

KIC 008678457

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})
008678457-01	OBS	No	534.017411	140.744148	793.1	4.363	18.4	6.9	1.96	5518	5.58	2.24
008678457-02	OBS	No	416.013045	194.634956	782.6	3.527	18.0	10.3	1.96	5518	5.67	3.13
008678457-03	OBS	No	415.359500	533.740505	853.6	8.122	20.3	8.6	1.96	5518	7.14	3.14
008678457-04	OBS	No	398.102177	465.899115	667.1	7.454	17.2	7.2	1.96	5518	6.11	3.32
008678457-05	OBS	No	629.542217	312.369397	637.0	4.204	14.9	6.7	1.96	5518	5.63	1.80
008678457-06	OBS	No	566.799710	329.161414	550.4	5.000	16.3	-1.0	1.96	5518	4.58	2.07

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008678457-01	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
008678457-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_POS_DV
008678457-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
008678457-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008678457-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
008678457-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS

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

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

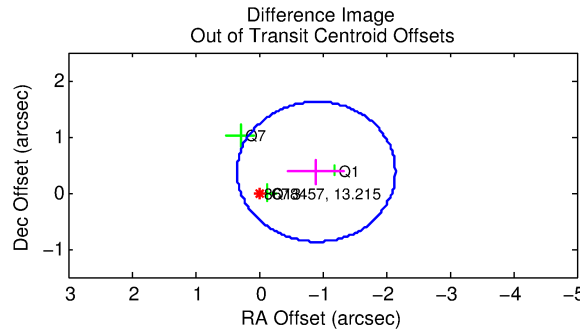
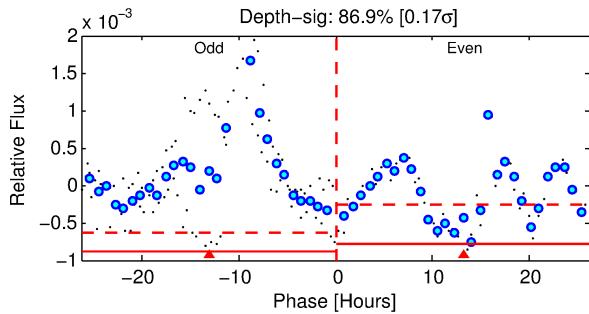
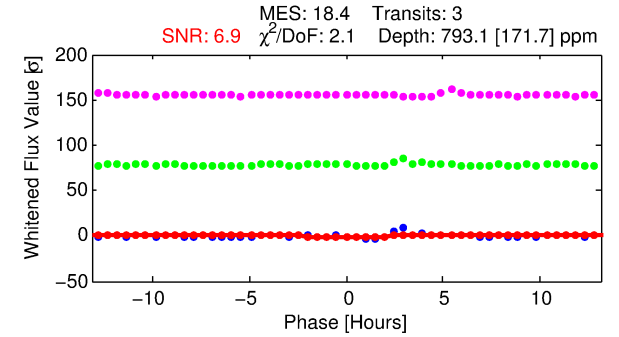
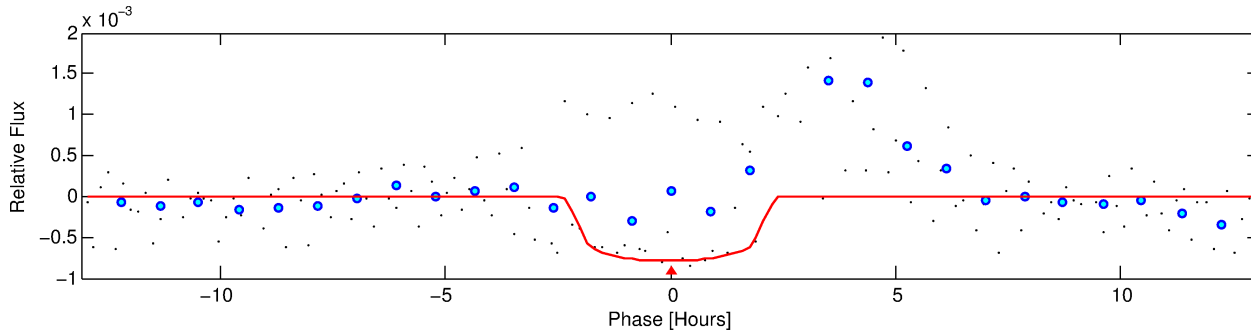
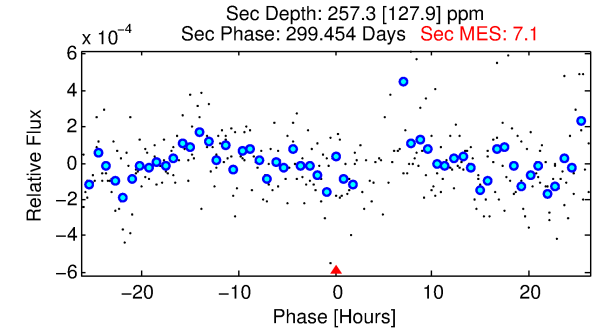
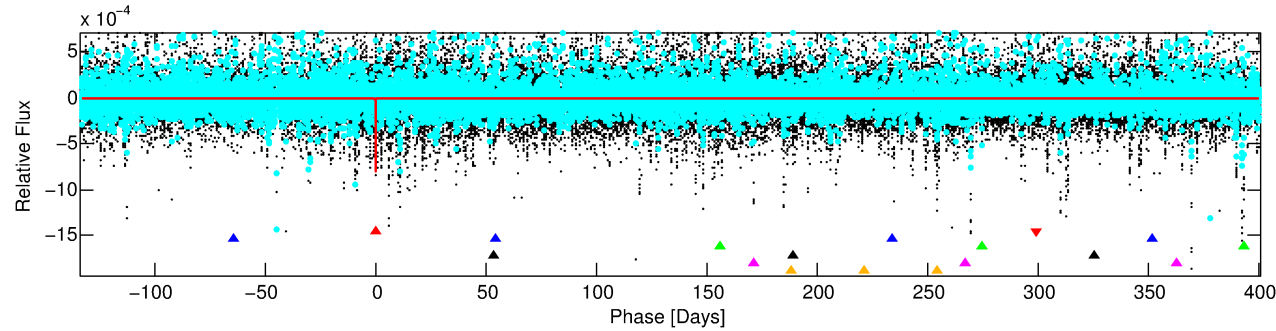
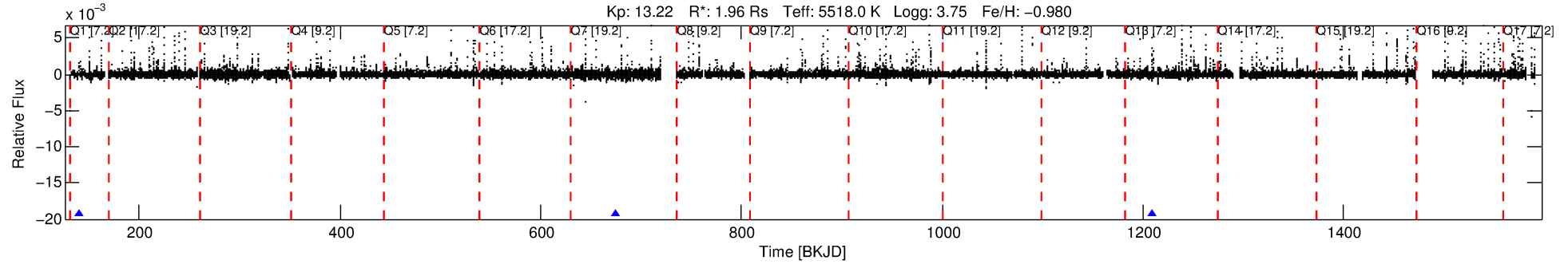
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008678457-01

No Significant Match Found

DV One-Page Summary

KIC: 8678457 Candidate: 1 of 6 Period: 534.017 d



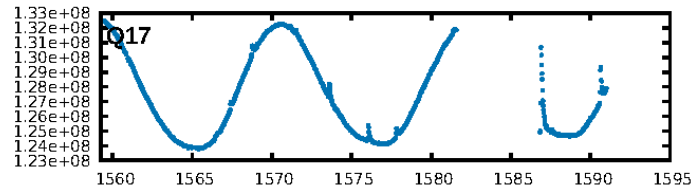
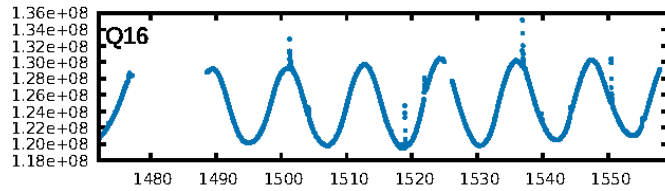
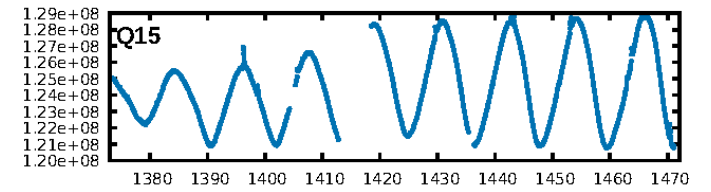
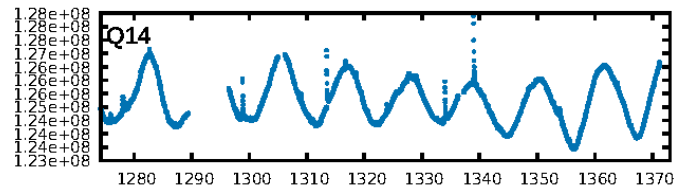
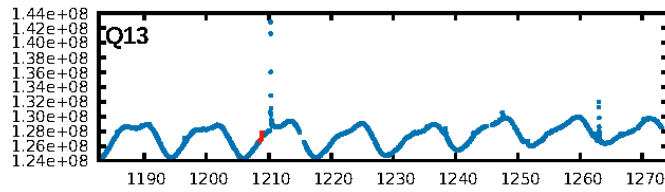
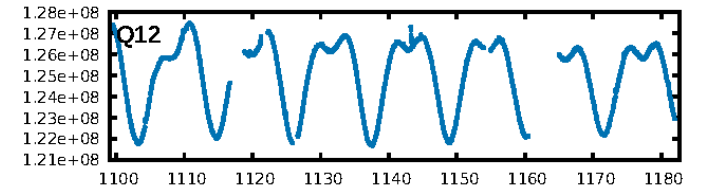
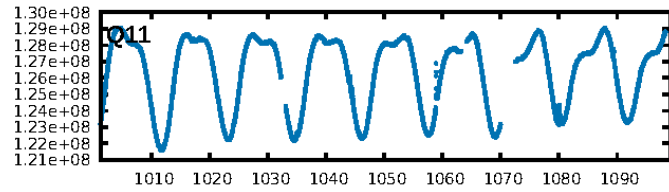
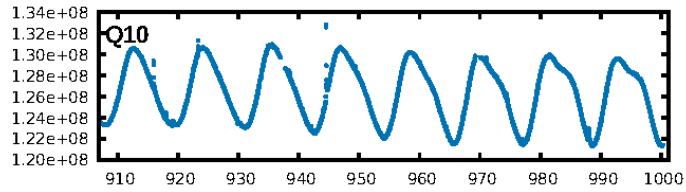
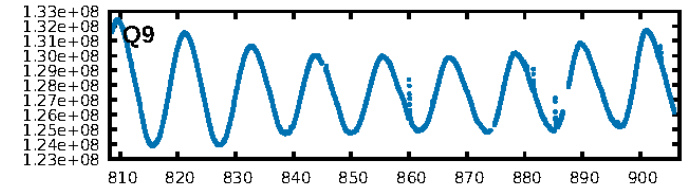
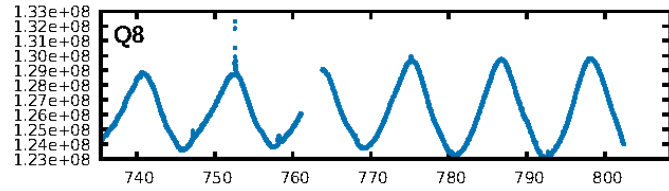
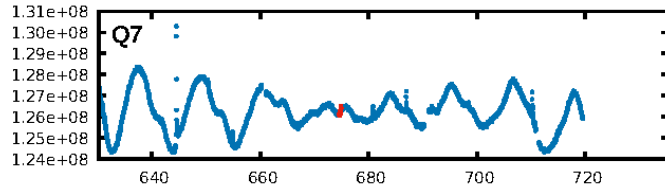
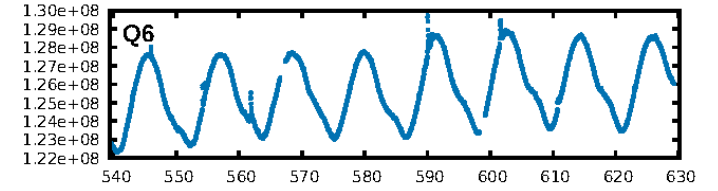
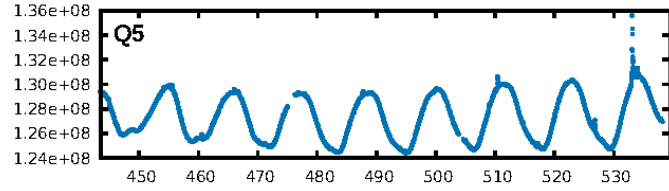
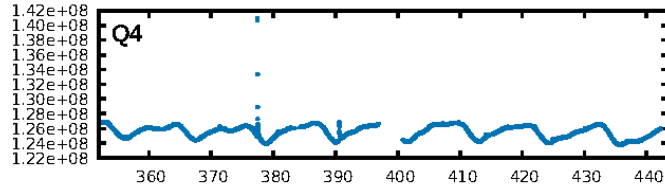
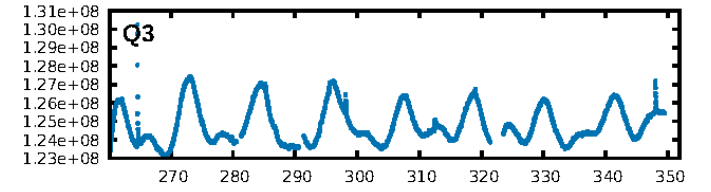
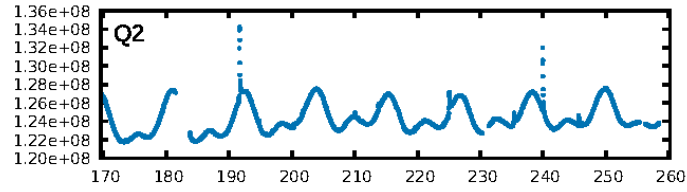
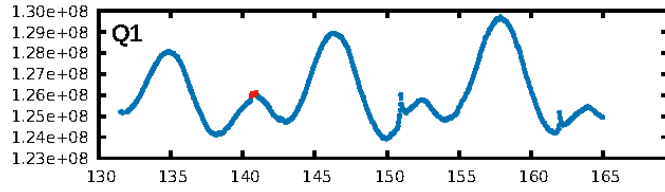
DV Fit Results:

Period = 534.01741 [0.00602] d
Epoch = 140.7441 [0.0078] BKJD
Rp/R* = 0.0261 [0.0387]
a/R* = 891.63 [6205.21]
b = 0.38 [15.80]
Seff = 2.24 [3.32]
Teff = 312 [115] K
Rp = 5.58 [9.06] Re
a = 1.1903 [0.9892] AU
Ag = 6442.32 [21552.02] [0.30σ]
Teffp = 4323 [3249] K [1.23σ]

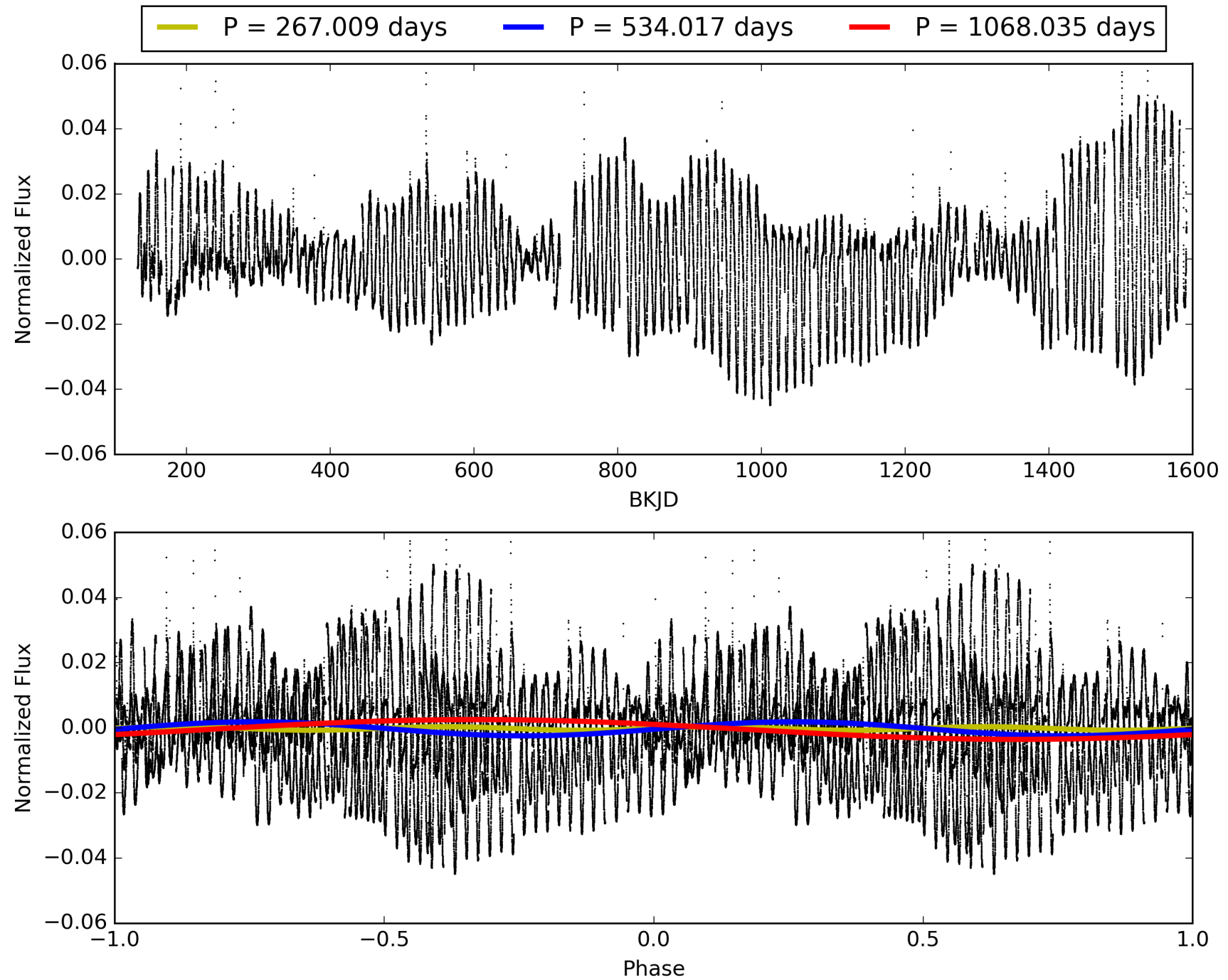
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [504.82σ]
LongPeriod-sig: 100.0% [118.57σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 0.7%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [2/2]
GhostDiagnostic-chr: 6.695
Centroid-sig: 76.3%
Centroid-so: 0.273 arcsec [0.61σ]
OotOffset-rm: 0.978 arcsec [2.36σ]
OotOffset-st: 0.1/0/2 [3]
KicOffset-rm: 0.968 arcsec [2.33σ]
KicOffset-st: 0.1/0/2 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [3/3]

TCE 008678457-01, PDC Light Curves

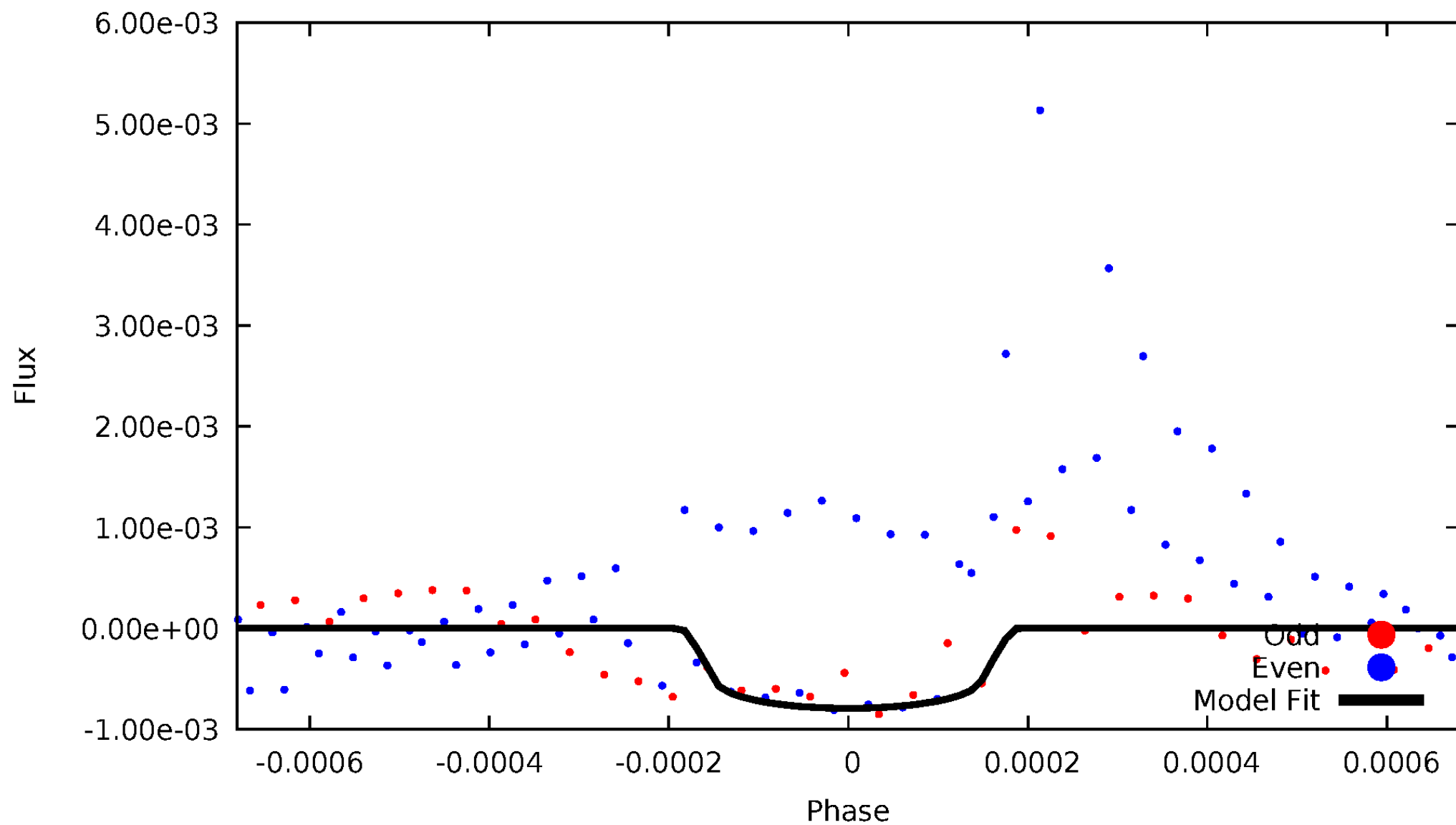


TCE 008678457-01



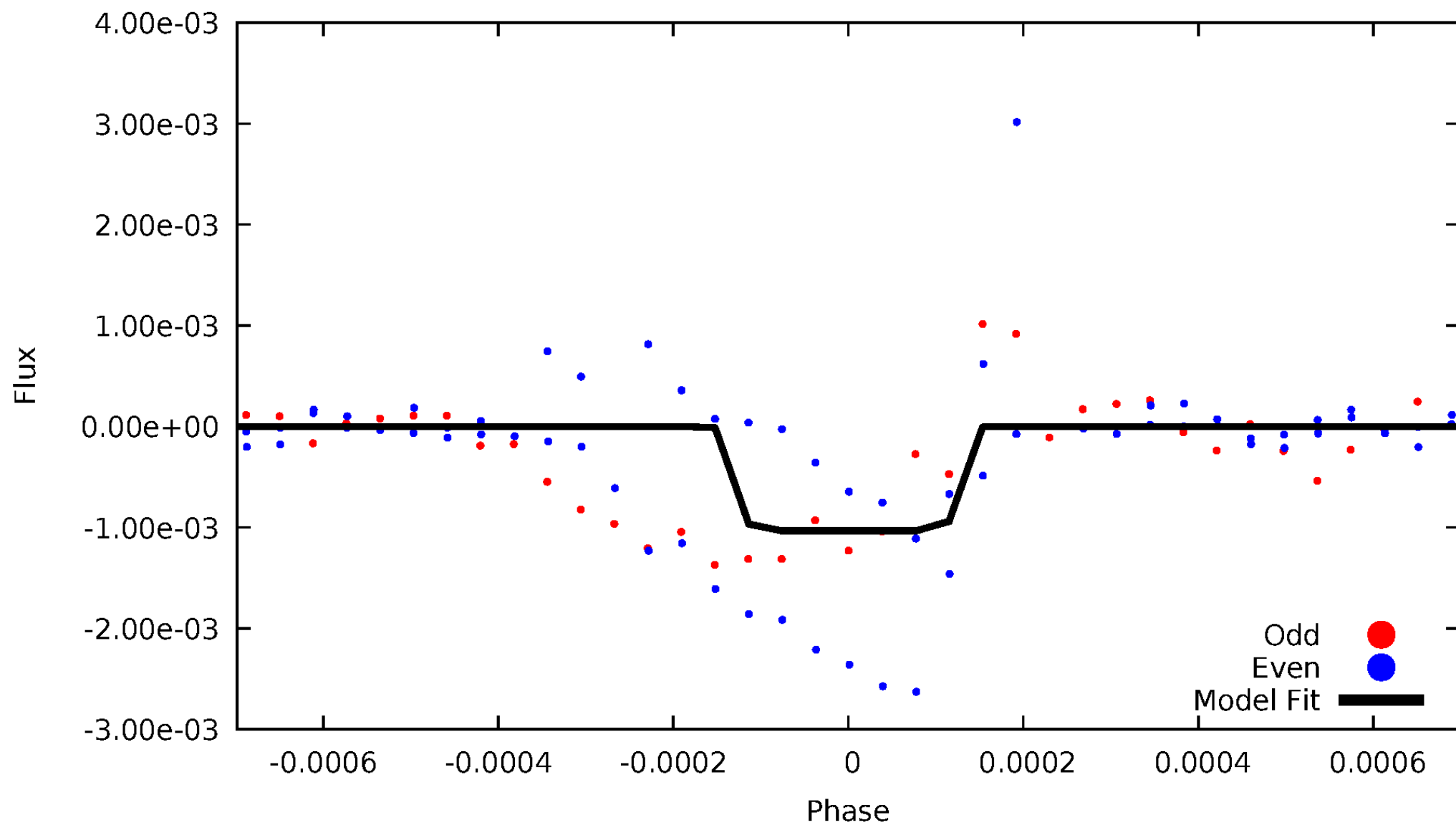
DV Odd/Even

TCE 008678457-01



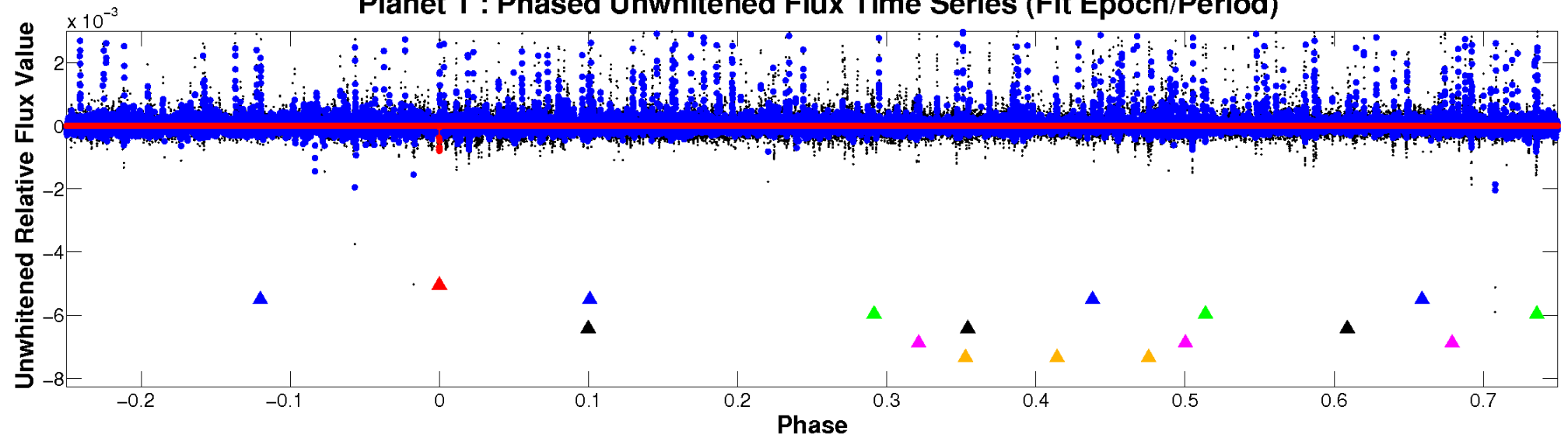
ALT Odd/Even

TCE 008678457-01

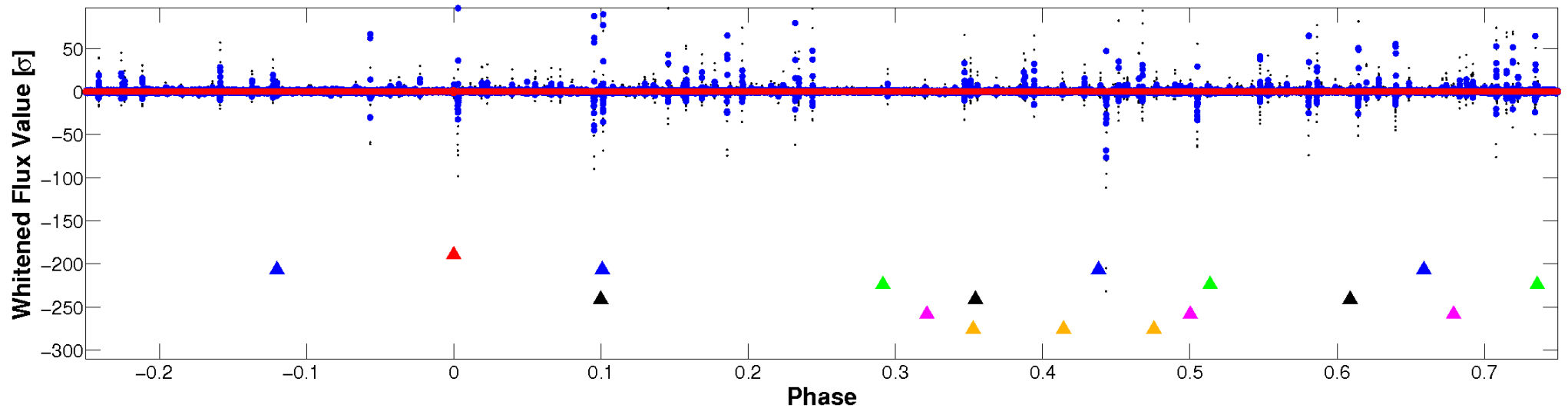


Non-Whitened Vs. Whitened Light Curve

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

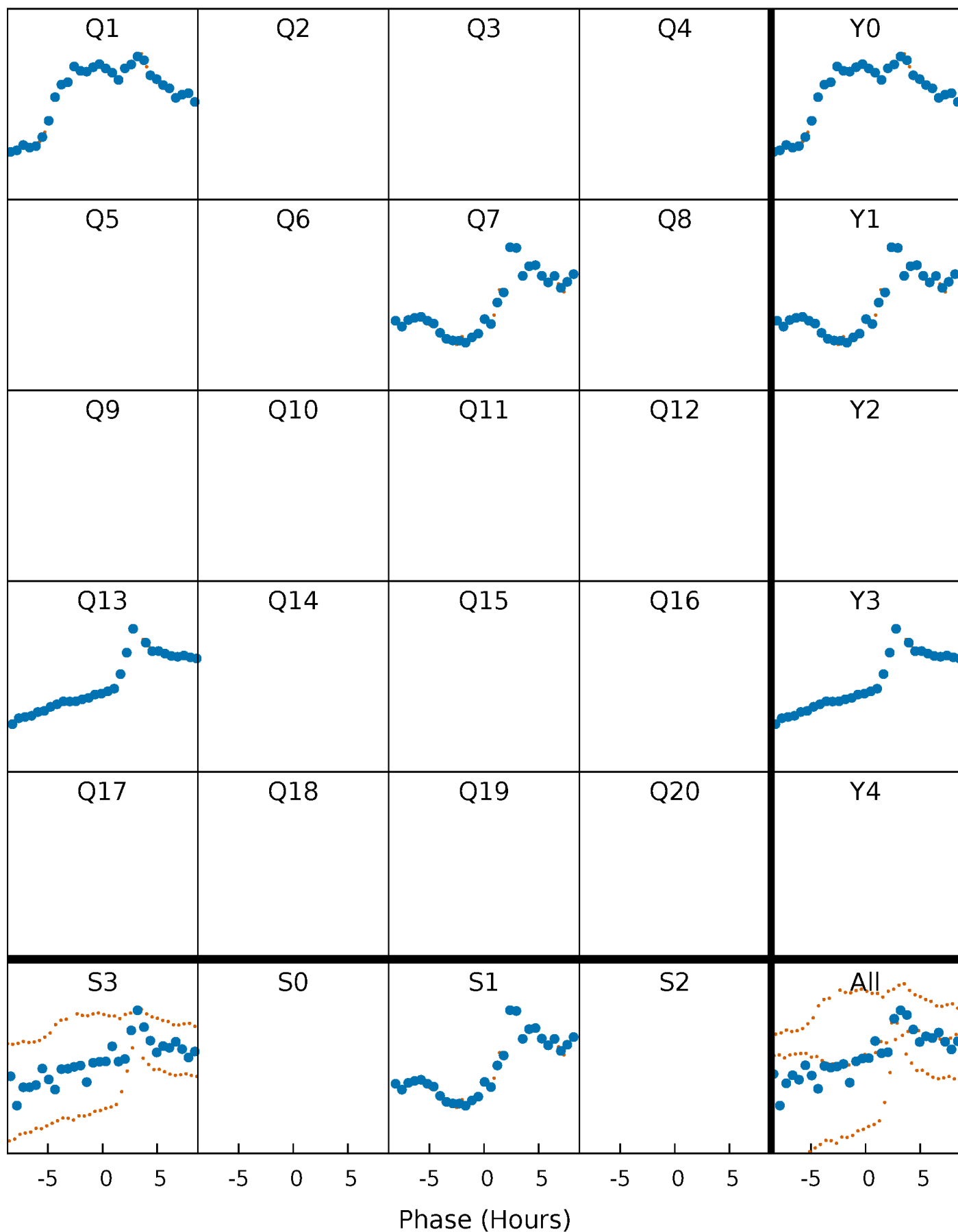


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



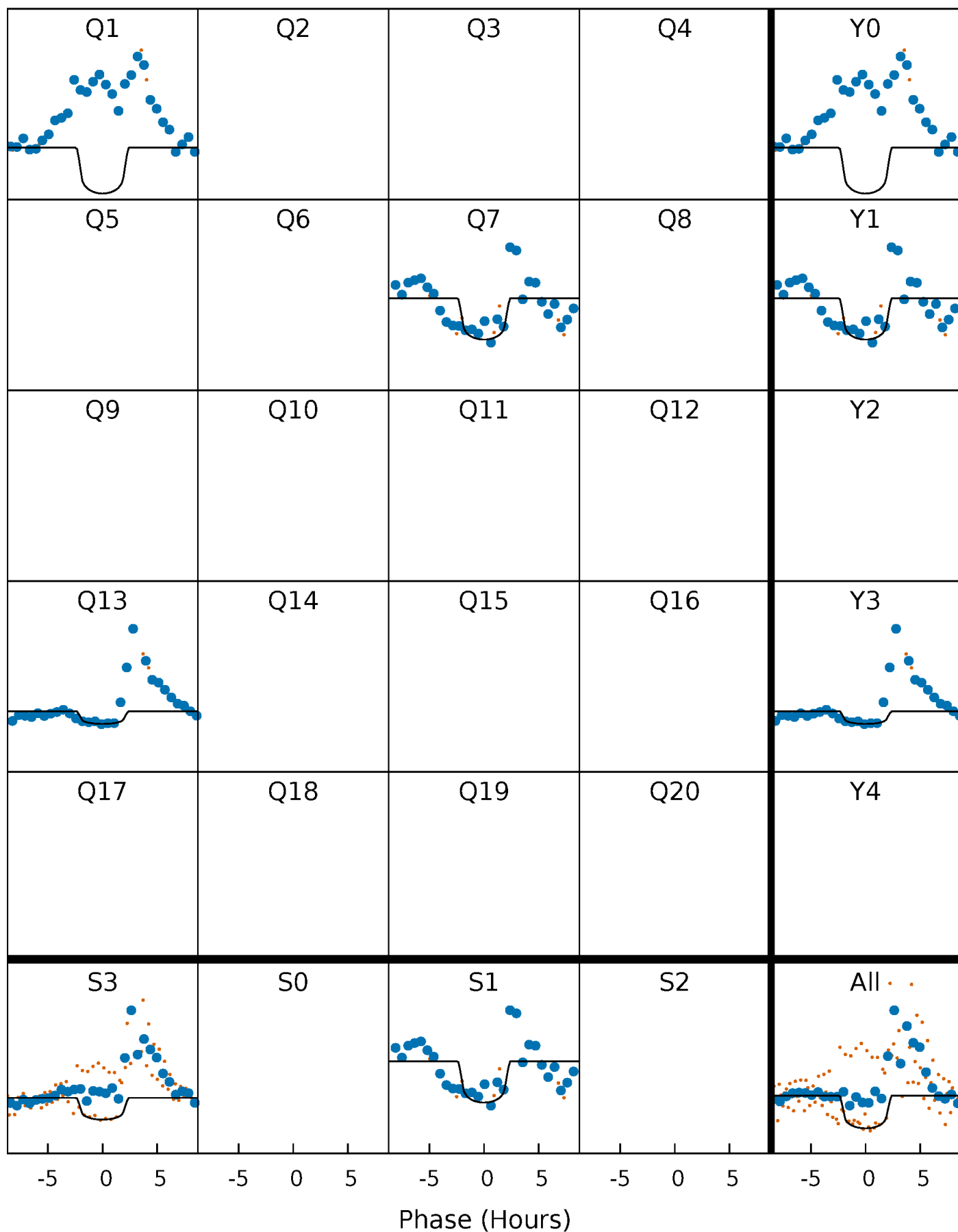
PDC Quarter-Phased Transit Curves

TCE 008678457-01 P=534.017411 Days $T_0=140.744148$ (BKJD)



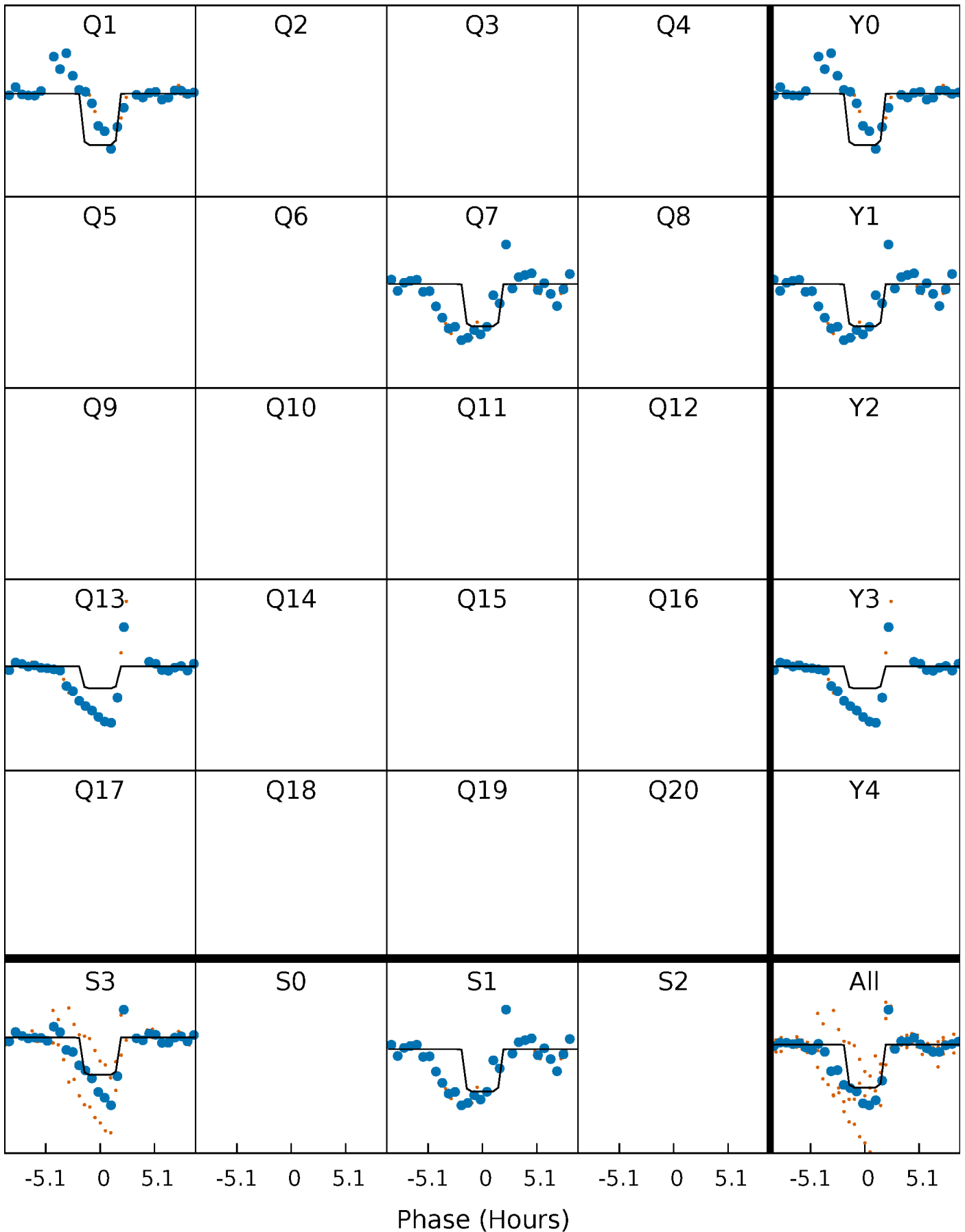
DV Quarter-Phased Transit Curves

TCE 008678457-01 P=534.017411 Days $T_0=140.744148$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

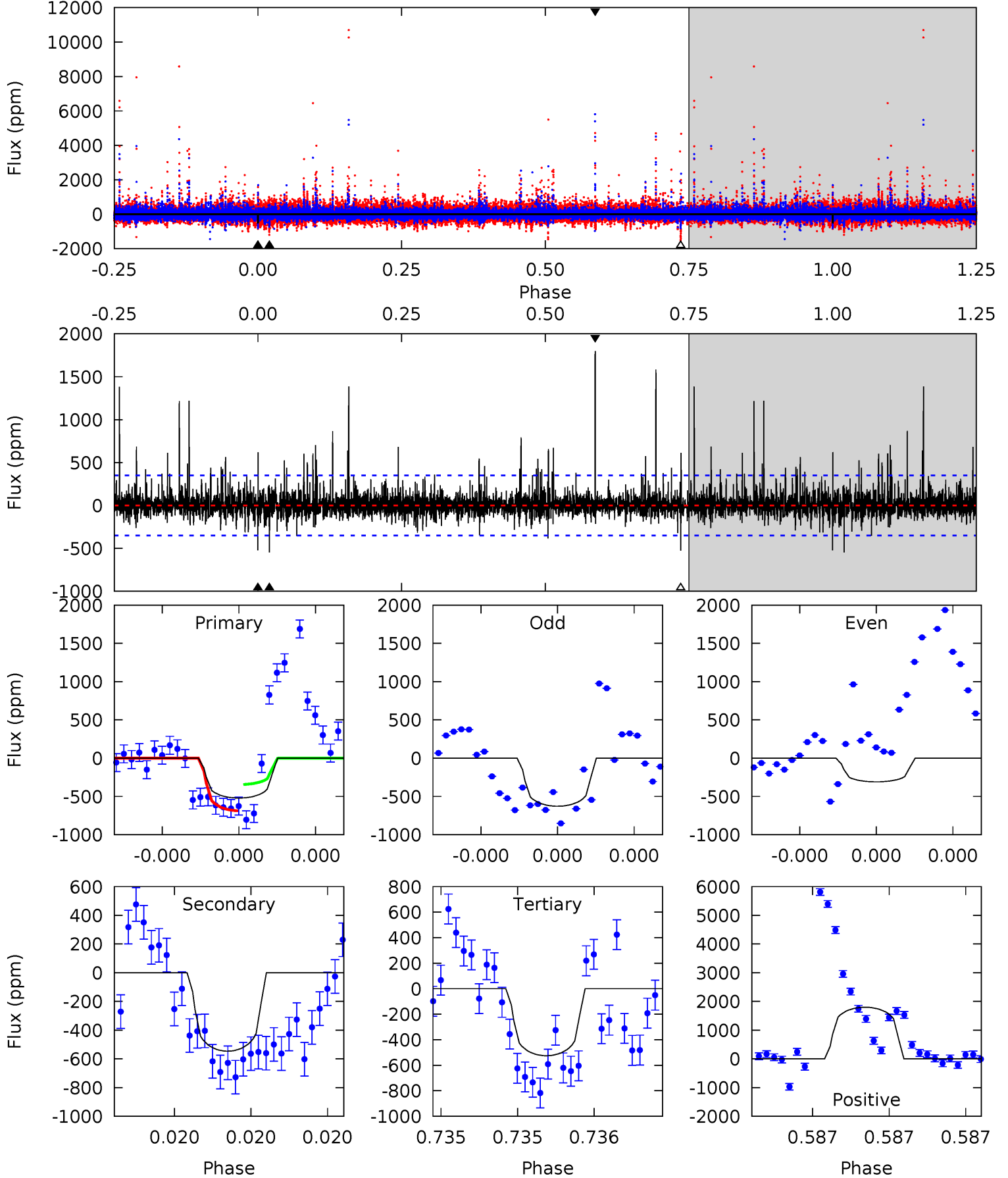
TCE 008678457-01 P=534.010657 Days $T_0=140.768940$ (BKJD)



DV Model-Shift Uniqueness Test

008678457-01, P = 534.017411 Days, E = 140.744148 Days

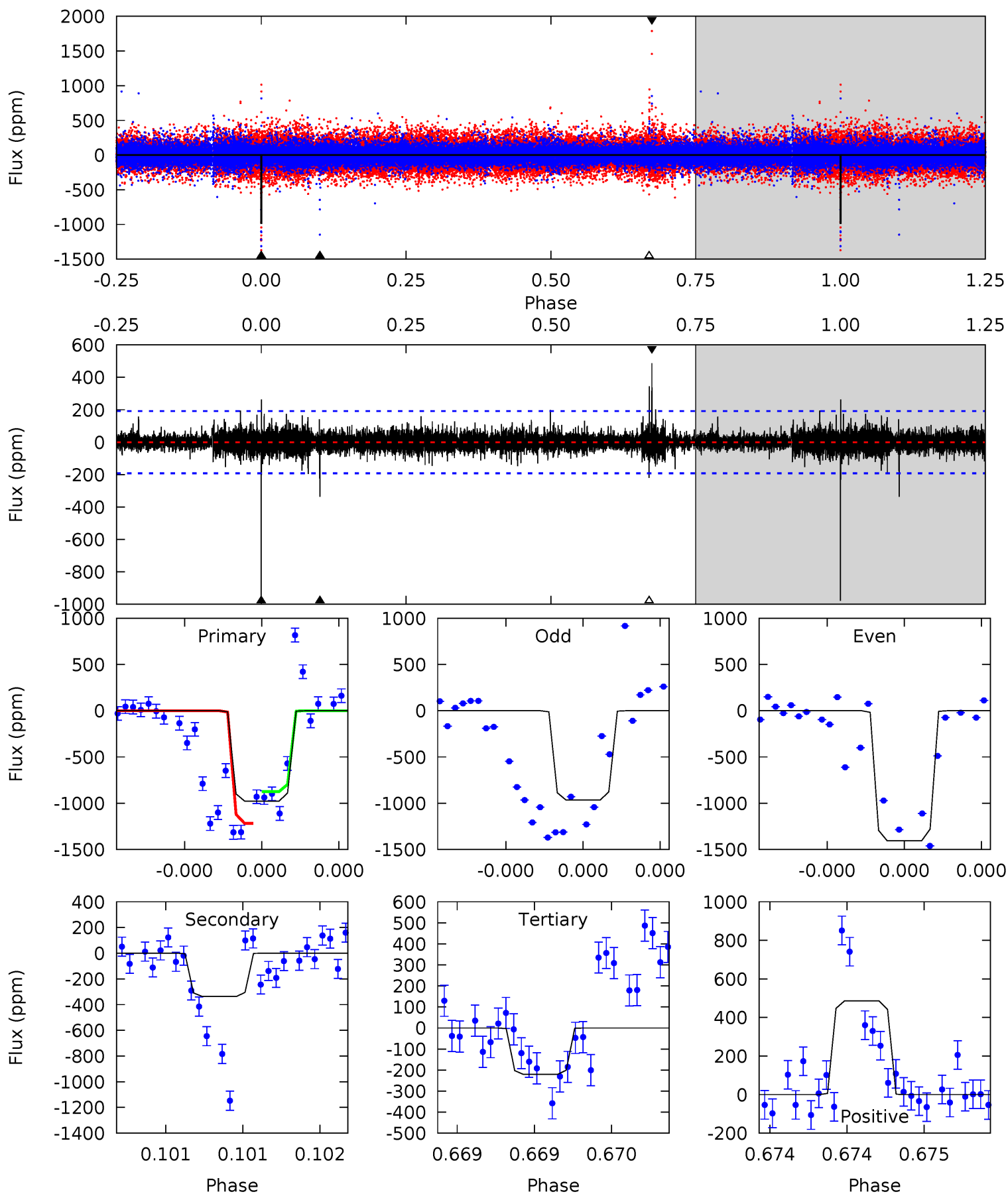
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.36	8.76	8.42	28.8	5.63	3.56	1.73	-0.06	-20.5	0.34	-20.1	1.33	0.05	0.77	2.78



Alt Model-Shift Uniqueness Test

008678457-01, P = 534.010657 Days, E = 140.768940 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
28.7	9.87	6.48	14.3	5.64	3.58	0.97	22.3	14.4	3.39	-4.42	6.42	1.28	0.33	0



Stellar Parameters For KIC 008678457

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5518^{+197}_{-164}	$3.752^{+0.915}_{-0.366}$	$-0.980^{+0.350}_{-0.250}$	$1.956^{+1.304}_{-1.304}$	$0.787^{+0.207}_{-0.095}$	$0.148^{+2.987}_{-0.104}$
	+4%/-3%	+24%/-10%	+36%/-26%	+67%/-67%	+26%/-12%	+2016%/-70%
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 008678457-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-546 ± 62	$7.94^{+7.72}_{-5.81}$	430^{+71}_{-88}	4439^{+3247}_{-893}	7228^{+95183}_{-5401}
Alt.	-336 ± 34	$8.60^{+9.72}_{-6.08}$	431^{+74}_{-89}	3898^{+2175}_{-704}	3530^{+37522}_{-2731}

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

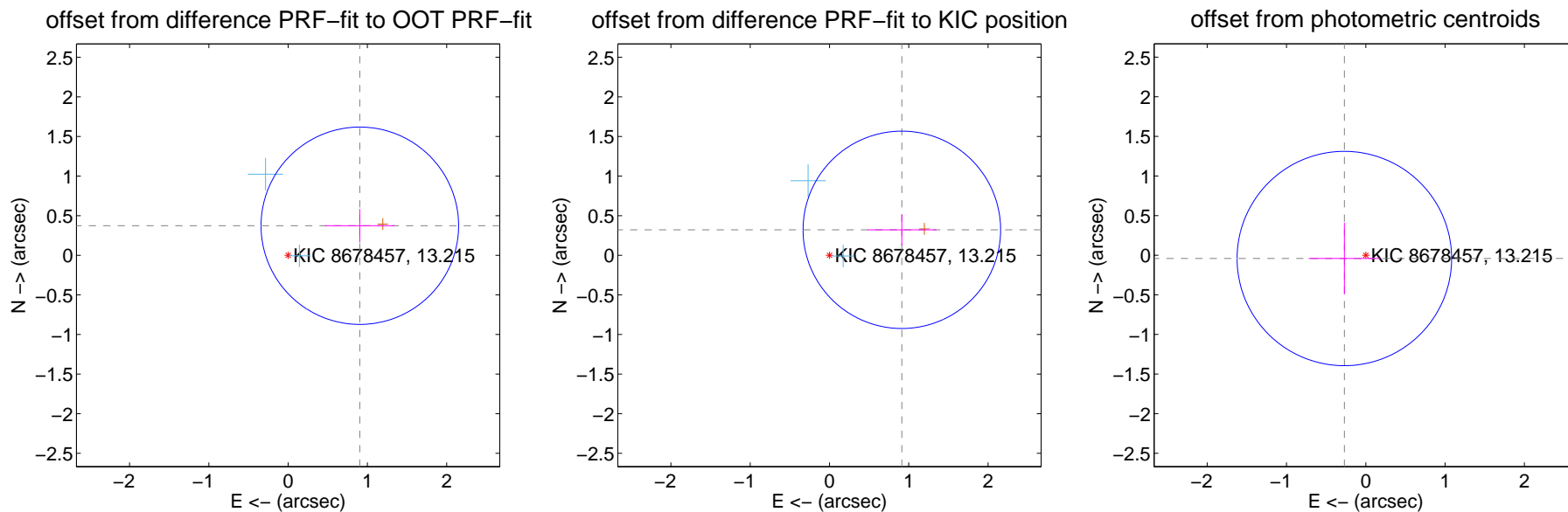
DV Centroid Data

Supplemental centroid analysis for 008678457-01. Kepler magnitude: 13.21. Transit SNR 6.94

There are 2 quarters with good PRF difference image offsets

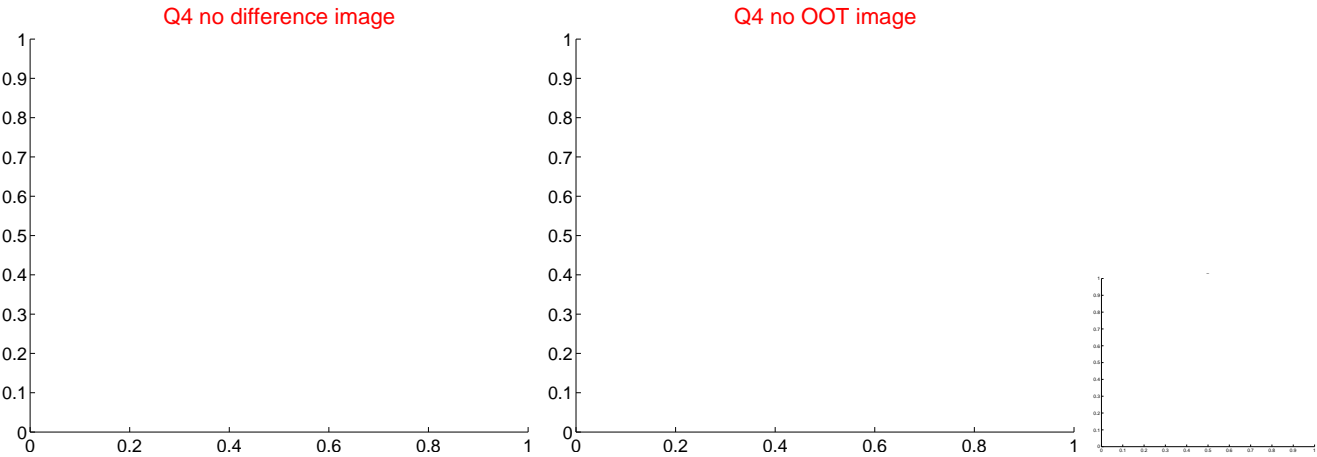
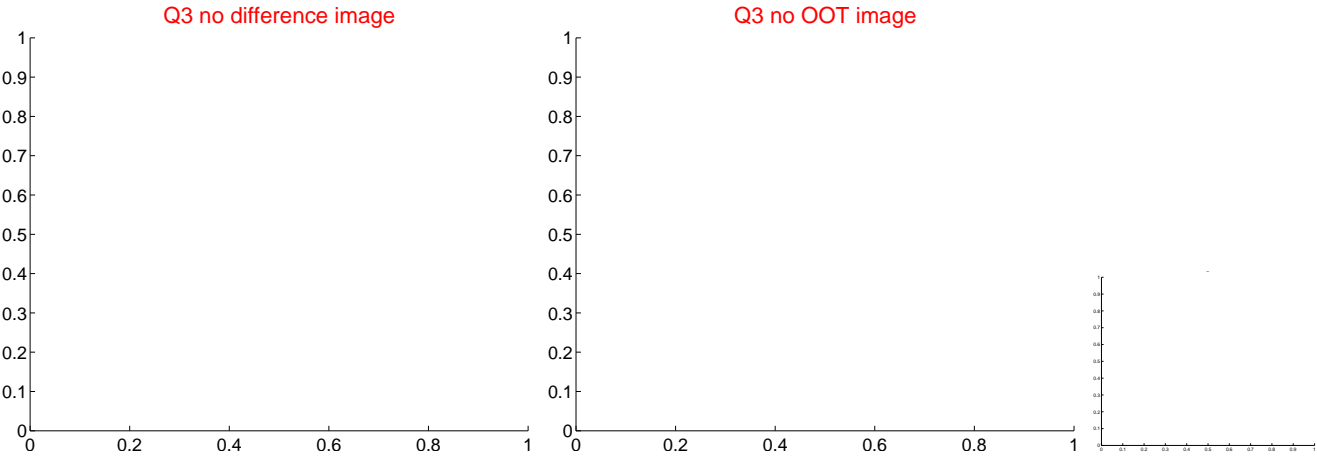
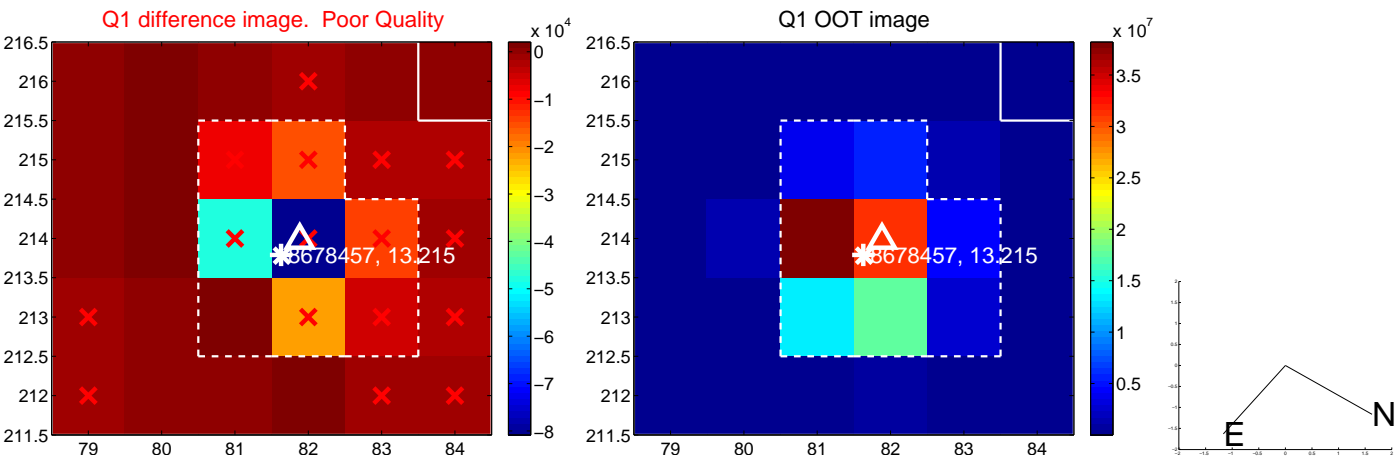
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.978 ± 0.415	2.36	-0.904 ± 0.441	0.373 ± 0.211
PRF-fit source offset from KIC position	0.968 ± 0.415	2.33	-0.913 ± 0.435	0.321 ± 0.197
photometric centroid source offset	0.27 ± 0.45	0.61	0.27 ± 0.45	-0.04 ± 0.45

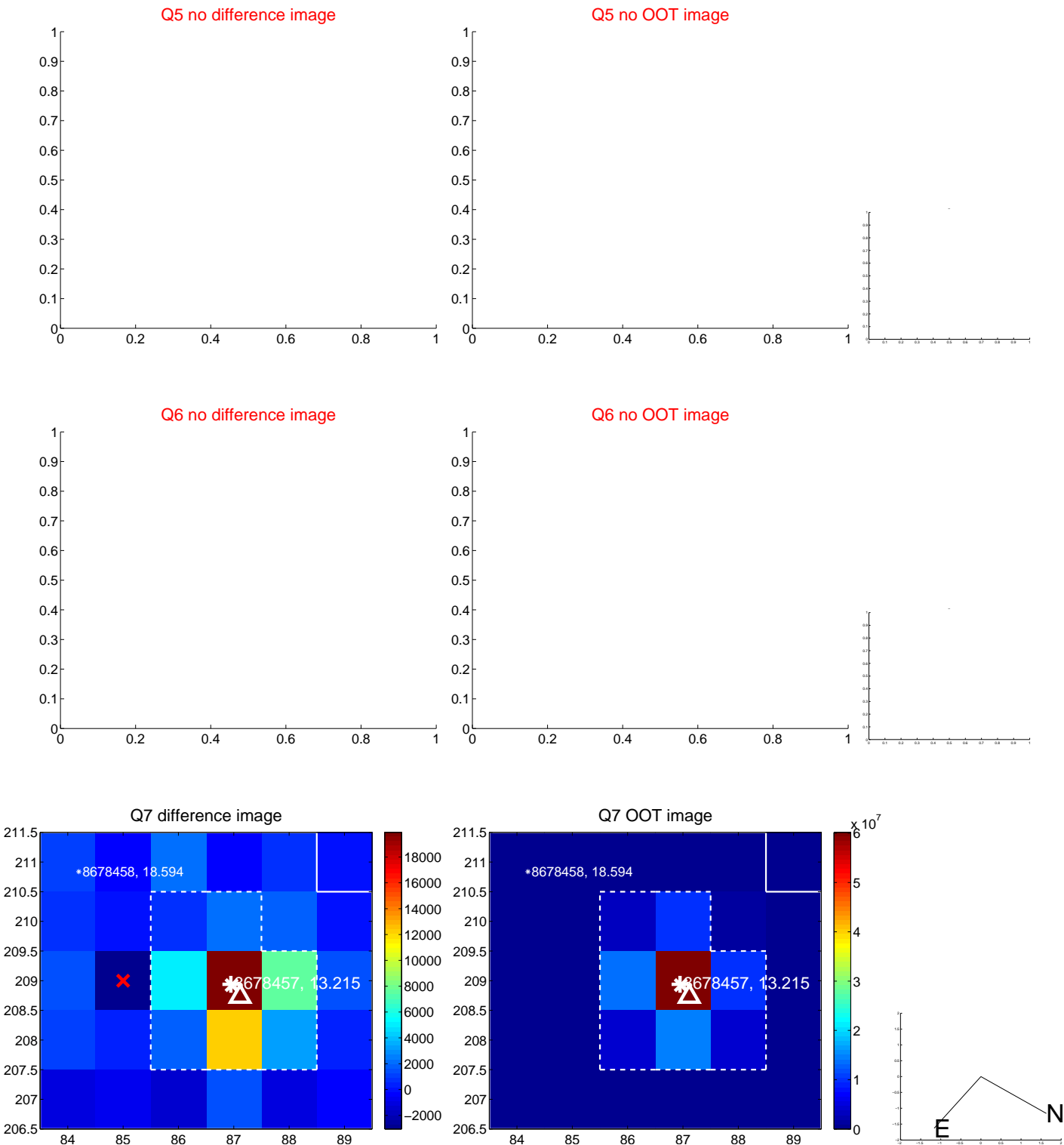


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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



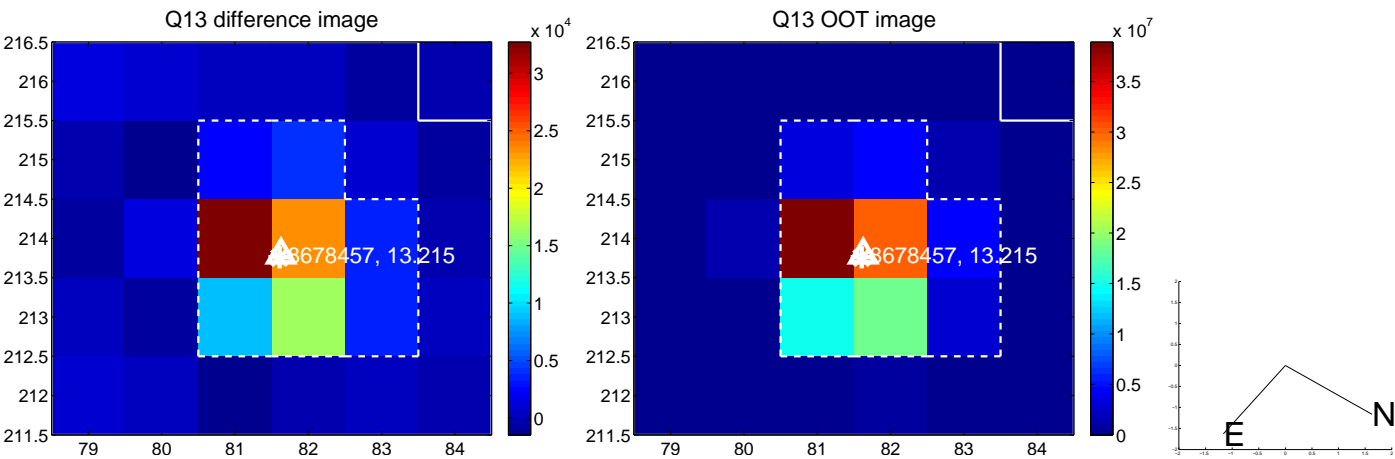
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



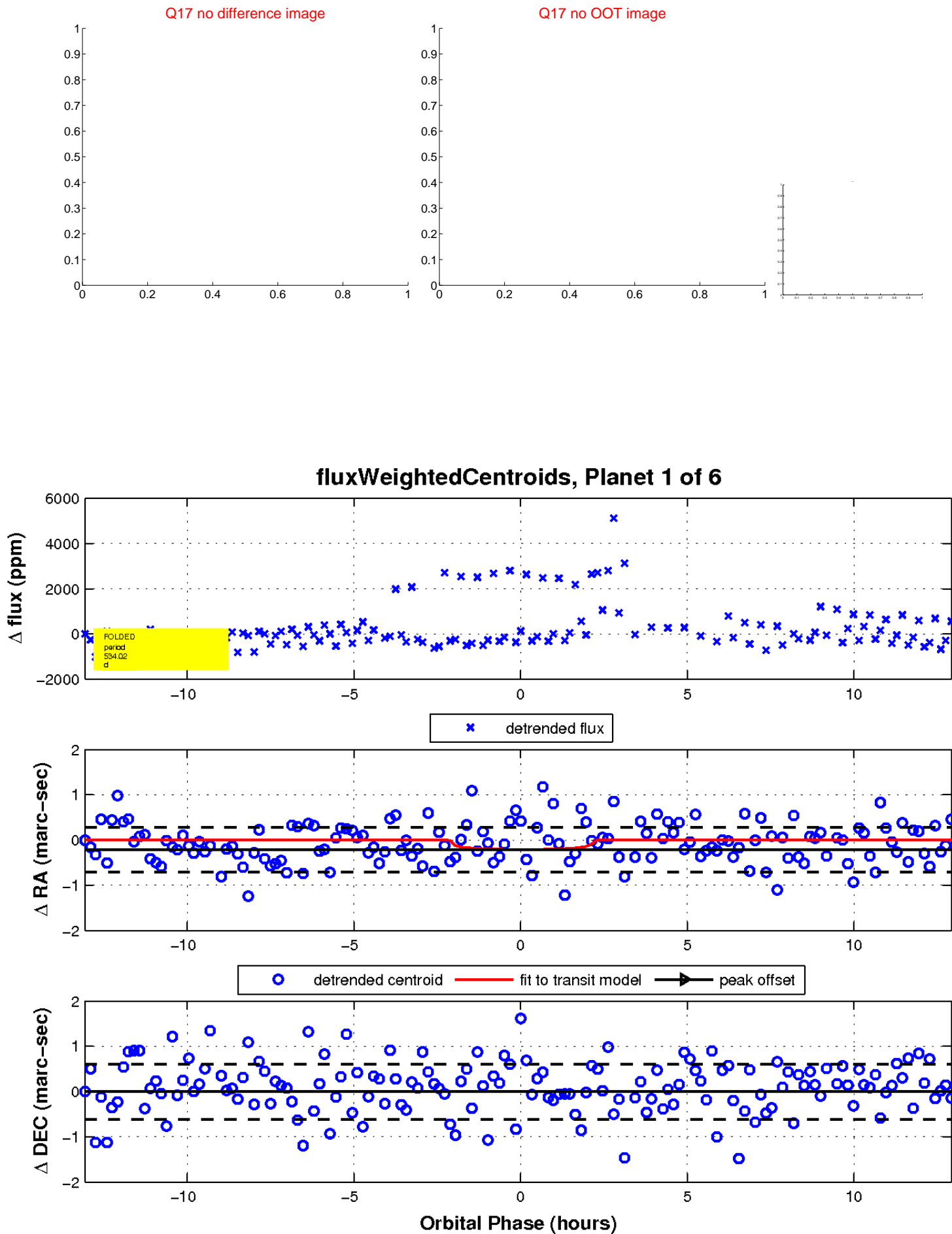
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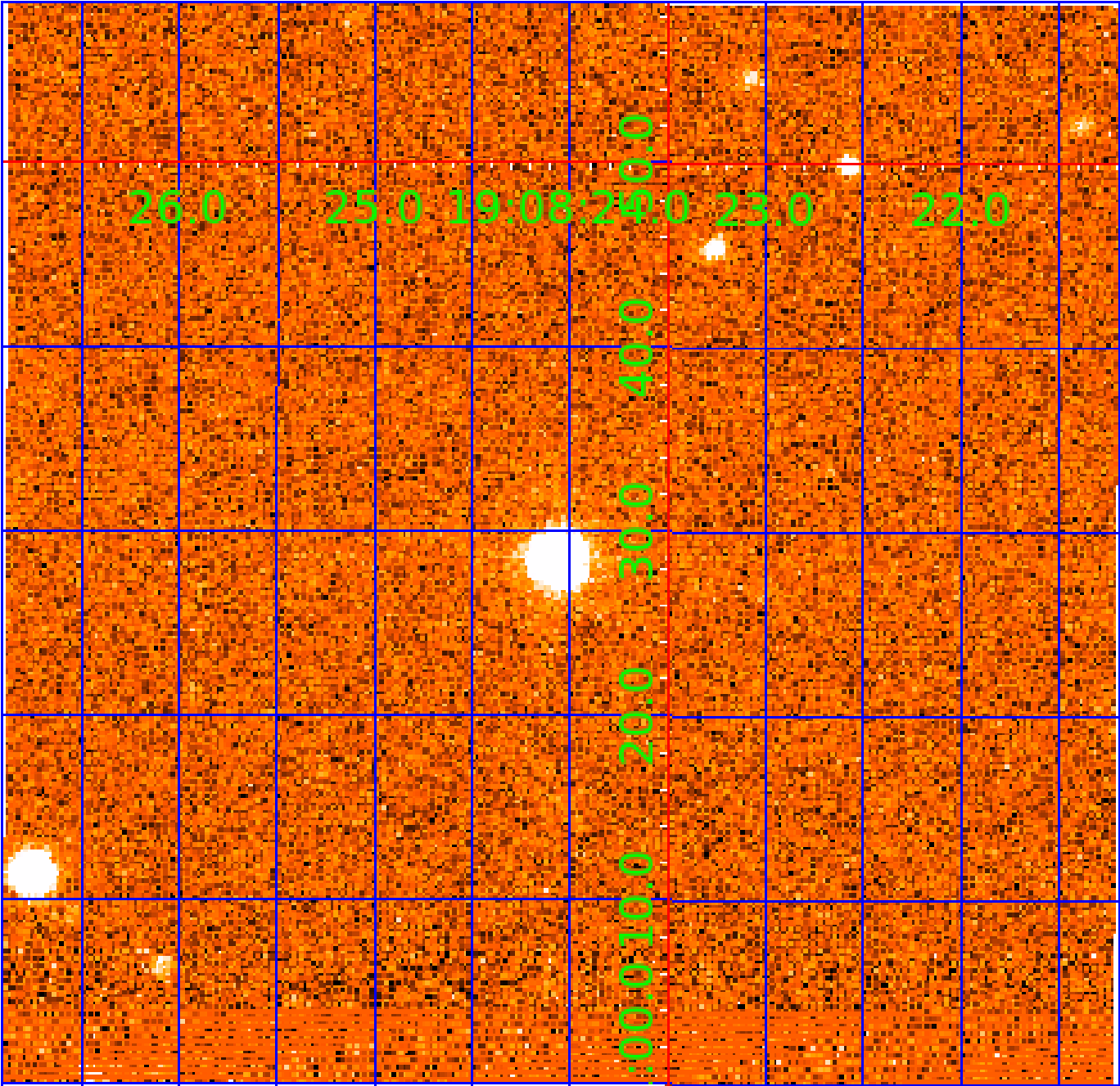


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008678457

Q1-17 DR25 TCE Parameters

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Robovetter Results

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008678457-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
008678457-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008678457-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
008678457-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS

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

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

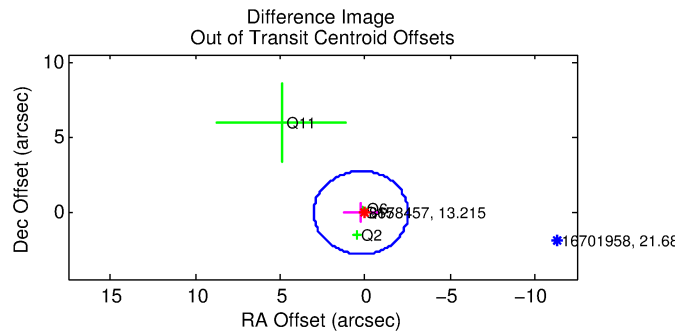
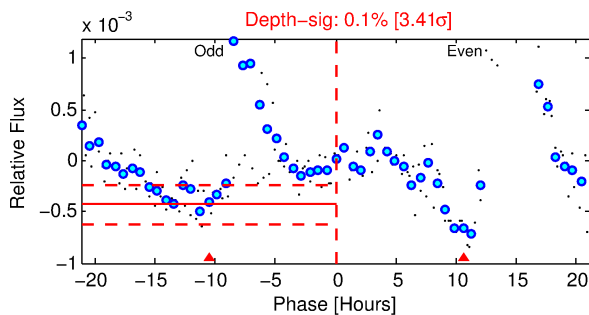
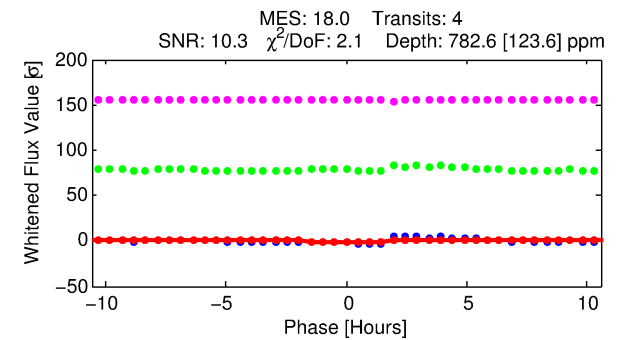
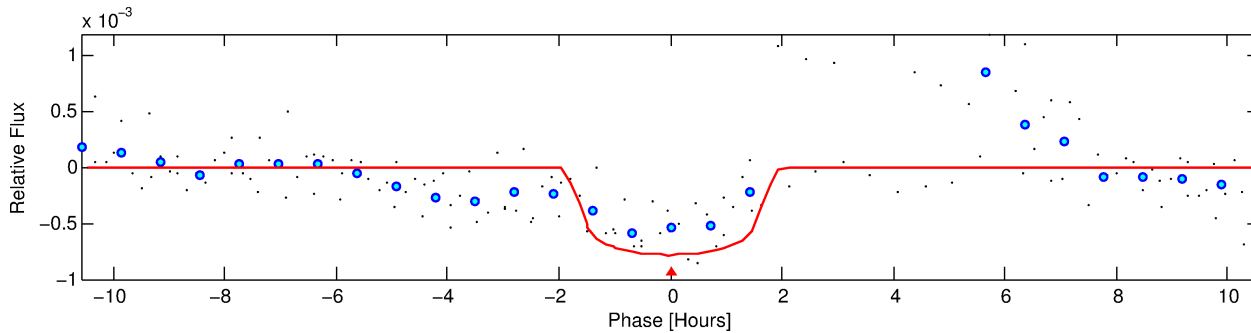
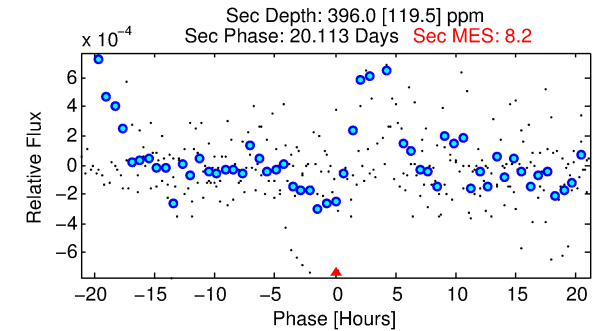
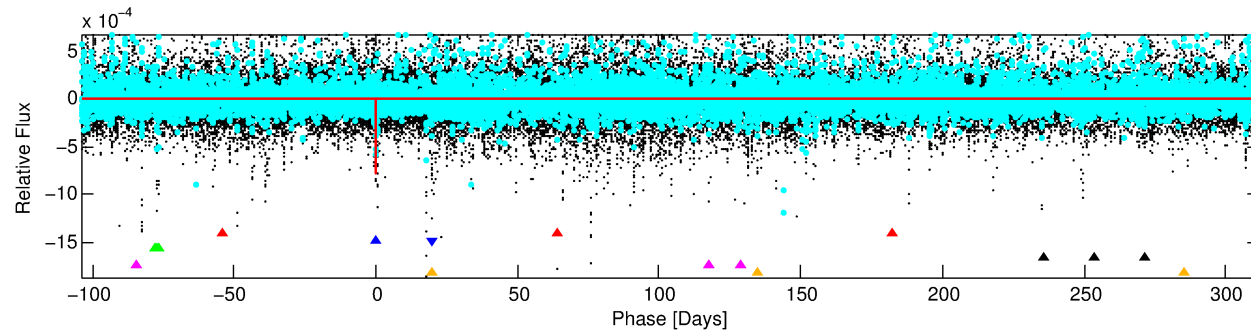
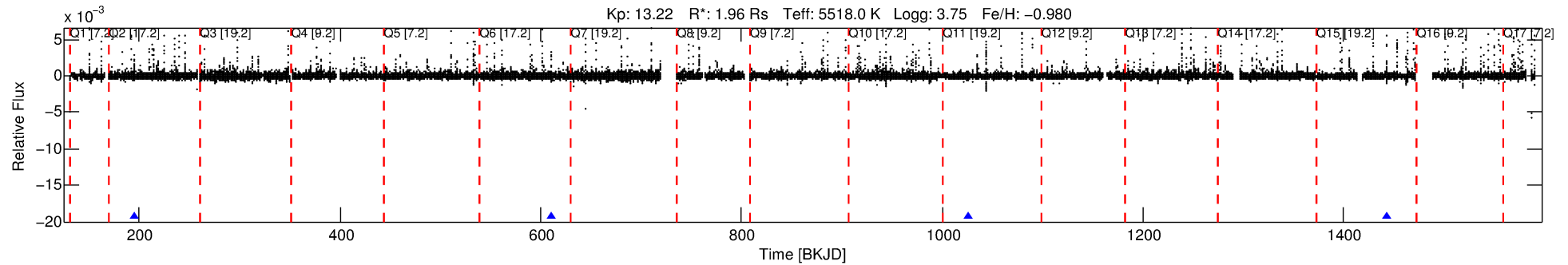
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008678457-02

No Significant Match Found

DV One-Page Summary

KIC: 8678457 Candidate: 2 of 6 Period: 416.013 d



DV Fit Results:

Period = 416.01304 [0.00376] d
Epoch = 194.6350 [0.0067] BKJD
Rp/R* = 0.0266 [0.0269]
a/R* = 777.37 [3719.51]
b = 0.56 [5.99]
Seff = 3.13 [4.63]
Teq = 339 [125] K
Rp = 5.67 [6.88] Re
a = 1.0077 [0.8375] AU
Ag = 6881.77 [17361.30] [0.40σ]
Teffp = 4776 [2451] K [1.81σ]

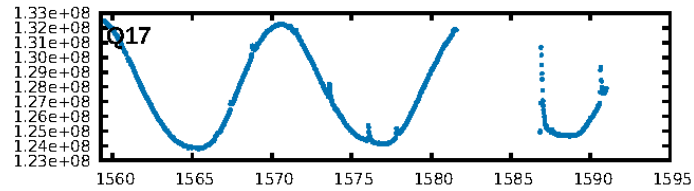
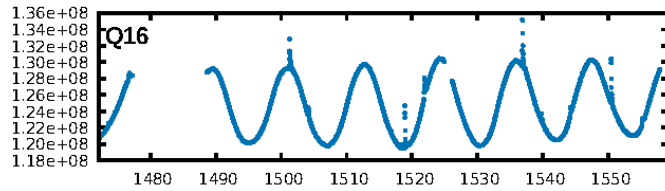
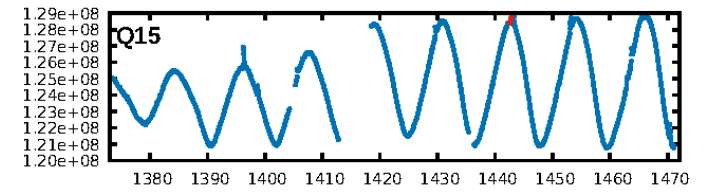
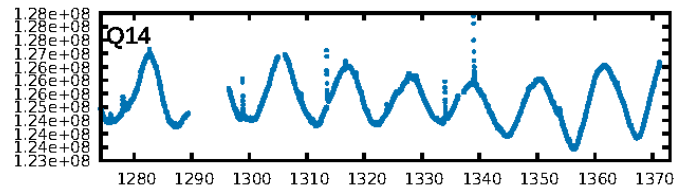
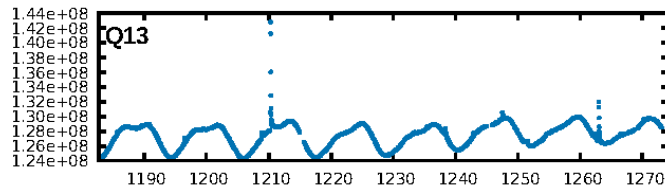
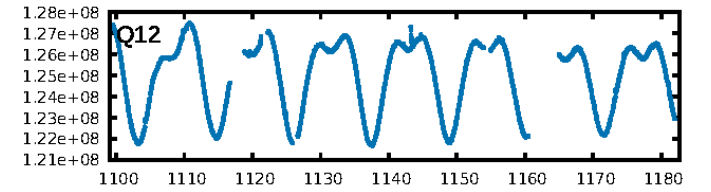
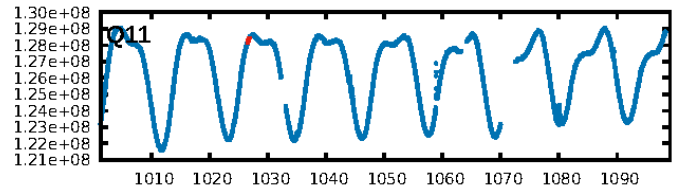
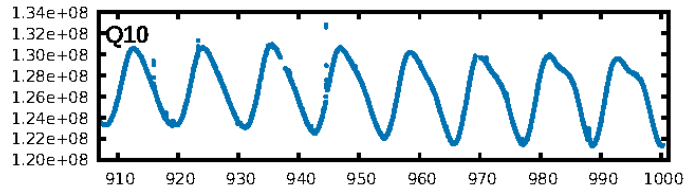
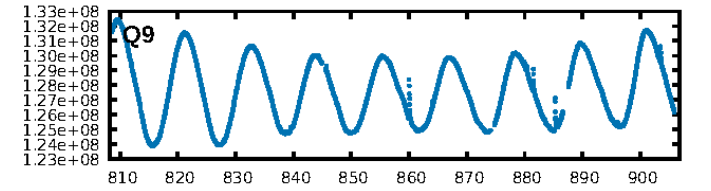
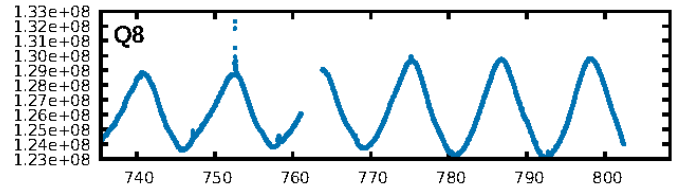
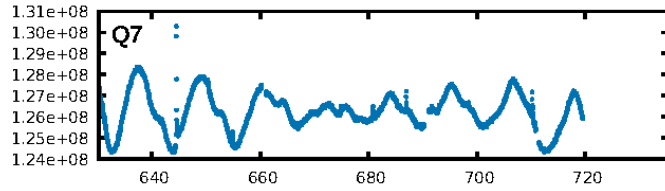
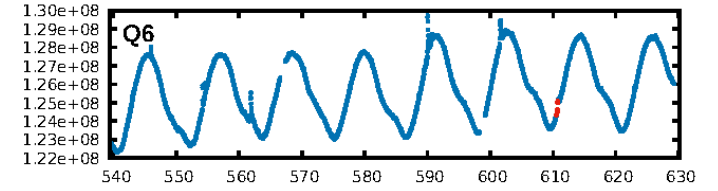
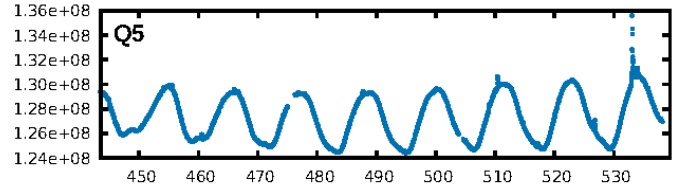
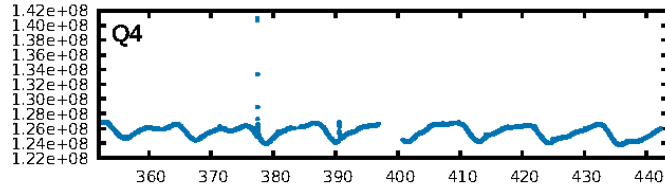
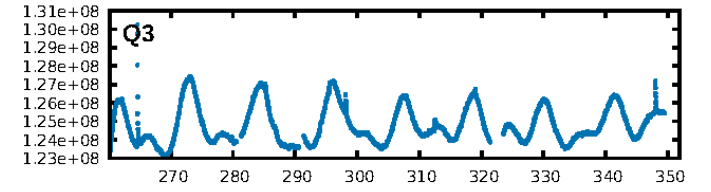
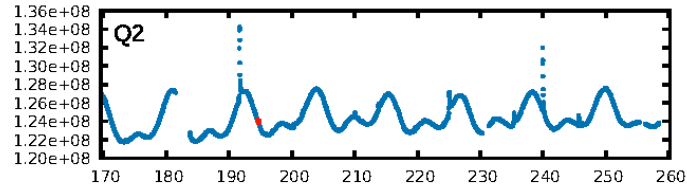
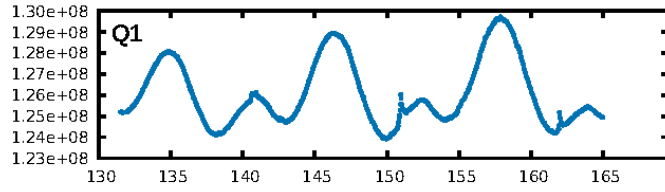
DV Diagnostic Results:

ShortPeriod-sig: 92.3% [1.77σ]
LongPeriod-sig: 100.0% [504.82σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 9.6%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 2.454
Centroid-sig: 75.6%
Centroid-so: 0.258 arcsec [0.54σ]
OotOffset-rm: 0.243 arcsec [0.26σ]
KicOffset-rm: 0.318 arcsec [0.36σ]
OotOffset-st: 2/2/0/0 [4]
KicOffset-st: 2/2/0/0 [4]
DiffImageQuality-fgm: 0.75 [3/4]
DiffImageOverlap-fno: 1.00 [4/4]

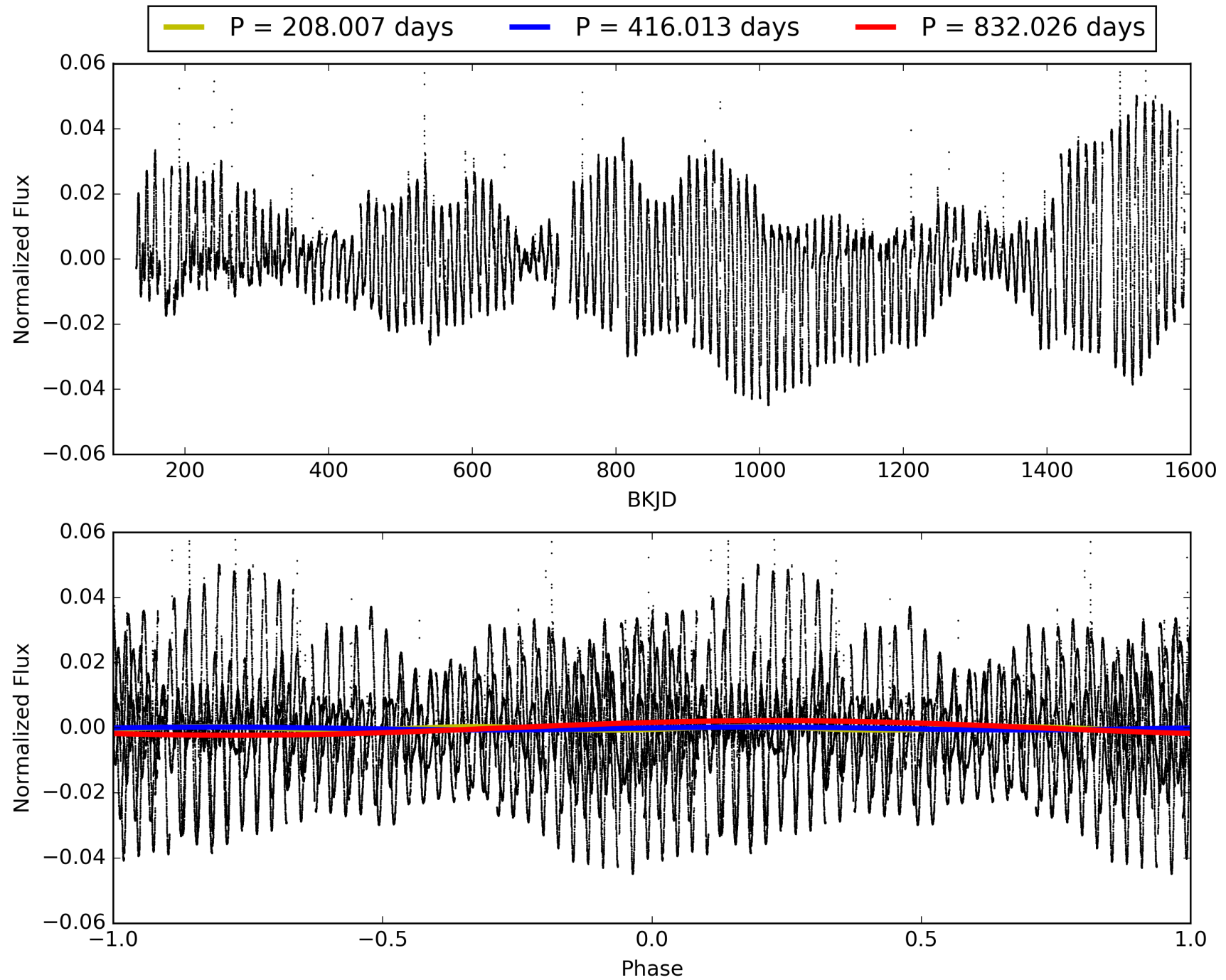
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:20:02 Z

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

TCE 008678457-02, PDC Light Curves

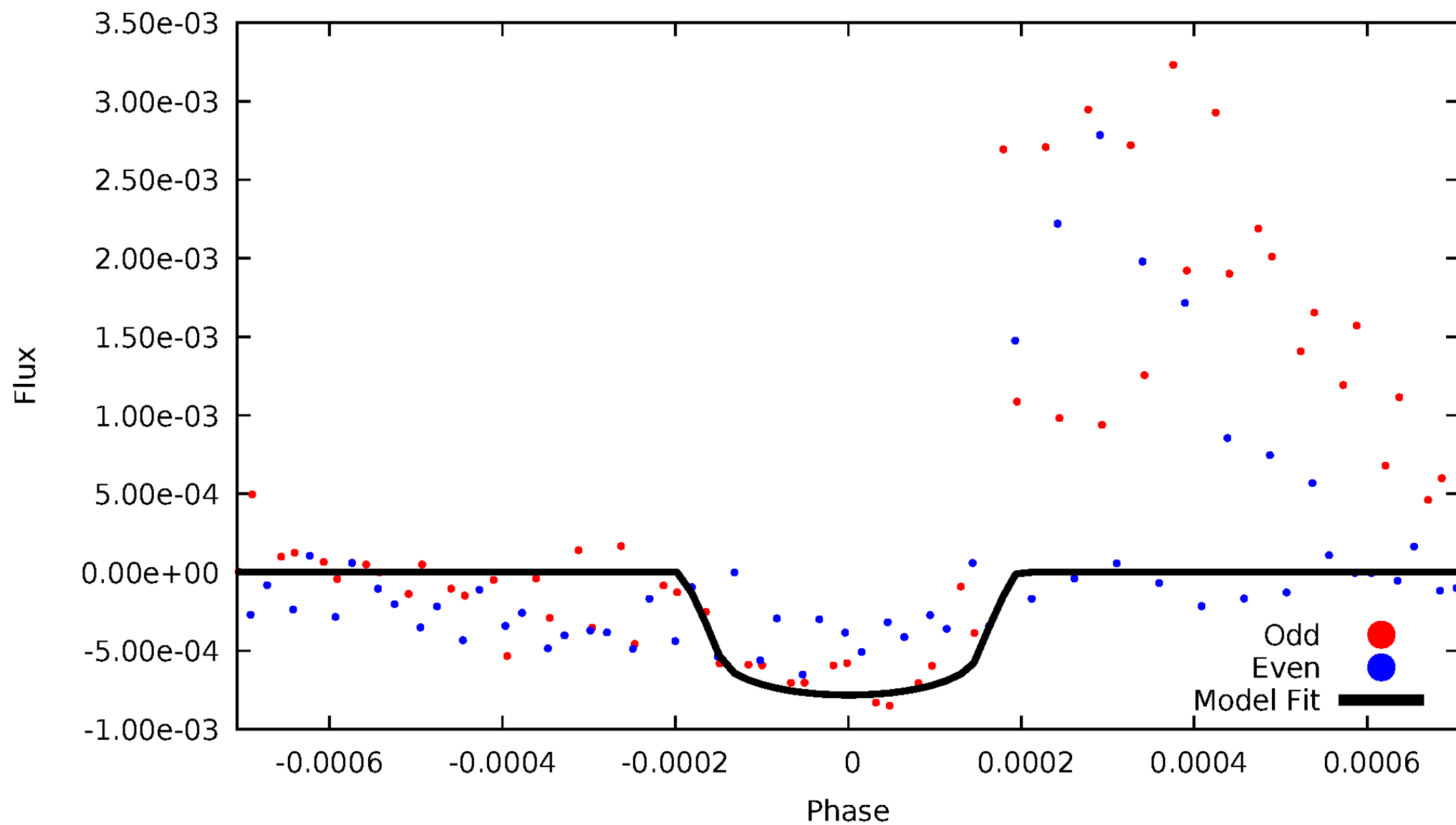


TCE 008678457-02



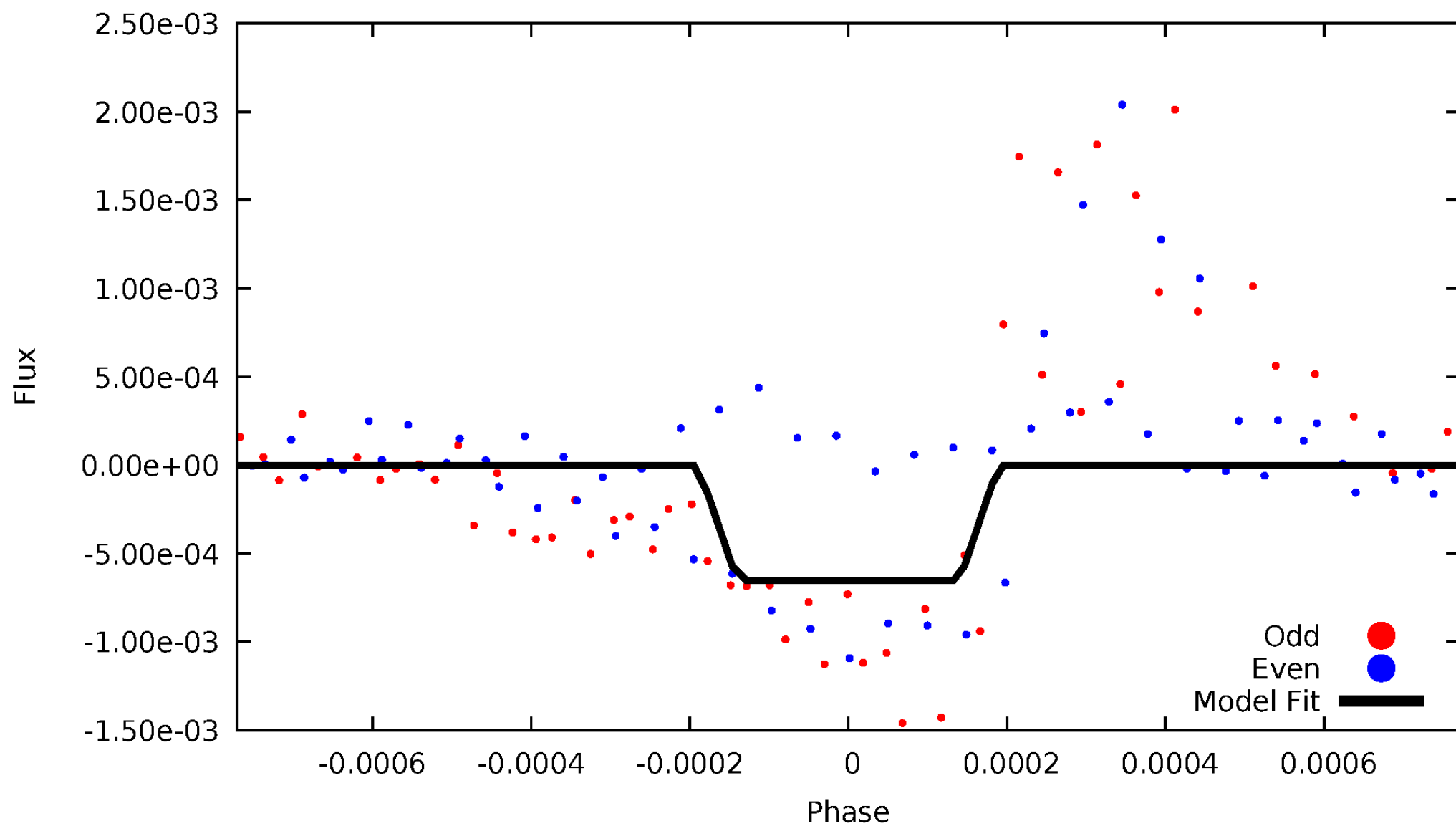
DV Odd/Even

TCE 008678457-02



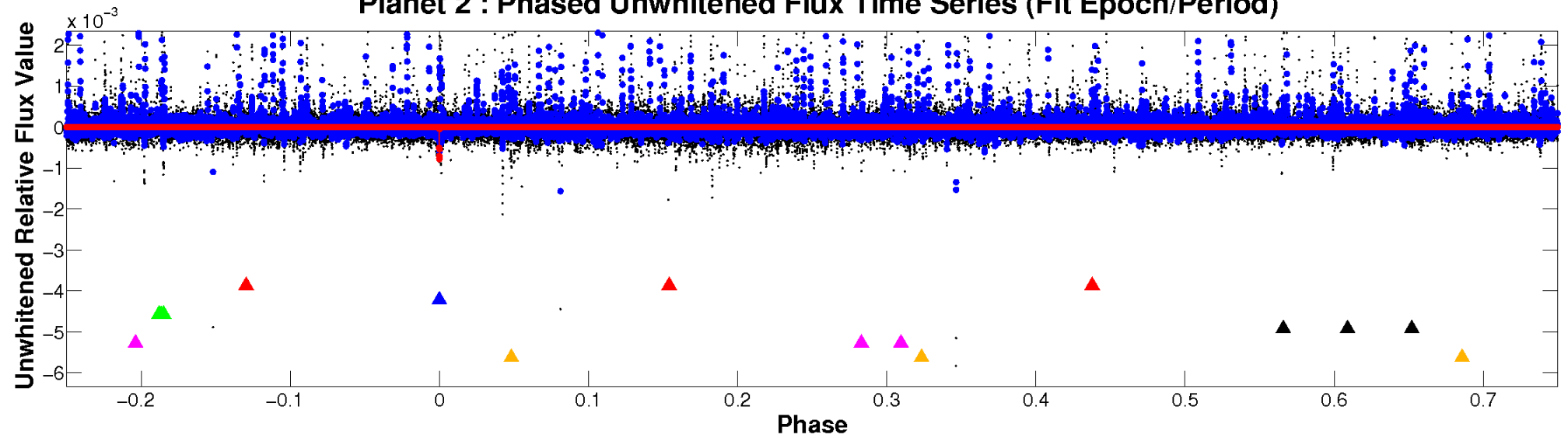
ALT Odd/Even

TCE 008678457-02

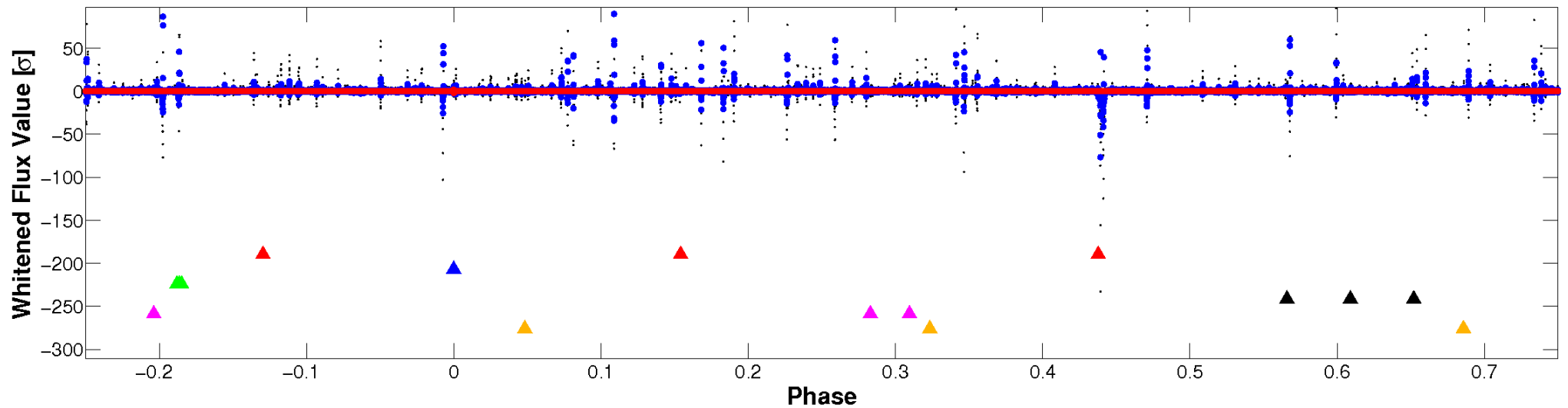


Non-Whitened Vs. Whitened Light Curve

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

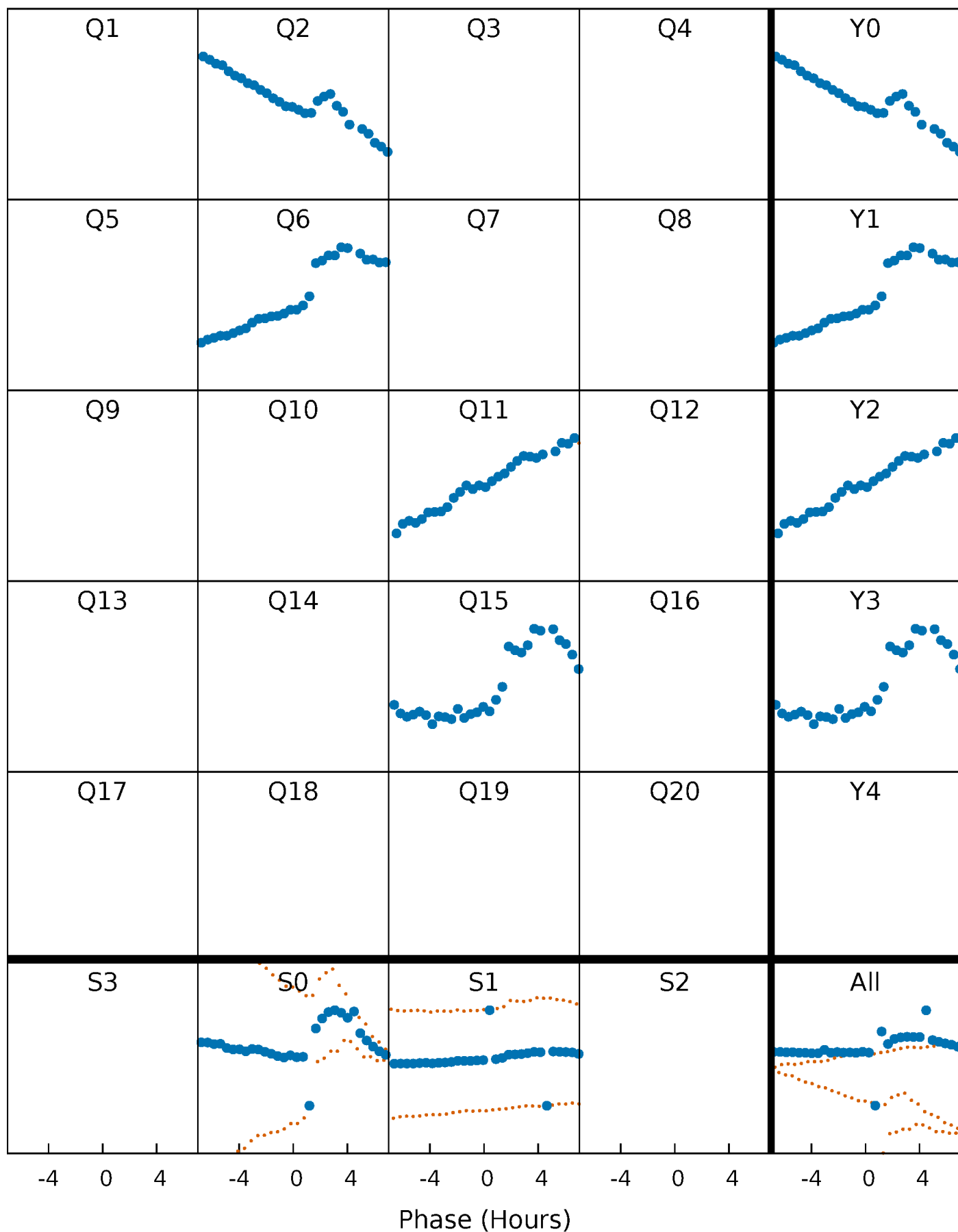


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



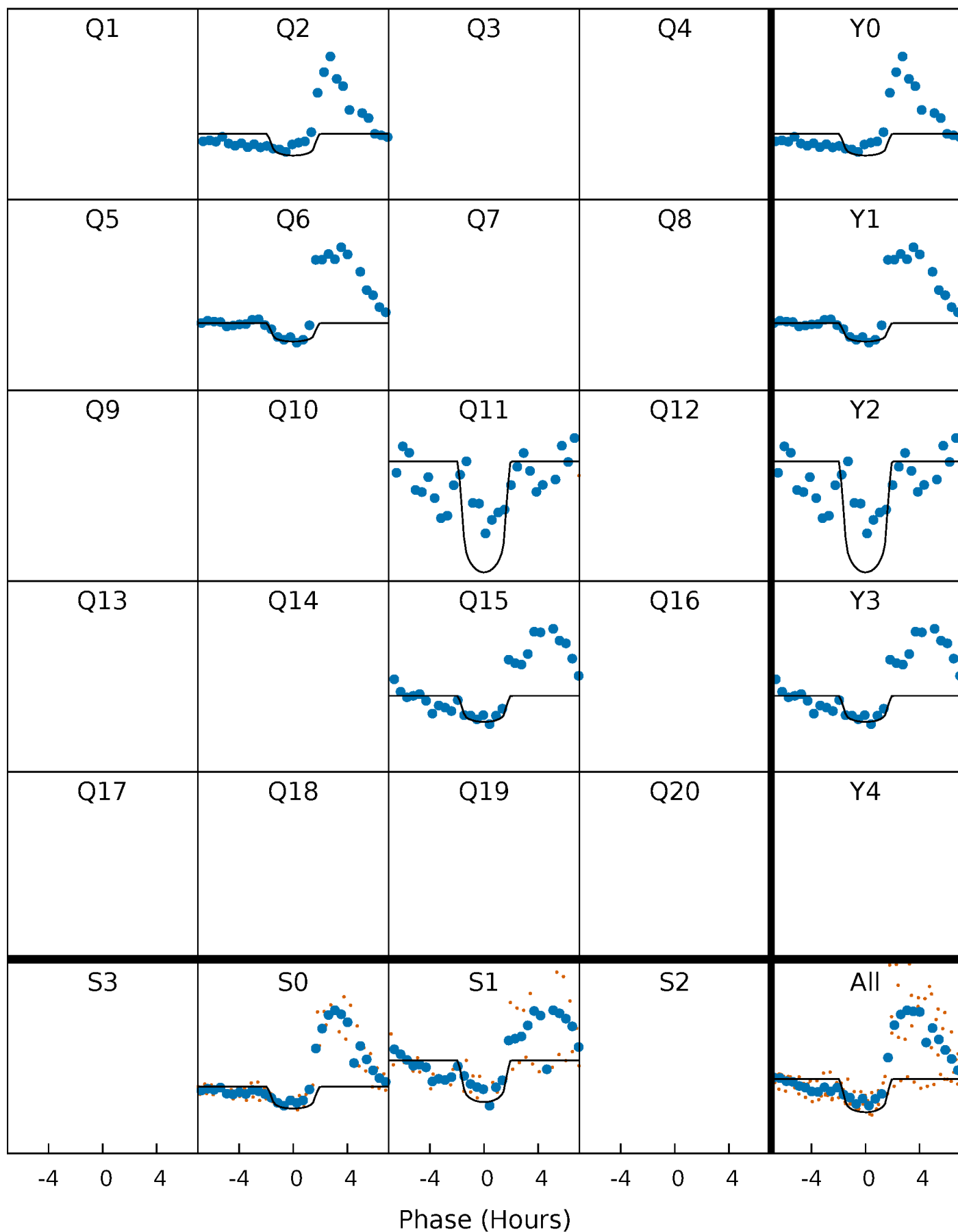
PDC Quarter-Phased Transit Curves

TCE 008678457-02 P=416.013045 Days $T_0=194.634956$ (BKJD)



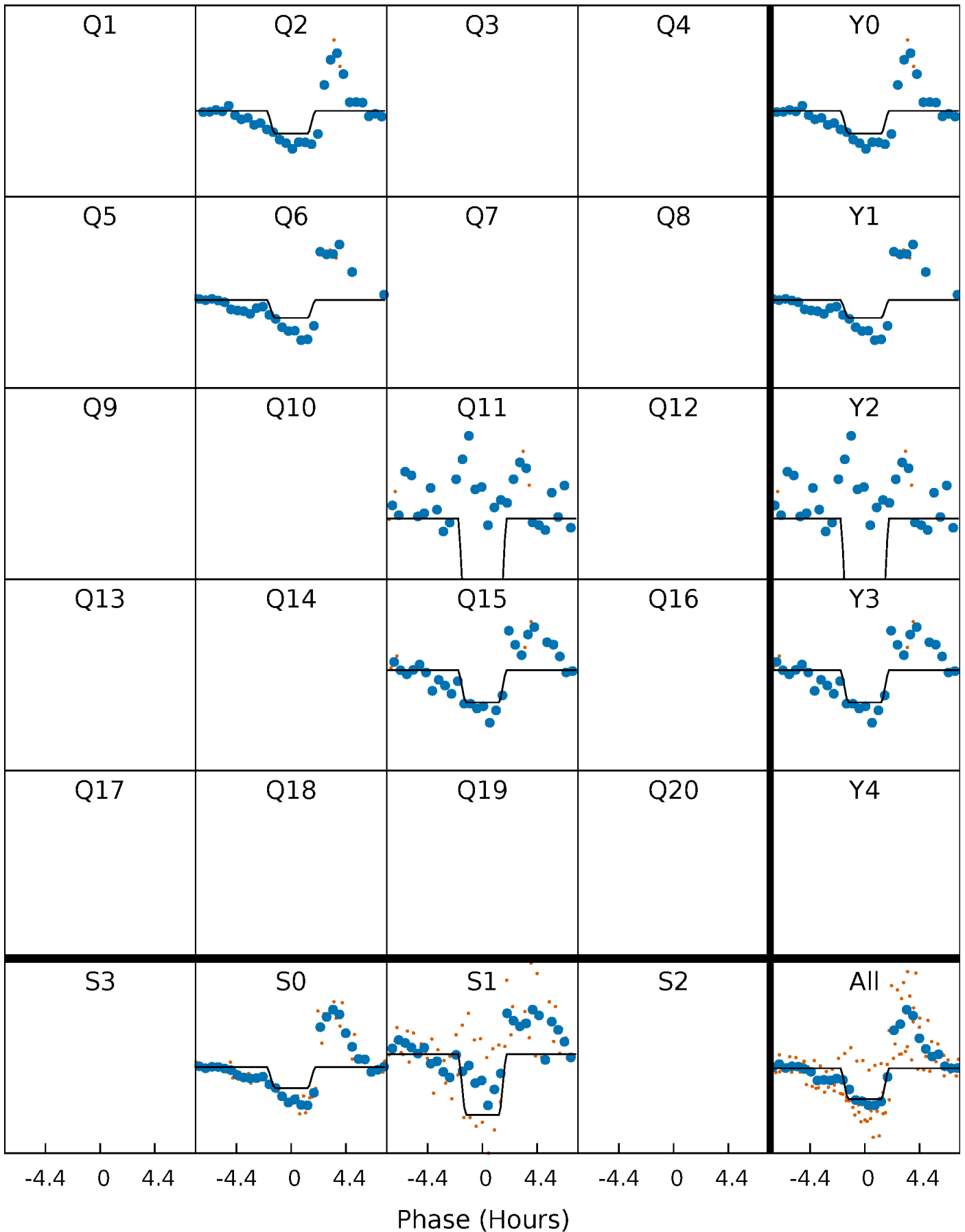
DV Quarter-Phased Transit Curves

TCE 008678457-02 P=416.013045 Days $T_0=194.634956$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

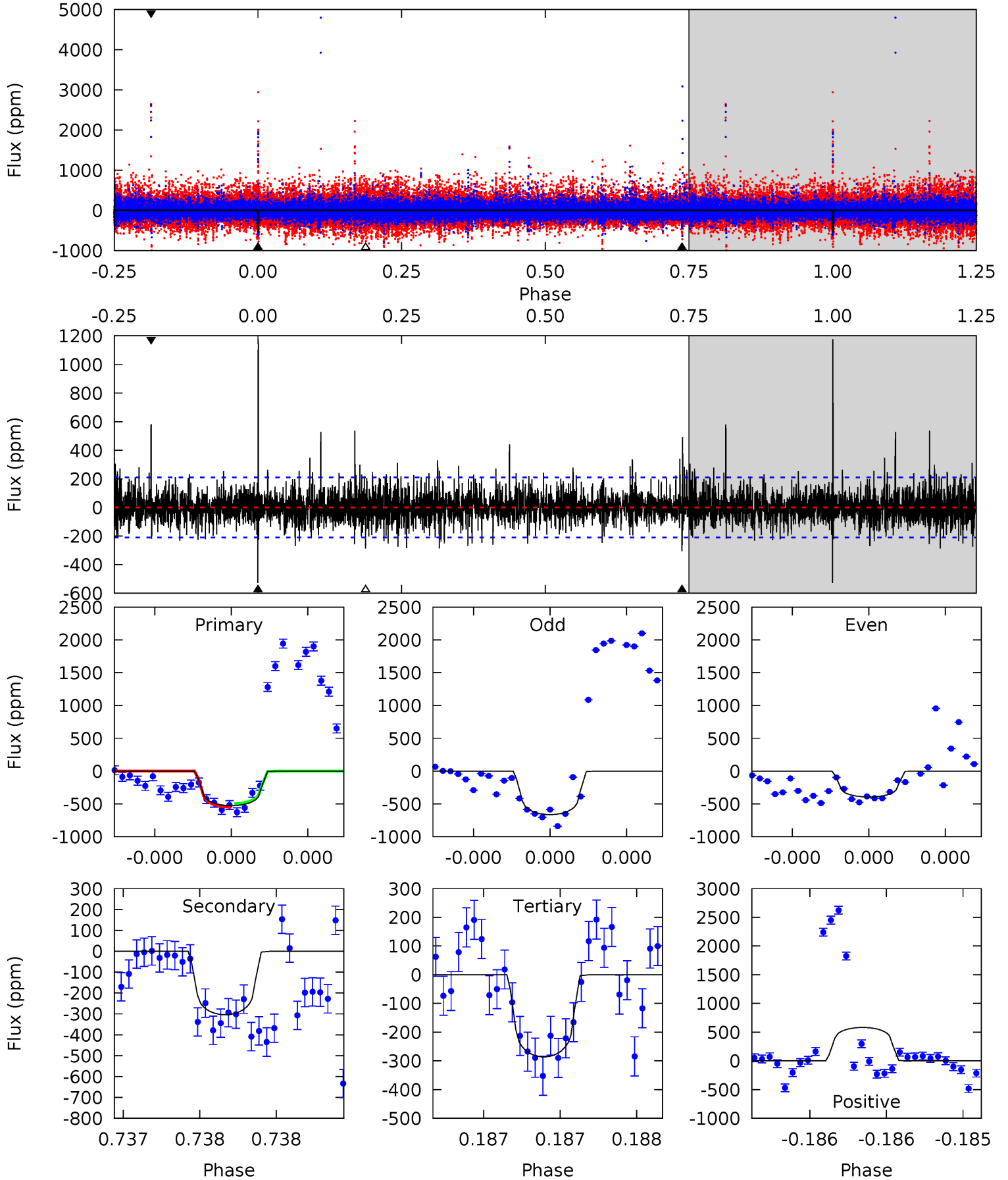
TCE 008678457-02 $P=416.020470$ Days $T_0=194.612466$ (BKJD)



DV Model-Shift Uniqueness Test

008678457-02, P = 416.013045 Days, E = 194.634956 Days

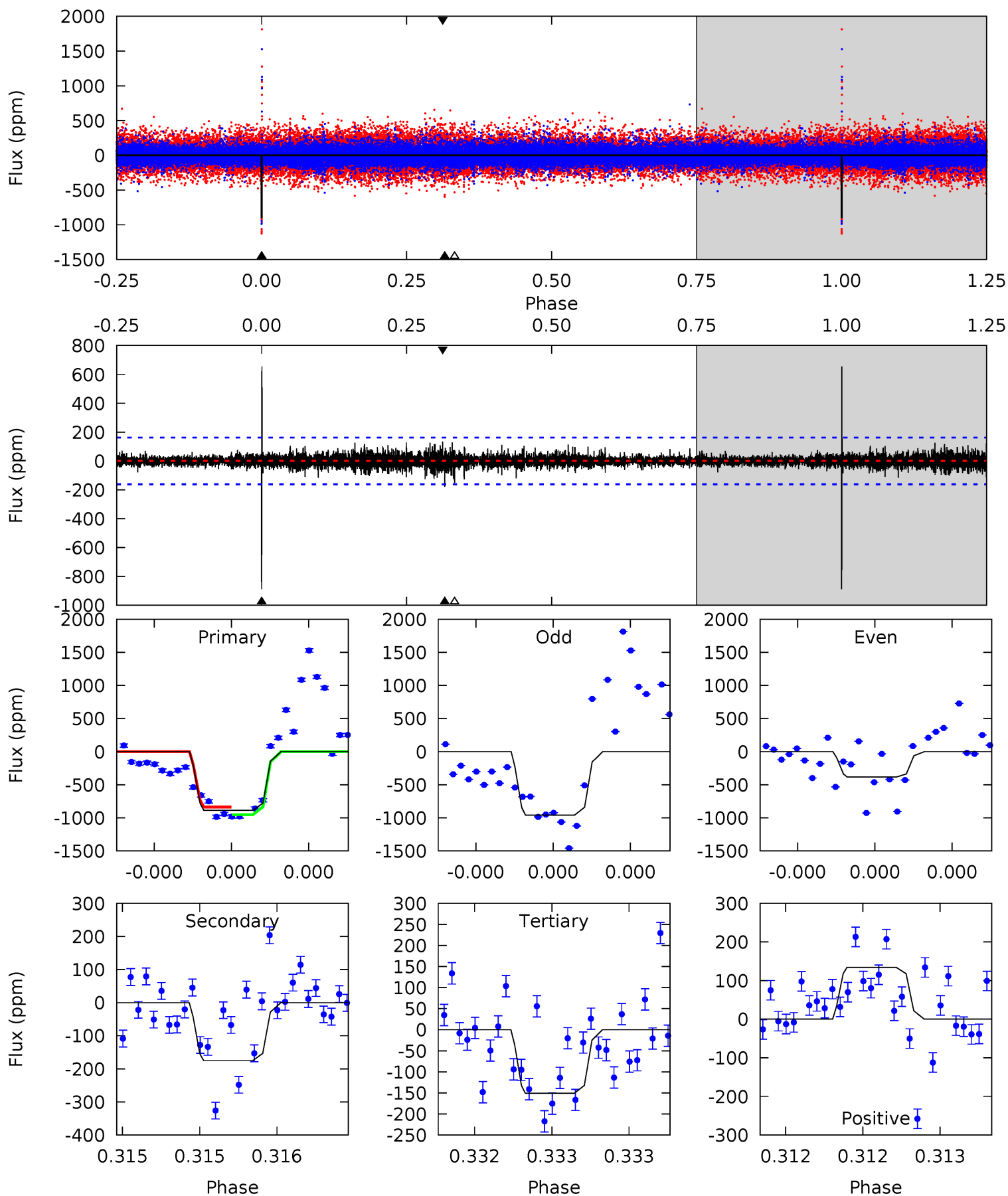
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.1	8.11	7.64	15.5	5.61	3.53	2.13	6.43	-1.47	0.47	-7.43	1.37	1.05	0.69	0.72



Alt Model-Shift Uniqueness Test

008678457-02, P = 416.020470 Days, E = 194.612466 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
30.9	6.09	5.24	4.67	5.63	3.57	0.91	25.6	26.2	0.85	1.42	11.3	0.79	0.42	1.99



Stellar Parameters For KIC 008678457

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5518^{+197}_{-164}	$3.752^{+0.915}_{-0.366}$	$-0.980^{+0.350}_{-0.250}$	$1.956^{+1.304}_{-1.304}$	$0.787^{+0.207}_{-0.095}$	$0.148^{+2.987}_{-0.104}$
	+4%/-3%	+24%/-10%	+36%/-26%	+67%/-67%	+26%/-12%	+2016%/-70%
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 008678457-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-304 ± 37	$5.93^{+6.30}_{-3.94}$	464^{+81}_{-94}	4311^{+2558}_{-801}	4895^{+40593}_{-3710}
Alt.	-175 ± 29	$6.33^{+6.29}_{-3.99}$	471^{+79}_{-92}	3862^{+1776}_{-651}	2435^{+17526}_{-1831}

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

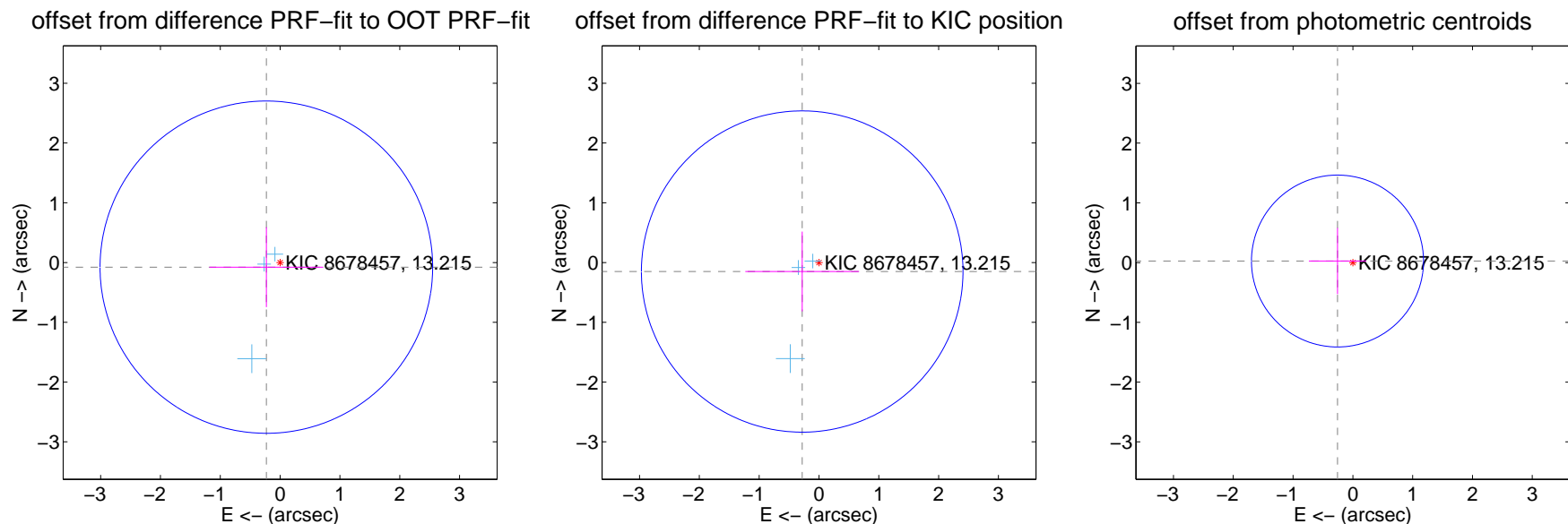
DV Centroid Data

Supplemental centroid analysis for 008678457-02. Kepler magnitude: 13.21. Transit SNR 10.29

There are 3 quarters with good PRF difference image offsets

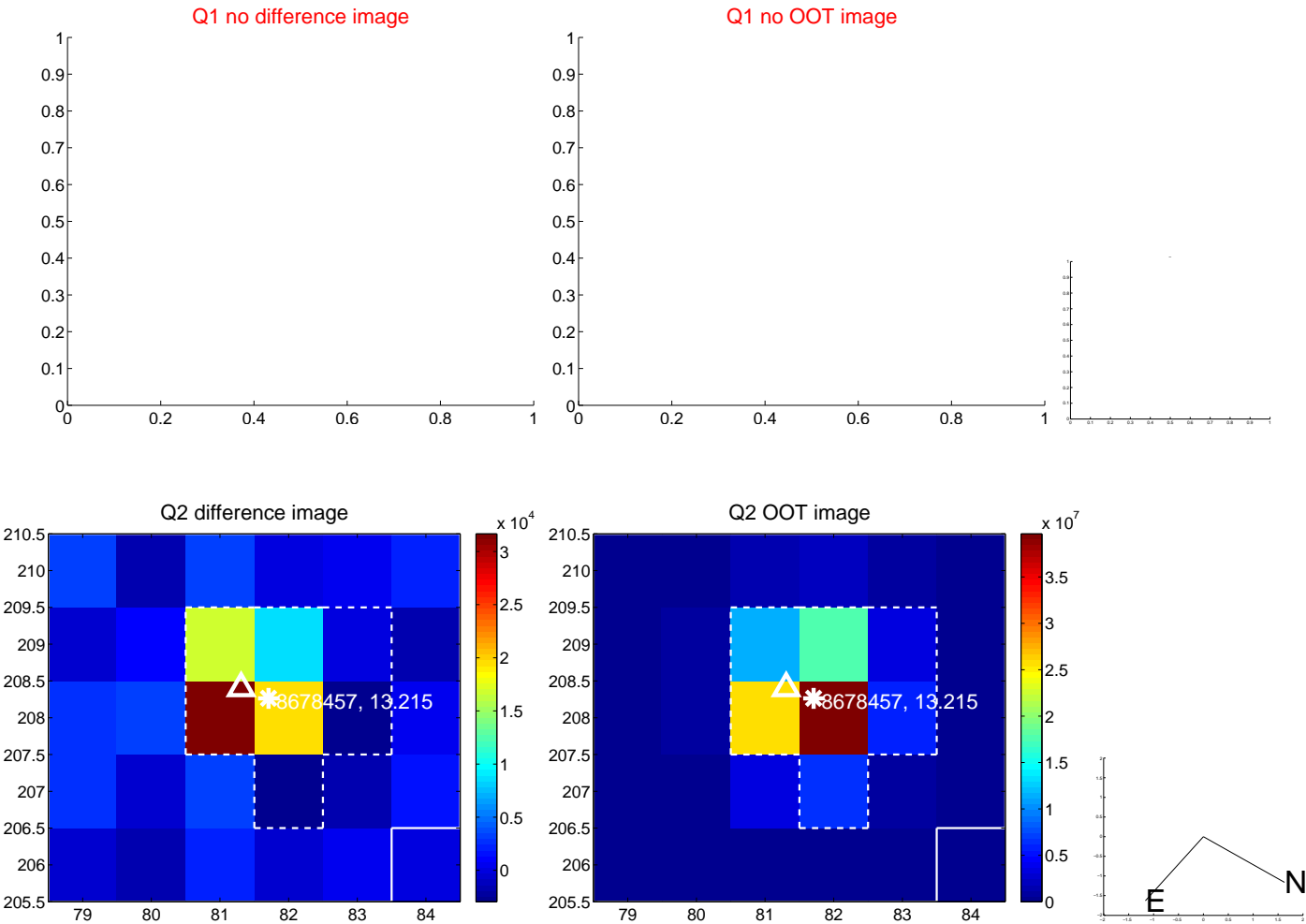
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.243 ± 0.927	0.26	0.230 ± 0.952	-0.077 ± 0.668
PRF-fit source offset from KIC position	0.318 ± 0.896	0.36	0.281 ± 0.952	-0.150 ± 0.668
photometric centroid source offset	0.26 ± 0.48	0.54	0.26 ± 0.48	0.03 ± 0.55

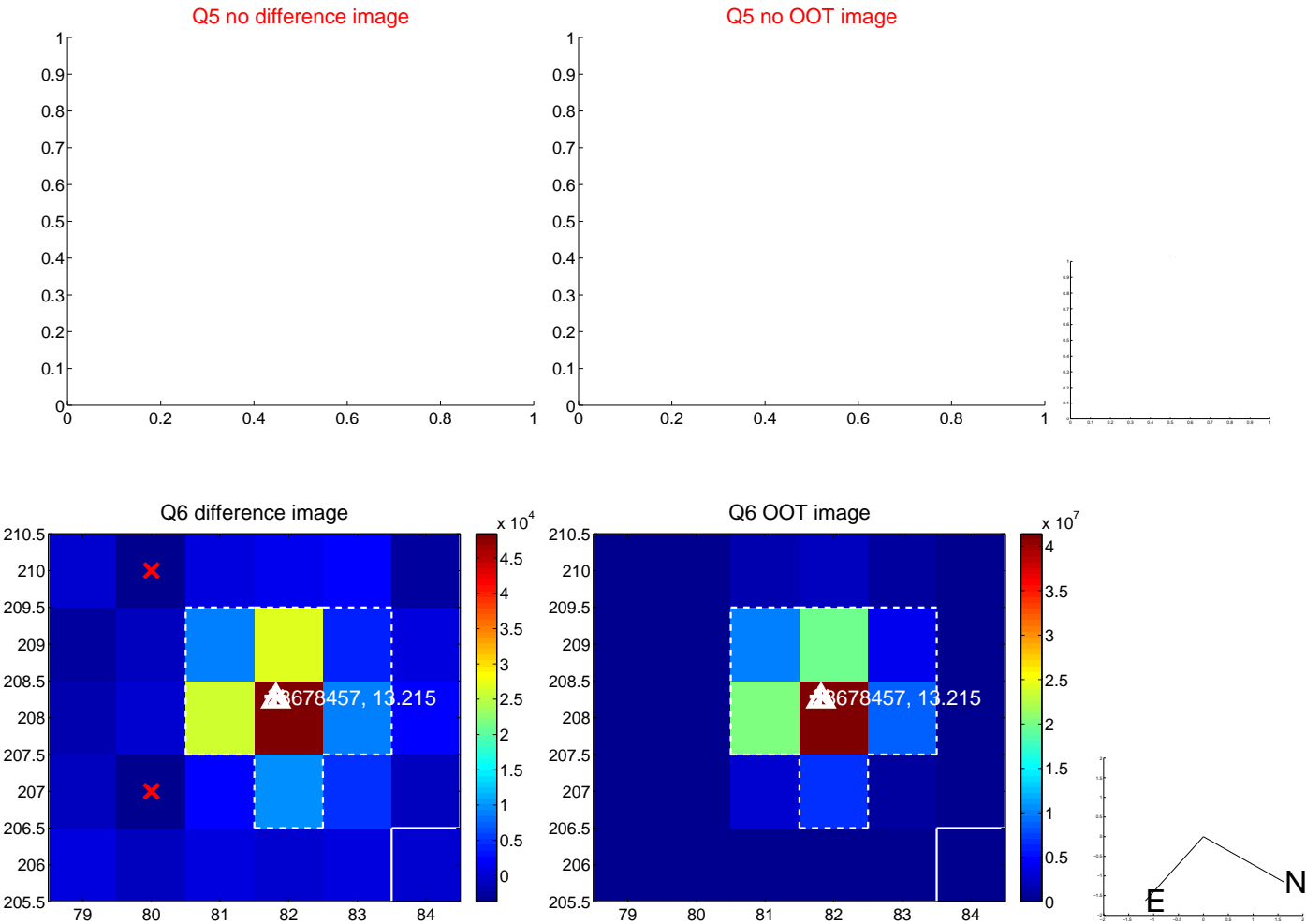


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

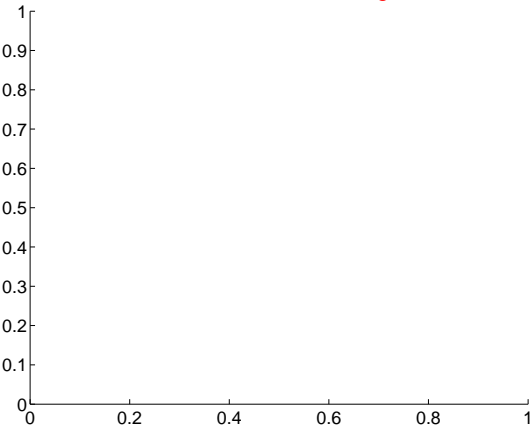
Q9 no difference image



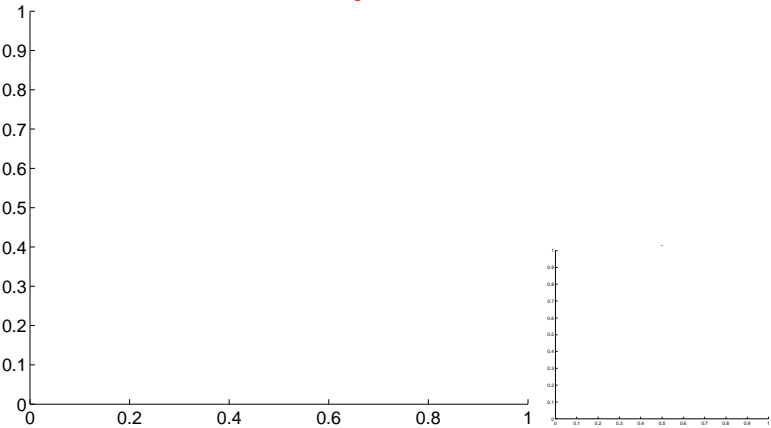
Q9 no OOT image



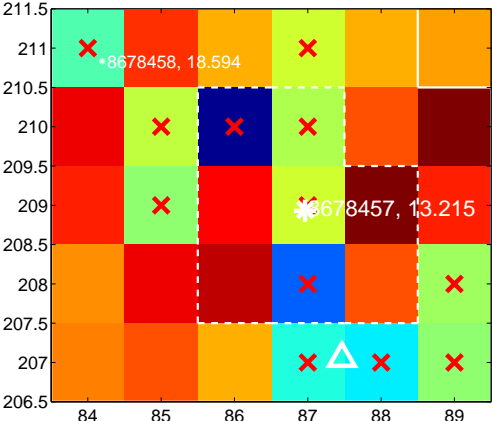
Q10 no difference image



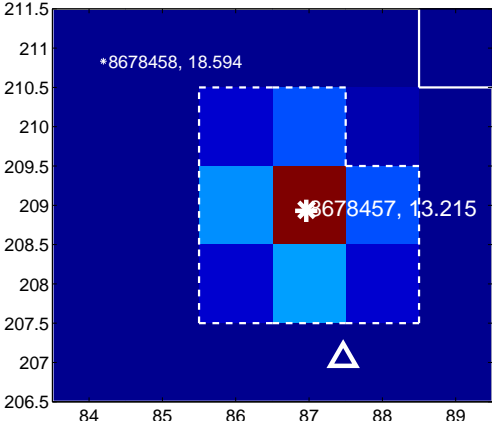
Q10 no OOT image



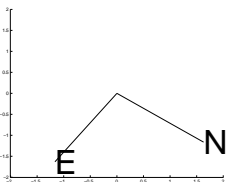
Q11 difference image. Poor Quality



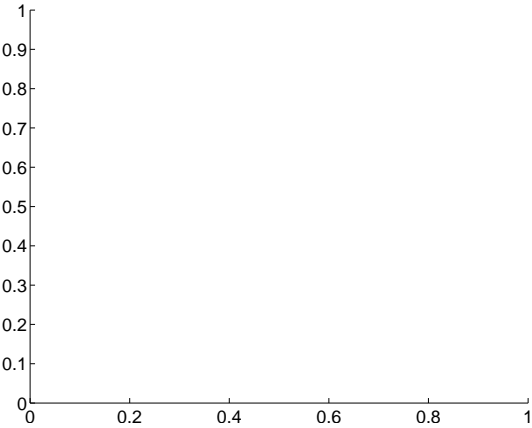
Q11 OOT image



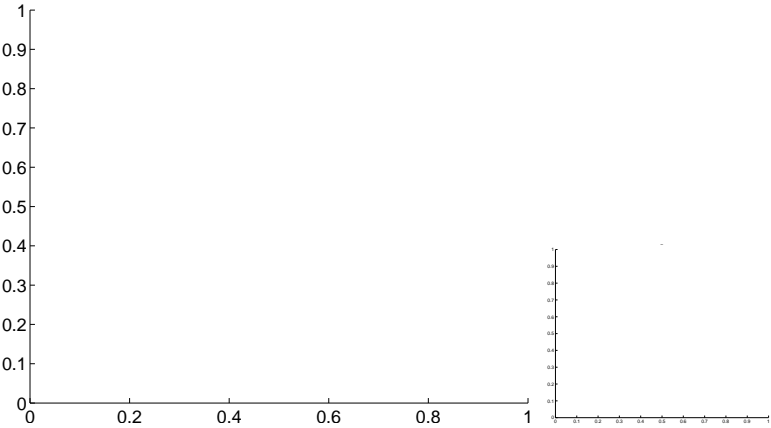
$\times 10^7$



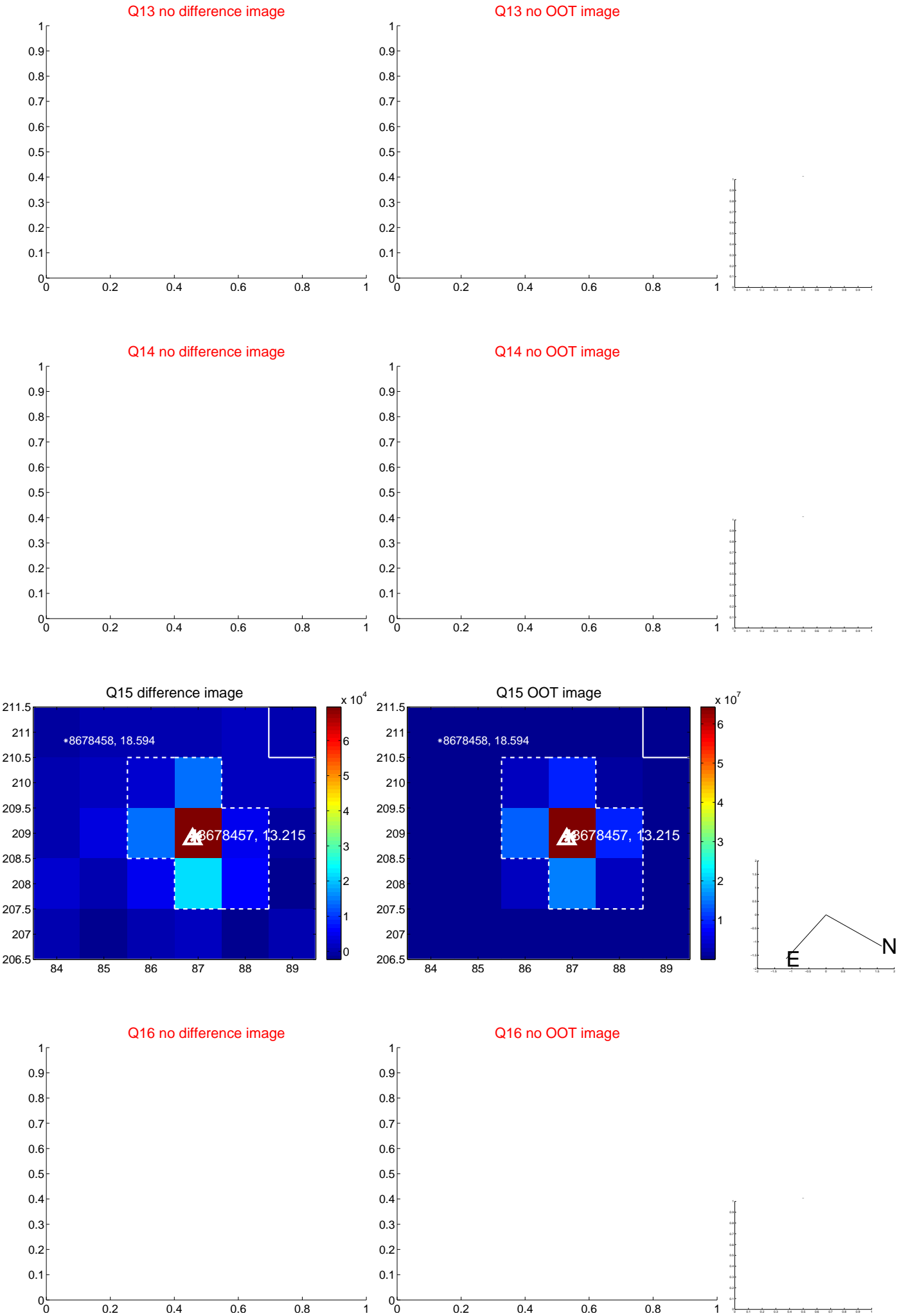
Q12 no difference image



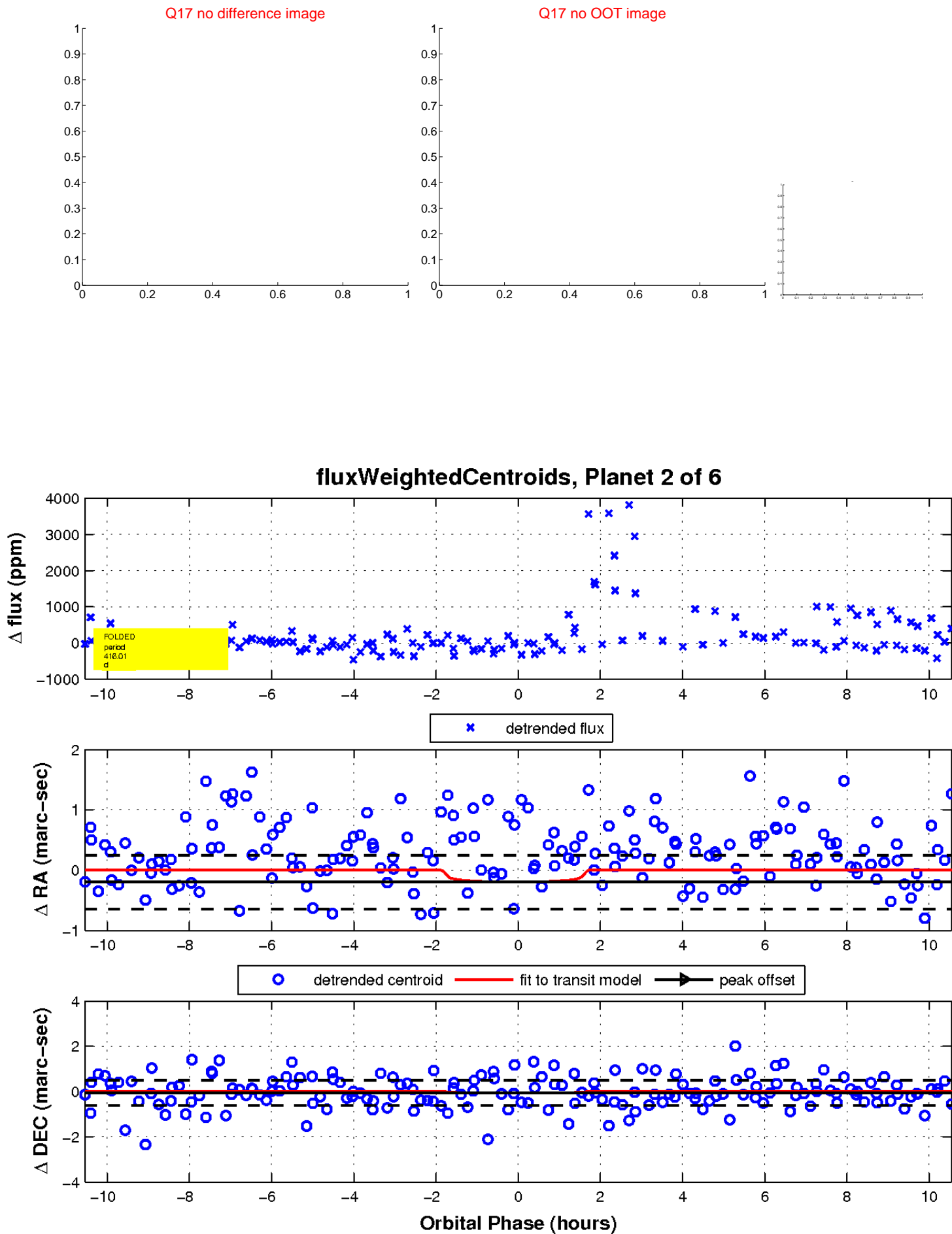
Q12 no OOT image



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

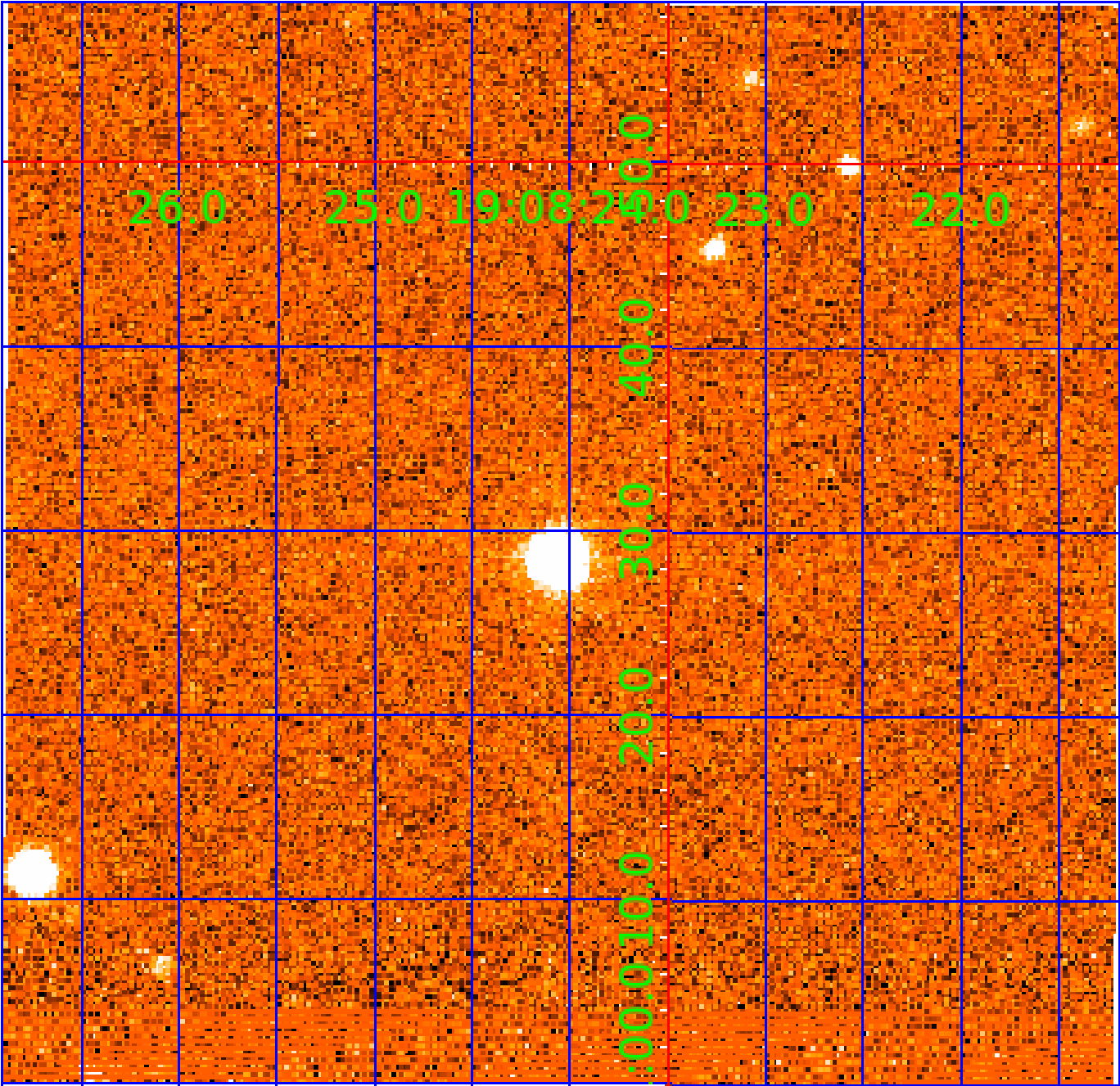


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008678457

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})
008678457-01	OBS	No	534.017411	140.744148	793.1	4.363	18.4	6.9	1.96	5518	5.58	2.24
008678457-02	OBS	No	416.013045	194.634956	782.6	3.527	18.0	10.3	1.96	5518	5.67	3.13
008678457-03	OBS	No	415.359500	533.740505	853.6	8.122	20.3	8.6	1.96	5518	7.14	3.14
008678457-04	OBS	No	398.102177	465.899115	667.1	7.454	17.2	7.2	1.96	5518	6.11	3.32
008678457-05	OBS	No	629.542217	312.369397	637.0	4.204	14.9	6.7	1.96	5518	5.63	1.80
008678457-06	OBS	No	566.799710	329.161414	550.4	5.000	16.3	-1.0	1.96	5518	4.58	2.07

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008678457-01	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
008678457-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_POS_DV
008678457-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
008678457-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008678457-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
008678457-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS

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

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

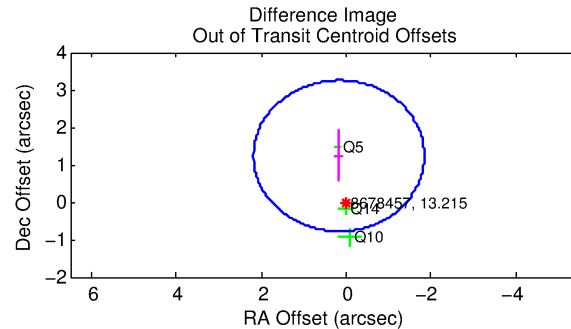
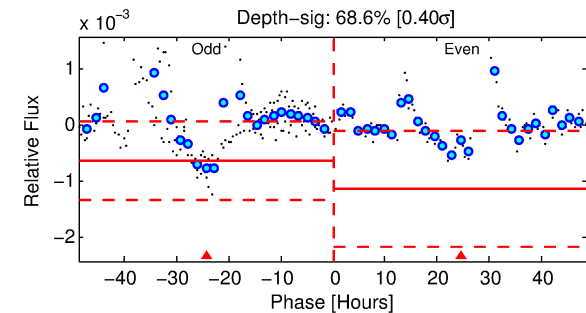
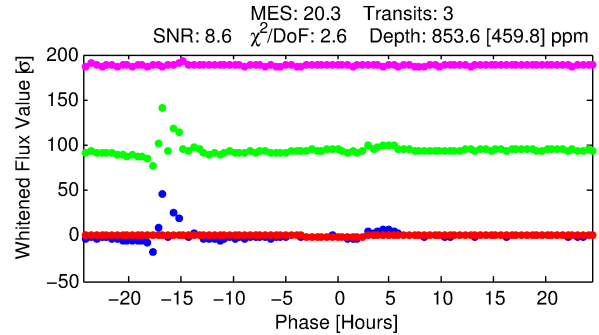
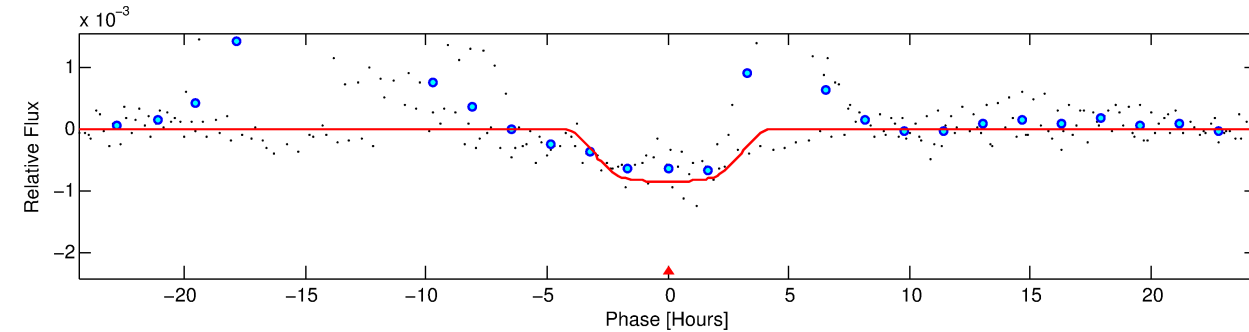
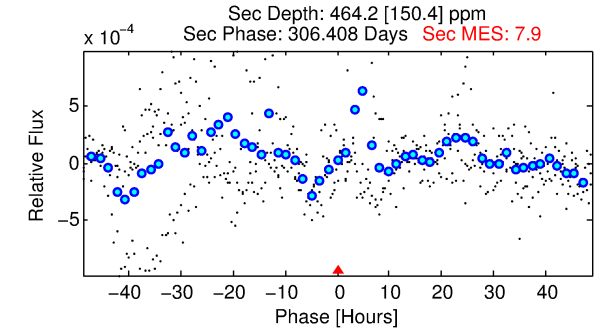
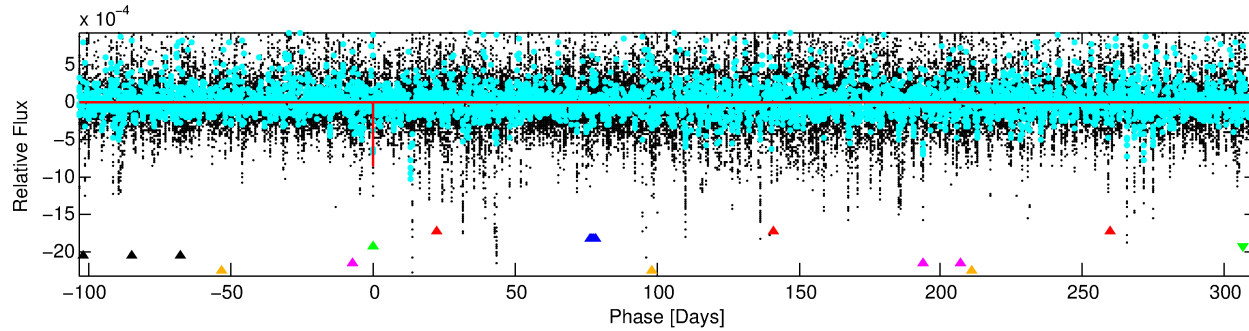
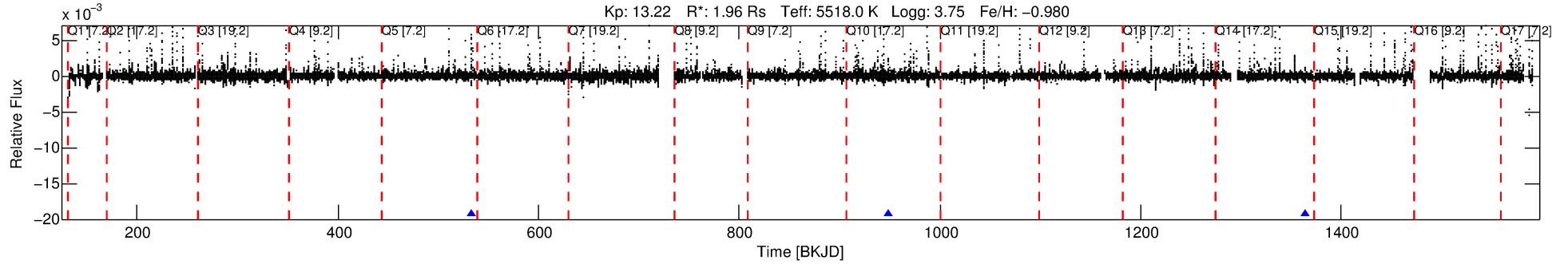
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008678457-03

No Significant Match Found

DV One-Page Summary

KIC: 8678457 Candidate: 3 of 6 Period: 415.359 d



DV Fit Results:

Period = 415.35950 [0.02888] d
Epoch = 533.7405 [0.0400] BKJD
Rp/R* = 0.0335 [0.0103]
a/R* = 162.44 [77.26]
b = 0.95 [0.06]
Seff = 3.14 [4.64]
Teq = 339 [126] K
Rp = 7.14 [5.24] Re
a = 1.0067 [0.8367] AU
Ag = 5077.02 [8269.35] [0.61 σ]
Teffp = 4429 [785] K [5.14 σ]

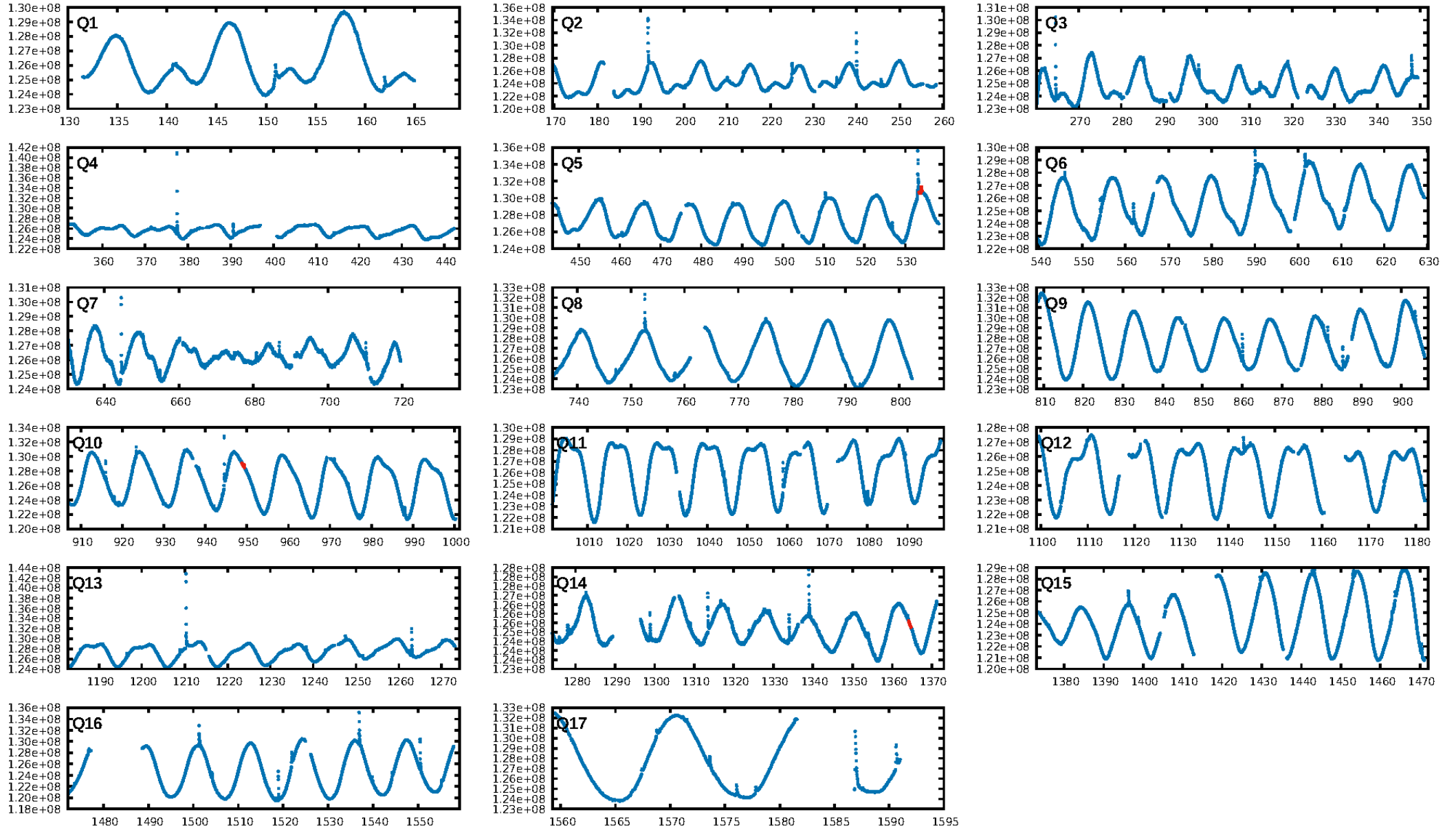
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [37.57 σ]
LongPeriod-sig: 92.3% [1.77 σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 0.2%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.3508
Centroid-sig: 34.2%
Centroid-so: 0.501 arcsec [1.09 σ]
OotOffset-rm: 1.247 arcsec [1.86 σ]
OotOffset-st: 2/0/0/1 [3]
KicOffset-rm: 1.212 arcsec [2.32 σ]
KicOffset-st: 2/0/0/1 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 1.00 [3/3]

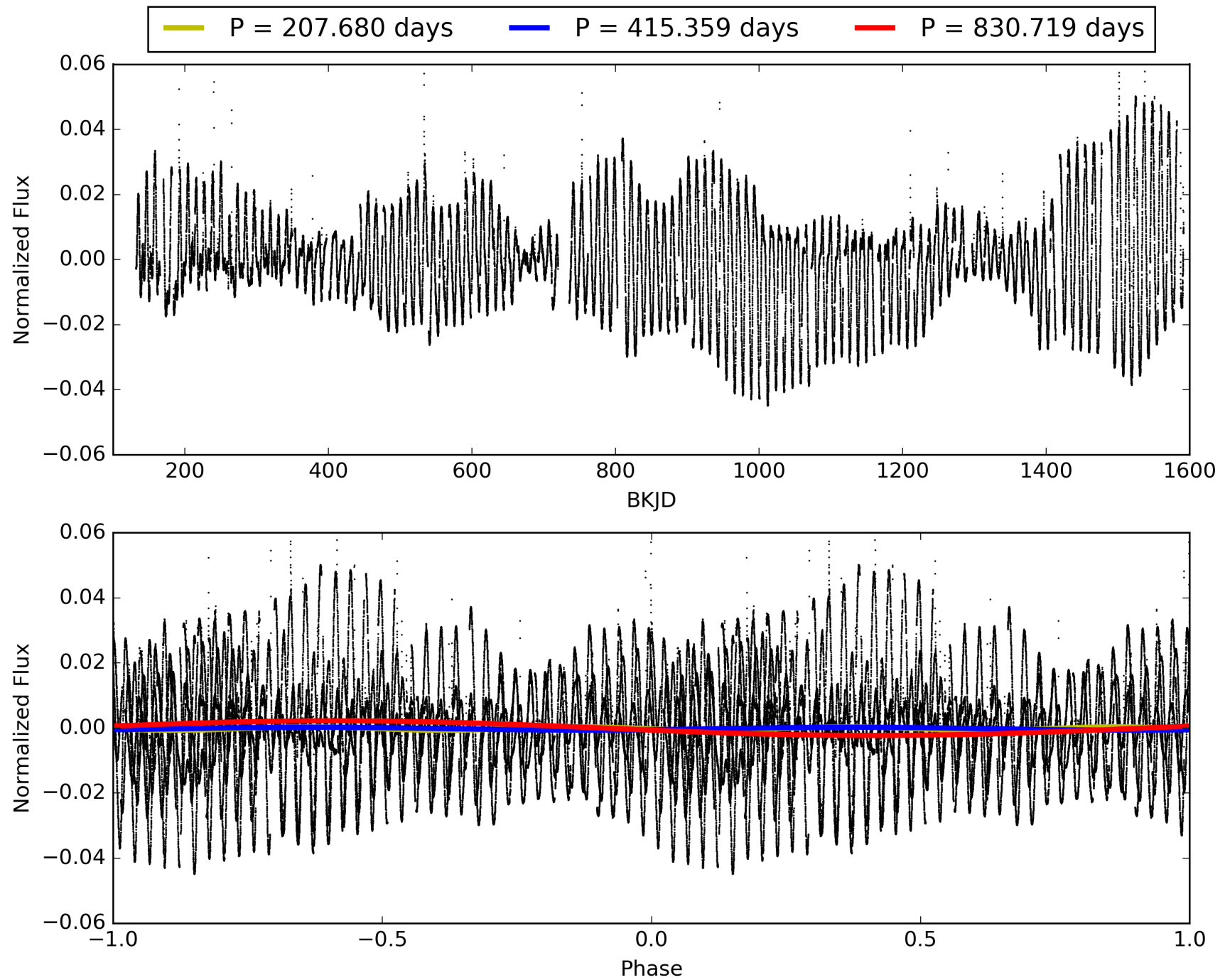
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:20:13 Z

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

TCE 008678457-03, PDC Light Curves

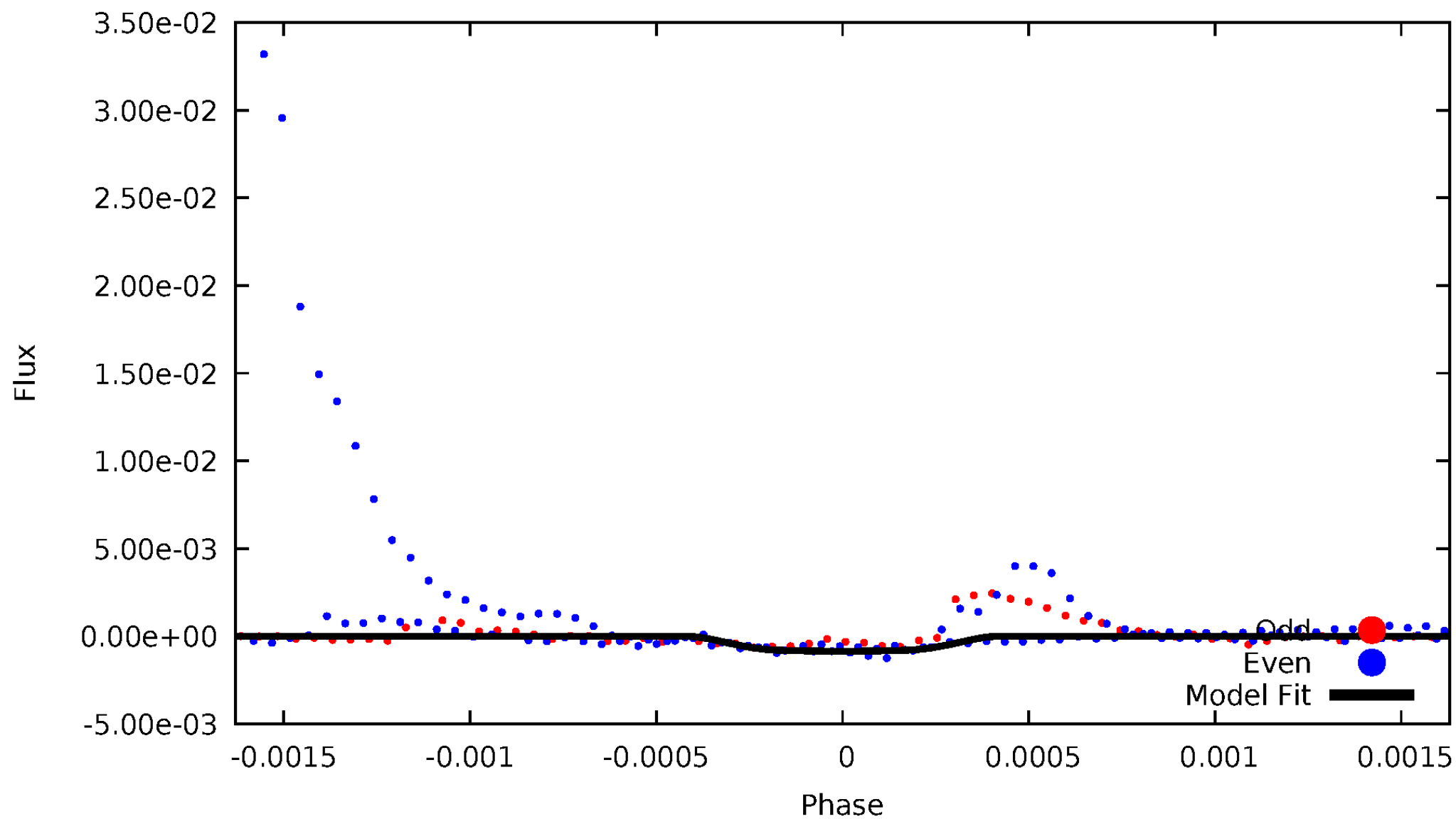


TCE 008678457-03



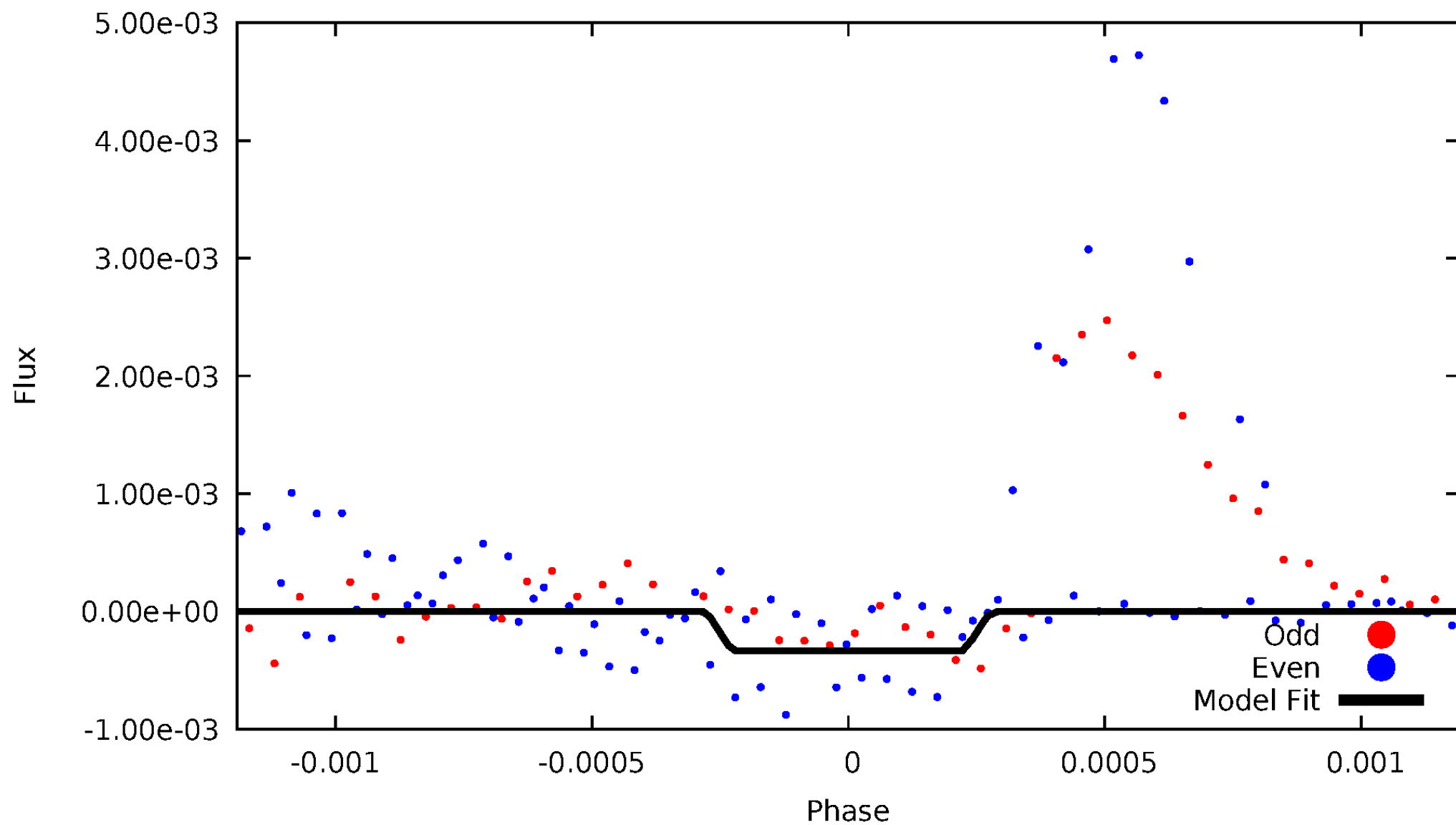
DV Odd/Even

TCE 008678457-03



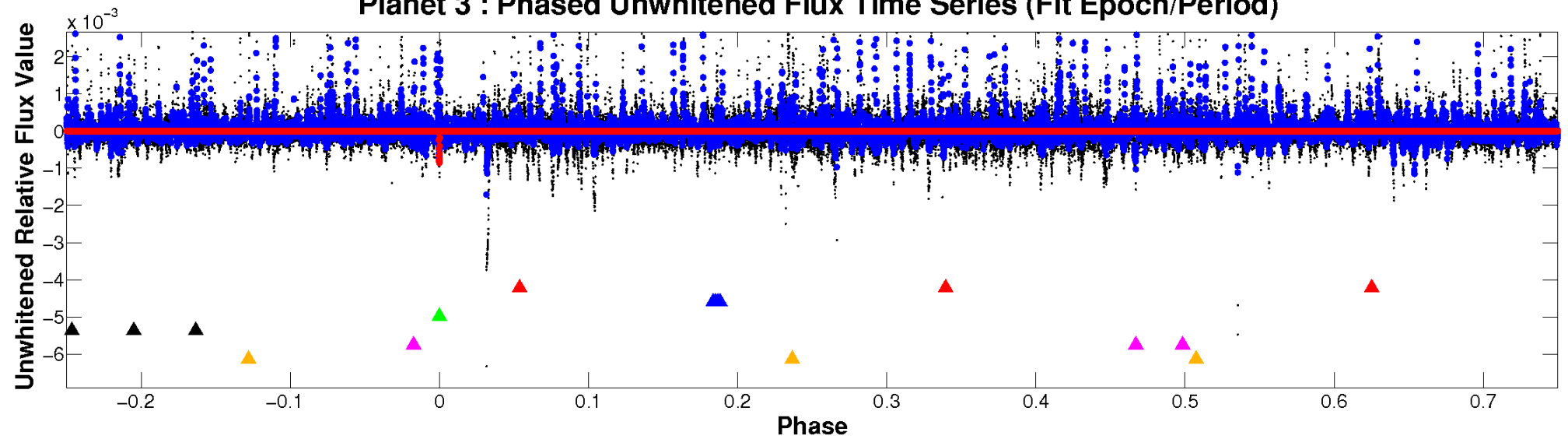
ALT Odd/Even

TCE 008678457-03

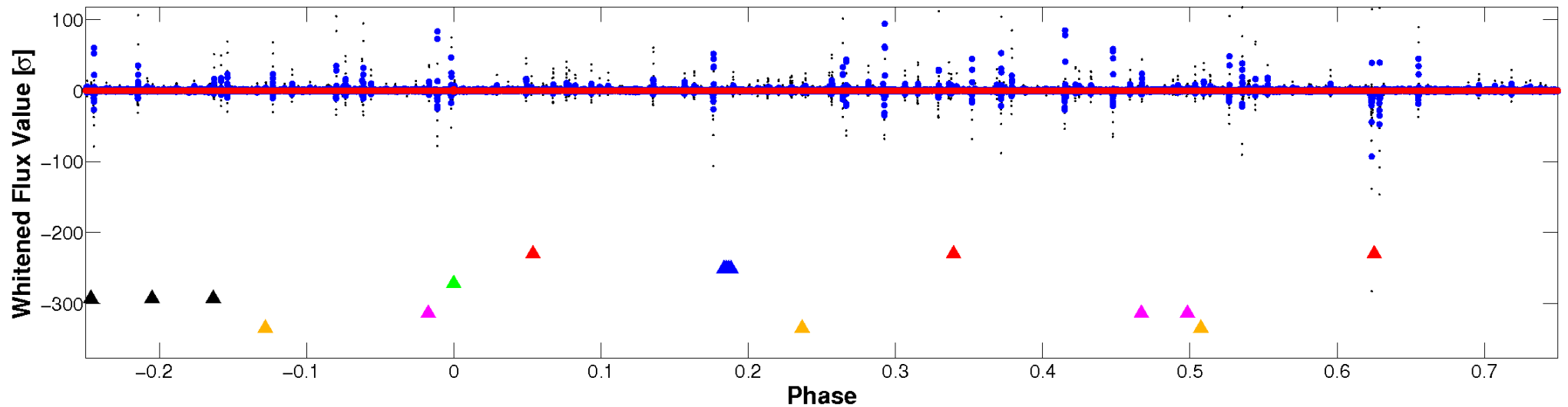


Non-Whitened Vs. Whitened Light Curve

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

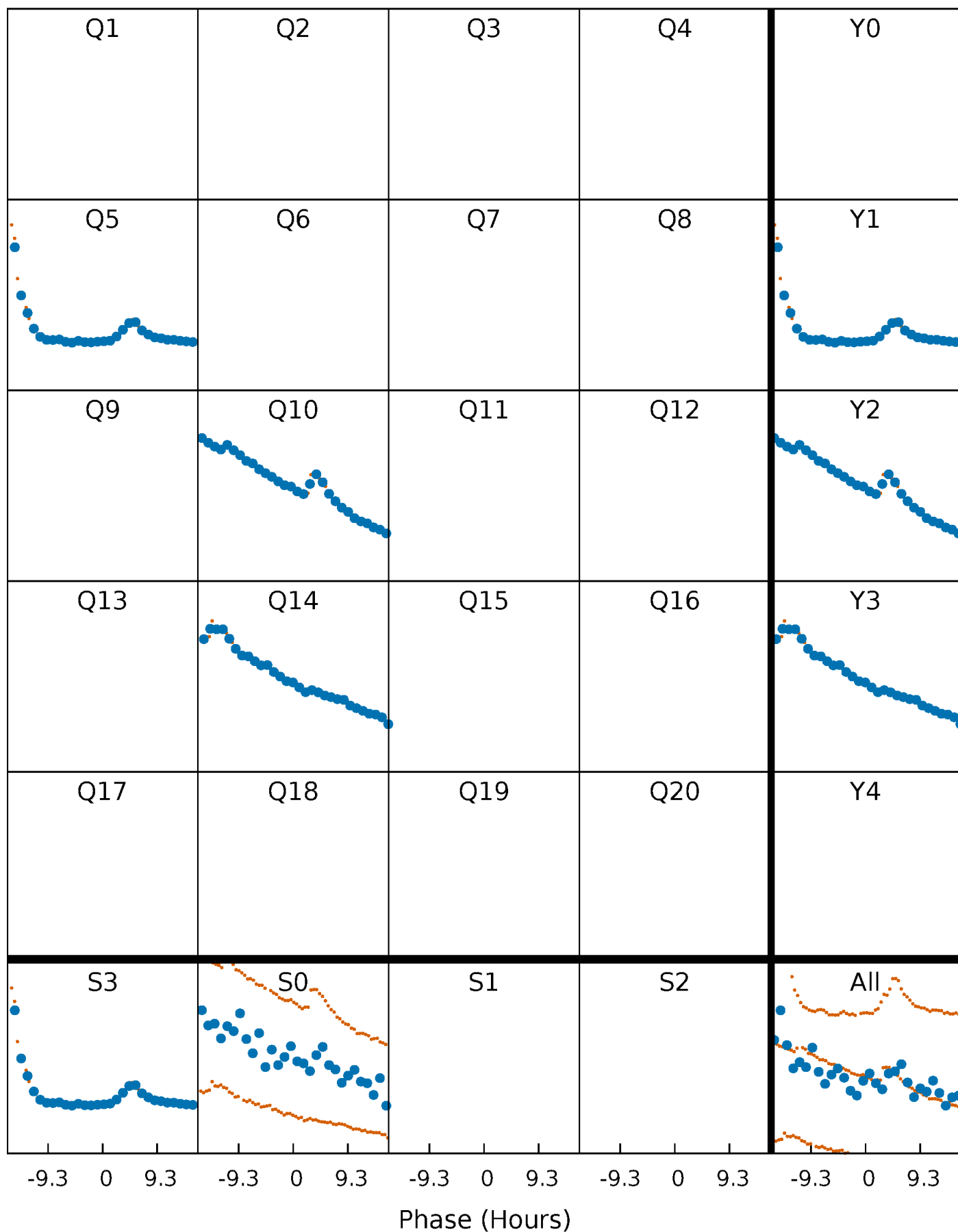


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



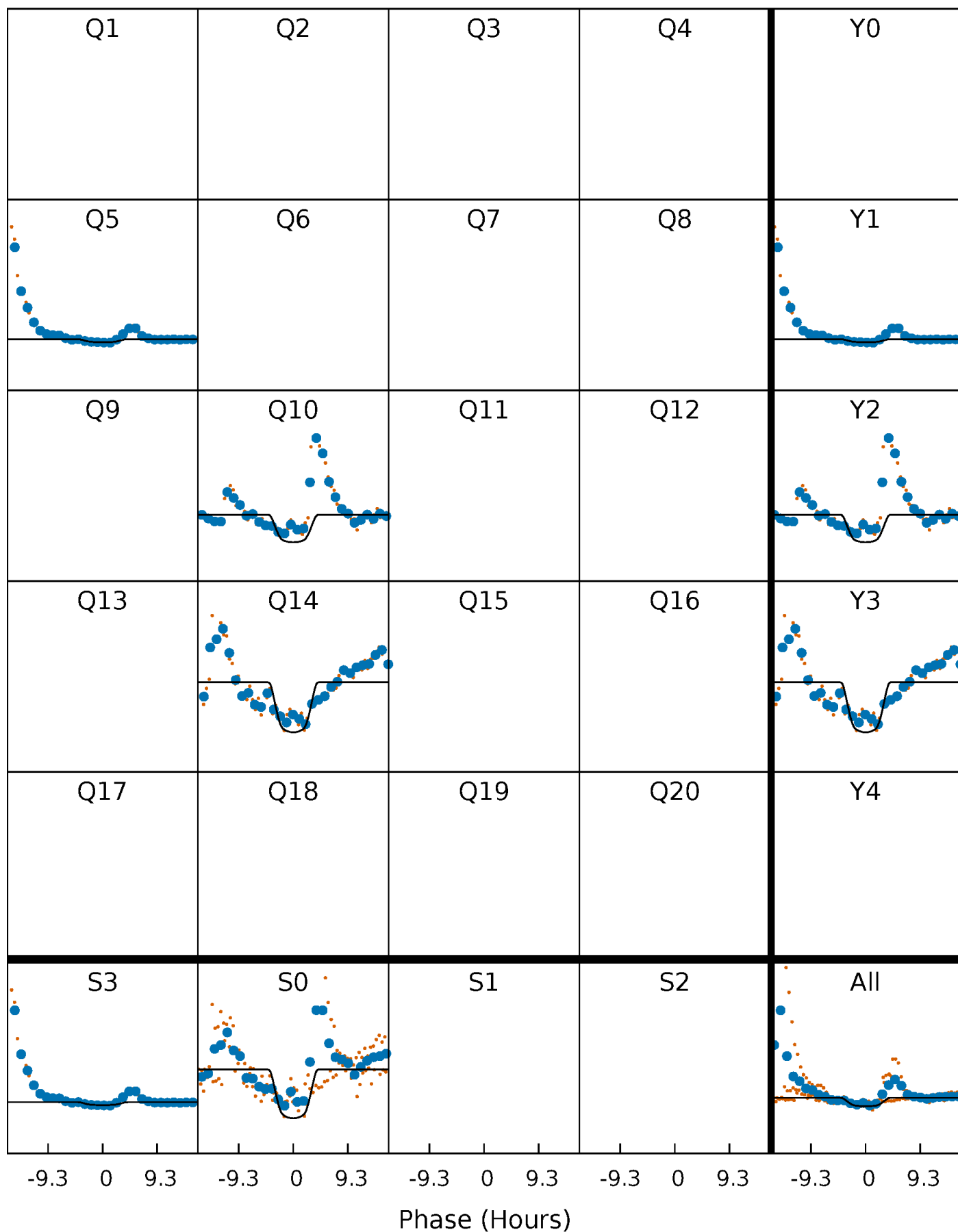
PDC Quarter-Phased Transit Curves

TCE 008678457-03 $P=415.359500$ Days $T_0=533.740505$ (BKJD)



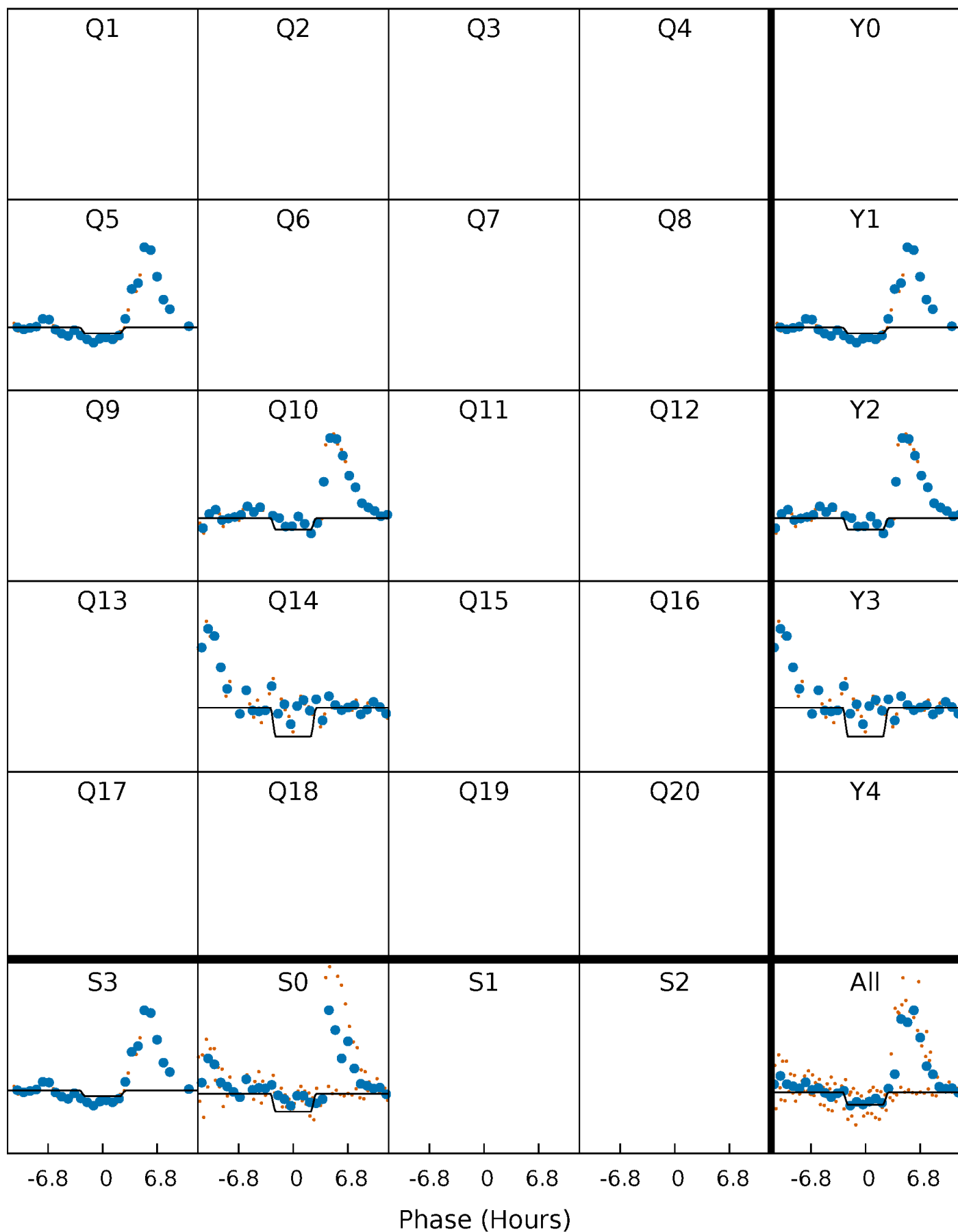
DV Quarter-Phased Transit Curves

TCE 008678457-03 P=415.359500 Days $T_0=533.740505$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

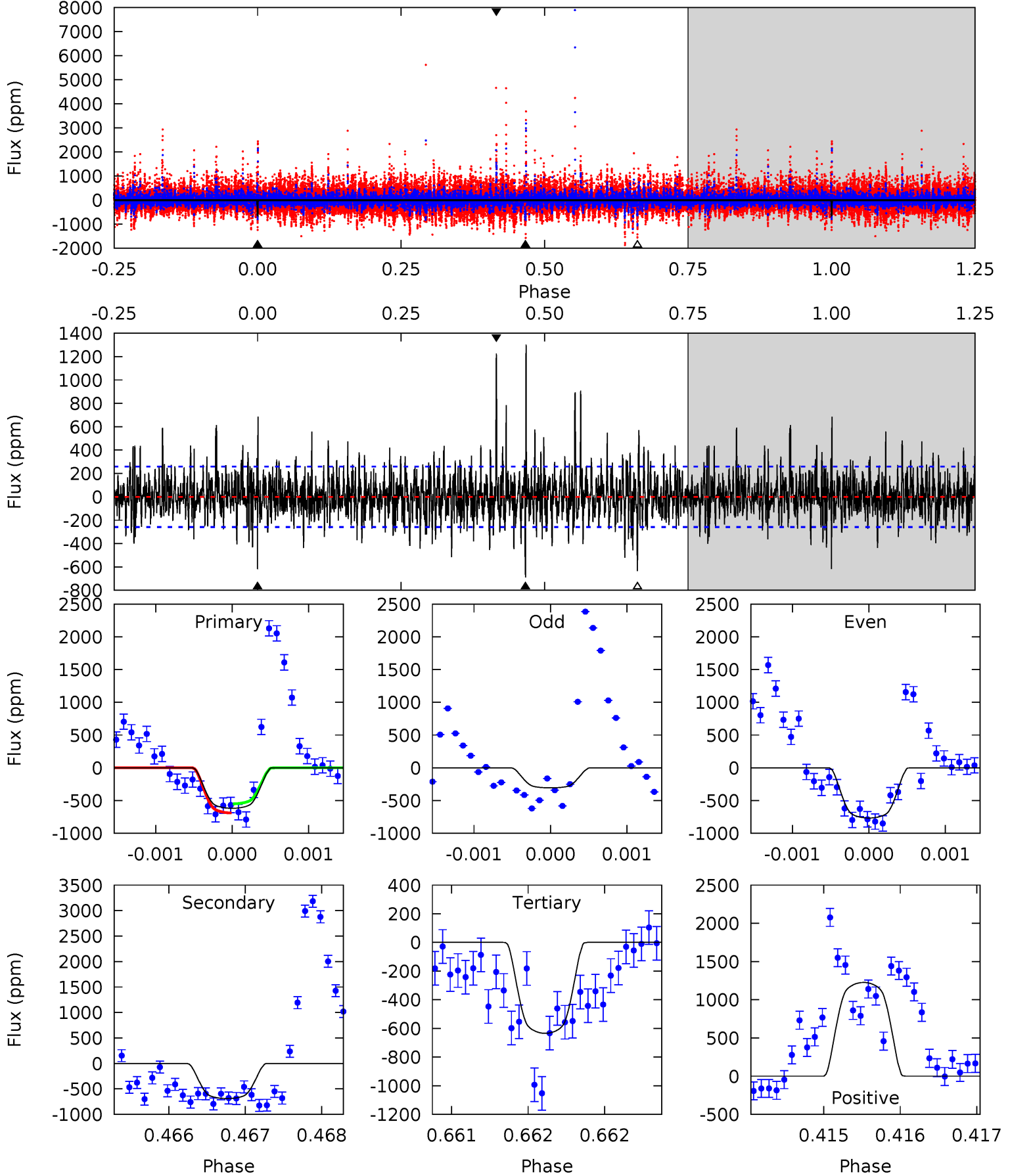
TCE 008678457-03 $P=415.339352$ Days $T_0=533.717869$ (BKJD)



DV Model-Shift Uniqueness Test

008678457-03, P = 415.359500 Days, E = 118.381005 Days

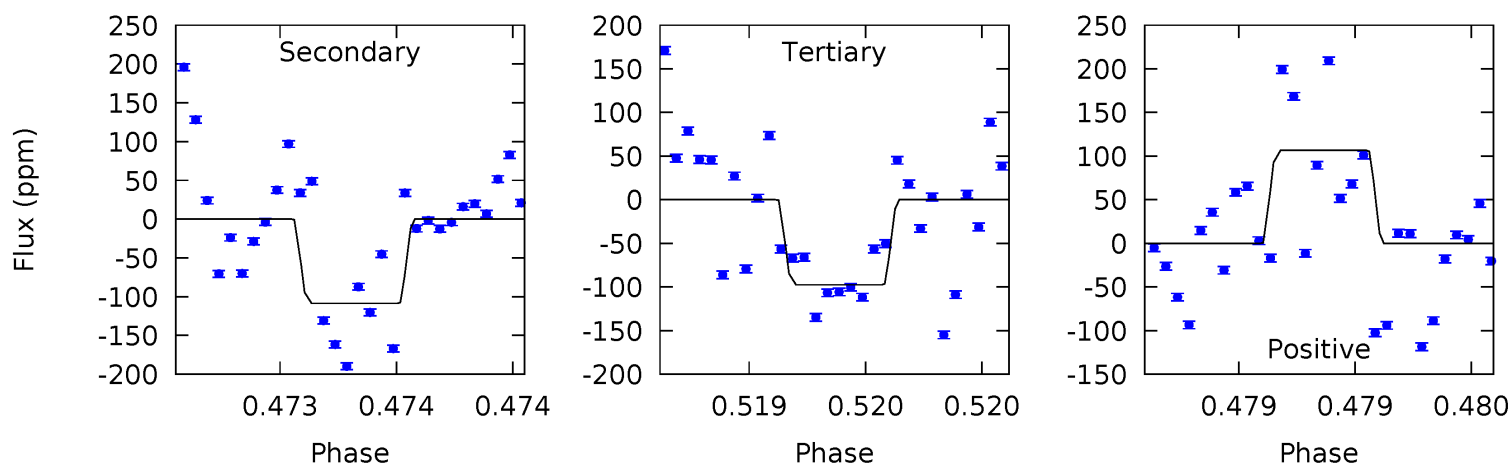
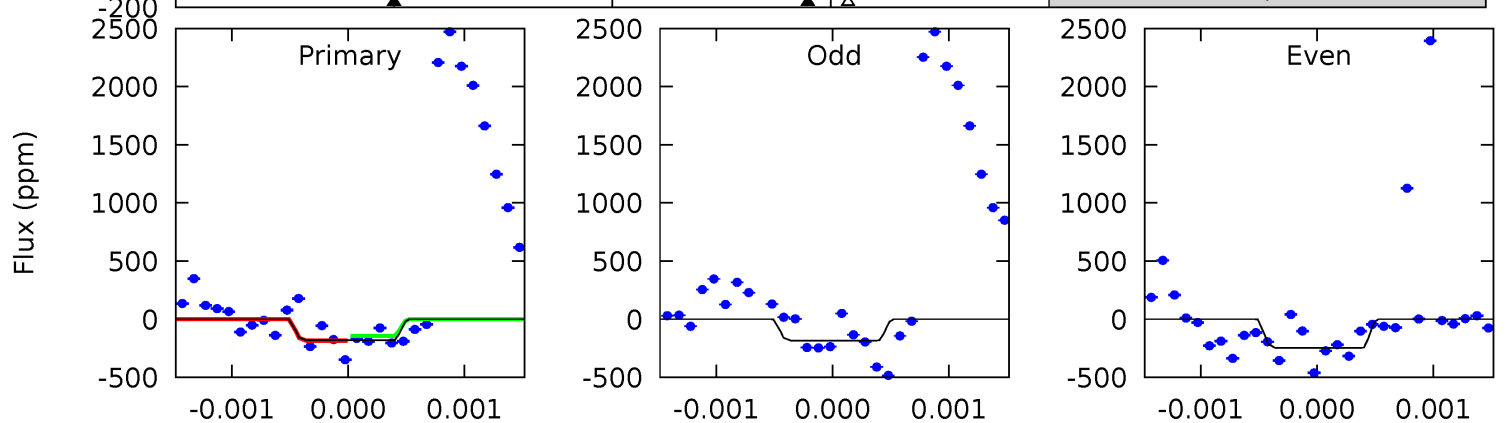
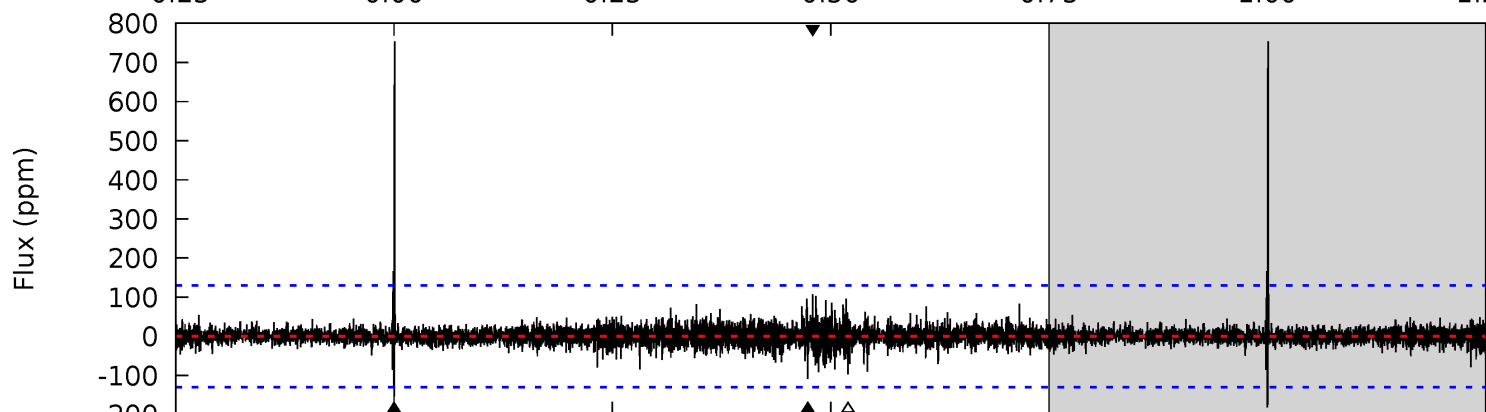
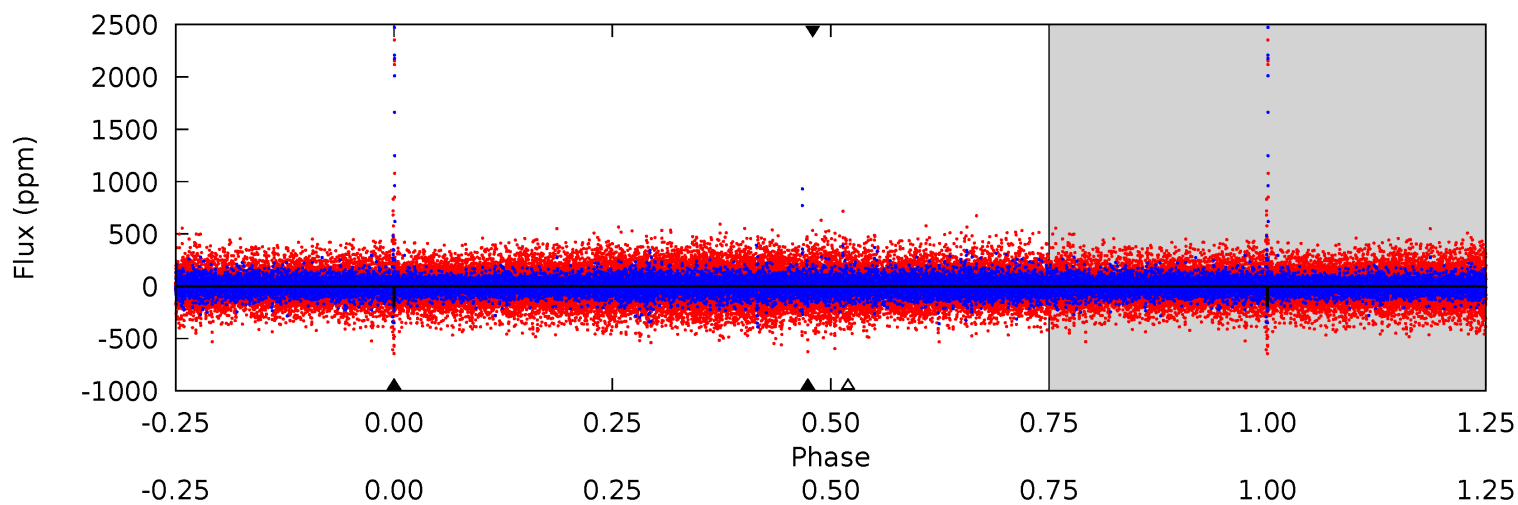
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.2	14.6	13.5	26.1	5.49	3.35	3.22	-0.33	-12.9	1.16	-11.4	2.04	0.86	0.65	1.50



Alt Model-Shift Uniqueness Test

008678457-03, P = 415.339352 Days, E = 118.378517 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.74	4.64	4.16	4.55	5.56	3.45	0.82	3.59	3.20	0.48	0.09	1.22	1.49	0.81	0.85



Stellar Parameters For KIC 008678457

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5518^{+197}_{-164}	$3.752^{+0.915}_{-0.366}$	$-0.980^{+0.350}_{-0.250}$	$1.956^{+1.304}_{-1.304}$	$0.787^{+0.207}_{-0.095}$	$0.148^{+2.987}_{-0.104}$
	+4%/-3%	+24%/-10%	+36%/-26%	+67%/-67%	+26%/-12%	+2016%/-70%
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 008678457-03 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-688 ± 47	$6.51^{+3.79}_{-2.96}$	459^{+81}_{-93}	4988^{+911}_{-544}	9384^{+21924}_{-5598}
Alt.	-109 ± 23	$3.46^{+2.83}_{-2.13}$	461^{+81}_{-95}	4328^{+1686}_{-640}	5105^{+29668}_{-3586}

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

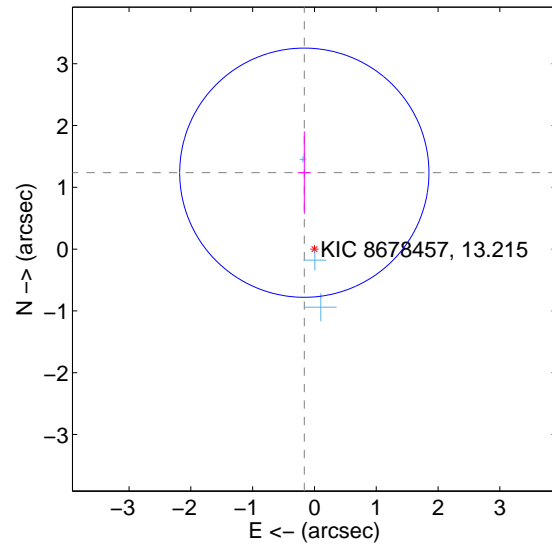
Supplemental centroid analysis for 008678457-03. Kepler magnitude: 13.21. Transit SNR 8.60

There are 3 quarters with good PRF difference image offsets

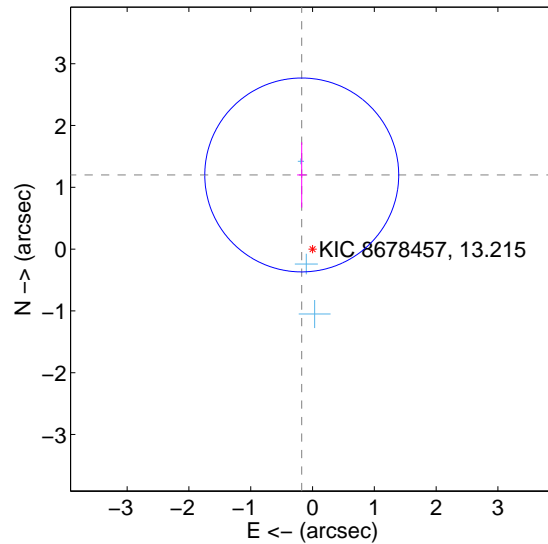
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.247 ± 0.672	1.86	0.164 ± 0.104	1.236 ± 0.667
PRF-fit source offset from KIC position	1.212 ± 0.523	2.32	0.174 ± 0.075	1.200 ± 0.528
photometric centroid source offset	0.50 ± 0.46	1.09	-0.50 ± 0.46	0.03 ± 0.44

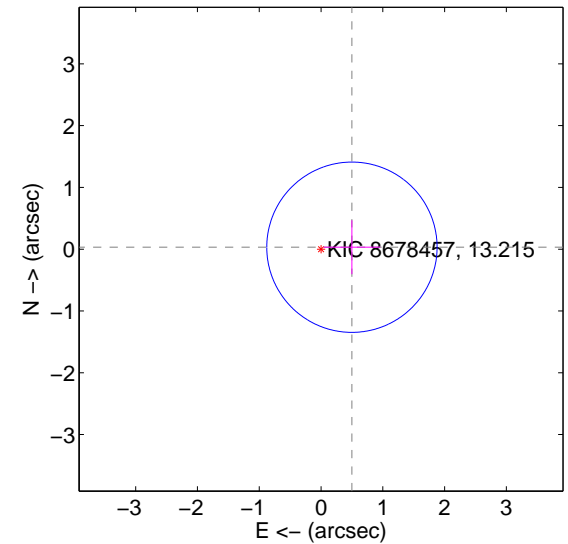
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

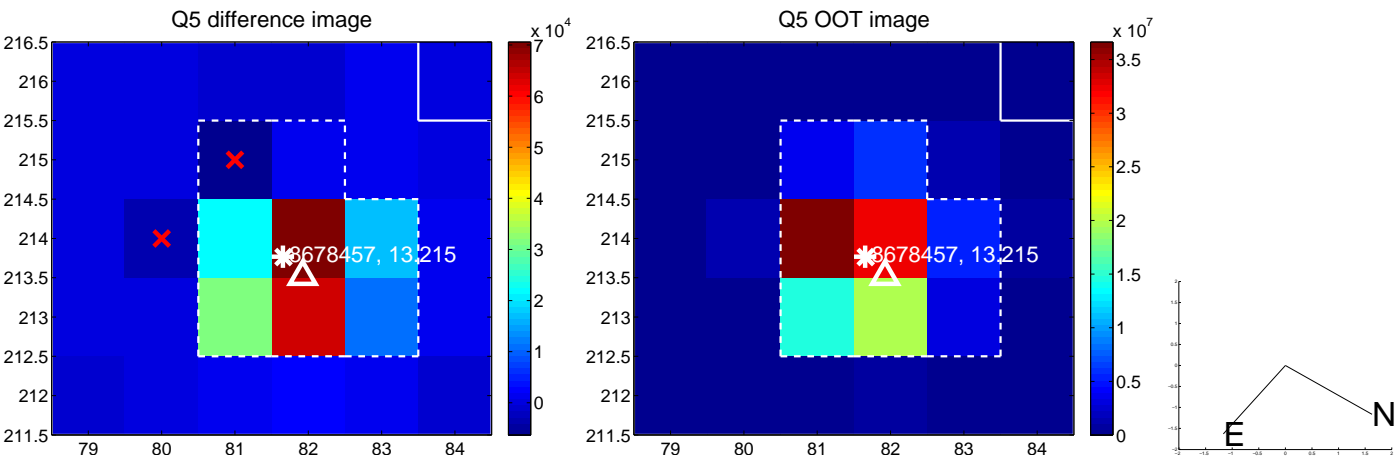


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

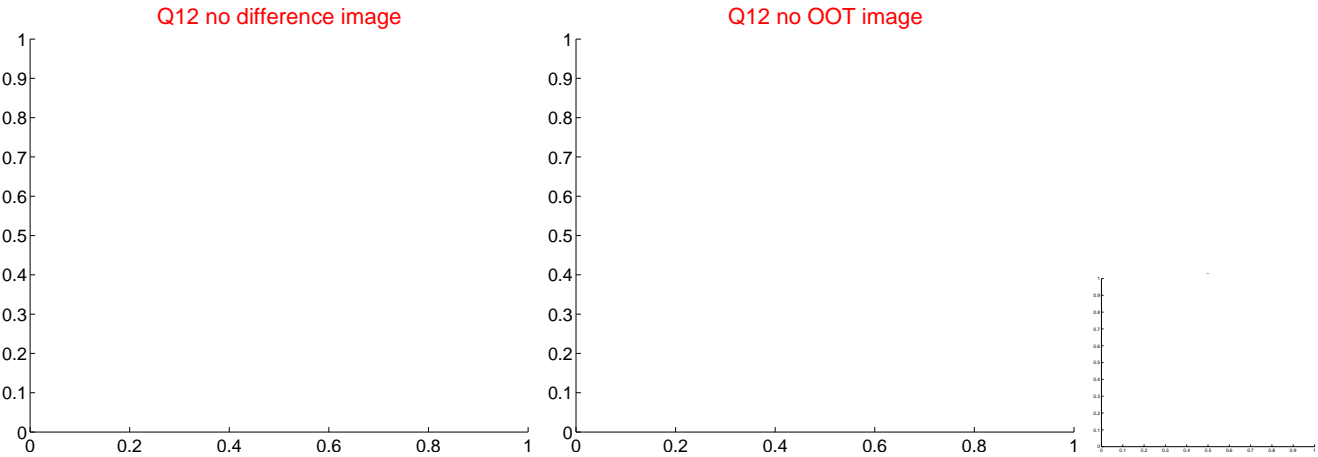
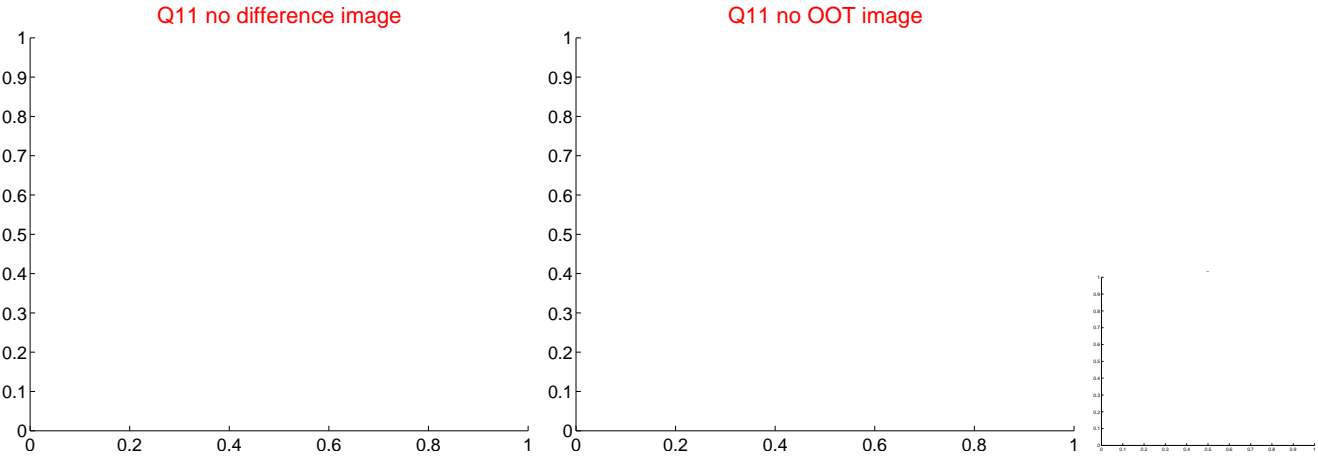
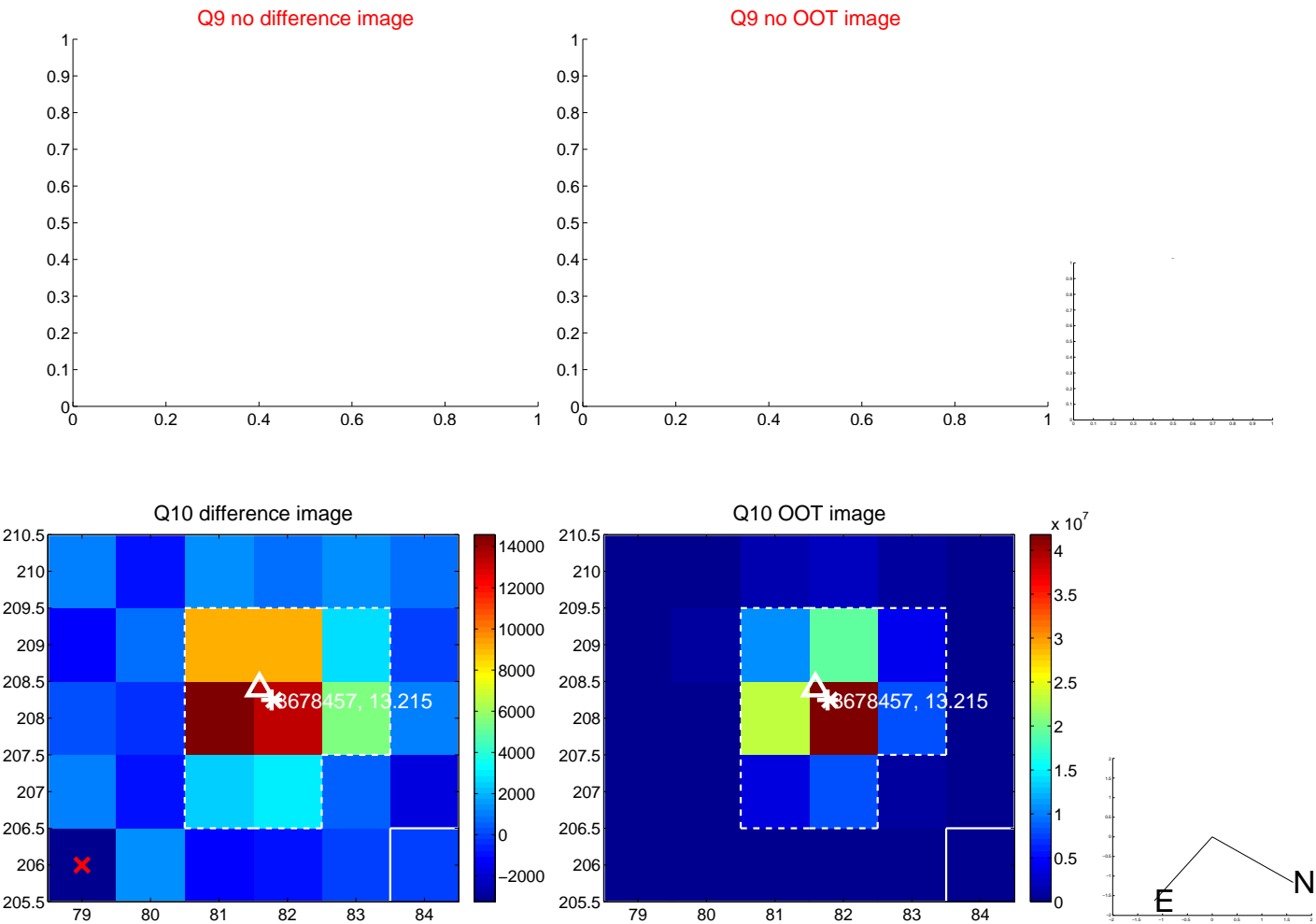
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



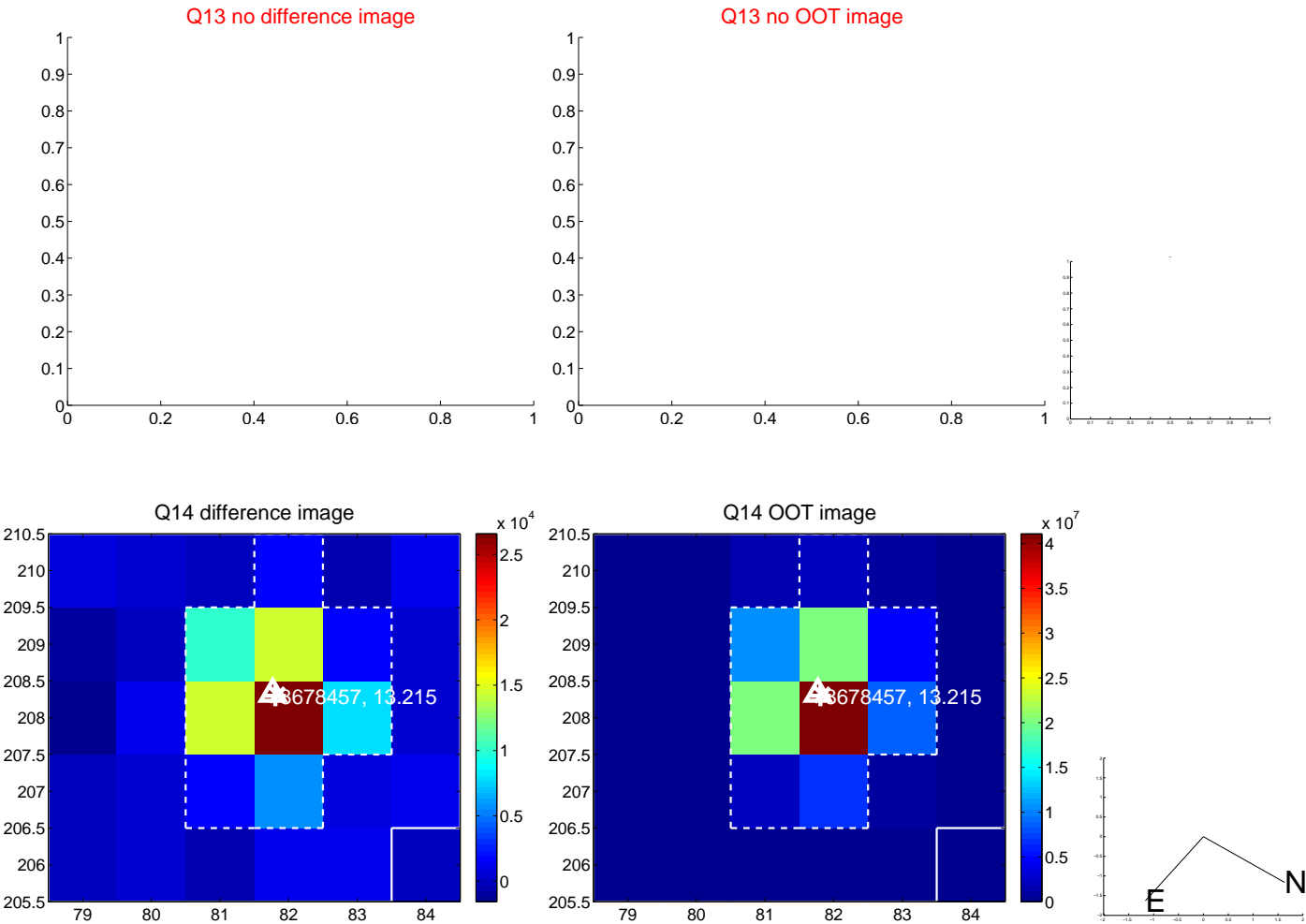
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



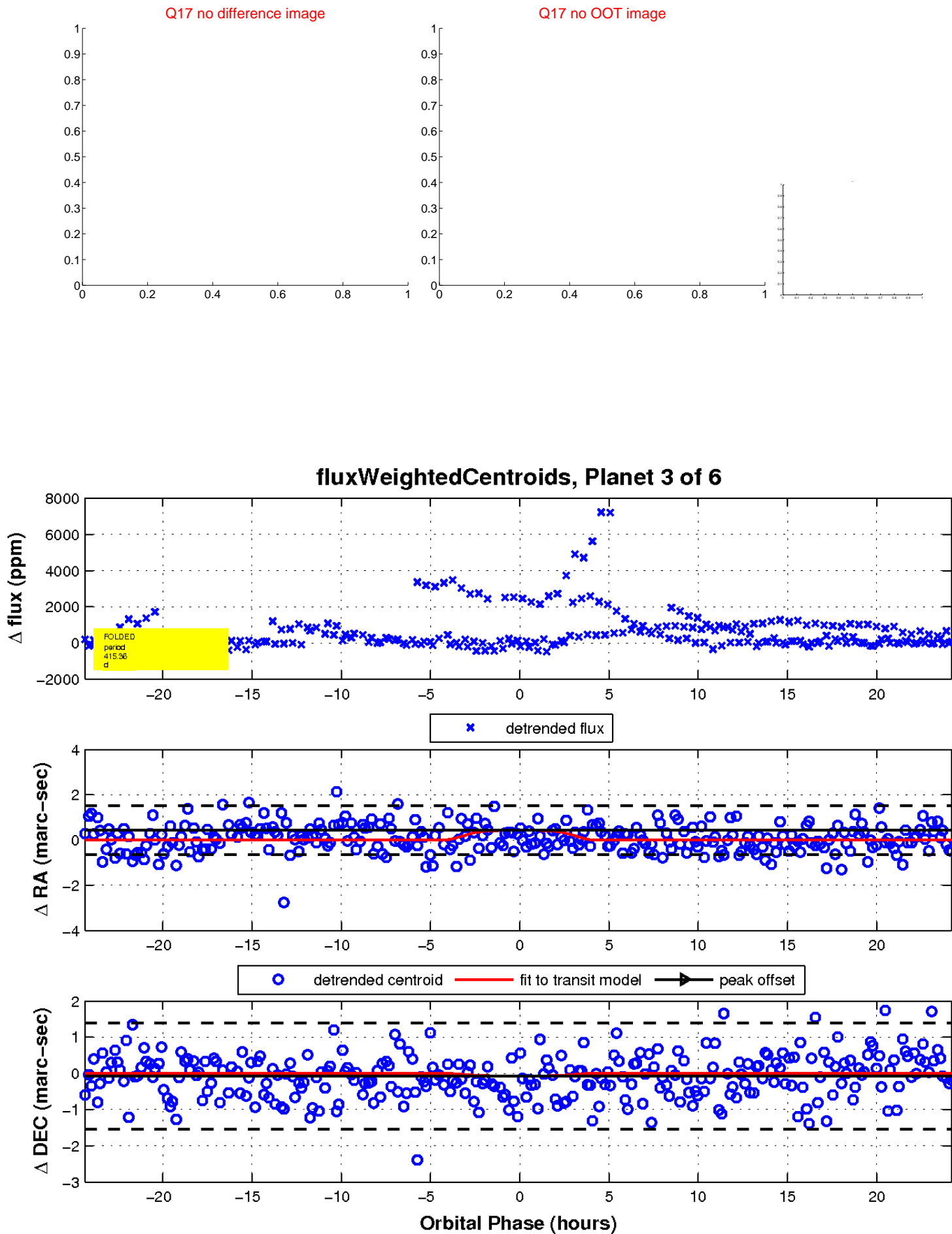
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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

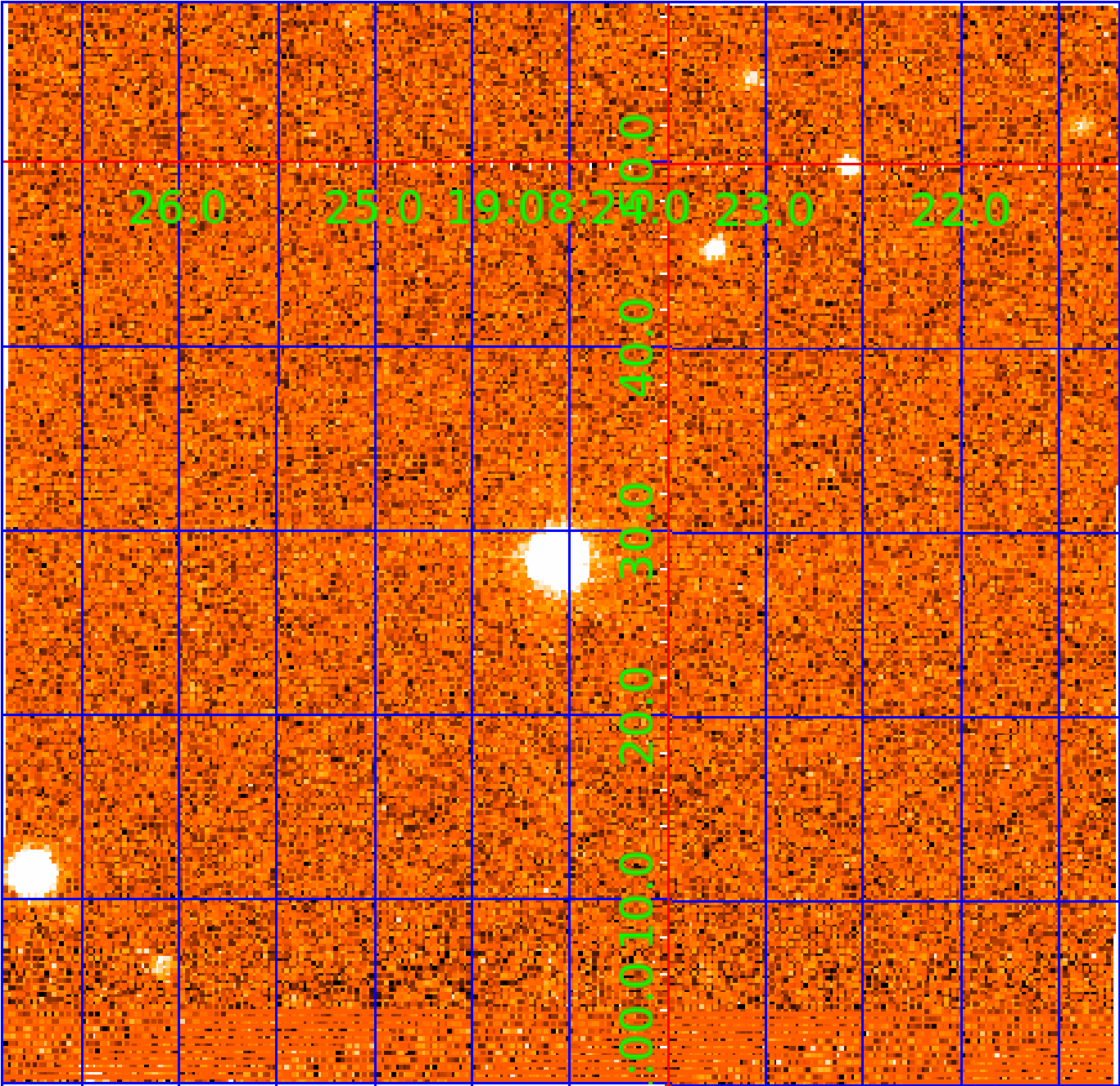


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008678457

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})
008678457-01	OBS	No	534.017411	140.744148	793.1	4.363	18.4	6.9	1.96	5518	5.58	2.24
008678457-02	OBS	No	416.013045	194.634956	782.6	3.527	18.0	10.3	1.96	5518	5.67	3.13
008678457-03	OBS	No	415.359500	533.740505	853.6	8.122	20.3	8.6	1.96	5518	7.14	3.14
008678457-04	OBS	No	398.102177	465.899115	667.1	7.454	17.2	7.2	1.96	5518	6.11	3.32
008678457-05	OBS	No	629.542217	312.369397	637.0	4.204	14.9	6.7	1.96	5518	5.63	1.80
008678457-06	OBS	No	566.799710	329.161414	550.4	5.000	16.3	-1.0	1.96	5518	4.58	2.07

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008678457-01	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
008678457-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_POS_DV
008678457-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
008678457-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008678457-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
008678457-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS

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

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

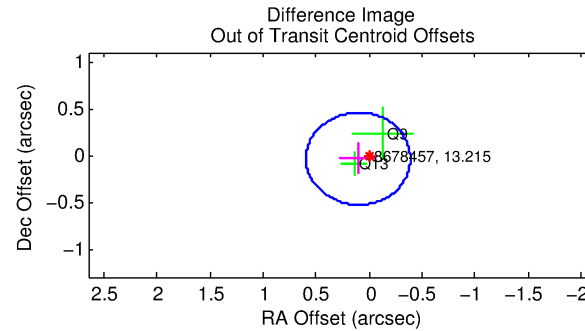
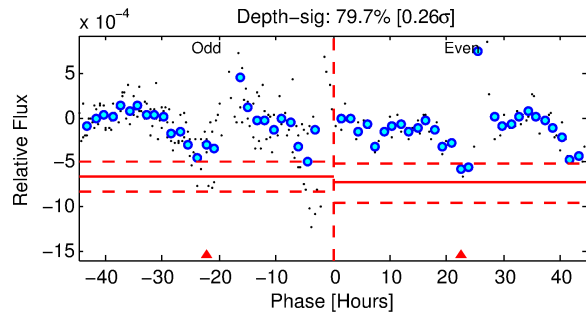
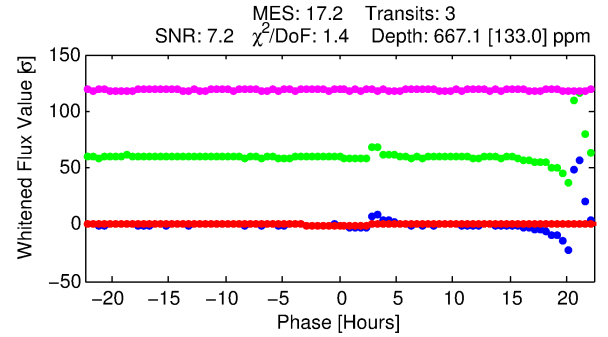
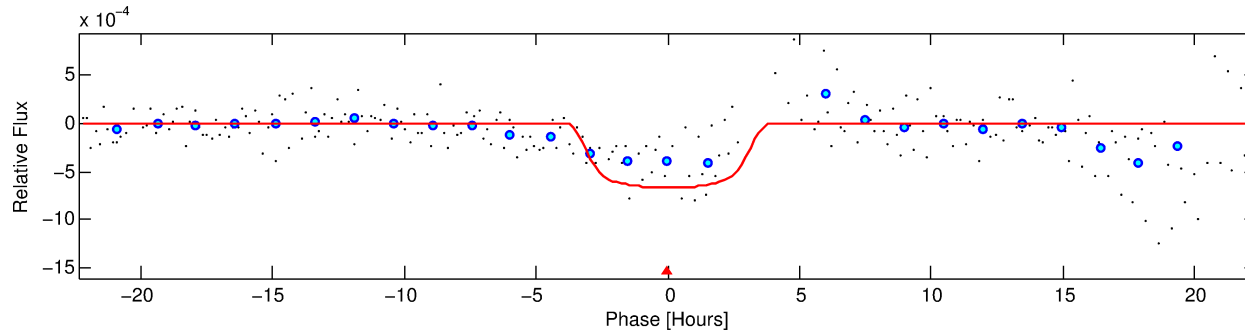
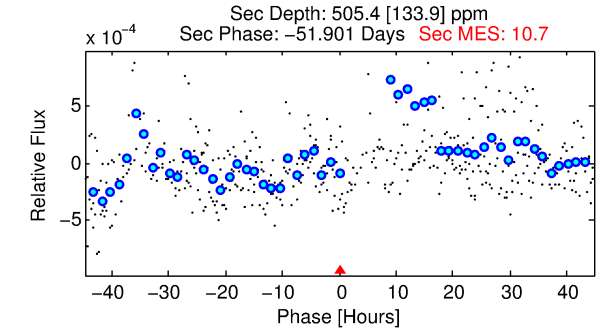
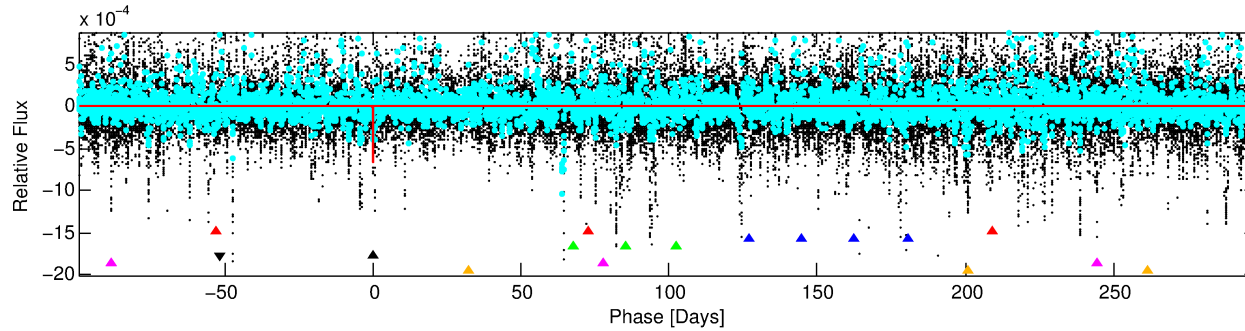
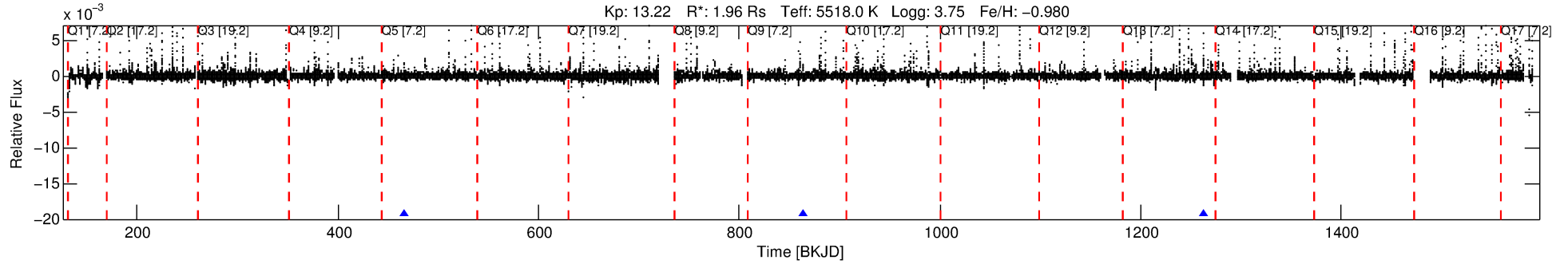
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008678457-04

No Significant Match Found

DV One-Page Summary

KIC: 8678457 Candidate: 4 of 6 Period: 398.102 d



DV Fit Results:

Period = 398.10218 [0.00840] d
Epoch = 465.8991 [0.0108] BKJD
Rp/R* = 0.0286 [0.0035]
a/R* = 184.33 [48.31]
b = 0.92 [0.04]
Seff = 3.32 [4.91]
Teq = 344 [127] K
Rp = 6.11 [4.14] Re
a = 0.9786 [0.8133] AU
Ag = 7133.23 [10819.31] [0.66 σ]
Teffp = 4890 [474] K [9.26 σ]

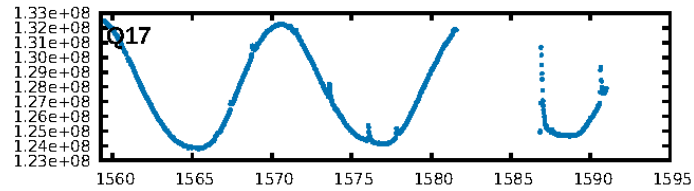
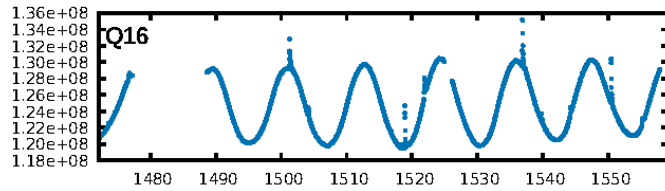
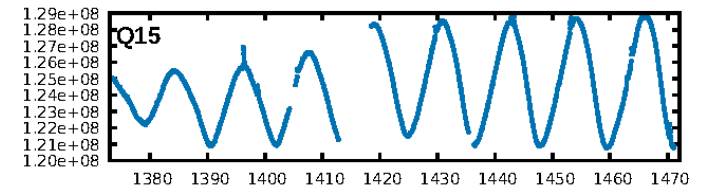
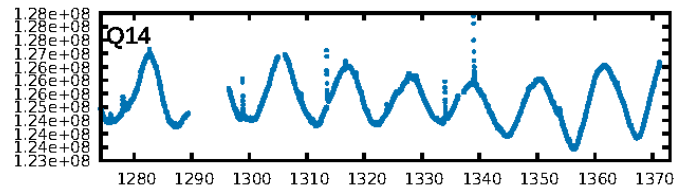
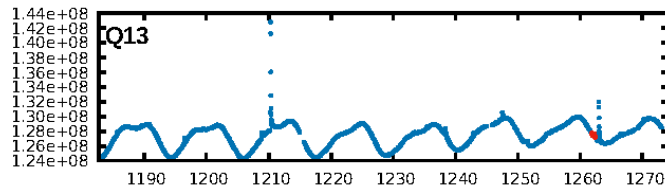
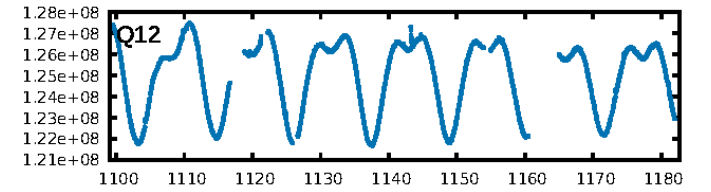
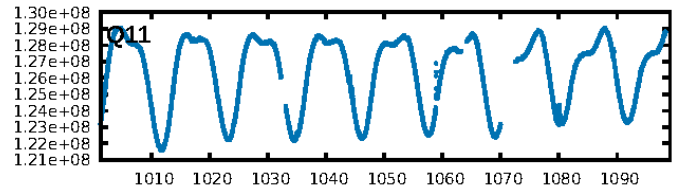
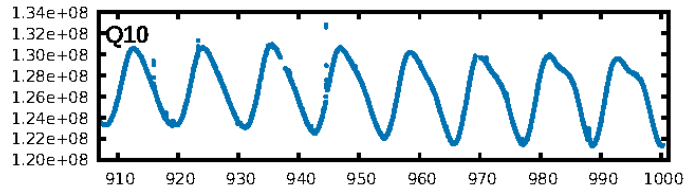
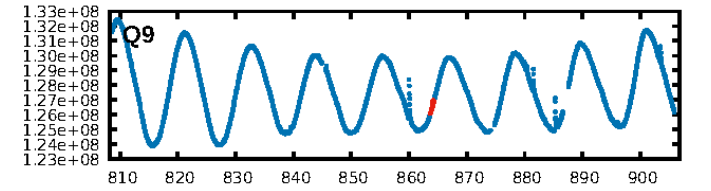
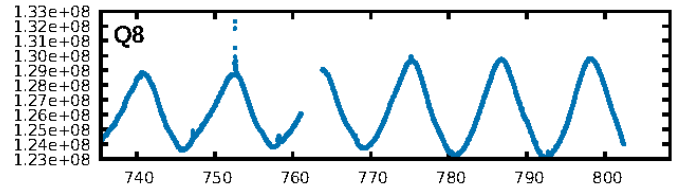
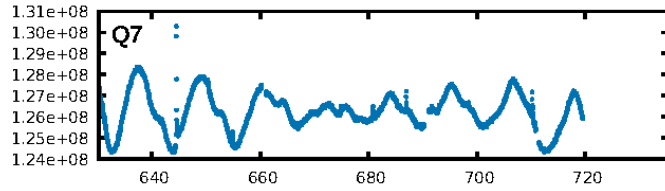
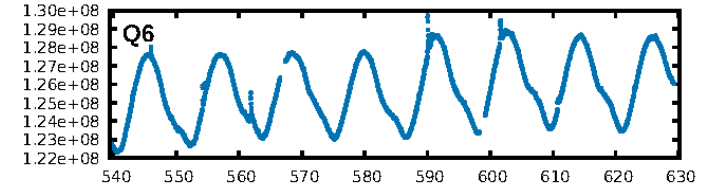
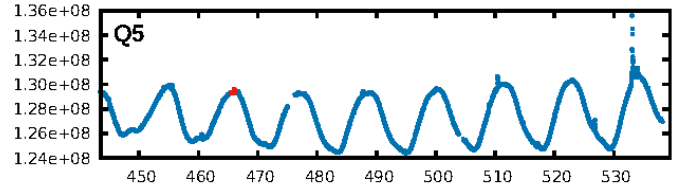
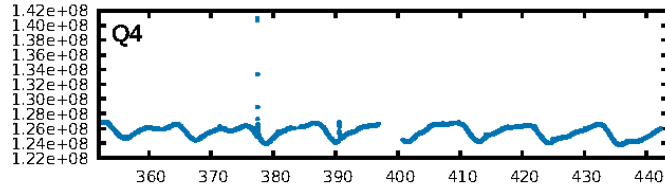
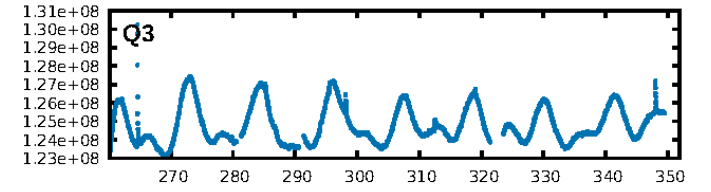
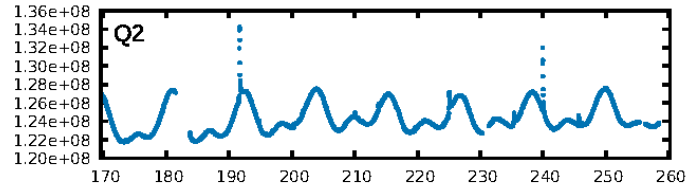
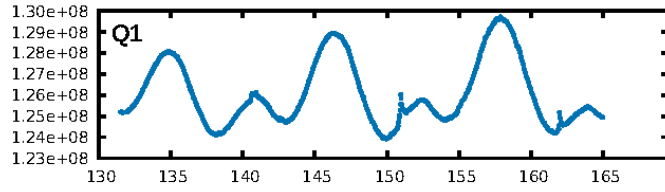
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [37.57 σ]
ModelChiSquare2-sig: 16.1%
ModelChiSquareGof-sig: 43.6%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -1.657
Centroid-sig: 36.1%
Centroid-so: 0.454 arcsec [1.08 σ]
OotOffset-rm: 0.110 arcsec [0.67 σ]
OotOffset-st: 0/0/0/2 [2]
KicOffset-rm: 0.122 arcsec [0.75 σ]
KicOffset-st: 0/0/0/2 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [3/3]

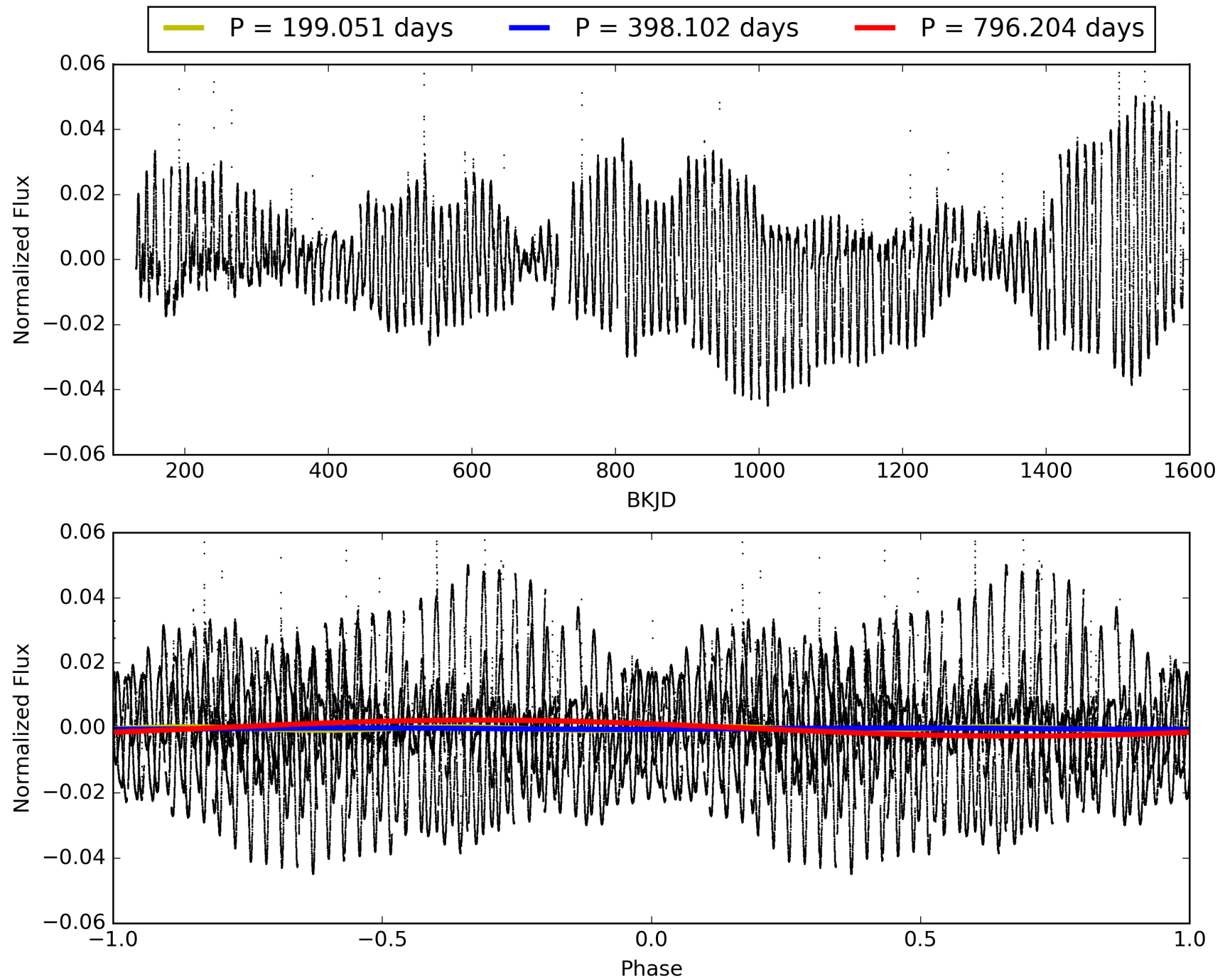
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:20:23 Z

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

TCE 008678457-04, PDC Light Curves

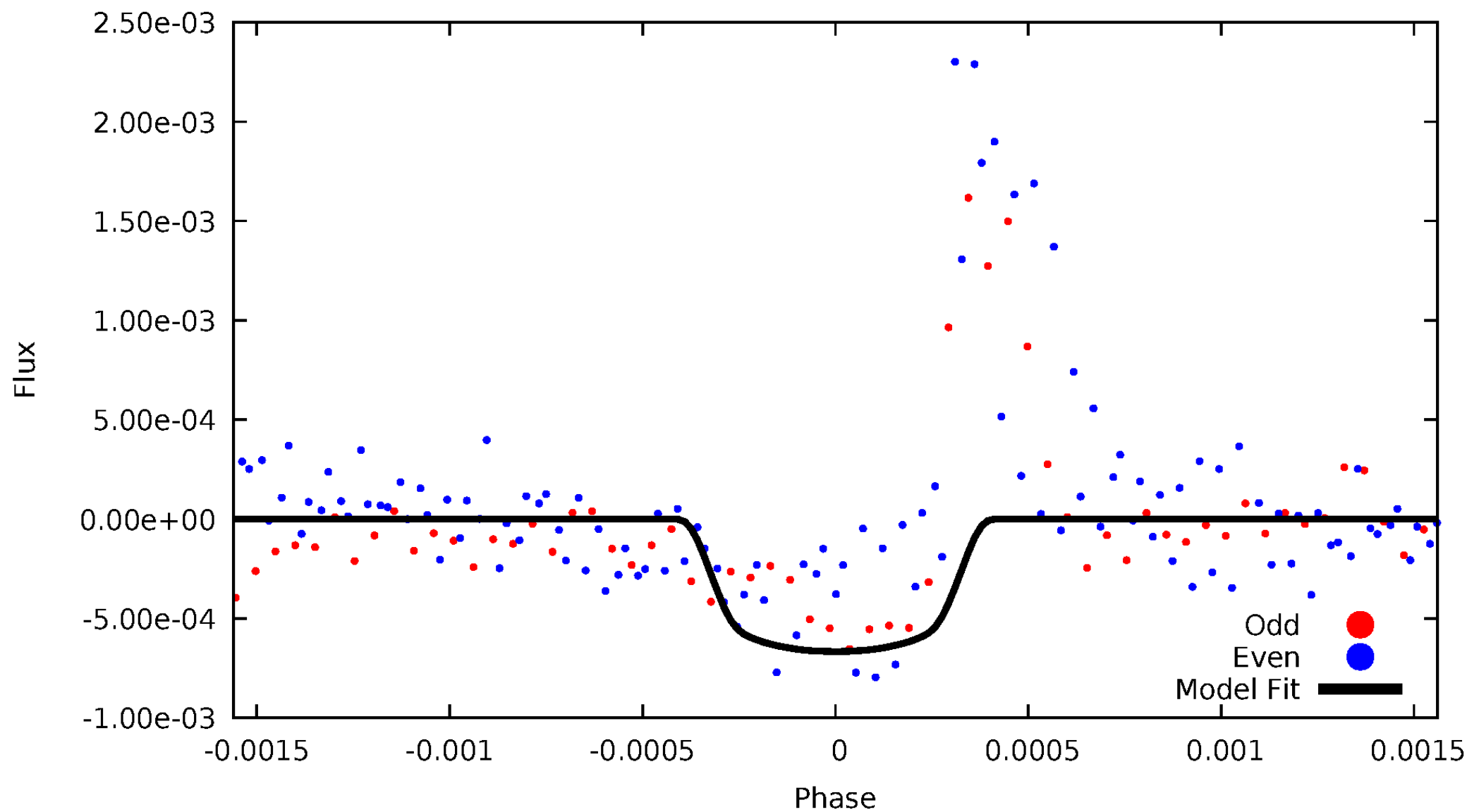


TCE 008678457-04



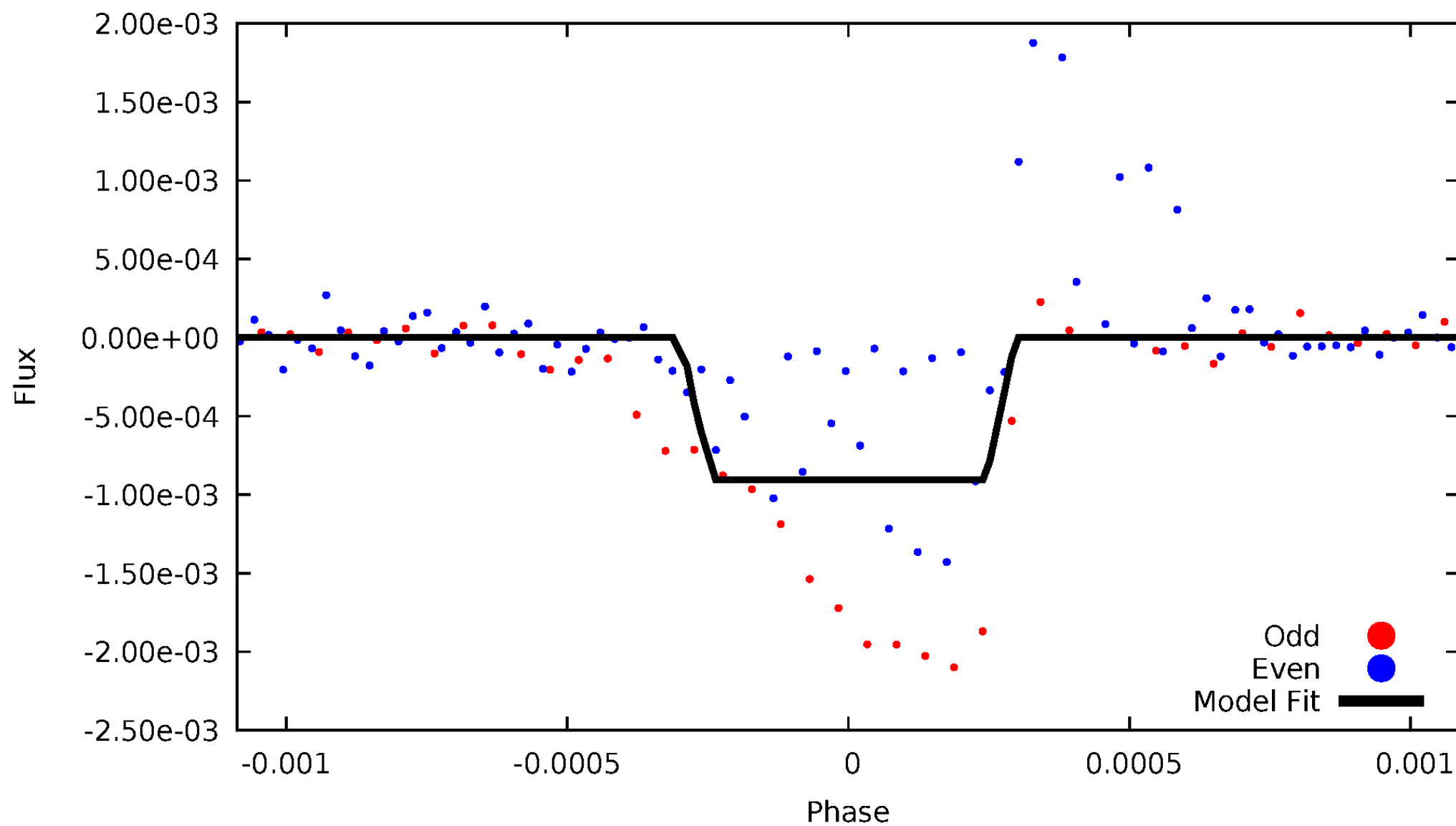
DV Odd/Even

TCE 008678457-04



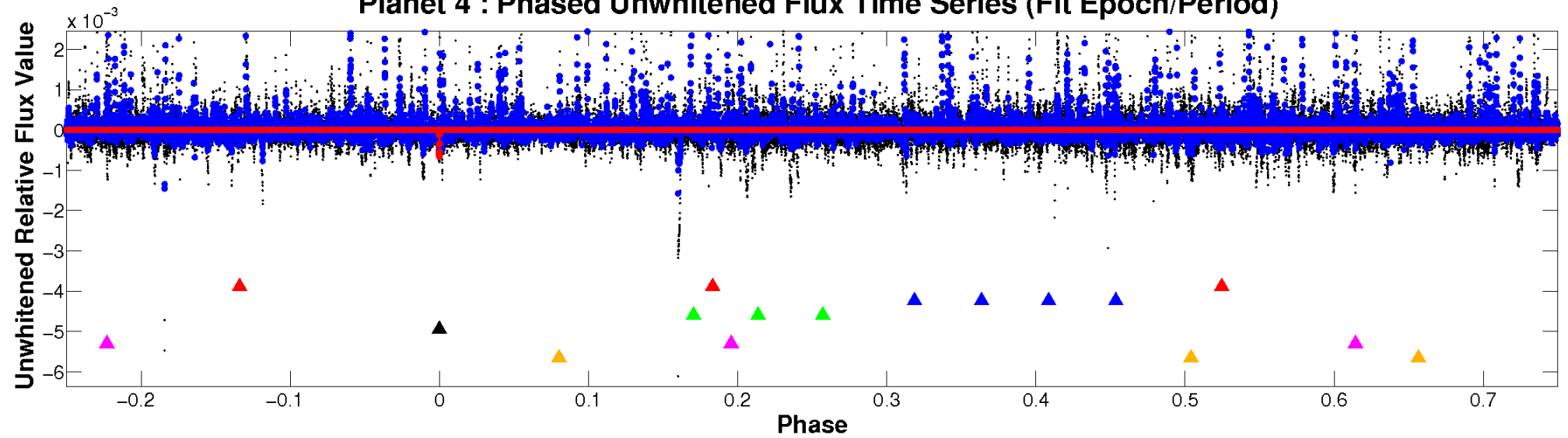
ALT Odd/Even

TCE 008678457-04

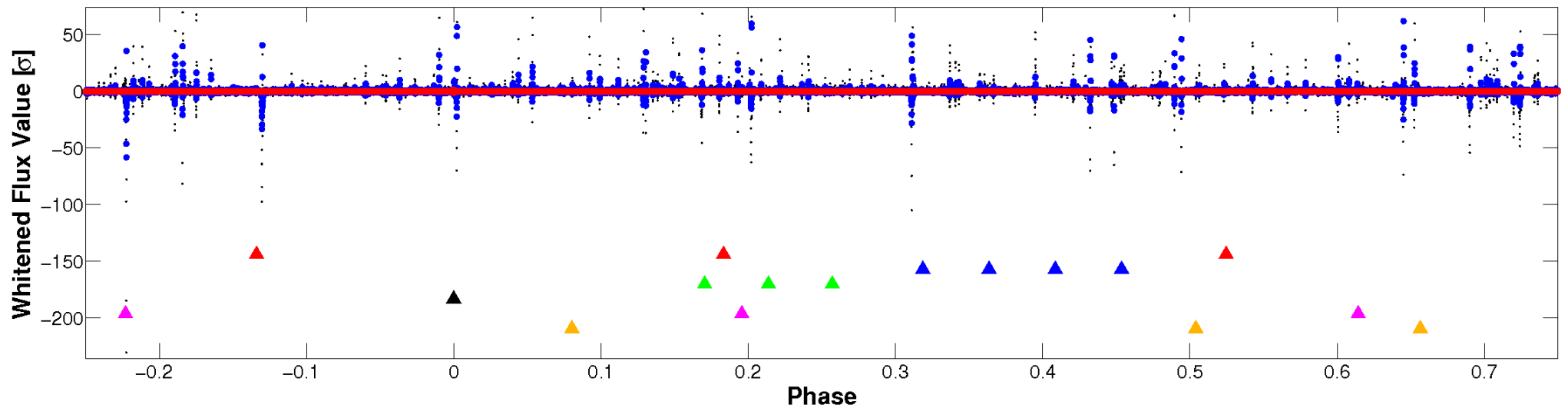


Non-Whitened Vs. Whitened Light Curve

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

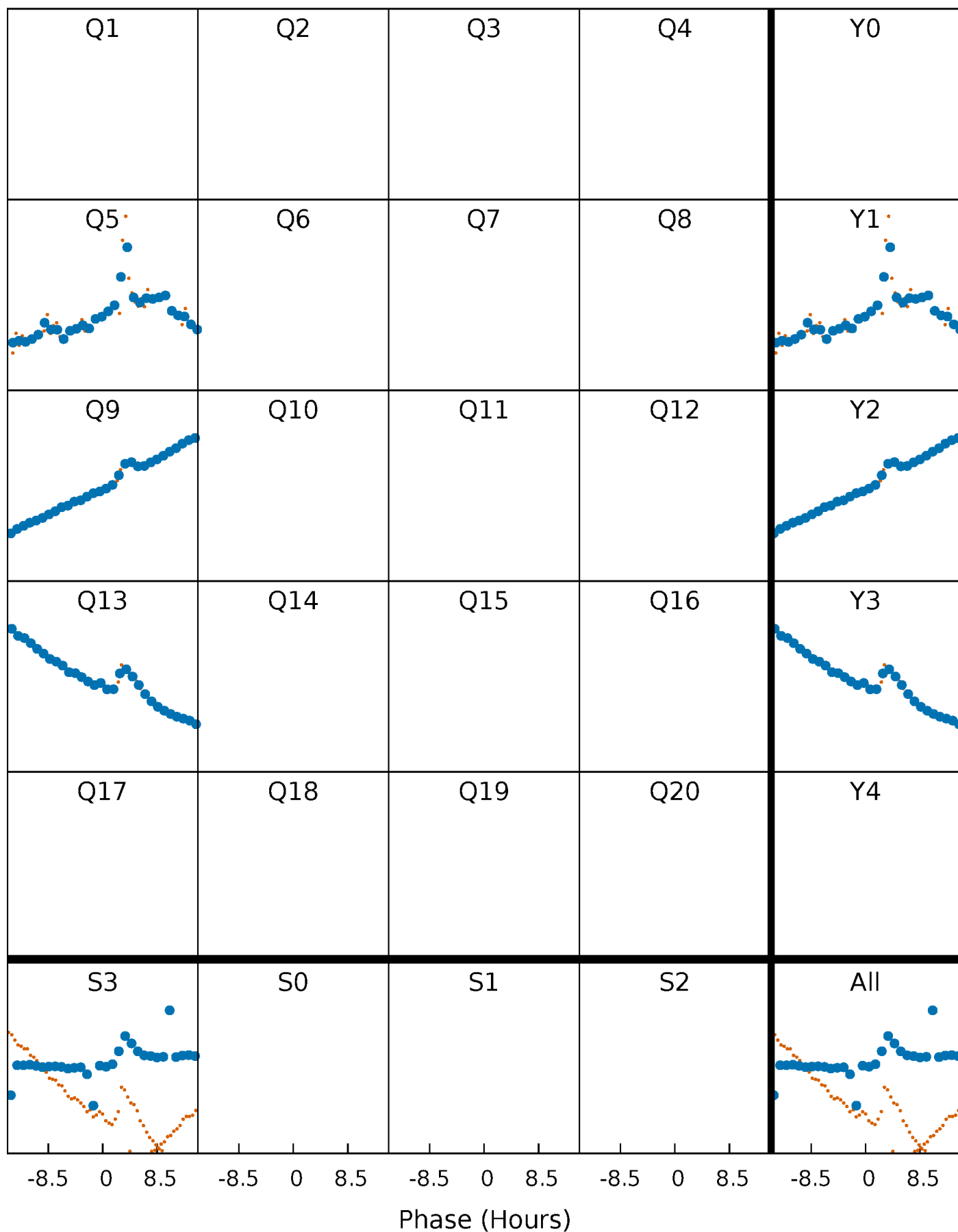


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



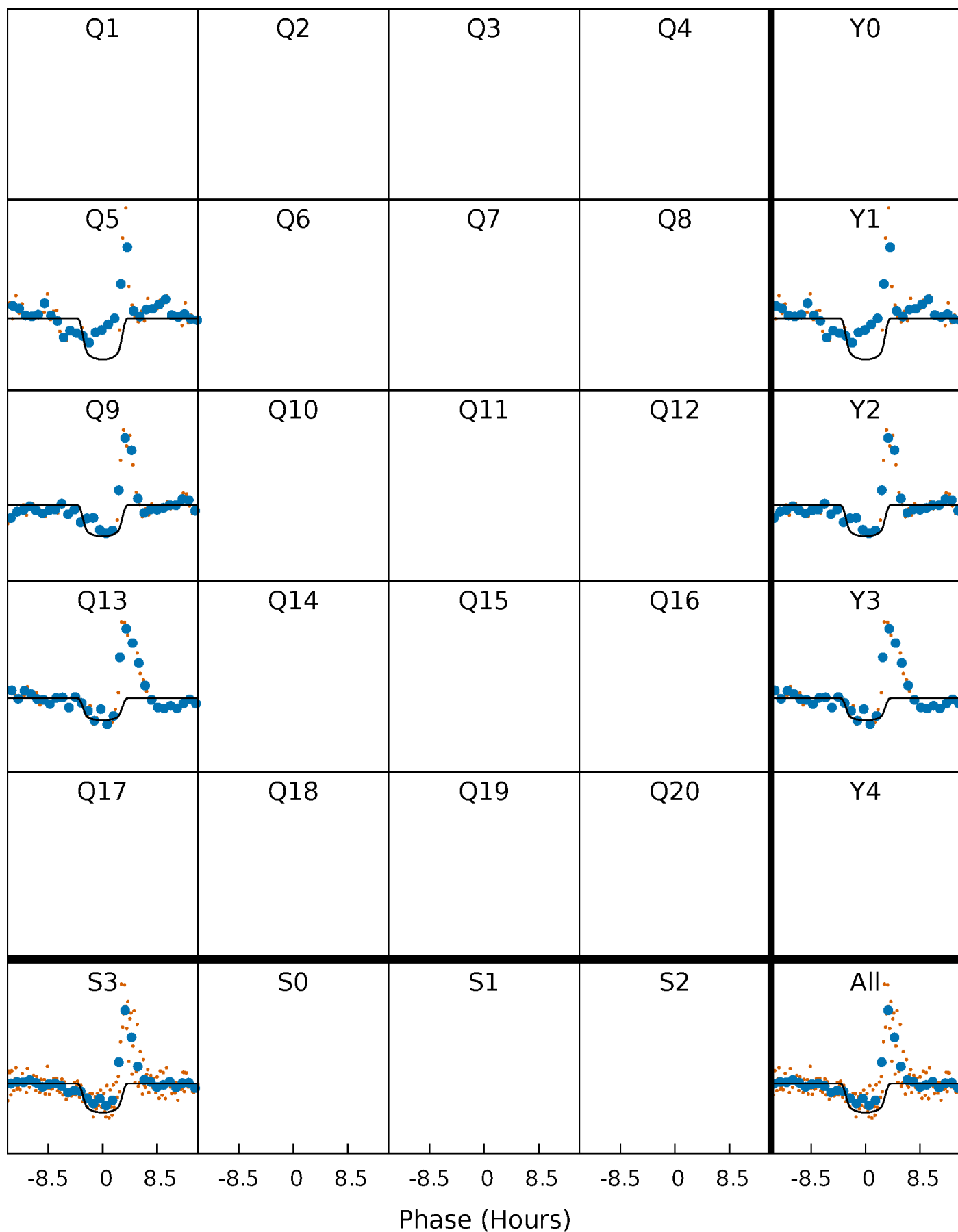
PDC Quarter-Phased Transit Curves

TCE 008678457-04 $P=398.102177$ Days $T_0=465.899114$ (BKJD)



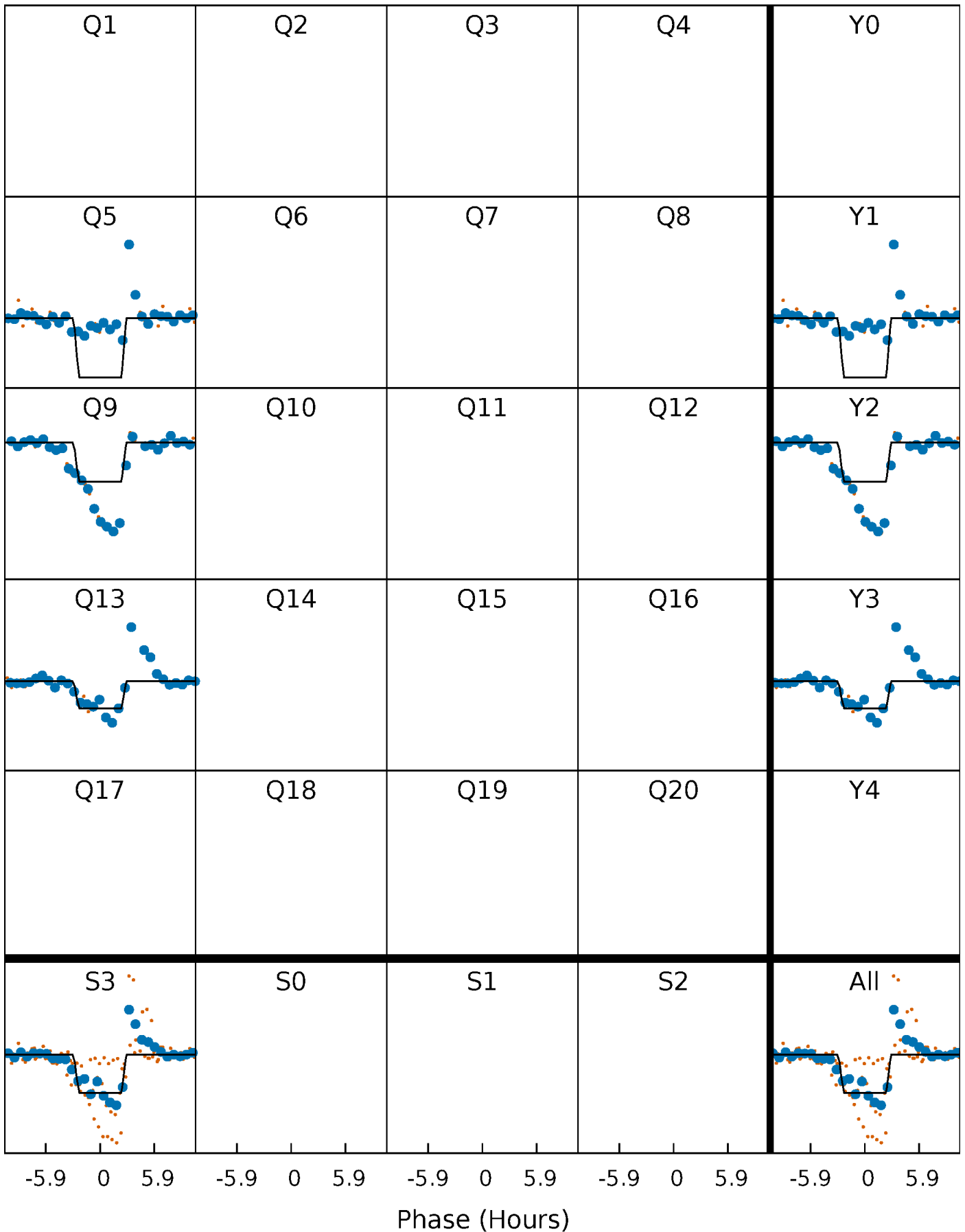
DV Quarter-Phased Transit Curves

TCE 008678457-04 $P=398.102177$ Days $T_0=465.899114$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

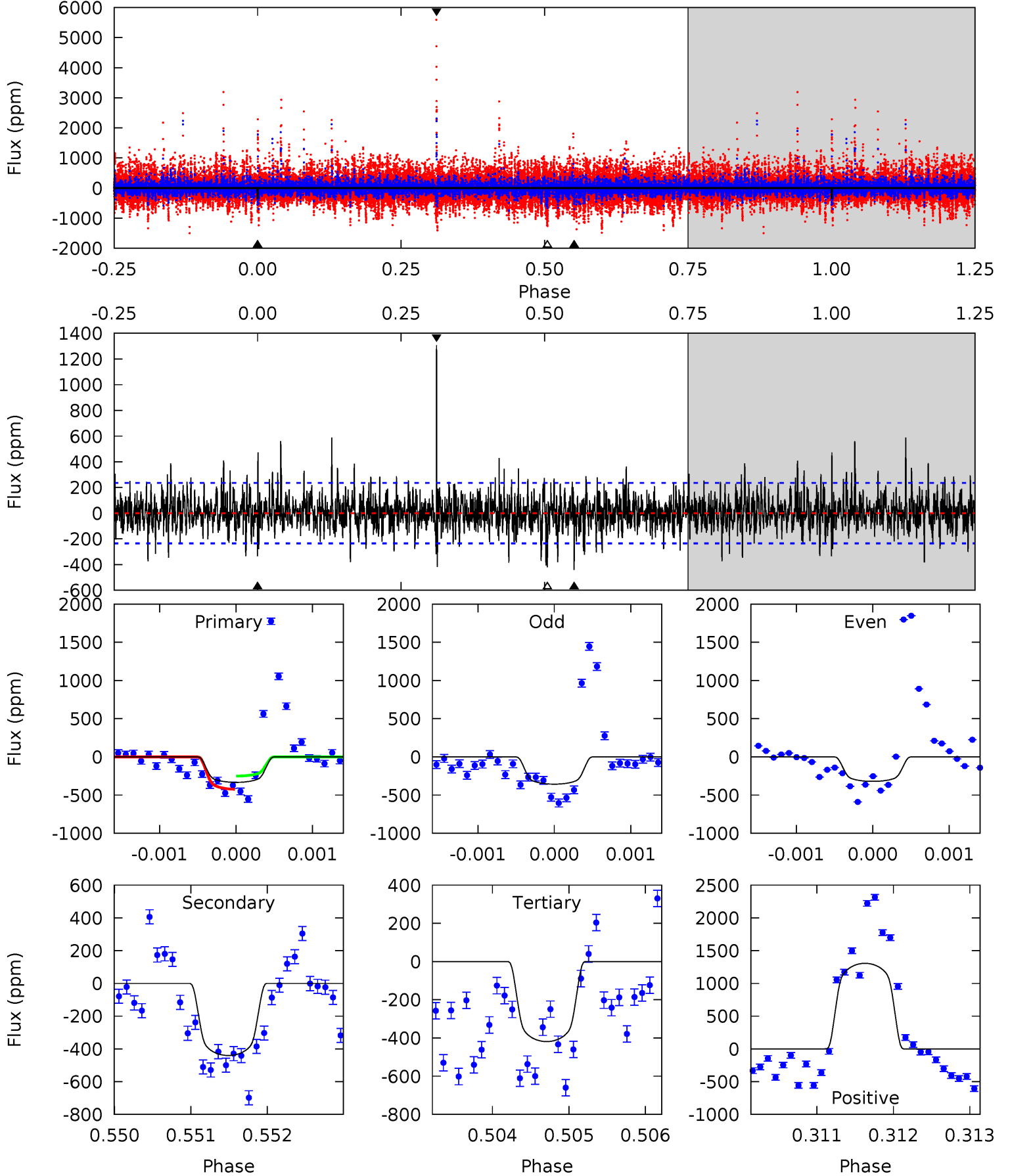
TCE 008678457-04 P=398.093427 Days $T_0=465.908939$ (BKJD)



DV Model-Shift Uniqueness Test

008678457-04, P = 398.102177 Days, E = 67.796937 Days

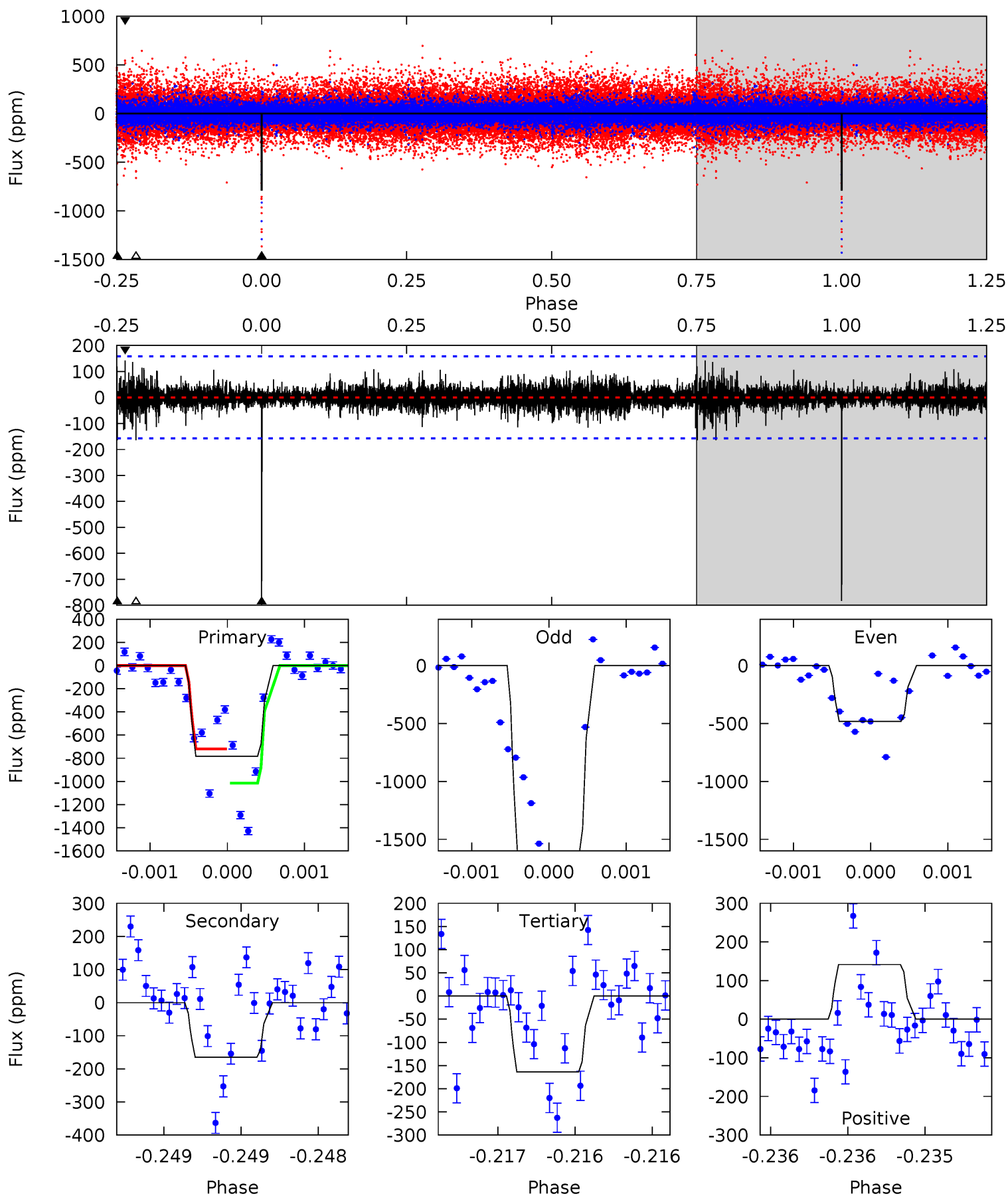
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.79	10.3	9.78	30.5	5.49	3.35	2.49	-1.99	-22.7	0.50	-20.2	0.21	0.81	0.75	2.05



Alt Model-Shift Uniqueness Test

008678457-04, P = 398.093427 Days, E = 67.815512 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
27.5	5.78	5.76	4.97	5.55	3.44	0.89	21.7	22.5	0.02	0.81	18.9	0.98	0.15	4.99



Stellar Parameters For KIC 008678457

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5518^{+197}_{-164}	$3.752^{+0.915}_{-0.366}$	$-0.980^{+0.350}_{-0.250}$	$1.956^{+1.304}_{-1.304}$	$0.787^{+0.207}_{-0.095}$	$0.148^{+2.987}_{-0.104}$
	+4%/-3%	+24%/-10%	+36%/-26%	+67%/-67%	+26%/-12%	+2016%/-70%
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 008678457-04 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-440 ± 43	$5.93^{+2.51}_{-2.17}$	476^{+78}_{-102}	4813^{+318}_{-259}	6726^{+10332}_{-3368}
Alt.	-165 ± 28	$6.06^{+2.56}_{-2.18}$	469^{+81}_{-95}	3930^{+239}_{-216}	2414^{+3339}_{-1237}

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

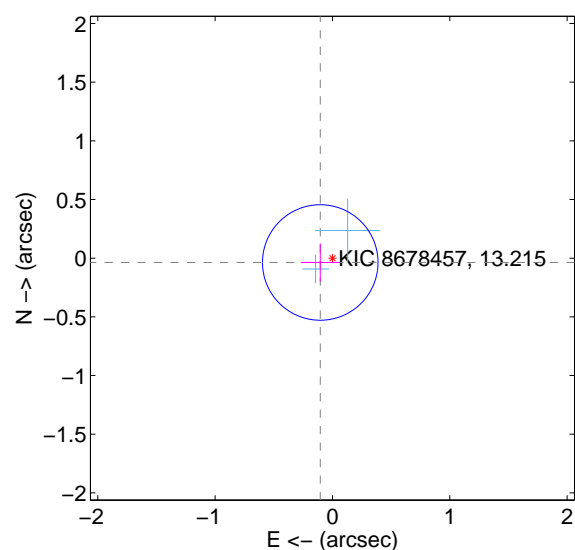
Supplemental centroid analysis for 008678457-04. Kepler magnitude: 13.21. Transit SNR 7.21

There are 2 quarters with good PRF difference image offsets

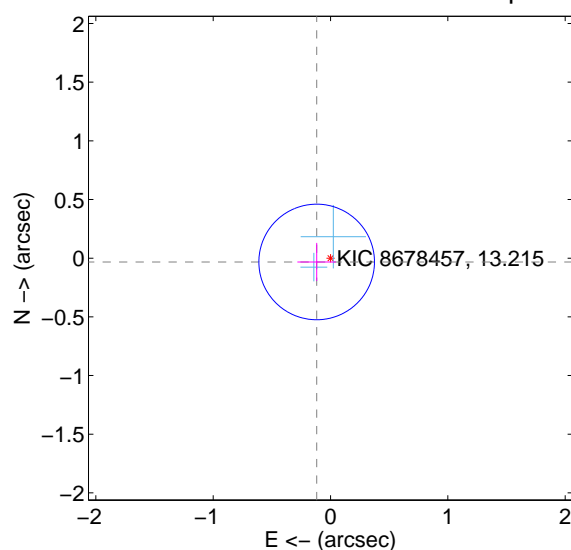
The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.110 ± 0.164	0.67	0.104 ± 0.164	-0.037 ± 0.162
PRF-fit source offset from KIC position	0.122 ± 0.164	0.75	0.118 ± 0.164	-0.032 ± 0.162
photometric centroid source offset	0.45 ± 0.42	1.08	-0.45 ± 0.42	-0.02 ± 0.47

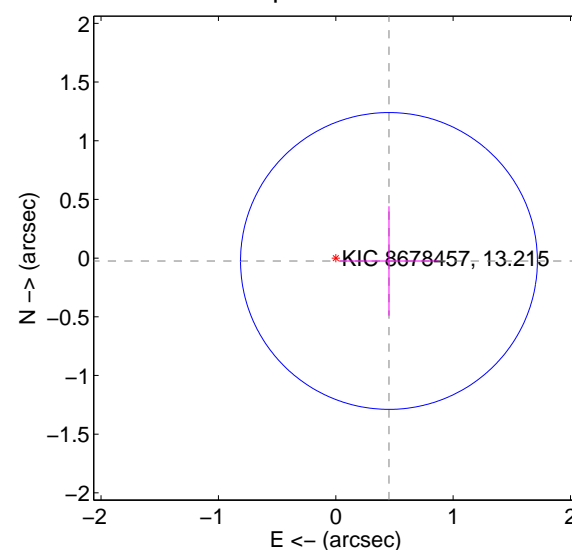
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

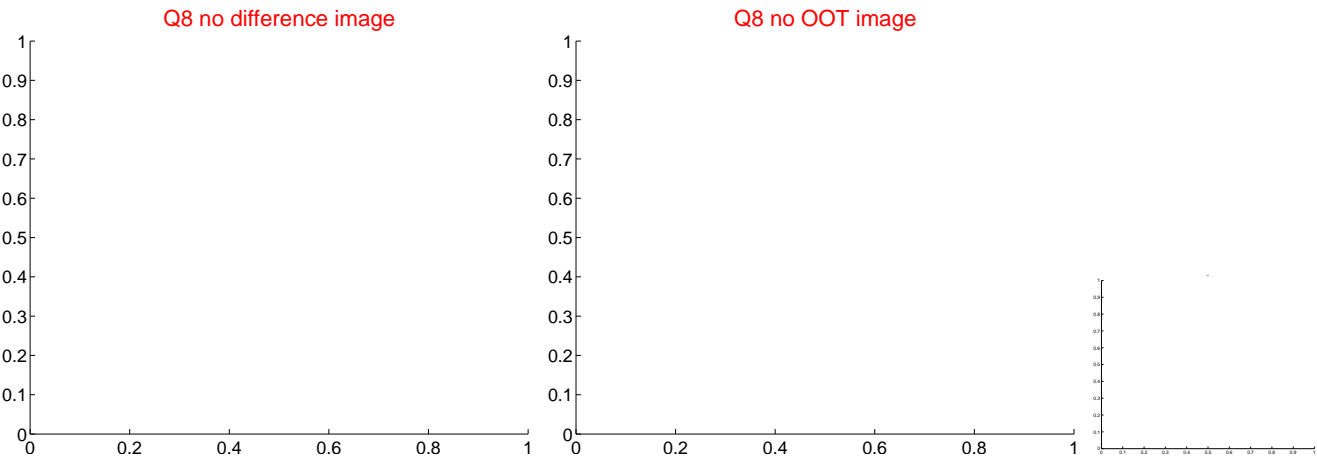
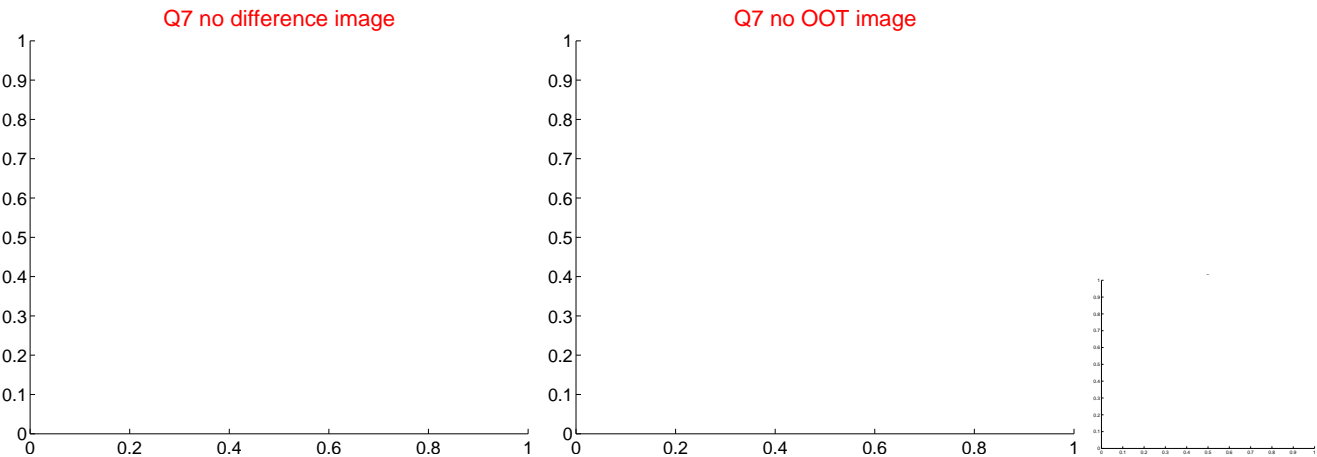
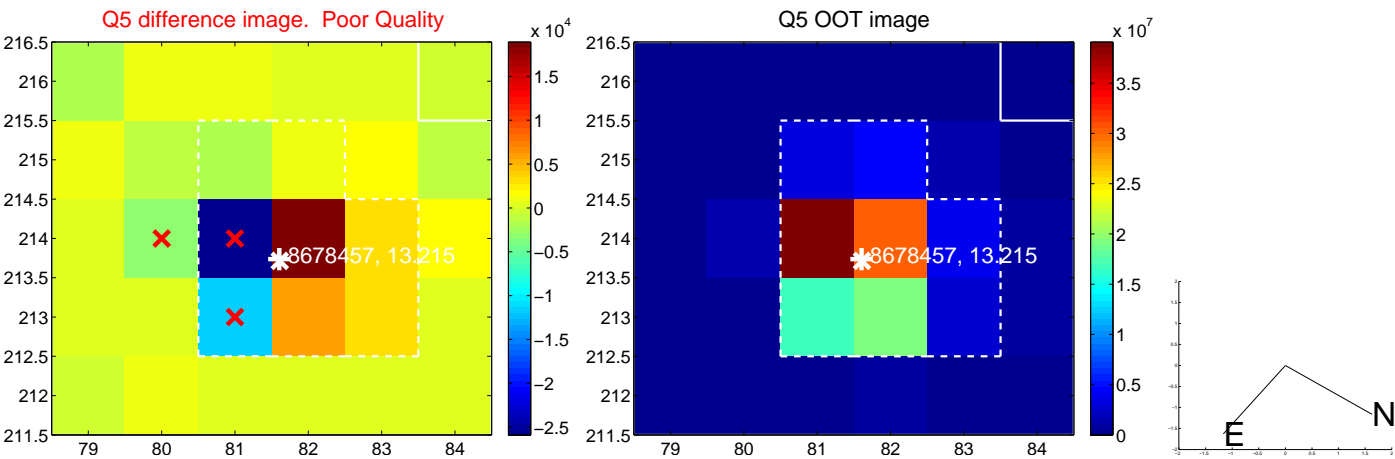


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

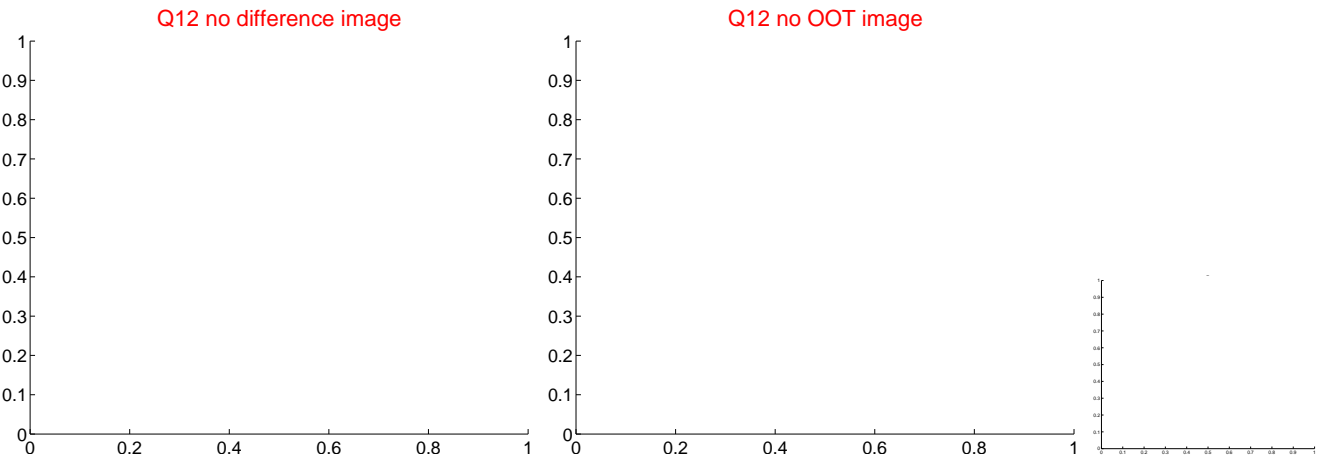
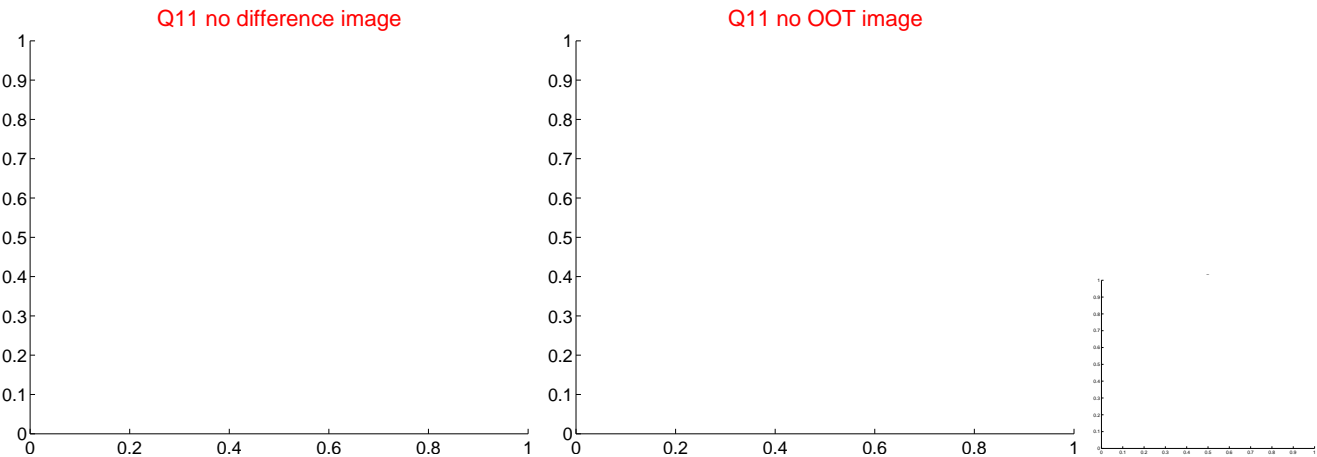
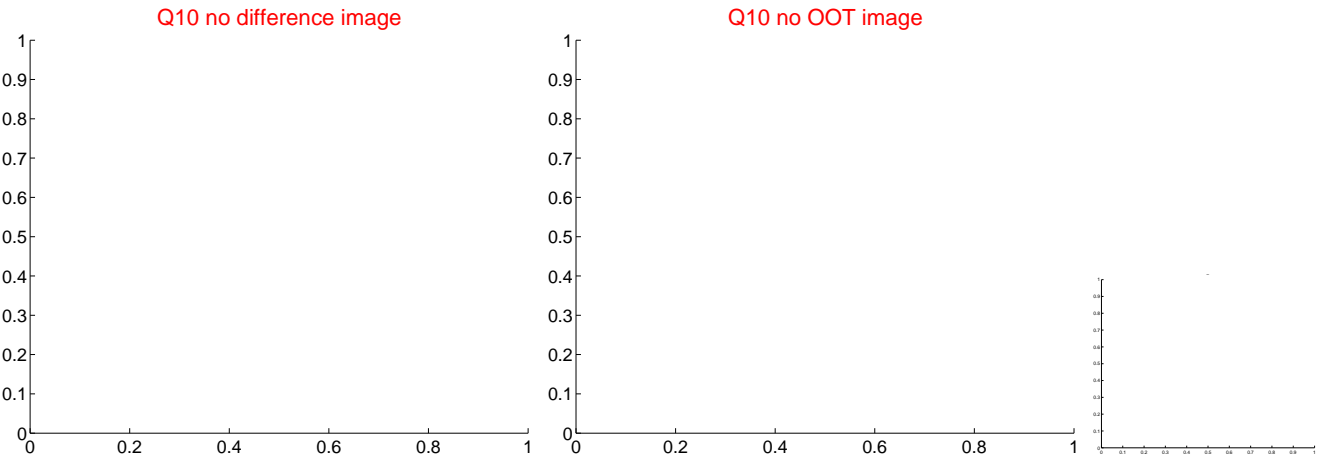
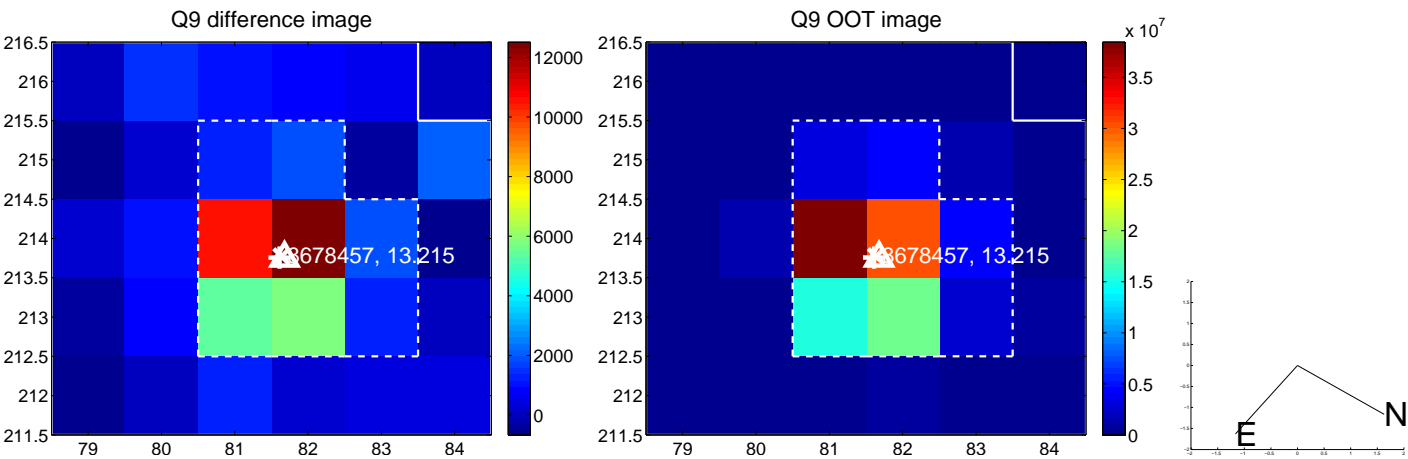
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



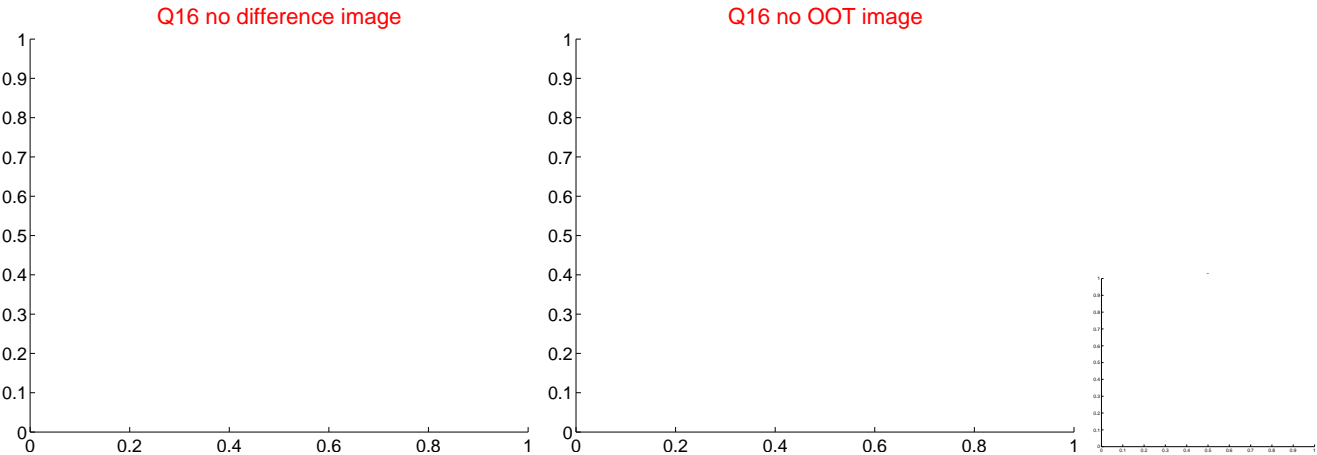
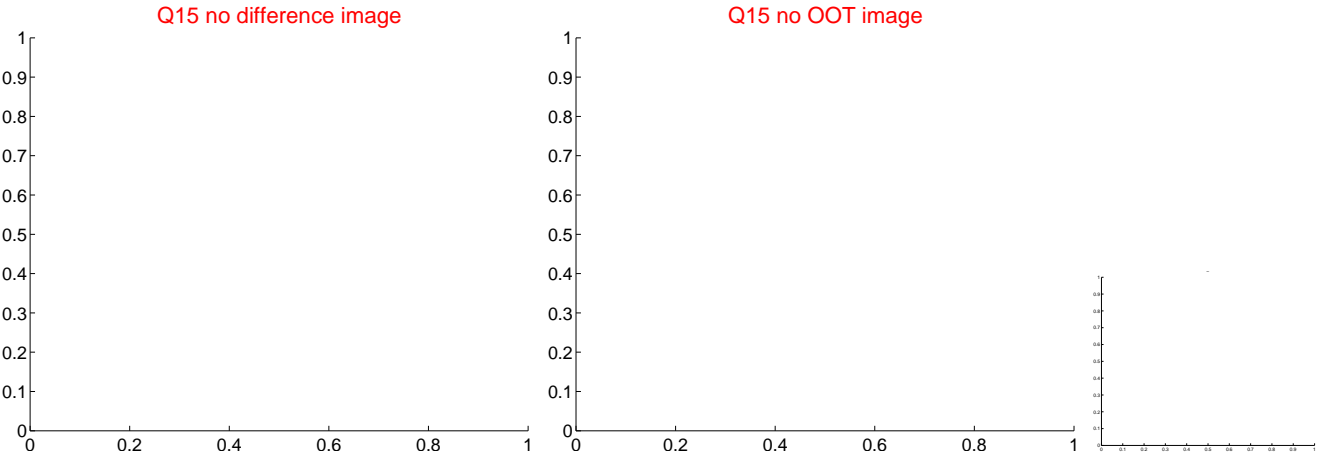
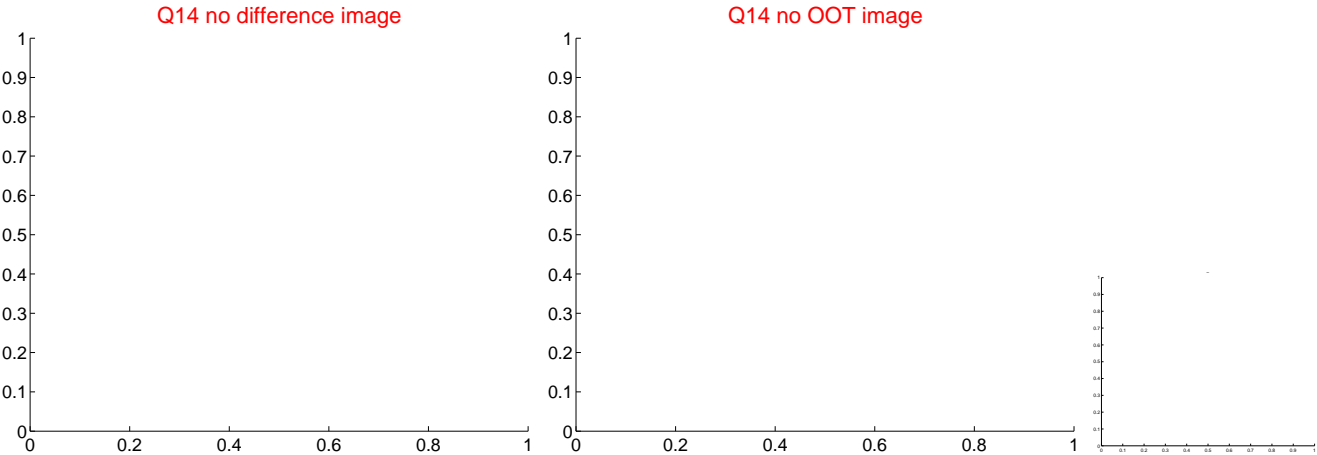
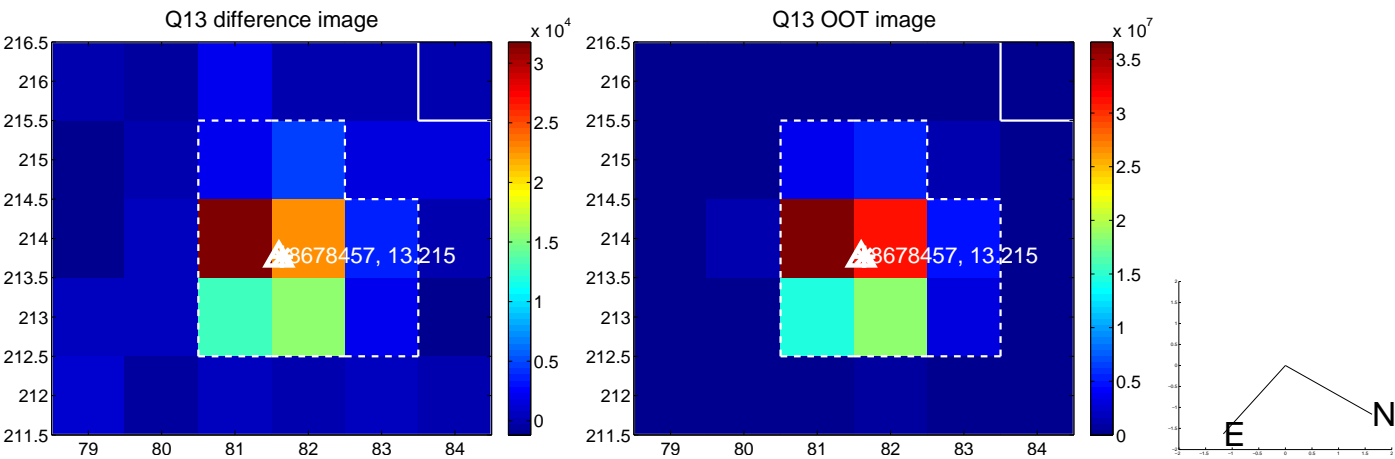
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



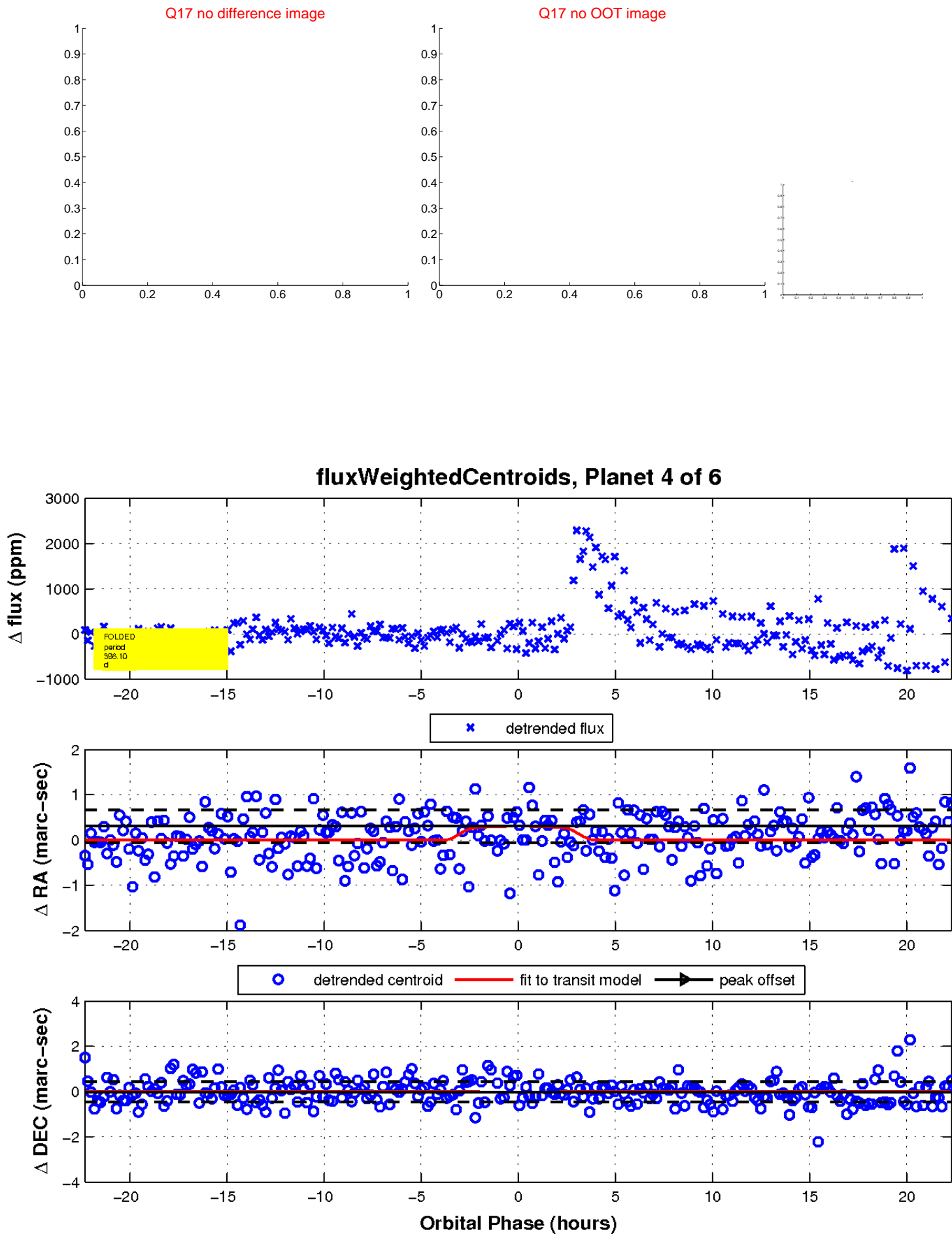
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

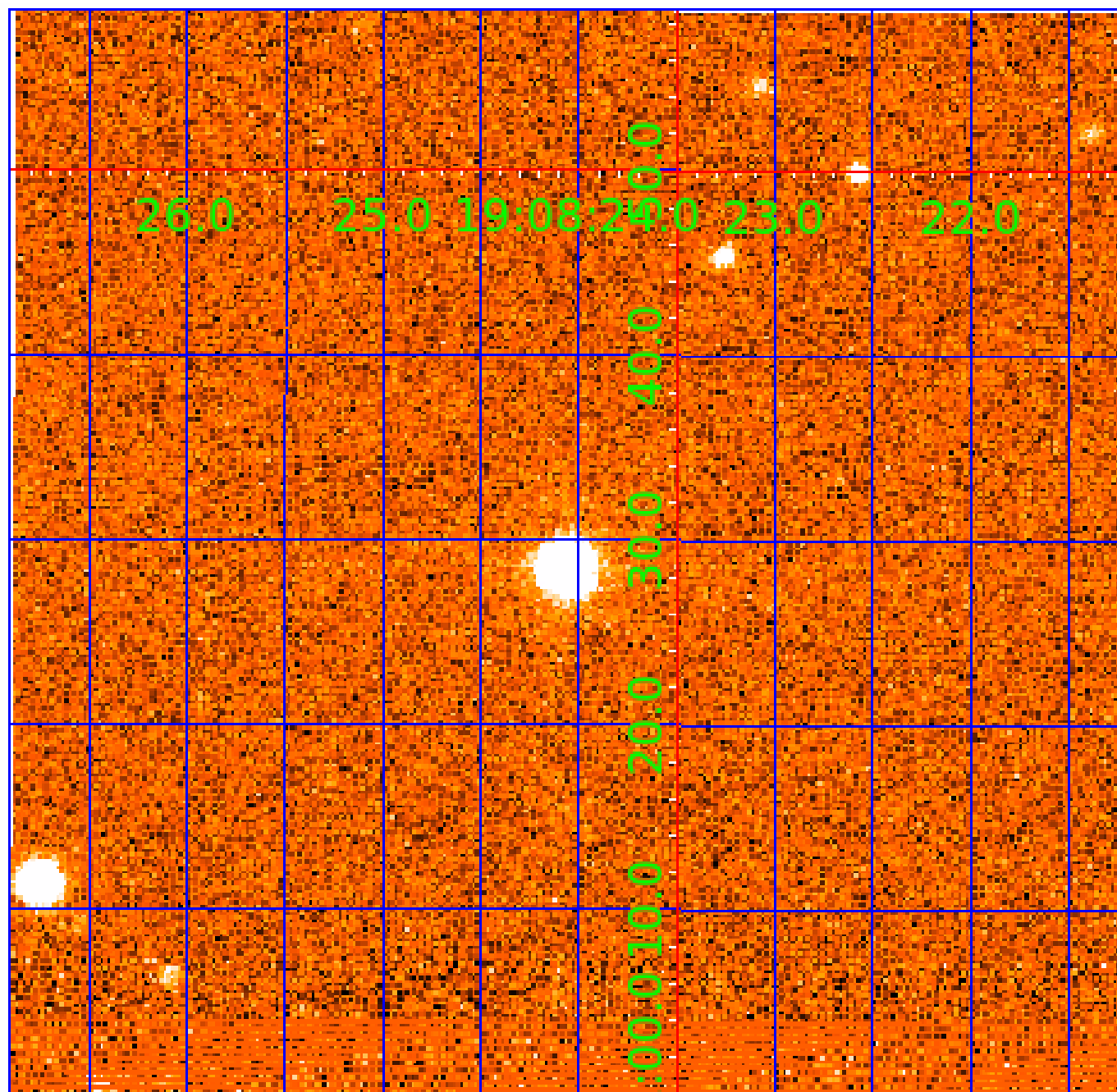


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008678457

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})
008678457-01	OBS	No	534.017411	140.744148	793.1	4.363	18.4	6.9	1.96	5518	5.58	2.24
008678457-02	OBS	No	416.013045	194.634956	782.6	3.527	18.0	10.3	1.96	5518	5.67	3.13
008678457-03	OBS	No	415.359500	533.740505	853.6	8.122	20.3	8.6	1.96	5518	7.14	3.14
008678457-04	OBS	No	398.102177	465.899115	667.1	7.454	17.2	7.2	1.96	5518	6.11	3.32
008678457-05	OBS	No	629.542217	312.369397	637.0	4.204	14.9	6.7	1.96	5518	5.63	1.80
008678457-06	OBS	No	566.799710	329.161414	550.4	5.000	16.3	-1.0	1.96	5518	4.58	2.07

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008678457-01	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
008678457-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_POS_DV
008678457-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
008678457-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008678457-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
008678457-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS

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

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

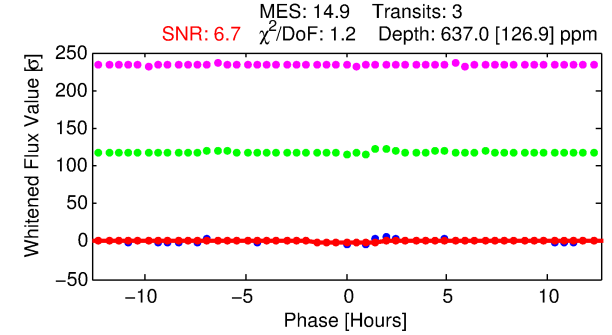
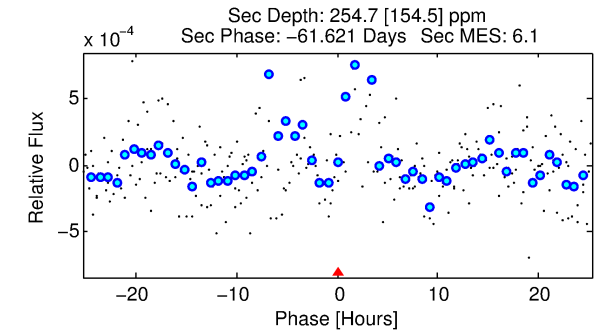
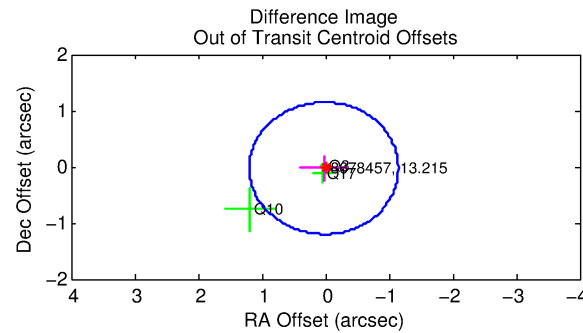
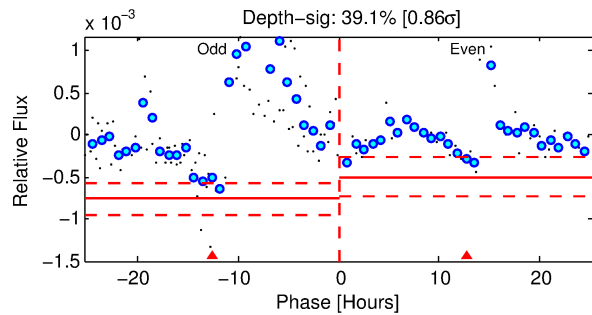
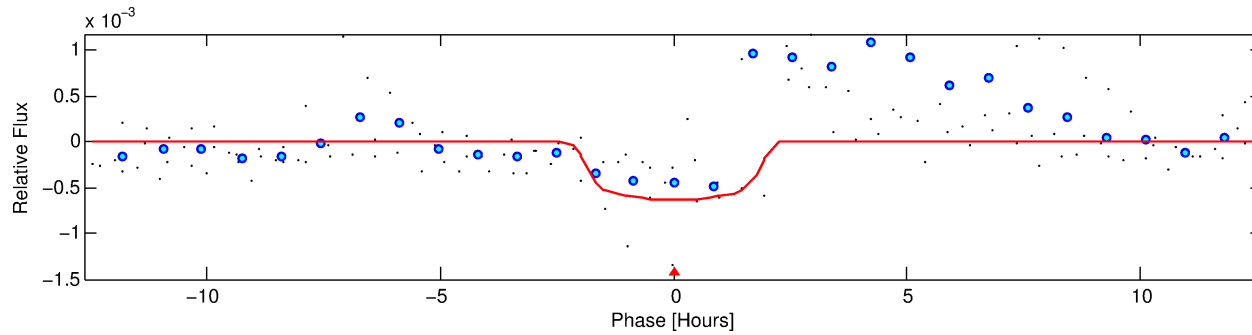
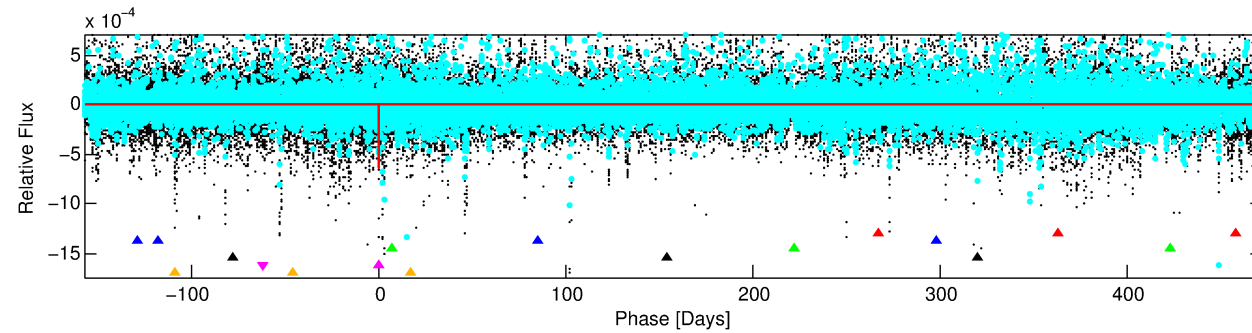
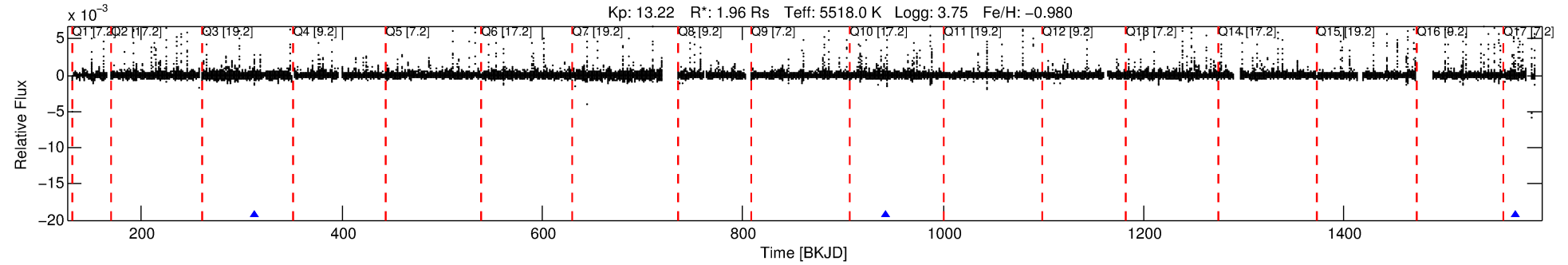
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008678457-05

No Significant Match Found

DV One-Page Summary

KIC: 8678457 Candidate: 5 of 6 Period: 629.542 d



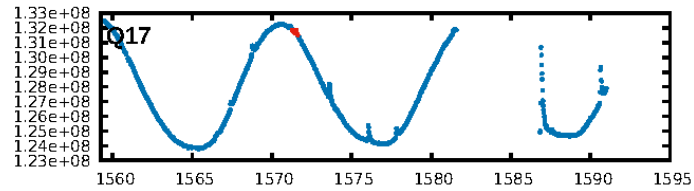
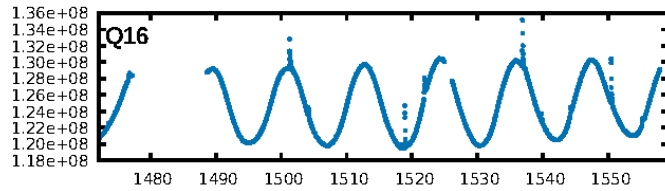
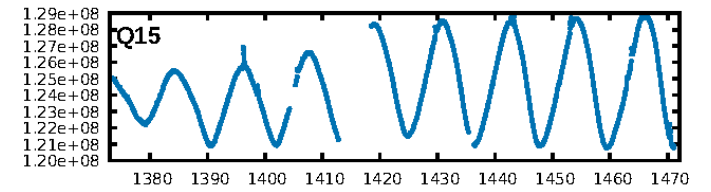
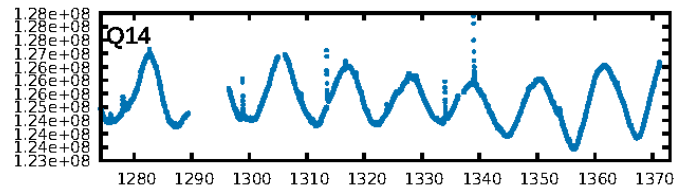
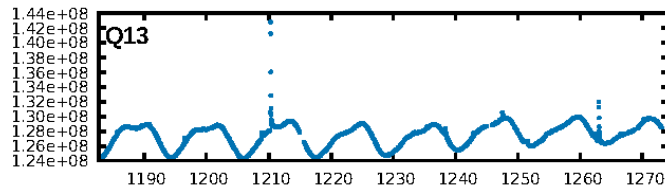
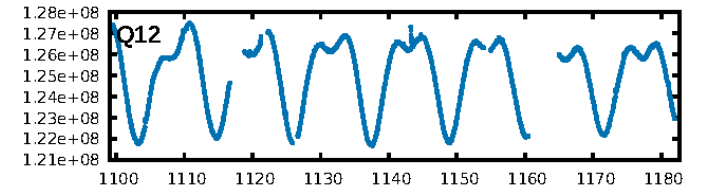
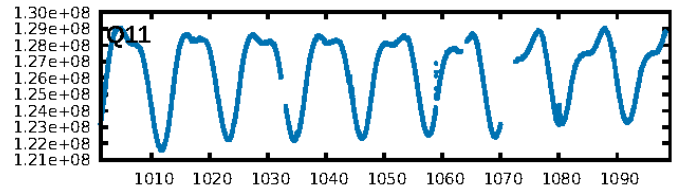
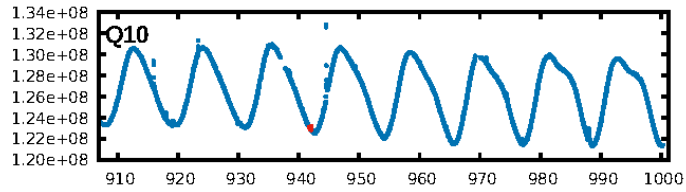
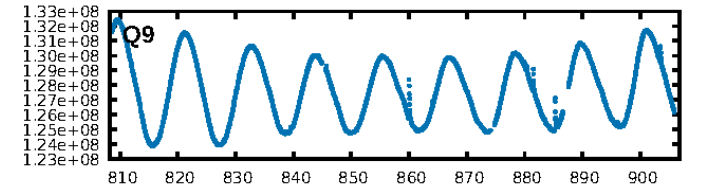
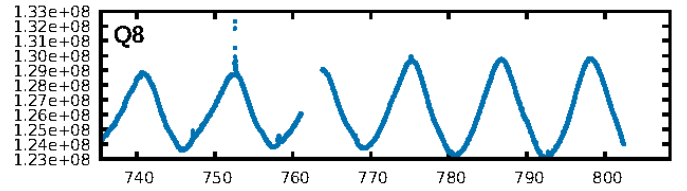
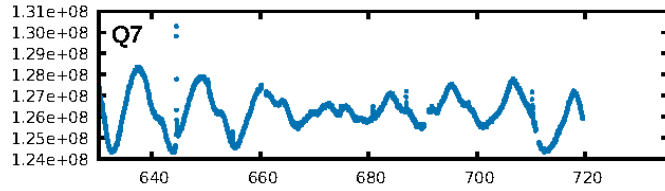
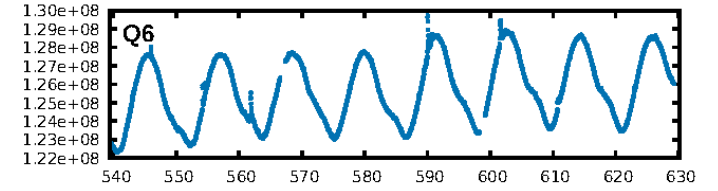
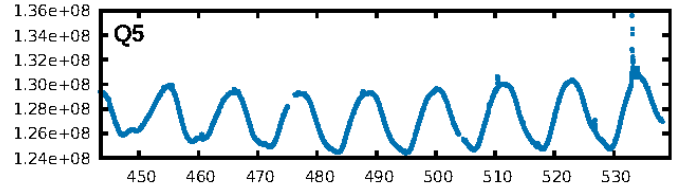
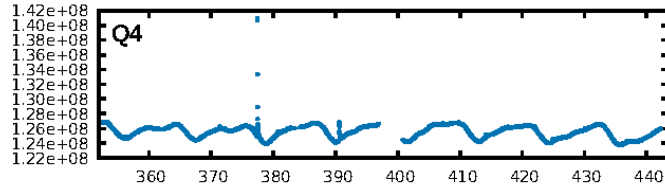
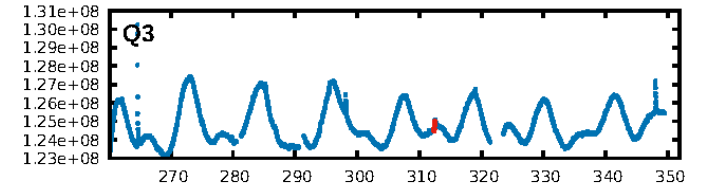
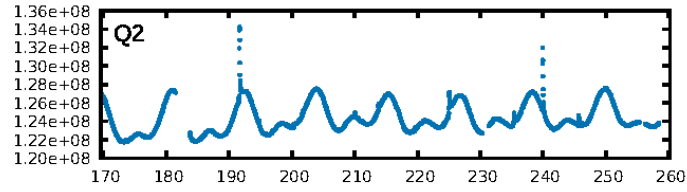
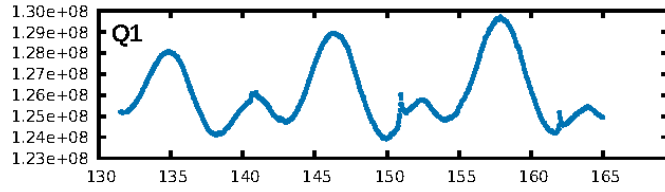
DV Fit Results:

Period = 629.54222 [0.00528] d
Epoch = 312.3694 [0.0070] BKJD
Rp/R* = 0.0264 [0.0105]
a/R* = 646.30 [1167.97]
b = 0.86 [0.57]
Seff = 1.80 [2.67]
Teq = 295 [109] K
Rp = 5.63 [4.38] Re
a = 1.3283 [1.1040] AU
Ag = 7787.32 [13876.74] [0.56 σ]
Teffp = 4290 [1086] K [3.66 σ]

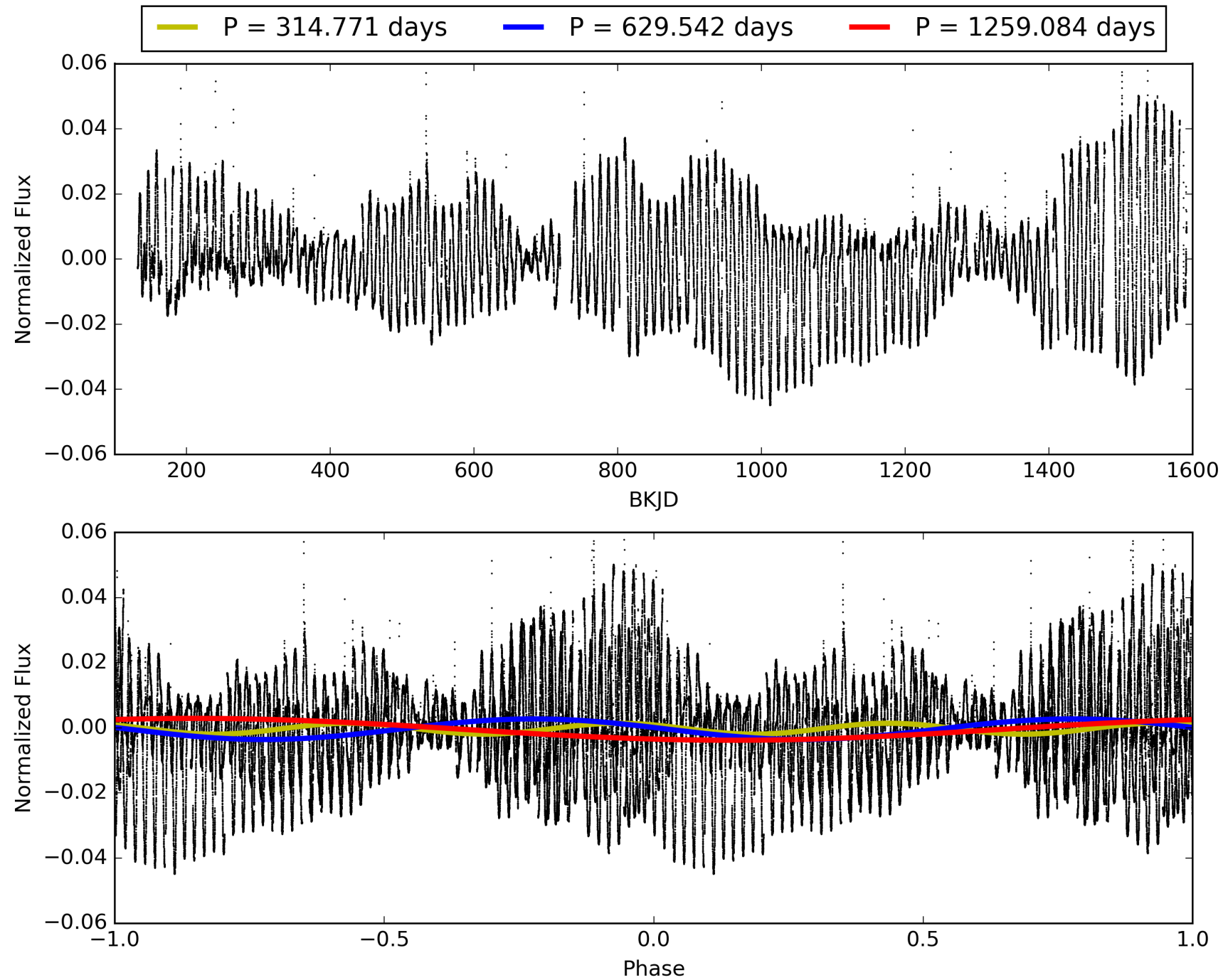
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [230.51 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 36.9%
ModelChiSquareGof-sig: 99.4%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [2/2]
GhostDiagnostic-chr: 0.531
Centroid-sig: 5.1%
Centroid-so: 0.765 arcsec [1.23 σ]
OotOffset-rm: 0.038 arcsec [0.10 σ]
OotOffset-st: 1/1/0/1 [3]
KicOffset-rm: 0.081 arcsec [0.24 σ]
KicOffset-st: 1/1/0/1 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [3/3]

TCE 008678457-05, PDC Light Curves

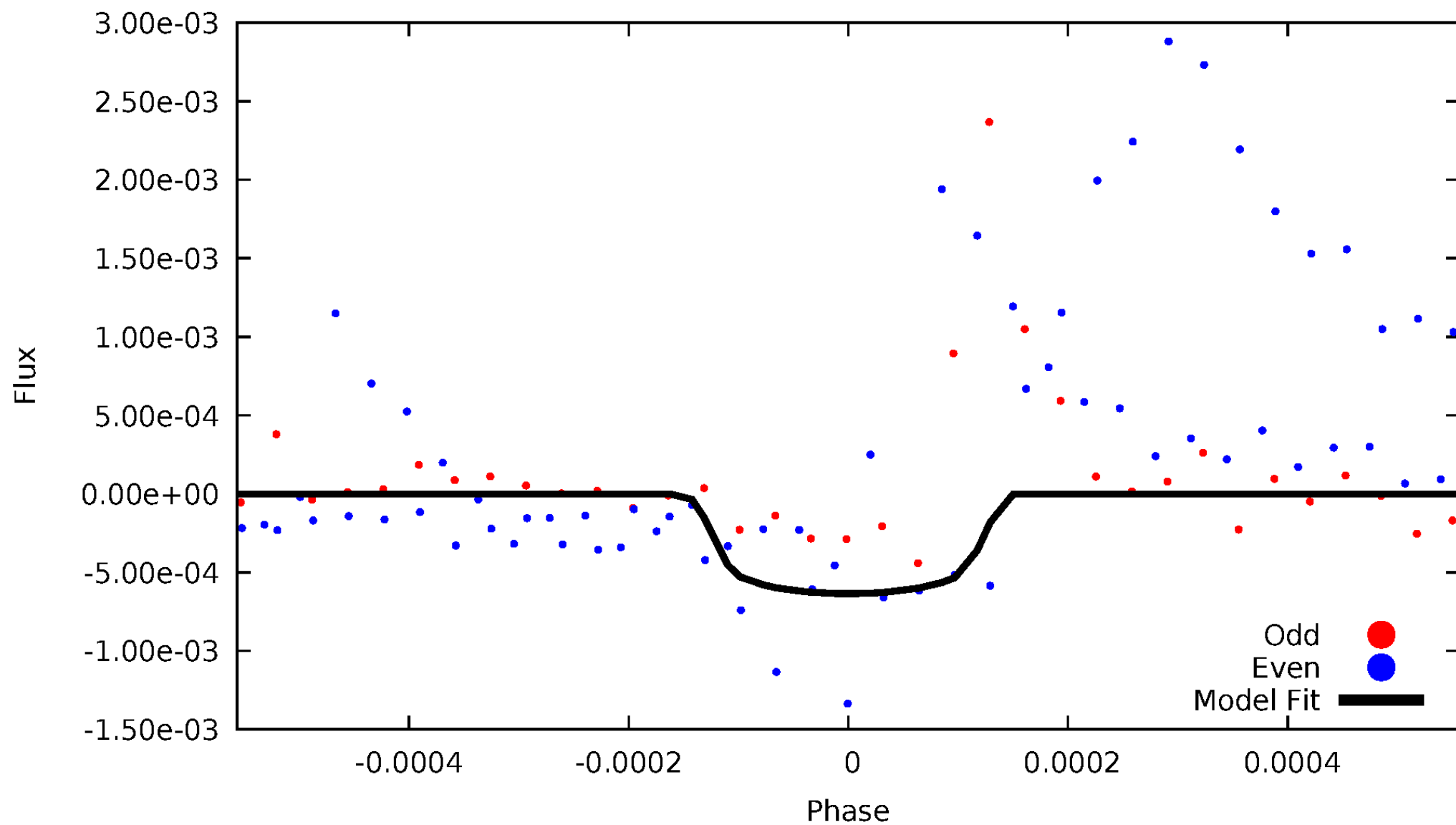


TCE 008678457-05



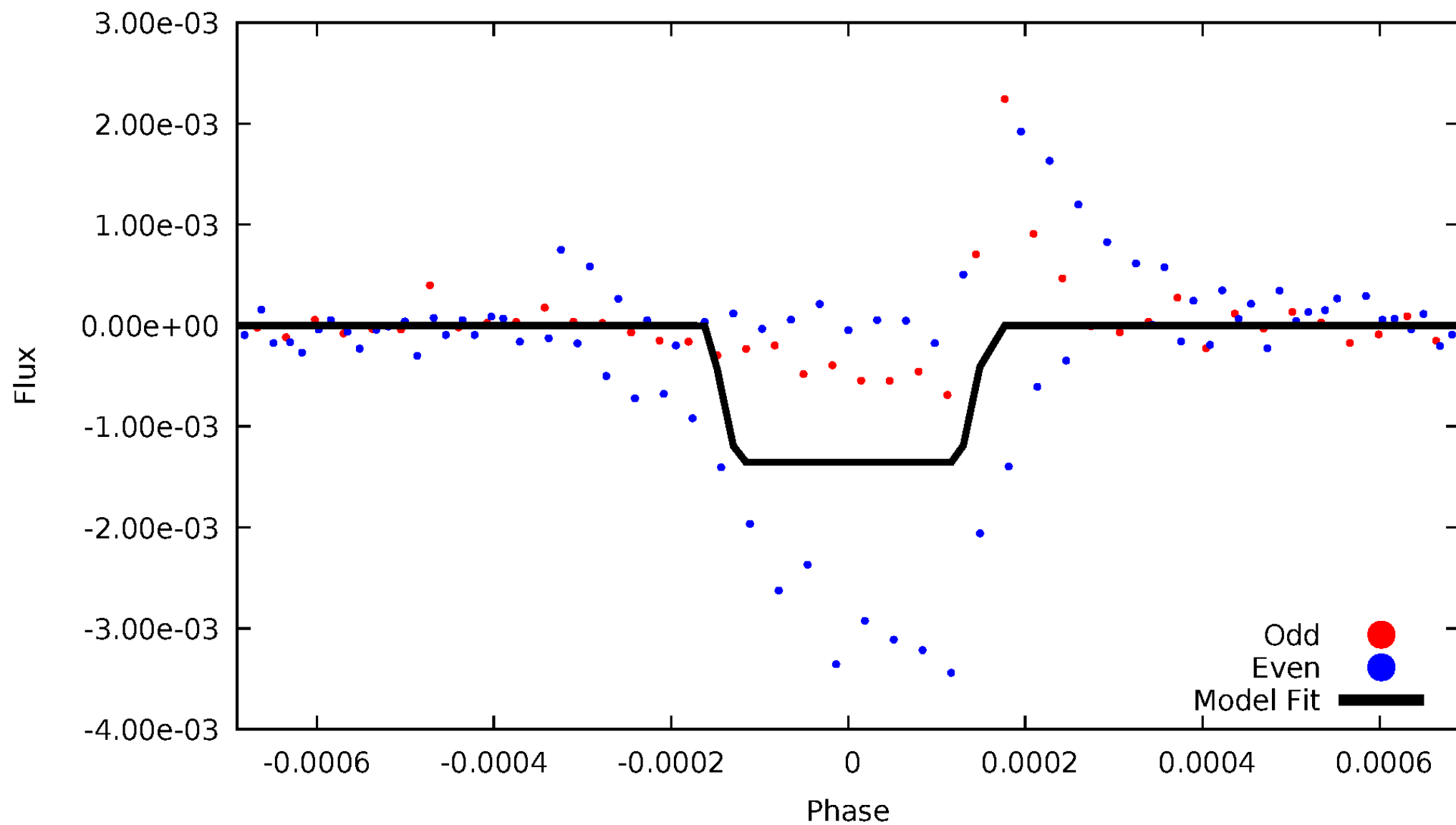
DV Odd/Even

TCE 008678457-05



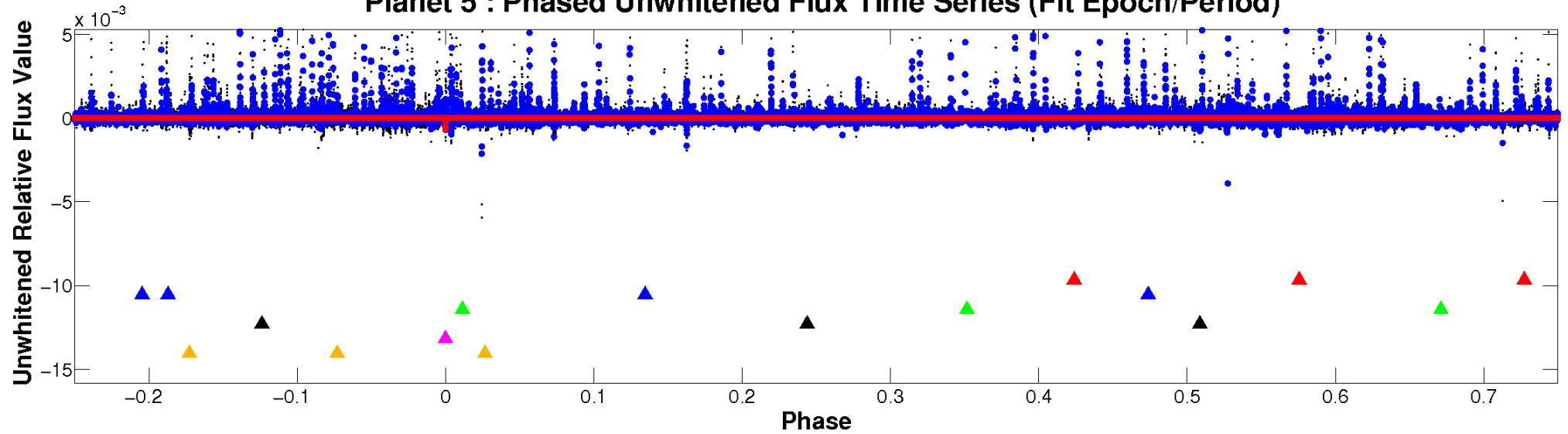
ALT Odd/Even

TCE 008678457-05

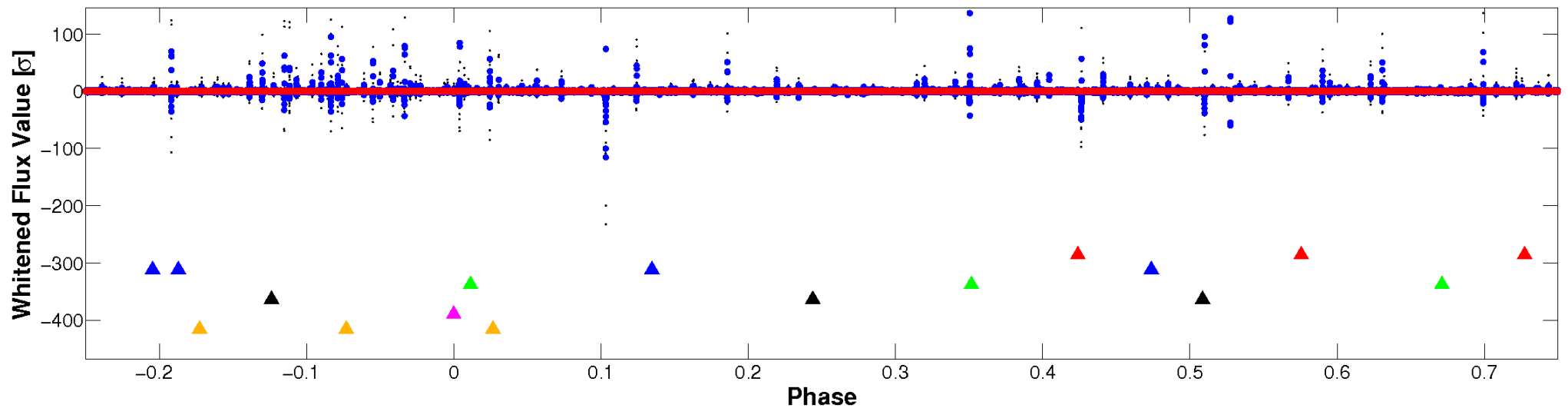


Non-Whitened Vs. Whitened Light Curve

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

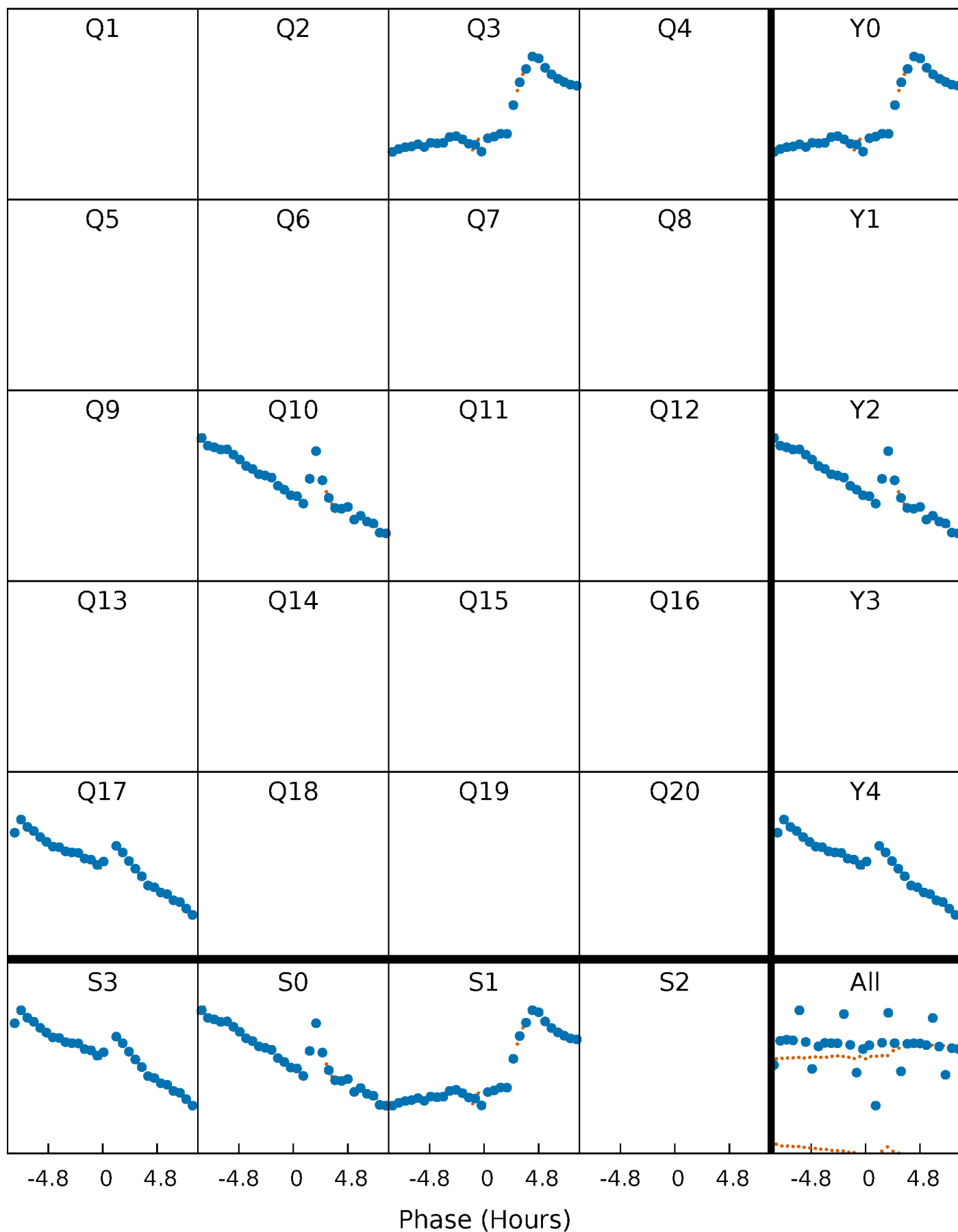


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



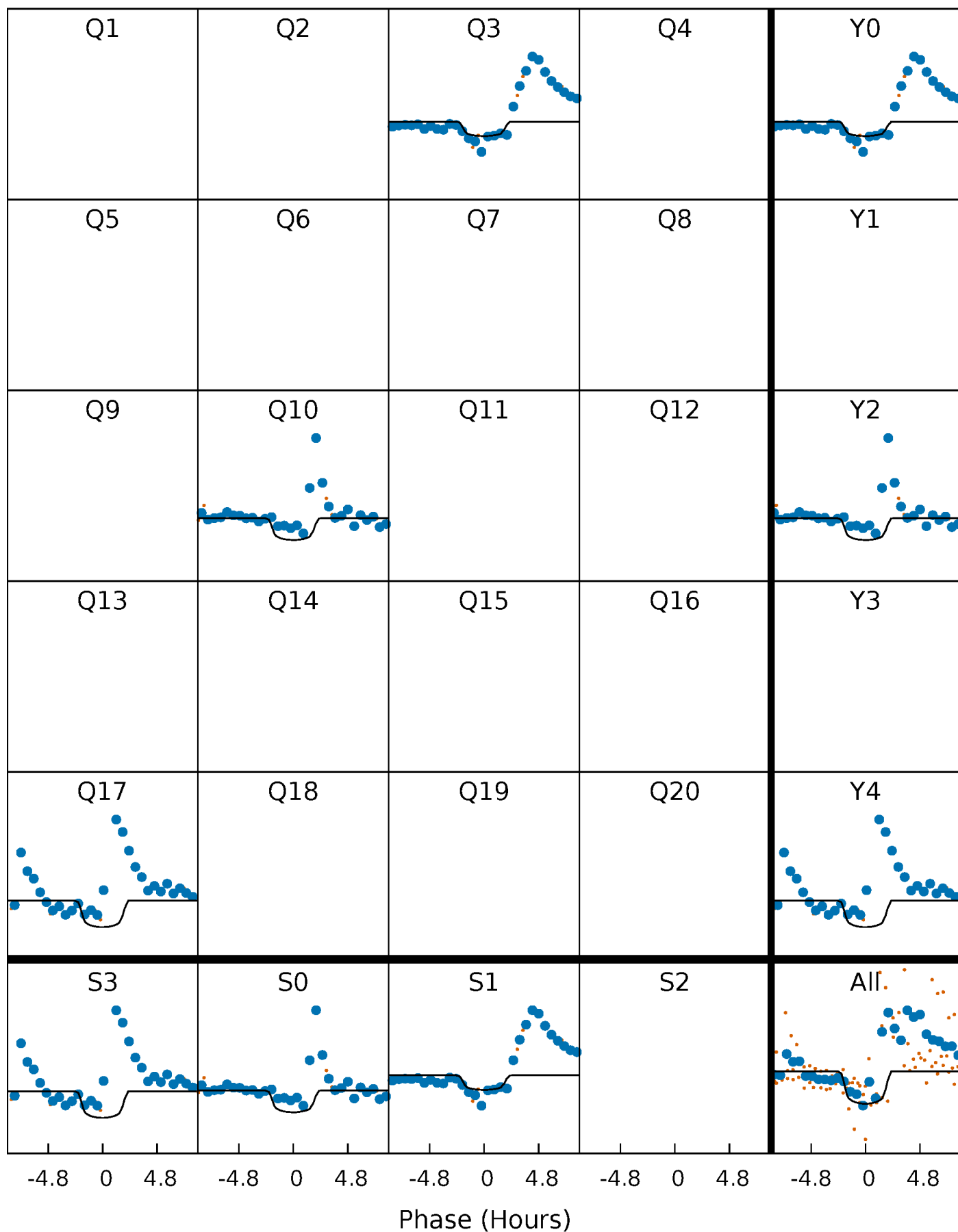
PDC Quarter-Phased Transit Curves

TCE 008678457-05 $P=629.542217$ Days $T_0=312.369397$ (BKJD)



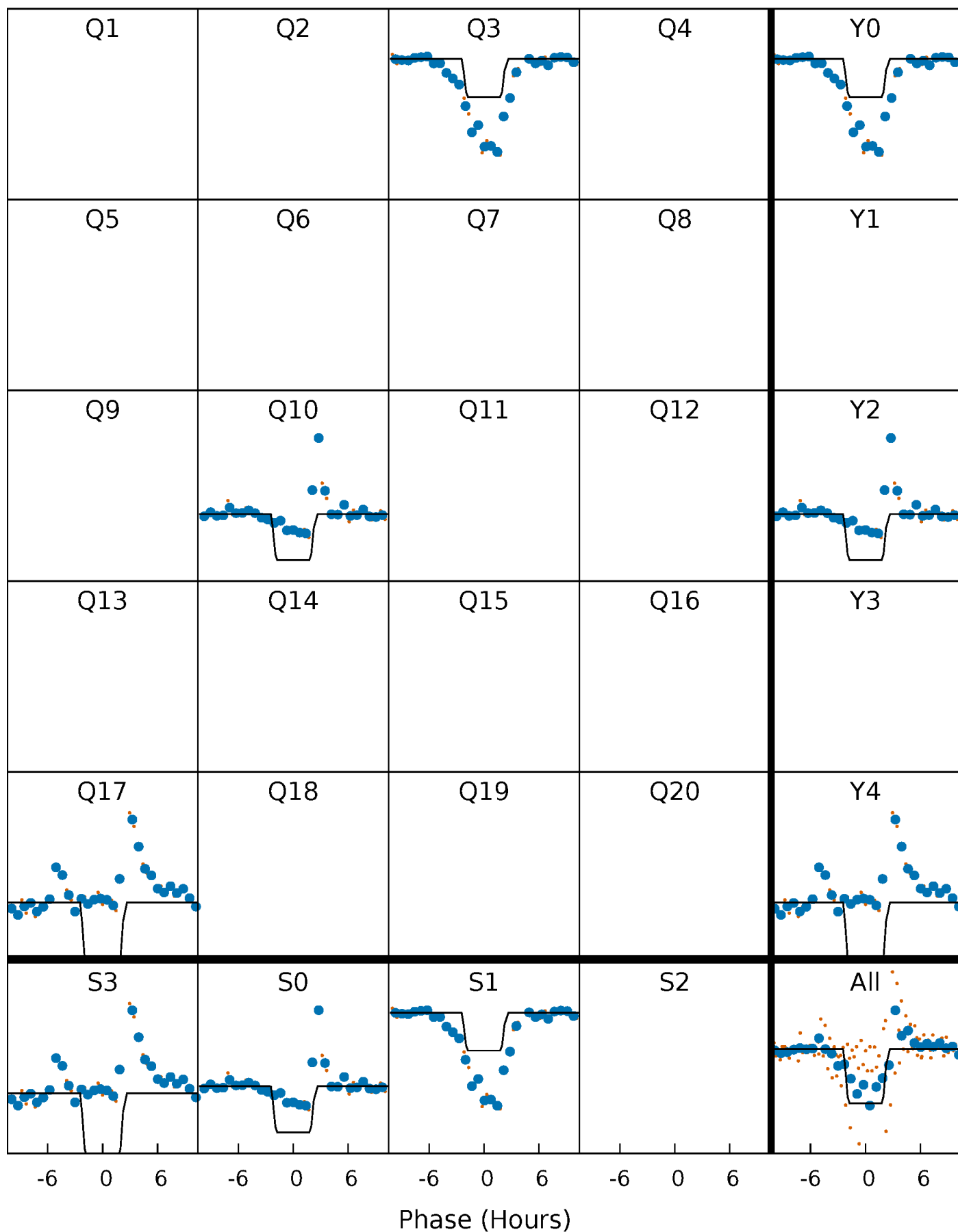
DV Quarter-Phased Transit Curves

TCE 008678457-05 P=629.542217 Days $T_0=312.369397$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

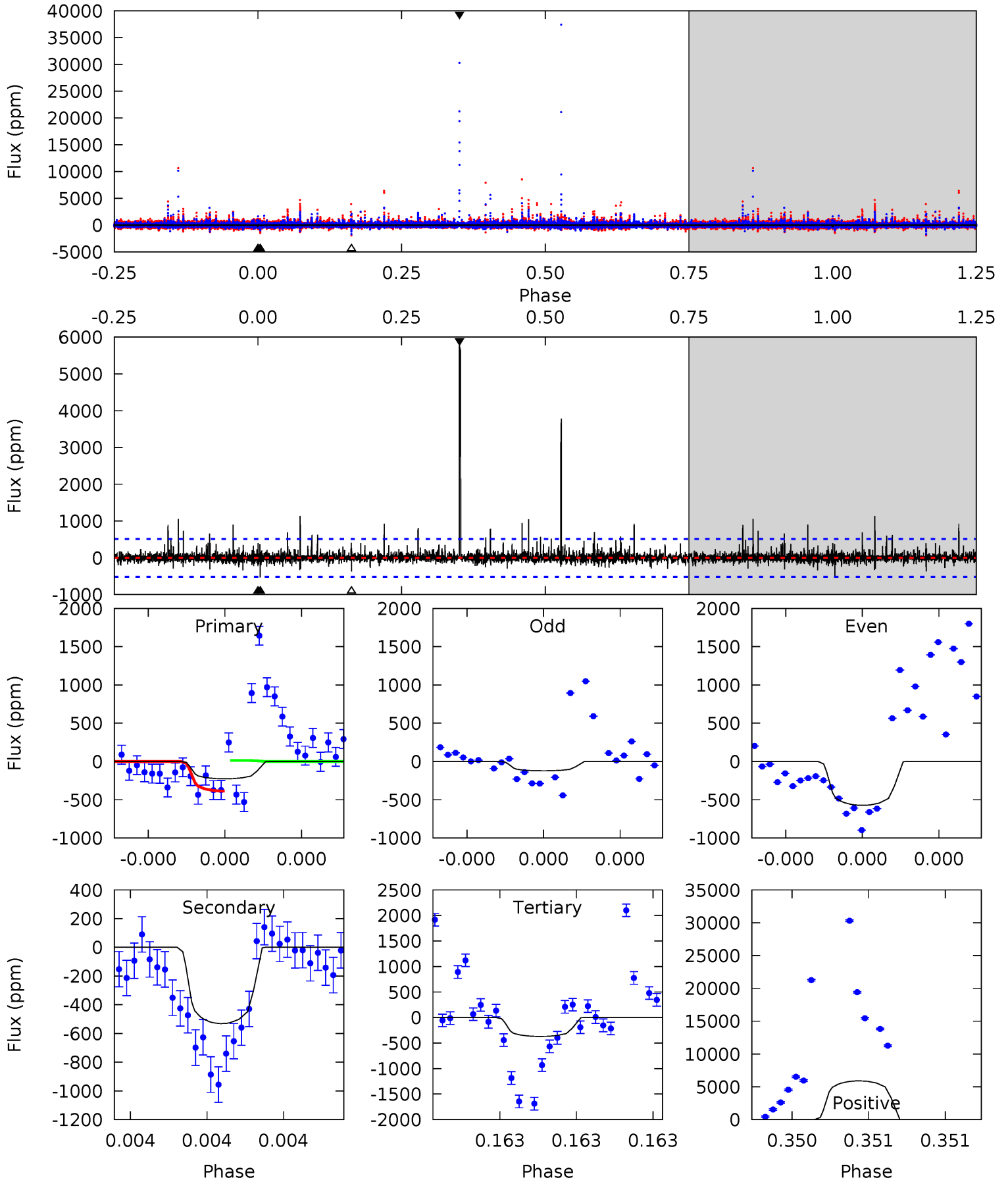
TCE 008678457-05 $P=629.503494$ Days $T_0=312.377676$ (BKJD)



DV Model-Shift Uniqueness Test

008678457-05, P = 629.542217 Days, E = 312.369397 Days

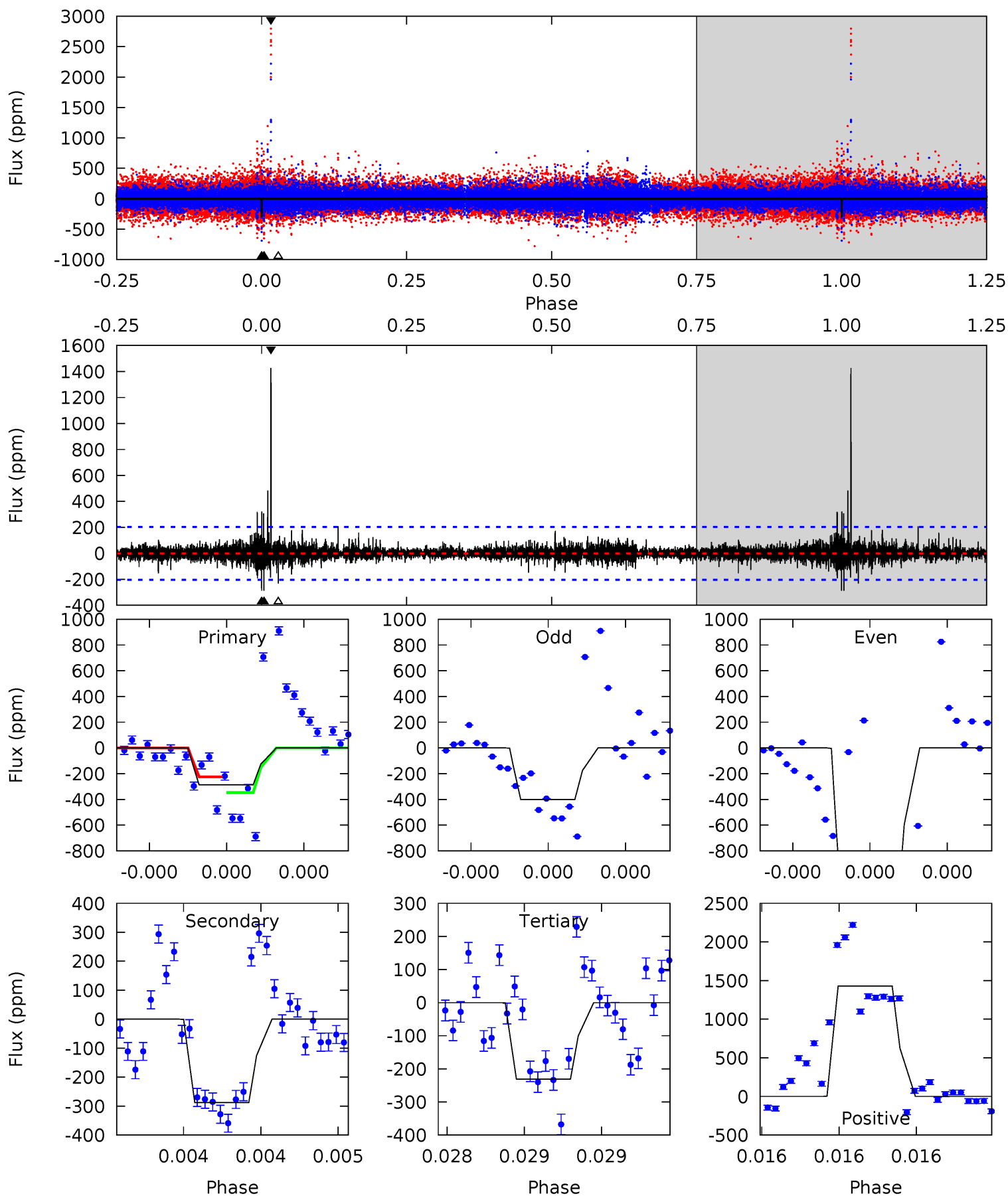
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.49	5.84	4.08	64.9	5.67	3.63	1.51	-1.59	-62.4	1.76	-59.1	0.94	56.8	0.92	0



Alt Model-Shift Uniqueness Test

008678457-05, P = 629.503494 Days, E = 312.377676 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.96	7.99	6.41	39.6	5.65	3.59	1.02	1.55	-31.7	1.58	-31.7	13.8	2.70	0.83	0



Stellar Parameters For KIC 008678457

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5518^{+197}_{-164}	$3.752^{+0.915}_{-0.366}$	$-0.980^{+0.350}_{-0.250}$	$1.956^{+1.304}_{-1.304}$	$0.787^{+0.207}_{-0.095}$	$0.148^{+2.987}_{-0.104}$
	+4%/-3%	+24%/-10%	+36%/-26%	+67%/-67%	+26%/-12%	+2016%/-70%
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 008678457-05 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-529 ± 90	$5.26^{+3.29}_{-2.58}$	406^{+73}_{-77}	5215^{+1492}_{-727}	18881^{+55047}_{-11737}
Alt.	-288 ± 36	$7.19^{+4.37}_{-3.19}$	401^{+75}_{-85}	4044^{+520}_{-363}	5662^{+12828}_{-3535}

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

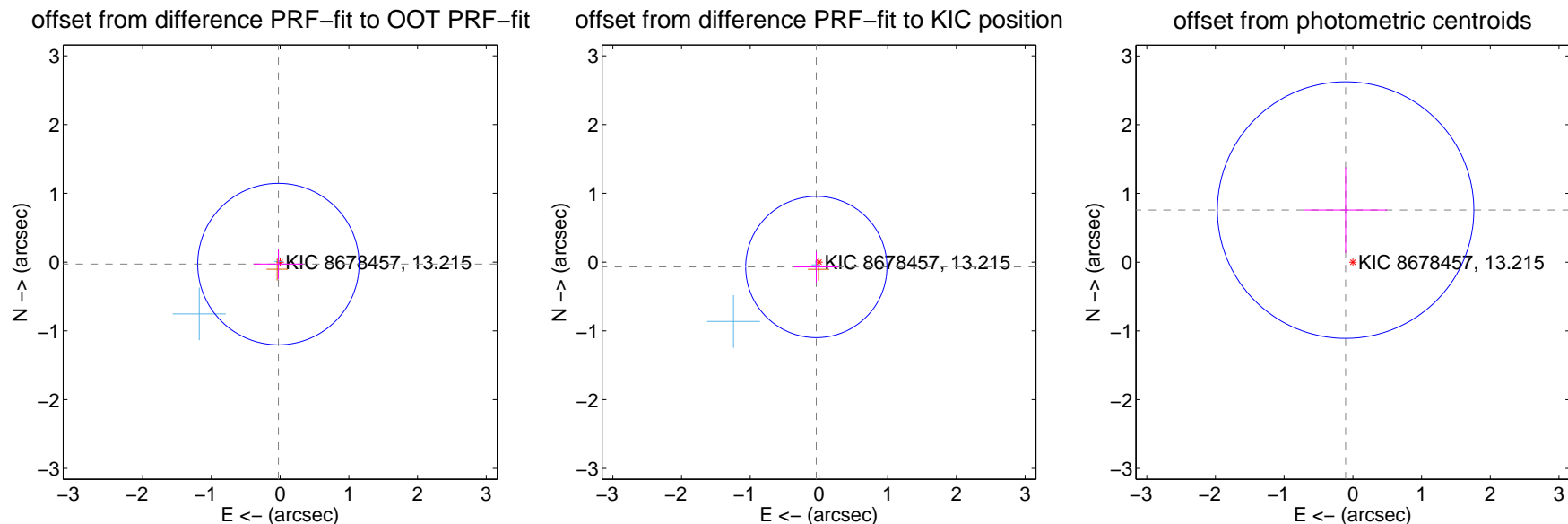
DV Centroid Data

Supplemental centroid analysis for 008678457-05. Kepler magnitude: 13.21. Transit SNR 6.68

There are 2 quarters with good PRF difference image offsets

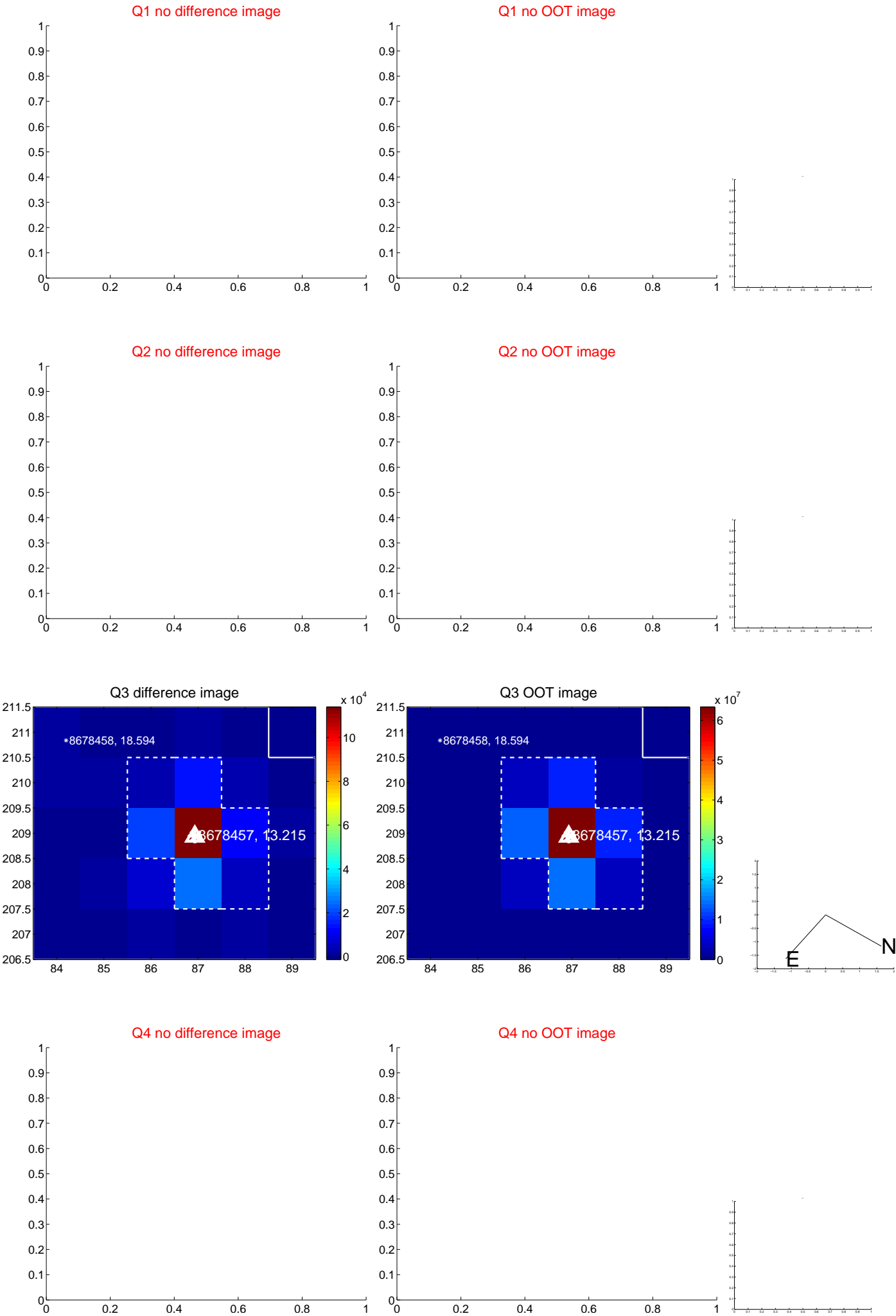
The direct PRF centroid is offset from the target star catalog position by about 0.04 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.038 ± 0.391	0.10	0.025 ± 0.358	-0.029 ± 0.218
PRF-fit source offset from KIC position	0.081 ± 0.343	0.24	0.039 ± 0.321	-0.072 ± 0.222
photometric centroid source offset	0.77 ± 0.62	1.23	0.11 ± 0.60	0.76 ± 0.62



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.

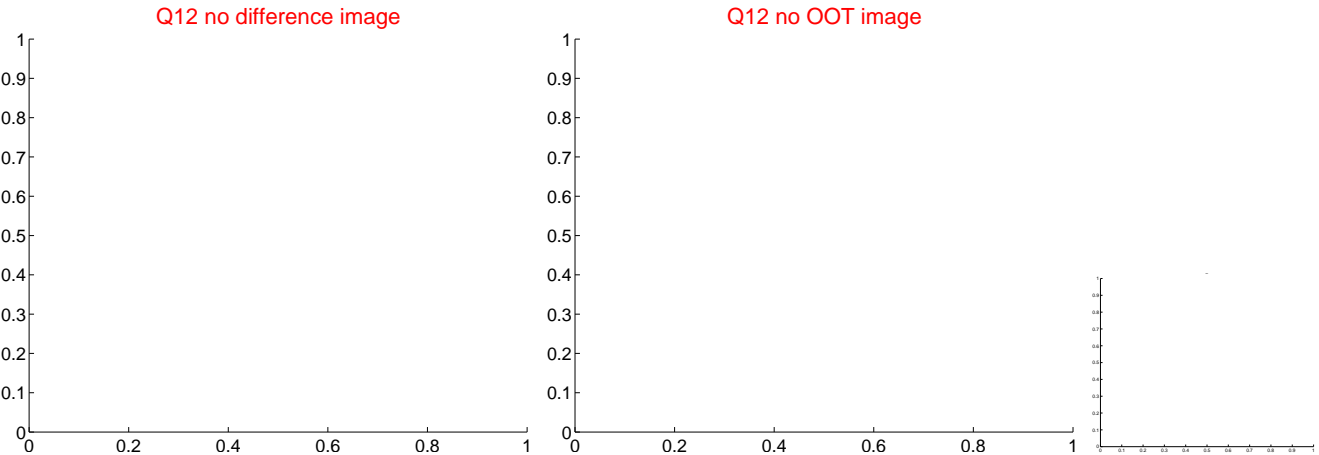
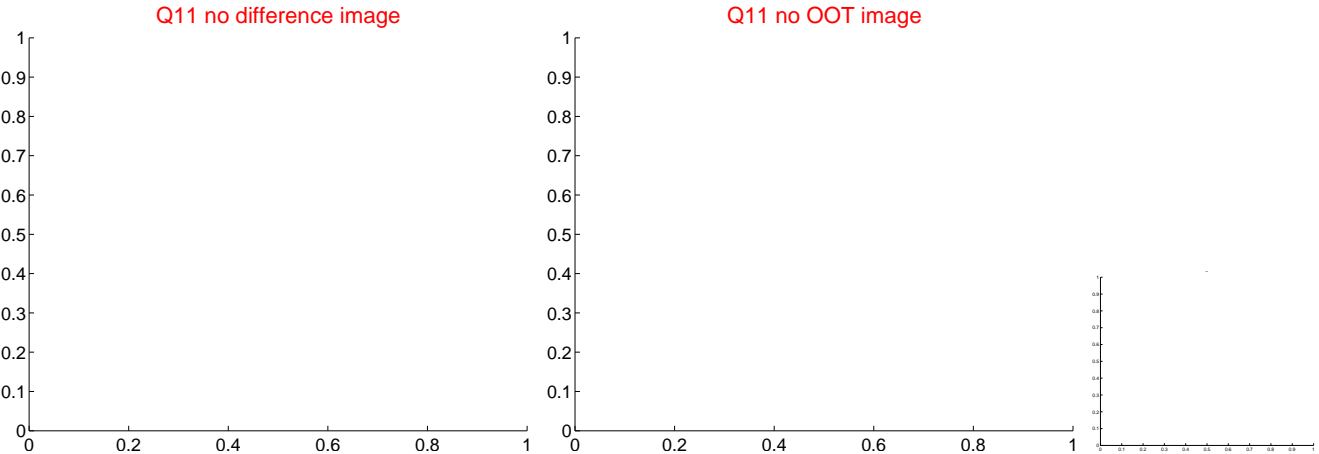
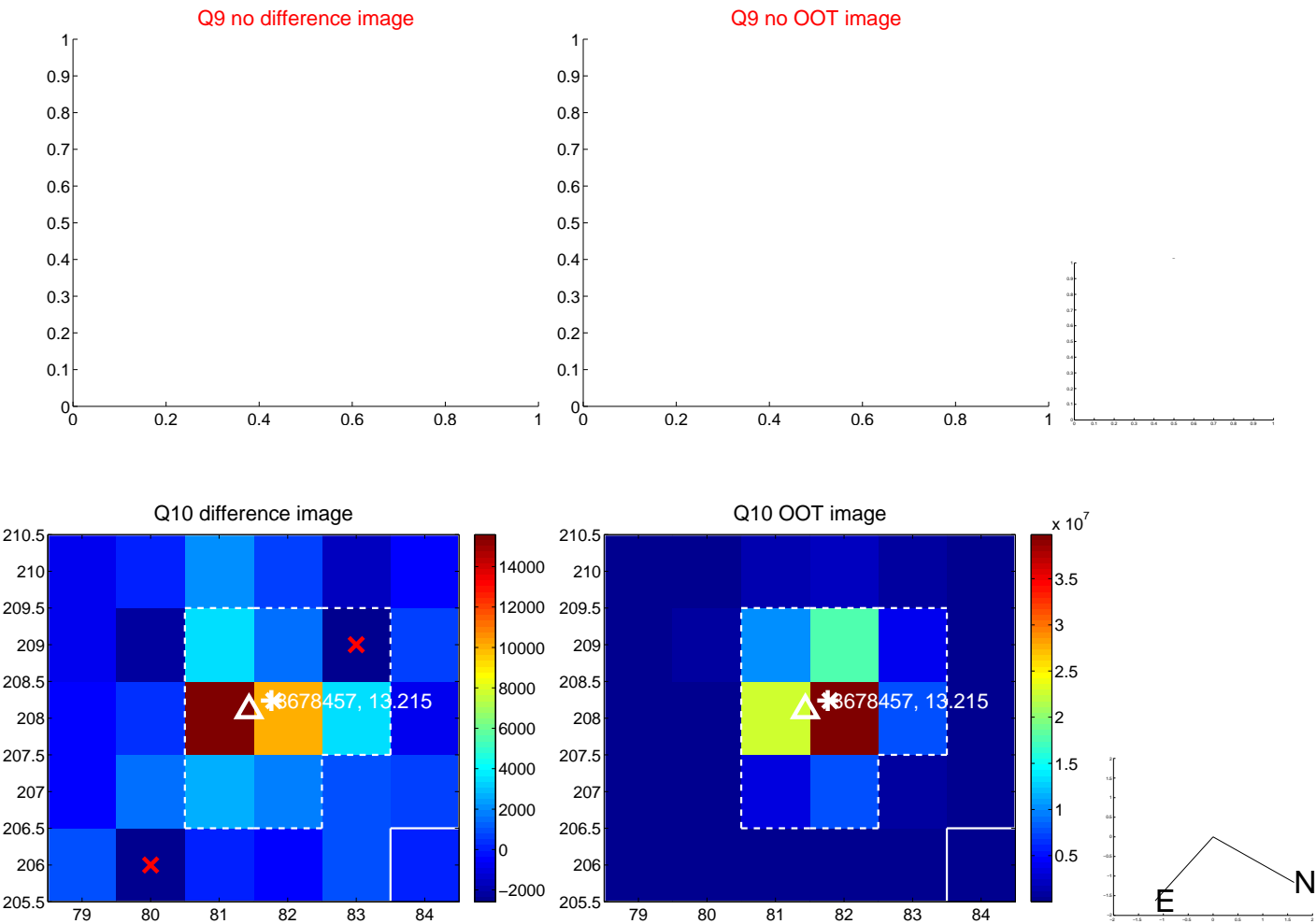
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



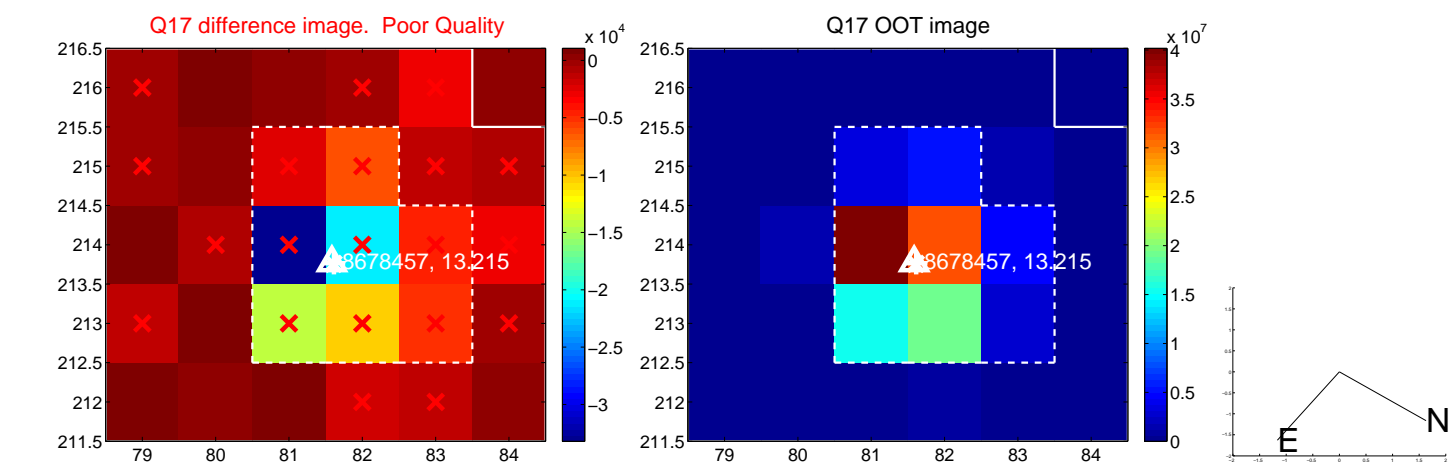
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



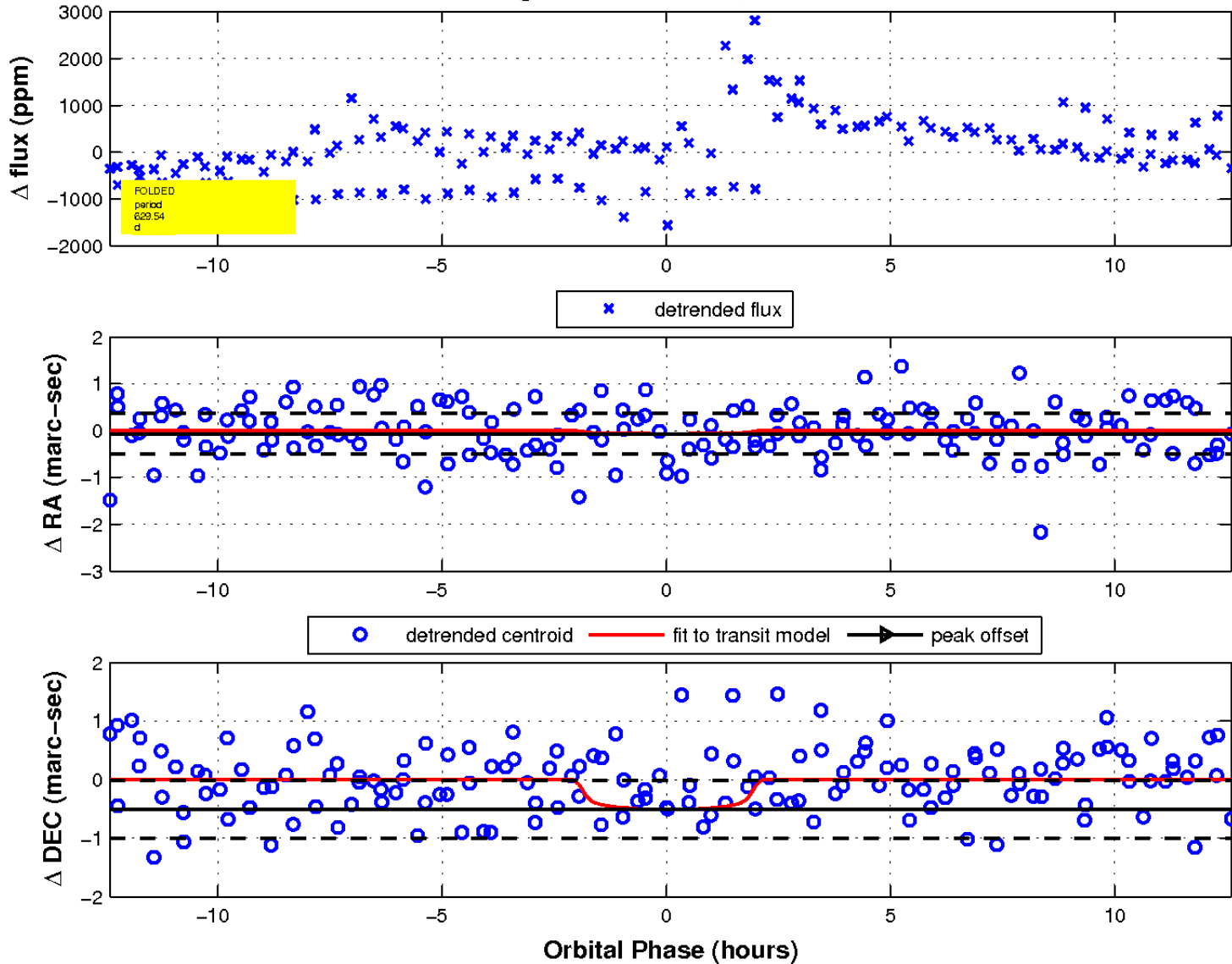
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

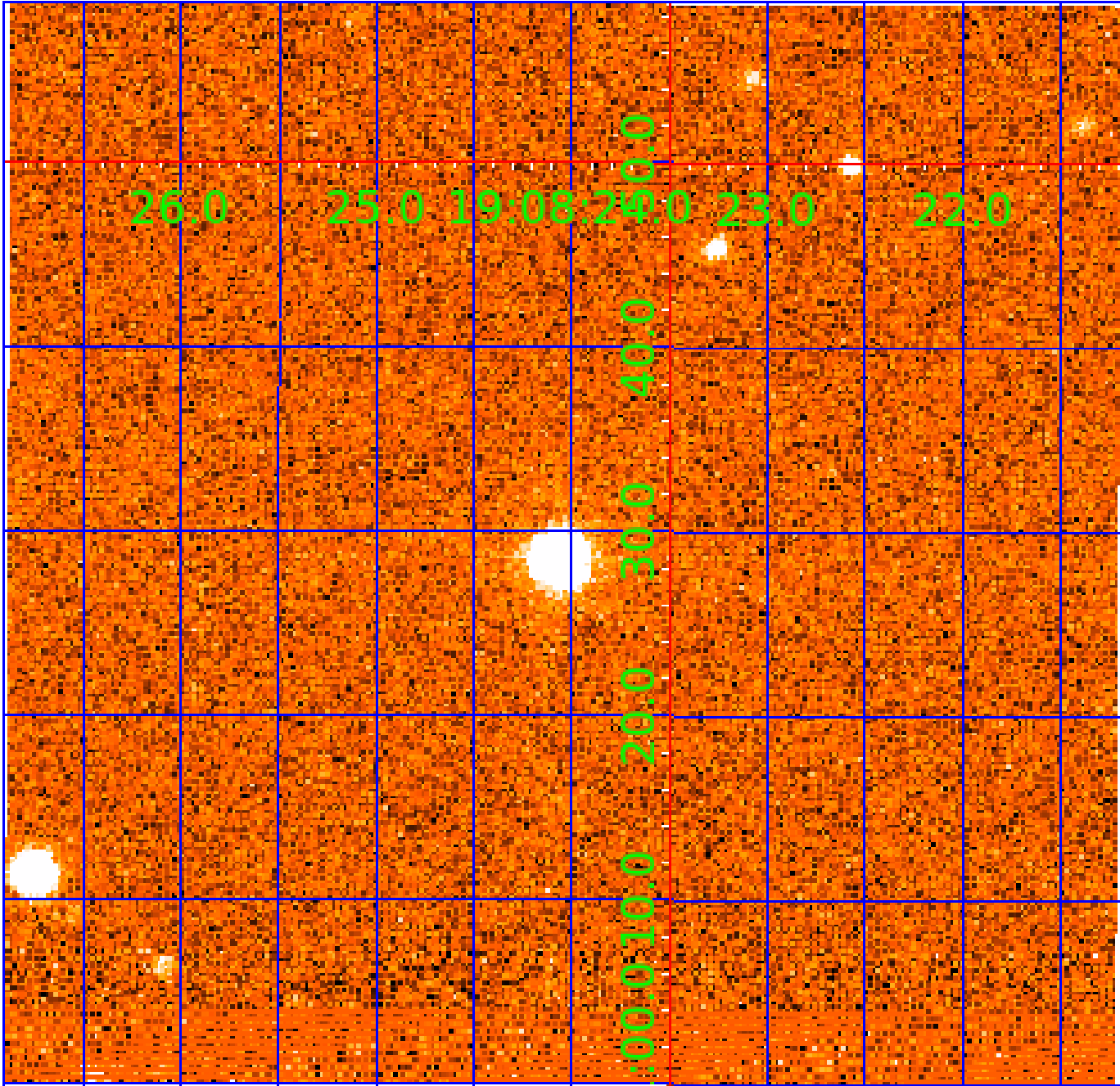


fluxWeightedCentroids, Planet 5 of 6



UKIRT Image

Declination



KIC 008678457

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})
008678457-01	OBS	No	534.017411	140.744148	793.1	4.363	18.4	6.9	1.96	5518	5.58	2.24
008678457-02	OBS	No	416.013045	194.634956	782.6	3.527	18.0	10.3	1.96	5518	5.67	3.13
008678457-03	OBS	No	415.359500	533.740505	853.6	8.122	20.3	8.6	1.96	5518	7.14	3.14
008678457-04	OBS	No	398.102177	465.899115	667.1	7.454	17.2	7.2	1.96	5518	6.11	3.32
008678457-05	OBS	No	629.542217	312.369397	637.0	4.204	14.9	6.7	1.96	5518	5.63	1.80
008678457-06	OBS	No	566.799710	329.161414	550.4	5.000	16.3	-1.0	1.96	5518	4.58	2.07

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008678457-01	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
008678457-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_POS_DV
008678457-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
008678457-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008678457-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
008678457-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS

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

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

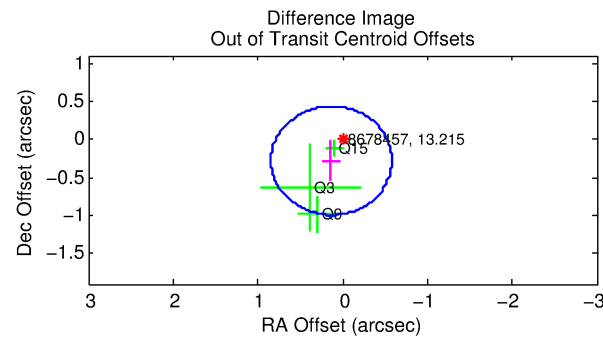
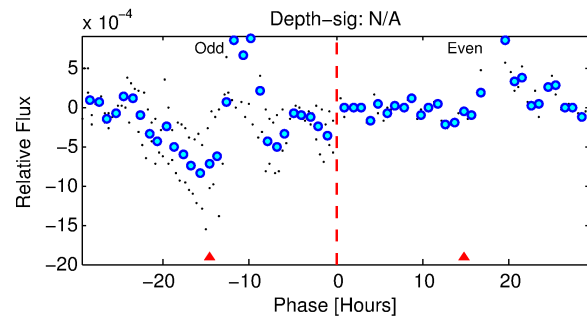
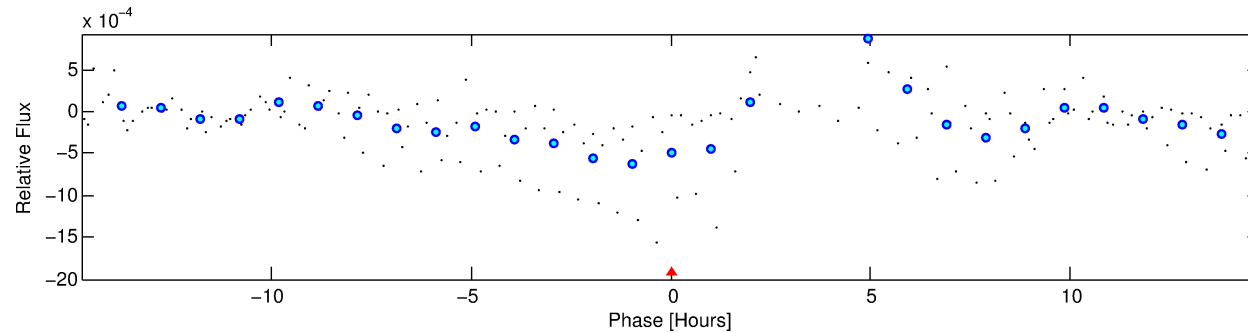
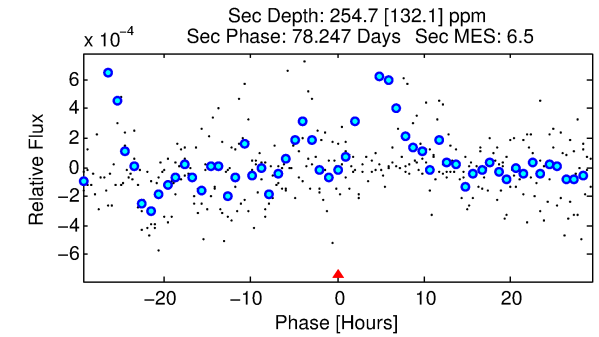
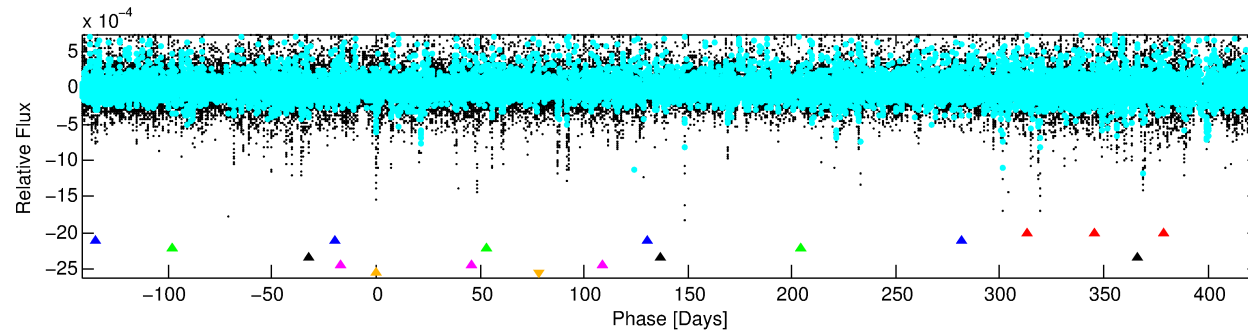
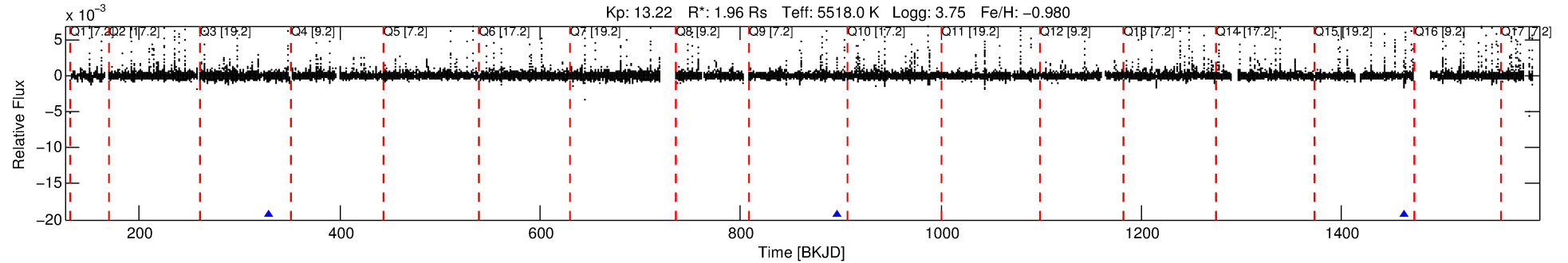
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008678457-06

No Significant Match Found

DV One-Page Summary

KIC: 8678457 Candidate: 6 of 6 Period: 566.800 d



TPS TCE Results:

Period = 566.79971 d
Epoch = 329.1614 BKJD

DV fit results are unavailable

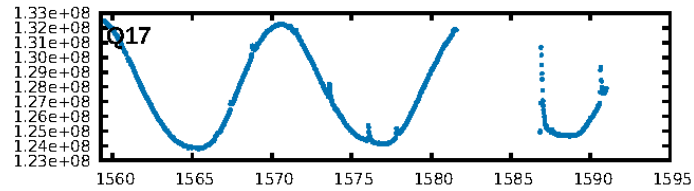
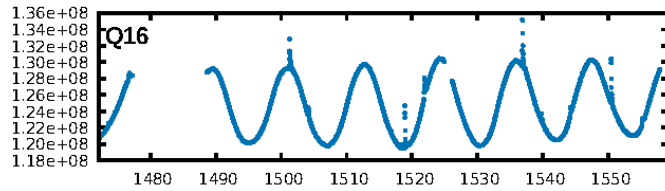
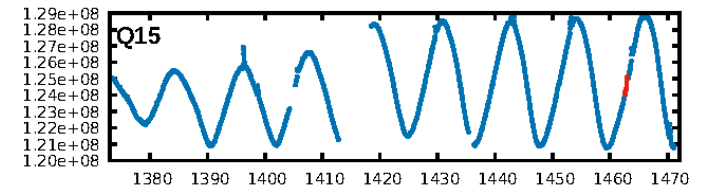
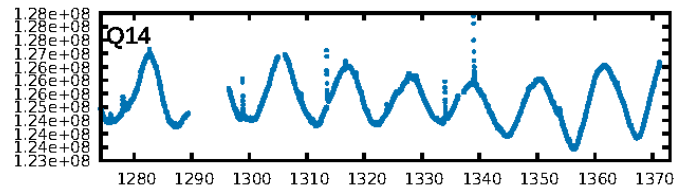
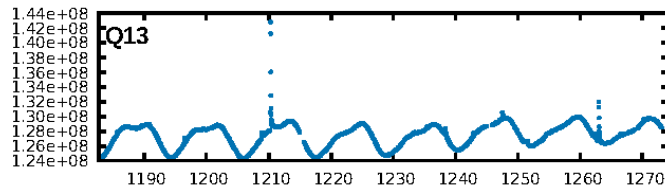
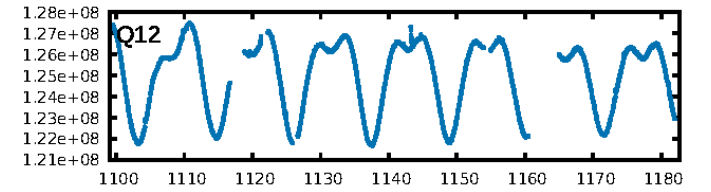
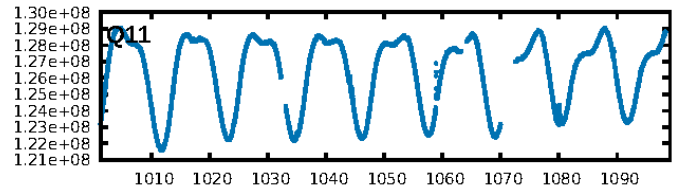
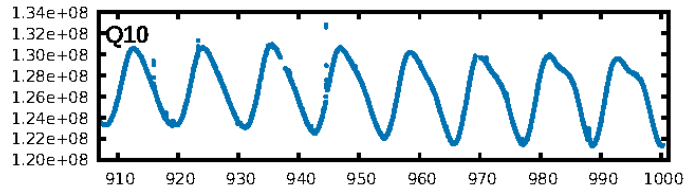
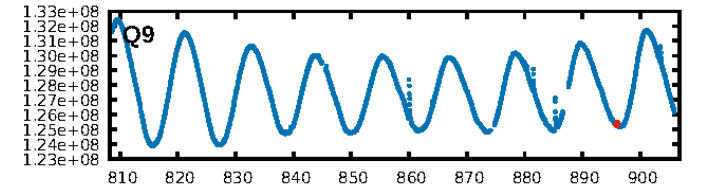
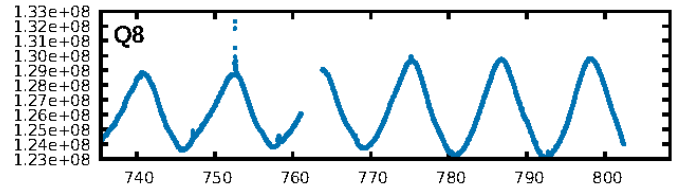
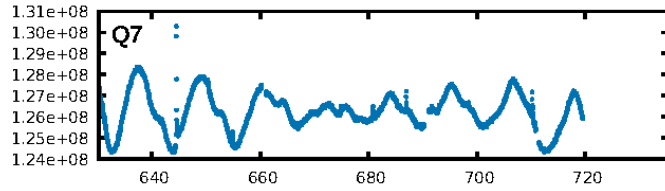
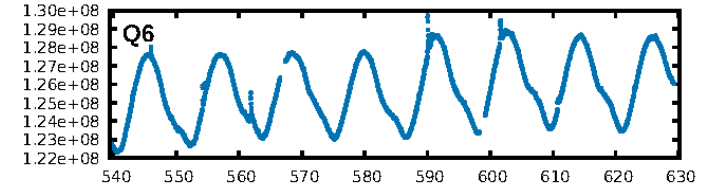
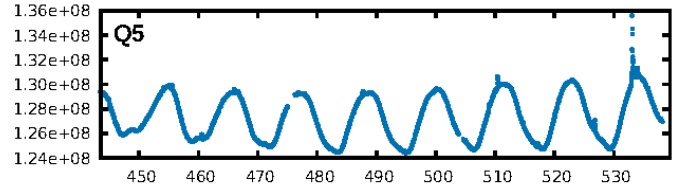
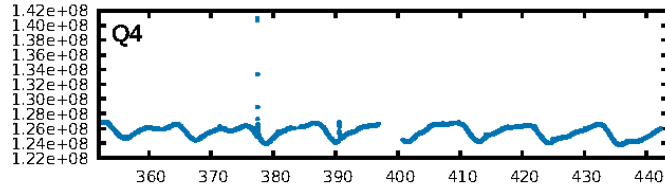
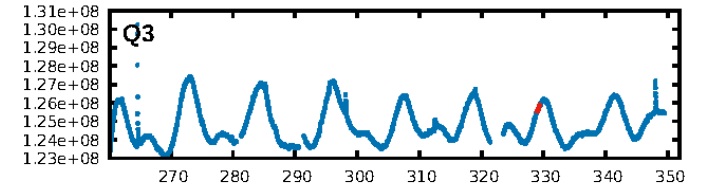
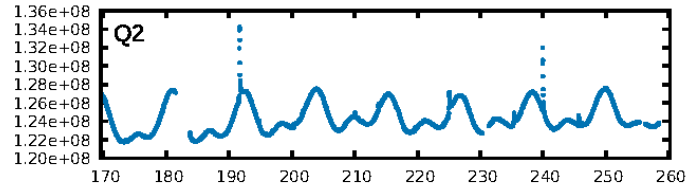
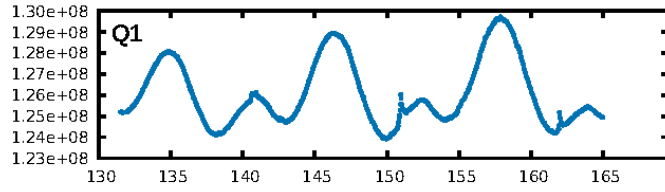
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [118.57σ]
LongPeriod-sig: 100.0% [230.51σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.2557
Centroid-sig: 12.2%
Centroid-so: 0.329 arcsec [1.41σ]
OotOffset-rm: 0.310 arcsec [1.30σ]
KicOffset-rm: 0.405 arcsec [1.49σ]
OotOffset-st: 0/2/0/1 [3]
KicOffset-st: 0/2/0/1 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [3/3]

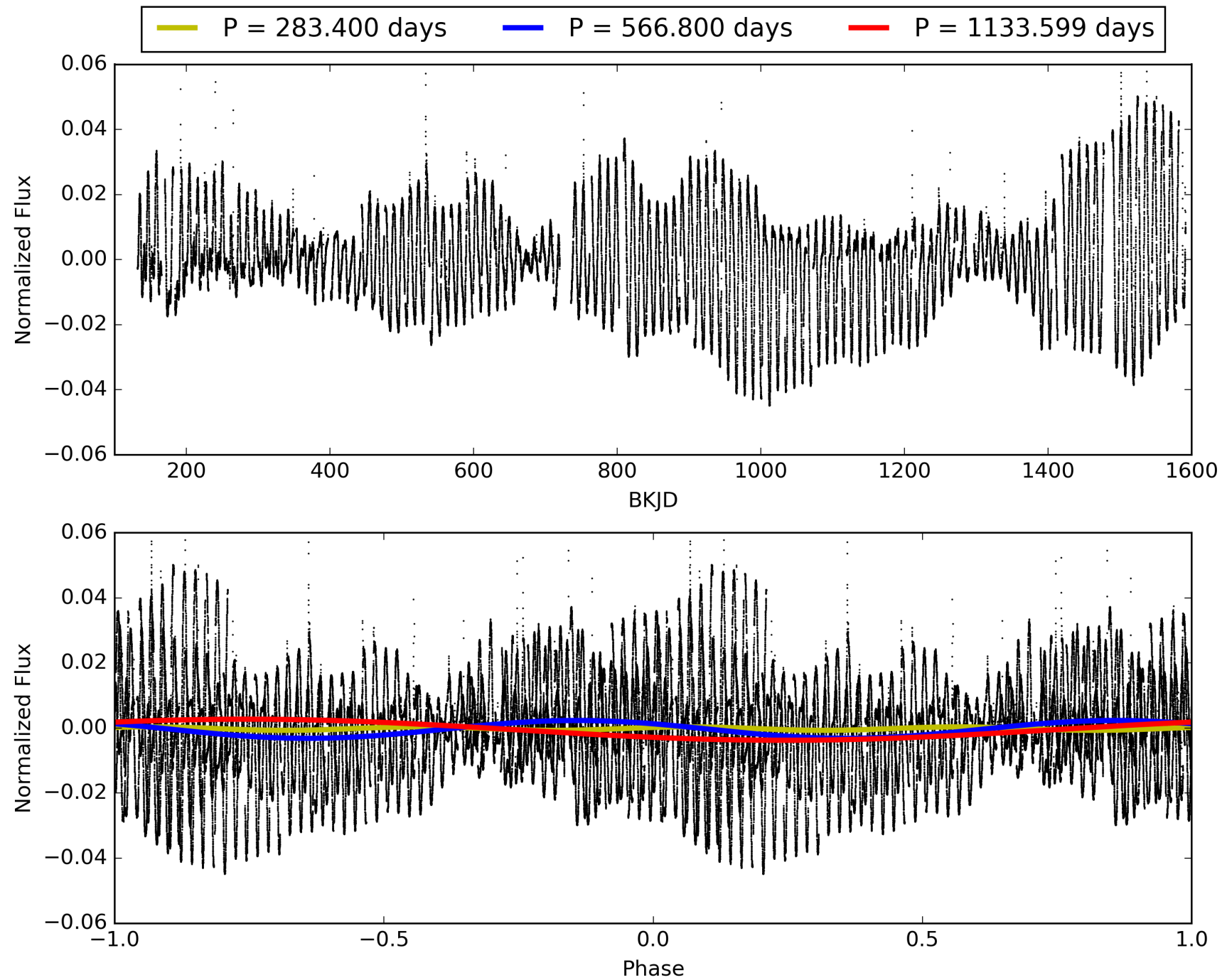
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:21:00 Z

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

TCE 008678457-06, PDC Light Curves

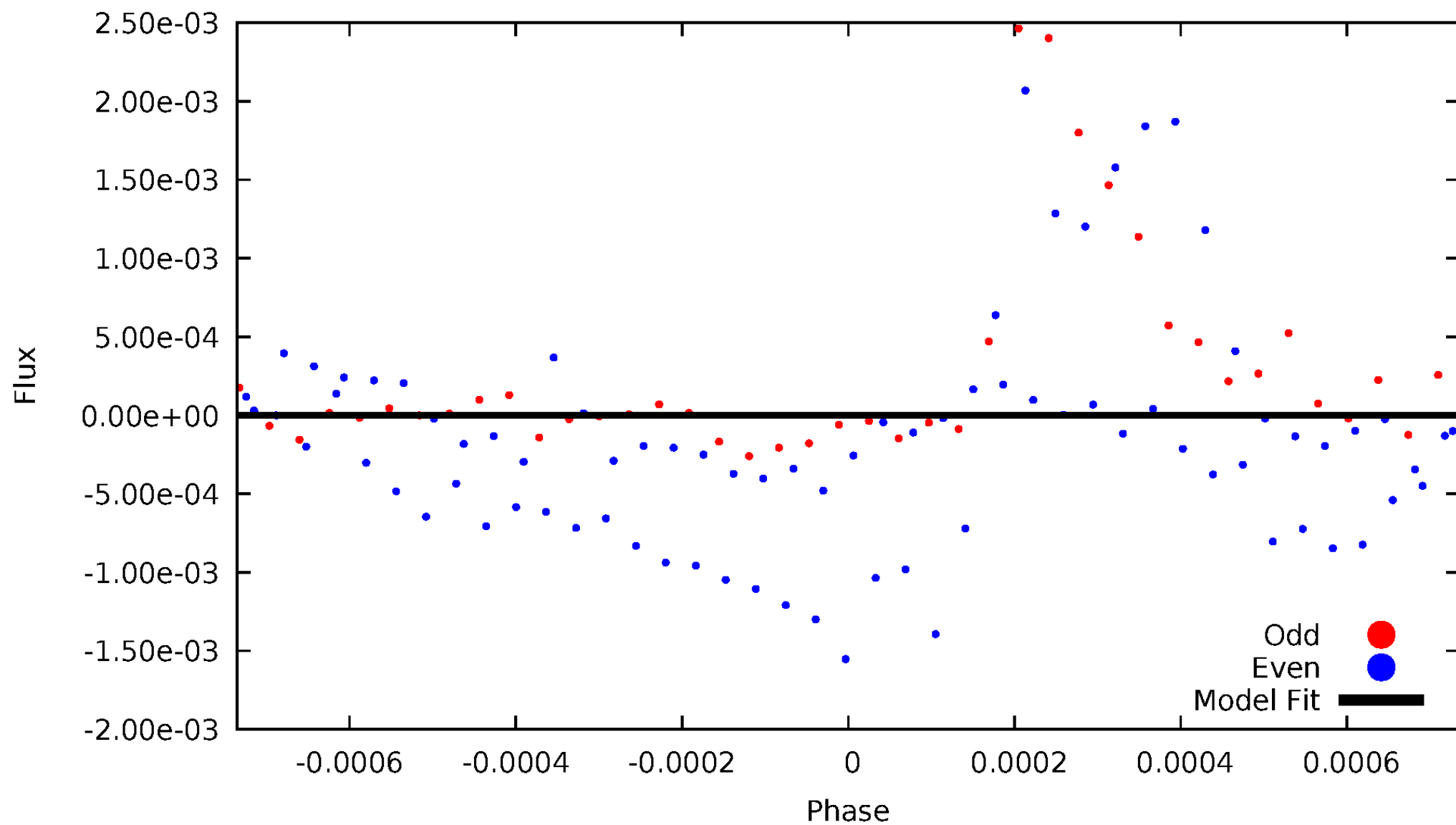


TCE 008678457-06



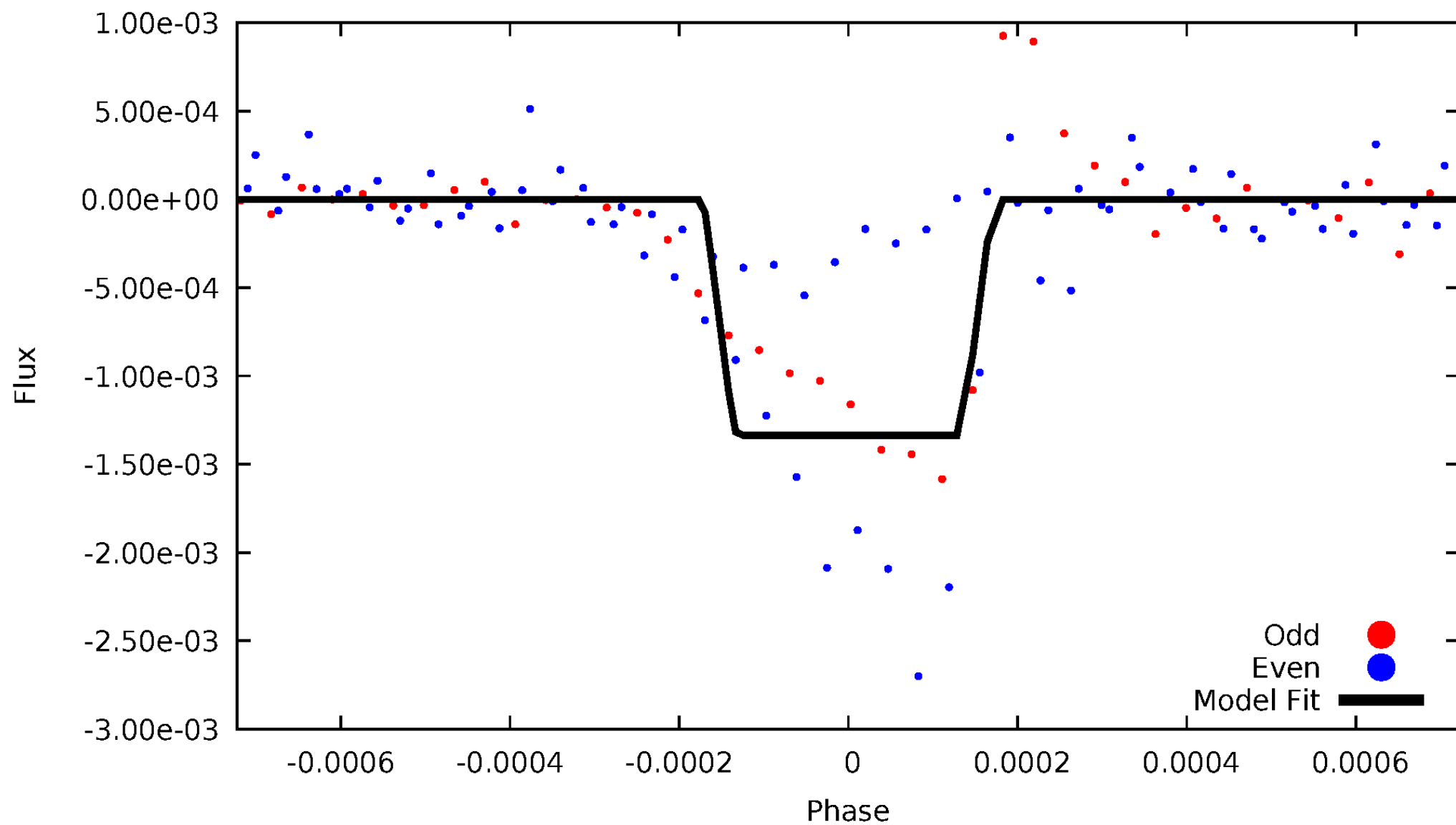
DV Odd/Even

TCE 008678457-06



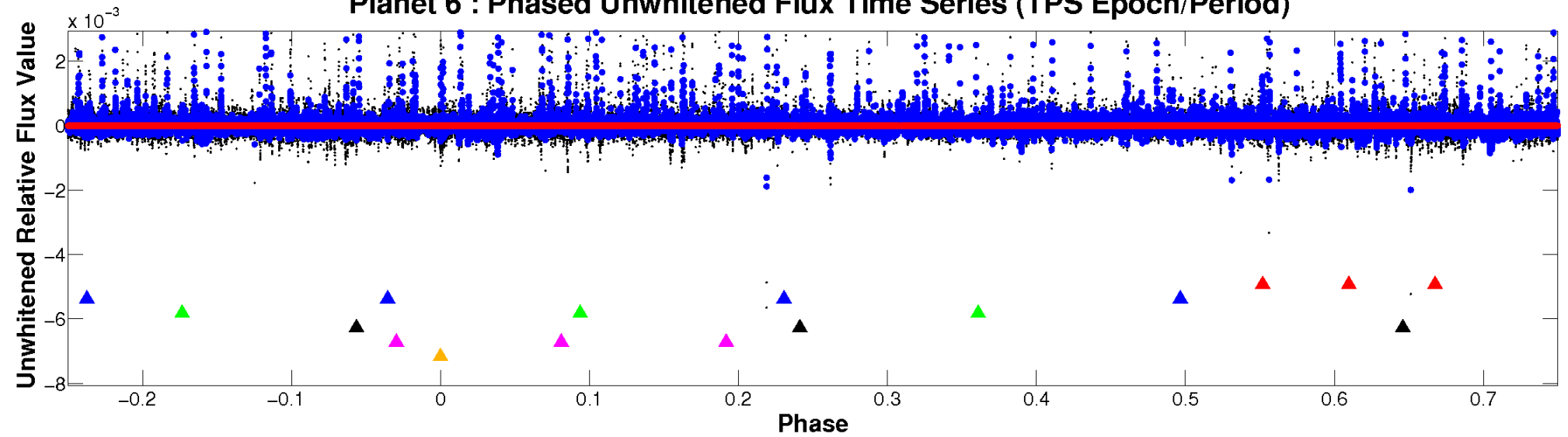
ALT Odd/Even

TCE 008678457-06

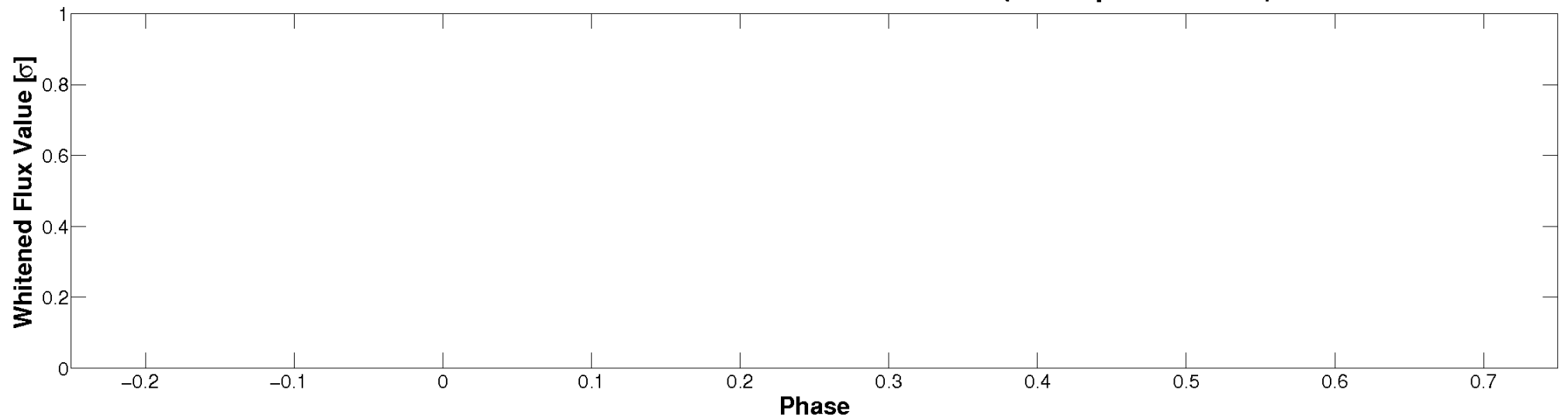


Non-Whitened Vs. Whitened Light Curve

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

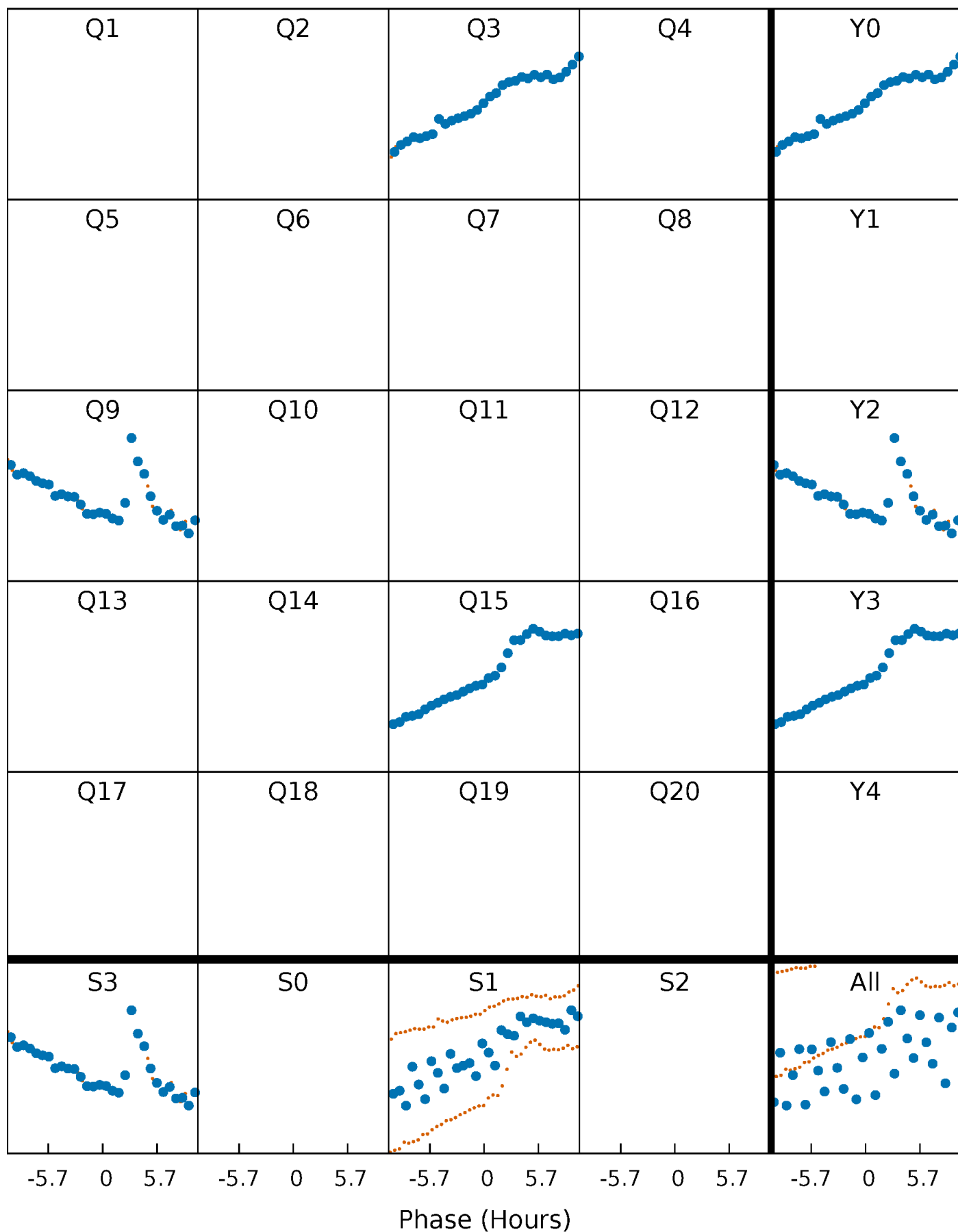


Planet 6 : Phased Whitened Flux Time Series (TPS Epoch/Period)



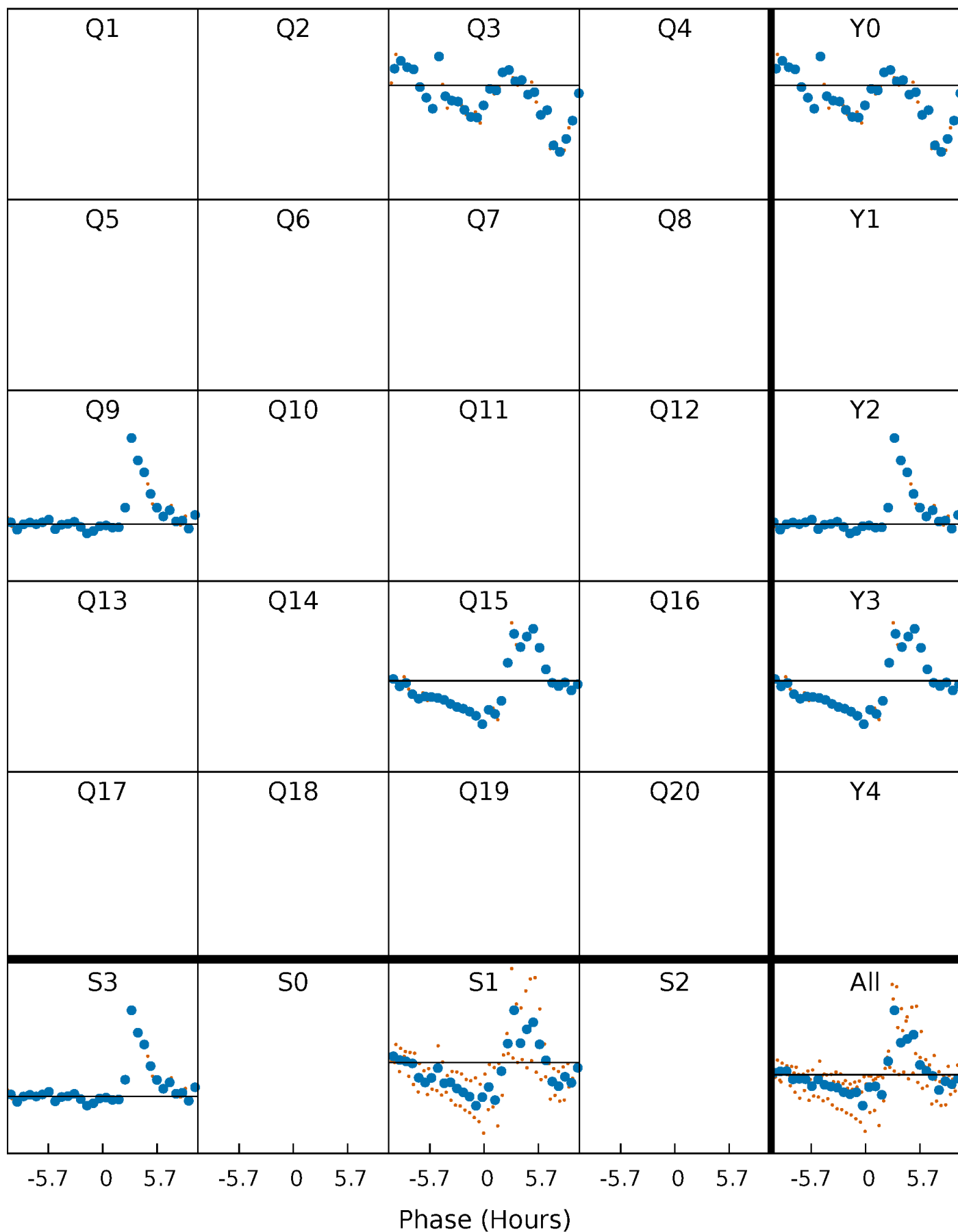
PDC Quarter-Phased Transit Curves

TCE 008678457-06 P=566.799710 Days $T_0=329.161414$ (BKJD)



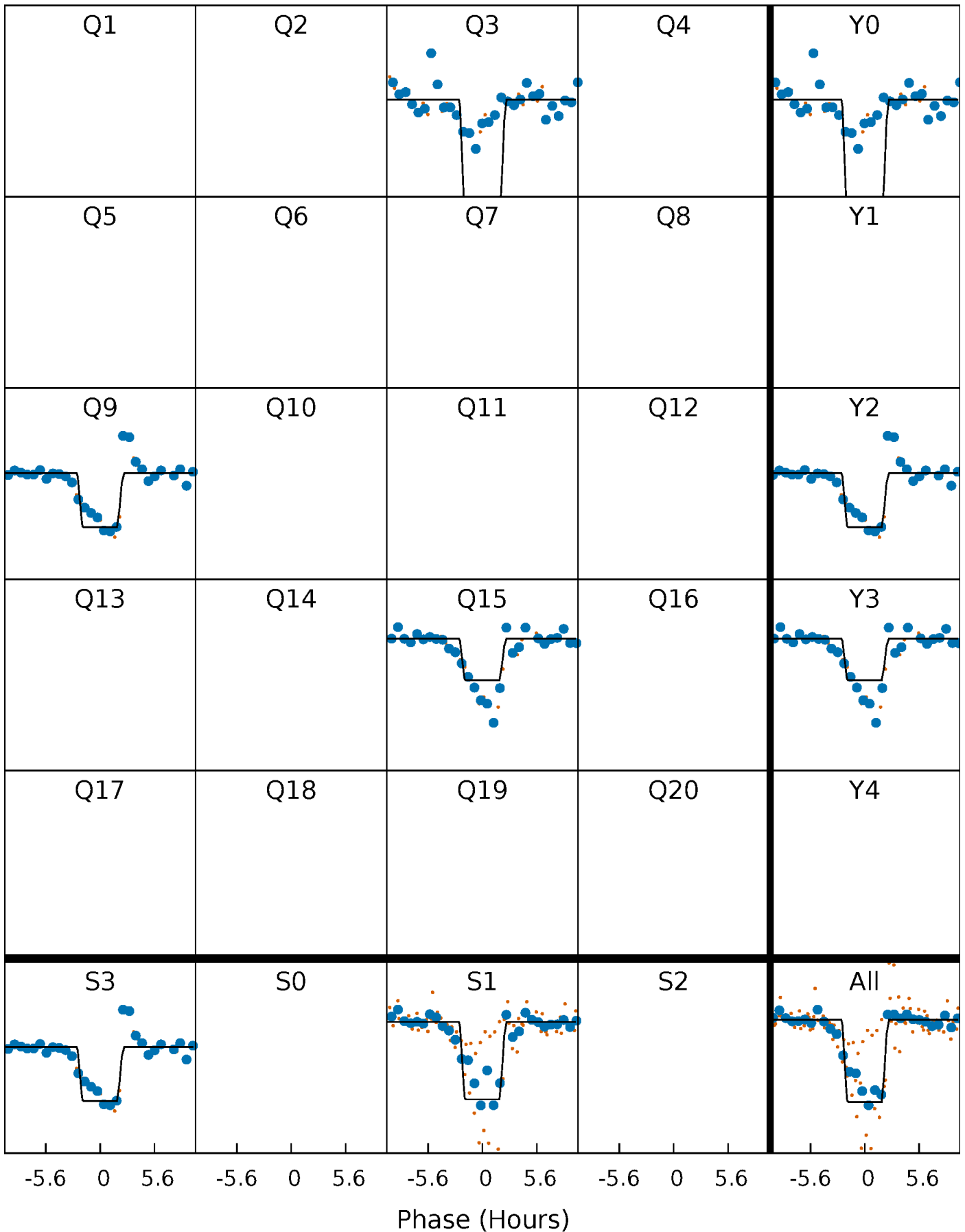
DV Quarter-Phased Transit Curves

TCE 008678457-06 P=566.799710 Days $T_0=329.161414$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

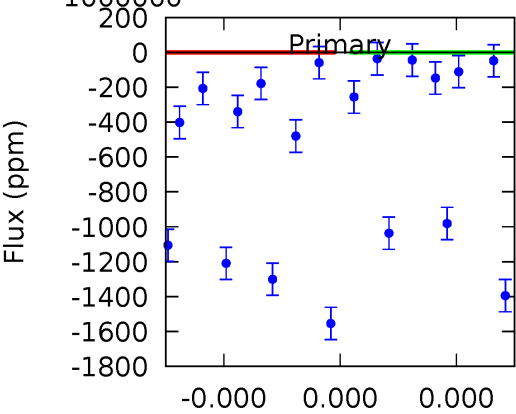
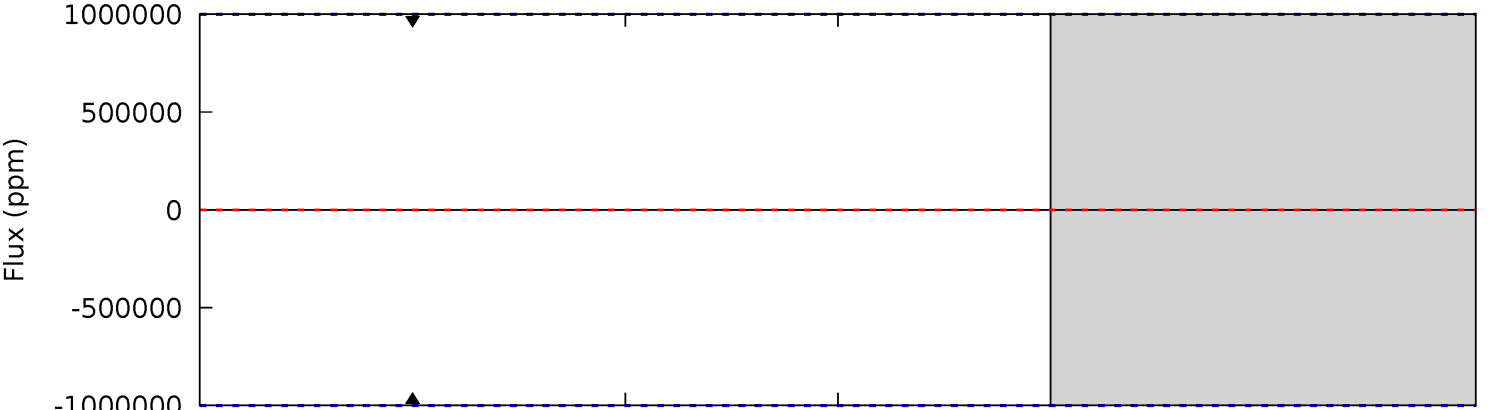
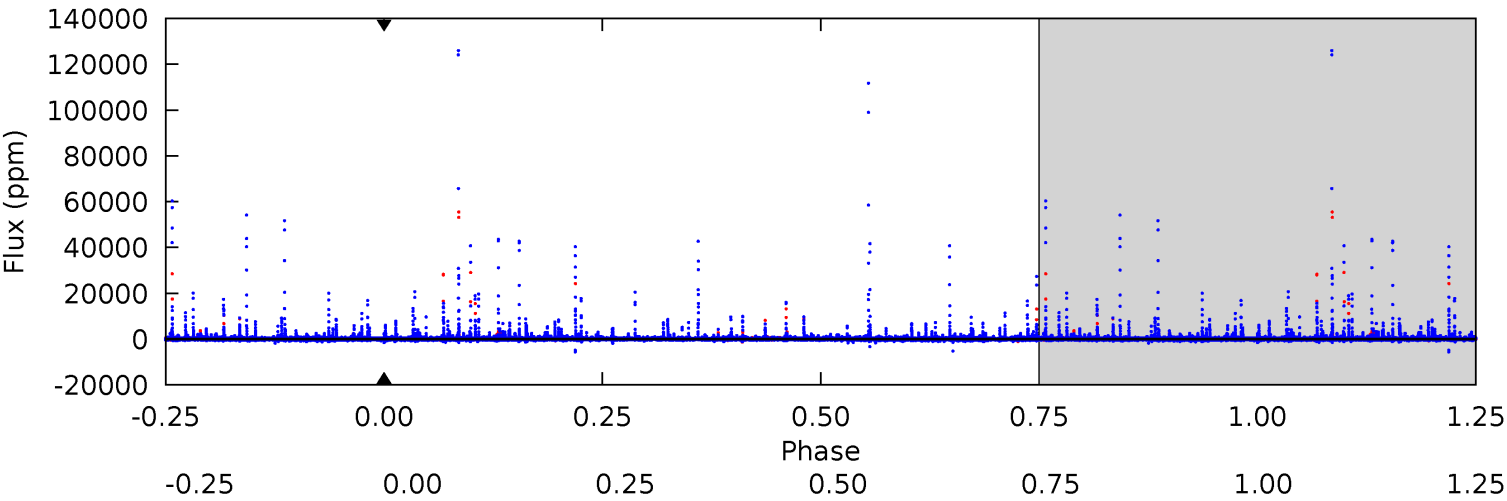
TCE 008678457-06 P=566.799710 Days $T_0=329.173831$ (BKJD)



DV Model-Shift Uniqueness Test

008678457-06, P = 566.799710 Days, E = 329.161414 Days

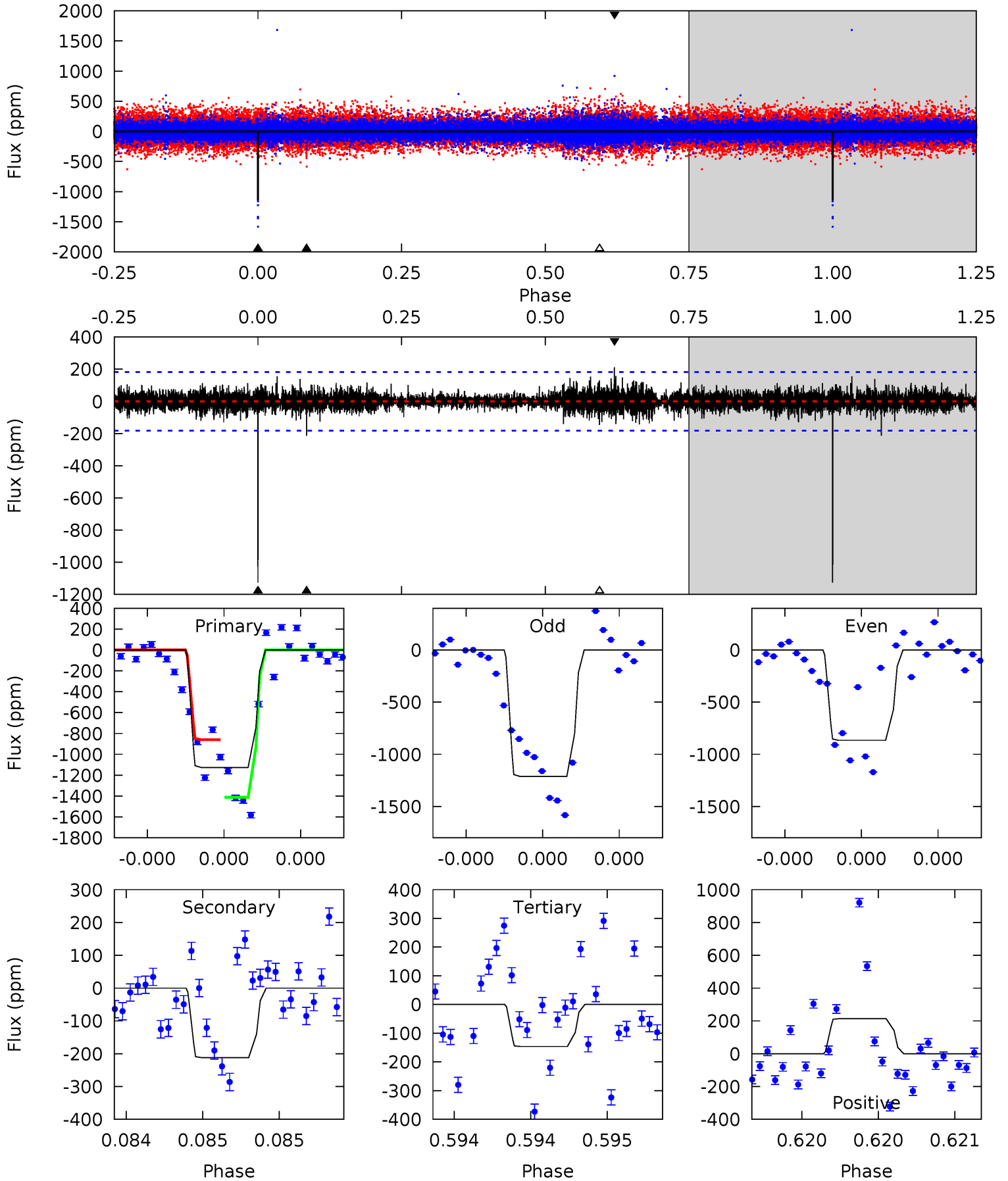
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

008678457-06, P = 566.799710 Days, E = 329.173831 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
34.8	6.56	4.53	6.60	5.63	3.57	0.91	30.3	28.2	2.03	-0.04	6.07	0.92	0.16	8.81



Stellar Parameters For KIC 008678457

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5518^{+197}_{-164}	$3.752^{+0.915}_{-0.366}$	$-0.980^{+0.350}_{-0.250}$	$1.956^{+1.304}_{-1.304}$	$0.787^{+0.207}_{-0.095}$	$0.148^{+2.987}_{-0.104}$
	+4%/-3%	+24%/-10%	+36%/-26%	+67%/-67%	+26%/-12%	+2016%/-70%
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 008678457-06 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	0 ± 1000000	$14.37^{+17.98}_{-10.49}$	418^{+68}_{-77}	-4494^{+21275}_{-15617}	$-5582.269^{+609393.249}_{-999018.085}$
Alt.	-212 ± 32	$16.38^{+18.08}_{-11.28}$	424^{+71}_{-77}	3000^{+1135}_{-495}	700^{+6232}_{-549}

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

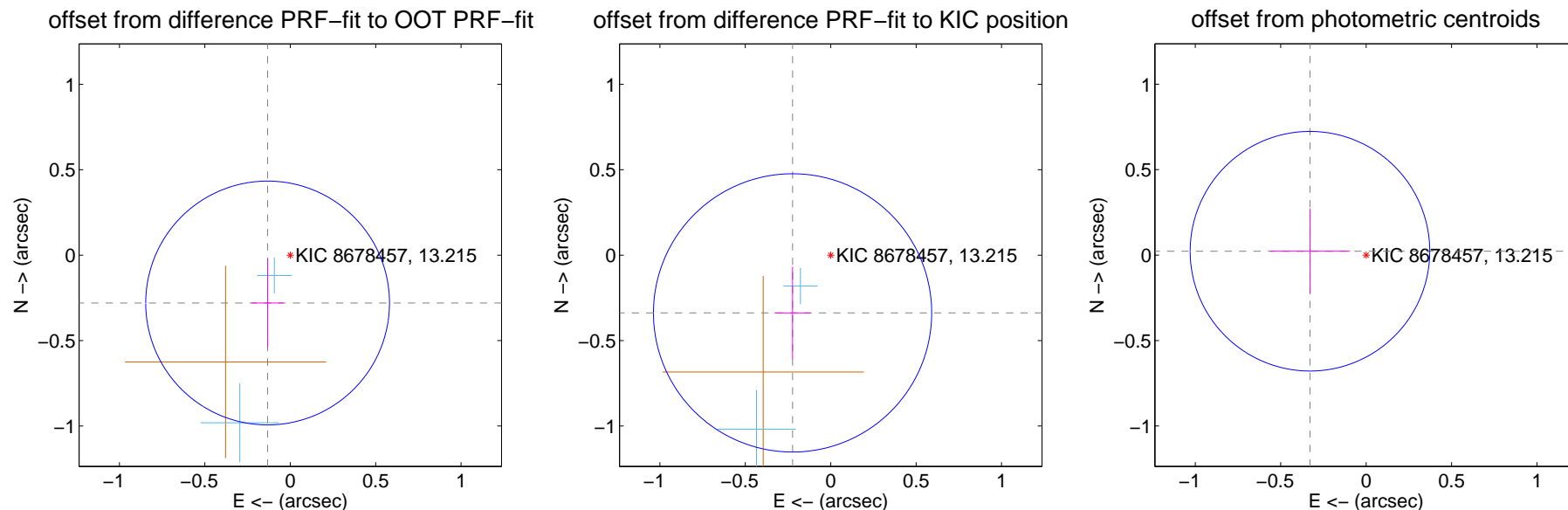
DV Centroid Data

Supplemental centroid analysis for 008678457-06. Kepler magnitude: 13.21. Transit SNR -1.00

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.310 ± 0.238	1.30	0.133 ± 0.094	-0.280 ± 0.259
PRF-fit source offset from KIC position	0.405 ± 0.271	1.49	0.223 ± 0.106	-0.338 ± 0.270
photometric centroid source offset	0.33 ± 0.23	1.41	0.33 ± 0.23	0.02 ± 0.25



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



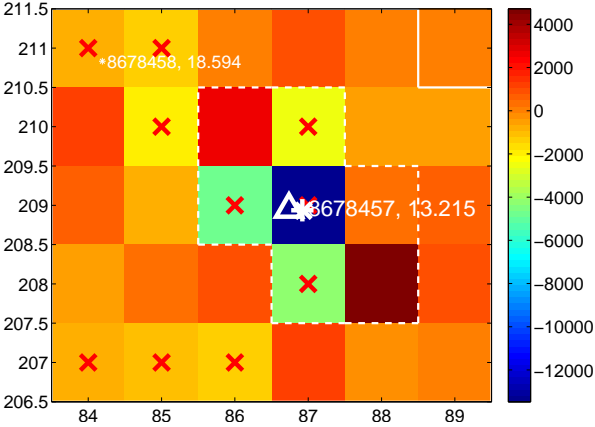
Q2 no difference image



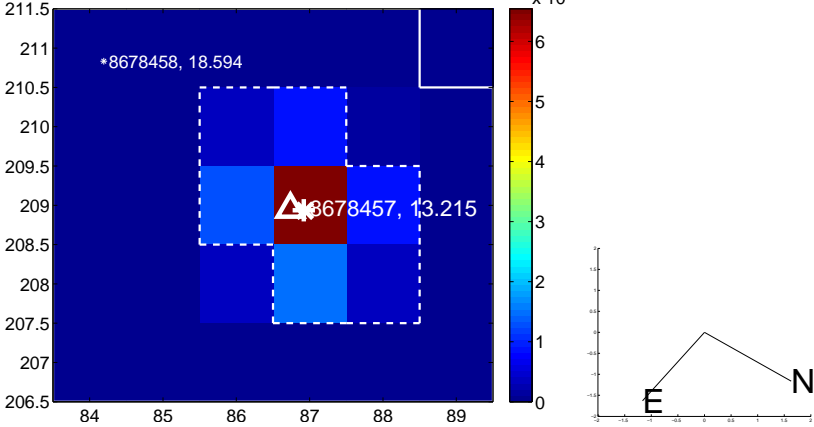
Q2 no OOT image



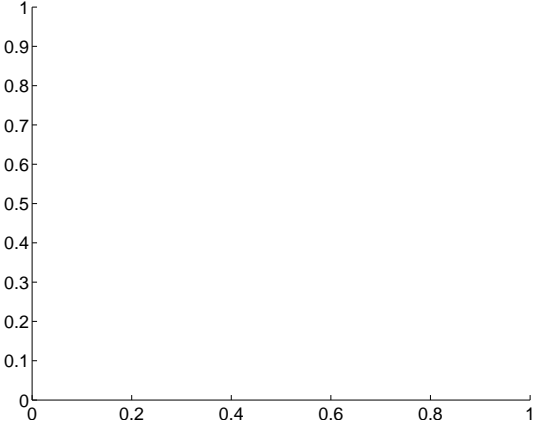
Q3 difference image. Poor Quality



Q3 OOT image



Q4 no difference image



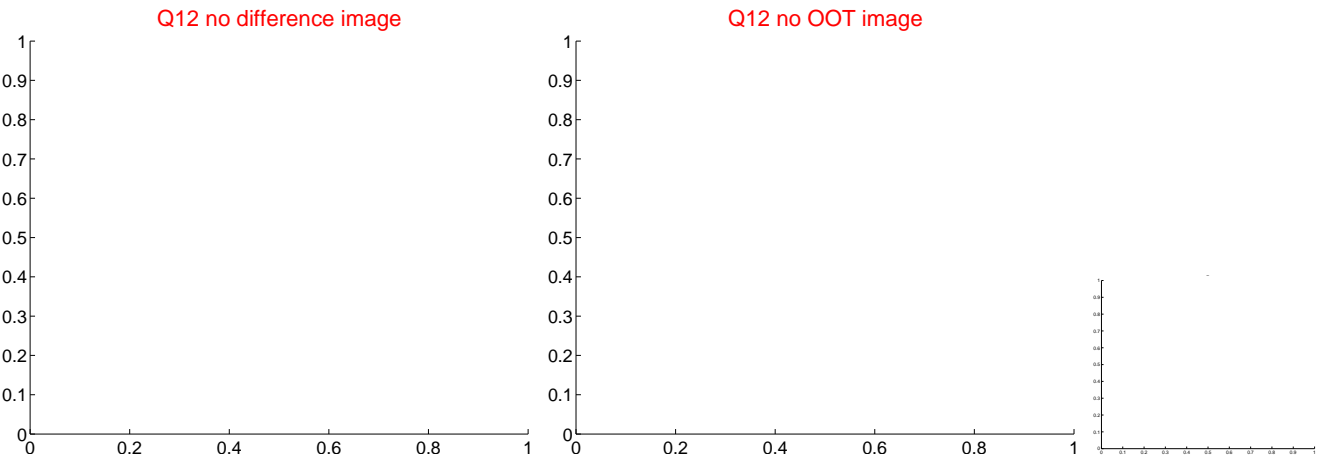
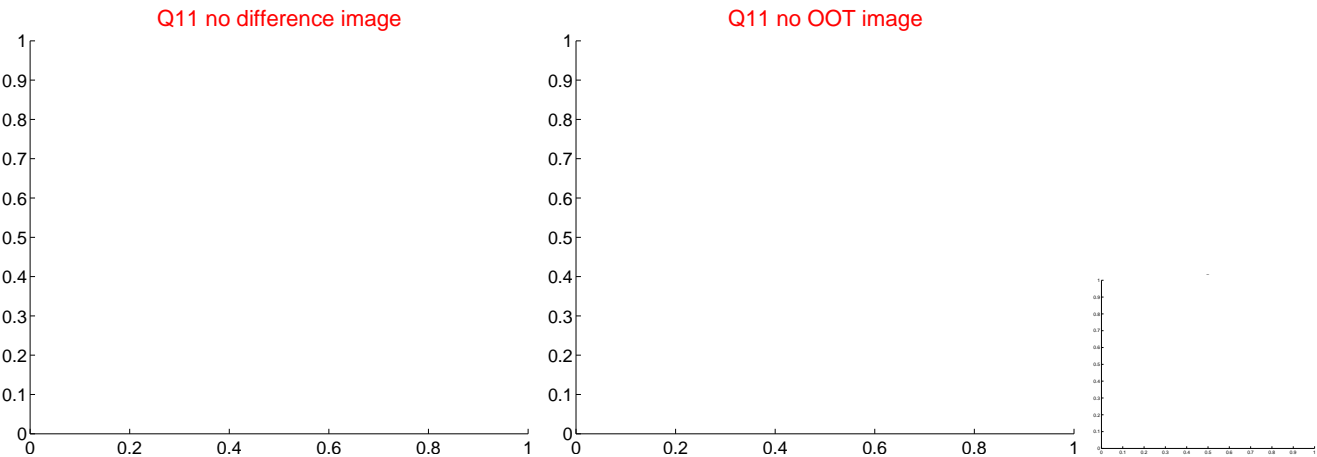
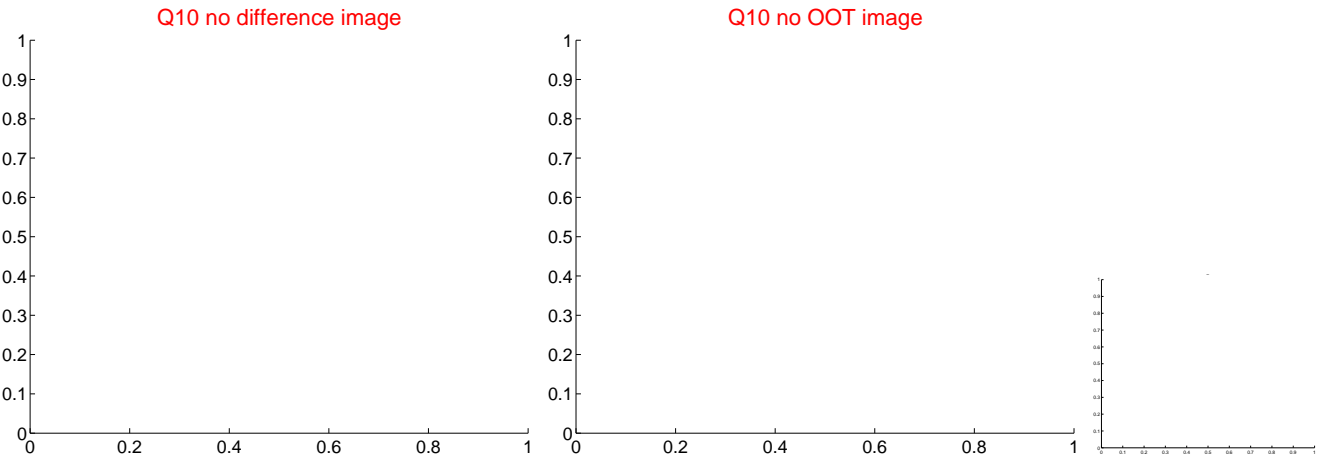
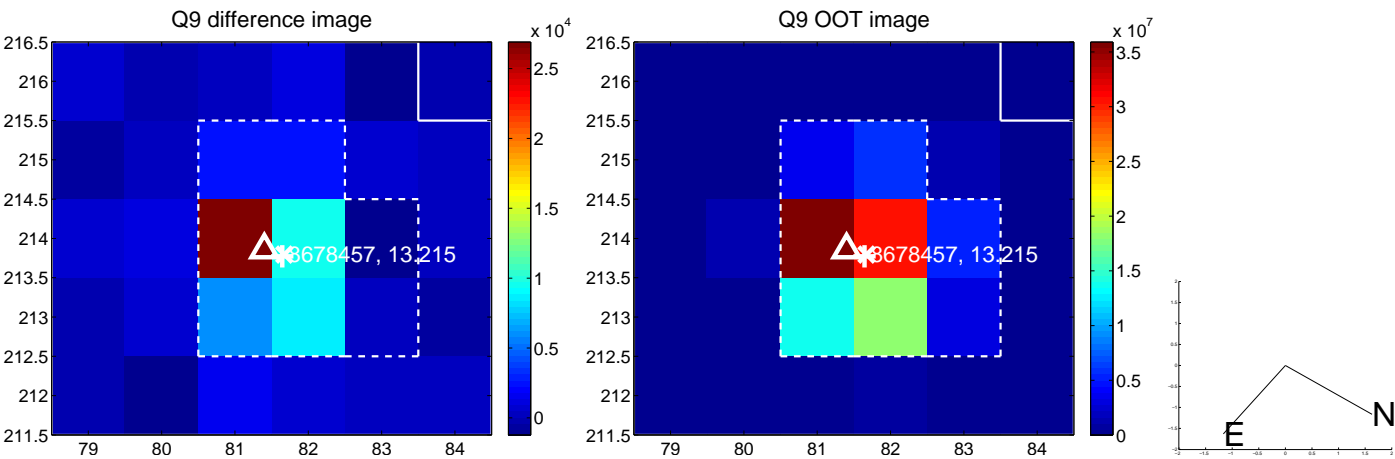
Q4 no OOT image



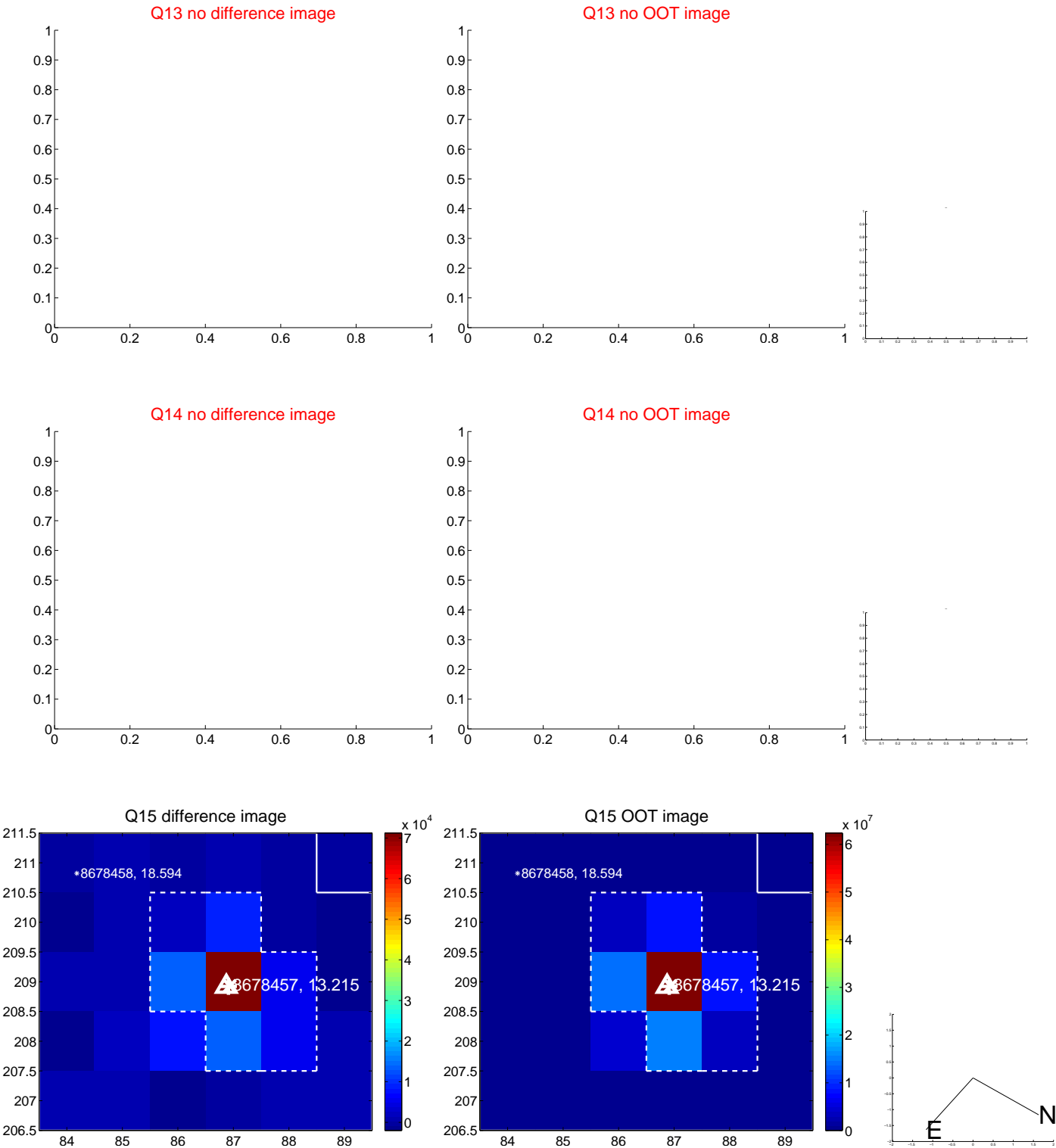
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



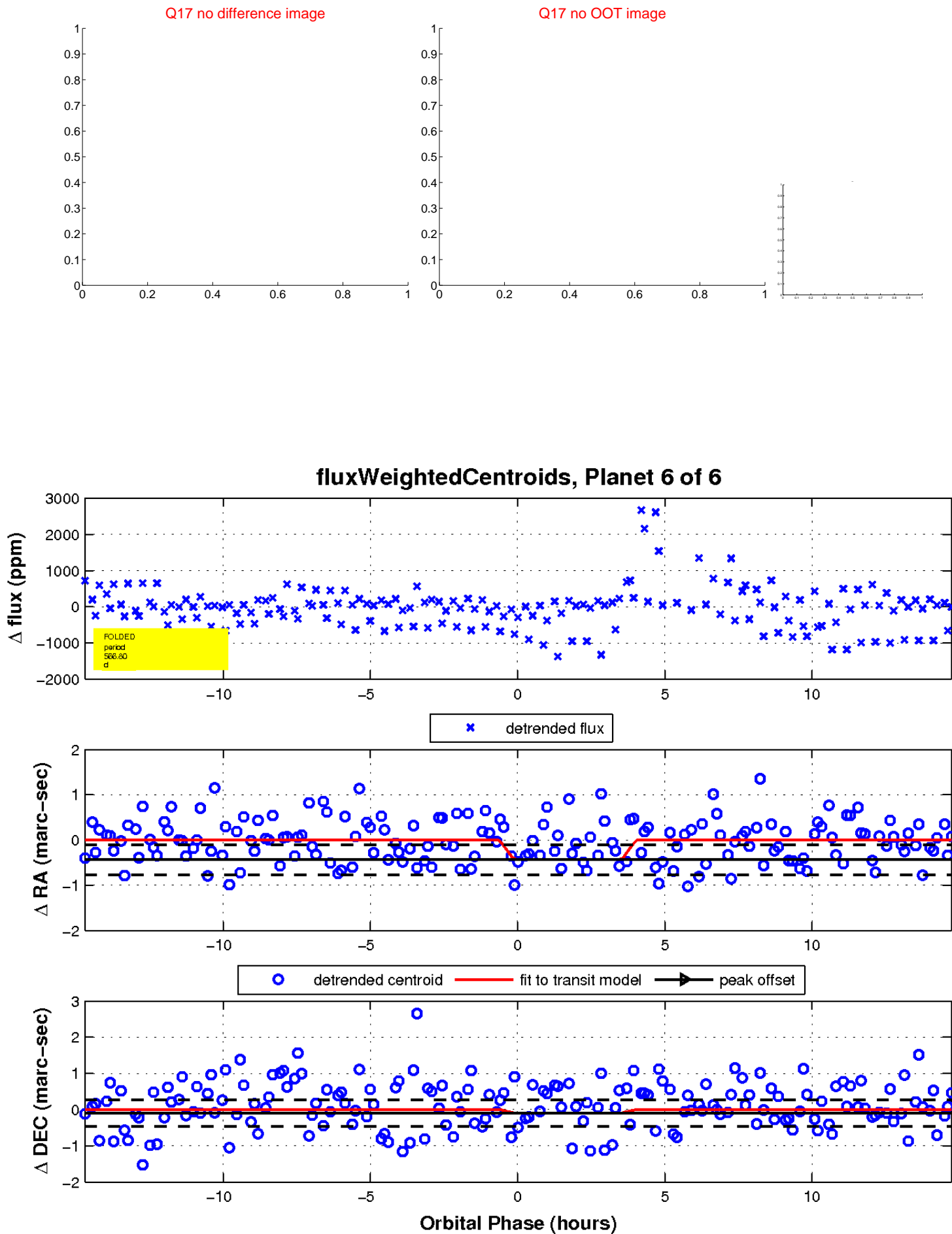
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

