

KIC 012556515

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})
012556515-01	OBS	No	531.746408	222.329760	1071.5	11.000	7.9	7.7	0.72	4858	2.99	0.19
012556515-02	OBS	No	464.939186	457.897140	1343.8	8.545	7.9	8.7	0.72	4858	2.84	0.22

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012556515-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
012556515-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST

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

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

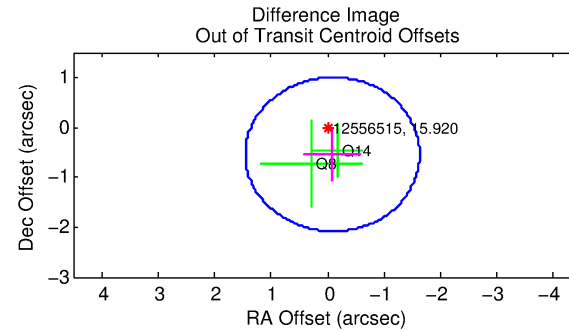
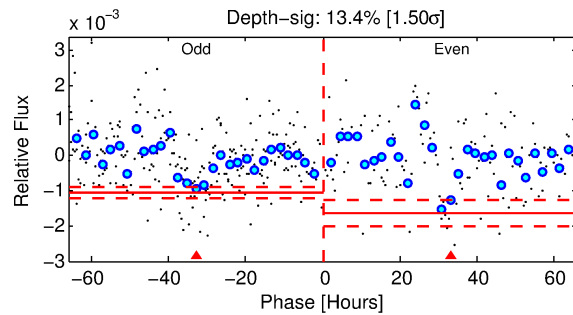
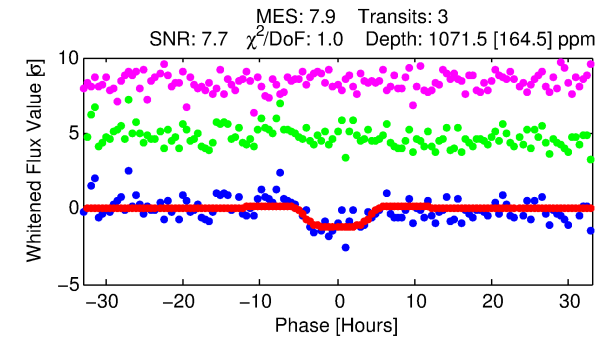
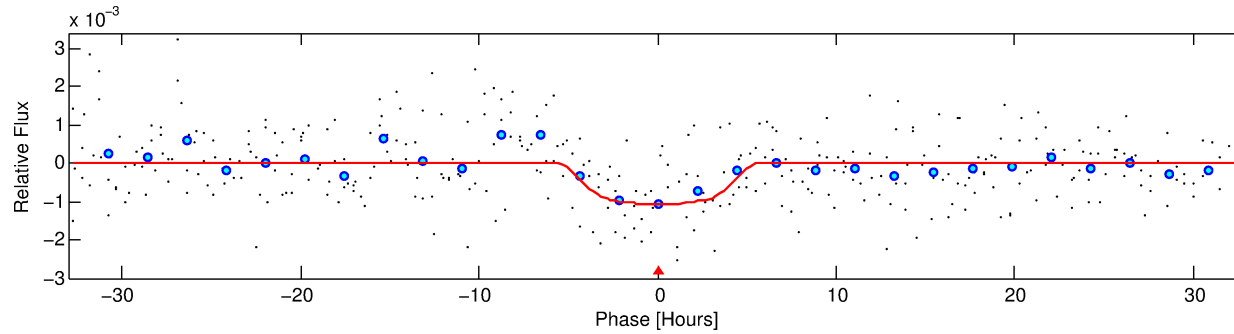
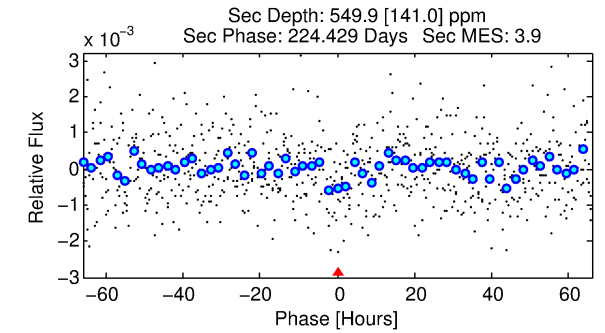
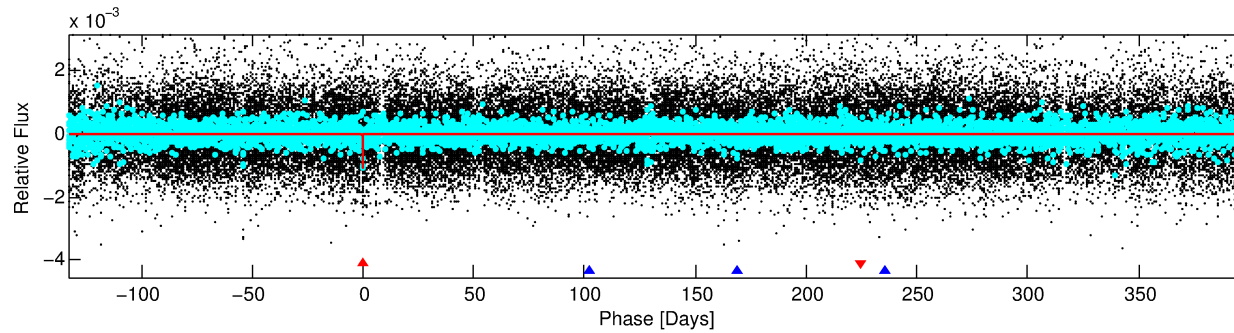
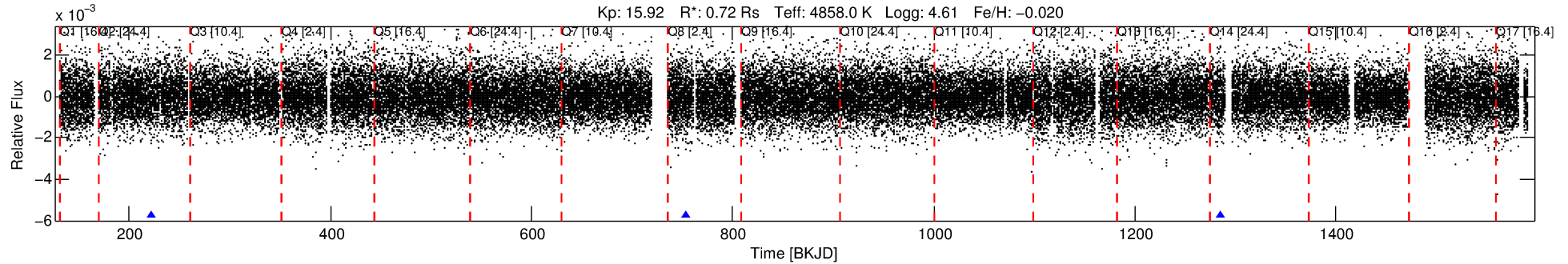
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012556515-01

No Significant Match Found

DV One-Page Summary

KIC: 12556515 Candidate: 1 of 2 Period: 531.746 d



DV Fit Results:

Period = 531.74641 [0.02070] d
Epoch = 222.3298 [0.0279] BKJD
Rp/R* = 0.0380 [0.0063]
a/R* = 173.93 [85.13]
b = 0.93 [0.08]
Seff = 0.19 [0.03]
Teq = 168 [7] K
Rp = 2.99 [0.58] Re
a = 1.1778 [0.0915] AU
Ag = 47035.90 [20323.22] [2.31σ]
Teffp = 3815 [416] K [8.77σ]

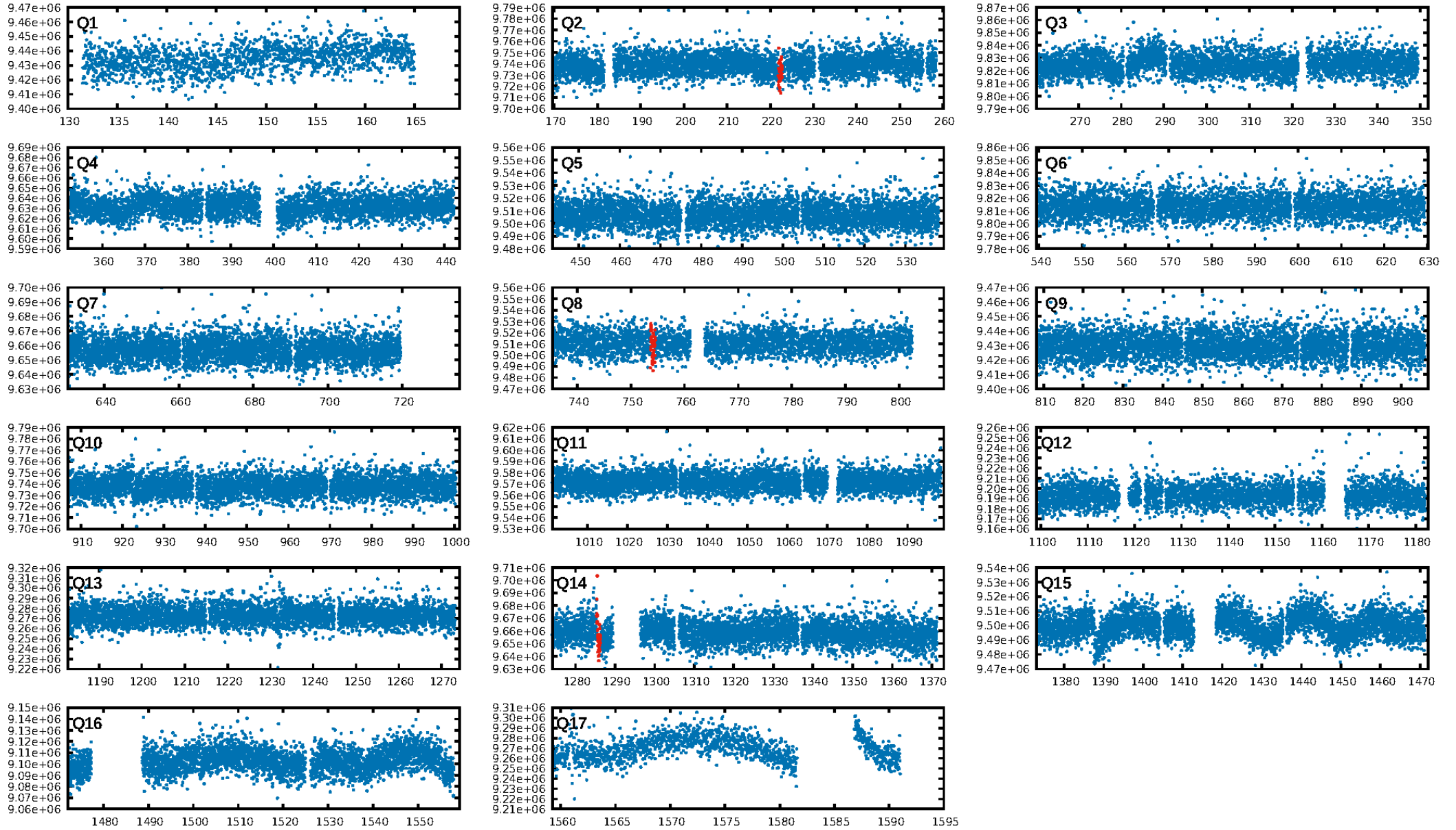
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [115.11σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 34.0%
ModelChiSquareGof-sig: 98.7%
Bootstrap-pfa: 1.03e-10
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 4.904
Centroid-sig: 73.4%
Centroid-so: 1.834 arcsec [1.03σ]
OotOffset-rm: 0.551 arcsec [1.07σ]
OotOffset-st: 1/0/1/0 [2]
KicOffset-rm: 0.370 arcsec [0.72σ]
KicOffset-st: 1/0/1/0 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [3/3]

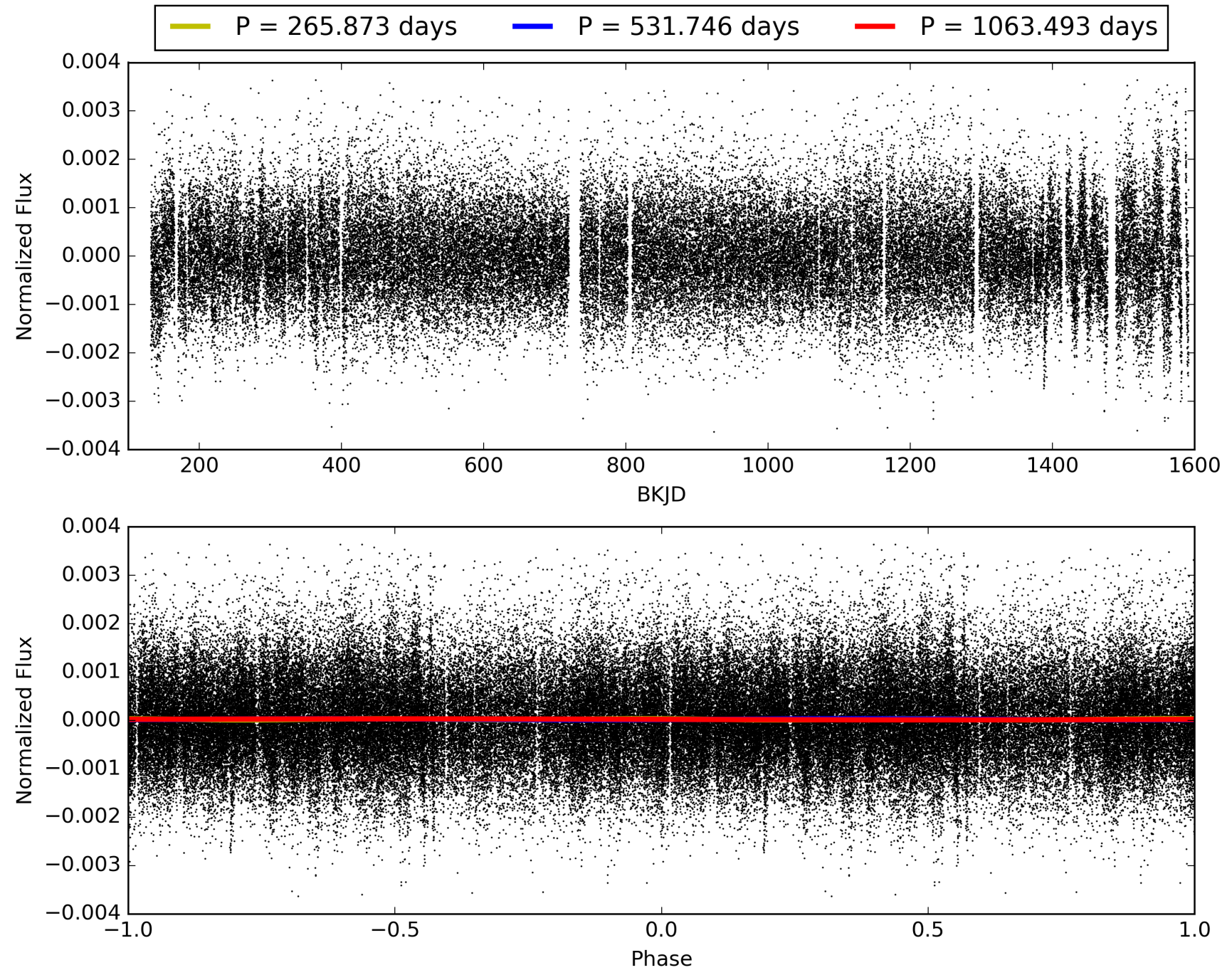
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 00:14:52 Z

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

TCE 012556515-01, PDC Light Curves

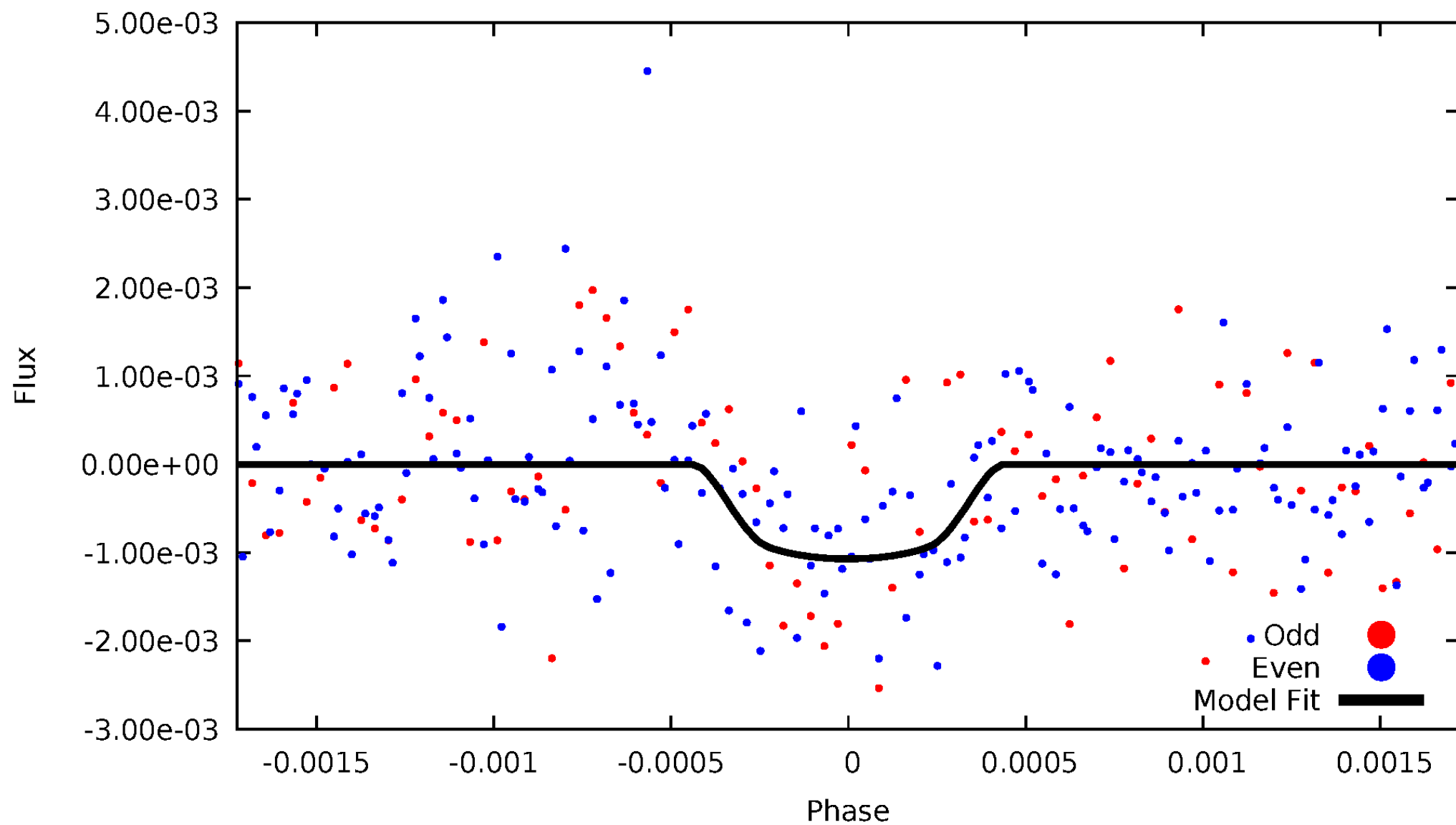


TCE 012556515-01



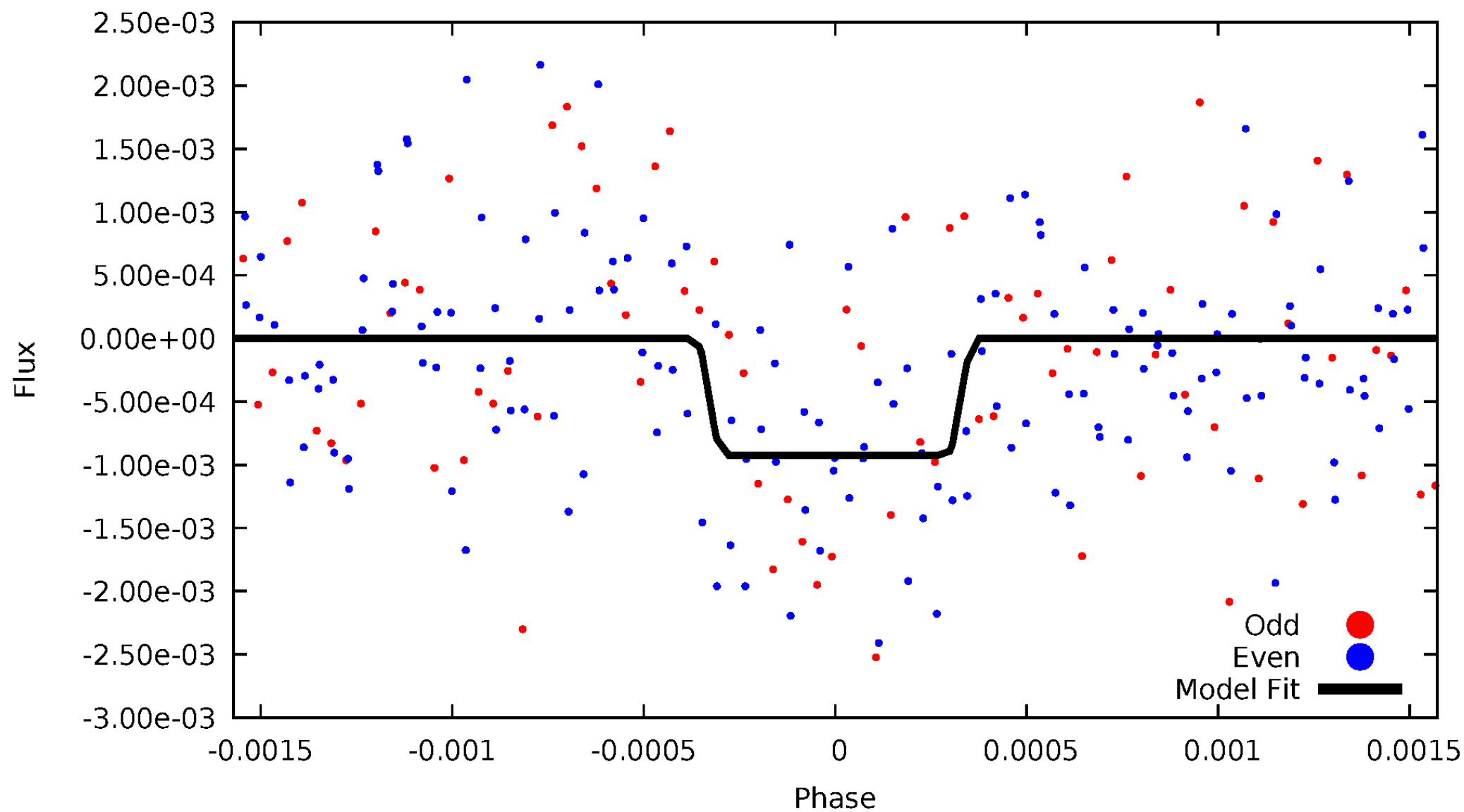
DV Odd/Even

TCE 012556515-01



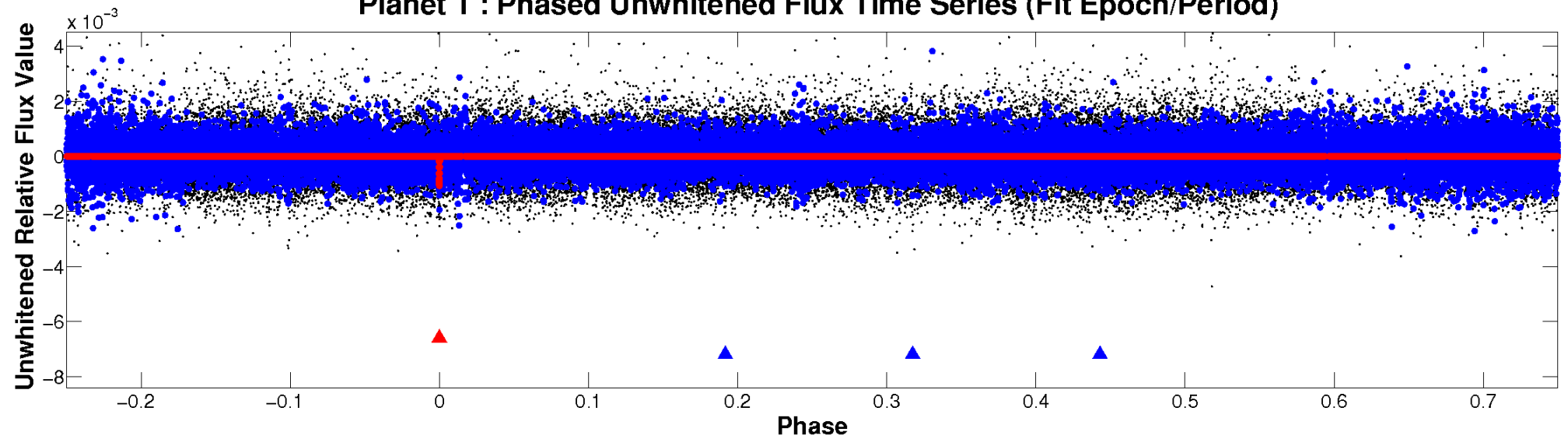
ALT Odd/Even

TCE 012556515-01

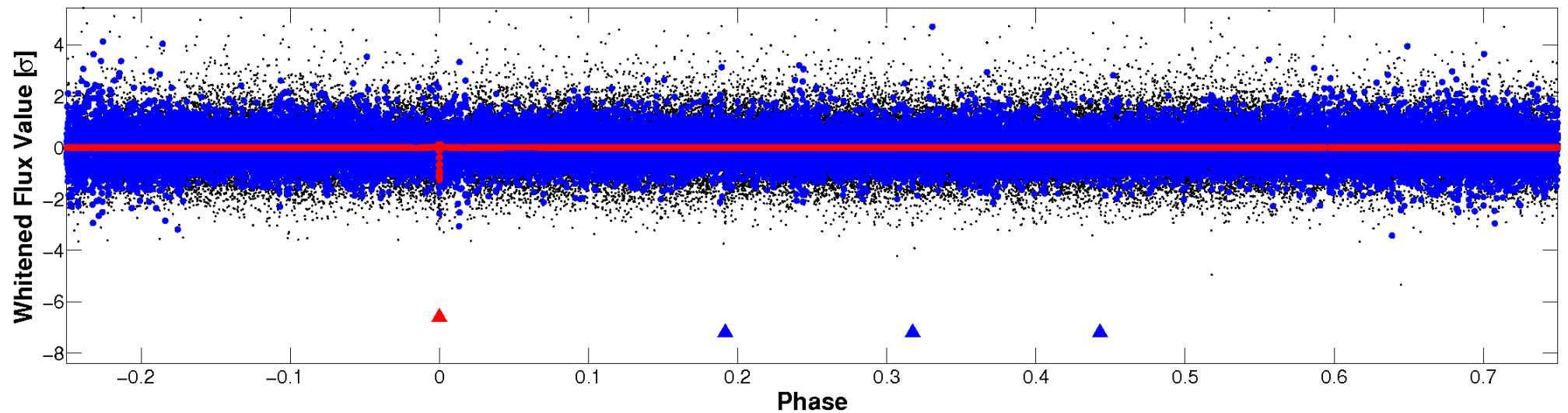


Non-Whitened Vs. Whitened Light Curve

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

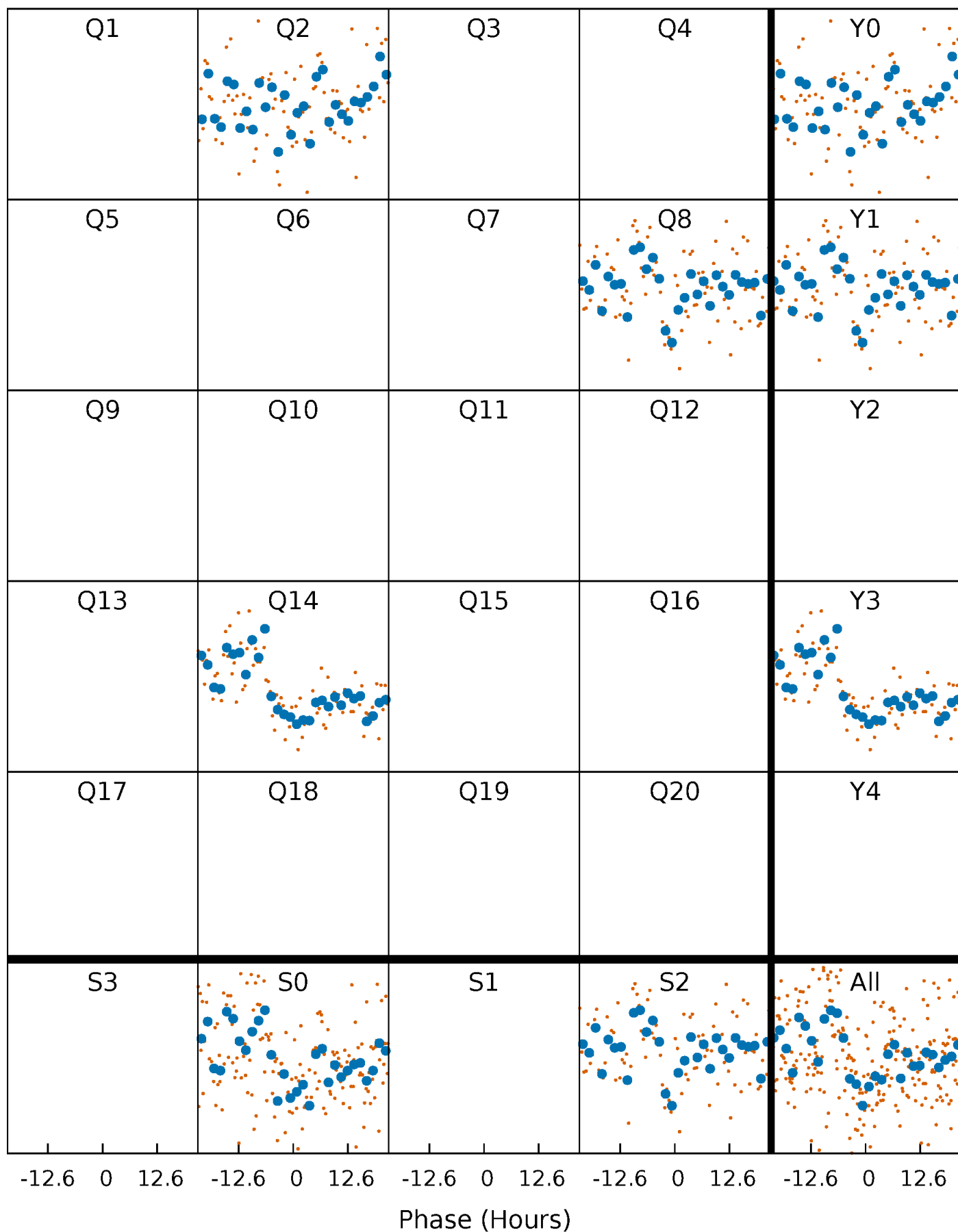


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



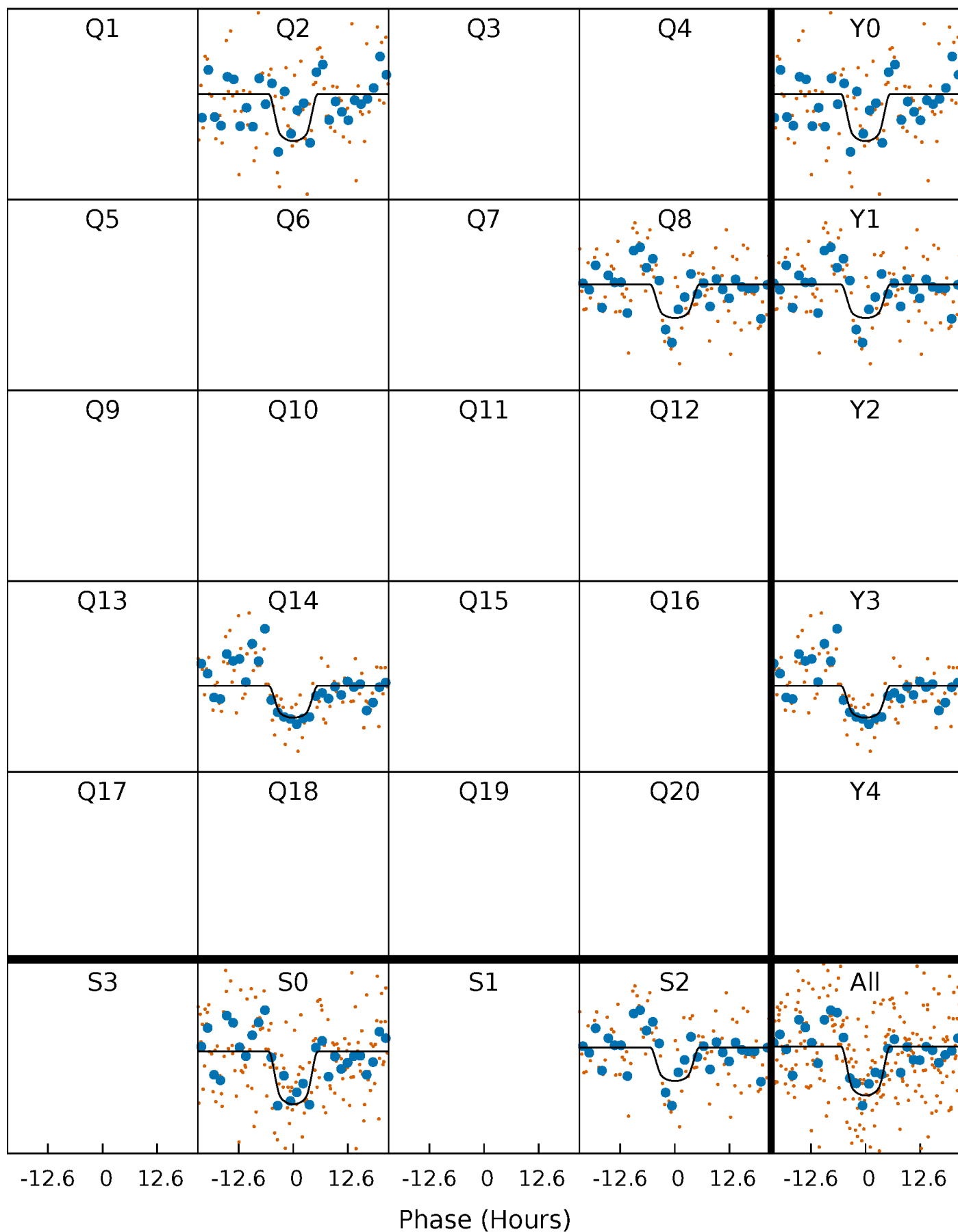
PDC Quarter-Phased Transit Curves

TCE 012556515-01 P=531.746408 Days $T_0=222.329760$ (BKJD)



DV Quarter-Phased Transit Curves

TCE 012556515-01 P=531.746408 Days $T_0=222.329760$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

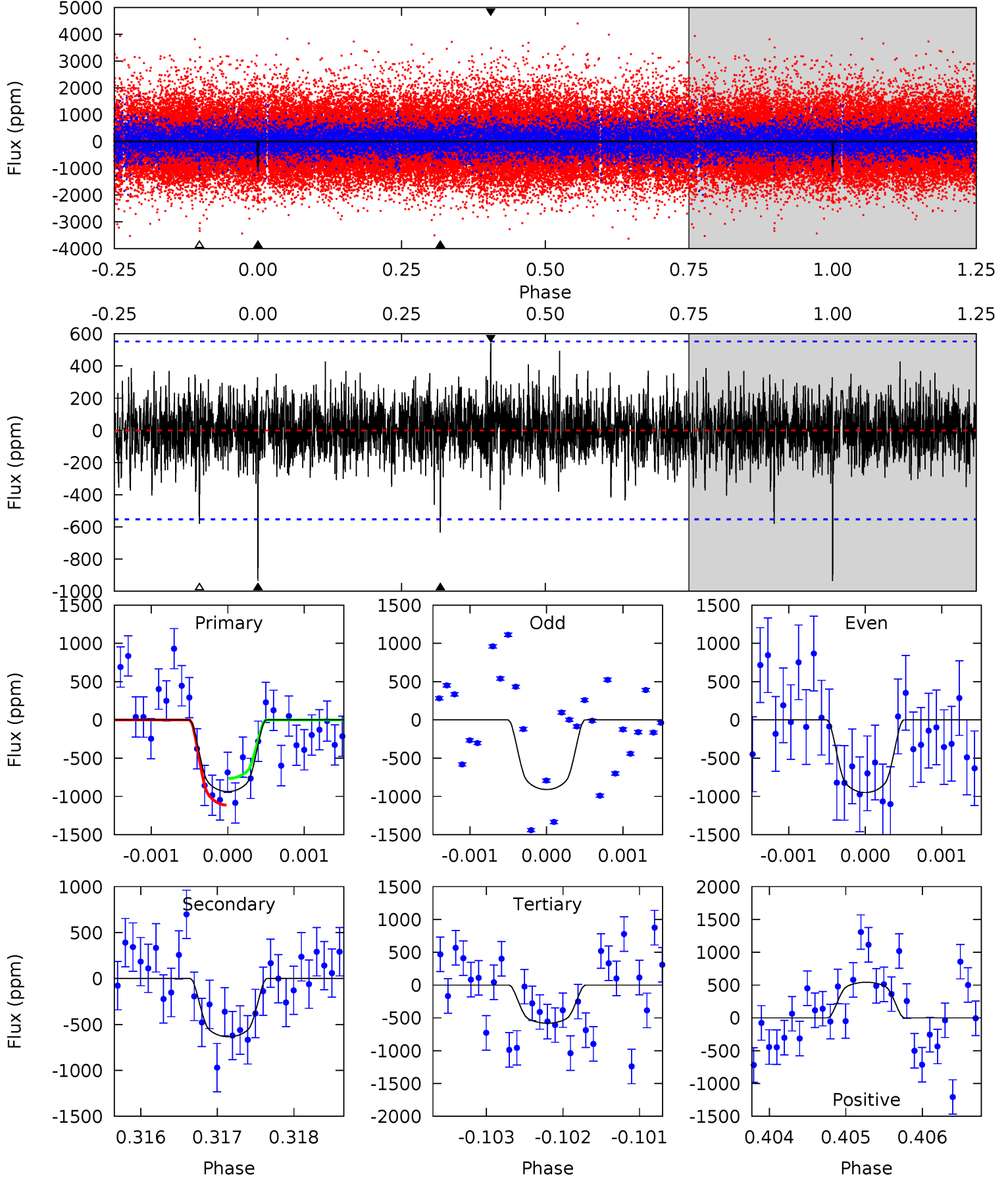
TCE 012556515-01 P=531.742532 Days $T_0=222.322798$ (BKJD)



DV Model-Shift Uniqueness Test

012556515-01, P = 531.746408 Days, E = 222.329760 Days

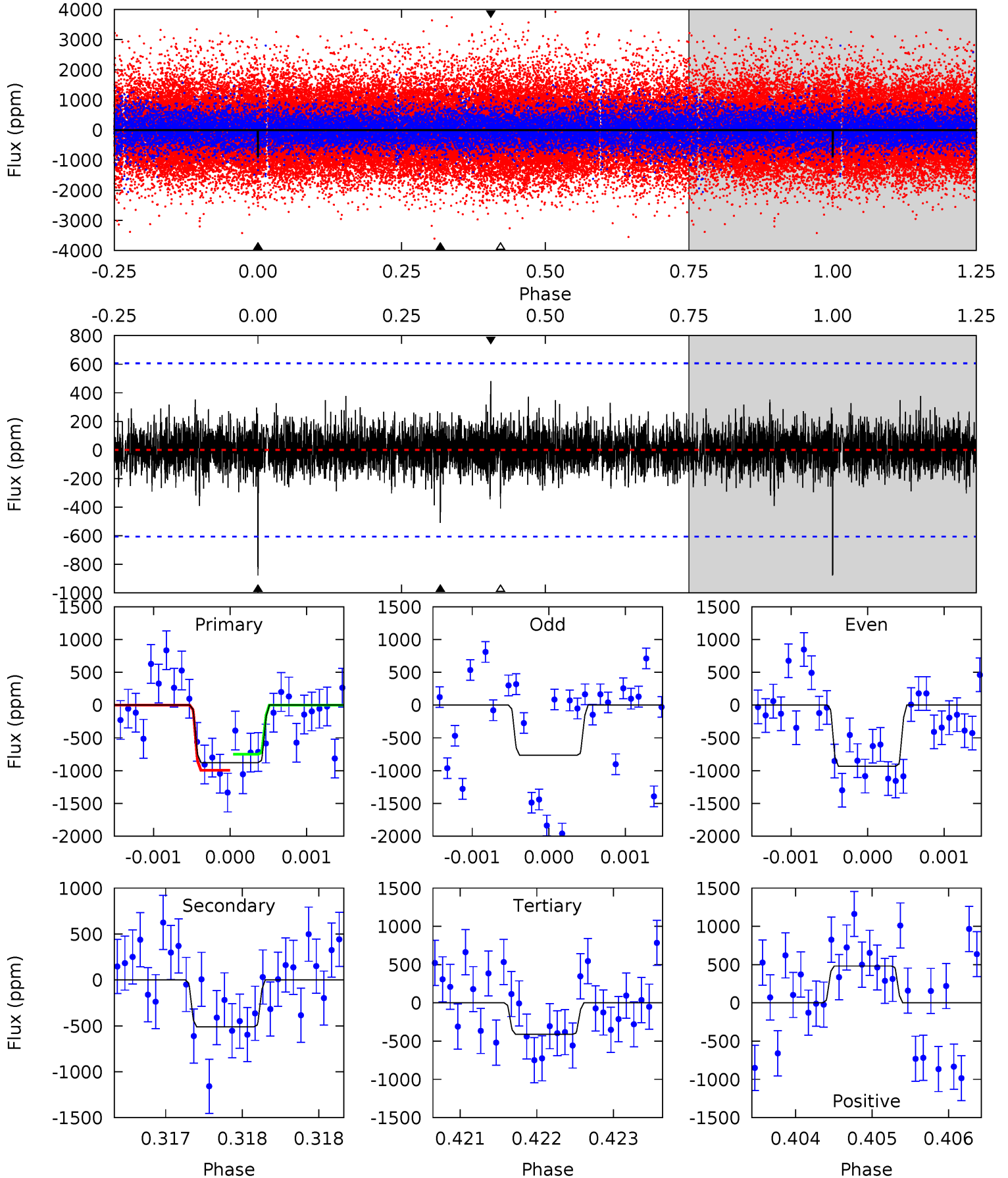
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.27	6.29	5.76	5.38	5.47	3.33	1.24	3.52	3.89	0.53	0.91	0.19	1.03	0.37	1.73



Alt Model-Shift Uniqueness Test

012556515-01, P = 531.742532 Days, E = 222.322798 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.98	4.64	3.72	4.38	5.51	3.38	0.88	4.26	3.60	0.92	0.26	0.71	1.15	0.35	1.11



Stellar Parameters For KIC 012556515

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4858^{+145}_{-130}	$4.610^{+0.028}_{-0.052}$	$-0.020^{+0.250}_{-0.300}$	$0.720^{+0.072}_{-0.053}$	$0.771^{+0.061}_{-0.068}$	$2.910^{+0.462}_{-0.578}$
	+3%/-3%	+1%/-1%	+1250%/-1500%	+10%/-7%	+8%/-9%	+16%/-20%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 012556515-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-635 ± 101	$3.01^{+0.52}_{-0.50}$	235^{+8}_{-7}	4128^{+318}_{-242}	53101^{+23936}_{-15572}
Alt.	-510 ± 110	$2.42^{+0.53}_{-0.50}$	236^{+9}_{-7}	4306^{+482}_{-353}	63597^{+45386}_{-22831}

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

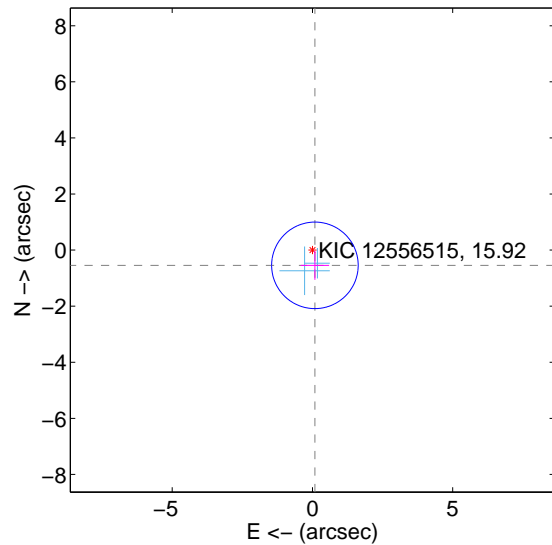
Supplemental centroid analysis for 012556515-01. Kepler magnitude: 15.92. Transit SNR 7.70

There are 2 quarters with good PRF difference image offsets

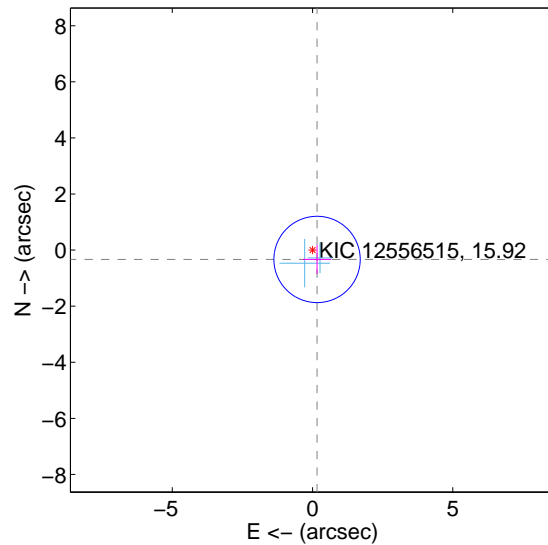
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.551 ± 0.514	1.07	-0.088 ± 0.506	-0.544 ± 0.515
PRF-fit source offset from KIC position	0.370 ± 0.513	0.72	-0.162 ± 0.506	-0.333 ± 0.515
photometric centroid source offset	1.83 ± 1.79	1.03	-1.29 ± 1.86	1.30 ± 1.71

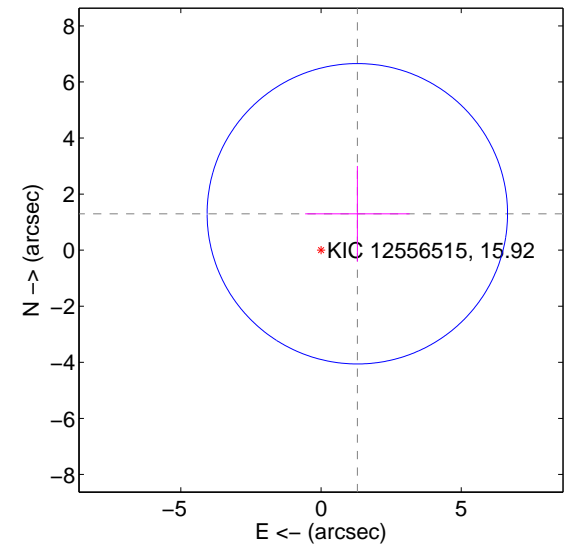
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

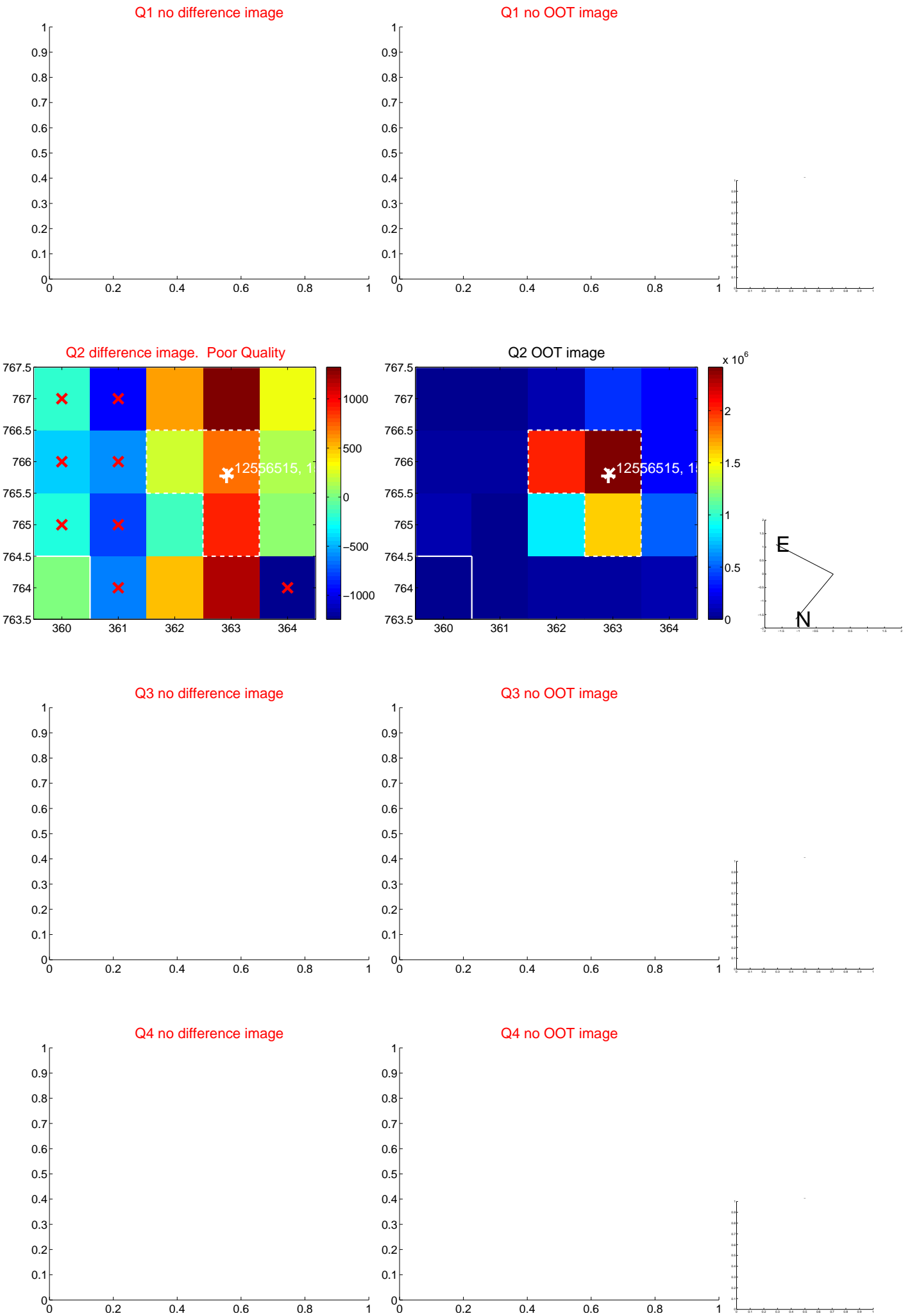


offset from photometric centroids

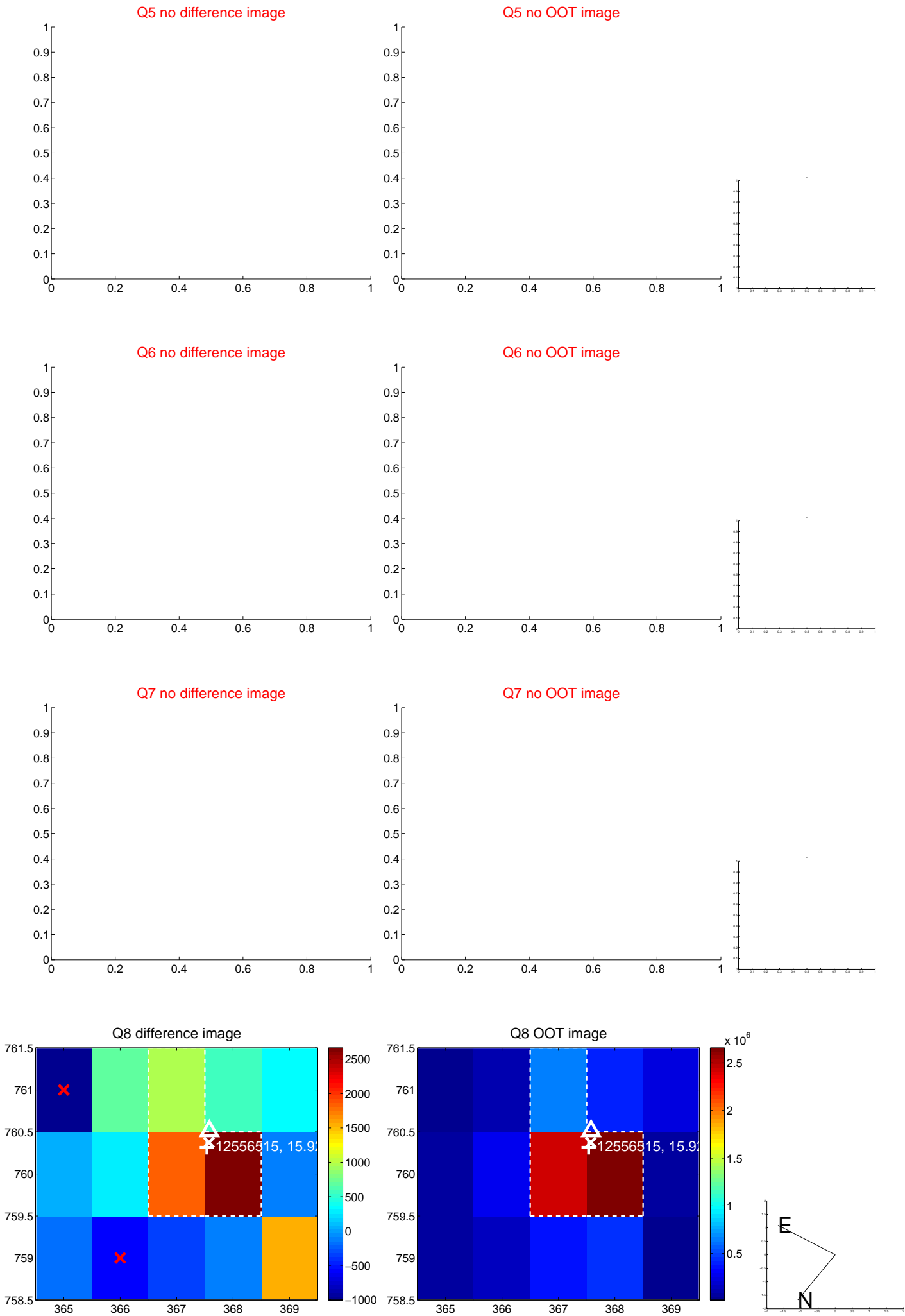


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

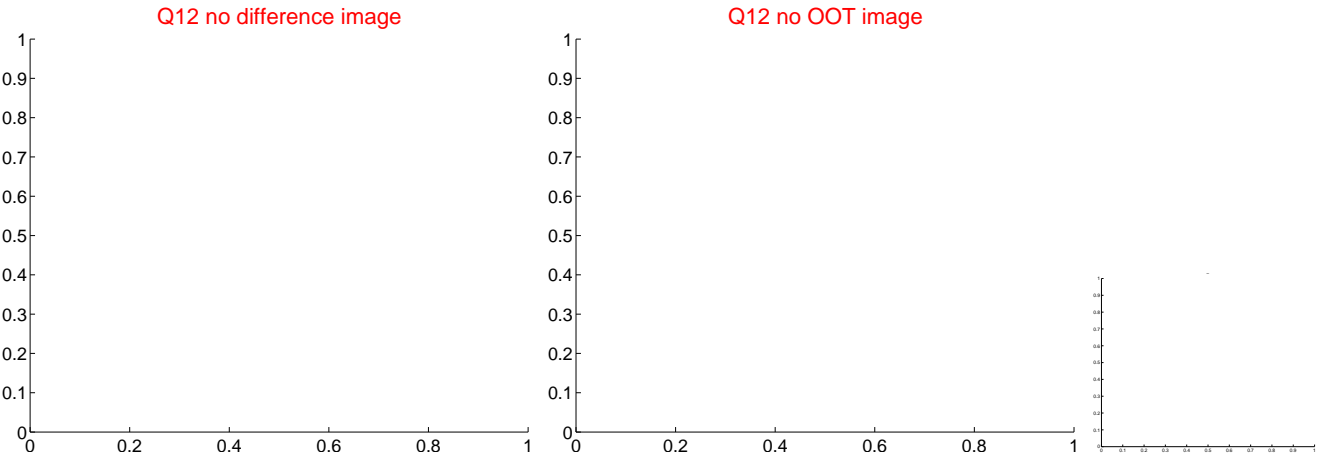
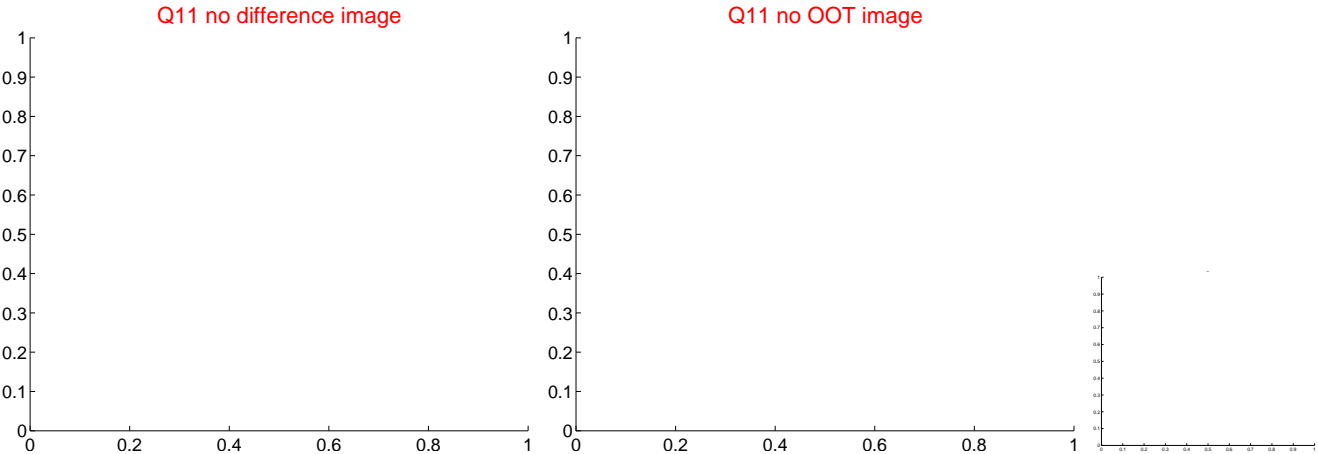
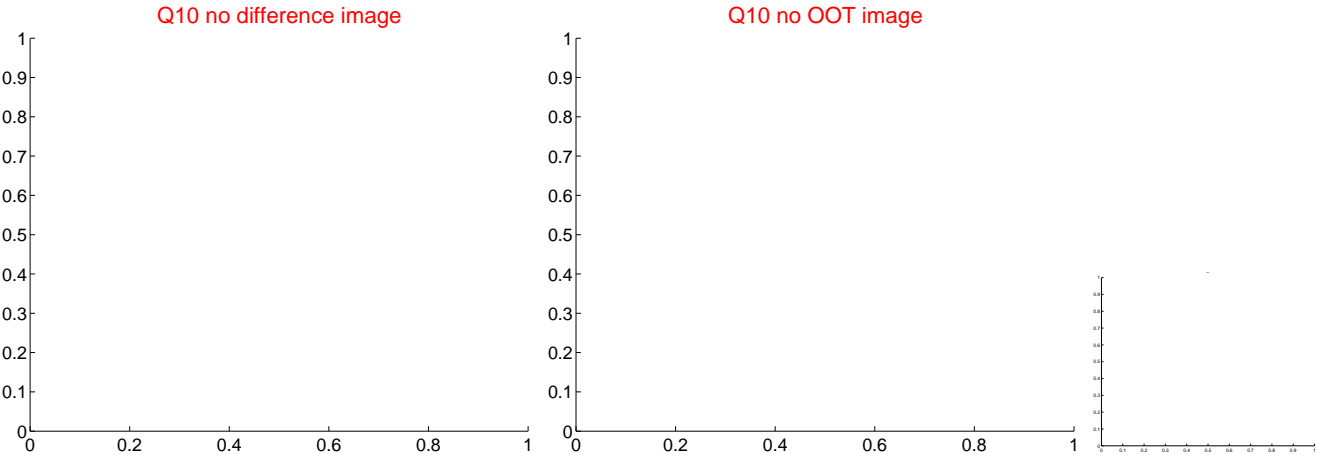
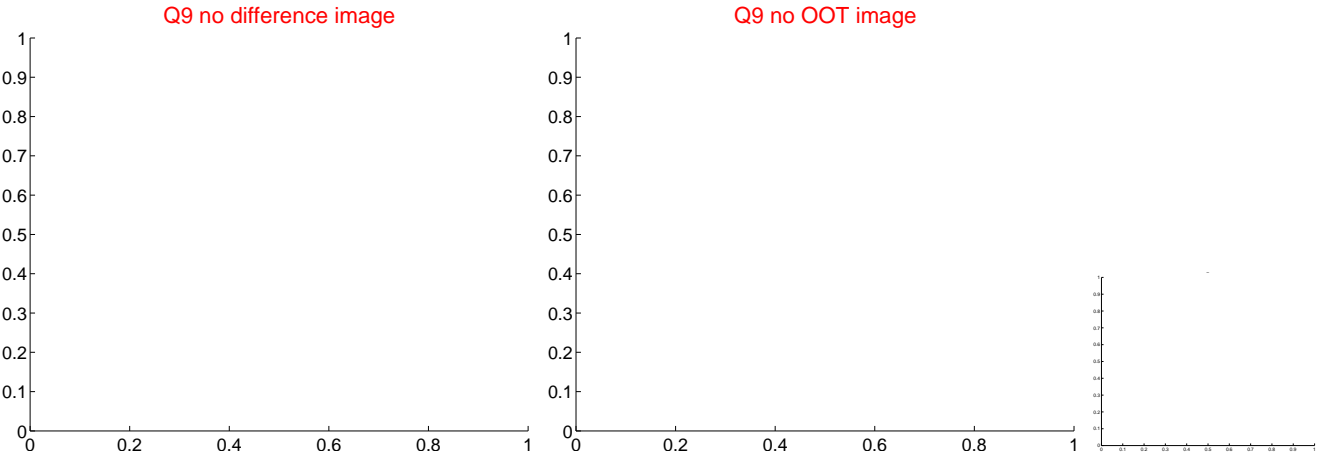
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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

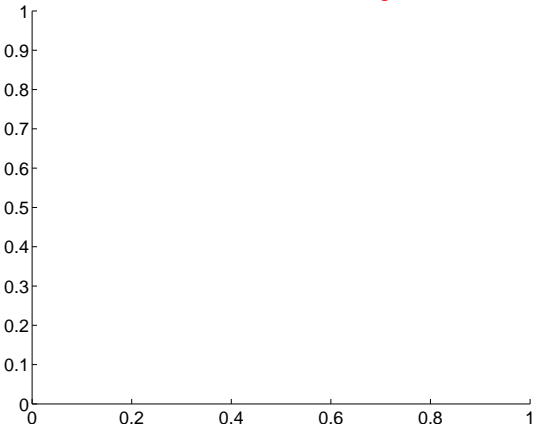


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

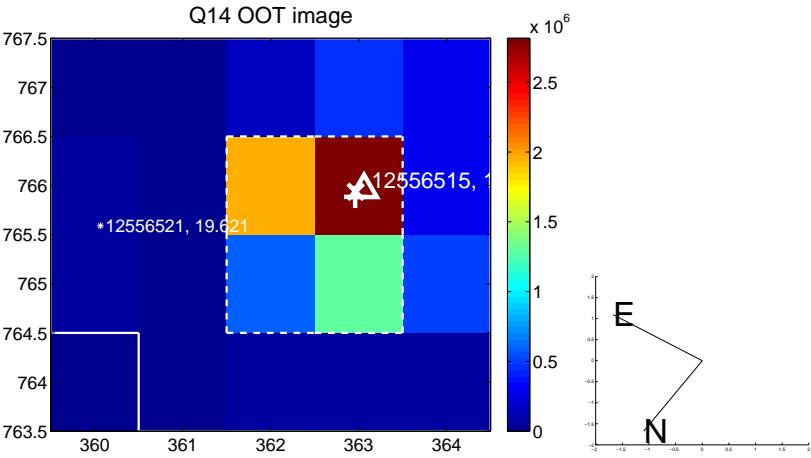
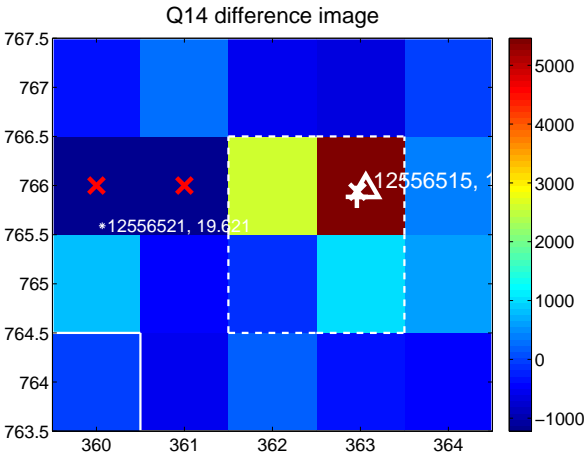
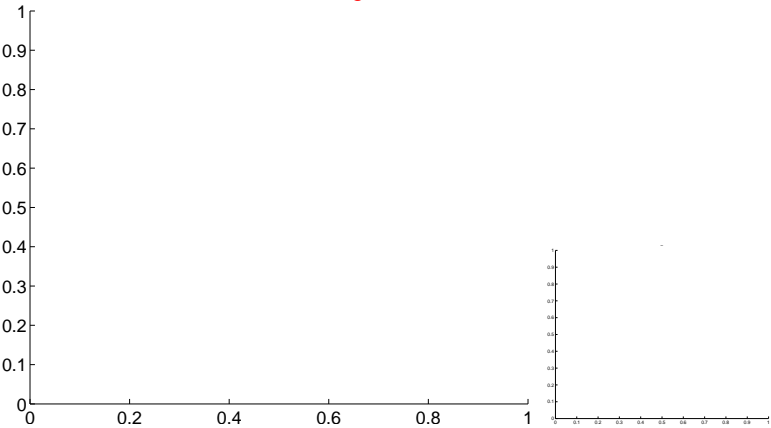


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

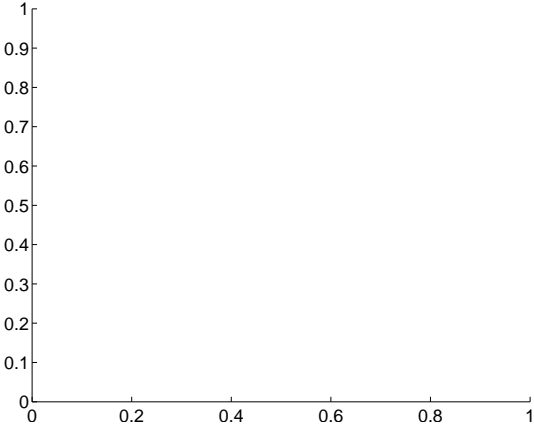
Q13 no difference image



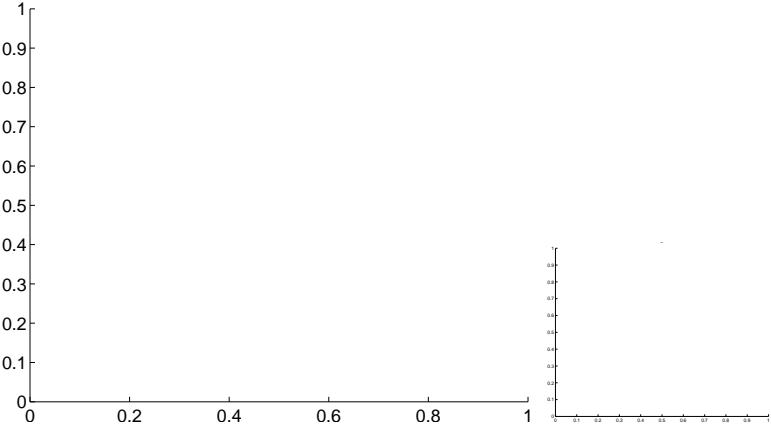
Q13 no OOT image



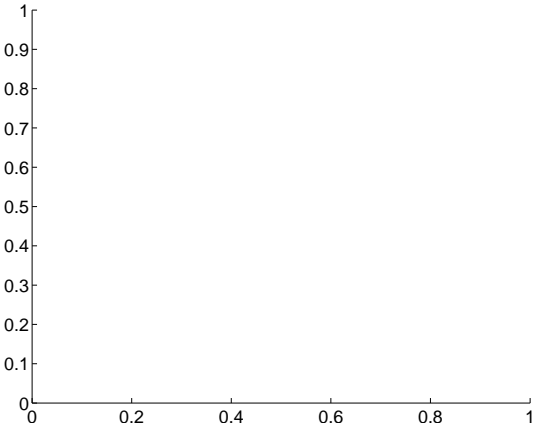
Q15 no difference image



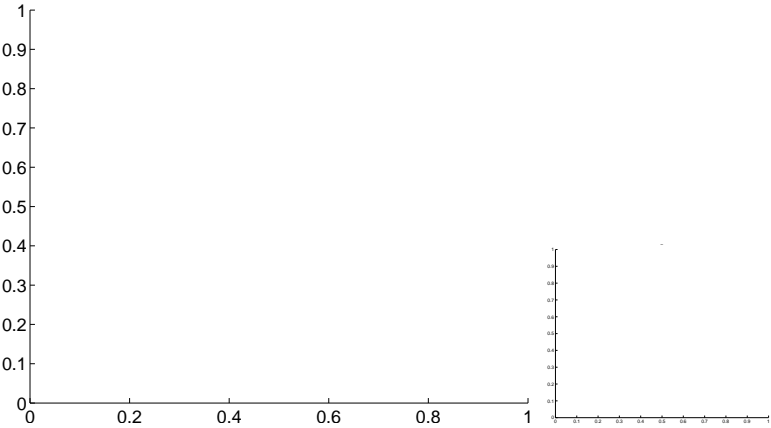
Q15 no OOT image



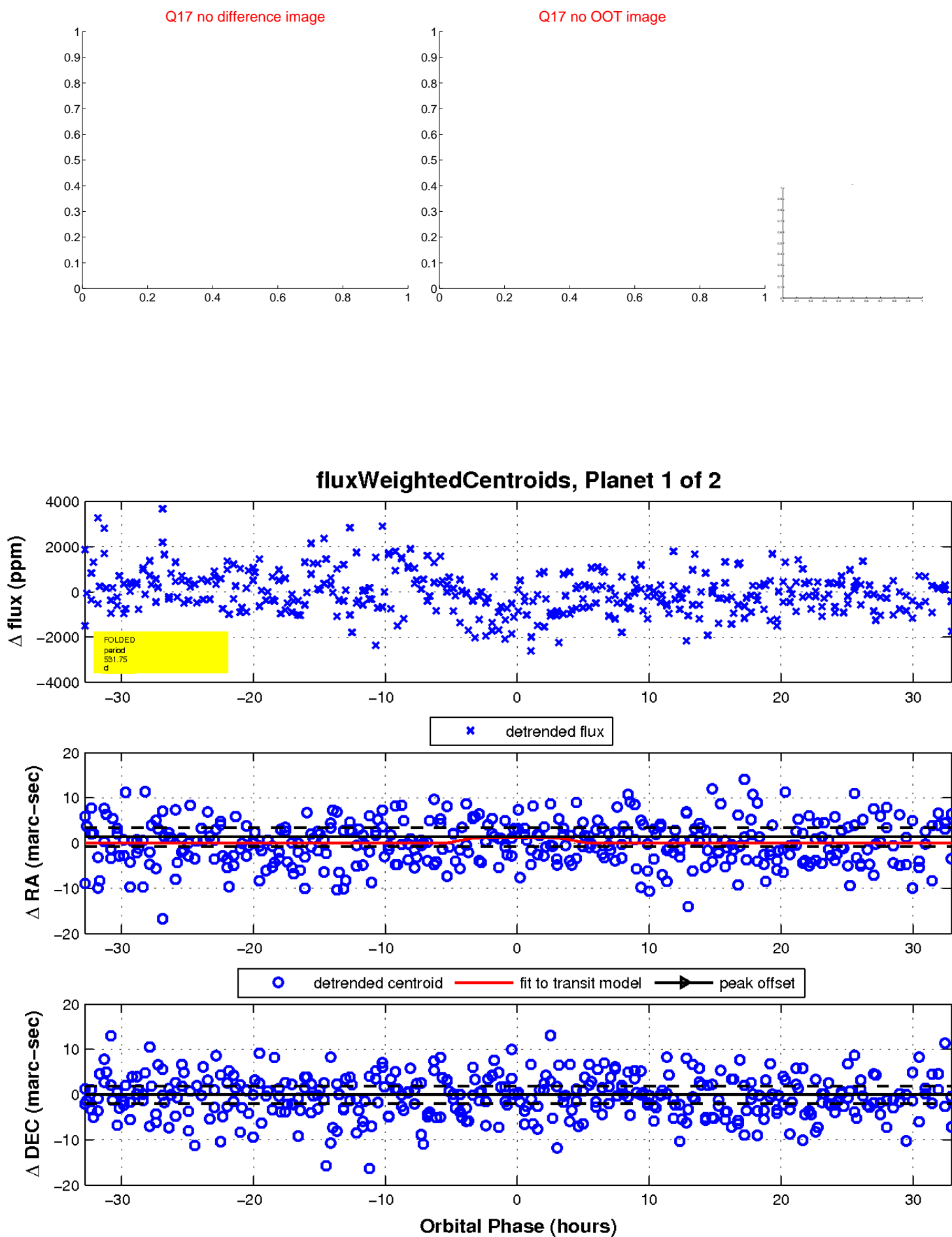
Q16 no difference image



Q16 no OOT image

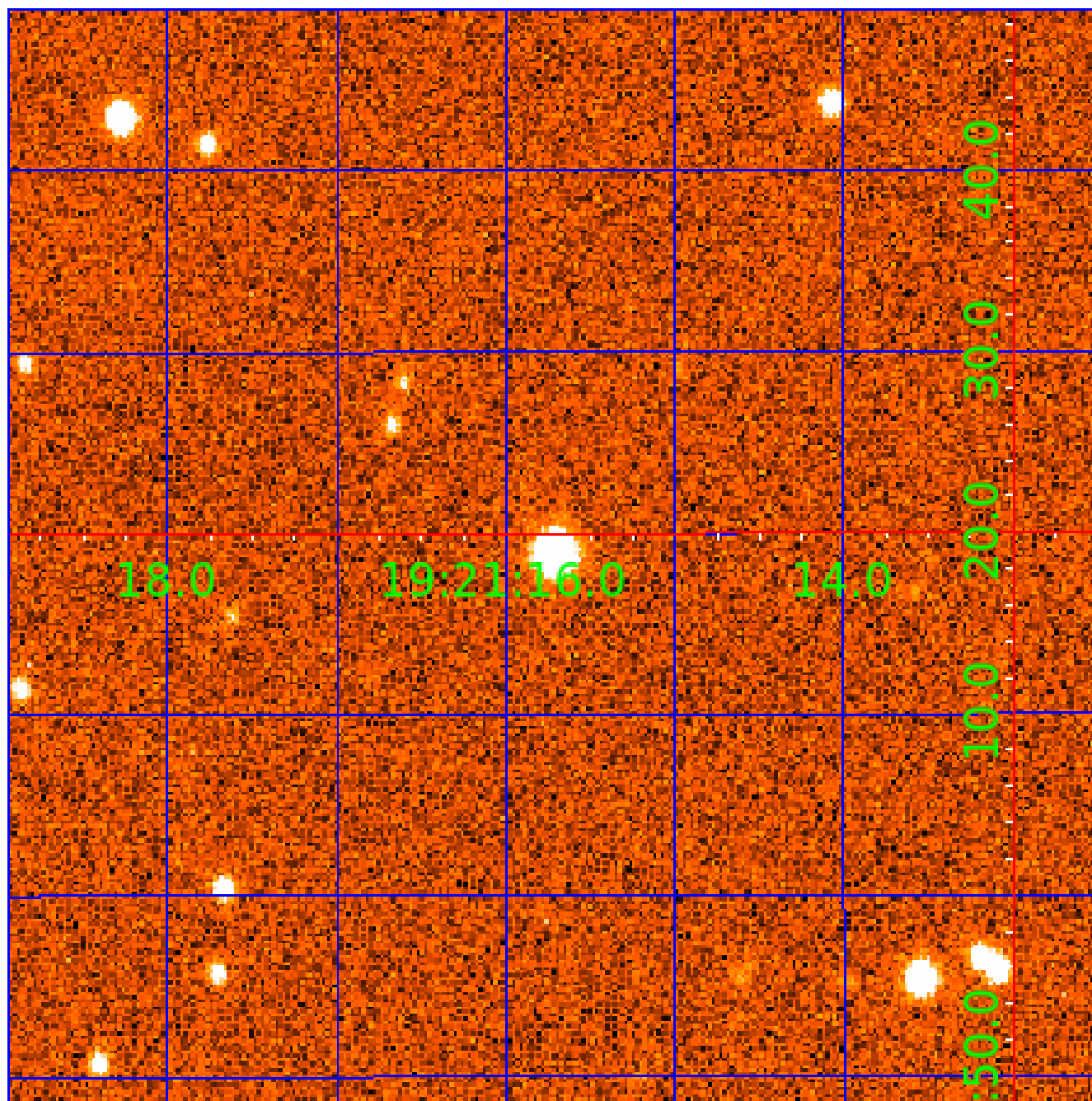


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 012556515

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})
012556515-01	OBS	No	531.746408	222.329760	1071.5	11.000	7.9	7.7	0.72	4858	2.99	0.19
012556515-02	OBS	No	464.939186	457.897140	1343.8	8.545	7.9	8.7	0.72	4858	2.84	0.22

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012556515-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
012556515-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST

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

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

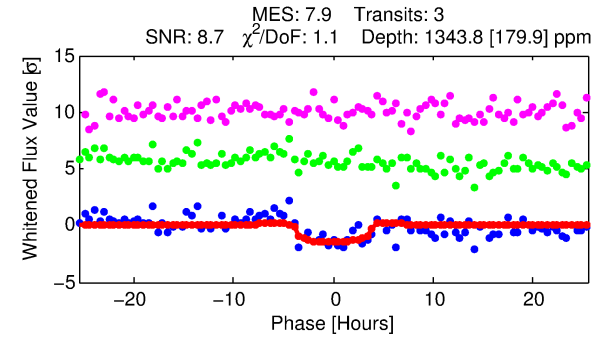
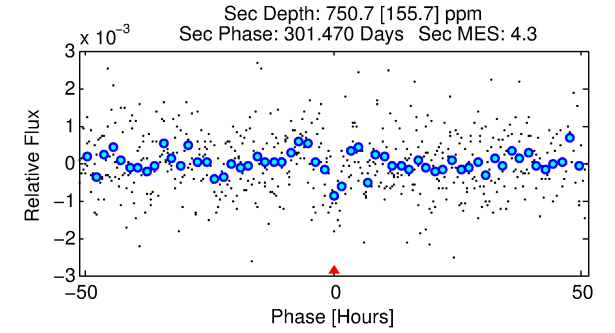
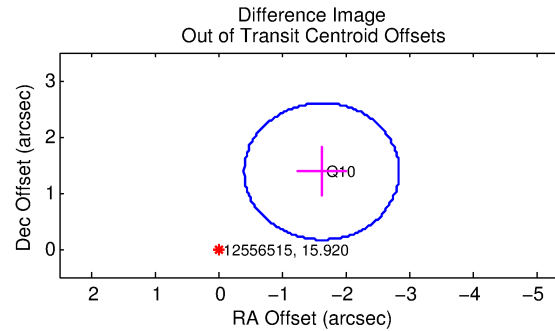
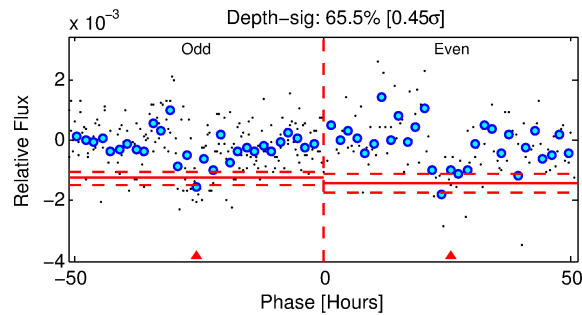
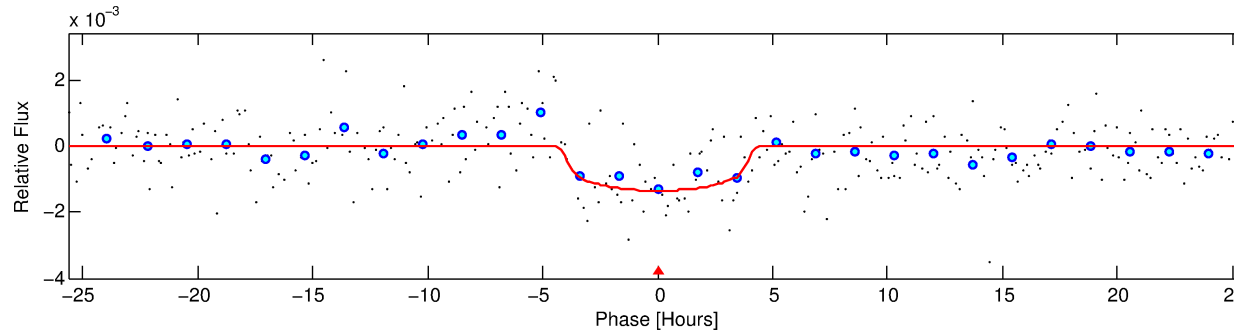
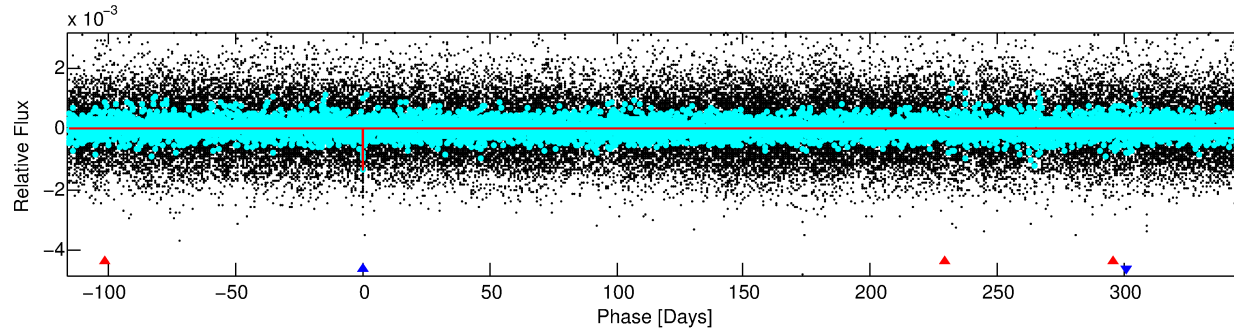
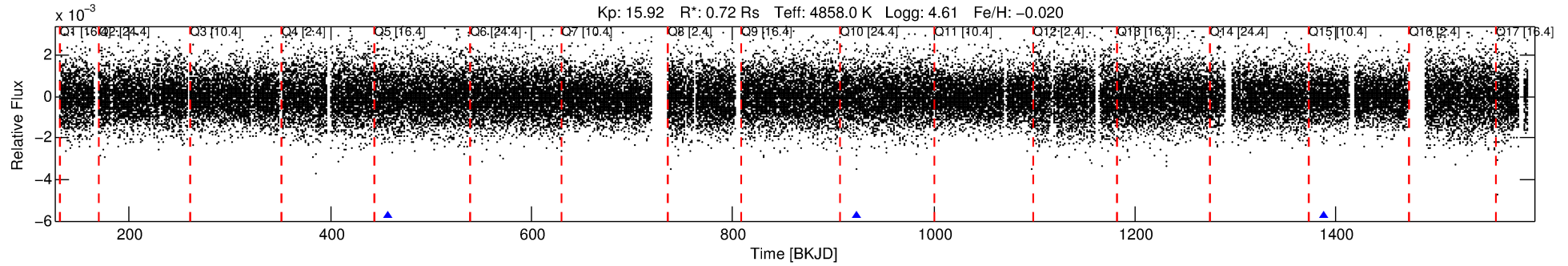
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012556515-02

No Significant Match Found

DV One-Page Summary

KIC: 12556515 Candidate: 2 of 2 Period: 464.939 d



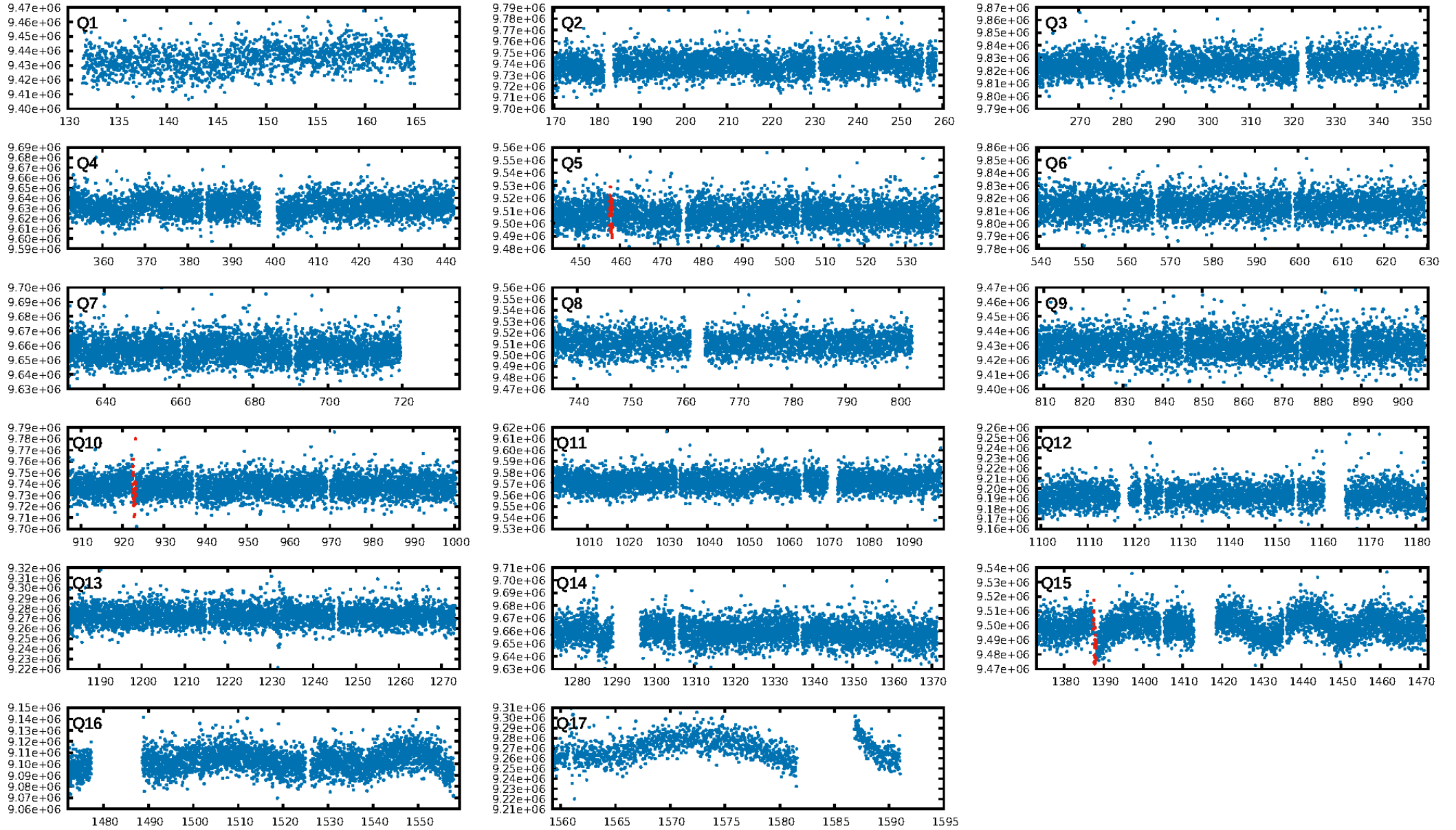
DV Fit Results:

Period = 464.93919 [0.01266] d
Epoch = 457.8971 [0.0174] BKJD
Rp/R* = 0.0362 [0.0223]
a/R* = 308.56 [634.89]
b = 0.72 [1.39]
Seff = 0.22 [0.04]
Teq = 175 [7] K
Rp = 2.84 [1.77] Re
a = 1.0769 [0.0837] AU
Ag = 59282.85 [74213.93] [0.80 σ]
Teffp = 4228 [1325] K [3.06 σ]

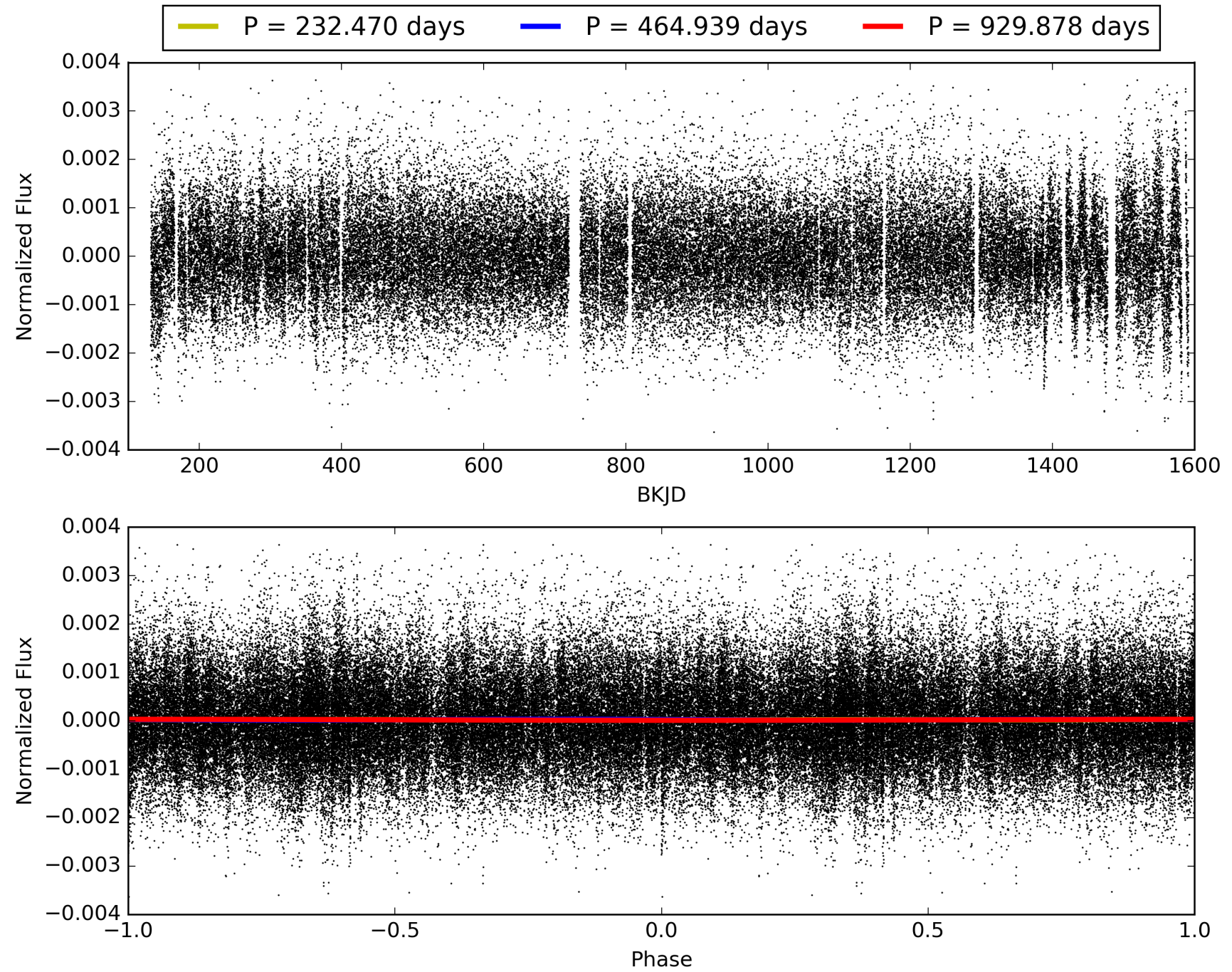
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [115.11 σ]
ModelChiSquare2-sig: 2.5%
ModelChiSquareGof-sig: 89.1%
Bootstrap-pfa: 9.99e-12
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -0.207
Centroid-sig: 21.2%
Centroid-so: 1.520 arcsec [1.02 σ]
OotOffset-rm: 2.134 arcsec [5.26 σ]
KicOffset-rm: 2.331 arcsec [5.72 σ]
OotOffset-st: 1/0/0/0 [1]
KicOffset-st: 1/0/0/0 [1]
DiffImageQuality-fgm: 1.00 [1/1]
DiffImageOverlap-fno: 1.00 [2/2]

TCE 012556515-02, PDC Light Curves

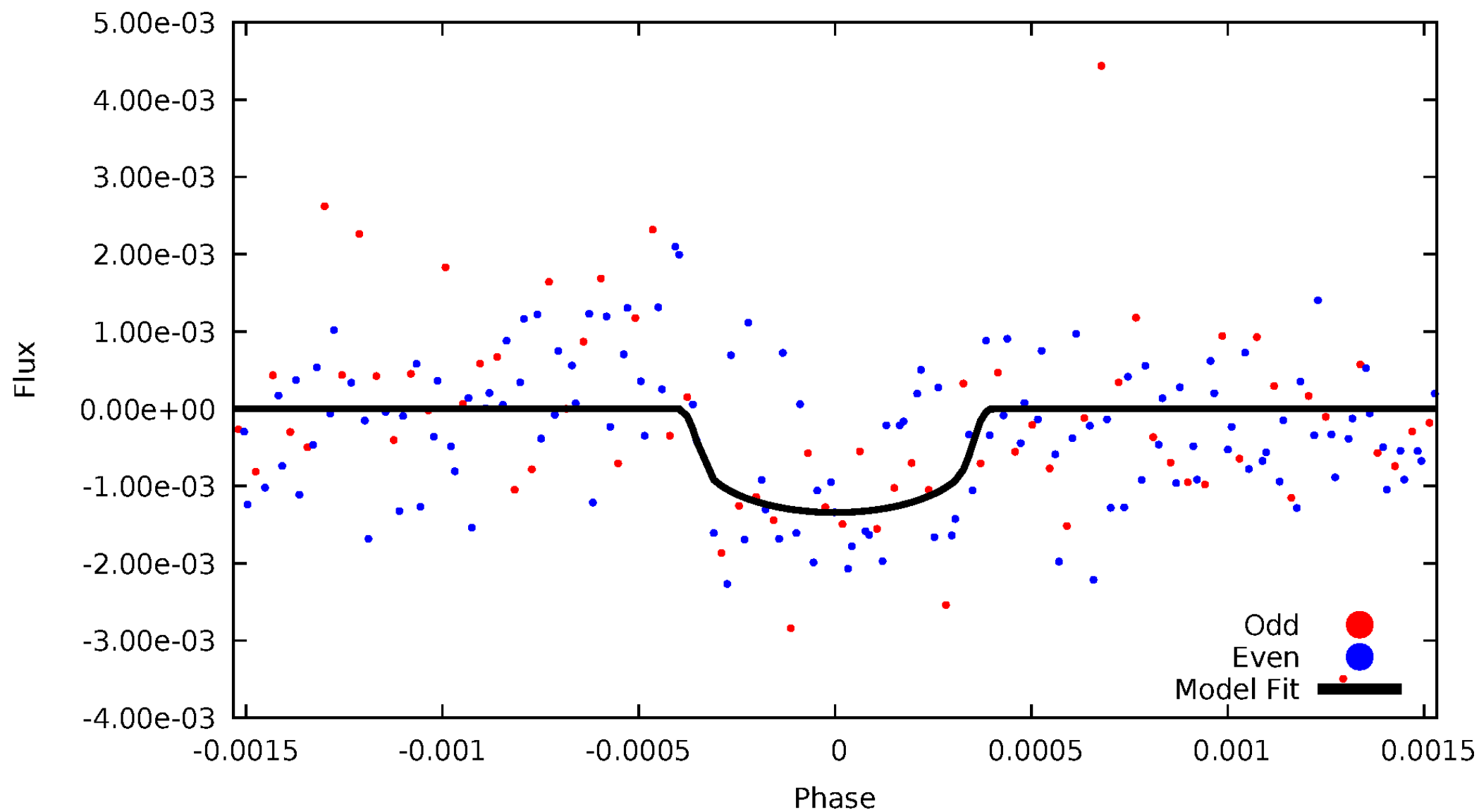


TCE 012556515-02



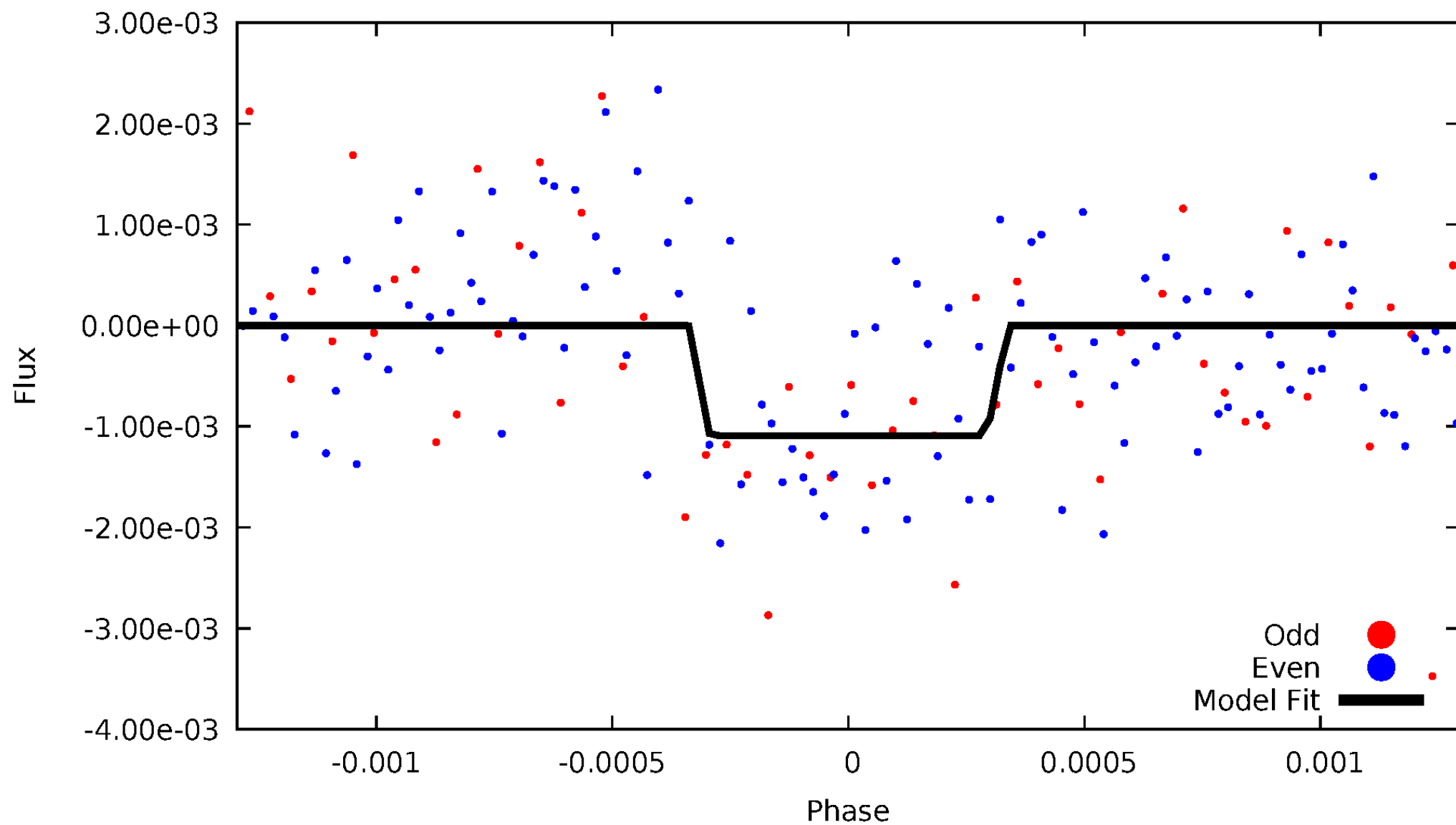
DV Odd/Even

TCE 012556515-02



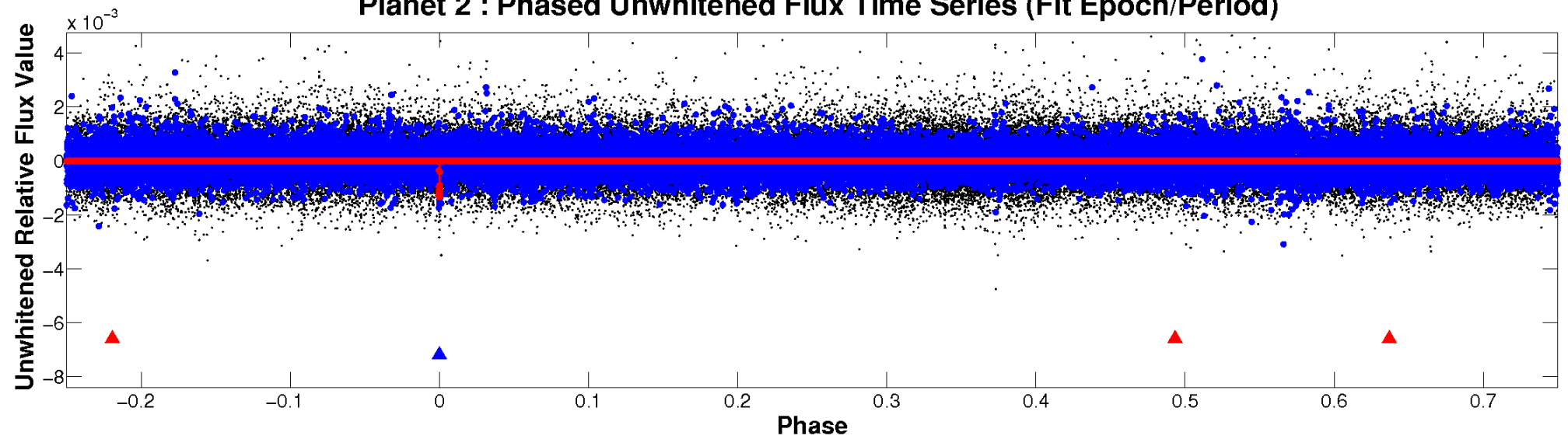
ALT Odd/Even

TCE 012556515-02

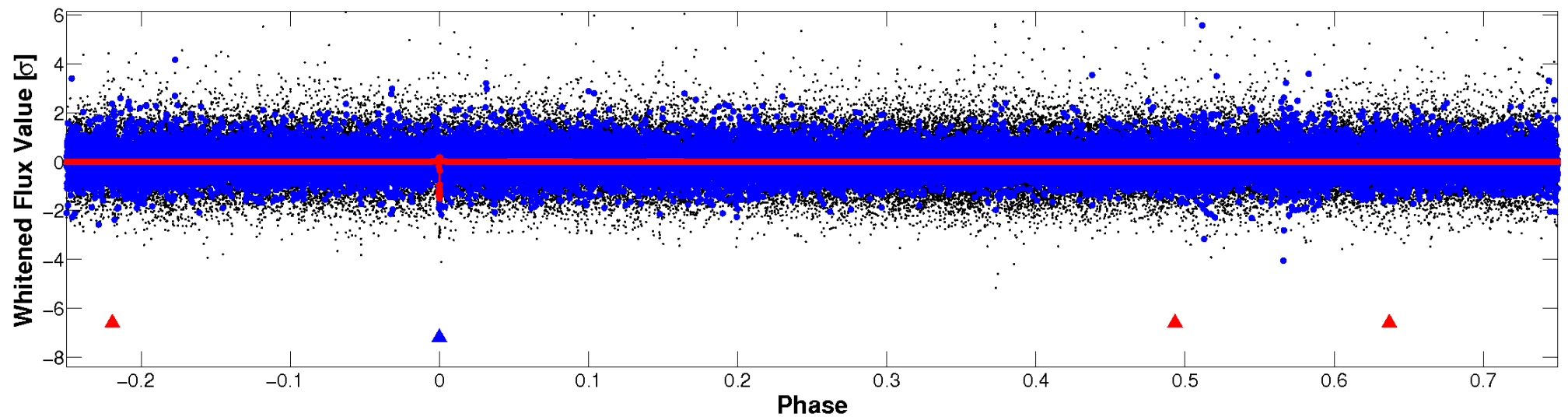


Non-Whitened Vs. Whitened Light Curve

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

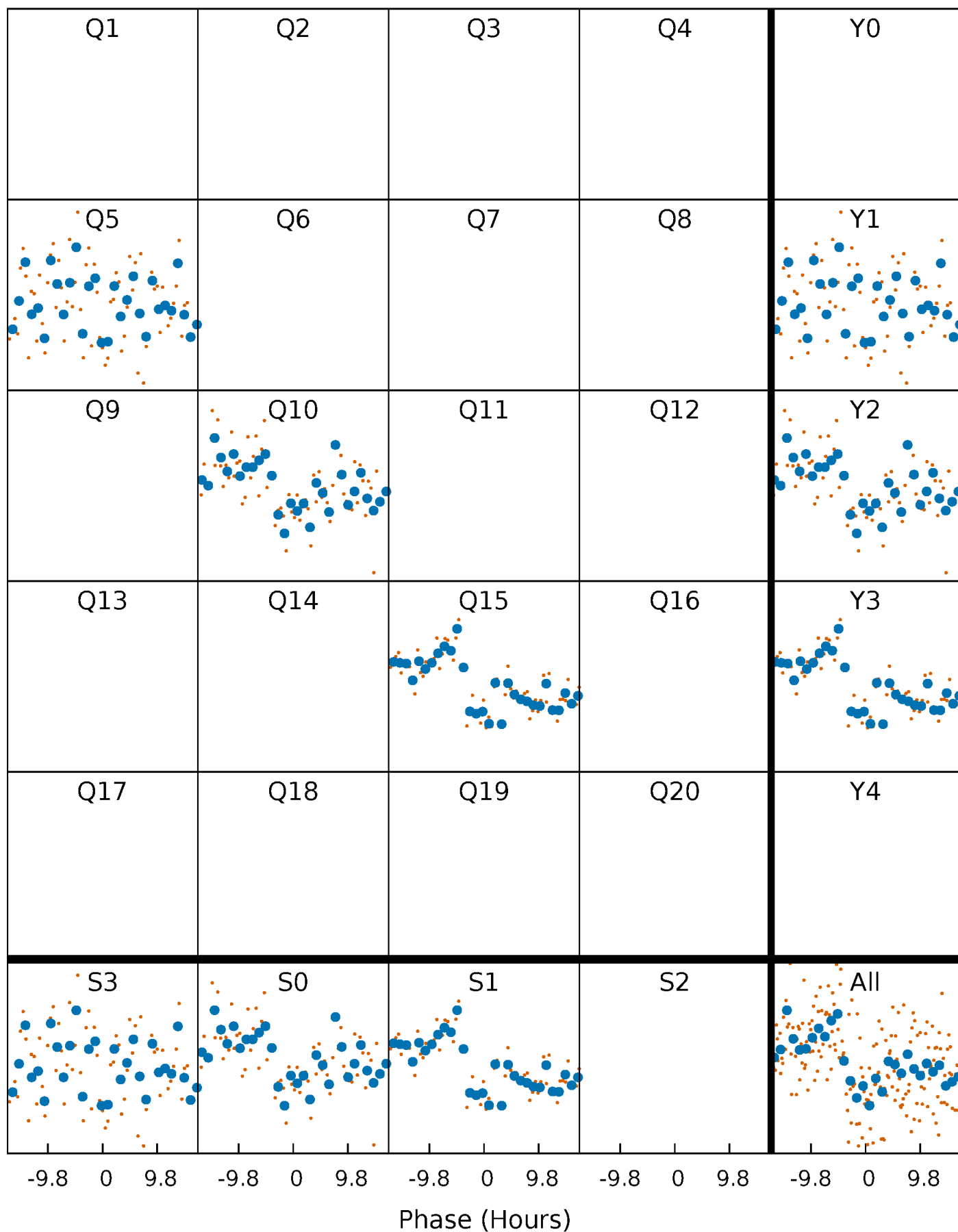


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



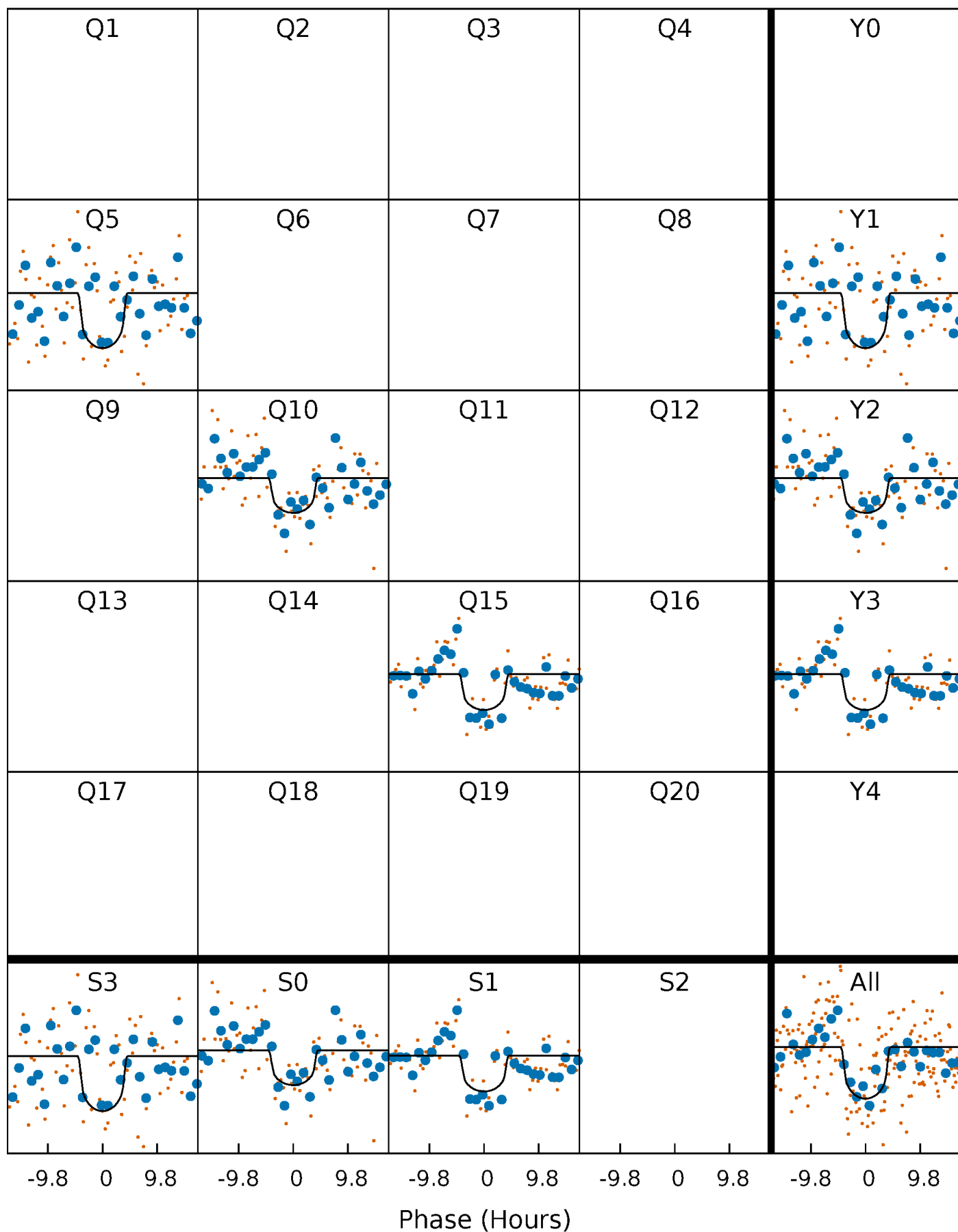
PDC Quarter-Phased Transit Curves

TCE 012556515-02 P=464.939186 Days $T_0=457.897140$ (BKJD)



DV Quarter-Phased Transit Curves

TCE 012556515-02 P=464.939186 Days $T_0=457.897140$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

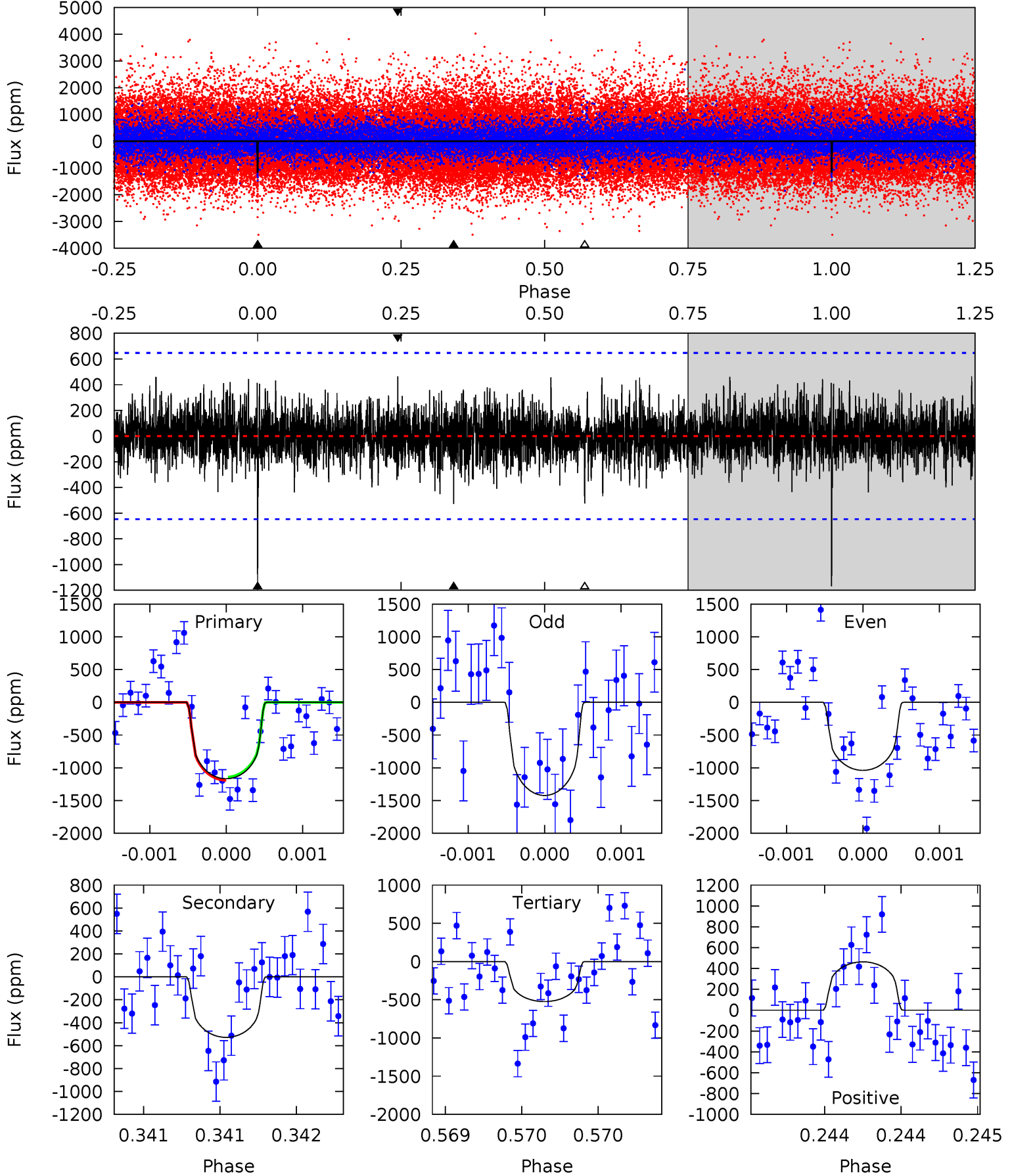
TCE 012556515-02 P=464.911168 Days $T_0=457.951660$ (BKJD)



DV Model-Shift Uniqueness Test

012556515-02, P = 464.939186 Days, E = 457.897140 Days

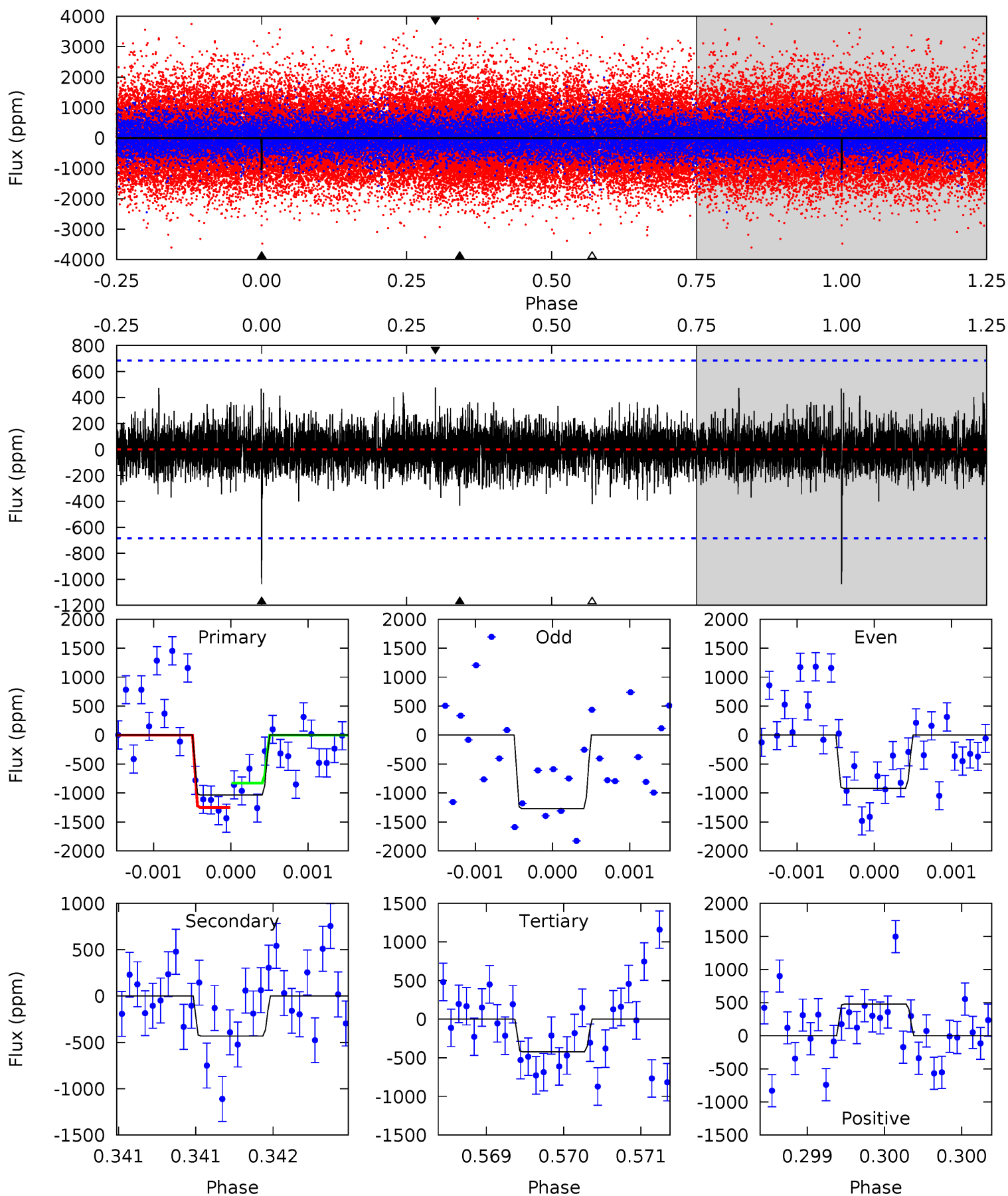
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.93	4.49	4.46	3.94	5.50	3.36	1.11	5.47	5.98	0.04	0.55	1.53	0.82	0.28	0.20



Alt Model-Shift Uniqueness Test

012556515-02, P = 464.911168 Days, E = 457.951660 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.36	3.48	3.40	3.84	5.52	3.40	0.89	4.97	4.52	0.09	-0.36	1.35	0.82	0.31	1.70



Stellar Parameters For KIC 012556515

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4858^{+145}_{-130}	$4.610^{+0.028}_{-0.052}$	$-0.020^{+0.250}_{-0.300}$	$0.720^{+0.072}_{-0.053}$	$0.771^{+0.061}_{-0.068}$	$2.910^{+0.462}_{-0.578}$
	+3%/-3%	+1%/-1%	+1250%/-1500%	+10%/-7%	+8%/-9%	+16%/-20%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 012556515-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-528 ± 118	$2.98^{+1.63}_{-1.73}$	246^{+9}_{-8}	4042^{+1663}_{-596}	$38294^{+171500}_{-23203}$
Alt.	-432 ± 124	$2.84^{+1.75}_{-1.64}$	246^{+8}_{-7}	3935^{+1642}_{-600}	$32916^{+154533}_{-20817}$

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 $A_{obs} \gg 1.0$

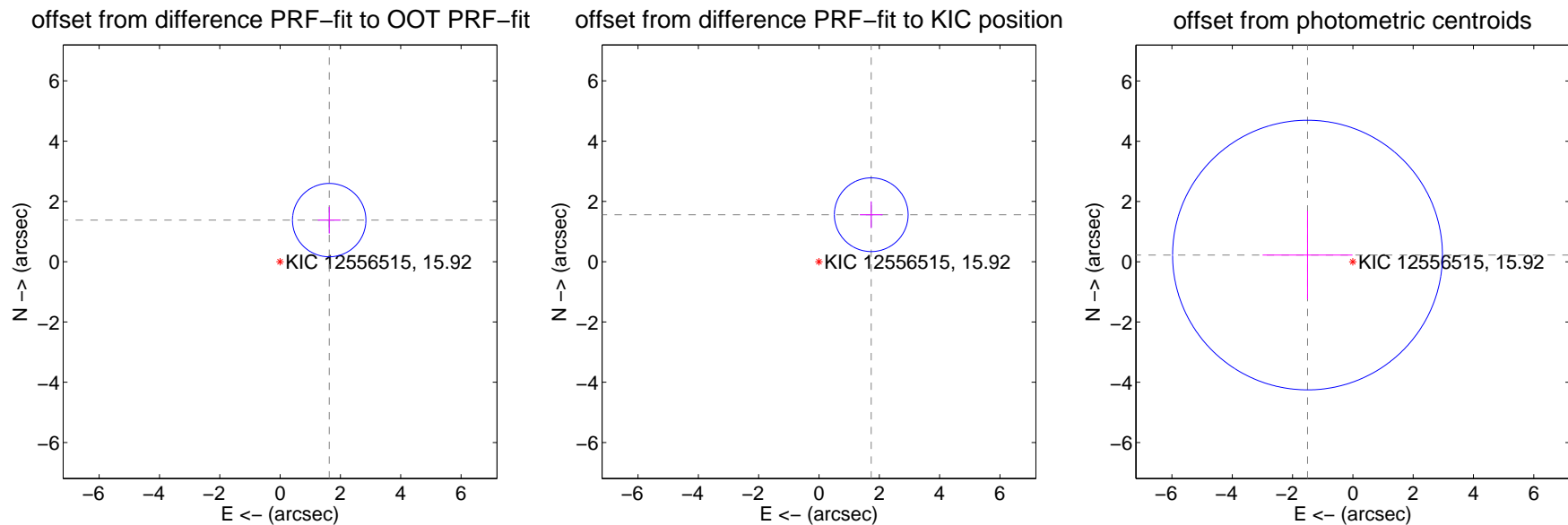
DV Centroid Data

Supplemental centroid analysis for 012556515-02. Kepler magnitude: 15.92. Transit SNR 8.66

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.134 \pm 0.406	5.26	-1.628 \pm 0.378	1.380 \pm 0.442
PRF-fit source offset from KIC position	2.331 \pm 0.408	5.72	-1.733 \pm 0.378	1.559 \pm 0.442
photometric centroid source offset	1.52 \pm 1.49	1.02	1.50 \pm 1.49	0.22 \pm 1.47

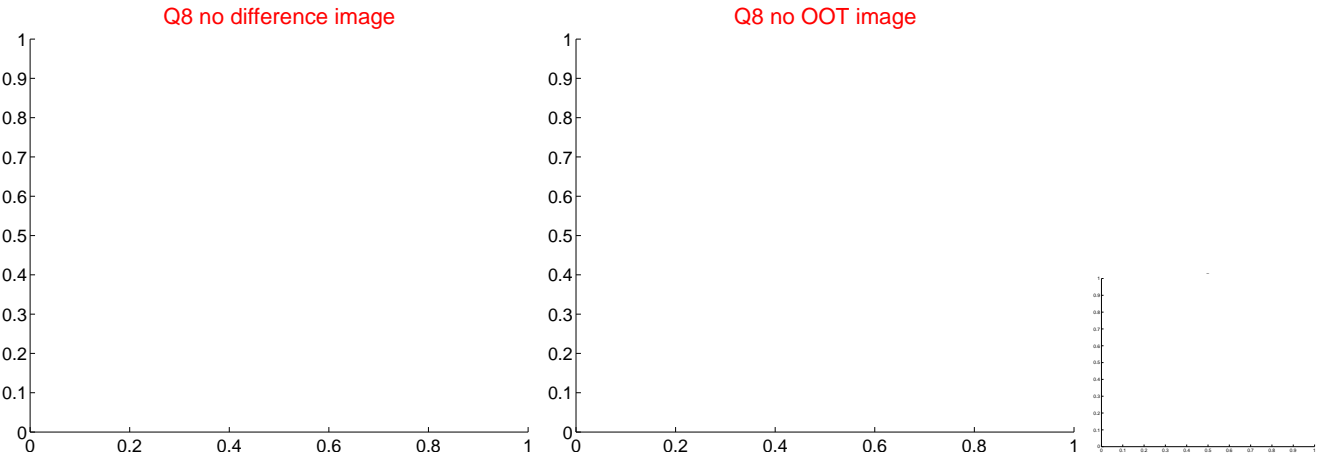
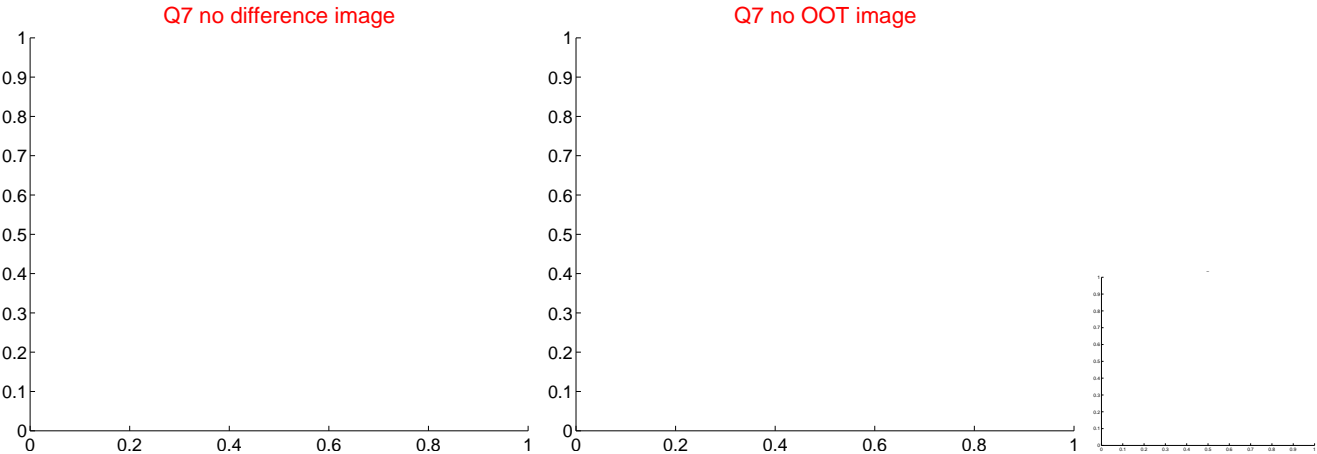
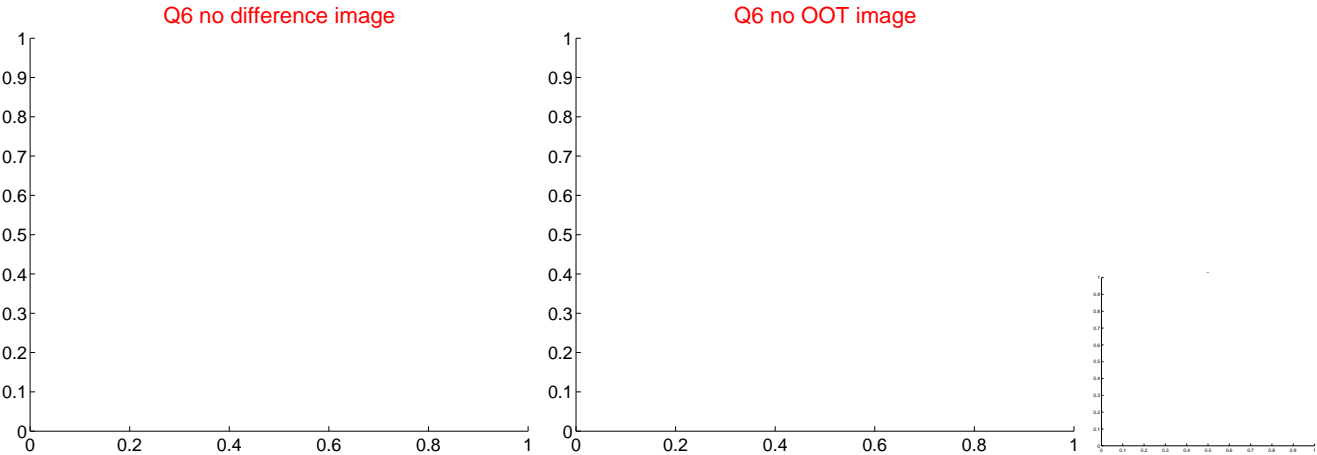
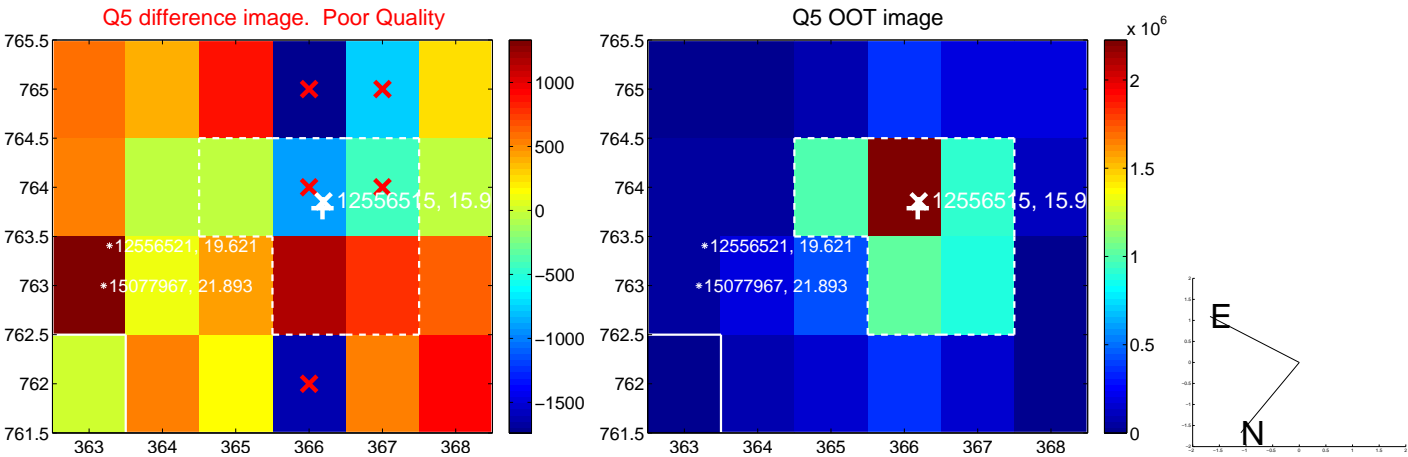


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

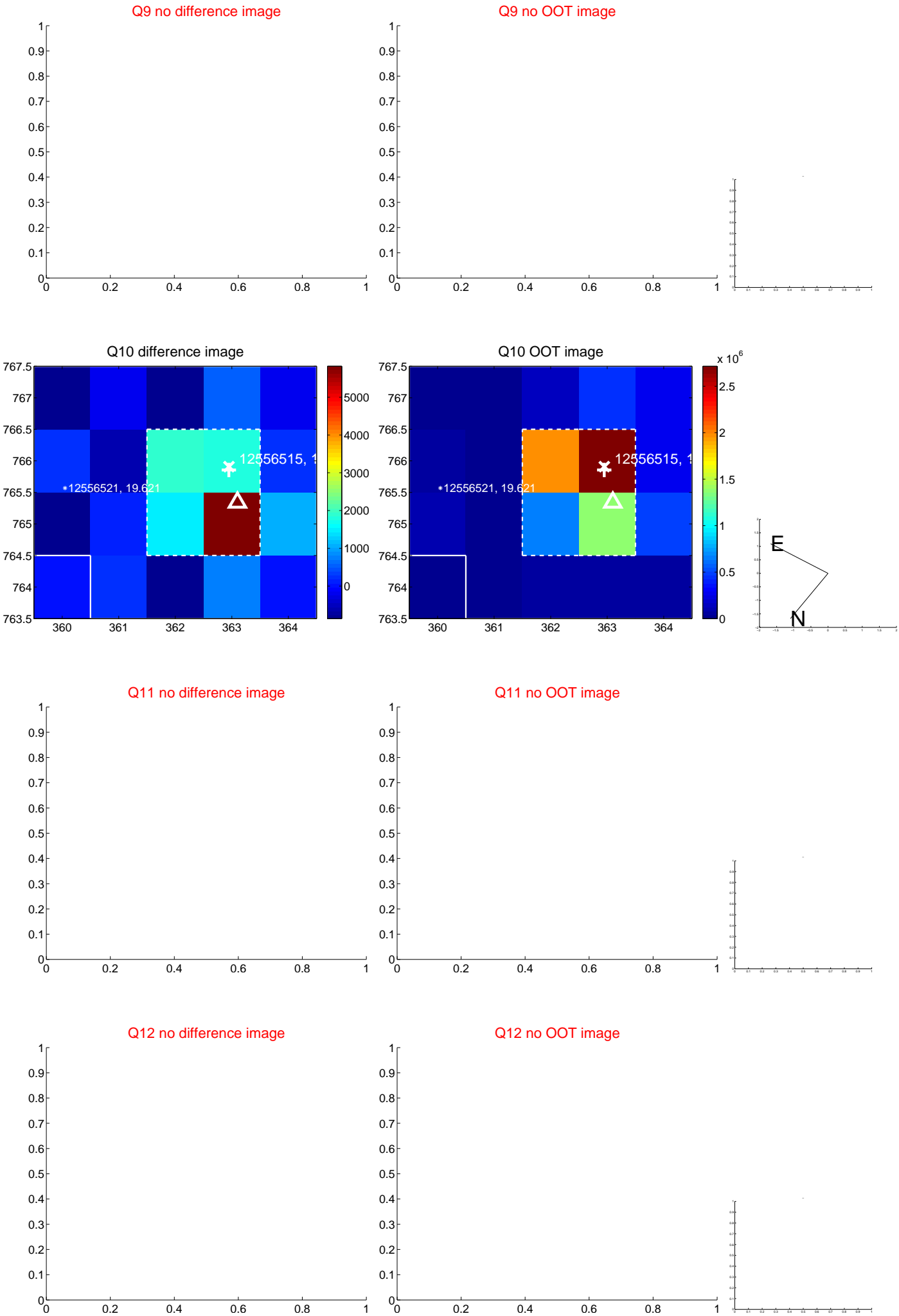
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



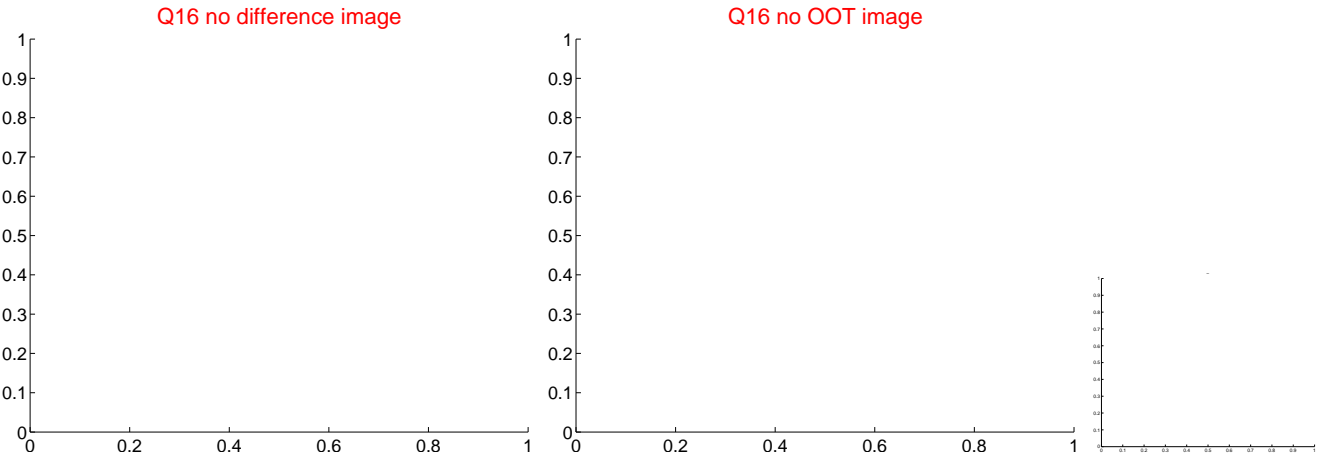
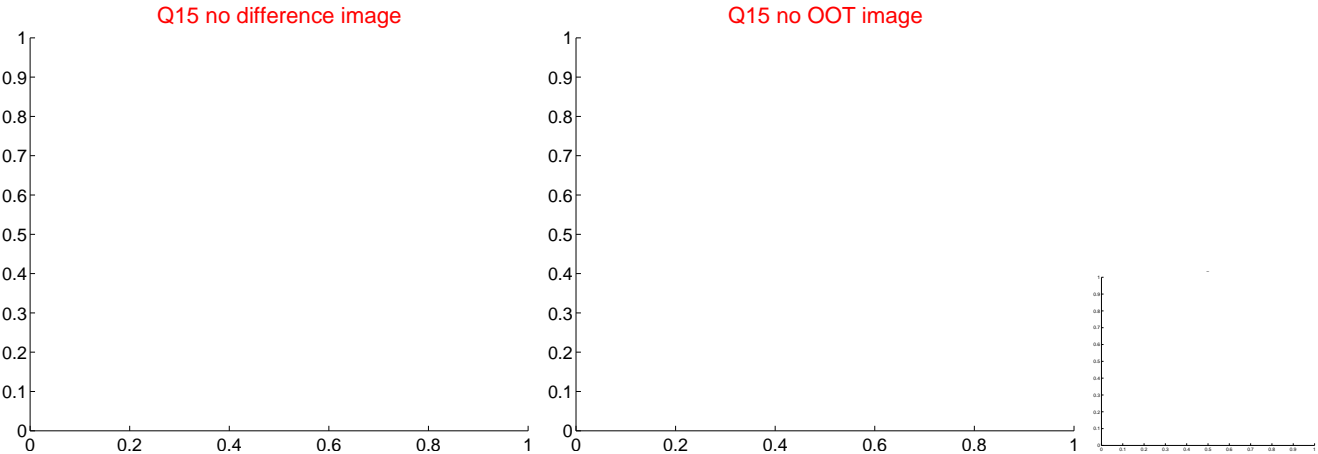
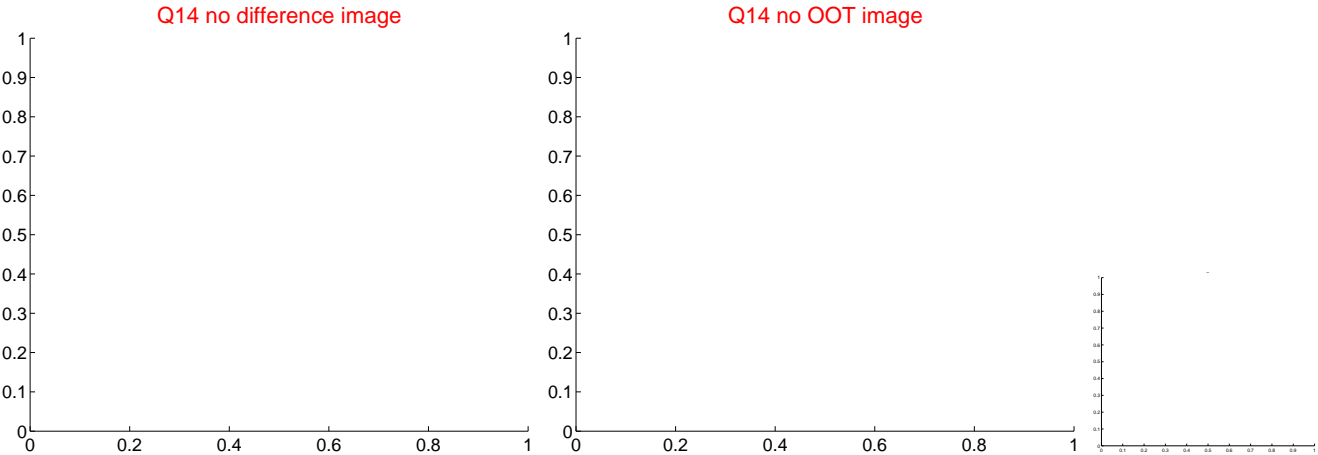
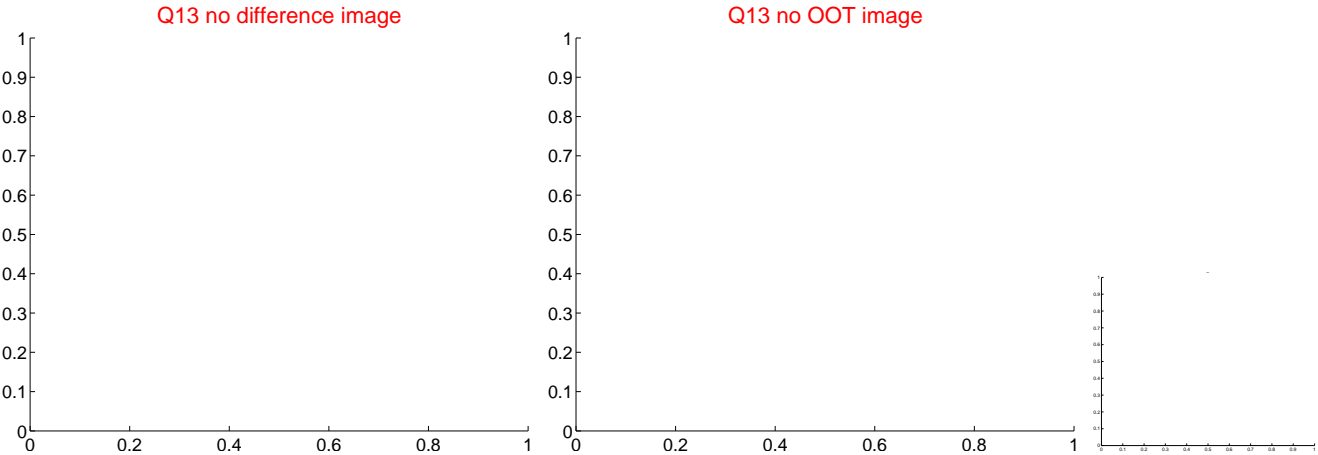
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



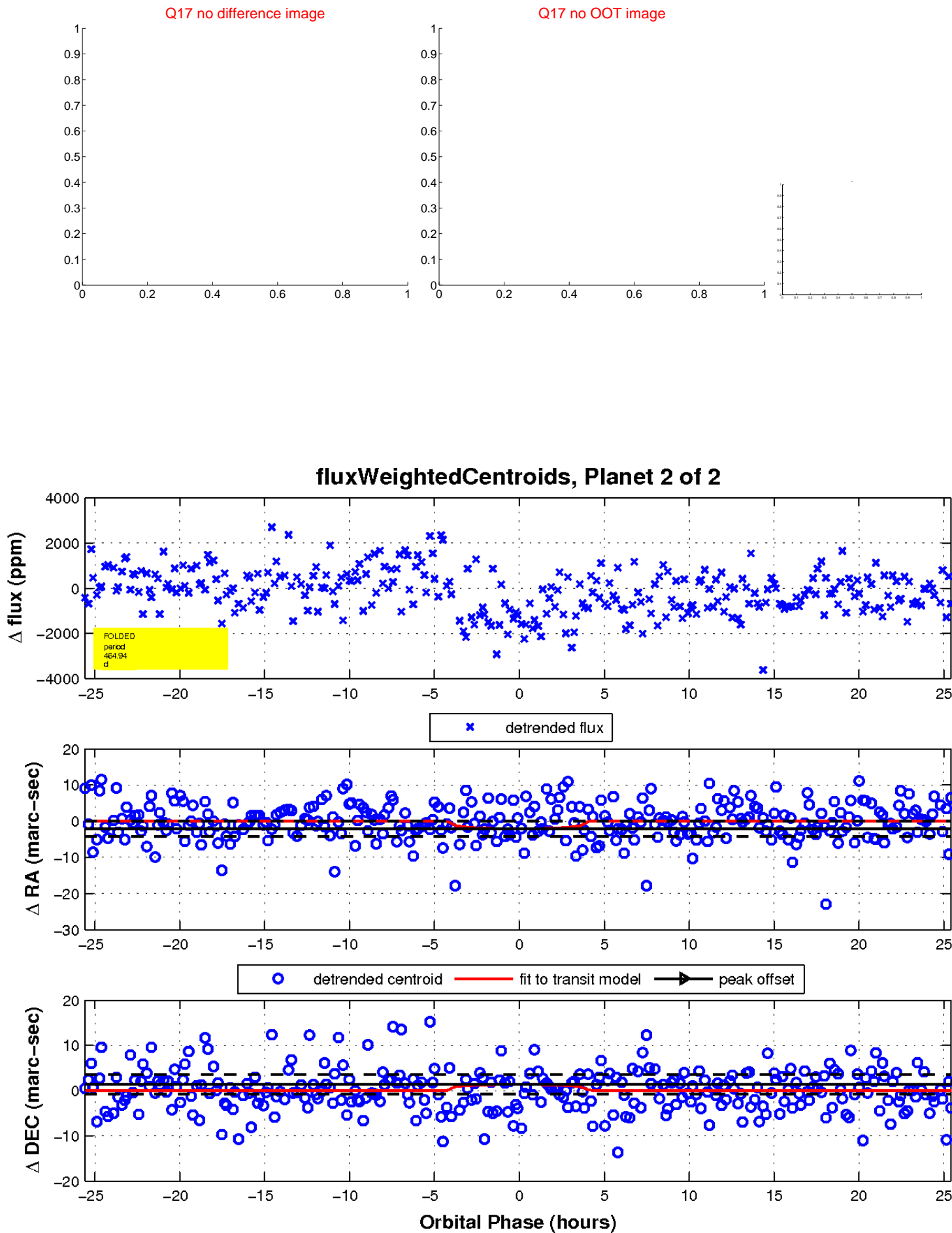
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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



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



UKIRT Image

Declination

