

KIC 010385459

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})
010385459-01	OBS	No	98.660889	160.323346	298.1	2.071	21.7	4.2	1.44	7159	2.52	23.58
010385459-02	OBS	No	635.429726	250.425440	4.1	5.909	65.6	0.0	1.44	7159	0.34	1.97
010385459-03	OBS	No	631.700057	254.701887	556.7	8.556	73.6	1.8	1.44	7159	3.63	1.98

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010385459-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
010385459-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_SATURATED
010385459-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED

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

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

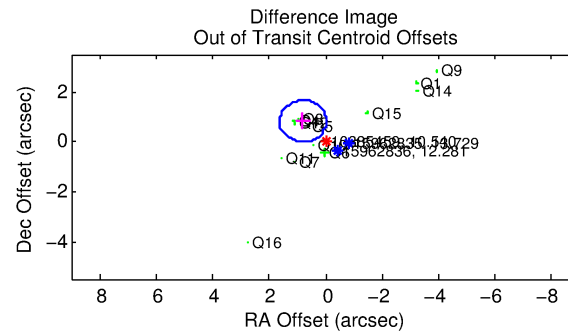
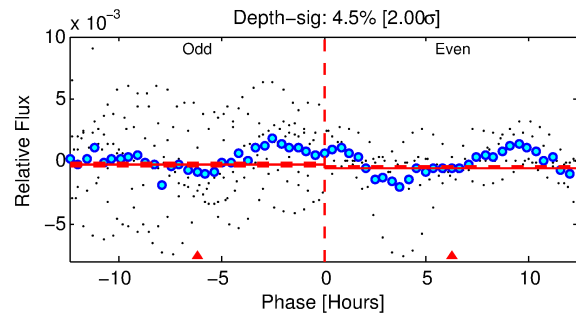
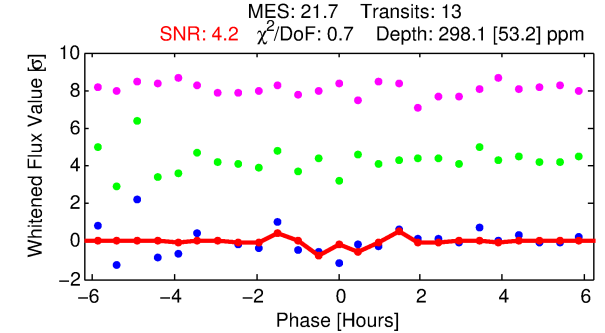
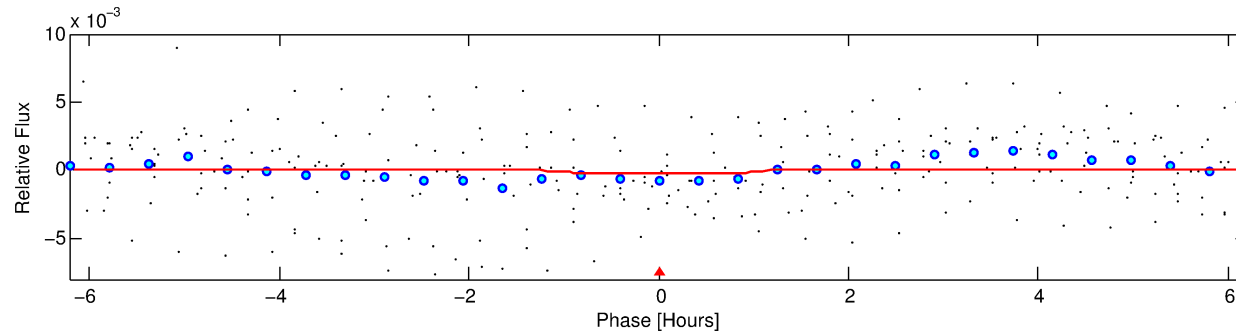
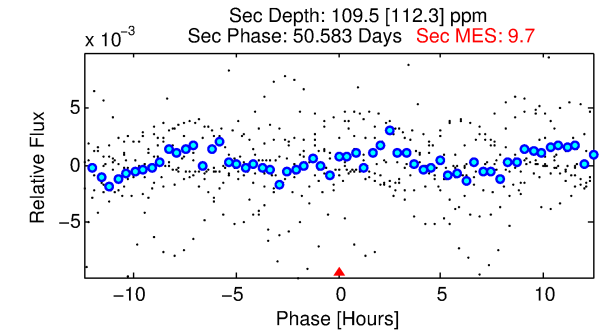
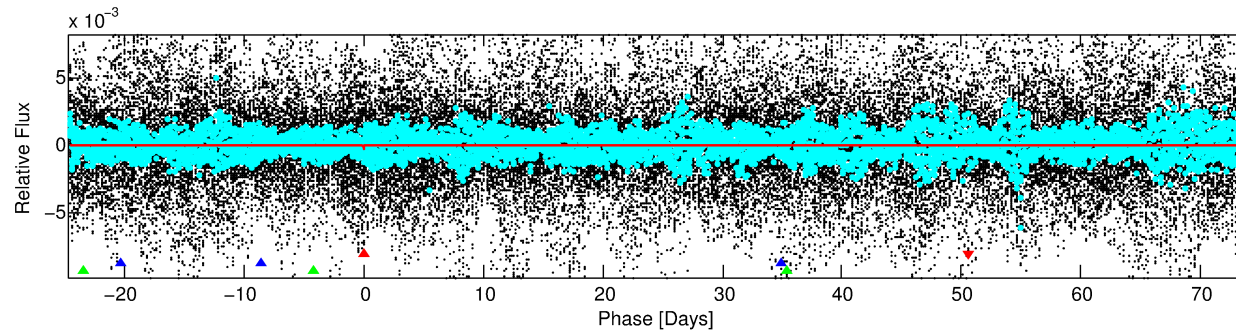
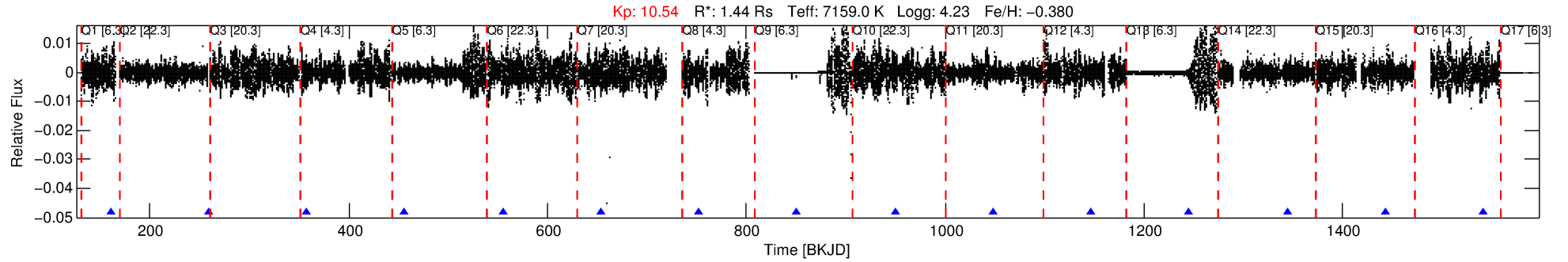
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010385459-01

No Significant Match Found

DV One-Page Summary

KIC: 10385459 Candidate: 1 of 3 Period: 98.661 d



DV Fit Results:

Period = 98.66089 [0.00043] d
Epoch = 160.3233 [0.0039] BKJD
Rp/R* = 0.0160 [0.0117]
a/R* = 369.75 [1576.54]
b = 0.01 [531.02]
Seff = 23.58 [8.90]
Teq = 562 [53] K
Rp = 2.52 [2.01] Re
a = 0.4552 [0.1151] AU
Ag = 1963.59 [3578.63] [0.55σ]
Teffp = 5783 [2592] K [2.01σ]

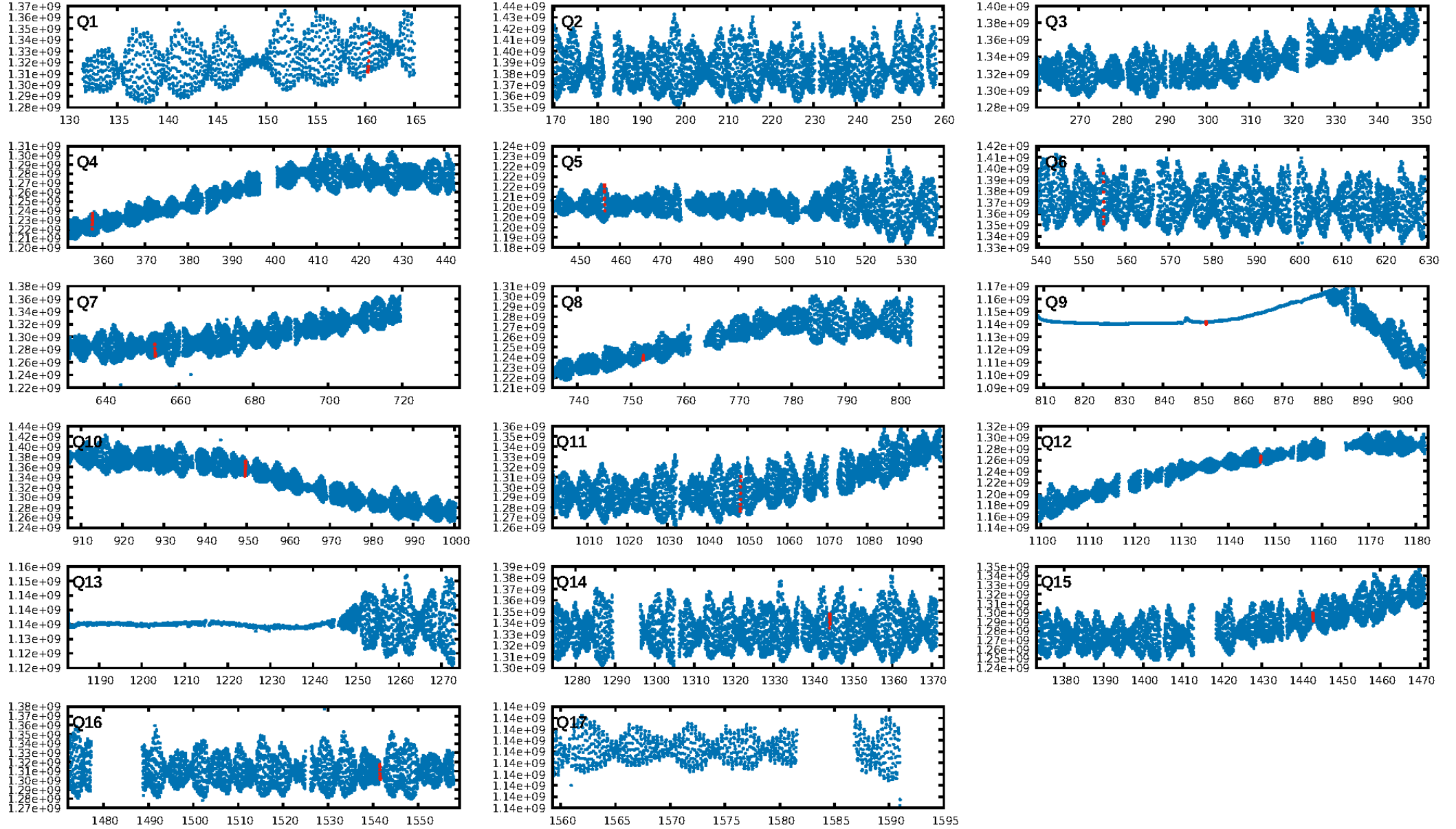
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [1453.25σ]
ModelChiSquare2-sig: 88.1%
ModelChiSquareGoF-sig: 99.9%
Bootstrap-pfa: 2.41e-20
RollingBand-fgt: 1.00 [12/12]
GhostDiagnostic-chr: N/A
Centroid-sig: 68.1%
Centroid-so: 1.134 arcsec [0.58σ]
OotOffset-rm: 1.152 arcsec [4.17σ]
KicOffset-rm: 1.255 arcsec [4.50σ]
OotOffset-st: 3/3/4/3 [13]
KicOffset-st: 3/3/4/3 [13]
DiffImageQuality-fgm: 0.54 [7/13]
DiffImageOverlap-fno: 1.00 [13/13]

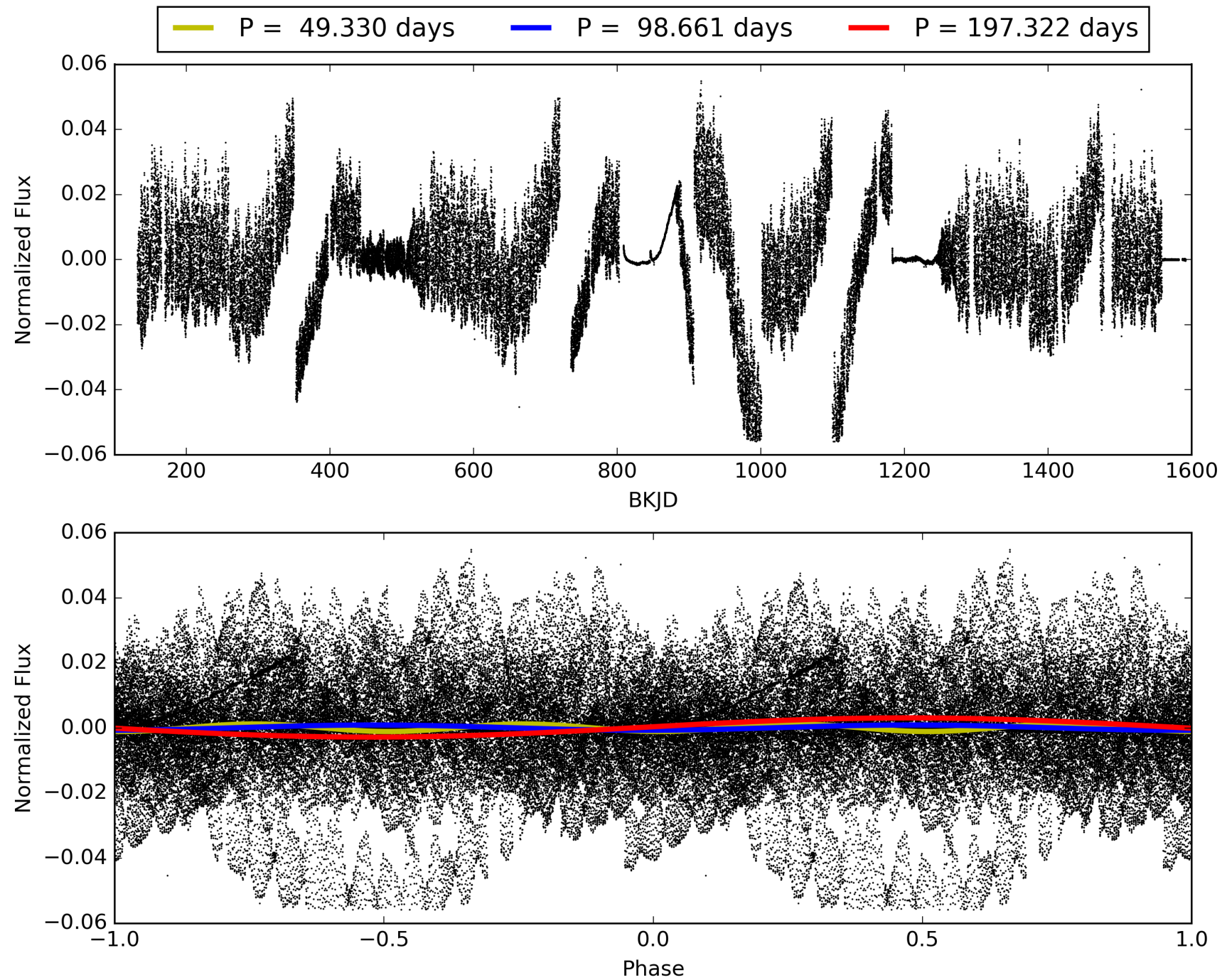
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 010385459-01, PDC Light Curves

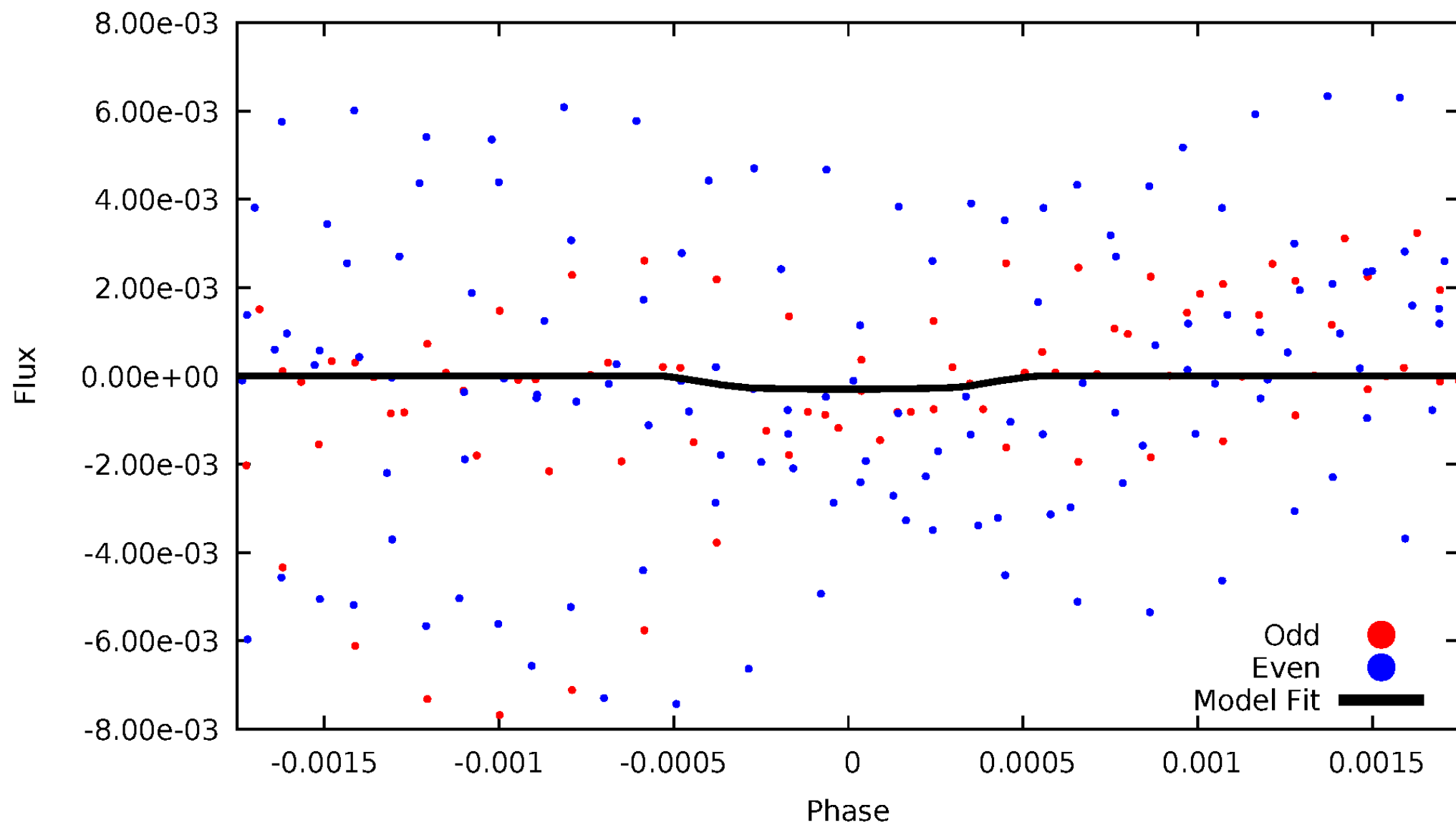


TCE 010385459-01



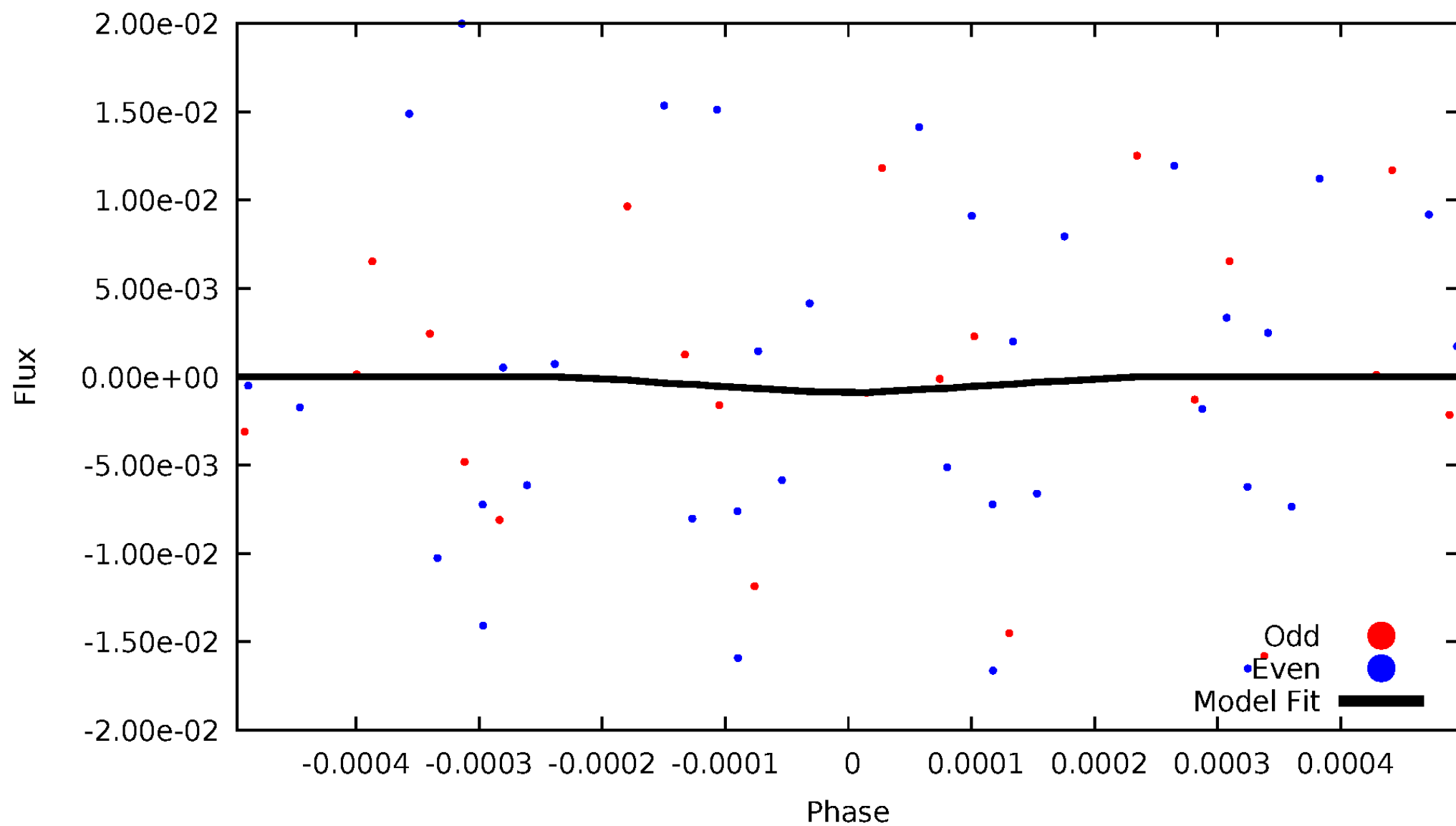
DV Odd/Even

TCE 010385459-01



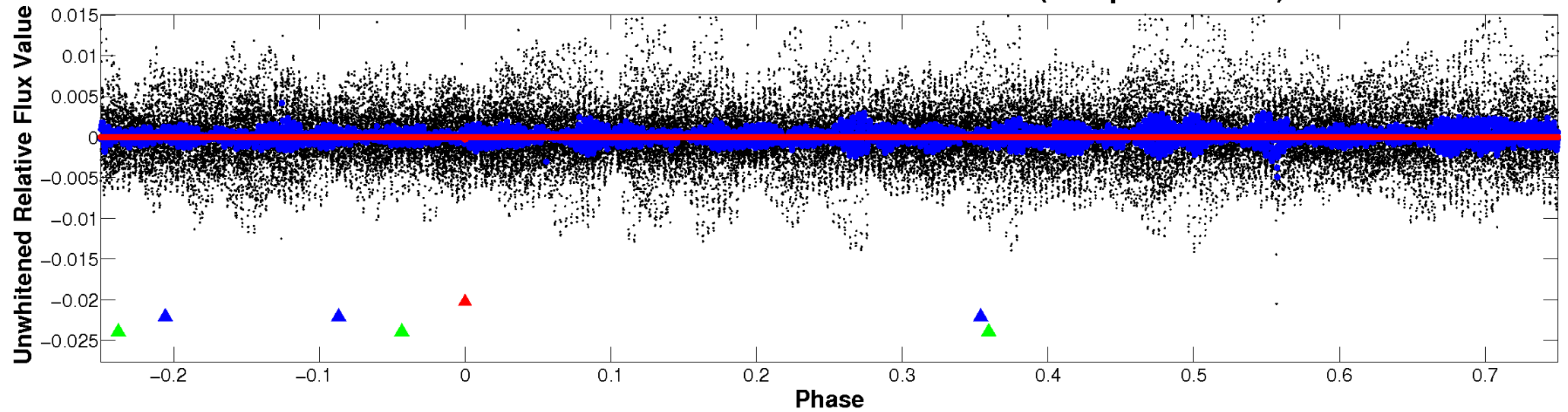
ALT Odd/Even

TCE 010385459-01

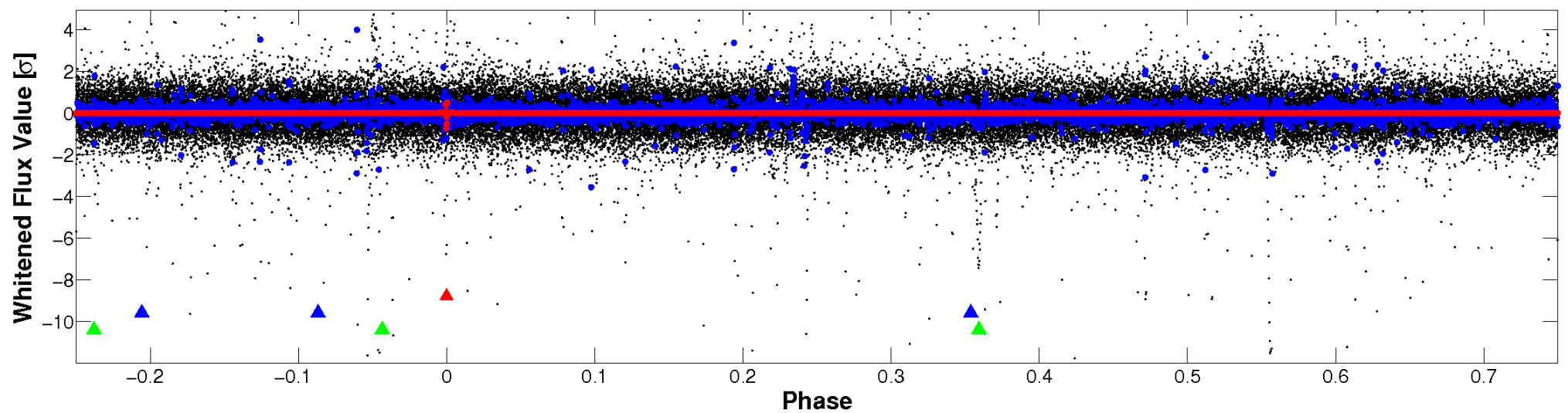


Non-Whitened Vs. Whitened Light Curve

Planet 1 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

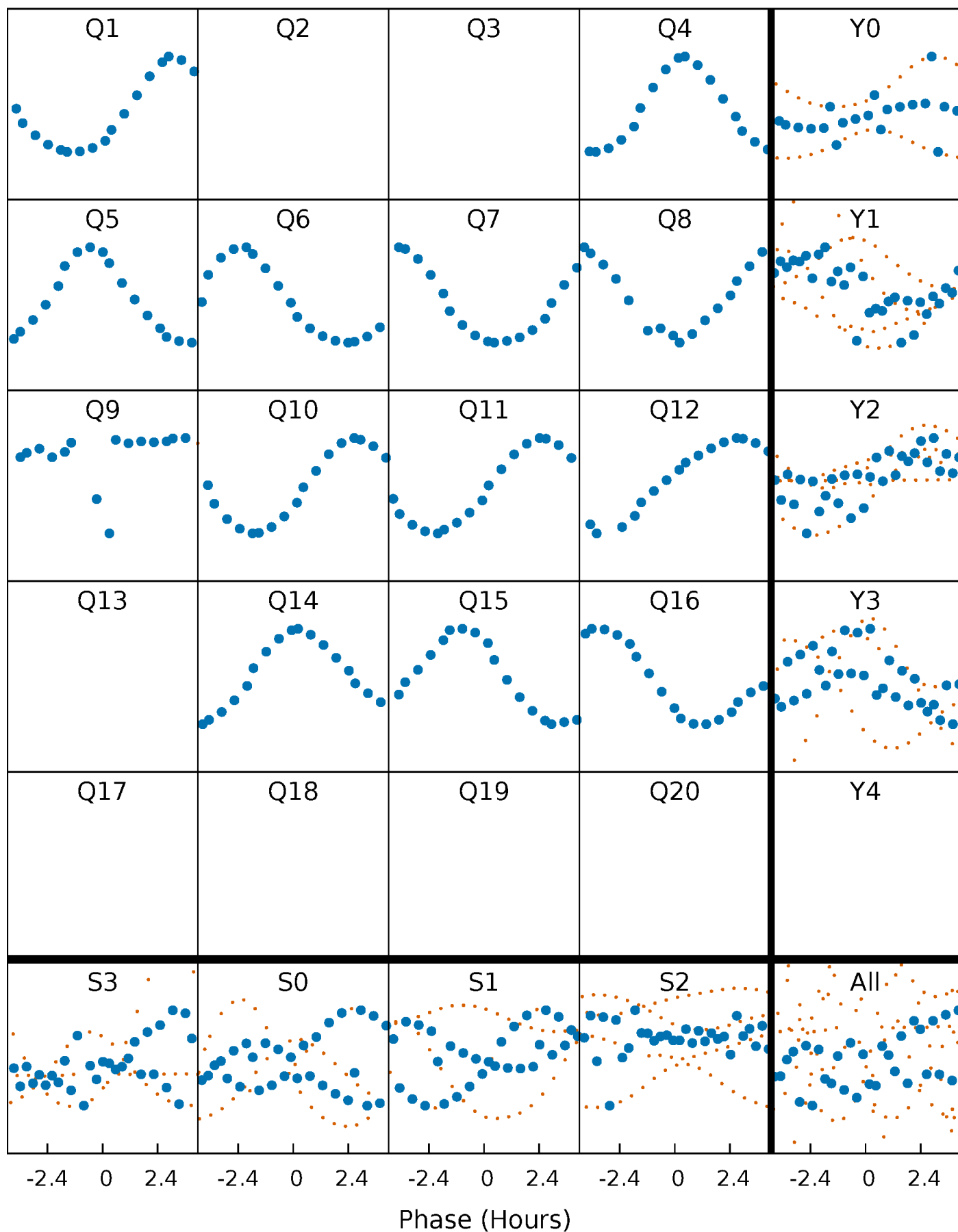


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



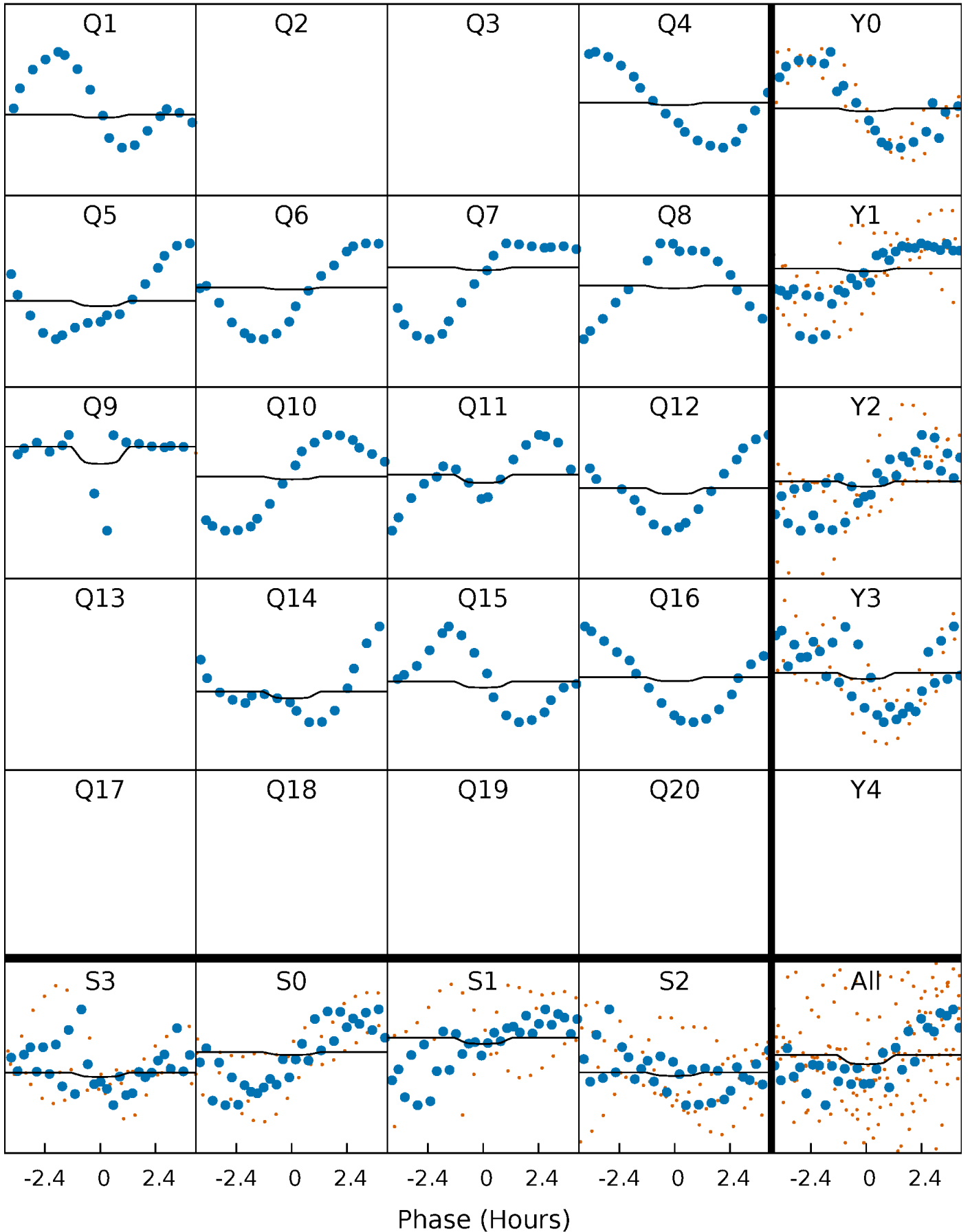
PDC Quarter-Phased Transit Curves

TCE 010385459-01 P= 98.660889 Days $T_0=160.323346$ (BKJD)



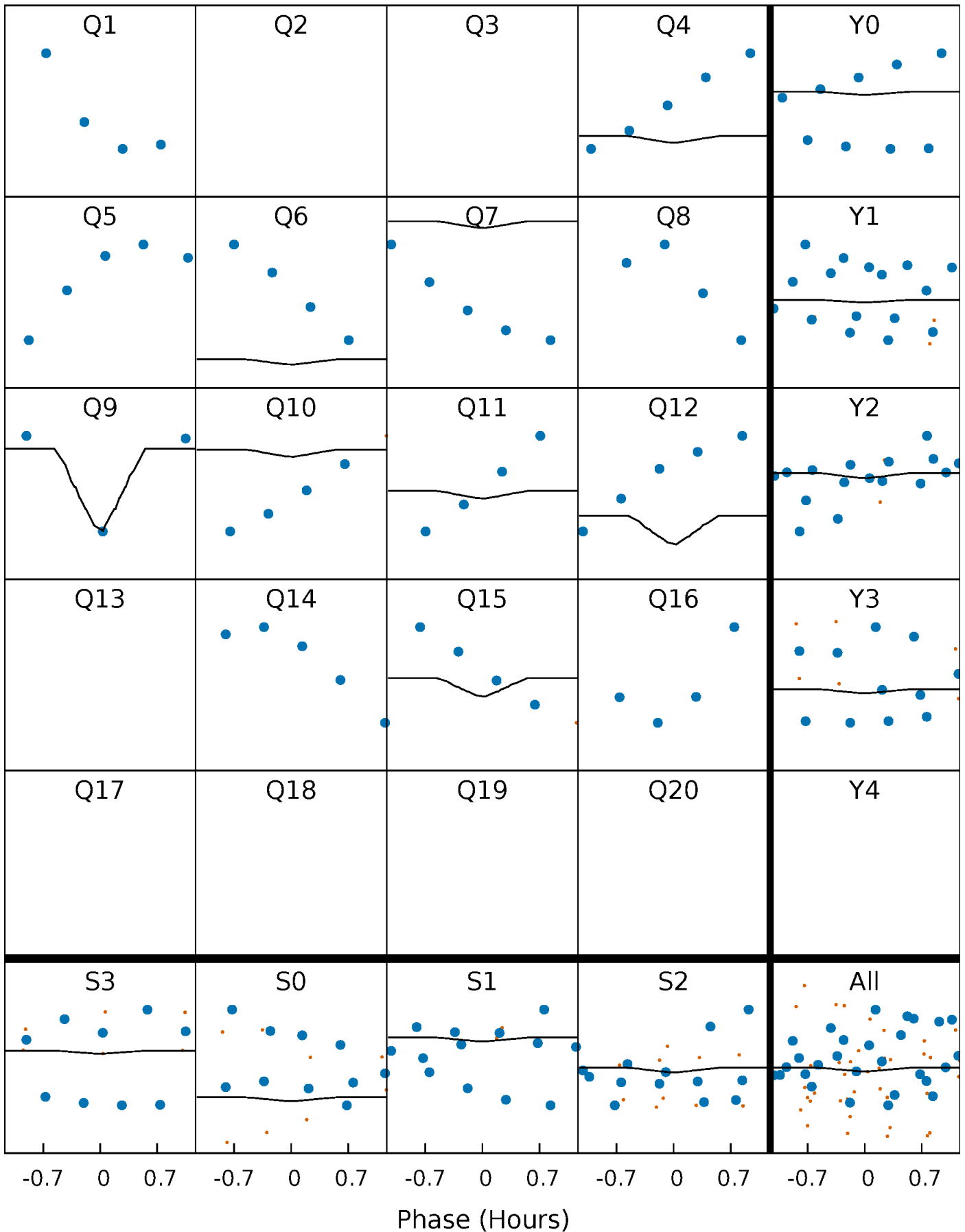
DV Quarter-Phased Transit Curves

TCE 010385459-01 P= 98.660889 Days $T_0=160.323346$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

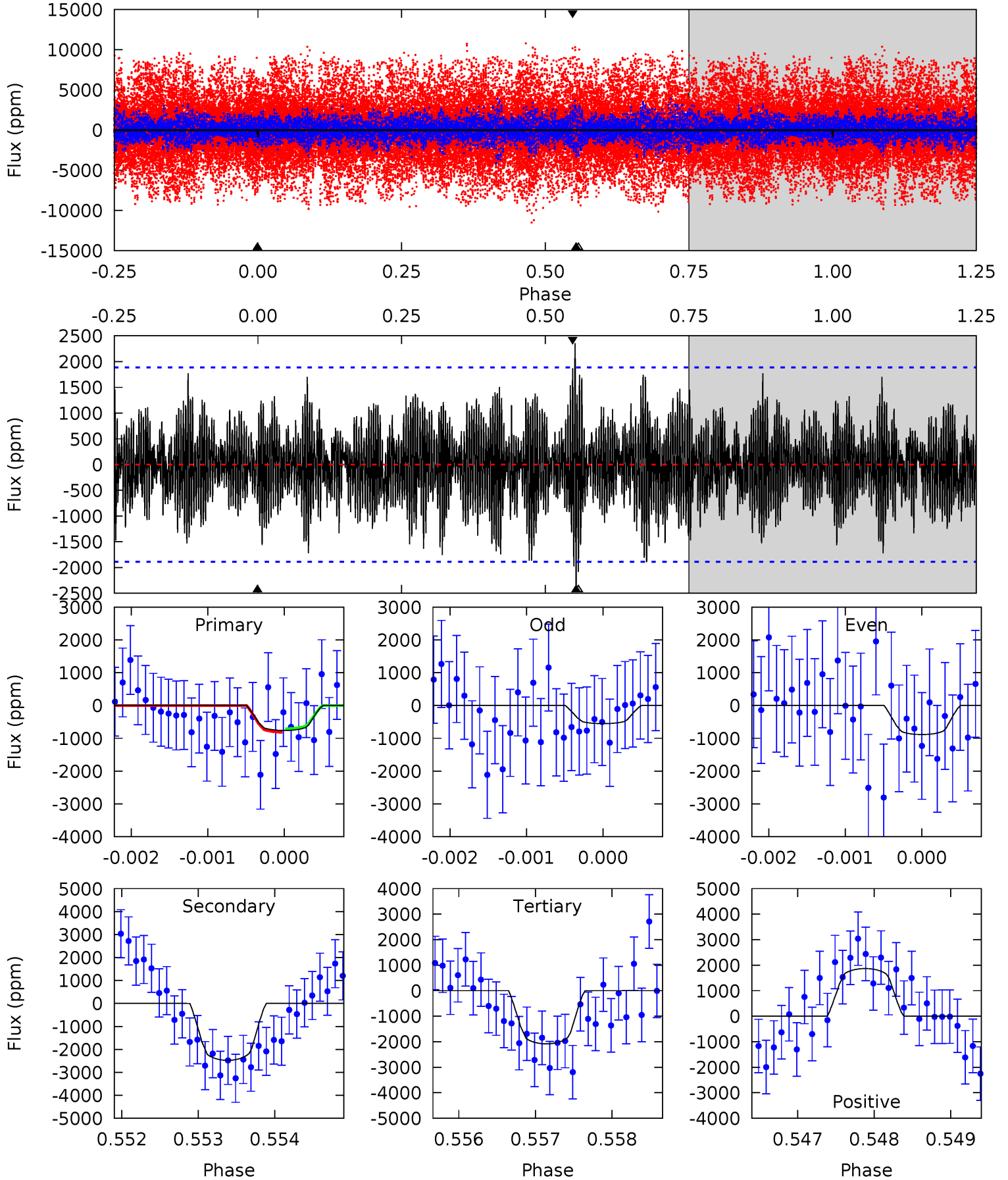
TCE 010385459-01 P= 98.669248 Days $T_0=160.251886$ (BKJD)



DV Model-Shift Uniqueness Test

010385459-01, P = 98.660889 Days, E = 61.662457 Days

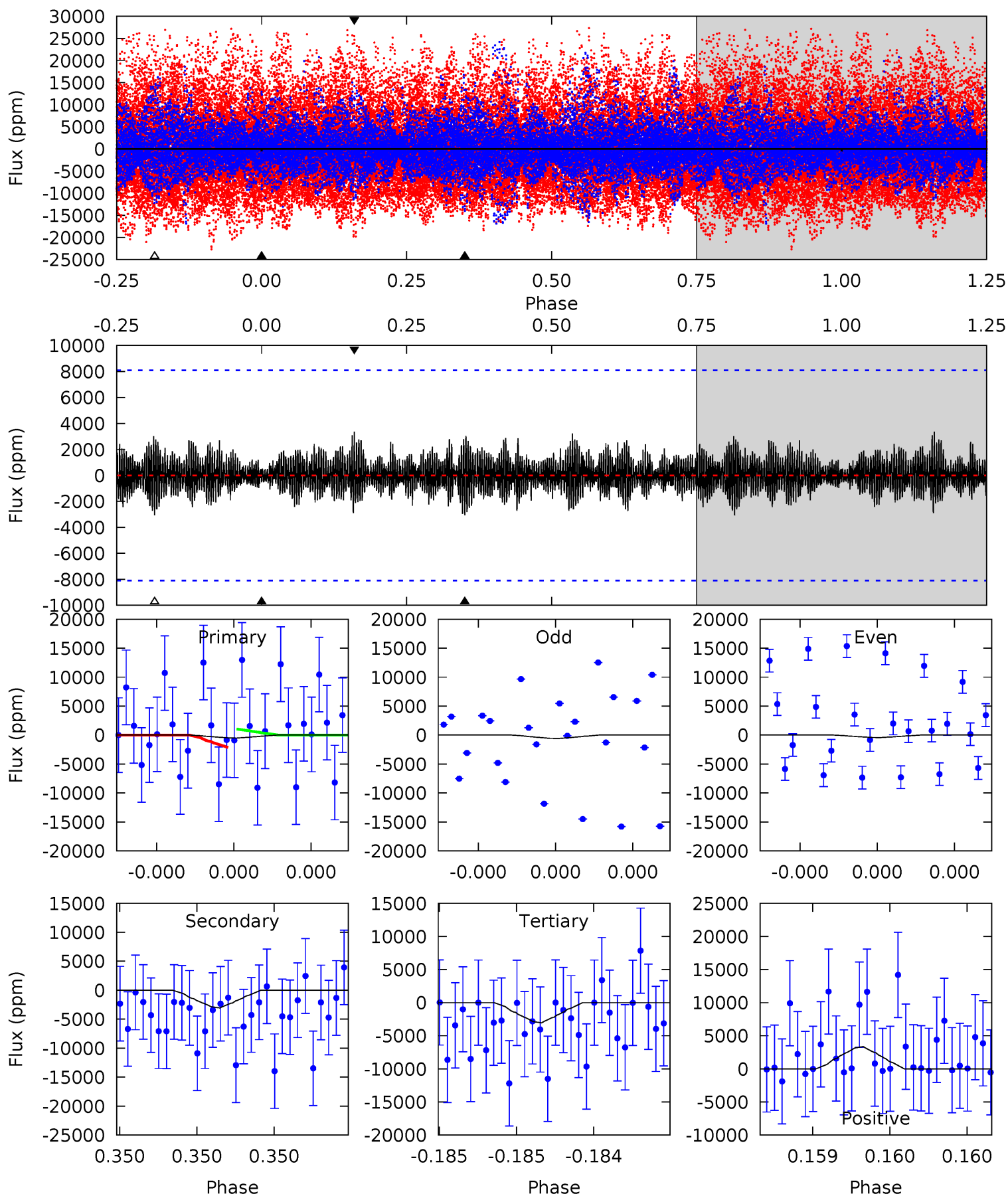
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.19	7.14	6.00	5.38	5.44	3.27	1.86	-3.81	-3.19	1.13	1.76	0.49	1.00	0.49	0.15



Alt Model-Shift Uniqueness Test

010385459-01, P = 98.669248 Days, E = 61.582638 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.36	2.12	2.12	2.33	5.61	3.53	0.69	-1.75	-1.97	0.00	-0.21	0.06	-1.60	0.52	0.38



Stellar Parameters For KIC 010385459

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7159^{+171}_{-235}	$4.232^{+0.124}_{-0.186}$	$-0.380^{+0.300}_{-0.350}$	$1.441^{+0.451}_{-0.243}$	$1.295^{+0.204}_{-0.167}$	$0.610^{+0.359}_{-0.303}$
	+2%/-3%	+3%/-4%	+79%/-92%	+31%/-17%	+16%/-13%	+59%/-50%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 010385459-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-2477 ± 347	$2.74^{+1.88}_{-1.64}$	791^{+63}_{-47}	16000^{+35843}_{-5598}	$37849^{+202167}_{-24723}$
Alt.	-3059 ± 1444	$4.69^{+2.12}_{-1.89}$	786^{+52}_{-46}	10581^{+6628}_{-2845}	14755^{+31668}_{-9193}

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

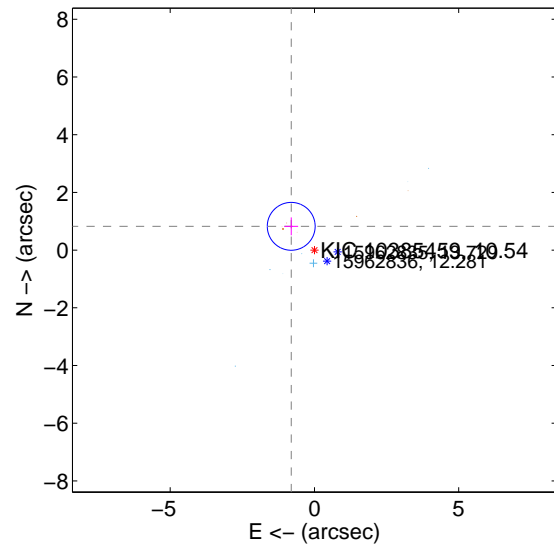
Supplemental centroid analysis for 010385459-01. **Kepler magnitude: 10.54**. Transit SNR 4.16

There are 7 quarters with good PRF difference image offsets

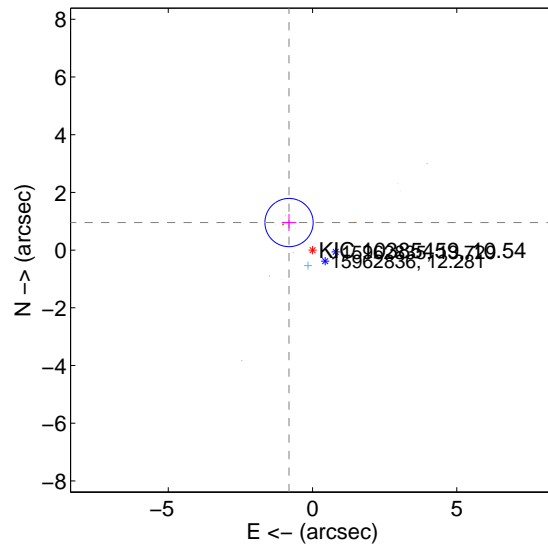
The direct PRF centroid is offset from the target star catalog position by about 0.35 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.152 \pm 0.276	4.17	0.805 \pm 0.239	0.824 \pm 0.308
PRF-fit source offset from KIC position	1.255 \pm 0.279	4.50	0.814 \pm 0.253	0.955 \pm 0.296
photometric centroid source offset	1.13 \pm 1.95	0.58	-0.77 \pm 1.93	-0.83 \pm 1.97

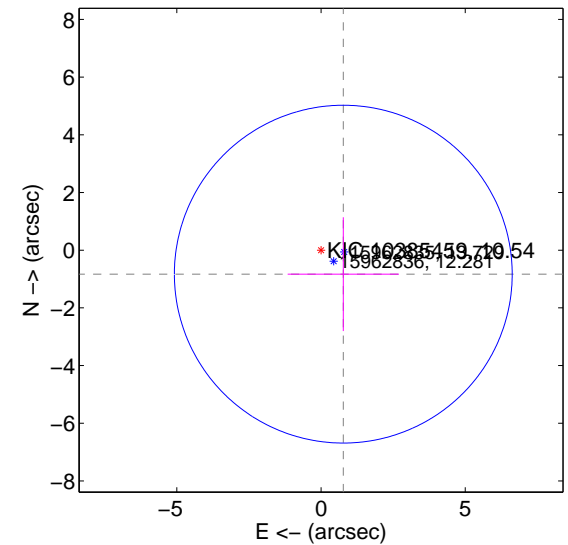
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

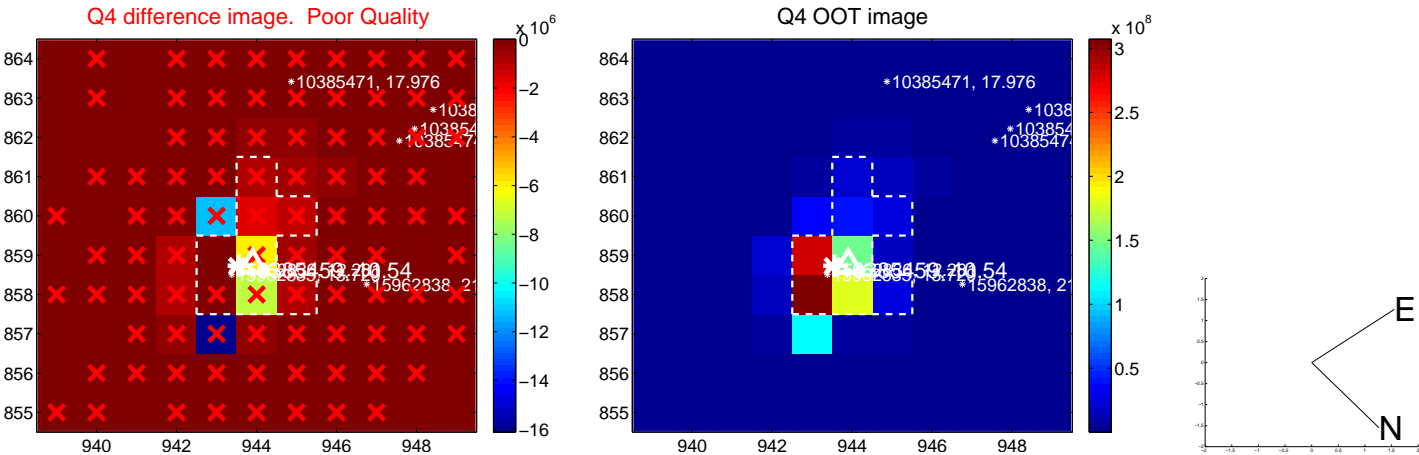
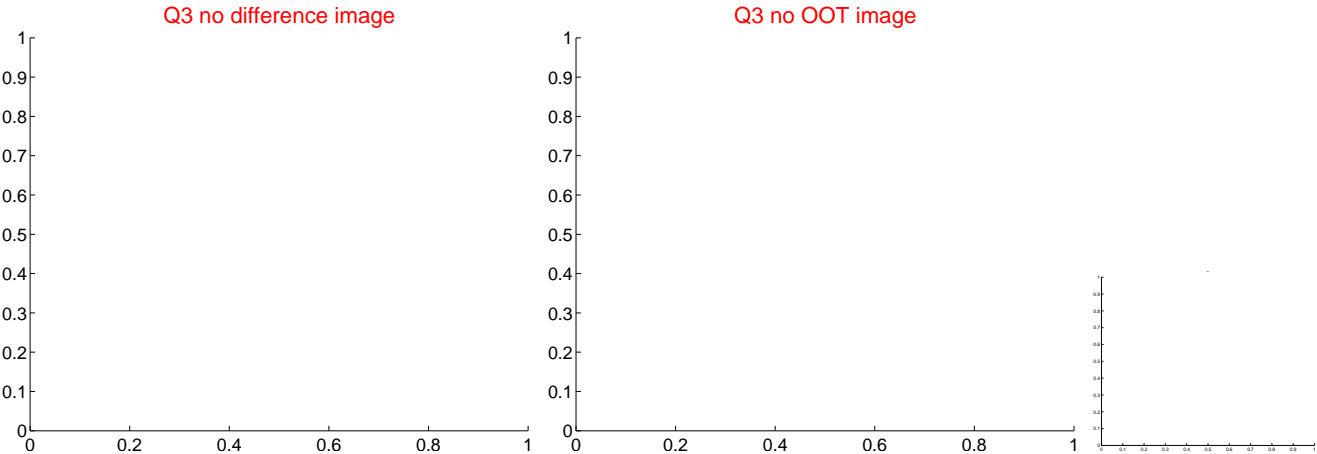
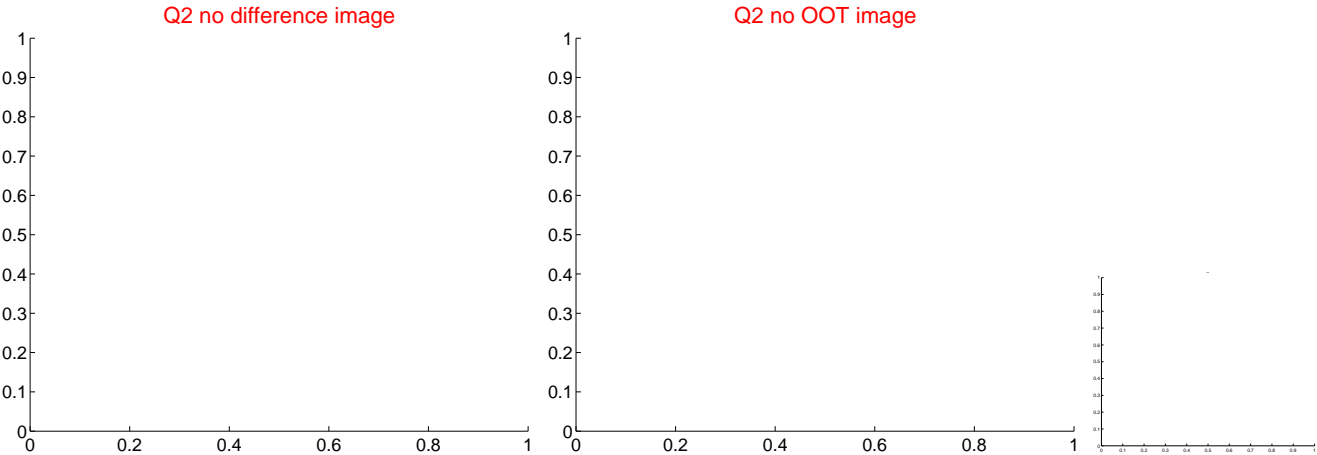
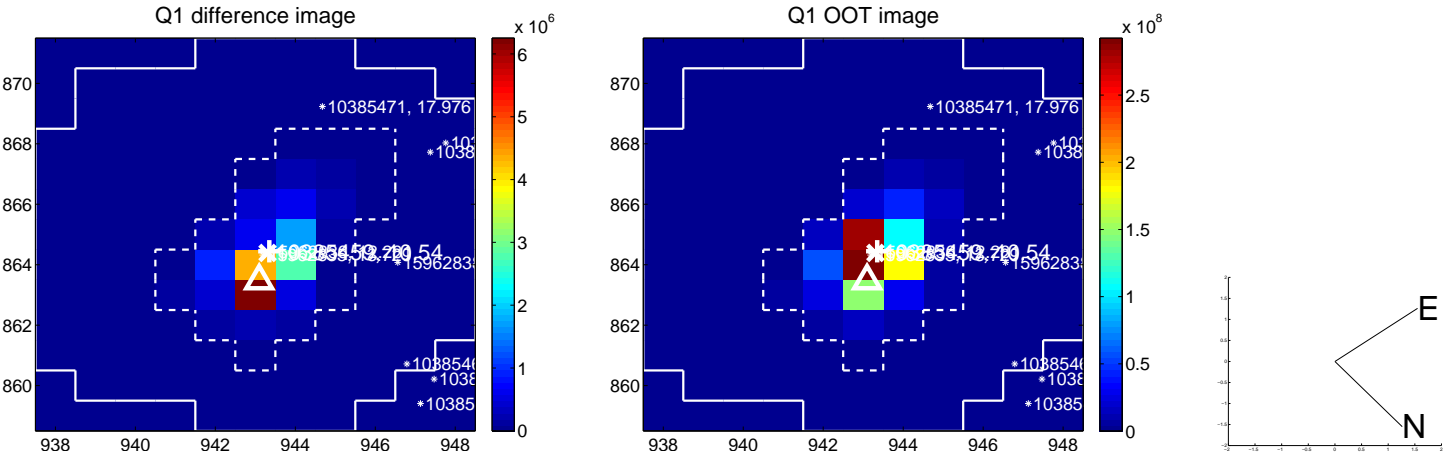


offset from photometric centroids

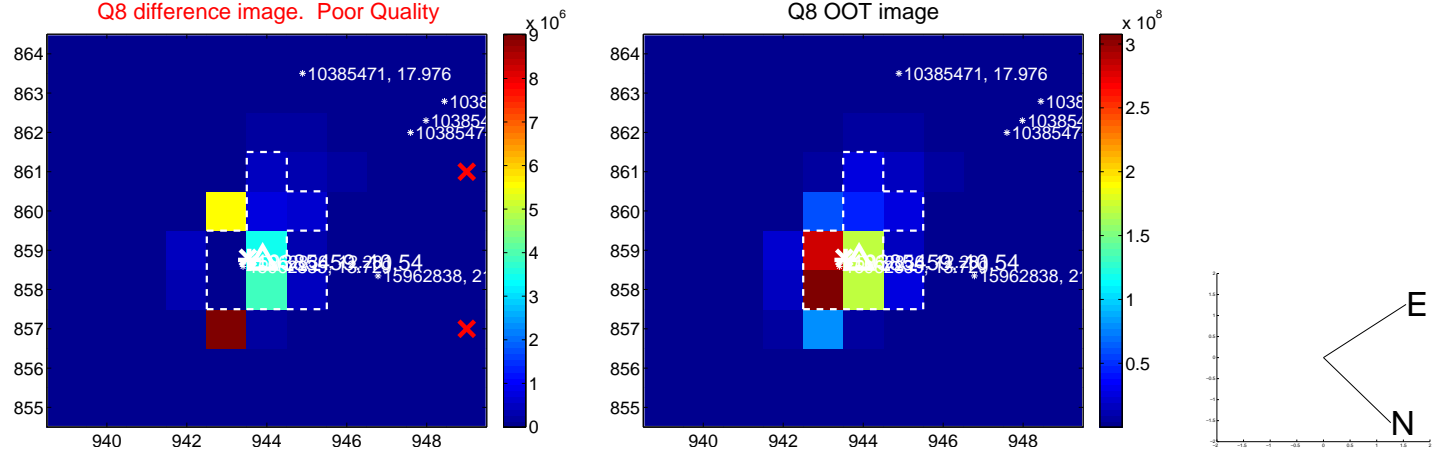
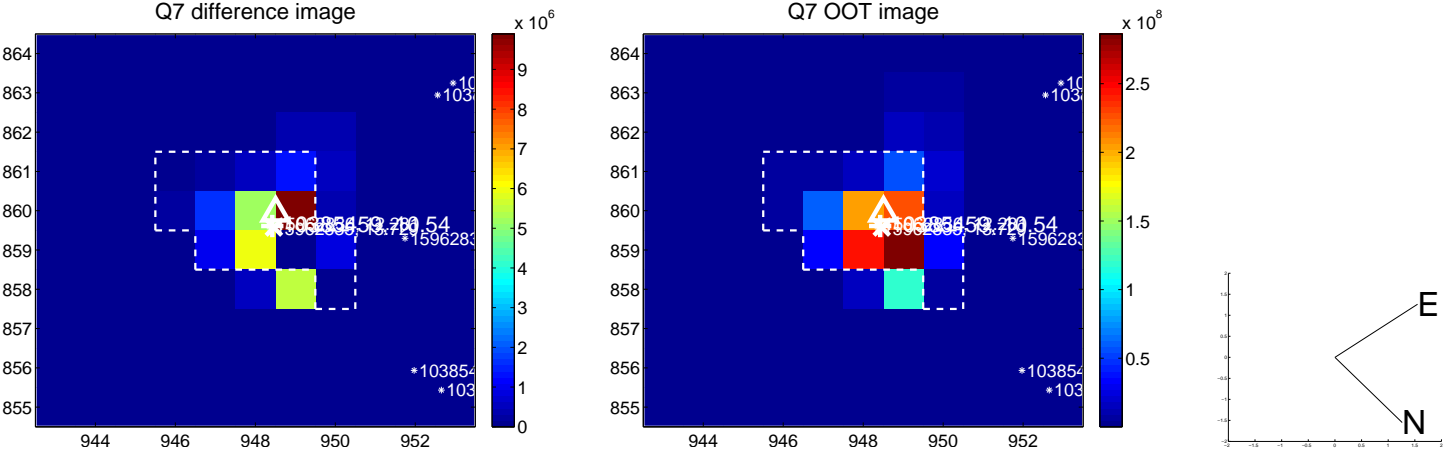
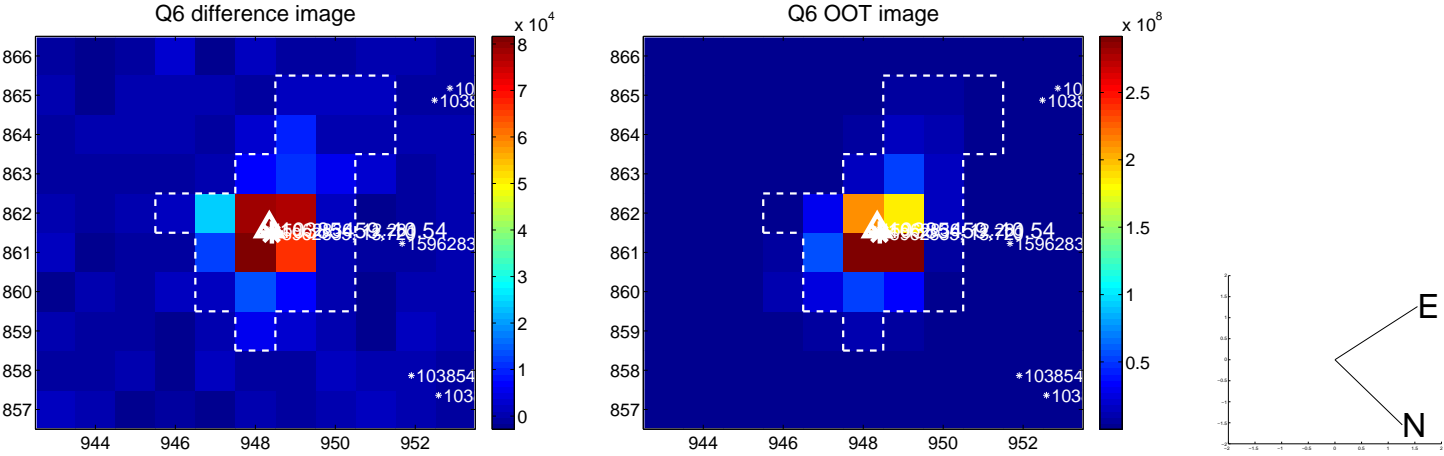
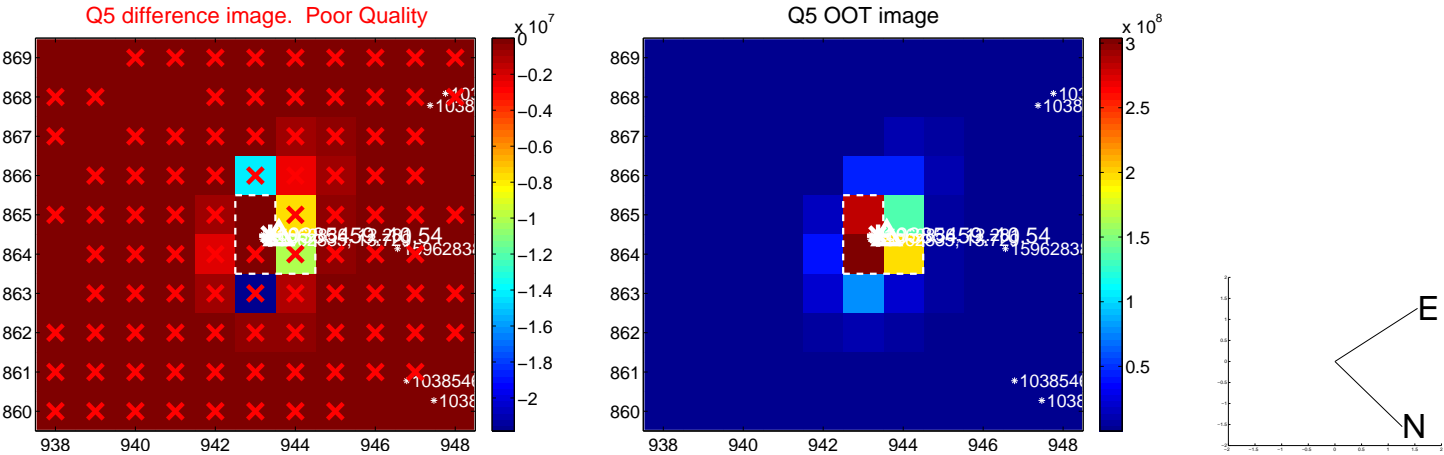


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- 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.

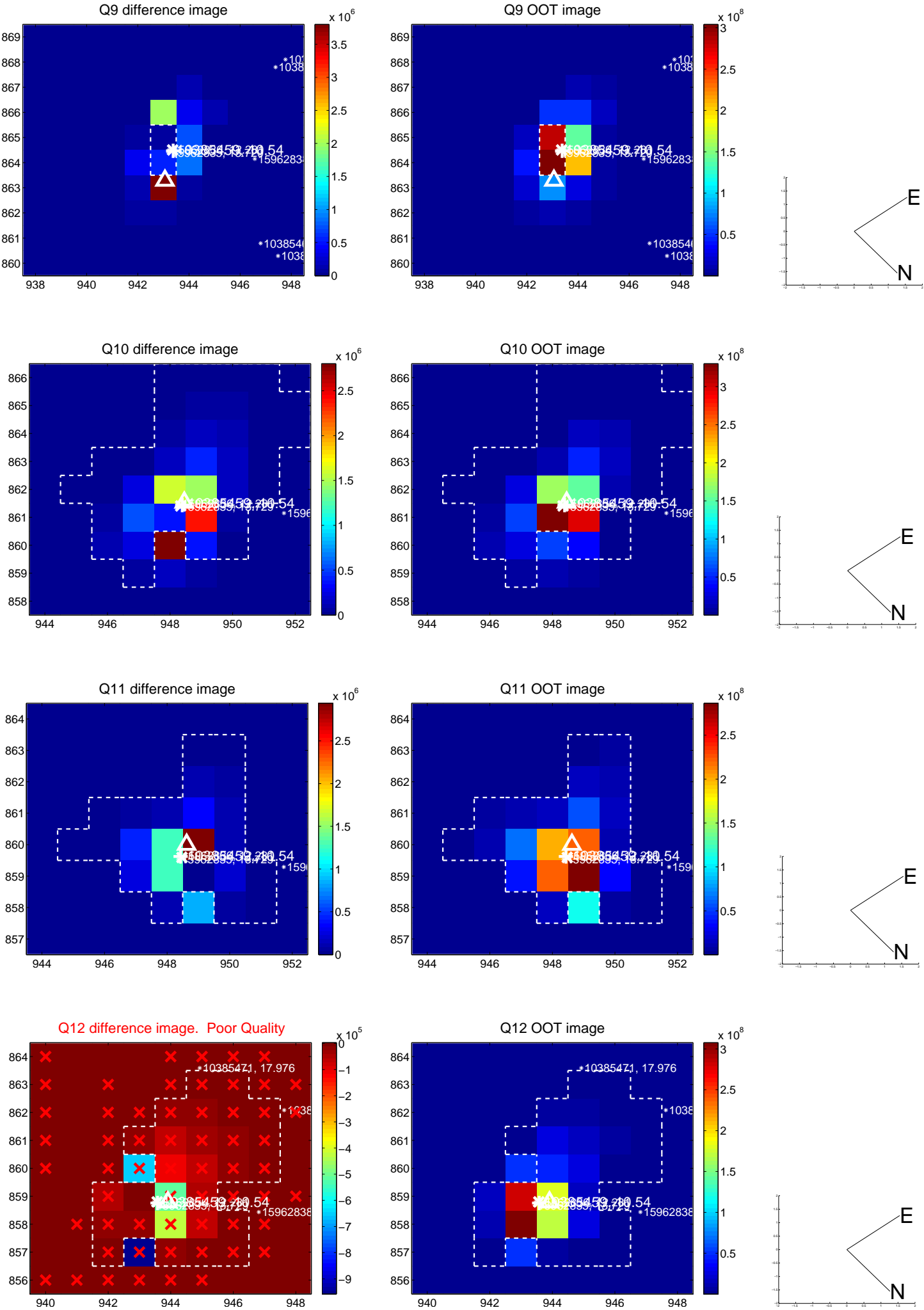
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



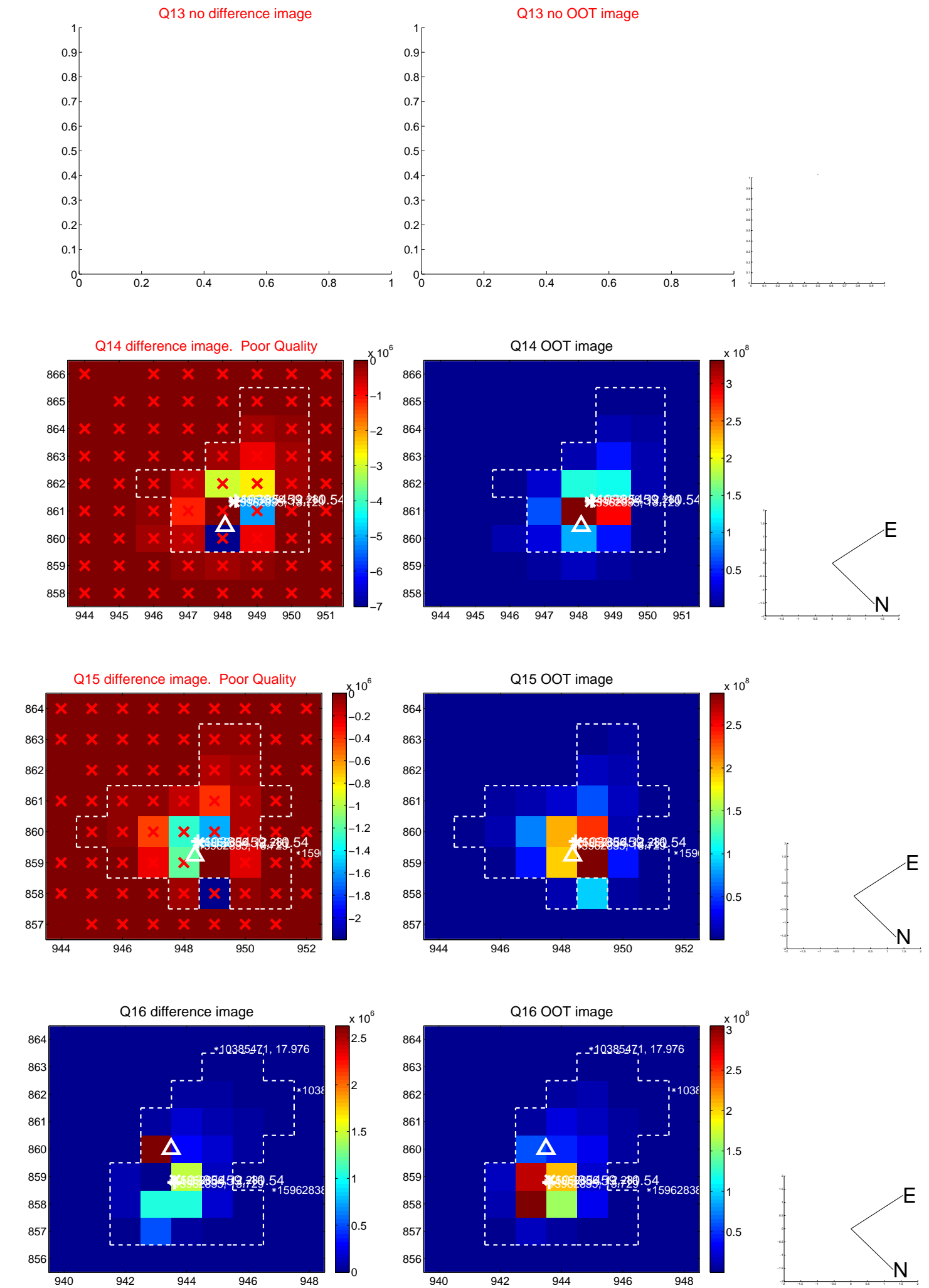
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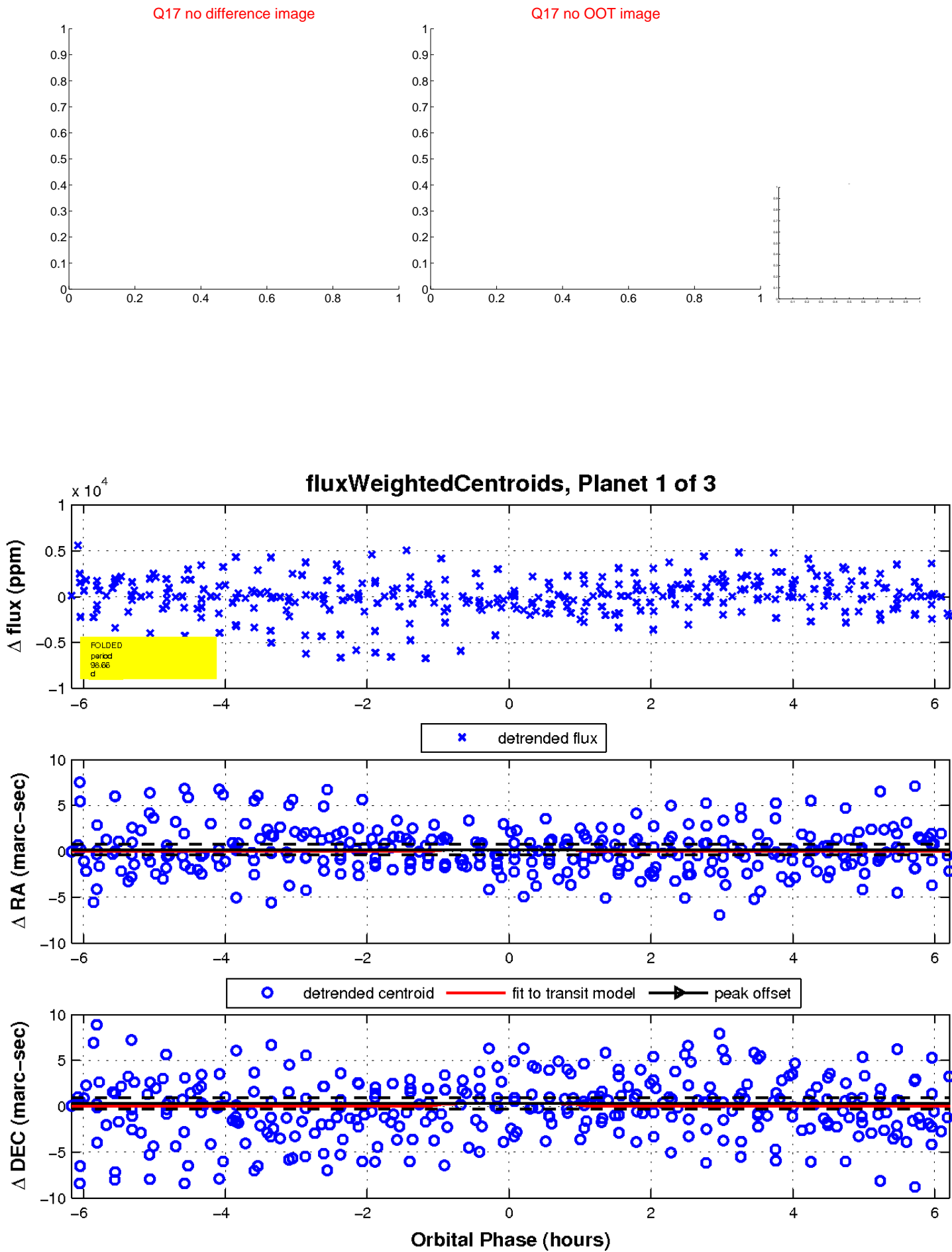
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white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

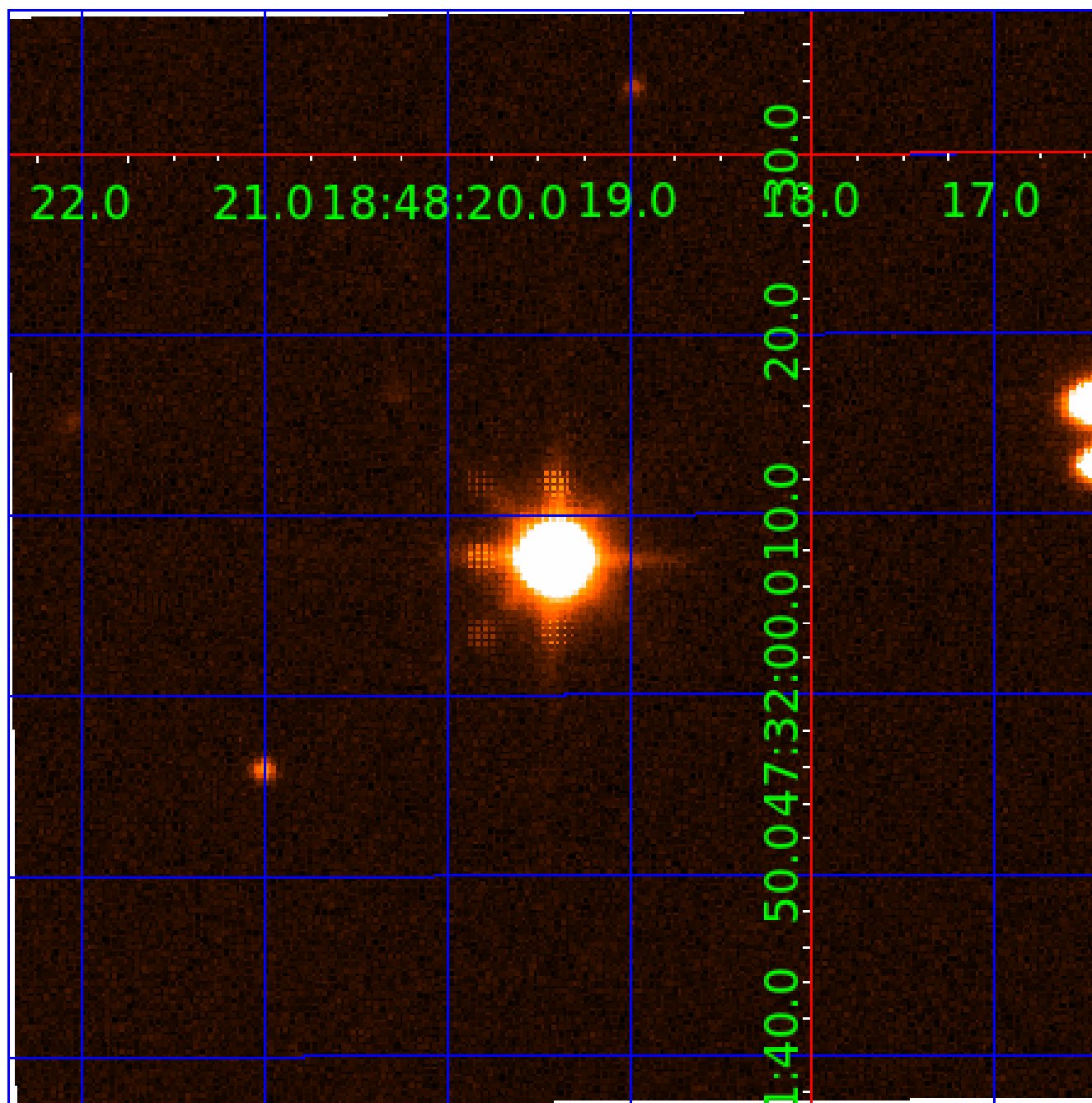


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010385459

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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Robovetter Results

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010385459-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
010385459-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_SATURATED
010385459-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED

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

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

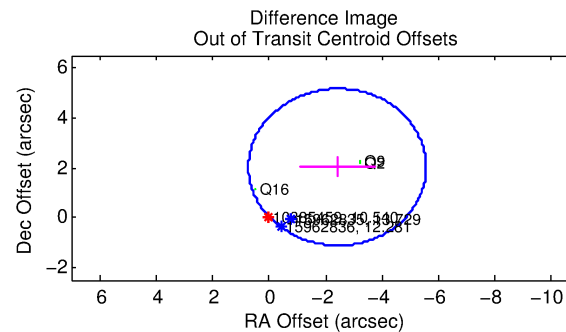
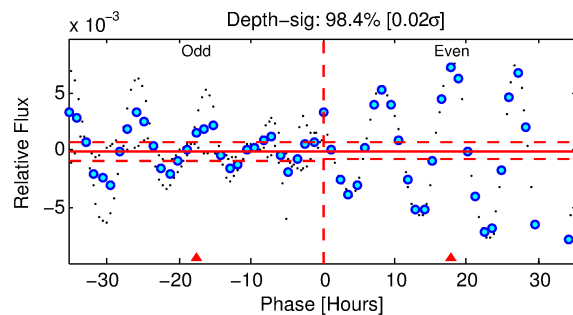
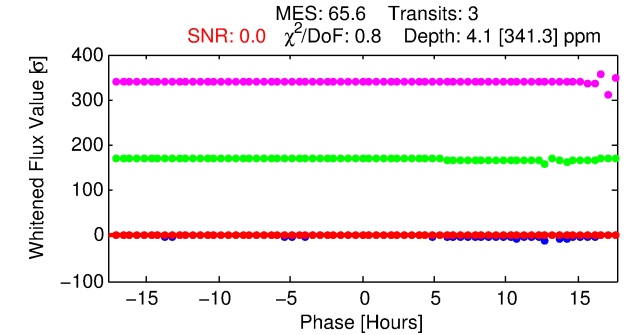
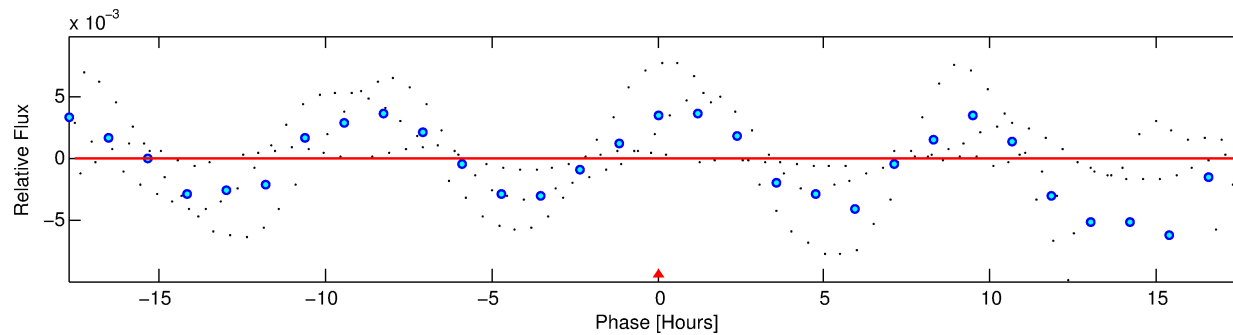
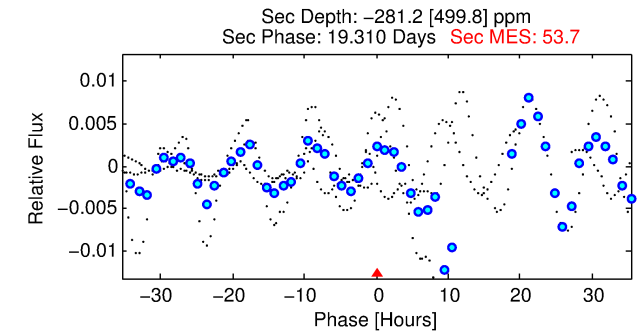
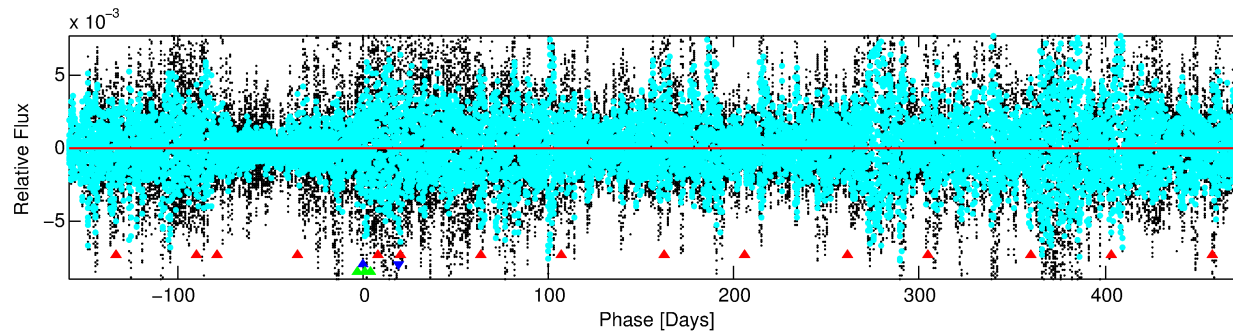
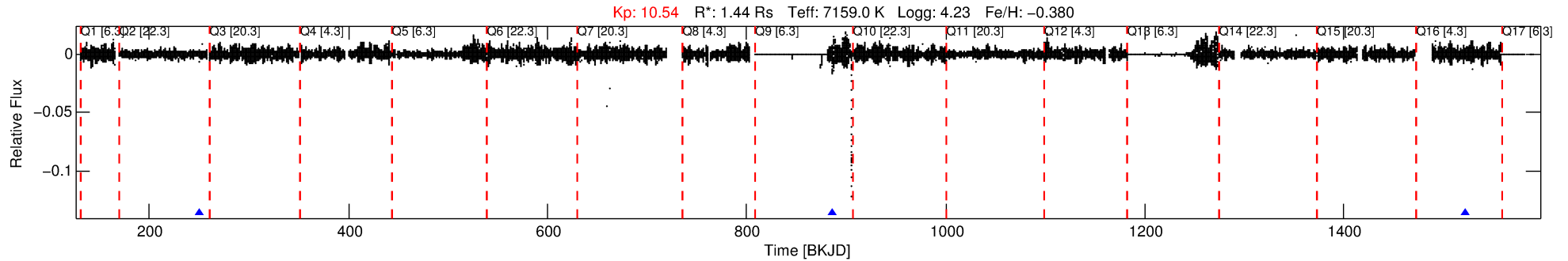
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010385459-02

No Significant Match Found

DV One-Page Summary

KIC: 10385459 Candidate: 2 of 3 Period: 635.430 d



DV Fit Results:

Period = 635.42973 [1.85620] d
Epoch = 250.4254 [3.2379] BKJD
Rp/R* = 0.0021 [0.1116]
a/R* = 370.65 [71880.37]
b = 0.89 [43.28]
Seff = 1.97 [0.74]
Teff = 302 [28] K
Rp = 0.34 [17.55] Re
a = 1.5759 [0.3984] AU
Ag = N/A
Teffp = N/A

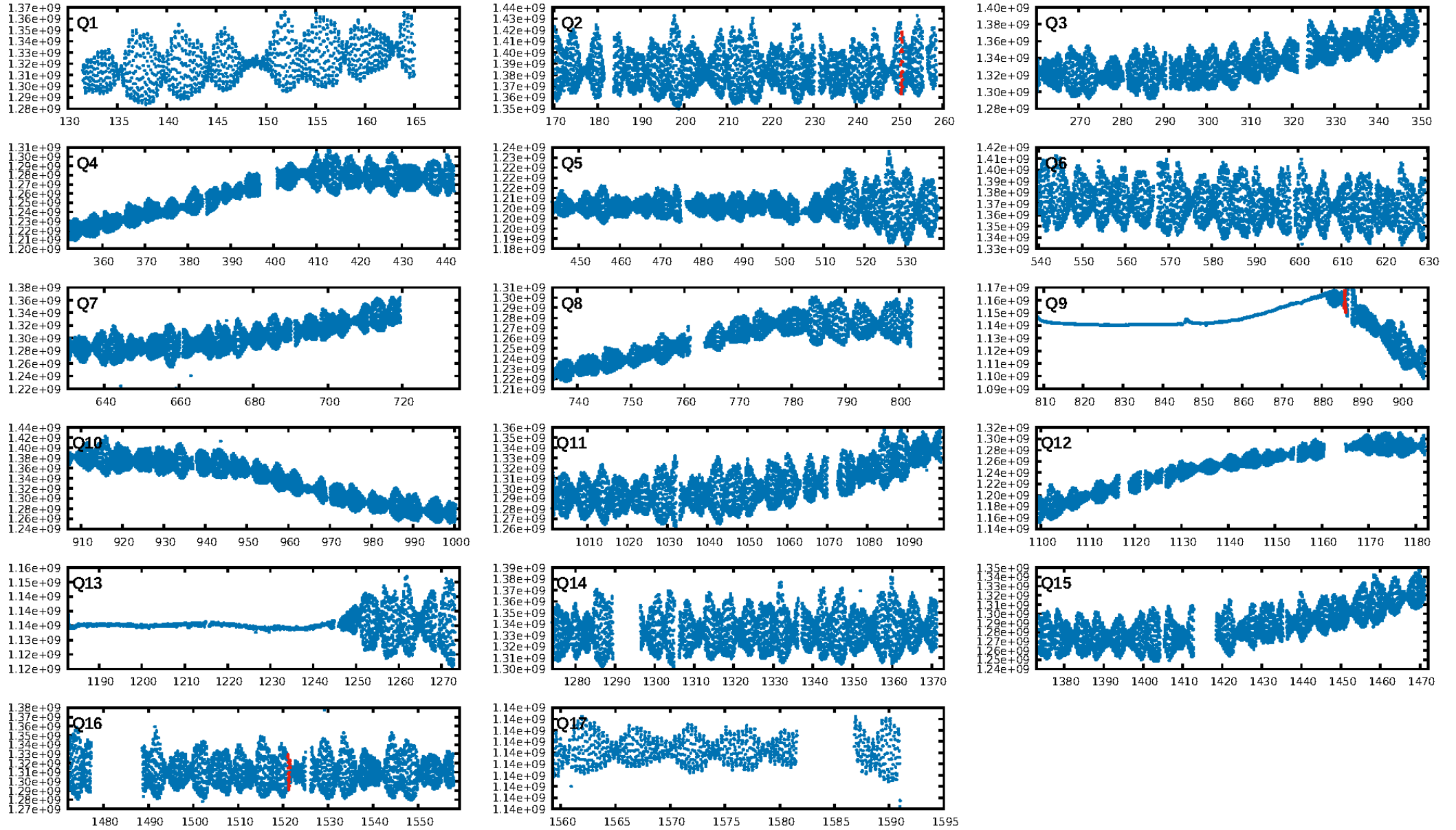
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [8.61 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 76.5%
ModelChiSquareGof-sig: 99.9%
Bootstrap-pfa: 7.06e-13
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: N/A
Centroid-sig: N/A
Centroid-so: N/A
OotOffset-rm: 3.152 arcsec [3.01 σ]
KicOffset-rm: 3.035 arcsec [3.43 σ]
OotOffset-st: 1/0/1/1 [3]
KicOffset-st: 1/0/1/1 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 0.67 [2/3]

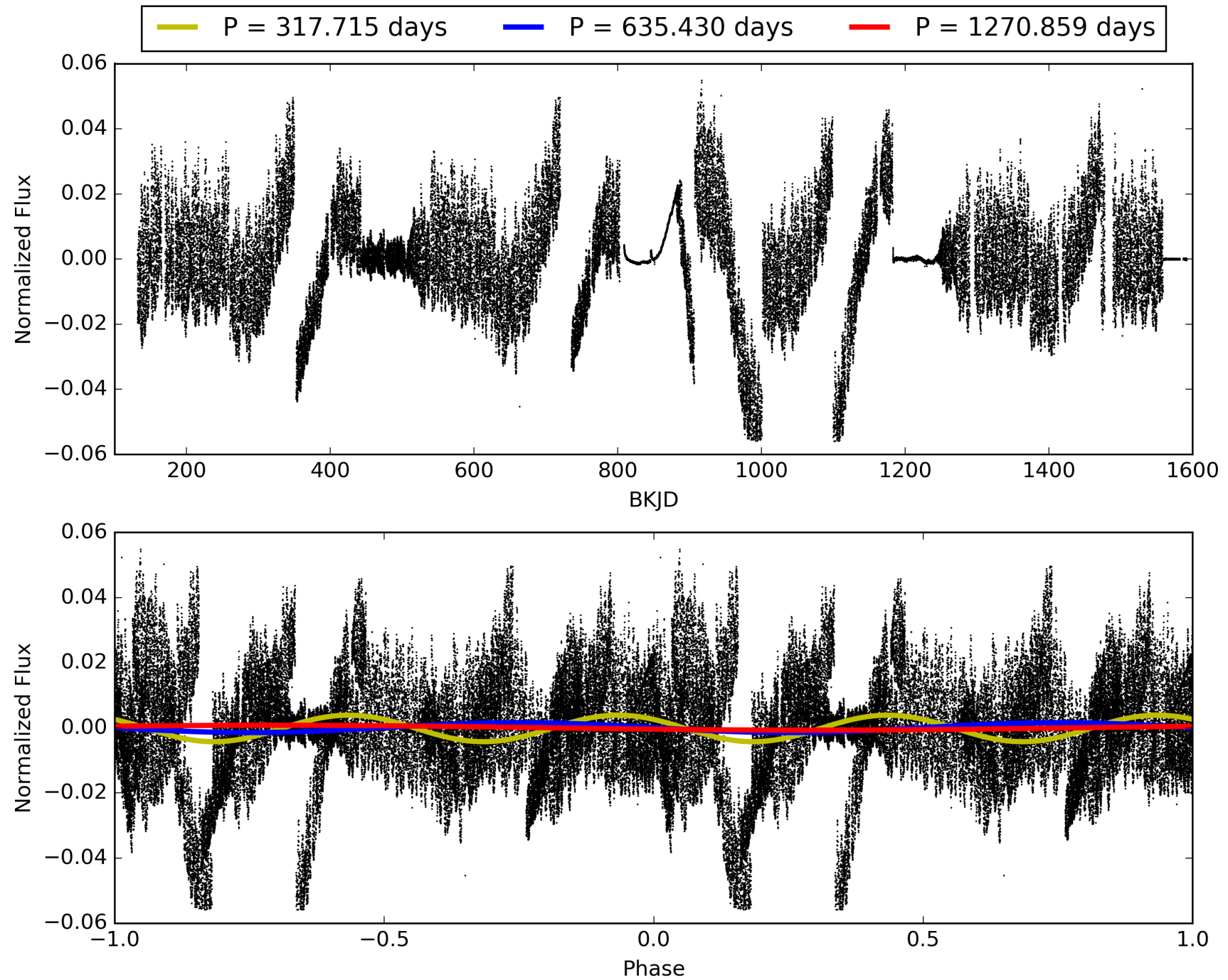
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 19:42:11 Z

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

TCE 010385459-02, PDC Light Curves

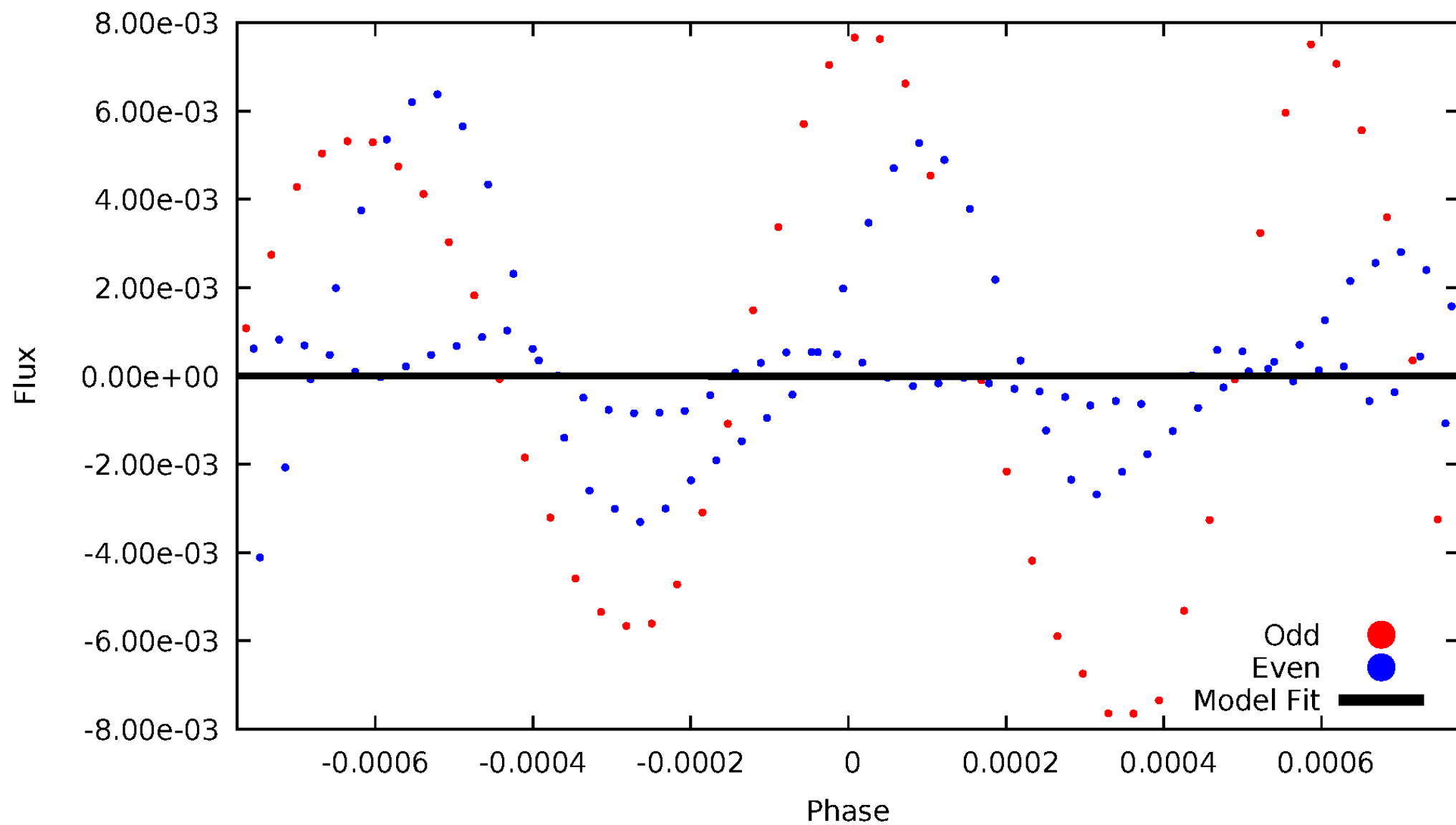


TCE 010385459-02



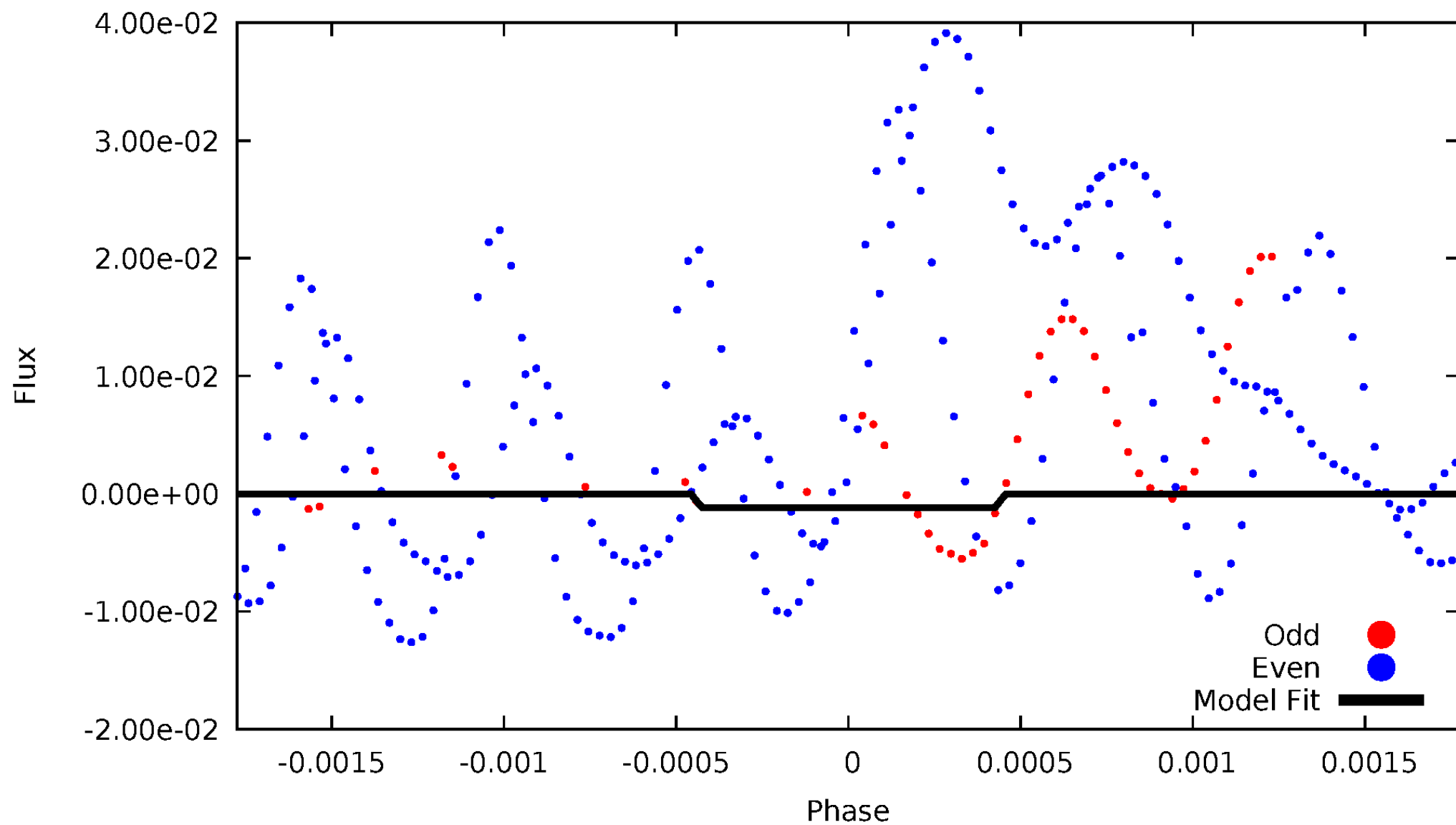
DV Odd/Even

TCE 010385459-02



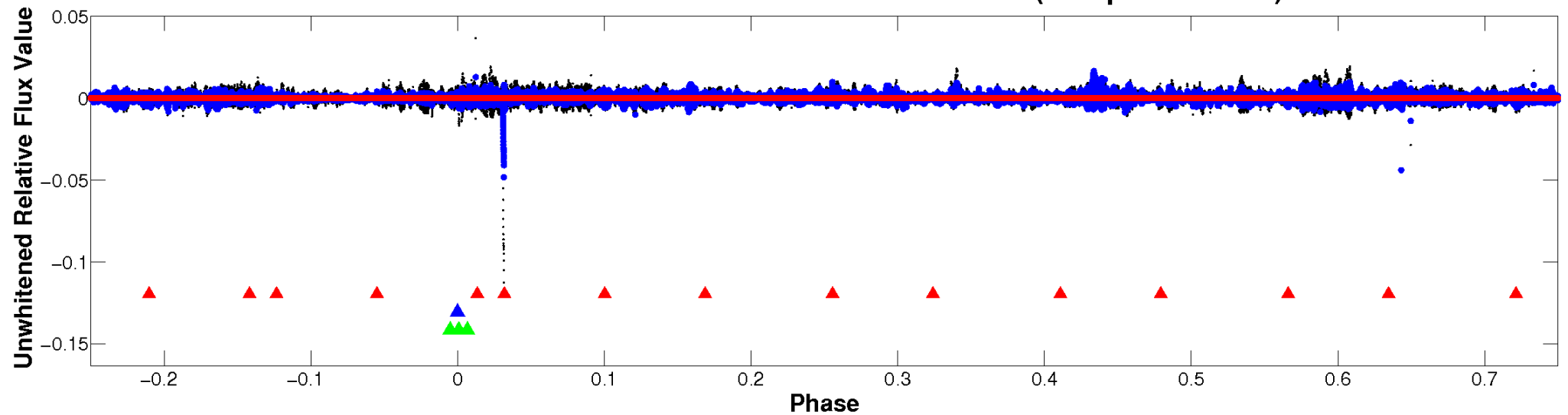
ALT Odd/Even

TCE 010385459-02

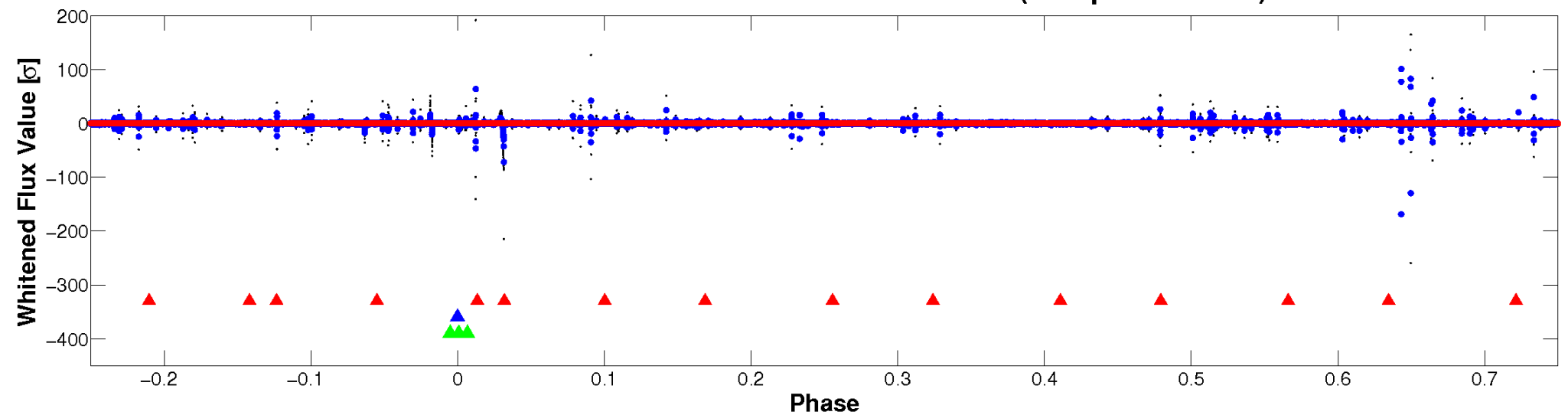


Non-Whitened Vs. Whitened Light Curve

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

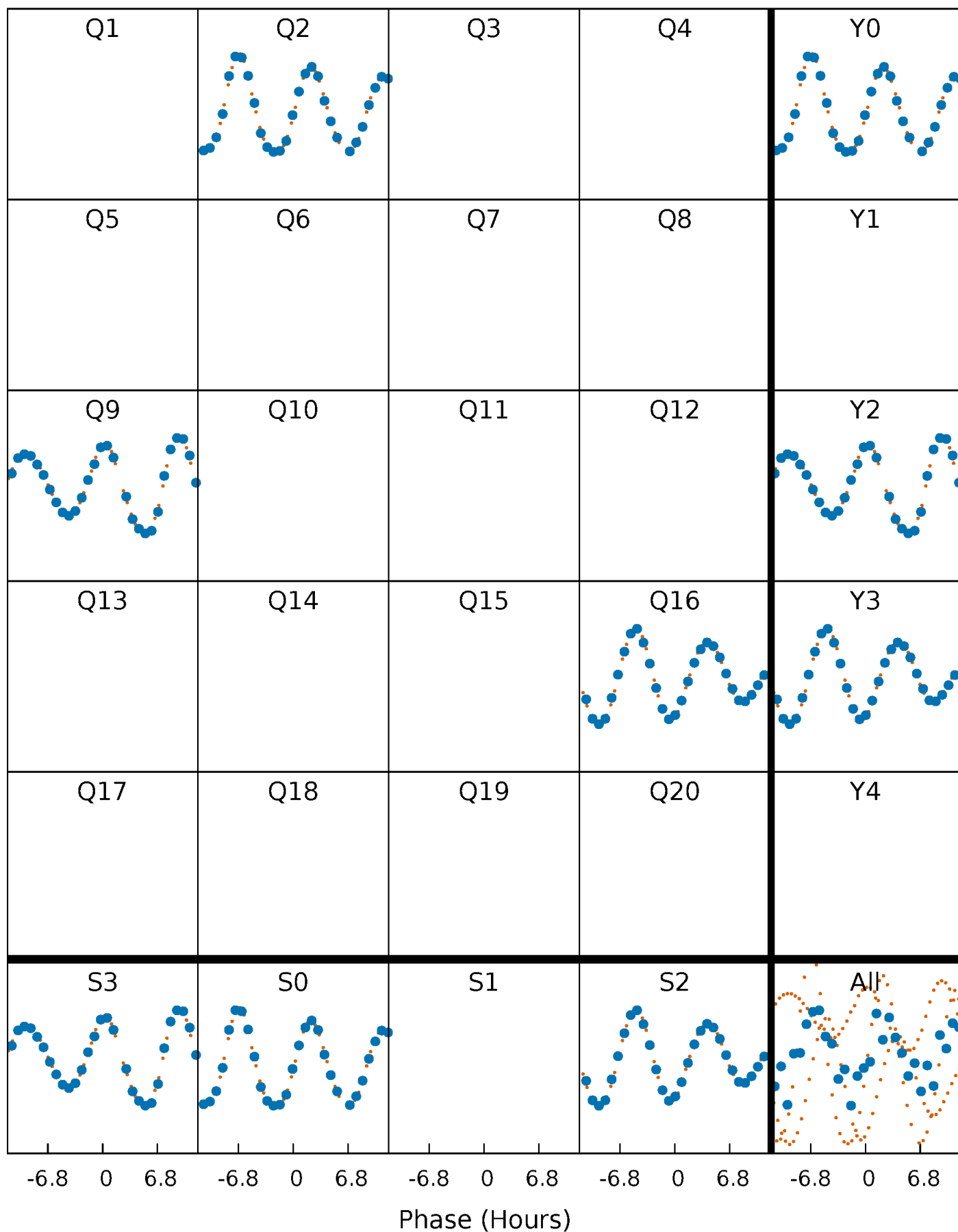


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



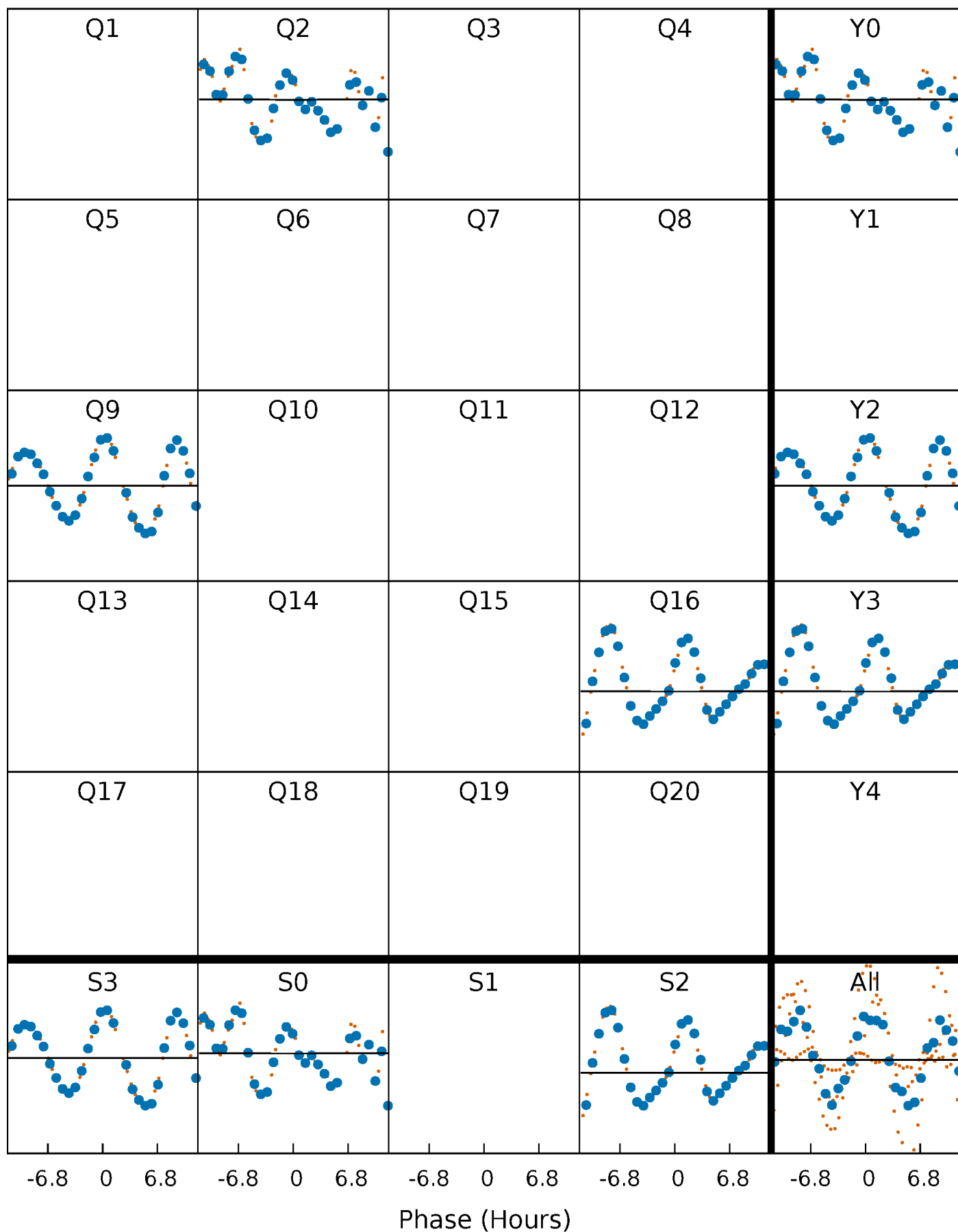
PDC Quarter-Phased Transit Curves

TCE 010385459-02 $P=635.429726$ Days $T_0=250.425440$ (BKJD)



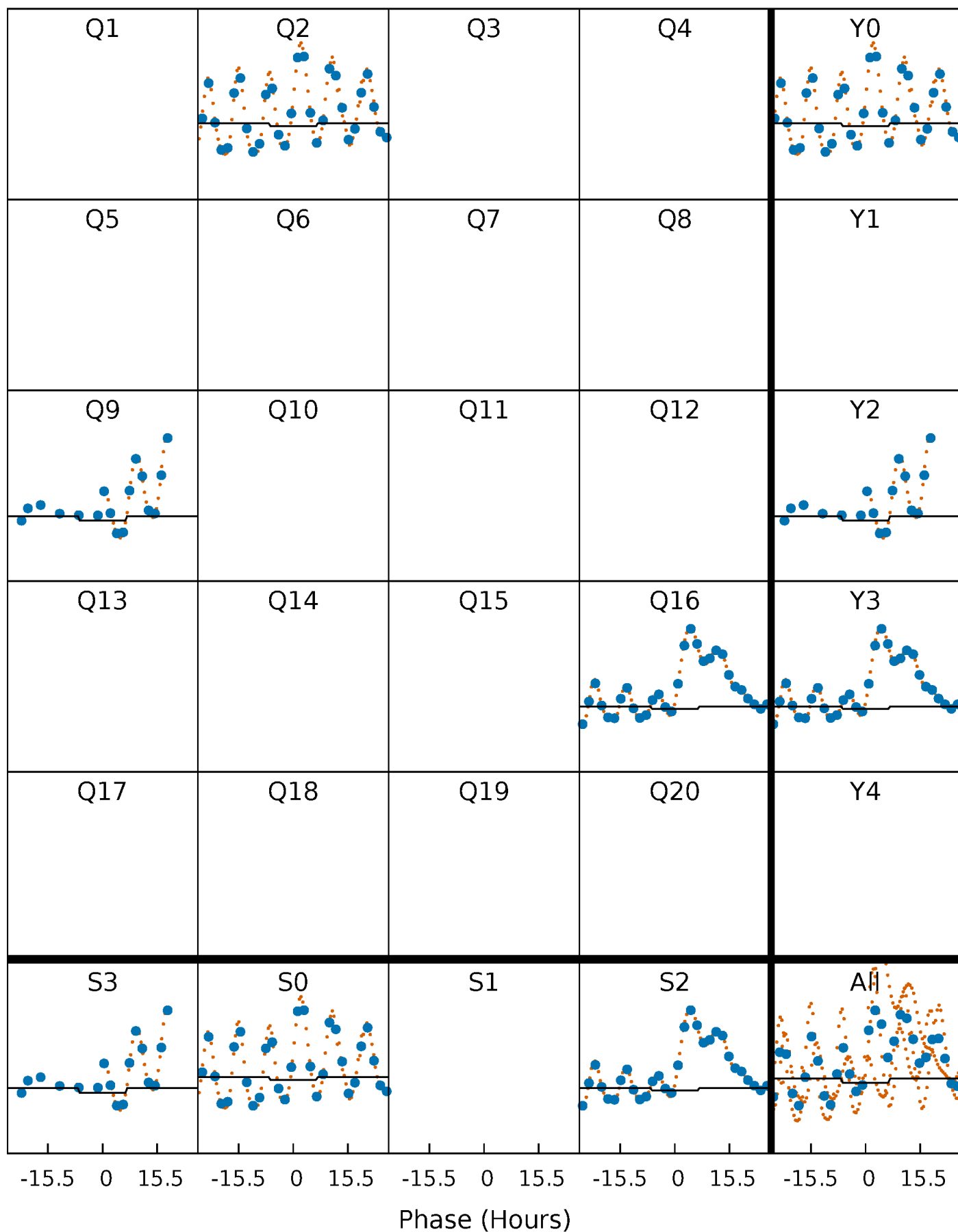
DV Quarter-Phased Transit Curves

TCE 010385459-02 $P=635.429726$ Days $T_0=250.425440$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

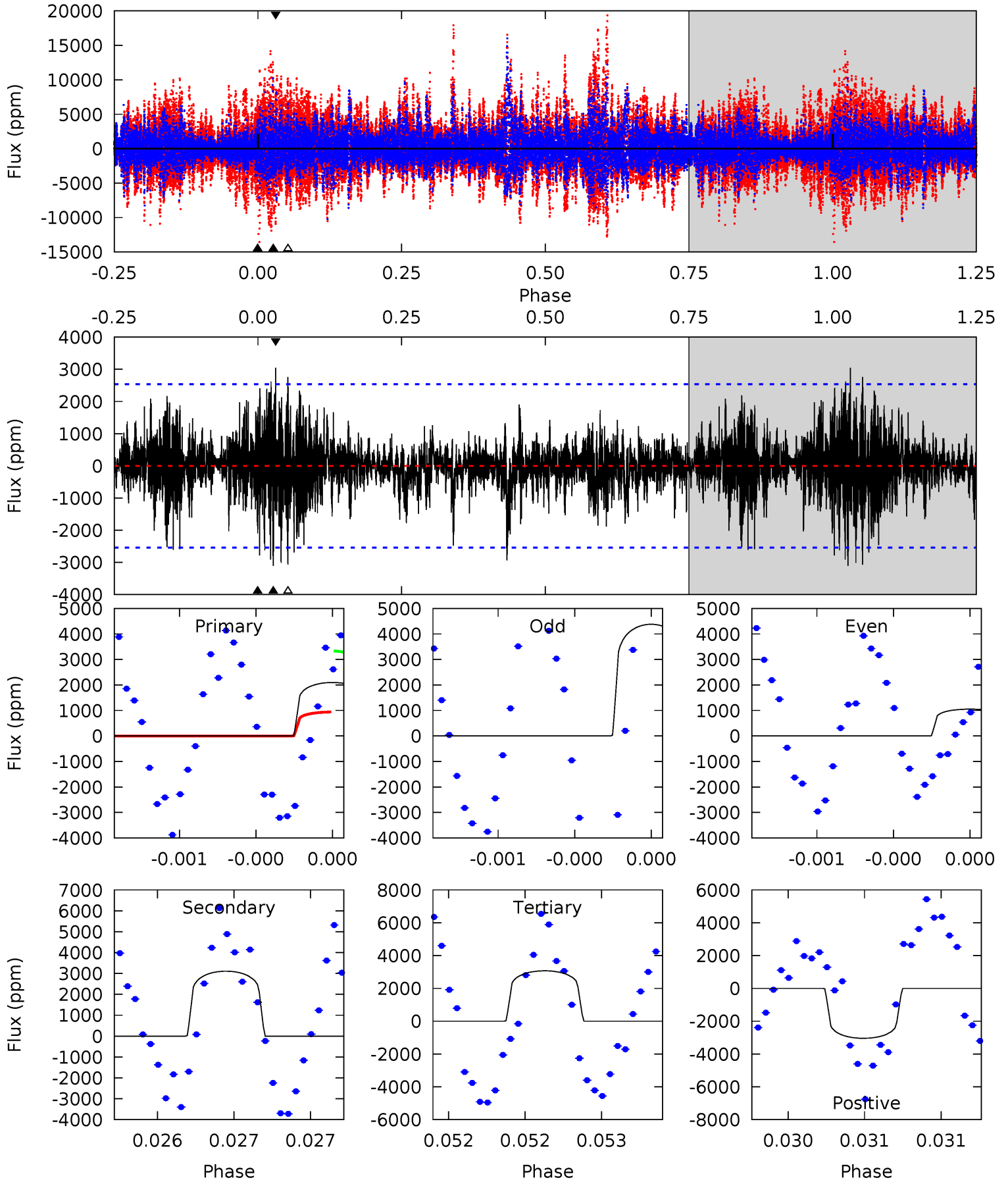
TCE 010385459-02 P=635.429227 Days $T_0=250.425680$ (BKJD)



DV Model-Shift Uniqueness Test

010385459-02, P = 635.429726 Days, E = 250.425440 Days

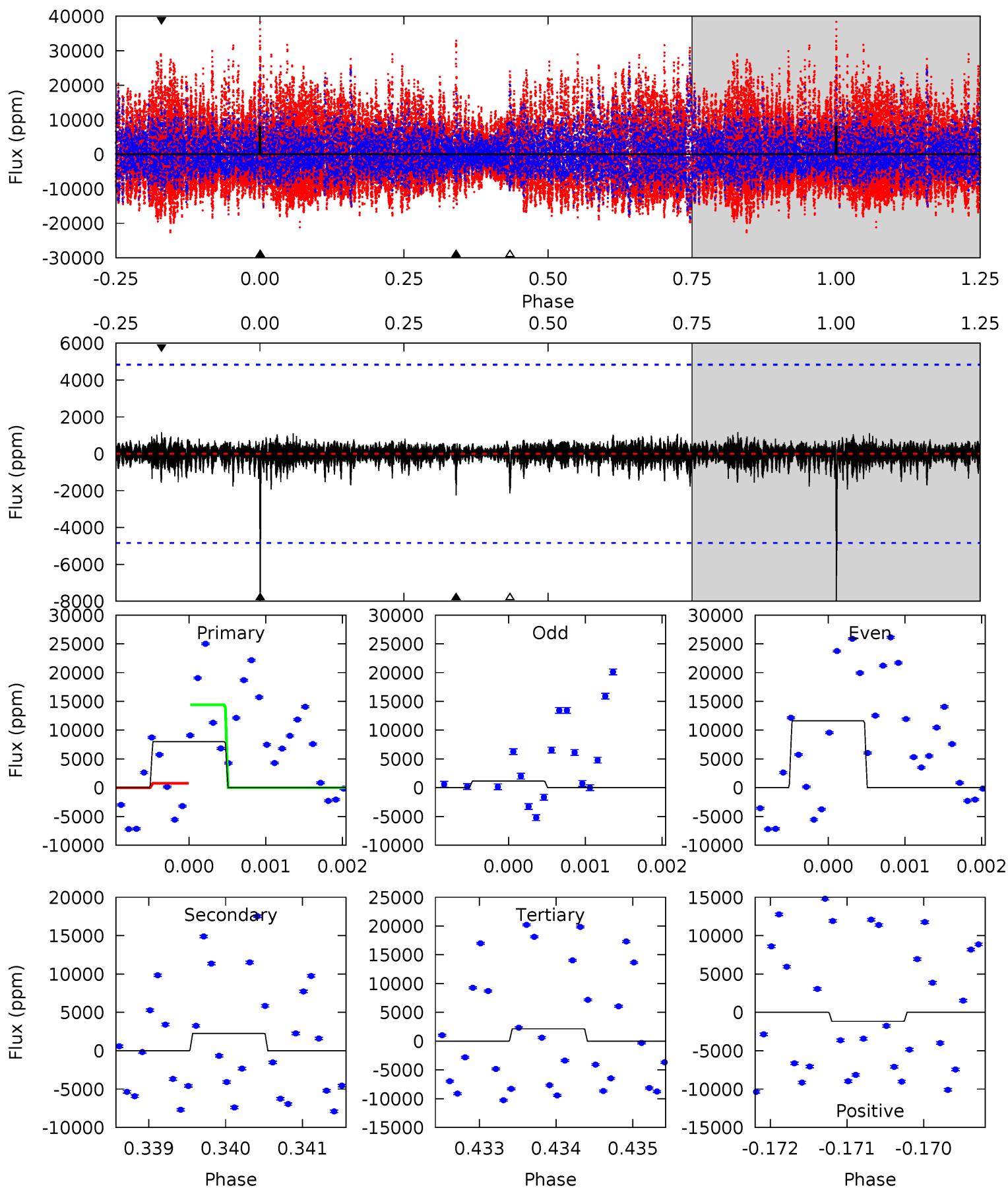
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.63	6.86	6.78	6.72	5.61	3.53	1.38	-2.15	-2.09	0.08	0.15	2.86	1.09	0.49	2.65



Alt Model-Shift Uniqueness Test

010385459-02, P = 635.429227 Days, E = 250.425680 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.04	2.54	2.43	1.32	5.47	3.32	0.42	6.61	7.73	0.11	1.23	4.90	0.88	0.13	7.66



Stellar Parameters For KIC 010385459

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7159^{+171}_{-235}	$4.232^{+0.124}_{-0.186}$	$-0.380^{+0.300}_{-0.350}$	$1.441^{+0.451}_{-0.243}$	$1.295^{+0.204}_{-0.167}$	$0.610^{+0.359}_{-0.303}$
	+2%/-3%	+3%/-4%	+79%/-92%	+31%/-17%	+16%/-13%	+59%/-50%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 010385459-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-3109 ± 453	$11.95^{+13.98}_{-8.16}$	423^{+31}_{-24}	6052^{+7154}_{-1666}	$29160^{+265716}_{-22927}$
Alt.	-2250 ± 884	$13.95^{+15.84}_{-9.87}$	424^{+30}_{-24}	5276^{+5054}_{-1438}	$15927^{+163290}_{-13017}$

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 $A_{\text{obs}} \gg 1.0$

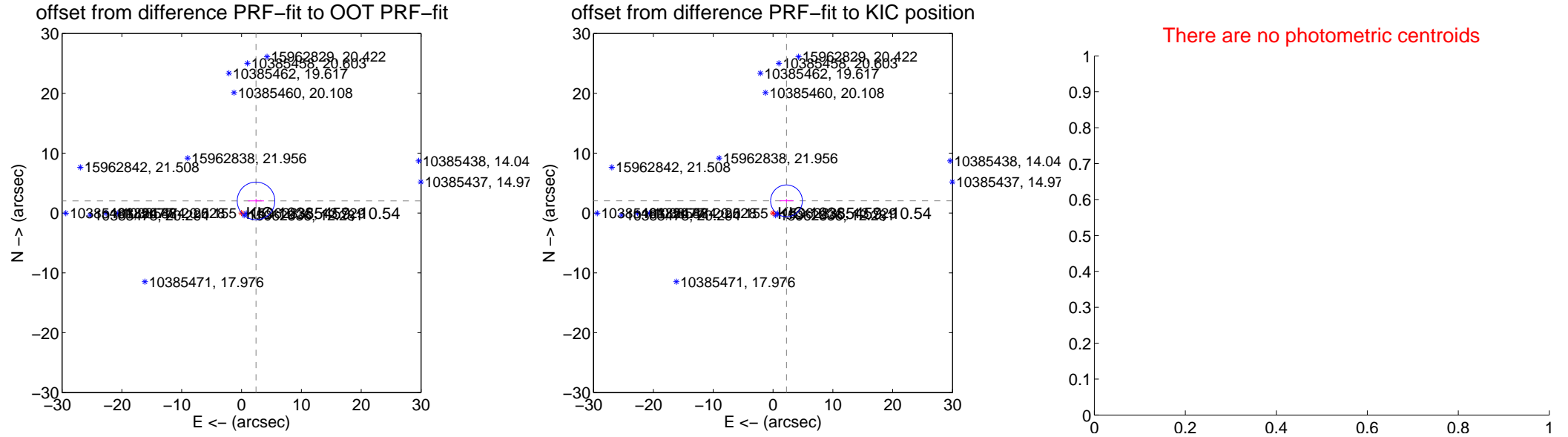
DV Centroid Data

Supplemental centroid analysis for 010385459-02. **Kepler magnitude: 10.54.** Transit SNR 0.02

There are 1 quarters with good PRF difference image offsets

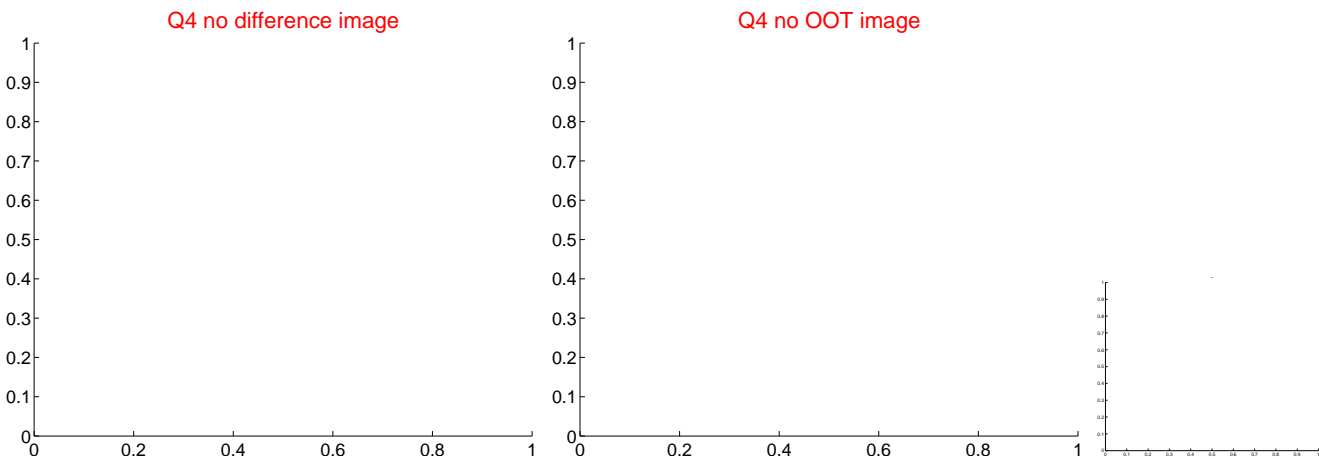
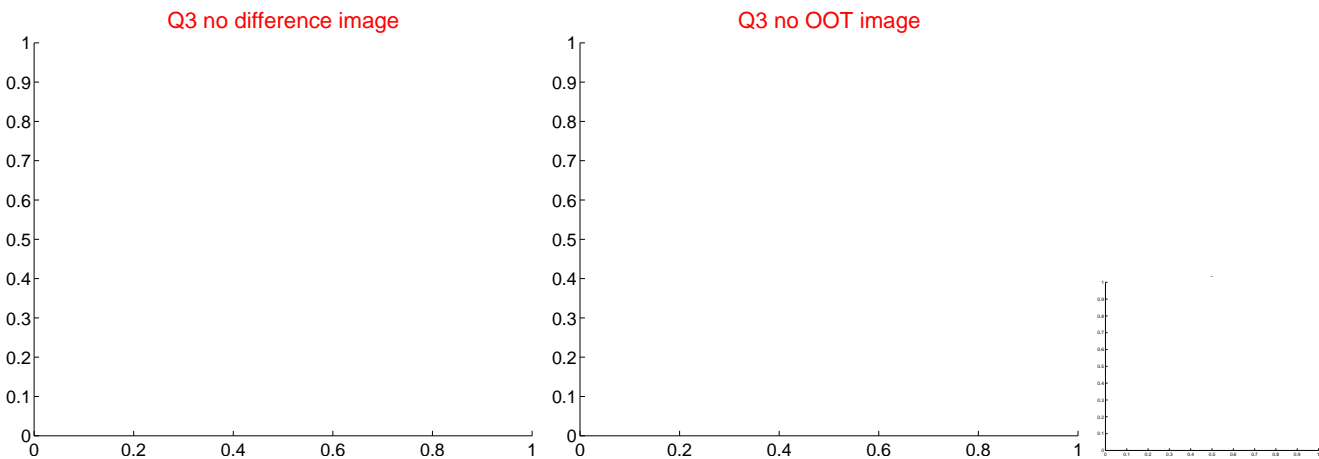
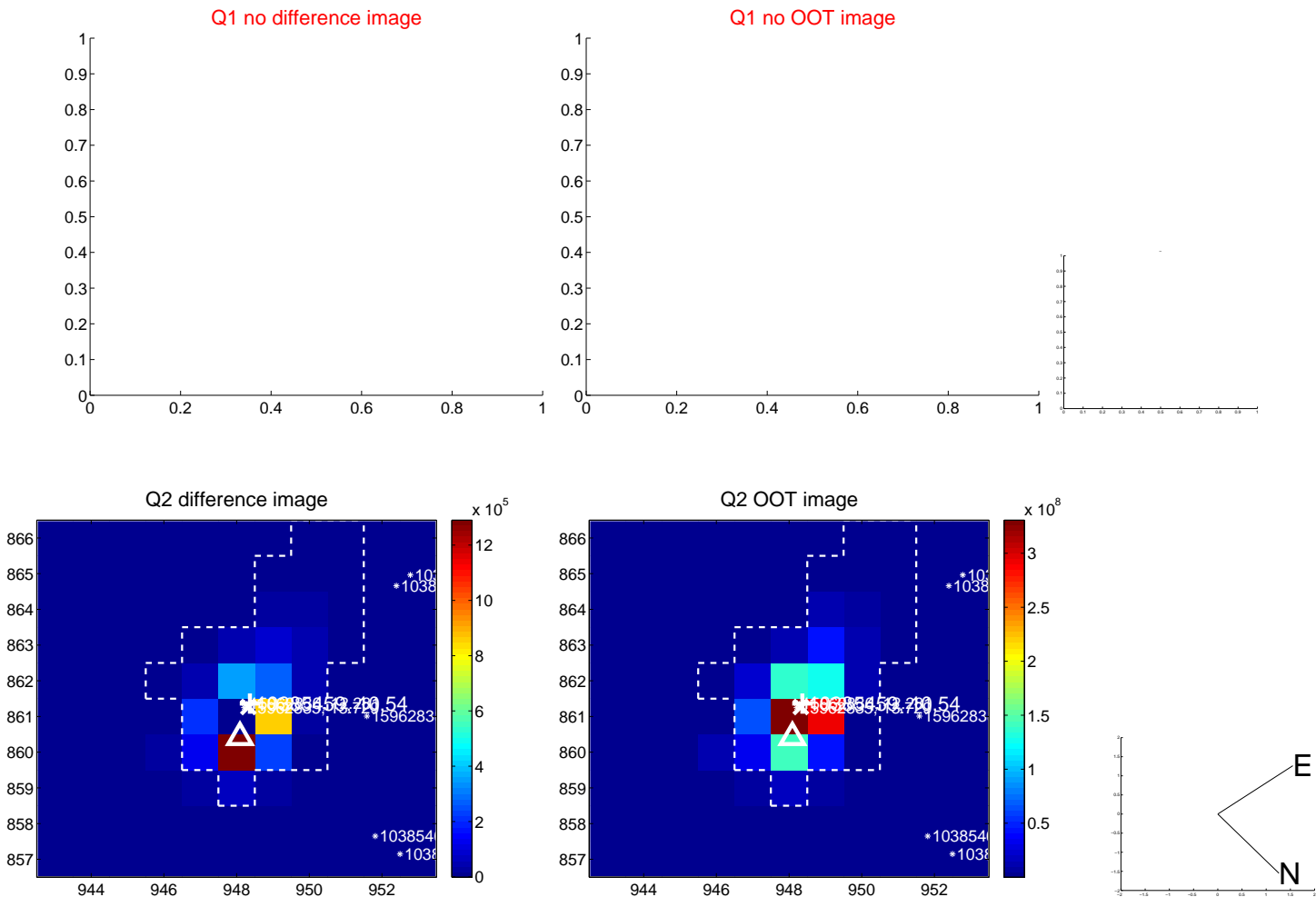
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.152 ± 1.048	3.01	-2.419 ± 1.333	2.021 ± 0.355
PRF-fit source offset from KIC position	3.035 ± 0.885	3.43	-2.252 ± 1.157	2.035 ± 0.317
photometric centroid source offset	—	—	—	—

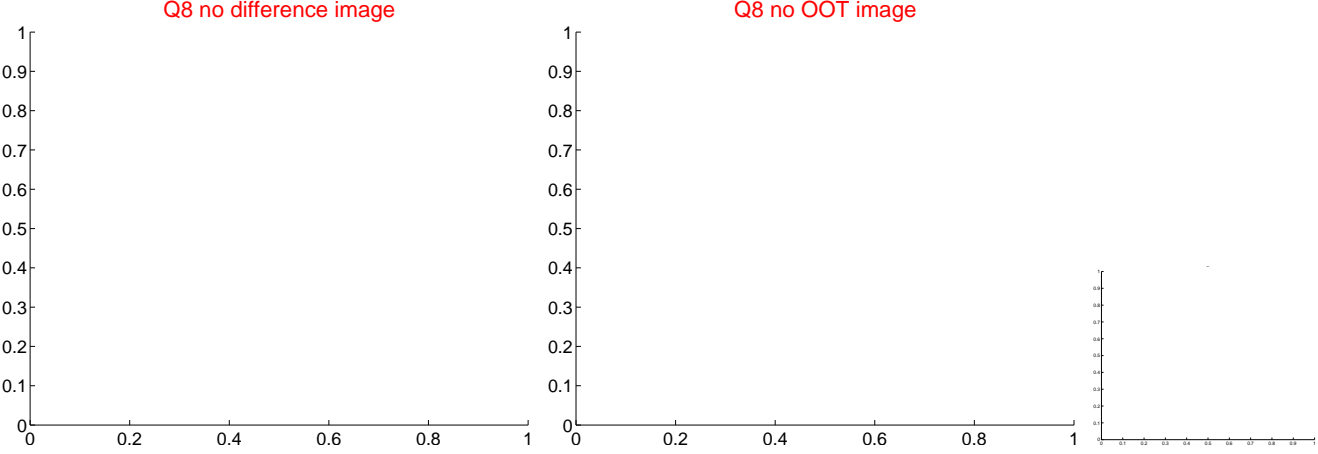
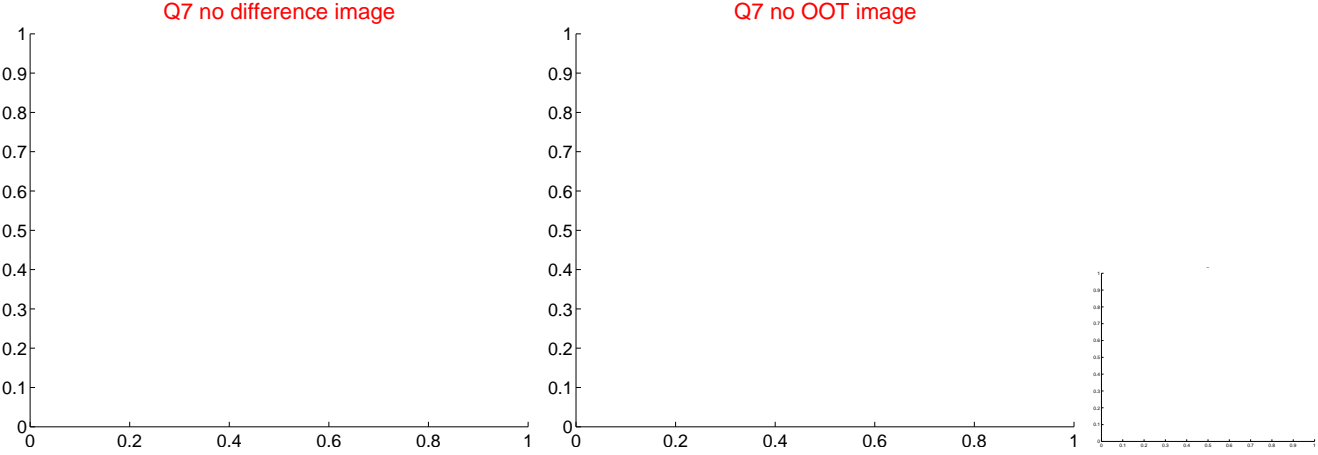
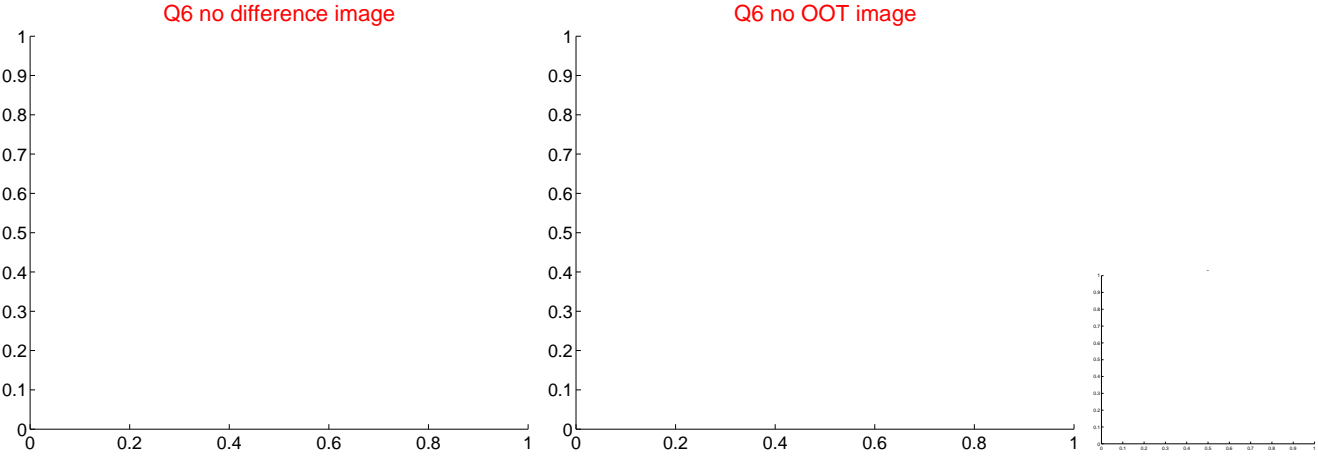
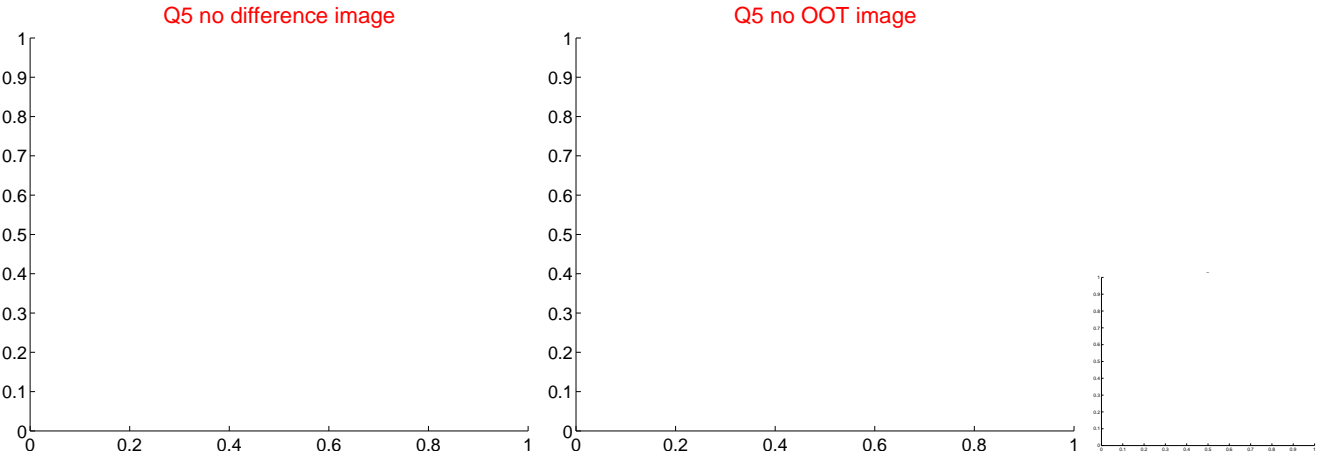


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- 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.

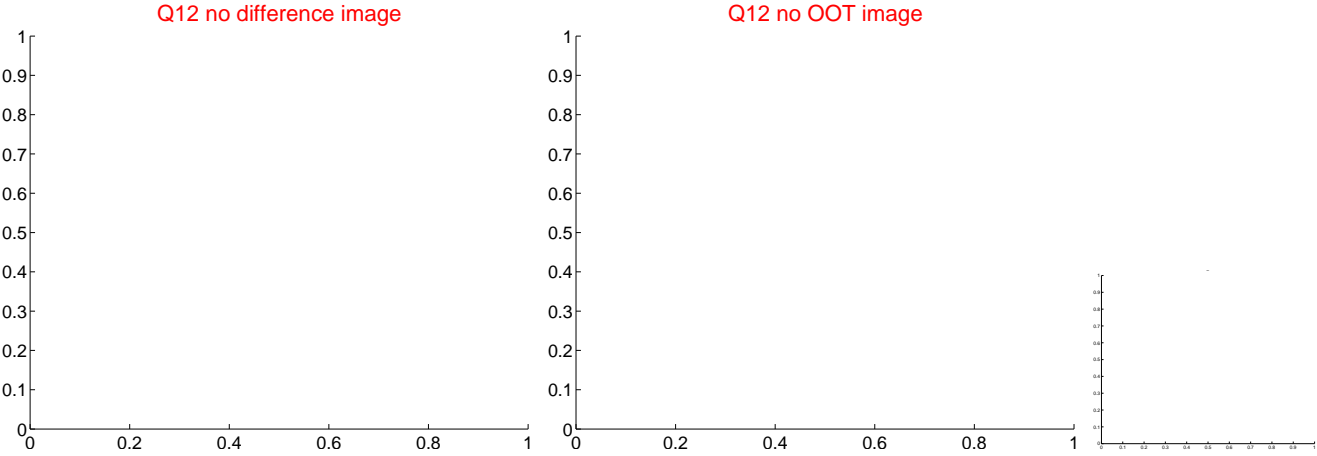
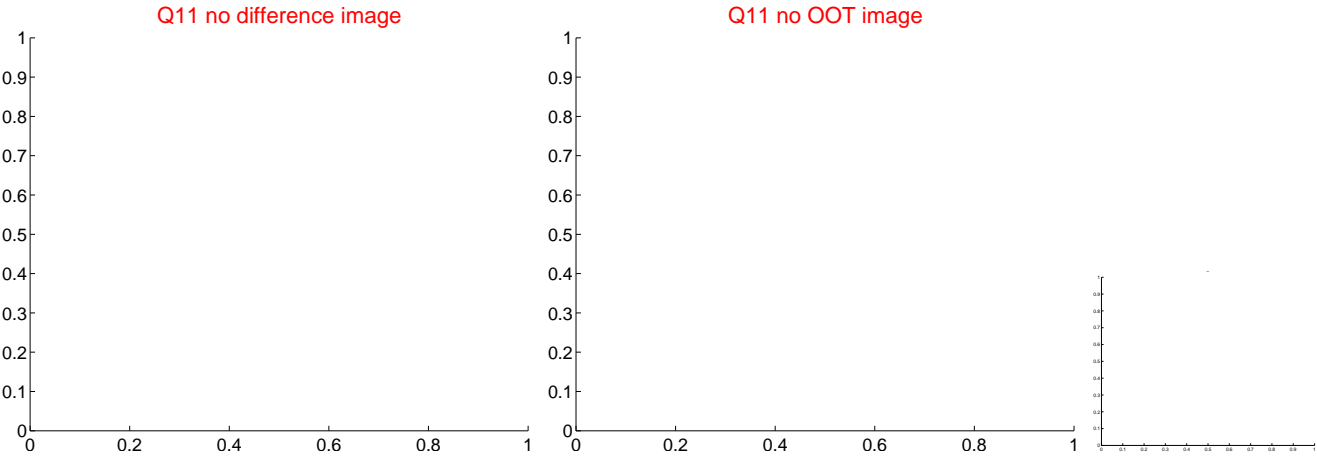
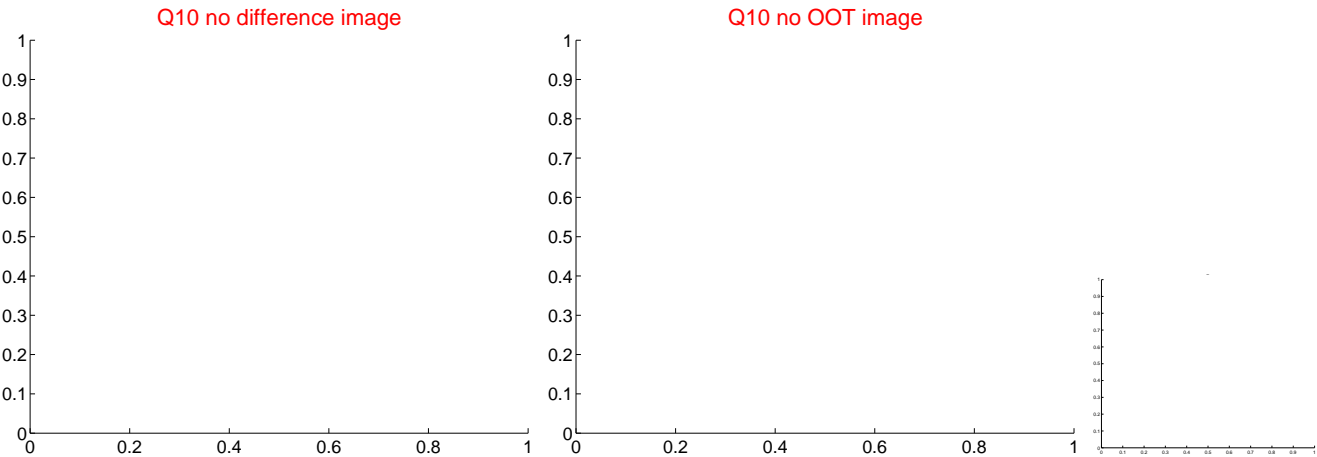
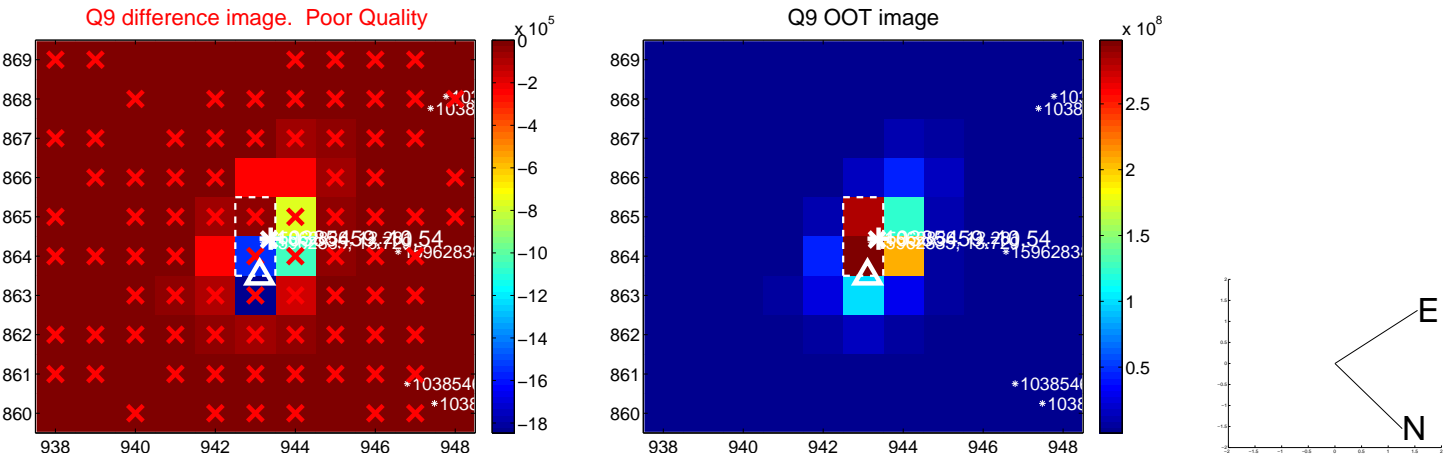
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



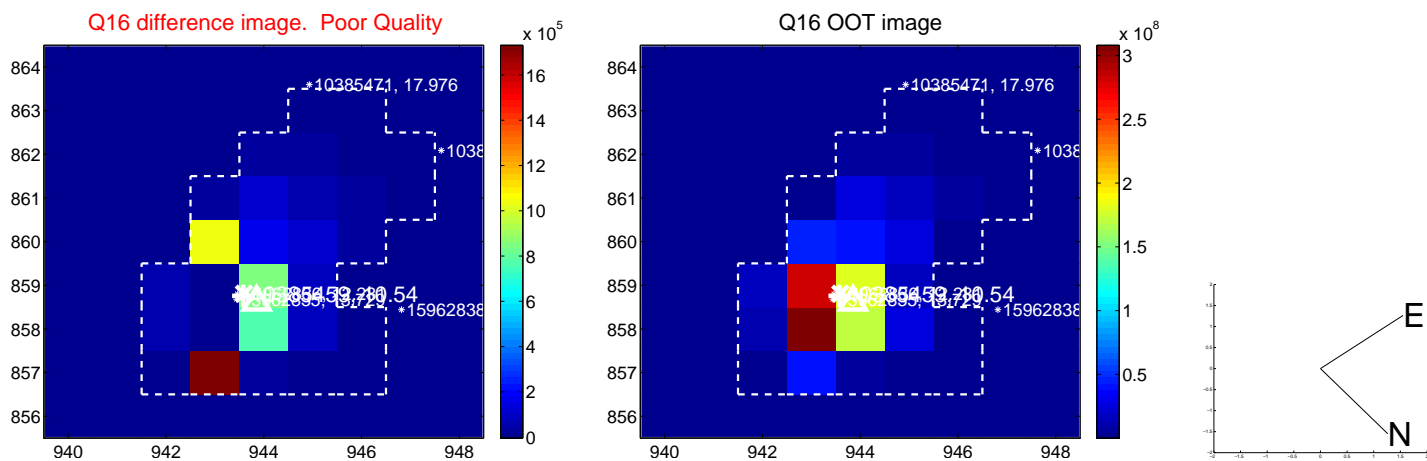
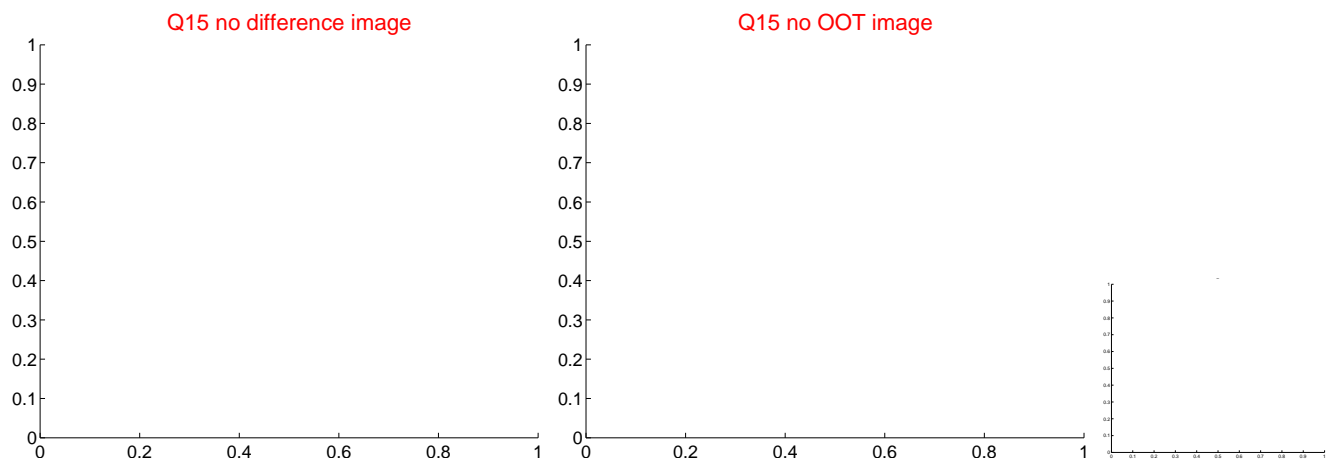
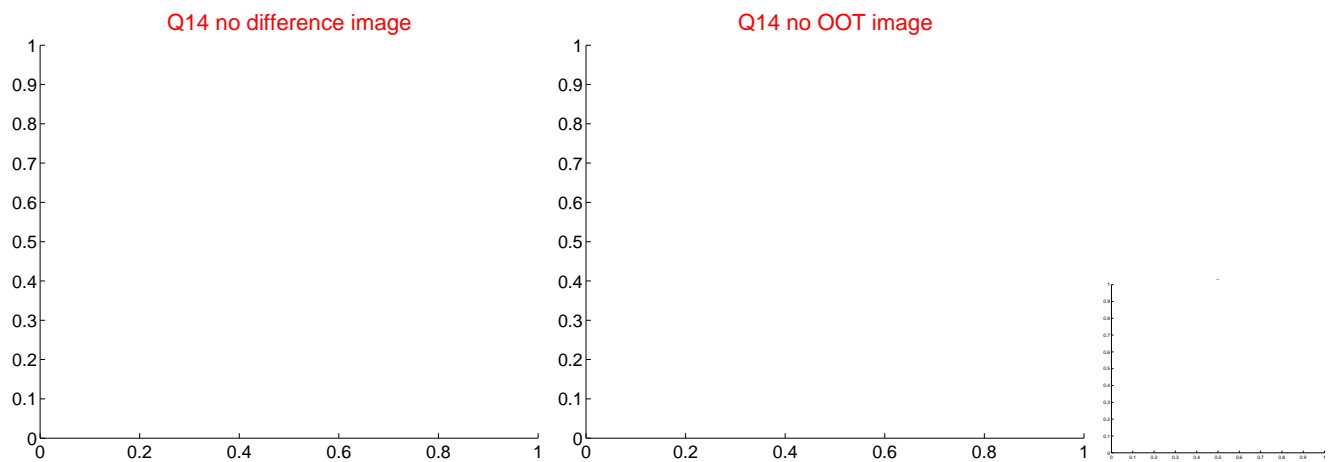
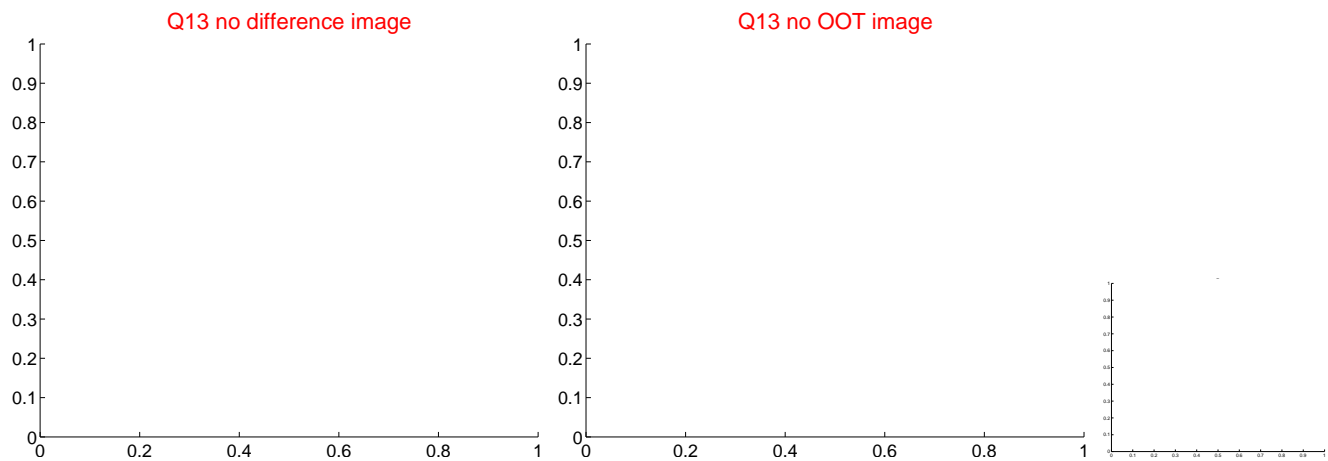
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



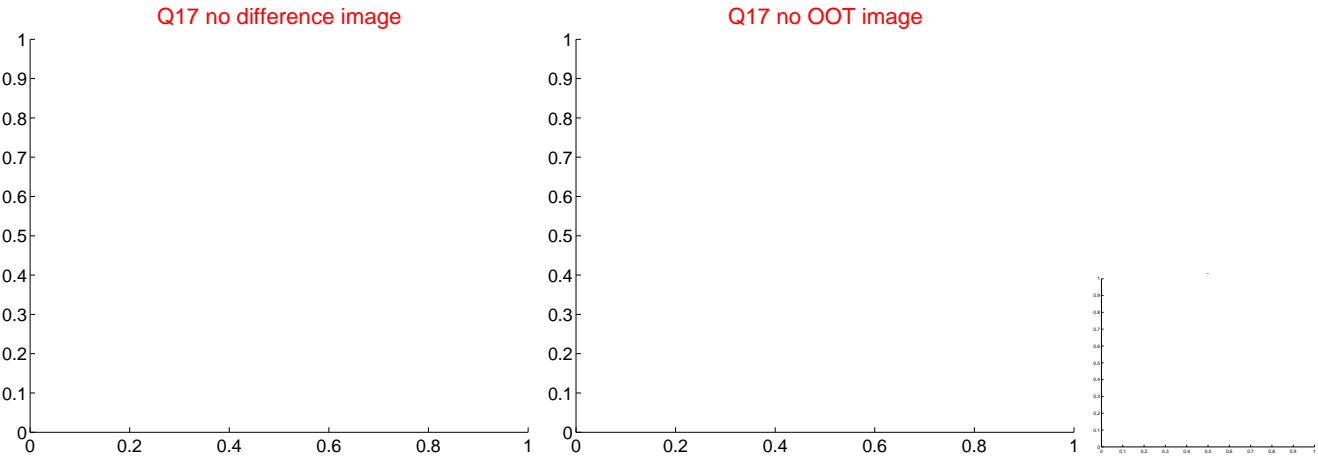
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



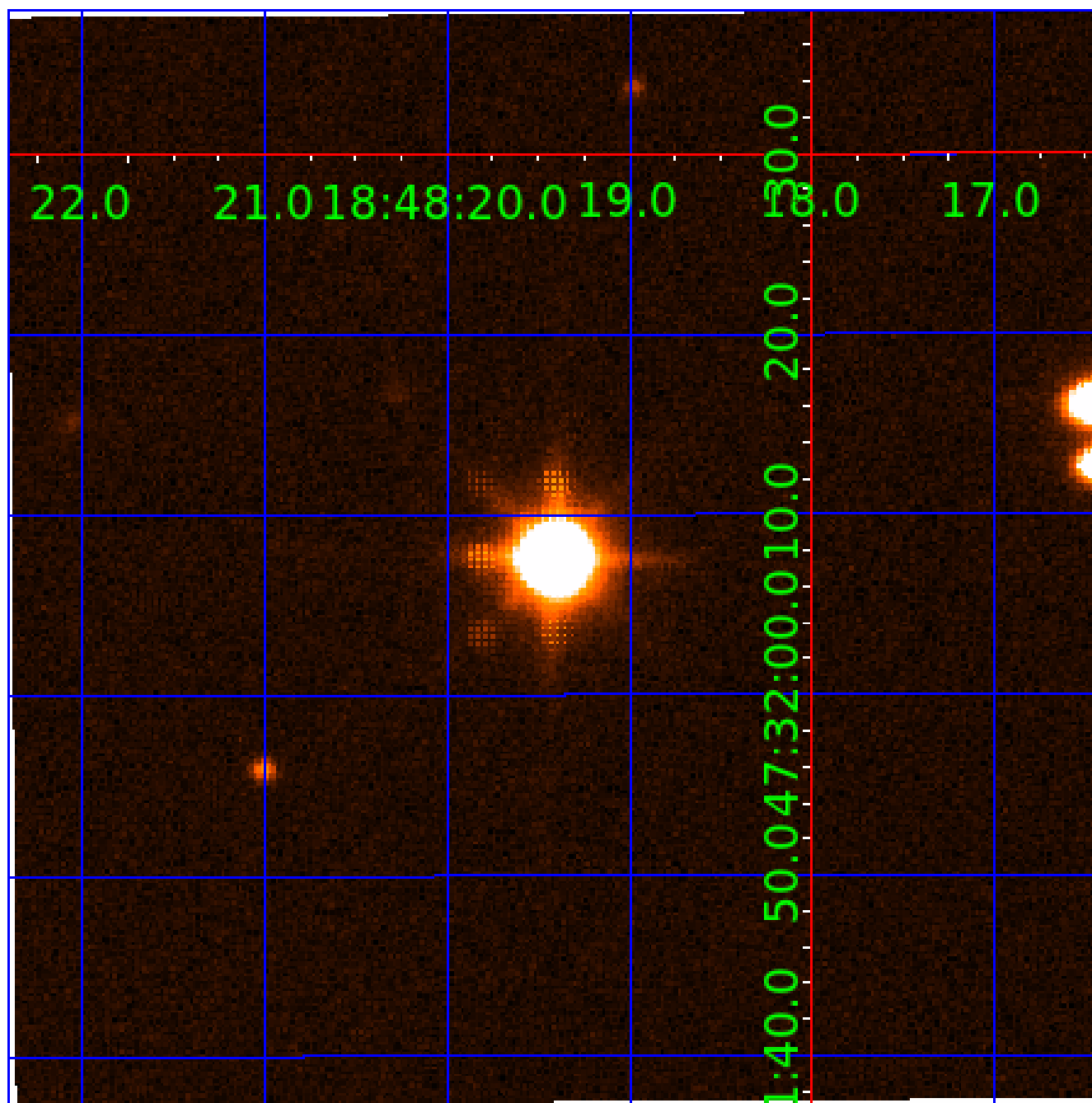
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



folded centroid time series figure for this object.

UKIRT Image

Declination



KIC 010385459

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})
010385459-01	OBS	No	98.660889	160.323346	298.1	2.071	21.7	4.2	1.44	7159	2.52	23.58
010385459-02	OBS	No	635.429726	250.425440	4.1	5.909	65.6	0.0	1.44	7159	0.34	1.97
010385459-03	OBS	No	631.700057	254.701887	556.7	8.556	73.6	1.8	1.44	7159	3.63	1.98

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010385459-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
010385459-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_SATURATED
010385459-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED

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

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

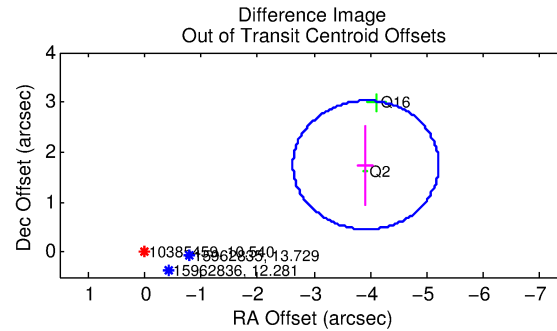
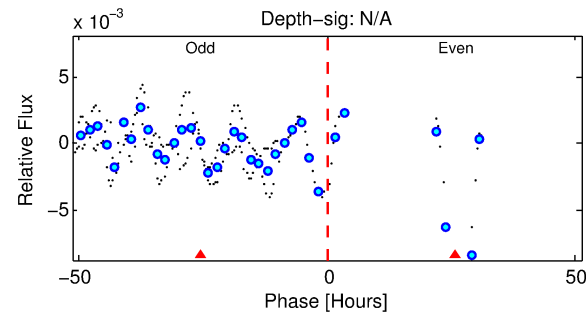
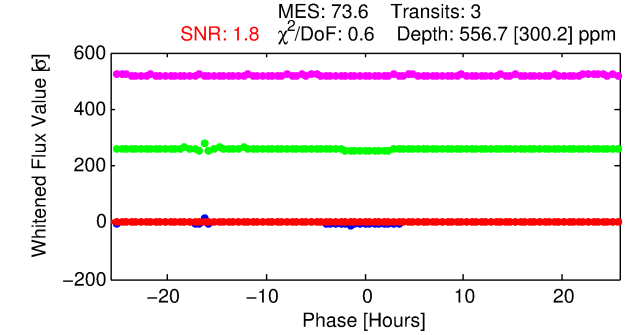
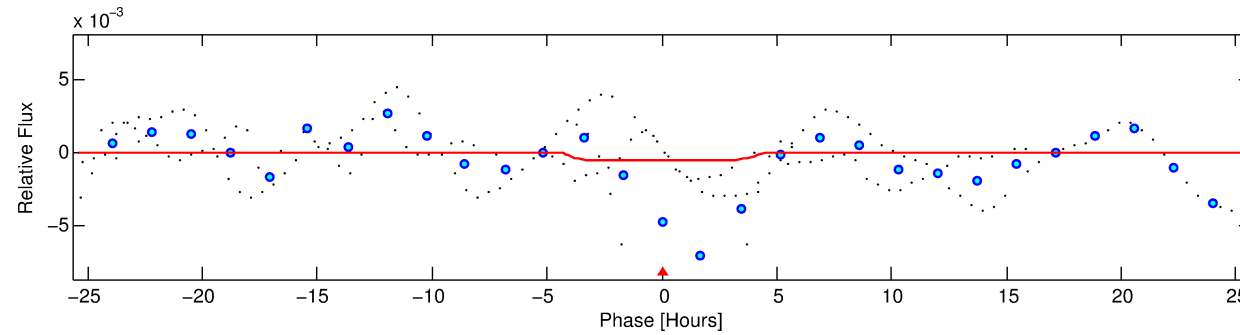
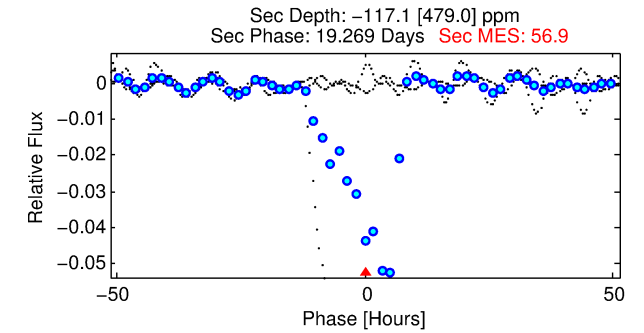
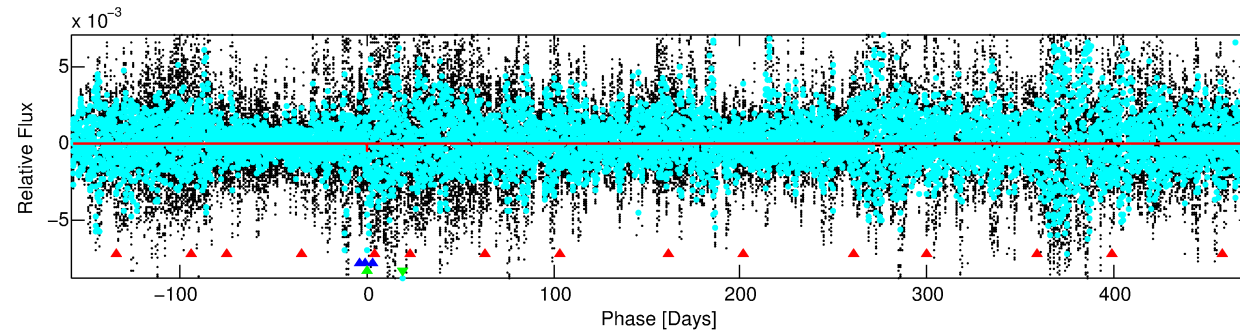
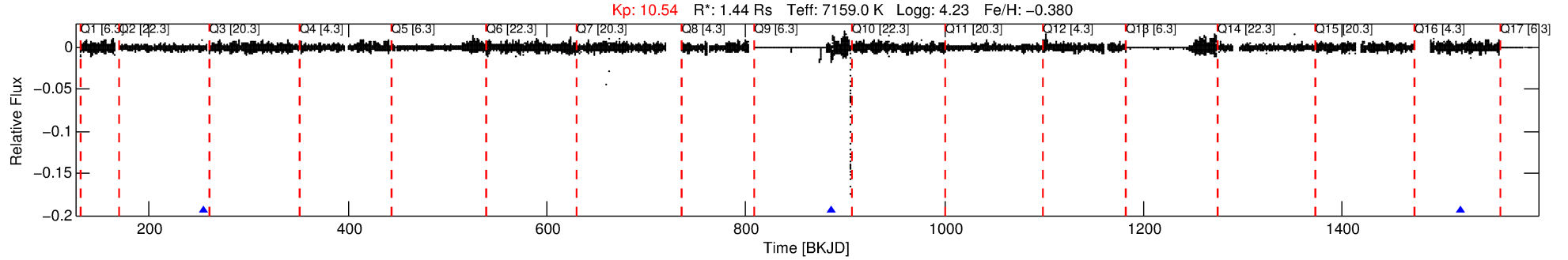
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010385459-03

No Significant Match Found

DV One-Page Summary

KIC: 10385459 Candidate: 3 of 3 Period: 631.700 d



DV Fit Results:

Period = 631.70006 [0.01132] d
Epoch = 254.7019 [0.0200] BKJD
Rp/R* = 0.0231 [0.0148]
a/R* = 429.26 [1317.84]
b = 0.68 [2.42]
Seff = 1.98 [0.75]
Teq = 303 [29] K
Rp = 3.63 [2.59] Re
a = 1.5697 [0.3968] AU
Ag = N/A
Teffp = N/A

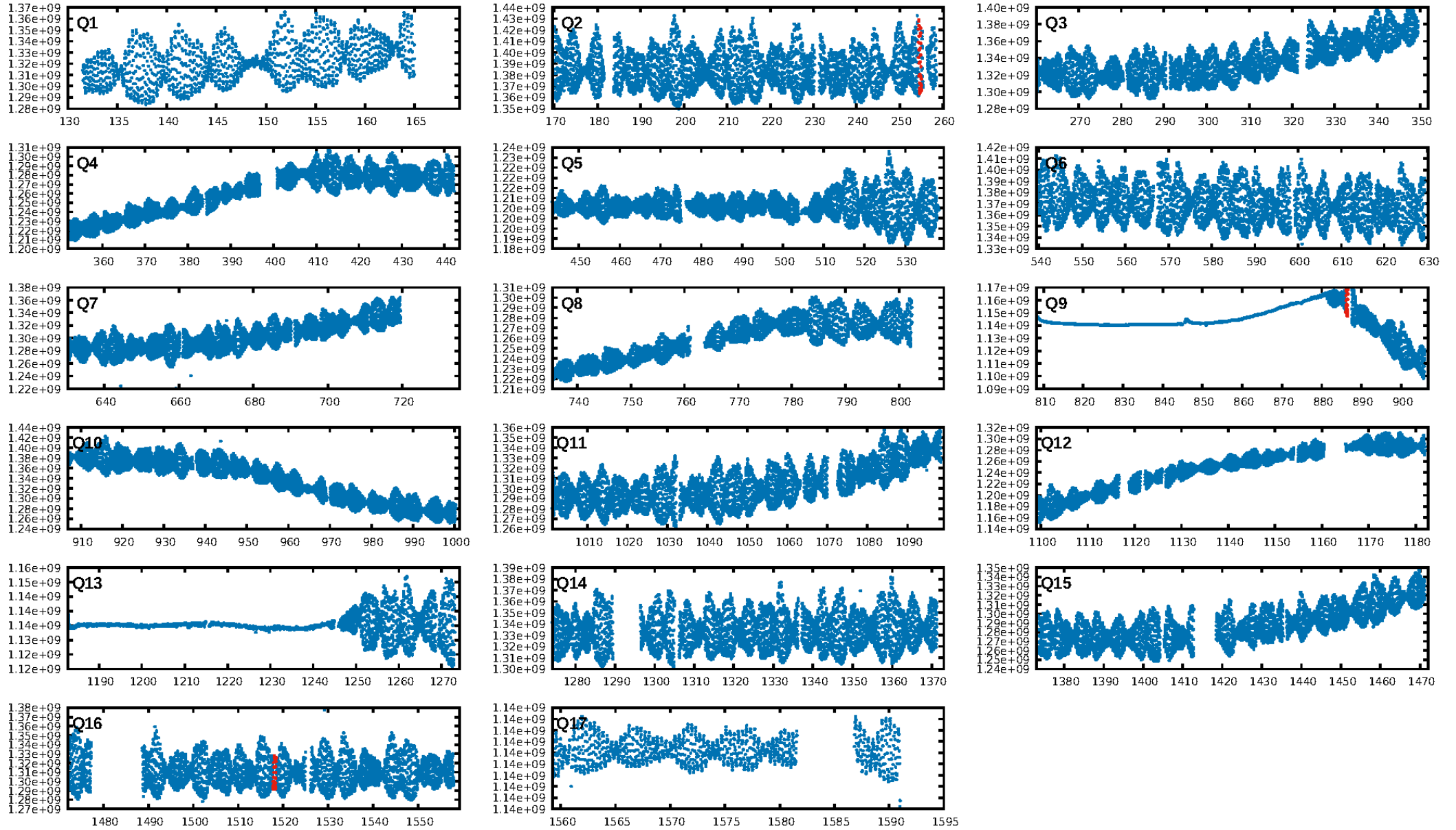
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [1453.25σ]
LongPeriod-sig: 100.0% [8.61σ]
ModelChiSquare2-sig: 46.6%
ModelChiSquareGoF-sig: 100.0%
Bootstrap-pfa: 7.76e-14
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: N/A
Centroid-sig: 5.4%
Centroid-so: 3.560 arcsec [1.64σ]
OotOffset-rm: 4.290 arcsec [9.98σ]
KicOffset-rm: 3.901 arcsec [10.09σ]
OotOffset-st: 1/0/1/0 [2]
KicOffset-st: 1/0/1/0 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [2/2]

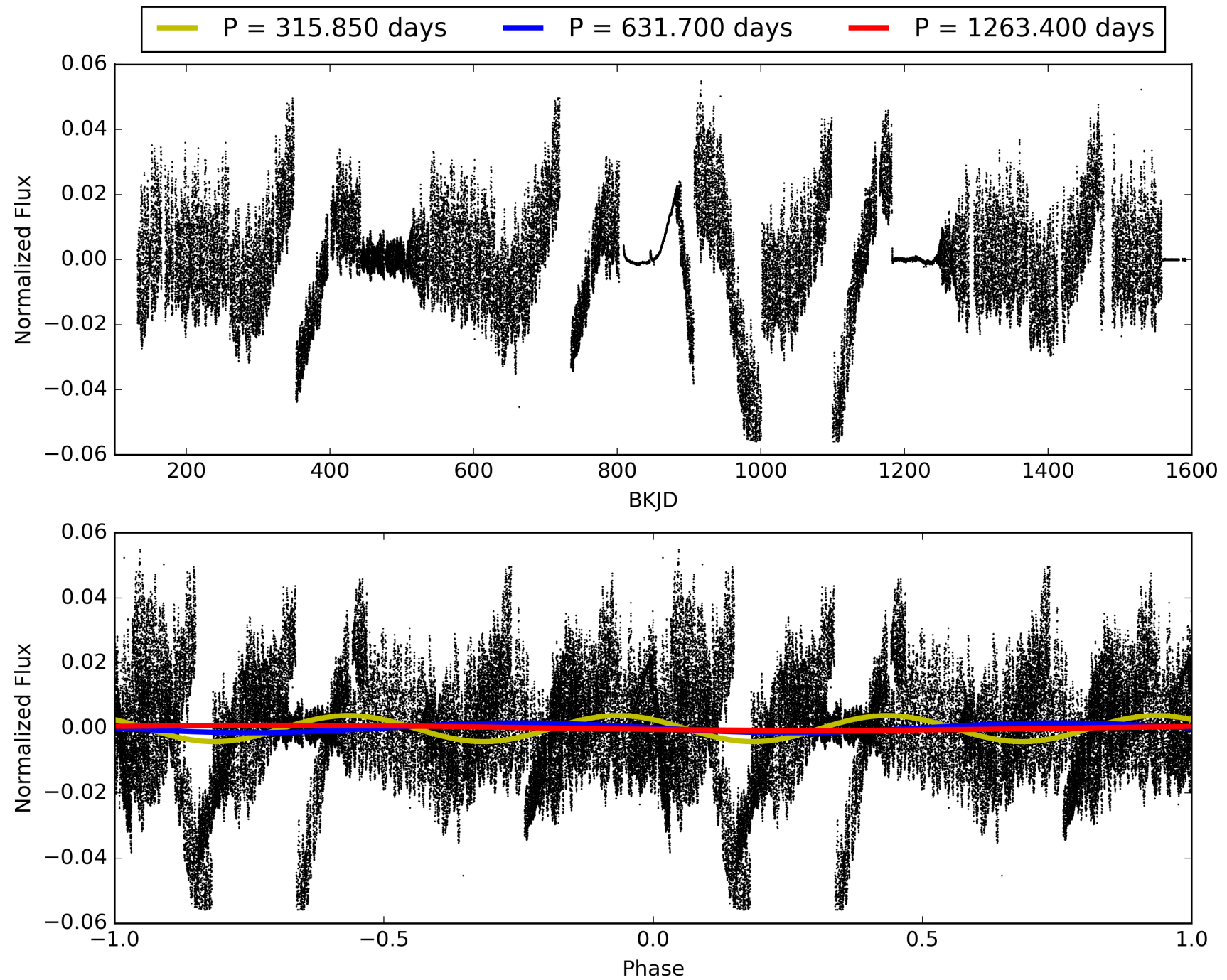
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 19:42:24 Z

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

TCE 010385459-03, PDC Light Curves

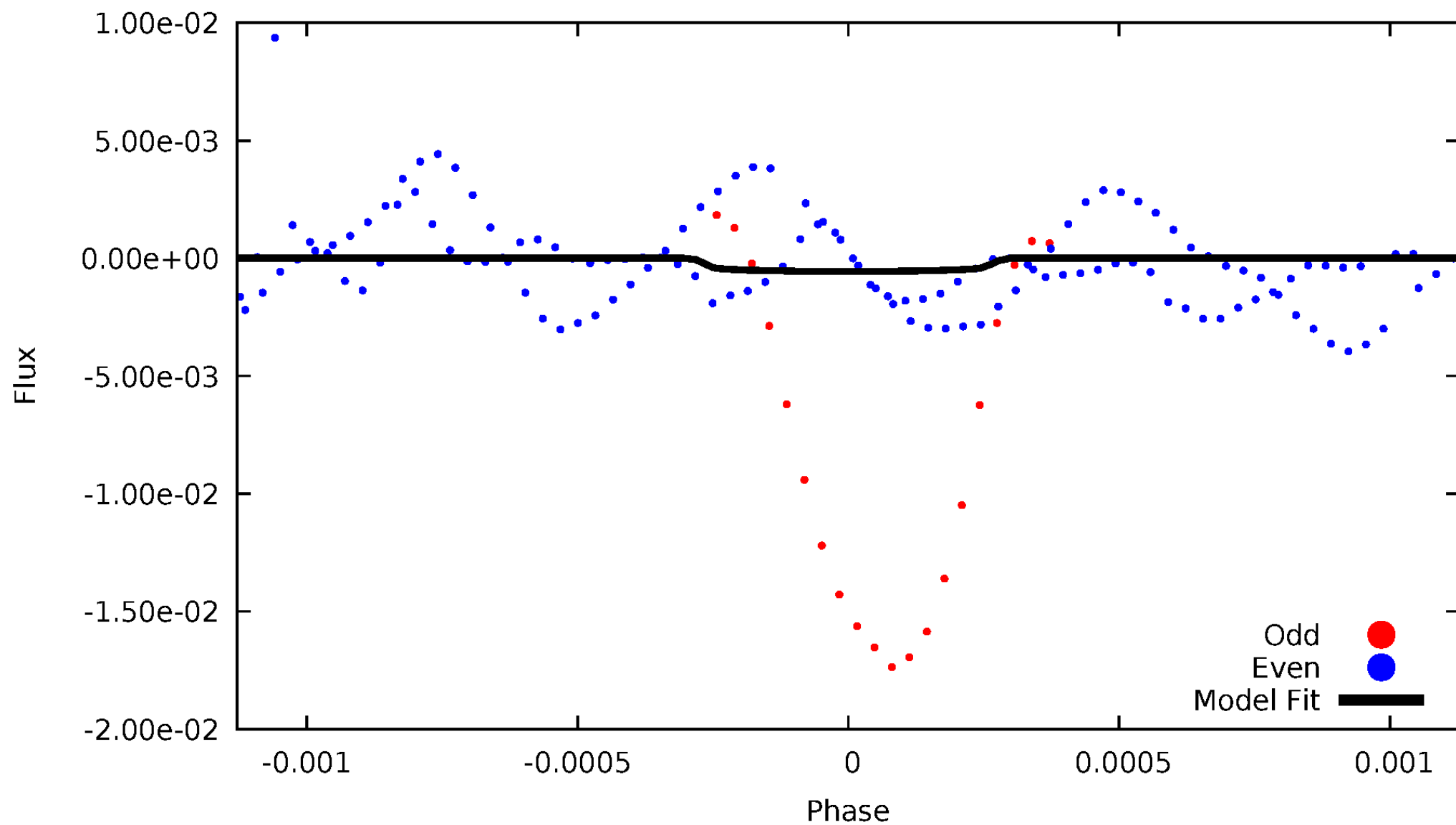


TCE 010385459-03



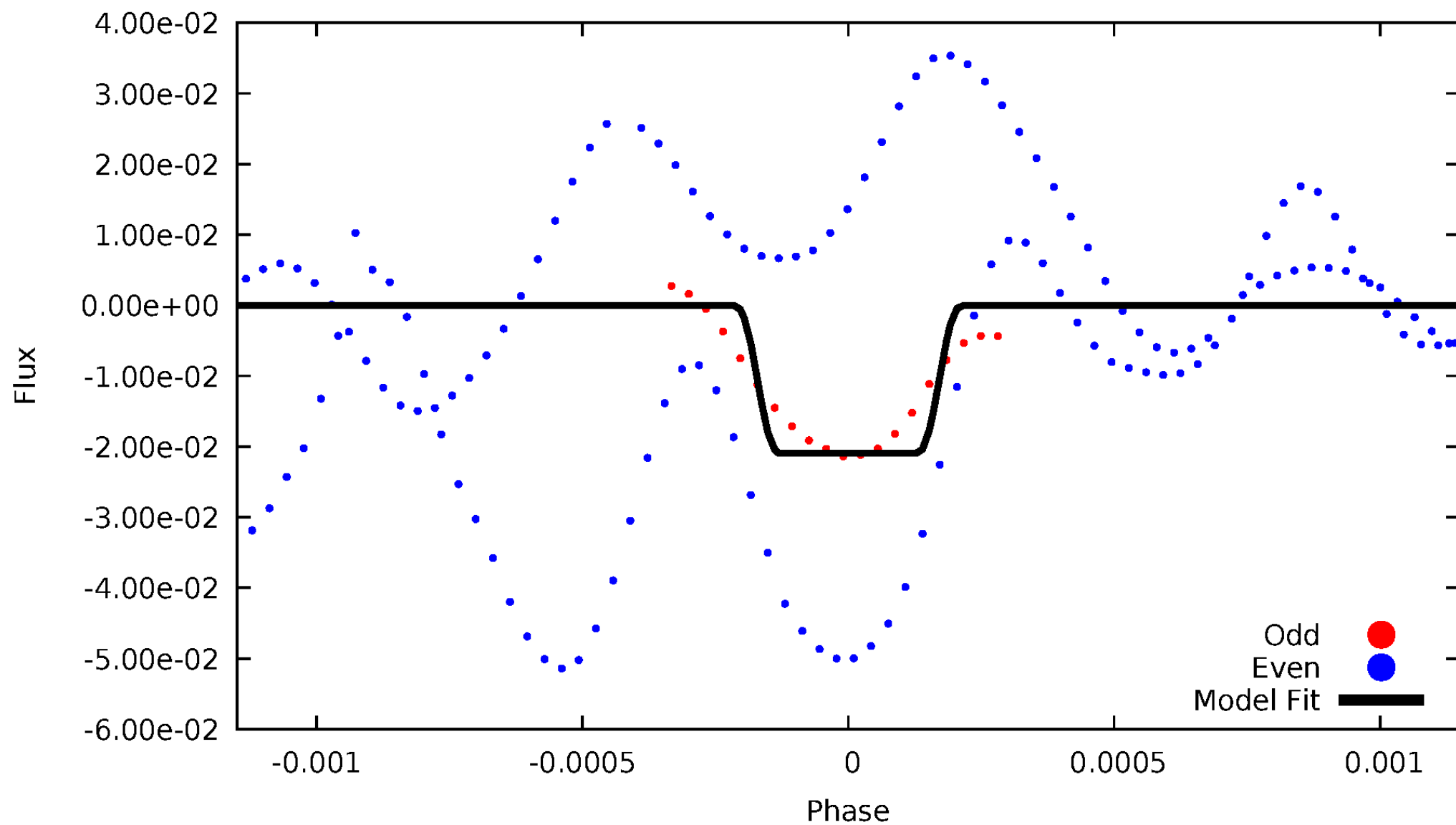
DV Odd/Even

TCE 010385459-03



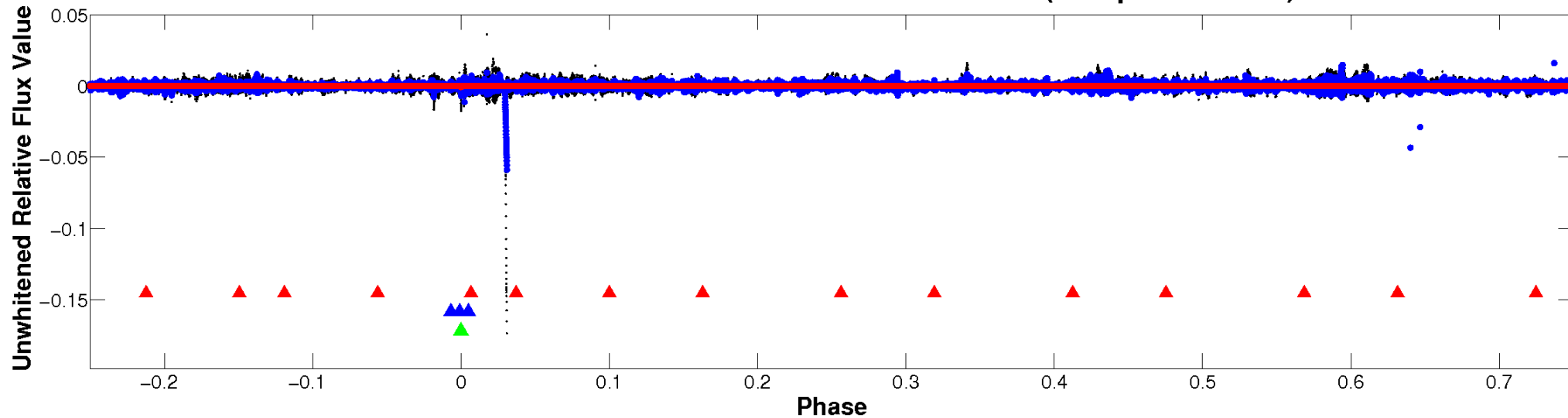
ALT Odd/Even

TCE 010385459-03

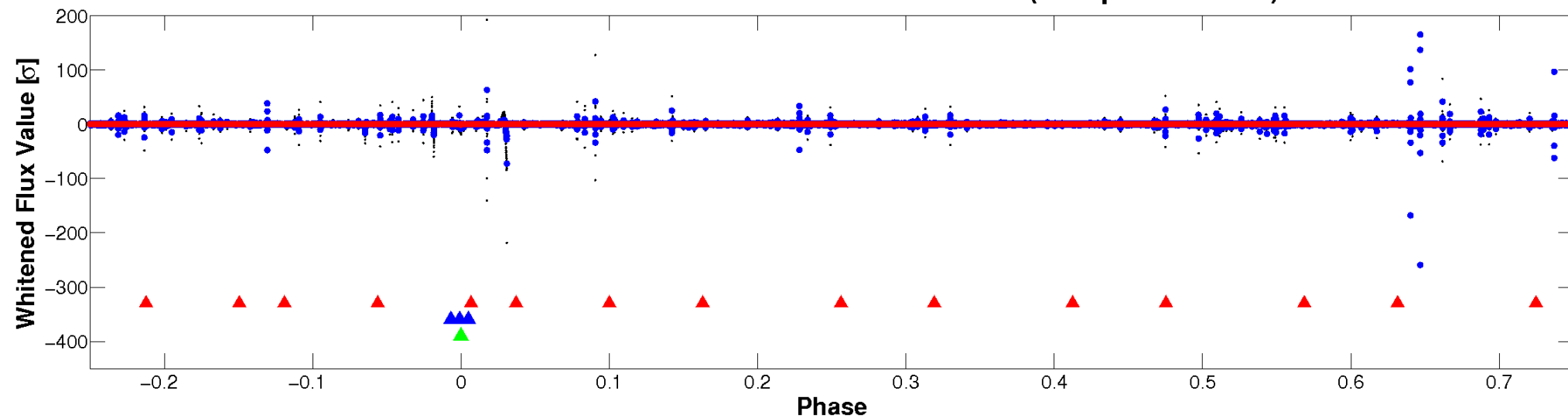


Non-Whitened Vs. Whitened Light Curve

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

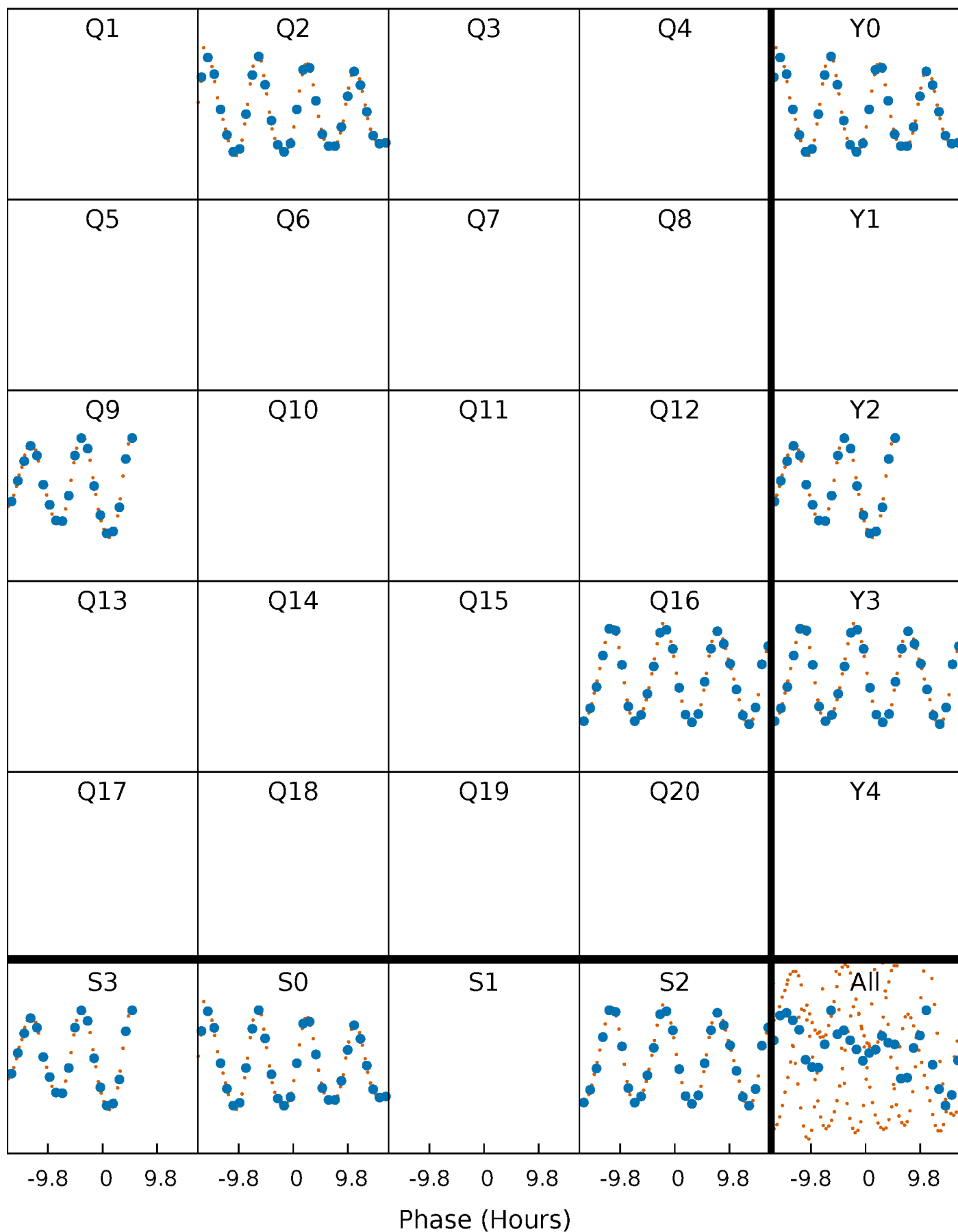


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



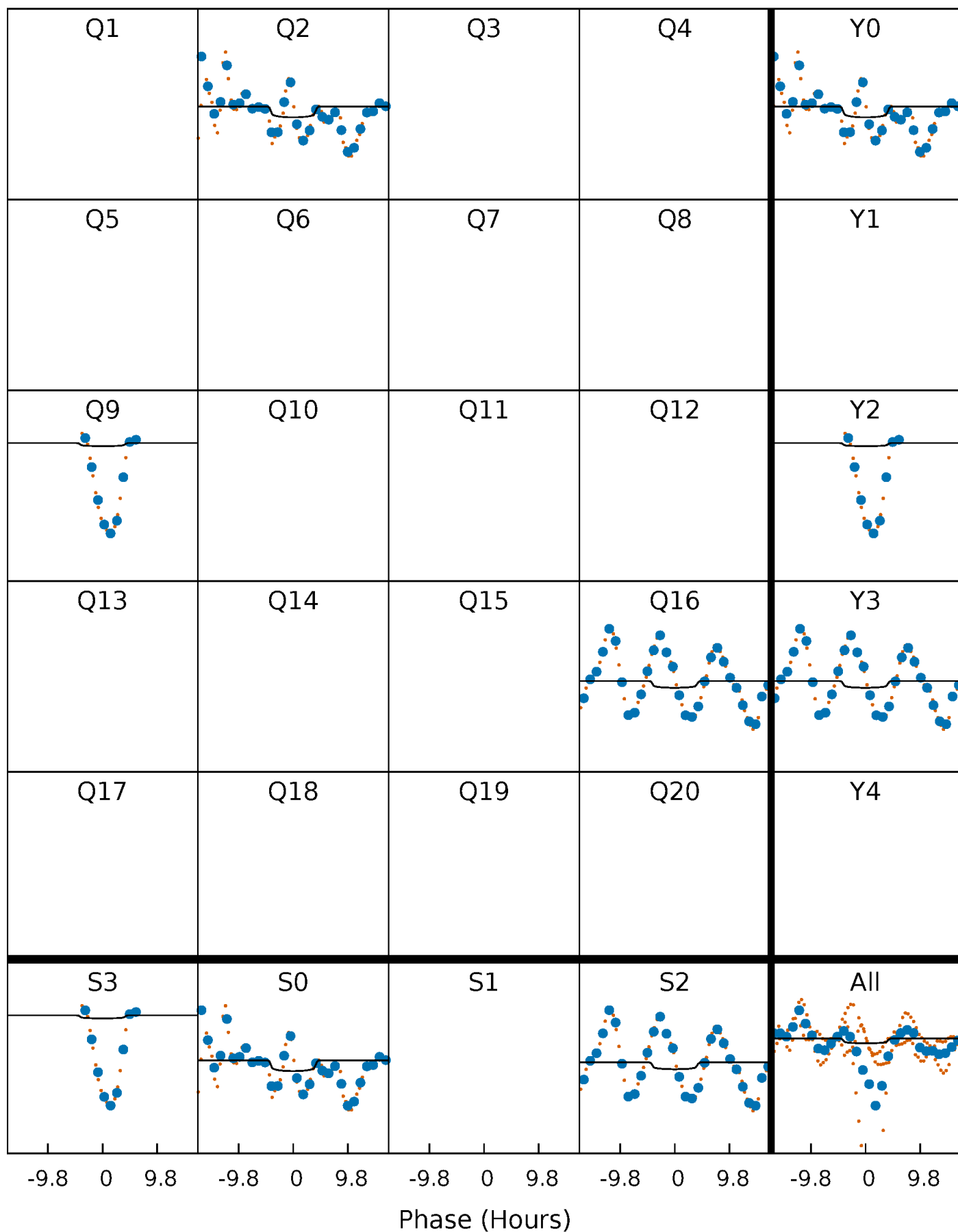
PDC Quarter-Phased Transit Curves

TCE 010385459-03 P=631.700057 Days $T_0=254.701887$ (BKJD)



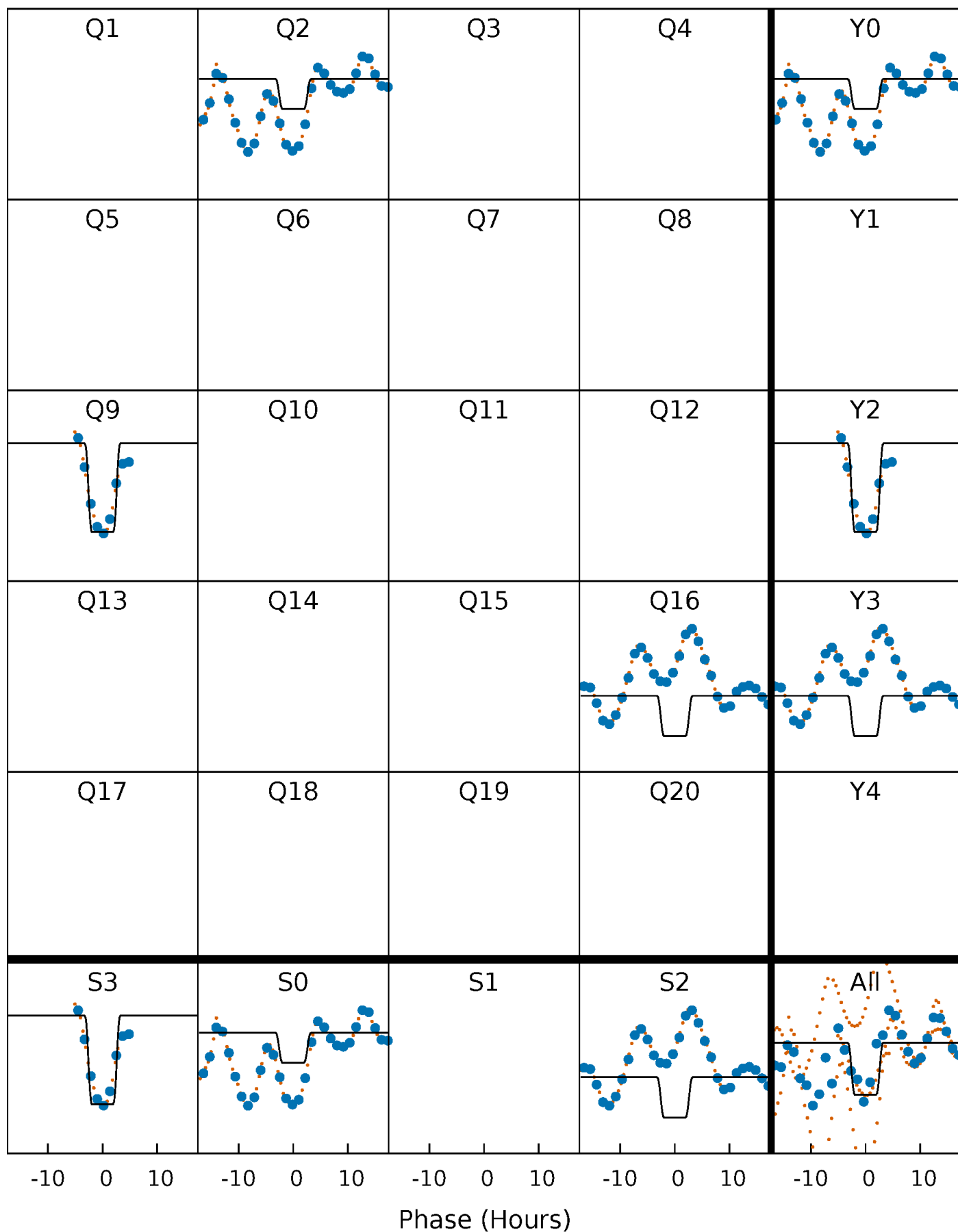
DV Quarter-Phased Transit Curves

TCE 010385459-03 P=631.700057 Days $T_0=254.701887$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

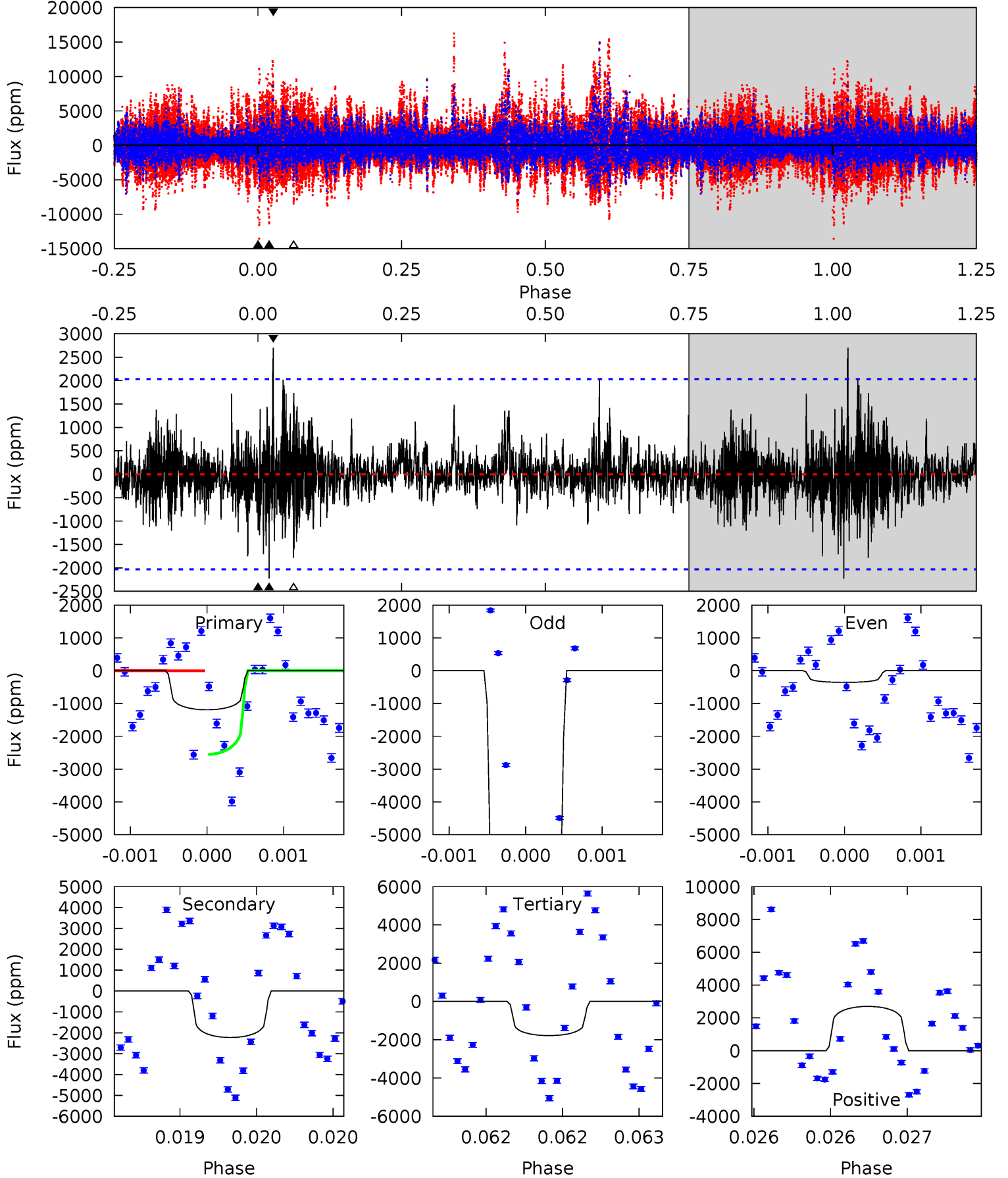
TCE 010385459-03 P=631.839731 Days $T_0=254.618927$ (BKJD)



DV Model-Shift Uniqueness Test

010385459-03, P = 631.700057 Days, E = 254.701887 Days

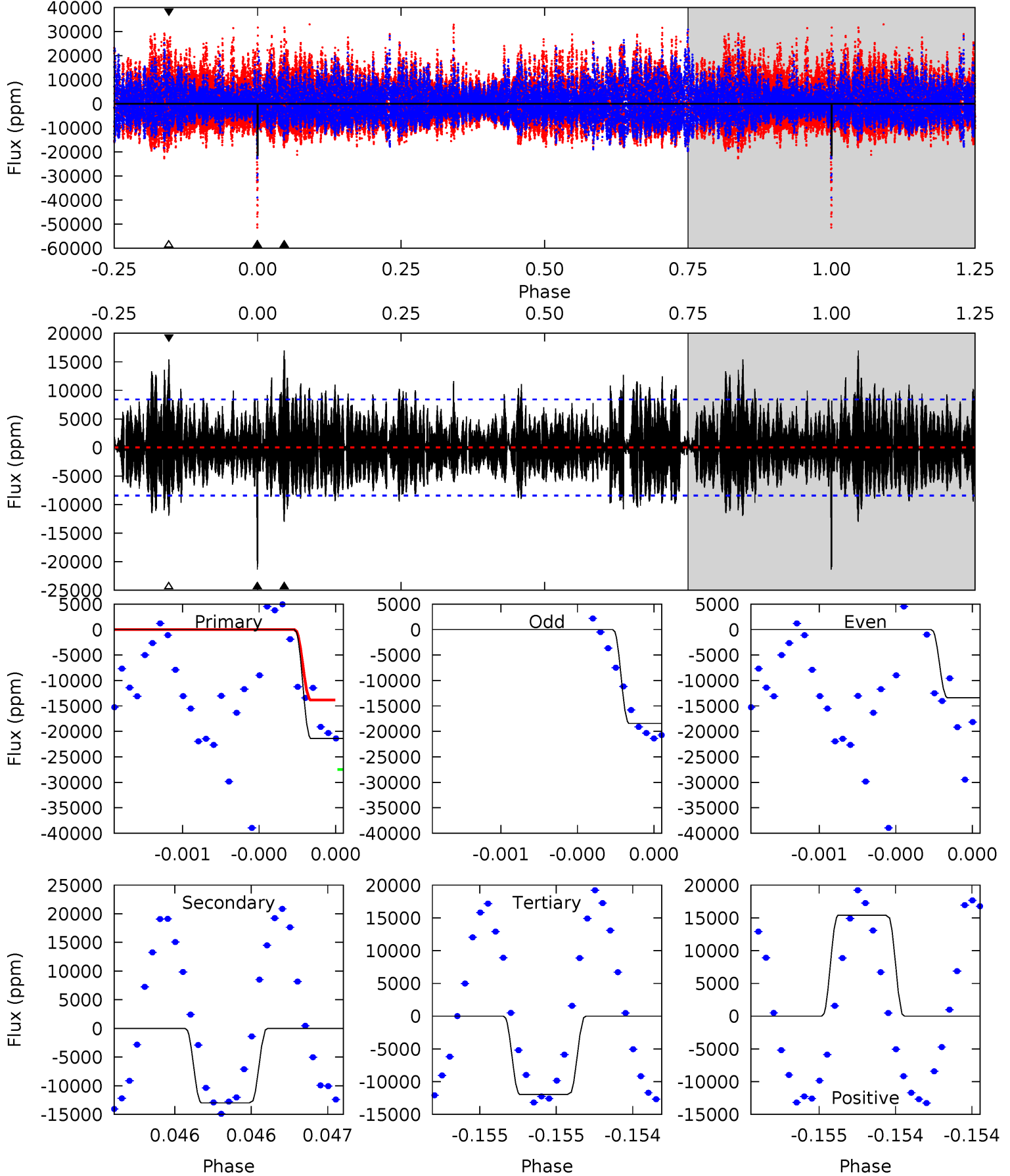
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.25	6.08	4.87	7.38	5.55	3.45	1.02	-1.62	-4.12	1.21	-1.29	13.4	4.98	0.55	3.48



Alt Model-Shift Uniqueness Test

010385459-03, P = 631.839731 Days, E = 254.618927 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.2	8.66	7.97	10.3	5.61	3.54	2.50	6.27	3.98	0.70	-1.60	2.03	0.82	0.44	4.64



Stellar Parameters For KIC 010385459

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7159^{+171}_{-235}	$4.232^{+0.124}_{-0.186}$	$-0.380^{+0.300}_{-0.350}$	$1.441^{+0.451}_{-0.243}$	$1.295^{+0.204}_{-0.167}$	$0.610^{+0.359}_{-0.303}$
	+2%/-3%	+3%/-4%	+79%/-92%	+31%/-17%	+16%/-13%	+59%/-50%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 010385459-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-2226 ± 366	$3.95^{+2.25}_{-2.16}$	425^{+27}_{-25}	10957^{+12579}_{-2916}	$192793^{+780153}_{-115779}$
Alt.	-13000 ± 1501	$22.93^{+4.02}_{-3.16}$	423^{+30}_{-23}	6317^{+453}_{-401}	33877^{+12015}_{-9420}

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

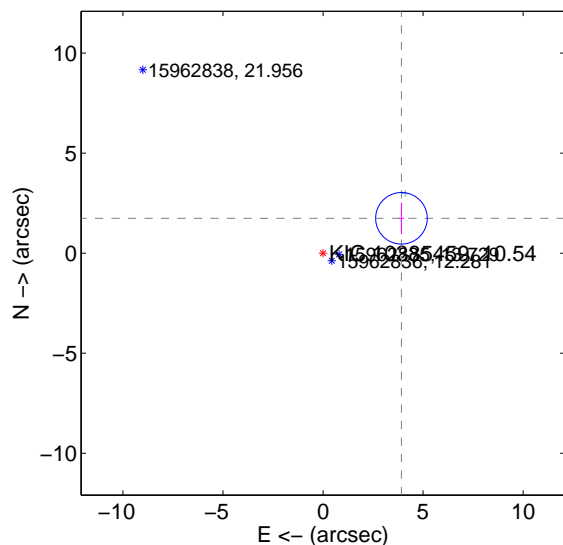
Supplemental centroid analysis for 010385459-03. **Kepler magnitude: 10.54**. Transit SNR 1.83

There are 2 quarters with good PRF difference image offsets

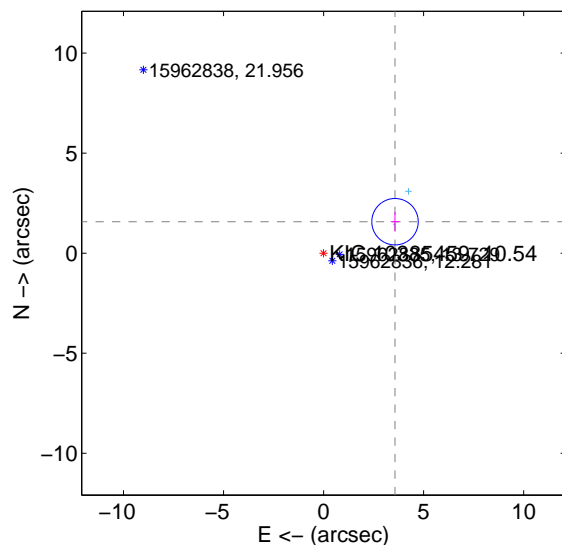
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	4.290 ± 0.430	9.98	-3.919 ± 0.133	1.743 ± 0.790
PRF-fit source offset from KIC position	3.901 ± 0.387	10.09	-3.570 ± 0.215	1.573 ± 0.484
photometric centroid source offset	3.56 ± 2.17	1.64	0.41 ± 1.84	3.54 ± 2.18

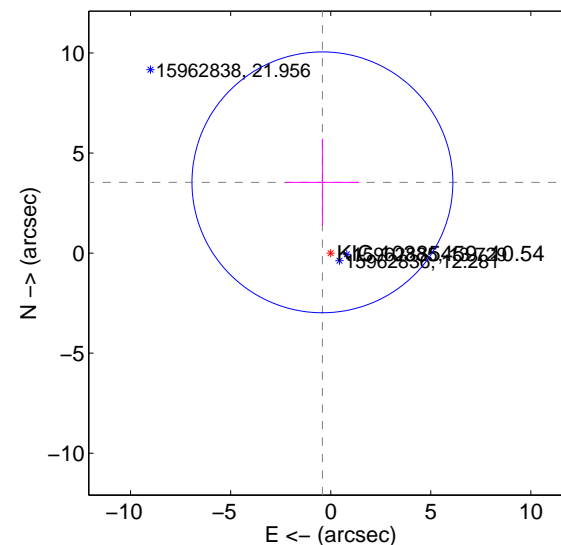
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



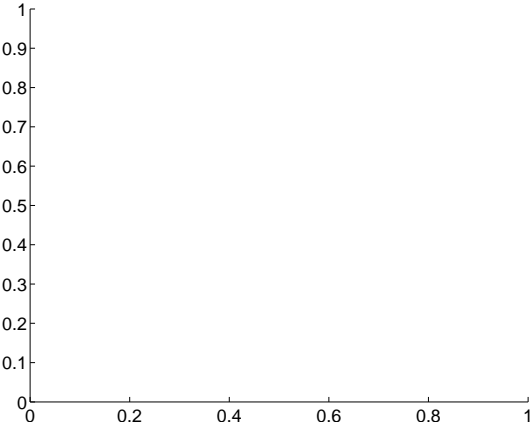
offset from photometric centroids



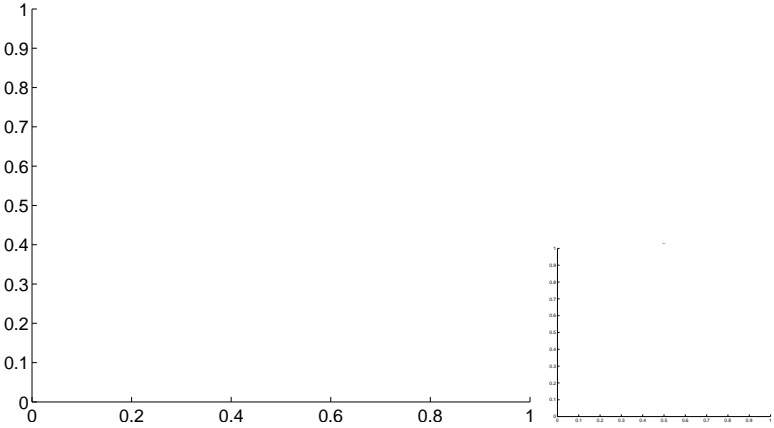
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- 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.

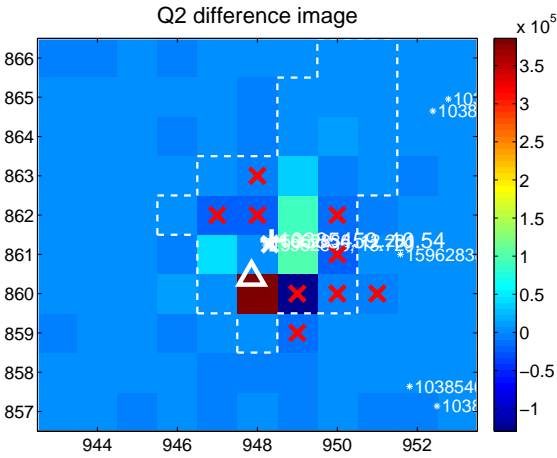
Q1 no difference image



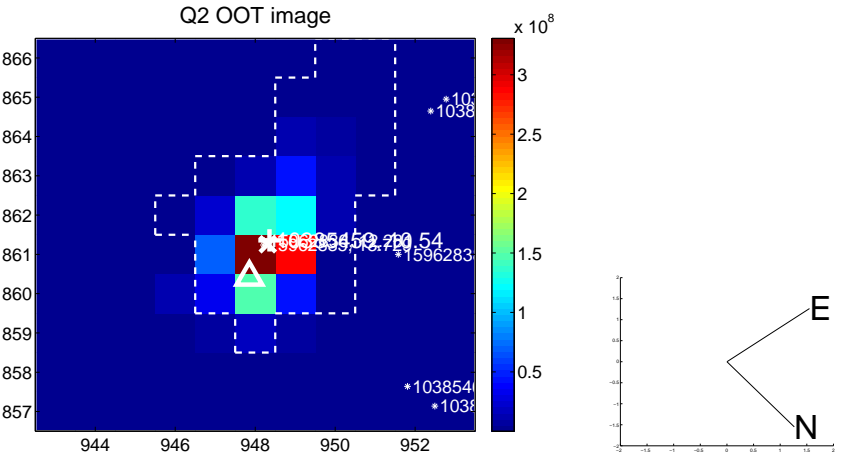
Q1 no OOT image



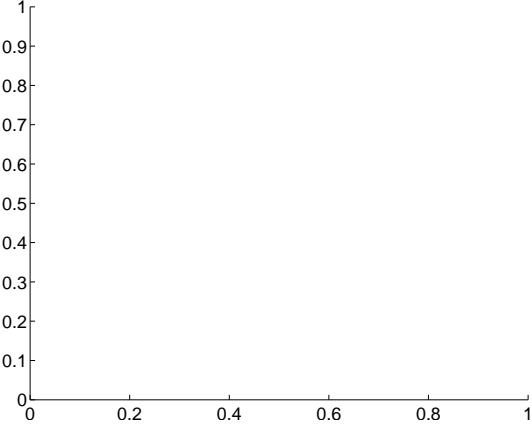
Q2 difference image



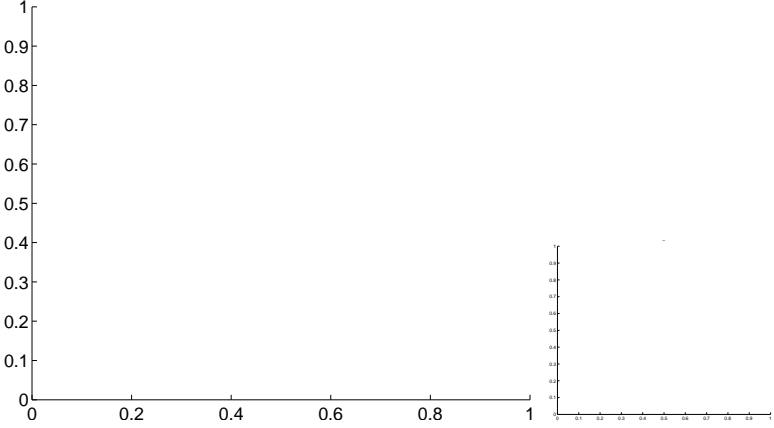
Q2 OOT image



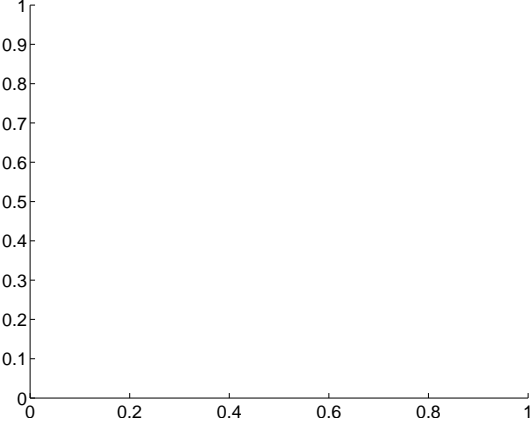
Q3 no difference image



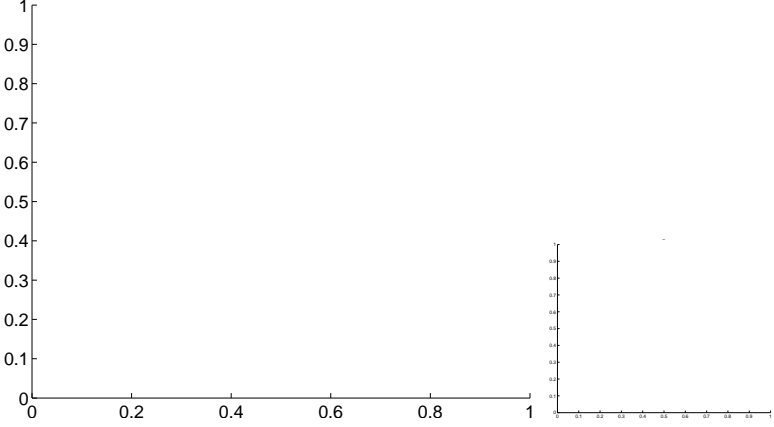
Q3 no OOT image



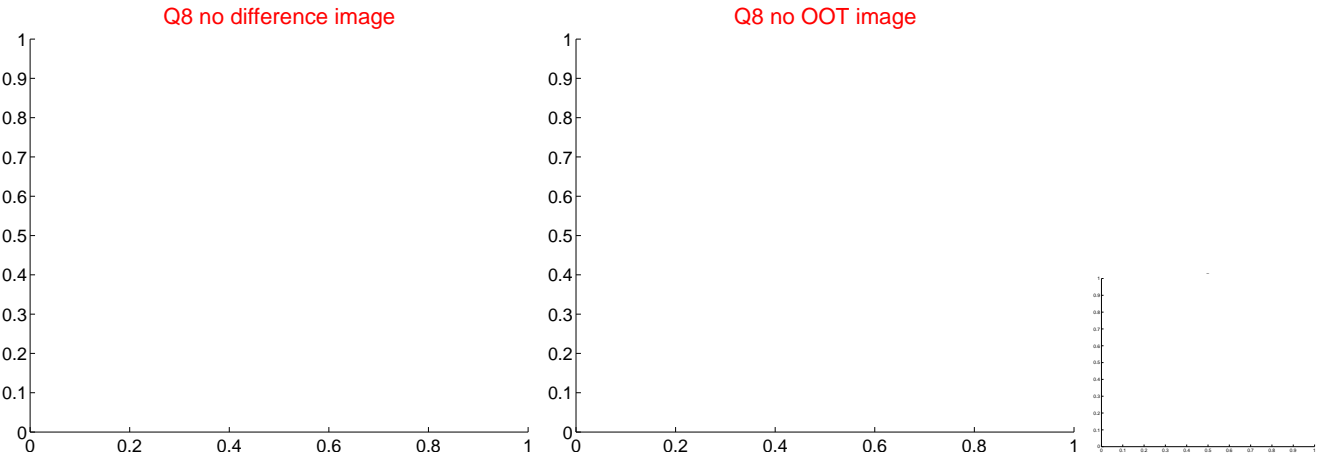
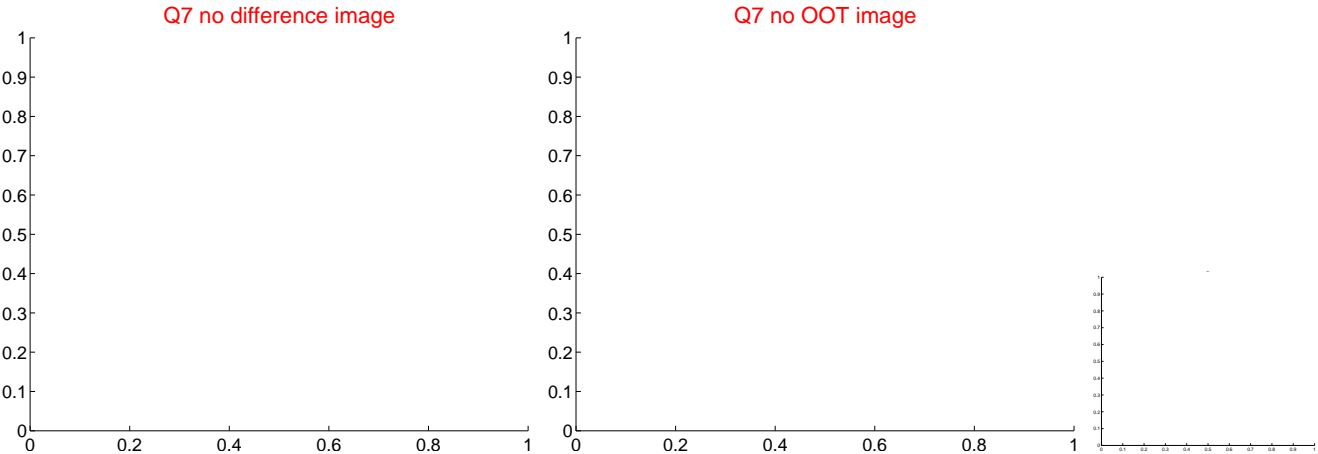
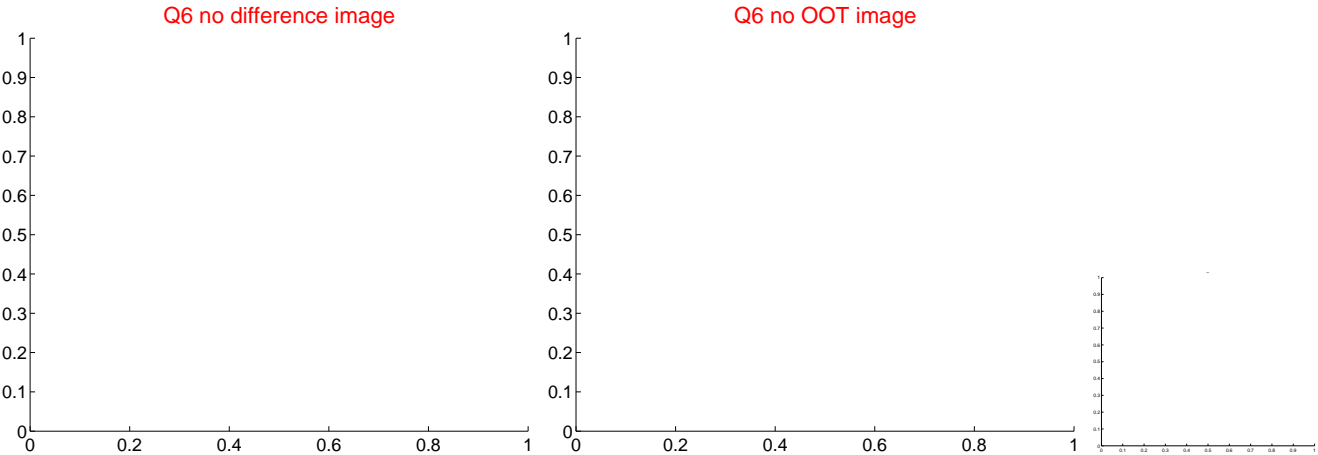
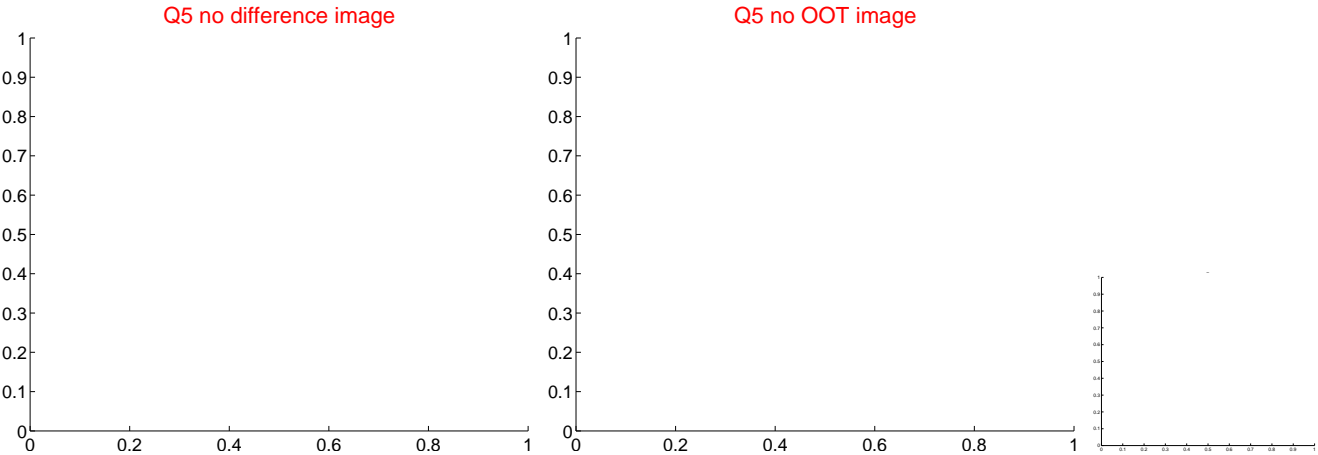
Q4 no difference image



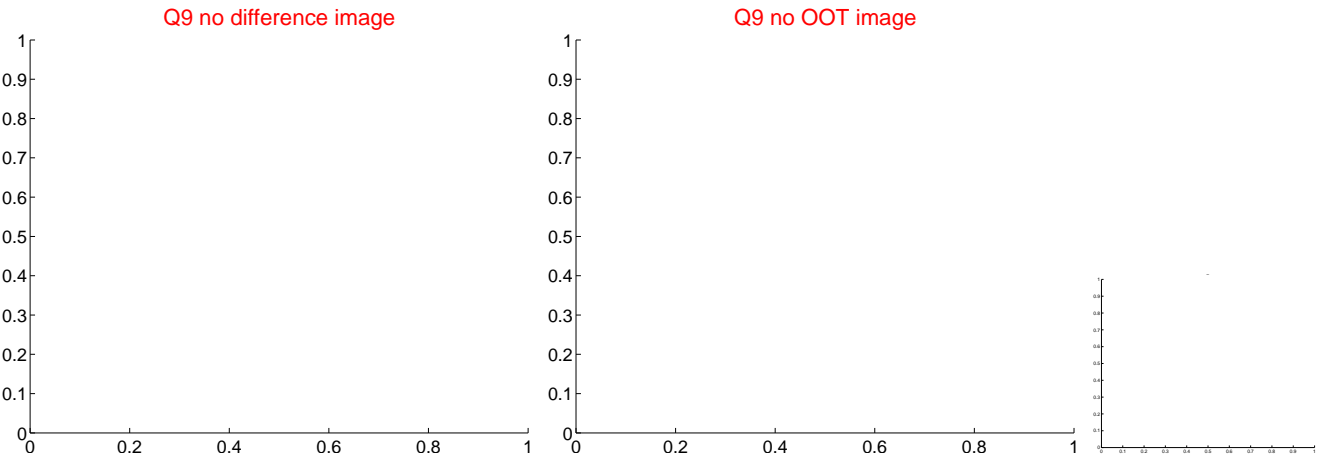
Q4 no OOT image



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

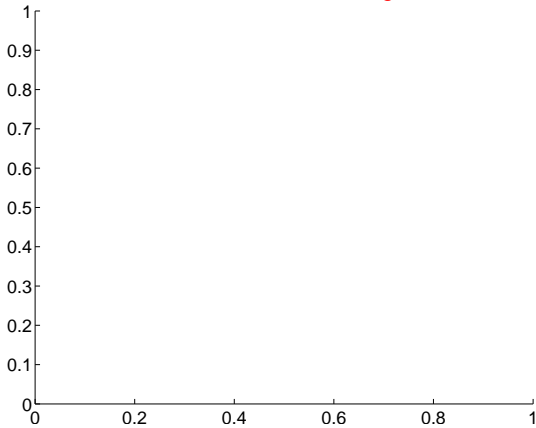


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

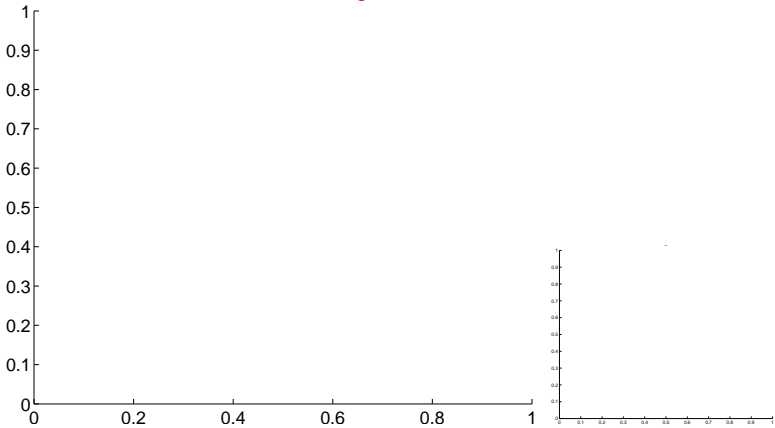


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

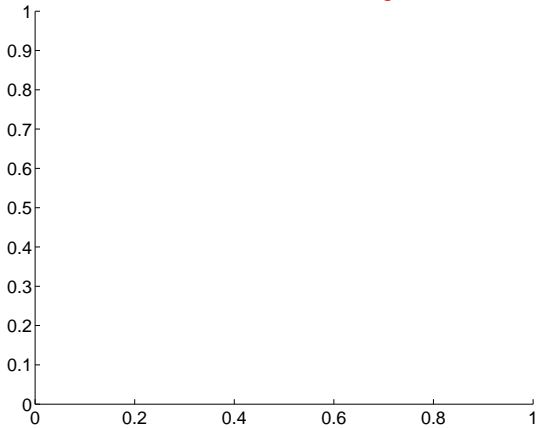
Q13 no difference image



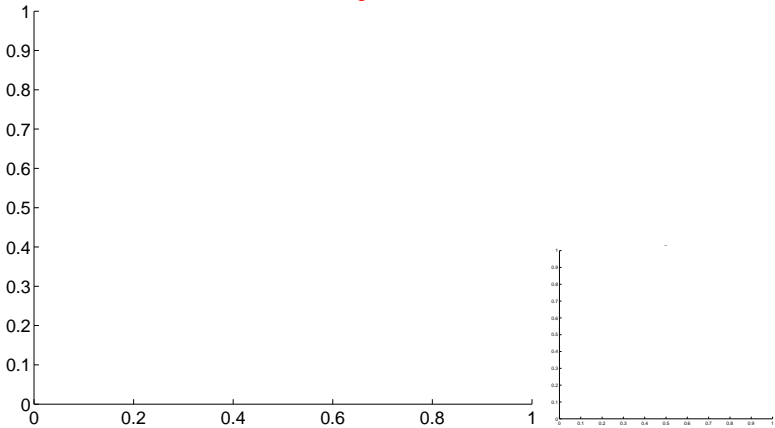
Q13 no OOT image



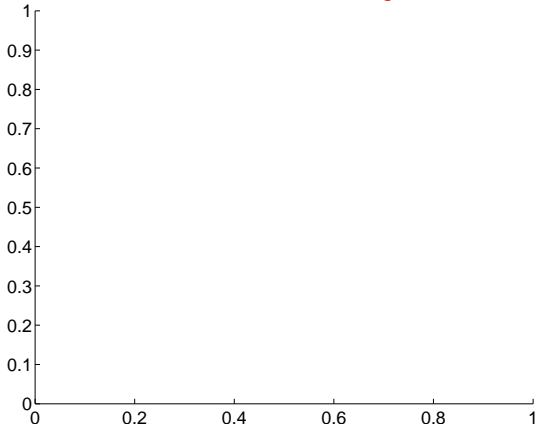
Q14 no difference image



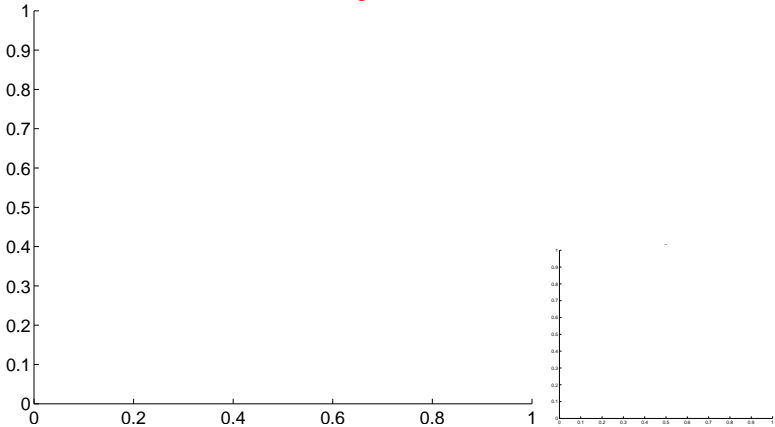
Q14 no OOT image



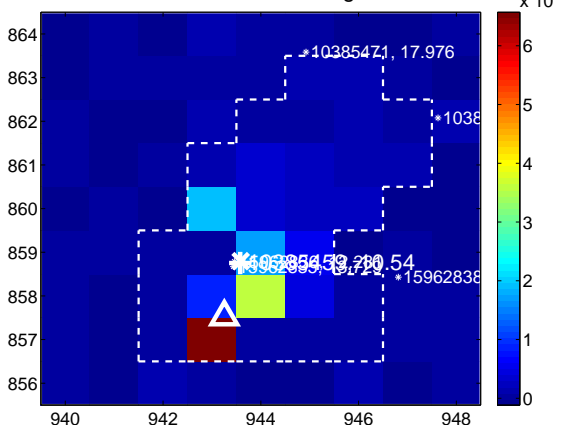
Q15 no difference image



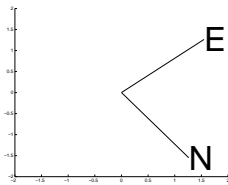
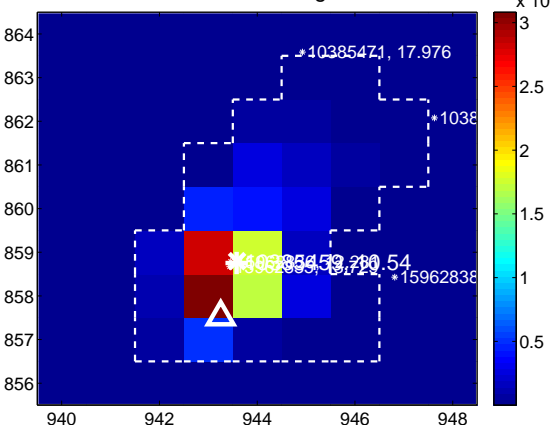
Q15 no OOT image



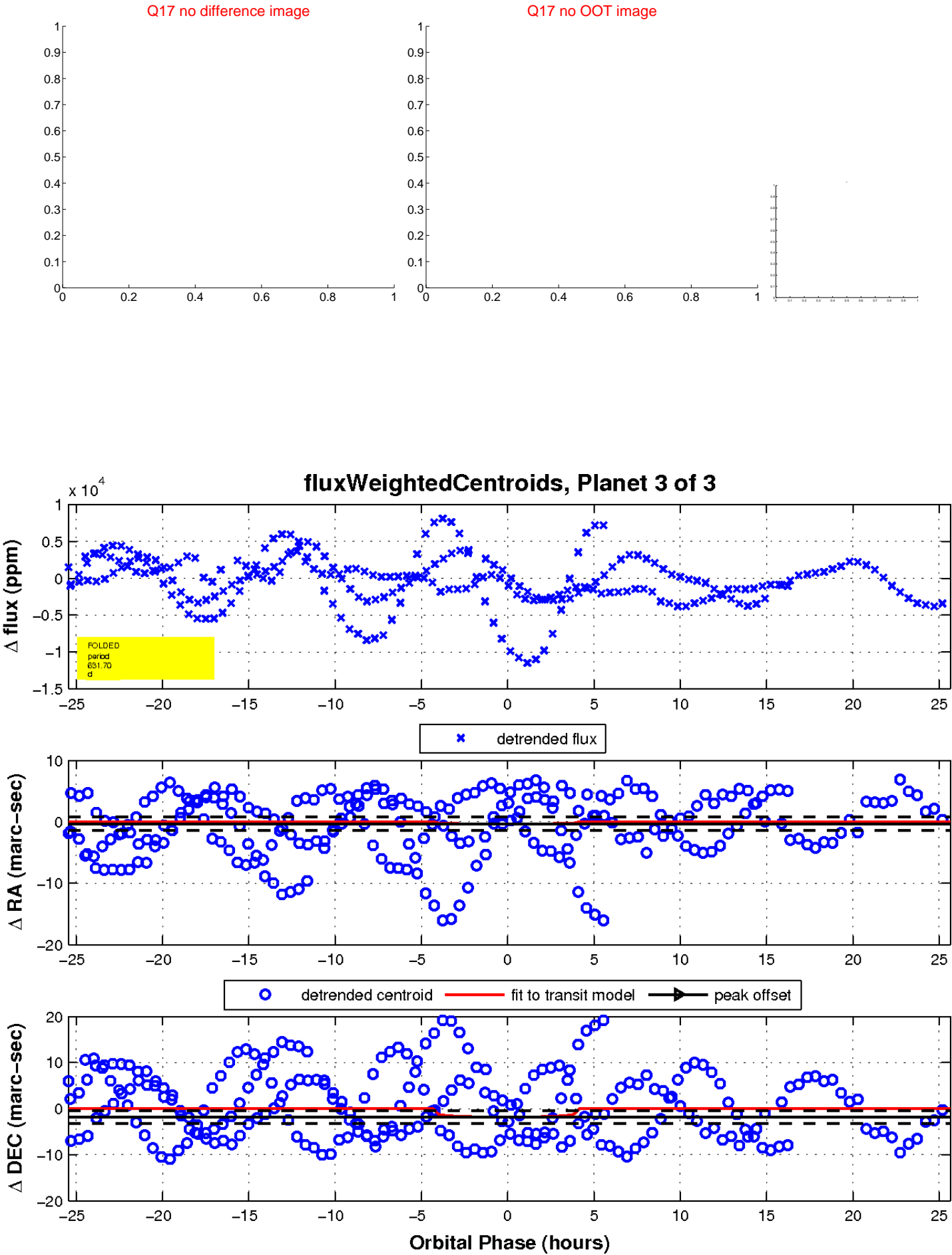
Q16 difference image



Q16 OOT image



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



UKIRT Image

Declination

