

KIC 008176468

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})
008176468-01	OBS	No	376.021803	288.262571	562.8	10.473	34.0	4.4	0.63	4327	1.45	0.17
008176468-02	OBS	No	545.452425	333.293831	996.3	11.780	14.2	7.6	0.63	4327	2.68	0.10
008176468-03	OBS	No	547.578541	470.769390	227.9	12.500	12.3	-1.0	0.63	4327	0.92	0.10
008176468-04	OBS	No	261.506148	287.665503	546.9	3.812	13.8	5.7	0.63	4327	1.53	0.27
008176468-05	OBS	No	465.313666	318.048512	896.5	5.401	12.7	7.2	0.63	4327	1.95	0.13
008176468-06	OBS	No	270.775055	370.377823	502.0	2.743	11.8	5.9	0.63	4327	1.40	0.26

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008176468-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
008176468-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008176468-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—CENT_NOFITS
008176468-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008176468-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—HALO_GHOST
008176468-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_ALT—ALL_TRANS_CHASES—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS

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

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

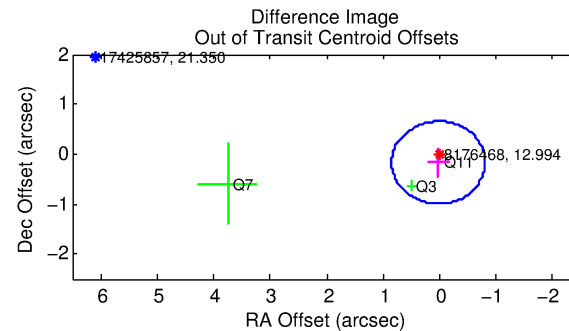
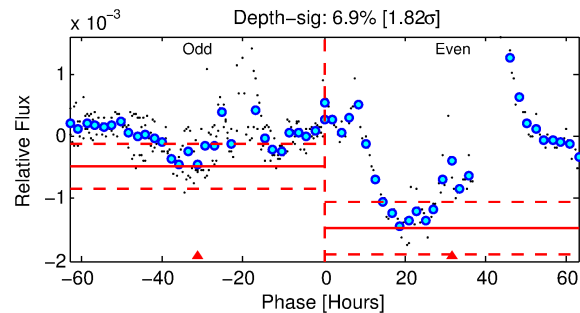
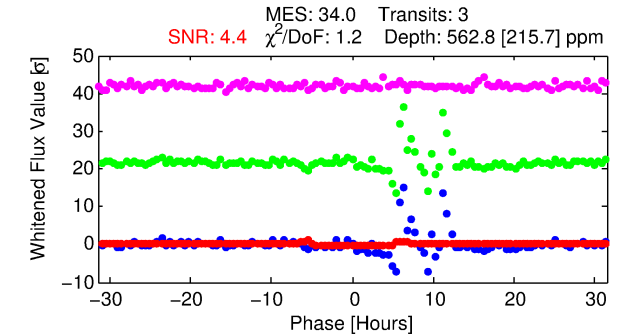
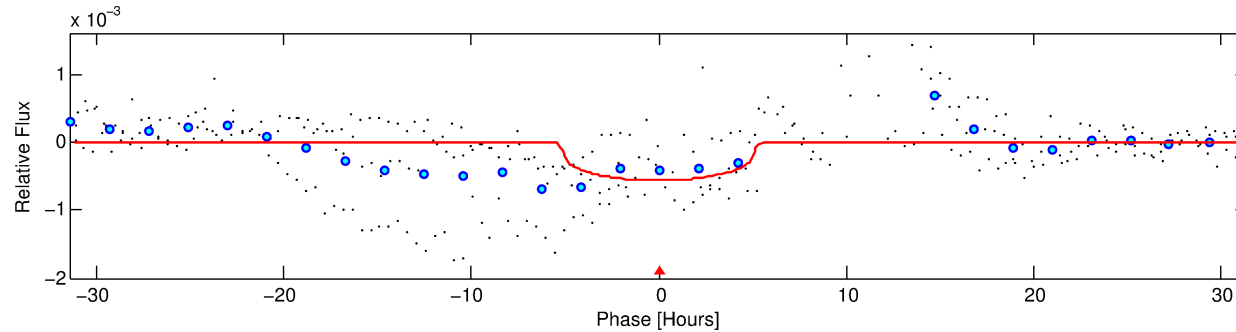
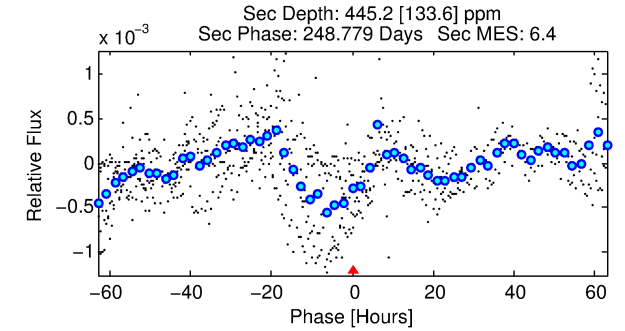
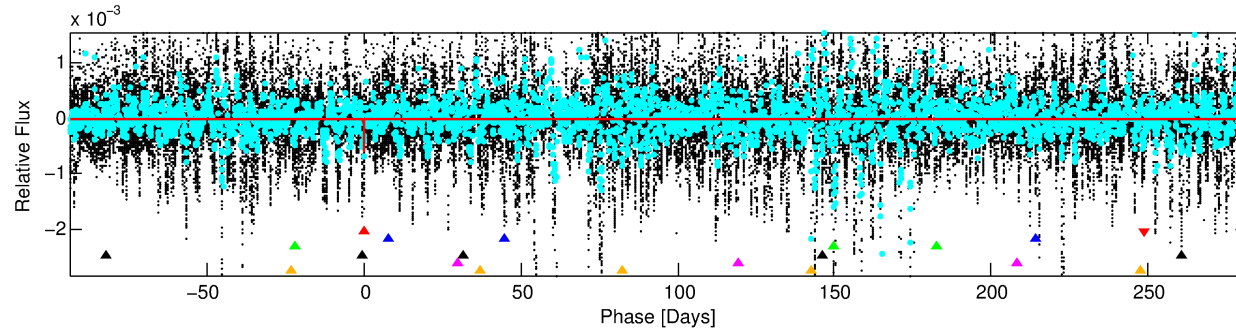
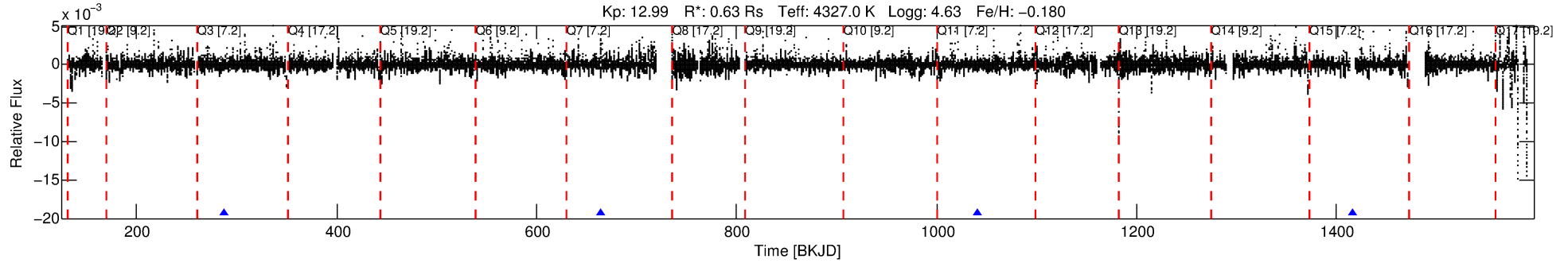
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008176468-01

No Significant Match Found

DV One-Page Summary

KIC: 8176468 Candidate: 1 of 6 Period: 376.022 d



DV Fit Results:

Period = 376.02180 [0.01071] d
Epoch = 288.2626 [0.0151] BKJD
Rp/R* = 0.0210 [0.0203]
a/R* = 273.60 [846.86]
b = 0.22 [13.70]
Seff = 0.17 [0.03]
Teq = 163 [6] K
Rp = 1.45 [1.41] Re
a = 0.8701 [0.0650] AU
Ag = 88175.07 [172807.61] [0.51 σ]
Teffp = 4341 [2128] K [1.96 σ]

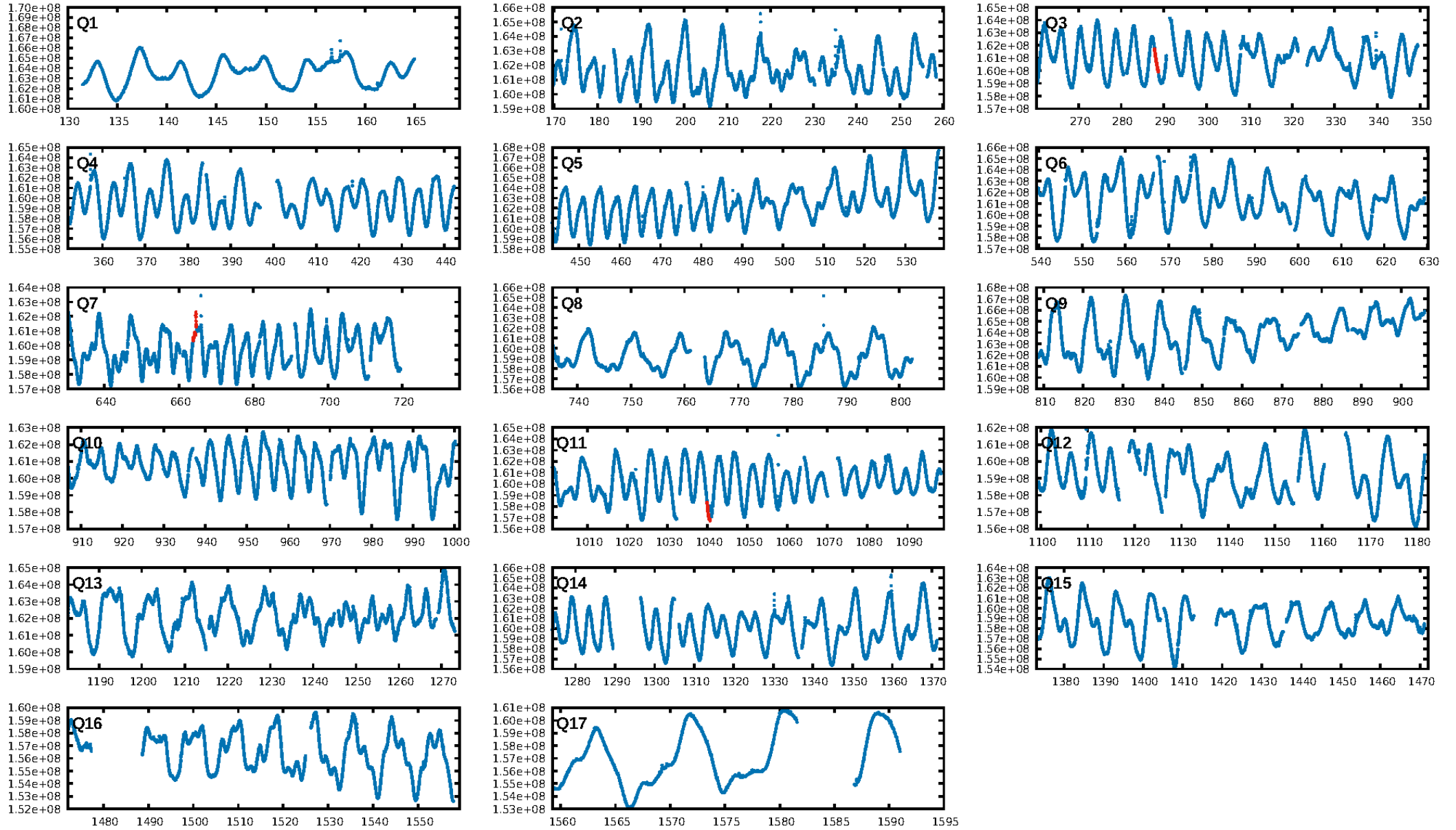
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [233.32 σ]
LongPeriod-sig: 100.0% [181.86 σ]
ModelChiSquare2-sig: 6.1%
ModelChiSquareGof-sig: 94.1%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 2.006
Centroid-sig: 69.8%
Centroid-so: 0.249 arcsec [0.52 σ]
OotOffset-rm: 0.170 arcsec [0.62 σ]
OotOffset-st: 0/3/0/0 [3]
KicOffset-rm: 0.394 arcsec [0.85 σ]
KicOffset-st: 0/3/0/0 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 0.67 [2/3]

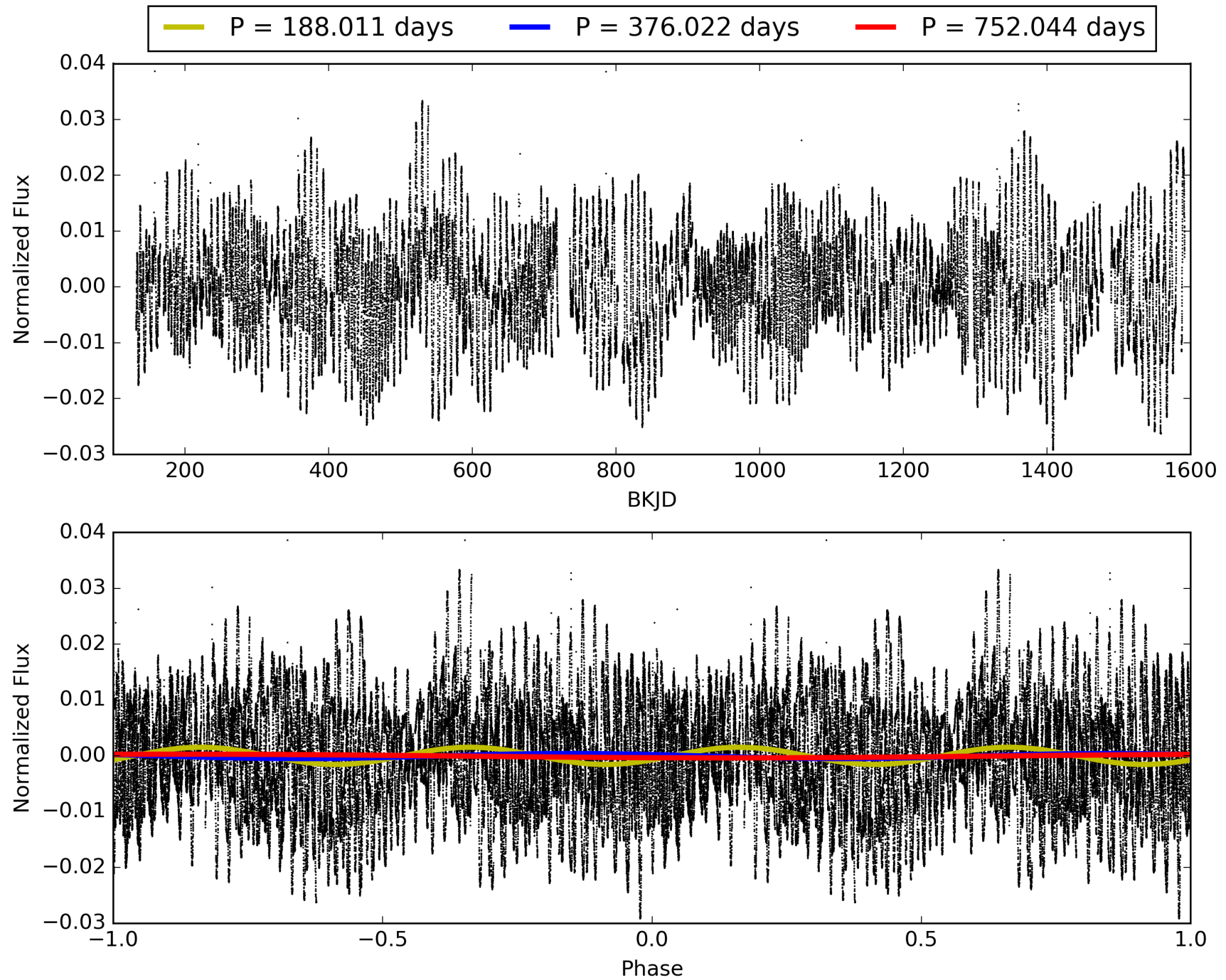
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 10:06:50 Z

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

TCE 008176468-01, PDC Light Curves

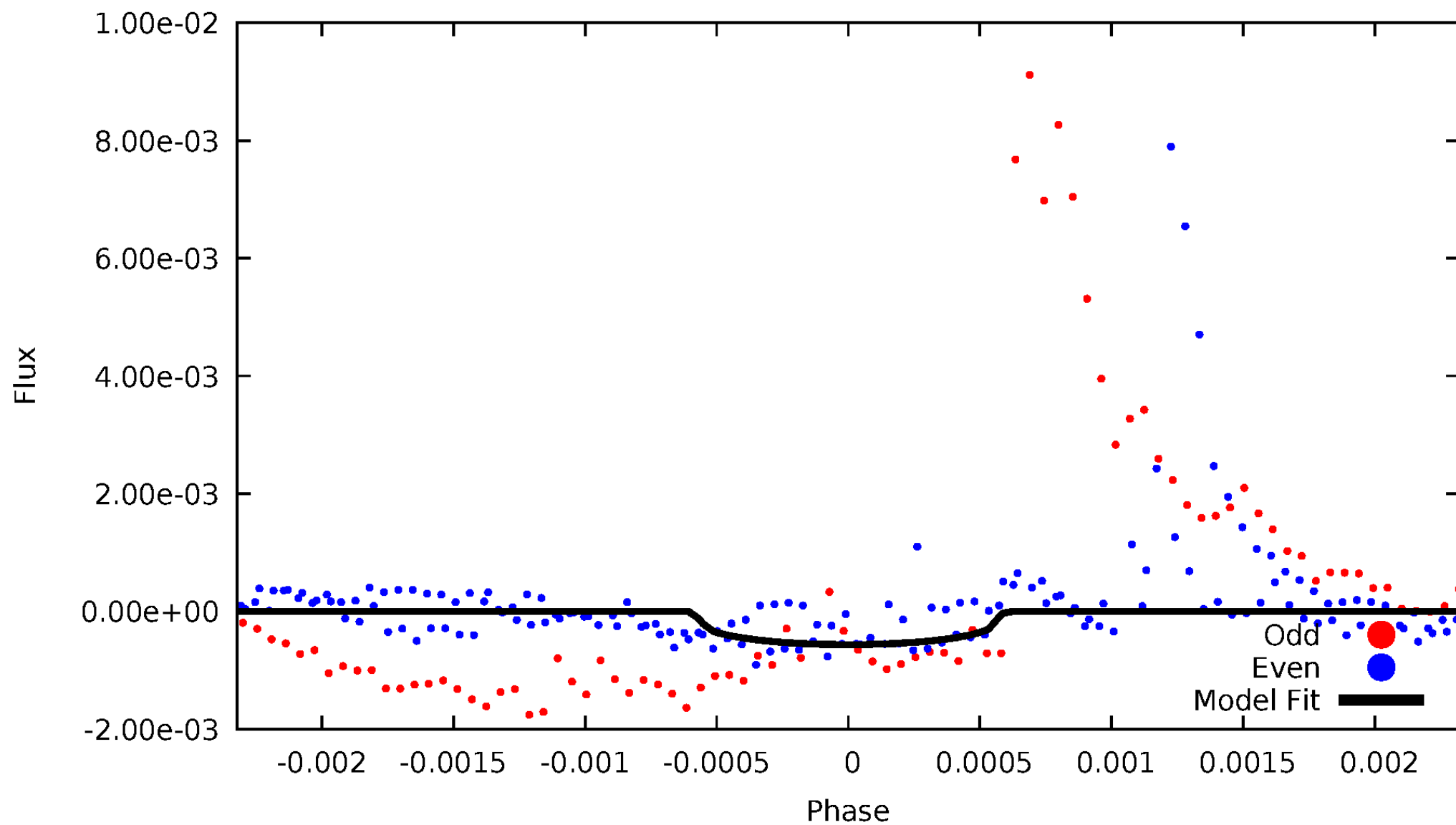


TCE 008176468-01



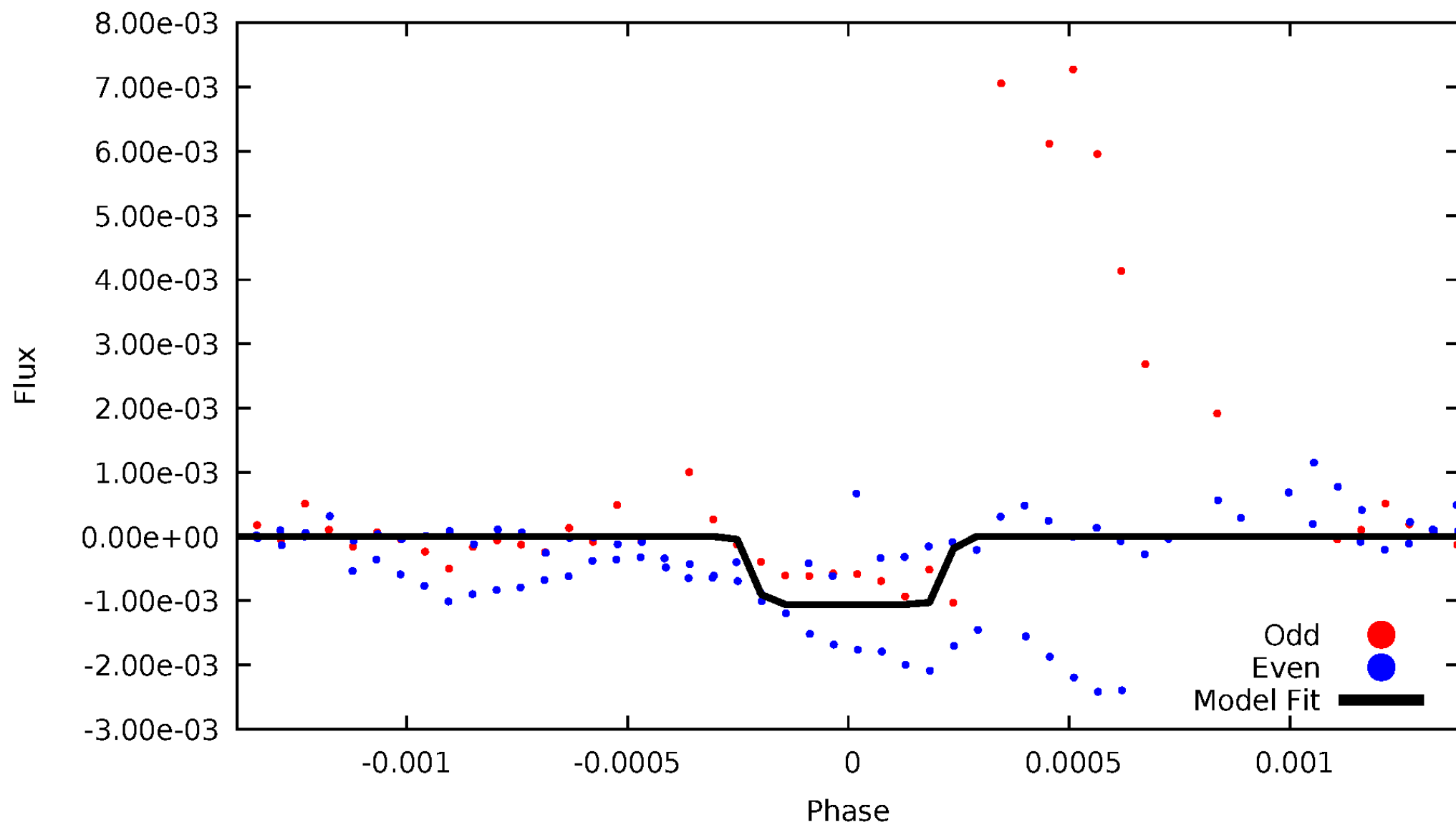
DV Odd/Even

TCE 008176468-01

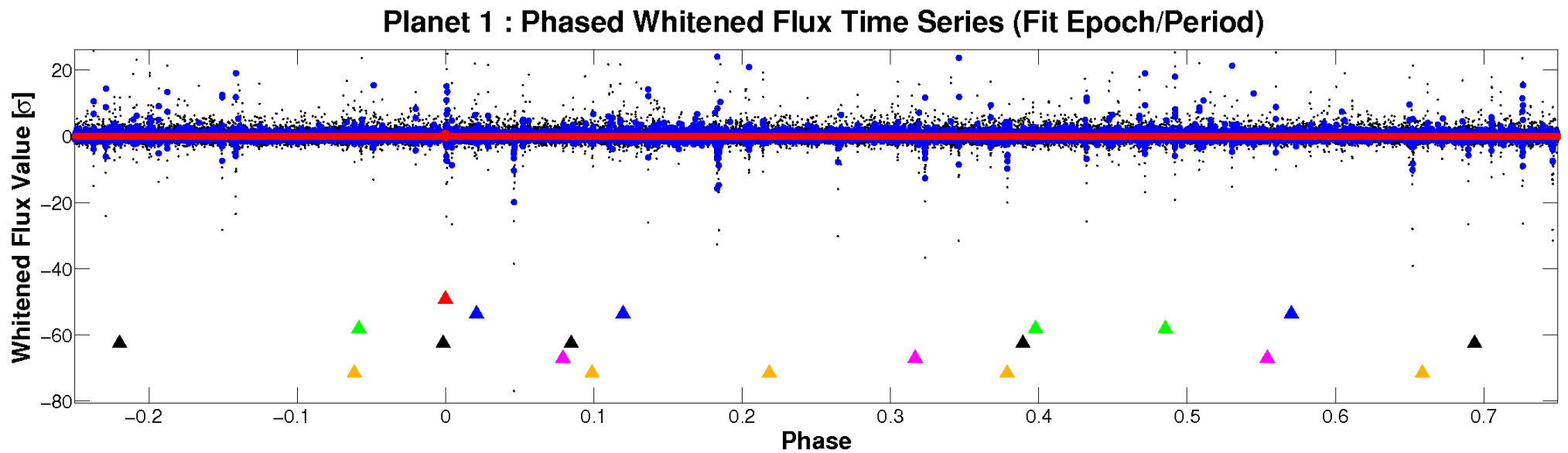
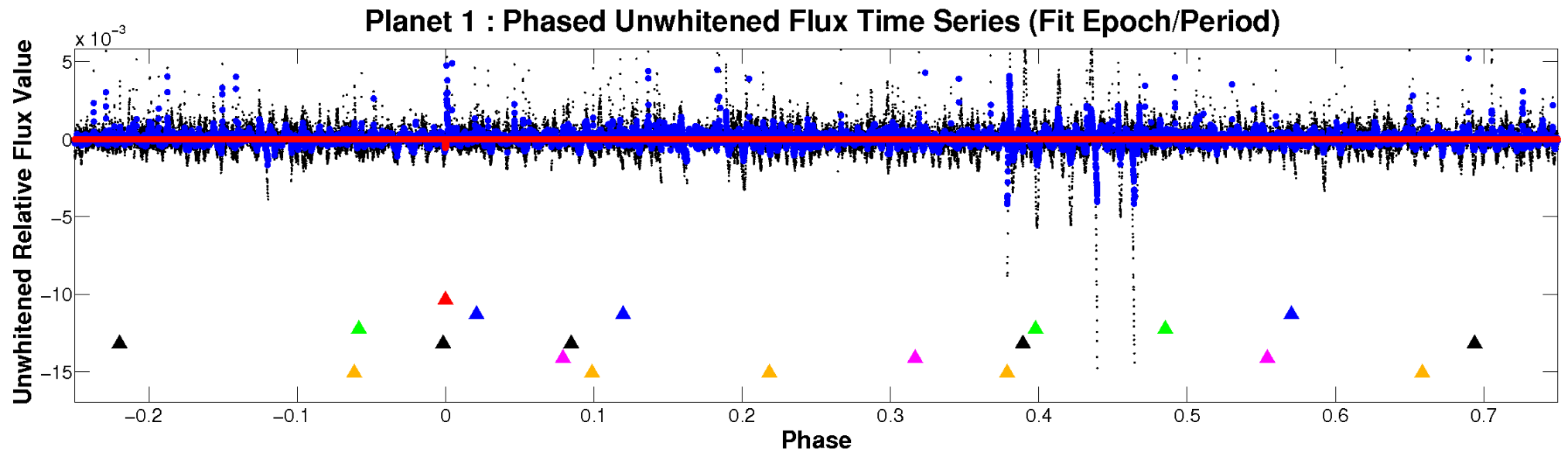


ALT Odd/Even

TCE 008176468-01

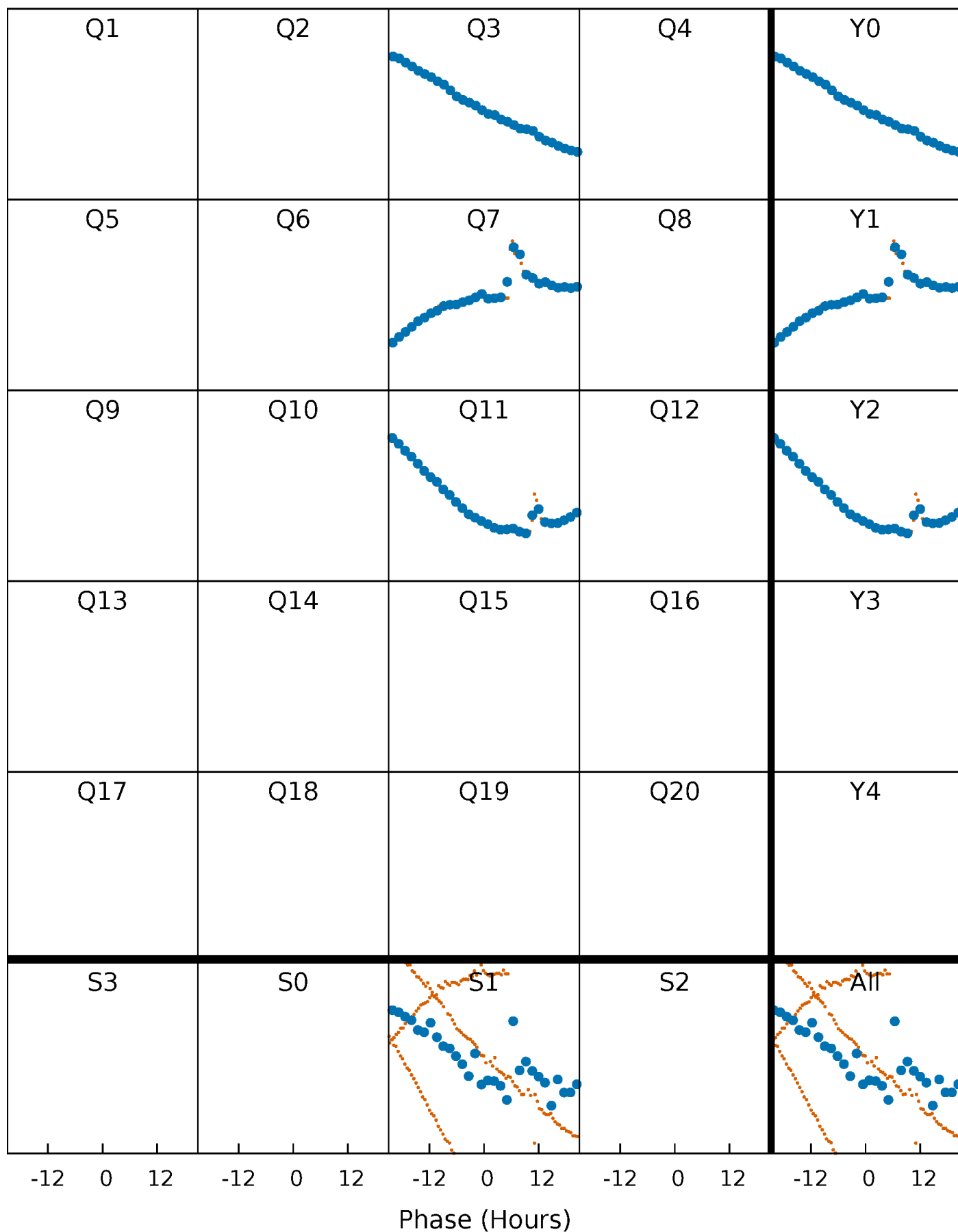


Non-Whitened Vs. Whitened Light Curve



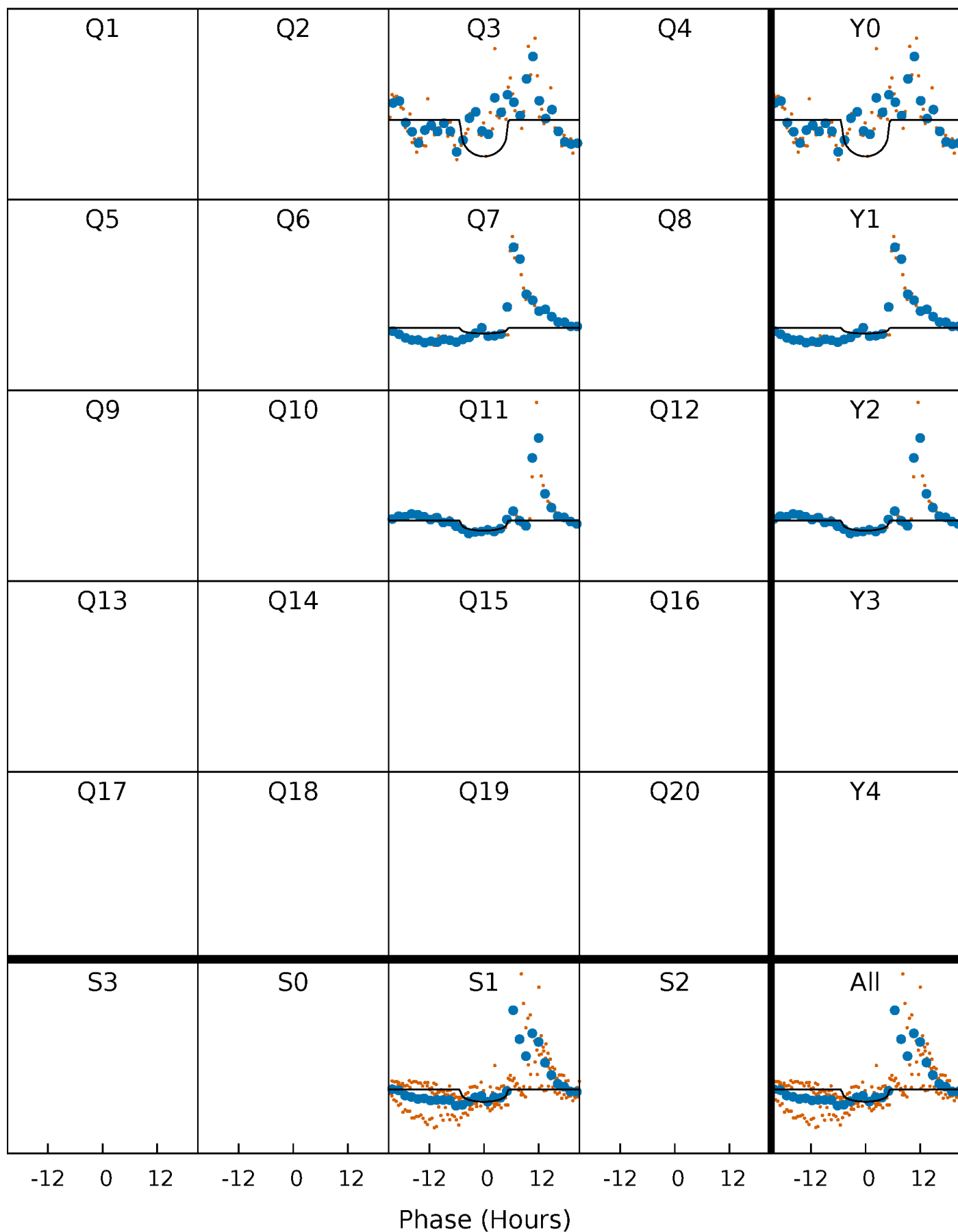
PDC Quarter-Phased Transit Curves

TCE 008176468-01 P=376.021803 Days $T_0=288.262571$ (BKJD)



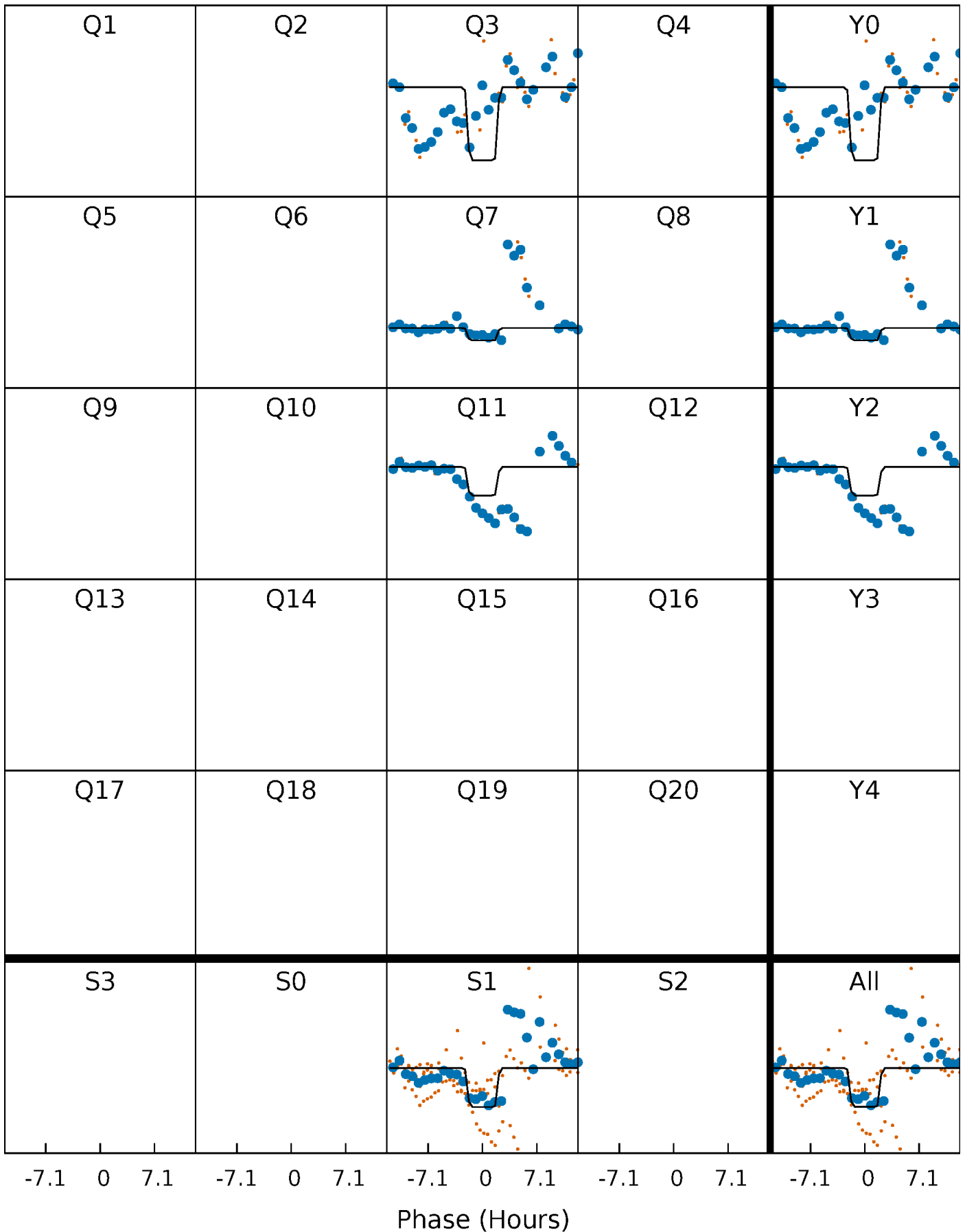
DV Quarter-Phased Transit Curves

TCE 008176468-01 P=376.021803 Days $T_0=288.262571$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

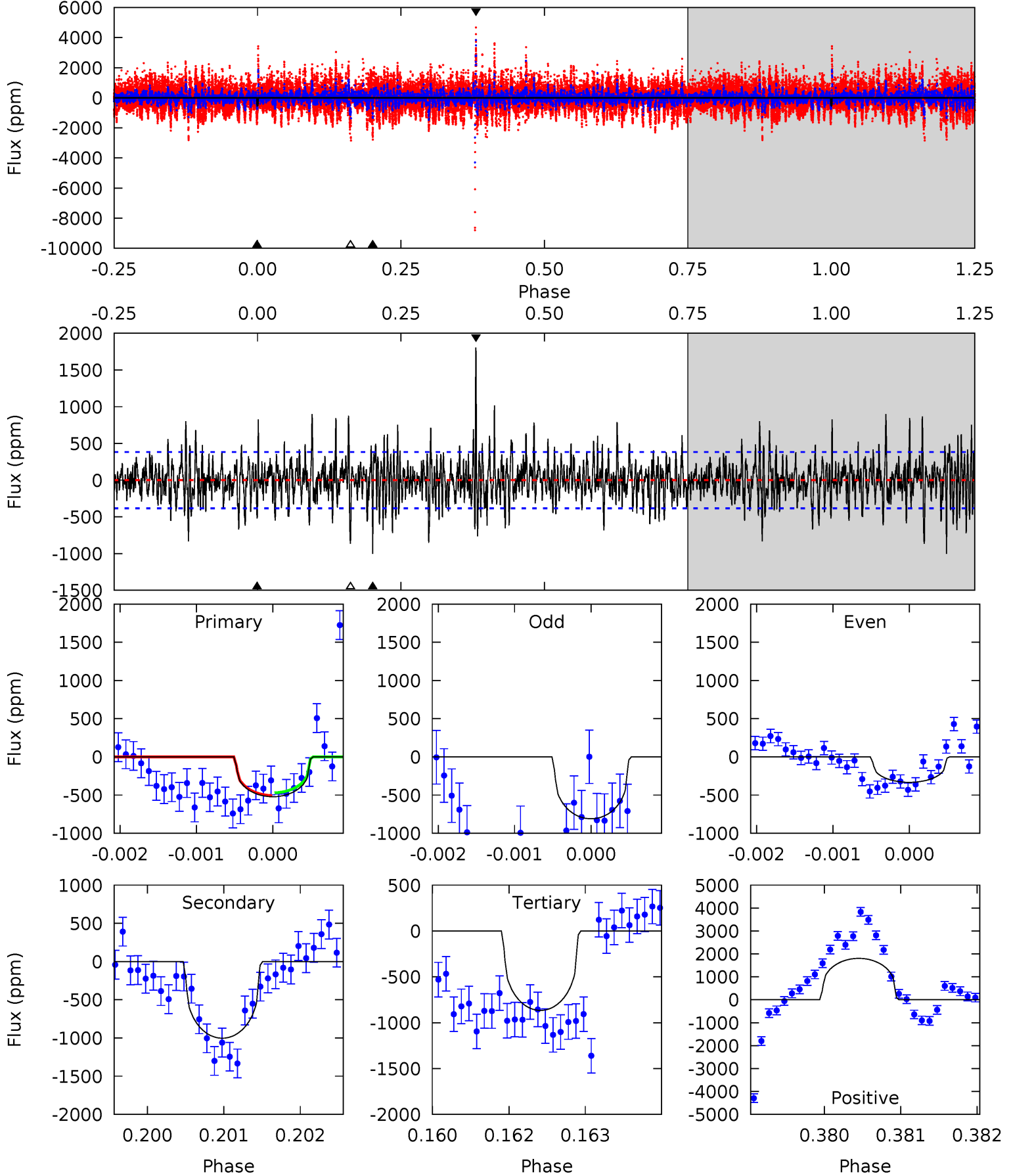
TCE 008176468-01 P=376.038805 Days $T_0=288.354168$ (BKJD)



DV Model-Shift Uniqueness Test

008176468-01, P = 376.021803 Days, E = 288.262571 Days

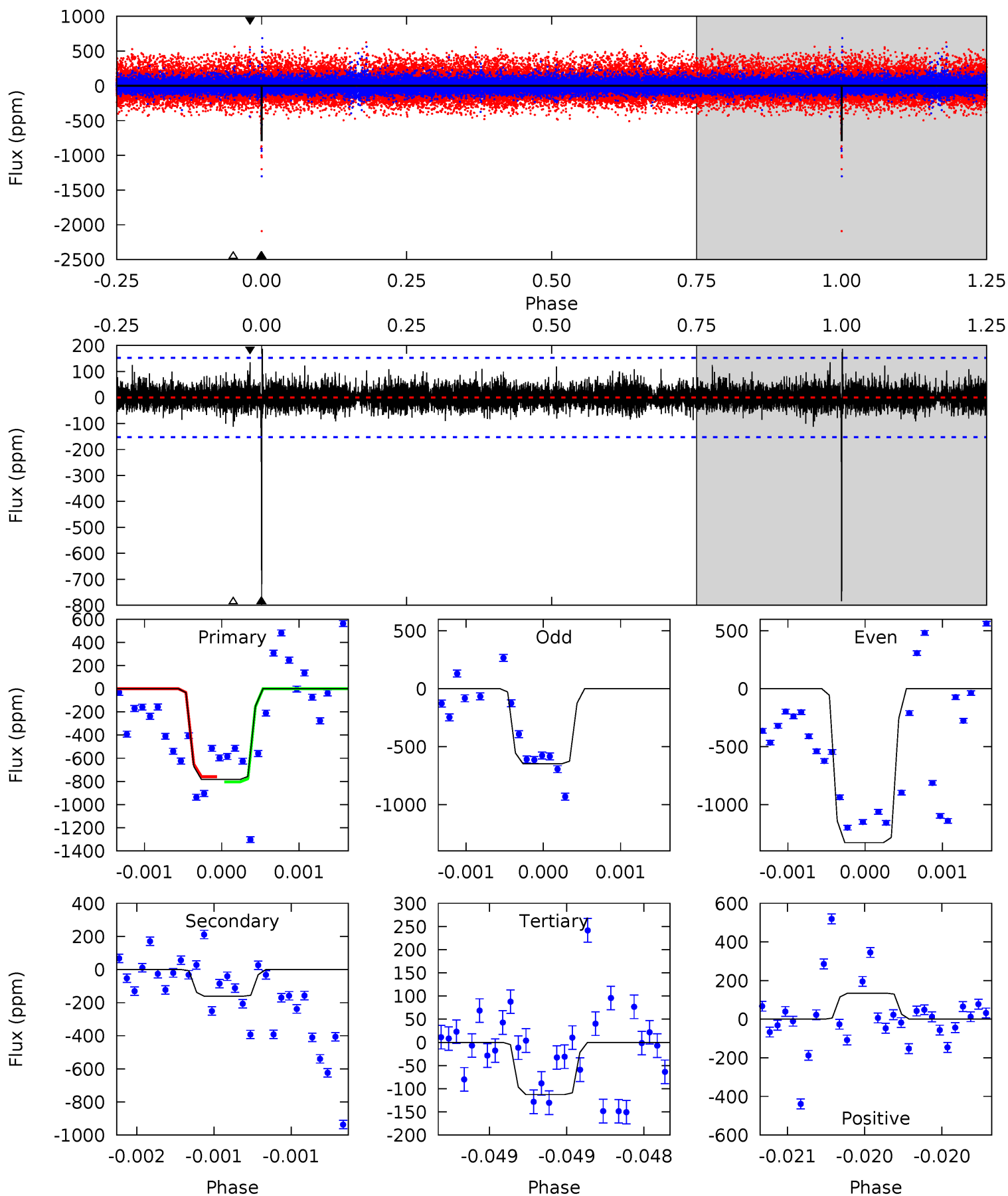
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.37	14.2	12.2	25.5	5.42	3.24	3.33	-4.87	-18.1	1.94	-11.3	2.42	0.74	0.64	0.26



Alt Model-Shift Uniqueness Test

008176468-01, P = 376.038805 Days, E = 288.354168 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
28.6	5.88	4.11	4.91	5.56	3.46	0.90	24.5	23.7	1.77	0.97	12.8	1.35	0.19	0



Stellar Parameters For KIC 008176468

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	4327^{+116}_{-129}	$4.627^{+0.052}_{-0.021}$	$-0.180^{+0.300}_{-0.300}$	$0.634^{+0.040}_{-0.060}$	$0.621^{+0.062}_{-0.056}$	$3.432^{+0.800}_{-0.366}$
	+3%/-3%	+1%/-0%	+167%/-167%	+6%/-9%	+10%/-9%	+23%/-11%
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 008176468-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-1003 ± 71	$1.68^{+1.17}_{-1.01}$	226^{+7}_{-8}	4760^{+2792}_{-864}	$150501^{+767307}_{-98674}$
Alt.	-161 ± 27	$2.37^{+1.37}_{-1.35}$	225^{+7}_{-7}	3126^{+888}_{-403}	12251^{+51041}_{-7462}

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

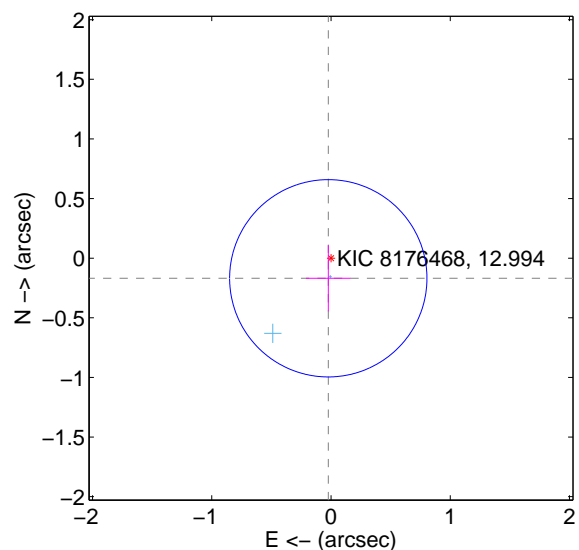
Supplemental centroid analysis for 008176468-01. Kepler magnitude: 12.99. Transit SNR 4.42

There are 3 quarters with good PRF difference image offsets

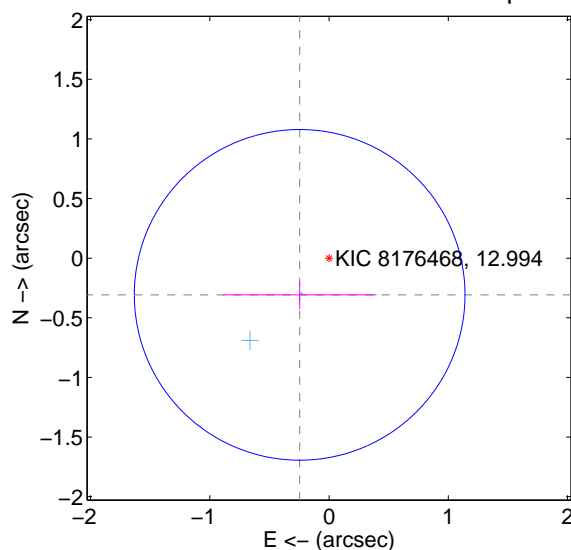
The direct PRF centroid is offset from the target star catalog position by about 0.27 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.170 ± 0.276	0.62	0.023 ± 0.187	-0.169 ± 0.277
PRF-fit source offset from KIC position	0.394 ± 0.462	0.85	0.247 ± 0.645	-0.308 ± 0.118
photometric centroid source offset	0.25 ± 0.48	0.52	-0.06 ± 0.54	-0.24 ± 0.48

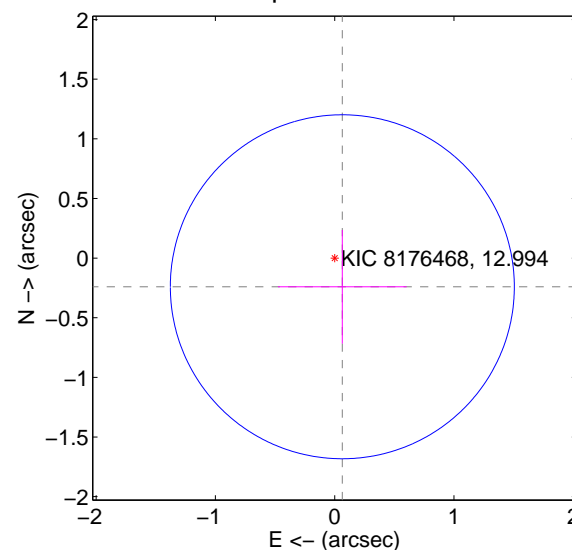
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

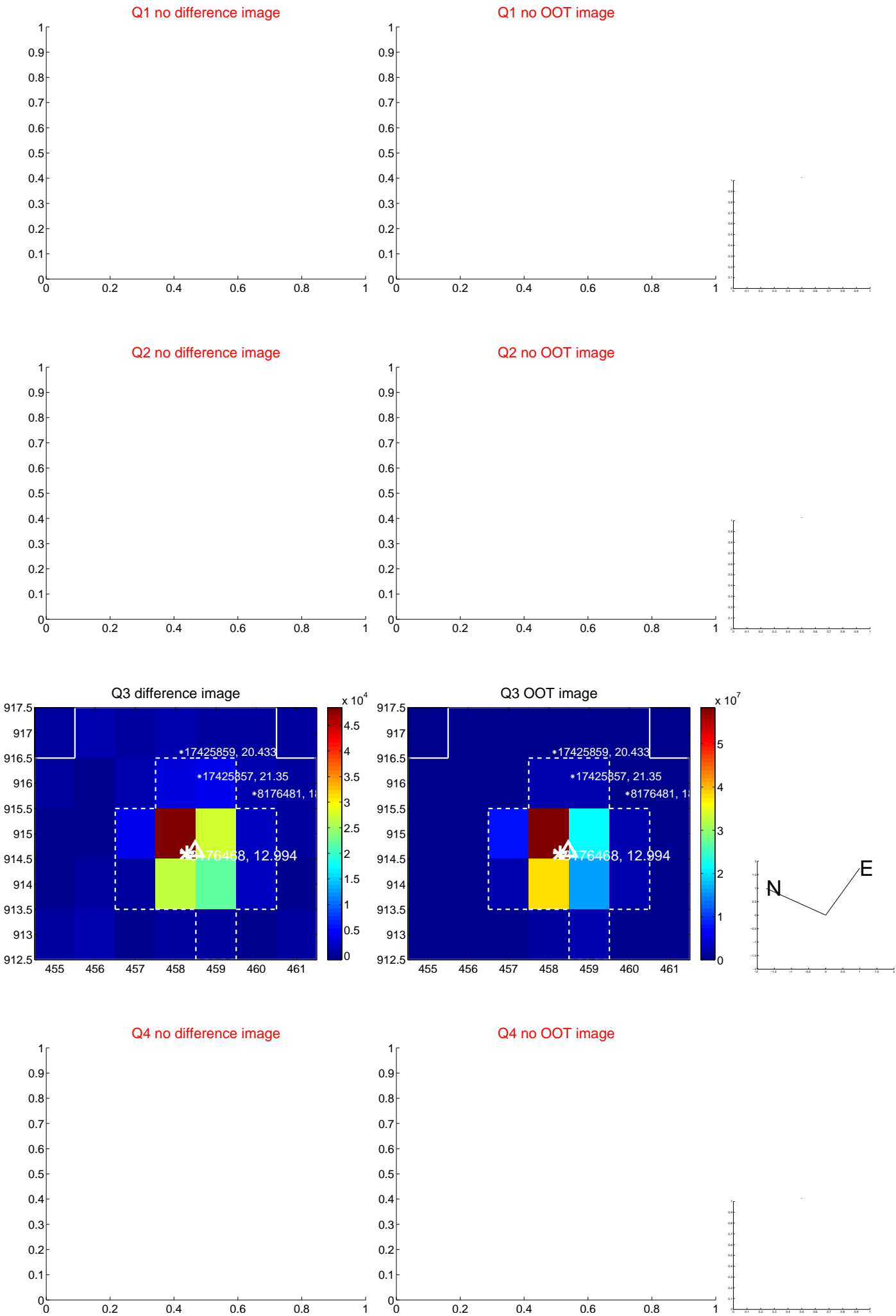


offset from photometric centroids

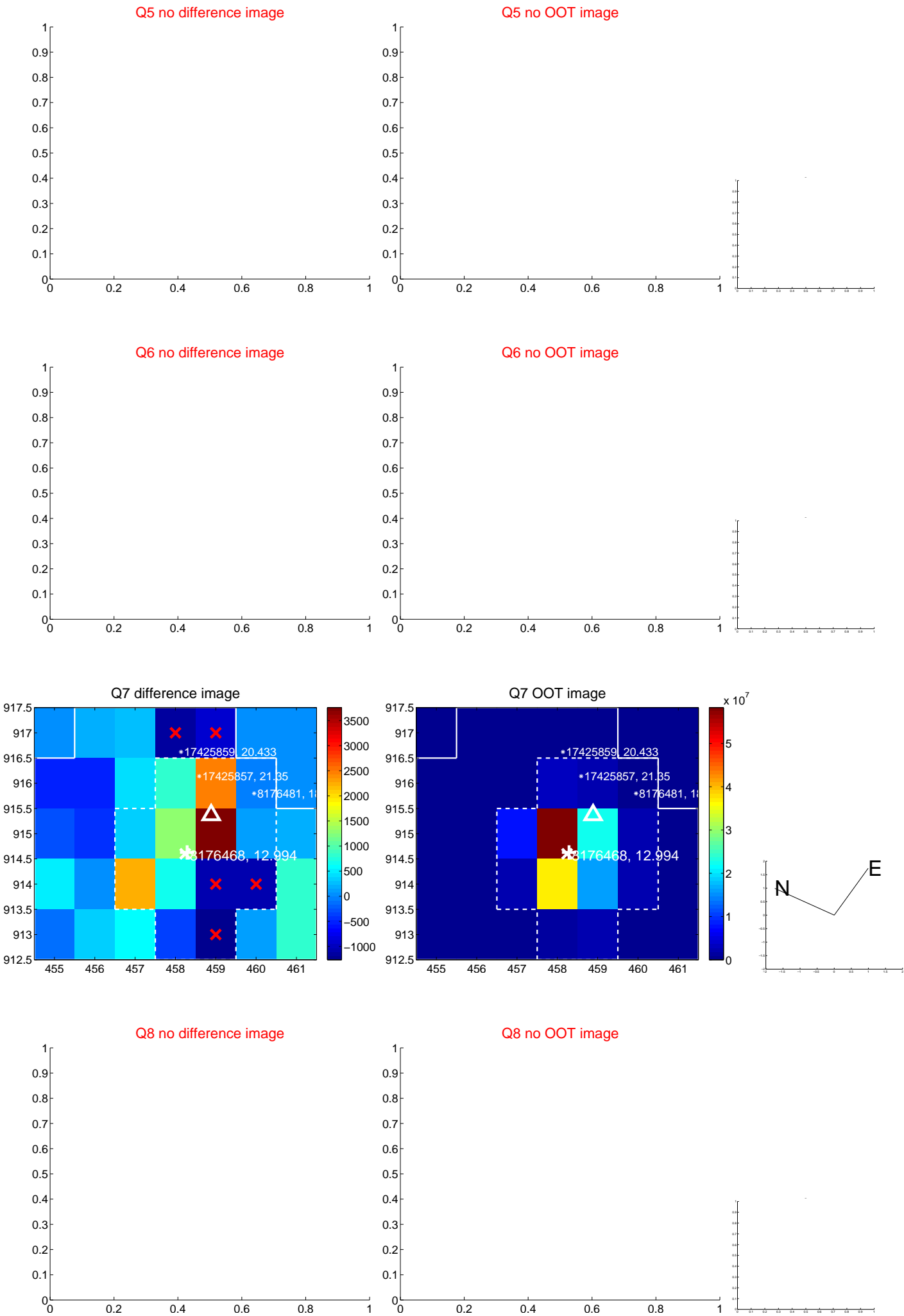


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

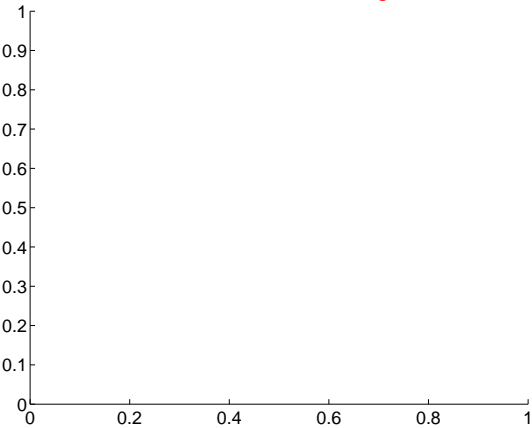
Q9 no difference image



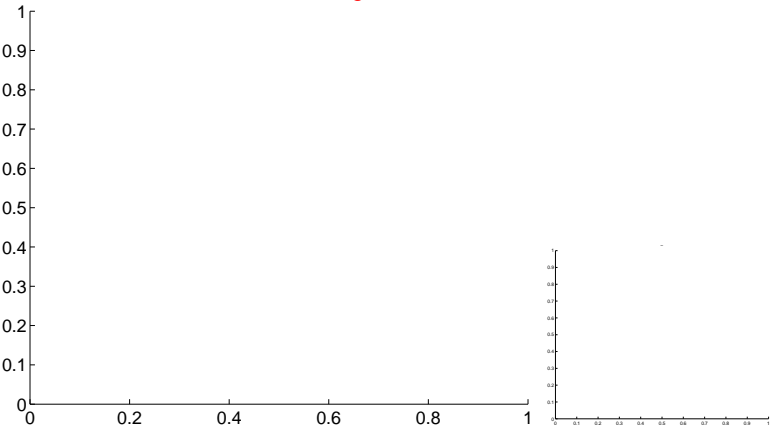
Q9 no OOT image



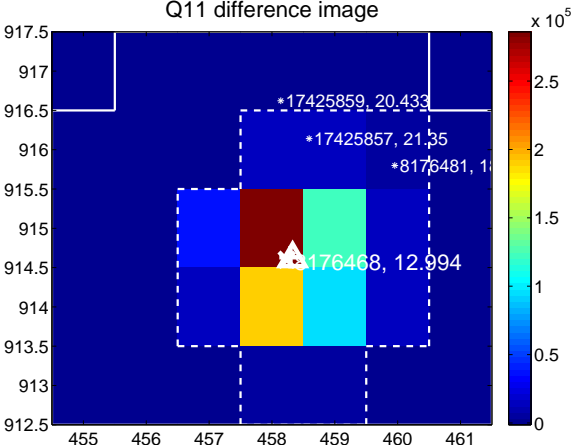
Q10 no difference image



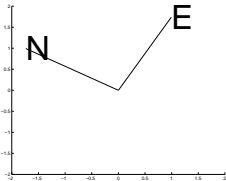
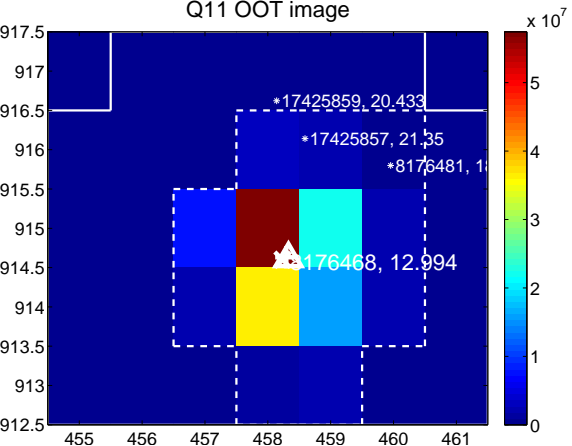
Q10 no OOT image



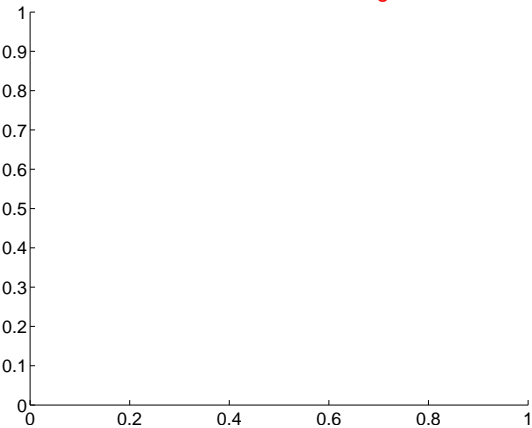
Q11 difference image



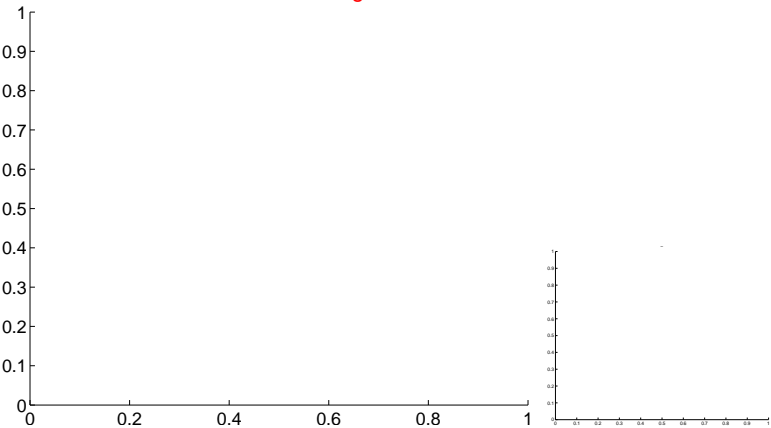
Q11 OOT image



Q12 no difference image



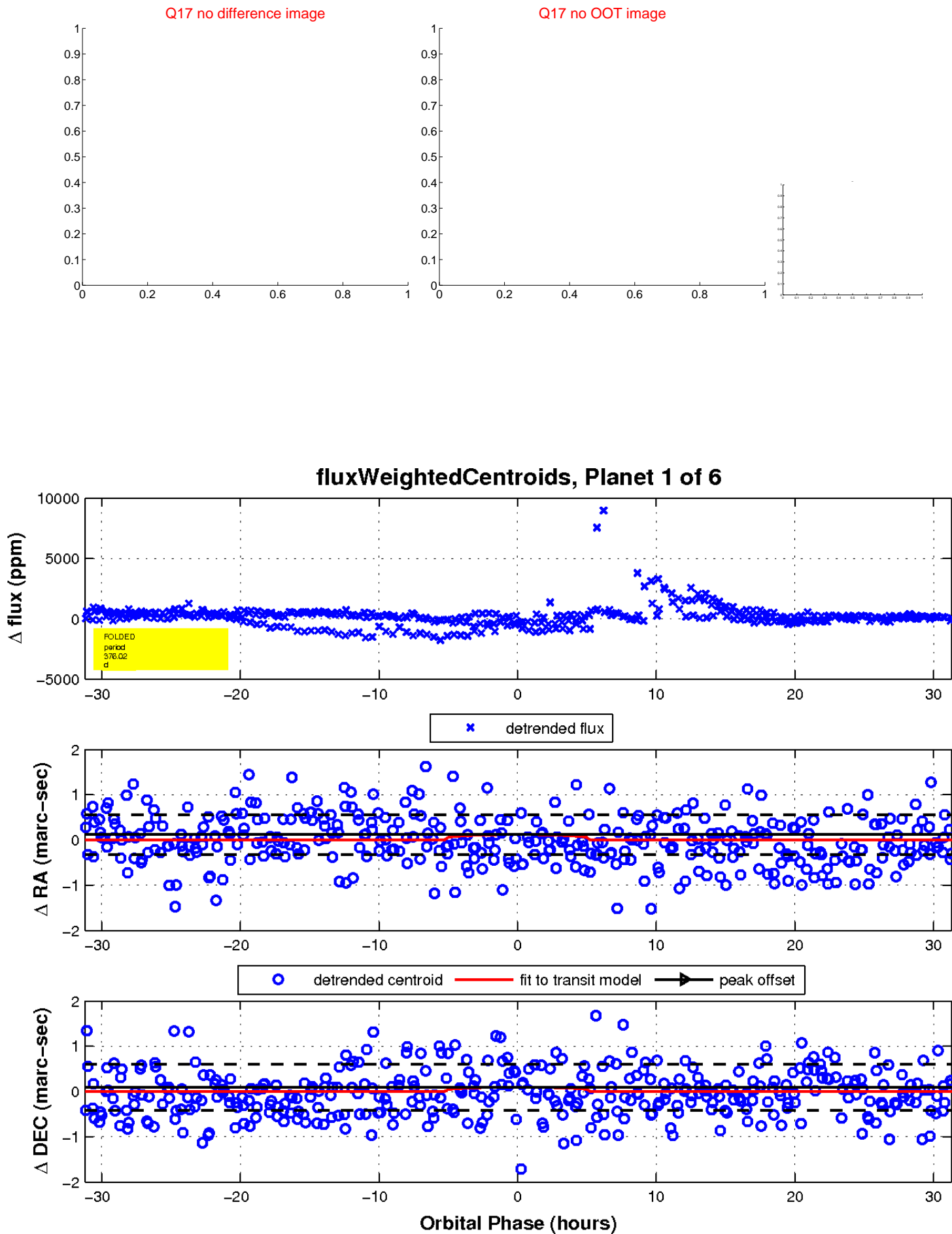
Q12 no OOT image



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

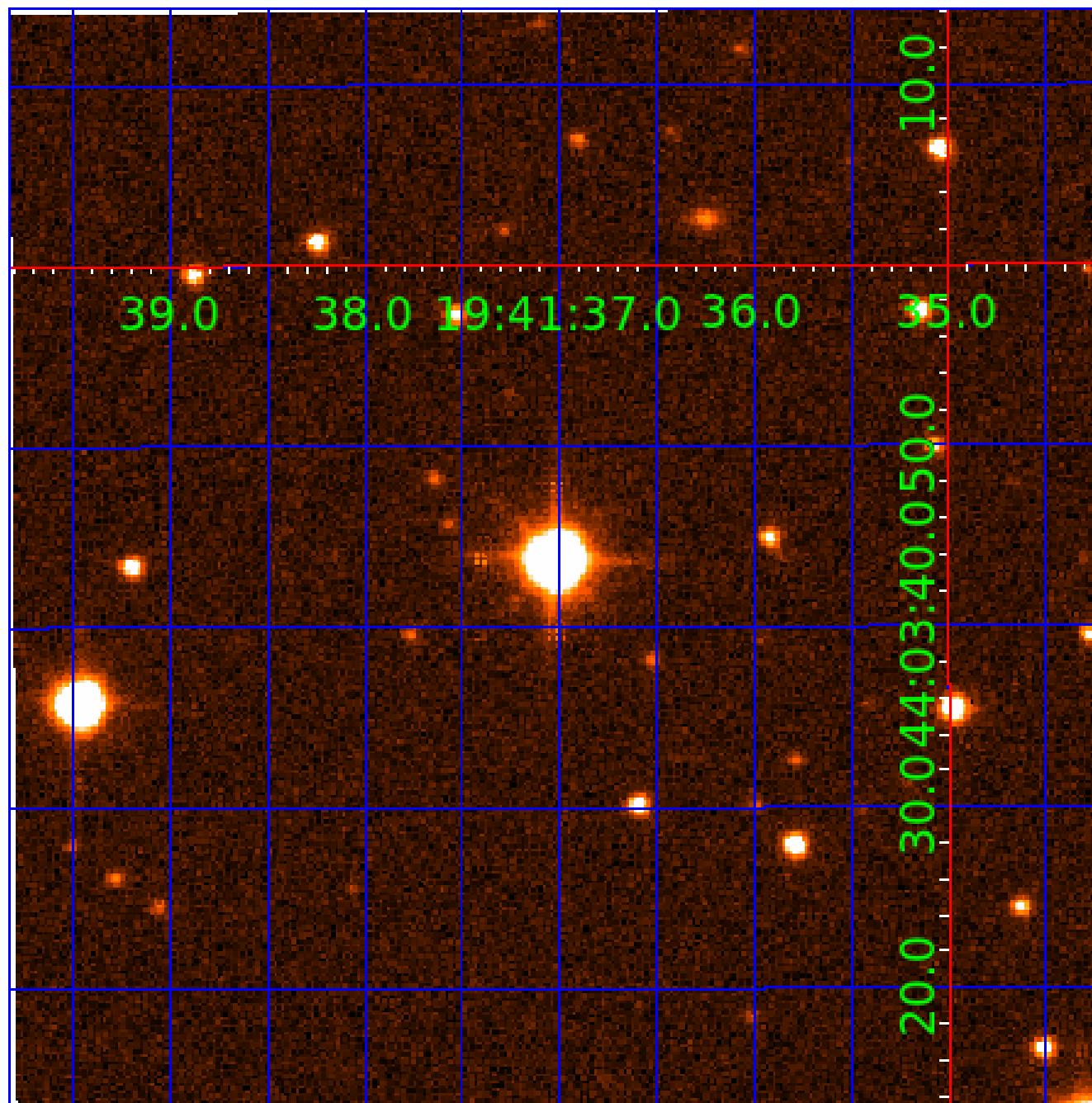


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008176468

Q1-17 DR25 TCE Parameters

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008176468-01	OBS	No	376.021803	288.262571	562.8	10.473	34.0	4.4	0.63	4327	1.45	0.17
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008176468-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008176468-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—CENT_NOFITS
008176468-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008176468-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—HALO_GHOST
008176468-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_ALT—ALL_TRANS_CHASES—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS

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

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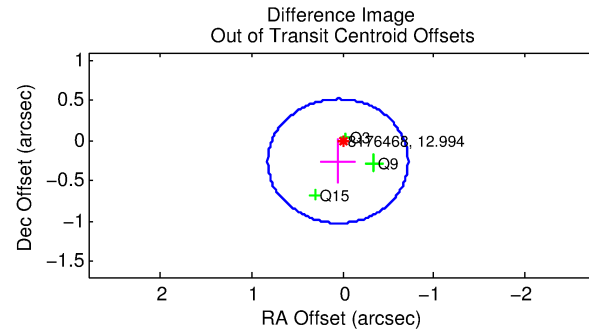
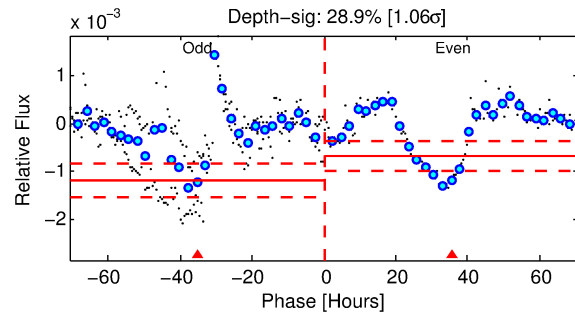
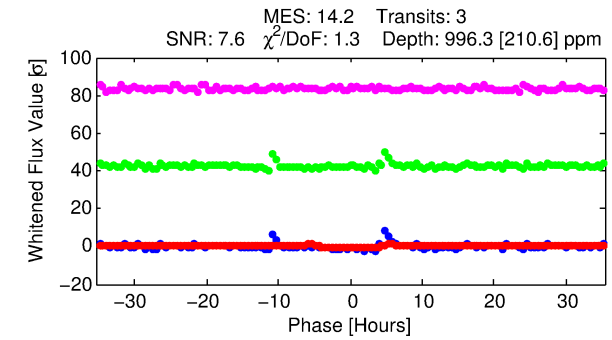
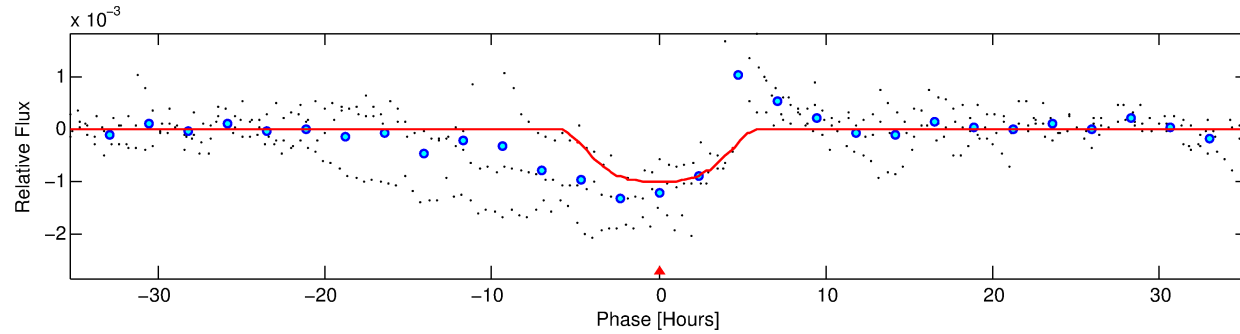
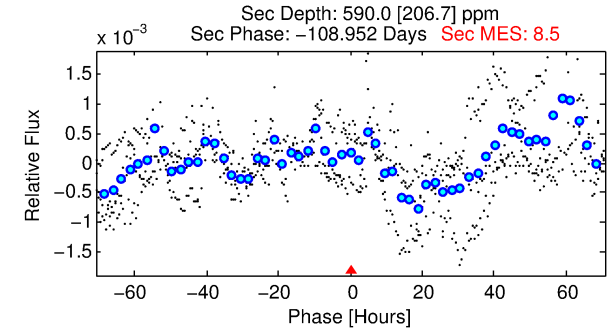
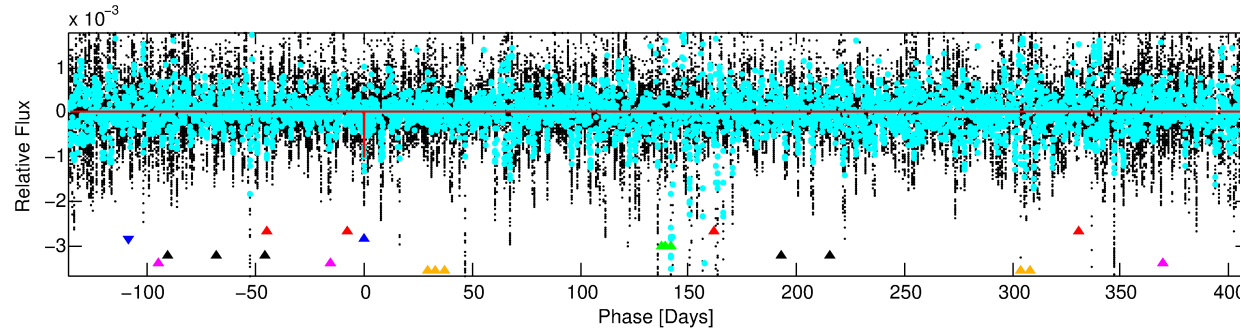
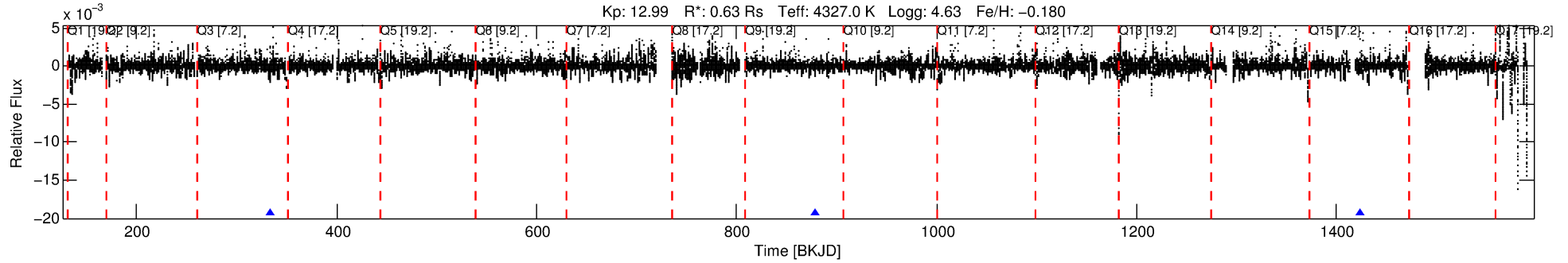
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008176468-02

No Significant Match Found

DV One-Page Summary

KIC: 8176468 Candidate: 2 of 6 Period: 545.452 d



DV Fit Results:

Period = 545.45243 [0.01922] d
Epoch = 333.2938 [0.0252] BKJD
Rp/R* = 0.0388 [0.0047]
a/R* = 148.14 [22.70]
b = 0.95 [0.02]
Seff = 0.10 [0.02]
Teq = 144 [6] K
Rp = 2.68 [0.41] Re
a = 1.1150 [0.0832] AU
Ag = 56083.28 [24580.87] [2.28 σ]
Teffp = 3425 [379] K [8.66 σ]

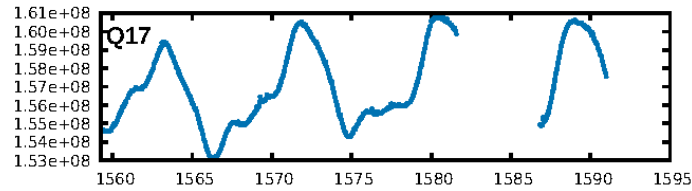
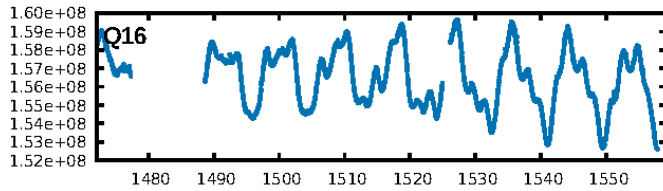
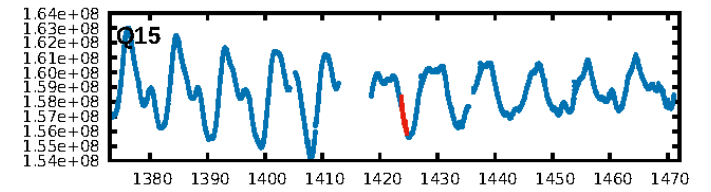
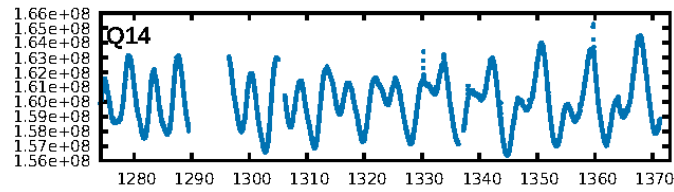
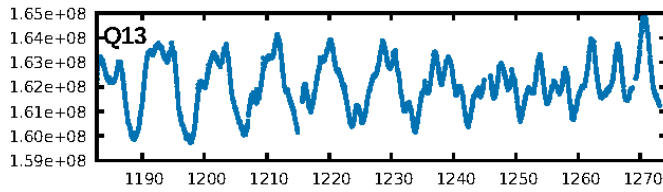
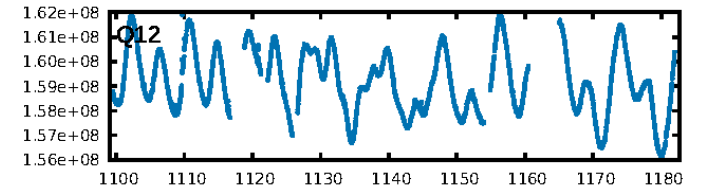
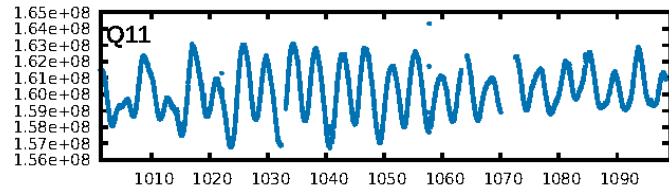
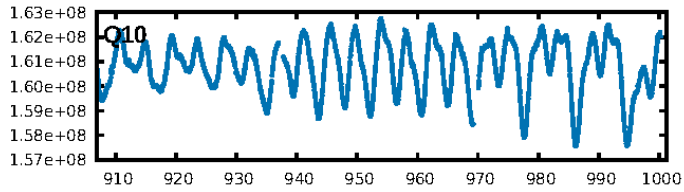
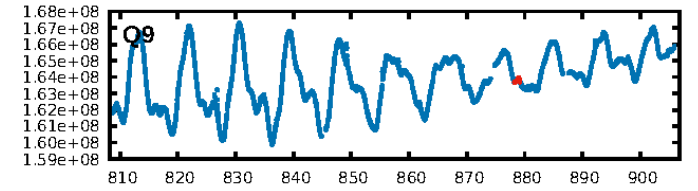
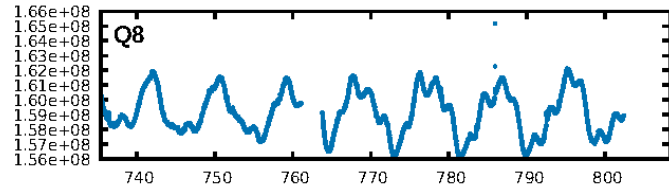
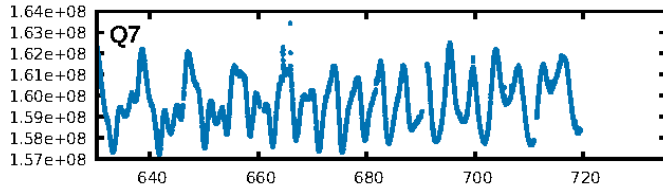
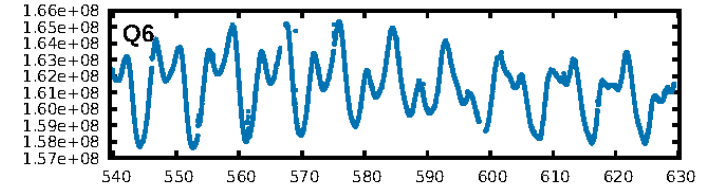
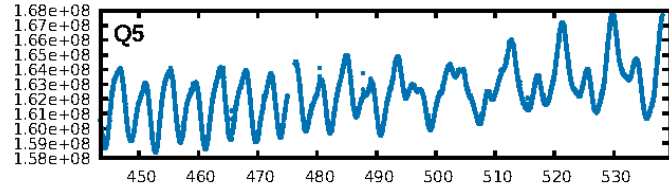
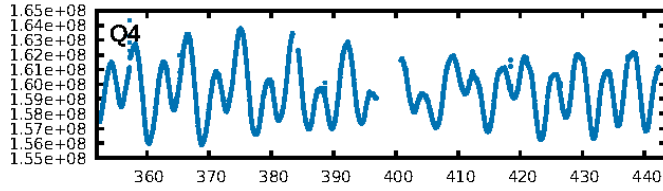
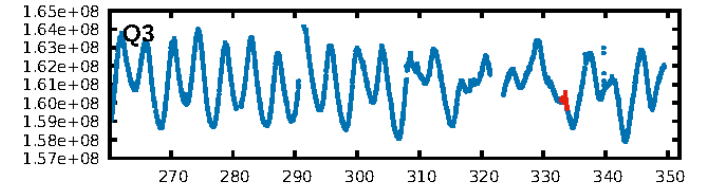
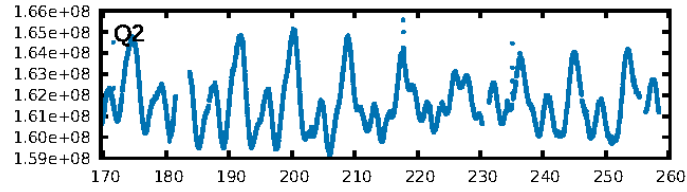
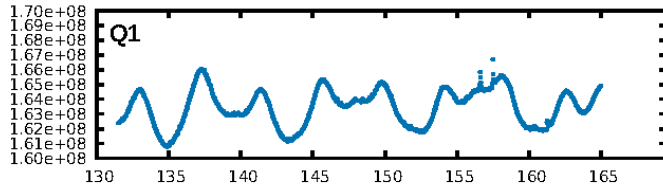
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [148.42 σ]
LongPeriod-sig: 99.7% [2.97 σ]
ModelChiSquare2-sig: 9.8%
ModelChiSquareGof-sig: 95.1%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 38.55
Centroid-sig: 20.7%
Centroid-so: 0.584 arcsec [1.68 σ]
OotOffset-rm: 0.261 arcsec [1.01 σ]
OotOffset-st: 0/2/0/1 [3]
KicOffset-rm: 0.382 arcsec [1.50 σ]
KicOffset-st: 0/2/0/1 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 1.00 [3/3]

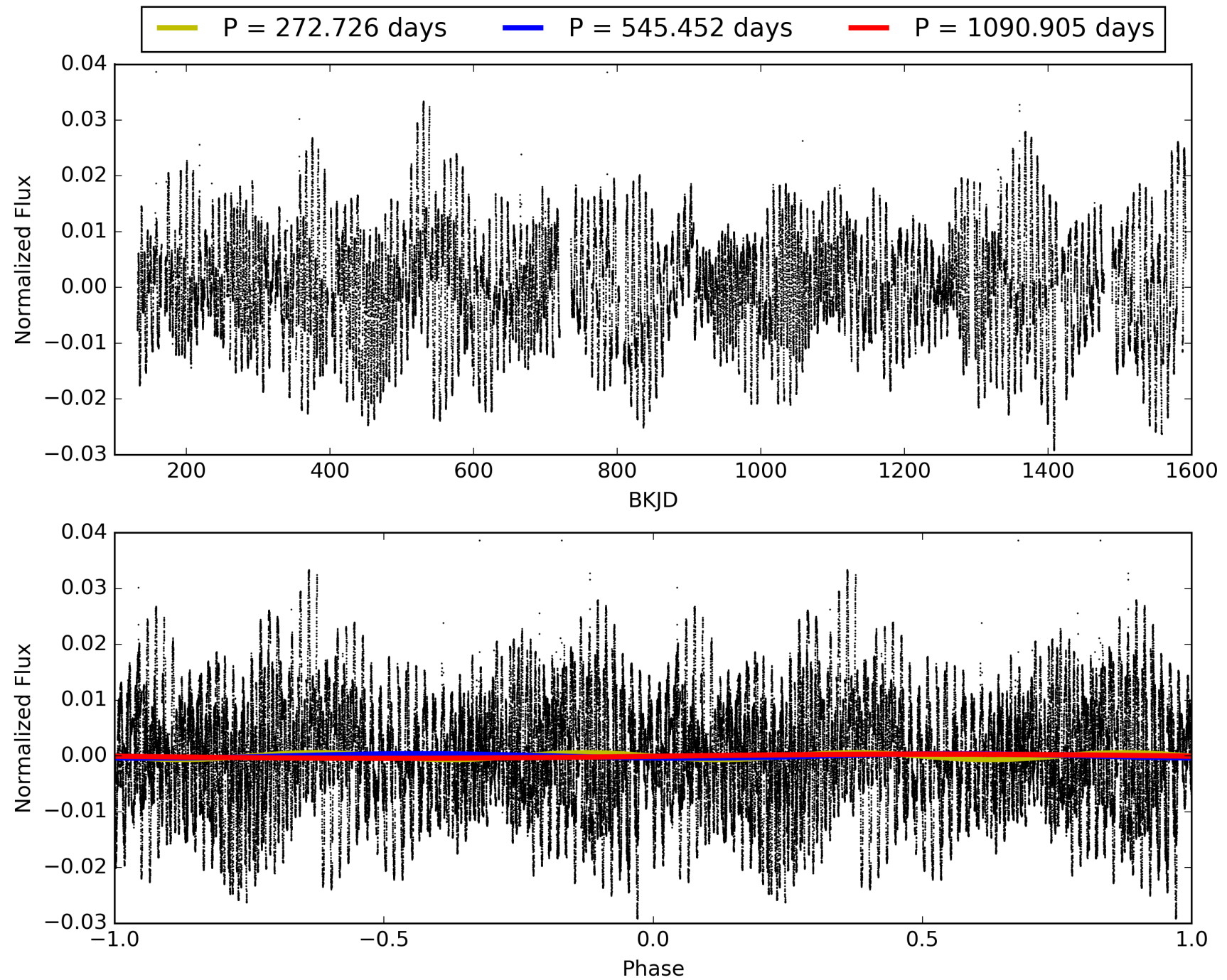
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 10:07:00 Z

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

TCE 008176468-02, PDC Light Curves

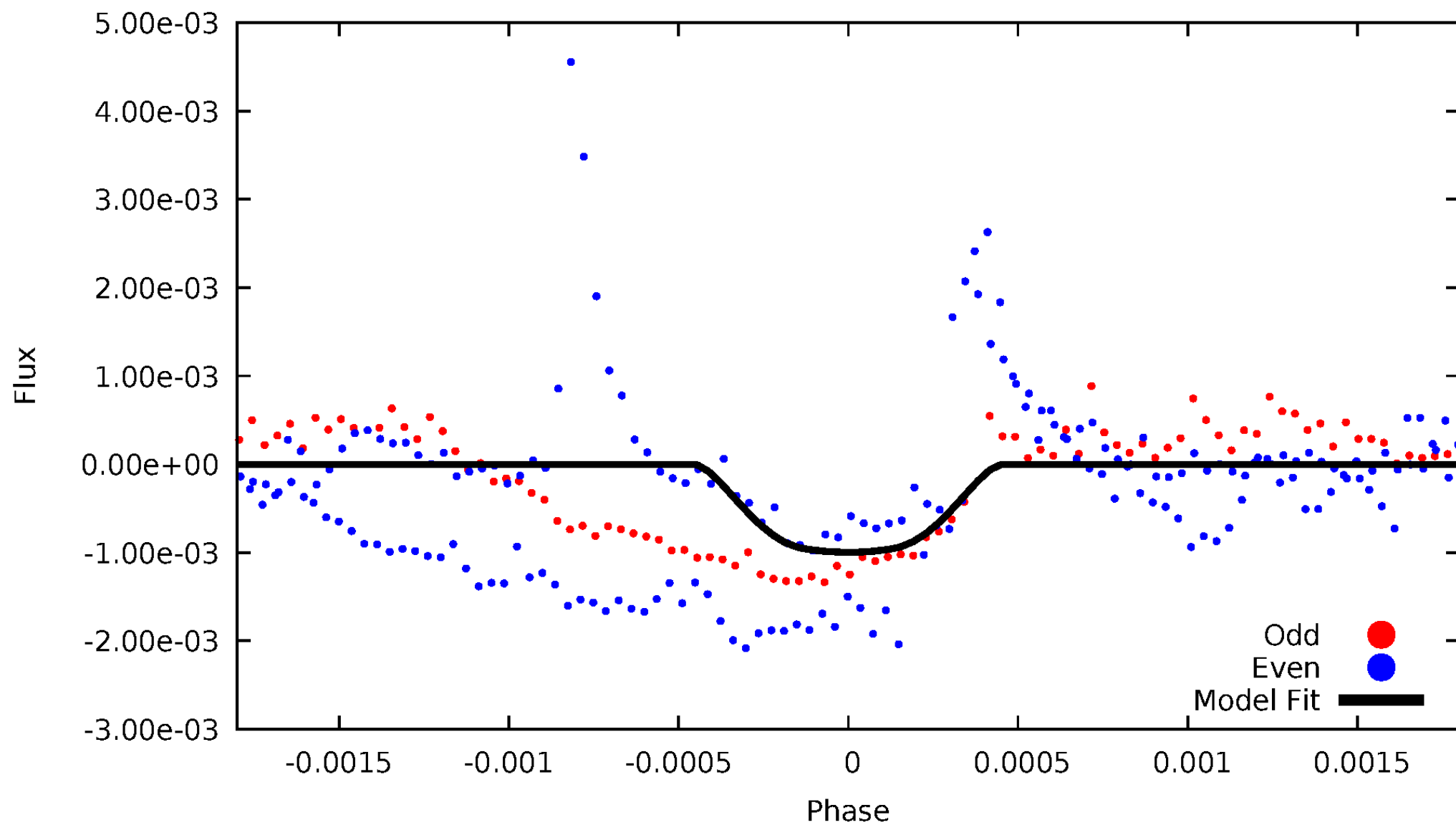


TCE 008176468-02



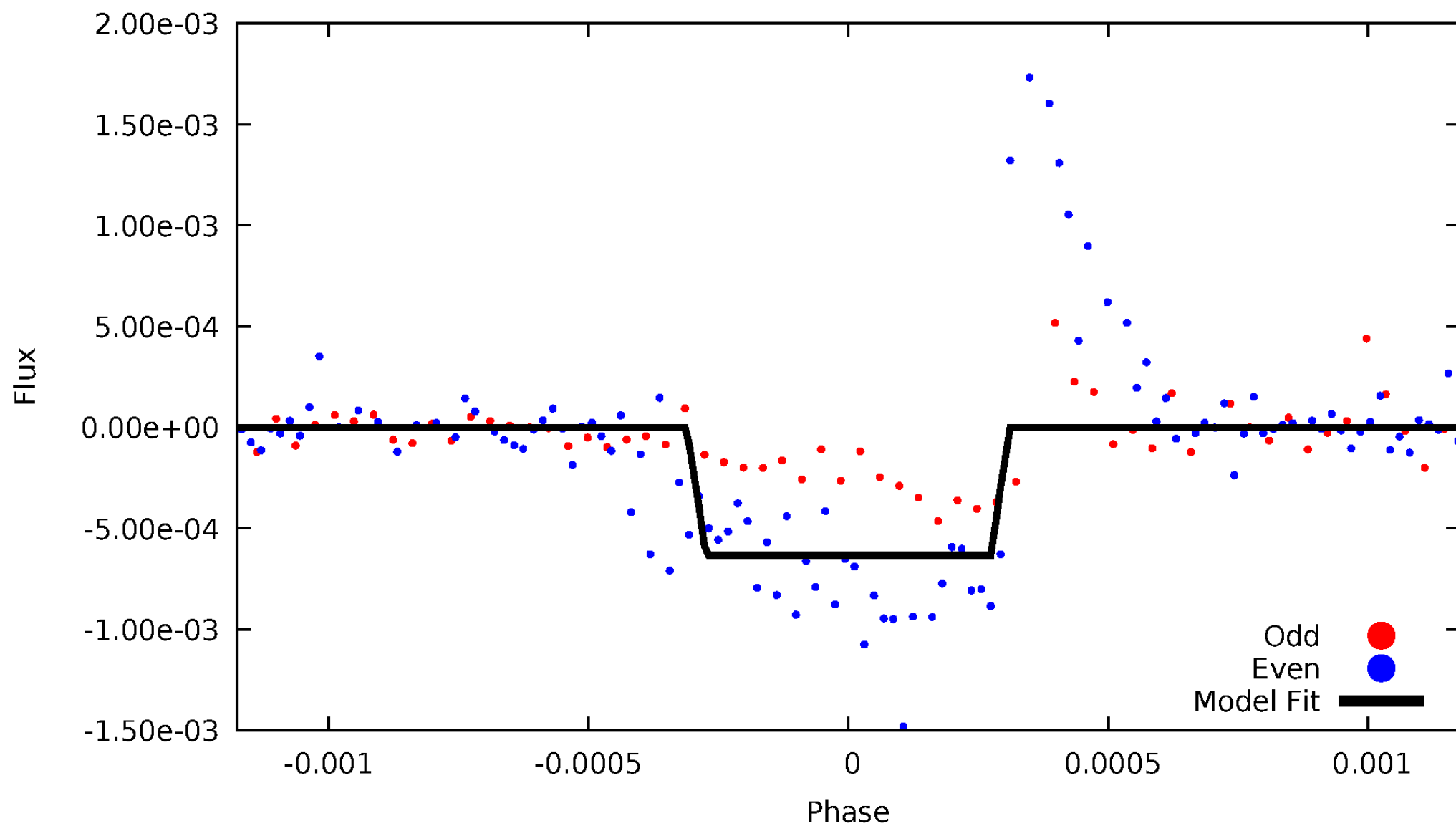
DV Odd/Even

TCE 008176468-02



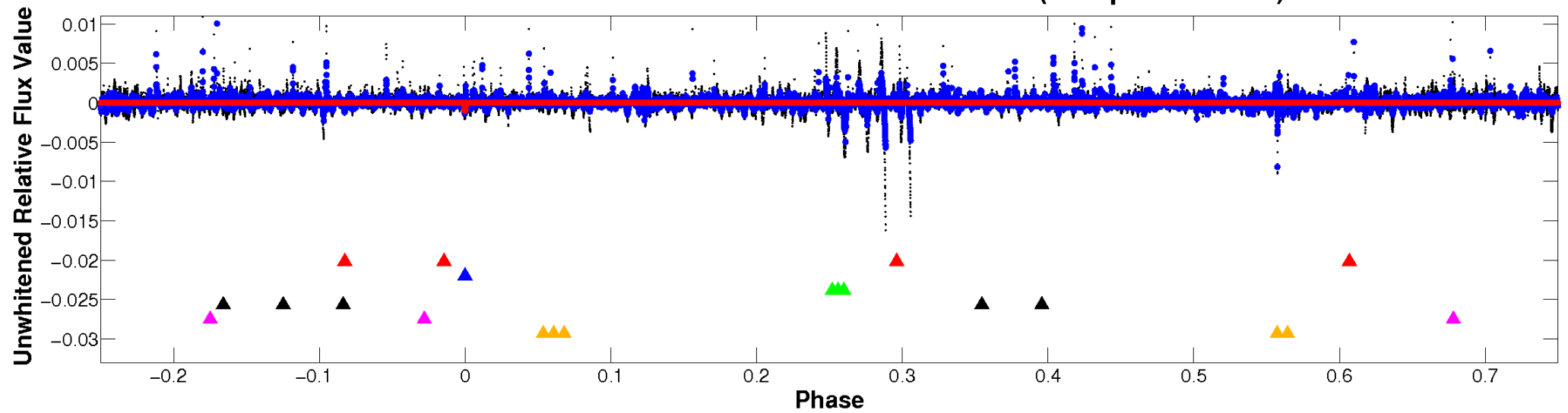
ALT Odd/Even

TCE 008176468-02

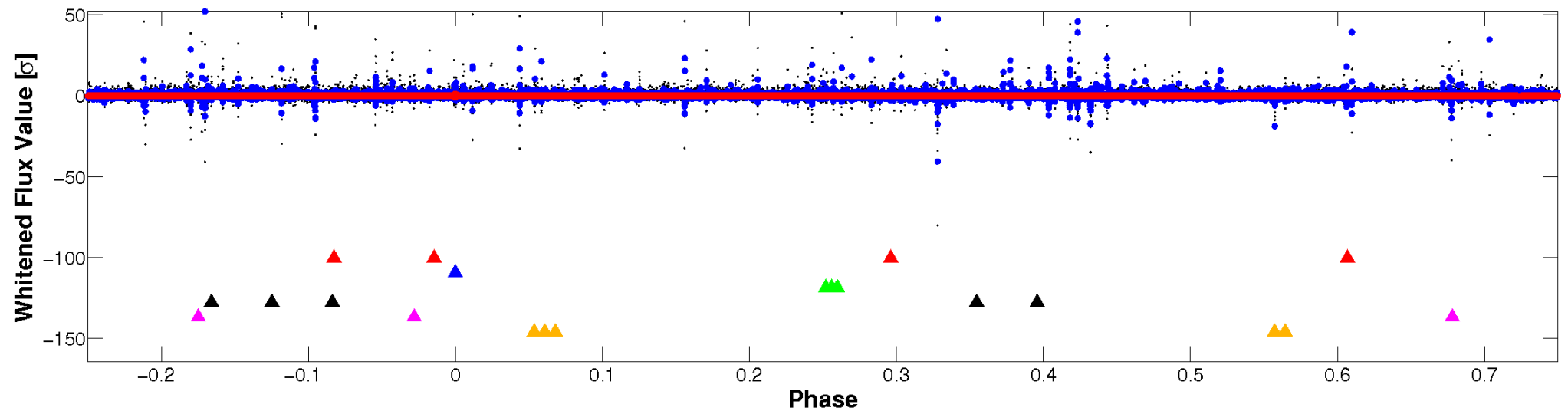


Non-Whitened Vs. Whitened Light Curve

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

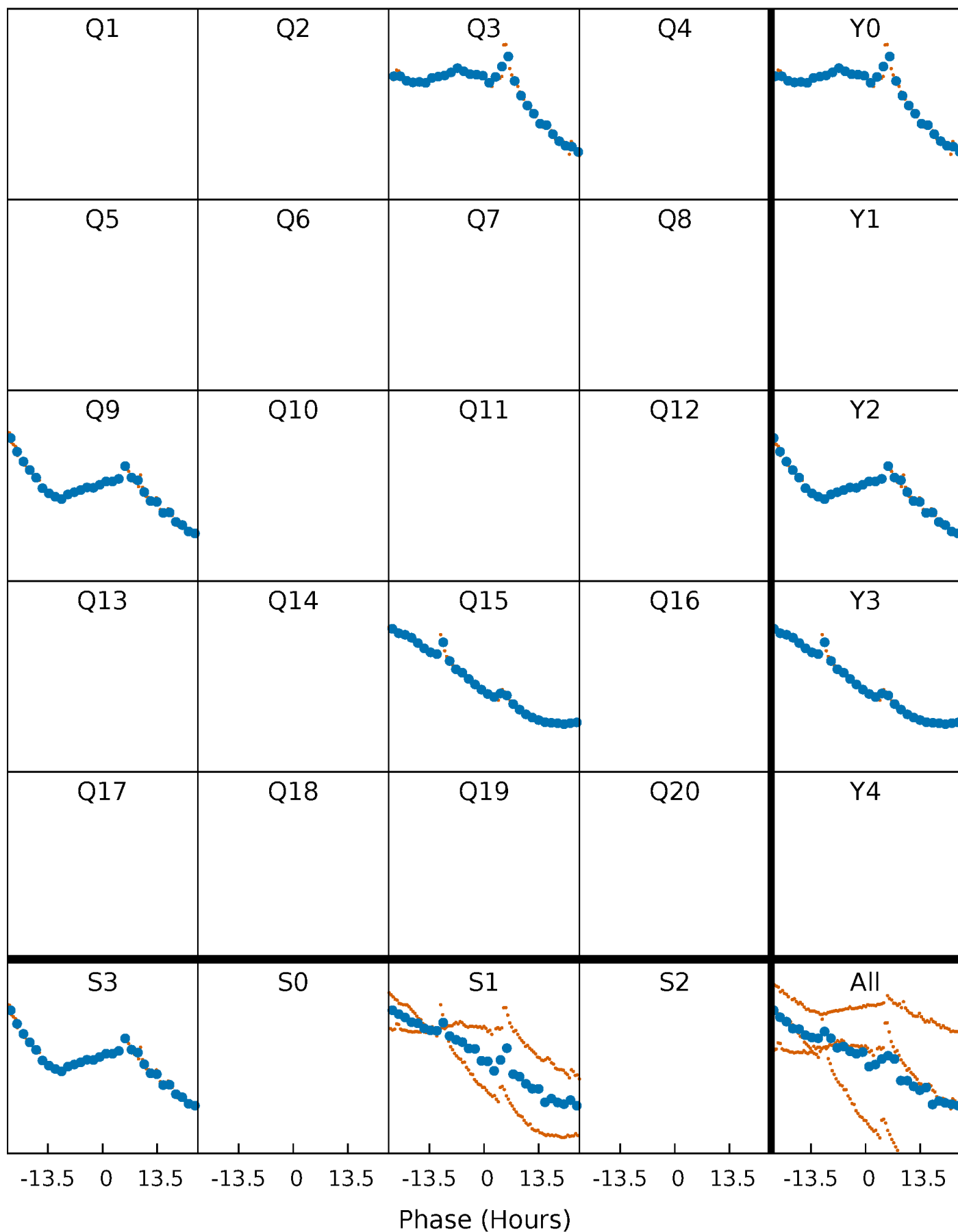


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



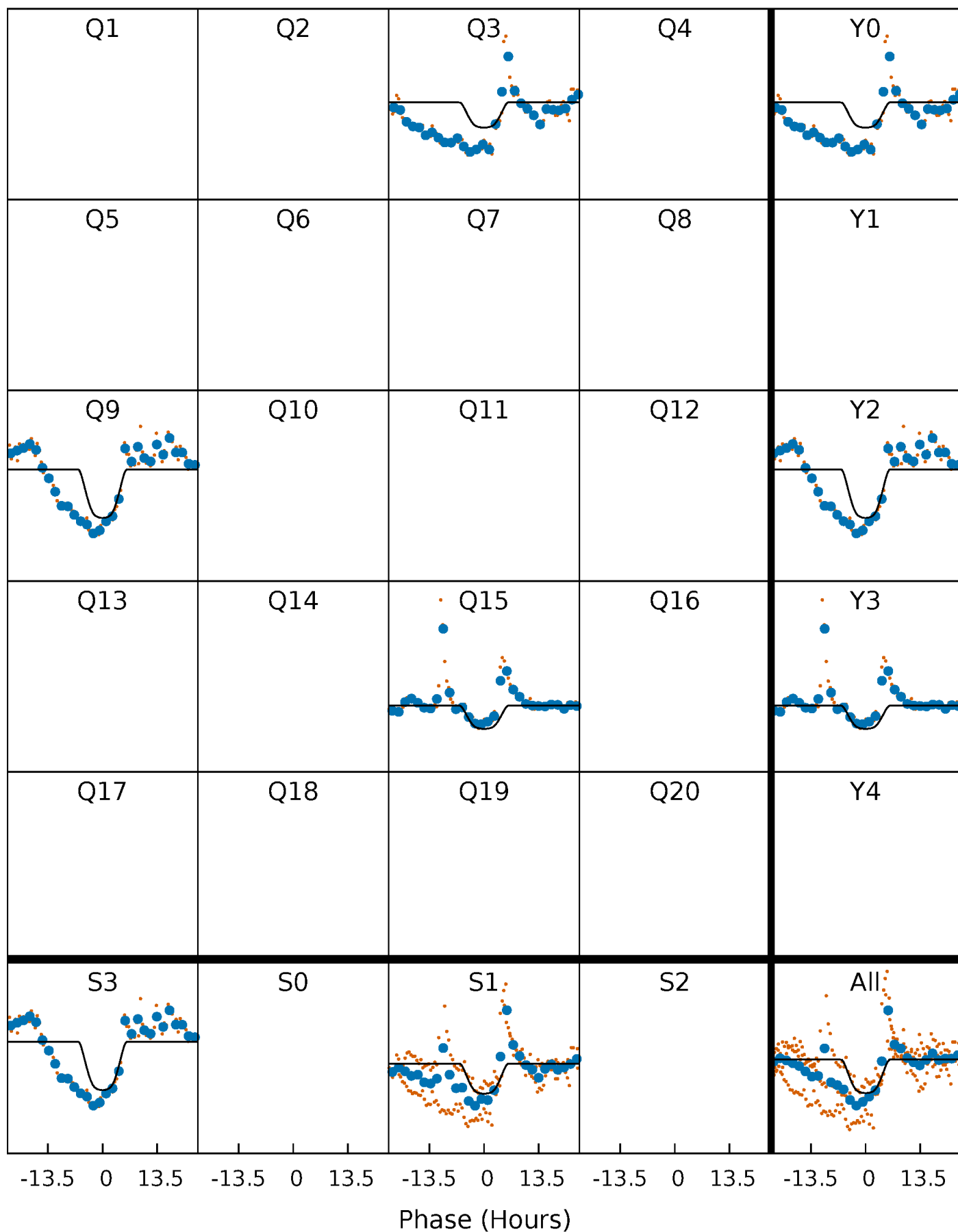
PDC Quarter-Phased Transit Curves

TCE 008176468-02 $P=545.452425$ Days $T_0=333.293831$ (BKJD)



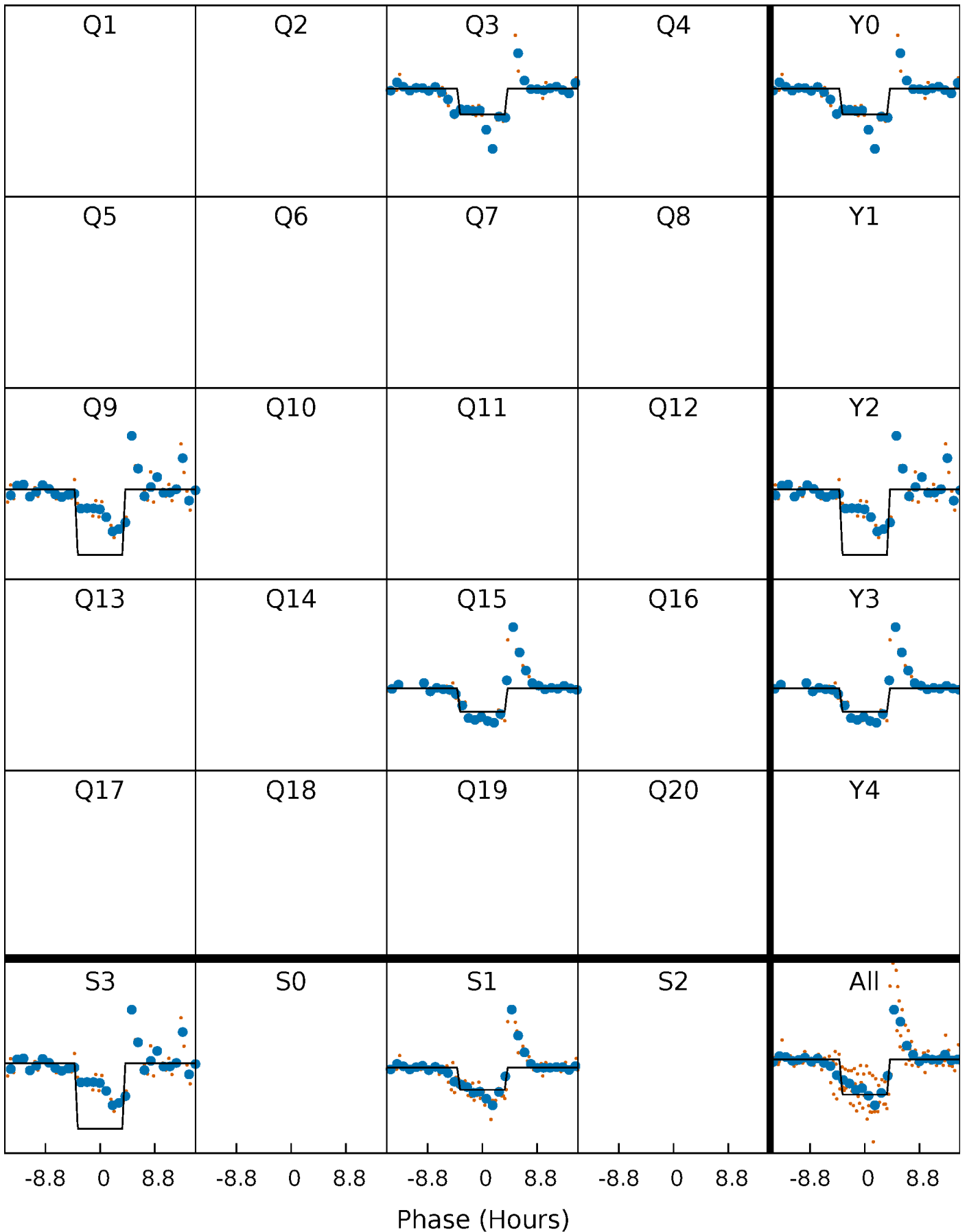
DV Quarter-Phased Transit Curves

TCE 008176468-02 P=545.452425 Days $T_0=333.293831$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

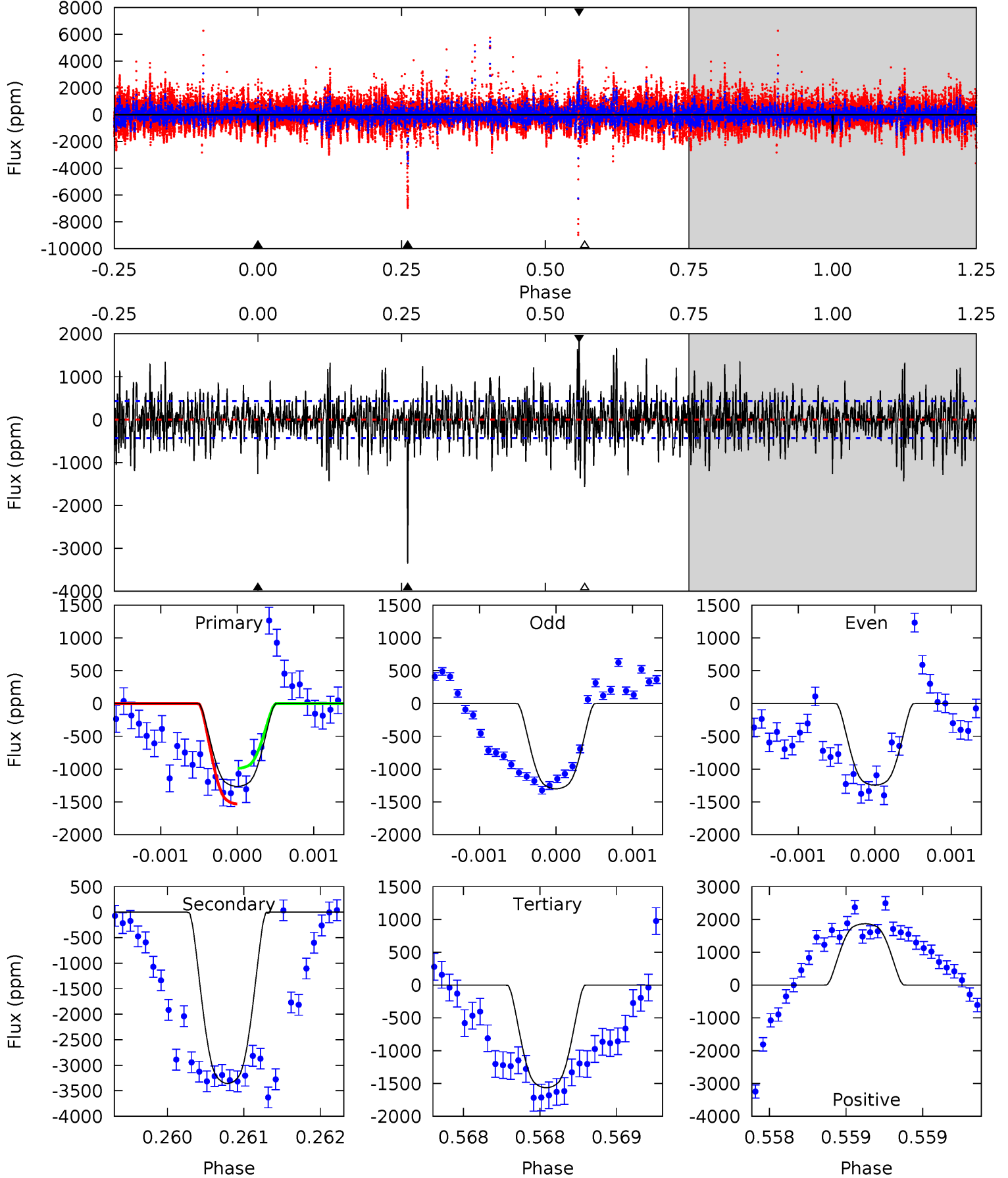
TCE 008176468-02 P=545.439828 Days $T_0=333.316662$ (BKJD)



DV Model-Shift Uniqueness Test

008176468-02, P = 545.452425 Days, E = 333.293831 Days

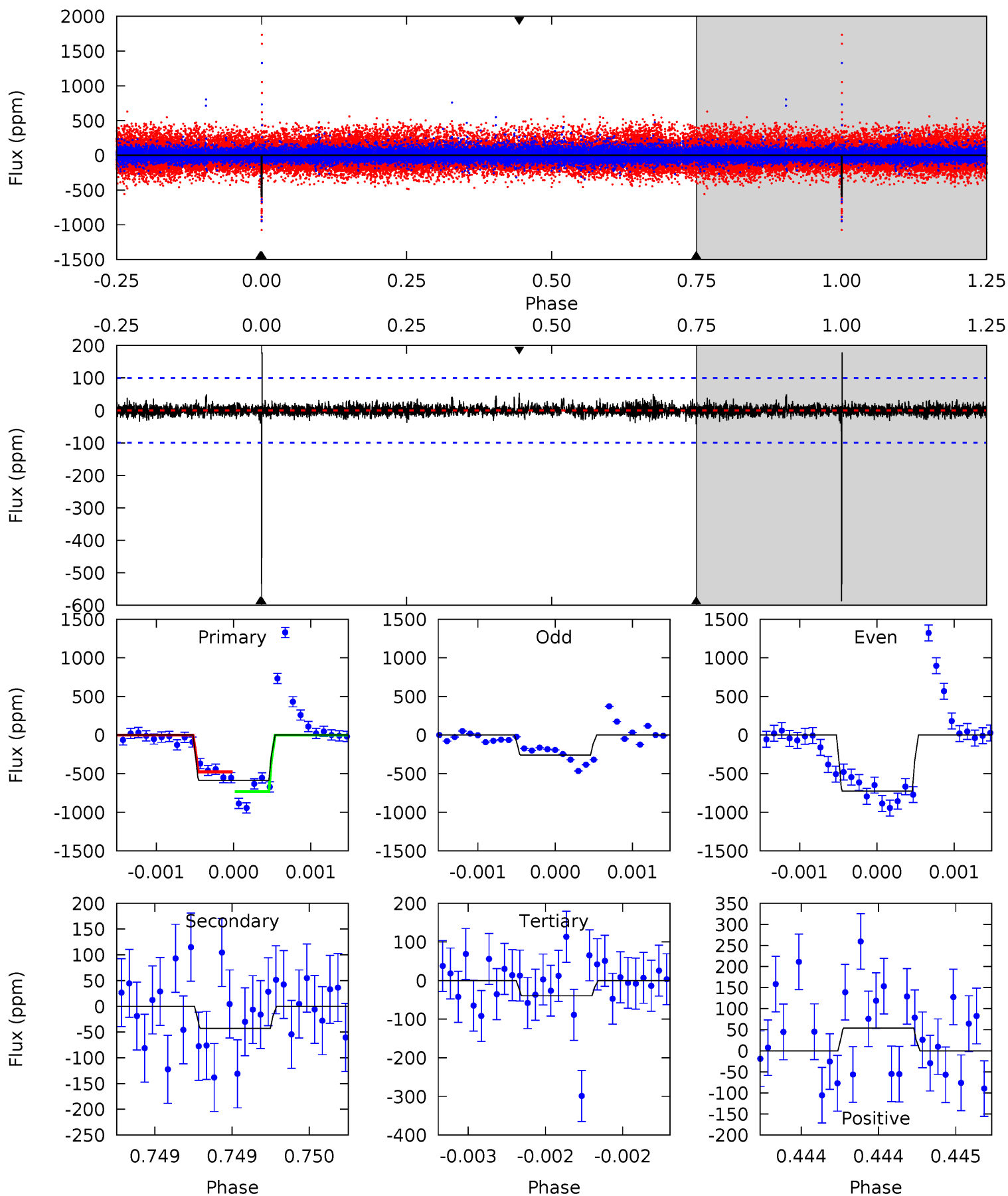
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.1	42.8	19.9	23.8	5.47	3.32	4.96	-3.83	-7.71	22.8	19.0	0.27	0.96	0.36	3.50



Alt Model-Shift Uniqueness Test

008176468-02, P = 545.439828 Days, E = 333.316662 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
32.7	2.38	2.20	3.01	5.54	3.43	0.52	30.5	29.7	0.18	-0.63	12.4	0.81	0.23	7.12



Stellar Parameters For KIC 008176468

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	4327^{+116}_{-129}	$4.627^{+0.052}_{-0.021}$	$-0.180^{+0.300}_{-0.300}$	$0.634^{+0.040}_{-0.060}$	$0.621^{+0.062}_{-0.056}$	$3.432^{+0.800}_{-0.366}$
	+3%/-3%	+1%/-0%	+167%/-167%	+6%/-9%	+10%/-9%	+23%/-11%
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 008176468-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-3357 ± 79	$2.67^{+0.36}_{-0.35}$	200^{+6}_{-6}	5088^{+325}_{-299}	$327774^{+102908}_{-69517}$
Alt.	-43 ± 18	$1.73^{+0.33}_{-0.32}$	199^{+6}_{-7}	2804^{+226}_{-193}	9612^{+7318}_{-4223}

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 $A_{obs} \gg 1.0$

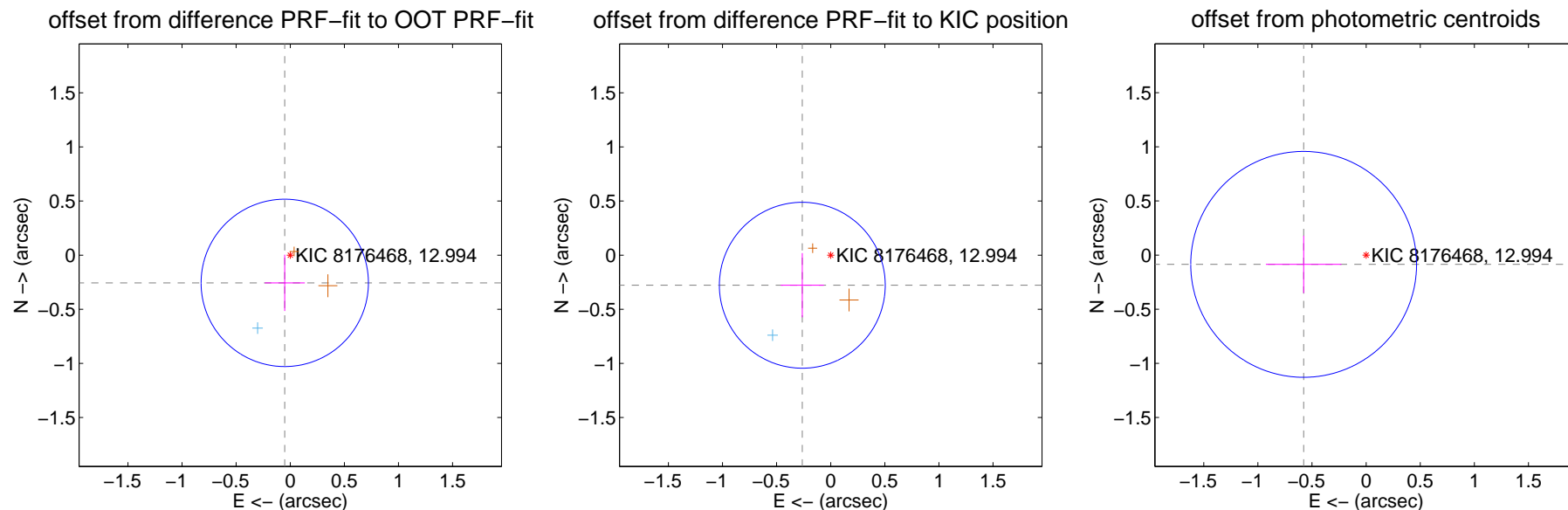
DV Centroid Data

Supplemental centroid analysis for 008176468-02. Kepler magnitude: 12.99. Transit SNR 7.60

There are 1 quarters with good PRF difference image offsets

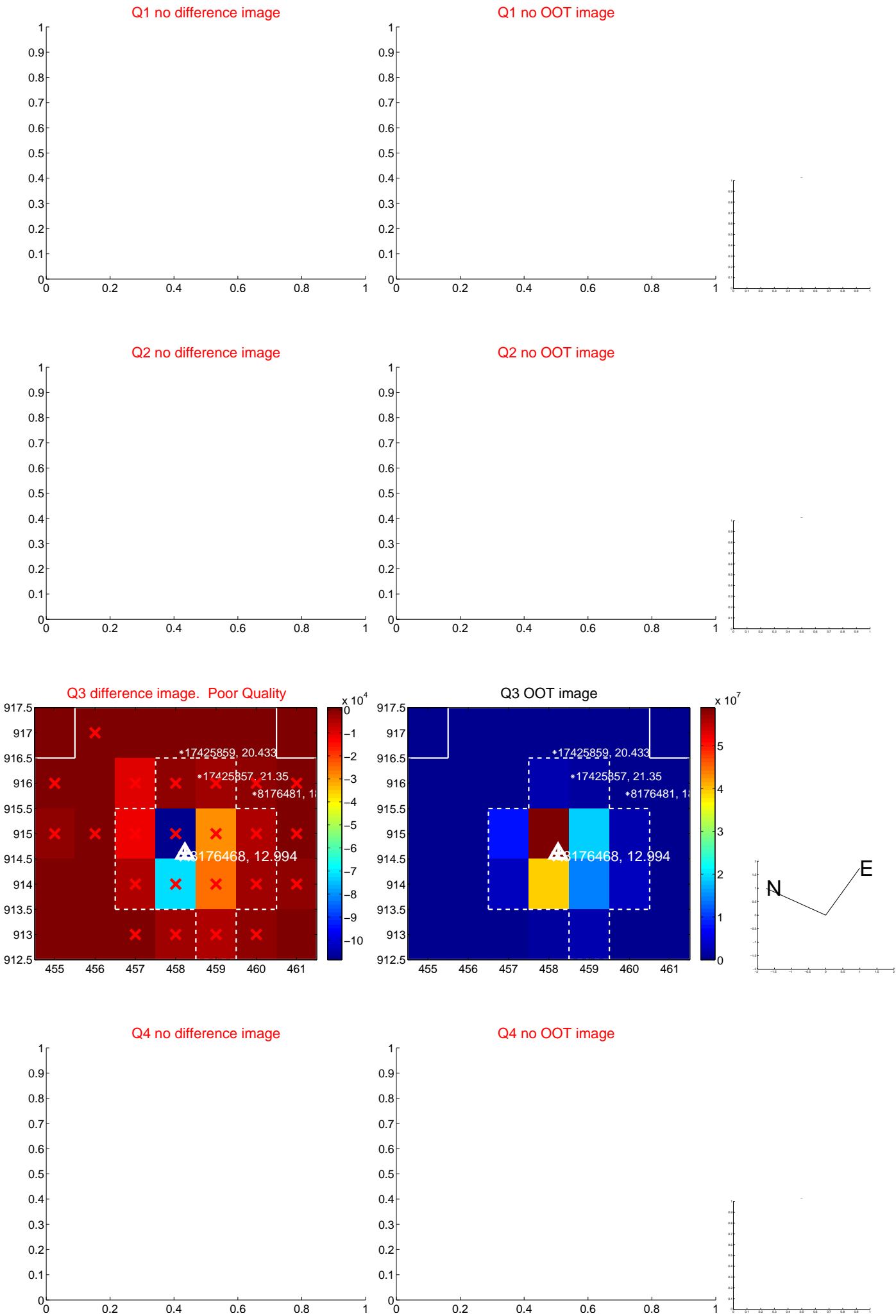
The direct PRF centroid is offset from the target star catalog position by about 0.24 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.261 ± 0.258	1.01	0.051 ± 0.185	-0.256 ± 0.260
PRF-fit source offset from KIC position	0.382 ± 0.256	1.50	0.263 ± 0.200	-0.278 ± 0.297
photometric centroid source offset	0.58 ± 0.35	1.68	0.58 ± 0.35	-0.09 ± 0.26



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.

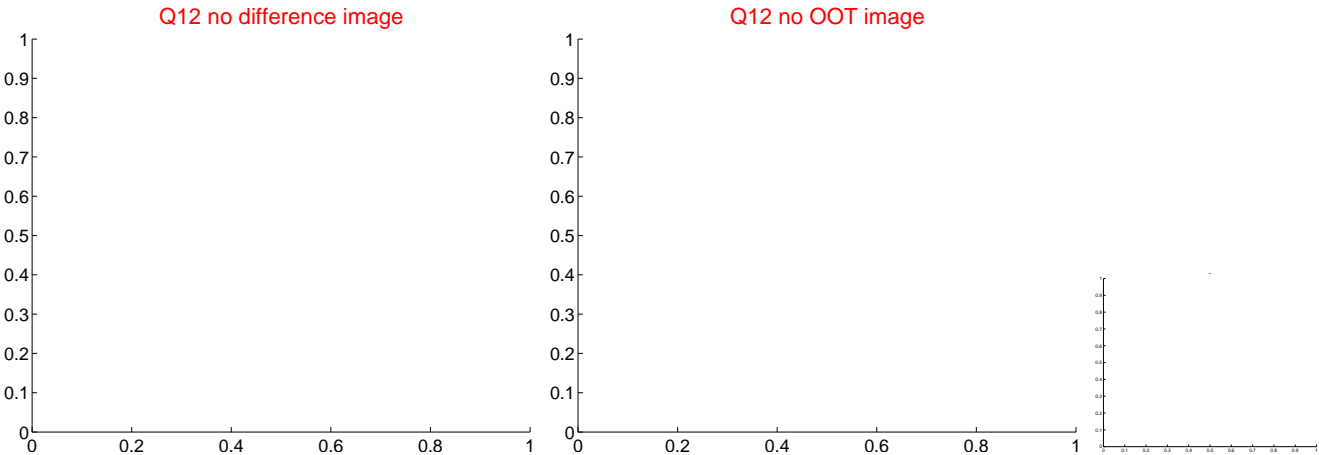
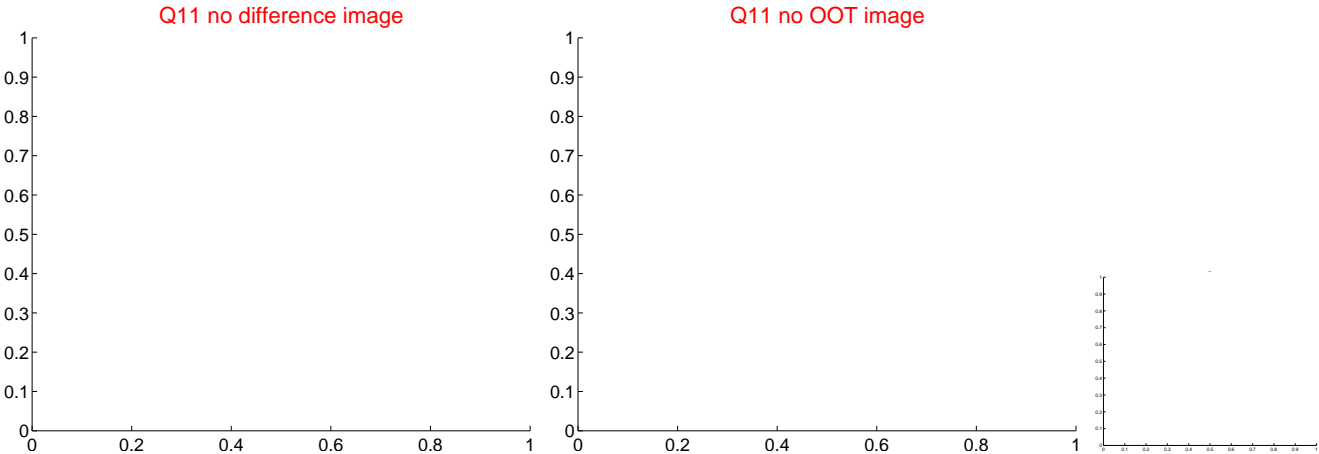
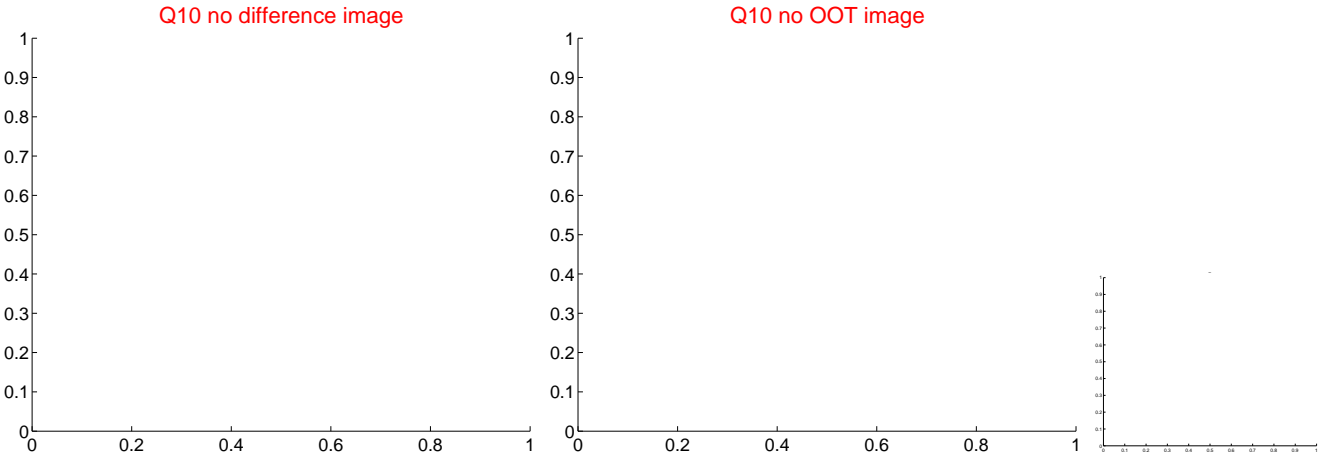
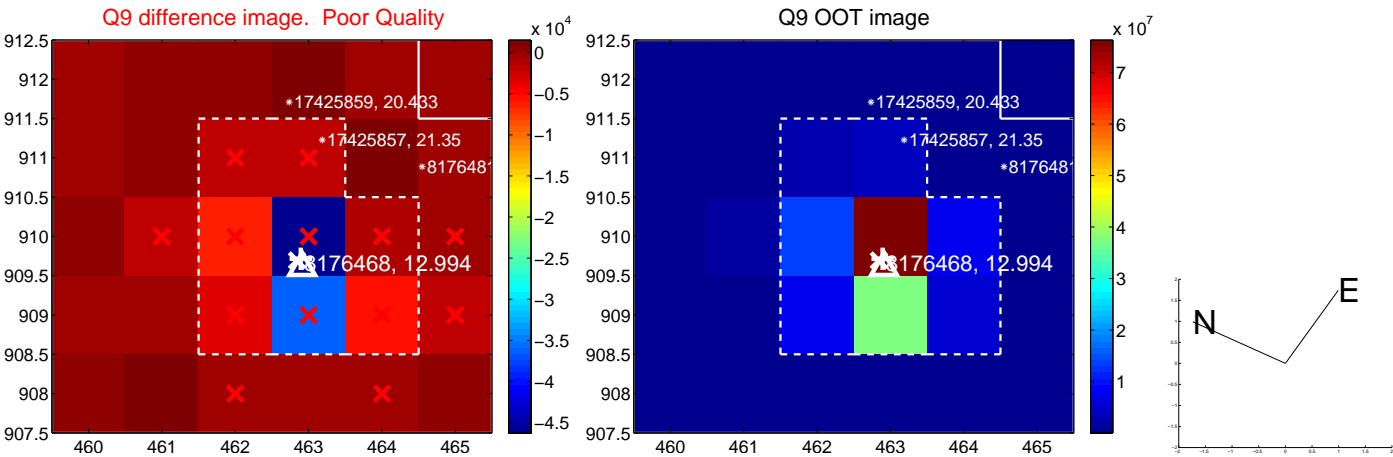
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



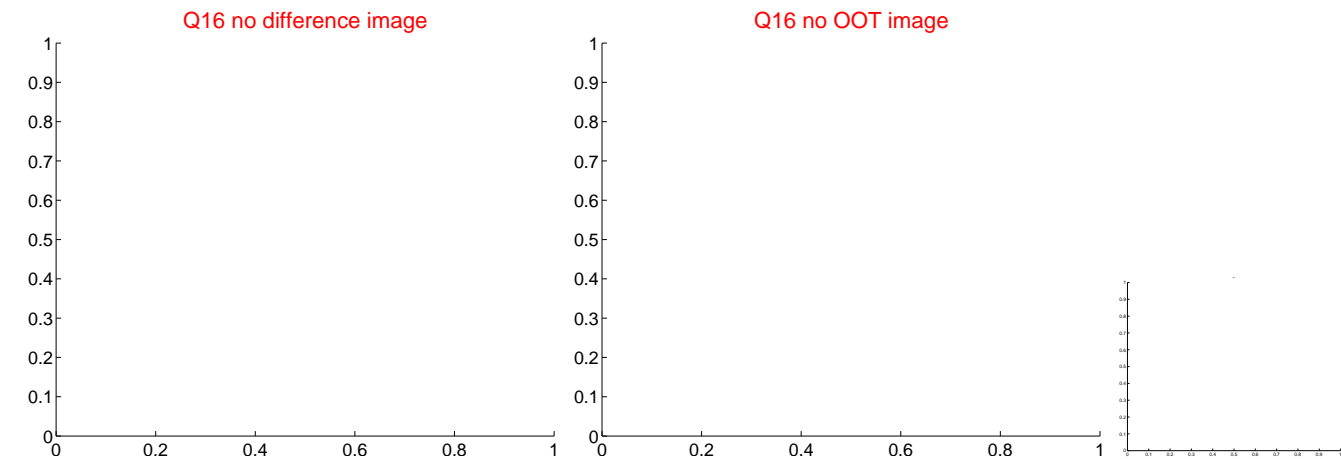
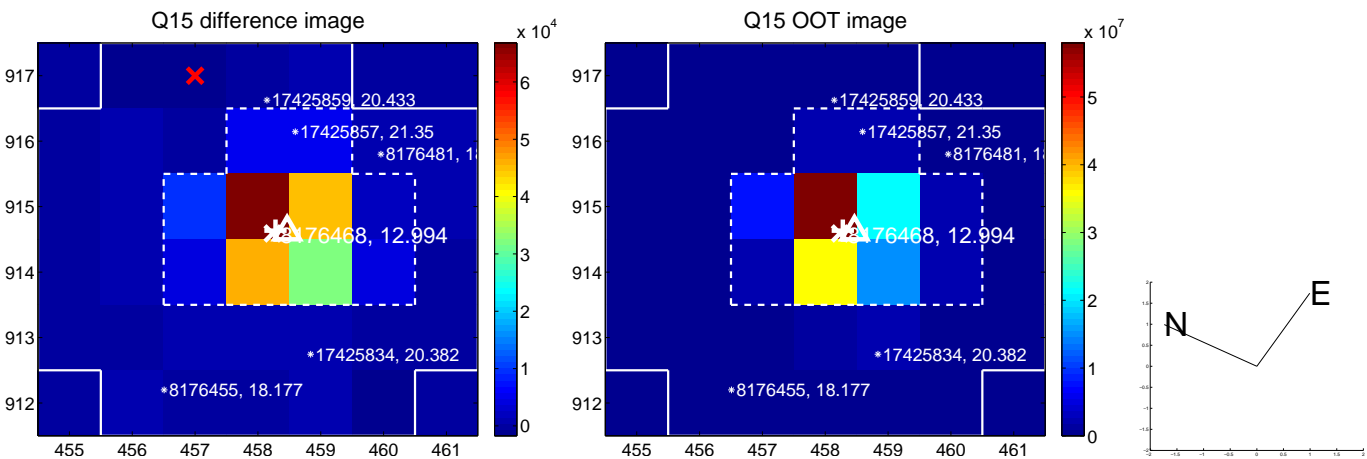
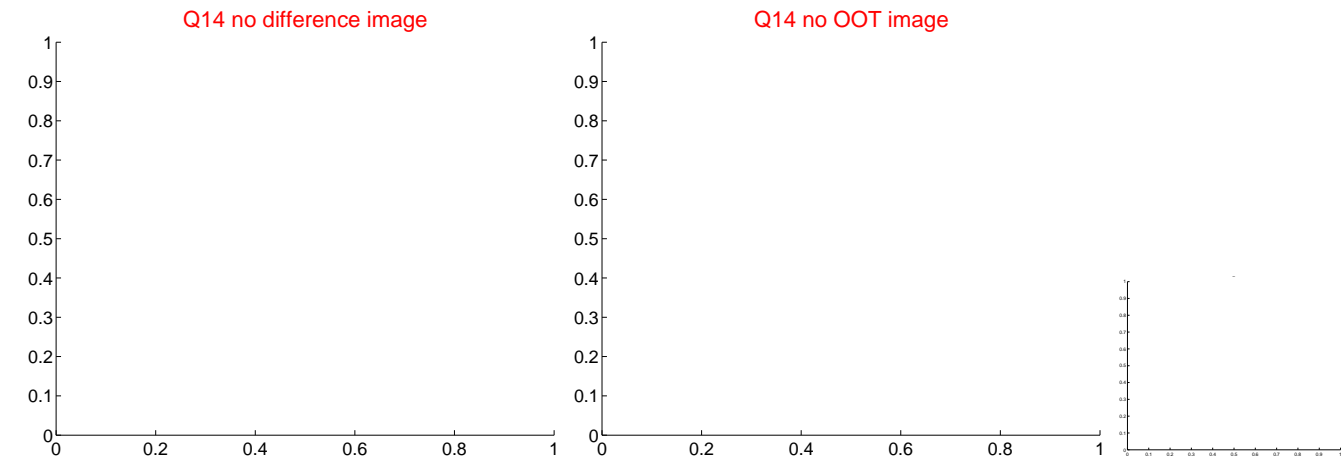
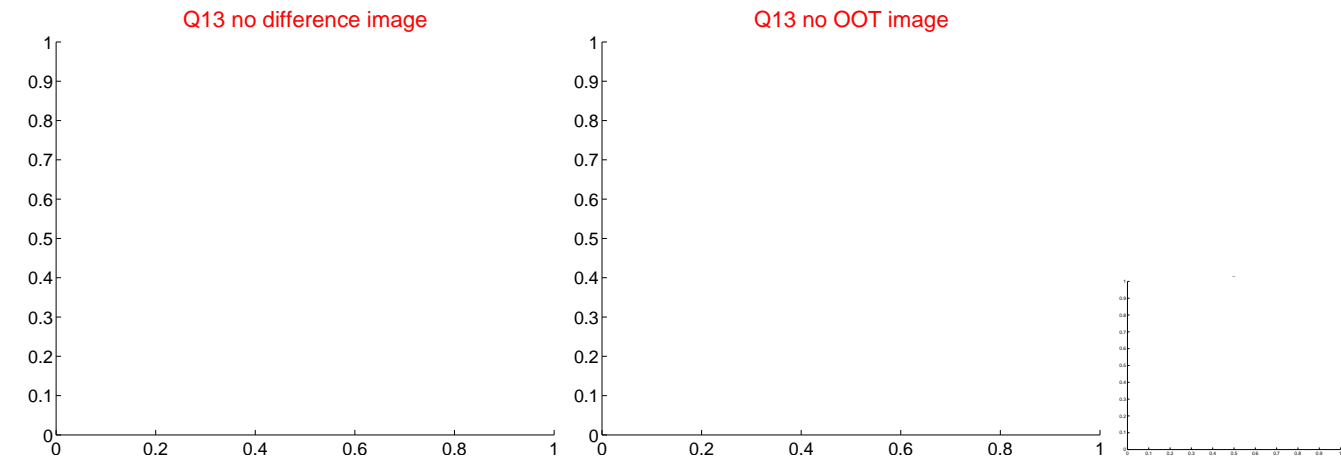
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



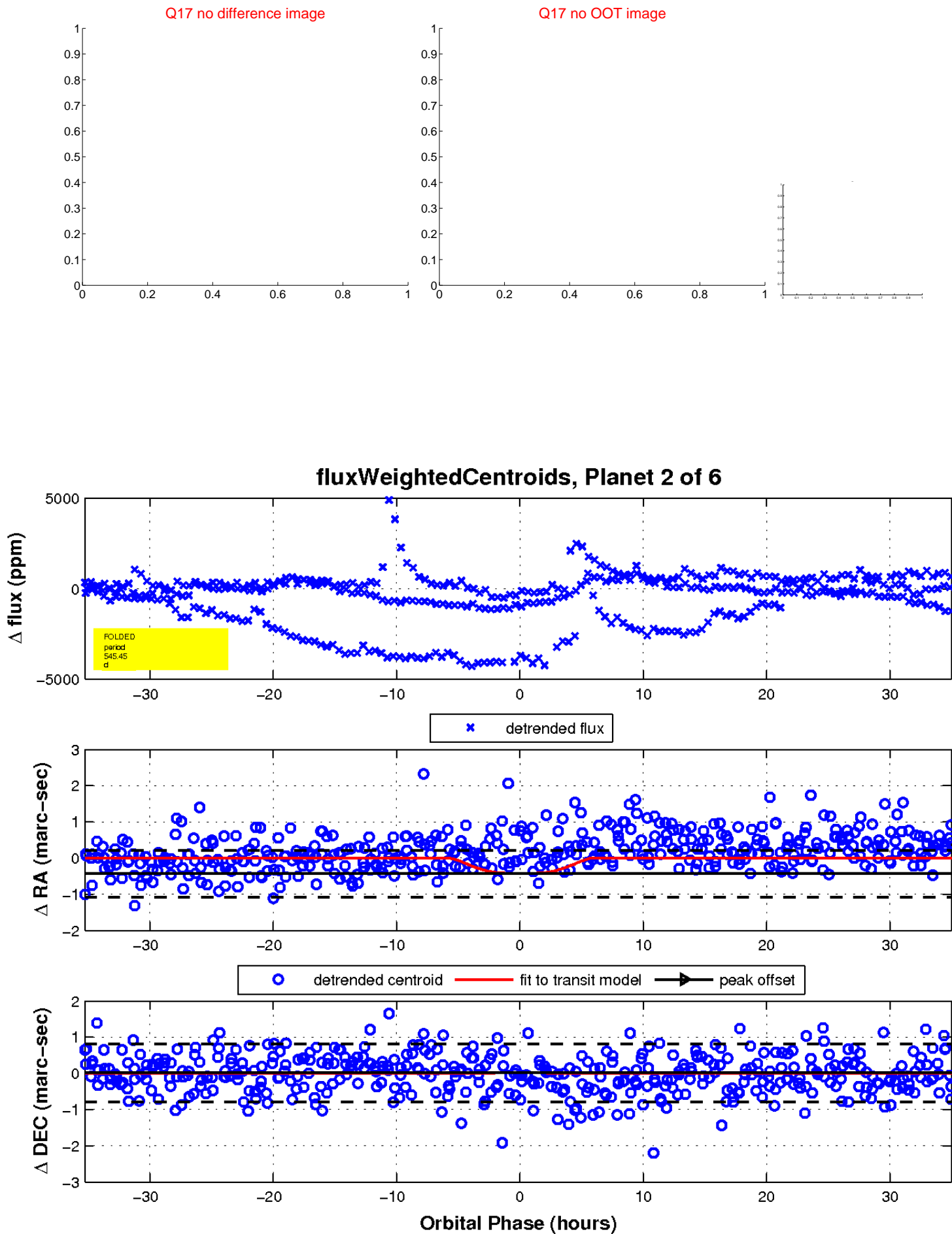
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

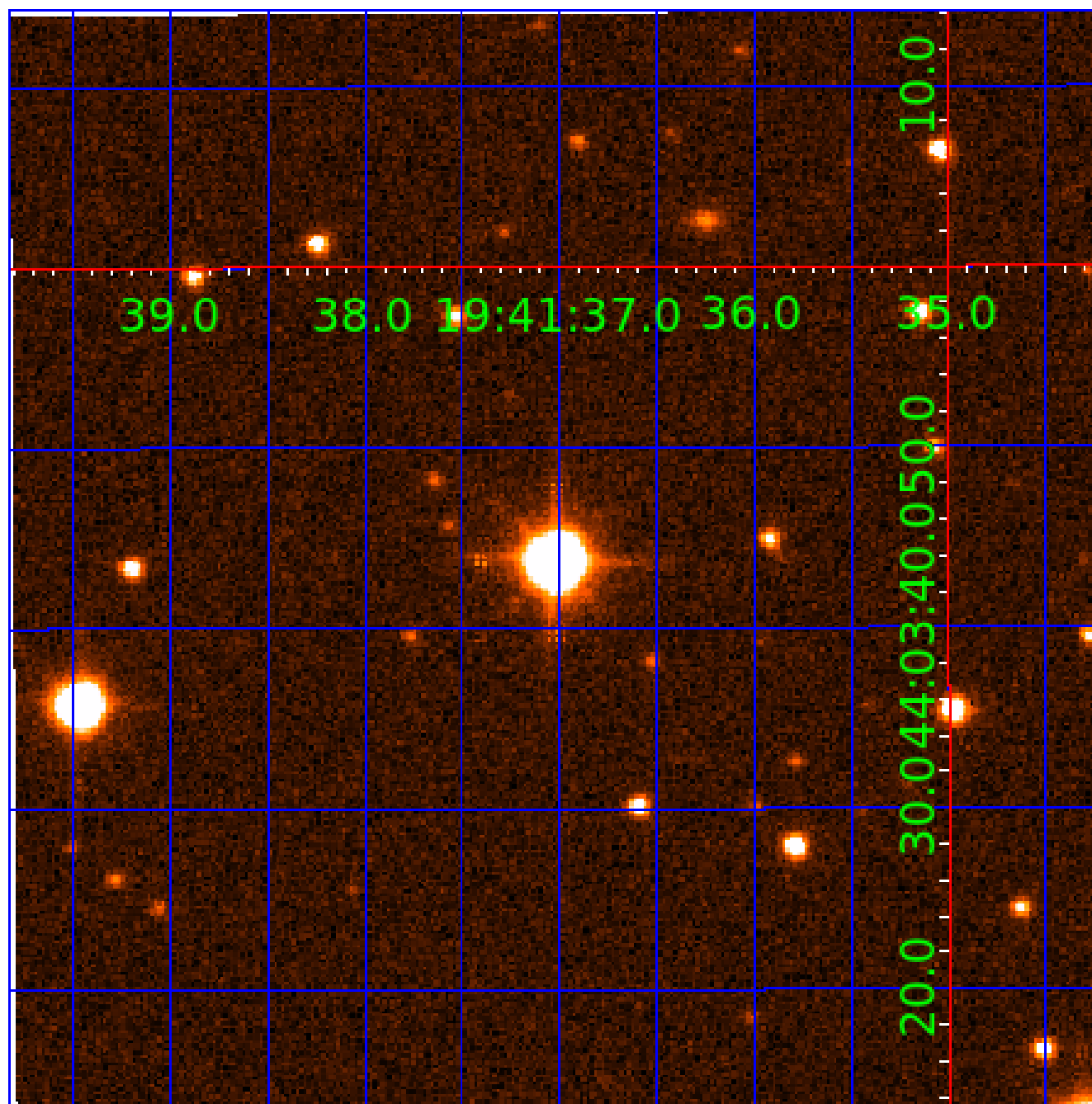


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008176468

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})
008176468-01	OBS	No	376.021803	288.262571	562.8	10.473	34.0	4.4	0.63	4327	1.45	0.17
008176468-02	OBS	No	545.452425	333.293831	996.3	11.780	14.2	7.6	0.63	4327	2.68	0.10
008176468-03	OBS	No	547.578541	470.769390	227.9	12.500	12.3	-1.0	0.63	4327	0.92	0.10
008176468-04	OBS	No	261.506148	287.665503	546.9	3.812	13.8	5.7	0.63	4327	1.53	0.27
008176468-05	OBS	No	465.313666	318.048512	896.5	5.401	12.7	7.2	0.63	4327	1.95	0.13
008176468-06	OBS	No	270.775055	370.377823	502.0	2.743	11.8	5.9	0.63	4327	1.40	0.26

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008176468-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
008176468-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008176468-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—CENT_NOFITS
008176468-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008176468-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—HALO_GHOST
008176468-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_ALT—ALL_TRANS_CHASES—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS

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

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

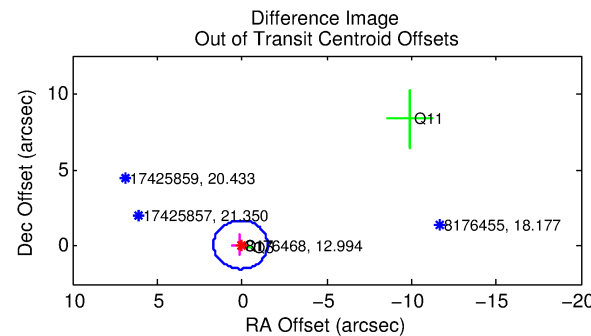
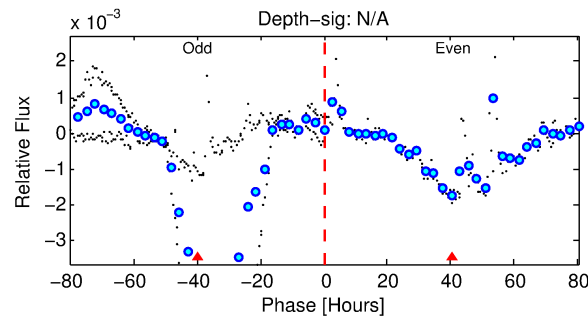
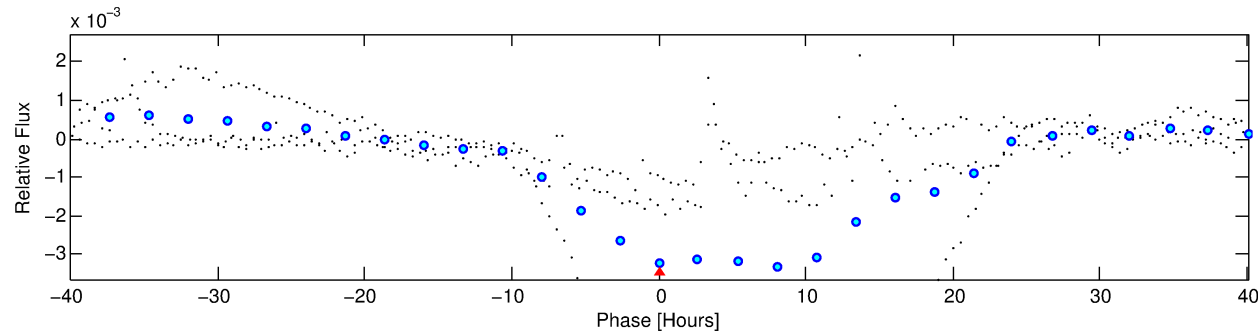
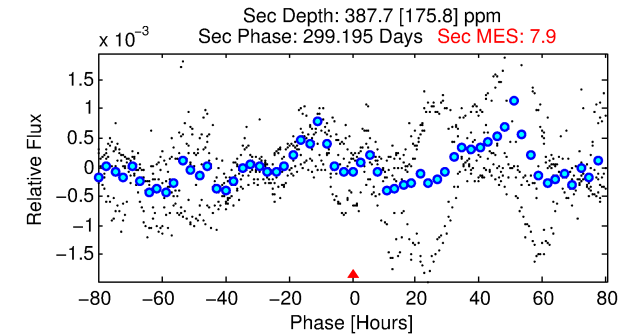
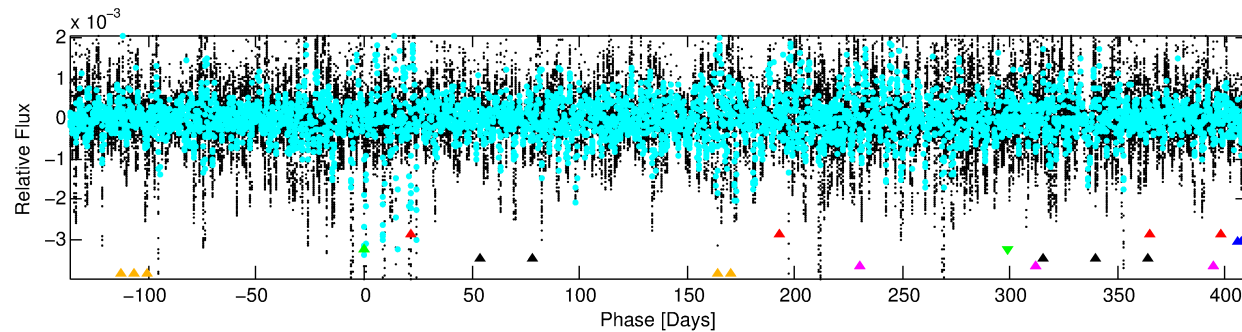
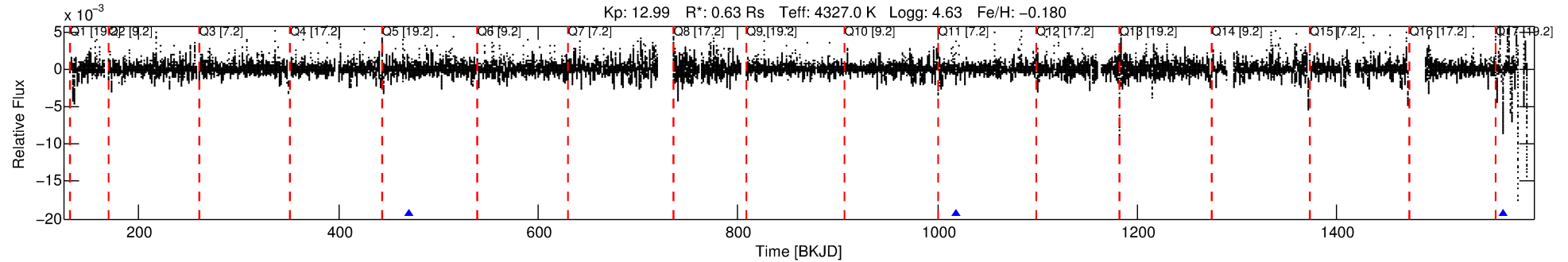
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008176468-03

No Significant Match Found

DV One-Page Summary

KIC: 8176468 Candidate: 3 of 6 Period: 547.579 d



TPS TCE Results:

Period = 547.57854 d
Epoch = 470.7694 BKJD

DV fit results are unavailable

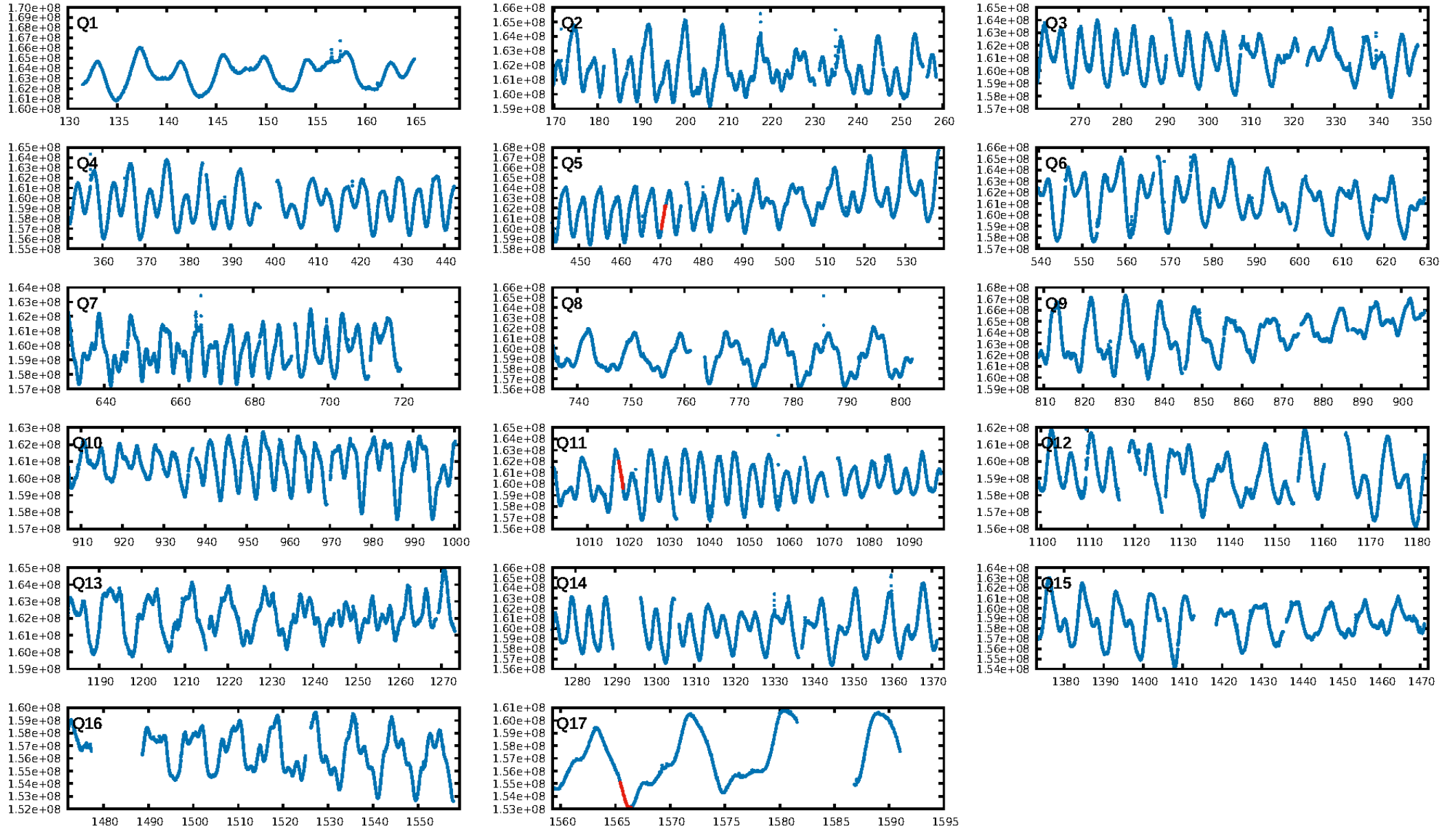
DV Diagnostic Results:

ShortPeriod-sig: 99.7% [2.97 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [2/2]
GhostDiagnostic-chr: -2.412
Centroid-sig: 49.6%
Centroid-so: 0.242 arcsec [1.03 σ]
OotOffset-rm: 0.113 arcsec [0.21 σ]
KicOffset-rm: 0.285 arcsec [0.08 σ]
OotOffset-st: 0/1/0/2 [3]
KicOffset-st: 0/1/0/2 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 1.00 [3/3]

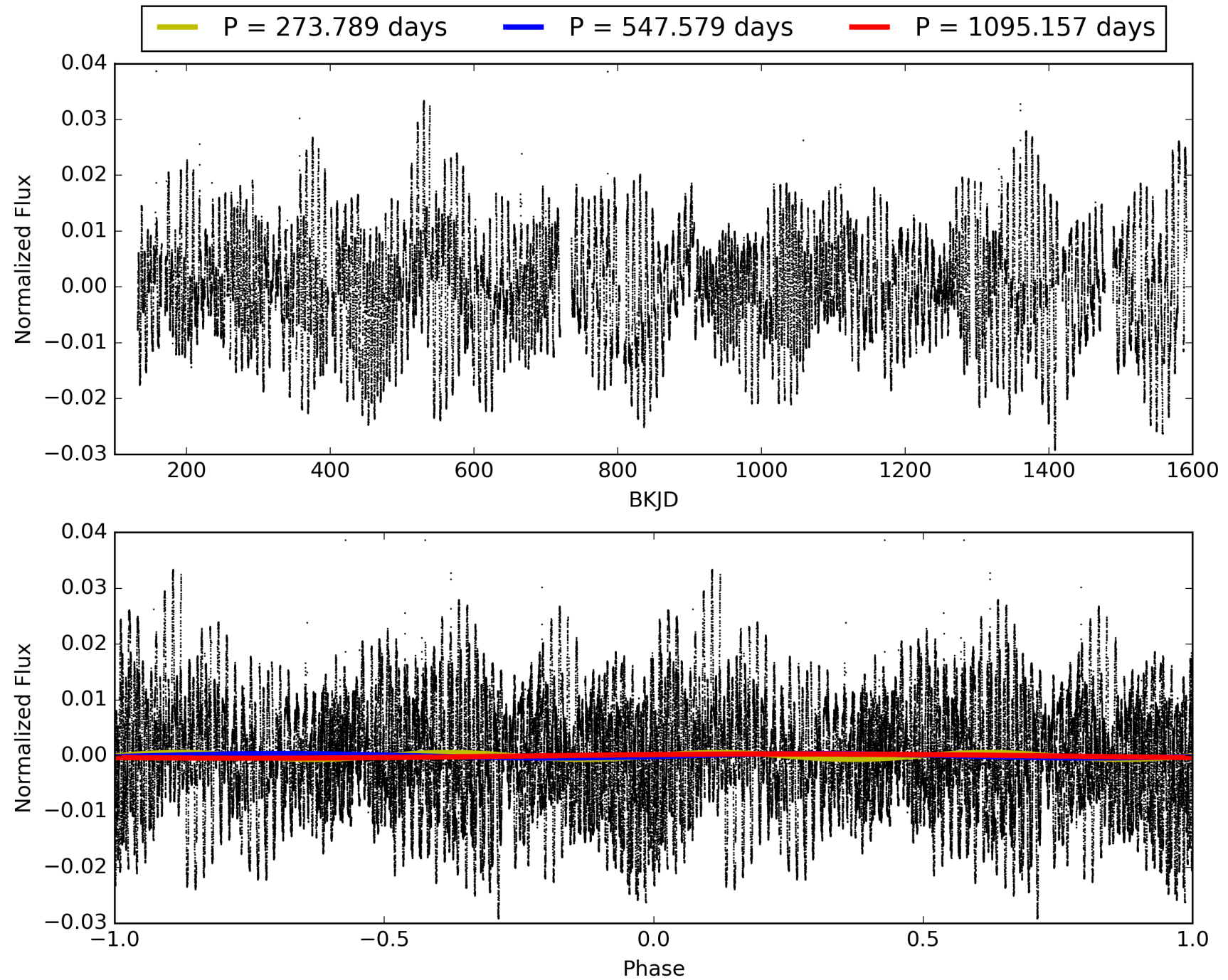
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 10:07:10 Z

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

TCE 008176468-03, PDC Light Curves

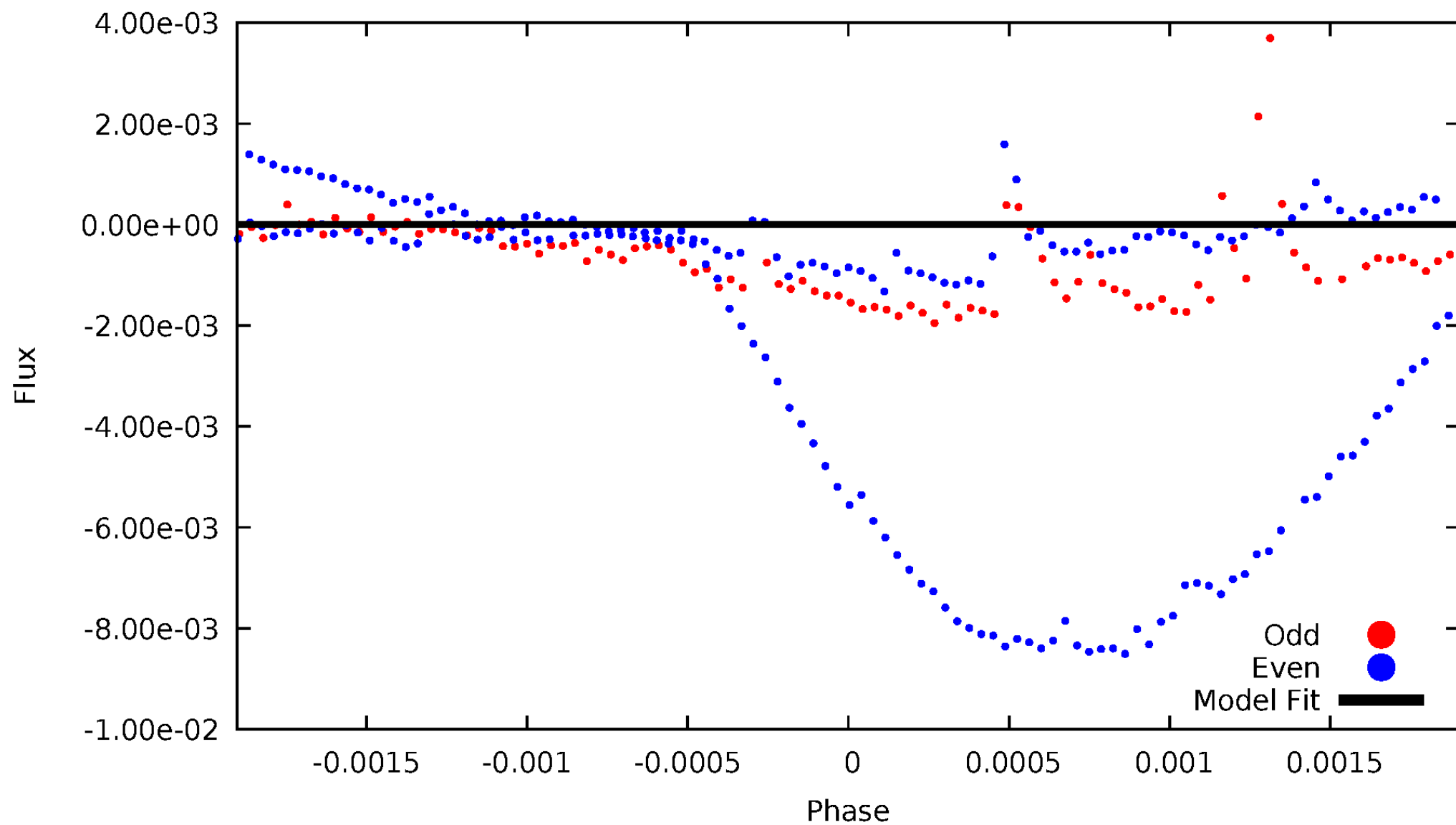


TCE 008176468-03



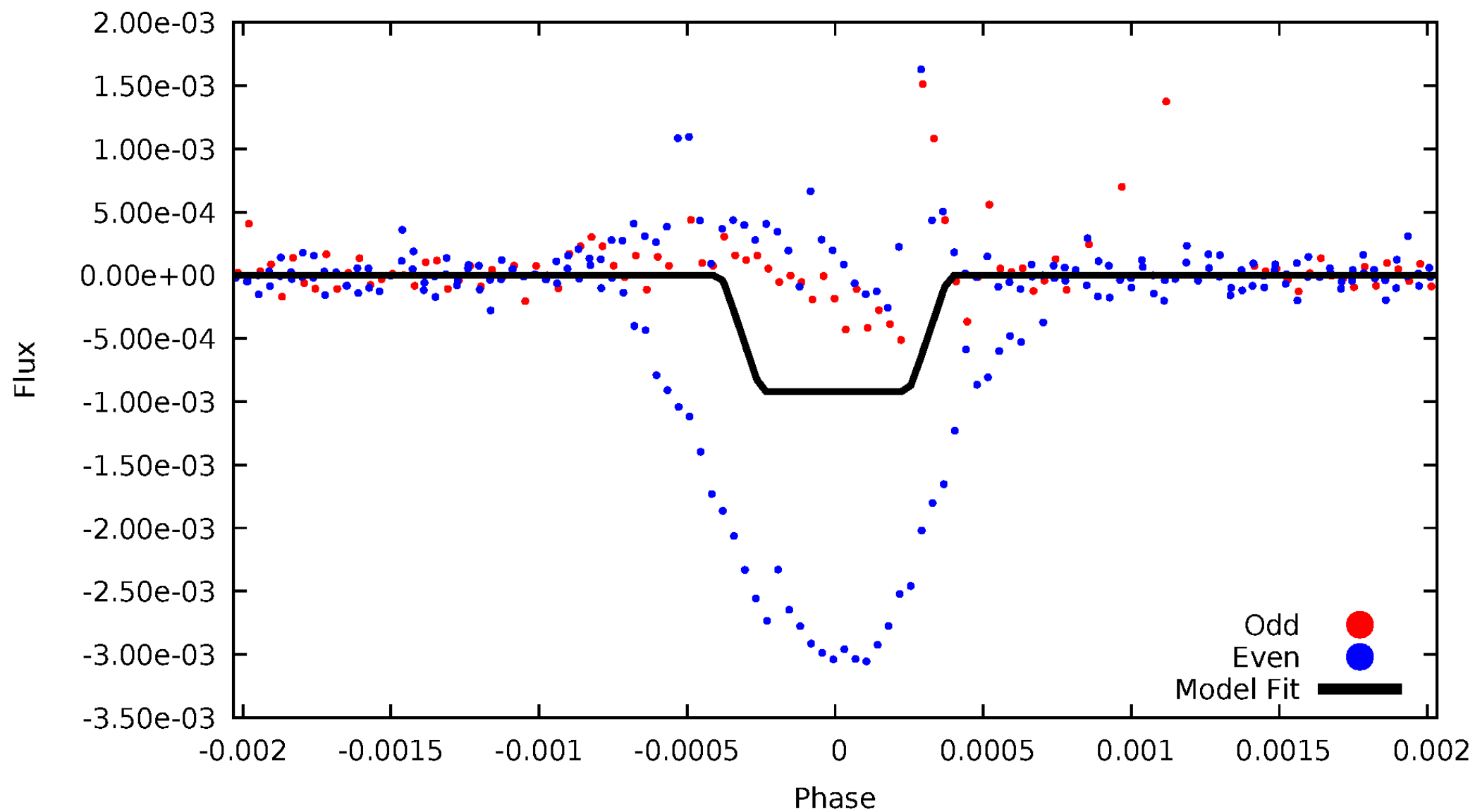
DV Odd/Even

TCE 008176468-03



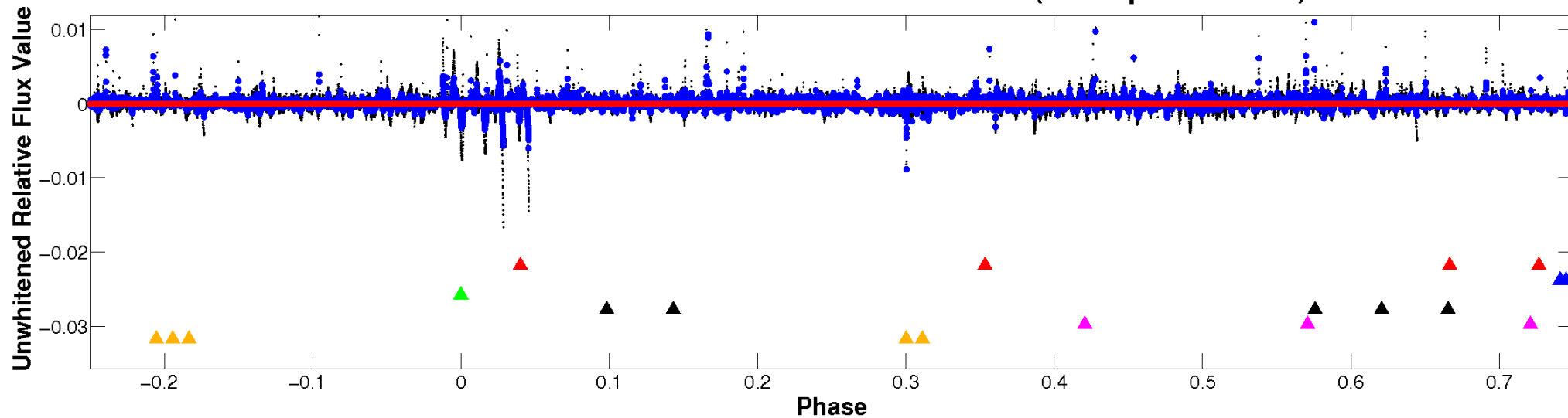
ALT Odd/Even

TCE 008176468-03

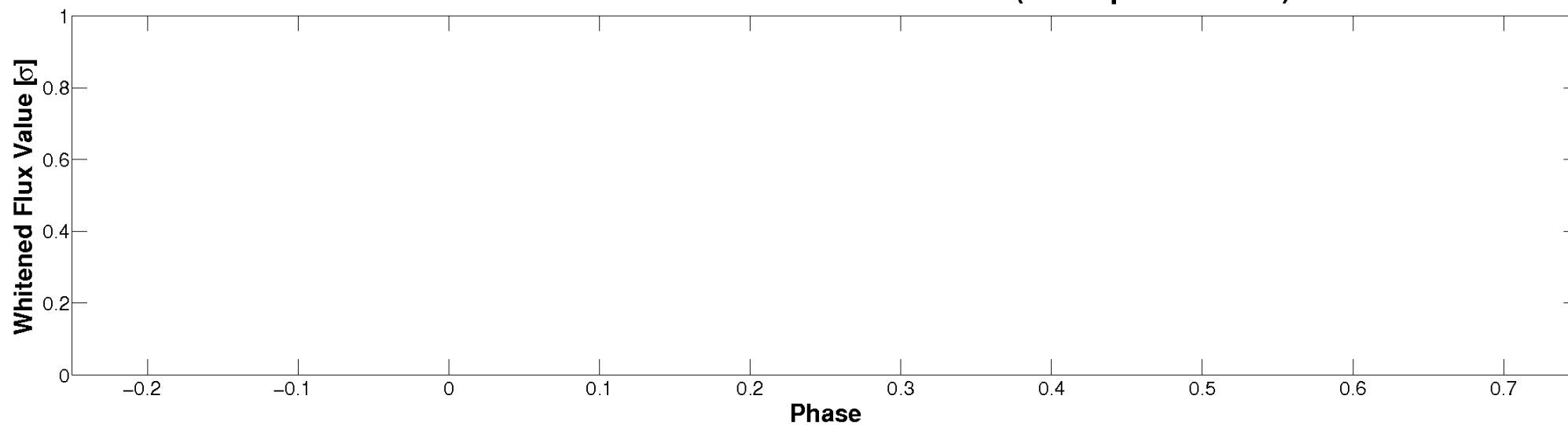


Non-Whitened Vs. Whitened Light Curve

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

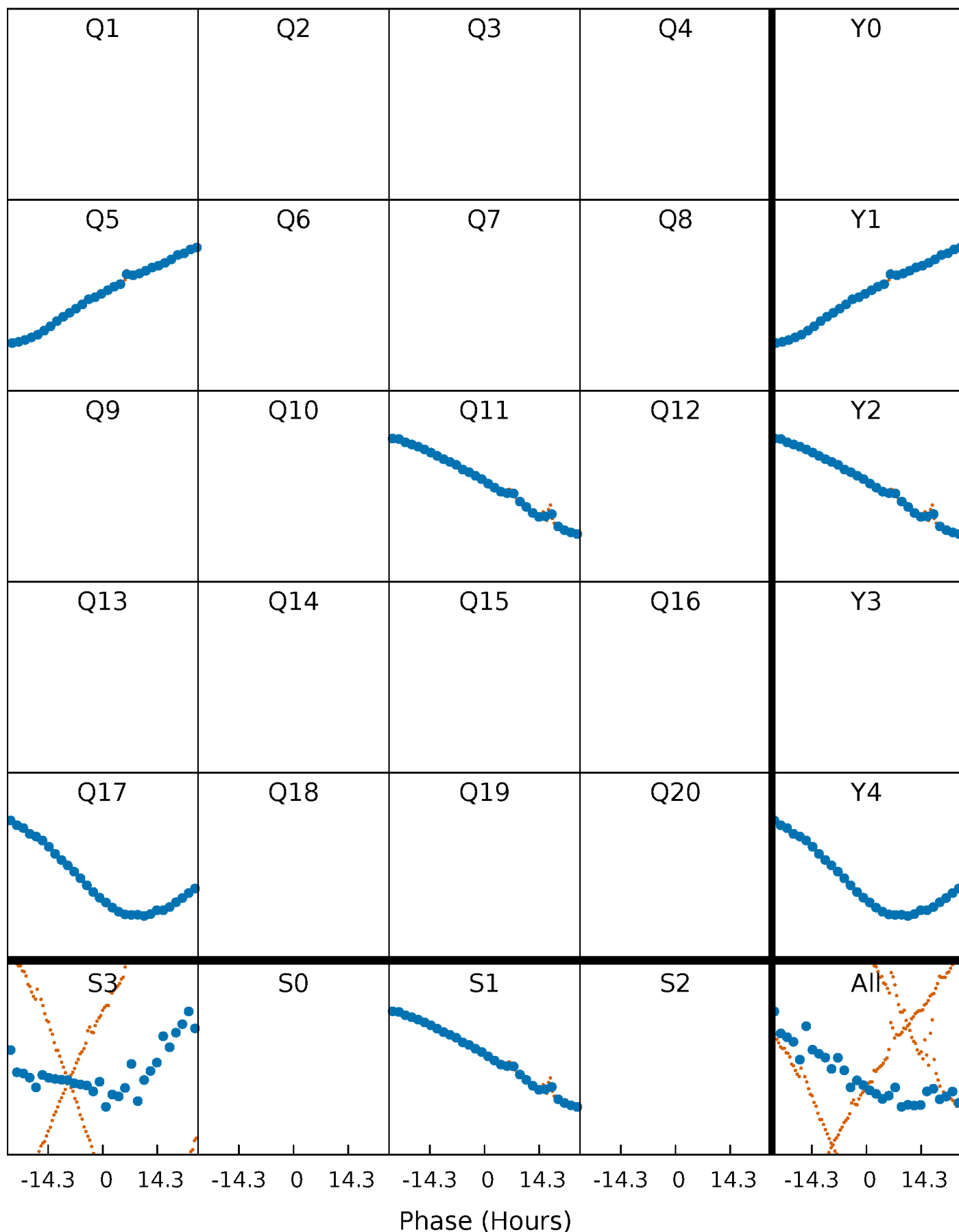


Planet 3 : Phased Whitened Flux Time Series (TPS Epoch/Period)



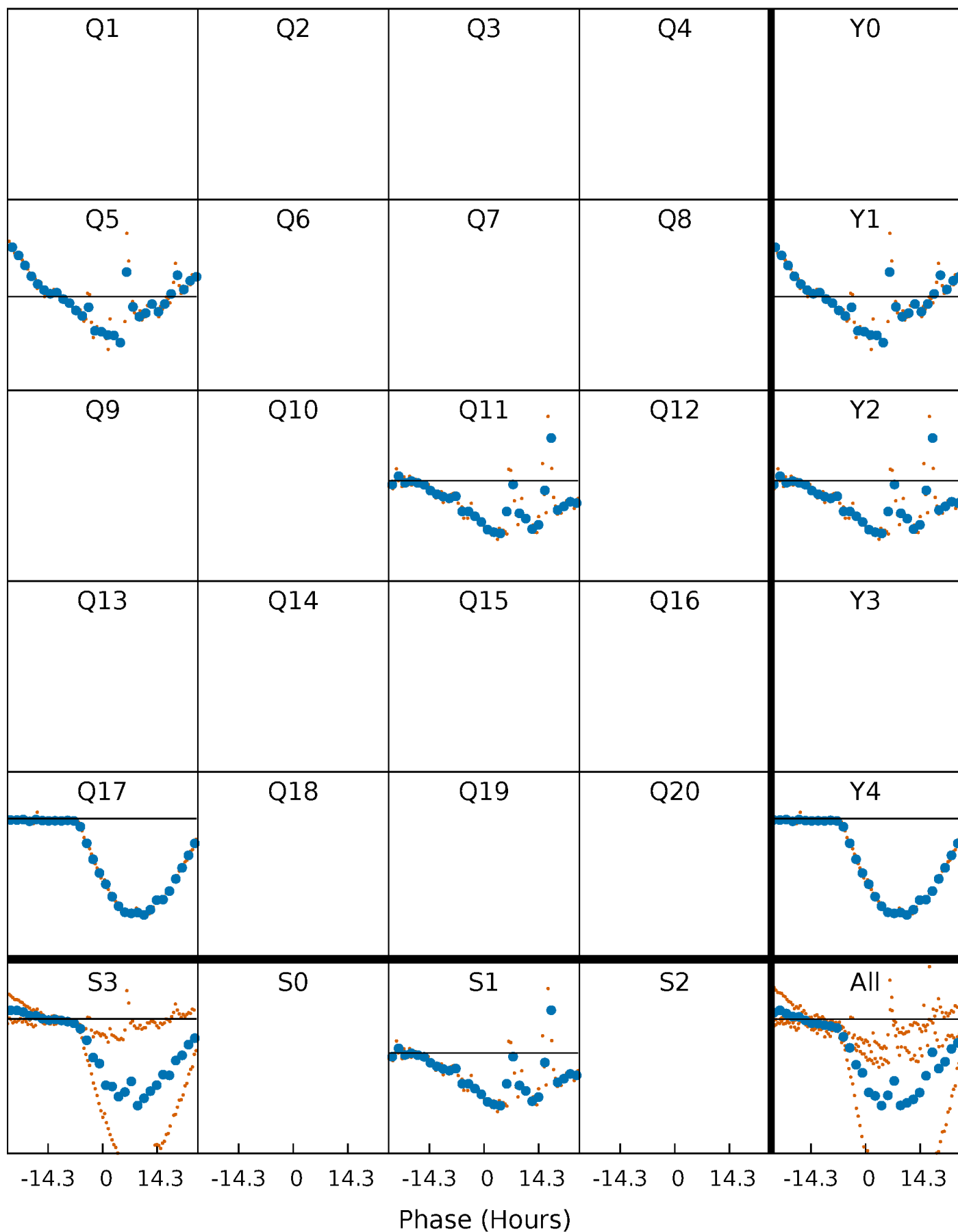
PDC Quarter-Phased Transit Curves

TCE 008176468-03 $P=547.578541$ Days $T_0=470.769390$ (BKJD)



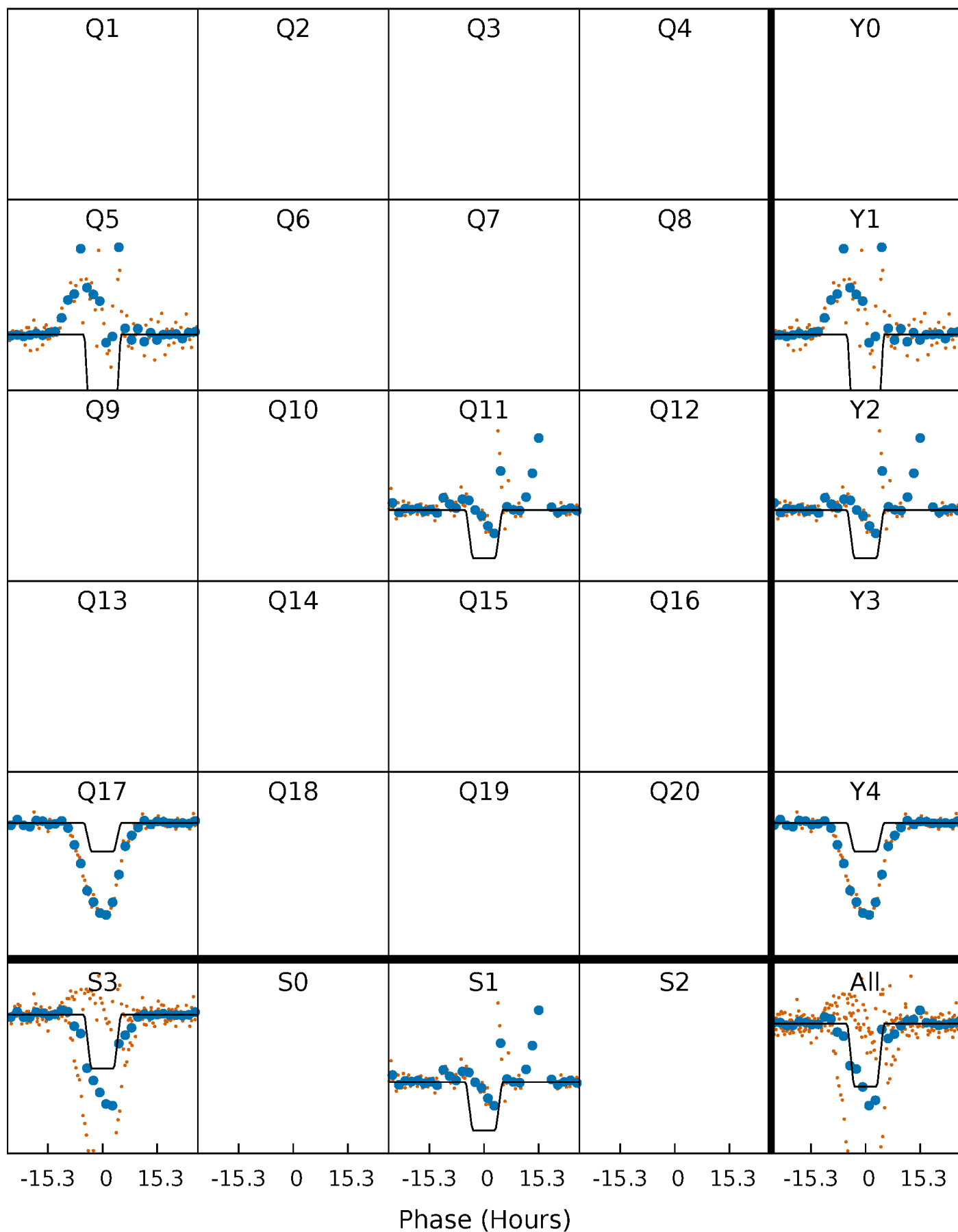
DV Quarter-Phased Transit Curves

TCE 008176468-03 $P=547.578541$ Days $T_0=470.769390$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

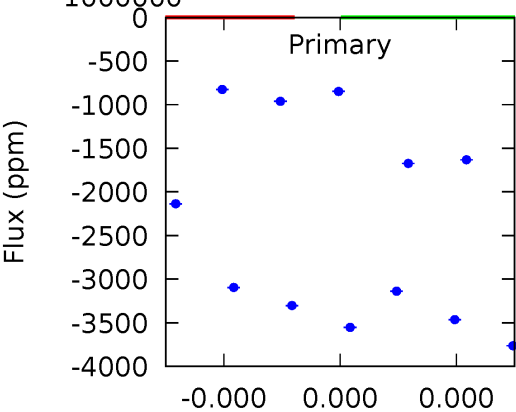
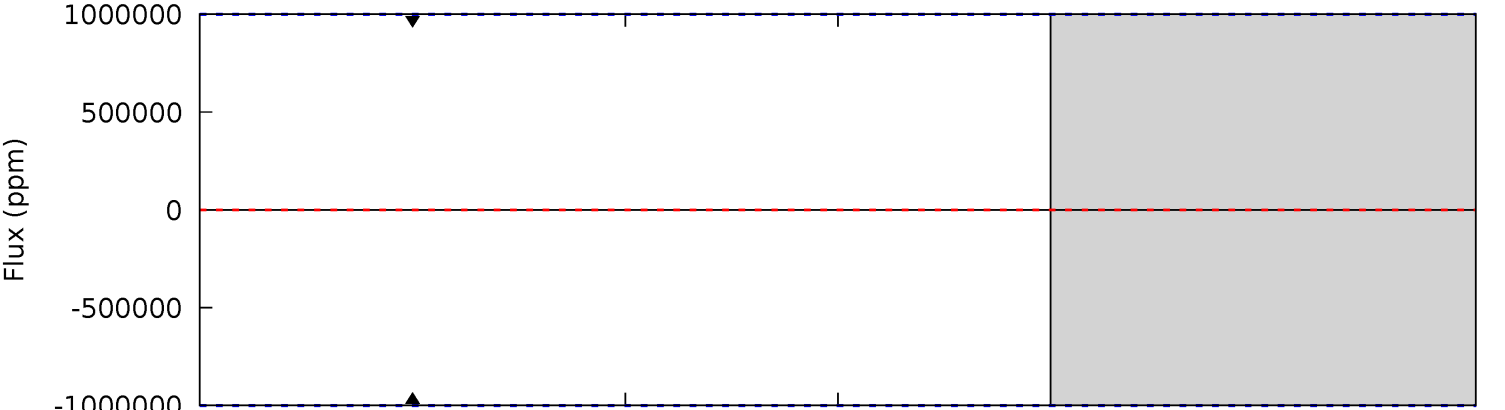
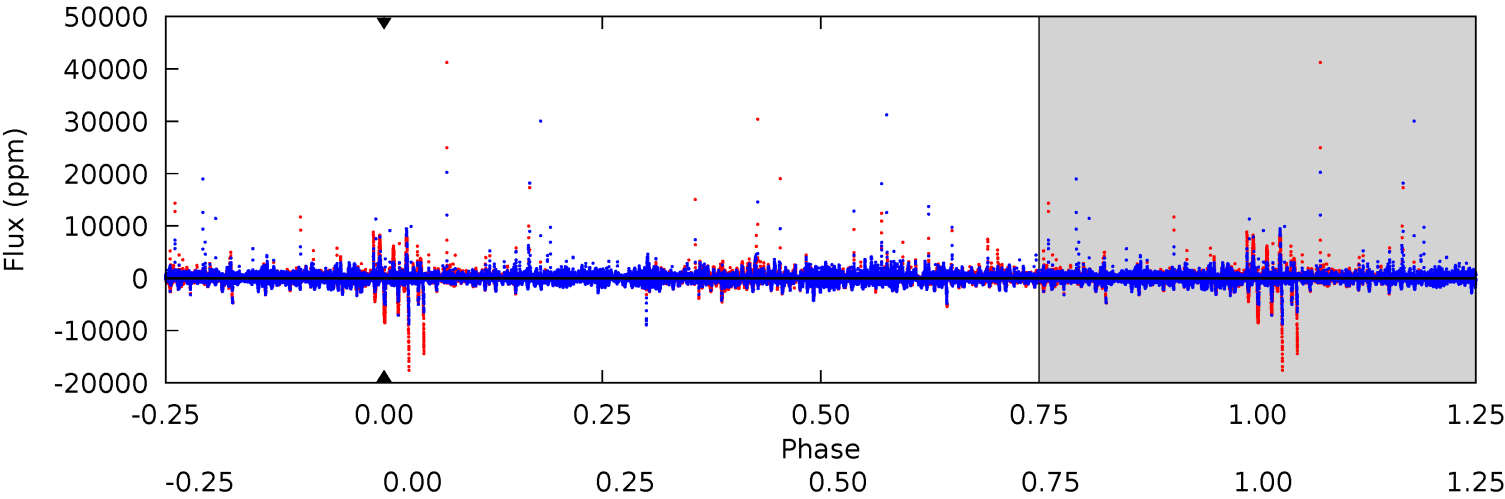
TCE 008176468-03 $P=547.578541$ Days $T_0=470.897080$ (BKJD)



DV Model-Shift Uniqueness Test

008176468-03, P = 547.578541 Days, E = 470.769390 Days

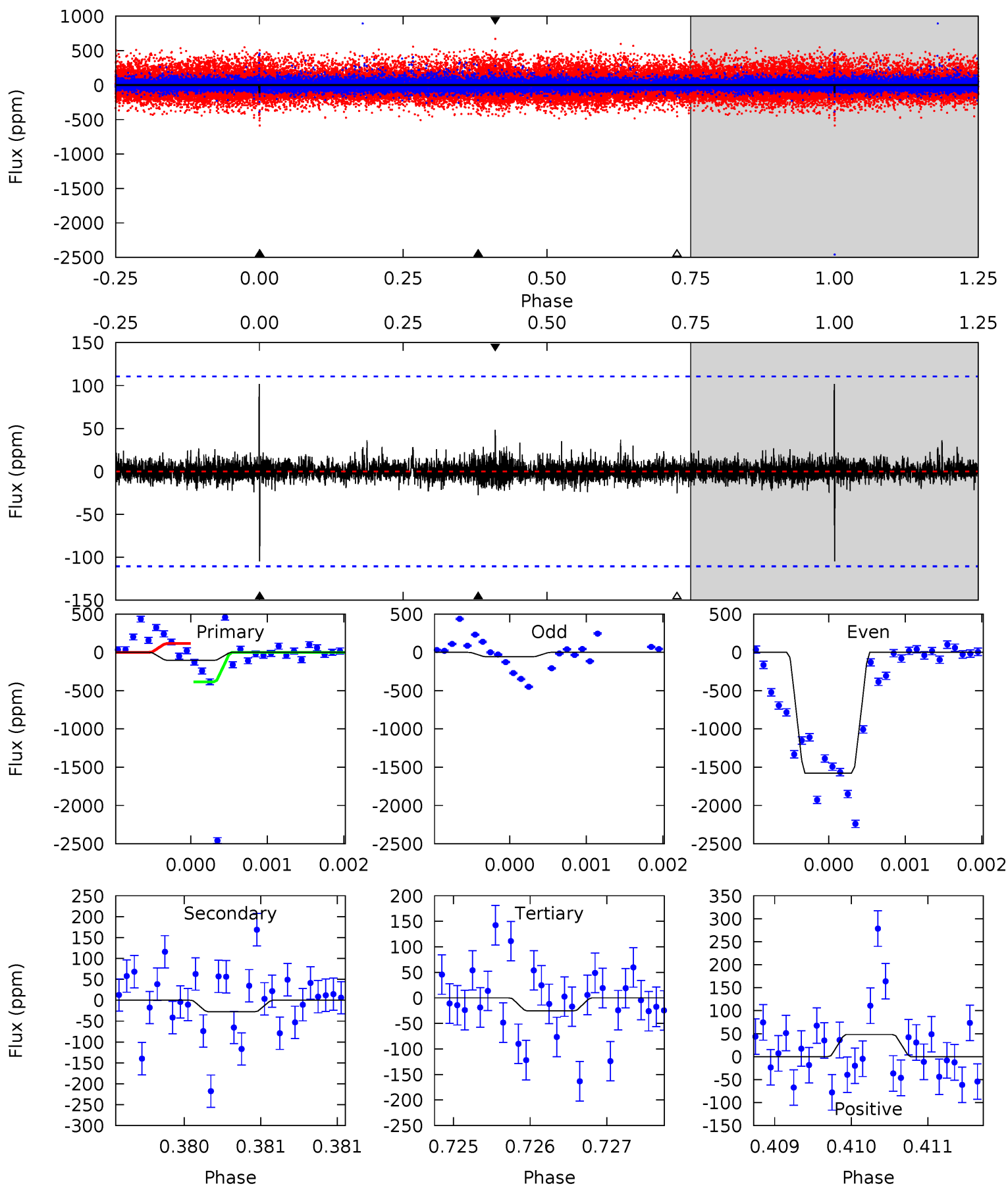
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

008176468-03, P = 547.578541 Days, E = 470.897080 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.21	1.38	1.27	2.40	5.50	3.37	0.34	3.94	2.82	0.10	-1.02	43.0	15.7	0.49	6.63



Stellar Parameters For KIC 008176468

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	4327^{+116}_{-129}	$4.627^{+0.052}_{-0.021}$	$-0.180^{+0.300}_{-0.300}$	$0.634^{+0.040}_{-0.060}$	$0.621^{+0.062}_{-0.056}$	$3.432^{+0.800}_{-0.366}$
	+3%/-3%	+1%/-0%	+167%/-167%	+6%/-9%	+10%/-9%	+23%/-11%
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 008176468-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	0 ± 1000000	$5.24^{+4.83}_{-3.64}$	199^{+6}_{-7}	-3278^{+14183}_{-7020}	$-24600.759^{+4568729.527}_{-4278580.232}$
Alt.	-28 ± 20	$5.81^{+5.64}_{-4.15}$	199^{+7}_{-6}	1970^{+637}_{-335}	453^{+4989}_{-387}

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 $A_{obs} \gg 1.0$

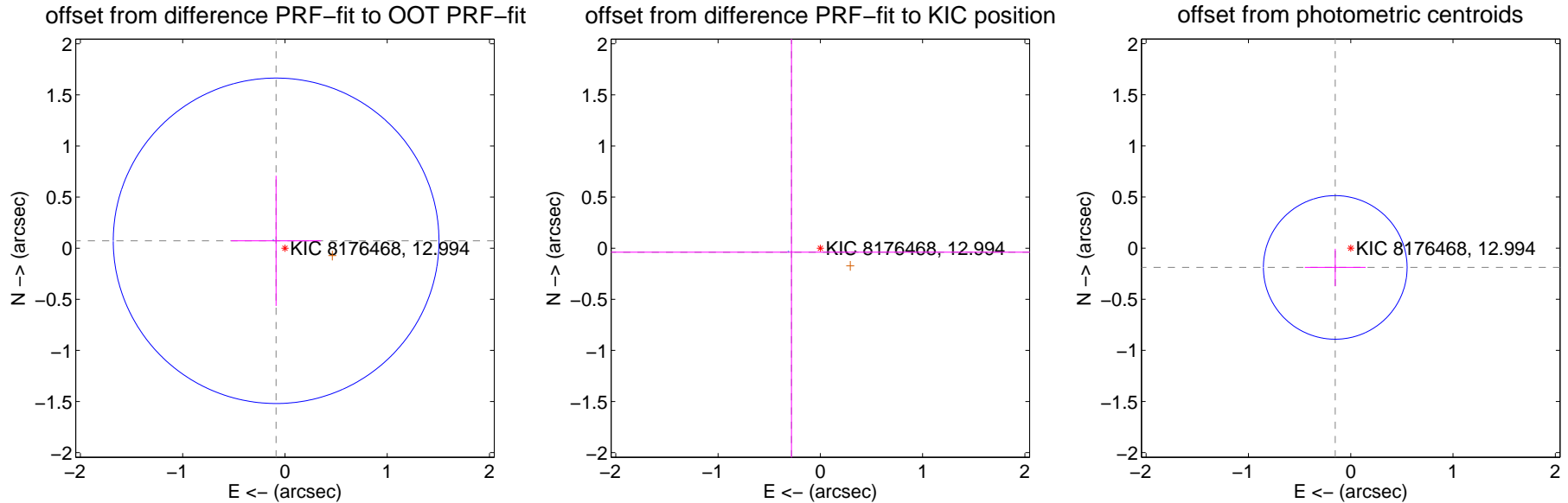
DV Centroid Data

Supplemental centroid analysis for 008176468-03. Kepler magnitude: 12.99. Transit SNR -1.00

There are 1 quarters with good PRF difference image offsets

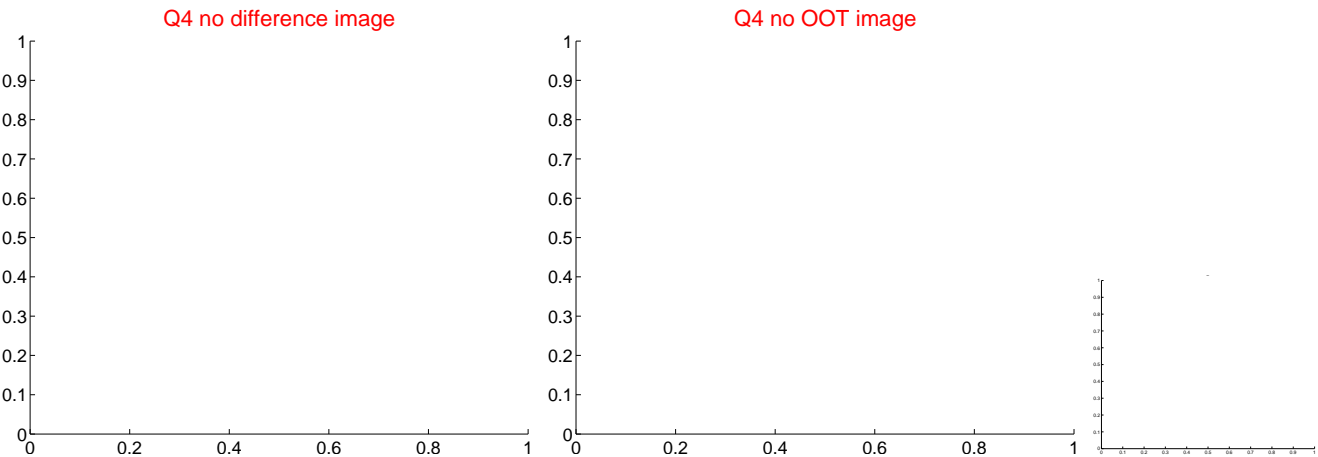
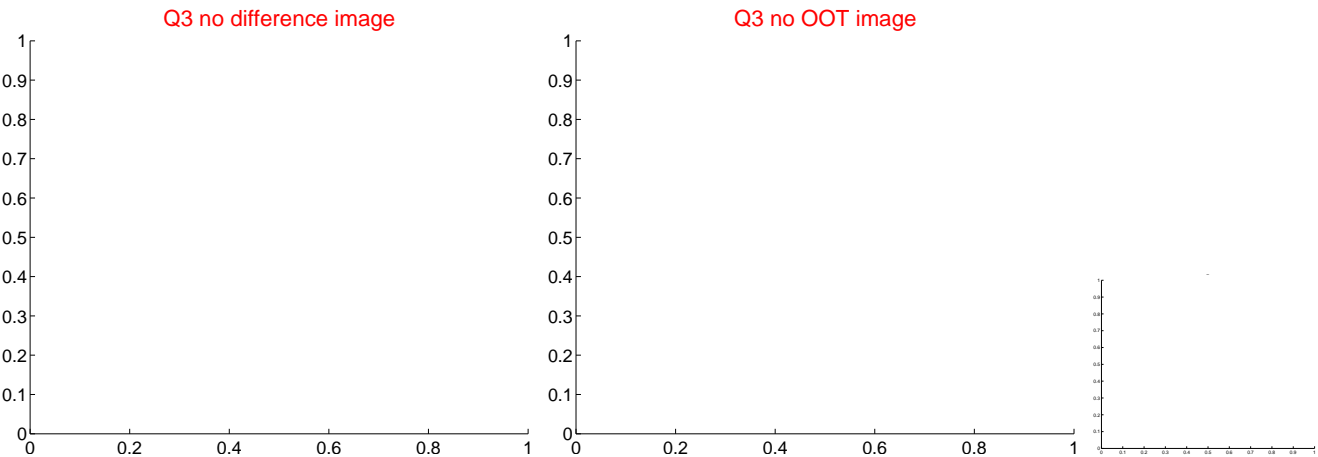
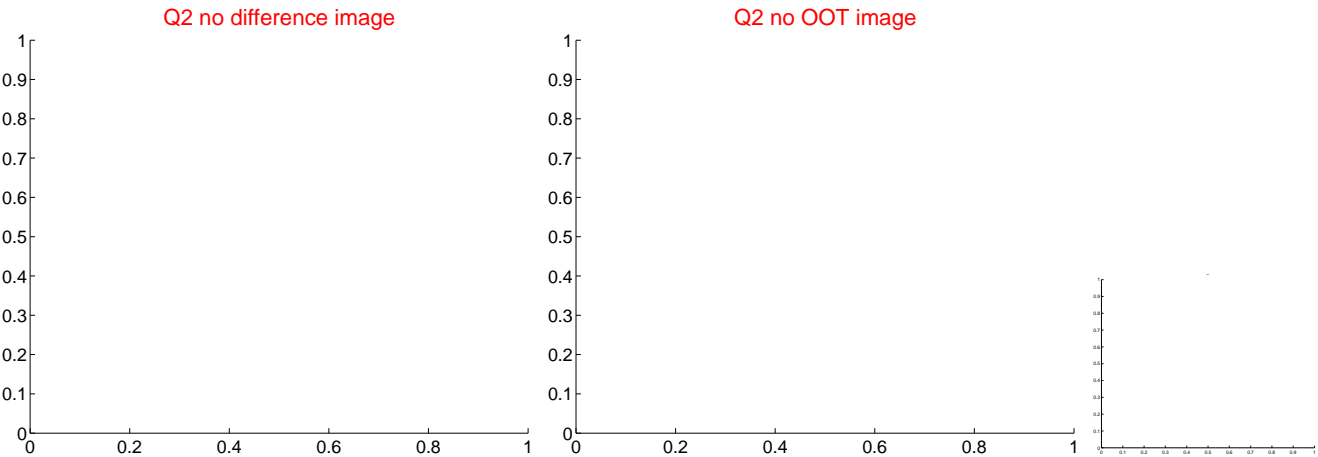
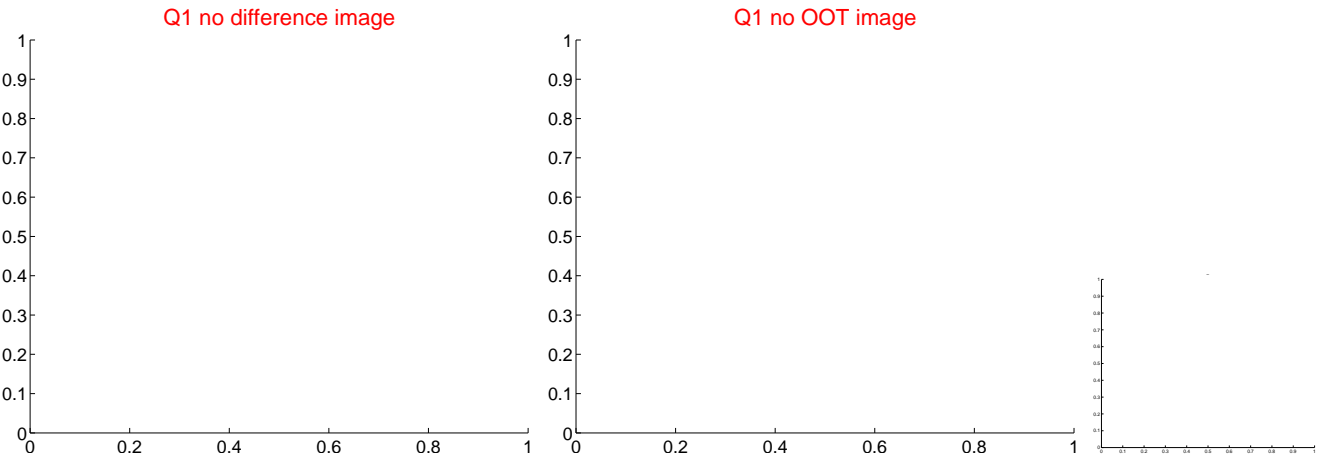
The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.113 ± 0.531	0.21	0.086 ± 0.441	0.072 ± 0.637
PRF-fit source offset from KIC position	0.285 ± 3.655	0.08	0.282 ± 3.309	-0.039 ± 2.737
photometric centroid source offset	0.24 ± 0.23	1.03	0.15 ± 0.30	-0.19 ± 0.18

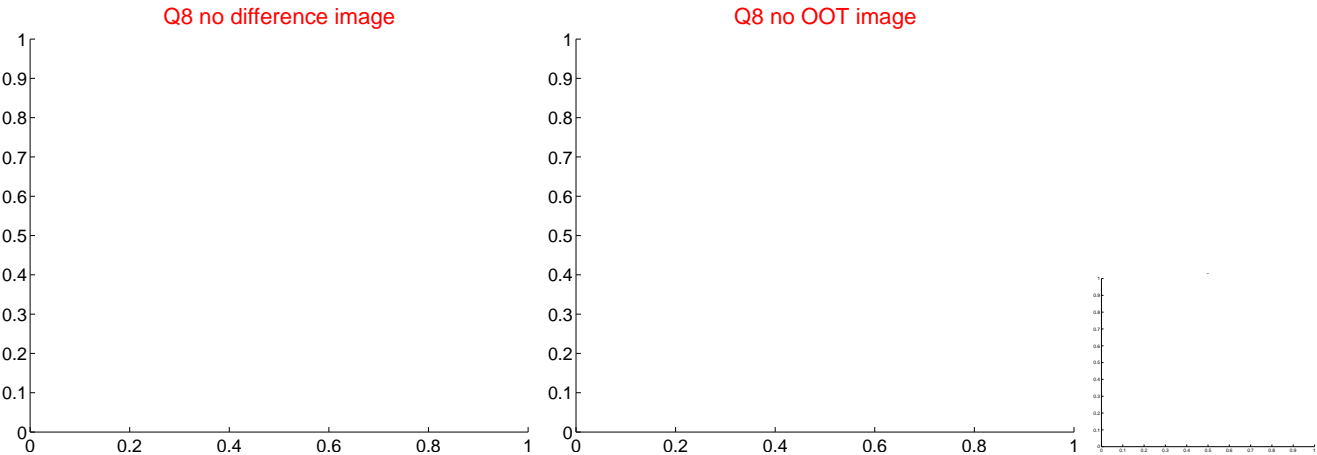
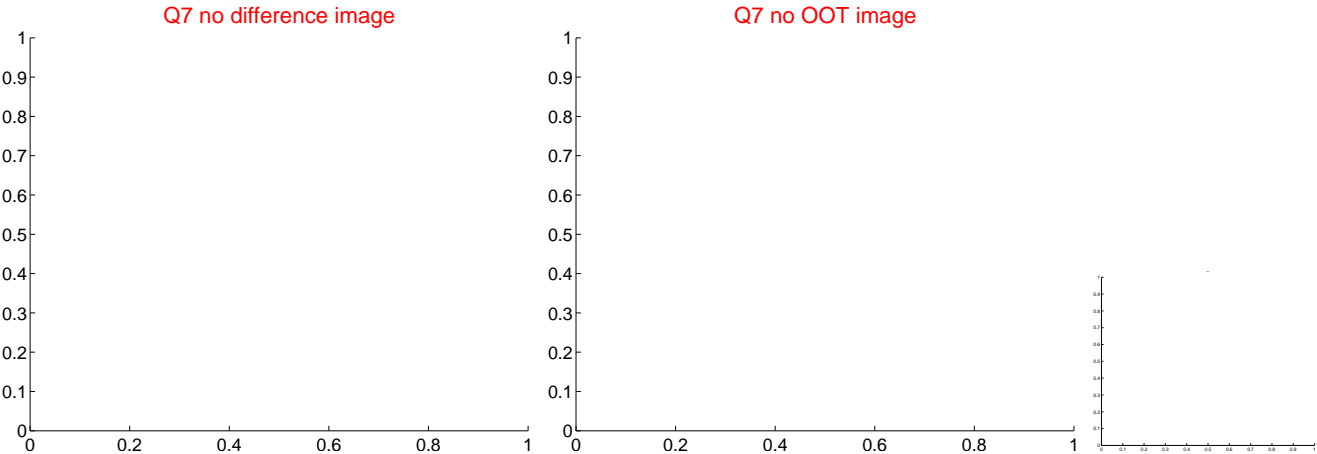
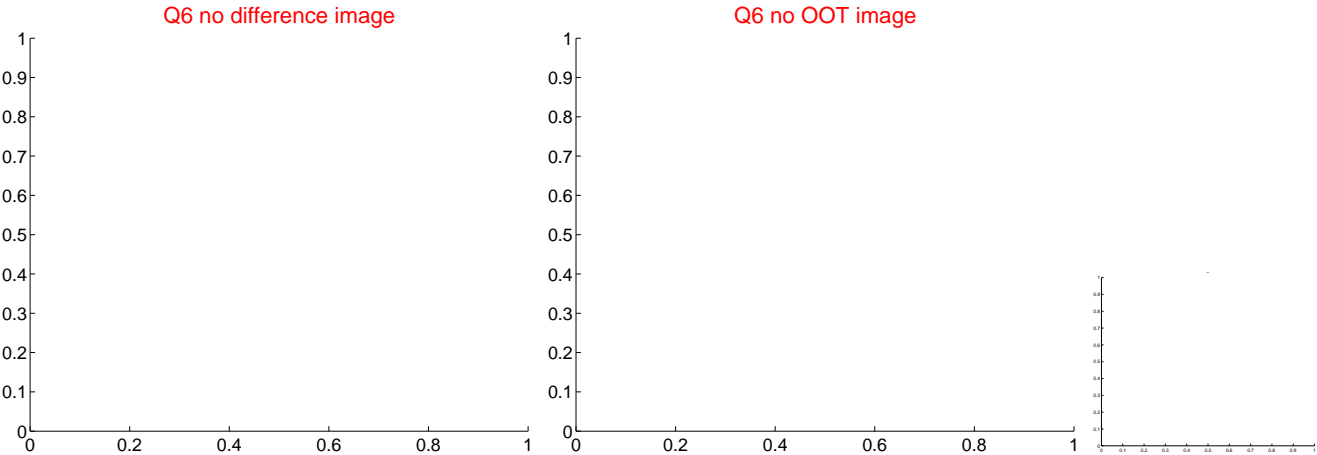
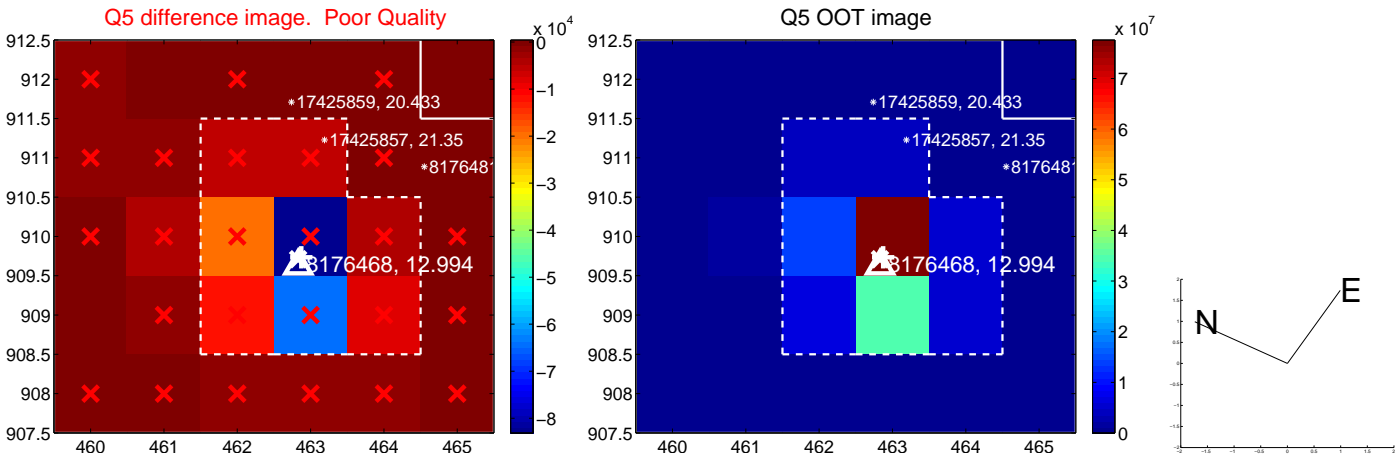


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

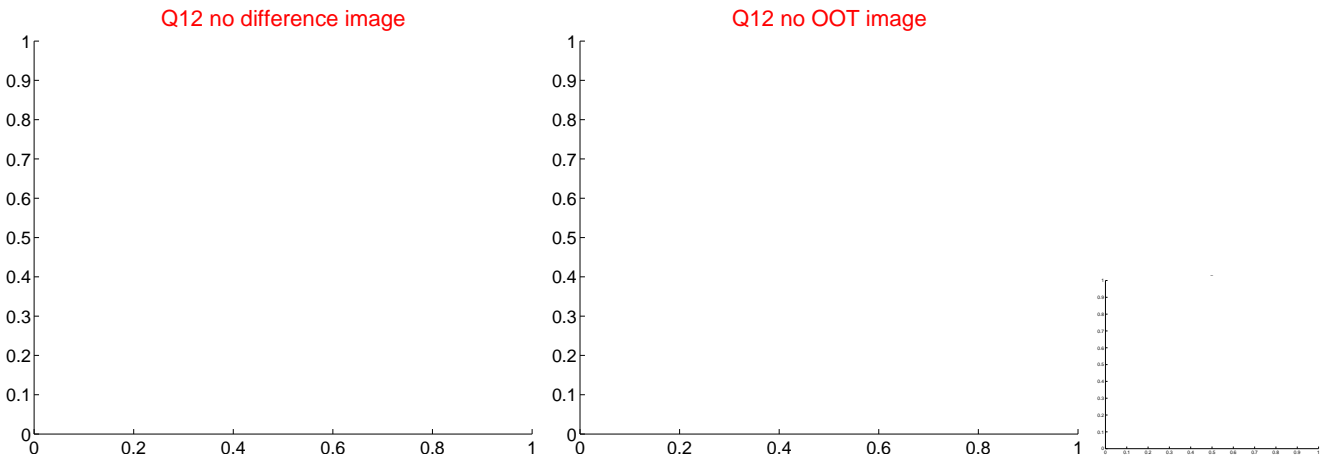
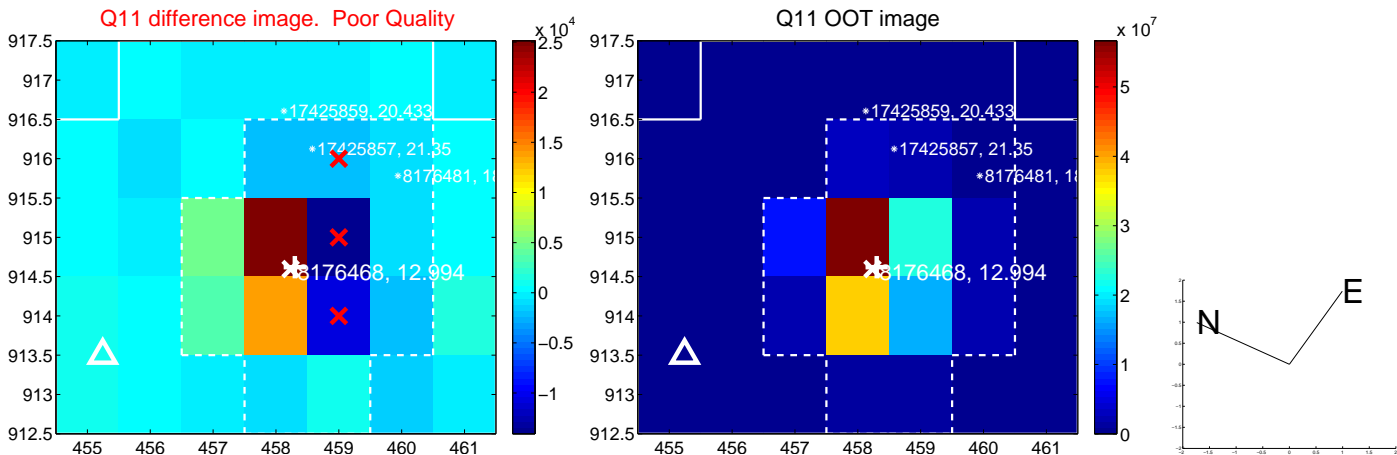
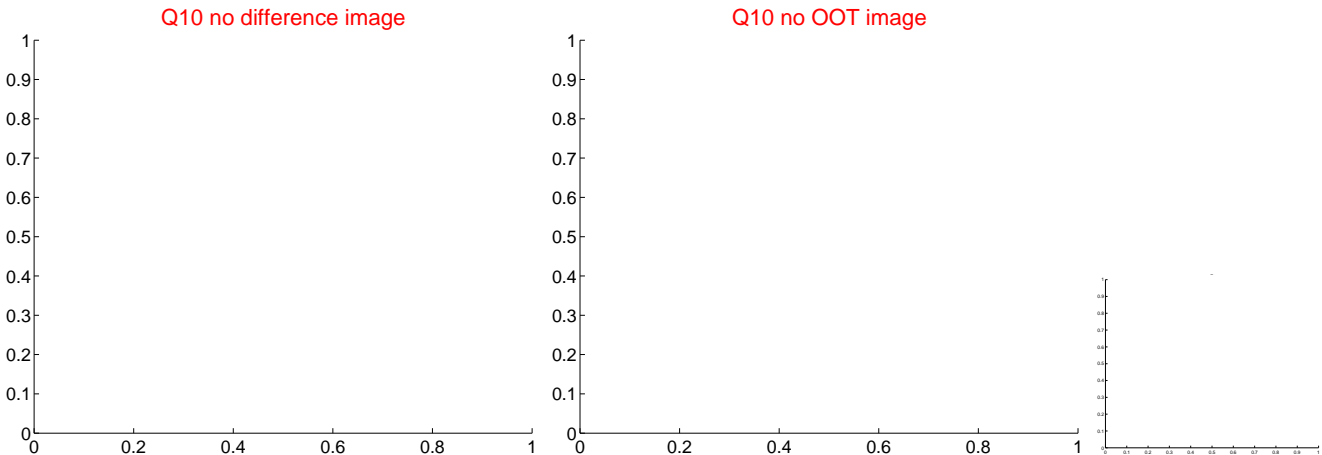
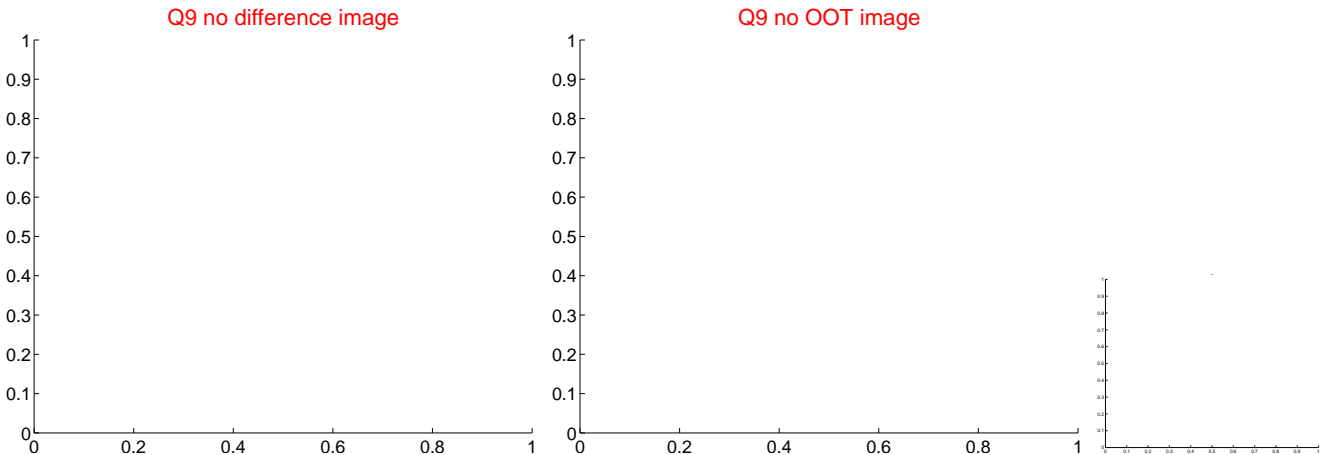
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



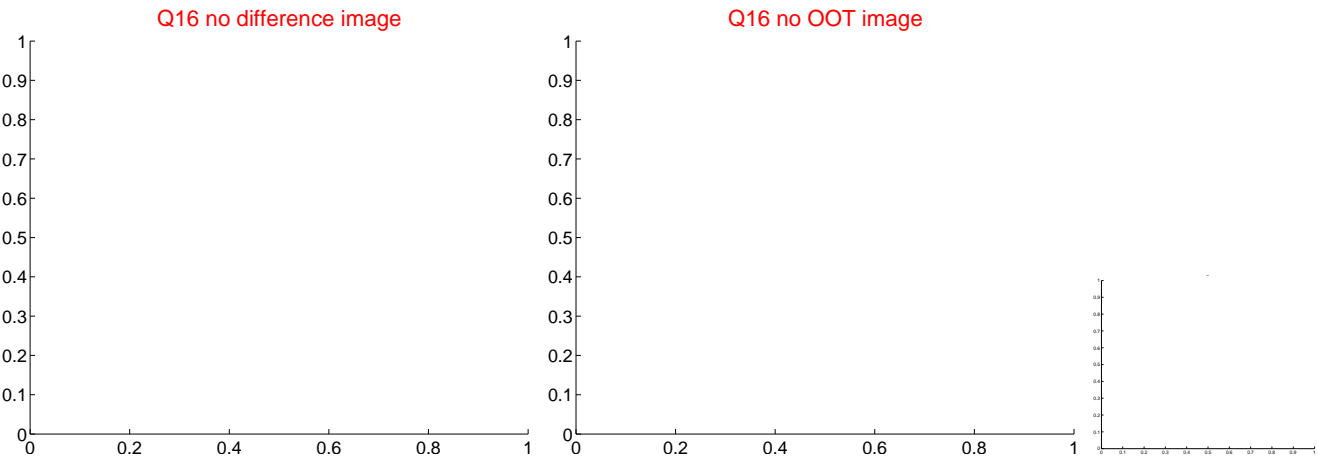
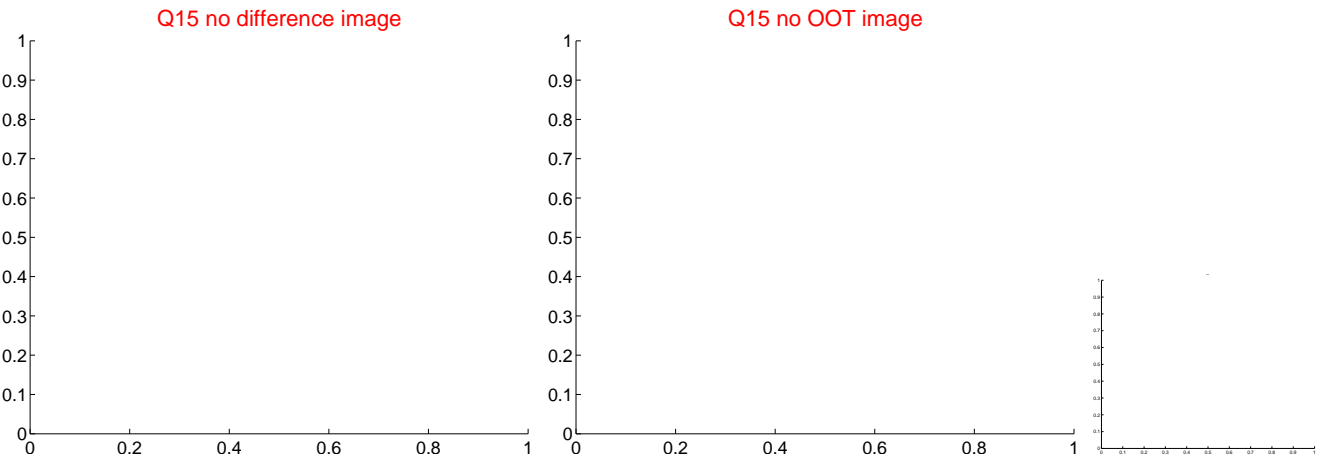
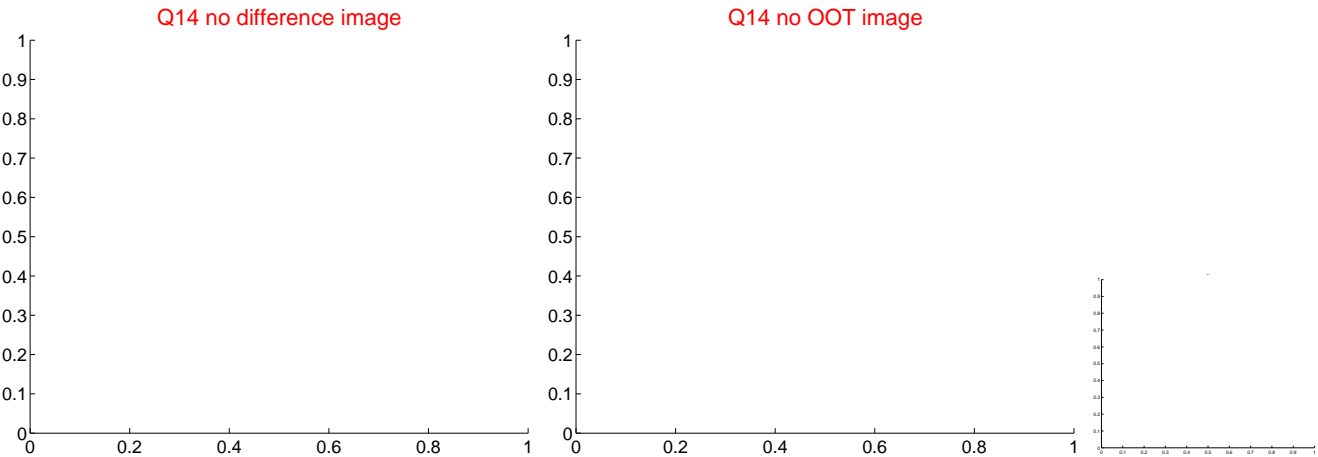
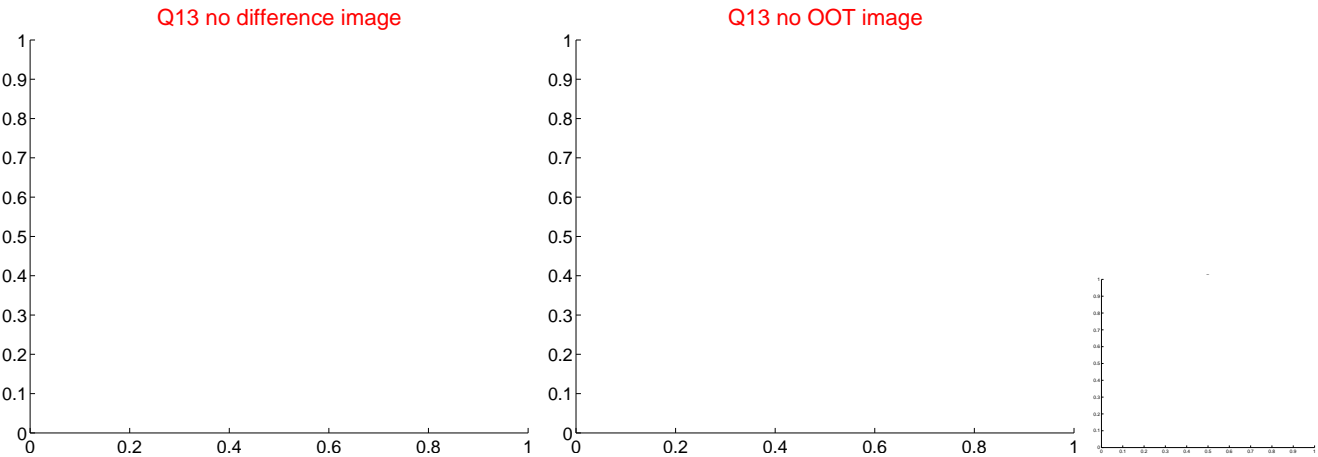
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



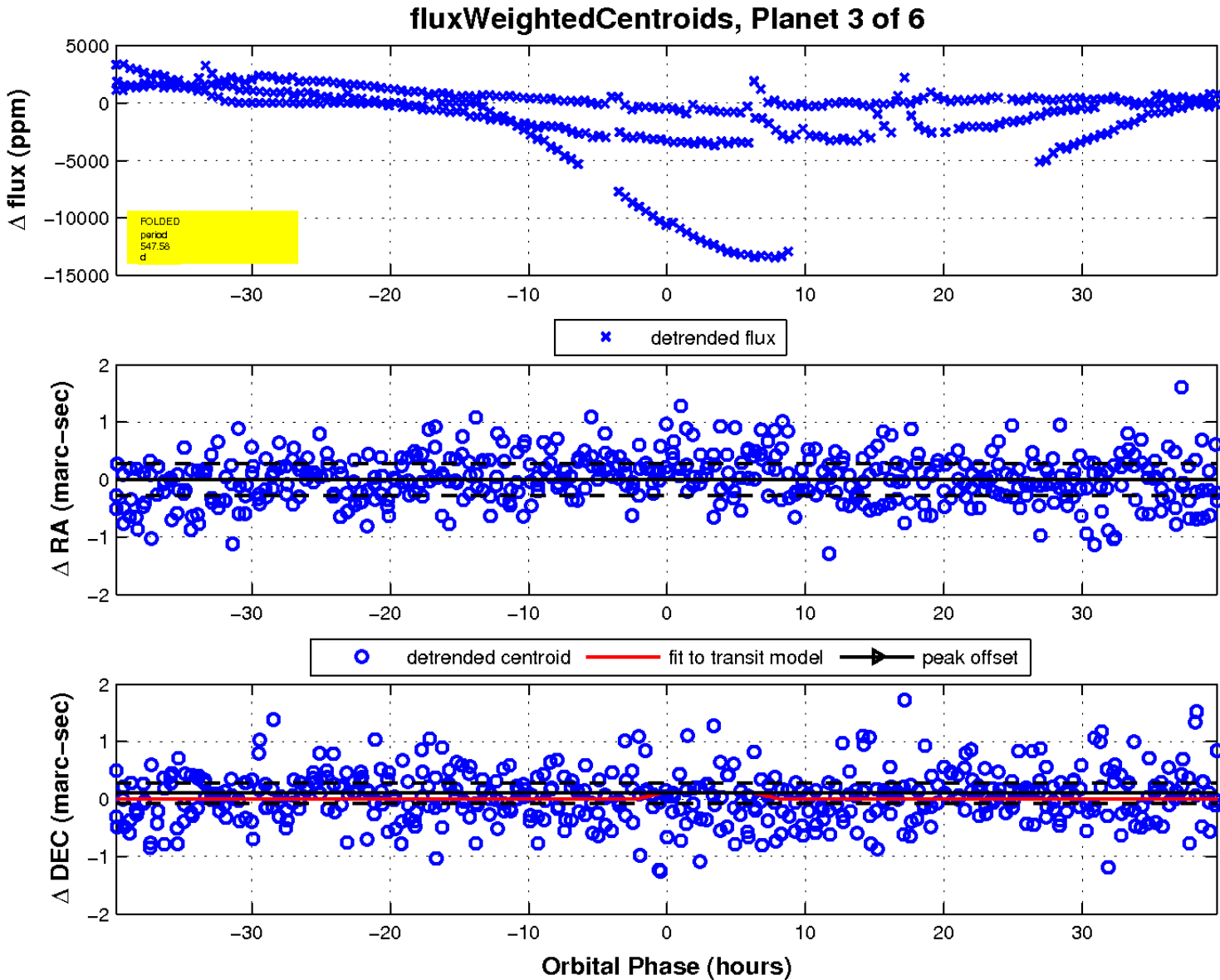
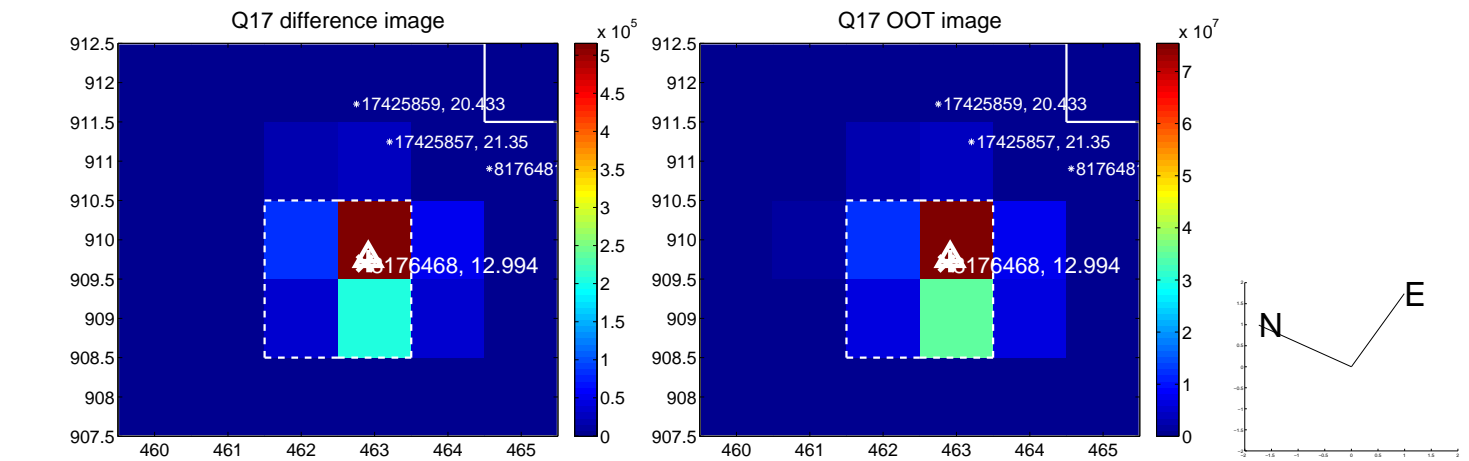
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



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

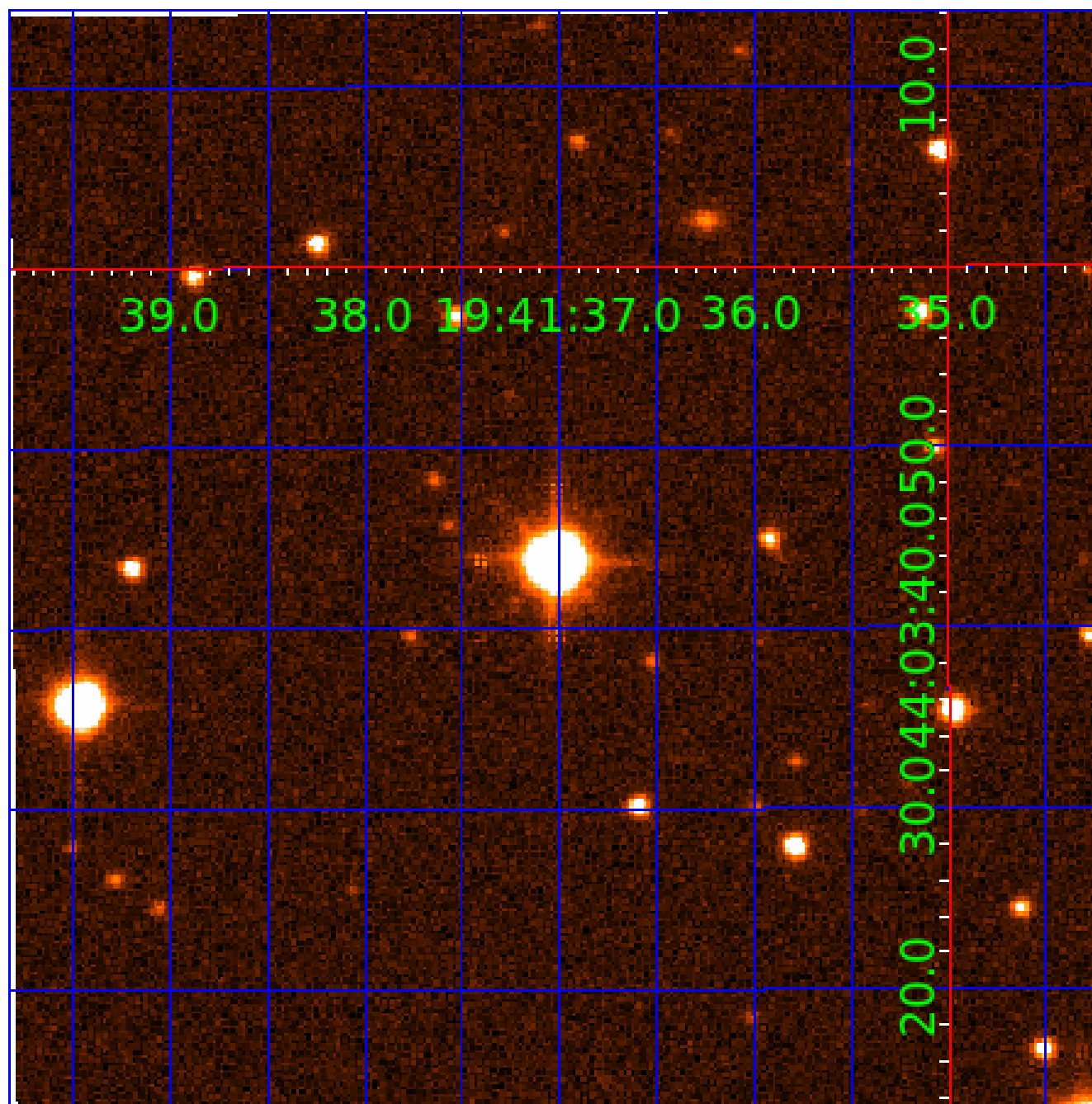


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008176468

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})
008176468-01	OBS	No	376.021803	288.262571	562.8	10.473	34.0	4.4	0.63	4327	1.45	0.17
008176468-02	OBS	No	545.452425	333.293831	996.3	11.780	14.2	7.6	0.63	4327	2.68	0.10
008176468-03	OBS	No	547.578541	470.769390	227.9	12.500	12.3	-1.0	0.63	4327	0.92	0.10
008176468-04	OBS	No	261.506148	287.665503	546.9	3.812	13.8	5.7	0.63	4327	1.53	0.27
008176468-05	OBS	No	465.313666	318.048512	896.5	5.401	12.7	7.2	0.63	4327	1.95	0.13
008176468-06	OBS	No	270.775055	370.377823	502.0	2.743	11.8	5.9	0.63	4327	1.40	0.26

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008176468-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
008176468-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008176468-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—CENT_NOFITS
008176468-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008176468-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—HALO_GHOST
008176468-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_ALT—ALL_TRANS_CHASES—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS

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

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

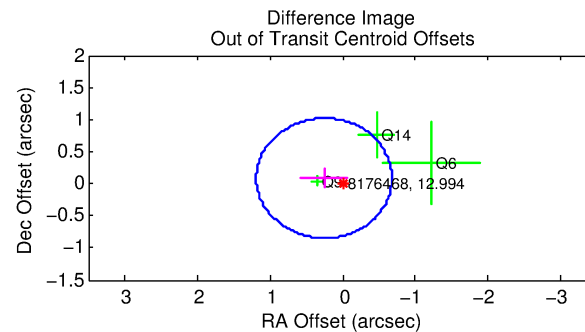
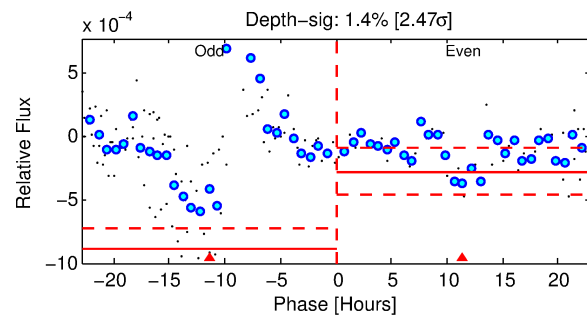
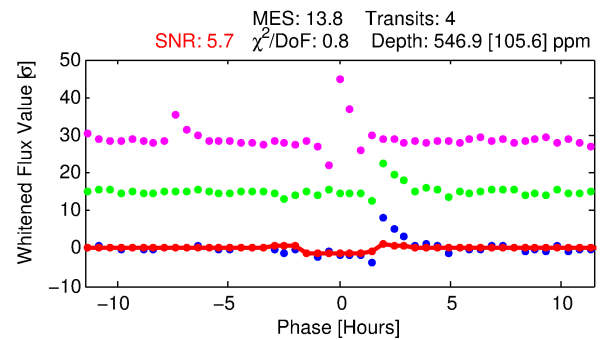
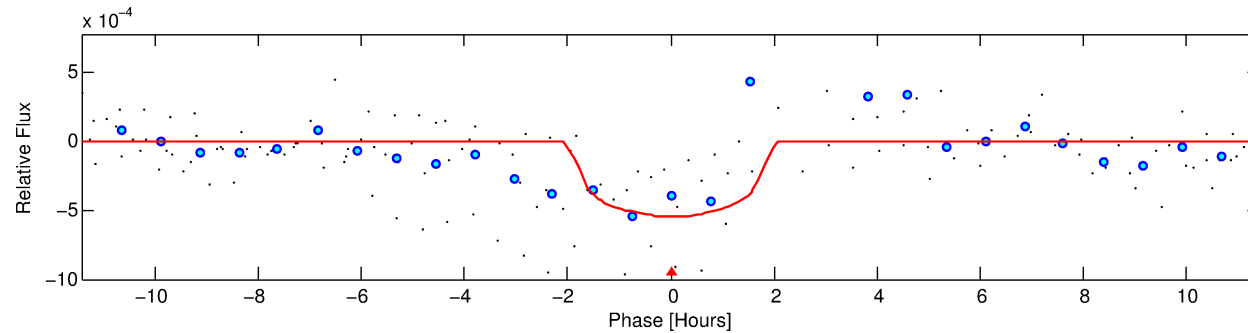
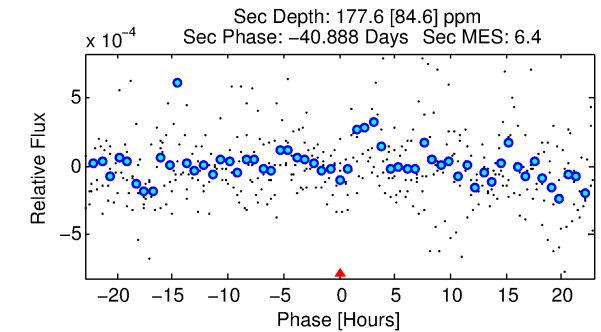
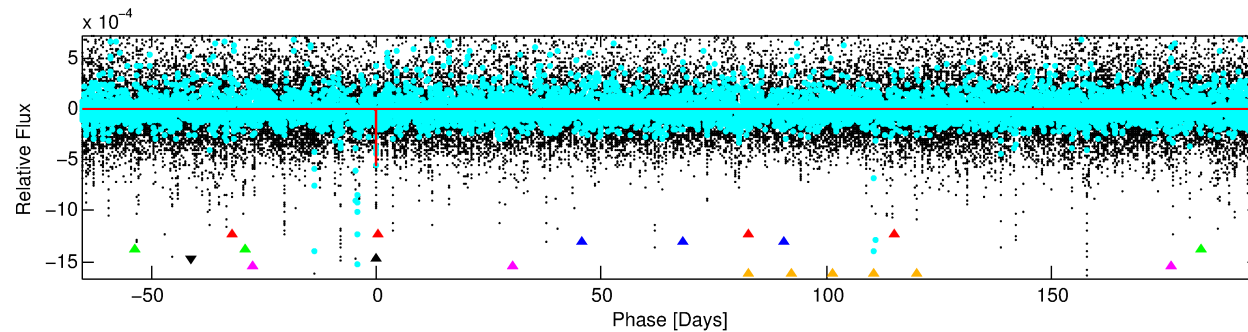
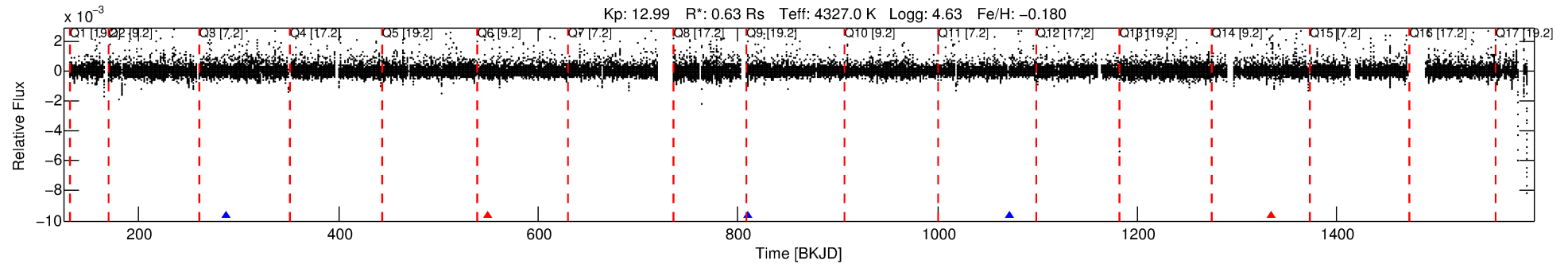
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008176468-04

No Significant Match Found

DV One-Page Summary

KIC: 8176468 Candidate: 4 of 6 Period: 261.506 d



DV Fit Results:

Period = 261.50615 [0.00346] d
Epoch = 287.6655 [0.0089] BKJD
Rp/R* = 0.0221 [0.0257]
a/R* = 429.59 [1563.59]
b = 0.61 [3.82]
Seff = 0.27 [0.04]
Teq = 184 [7] K
Rp = 1.53 [1.79] Re
a = 0.6830 [0.0510] AU
Ag = 19404.64 [46084.92] [0.42 σ]
Teffp = 3356 [1993] K [1.59 σ]

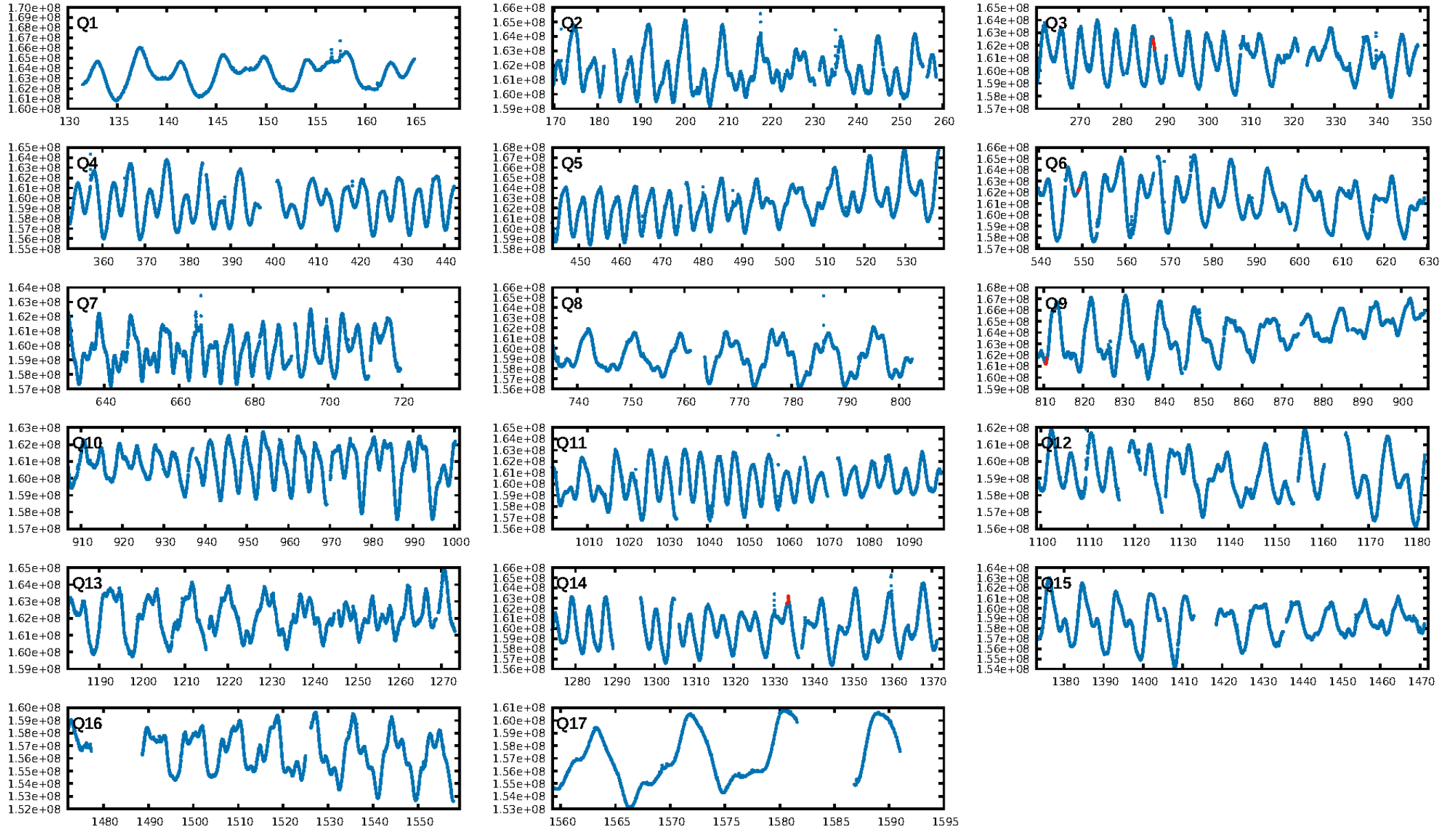
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [47.37 σ]
ModelChiSquare2-sig: 16.0%
ModelChiSquareGof-sig: 99.9%
Bootstrap-pfa: N/A
RollingBand-fgt: 0.50 [2/4]
GhostDiagnostic-chr: 0.8237
Centroid-sig: 53.7%
Centroid-so: 0.591 arcsec [0.82 σ]
OotOffset-rm: 0.269 arcsec [0.86 σ]
KicOffset-rm: 0.472 arcsec [1.10 σ]
OotOffset-st: 2/0/0/1 [3]
KicOffset-st: 2/0/0/1 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 0.75 [3/4]

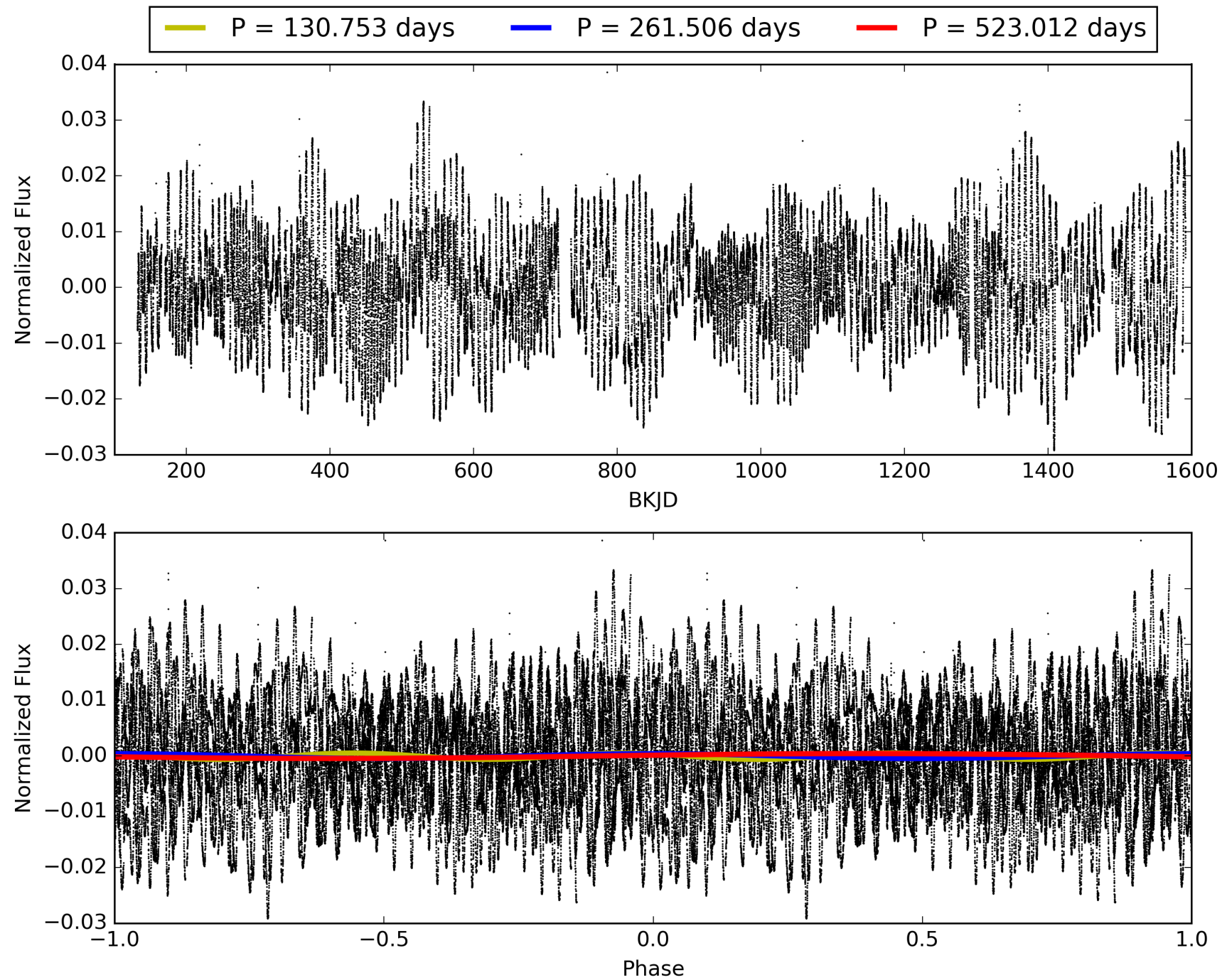
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 10:07:22 Z

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

TCE 008176468-04, PDC Light Curves

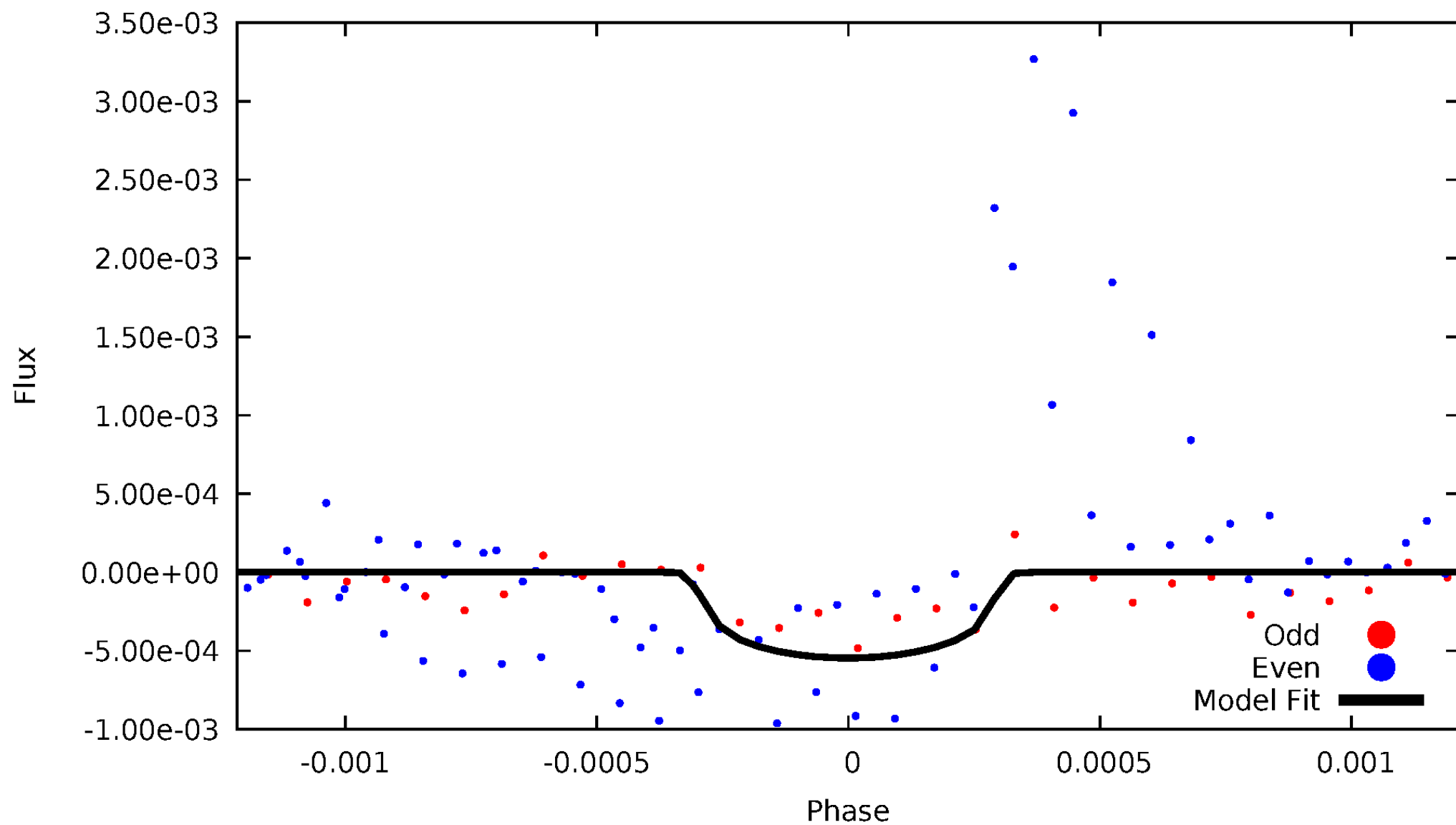


TCE 008176468-04



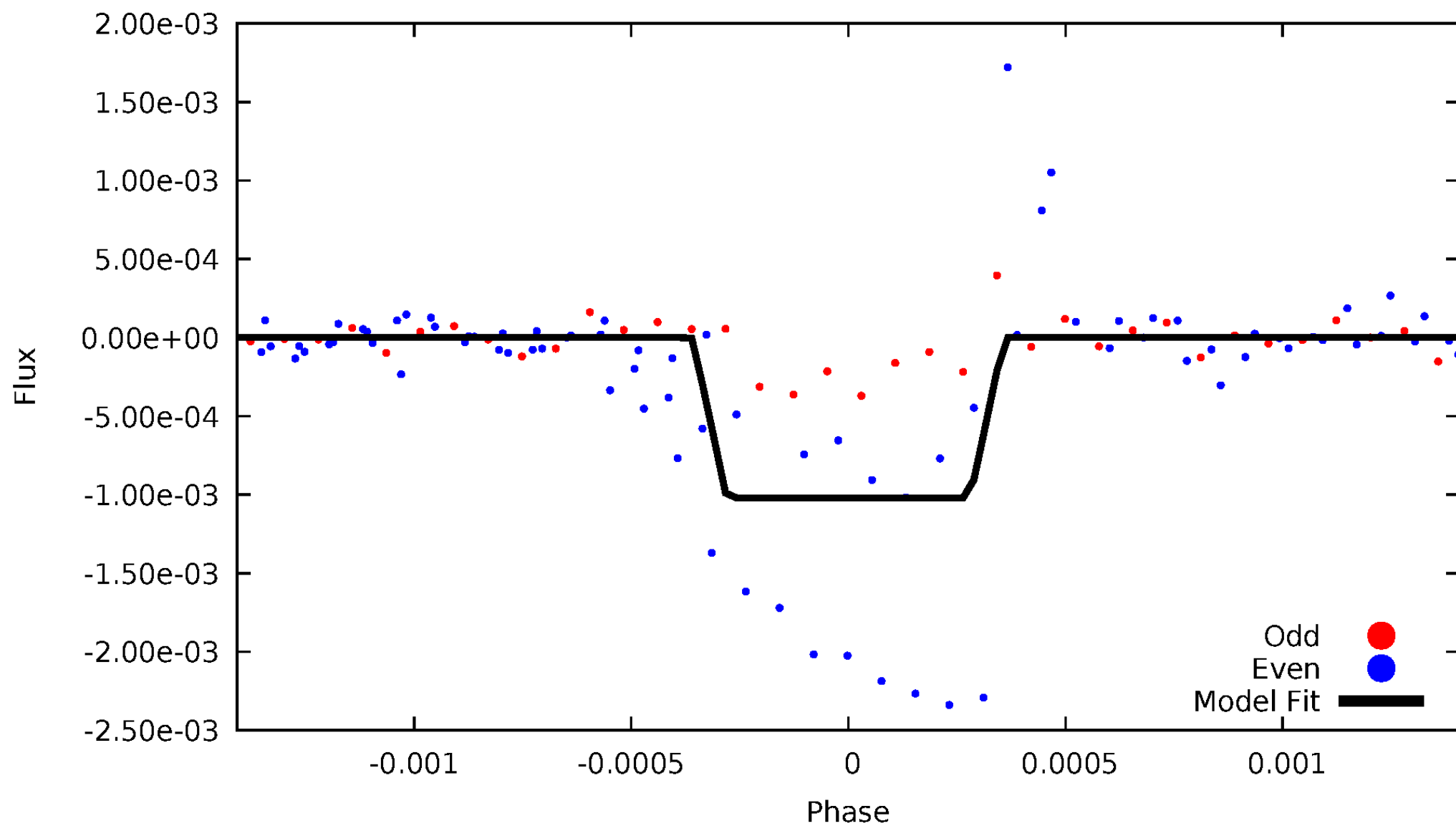
DV Odd/Even

TCE 008176468-04



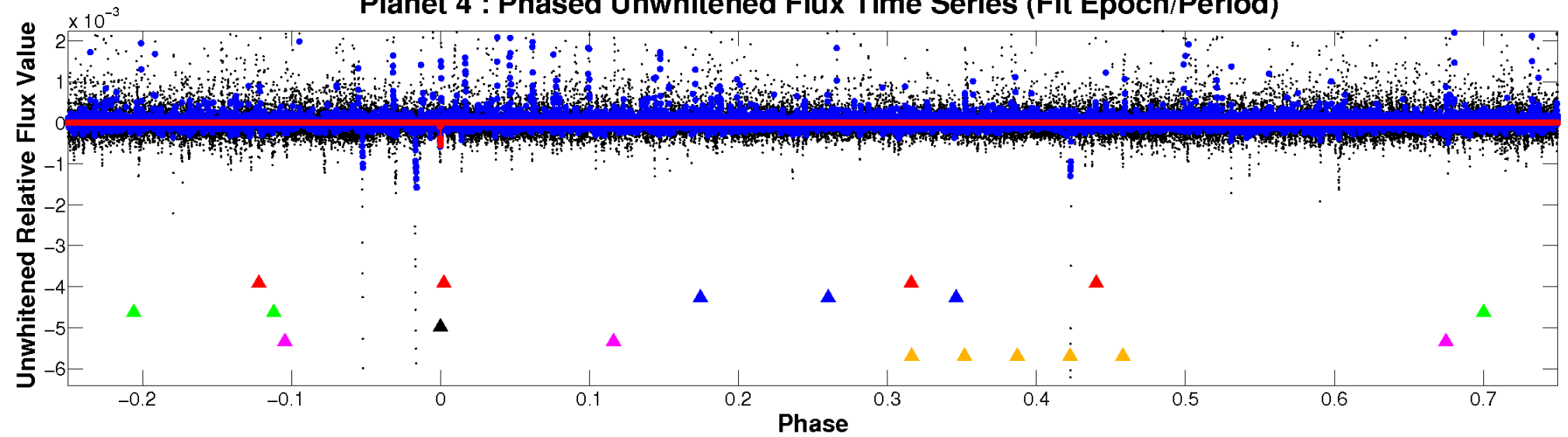
ALT Odd/Even

TCE 008176468-04

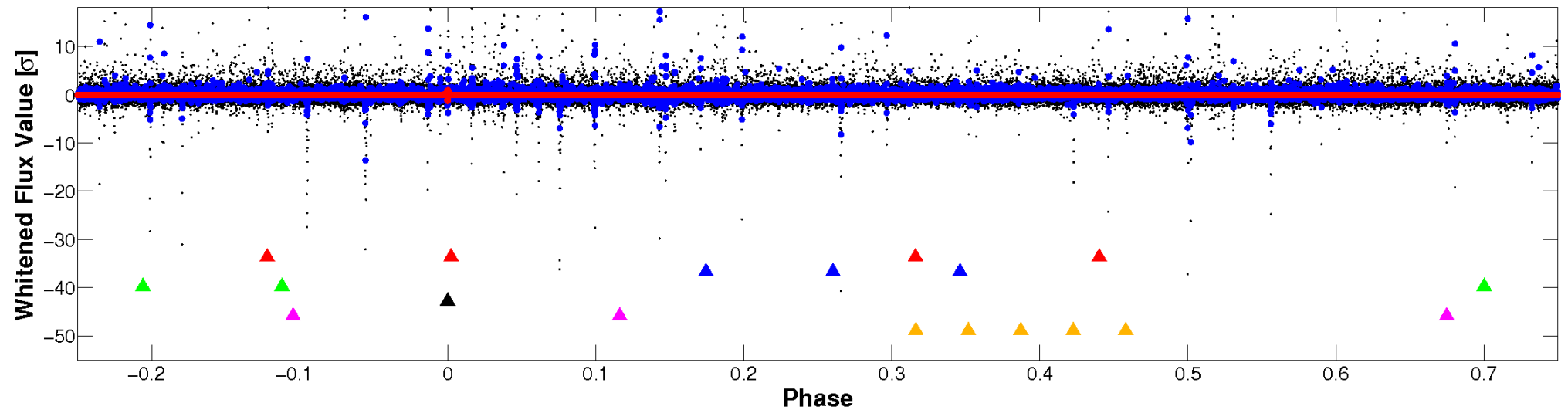


Non-Whitened Vs. Whitened Light Curve

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

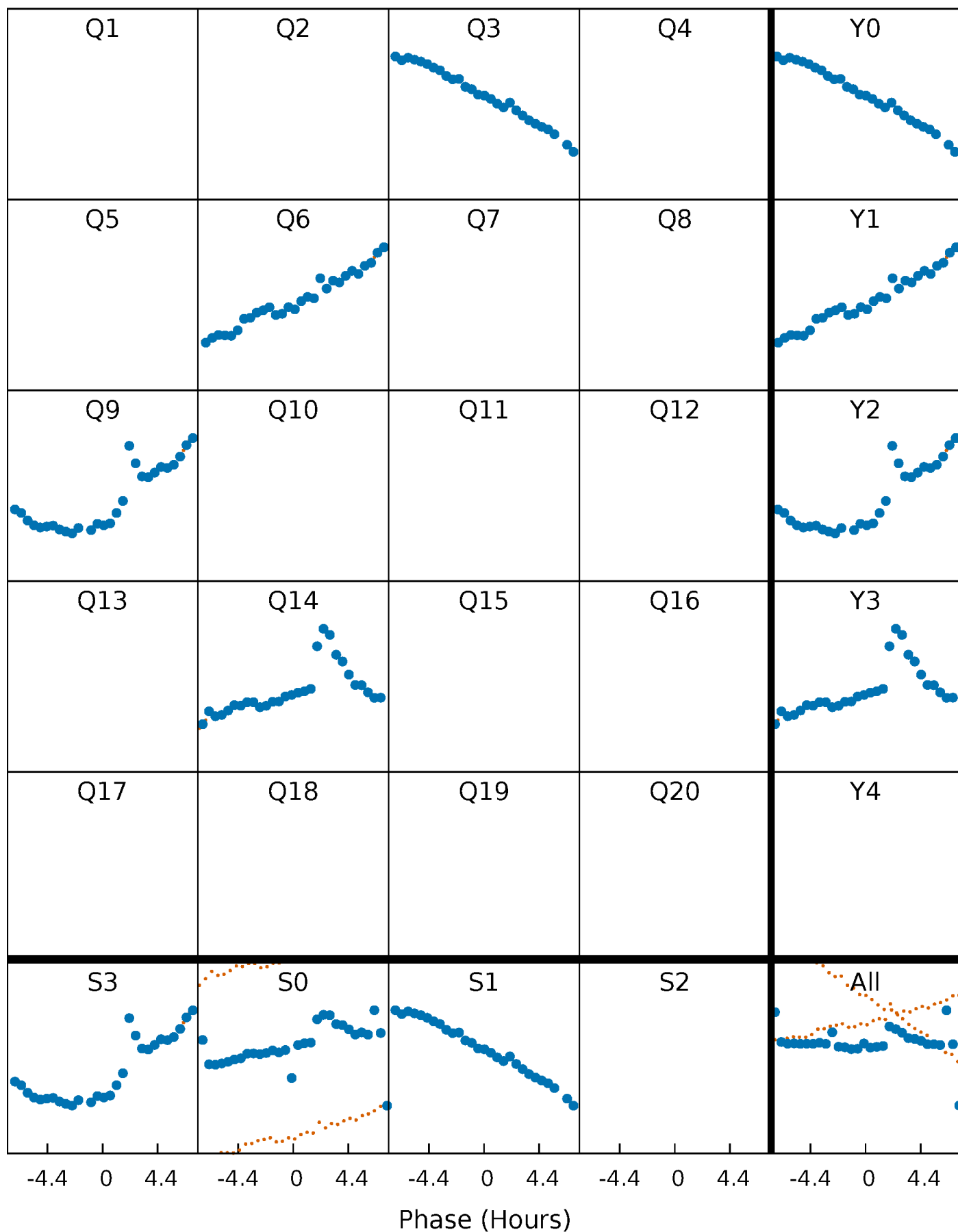


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



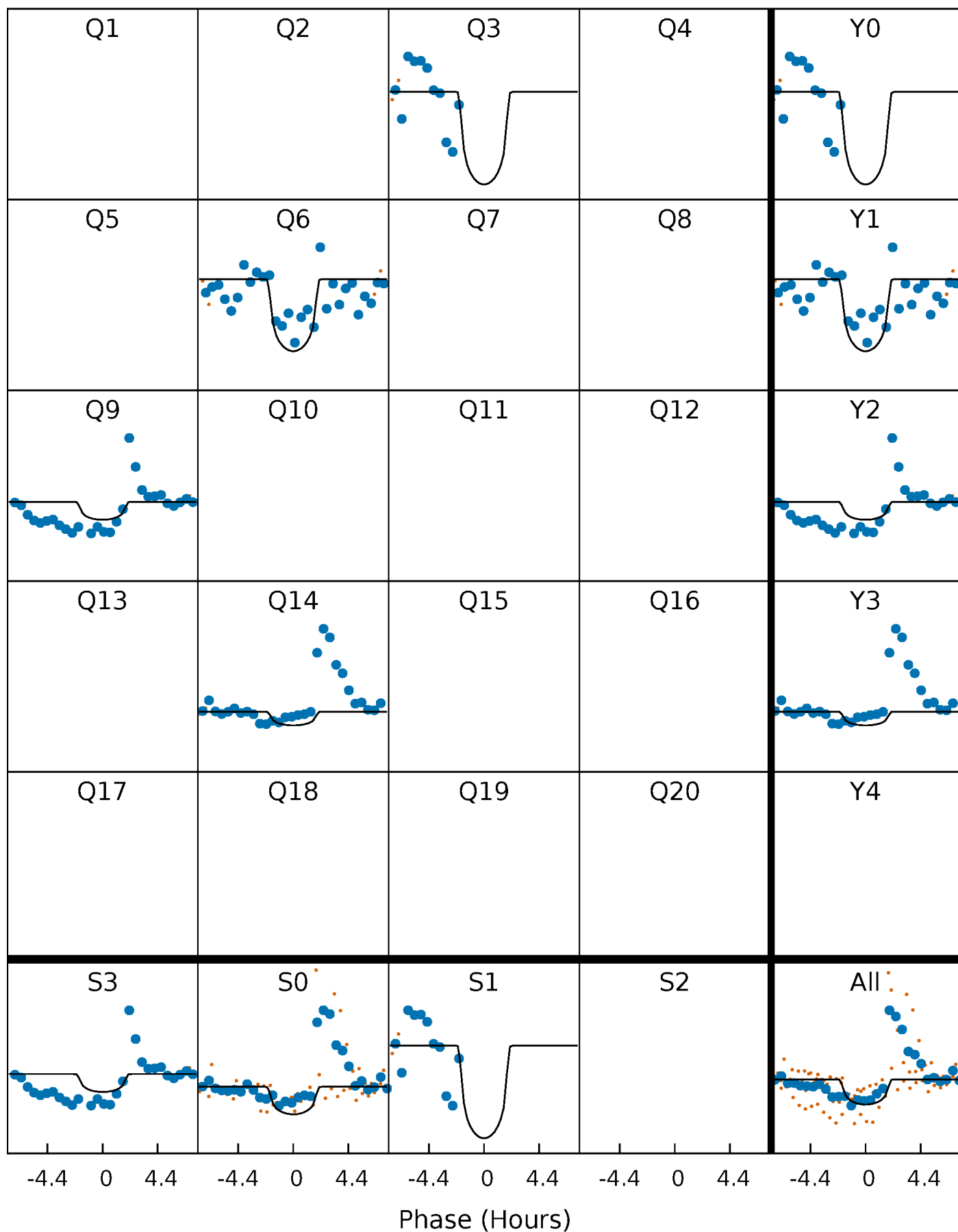
PDC Quarter-Phased Transit Curves

TCE 008176468-04 P=261.506148 Days $T_0=287.665503$ (BKJD)



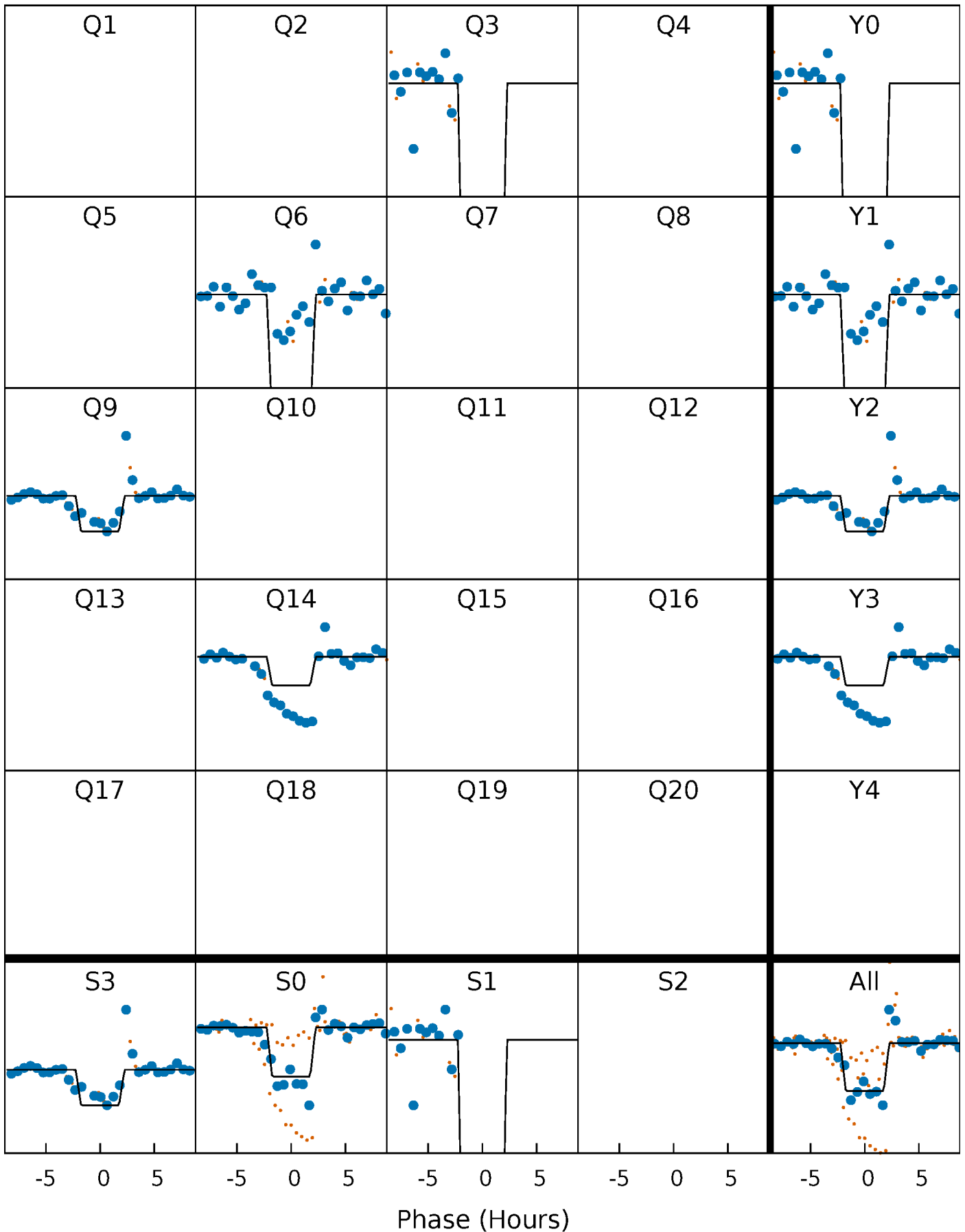
DV Quarter-Phased Transit Curves

TCE 008176468-04 P=261.506148 Days $T_0=287.665503$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

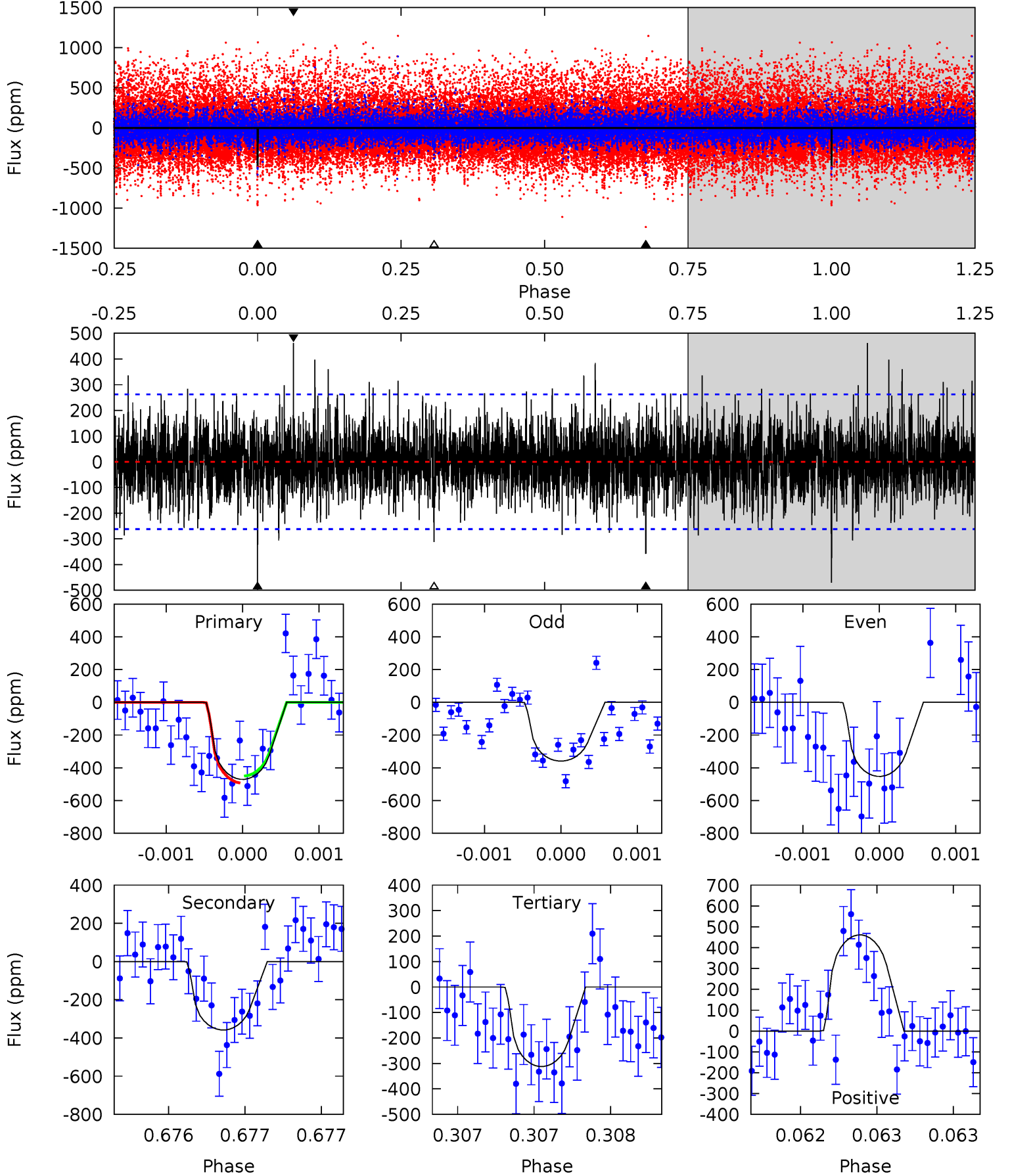
TCE 008176468-04 P=261.498548 Days $T_0=287.670162$ (BKJD)



DV Model-Shift Uniqueness Test

008176468-04, P = 261.506148 Days, E = 26.159355 Days

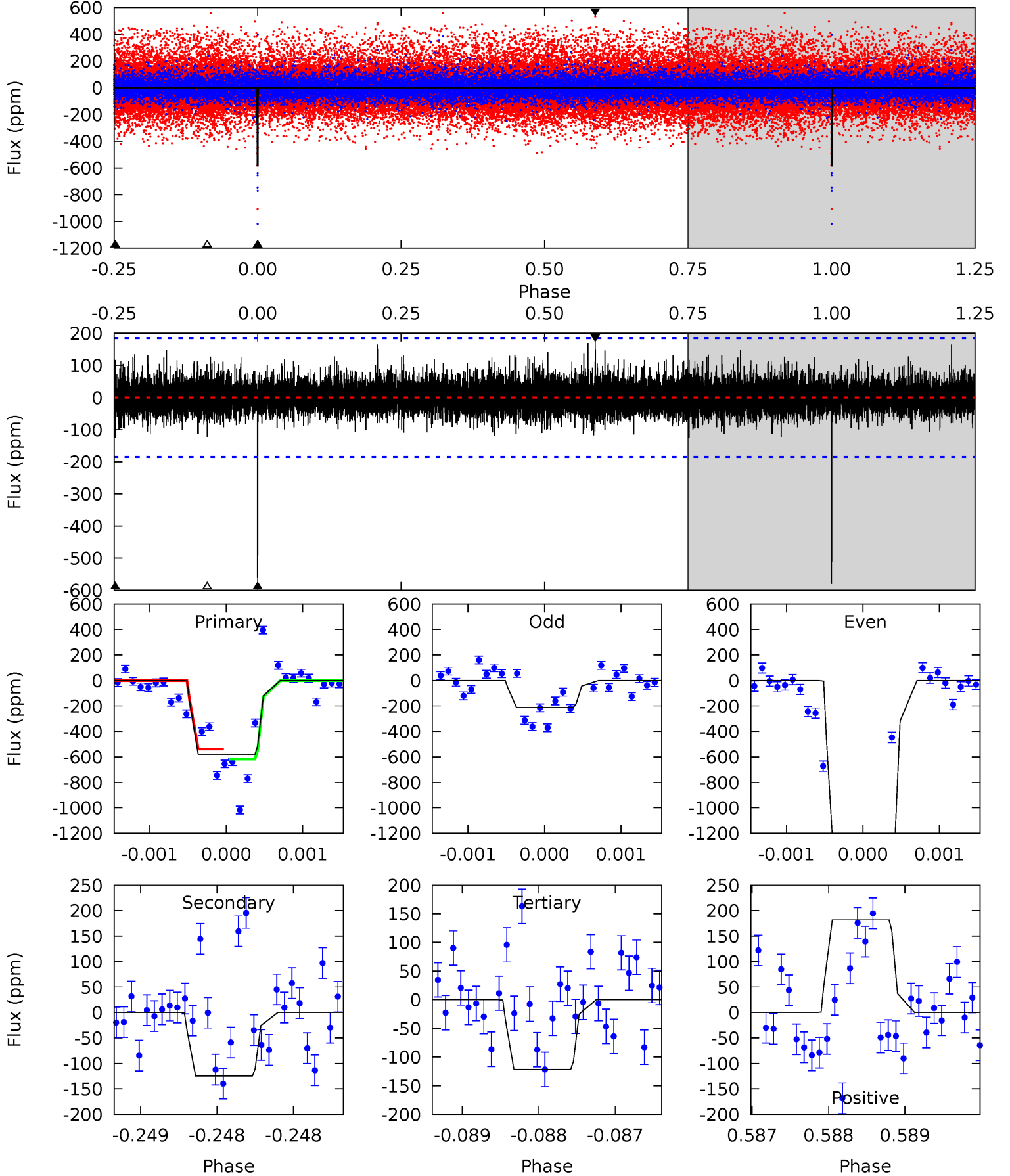
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.89	7.52	6.56	9.69	5.51	3.39	1.77	3.33	0.20	0.97	-2.17	0.94	1.21	0.49	0.45



Alt Model-Shift Uniqueness Test

008176468-04, P = 261.498548 Days, E = 26.171614 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.3	3.72	3.63	5.42	5.51	3.39	0.96	13.7	11.9	0.10	-1.70	25.5	1.37	0.24	0



Stellar Parameters For KIC 008176468

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	4327^{+116}_{-129}	$4.627^{+0.052}_{-0.021}$	$-0.180^{+0.300}_{-0.300}$	$0.634^{+0.040}_{-0.060}$	$0.621^{+0.062}_{-0.056}$	$3.432^{+0.800}_{-0.366}$
	+3%/-3%	+1%/-0%	+167%/-167%	+6%/-9%	+10%/-9%	+23%/-11%
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 008176468-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-358 ± 48	$1.99^{+1.53}_{-1.18}$	256^{+8}_{-9}	3723^{+1649}_{-607}	$23829^{+125782}_{-16268}$
Alt.	-125 ± 34	$2.44^{+1.45}_{-1.41}$	255^{+8}_{-9}	2960^{+973}_{-367}	5338^{+28216}_{-3422}

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 $A_{obs} \gg 1.0$

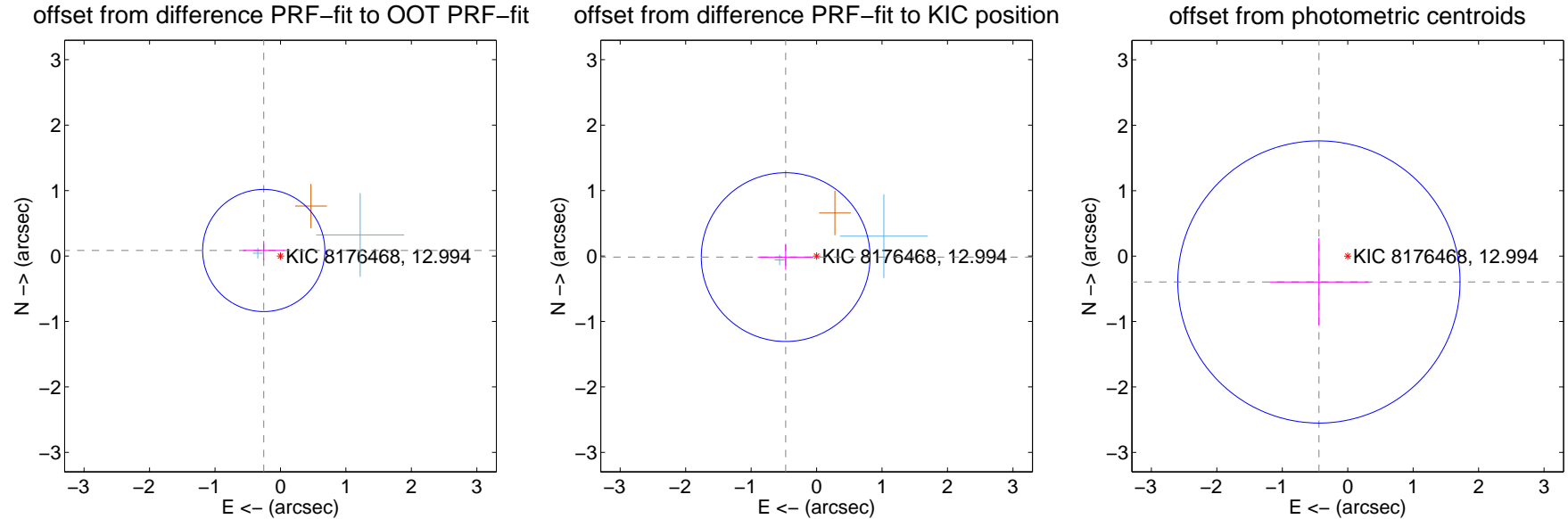
DV Centroid Data

Supplemental centroid analysis for 008176468-04. Kepler magnitude: 12.99. Transit SNR 5.69

There are 2 quarters with good PRF difference image offsets

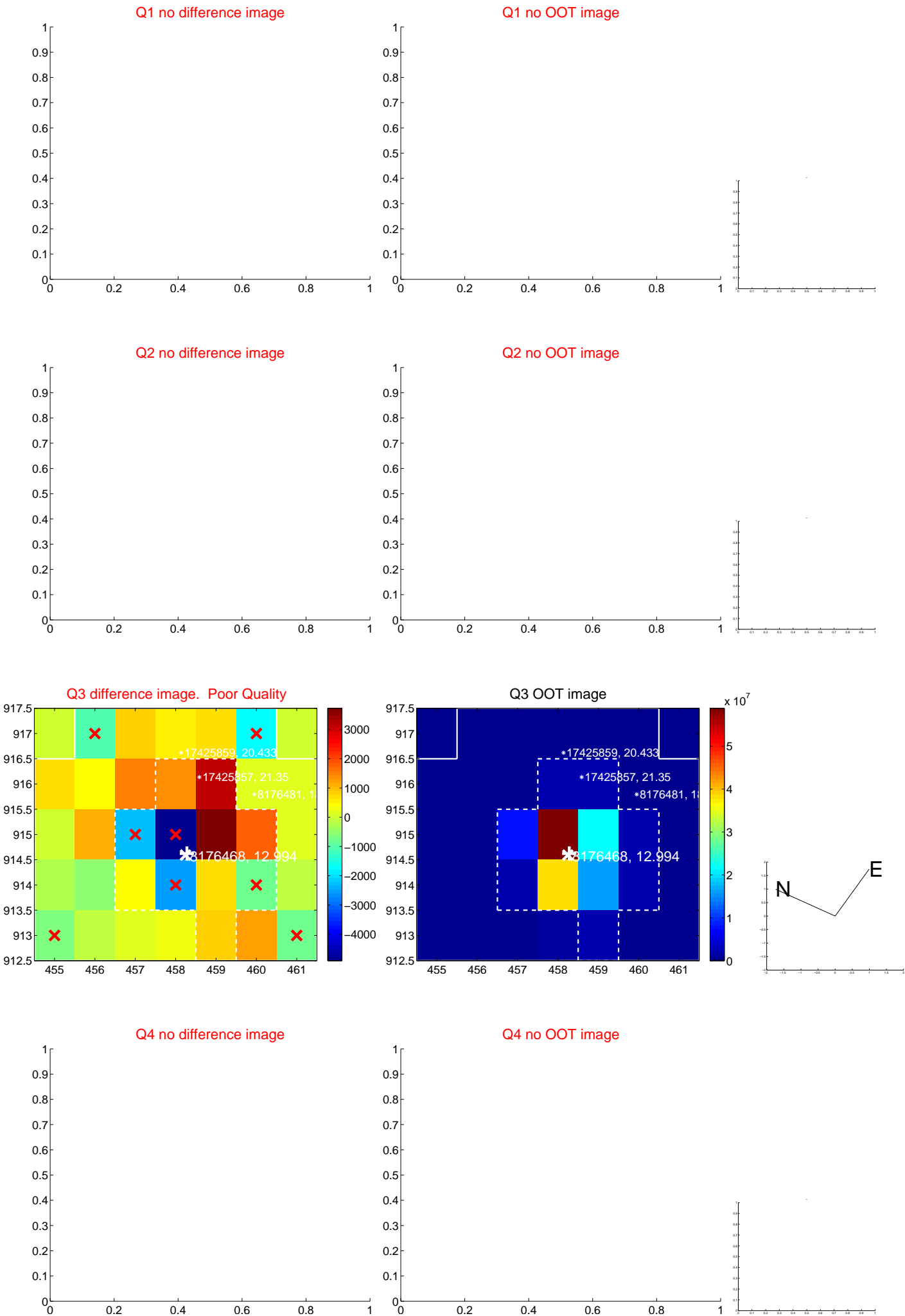
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.269 ± 0.311	0.86	0.255 ± 0.316	0.085 ± 0.145
PRF-fit source offset from KIC position	0.472 ± 0.430	1.10	0.472 ± 0.425	-0.017 ± 0.193
photometric centroid source offset	0.59 ± 0.72	0.82	0.44 ± 0.76	-0.40 ± 0.67



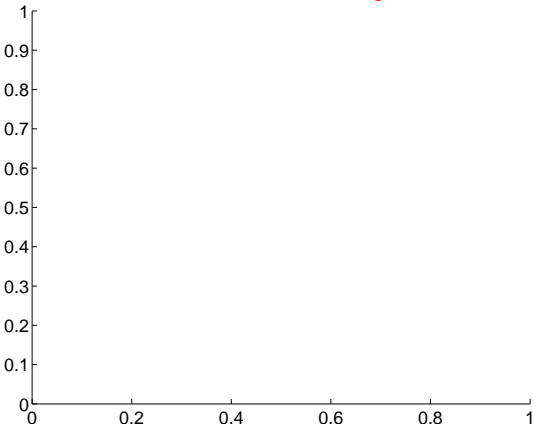
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

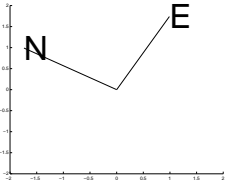
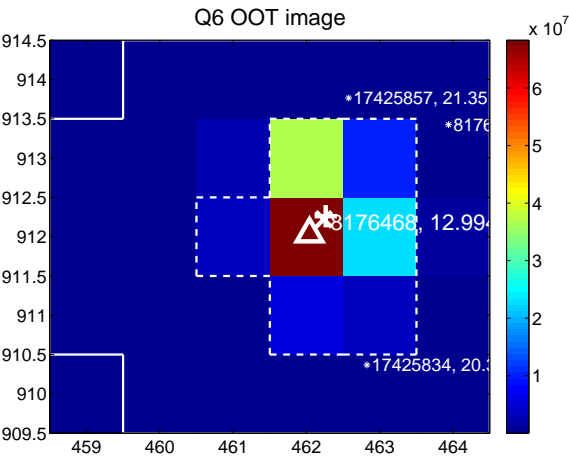
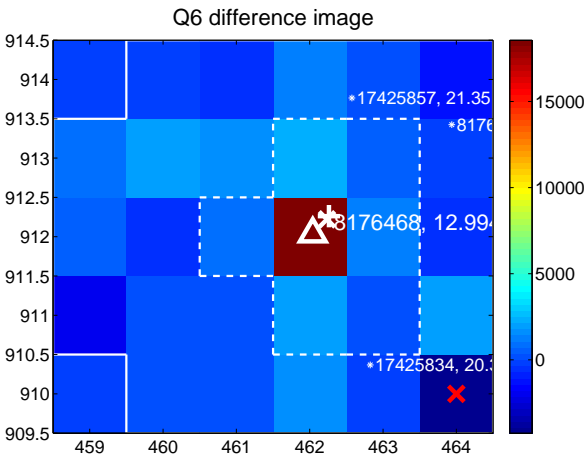
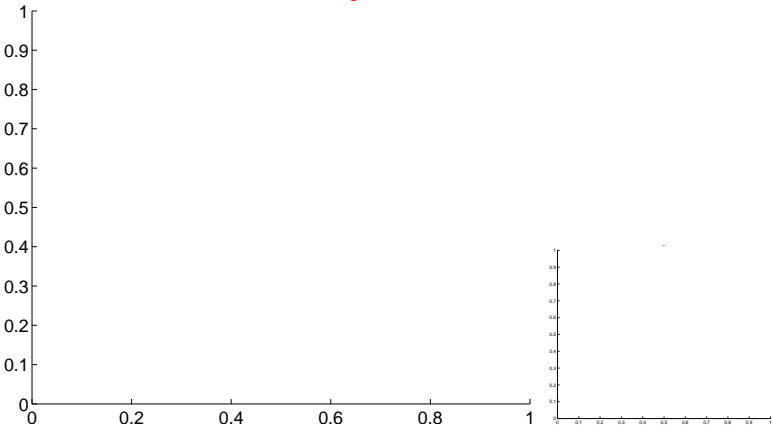


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

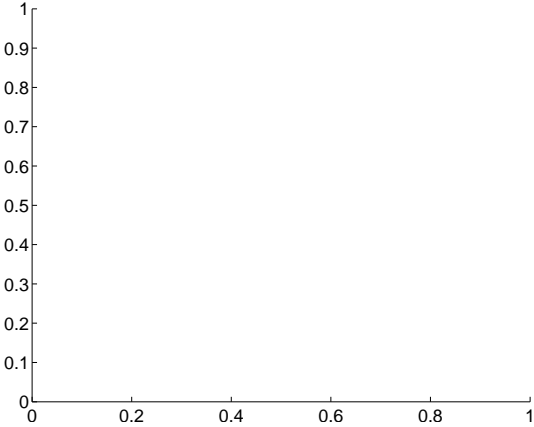
Q5 no difference image



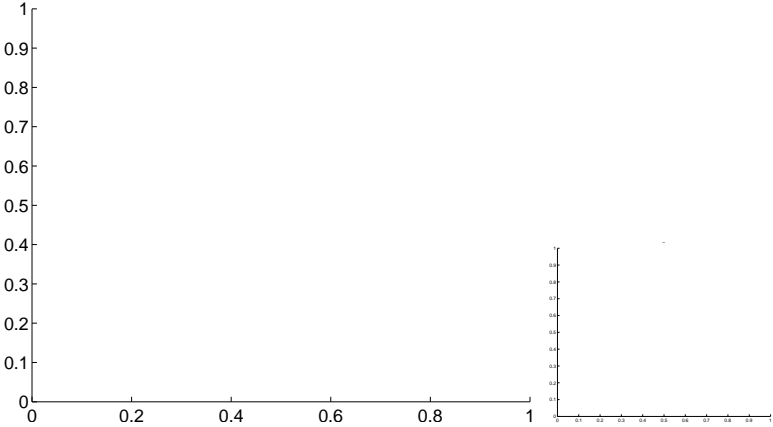
Q5 no OOT image



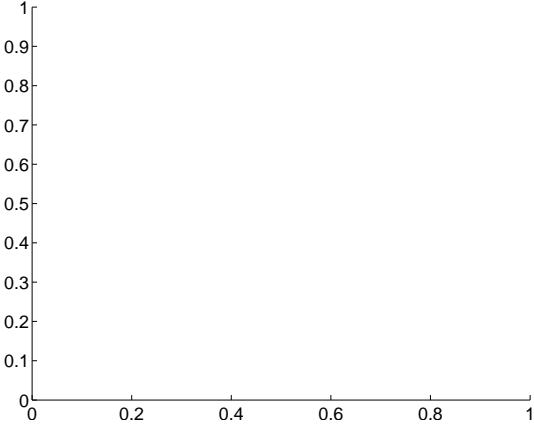
Q7 no difference image



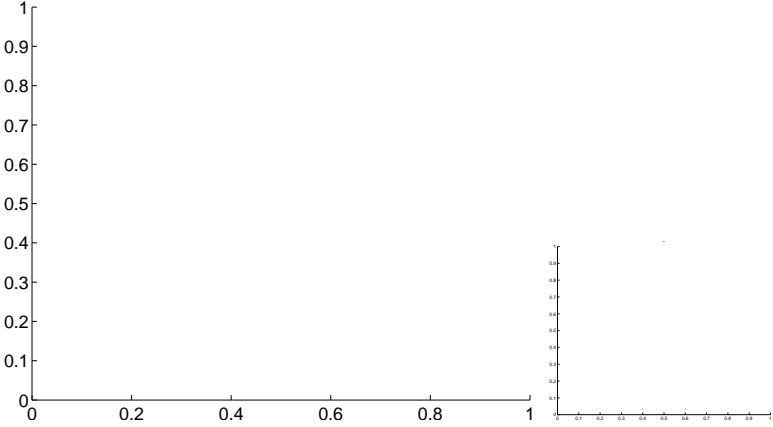
Q7 no OOT image



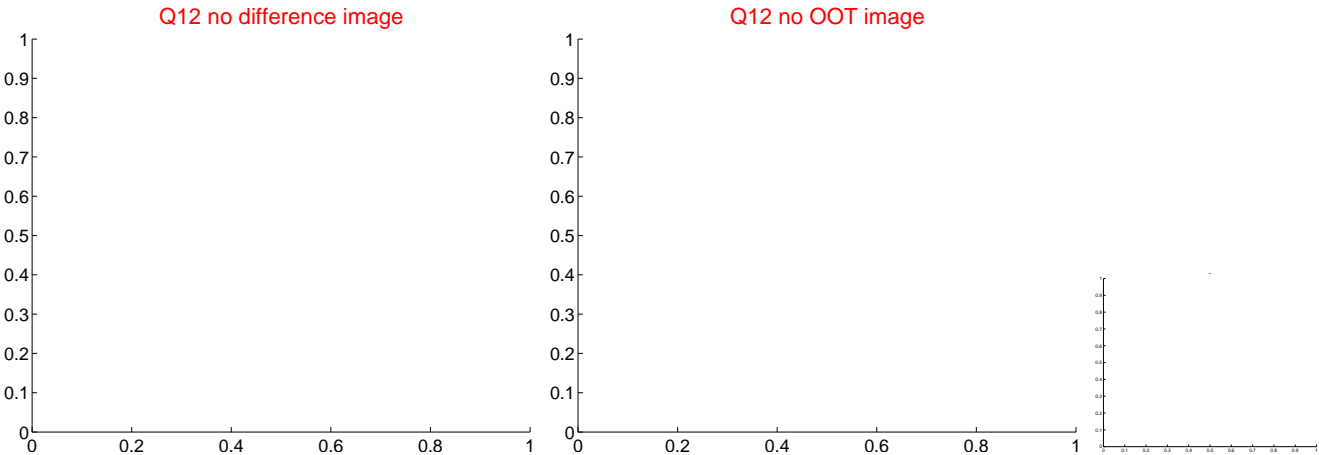
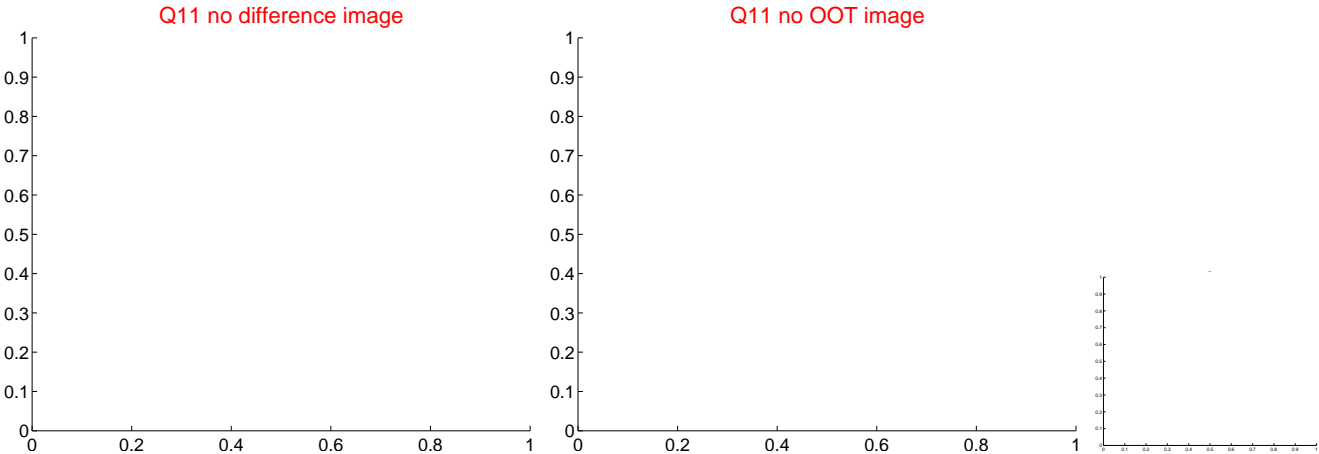
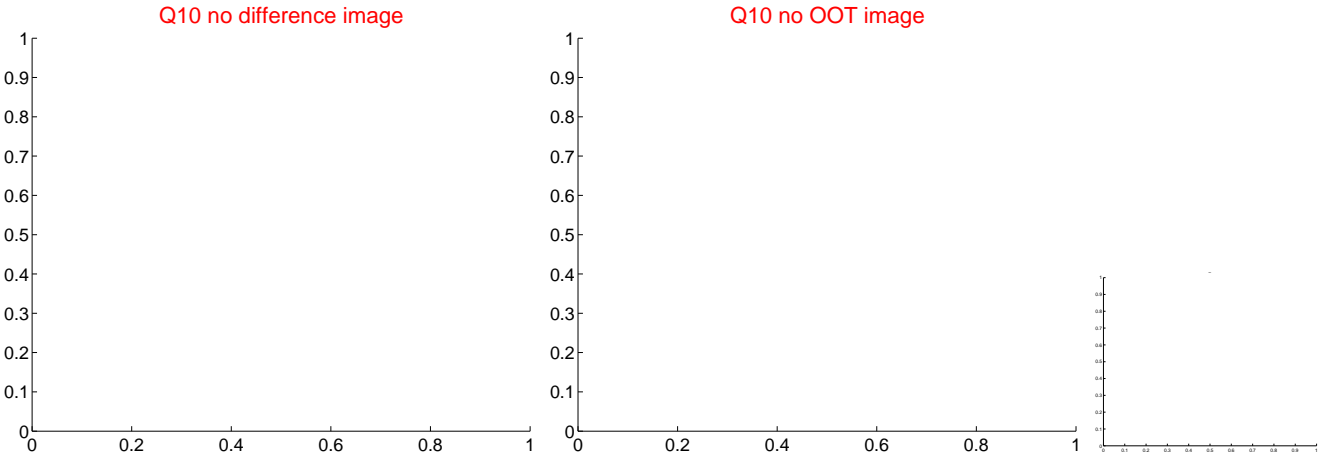
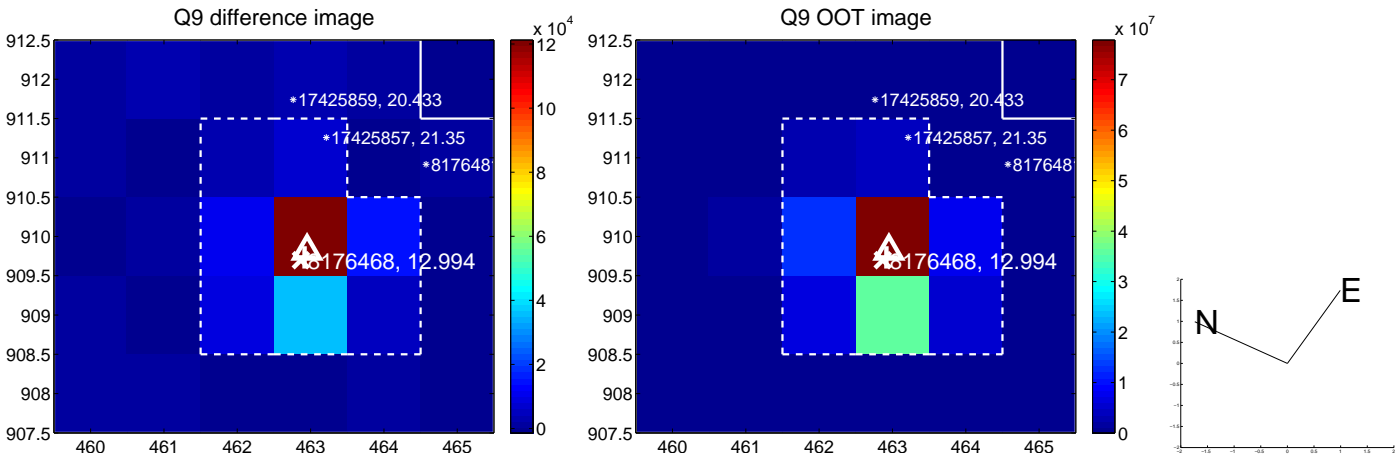
Q8 no difference image



Q8 no OOT image

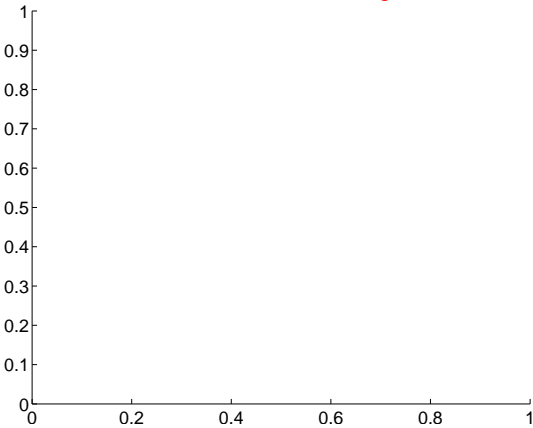


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

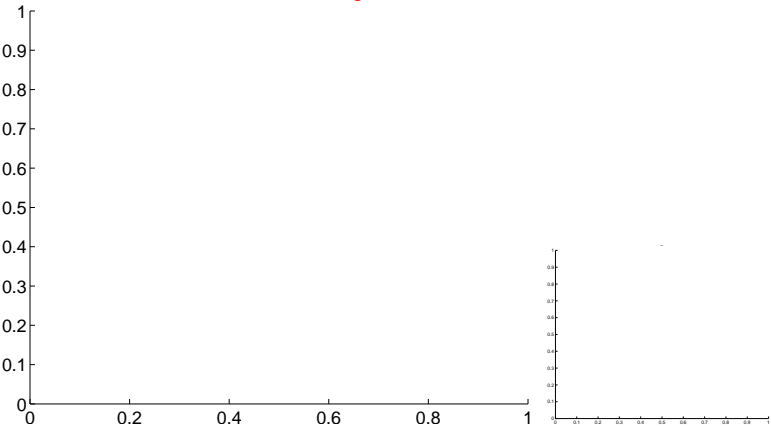


white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

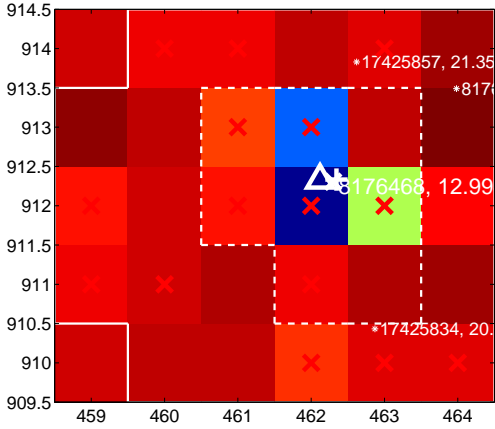
Q13 no difference image



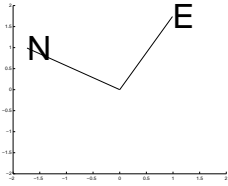
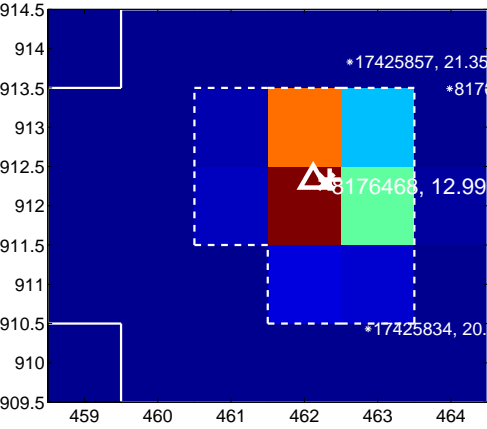
Q13 no OOT image



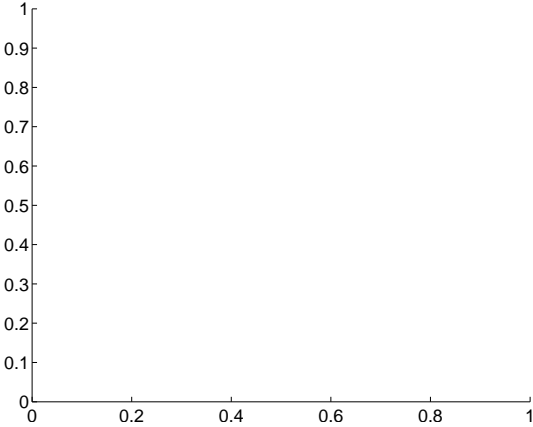
Q14 difference image. Poor Quality



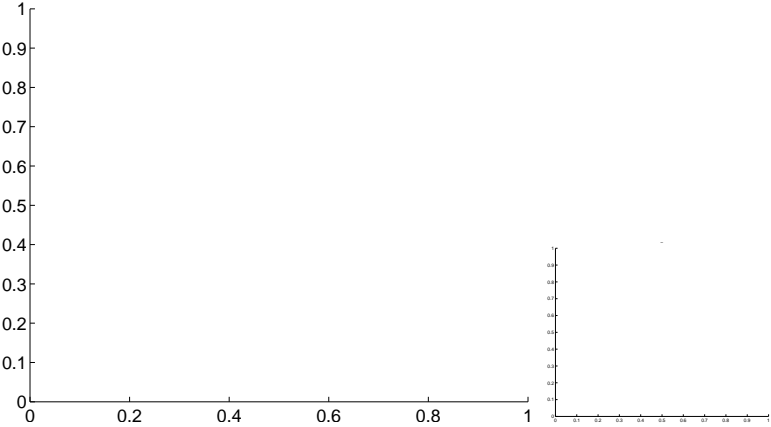
Q14 OOT image



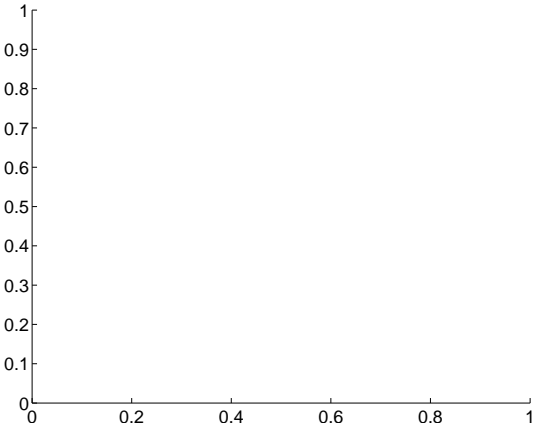
Q15 no difference image



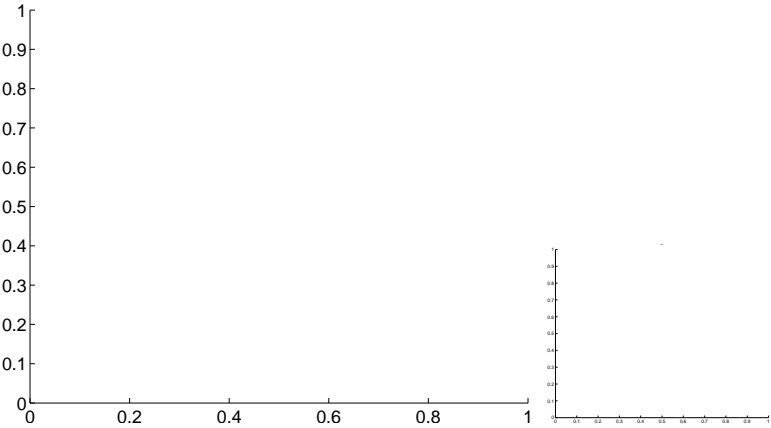
Q15 no OOT image



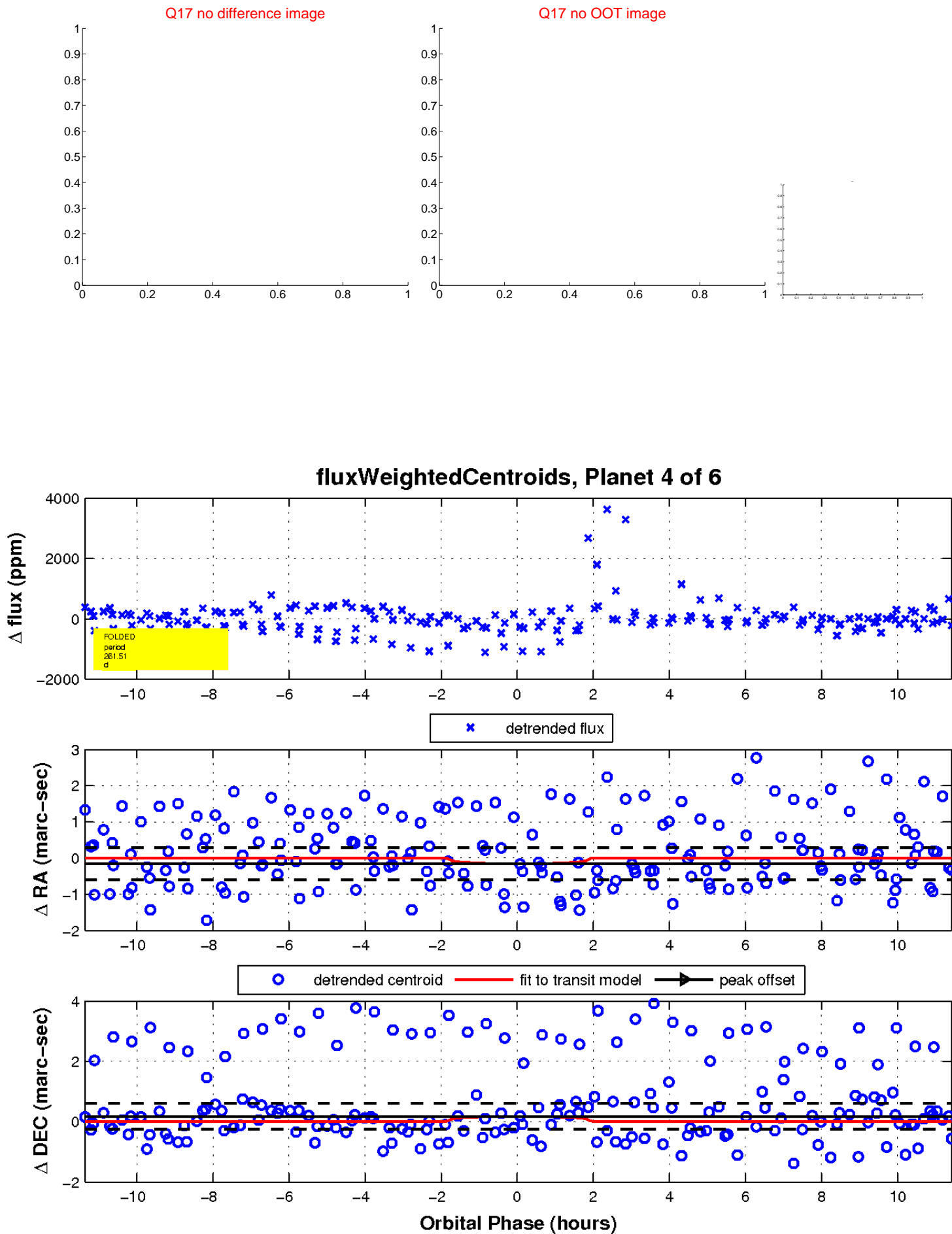
Q16 no difference image



Q16 no OOT image

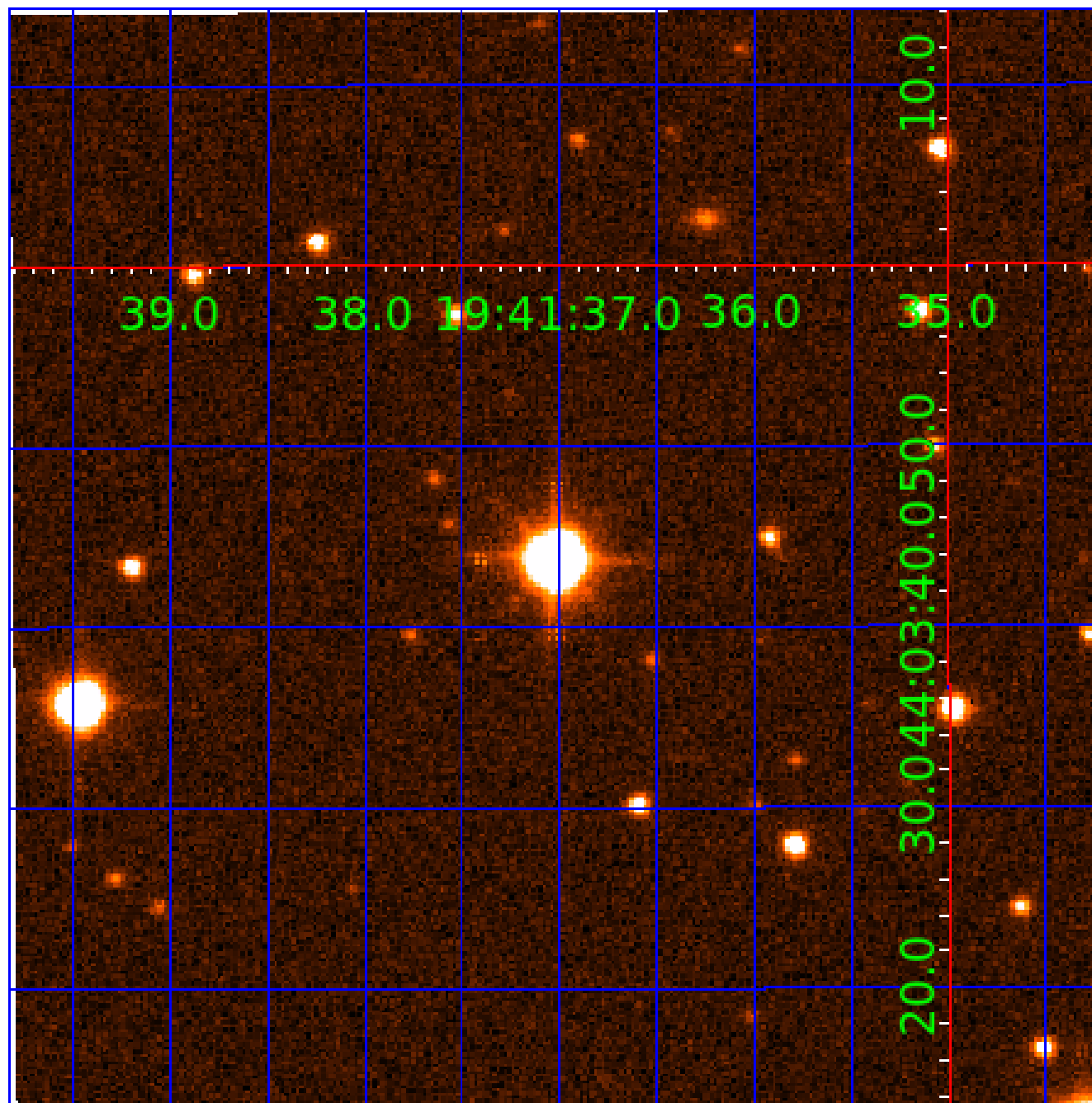


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008176468

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})
008176468-01	OBS	No	376.021803	288.262571	562.8	10.473	34.0	4.4	0.63	4327	1.45	0.17
008176468-02	OBS	No	545.452425	333.293831	996.3	11.780	14.2	7.6	0.63	4327	2.68	0.10
008176468-03	OBS	No	547.578541	470.769390	227.9	12.500	12.3	-1.0	0.63	4327	0.92	0.10
008176468-04	OBS	No	261.506148	287.665503	546.9	3.812	13.8	5.7	0.63	4327	1.53	0.27
008176468-05	OBS	No	465.313666	318.048512	896.5	5.401	12.7	7.2	0.63	4327	1.95	0.13
008176468-06	OBS	No	270.775055	370.377823	502.0	2.743	11.8	5.9	0.63	4327	1.40	0.26

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008176468-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
008176468-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008176468-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—CENT_NOFITS
008176468-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008176468-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—HALO_GHOST
008176468-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_ALT—ALL_TRANS_CHASES—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS

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

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

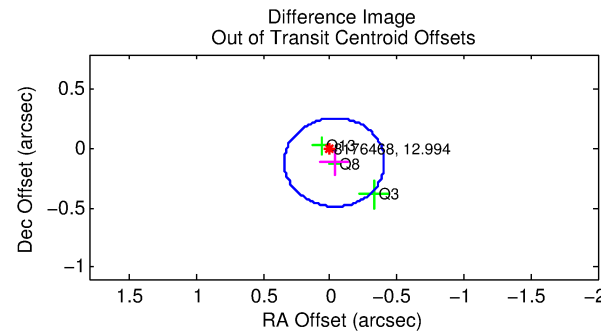
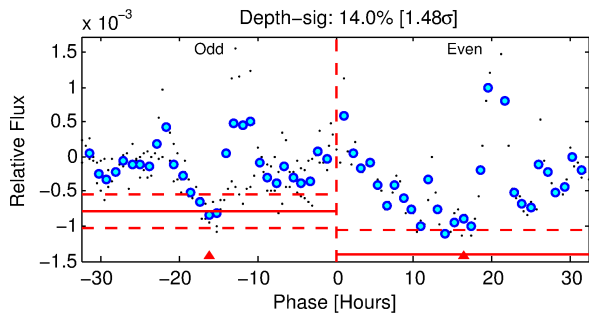
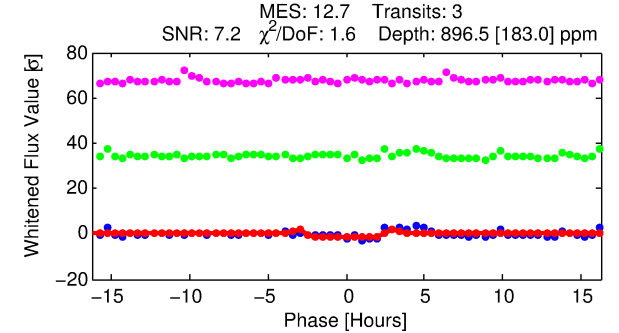
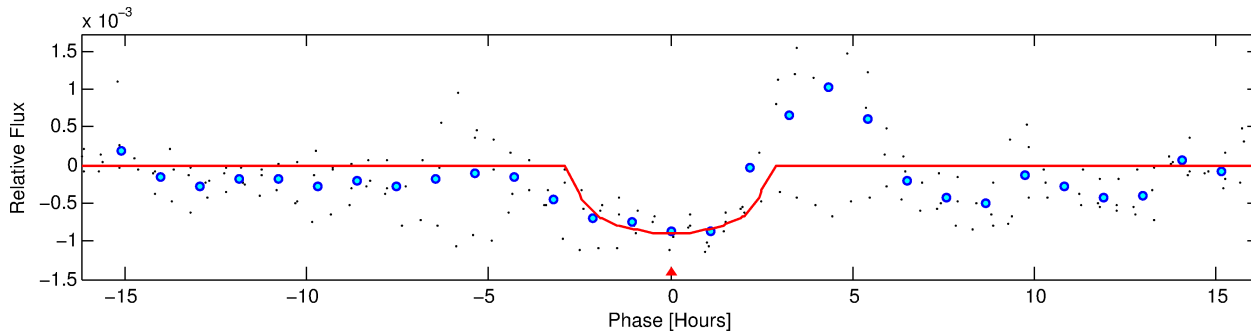
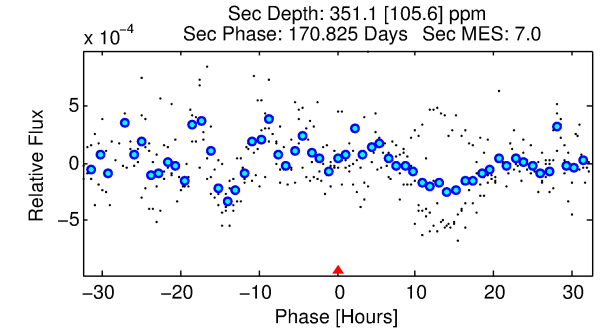
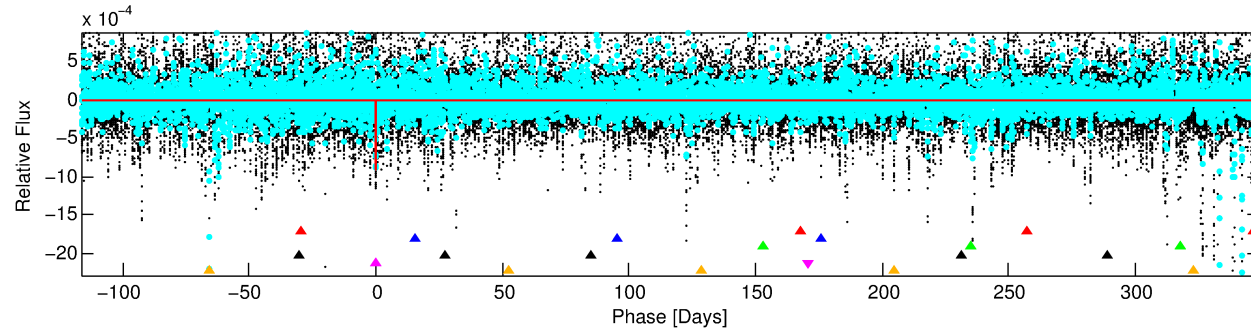
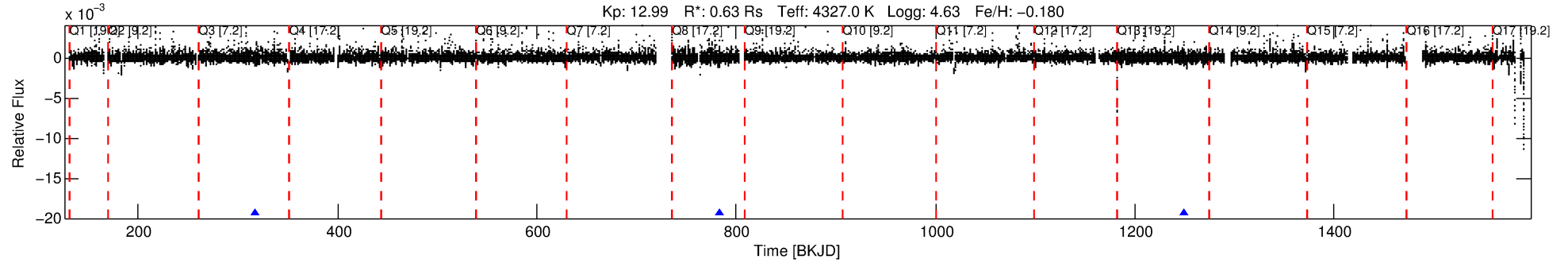
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008176468-05

No Significant Match Found

DV One-Page Summary

KIC: 8176468 Candidate: 5 of 6 Period: 465.314 d



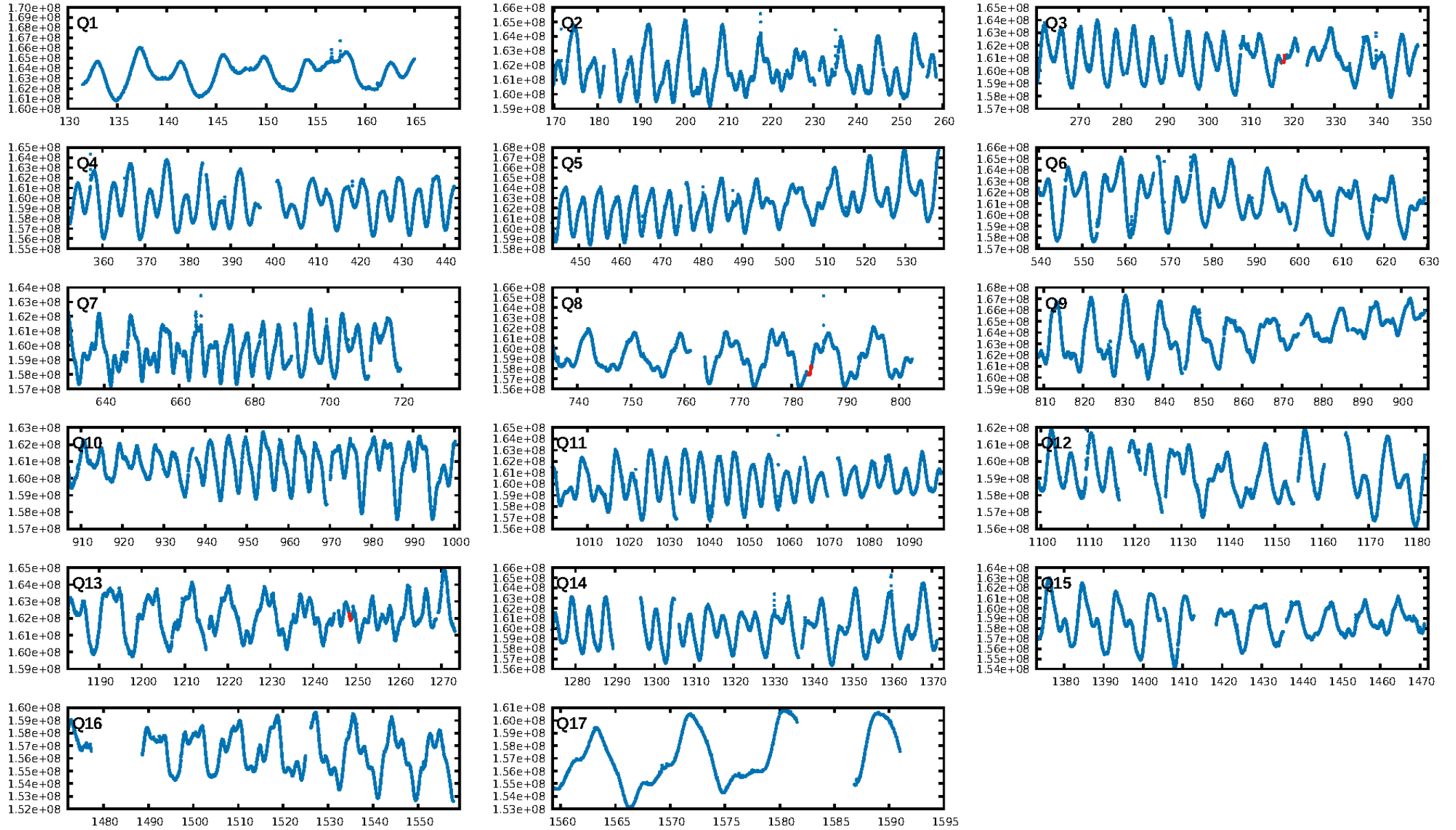
DV Fit Results:

Period = 465.31367 [0.00481] d
Epoch = 318.0485 [0.0062] BKJD
Rp/R* = 0.0282 [0.0251]
a/R* = 553.81 [1563.80]
b = 0.59 [3.17]
Seff = 0.13 [0.02]
Teq = 152 [6] K
Rp = 1.95 [1.75] Re
a = 1.0029 [0.0749] AU
Ag = 51120.41 [92665.21] [0.55σ]
Teffp = 3529 [1600] K [2.11σ]

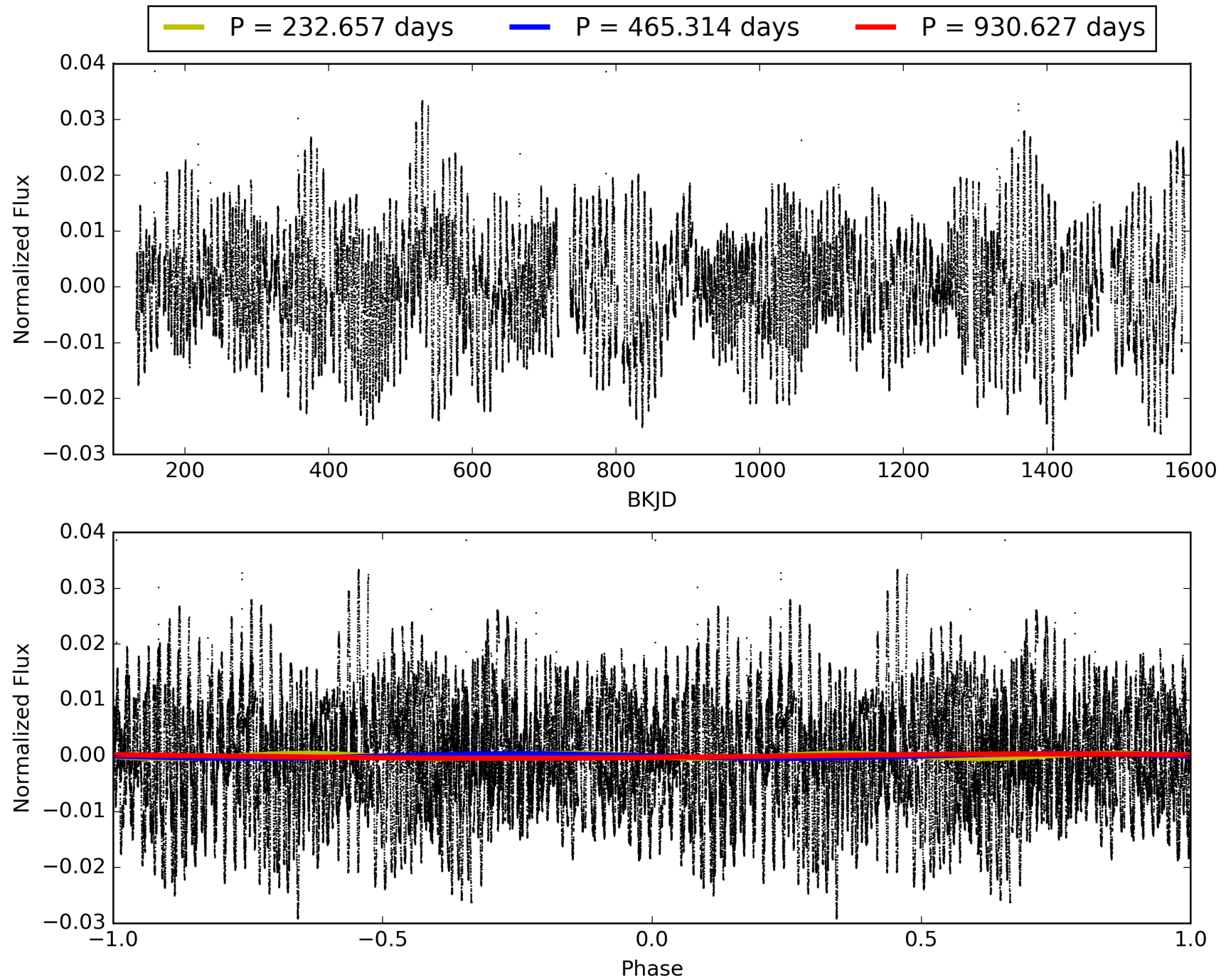
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [181.86σ]
LongPeriod-sig: 100.0% [148.42σ]
ModelChiSquare2-sig: 3.6%
ModelChiSquareGof-sig: 44.2%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.1291
Centroid-sig: 27.7%
Centroid-so: 0.195 arcsec [0.47σ]
OotOffset-rm: 0.118 arcsec [0.94σ]
KicOffset-rm: 0.268 arcsec [2.70σ]
OotOffset-st: 0/1/1/1 [3]
KicOffset-st: 0/1/1/1 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 1.00 [3/3]

TCE 008176468-05, PDC Light Curves

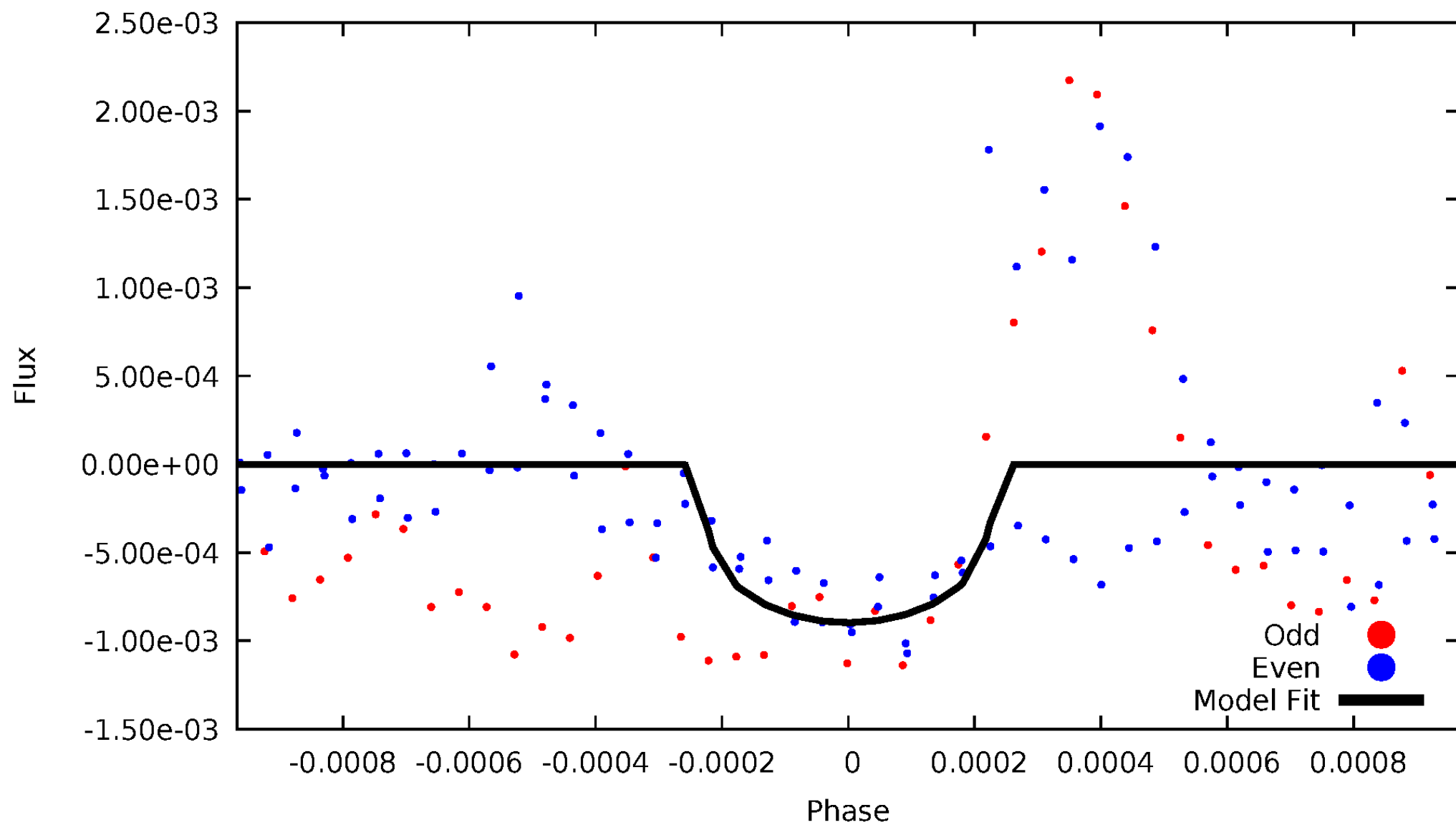


TCE 008176468-05



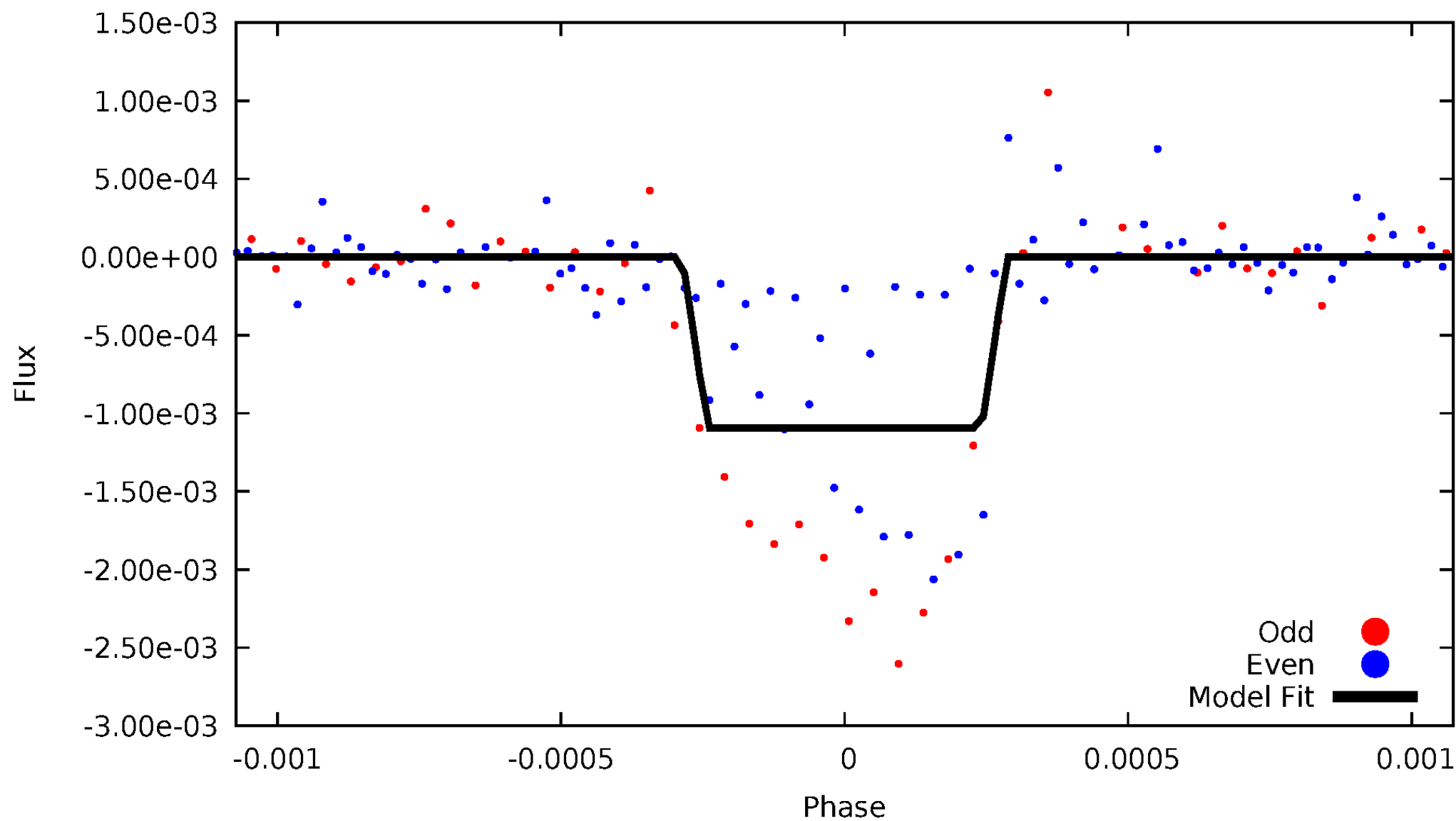
DV Odd/Even

TCE 008176468-05



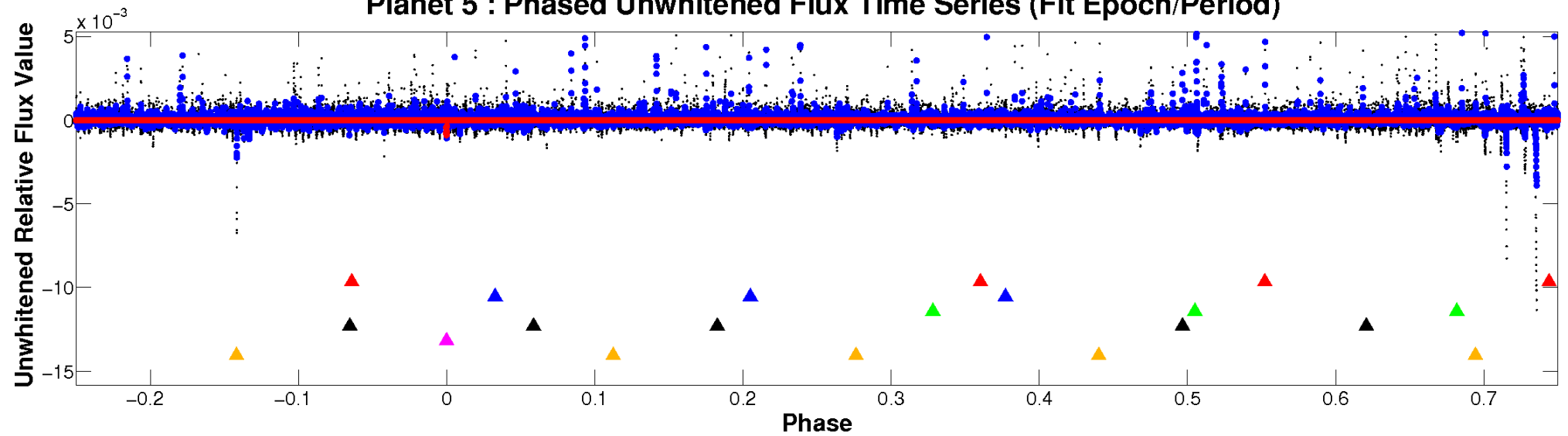
ALT Odd/Even

TCE 008176468-05

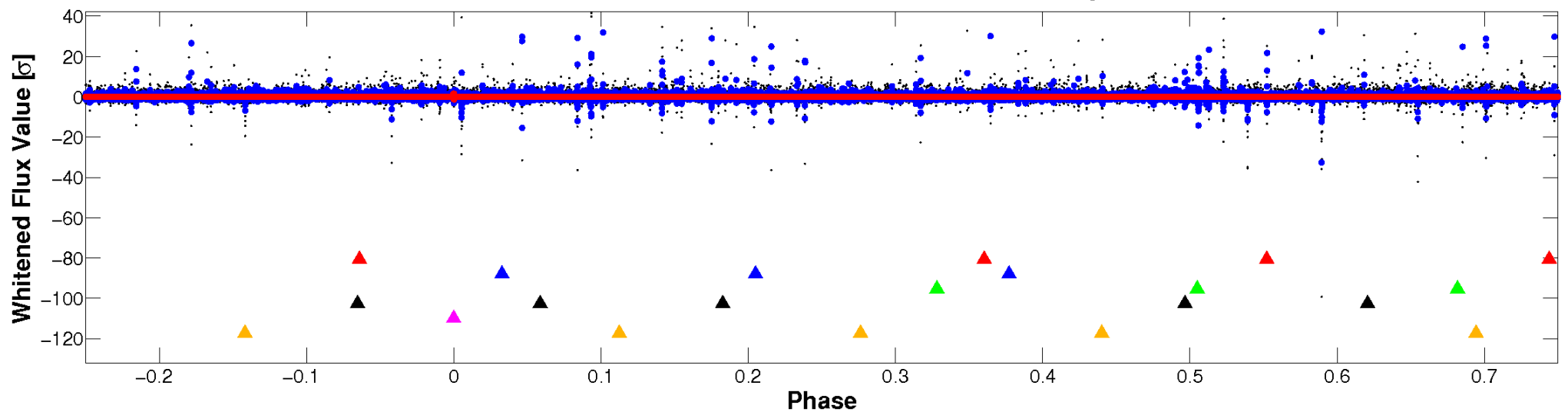


Non-Whitened Vs. Whitened Light Curve

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

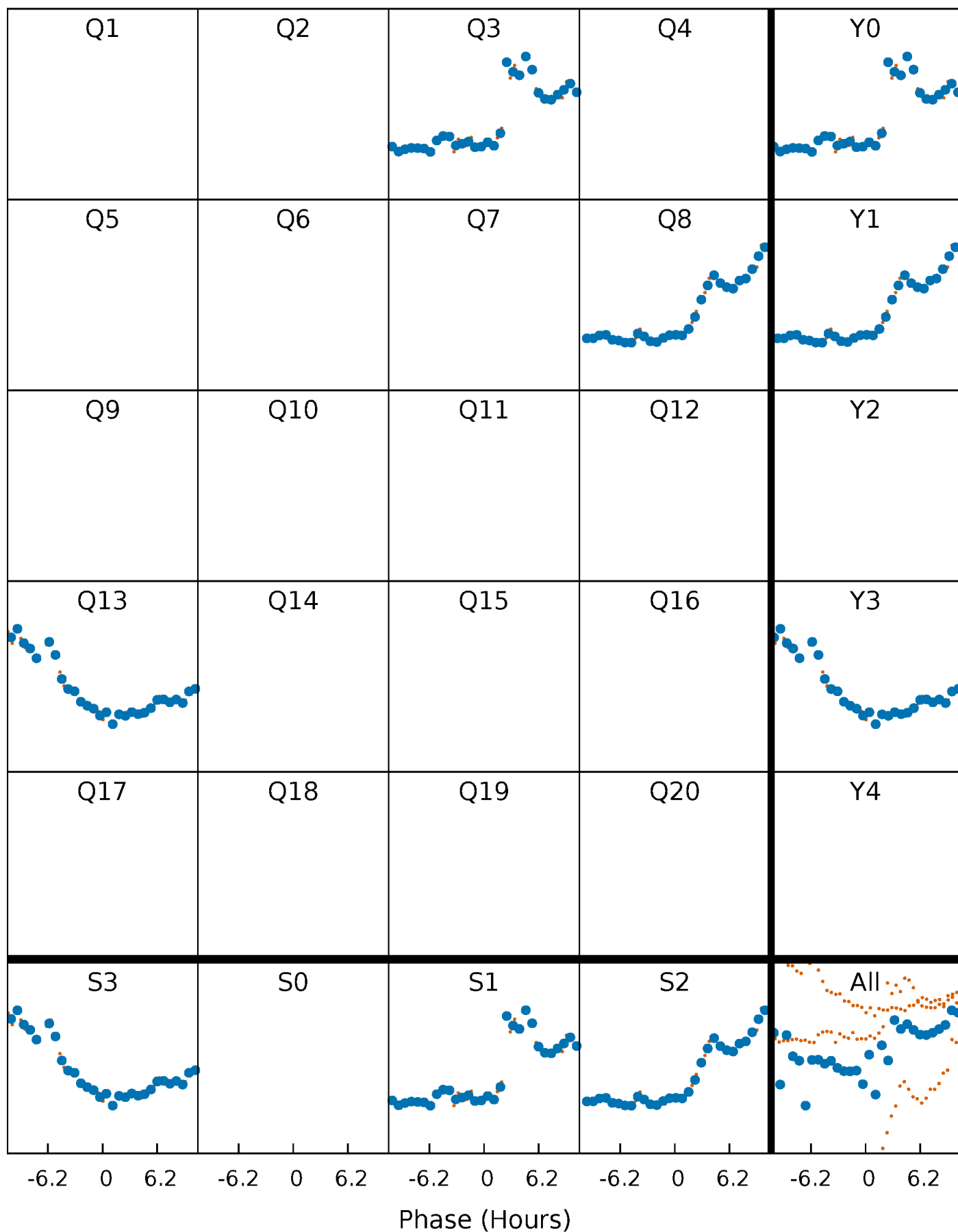


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



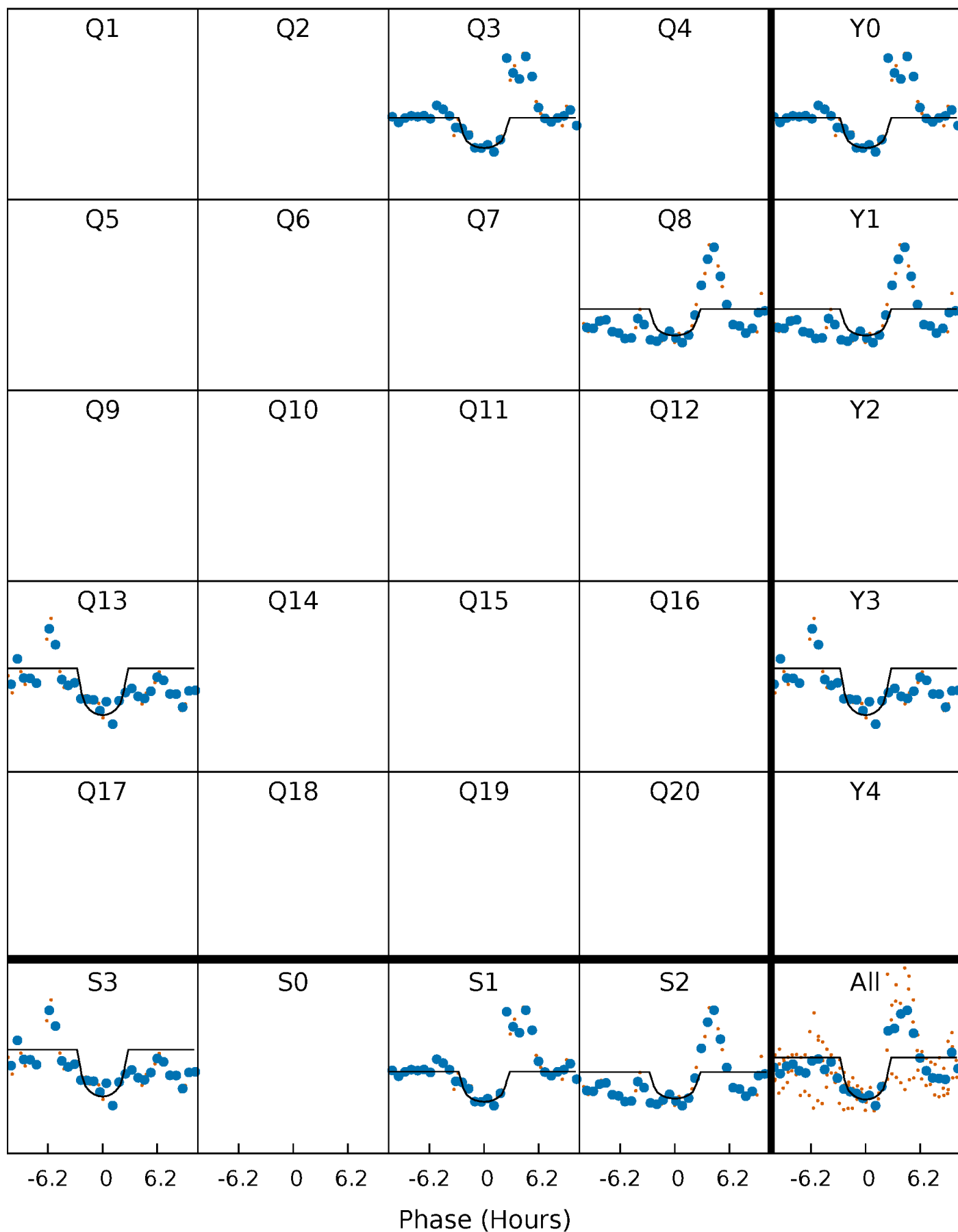
PDC Quarter-Phased Transit Curves

TCE 008176468-05 $P=465.313666$ Days $T_0=318.048512$ (BKJD)



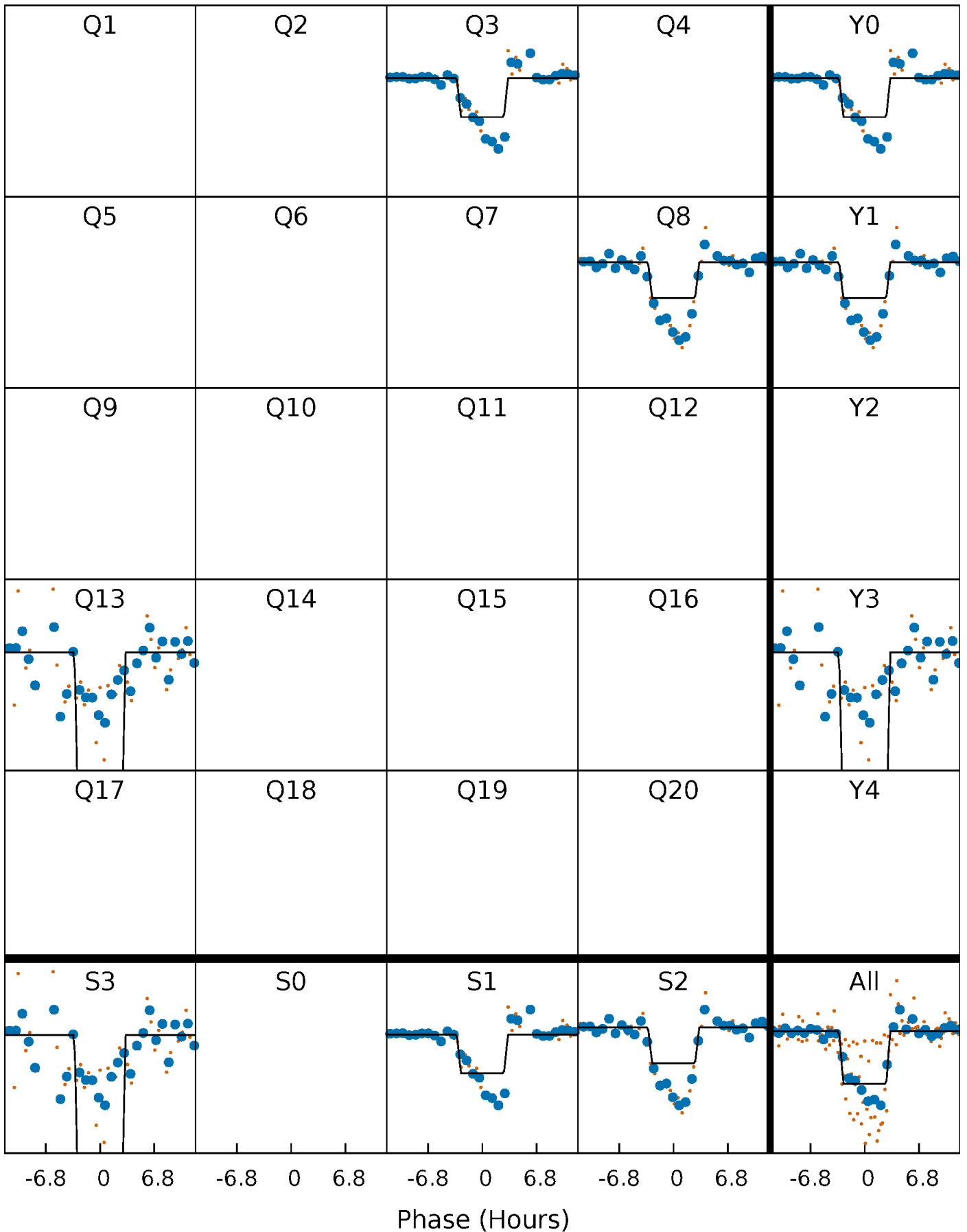
DV Quarter-Phased Transit Curves

TCE 008176468-05 $P=465.313666$ Days $T_0=318.048512$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

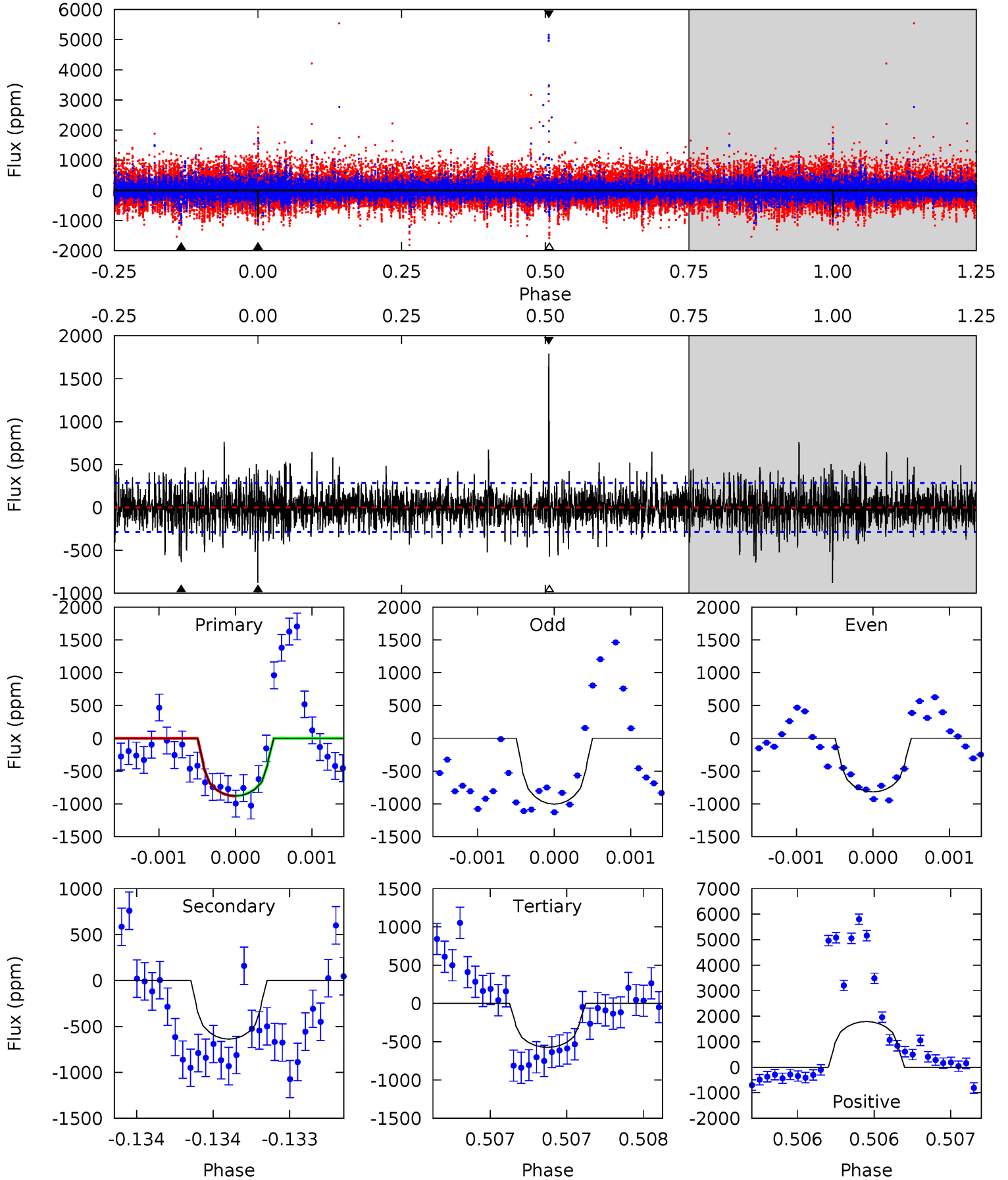
TCE 008176468-05 $P=465.340273$ Days $T_0=318.017663$ (BKJD)



DV Model-Shift Uniqueness Test

008176468-05, P = 465.313666 Days, E = 318.048512 Days

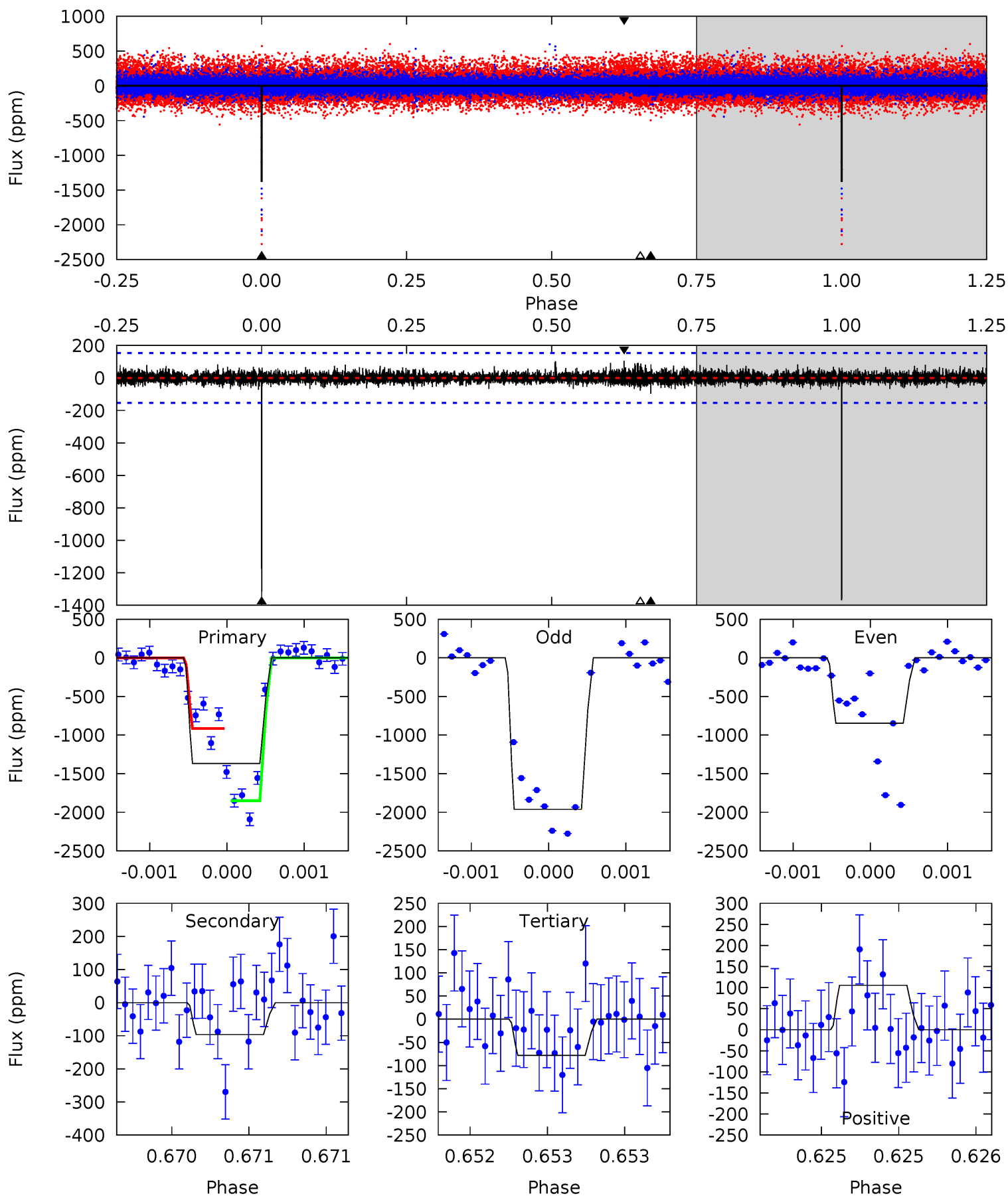
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.1	12.4	11.1	34.7	5.57	3.47	2.81	5.95	-17.7	1.27	-22.4	1.31	1.06	0.67	0.04



Alt Model-Shift Uniqueness Test

008176468-05, P = 465.340273 Days, E = 318.017663 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
49.7	3.49	2.84	3.82	5.56	3.46	0.65	46.8	45.9	0.65	-0.33	24.8	0.85	0.07	16.5



Stellar Parameters For KIC 008176468

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	4327^{+116}_{-129}	$4.627^{+0.052}_{-0.021}$	$-0.180^{+0.300}_{-0.300}$	$0.634^{+0.040}_{-0.060}$	$0.621^{+0.062}_{-0.056}$	$3.432^{+0.800}_{-0.366}$
	+3%/-3%	+1%/-0%	+167%/-167%	+6%/-9%	+10%/-9%	+23%/-11%
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 008176468-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-638 ± 52	$2.27^{+1.57}_{-1.37}$	210^{+7}_{-7}	3937^{+1793}_{-669}	$69232^{+392674}_{-45776}$
Alt.	-96 ± 28	$2.56^{+1.60}_{-1.49}$	210^{+7}_{-8}	2821^{+869}_{-347}	8058^{+38660}_{-5150}

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

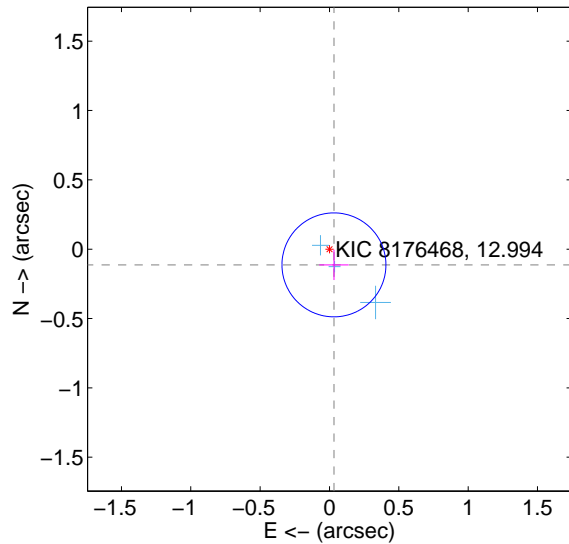
Supplemental centroid analysis for 008176468-05. Kepler magnitude: 12.99. Transit SNR 7.22

There are 3 quarters with good PRF difference image offsets

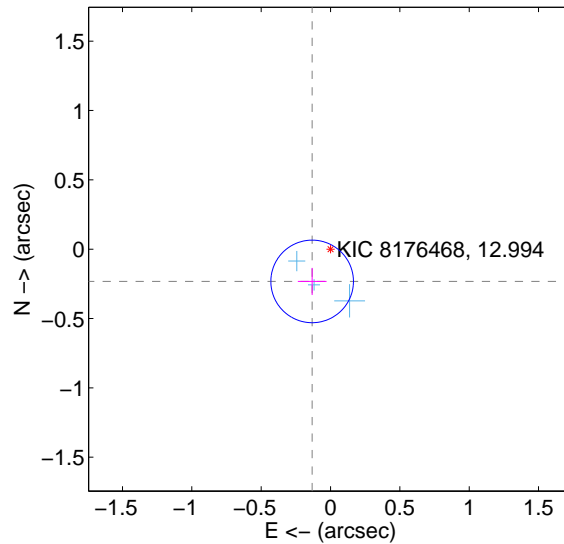
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.118 ± 0.125	0.94	-0.032 ± 0.106	-0.113 ± 0.109
PRF-fit source offset from KIC position	0.268 ± 0.099	2.70	0.132 ± 0.104	-0.233 ± 0.098
photometric centroid source offset	0.20 ± 0.42	0.47	-0.15 ± 0.43	0.12 ± 0.40

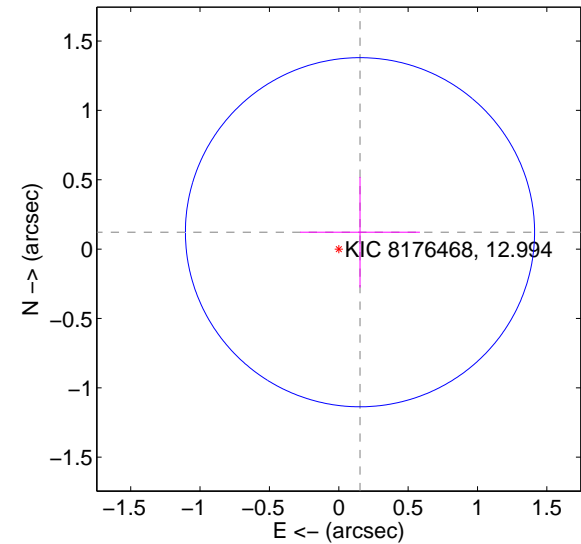
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



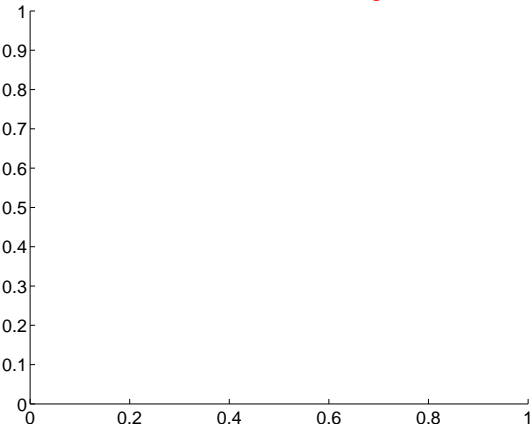
offset from photometric centroids



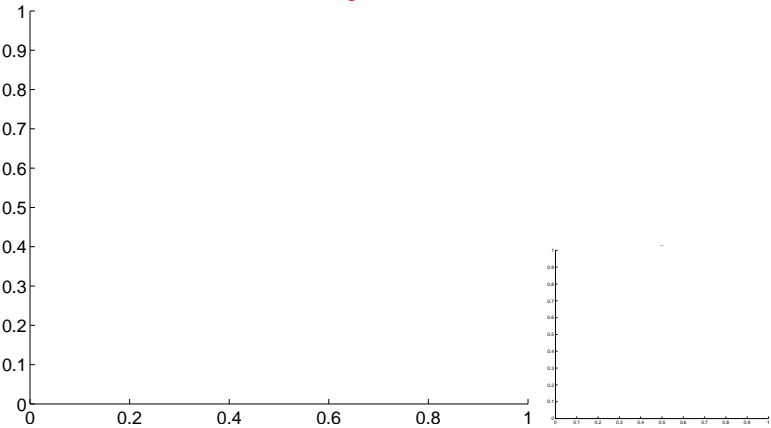
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

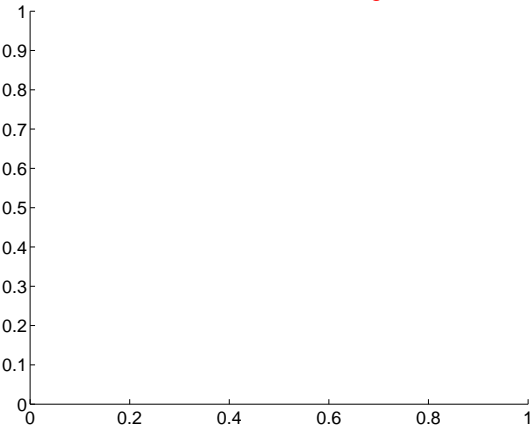
Q1 no difference image



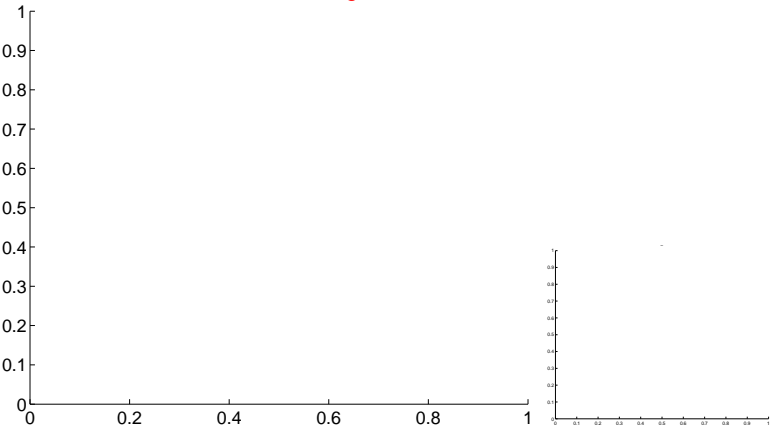
Q1 no OOT image



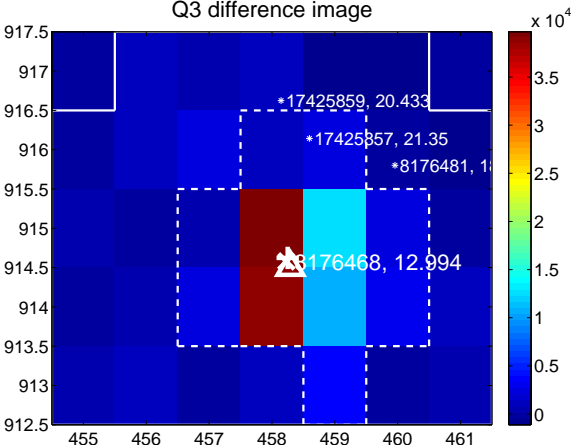
Q2 no difference image



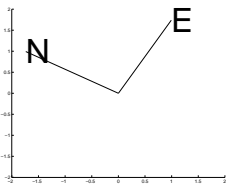
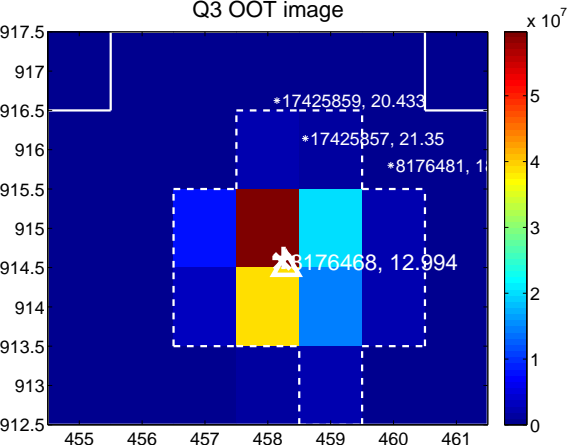
Q2 no OOT image



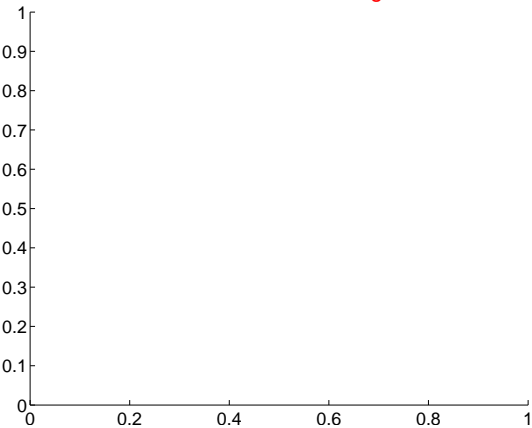
Q3 difference image



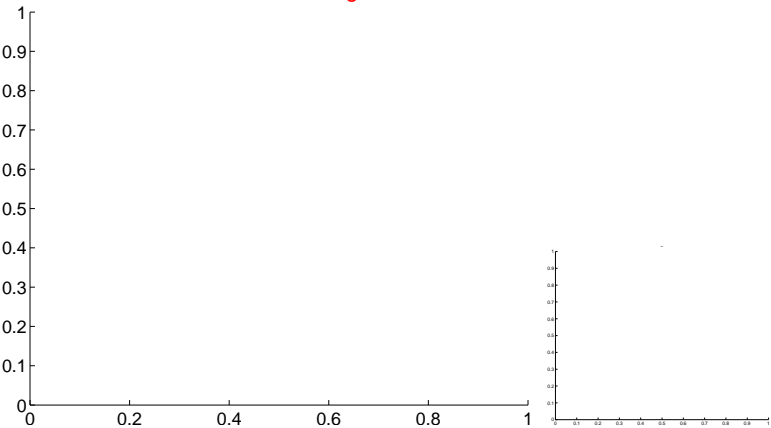
Q3 OOT image



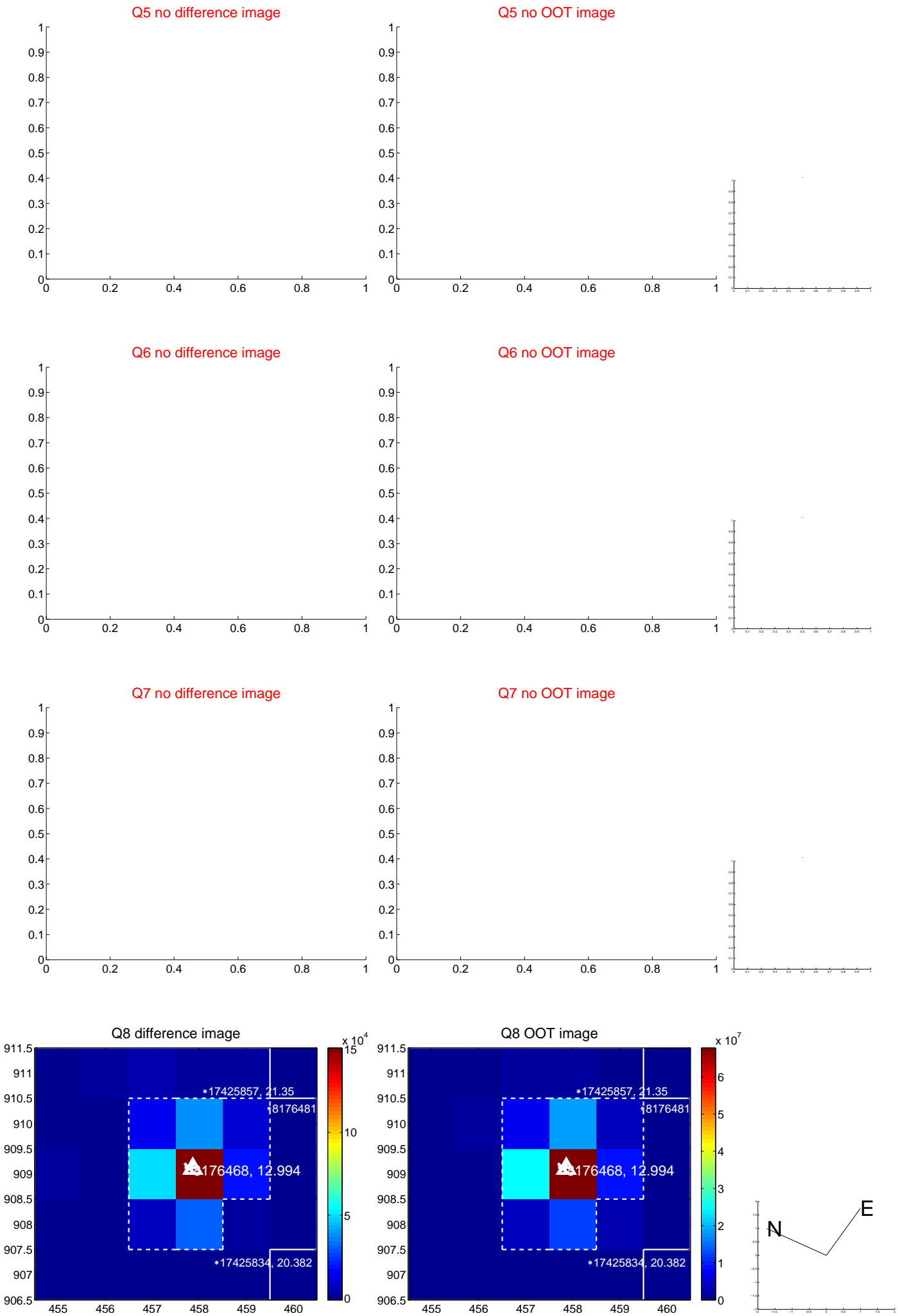
Q4 no difference image



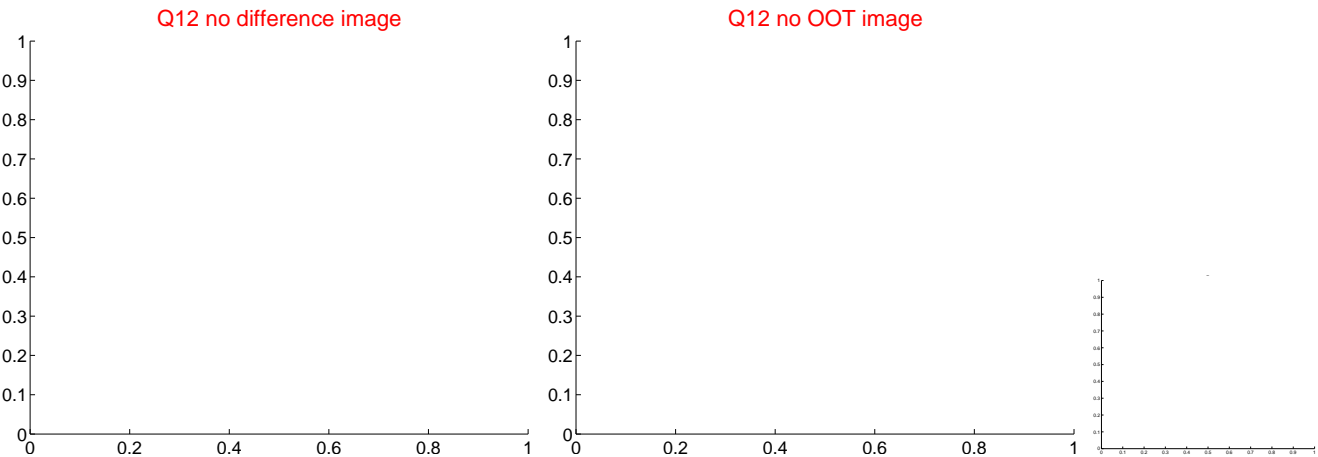
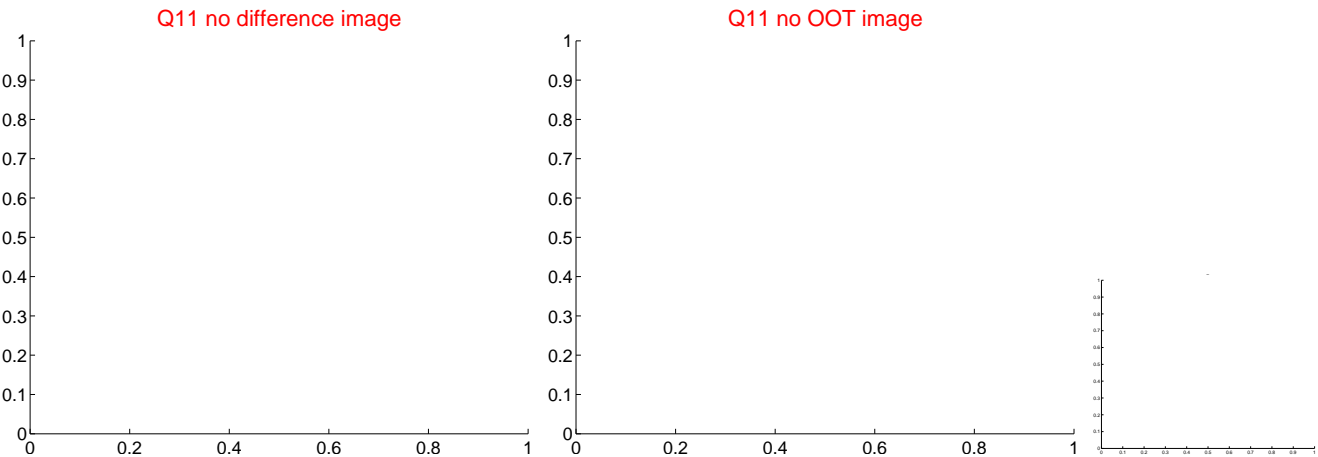
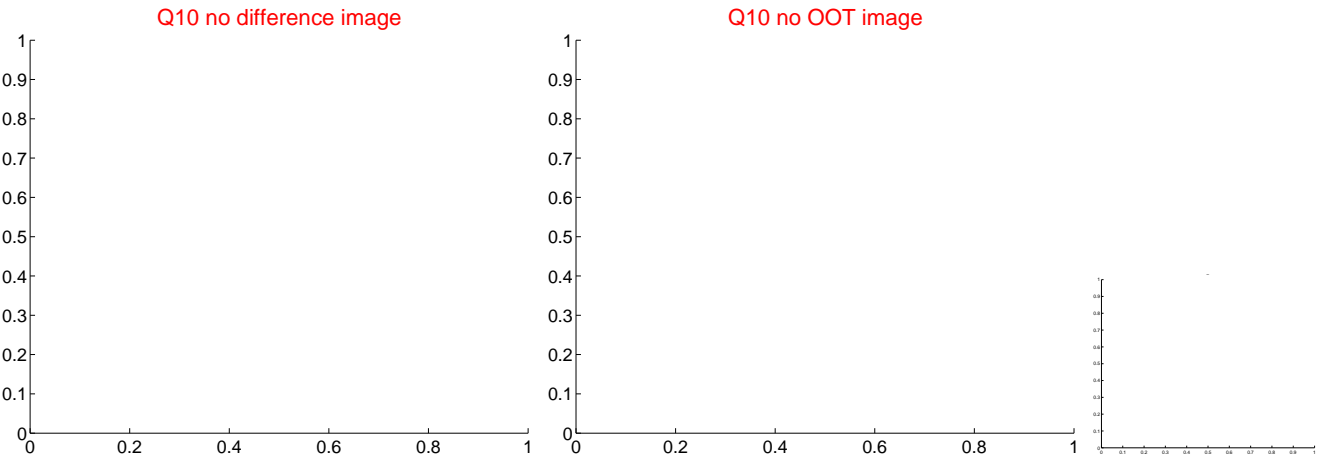
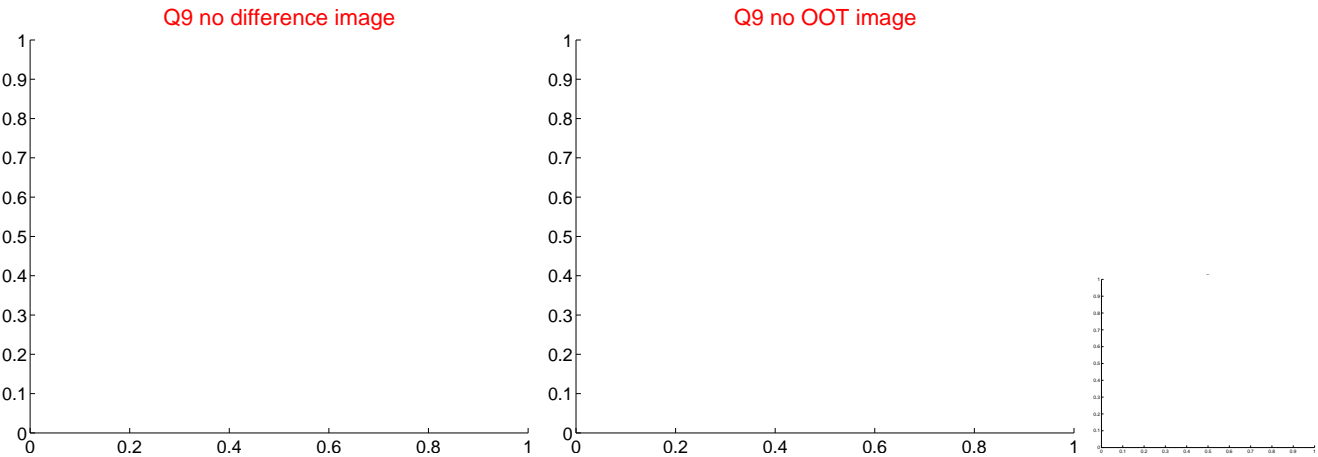
Q4 no OOT image



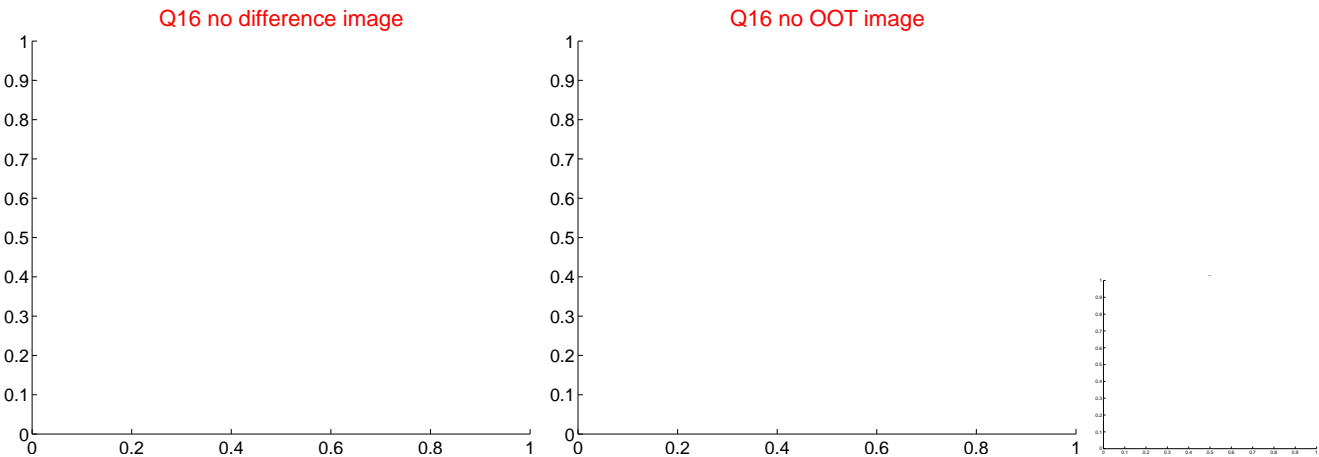
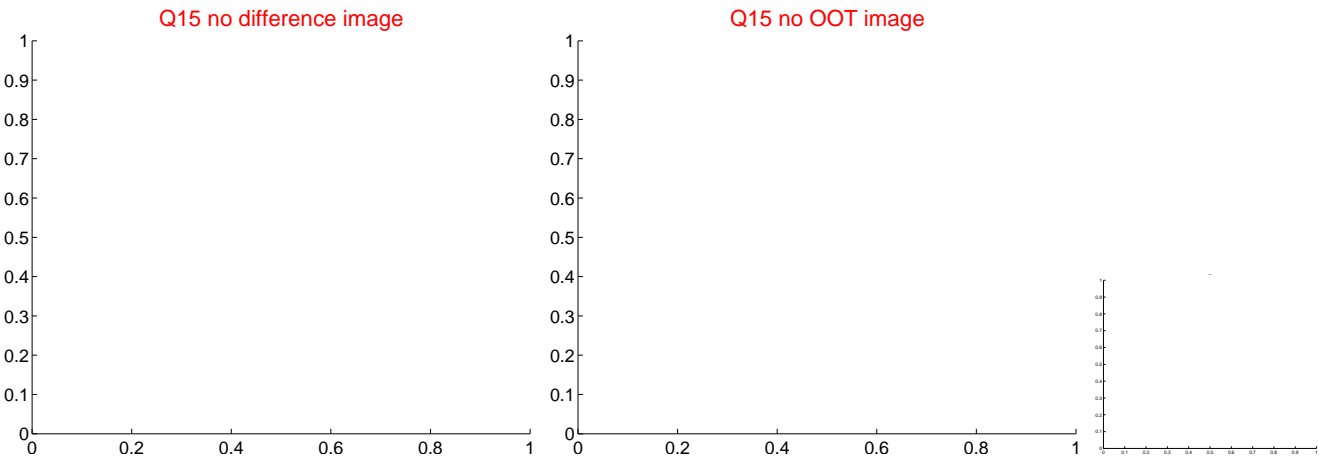
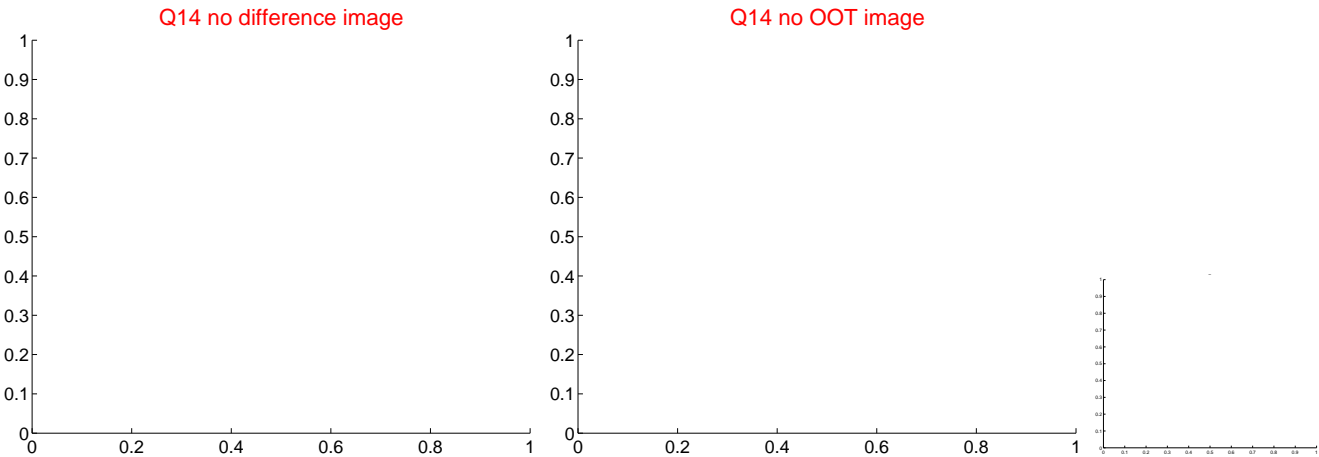
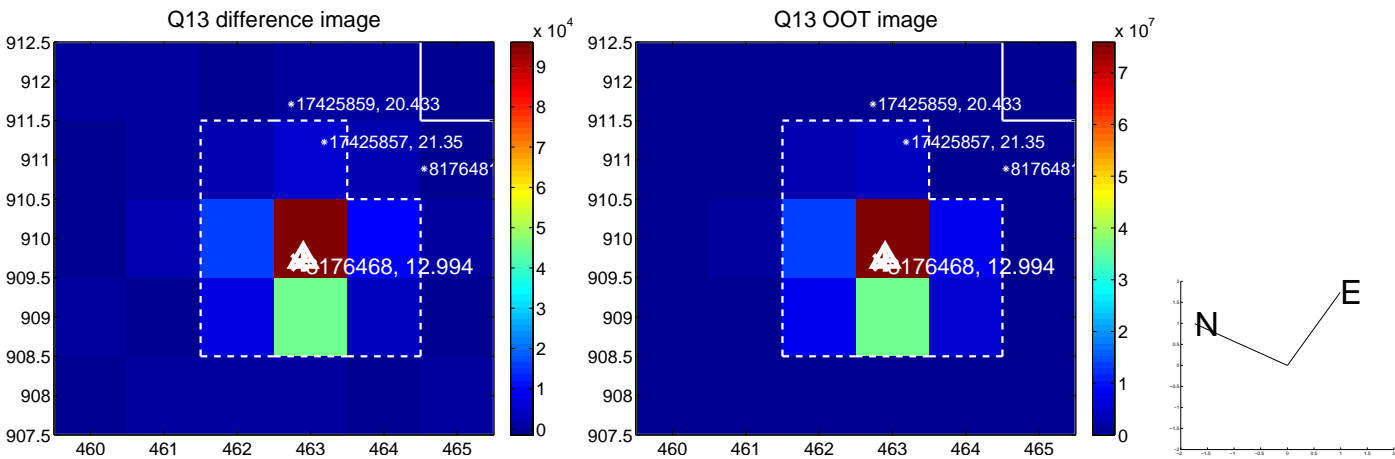
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



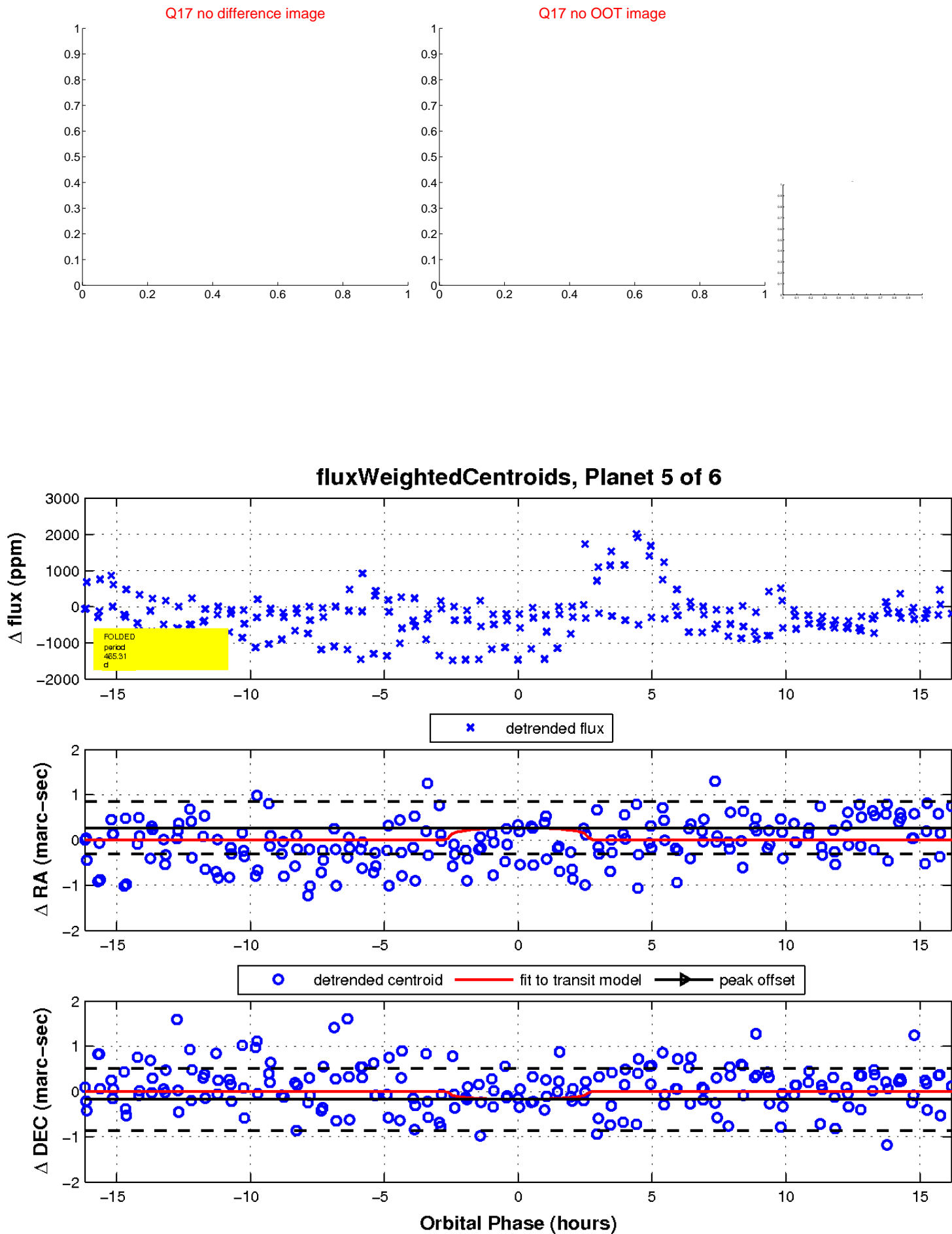
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

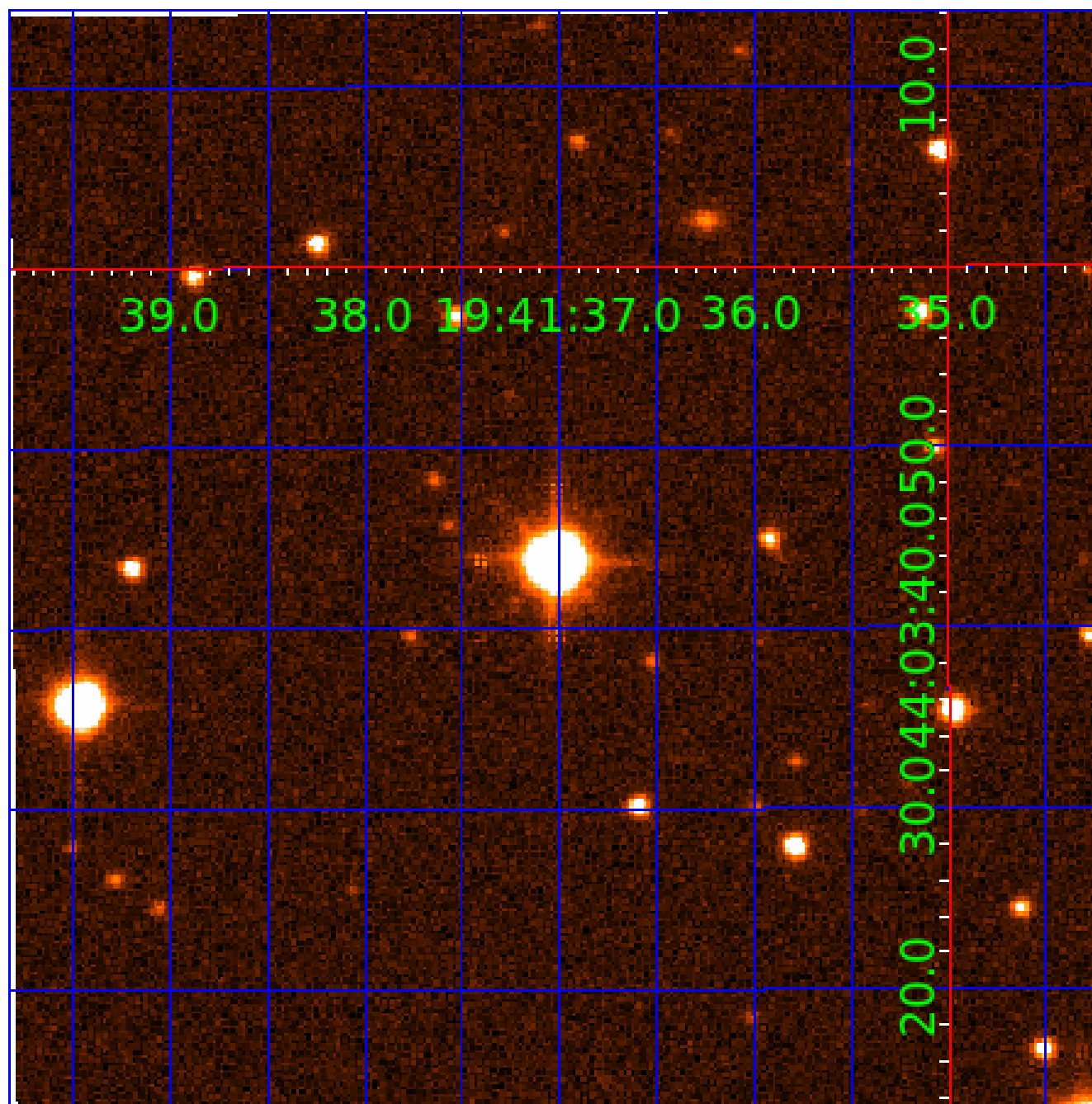


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008176468

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})
008176468-01	OBS	No	376.021803	288.262571	562.8	10.473	34.0	4.4	0.63	4327	1.45	0.17
008176468-02	OBS	No	545.452425	333.293831	996.3	11.780	14.2	7.6	0.63	4327	2.68	0.10
008176468-03	OBS	No	547.578541	470.769390	227.9	12.500	12.3	-1.0	0.63	4327	0.92	0.10
008176468-04	OBS	No	261.506148	287.665503	546.9	3.812	13.8	5.7	0.63	4327	1.53	0.27
008176468-05	OBS	No	465.313666	318.048512	896.5	5.401	12.7	7.2	0.63	4327	1.95	0.13
008176468-06	OBS	No	270.775055	370.377823	502.0	2.743	11.8	5.9	0.63	4327	1.40	0.26

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008176468-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
008176468-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008176468-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—CENT_NOFITS
008176468-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008176468-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—HALO_GHOST
008176468-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_ALT—ALL_TRANS_CHASES—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS

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

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

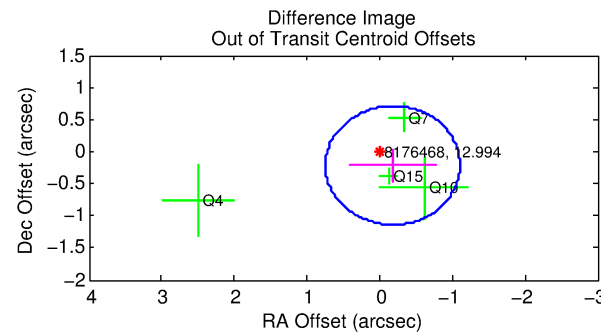
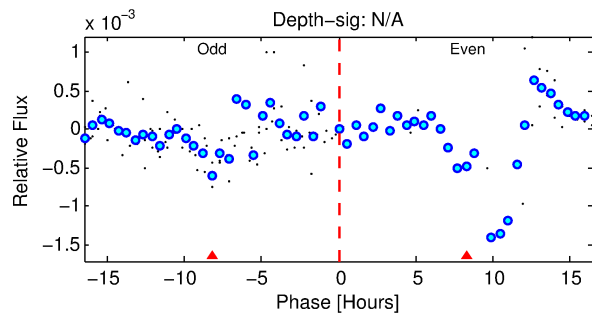
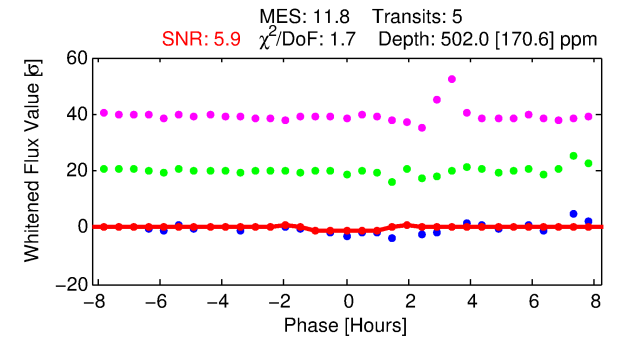
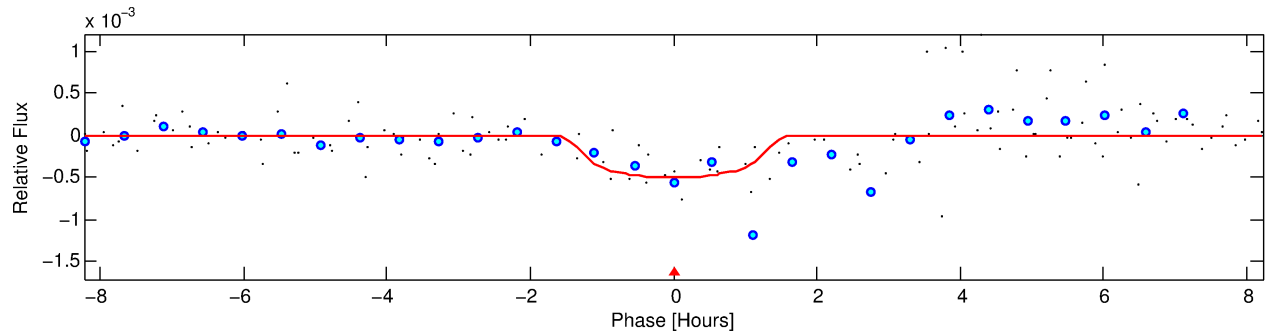
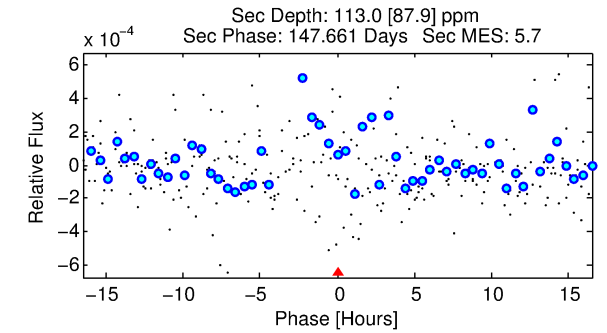
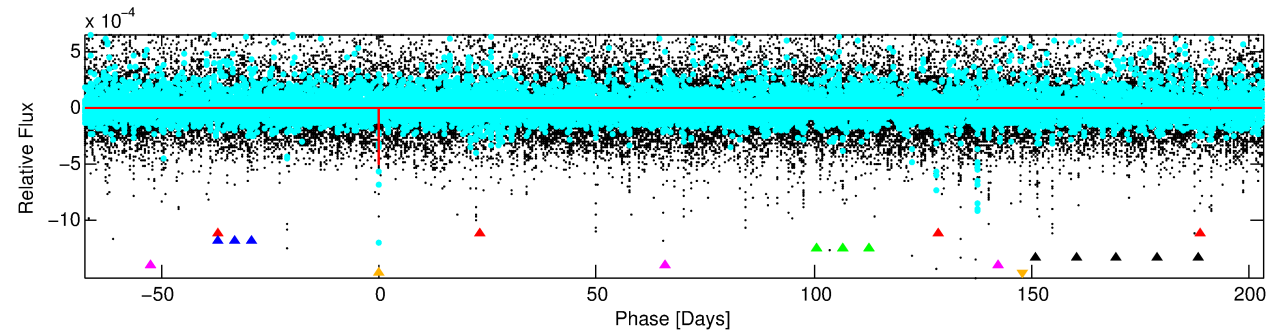
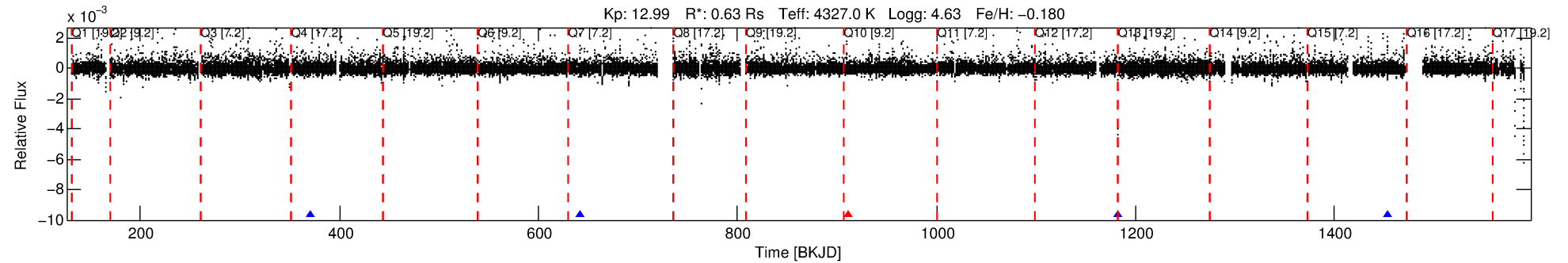
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008176468-06

No Significant Match Found

DV One-Page Summary

KIC: 8176468 Candidate: 6 of 6 Period: 270.775 d



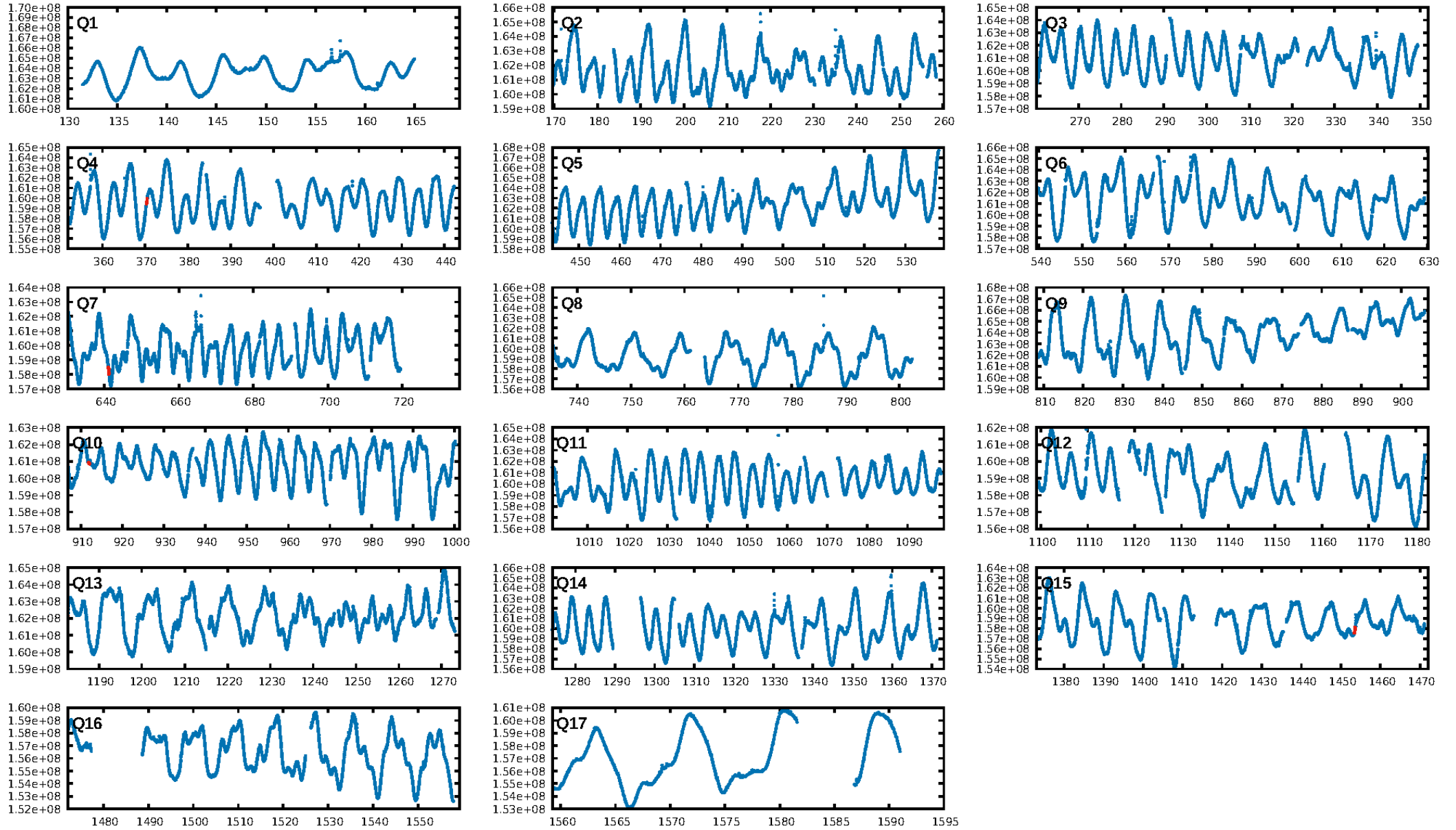
DV Fit Results:

Period = 270.77505 [0.00479] d
Epoch = 370.3778 [0.0119] BKJD
Rp/R* = 0.0202 [0.0656]
a/R* = 714.28 [6917.52]
b = 0.38 [22.51]
Seff = 0.26 [0.04]
Teq = 182 [7] K
Rp = 1.40 [4.54] Re
a = 0.6990 [0.0522] AU
Ag = 15579.02 [102006.93] [0.15σ]
Teffp = 3140 [5141] K [0.58σ]

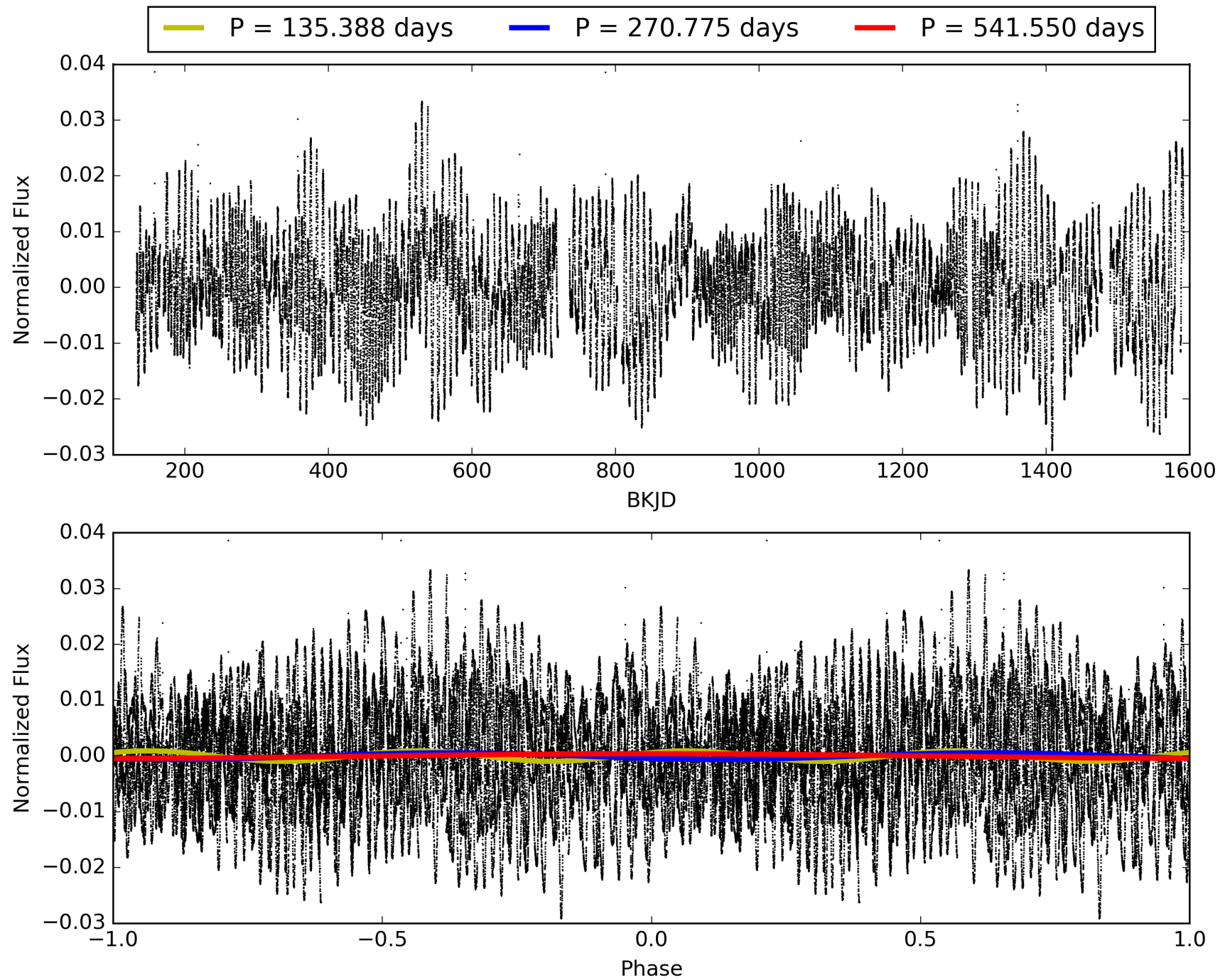
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [47.37σ]
LongPeriod-sig: 100.0% [233.32σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 46.3%
Bootstrap-pfa: N/A
RollingBand-fgt: 0.80 [4/5]
GhostDiagnostic-chr: 6.328
Centroid-sig: 7.5%
Centroid-so: 1.395 arcsec [1.56σ]
OotOffset-rm: 0.278 arcsec [0.90σ]
OotOffset-st: 1/2/1/0 [4]
KicOffset-rm: 0.284 arcsec [0.58σ]
KicOffset-st: 1/2/1/0 [4]
DiffImageQuality-fgm: 1.00 [4/4]
DiffImageOverlap-fno: 1.00 [4/4]

TCE 008176468-06, PDC Light Curves

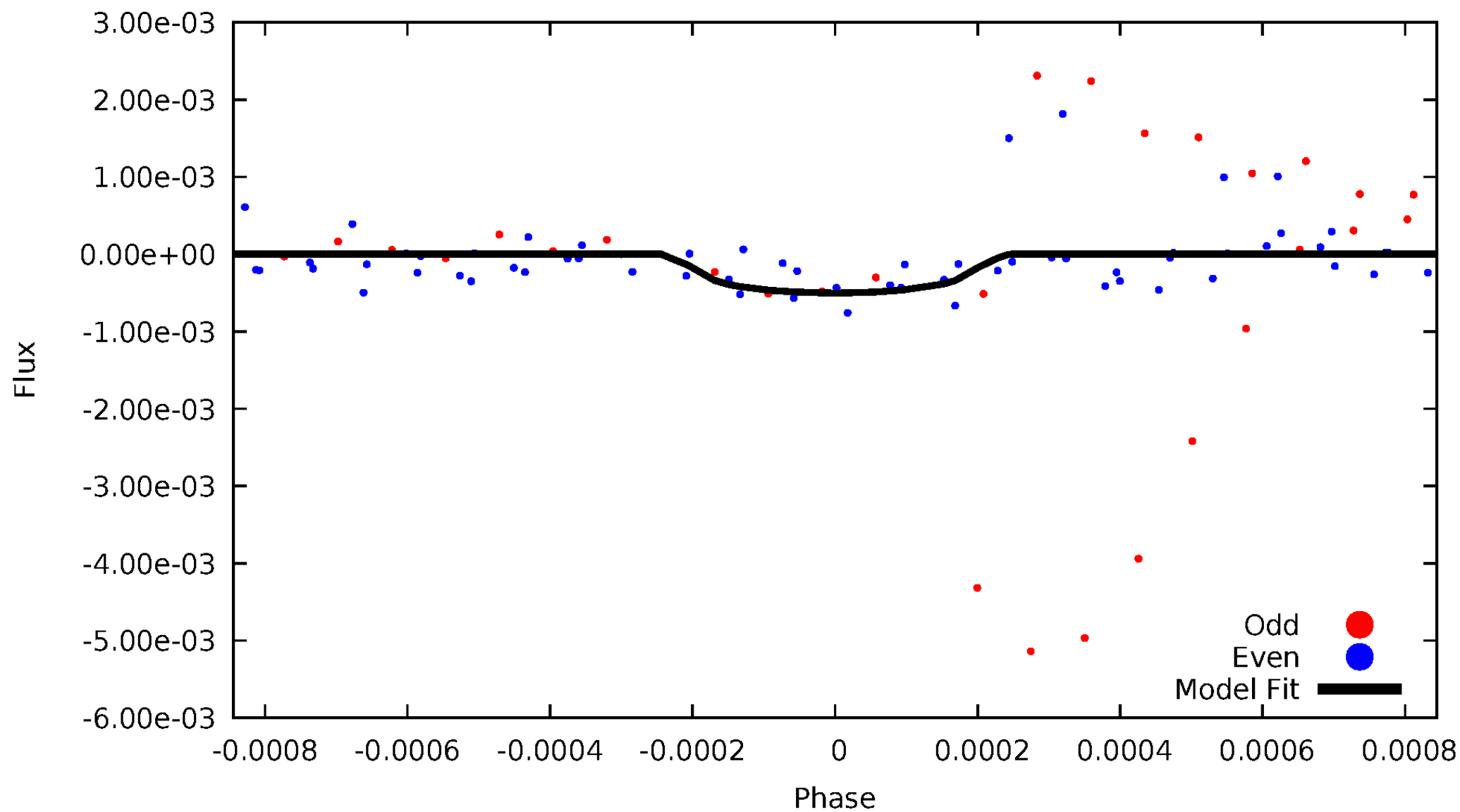


TCE 008176468-06



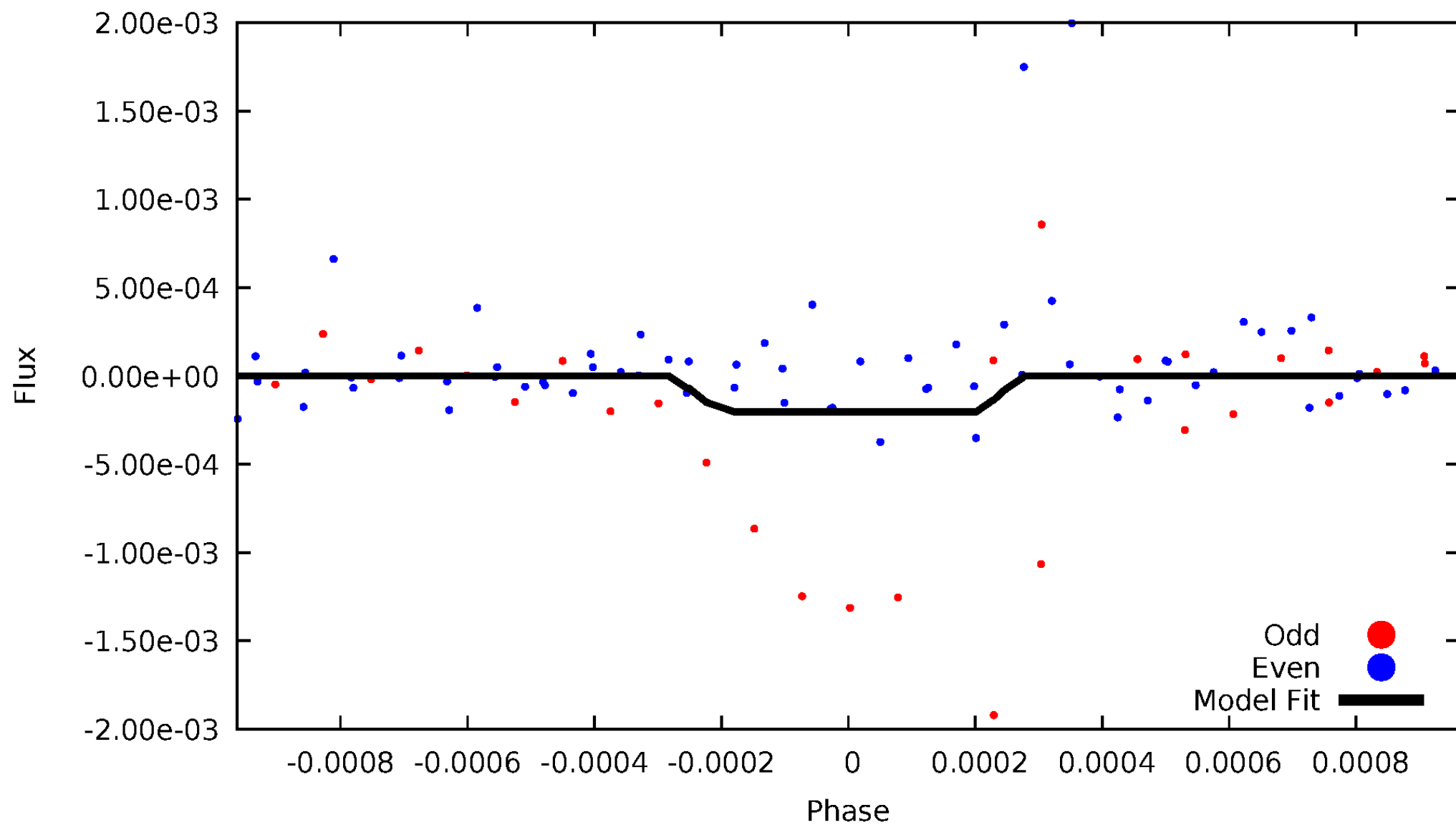
DV Odd/Even

TCE 008176468-06



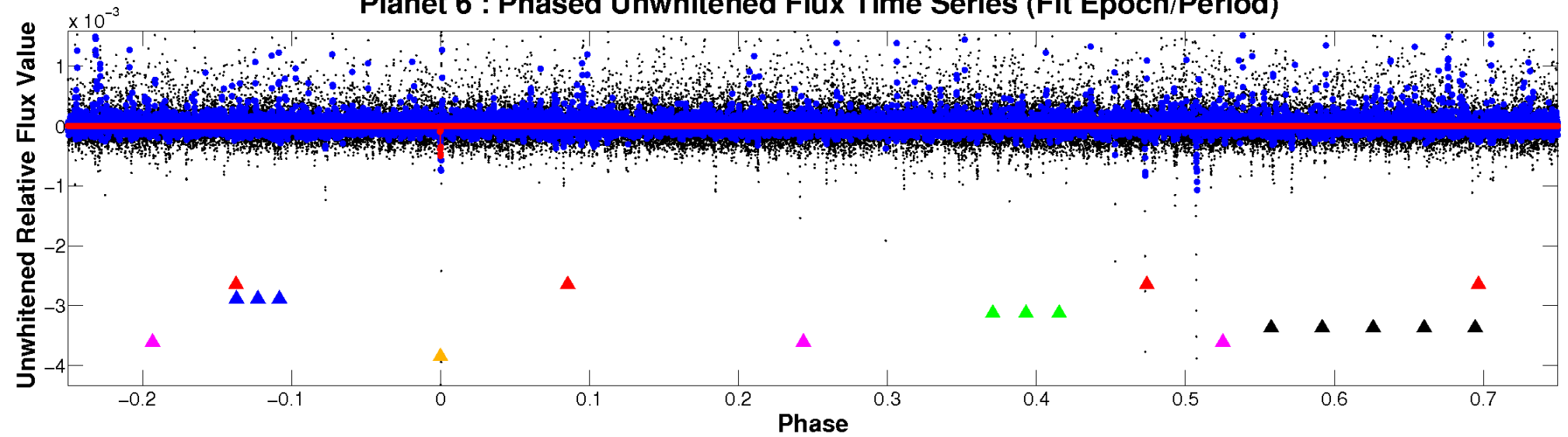
ALT Odd/Even

TCE 008176468-06

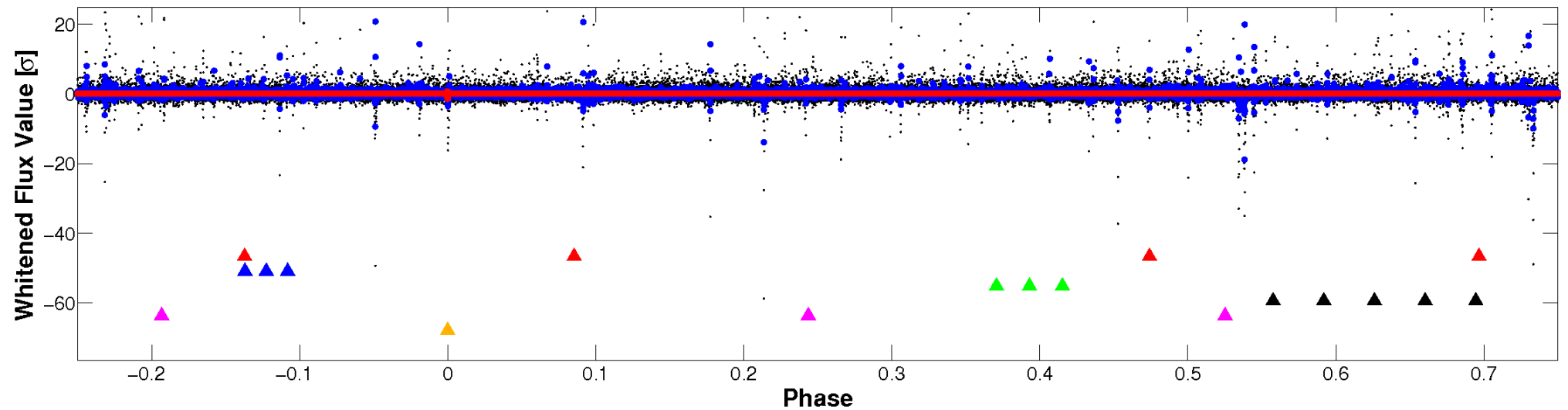


Non-Whitened Vs. Whitened Light Curve

Planet 6 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

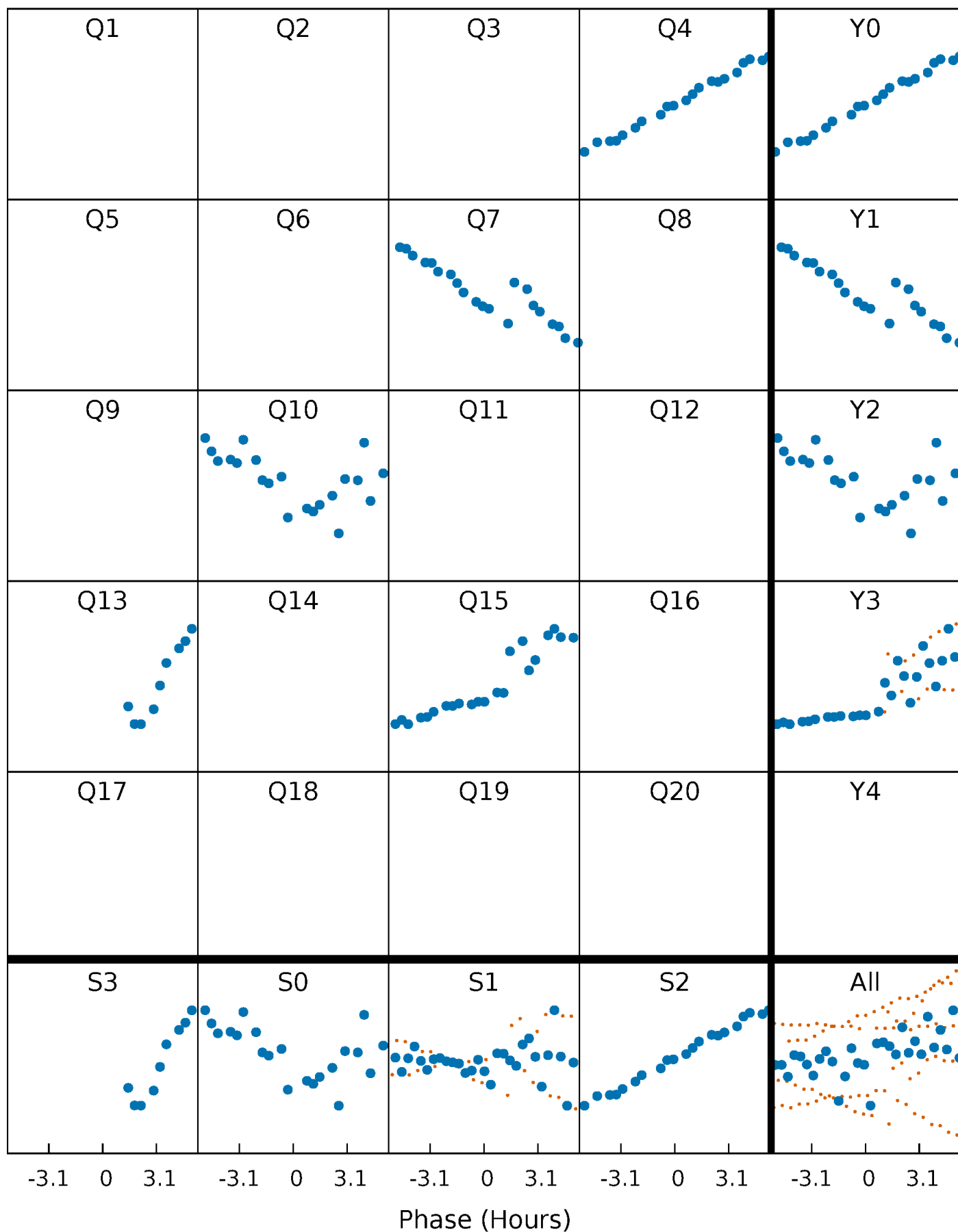


Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



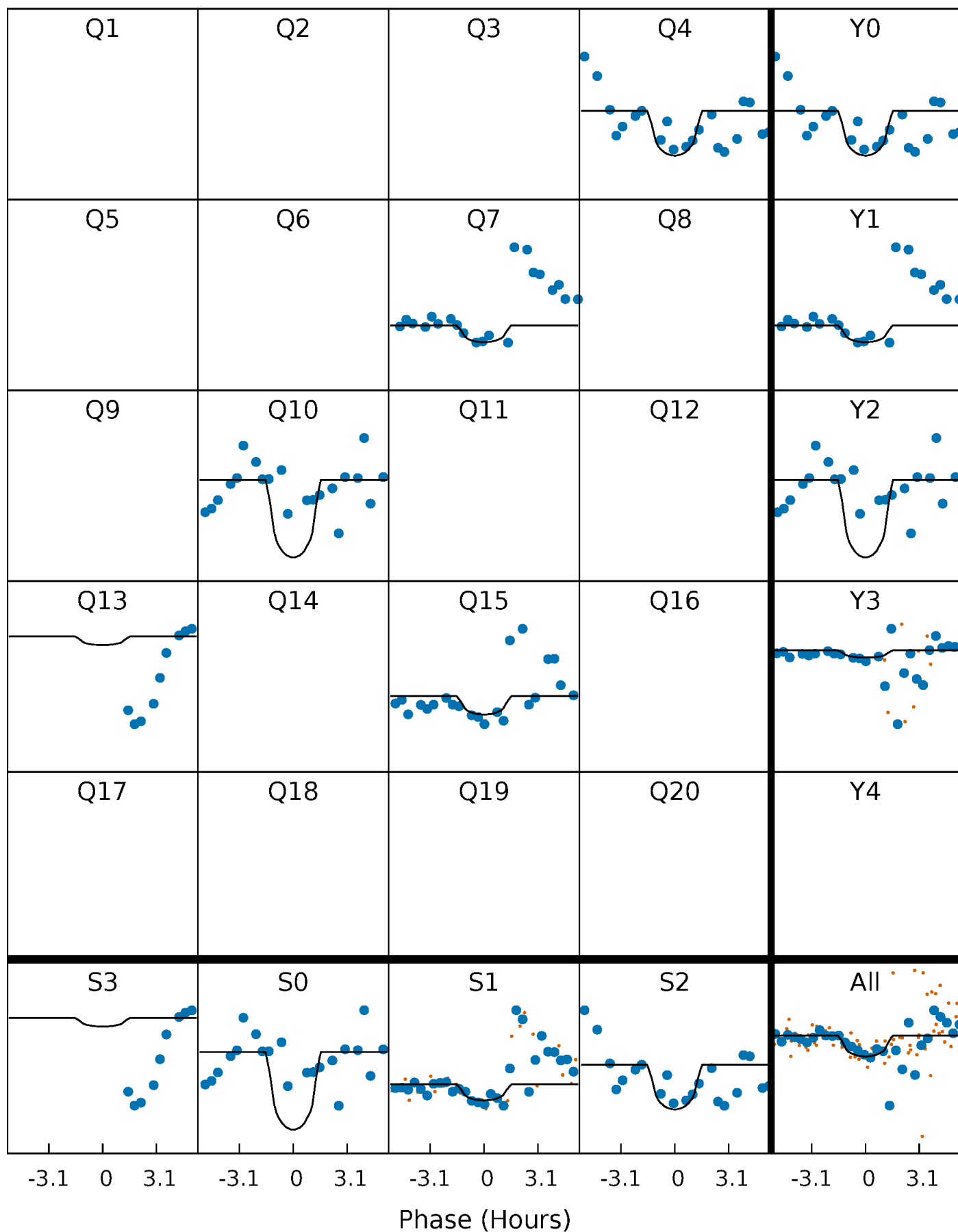
PDC Quarter-Phased Transit Curves

TCE 008176468-06 P=270.775055 Days $T_0=370.377823$ (BKJD)



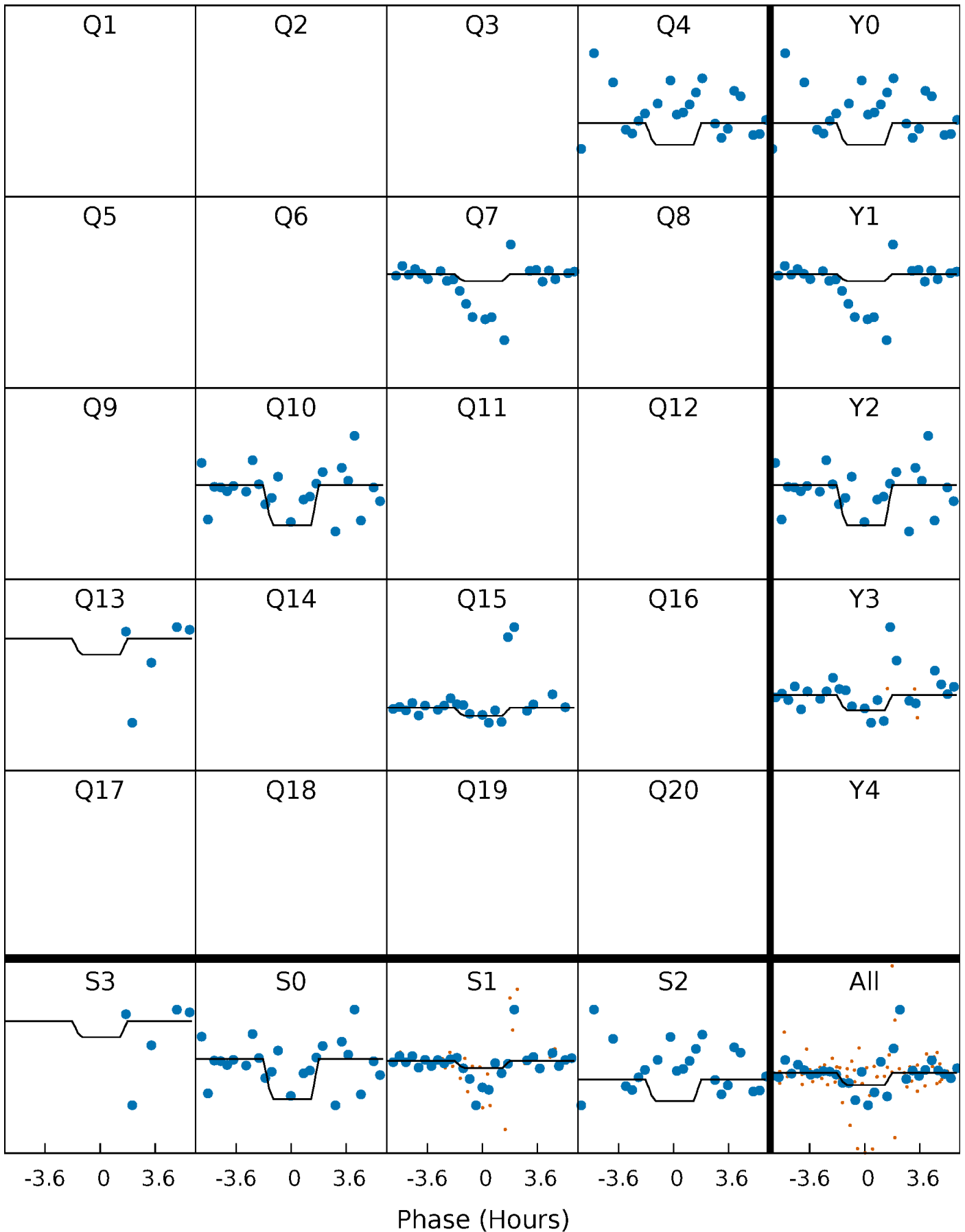
DV Quarter-Phased Transit Curves

TCE 008176468-06 P=270.775055 Days $T_0=370.377823$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

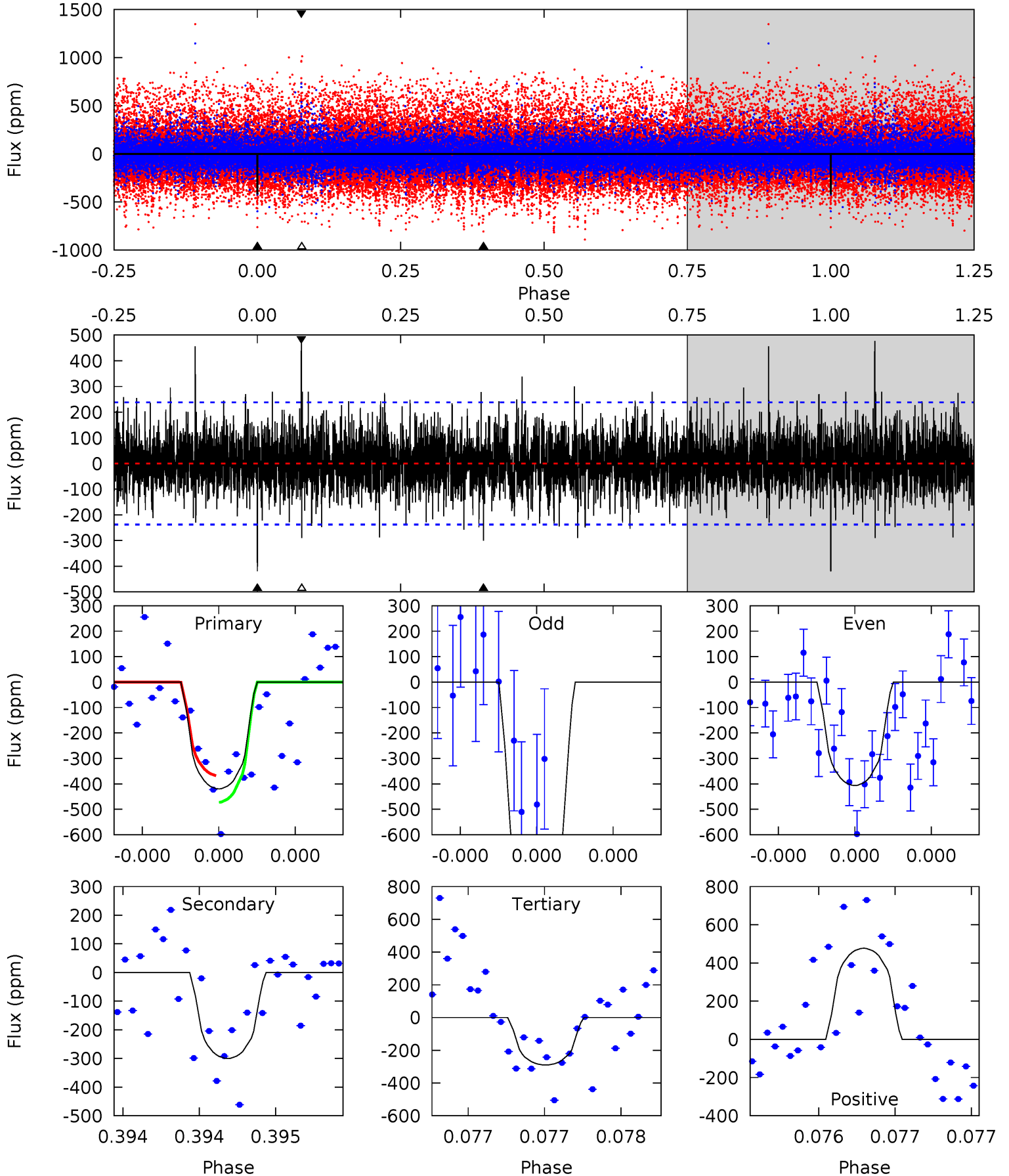
TCE 008176468-06 P=270.773998 Days $T_0=370.373197$ (BKJD)



DV Model-Shift Uniqueness Test

008176468-06, $P = 270.775055$ Days, $E = 99.602768$ Days

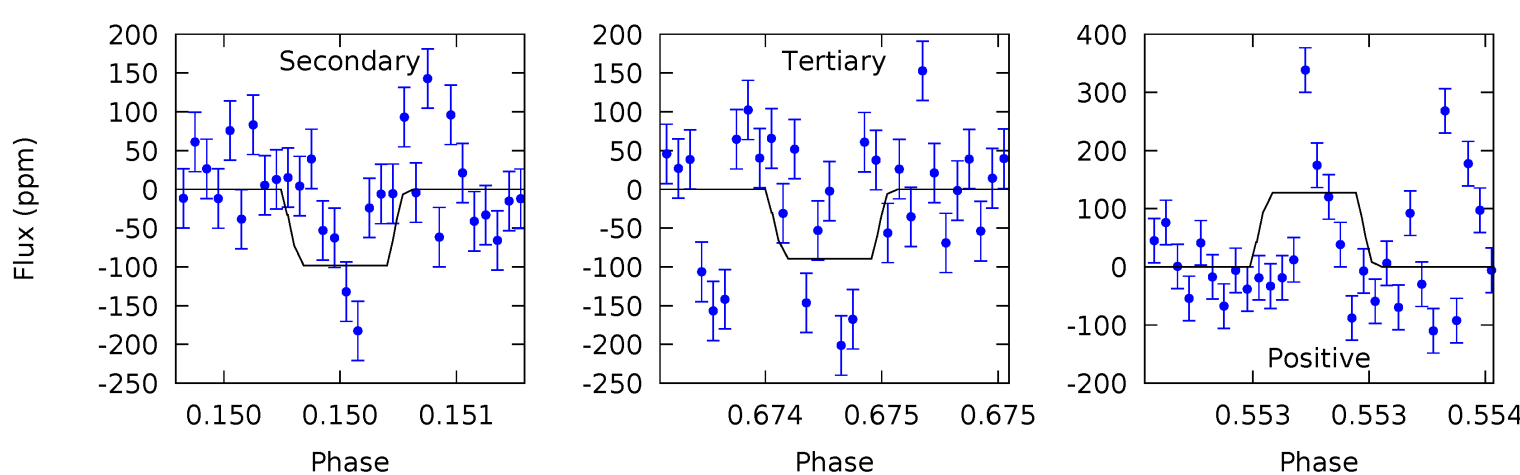
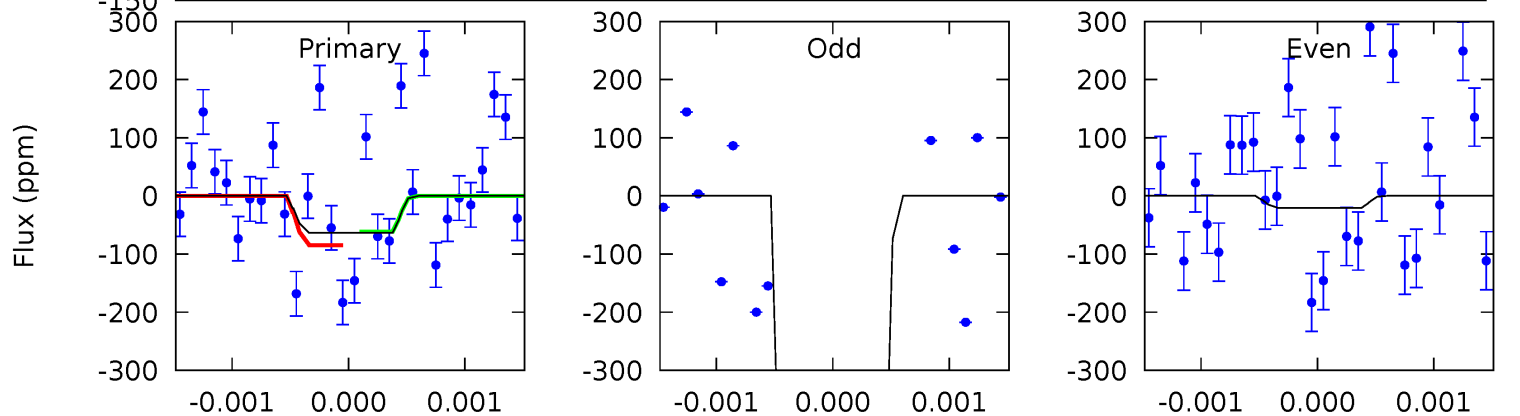
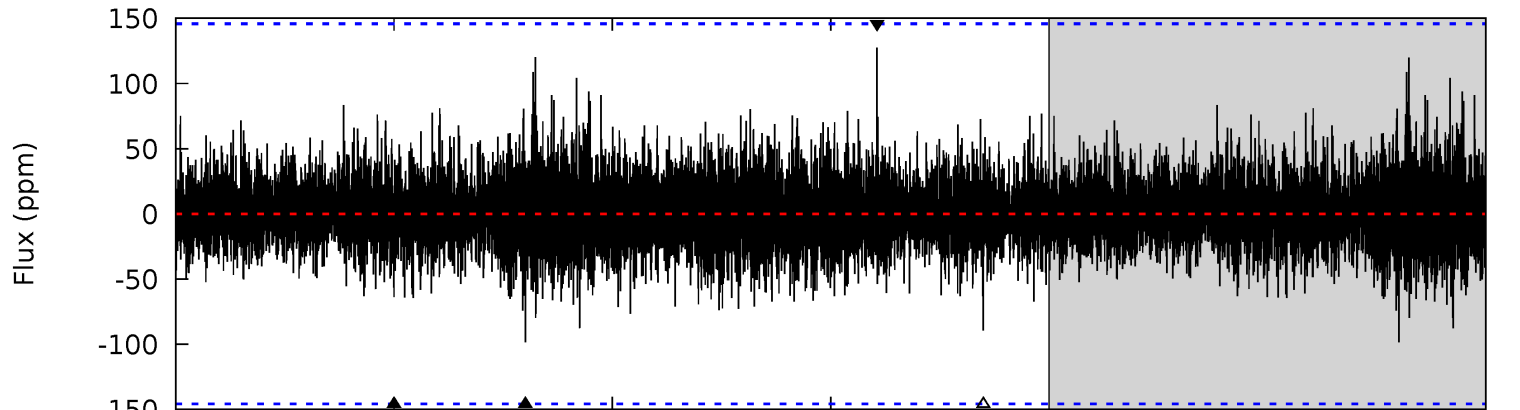
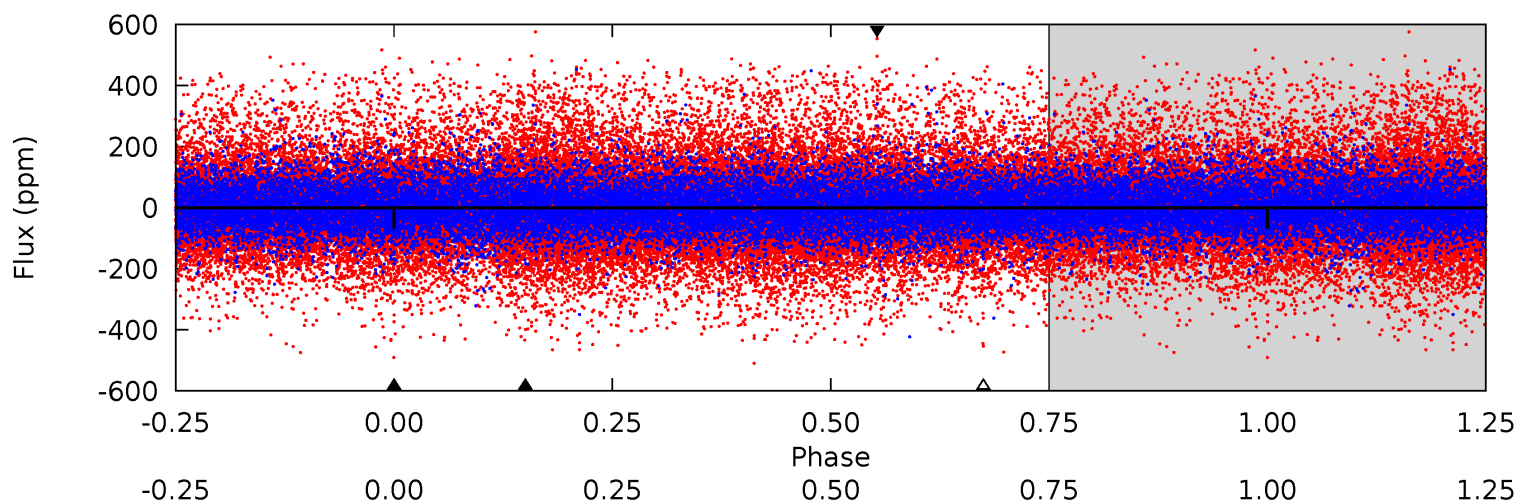
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.84	7.04	6.80	11.2	5.58	3.48	1.79	3.04	-1.35	0.24	-4.15	4.22	0.97	0.53	1.24



Alt Model-Shift Uniqueness Test

008176468-06, P = 270.773998 Days, E = 99.599199 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.43	3.75	3.41	4.86	5.56	3.46	0.82	-0.98	-2.43	0.34	-1.11	18.1	2.69	0.56	0.43



Stellar Parameters For KIC 008176468

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	4327^{+116}_{-129}	$4.627^{+0.052}_{-0.021}$	$-0.180^{+0.300}_{-0.300}$	$0.634^{+0.040}_{-0.060}$	$0.621^{+0.062}_{-0.056}$	$3.432^{+0.800}_{-0.366}$
	+3%/-3%	+1%/-0%	+167%/-167%	+6%/-9%	+10%/-9%	+23%/-11%
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 008176468-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-300 ± 43	$3.33^{+3.60}_{-2.31}$	252^{+8}_{-8}	3080^{+1534}_{-564}	7221^{+69292}_{-5582}
Alt.	-98 ± 26	$3.49^{+3.35}_{-2.57}$	252^{+8}_{-8}	2632^{+1218}_{-437}	2314^{+29240}_{-1814}

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 $A_{obs} \gg 1.0$

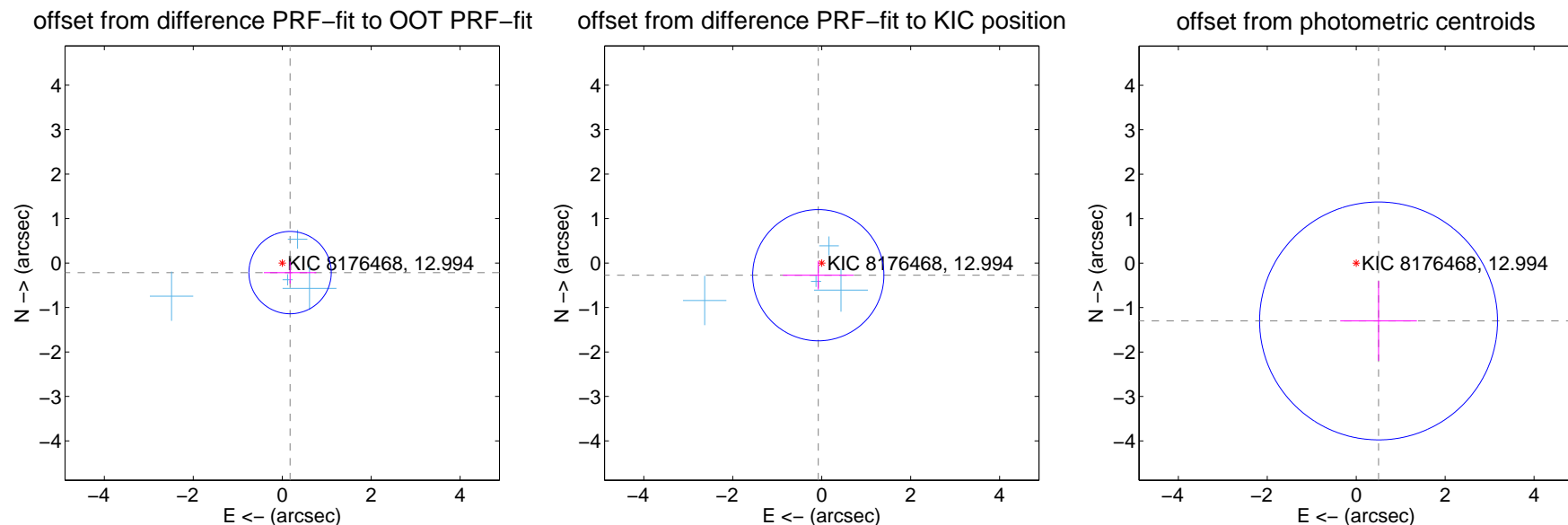
DV Centroid Data

Supplemental centroid analysis for 008176468-06. Kepler magnitude: 12.99. Transit SNR 5.93

There are 4 quarters with good PRF difference image offsets

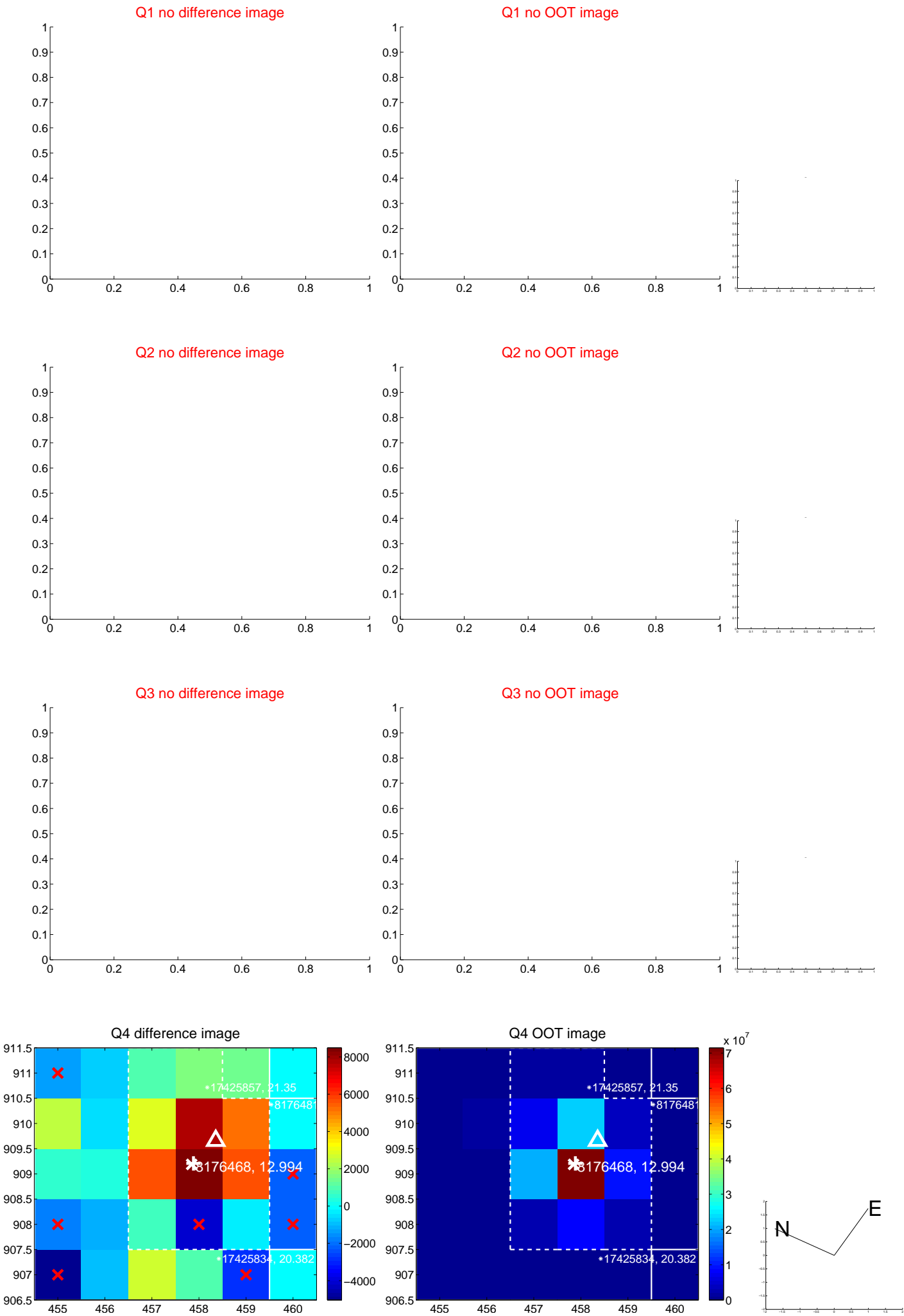
The direct PRF centroid is offset from the target star catalog position by about 0.25 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.278 ± 0.309	0.90	-0.177 ± 0.590	-0.215 ± 0.248
PRF-fit source offset from KIC position	0.284 ± 0.492	0.58	0.077 ± 0.795	-0.274 ± 0.322
photometric centroid source offset	1.39 ± 0.89	1.56	-0.50 ± 0.86	-1.30 ± 0.90



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.

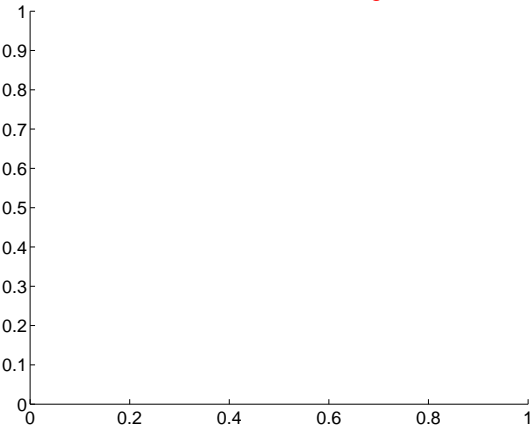
Q5 no difference image



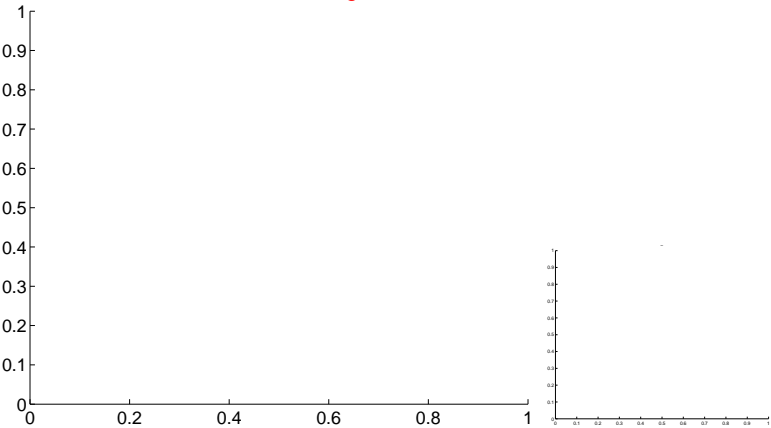
Q5 no OOT image



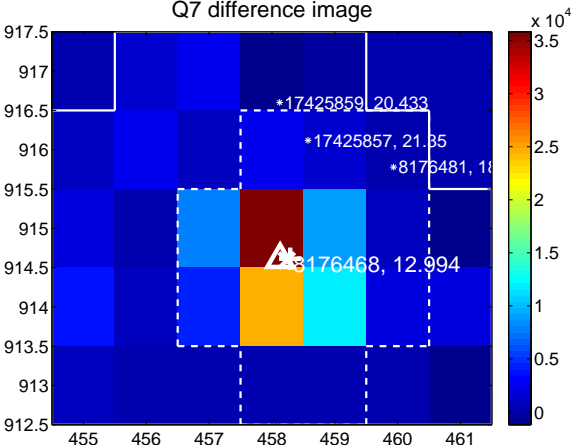
Q6 no difference image



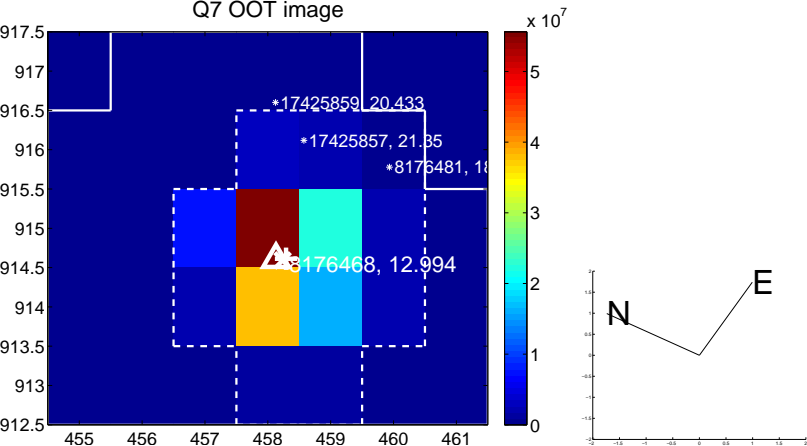
Q6 no OOT image



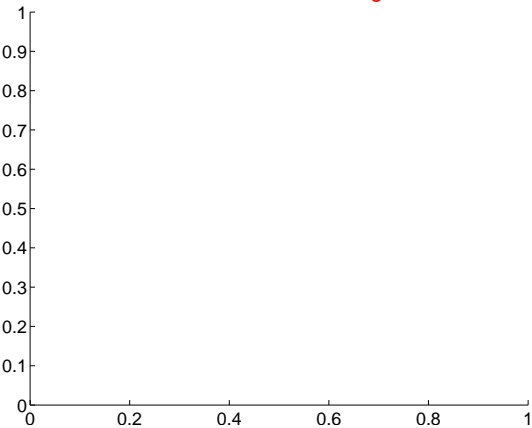
Q7 difference image



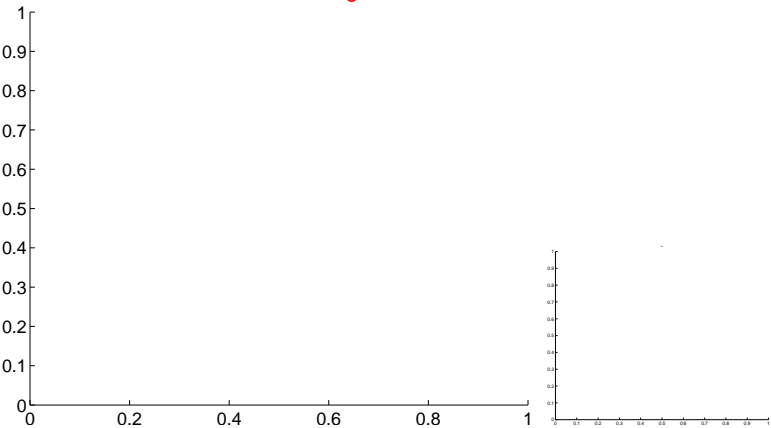
Q7 OOT image



Q8 no difference image

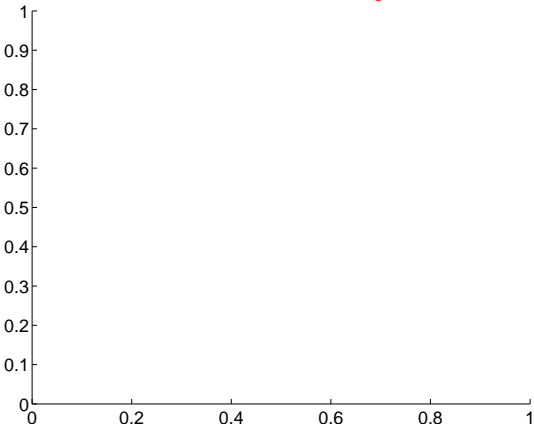


Q8 no OOT image

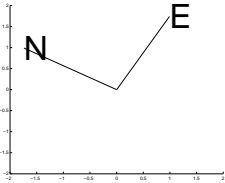
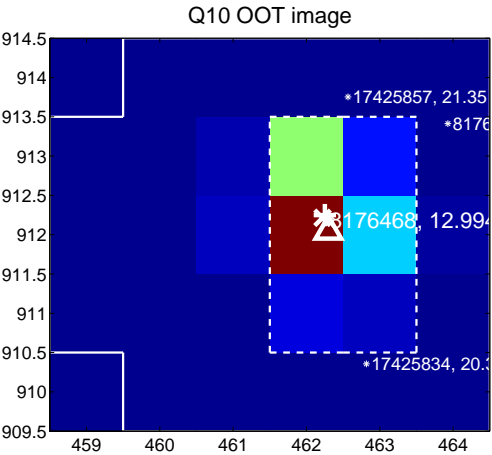
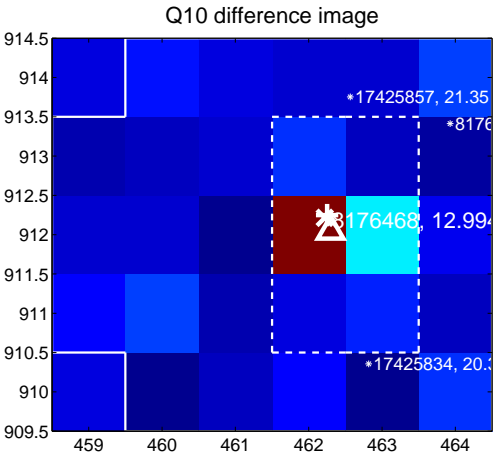
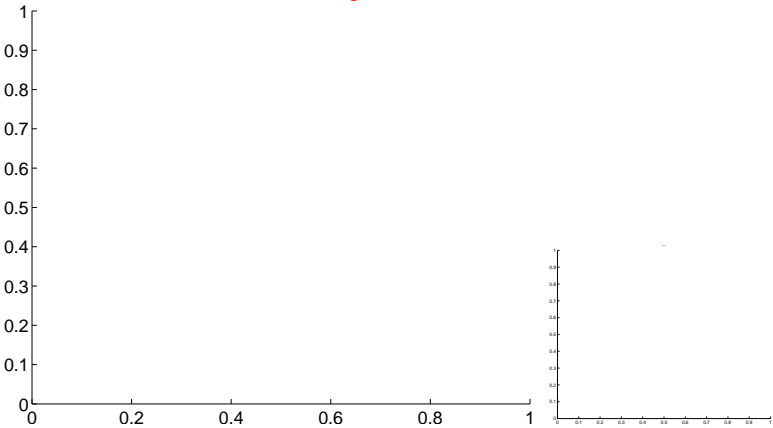


white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

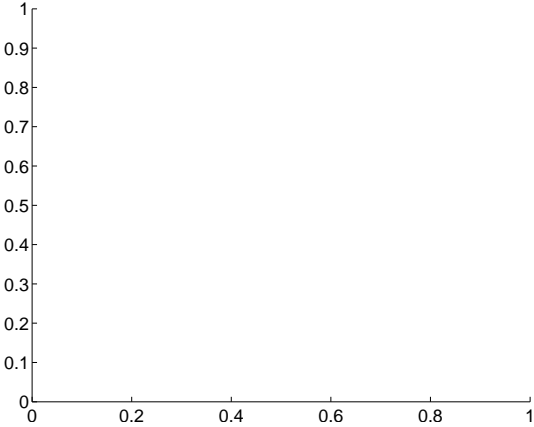
Q9 no difference image



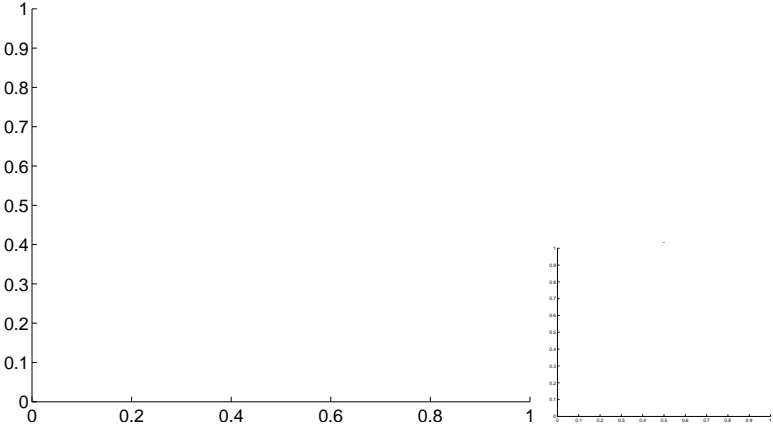
Q9 no OOT image



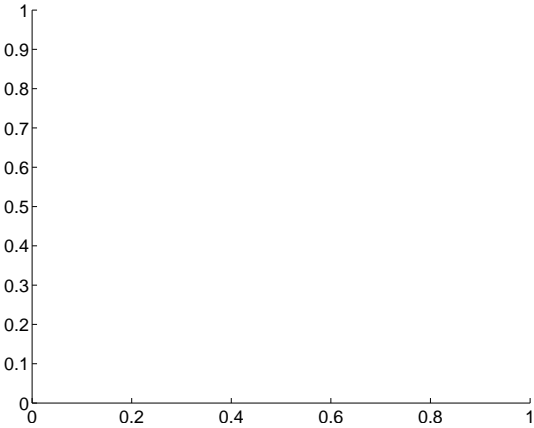
Q11 no difference image



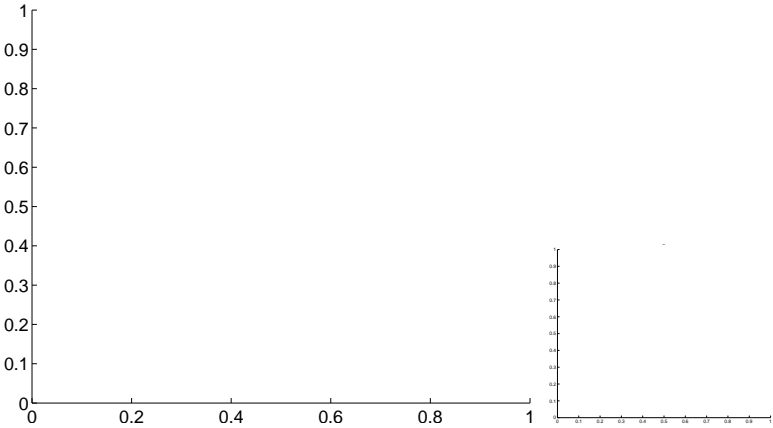
Q11 no OOT image



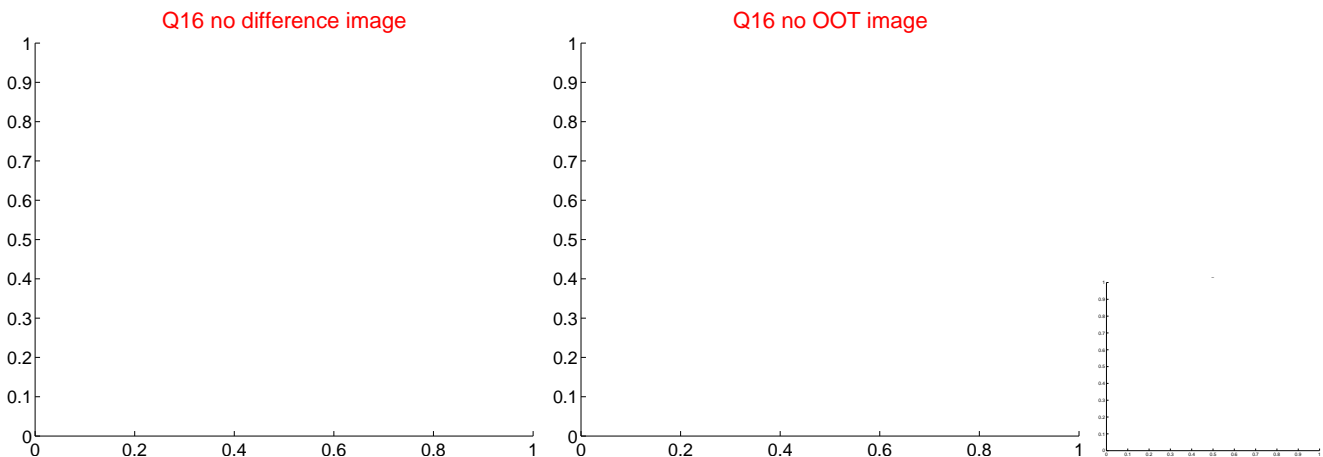
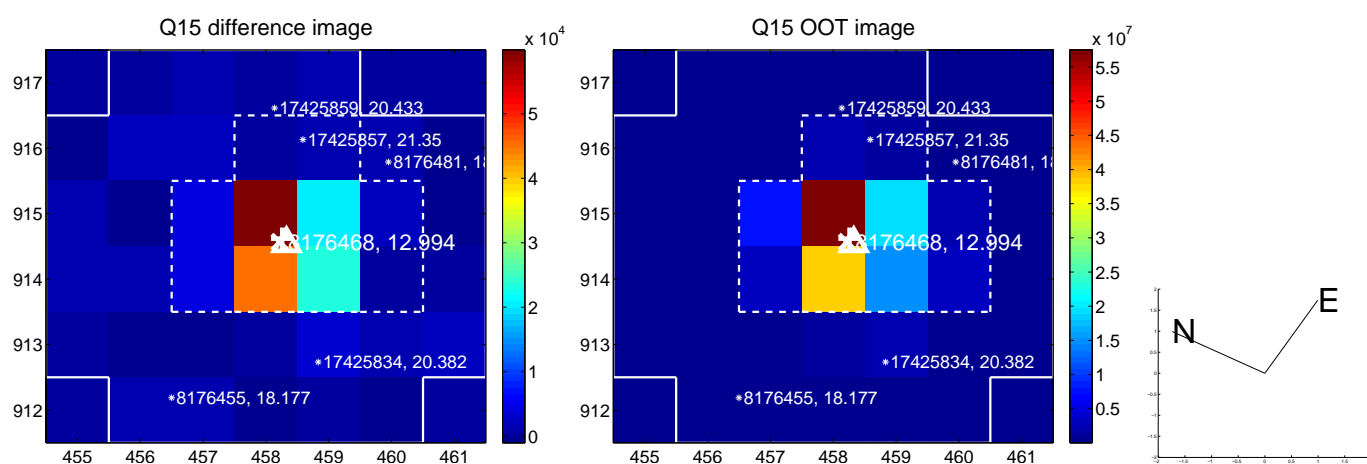
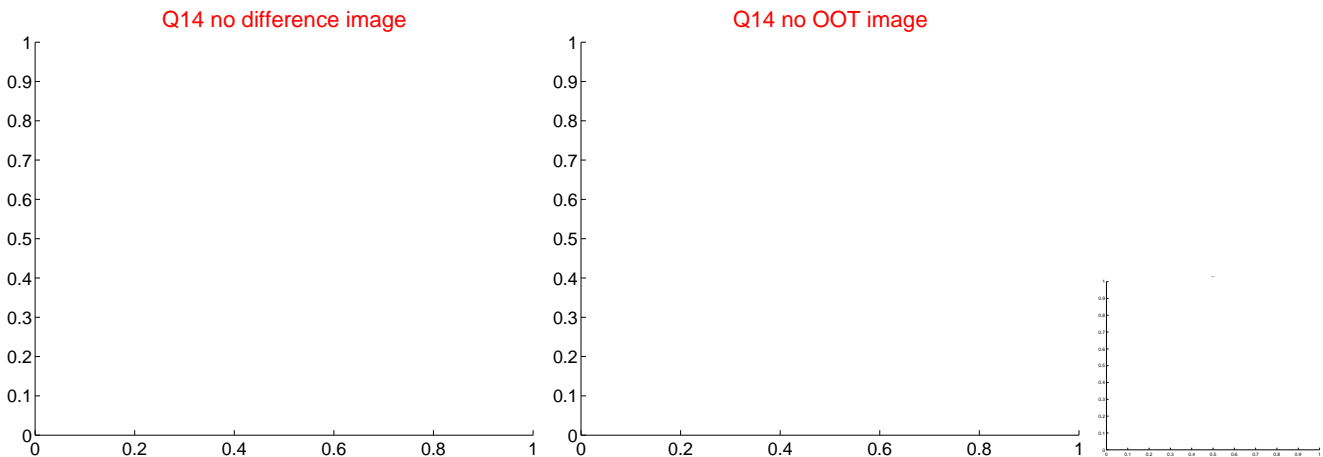
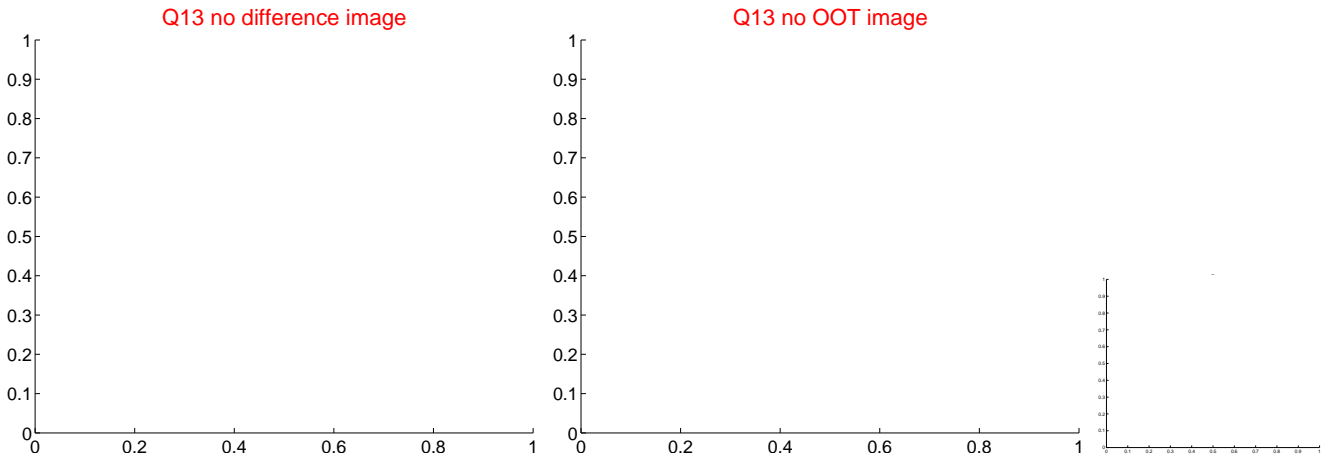
Q12 no difference image



Q12 no OOT image



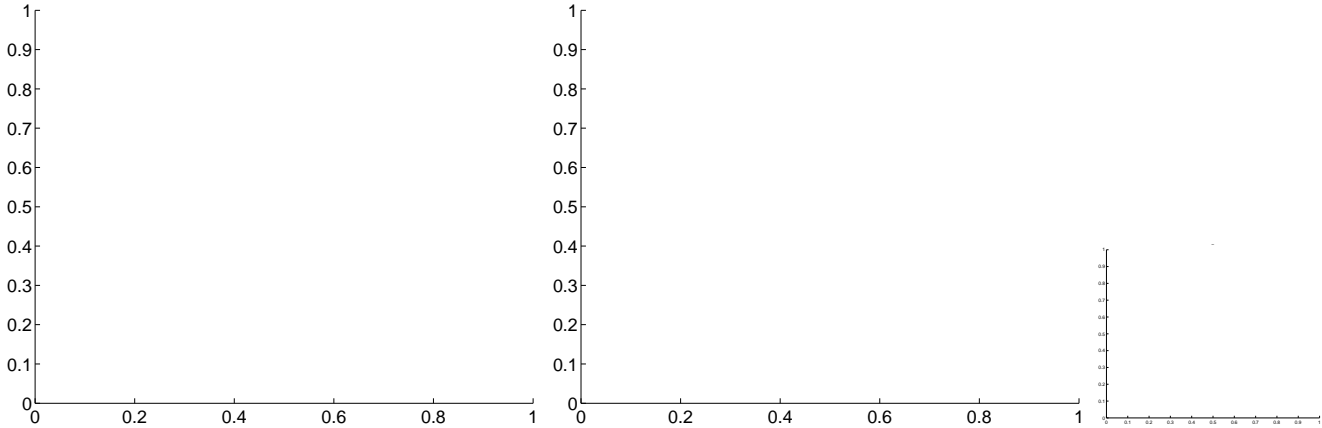
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



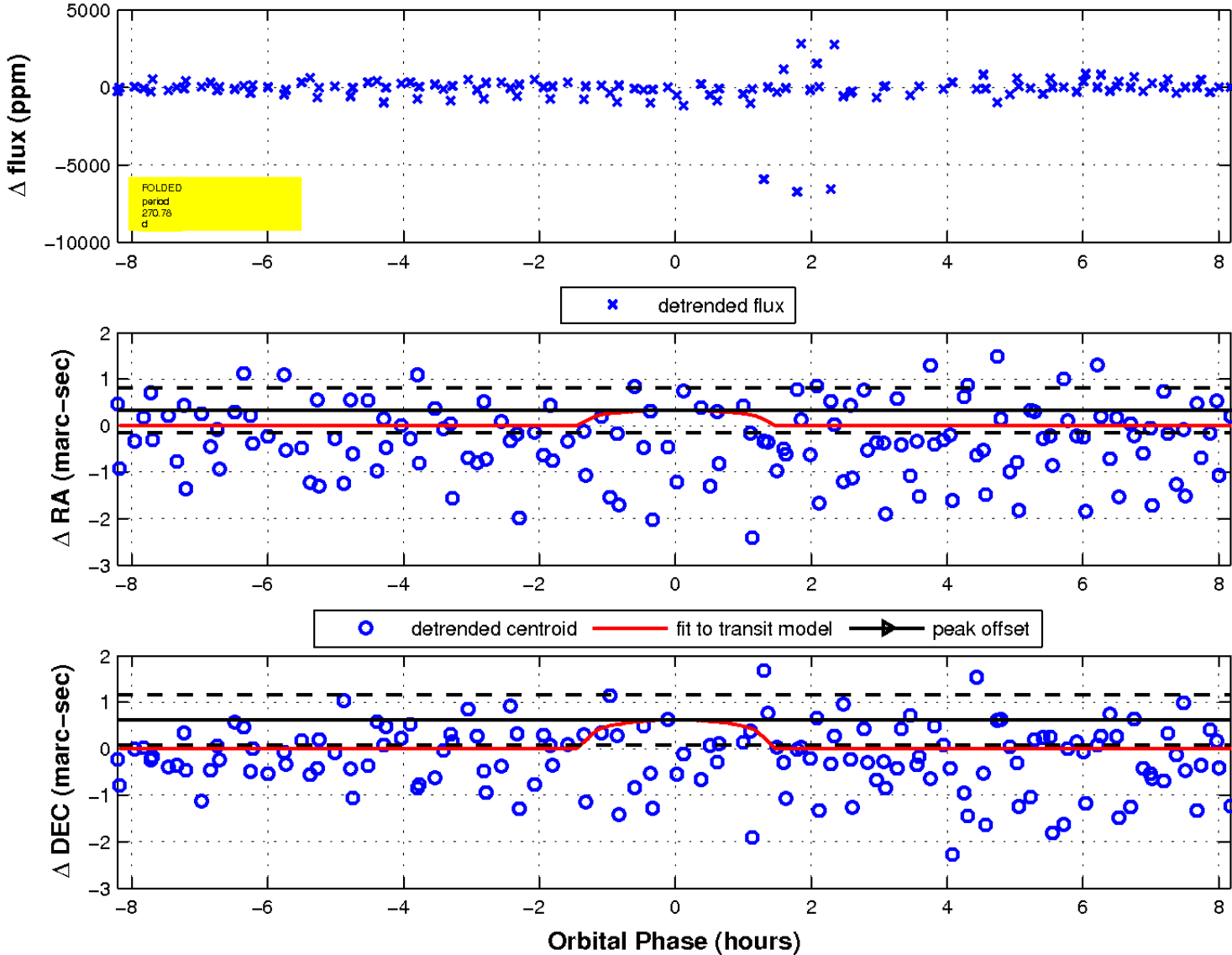
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

Q17 no difference image

Q17 no OOT image



fluxWeightedCentroids, Planet 6 of 6



UKIRT Image

Declination

