

KIC 010751515

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})
010751515-01	OBS	3589.01	56.406529	170.608275	113963.7	13.415	1391.7	1305.2	0.65	5011	22.46	3.87
010751515-02	OBS	No	56.406546	138.309323	102542.4	18.456	1314.1	1154.0	0.65	5011	21.90	3.87

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010751515-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—MOD_ODDEVEN_DV—HAS_SEC_TCE
010751515-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

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.

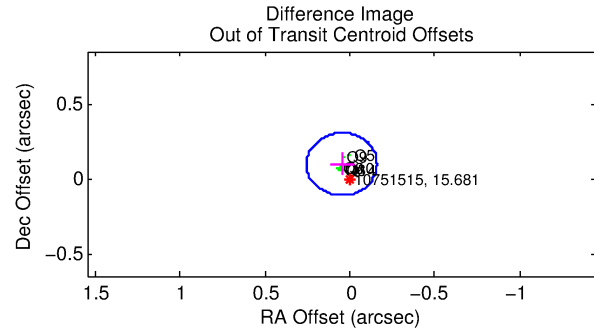
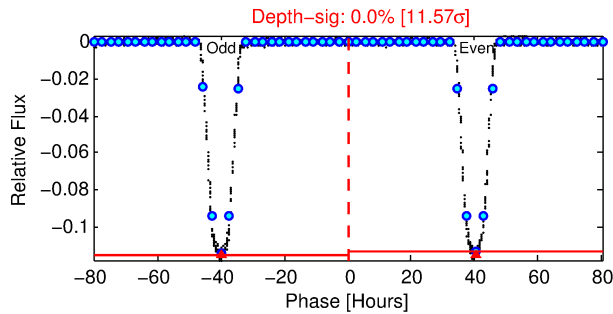
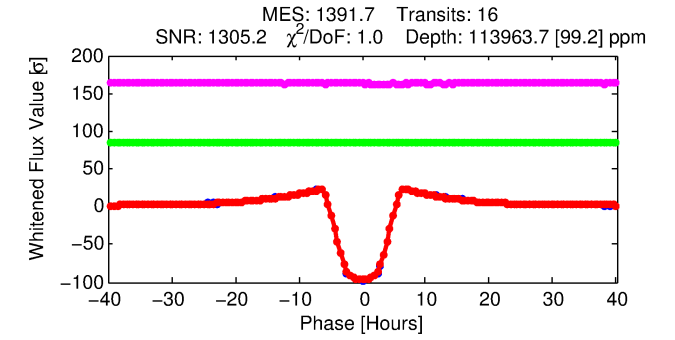
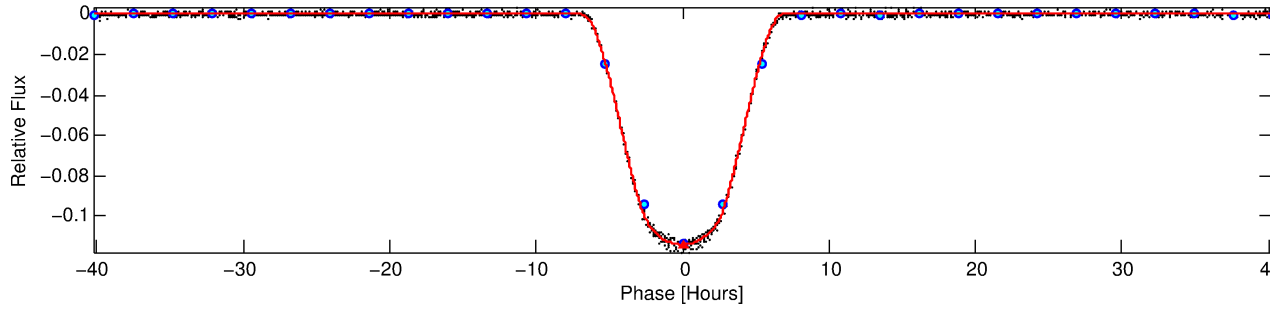
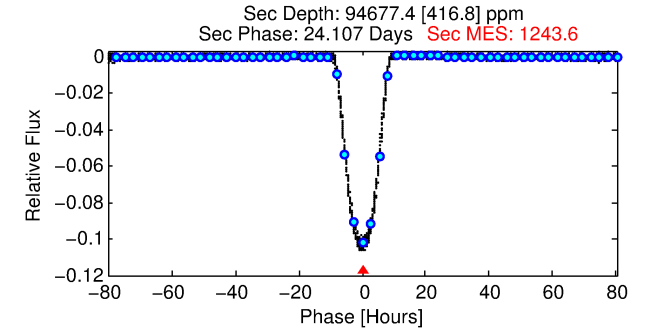
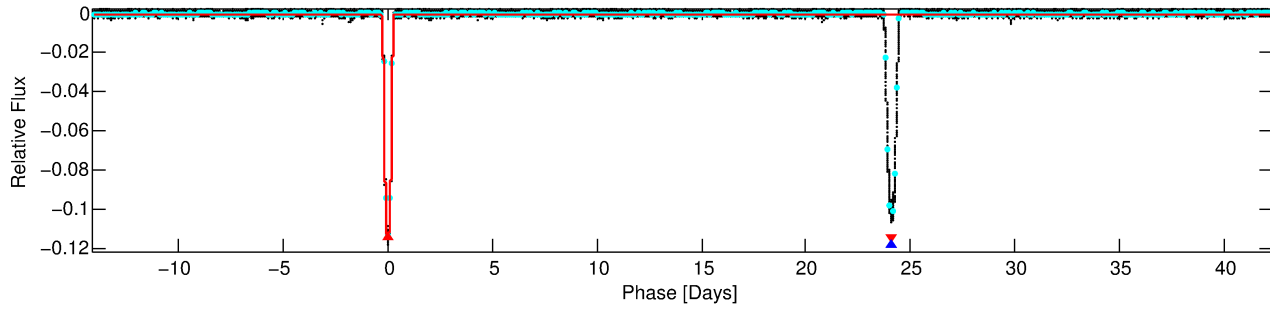
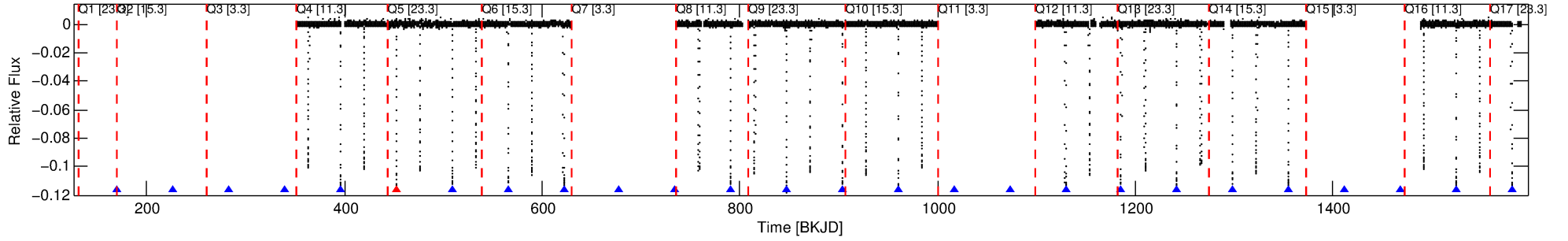
Ephemeris Match Information For 010751515-01

No Significant Match Found

DV One-Page Summary

KIC: 10751515 Candidate: 1 of 2 Period: 56.407 d
KOI: K03589 Corr: No Ephemeris Match

Kp: 15.68 R*: 0.65 Rs Teff: 5011.0 K Logg: 4.62 Fe/H: -0.680



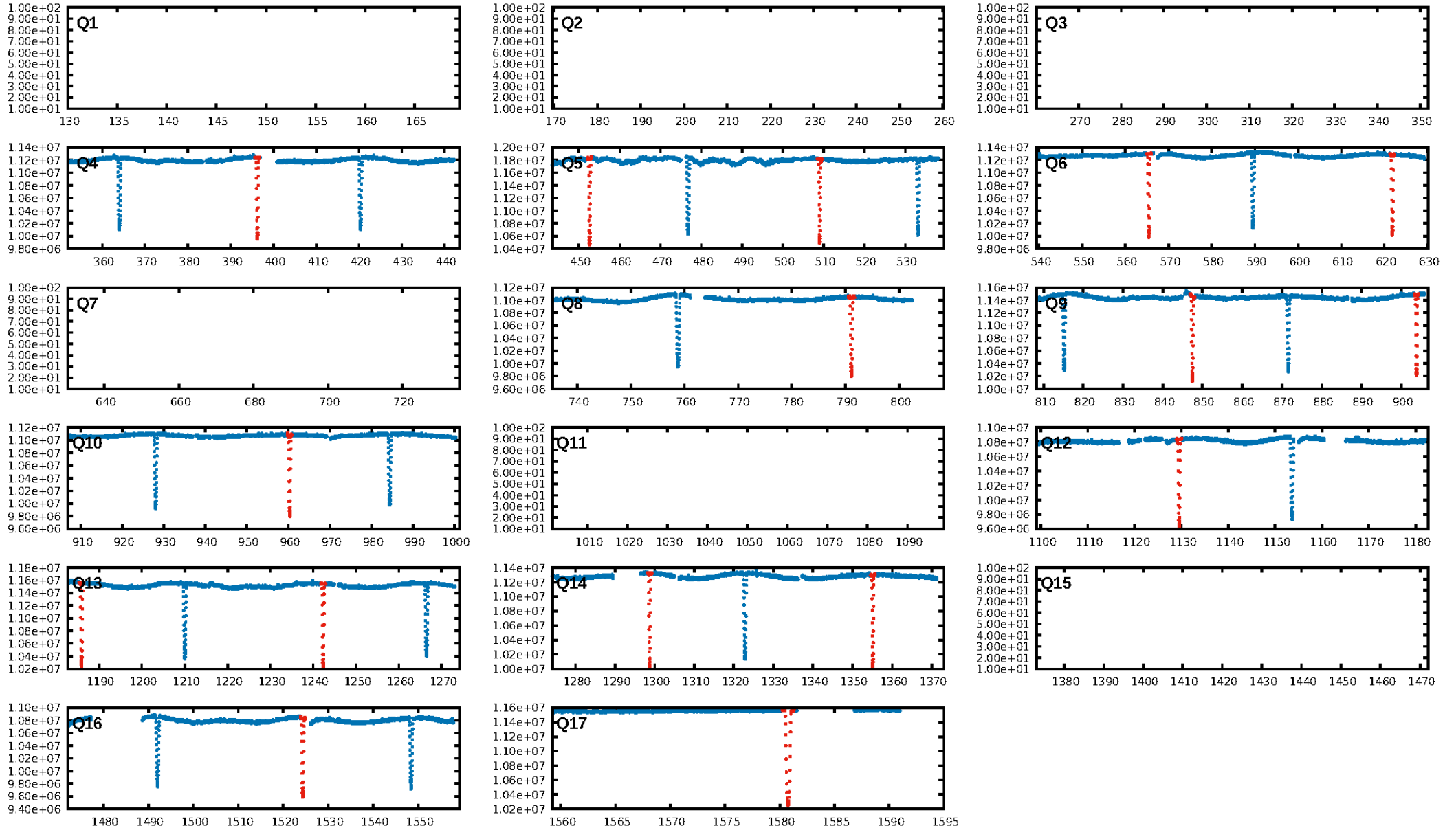
DV Fit Results:

Period = 56.40653 [0.00002] d
Epoch = 170.6083 [0.0002] BKJD
Rp/R* = 0.3181 [0.0002]
a/R* = 39.02 [0.05]
b = 0.51 [0.00]
Seff = 3.87 [0.71]
Teq = 358 [16] K
Rp = 22.46 [2.19] Re
a = 0.2471 [0.0203] AU
Ag = 6302.78 [758.95] [8.30σ]
Teffp = 4928 [171] K [26.57σ]

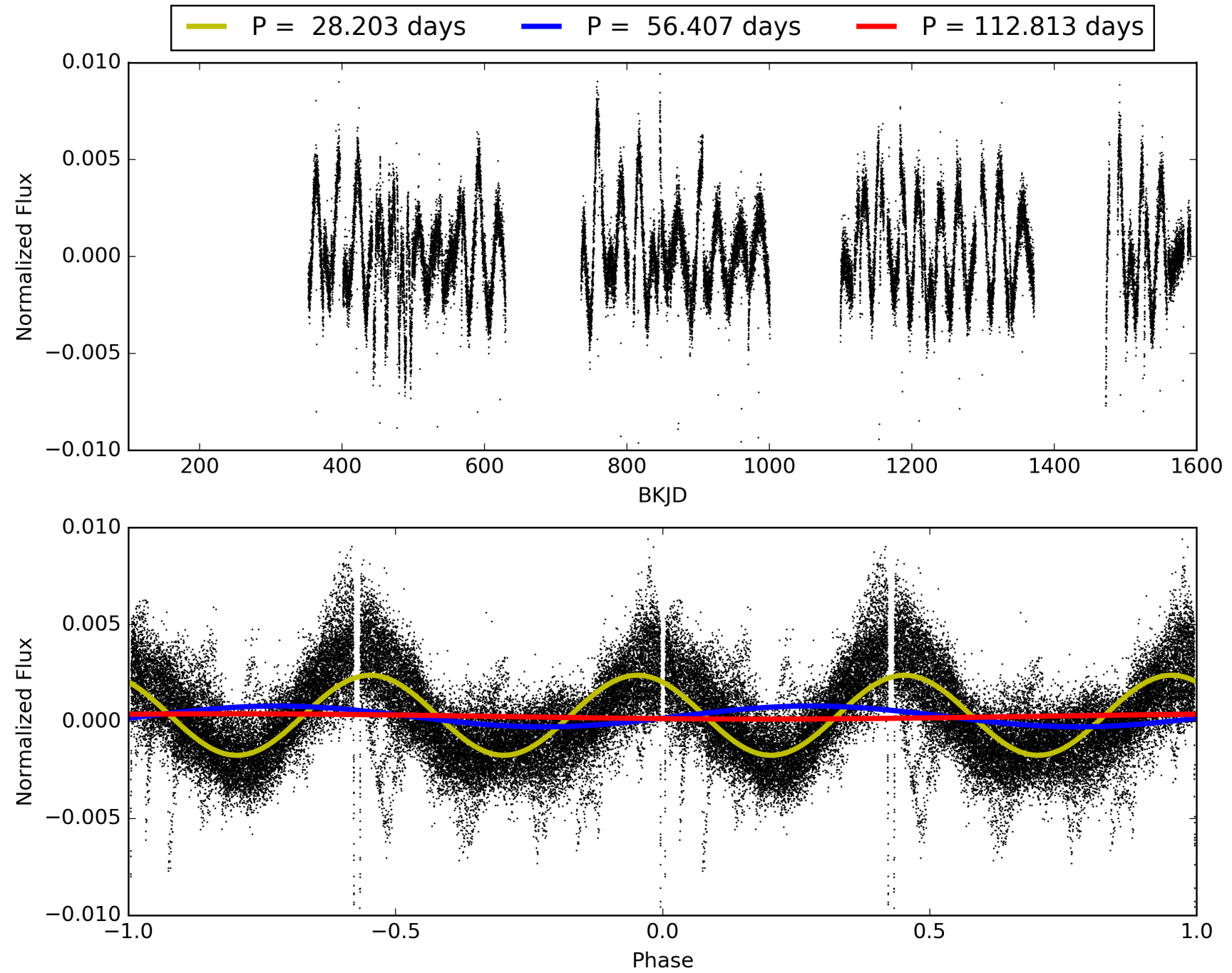
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 99.9%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 0.93 [14/15]
GhostDiagnostic-chr: 4.98
Centroid-sig: 0.0%
Centroid-so: 0.265 arcsec [36.95σ]
OotOffset-rm: 0.108 arcsec [1.56σ]
OotOffset-st: 3/0/1/2 [6]
KicOffset-rm: 0.130 arcsec [1.92σ]
KicOffset-st: 3/0/1/2 [6]
DiffImageQuality-fgm: 1.00 [6/6]
DiffImageOverlap-fno: 1.00 [6/6]

TCE 010751515-01, PDC Light Curves

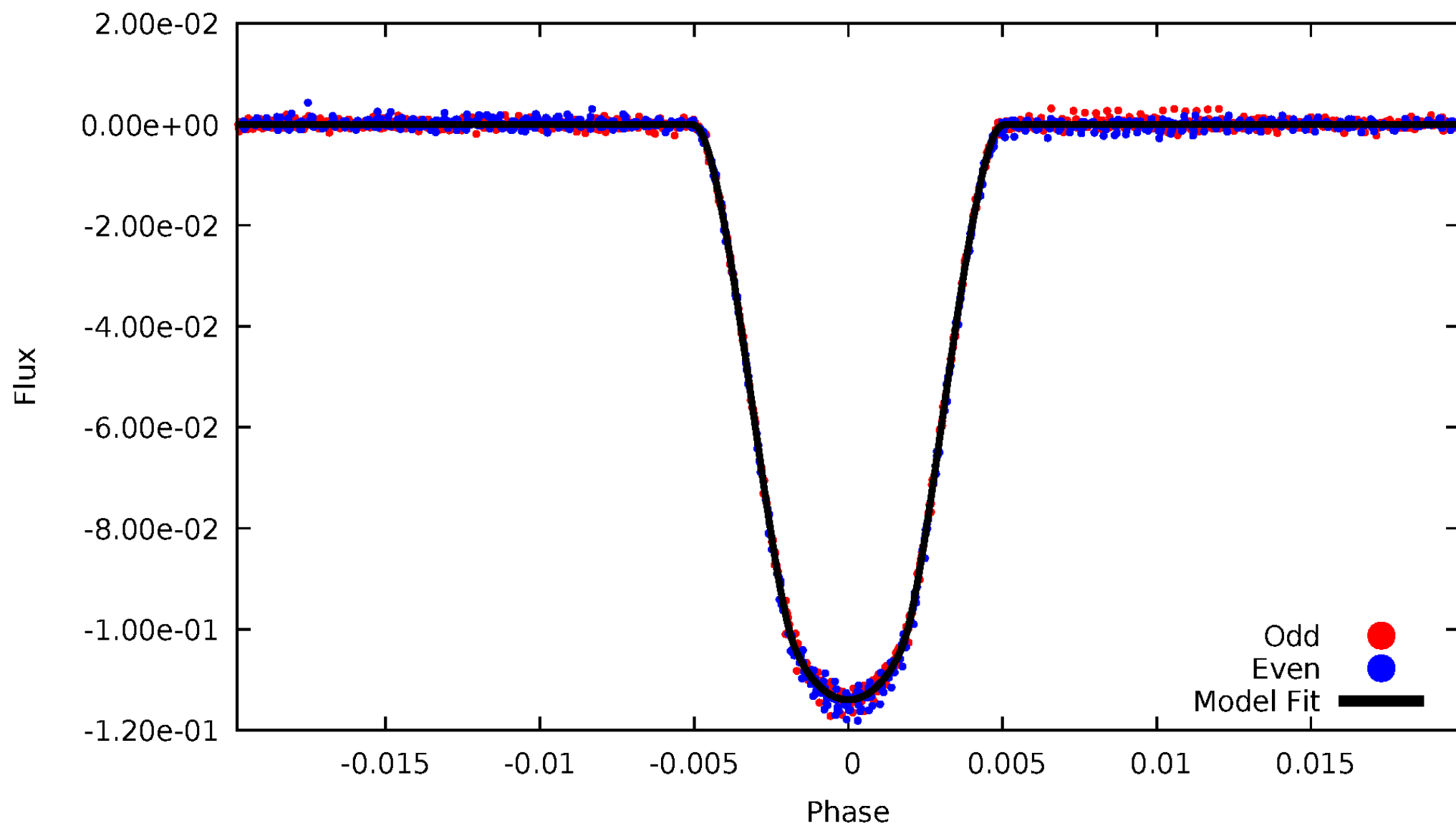


TCE 010751515-01



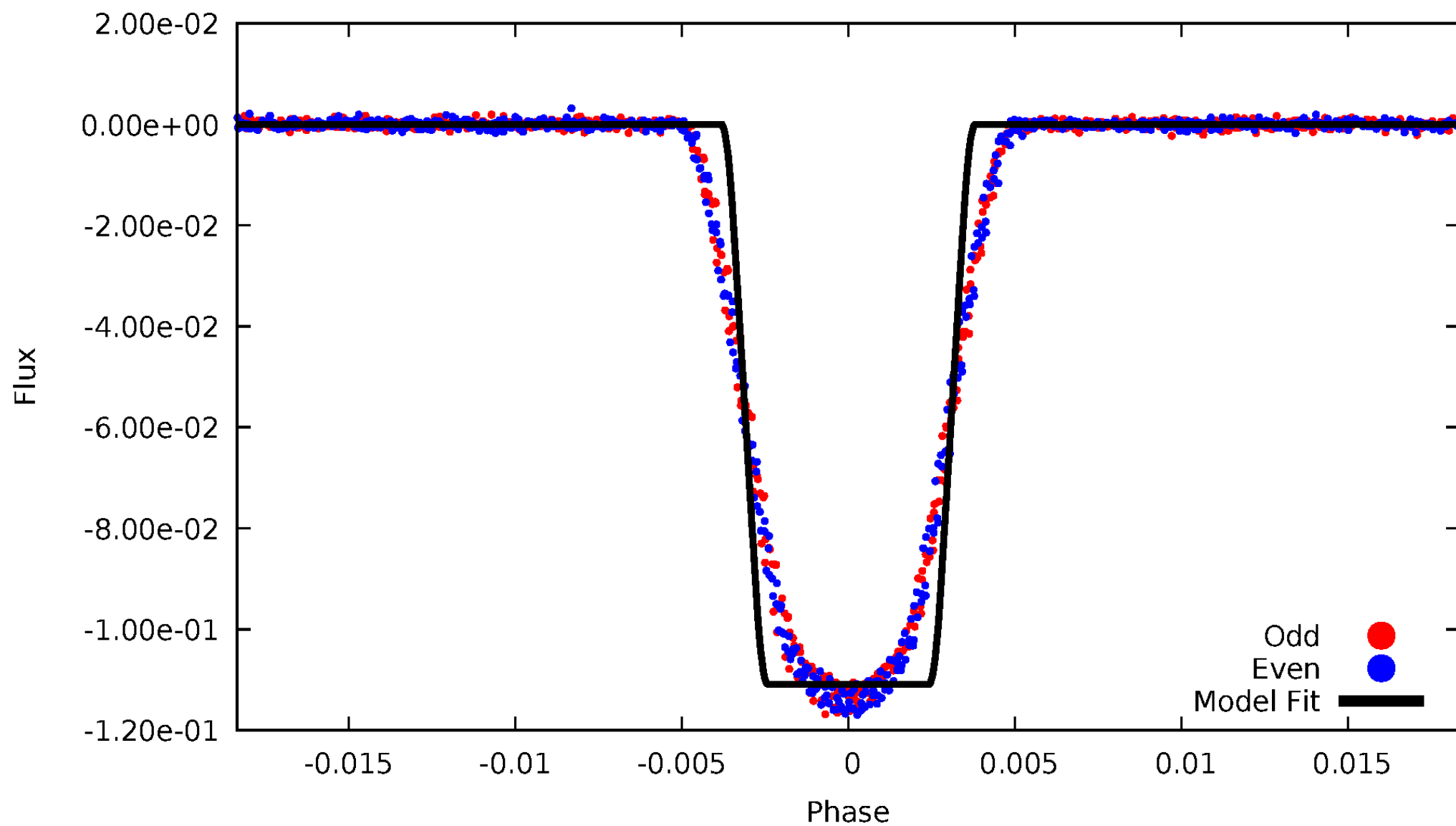
DV Odd/Even

TCE 010751515-01



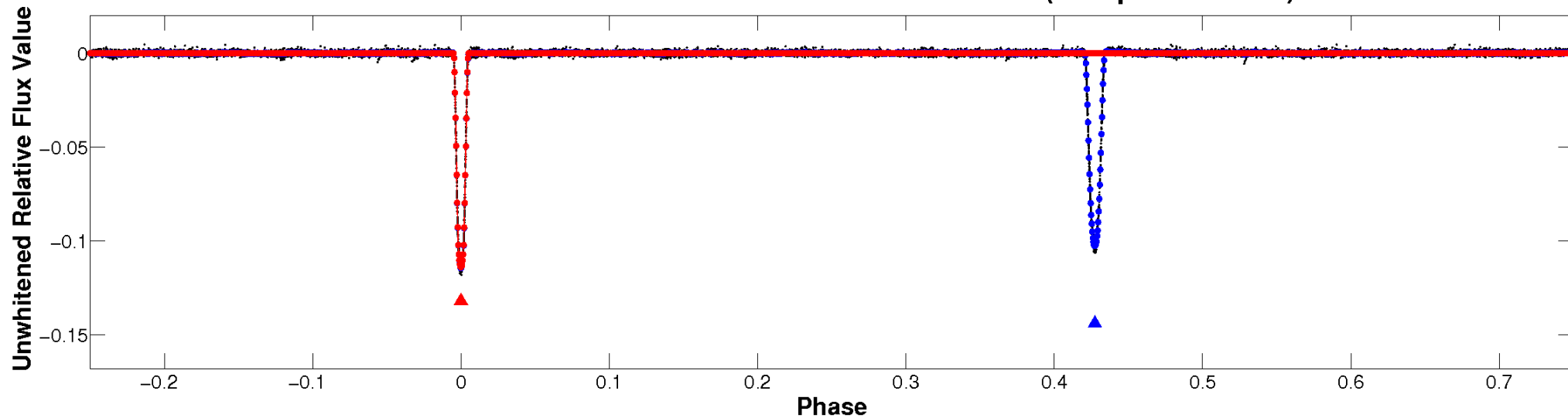
ALT Odd/Even

TCE 010751515-01

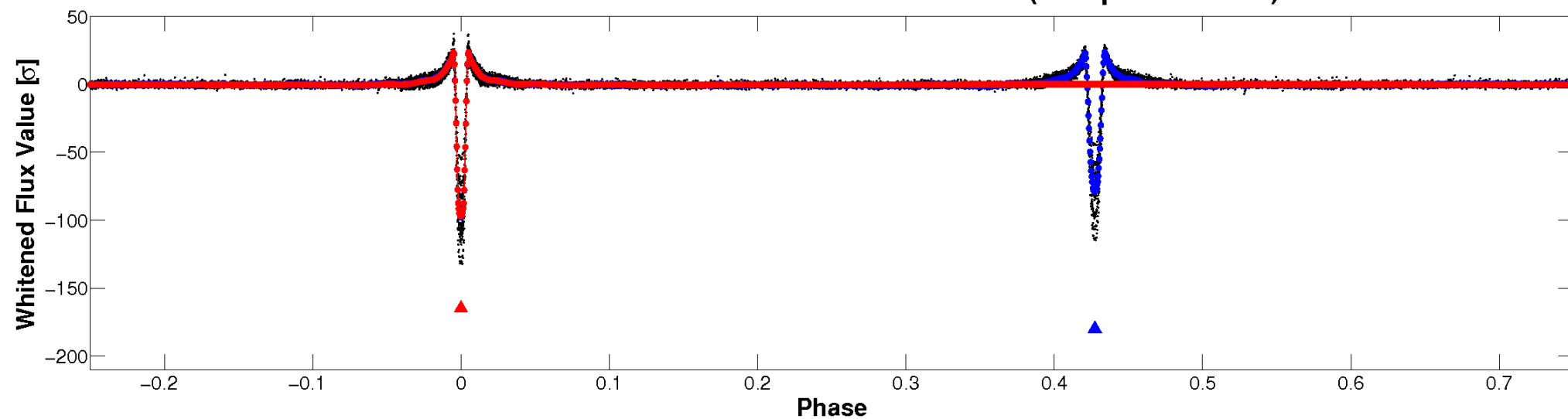


Non-Whitened Vs. Whitened Light Curve

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

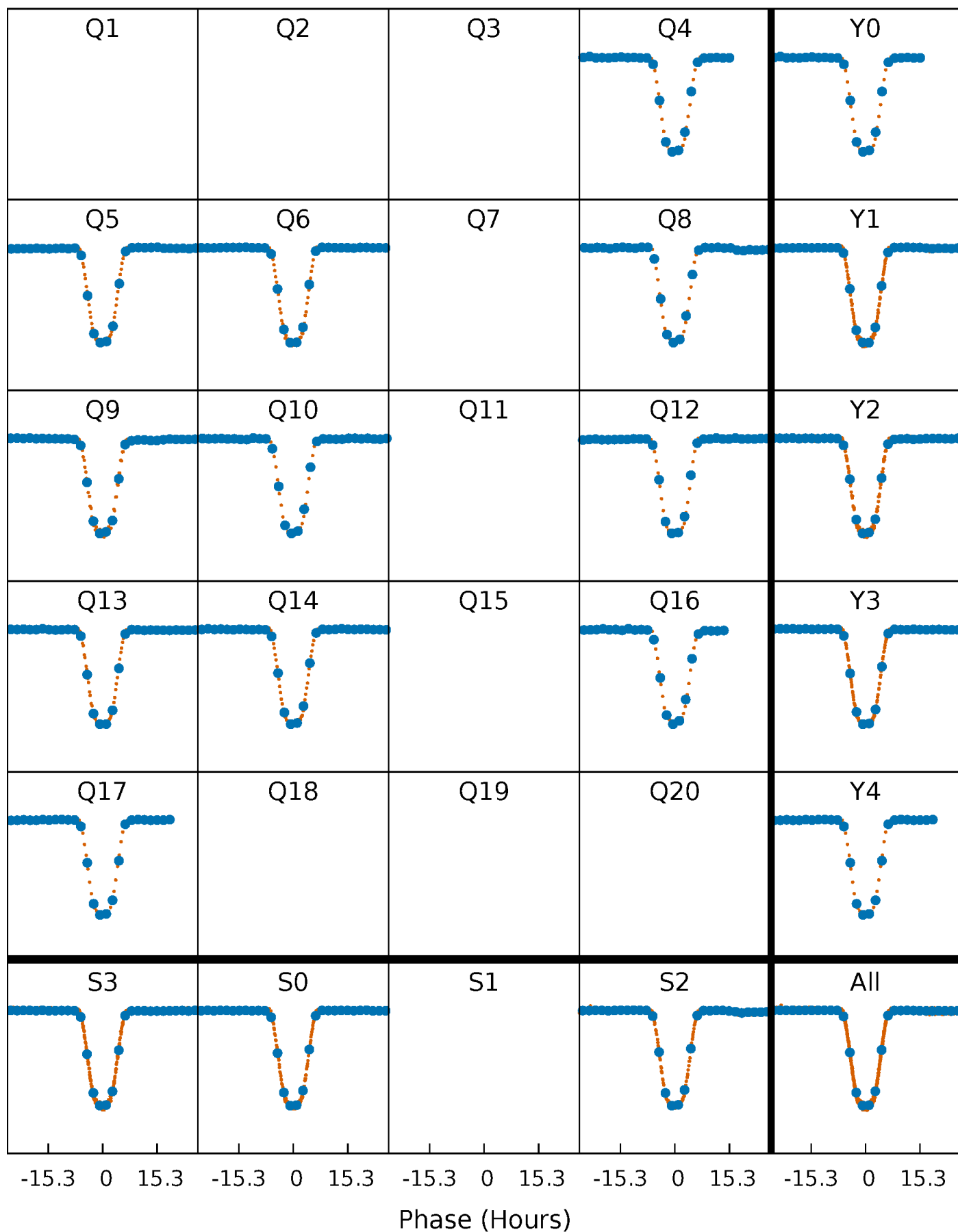


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



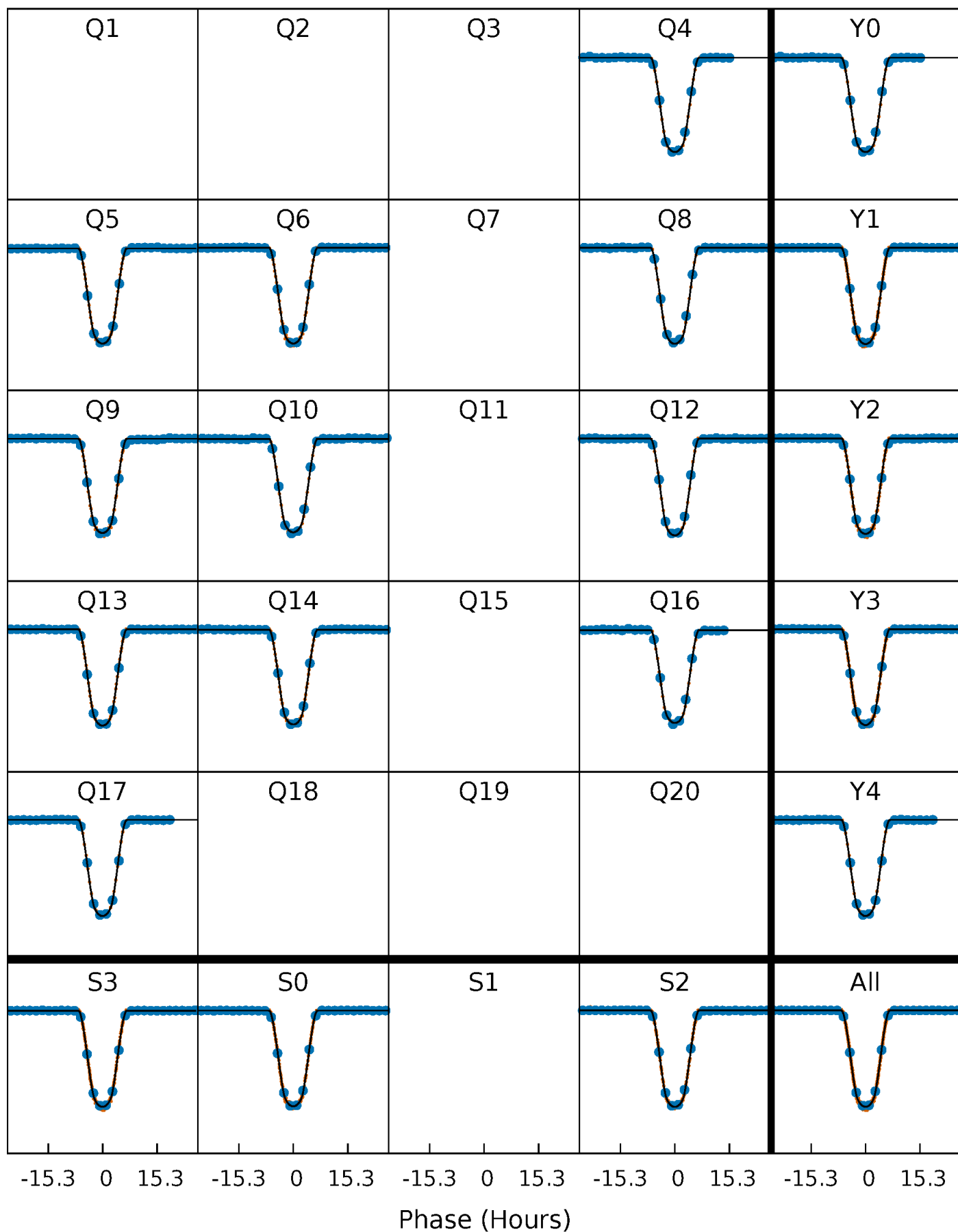
PDC Quarter-Phased Transit Curves

TCE 010751515-01 P= 56.406529 Days $T_0=170.608275$ (BKJD)



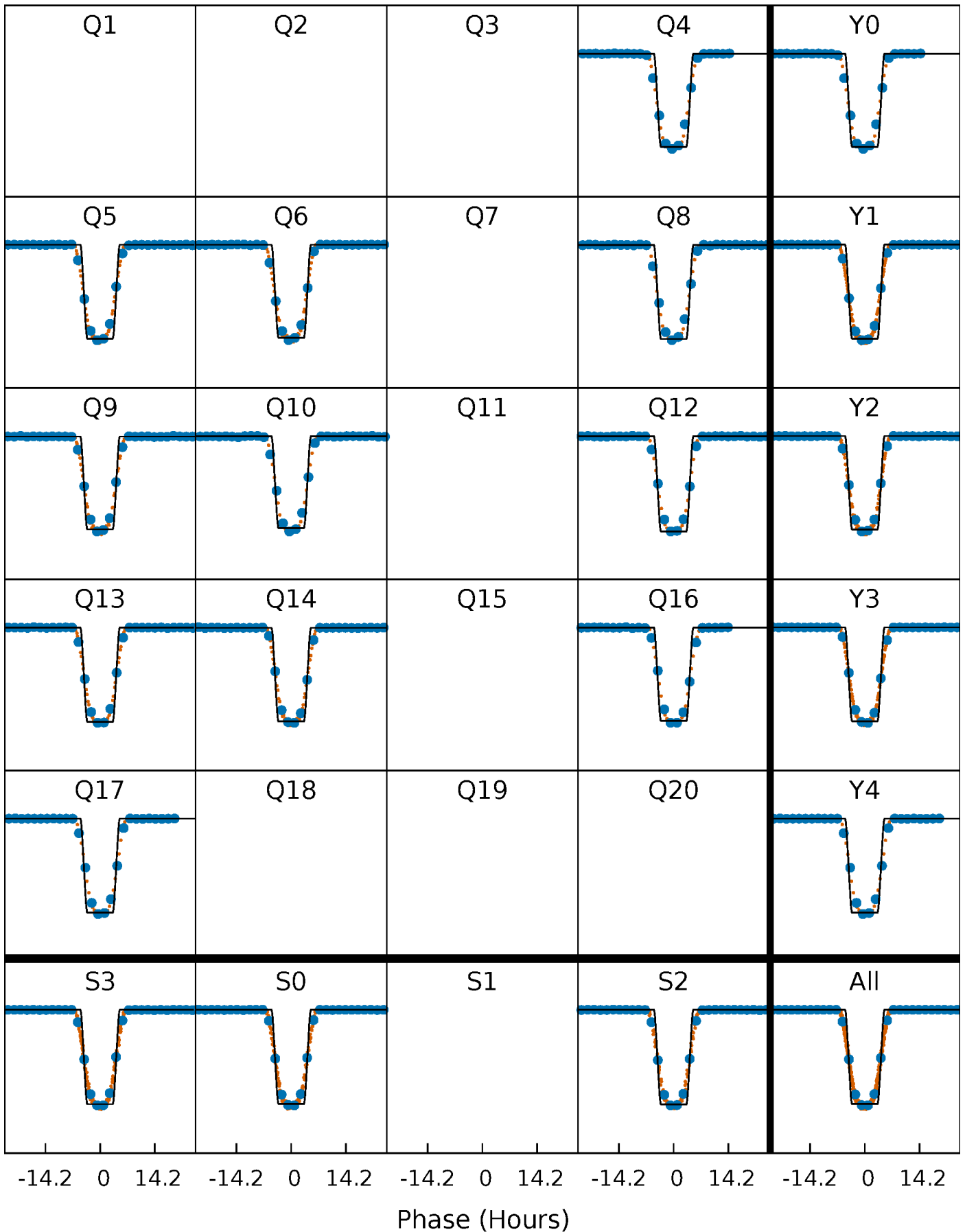
DV Quarter-Phased Transit Curves

TCE 010751515-01 P= 56.406529 Days $T_0=170.608275$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

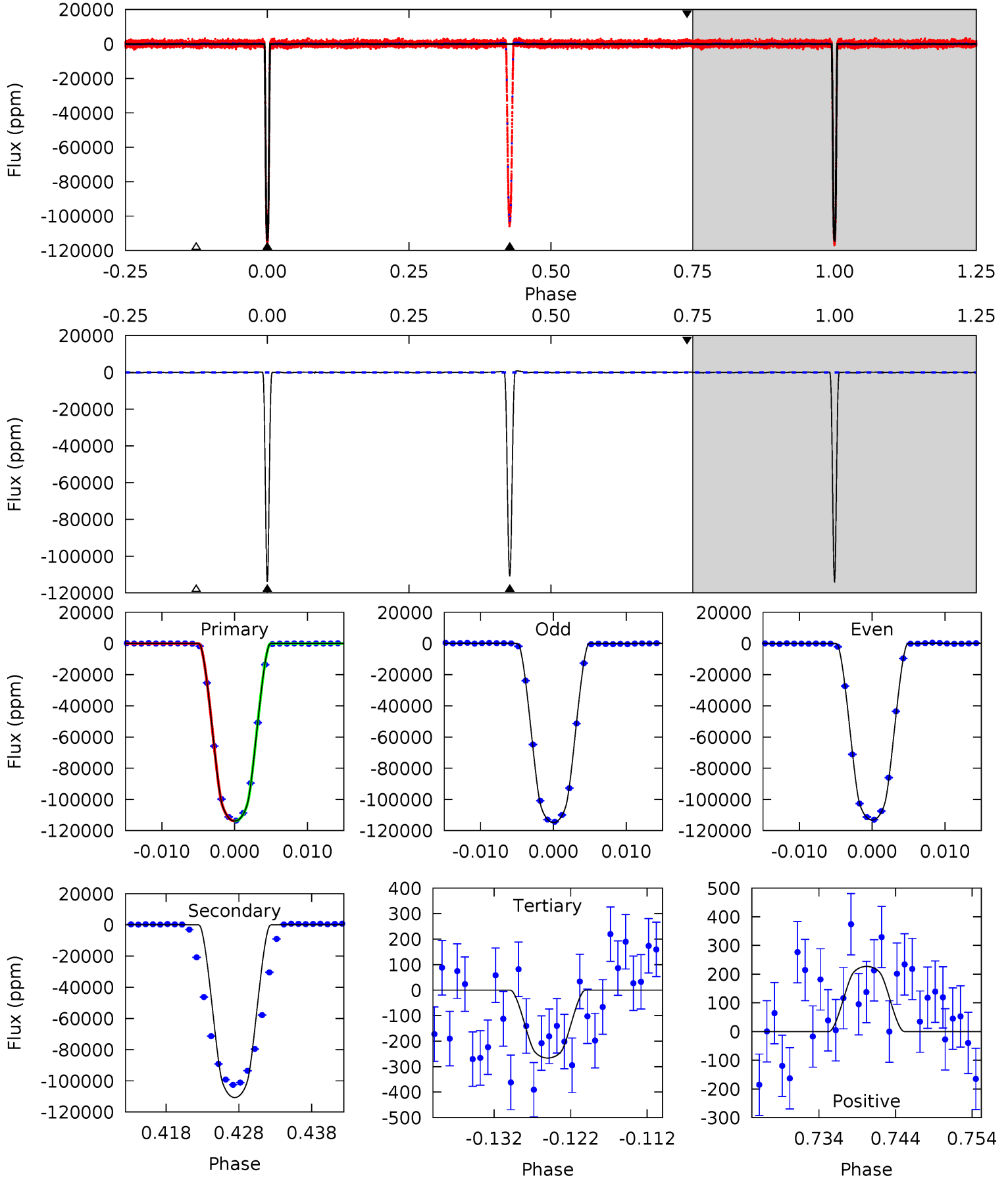
TCE 010751515-01 P= 56.405707 Days $T_0=170.620093$ (BKJD)



DV Model-Shift Uniqueness Test

010751515-01, P = 56.406529 Days, E = 170.608275 Days

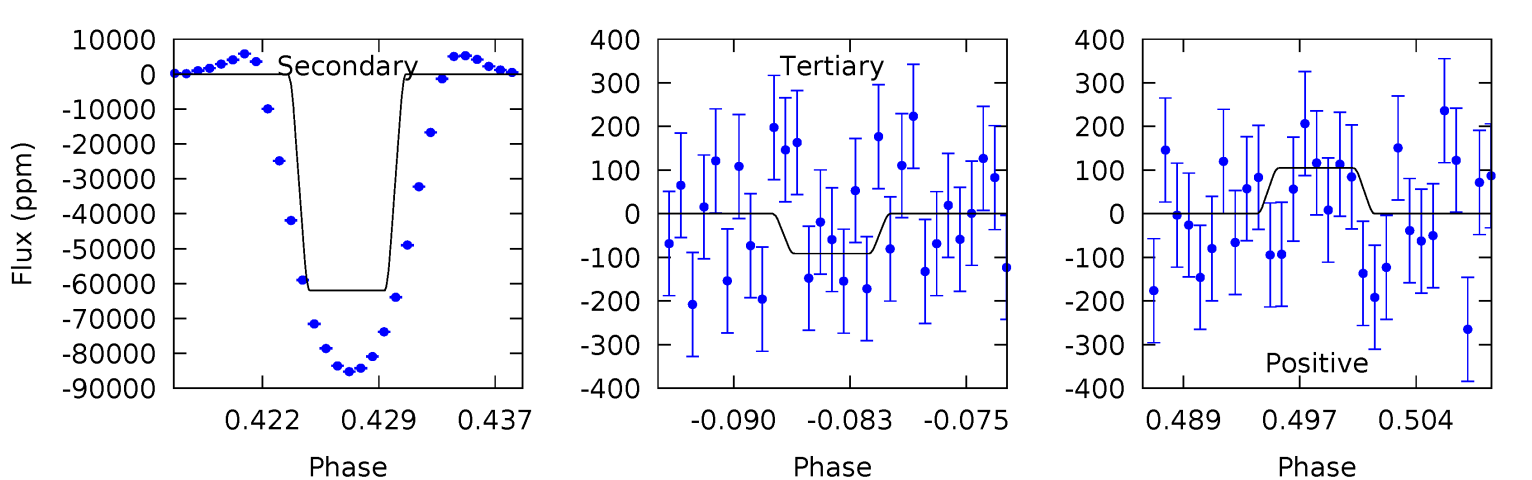
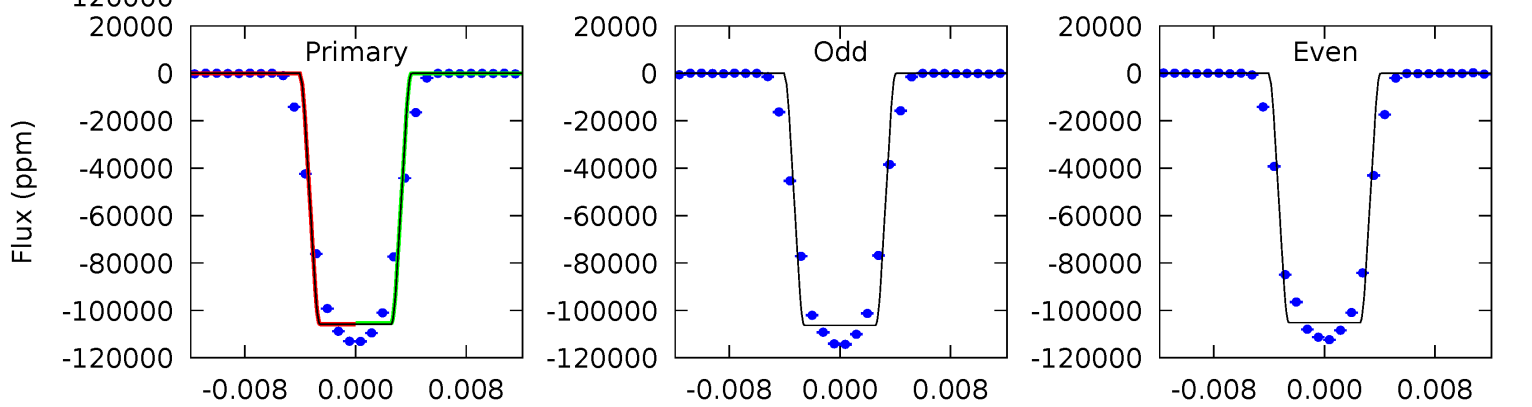
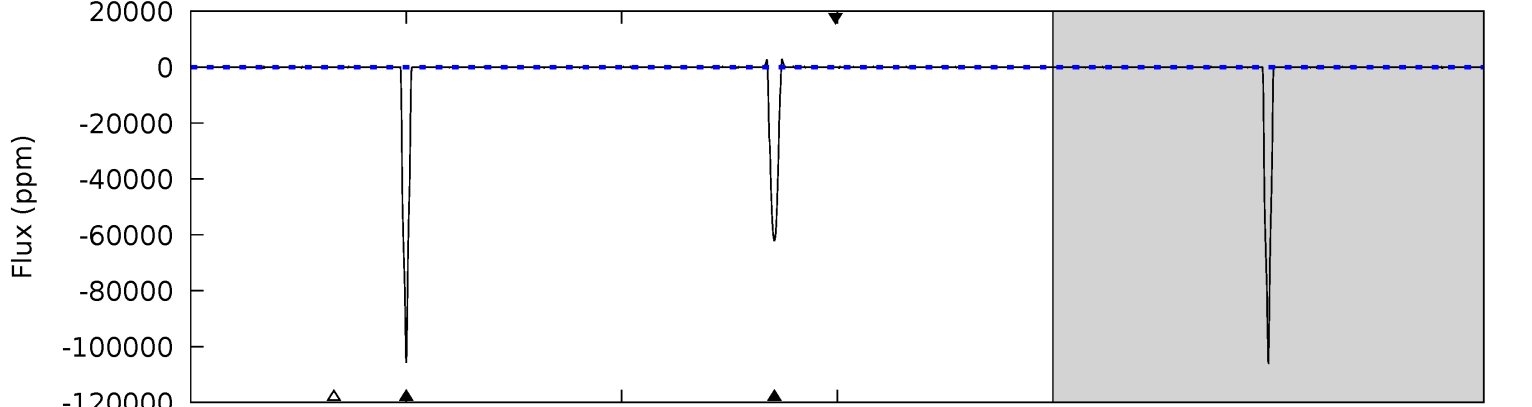
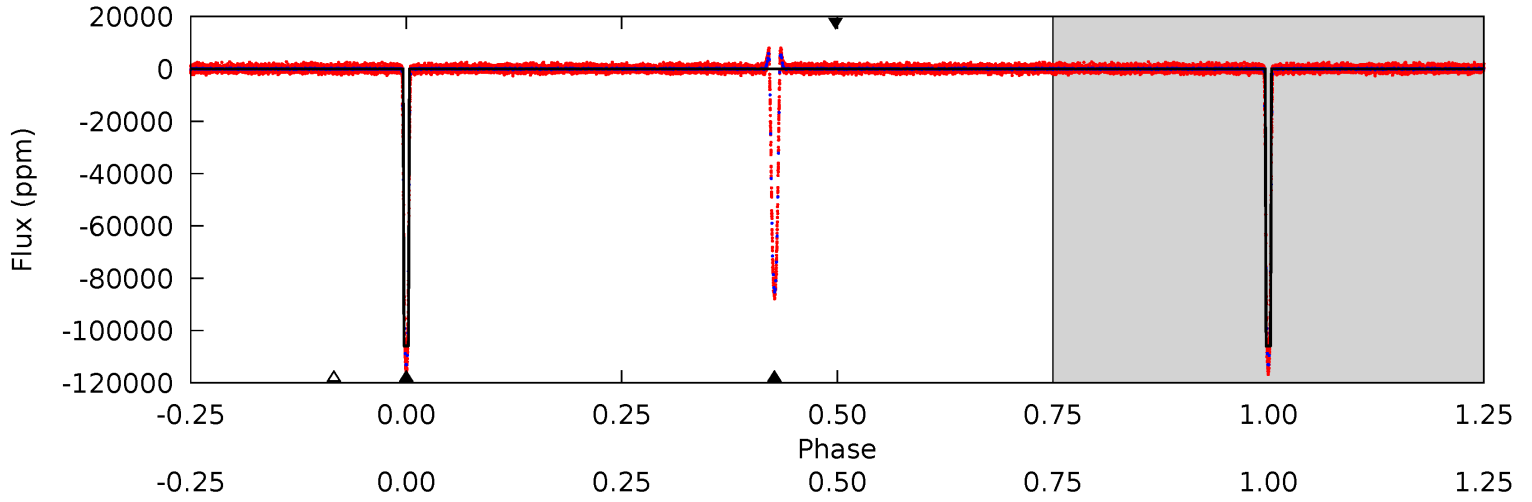
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3136	3048	7.33	6.25	5.02	2.57	3.53	3128	3130	3041	3042	22.3	1.00	0.01	0.55



Alt Model-Shift Uniqueness Test

010751515-01, P = 56.405707 Days, E = 170.620093 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2194	1285	1.89	2.17	5.08	2.67	3.23	2192	2191	1283	1283	11.5	1.00	0.03	0.90



Stellar Parameters For KIC 010751515

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5011^{+174}_{-174}	$4.617^{+0.066}_{-0.044}$	$-0.680^{+0.300}_{-0.300}$	$0.647^{+0.063}_{-0.058}$	$0.632^{+0.077}_{-0.030}$	$3.280^{+0.845}_{-0.562}$
	+3%/-3%	+1%/-1%	+44%/-44%	+10%/-9%	+12%/-5%	+26%/-17%
Source	KIC0	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 010751515-01 / KOI 3589.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-110704 ± 36	$22.53^{+1.20}_{-1.17}$	498^{+20}_{-19}	5241^{+197}_{-191}	8370^{+837}_{-635}
Alt.	-61994 ± 48	$23.44^{+1.29}_{-1.03}$	498^{+20}_{-21}	4513^{+140}_{-146}	4052^{+390}_{-296}

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 $A_{obs} \gg 1.0$

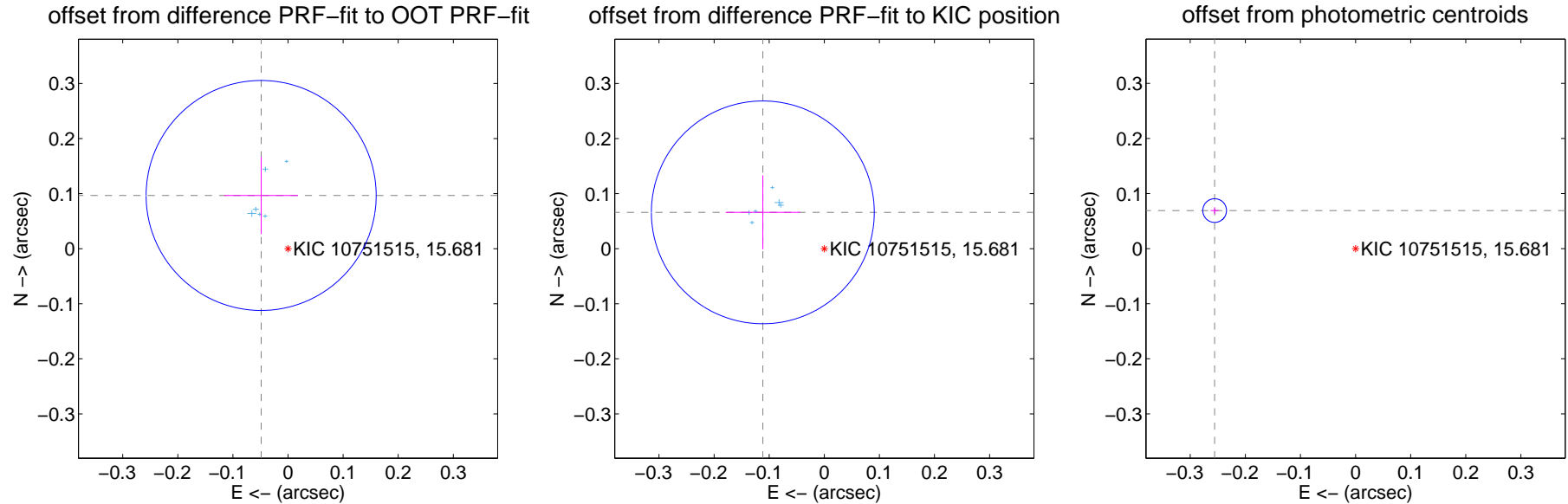
DV Centroid Data

Supplemental centroid analysis for 010751515-01. Kepler magnitude: 15.68. Transit SNR 1305.17

There are 6 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.108 ± 0.070	1.56	0.049 ± 0.067	0.097 ± 0.070
PRF-fit source offset from KIC position	0.130 ± 0.067	1.92	0.112 ± 0.068	0.066 ± 0.067
photometric centroid source offset	0.26 ± 0.01	36.95	0.26 ± 0.01	0.07 ± 0.01

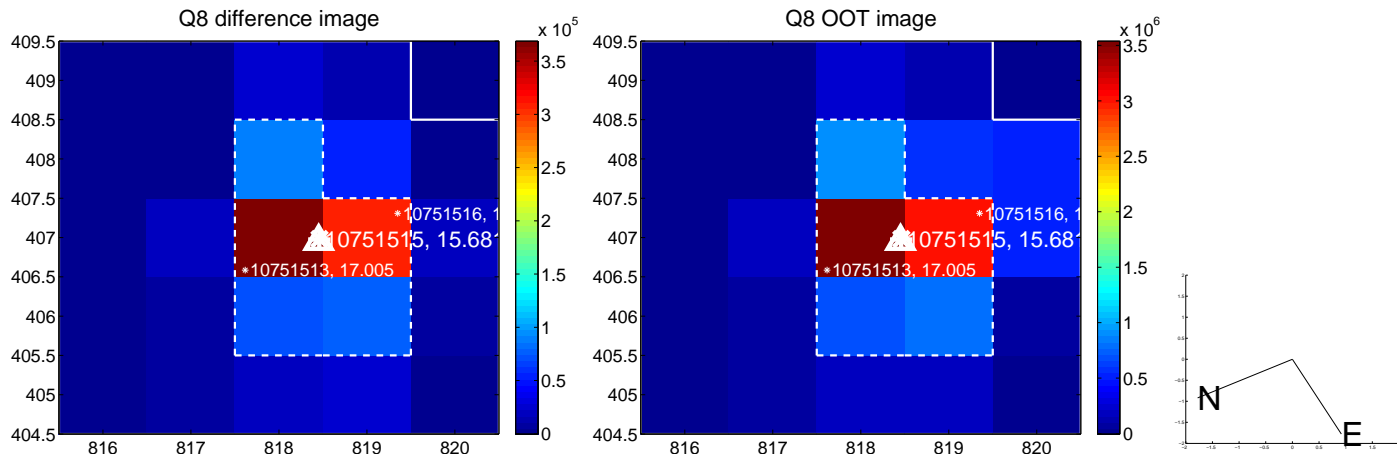
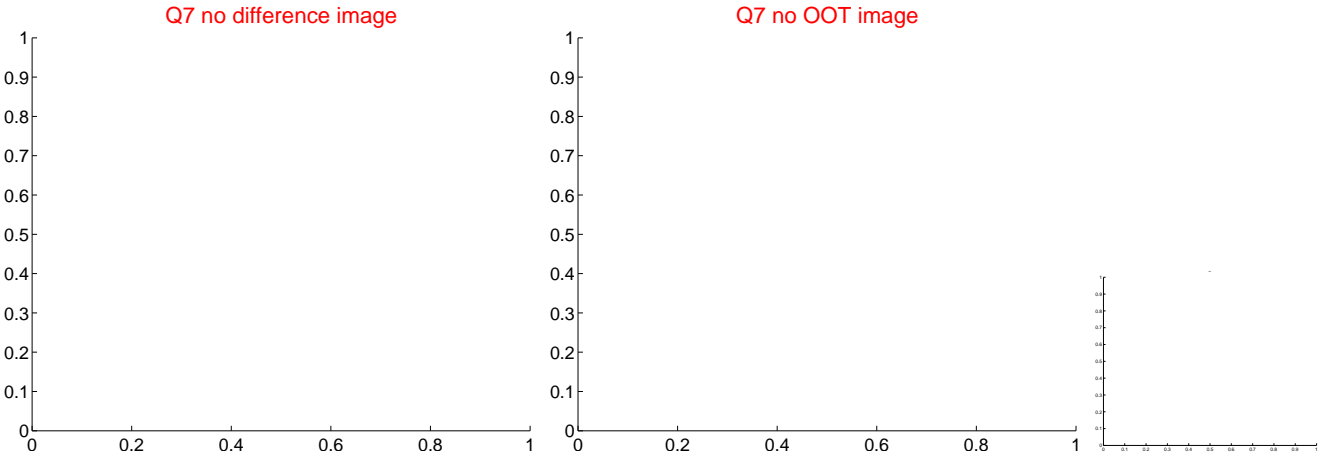
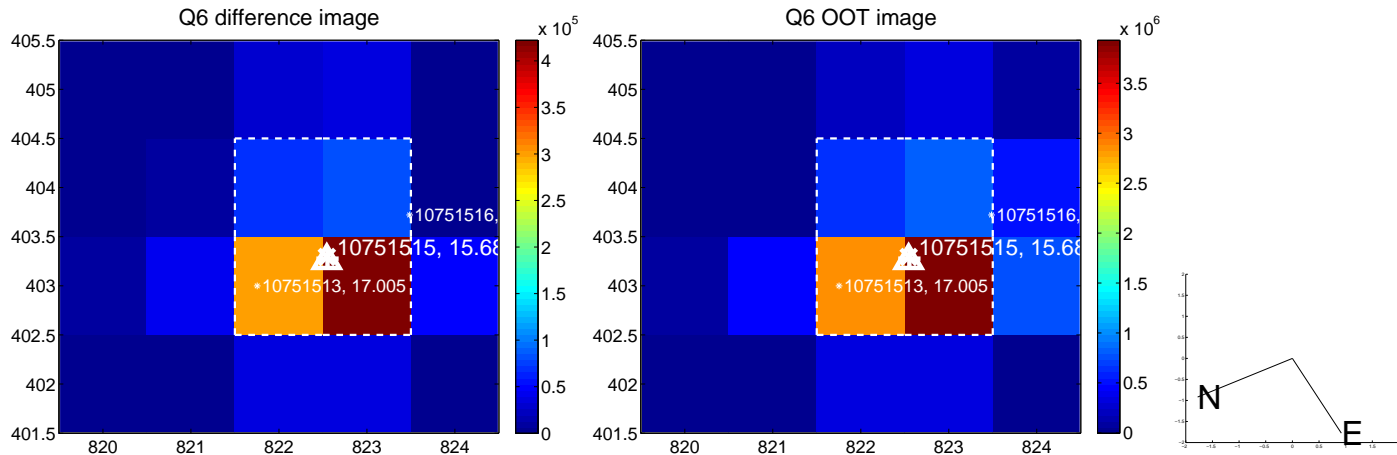
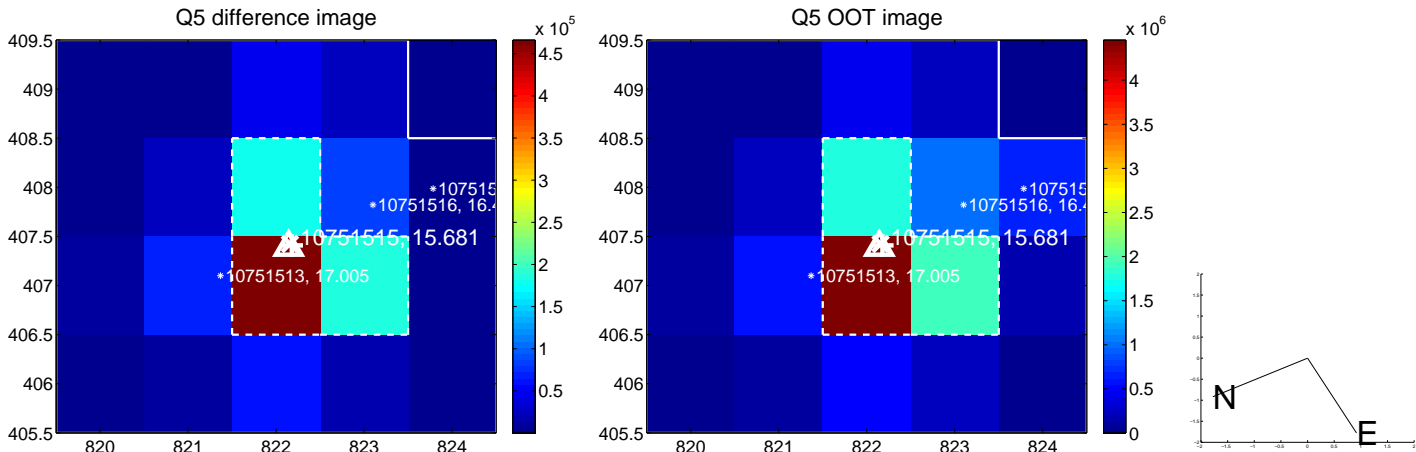


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

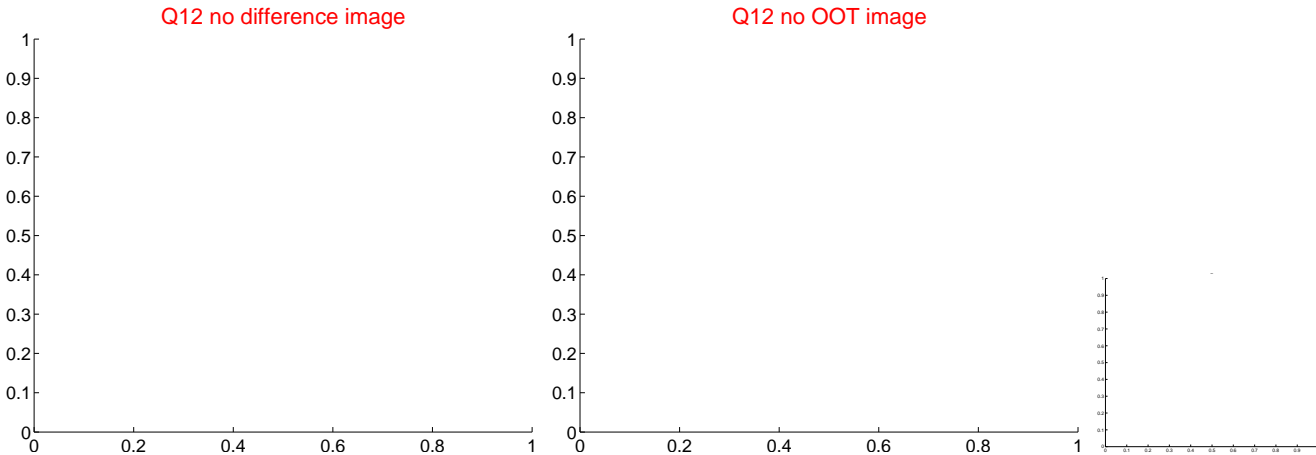
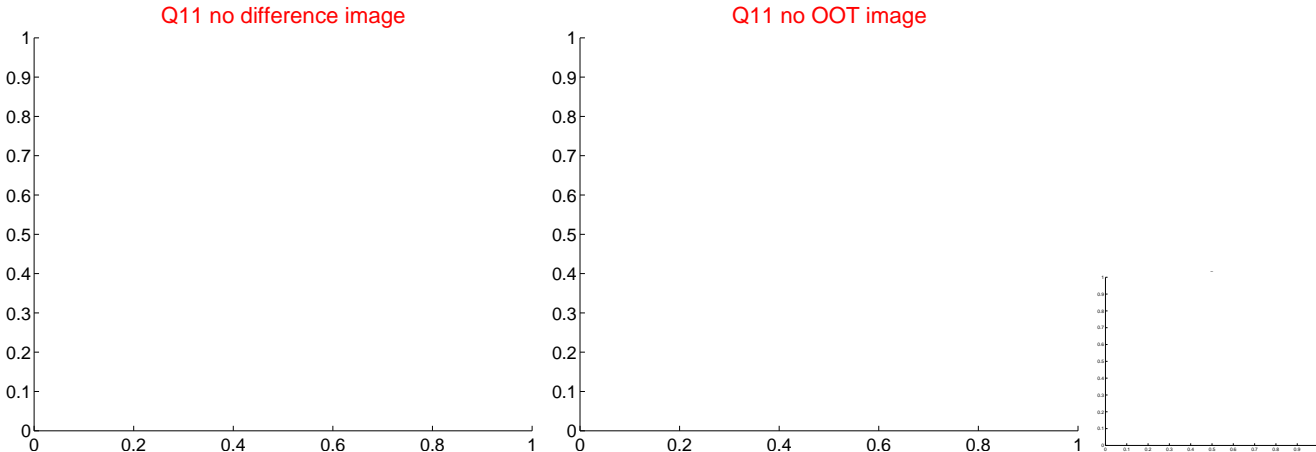
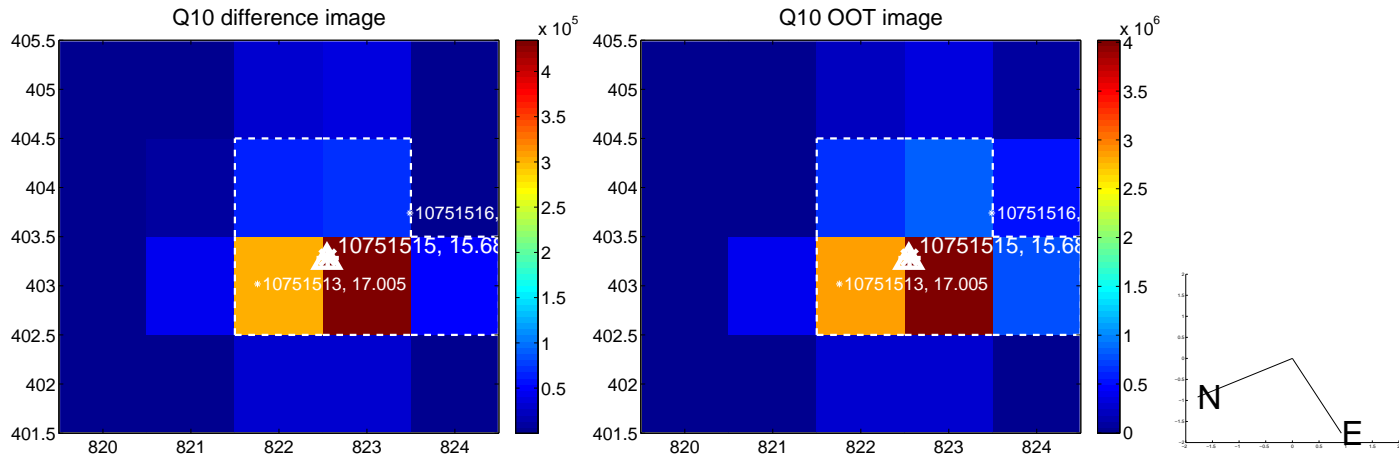
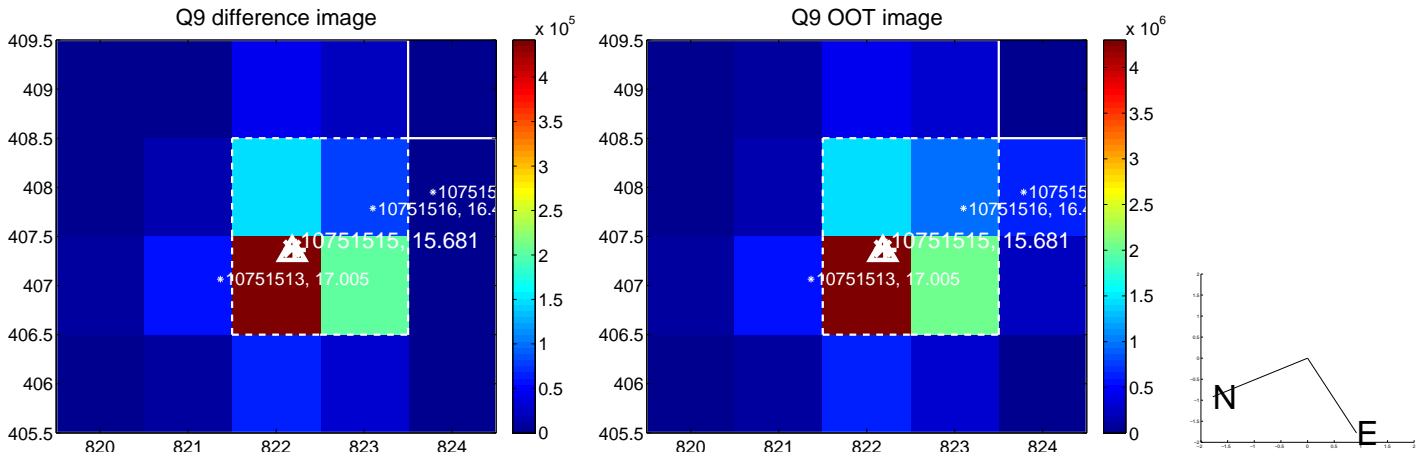
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

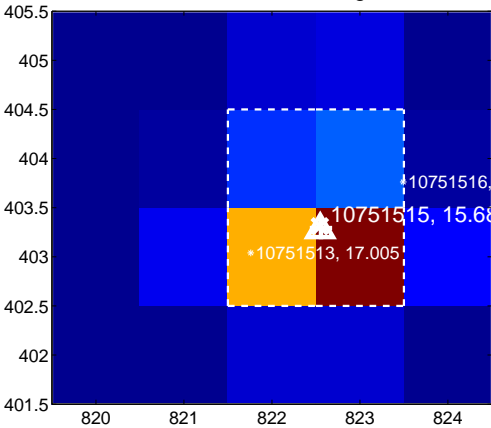
Q13 no difference image



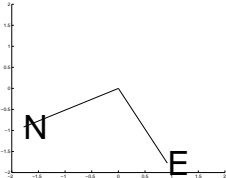
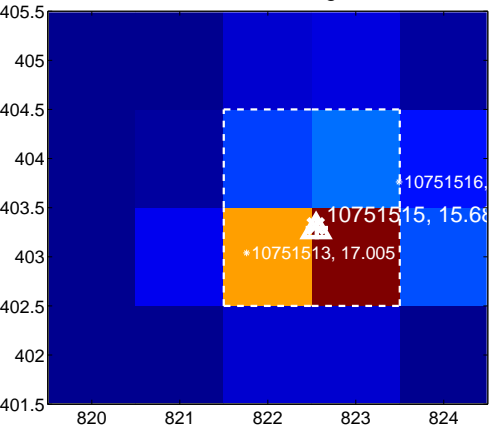
Q13 no OOT image



Q14 difference image



Q14 OOT image



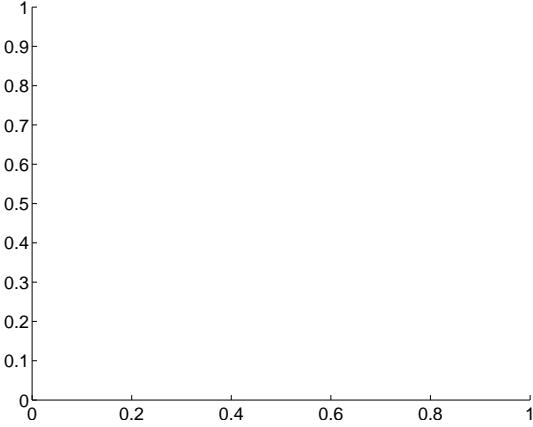
Q15 no difference image



Q15 no OOT image



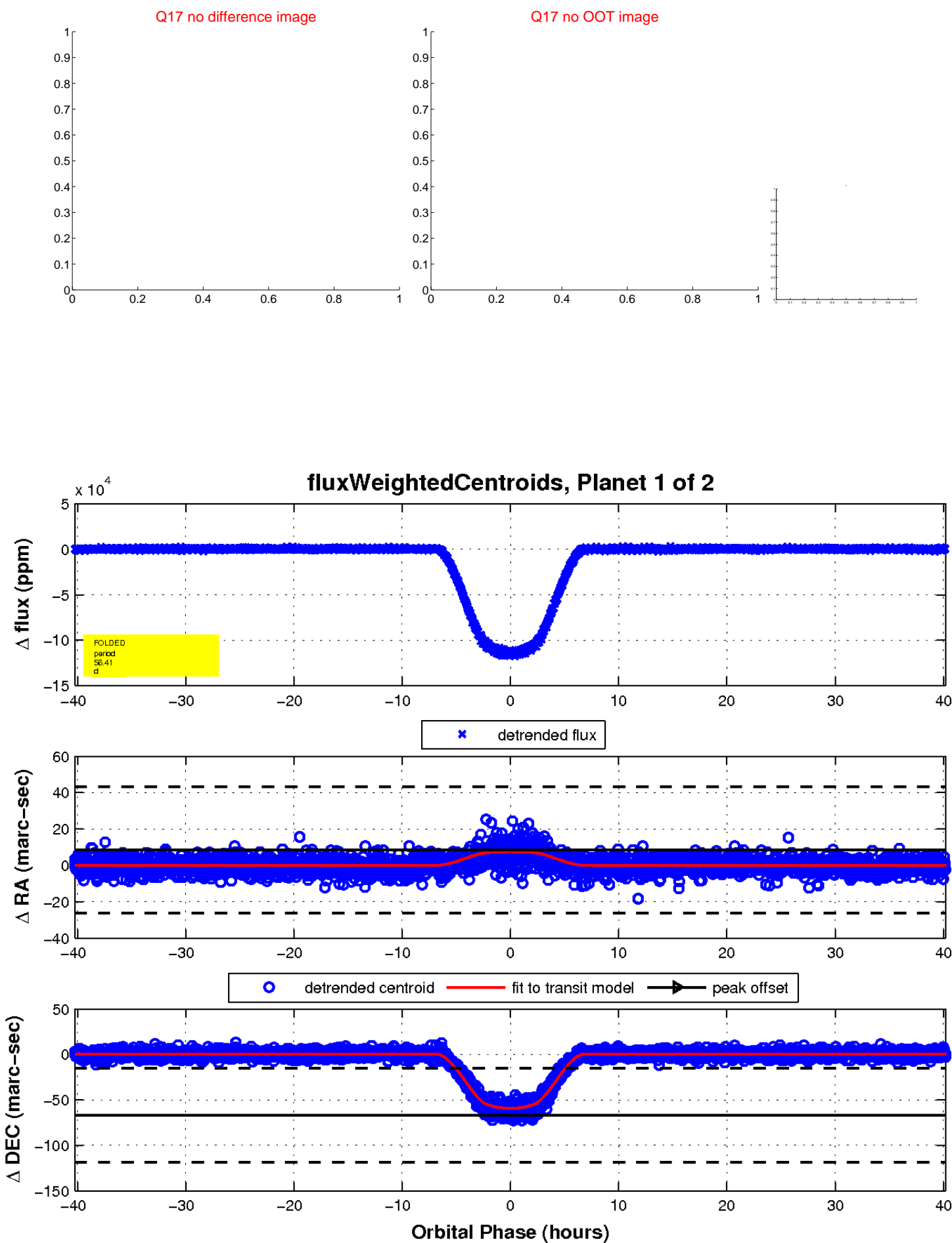
Q16 no difference image



Q16 no OOT image

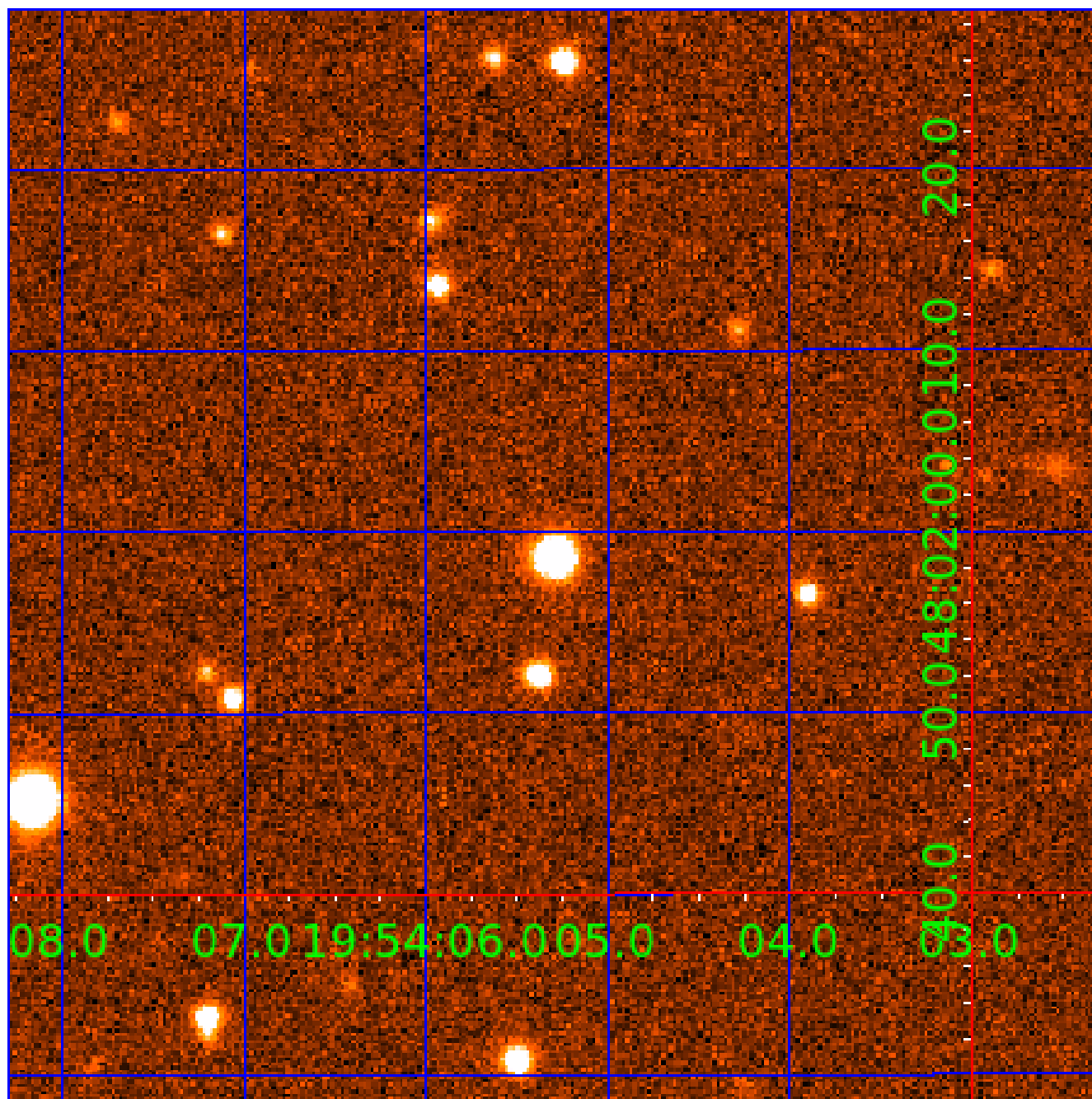


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010751515

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})
010751515-01	OBS	3589.01	56.406529	170.608275	113963.7	13.415	1391.7	1305.2	0.65	5011	22.46	3.87
010751515-02	OBS	No	56.406546	138.309323	102542.4	18.456	1314.1	1154.0	0.65	5011	21.90	3.87

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010751515-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—MOD_ODDEVEN_DV—HAS_SEC_TCE
010751515-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

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.

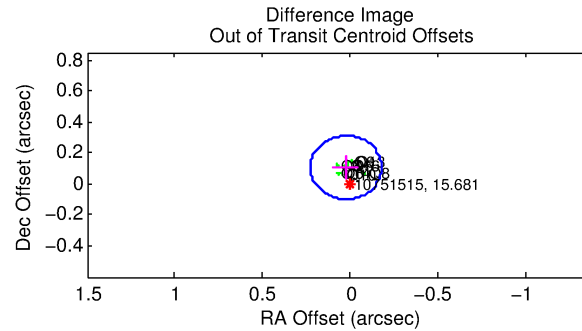
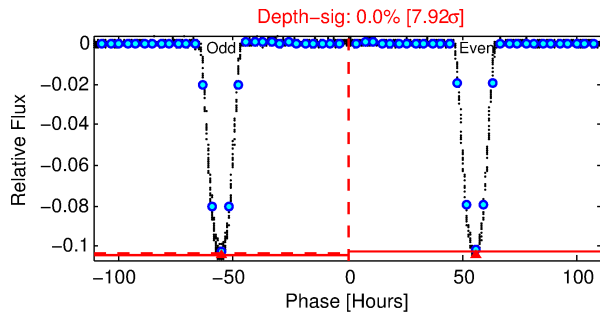
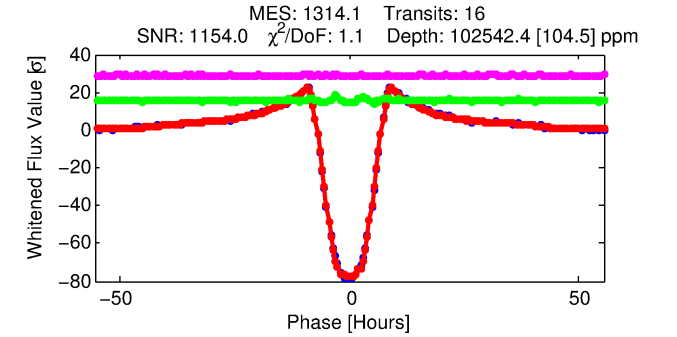
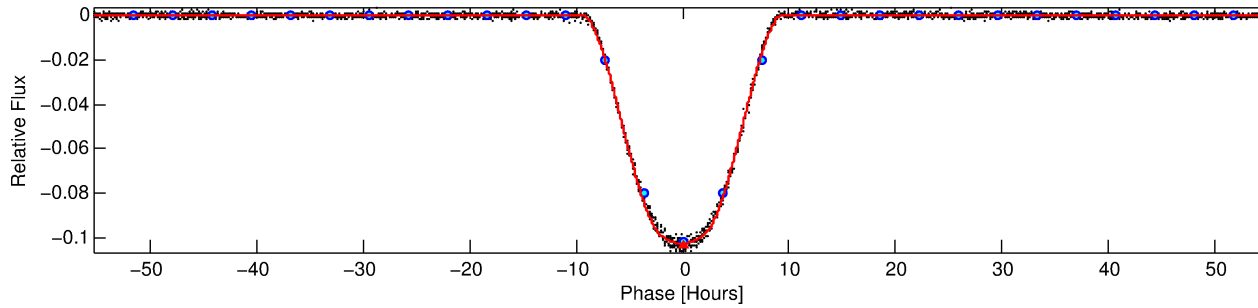
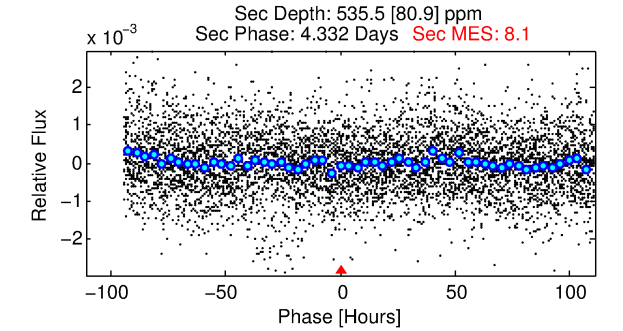
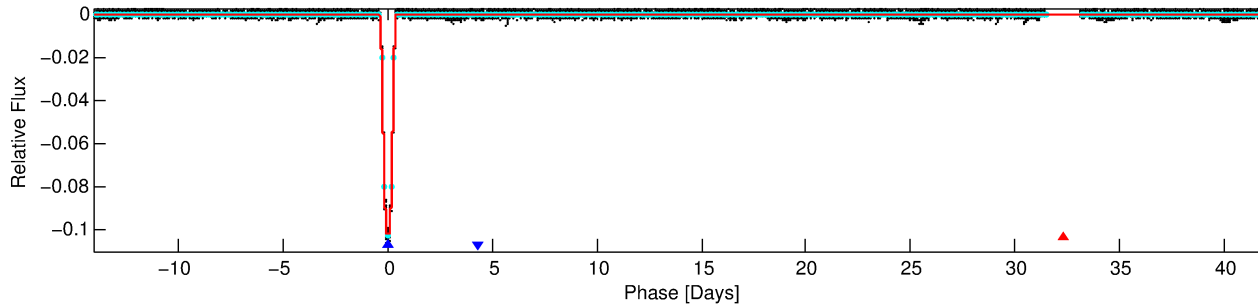
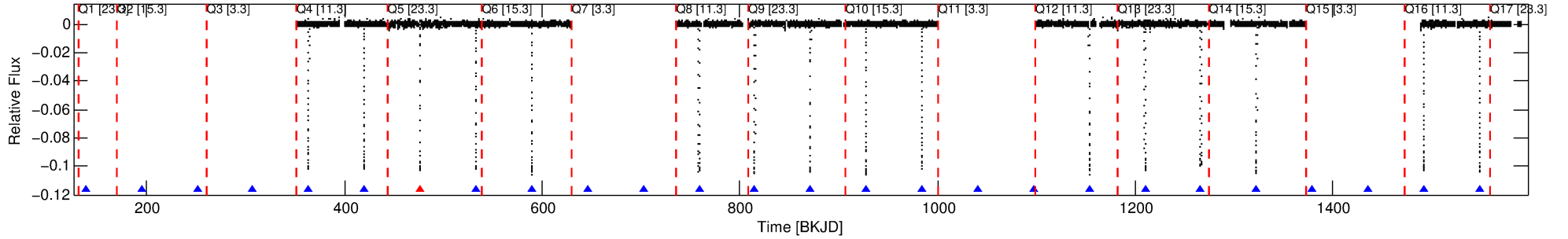
Ephemeris Match Information For 010751515-02

No Significant Match Found

DV One-Page Summary

KIC: 10751515 Candidate: 2 of 2 Period: 56.407 d
KOI: K03589.01 Corr: 0.994

Kp: 15.68 R*: 0.65 Rs Teff: 5011.0 K Logg: 4.62 Fe/H: -0.680



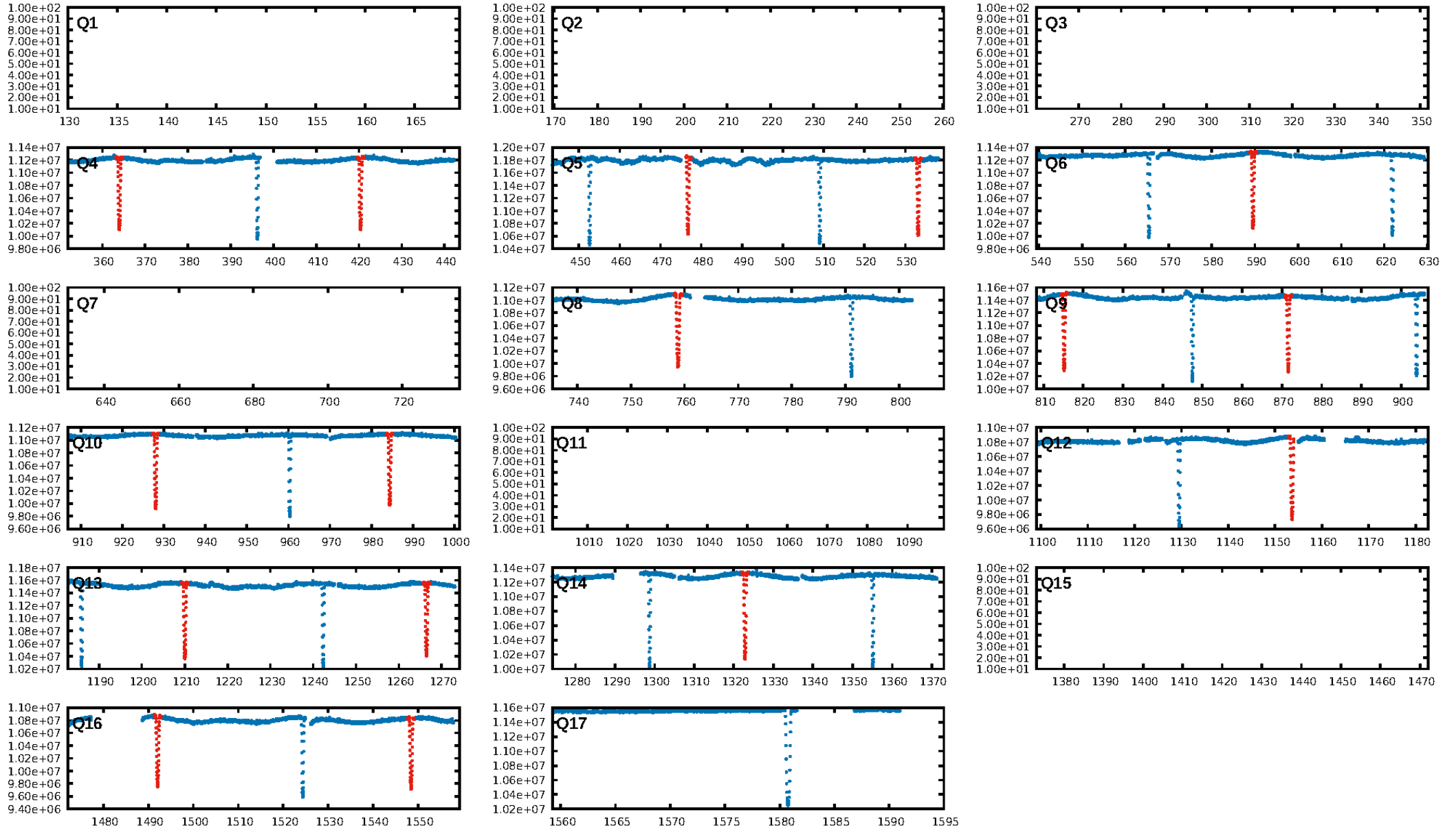
DV Fit Results:

Period = 56.40655 [0.00002] d
Epoch = 138.3093 [0.0004] BKJD
Rp/R* = 0.3101 [0.0003]
a/R* = 26.98 [0.03]
b = 0.62 [0.00]
Seff = 3.87 [0.71]
Teq = 358 [16] K
Rp = 21.90 [2.13] Re
a = 0.2471 [0.0203] AU
Ag = 37.51 [7.25] [5.04σ]
Teffp = 1369 [70] K [14.02σ]

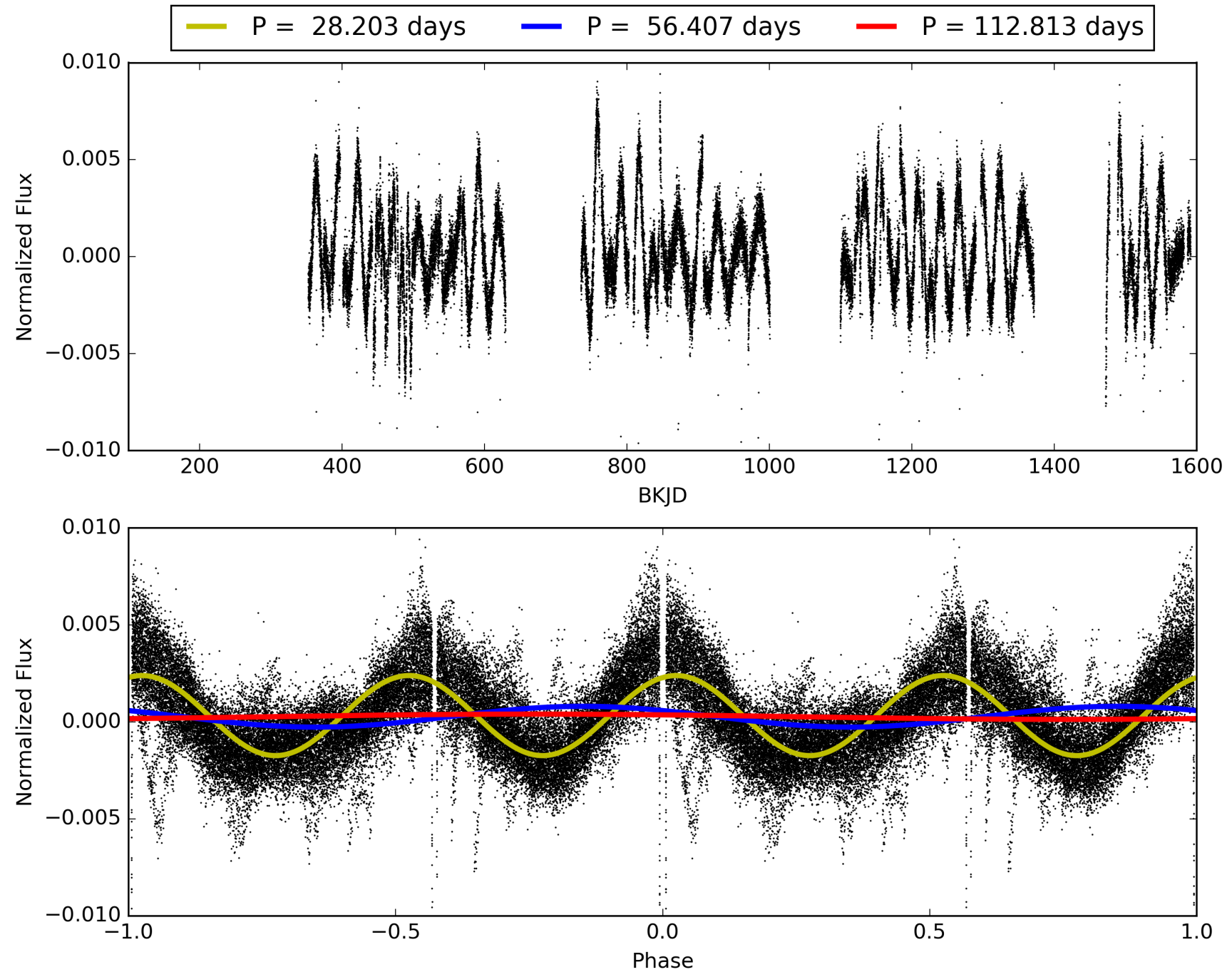
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 98.8%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 0.94 [15/16]
GhostDiagnostic-chr: 4.034
Centroid-sig: 0.0%
Centroid-so: 0.283 arcsec [37.80σ]
OotOffset-rm: 0.110 arcsec [1.61σ]
KicOffset-rm: 0.133 arcsec [1.86σ]
OotOffset-st: 3/0/3/3 [9]
KicOffset-st: 3/0/3/3 [9]
DiffImageQuality-fgm: 1.00 [9/9]
DiffImageOverlap-fno: 1.00 [9/9]

TCE 010751515-02, PDC Light Curves

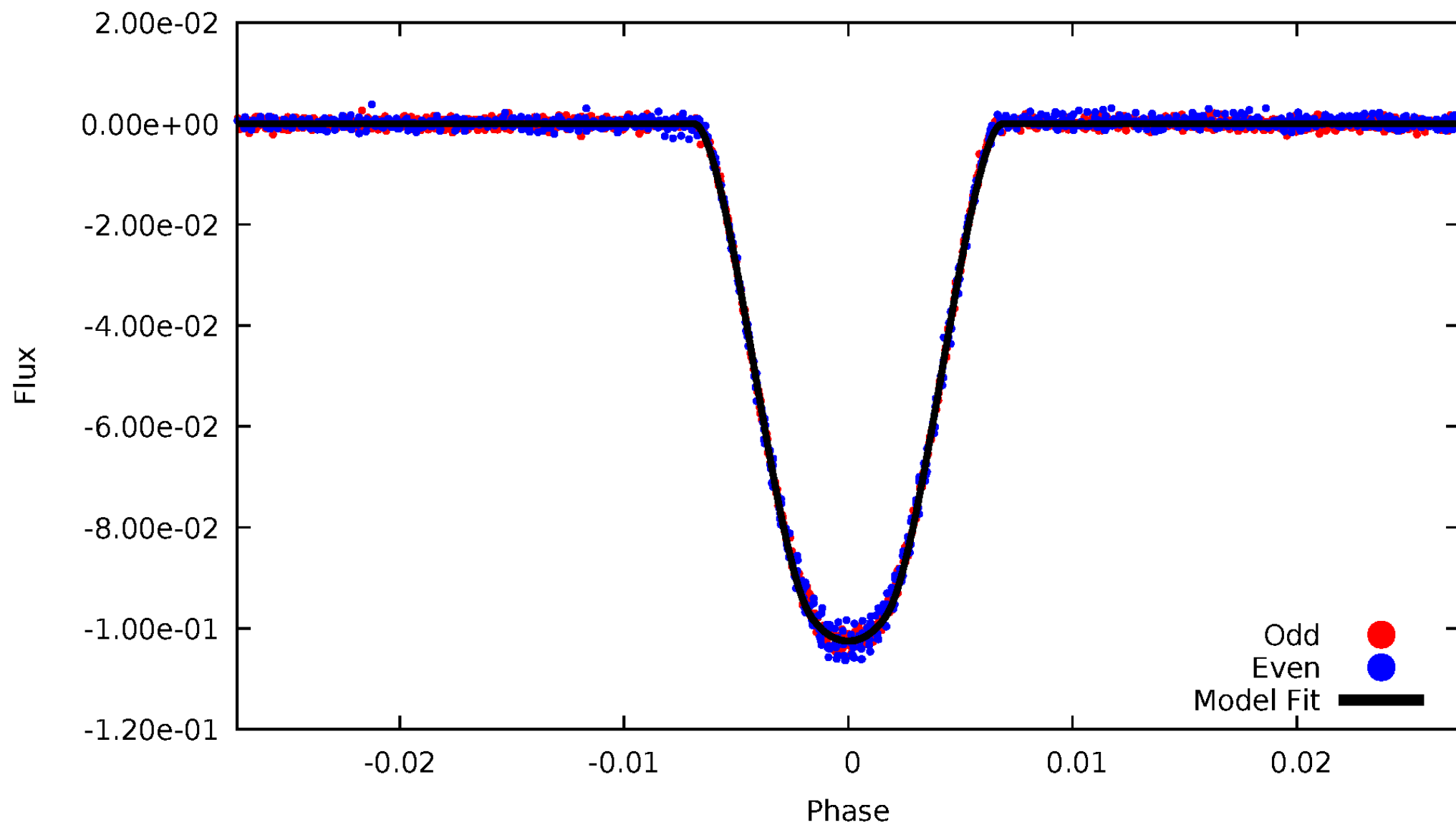


TCE 010751515-02



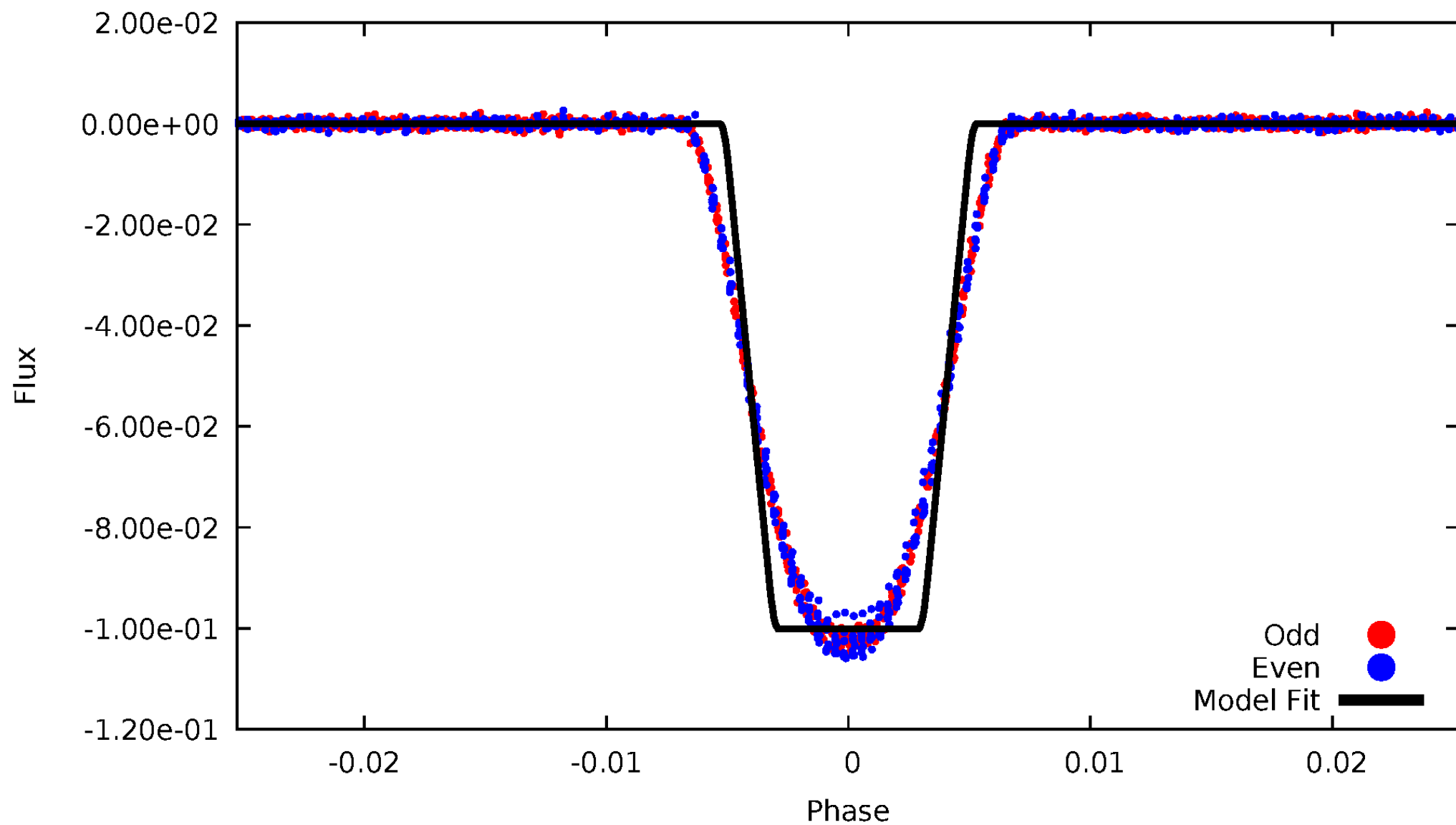
DV Odd/Even

TCE 010751515-02



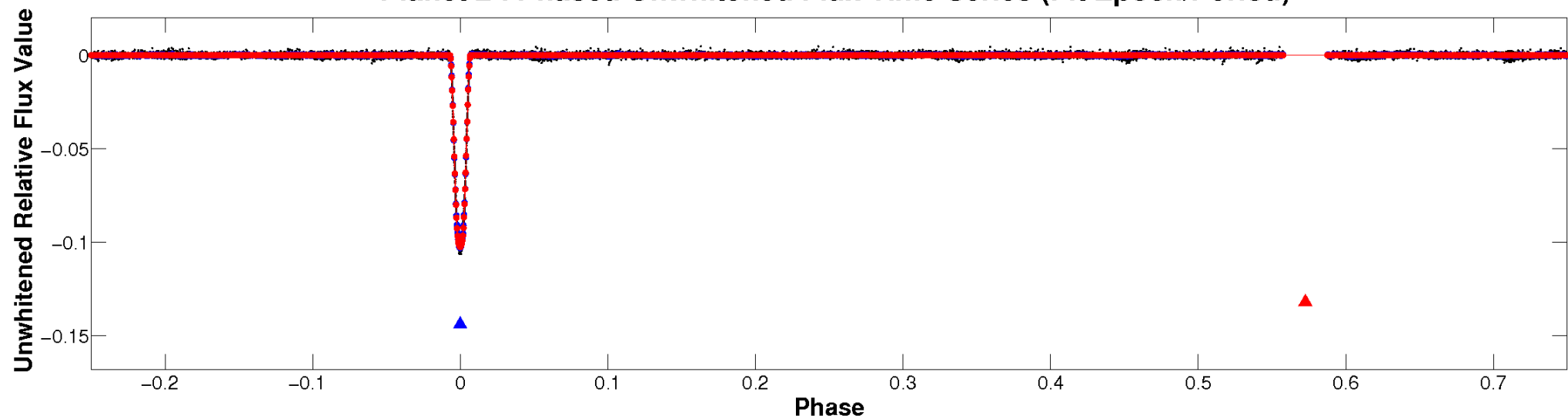
ALT Odd/Even

TCE 010751515-02

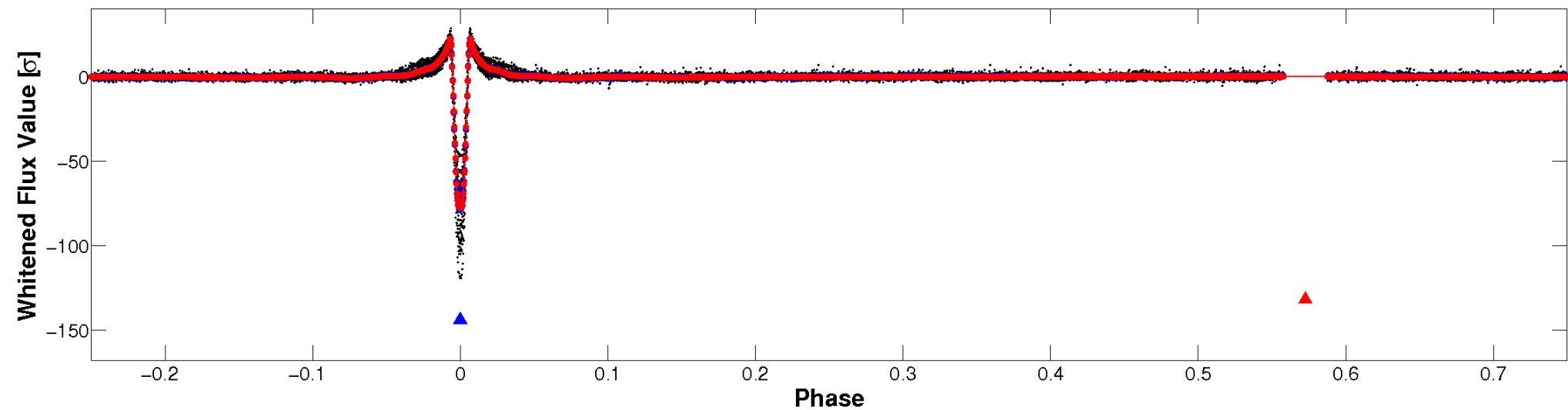


Non-Whitened Vs. Whitened Light Curve

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

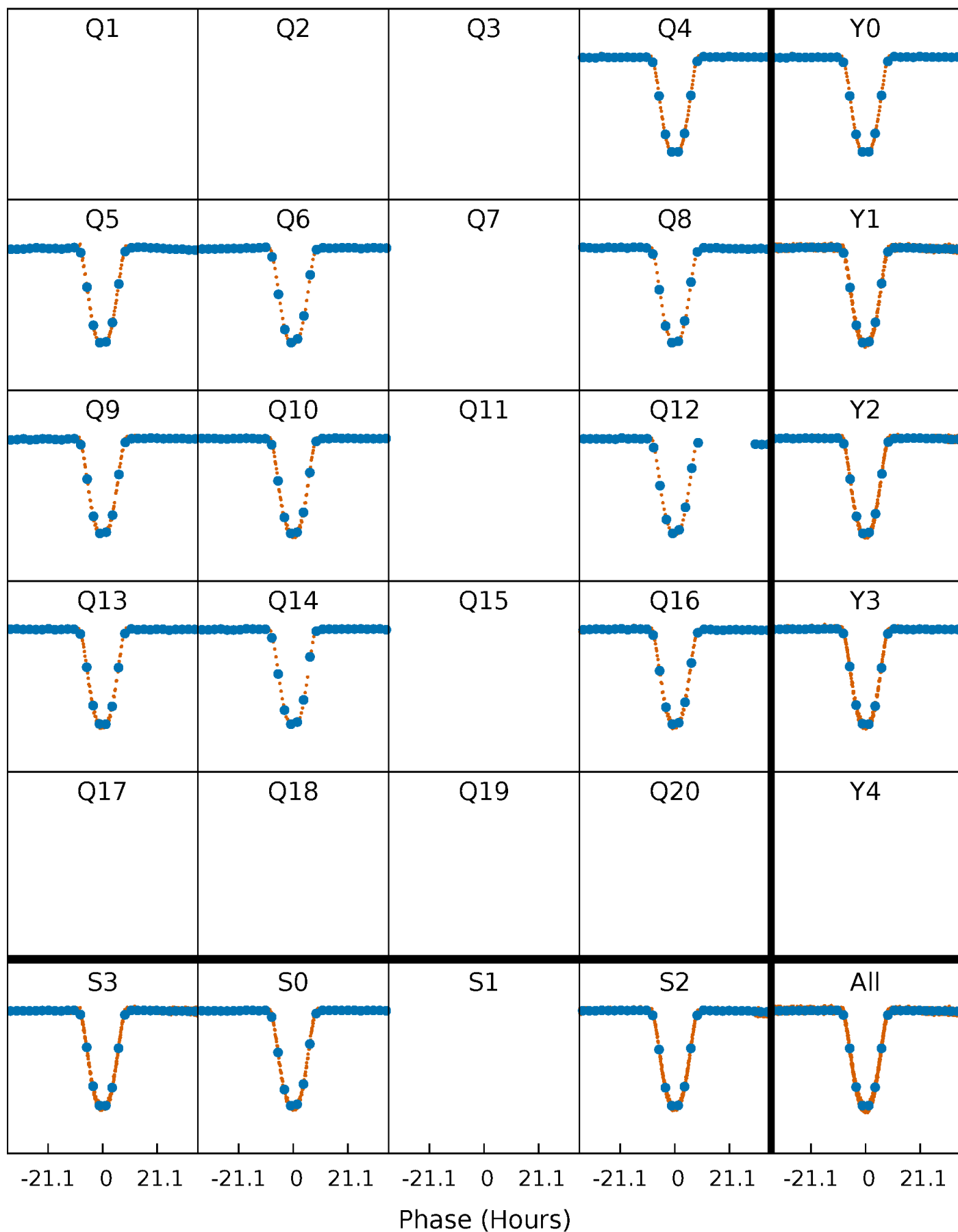


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



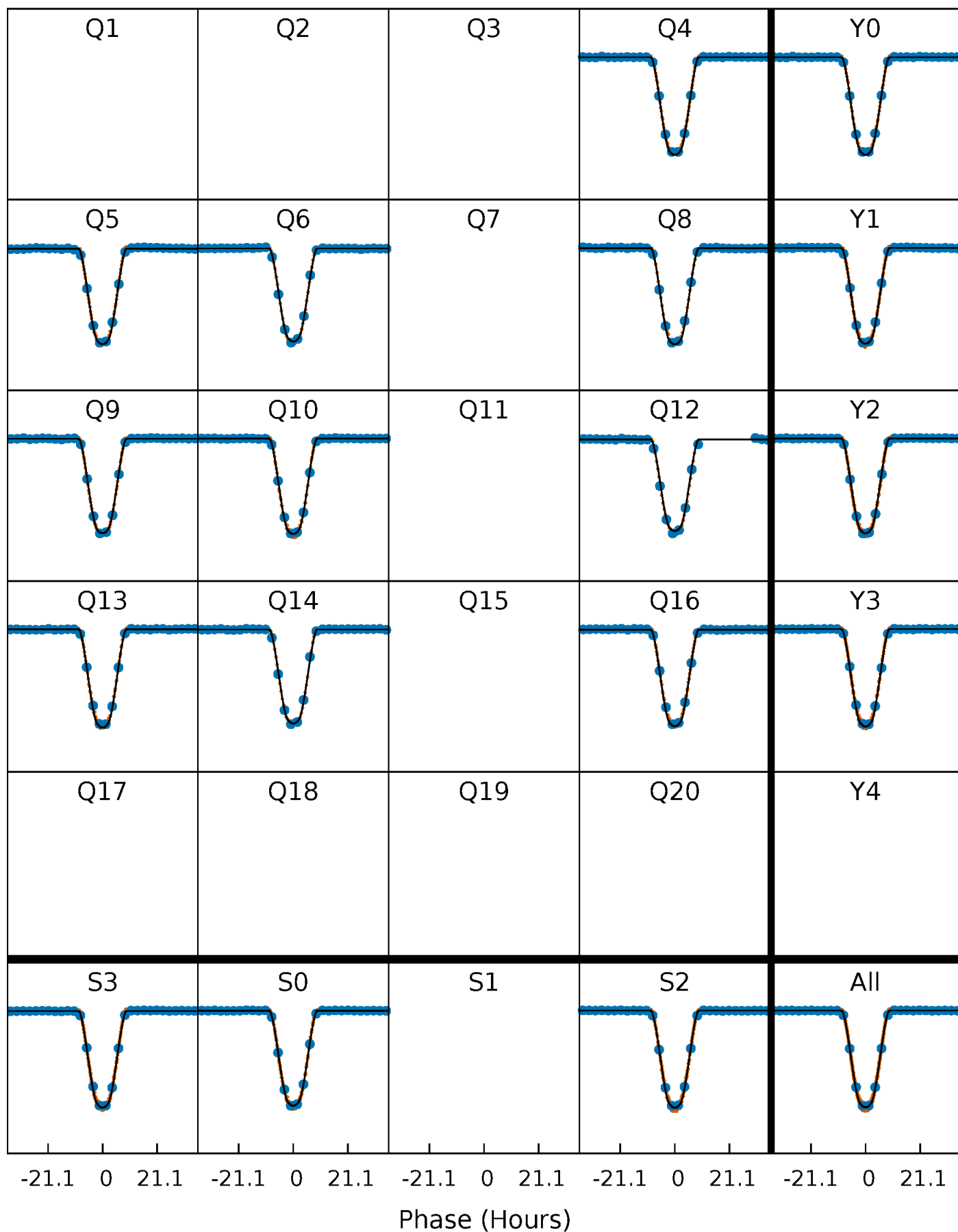
PDC Quarter-Phased Transit Curves

TCE 010751515-02 P= 56.406546 Days $T_0=138.309323$ (BKJD)



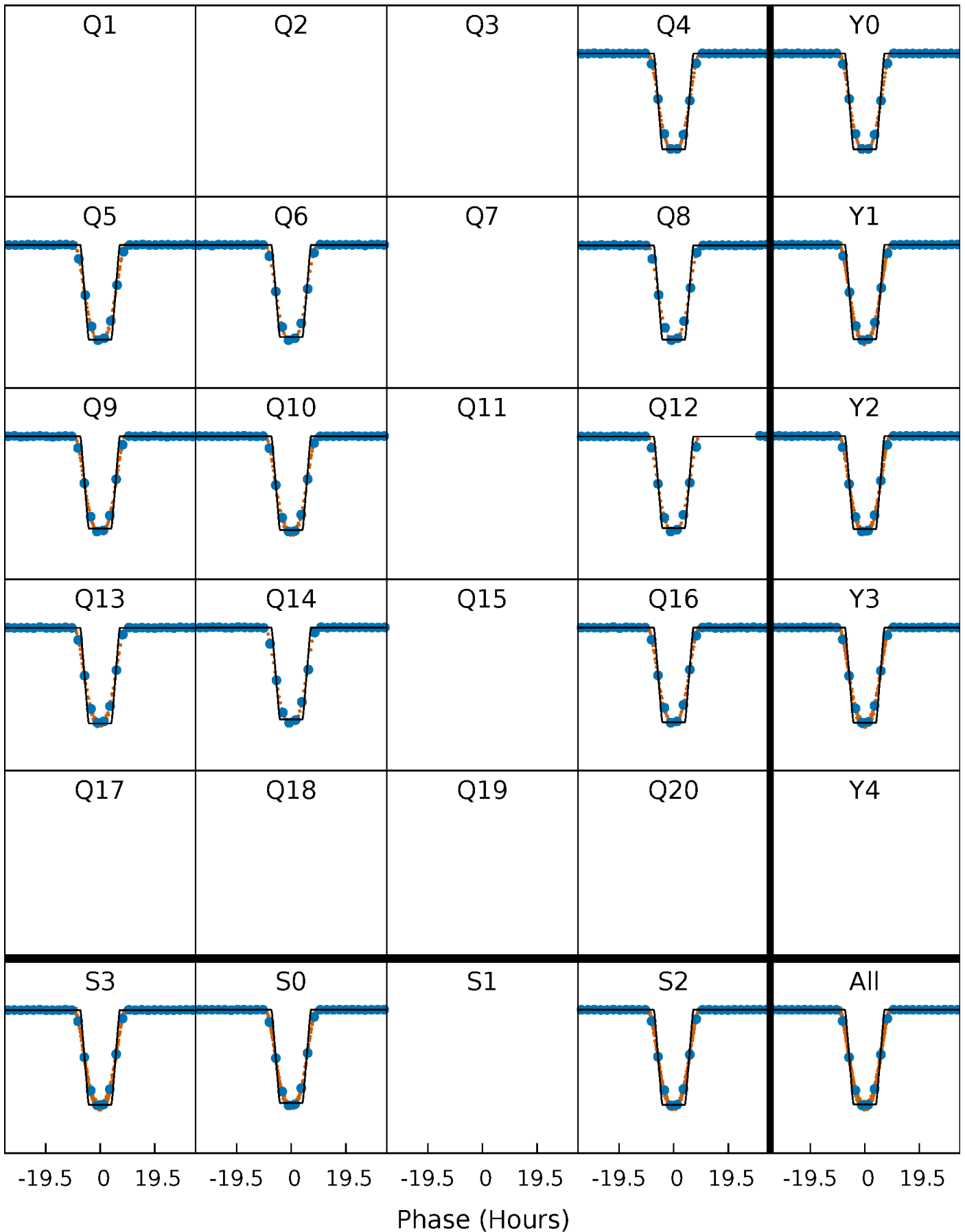
DV Quarter-Phased Transit Curves

TCE 010751515-02 P= 56.406546 Days $T_0=138.309323$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

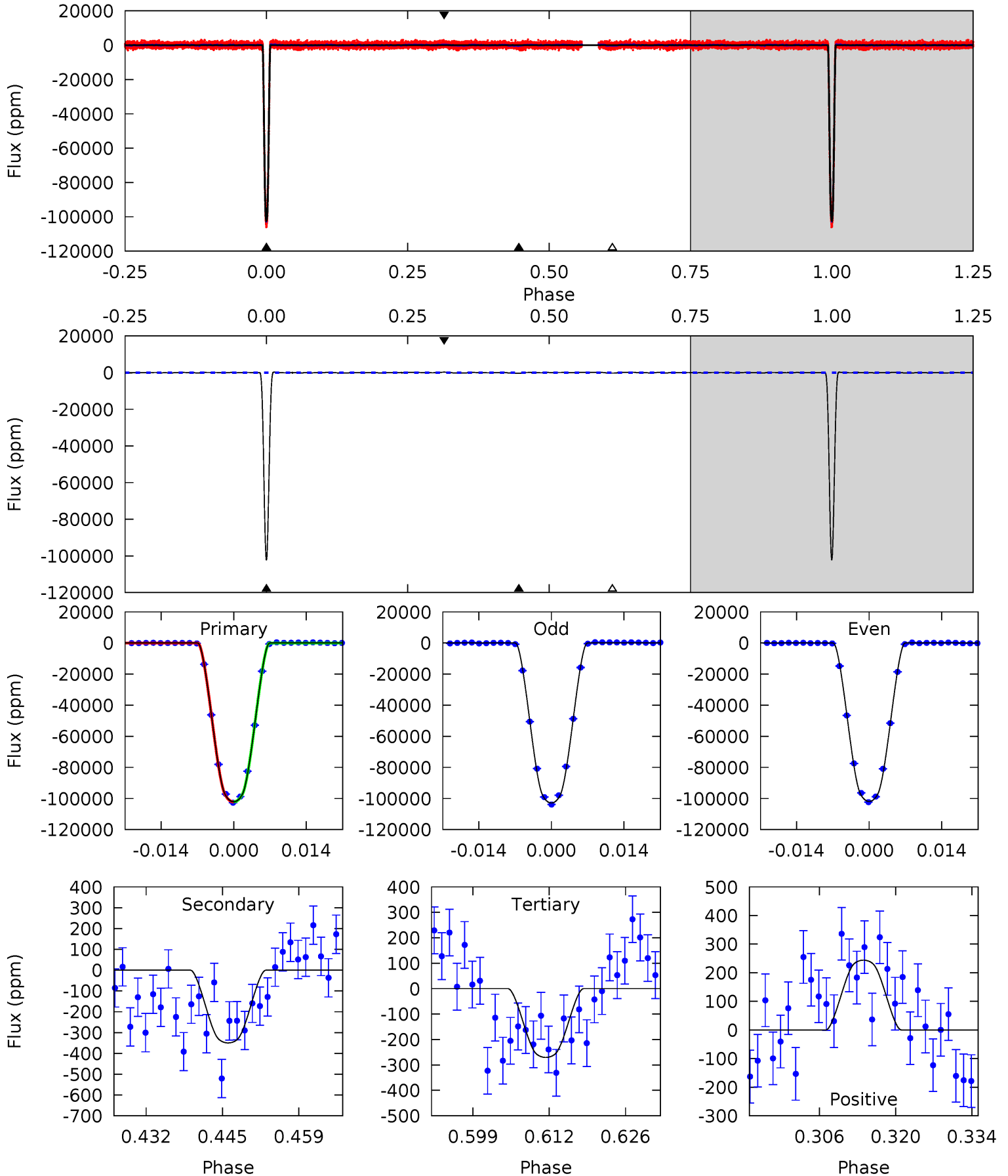
TCE 010751515-02 P= 56.406960 Days $T_0=138.303902$ (BKJD)



DV Model-Shift Uniqueness Test

010751515-02, P = 56.406546 Days, E = 138.309323 Days

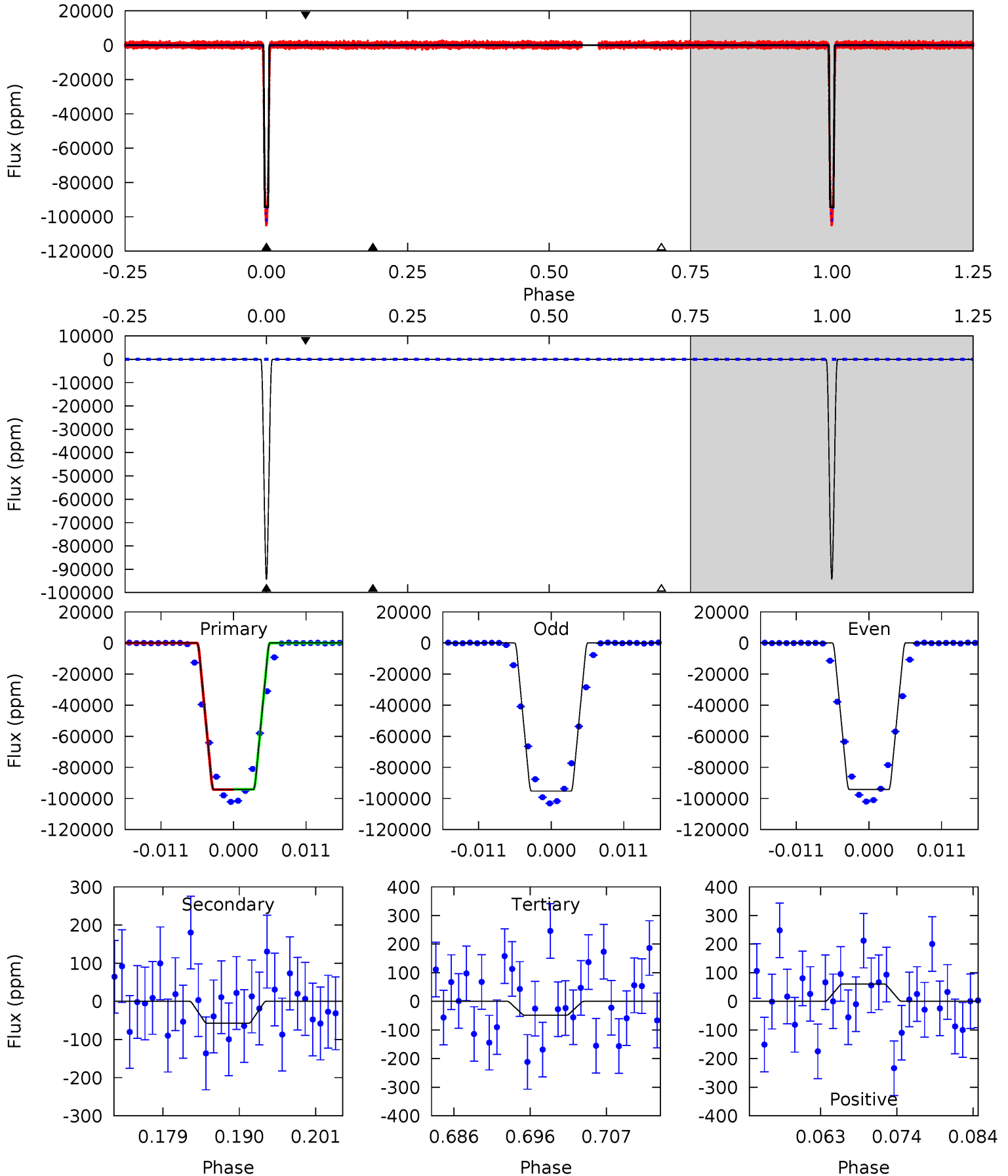
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3214	11.0	8.51	7.68	4.96	2.46	3.26	3205	3206	2.50	3.33	15.4	1.00	0.00	2.07



Alt Model-Shift Uniqueness Test

010751515-02, P = 56.406960 Days, E = 138.303902 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2818	1.71	1.45	1.81	5.02	2.56	0.54	2816	2816	0.26	-0.10	15.3	1.00	0.00	2.81



Stellar Parameters For KIC 010751515

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	5011^{+174}_{-174}	$4.617^{+0.066}_{-0.044}$	$-0.680^{+0.300}_{-0.300}$	$0.647^{+0.063}_{-0.058}$	$0.632^{+0.077}_{-0.030}$	$3.280^{+0.845}_{-0.562}$
	+3%/-3%	+1%/-1%	+44%/-44%	+10%/-9%	+12%/-5%	+26%/-17%
Source	KIC0	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 010751515-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-350 ± 32	$21.84^{+1.19}_{-1.08}$	497^{+20}_{-20}	2166^{+42}_{-41}	25^{+3}_{-2}
Alt.	-57 ± 33	$22.25^{+1.24}_{-1.07}$	497^{+21}_{-21}	1791^{+92}_{-167}	$4.033^{+2.383}_{-2.472}$

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 $A_{obs} \gg 1.0$

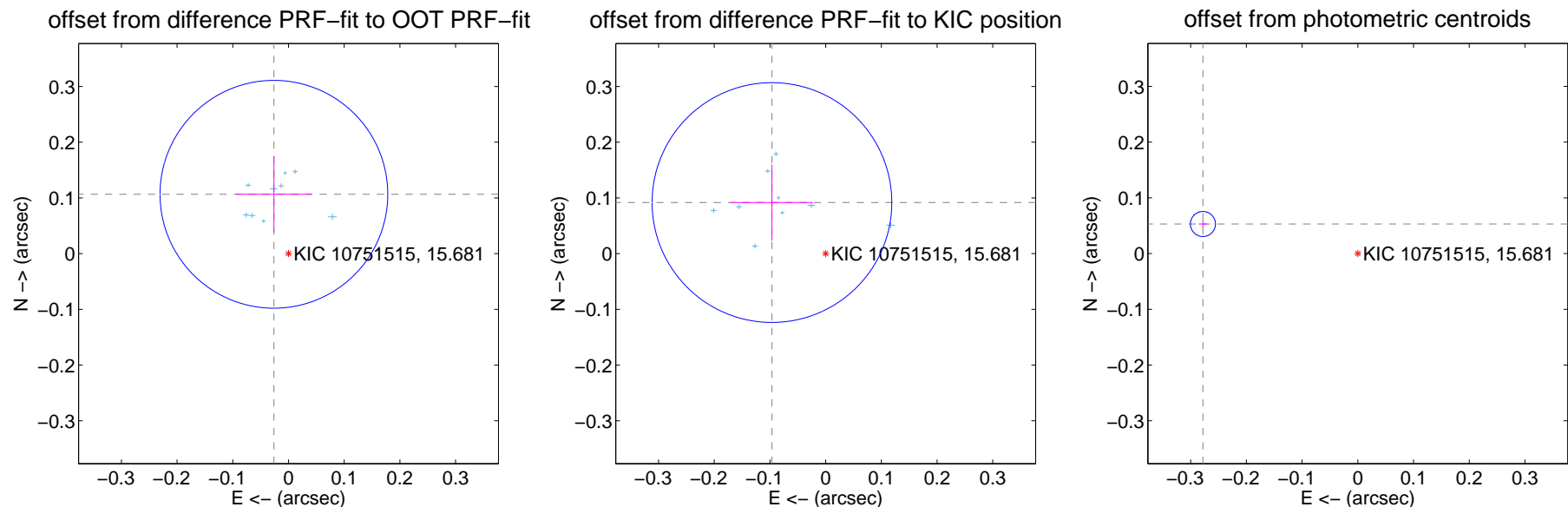
DV Centroid Data

Supplemental centroid analysis for 010751515-02. Kepler magnitude: 15.68. Transit SNR 1154.00

There are 9 quarters with good PRF difference image offsets

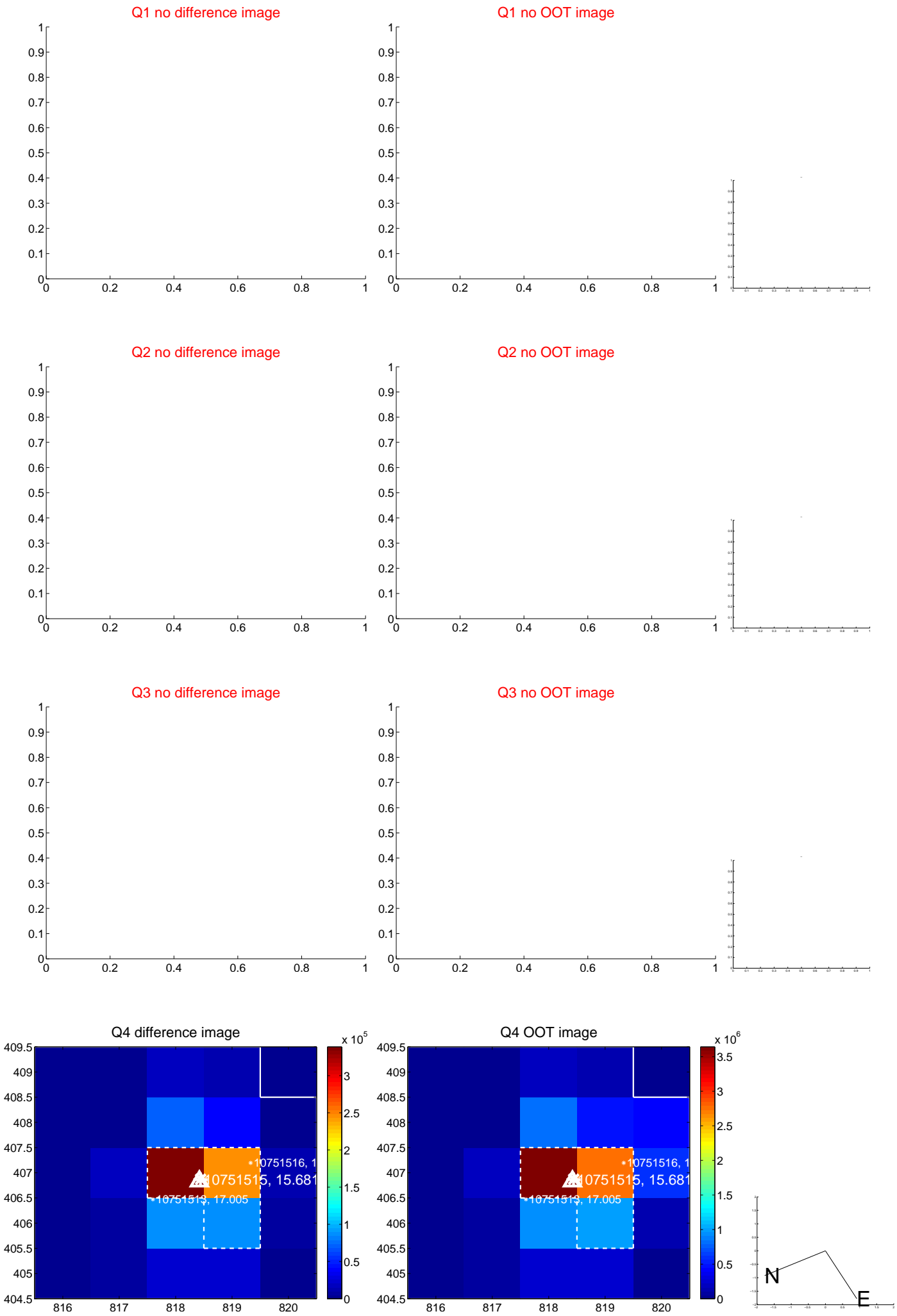
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.110 ± 0.068	1.61	0.026 ± 0.068	0.107 ± 0.068
PRF-fit source offset from KIC position	0.133 ± 0.072	1.86	0.096 ± 0.073	0.092 ± 0.068
photometric centroid source offset	0.28 ± 0.01	37.80	0.28 ± 0.01	0.05 ± 0.01

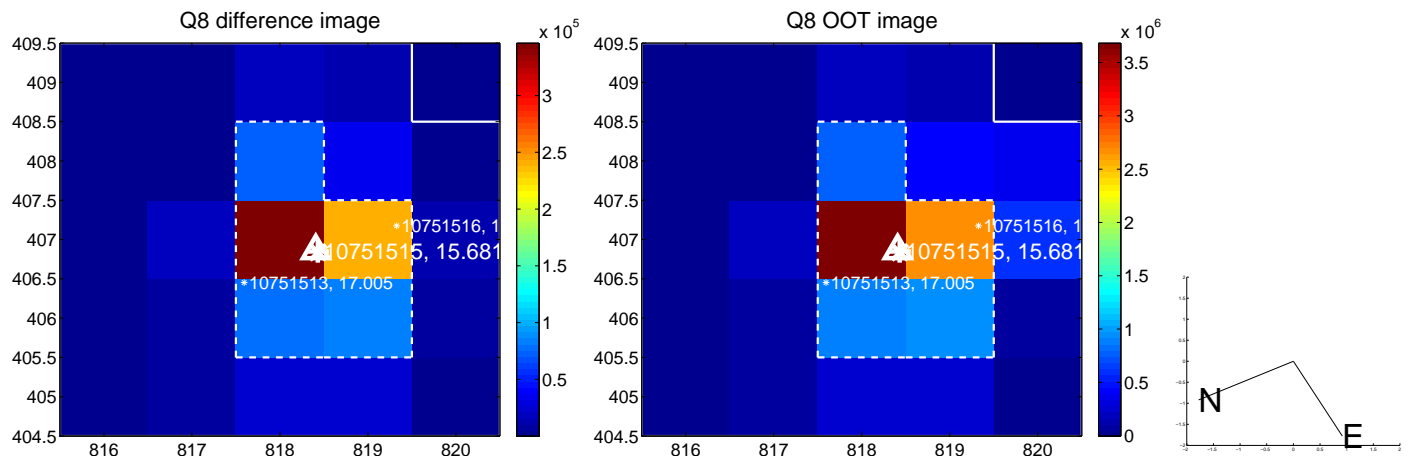
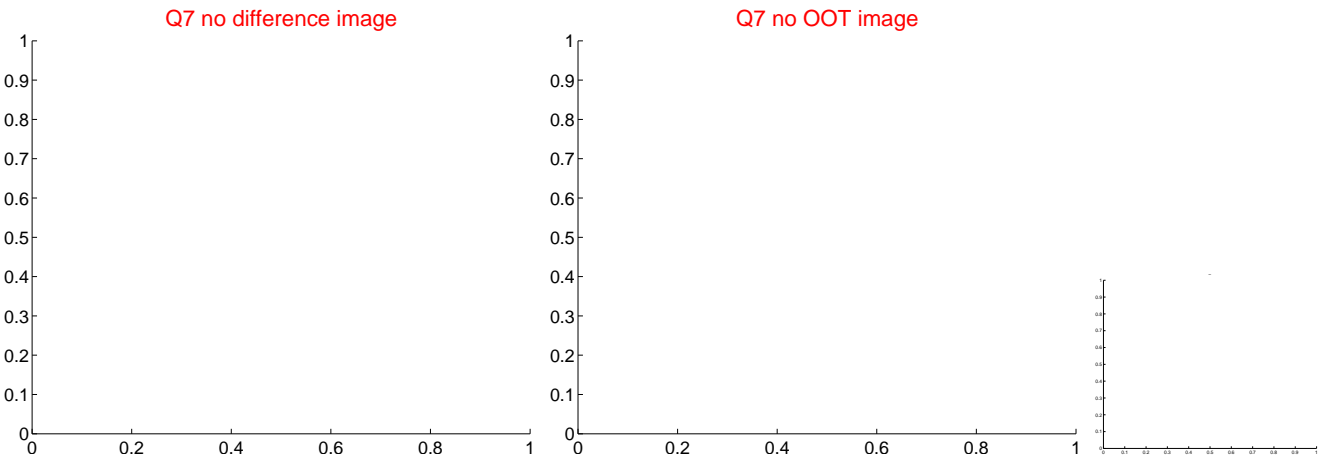
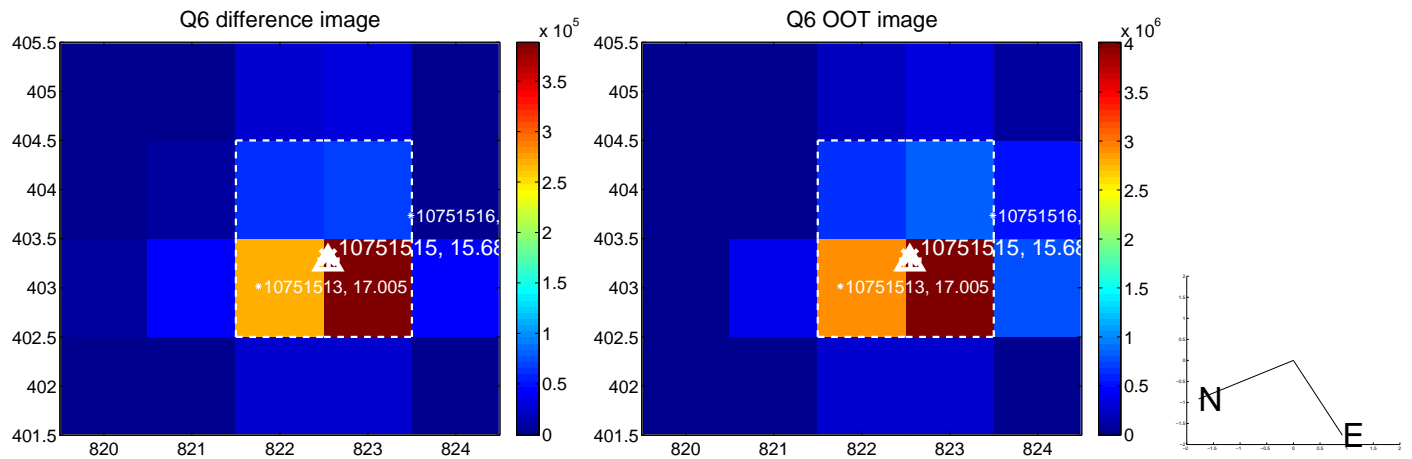
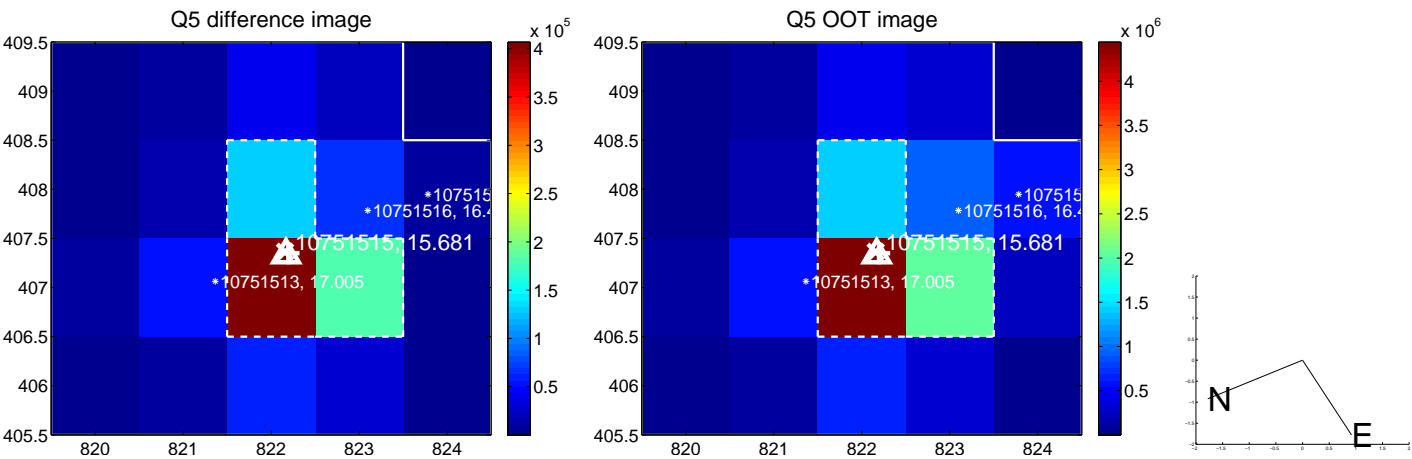


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

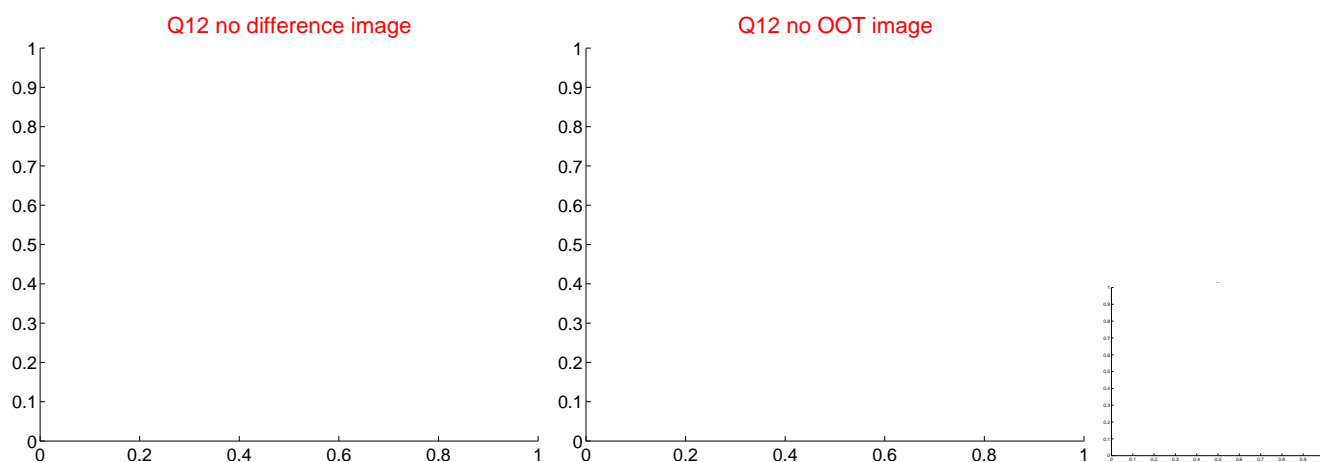
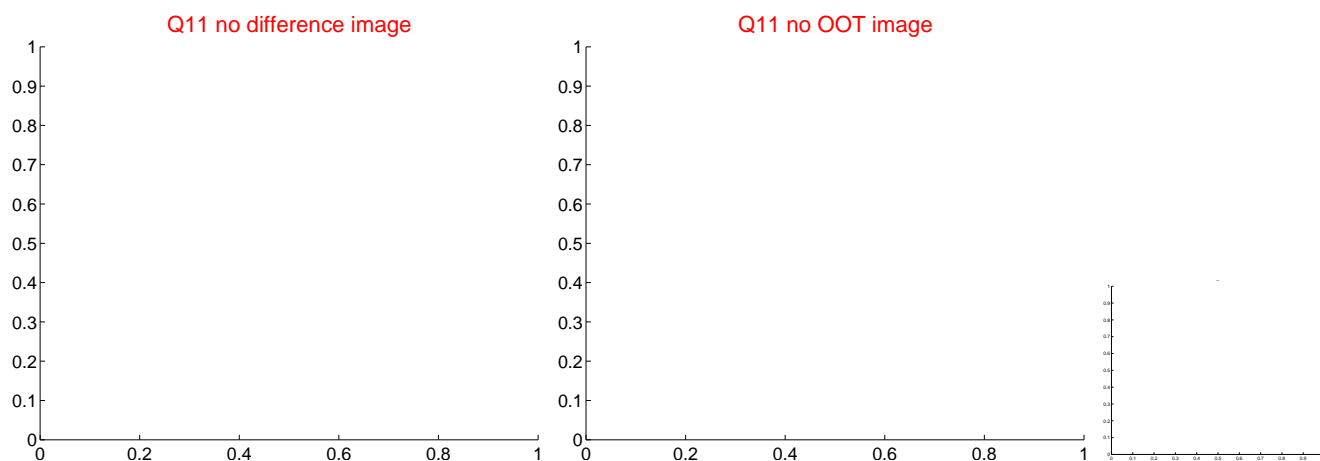
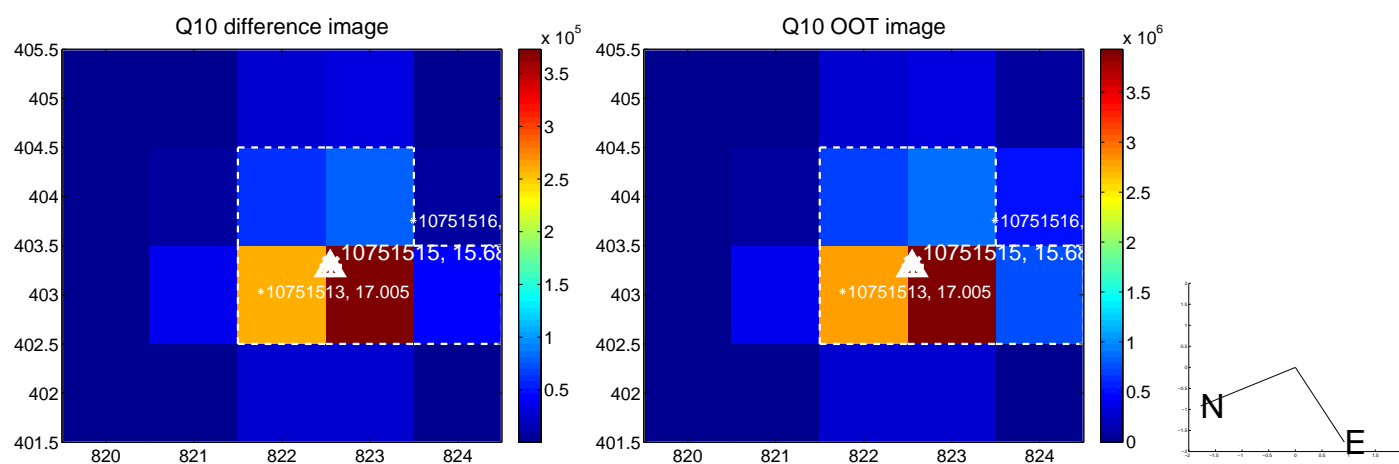
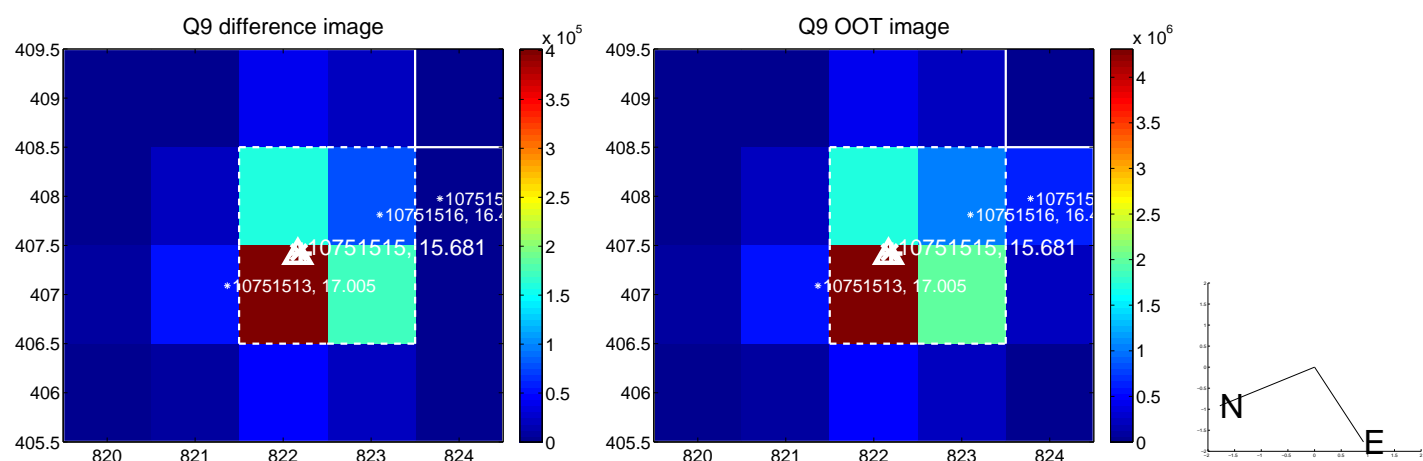
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



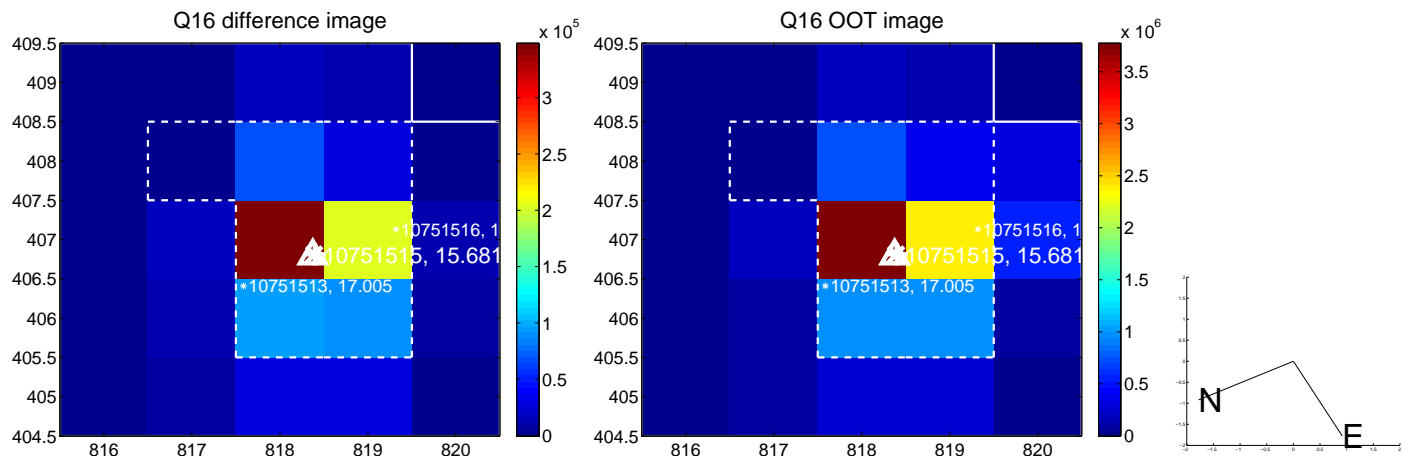
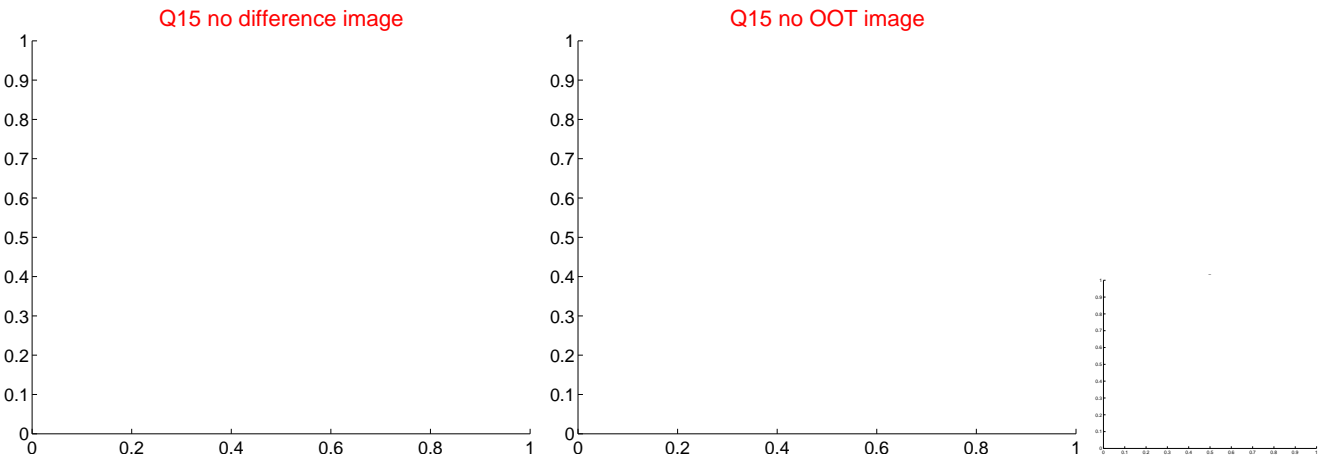
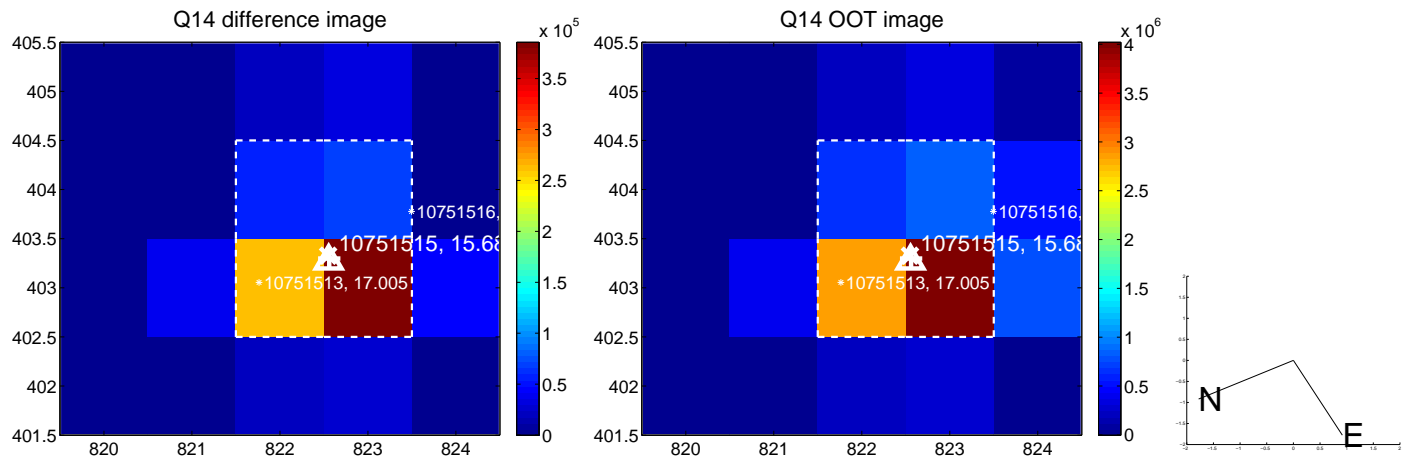
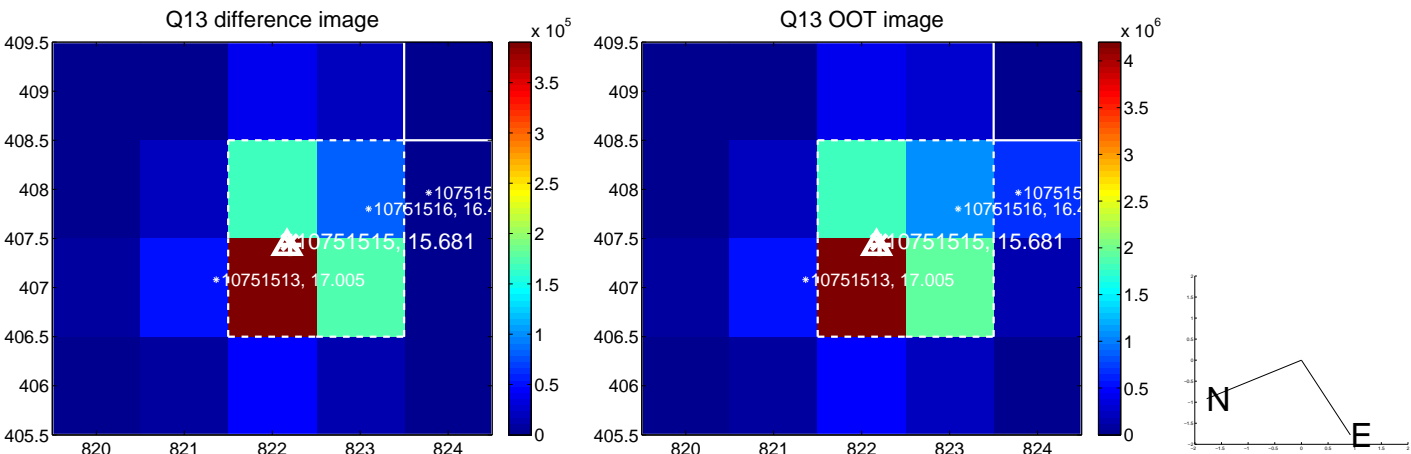
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



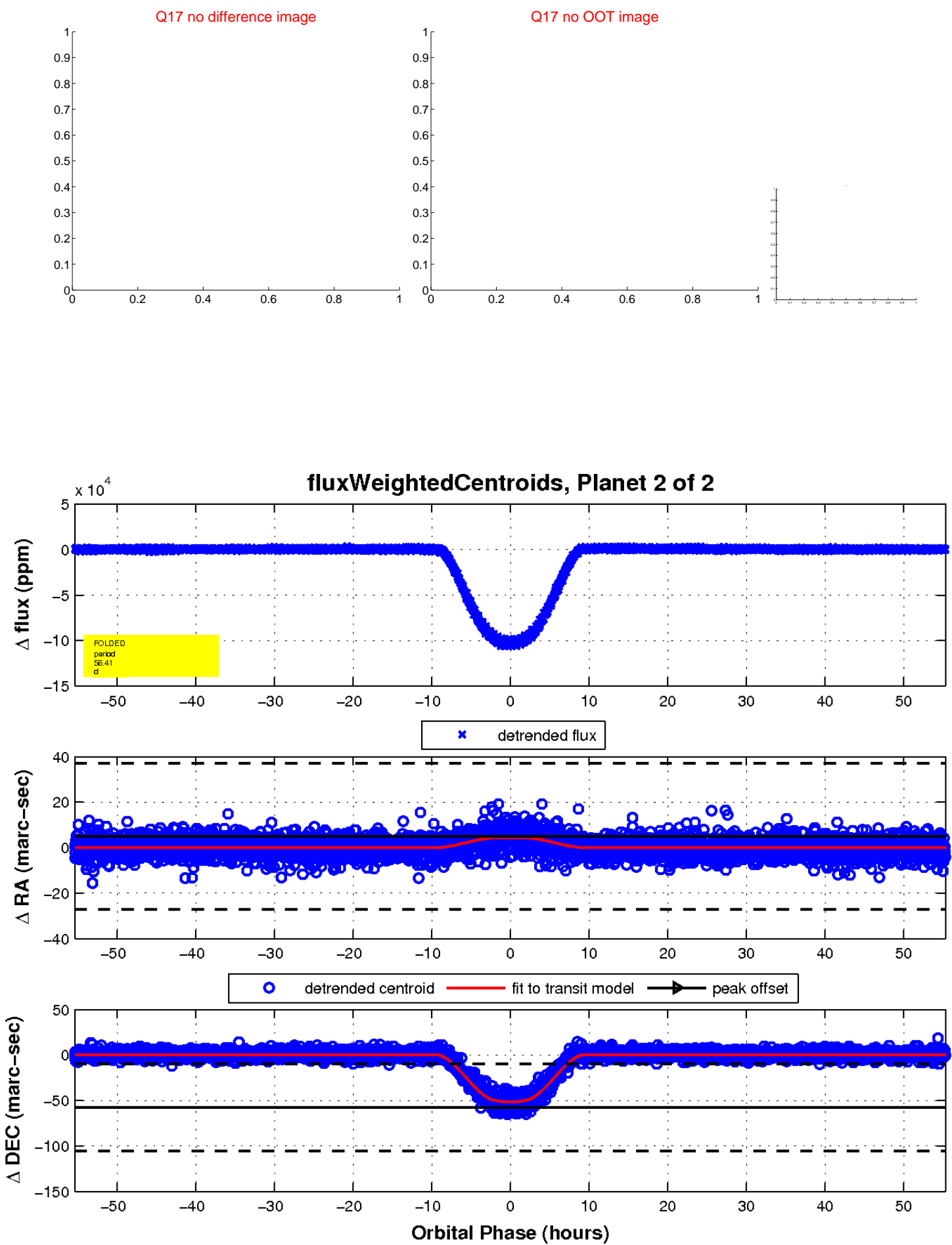
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

