

KIC 009784590

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})
009784590-01	OBS	No	5.451923	131.907010	34.7	14.504	11.5	11.1	1.63	6748	1.14	1138.11
009784590-02	OBS	No	5.452031	135.017650	32.2	13.259	10.4	11.5	1.63	6748	0.93	1138.08
009784590-03	OBS	No	102.363639	166.314424	149.5	7.128	7.9	6.4	1.63	6748	2.34	22.81

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009784590-01	OBS	FP	0.00	1	0	0	0	LPP_DV
009784590-02	OBS	FP	0.00	1	0	0	0	LPP_DV—SAME_NTL_PERIOD
009784590-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

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

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

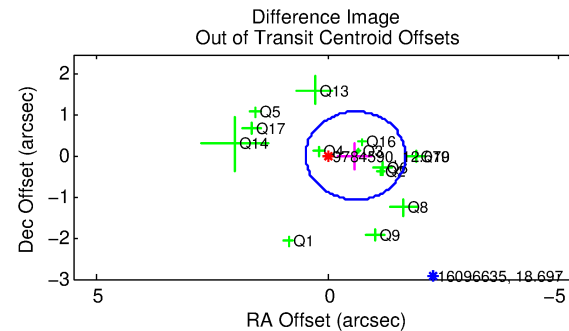
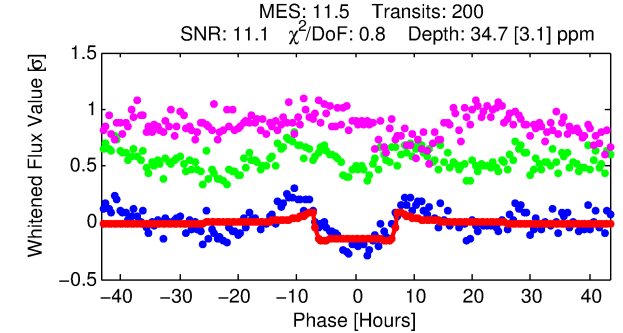
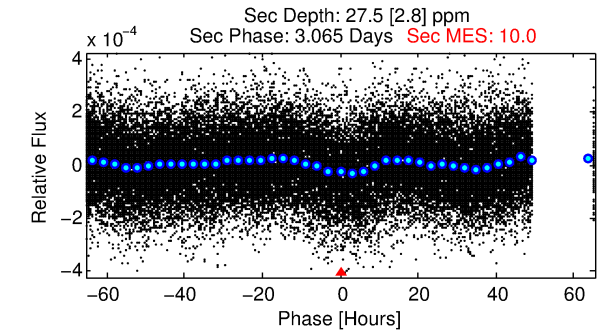
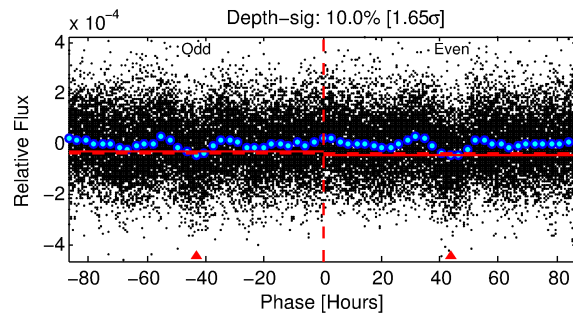
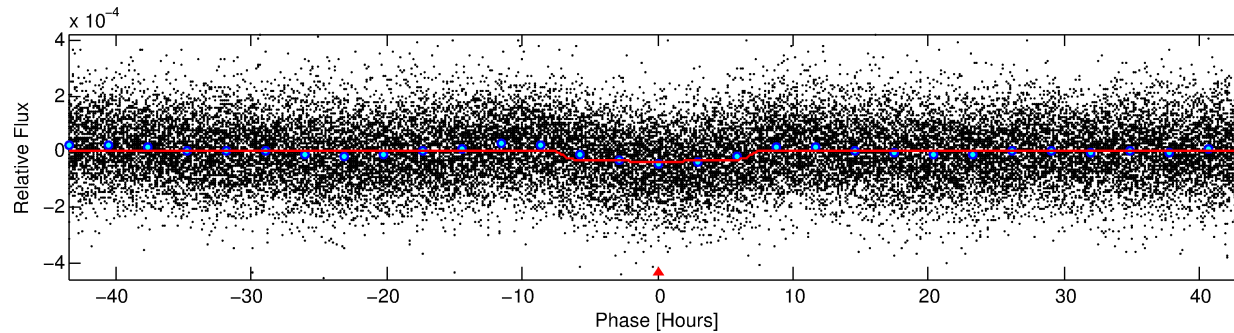
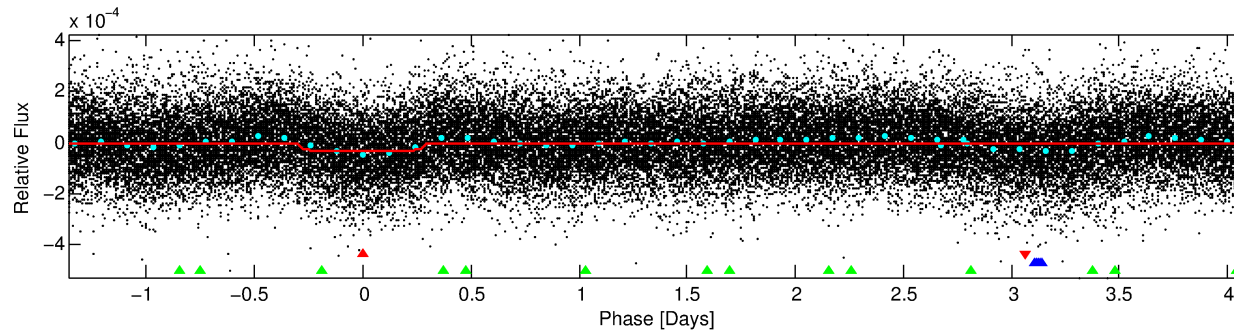
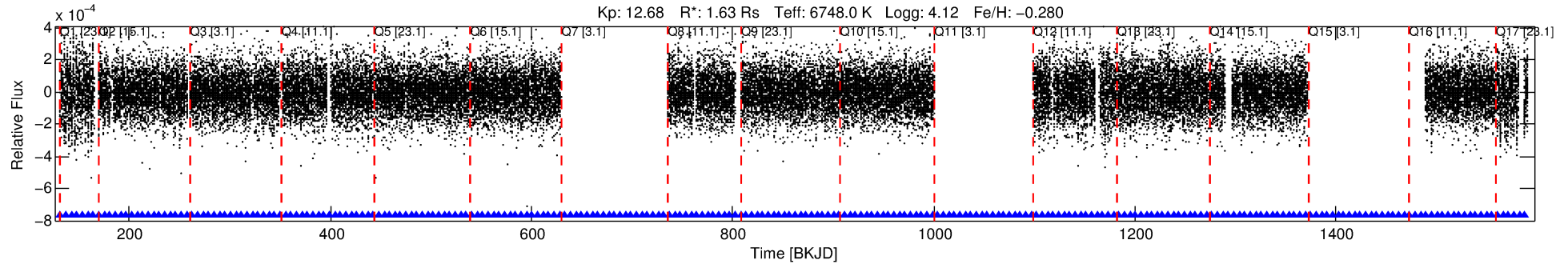
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009784590-01

No Significant Match Found

DV One-Page Summary

KIC: 9784590 Candidate: 1 of 3 Period: 5.452 d



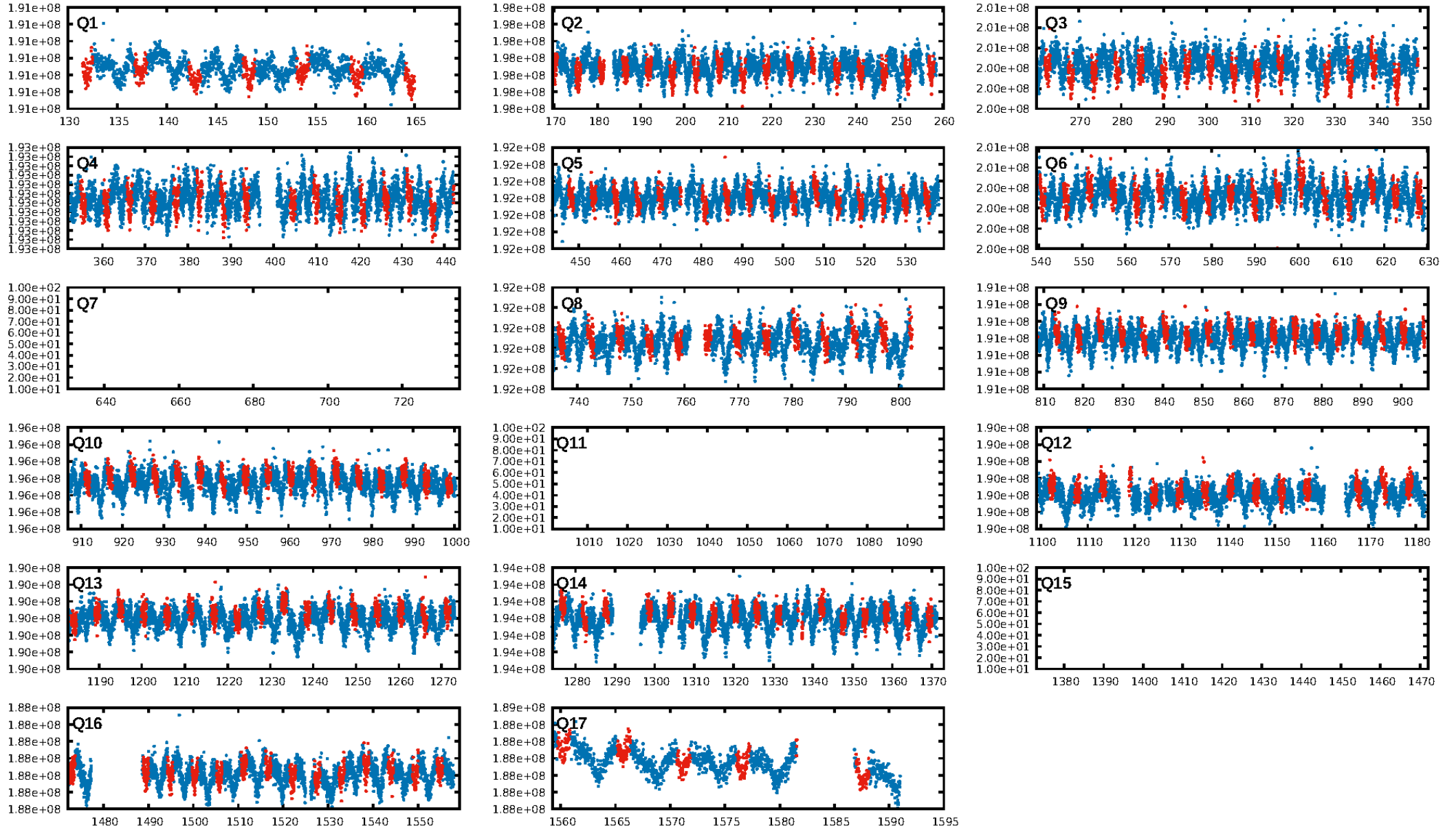
DV Fit Results:

Period = 5.45192 [0.00007] d
Epoch = 131.9070 [0.0082] BKJD
Rp/R* = 0.0064 [0.0005]
a/R* = 1.52 [0.36]
b = 0.92 [0.07]
Seff = 1138.11 [401.33]
Teq = 1481 [131] K
Rp = 1.14 [0.29] Re
a = 0.0660 [0.0141] AU
Ag = 51.00 [19.46] [2.57 σ]
Teffp = 6119 [363] K [12.03 σ]

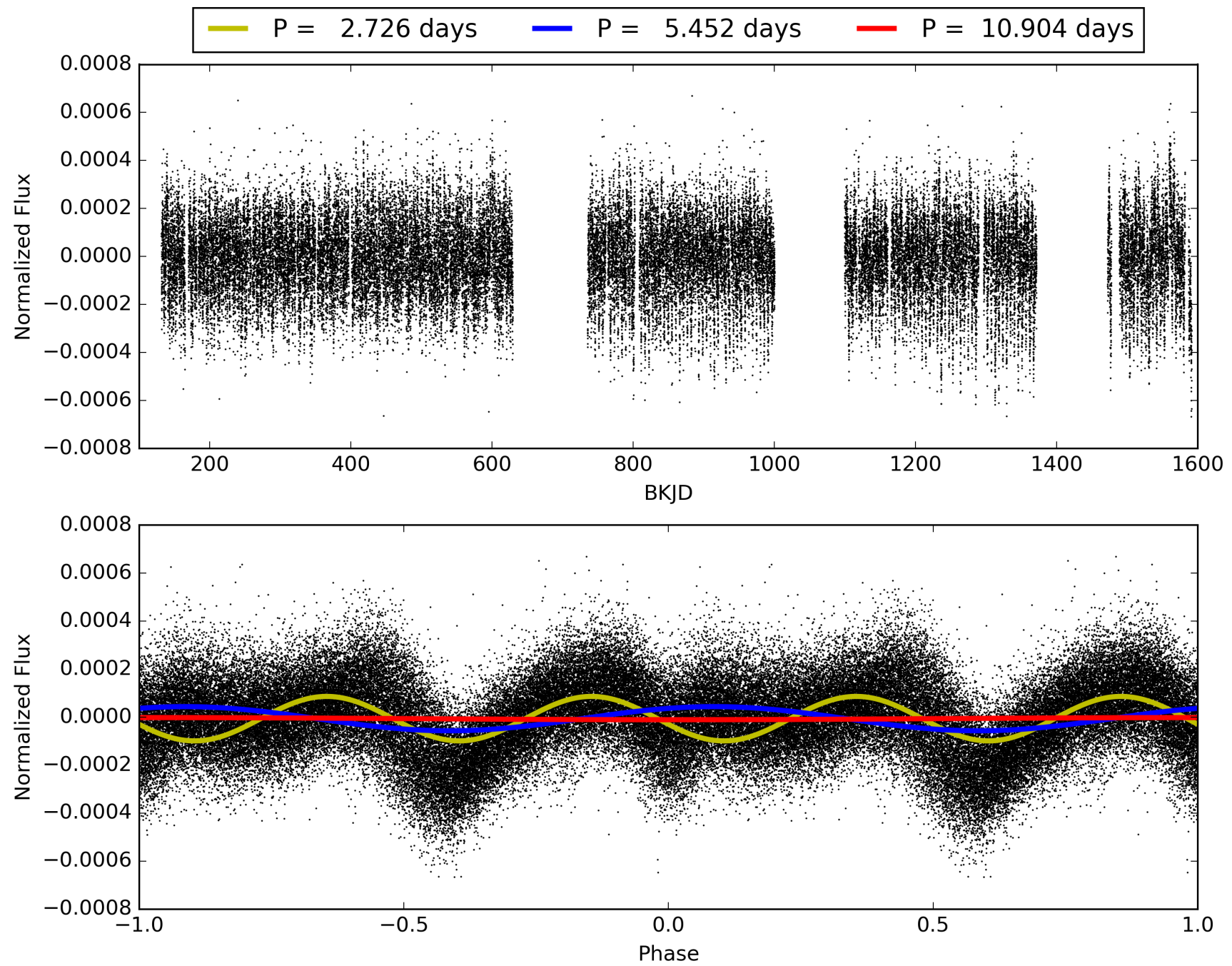
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00 σ]
ModelChiSquare2-sig: 100.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 5.05e-21
RollingBand-fgt: 1.00 [188/188]
GhostDiagnostic-chr: 2.277
Centroid-sig: 0.9%
Centroid-so: 1.513 arcsec [2.21 σ]
OotOffset-rm: 0.605 arcsec [1.68 σ]
KicOffset-rm: 0.454 arcsec [1.28 σ]
OotOffset-st: 4/1/3/5 [13]
KicOffset-st: 4/1/3/5 [13]
DiffImageQuality-fgm: 1.00 [13/13]
DiffImageOverlap-fno: 1.00 [14/14]

TCE 009784590-01, PDC Light Curves

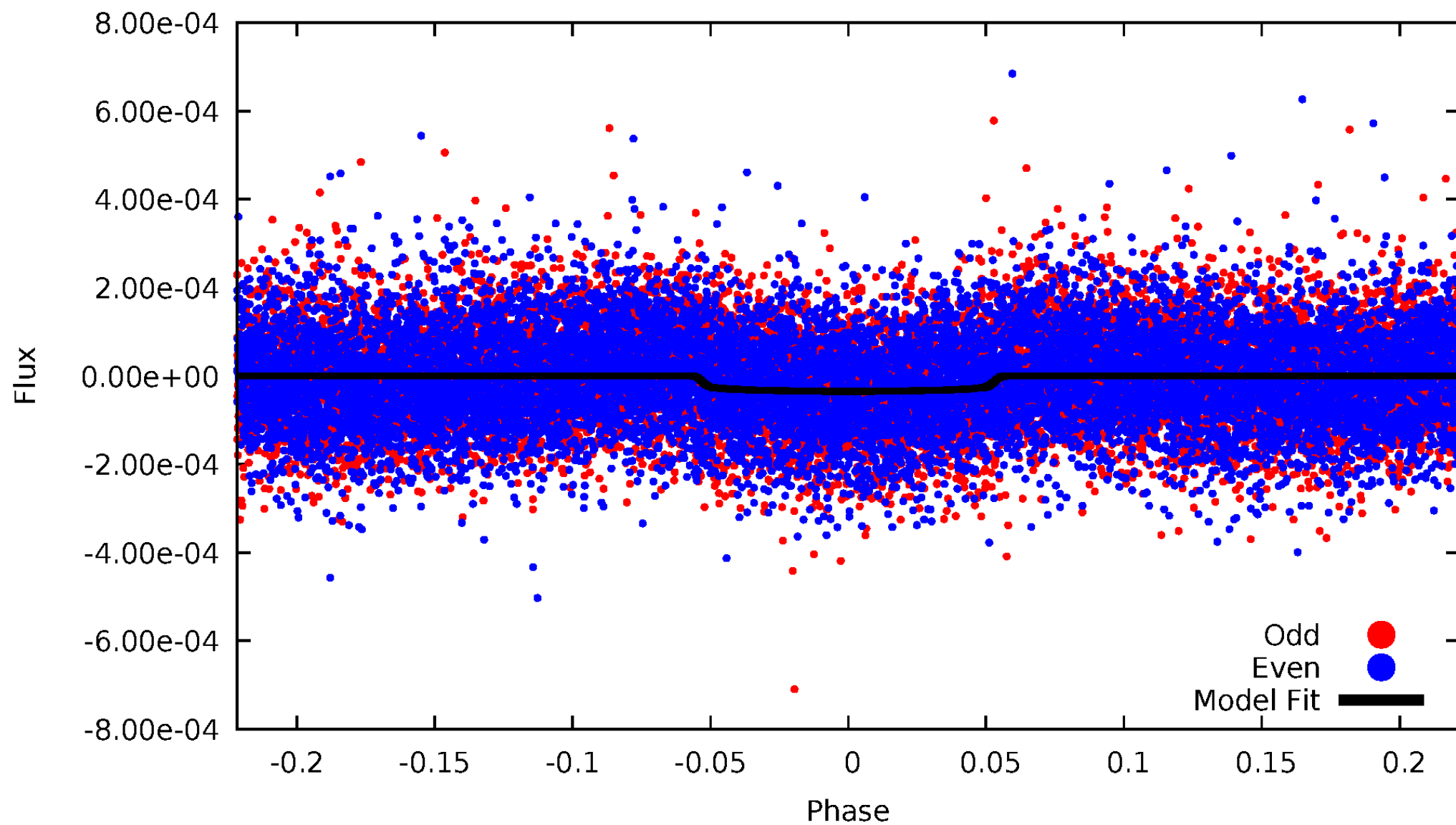


TCE 009784590-01



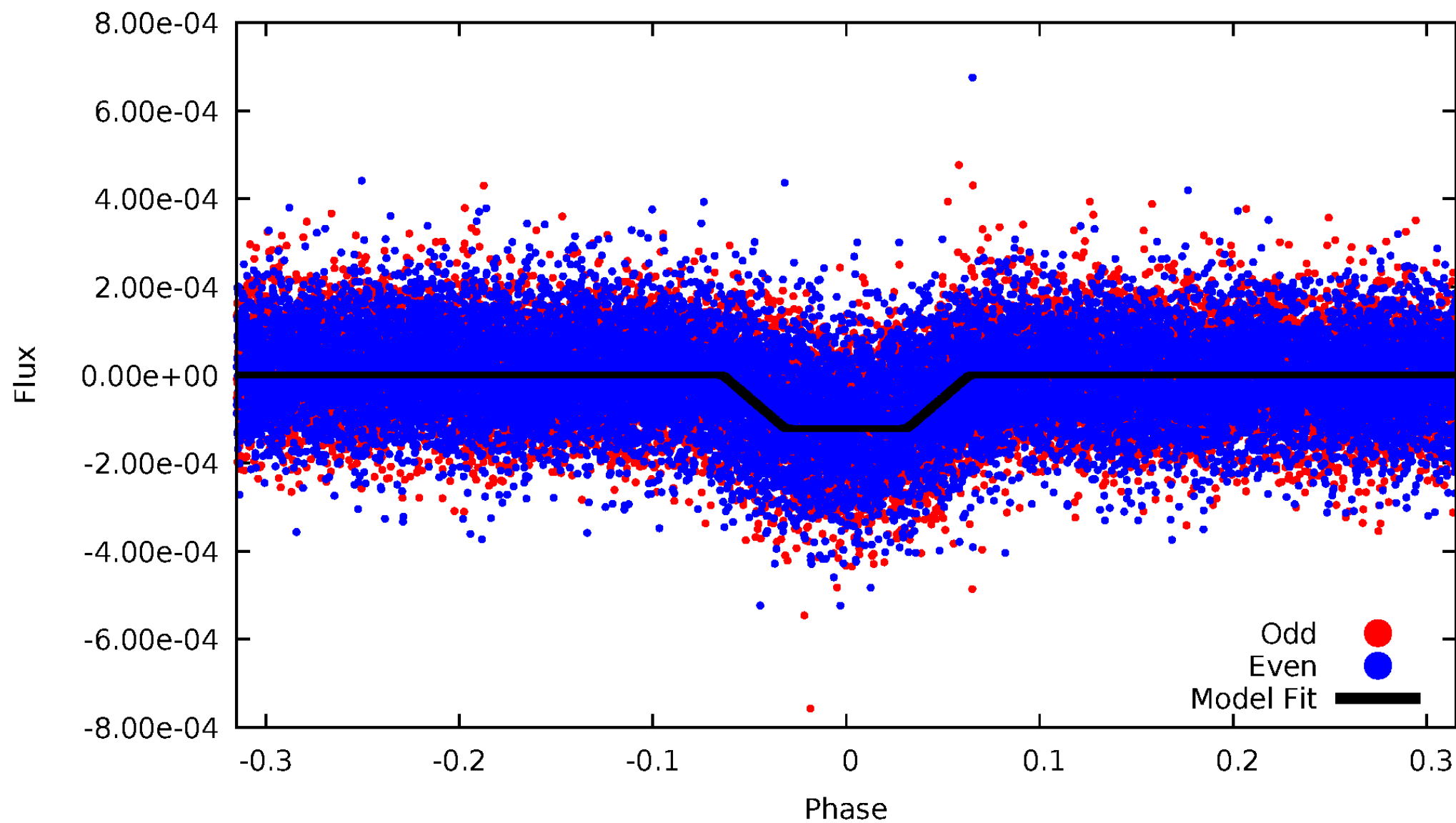
DV Odd/Even

TCE 009784590-01



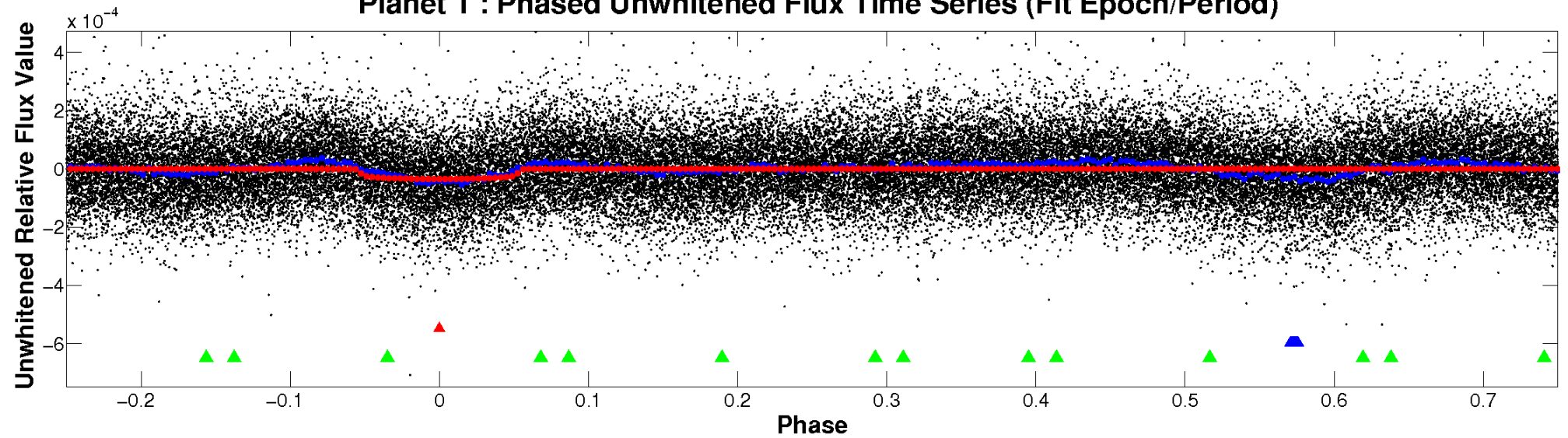
ALT Odd/Even

TCE 009784590-01

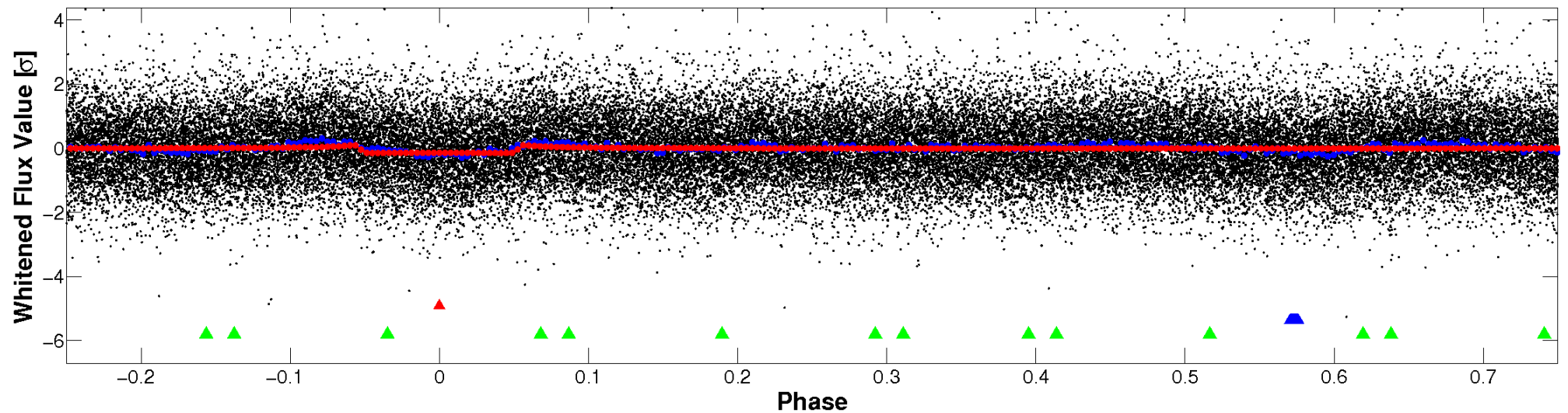


Non-Whitened Vs. Whitened Light Curve

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

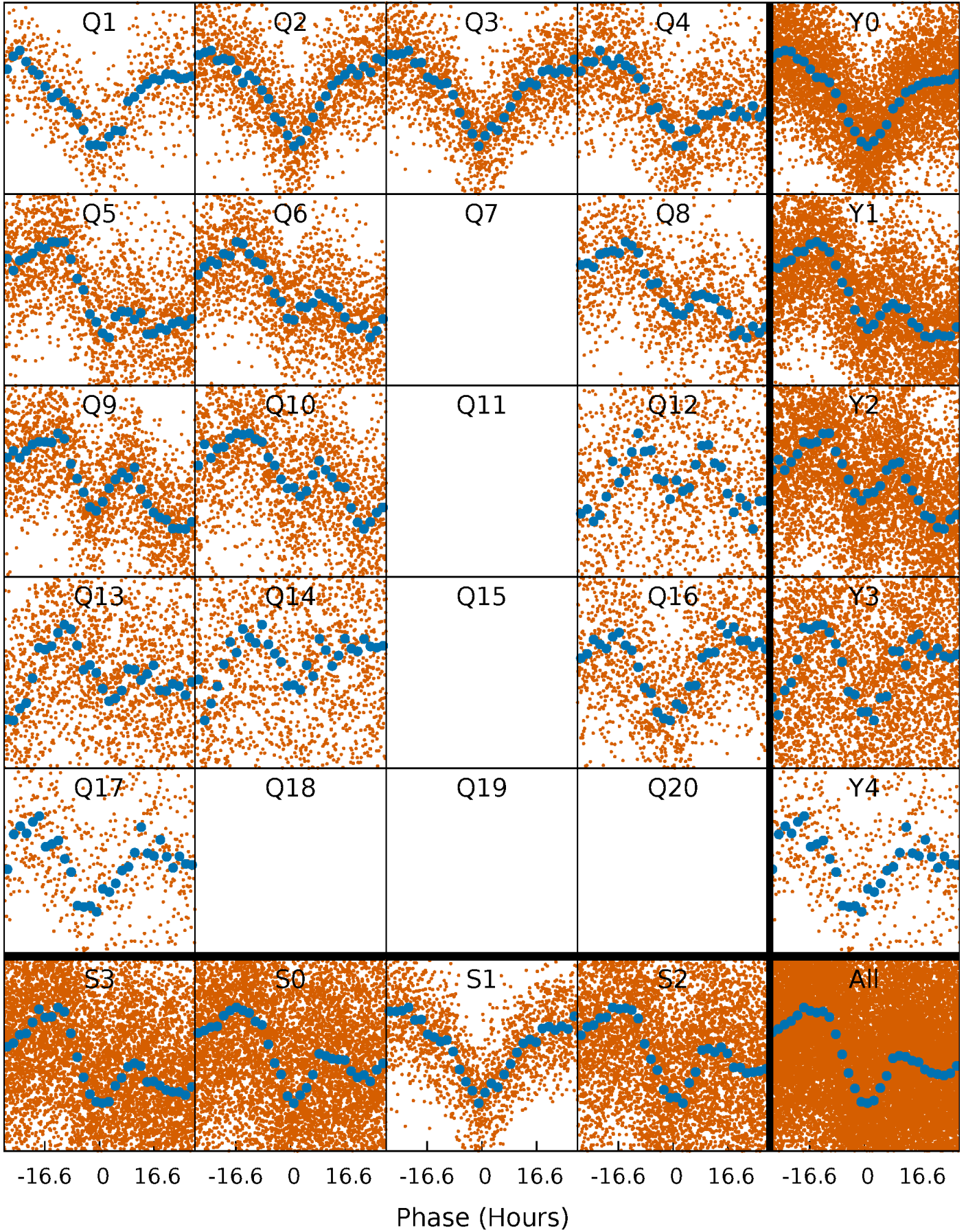


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



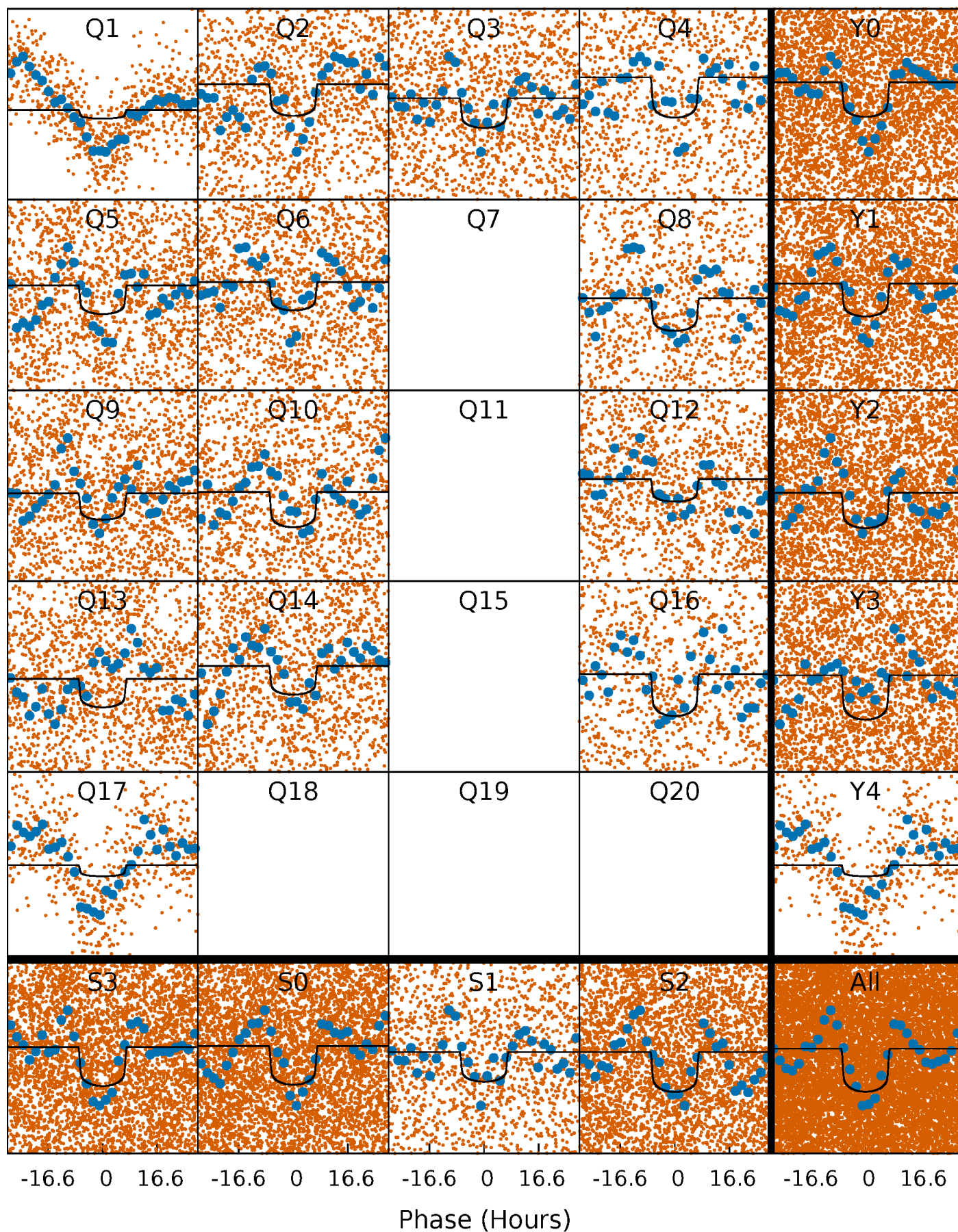
PDC Quarter-Phased Transit Curves

TCE 009784590-01 P= 5.451923 Days $T_0=131.907010$ (BKJD)



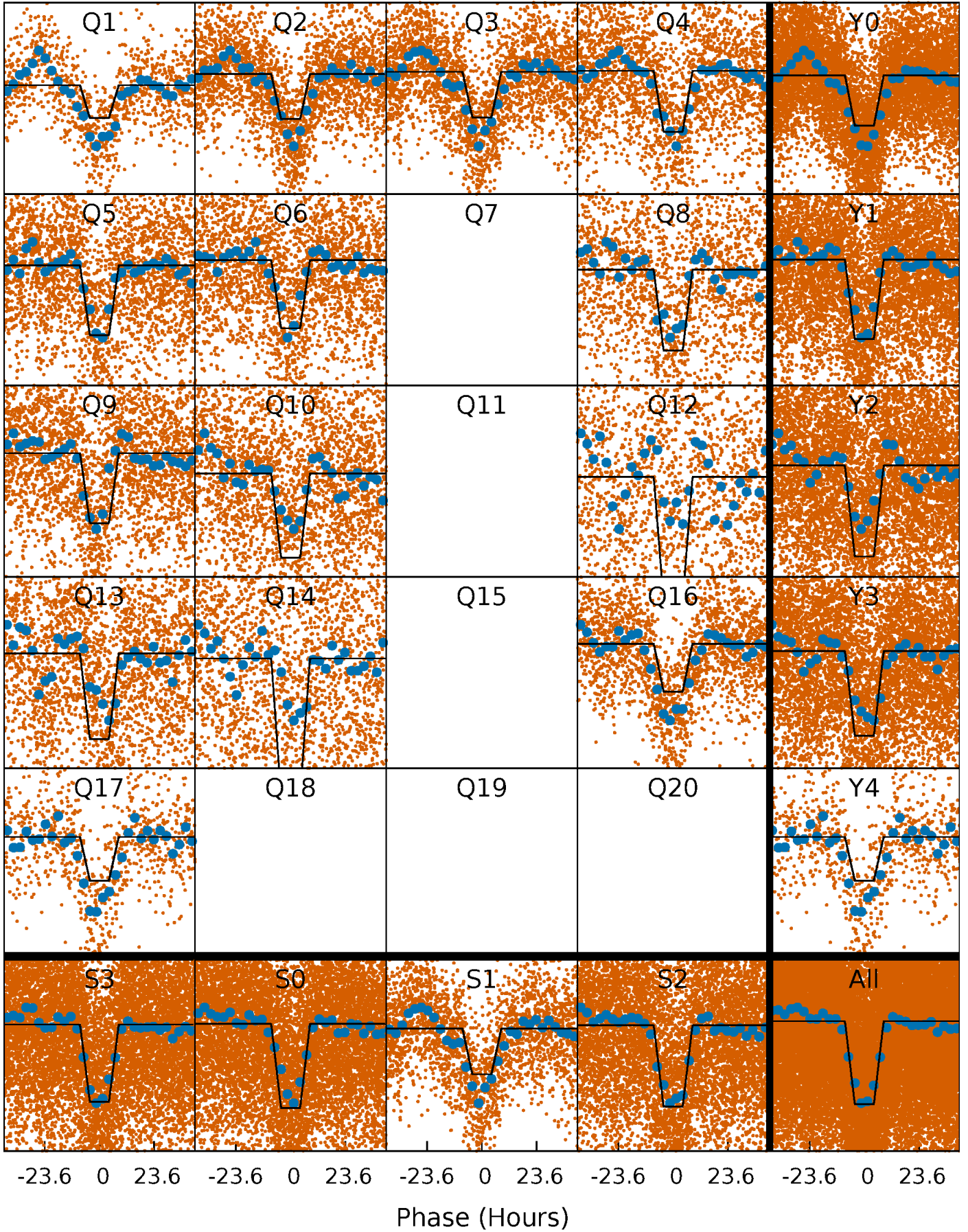
DV Quarter-Phased Transit Curves

TCE 009784590-01 P= 5.451923 Days $T_0=131.907010$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

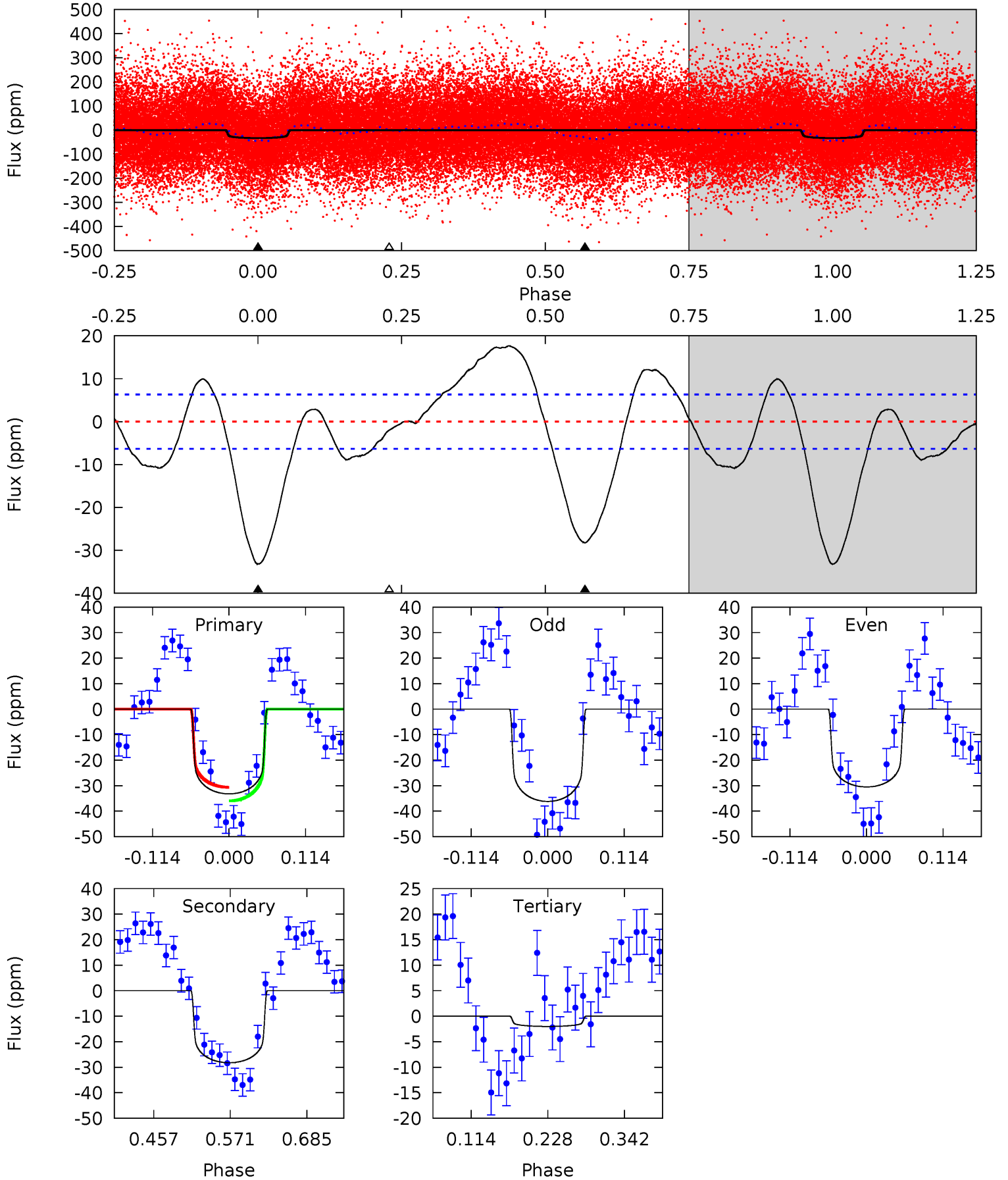
TCE 009784590-01 P= 5.451716 Days $T_0=131.918194$ (BKJD)



DV Model-Shift Uniqueness Test

009784590-01, P = 5.451923 Days, E = 126.455087 Days

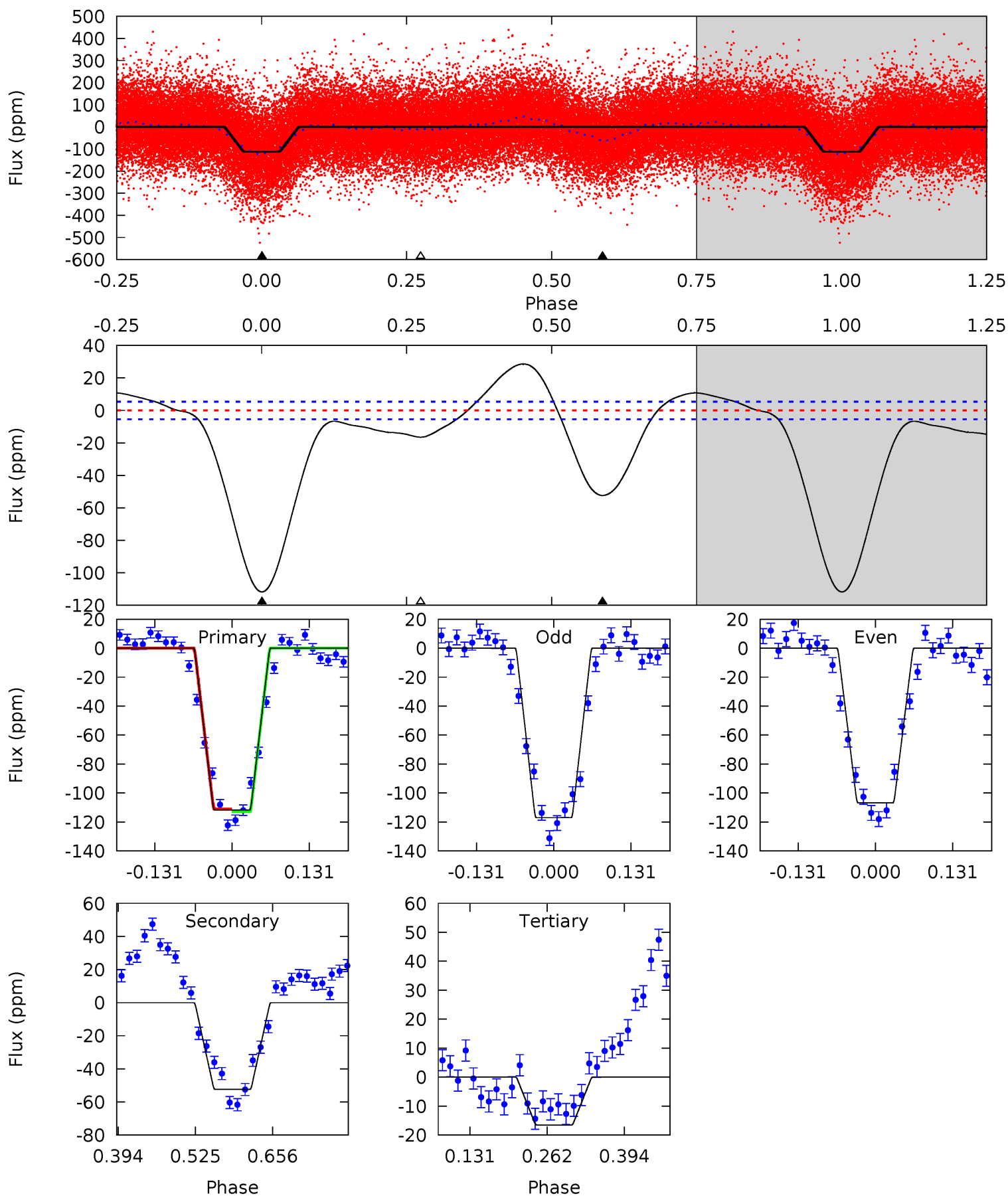
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
23.8	20.2	1.44	0	4.54	1.58	6.37	22.4	23.8	18.8	20.2	2.04	1.15	0.35	1.92



Alt Model-Shift Uniqueness Test

009784590-01, P = 5.451716 Days, E = 126.466478 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
93.2	43.7	13.8	0	4.51	1.51	10.7	79.4	93.2	29.9	43.7	4.29	1.03	0.20	0.75



Stellar Parameters For KIC 009784590

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6748^{+162}_{-223}	$4.122^{+0.186}_{-0.140}$	$-0.280^{+0.250}_{-0.300}$	$1.633^{+0.354}_{-0.390}$	$1.296^{+0.151}_{-0.208}$	$0.419^{+0.388}_{-0.176}$
	+2%/-3%	+5%/-3%	+89%/-107%	+22%/-24%	+12%/-16%	+93%/-42%
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 009784590-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-28 ± 1	$1.13^{+0.18}_{-0.17}$	2059^{+139}_{-132}	6081^{+366}_{-262}	52^{+19}_{-13}
Alt.	-52 ± 1	$1.95^{+0.27}_{-0.26}$	2052^{+133}_{-138}	5455^{+186}_{-179}	33^{+11}_{-7}

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 $A_{obs} \gg 1.0$

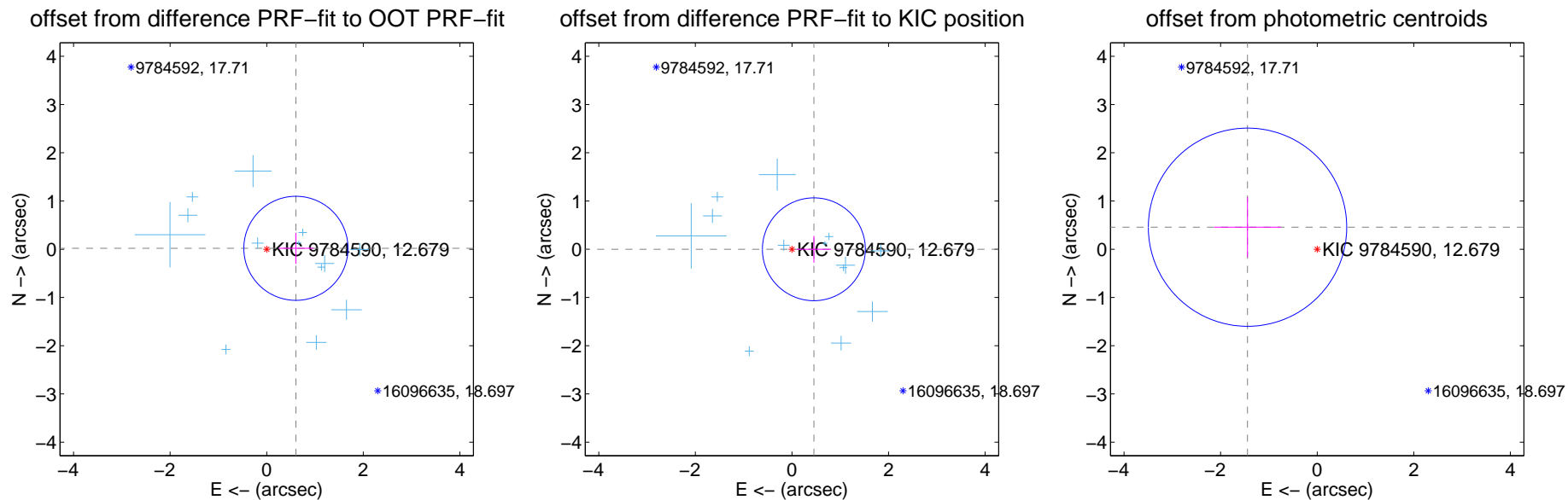
DV Centroid Data

Supplemental centroid analysis for 009784590-01. Kepler magnitude: 12.68. Transit SNR 11.11

There are 13 quarters with good PRF difference image offsets

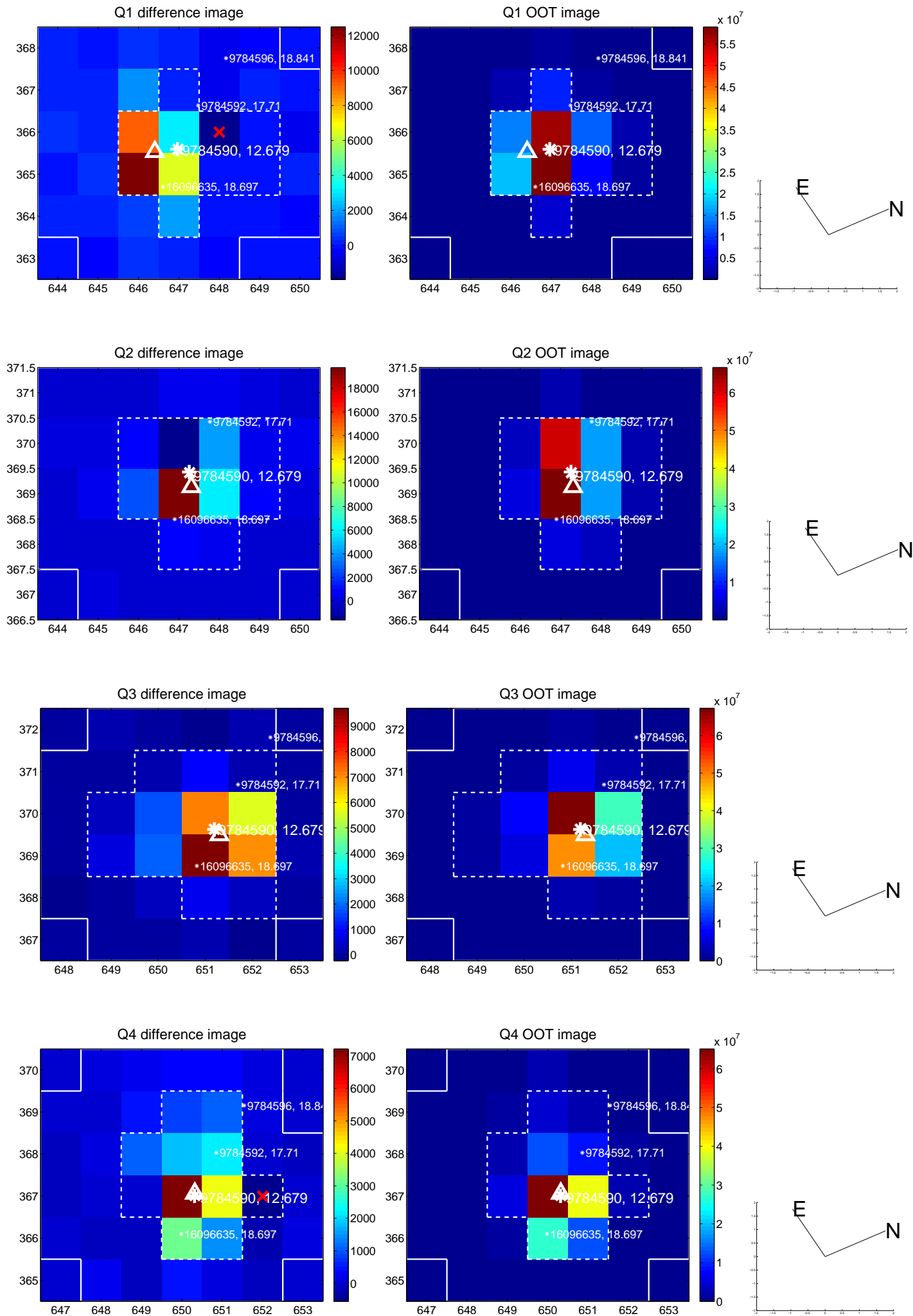
The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.605 ± 0.360	1.68	-0.605 ± 0.364	0.019 ± 0.321
PRF-fit source offset from KIC position	0.454 ± 0.355	1.28	-0.454 ± 0.355	-0.001 ± 0.278
photometric centroid source offset	1.51 ± 0.68	2.21	1.44 ± 0.69	0.46 ± 0.62

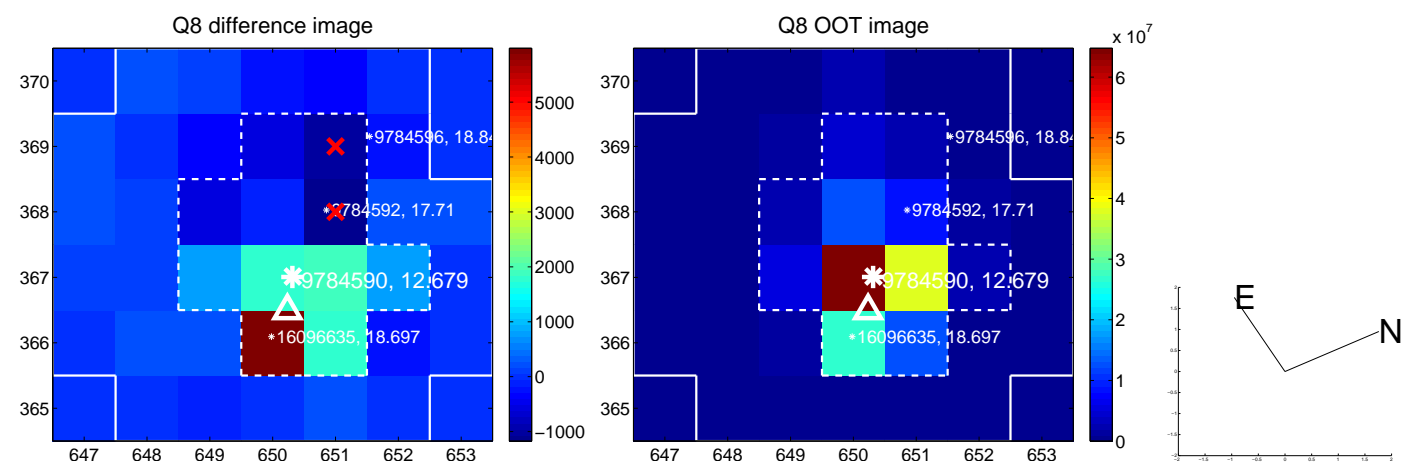
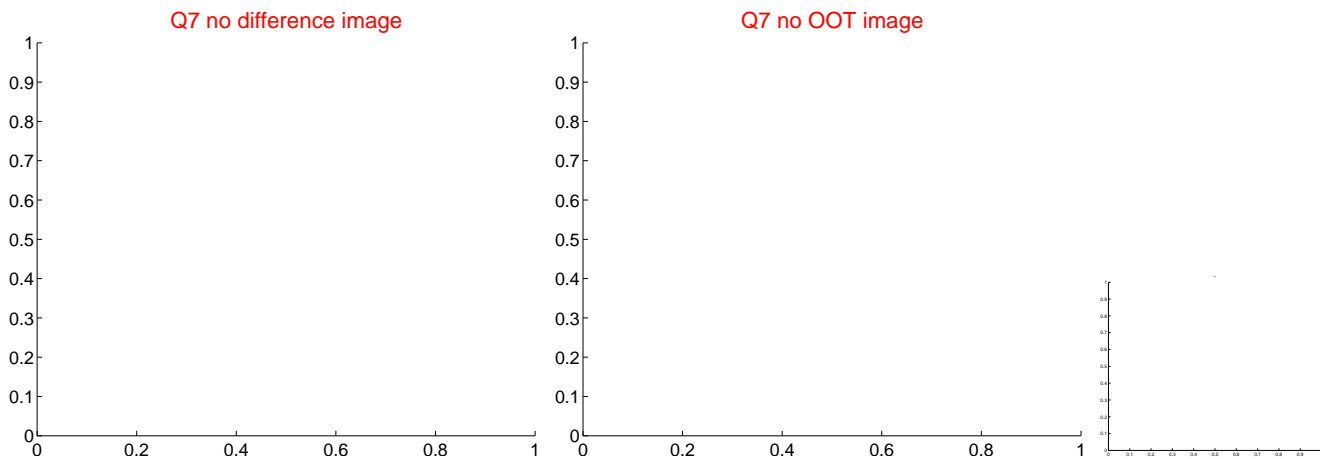
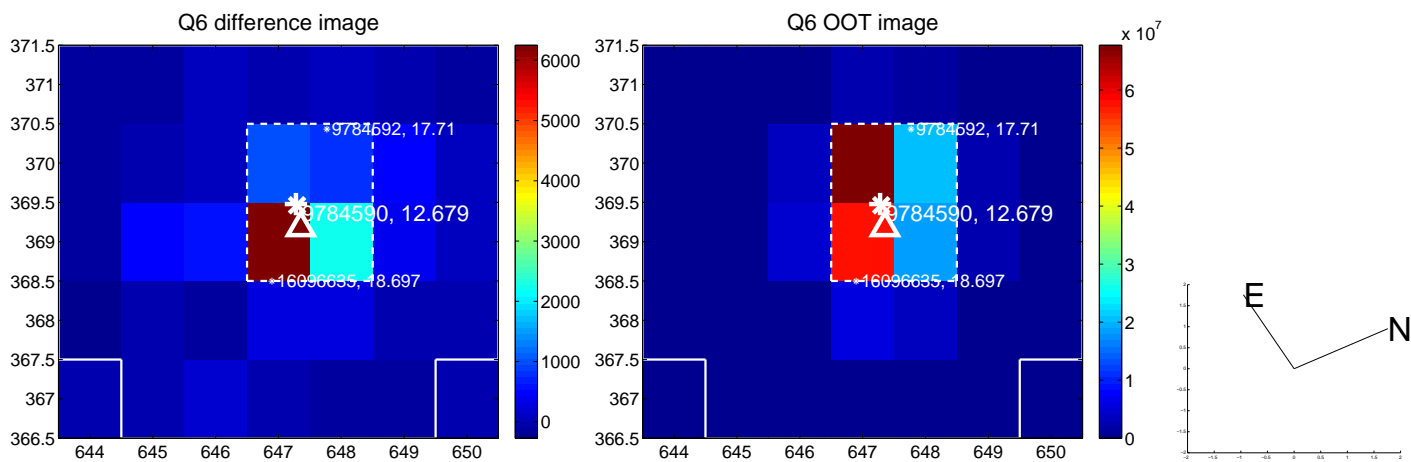
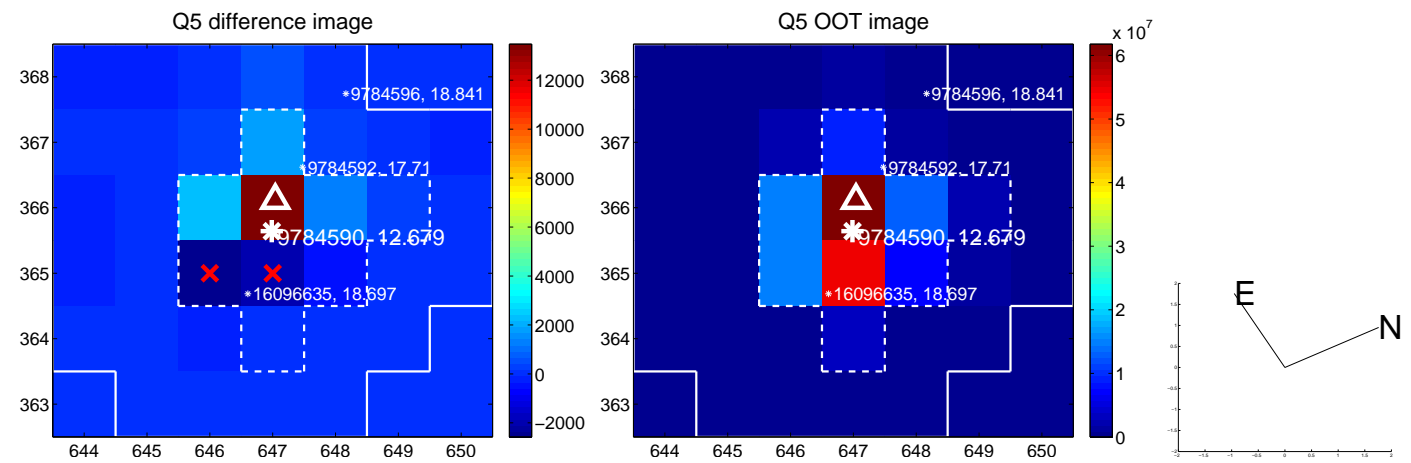


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

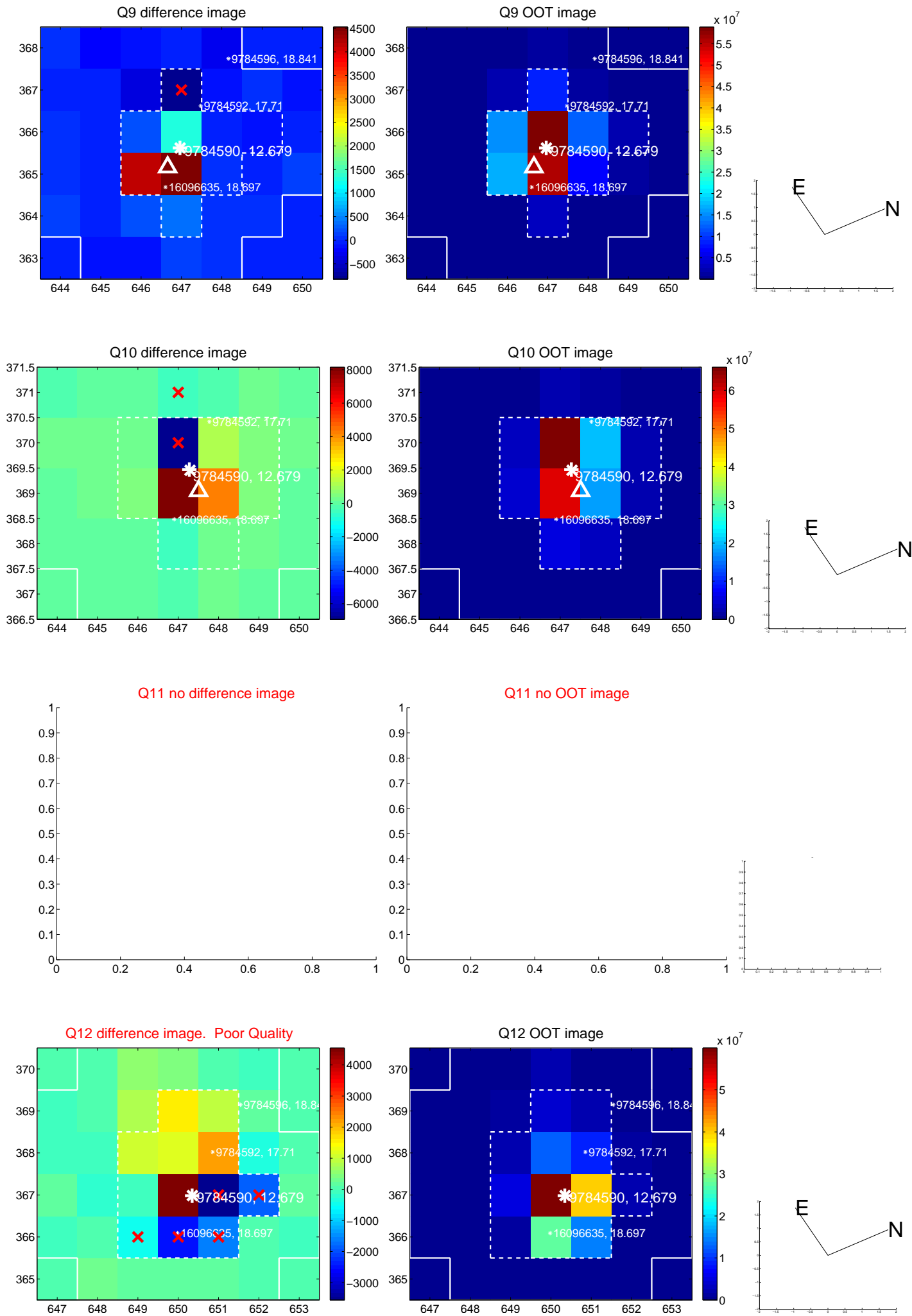
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



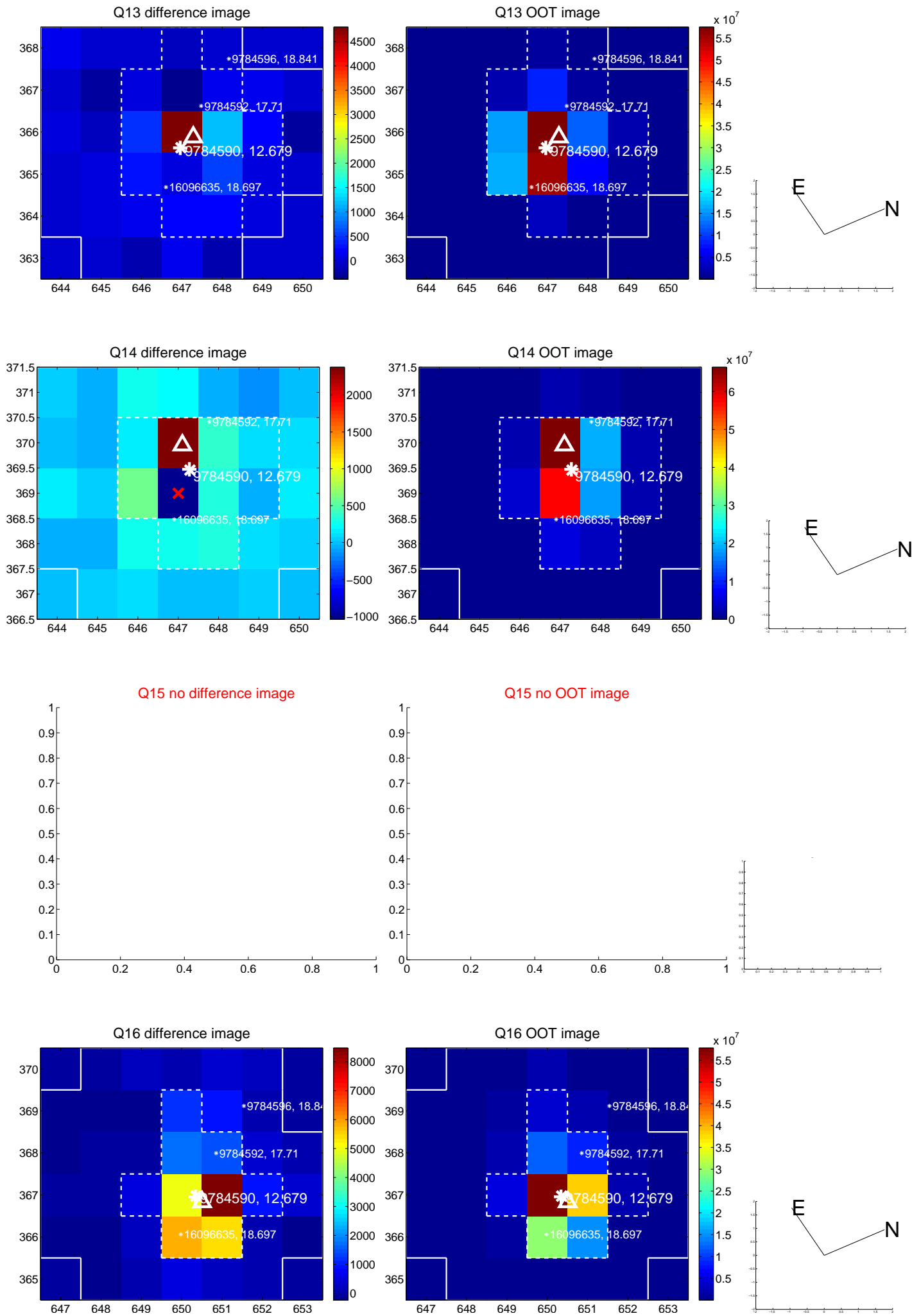
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



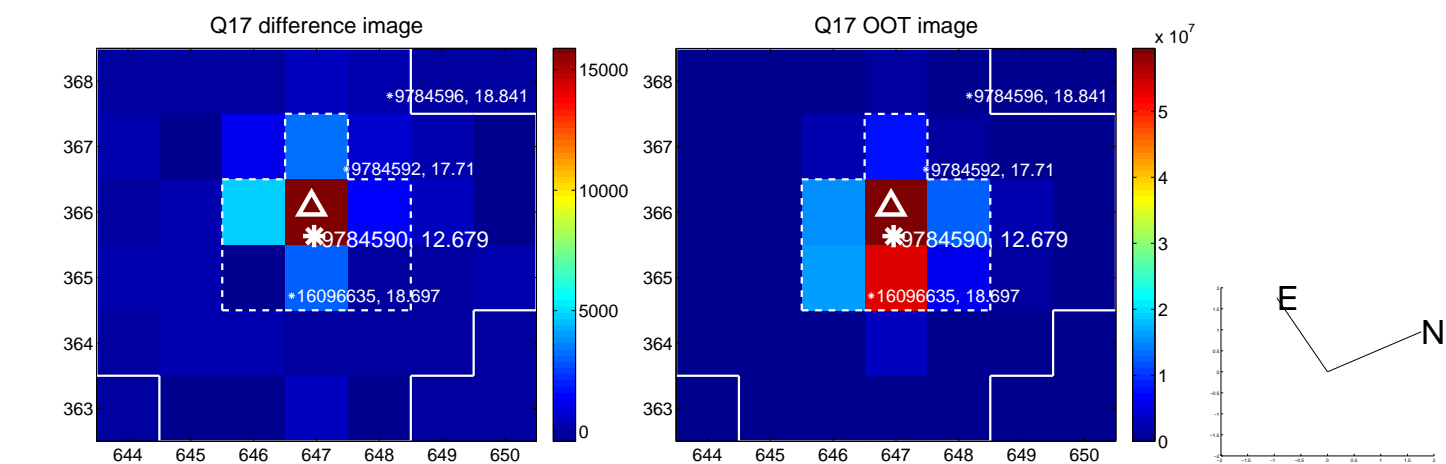
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



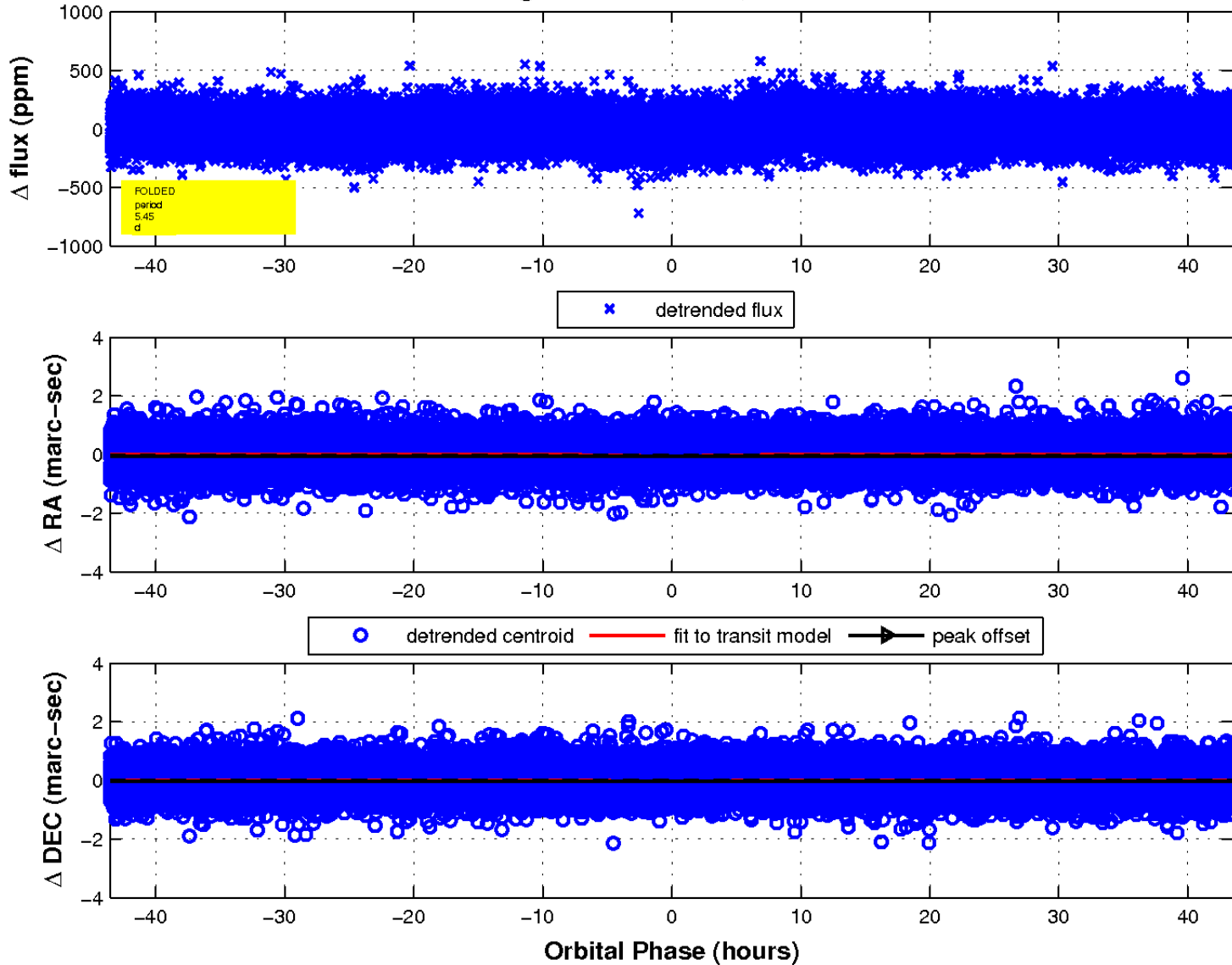
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

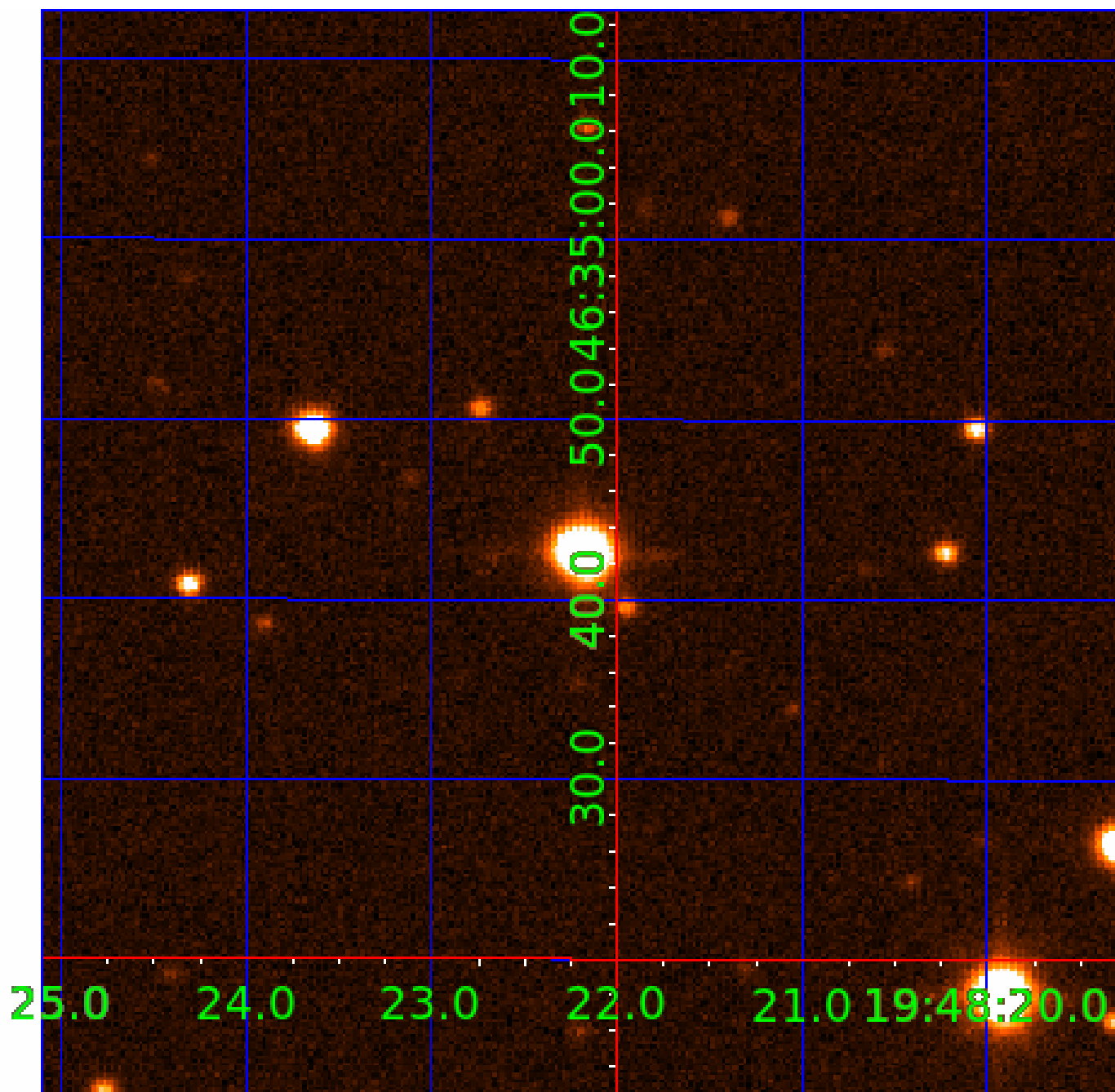


fluxWeightedCentroids, Planet 1 of 3



UKIRT Image

Declination



KIC 009784590

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})
009784590-01	OBS	No	5.451923	131.907010	34.7	14.504	11.5	11.1	1.63	6748	1.14	1138.11
009784590-02	OBS	No	5.452031	135.017650	32.2	13.259	10.4	11.5	1.63	6748	0.93	1138.08
009784590-03	OBS	No	102.363639	166.314424	149.5	7.128	7.9	6.4	1.63	6748	2.34	22.81

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009784590-01	OBS	FP	0.00	1	0	0	0	LPP_DV
009784590-02	OBS	FP	0.00	1	0	0	0	LPP_DV—SAME_NTL_PERIOD
009784590-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

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

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

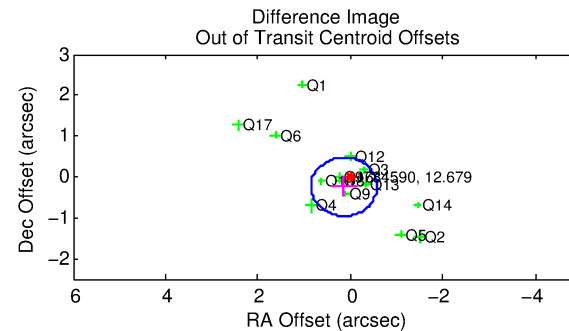
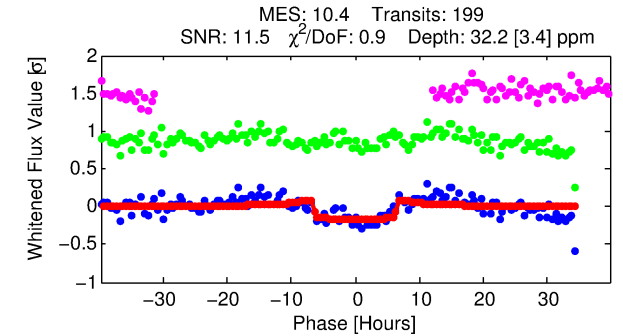
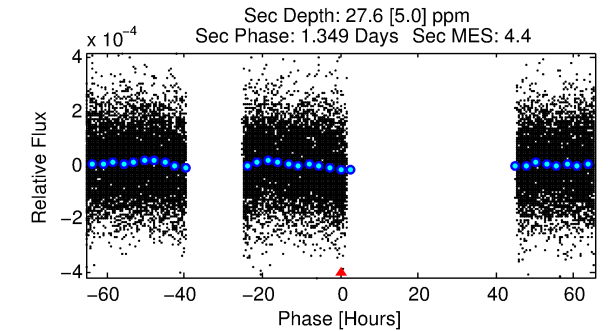
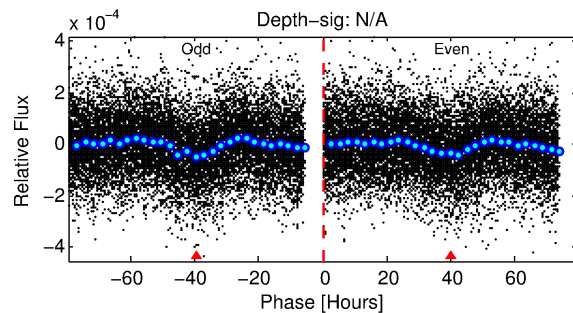
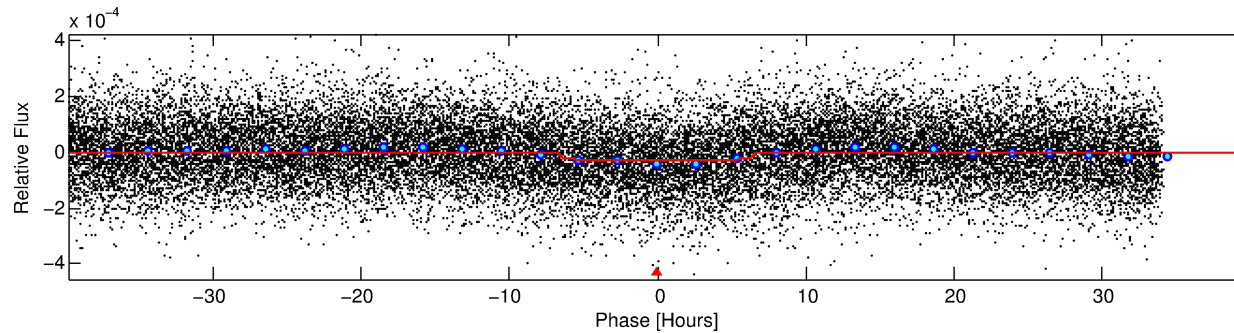
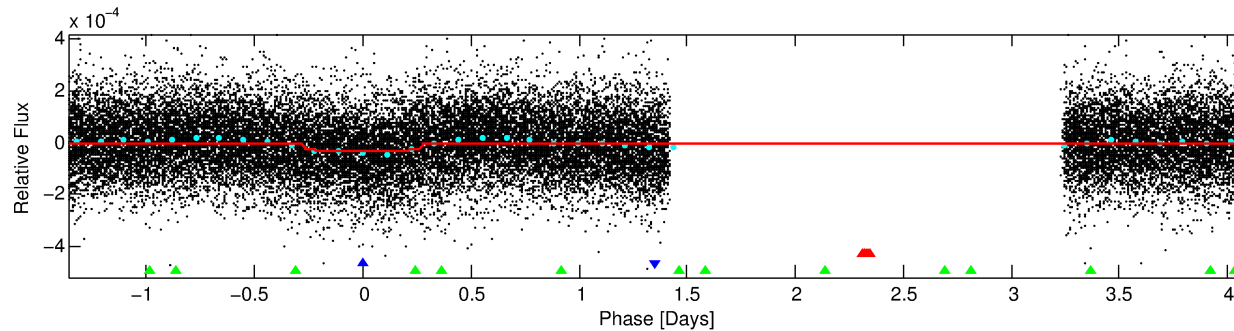
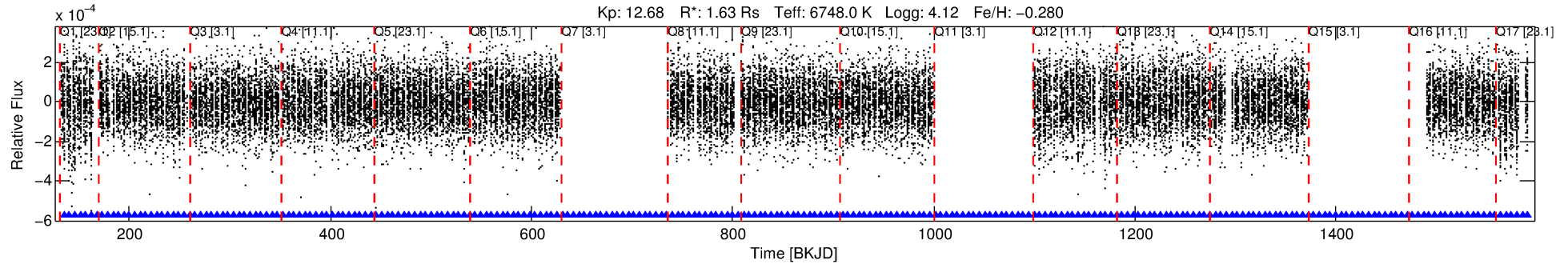
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009784590-02

No Significant Match Found

DV One-Page Summary

KIC: 9784590 Candidate: 2 of 3 Period: 5.452 d



DV Fit Results:

Period = 5.45203 [0.00006] d
Epoch = 135.0177 [0.0075] BKJD
Rp/R* = 0.0052 [0.0037]
a/R* = 3.21 [11.25]
b = 0.01 [336.35]
Seff = 1138.08 [401.32]
Teq = 1481 [131] K
Rp = 0.93 [0.69] Re
a = 0.0660 [0.0141] AU
Ag = 75.90 [109.66] [0.68σ]
Teffp = 6759 [2388] K [2.21σ]

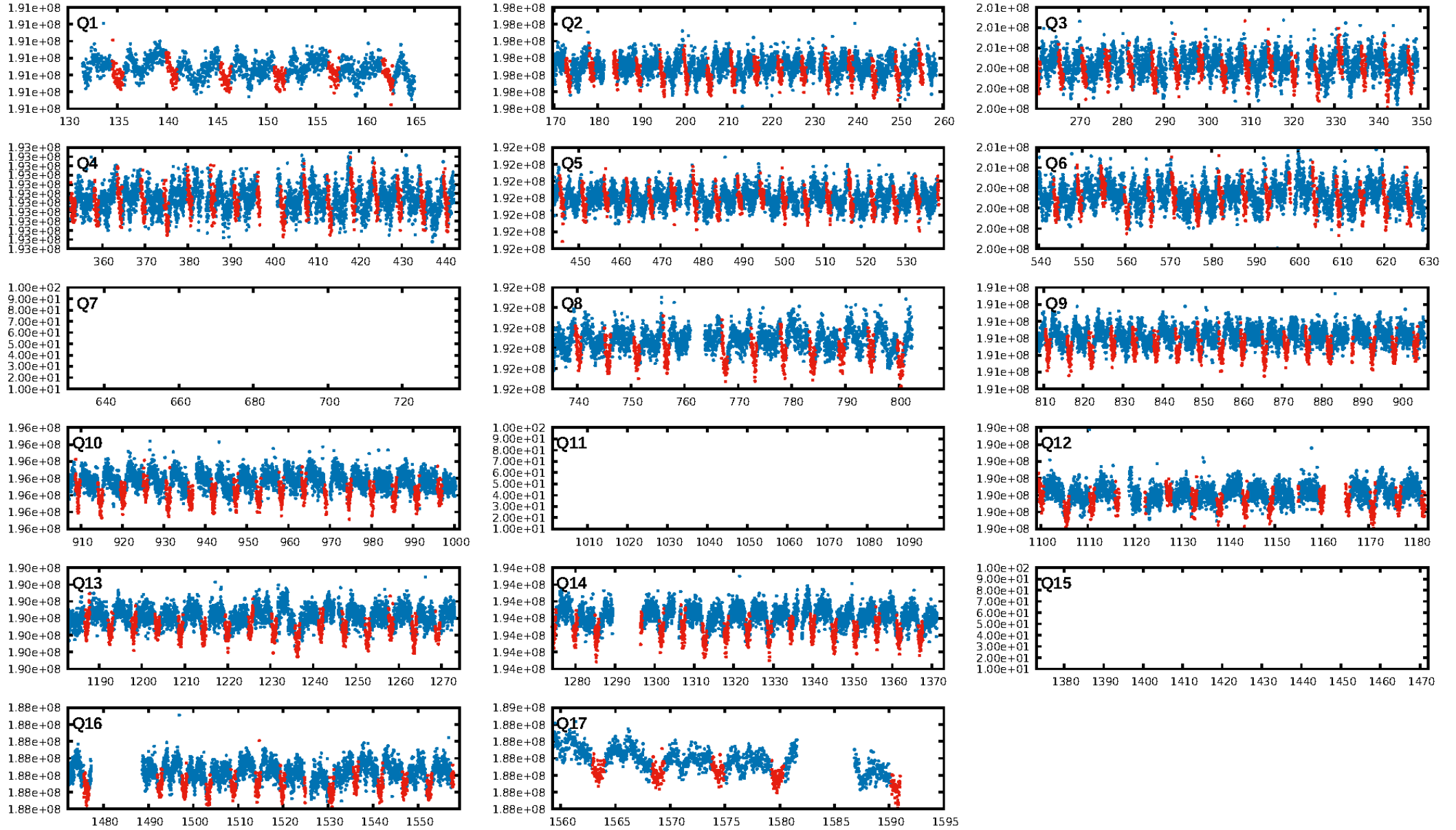
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: 100.0% [154.50σ]
ModelChiSquare2-sig: 92.6%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 2.80e-17
RollingBand-fgt: 1.00 [188/188]
GhostDiagnostic-chr: 1.469
Centroid-sig: 61.2%
Centroid-so: 0.388 arcsec [0.55σ]
OotOffset-rm: 0.284 arcsec [1.19σ]
KicOffset-rm: 0.317 arcsec [1.33σ]
OotOffset-st: 4/1/4/5 [14]
KicOffset-st: 4/1/4/5 [14]
DiffImageQuality-fgm: 1.00 [14/14]
DiffImageOverlap-fno: 1.00 [14/14]

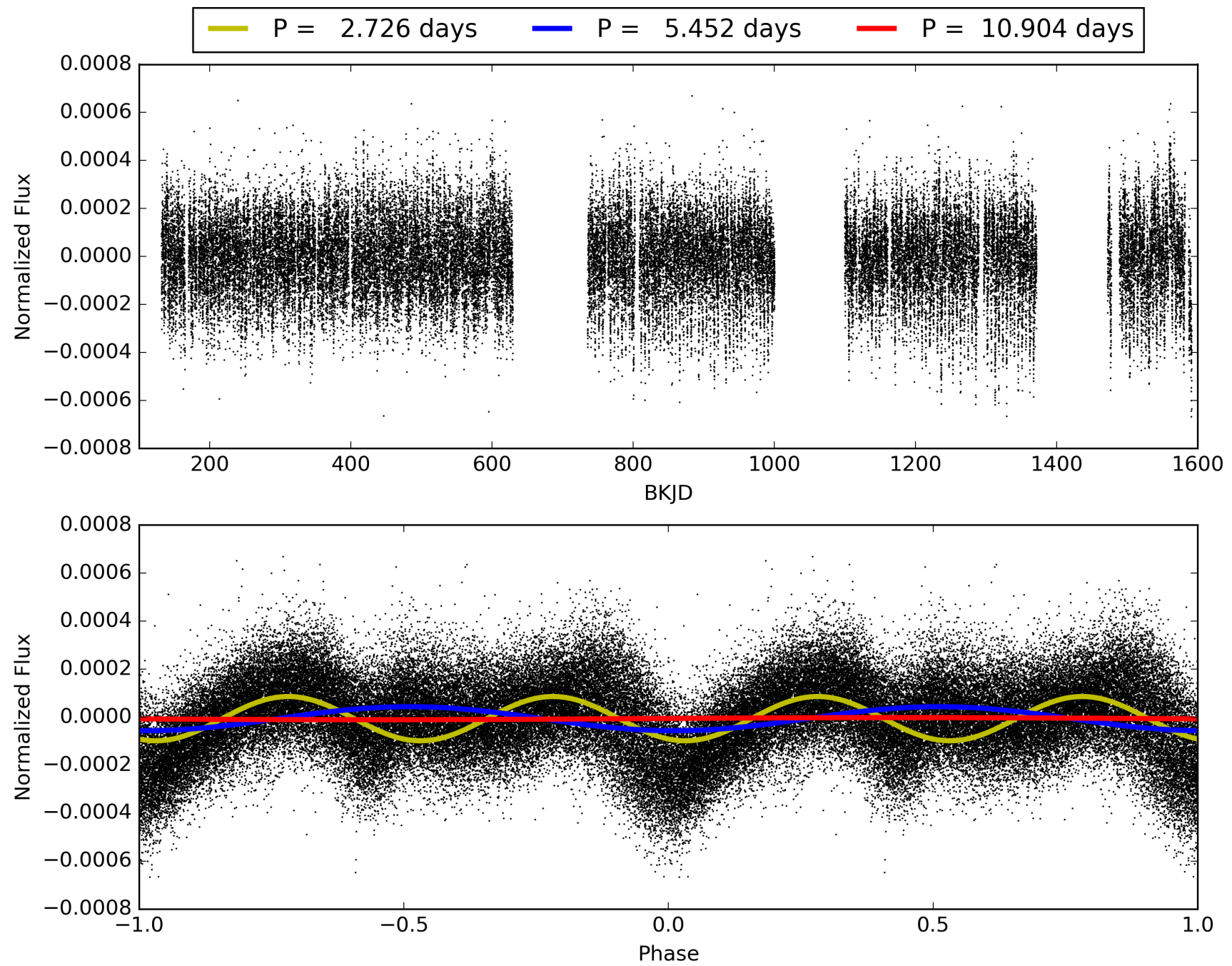
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 17:29:26 Z

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

TCE 009784590-02, PDC Light Curves

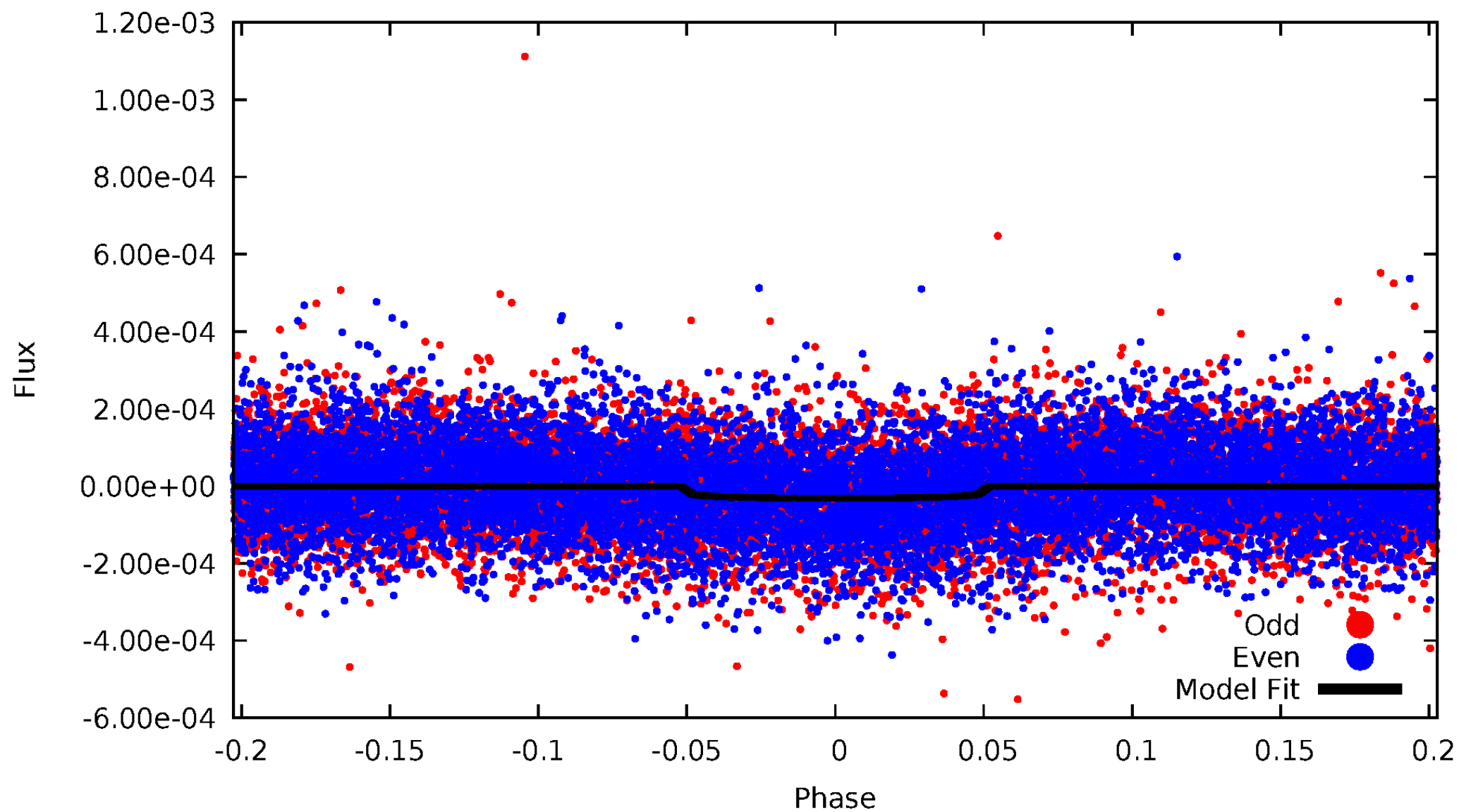


TCE 009784590-02



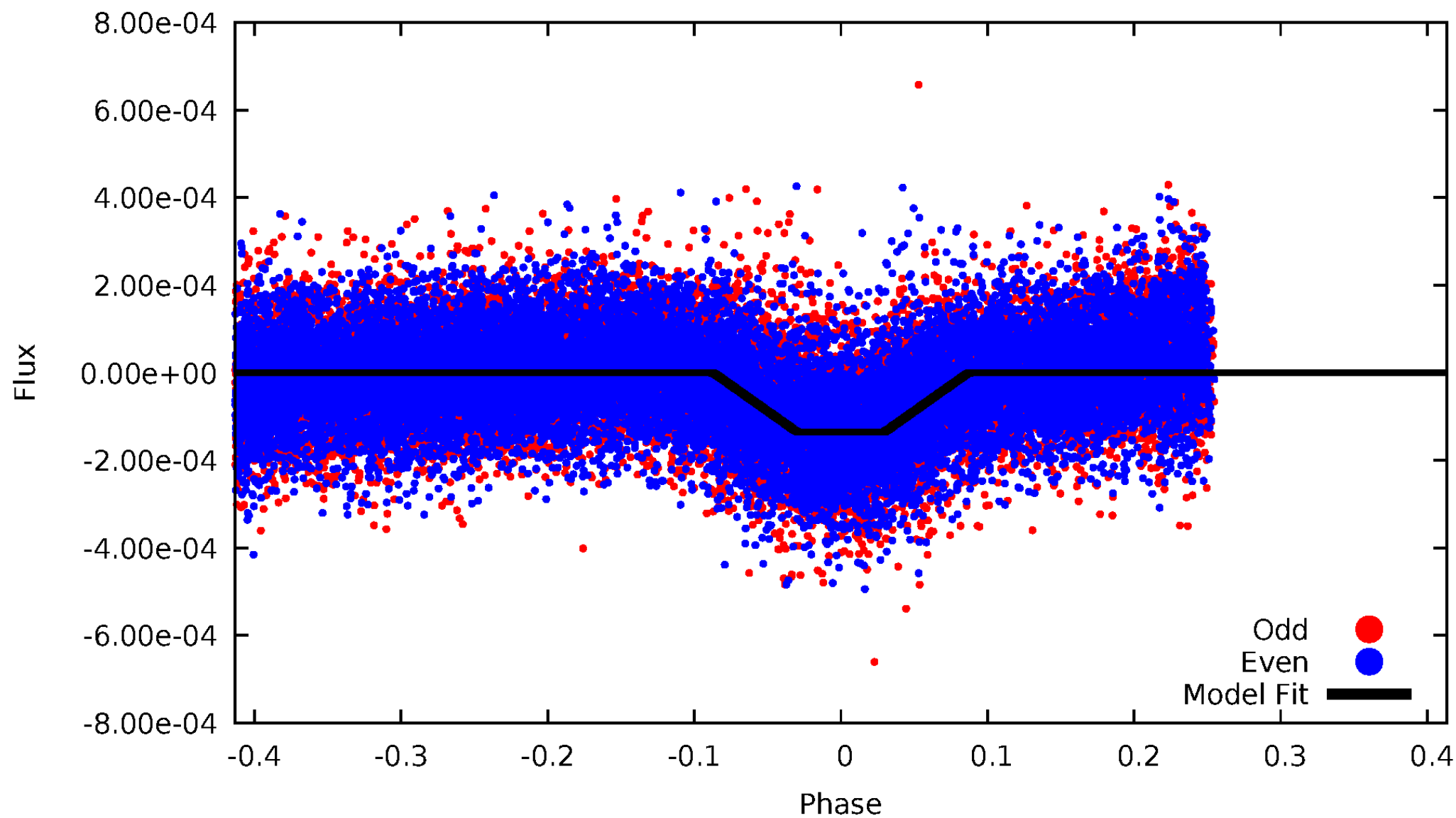
DV Odd/Even

TCE 009784590-02



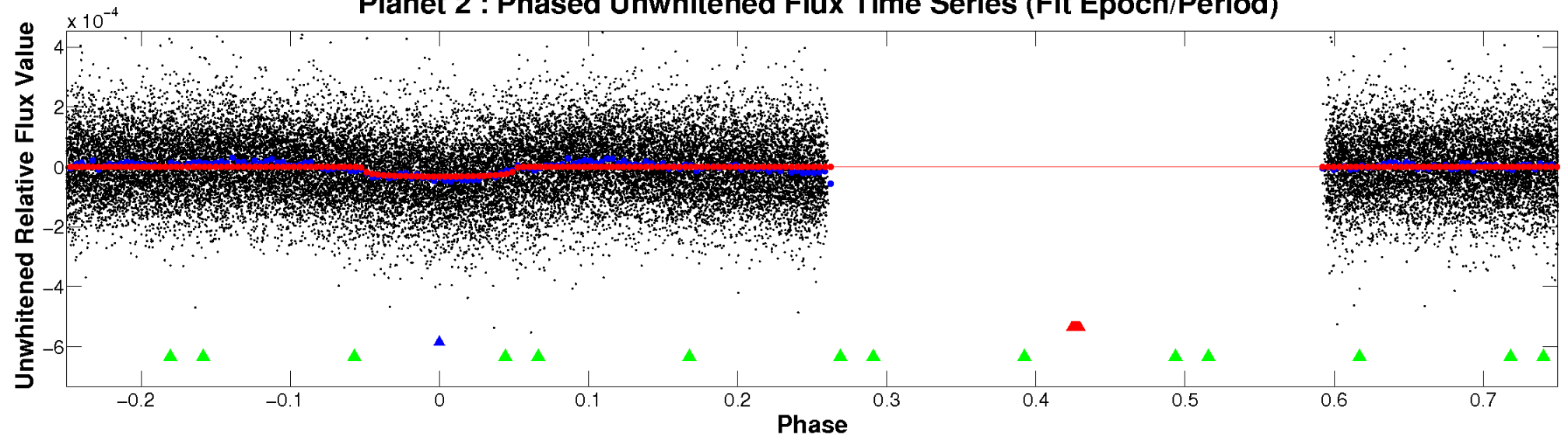
ALT Odd/Even

TCE 009784590-02

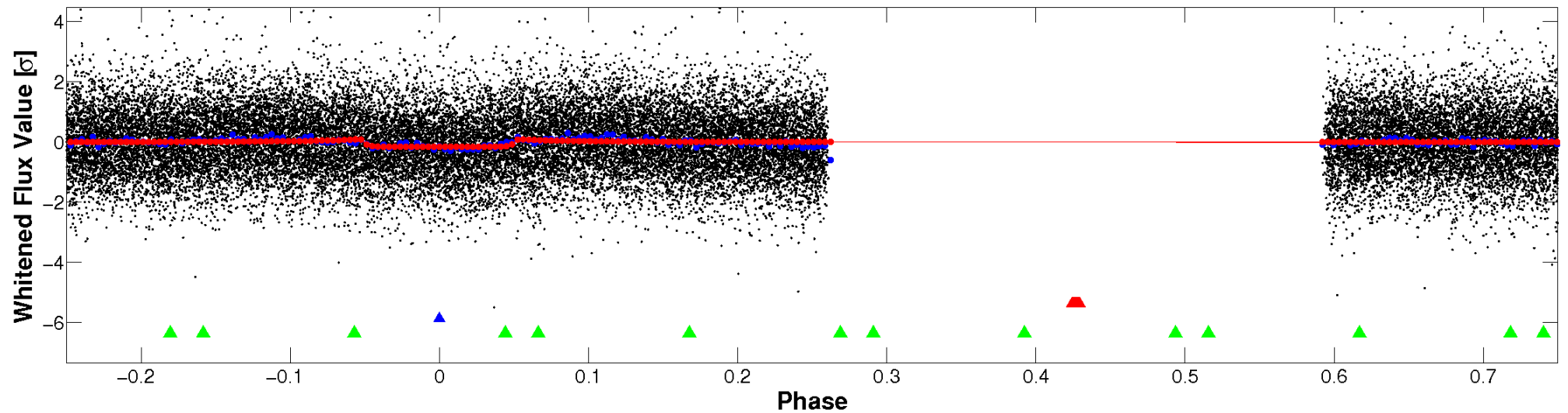


Non-Whitened Vs. Whitened Light Curve

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

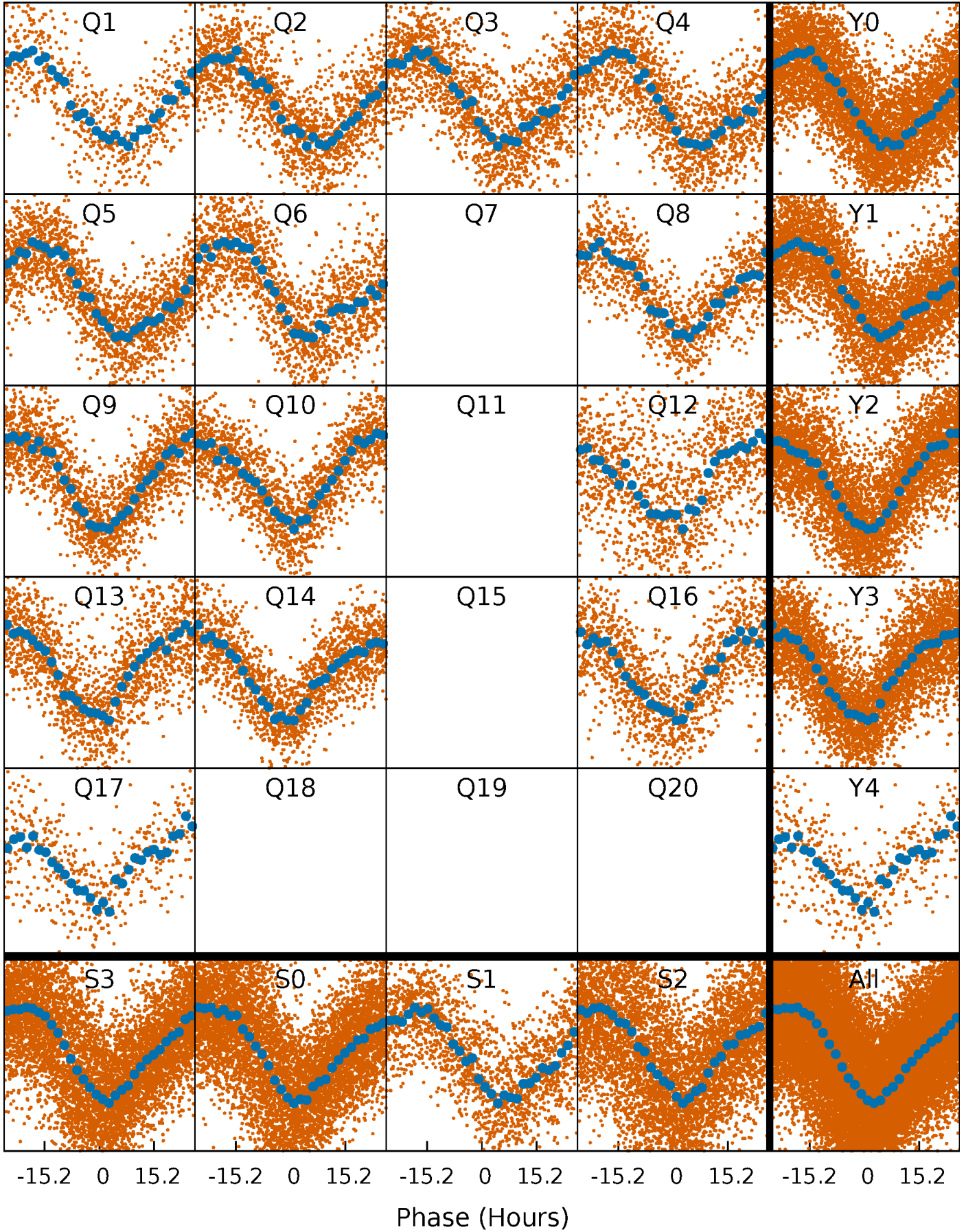


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



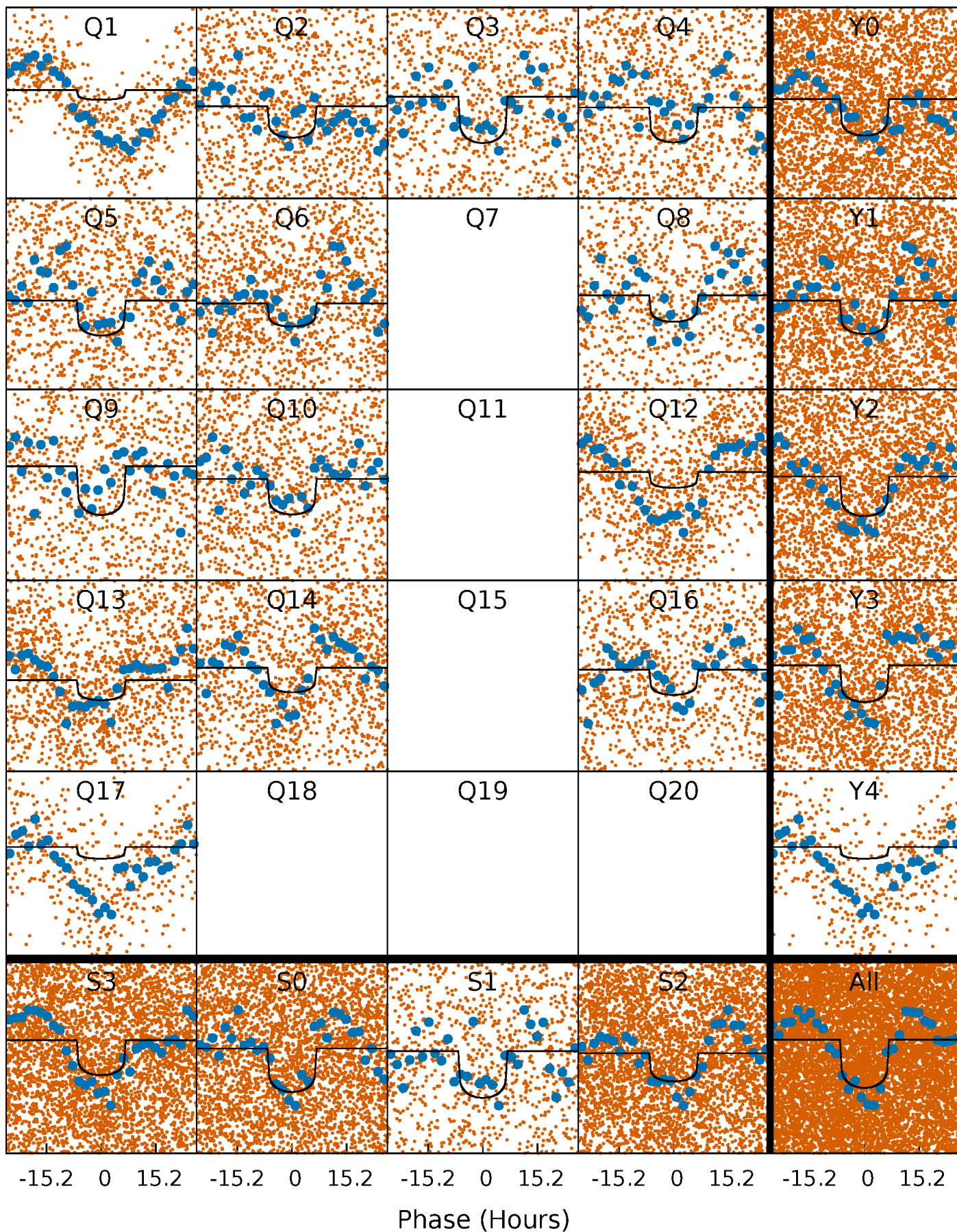
PDC Quarter-Phased Transit Curves

TCE 009784590-02 P= 5.452031 Days $T_0=135.017650$ (BKJD)



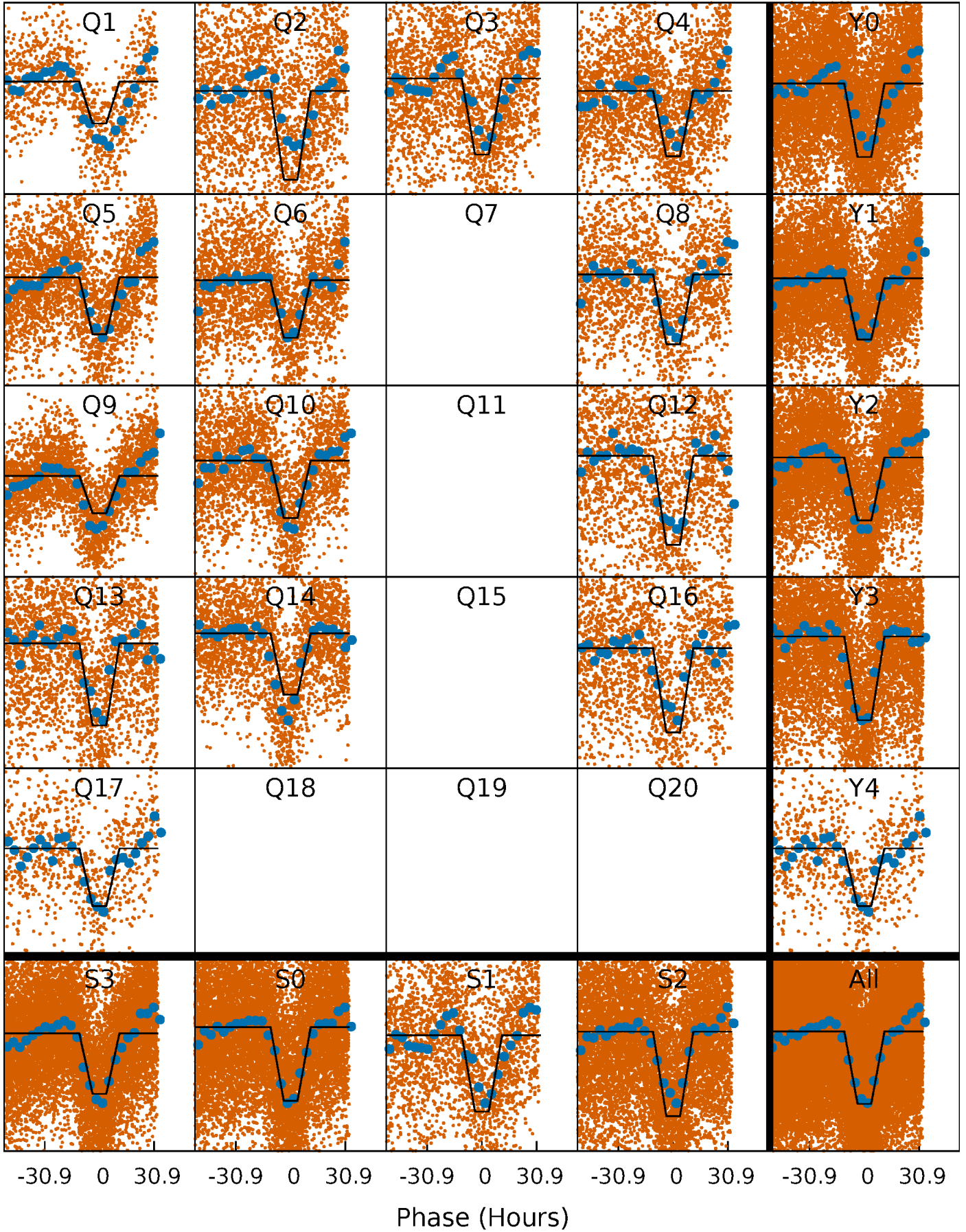
DV Quarter-Phased Transit Curves

TCE 009784590-02 P= 5.452031 Days $T_0=135.017650$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

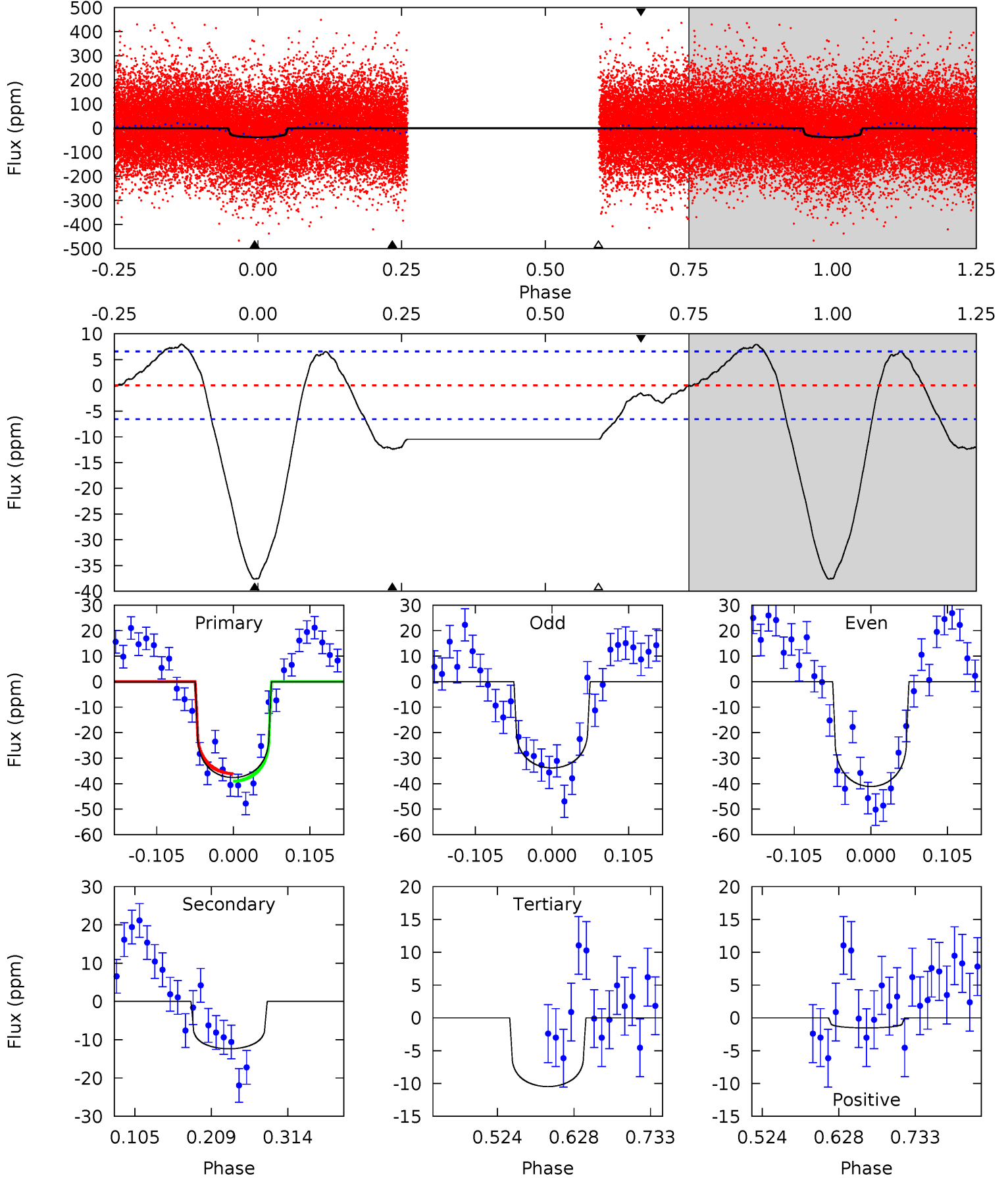
TCE 009784590-02 P= 5.451697 Days $T_0=135.111725$ (BKJD)



DV Model-Shift Uniqueness Test

009784590-02, P = 5.452031 Days, E = 129.565619 Days

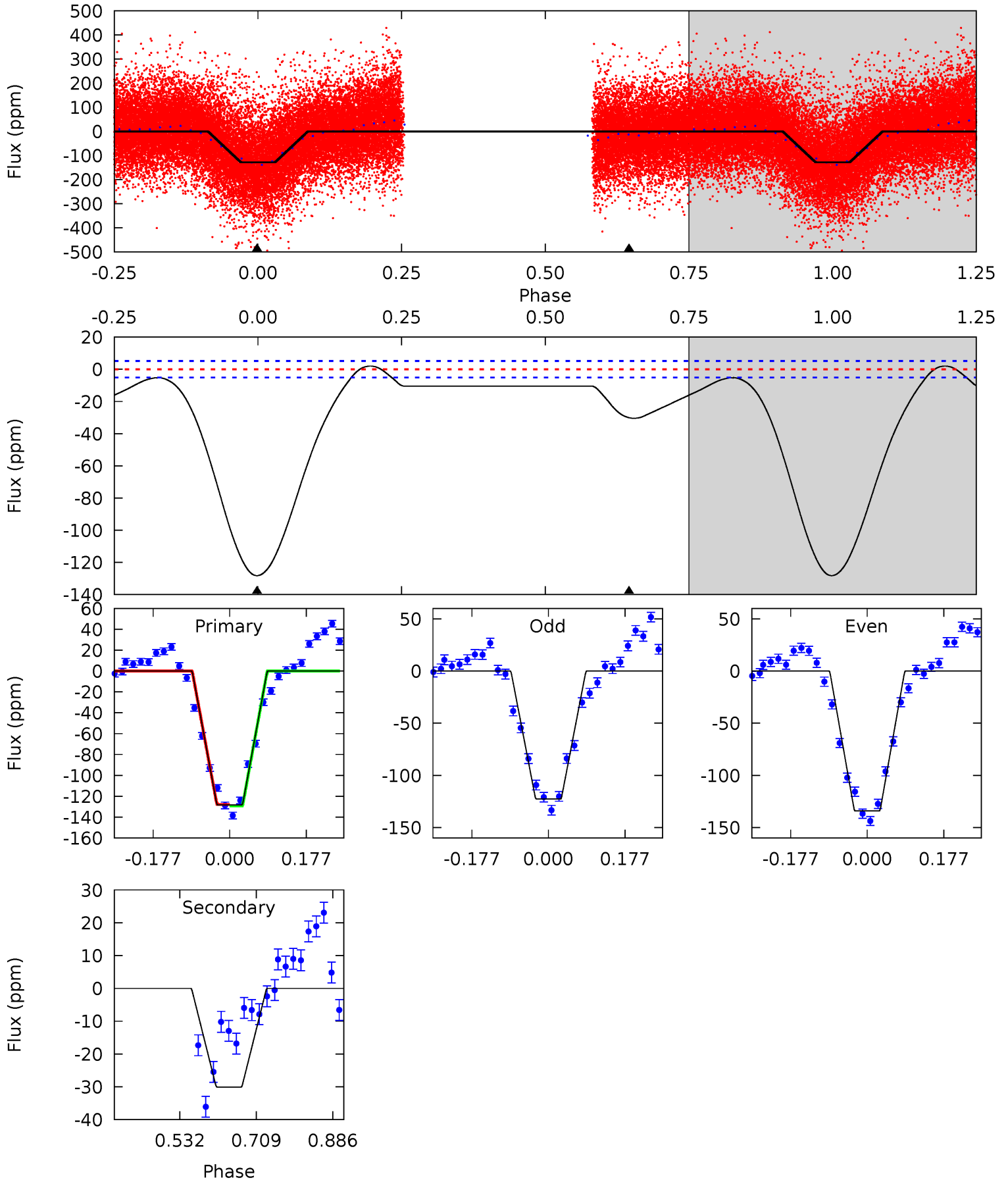
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
26.1	8.58	7.27	-1.06	4.56	1.62	3.37	18.8	27.2	1.31	9.64	2.54	1.33	0.17	1.04



Alt Model-Shift Uniqueness Test

009784590-02, P = 5.451697 Days, E = 129.660028 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
110.6	25.9	0	0	4.44	1.35	3.25	110.6	110.6	25.9	25.9	4.92	1.00	0.02	0.68



Stellar Parameters For KIC 009784590

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6748^{+162}_{-223}	$4.122^{+0.186}_{-0.140}$	$-0.280^{+0.250}_{-0.300}$	$1.633^{+0.354}_{-0.390}$	$1.296^{+0.151}_{-0.208}$	$0.419^{+0.388}_{-0.176}$
	+2%/-3%	+5%/-3%	+89%/-107%	+22%/-24%	+12%/-16%	+93%/-42%
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 009784590-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-12 ± 1	$0.95^{+0.68}_{-0.51}$	2060^{+125}_{-138}	5405^{+2623}_{-1061}	32^{+117}_{-21}
Alt.	-30 ± 1	$2.05^{+0.78}_{-0.67}$	2063^{+130}_{-137}	4685^{+915}_{-486}	17^{+20}_{-7}

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

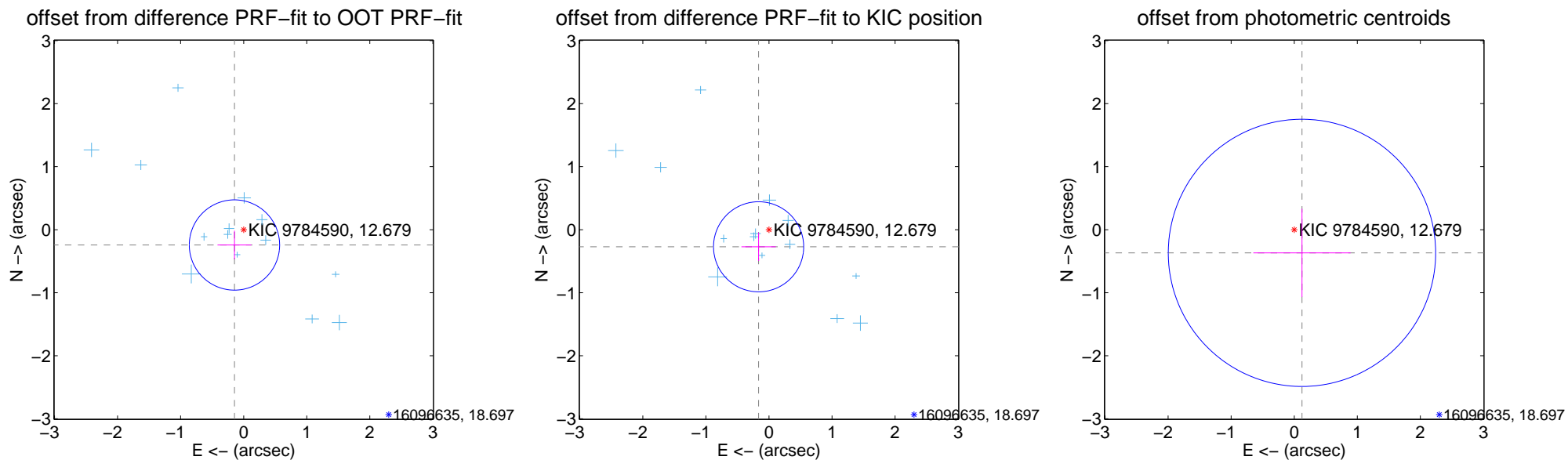
DV Centroid Data

Supplemental centroid analysis for 009784590-02. Kepler magnitude: 12.68. Transit SNR 11.45

There are 14 quarters with good PRF difference image offsets

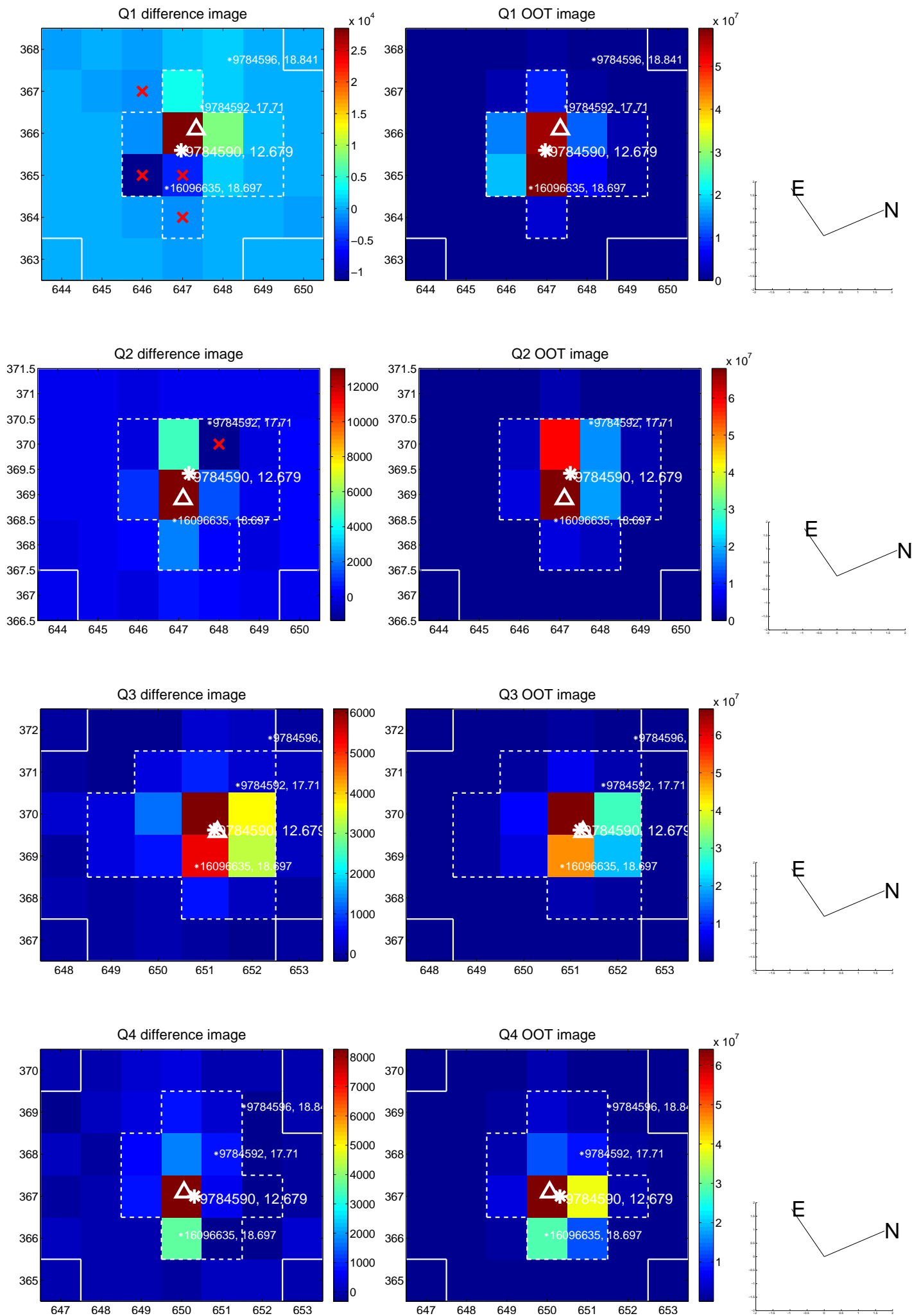
The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.284 ± 0.239	1.19	0.146 ± 0.269	-0.243 ± 0.227
PRF-fit source offset from KIC position	0.317 ± 0.238	1.33	0.164 ± 0.273	-0.271 ± 0.224
photometric centroid source offset	0.39 ± 0.71	0.55	-0.12 ± 0.77	-0.37 ± 0.70

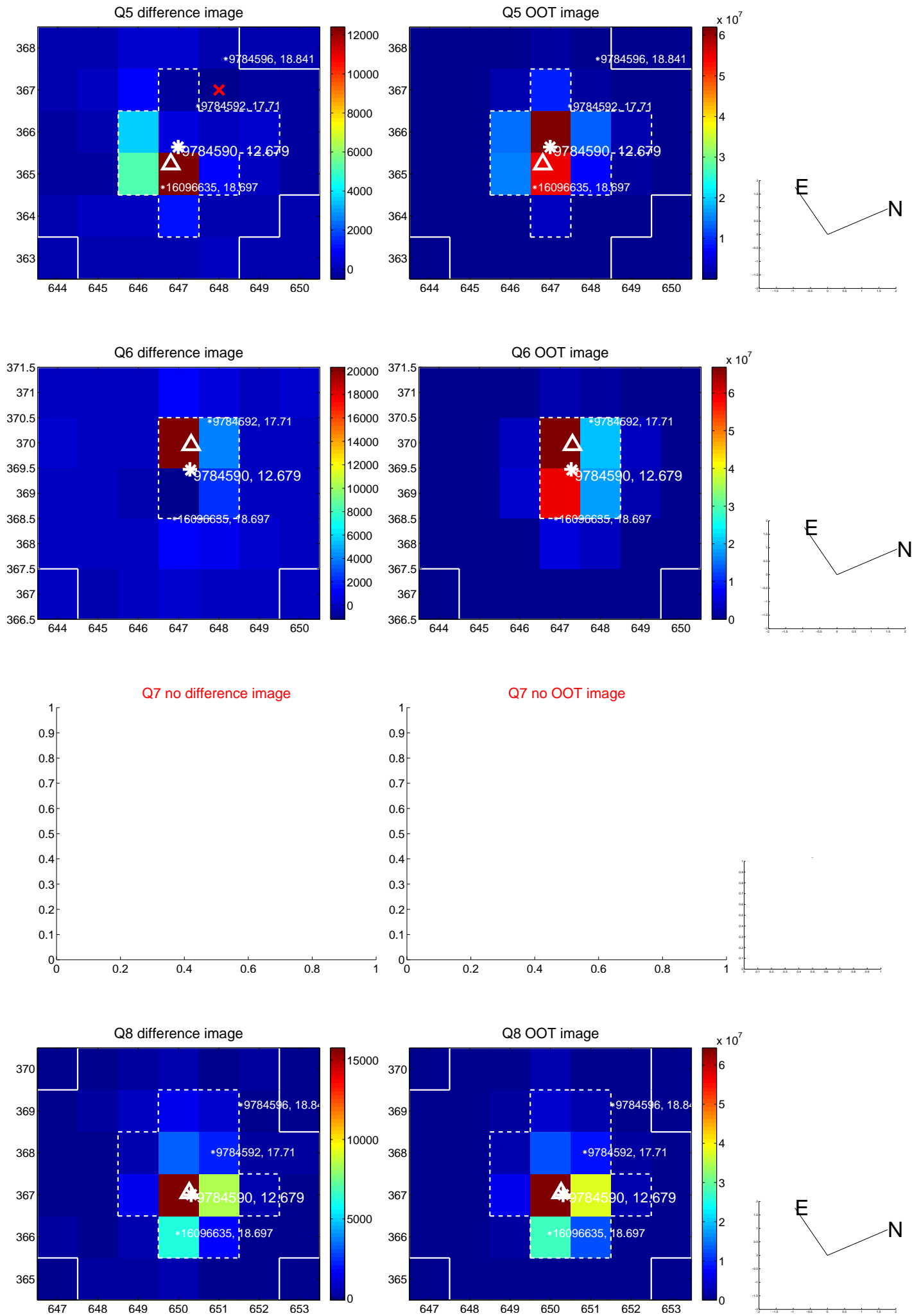


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

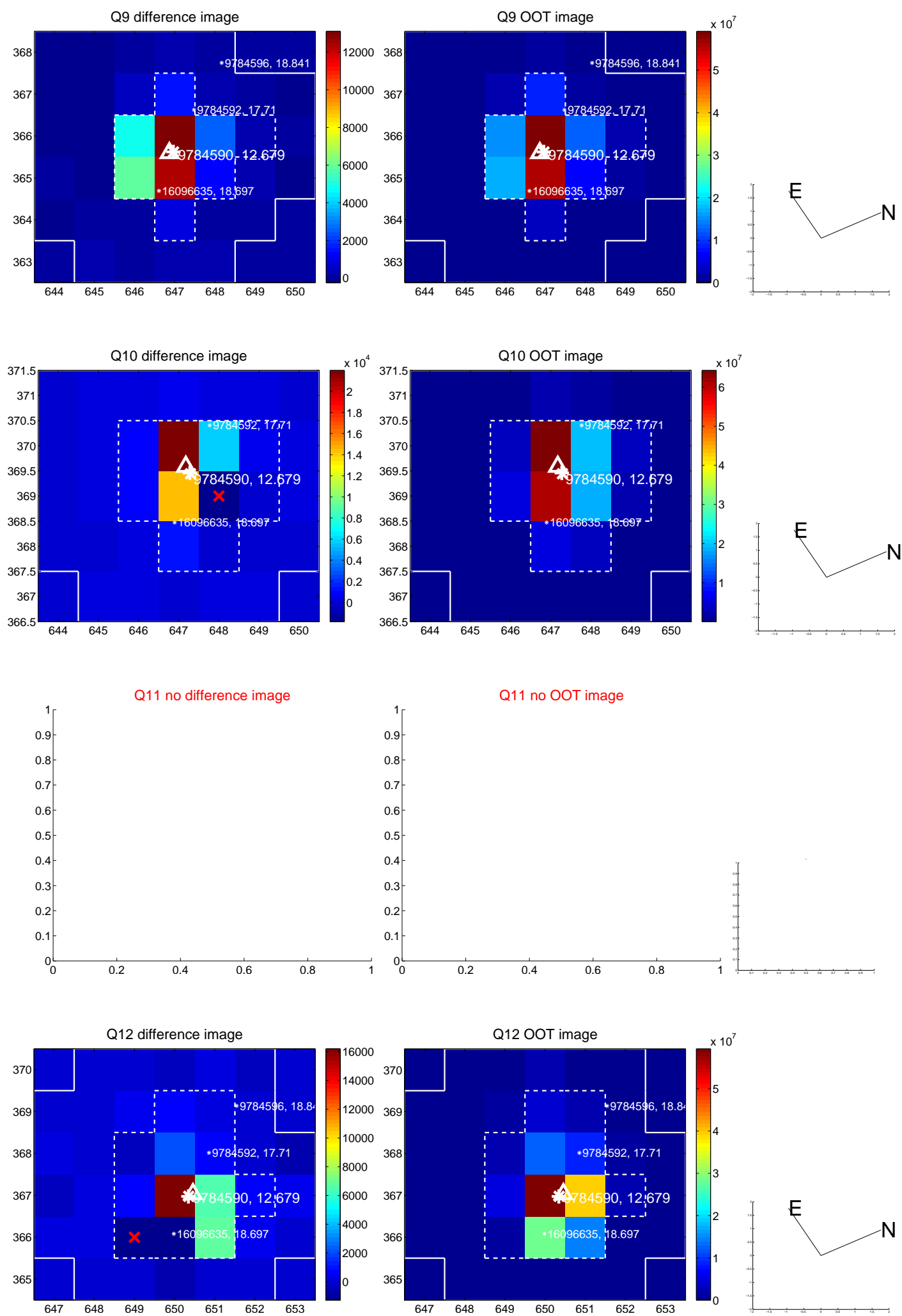
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



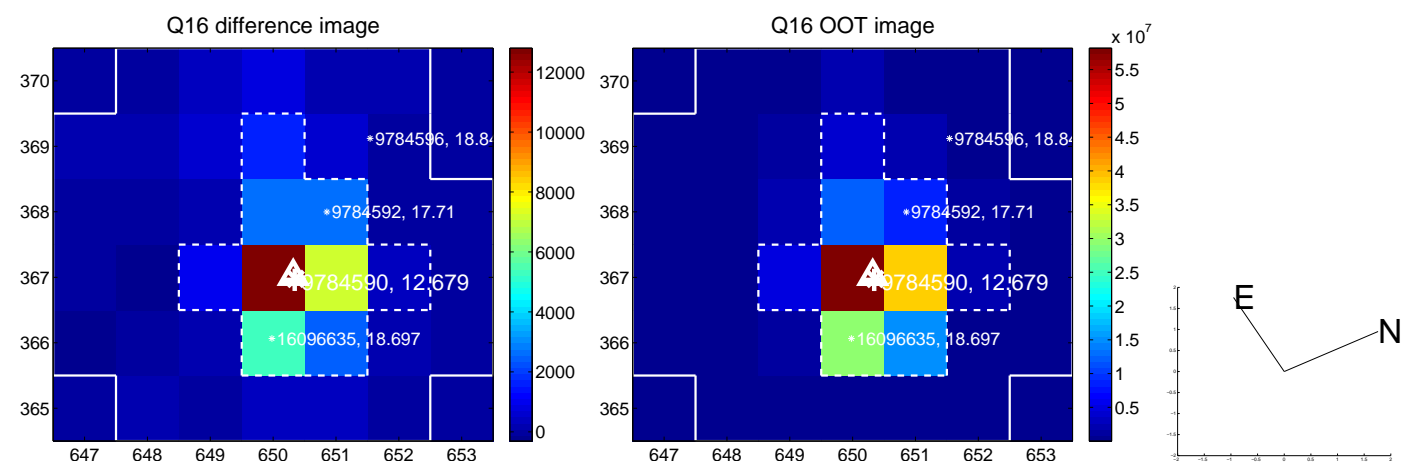
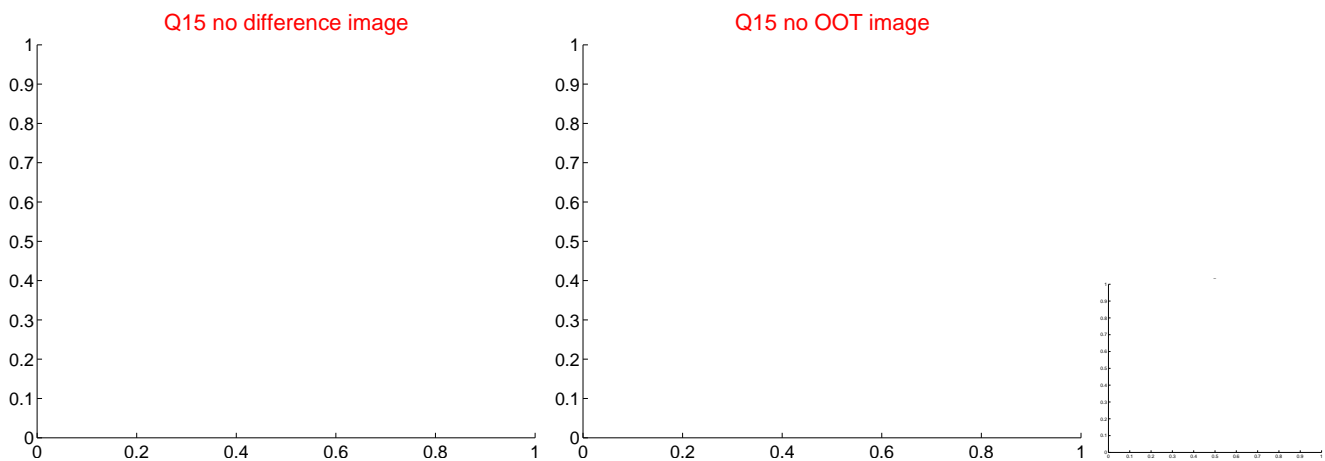
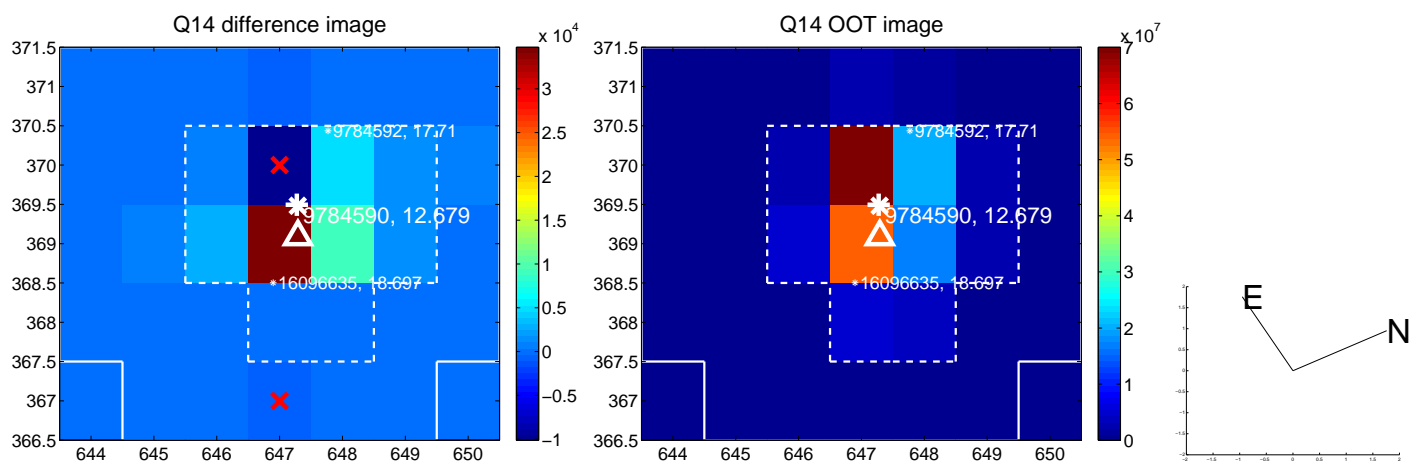
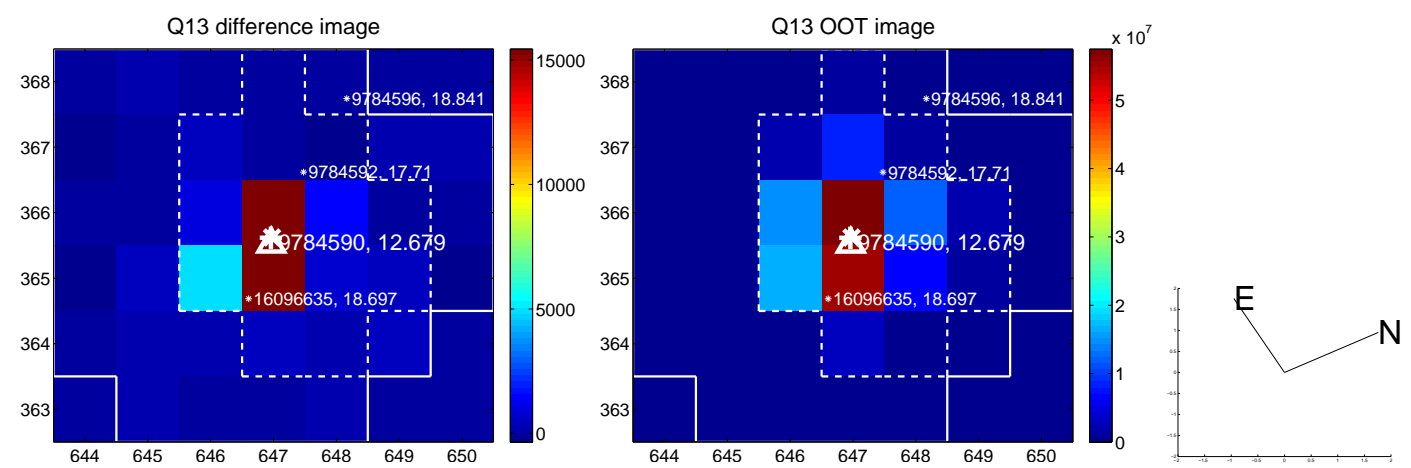
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



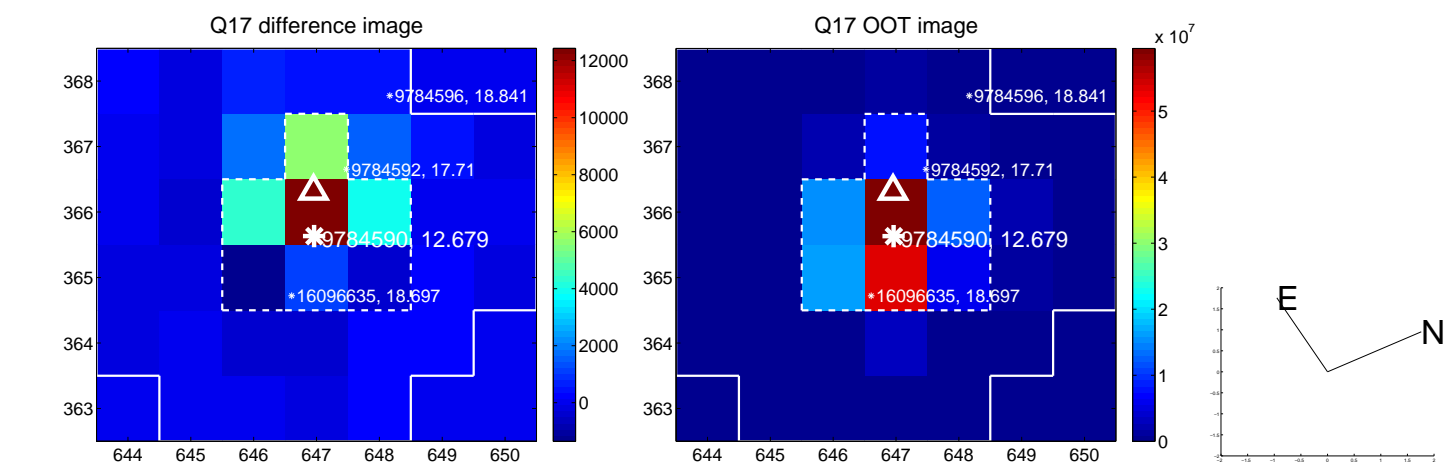
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



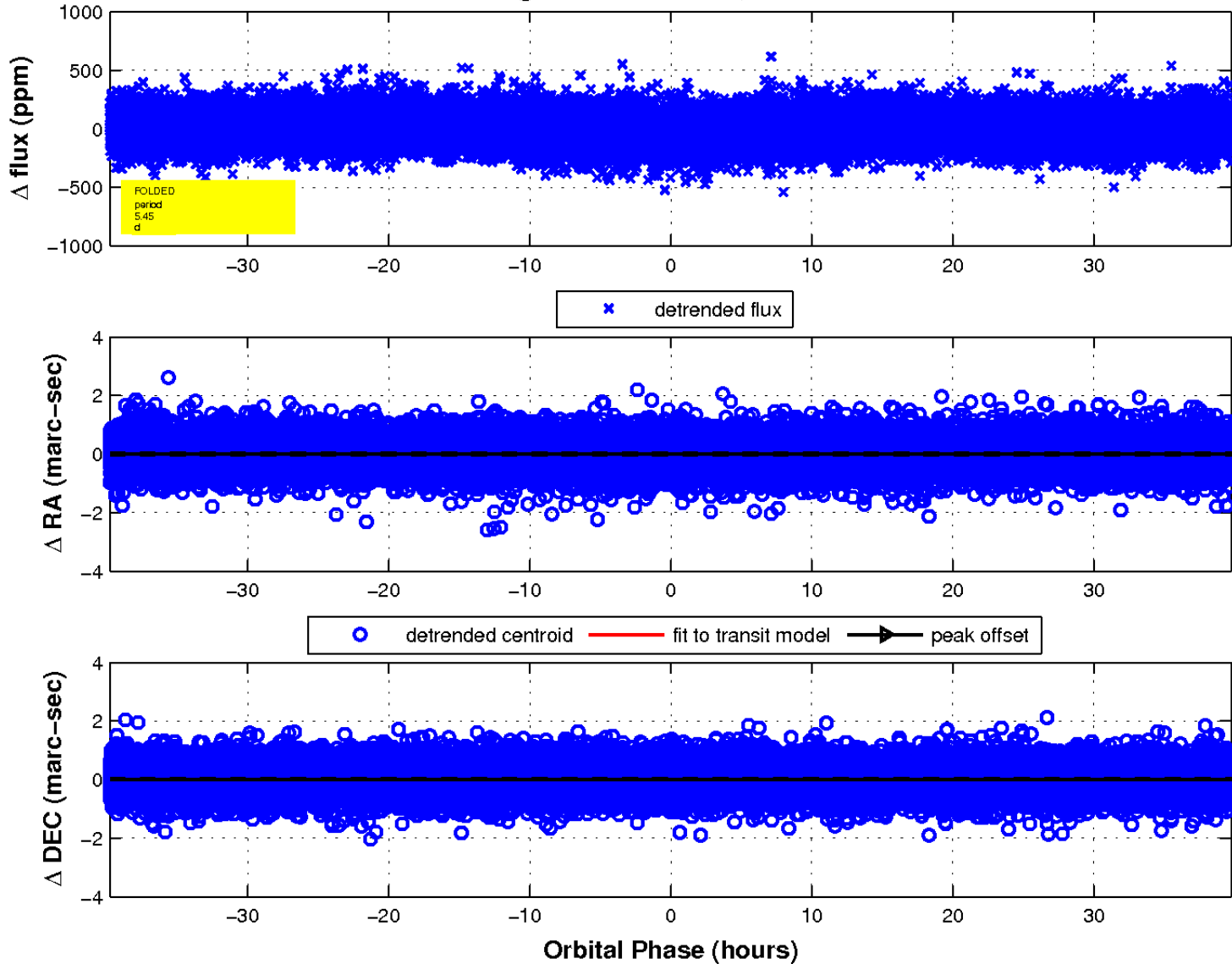
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

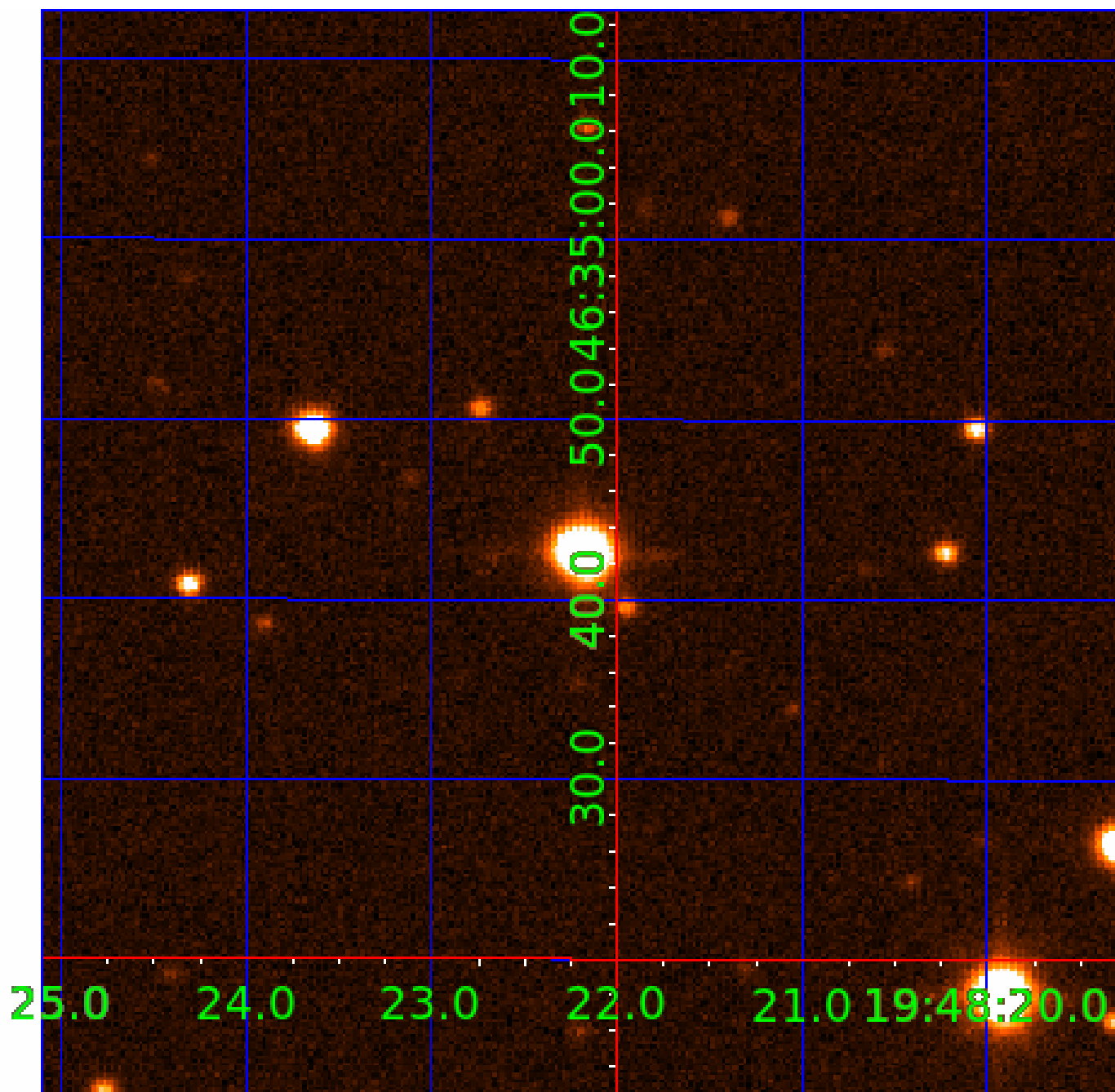


fluxWeightedCentroids, Planet 2 of 3



UKIRT Image

Declination



KIC 009784590

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})
009784590-01	OBS	No	5.451923	131.907010	34.7	14.504	11.5	11.1	1.63	6748	1.14	1138.11
009784590-02	OBS	No	5.452031	135.017650	32.2	13.259	10.4	11.5	1.63	6748	0.93	1138.08
009784590-03	OBS	No	102.363639	166.314424	149.5	7.128	7.9	6.4	1.63	6748	2.34	22.81

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009784590-01	OBS	FP	0.00	1	0	0	0	LPP_DV
009784590-02	OBS	FP	0.00	1	0	0	0	LPP_DV—SAME_NTL_PERIOD
009784590-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

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

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

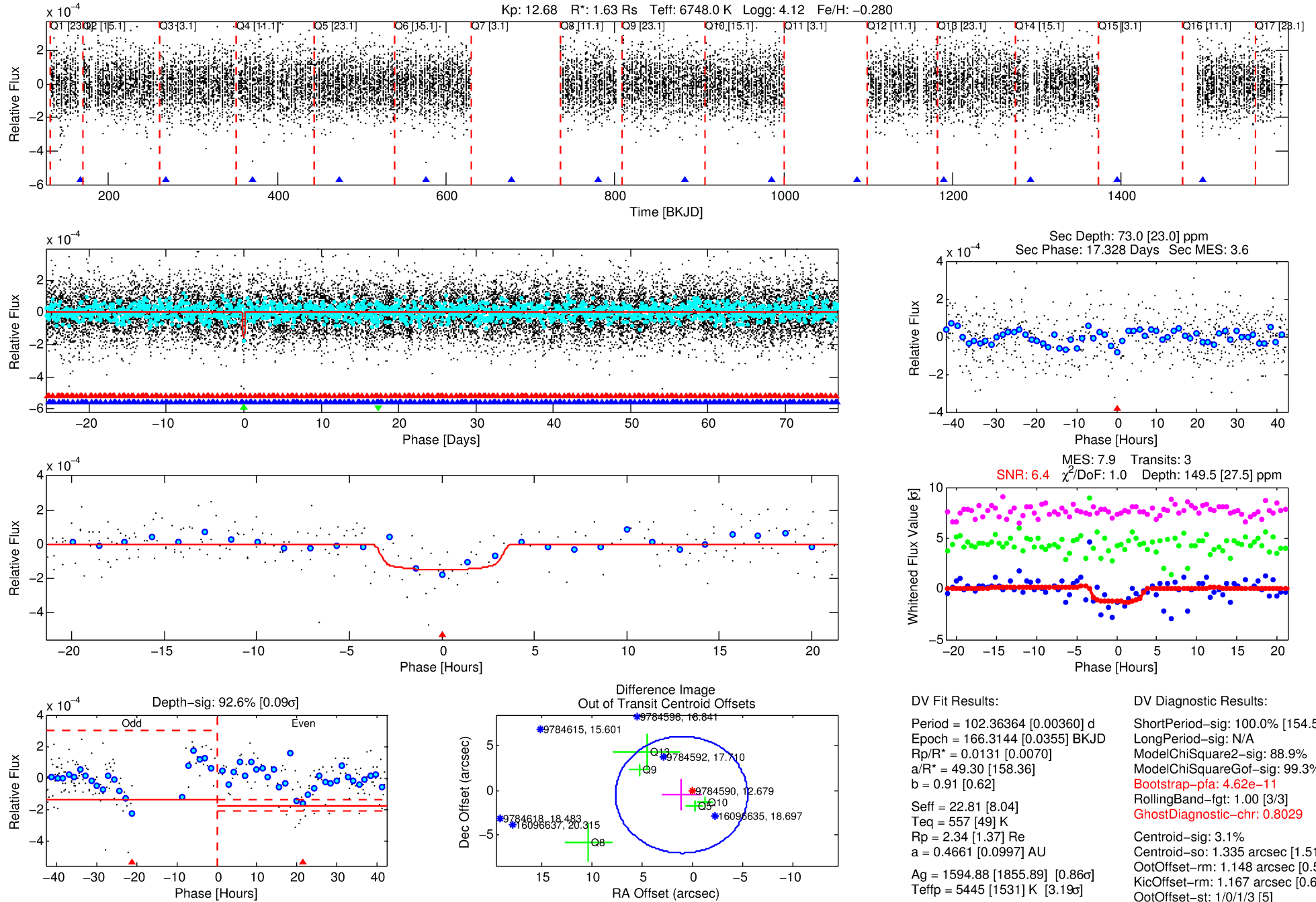
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009784590-03

No Significant Match Found

DV One-Page Summary

KIC: 9784590 Candidate: 3 of 3 Period: 102.364 d



DV Fit Results:

Period = 102.36364 [0.00360] d
 Epoch = 166.3144 [0.0355] BKJD
 Rp/R* = 0.0131 [0.0070]
 a/R* = 49.30 [158.36]
 b = 0.91 [0.62]
 Seff = 22.81 [8.04]
 Teq = 557 [49] K
 Rp = 2.34 [1.37] Re
 a = 0.4661 [0.0997] AU
 Ag = 1594.88 [1855.89] [0.86 σ]
 Teffp = 5445 [1531] K [3.19 σ]

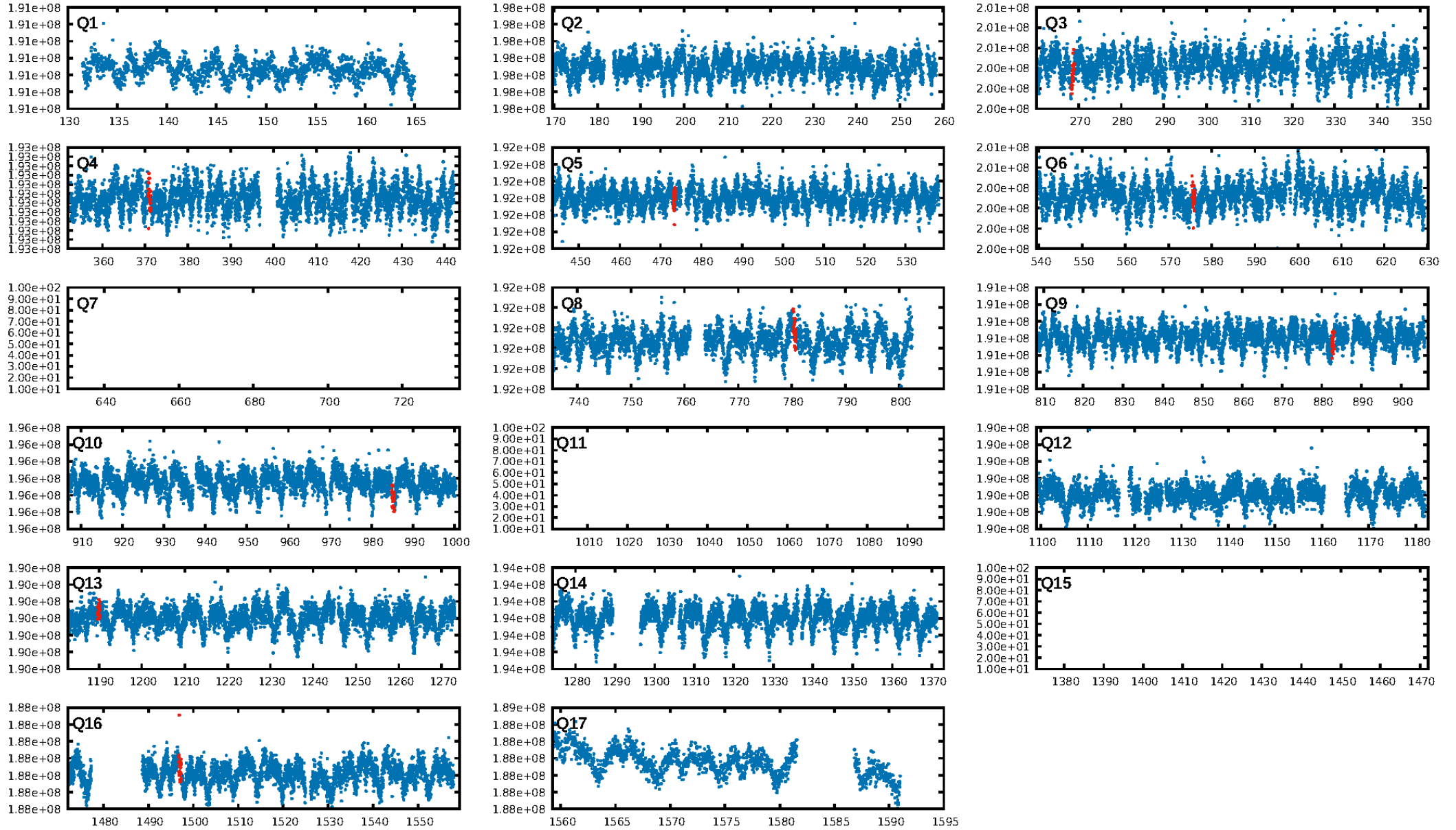
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [154.50 σ]
 LongPeriod-sig: N/A
 ModelChiSquare2-sig: 88.9%
 ModelChiSquareGof-sig: 99.3%
 Bootstrap-pfa: 4.62e-11
 RollingBand-fgt: 1.00 [3/3]
 GhostDiagnostic-chr: 0.8029
 Centroid-sig: 3.1%
 Centroid-so: 1.335 arcsec [1.51 σ]
 OotOffset-rm: 1.148 arcsec [0.52 σ]
 OotOffset-st: 1/0/1/3 [5]
 KicOffset-rm: 1.167 arcsec [0.62 σ]
 KicOffset-st: 1/0/1/3 [5]
 DiffImageQuality-fgm: 0.40 [2/5]
 DiffImageOverlap-fno: 0.33 [3/9]

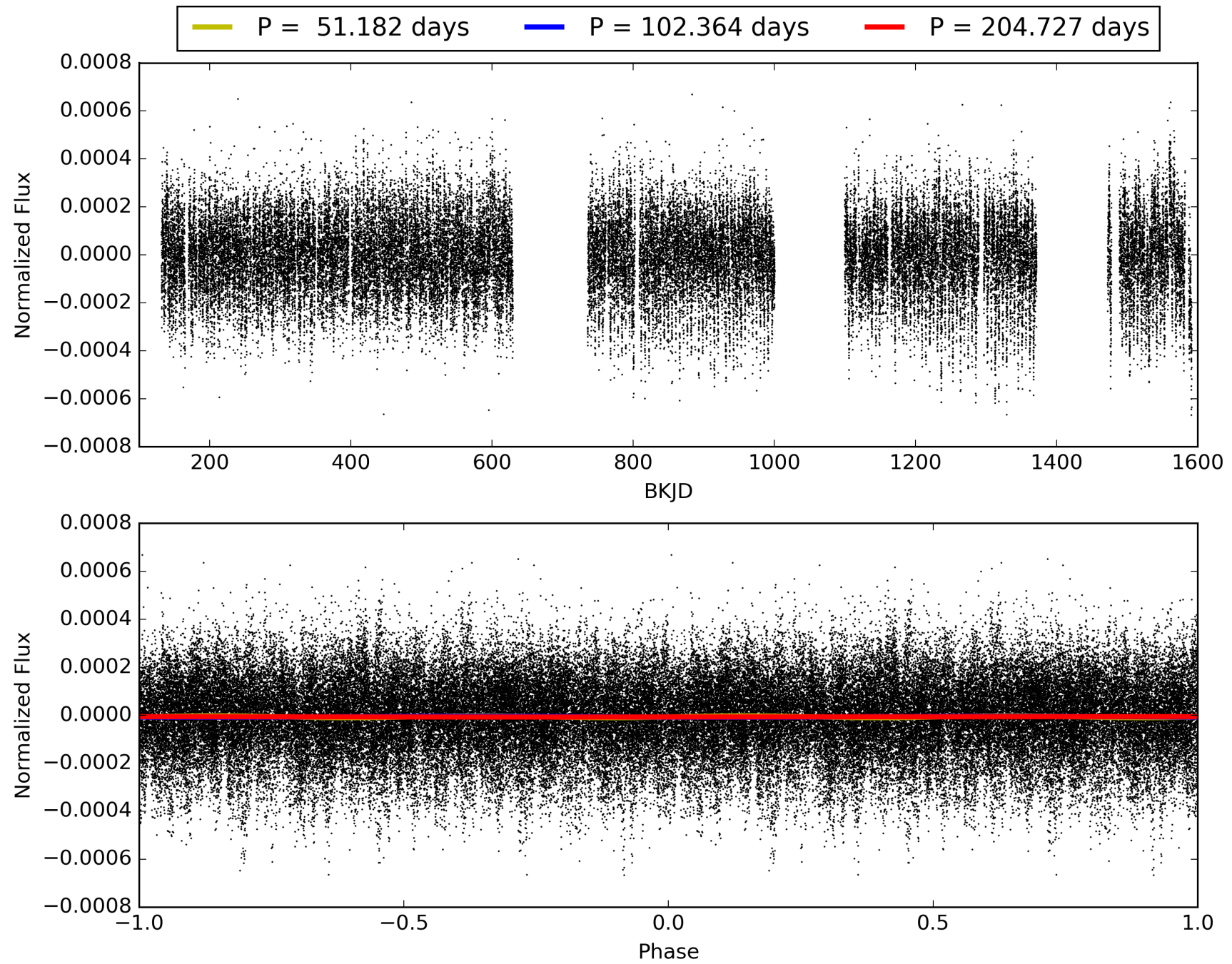
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 17:29:33 Z

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

TCE 009784590-03, PDC Light Curves

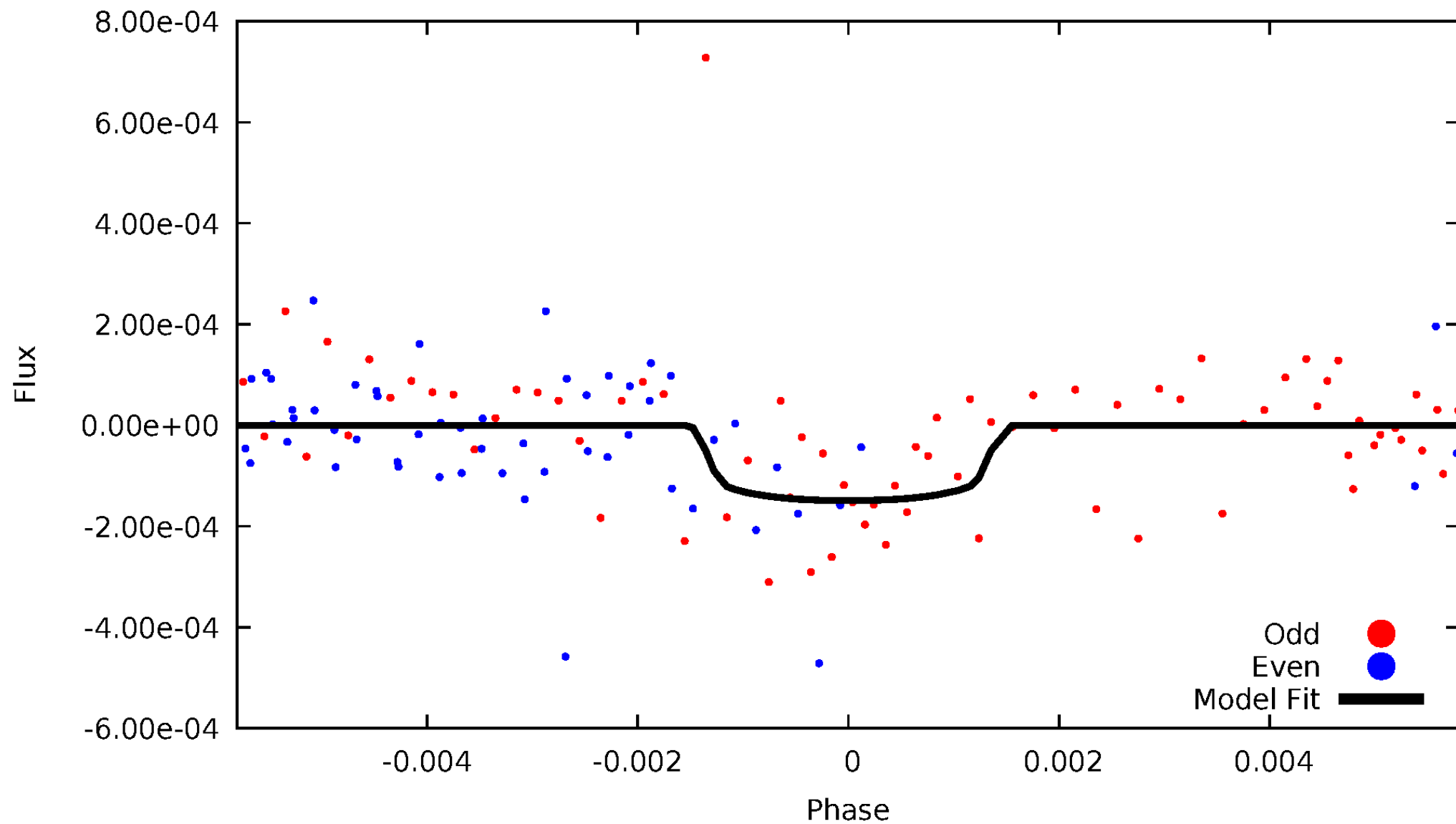


TCE 009784590-03



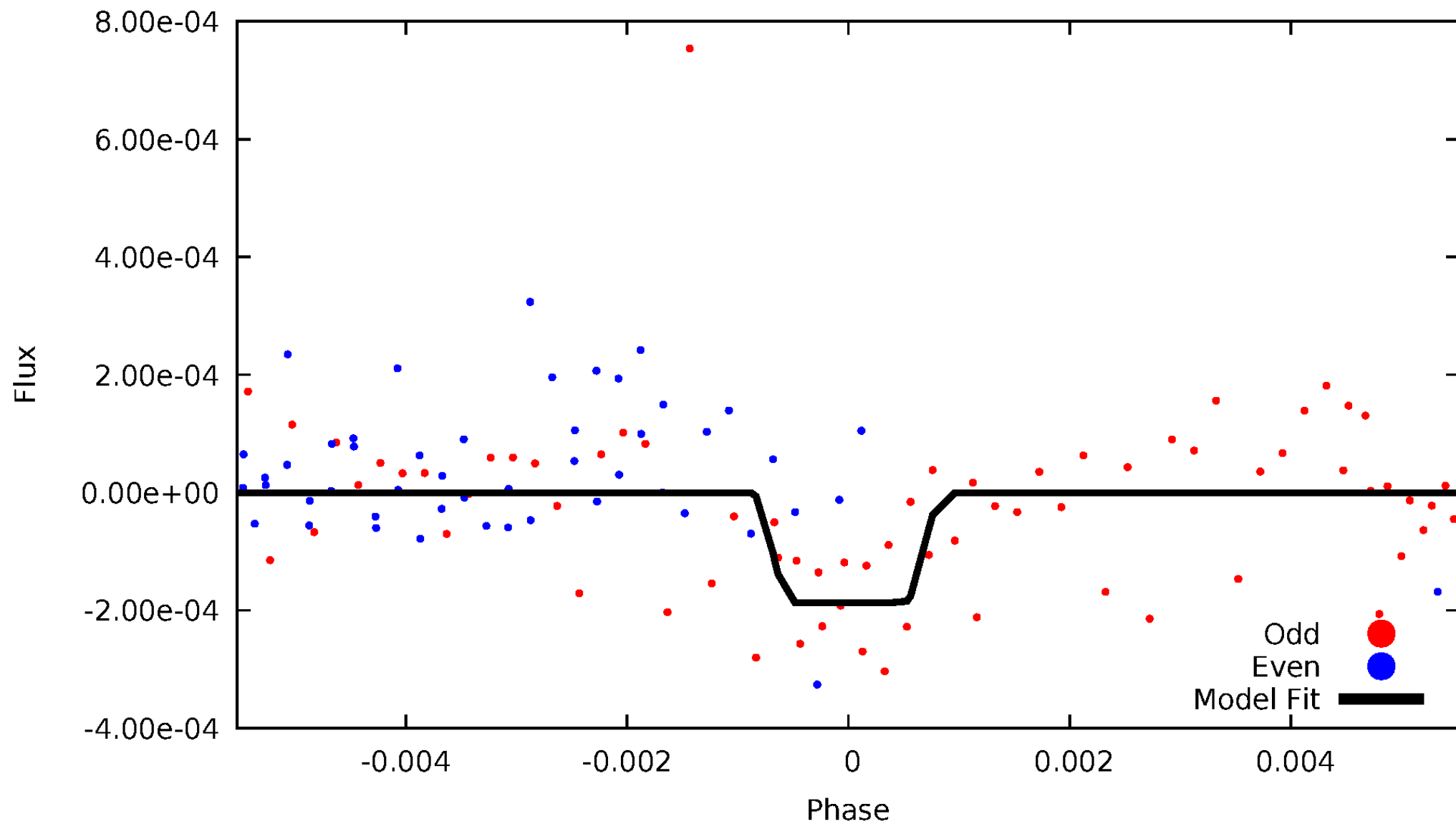
DV Odd/Even

TCE 009784590-03



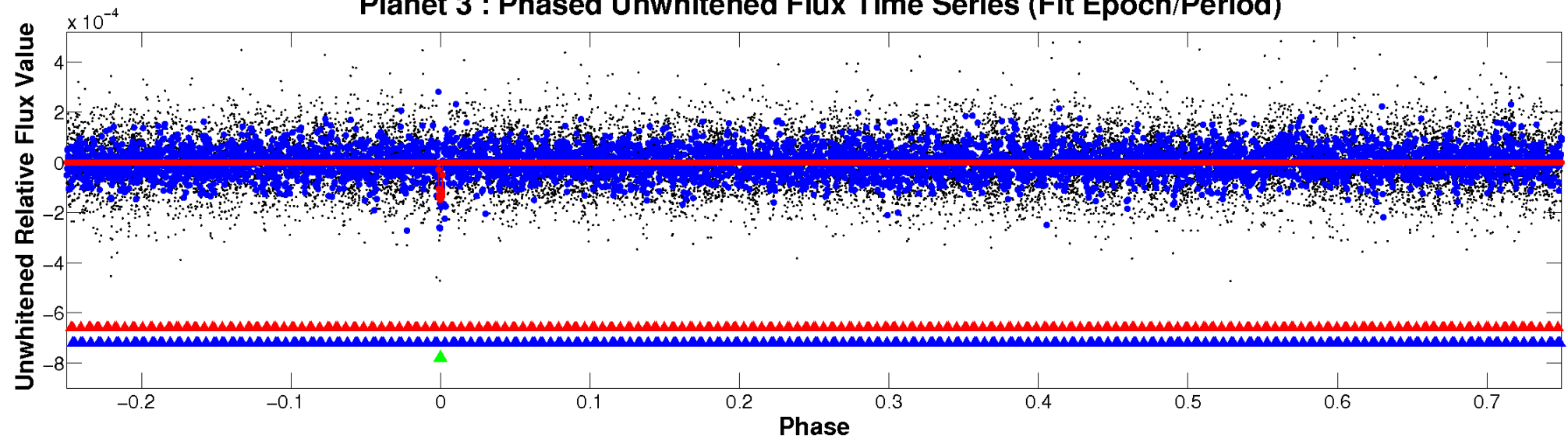
ALT Odd/Even

TCE 009784590-03

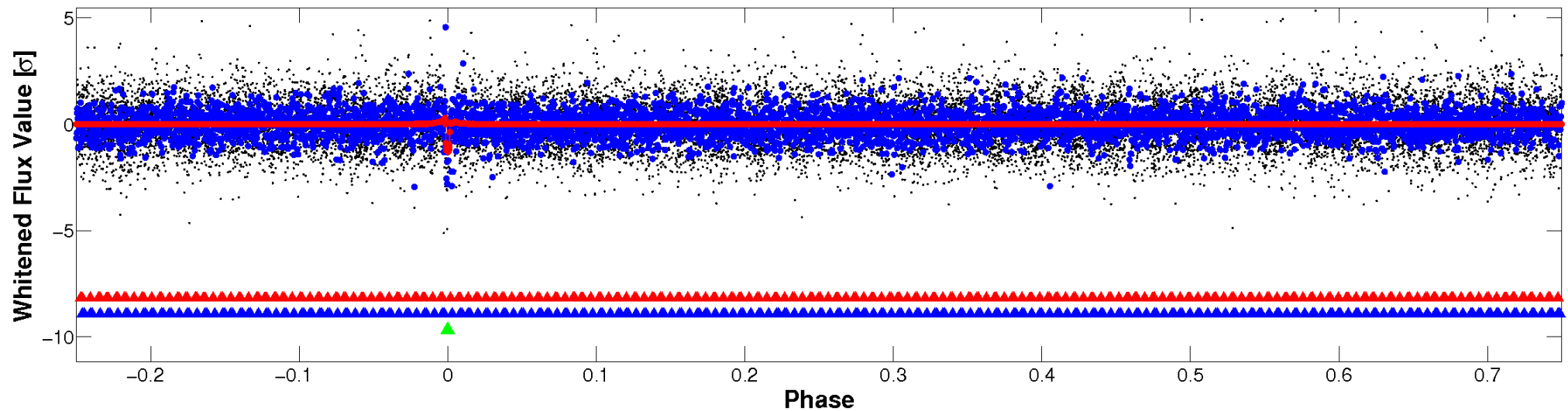


Non-Whitened Vs. Whitened Light Curve

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

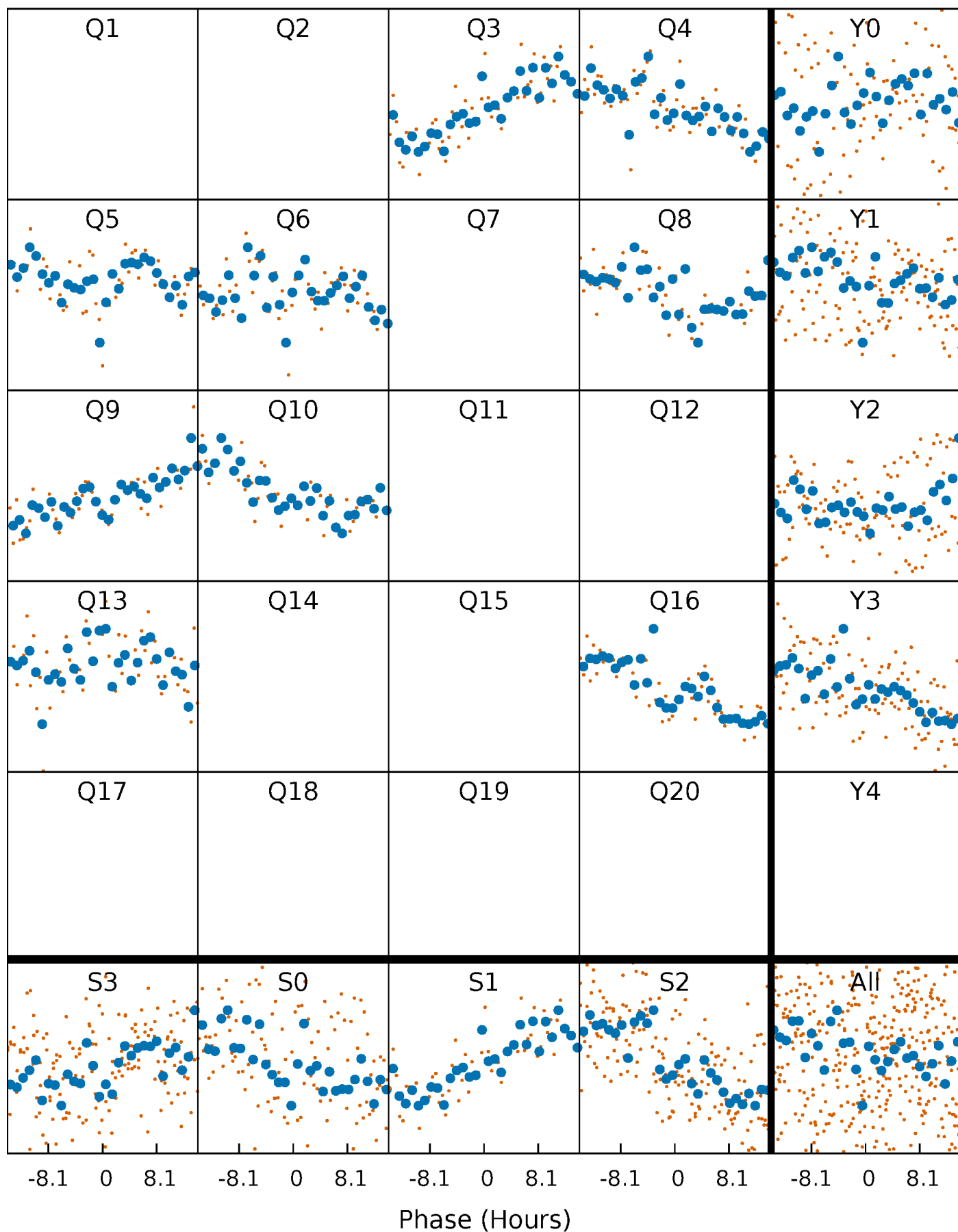


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



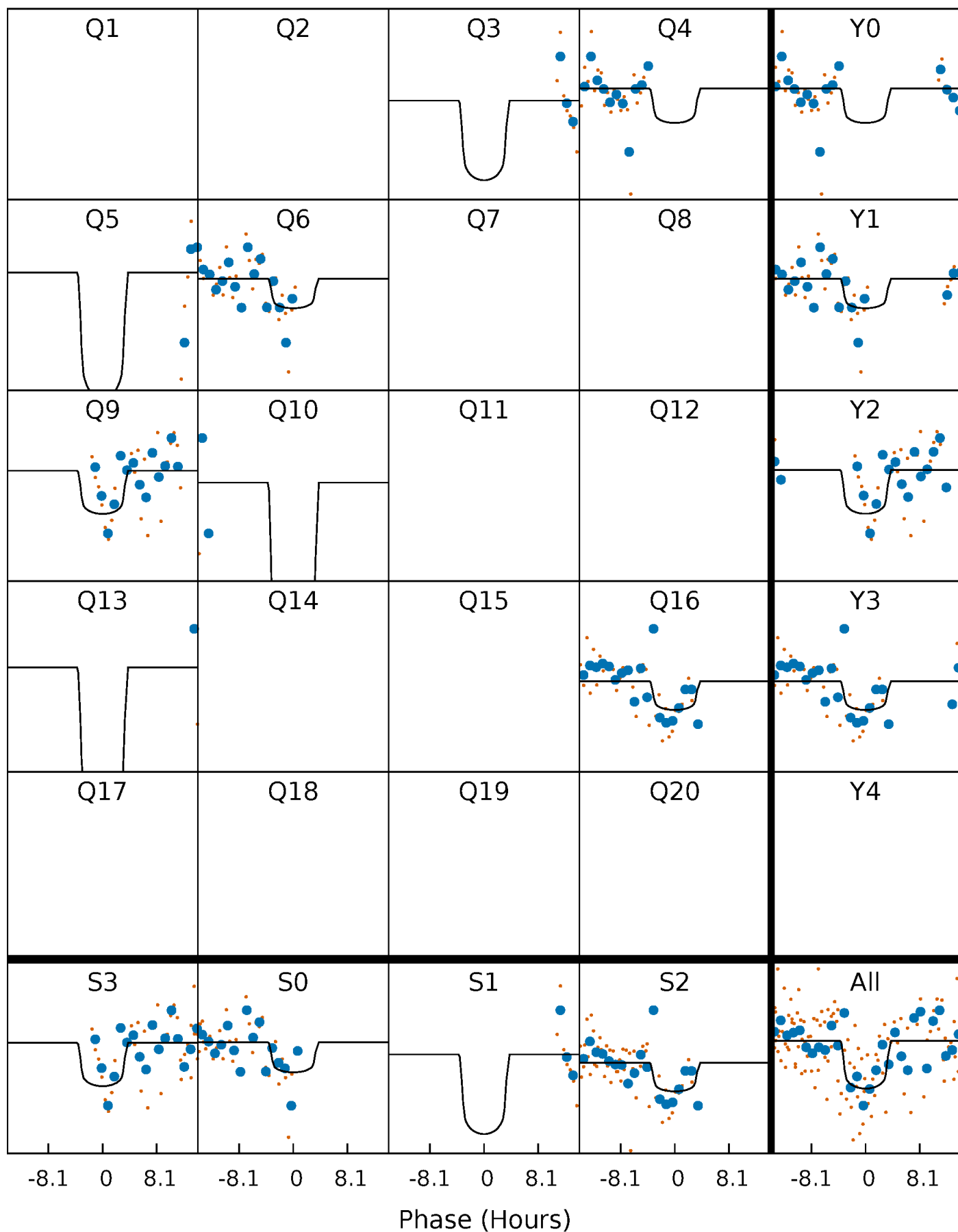
PDC Quarter-Phased Transit Curves

TCE 009784590-03 $P=102.363639$ Days $T_0=166.314424$ (BKJD)



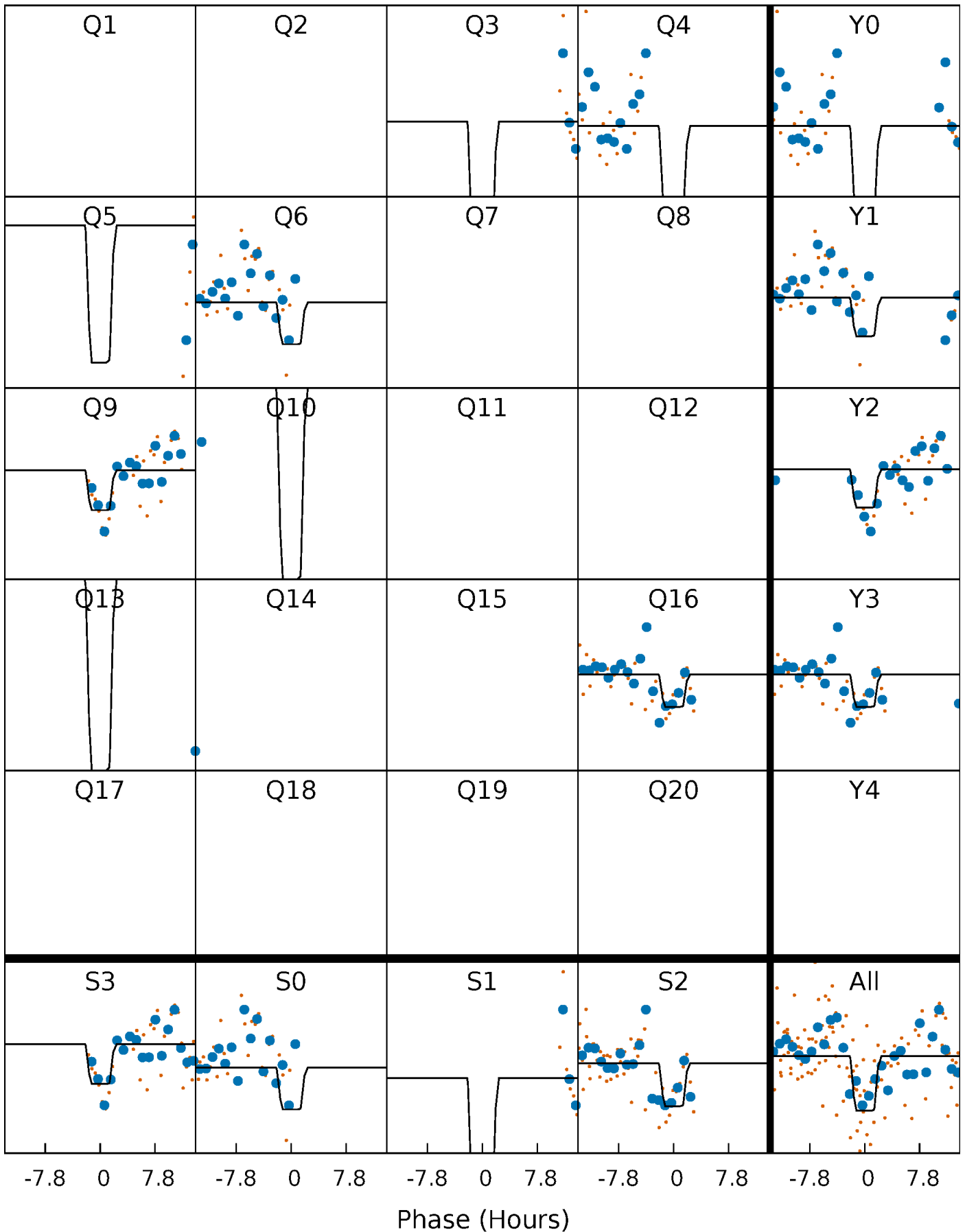
DV Quarter-Phased Transit Curves

TCE 009784590-03 P=102.363639 Days $T_0=166.314424$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

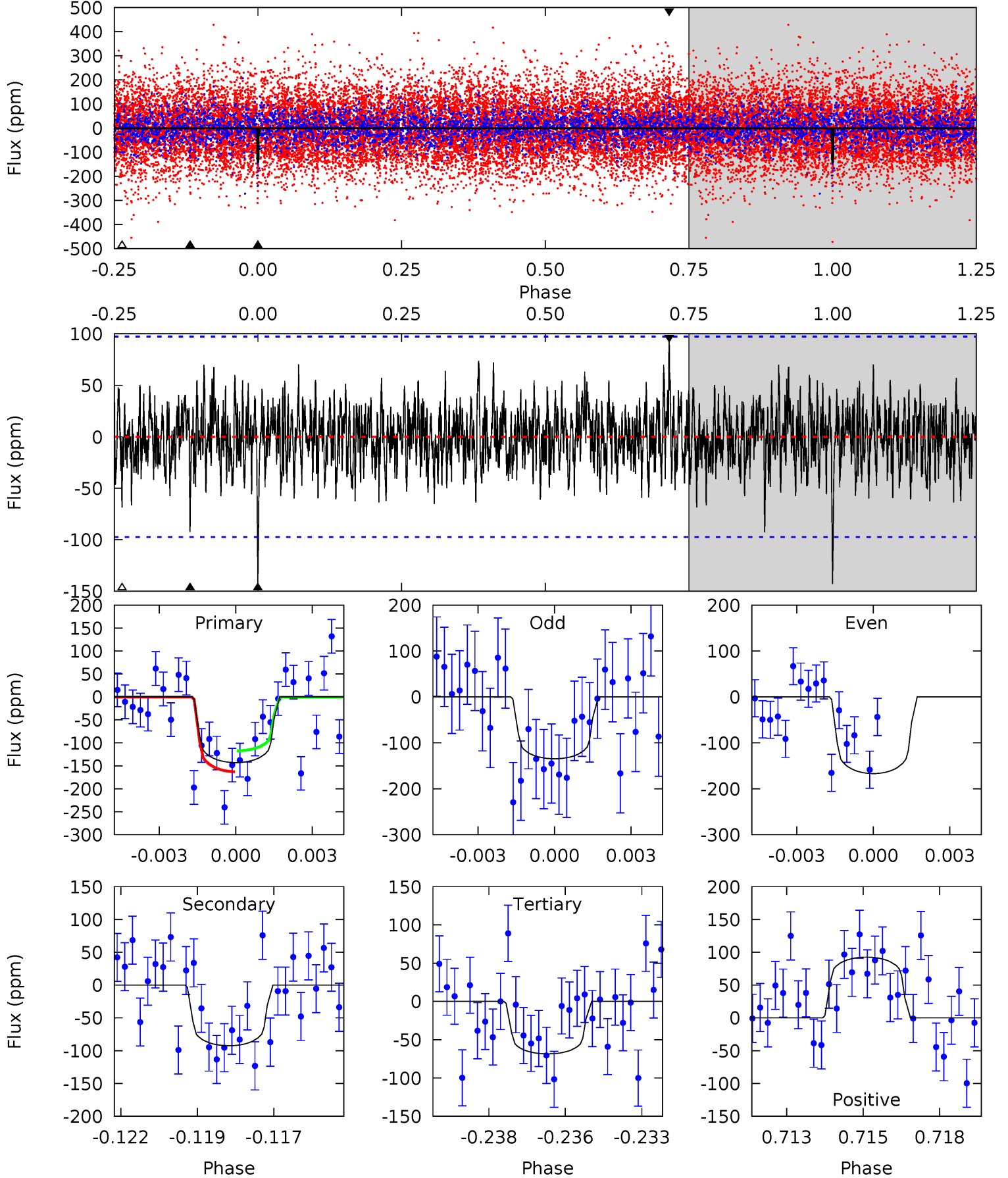
TCE 009784590-03 P=102.364509 Days $T_0=166.311263$ (BKJD)



DV Model-Shift Uniqueness Test

009784590-03, P = 102.363639 Days, E = 63.950785 Days

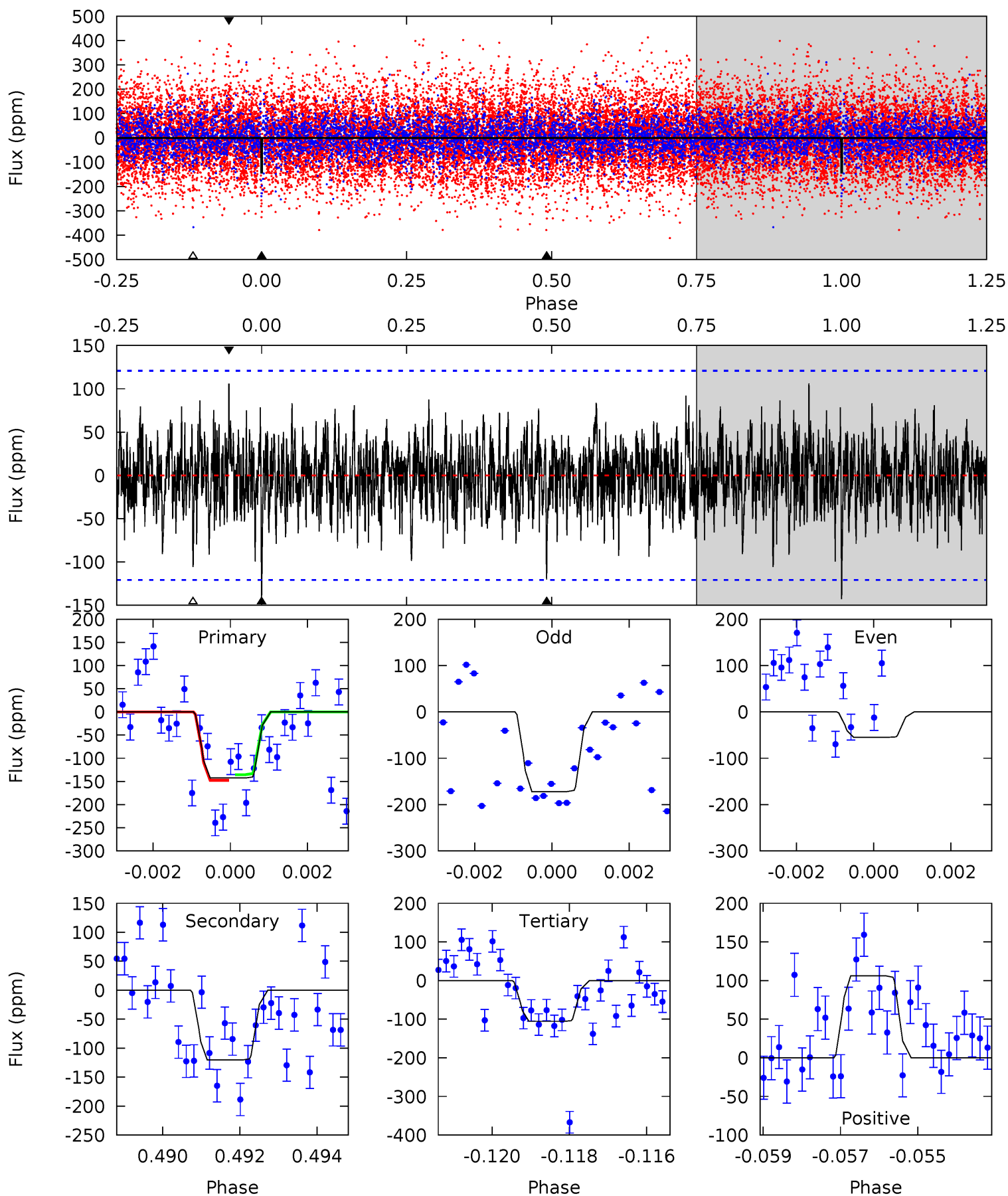
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.74	5.01	3.71	5.01	5.27	3.00	1.26	4.03	2.73	1.30	-0.00	0.77	0.92	0.39	1.22



Alt Model-Shift Uniqueness Test

009784590-03, P = 102.364509 Days, E = 63.946754 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.31	5.32	4.68	4.69	5.34	3.11	1.33	1.64	1.62	0.65	0.63	2.14	0.94	0.43	0.27



Stellar Parameters For KIC 009784590

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6748^{+162}_{-223}	$4.122^{+0.186}_{-0.140}$	$-0.280^{+0.250}_{-0.300}$	$1.633^{+0.354}_{-0.390}$	$1.296^{+0.151}_{-0.208}$	$0.419^{+0.388}_{-0.176}$
	+2%/-3%	+5%/-3%	+89%/-107%	+22%/-24%	+12%/-16%	+93%/-42%
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 009784590-03 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-92±18	$2.39^{+1.24}_{-1.12}$	775^{+51}_{-51}	5649^{+2235}_{-922}	1893^{+5008}_{-1074}
Alt.	-120±23	$2.50^{+1.36}_{-1.19}$	772^{+46}_{-51}	5882^{+2408}_{-1027}	2250^{+5964}_{-1274}

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

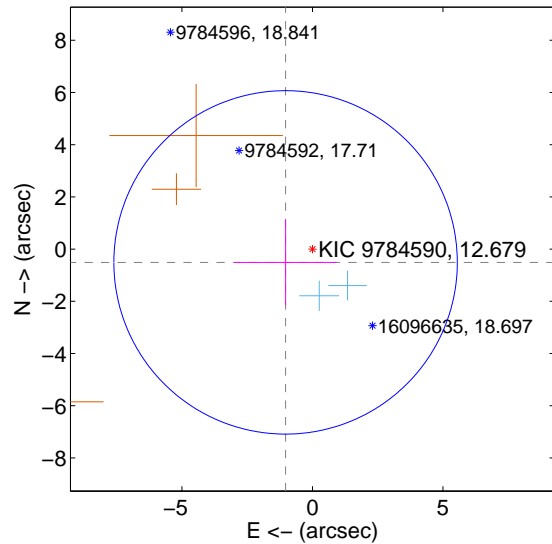
Supplemental centroid analysis for 009784590-03. Kepler magnitude: 12.68. Transit SNR 6.37

There are 2 quarters with good PRF difference image offsets

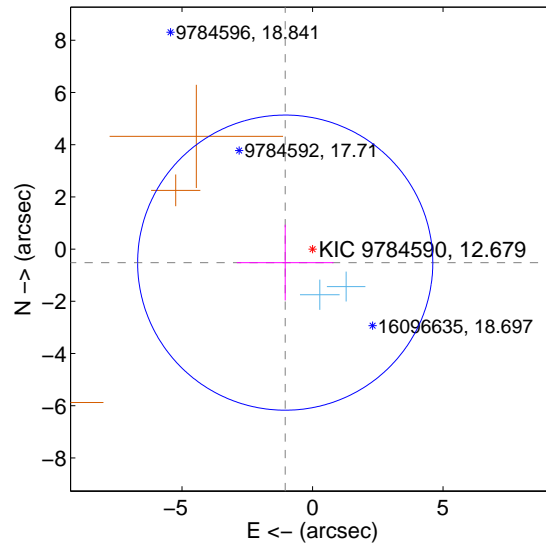
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.148 ± 2.192	0.52	1.028 ± 1.951	-0.509 ± 1.645
PRF-fit source offset from KIC position	1.167 ± 1.884	0.62	1.046 ± 1.850	-0.518 ± 1.450
photometric centroid source offset	1.33 ± 0.88	1.51	0.54 ± 0.96	-1.22 ± 0.87

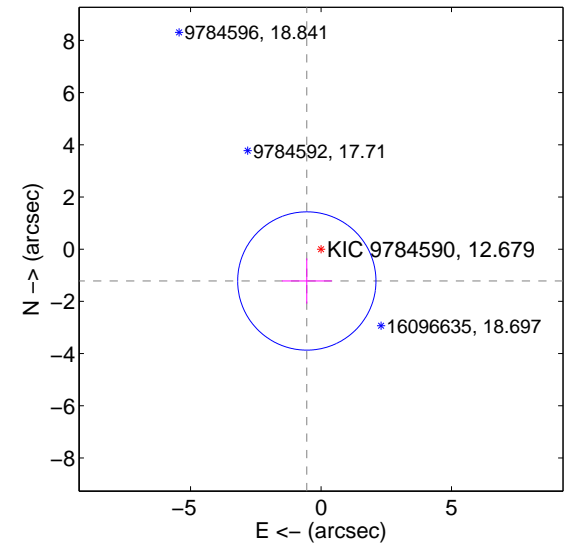
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids



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

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

Q1 no difference image



Q1 no OOT image



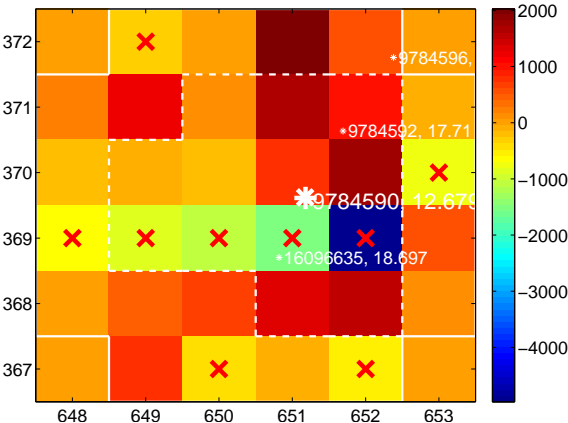
Q2 no difference image



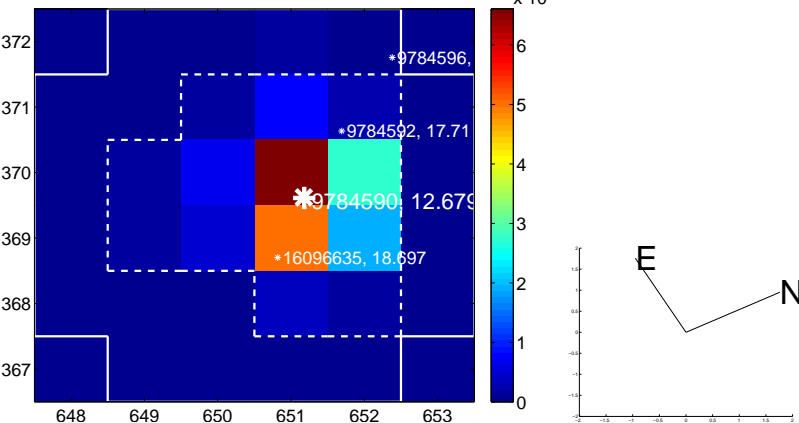
Q2 no OOT image



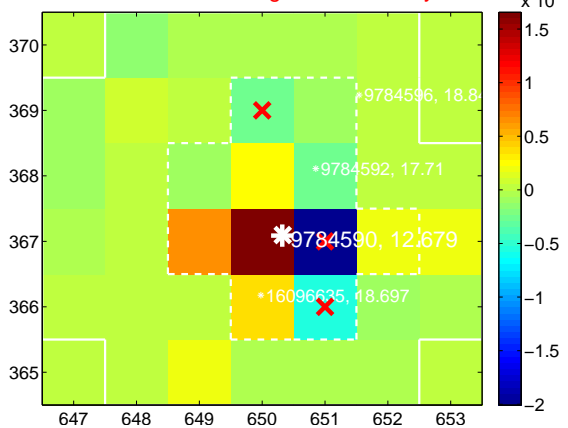
Q3 difference image. Poor Quality



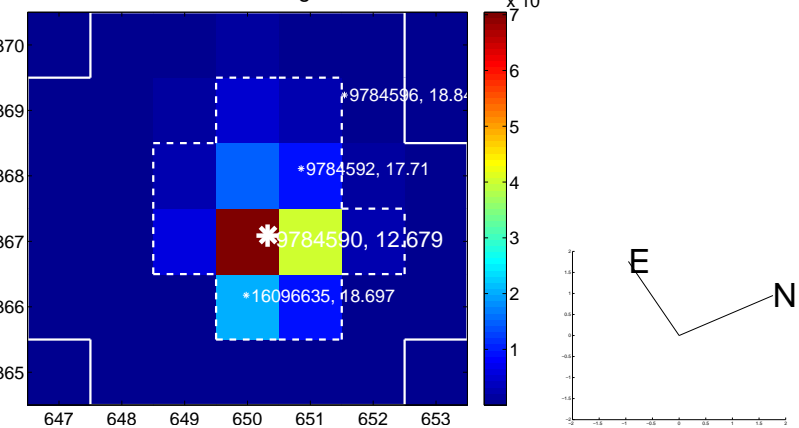
Q3 OOT image



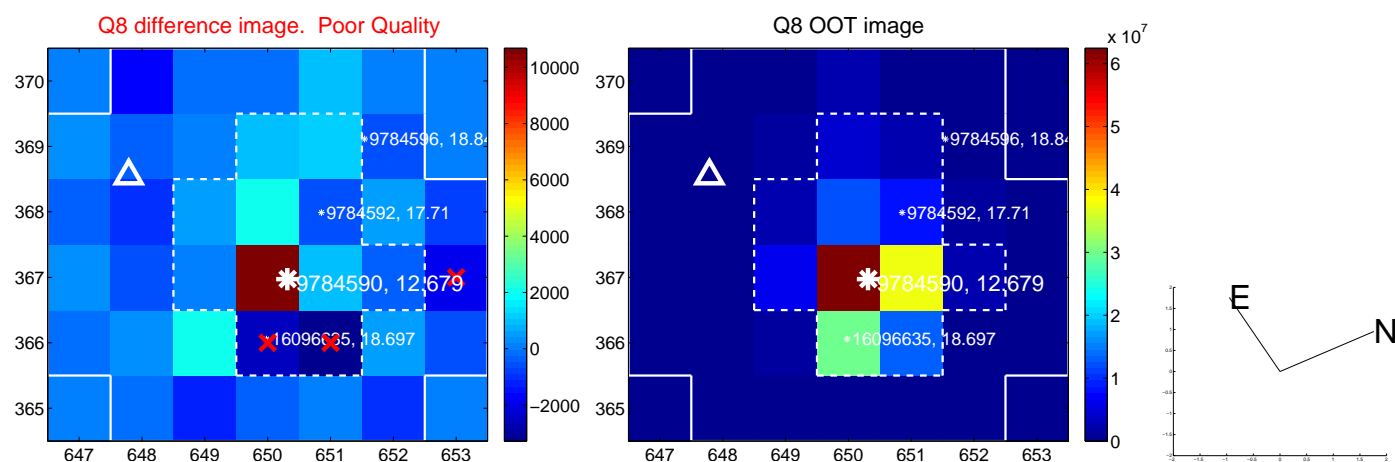
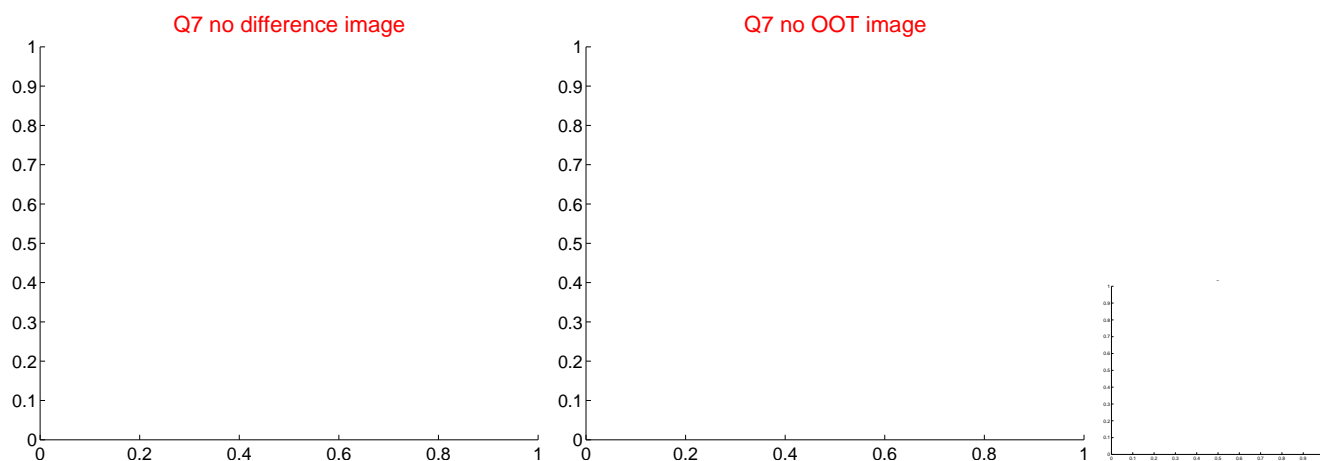
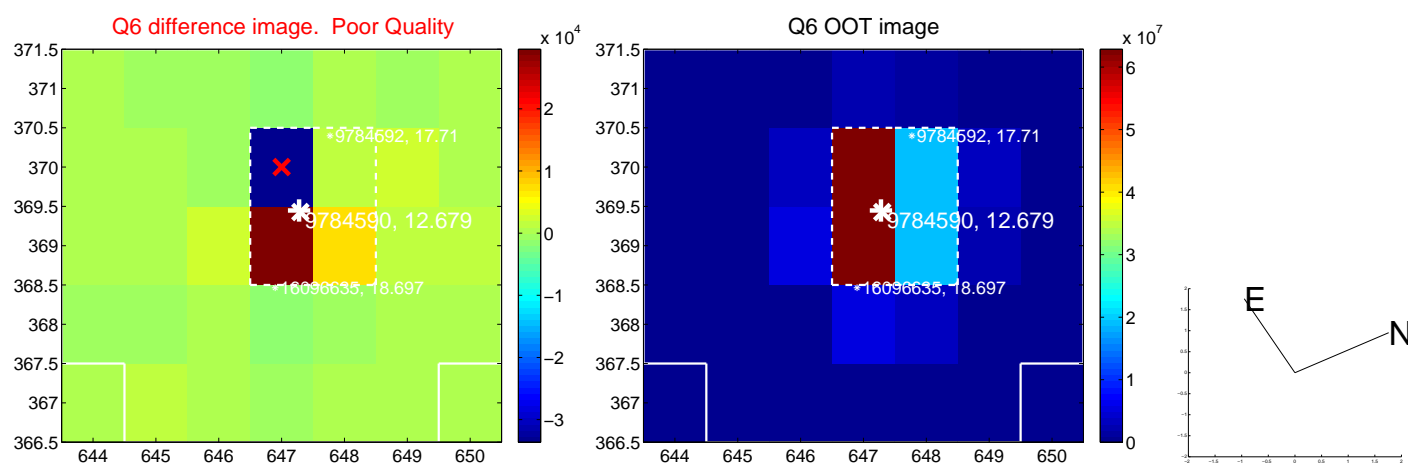
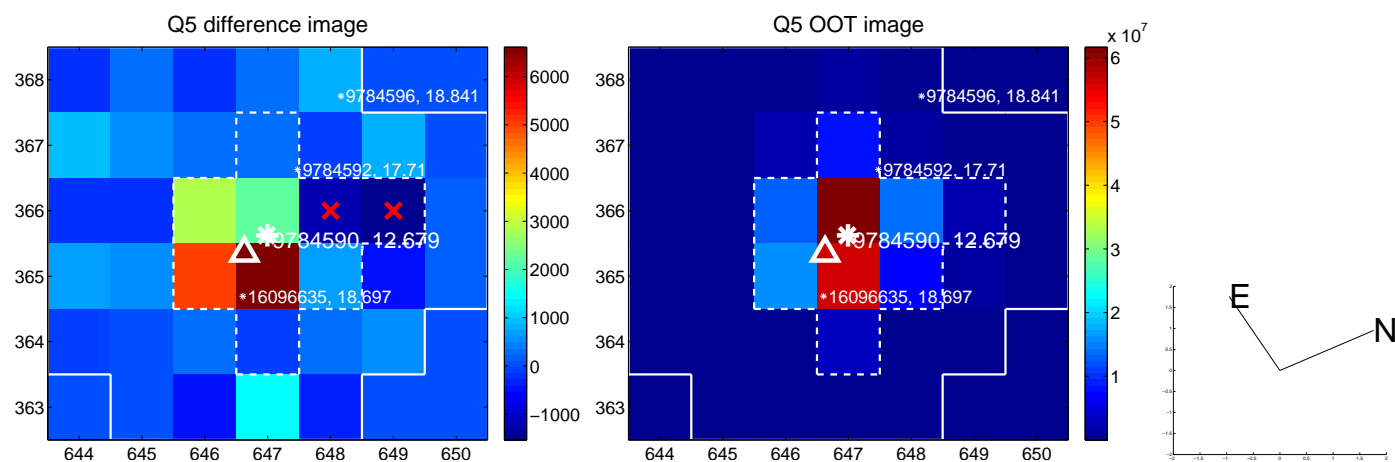
Q4 difference image. Poor Quality



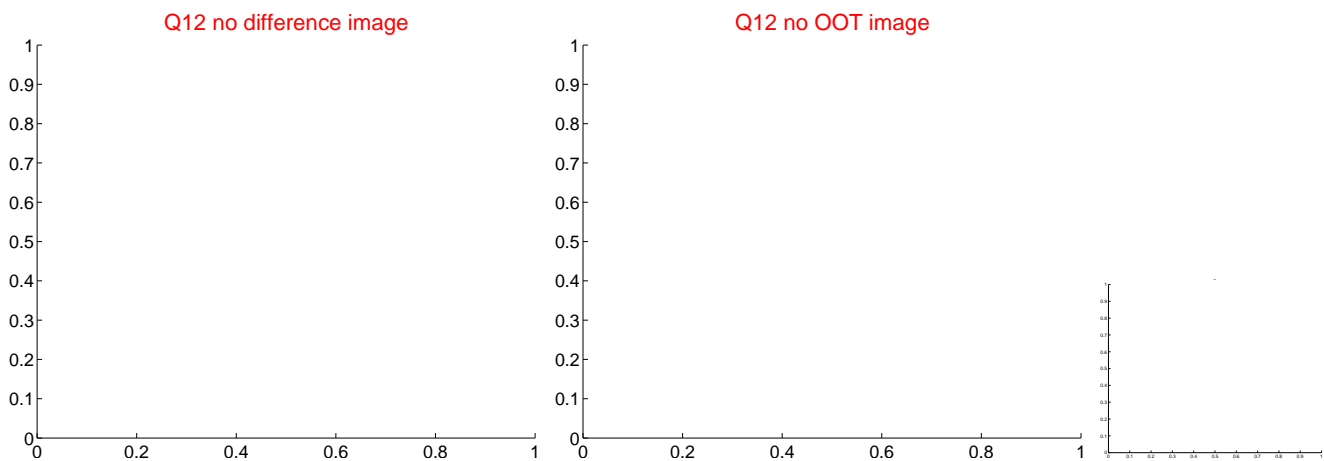
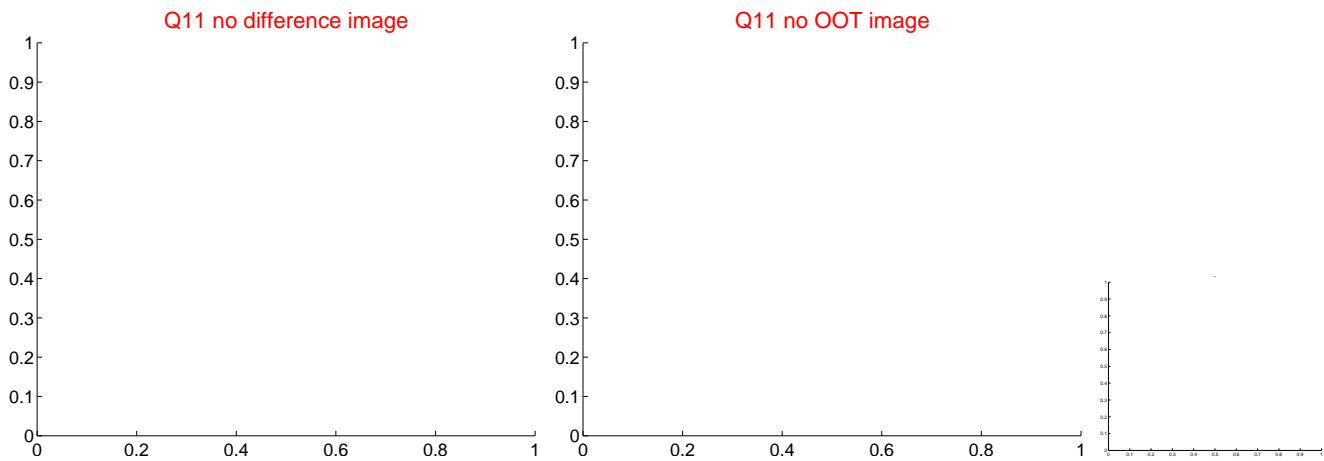
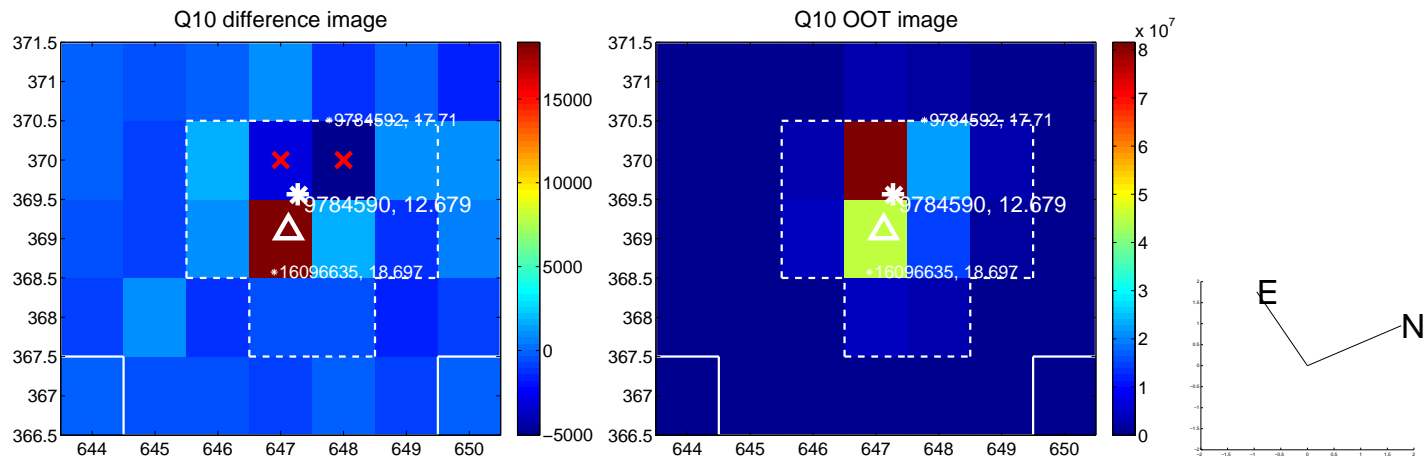
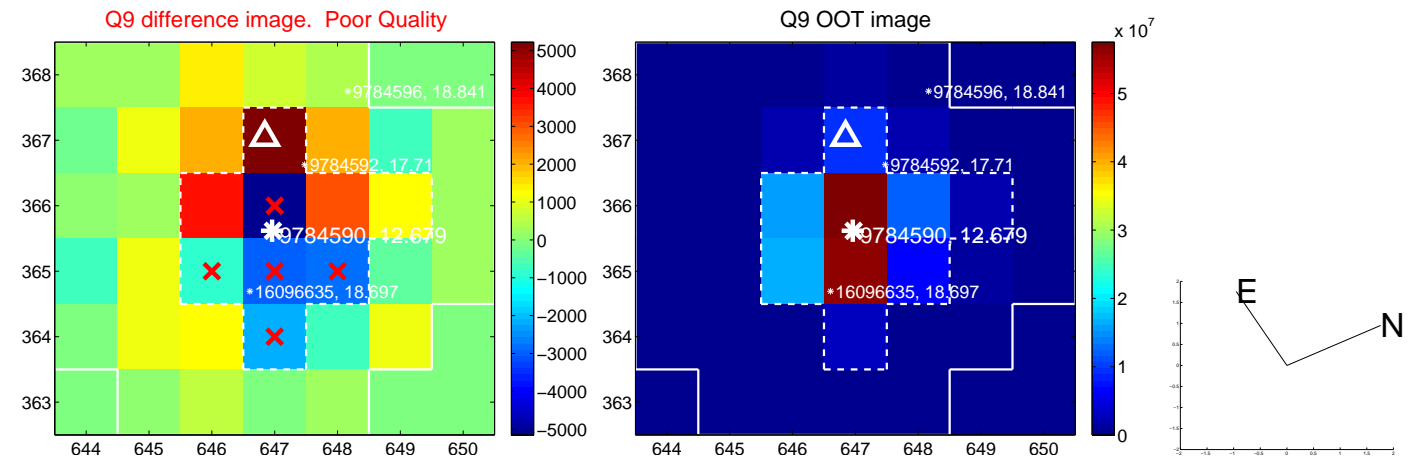
Q4 OOT image



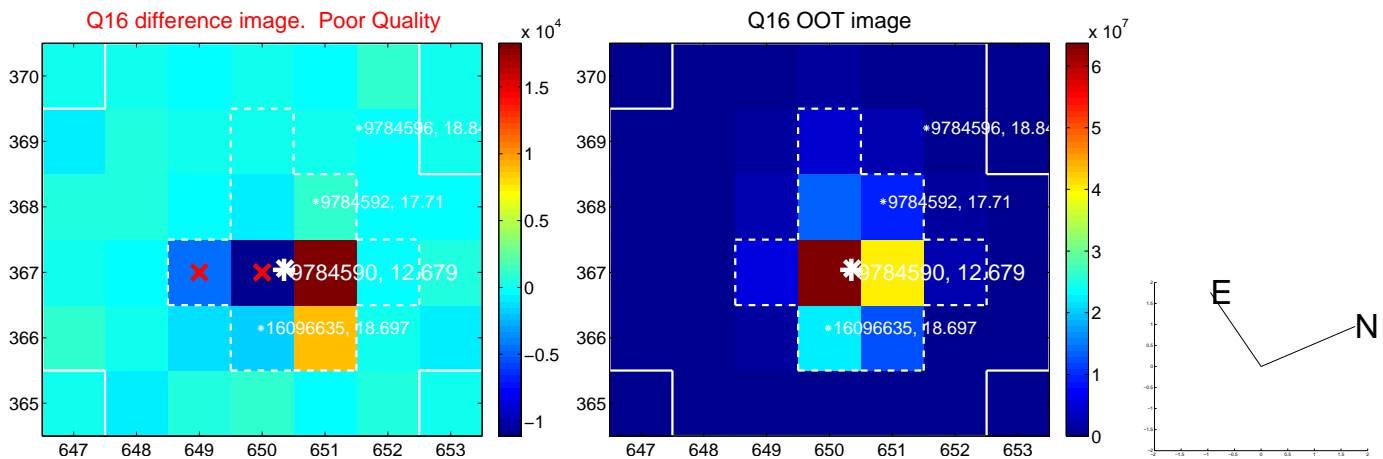
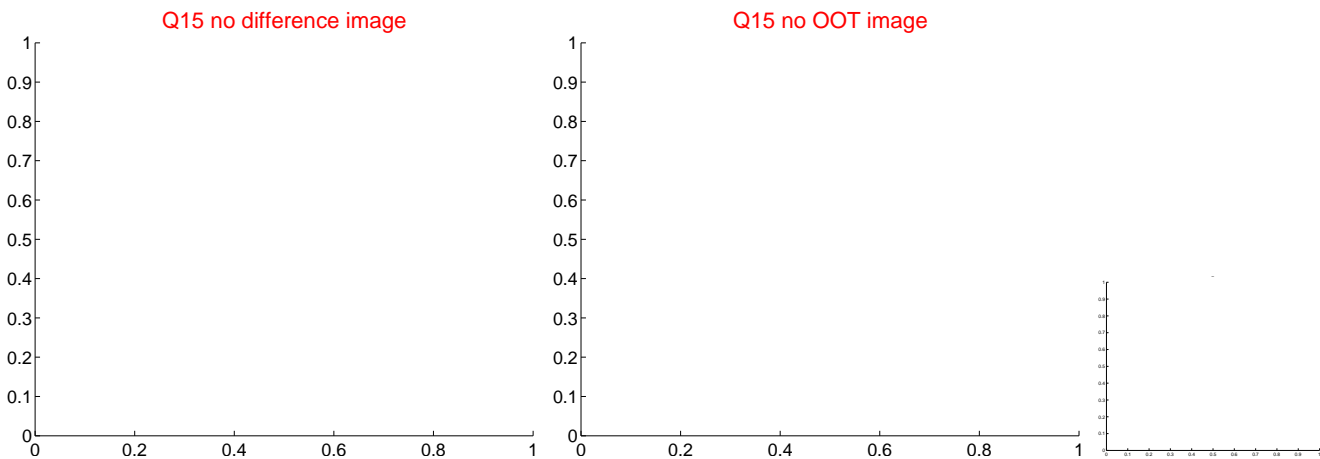
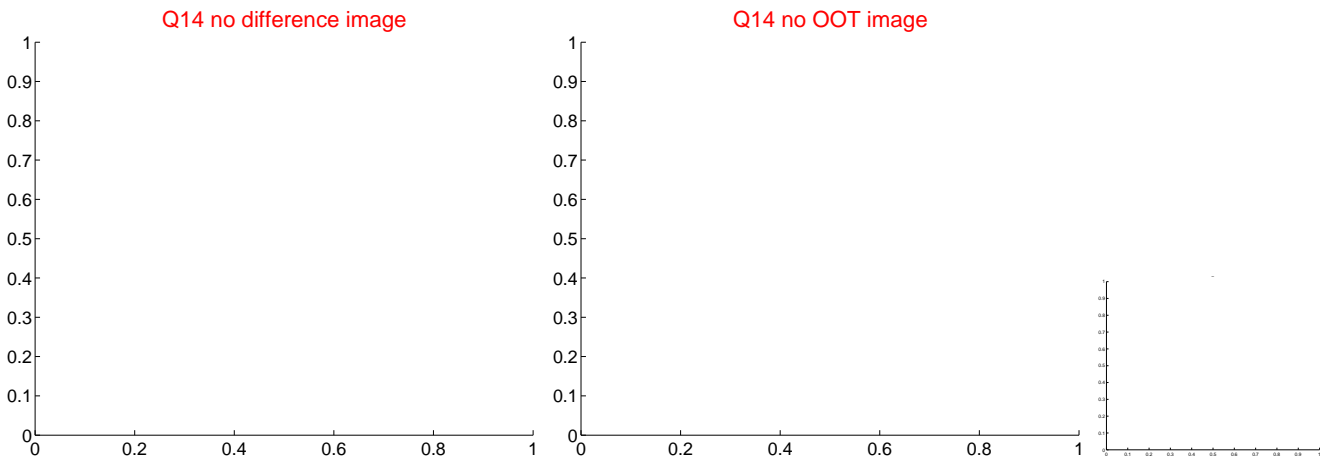
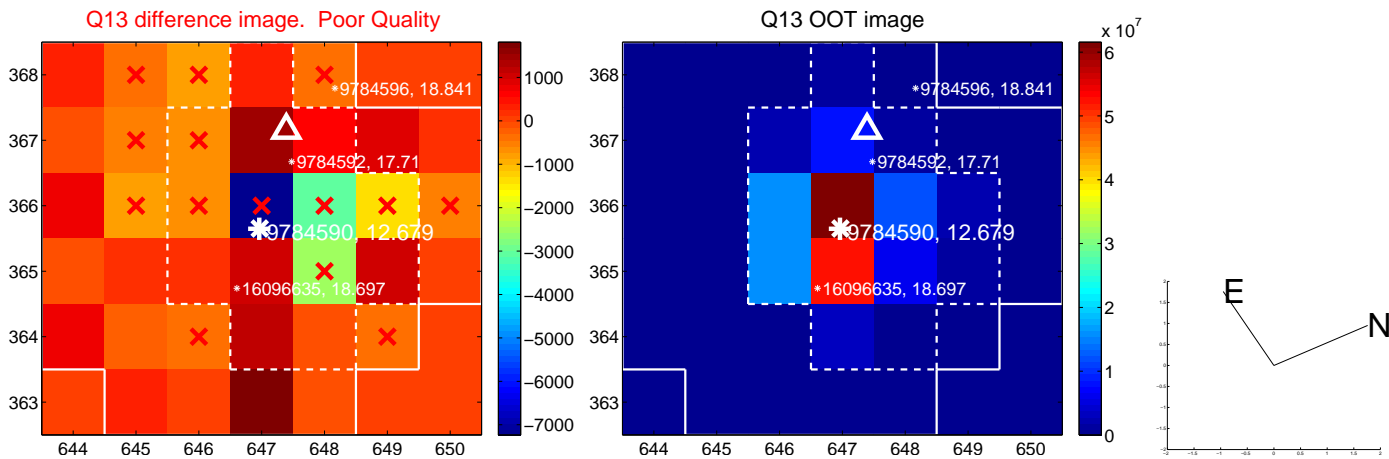
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



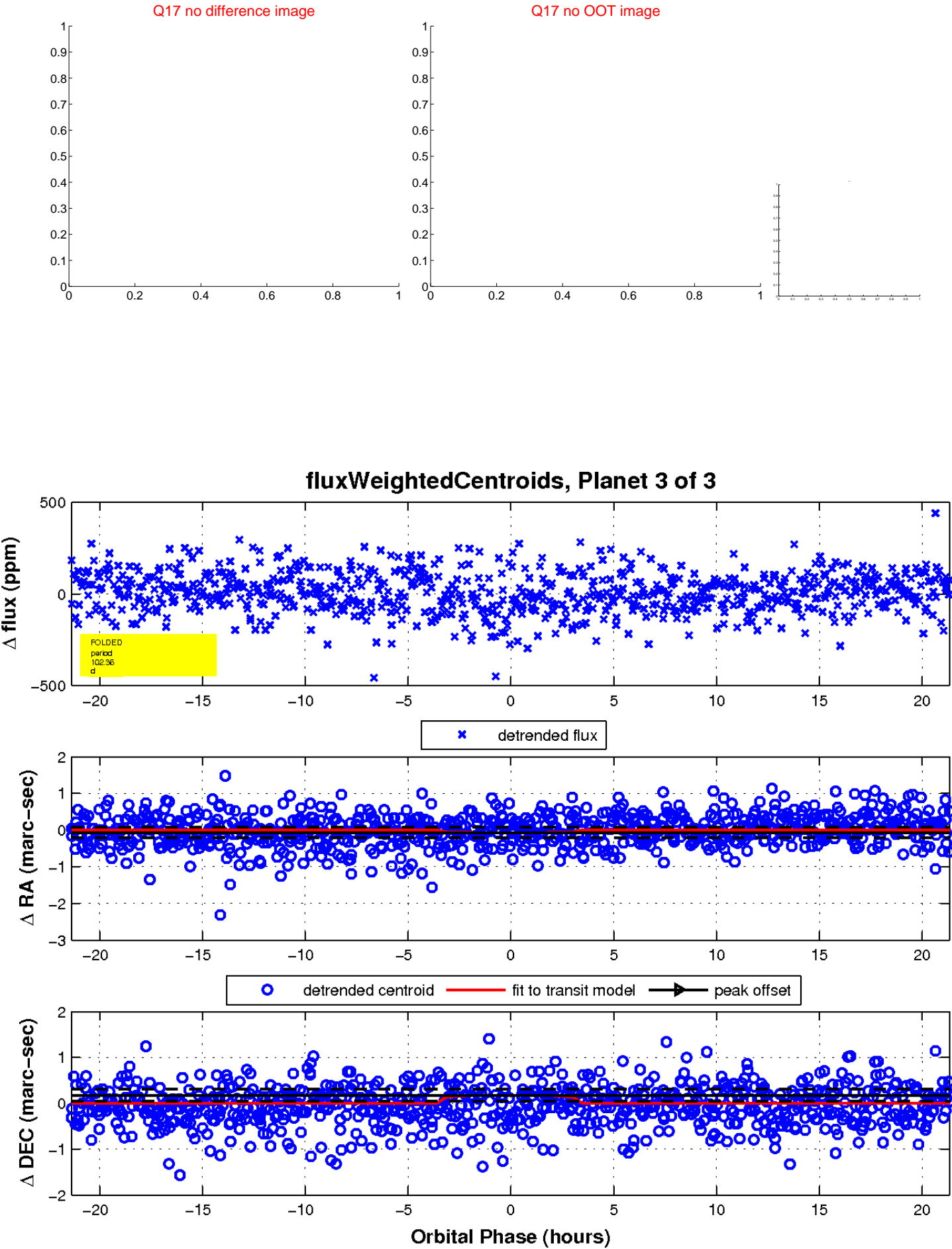
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

