

KIC 002558488

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})
002558488-01	OBS	No	1.287919	132.239601	23.8	5.726	11.1	11.3	1.45	6351	0.83	5050.37
002558488-02	OBS	No	218.209786	269.921343	230.4	11.757	10.6	8.1	1.45	6351	2.43	5.39
002558488-03	OBS	No	209.562649	297.716272	209.0	5.429	7.8	7.2	1.45	6351	2.32	5.68
002558488-04	OBS	No	111.590724	216.243210	241.0	4.492	7.5	8.2	1.45	6351	2.56	13.17

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002558488-01	OBS	FP	0.00	1	0	0	0	LPP_DV
002558488-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS
002558488-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—HALO_GHOST
002558488-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_ALT

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

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

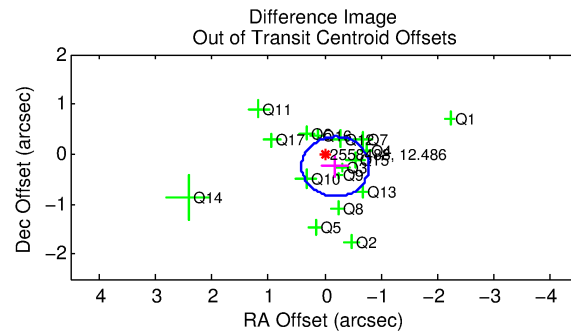
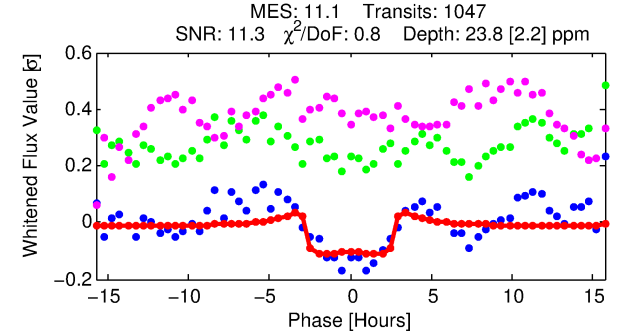
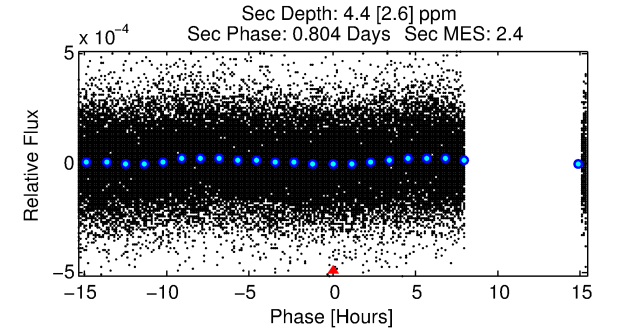
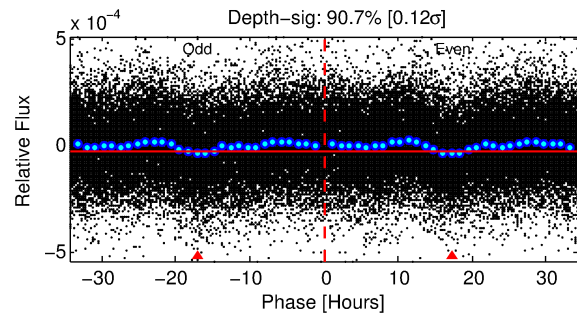
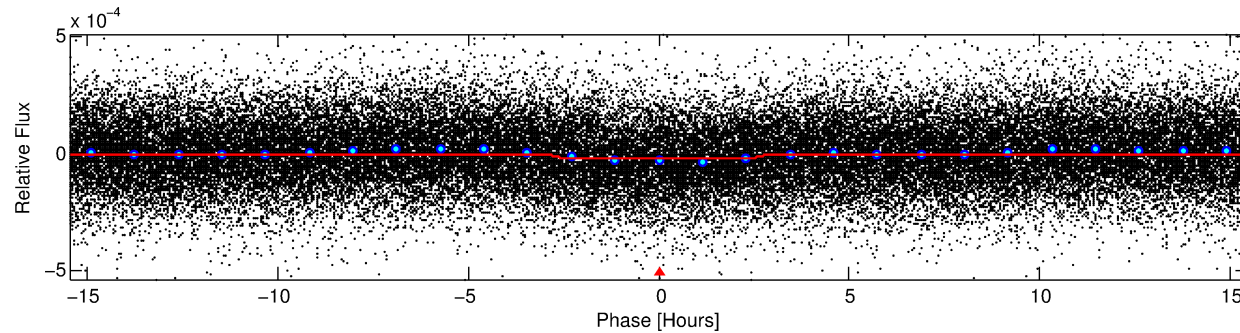
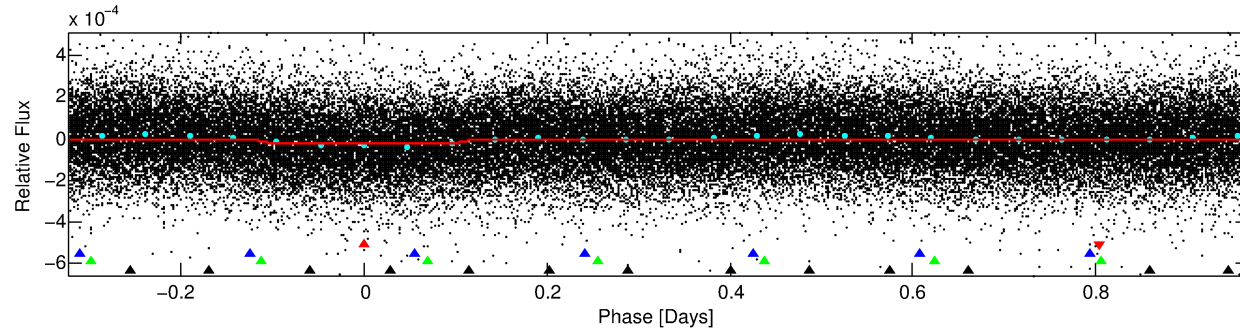
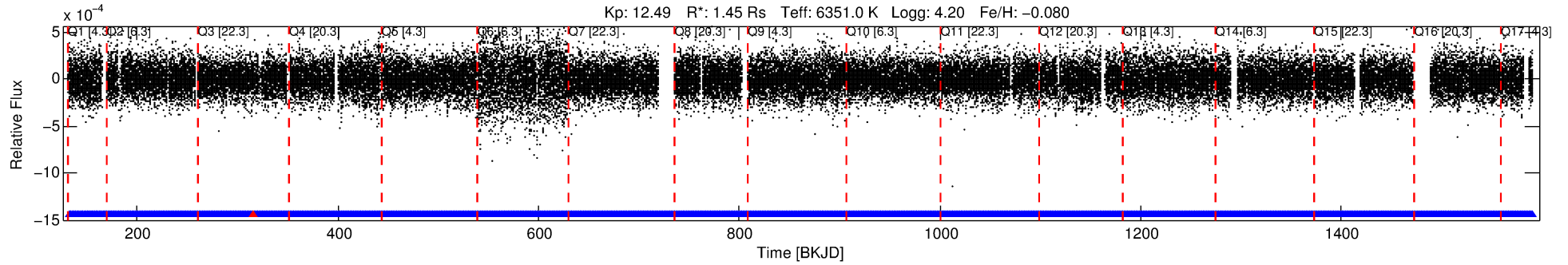
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002558488-01

No Significant Match Found

DV One-Page Summary

KIC: 2558488 Candidate: 1 of 4 Period: 1.288 d



DV Fit Results:

Period = 1.28792 [0.00001] d
Epoch = 132.2396 [0.0034] BKJD
Rp/R* = 0.0053 [0.0013]
a/R* = 1.20 [0.51]
b = 0.91 [0.27]
Seff = 5050.37 [1923.10]
Teq = 2150 [205] K
Rp = 0.83 [0.33] Re
a = 0.0246 [0.0061] AU
Ag = 2.13 [1.80] [0.63 σ]
Teffp = 4013 [787] K [2.29 σ]

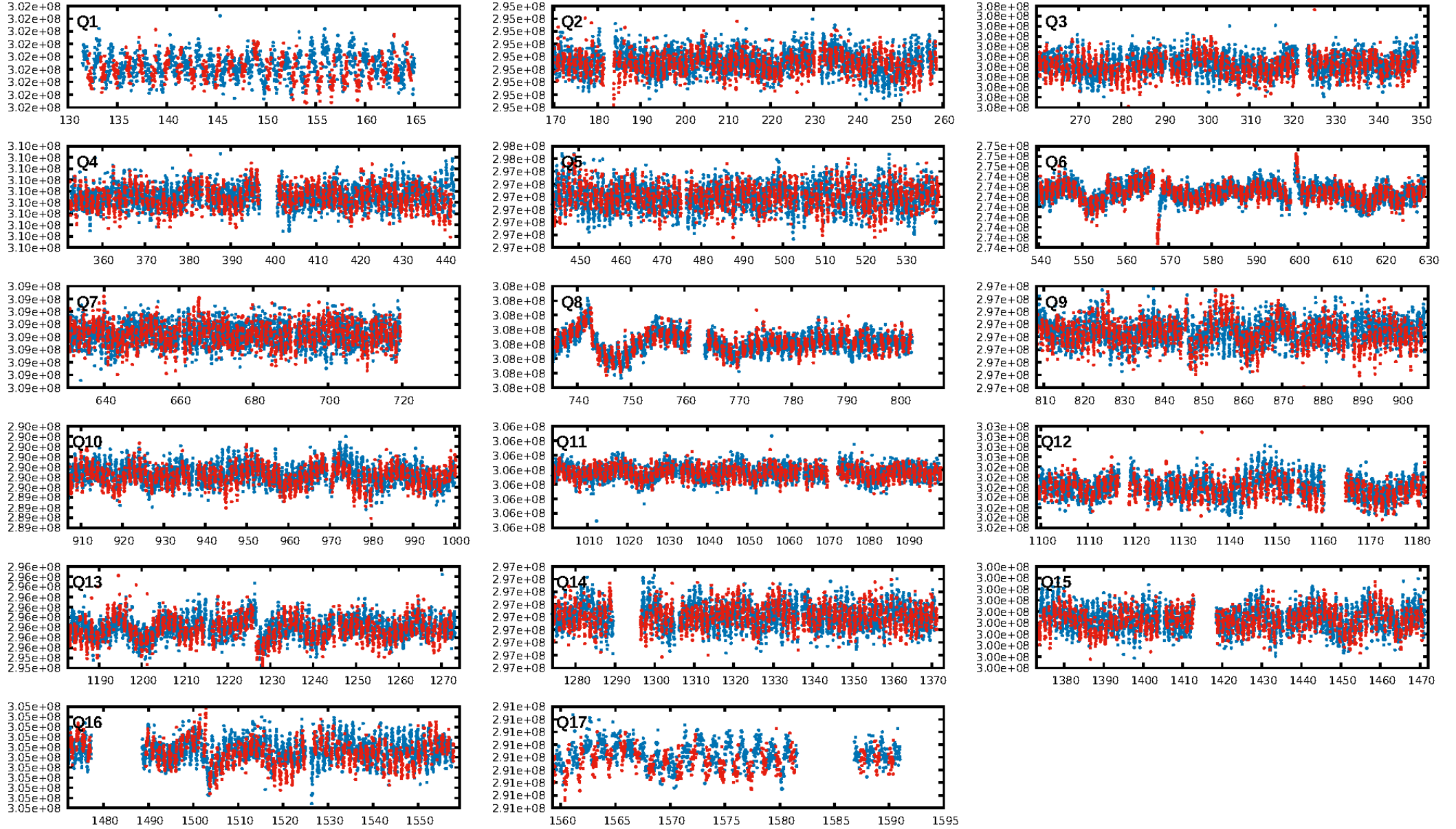
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [363.72 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 2.27e-19
RollingBand-fgt: 1.00 [999/1000]
GhostDiagnostic-chr: 1.533
Centroid-sig: 34.5%
Centroid-so: 0.495 arcsec [1.03 σ]
OotOffset-rm: 0.311 arcsec [1.56 σ]
KicOffset-rm: 0.213 arcsec [1.01 σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 1.00 [17/17]

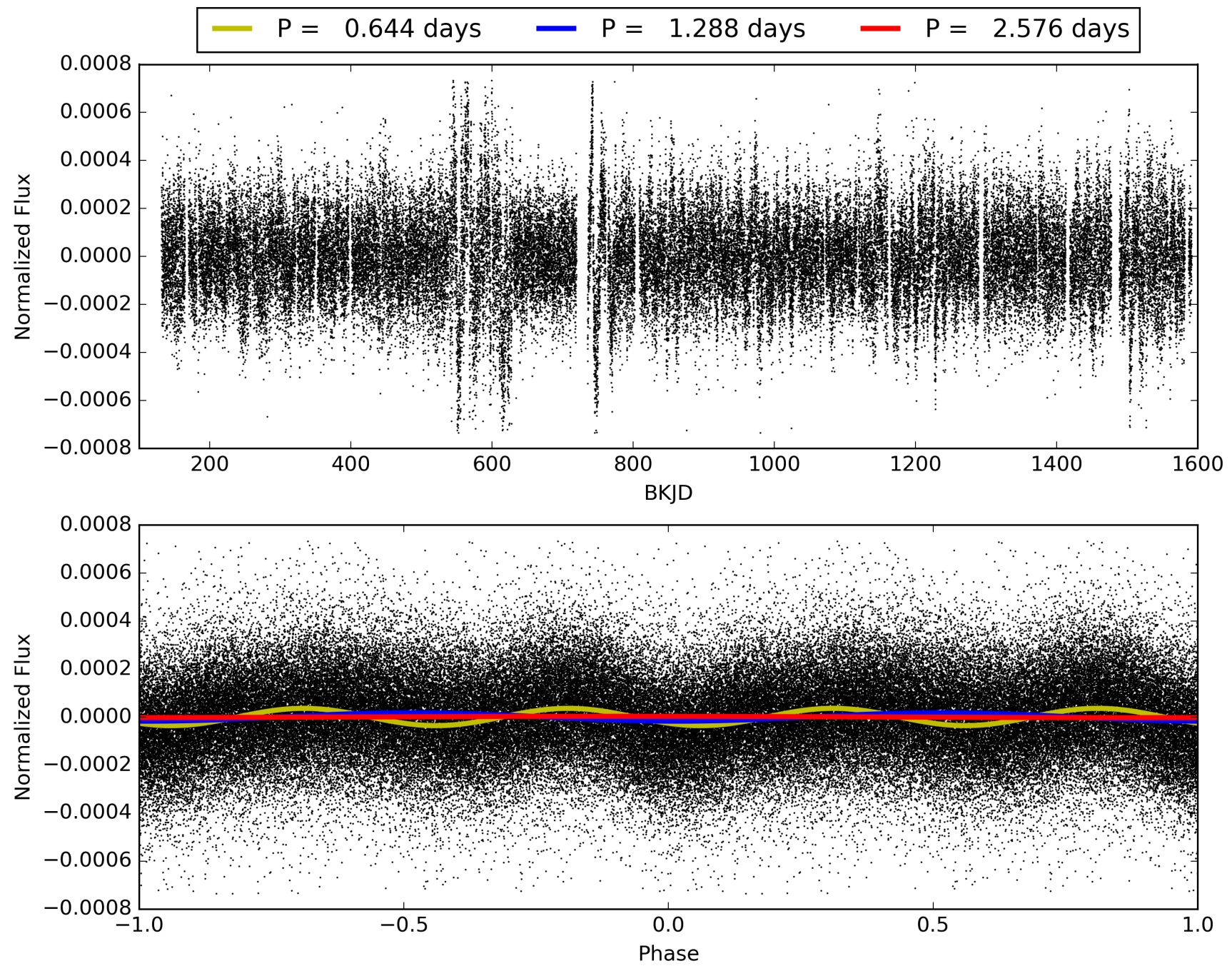
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 002558488-01, PDC Light Curves

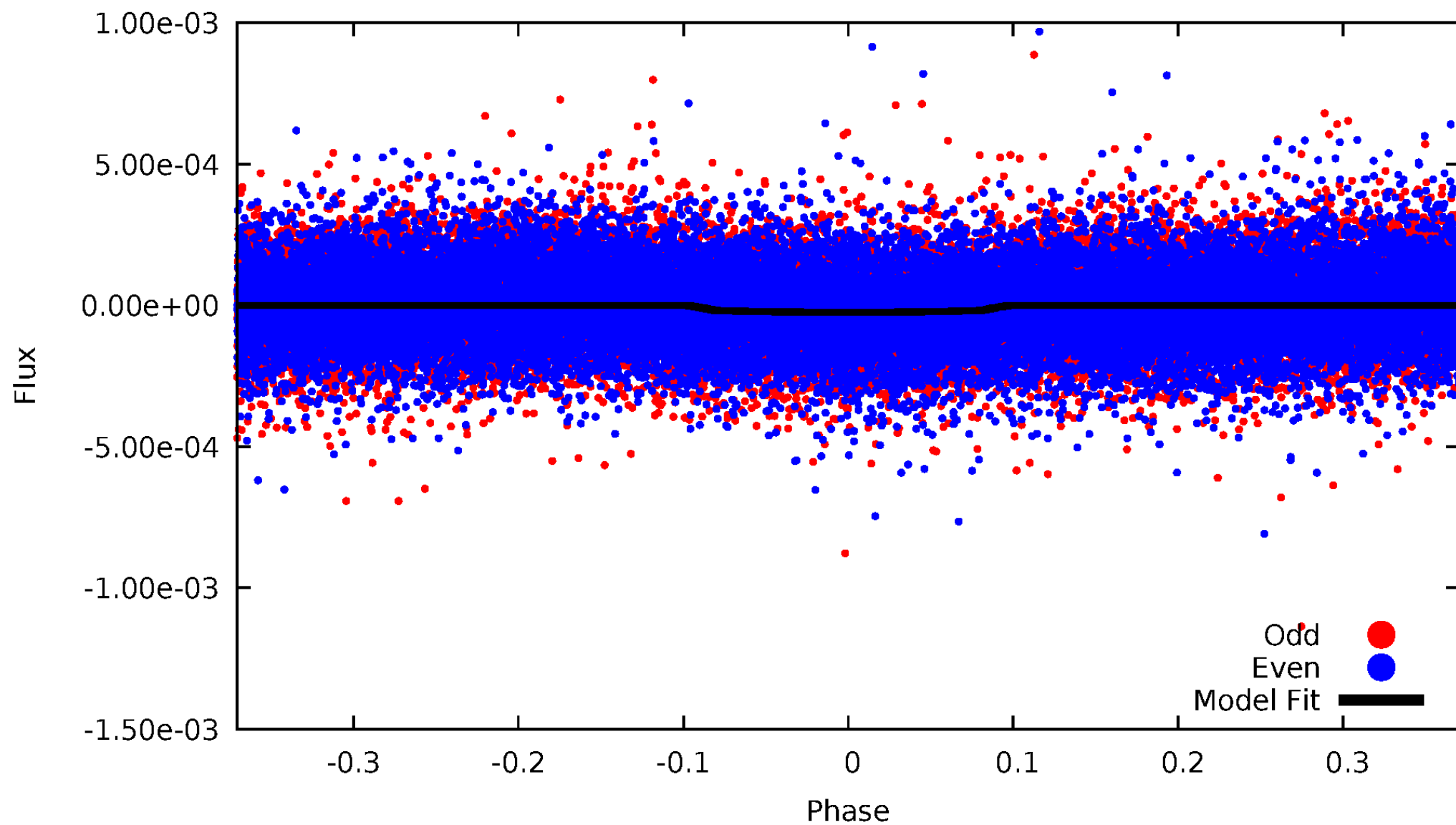


TCE 002558488-01



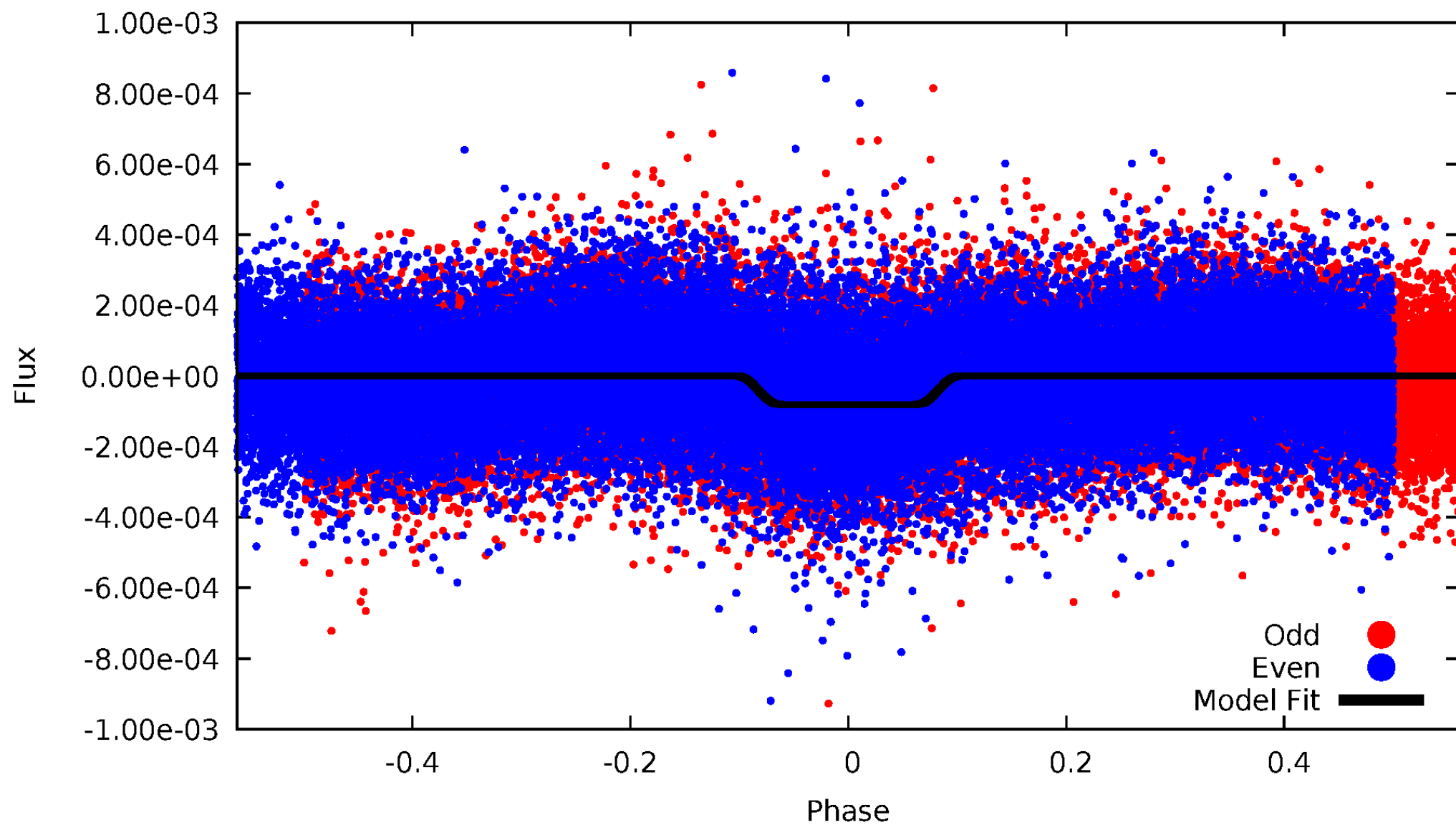
DV Odd/Even

TCE 002558488-01

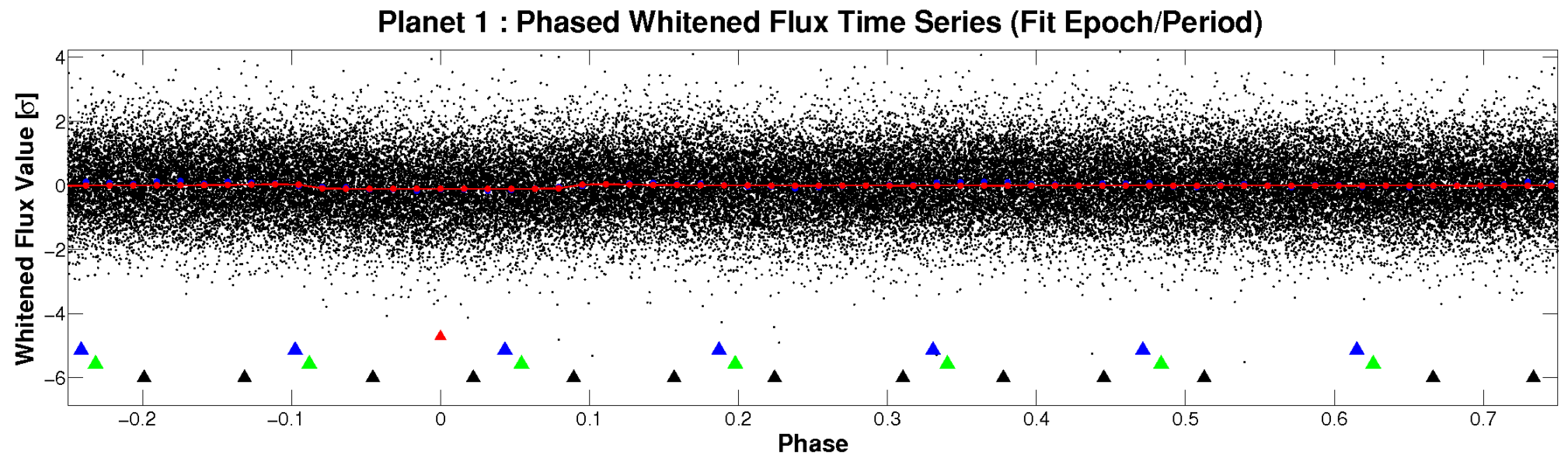
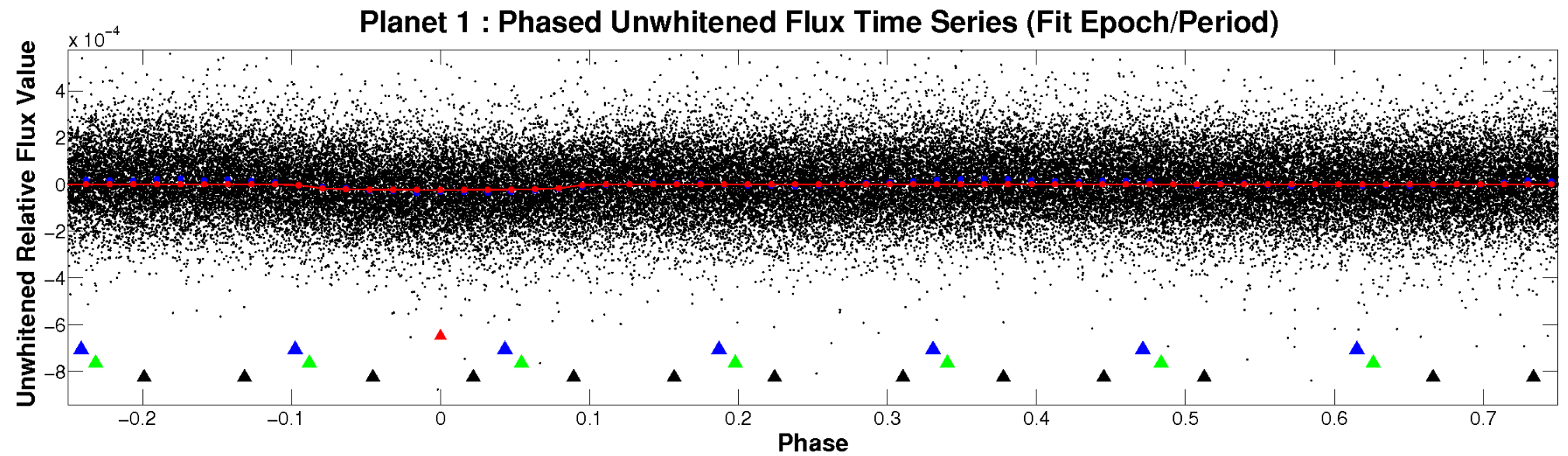


ALT Odd/Even

TCE 002558488-01

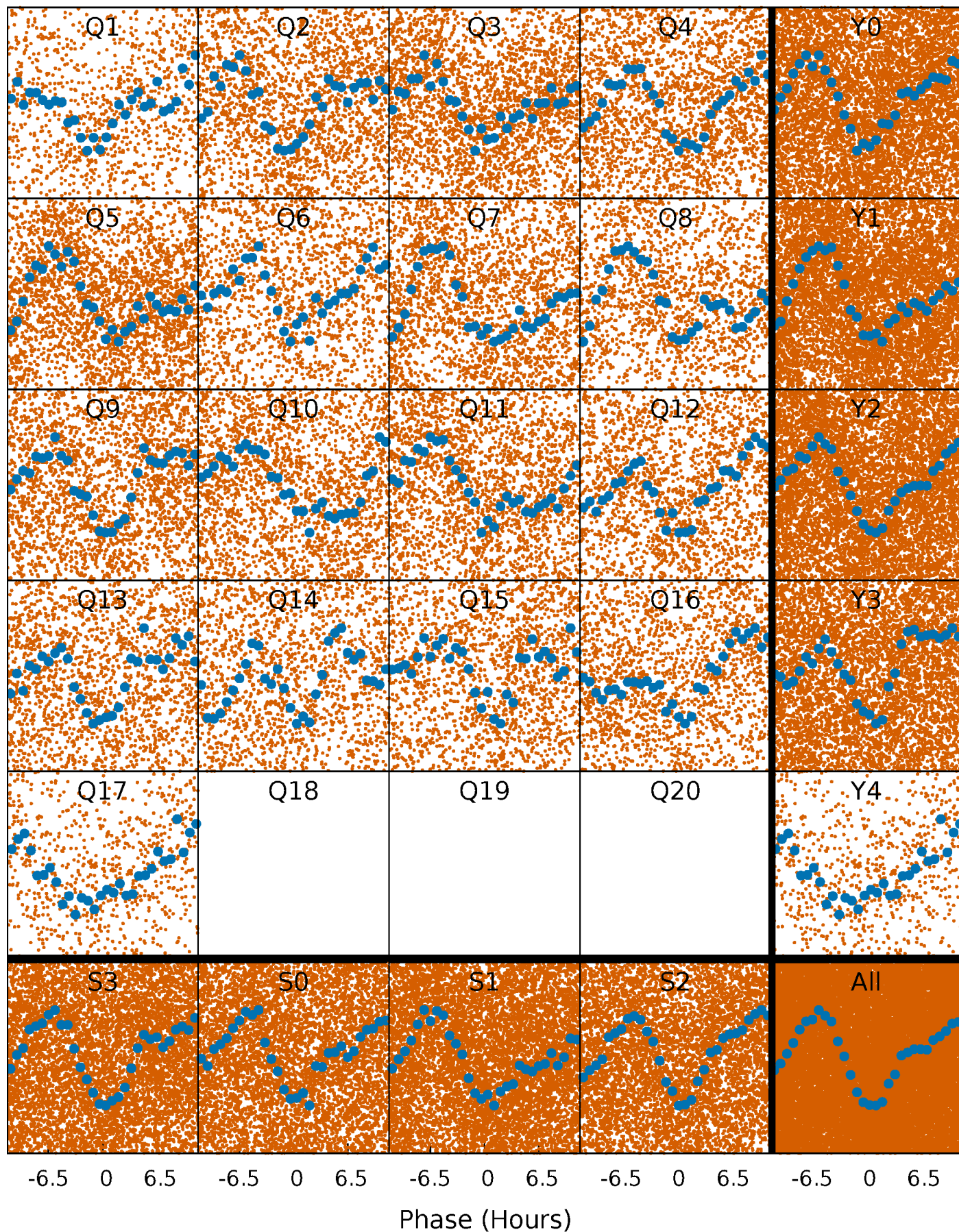


Non-Whitened Vs. Whitened Light Curve



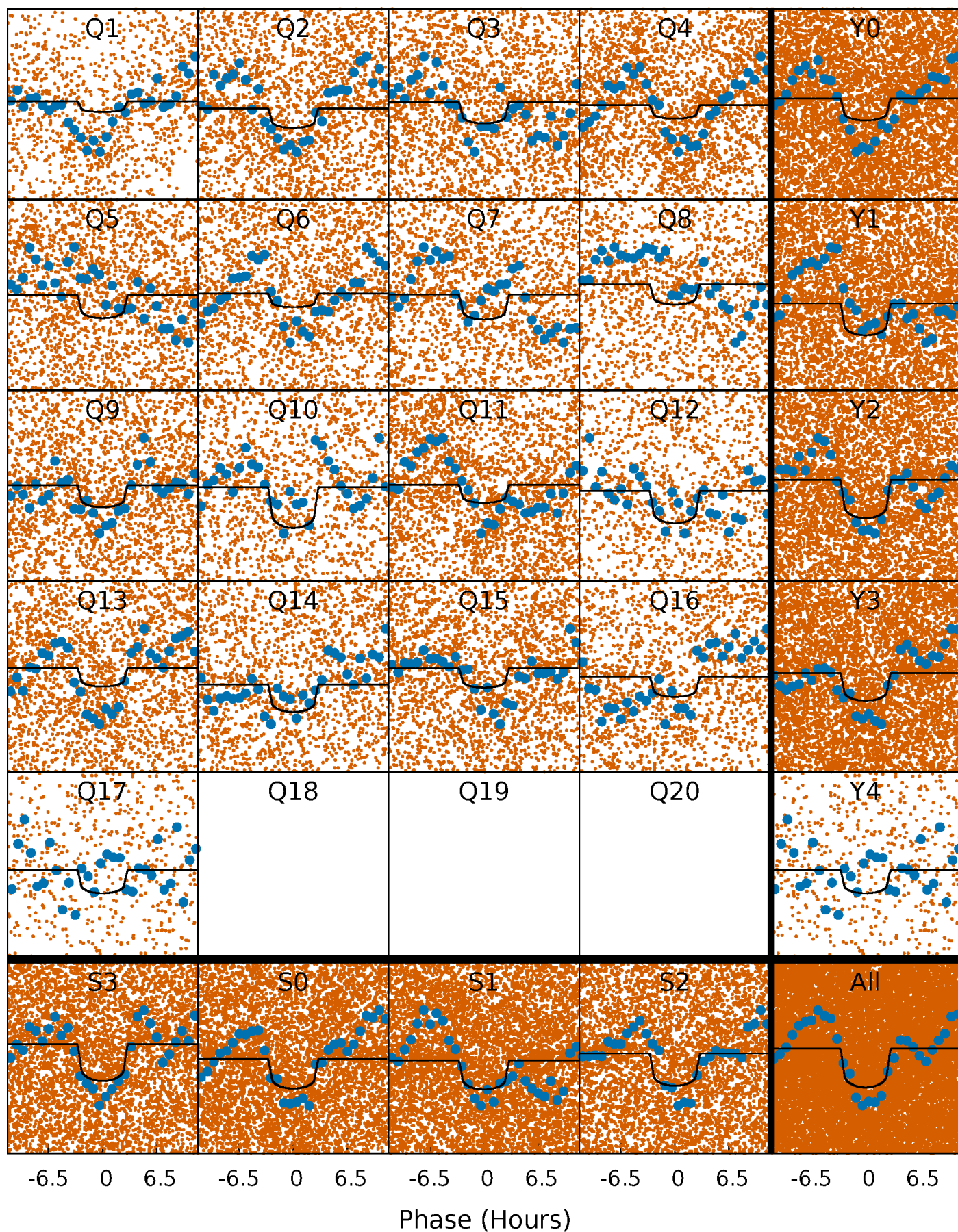
PDC Quarter-Phased Transit Curves

TCE 002558488-01 P= 1.287919 Days $T_0=132.239601$ (BKJD)



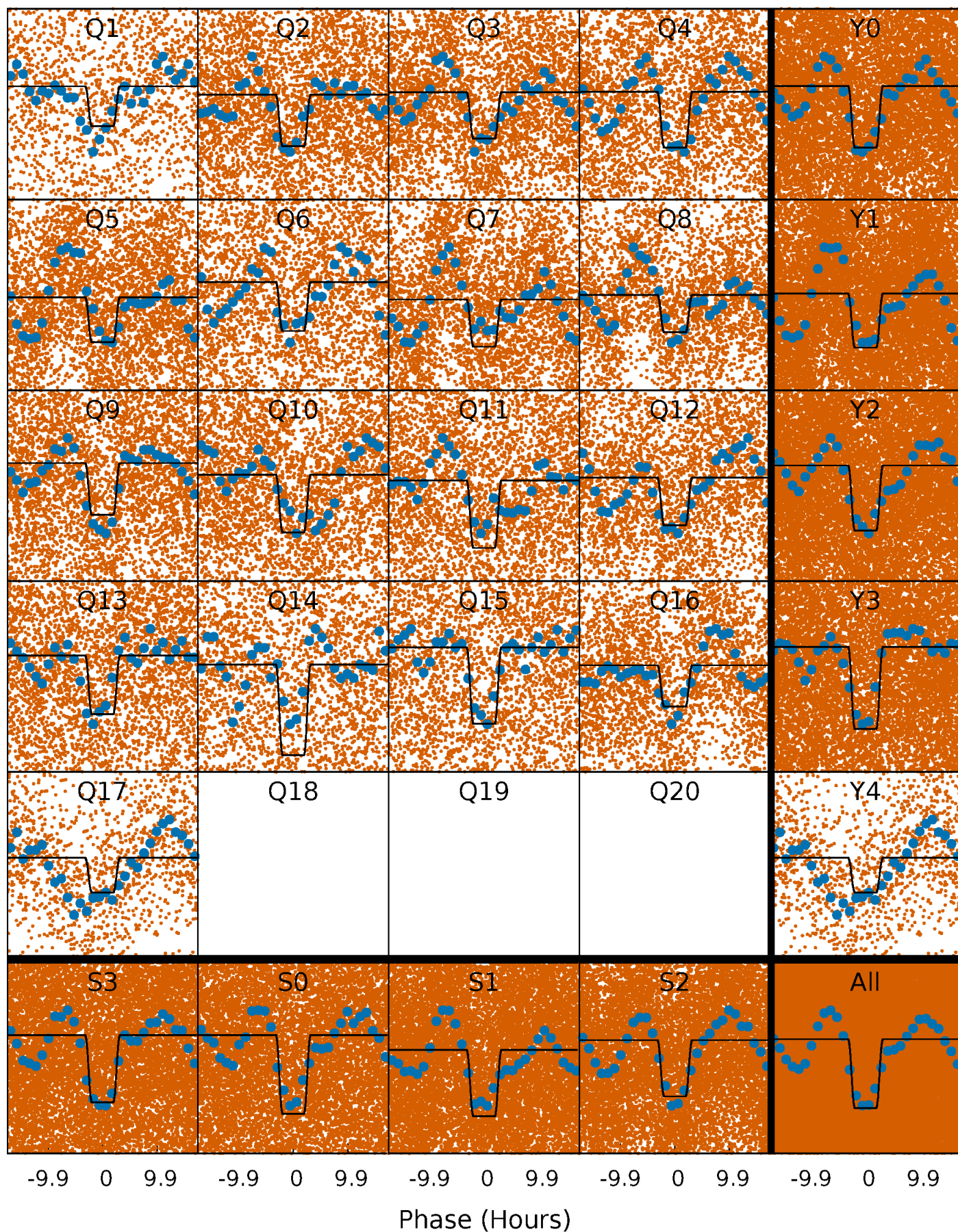
DV Quarter-Phased Transit Curves

TCE 002558488-01 P= 1.287919 Days $T_0=132.239601$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

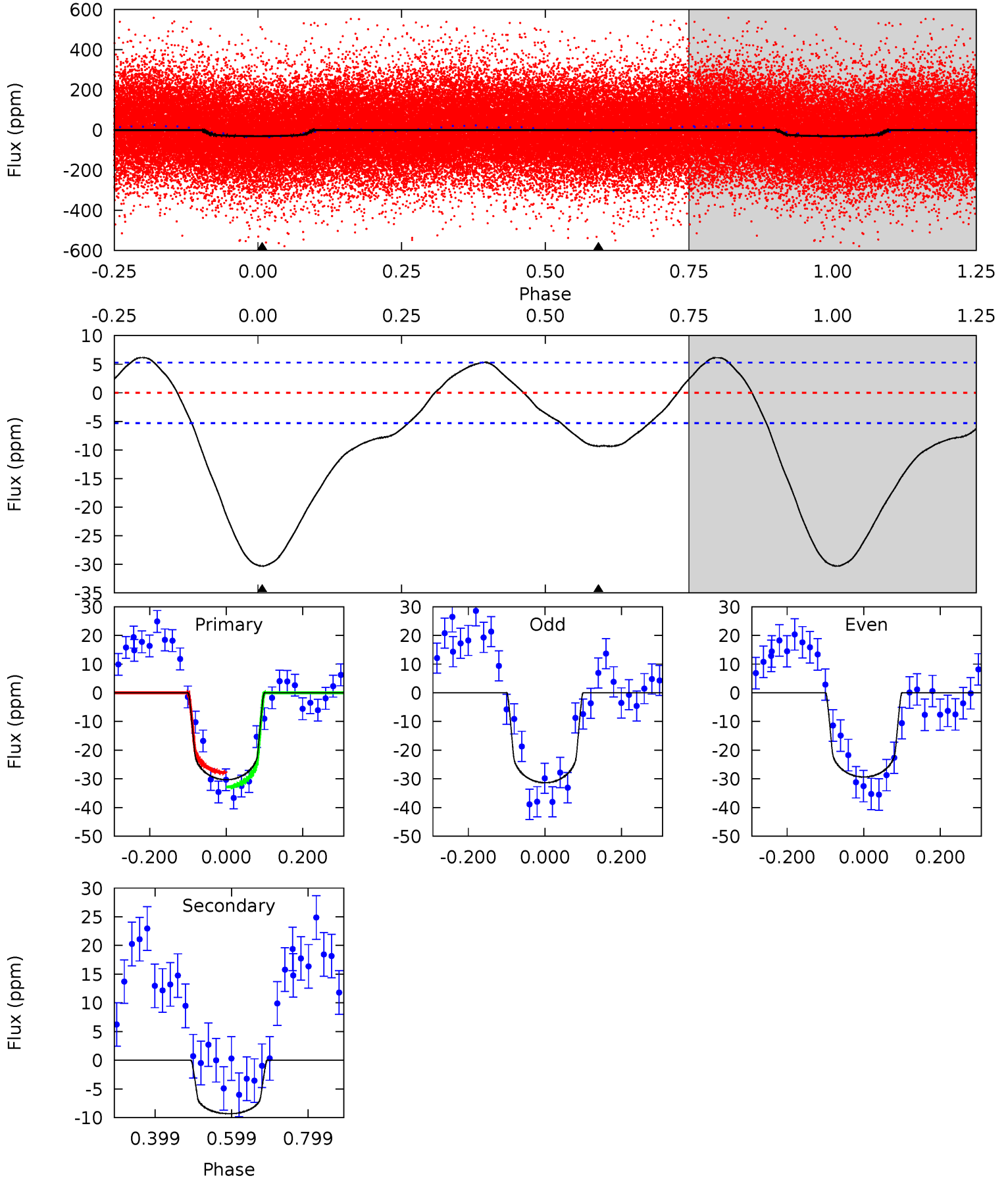
TCE 002558488-01 P= 1.287967 Days $T_0=132.244715$ (BKJD)



DV Model-Shift Uniqueness Test

002558488-01, P = 1.287919 Days, E = 130.951682 Days

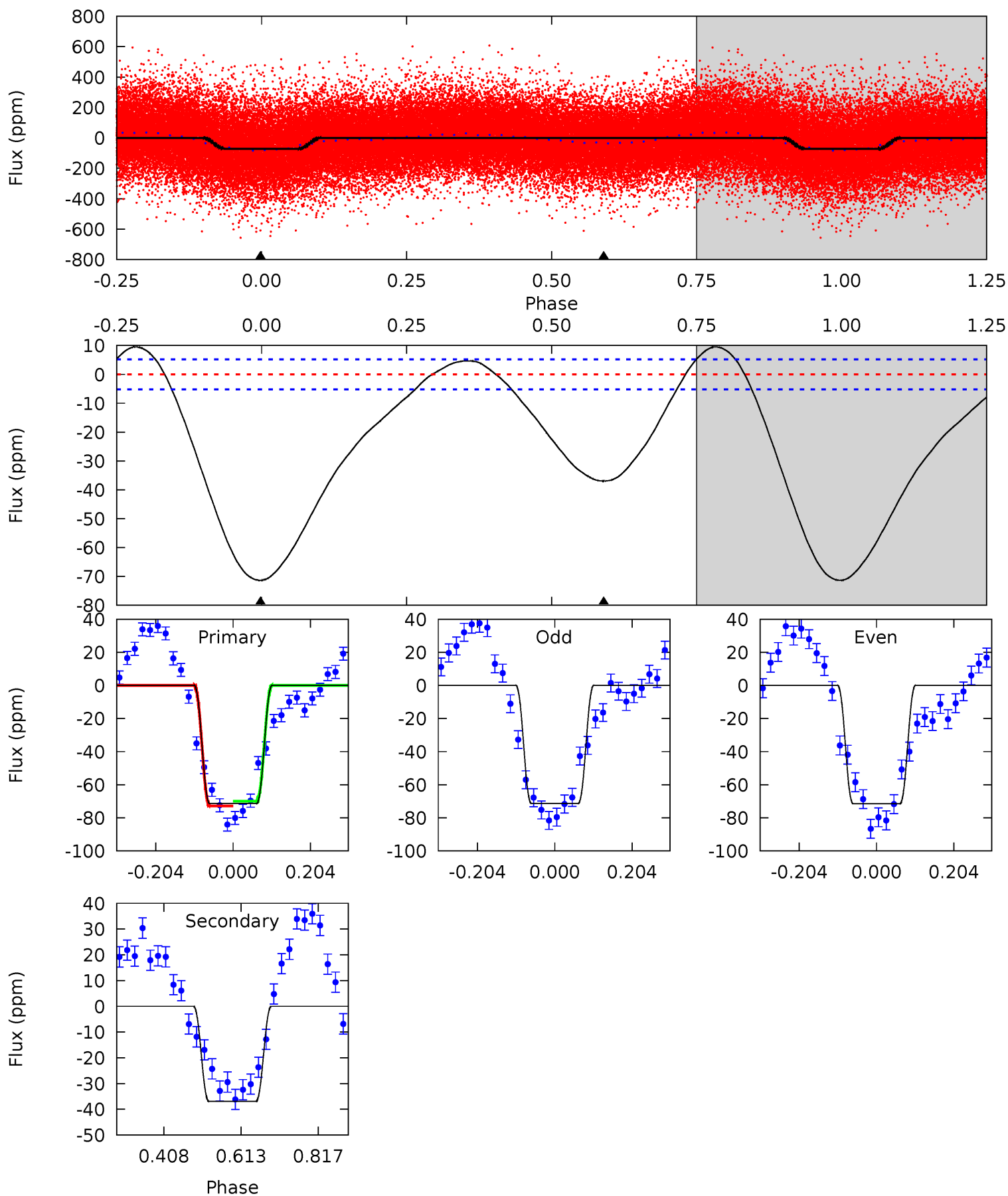
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
25.3	7.79	0	0	4.42	1.28	4.12	25.3	25.3	7.79	7.79	0.83	1.04	0.17	2.09



Alt Model-Shift Uniqueness Test

002558488-01, P = 1.287967 Days, E = 130.956748 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
60.6	31.4	0	0	4.41	1.27	5.73	60.6	60.6	31.4	31.4	0.08	1.00	0.12	1.22



Stellar Parameters For KIC 002558488

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6351^{+177}_{-243}	$4.195^{+0.185}_{-0.185}$	$-0.080^{+0.250}_{-0.300}$	$1.450^{+0.440}_{-0.360}$	$1.203^{+0.177}_{-0.194}$	$0.555^{+0.600}_{-0.266}$
	+3%/-4%	+4%/-4%	+312%/-375%	+30%/-25%	+15%/-16%	+108%/-48%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 002558488-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-9 ± 1	$0.83^{+0.25}_{-0.22}$	3009^{+240}_{-217}	4847^{+711}_{-446}	$4.489^{+3.942}_{-1.814}$
Alt.	-37 ± 1	$1.43^{+0.31}_{-0.27}$	3007^{+245}_{-210}	5190^{+477}_{-327}	$6.041^{+3.194}_{-1.896}$

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

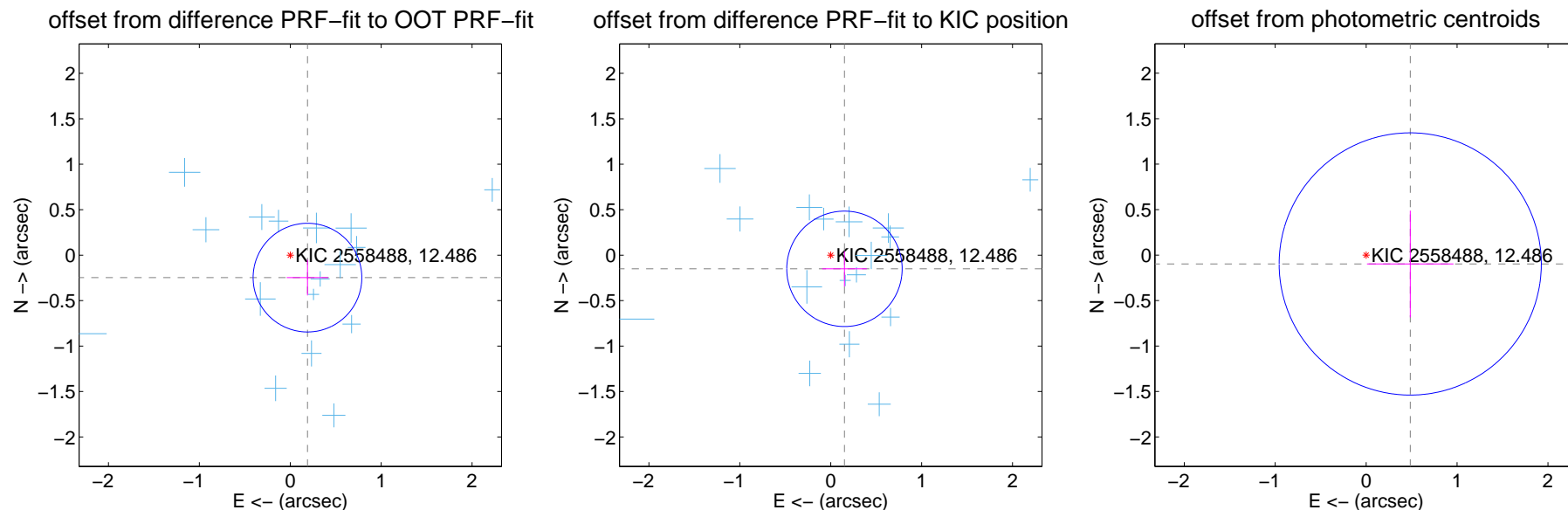
DV Centroid Data

Supplemental centroid analysis for 002558488-01. Kepler magnitude: 12.49. Transit SNR 11.29

There are 17 quarters with good PRF difference image offsets

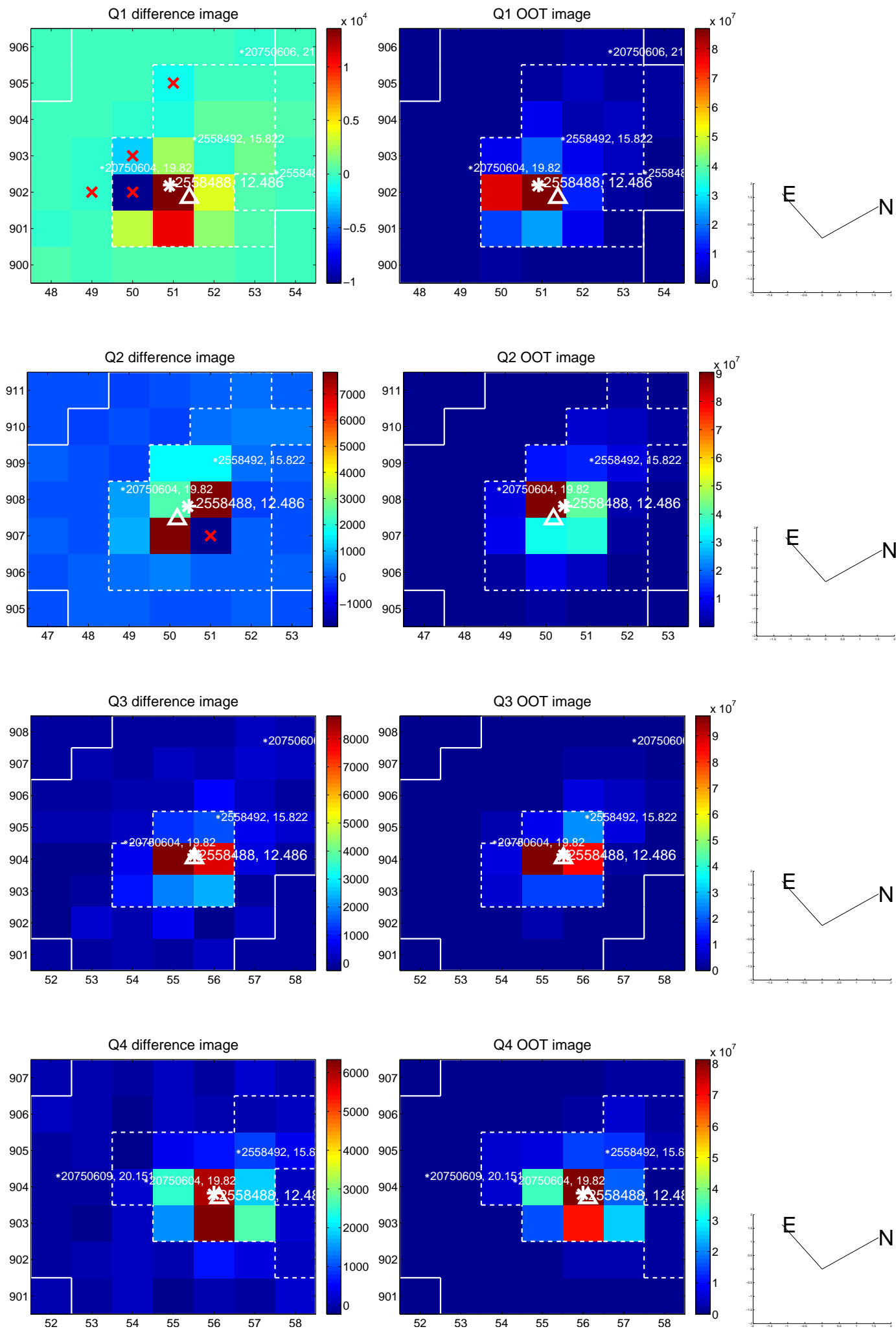
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.311 ± 0.199	1.56	-0.189 ± 0.229	-0.247 ± 0.195
PRF-fit source offset from KIC position	0.213 ± 0.212	1.01	-0.151 ± 0.245	-0.150 ± 0.195
photometric centroid source offset	0.49 ± 0.48	1.03	-0.49 ± 0.48	-0.10 ± 0.59

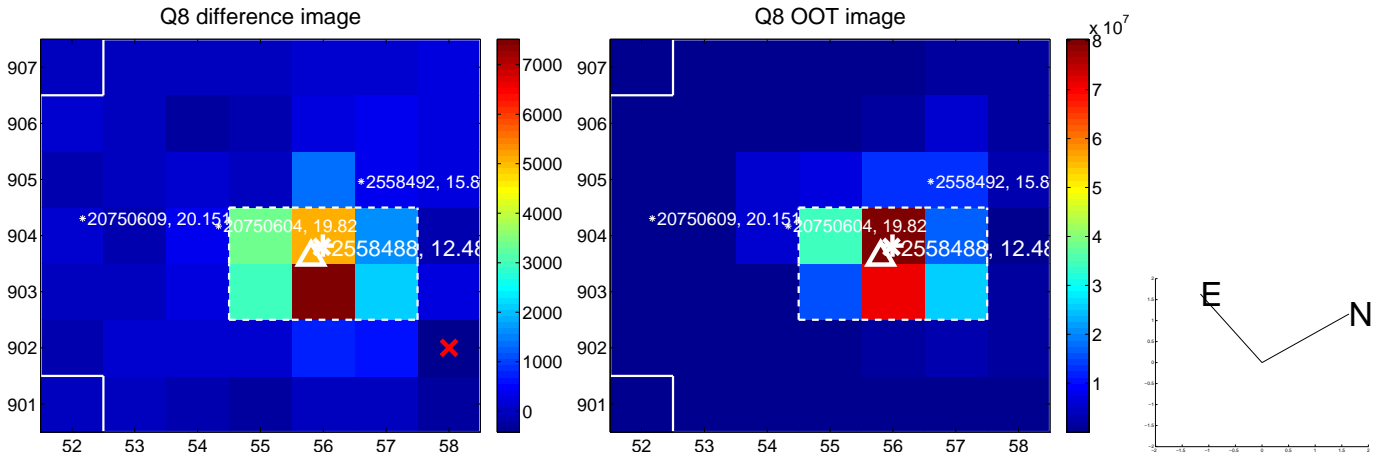
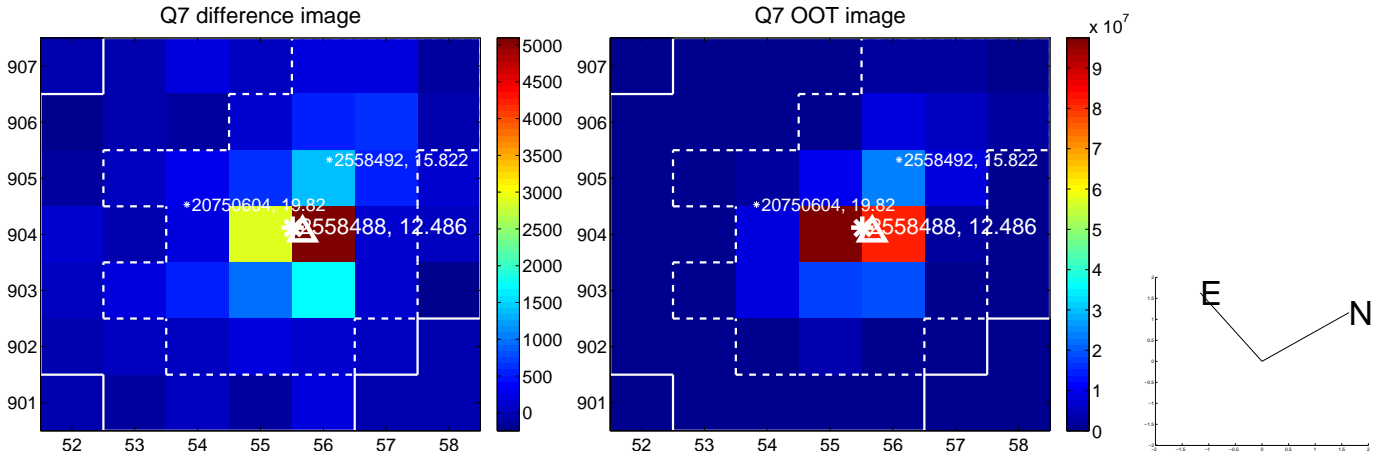
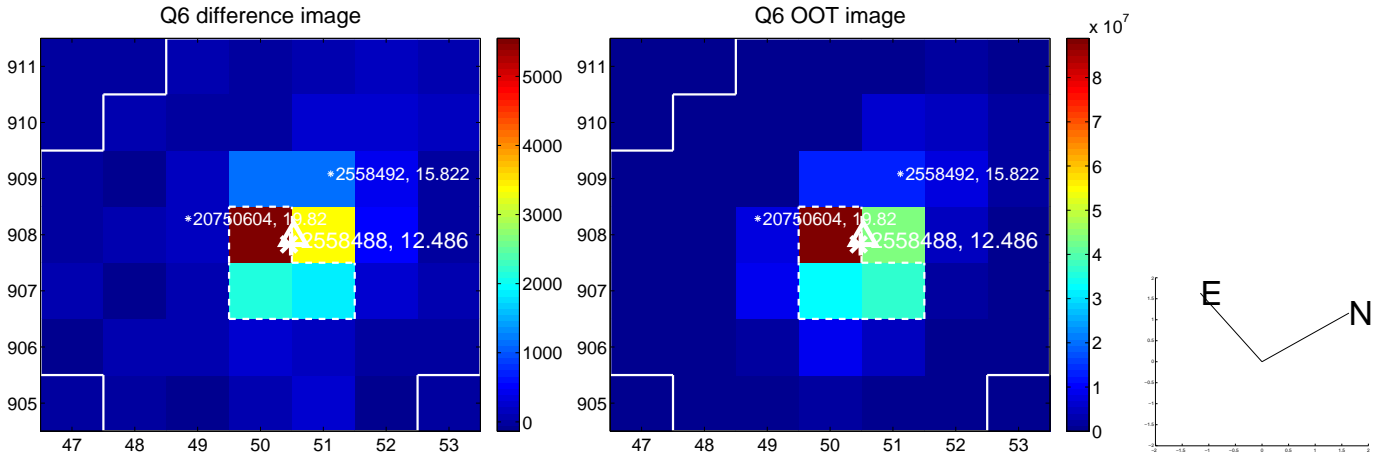
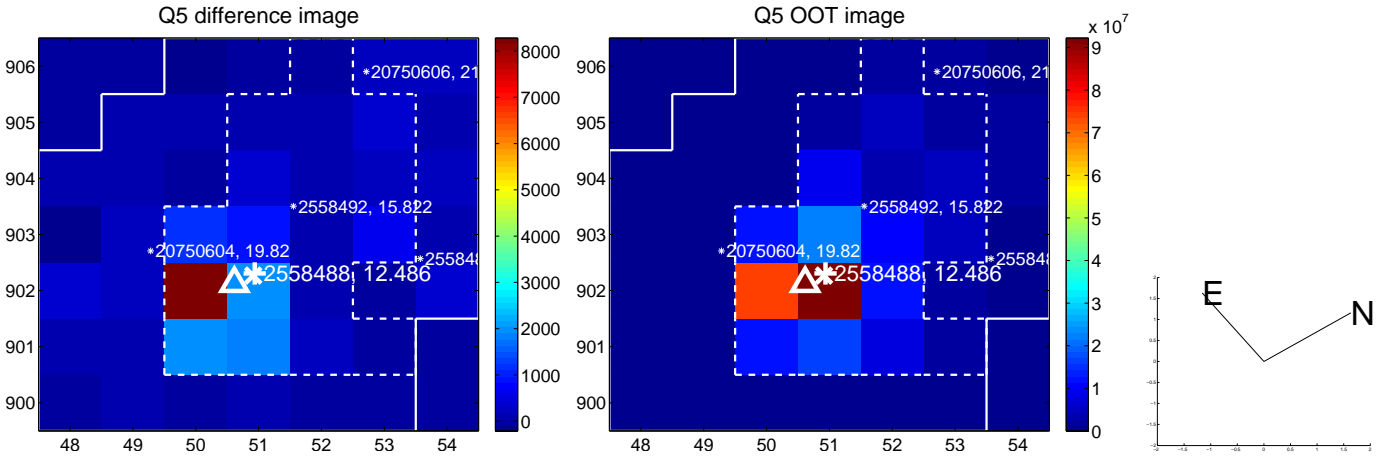


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

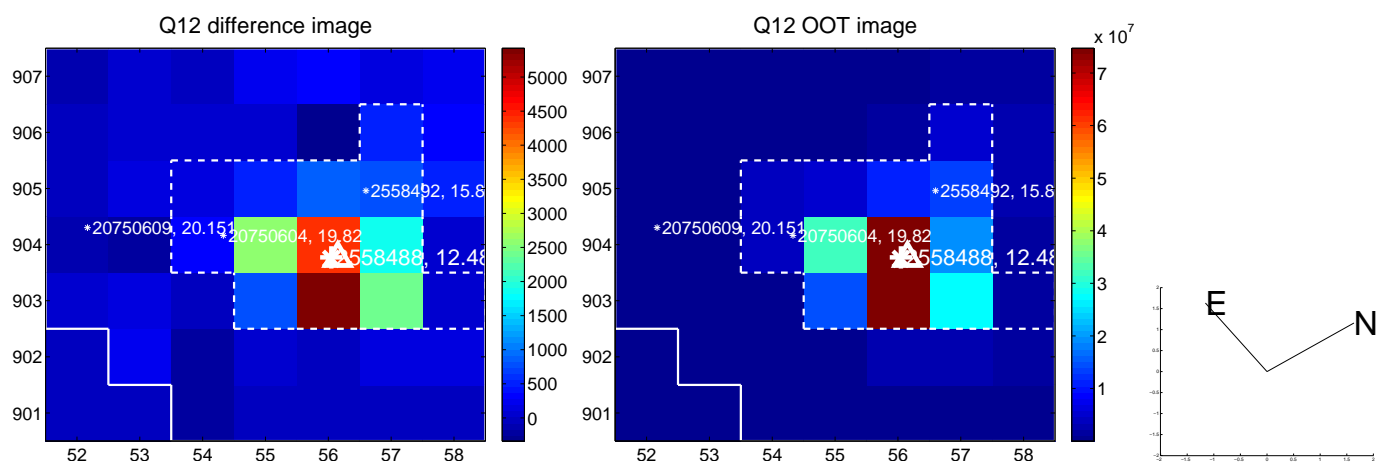
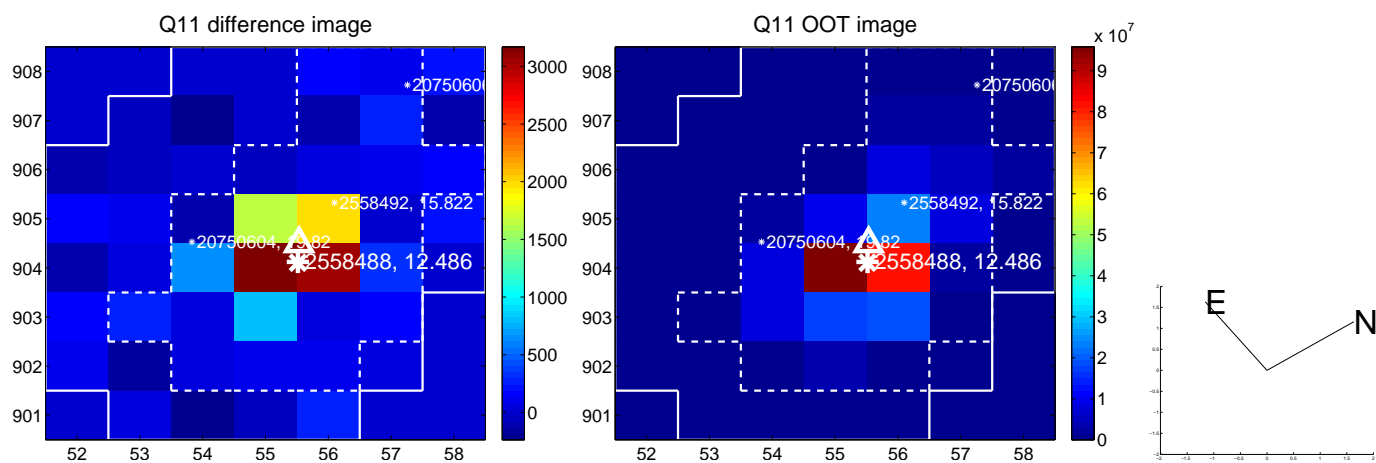
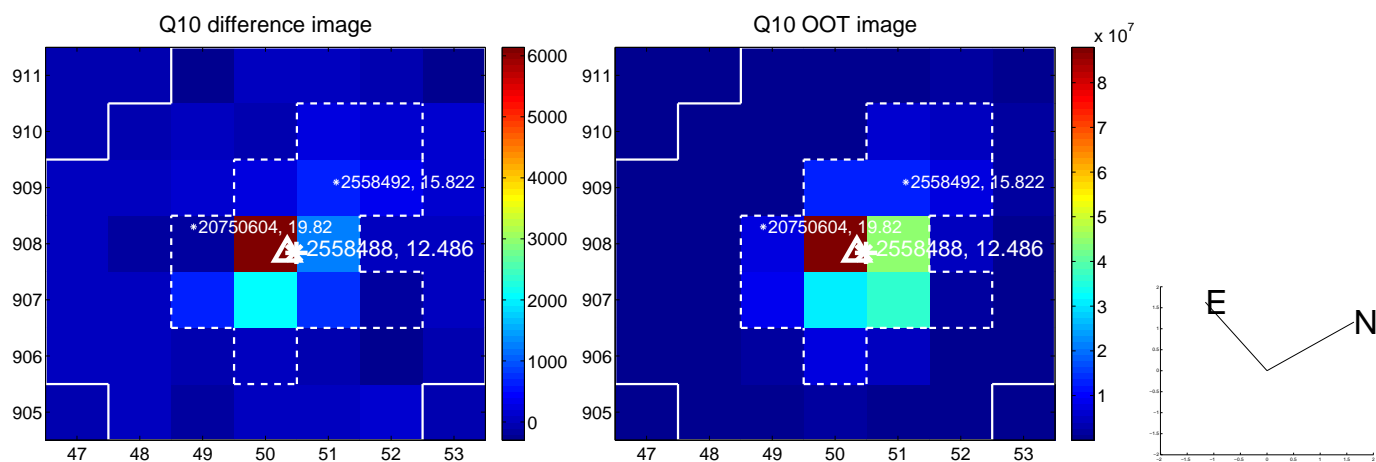
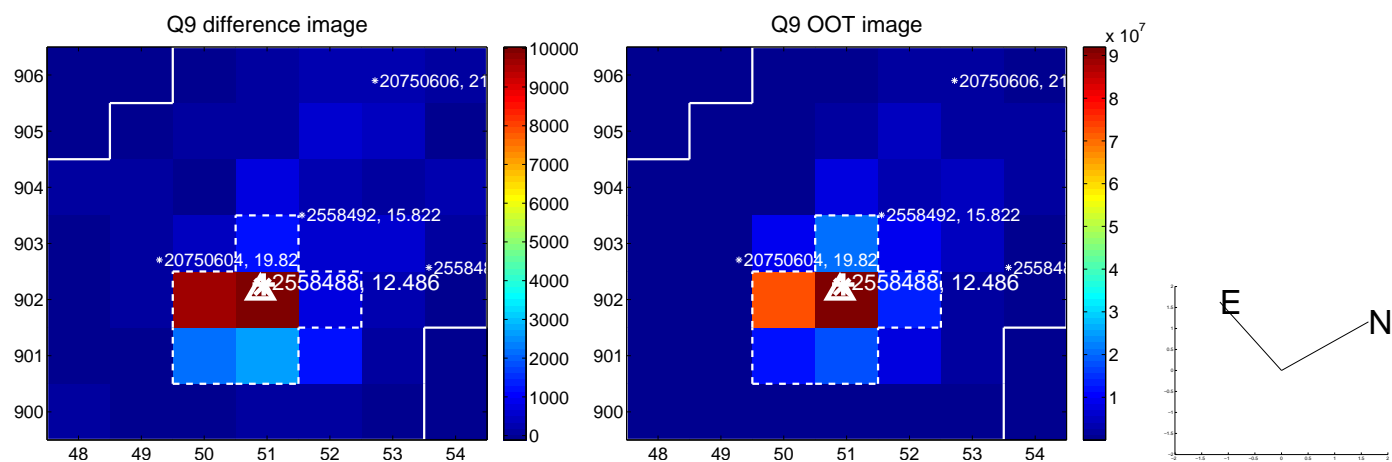
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



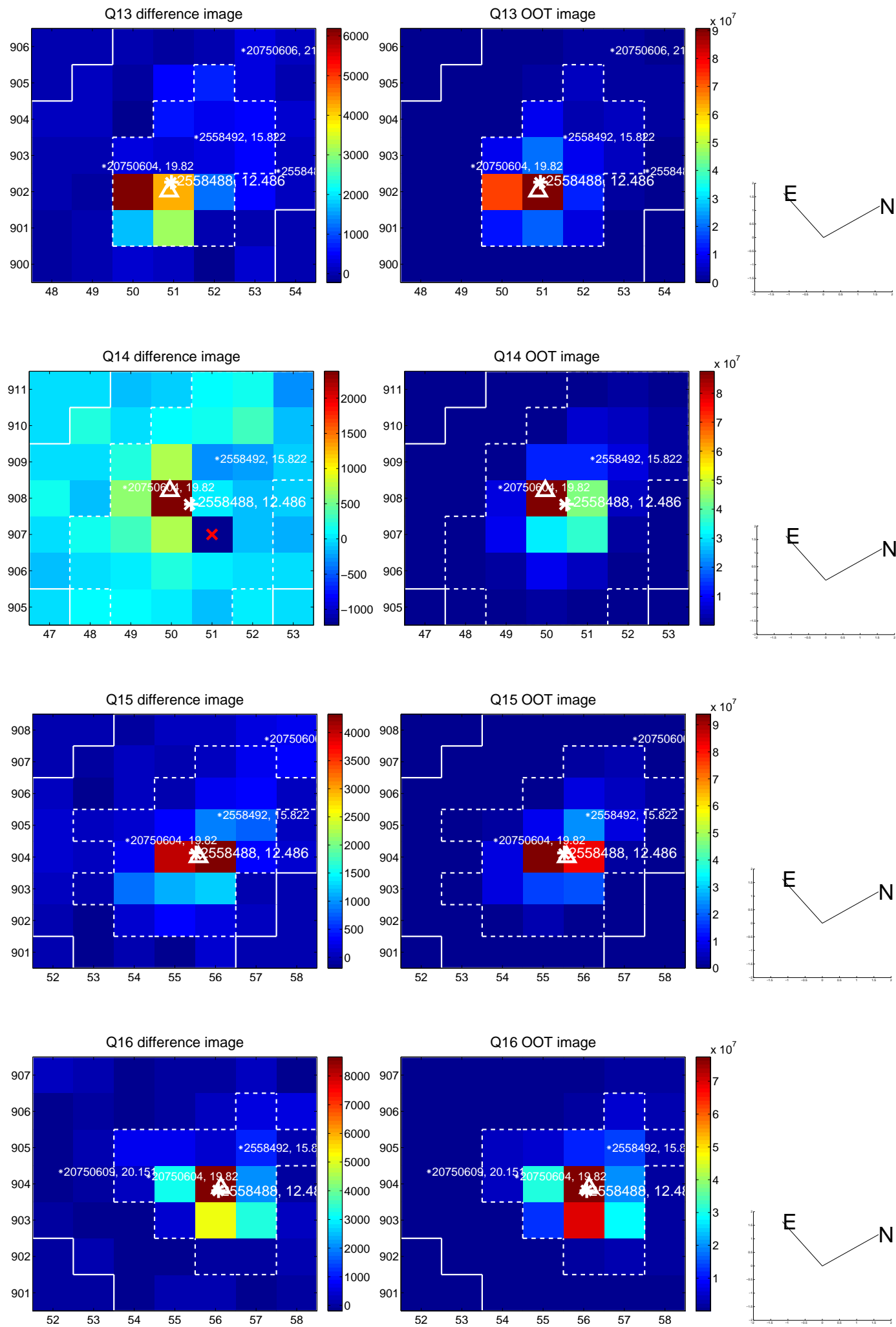
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



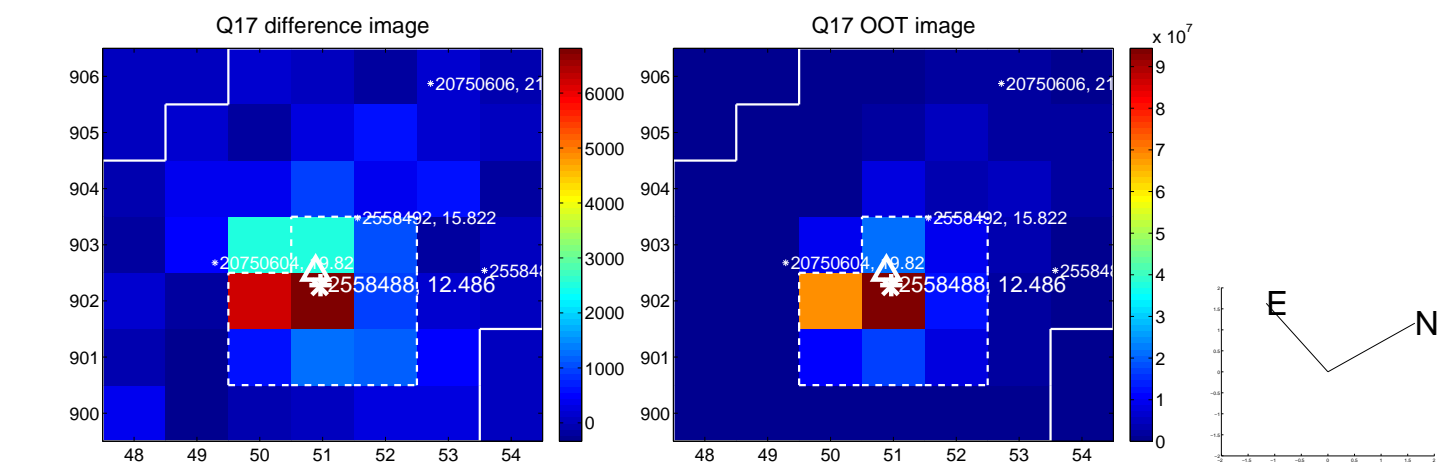
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



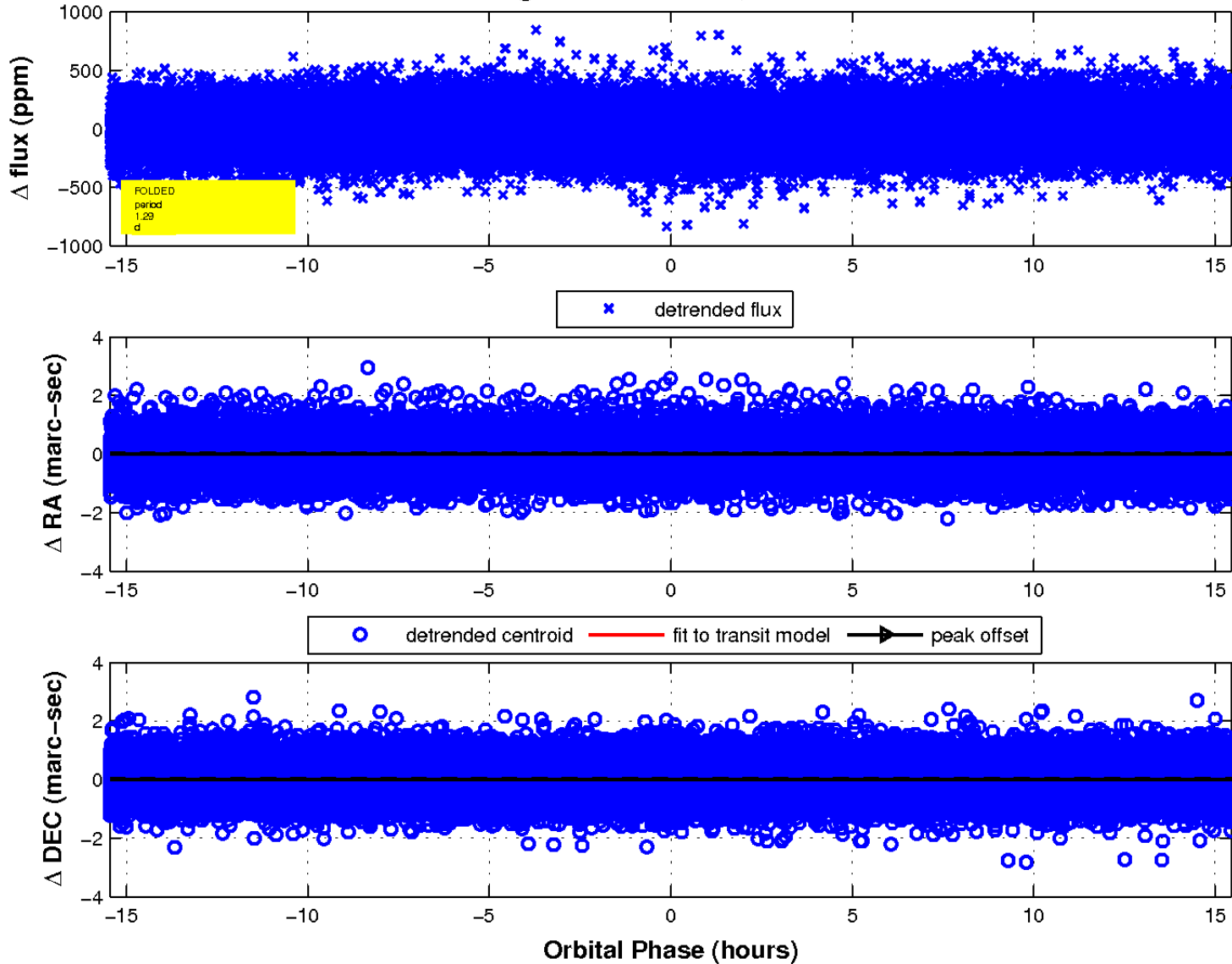
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

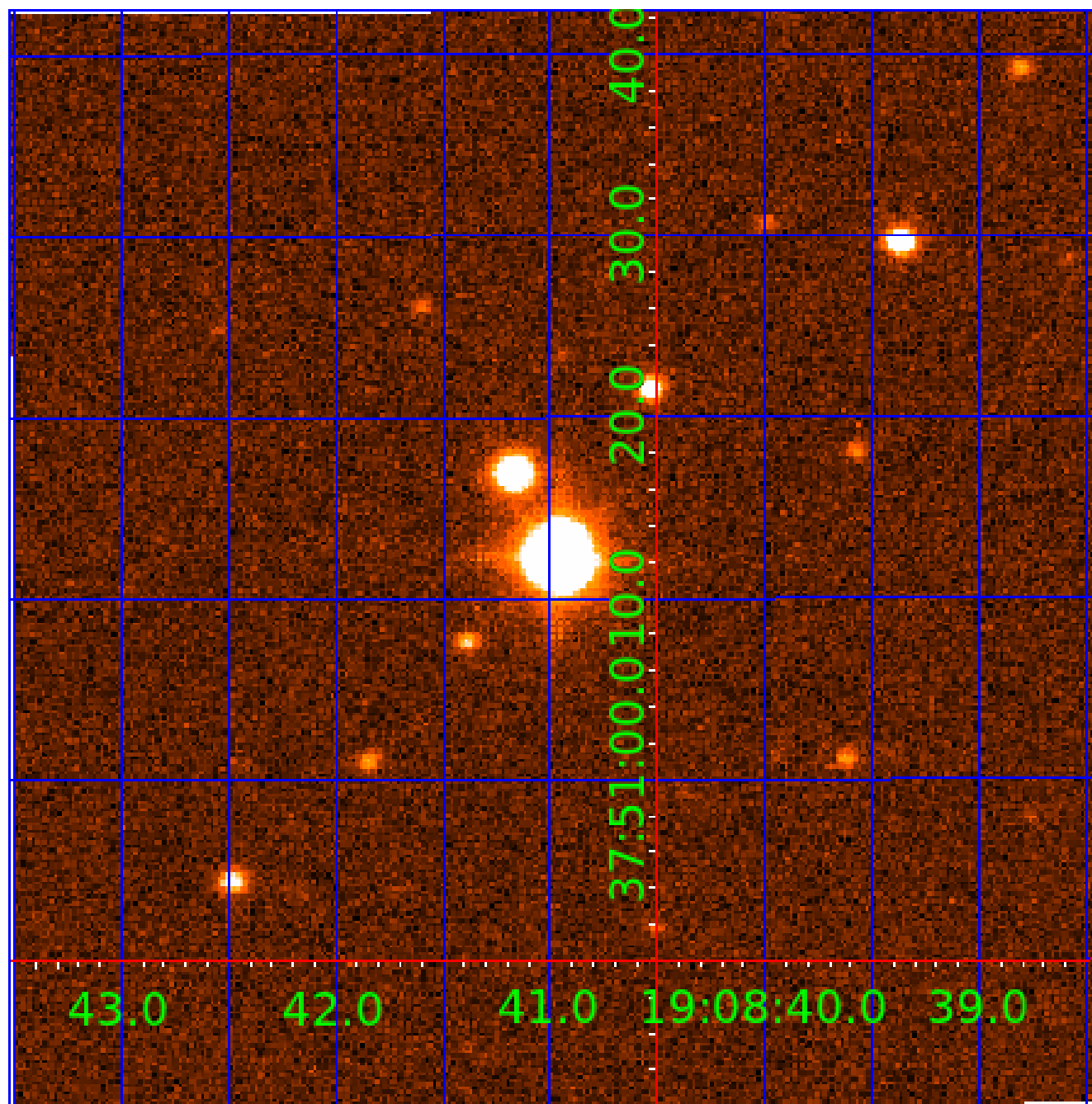


fluxWeightedCentroids, Planet 1 of 4



UKIRT Image

Declination



KIC 002558488

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
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Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
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002558488-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS
002558488-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—HALO_GHOST
002558488-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_ALT

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

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

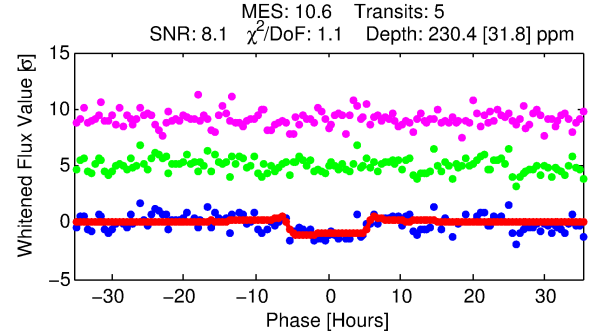
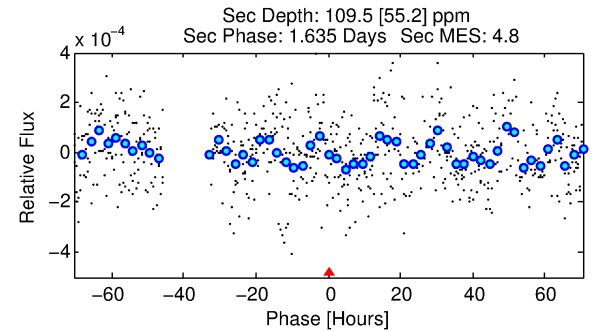
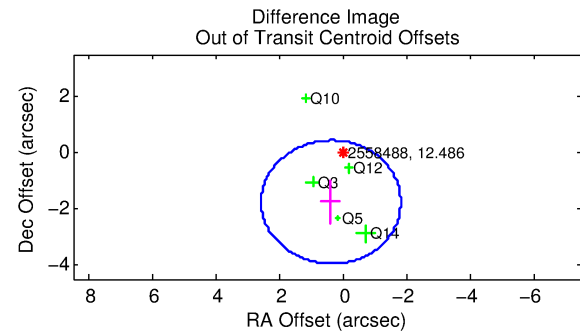
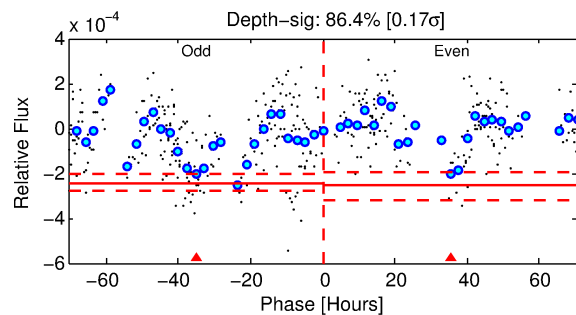
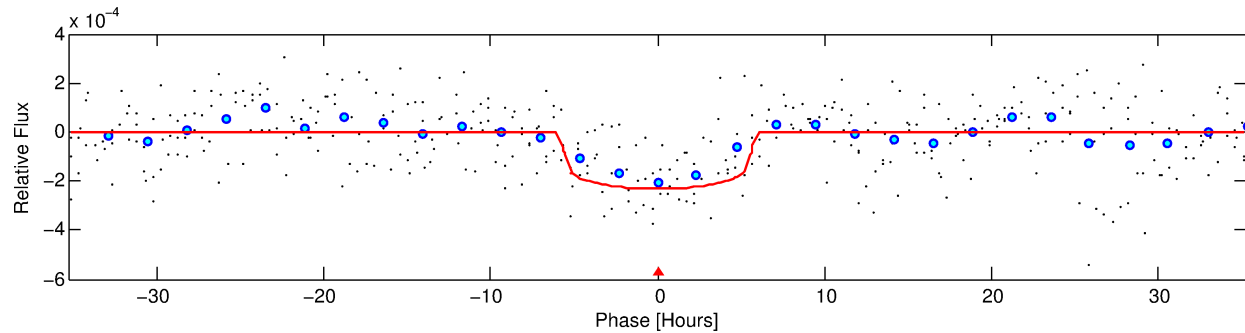
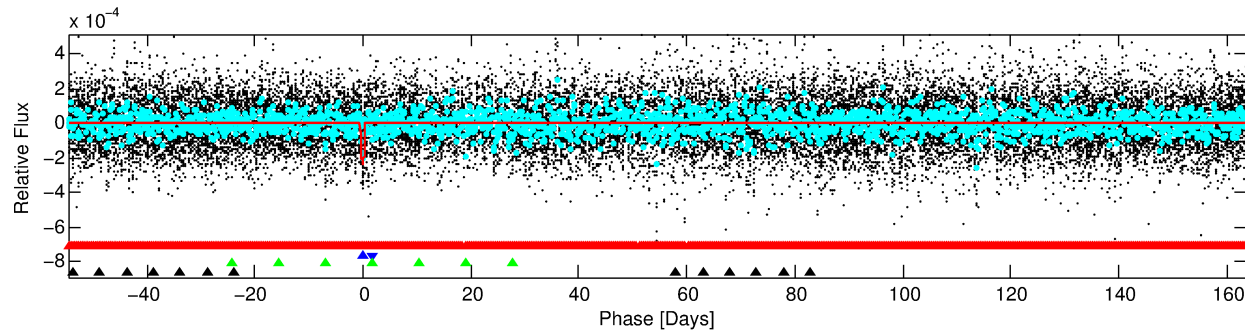
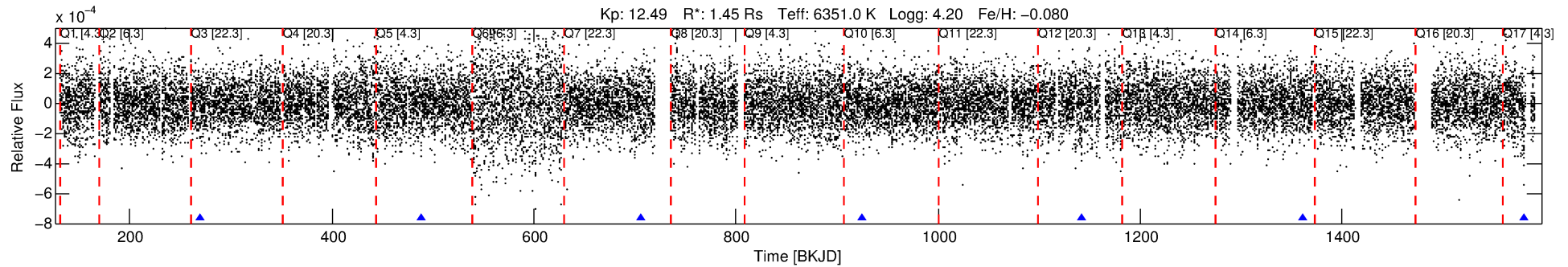
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002558488-02

No Significant Match Found

DV One-Page Summary

KIC: 2558488 Candidate: 2 of 4 Period: 218.210 d



DV Fit Results:

Period = 218.20979 [0.00390] d
Epoch = 269.9213 [0.0164] BKJD
Rp/R* = 0.0154 [0.0063]
a/R* = 89.14 [190.64]
b = 0.80 [0.99]
Seff = 5.39 [2.05]
Teq = 388 [37] K
Rp = 2.43 [1.24] Re
a = 0.7543 [0.1864] AU
Ag = 5805.49 [5958.72] [0.97 σ]
Teffp = 5243 [1281] K [3.79 σ]

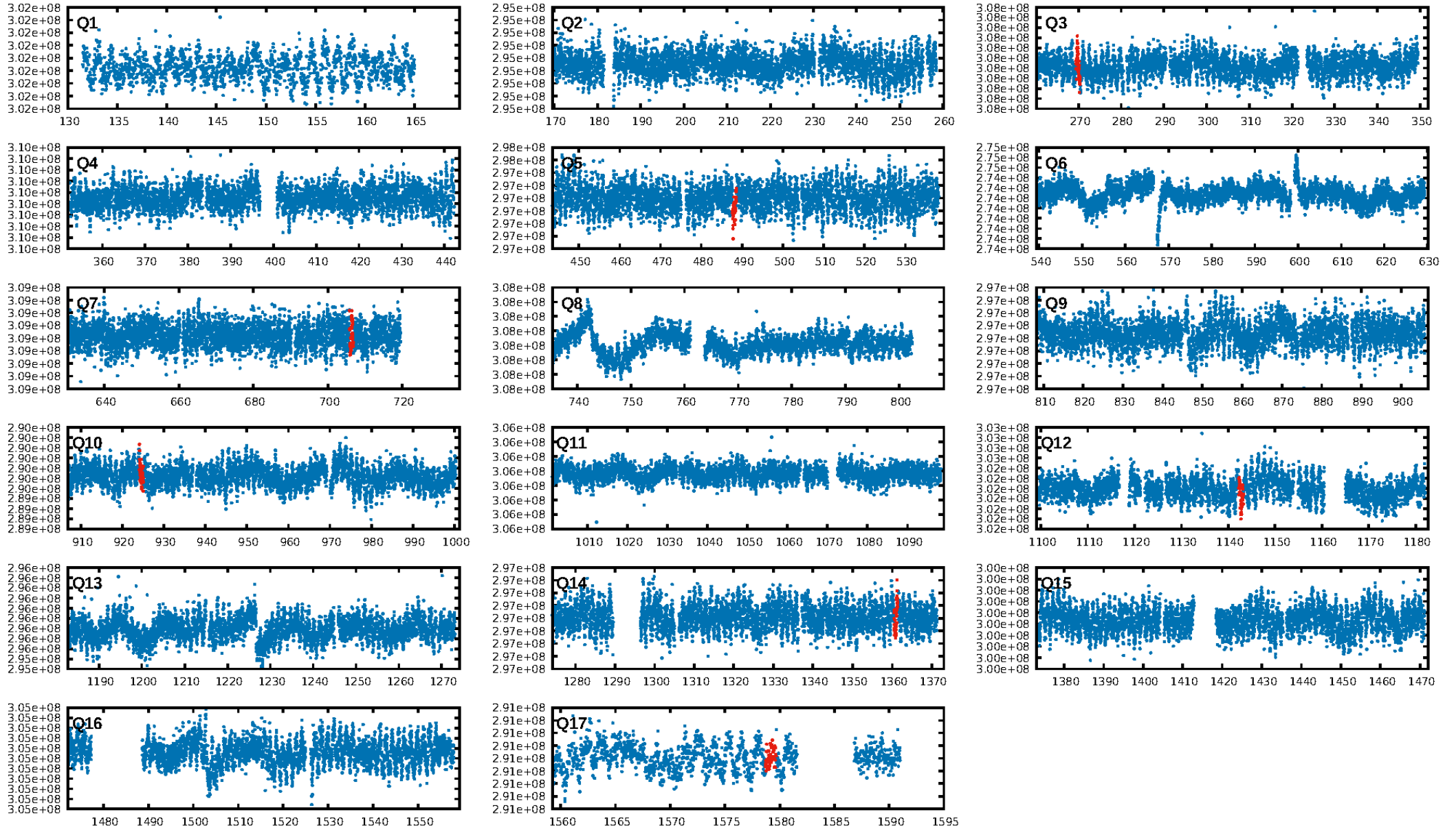
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [16.03 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.9%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 5.45e-19
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 52.43
Centroid-sig: 30.6%
Centroid-so: 0.378 arcsec [0.69 σ]
OotOffset-rm: 1.805 arcsec [2.46 σ]
KicOffset-rm: 1.709 arcsec [2.78 σ]
OotOffset-st: 2/1/1/1 [5]
KicOffset-st: 2/1/1/1 [5]
DiffImageQuality-fgm: 0.80 [4/5]
DiffImageOverlap-fno: 0.00 [0/7]

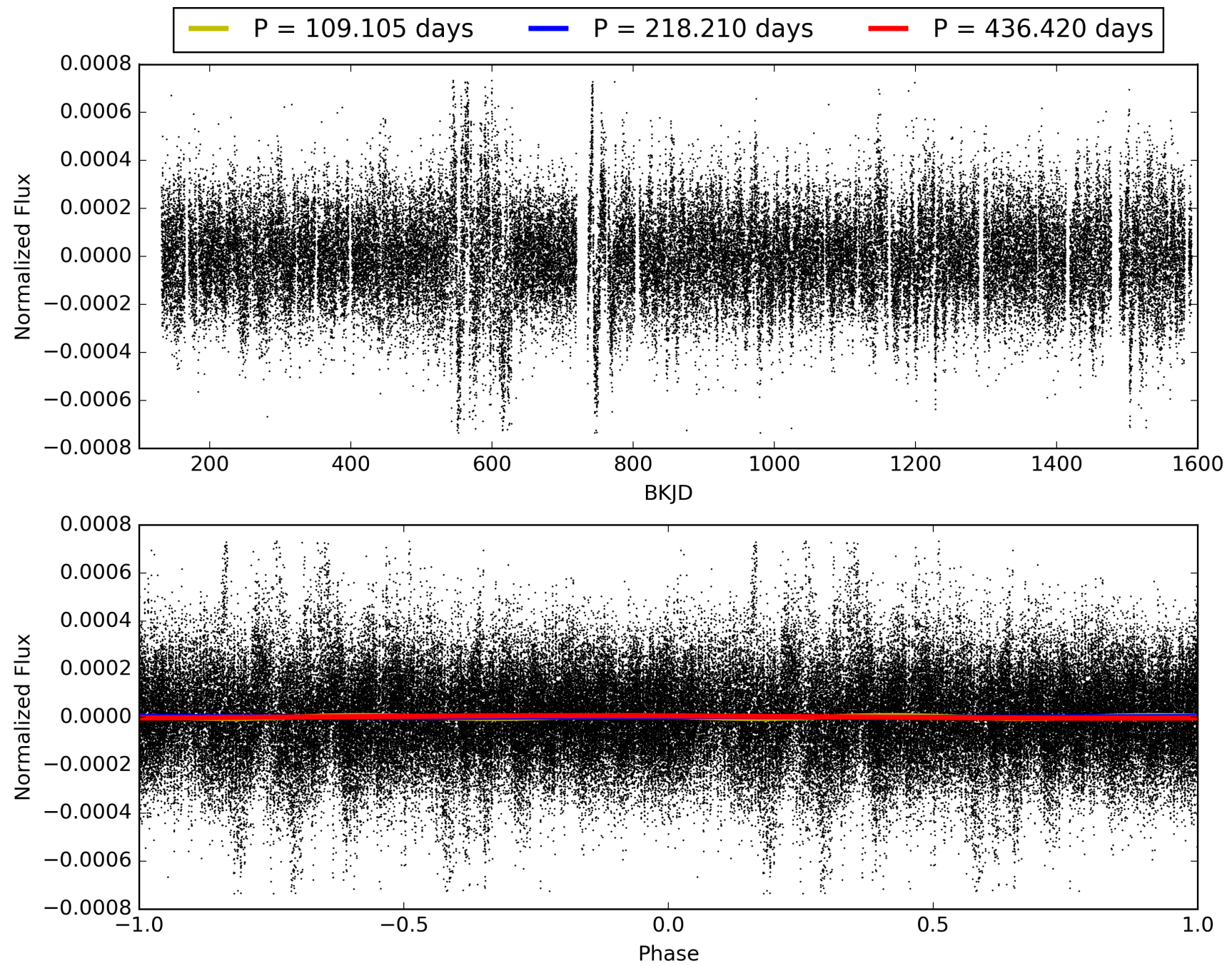
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 09:06:53 Z

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

TCE 002558488-02, PDC Light Curves

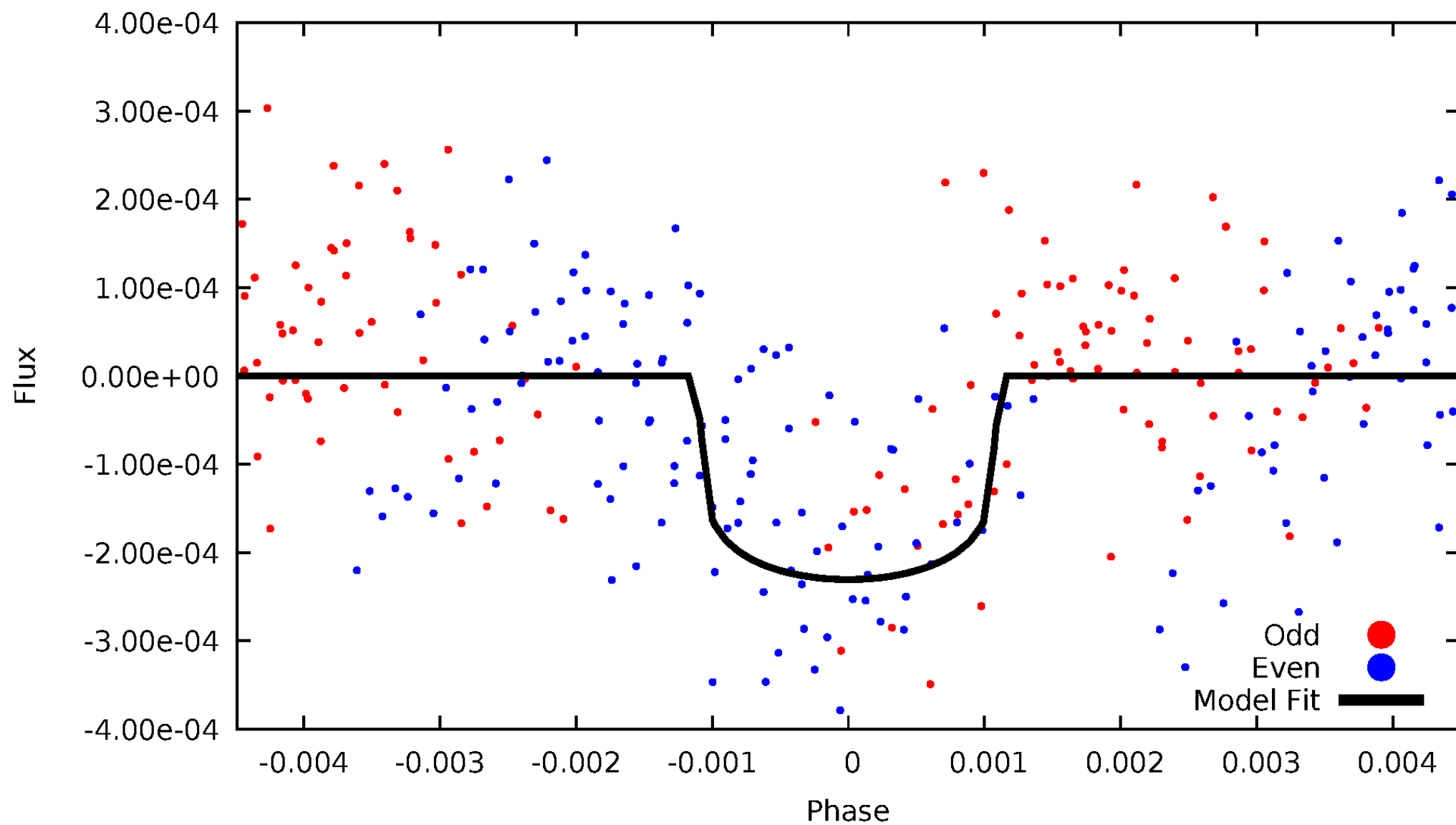


TCE 002558488-02



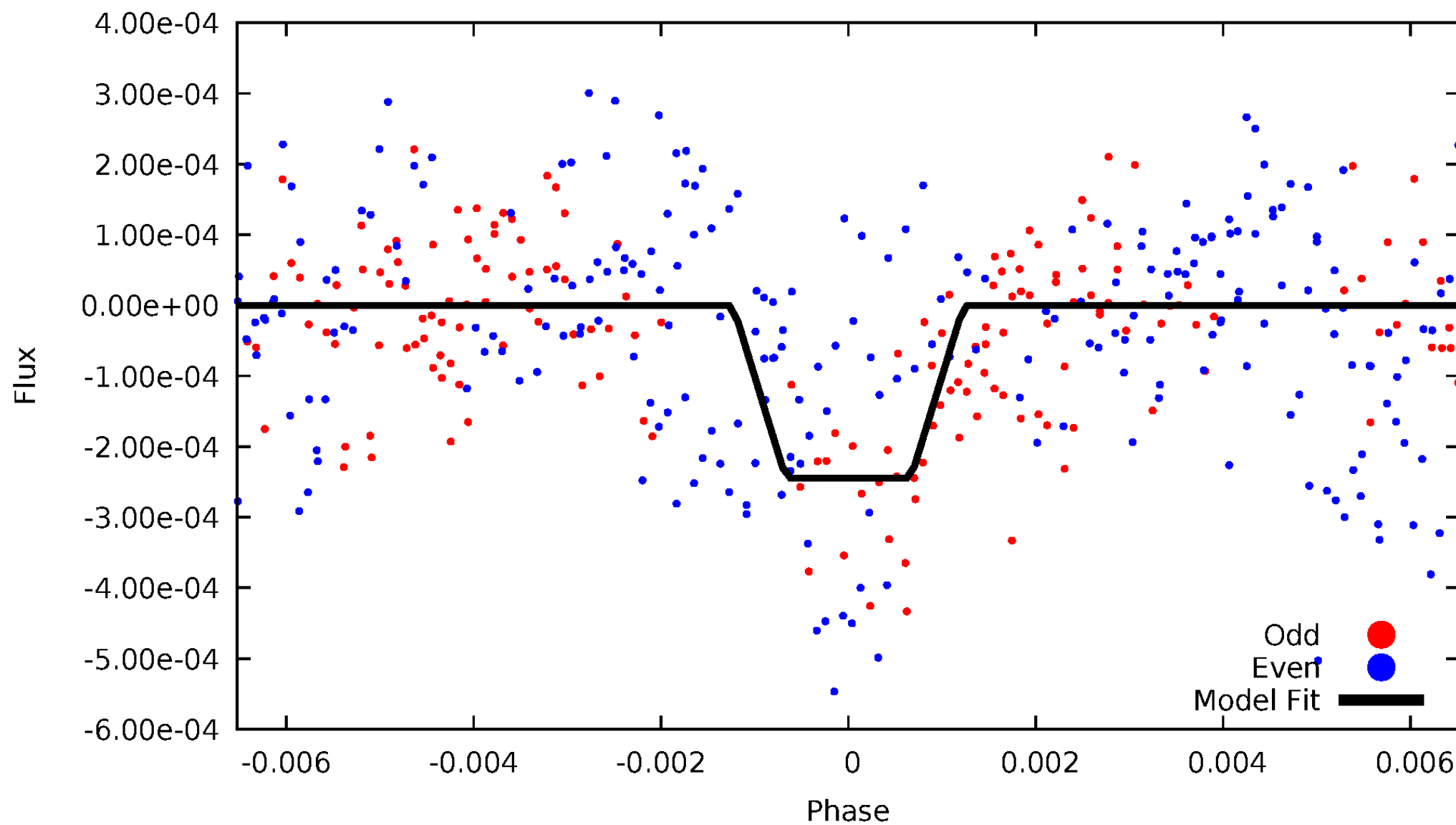
DV Odd/Even

TCE 002558488-02



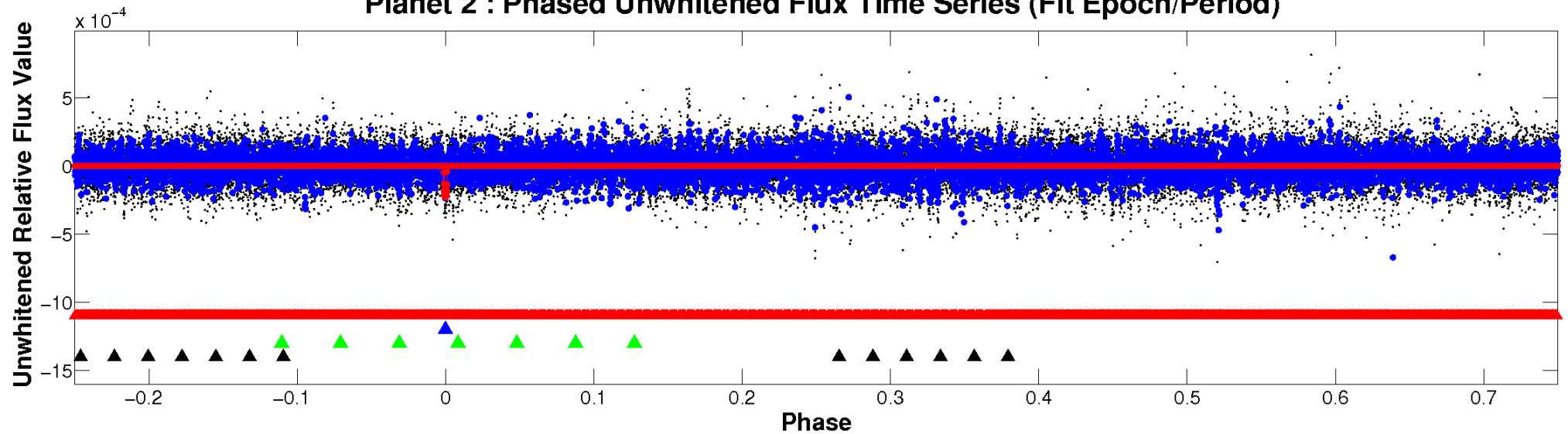
ALT Odd/Even

TCE 002558488-02

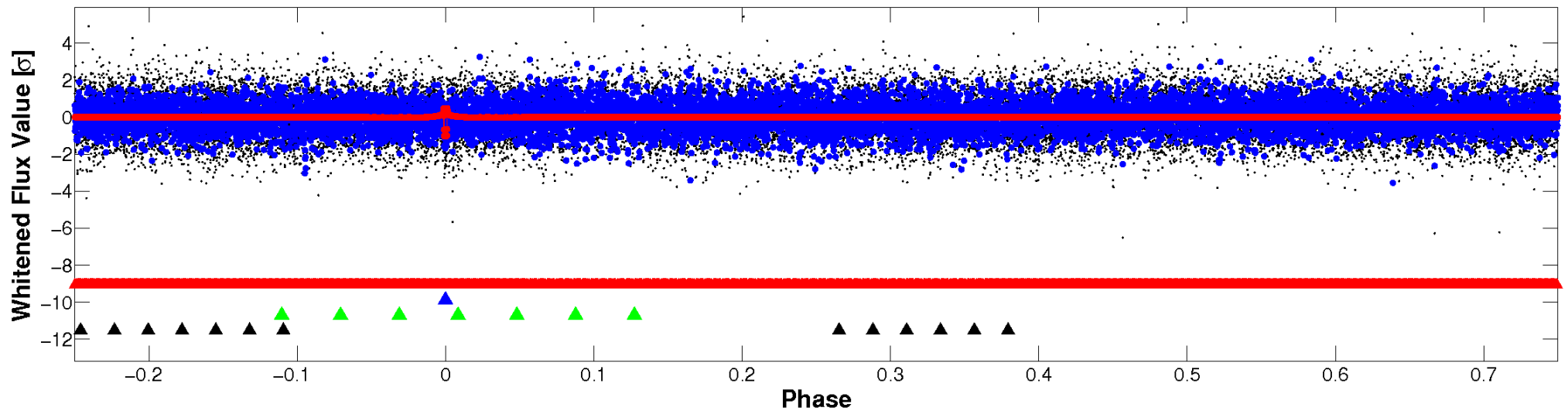


Non-Whitened Vs. Whitened Light Curve

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

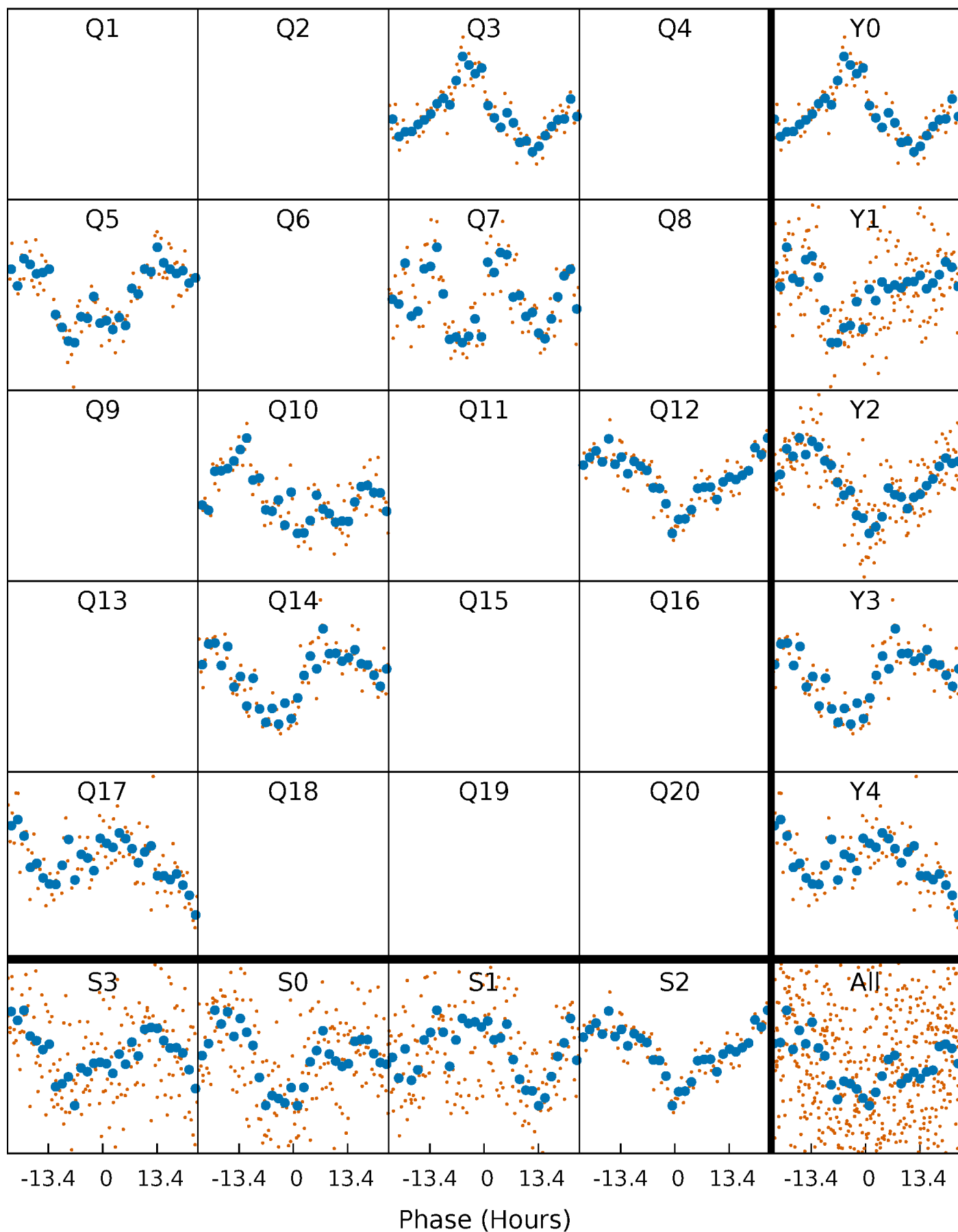


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



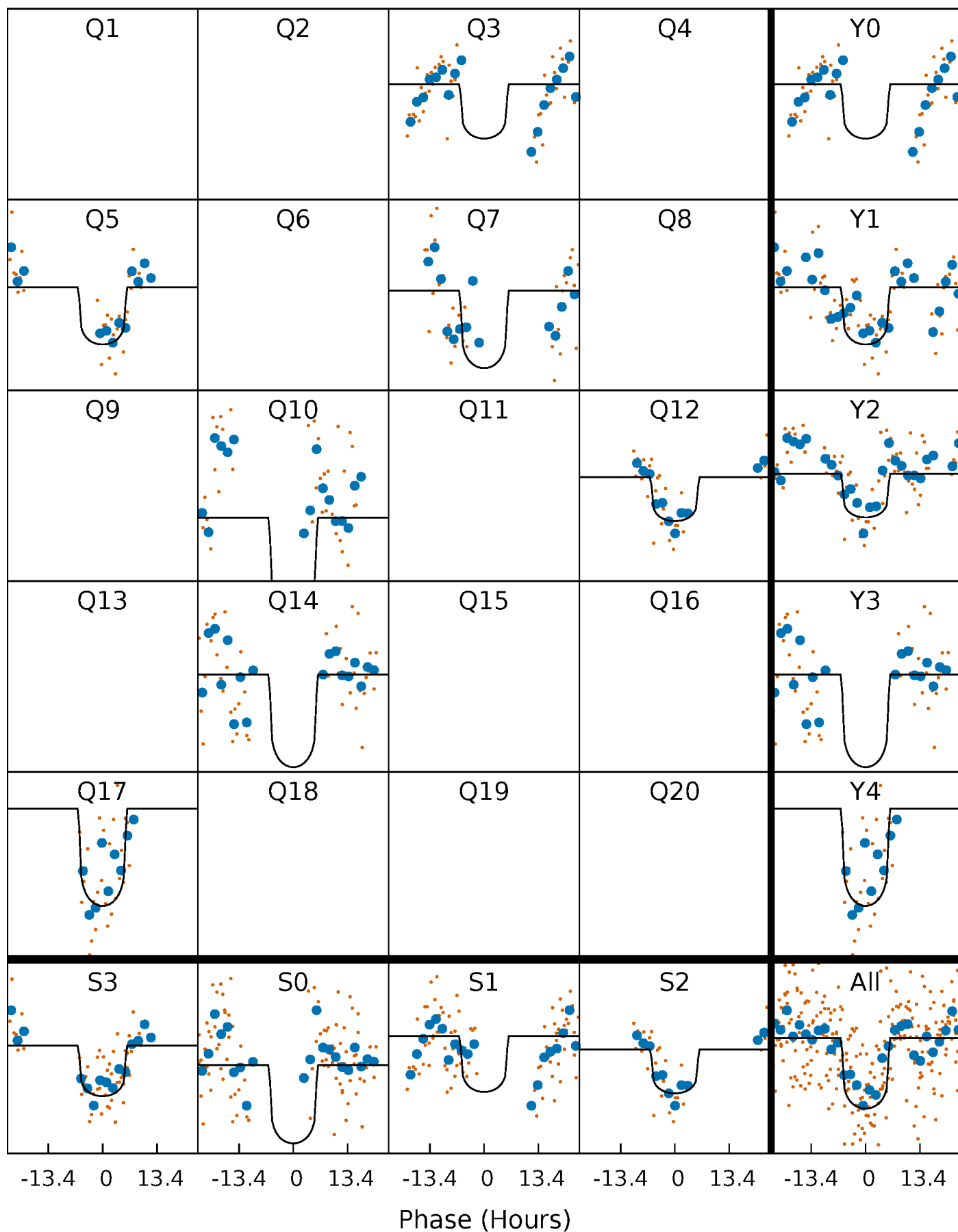
PDC Quarter-Phased Transit Curves

TCE 002558488-02 $P=218.209786$ Days $T_0=269.921343$ (BKJD)



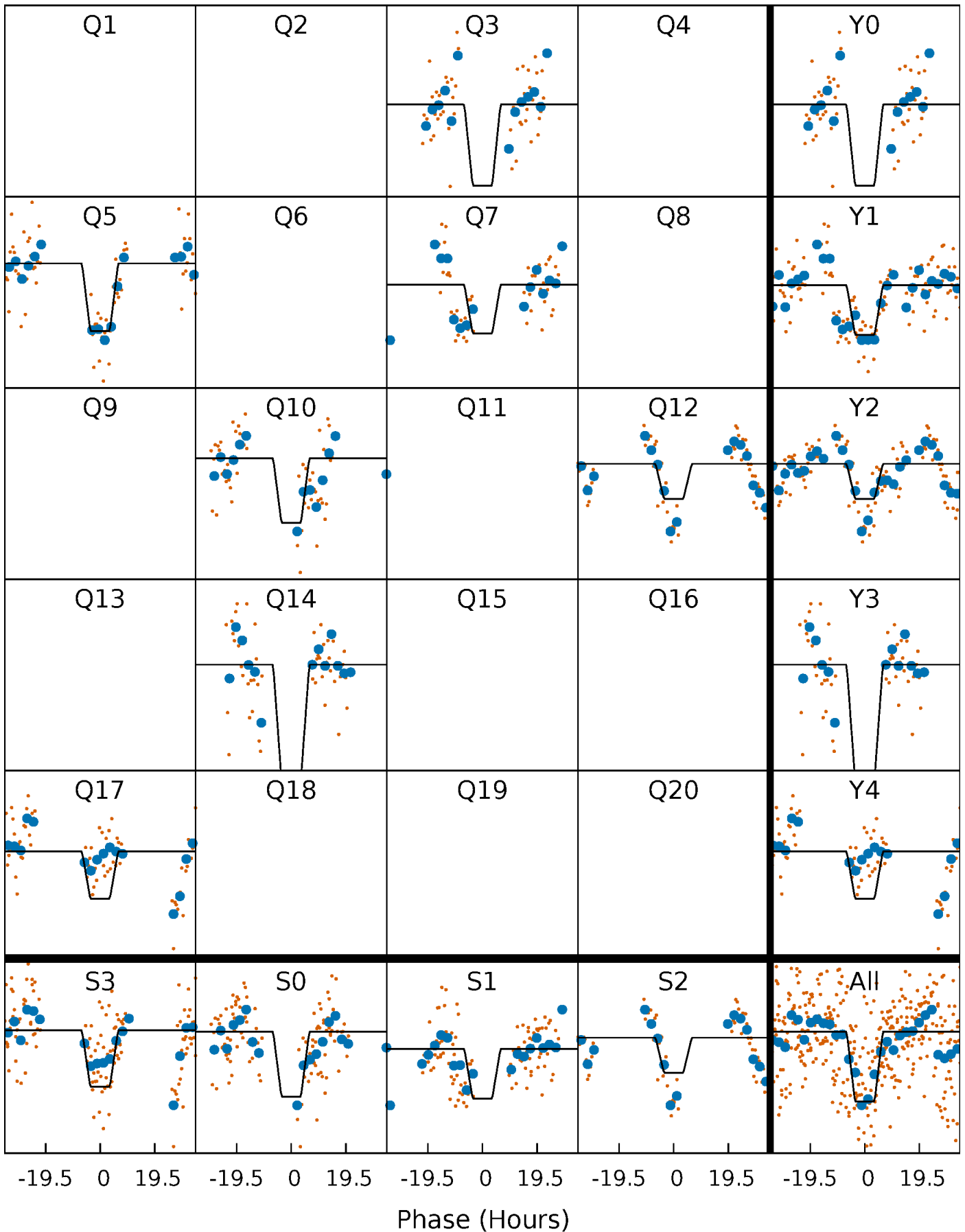
DV Quarter-Phased Transit Curves

TCE 002558488-02 P=218.209786 Days $T_0=269.921343$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

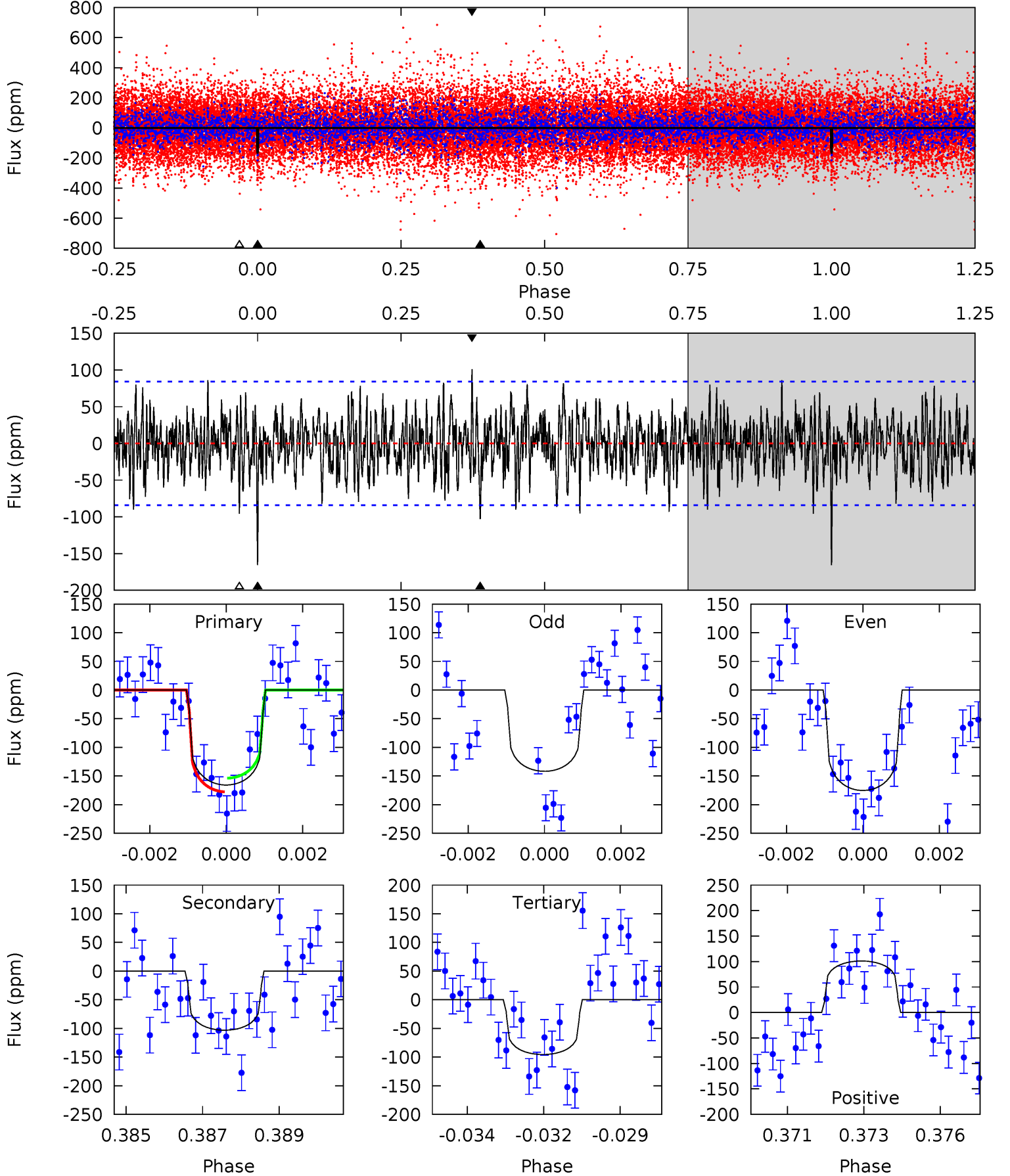
TCE 002558488-02 $P=218.189554$ Days $T_0=270.021774$ (BKJD)



DV Model-Shift Uniqueness Test

002558488-02, $P = 218.209786$ Days, $E = 51.711557$ Days

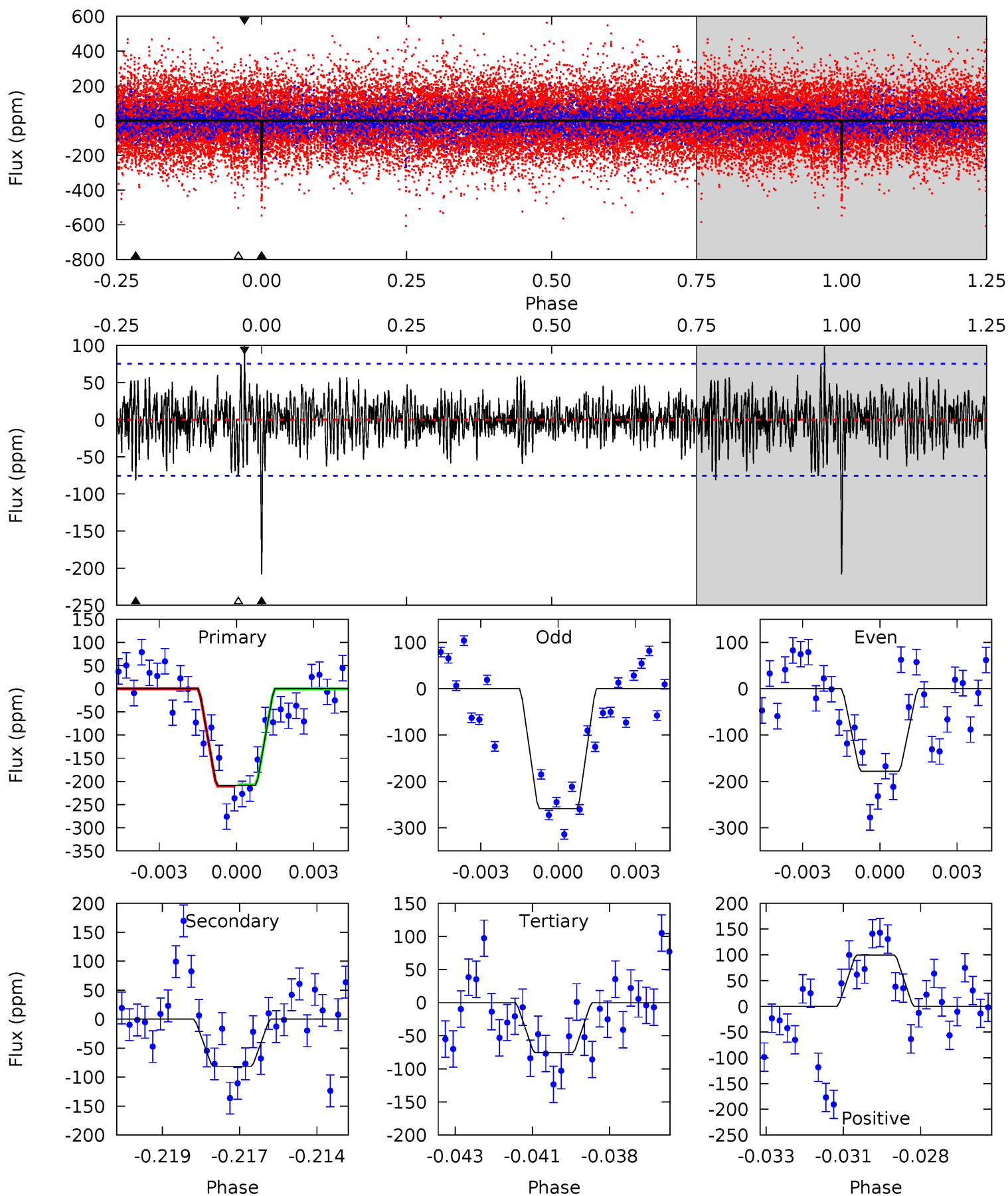
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.4	6.50	6.02	6.37	5.30	3.05	1.90	4.42	4.08	0.48	0.13	0.97	0.67	0.38	0.75



Alt Model-Shift Uniqueness Test

002558488-02, P = 218.189554 Days, E = 51.832220 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.6	5.71	5.30	6.96	5.28	3.02	1.48	9.30	7.64	0.41	-1.25	2.76	0.86	0.32	0.12



Stellar Parameters For KIC 002558488

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6351^{+177}_{-243}	$4.195^{+0.185}_{-0.185}$	$-0.080^{+0.250}_{-0.300}$	$1.450^{+0.440}_{-0.360}$	$1.203^{+0.177}_{-0.194}$	$0.555^{+0.600}_{-0.266}$
	+3%/-4%	+4%/-4%	+312%/-375%	+30%/-25%	+15%/-16%	+108%/-48%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 002558488-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-103 ± 16	$2.47^{+1.11}_{-1.02}$	542^{+44}_{-41}	5174^{+1396}_{-726}	5287^{+9153}_{-2815}
Alt.	-82 ± 14	$2.48^{+1.18}_{-1.04}$	542^{+43}_{-39}	4885^{+1341}_{-625}	4098^{+8542}_{-2222}

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

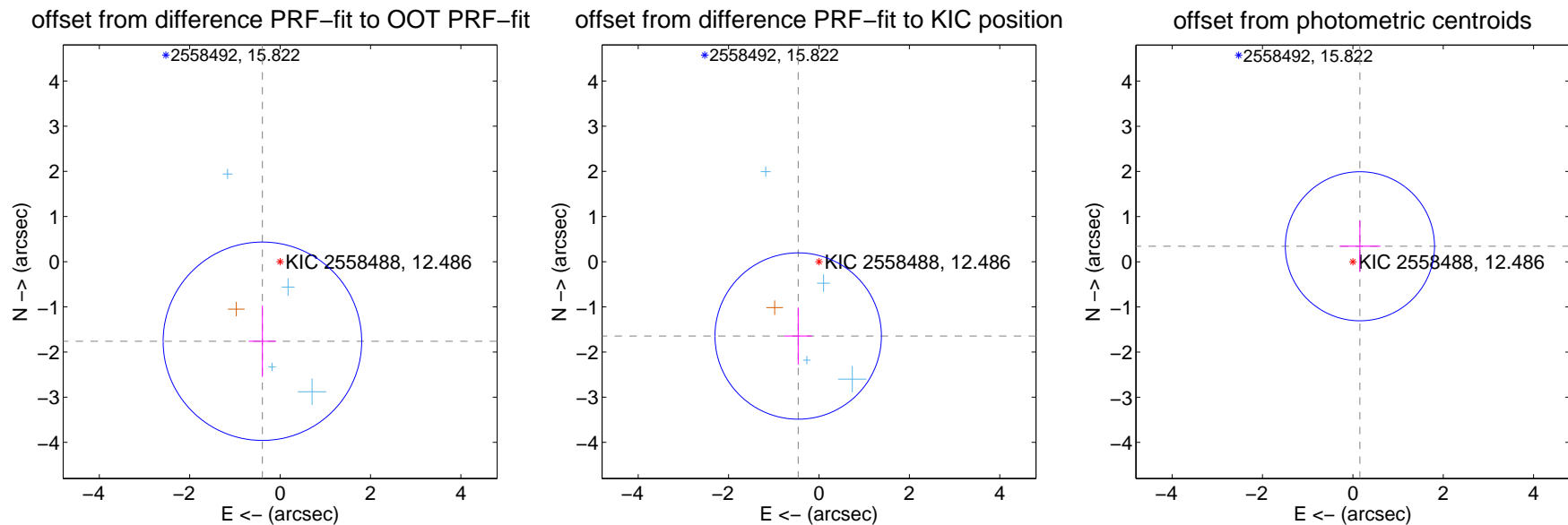
DV Centroid Data

Supplemental centroid analysis for 002558488-02. Kepler magnitude: 12.49. Transit SNR 8.15

There are 4 quarters with good PRF difference image offsets

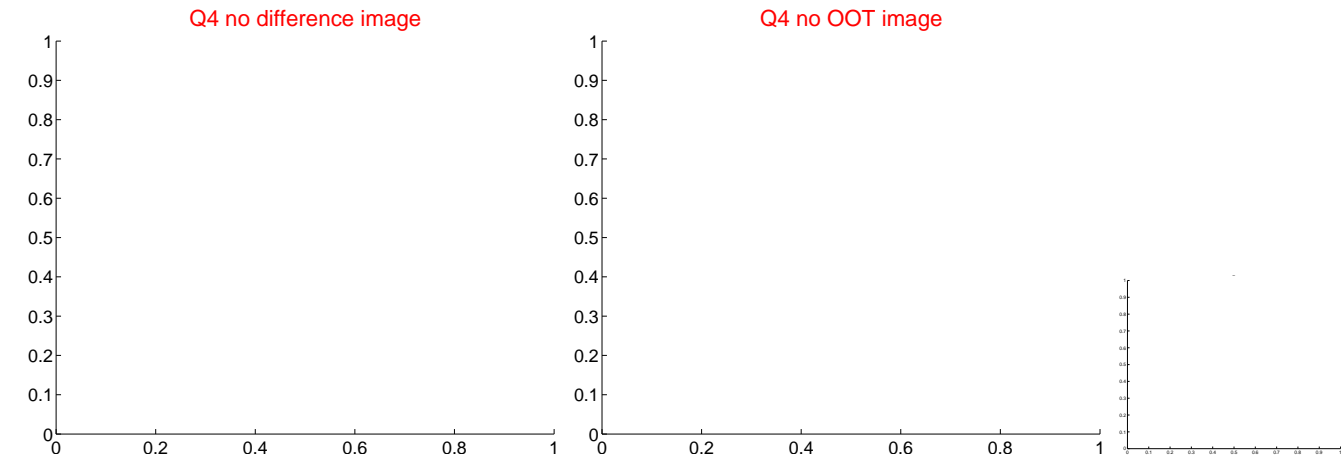
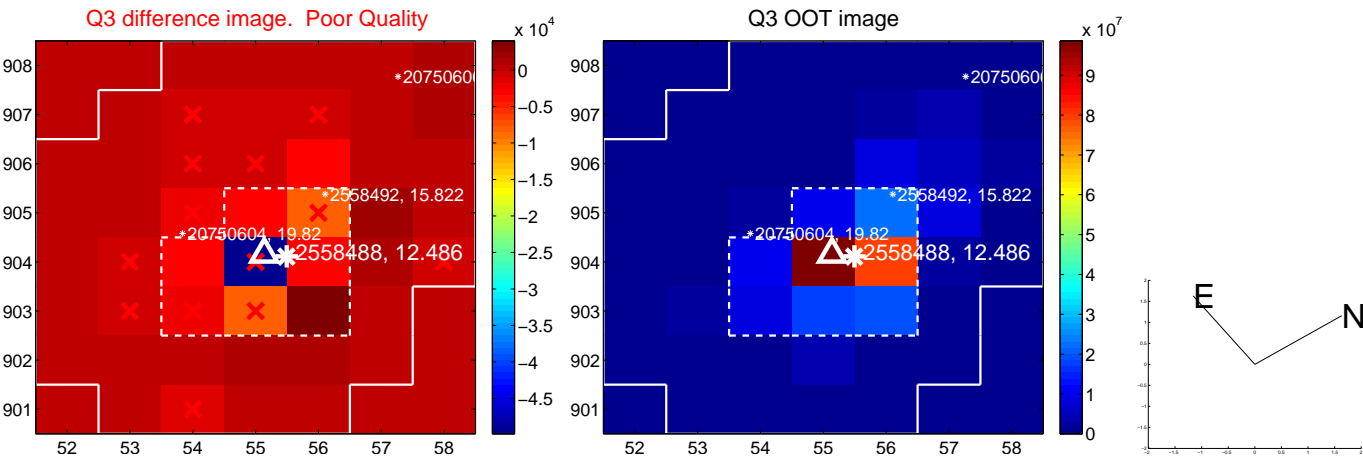
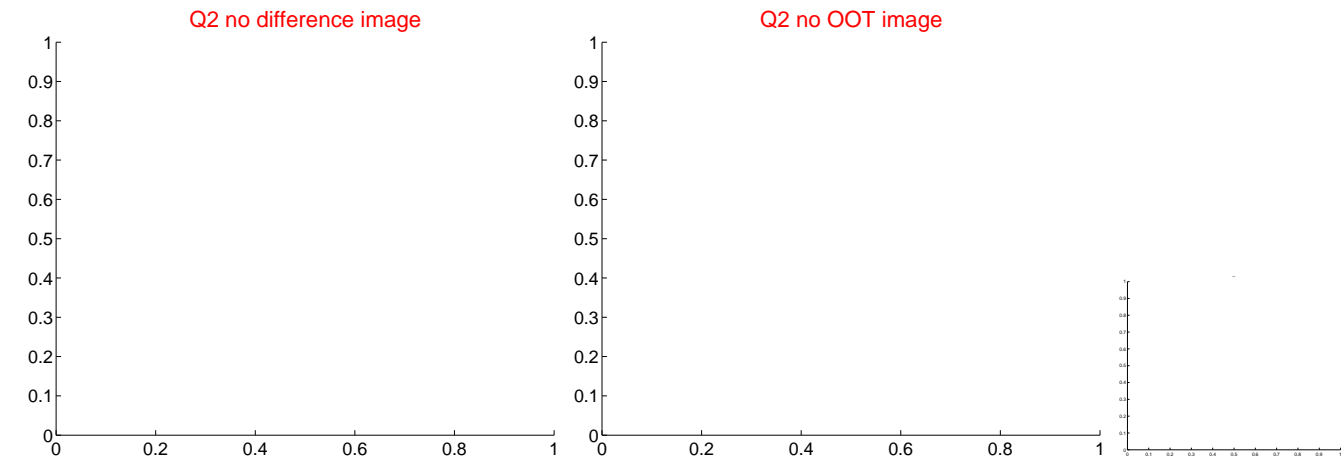
The direct PRF centroid is offset from the target star catalog position by about 0.28 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.805 ± 0.732	2.46	0.392 ± 0.303	-1.762 ± 0.790
PRF-fit source offset from KIC position	1.709 ± 0.614	2.78	0.460 ± 0.305	-1.646 ± 0.632
photometric centroid source offset	0.38 ± 0.55	0.69	-0.16 ± 0.45	0.34 ± 0.57

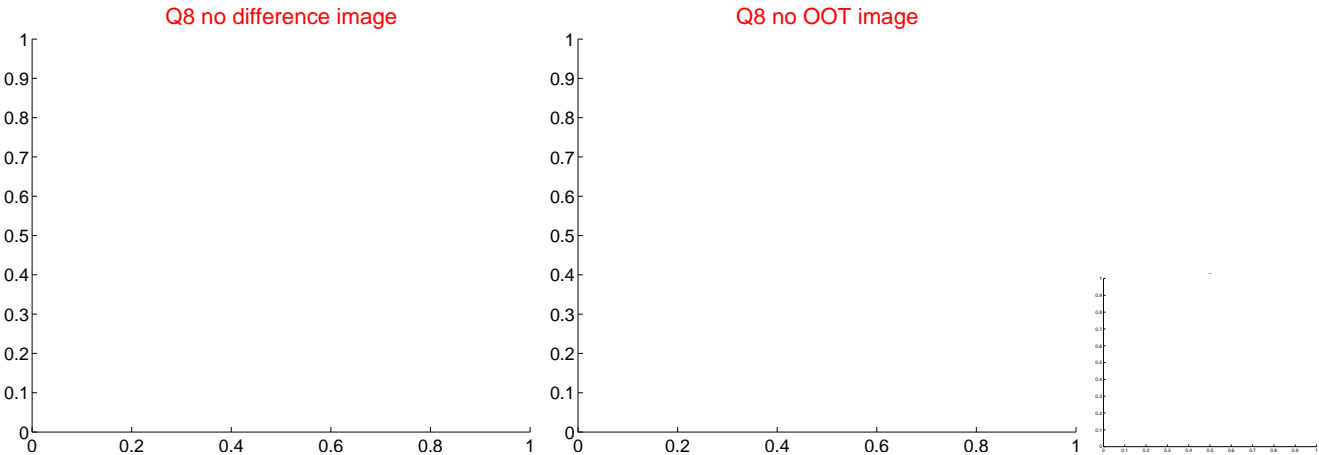
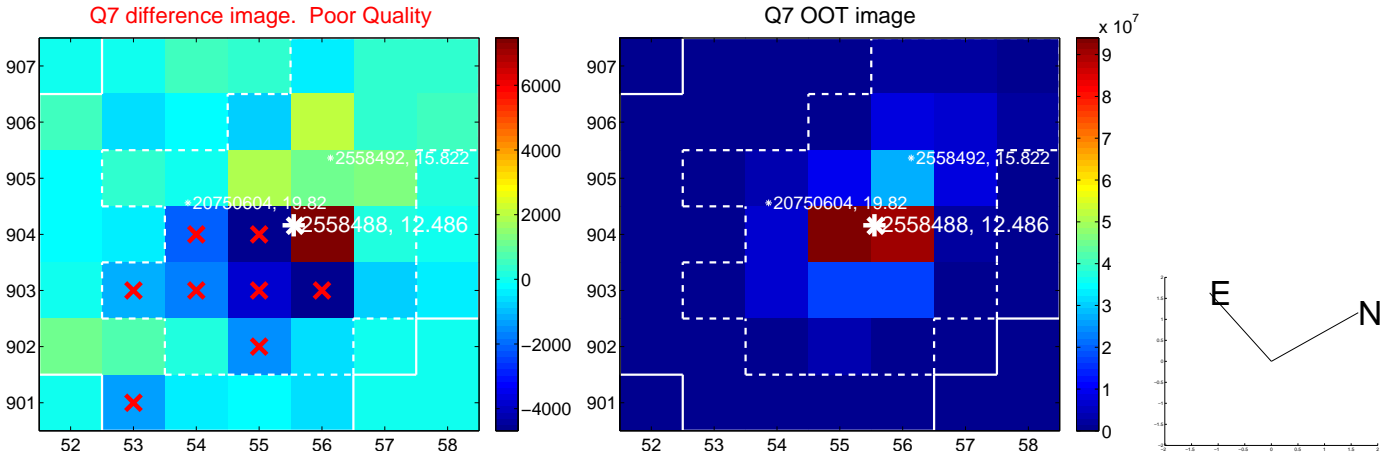
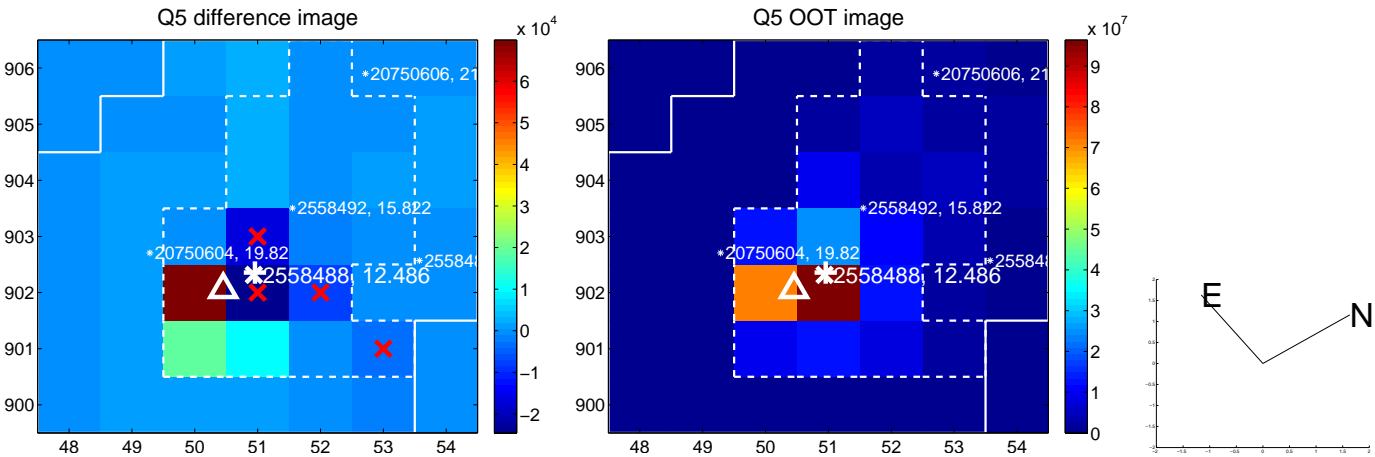


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

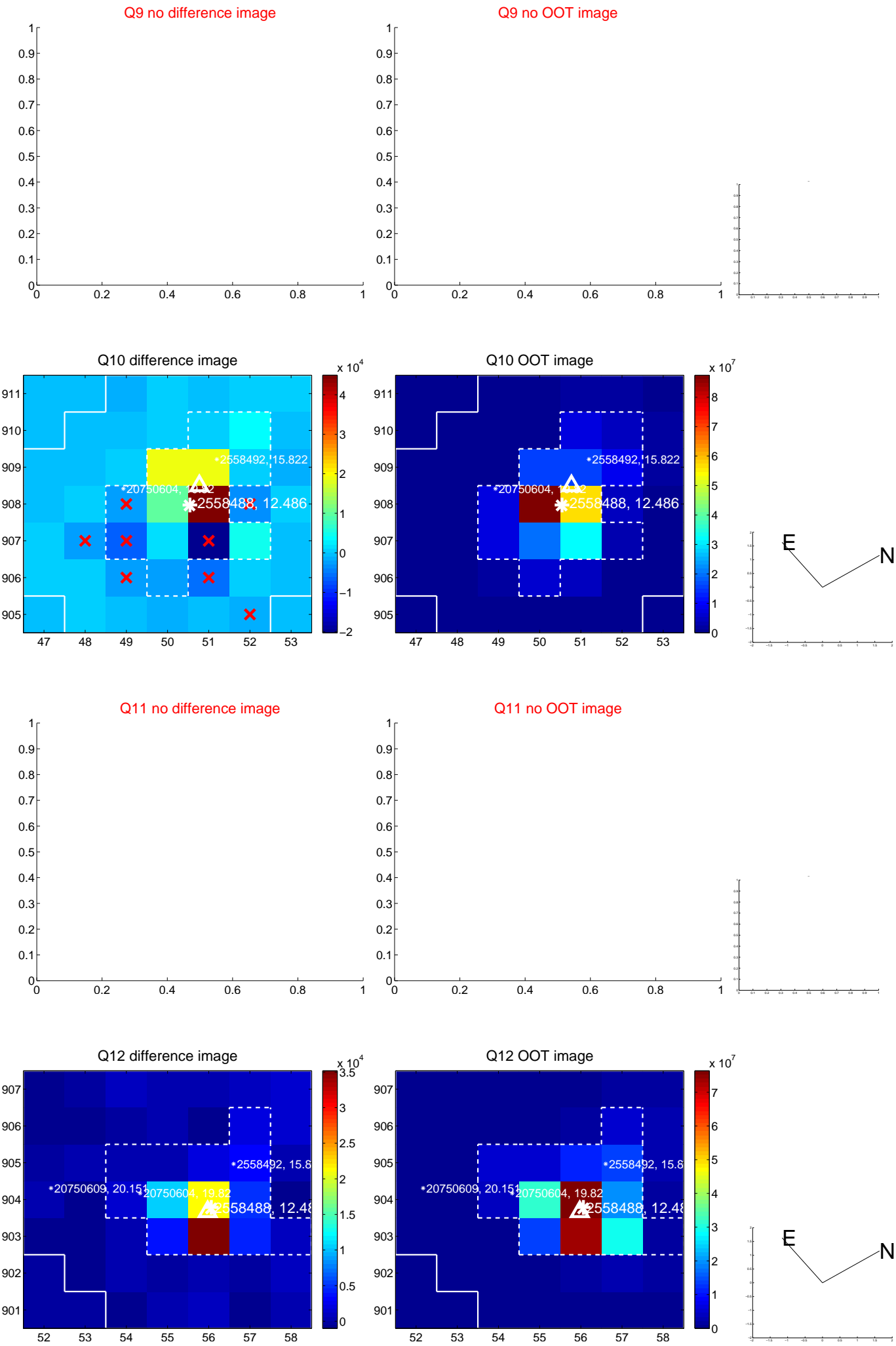
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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.

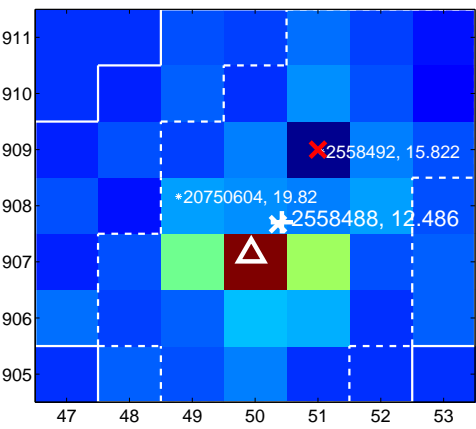
Q13 no difference image



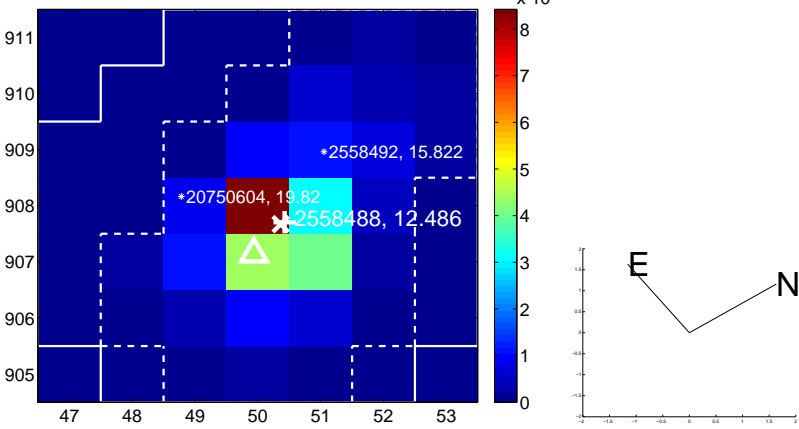
Q13 no OOT image



Q14 difference image



Q14 OOT image



Q15 no difference image



Q15 no OOT image



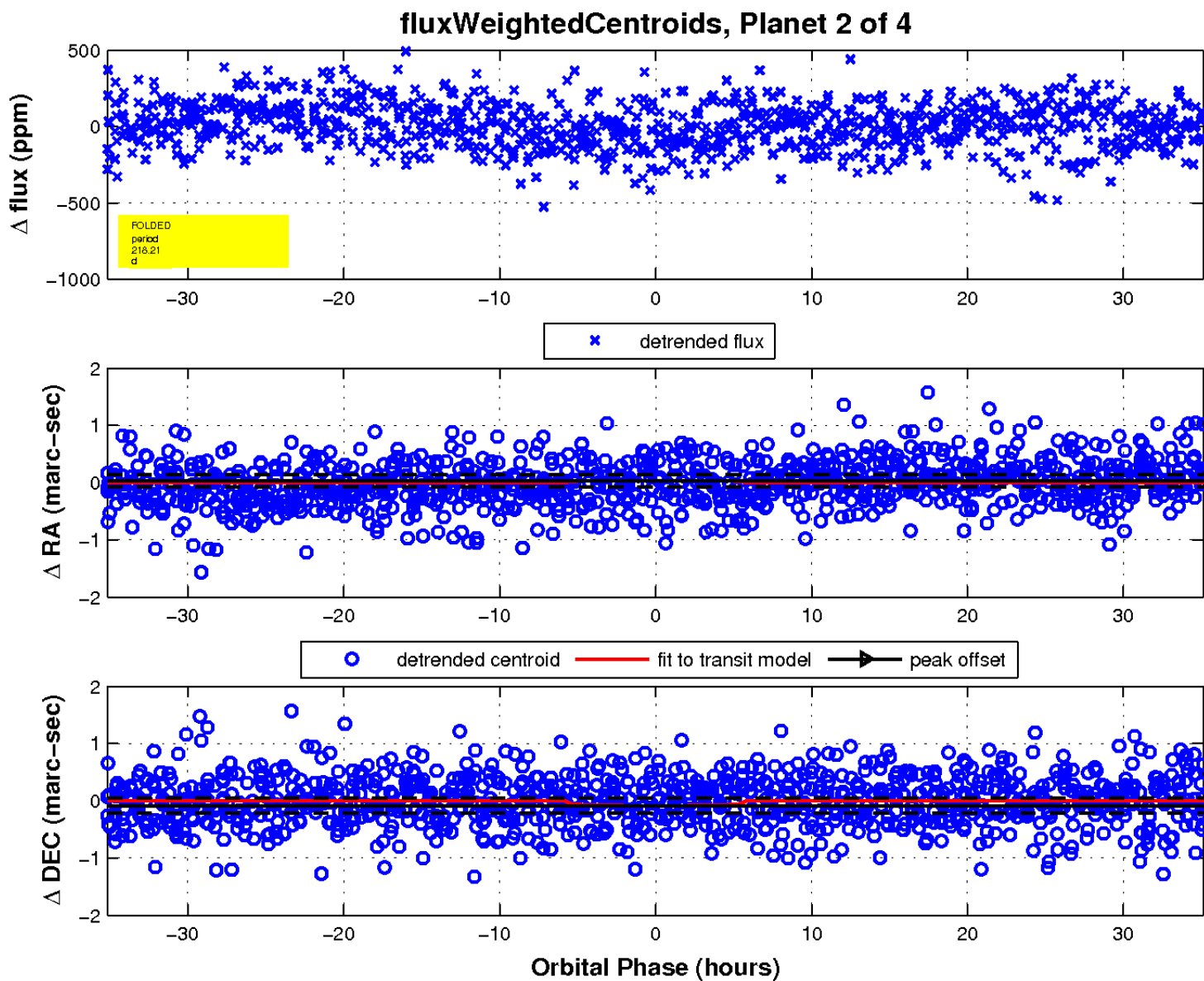
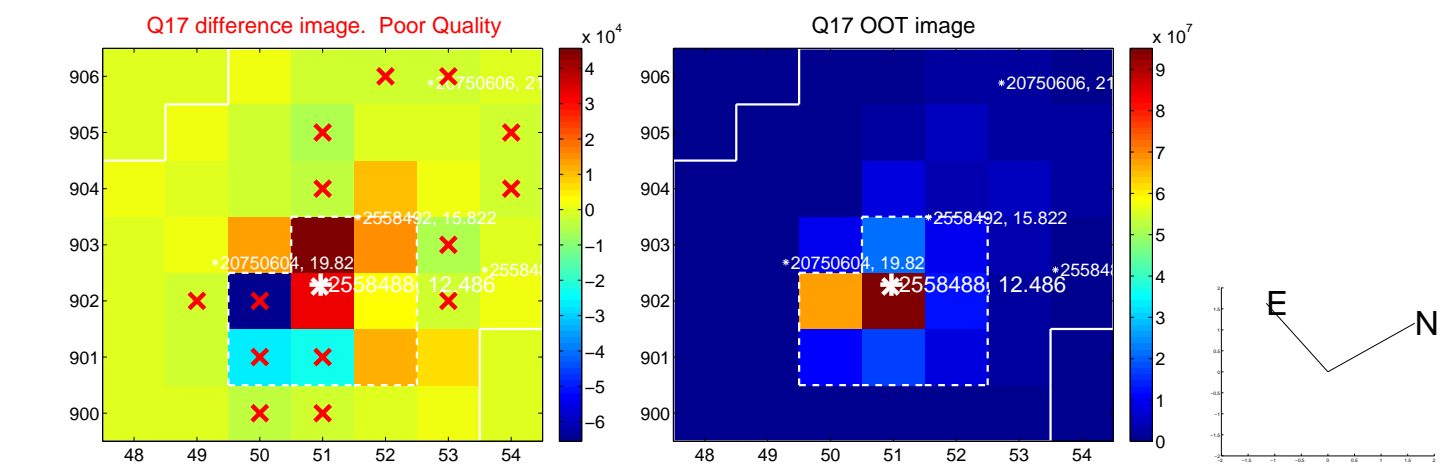
Q16 no difference image



Q16 no OOT image

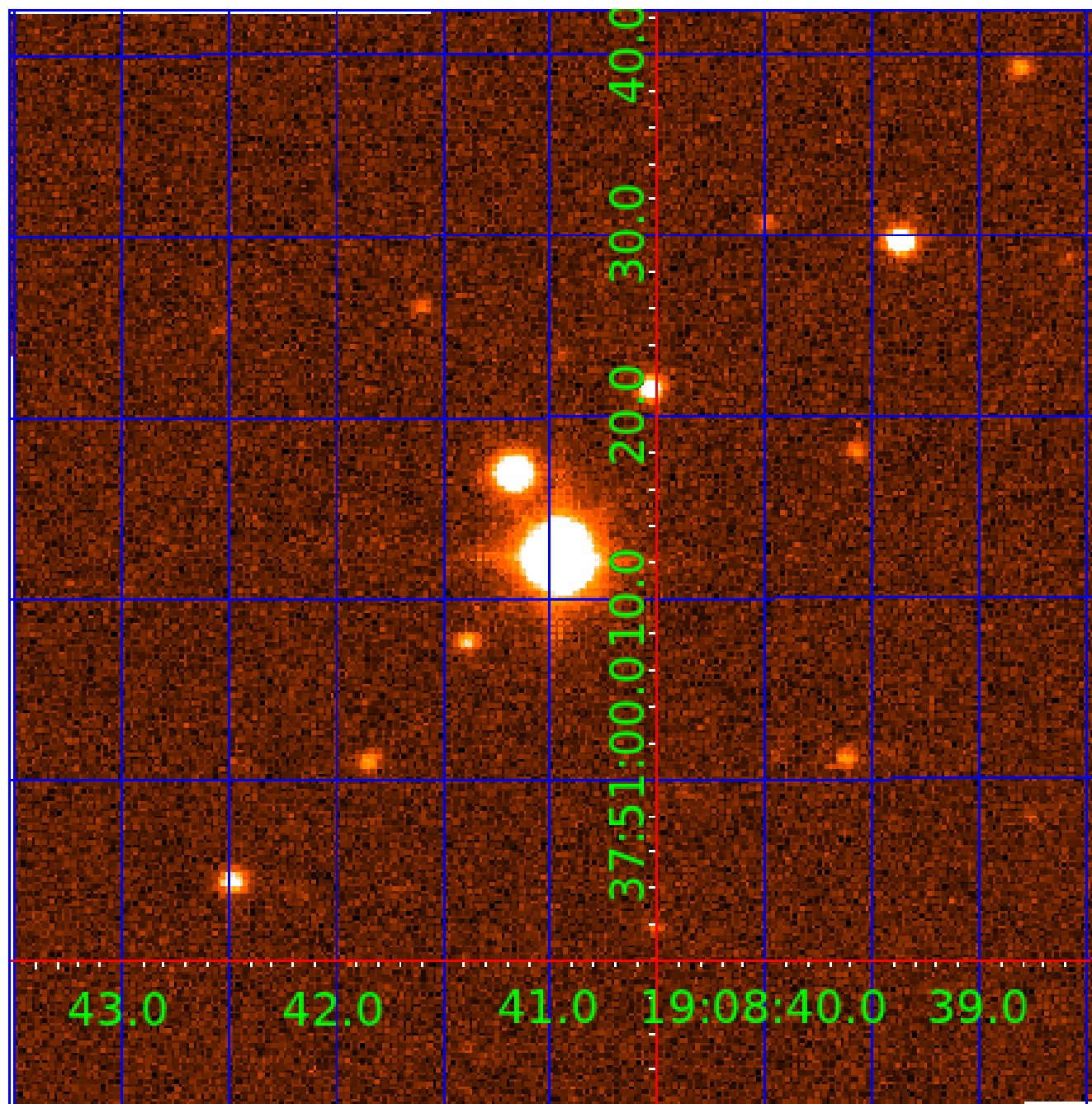


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 002558488

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})
002558488-01	OBS	No	1.287919	132.239601	23.8	5.726	11.1	11.3	1.45	6351	0.83	5050.37
002558488-02	OBS	No	218.209786	269.921343	230.4	11.757	10.6	8.1	1.45	6351	2.43	5.39
002558488-03	OBS	No	209.562649	297.716272	209.0	5.429	7.8	7.2	1.45	6351	2.32	5.68
002558488-04	OBS	No	111.590724	216.243210	241.0	4.492	7.5	8.2	1.45	6351	2.56	13.17

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002558488-01	OBS	FP	0.00	1	0	0	0	LPP_DV
002558488-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS
002558488-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—HALO_GHOST
002558488-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_ALT

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

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

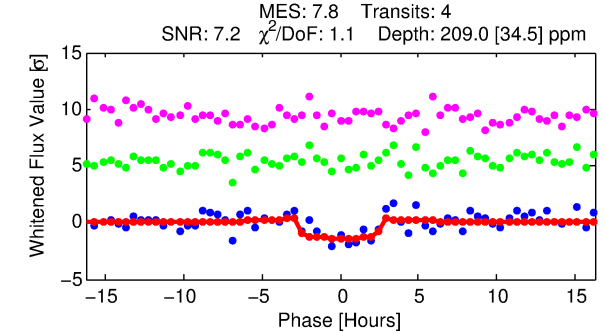
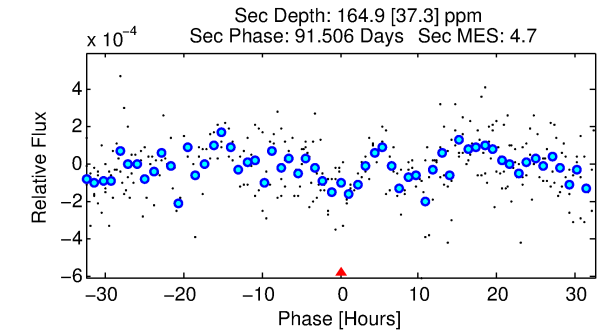
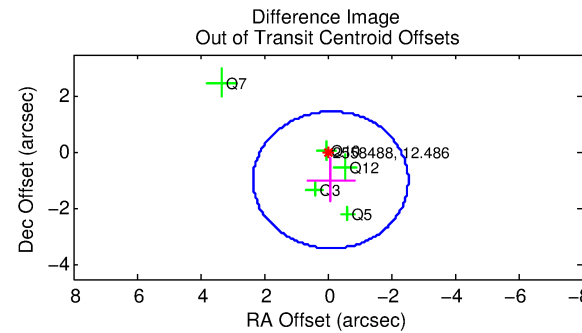
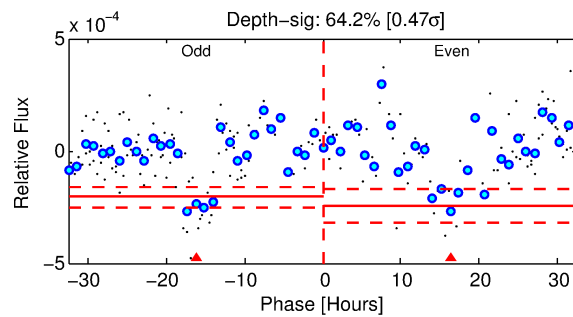
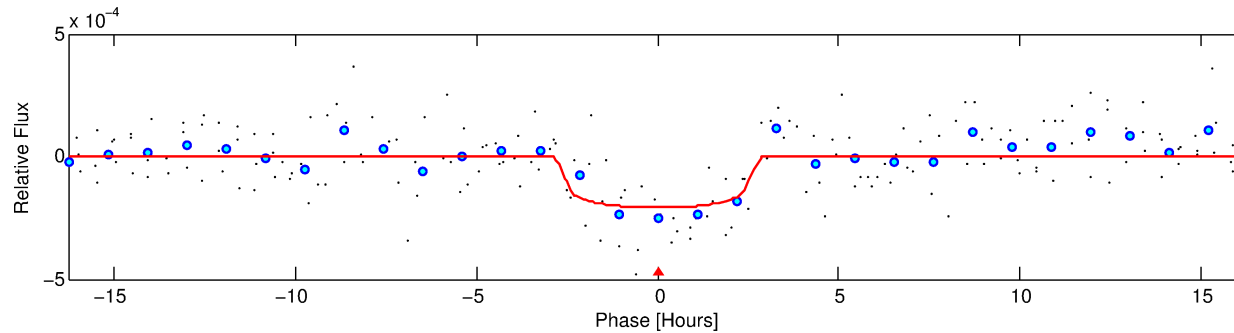
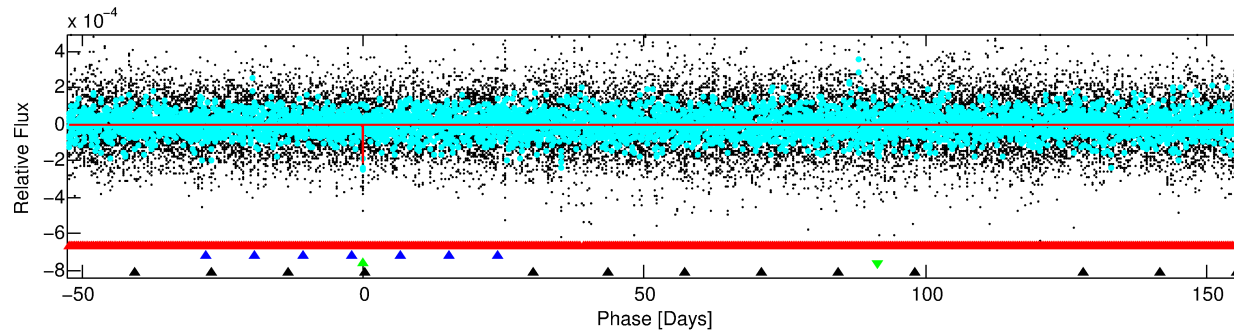
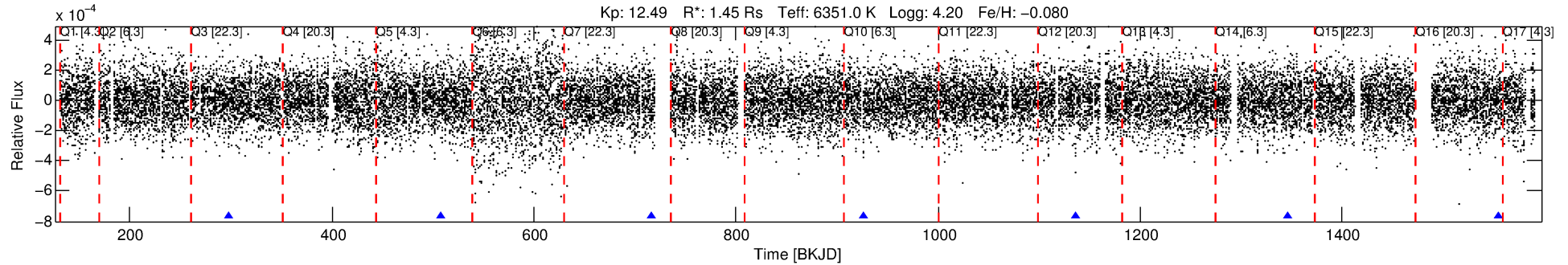
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002558488-03

No Significant Match Found

DV One-Page Summary

KIC: 2558488 Candidate: 3 of 4 Period: 209.563 d



DV Fit Results:

Period = 209.56265 [0.00376] d
Epoch = 297.7163 [0.0109] BKJD
Rp/R* = 0.0147 [0.0090]
a/R* = 181.24 [588.55]
b = 0.81 [1.40]
Seff = 5.69 [2.16]
Teq = 394 [37] K
Rp = 2.32 [1.59] Re
a = 0.7342 [0.1815] AU
Ag = 9054.04 [11696.81] [0.77 σ]
Teffp = 5938 [1861] K [2.98 σ]

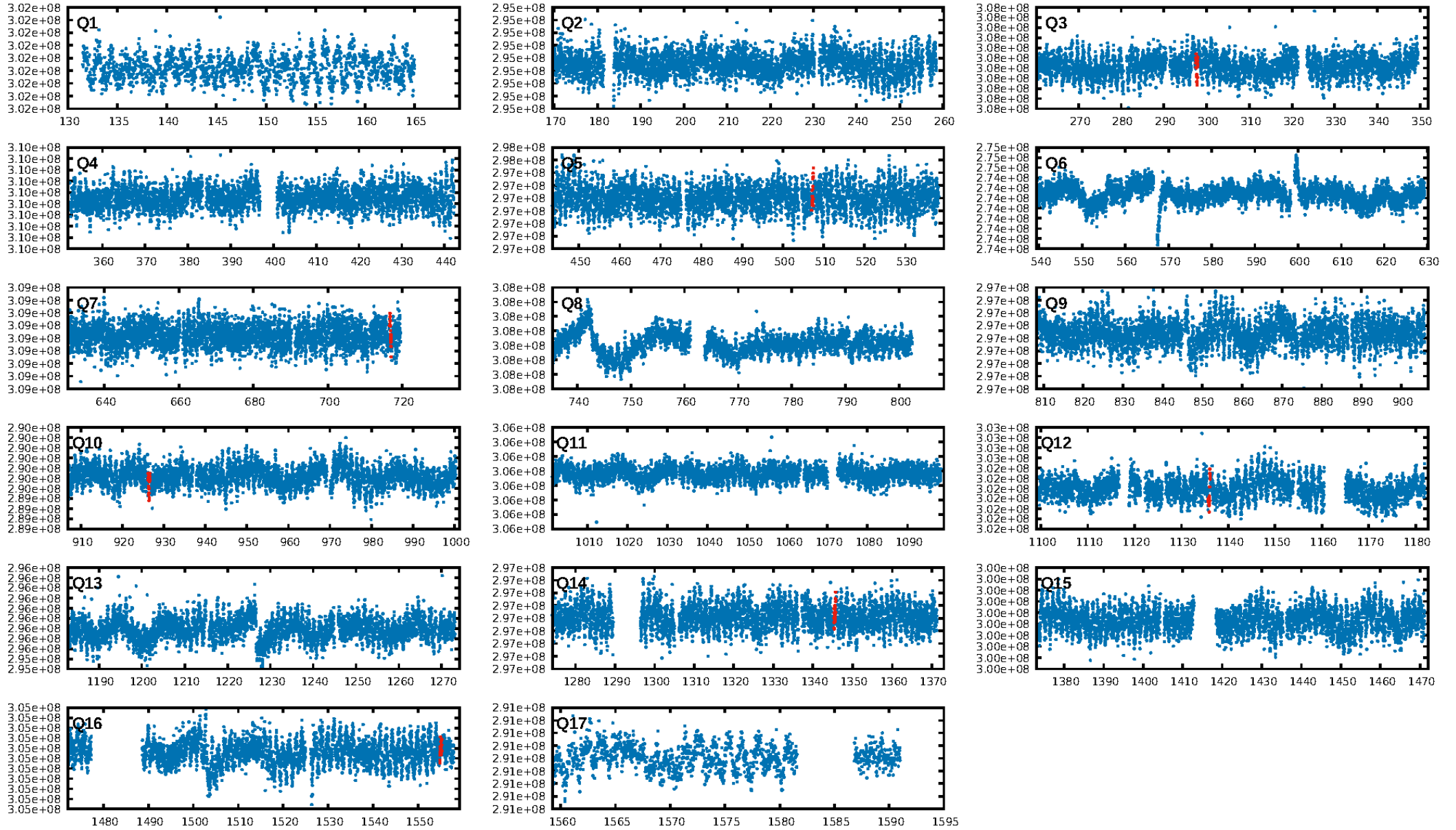
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [333.68 σ]
LongPeriod-sig: 100.0% [16.03 σ]
ModelChiSquare2-sig: 16.3%
ModelChiSquareGof-sig: 99.7%
Bootstrap-pfa: 3.74e-10
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 0.1317
Centroid-sig: 95.1%
Centroid-so: 0.163 arcsec [0.19 σ]
OotOffset-rm: 0.982 arcsec [1.21 σ]
OotOffset-st: 1/2/1/1 [5]
KicOffset-rm: 0.894 arcsec [1.29 σ]
KicOffset-st: 1/2/1/1 [5]
DiffImageQuality-fgm: 0.60 [3/5]
DiffImageOverlap-fno: 0.14 [1/7]

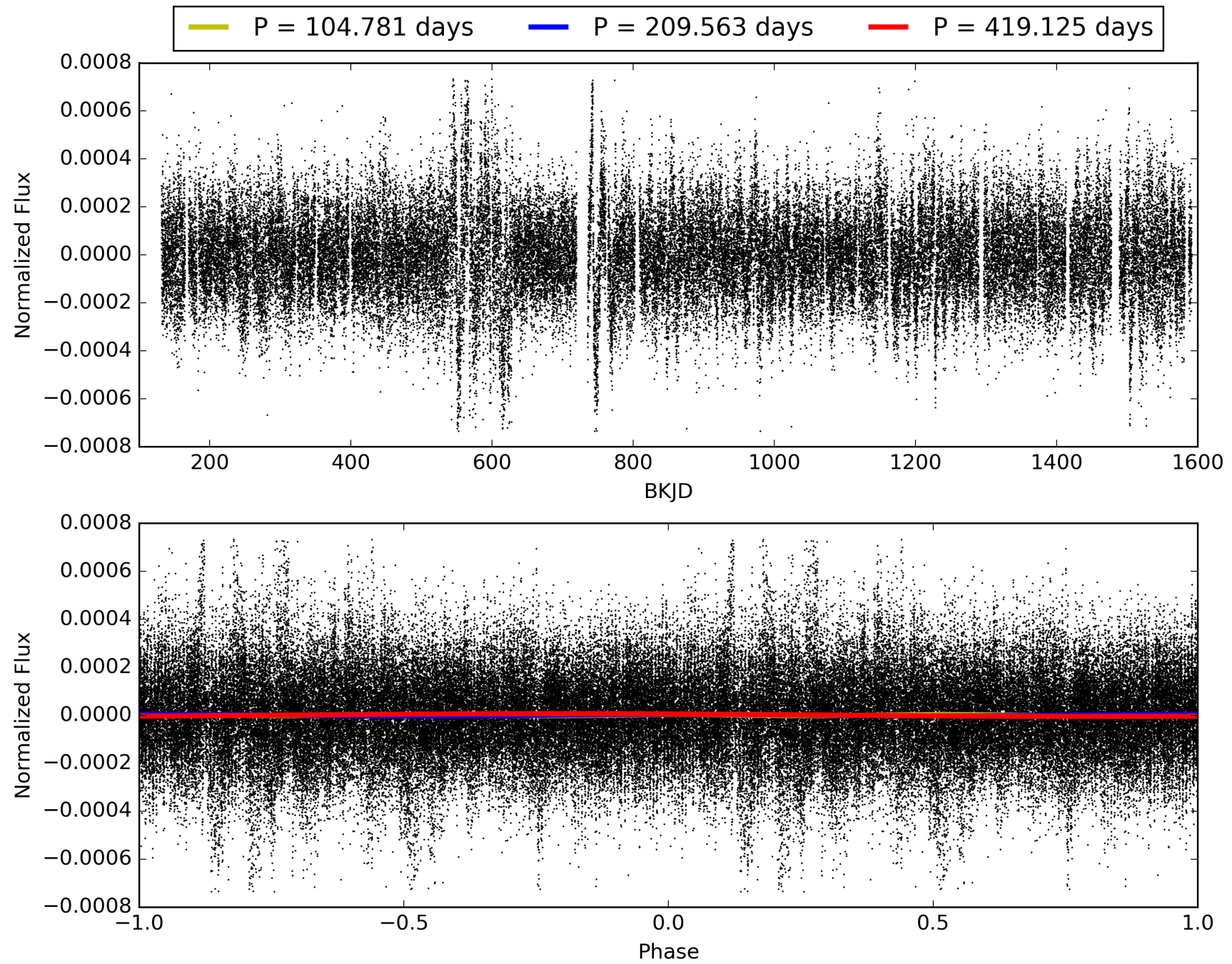
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 09:06:58 Z

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

TCE 002558488-03, PDC Light Curves

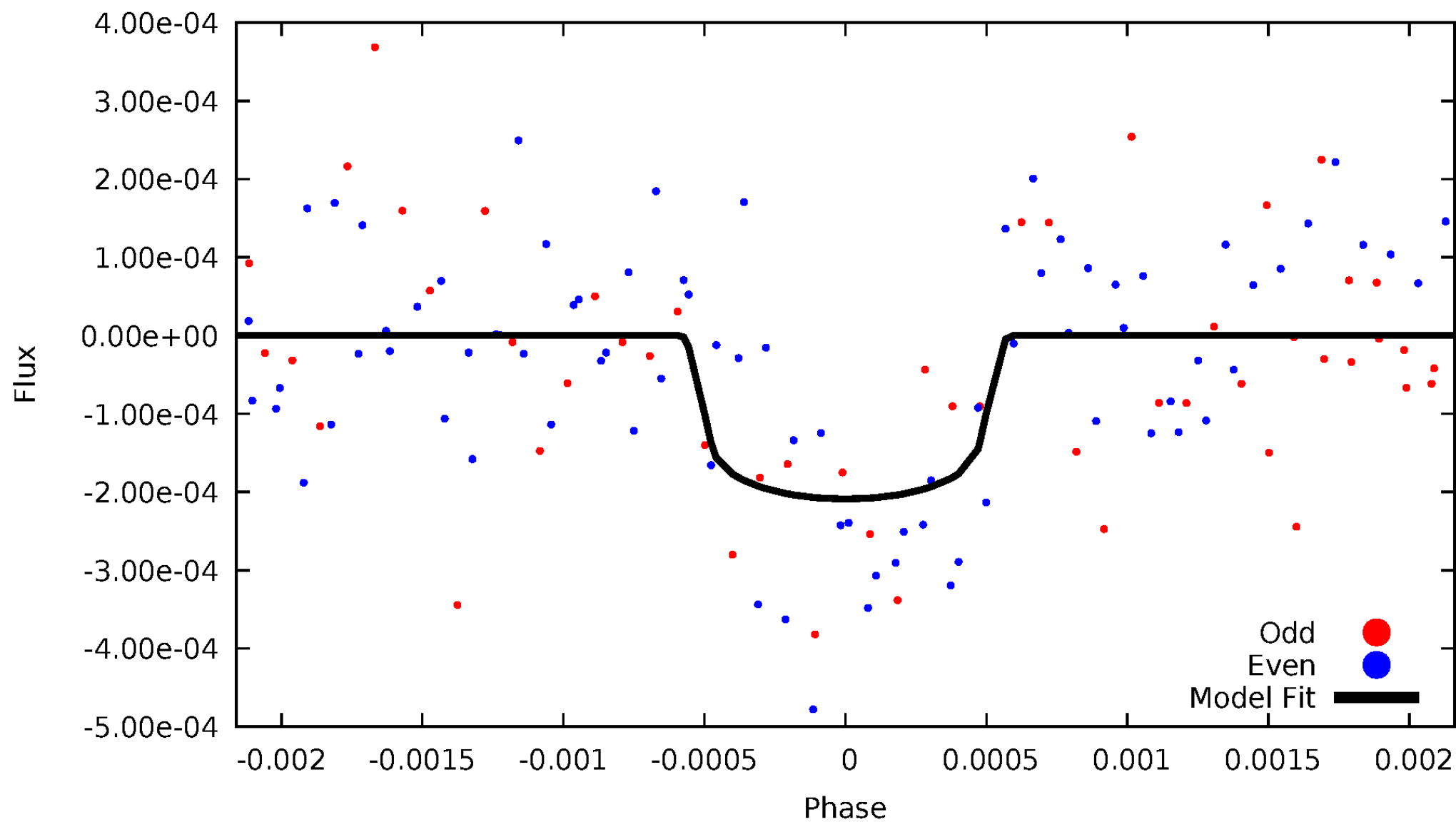


TCE 002558488-03



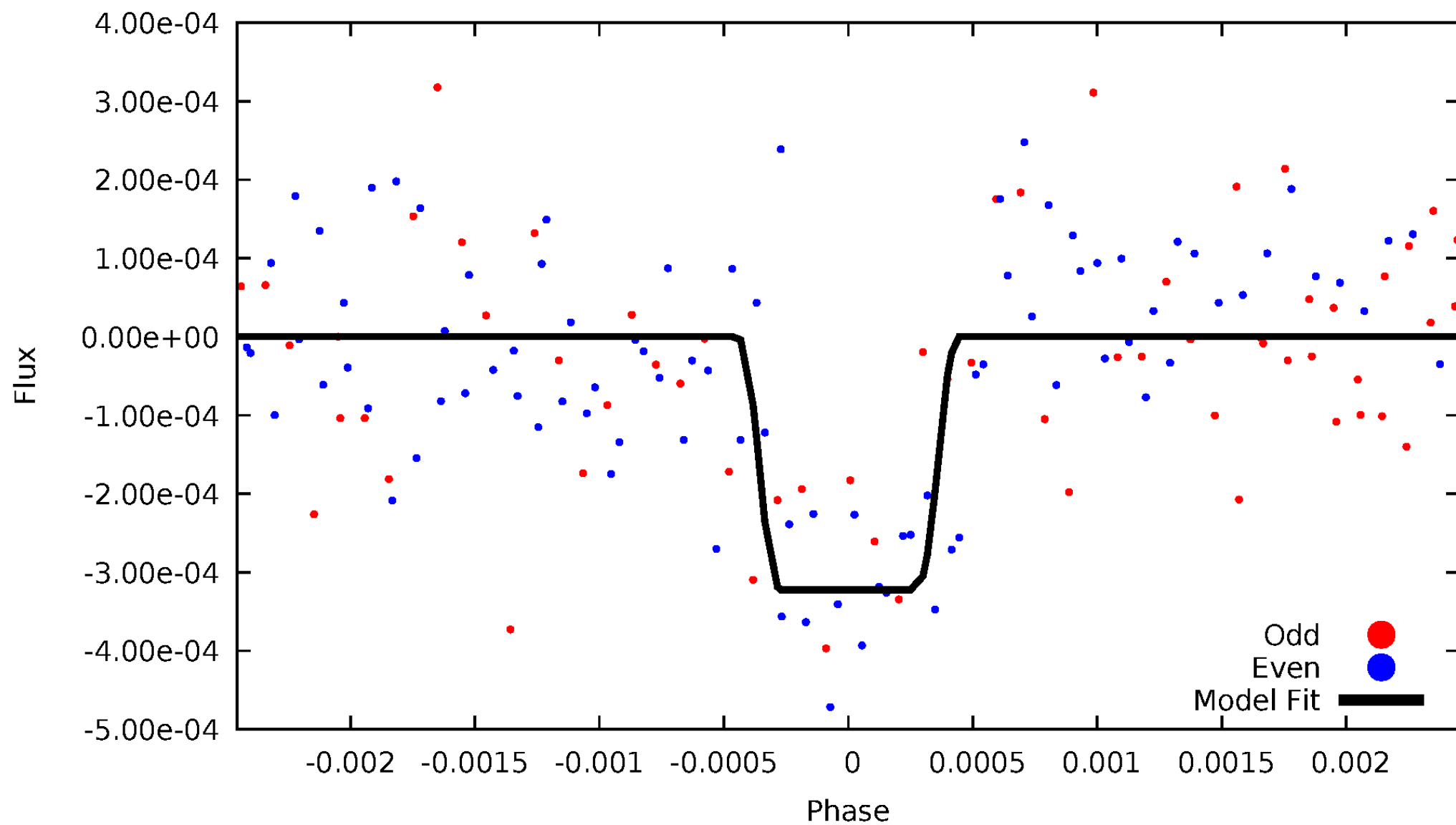
DV Odd/Even

TCE 002558488-03



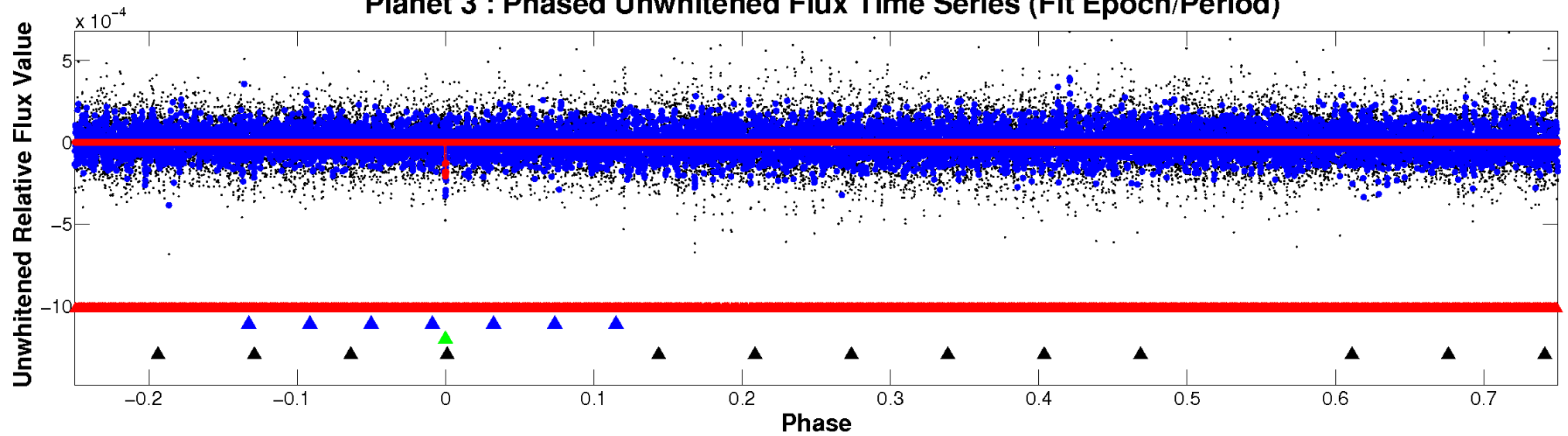
ALT Odd/Even

TCE 002558488-03

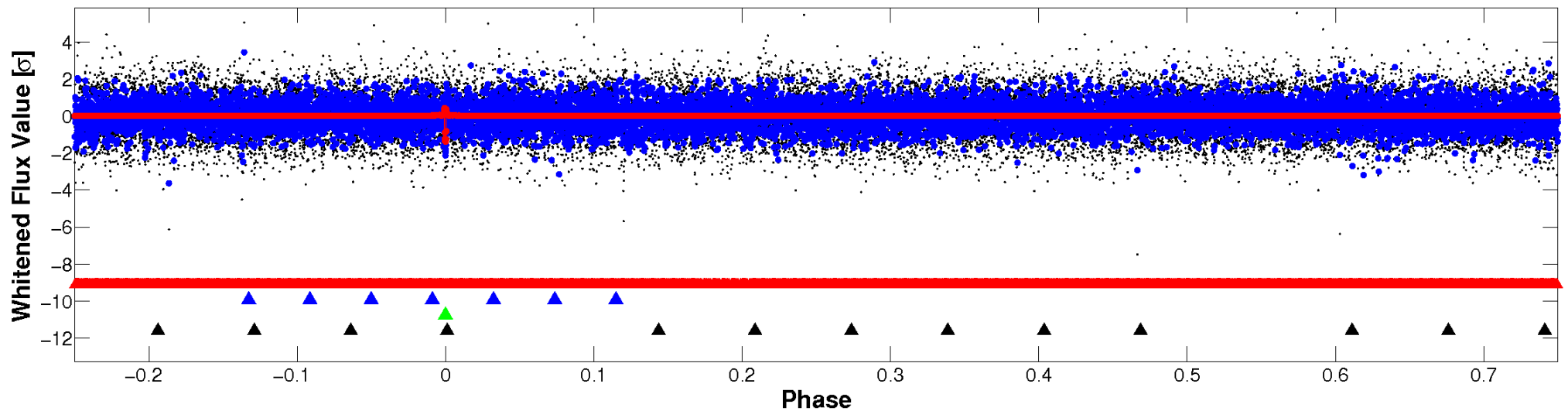


Non-Whitened Vs. Whitened Light Curve

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



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



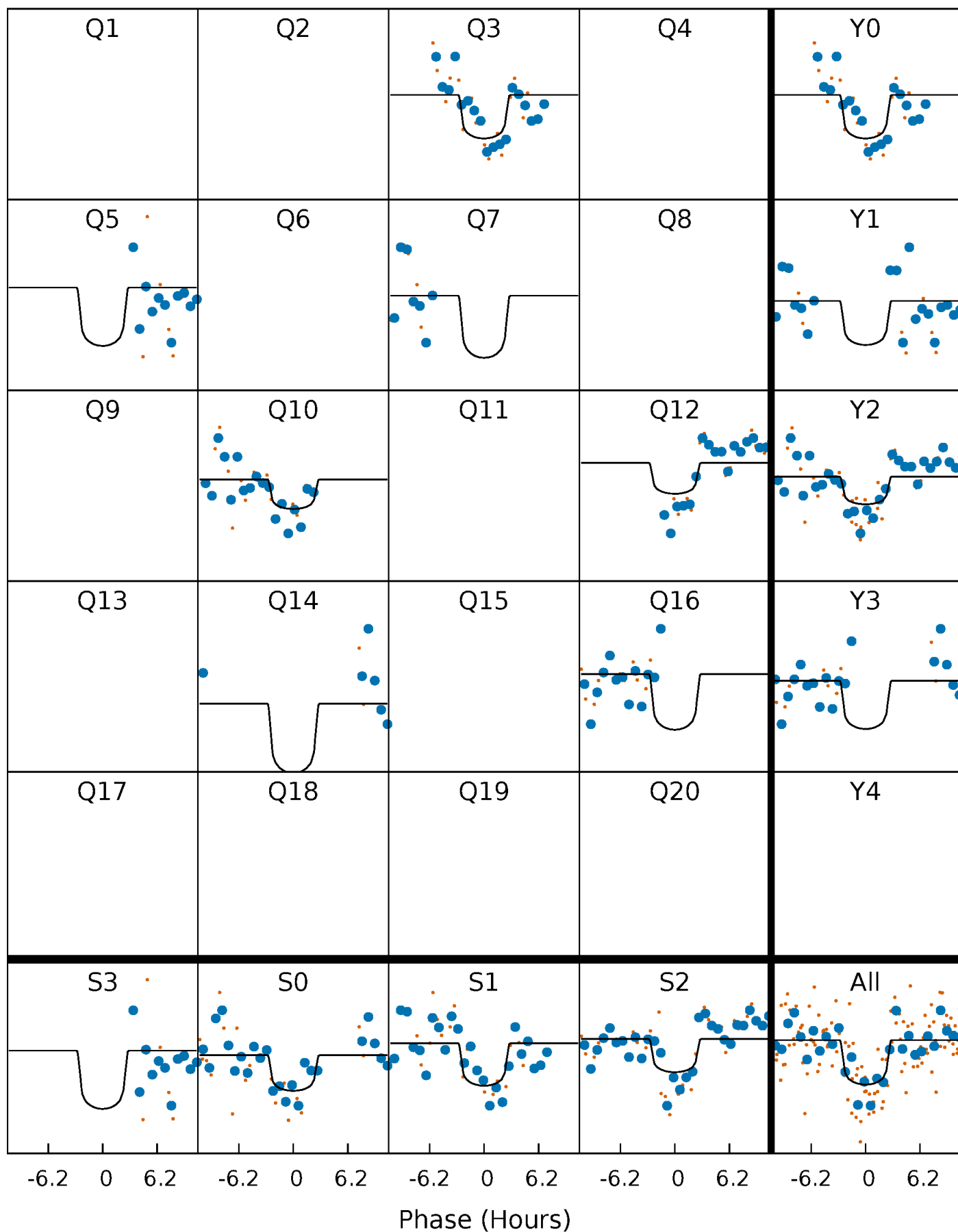
PDC Quarter-Phased Transit Curves

TCE 002558488-03 $P=209.562649$ Days $T_0=297.716272$ (BKJD)



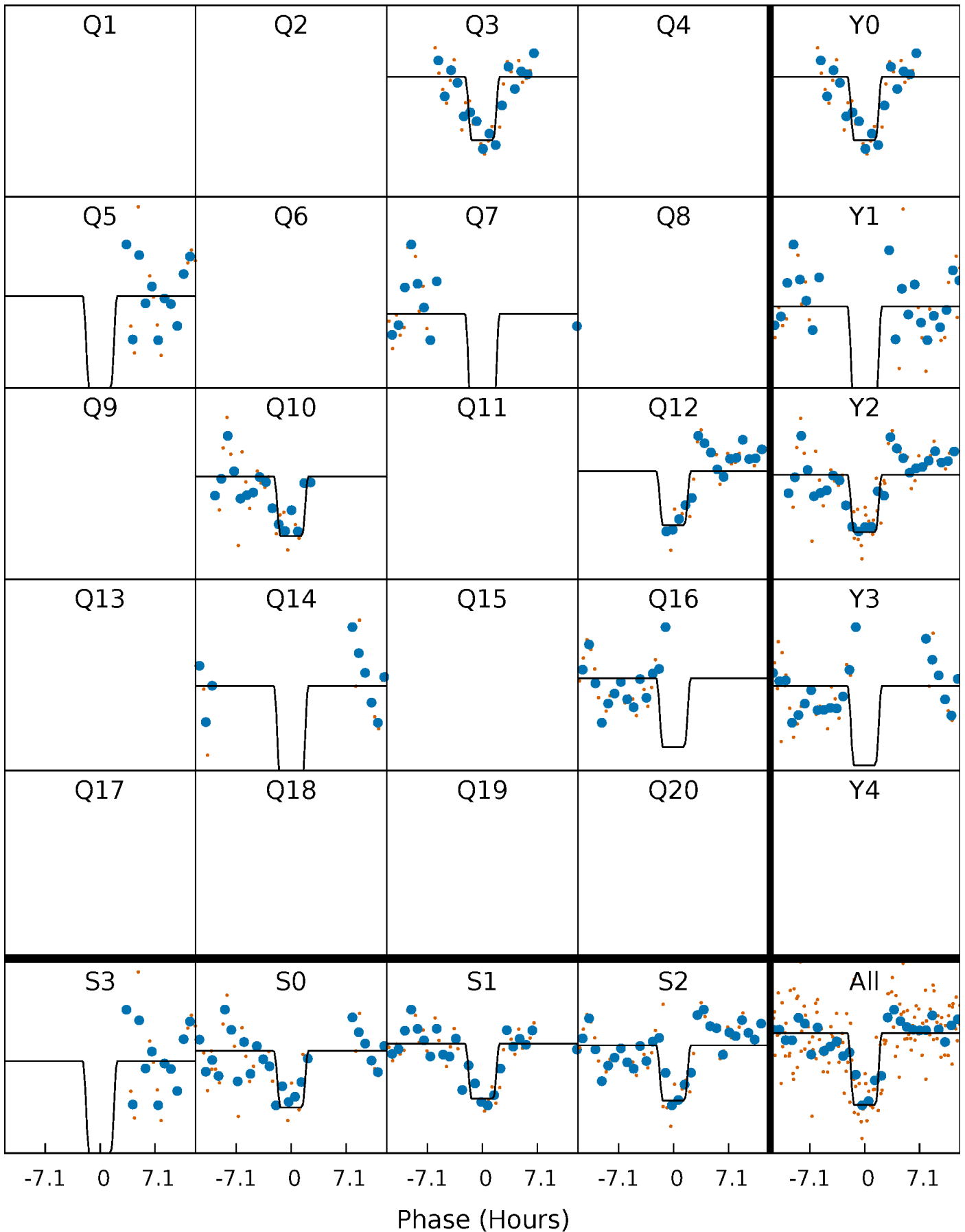
DV Quarter-Phased Transit Curves

TCE 002558488-03 $P=209.562649$ Days $T_0=297.716272$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

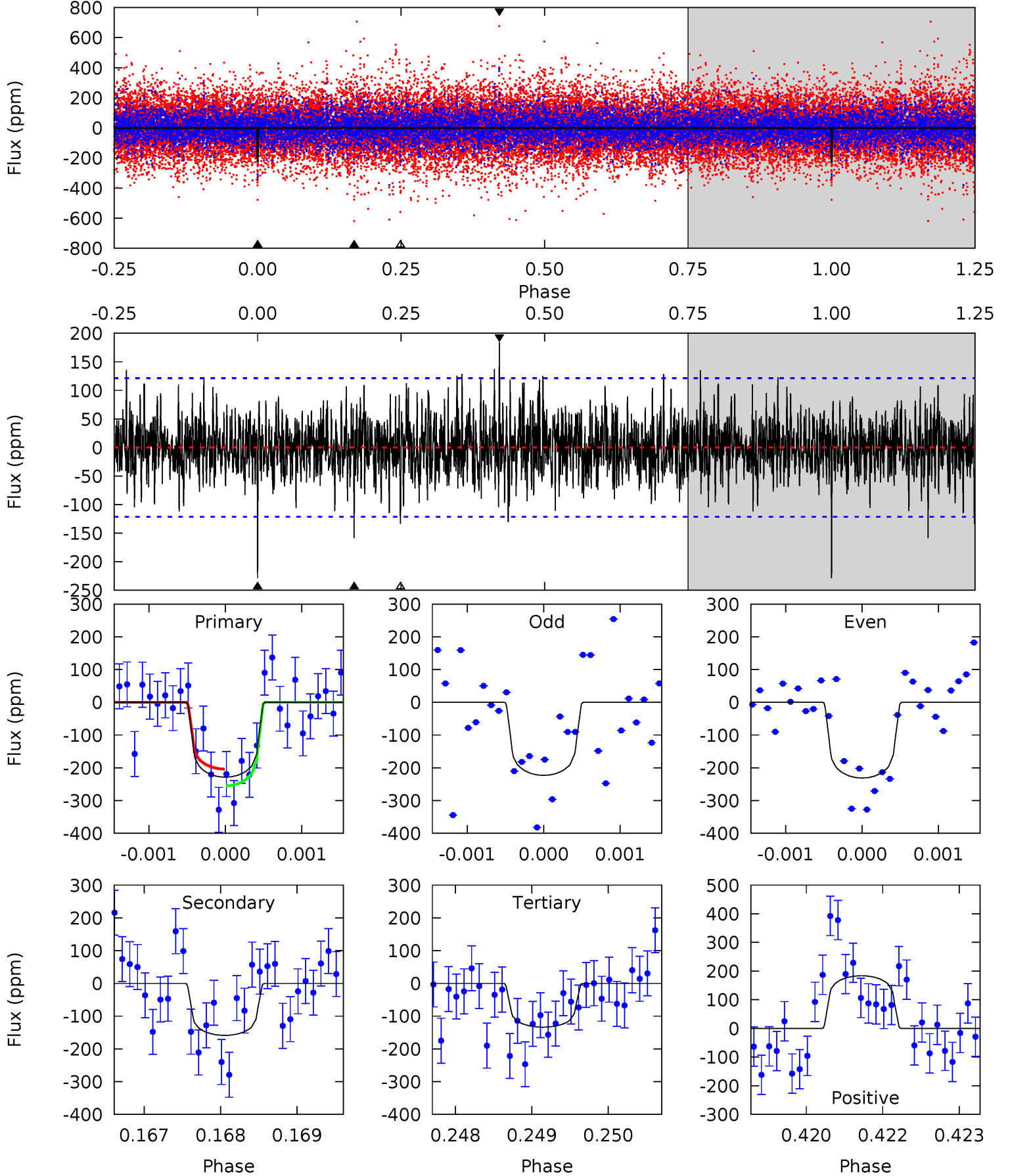
TCE 002558488-03 P=209.557643 Days $T_0=297.727523$ (BKJD)



DV Model-Shift Uniqueness Test

002558488-03, P = 209.562649 Days, E = 88.153623 Days

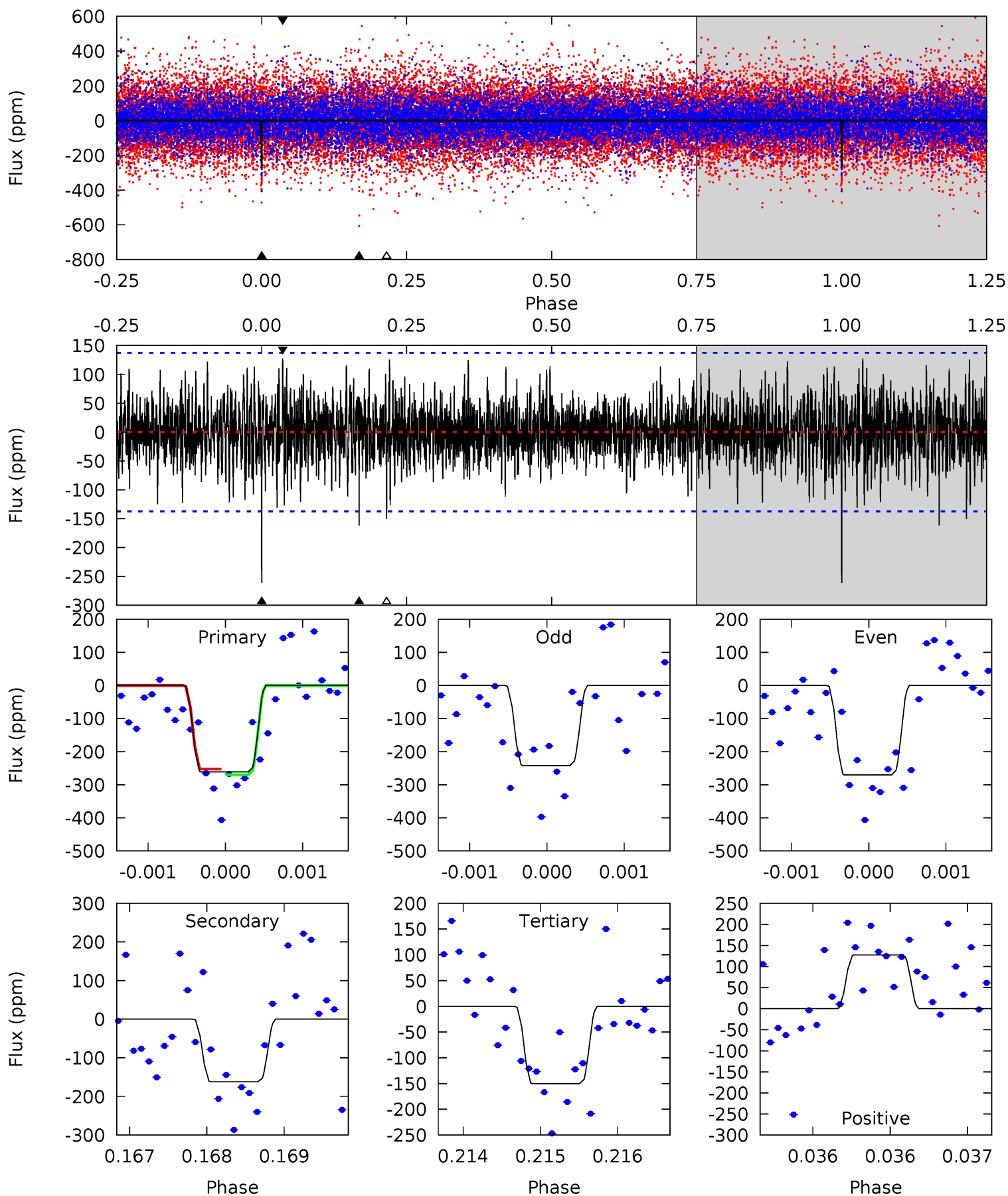
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.2	7.09	5.98	8.21	5.43	3.25	1.74	4.24	2.01	1.12	-1.12	0.17	0.76	0.45	1.14



Alt Model-Shift Uniqueness Test

002558488-03, P = 209.557643 Days, E = 88.169880 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.4	6.46	6.00	5.09	5.48	3.34	1.50	4.44	5.34	0.47	1.37	0.54	0.59	0.33	0.35



Stellar Parameters For KIC 002558488

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6351^{+177}_{-243}	$4.195^{+0.185}_{-0.185}$	$-0.080^{+0.250}_{-0.300}$	$1.450^{+0.440}_{-0.360}$	$1.203^{+0.177}_{-0.194}$	$0.555^{+0.600}_{-0.266}$
	+3%/-4%	+4%/-4%	+312%/-375%	+30%/-25%	+15%/-16%	+108%/-48%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 002558488-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-159 ± 22	$2.31^{+1.36}_{-1.35}$	550^{+48}_{-41}	5921^{+3634}_{-1137}	9111^{+40041}_{-5763}
Alt.	-162 ± 25	$2.89^{+1.51}_{-1.43}$	549^{+45}_{-40}	5339^{+2033}_{-863}	5787^{+15752}_{-3418}

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

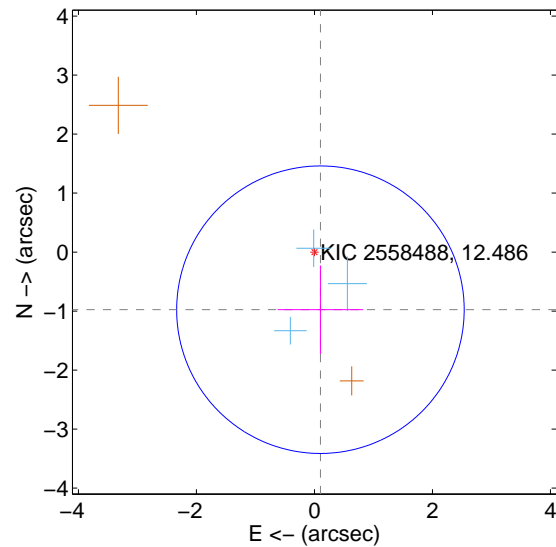
Supplemental centroid analysis for 002558488-03. Kepler magnitude: 12.49. Transit SNR 7.20

There are 3 quarters with good PRF difference image offsets

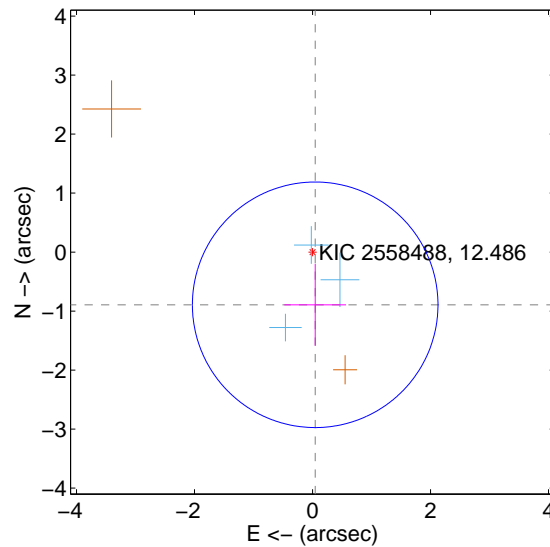
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.982 ± 0.812	1.21	-0.101 ± 0.726	-0.977 ± 0.750
PRF-fit source offset from KIC position	0.894 ± 0.694	1.29	-0.045 ± 0.523	-0.893 ± 0.694
photometric centroid source offset	0.16 ± 0.88	0.19	0.11 ± 0.76	-0.12 ± 0.96

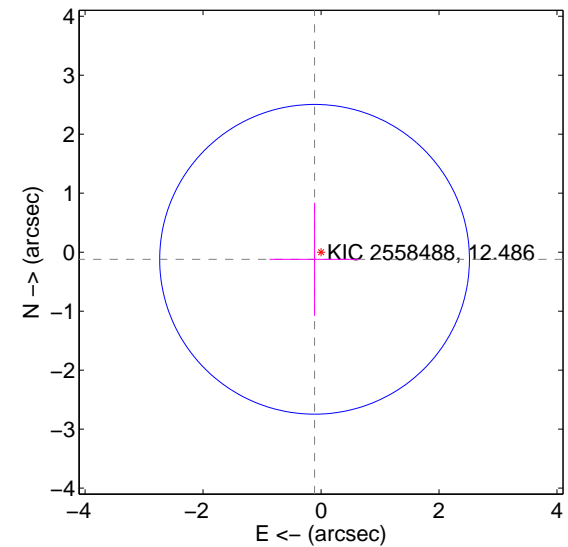
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

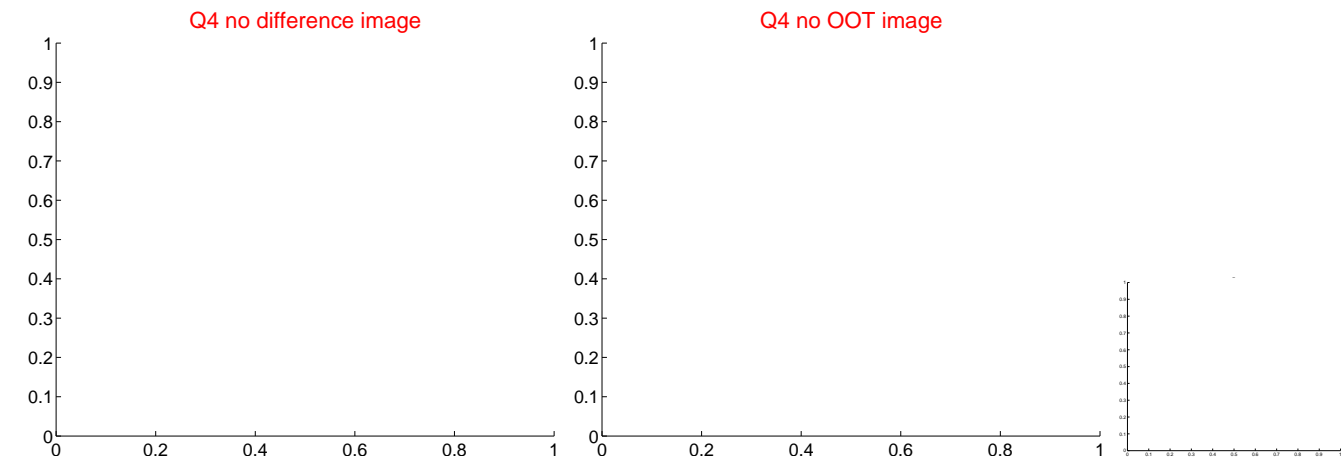
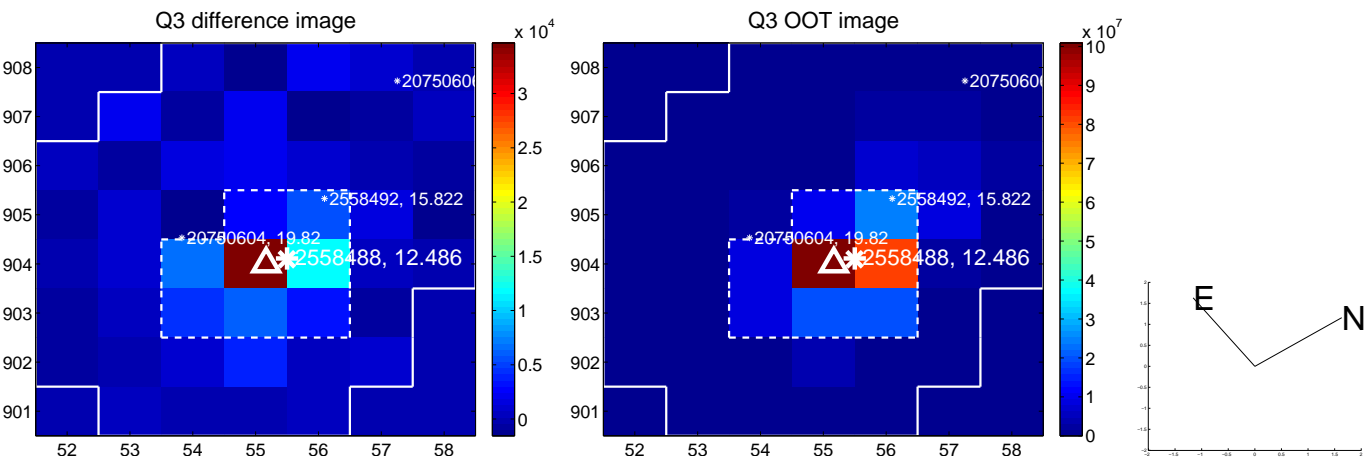
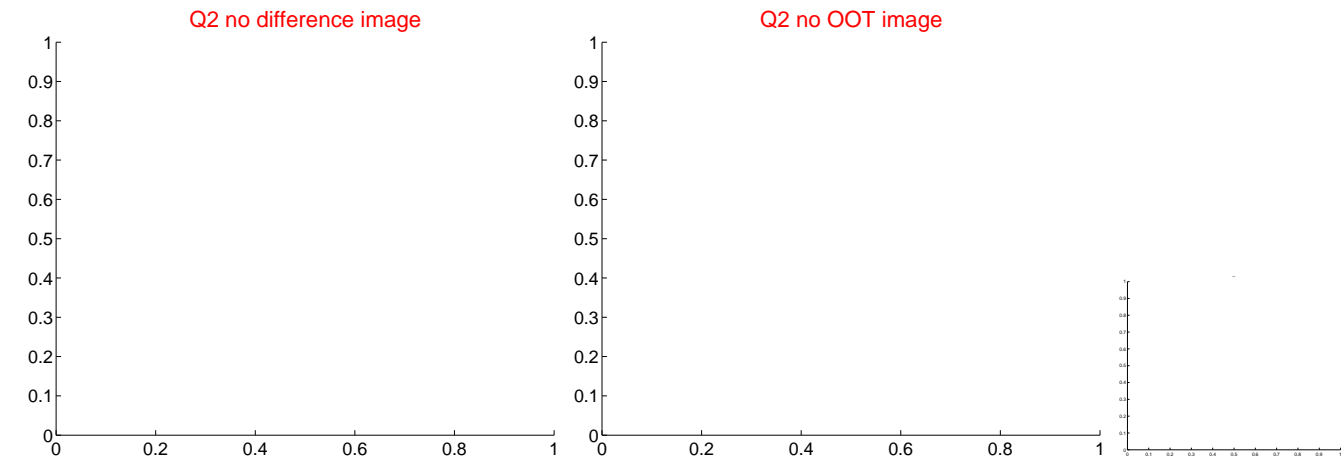


offset from photometric centroids

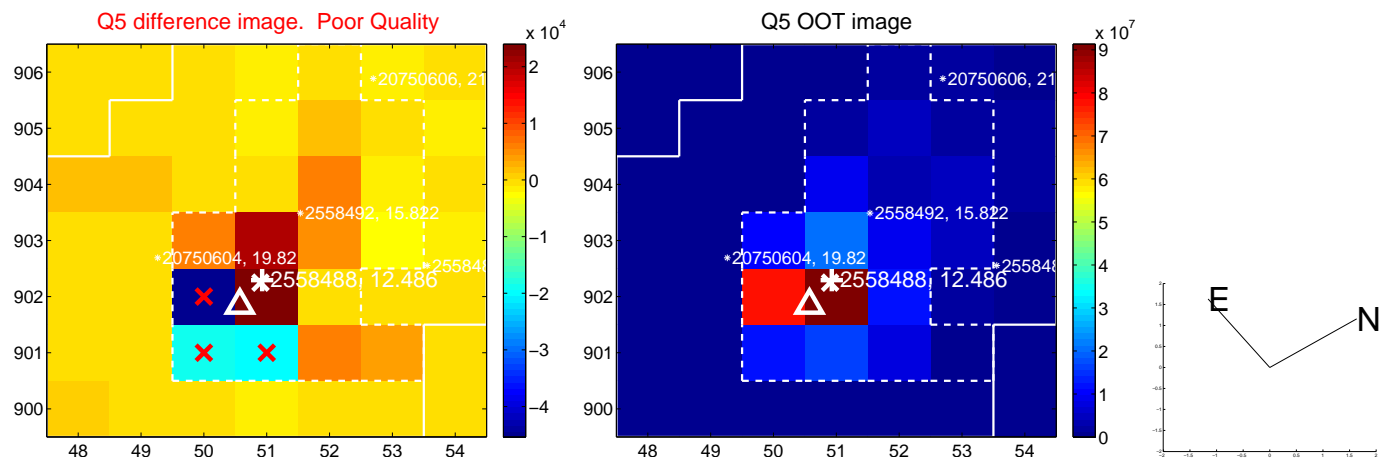


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

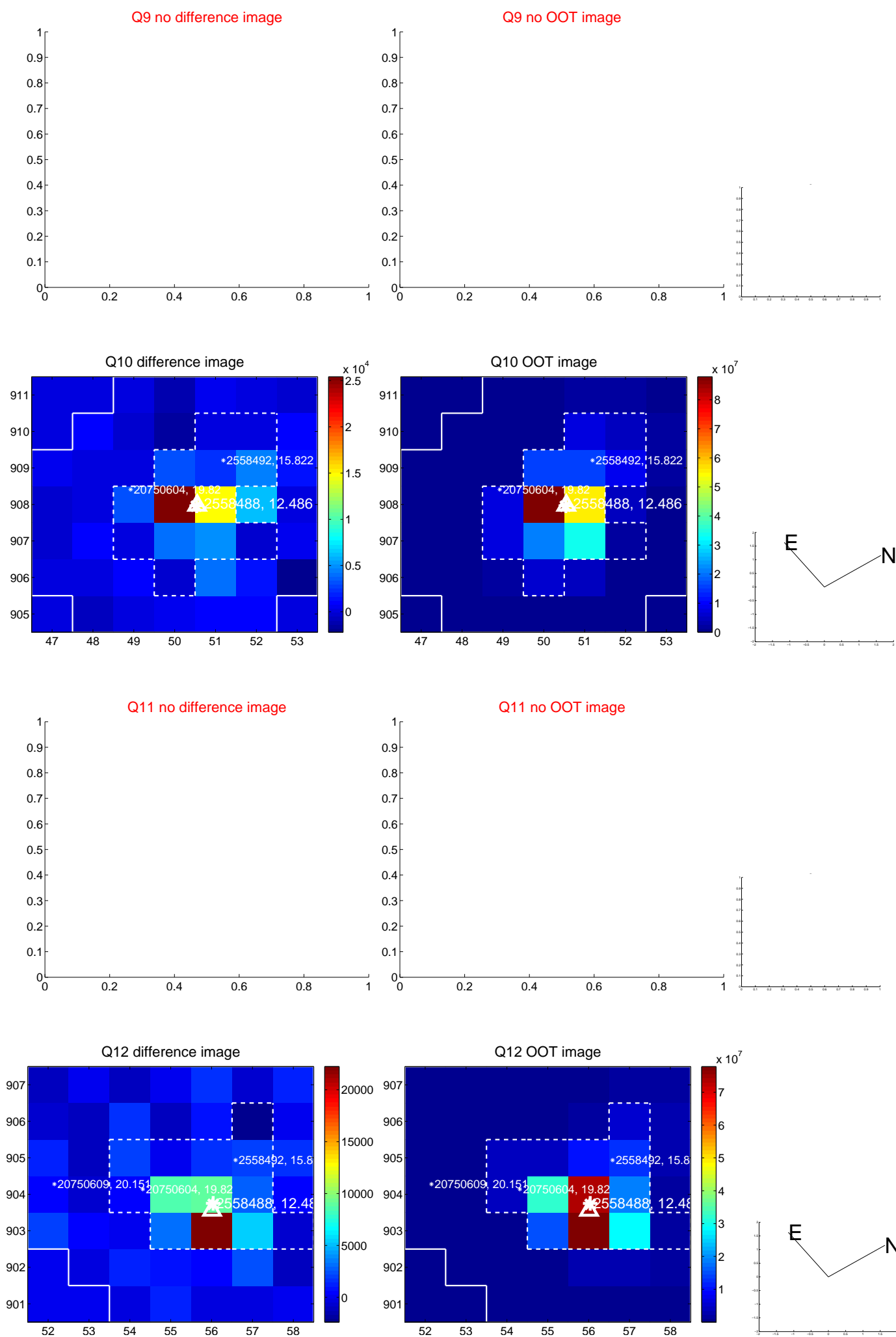
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



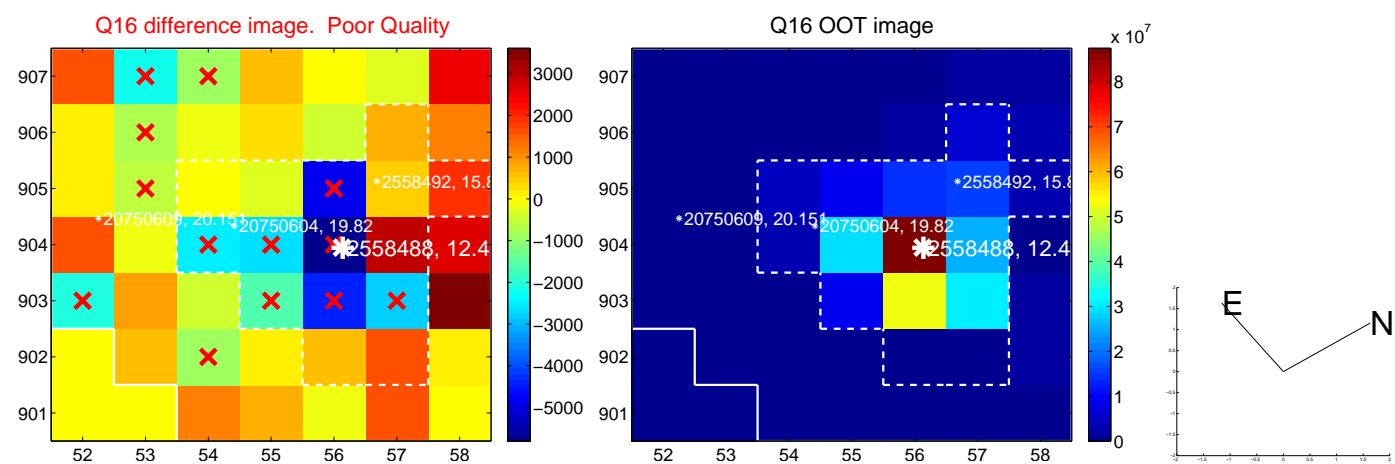
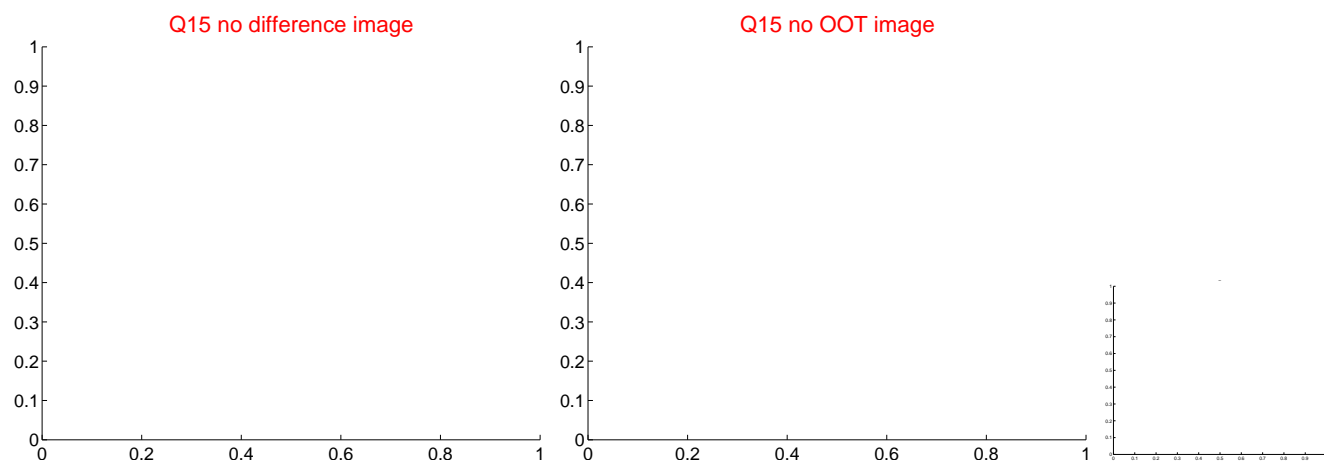
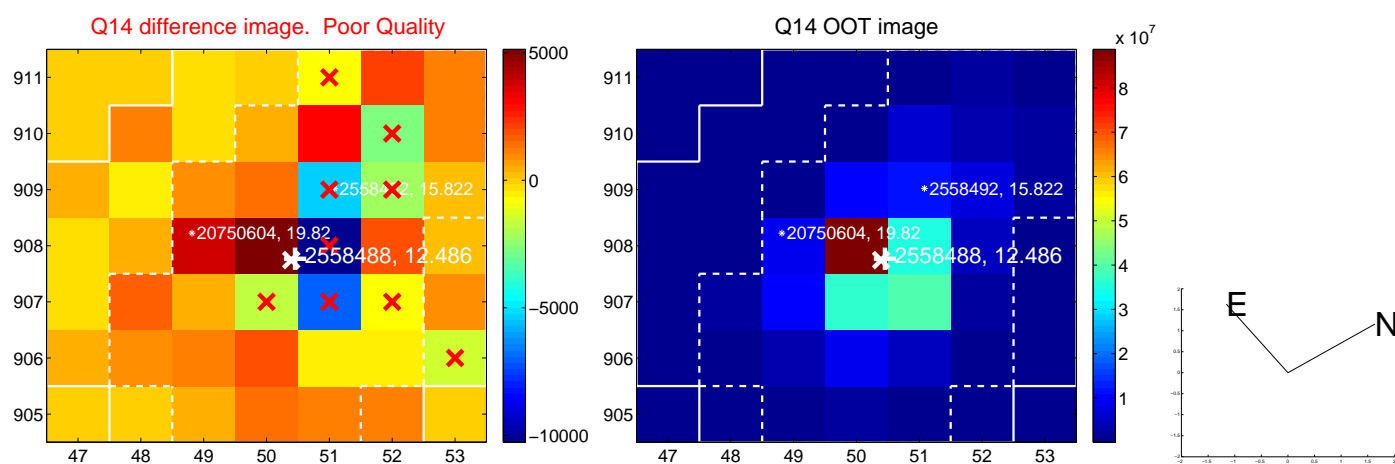
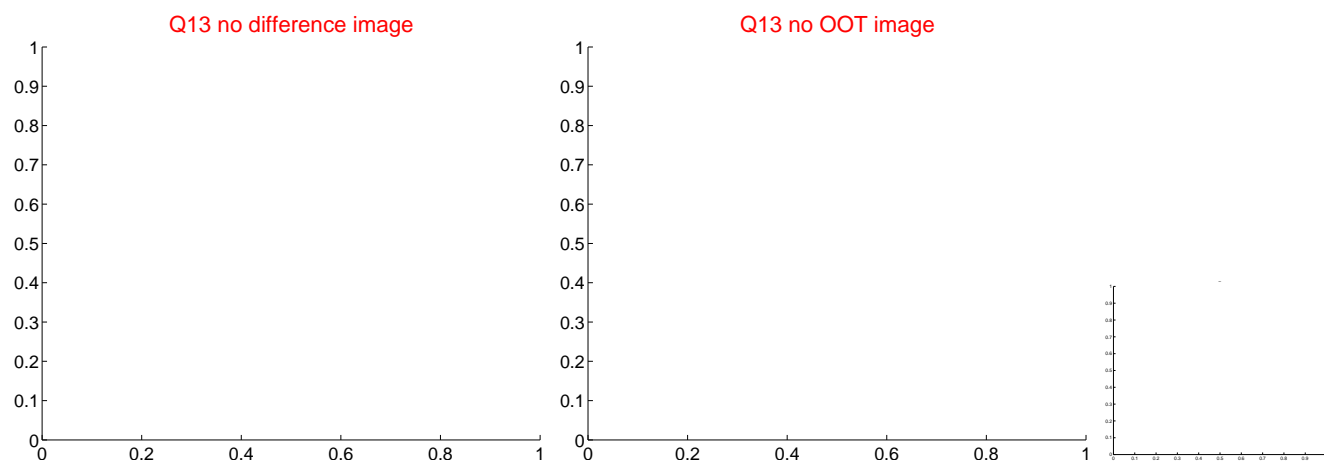
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



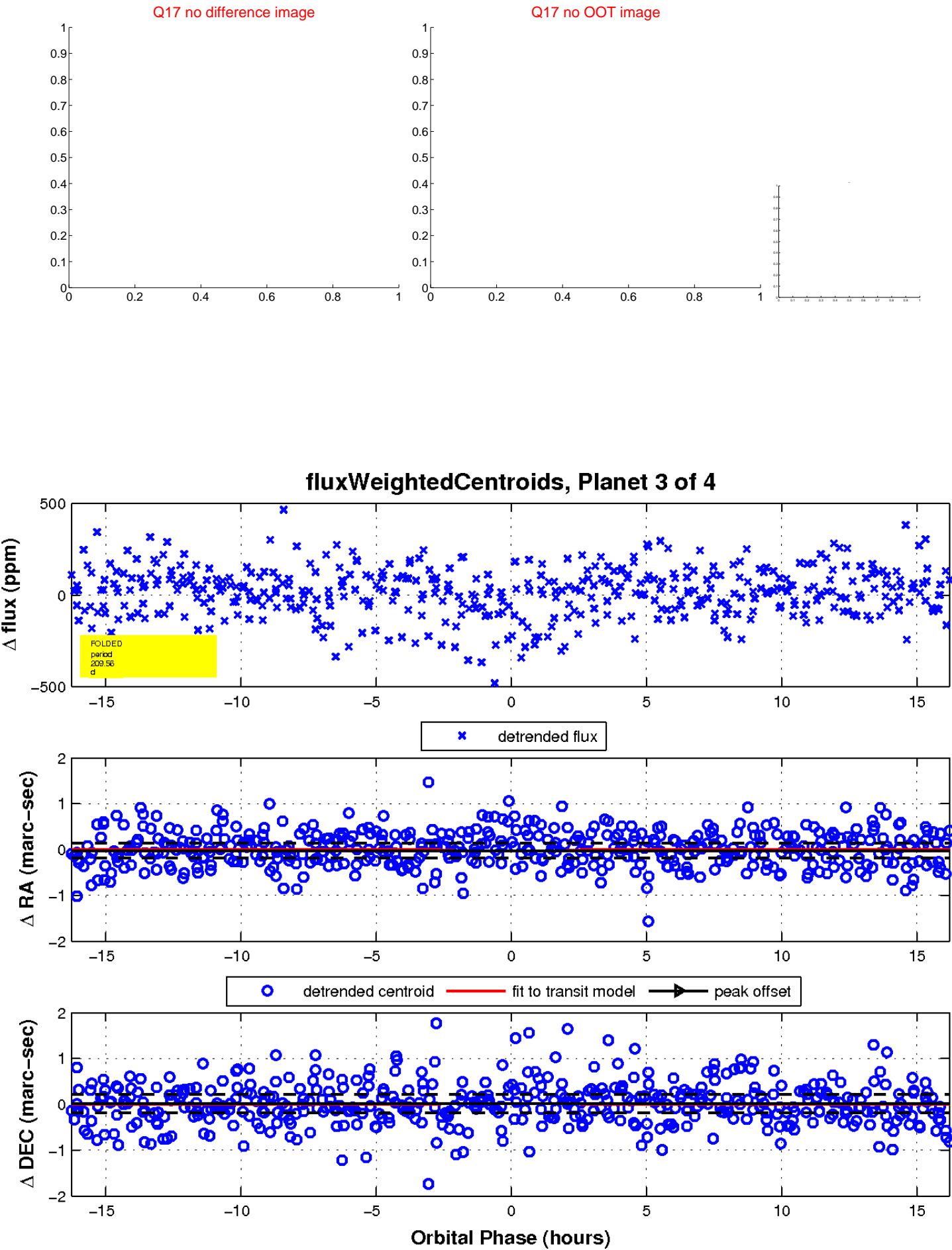
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



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

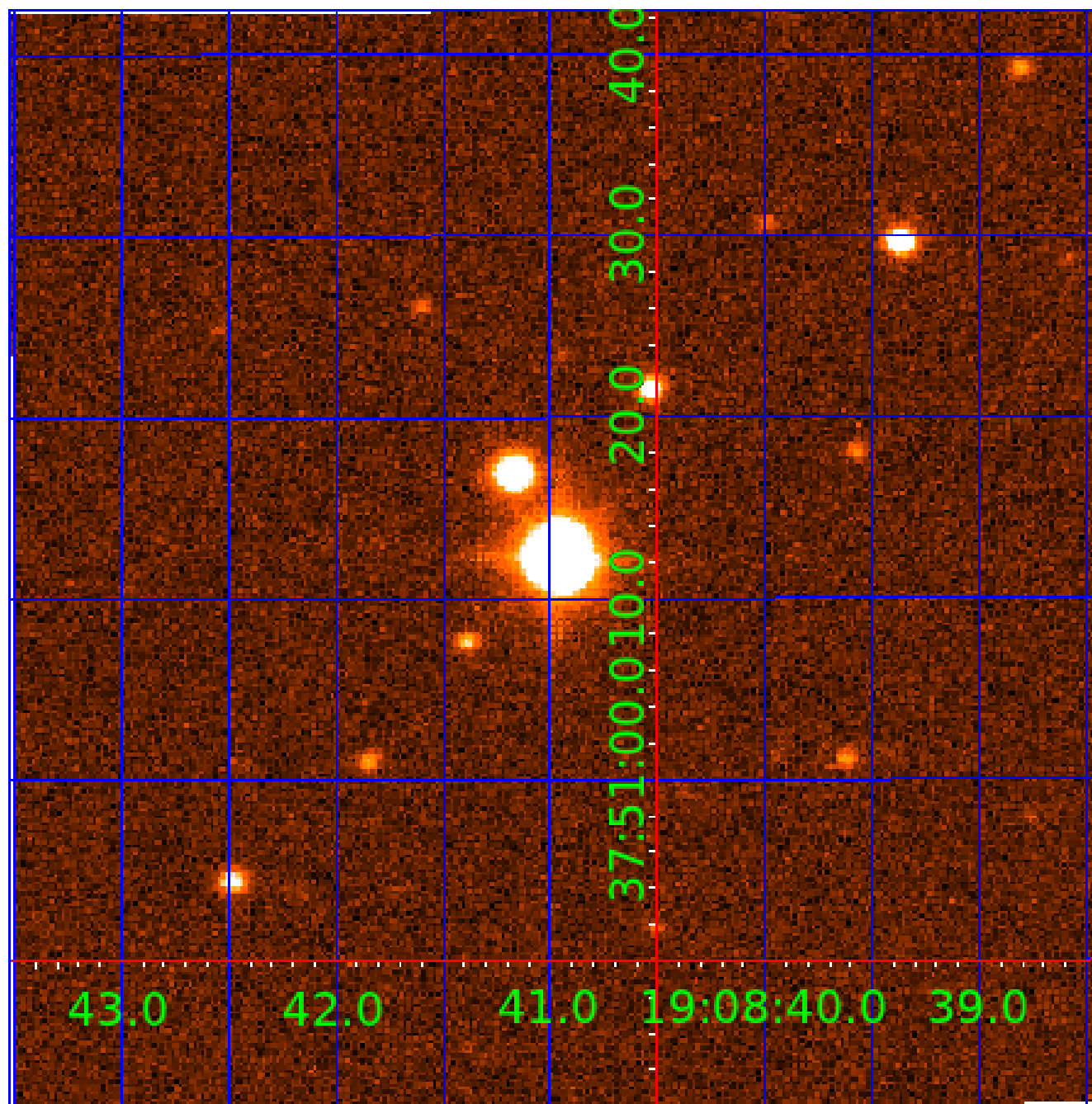


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 002558488

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})
002558488-01	OBS	No	1.287919	132.239601	23.8	5.726	11.1	11.3	1.45	6351	0.83	5050.37
002558488-02	OBS	No	218.209786	269.921343	230.4	11.757	10.6	8.1	1.45	6351	2.43	5.39
002558488-03	OBS	No	209.562649	297.716272	209.0	5.429	7.8	7.2	1.45	6351	2.32	5.68
002558488-04	OBS	No	111.590724	216.243210	241.0	4.492	7.5	8.2	1.45	6351	2.56	13.17

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002558488-01	OBS	FP	0.00	1	0	0	0	LPP_DV
002558488-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS
002558488-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—HALO_GHOST
002558488-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_ALT

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

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

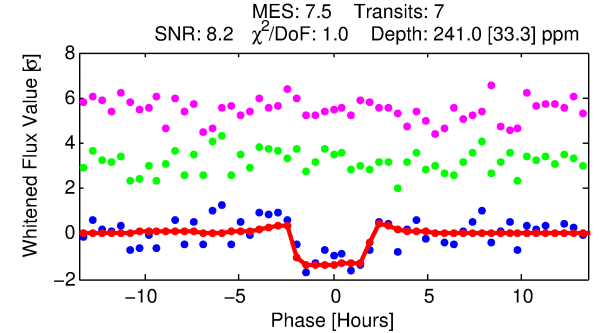
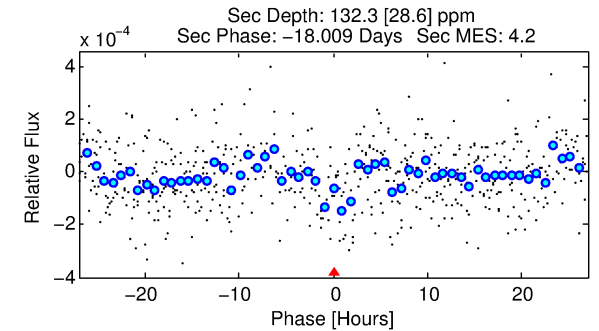
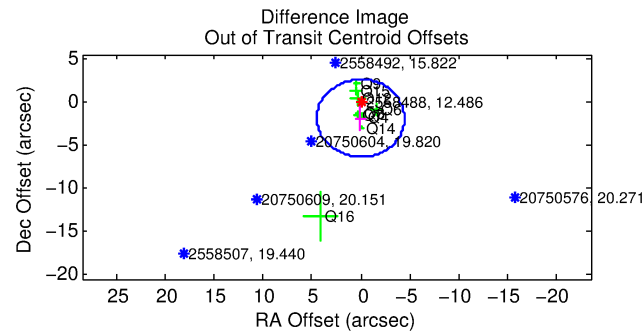
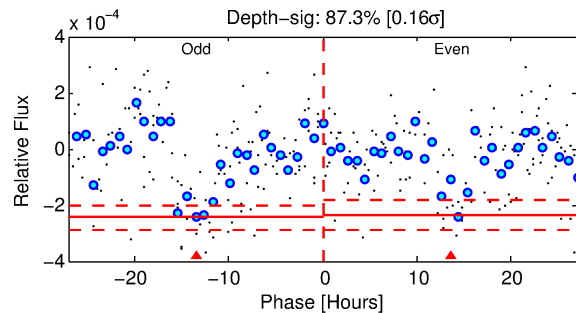
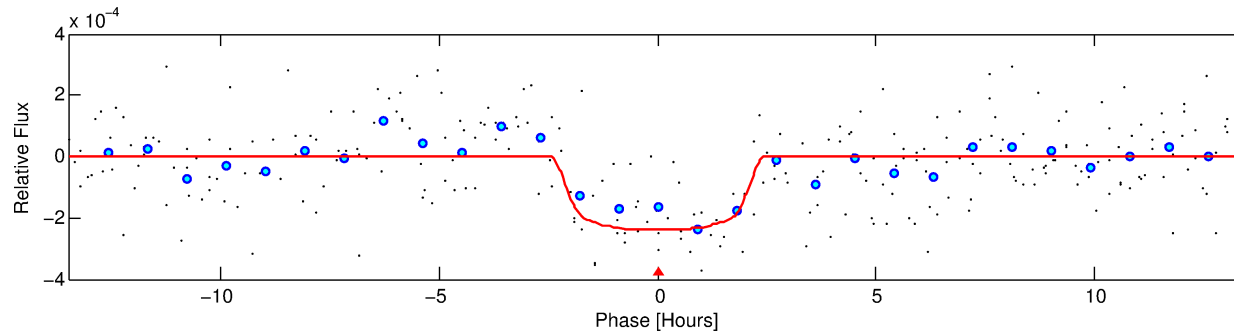
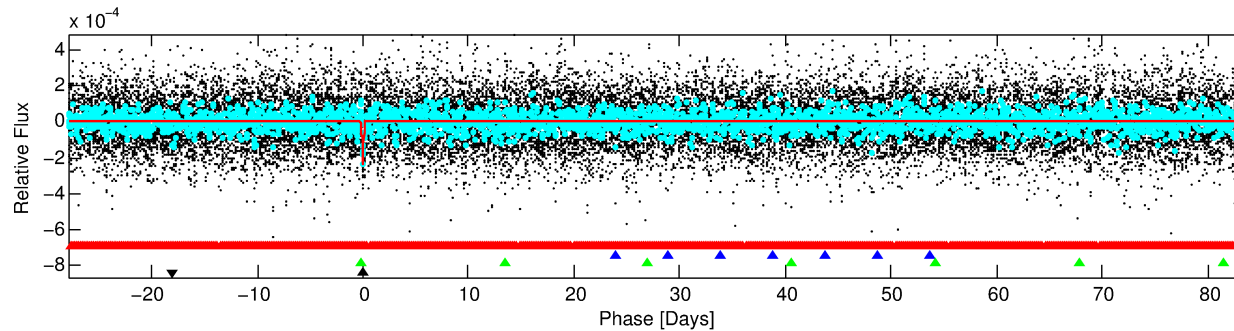
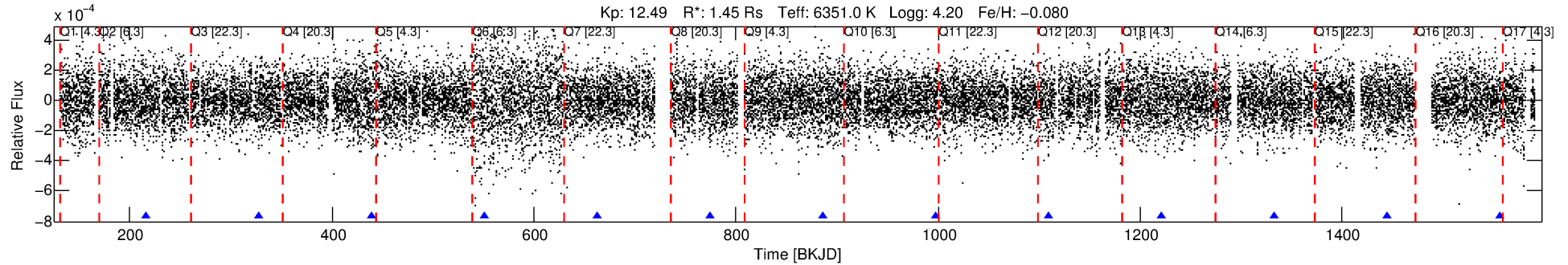
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002558488-04

No Significant Match Found

DV One-Page Summary

KIC: 2558488 Candidate: 4 of 4 Period: 111.591 d



DV Fit Results:

Period = 111.59072 [0.00138] d
Epoch = 216.2432 [0.0090] BKJD
Rp/R* = 0.0162 [0.0079]
a/R* = 104.32 [274.88]
b = 0.85 [0.84]
Seff = 13.17 [5.02]
Teq = 486 [46] K
Rp = 2.56 [1.48] Re
a = 0.4823 [0.1192] AU
Ag = 2592.58 [2760.71] [0.94 σ]
Teffp = 5359 [1364] K [3.57 σ]

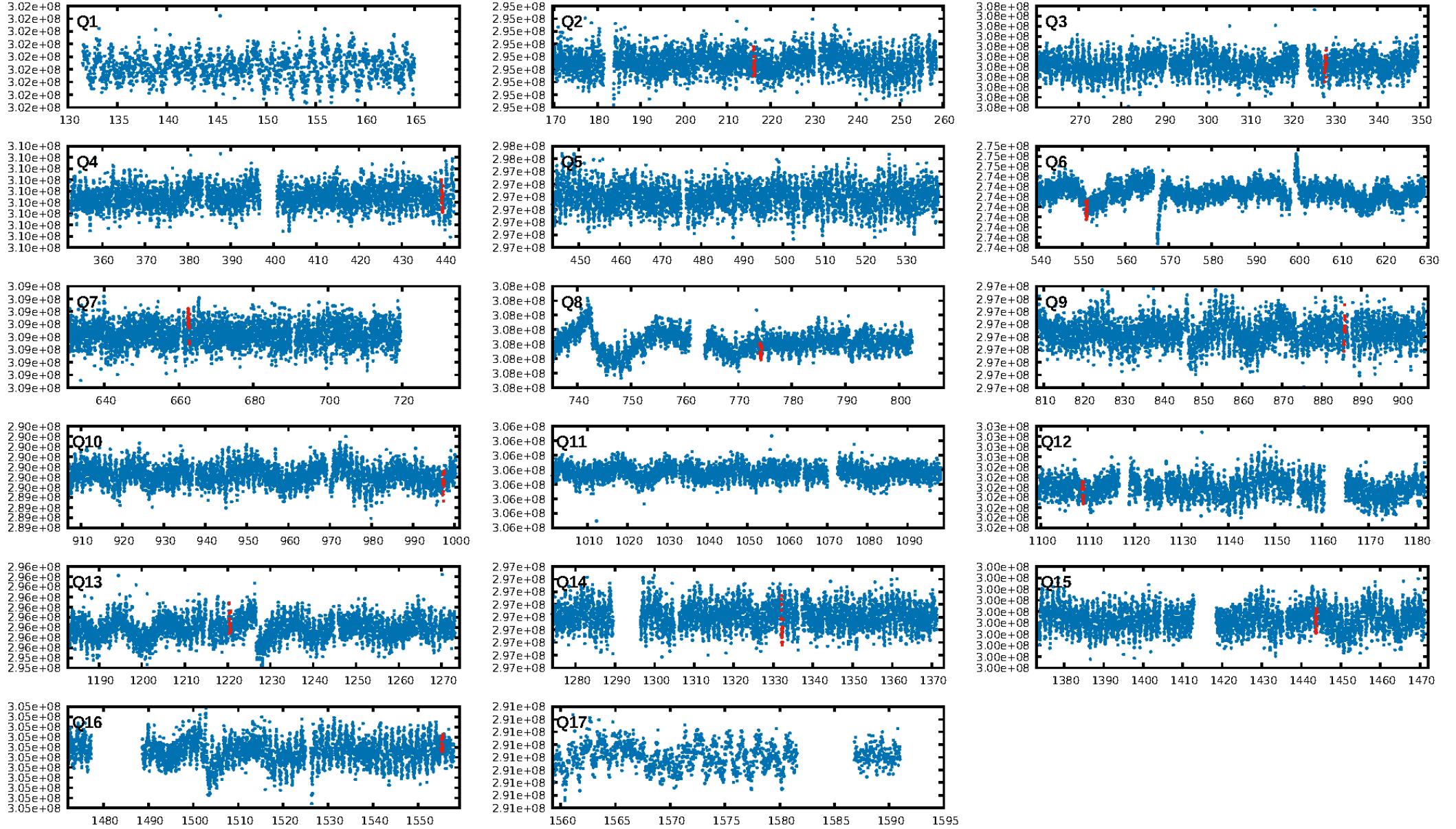
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [363.72 σ]
LongPeriod-sig: 100.0% [333.68 σ]
ModelChiSquare2-sig: 66.6%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.27e-09
RollingBand-fgt: 1.00 [7/7]
GhostDiagnostic-chr: -1.218
Centroid-sig: 0.0%
Centroid-so: 1.549 arcsec [2.65 σ]
OotOffset-rm: 1.895 arcsec [1.27 σ]
KicOffset-rm: 1.781 arcsec [1.18 σ]
OotOffset-st: 2/2/4/1 [9]
KicOffset-st: 2/2/4/1 [9]
DiffImageQuality-fgm: 0.67 [6/9]
DiffImageOverlap-fno: 0.17 [2/12]

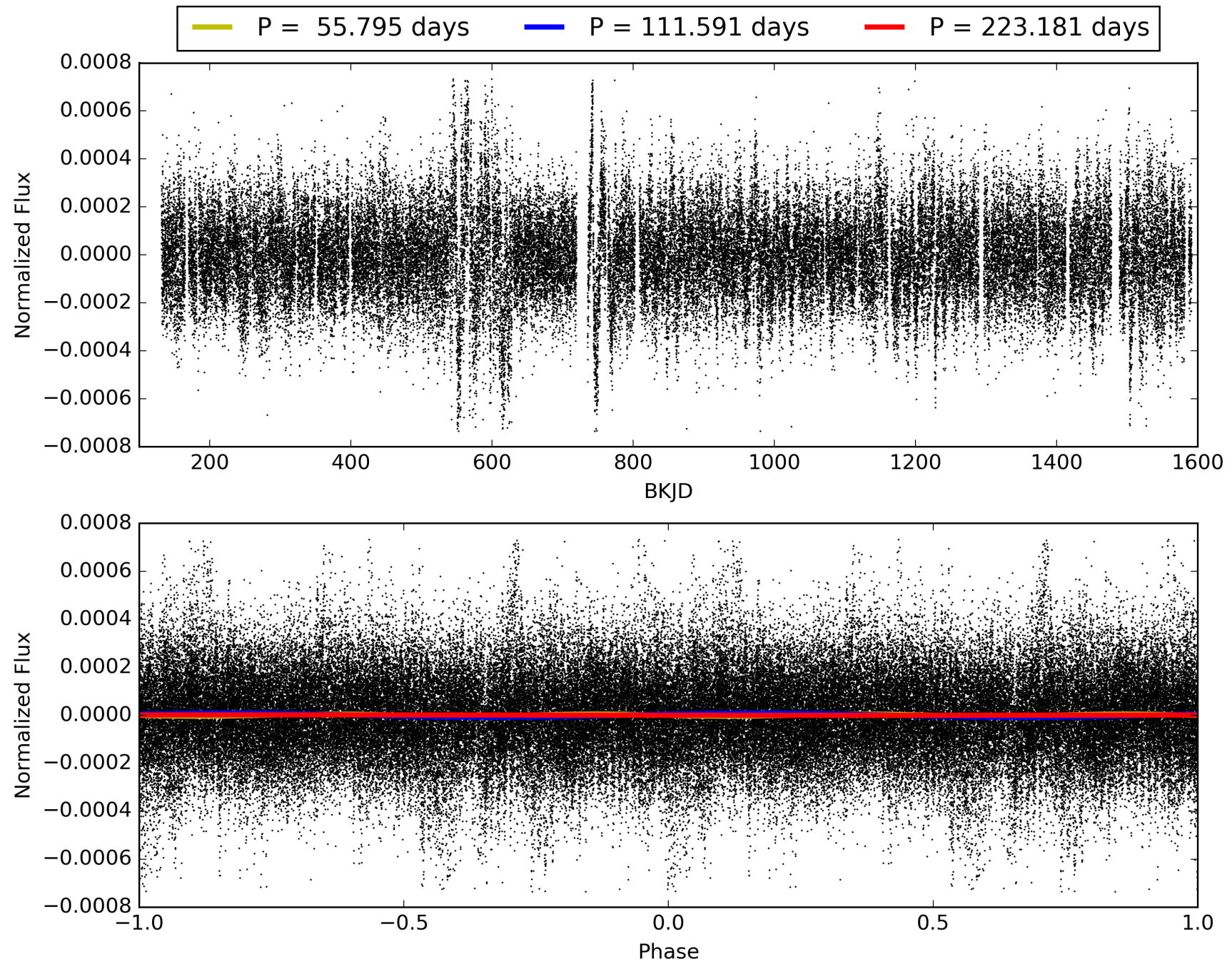
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 09:07:04 Z

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

TCE 002558488-04, PDC Light Curves

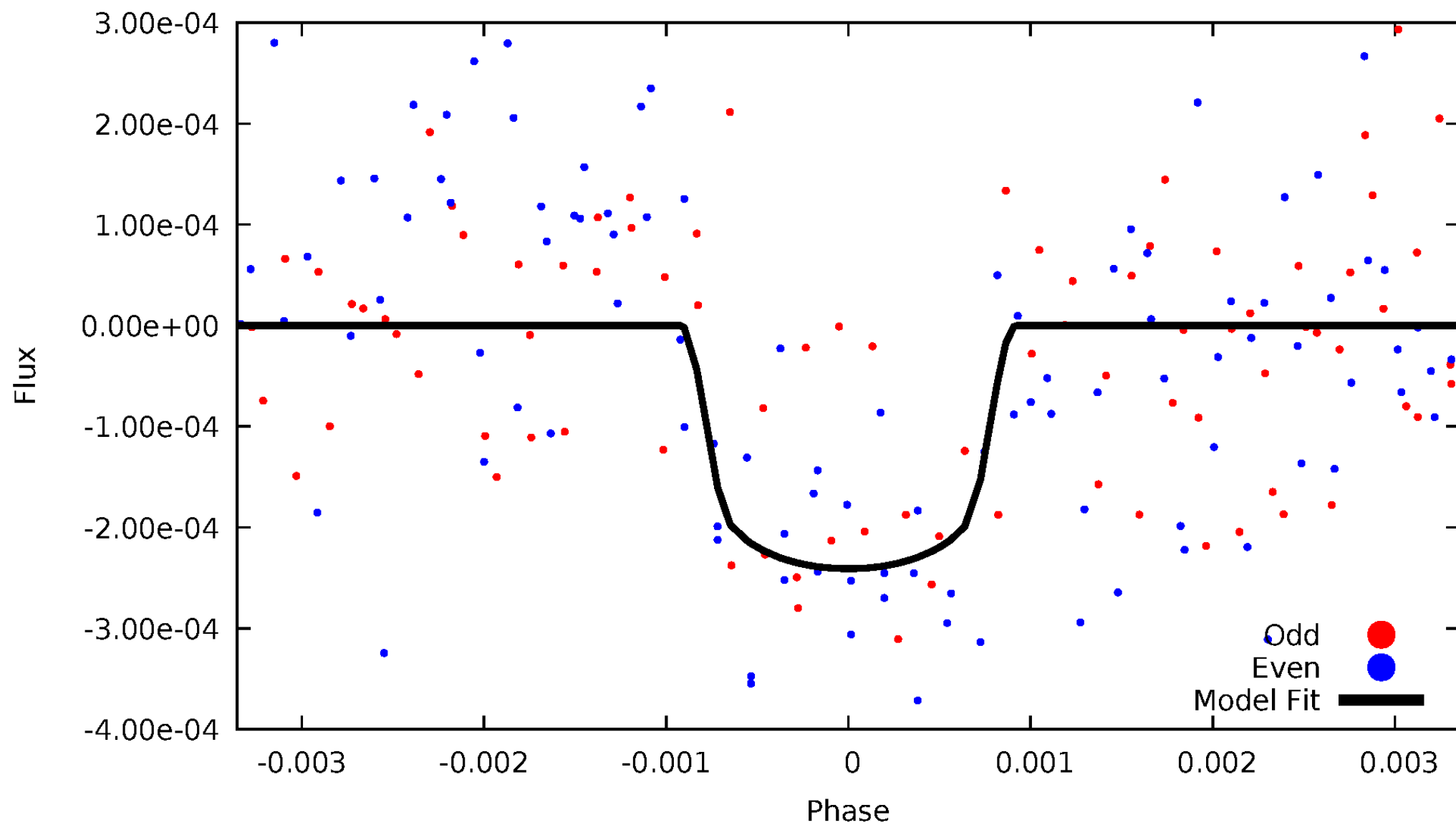


TCE 002558488-04



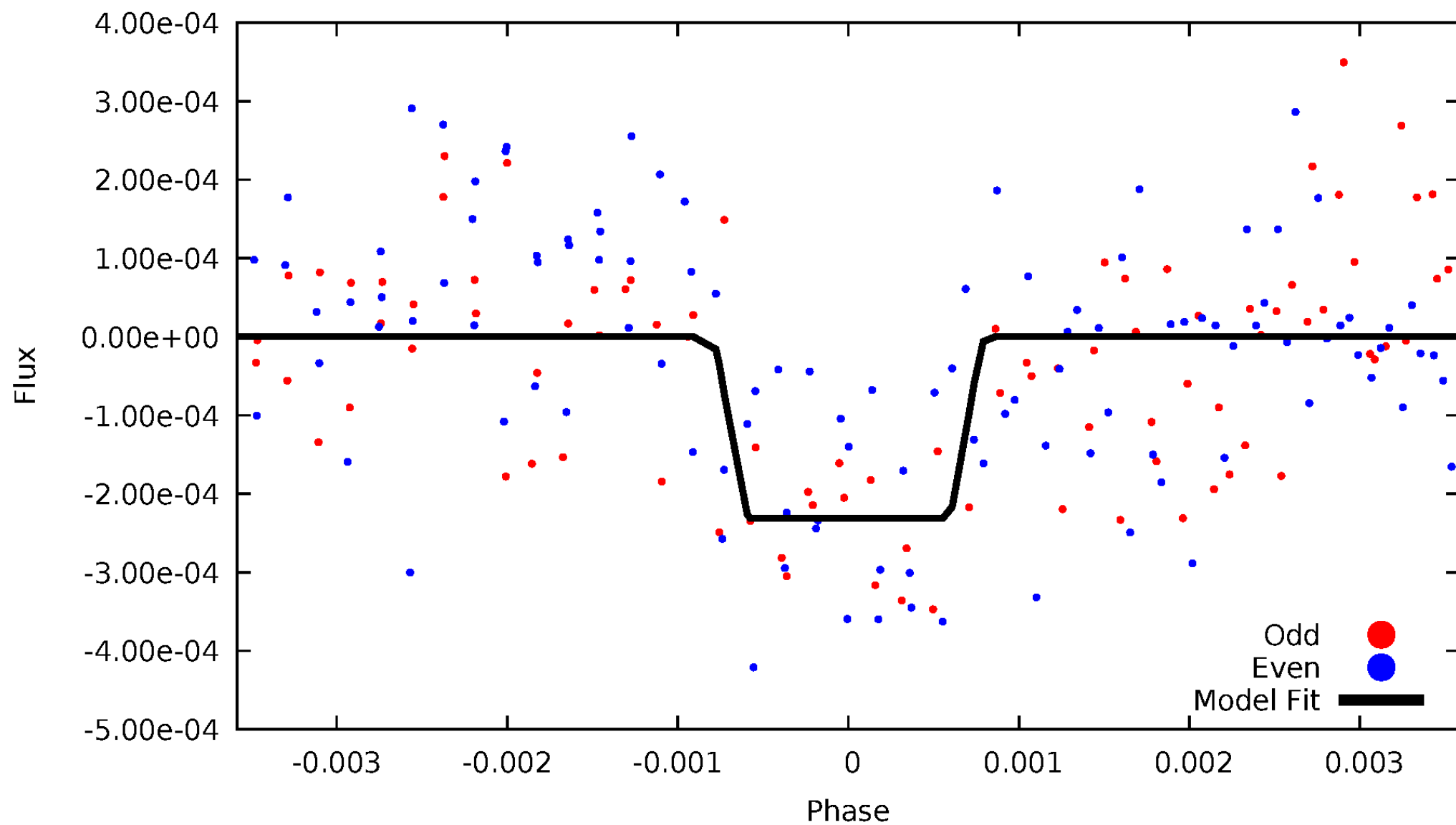
DV Odd/Even

TCE 002558488-04



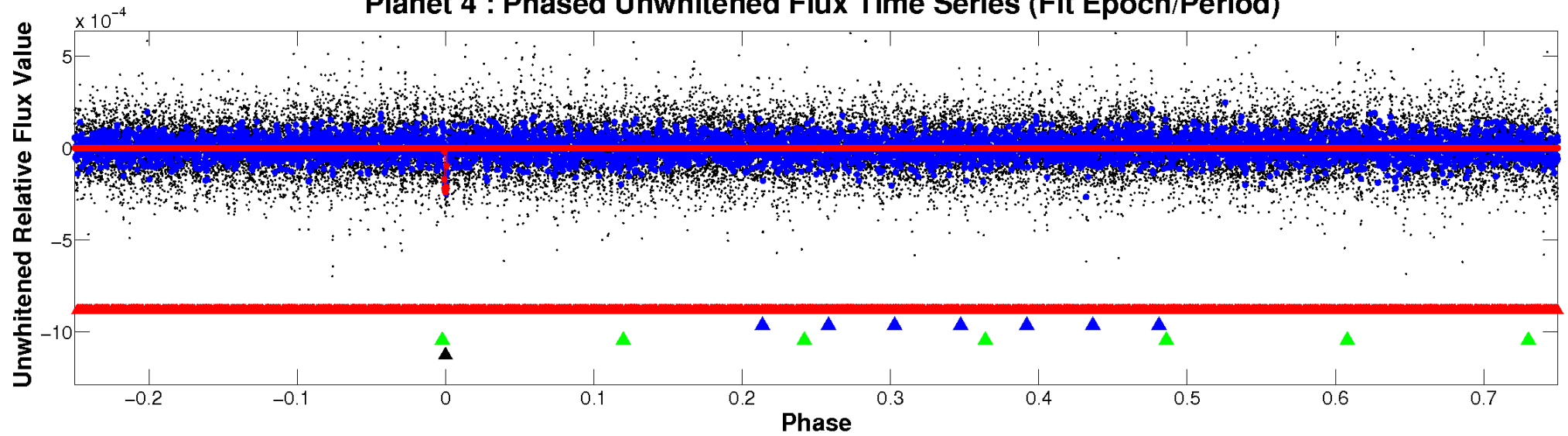
ALT Odd/Even

TCE 002558488-04

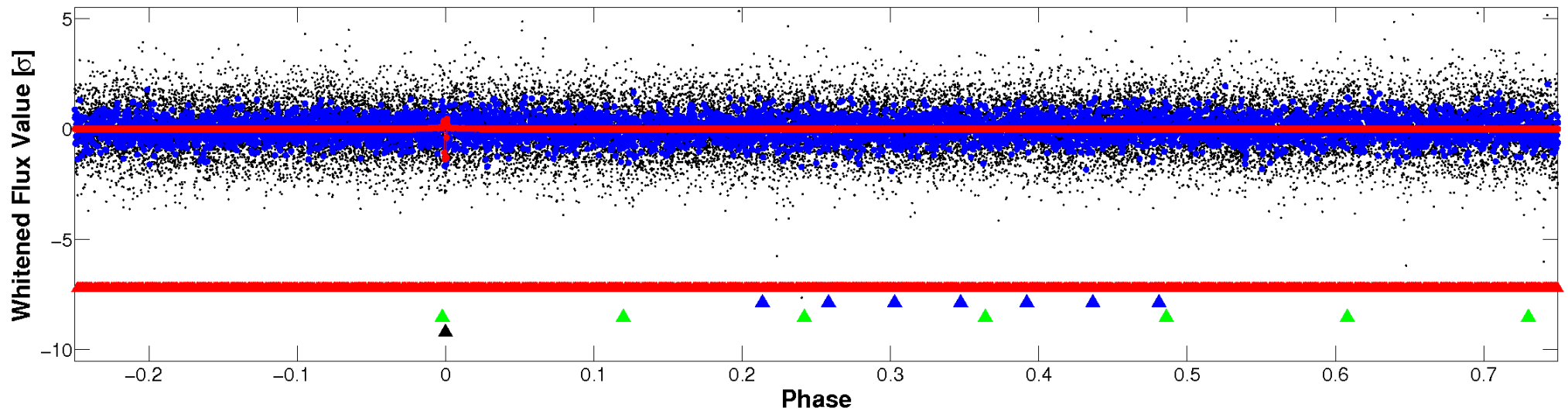


Non-Whitened Vs. Whitened Light Curve

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

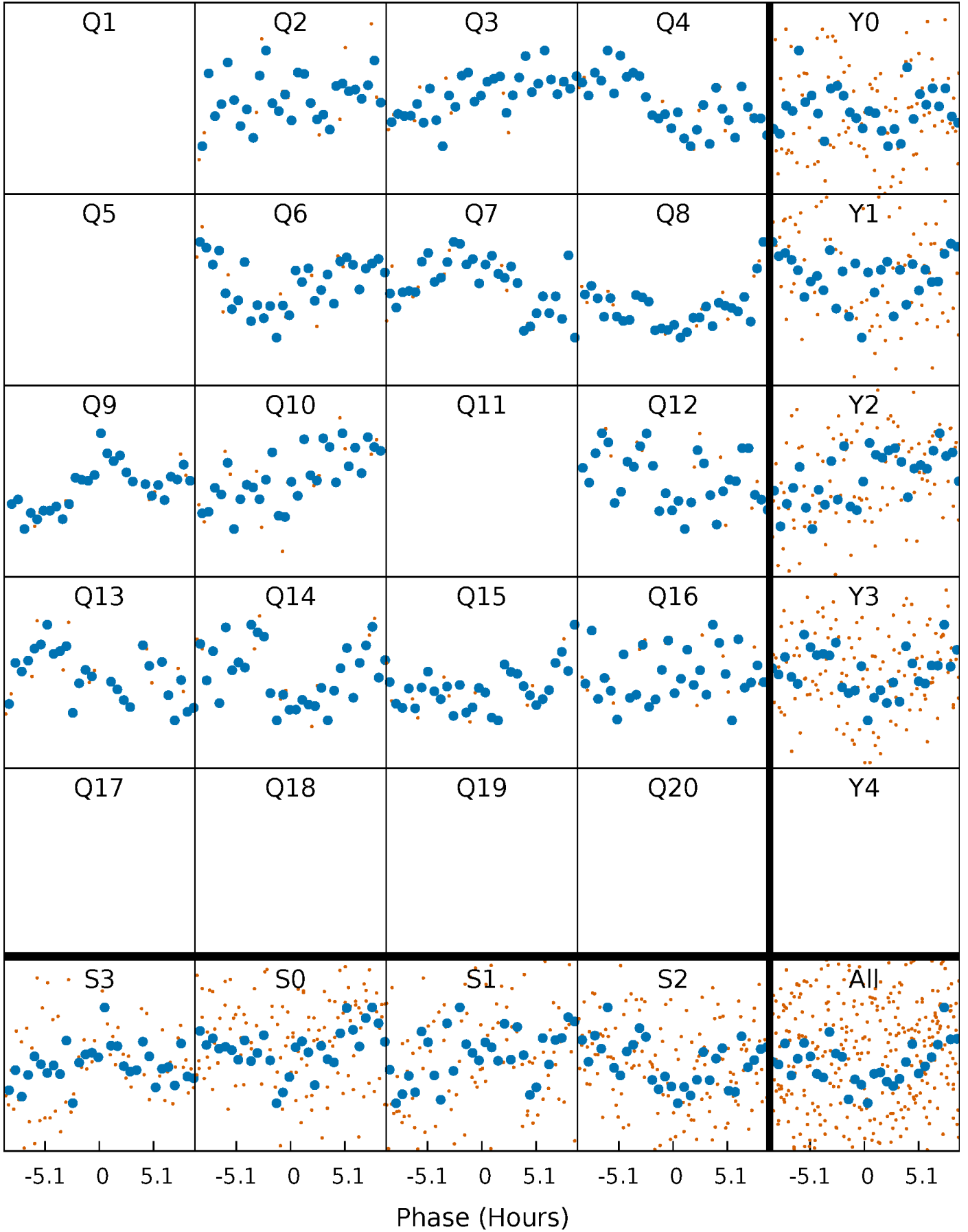


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



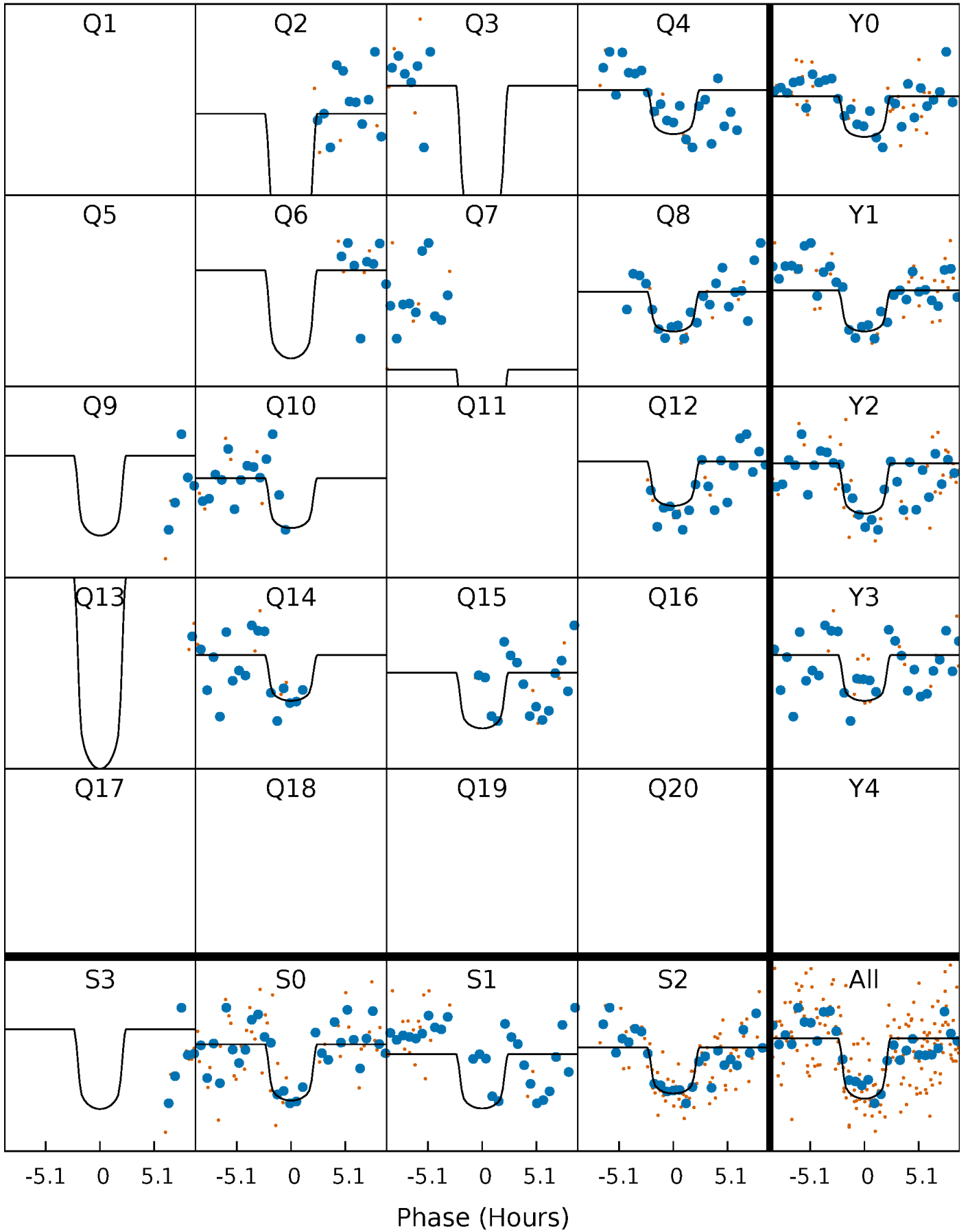
PDC Quarter-Phased Transit Curves

TCE 002558488-04 P=111.590724 Days $T_0=216.243210$ (BKJD)



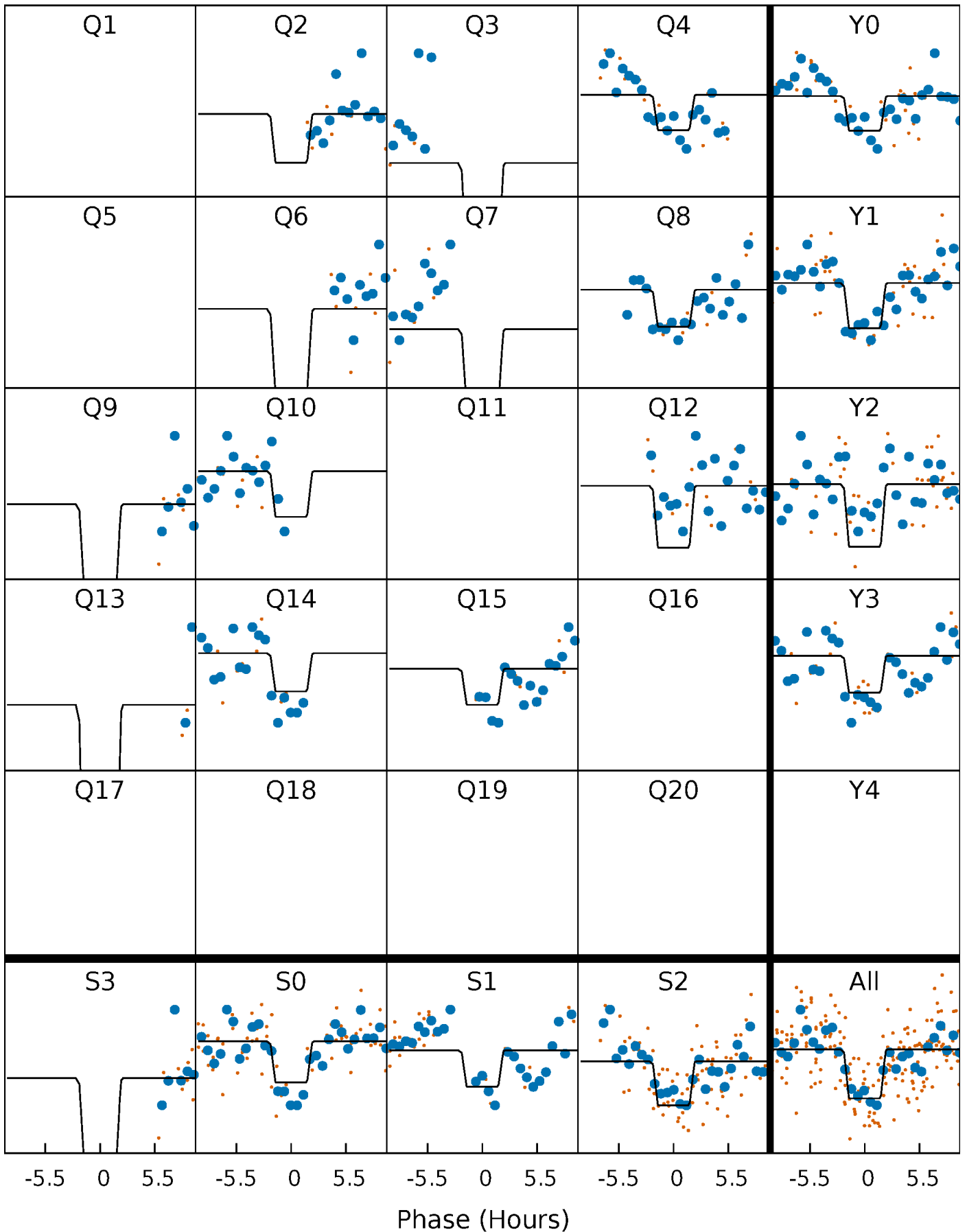
DV Quarter-Phased Transit Curves

TCE 002558488-04 P=111.590724 Days $T_0=216.243210$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

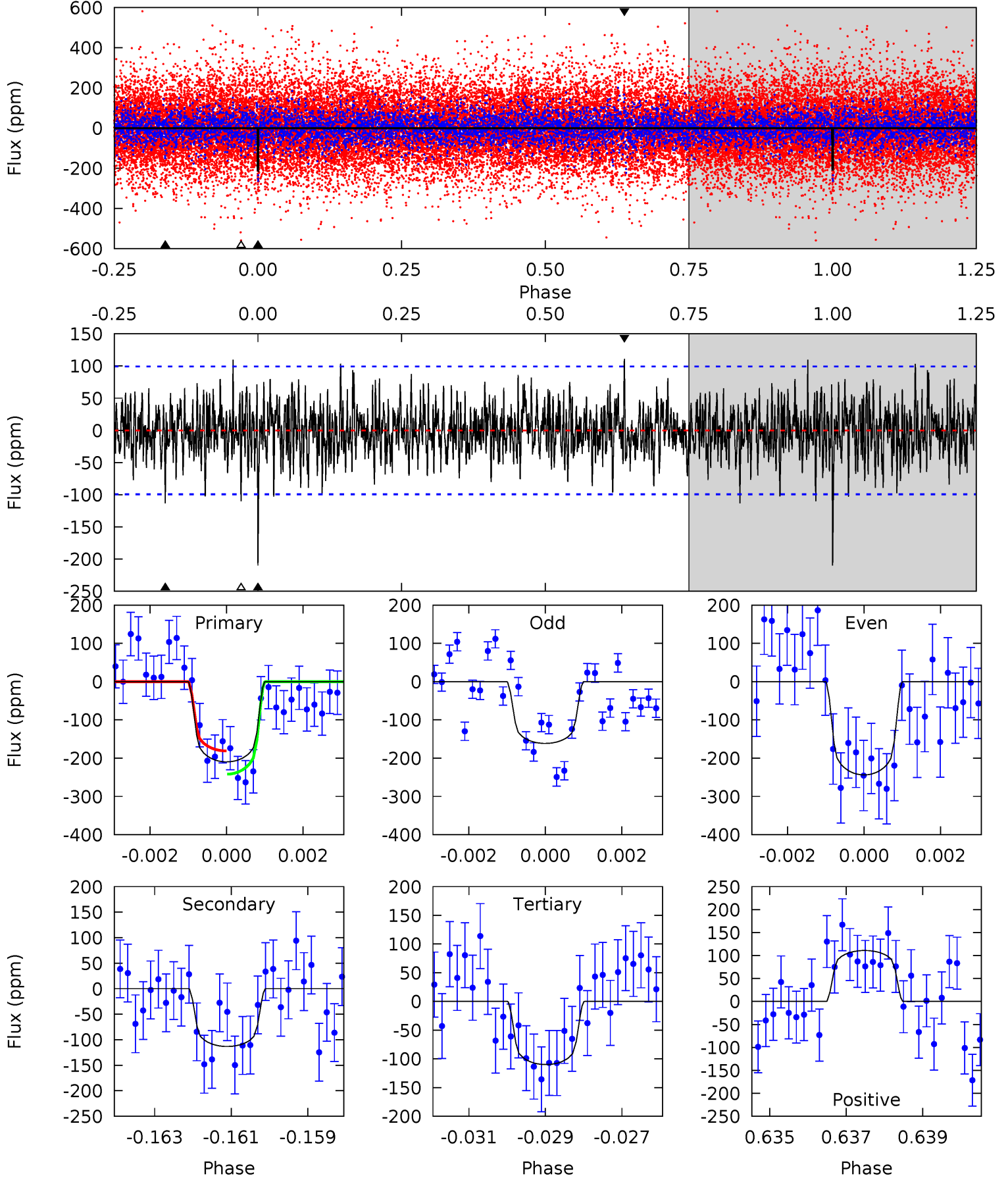
TCE 002558488-04 P=111.588618 Days $T_0=216.266624$ (BKJD)



DV Model-Shift Uniqueness Test

002558488-04, P = 111.590724 Days, E = 104.652486 Days

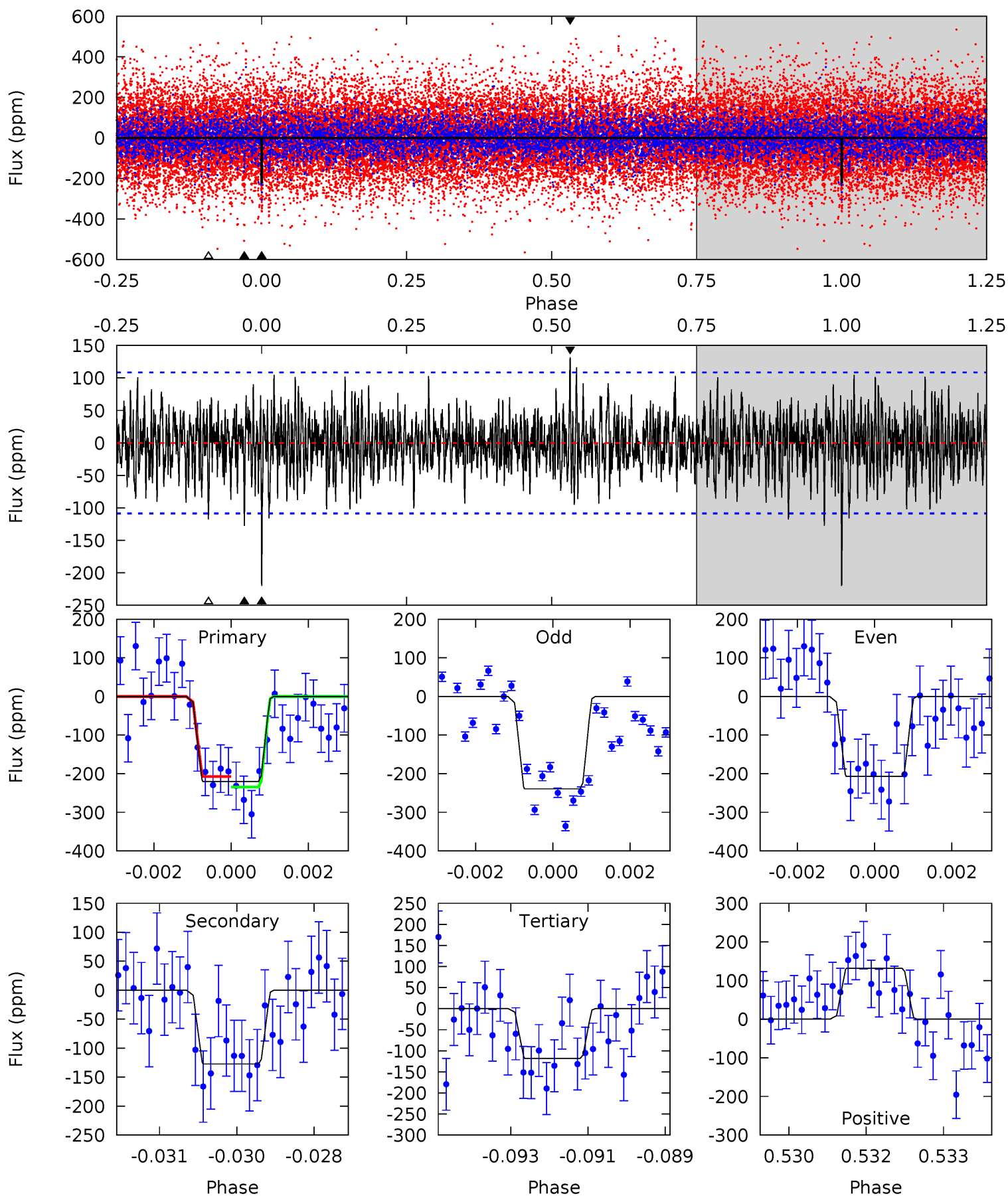
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.3	6.09	5.92	5.97	5.34	3.12	1.69	5.37	5.32	0.18	0.12	2.18	0.87	0.35	1.64



Alt Model-Shift Uniqueness Test

002558488-04, P = 111.588618 Days, E = 104.678006 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.9	6.30	5.83	6.54	5.37	3.16	1.71	5.06	4.35	0.47	-0.23	0.78	0.81	0.38	0.67



Stellar Parameters For KIC 002558488

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6351^{+177}_{-243}	$4.195^{+0.185}_{-0.185}$	$-0.080^{+0.250}_{-0.300}$	$1.450^{+0.440}_{-0.360}$	$1.203^{+0.177}_{-0.194}$	$0.555^{+0.600}_{-0.266}$
	+3%/-4%	+4%/-4%	+312%/-375%	+30%/-25%	+15%/-16%	+108%/-48%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 002558488-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-113 ± 19	$2.57^{+1.39}_{-1.15}$	676^{+58}_{-49}	5170^{+1792}_{-794}	2201^{+5062}_{-1308}
Alt.	-127 ± 20	$2.43^{+1.33}_{-1.24}$	670^{+54}_{-47}	5395^{+2406}_{-881}	2674^{+8591}_{-1561}

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

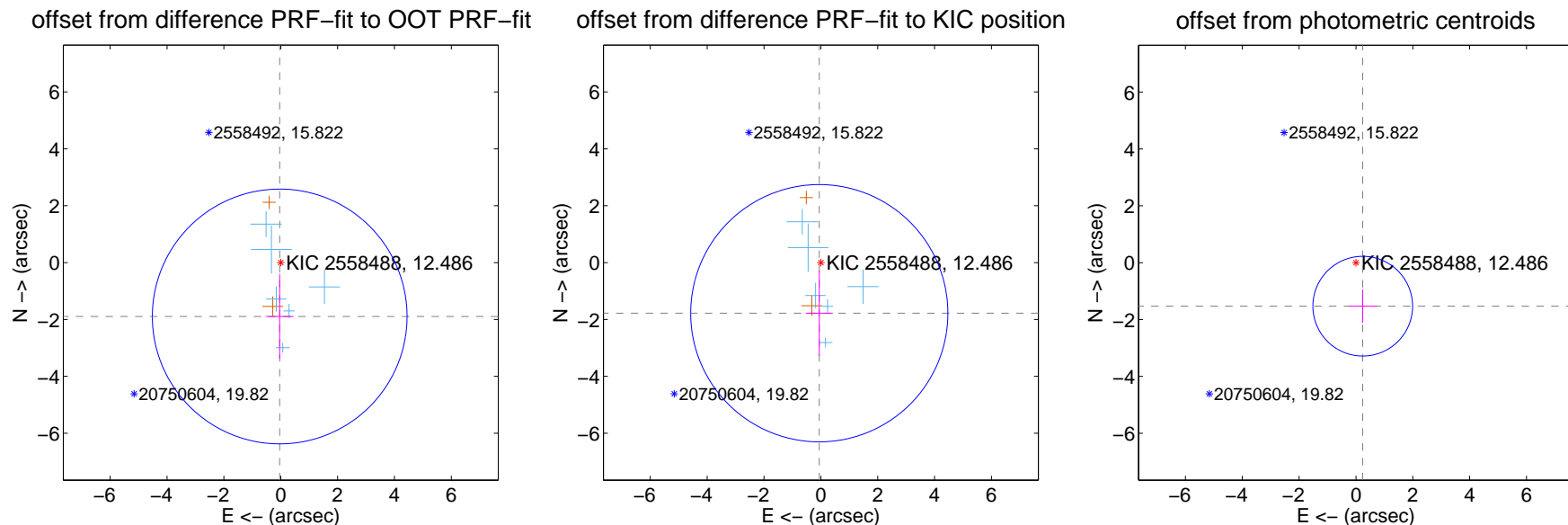
DV Centroid Data

Supplemental centroid analysis for 002558488-04. Kepler magnitude: 12.49. Transit SNR 8.24

There are 6 quarters with good PRF difference image offsets

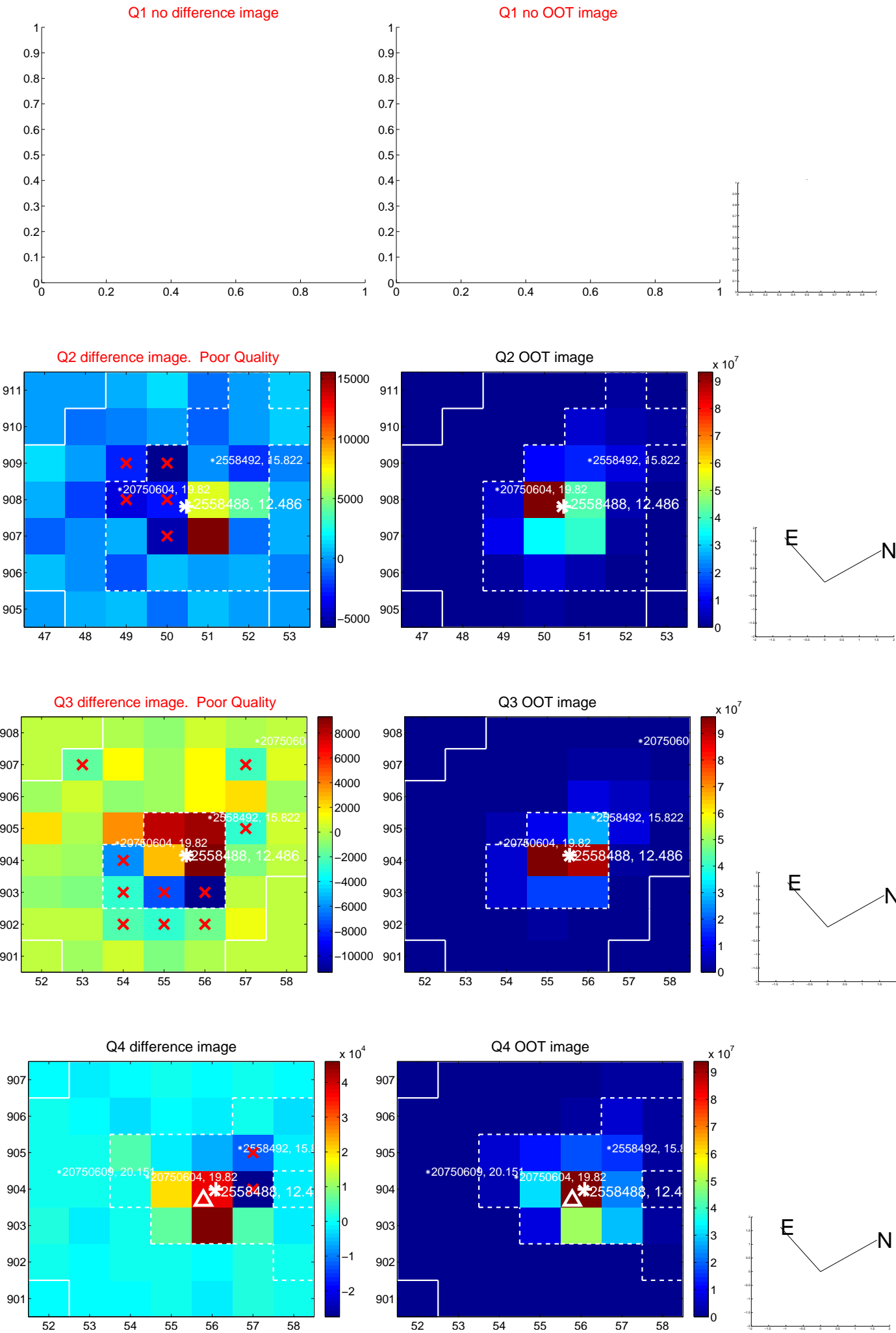
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.895 ± 1.493	1.27	0.037 ± 0.492	-1.895 ± 1.486
PRF-fit source offset from KIC position	1.781 ± 1.508	1.18	0.056 ± 0.474	-1.781 ± 1.497
photometric centroid source offset	1.55 ± 0.58	2.65	-0.24 ± 0.49	-1.53 ± 0.59

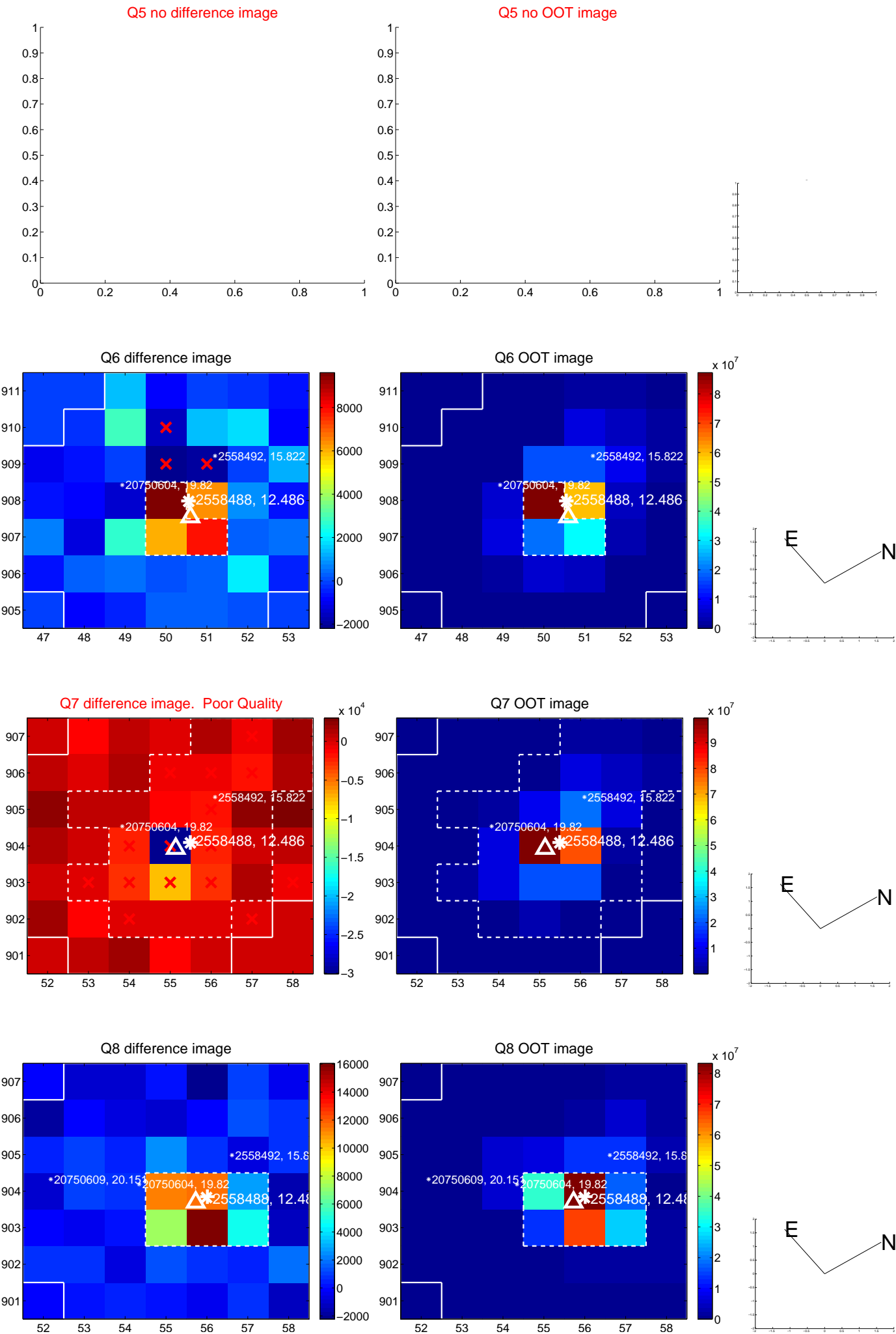


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

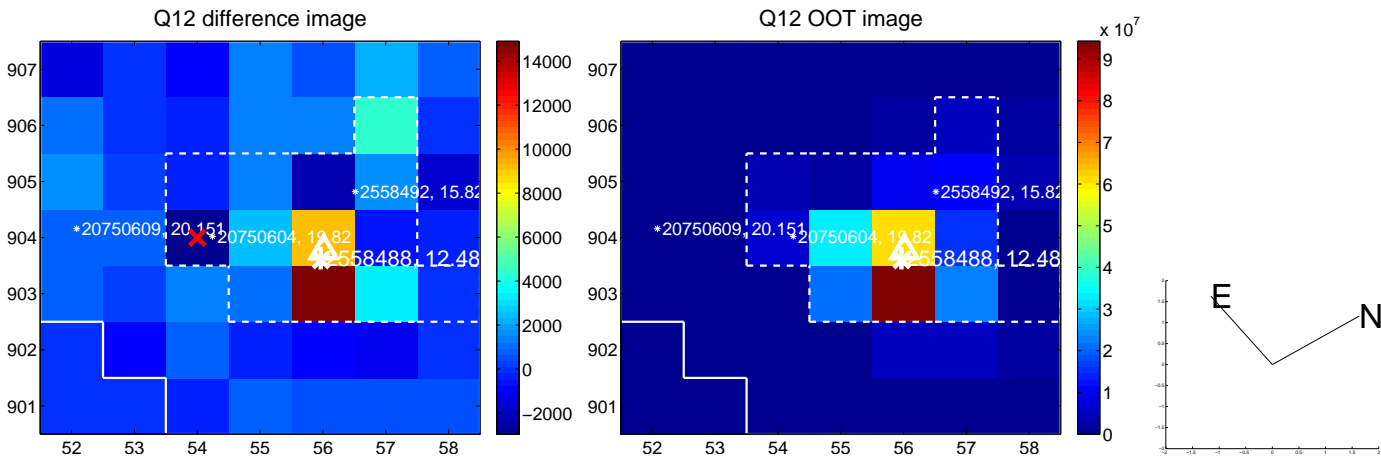
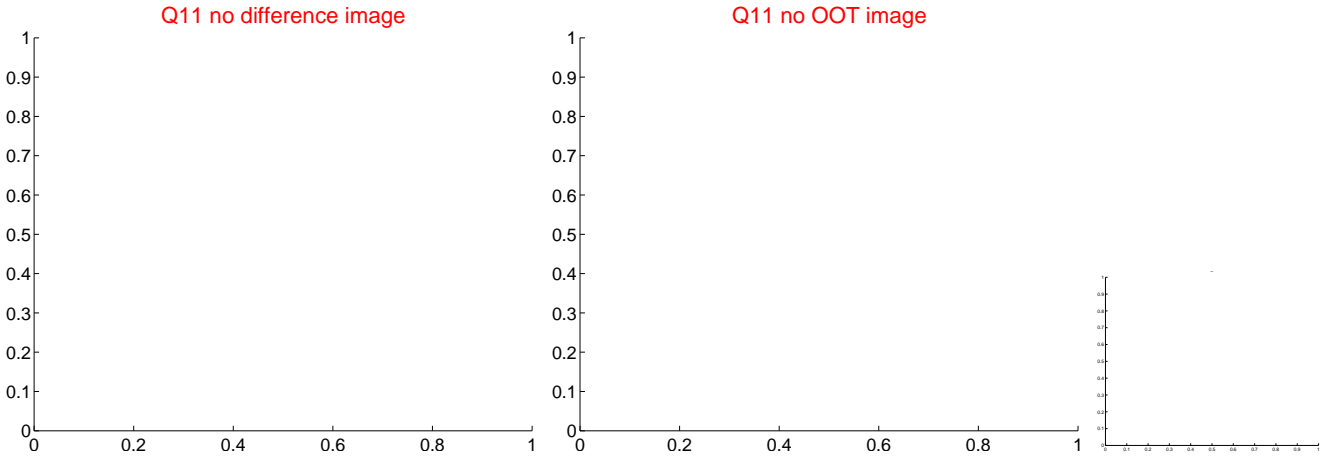
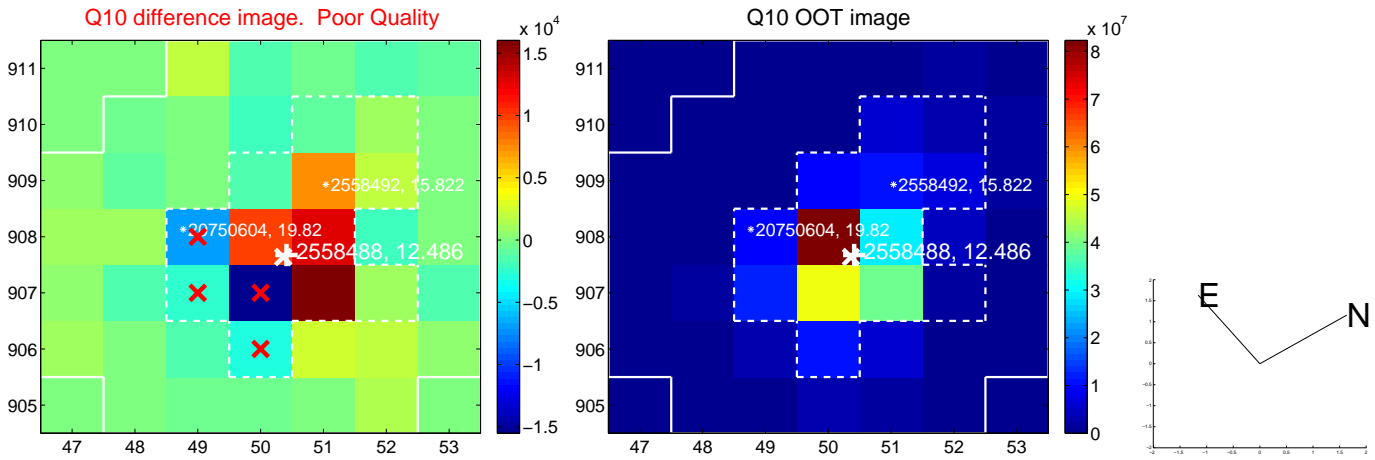
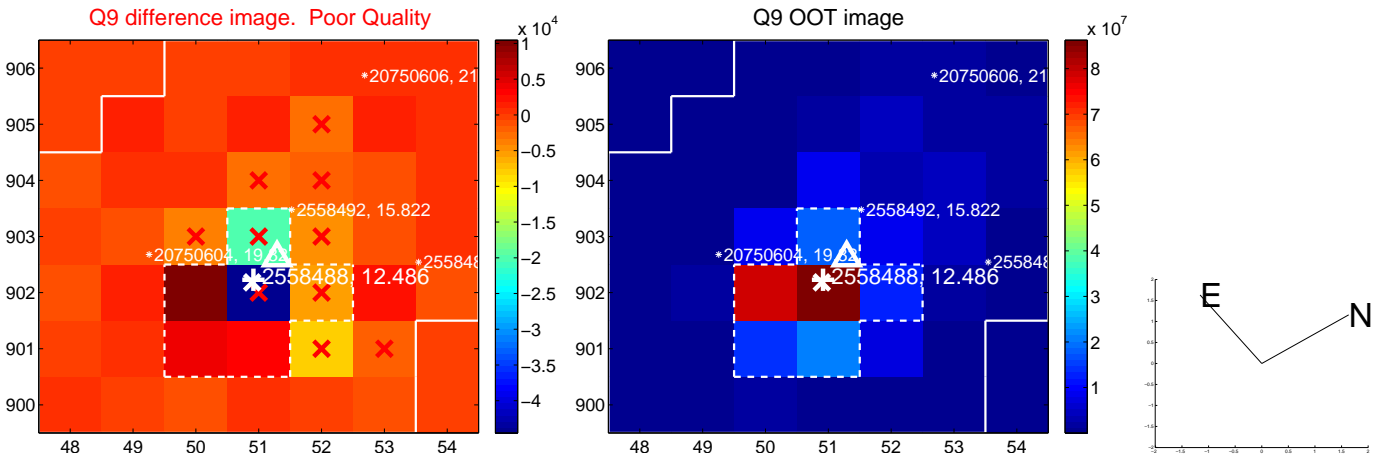
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



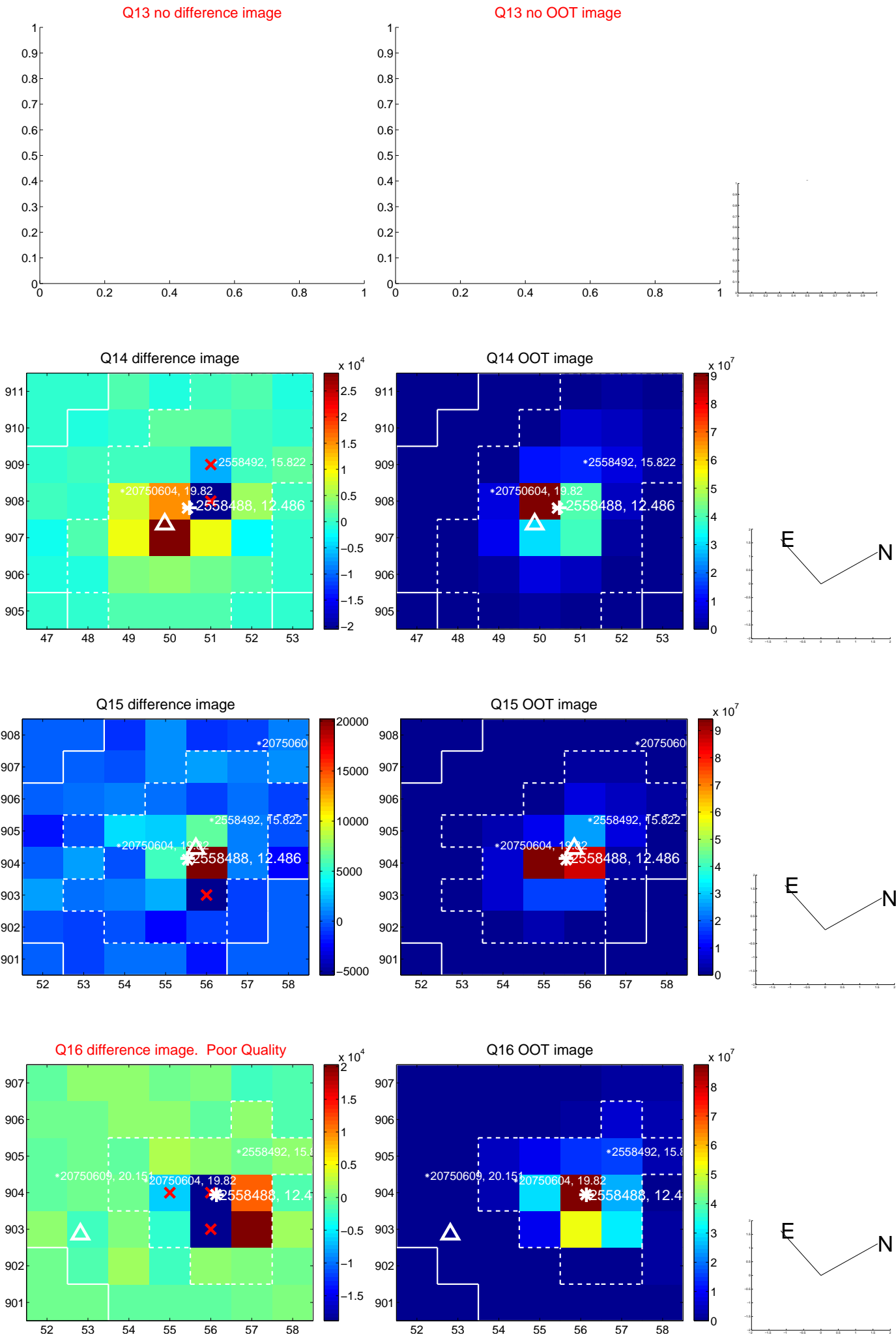
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



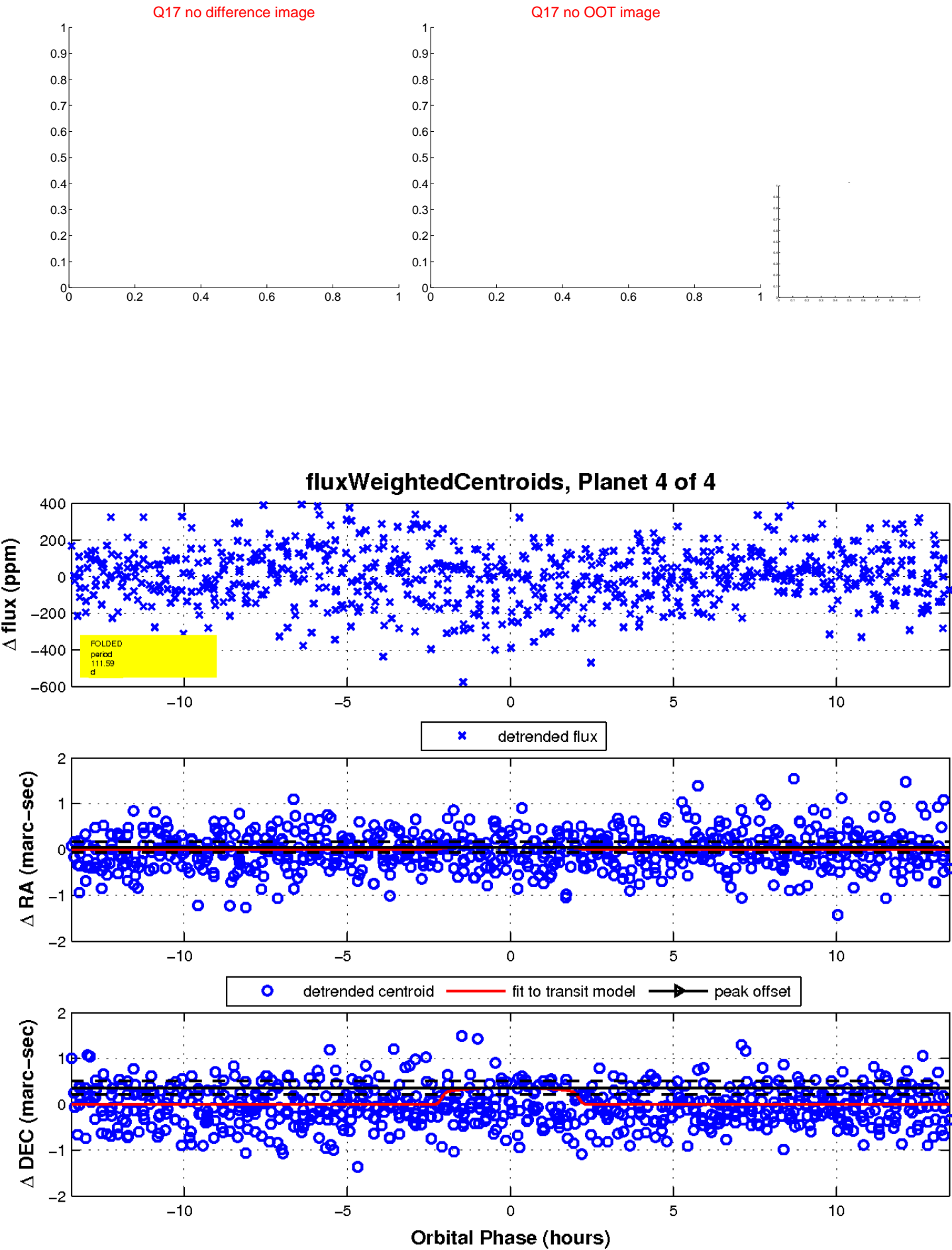
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

