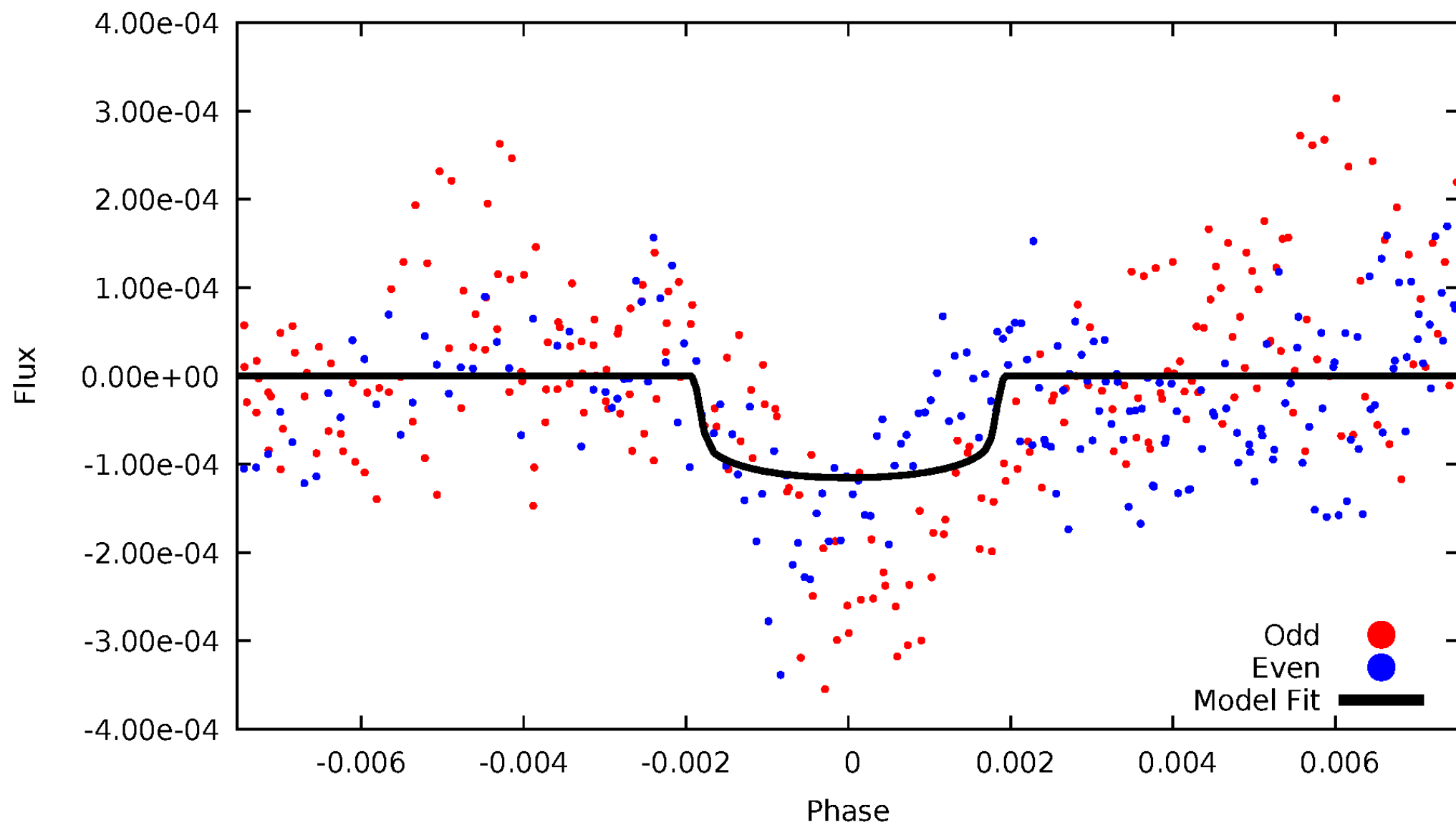


TCE 003631985-03



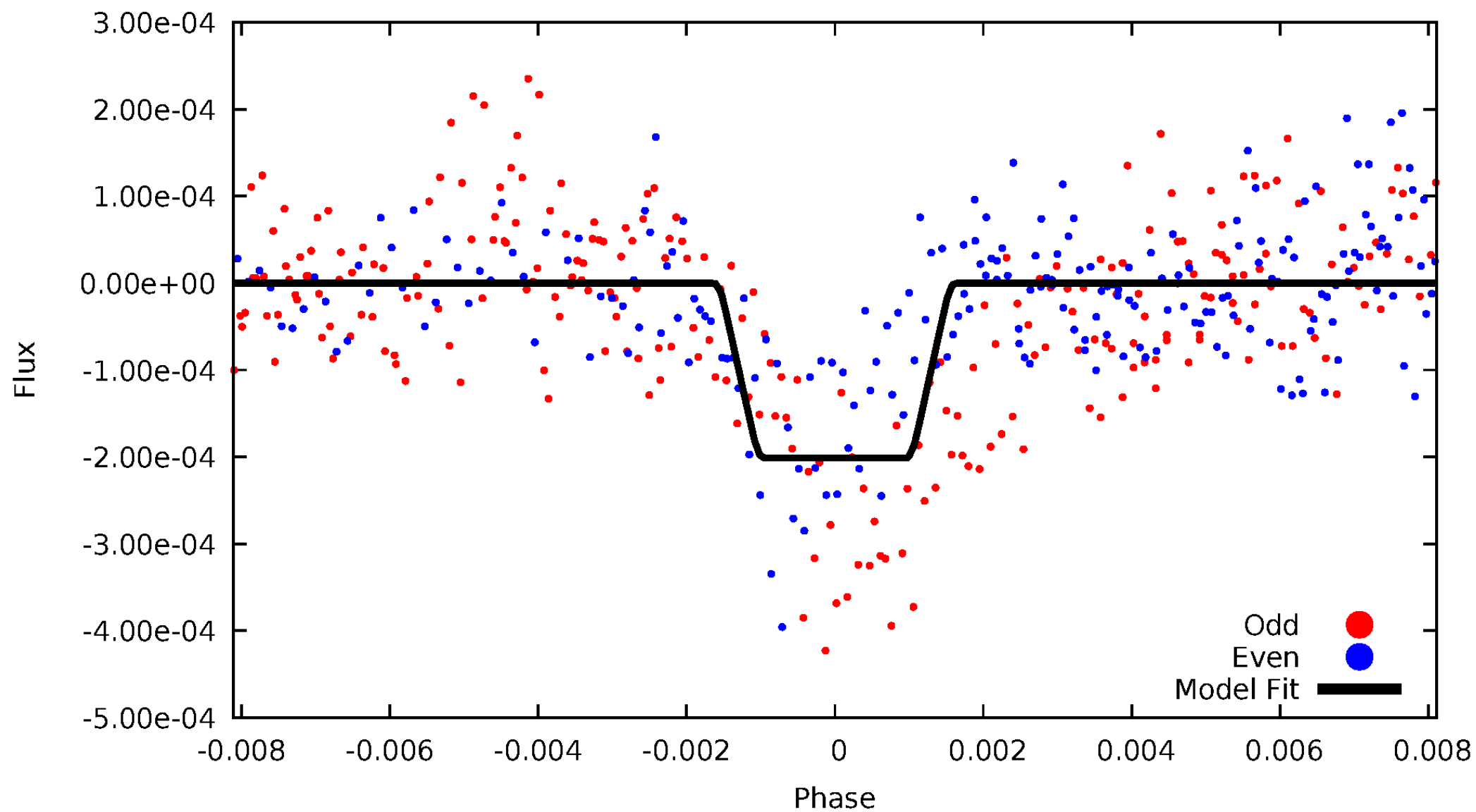
DV Odd/Even

TCE 003631985-03



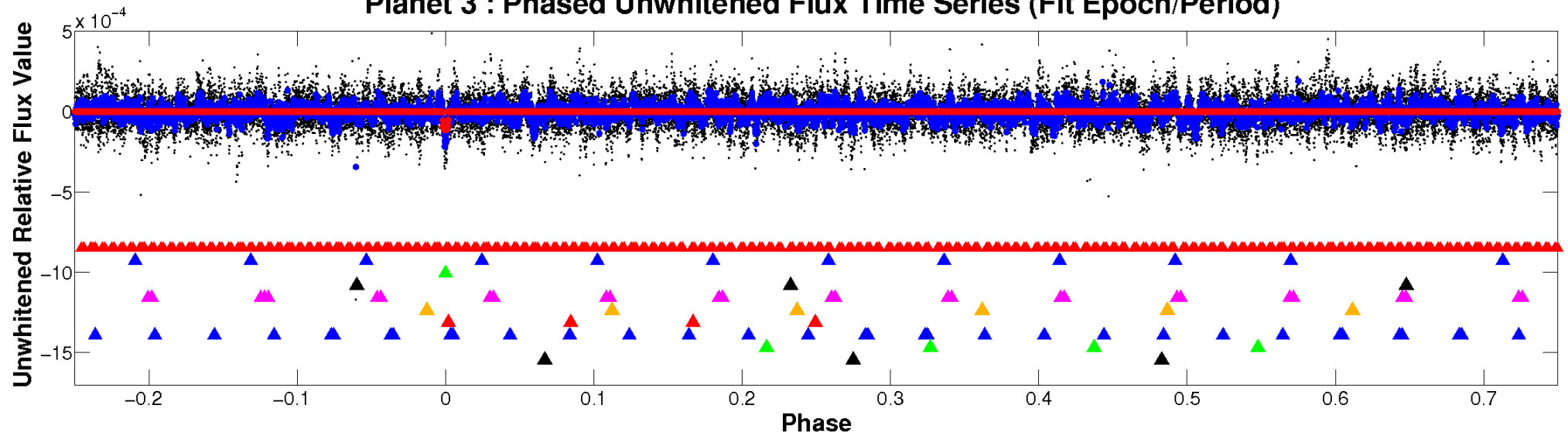
ALT Odd/Even

TCE 003631985-03

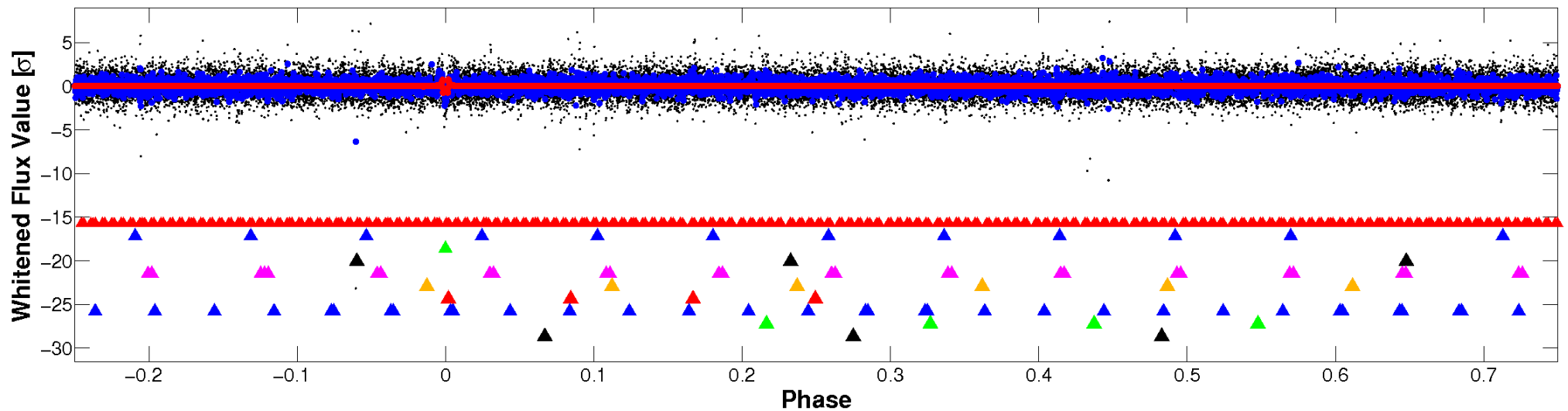


Non-Whitened Vs. Whitened Light Curve

Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

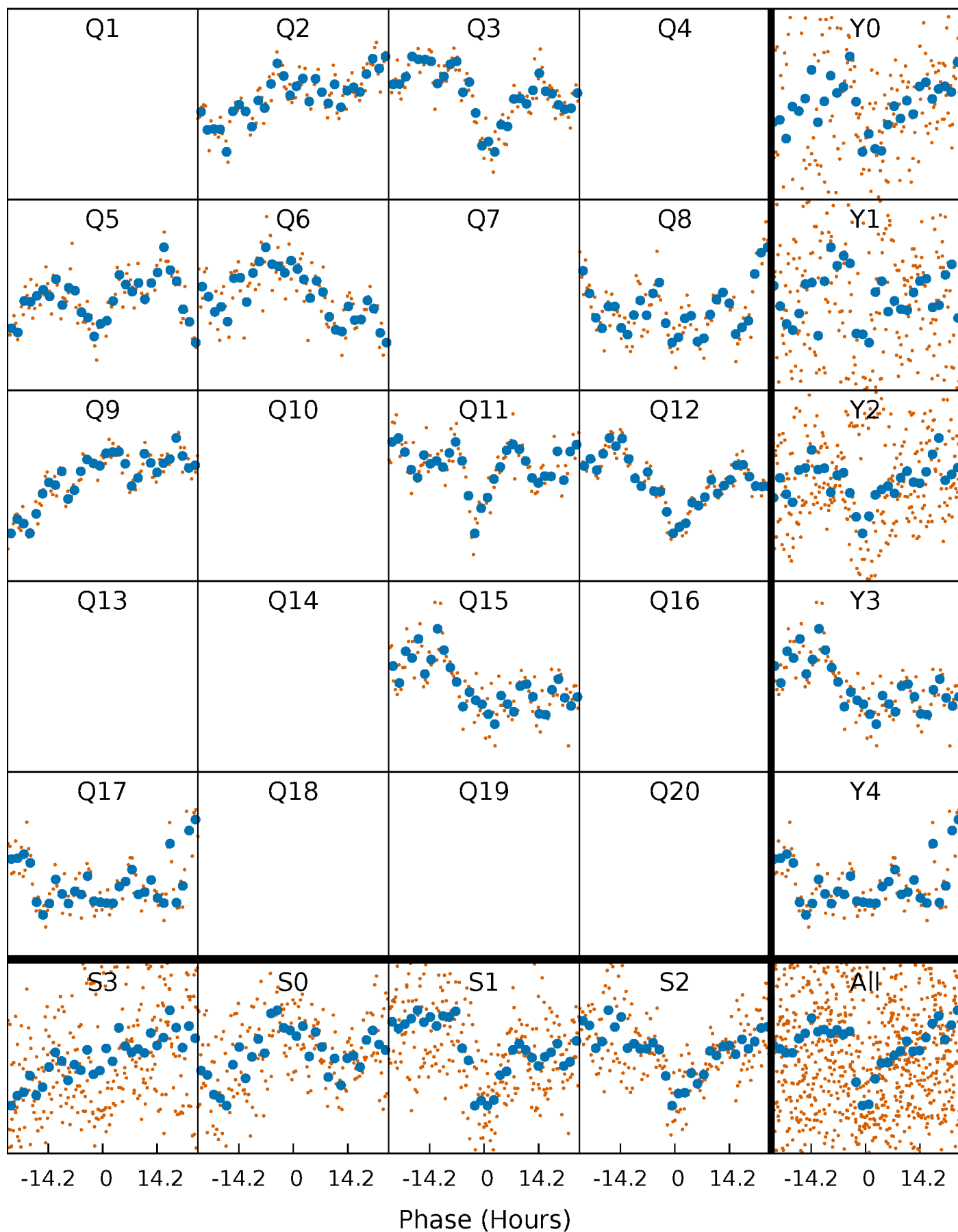


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



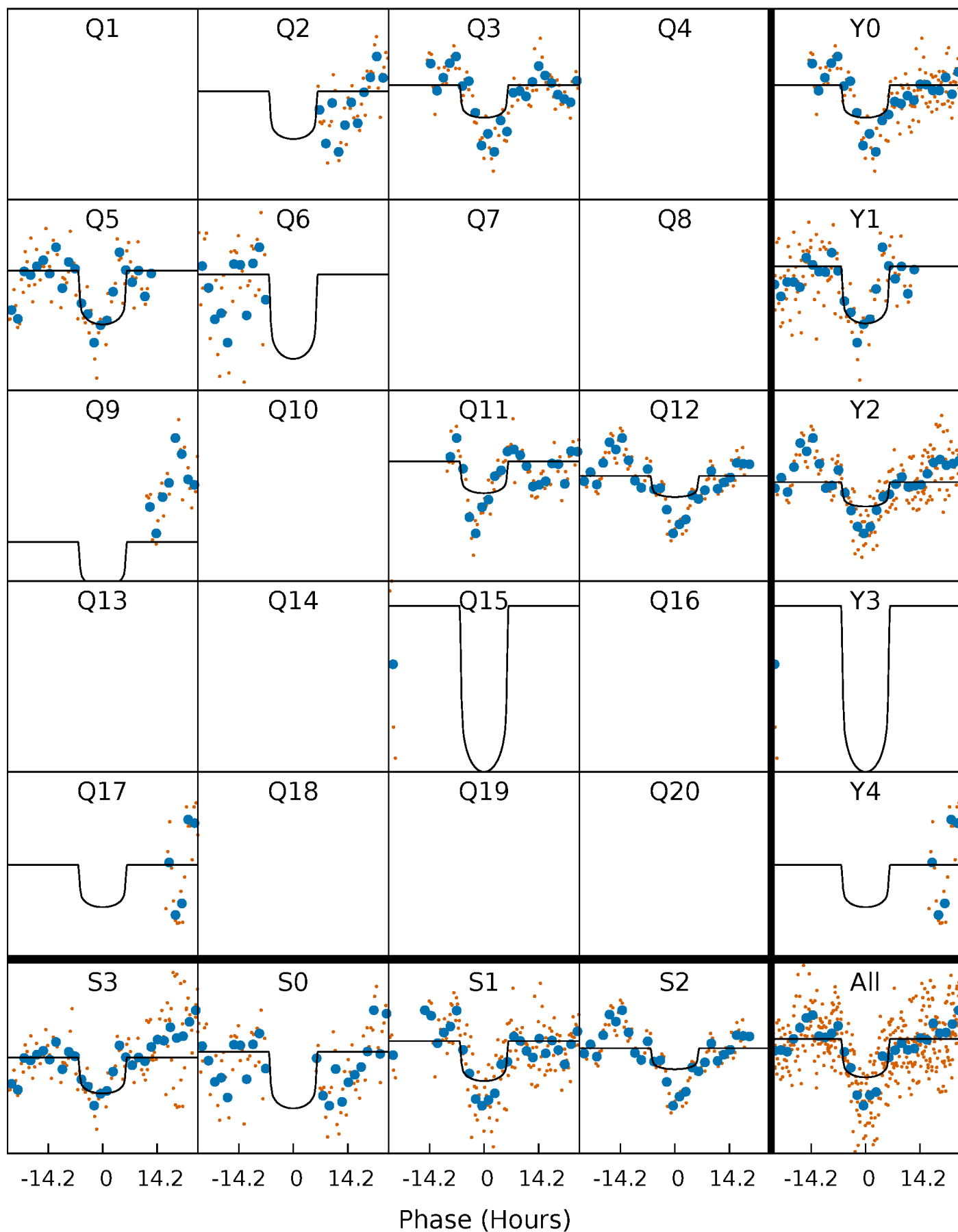
PDC Quarter-Phased Transit Curves

TCE 003631985-03 P=137.684361 Days $T_0=192.319484$ (BKJD)



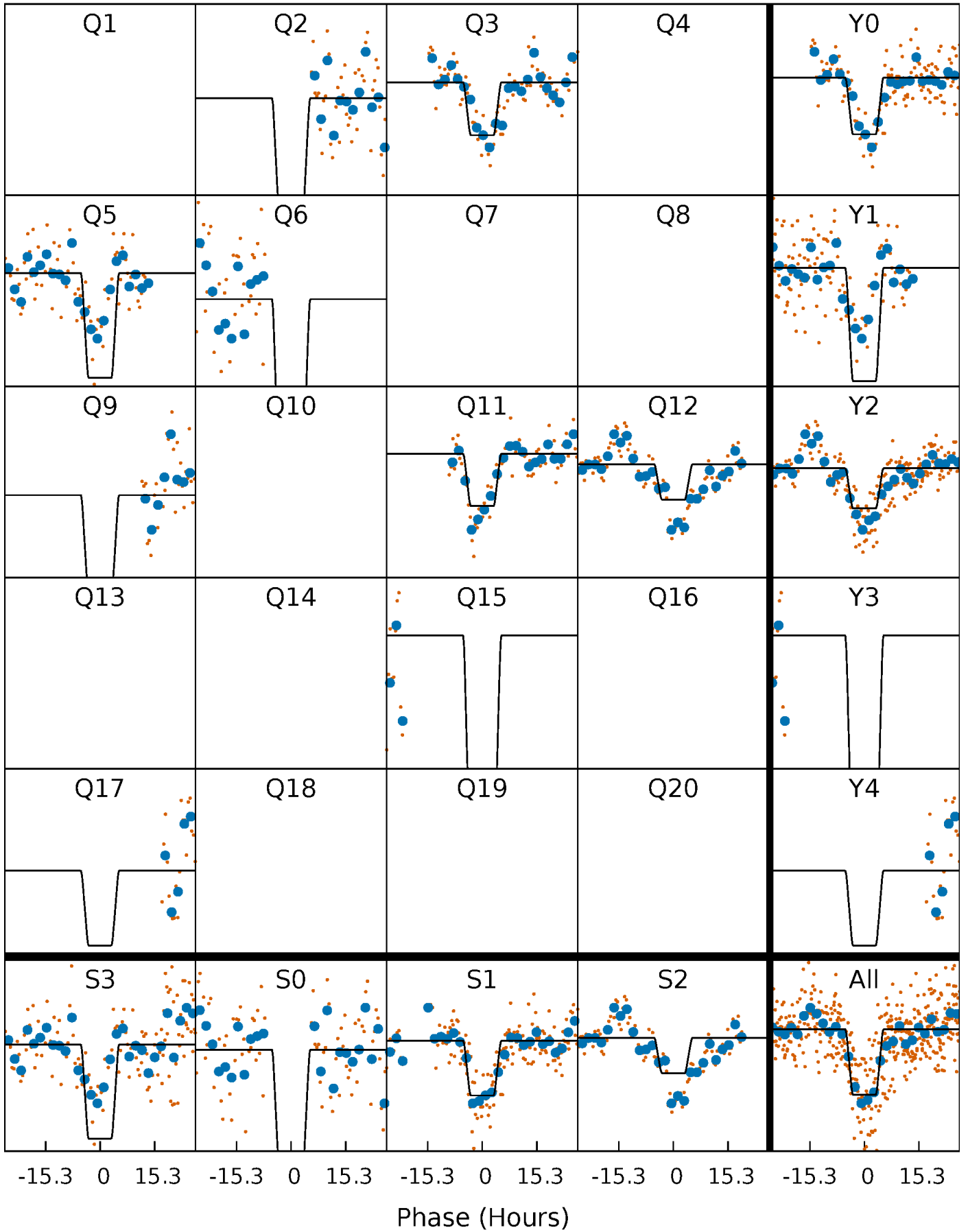
DV Quarter-Phased Transit Curves

TCE 003631985-03 P=137.684361 Days $T_0=192.319484$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

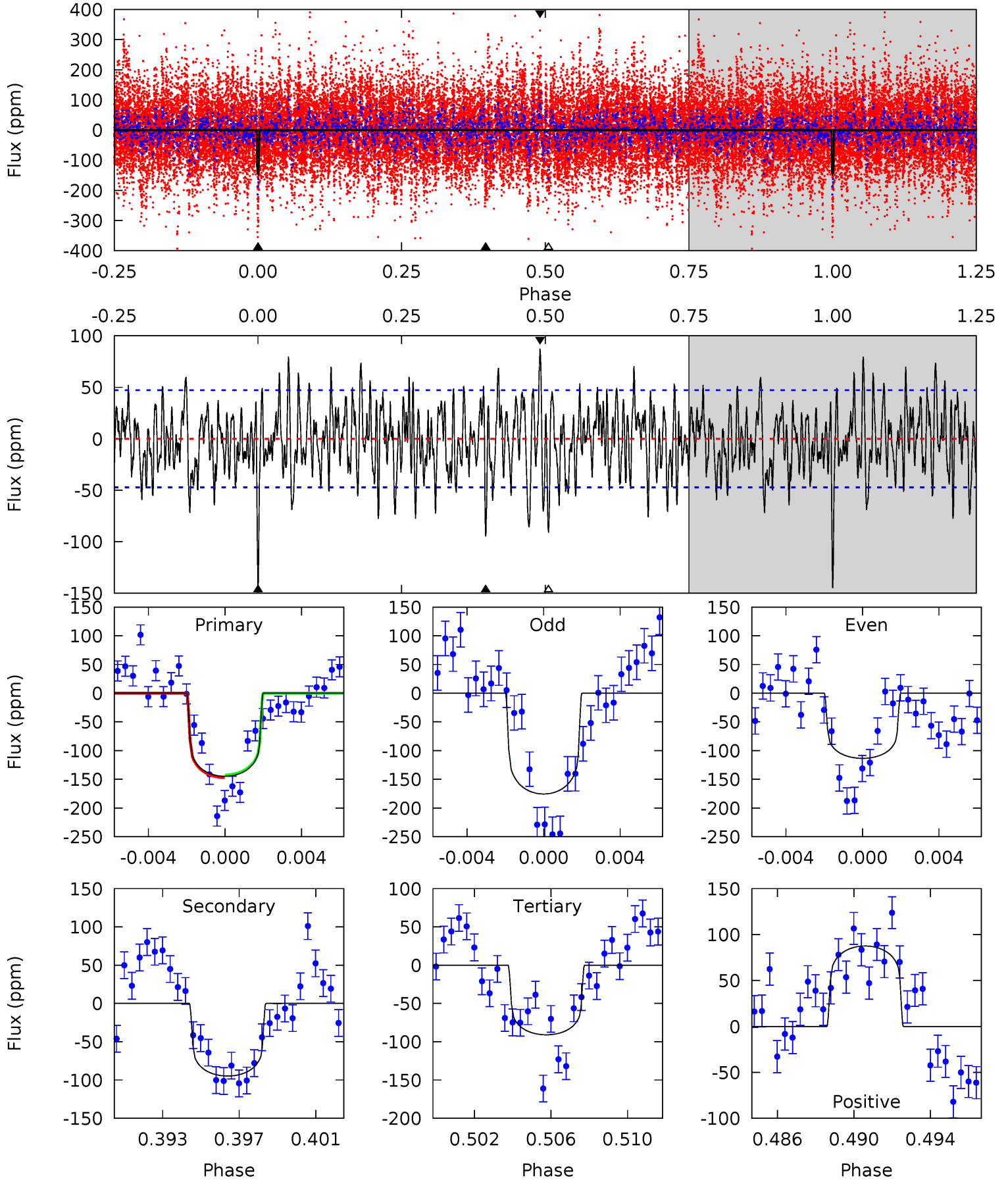
TCE 003631985-03 P=137.679550 Days $T_0=192.331117$ (BKJD)



DV Model-Shift Uniqueness Test

003631985-03, P = 137.684361 Days, E = 54.635123 Days

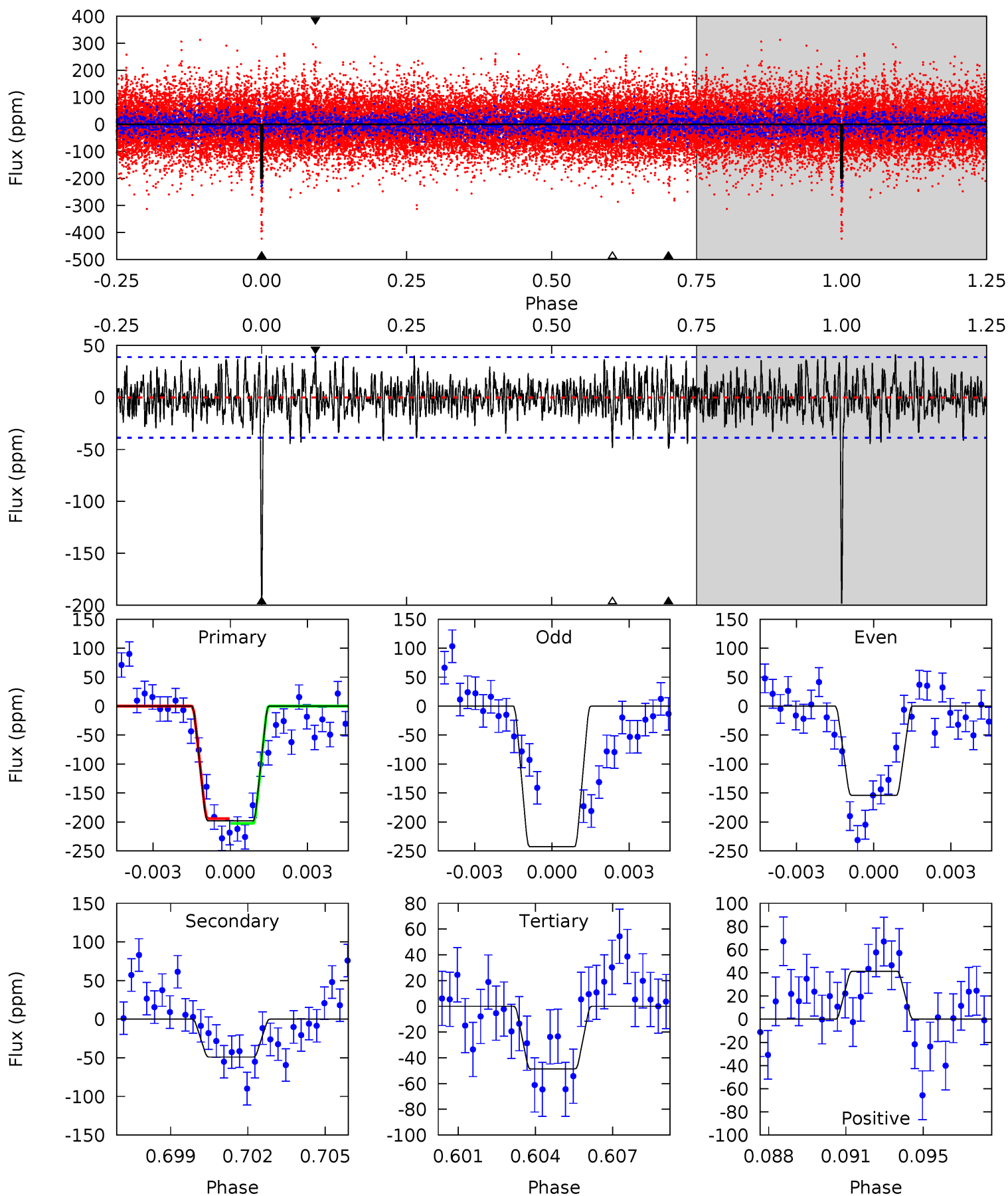
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.0	10.5	10.0	9.65	5.20	2.89	3.14	5.93	6.31	0.42	0.80	3.45	1.02	0.38	0.26



Alt Model-Shift Uniqueness Test

003631985-03, P = 137.679550 Days, E = 54.651567 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
26.8	6.63	6.56	5.58	5.24	2.94	1.88	20.2	21.2	0.07	1.04	5.98	0.97	0.17	0.55



Stellar Parameters For KIC 003631985

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6627^{+186}_{-255}	$4.277^{+0.124}_{-0.186}$	$-0.220^{+0.250}_{-0.300}$	$1.317^{+0.408}_{-0.220}$	$1.204^{+0.183}_{-0.183}$	$0.742^{+0.432}_{-0.369}$
	+3%/-4%	+3%/-4%	+114%/-136%	+31%/-17%	+15%/-15%	+58%/-50%
Source	PHO54	PHO54	PHO54	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 003631985-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-95 ± 9	$1.59^{+0.44}_{-0.39}$	635^{+46}_{-43}	6222^{+1000}_{-648}	6369^{+4616}_{-2554}
Alt.	-49 ± 7	$2.08^{+0.49}_{-0.42}$	632^{+44}_{-41}	4741^{+430}_{-346}	1923^{+1065}_{-705}

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming A=0.3)

A_{obs} = Observed Albedo (Assuming T=0)

If a secondary eclipse is present, the system is likely an EB if $T_{obs} \gg T_{max}$ AND $A_{obs} \gg 1.0$

DV Centroid Data

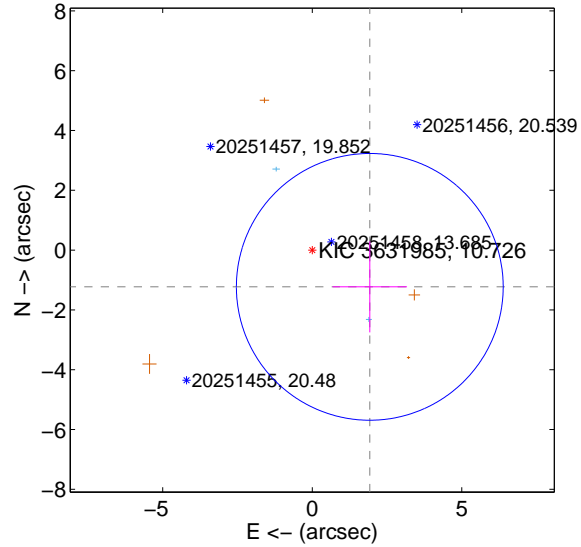
Supplemental centroid analysis for 003631985-03. **Kepler magnitude: 10.73.** Transit SNR 7.78

There are 2 quarters with good PRF difference image offsets

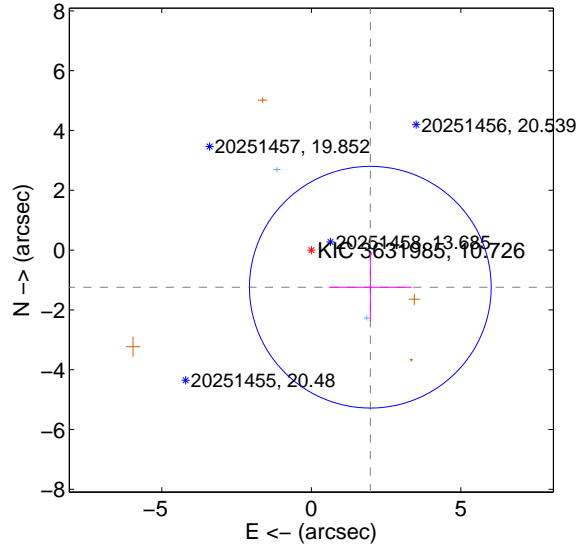
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.283 ± 1.487	1.54	-1.924 ± 1.245	-1.229 ± 1.523
PRF-fit source offset from KIC position	2.331 ± 1.347	1.73	-1.973 ± 1.384	-1.241 ± 1.153
photometric centroid source offset	1.71 ± 1.19	1.44	1.48 ± 1.19	0.85 ± 1.19

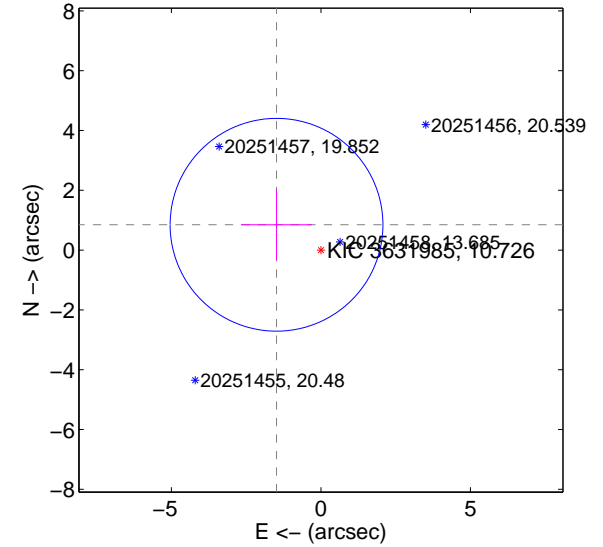
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

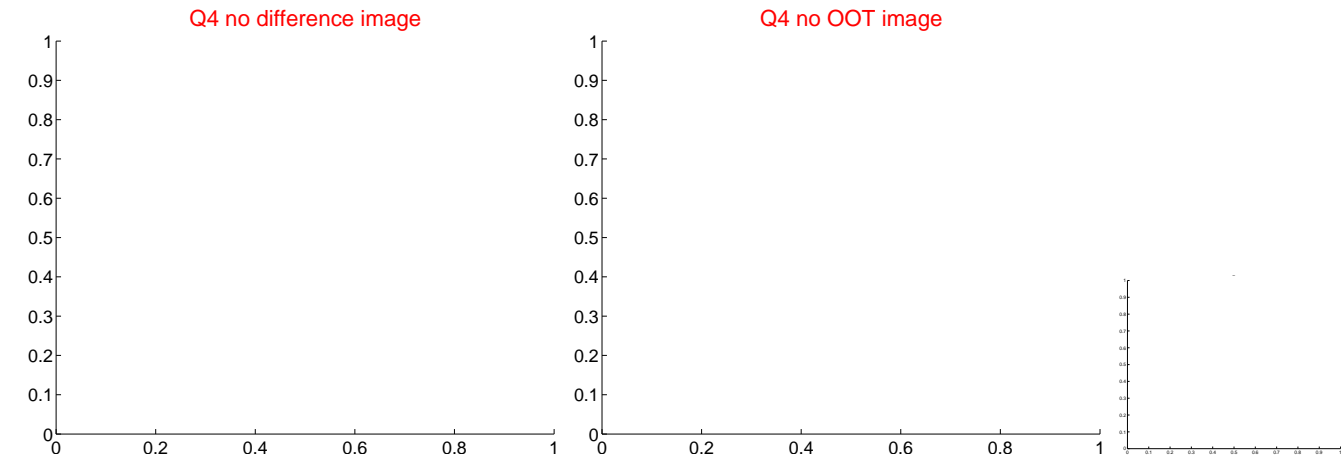
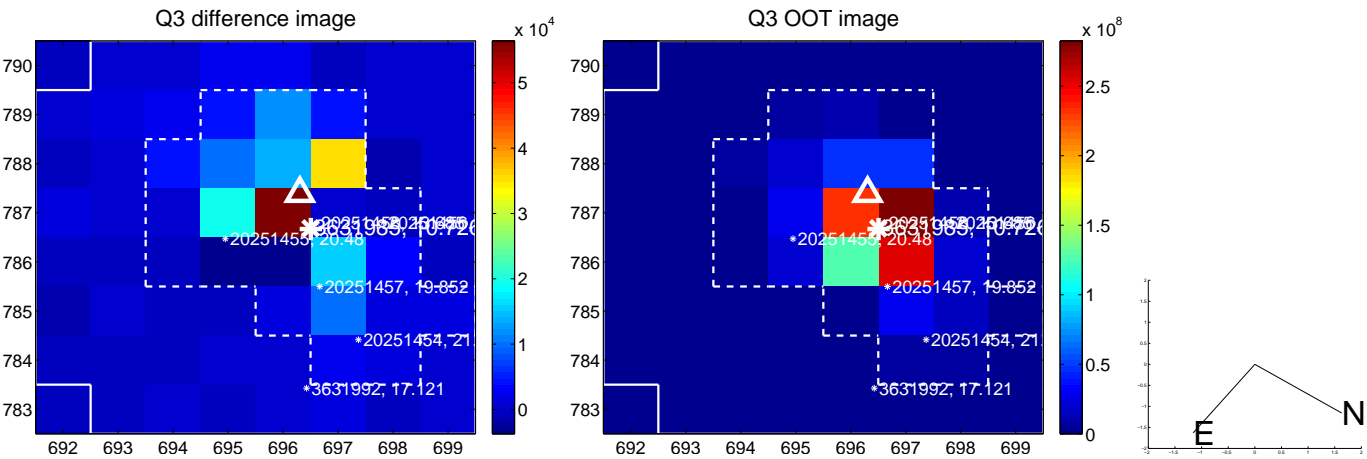
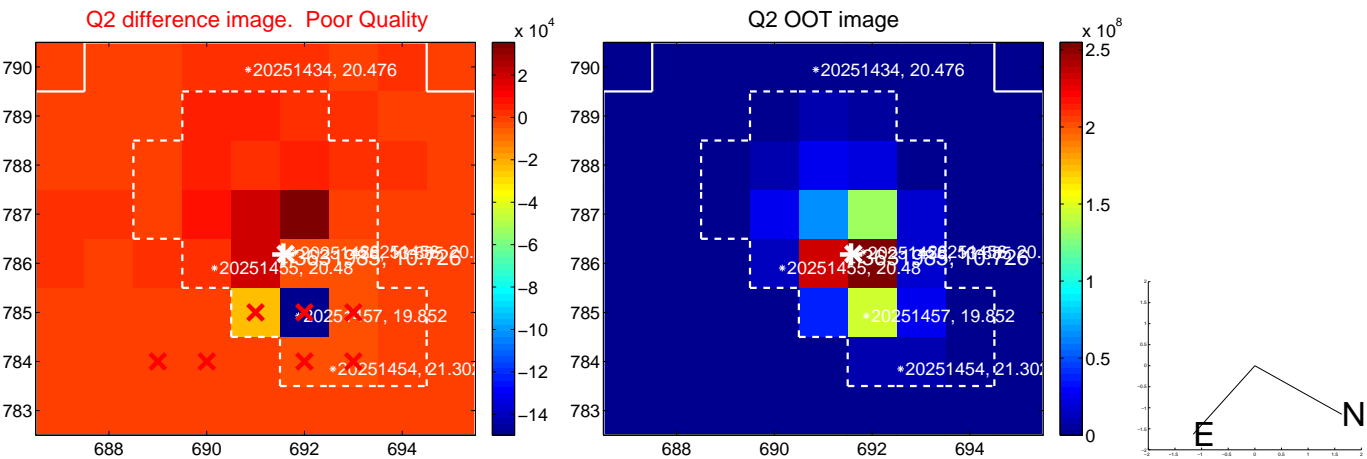


offset from photometric centroids

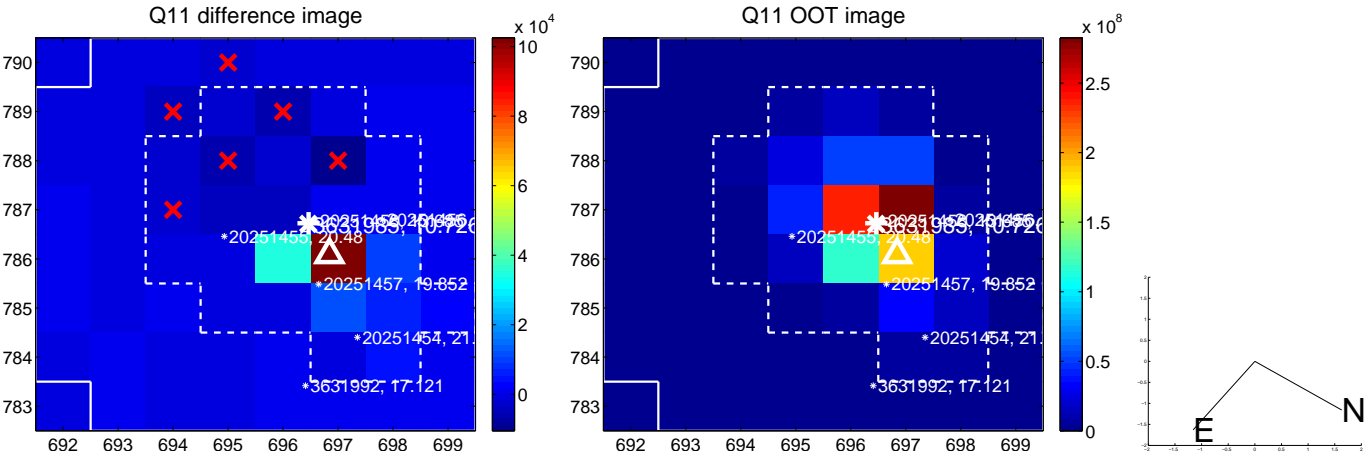
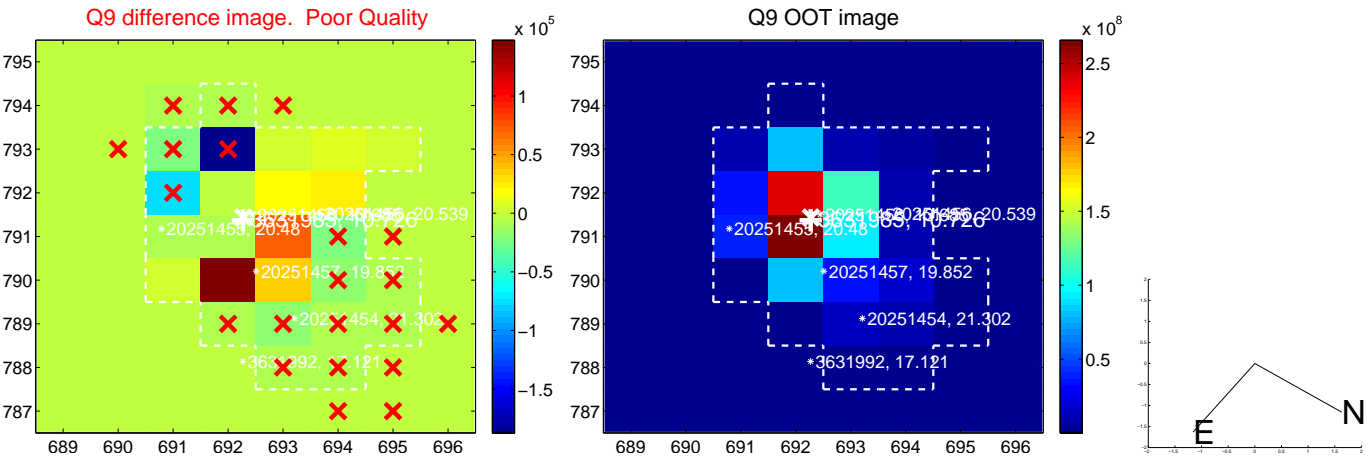


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15, 000, 000 are from the UKIRT catalog.

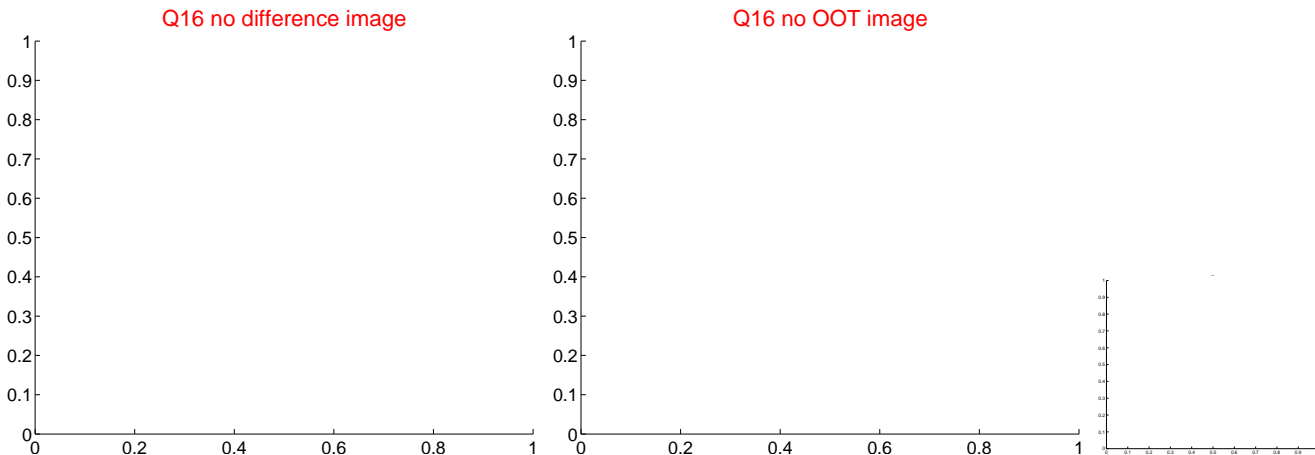
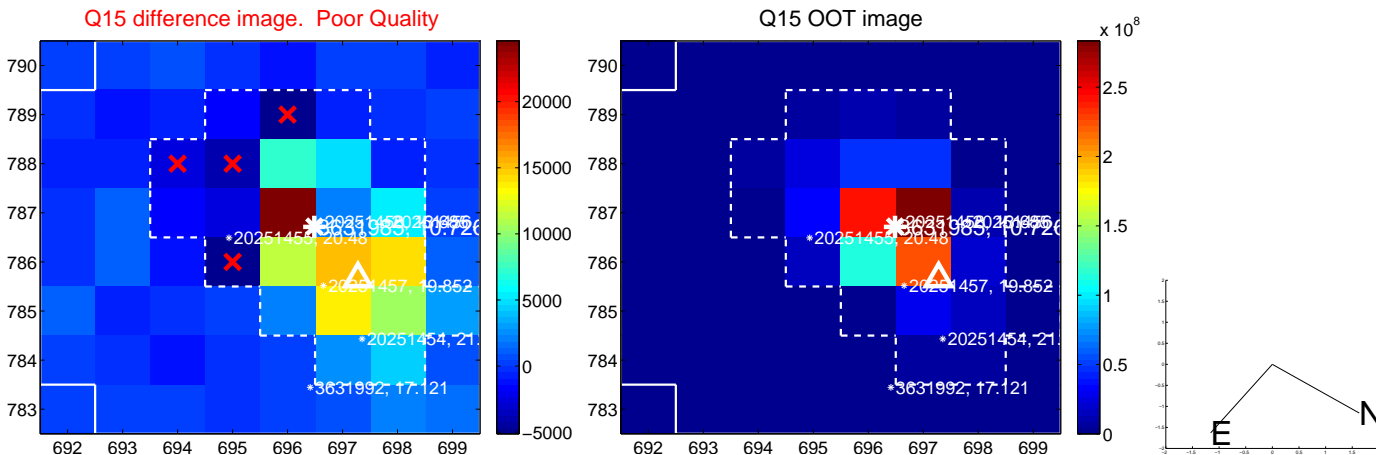
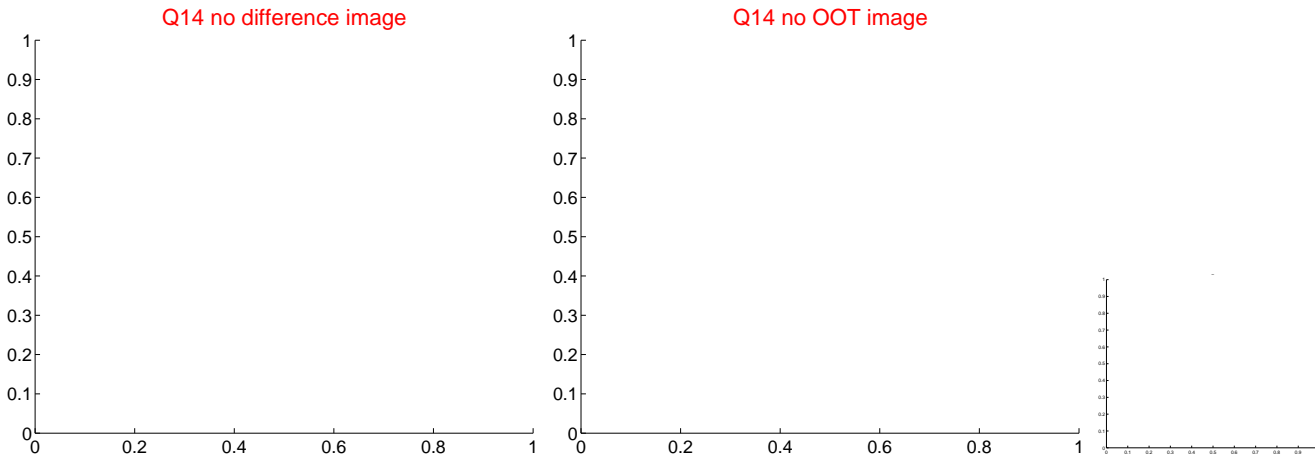
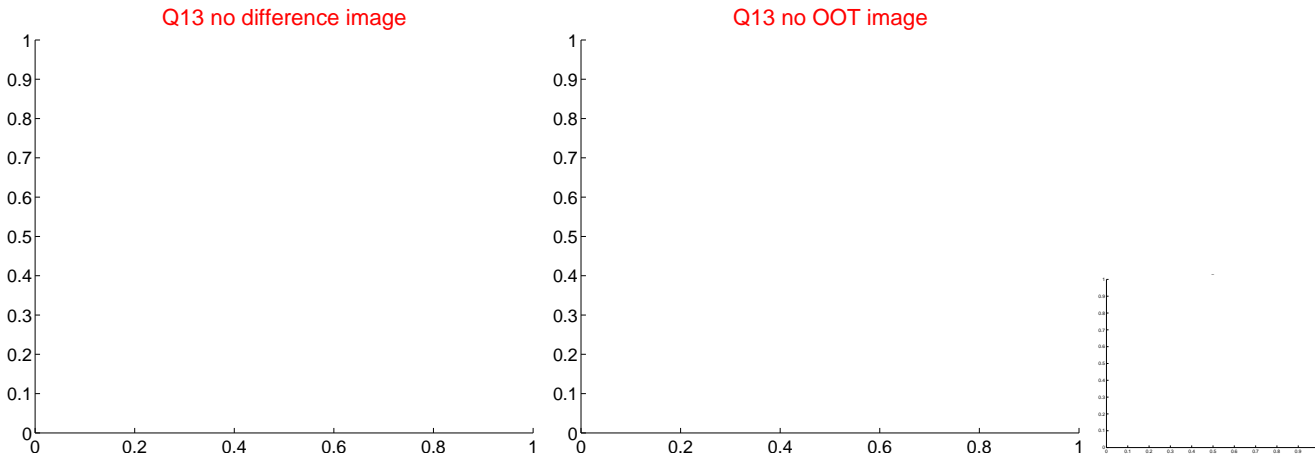
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



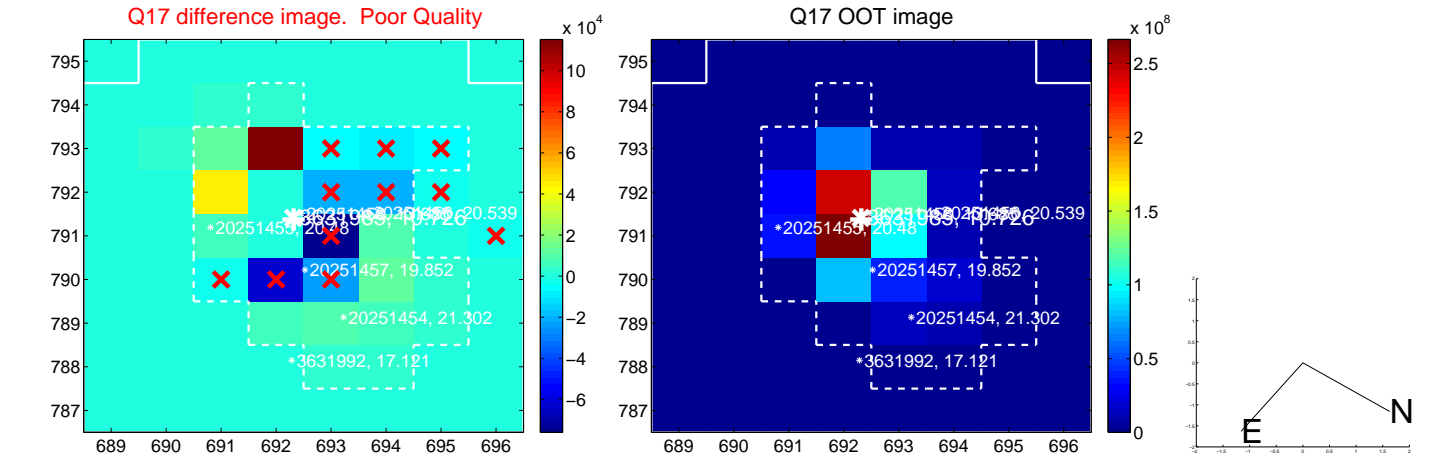
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



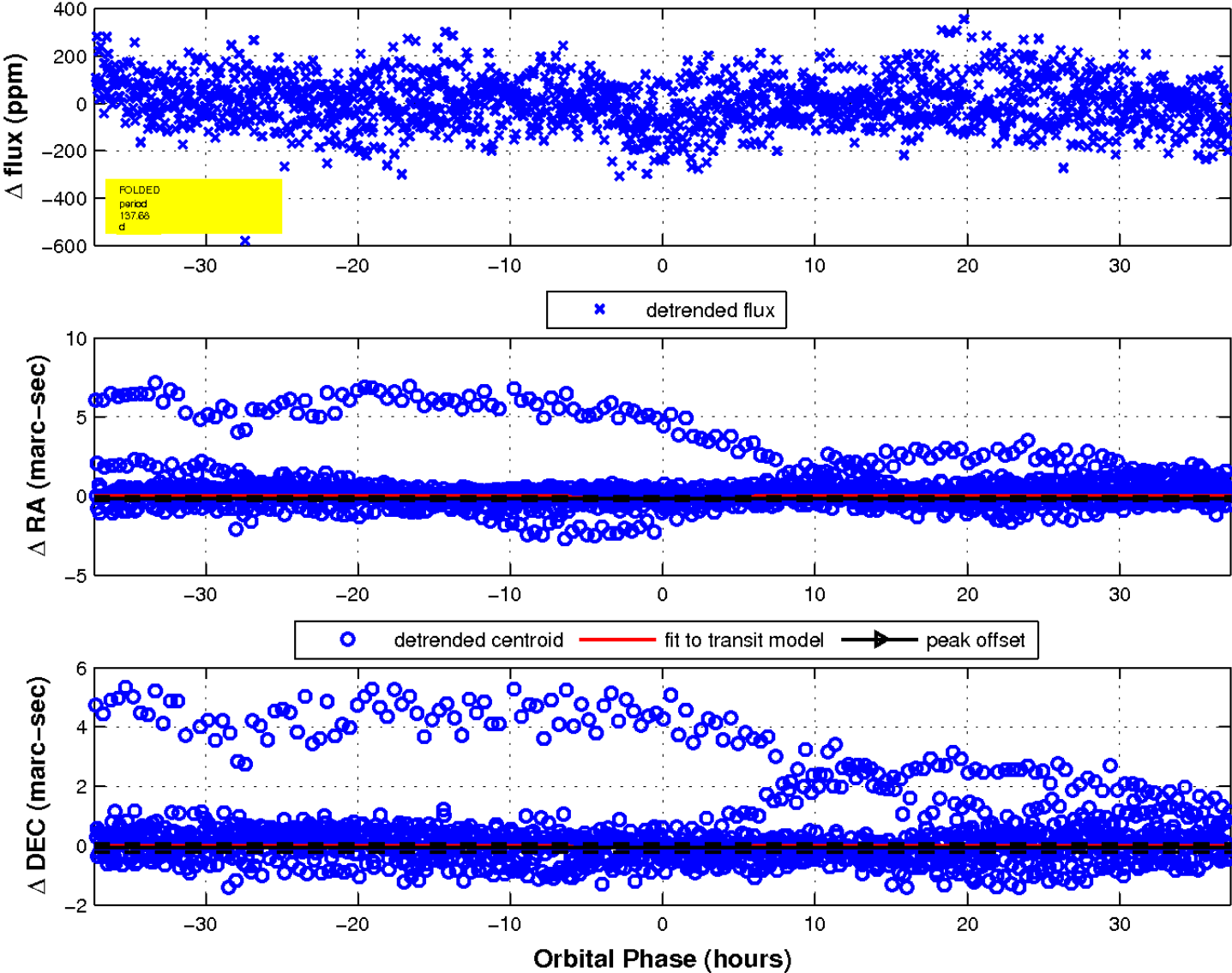
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

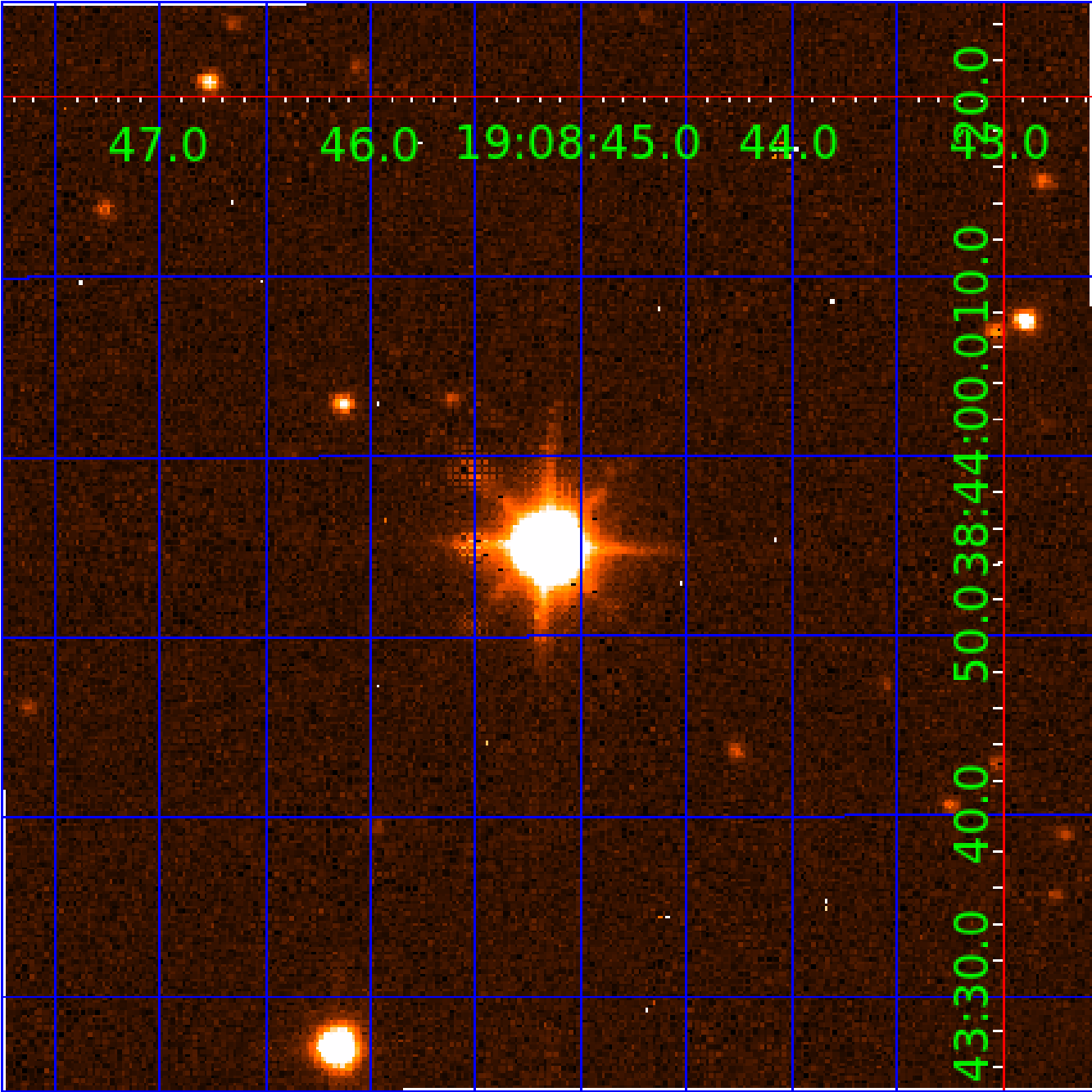


fluxWeightedCentroids, Planet 3 of 10



UKIRT Image

Declination



KIC 003631985

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
003631985-01	OBS	No	4.560527	132.026788	8.1	19.919	7.2	3.3	1.32	6627	0.43	917.35
003631985-02	OBS	No	126.957570	133.100780	130.0	12.168	10.5	8.9	1.32	6627	1.75	10.87
003631985-03	OBS	No	137.684361	192.319484	115.3	12.440	10.0	7.8	1.32	6627	1.55	9.76
003631985-04	OBS	No	510.471188	499.727737	148.5	5.818	9.2	8.6	1.32	6627	1.84	1.70
003631985-05	OBS	No	52.982172	175.171808	95.5	4.252	9.2	8.7	1.32	6627	1.48	34.86
003631985-07	OBS	No	424.406935	192.591667	163.7	10.410	9.1	8.3	1.32	6627	1.89	2.17
003631985-08	OBS	No	44.050048	148.961830	76.7	11.194	8.9	7.9	1.32	6627	1.30	44.59
003631985-09	OBS	No	428.258732	222.123753	150.7	10.780	9.0	8.9	1.32	6627	1.74	2.15
003631985-10	OBS	No	579.371898	339.223546	119.6	18.051	8.8	6.7	1.32	6627	1.69	1.44

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003631985-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
003631985-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED
003631985-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—CENT_SATURATED
003631985-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_SATURATED
003631985-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
003631985-07	OBS	FP	0.01	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED
003631985-08	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
003631985-09	OBS	FP	0.00	1	0	0	0	ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED
003631985-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

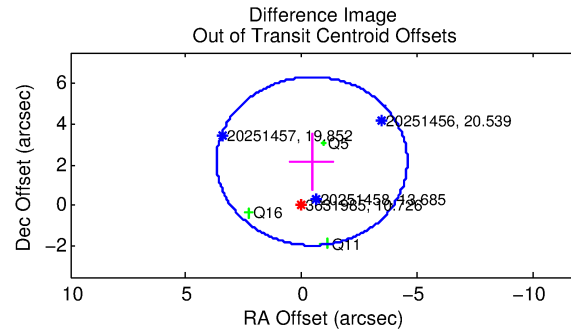
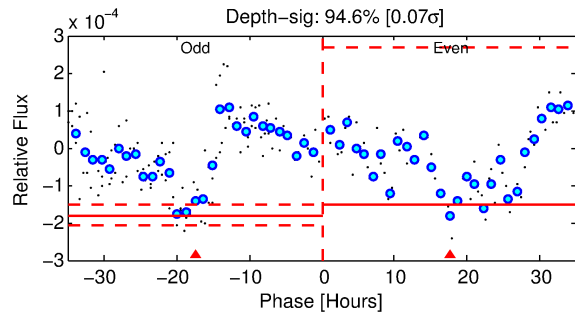
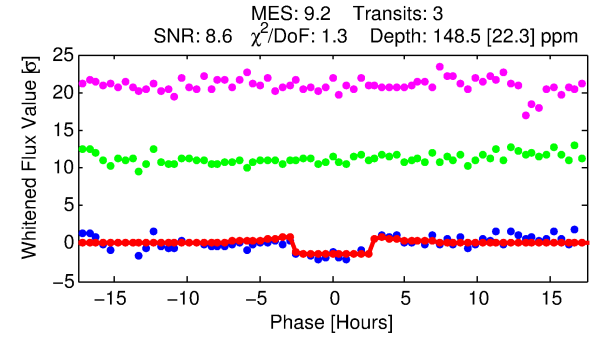
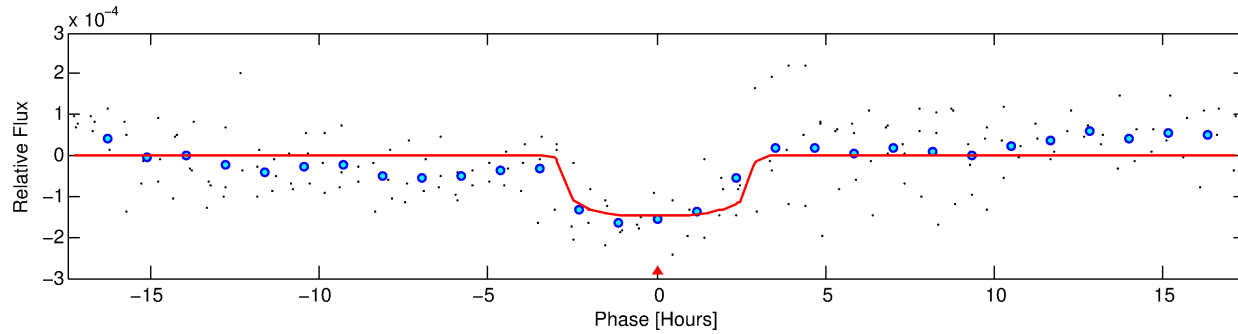
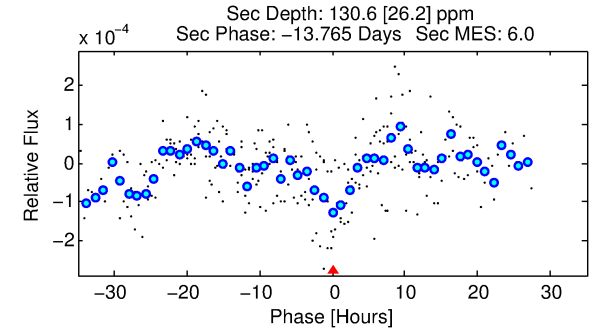
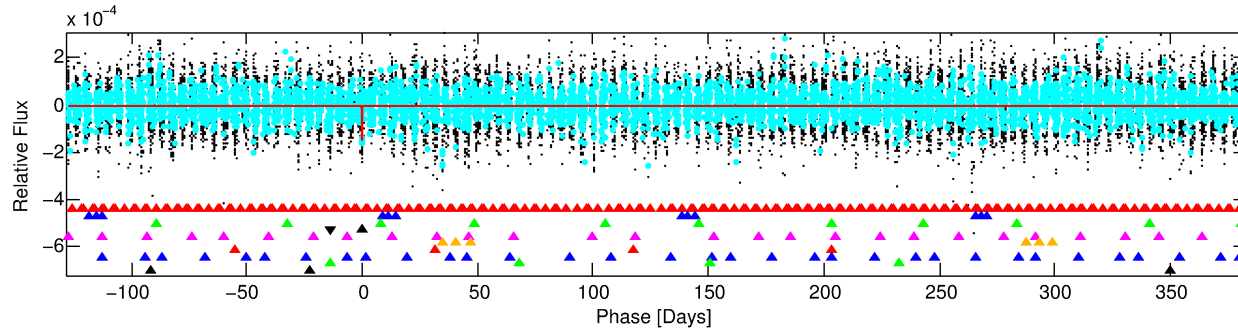
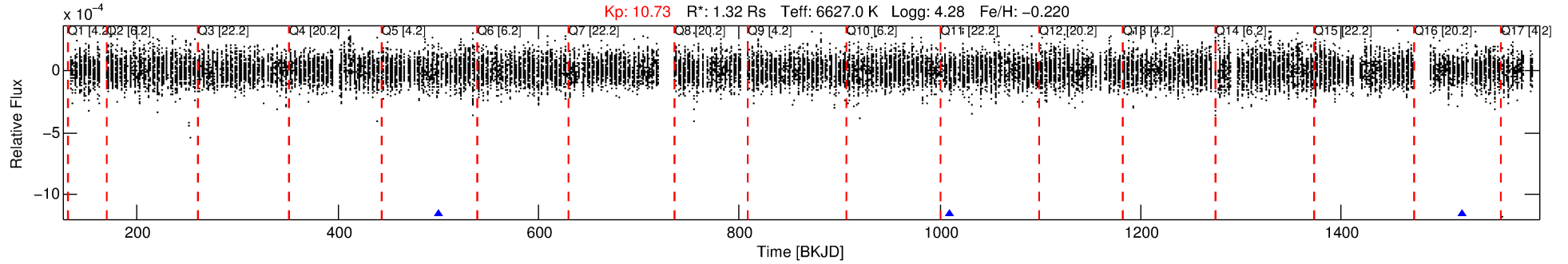
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 003631985-04

No Significant Match Found

DV One-Page Summary

KIC: 3631985 Candidate: 4 of 10 Period: 510.471 d



DV Fit Results:

Period = 510.47119 [0.00731] d
Epoch = 499.7277 [0.0110] BKJD
Rp/R* = 0.0128 [0.0036]
a/R* = 338.71 [507.52]
b = 0.88 [0.40]
Seff = 1.70 [0.65]
Teq = 291 [28] K
Rp = 1.84 [0.77] Re
a = 1.3276 [0.3333] AU
Ag = 37338.29 [26028.80] [1.43σ]
Teffp = 6258 [971] K [6.14σ]

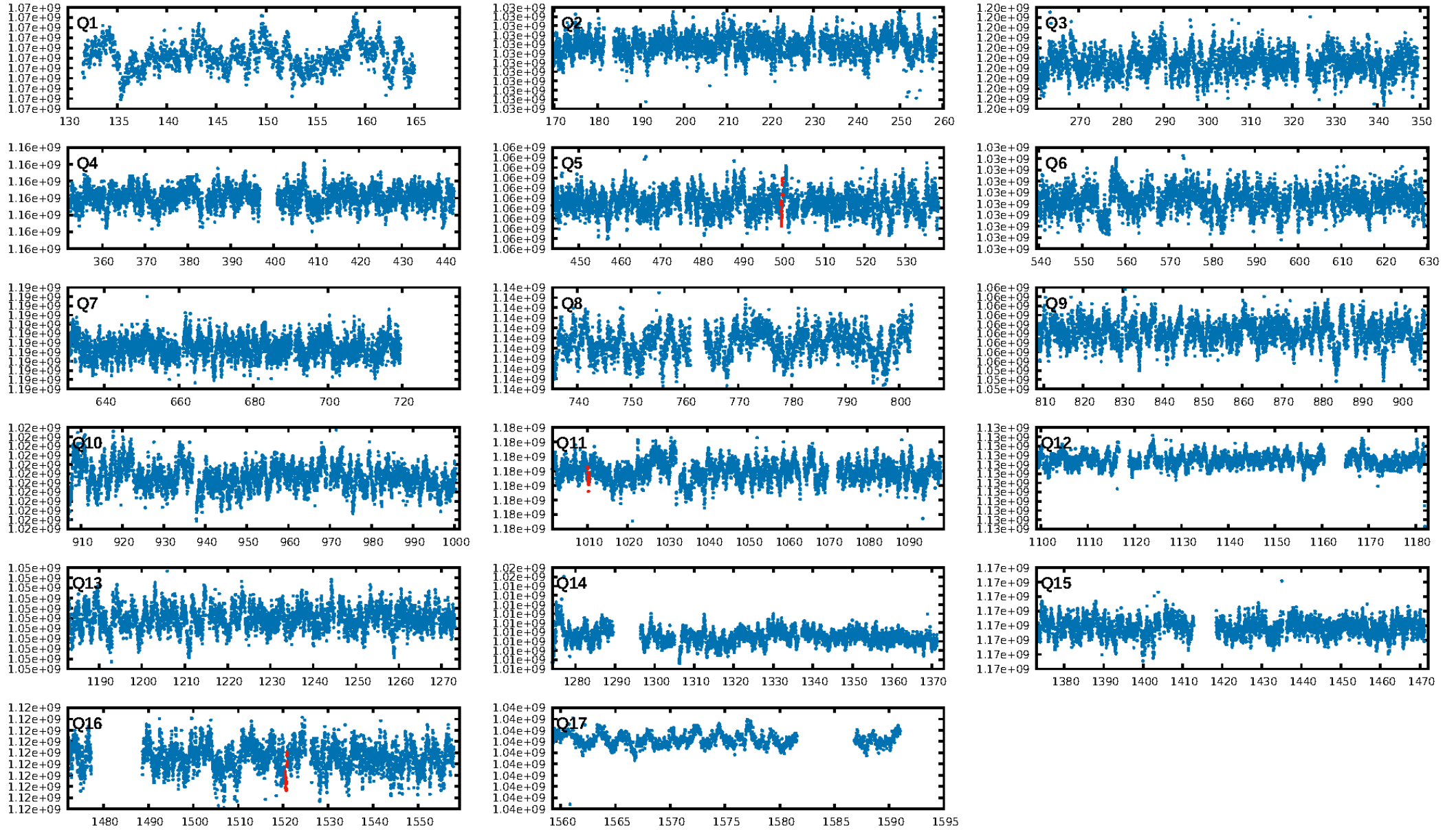
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [161.07σ]
LongPeriod-sig: 100.0% [87.19σ]
ModelChiSquare2-sig: 32.7%
ModelChiSquareGof-sig: 88.5%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 1.332
Centroid-sig: 5.0%
Centroid-so: 2.556 arcsec [1.61σ]
OotOffset-rm: 2.214 arcsec [1.61σ]
OotOffset-st: 0/1/1/1 [3]
KicOffset-rm: 2.220 arcsec [1.67σ]
KicOffset-st: 0/1/1/1 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [3/3]

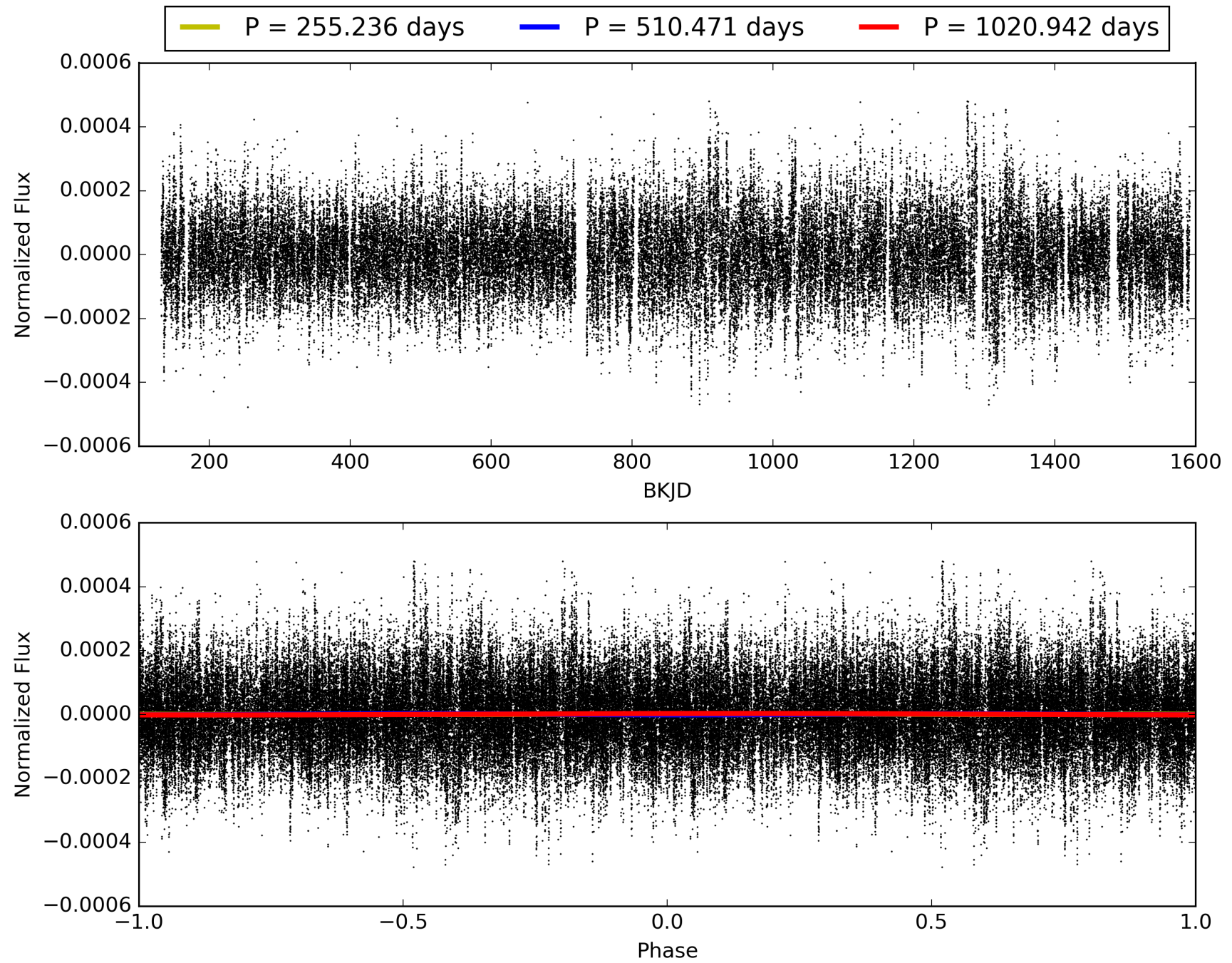
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 18:55:34 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 003631985-04, PDC Light Curves

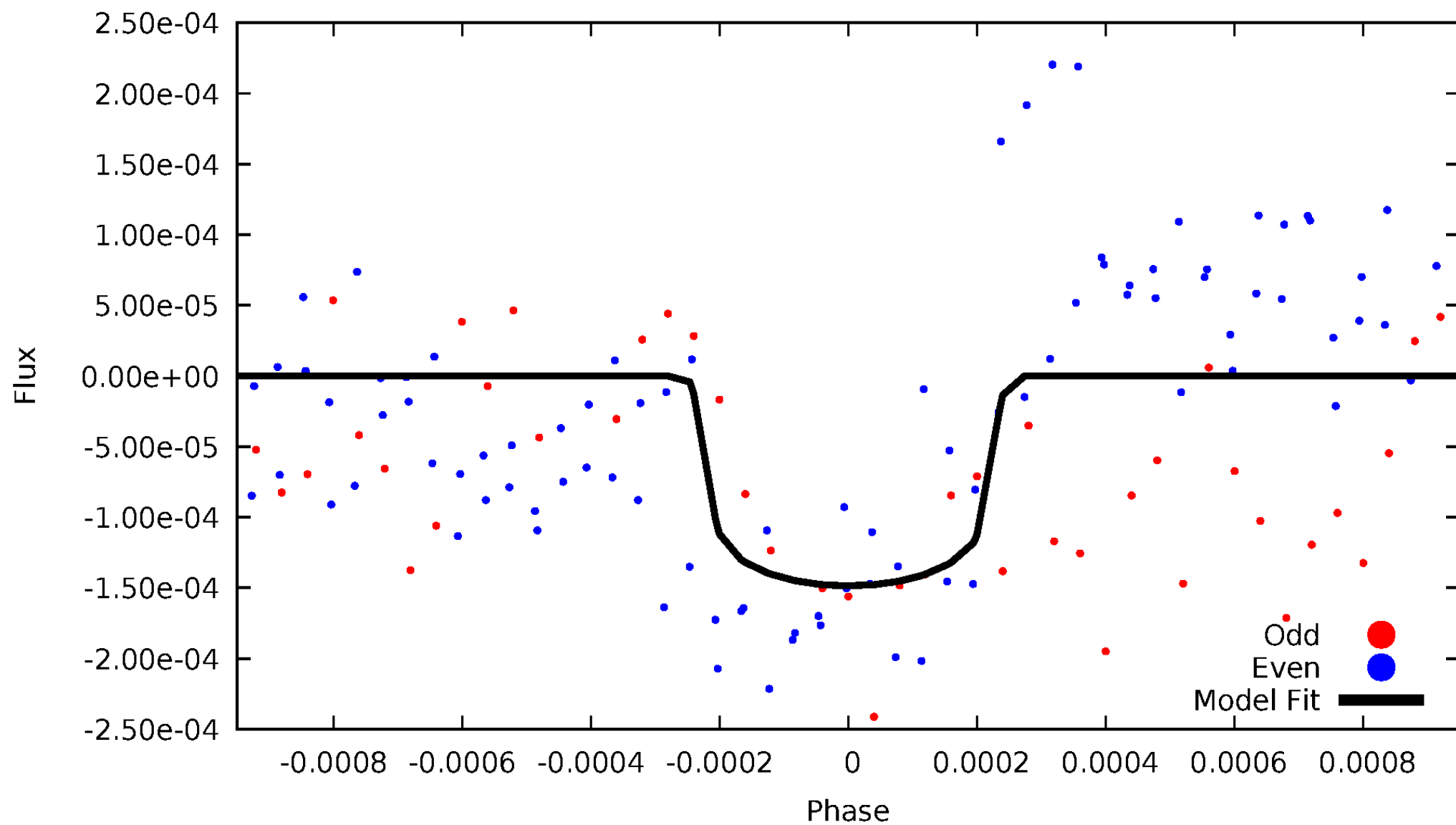


TCE 003631985-04



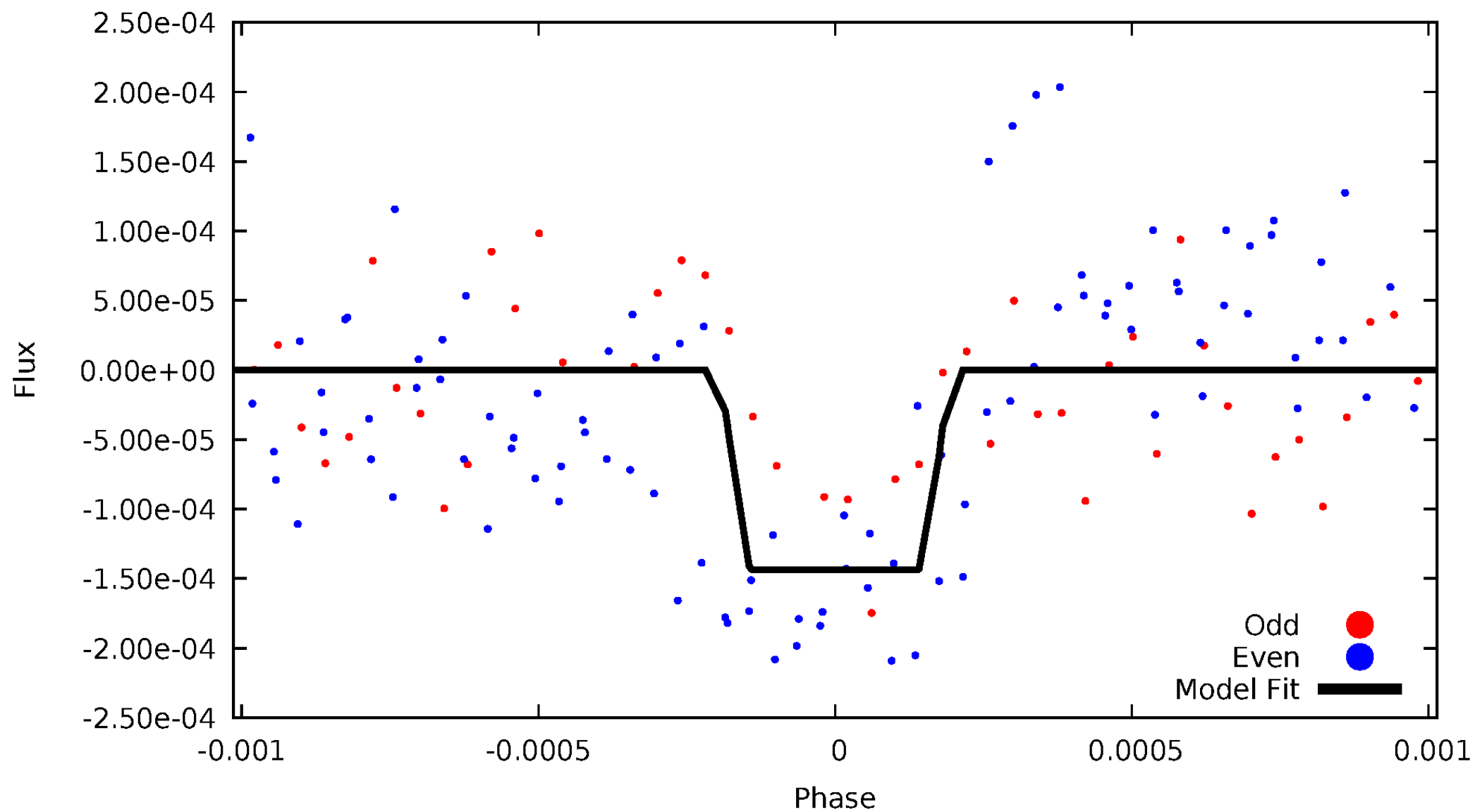
DV Odd/Even

TCE 003631985-04



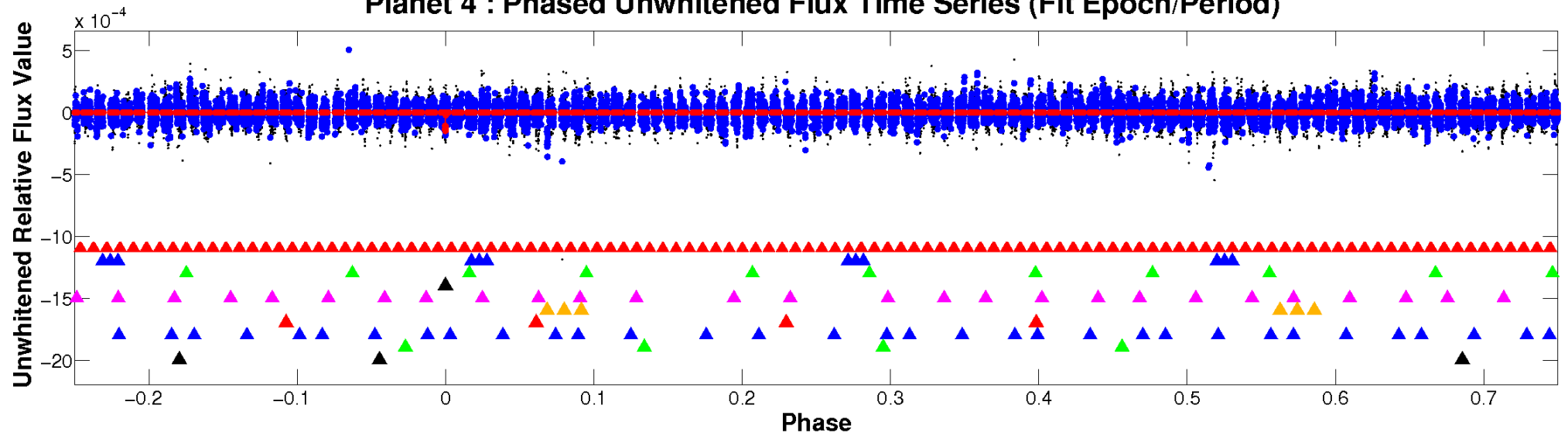
ALT Odd/Even

TCE 003631985-04

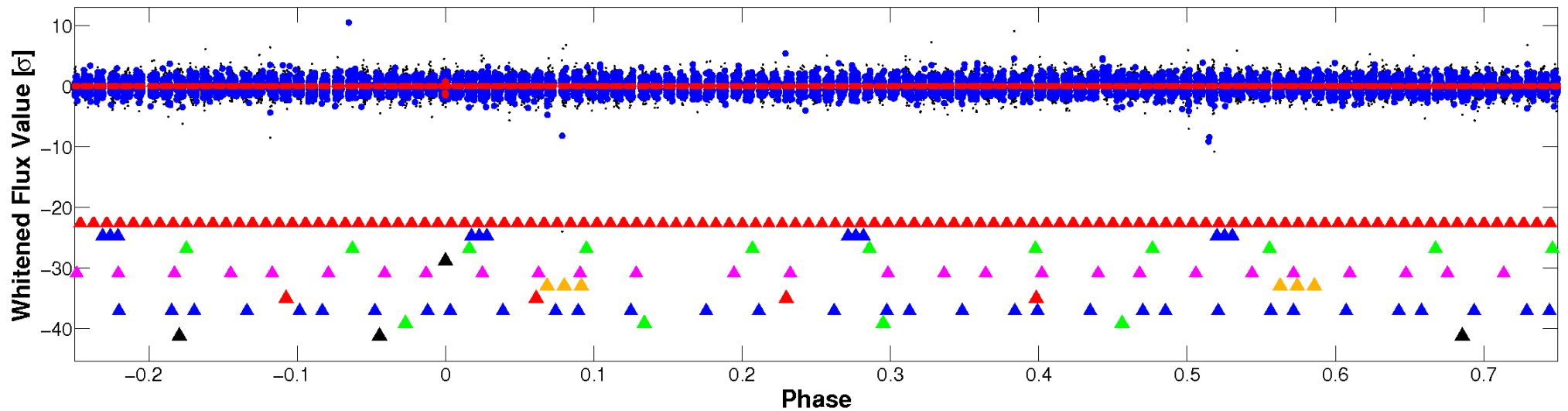


Non-Whitened Vs. Whitened Light Curve

Planet 4 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

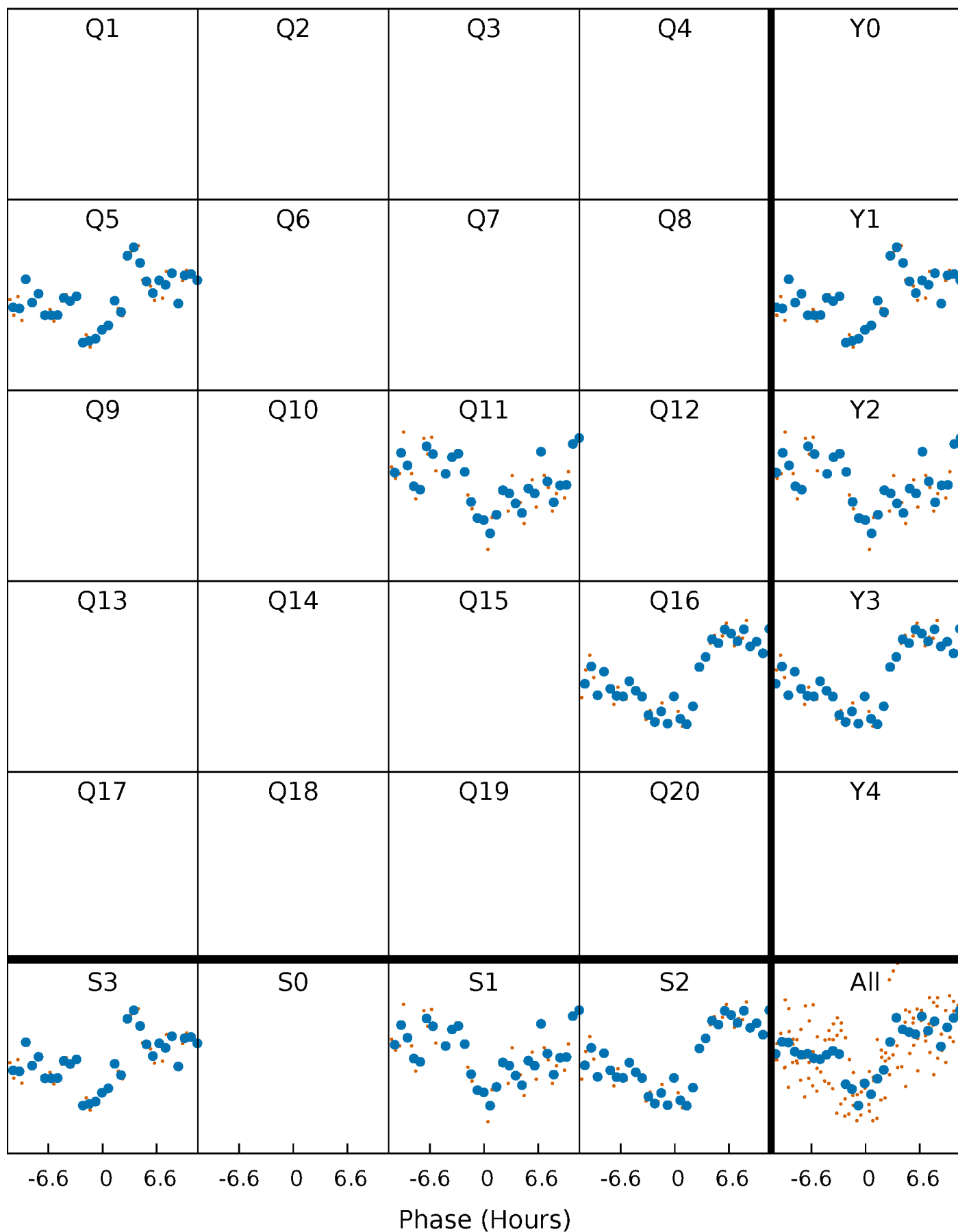


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



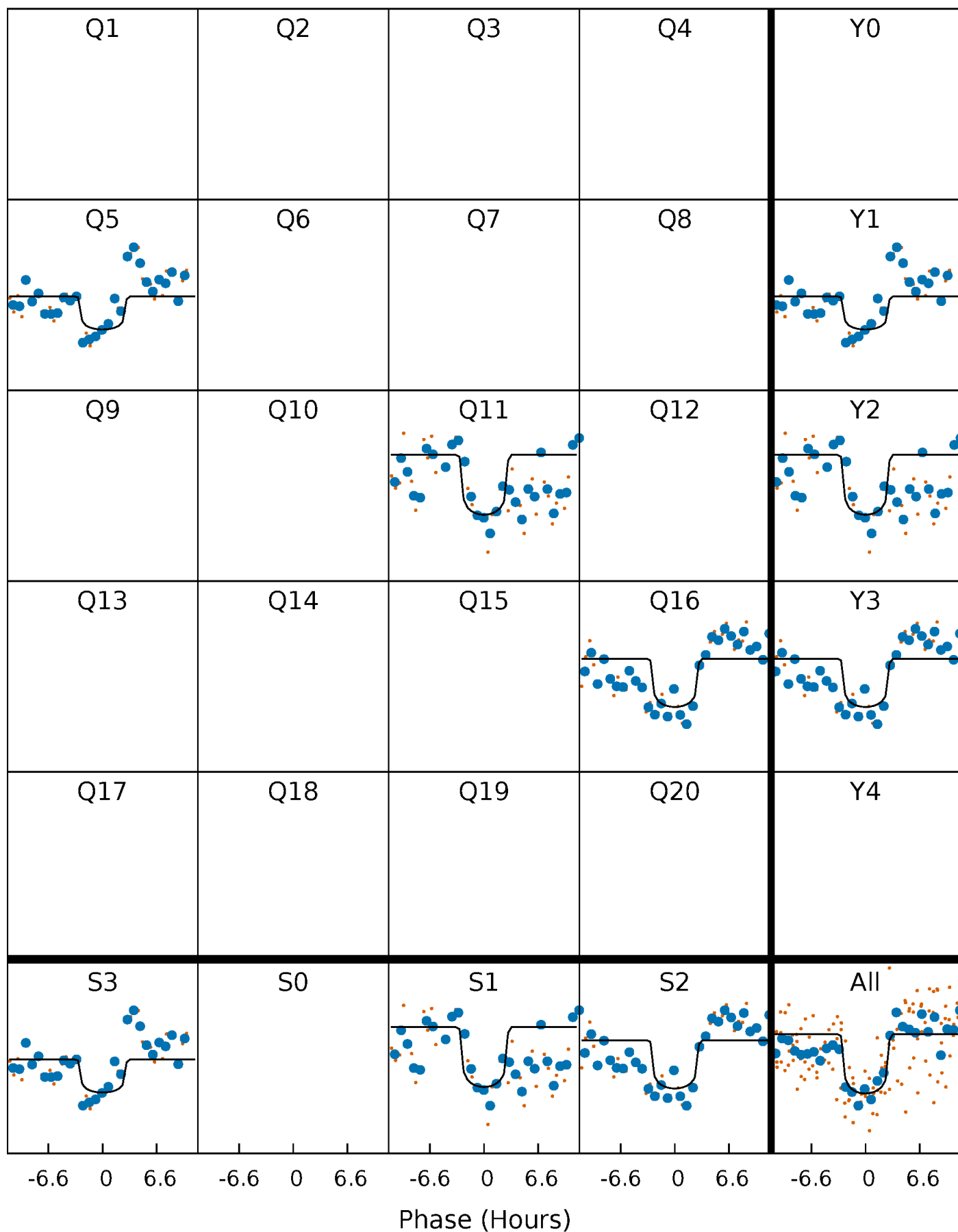
PDC Quarter-Phased Transit Curves

TCE 003631985-04 $P=510.471188$ Days $T_0=499.727737$ (BKJD)



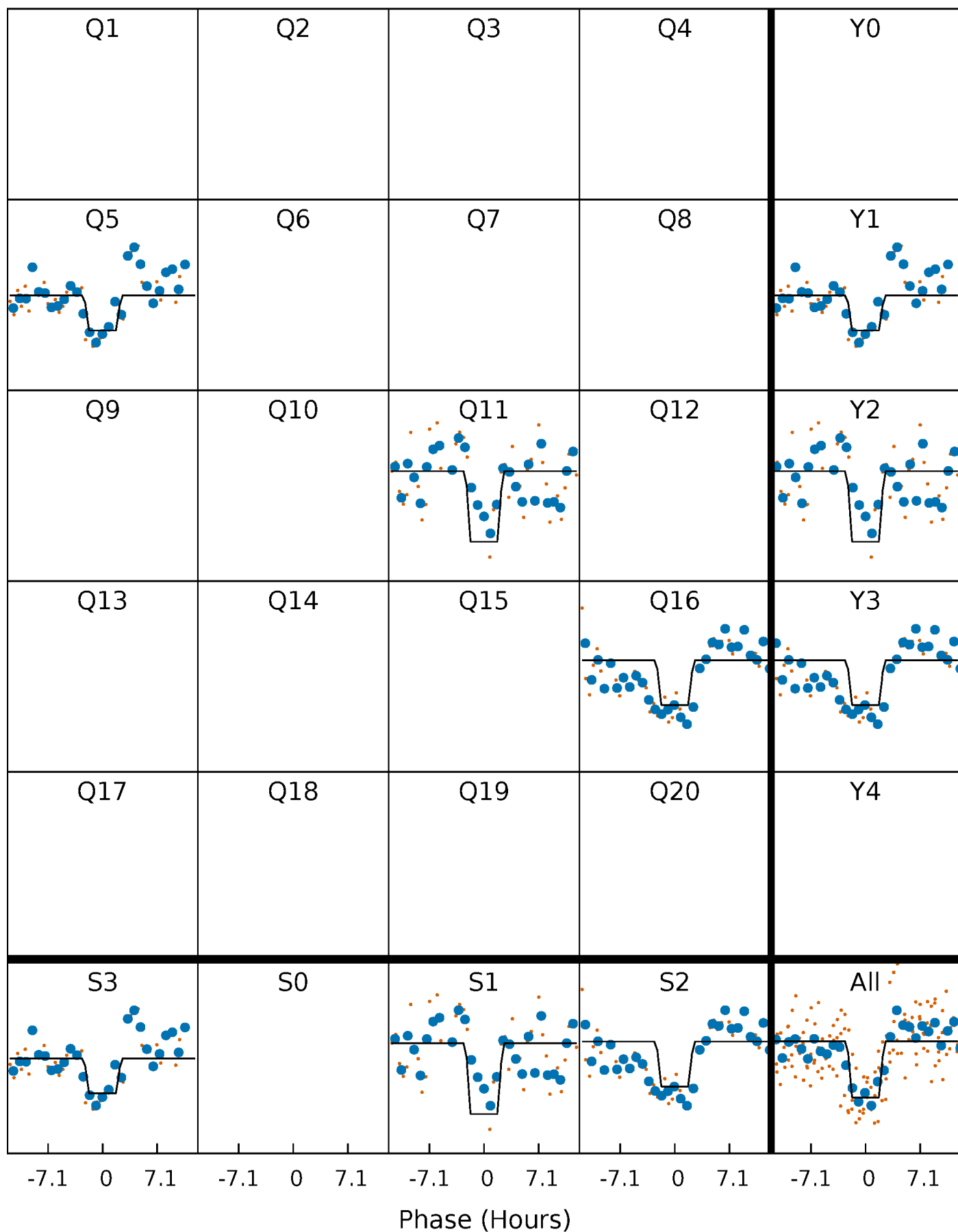
DV Quarter-Phased Transit Curves

TCE 003631985-04 $P=510.471188$ Days $T_0=499.727737$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

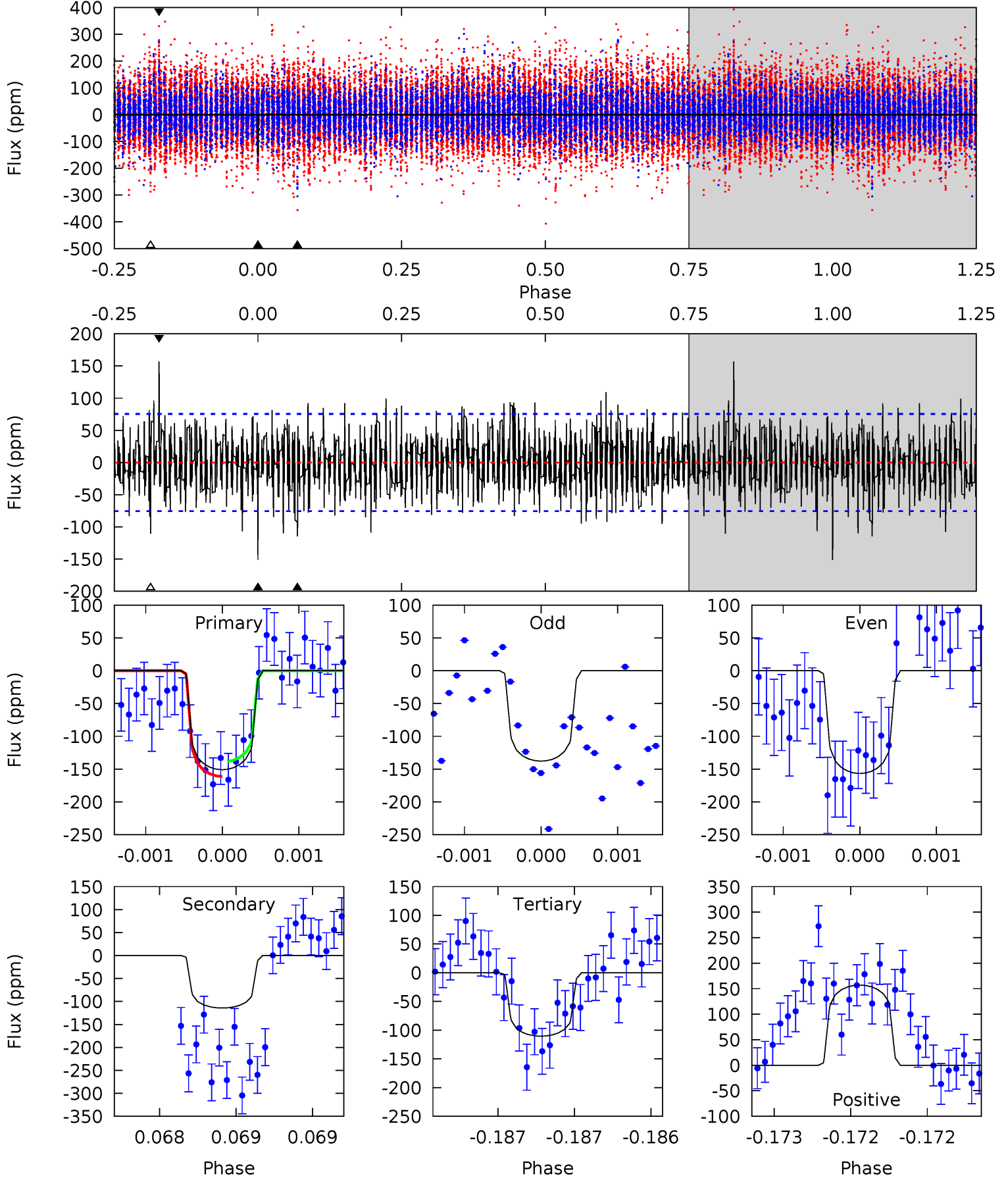
TCE 003631985-04 $P=510.471196$ Days $T_0=499.716737$ (BKJD)



DV Model-Shift Uniqueness Test

003631985-04, P = 510.471188 Days, E = 499.727737 Days

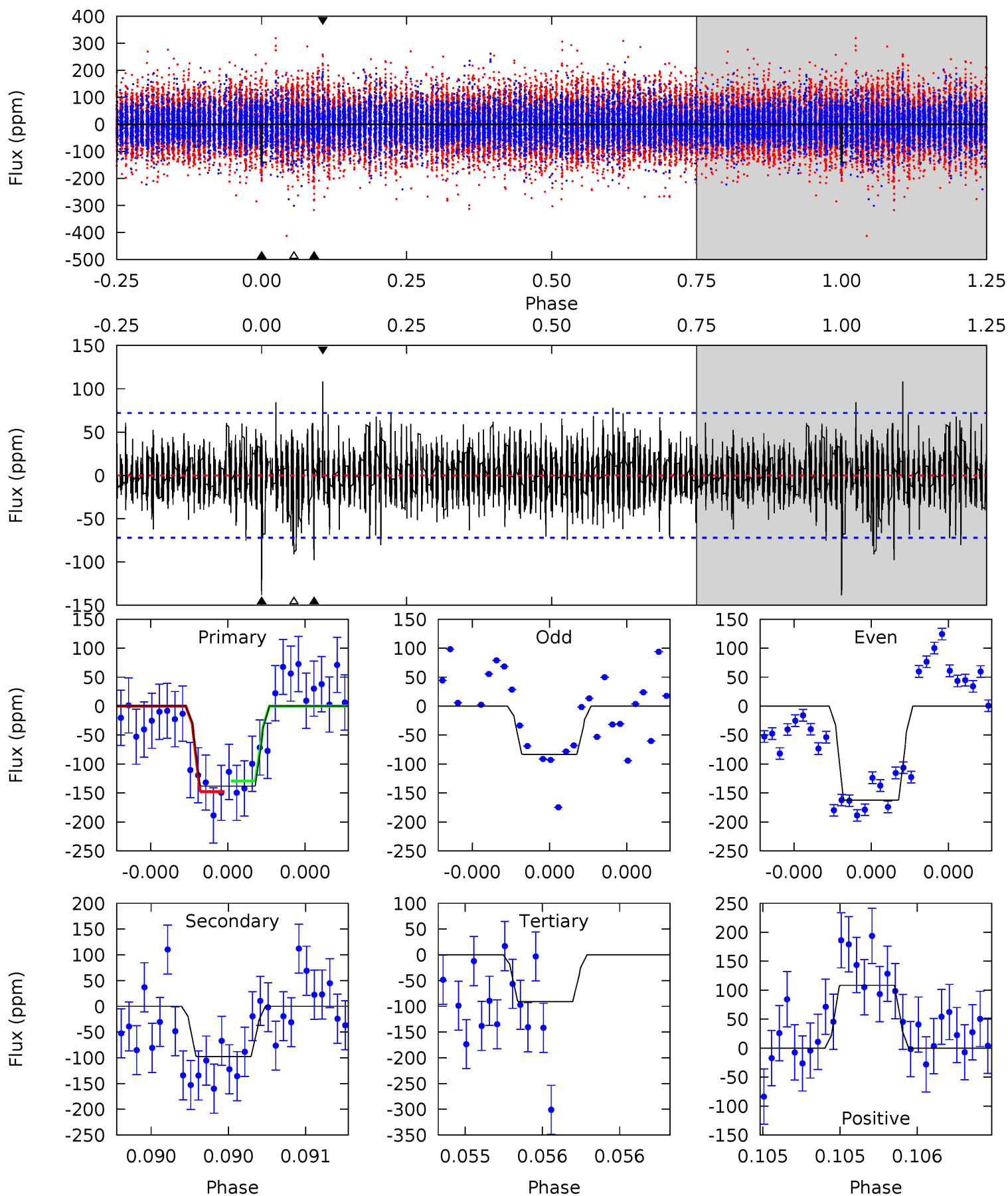
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.1	8.43	8.16	11.6	5.57	3.47	2.40	2.98	-0.46	0.28	-3.16	0.66	1.05	0.51	0.83



Alt Model-Shift Uniqueness Test

003631985-04, P = 510.471196 Days, E = 499.716737 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.8	7.61	7.08	8.45	5.61	3.54	1.76	3.68	2.31	0.53	-0.84	2.88	0.92	0.44	0.71



Stellar Parameters For KIC 003631985

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6627^{+186}_{-255}	$4.277^{+0.124}_{-0.186}$	$-0.220^{+0.250}_{-0.300}$	$1.317^{+0.408}_{-0.220}$	$1.204^{+0.183}_{-0.183}$	$0.742^{+0.432}_{-0.369}$
	+3%/-4%	+3%/-4%	+114%/-136%	+31%/-17%	+15%/-15%	+58%/-50%
Source	PHO54	PHO54	PHO54	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 003631985-04 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-114 ± 14	$1.87^{+0.63}_{-0.54}$	408^{+28}_{-24}	5980^{+1174}_{-703}	31631^{+32036}_{-14389}
Alt.	-98 ± 13	$1.75^{+0.60}_{-0.57}$	410^{+29}_{-25}	5988^{+1300}_{-685}	30454^{+34114}_{-13712}

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{\text{obs}} \gg T_{\text{max}}$ AND $A_{\text{obs}} \gg 1.0$

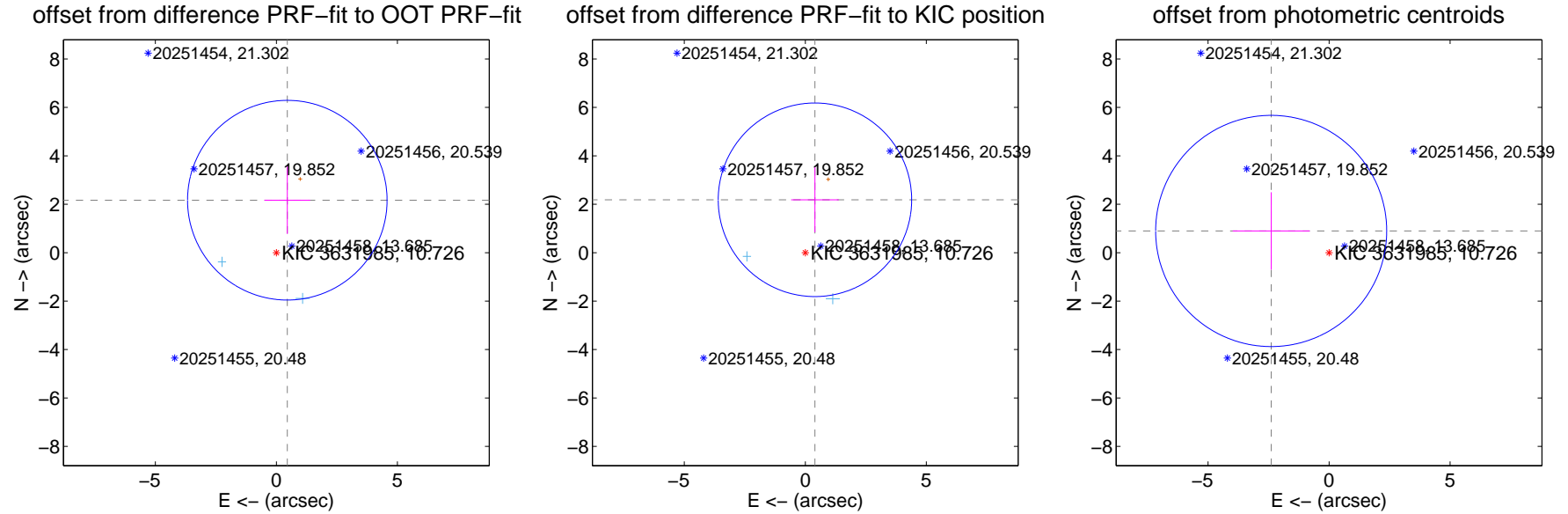
DV Centroid Data

Supplemental centroid analysis for 003631985-04. **Kepler magnitude: 10.73.** Transit SNR 8.63

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.28 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.214 ± 1.374	1.61	-0.452 ± 0.944	2.168 ± 1.390
PRF-fit source offset from KIC position	2.220 ± 1.332	1.67	-0.398 ± 0.984	2.184 ± 1.342
photometric centroid source offset	2.56 ± 1.59	1.61	2.39 ± 1.59	0.90 ± 1.60

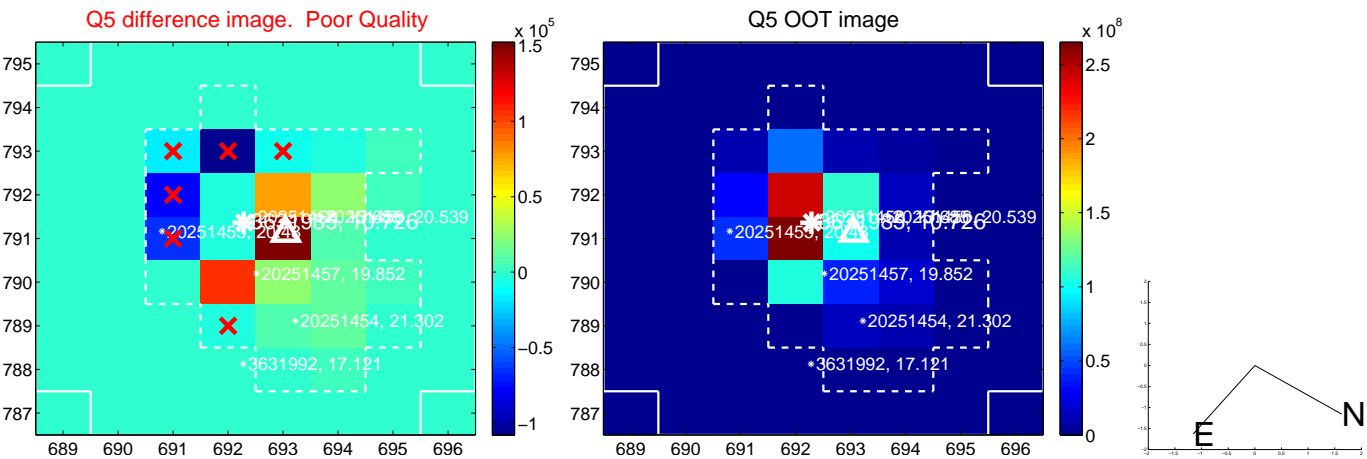


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

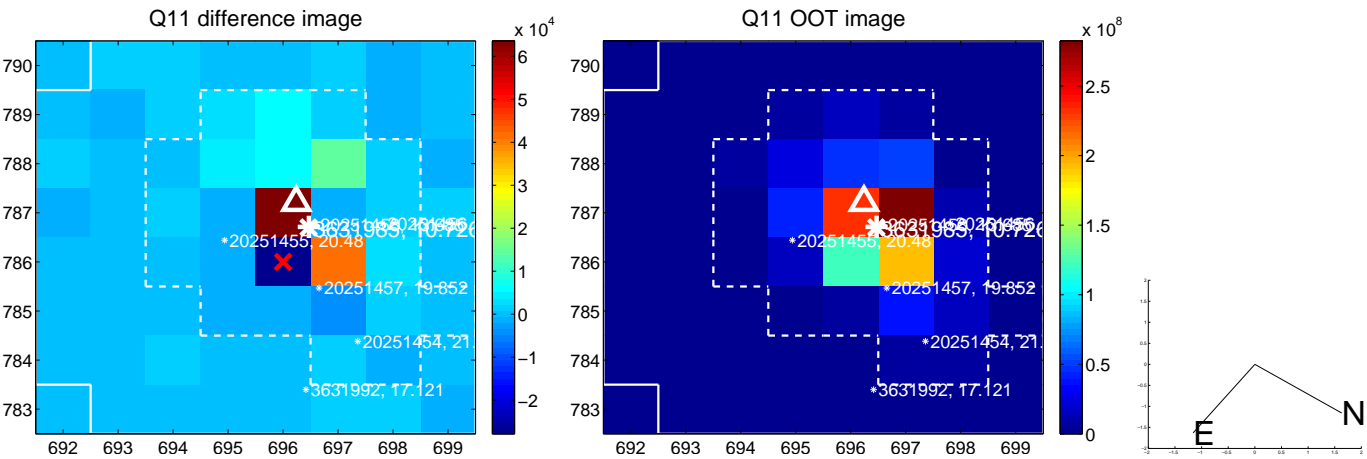
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



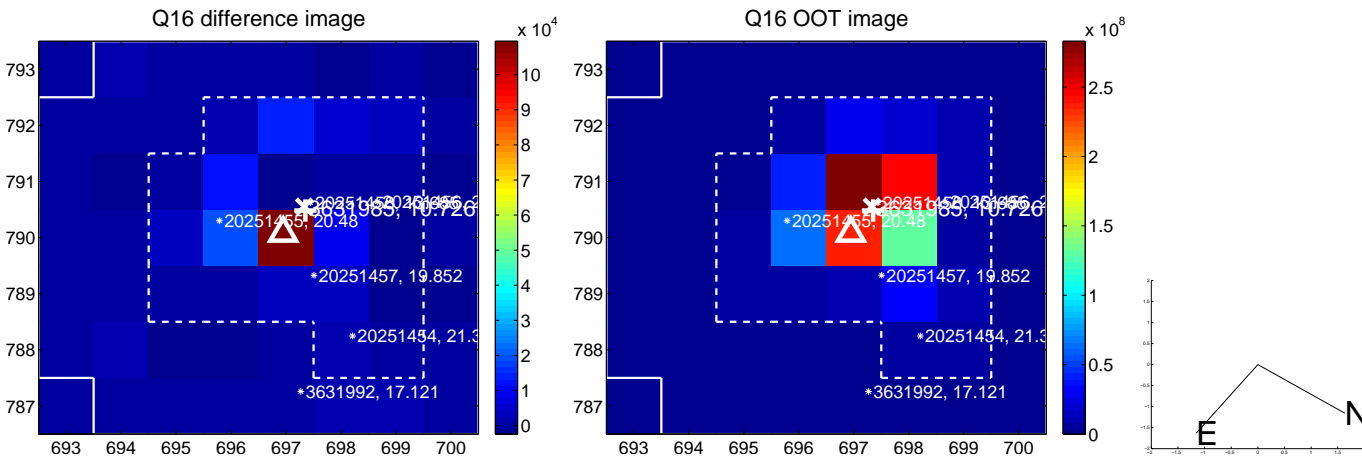
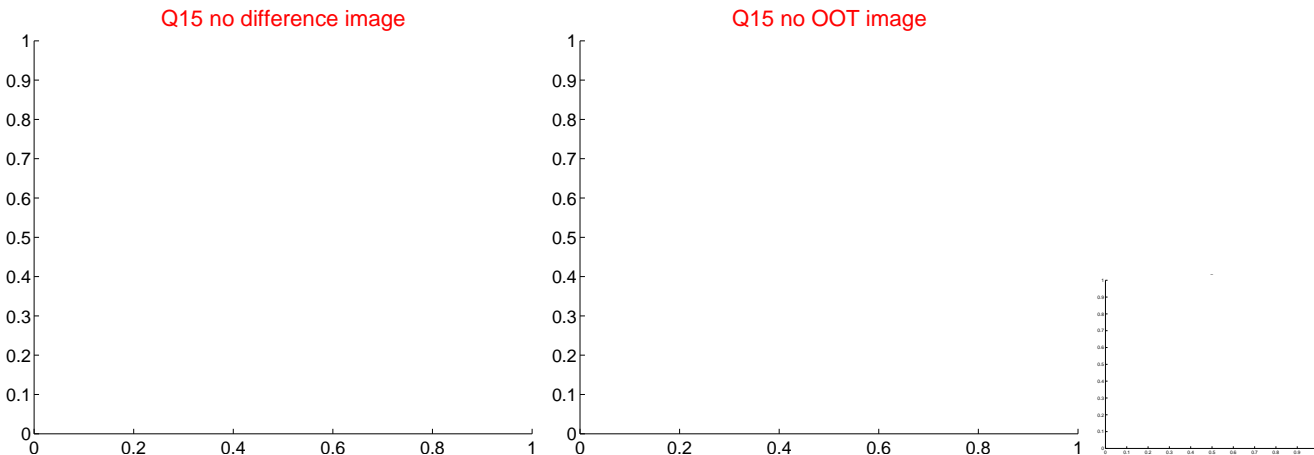
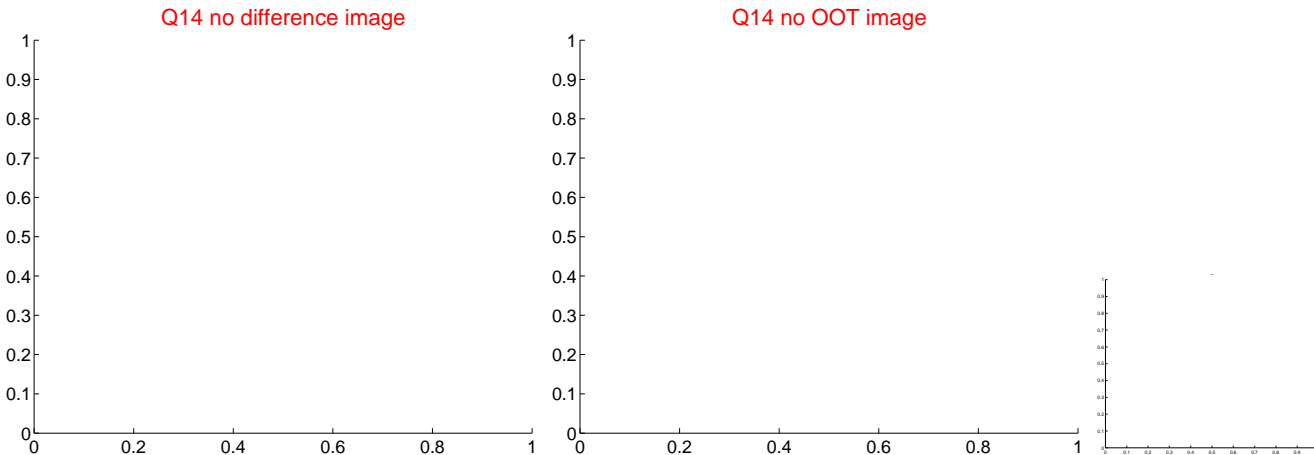
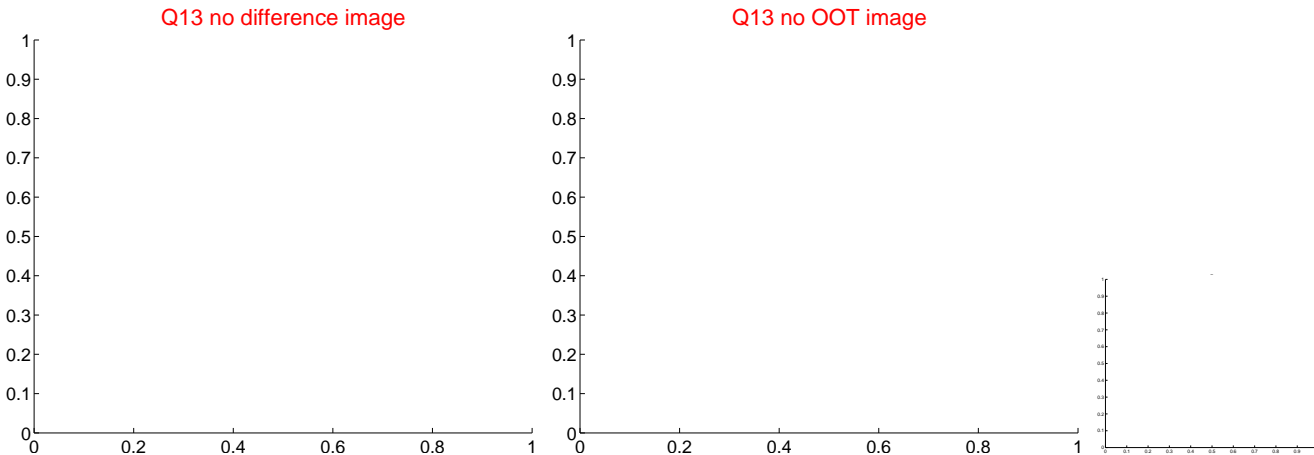
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



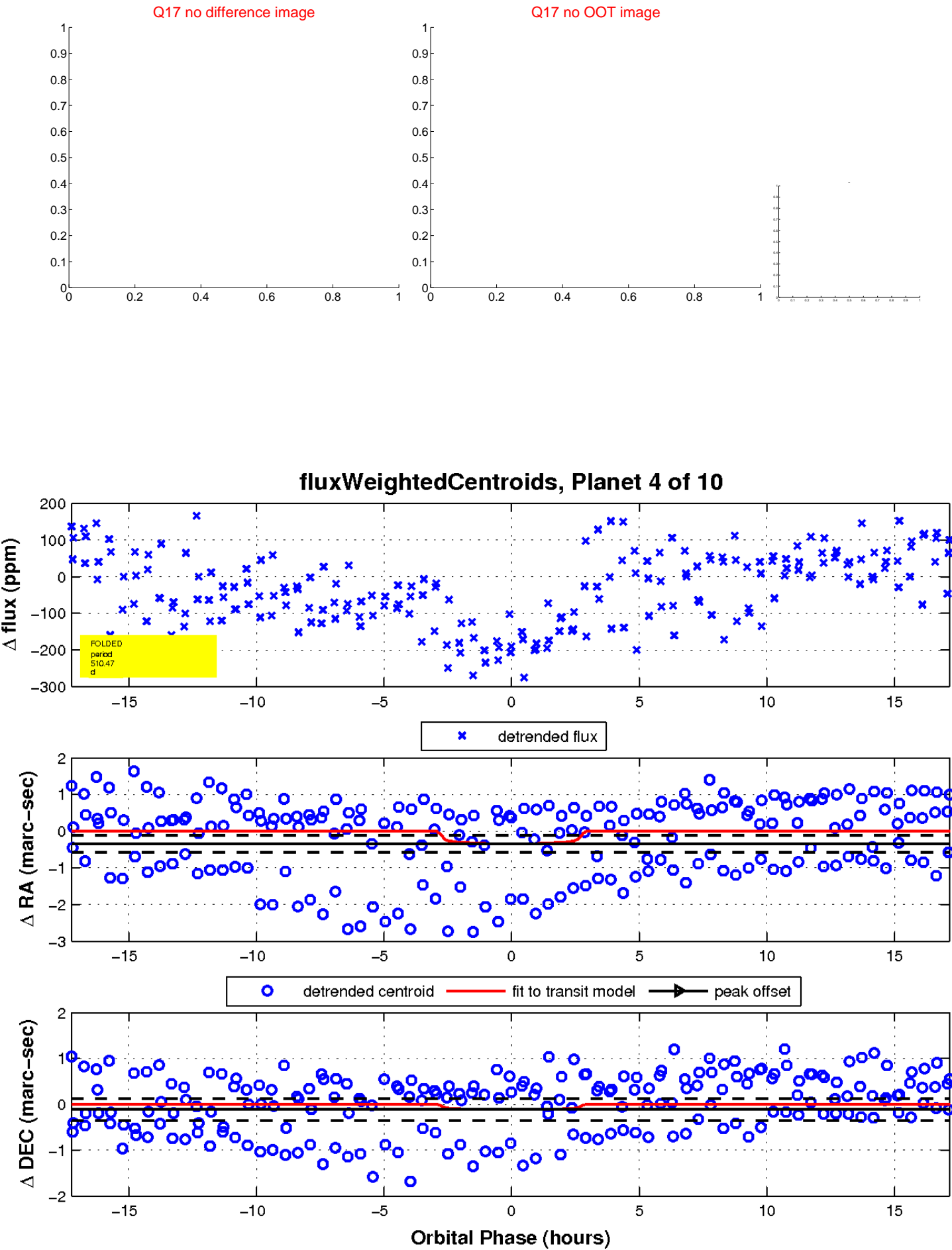
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value

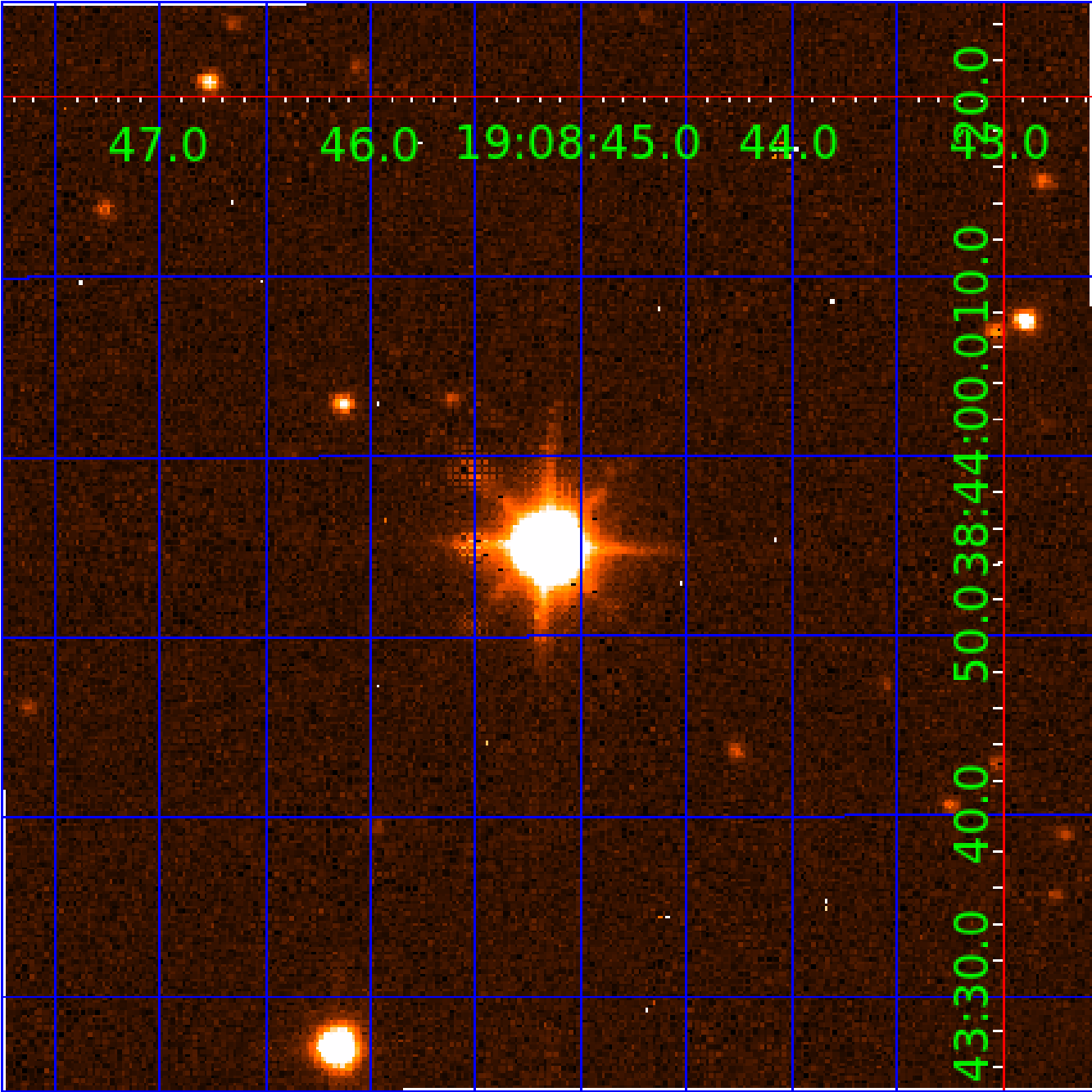


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 003631985

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
003631985-01	OBS	No	4.560527	132.026788	8.1	19.919	7.2	3.3	1.32	6627	0.43	917.35
003631985-02	OBS	No	126.957570	133.100780	130.0	12.168	10.5	8.9	1.32	6627	1.75	10.87
003631985-03	OBS	No	137.684361	192.319484	115.3	12.440	10.0	7.8	1.32	6627	1.55	9.76
003631985-04	OBS	No	510.471188	499.727737	148.5	5.818	9.2	8.6	1.32	6627	1.84	1.70
003631985-05	OBS	No	52.982172	175.171808	95.5	4.252	9.2	8.7	1.32	6627	1.48	34.86
003631985-07	OBS	No	424.406935	192.591667	163.7	10.410	9.1	8.3	1.32	6627	1.89	2.17
003631985-08	OBS	No	44.050048	148.961830	76.7	11.194	8.9	7.9	1.32	6627	1.30	44.59
003631985-09	OBS	No	428.258732	222.123753	150.7	10.780	9.0	8.9	1.32	6627	1.74	2.15
003631985-10	OBS	No	579.371898	339.223546	119.6	18.051	8.8	6.7	1.32	6627	1.69	1.44

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003631985-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
003631985-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED
003631985-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—CENT_SATURATED
003631985-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_SATURATED
003631985-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
003631985-07	OBS	FP	0.01	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED
003631985-08	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
003631985-09	OBS	FP	0.00	1	0	0	0	ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED
003631985-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

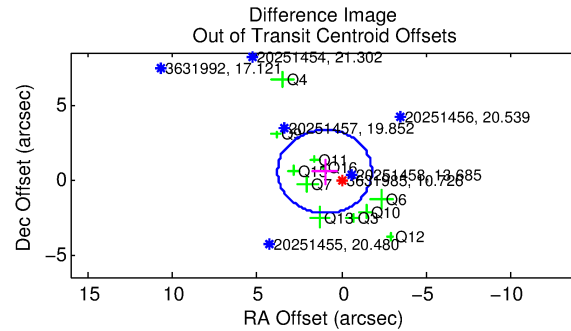
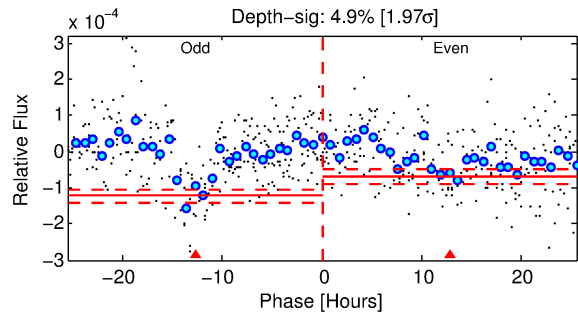
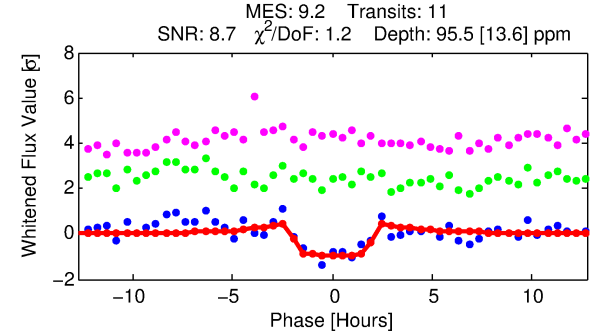
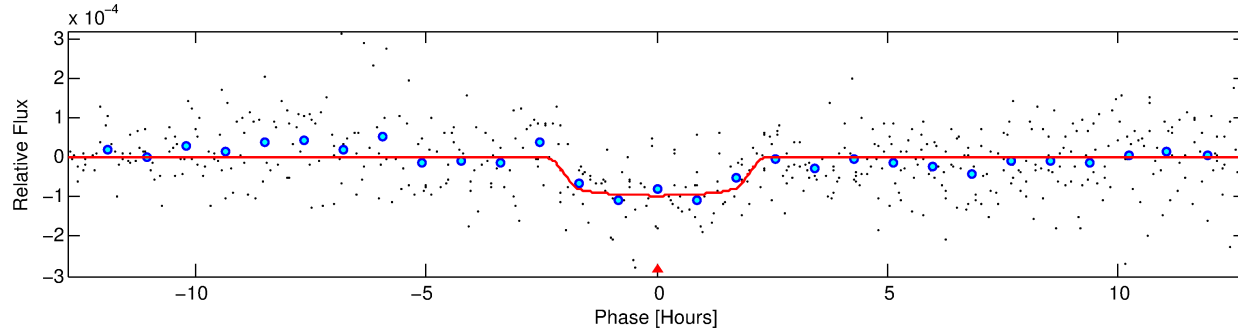
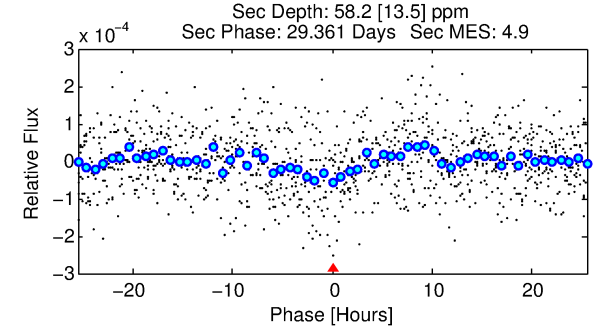
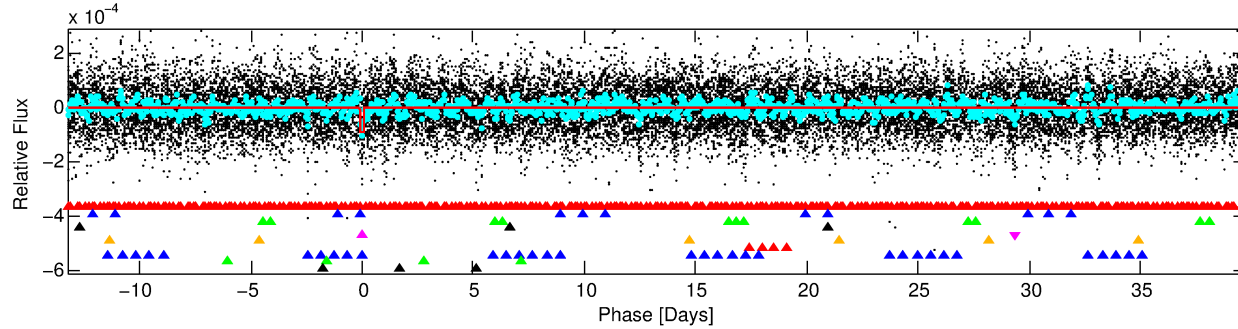
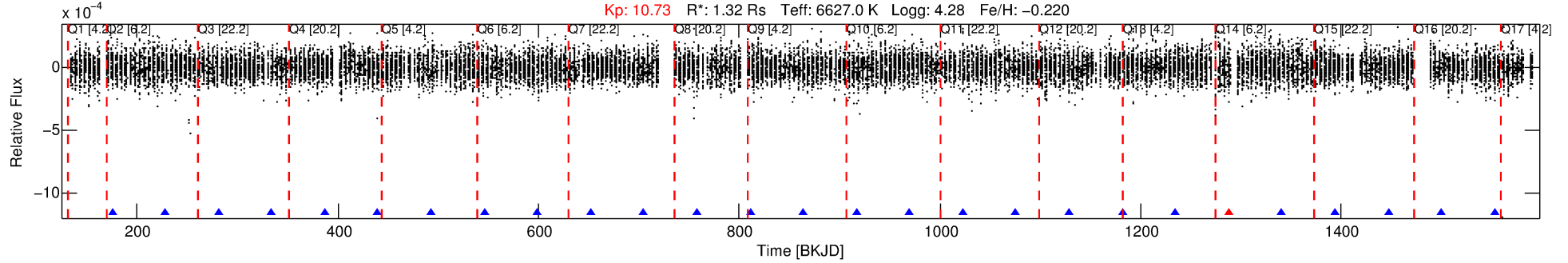
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 003631985-05

No Significant Match Found

DV One-Page Summary

KIC: 3631985 Candidate: 5 of 10 Period: 52.982 d



DV Fit Results:

Period = 52.98217 [0.00053] d
Epoch = 175.1718 [0.0090] BKJD
Rp/R* = 0.0103 [0.0049]
a/R* = 47.07 [128.25]
b = 0.88 [0.70]
Seff = 34.86 [13.41]
Teq = 620 [60] K
Rp = 1.48 [0.84] Re
a = 0.2932 [0.0736] AU
Ag = 1255.88 [1307.27] [0.96σ]
Teff = 5703 [1414] K [3.59σ]

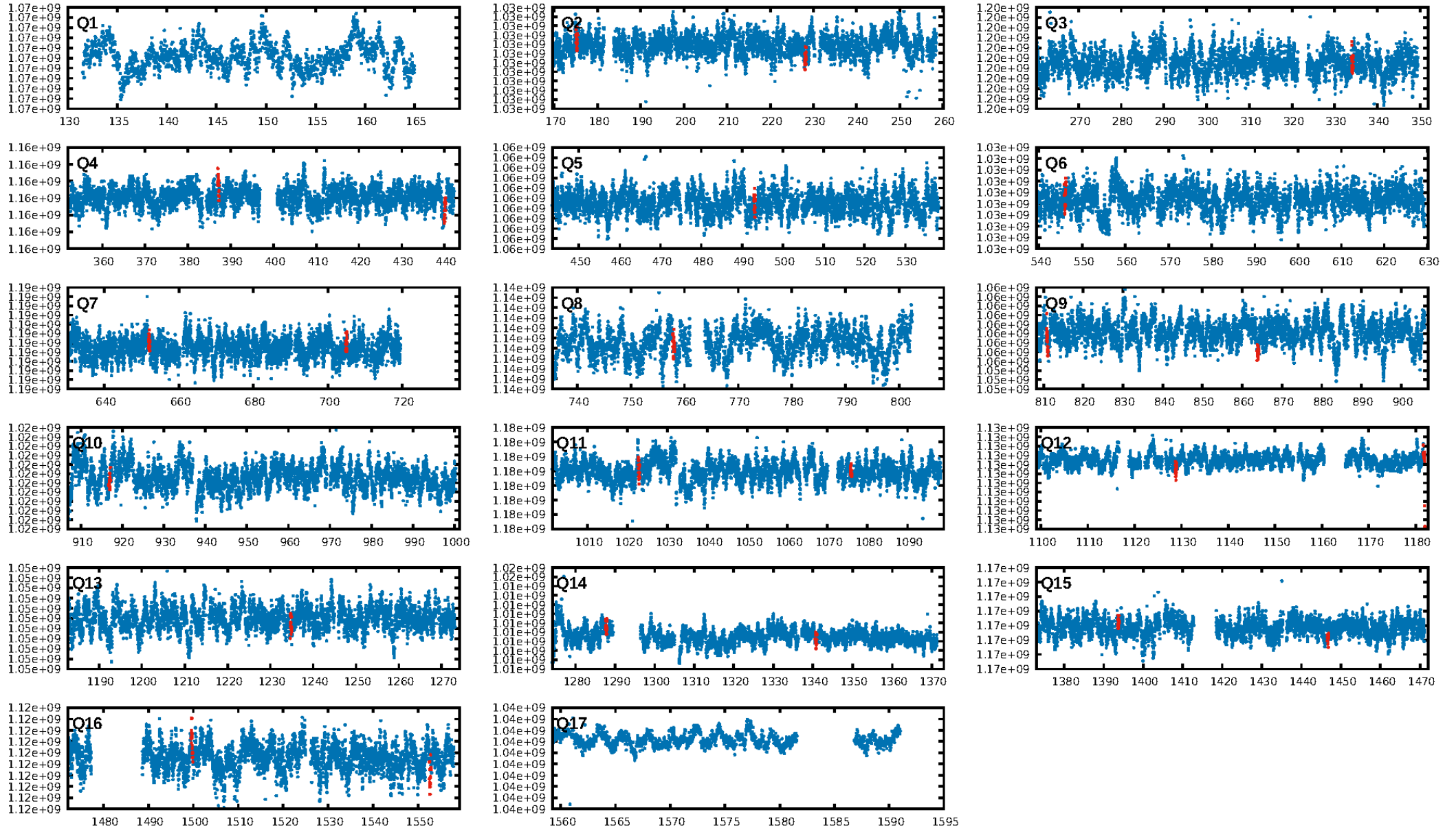
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [17.90σ]
LongPeriod-sig: 100.0% [137.74σ]
ModelChiSquare2-sig: 18.6%
ModelChiSquareGof-sig: 99.5%
Bootstrap-pfa: N/A
RollingBand-fgt: 0.91 [10/11]
GhostDiagnostic-chr: 5.328
Centroid-sig: 28.4%
Centroid-so: 0.951 arcsec [1.02σ]
OotOffset-rm: 1.132 arcsec [1.22σ]
KicOffset-rm: 1.092 arcsec [1.27σ]
OotOffset-st: 2/4/3/2 [11]
KicOffset-st: 2/4/3/2 [11]
DiffImageQuality-fgm: 0.73 [8/11]
DiffImageOverlap-fno: 0.87 [13/15]

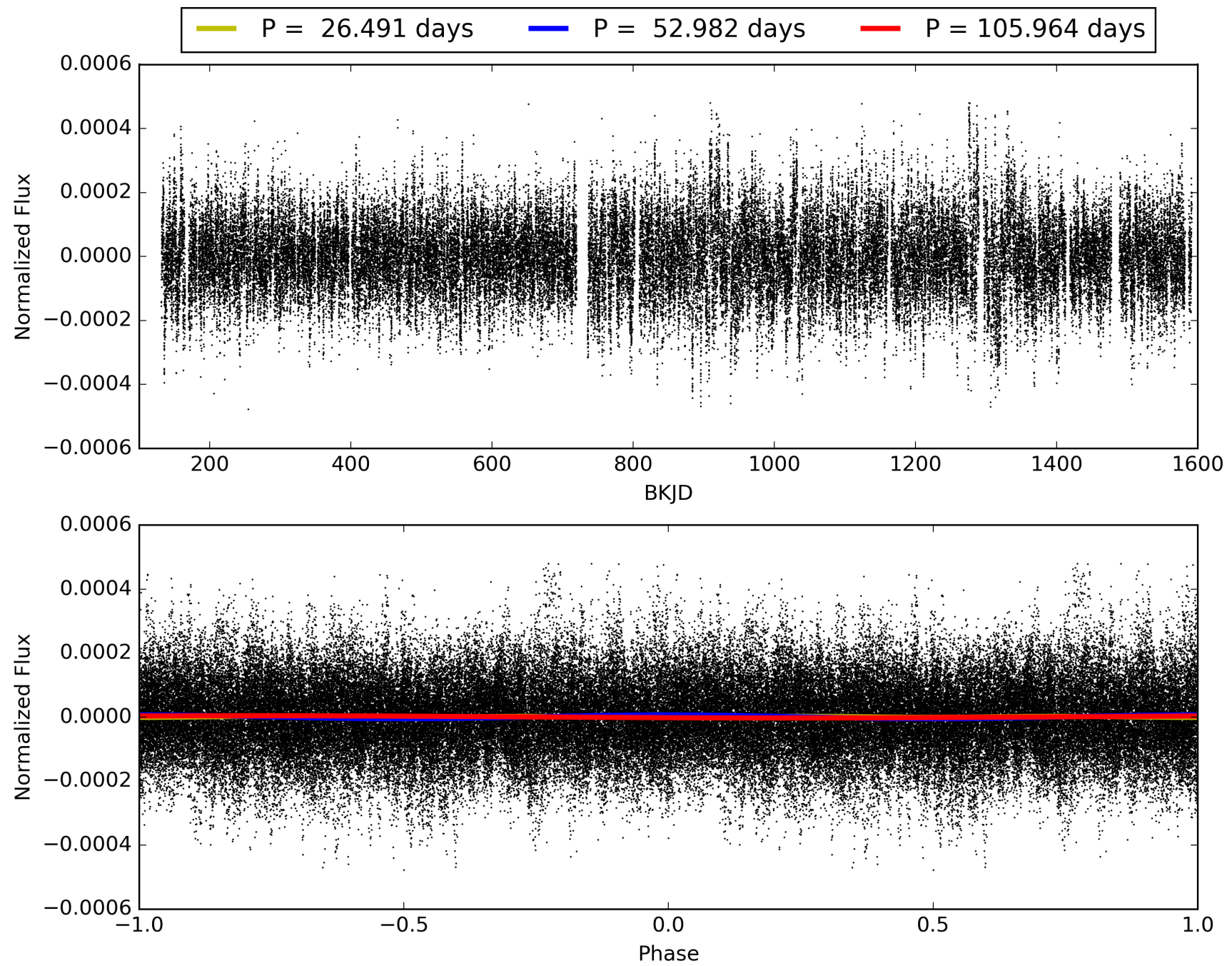
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 18:55:39 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 003631985-05, PDC Light Curves

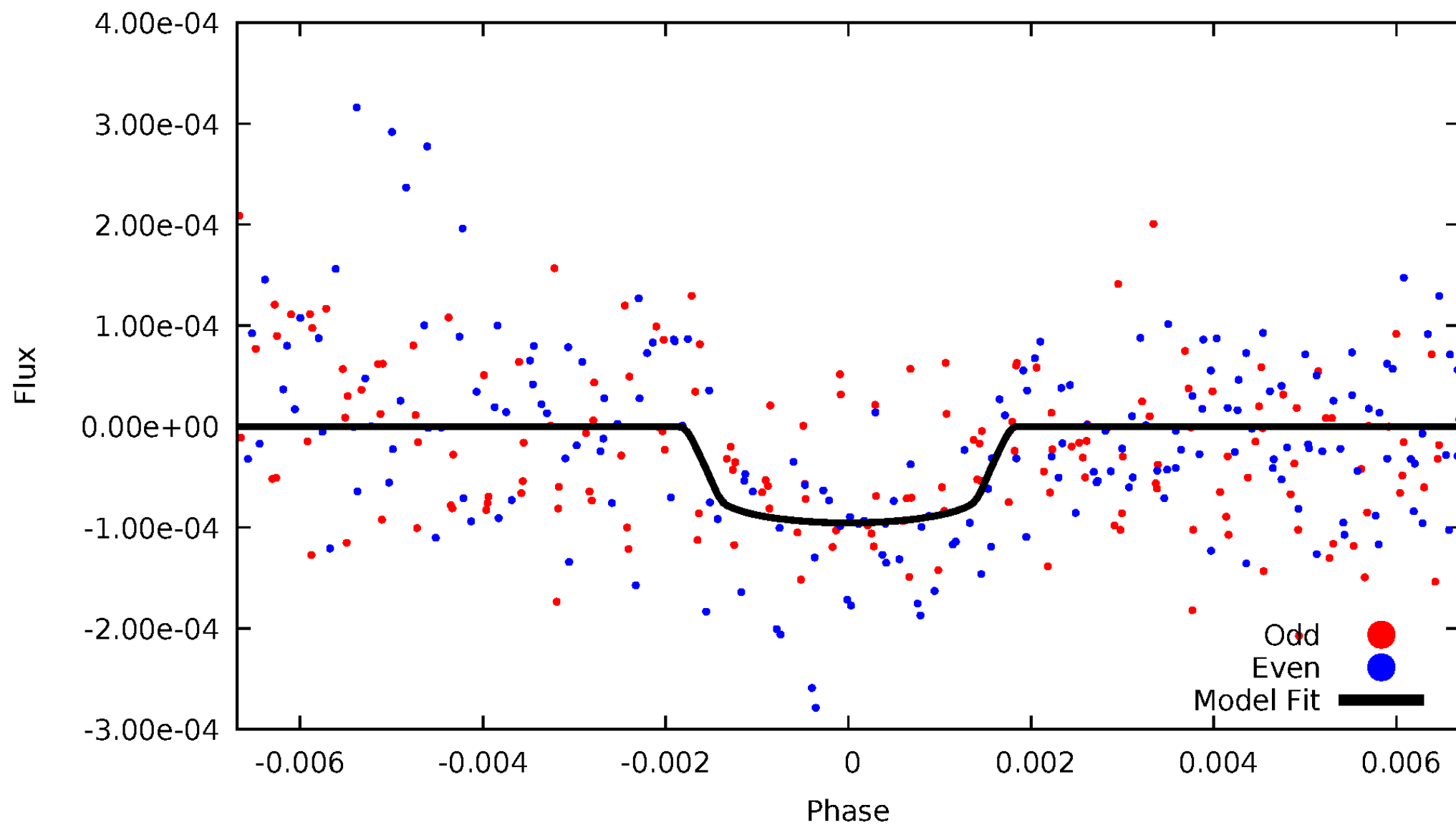


TCE 003631985-05



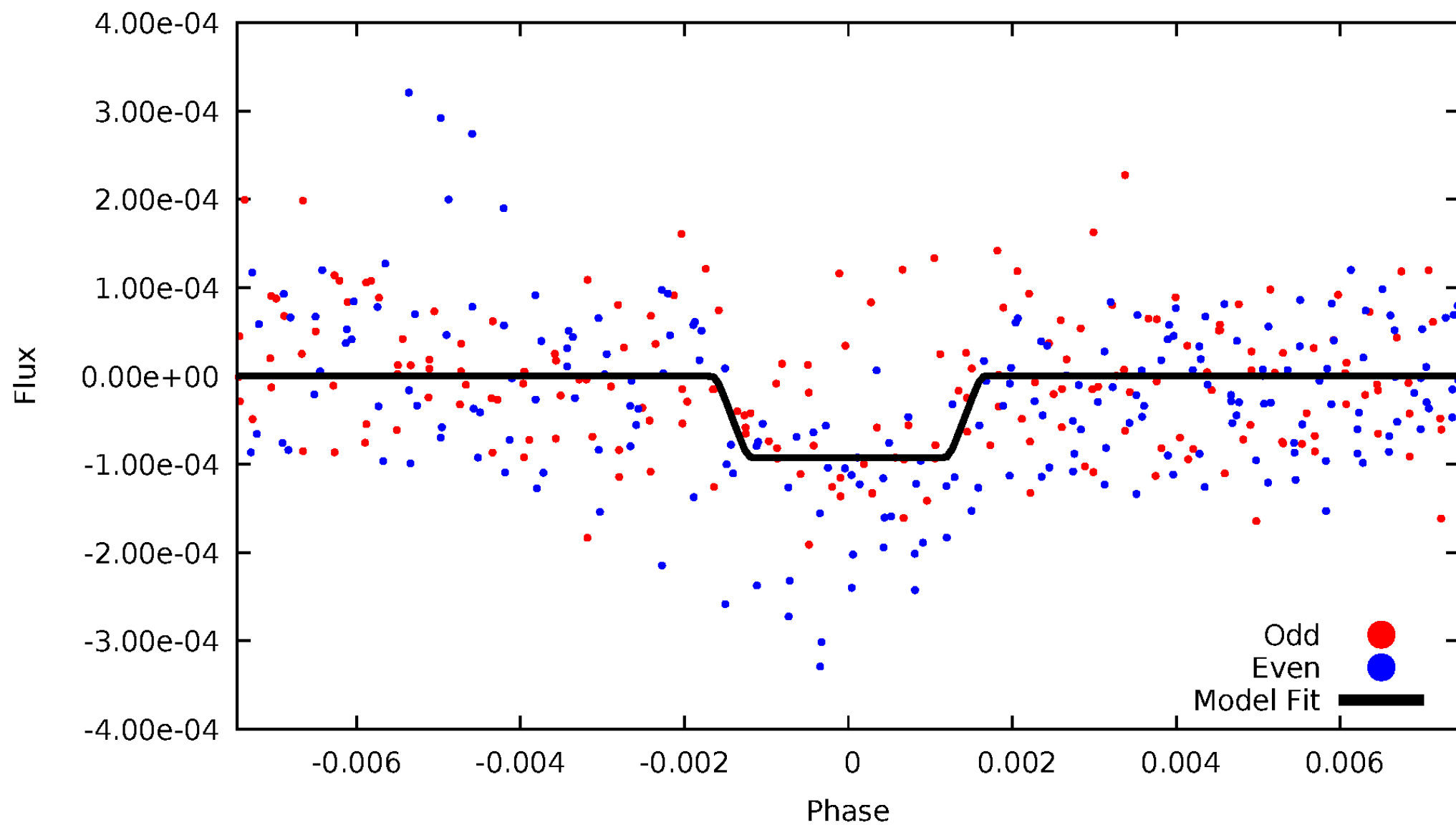
DV Odd/Even

TCE 003631985-05



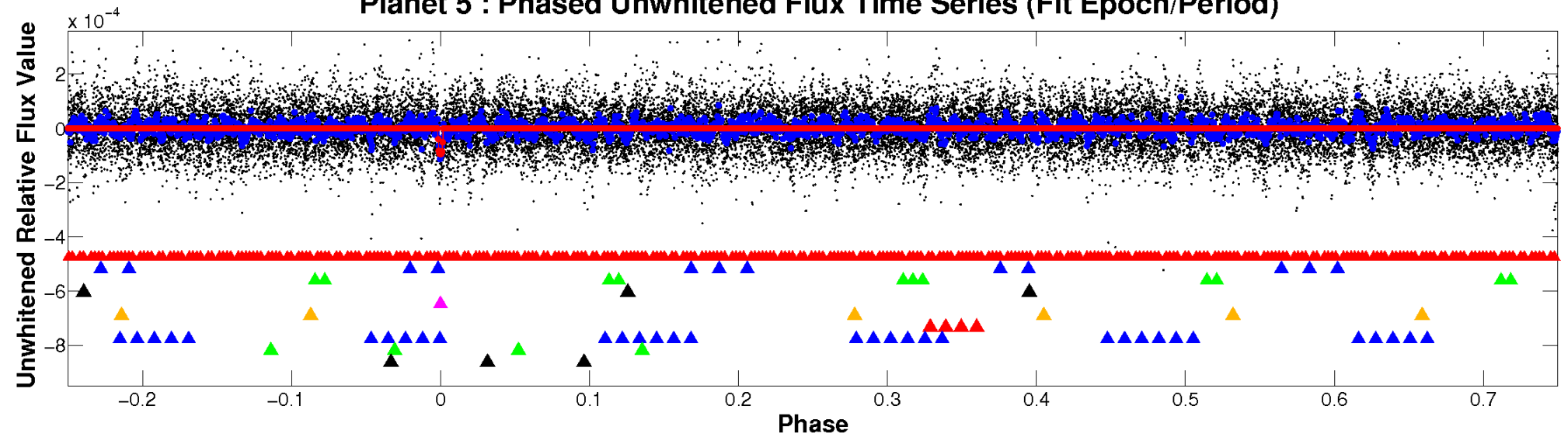
ALT Odd/Even

TCE 003631985-05

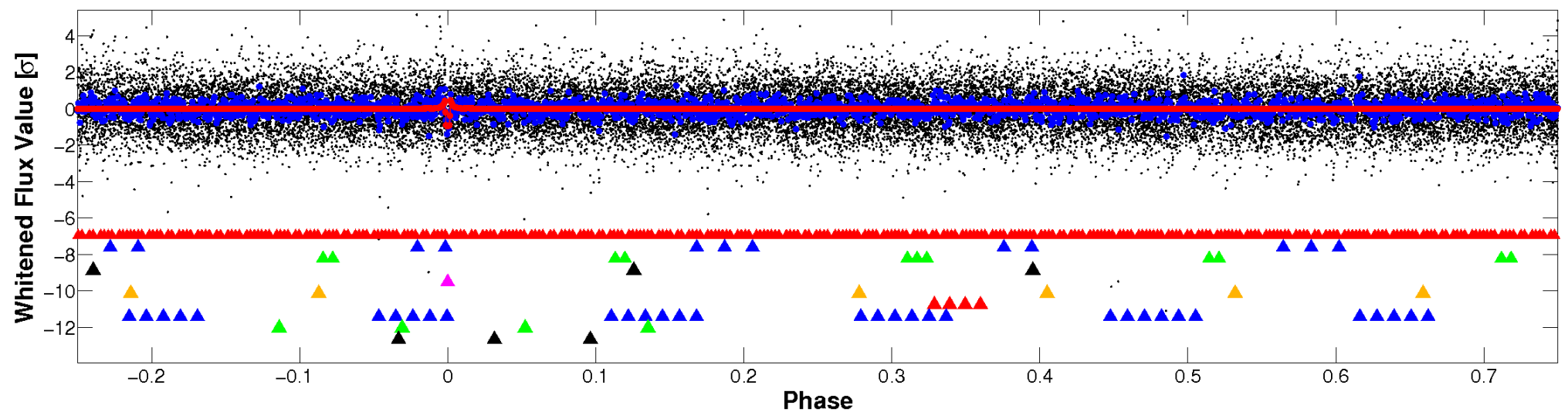


Non-Whitened Vs. Whitened Light Curve

Planet 5 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

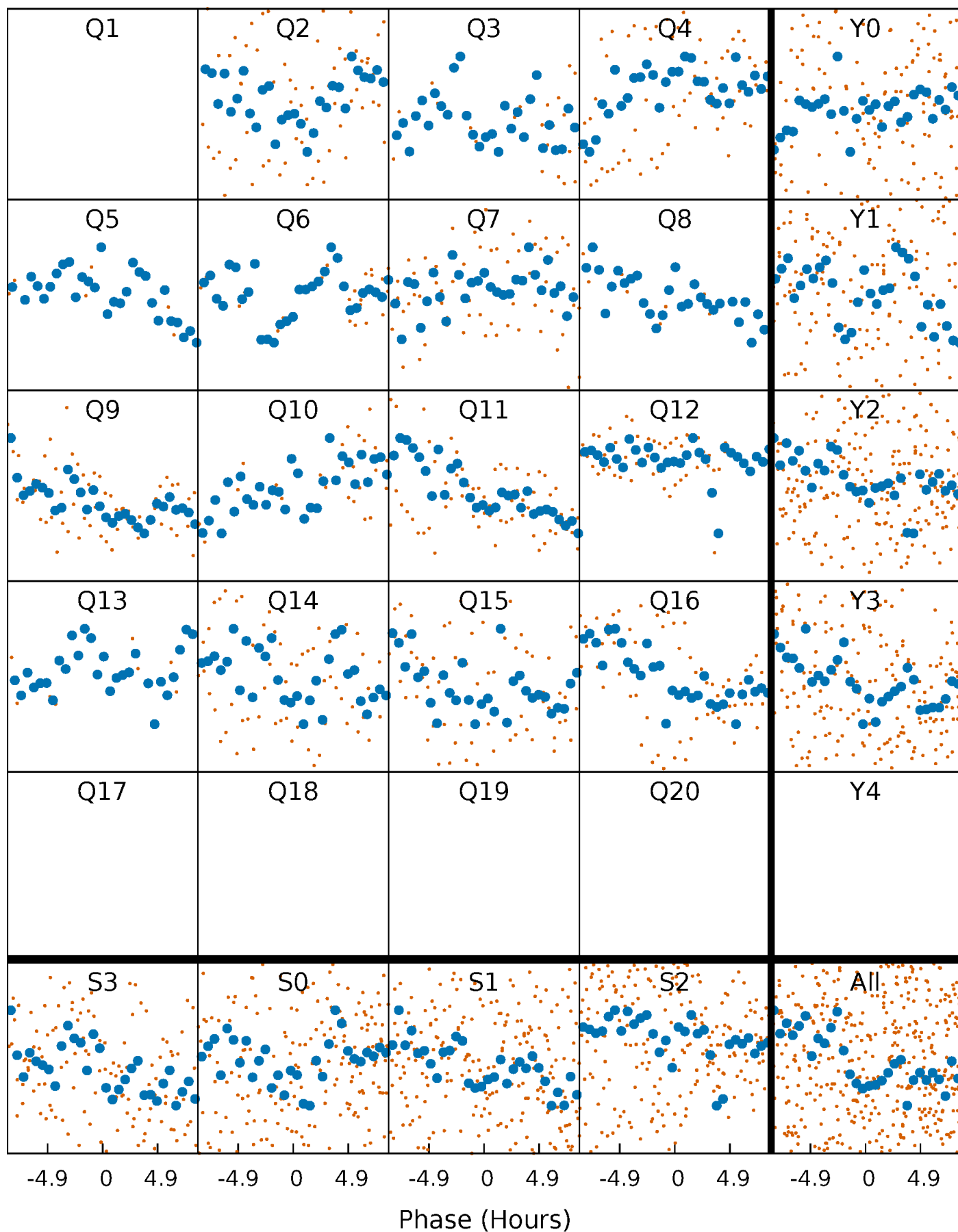


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



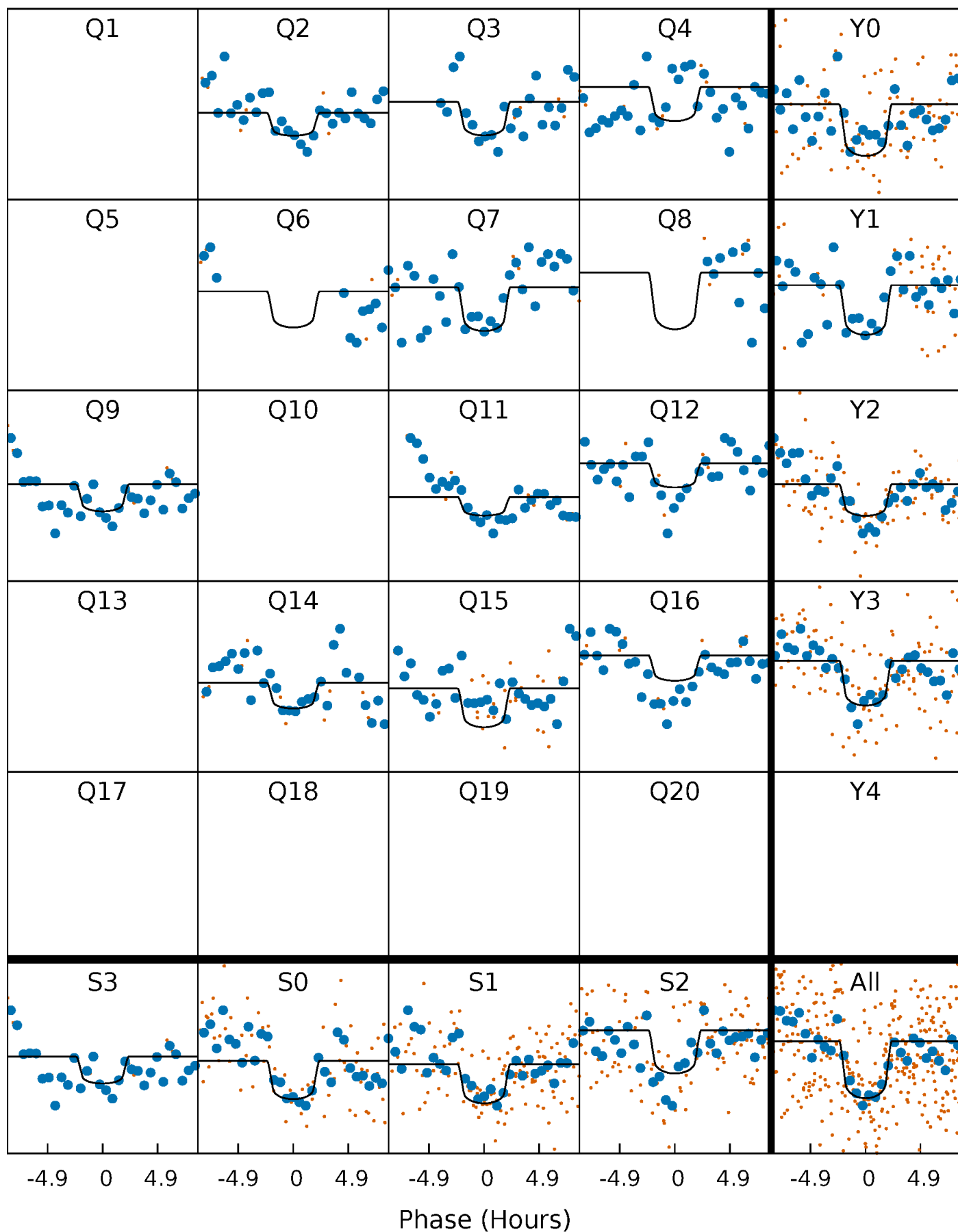
PDC Quarter-Phased Transit Curves

TCE 003631985-05 P= 52.982172 Days $T_0=175.171808$ (BKJD)



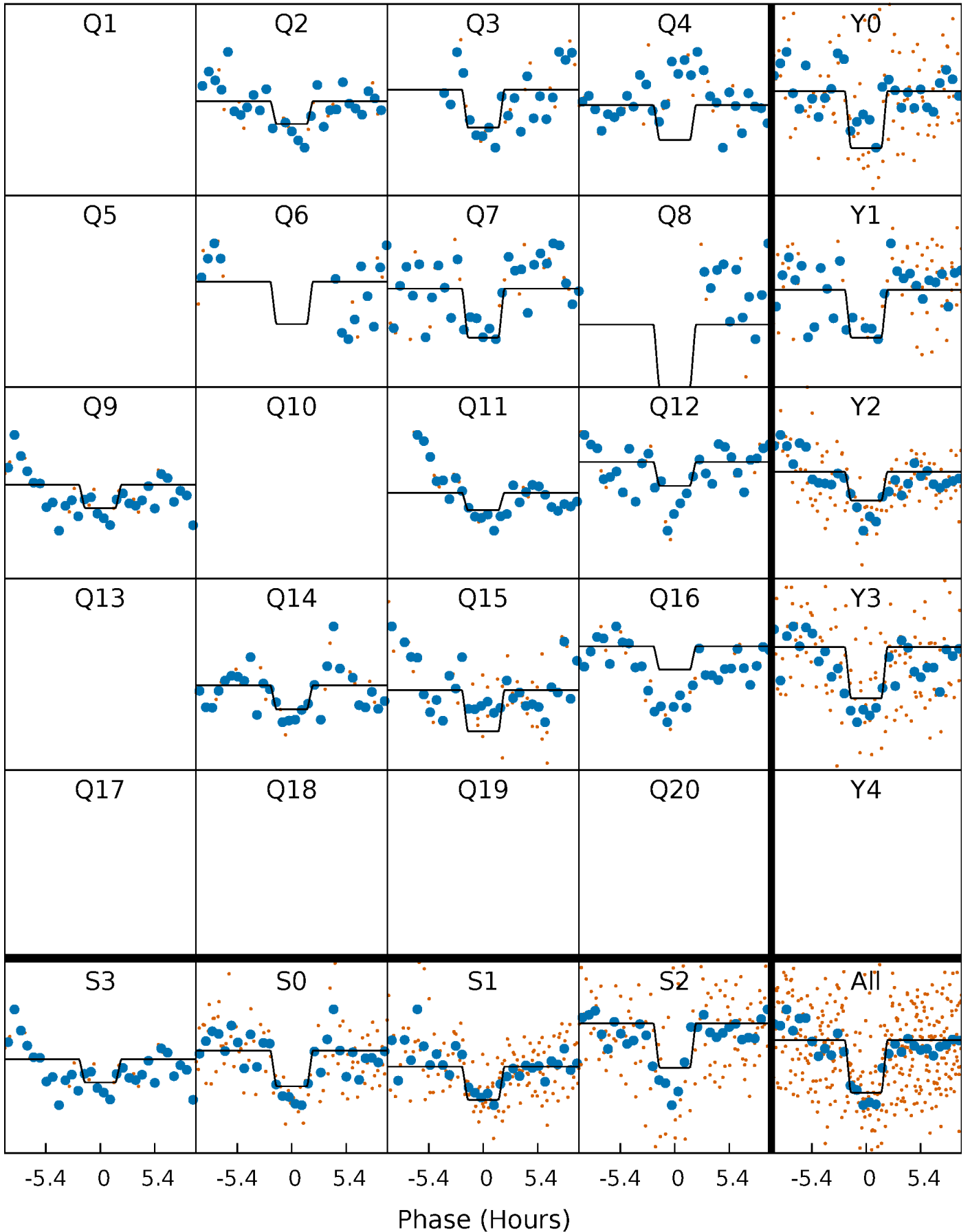
DV Quarter-Phased Transit Curves

TCE 003631985-05 P= 52.982172 Days $T_0=175.171808$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

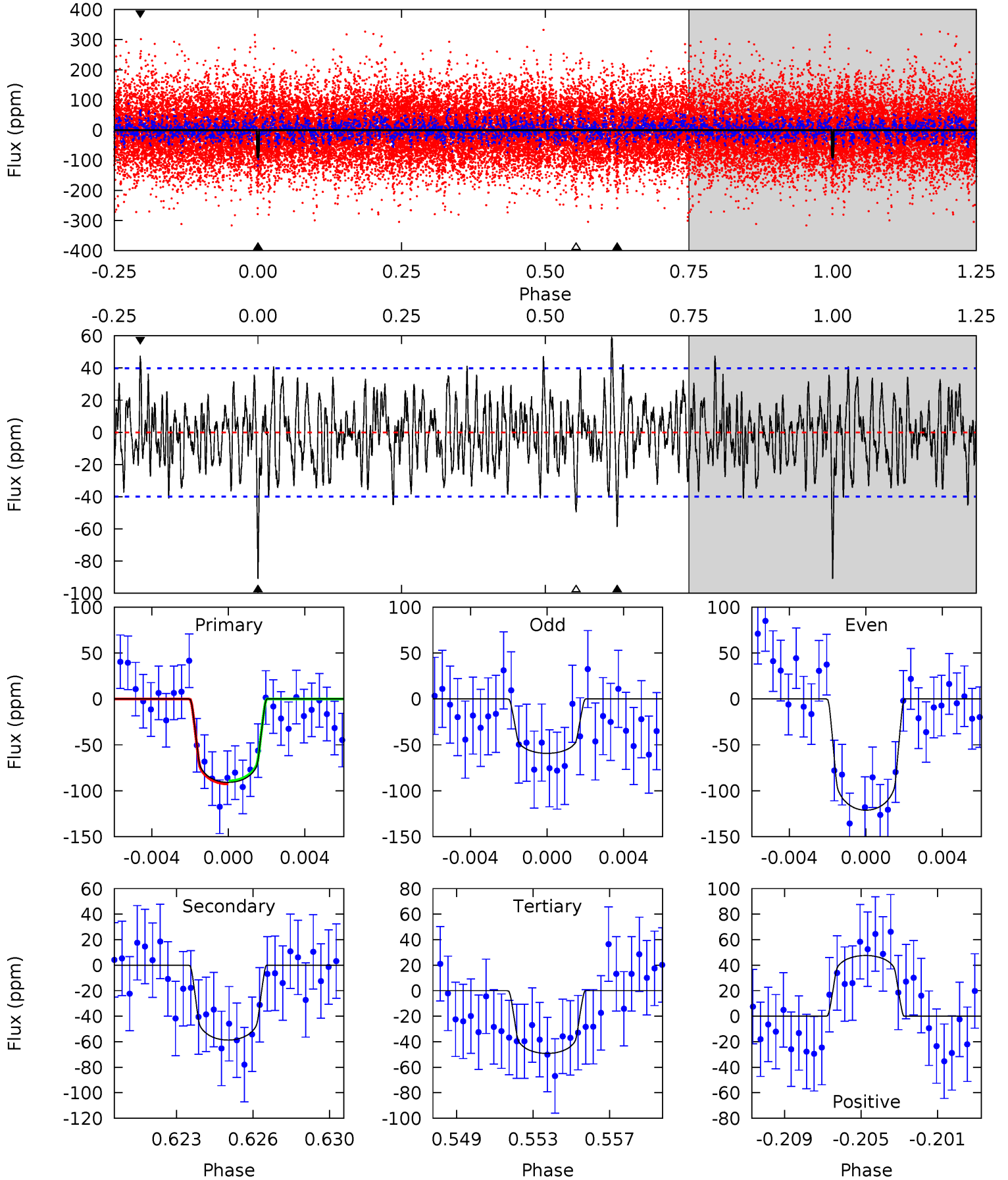
TCE 003631985-05 $P = 52.981988$ Days $T_0 = 175.173662$ (BKJD)



DV Model-Shift Uniqueness Test

003631985-05, $P = 52.982172$ Days, $E = 122.189636$ Days

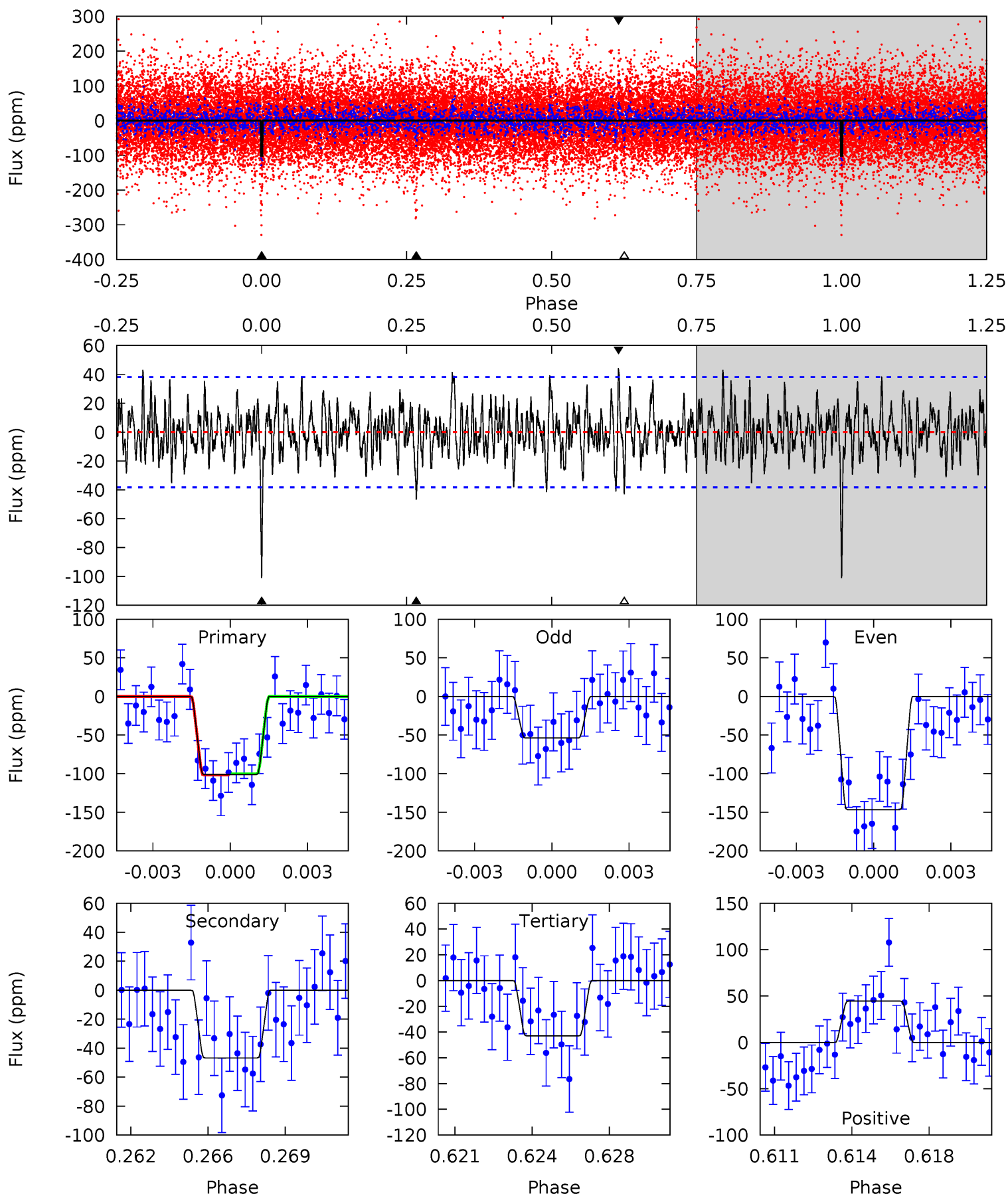
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.9	7.67	6.43	6.22	5.22	2.91	2.18	5.45	5.66	1.24	1.45	4.06	1.08	0.40	0.21



Alt Model-Shift Uniqueness Test

003631985-05, P = 52.981988 Days, E = 122.191674 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.8	6.40	5.87	6.08	5.23	2.94	1.86	7.94	7.74	0.53	0.32	6.34	1.02	0.31	0.11



Stellar Parameters For KIC 003631985

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6627^{+186}_{-255}	$4.277^{+0.124}_{-0.186}$	$-0.220^{+0.250}_{-0.300}$	$1.317^{+0.408}_{-0.220}$	$1.204^{+0.183}_{-0.183}$	$0.742^{+0.432}_{-0.369}$
	+3%/-4%	+3%/-4%	+114%/-136%	+31%/-17%	+15%/-15%	+58%/-50%
Source	PHO54	PHO54	PHO54	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 003631985-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-59 ± 8	$1.50^{+0.74}_{-0.69}$	870^{+67}_{-53}	5654^{+2209}_{-880}	1215^{+2766}_{-679}
Alt.	-47 ± 7	$1.47^{+0.75}_{-0.73}$	871^{+62}_{-54}	5432^{+2466}_{-808}	980^{+3156}_{-556}

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{\text{obs}} \gg T_{\text{max}}$ AND $A_{\text{obs}} \gg 1.0$

DV Centroid Data

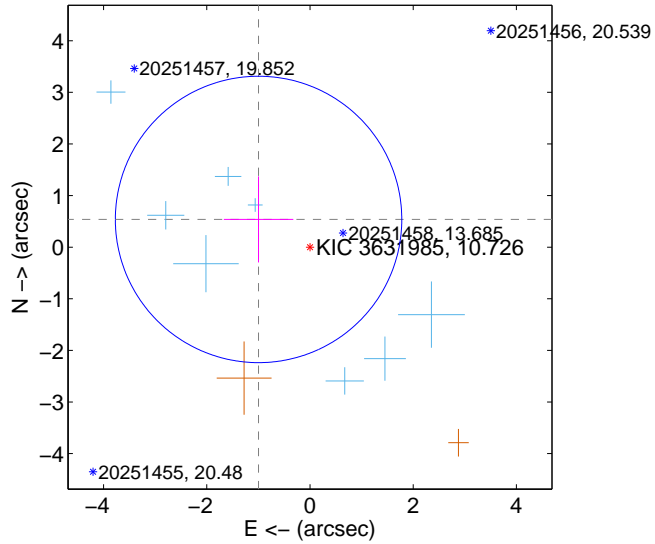
Supplemental centroid analysis for 003631985-05. **Kepler magnitude: 10.73.** Transit SNR 8.68

There are 8 quarters with good PRF difference image offsets

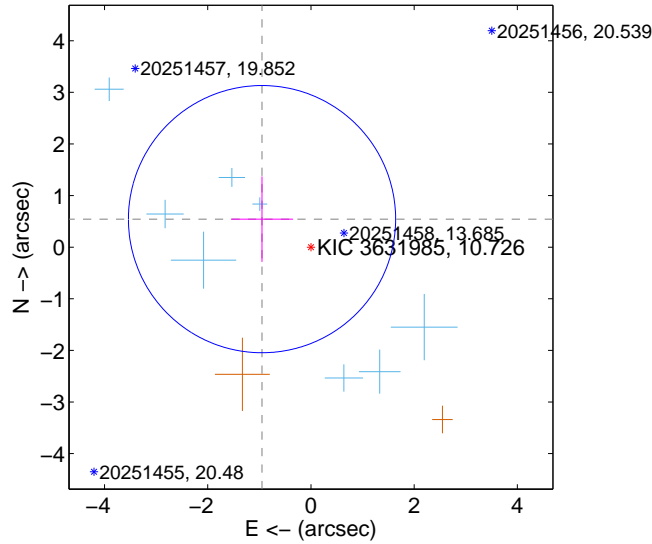
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.132 ± 0.925	1.22	0.996 ± 0.672	0.537 ± 0.834
PRF-fit source offset from KIC position	1.092 ± 0.863	1.27	0.948 ± 0.600	0.543 ± 0.827
photometric centroid source offset	0.95 ± 0.93	1.02	0.91 ± 0.93	-0.26 ± 1.00

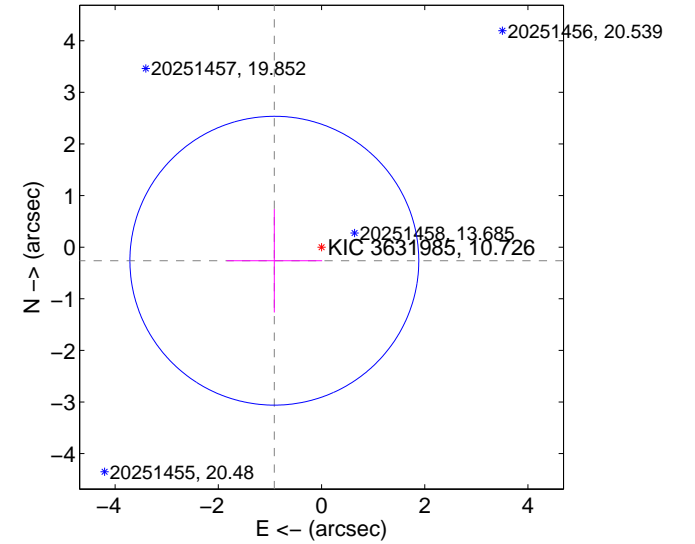
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

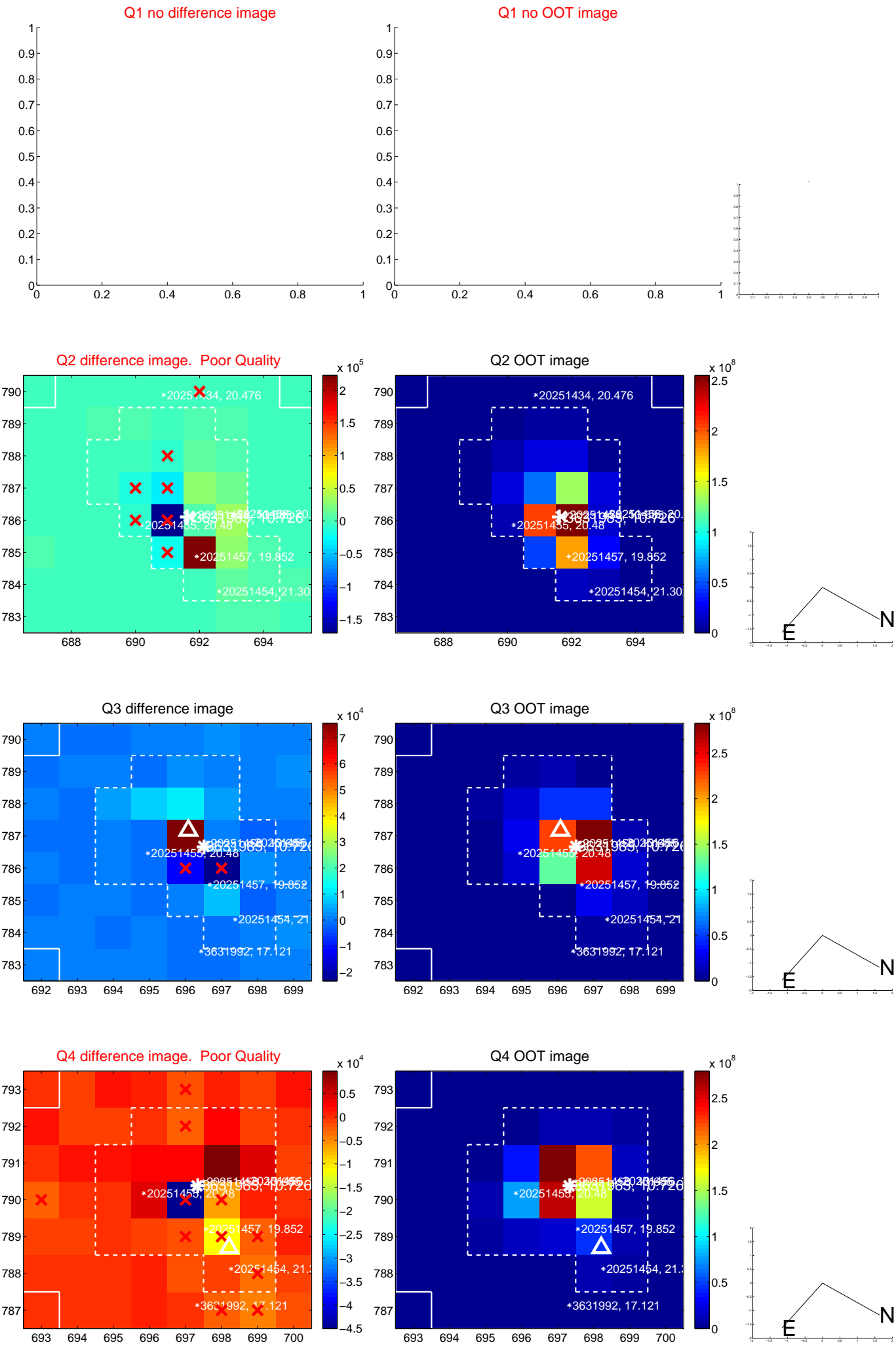


offset from photometric centroids

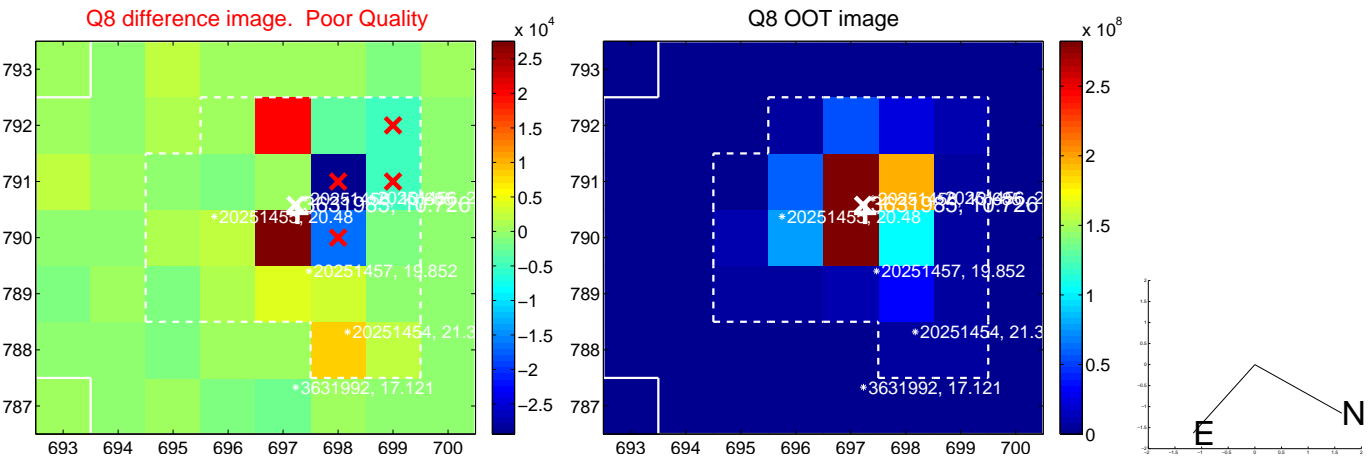
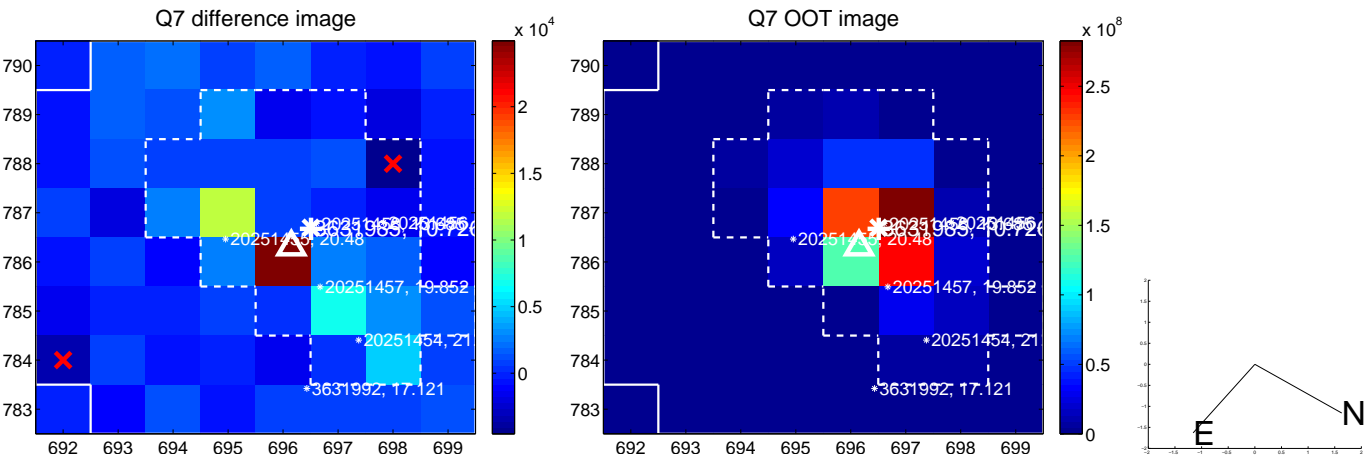
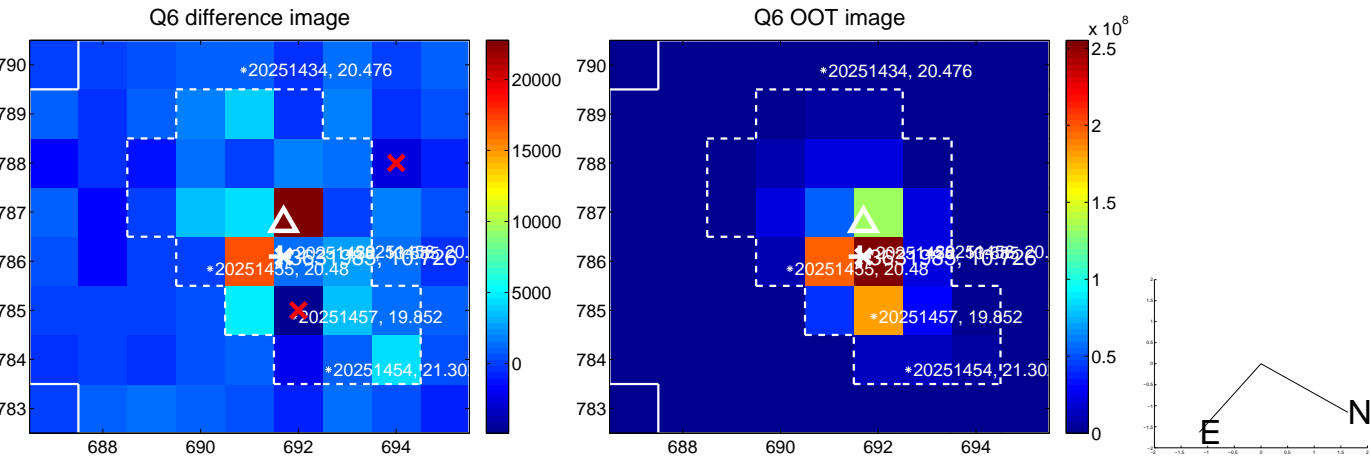
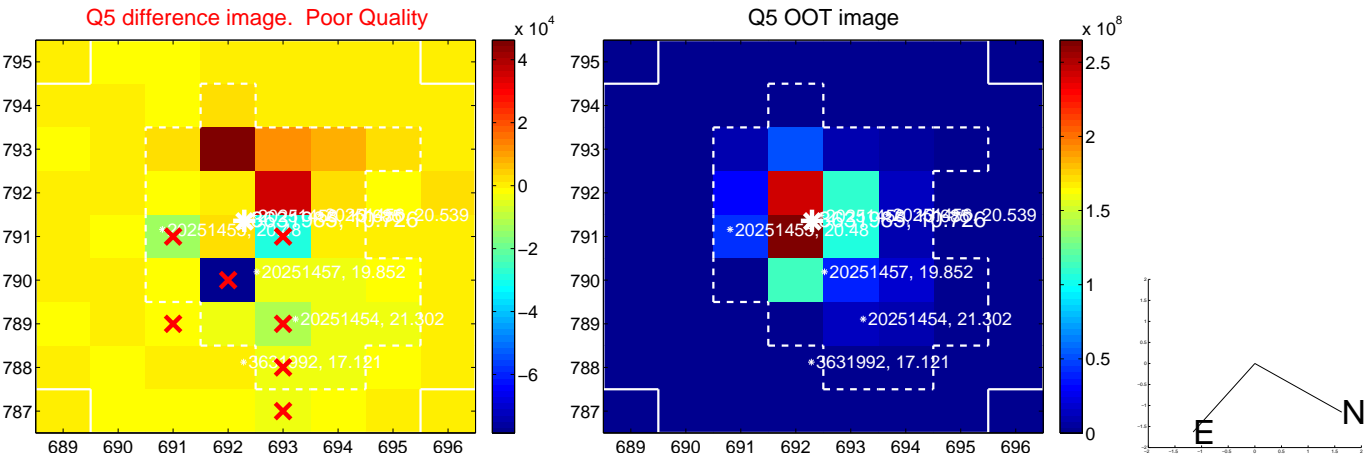


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

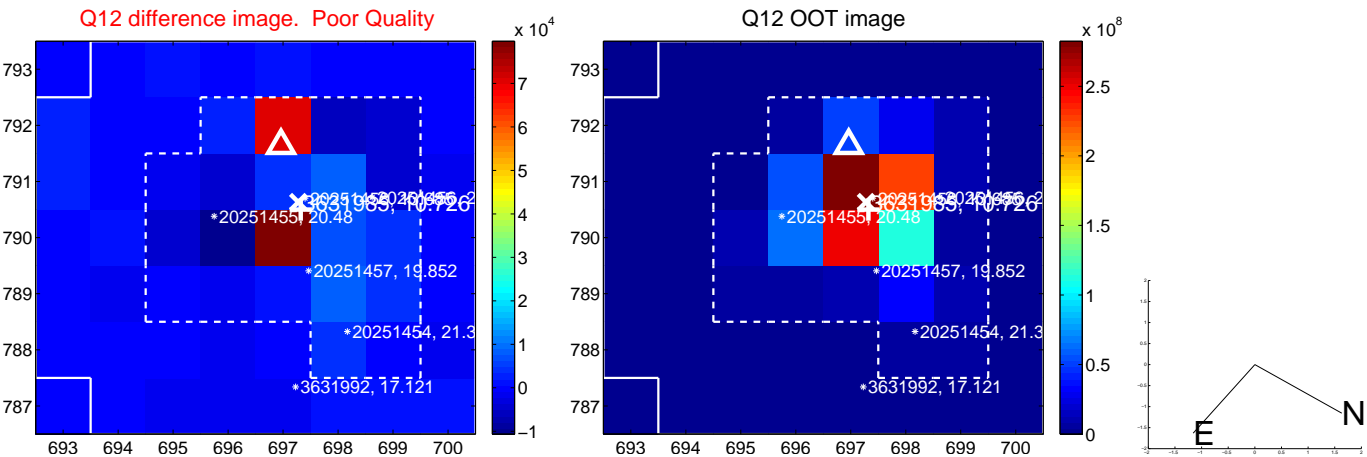
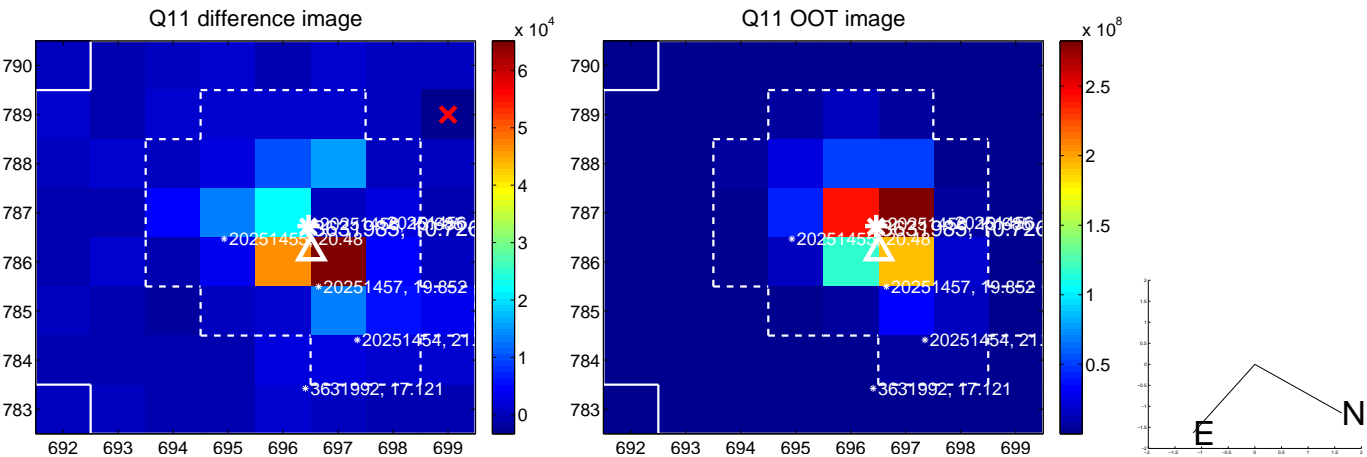
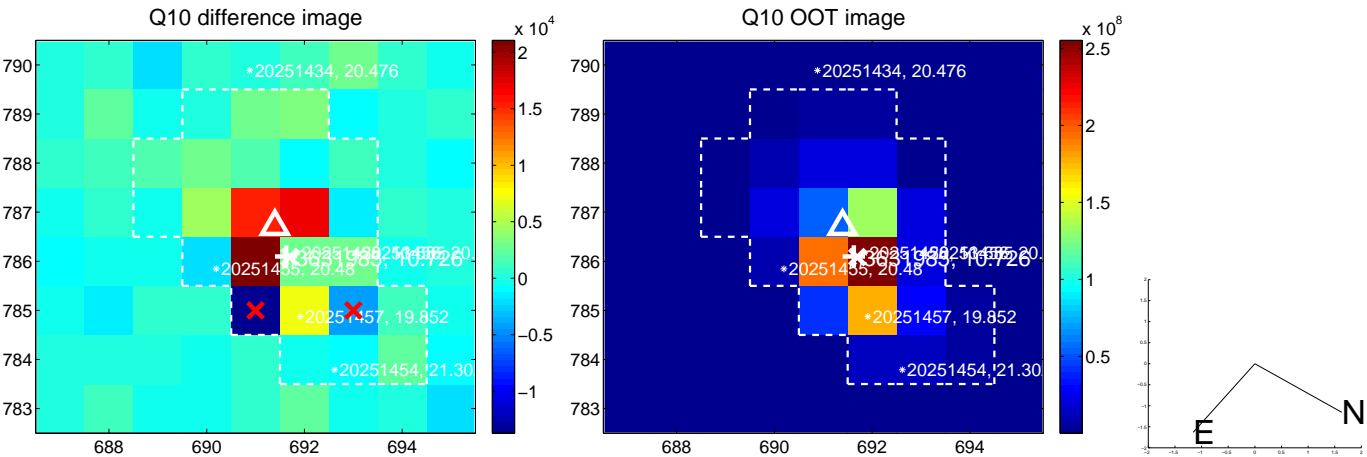
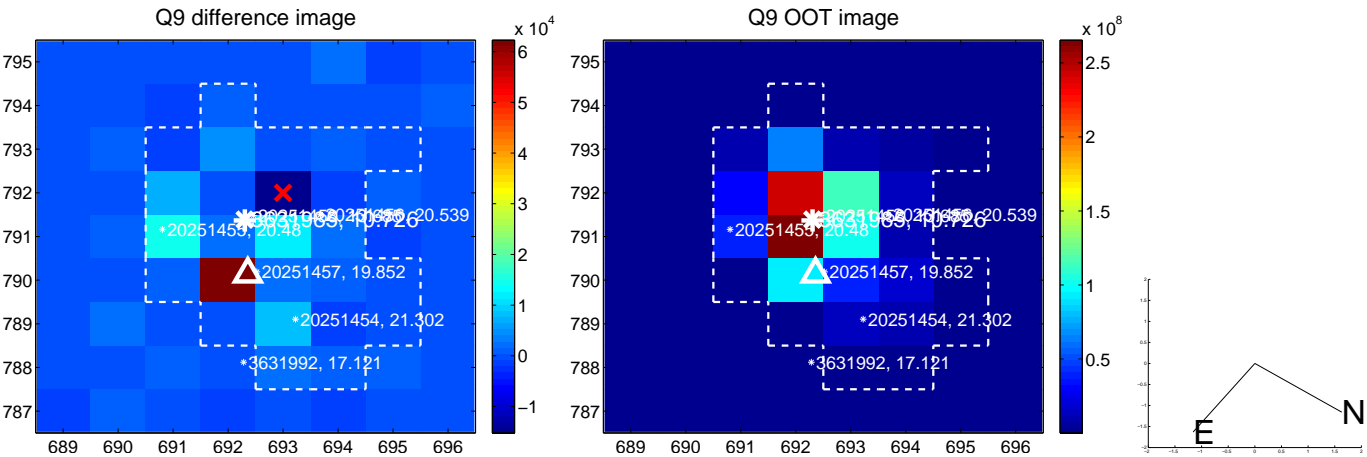
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



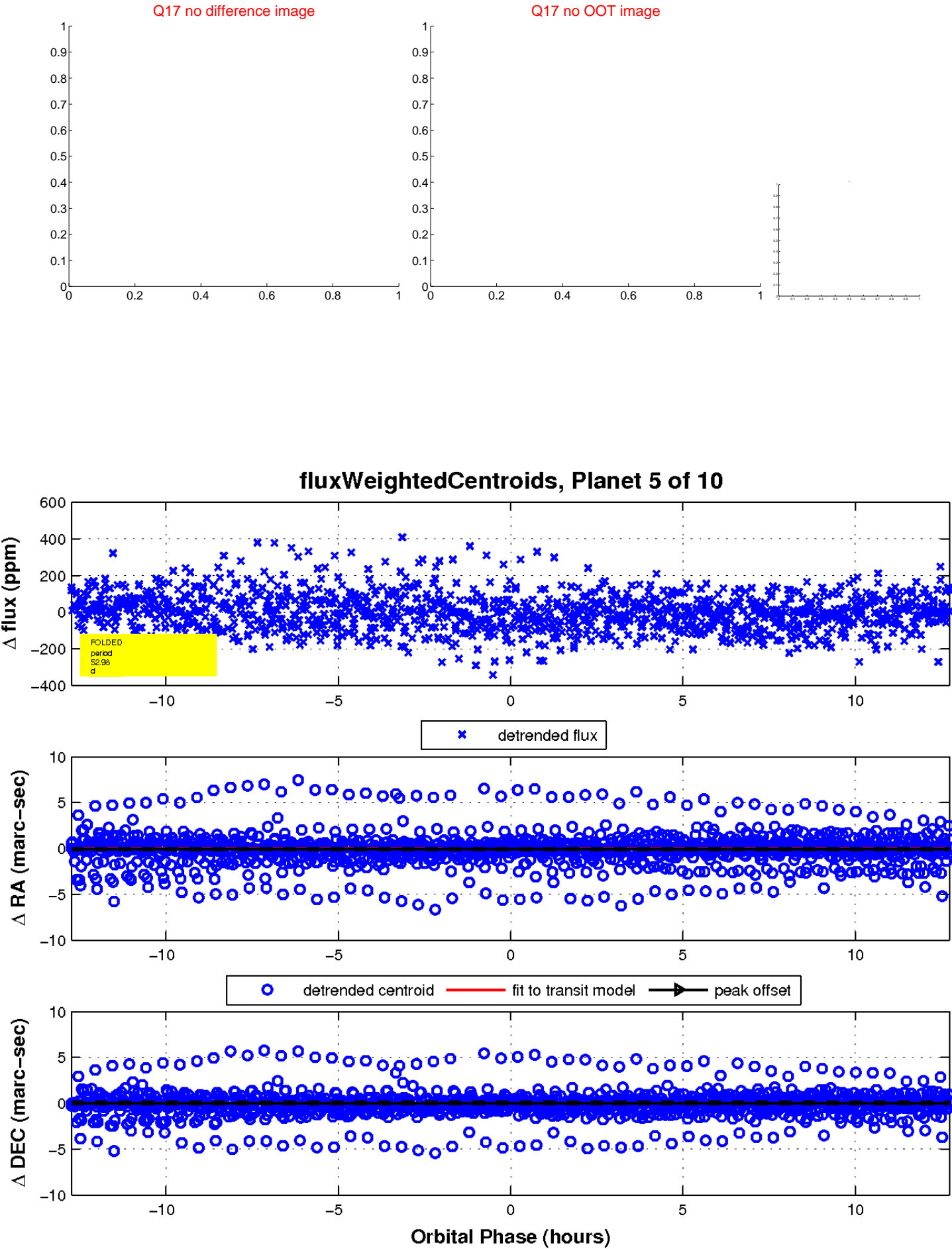
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

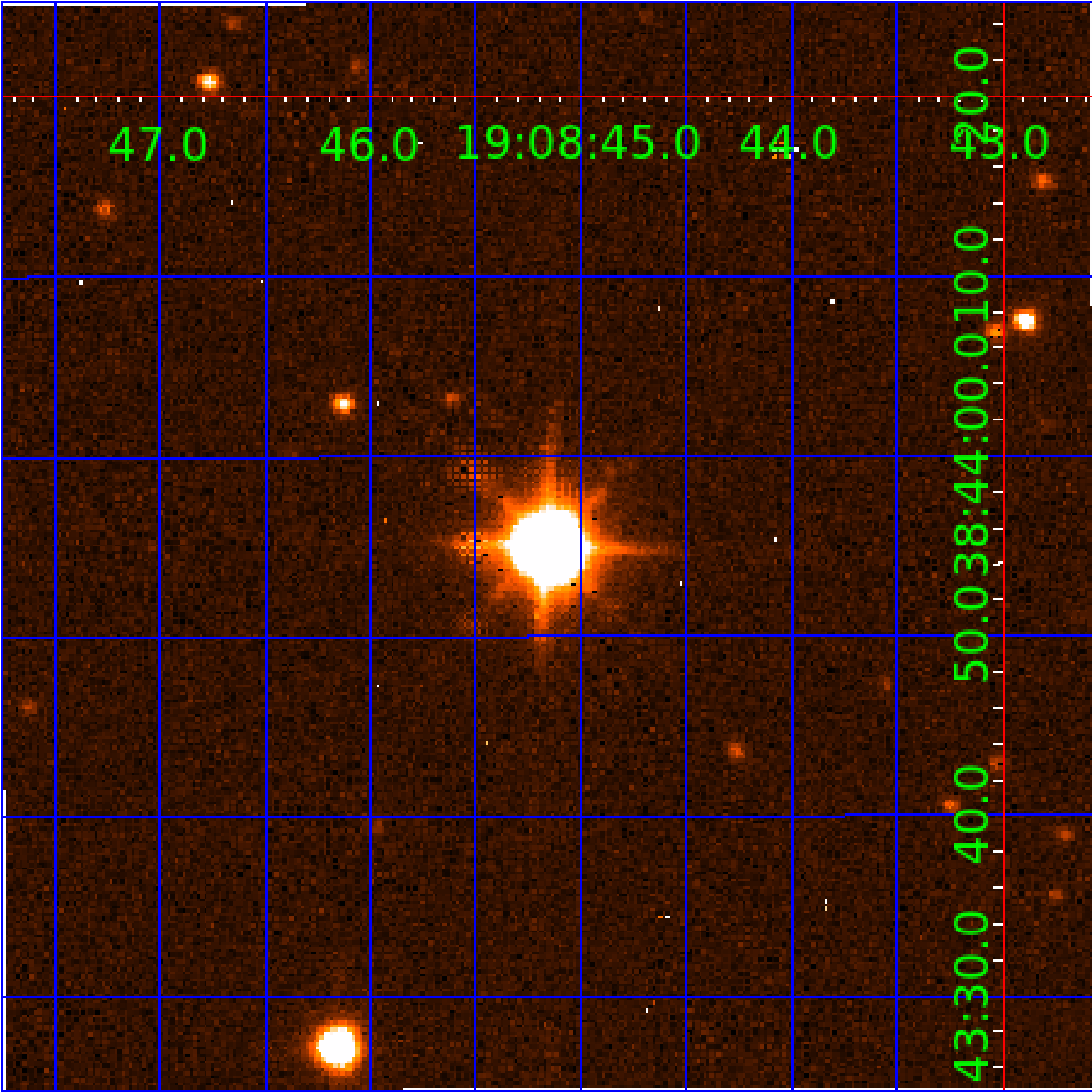


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 003631985

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
003631985-01	OBS	No	4.560527	132.026788	8.1	19.919	7.2	3.3	1.32	6627	0.43	917.35
003631985-02	OBS	No	126.957570	133.100780	130.0	12.168	10.5	8.9	1.32	6627	1.75	10.87
003631985-03	OBS	No	137.684361	192.319484	115.3	12.440	10.0	7.8	1.32	6627	1.55	9.76
003631985-04	OBS	No	510.471188	499.727737	148.5	5.818	9.2	8.6	1.32	6627	1.84	1.70
003631985-05	OBS	No	52.982172	175.171808	95.5	4.252	9.2	8.7	1.32	6627	1.48	34.86
003631985-07	OBS	No	424.406935	192.591667	163.7	10.410	9.1	8.3	1.32	6627	1.89	2.17
003631985-08	OBS	No	44.050048	148.961830	76.7	11.194	8.9	7.9	1.32	6627	1.30	44.59
003631985-09	OBS	No	428.258732	222.123753	150.7	10.780	9.0	8.9	1.32	6627	1.74	2.15
003631985-10	OBS	No	579.371898	339.223546	119.6	18.051	8.8	6.7	1.32	6627	1.69	1.44

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003631985-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
003631985-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED
003631985-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—CENT_SATURATED
003631985-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_SATURATED
003631985-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
003631985-07	OBS	FP	0.01	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED
003631985-08	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
003631985-09	OBS	FP	0.00	1	0	0	0	ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED
003631985-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

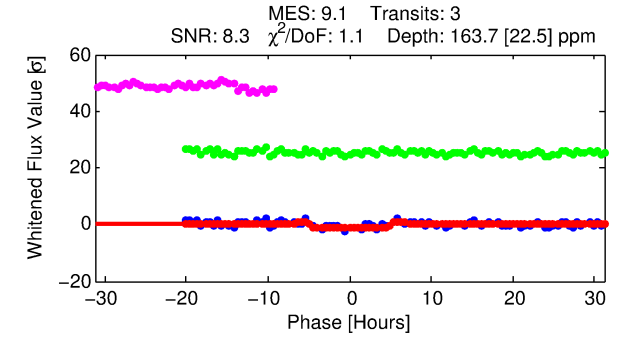
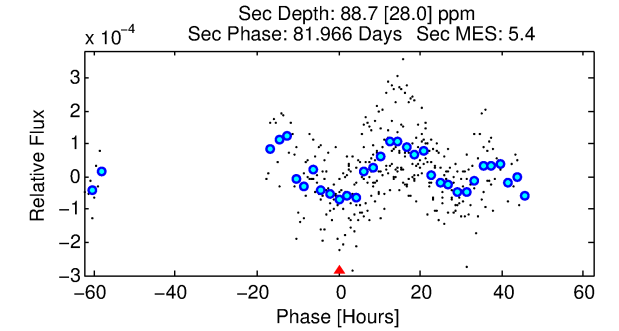
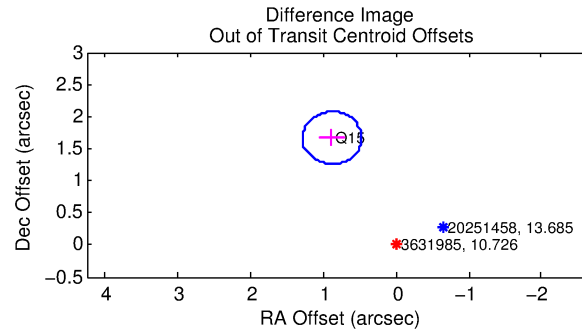
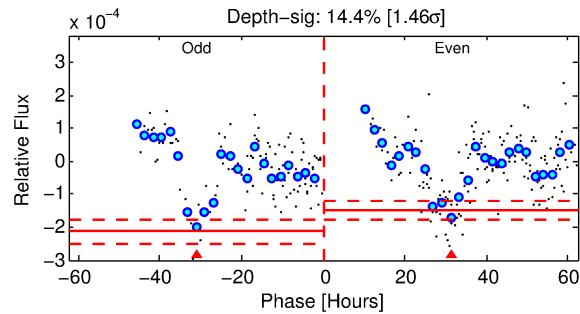
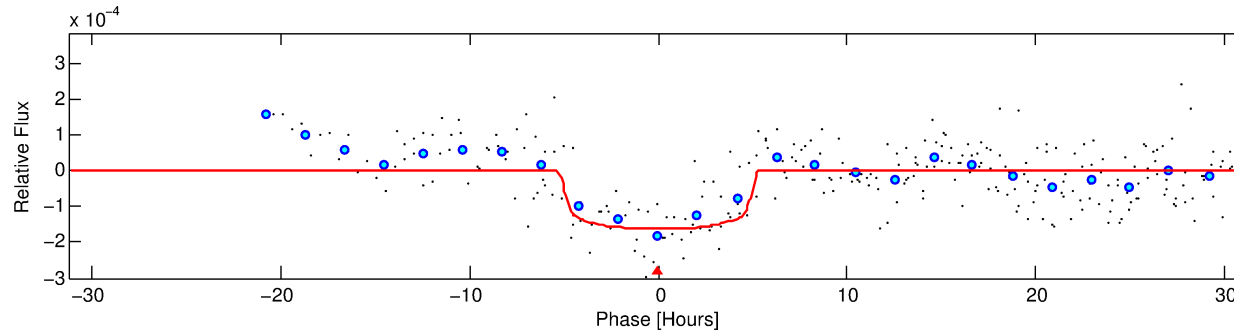
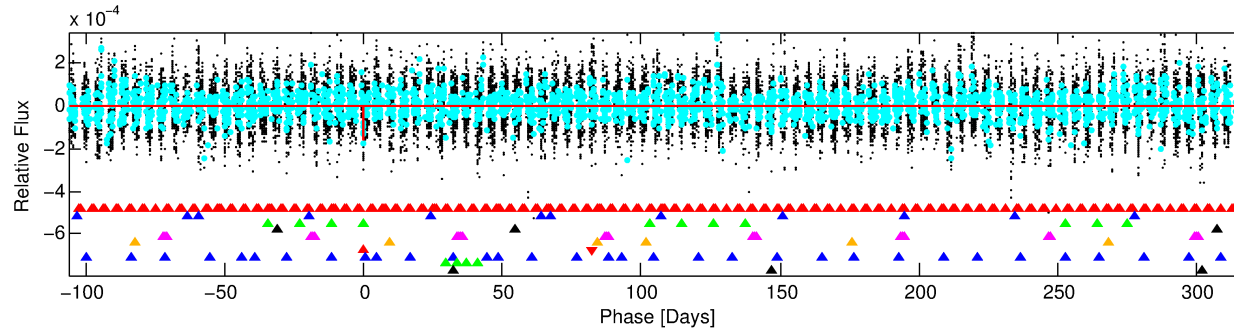
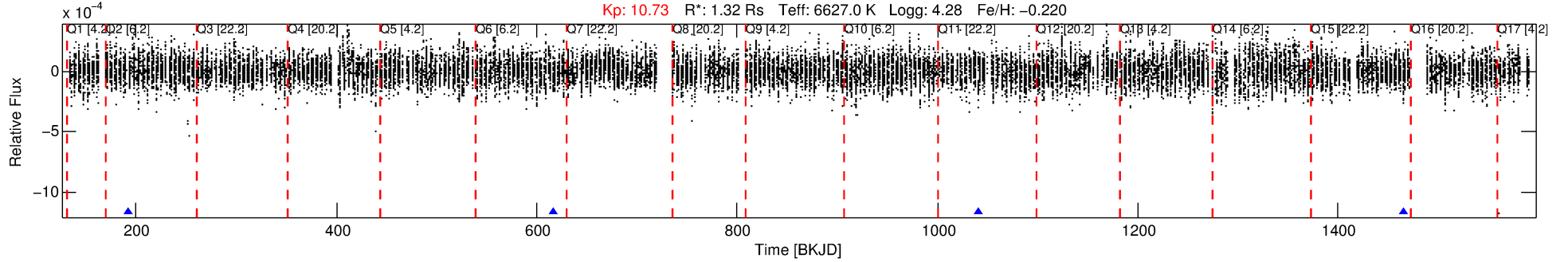
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 003631985-07

No Significant Match Found

DV One-Page Summary

KIC: 3631985 Candidate: 7 of 10 Period: 424.407 d



DV Fit Results:

Period = 424.40694 [0.00638] d
Epoch = 192.5917 [0.0131] BKJD
Rp/R* = 0.0132 [0.0021]
a/R* = 175.86 [131.39]
b = 0.84 [0.26]
Seff = 2.18 [0.84]
Teq = 310 [30] K
Rp = 1.89 [0.66] Re
a = 1.1738 [0.2947] AU
Ag = 18760.06 [10656.01] [1.76 σ]
Teffp = 5603 [660] K [8.01 σ]

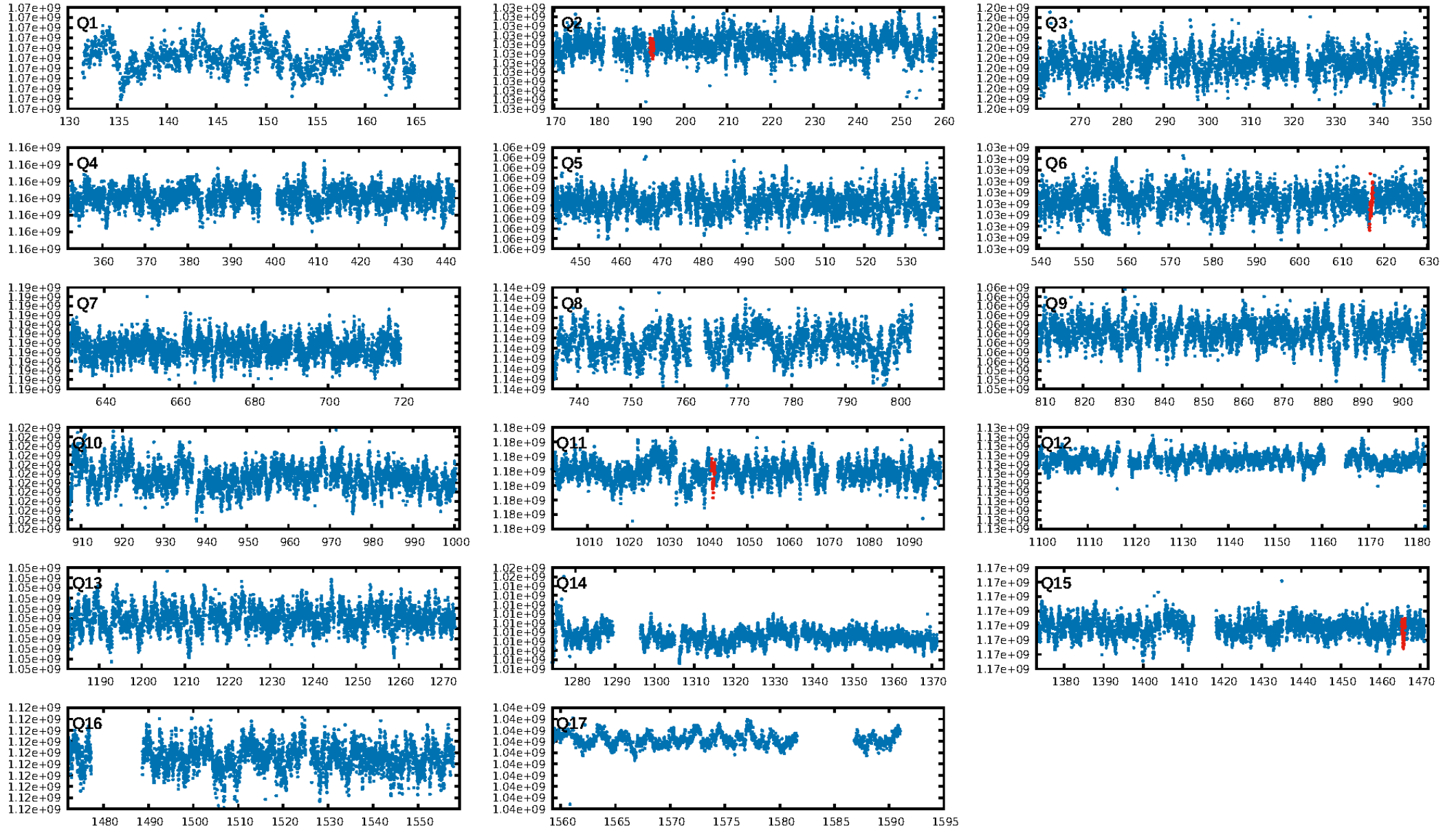
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [204.83 σ]
LongPeriod-sig: 100.0% [6.17 σ]
ModelChiSquare2-sig: 77.4%
ModelChiSquareGof-sig: 98.9%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 2.191
Centroid-sig: 5.3%
Centroid-so: 1.870 arcsec [1.40 σ]
OotOffset-rm: 1.886 arcsec [13.92 σ]
KicOffset-rm: 1.947 arcsec [14.34 σ]
OotOffset-st: 0/1/0/0 [1]
KicOffset-st: 0/1/0/0 [1]
DiffImageQuality-fgm: 1.00 [1/1]
DiffImageOverlap-fno: 0.67 [2/3]

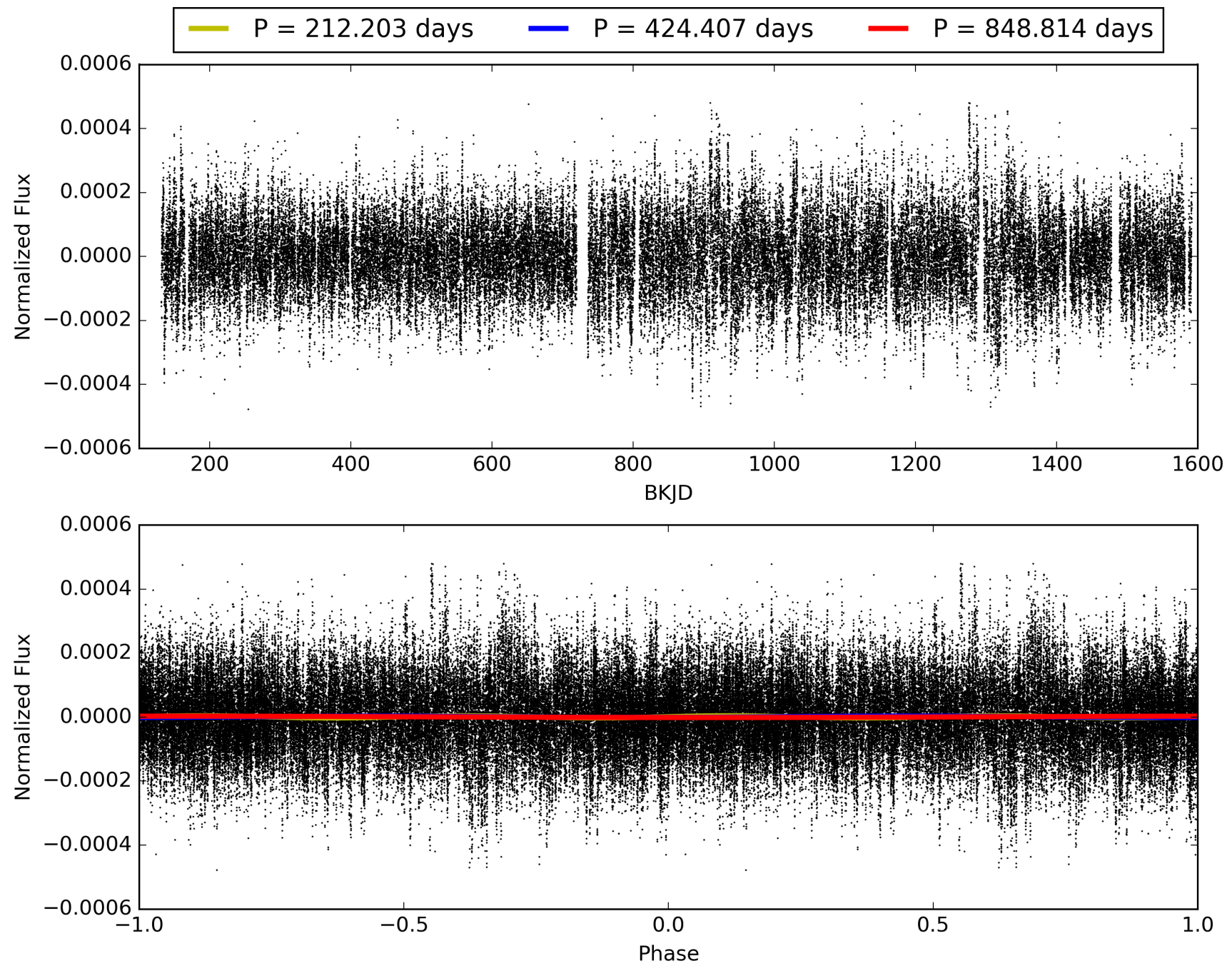
Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 18:55:51 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 003631985-07, PDC Light Curves

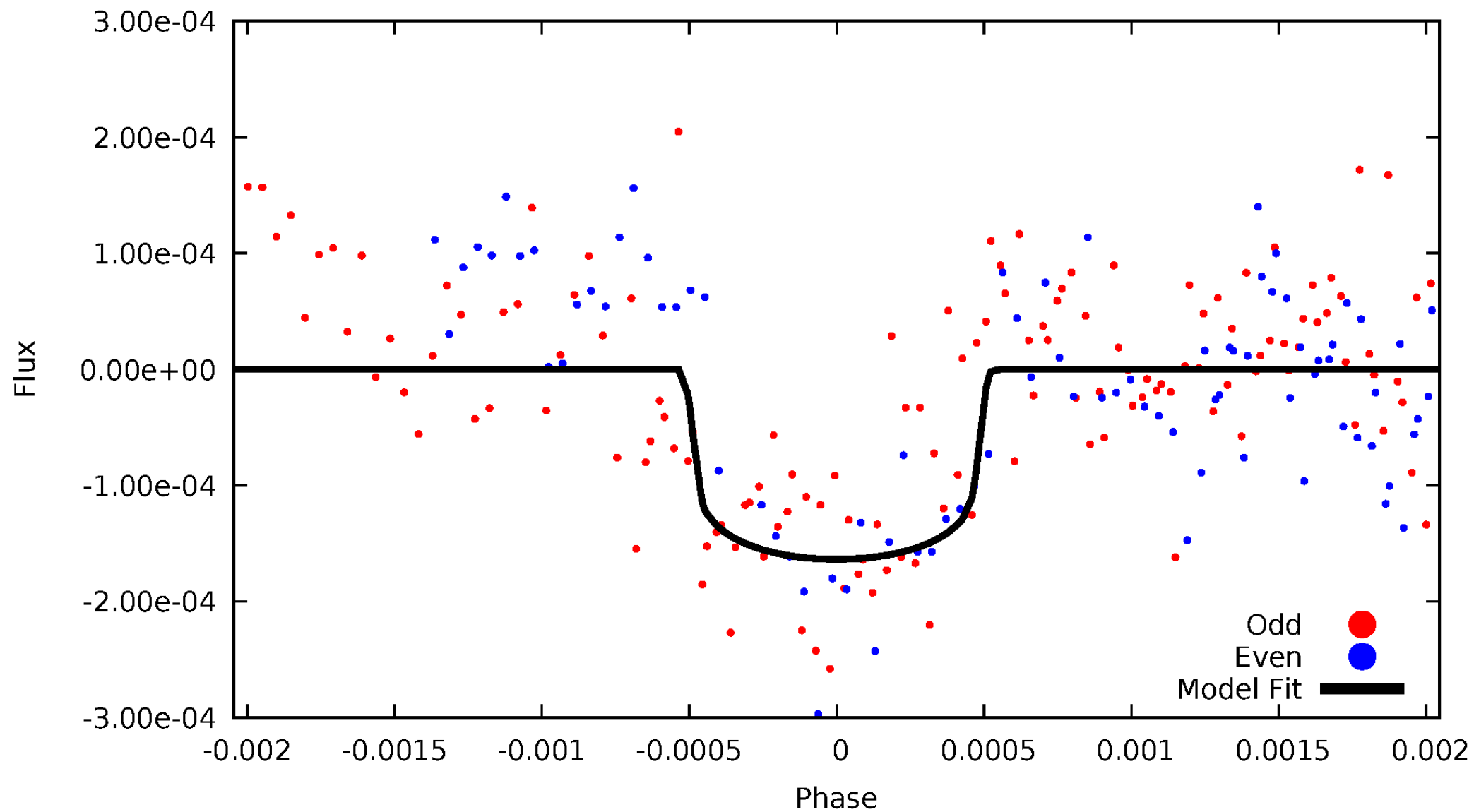


TCE 003631985-07



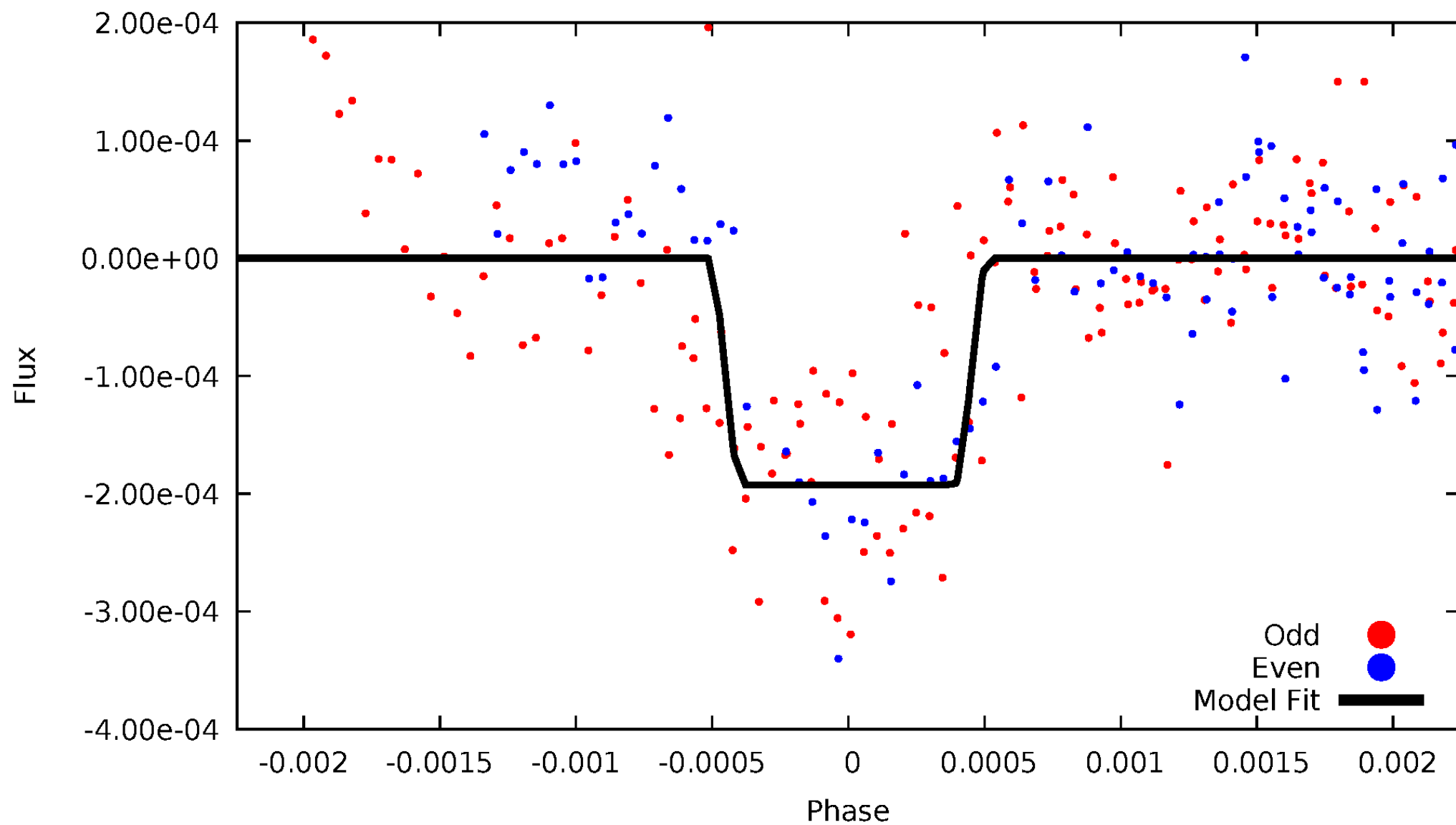
DV Odd/Even

TCE 003631985-07



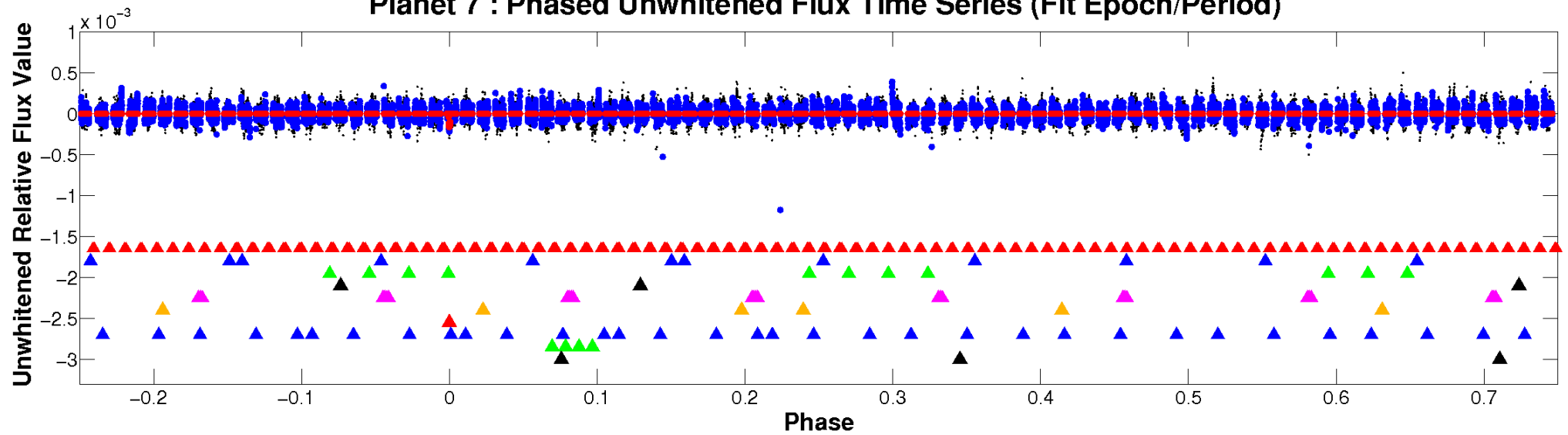
ALT Odd/Even

TCE 003631985-07

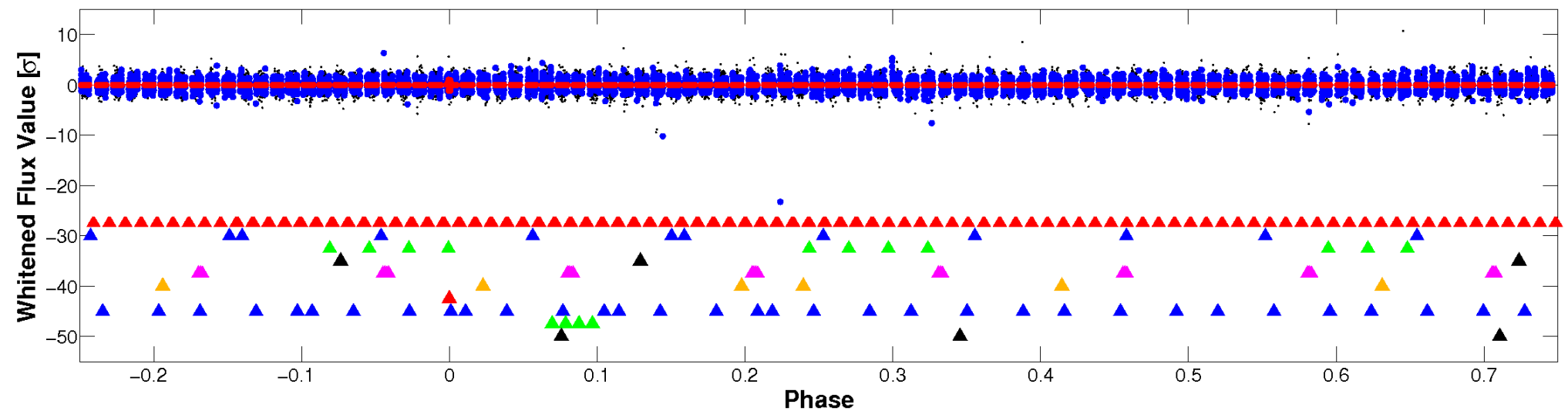


Non-Whitened Vs. Whitened Light Curve

Planet 7 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)



Planet 7 : Phased Whitened Flux Time Series (Fit Epoch/Period)



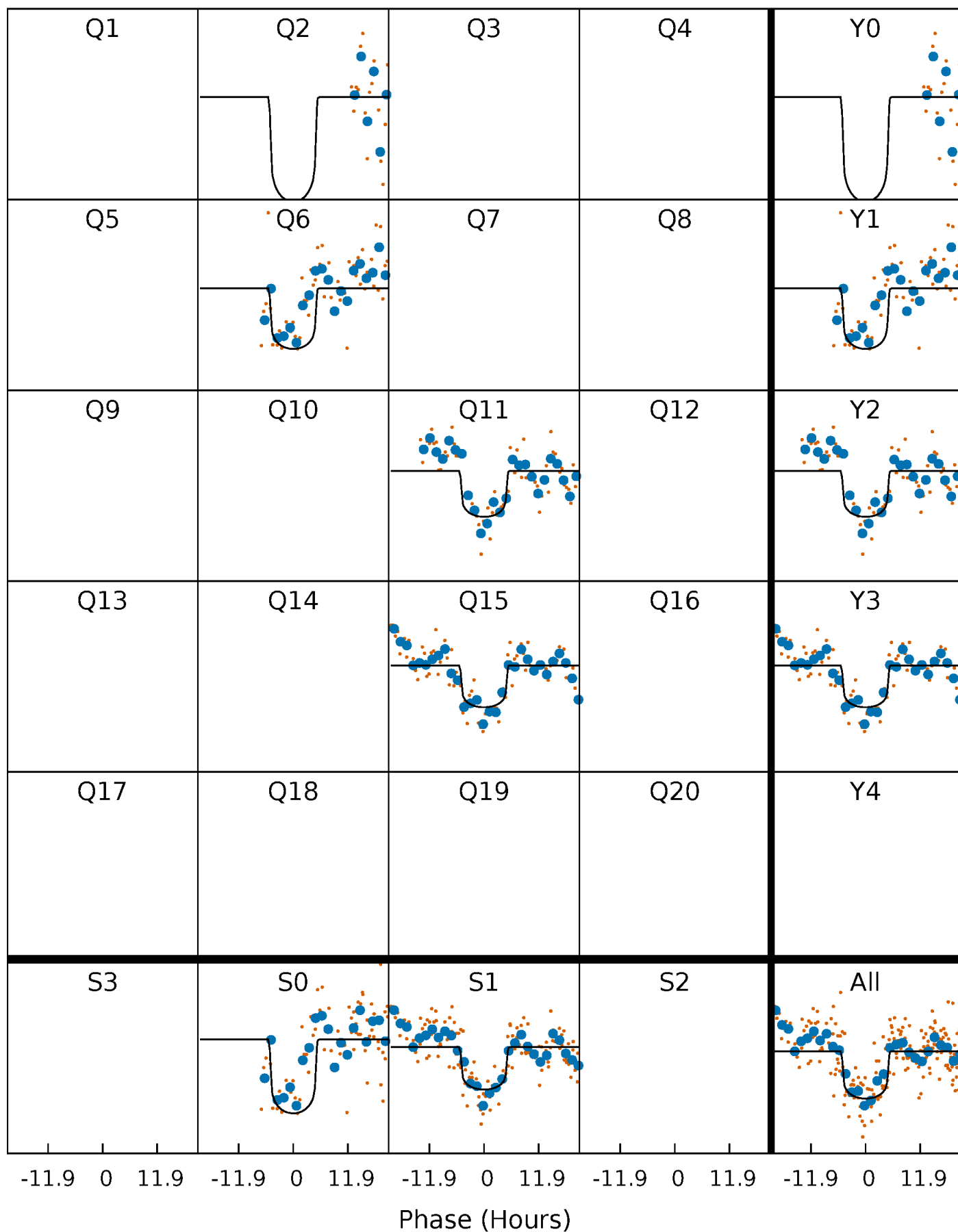
PDC Quarter-Phased Transit Curves

TCE 003631985-07 P=424.406935 Days $T_0=192.591667$ (BKJD)



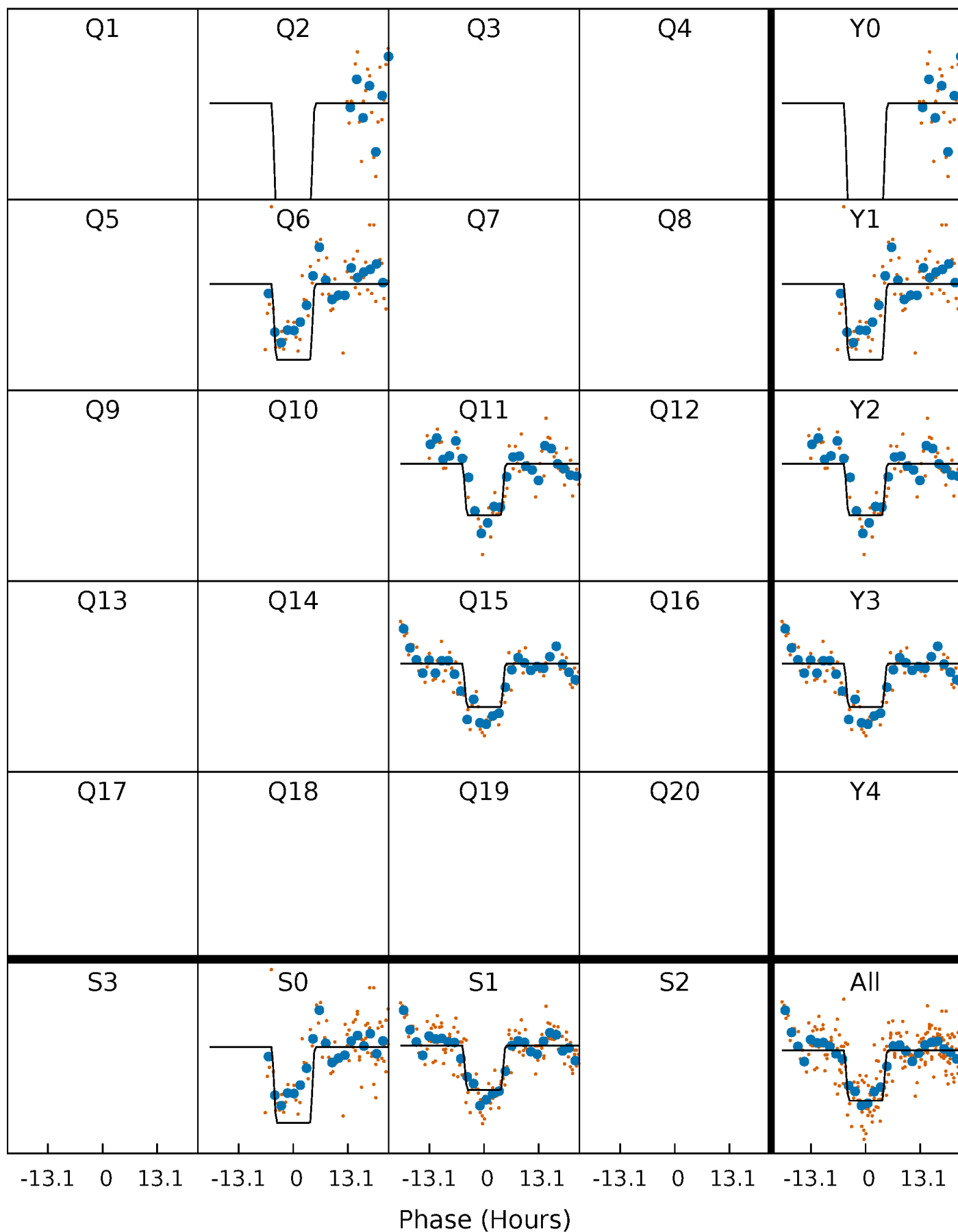
DV Quarter-Phased Transit Curves

TCE 003631985-07 P=424.406935 Days $T_0=192.591667$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

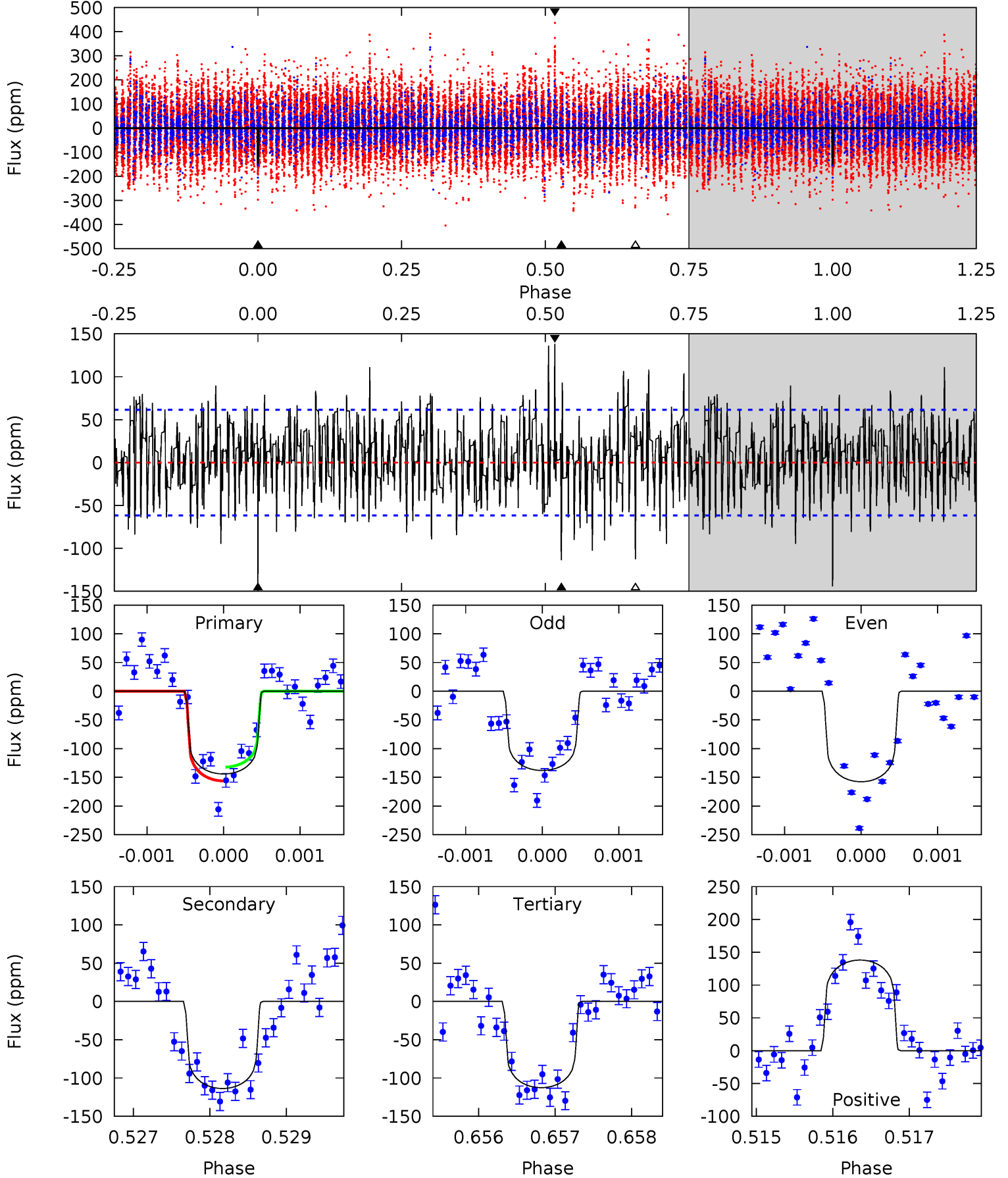
TCE 003631985-07 P=424.405041 Days $T_0=192.584219$ (BKJD)



DV Model-Shift Uniqueness Test

003631985-07, P = 424.406935 Days, E = 192.591667 Days

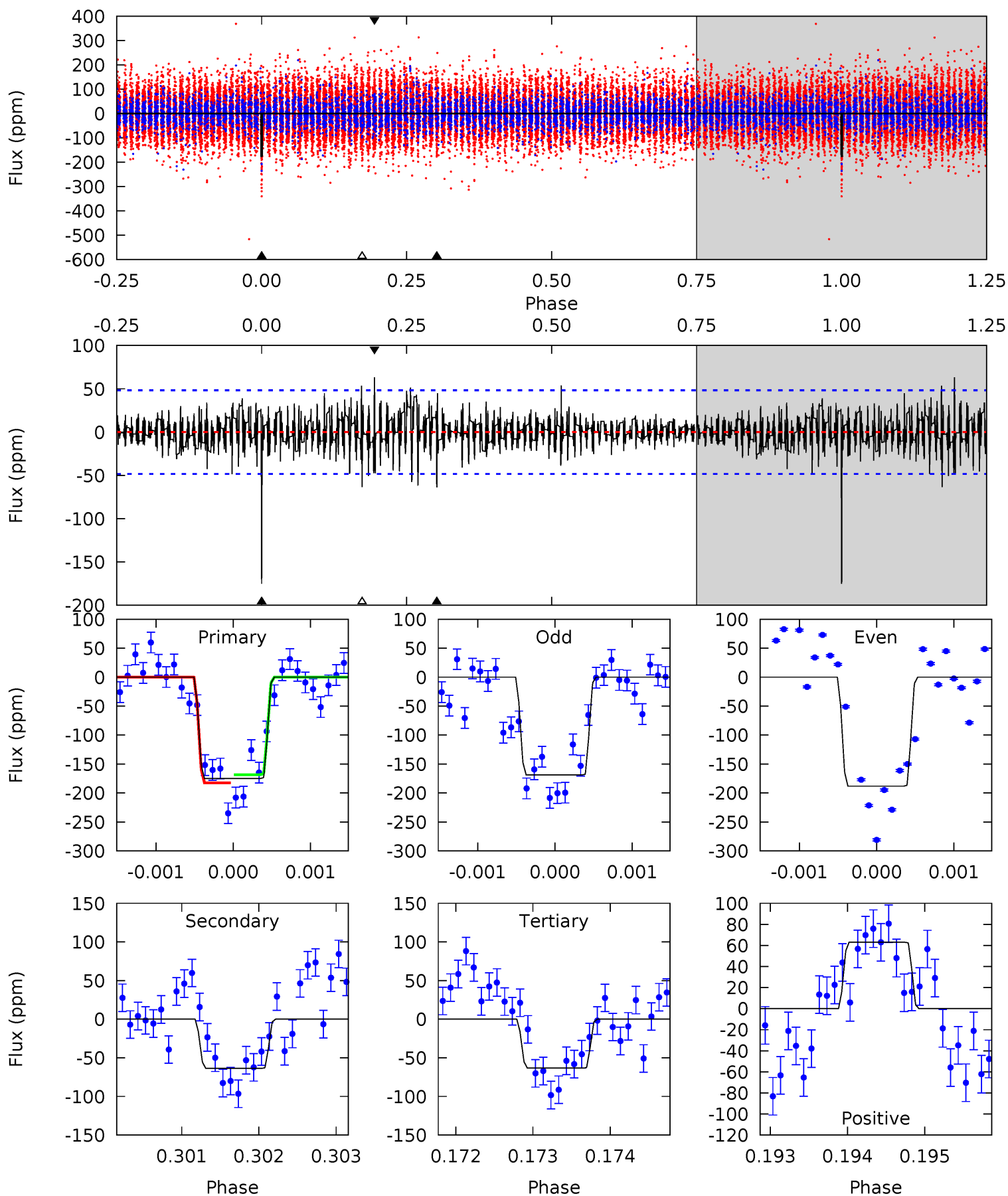
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.8	10.1	9.96	12.2	5.44	3.28	3.13	2.80	0.54	0.10	-2.16	0.80	0.92	0.49	1.05



Alt Model-Shift Uniqueness Test

003631985-07, P = 424.405041 Days, E = 192.584219 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.7	7.18	7.15	7.11	5.45	3.29	1.66	12.6	12.6	0.04	0.07	1.01	0.93	0.26	0.80



Stellar Parameters For KIC 003631985

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6627^{+186}_{-255}	$4.277^{+0.124}_{-0.186}$	$-0.220^{+0.250}_{-0.300}$	$1.317^{+0.408}_{-0.220}$	$1.204^{+0.183}_{-0.183}$	$0.742^{+0.432}_{-0.369}$
	+3%/-4%	+3%/-4%	+114%/-136%	+31%/-17%	+15%/-15%	+58%/-50%
Source	PHO54	PHO54	PHO54	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 003631985-07 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-114 ± 11	$1.93^{+0.43}_{-0.38}$	437^{+34}_{-28}	5934^{+635}_{-480}	22881^{+13023}_{-7564}
Alt.	-64 ± 9	$2.01^{+0.48}_{-0.39}$	435^{+31}_{-26}	5089^{+444}_{-393}	11808^{+6303}_{-4113}

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{obs} \gg T_{max}$ AND $A_{obs} \gg 1.0$

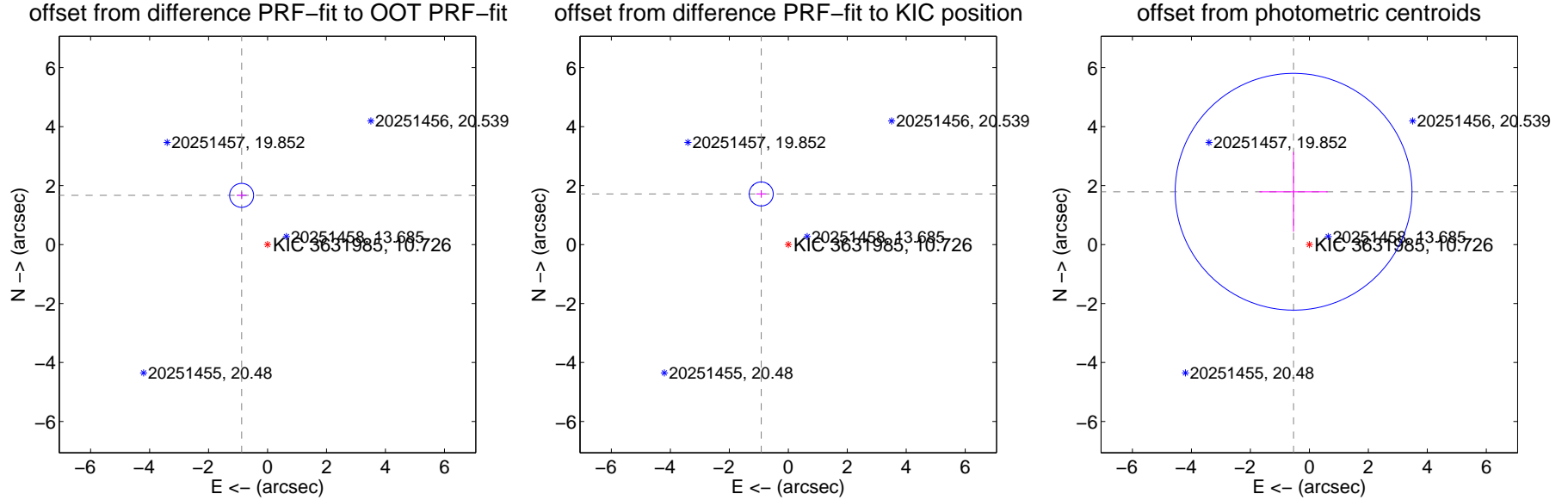
DV Centroid Data

Supplemental centroid analysis for 003631985-07. **Kepler magnitude: 10.73.** Transit SNR 8.26

There are 1 quarters with good PRF difference image offsets

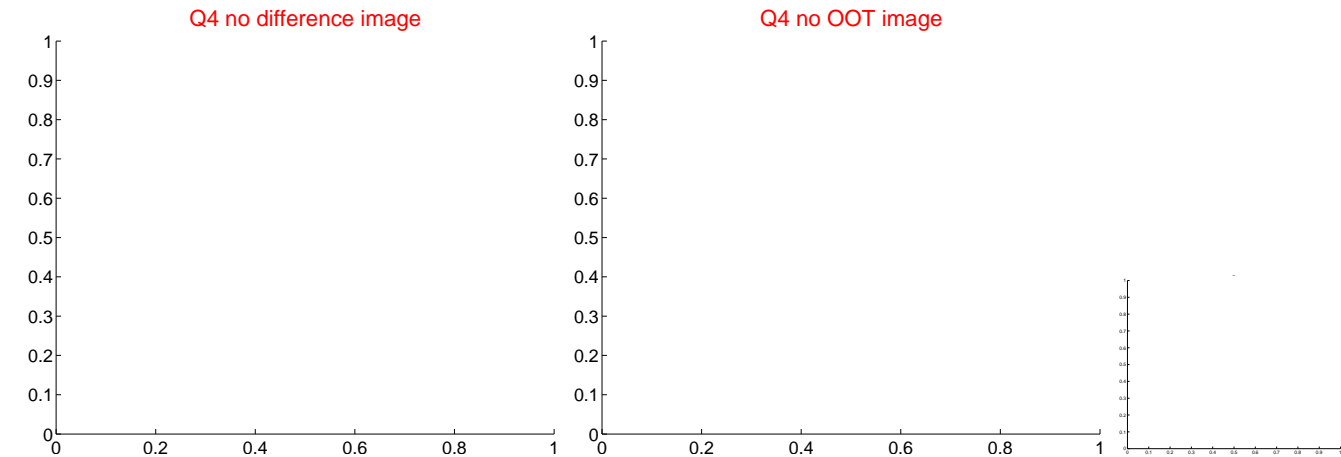
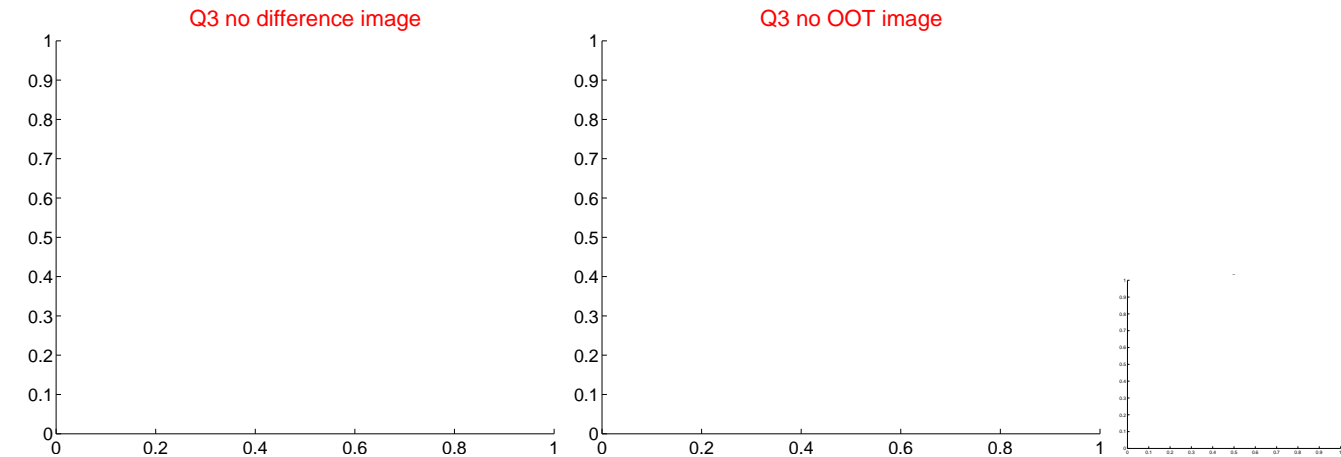
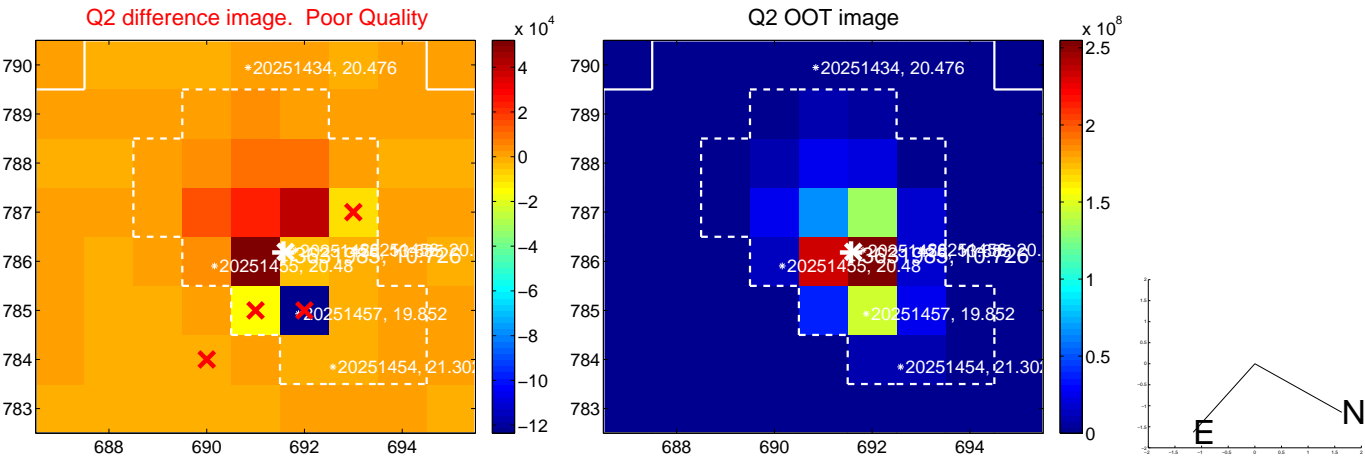
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.886 \pm 0.136	13.92	0.879 \pm 0.169	1.669 \pm 0.125
PRF-fit source offset from KIC position	1.947 \pm 0.136	14.34	0.918 \pm 0.169	1.717 \pm 0.125
photometric centroid source offset	1.87 \pm 1.34	1.40	0.54 \pm 1.16	1.79 \pm 1.35

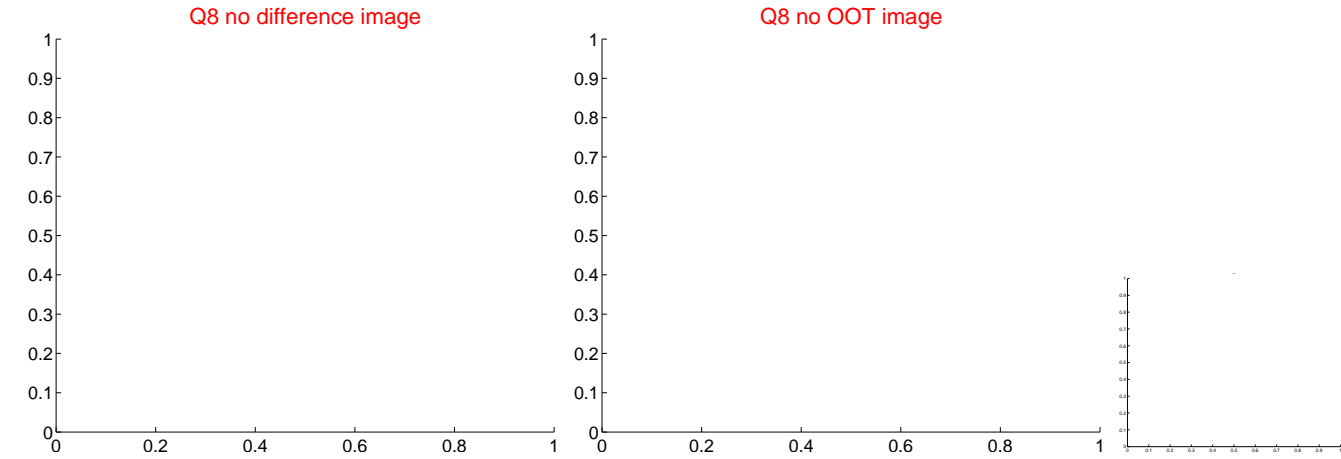
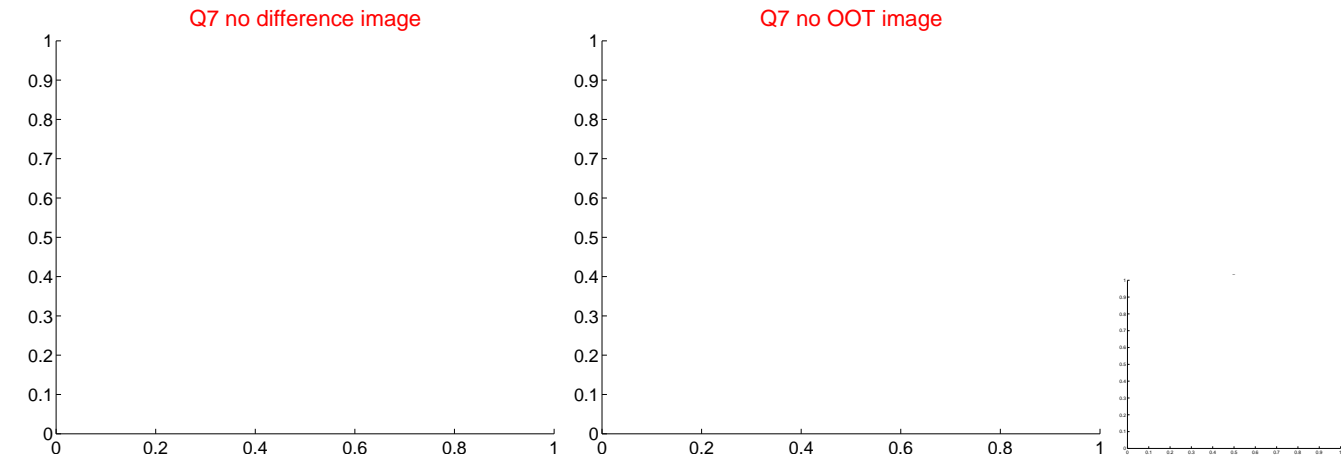
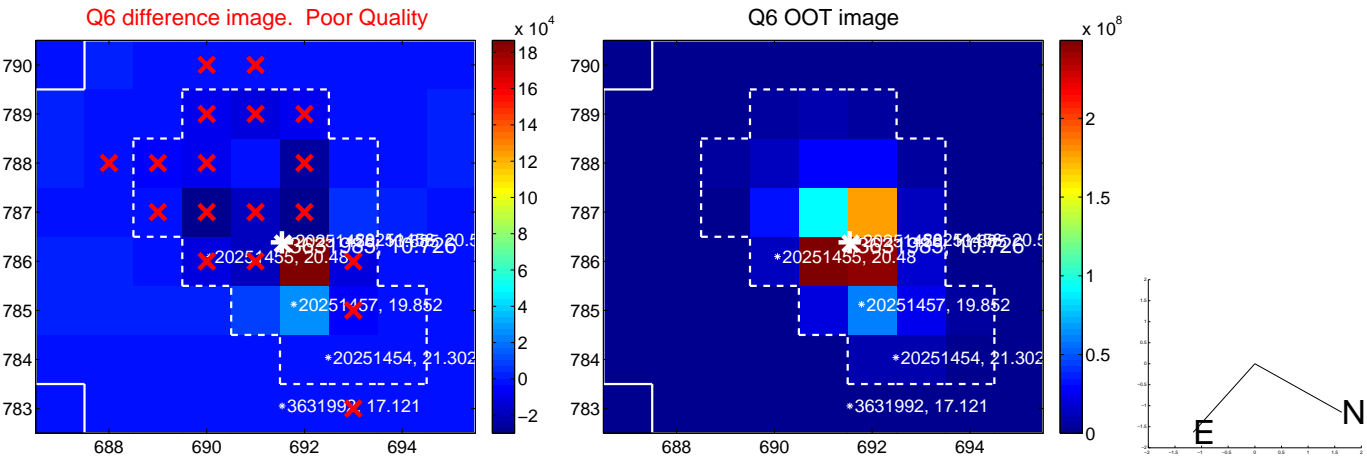


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



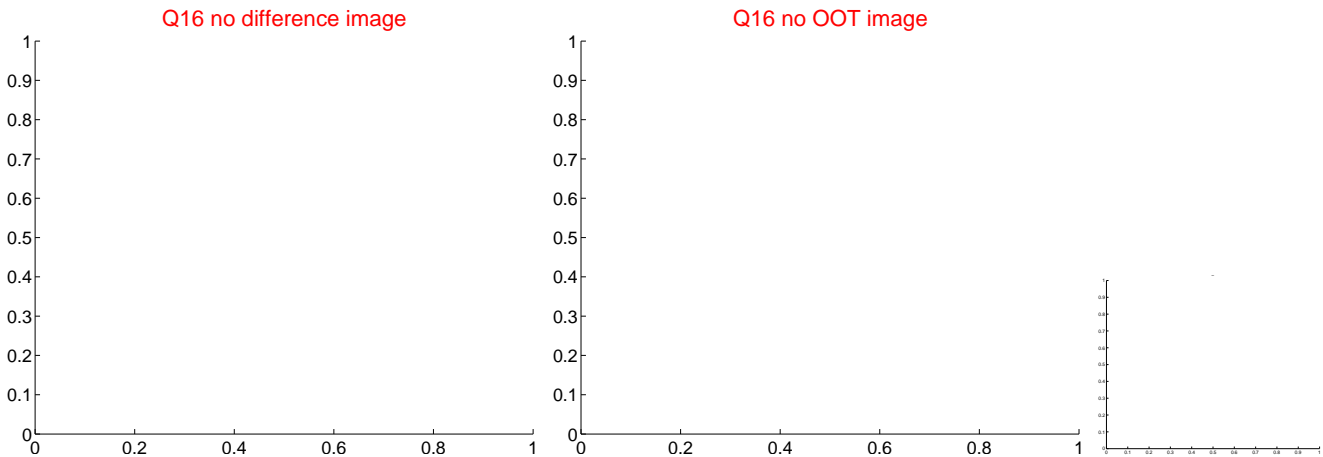
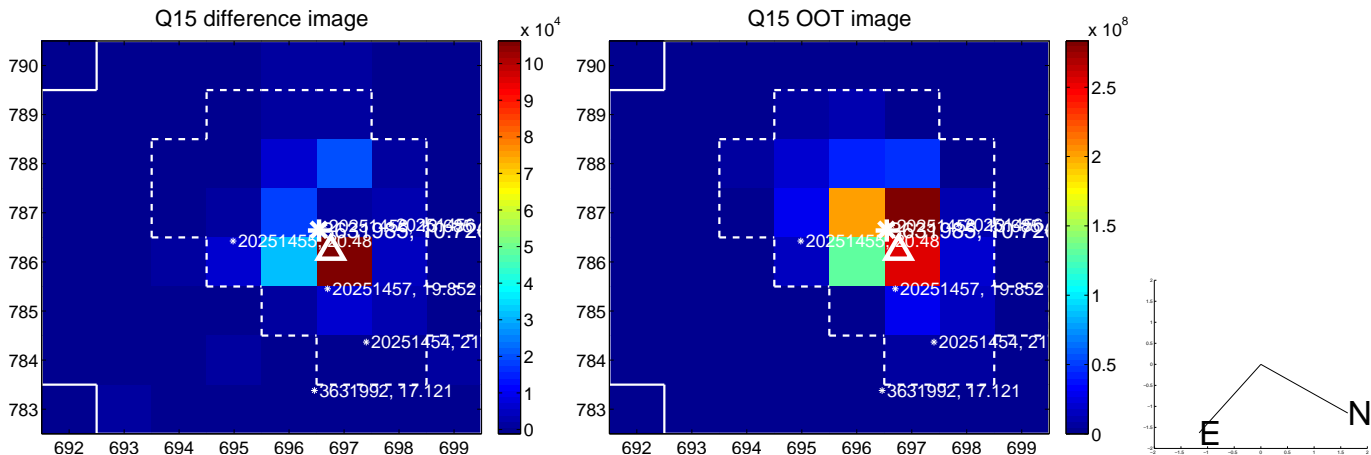
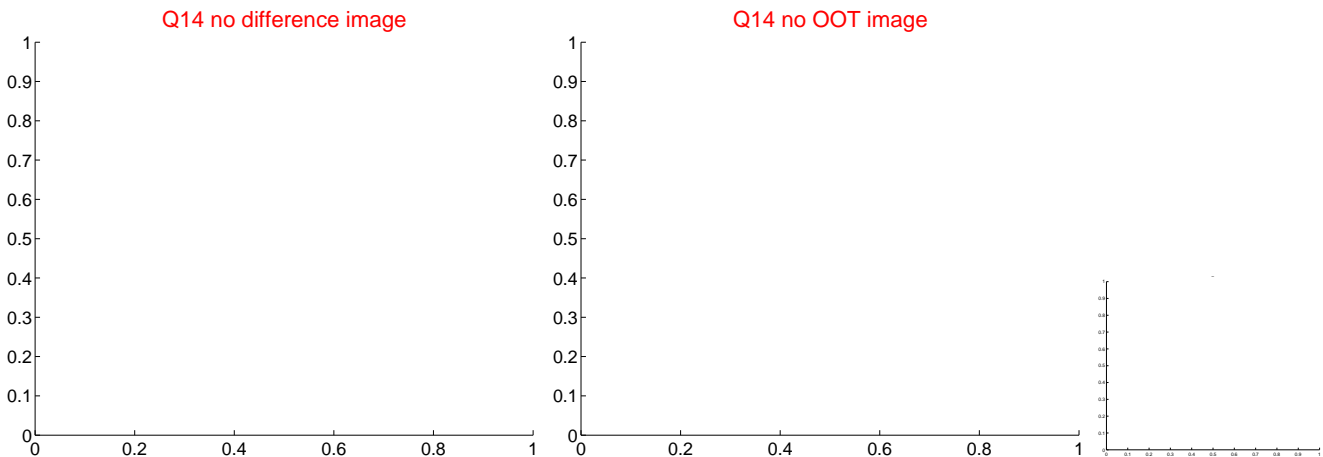
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



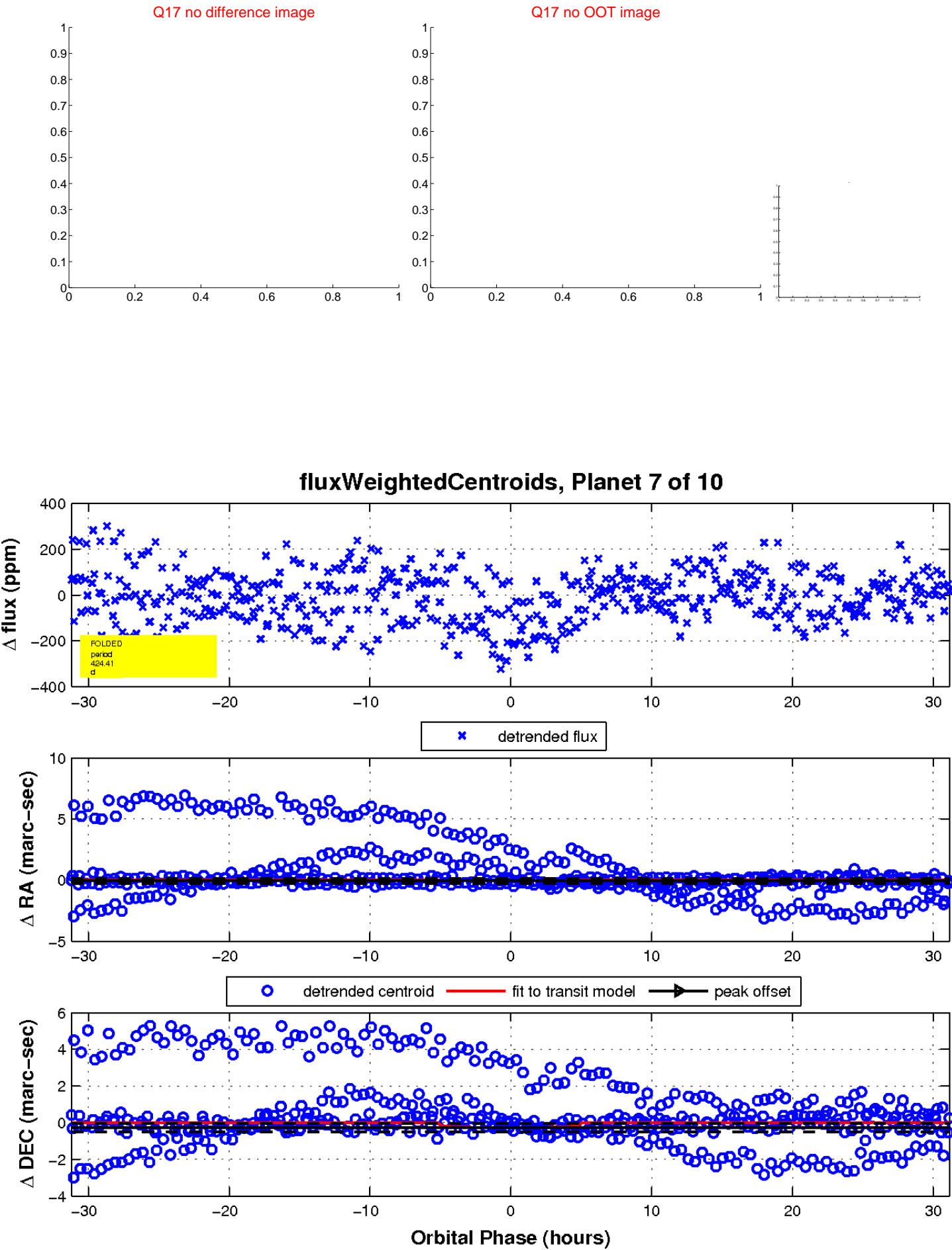
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value

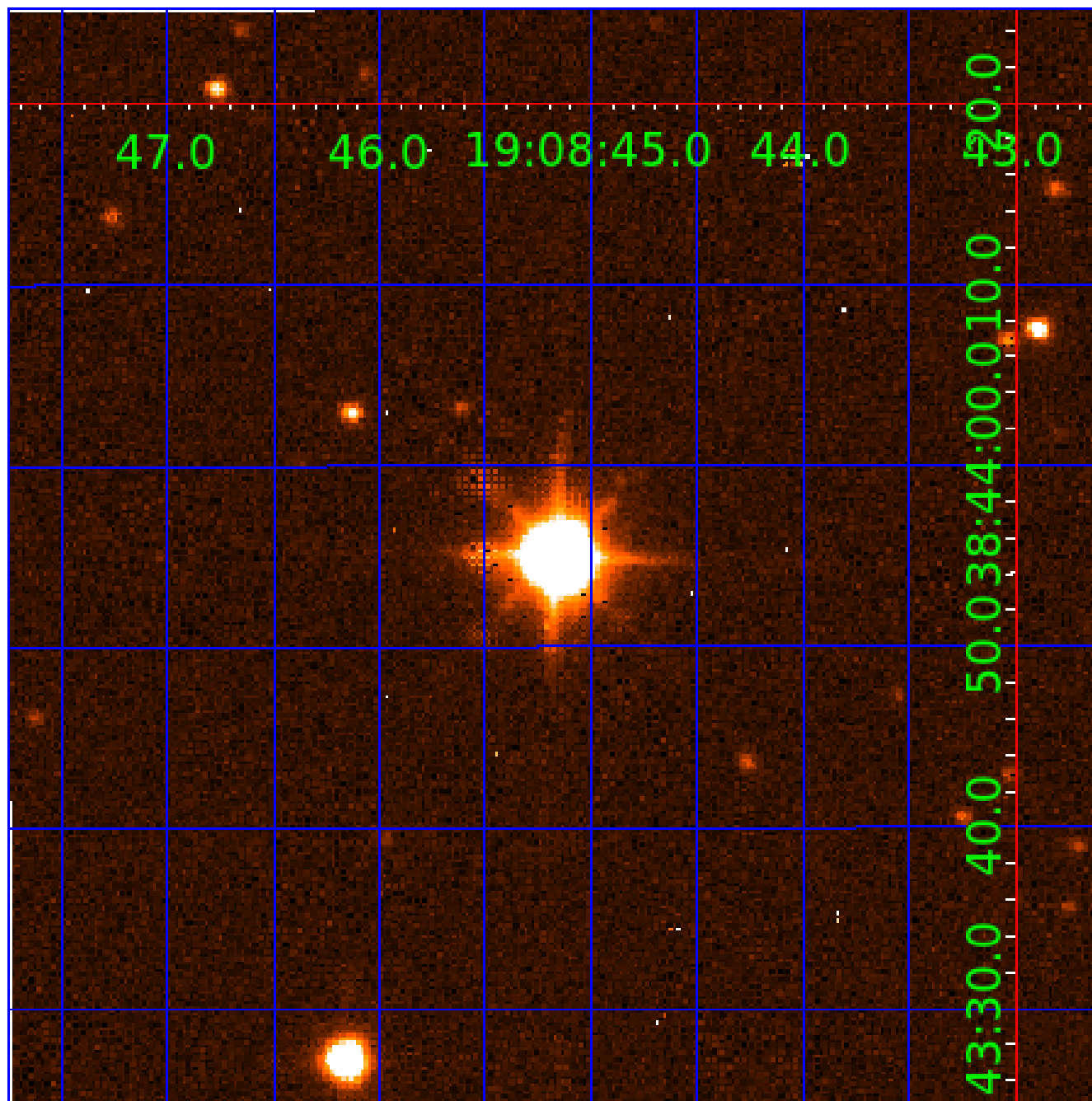


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 003631985

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
003631985-01	OBS	No	4.560527	132.026788	8.1	19.919	7.2	3.3	1.32	6627	0.43	917.35
003631985-02	OBS	No	126.957570	133.100780	130.0	12.168	10.5	8.9	1.32	6627	1.75	10.87
003631985-03	OBS	No	137.684361	192.319484	115.3	12.440	10.0	7.8	1.32	6627	1.55	9.76
003631985-04	OBS	No	510.471188	499.727737	148.5	5.818	9.2	8.6	1.32	6627	1.84	1.70
003631985-05	OBS	No	52.982172	175.171808	95.5	4.252	9.2	8.7	1.32	6627	1.48	34.86
003631985-07	OBS	No	424.406935	192.591667	163.7	10.410	9.1	8.3	1.32	6627	1.89	2.17
003631985-08	OBS	No	44.050048	148.961830	76.7	11.194	8.9	7.9	1.32	6627	1.30	44.59
003631985-09	OBS	No	428.258732	222.123753	150.7	10.780	9.0	8.9	1.32	6627	1.74	2.15
003631985-10	OBS	No	579.371898	339.223546	119.6	18.051	8.8	6.7	1.32	6627	1.69	1.44

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003631985-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
003631985-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED
003631985-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—CENT_SATURATED
003631985-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_SATURATED
003631985-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
003631985-07	OBS	FP	0.01	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED
003631985-08	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
003631985-09	OBS	FP	0.00	1	0	0	0	ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED
003631985-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

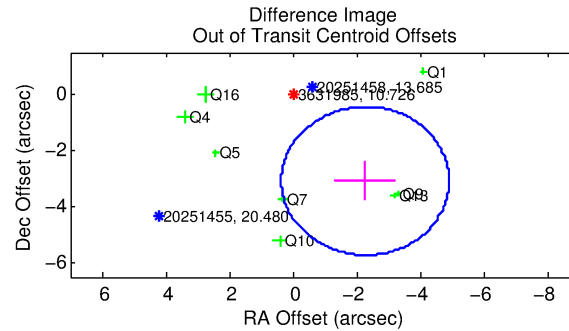
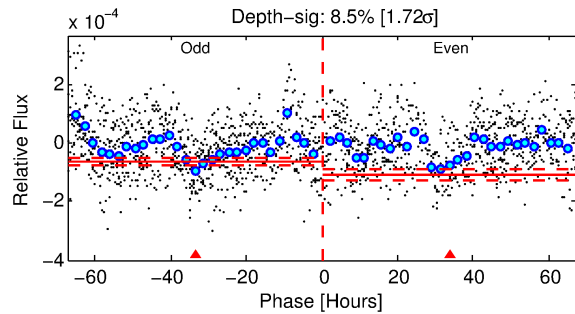
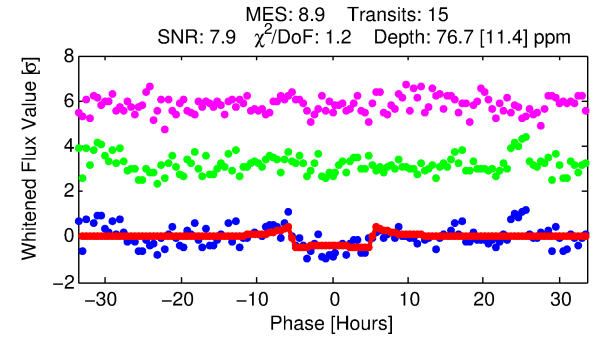
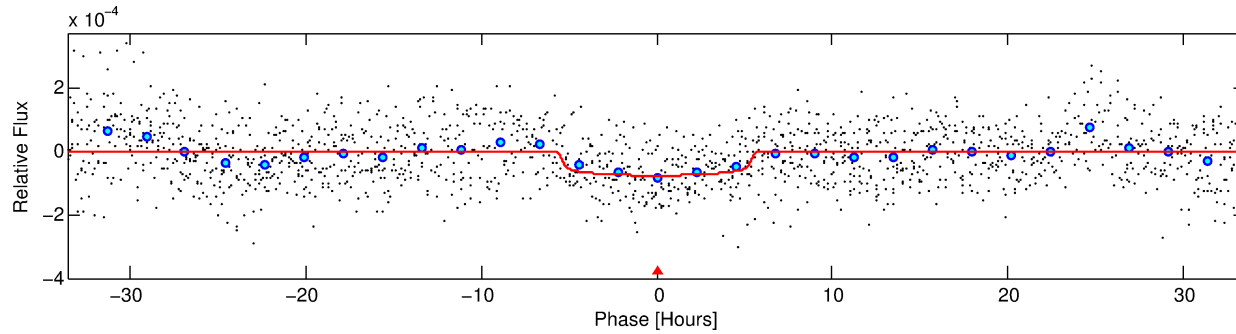
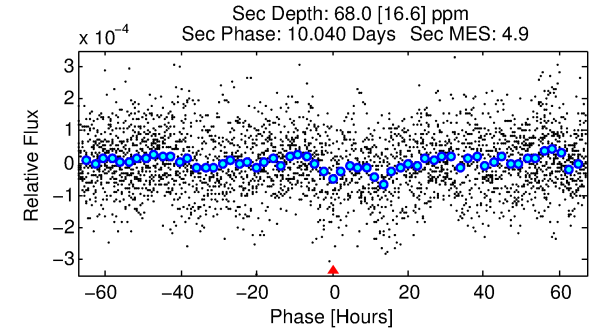
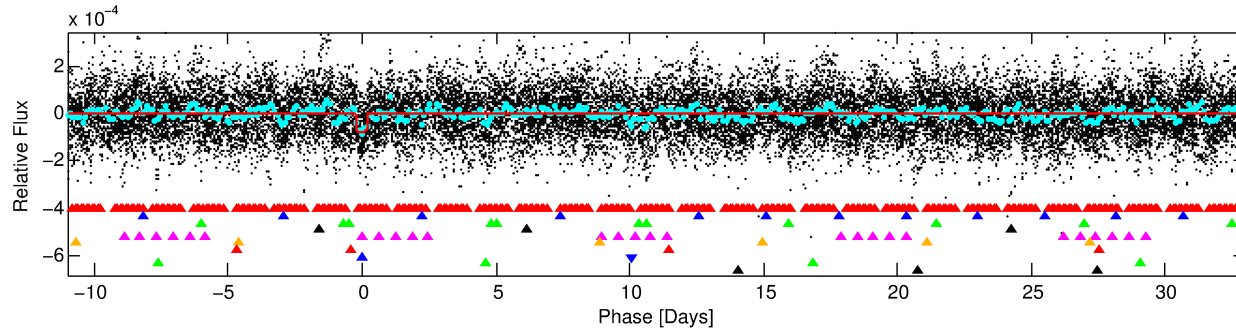
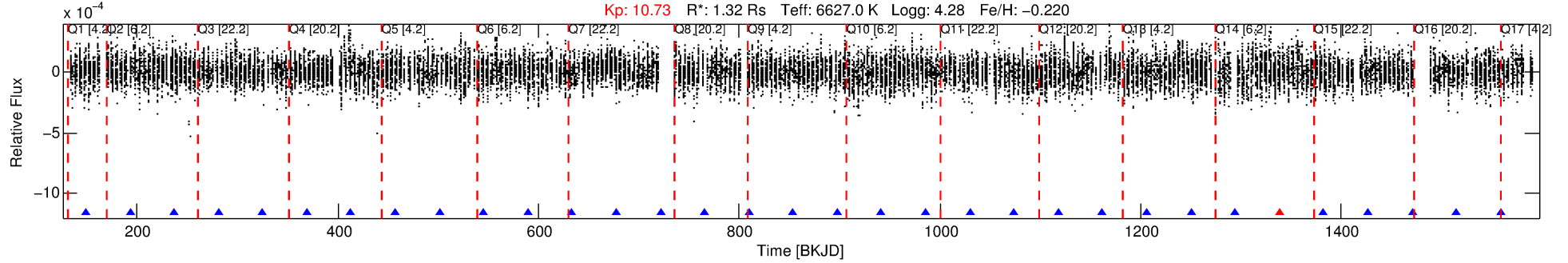
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 003631985-08

No Significant Match Found

DV One-Page Summary

KIC: 3631985 Candidate: 8 of 10 Period: 44.050 d



DV Fit Results:

Period = 44.05005 [0.00064] d
Epoch = 148.9618 [0.0114] BKJD
Rp/R* = 0.0090 [0.0016]
a/R* = 16.54 [14.28]
b = 0.85 [0.29]
Seff = 44.60 [17.15]
Teq = 659 [63] K
Rp = 1.30 [0.46] Re
a = 0.2592 [0.0651] AU
Ag = 1489.54 [827.77] [1.80σ]
Teffp = 6329 [722] K [7.82σ]

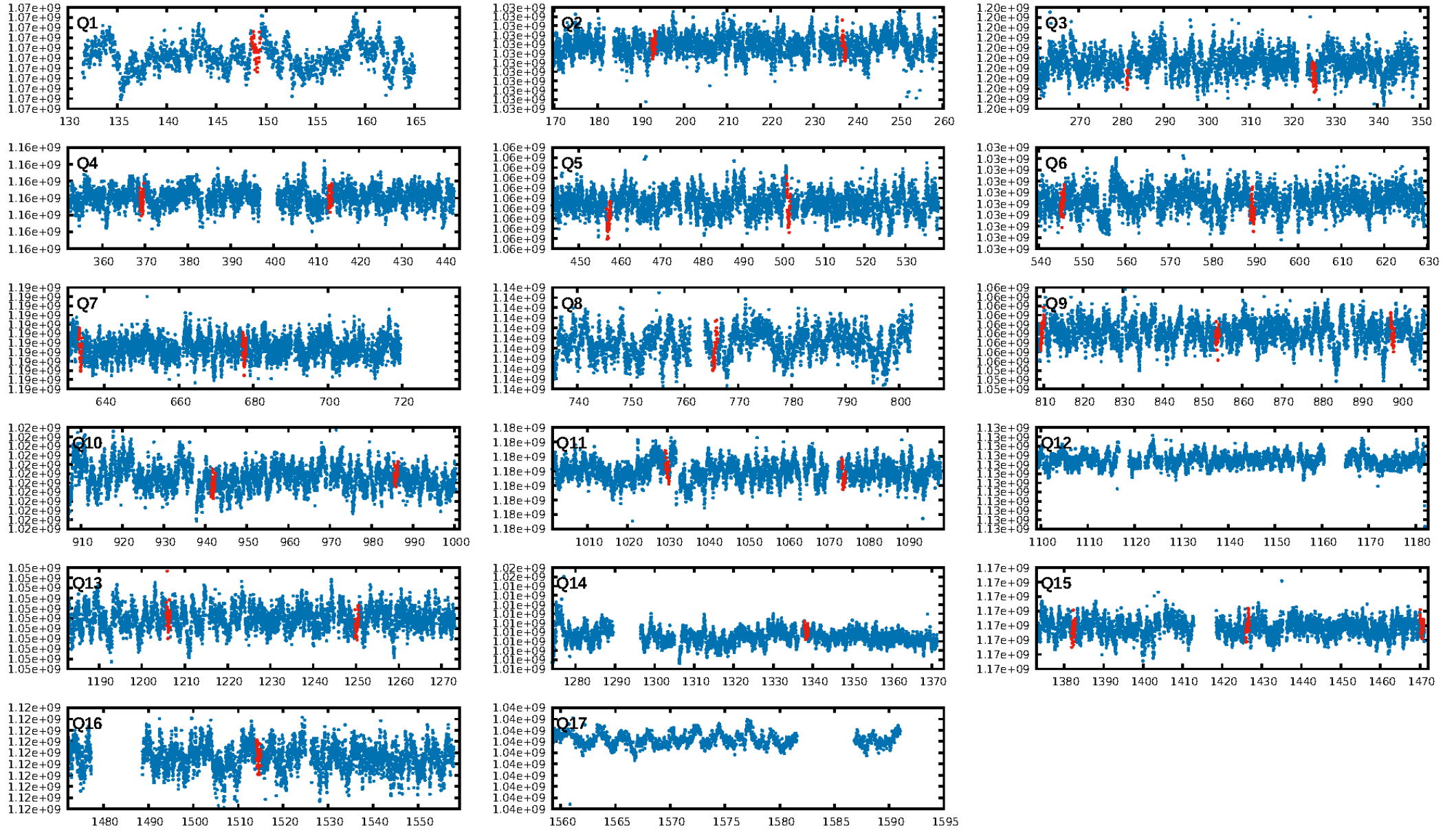
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [41.48σ]
LongPeriod-sig: 100.0% [17.90σ]
ModelChiSquare2-sig: 17.4%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 0.93 [13/14]
GhostDiagnostic-chr: 1.244
Centroid-sig: 0.6%
Centroid-so: 1.849 arcsec [1.67σ]
OotOffset-rm: 3.831 arcsec [4.35σ]
KicOffset-rm: 3.663 arcsec [4.31σ]
OotOffset-st: 1/1/2/4 [8]
KicOffset-st: 1/1/2/4 [8]
DiffImageQuality-fgm: 0.50 [4/8]
DiffImageOverlap-fno: 0.50 [6/12]

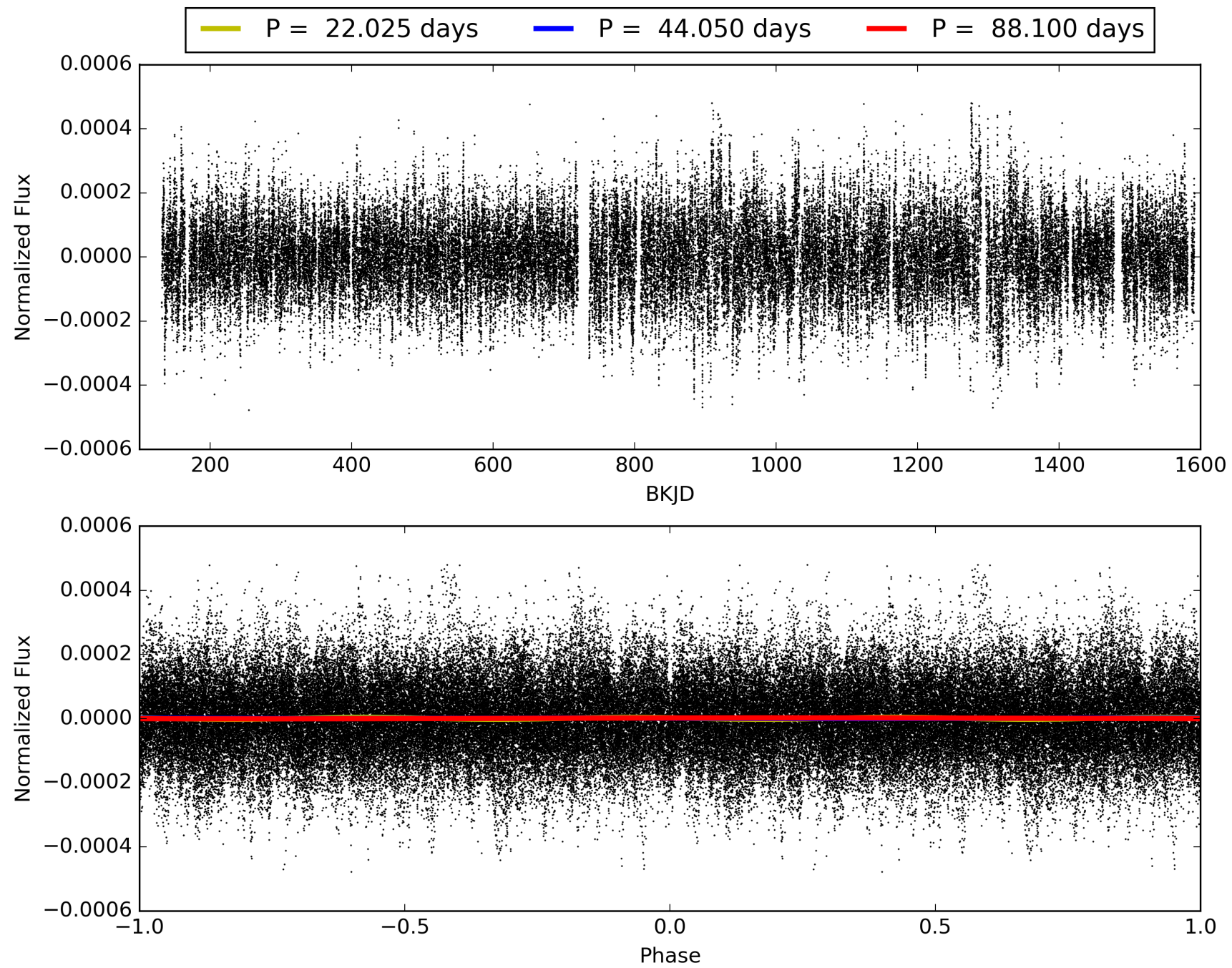
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 18:55:55 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 003631985-08, PDC Light Curves

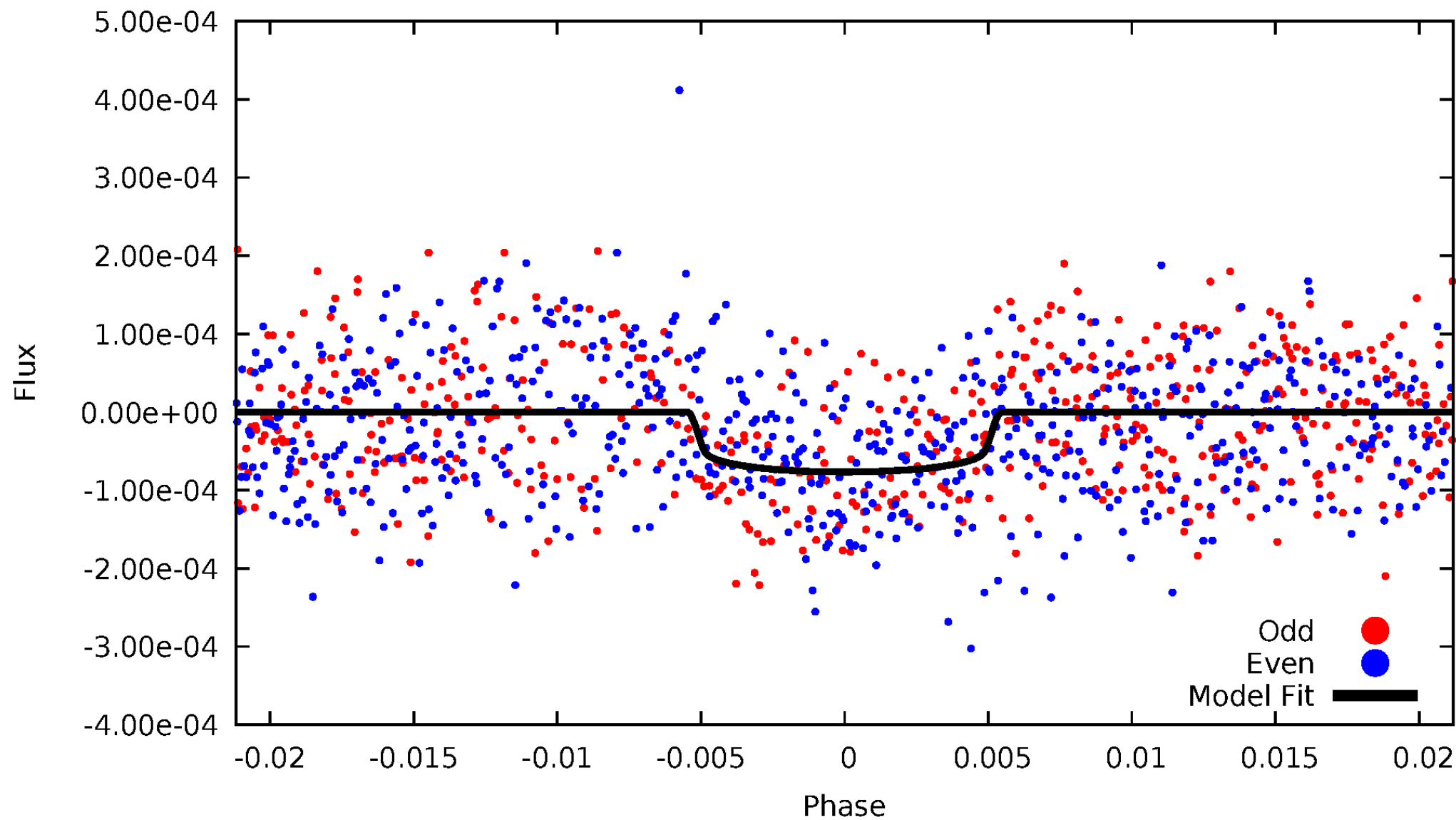


TCE 003631985-08



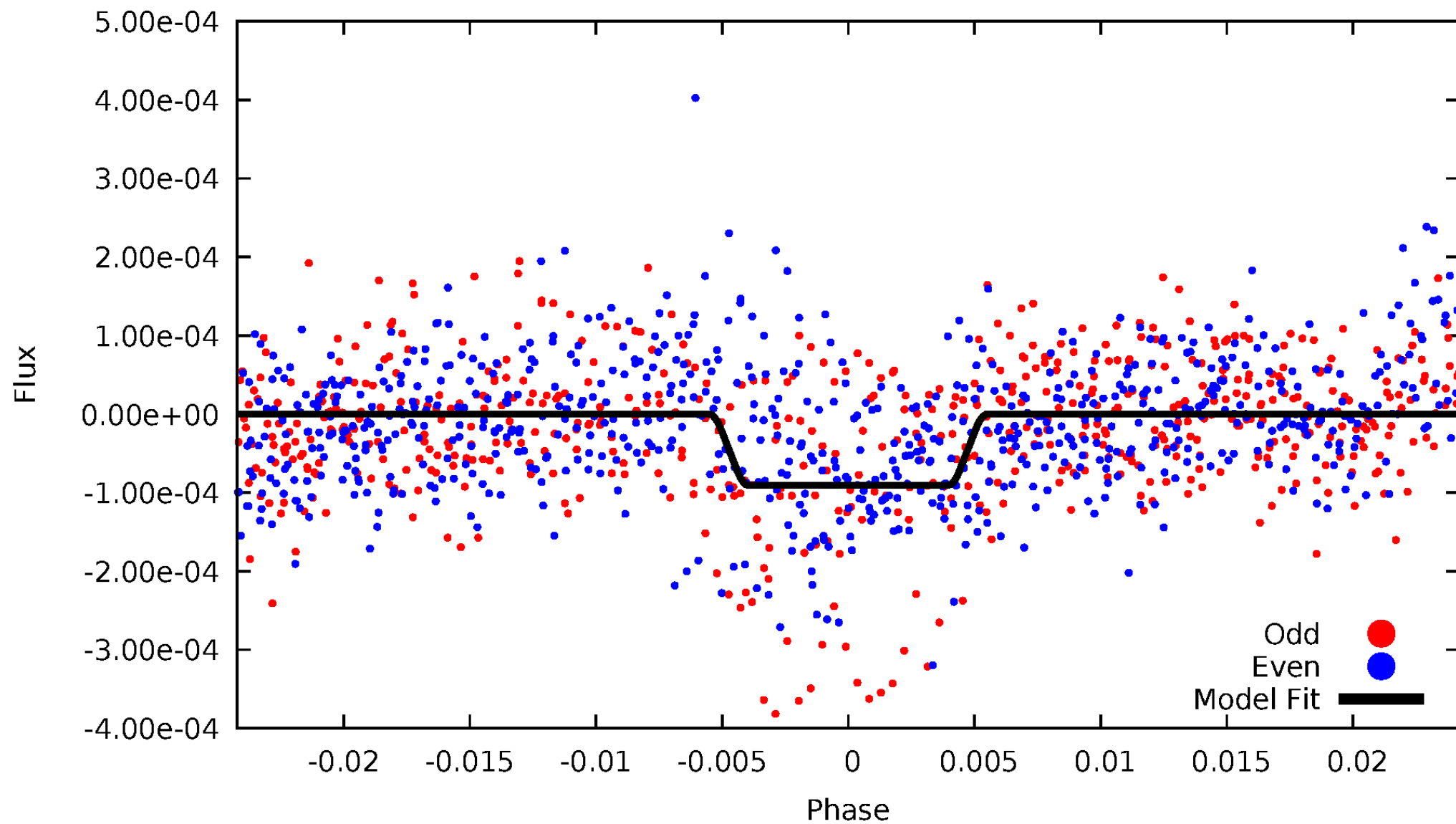
DV Odd/Even

TCE 003631985-08



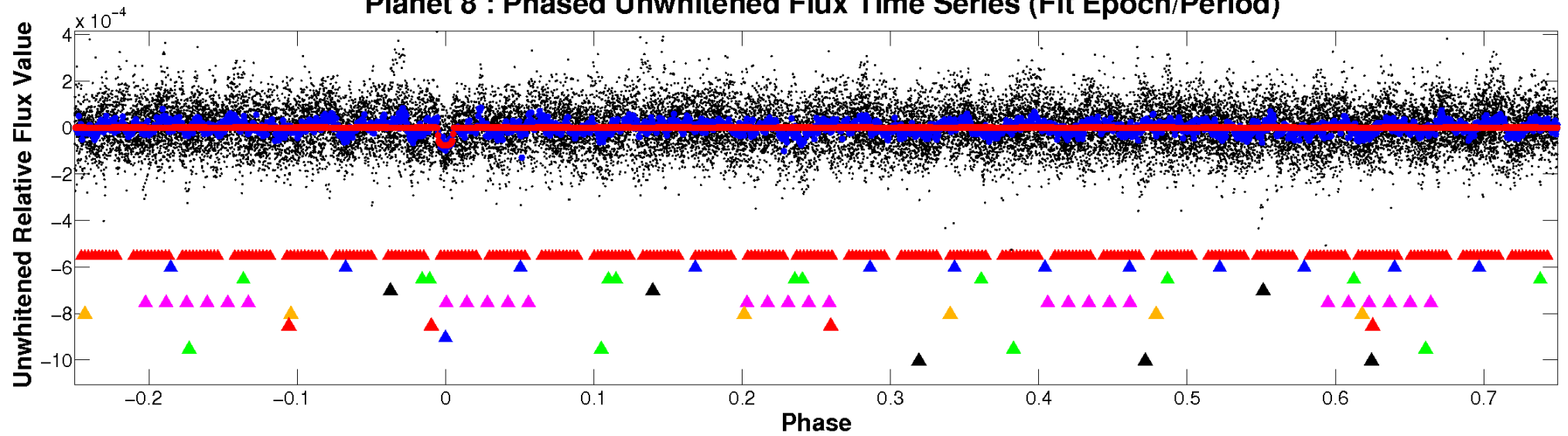
ALT Odd/Even

TCE 003631985-08

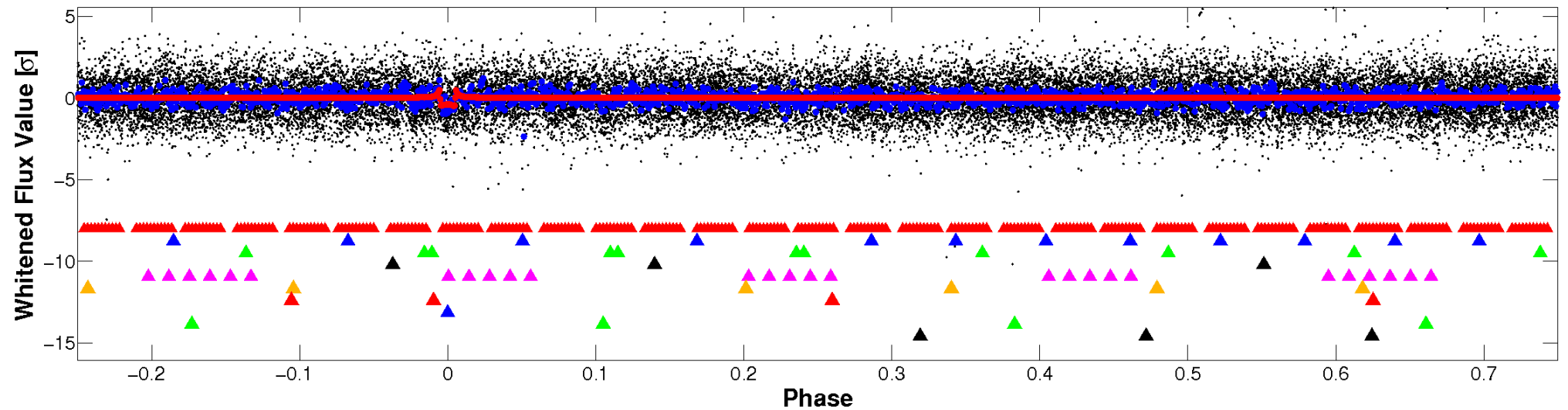


Non-Whitened Vs. Whitened Light Curve

Planet 8 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

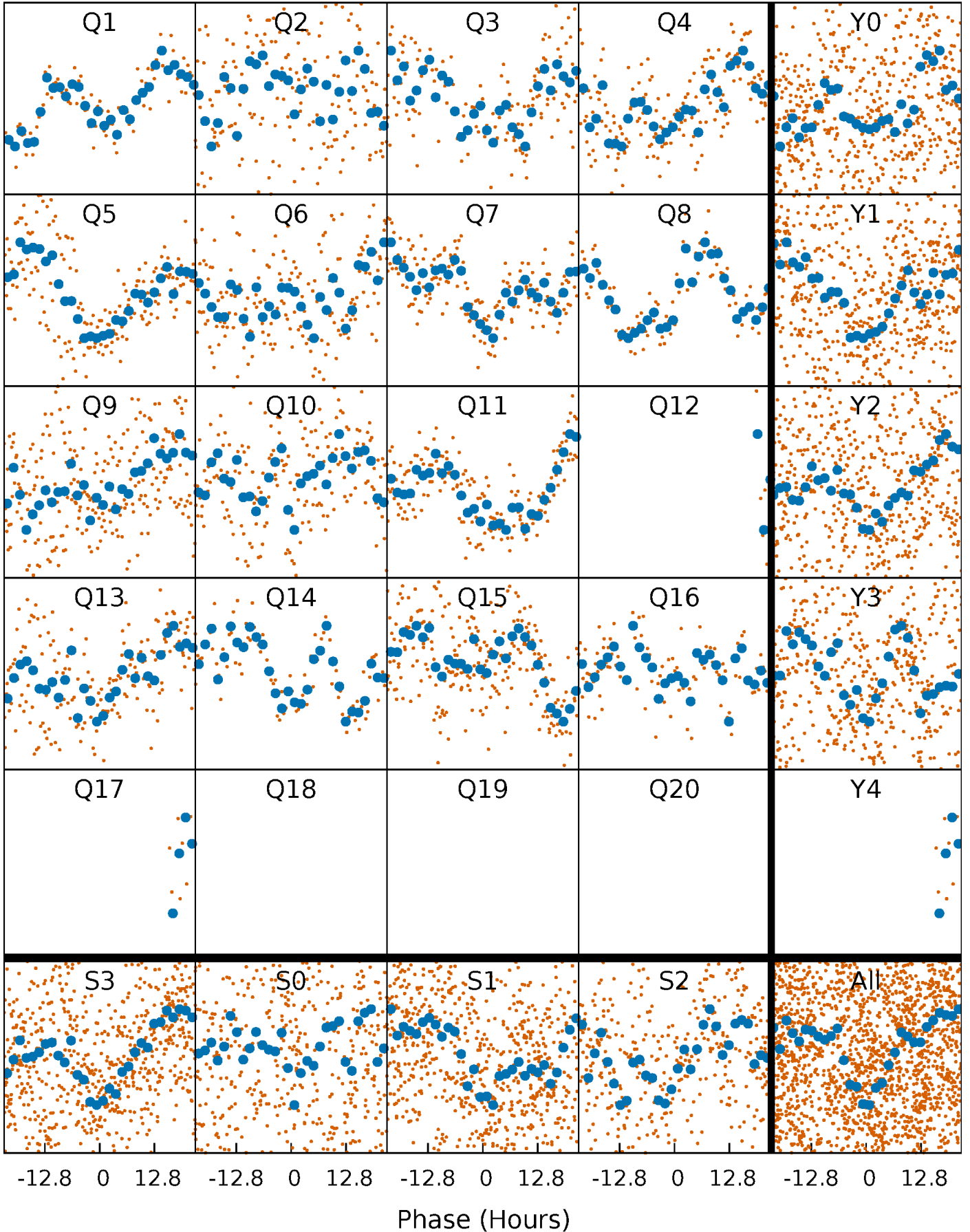


Planet 8 : Phased Whitened Flux Time Series (Fit Epoch/Period)



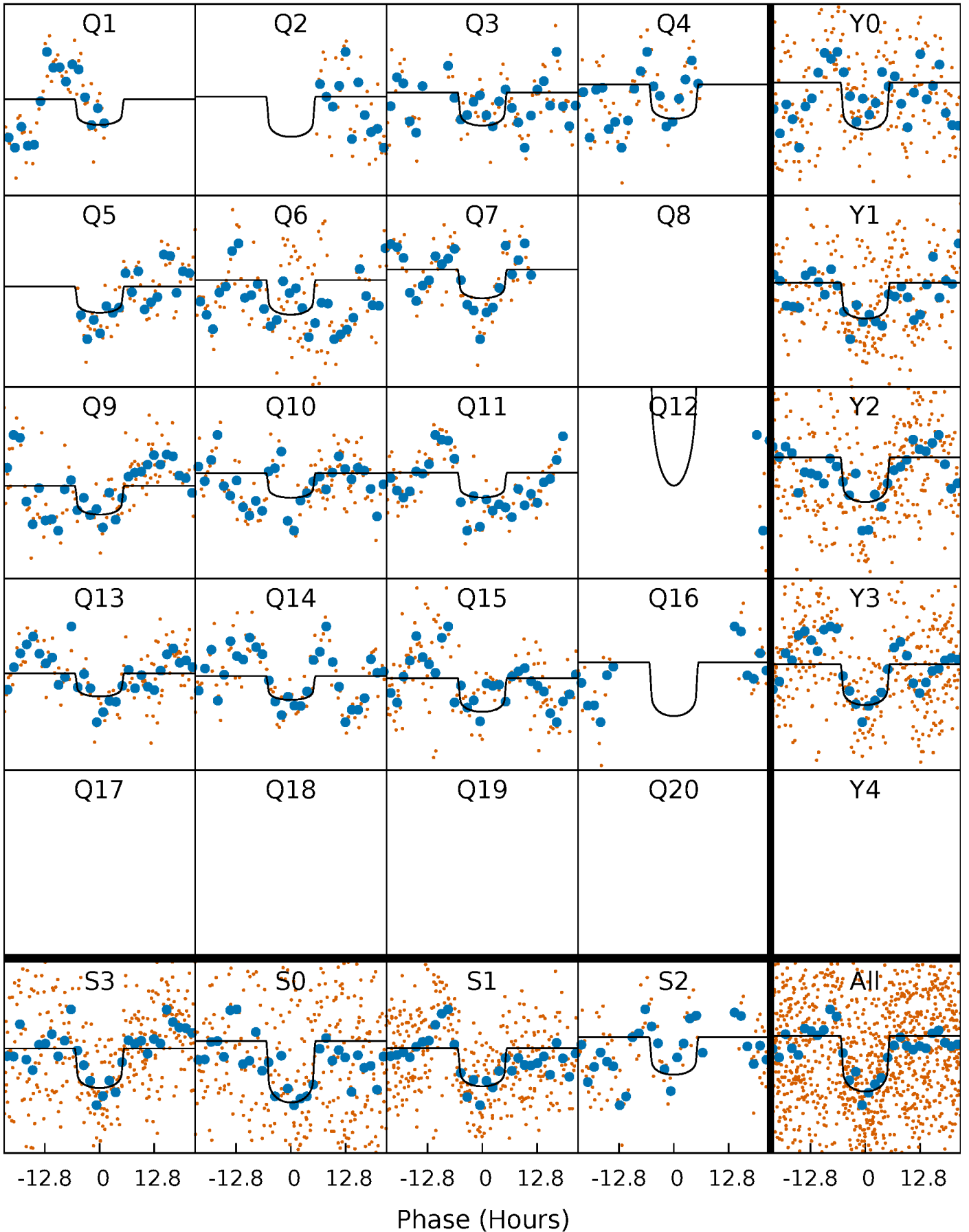
PDC Quarter-Phased Transit Curves

TCE 003631985-08 $P = 44.050048$ Days $T_0 = 148.961830$ (BKJD)



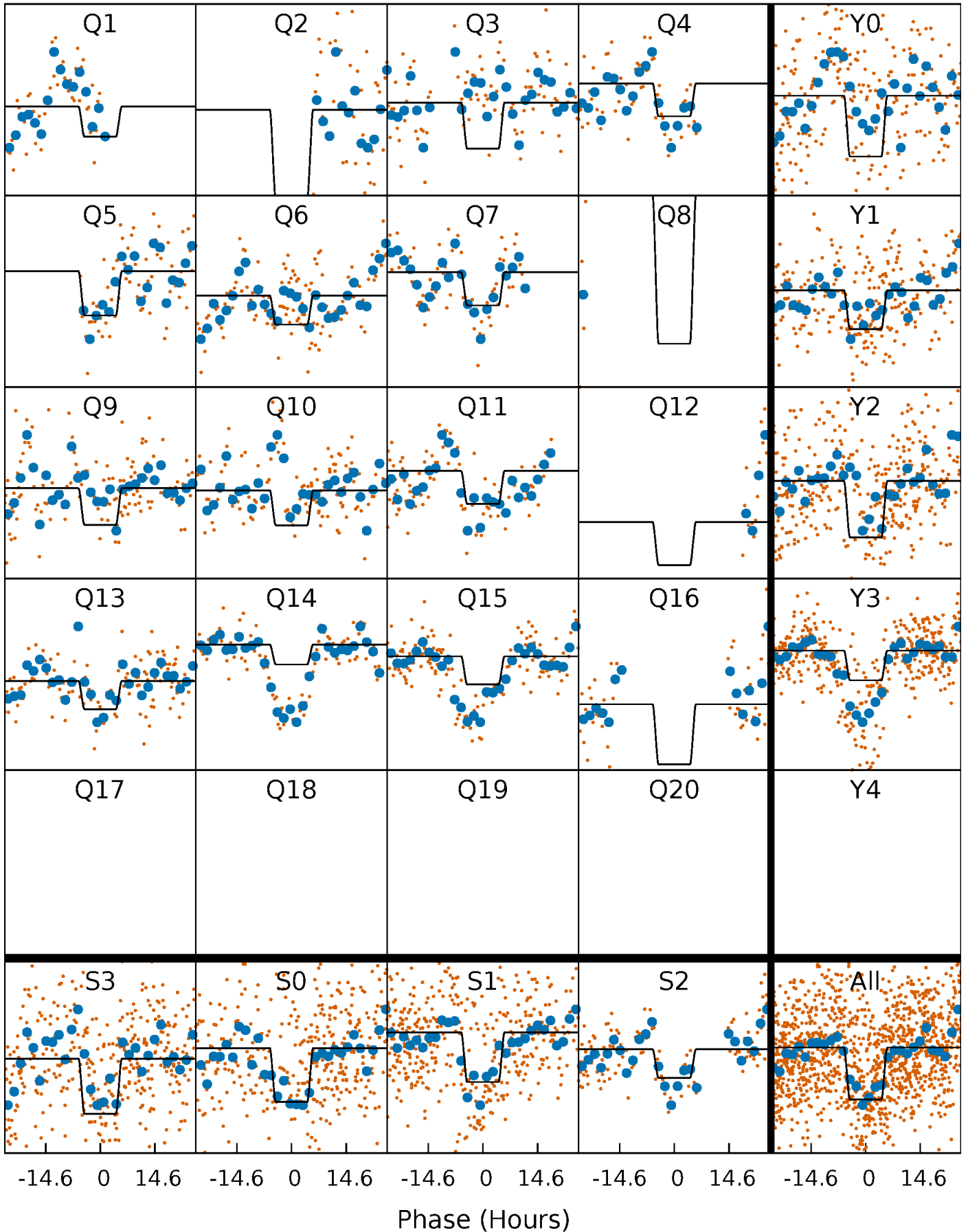
DV Quarter-Phased Transit Curves

TCE 003631985-08 P= 44.050048 Days $T_0=148.961830$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

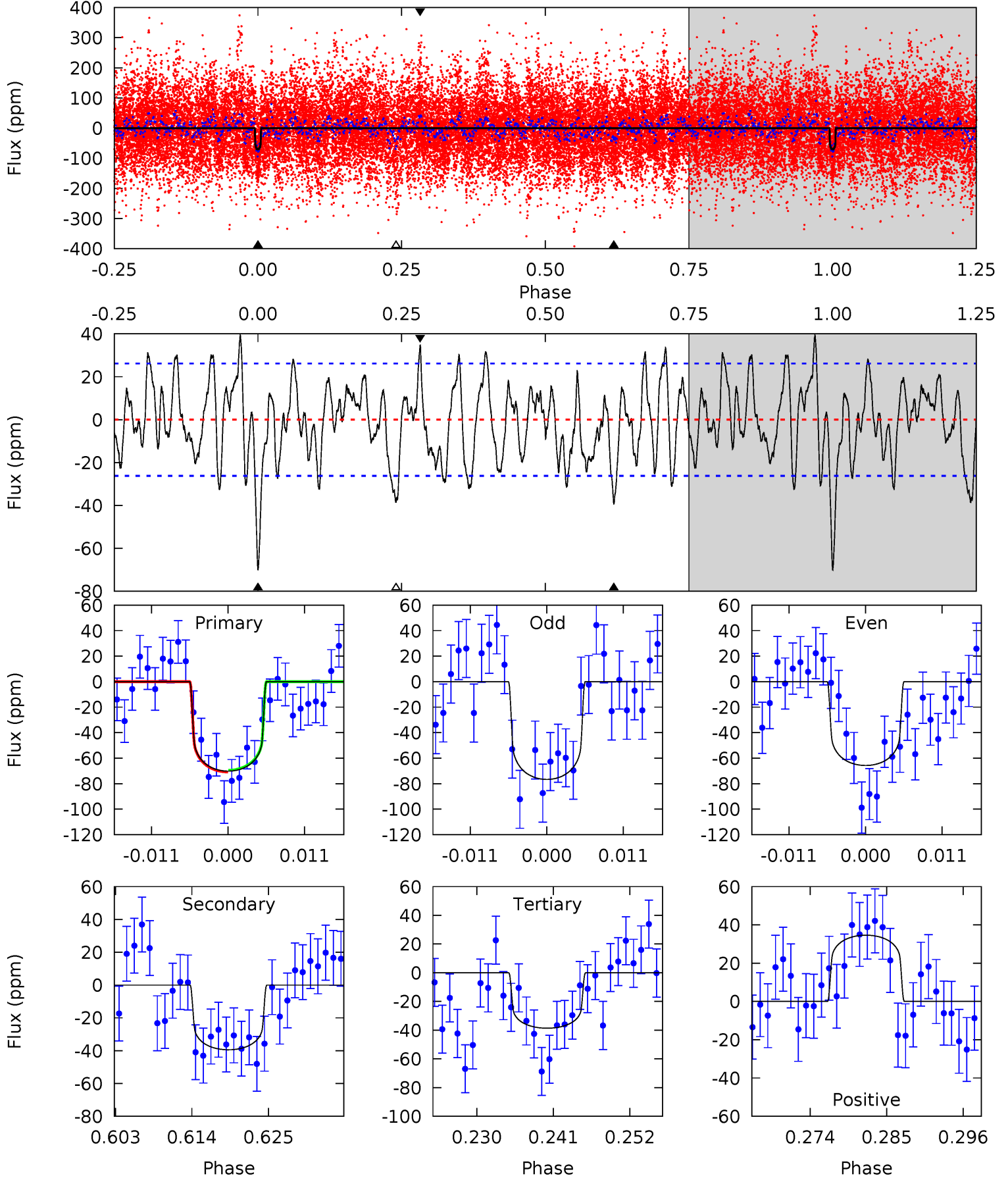
TCE 003631985-08 P= 44.050320 Days $T_0=148.968795$ (BKJD)



DV Model-Shift Uniqueness Test

003631985-08, P = 44.050048 Days, E = 104.911782 Days

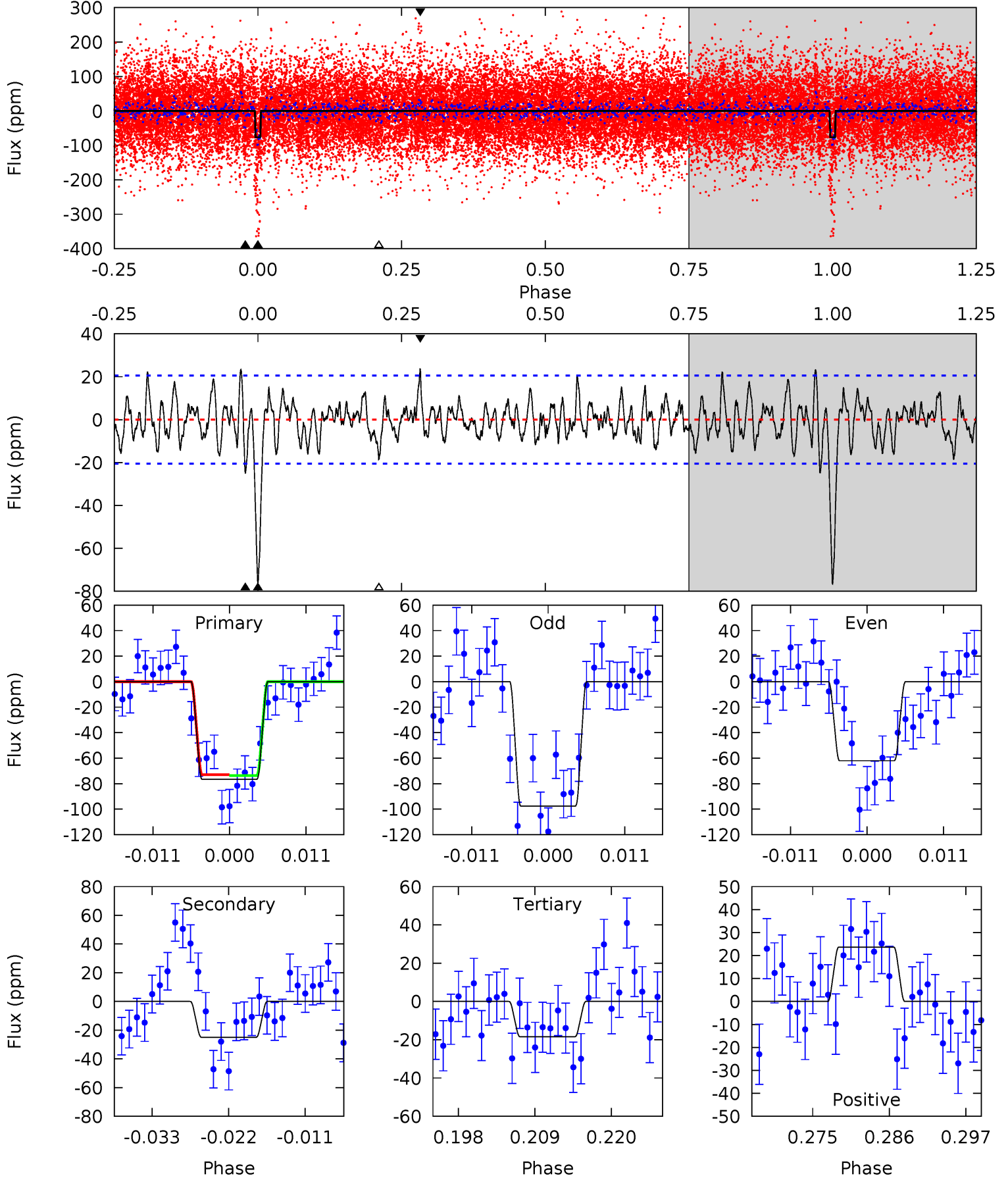
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.4	7.54	7.38	6.61	5.01	2.54	2.99	6.02	6.79	0.16	0.92	1.03	1.01	0.36	0.12



Alt Model-Shift Uniqueness Test

003631985-08, P = 44.050320 Days, E = 104.918475 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.7	6.09	4.50	5.78	5.01	2.54	1.73	14.2	12.9	1.58	0.30	4.28	1.05	0.24	0.08



Stellar Parameters For KIC 003631985

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6627^{+186}_{-255}	$4.277^{+0.124}_{-0.186}$	$-0.220^{+0.250}_{-0.300}$	$1.317^{+0.408}_{-0.220}$	$1.204^{+0.183}_{-0.183}$	$0.742^{+0.432}_{-0.369}$
	+3%/-4%	+3%/-4%	+114%/-136%	+31%/-17%	+15%/-15%	+58%/-50%
Source	PHO54	PHO54	PHO54	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 003631985-08 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-39 ± 5	$1.34^{+0.31}_{-0.30}$	926^{+71}_{-59}	5495^{+623}_{-446}	798^{+549}_{-260}
Alt.	-25 ± 4	$1.40^{+0.32}_{-0.28}$	926^{+66}_{-56}	4867^{+452}_{-371}	468^{+268}_{-170}

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{\text{obs}} \gg T_{\text{max}}$ AND $A_{\text{obs}} \gg 1.0$

DV Centroid Data

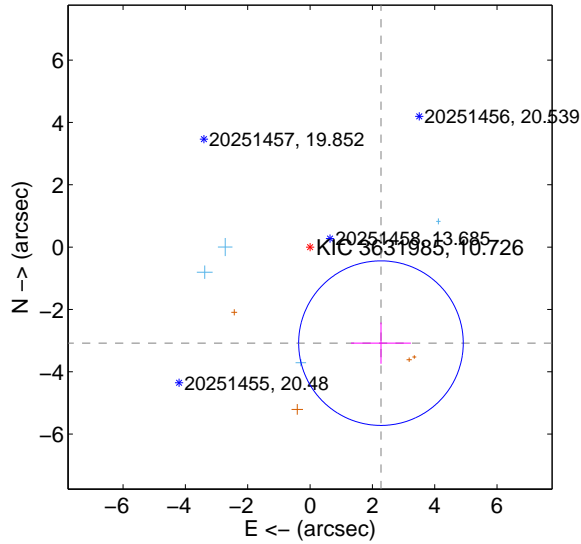
Supplemental centroid analysis for 003631985-08. **Kepler magnitude: 10.73**. Transit SNR 7.94

There are 4 quarters with good PRF difference image offsets

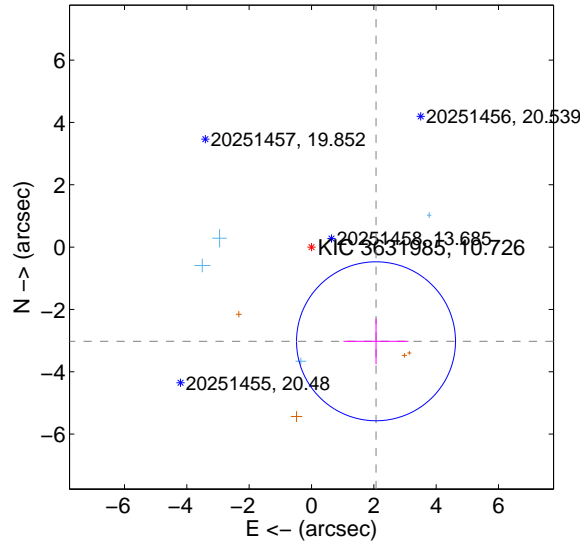
The direct PRF centroid is offset from the target star catalog position by about 0.36 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.831 ± 0.880	4.35	-2.275 ± 0.960	-3.082 ± 0.660
PRF-fit source offset from KIC position	3.663 ± 0.850	4.31	-2.070 ± 1.042	-3.022 ± 0.731
photometric centroid source offset	1.85 ± 1.11	1.67	-0.83 ± 1.06	-1.65 ± 1.12

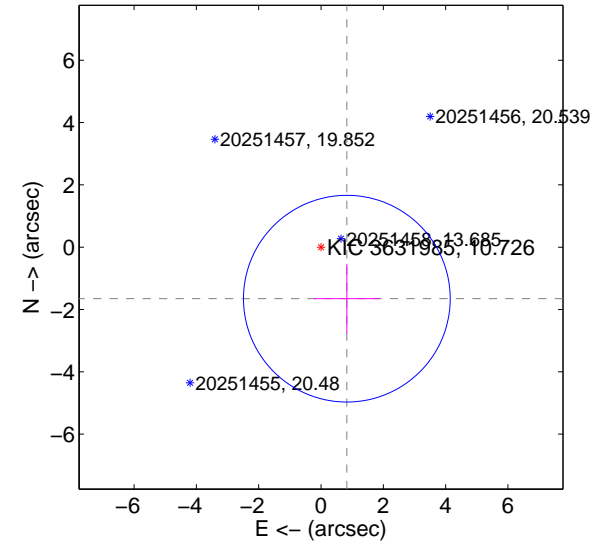
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

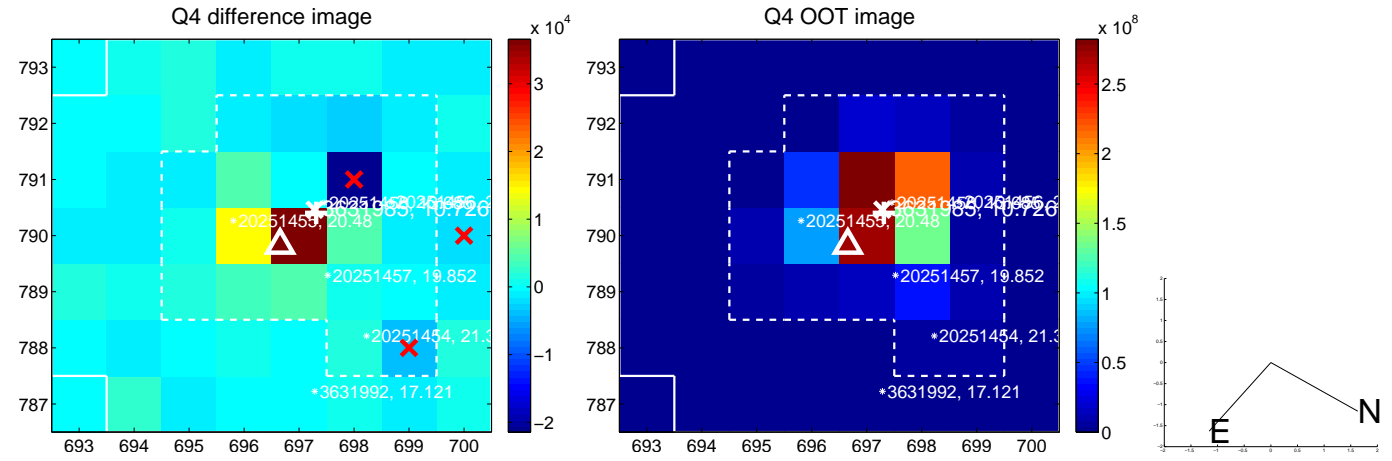
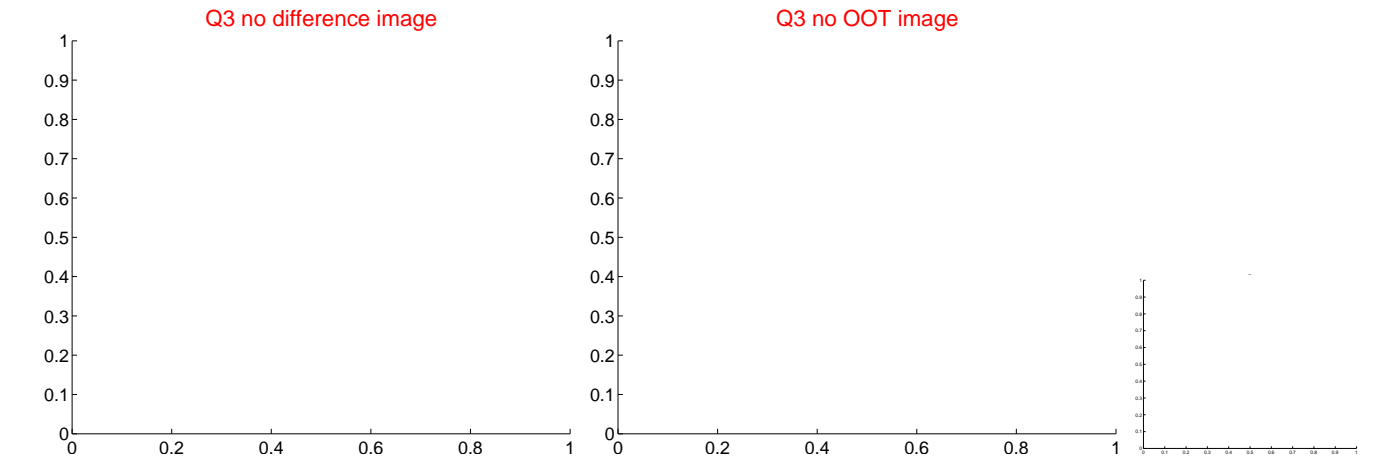
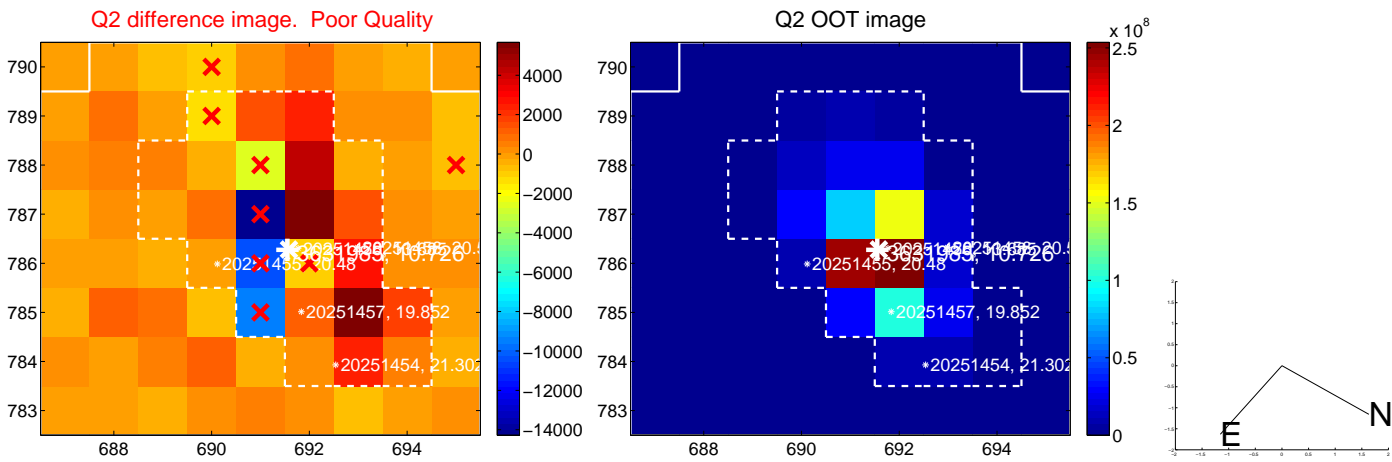
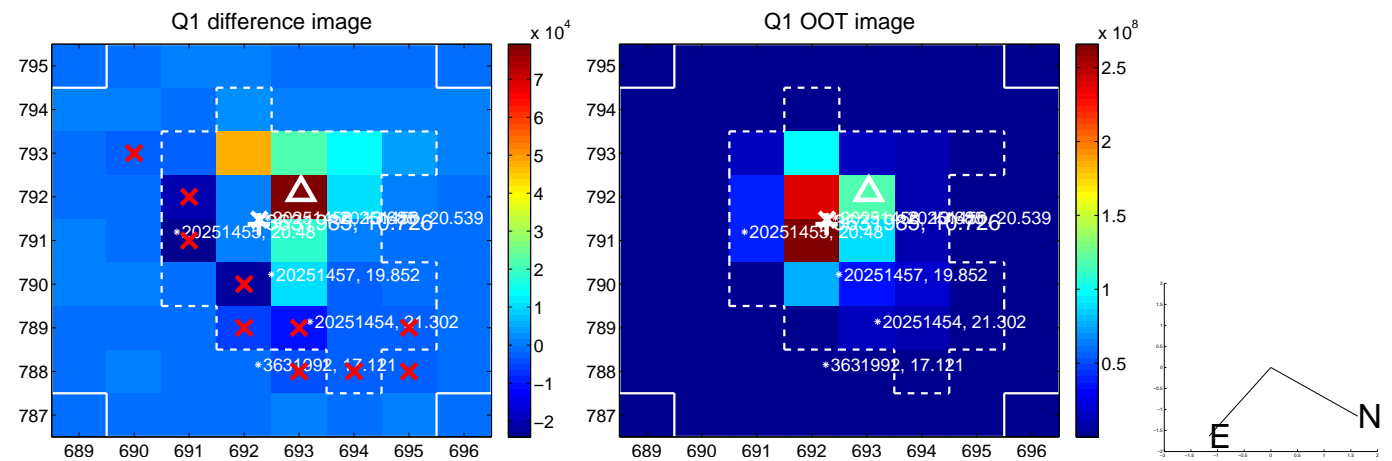


offset from photometric centroids

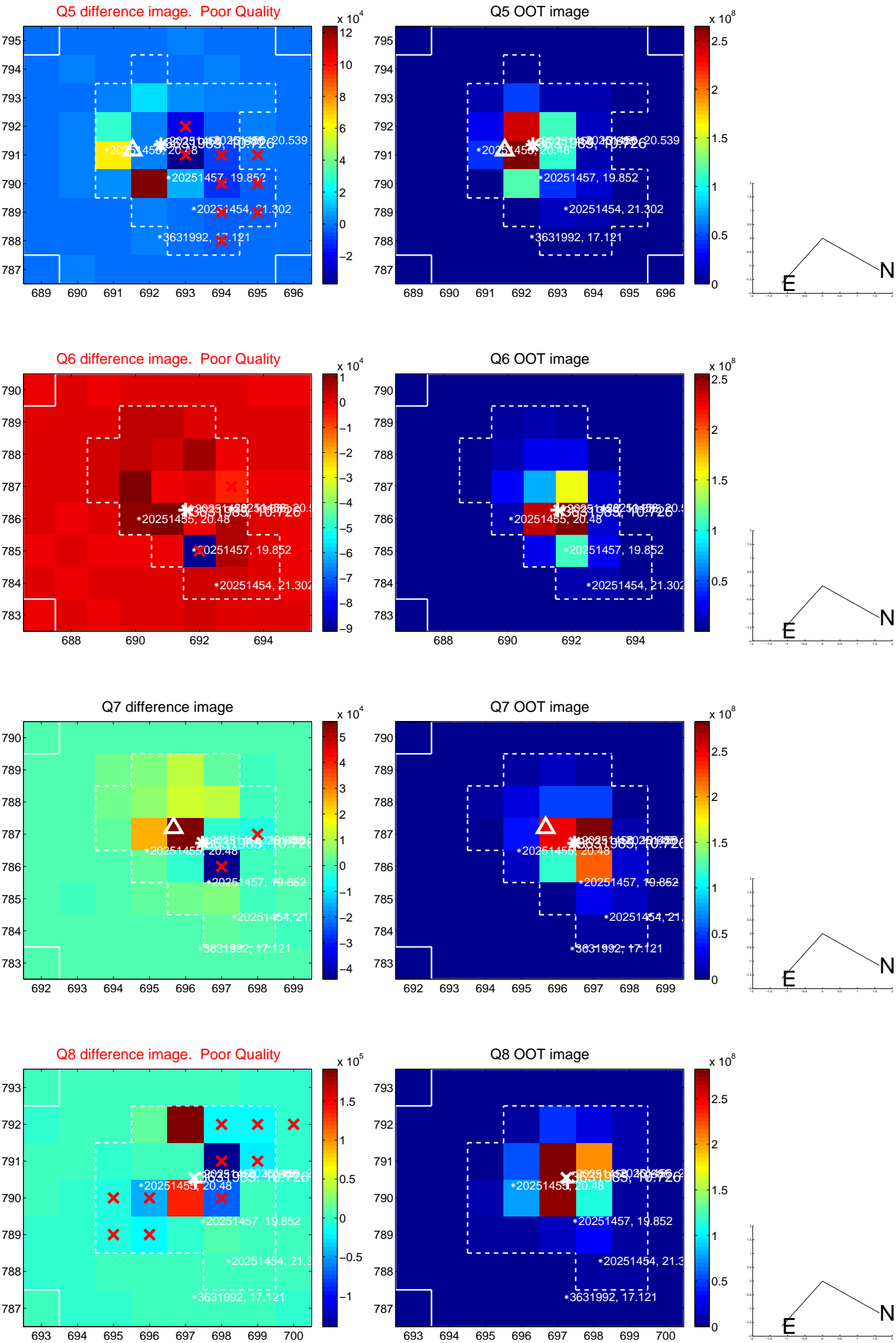


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

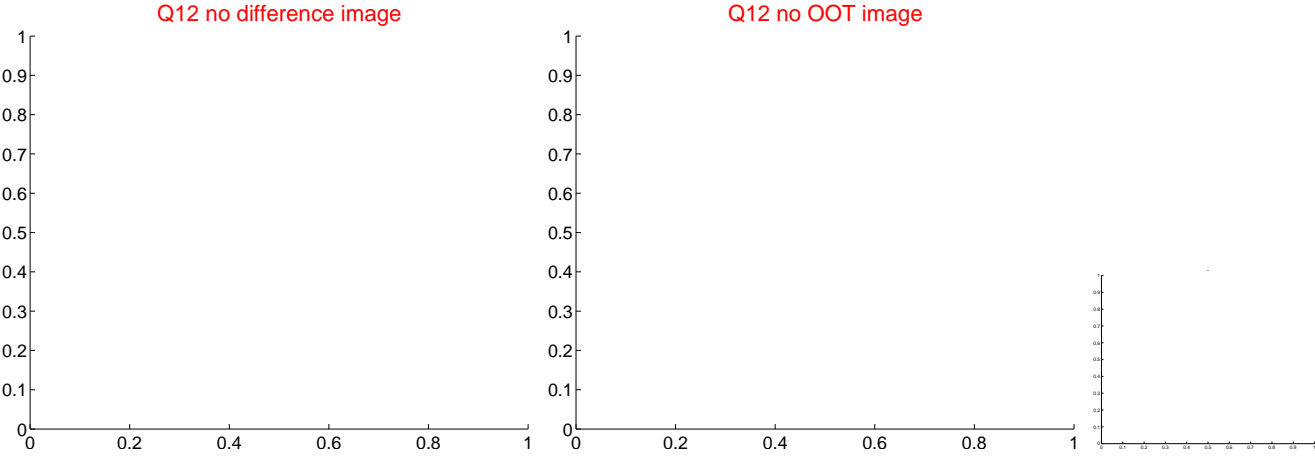
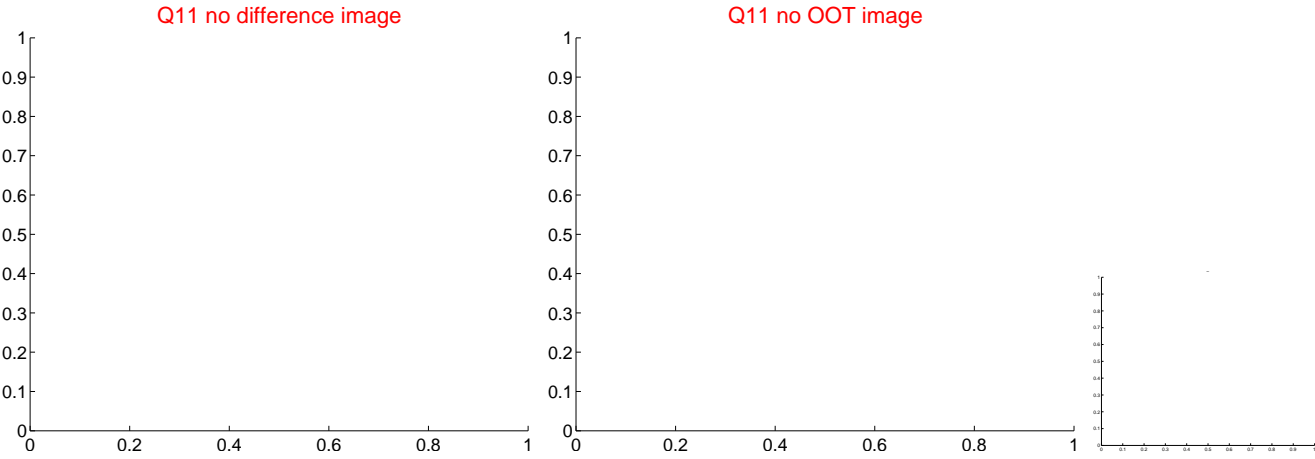
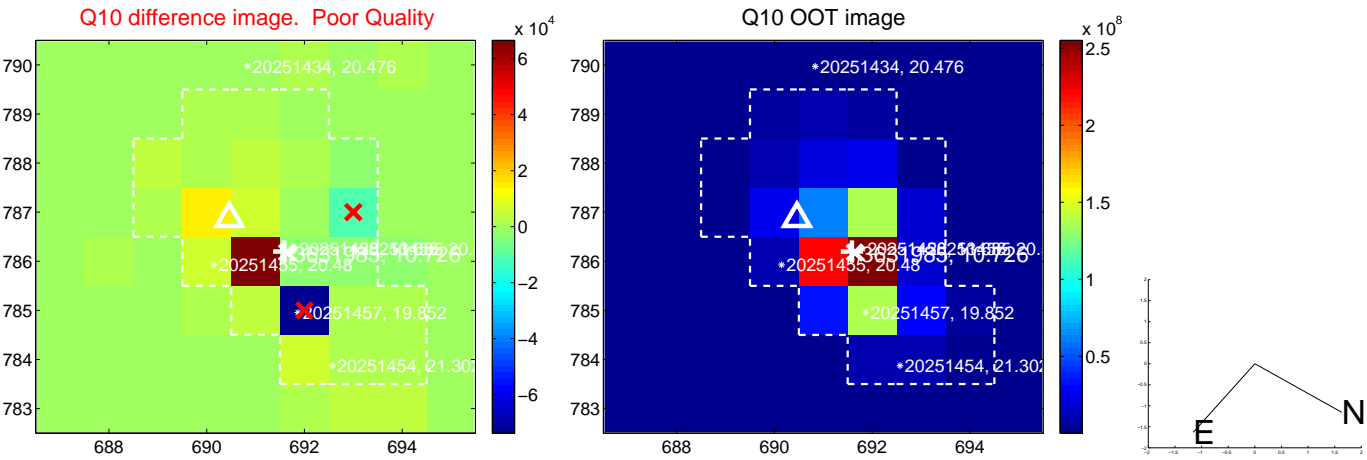
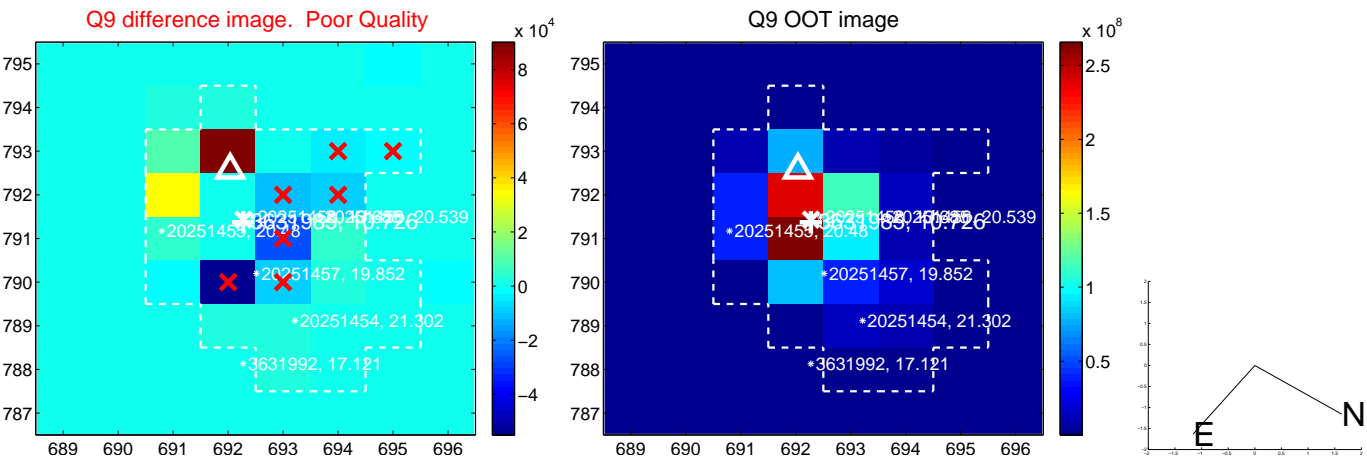
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



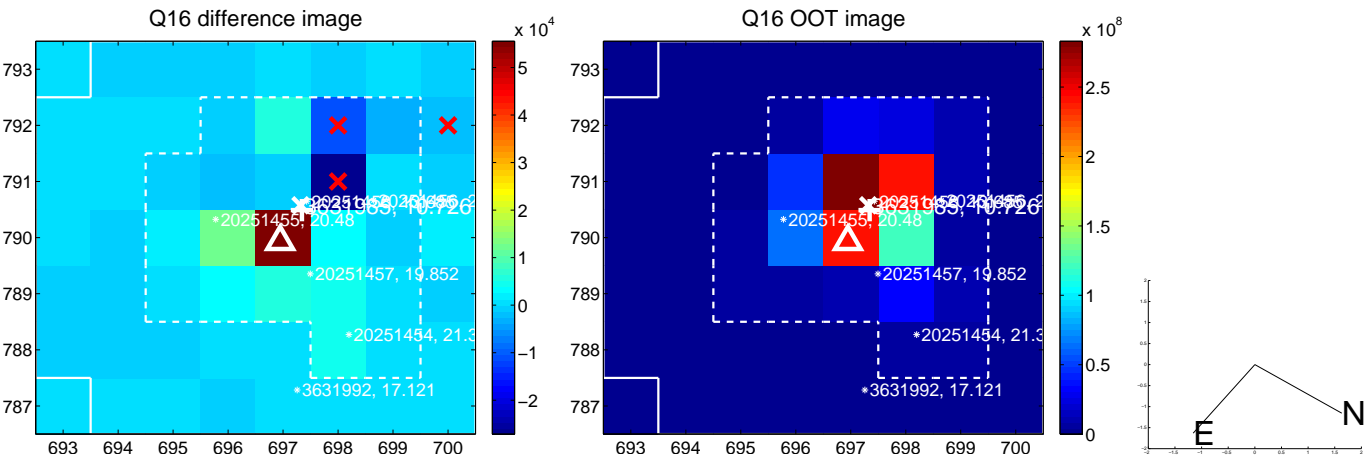
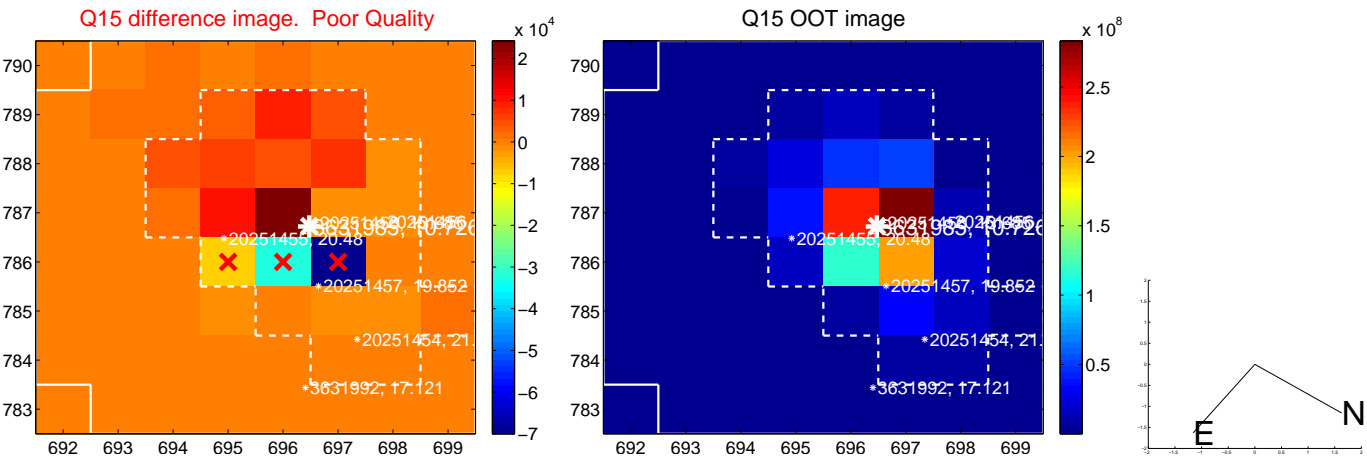
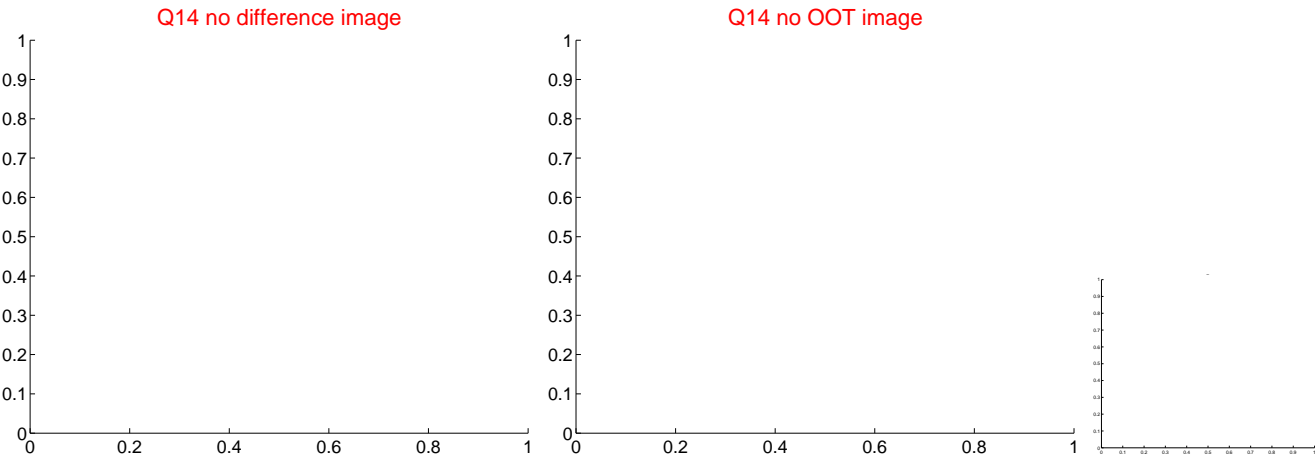
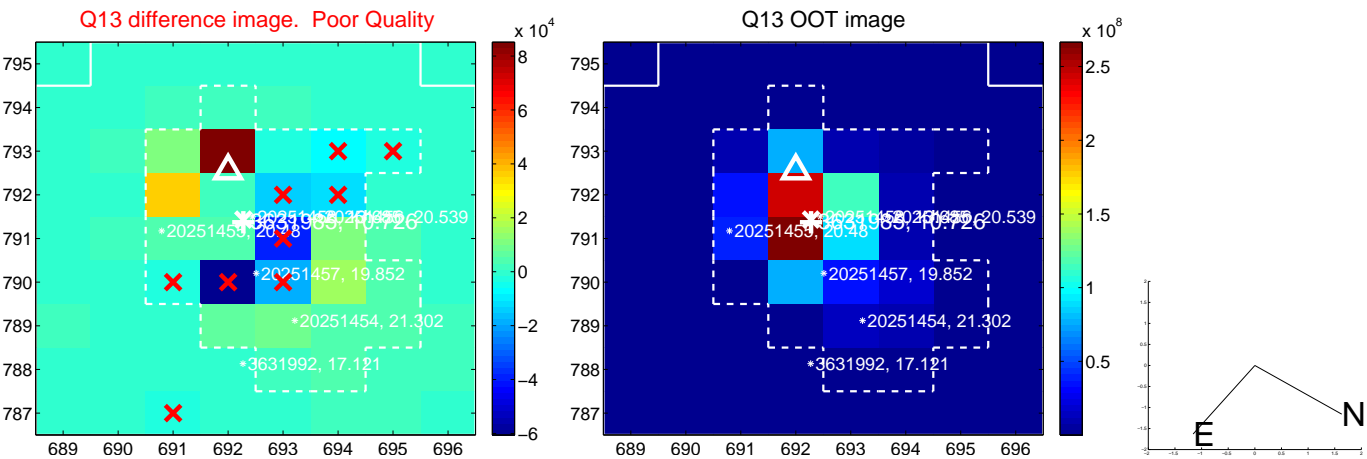
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



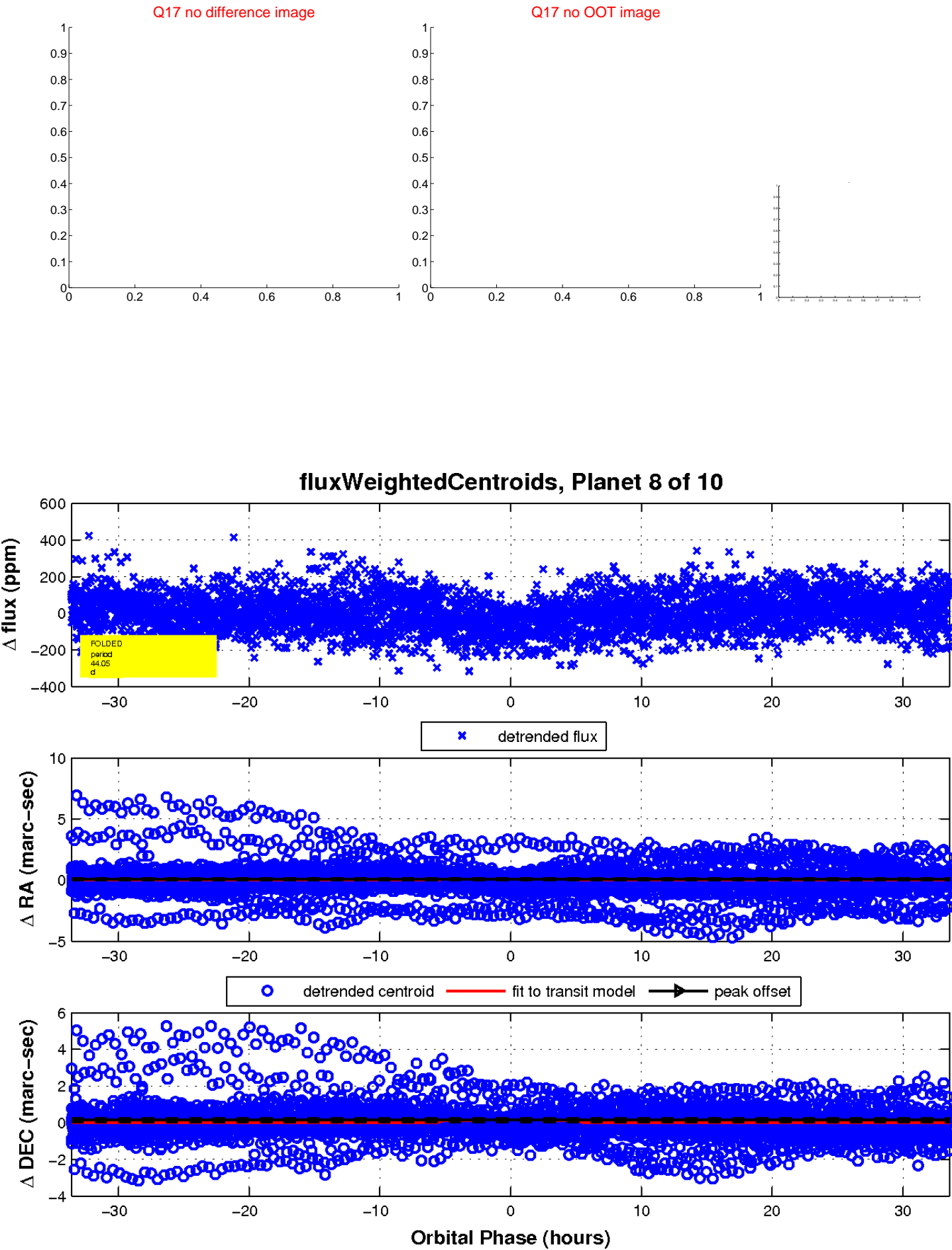
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

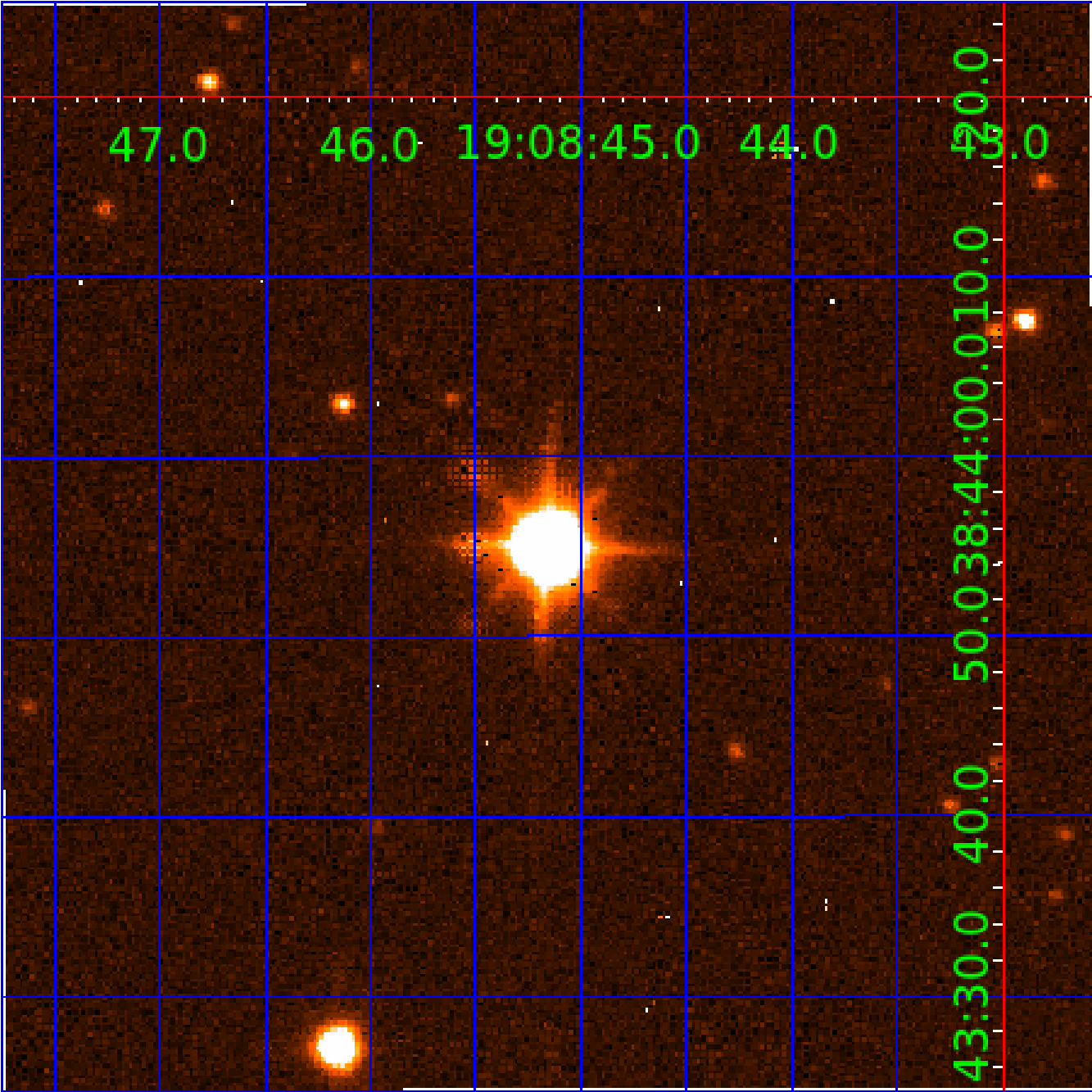


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 003631985

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
003631985-01	OBS	No	4.560527	132.026788	8.1	19.919	7.2	3.3	1.32	6627	0.43	917.35
003631985-02	OBS	No	126.957570	133.100780	130.0	12.168	10.5	8.9	1.32	6627	1.75	10.87
003631985-03	OBS	No	137.684361	192.319484	115.3	12.440	10.0	7.8	1.32	6627	1.55	9.76
003631985-04	OBS	No	510.471188	499.727737	148.5	5.818	9.2	8.6	1.32	6627	1.84	1.70
003631985-05	OBS	No	52.982172	175.171808	95.5	4.252	9.2	8.7	1.32	6627	1.48	34.86
003631985-07	OBS	No	424.406935	192.591667	163.7	10.410	9.1	8.3	1.32	6627	1.89	2.17
003631985-08	OBS	No	44.050048	148.961830	76.7	11.194	8.9	7.9	1.32	6627	1.30	44.59
003631985-09	OBS	No	428.258732	222.123753	150.7	10.780	9.0	8.9	1.32	6627	1.74	2.15
003631985-10	OBS	No	579.371898	339.223546	119.6	18.051	8.8	6.7	1.32	6627	1.69	1.44

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003631985-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
003631985-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED
003631985-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—CENT_SATURATED
003631985-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_SATURATED
003631985-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
003631985-07	OBS	FP	0.01	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED
003631985-08	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
003631985-09	OBS	FP	0.00	1	0	0	0	ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED
003631985-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

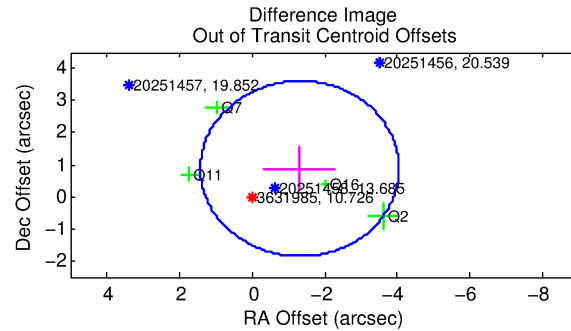
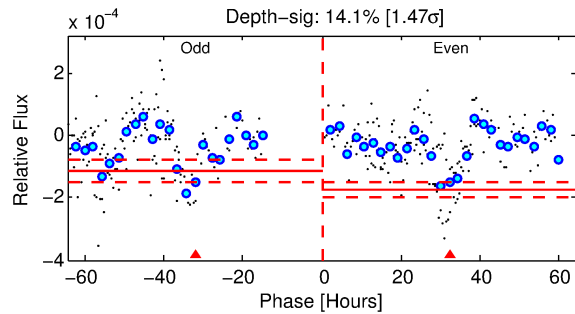
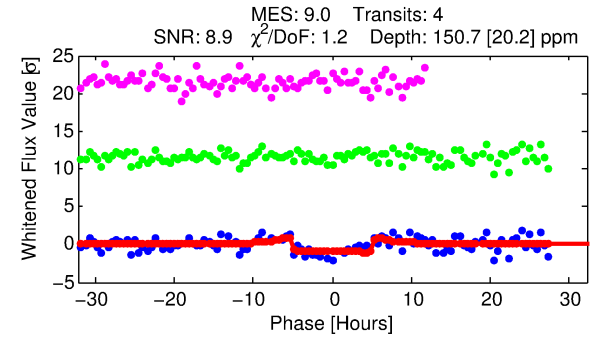
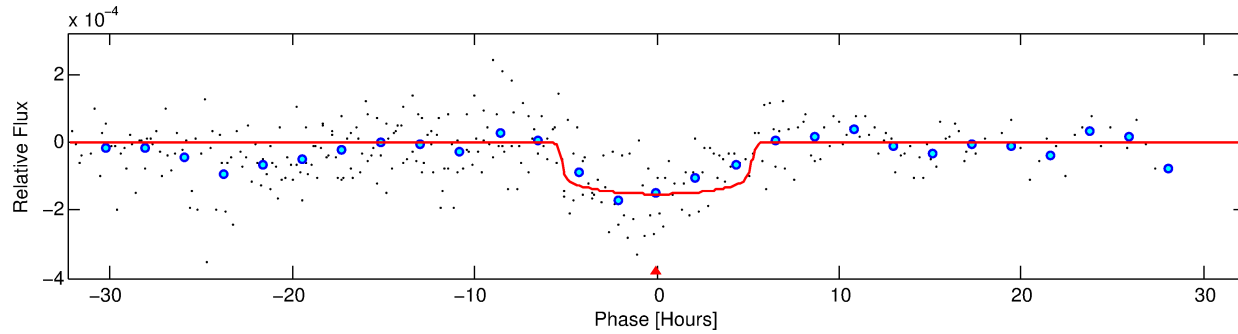
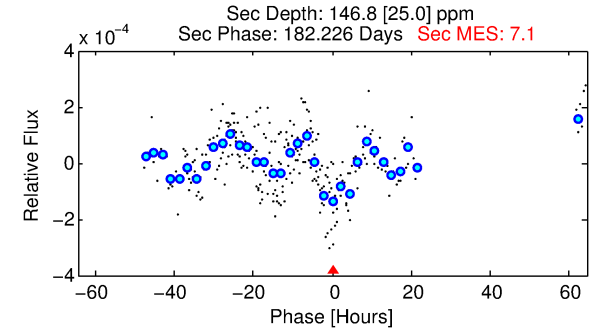
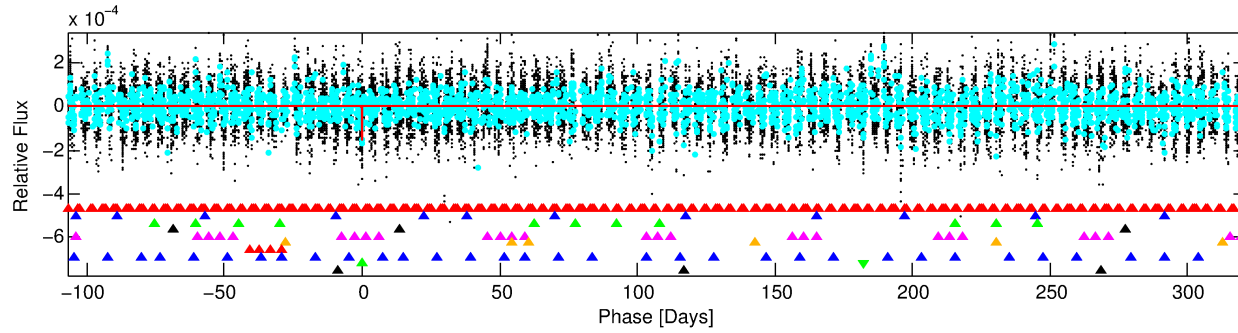
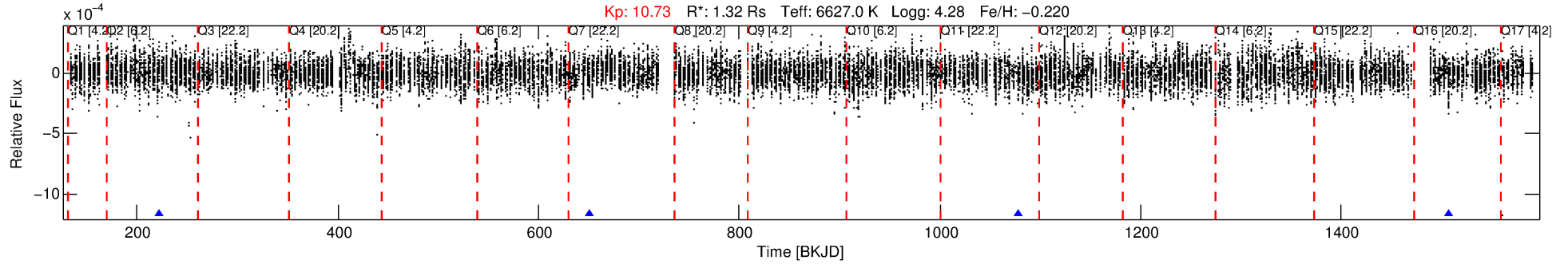
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 003631985-09

No Significant Match Found

DV One-Page Summary

KIC: 3631985 Candidate: 9 of 10 Period: 428.259 d



DV Fit Results:

Period = 428.25873 [0.00552] d
Epoch = 222.1238 [0.0116] BKJD
Rp/R* = 0.0121 [0.0039]
a/R* = 218.65 [377.41]
b = 0.71 [1.21]
Seff = 2.15 [0.83]
Teq = 309 [30] K
Rp = 1.74 [0.77] Re
a = 1.1809 [0.2965] AU
Ag = 37394.92 [28093.48] [1.33σ]
Teffp = 6638 [1130] K [5.60σ]

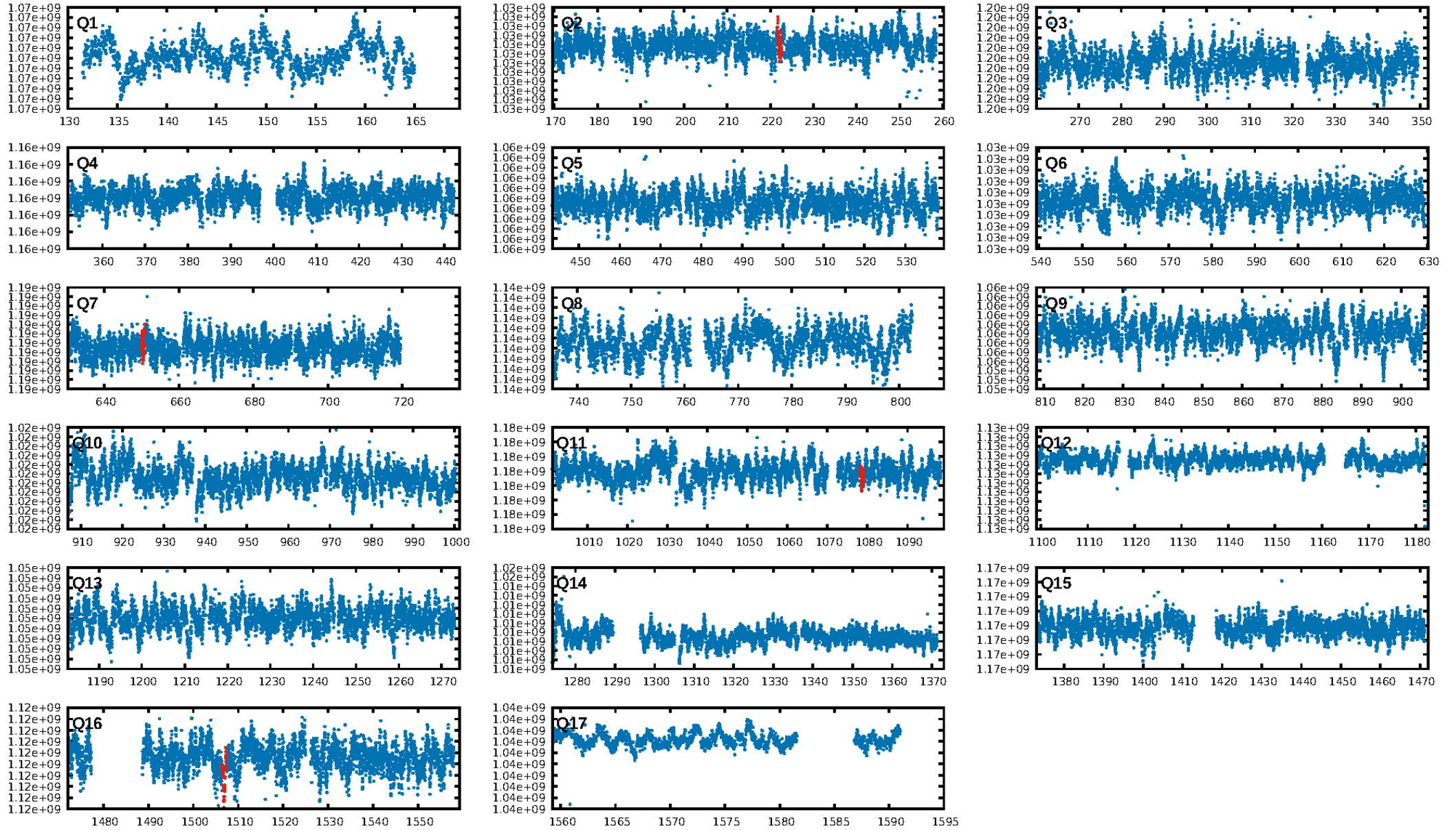
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [6.17σ]
LongPeriod-sig: 100.0% [161.07σ]
ModelChiSquare2-sig: 21.6%
ModelChiSquareGof-sig: 99.5%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: -1.941
Centroid-sig: 17.7%
Centroid-so: 1.795 arcsec [1.17σ]
OotOffset-rm: 1.579 arcsec [1.73σ]
OotOffset-st: 1/2/1/0 [4]
KicOffset-rm: 1.268 arcsec [1.55σ]
KicOffset-st: 1/2/1/0 [4]
DiffImageQuality-fgm: 0.75 [3/4]
DiffImageOverlap-fno: 0.75 [3/4]

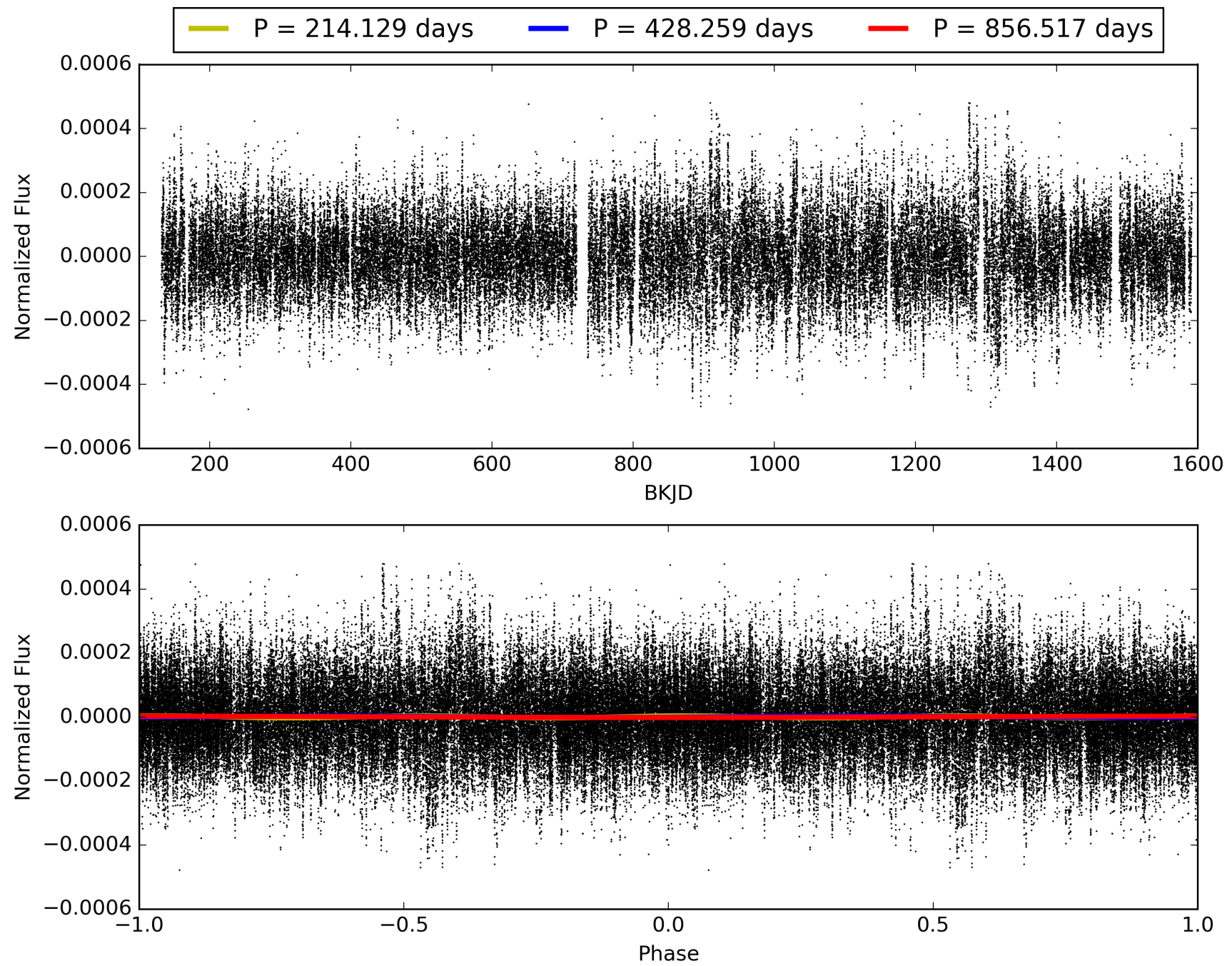
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 18:56:01 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 003631985-09, PDC Light Curves

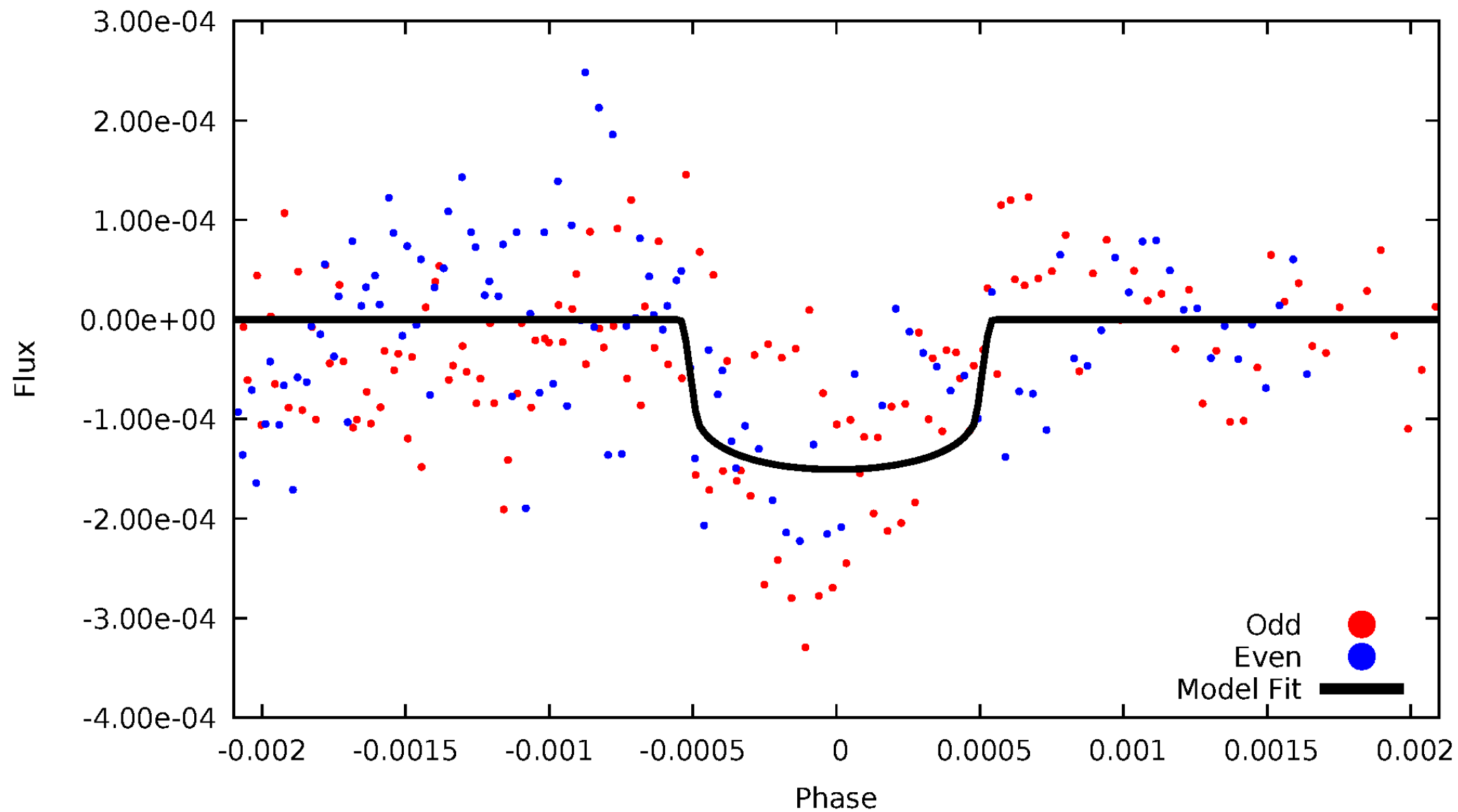


TCE 003631985-09



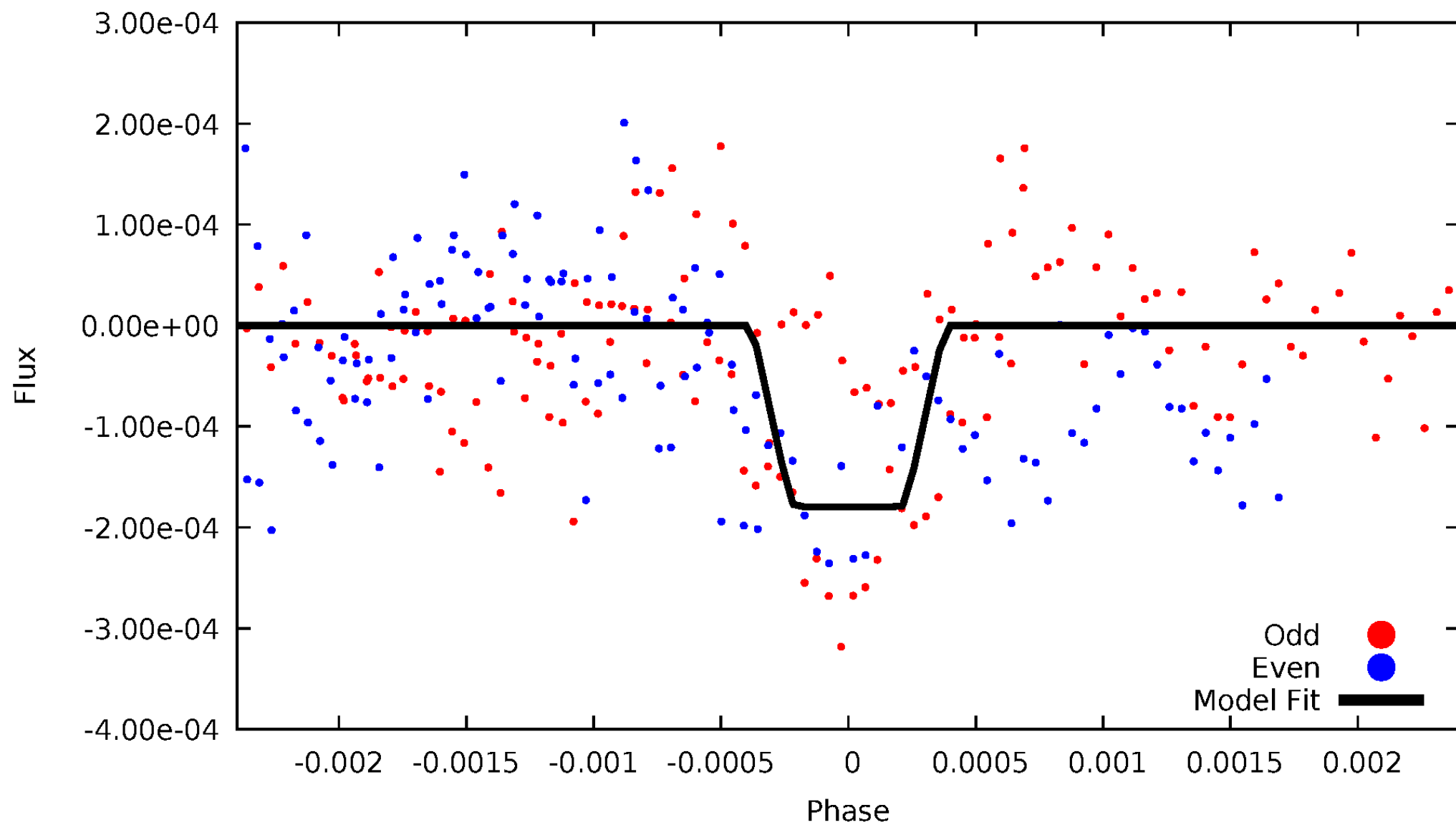
DV Odd/Even

TCE 003631985-09



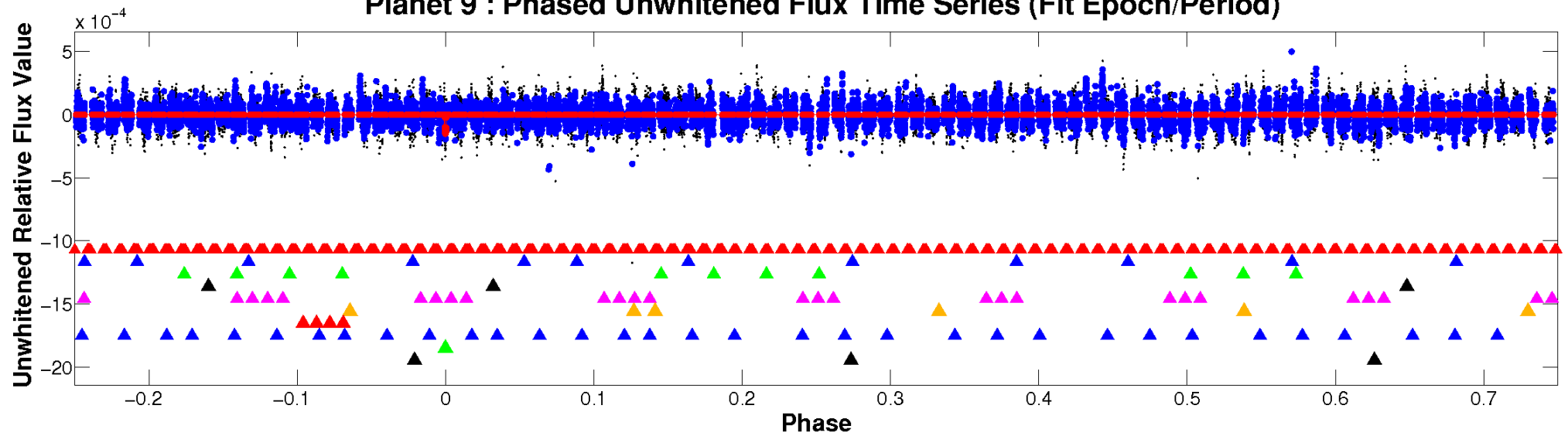
ALT Odd/Even

TCE 003631985-09

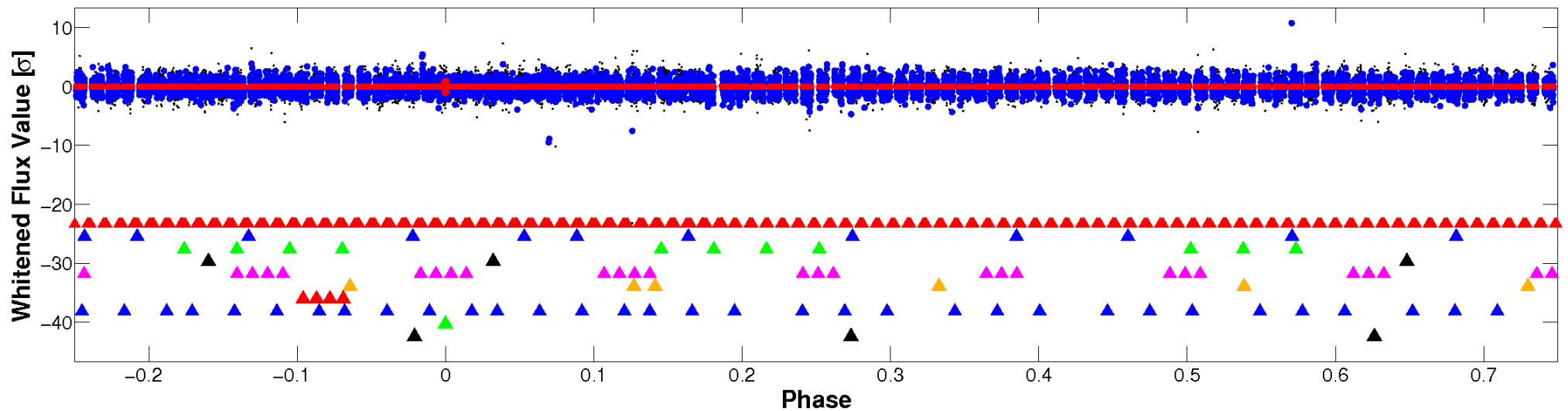


Non-Whitened Vs. Whitened Light Curve

Planet 9 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

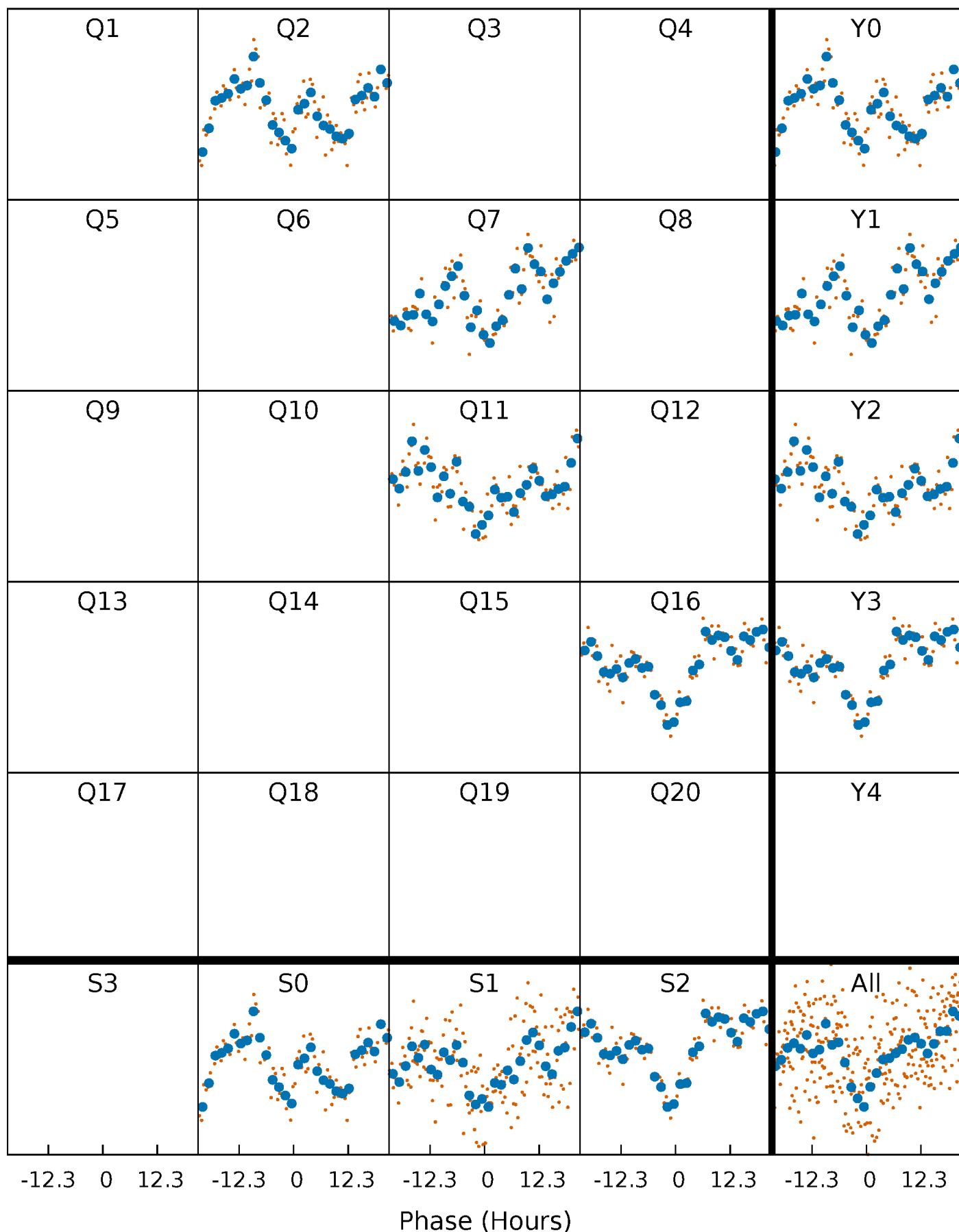


Planet 9 : Phased Whitened Flux Time Series (Fit Epoch/Period)



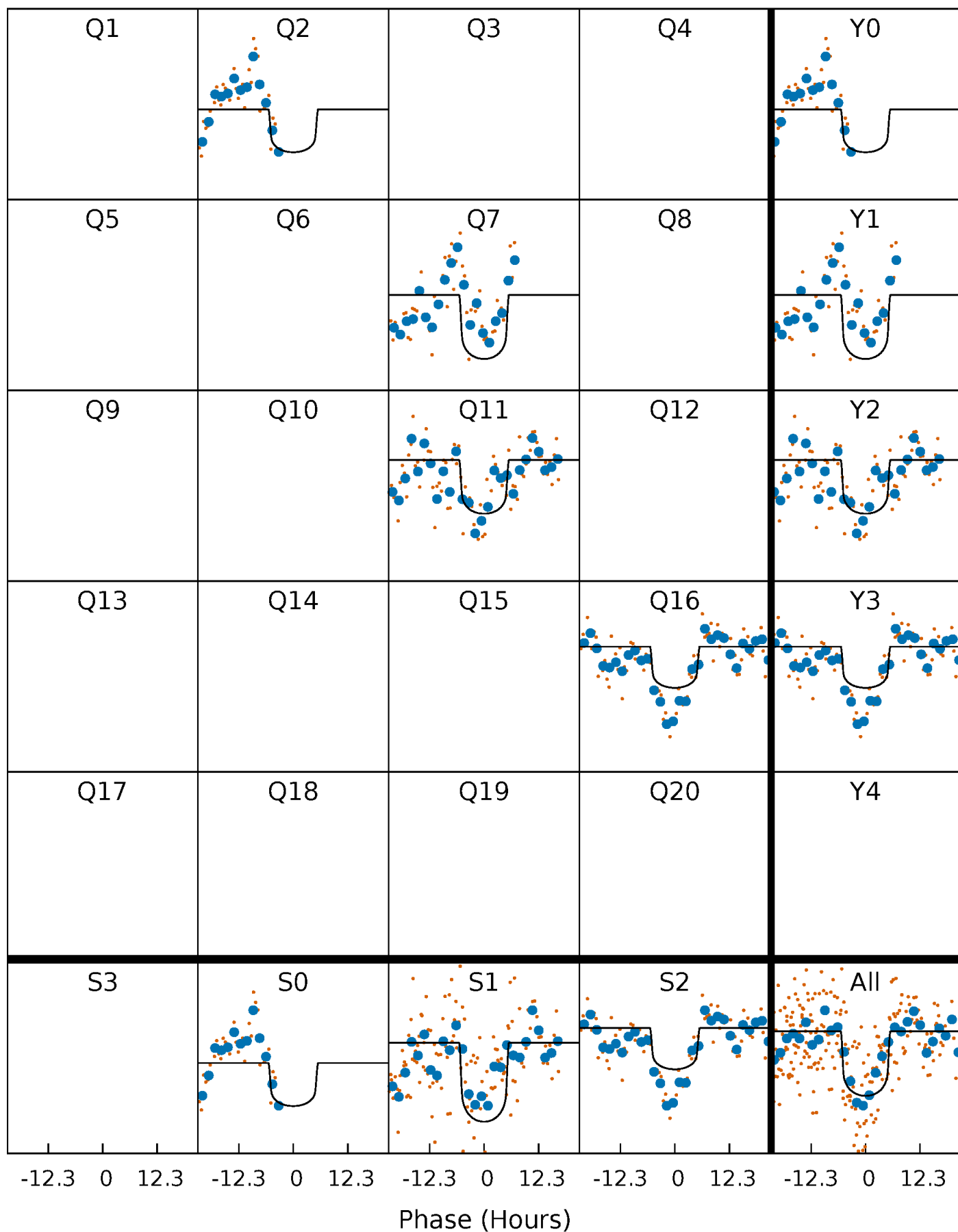
PDC Quarter-Phased Transit Curves

TCE 003631985-09 $P=428.258732$ Days $T_0=222.123753$ (BKJD)



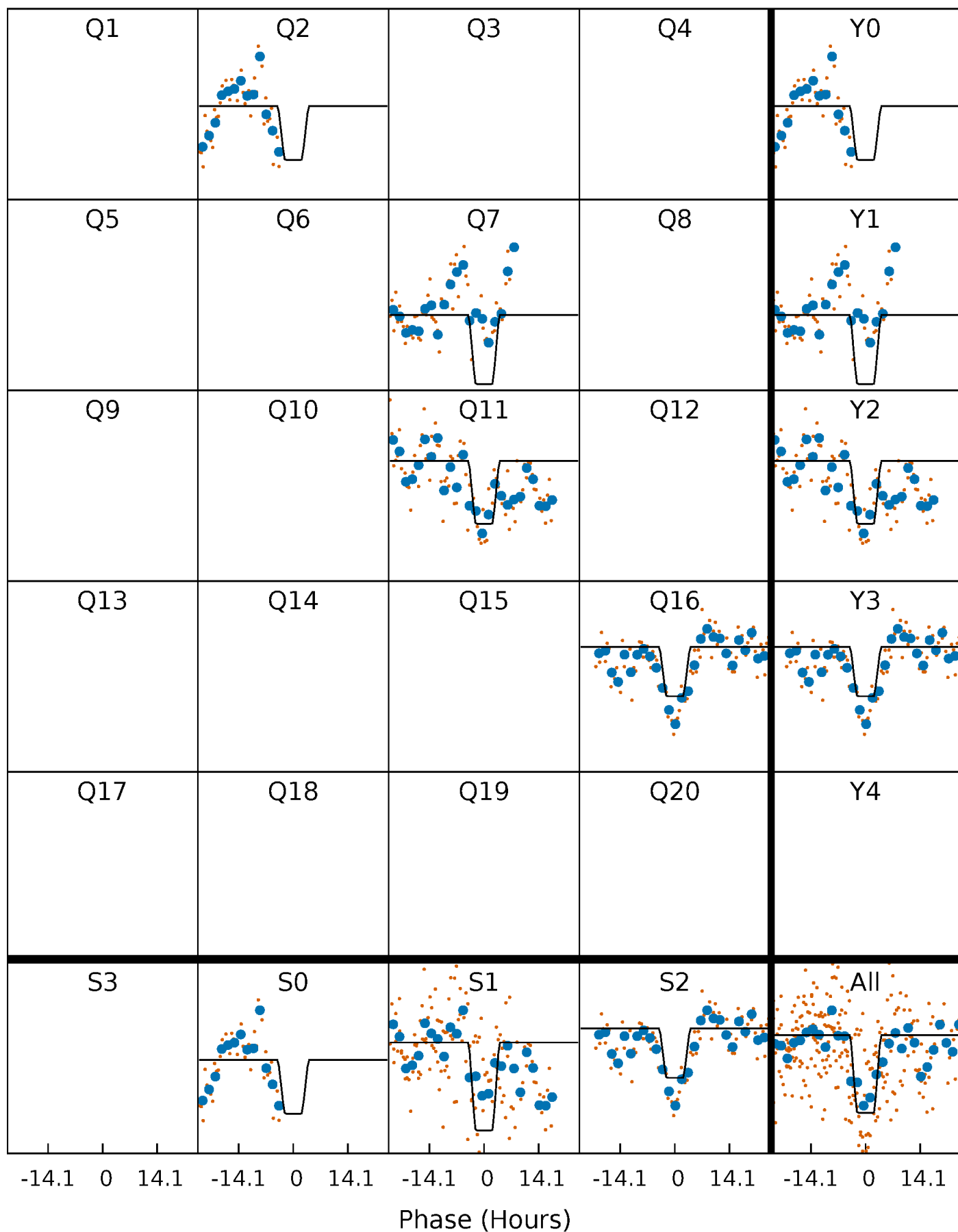
DV Quarter-Phased Transit Curves

TCE 003631985-09 $P=428.258732$ Days $T_0=222.123753$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

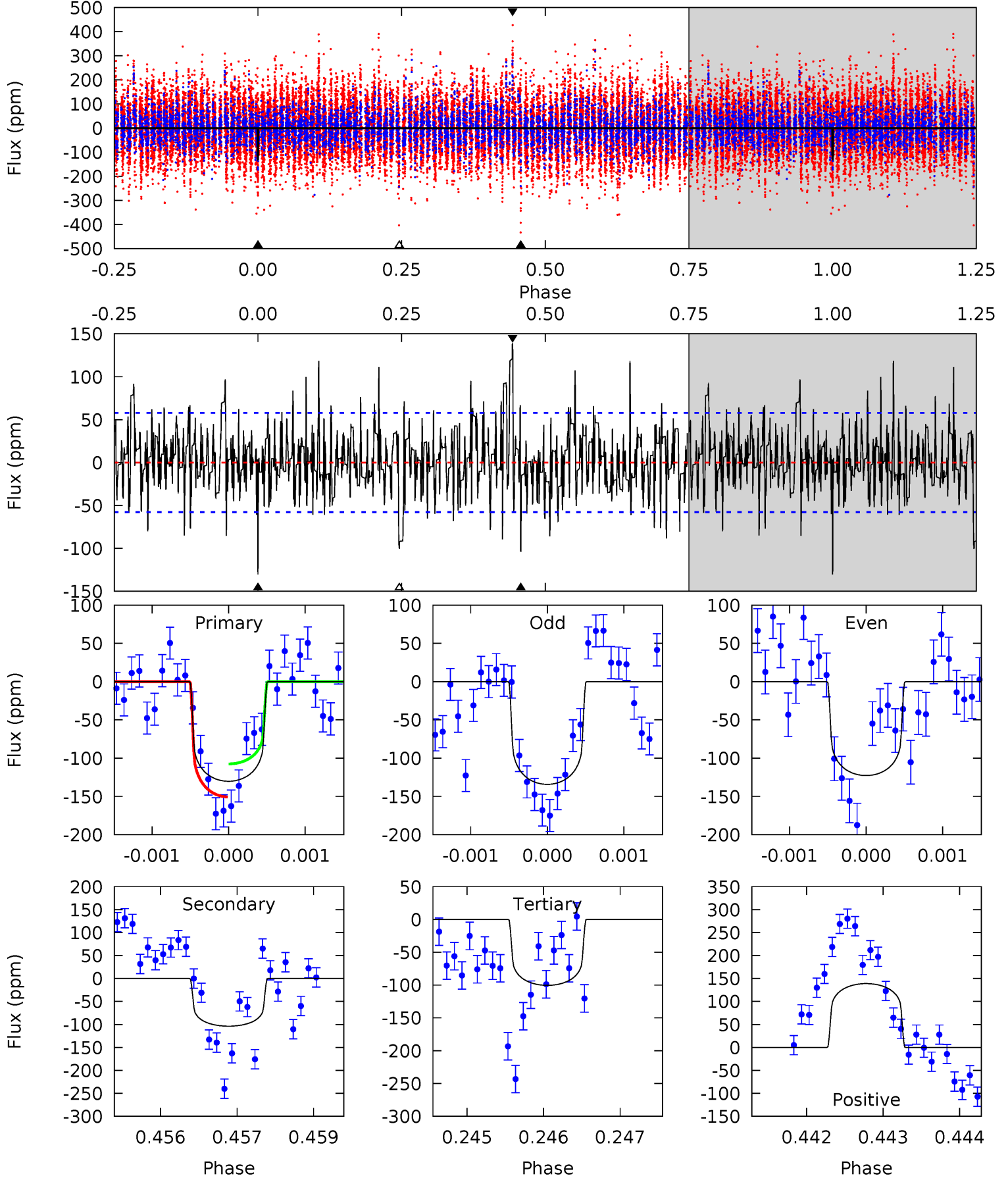
TCE 003631985-09 P=428.246551 Days $T_0=222.126271$ (BKJD)



DV Model-Shift Uniqueness Test

003631985-09, P = 428.258732 Days, E = 222.123753 Days

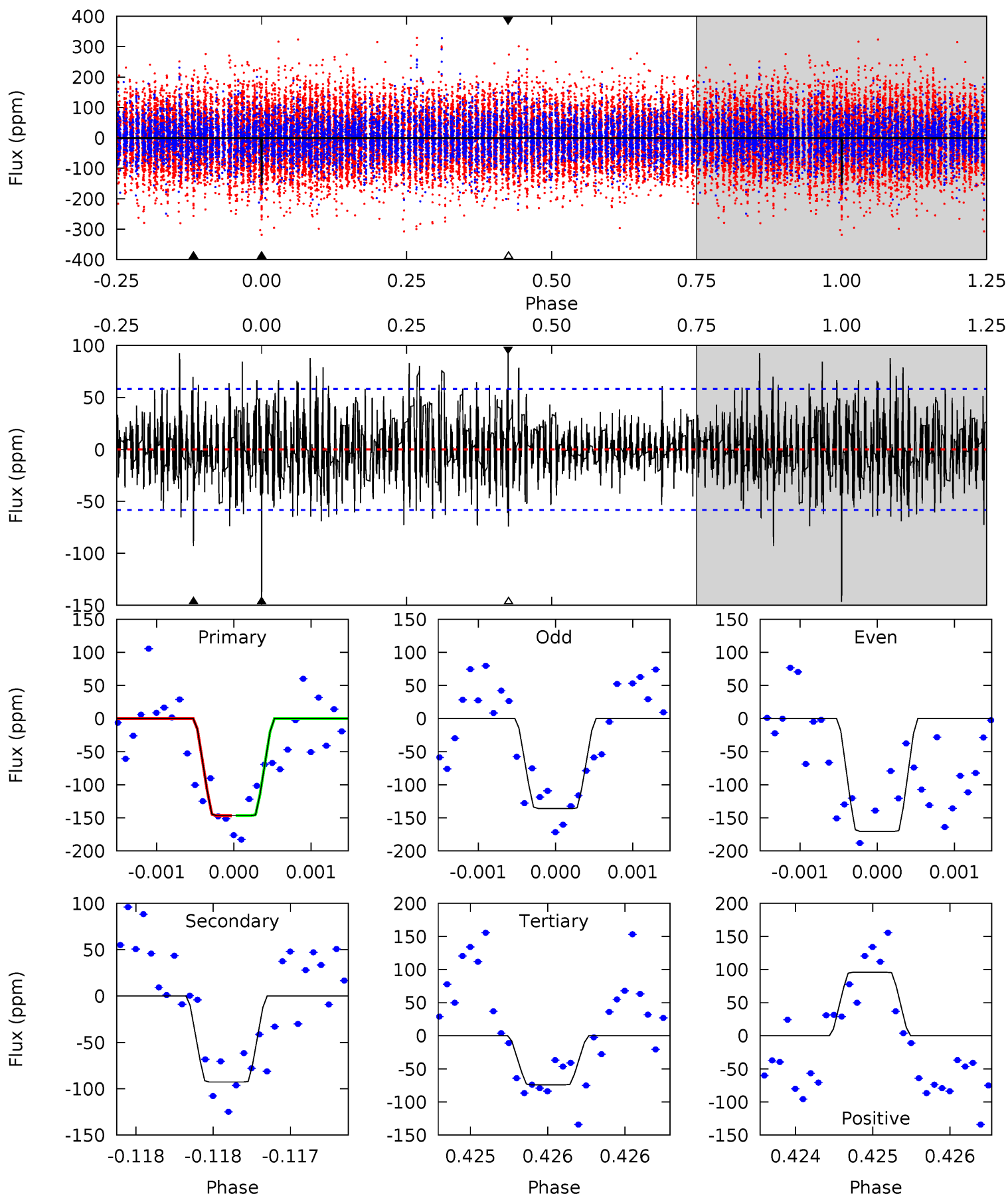
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.2	9.76	9.45	13.1	5.44	3.27	3.01	2.79	-0.82	0.31	-3.30	0.52	1.06	0.52	2.03



Alt Model-Shift Uniqueness Test

003631985-09, P = 428.246551 Days, E = 222.126271 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.8	8.74	6.98	9.04	5.50	3.37	2.29	6.85	4.79	1.76	-0.29	1.52	0.87	0.40	0.02



Stellar Parameters For KIC 003631985

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6627^{+186}_{-255}	$4.277^{+0.124}_{-0.186}$	$-0.220^{+0.250}_{-0.300}$	$1.317^{+0.408}_{-0.220}$	$1.204^{+0.183}_{-0.183}$	$0.742^{+0.432}_{-0.369}$
	+3%/-4%	+3%/-4%	+114%/-136%	+31%/-17%	+15%/-15%	+58%/-50%
Source	PHO54	PHO54	PHO54	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 003631985-09 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-104 ± 11	$1.74^{+0.63}_{-0.61}$	433^{+33}_{-25}	6058^{+1488}_{-764}	25762^{+35431}_{-11944}
Alt.	-93 ± 11	$1.94^{+0.64}_{-0.61}$	430^{+33}_{-25}	5650^{+1055}_{-689}	18870^{+20061}_{-8417}

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{obs} \gg T_{max}$ AND $A_{obs} \gg 1.0$

DV Centroid Data

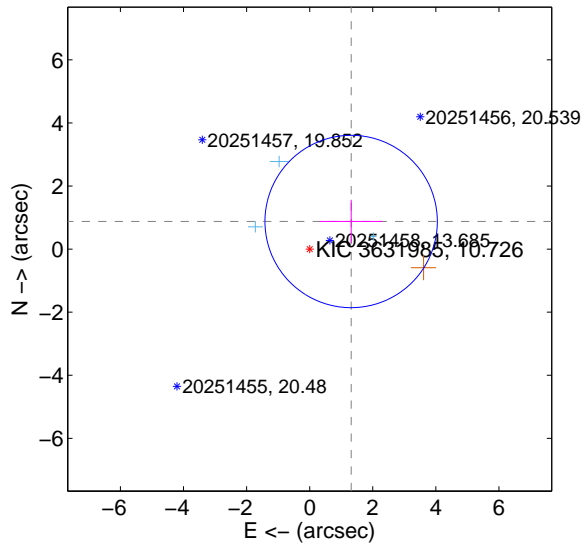
Supplemental centroid analysis for 003631985-09. **Kepler magnitude: 10.73**. Transit SNR 8.88

There are 3 quarters with good PRF difference image offsets

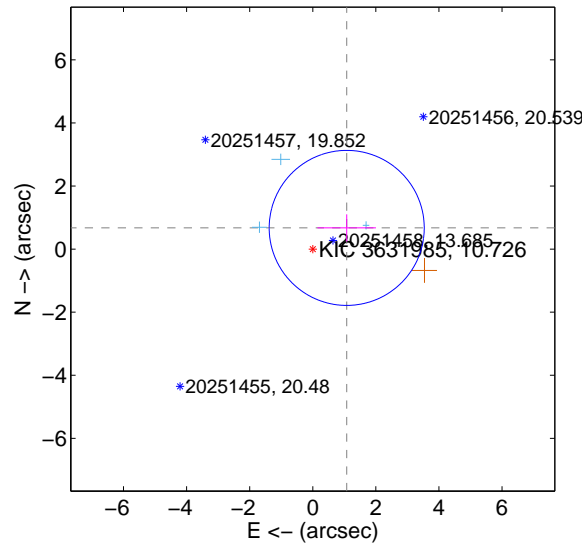
The direct PRF centroid is offset from the target star catalog position by about 0.48 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.579 ± 0.910	1.73	-1.314 ± 0.993	0.875 ± 0.689
PRF-fit source offset from KIC position	1.268 ± 0.819	1.55	-1.076 ± 0.927	0.672 ± 0.430
photometric centroid source offset	1.80 ± 1.53	1.17	0.04 ± 1.32	1.79 ± 1.53

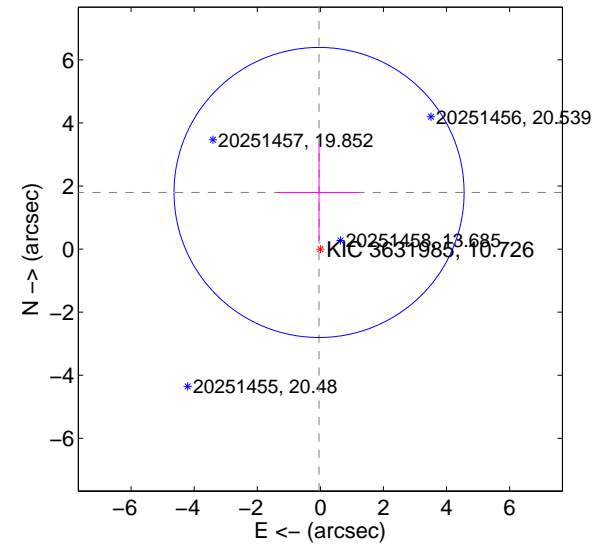
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

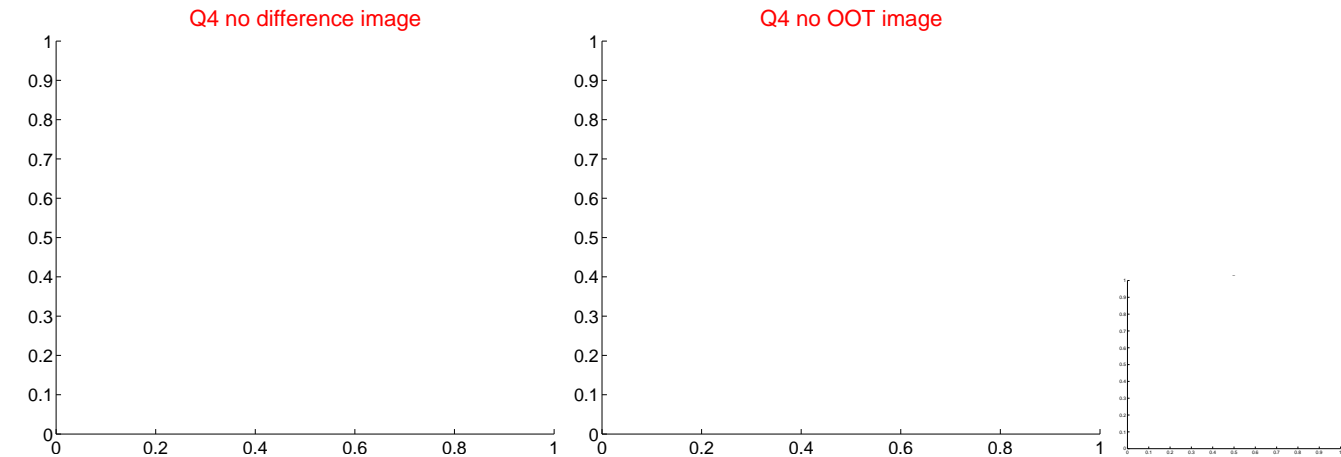
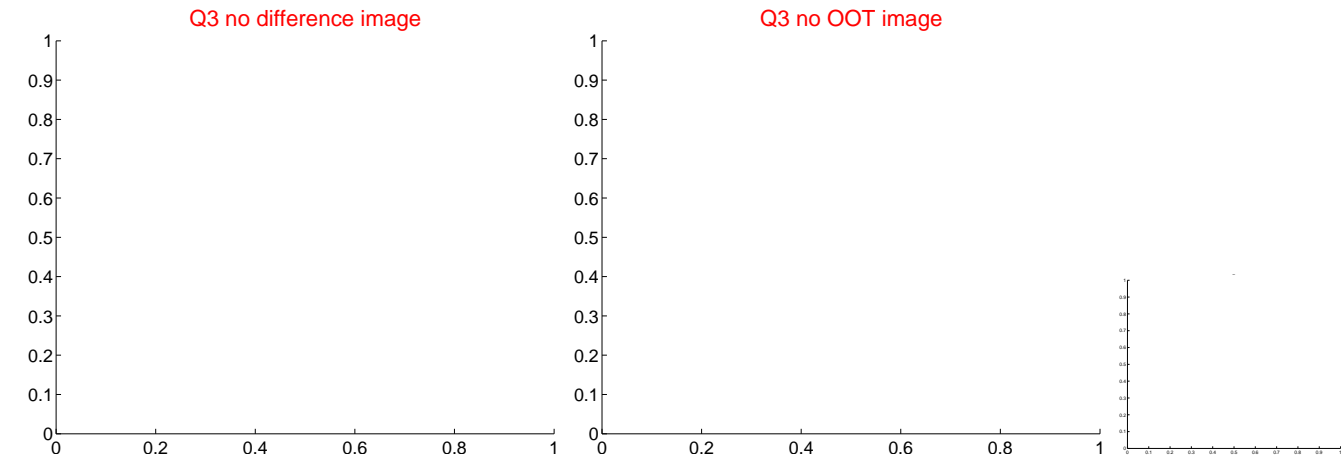
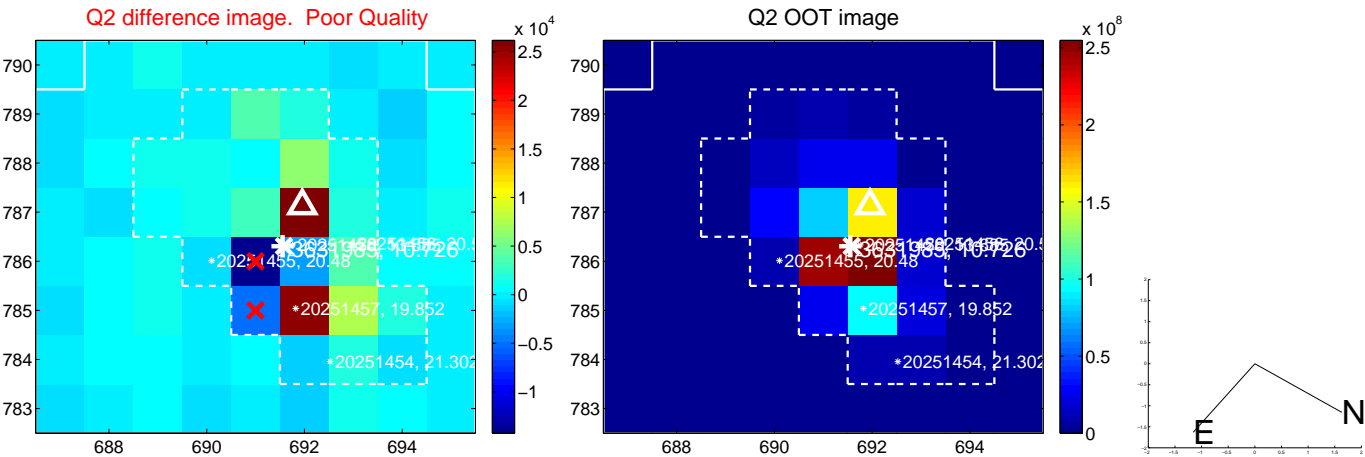


offset from photometric centroids

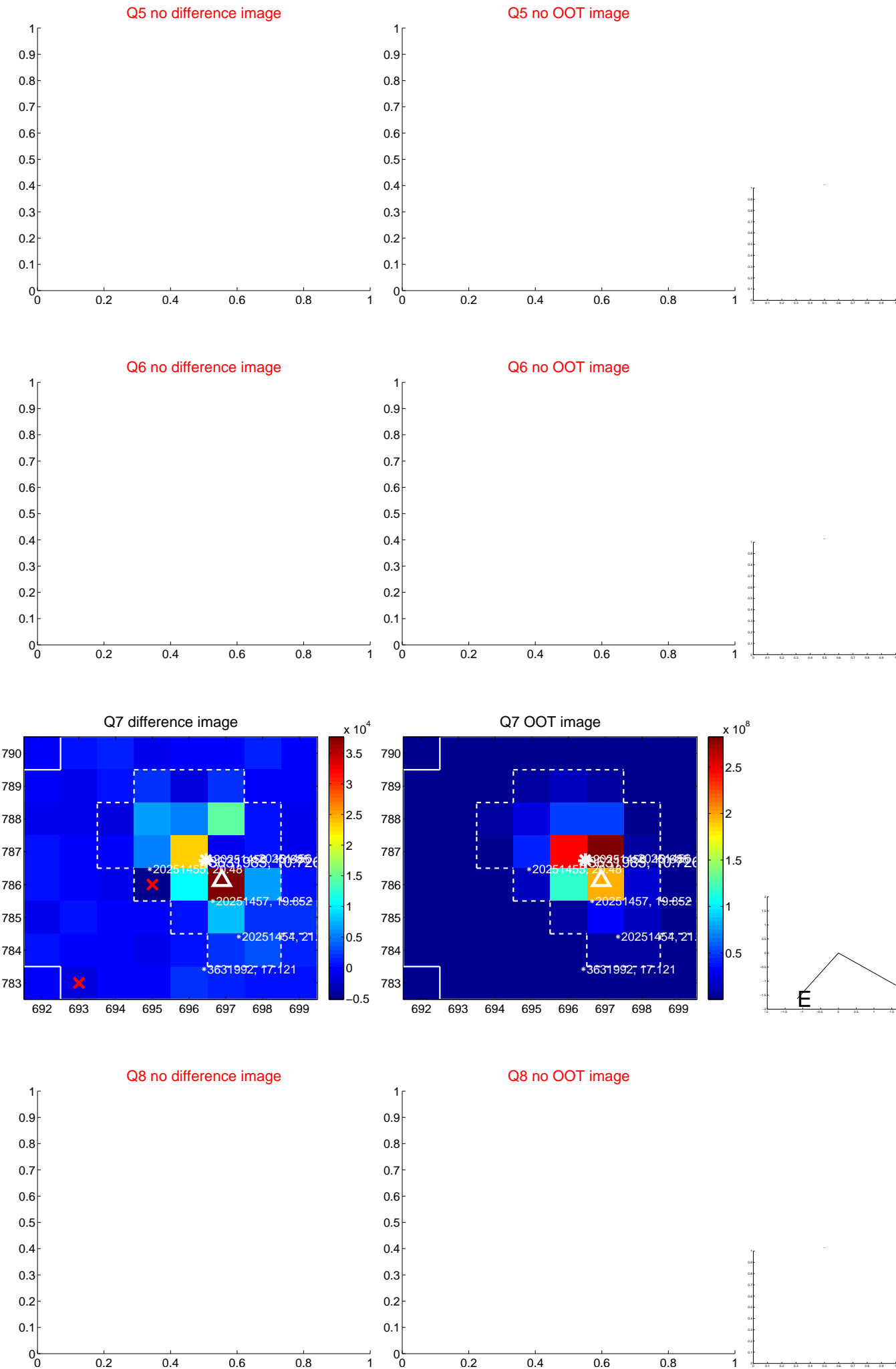


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

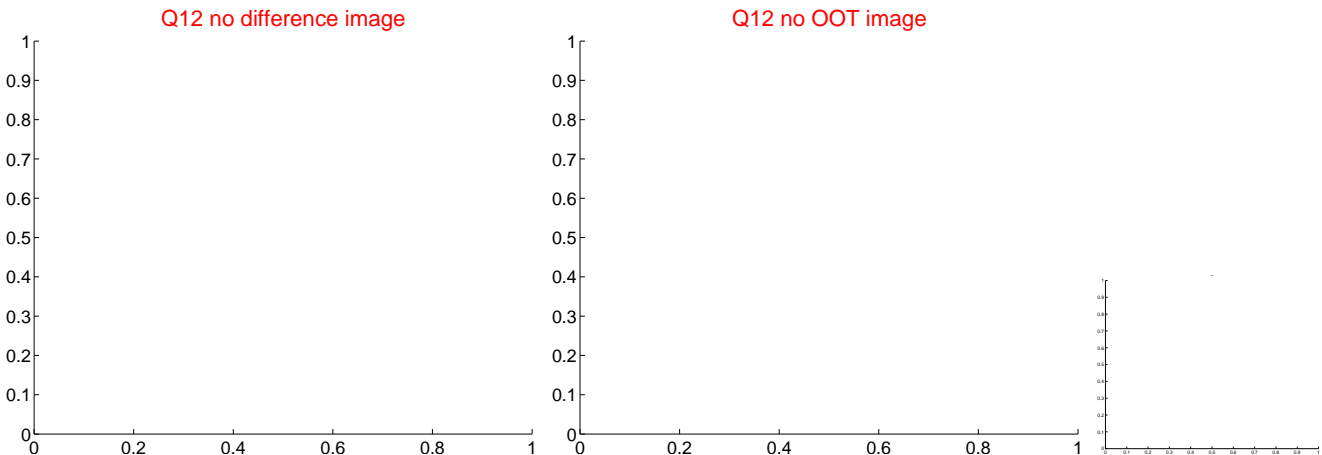
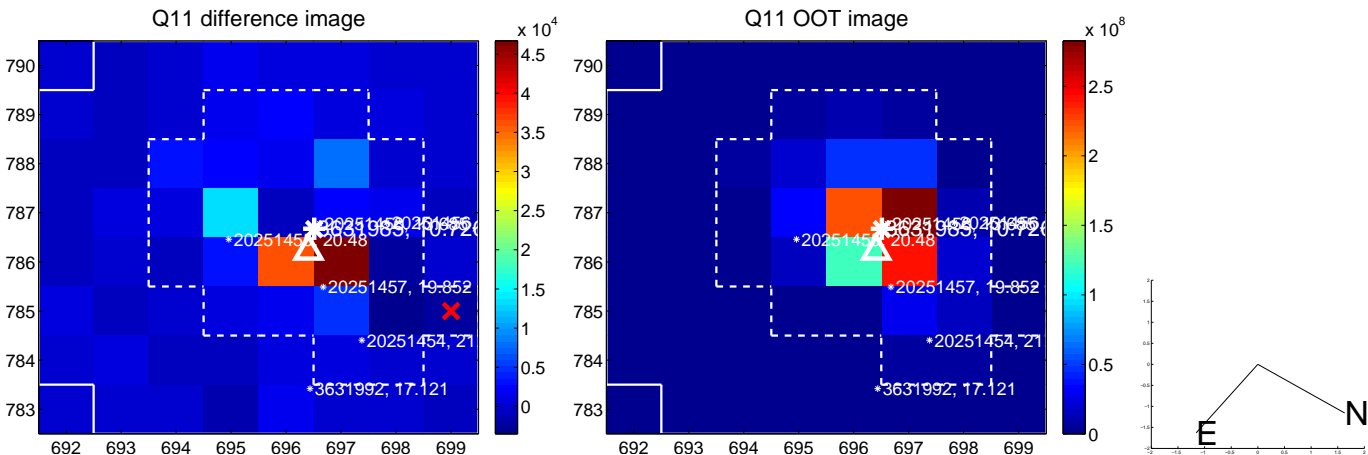
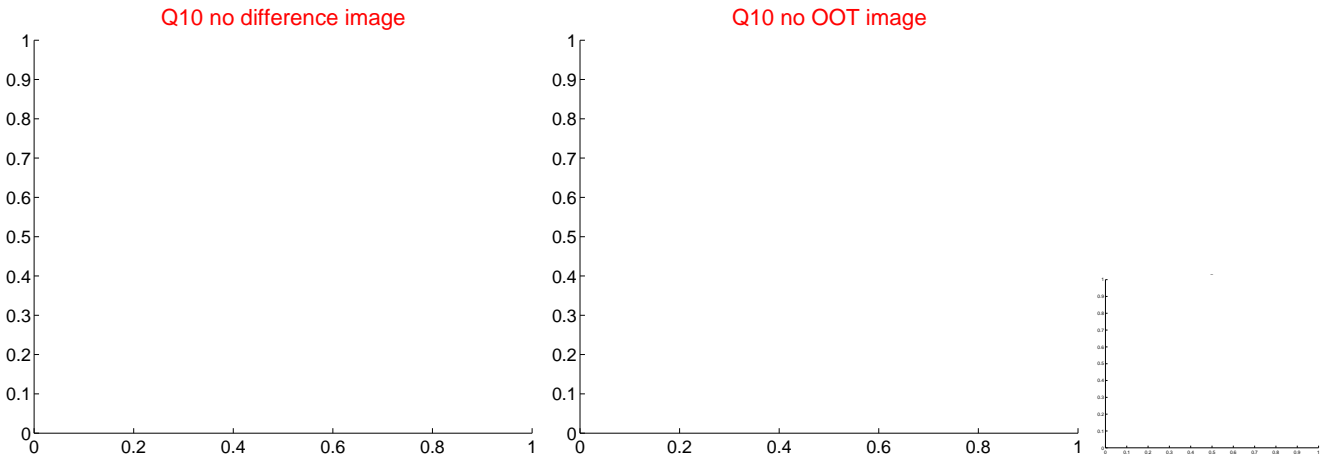
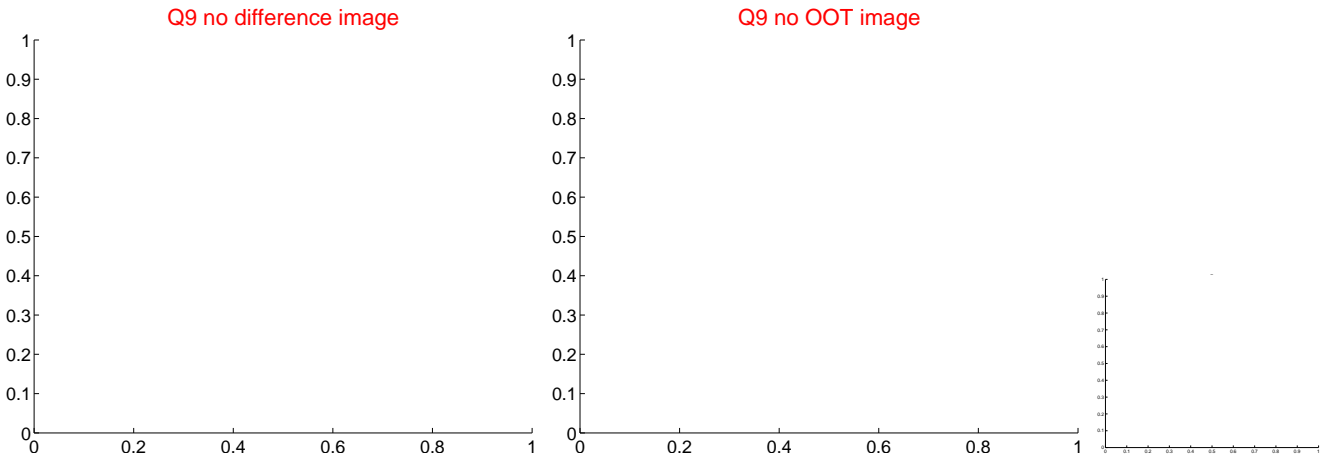
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



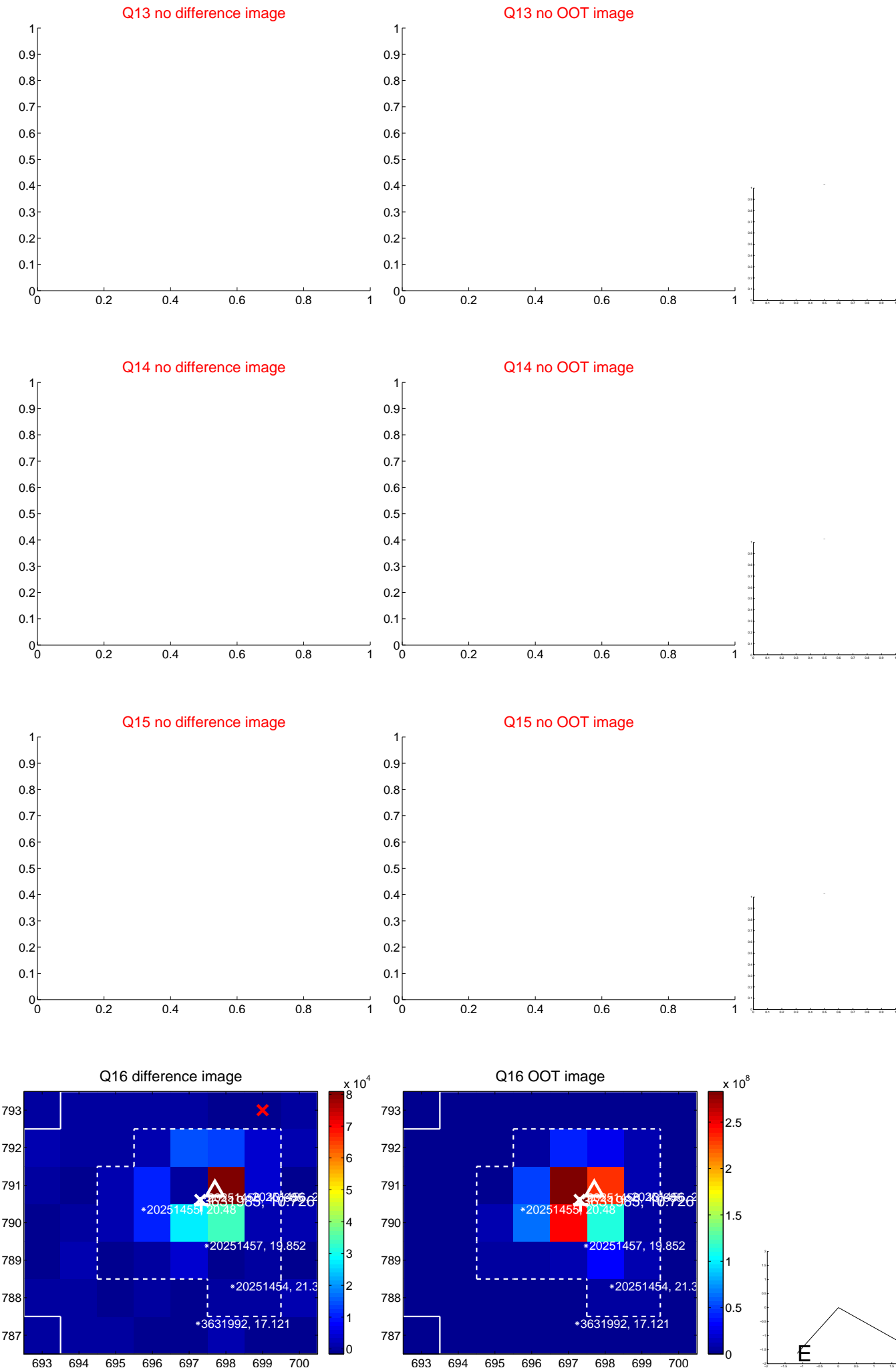
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



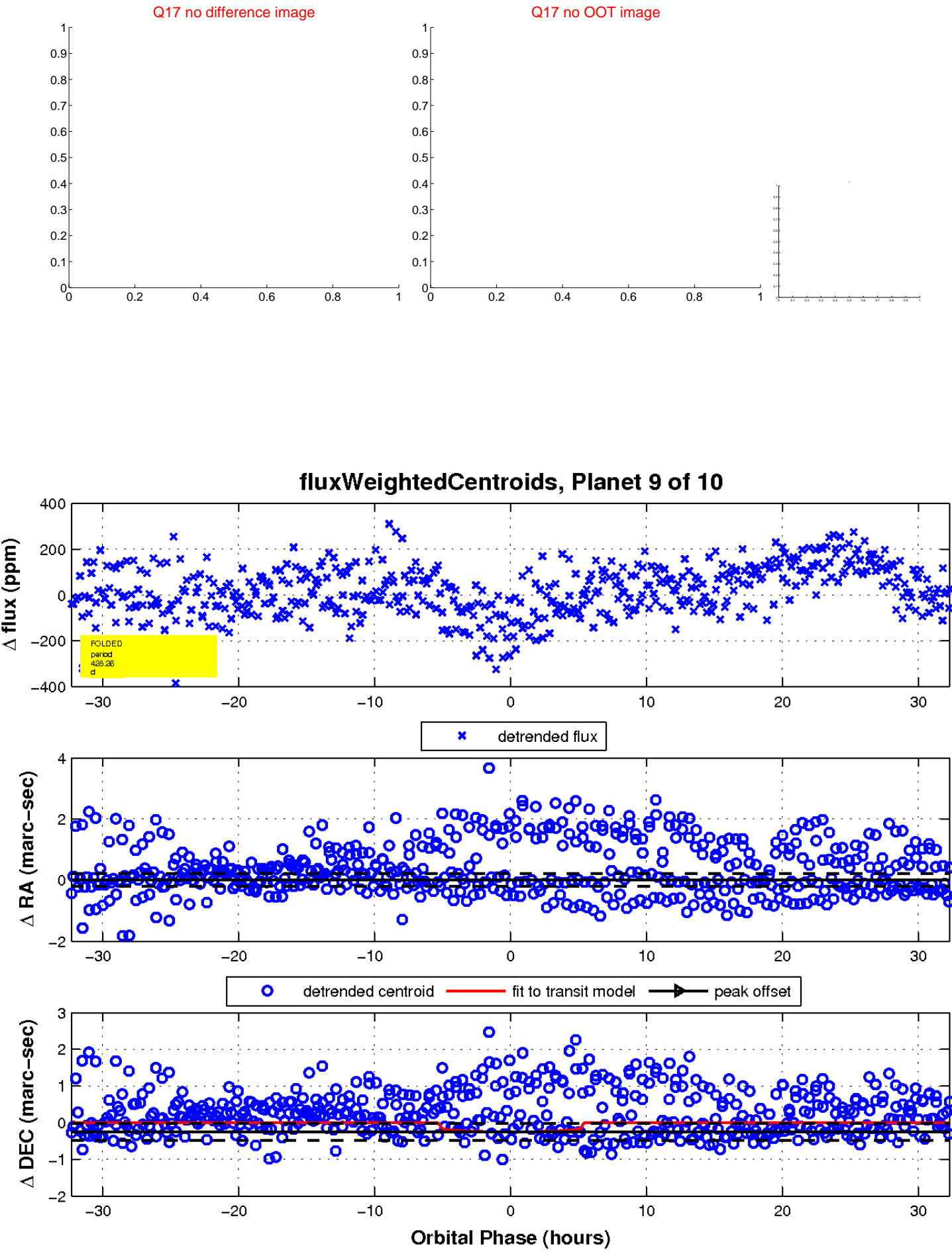
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

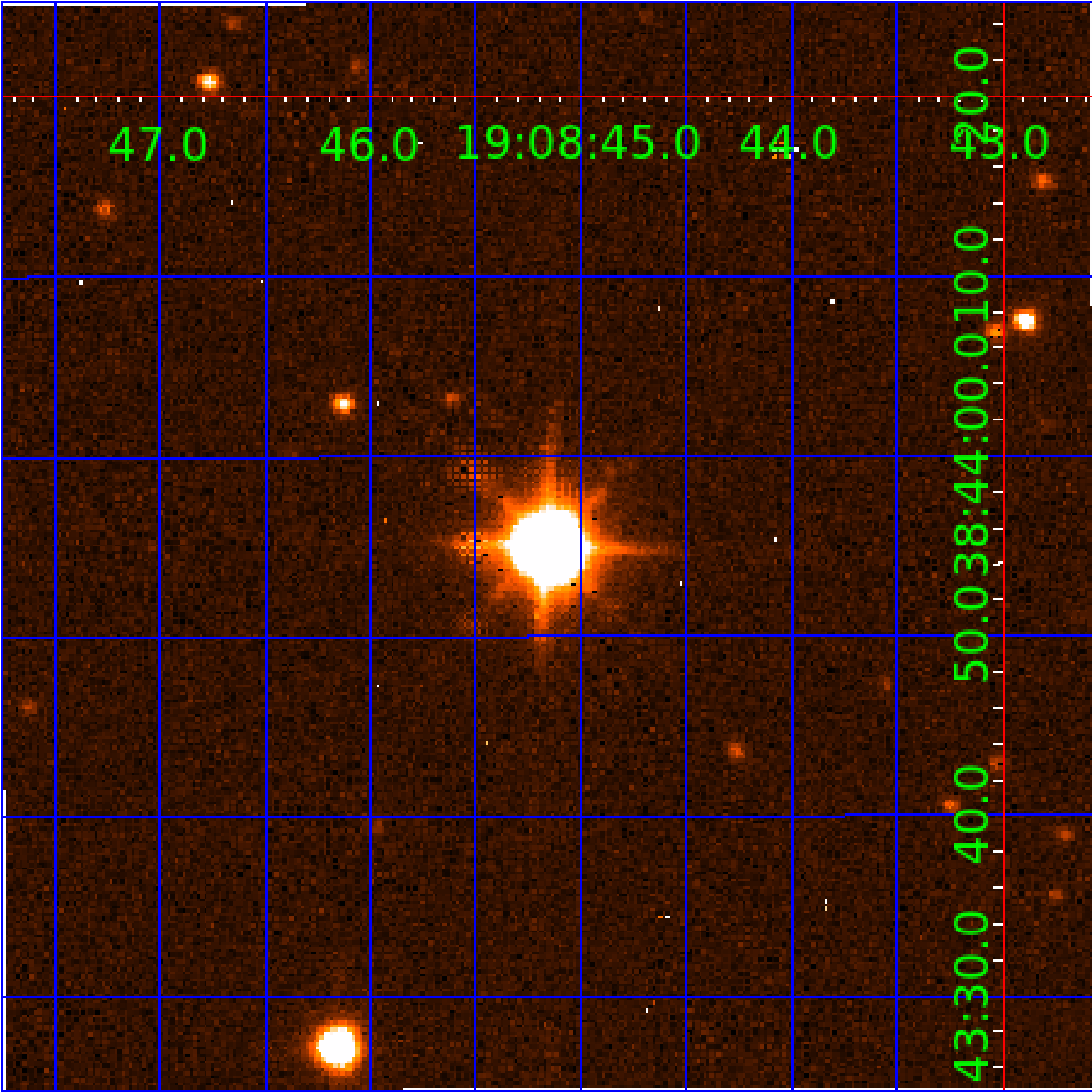


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 003631985

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
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003631985-03	OBS	No	137.684361	192.319484	115.3	12.440	10.0	7.8	1.32	6627	1.55	9.76
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003631985-08	OBS	No	44.050048	148.961830	76.7	11.194	8.9	7.9	1.32	6627	1.30	44.59
003631985-09	OBS	No	428.258732	222.123753	150.7	10.780	9.0	8.9	1.32	6627	1.74	2.15
003631985-10	OBS	No	579.371898	339.223546	119.6	18.051	8.8	6.7	1.32	6627	1.69	1.44

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003631985-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
003631985-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED
003631985-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—CENT_SATURATED
003631985-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_SATURATED
003631985-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
003631985-07	OBS	FP	0.01	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED
003631985-08	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
003631985-09	OBS	FP	0.00	1	0	0	0	ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED
003631985-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

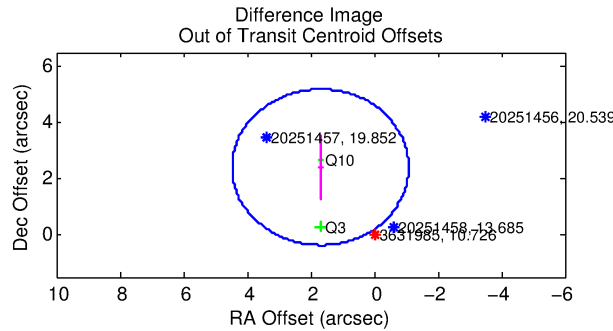
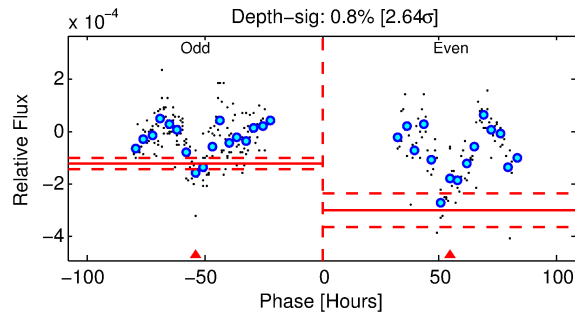
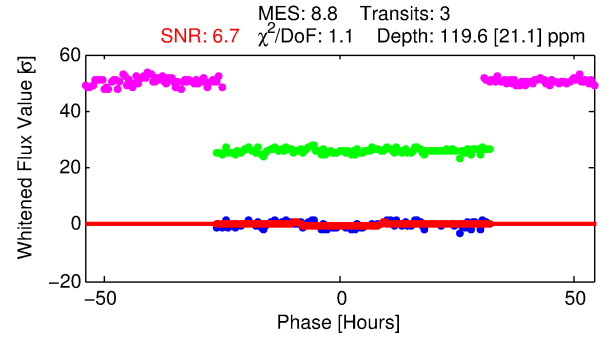
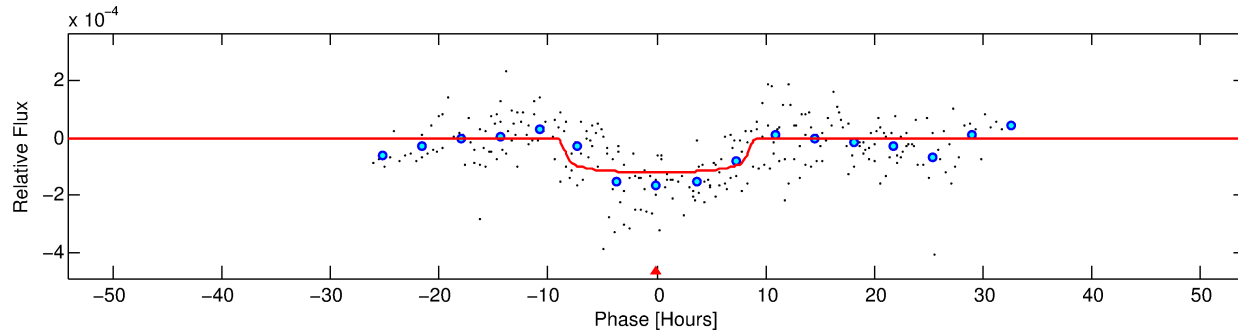
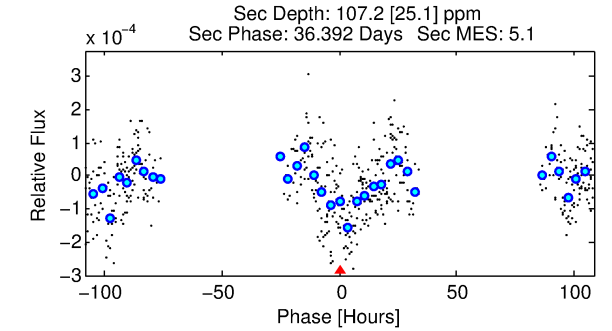
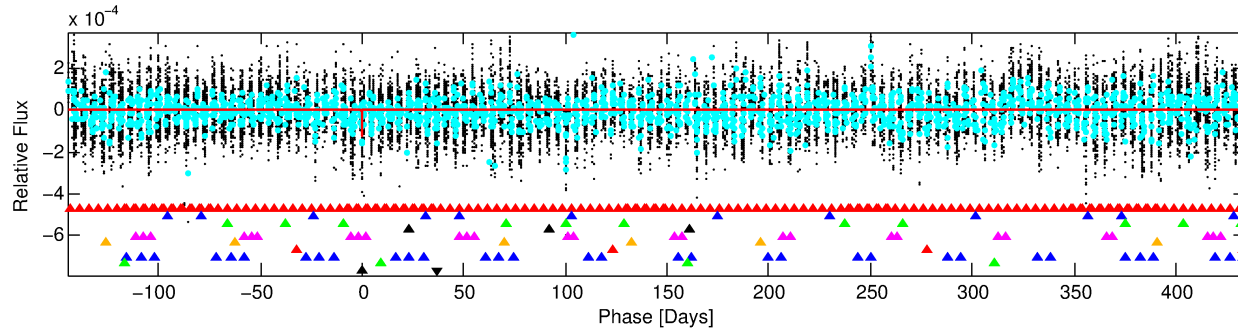
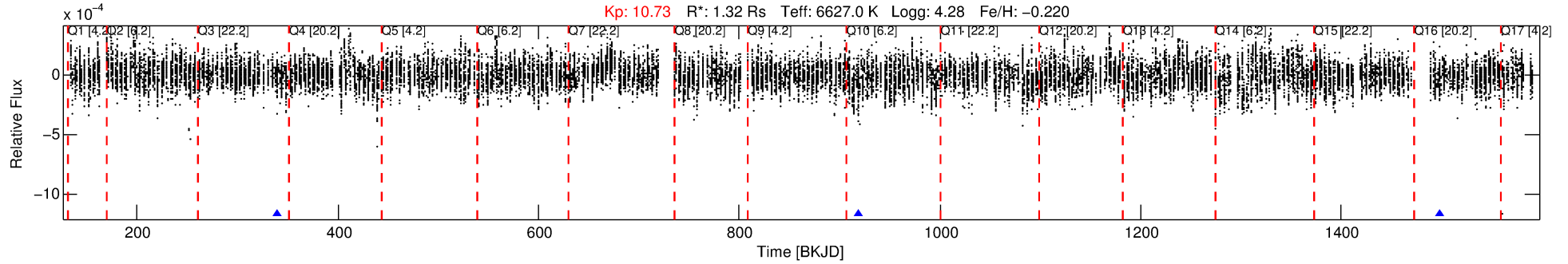
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 003631985-10

No Significant Match Found

DV One-Page Summary

KIC: 3631985 Candidate: 10 of 10 Period: 579.372 d



DV Fit Results:

Period = 579.37190 [0.01329] d
Epoch = 339.2235 [0.0170] BKJD
 R_p/R^* = 0.0118 [0.0014]
 a/R^* = 109.24 [48.23]
 b = 0.91 [0.09]
 Seff = 1.44 [0.55]
 T_{eq} = 279 [27] K
 R_p = 1.69 [0.56] R_e
 a = 1.4445 [0.3627] AU
 A_g = 43063.75 [21083.45] [2.04 σ]
 T_{eff} = 6217 [580] K [10.23 σ]

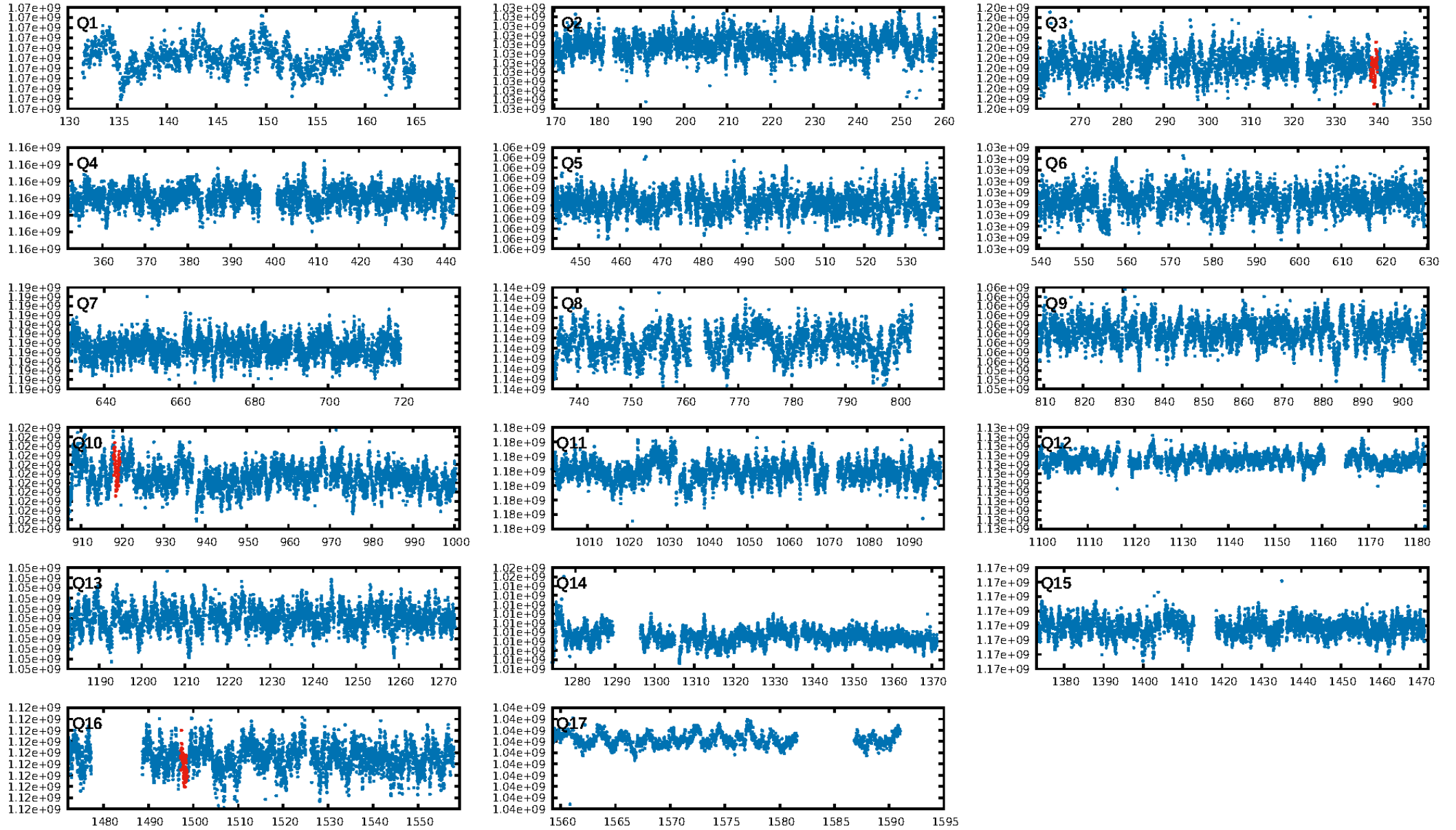
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [87.19 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 94.5%
ModelChiSquareGof-sig: 80.7%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.4542
Centroid-sig: 99.6%
Centroid-so: 0.045 arcsec [0.02 σ]
OotOffset-rm: 2.944 arcsec [3.18 σ]
KicOffset-rm: 2.835 arcsec [5.17 σ]
OotOffset-st: 1/1/0/0 [2]
KicOffset-st: 1/1/0/0 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [2/2]

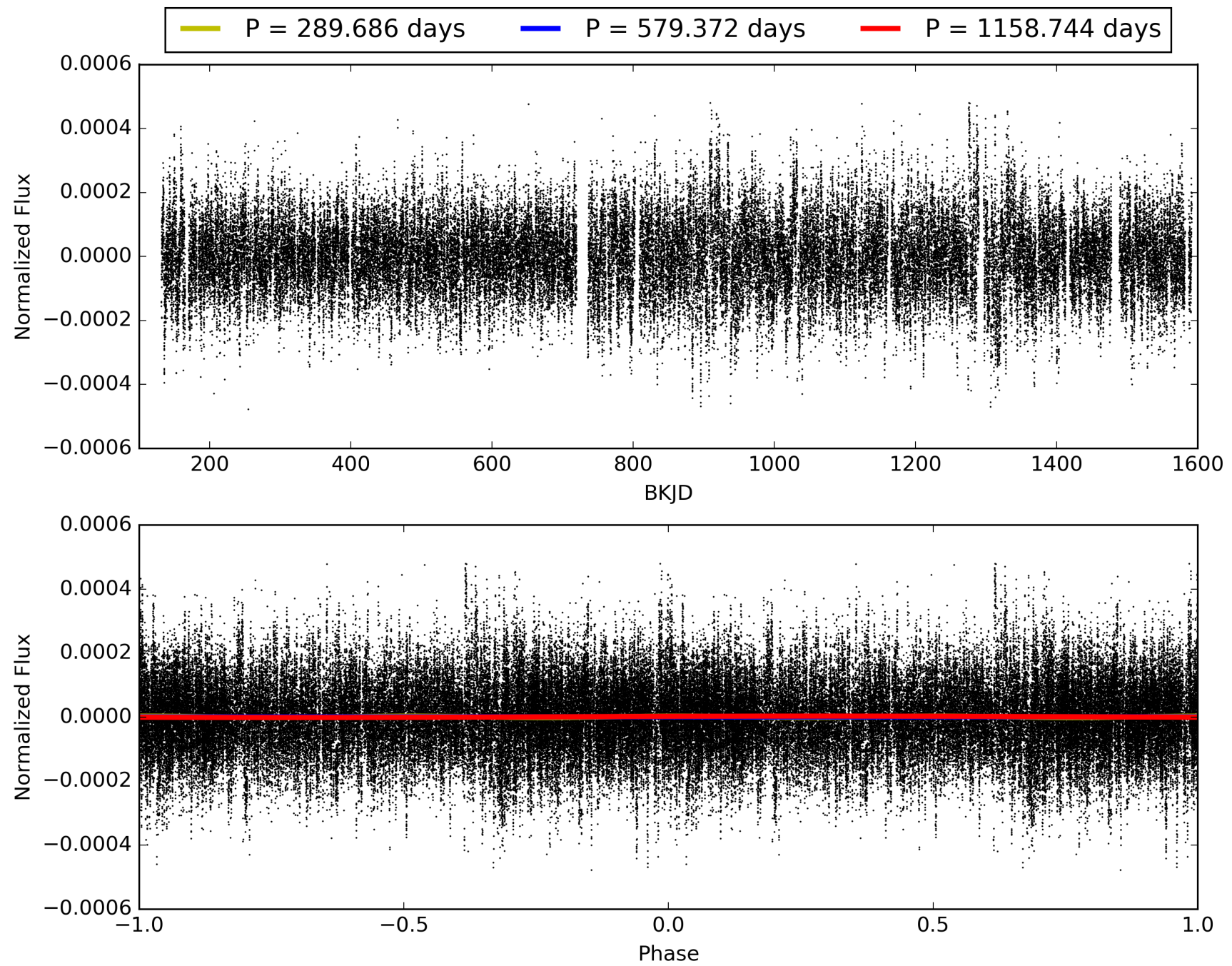
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 18:56:07 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 003631985-10, PDC Light Curves

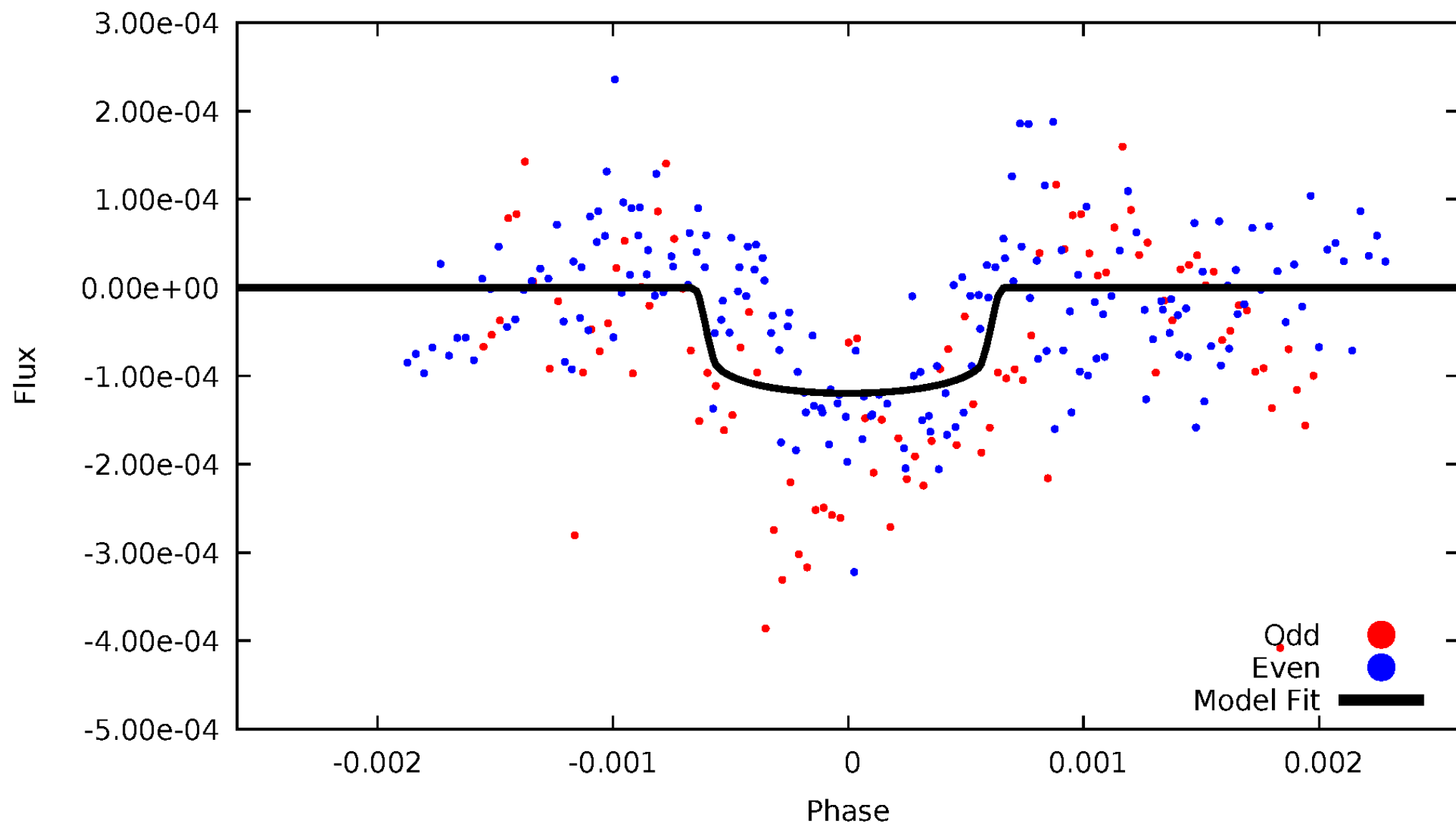


TCE 003631985-10



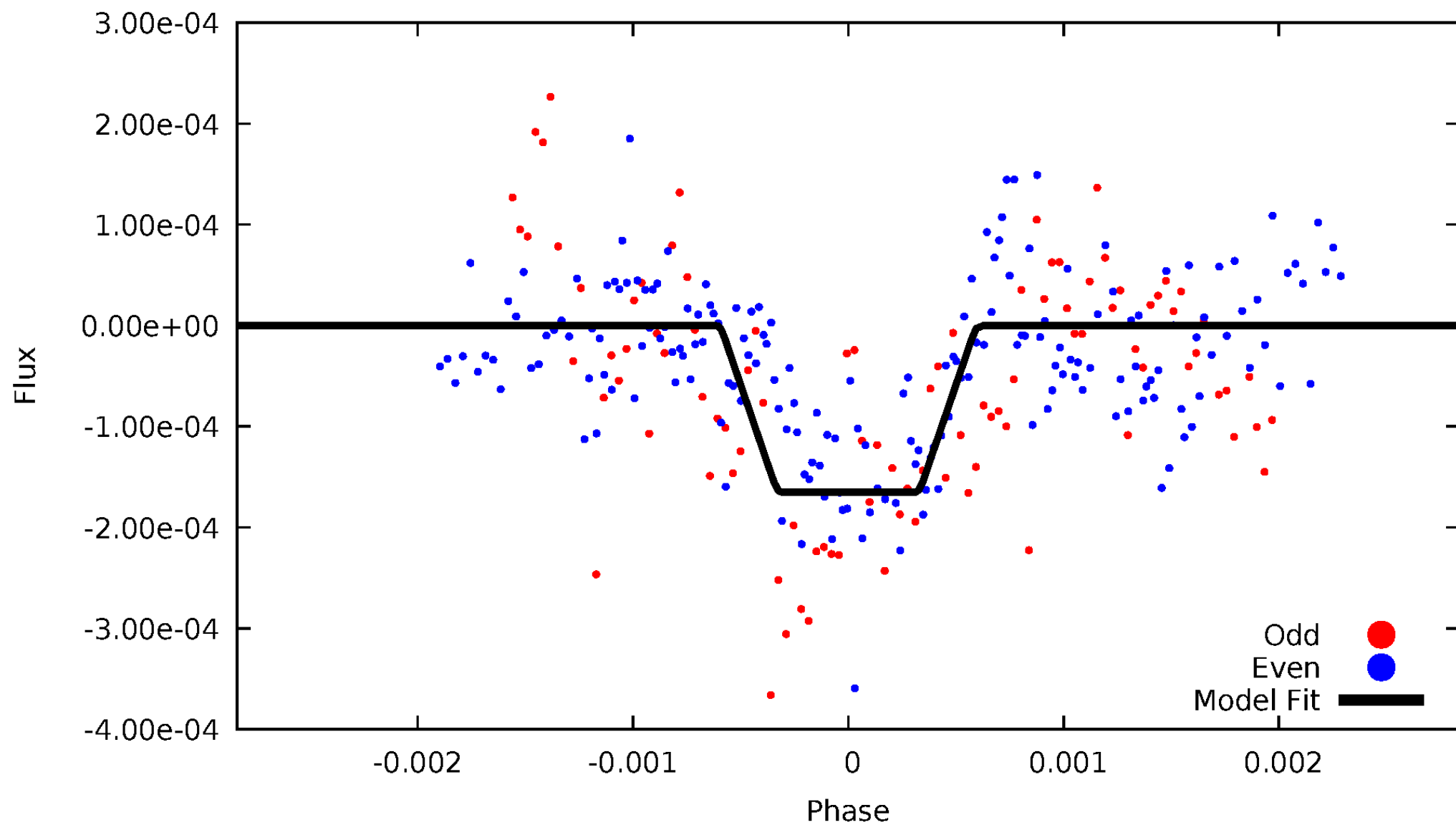
DV Odd/Even

TCE 003631985-10



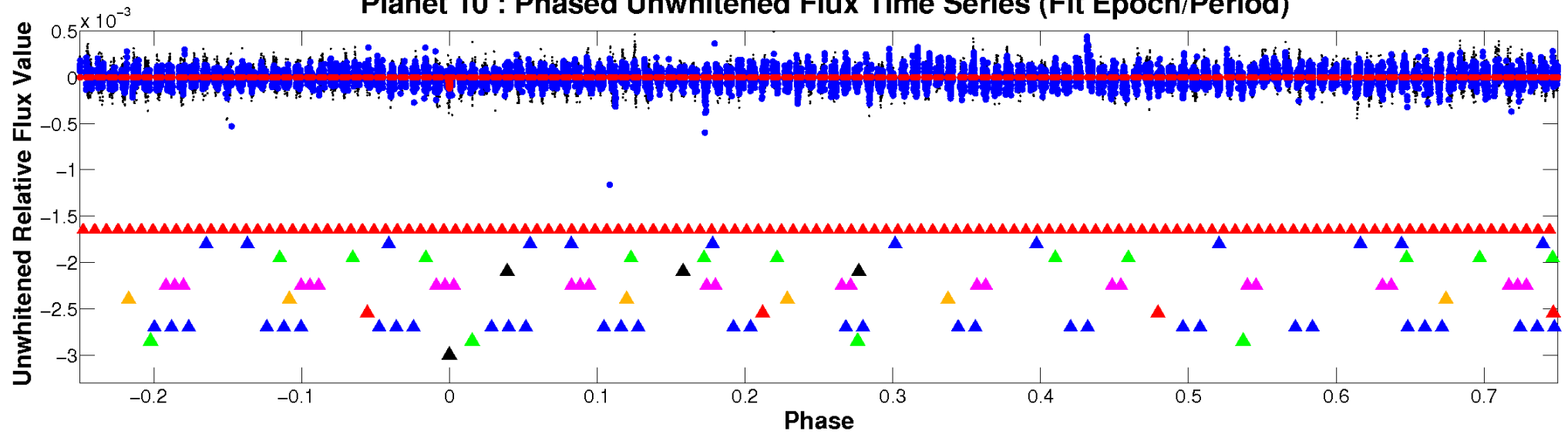
ALT Odd/Even

TCE 003631985-10

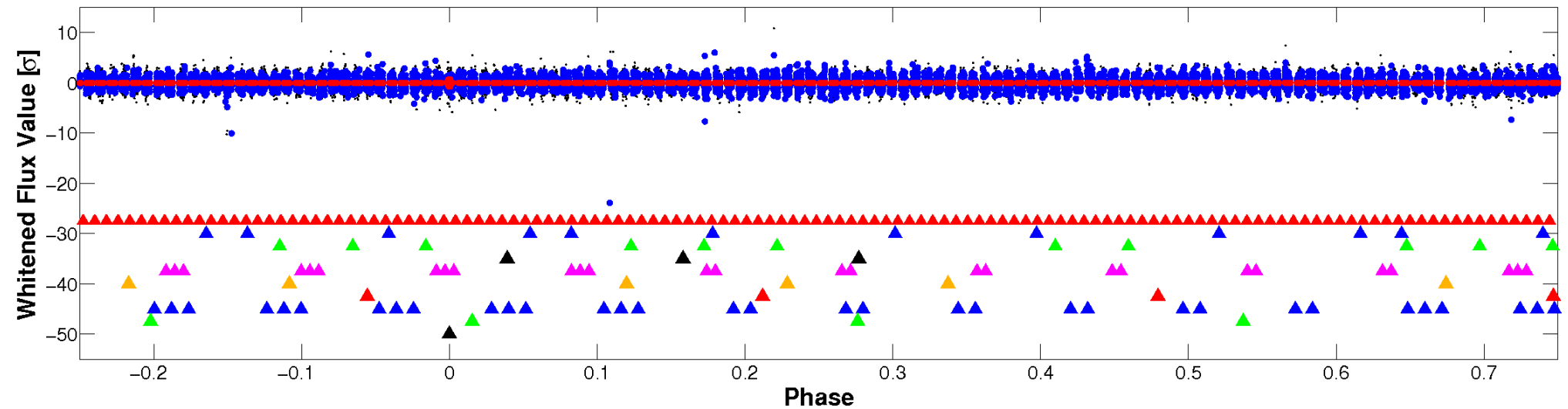


Non-Whitened Vs. Whitened Light Curve

Planet 10 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

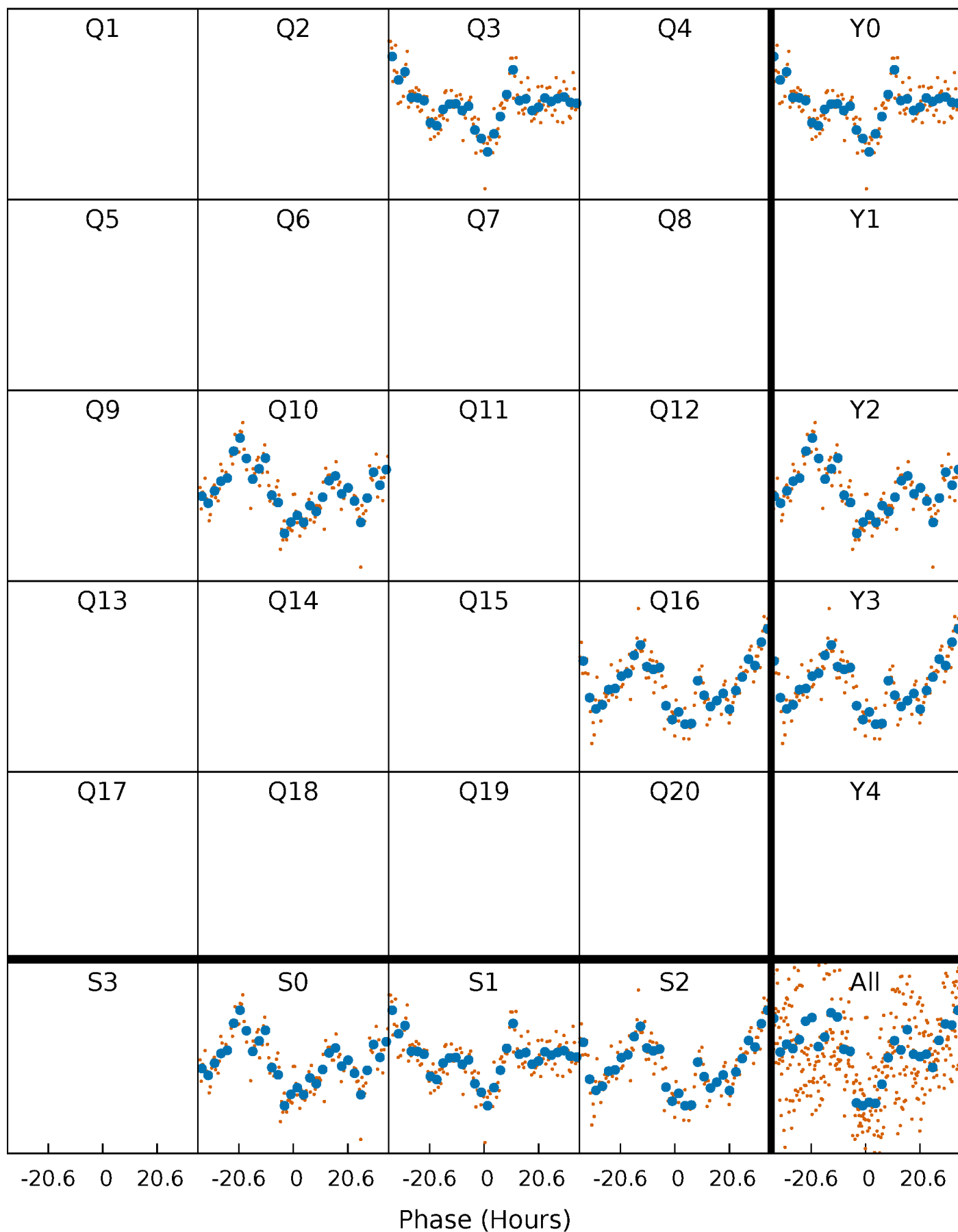


Planet 10 : Phased Whitened Flux Time Series (Fit Epoch/Period)



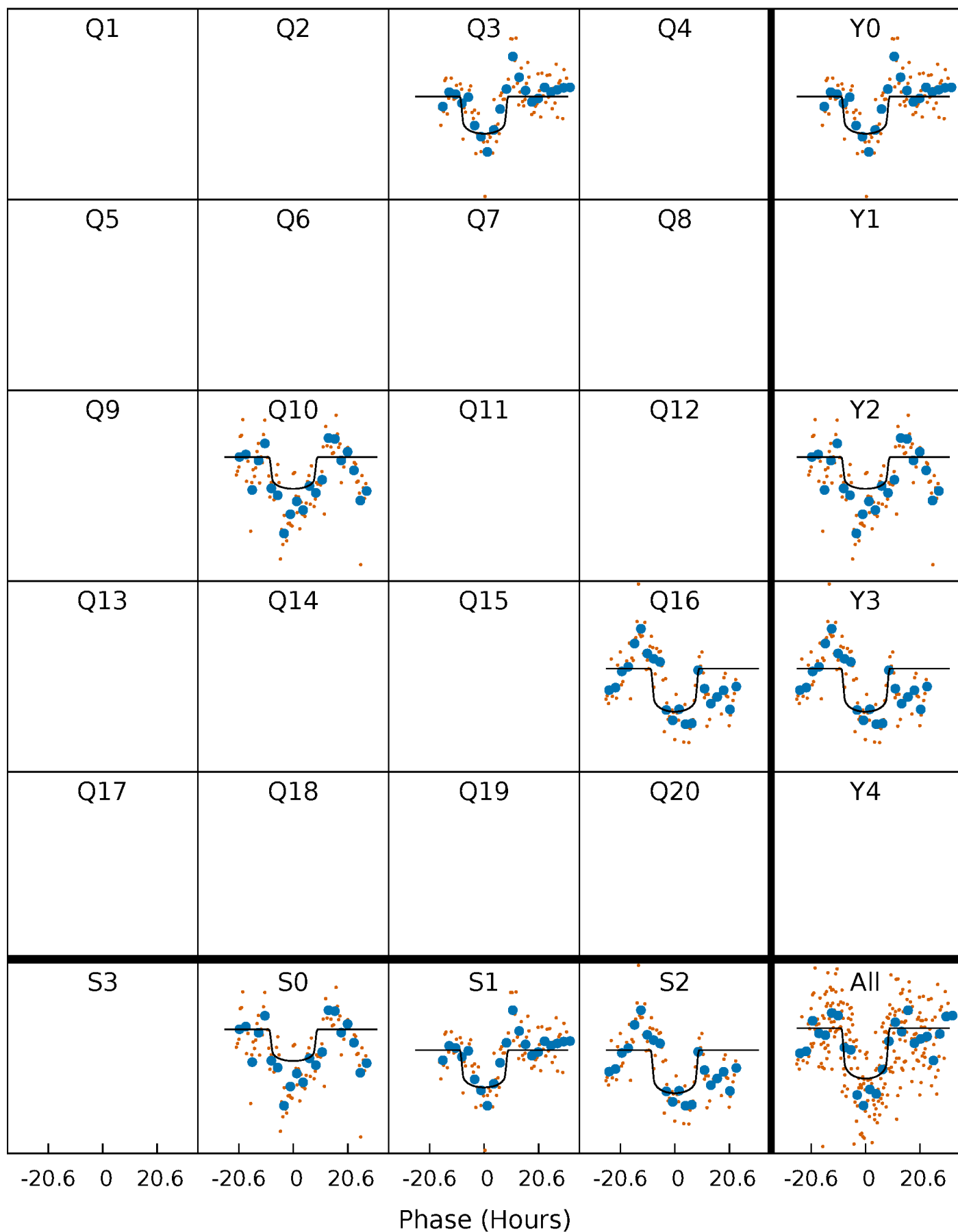
PDC Quarter-Phased Transit Curves

TCE 003631985-10 P=579.371898 Days $T_0=339.223546$ (BKJD)



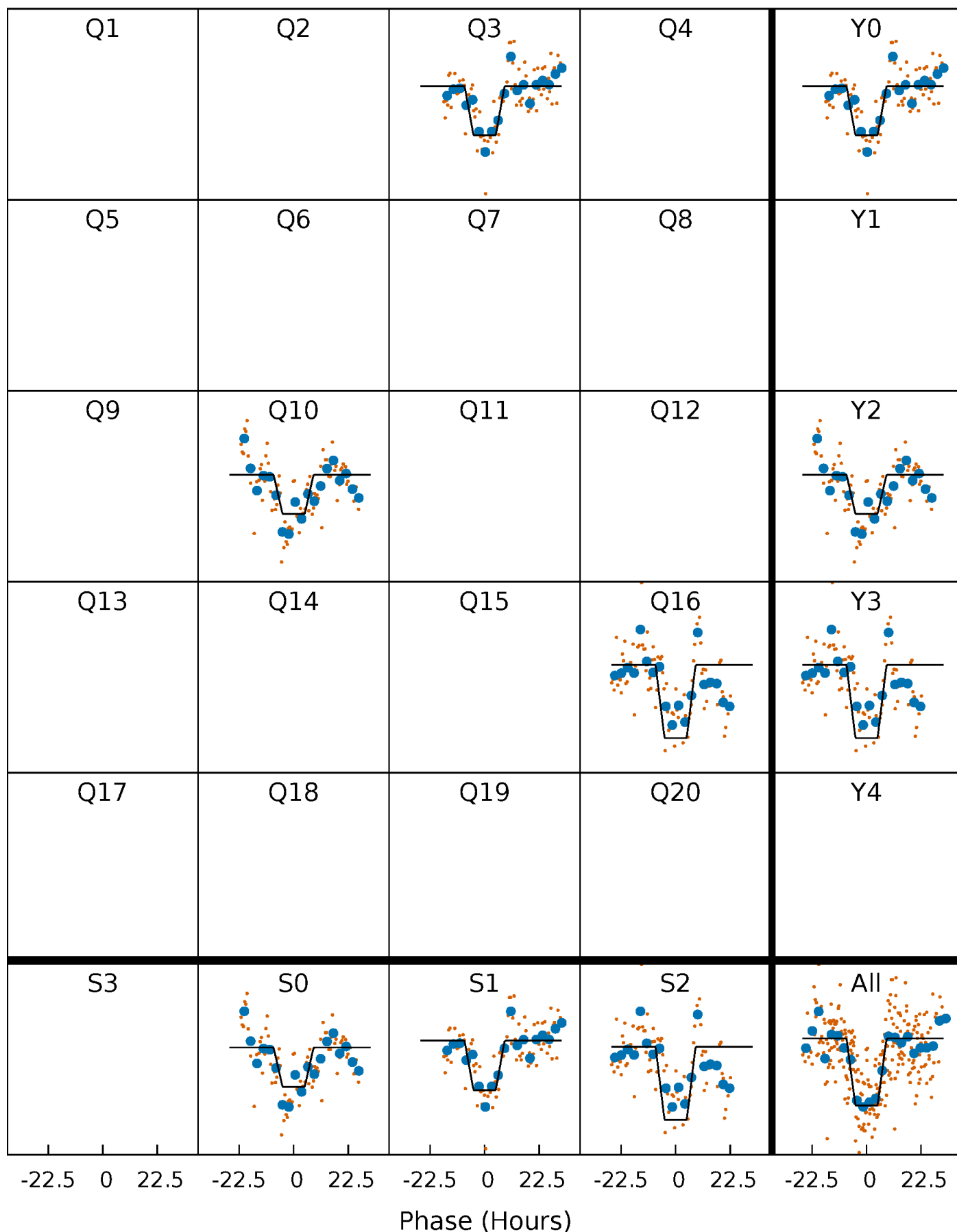
DV Quarter-Phased Transit Curves

TCE 003631985-10 P=579.371898 Days $T_0=339.223546$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

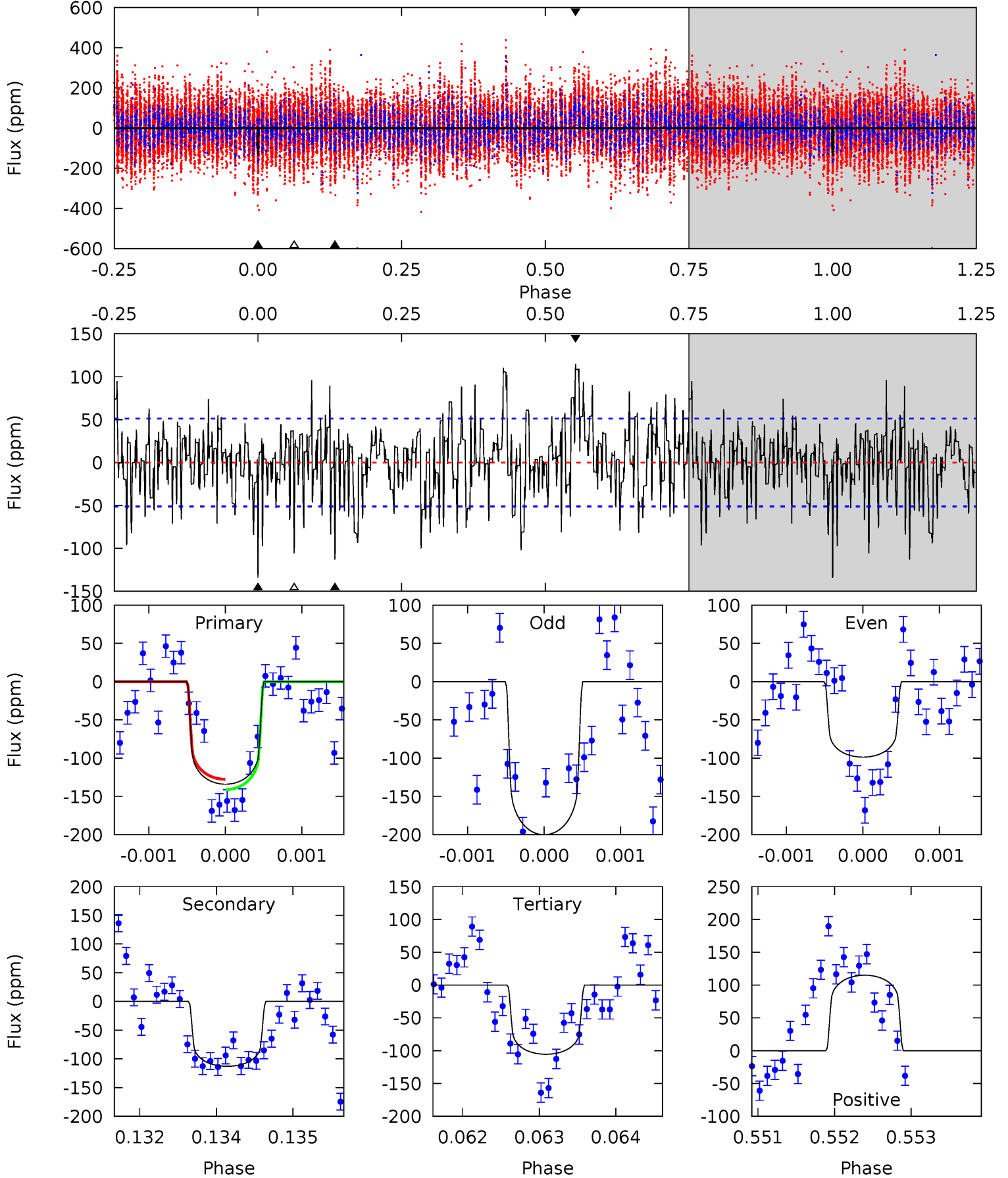
TCE 003631985-10 P=579.379971 Days $T_0=339.220462$ (BKJD)



DV Model-Shift Uniqueness Test

003631985-10, P = 579.371898 Days, E = 339.223546 Days

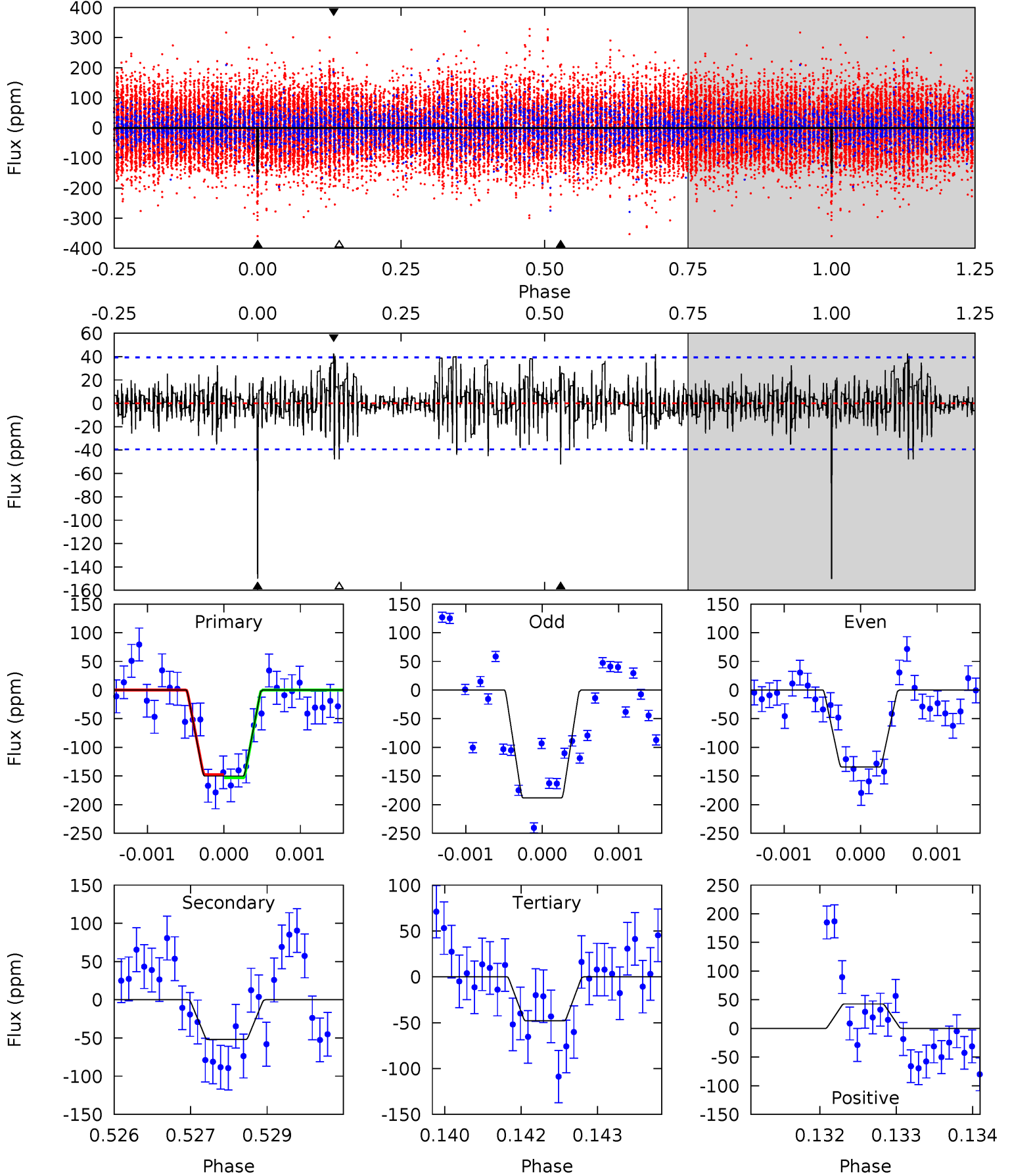
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.1	11.9	11.1	12.1	5.40	3.21	3.84	3.01	2.01	0.79	-0.21	5.12	1.30	0.46	0.71



Alt Model-Shift Uniqueness Test

003631985-10, P = 579.379971 Days, E = 339.220462 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.7	7.15	6.60	5.86	5.41	3.23	1.71	14.1	14.8	0.55	1.29	3.62	0.99	0.22	0.36



Stellar Parameters For KIC 003631985

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6627^{+186}_{-255}	$4.277^{+0.124}_{-0.186}$	$-0.220^{+0.250}_{-0.300}$	$1.317^{+0.408}_{-0.220}$	$1.204^{+0.183}_{-0.183}$	$0.742^{+0.432}_{-0.369}$
	+3%/-4%	+3%/-4%	+114%/-136%	+31%/-17%	+15%/-15%	+58%/-50%
Source	PHO54	PHO54	PHO54	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 003631985-10 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-113 ± 9	$1.70^{+0.34}_{-0.29}$	392^{+26}_{-25}	6243^{+559}_{-397}	43858^{+18689}_{-13327}
Alt.	-52 ± 7	$1.88^{+0.32}_{-0.29}$	392^{+28}_{-25}	5008^{+344}_{-291}	16833^{+6608}_{-4813}

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{\text{obs}} \gg T_{\text{max}}$ AND $A_{\text{obs}} \gg 1.0$

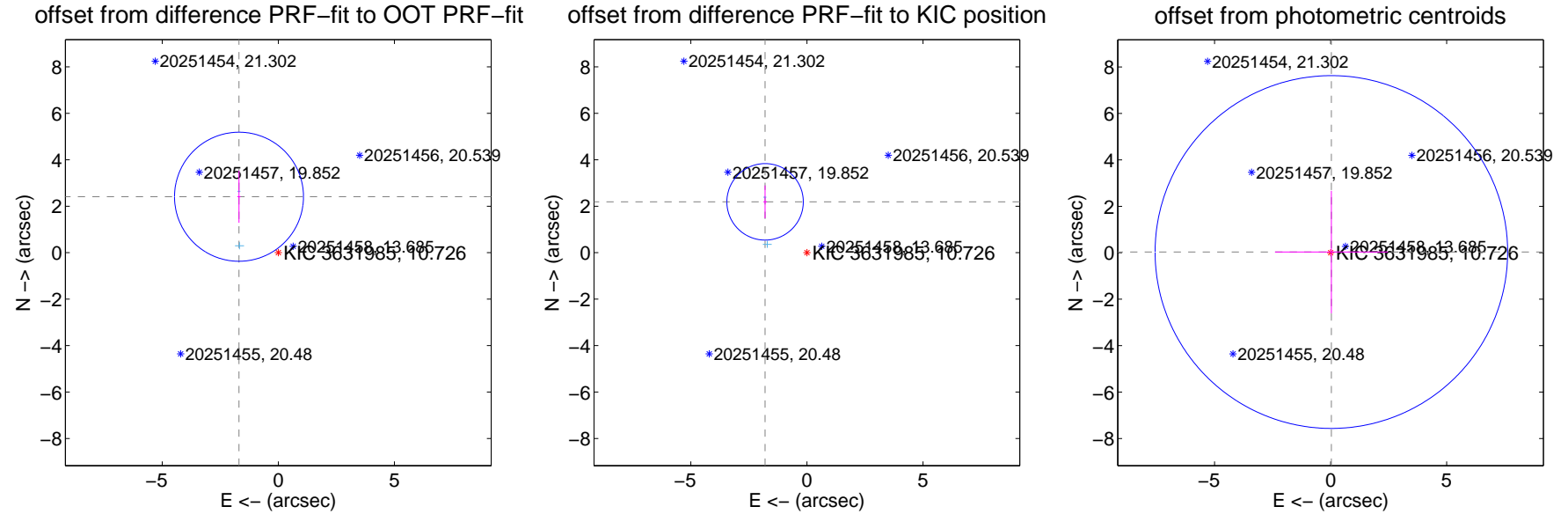
DV Centroid Data

Supplemental centroid analysis for 003631985-10. **Kepler magnitude: 10.73.** Transit SNR 6.69

There are 2 quarters with good PRF difference image offsets

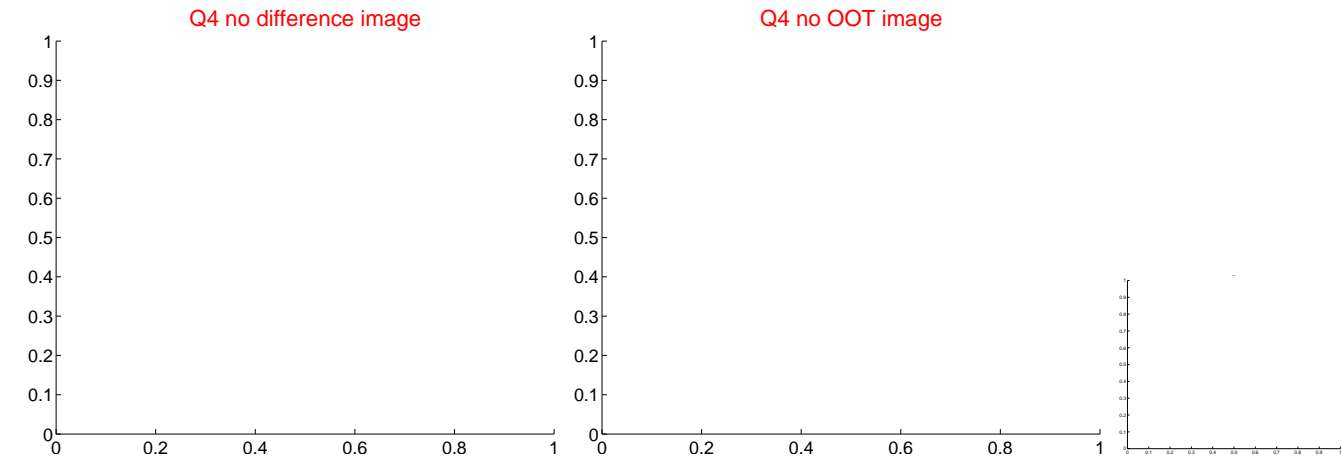
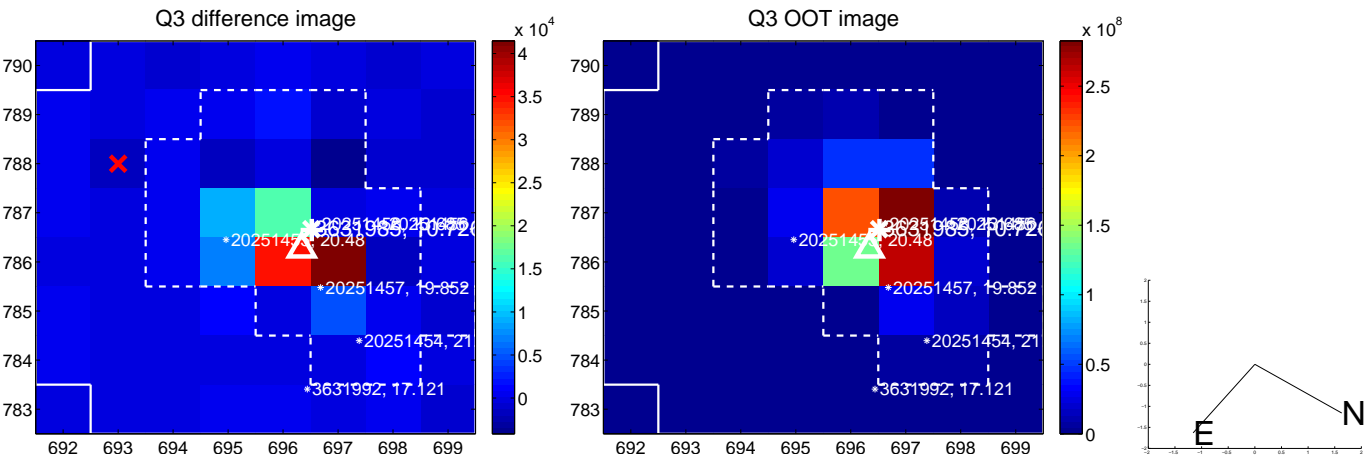
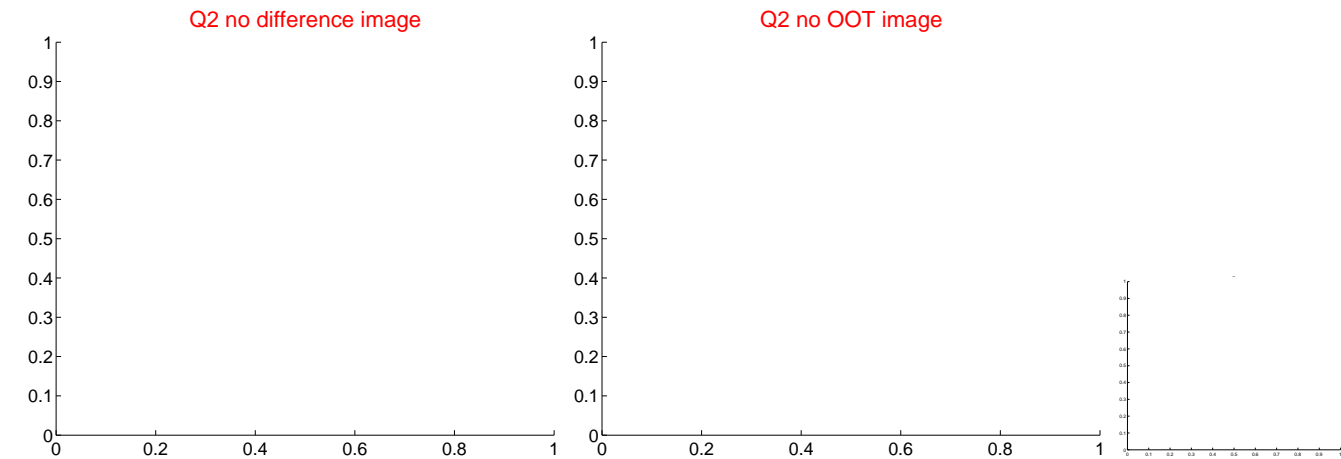
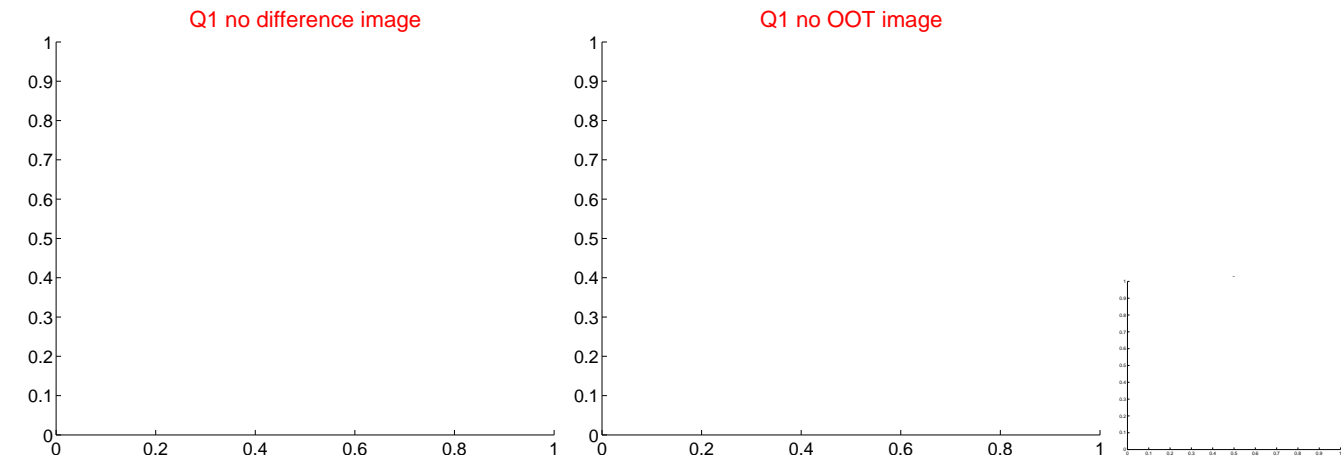
The direct PRF centroid is offset from the target star catalog position by about 0.28 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.944 ± 0.926	3.18	1.693 ± 0.068	2.408 ± 1.123
PRF-fit source offset from KIC position	2.835 ± 0.549	5.17	1.802 ± 0.076	2.188 ± 0.708
photometric centroid source offset	0.05 ± 2.53	0.02	-0.03 ± 2.43	0.03 ± 2.64



Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

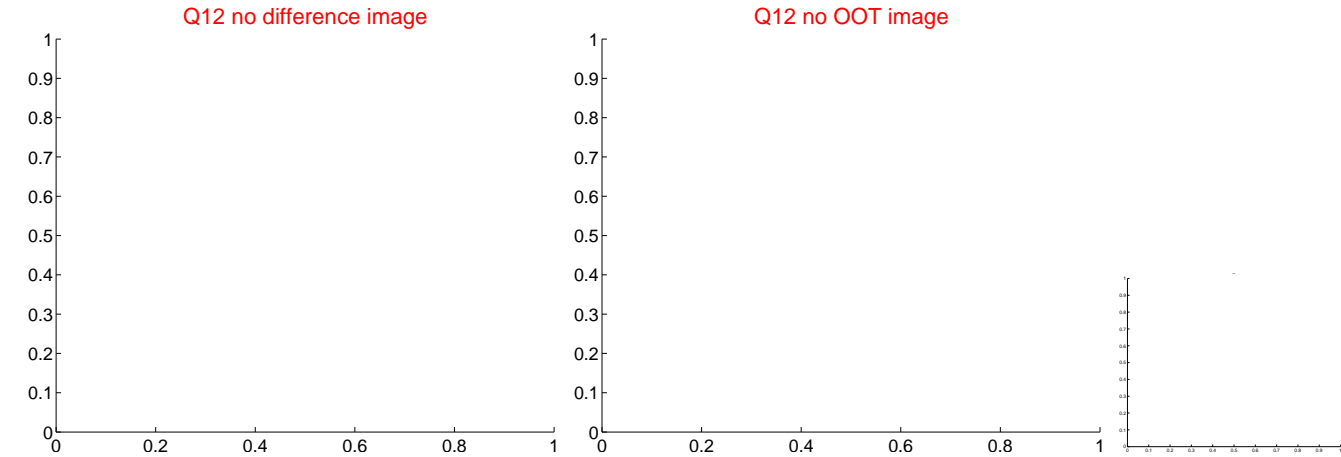
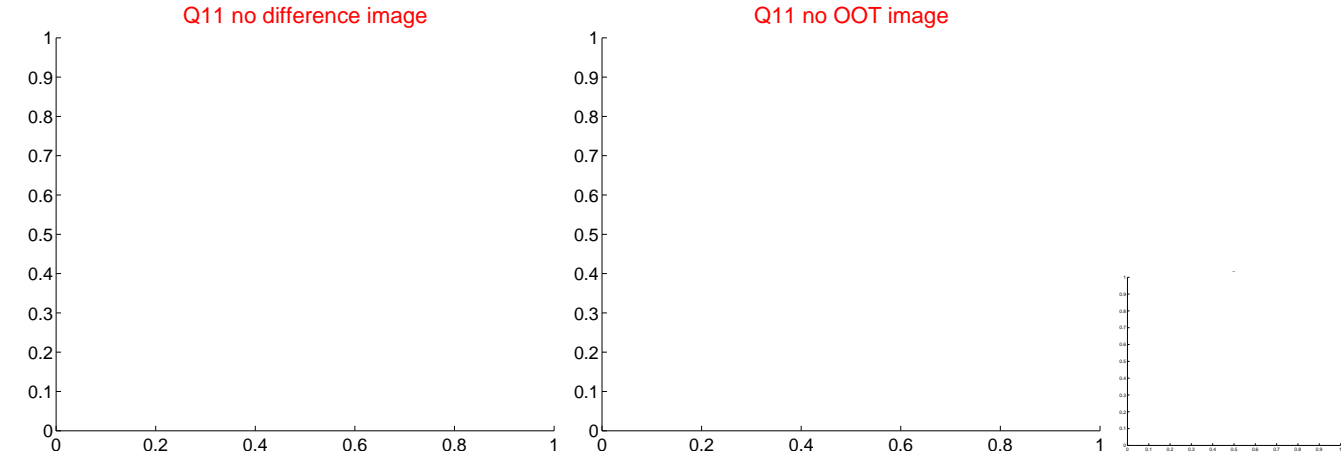
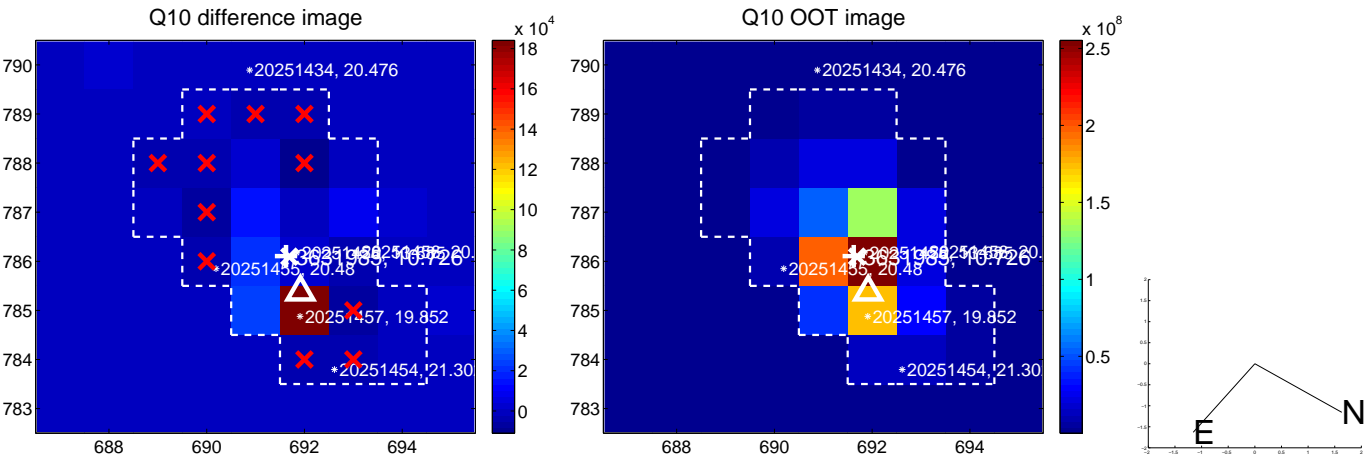
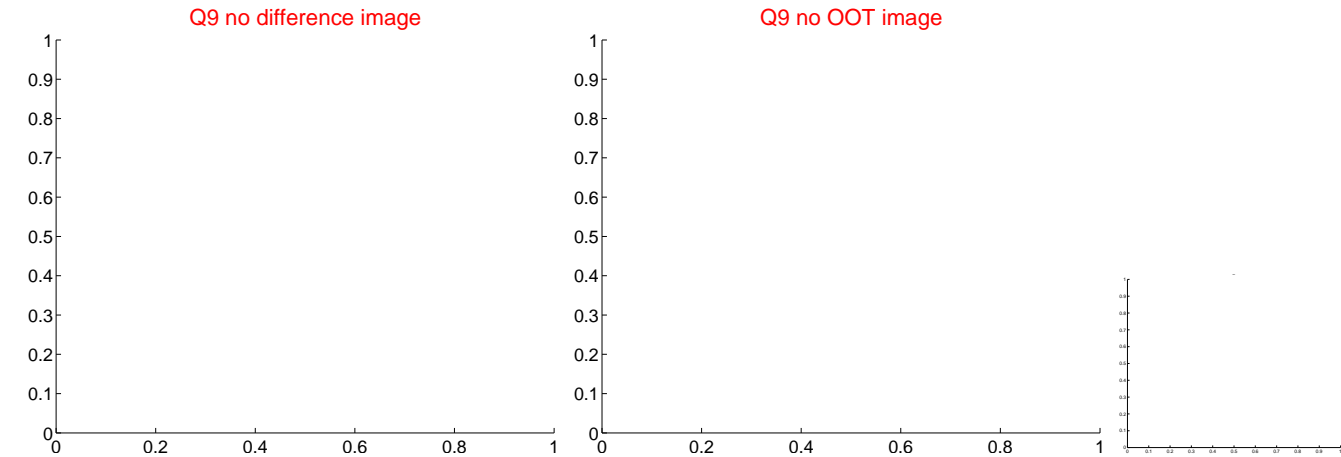
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



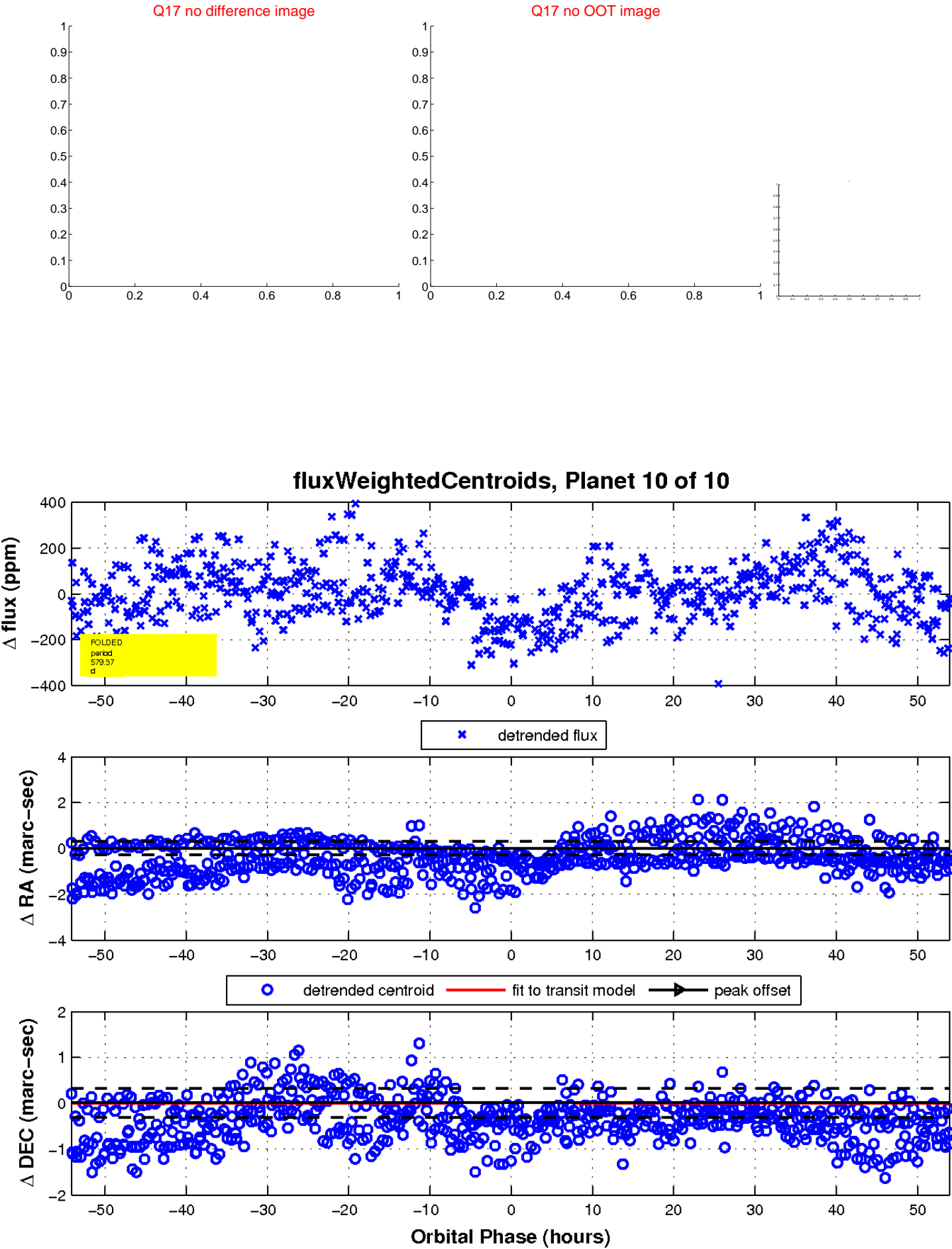
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination

