

KIC 004768846

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})
004768846-01	OBS	2077.01	1.254849	132.178909	90.7	2.339	24.4	27.5	2.57	6168	2.88	13495.75
004768846-02	OBS	No	1.254859	131.550876	34.0	2.479	10.8	10.9	2.57	6168	1.77	13495.61
004768846-03	OBS	No	360.979355	249.502132	158.6	0.694	9.1	1.5	2.57	6168	3.54	7.11
004768846-04	OBS	No	152.177645	182.444874	134.5	9.969	9.1	2.7	2.57	6168	3.34	22.48

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004768846-01	OBS	FP	0.00	0	1	1	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_RESOLVED_OFFSET—HALO_GHOST
004768846-02	OBS	FP	0.00	1	1	1	0	IS_SEC_TCE—CENT_RESOLVED_OFFSET—HALO_GHOST
004768846-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_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—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004768846-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—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

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

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

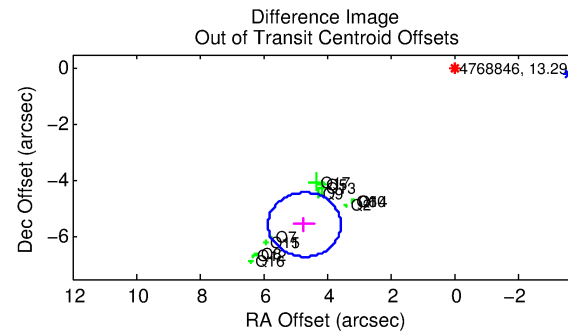
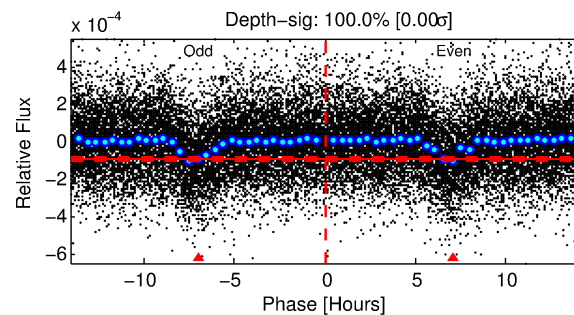
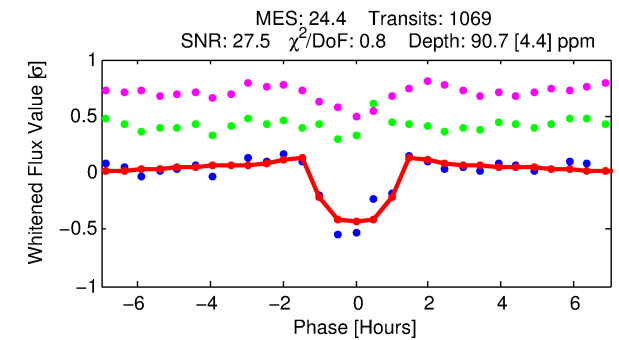
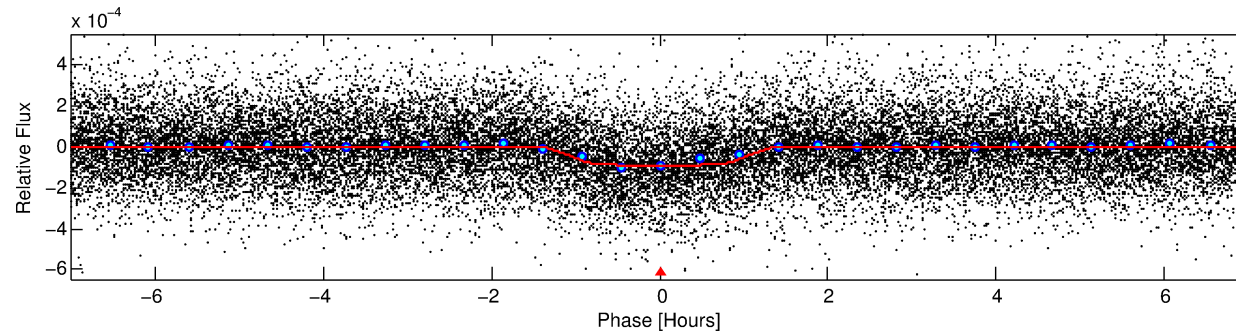
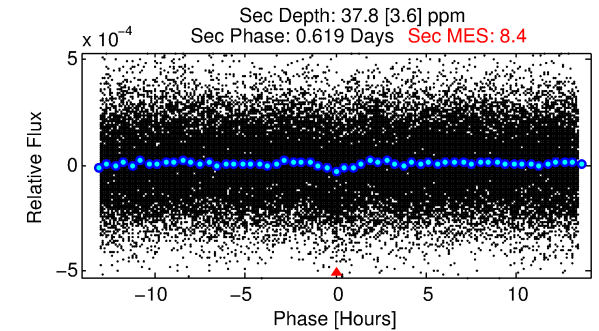
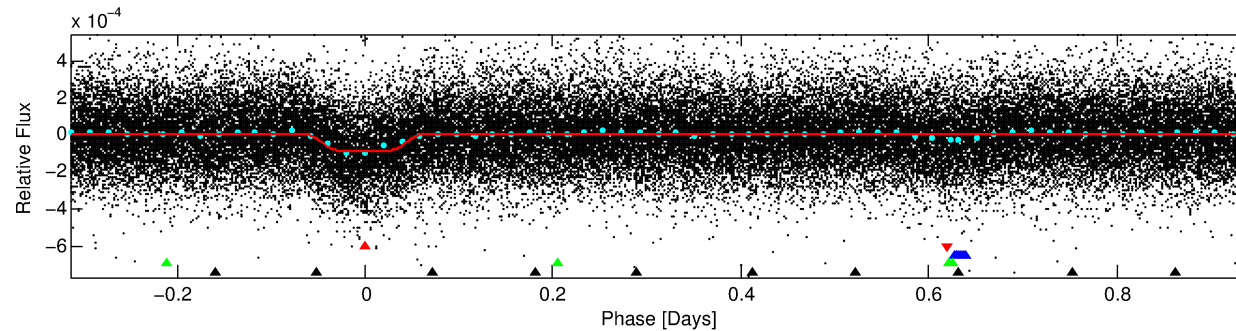
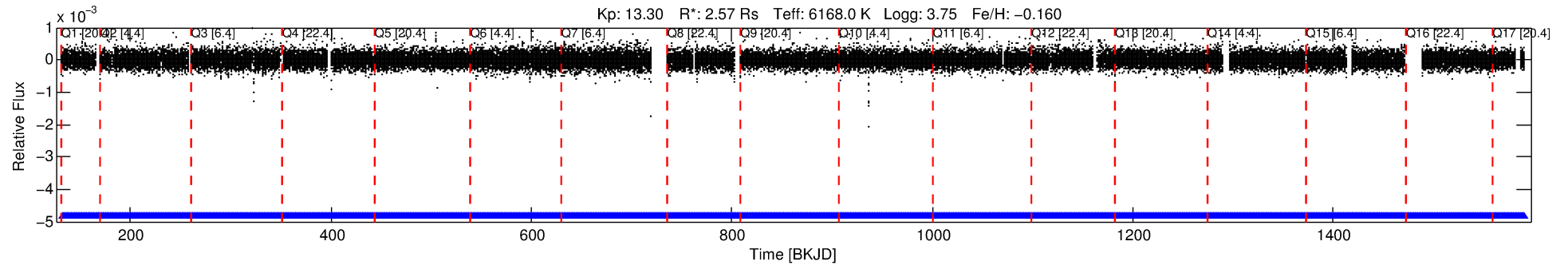
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004768846-01

No Significant Match Found

DV One-Page Summary

KIC: 4768846 Candidate: 1 of 4 Period: 1.255 d
KOI: K02077.01 Corr: 0.947



DV Fit Results:

Period = 1.25485 [0.00000] d
Epoch = 132.1789 [0.0009] BKJD
Rp/R* = 0.0103 [0.0019]
a/R* = 2.10 [1.62]
b = 0.90 [0.21]
Seff = 13495.75 [7359.23]
Teq = 2748 [375] K
Rp = 2.88 [1.20] Re
a = 0.0252 [0.0086] AU
Ag = 1.60 [1.05] [0.57σ]
Teff = 4776 [473] K [3.36σ]

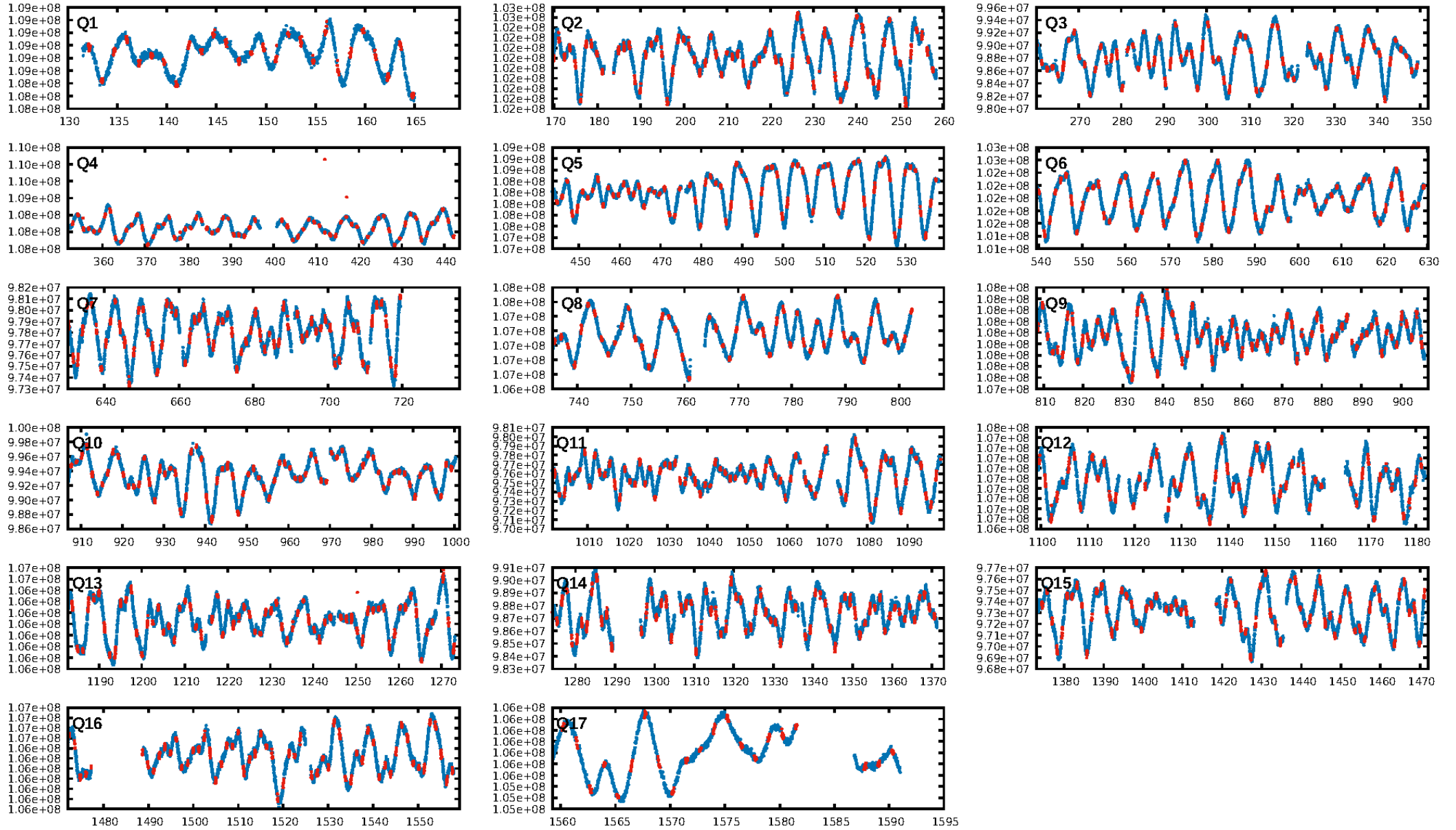
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGoF-sig: N/A
Bootstrap-pfa: 1.68e-112
RollingBand-fgt: 1.00 [1021/1021]
GhostDiagnostic-chr: -0.07492
Centroid-sig: 0.0%
Centroid-so: 6.015 arcsec [15.11σ]
OotOffset-rm: 7.288 arcsec [19.12σ]
KicOffset-rm: 7.537 arcsec [19.25σ]
OotOffset-st: 4/3/3/4 [14]
KicOffset-st: 4/3/3/4 [14]
DiffImageQuality-fgm: 1.00 [14/14]
DiffImageOverlap-fno: 1.00 [17/17]

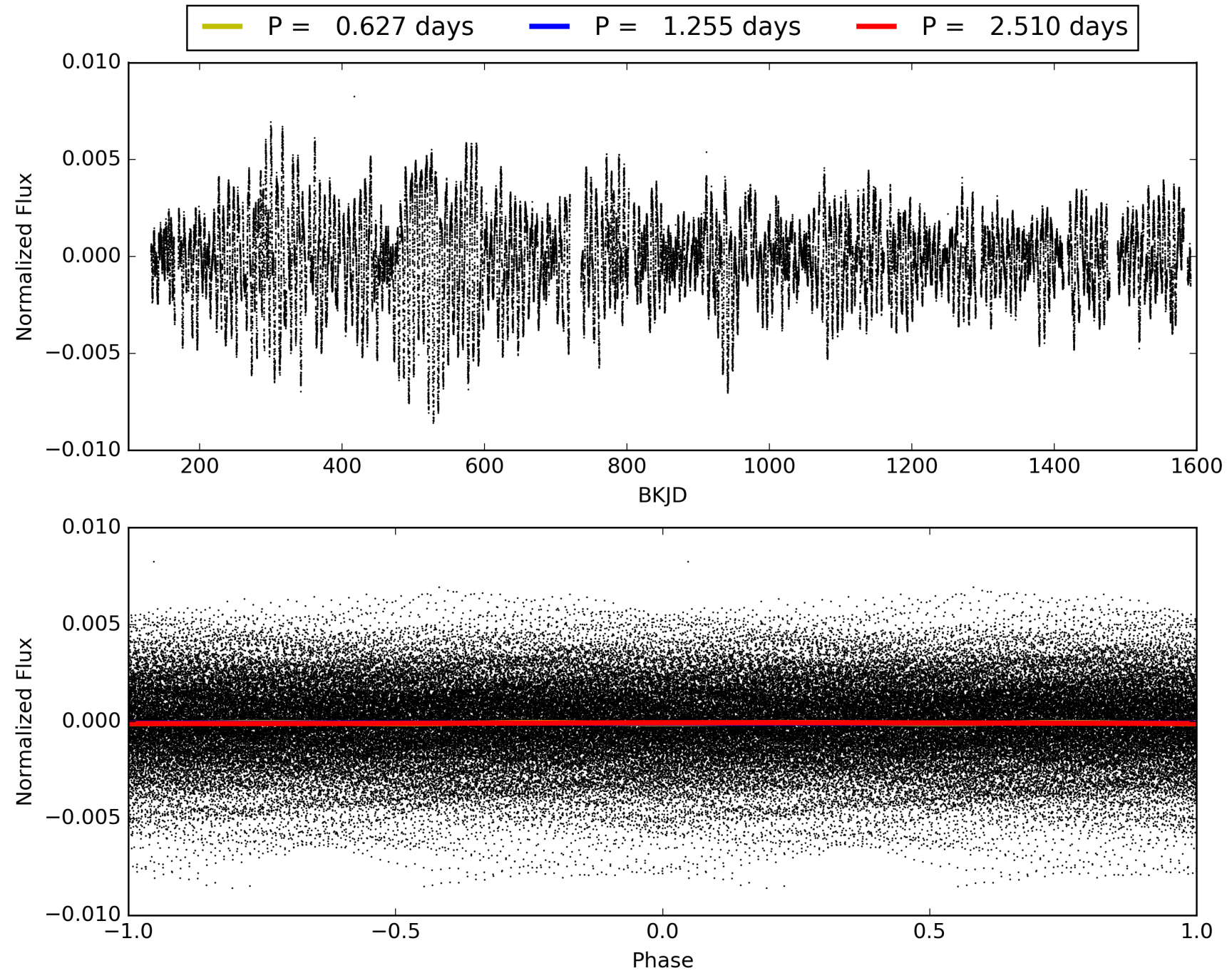
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 004768846-01, PDC Light Curves

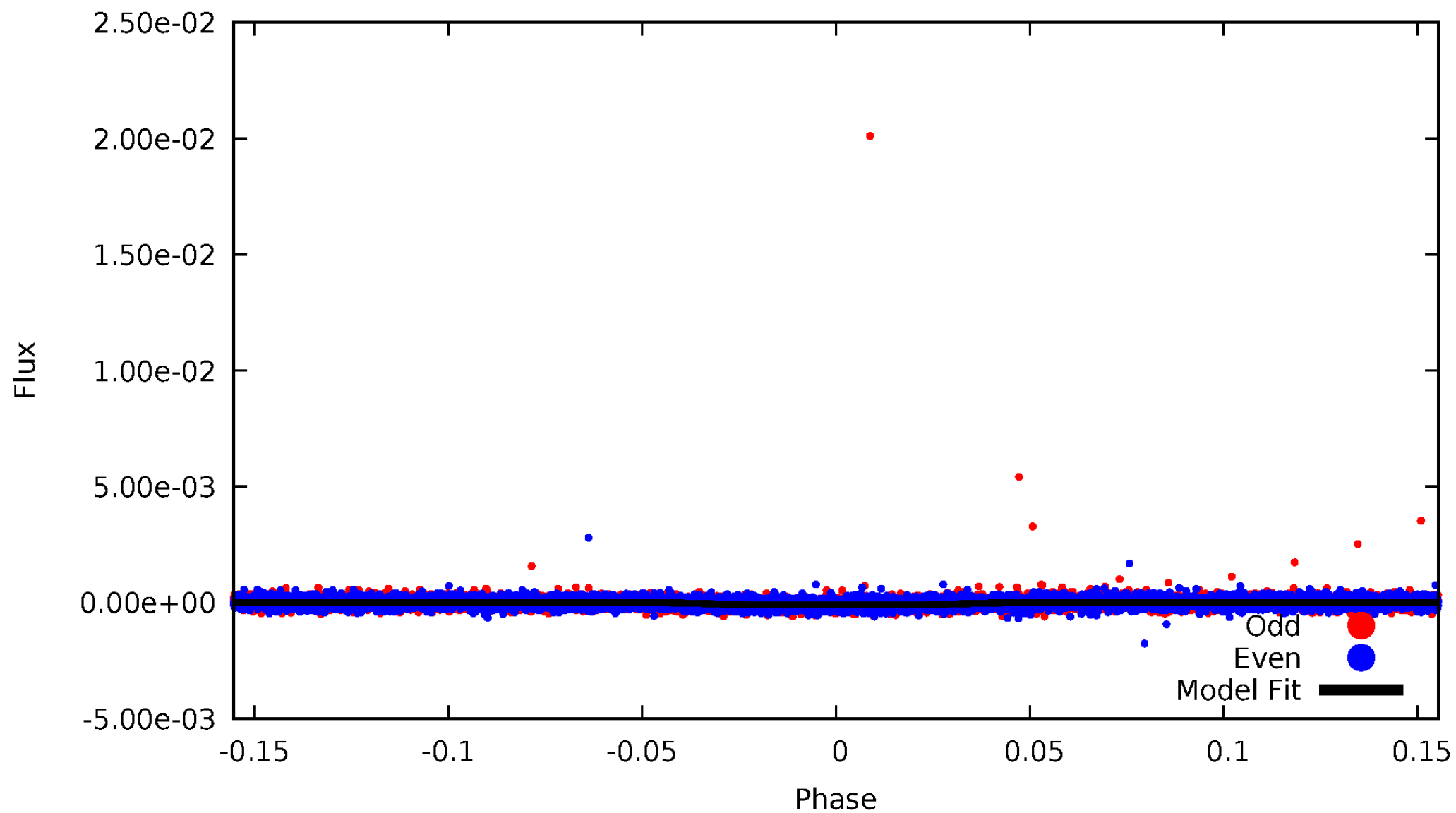


TCE 004768846-01



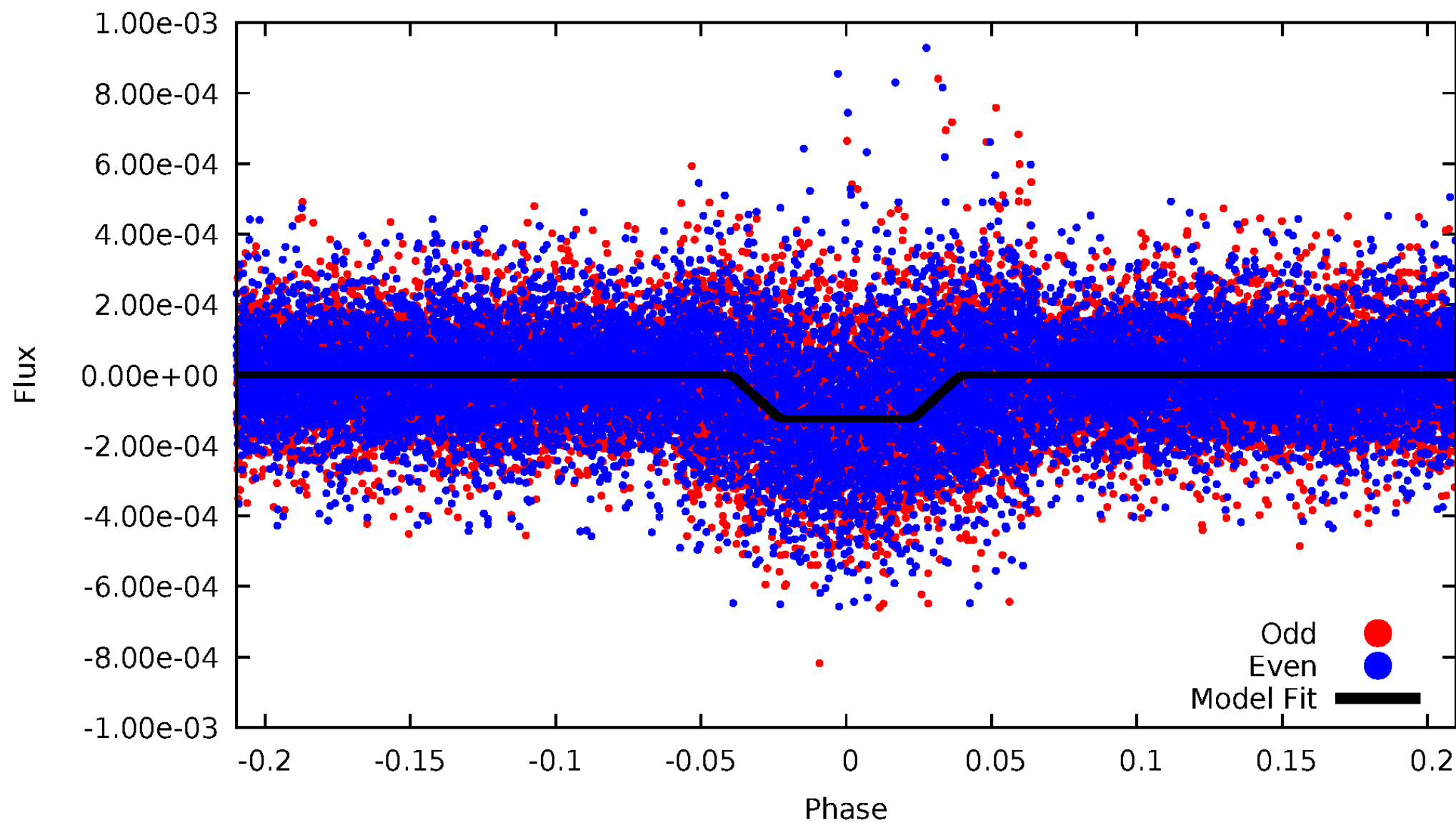
DV Odd/Even

TCE 004768846-01

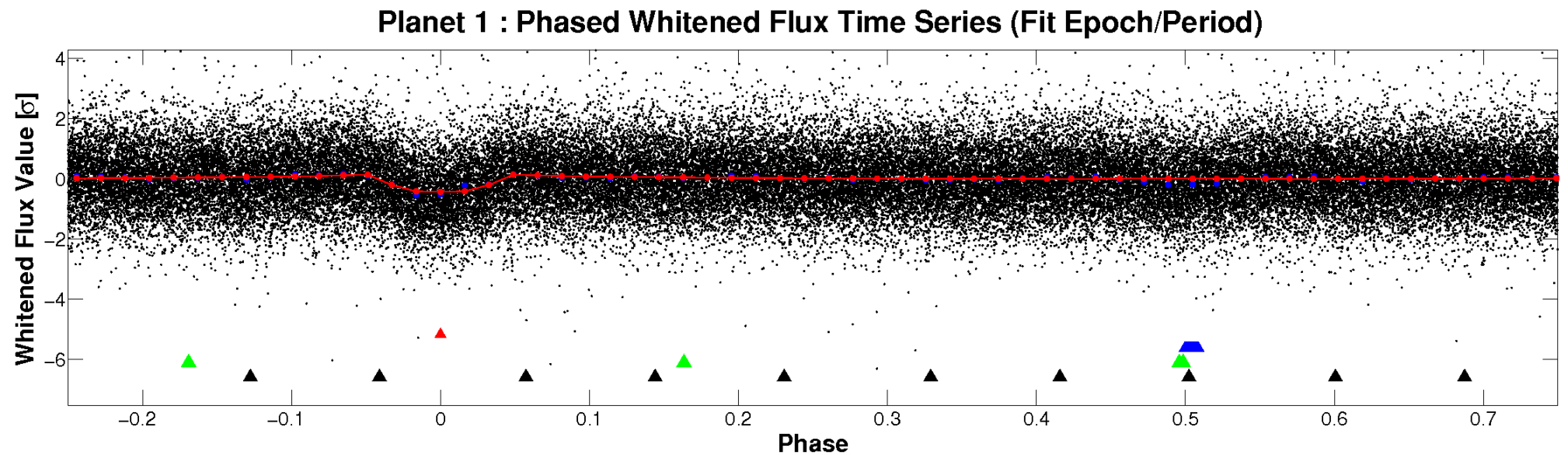
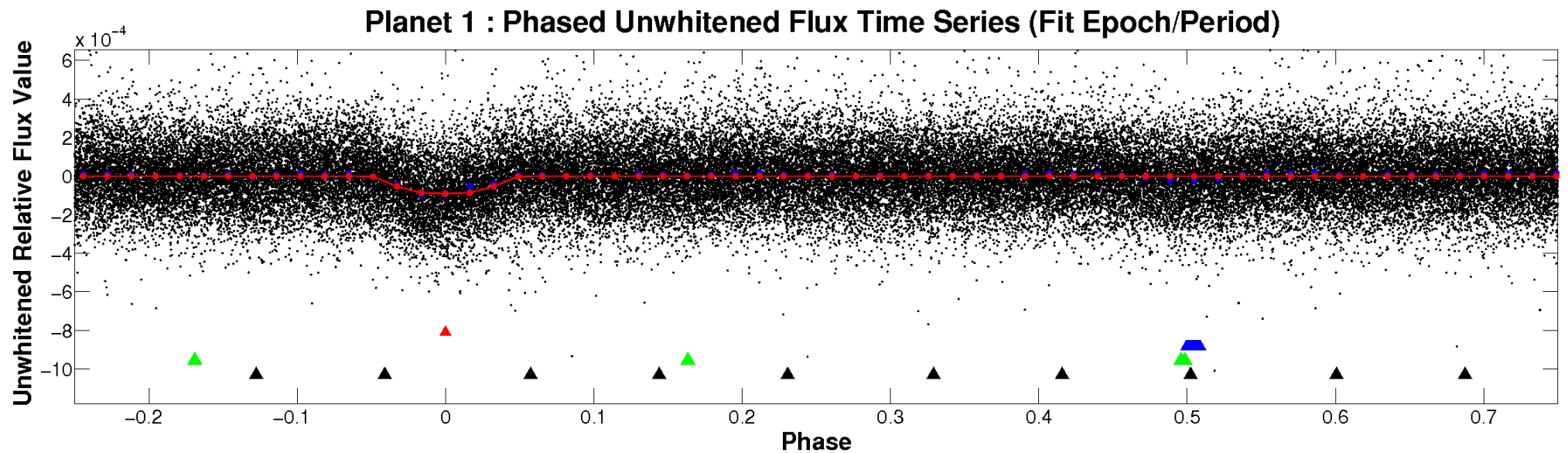


ALT Odd/Even

TCE 004768846-01

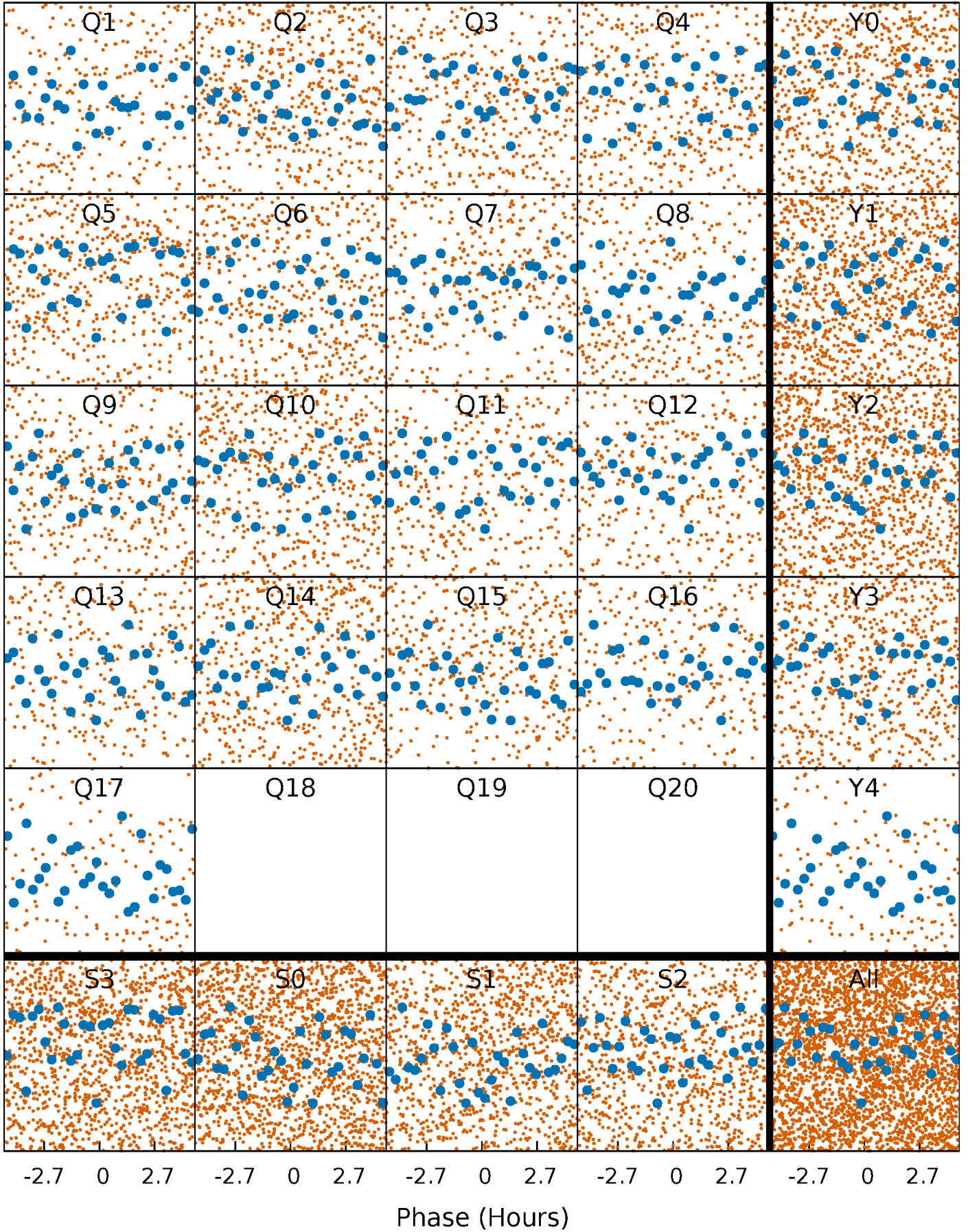


Non-Whitened Vs. Whitened Light Curve



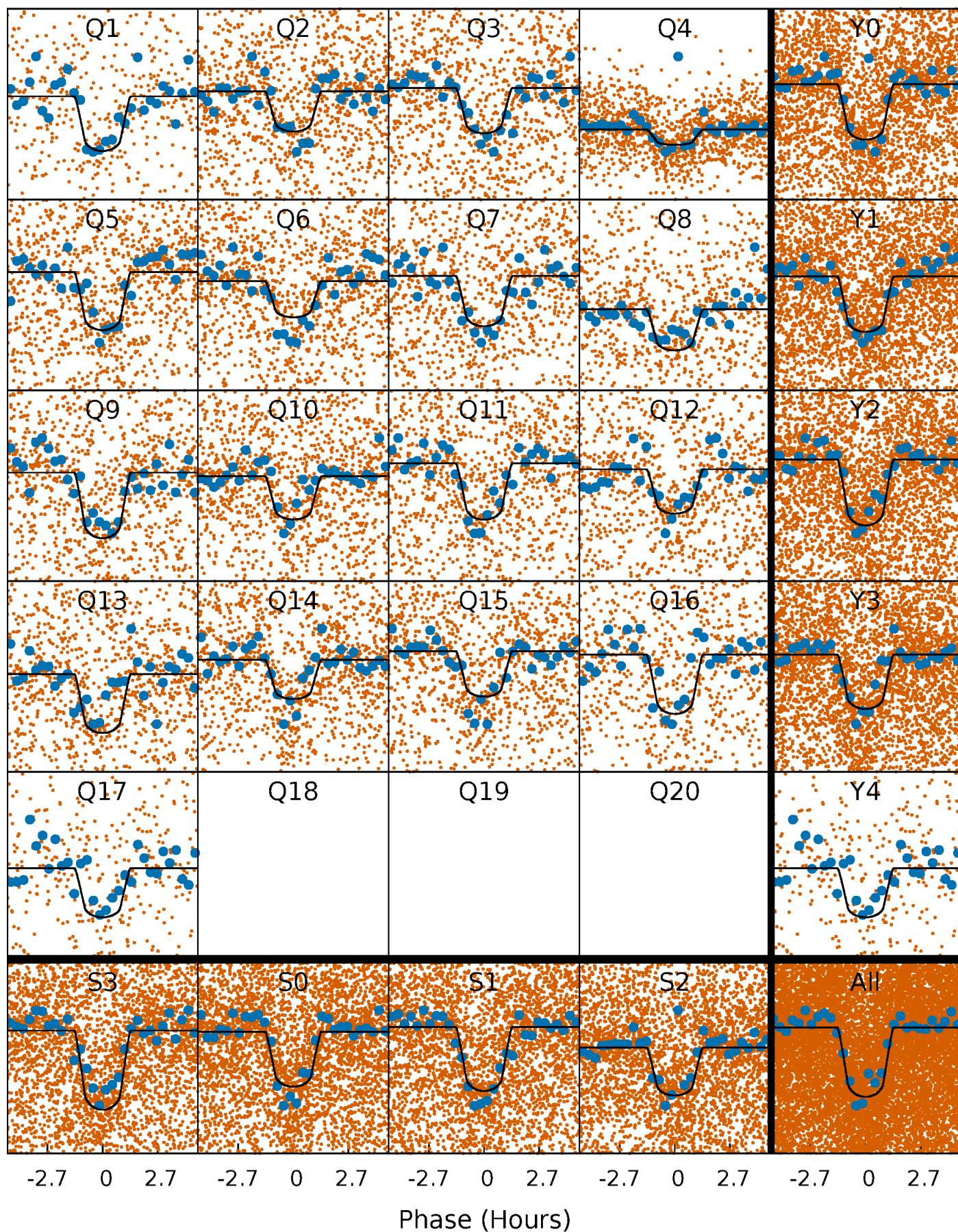
PDC Quarter-Phased Transit Curves

TCE 004768846-01 P= 1.254849 Days $T_0=132.178910$ (BKJD)



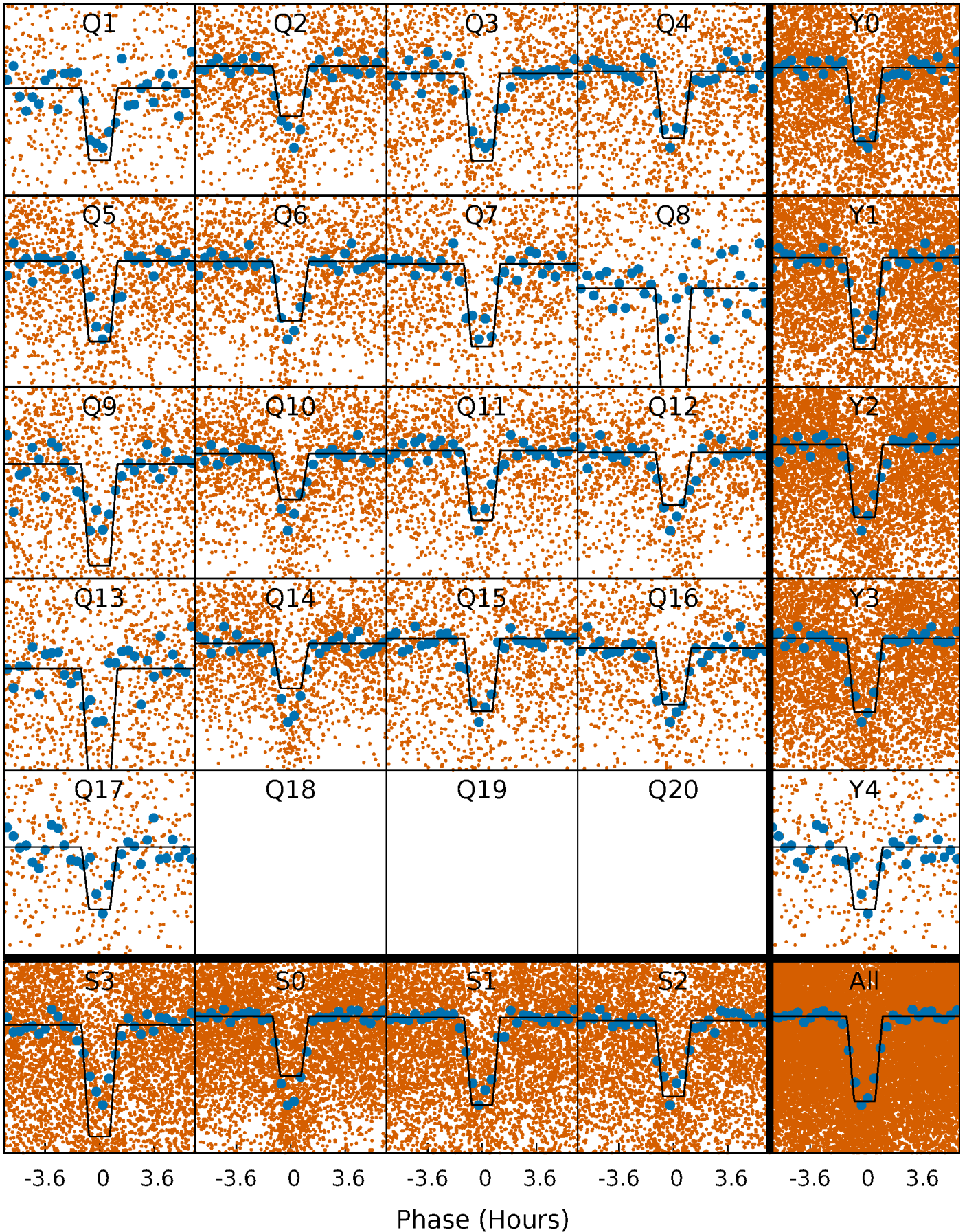
DV Quarter-Phased Transit Curves

TCE 004768846-01 P= 1.254849 Days $T_0=132.178910$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

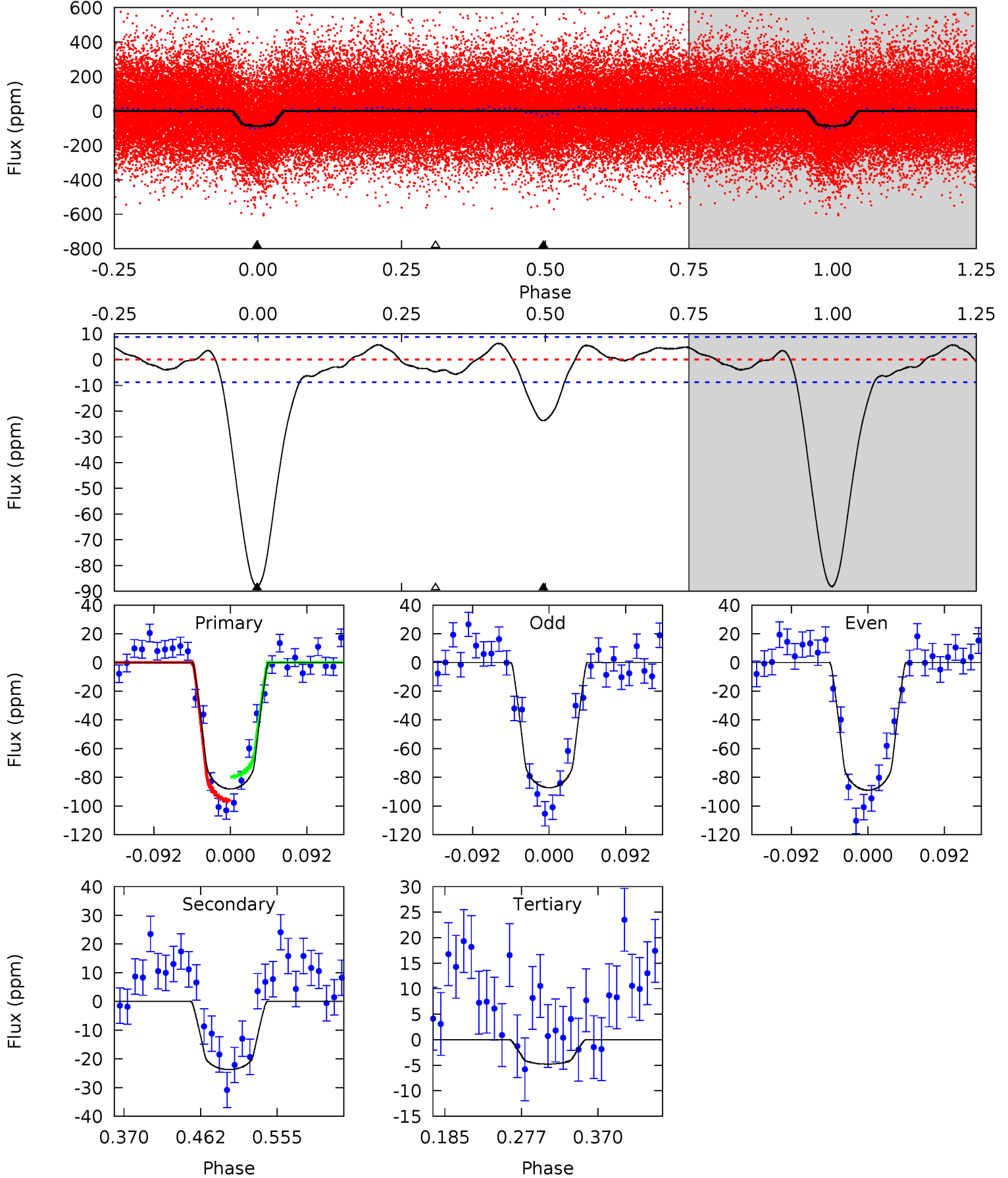
TCE 004768846-01 P= 1.254839 Days $T_0=132.180782$ (BKJD)



DV Model-Shift Uniqueness Test

004768846-01, P = 1.254849 Days, E = 130.924061 Days

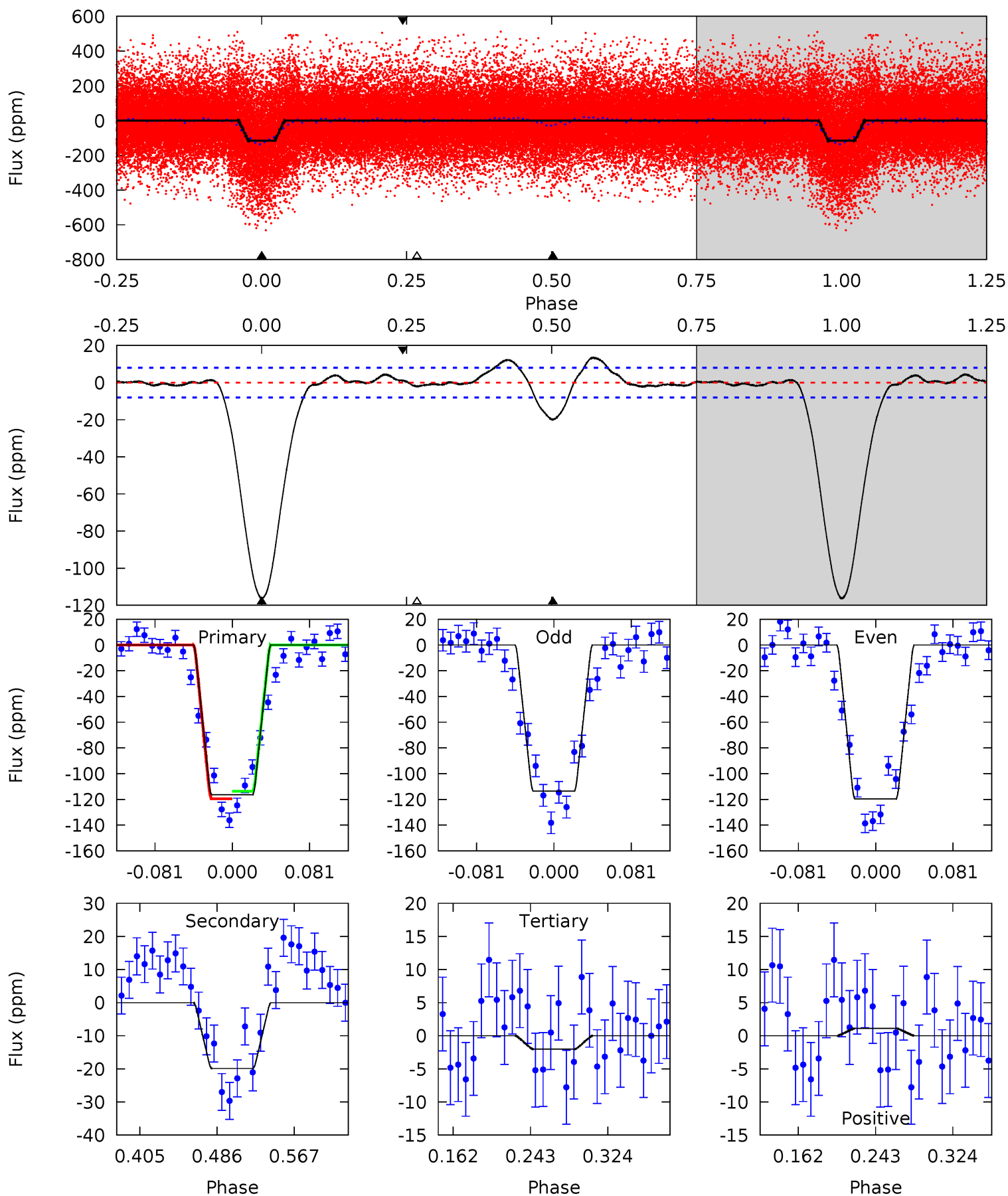
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
45.9	12.4	2.48	0	4.58	1.68	1.71	43.4	45.9	9.88	12.4	0.45	0.93	0.07	4.37



Alt Model-Shift Uniqueness Test

004768846-01, P = 1.254839 Days, E = 130.925943 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
66.9	11.4	1.17	0.63	4.61	1.75	1.69	65.7	66.2	10.3	10.8	1.78	0.99	0.10	1.68



Stellar Parameters For KIC 004768846

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6168^{+170}_{-170}	$3.750^{+0.308}_{-0.082}$	$-0.160^{+0.300}_{-0.300}$	$2.572^{+0.411}_{-0.958}$	$1.358^{+0.224}_{-0.299}$	$0.113^{+0.257}_{-0.028}$
	+3%/-3%	+8%/-2%	+188%/-188%	+16%/-37%	+16%/-22%	+228%/-25%
Source	PHO1	FLK73	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 004768846-01 / KOI 2077.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-24 ± 2	$2.75^{+0.67}_{-0.71}$	3755^{+234}_{-335}	4187^{+463}_{-376}	$1.137^{+0.892}_{-0.406}$
Alt.	-20 ± 2	$2.96^{+0.64}_{-0.75}$	3772^{+208}_{-361}	3852^{+417}_{-389}	$0.813^{+0.570}_{-0.271}$

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

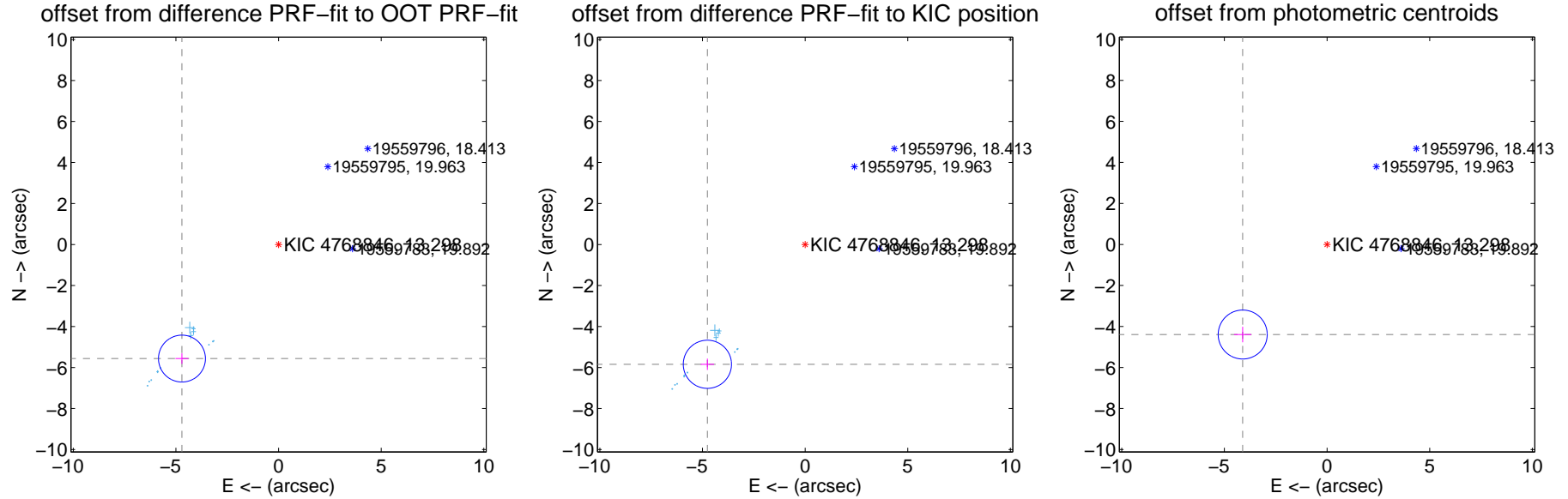
DV Centroid Data

Supplemental centroid analysis for 004768846-01. Kepler magnitude: 13.30. Transit SNR 27.53

There are 14 quarters with good PRF difference image offsets

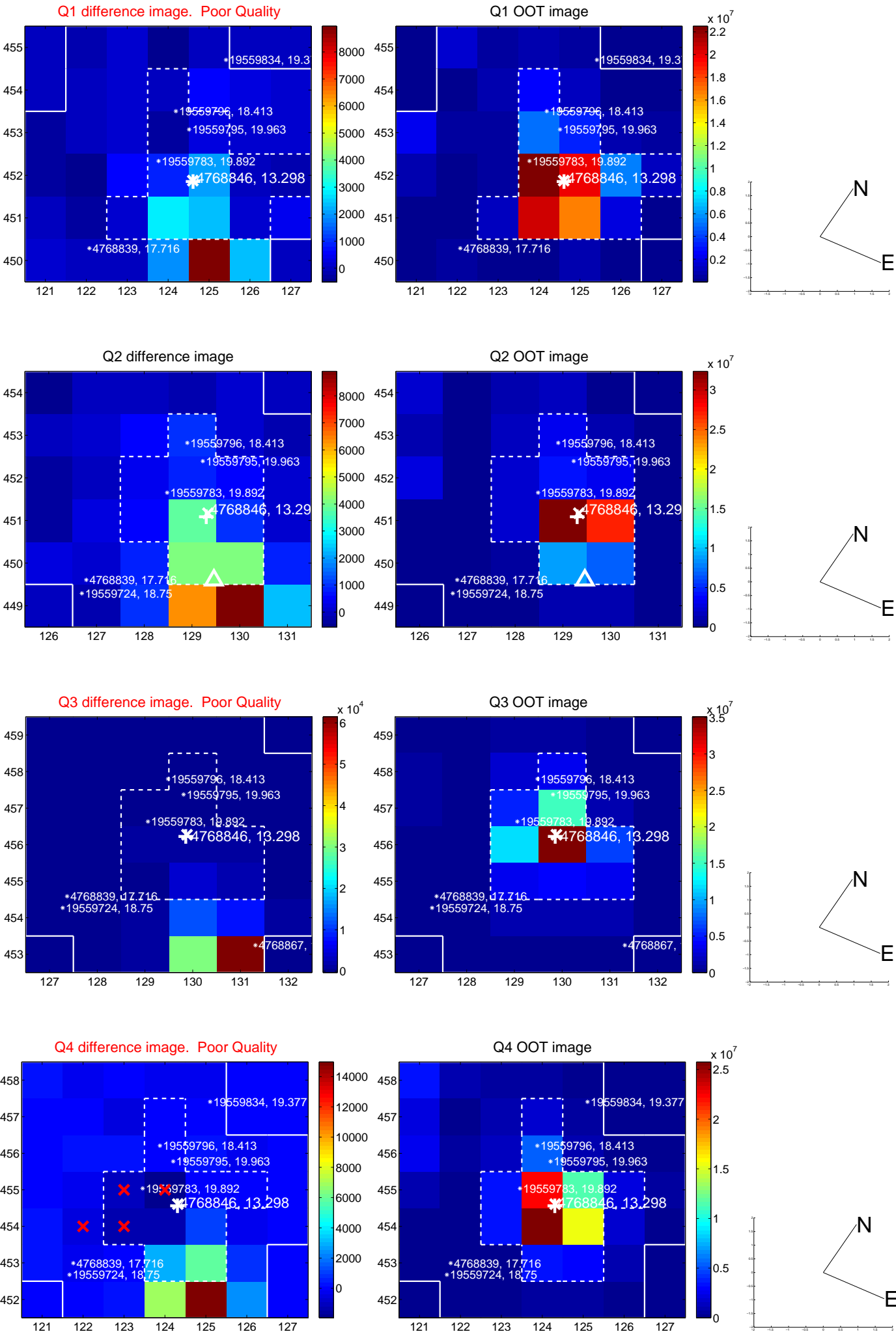
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	7.288 ± 0.381	19.12	4.707 ± 0.319	-5.564 ± 0.257
PRF-fit source offset from KIC position	7.537 ± 0.392	19.25	4.762 ± 0.325	-5.842 ± 0.274
photometric centroid source offset	6.01 ± 0.40	15.11	4.11 ± 0.42	-4.39 ± 0.38

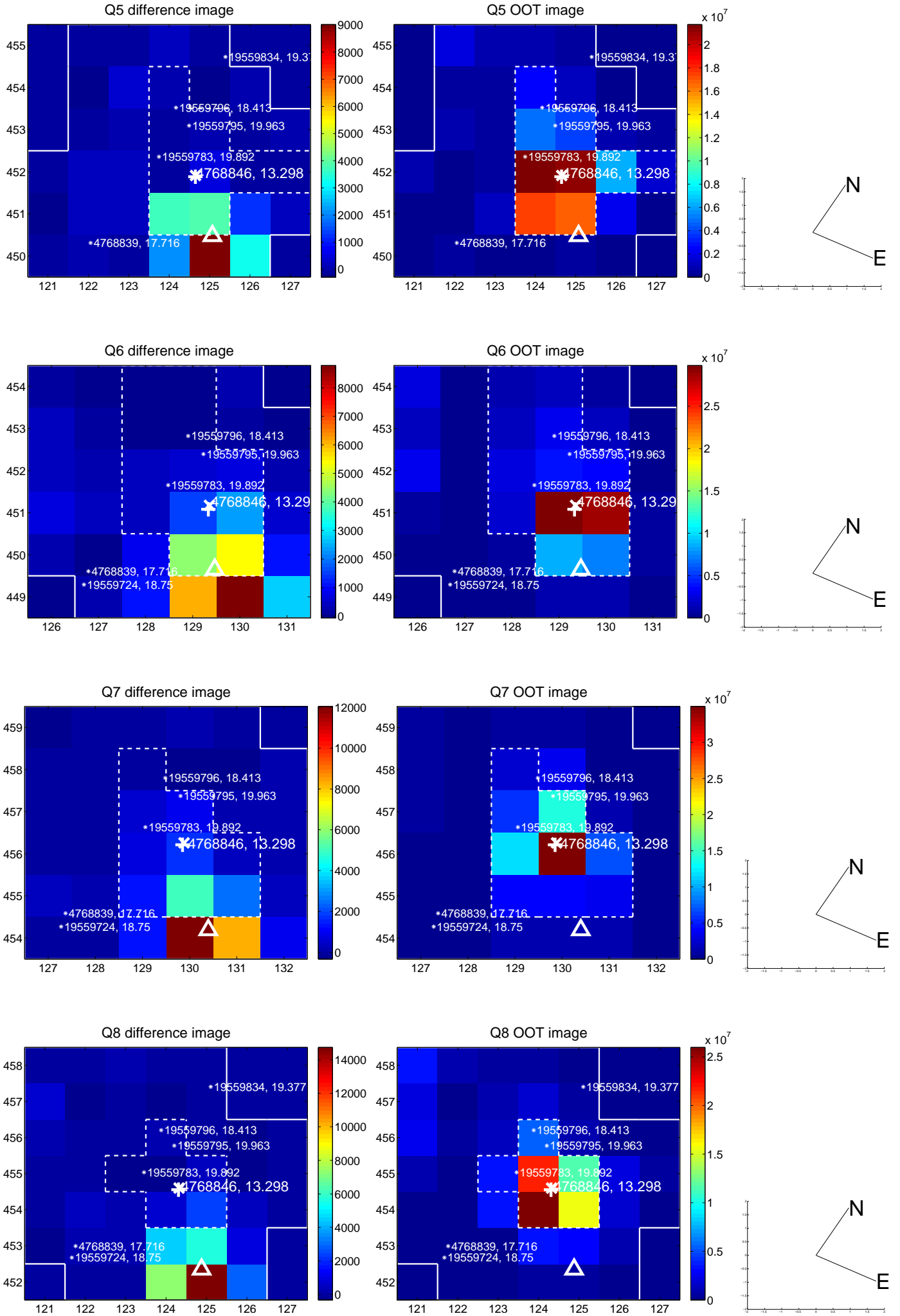


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

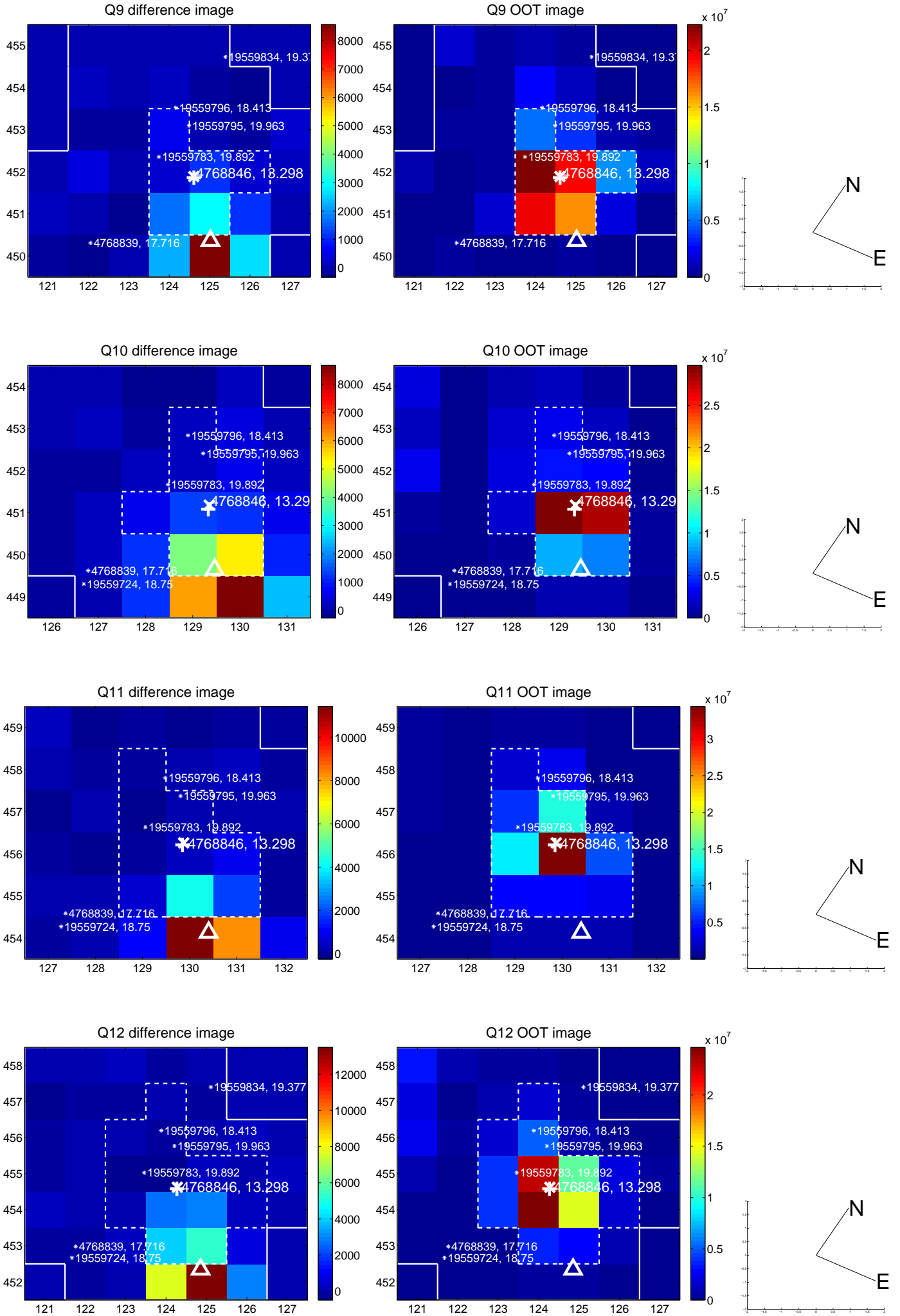
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



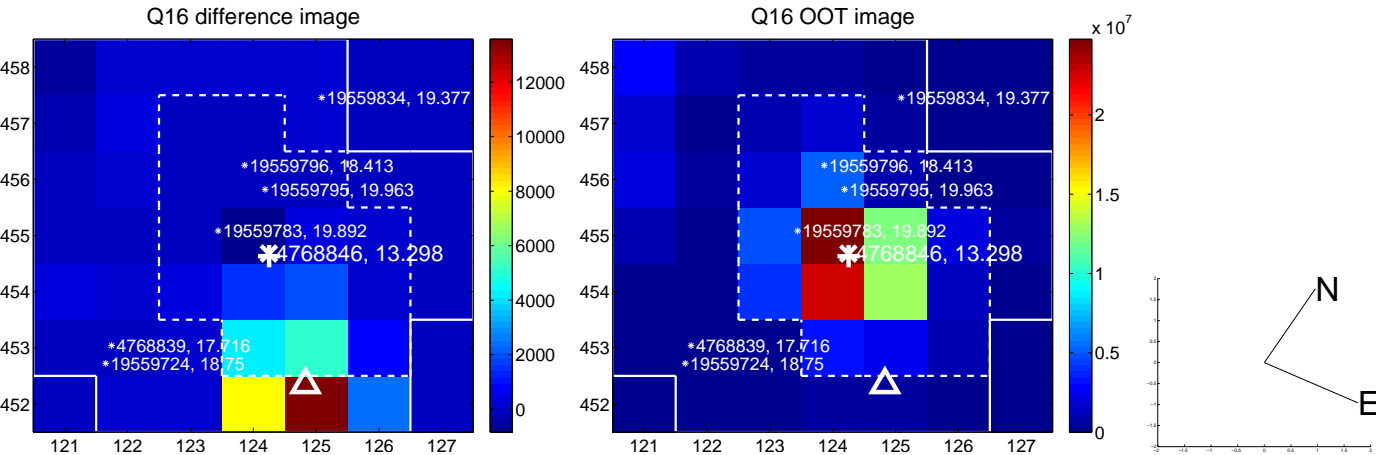
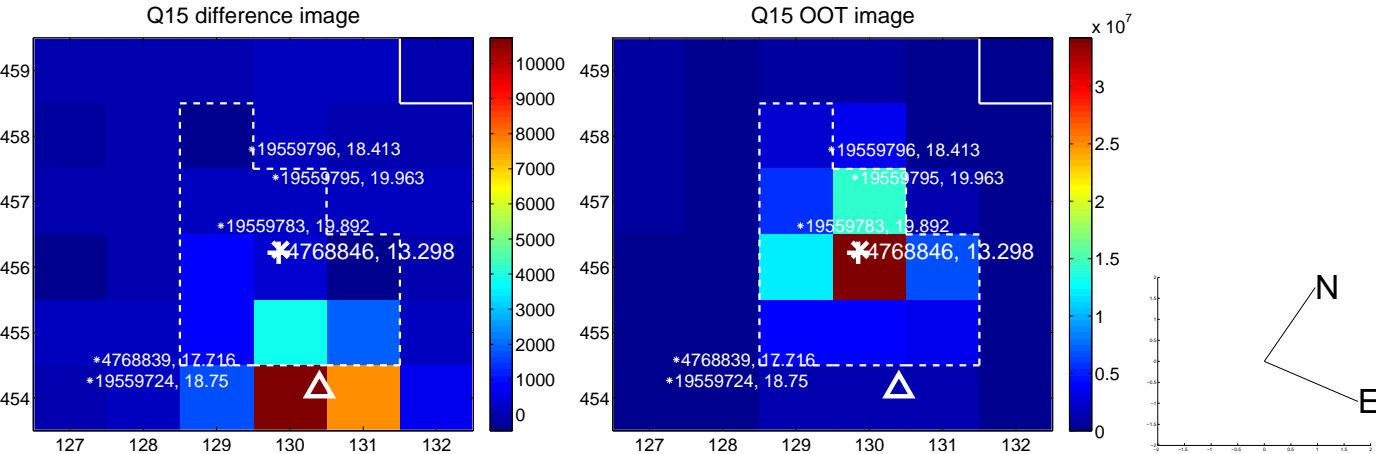
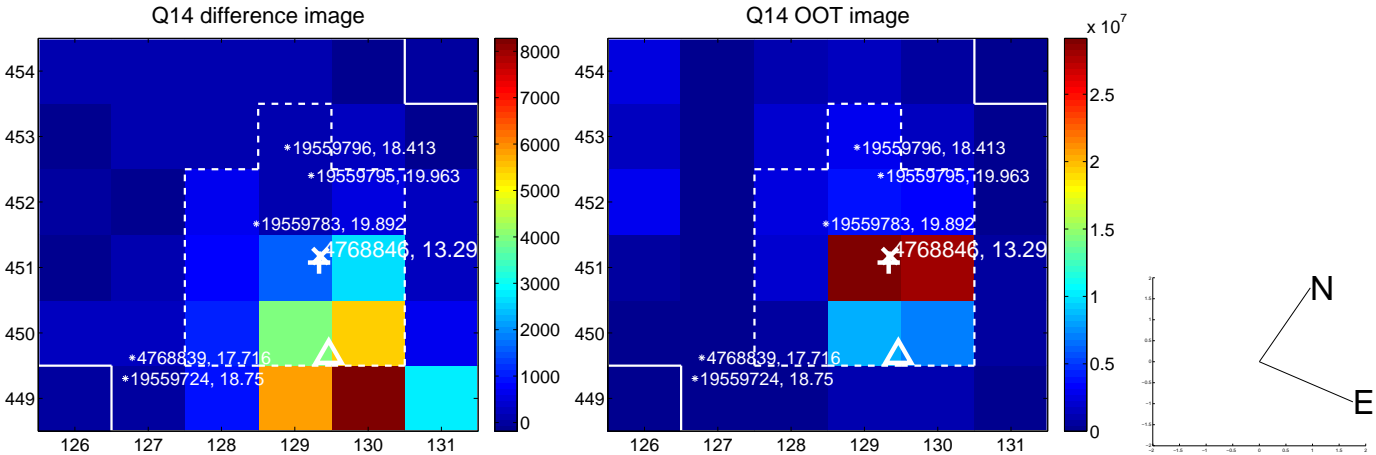
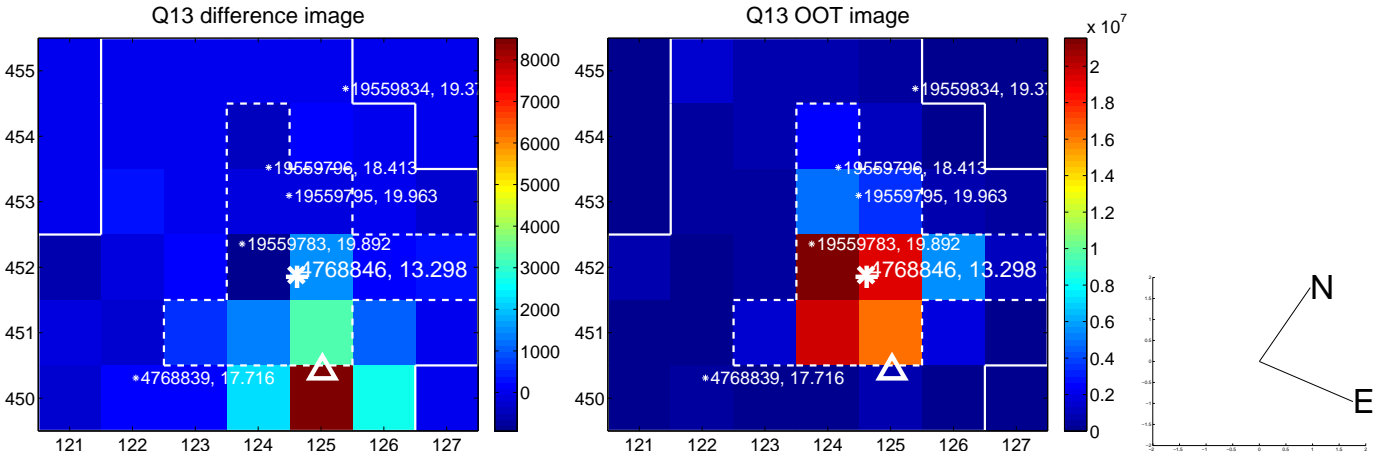
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



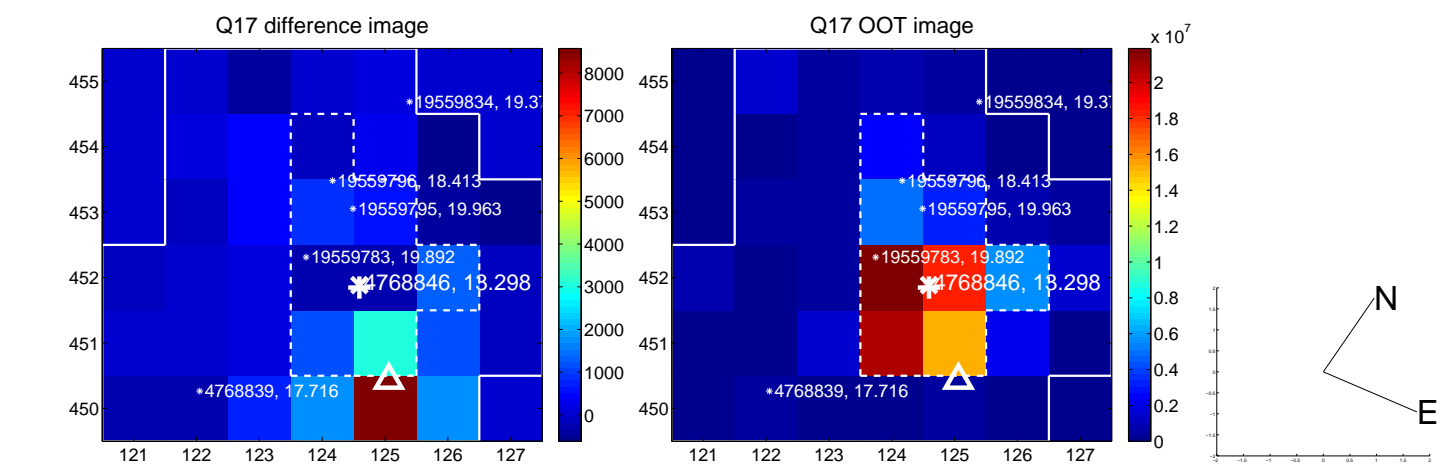
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



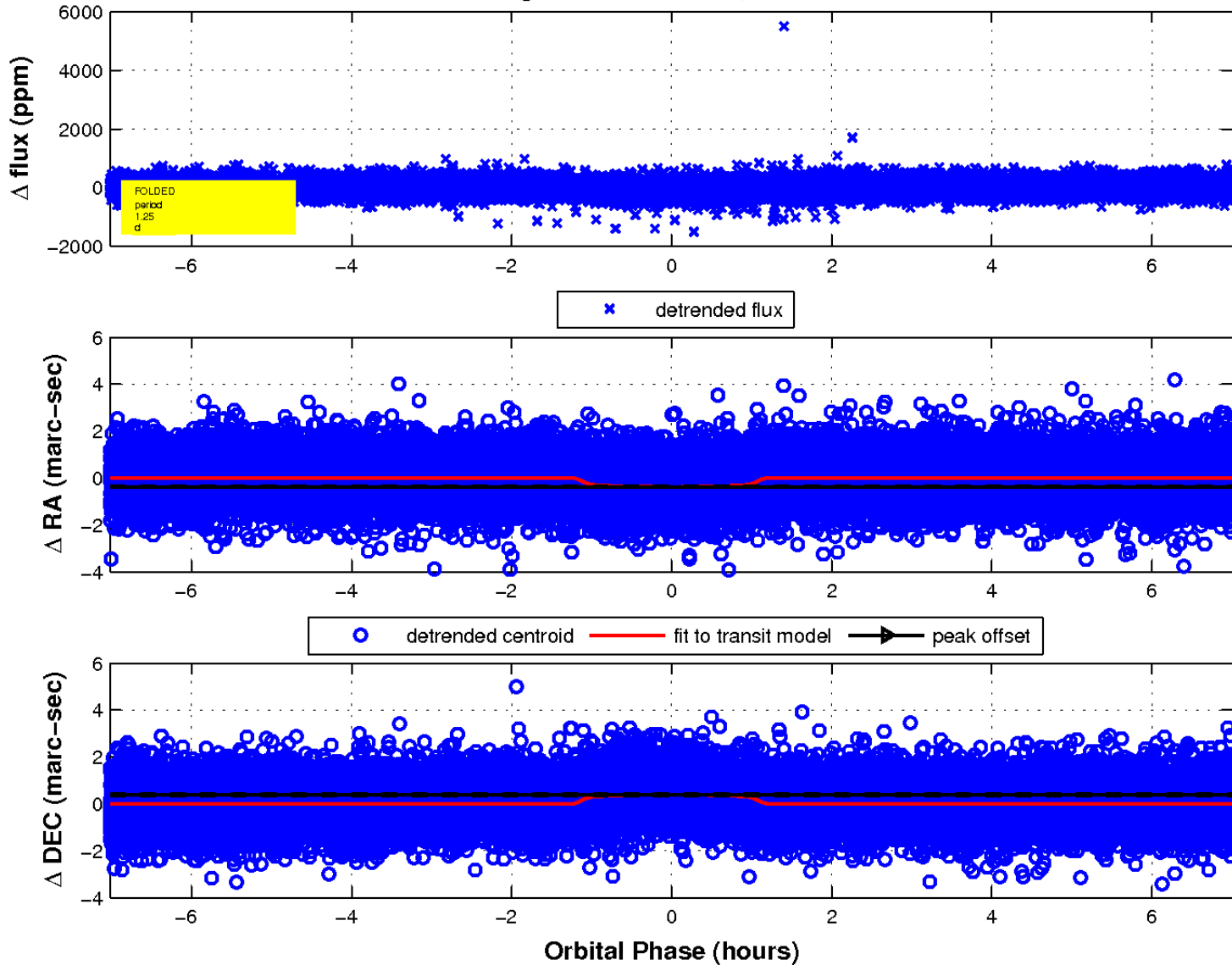
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

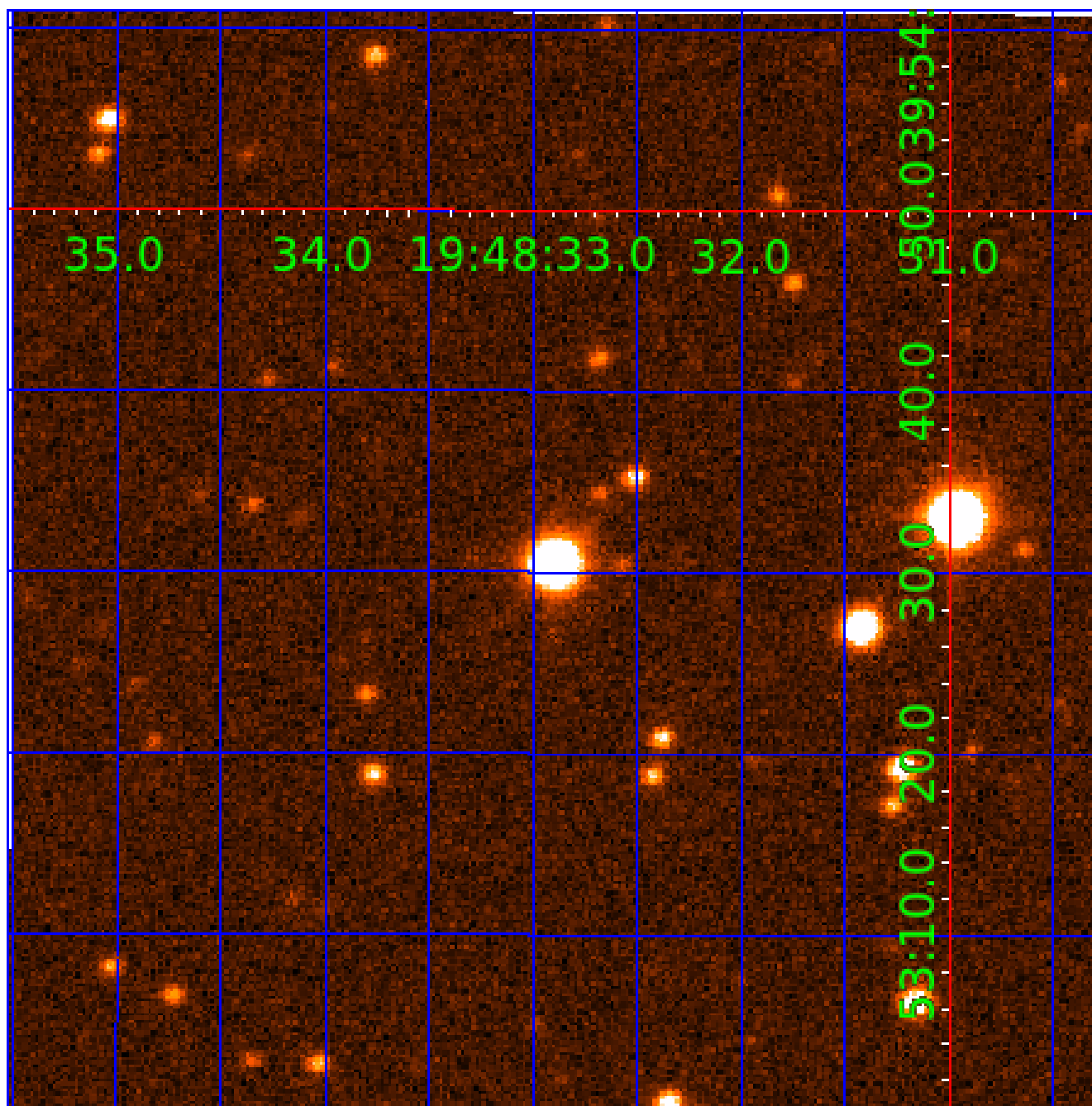


fluxWeightedCentroids, Planet 1 of 4



UKIRT Image

Declination



KIC 004768846

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})
004768846-01	OBS	2077.01	1.254849	132.178909	90.7	2.339	24.4	27.5	2.57	6168	2.88	13495.75
004768846-02	OBS	No	1.254859	131.550876	34.0	2.479	10.8	10.9	2.57	6168	1.77	13495.61
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004768846-04	OBS	No	152.177645	182.444874	134.5	9.969	9.1	2.7	2.57	6168	3.34	22.48

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004768846-01	OBS	FP	0.00	0	1	1	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_RESOLVED_OFFSET—HALO_GHOST
004768846-02	OBS	FP	0.00	1	1	1	0	IS_SEC_TCE—CENT_RESOLVED_OFFSET—HALO_GHOST
004768846-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_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—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004768846-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—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

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.

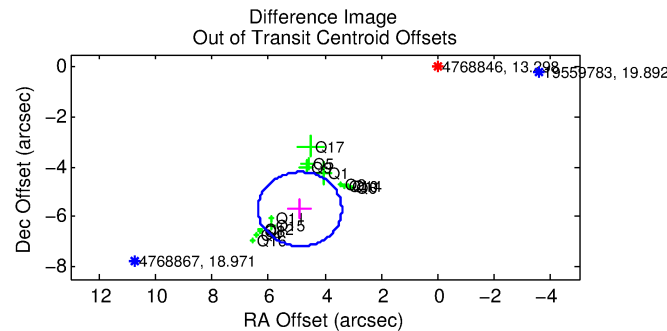
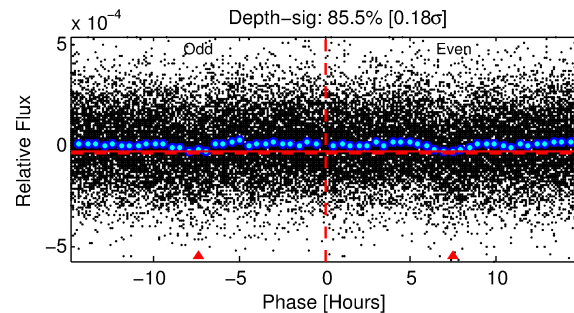
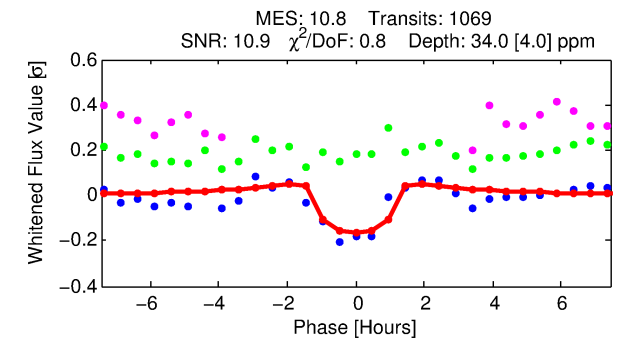
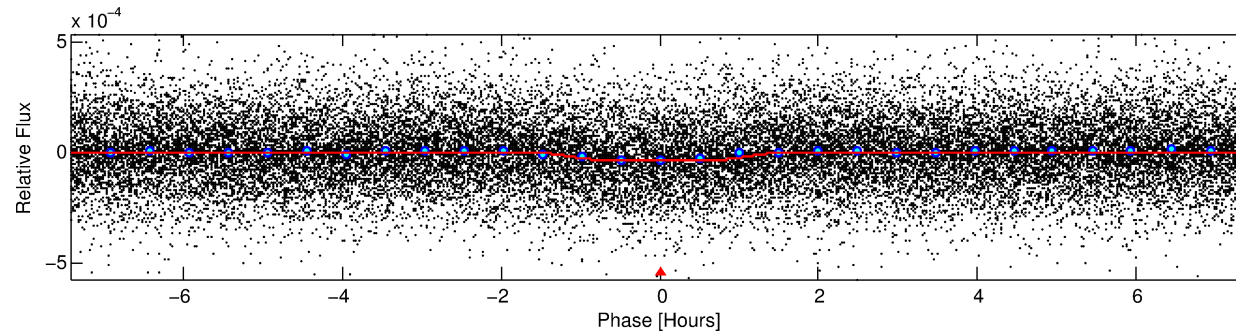
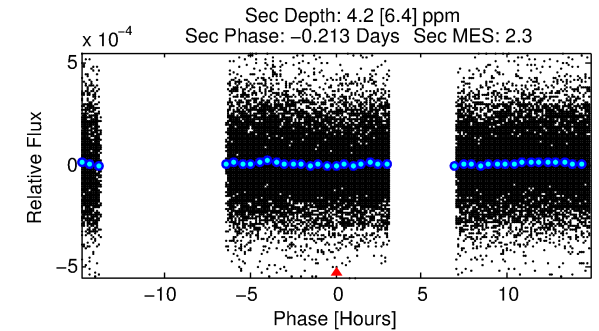
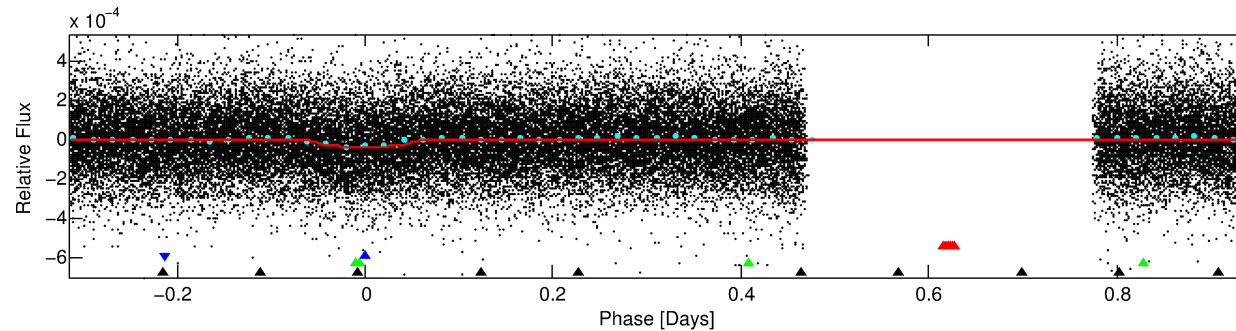
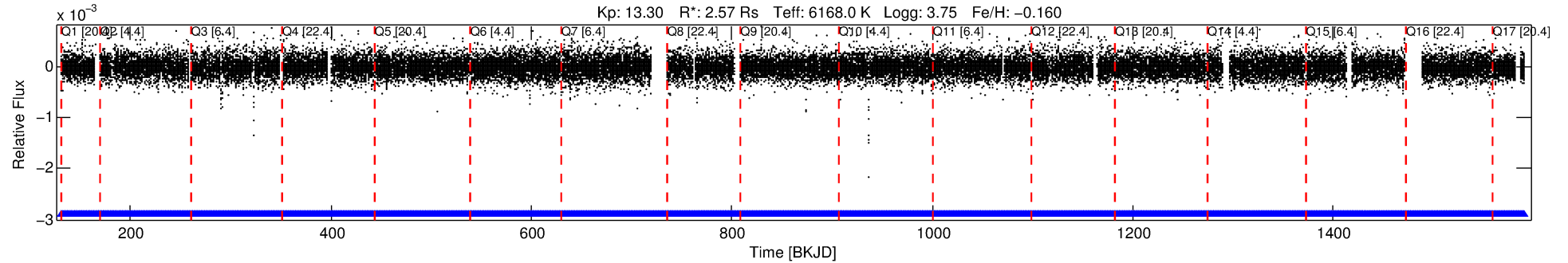
Ephemeris Match Information For 004768846-02

No Significant Match Found

DV One-Page Summary

KIC: 4768846 Candidate: 2 of 4 Period: 1.255 d
KOI: K02077 Corr: No Ephemeris Match

Kp: 13.30 R*: 2.57 Rs Teff: 6168.0 K Logg: 3.75 Fe/H: -0.160



DV Fit Results:

Period = 1.25486 [0.00001] d
Epoch = 131.5509 [0.0024] BKJD
Rp/R* = 0.0063 [0.0019]
a/R* = 1.96 [2.38]
b = 0.90 [0.34]
Seff = 13495.61 [7359.16]
Teq = 2748 [375] K
Rp = 1.77 [0.85] Re
a = 0.0252 [0.0086] AU
Ag = 0.47 [0.81] [-0.66σ]
Teffp = 3517 [1443] K [0.52σ]

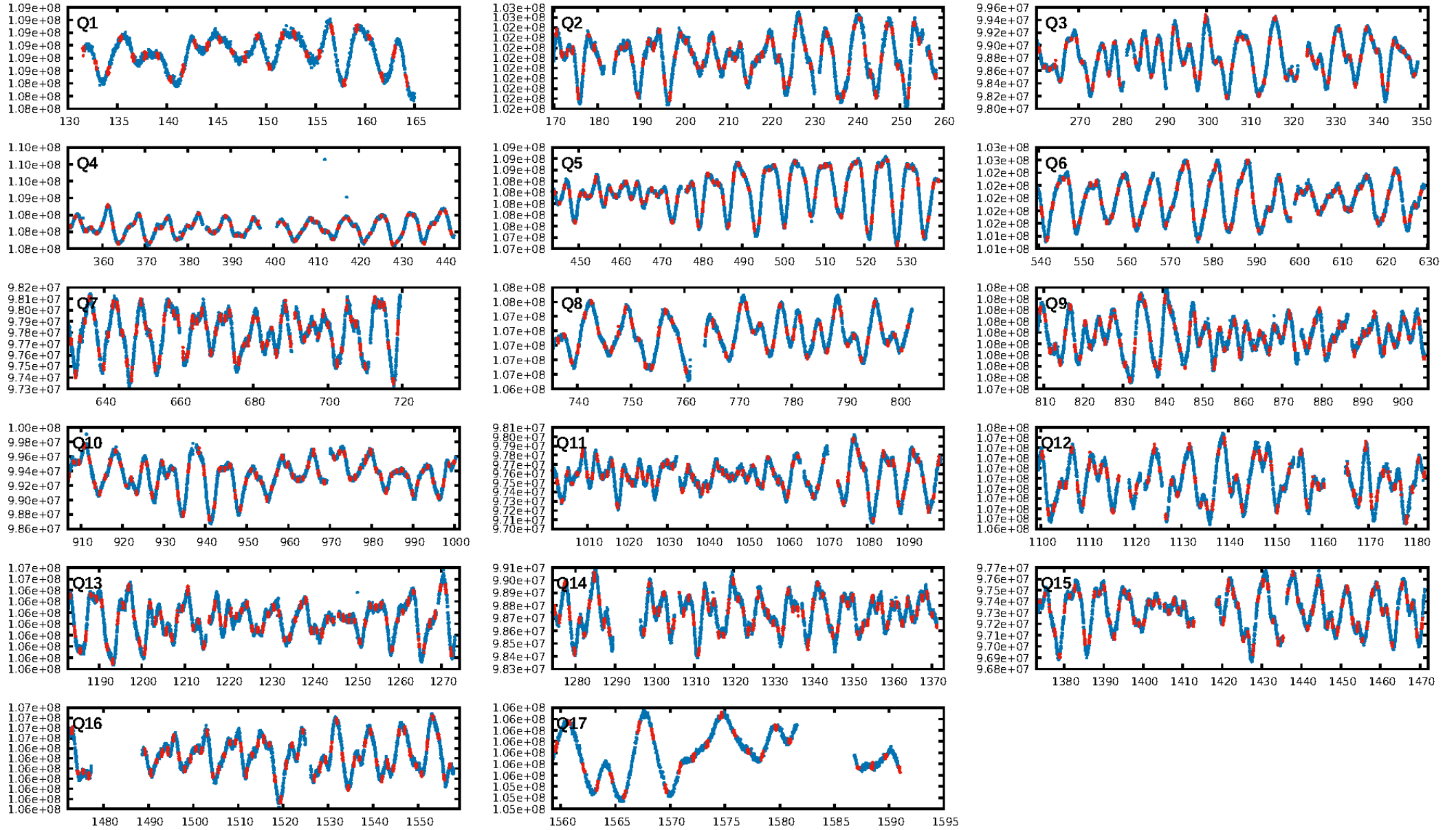
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: 100.0% [352.62σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGoF-sig: N/A
Bootstrap-pfa: 1.04e-24
RollingBand-fgt: 1.00 [1020/1020]
GhostDiagnostic-chr: -0.1149
Centroid-sig: 0.0%
Centroid-so: 6.842 arcsec [6.53σ]
OotOffset-rm: 7.507 arcsec [15.16σ]
KicOffset-rm: 7.747 arcsec [18.27σ]
OotOffset-st: 4/2/4/4 [14]
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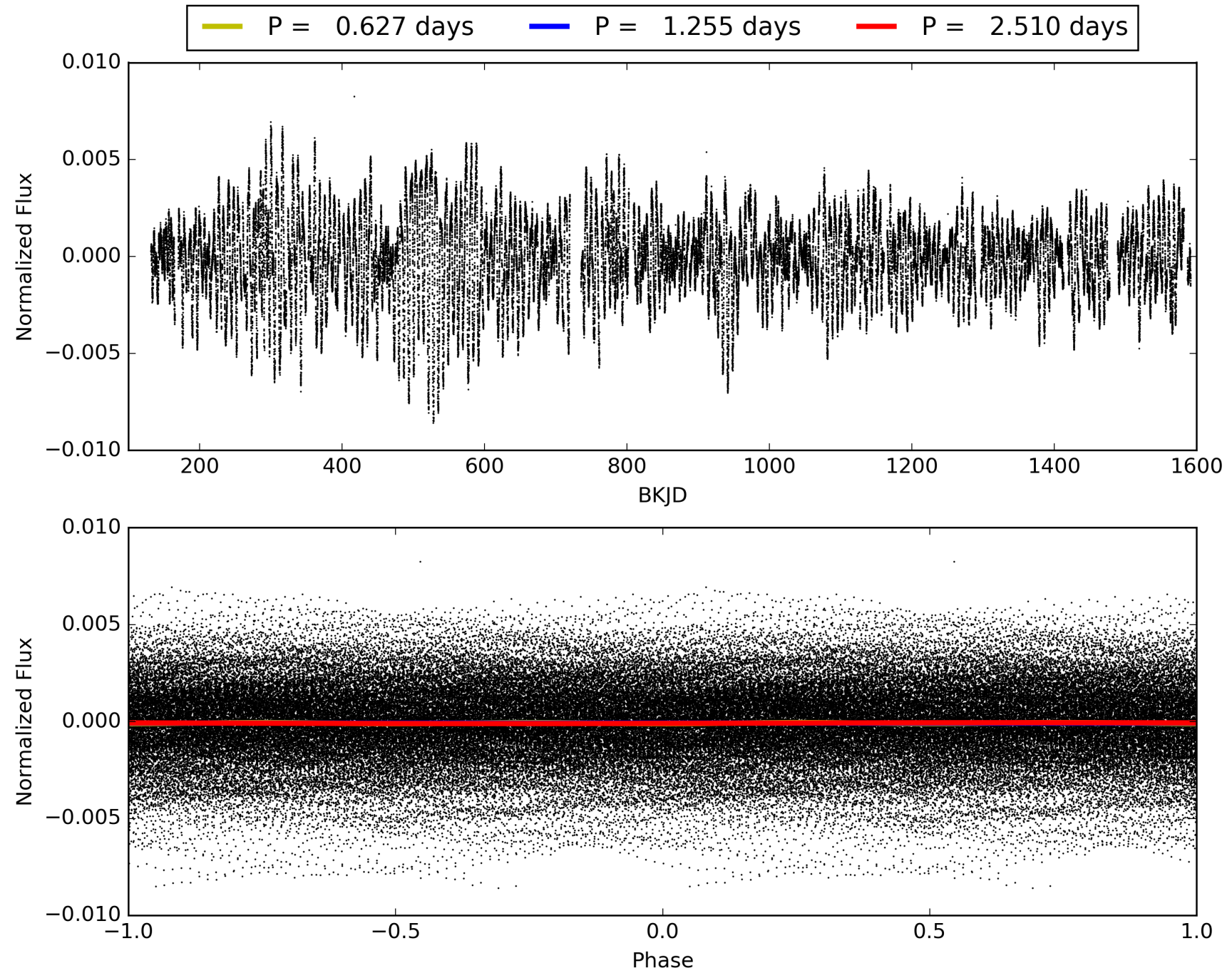
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 004768846-02, PDC Light Curves

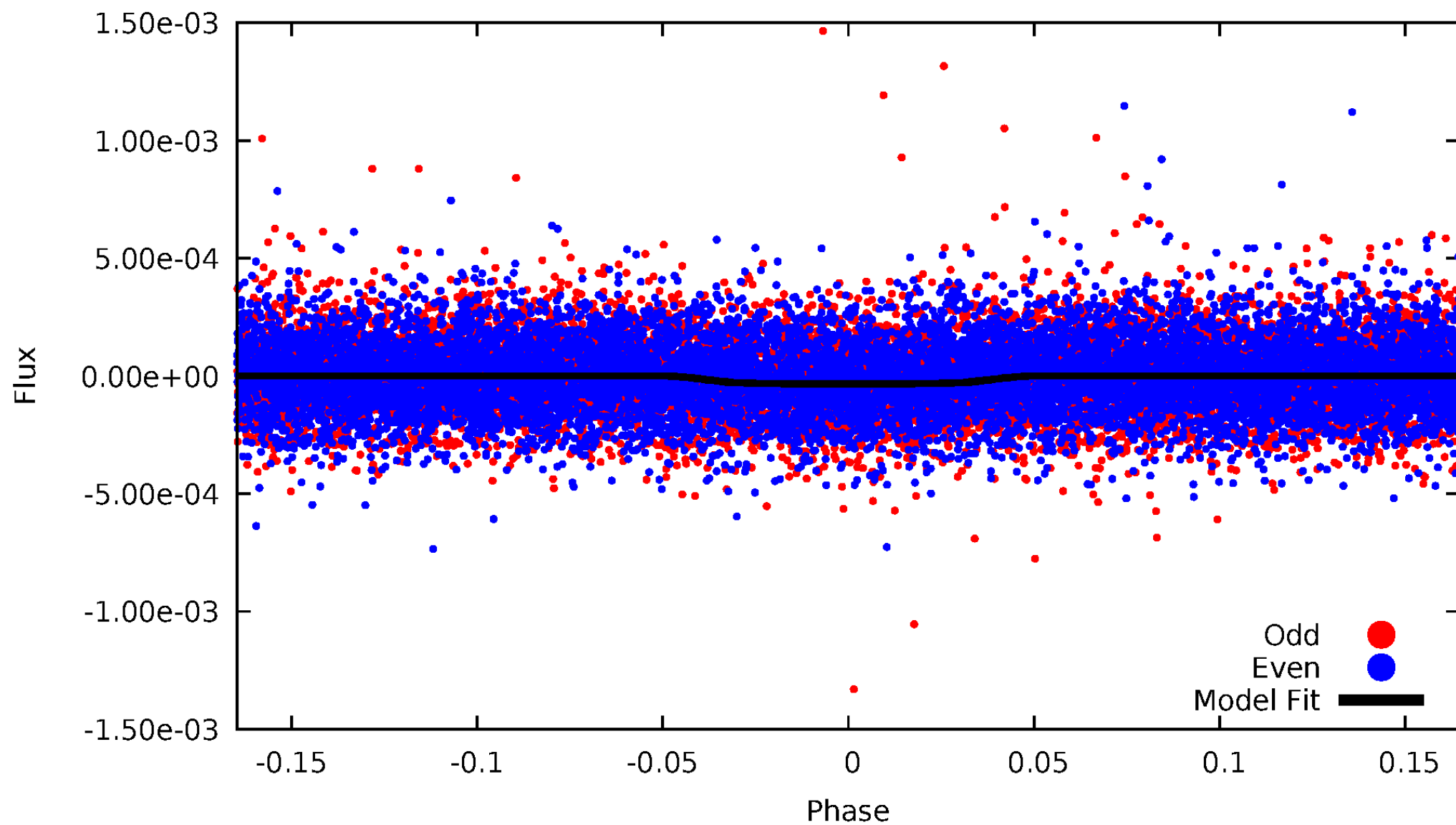


TCE 004768846-02



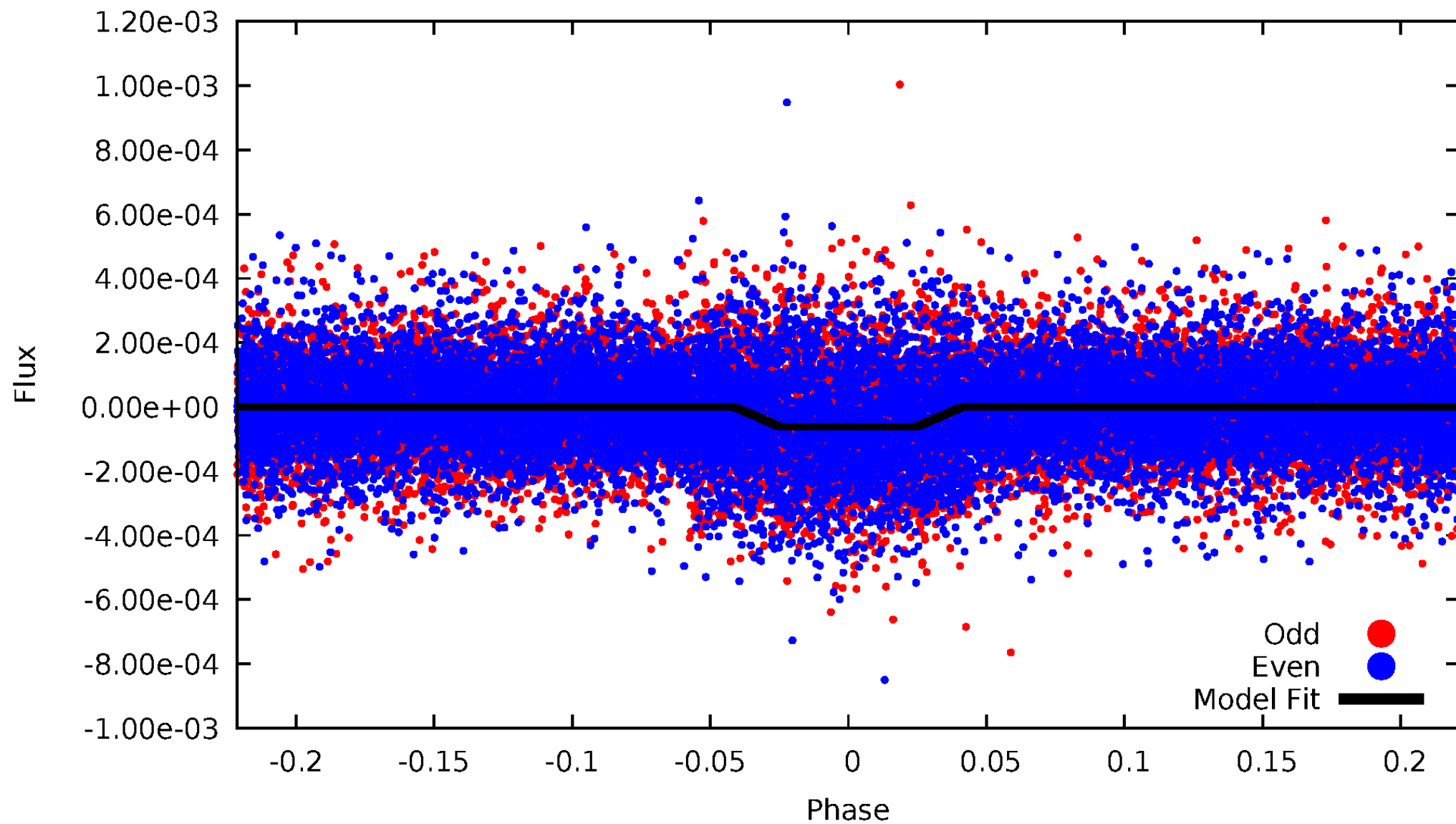
DV Odd/Even

TCE 004768846-02



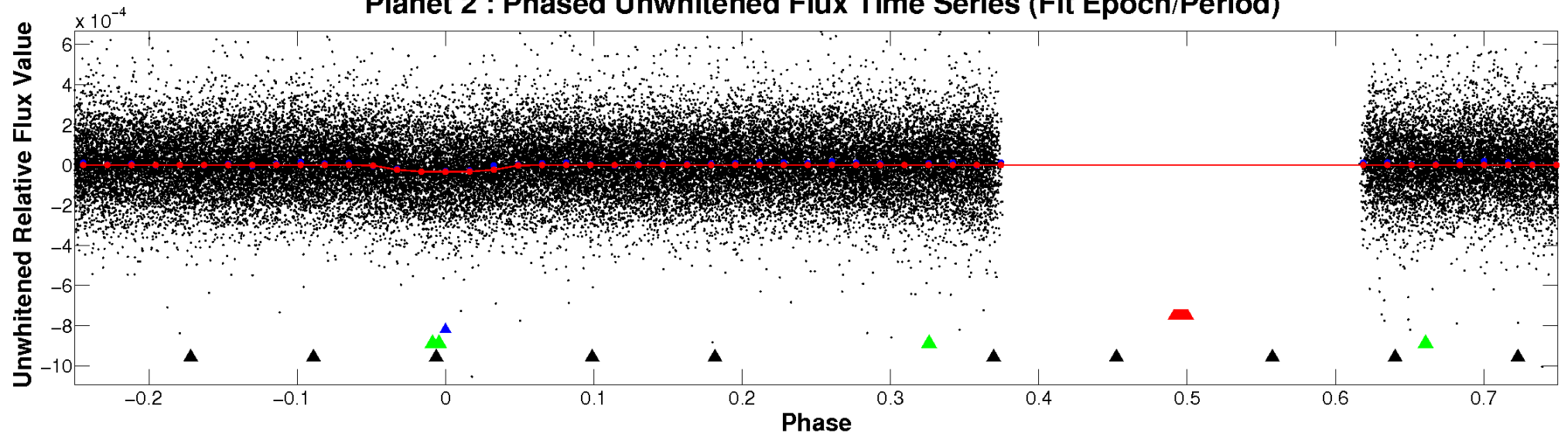
ALT Odd/Even

TCE 004768846-02

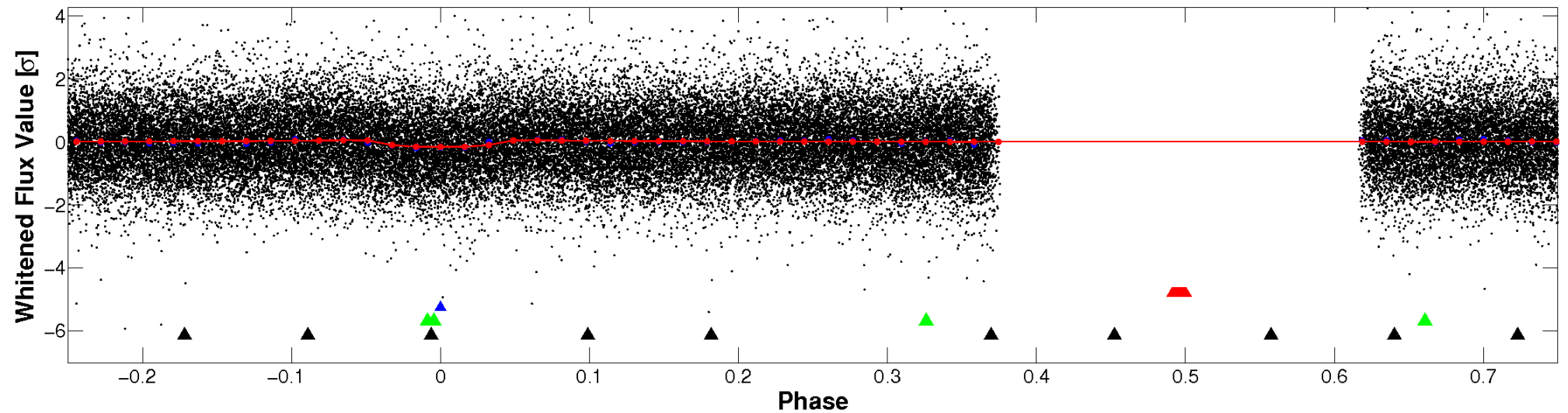


Non-Whitened Vs. Whitened Light Curve

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

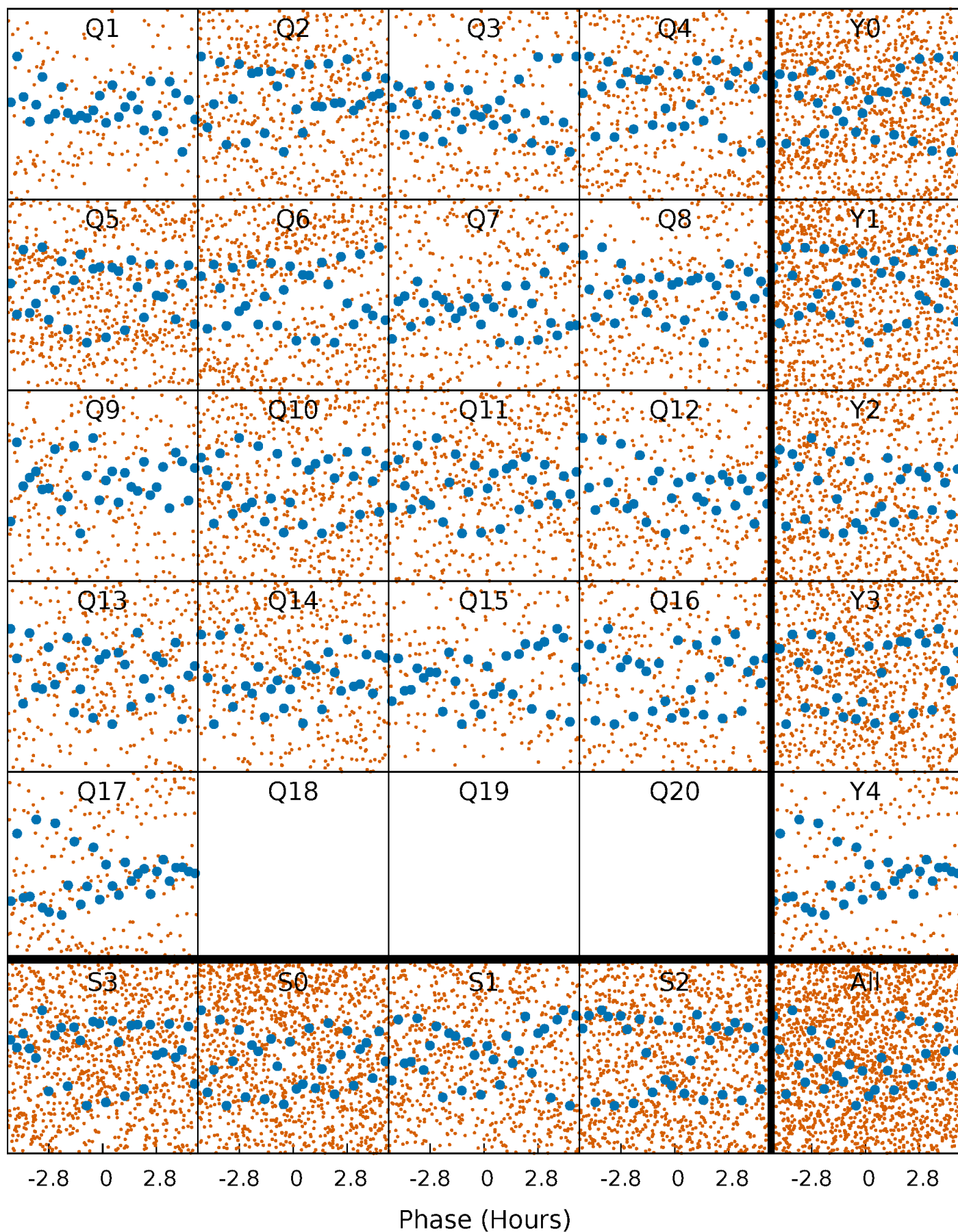


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



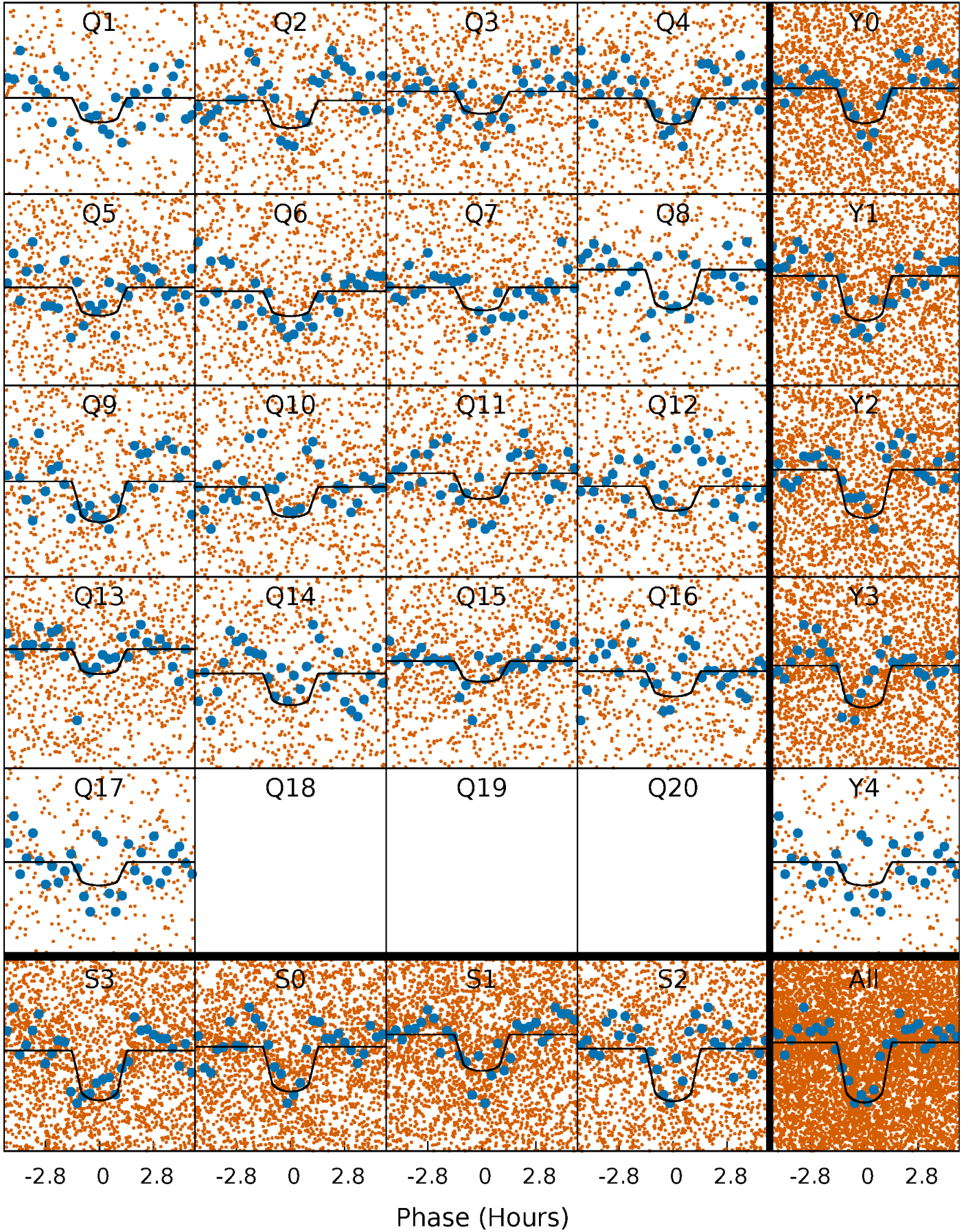
PDC Quarter-Phased Transit Curves

TCE 004768846-02 P= 1.254859 Days $T_0=131.550876$ (BKJD)



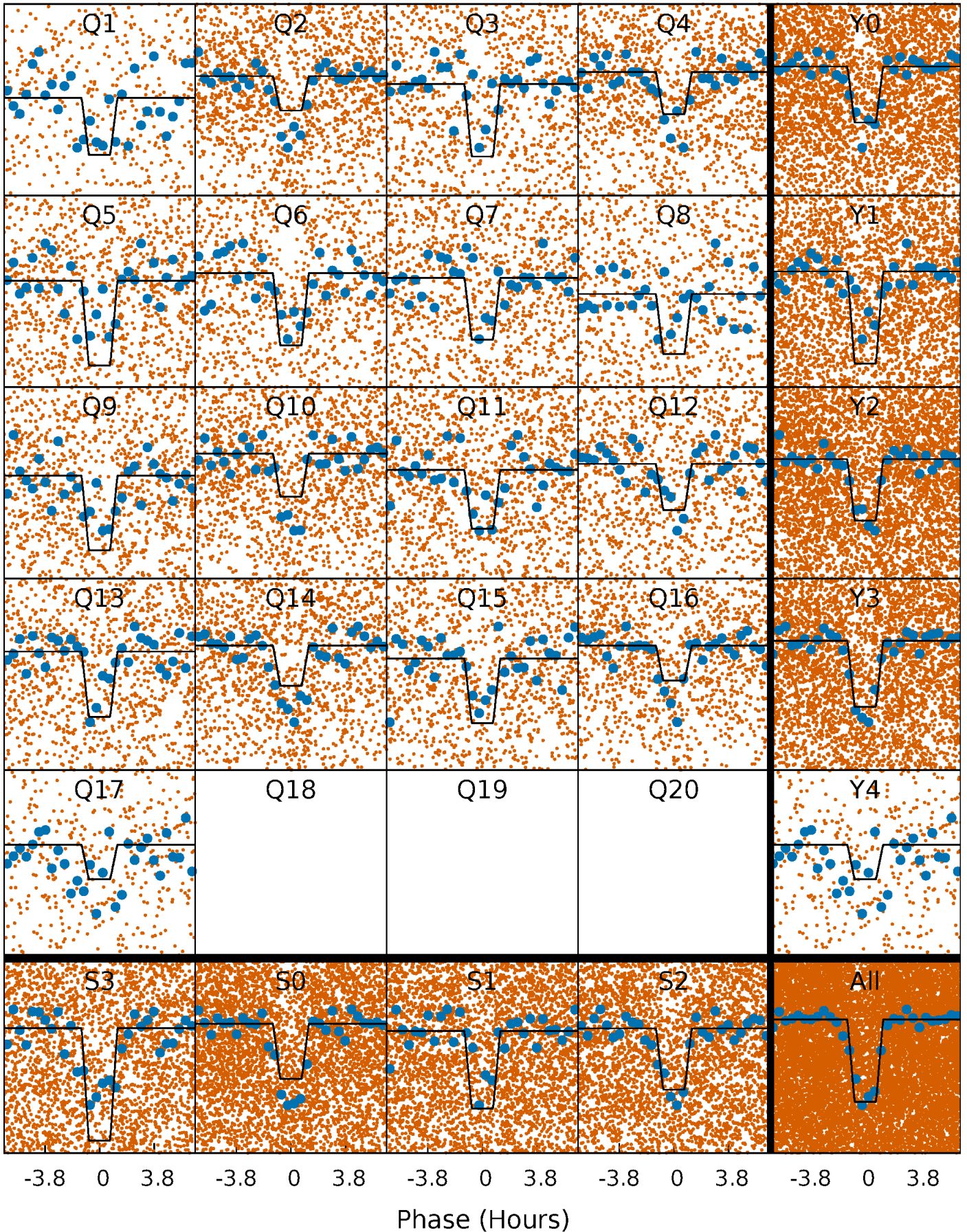
DV Quarter-Phased Transit Curves

TCE 004768846-02 $P = 1.254859$ Days $T_0 = 131.550876$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

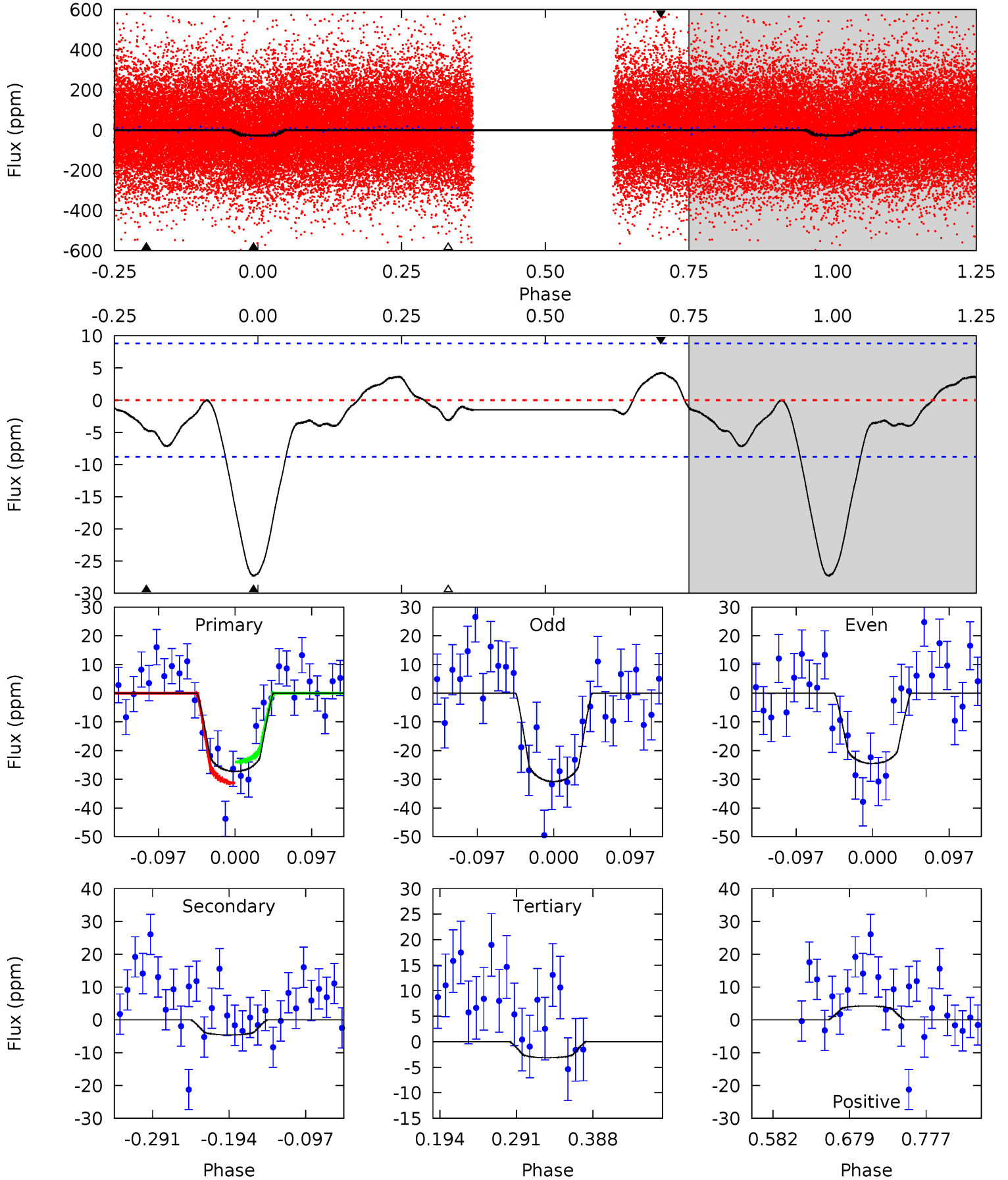
TCE 004768846-02 P= 1.254830 Days $T_0=131.559671$ (BKJD)



DV Model-Shift Uniqueness Test

004768846-02, P = 1.254859 Days, E = 130.296017 Days

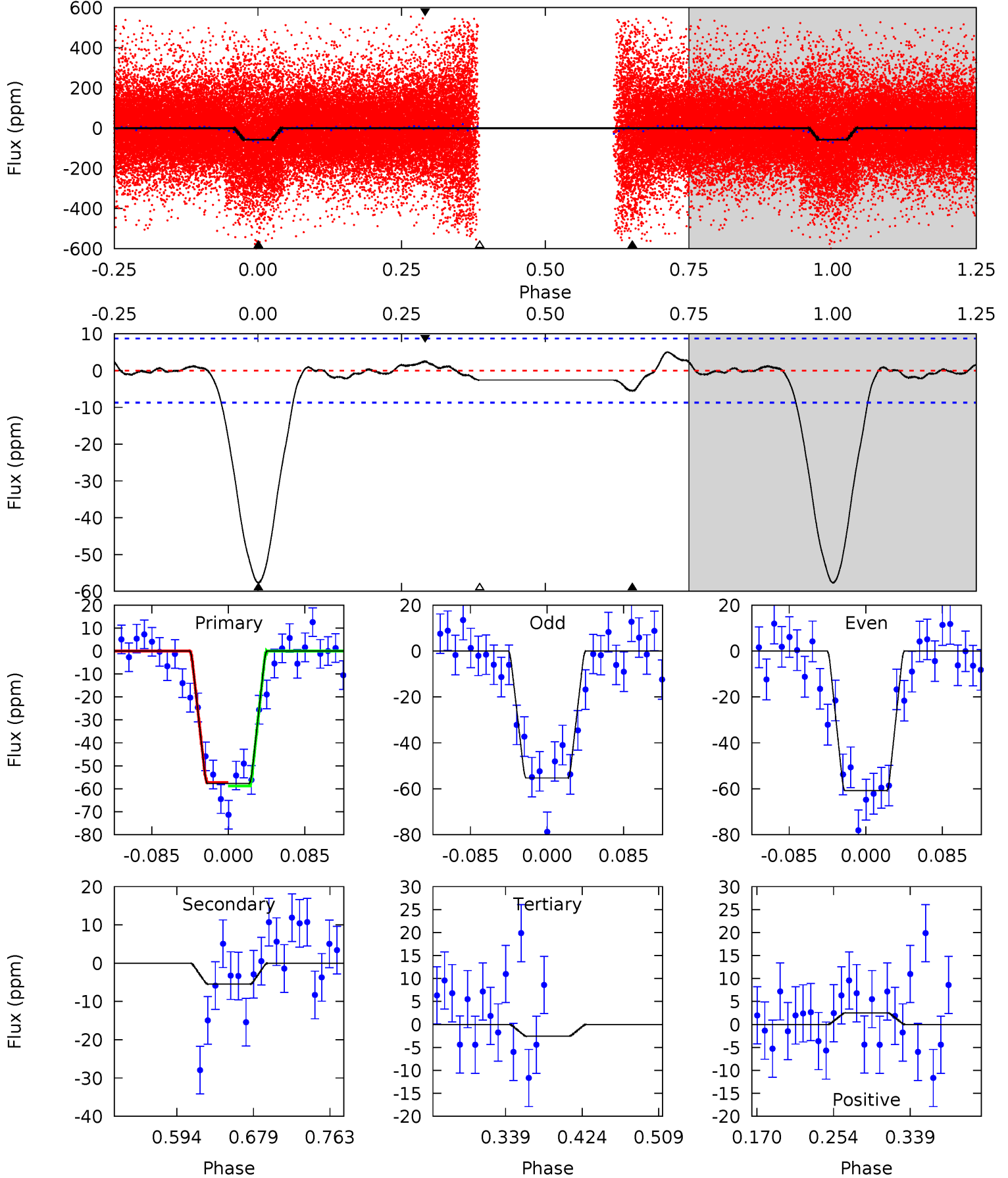
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.2	2.39	1.63	2.20	4.57	1.66	1.33	12.5	12.0	0.76	0.19	1.64	0.95	0.13	1.95



Alt Model-Shift Uniqueness Test

004768846-02, P = 1.254830 Days, E = 130.304841 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
30.4	2.89	1.36	1.32	4.60	1.72	0.61	29.0	29.0	1.53	1.56	1.46	0.93	0.08	0.44



Stellar Parameters For KIC 004768846

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6168^{+170}_{-170}	$3.750^{+0.308}_{-0.082}$	$-0.160^{+0.300}_{-0.300}$	$2.572^{+0.411}_{-0.958}$	$1.358^{+0.224}_{-0.299}$	$0.113^{+0.257}_{-0.028}$
	+3%/-3%	+8%/-2%	+188%/-188%	+16%/-37%	+16%/-22%	+228%/-25%
Source	PHO1	FLK73	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 004768846-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-5 ± 2	$1.66^{+0.58}_{-0.53}$	3760^{+222}_{-335}	3423^{+865}_{-6157}	$0.553^{+0.723}_{-0.302}$
Alt.	-5 ± 2	$2.03^{+0.65}_{-0.58}$	3745^{+226}_{-322}	3191^{+743}_{-6029}	$0.457^{+0.501}_{-0.221}$

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 $A_{obs} \gg 1.0$

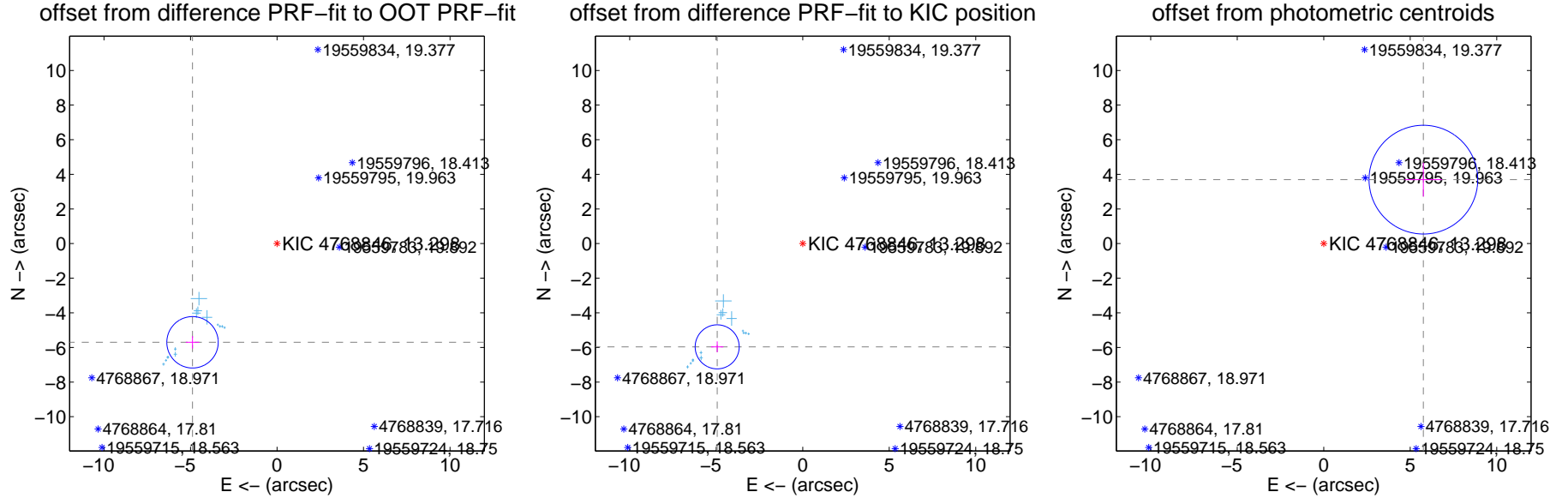
DV Centroid Data

Supplemental centroid analysis for 004768846-02. Kepler magnitude: 13.30. Transit SNR 10.87

There are 14 quarters with good PRF difference image offsets

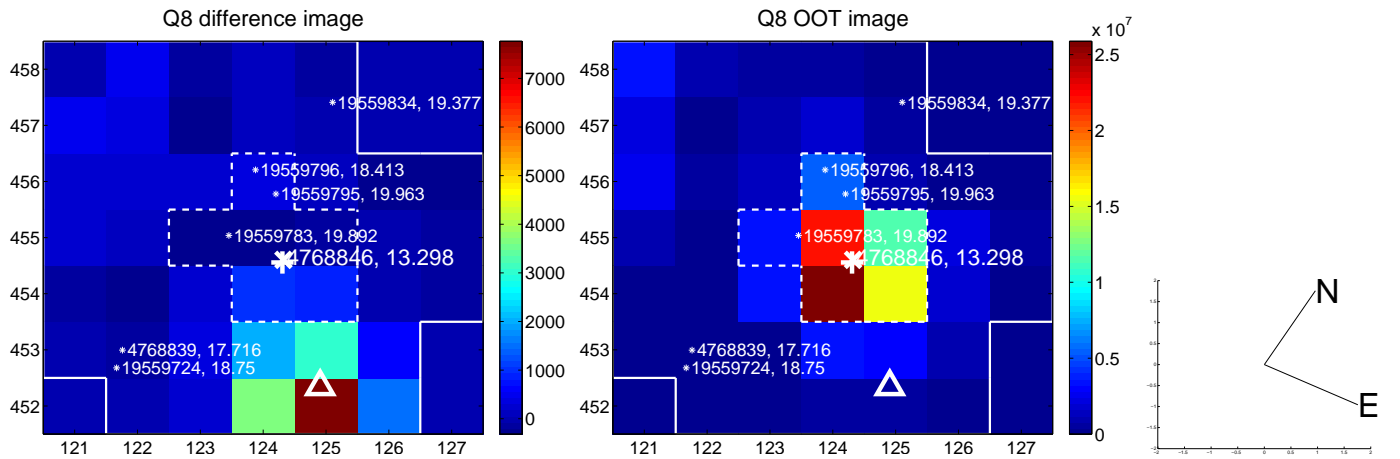
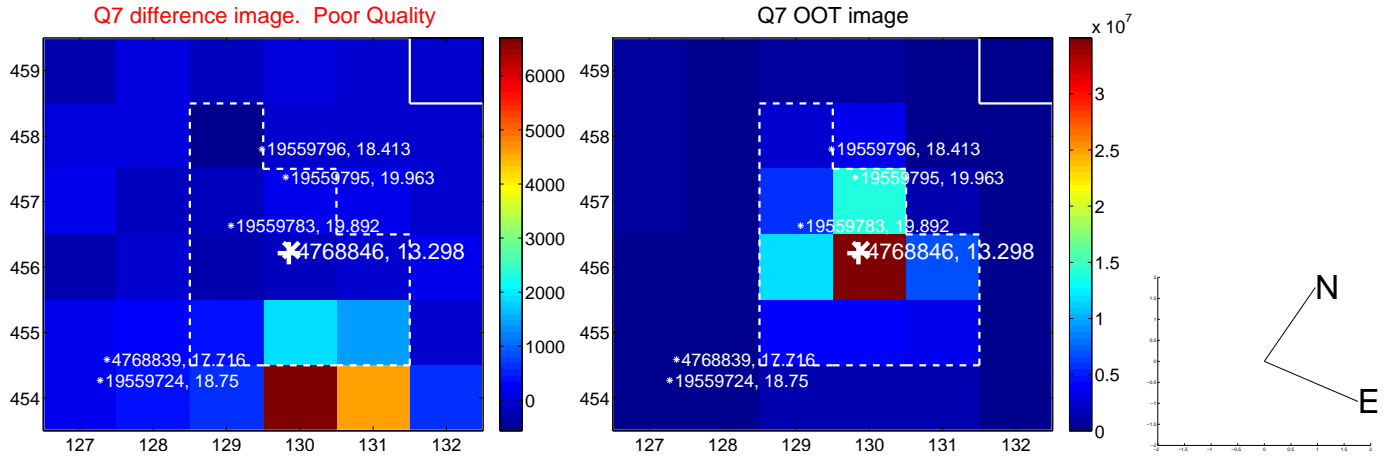
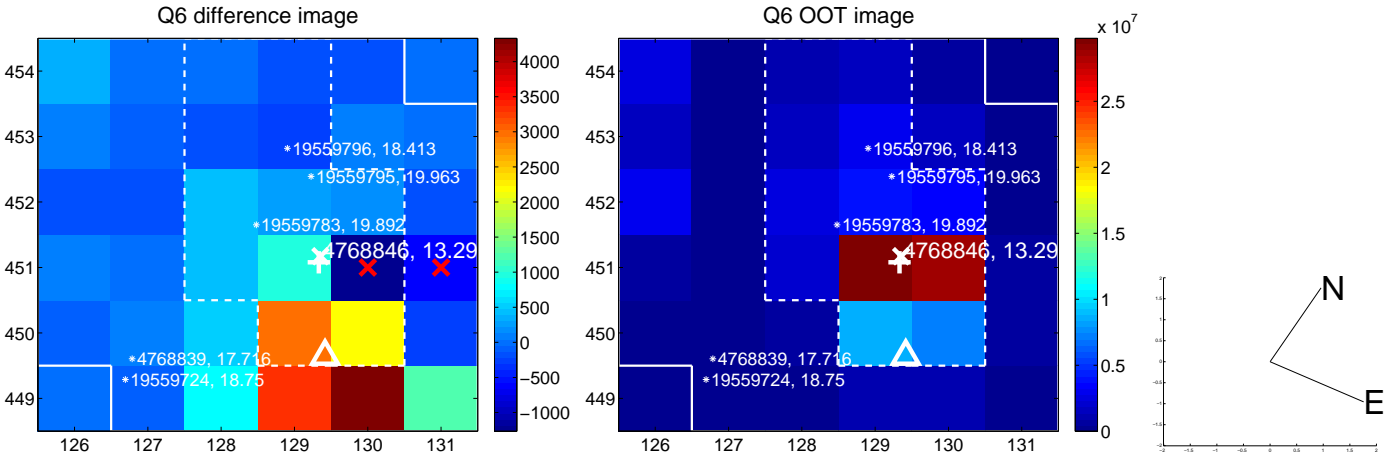
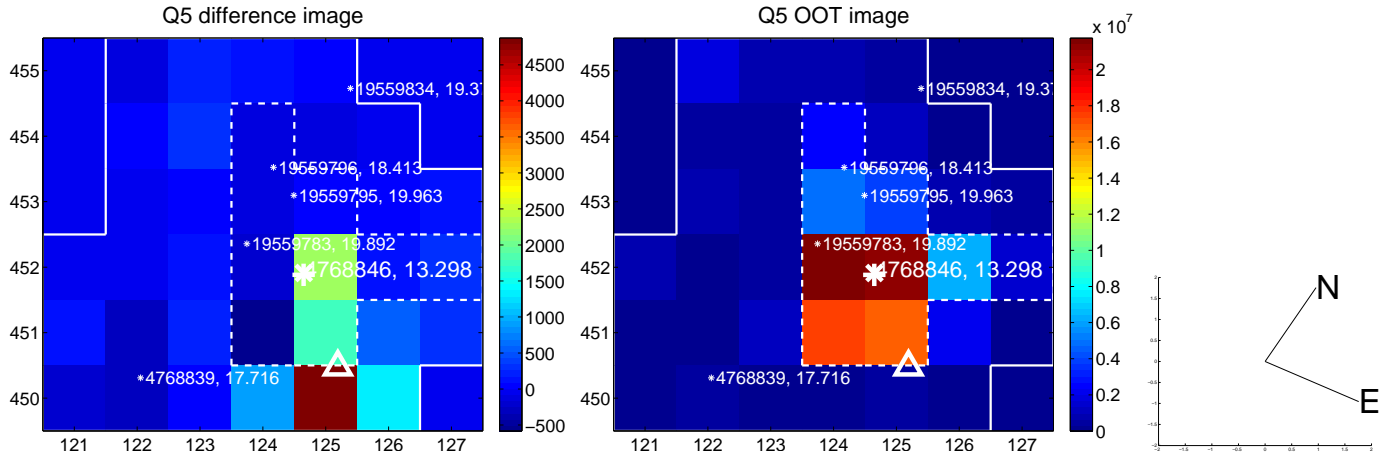
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	7.507 ± 0.495	15.16	4.882 ± 0.386	-5.702 ± 0.359
PRF-fit source offset from KIC position	7.747 ± 0.424	18.27	4.943 ± 0.352	-5.965 ± 0.314
photometric centroid source offset	6.84 ± 1.05	6.53	-5.76 ± 1.08	3.69 ± 0.98

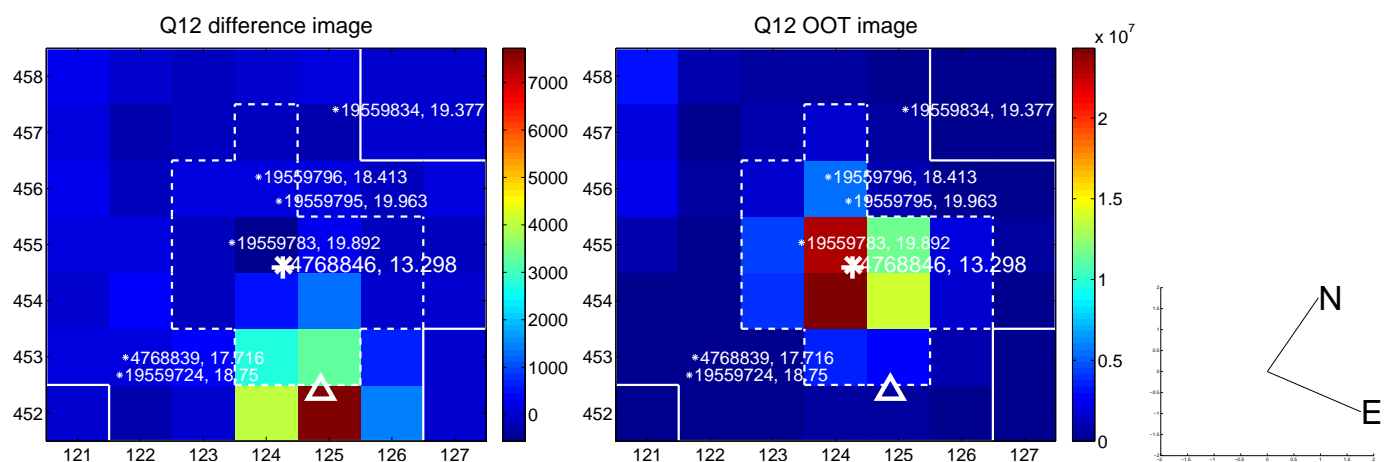
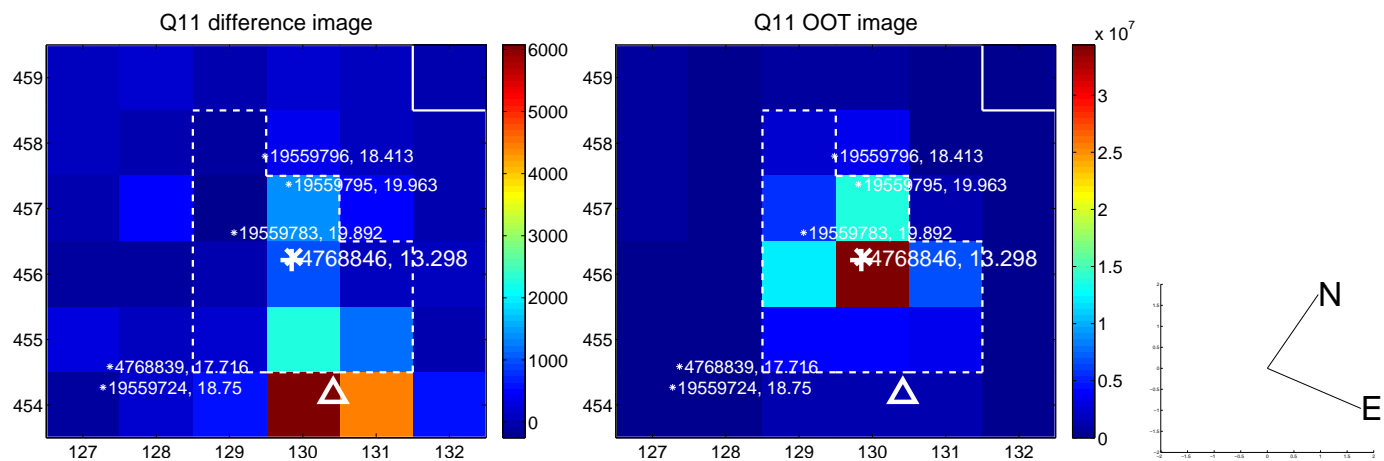
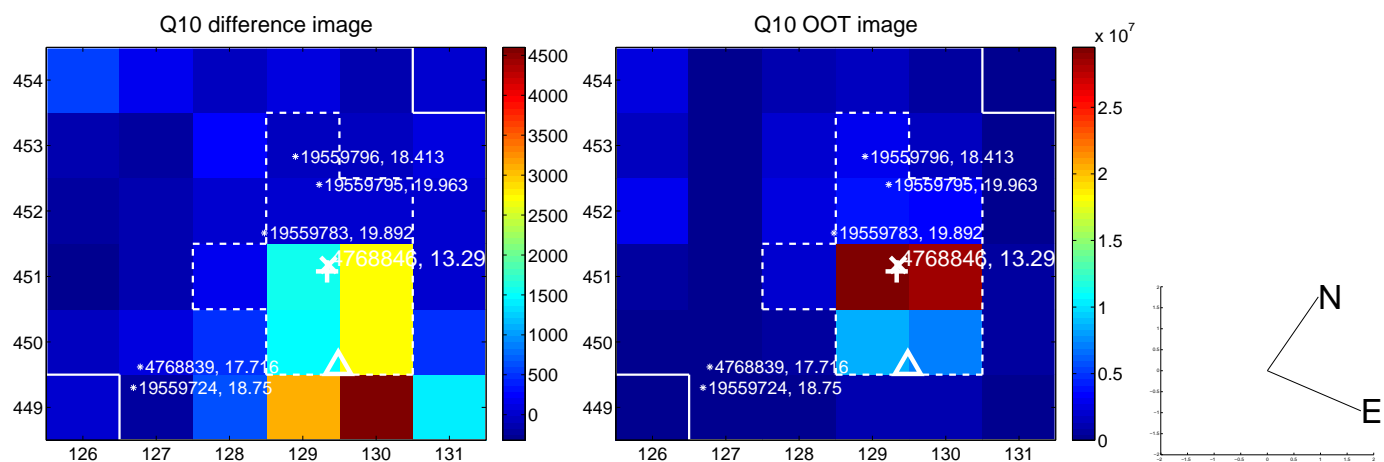
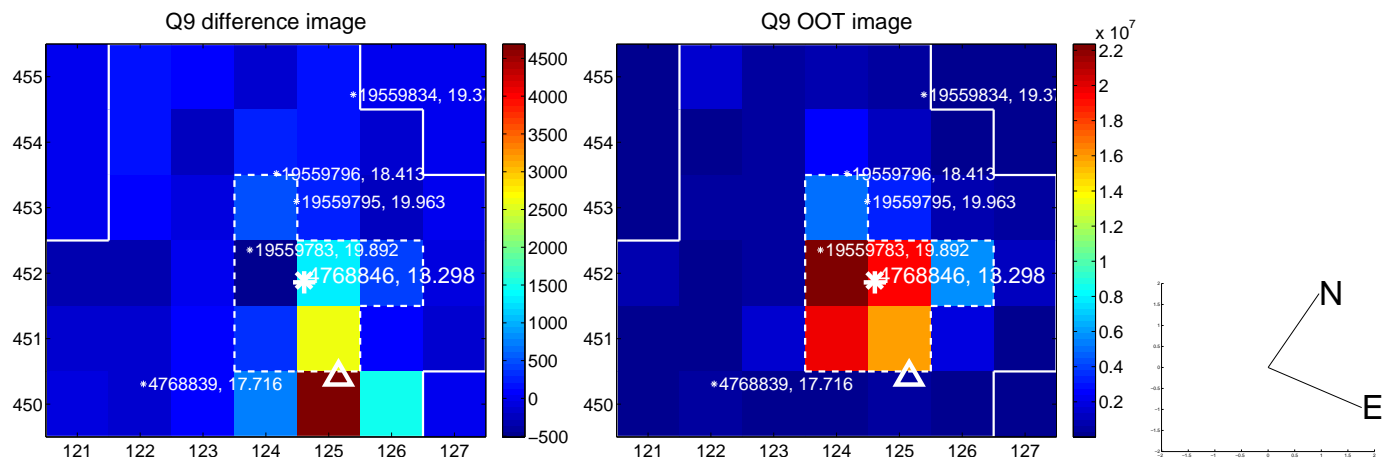


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

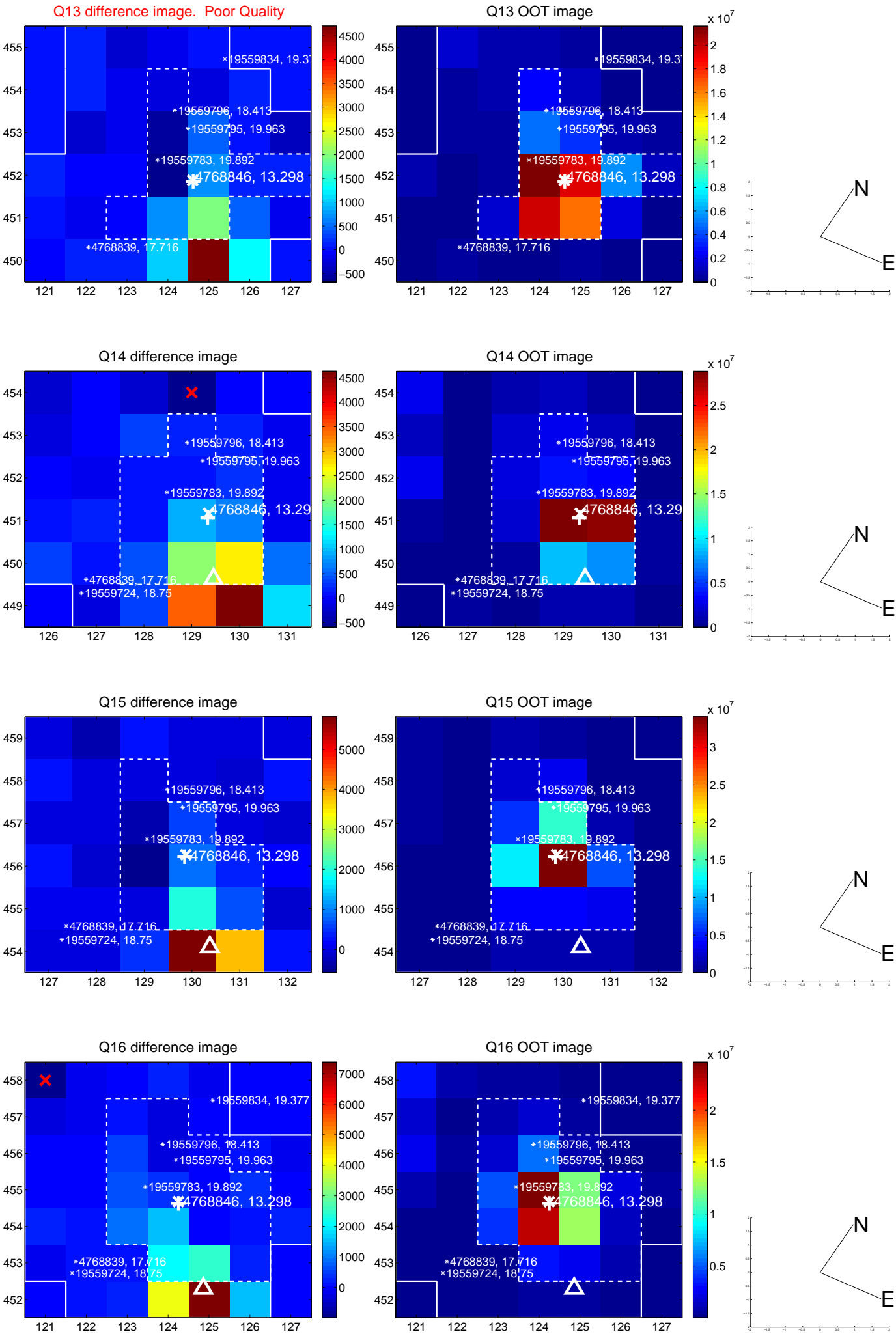
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



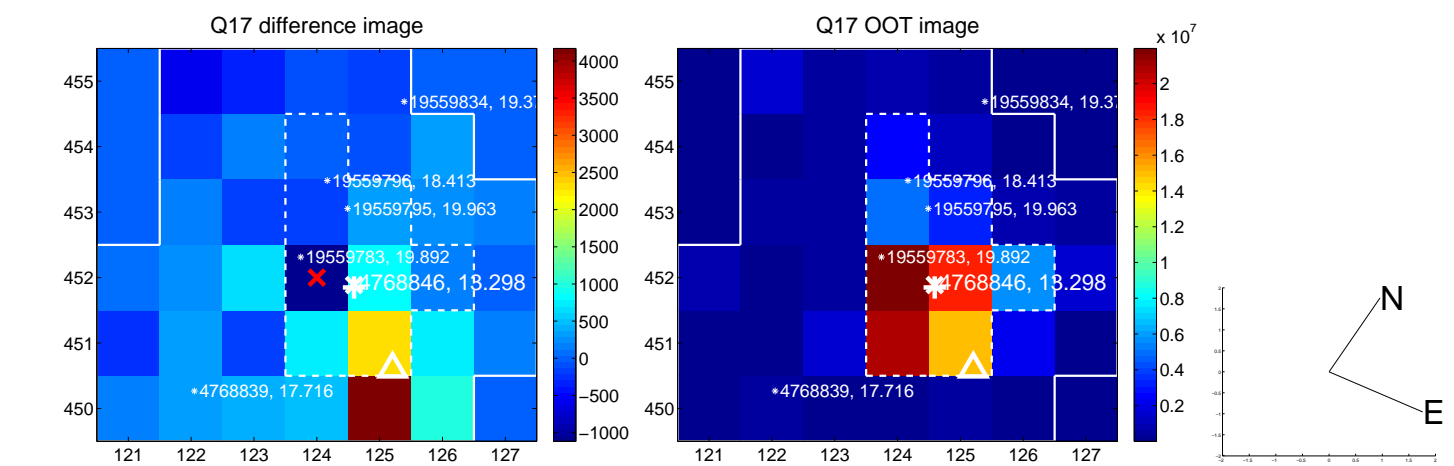
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



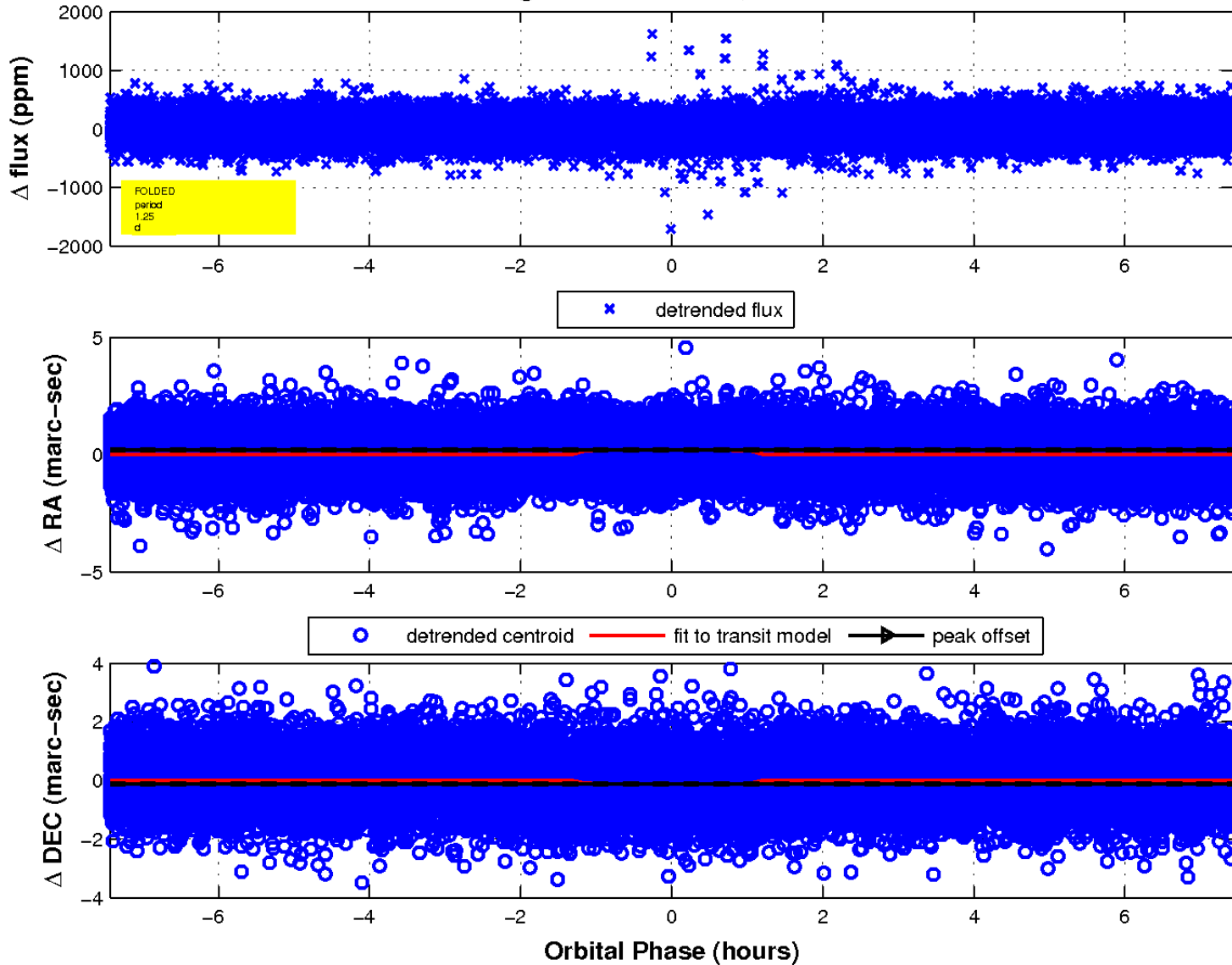
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

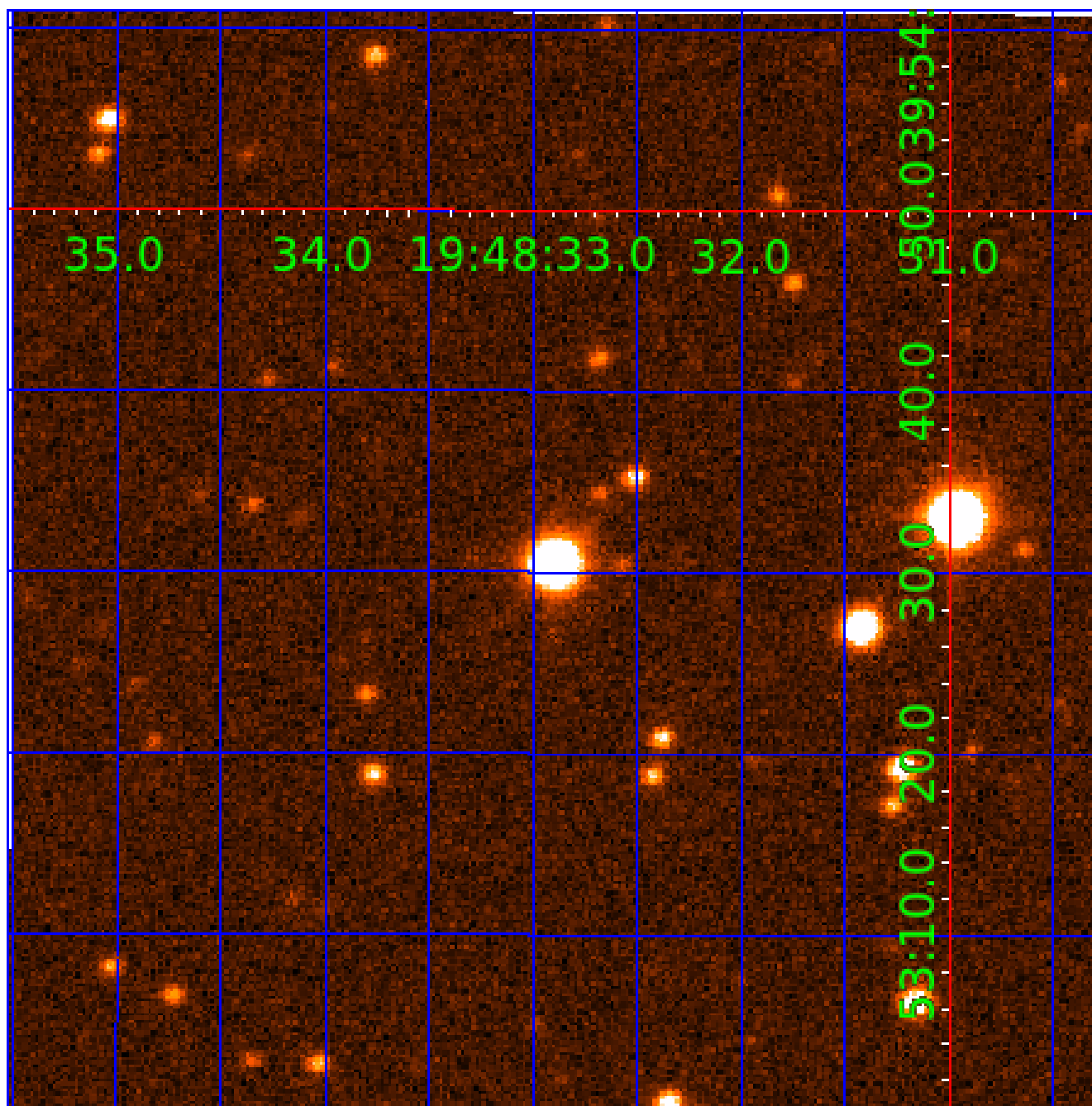


fluxWeightedCentroids, Planet 2 of 4



UKIRT Image

Declination



KIC 004768846

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})
004768846-01	OBS	2077.01	1.254849	132.178909	90.7	2.339	24.4	27.5	2.57	6168	2.88	13495.75
004768846-02	OBS	No	1.254859	131.550876	34.0	2.479	10.8	10.9	2.57	6168	1.77	13495.61
004768846-03	OBS	No	360.979355	249.502132	158.6	0.694	9.1	1.5	2.57	6168	3.54	7.11
004768846-04	OBS	No	152.177645	182.444874	134.5	9.969	9.1	2.7	2.57	6168	3.34	22.48

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004768846-01	OBS	FP	0.00	0	1	1	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_RESOLVED_OFFSET—HALO_GHOST
004768846-02	OBS	FP	0.00	1	1	1	0	IS_SEC_TCE—CENT_RESOLVED_OFFSET—HALO_GHOST
004768846-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_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—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004768846-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—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

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.

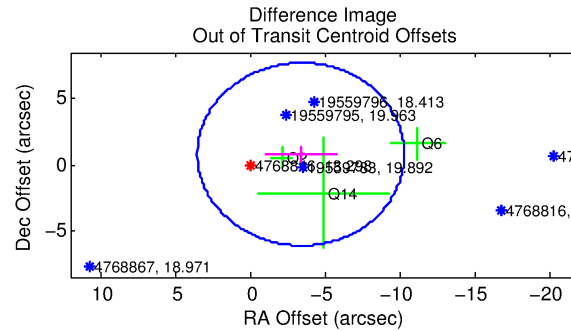
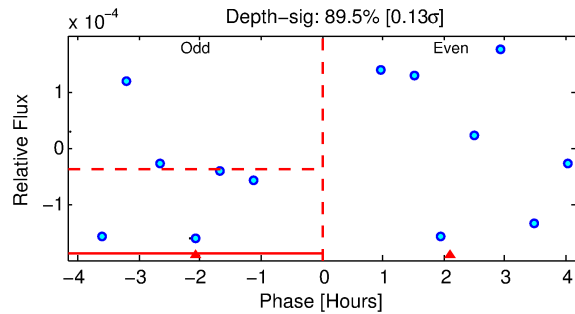
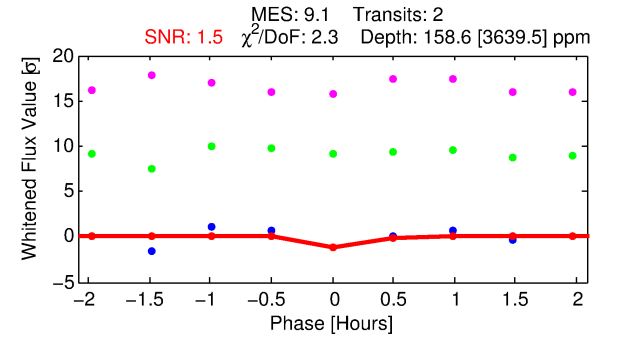
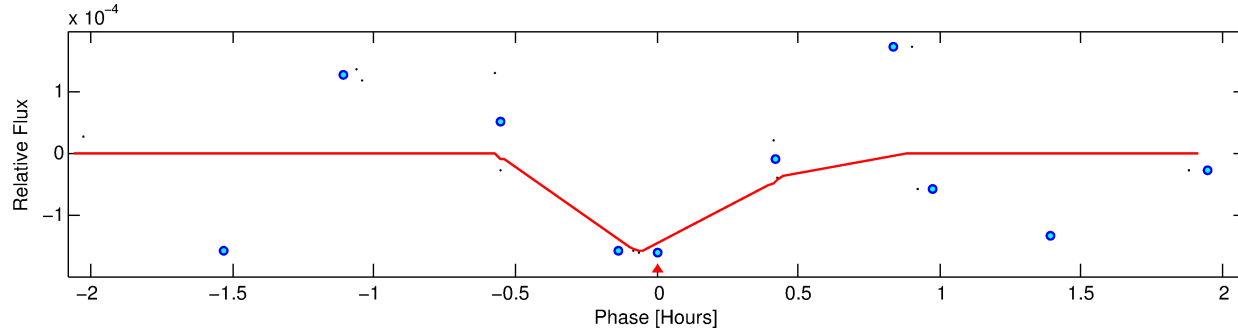
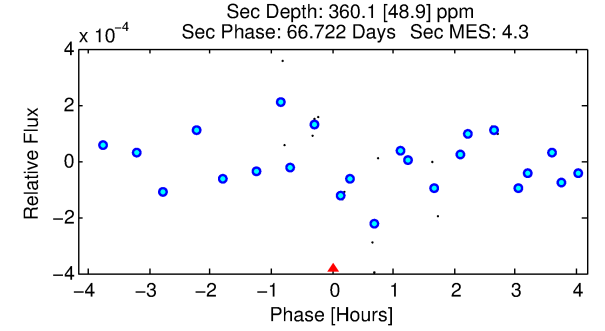
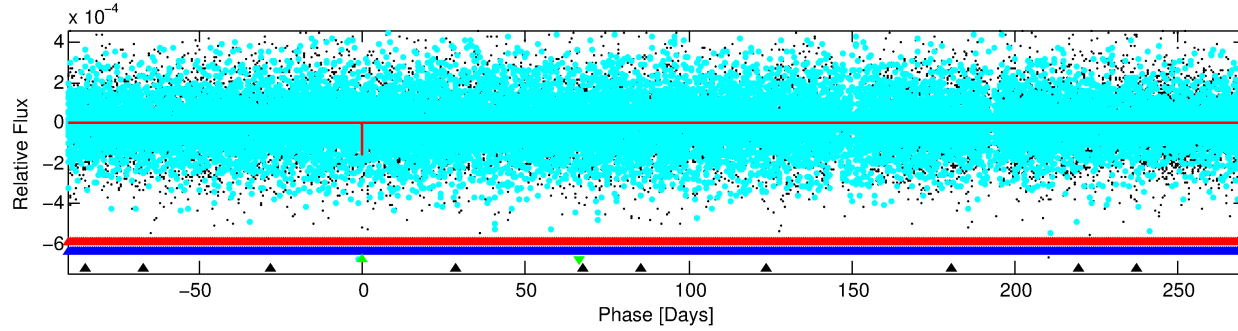
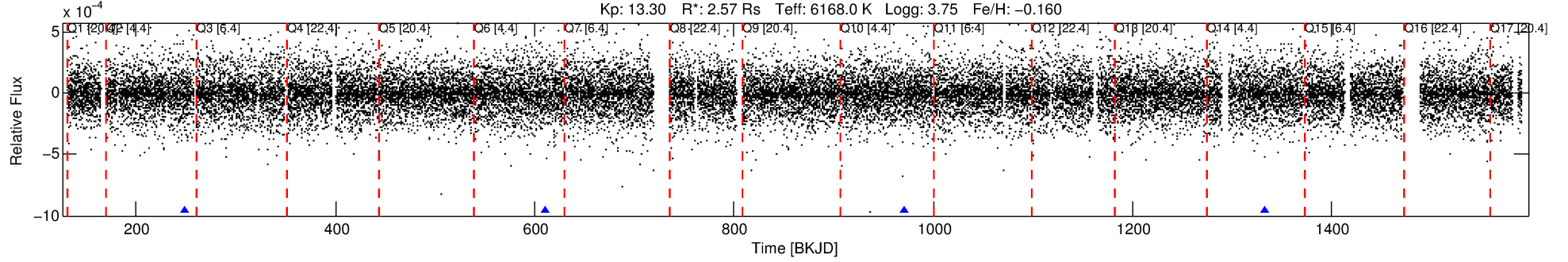
Ephemeris Match Information For 004768846-03

No Significant Match Found

DV One-Page Summary

KIC: 4768846 Candidate: 3 of 4 Period: 360.979 d
KOI: K02077 Corr: No Ephemeris Match

Kp: 13.30 R*: 2.57 Rs Teff: 6168.0 K Logg: 3.75 Fe/H: -0.160



DV Fit Results:

Period = 360.97935 [0.25069] d
Epoch = 249.5021 [0.1125] BKJD
Rp/R* = 0.0126 [12.2602]
a/R* = 2912.29 [14610451.84]
b = 0.70 [3712.45]
Seff = 7.11 [3.88]
Teq = 416 [57] K
Rp = 3.54 [3440.99] Re
a = 1.0987 [0.3767] AU
Ag = 19048.37 [36997626.41] [0.00σ]
Teffp = 7562 [3672027] K [0.00σ]

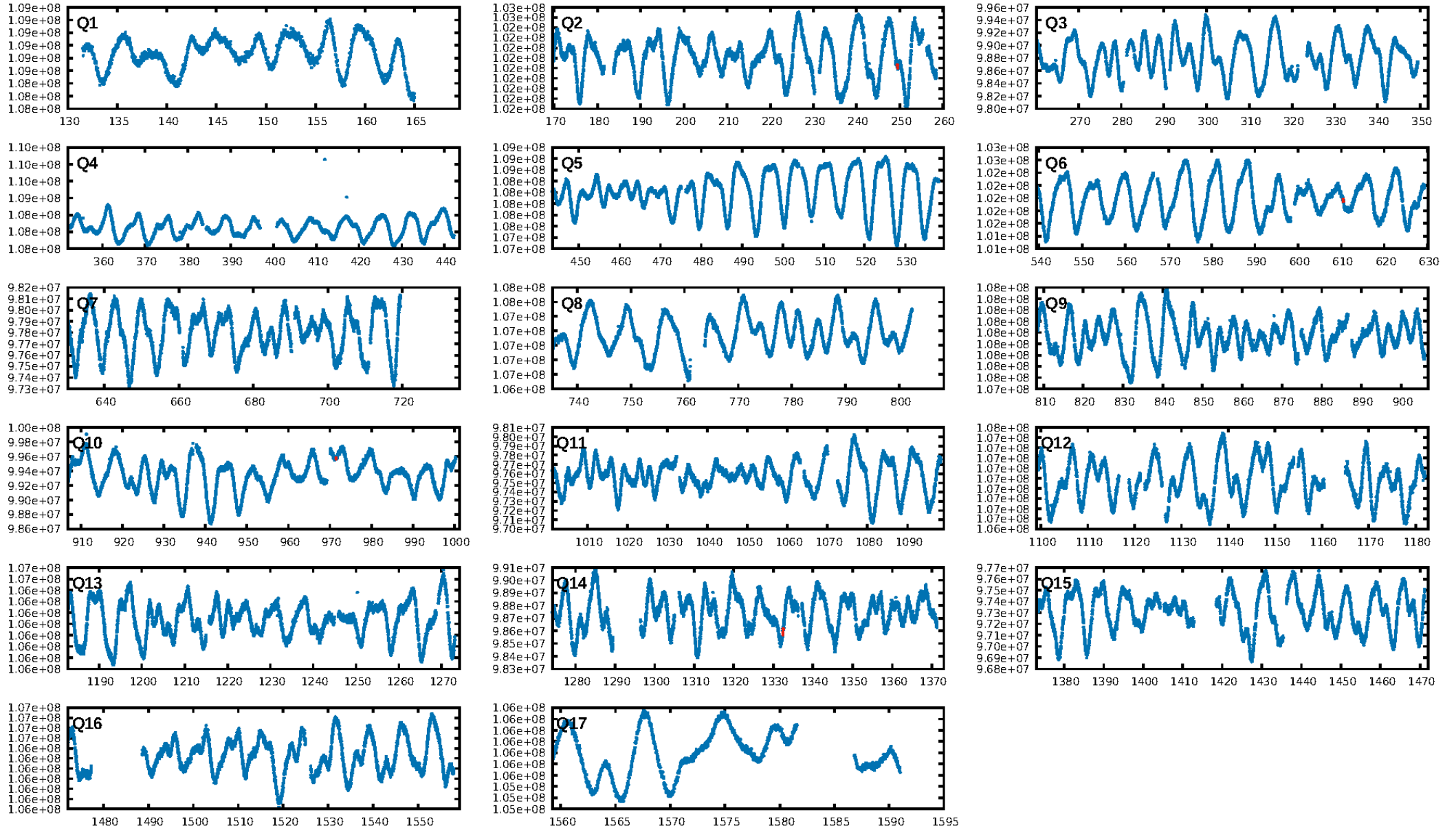
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [501.49σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 25.5%
ModelChiSquareGof-sig: 75.4%
Bootstrap-pfa: 4.17e-09
RollingBand-fgt: 1.00 [2/2]
GhostDiagnostic-chr: -41.36
Centroid-sig: 92.7%
Centroid-so: 2.217 arcsec [0.31σ]
OotOffset-rm: 3.502 arcsec [1.52σ]
OotOffset-st: 3/0/0/0 [3]
KicOffset-rm: 3.509 arcsec [1.51σ]
KicOffset-st: 3/0/0/0 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 0.00 [0/4]

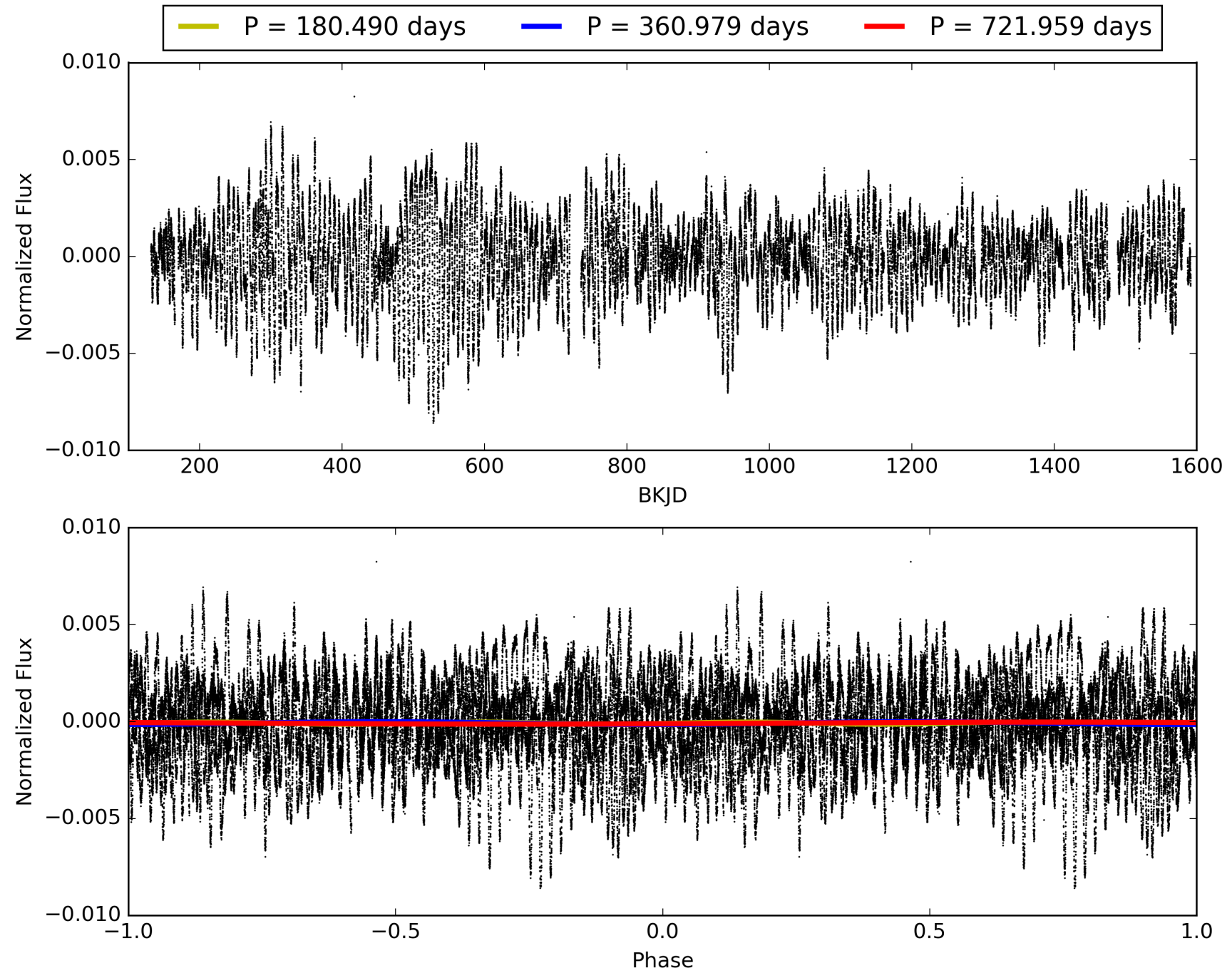
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 03:24:04 Z

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

TCE 004768846-03, PDC Light Curves

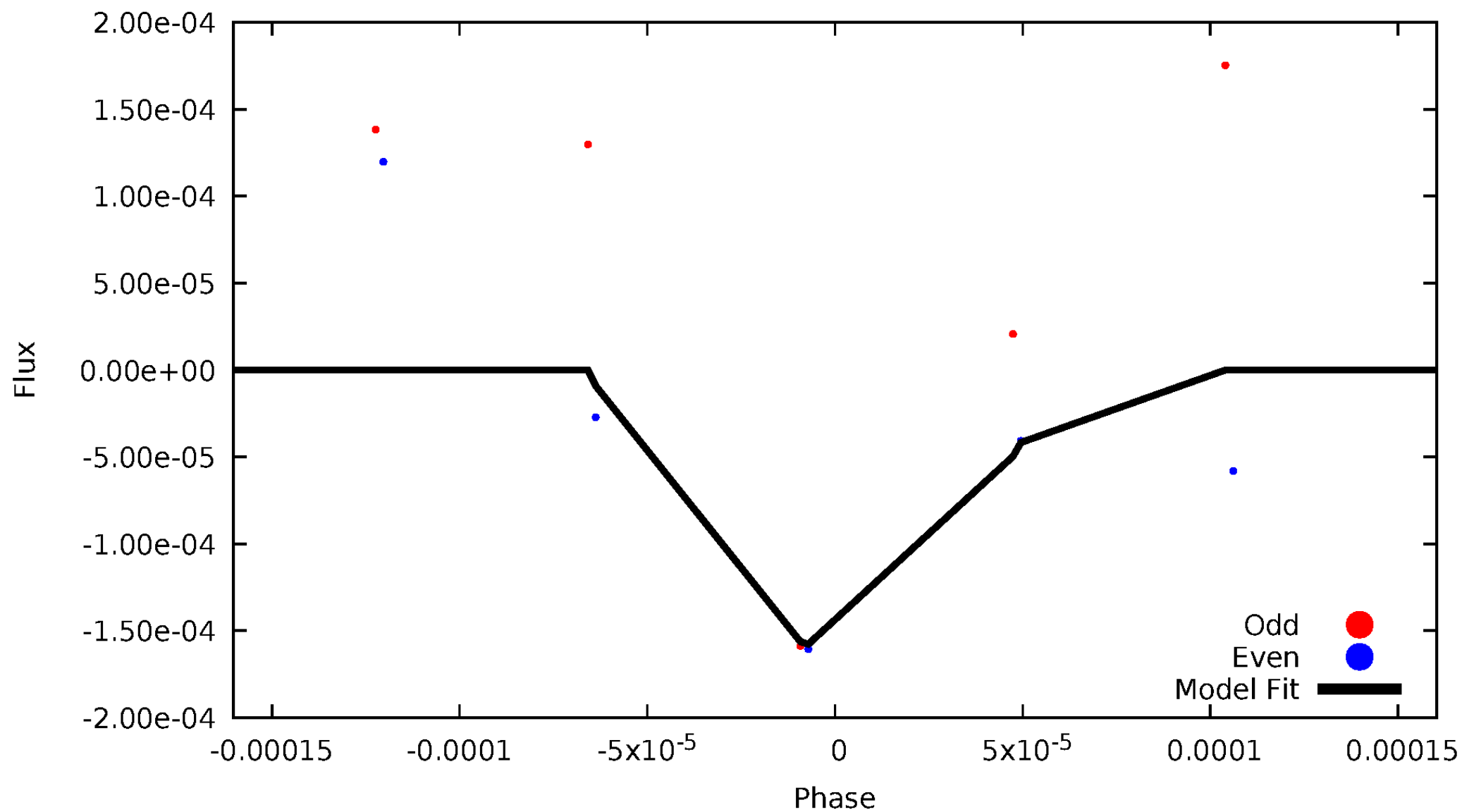


TCE 004768846-03



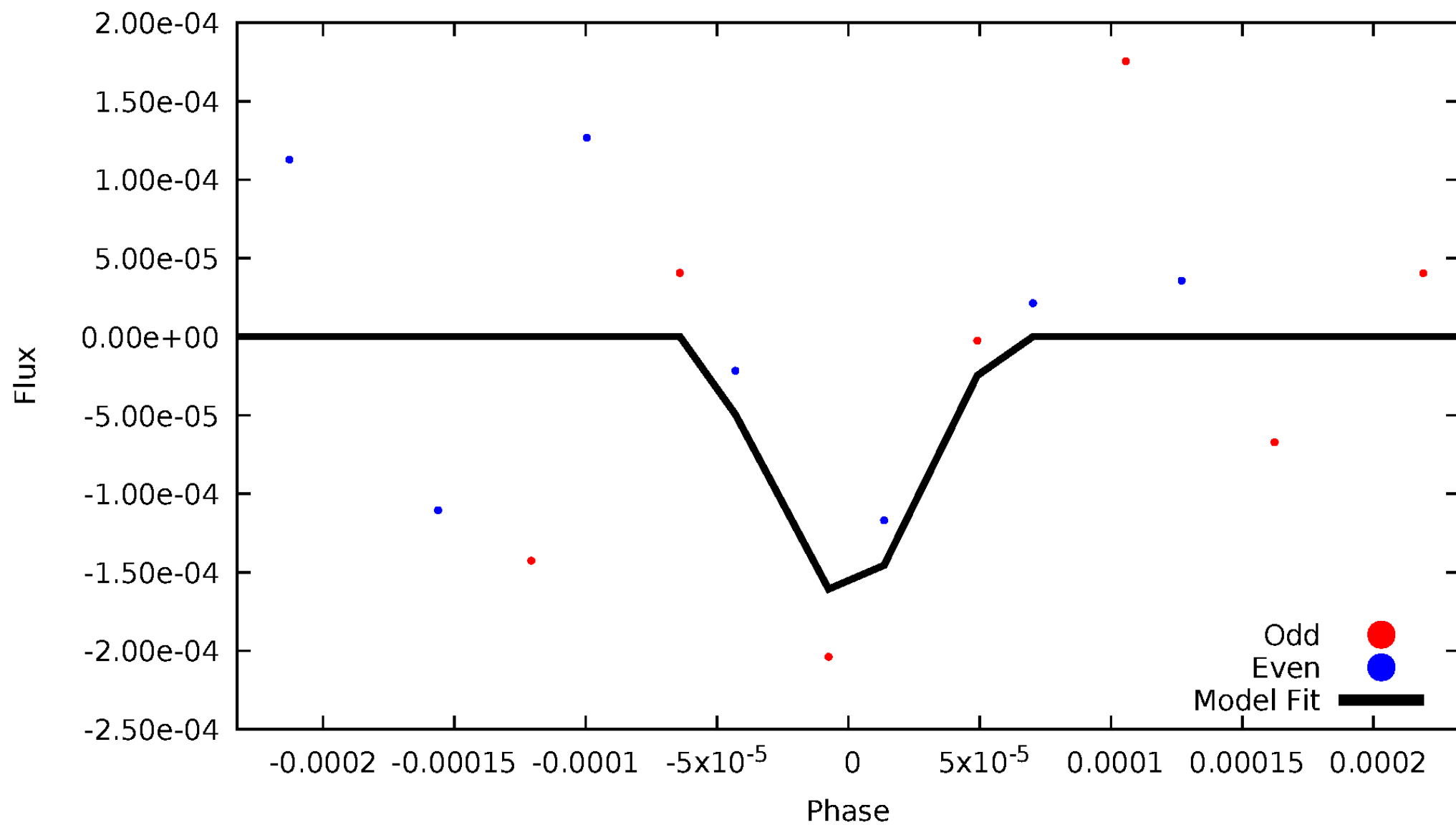
DV Odd/Even

TCE 004768846-03



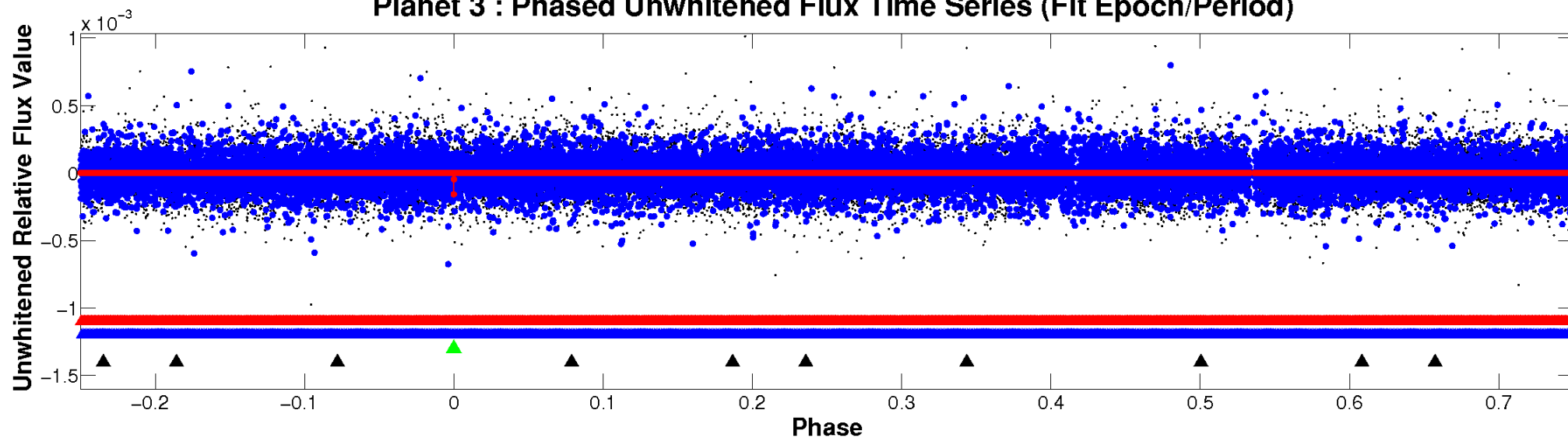
ALT Odd/Even

TCE 004768846-03

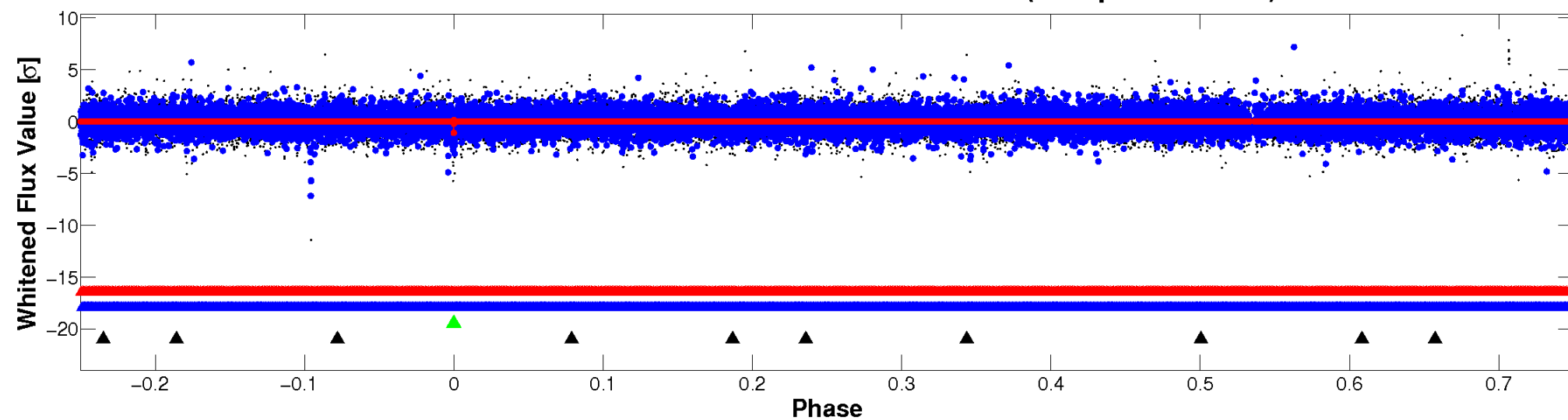


Non-Whitened Vs. Whitened Light Curve

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

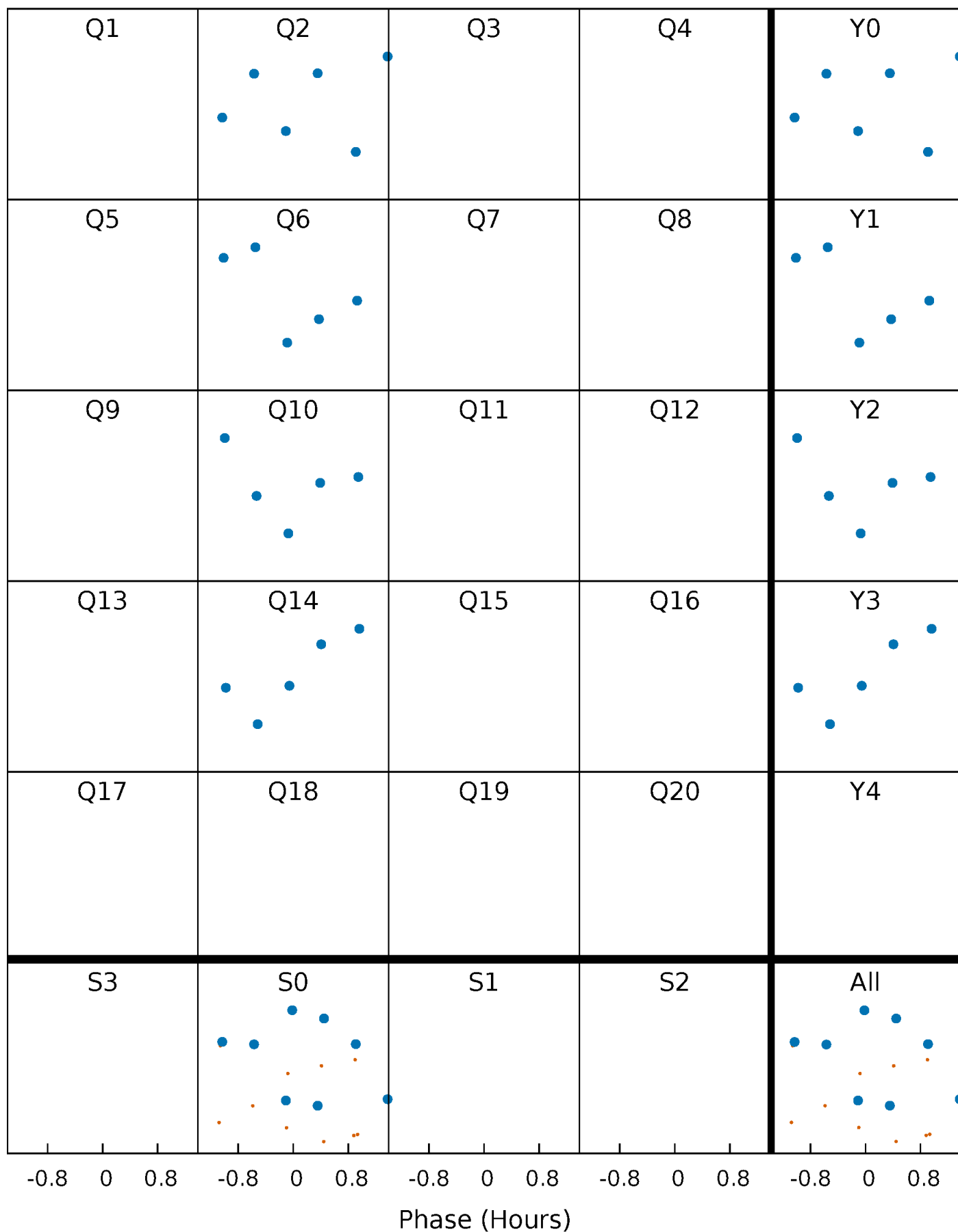


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



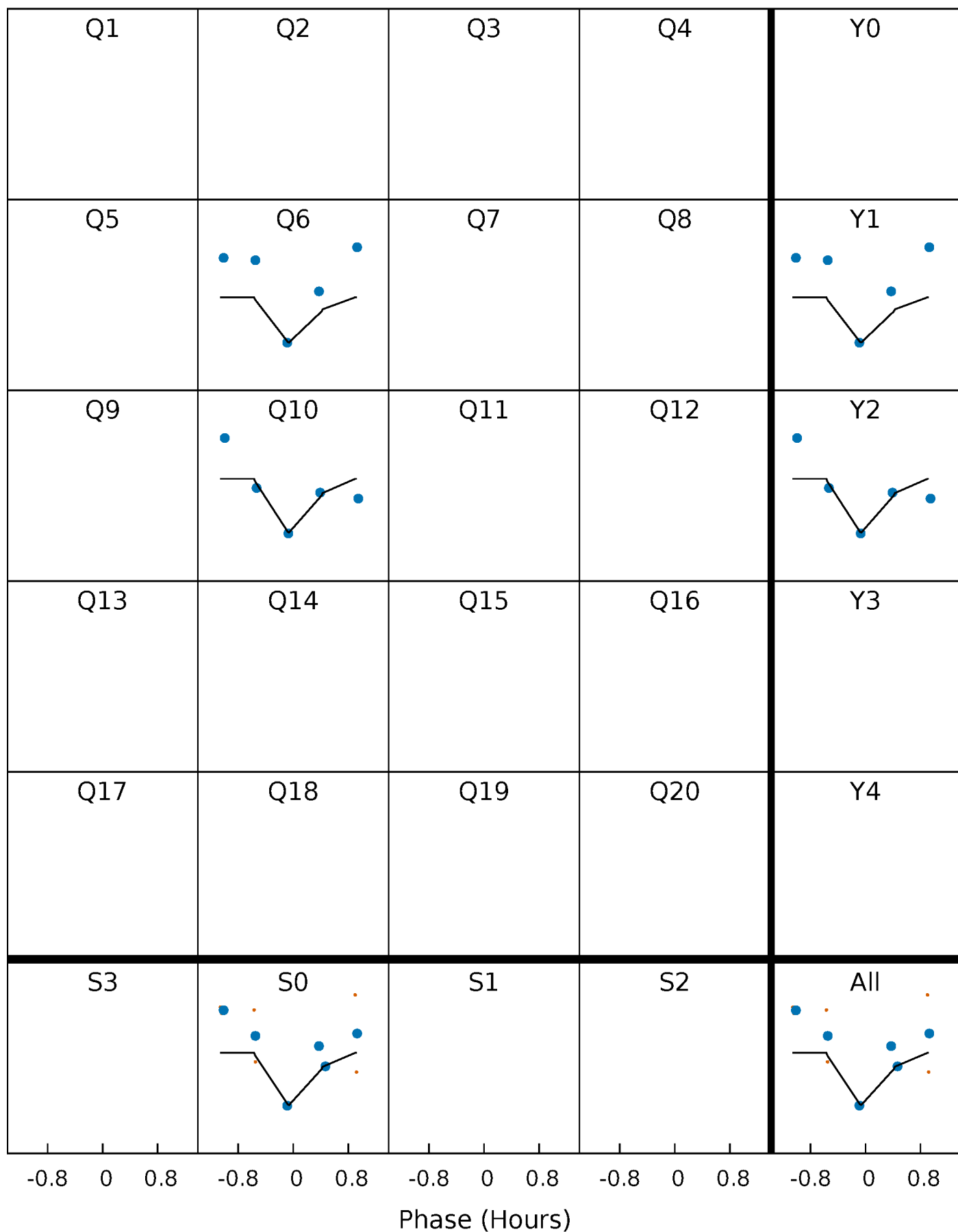
PDC Quarter-Phased Transit Curves

TCE 004768846-03 P=360.979355 Days $T_0=249.502132$ (BKJD)



DV Quarter-Phased Transit Curves

TCE 004768846-03 P=360.979355 Days $T_0=249.502132$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

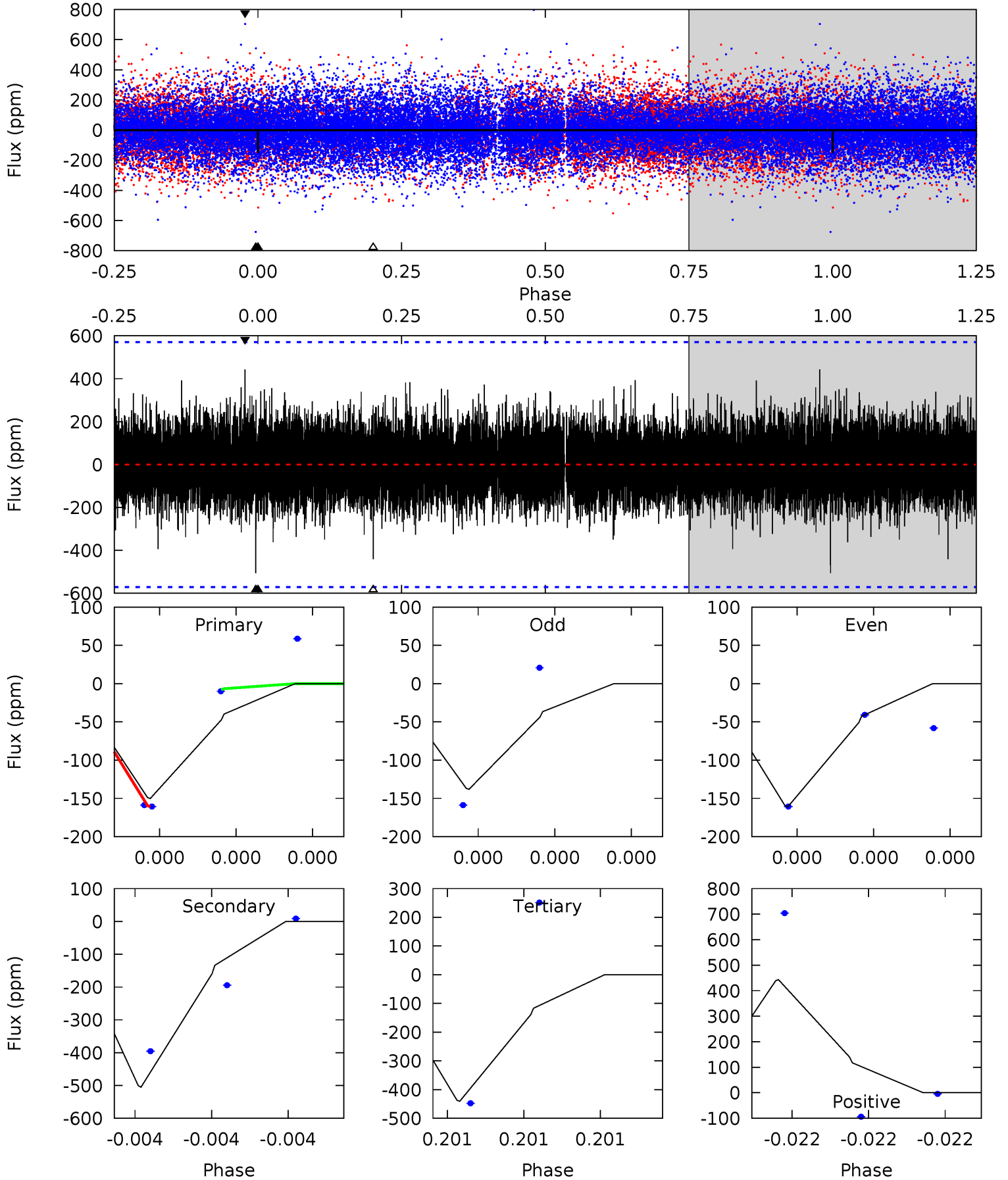
TCE 004768846-03 P=360.972460 Days $T_0=249.508430$ (BKJD)



DV Model-Shift Uniqueness Test

004768846-03, P = 360.979355 Days, E = 249.502132 Days

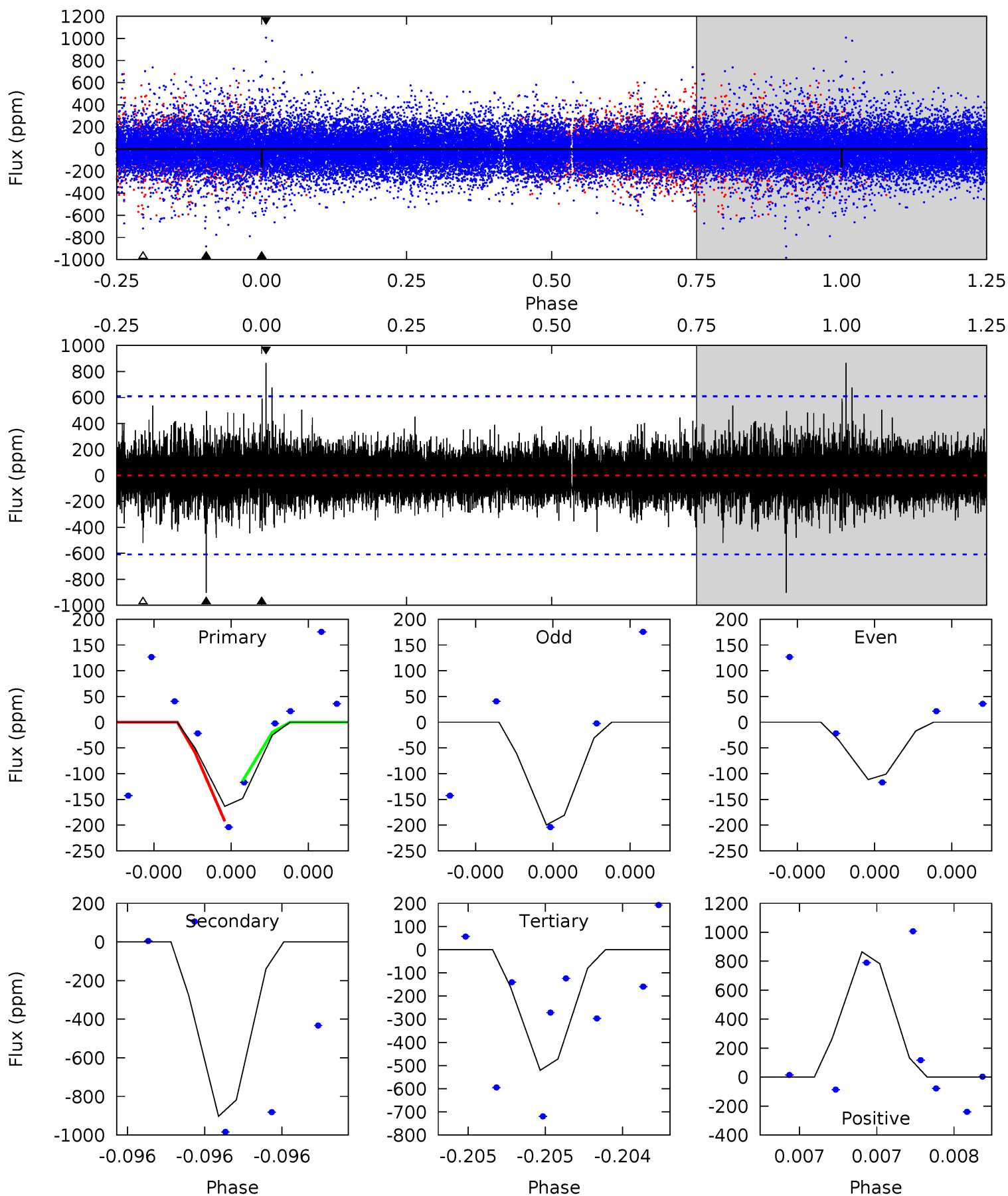
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.56	5.25	4.58	4.61	5.94	4.02	0.94	-3.02	-3.05	0.67	0.64	0.14	1.00	0.47	0.80



Alt Model-Shift Uniqueness Test

004768846-03, P = 360.972460 Days, E = 249.508430 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.57	8.69	5.01	8.32	5.86	3.91	1.00	-3.44	-6.75	3.68	0.37	0.42	1.00	0.49	0.38



Stellar Parameters For KIC 004768846

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6168^{+170}_{-170}	$3.750^{+0.308}_{-0.082}$	$-0.160^{+0.300}_{-0.300}$	$2.572^{+0.411}_{-0.958}$	$1.358^{+0.224}_{-0.299}$	$0.113^{+0.257}_{-0.028}$
	+3%/-3%	+8%/-2%	+188%/-188%	+16%/-37%	+16%/-22%	+228%/-25%
Source	PHO1	FLK73	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 004768846-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-505 ± 96	$2306.73^{+2263.43}_{-1621.61}$	569^{+33}_{-51}	-1469^{+3022}_{-55}	$0.065^{+0.626}_{-0.049}$
Alt.	-903 ± 104	$2047.77^{+2528.92}_{-1408.88}$	567^{+36}_{-50}	-1416^{+3091}_{-95}	$0.148^{+1.308}_{-0.118}$

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 $A_{obs} \gg 1.0$

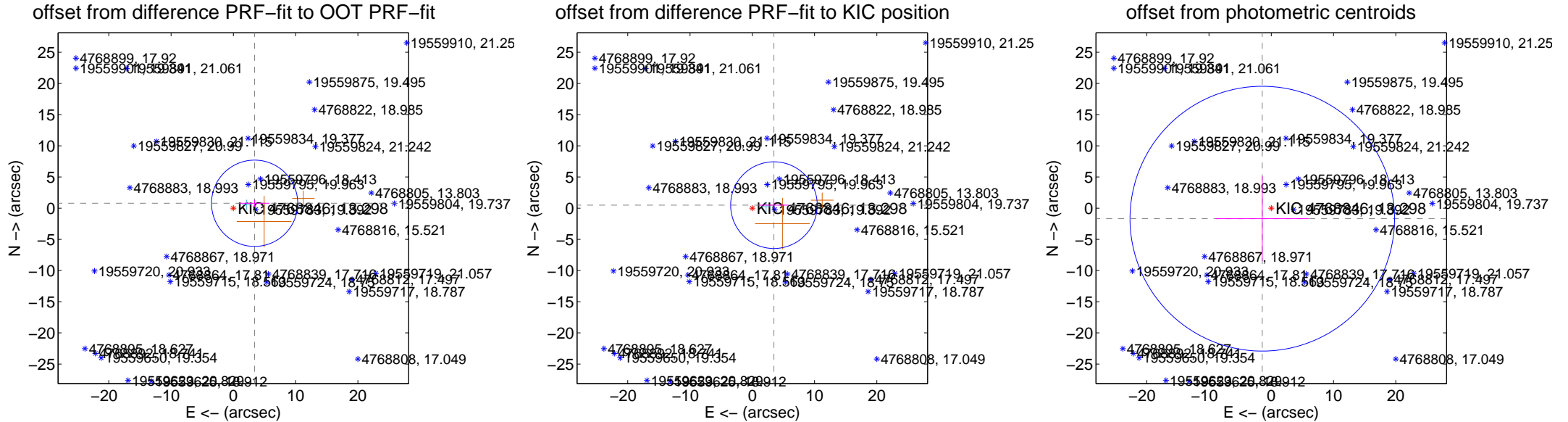
DV Centroid Data

Supplemental centroid analysis for 004768846-03. Kepler magnitude: 13.30. Transit SNR 1.48

There are 1 quarters with good PRF difference image offsets

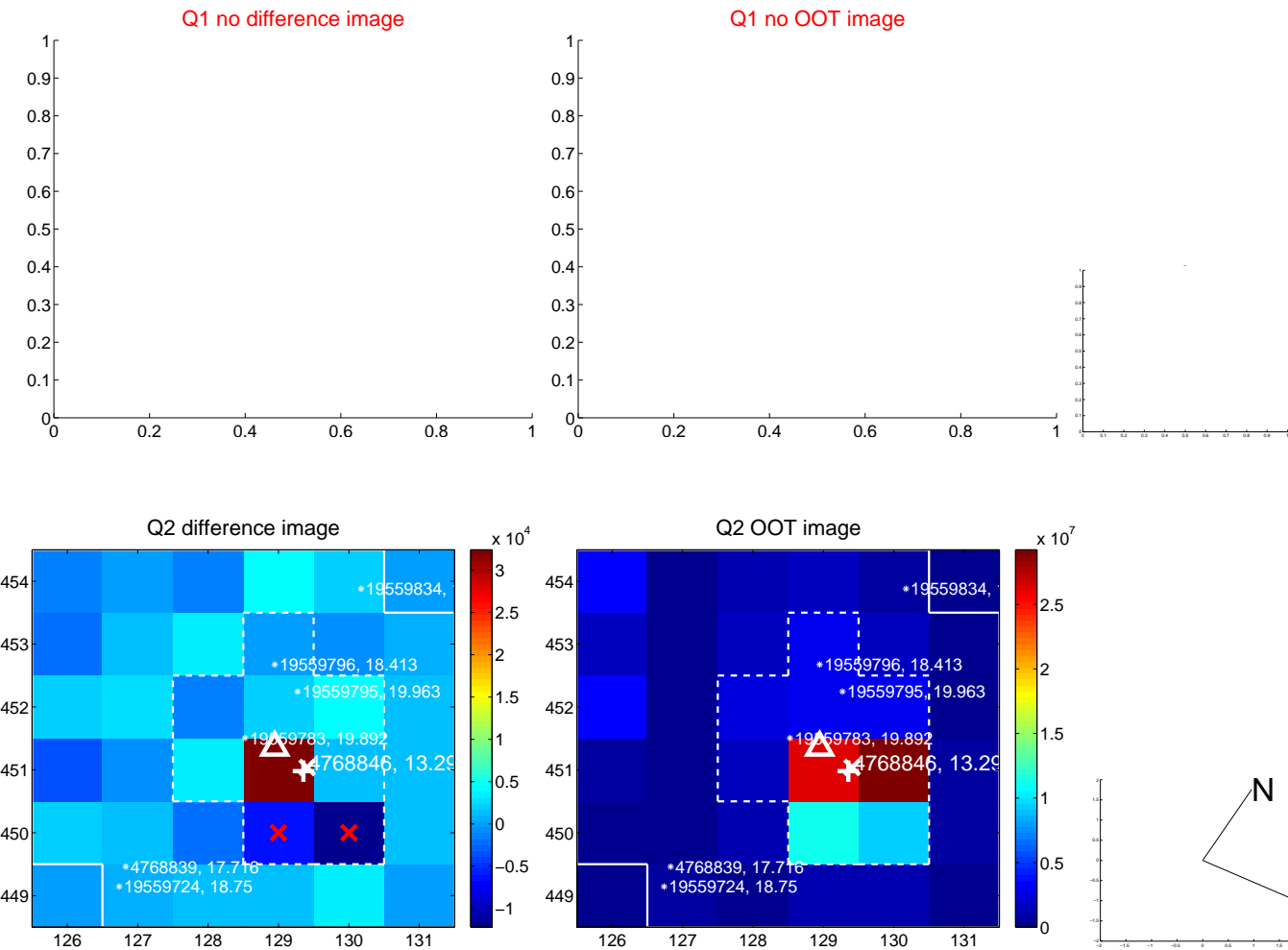
The direct PRF centroid is offset from the target star catalog position by about 0.35 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.502 ± 2.306	1.52	-3.413 ± 2.364	0.786 ± 0.543
PRF-fit source offset from KIC position	3.509 ± 2.317	1.51	-3.475 ± 2.338	0.485 ± 0.548
photometric centroid source offset	2.22 ± 7.08	0.31	1.44 ± 7.45	-1.69 ± 6.79

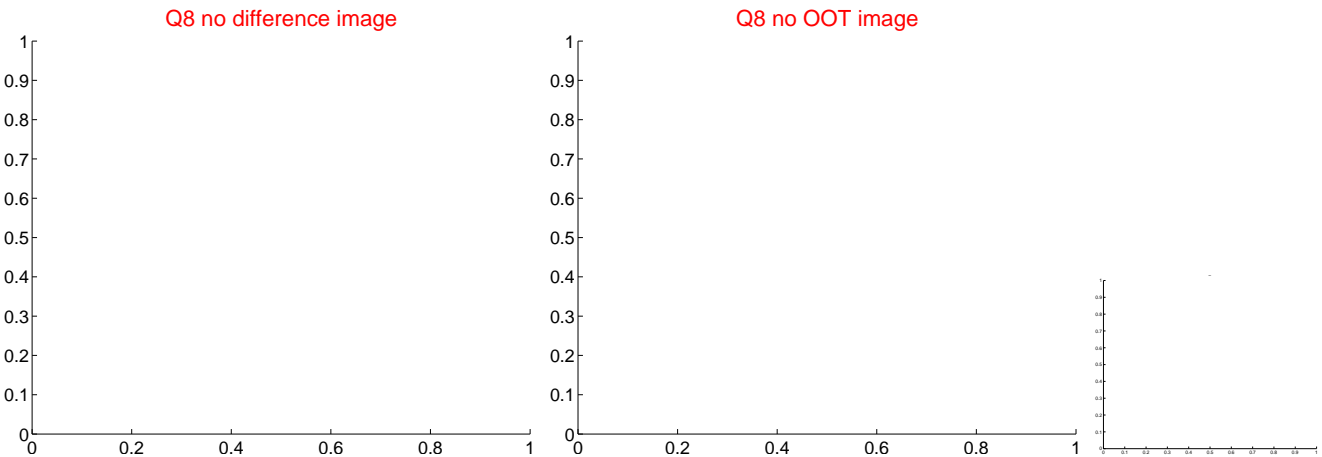
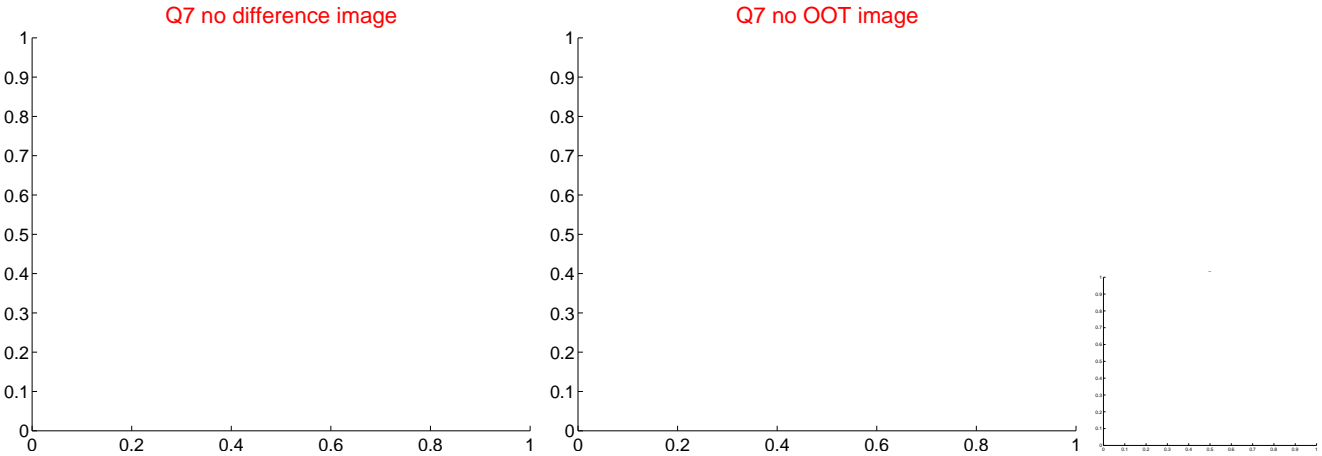
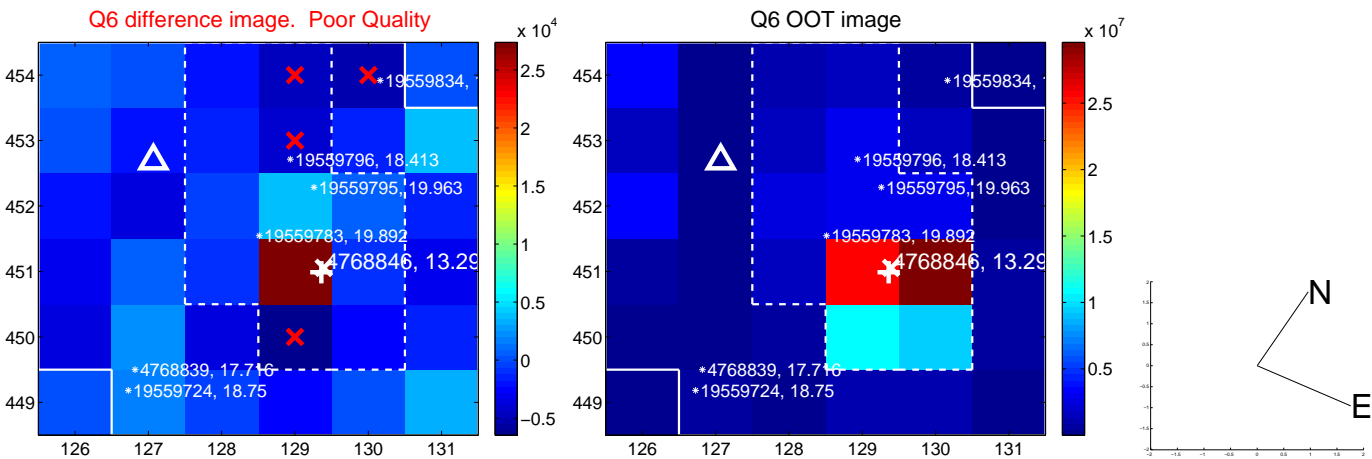
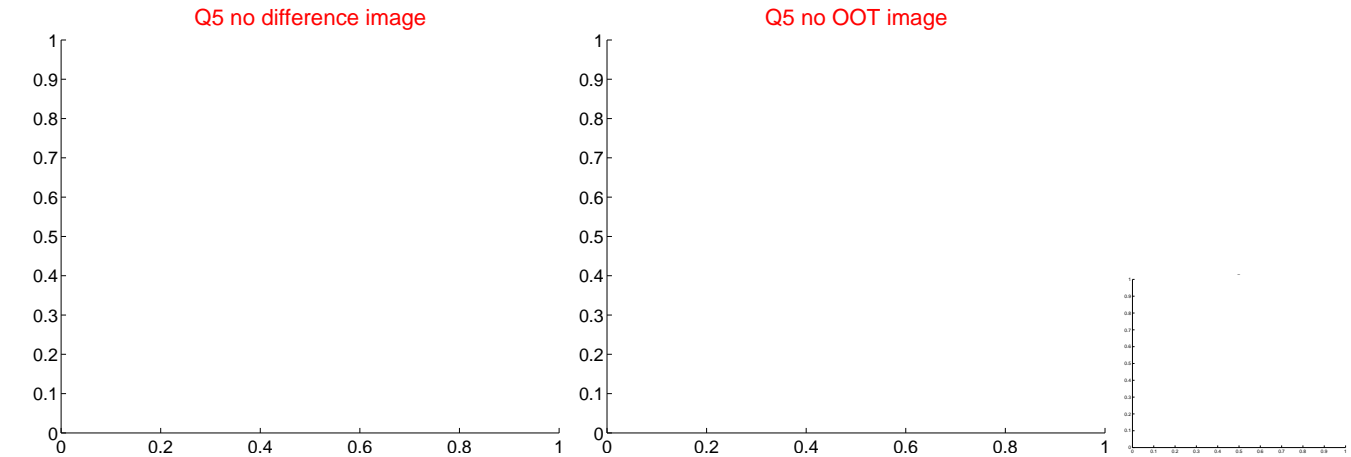


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

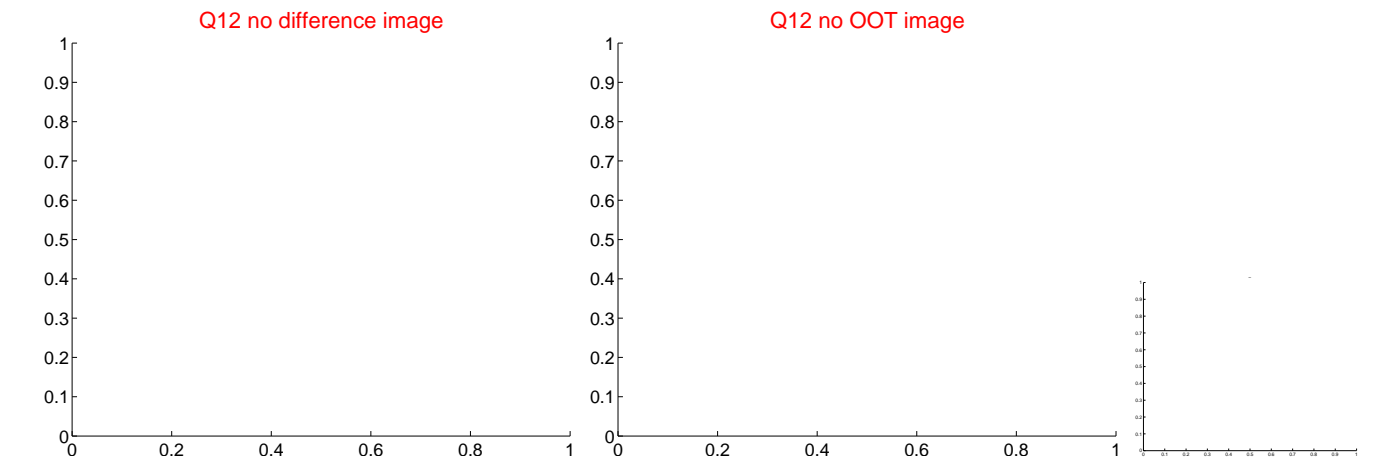
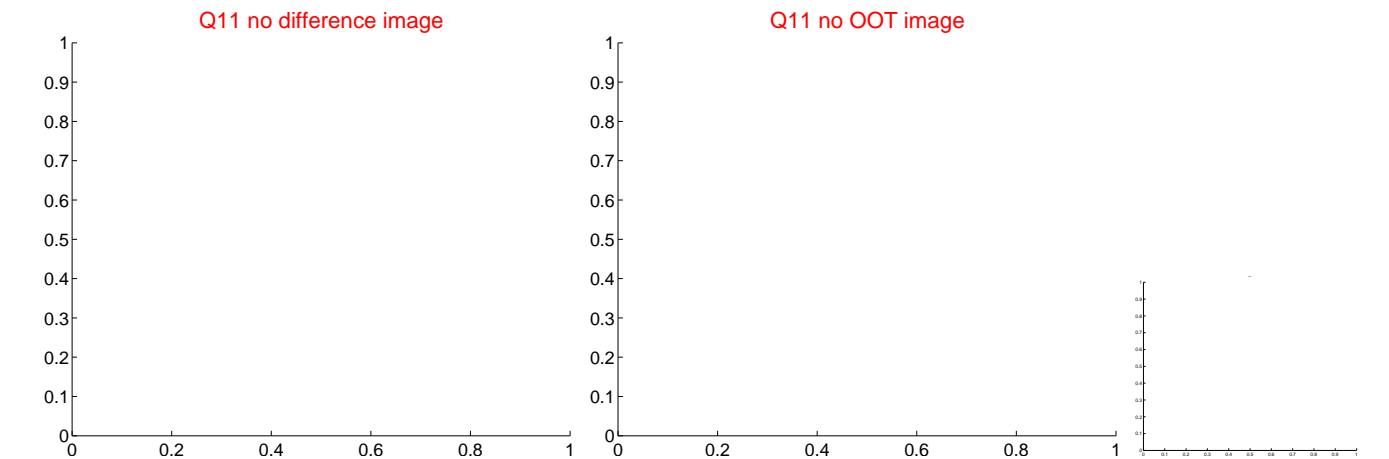
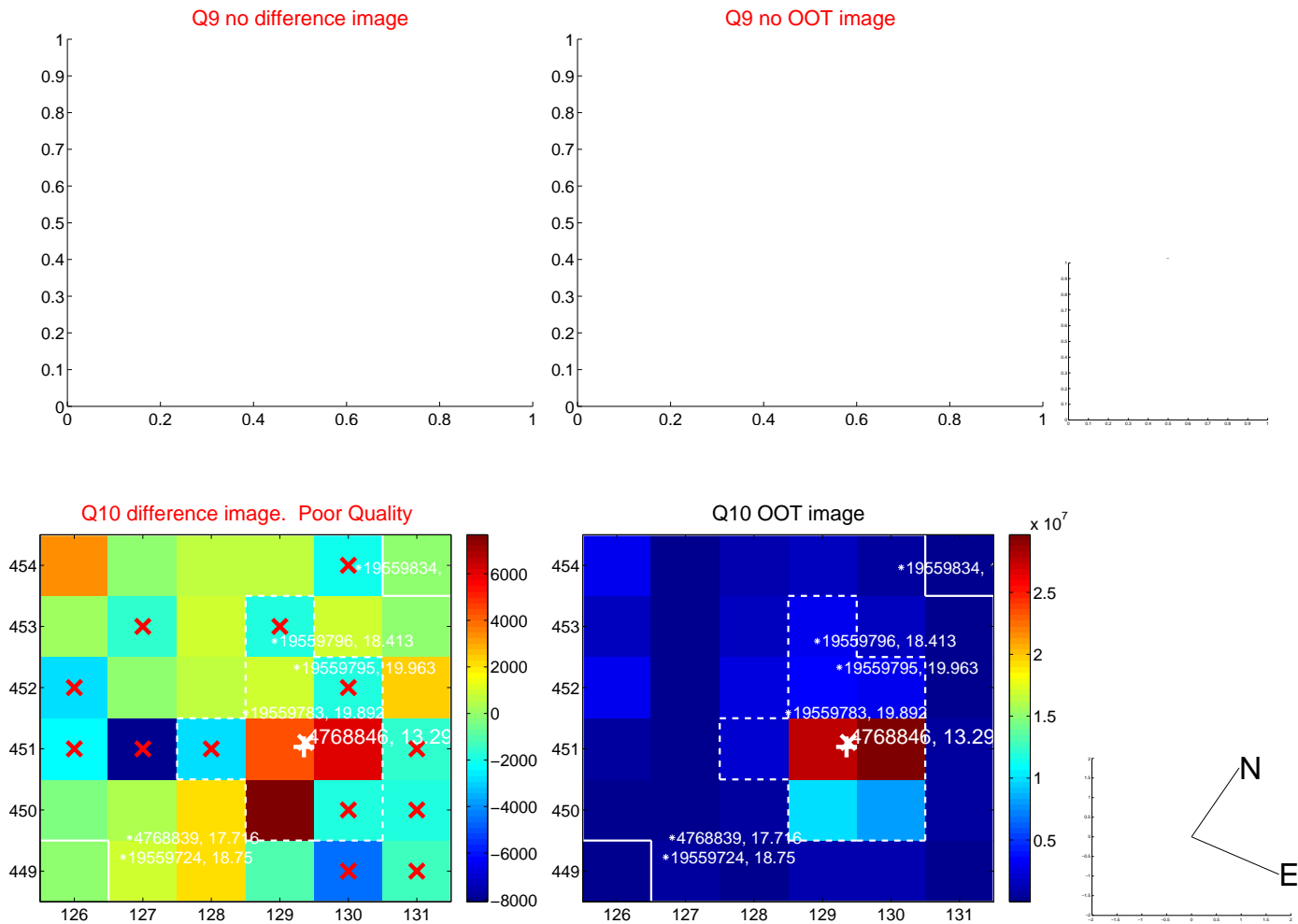
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

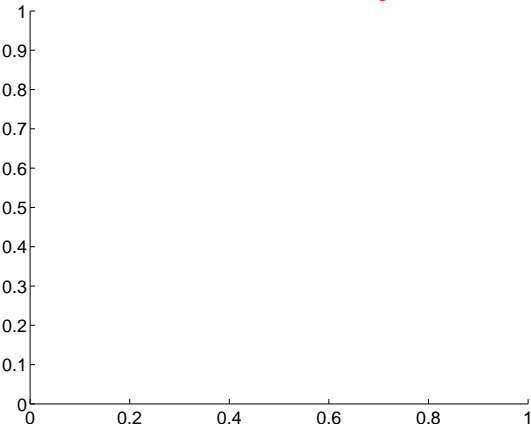


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

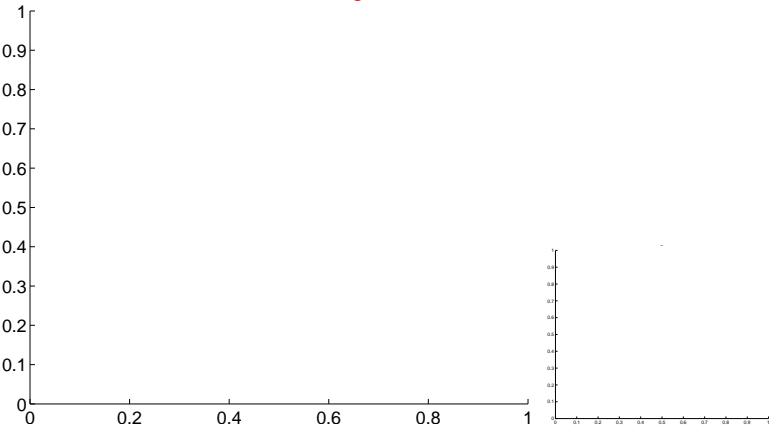


white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

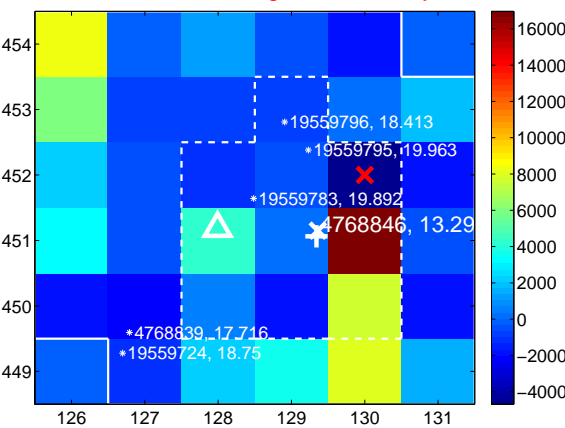
Q13 no difference image



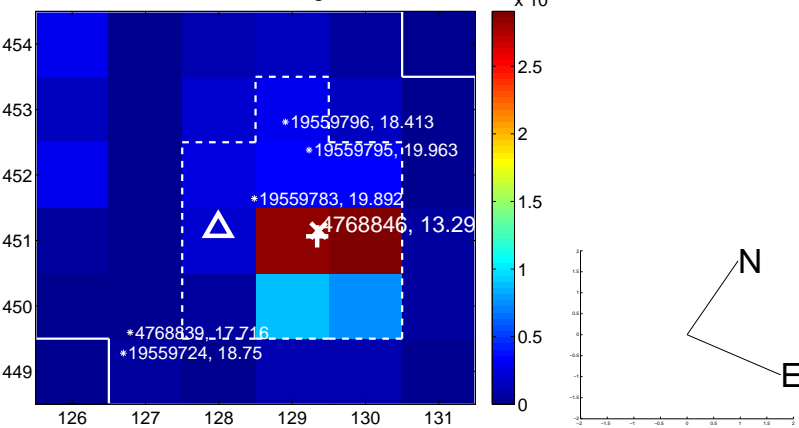
Q13 no OOT image



Q14 difference image. Poor Quality



Q14 OOT image



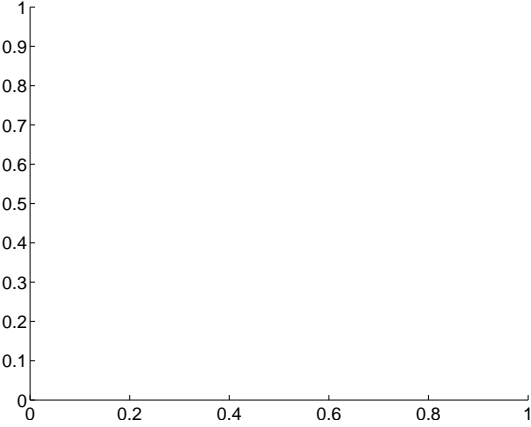
Q15 no difference image



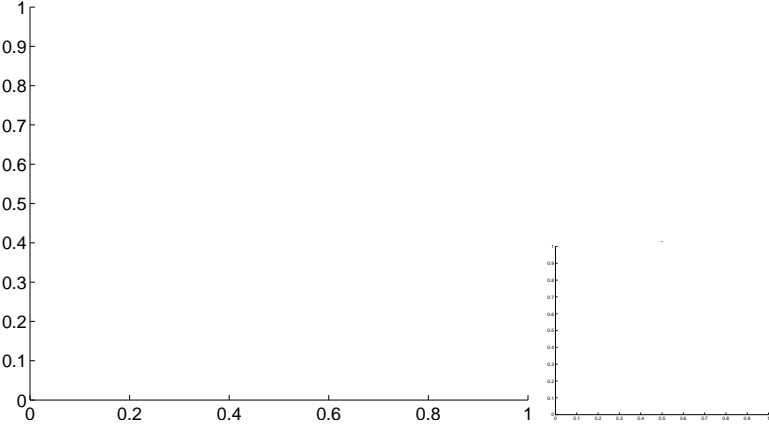
Q15 no OOT image



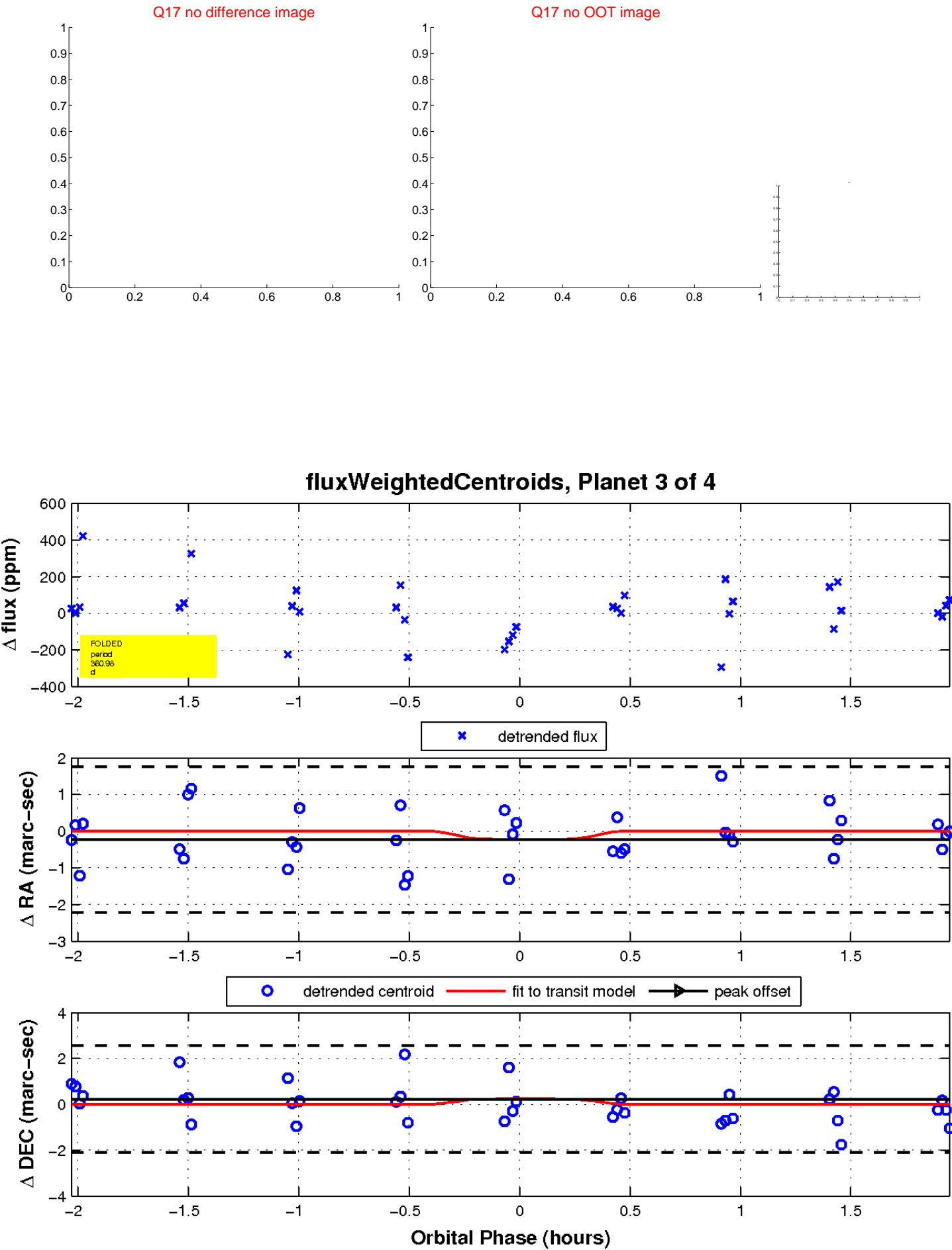
Q16 no difference image



Q16 no OOT image

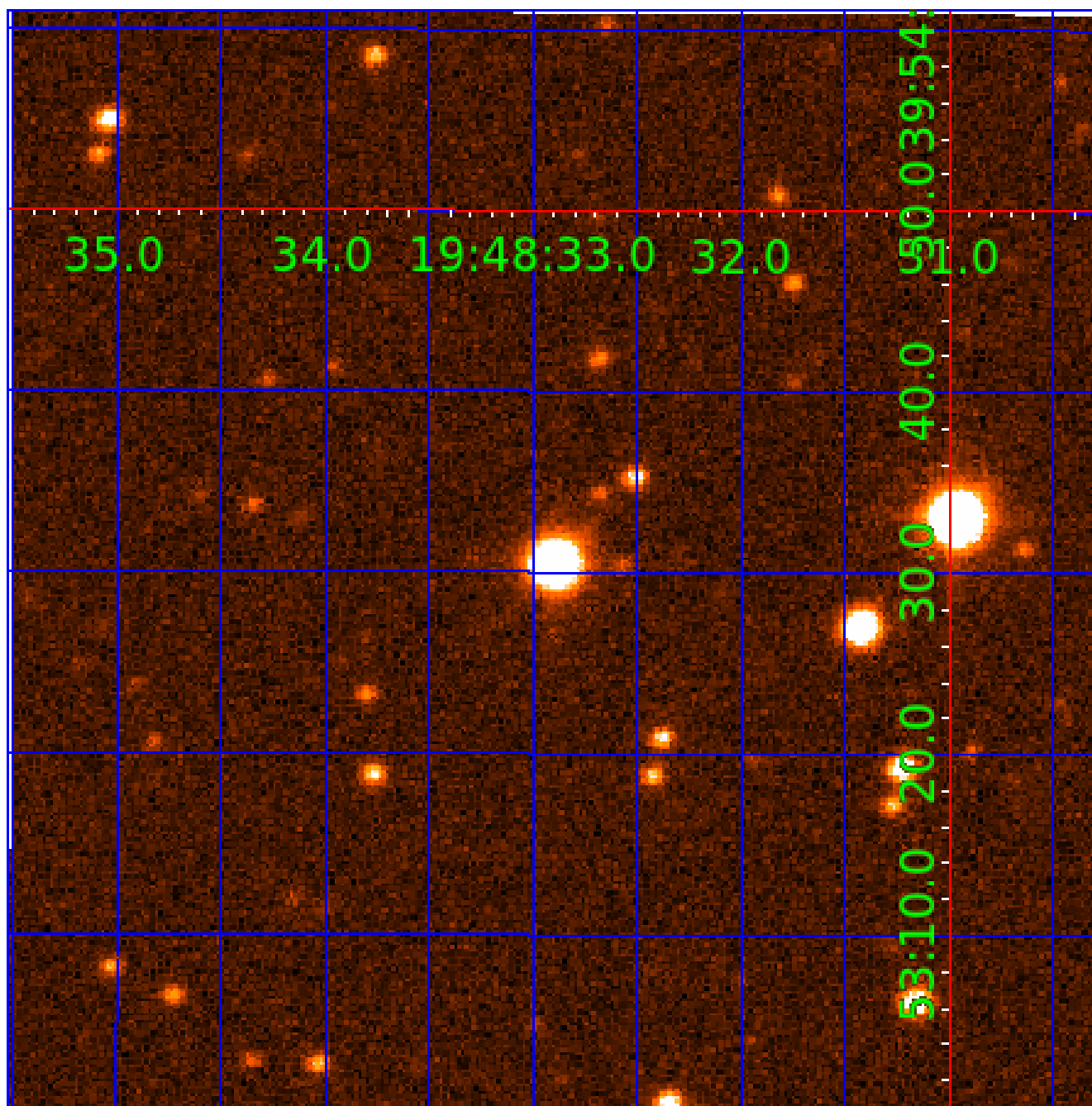


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 004768846

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})
004768846-01	OBS	2077.01	1.254849	132.178909	90.7	2.339	24.4	27.5	2.57	6168	2.88	13495.75
004768846-02	OBS	No	1.254859	131.550876	34.0	2.479	10.8	10.9	2.57	6168	1.77	13495.61
004768846-03	OBS	No	360.979355	249.502132	158.6	0.694	9.1	1.5	2.57	6168	3.54	7.11
004768846-04	OBS	No	152.177645	182.444874	134.5	9.969	9.1	2.7	2.57	6168	3.34	22.48

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004768846-01	OBS	FP	0.00	0	1	1	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_RESOLVED_OFFSET—HALO_GHOST
004768846-02	OBS	FP	0.00	1	1	1	0	IS_SEC_TCE—CENT_RESOLVED_OFFSET—HALO_GHOST
004768846-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_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—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004768846-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—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

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.

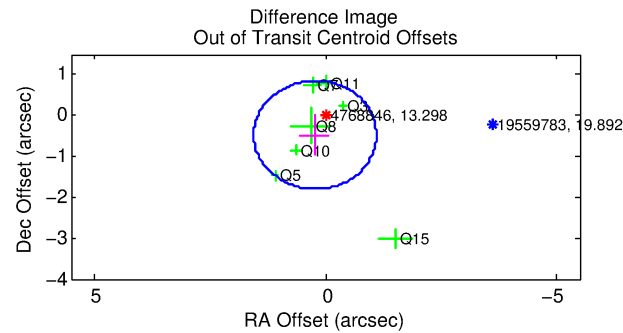
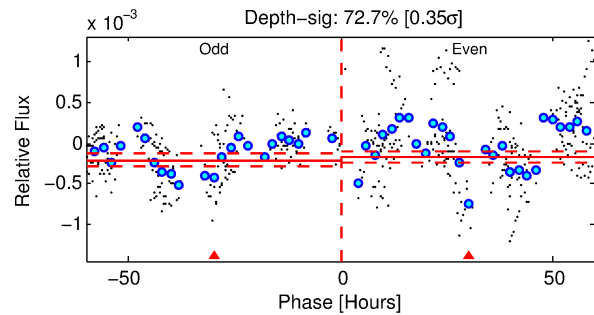
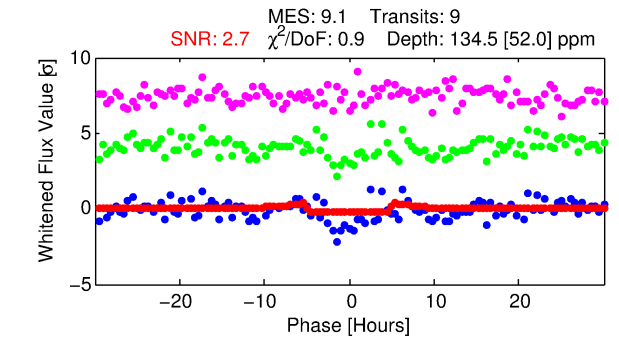
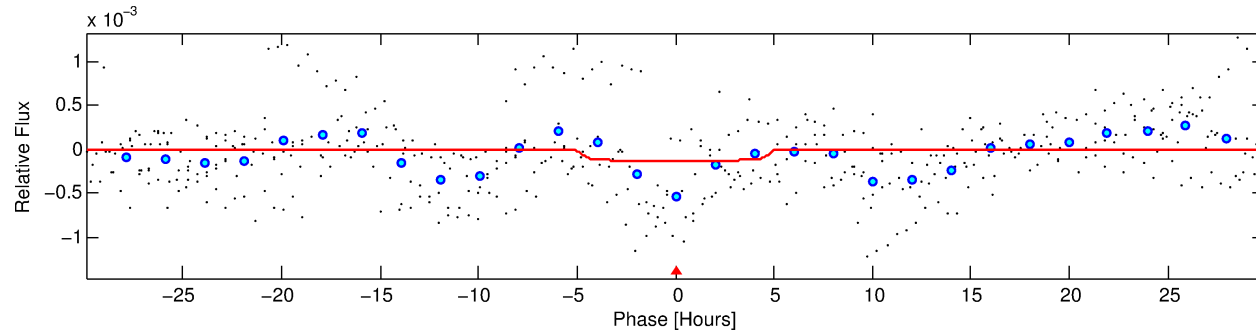
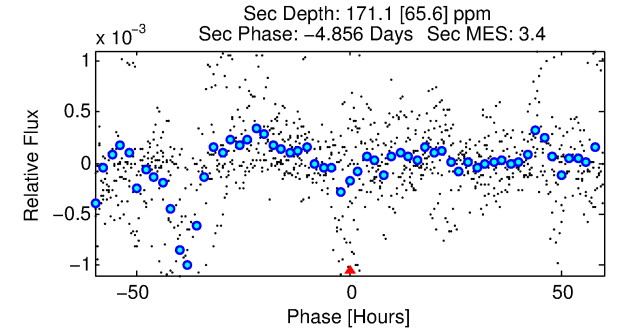
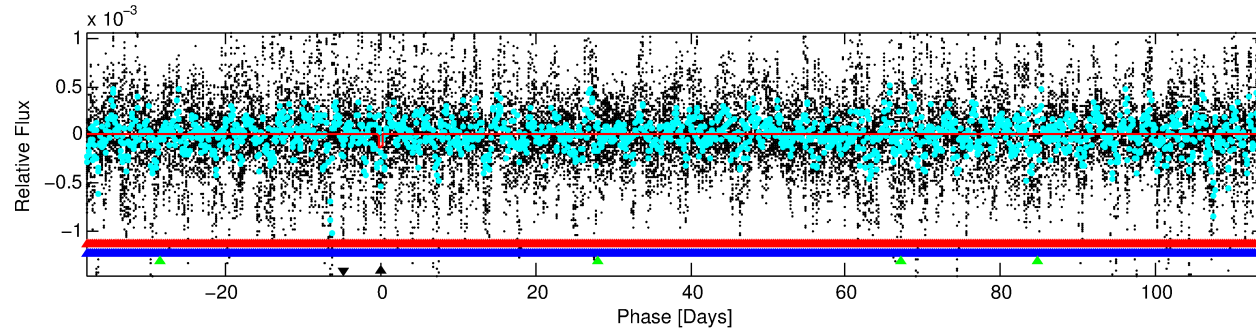
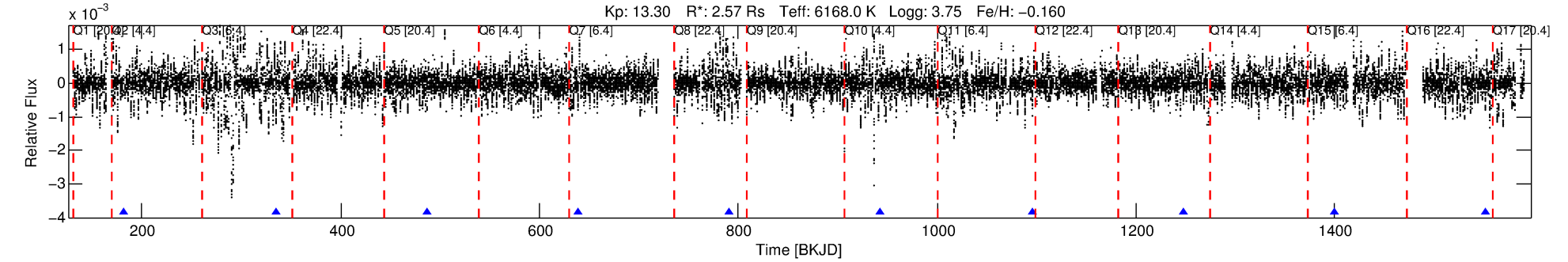
Ephemeris Match Information For 004768846-04

No Significant Match Found

DV One-Page Summary

KIC: 4768846 Candidate: 4 of 4 Period: 152.178 d
KOI: K02077 Corr: No Ephemeris Match

Kp: 13.30 R*: 2.57 Rs Teff: 6168.0 K Logg: 3.75 Fe/H: -0.160



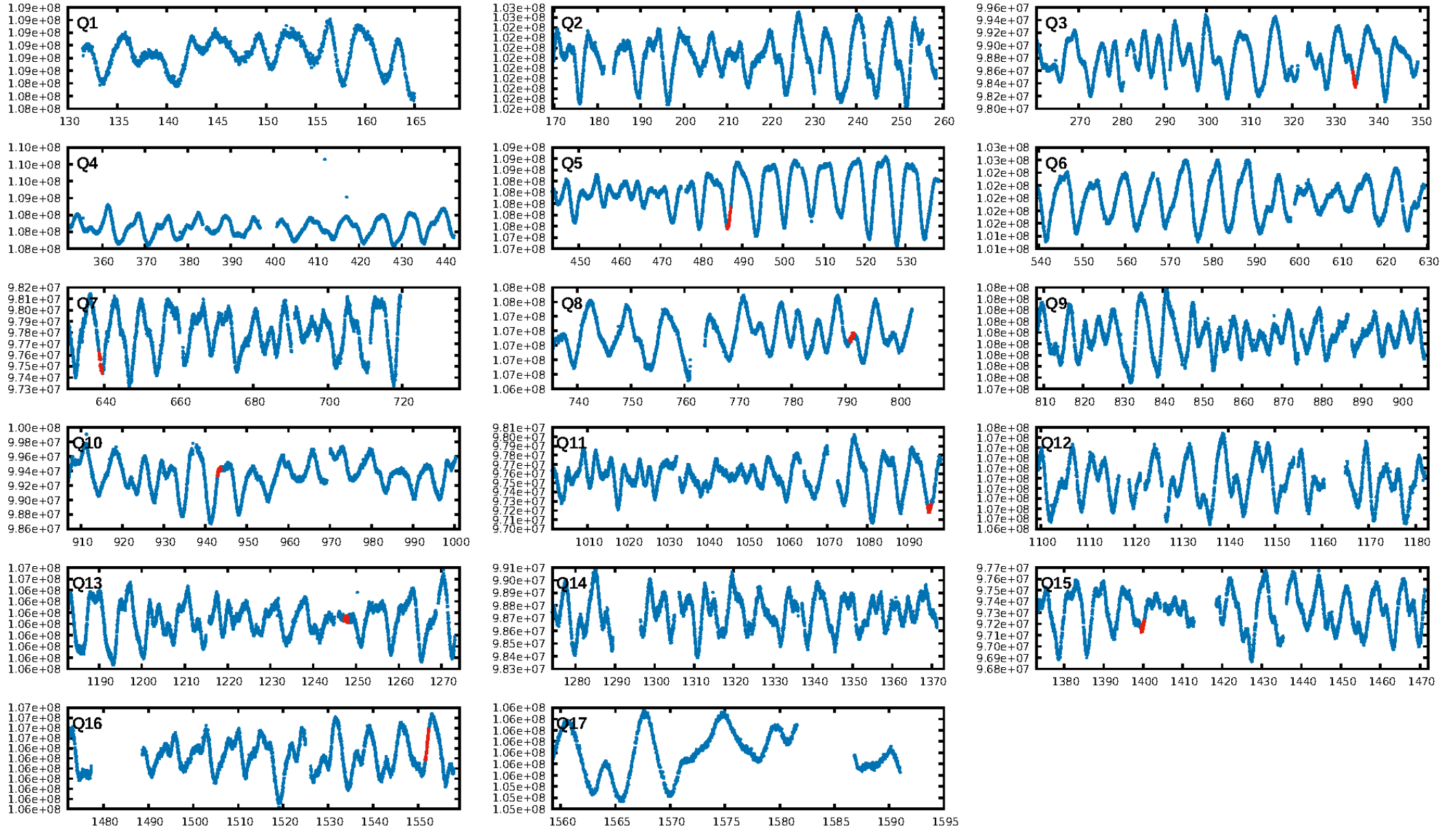
DV Fit Results:

Period = 152.17765 [0.00528] d
Epoch = 182.4449 [0.0313] BKJD
Rp/R* = 0.0119 [0.0087]
a/R* = 68.08 [245.23]
b = 0.83 [1.38]
Seff = 22.48 [12.26]
Teff = 555 [76] K
Rp = 3.34 [2.75] Re
a = 0.6177 [0.2118] AU
Ag = 3222.06 [5186.41] [0.62 σ]
Teffp = 6468 [2462] K [2.40 σ]

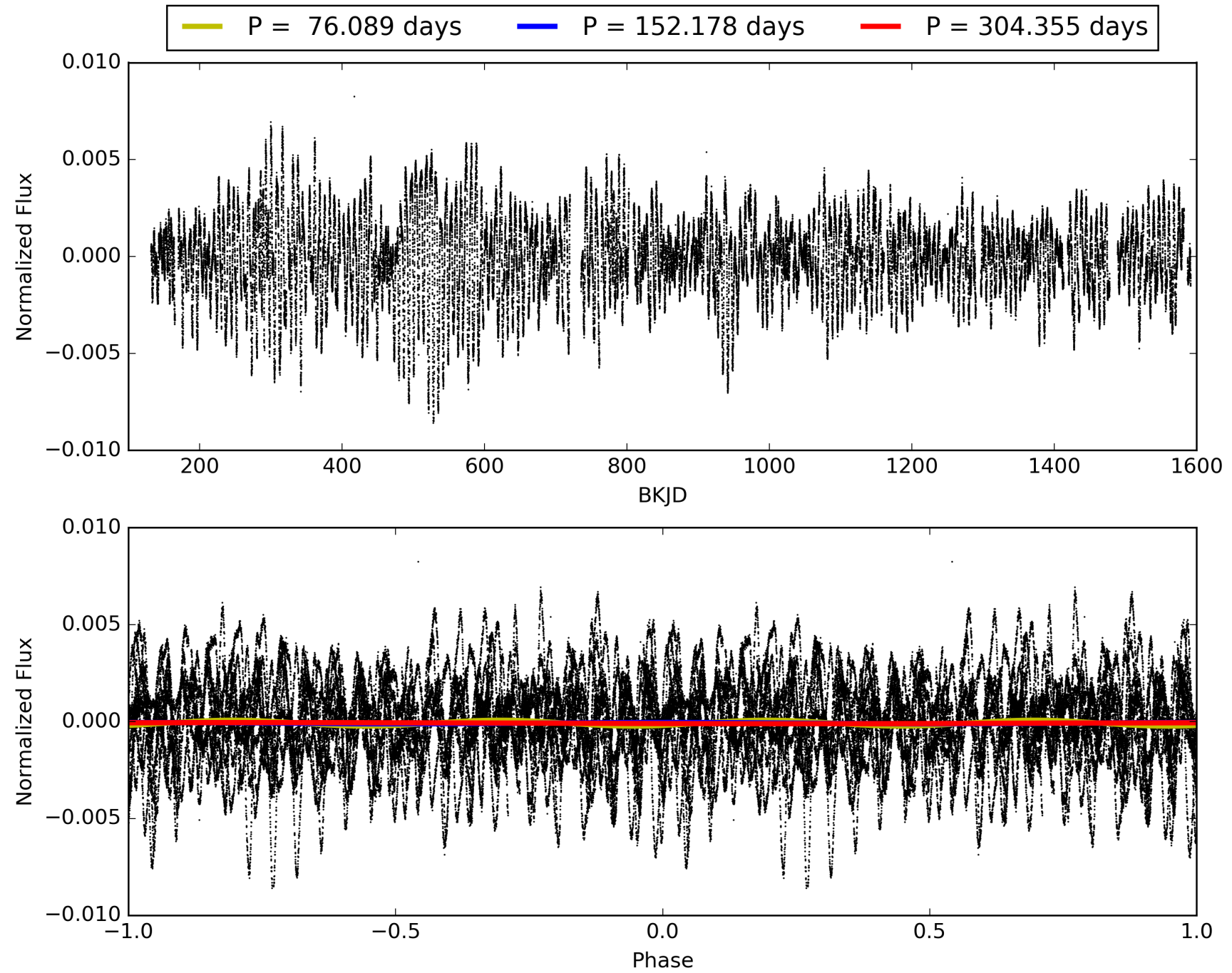
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [352.62 σ]
LongPeriod-sig: 100.0% [501.49 σ]
ModelChiSquare2-sig: 3.2%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.11e-10
RollingBand-fgt: 1.00 [9/9]
GhostDiagnostic-chr: -1.547
Centroid-sig: 53.5%
Centroid-so: 0.941 arcsec [0.59 σ]
OotOffset-rm: 0.524 arcsec [1.19 σ]
KicOffset-rm: 0.770 arcsec [1.75 σ]
OotOffset-st: 1/4/1/1 [7]
KicOffset-st: 1/4/1/1 [7]
DiffImageQuality-fgm: 0.71 [5/7]
DiffImageOverlap-fno: 0.00 [0/9]

TCE 004768846-04, PDC Light Curves

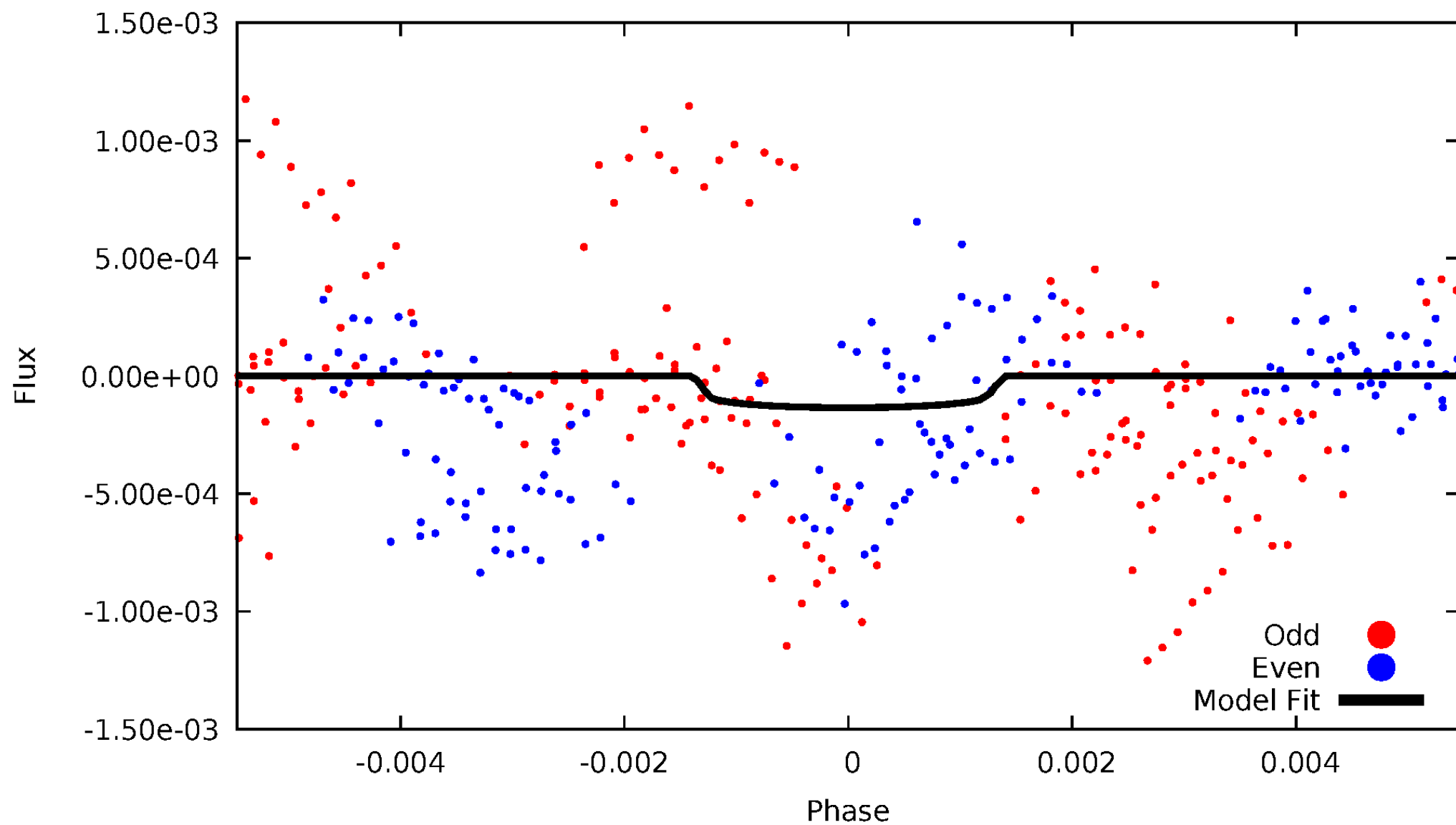


TCE 004768846-04



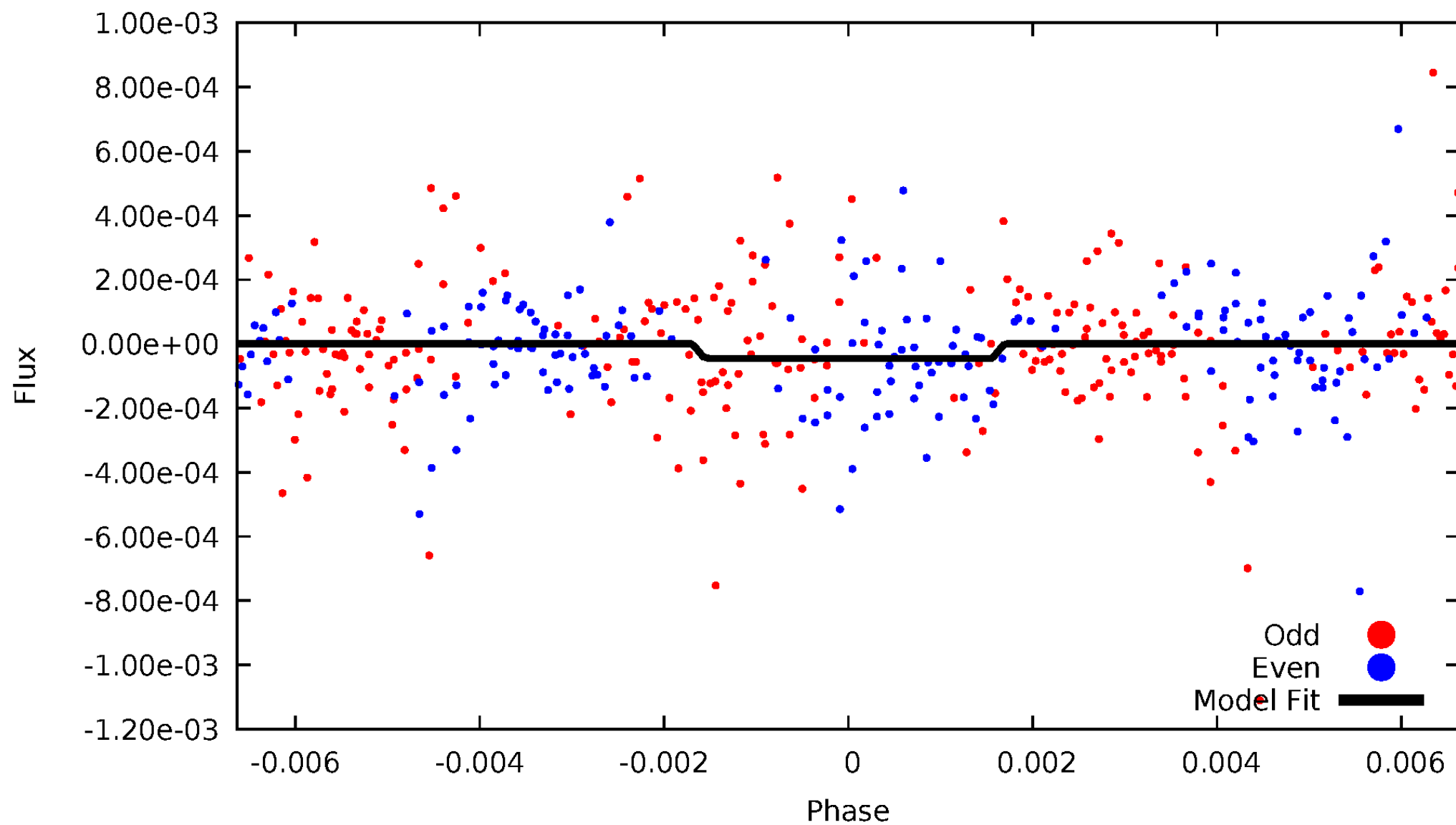
DV Odd/Even

TCE 004768846-04



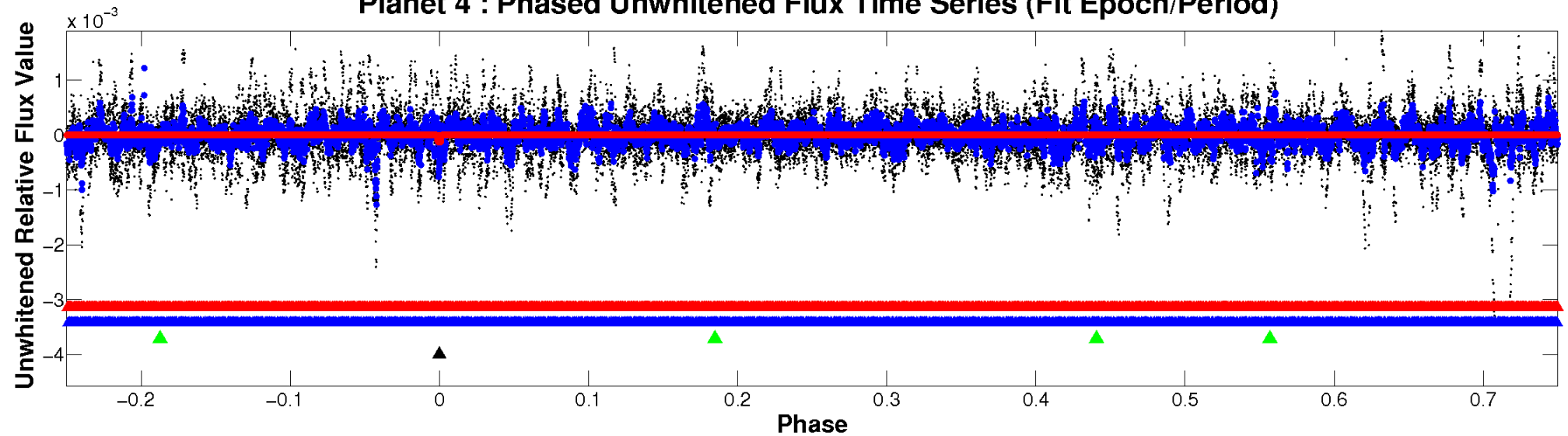
ALT Odd/Even

TCE 004768846-04

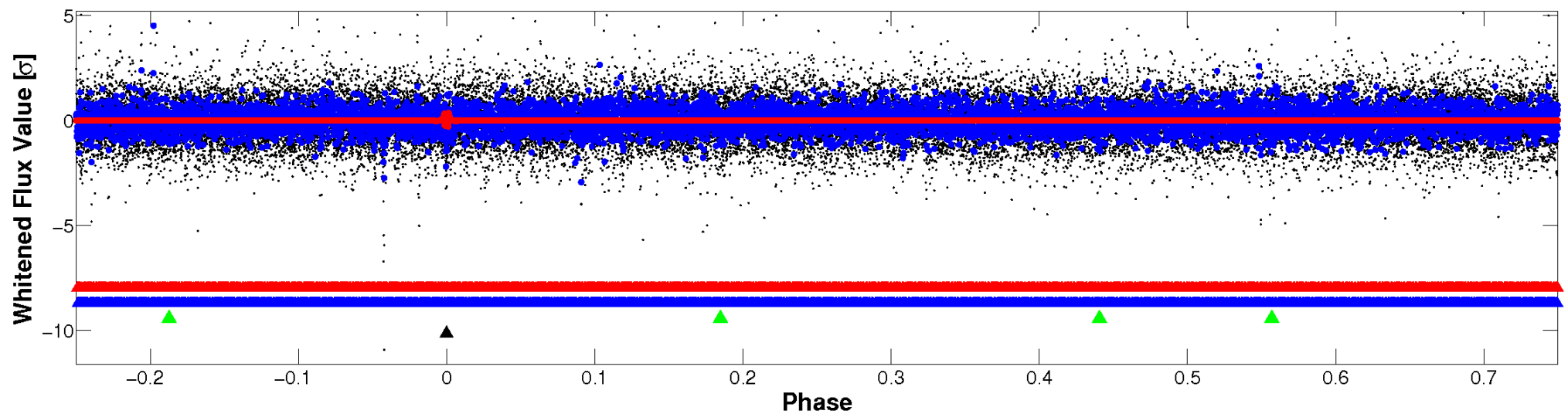


Non-Whitened Vs. Whitened Light Curve

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

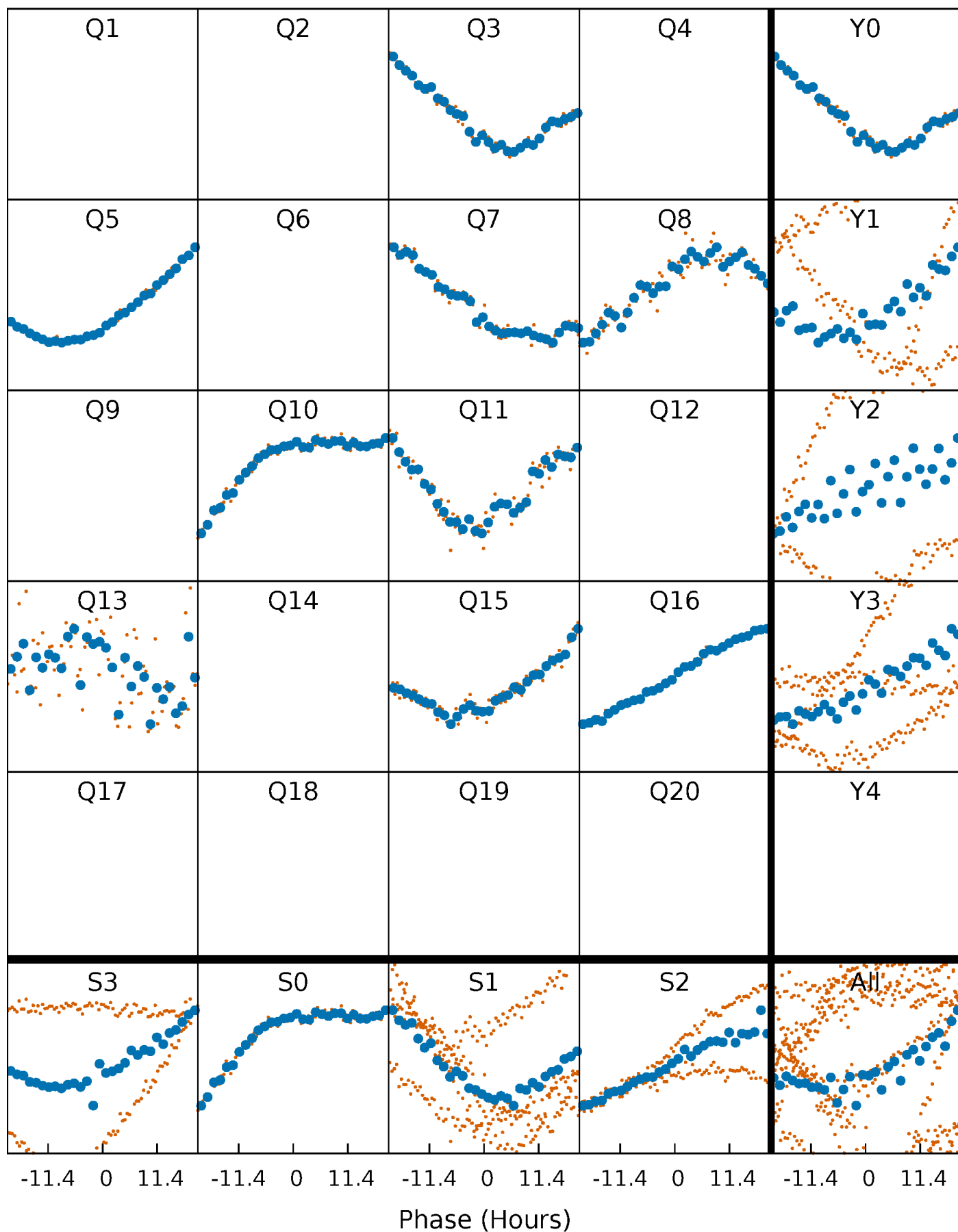


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



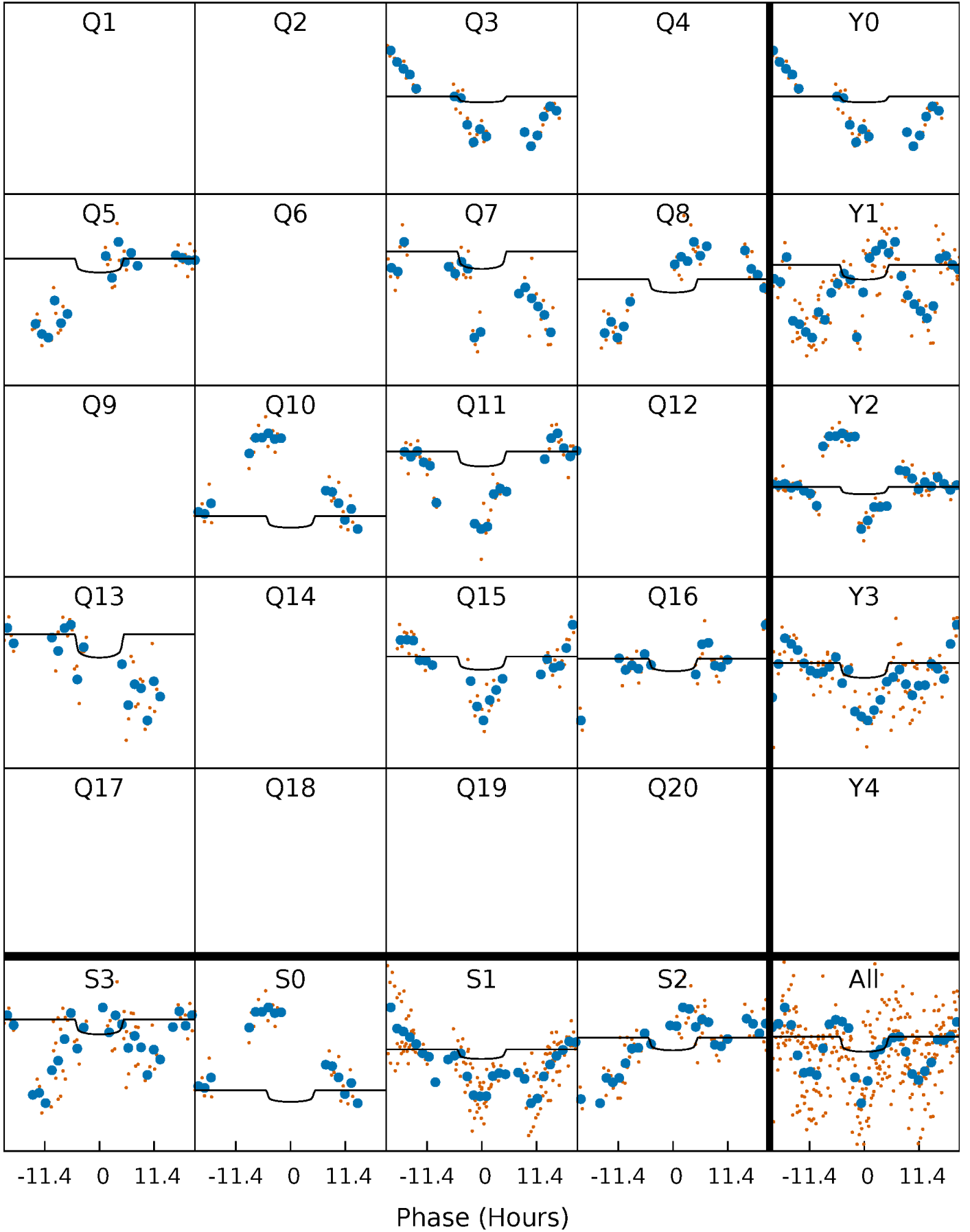
PDC Quarter-Phased Transit Curves

TCE 004768846-04 P=152.177645 Days $T_0=182.444874$ (BKJD)



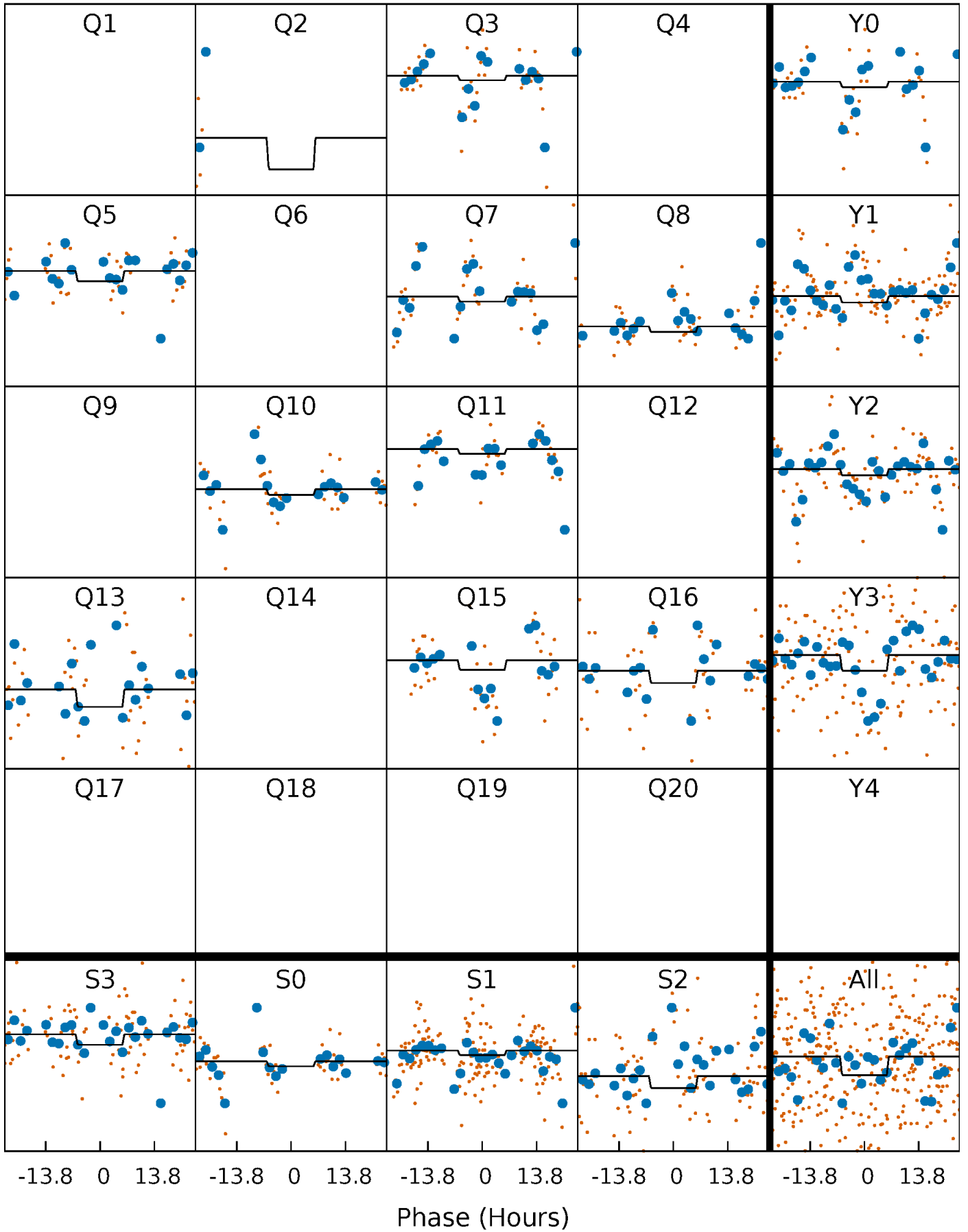
DV Quarter-Phased Transit Curves

TCE 004768846-04 $P=152.177645$ Days $T_0=182.444874$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

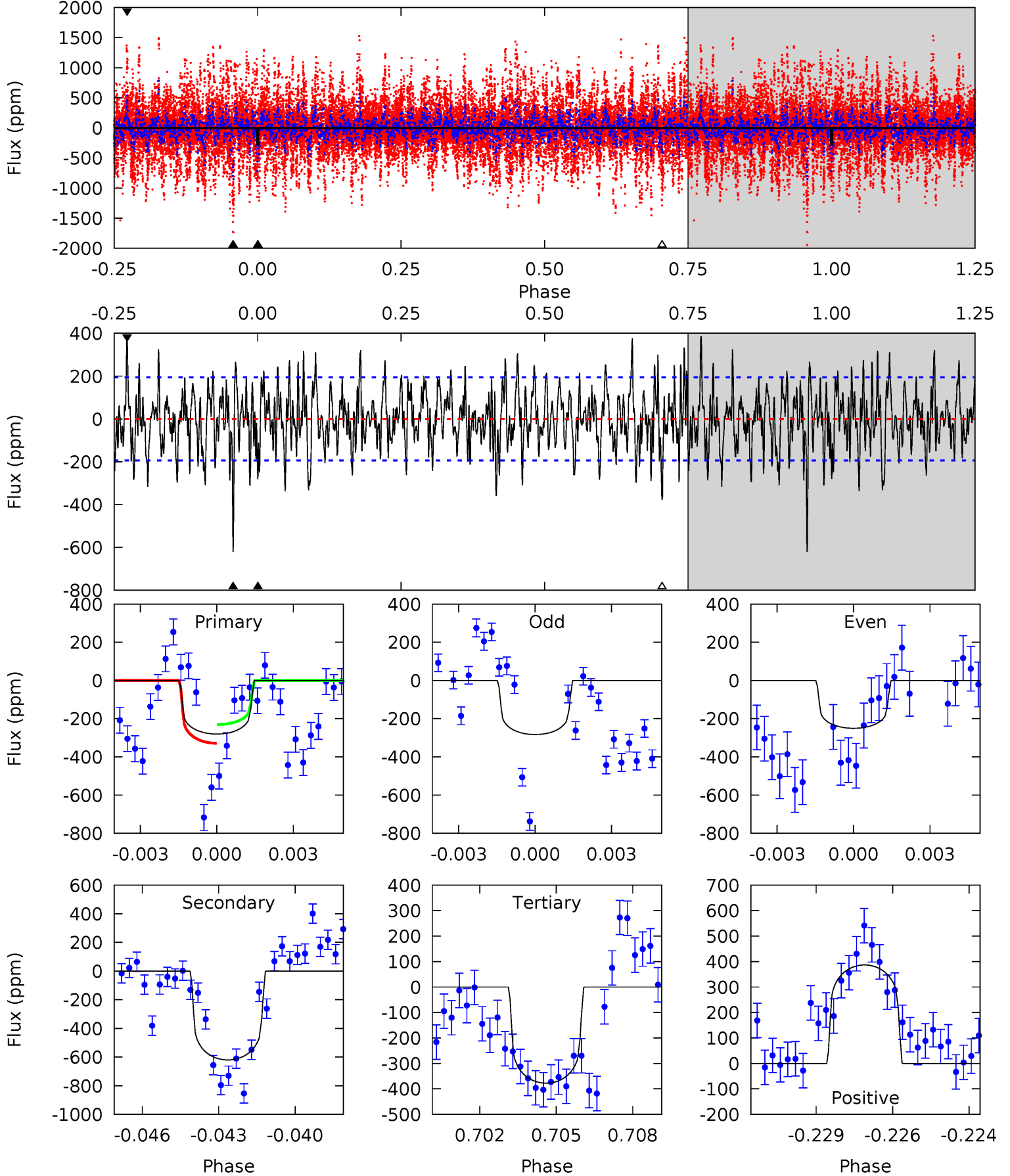
TCE 004768846-04 P=152.180910 Days $T_0=182.434155$ (BKJD)



DV Model-Shift Uniqueness Test

004768846-04, P = 152.177645 Days, E = 30.267229 Days

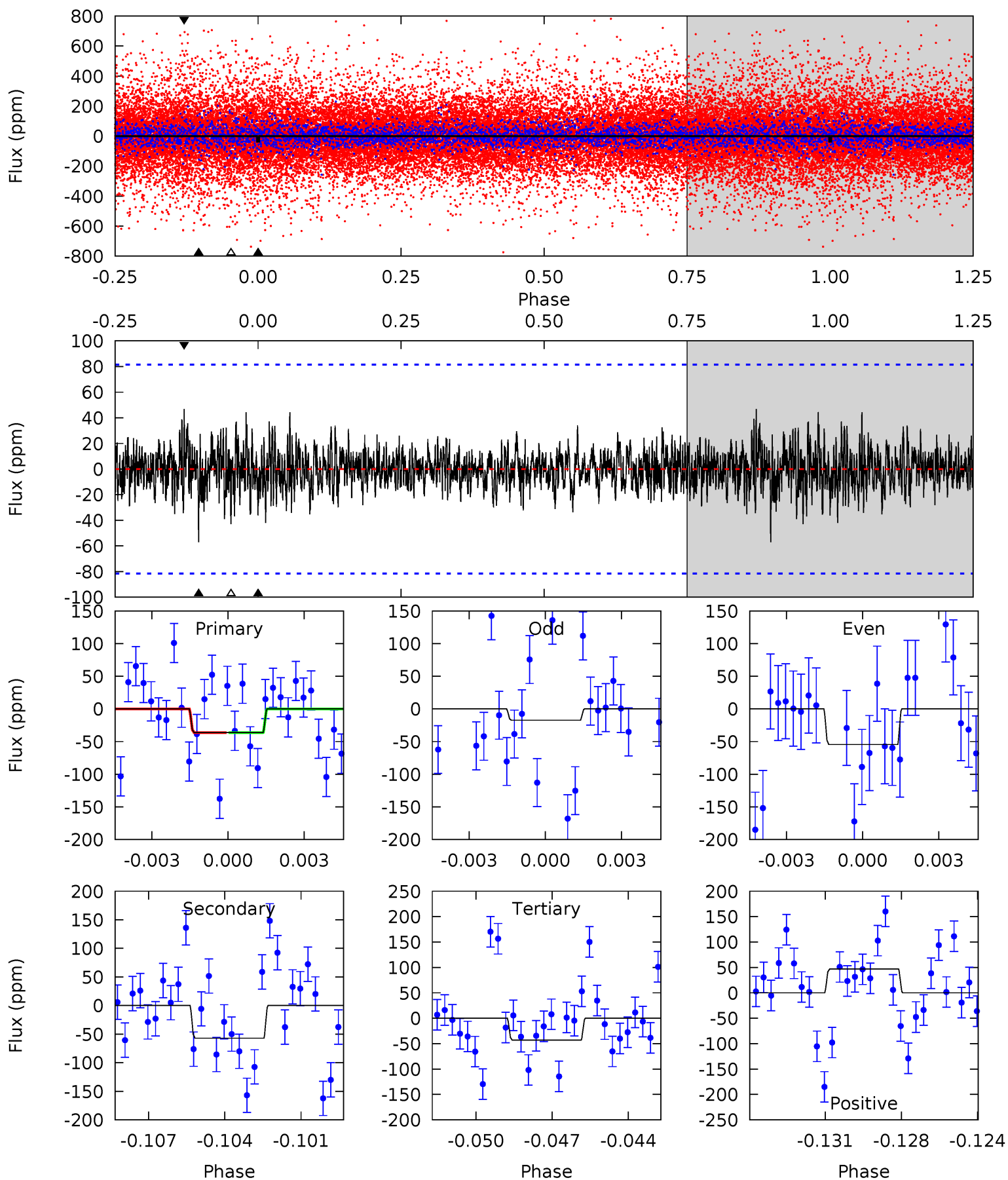
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.59	16.8	10.2	10.5	5.26	2.98	3.27	-2.62	-2.87	6.56	6.32	0.43	0.73	0.38	1.34



Alt Model-Shift Uniqueness Test

004768846-04, $P = 152.180910$ Days, $E = 30.253245$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.33	3.66	2.76	3.00	5.23	2.93	0.76	-0.43	-0.67	0.90	0.66	1.17	0.66	0.45	0.00



Stellar Parameters For KIC 004768846

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6168^{+170}_{-170}	$3.750^{+0.308}_{-0.082}$	$-0.160^{+0.300}_{-0.300}$	$2.572^{+0.411}_{-0.958}$	$1.358^{+0.224}_{-0.299}$	$0.113^{+0.257}_{-0.028}$
	+3%/-3%	+8%/-2%	+188%/-188%	+16%/-37%	+16%/-22%	+228%/-25%
Source	PHO1	FLK73	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 004768846-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-620 ± 37	$3.37^{+2.13}_{-1.96}$	757^{+47}_{-57}	9016^{+9800}_{-2219}	11564^{+50430}_{-7301}
Alt.	-57 ± 16	$2.45^{+1.99}_{-1.60}$	761^{+47}_{-66}	5577^{+4278}_{-1295}	1944^{+13487}_{-1361}

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

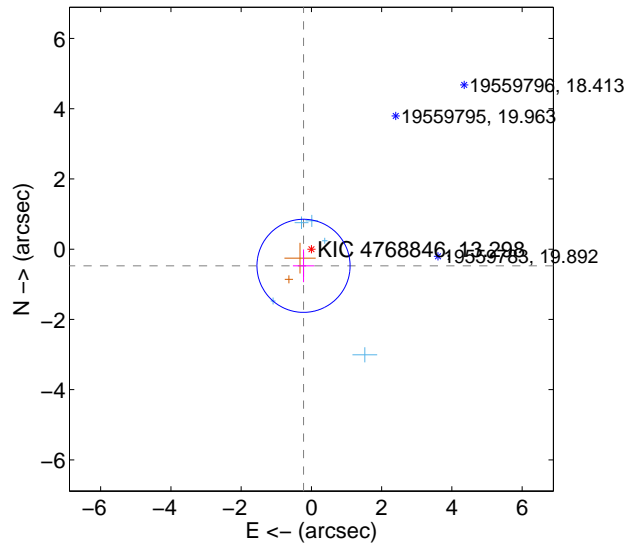
Supplemental centroid analysis for 004768846-04. Kepler magnitude: 13.30. Transit SNR 2.68

There are 5 quarters with good PRF difference image offsets

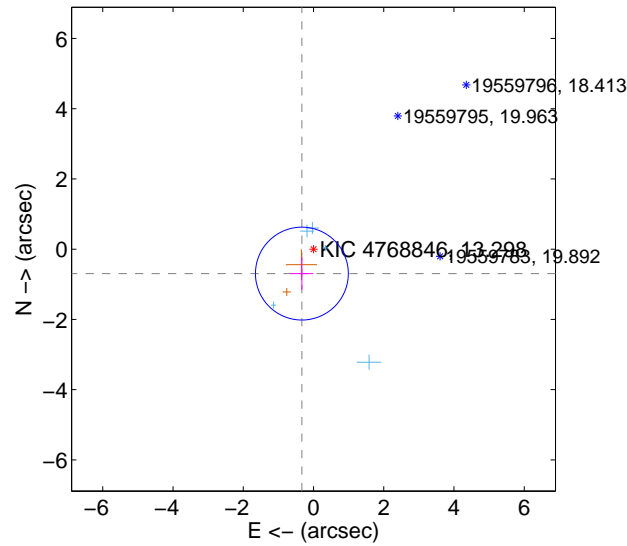
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.524 ± 0.442	1.19	0.224 ± 0.304	-0.474 ± 0.467
PRF-fit source offset from KIC position	0.770 ± 0.441	1.75	0.331 ± 0.327	-0.696 ± 0.463
photometric centroid source offset	0.94 ± 1.60	0.59	-0.86 ± 1.62	0.39 ± 1.48

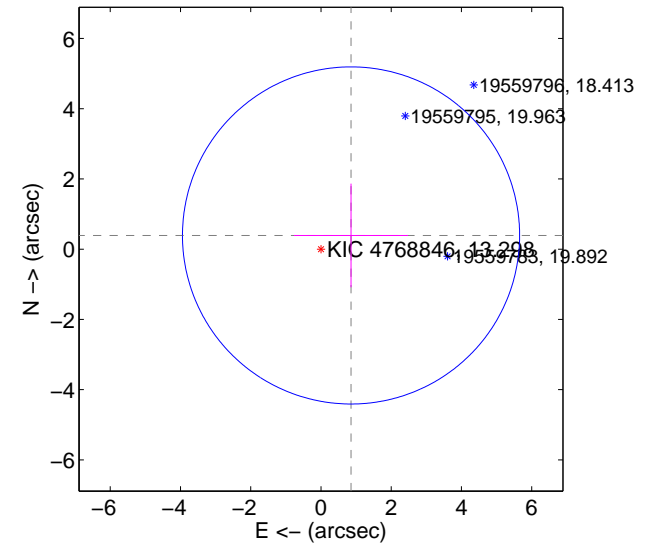
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

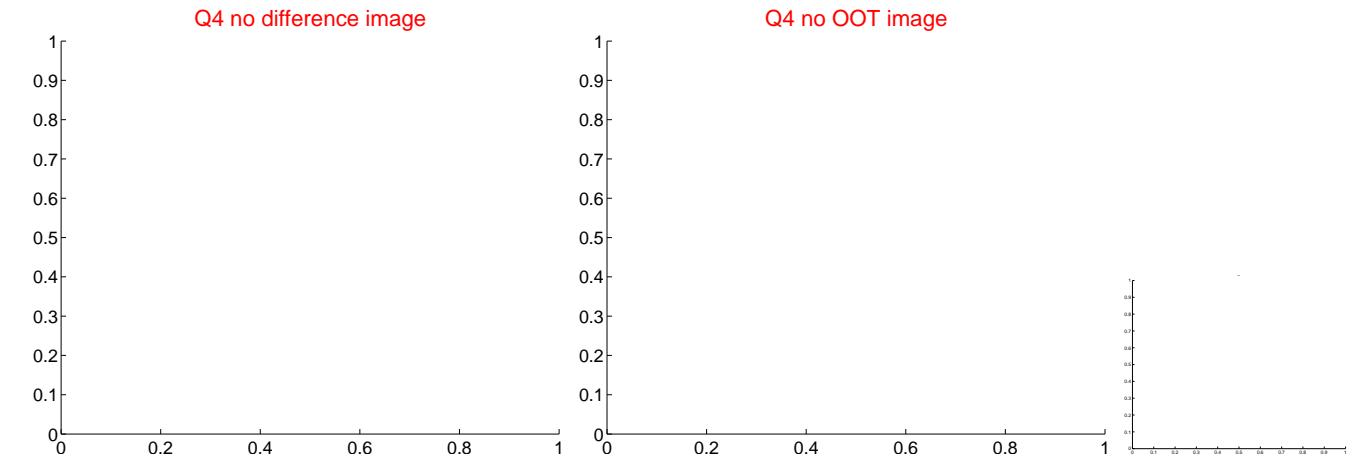
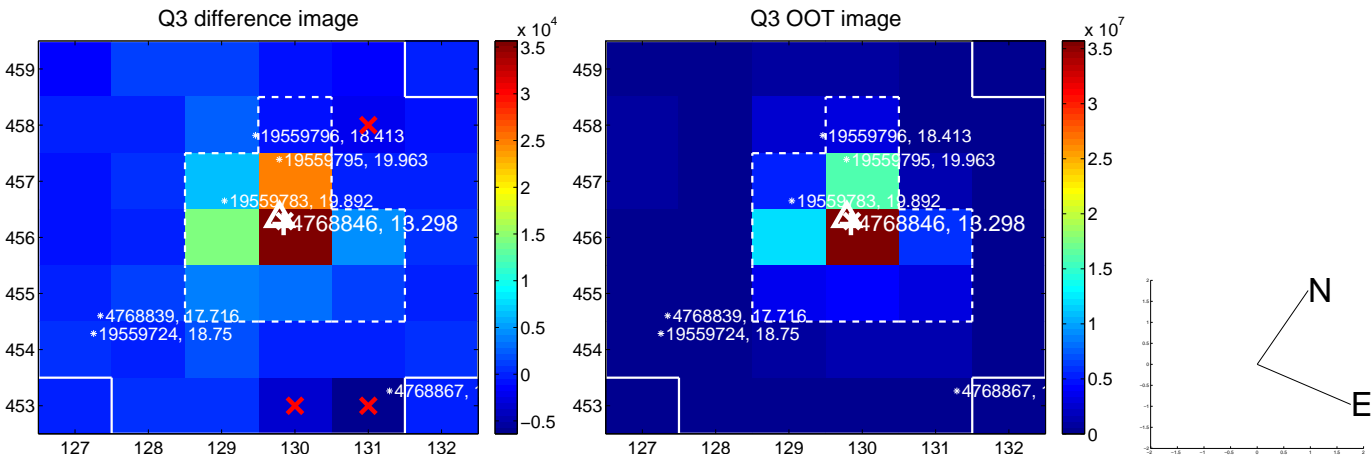
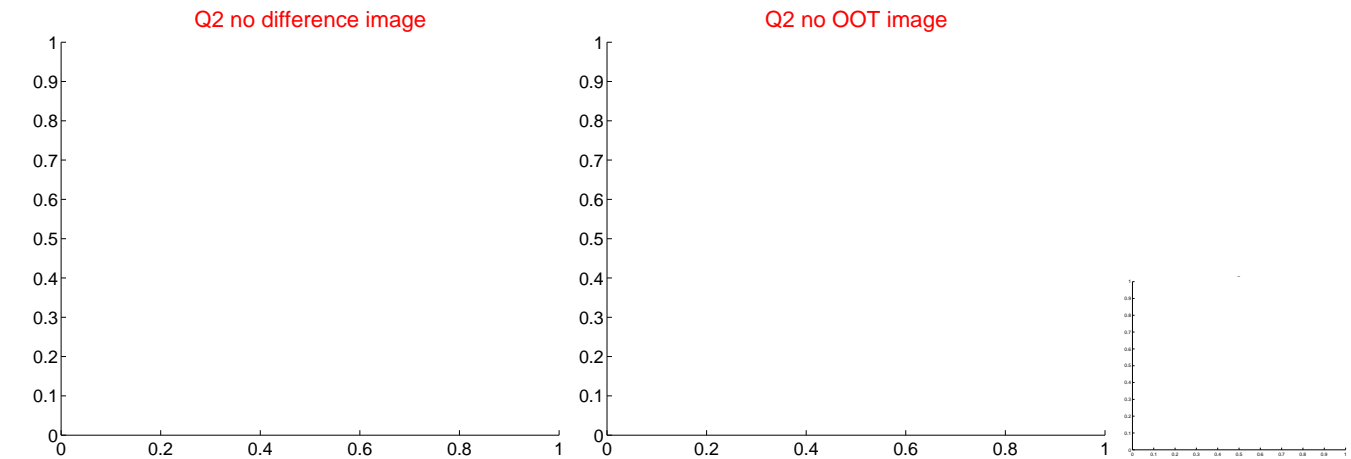
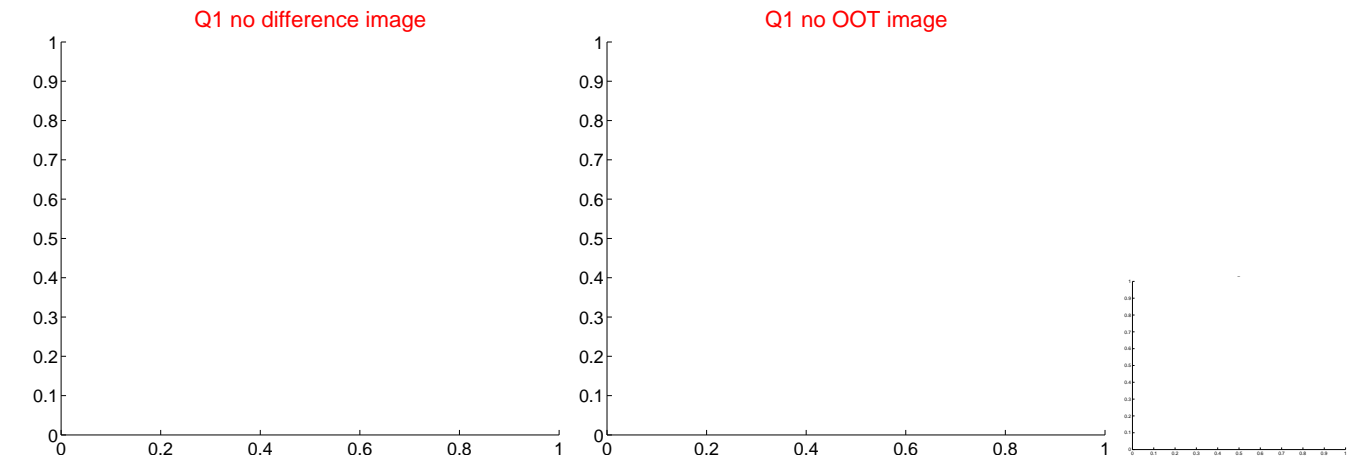


offset from photometric centroids

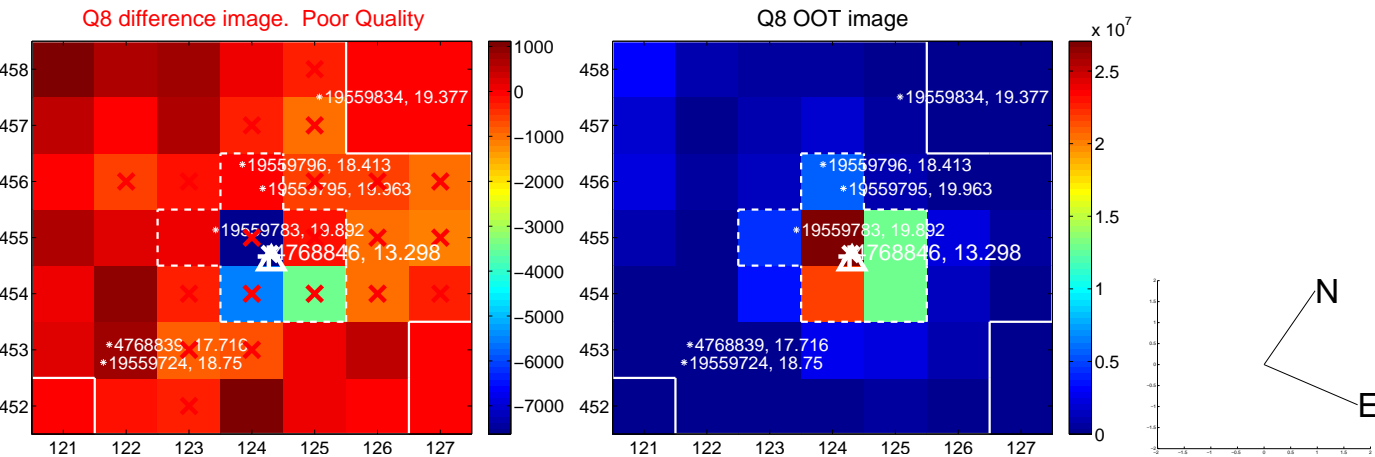
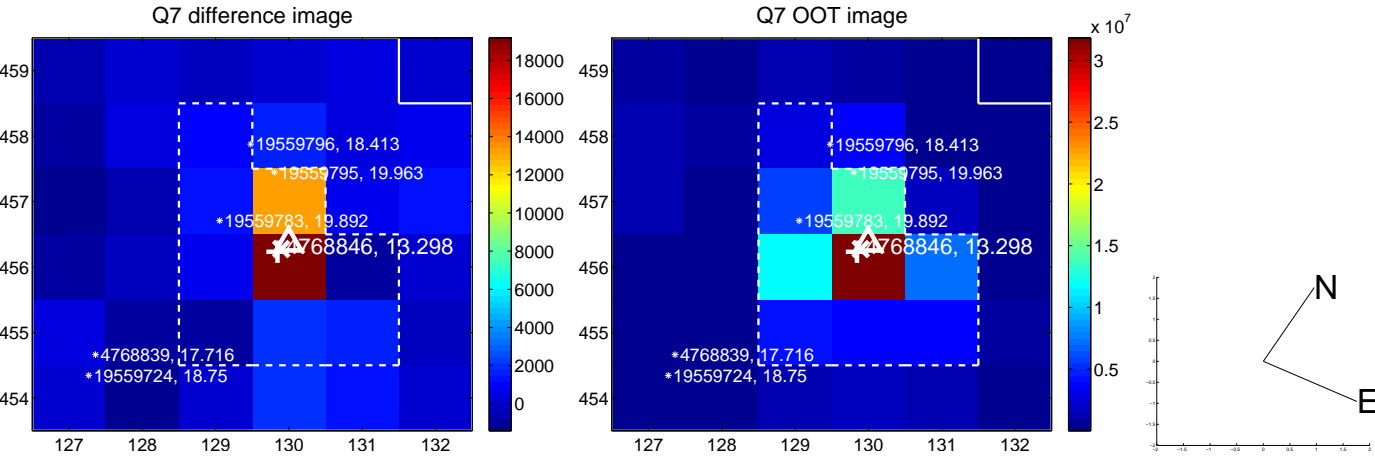
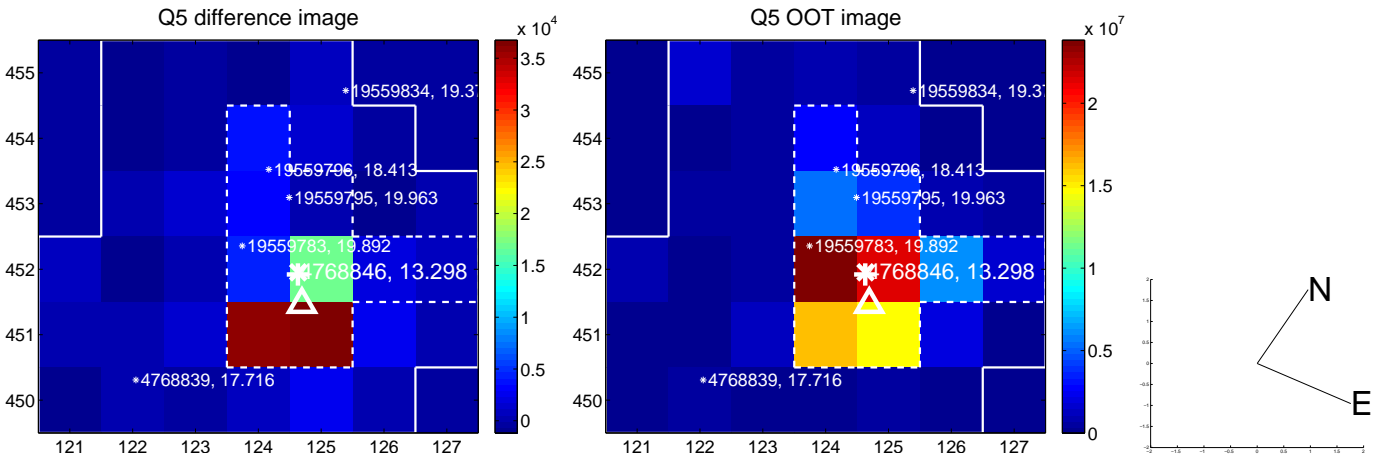


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

white \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.

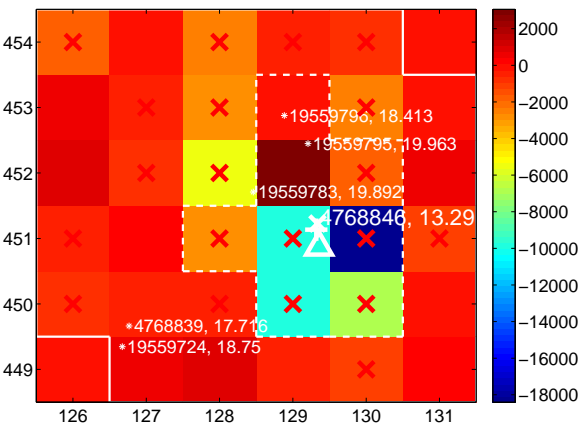
Q9 no difference image



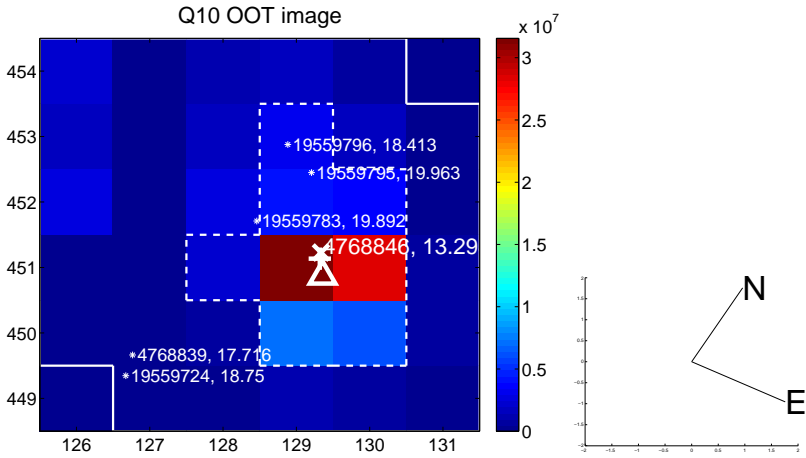
Q9 no OOT image



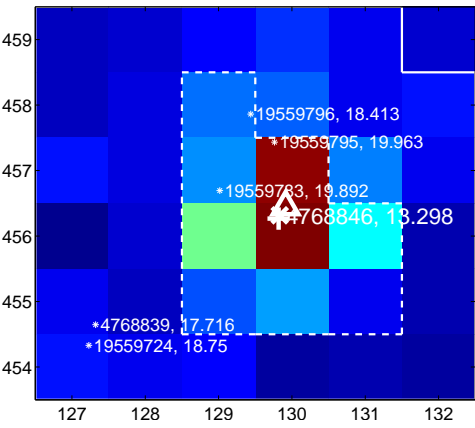
Q10 difference image. Poor Quality



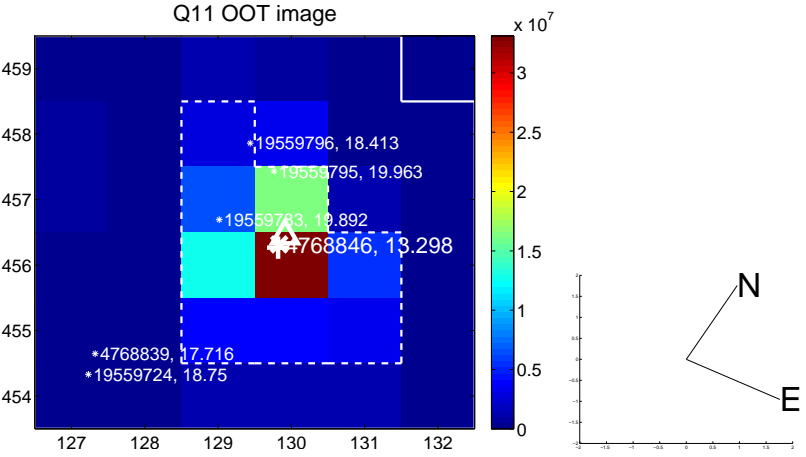
Q10 OOT image



Q11 difference image



Q11 OOT image



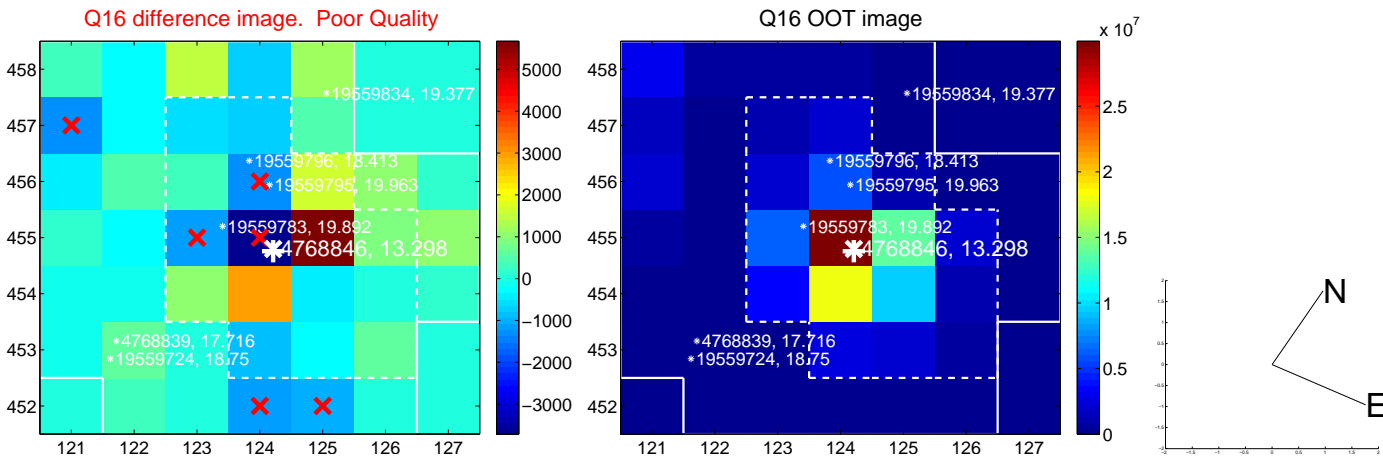
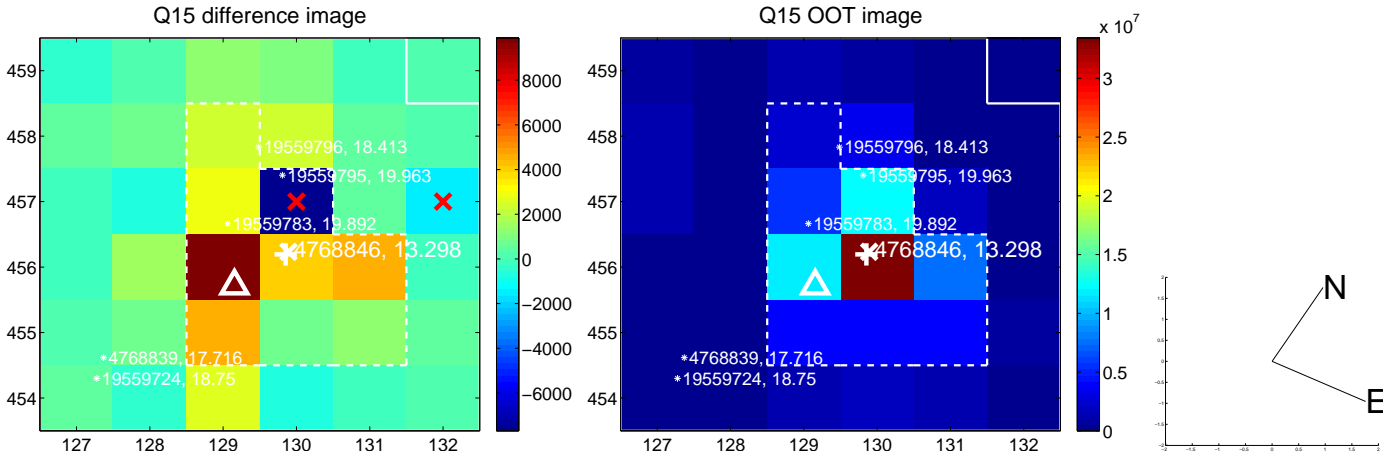
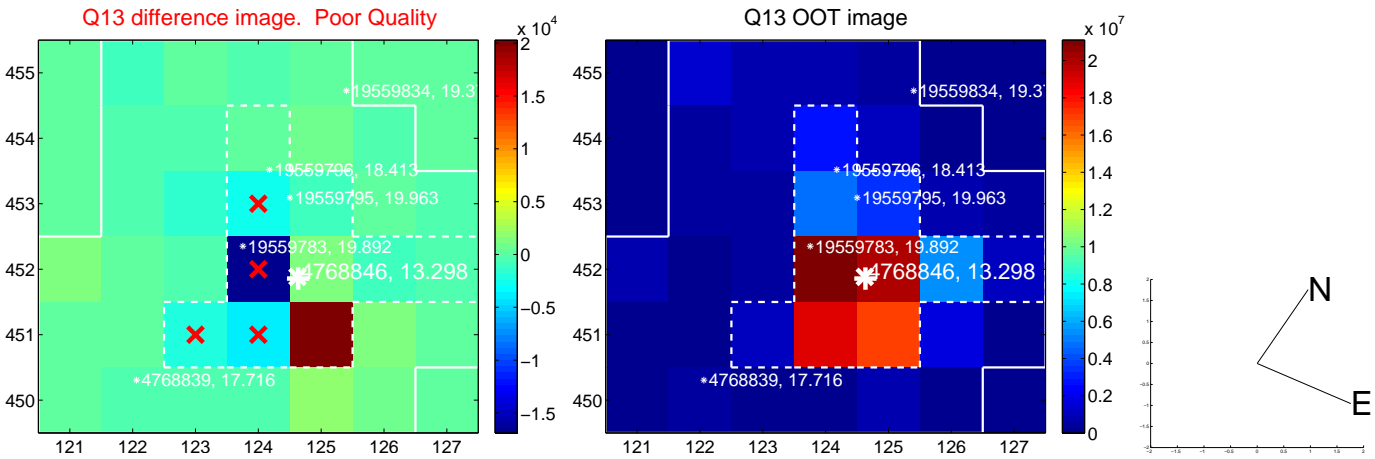
Q12 no difference image



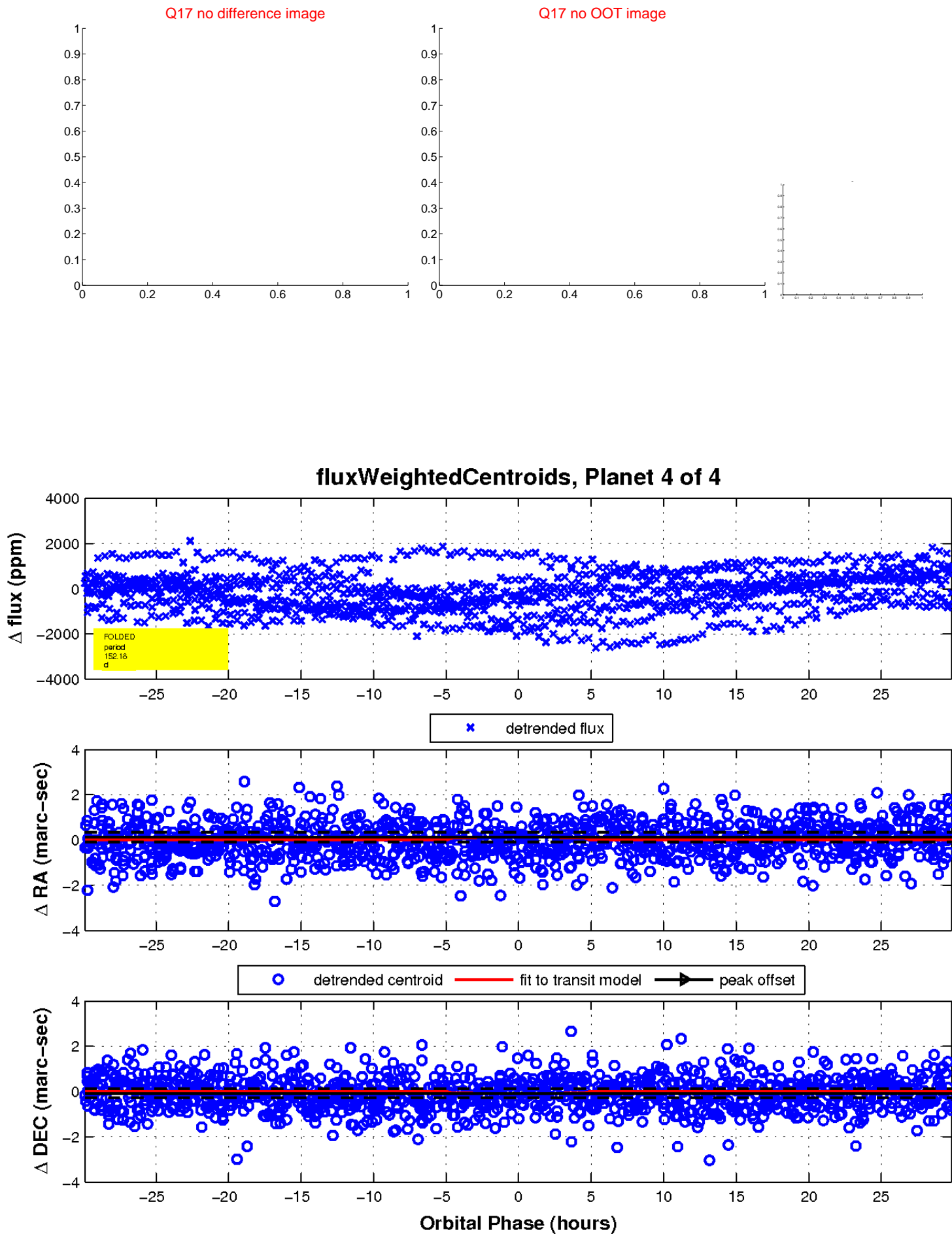
Q12 no OOT image



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



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



UKIRT Image

Declination

