

KIC 008878567

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})
008878567-01	OBS	No	0.918398	131.620401	8.6	2.488	7.2	6.1	1.29	6290	0.44	6470.68
008878567-03	OBS	No	283.316711	245.374807	177.8	8.977	8.7	6.0	1.29	6290	1.91	3.10

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008878567-01	OBS	FP	0.00	1	0	0	1	LPP_DV—EPHEM_MATCH
008878567-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—HALO_GHOST

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.

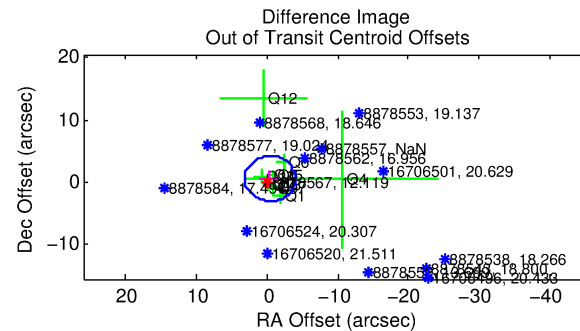
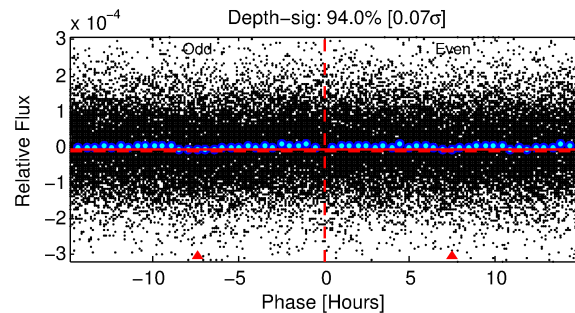
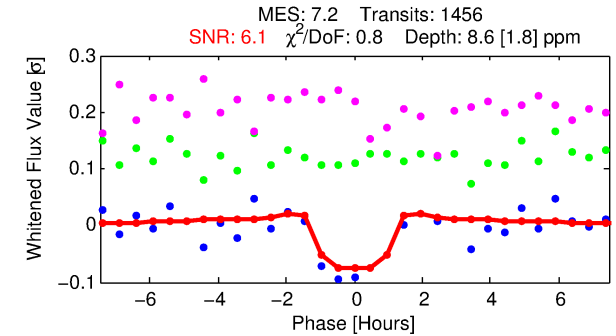
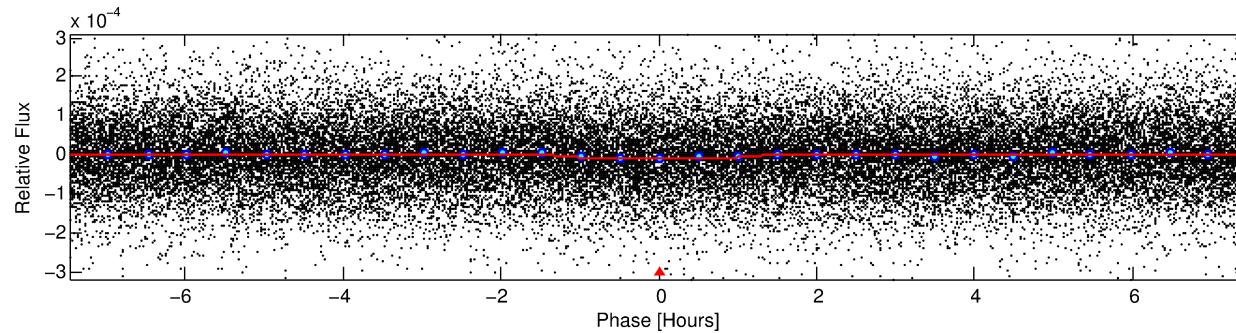
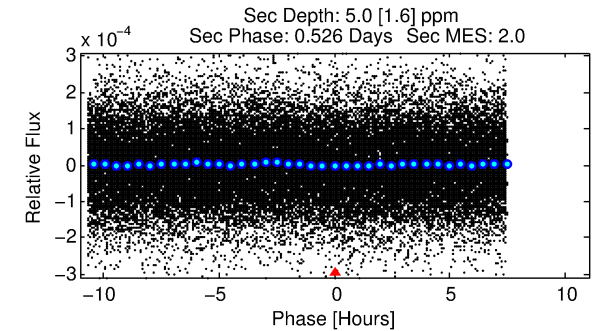
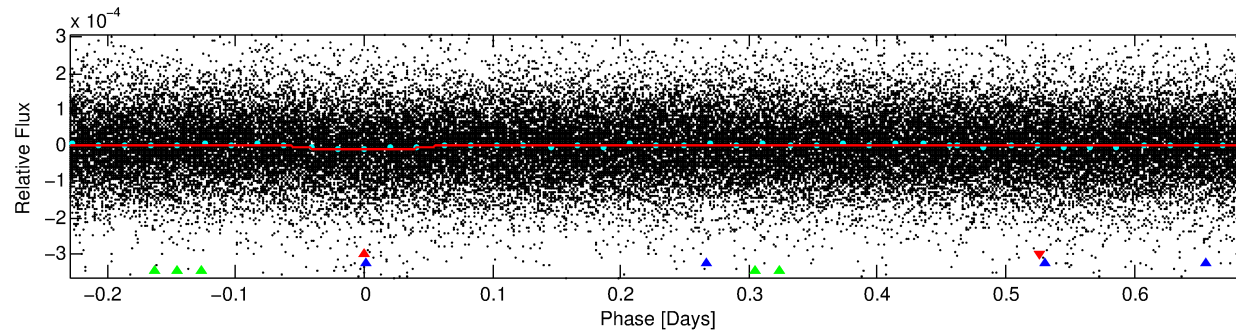
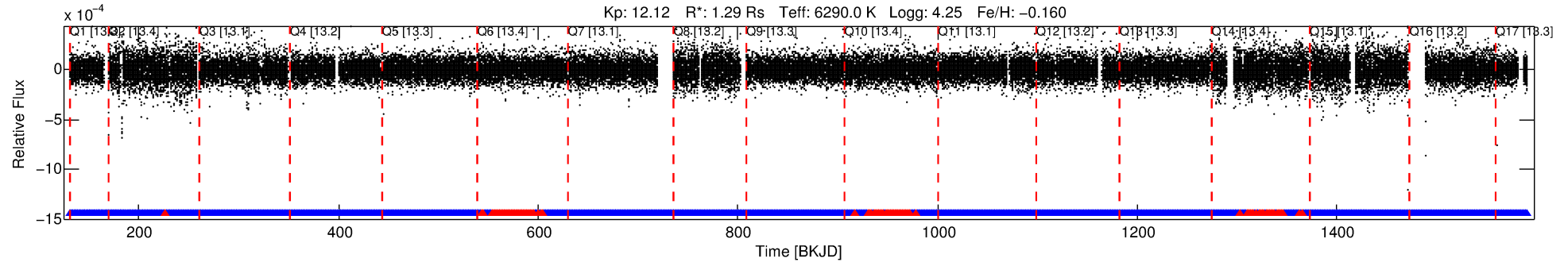
Ephemeris Match Information For 008878567-01

TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ($''$)	Δ Row	Δ Col	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
008878567-01	8878567	009083523-pri	9083523	1:1	1709.6	-430	5	12.71	12.12	49744.00	Col-Anomaly	0	2.35	2.49

Notes: $P_1:P_2$ is the period ratio. Dist is the distance in arcseconds. Δ Row and Δ Col are the number of pixels apart in row and column. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match in period and epoch. For a match to be considered significant $\sigma_P < 5.0$ and $\sigma_T < 5.0$. Matches which have σ_P and σ_T very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

DV One-Page Summary

KIC: 8878567 Candidate: 1 of 3 Period: 0.918 d



DV Fit Results:

Period = 0.91840 [0.00002] d
Epoch = 131.6204 [0.0043] BKJD
Rp/R* = 0.0032 [0.0007]
a/R* = 1.56 [1.05]
b = 0.90 [0.24]
Seff = 6470.67 [2528.86]
Teq = 2287 [223] K
Rp = 0.44 [0.17] Re
a = 0.0189 [0.0048] AU
Ag = 5.08 [3.35] [1.22σ]
Teffp = 5309 [763] K [3.80σ]

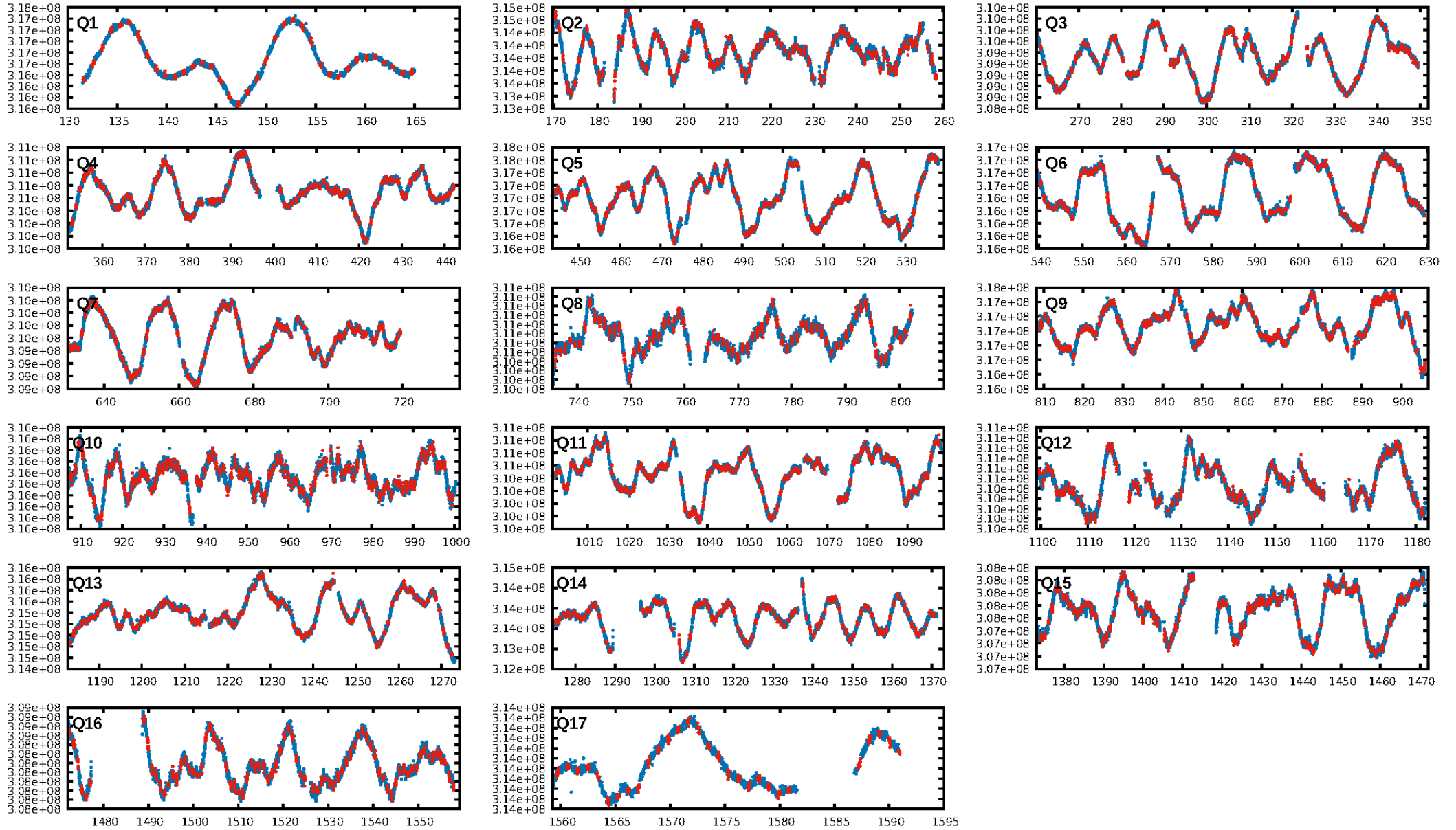
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [727.57σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 3.38e-13
RollingBand-fgt: 0.91 [1266/1390]
GhostDiagnostic-chr: 0.725
Centroid-sig: 28.8%
Centroid-so: 1.528 arcsec [0.93σ]
OotOffset-rm: 0.717 arcsec [0.60σ]
OotOffset-st: 2/2/2/5 [11]
KicOffset-rm: 0.594 arcsec [0.48σ]
KicOffset-st: 2/2/2/5 [11]
DiffImageQuality-fgm: 0.55 [6/11]
DiffImageOverlap-fno: 1.00 [17/17]

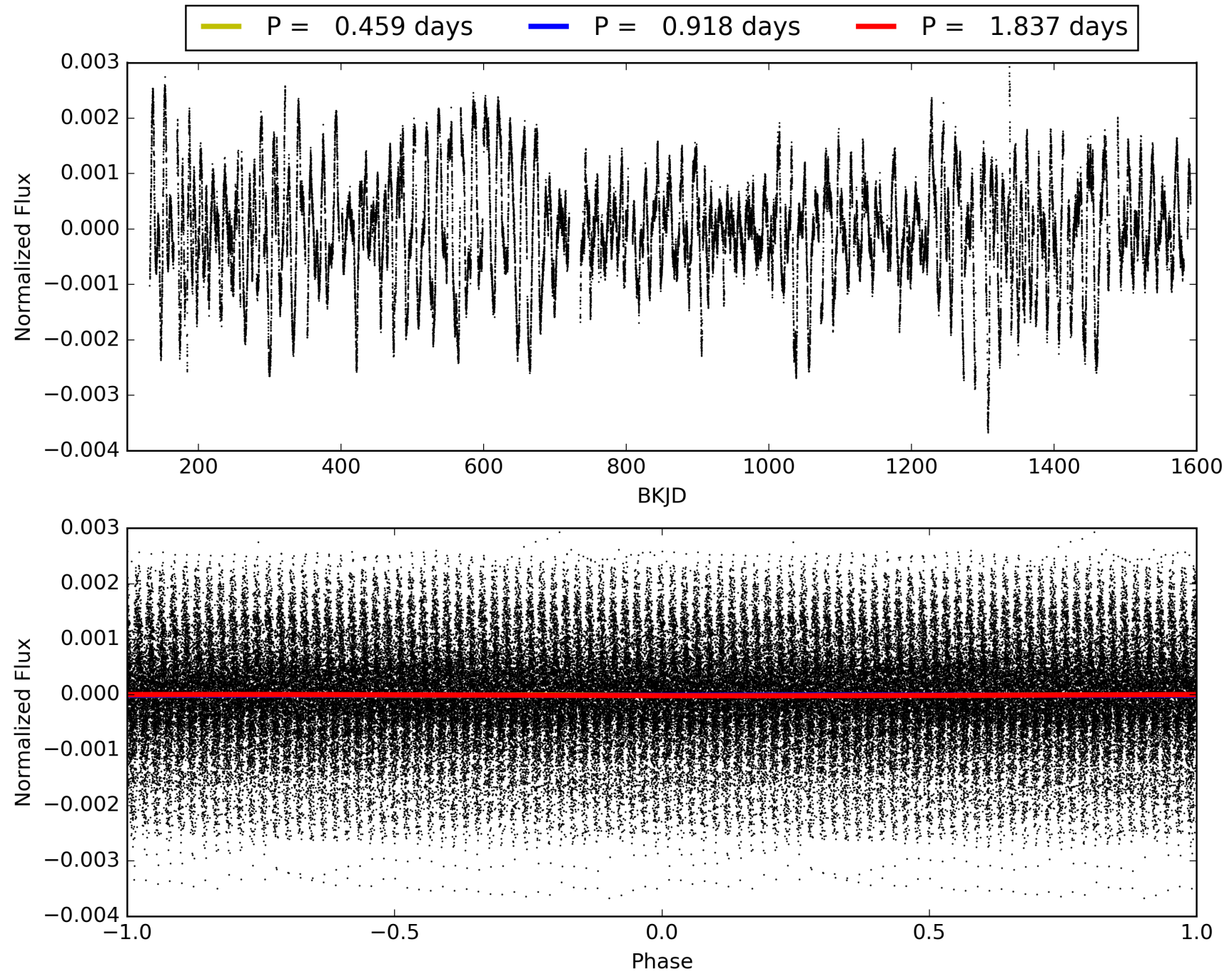
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 02:20:20 Z

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

TCE 008878567-01, PDC Light Curves

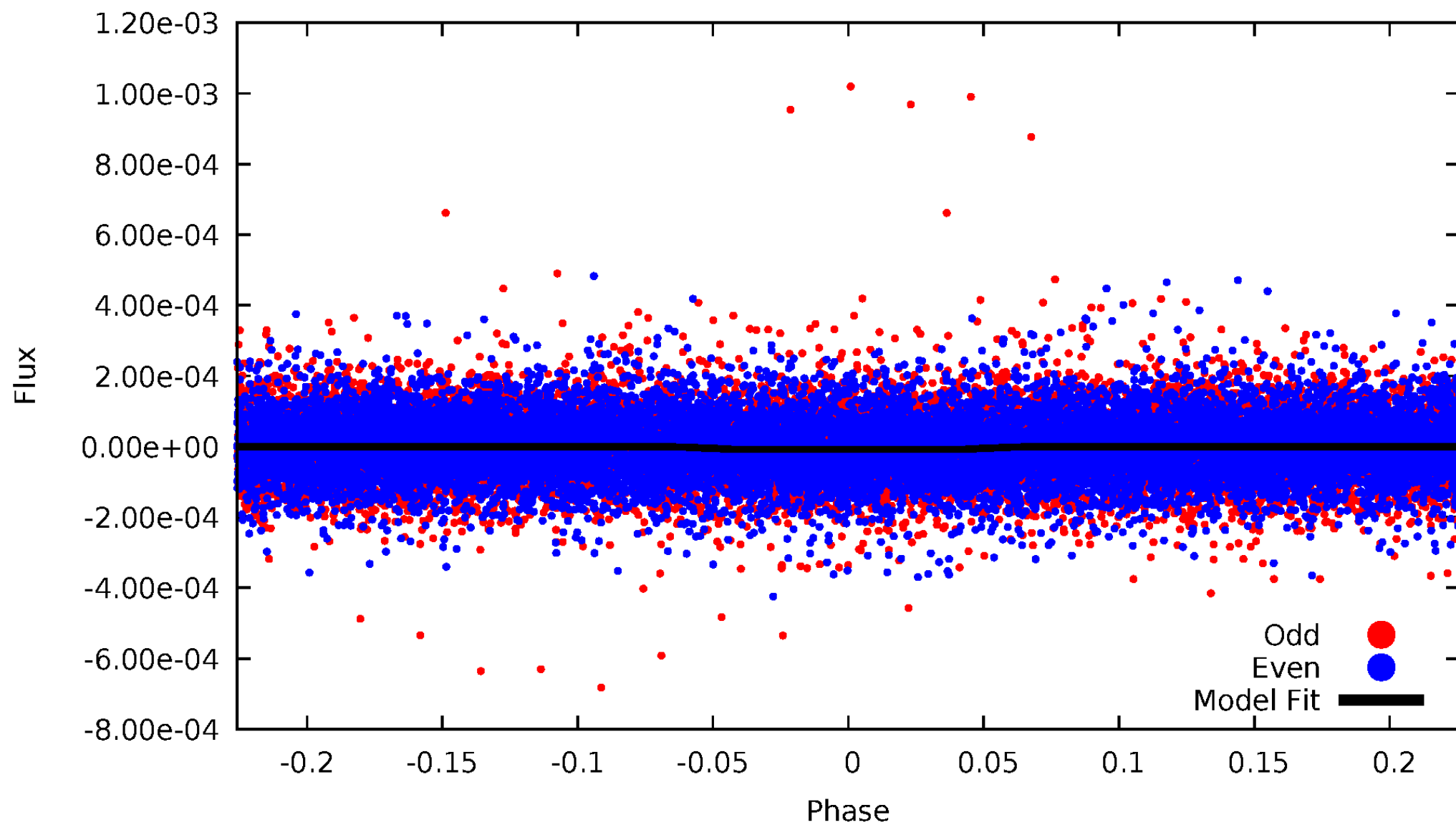


TCE 008878567-01



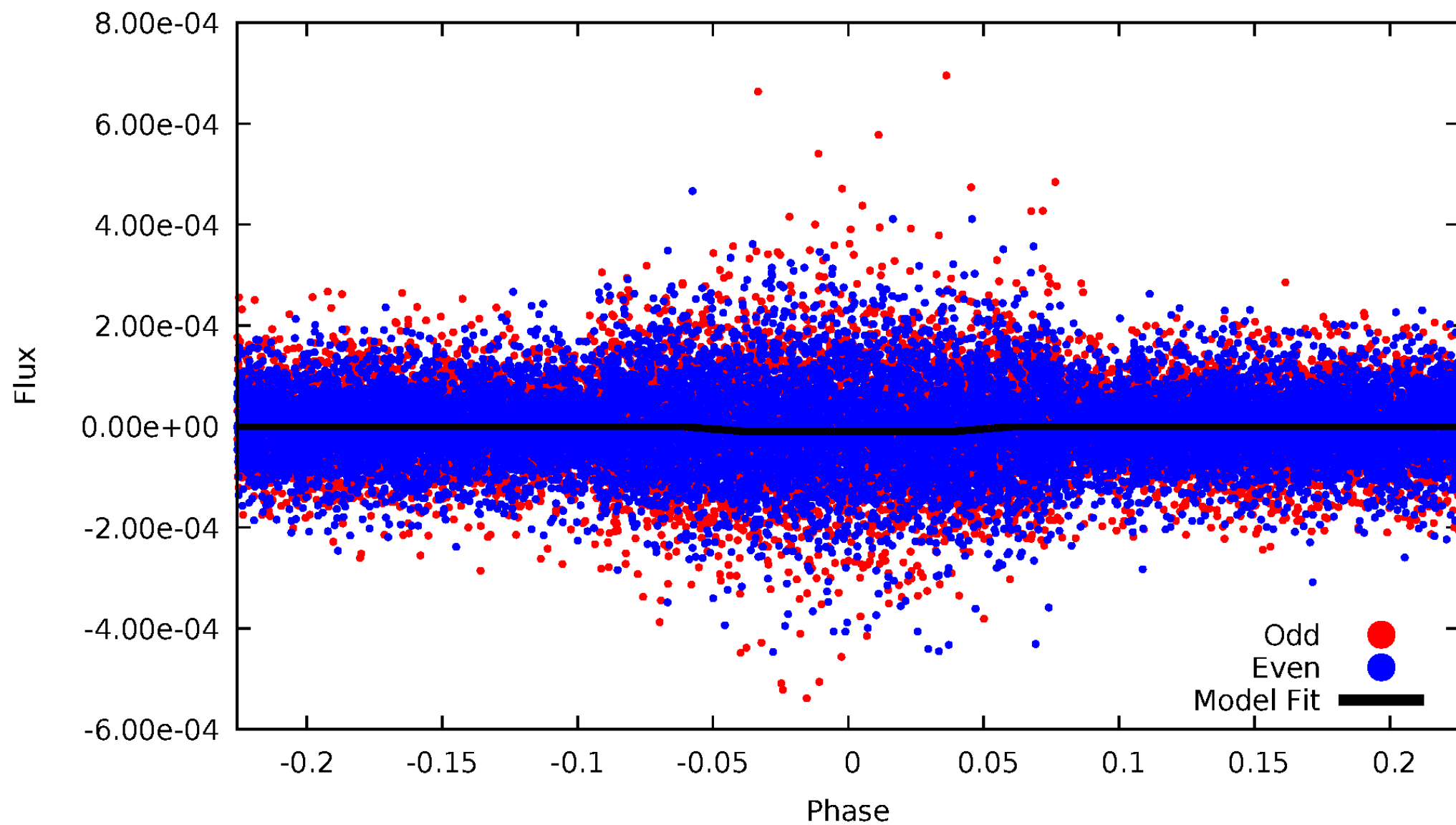
DV Odd/Even

TCE 008878567-01

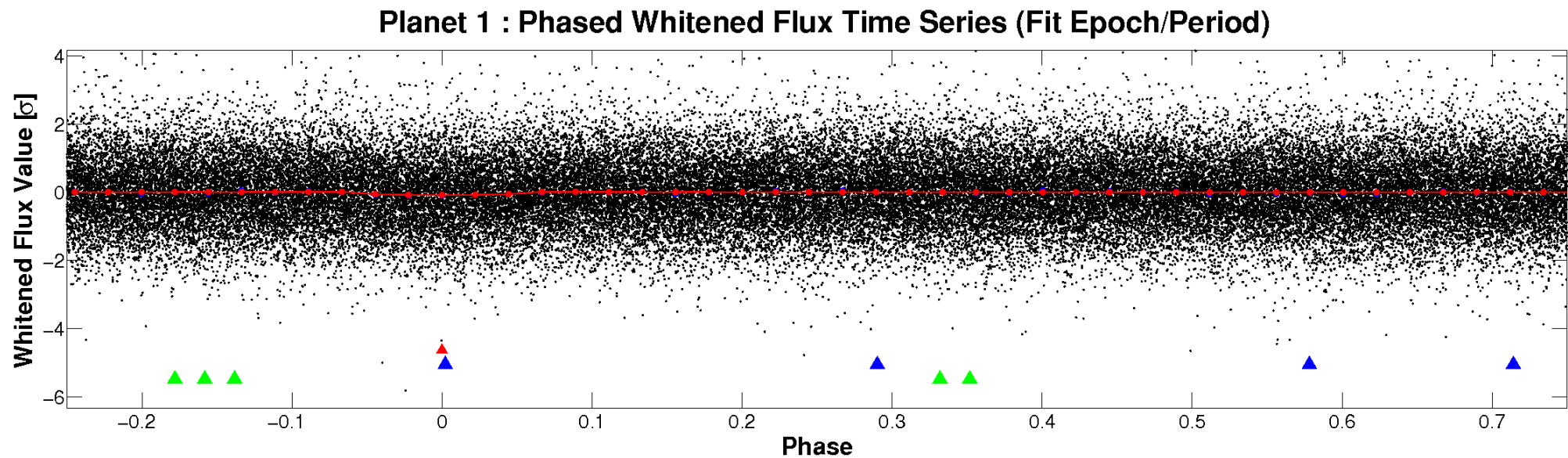
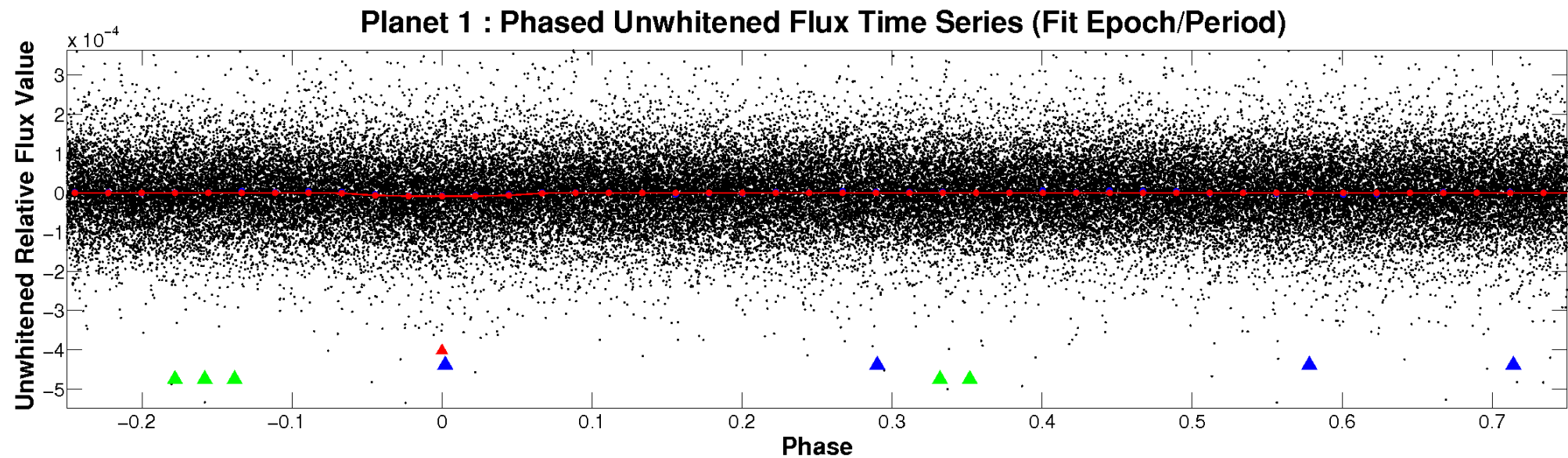


ALT Odd/Even

TCE 008878567-01

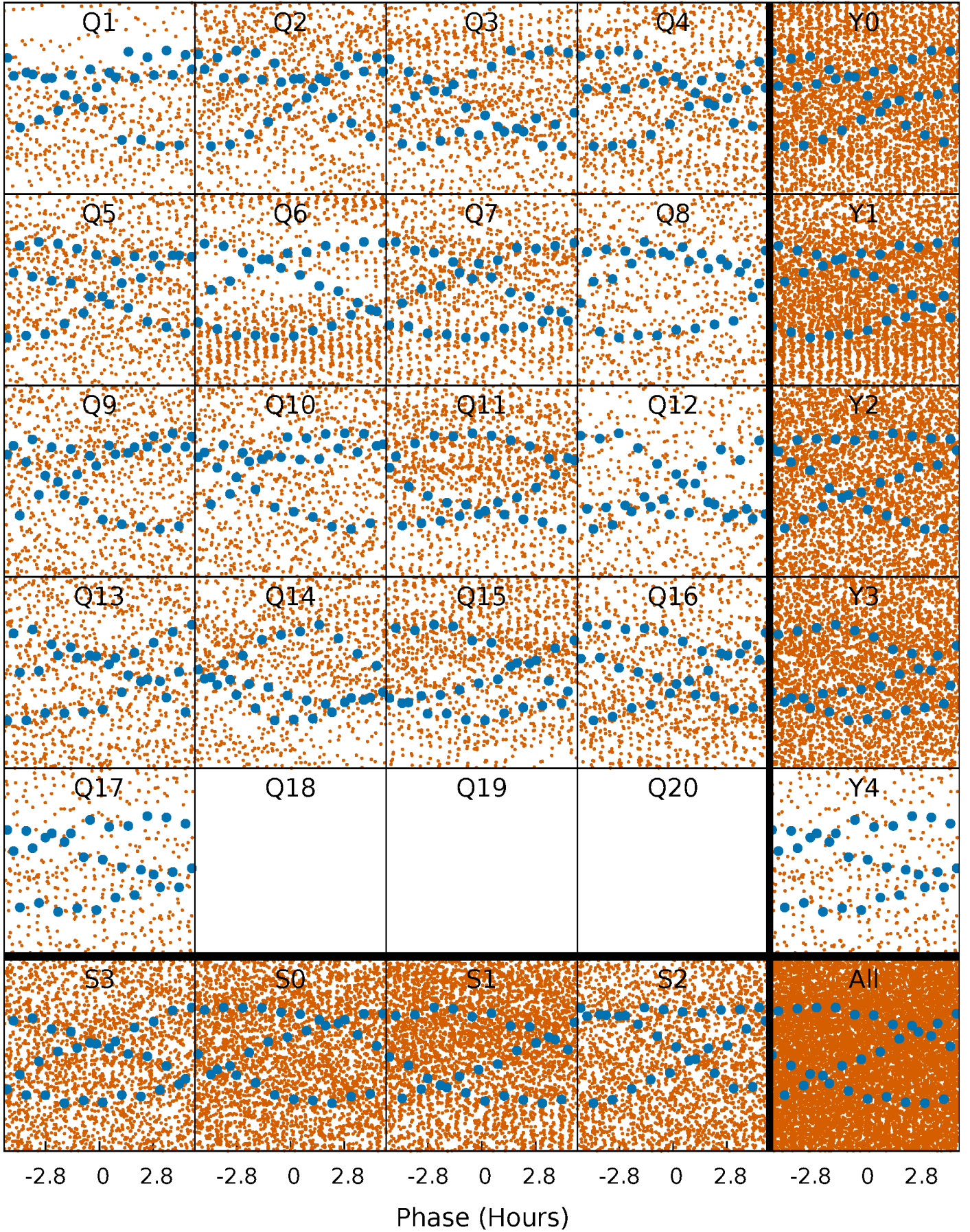


Non-Whitened Vs. Whitened Light Curve



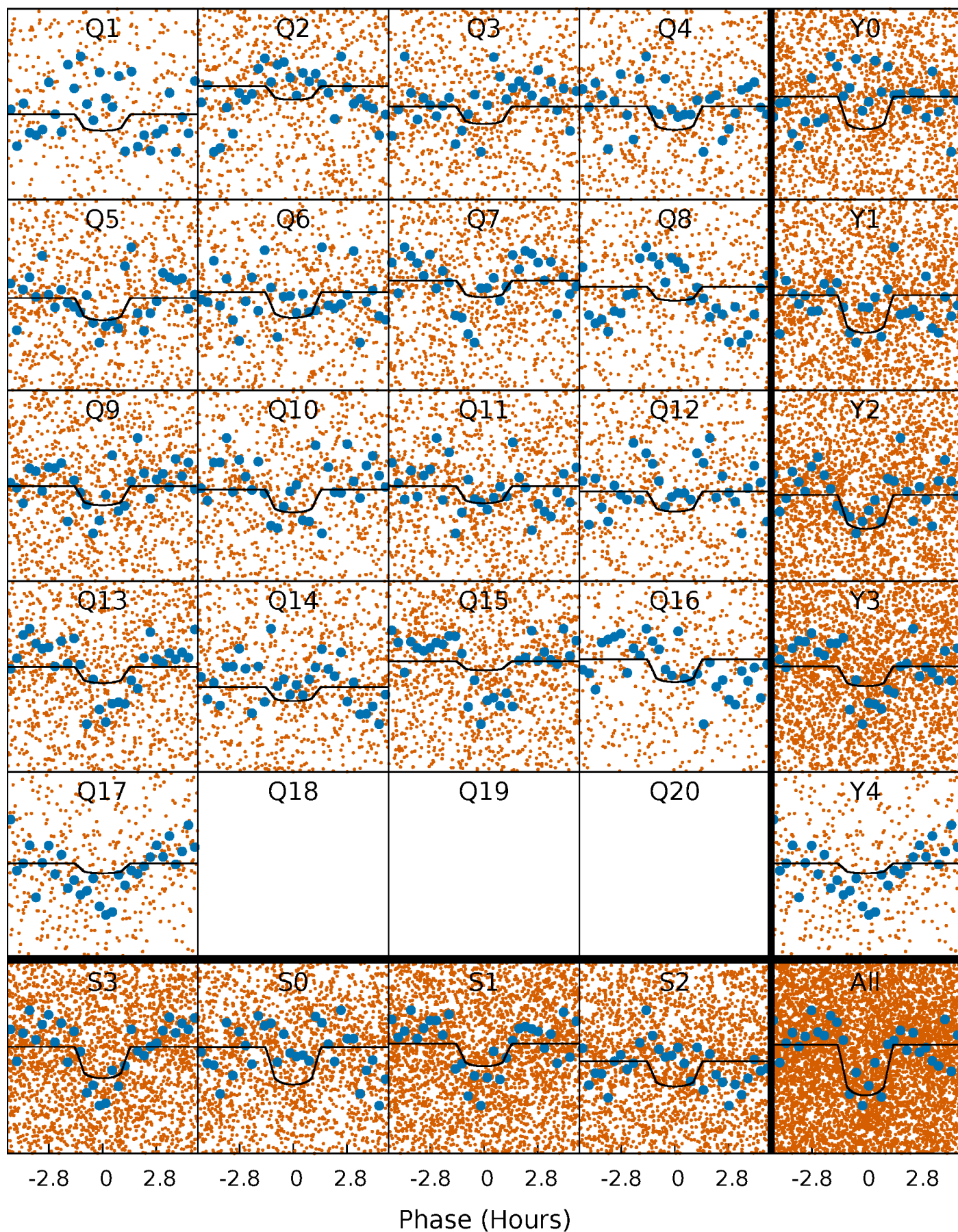
PDC Quarter-Phased Transit Curves

TCE 008878567-01 P= 0.918398 Days $T_0=131.620401$ (BKJD)



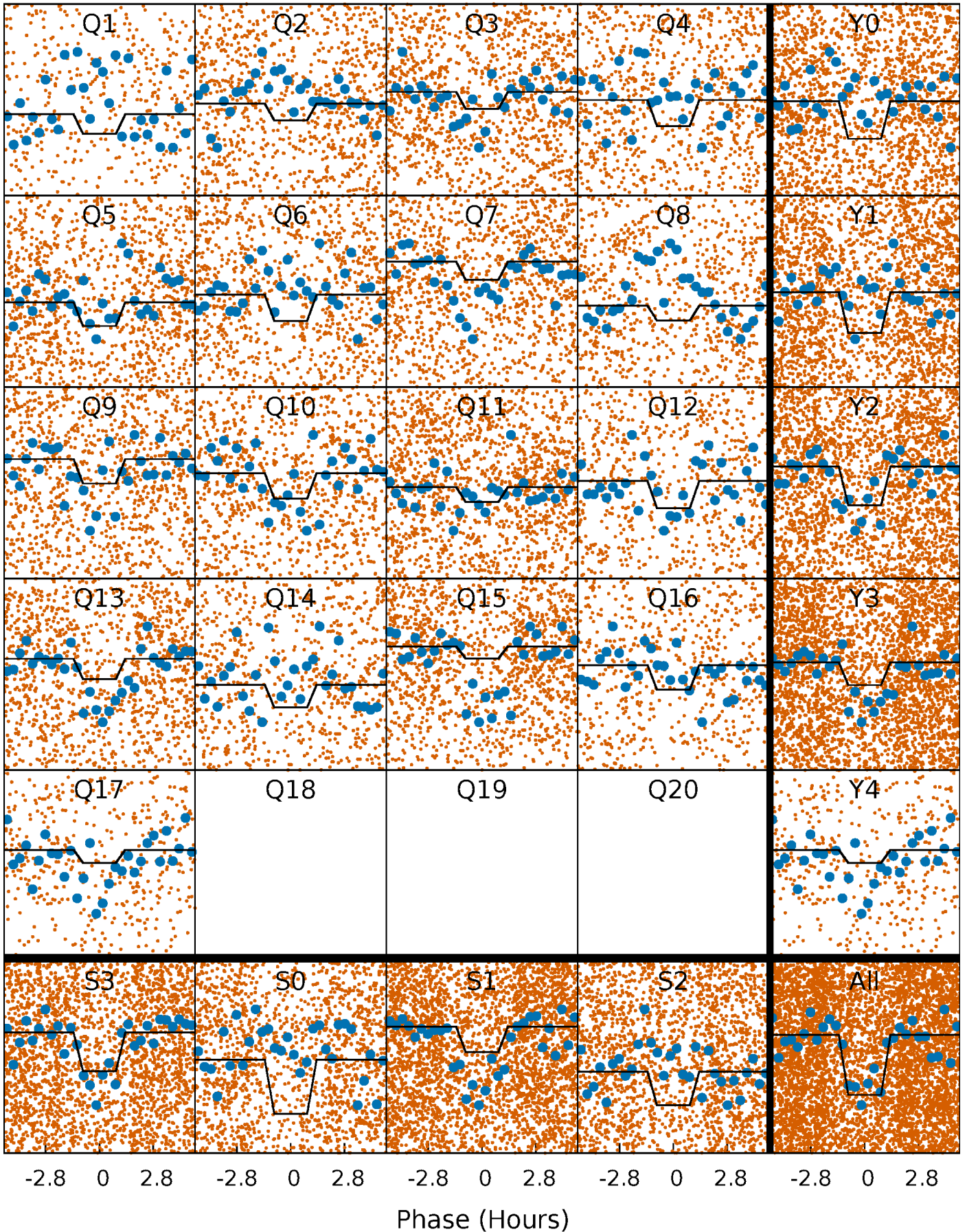
DV Quarter-Phased Transit Curves

TCE 008878567-01 P= 0.918398 Days $T_0=131.620401$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

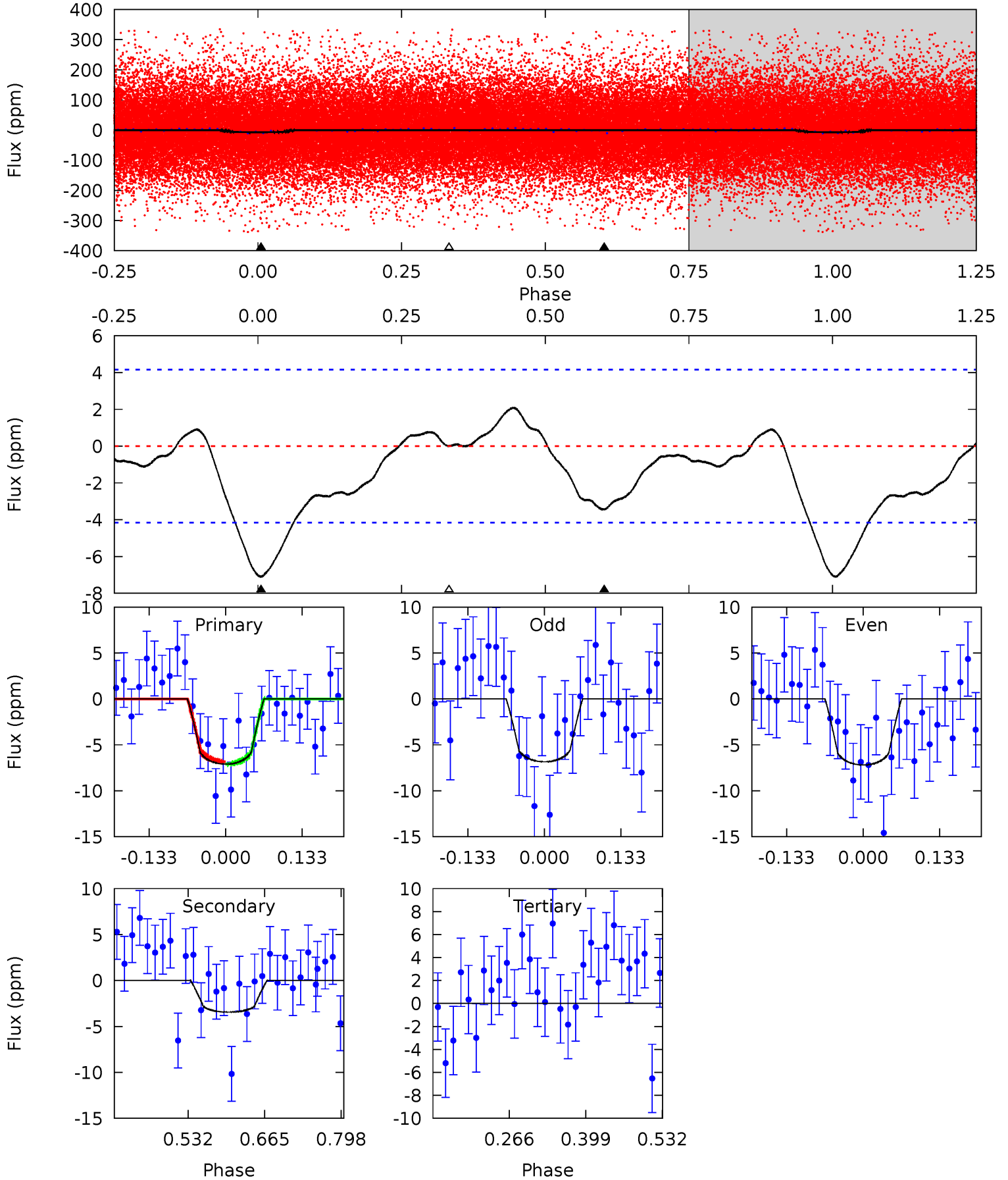
TCE 008878567-01 P= 0.918398 Days $T_0=131.620391$ (BKJD)



DV Model-Shift Uniqueness Test

008878567-01, P = 0.918398 Days, E = 130.702003 Days

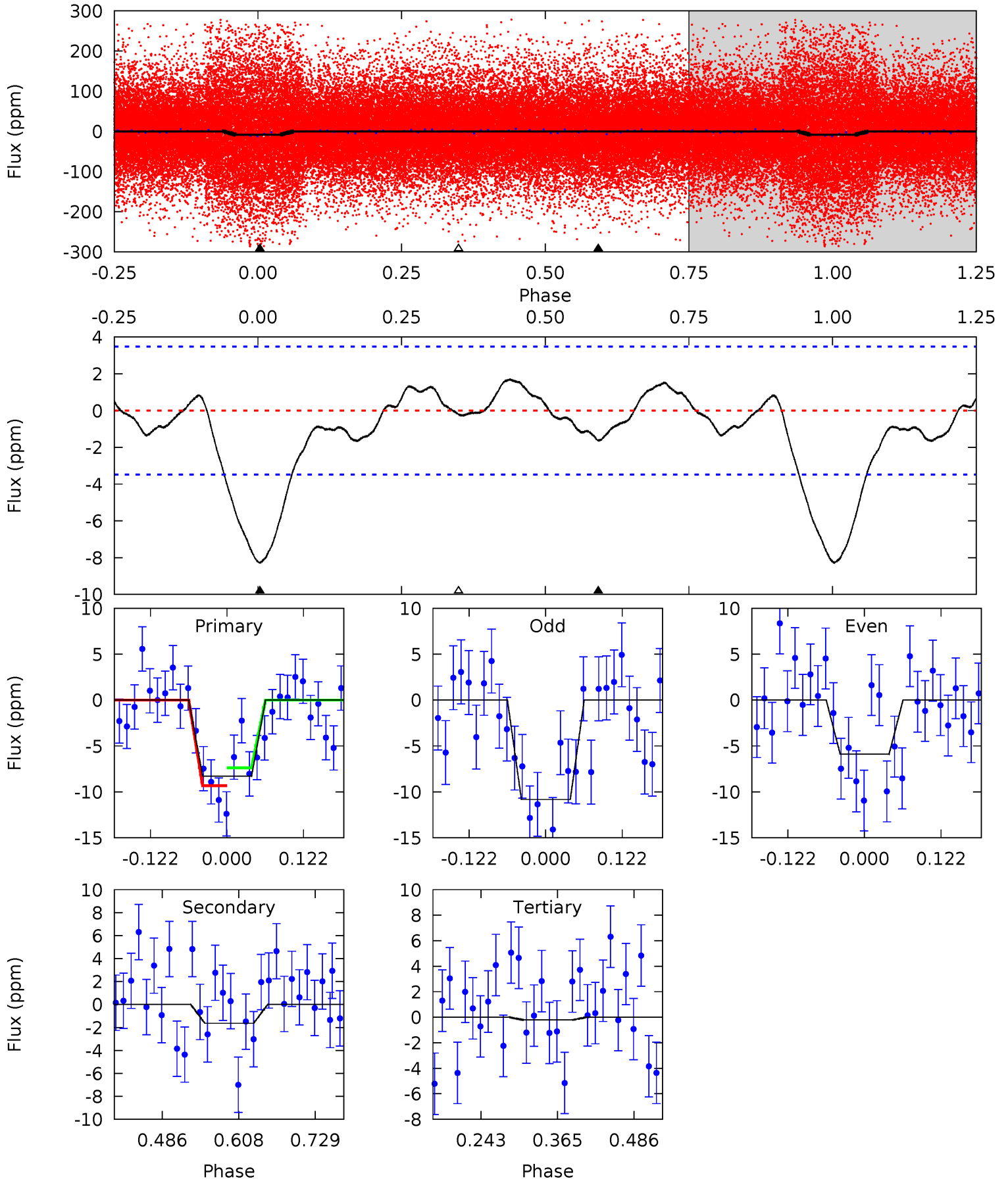
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.69	3.73	0	0	4.50	1.50	1.26	7.69	7.69	3.73	3.73	0.19	0.83	0.23	0.13



Alt Model-Shift Uniqueness Test

008878567-01, P = 0.918398 Days, E = 130.701993 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.8	2.13	0.28	0	4.52	1.55	1.22	10.5	10.8	1.85	2.13	3.20	0.88	0.17	1.26



Stellar Parameters For KIC 008878567

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6290^{+199}_{-243}	$4.250^{+0.158}_{-0.193}$	$-0.160^{+0.250}_{-0.300}$	$1.286^{+0.391}_{-0.261}$	$1.071^{+0.182}_{-0.136}$	$0.709^{+0.631}_{-0.354}$
	+3%/-4%	+4%/-5%	+156%/-188%	+30%/-20%	+17%/-13%	+89%/-50%
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 008878567-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-3 ± 1	$0.44^{+0.14}_{-0.11}$	3198^{+248}_{-215}	4790^{+730}_{-545}	$3.372^{+2.771}_{-1.526}$
Alt.	-2 ± 1	$0.44^{+0.12}_{-0.12}$	3215^{+242}_{-225}	4050^{+708}_{-675}	$1.549^{+1.770}_{-0.877}$

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

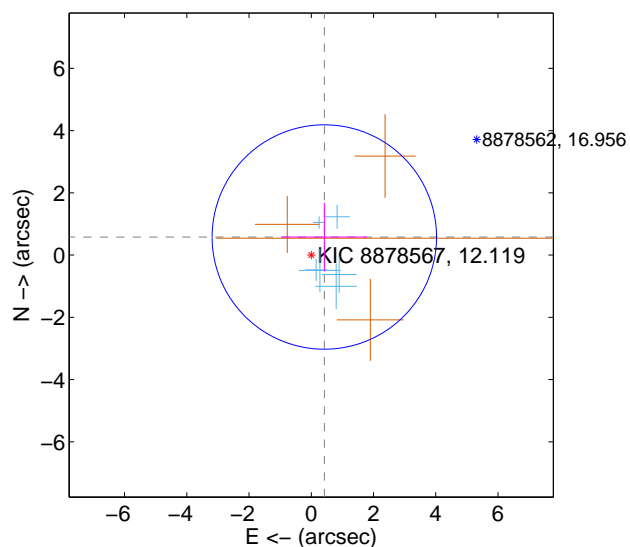
Supplemental centroid analysis for 008878567-01. Kepler magnitude: 12.12. Transit SNR 6.08

There are 6 quarters with good PRF difference image offsets

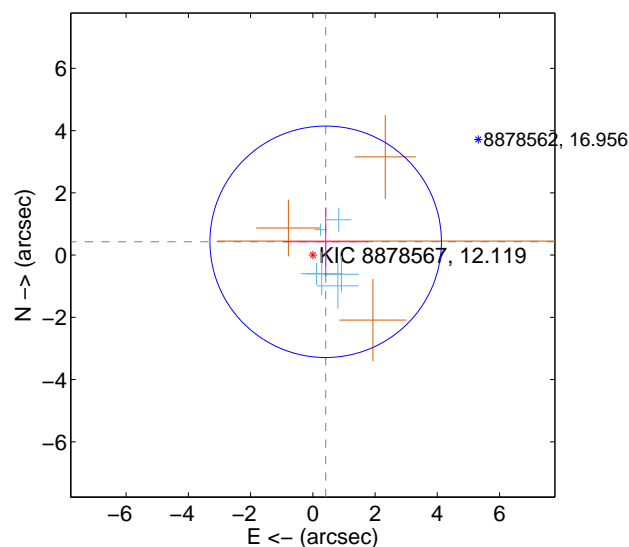
The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.717 ± 1.202	0.60	-0.420 ± 1.371	0.581 ± 1.103
PRF-fit source offset from KIC position	0.594 ± 1.240	0.48	-0.413 ± 1.371	0.428 ± 1.103
photometric centroid source offset	1.53 ± 1.65	0.93	0.53 ± 1.66	-1.44 ± 1.65

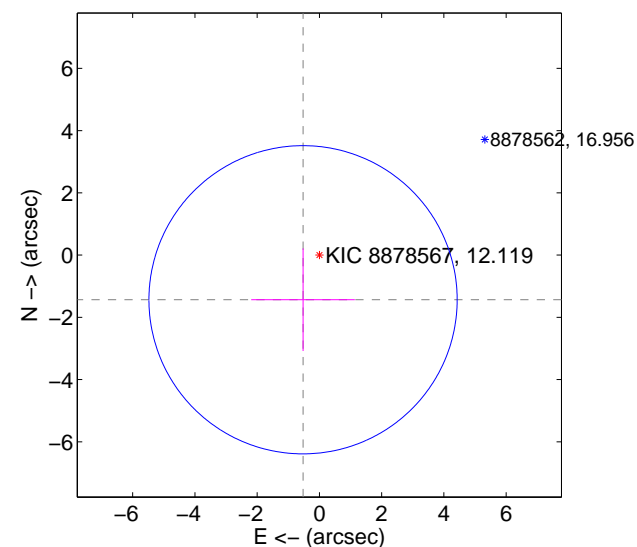
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

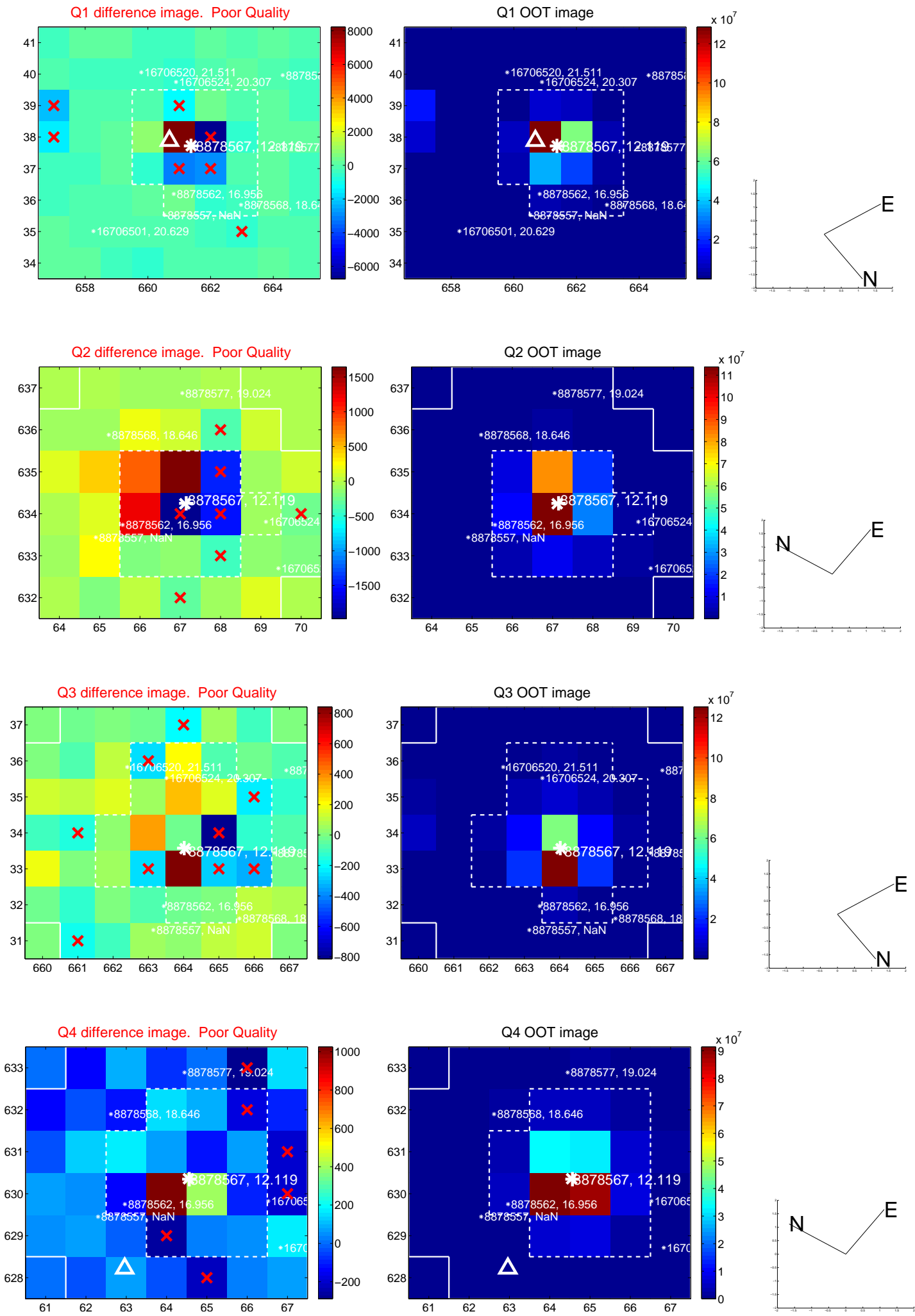


offset from photometric centroids

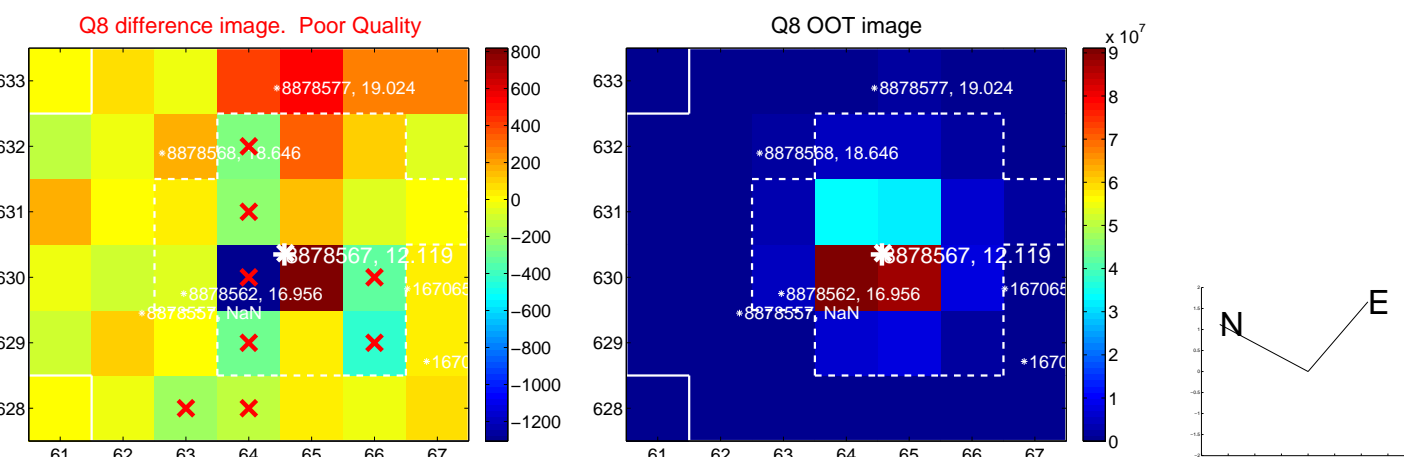
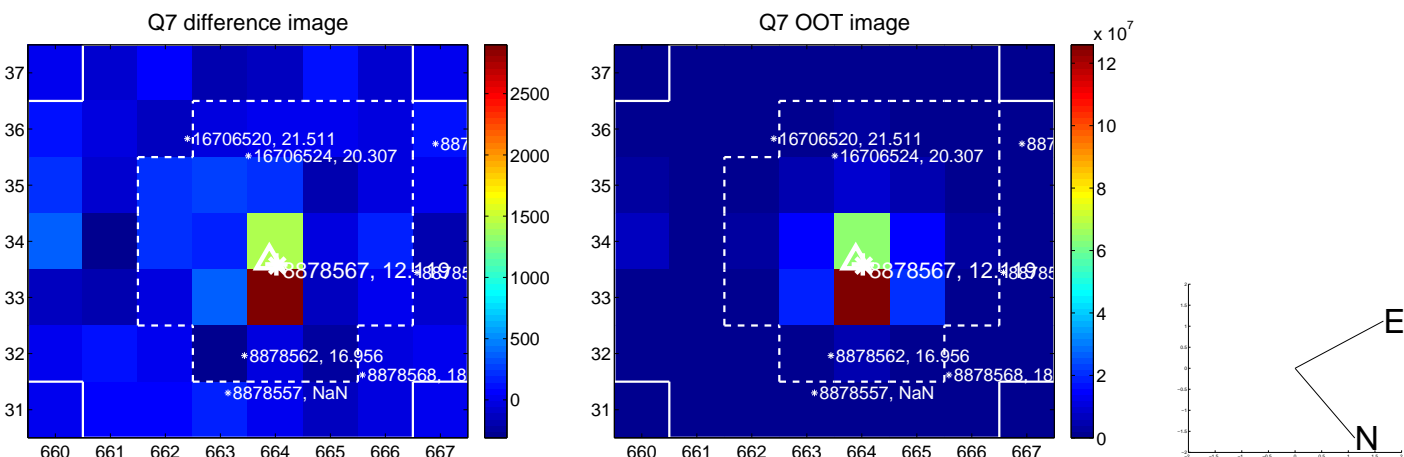
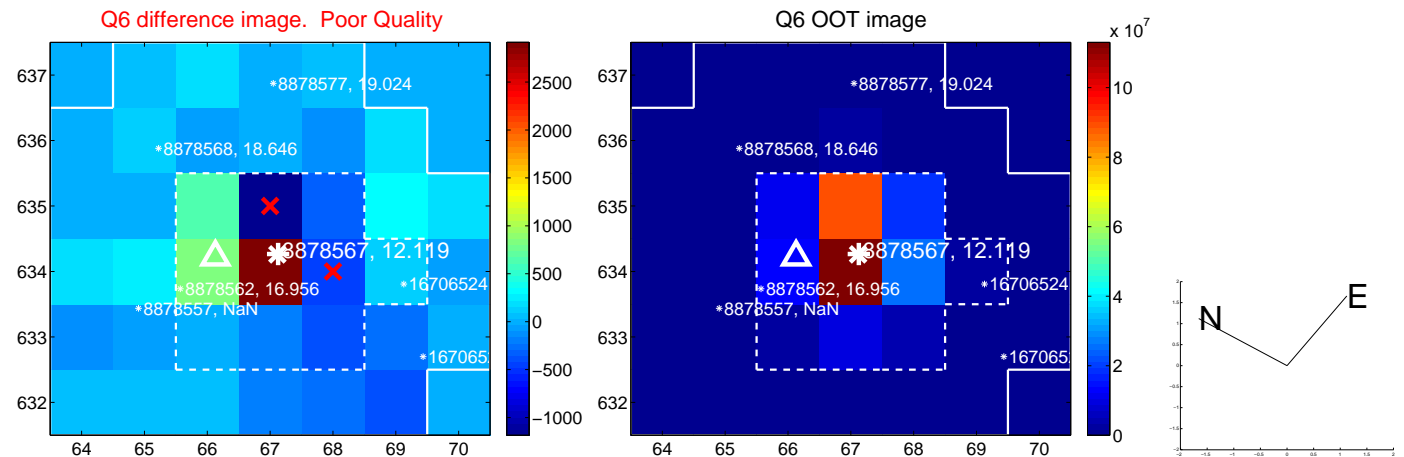
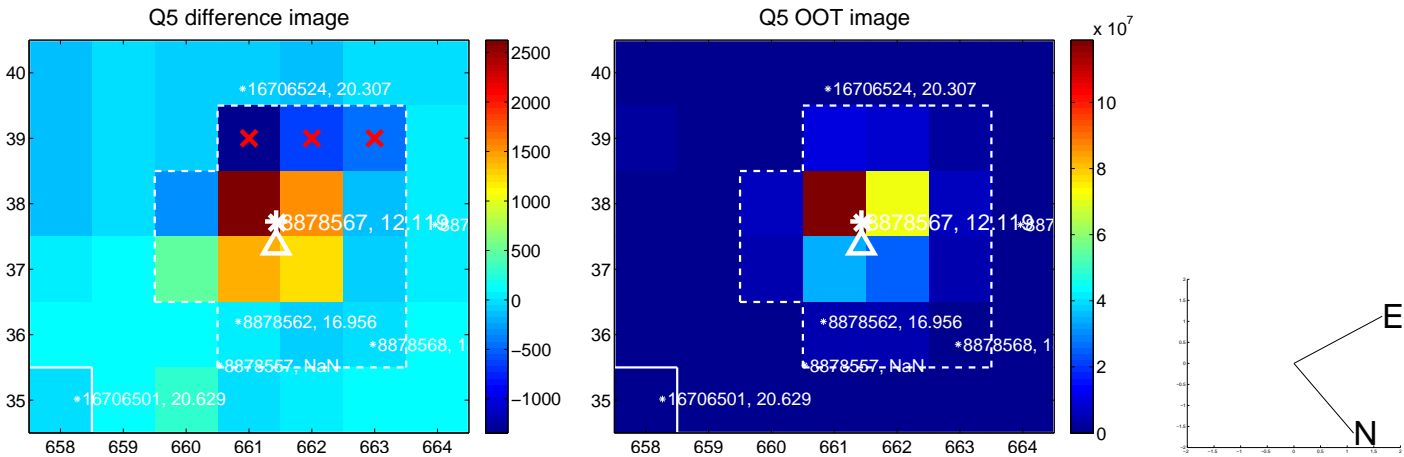


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

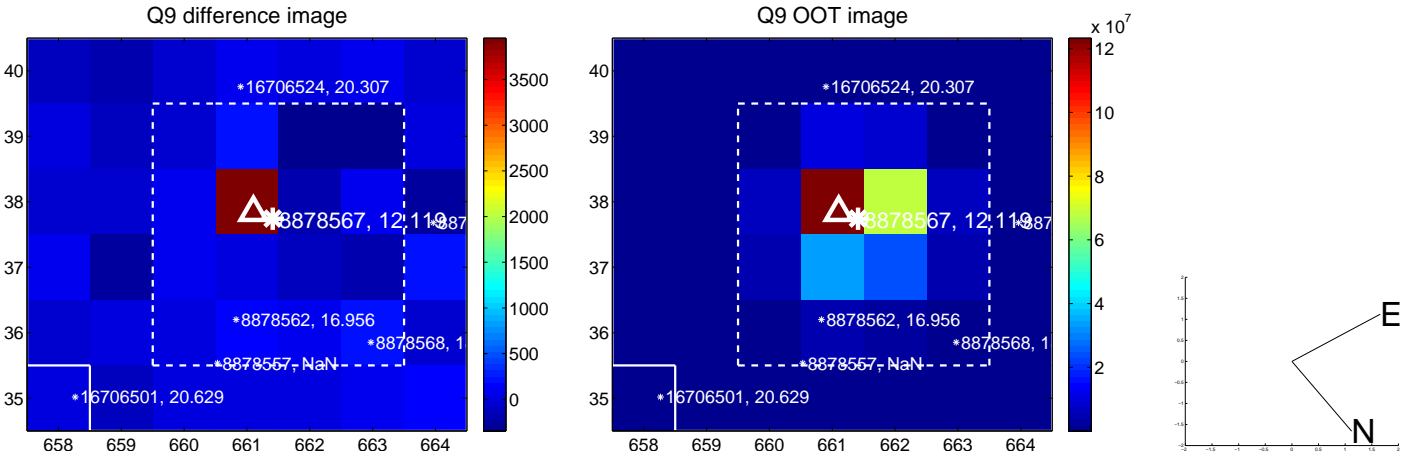
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



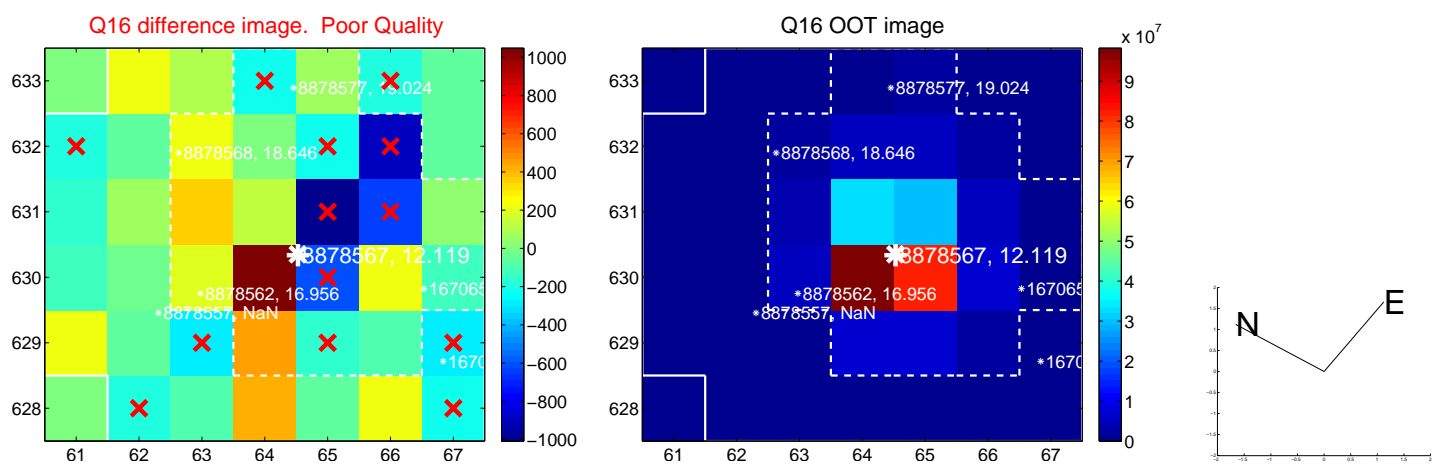
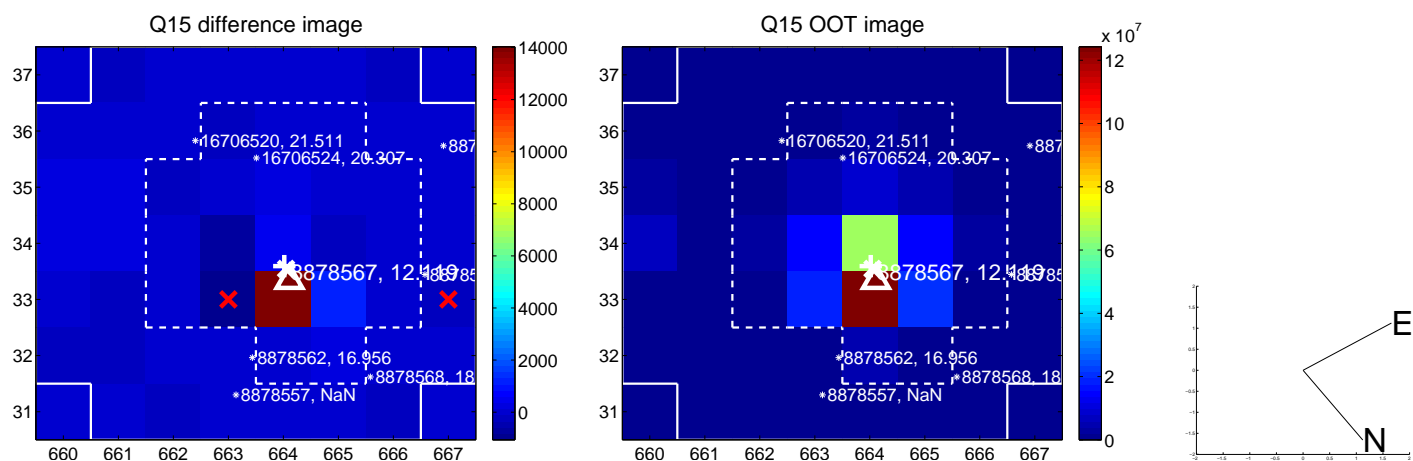
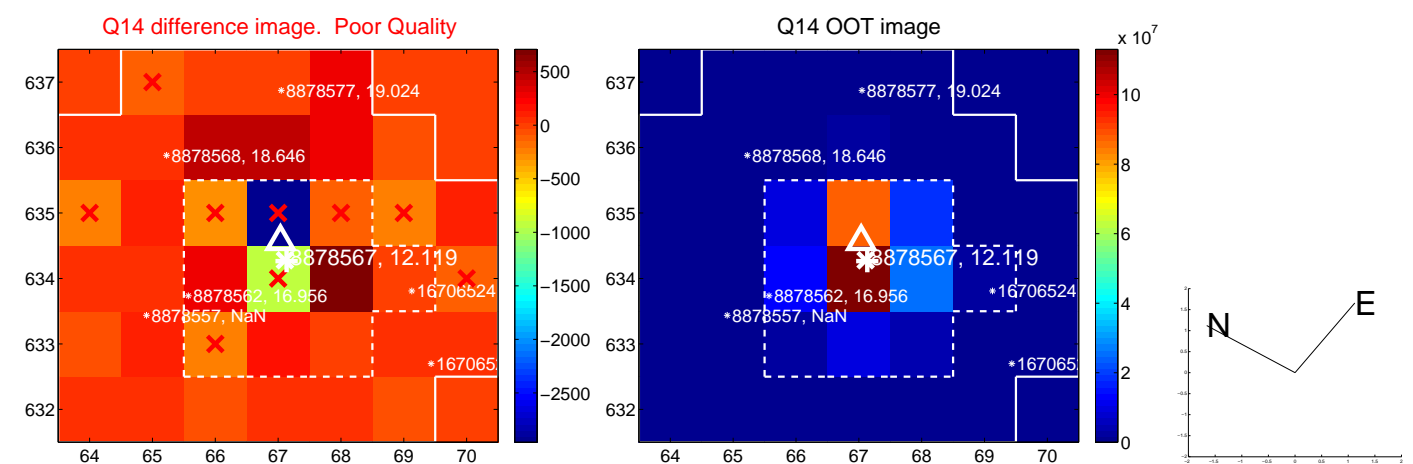
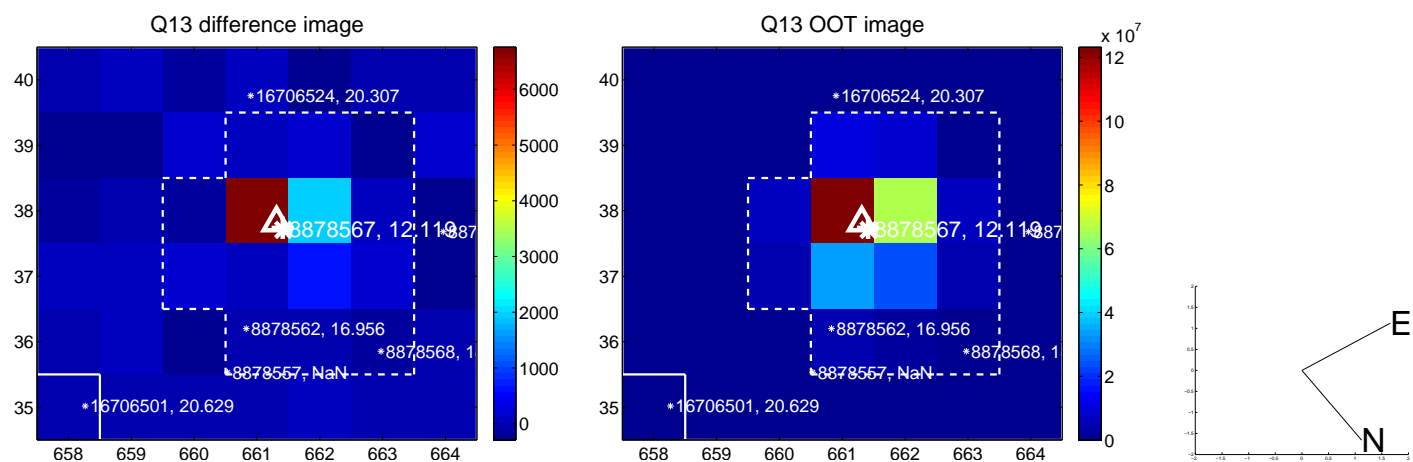
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



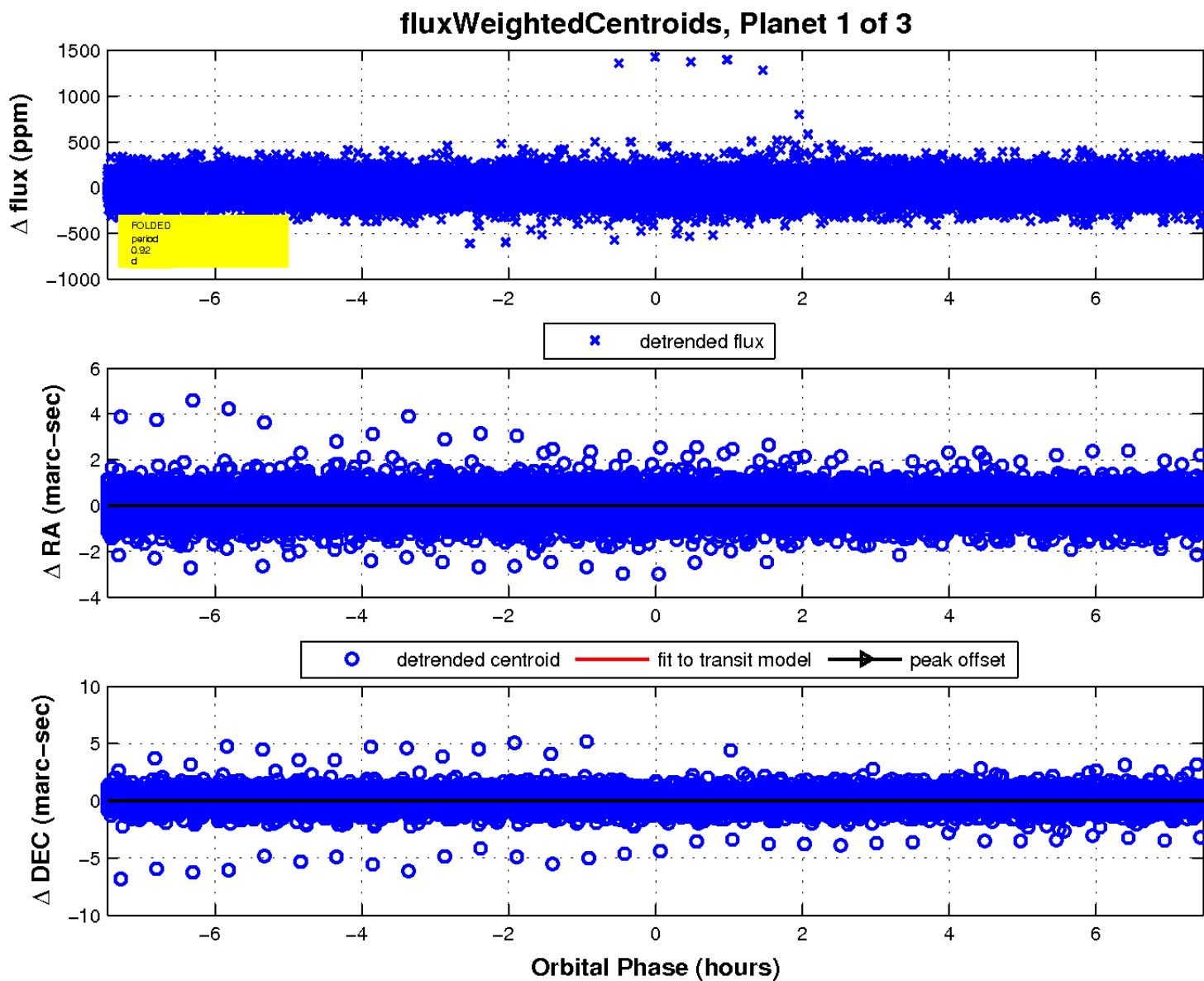
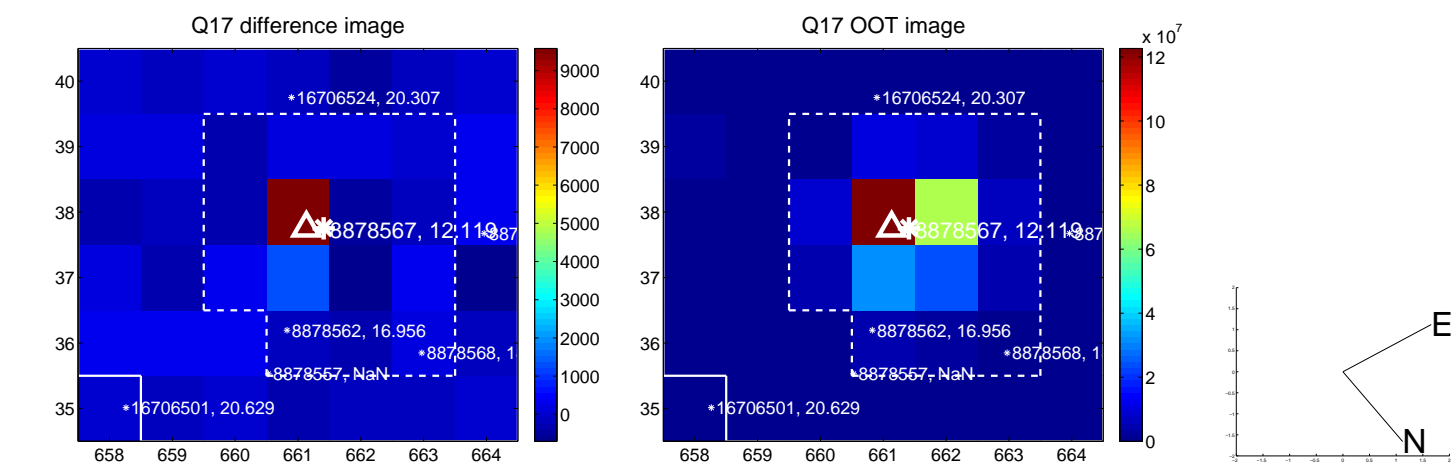
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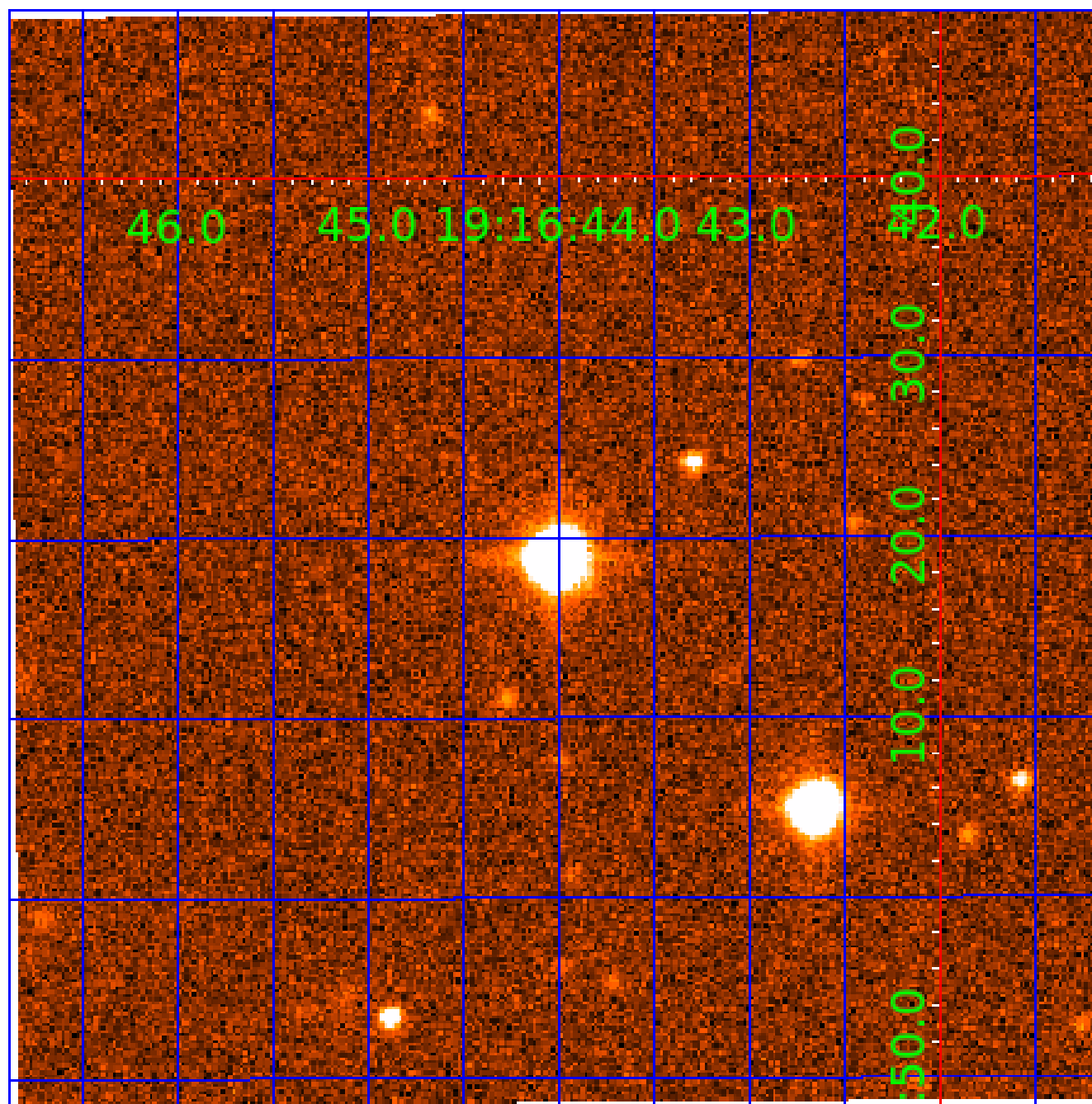


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008878567

Q1-17 DR25 TCE Parameters

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Robovetter Results

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008878567-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—HALO_GHOST

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

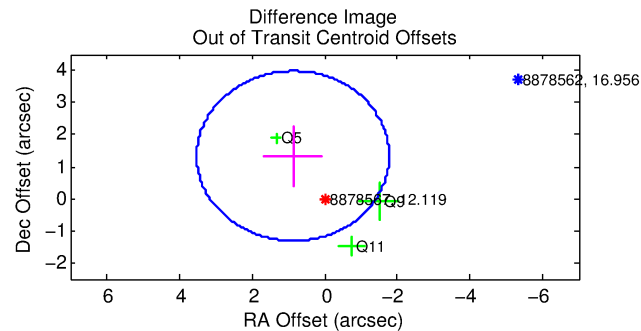
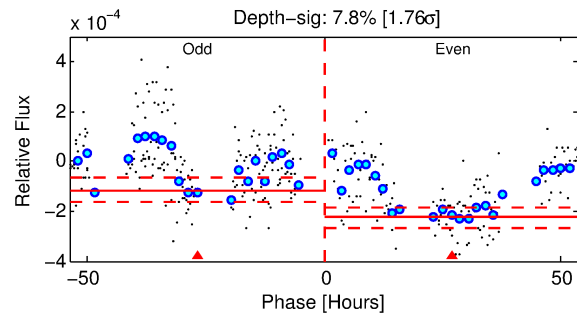
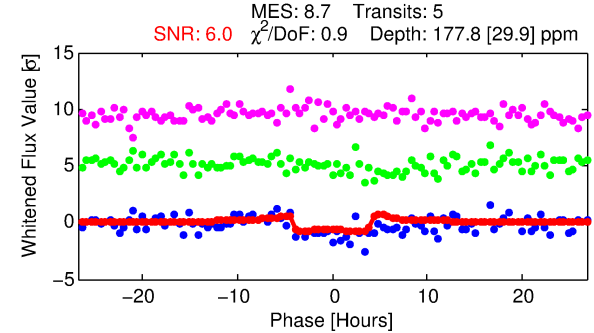
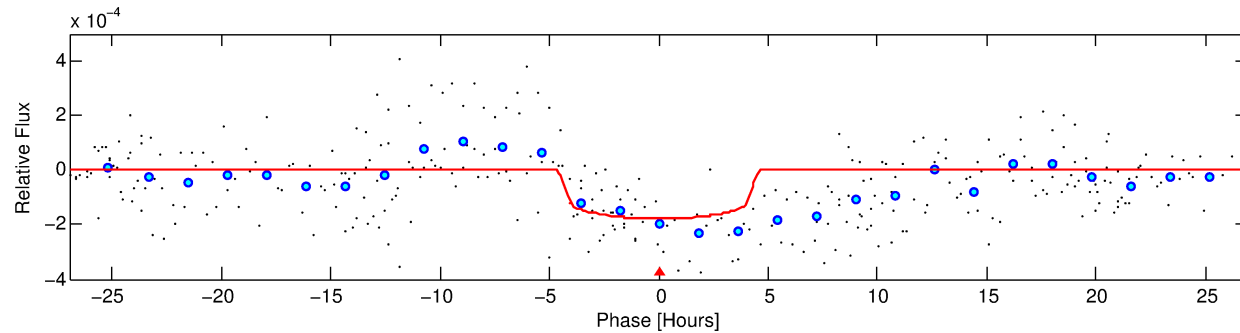
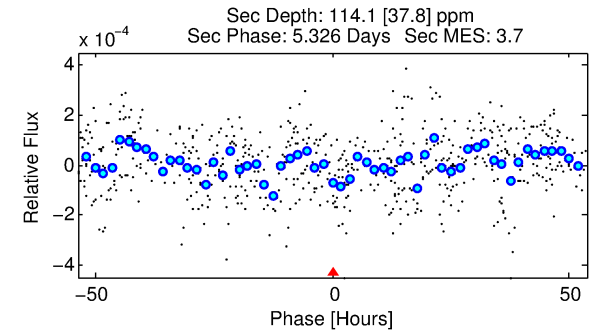
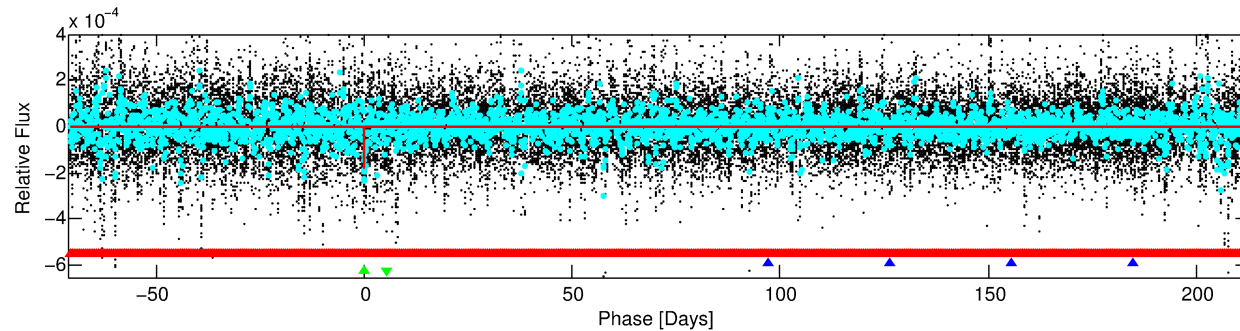
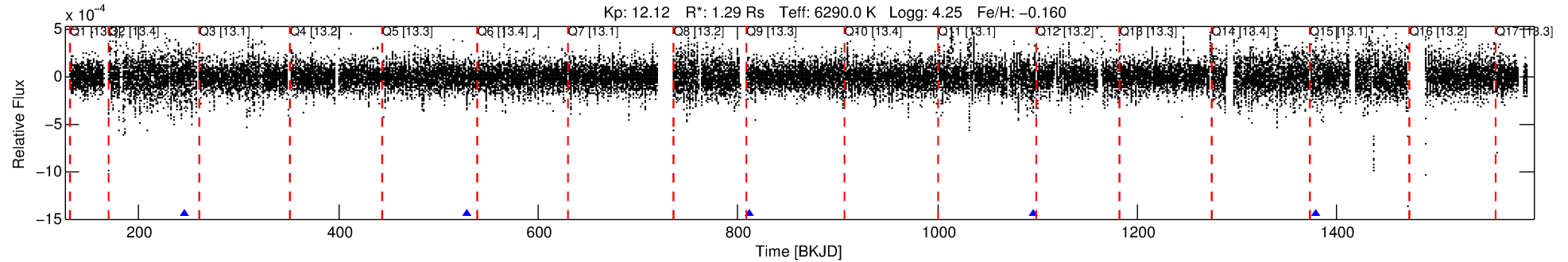
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008878567-03

No Significant Match Found

DV One-Page Summary

KIC: 8878567 Candidate: 3 of 3 Period: 283.317 d



DV Fit Results:

Period = 283.31671 [0.00714] d
Epoch = 245.3748 [0.0162] BKJD
Rp/R* = 0.0136 [0.0045]
a/R* = 144.06 [243.04]
b = 0.82 [0.68]
Seff = 3.10 [1.21]
Teq = 338 [33] K
Rp = 1.91 [0.86] Re
a = 0.8644 [0.2170] AU
Ag = 12844.99 [10607.39] [1.21σ]
Teffp = 5571 [1058] K [4.94σ]

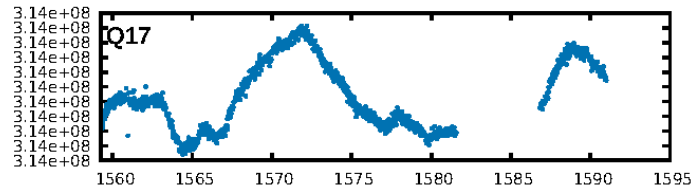
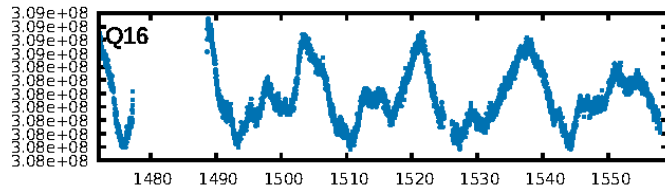
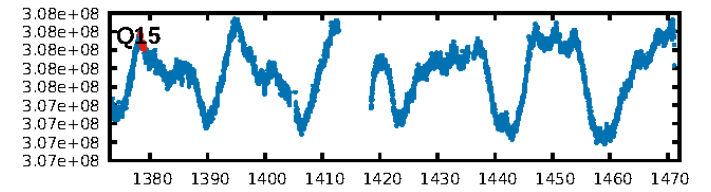
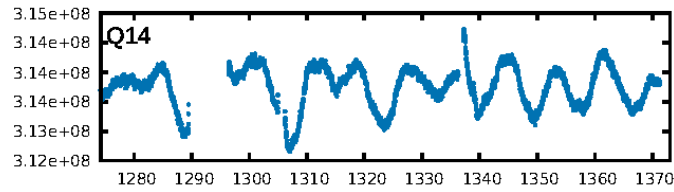
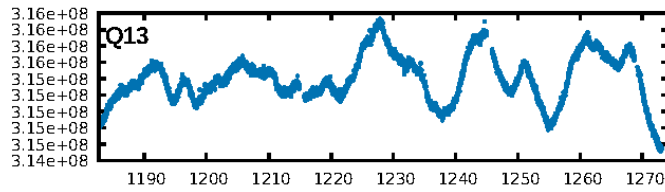
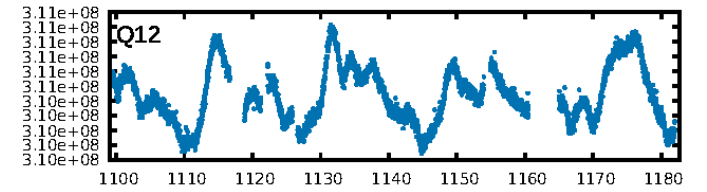
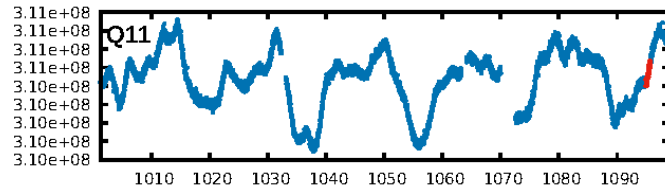
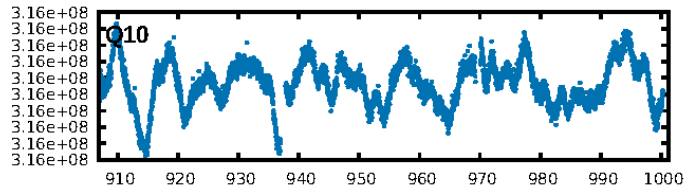
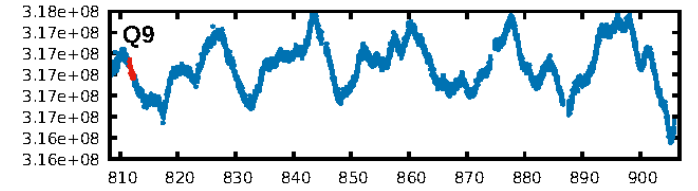
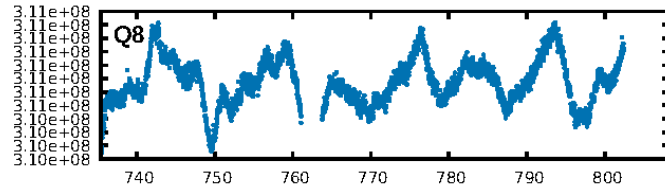
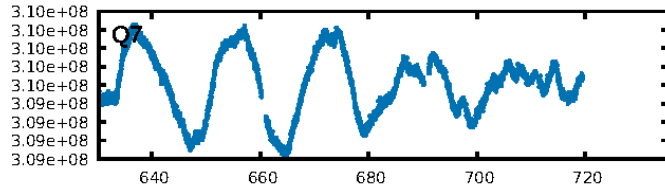
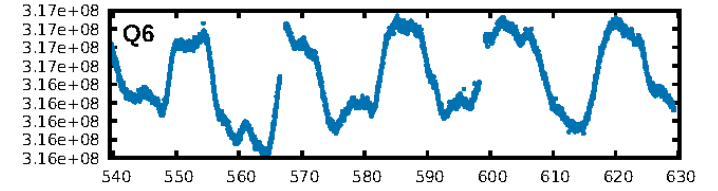
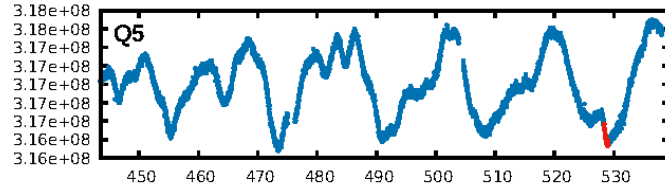
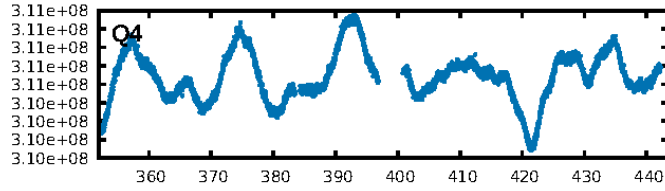
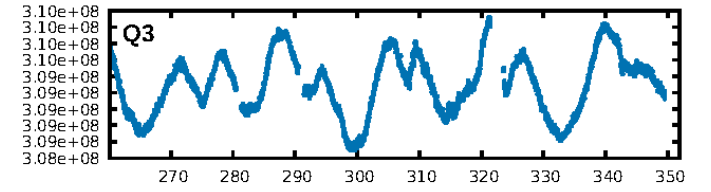
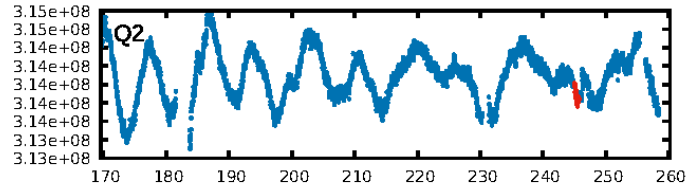
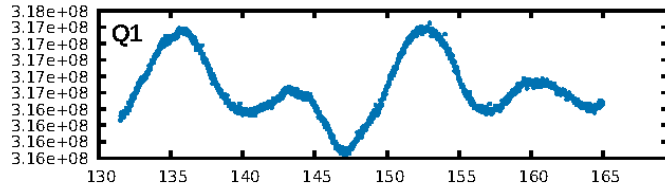
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [727.57σ]
LongPeriod-sig: 100.0% [67.64σ]
ModelChiSquare2-sig: 8.9%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 4.38e-11
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: -0.2478
Centroid-sig: 81.6%
Centroid-so: 0.379 arcsec [0.40σ]
OotOffset-rm: 1.591 arcsec [1.80σ]
OotOffset-st: 0/1/0/2 [3]
KicOffset-rm: 1.505 arcsec [1.27σ]
KicOffset-st: 0/1/0/2 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 0.00 [0/5]

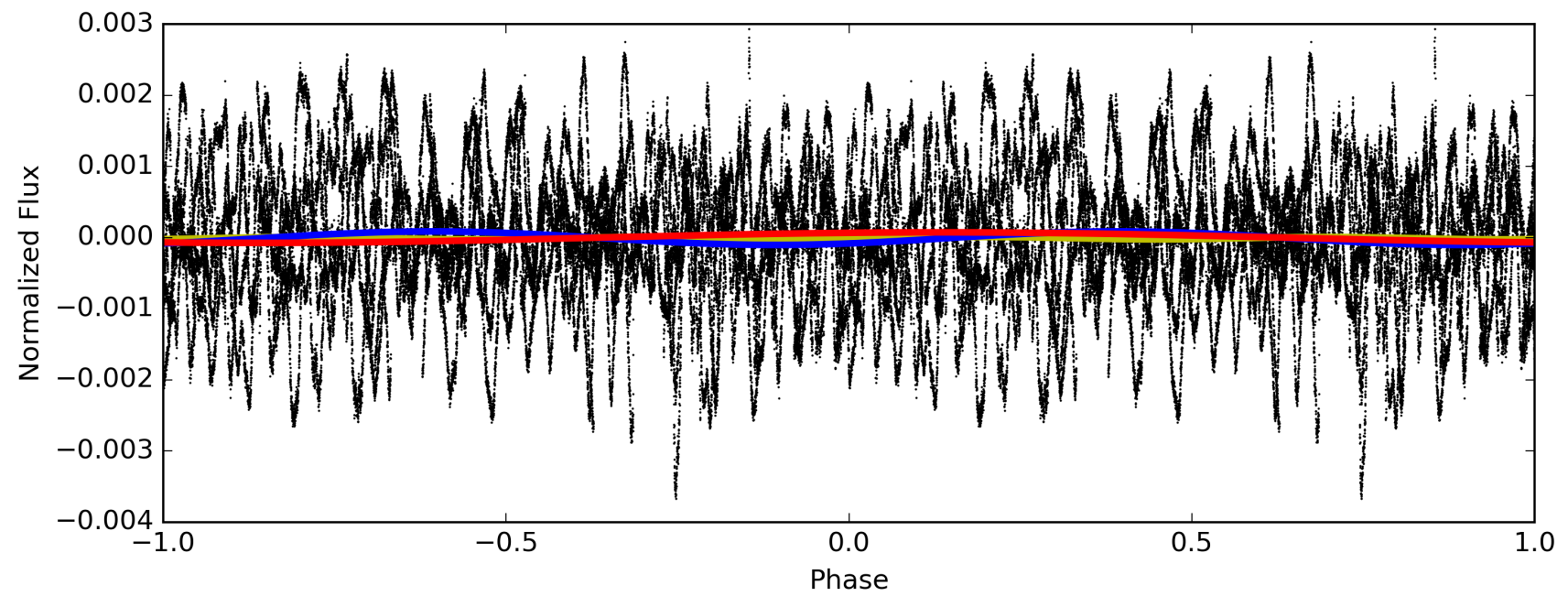
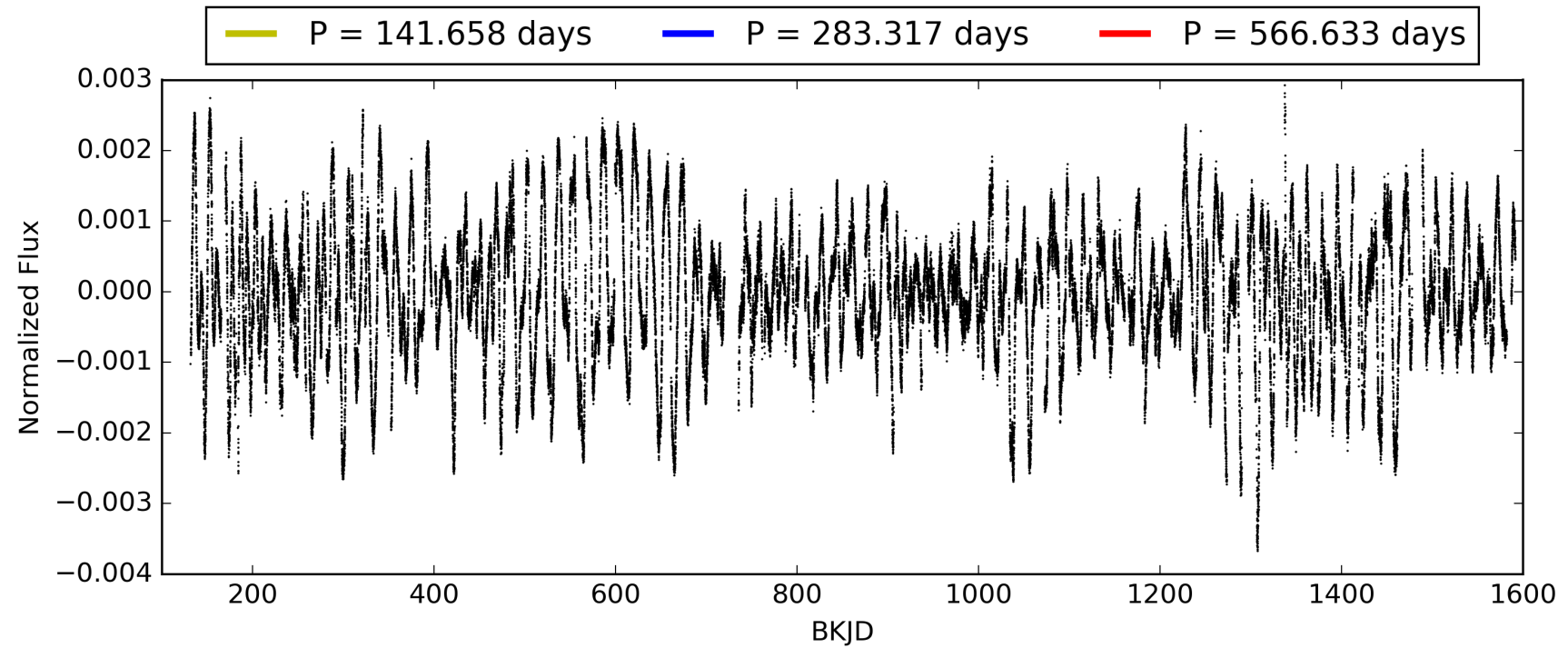
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 02:20:40 Z

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

TCE 008878567-03, PDC Light Curves

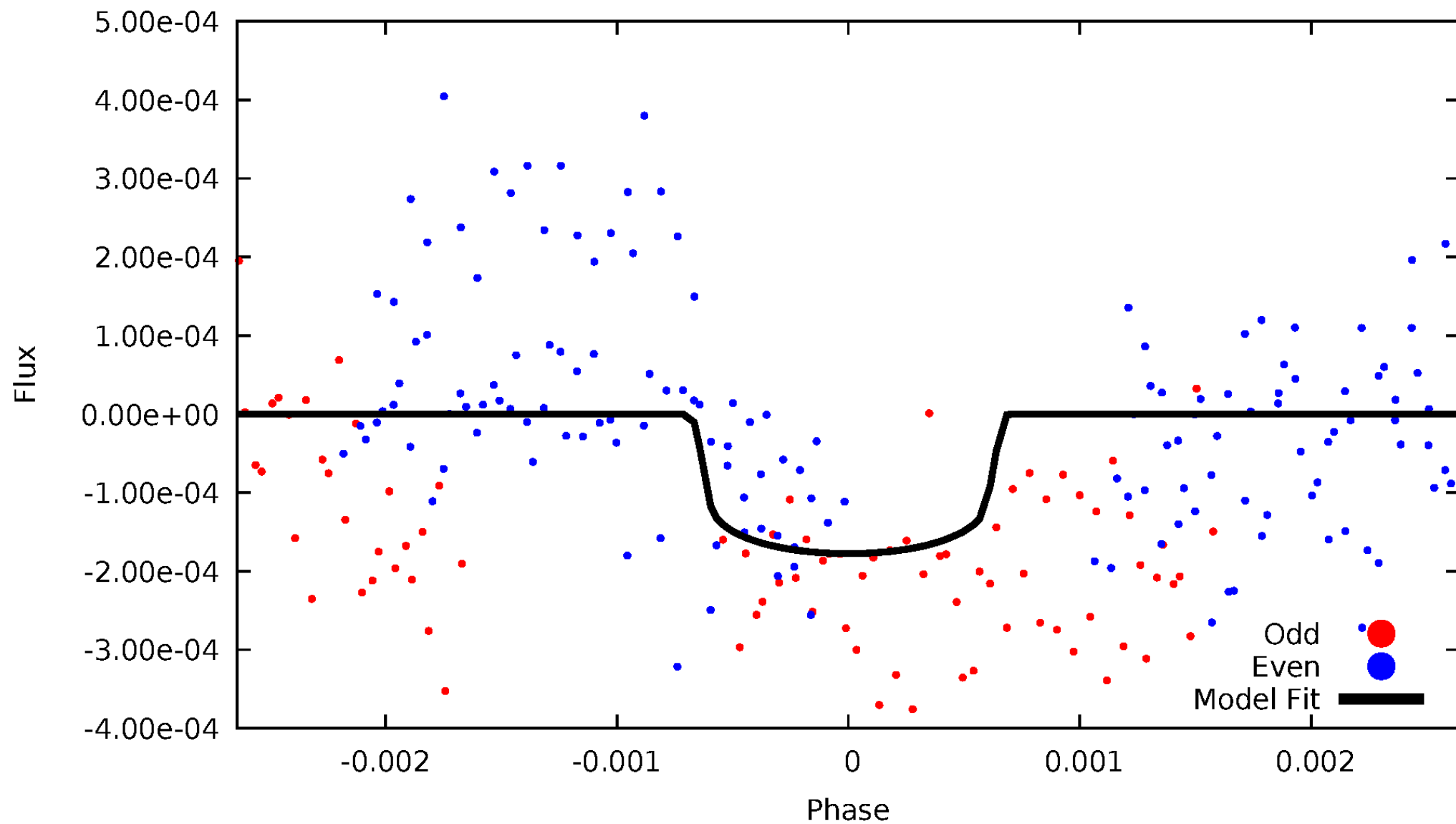


TCE 008878567-03



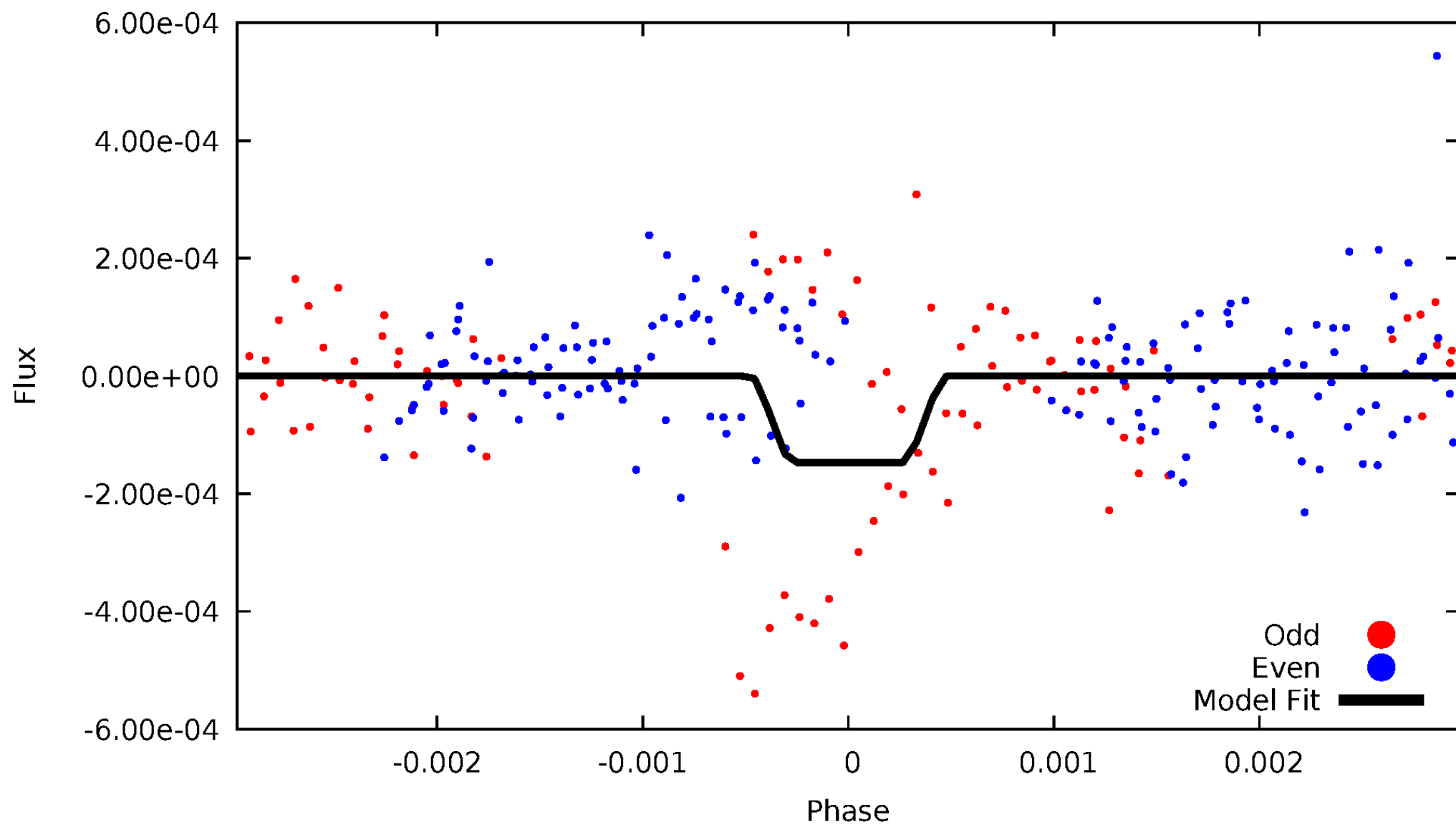
DV Odd/Even

TCE 008878567-03



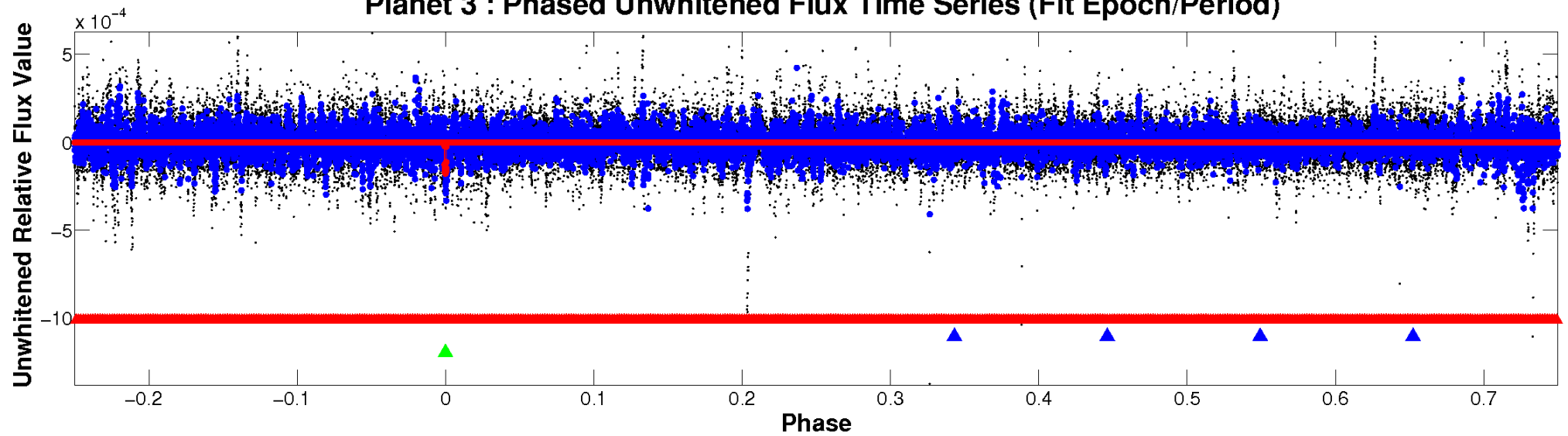
ALT Odd/Even

TCE 008878567-03

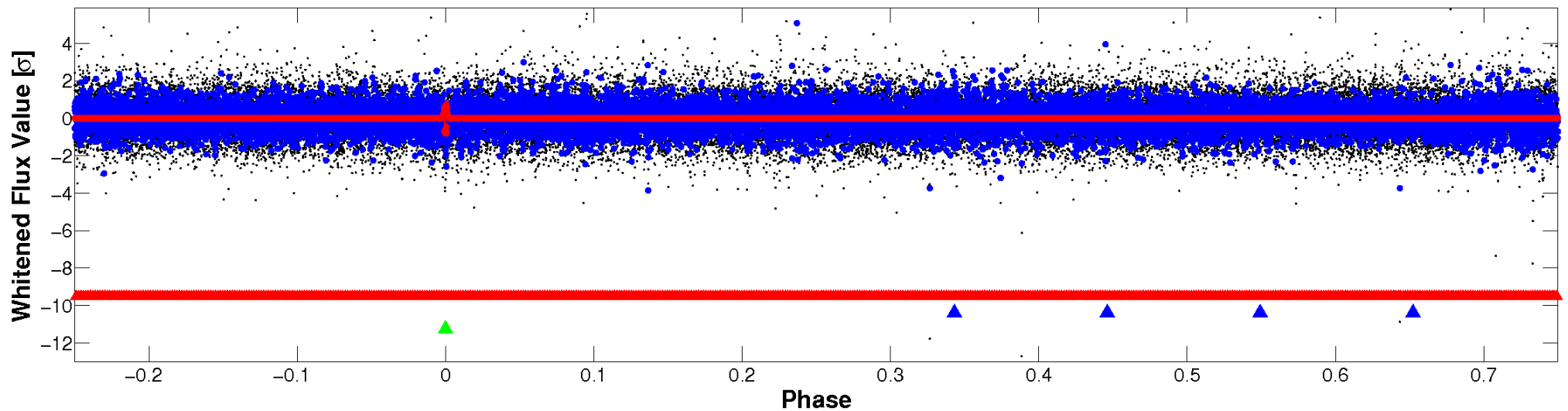


Non-Whitened Vs. Whitened Light Curve

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

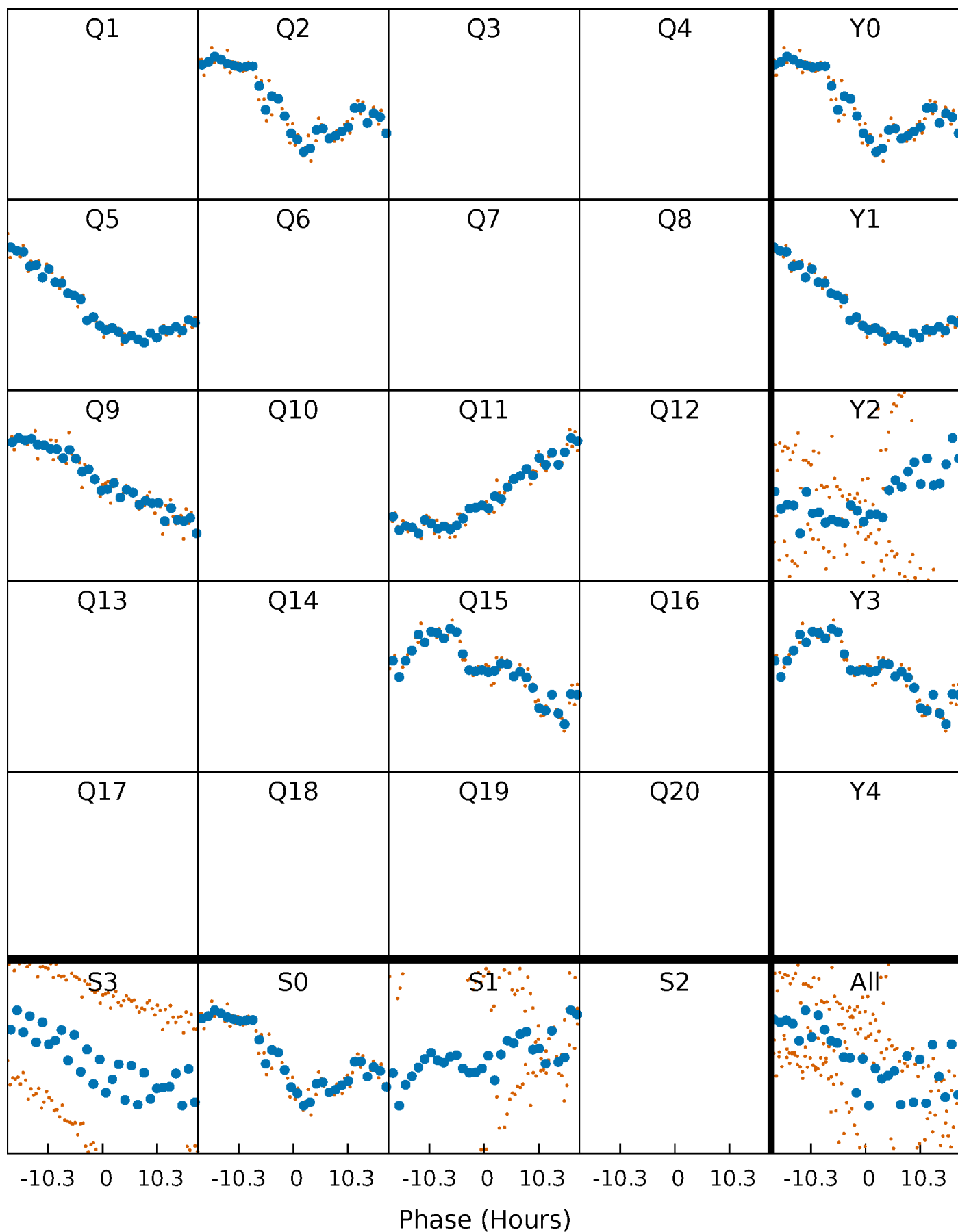


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



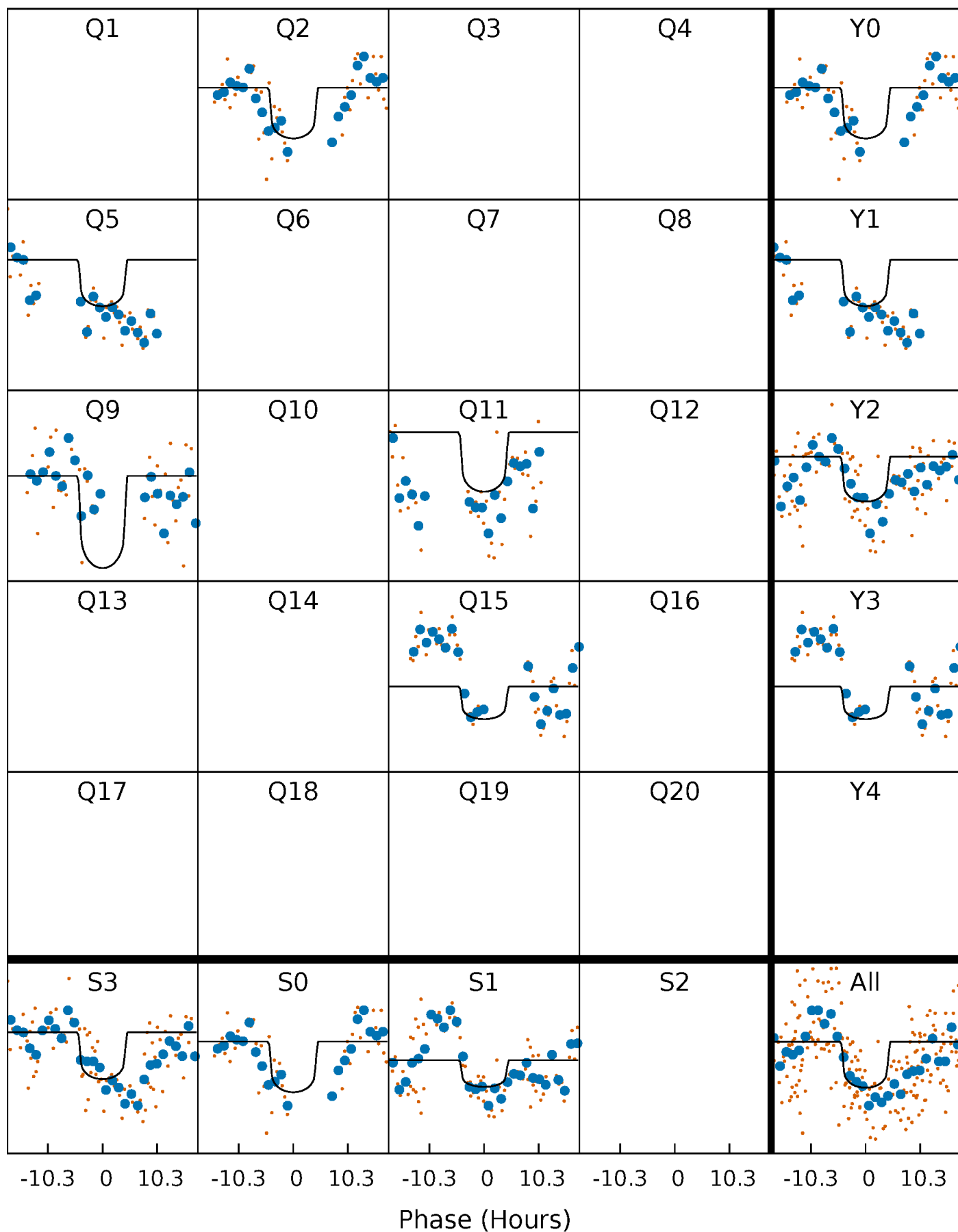
PDC Quarter-Phased Transit Curves

TCE 008878567-03 $P=283.316711$ Days $T_0=245.374807$ (BKJD)



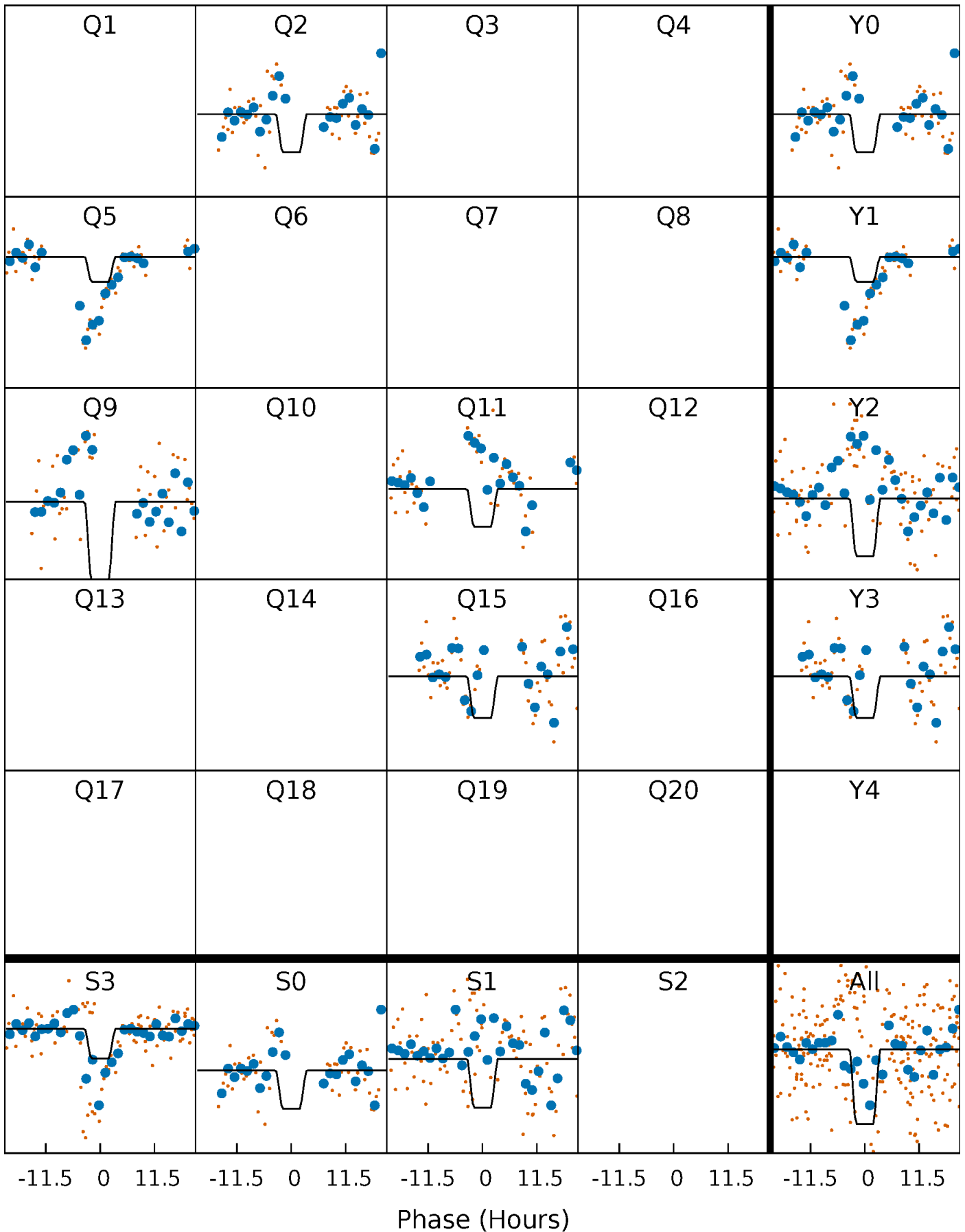
DV Quarter-Phased Transit Curves

TCE 008878567-03 $P=283.316711$ Days $T_0=245.374807$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

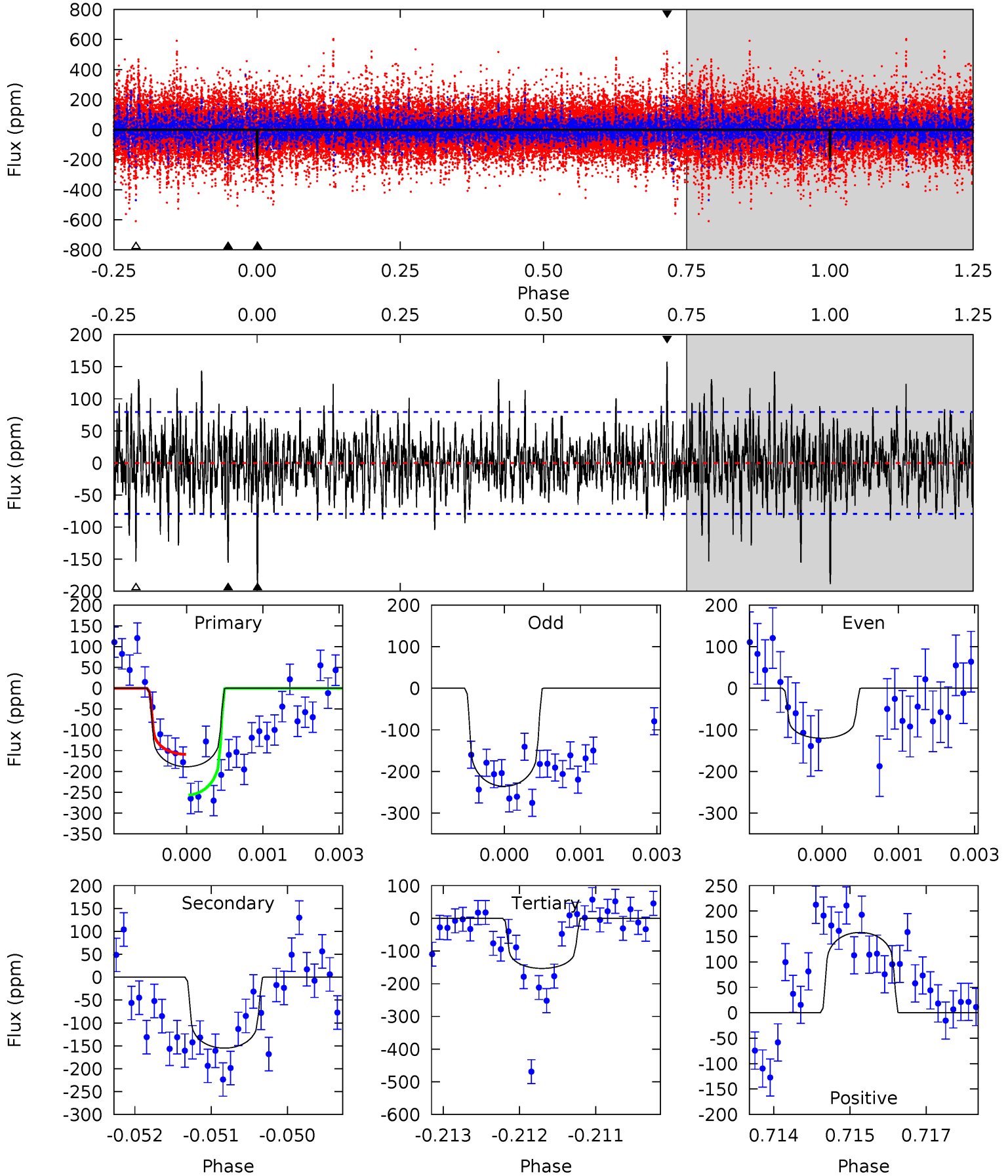
TCE 008878567-03 $P=283.311309$ Days $T_0=245.396396$ (BKJD)



DV Model-Shift Uniqueness Test

008878567-03, P = 283.316711 Days, E = 245.374807 Days

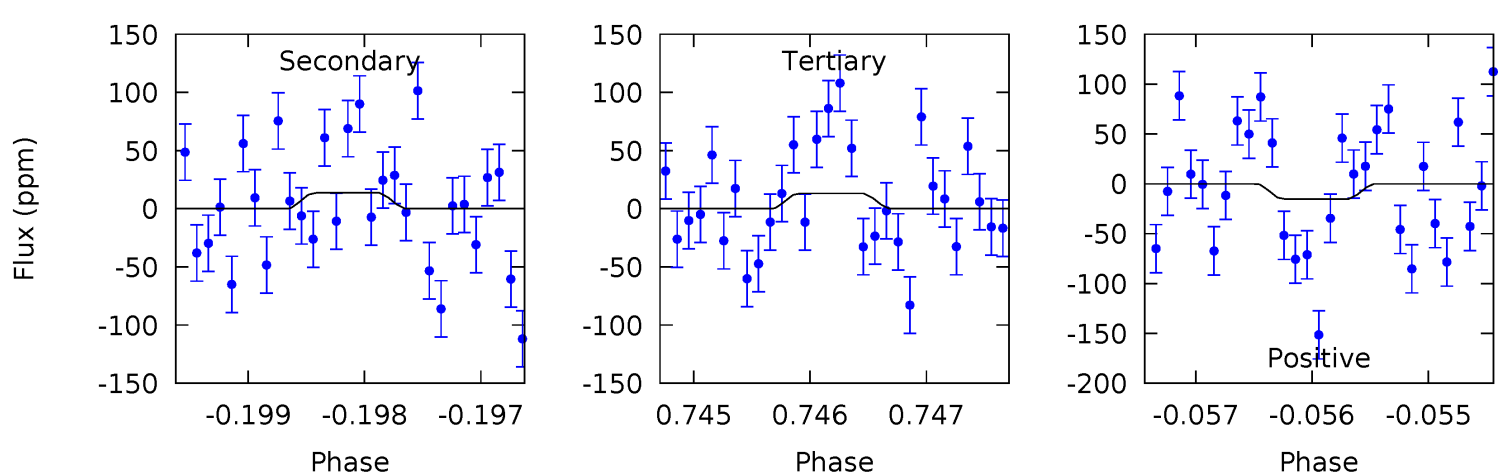
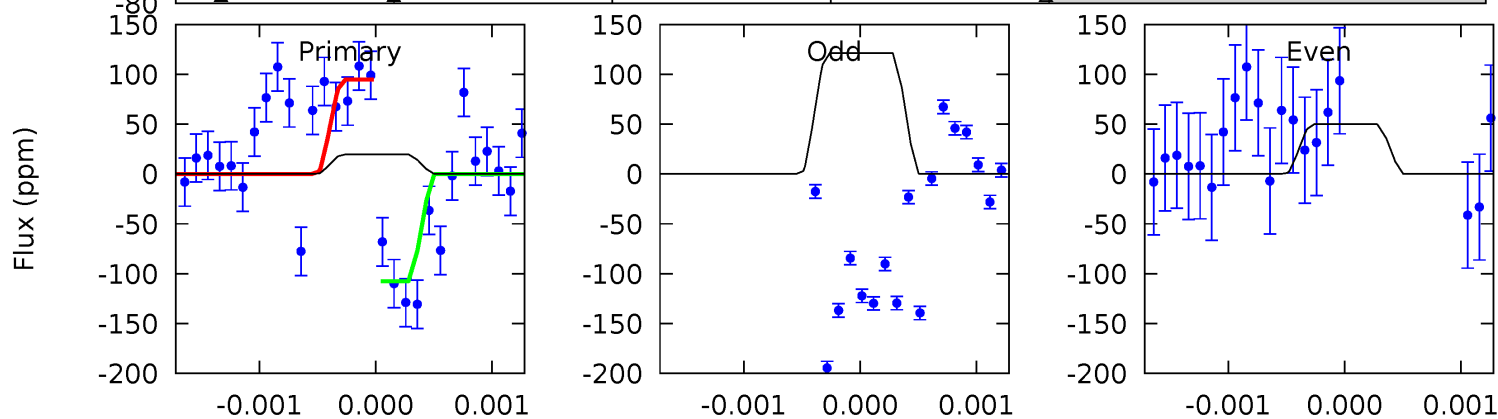
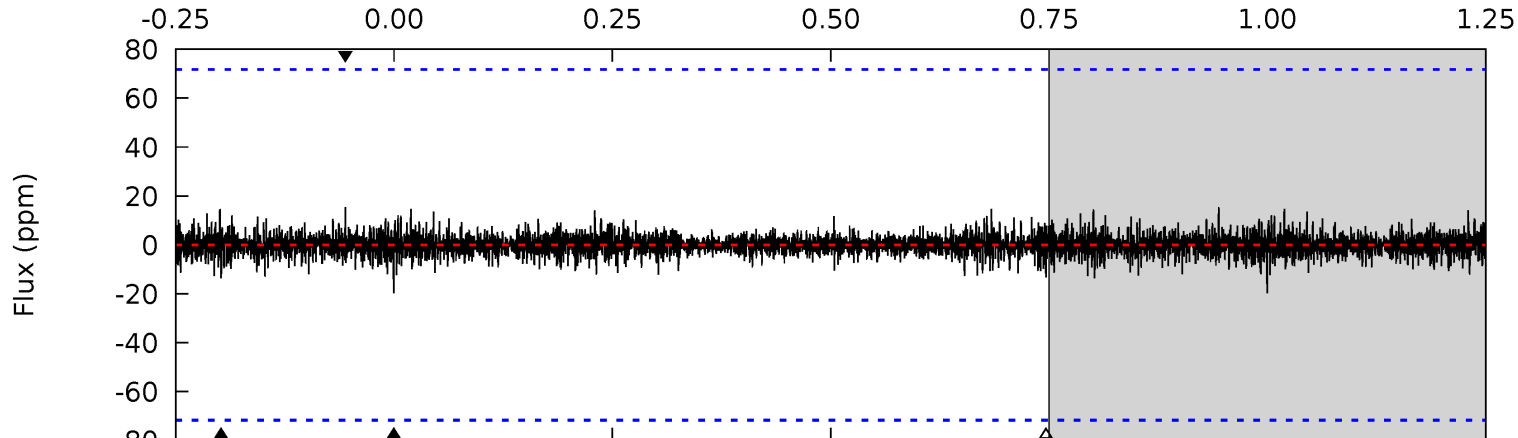
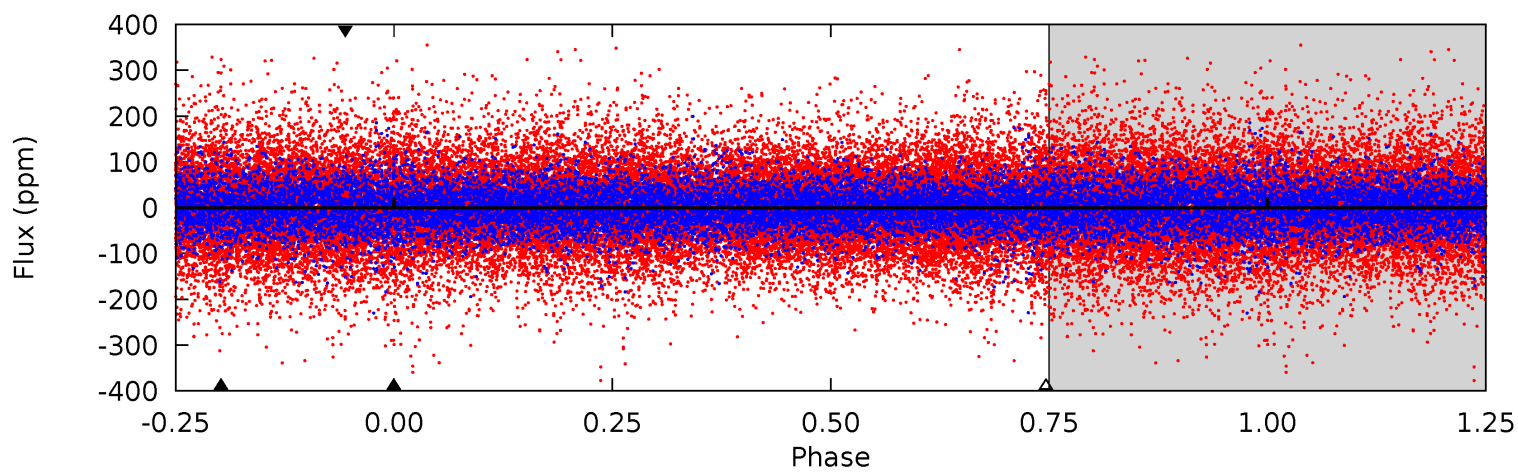
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.8	10.5	10.4	10.7	5.39	3.20	2.37	2.40	2.09	0.11	-0.20	3.83	0.95	0.46	3.19



Alt Model-Shift Uniqueness Test

008878567-03, P = 283.311309 Days, E = 245.396396 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.50	1.04	1.01	1.17	5.46	3.31	0.26	0.49	0.33	0.03	-0.13	2.88	0.01	0.44	0.48



Stellar Parameters For KIC 008878567

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6290^{+199}_{-243}	$4.250^{+0.158}_{-0.193}$	$-0.160^{+0.250}_{-0.300}$	$1.286^{+0.391}_{-0.261}$	$1.071^{+0.182}_{-0.136}$	$0.709^{+0.631}_{-0.354}$
	+3%/-4%	+4%/-5%	+156%/-188%	+30%/-20%	+17%/-13%	+89%/-50%
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 008878567-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-155 ± 15	$1.97^{+0.70}_{-0.71}$	476^{+37}_{-35}	5978^{+1500}_{-792}	16516^{+24725}_{-7661}
Alt.	-14 ± 13	$1.73^{+0.66}_{-0.64}$	474^{+36}_{-32}	3765^{+905}_{-1501}	1718^{+3708}_{-1677}

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

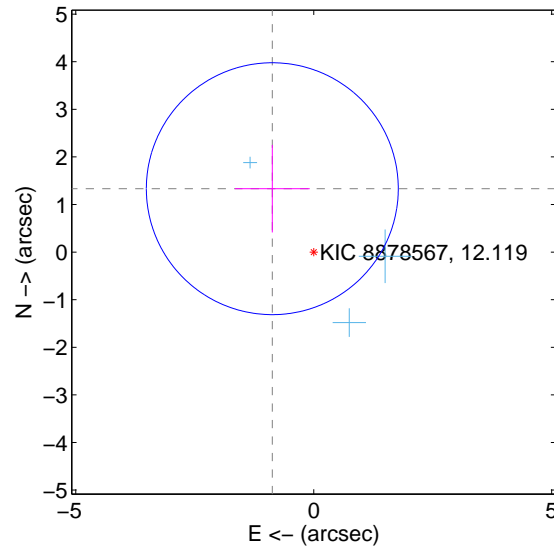
Supplemental centroid analysis for 008878567-03. Kepler magnitude: 12.12. Transit SNR 6.03

There are 3 quarters with good PRF difference image offsets

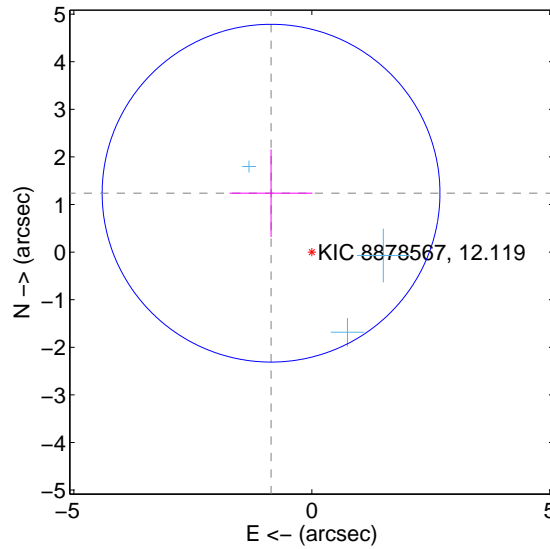
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.591 ± 0.882	1.80	0.870 ± 0.787	1.332 ± 0.920
PRF-fit source offset from KIC position	1.505 ± 1.183	1.27	0.856 ± 0.870	1.238 ± 0.919
photometric centroid source offset	0.38 ± 0.95	0.40	-0.30 ± 0.91	0.23 ± 1.01

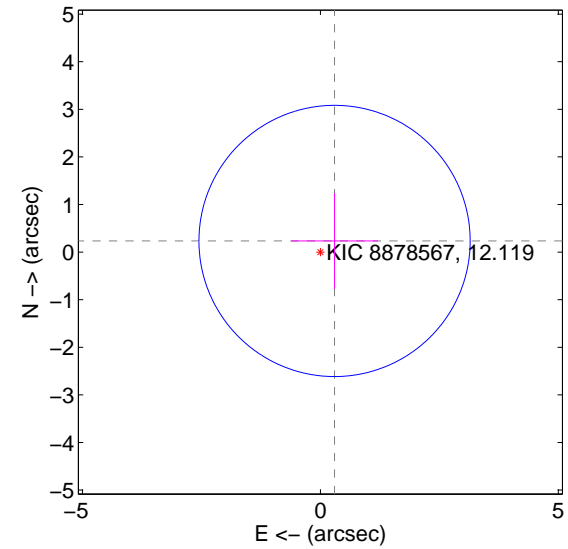
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

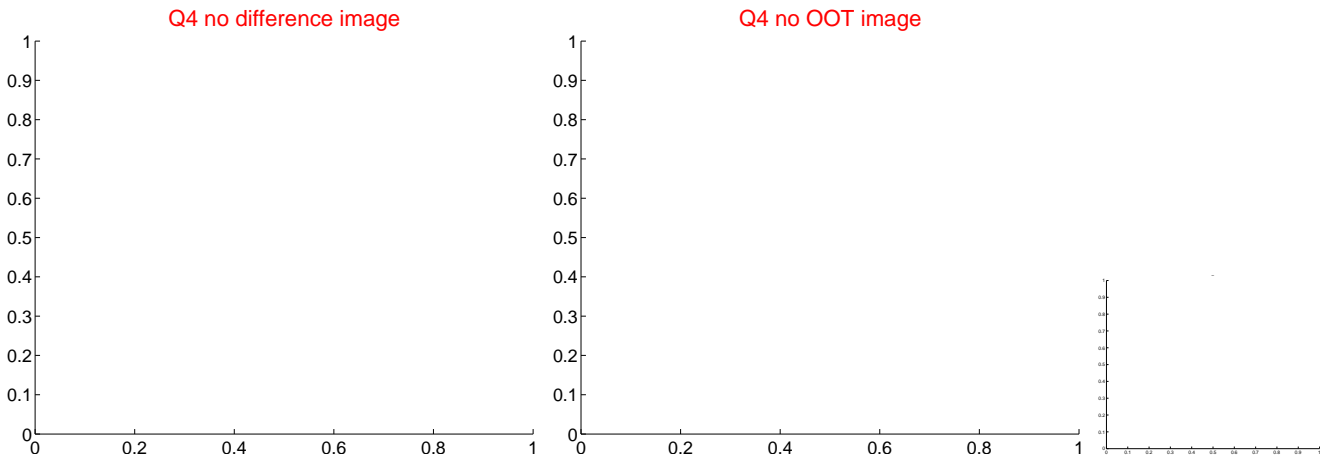
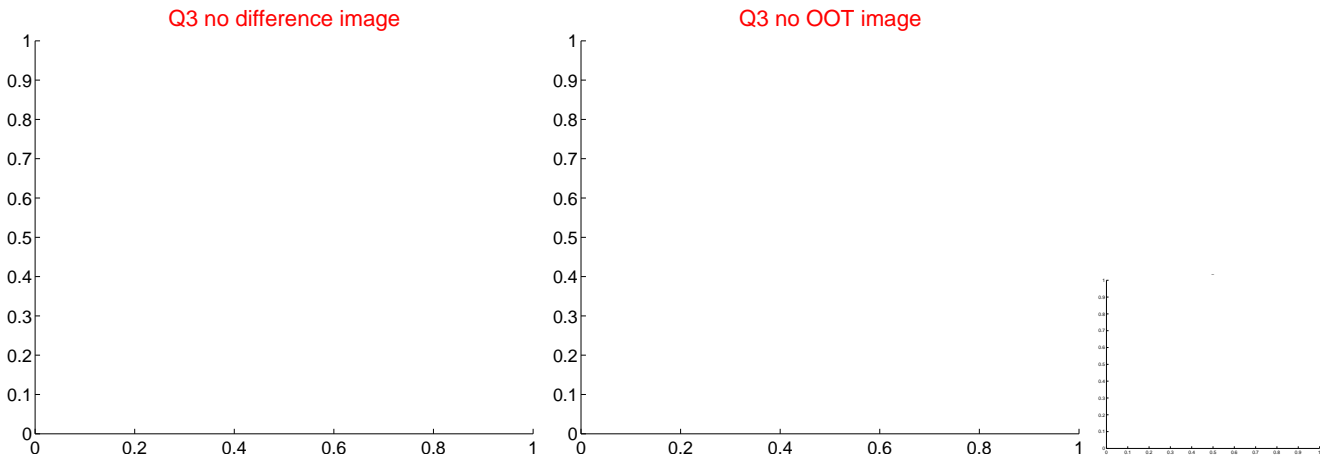
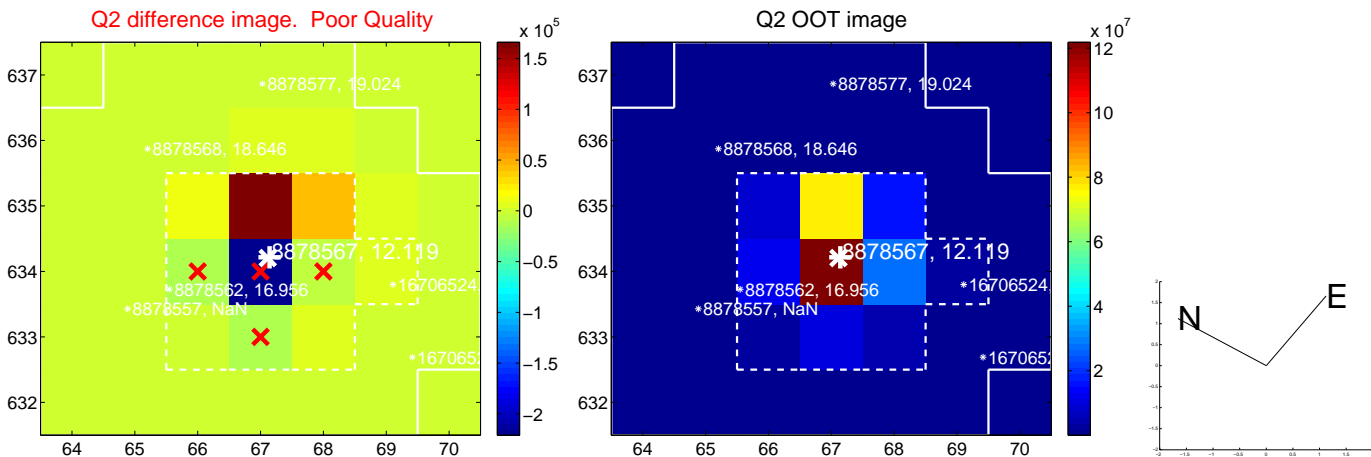
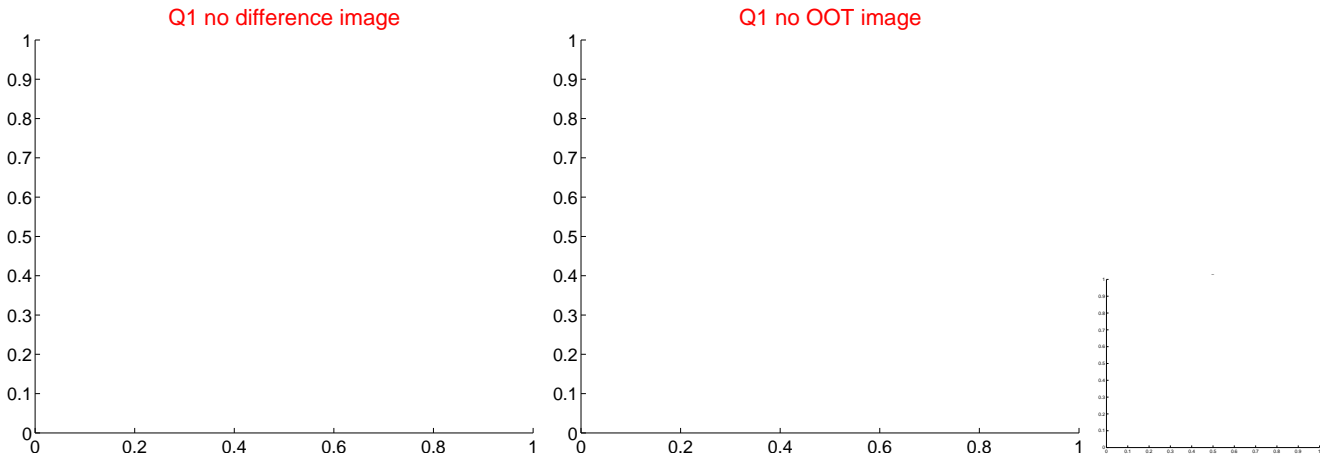


offset from photometric centroids

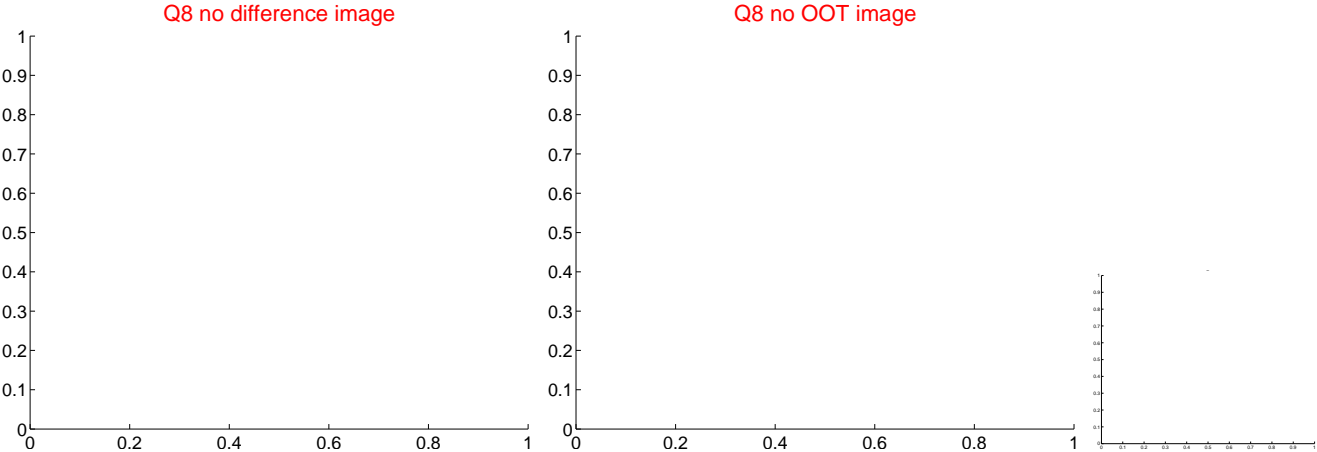
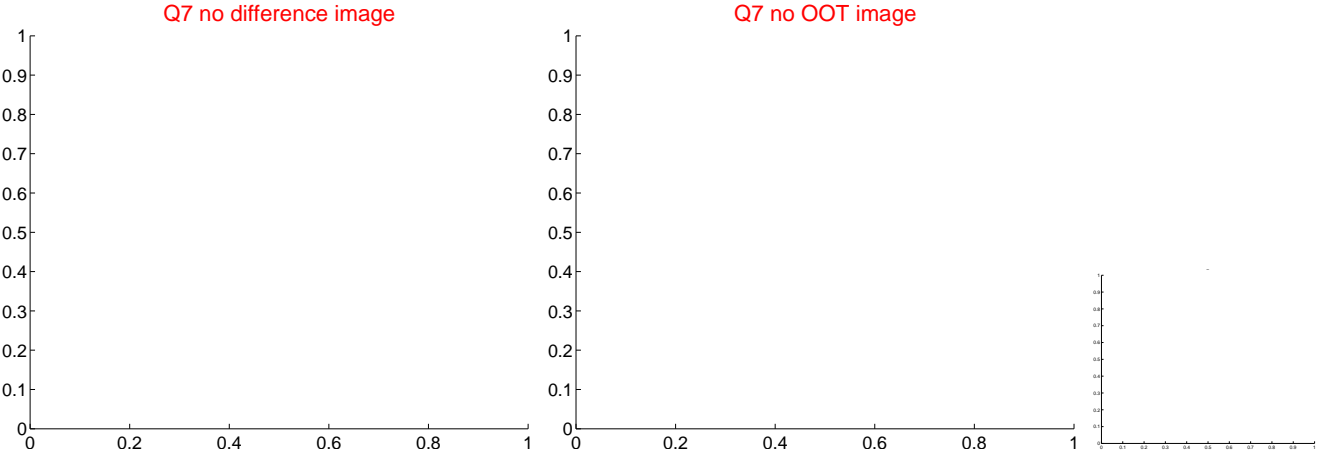
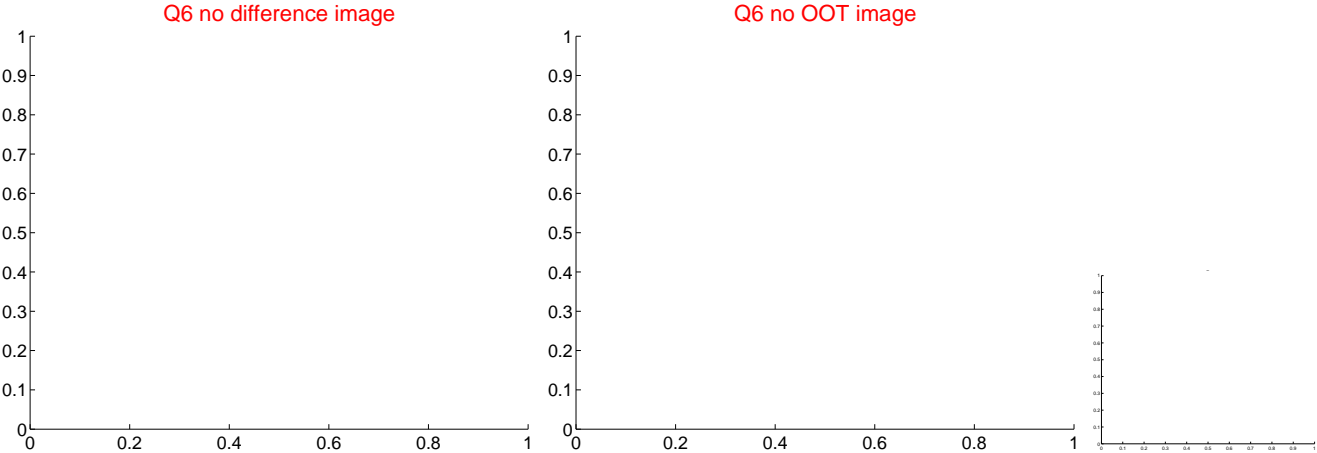
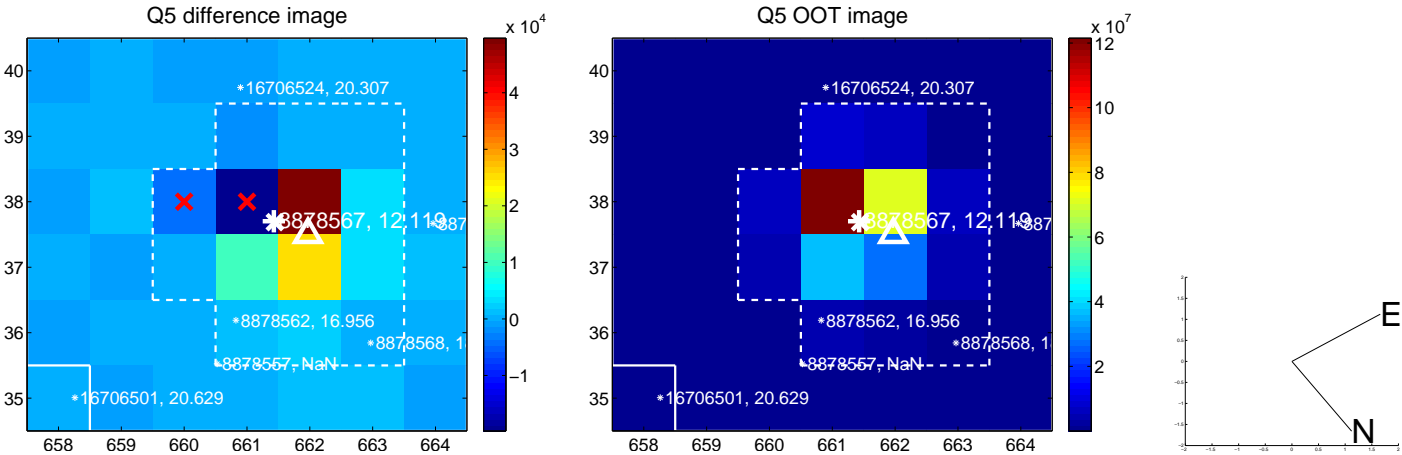


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

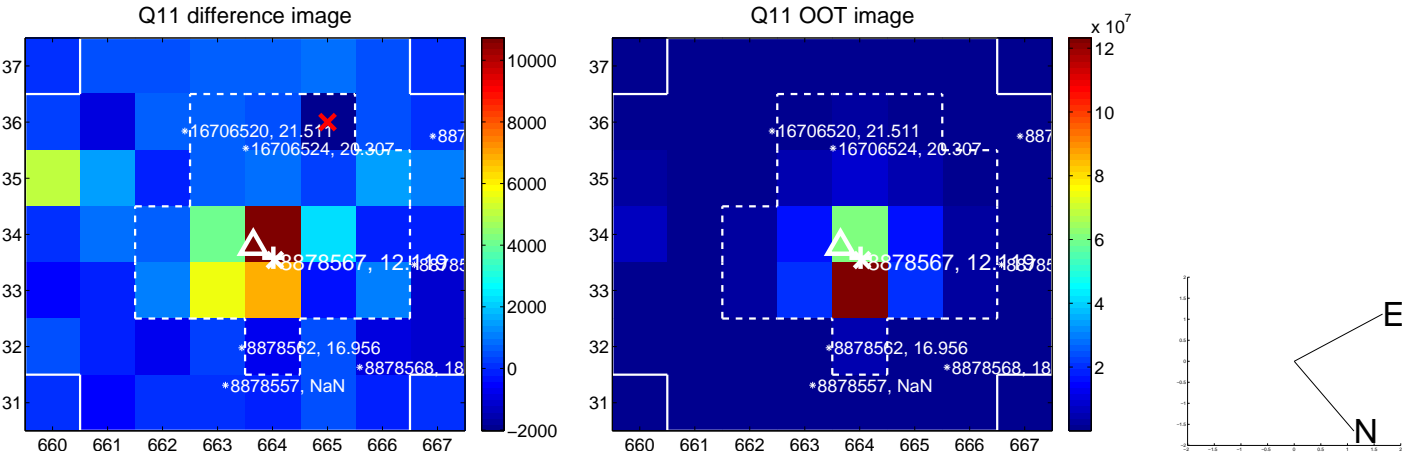
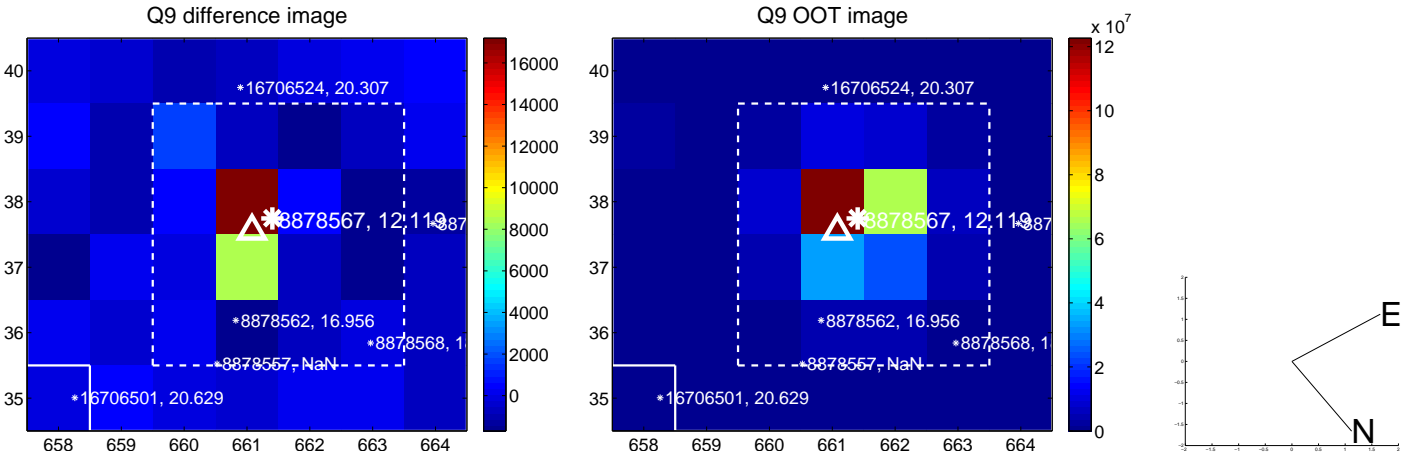
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



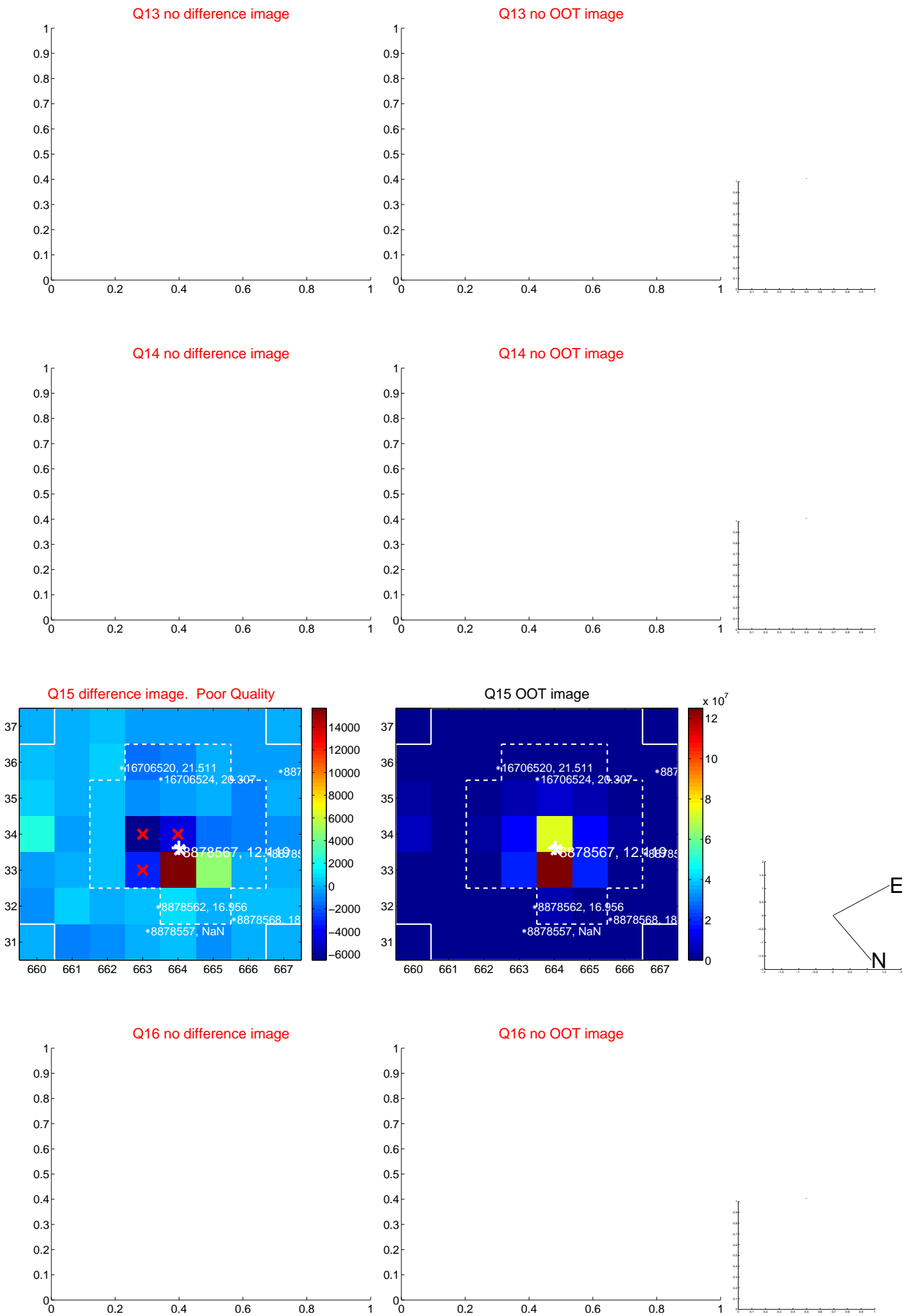
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



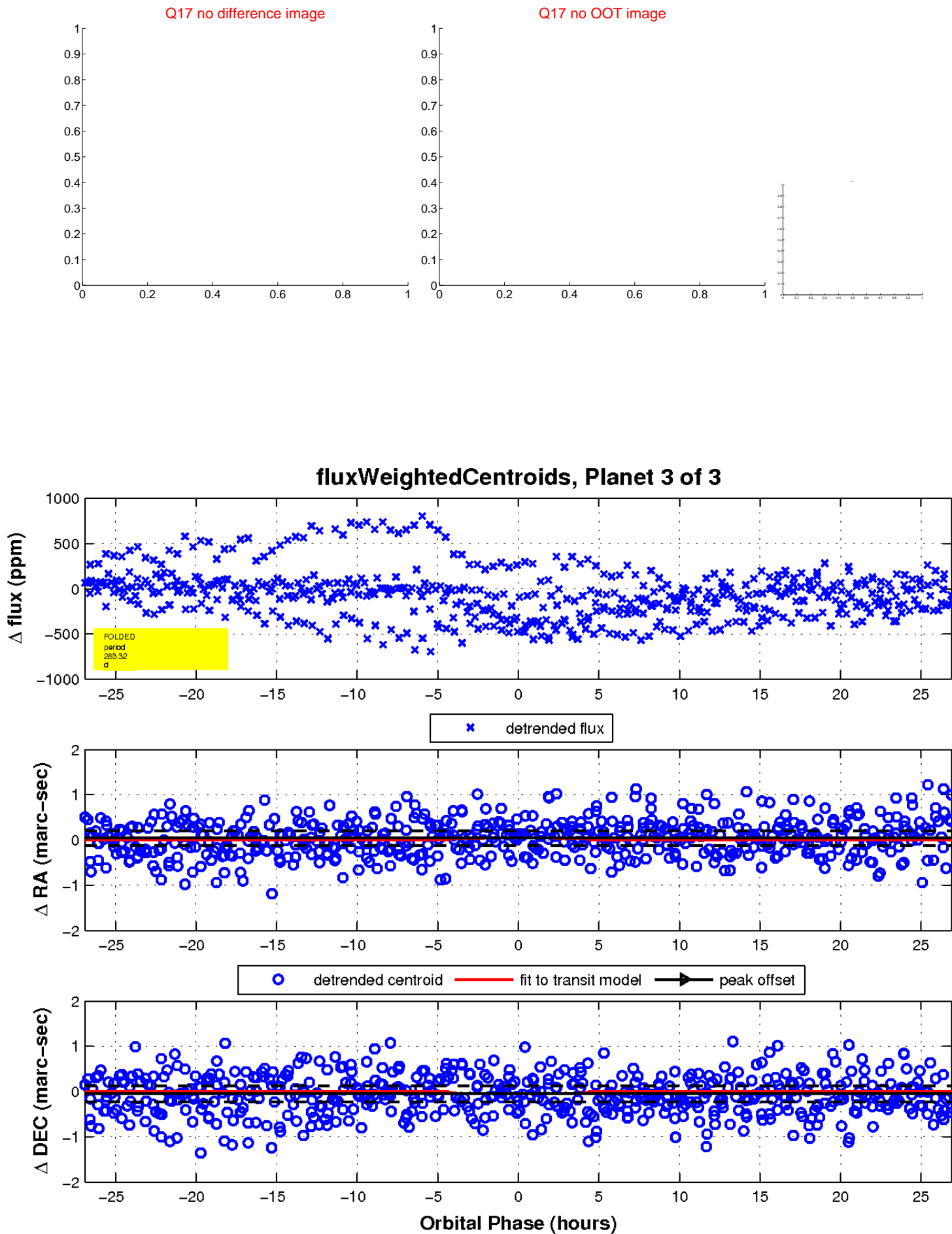
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



UKIRT Image

Declination

