

KIC 012405425

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})
012405425-01	OBS	No	357.105337	373.799043	114.2	18.936	8.4	8.7	1.19	6329	1.38	2.15
012405425-02	OBS	No	505.370768	551.909975	161.9	5.163	9.4	8.5	1.19	6329	1.69	1.35

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012405425-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_SATURATED
012405425-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED

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

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

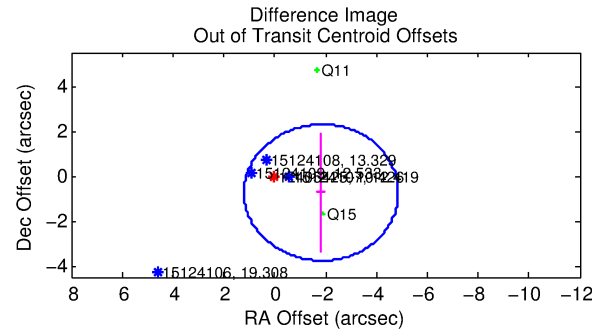
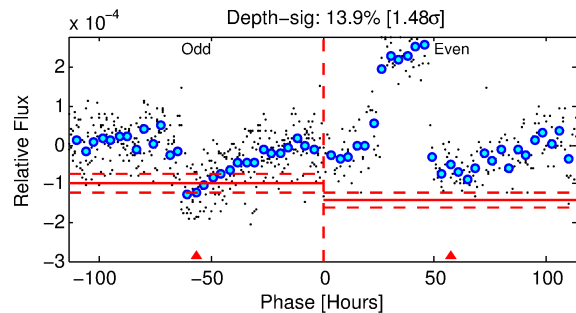
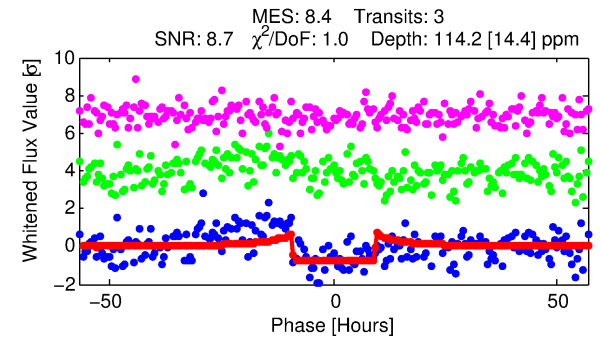
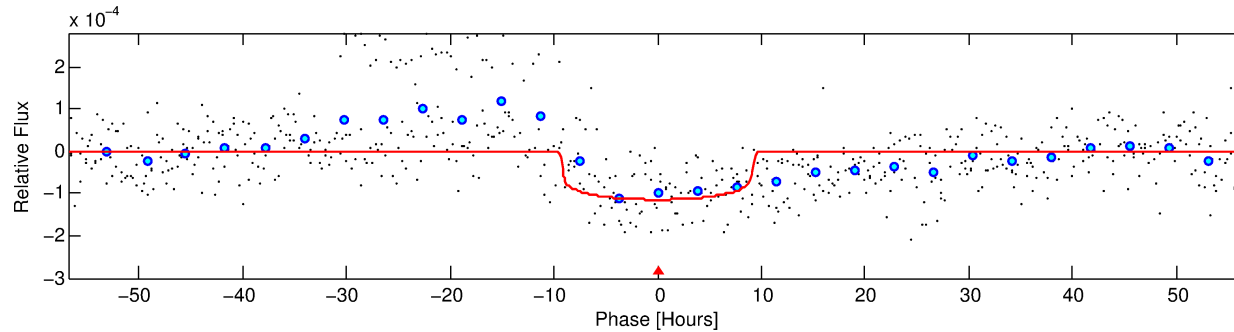
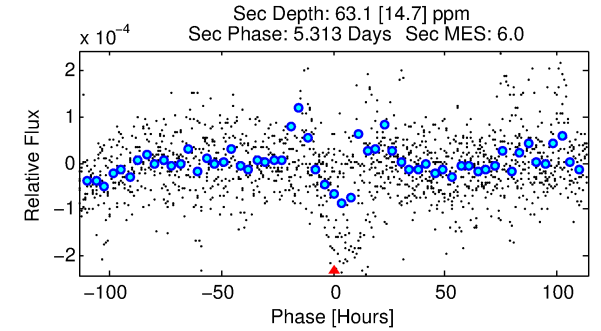
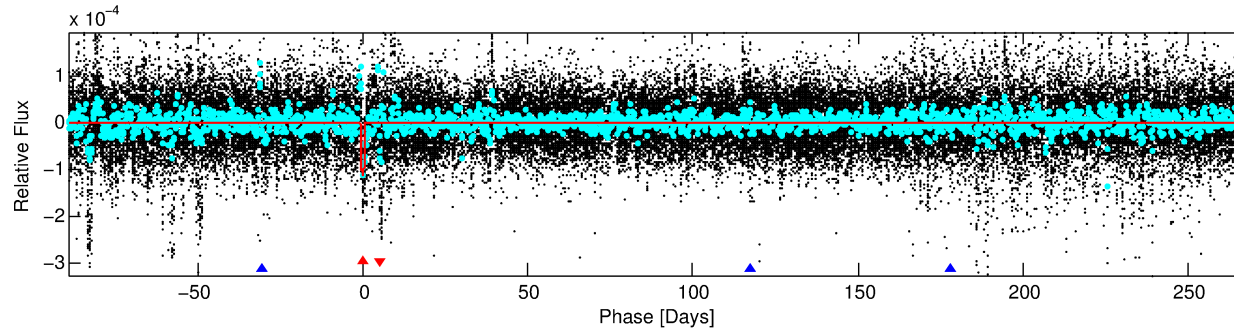
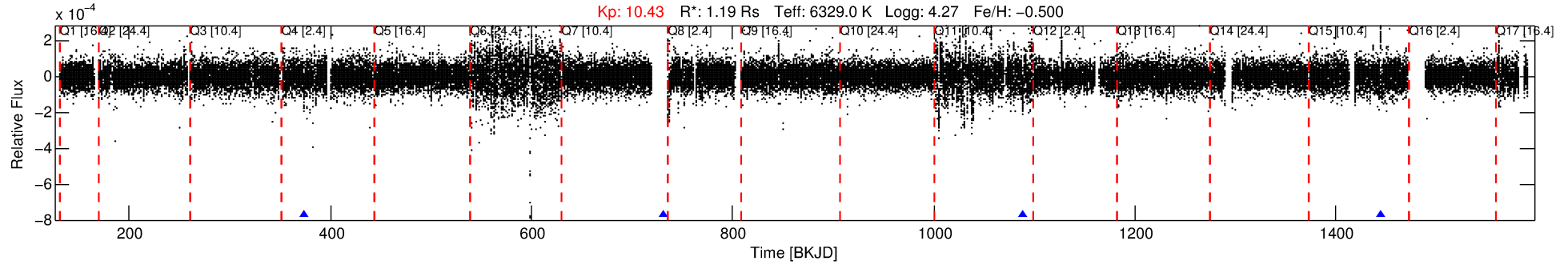
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012405425-01

No Significant Match Found

DV One-Page Summary

KIC: 12405425 Candidate: 1 of 2 Period: 357.105 d



DV Fit Results:

Period = 357.10534 [0.00616] d
Epoch = 373.7990 [0.0130] BKJD
Rp/R* = 0.0106 [0.0015]
a/R* = 96.97 [64.86]
b = 0.75 [0.38]
Seff = 2.15 [0.65]
Teq = 309 [23] K
Rp = 1.38 [0.34] Re
a = 0.9717 [0.1772] AU
Ag = 17268.36 [7970.71] [2.17σ]
Teffp = 5470 [524] K [9.85σ]

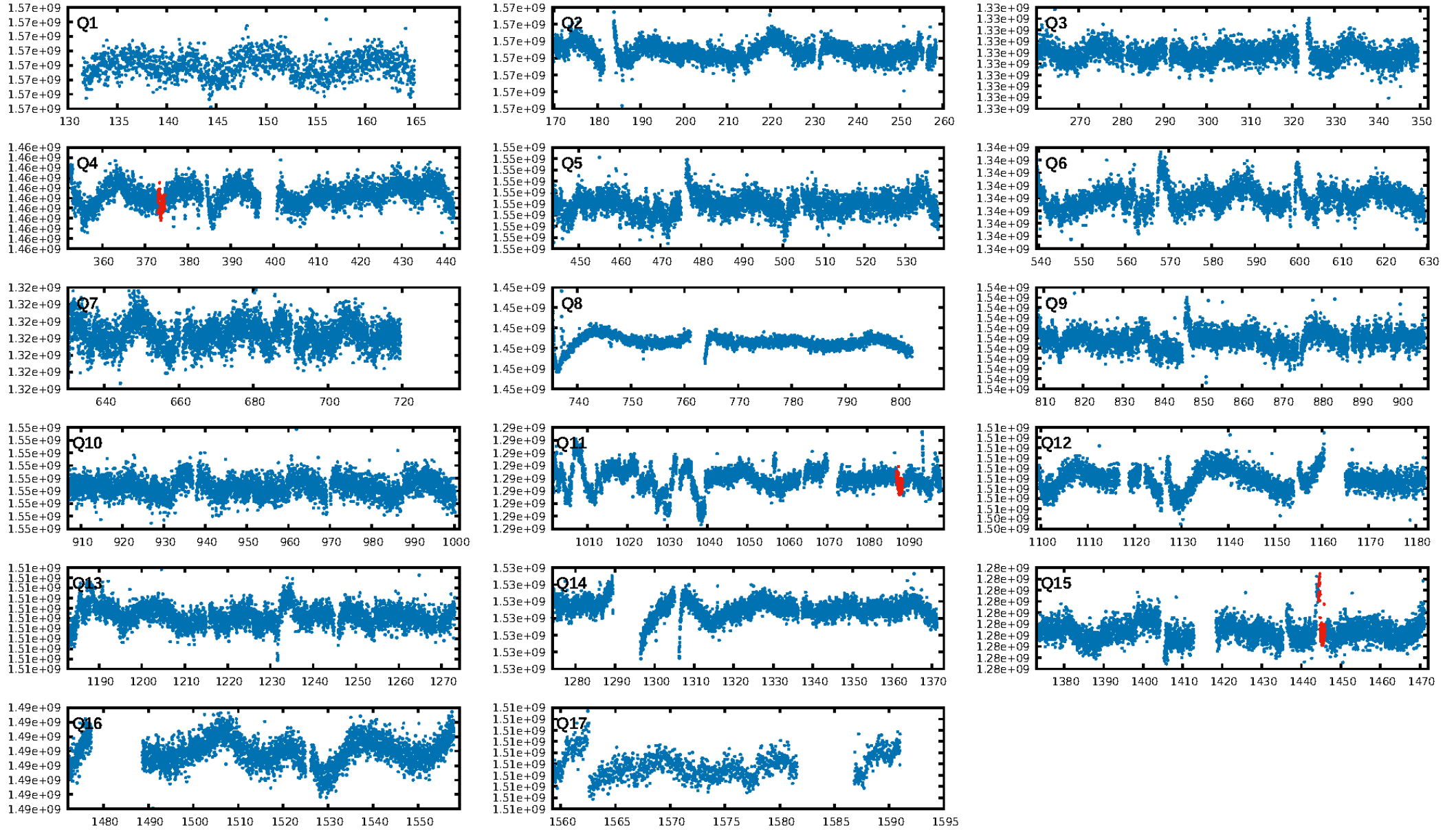
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [181.30σ]
ModelChiSquare2-sig: 89.0%
ModelChiSquareGof-sig: 99.5%
Bootstrap-pfa: 2.10e-12
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: N/A
Centroid-sig: 92.5%
Centroid-so: 0.674 arcsec [0.30σ]
OotOffset-rm: 1.980 arcsec [1.96σ]
KicOffset-rm: 2.074 arcsec [1.70σ]
OotOffset-st: 0/2/0/0 [2]
KicOffset-st: 0/2/0/0 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [2/2]

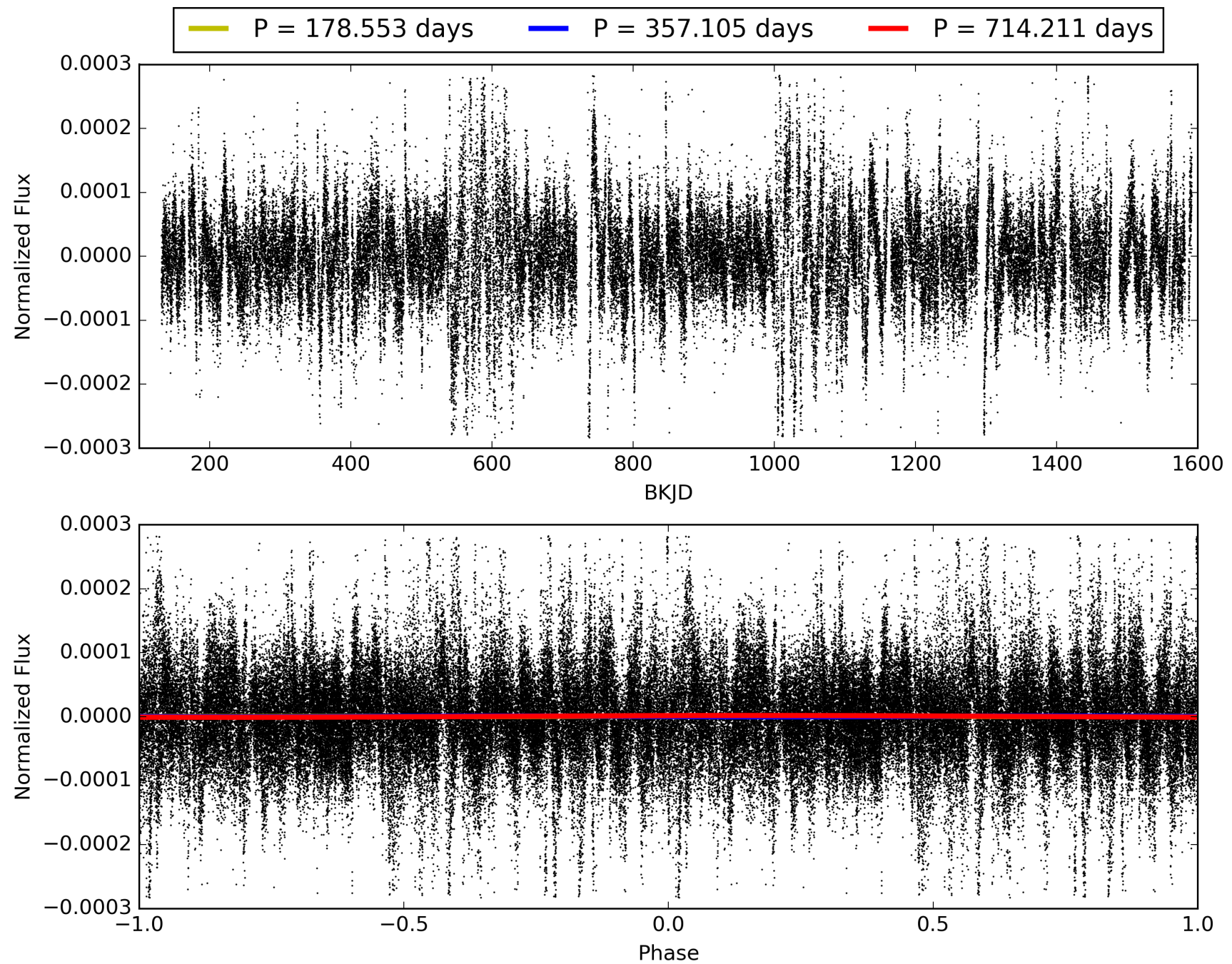
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 02:45:21 Z

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

TCE 012405425-01, PDC Light Curves

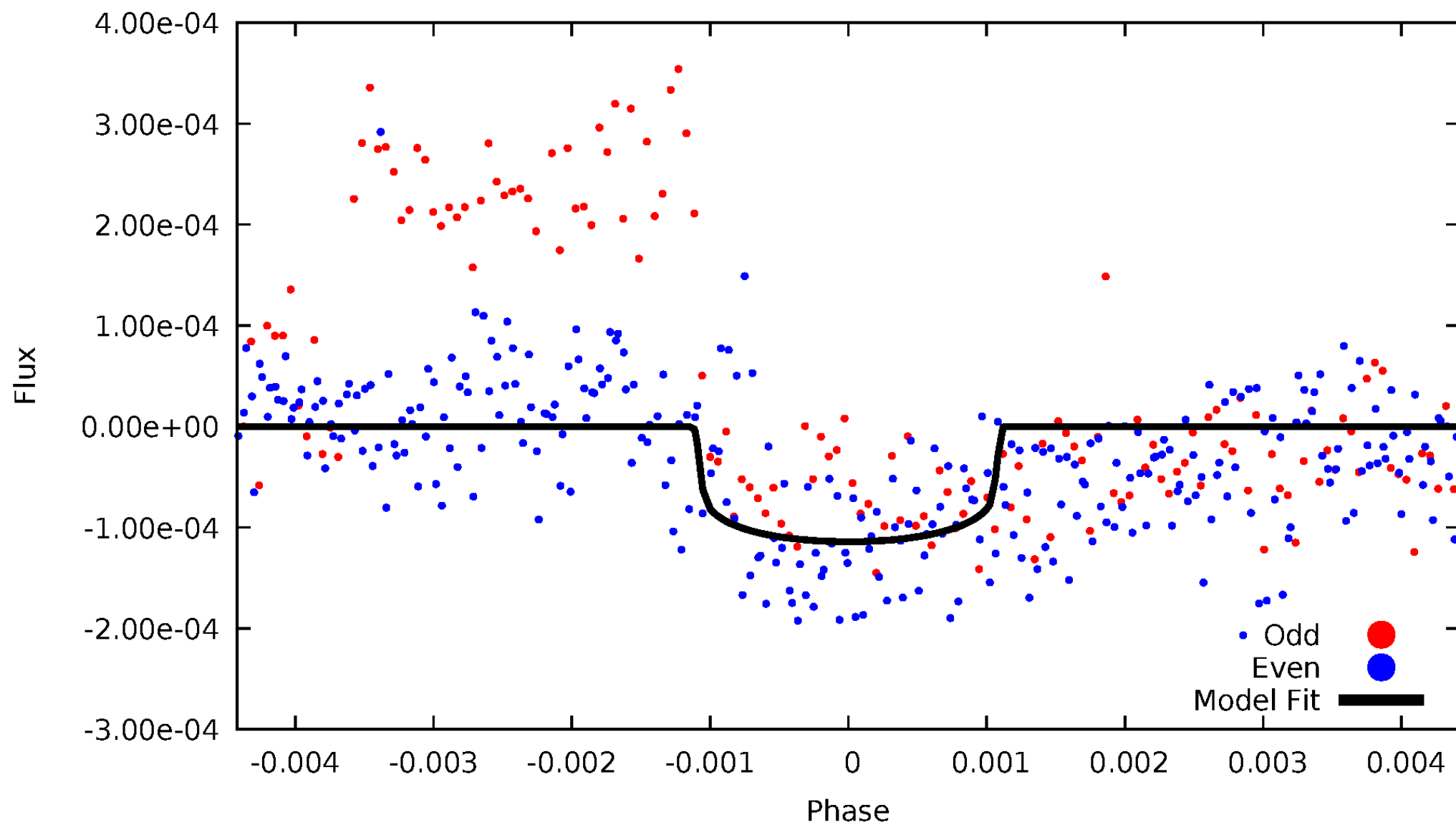


TCE 012405425-01



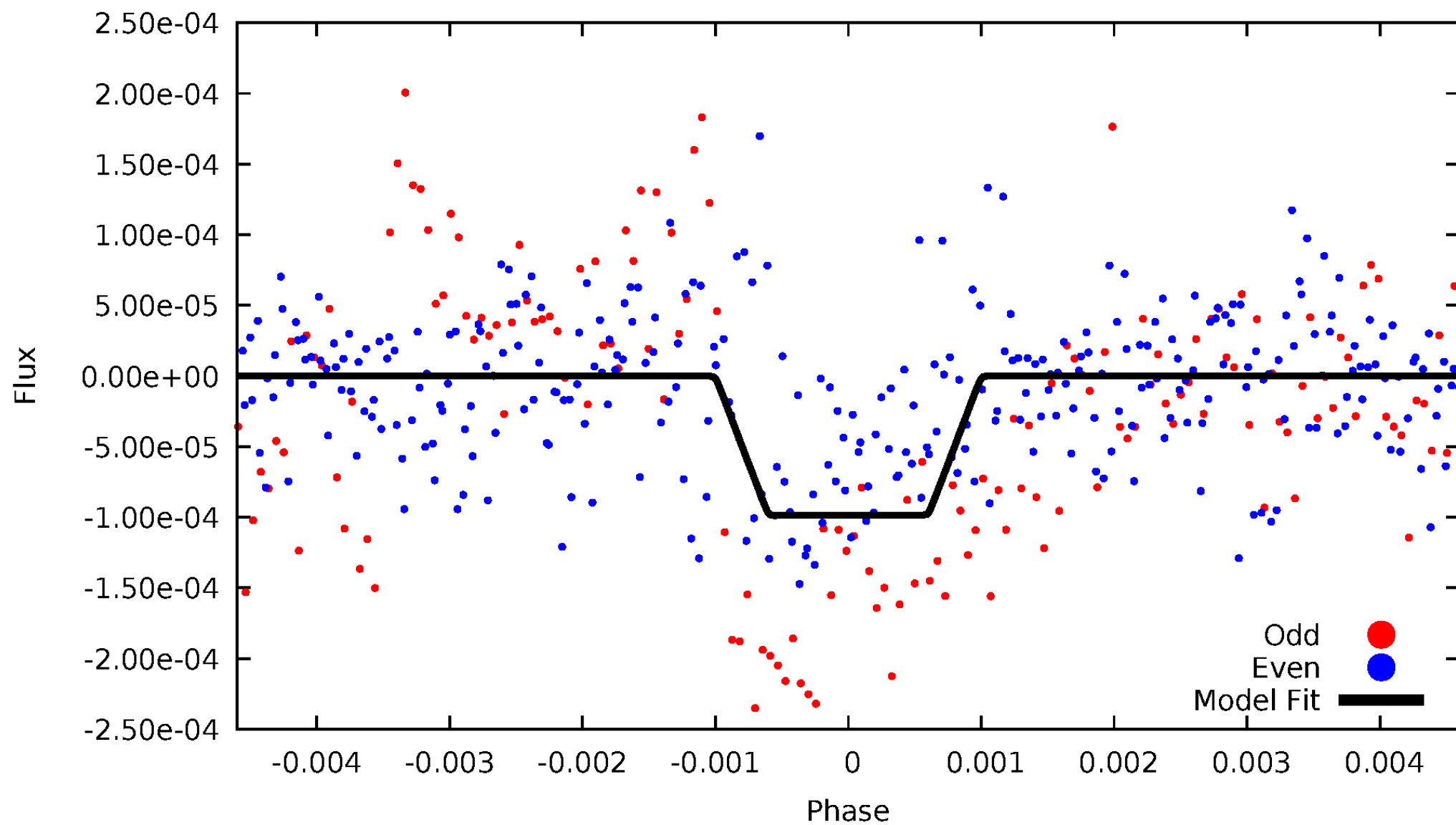
DV Odd/Even

TCE 012405425-01

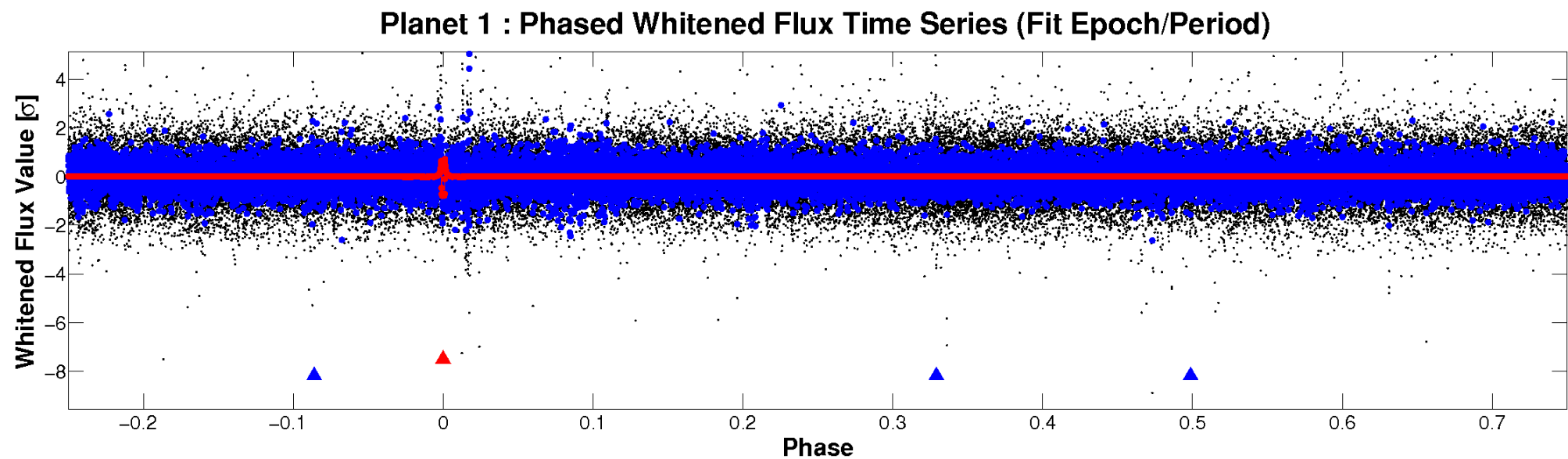
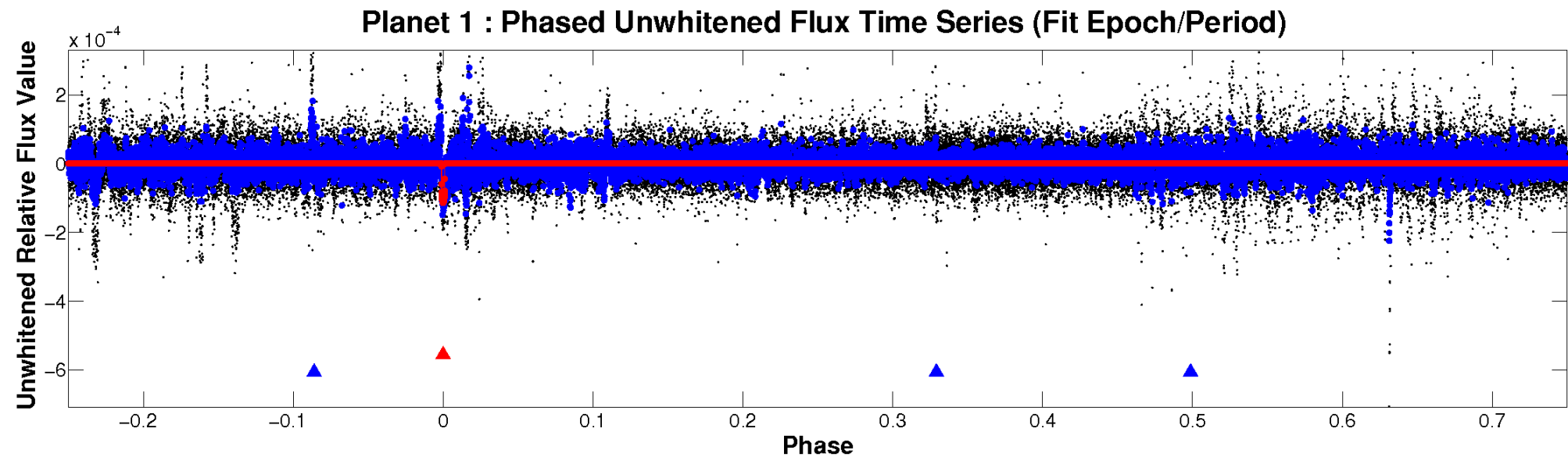


ALT Odd/Even

TCE 012405425-01

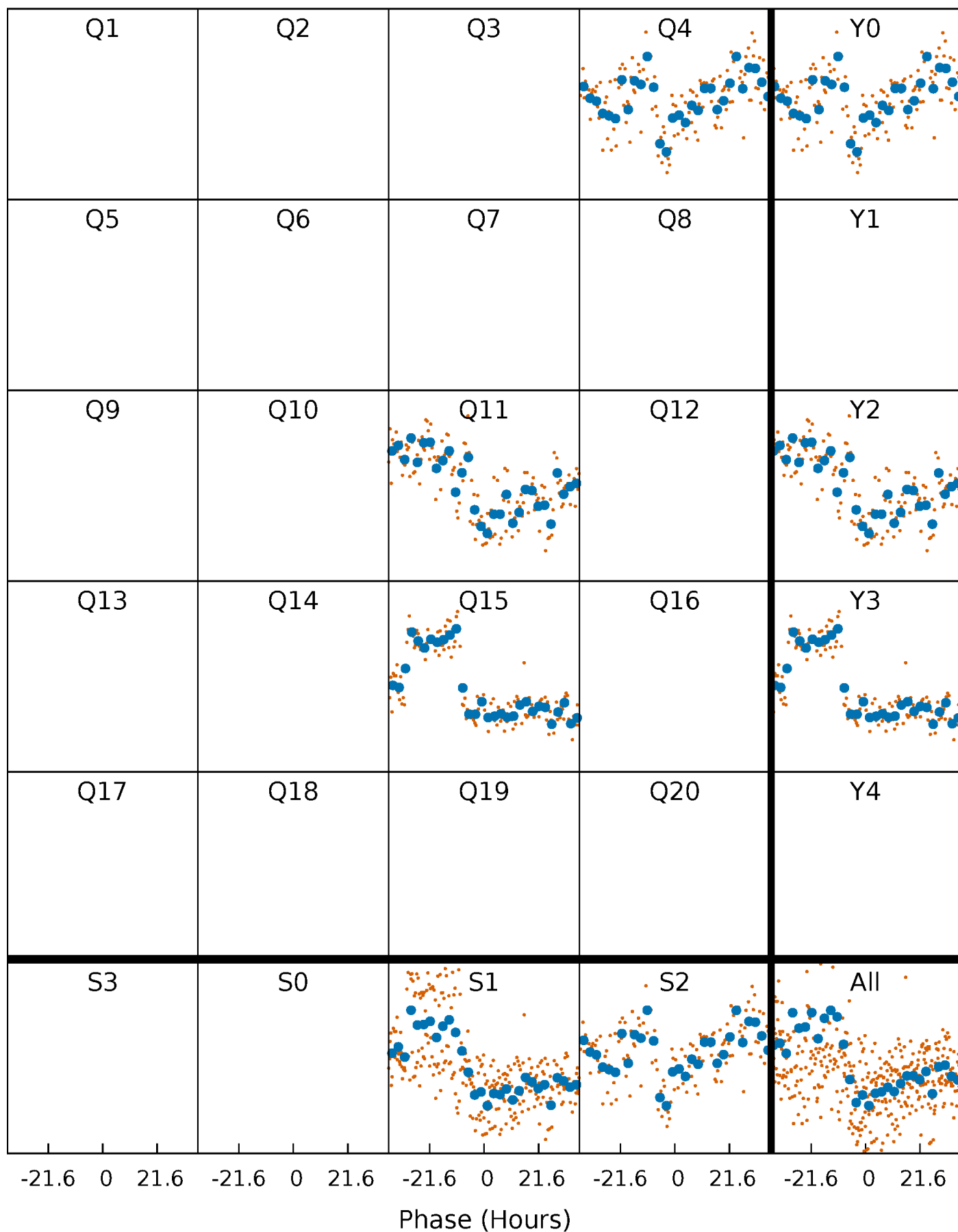


Non-Whitened Vs. Whitened Light Curve



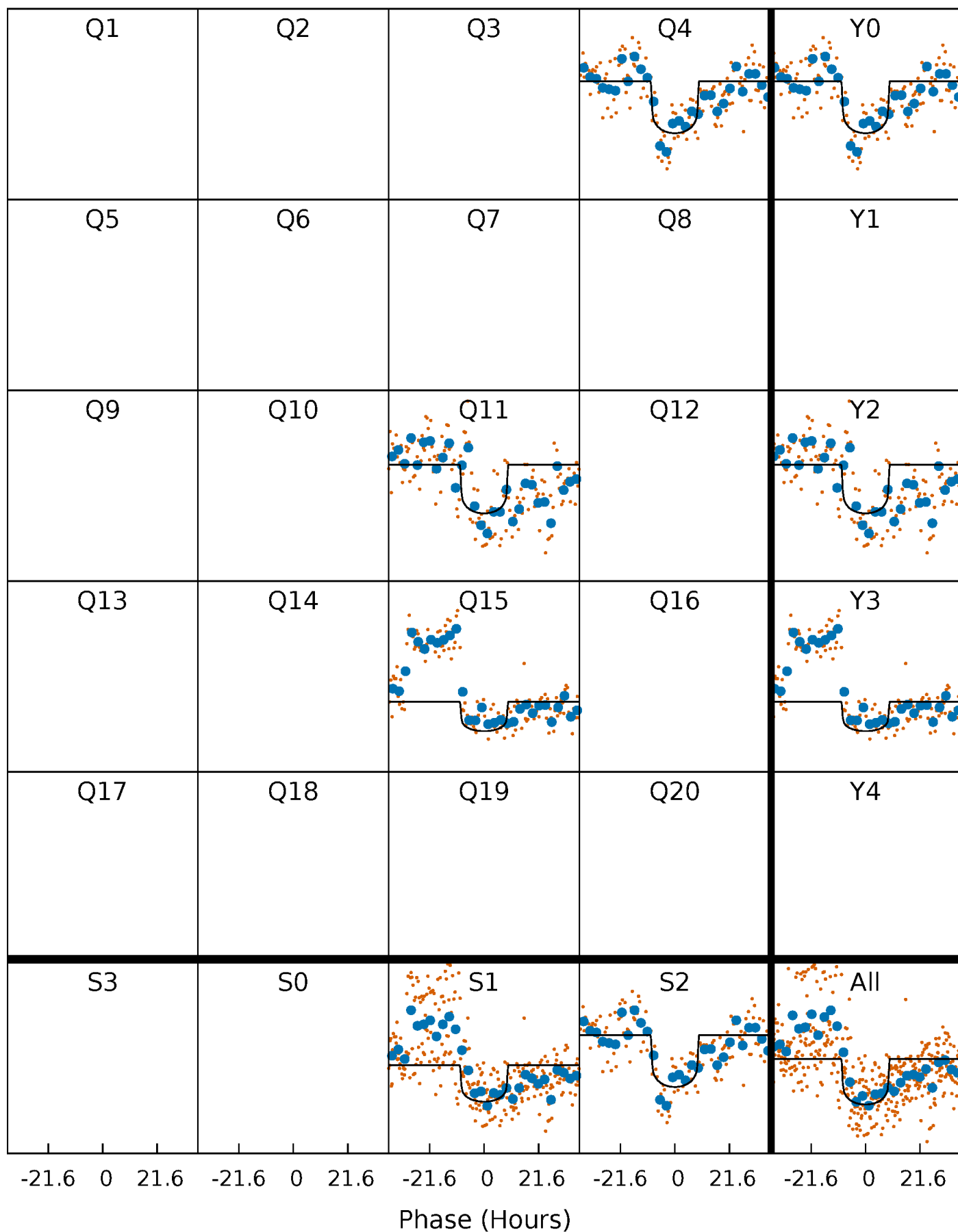
PDC Quarter-Phased Transit Curves

TCE 012405425-01 P=357.105337 Days $T_0=373.799043$ (BKJD)



DV Quarter-Phased Transit Curves

TCE 012405425-01 P=357.105337 Days $T_0=373.799043$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

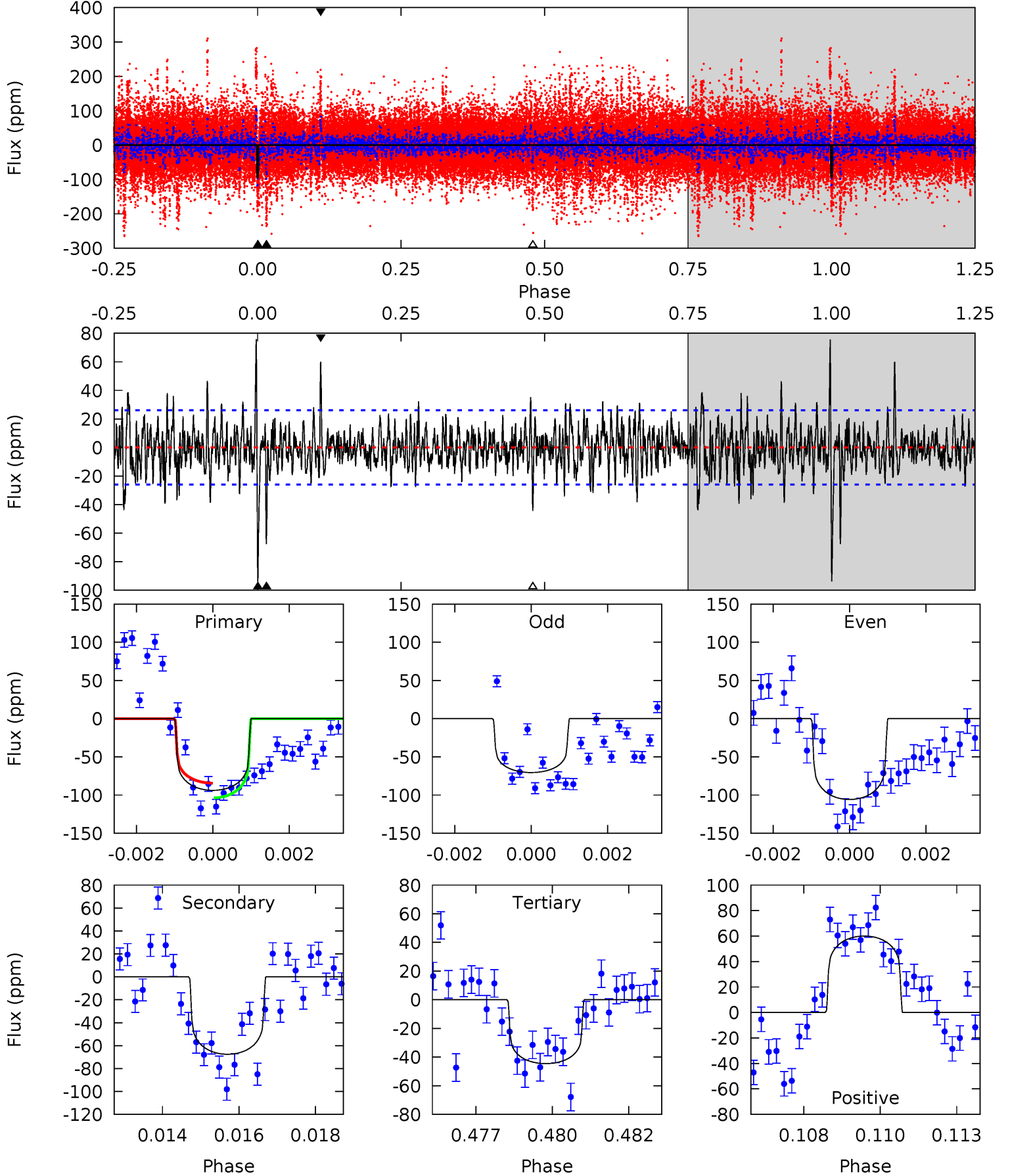
TCE 012405425-01 P=357.090083 Days $T_0=373.799758$ (BKJD)



DV Model-Shift Uniqueness Test

012405425-01, $P = 357.105337$ Days, $E = 16.693706$ Days

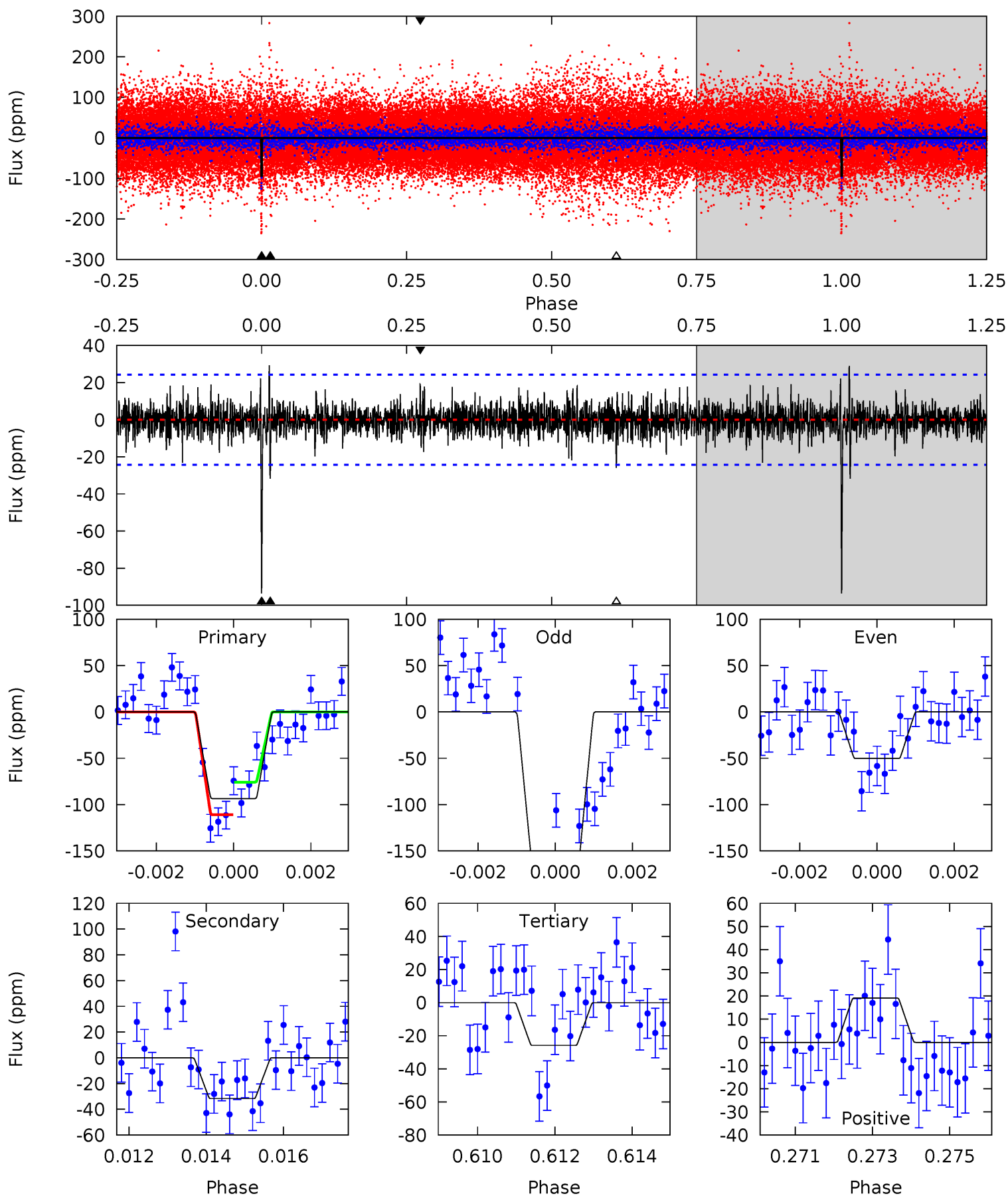
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.1	13.8	9.08	12.2	5.31	3.05	2.46	10.0	6.89	4.69	1.53	3.27	0.96	0.45	1.97



Alt Model-Shift Uniqueness Test

012405425-01, P = 357.090083 Days, E = 16.709675 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.5	6.94	5.67	4.20	5.32	3.09	1.23	14.8	16.3	1.27	2.74	12.3	1.23	0.24	3.85



Stellar Parameters For KIC 012405425

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6329^{+158}_{-174}	$4.271^{+0.160}_{-0.131}$	$-0.500^{+0.300}_{-0.300}$	$1.187^{+0.240}_{-0.216}$	$0.960^{+0.134}_{-0.097}$	$0.808^{+0.633}_{-0.304}$
	+2%/-3%	+4%/-3%	+60%/-60%	+20%/-18%	+14%/-10%	+78%/-38%
Source	PHO1	FLK73	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 012405425-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-68 ± 5	$1.35^{+0.28}_{-0.24}$	430^{+26}_{-25}	5588^{+489}_{-337}	19171^{+9167}_{-5805}
Alt.	-32 ± 5	$1.27^{+0.26}_{-0.23}$	429^{+23}_{-24}	4890^{+384}_{-338}	10375^{+4965}_{-3247}

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

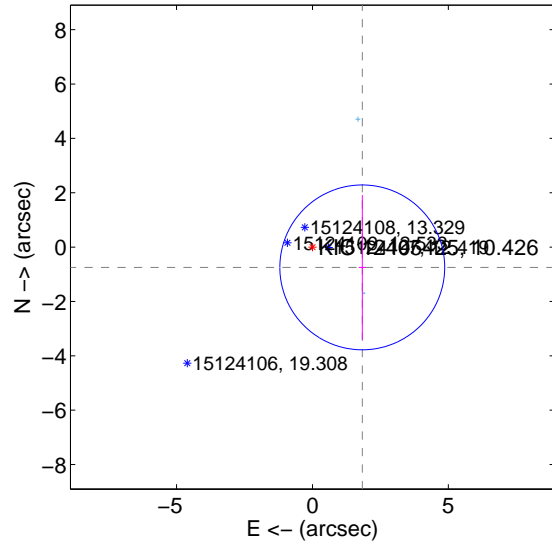
Supplemental centroid analysis for 012405425-01. **Kepler magnitude: 10.43.** Transit SNR 8.73

There are 2 quarters with good PRF difference image offsets

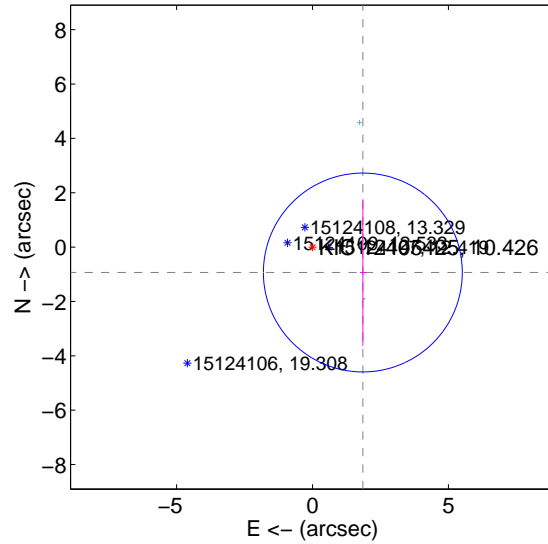
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.980 ± 1.011	1.96	-1.834 ± 0.132	-0.746 ± 2.662
PRF-fit source offset from KIC position	2.074 ± 1.220	1.70	-1.851 ± 0.111	-0.935 ± 2.696
photometric centroid source offset	0.67 ± 2.25	0.30	-0.38 ± 1.50	0.56 ± 2.52

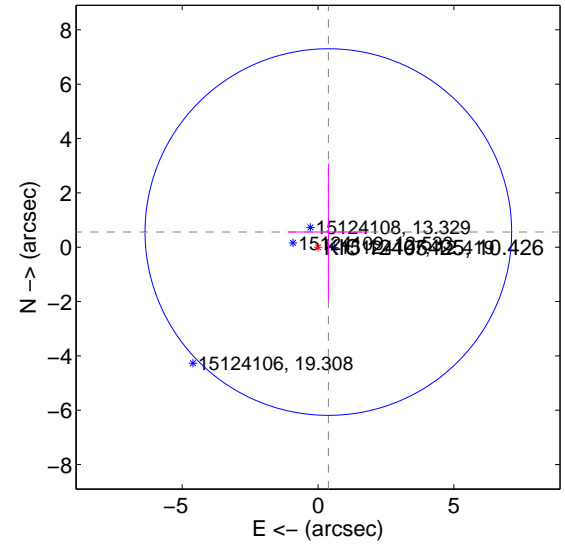
offset from difference PRF-fit to OOT PRF-fit



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.

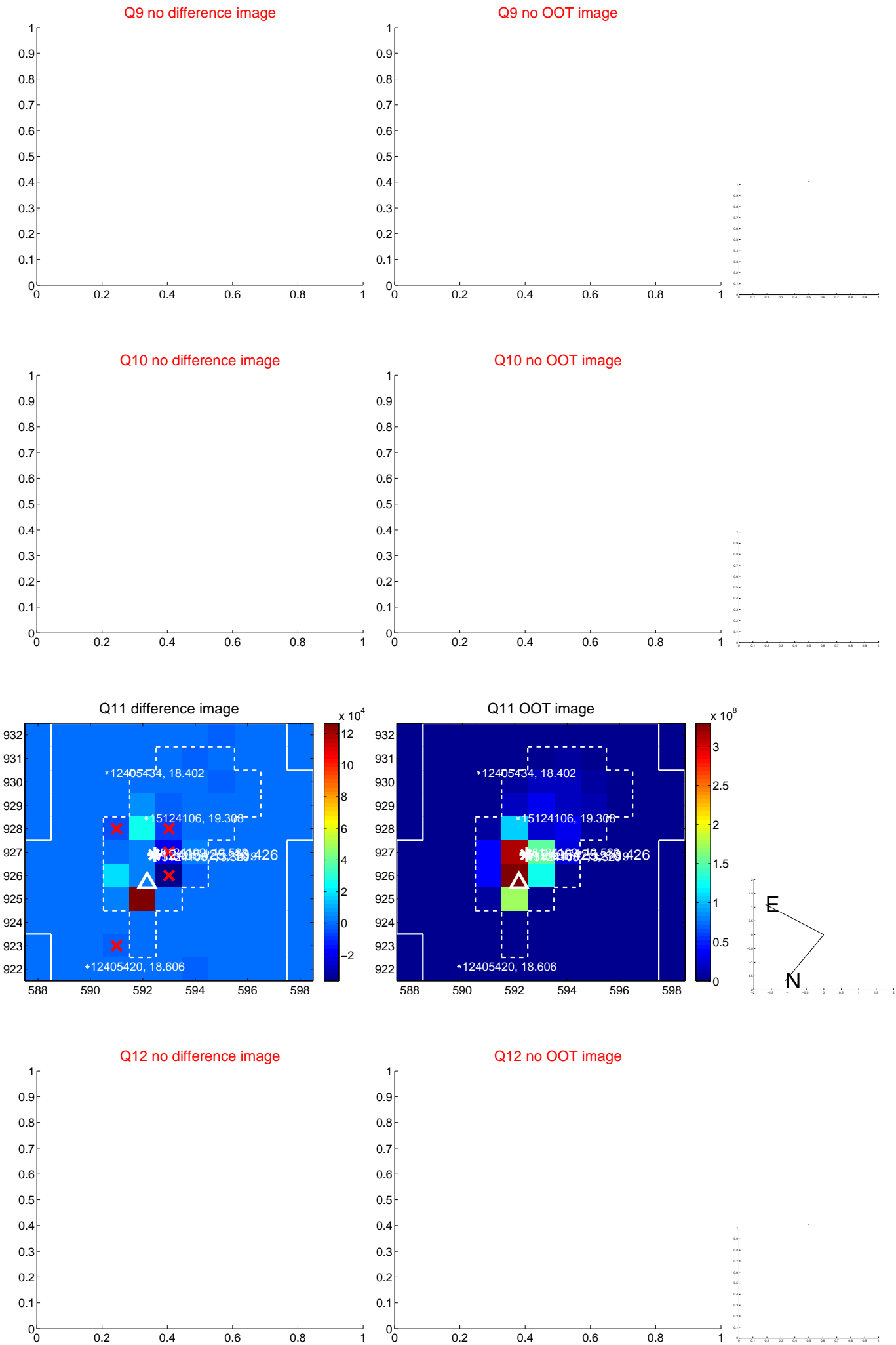
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



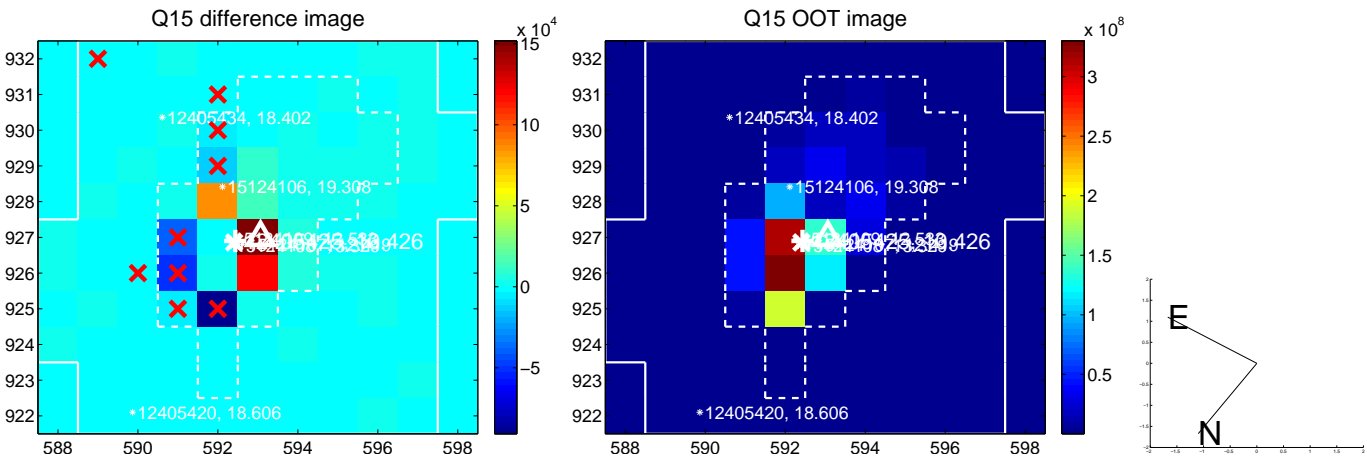
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



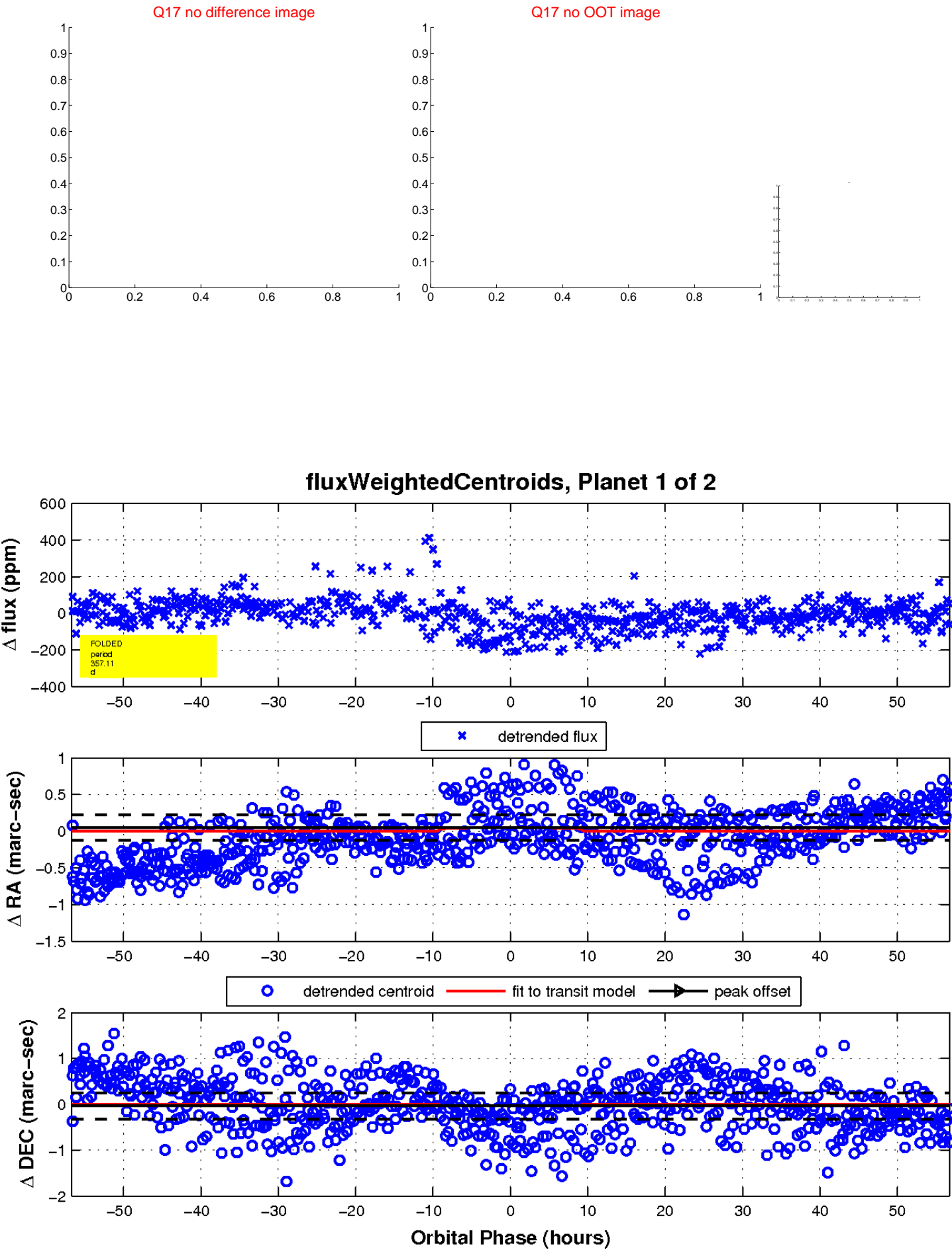
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



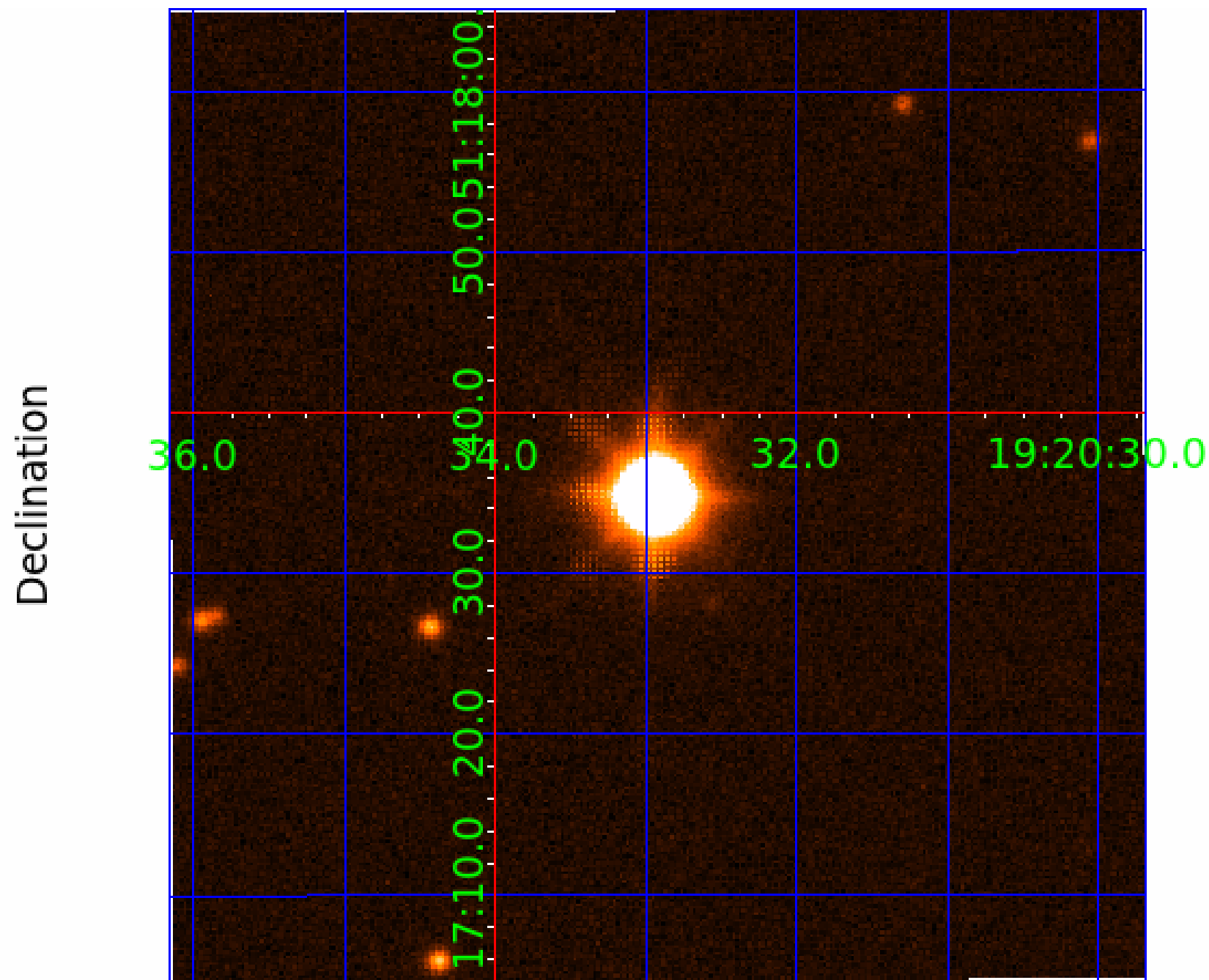
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 012405425

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})
012405425-01	OBS	No	357.105337	373.799043	114.2	18.936	8.4	8.7	1.19	6329	1.38	2.15
012405425-02	OBS	No	505.370768	551.909975	161.9	5.163	9.4	8.5	1.19	6329	1.69	1.35

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012405425-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_SATURATED
012405425-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED

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

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

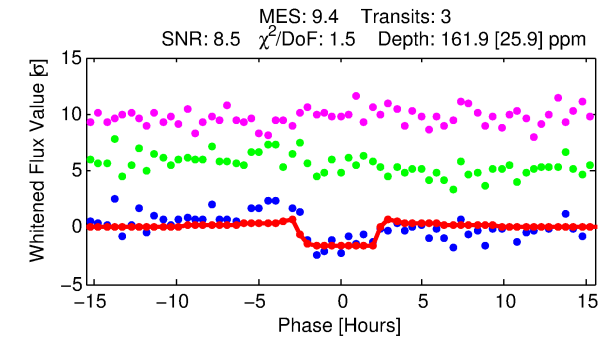
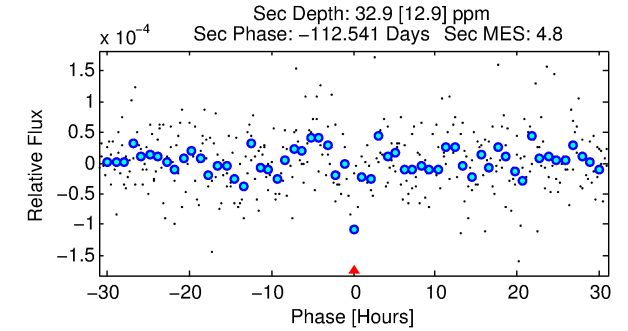
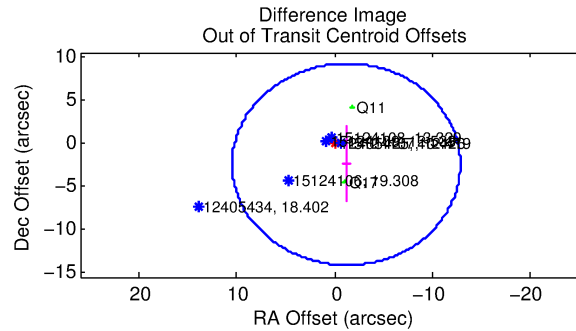
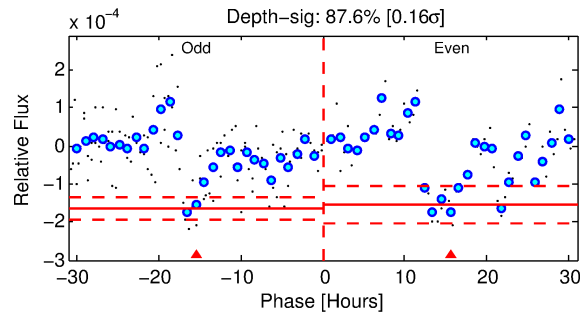
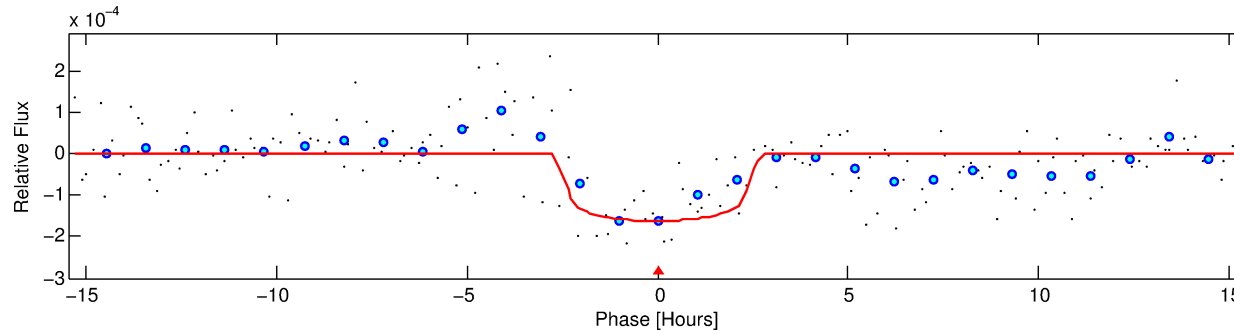
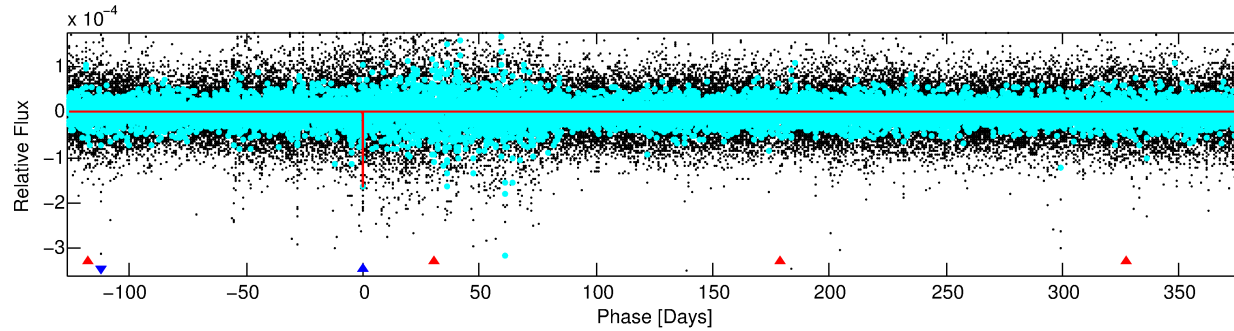
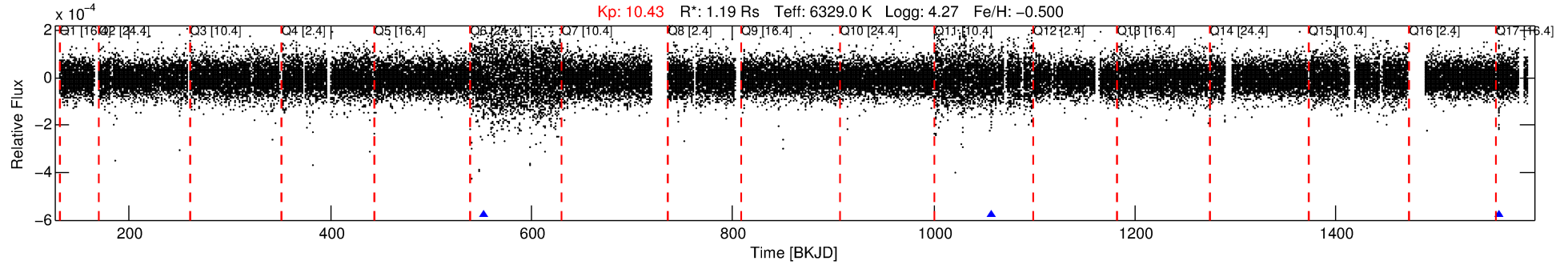
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012405425-02

No Significant Match Found

DV One-Page Summary

KIC: 12405425 Candidate: 2 of 2 Period: 505.371 d



DV Fit Results:

Period = 505.37077 [0.00701] d
Epoch = 551.9100 [0.0097] BKJD
Rp/R* = 0.0131 [0.0045]
a/R* = 431.56 [775.99]
b = 0.83 [0.67]
Seff = 1.35 [0.41]
Teq = 275 [21] K
Rp = 1.69 [0.68] Re
a = 1.2248 [0.2233] AU
Ag = 9478.79 [7968.37] [1.19σ]
Teff = 4193 [839] K [4.67σ]

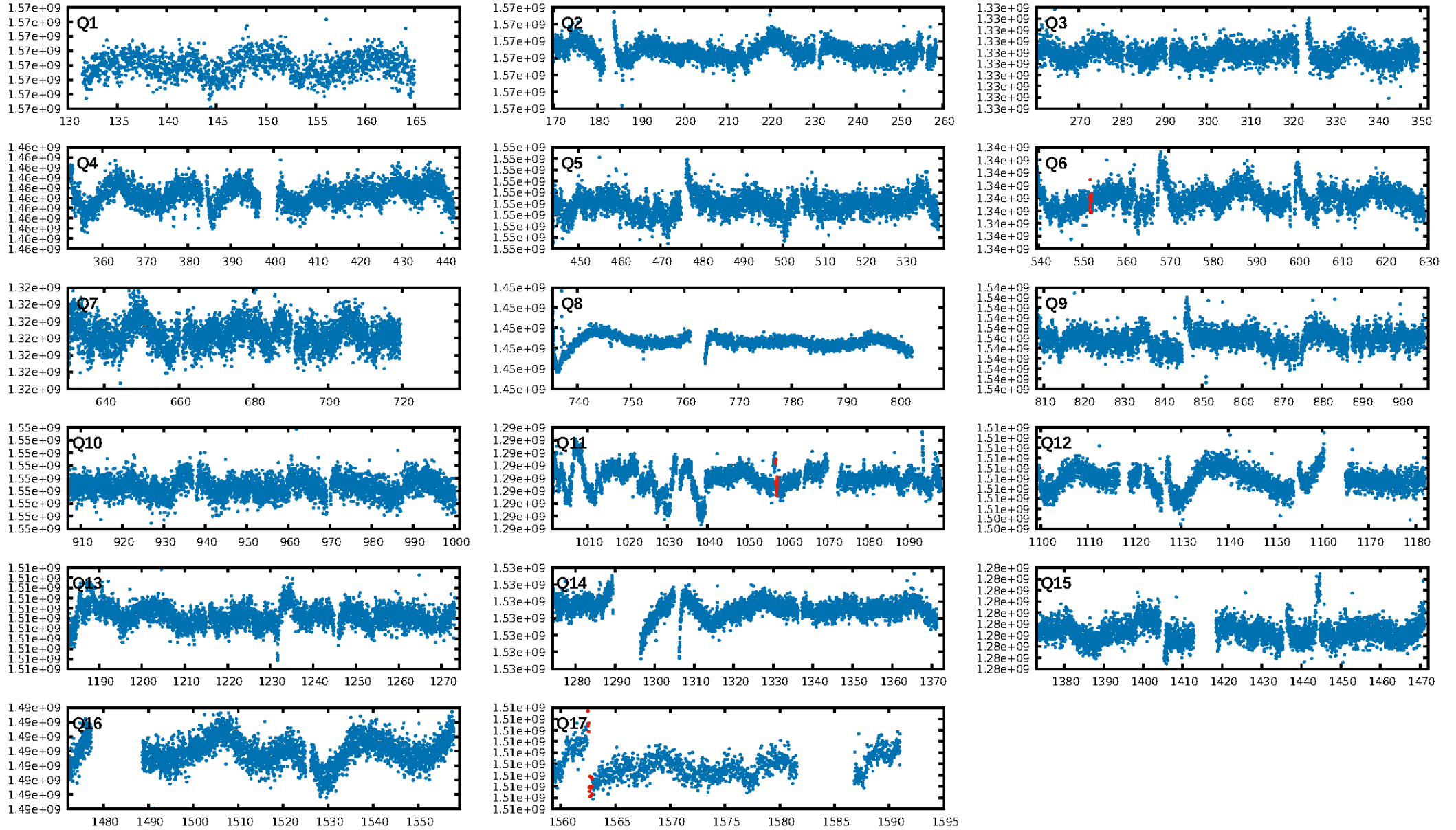
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [181.30σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 8.7%
ModelChiSquareGof-sig: 85.8%
Bootstrap-pfa: 1.82e-11
RollingBand-fgt: 1.00 [2/2]
GhostDiagnostic-chr: N/A
Centroid-sig: 39.4%
Centroid-so: 1.332 arcsec [1.06σ]
OotOffset-rm: 2.746 arcsec [0.71σ]
KicOffset-rm: 2.768 arcsec [0.72σ]
OotOffset-st: 0/1/0/1 [2]
KicOffset-st: 0/1/0/1 [2]
DiffImageQuality-fgm: 0.50 [1/2]
DiffImageOverlap-fno: 1.00 [3/3]

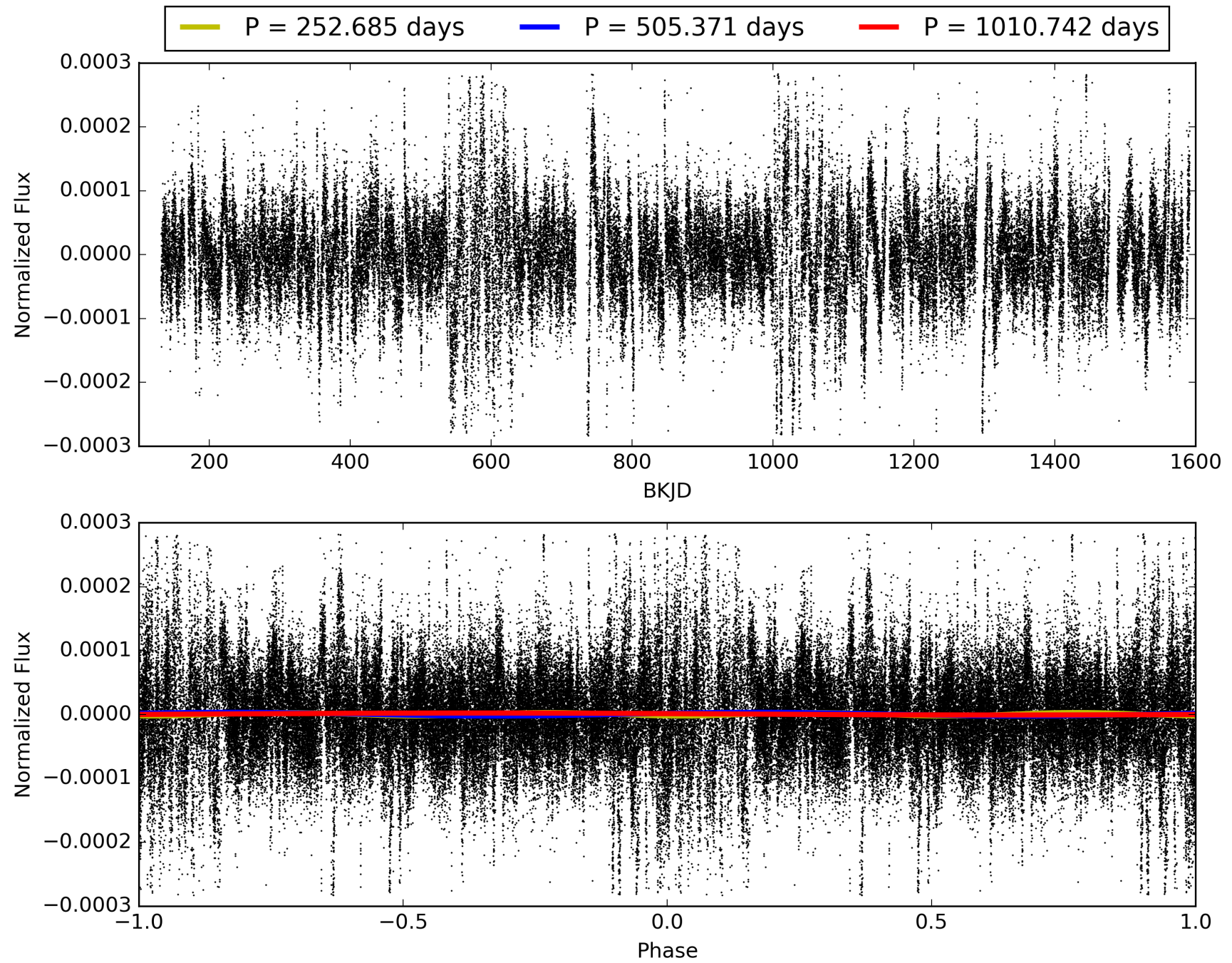
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 02:45:37 Z

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

TCE 012405425-02, PDC Light Curves

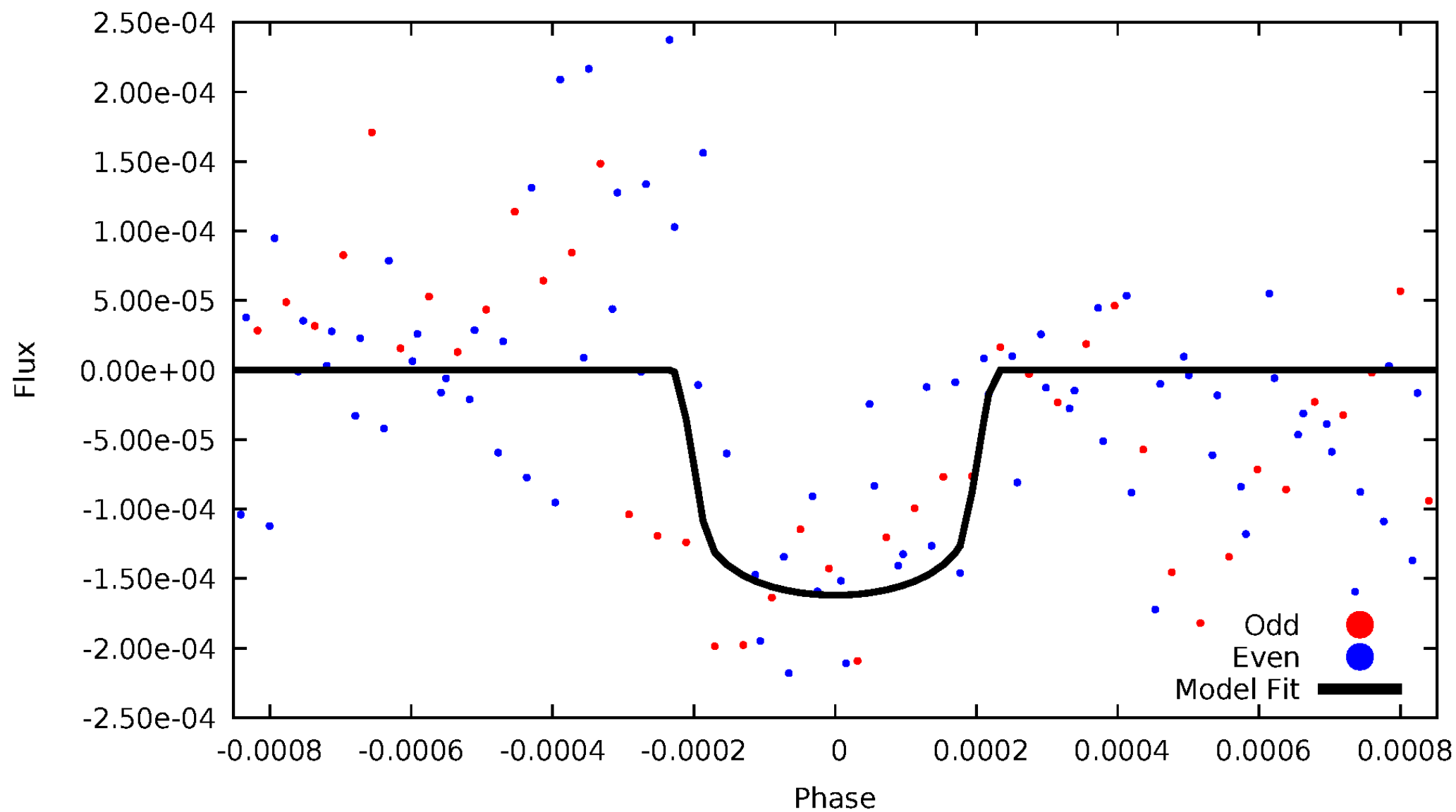


TCE 012405425-02



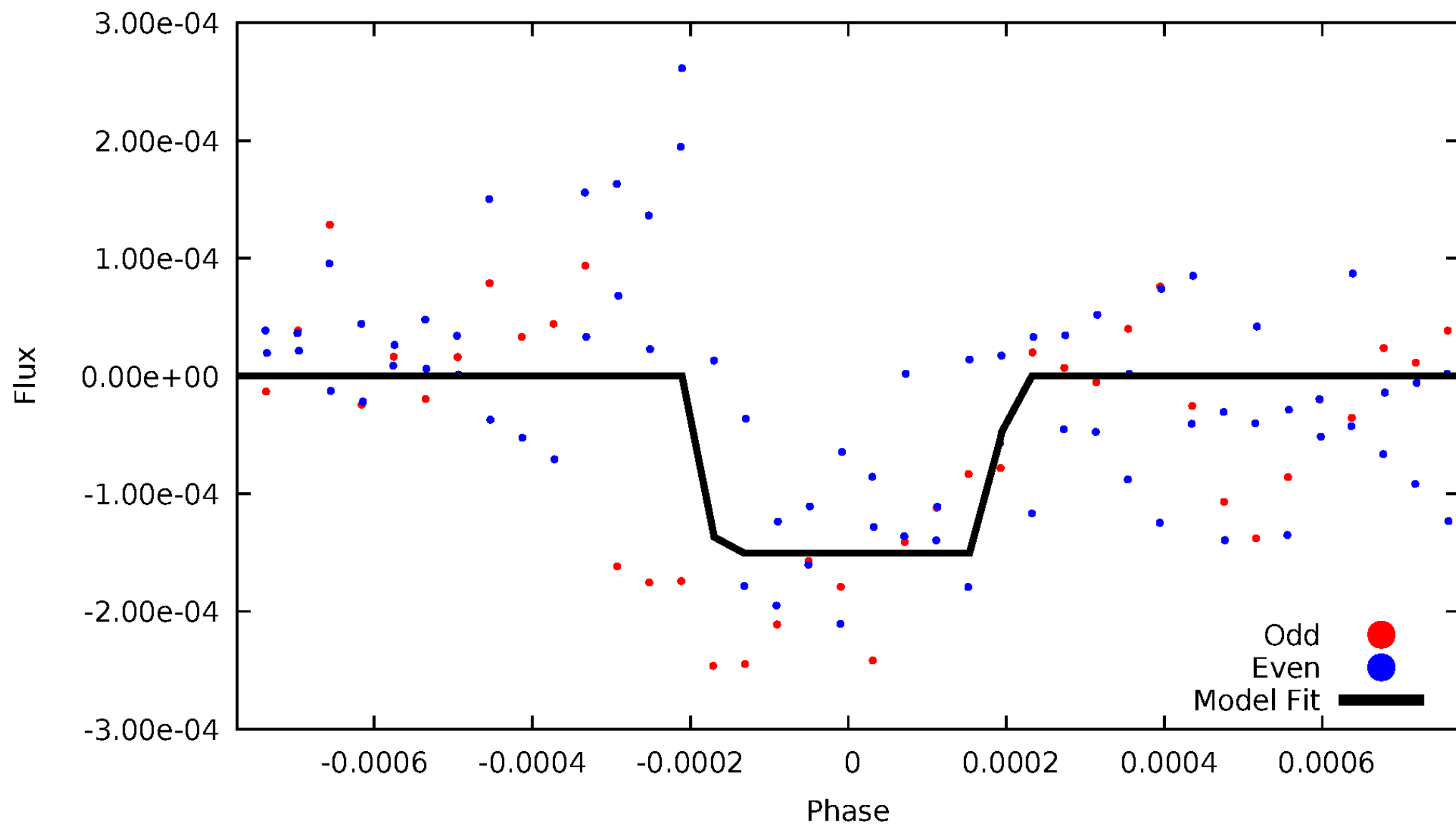
DV Odd/Even

TCE 012405425-02



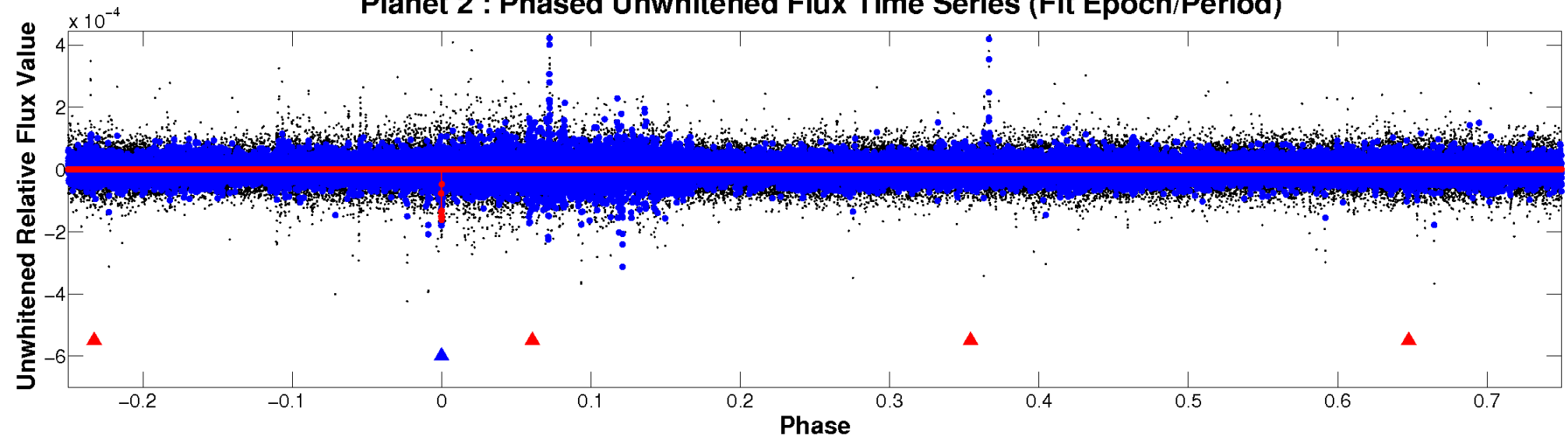
ALT Odd/Even

TCE 012405425-02

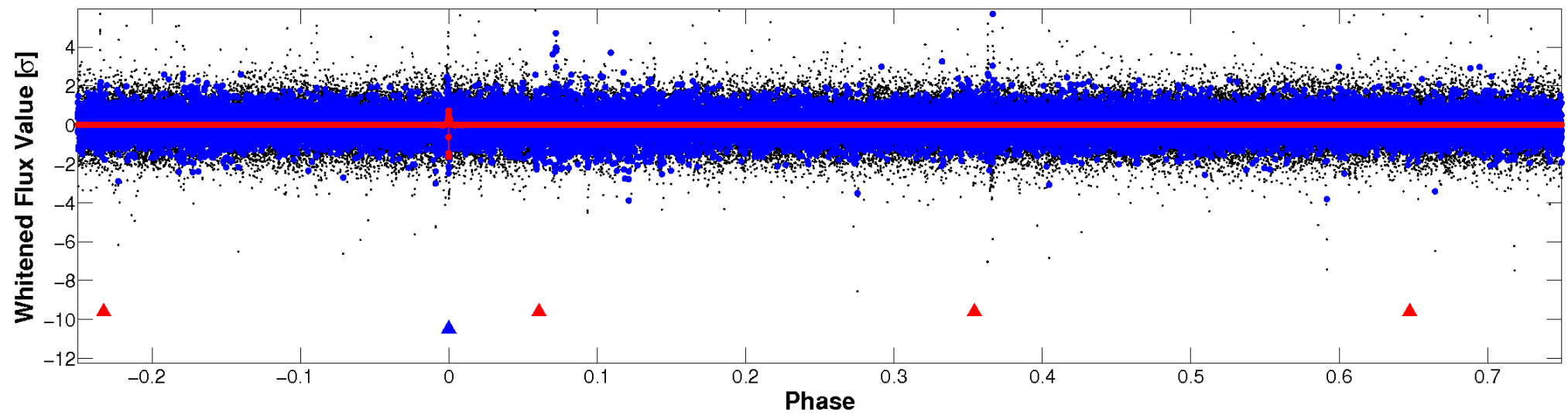


Non-Whitened Vs. Whitened Light Curve

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

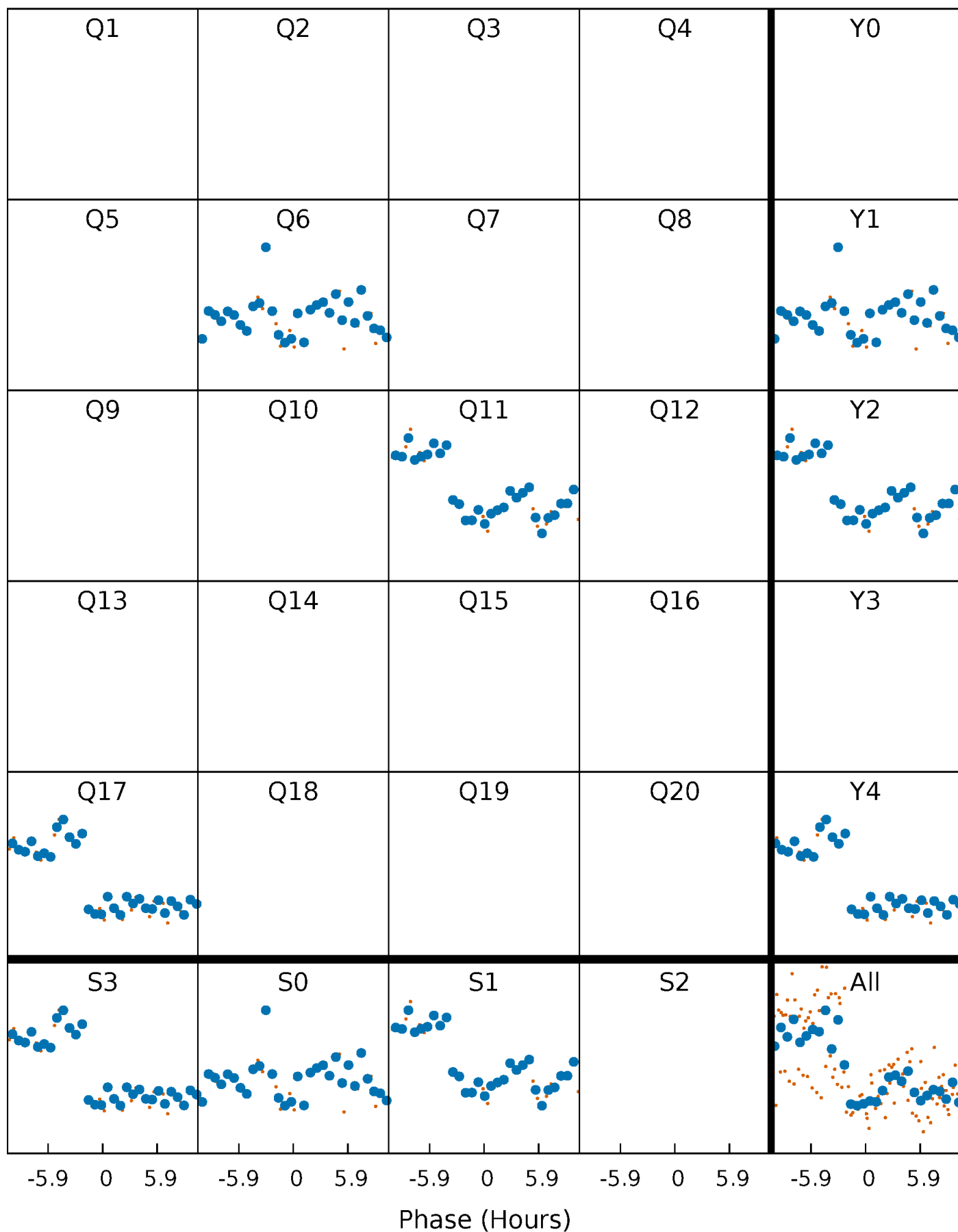


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



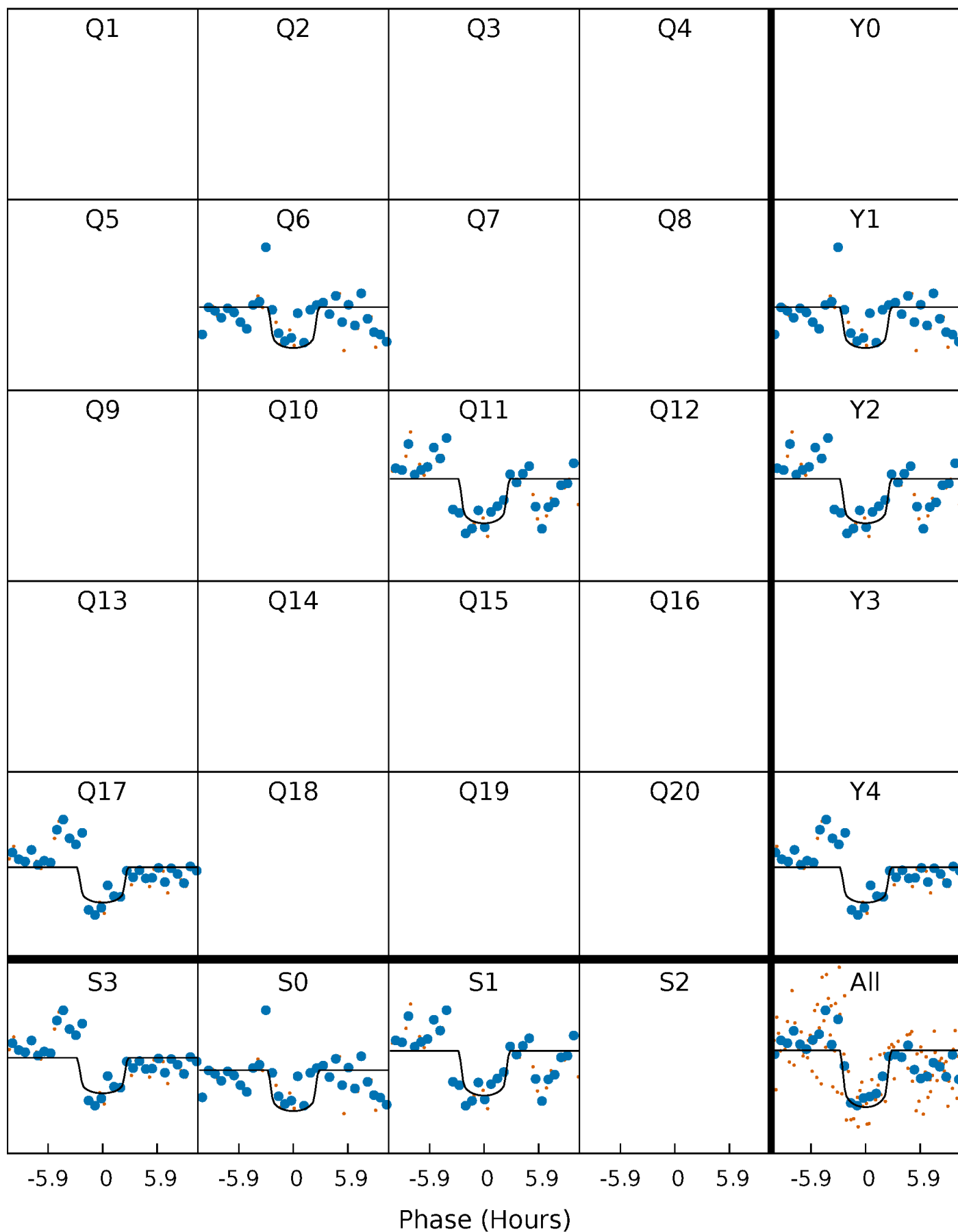
PDC Quarter-Phased Transit Curves

TCE 012405425-02 P=505.370768 Days $T_0=551.909975$ (BKJD)



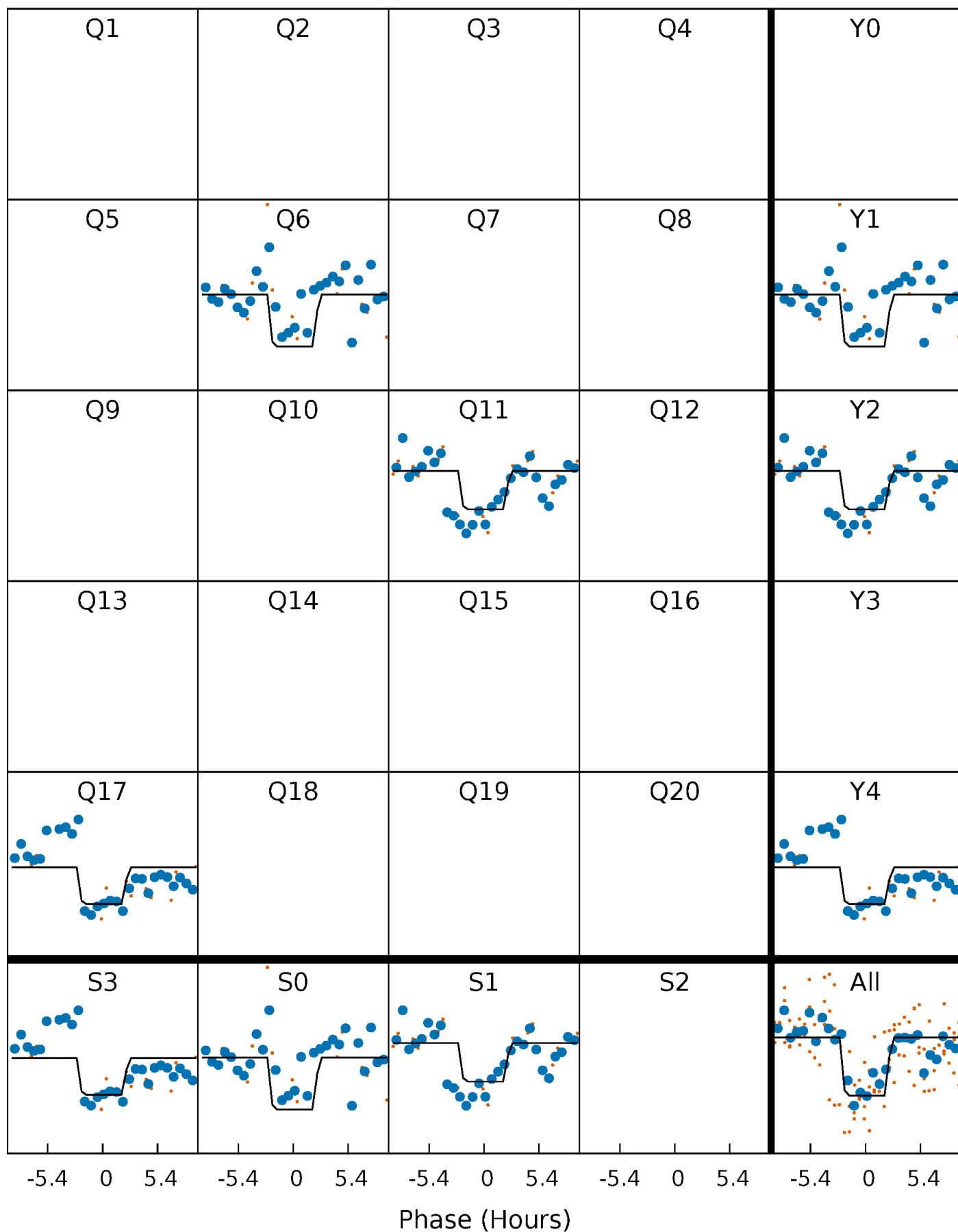
DV Quarter-Phased Transit Curves

TCE 012405425-02 $P=505.370768$ Days $T_0=551.909975$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

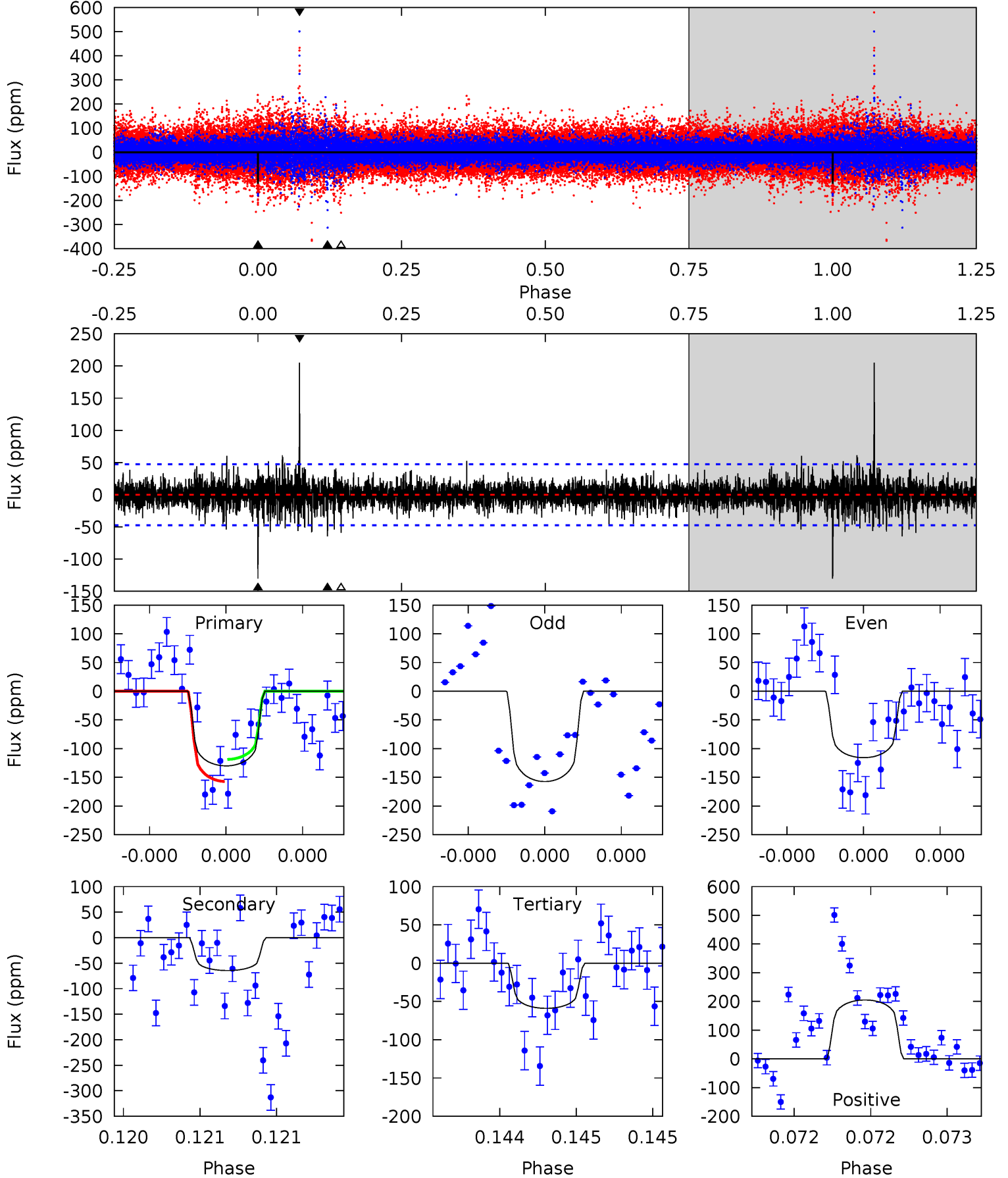
TCE 012405425-02 $P=505.383240$ Days $T_0=551.897872$ (BKJD)



DV Model-Shift Uniqueness Test

012405425-02, P = 505.370768 Days, E = 46.539207 Days

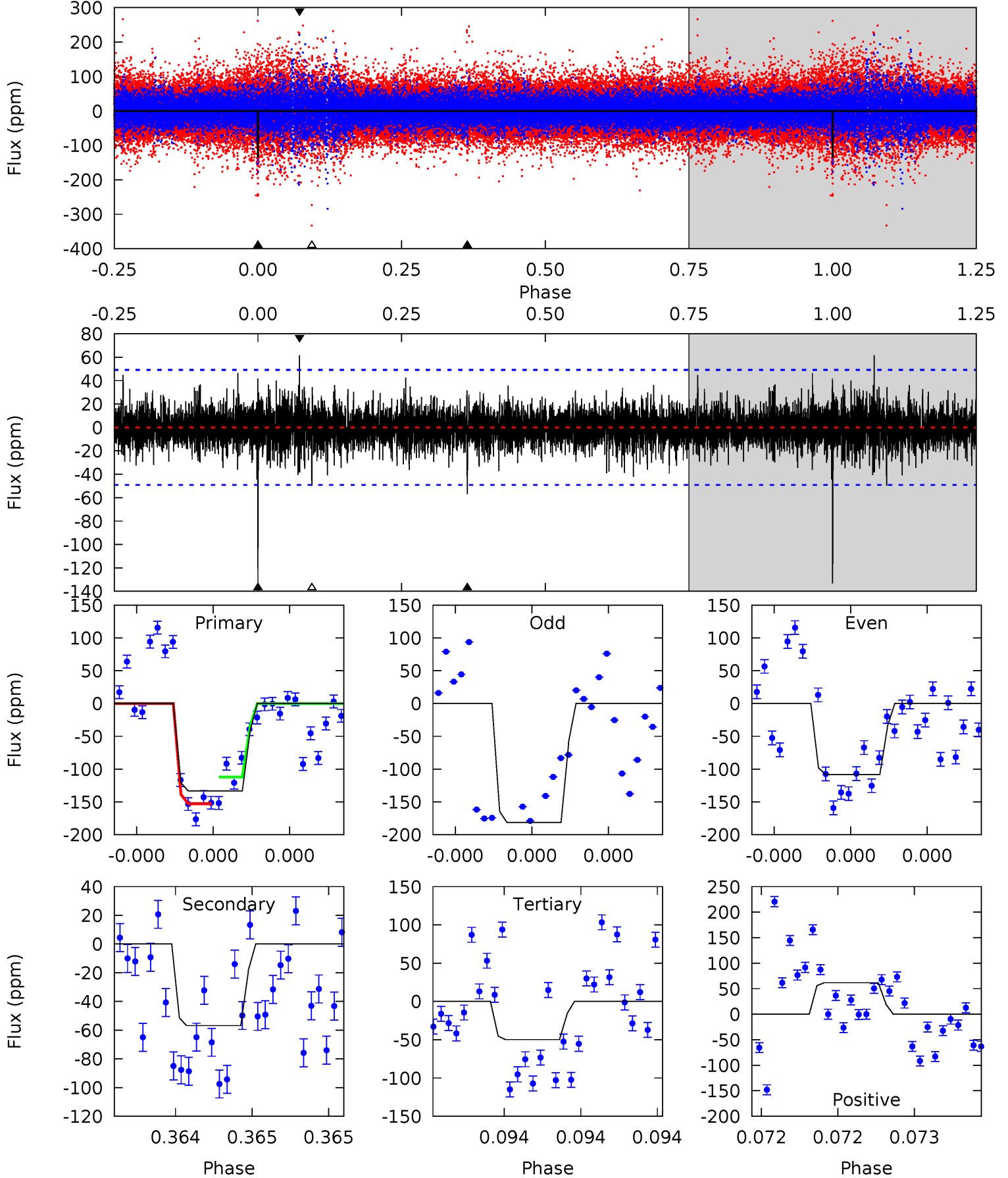
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.3	7.59	6.95	24.2	5.59	3.50	1.58	8.38	-8.85	0.64	-16.6	2.33	0.90	0.61	2.23



Alt Model-Shift Uniqueness Test

012405425-02, P = 505.383240 Days, E = 46.514632 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.2	6.49	5.68	7.03	5.61	3.54	1.21	9.54	8.18	0.81	-0.54	3.97	0.84	0.32	2.32



Stellar Parameters For KIC 012405425

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6329^{+158}_{-174}	$4.271^{+0.160}_{-0.131}$	$-0.500^{+0.300}_{-0.300}$	$1.187^{+0.240}_{-0.216}$	$0.960^{+0.134}_{-0.097}$	$0.808^{+0.633}_{-0.304}$
	+2%/-3%	+4%/-3%	+60%/-60%	+20%/-18%	+14%/-10%	+78%/-38%
Source	PHO1	FLK73	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 012405425-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-64 ± 8	$1.73^{+0.60}_{-0.62}$	382^{+23}_{-20}	4990^{+1070}_{-565}	18273^{+25822}_{-8695}
Alt.	-57 ± 9	$1.57^{+0.58}_{-0.58}$	383^{+22}_{-21}	5056^{+1218}_{-624}	19133^{+30026}_{-9308}

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

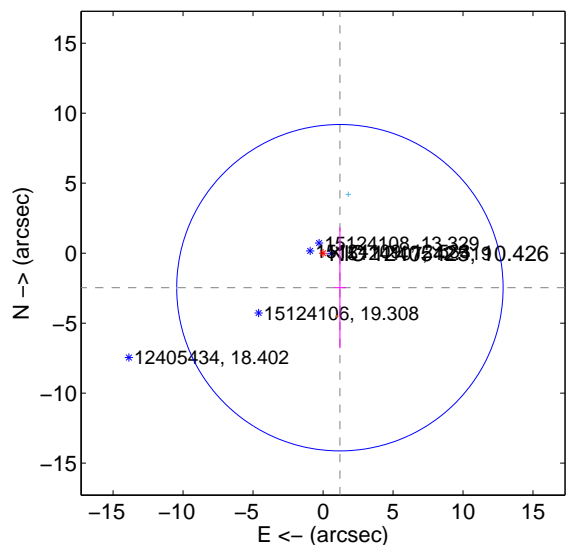
Supplemental centroid analysis for 012405425-02. **Kepler magnitude: 10.43.** Transit SNR 8.54

There are 1 quarters with good PRF difference image offsets

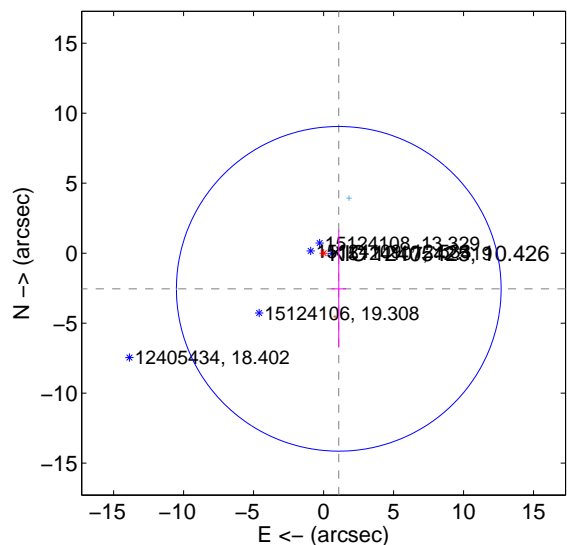
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.746 ± 3.887	0.71	-1.205 ± 0.427	-2.467 ± 4.321
PRF-fit source offset from KIC position	2.768 ± 3.866	0.72	-1.085 ± 0.526	-2.547 ± 4.197
photometric centroid source offset	1.33 ± 1.26	1.06	-1.06 ± 0.90	0.81 ± 1.71

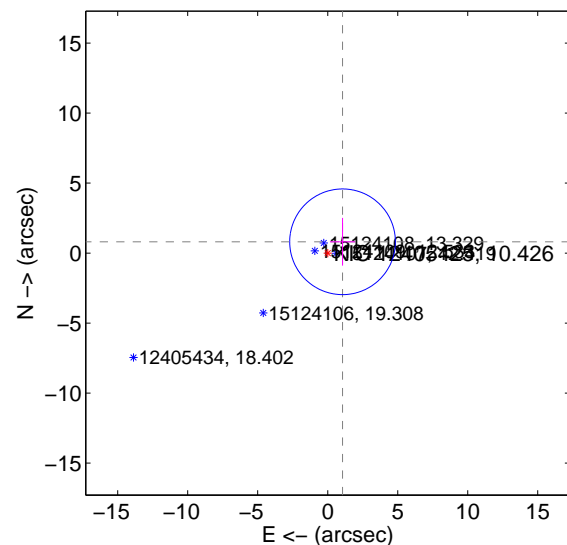
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

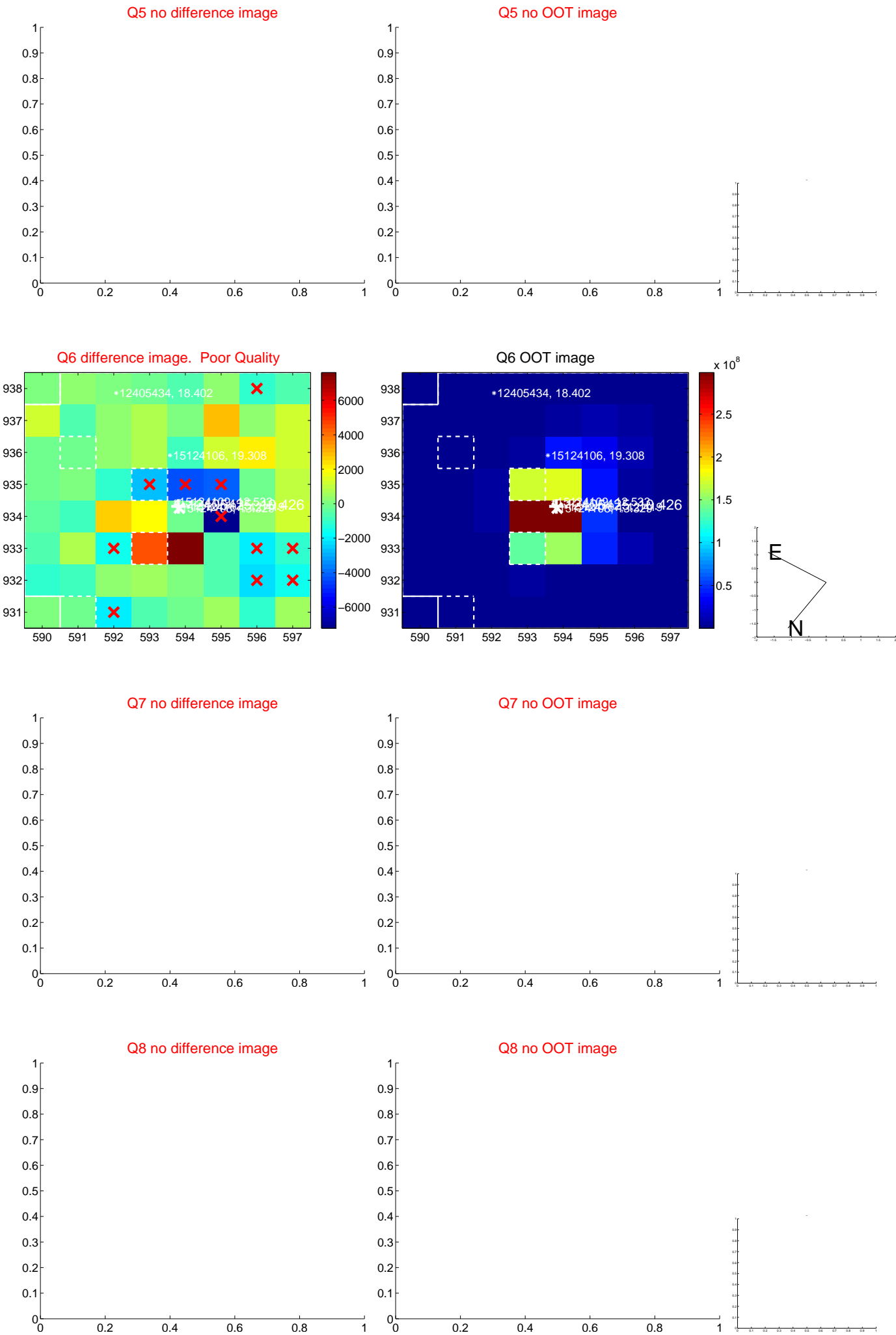


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

Q9 no difference image



Q9 no OOT image



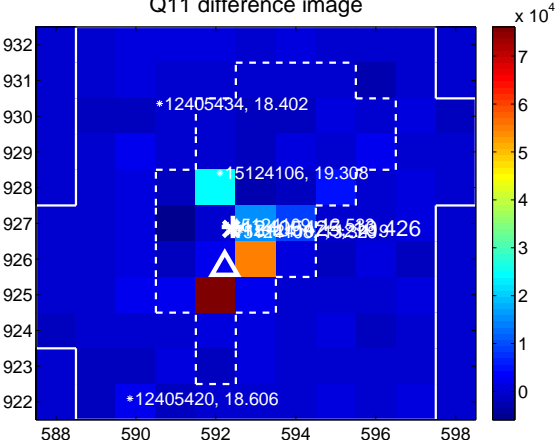
Q10 no difference image



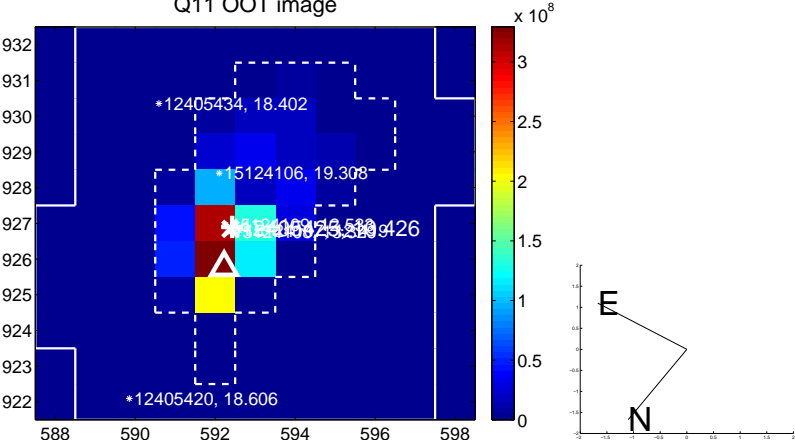
Q10 no OOT image



Q11 difference image



Q11 OOT image



Q12 no difference image



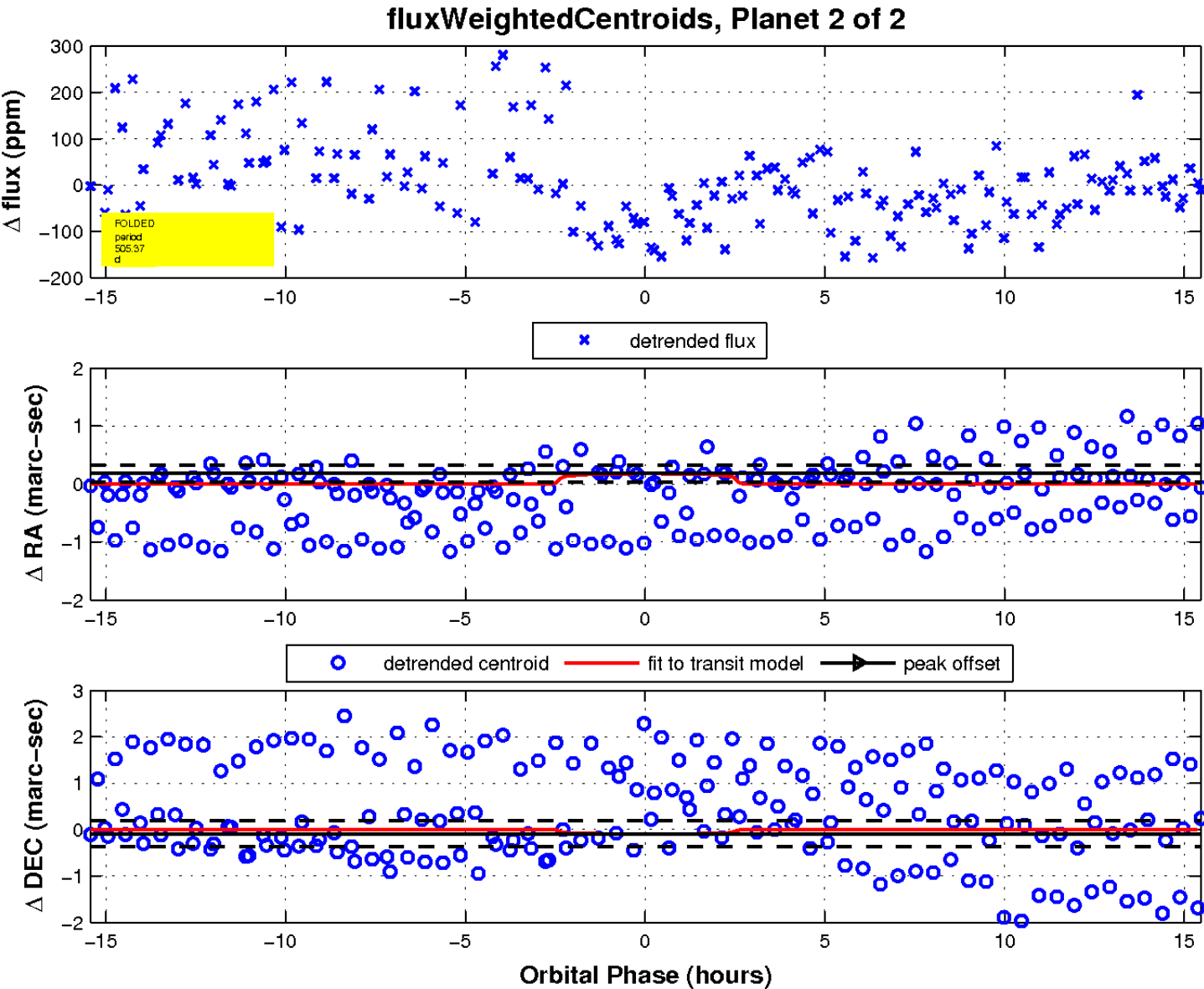
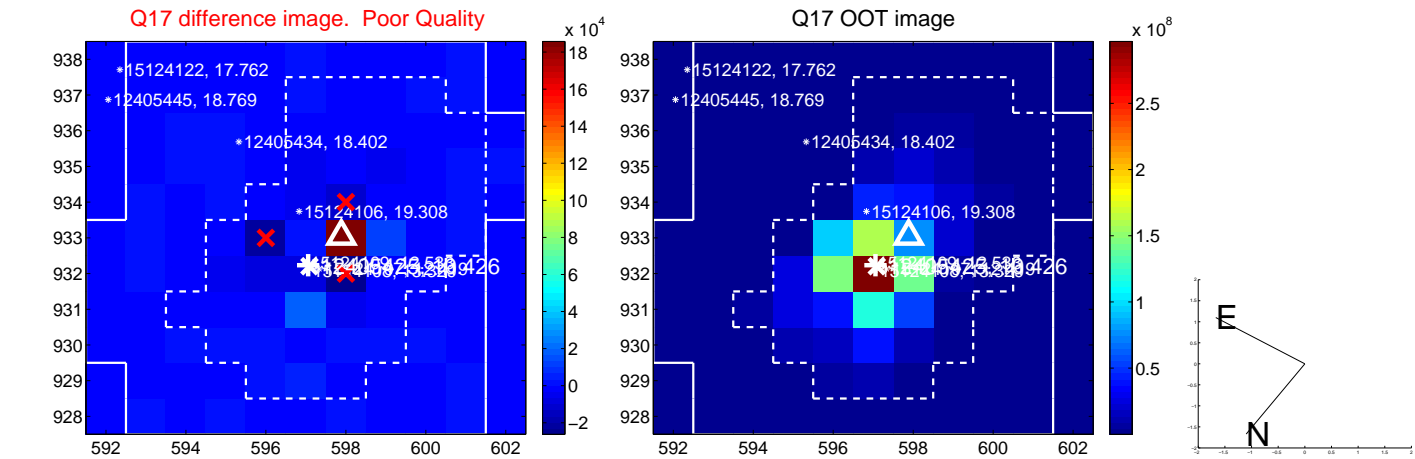
Q12 no OOT image



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



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



UKIRT Image

