

KIC 004742716

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})
004742716-01	OBS	No	370.140619	436.417107	52.1	1.722	12.3	4.1	30.73	4074	28.30	162.25
004742716-02	OBS	No	297.229347	167.241530	98.3	3.251	9.0	5.7	30.73	4074	28.54	217.38

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004742716-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
004742716-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_ZUMA—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—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.

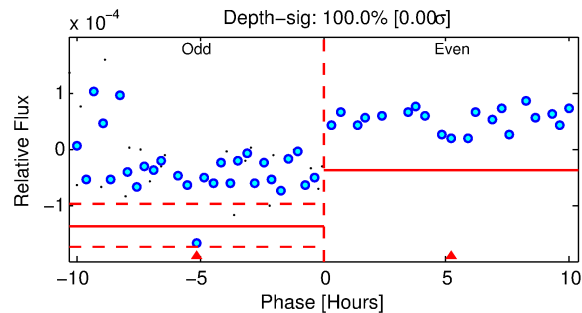
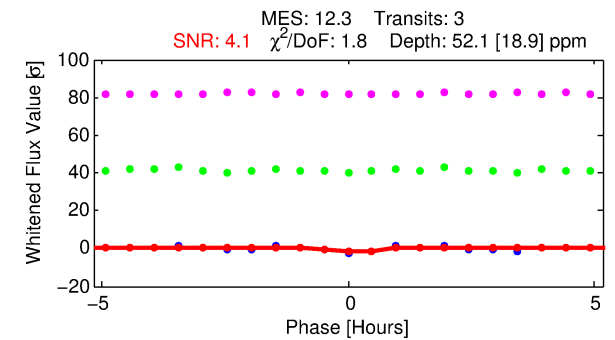
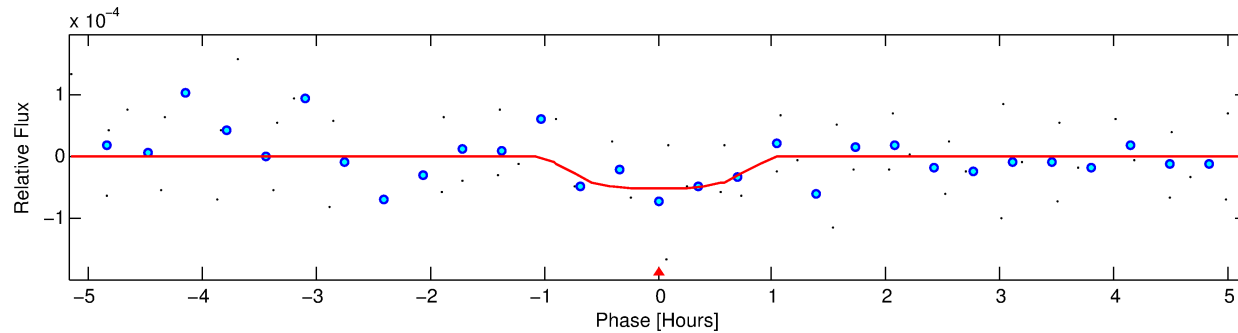
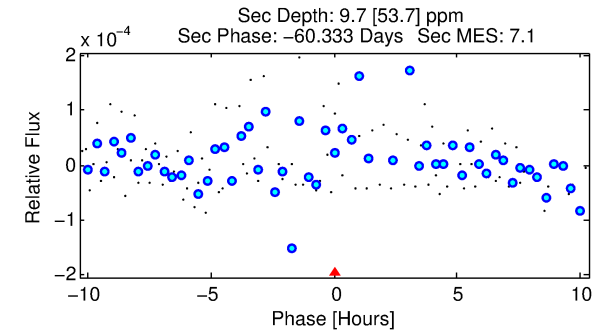
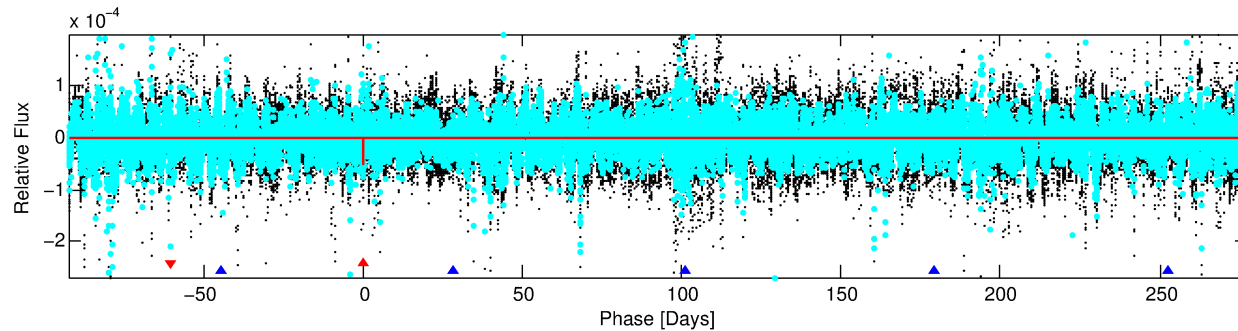
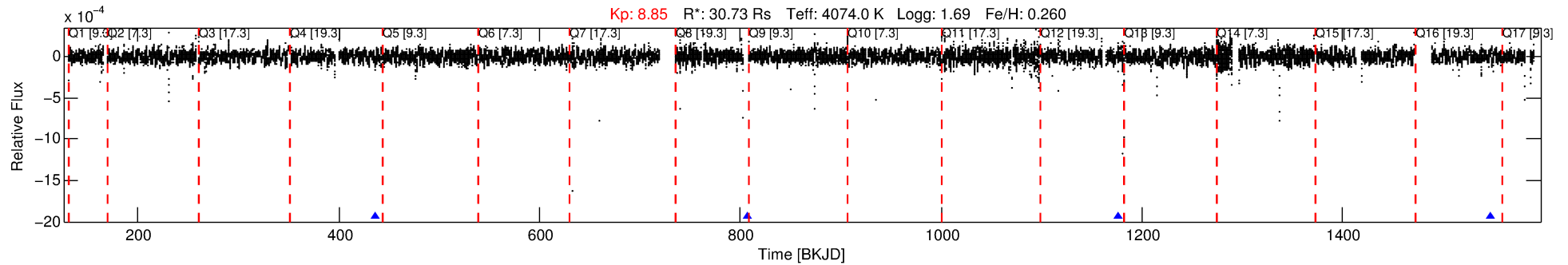
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004742716-01

No Significant Match Found

DV One-Page Summary

KIC: 4742716 Candidate: 1 of 2 Period: 370.141 d



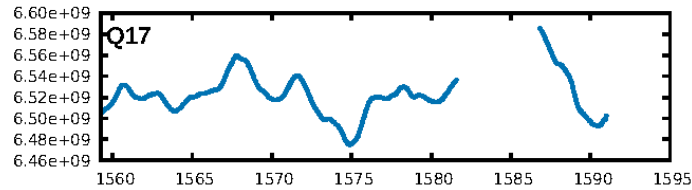
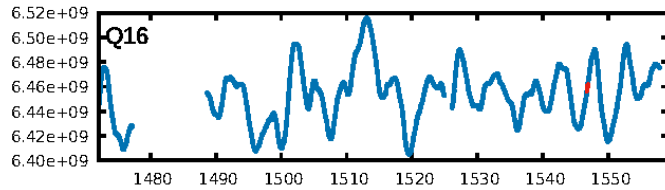
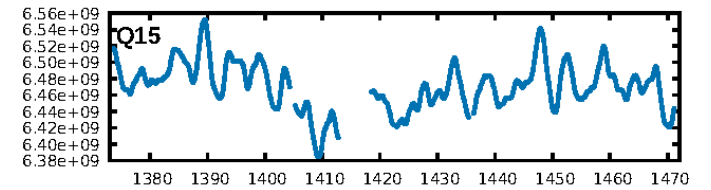
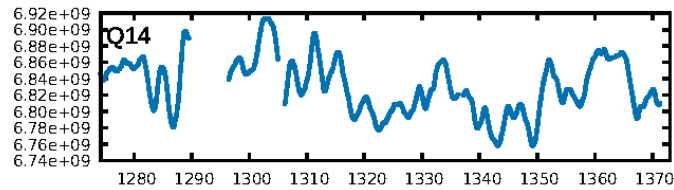
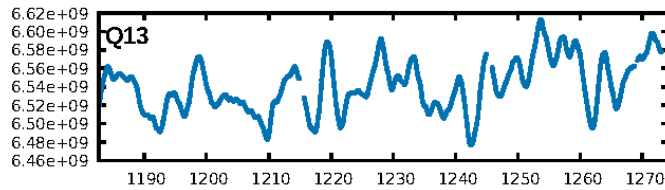
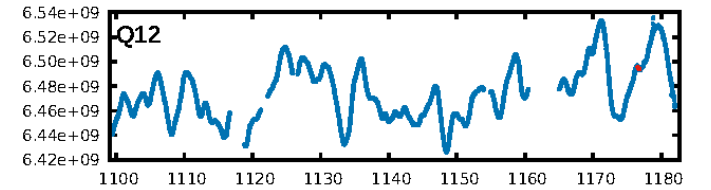
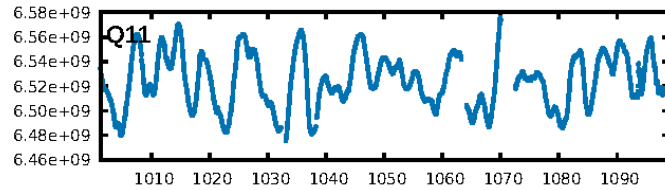
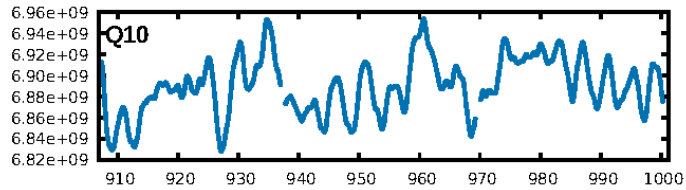
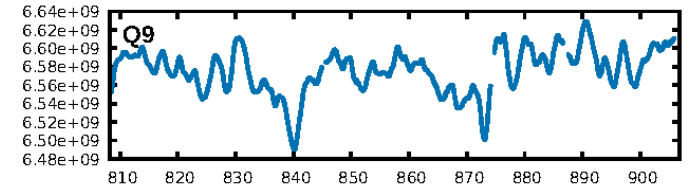
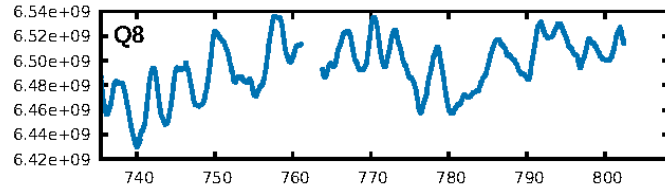
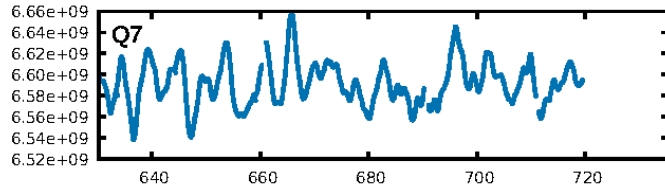
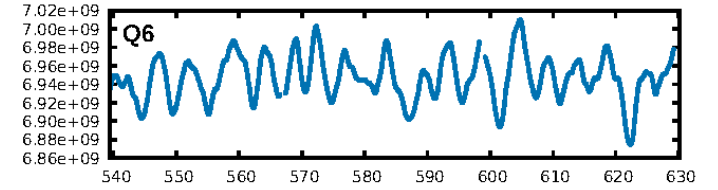
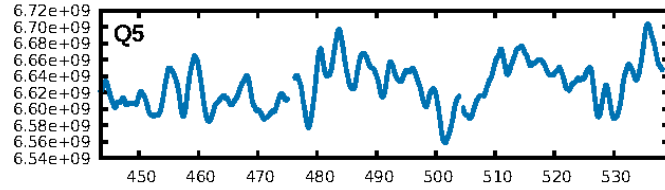
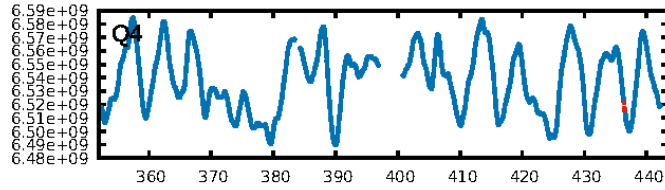
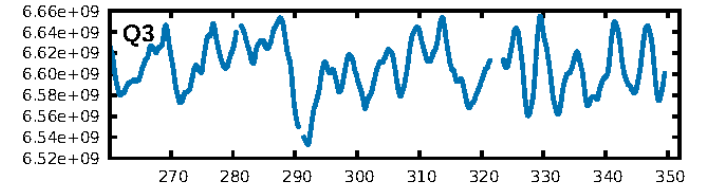
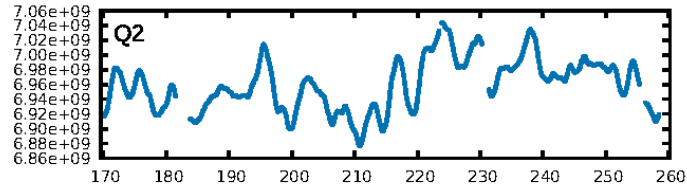
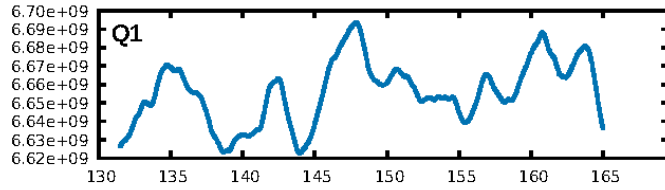
DV Fit Results:

Period = 370.14062 [0.00516] d
Epoch = 436.4171 [0.0139] BKJD
 $R_p/R^* = 0.0084$ [0.0267]
 $a/R^* = 729.68$ [7611.71]
 $b = 0.91$ [2.15]
 $S_{\text{eff}} = 162.25$ [90.73]
 $T_{\text{eq}} = 910$ [127] K
 $R_p = 28.30$ [90.14] R_e
 $a = 1.1985$ [0.4173] AU
 $A_g = 9.53$ [80.41] [0.11σ]
 $T_{\text{effp}} = 2472$ [5205] K [0.30σ]

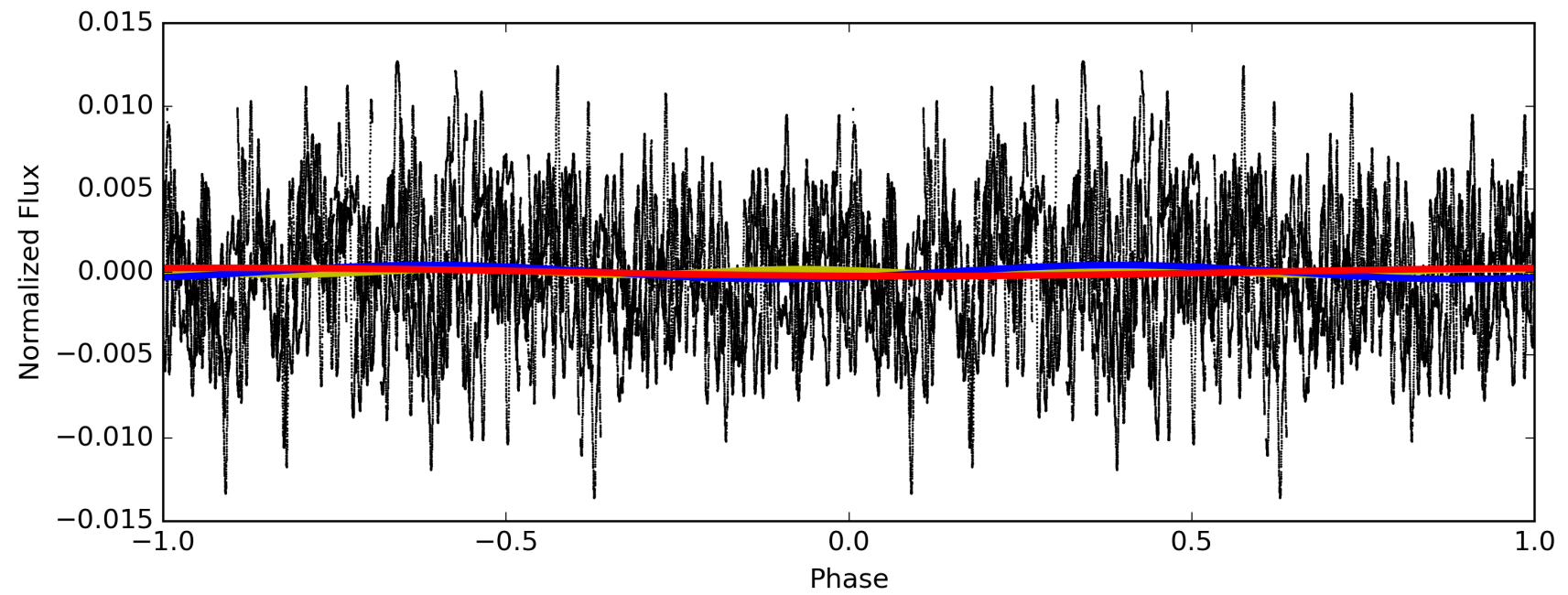
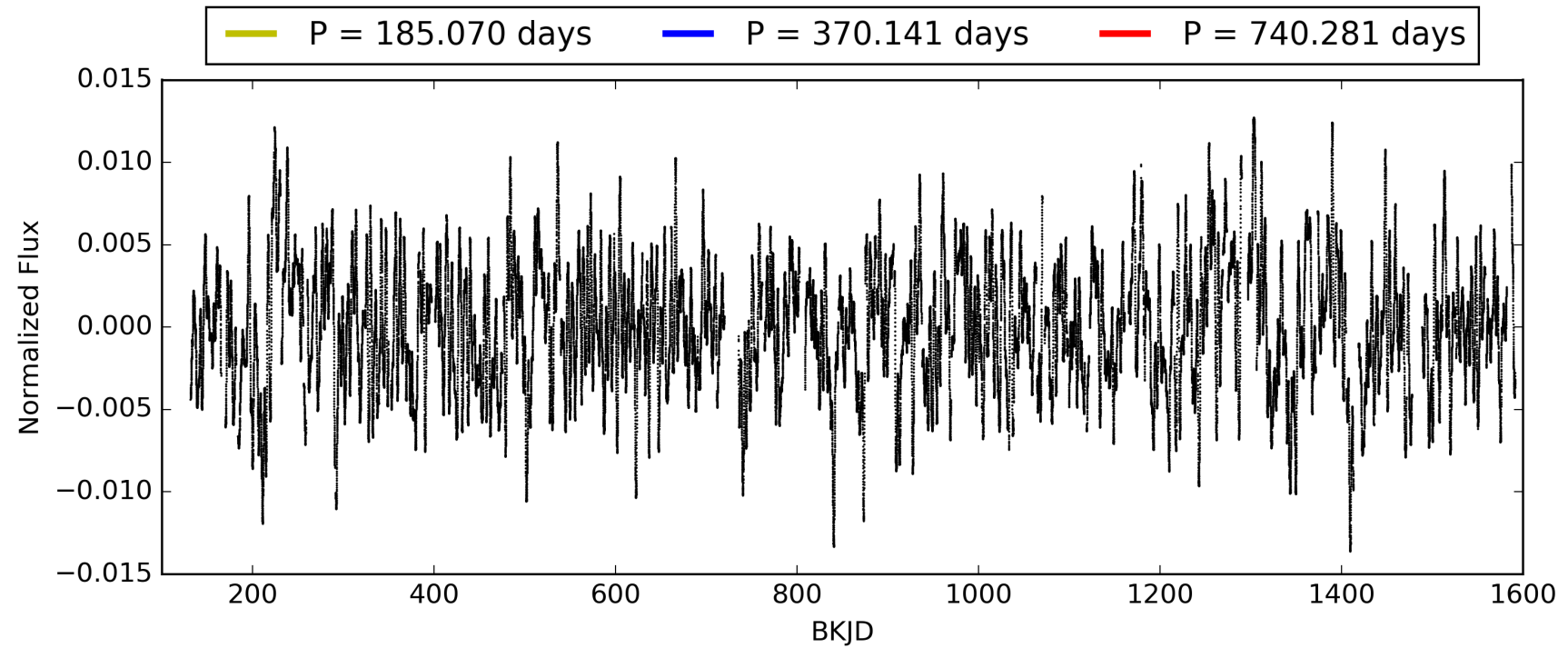
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [475.67σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 19.5%
ModelChiSquareGof-sig: 90.8%
Bootstrap-pfa: 2.02e-07
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: N/A
Centroid-sig: 55.7%
Centroid-so: 6.969 arcsec [0.51σ]
OotOffset-rm: N/A
KicOffset-rm: N/A
OotOffset-st: 0/0/0 [0]
KicOffset-st: 0/0/0 [0]
DiffImageQuality-fgm: N/A
DiffImageOverlap-fno: 1.00 [2/2]

TCE 004742716-01, PDC Light Curves

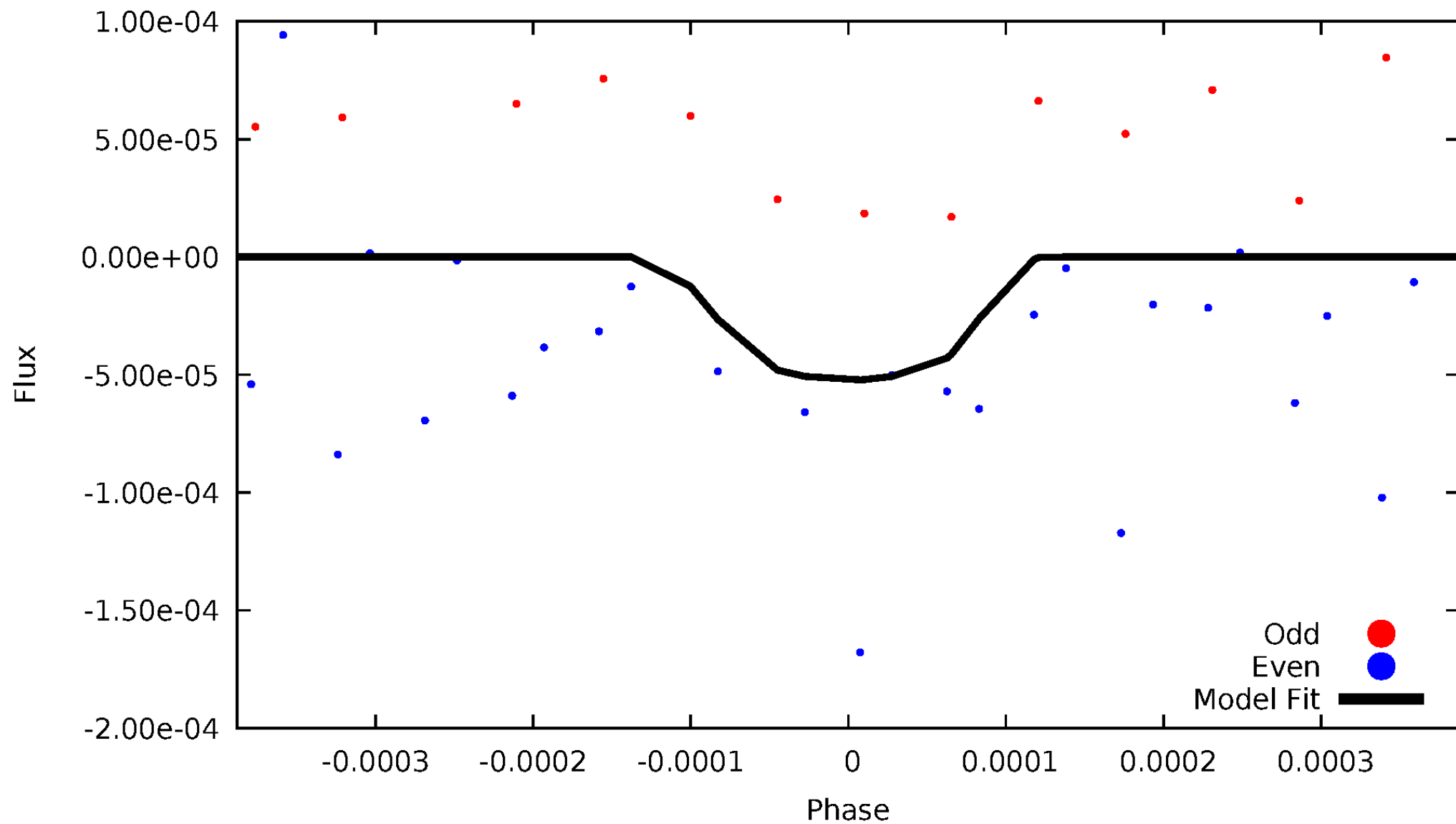


TCE 004742716-01



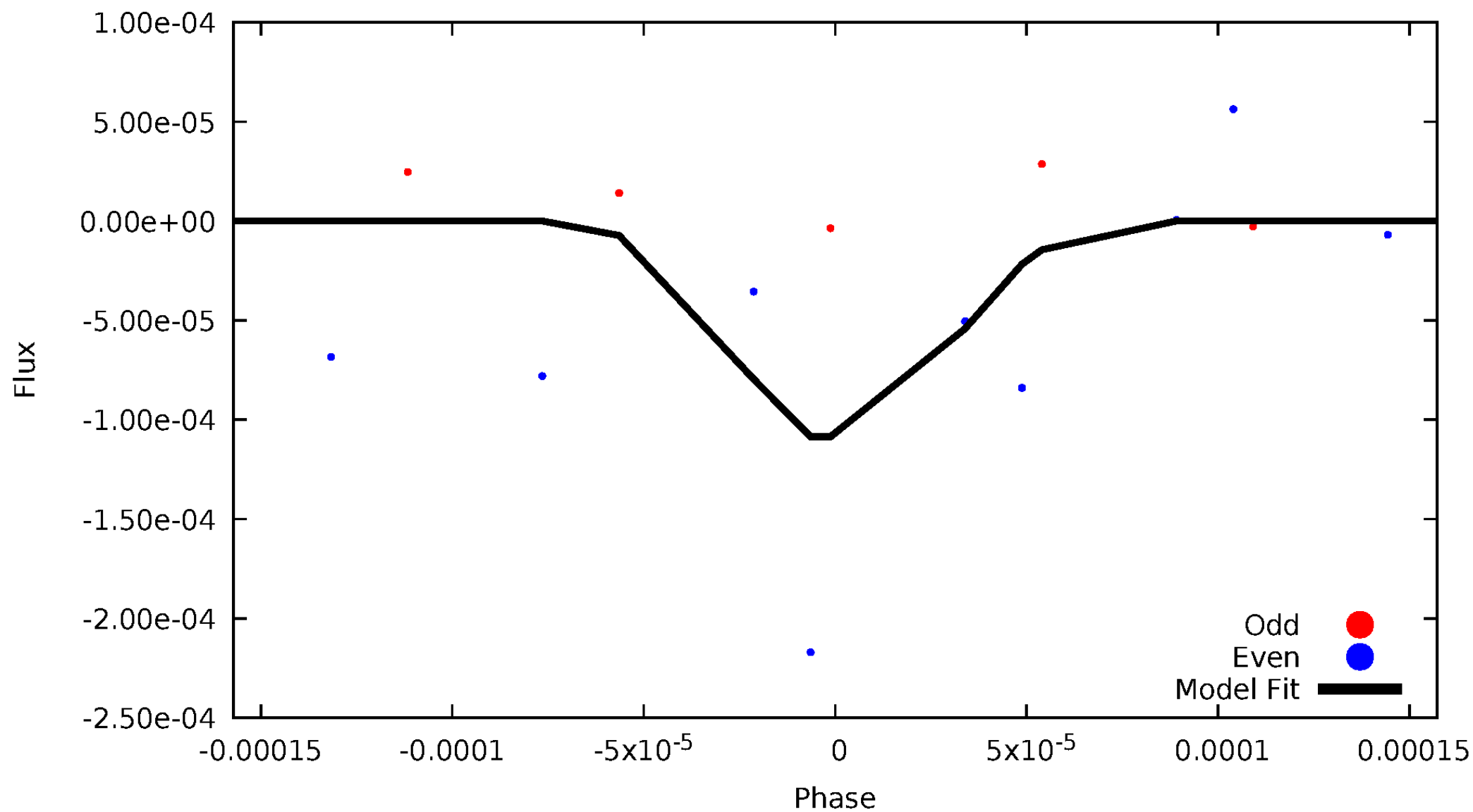
DV Odd/Even

TCE 004742716-01



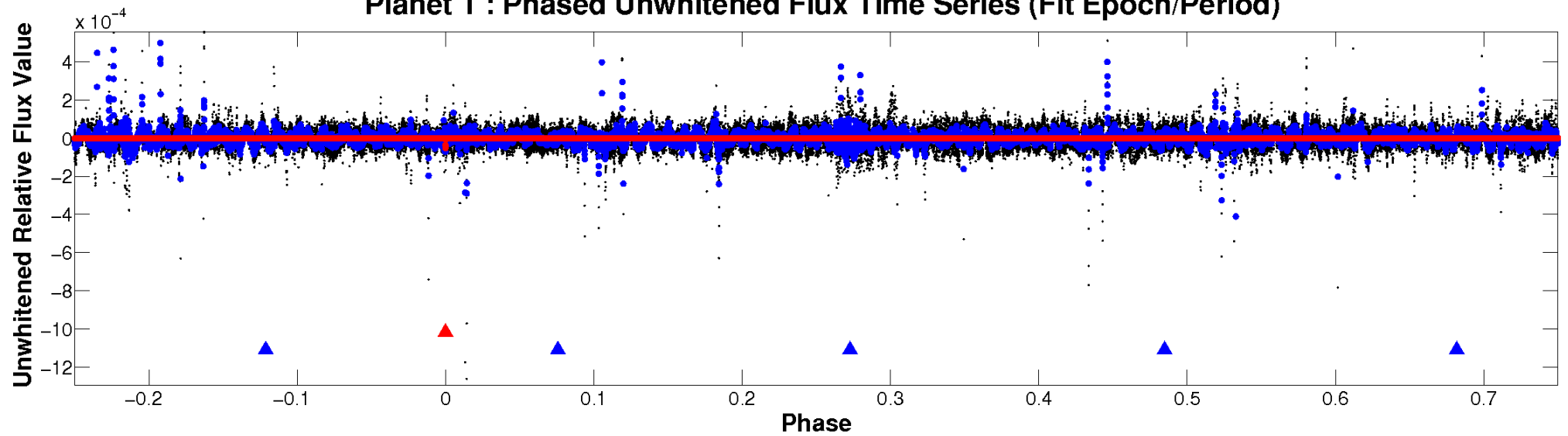
ALT Odd/Even

TCE 004742716-01

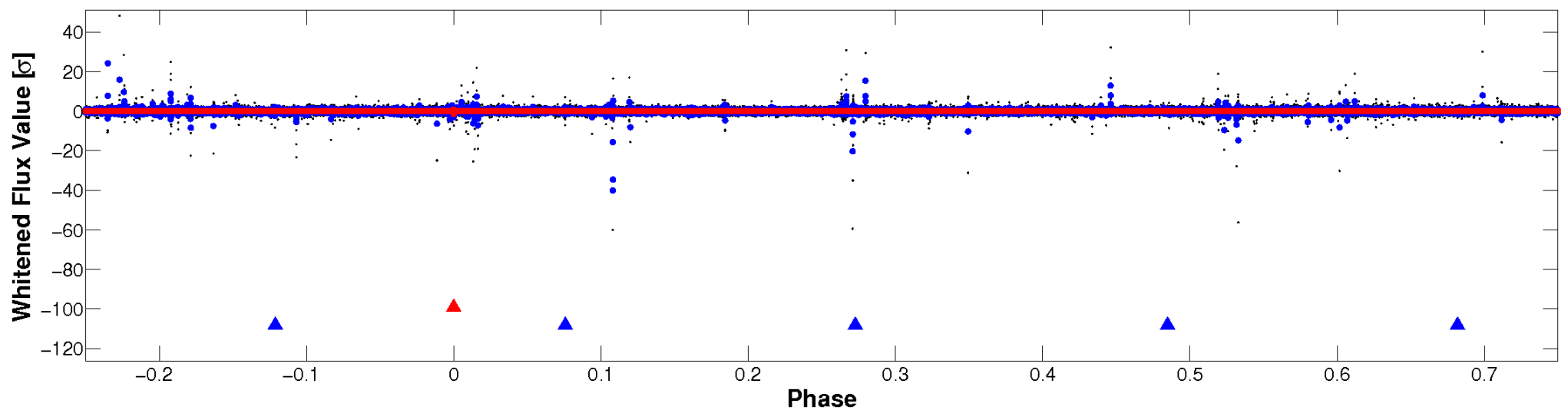


Non-Whitened Vs. Whitened Light Curve

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

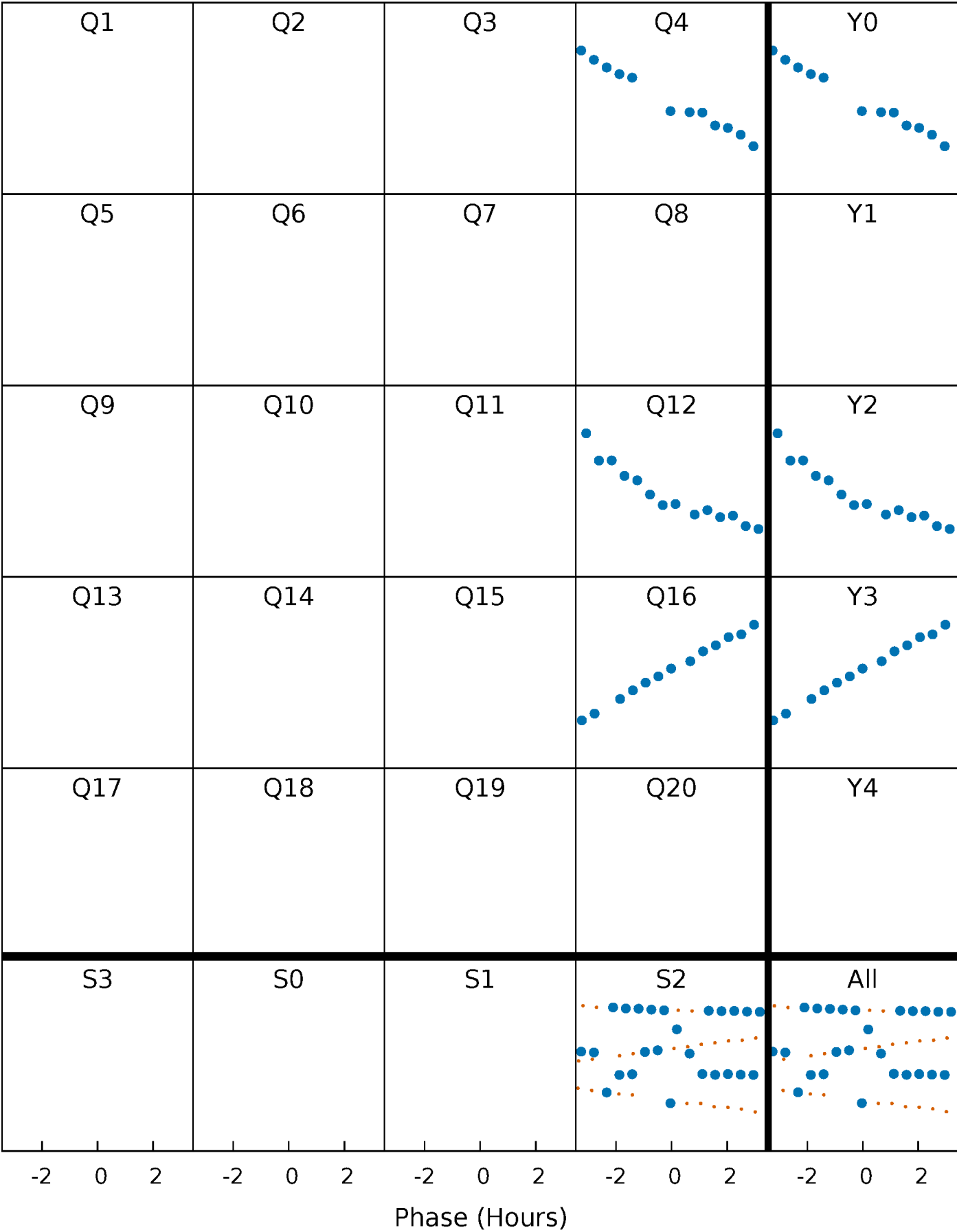


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



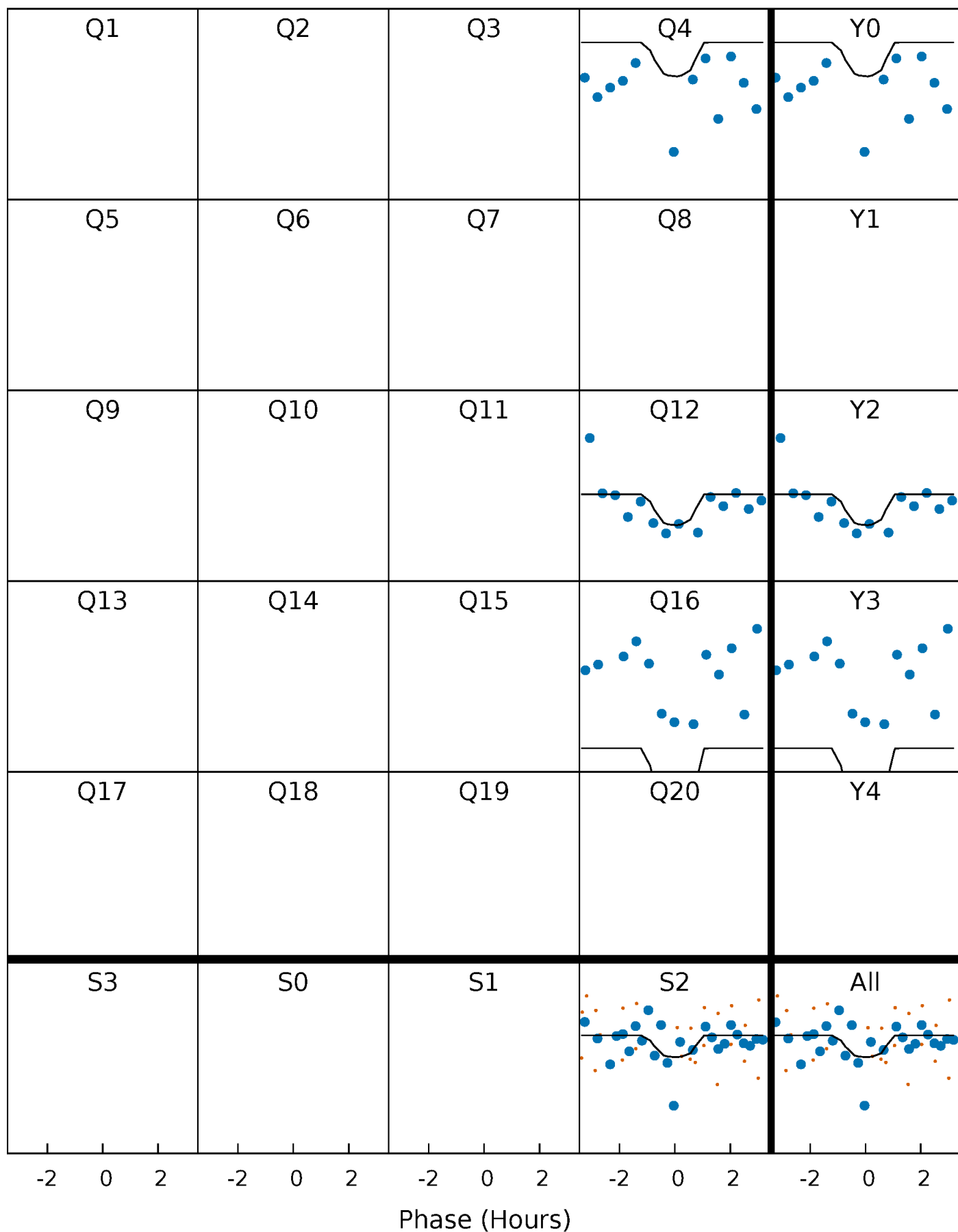
PDC Quarter-Phased Transit Curves

TCE 004742716-01 P=370.140619 Days T₀=436.417107 (BKJD)



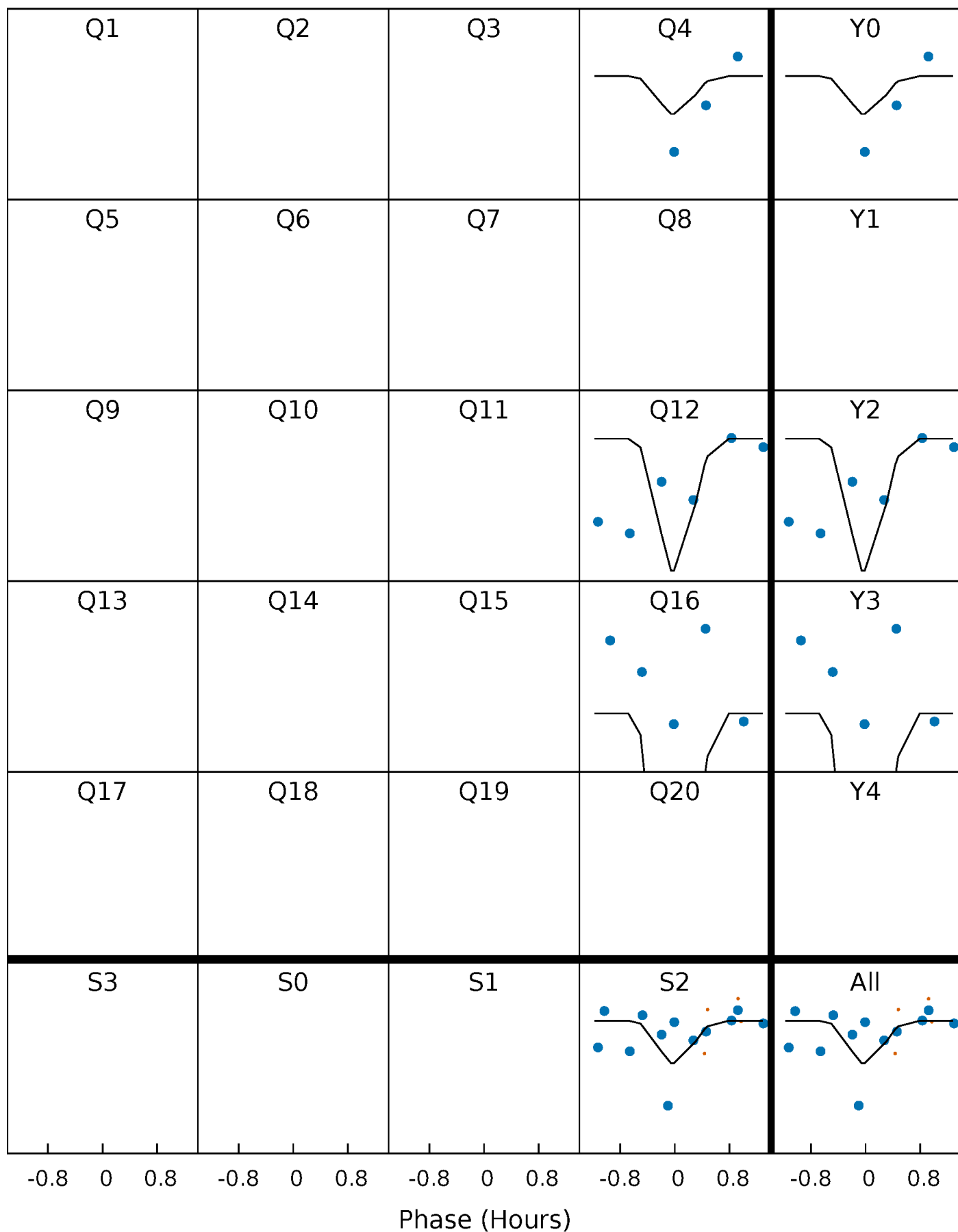
DV Quarter-Phased Transit Curves

TCE 004742716-01 P=370.140619 Days $T_0=436.417107$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

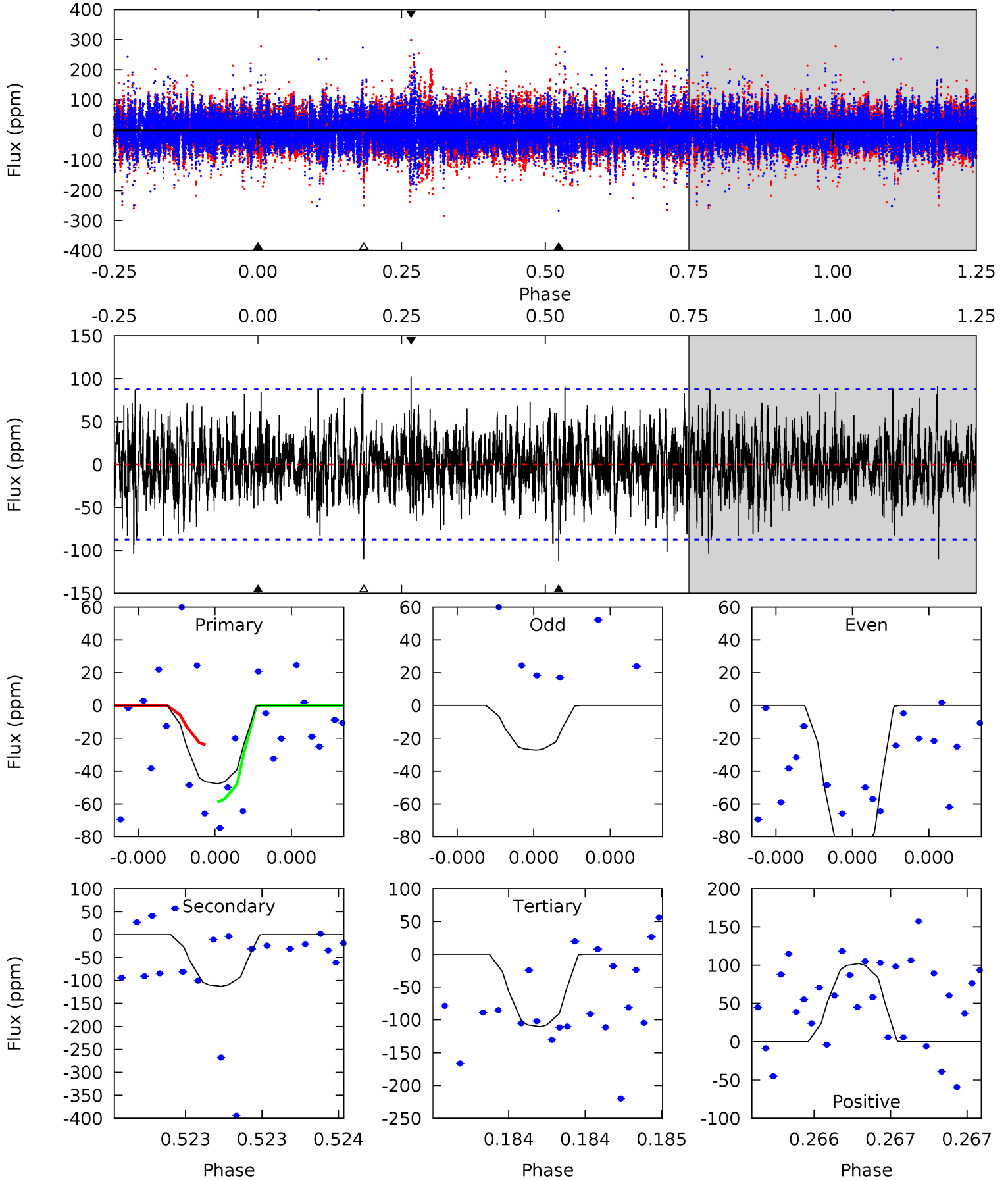
TCE 004742716-01 P=370.147128 Days $T_0=436.422238$ (BKJD)



DV Model-Shift Uniqueness Test

004742716-01, P = 370.140619 Days, E = 66.276488 Days

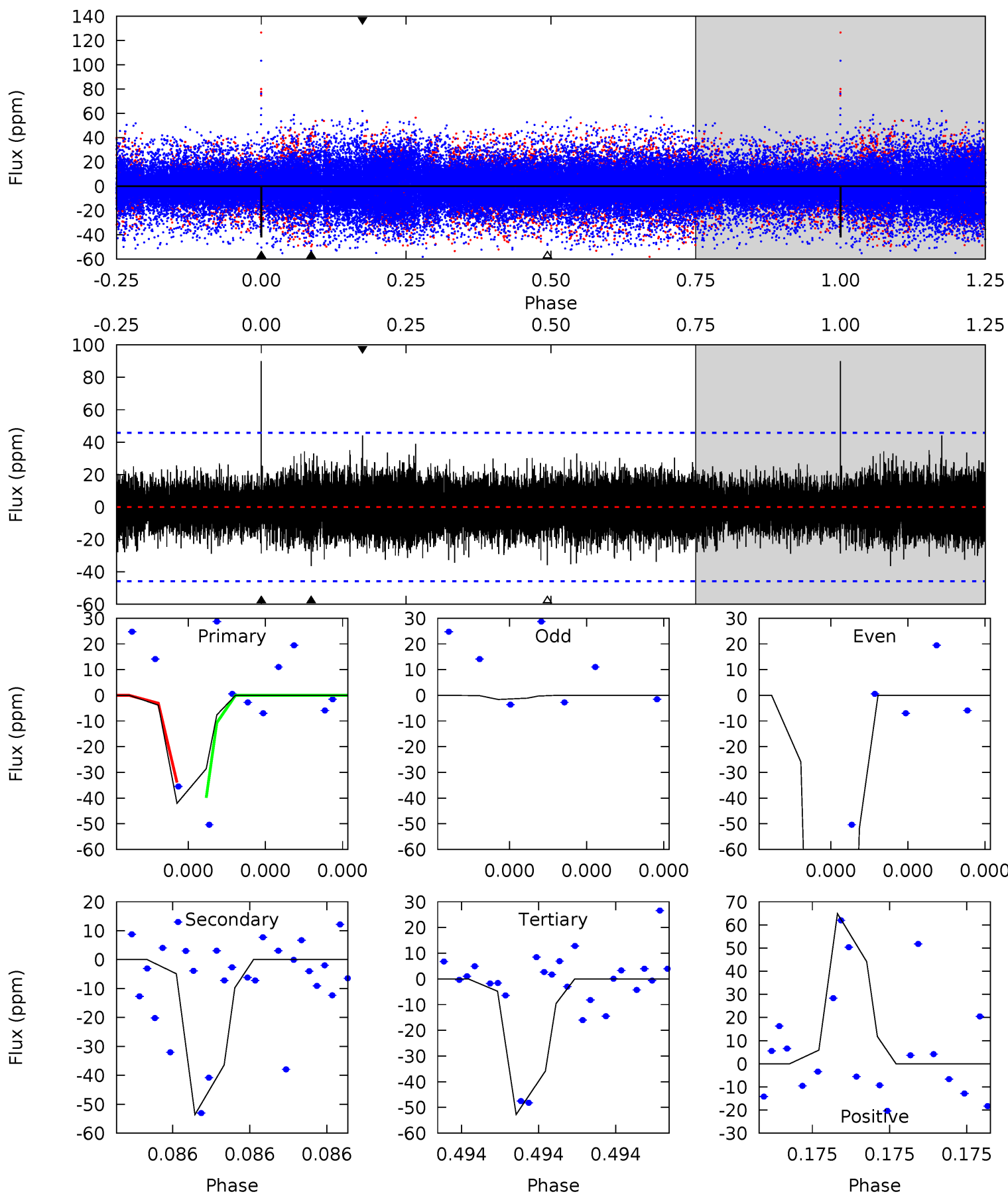
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.11	7.34	7.21	6.66	5.71	3.69	1.58	-4.09	-3.54	0.13	0.68	1.98	0.81	0.48	1.04



Alt Model-Shift Uniqueness Test

004742716-01, P = 370.147128 Days, E = 66.275110 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.61	4.60	4.53	5.57	5.78	3.80	0.96	-0.92	-1.96	0.07	-0.97	14.2	1.48	0.71	0



Stellar Parameters For KIC 004742716

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4074^{+142}_{-113}	$1.687^{+0.312}_{-0.208}$	$0.260^{+0.150}_{-0.250}$	$30.729^{+8.739}_{-11.652}$	$1.676^{+0.209}_{-0.523}$	$0.000^{+0.000}_{-0.000}$
	+3%/-3%	+18%/-12%	+58%/-96%	+28%/-38%	+12%/-31%	+233%/-47%
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 004742716-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-113 ± 15	$70.21^{+68.29}_{-45.33}$	1272^{+120}_{-127}	3161^{+1351}_{-508}	16^{+115}_{-12}
Alt.	-36 ± 8	$73.91^{+82.18}_{-52.44}$	1275^{+119}_{-127}	2676^{+1159}_{-469}	$4.969^{+53.035}_{-3.857}$

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

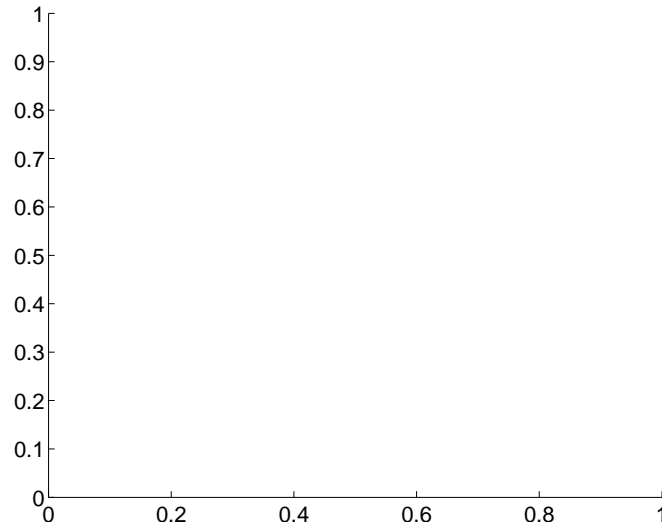
Supplemental centroid analysis for 004742716-01. **Kepler magnitude: 8.85.** Transit SNR 4.10

There are 0 quarters with good PRF difference image offsets

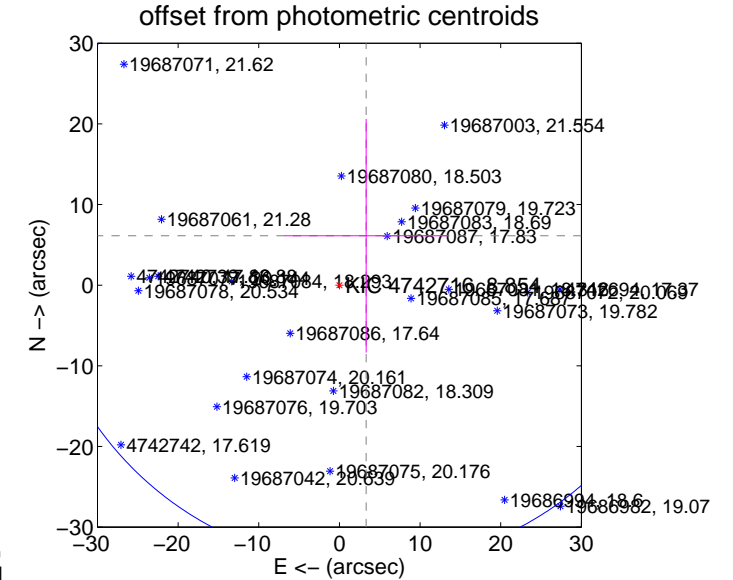
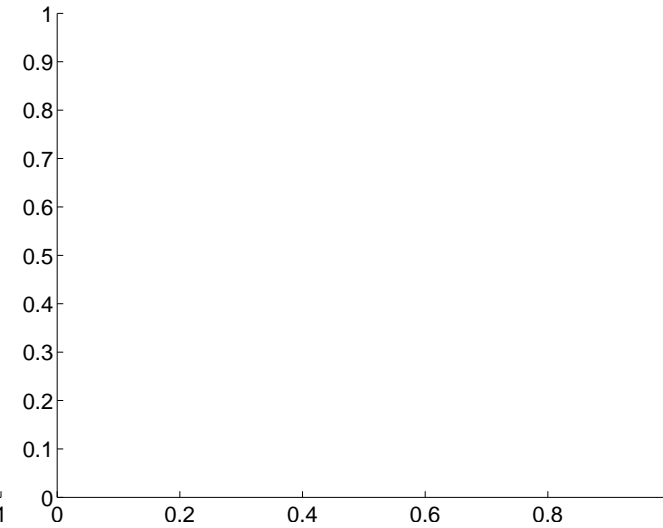
The direct PRF centroid is offset from the target star catalog position by about NaN arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	—	—	—	—
PRF-fit source offset from KIC position	—	—	—	—
photometric centroid source offset	6.97 ± 13.62	0.51	-3.32 ± 10.19	6.13 ± 14.48

There is no PRF-fit offset from OOT-fit



There is no PRF-fit offset from KIC



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.

Q9 no difference image



Q9 no OOT image



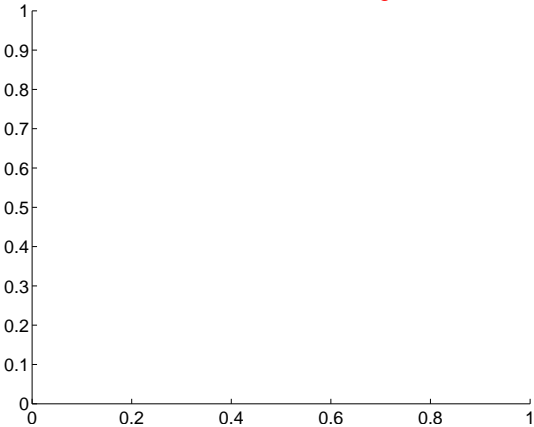
Q10 no difference image



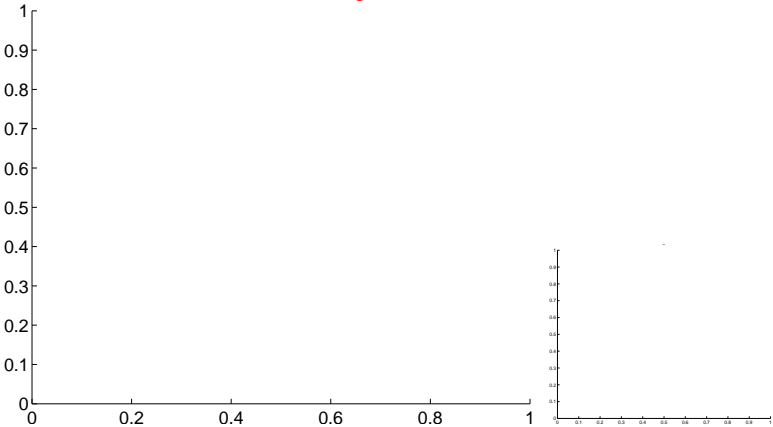
Q10 no OOT image



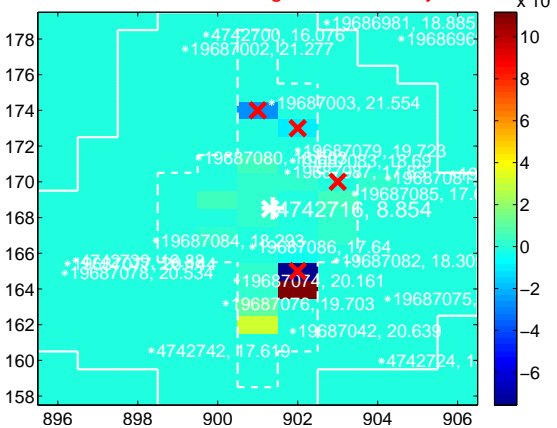
Q11 no difference image



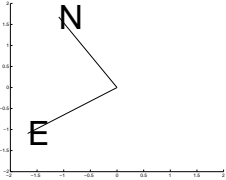
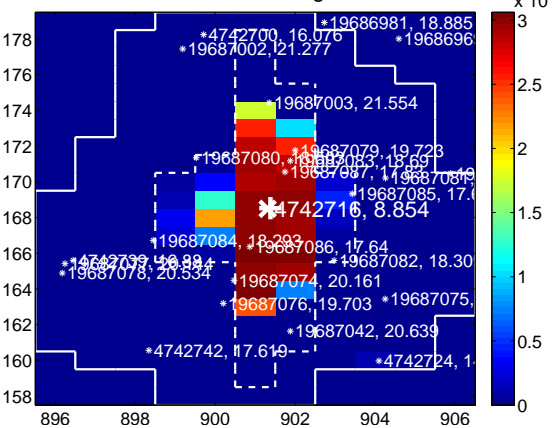
Q11 no OOT image



Q12 difference image. Poor Quality



Q12 OOT image

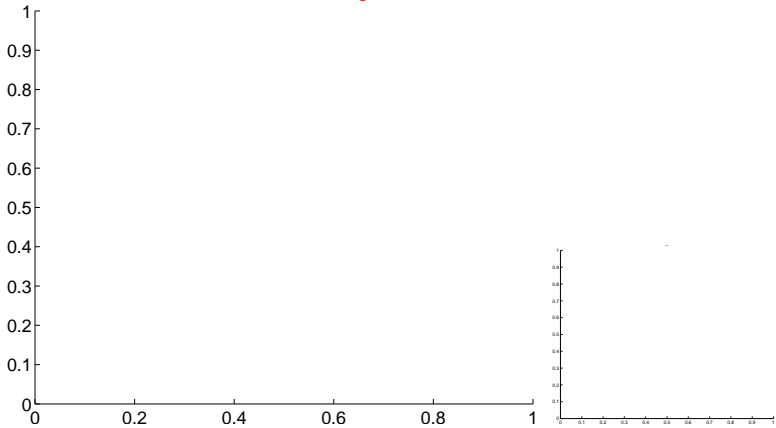


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

Q13 no difference image



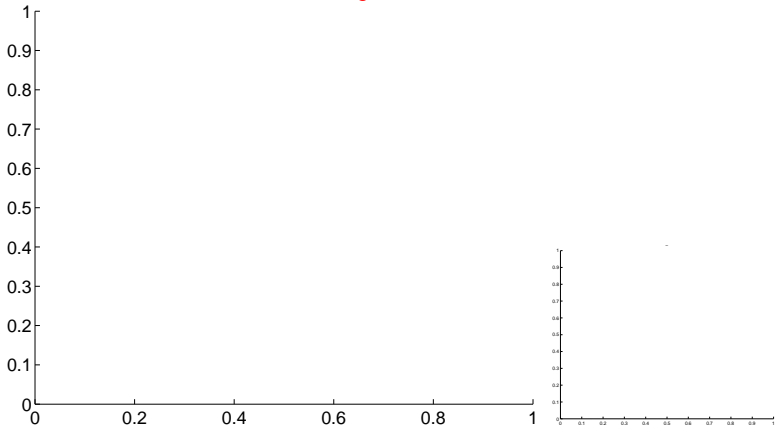
Q13 no OOT image



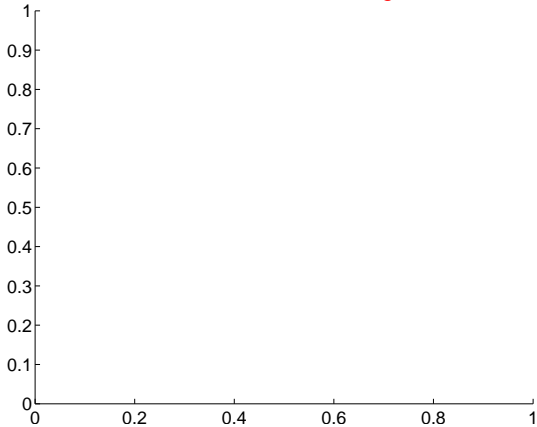
Q14 no difference image



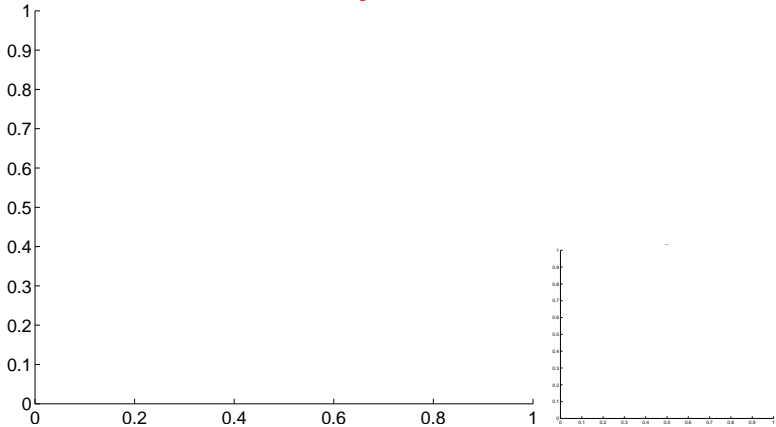
Q14 no OOT image



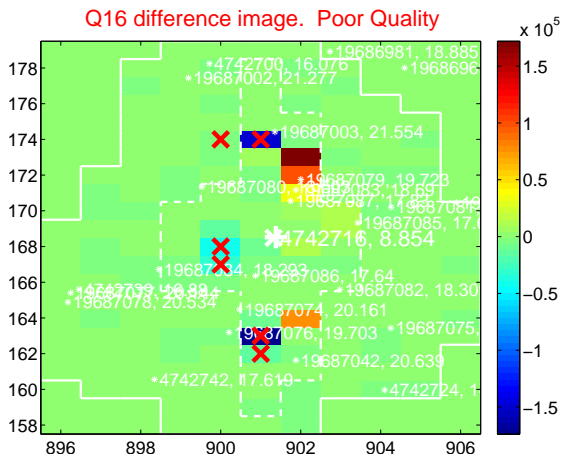
Q15 no difference image



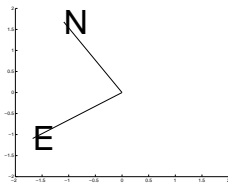
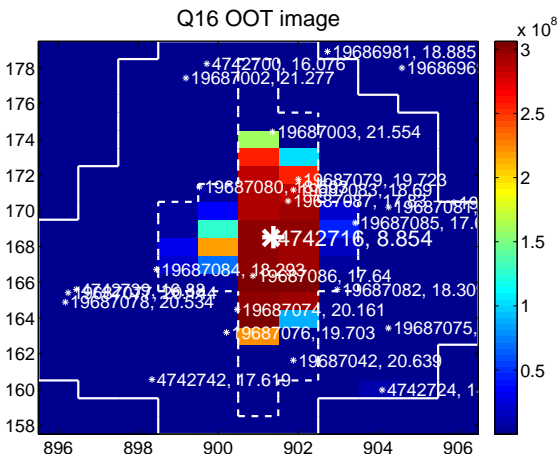
Q15 no OOT image



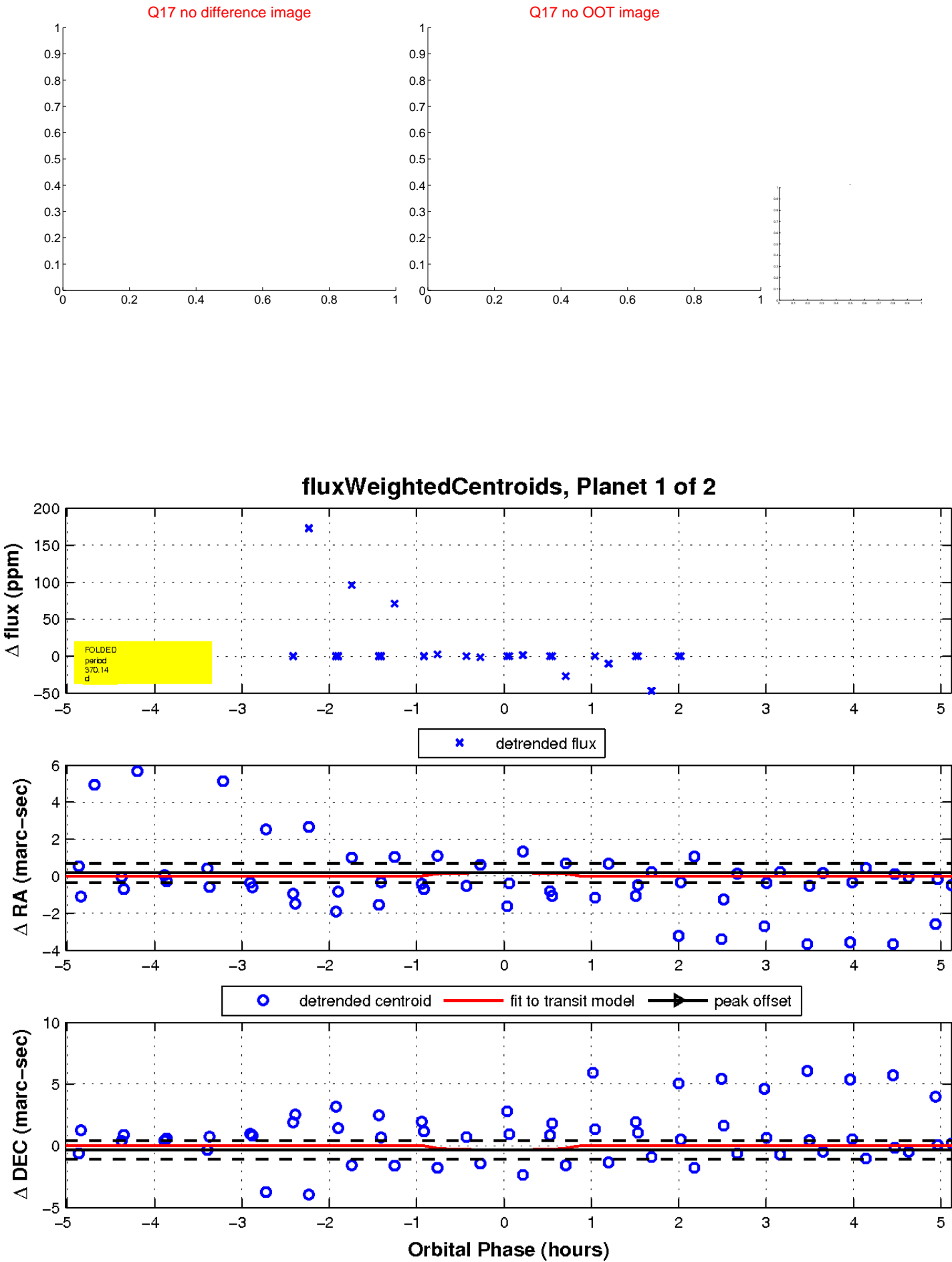
Q16 difference image. Poor Quality



Q16 OOT image

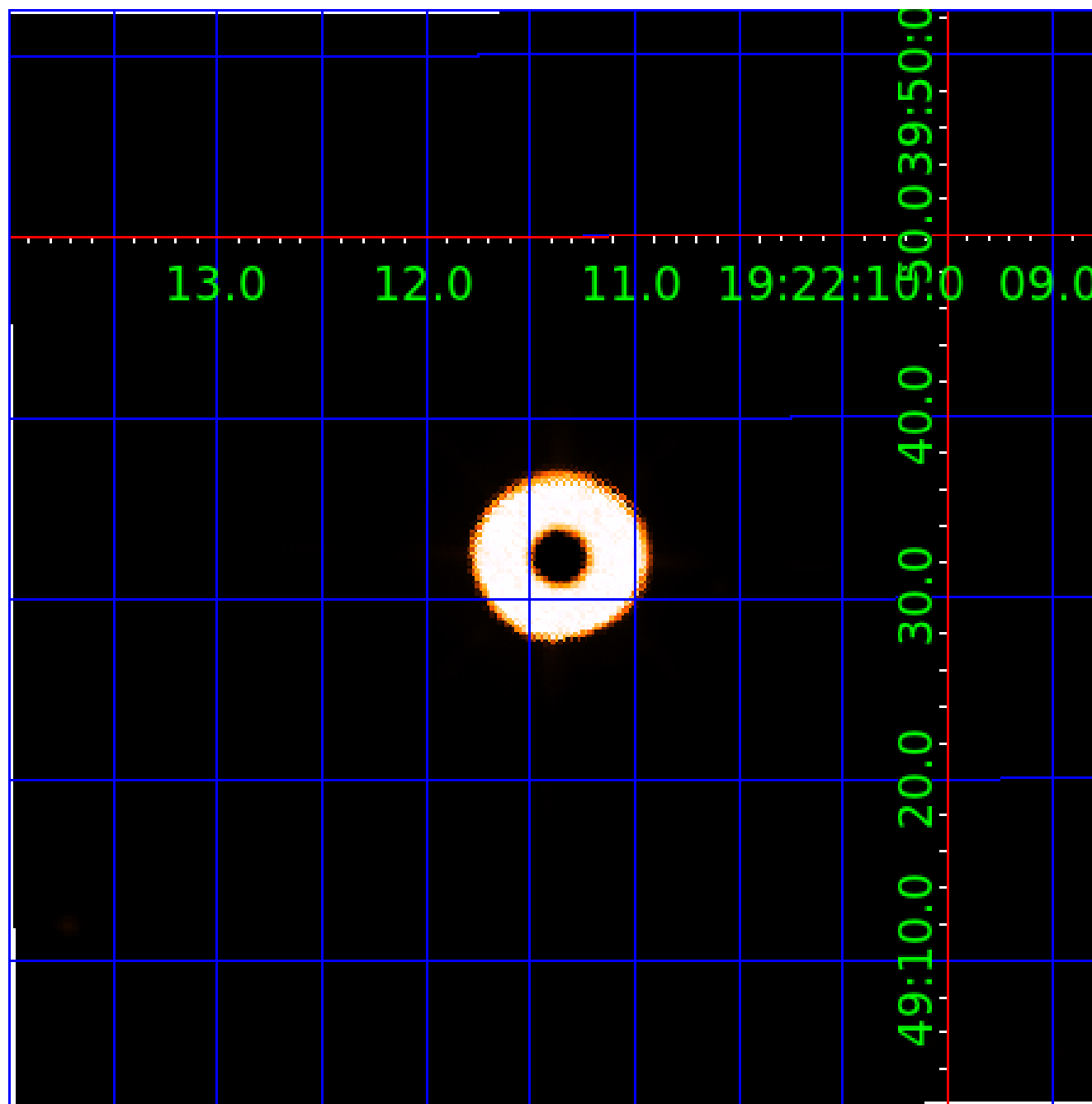


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 004742716

Q1-17 DR25 TCE Parameters

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

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004742716-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
004742716-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_ZUMA—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—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.

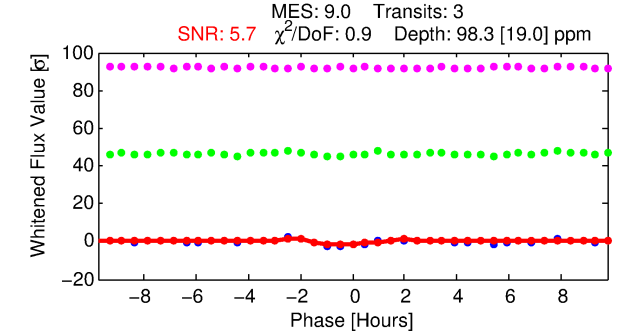
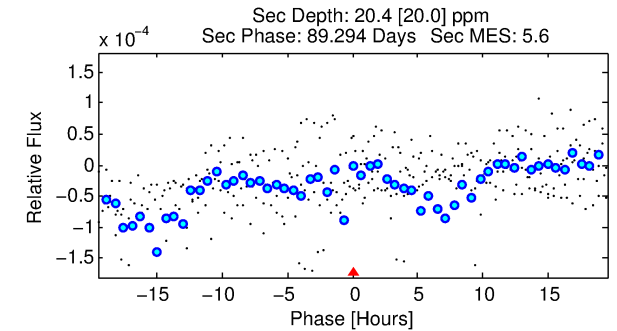
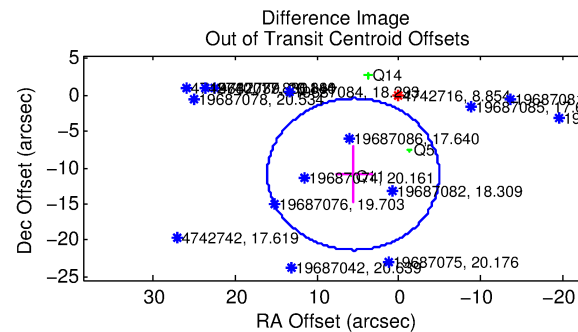
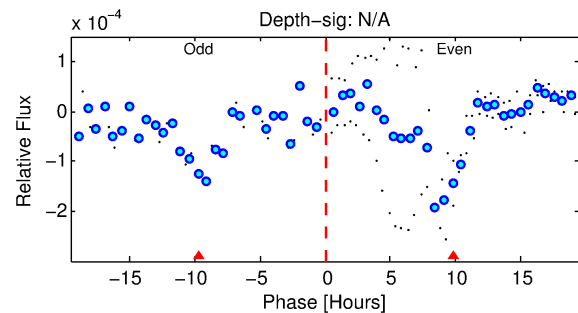
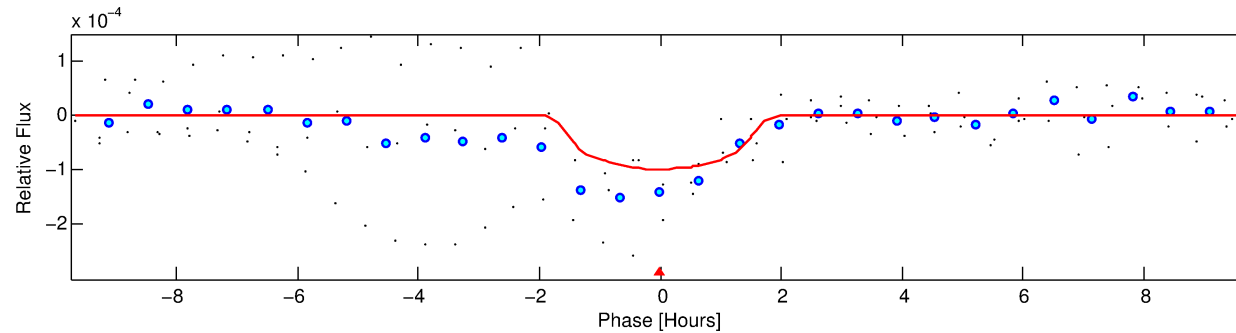
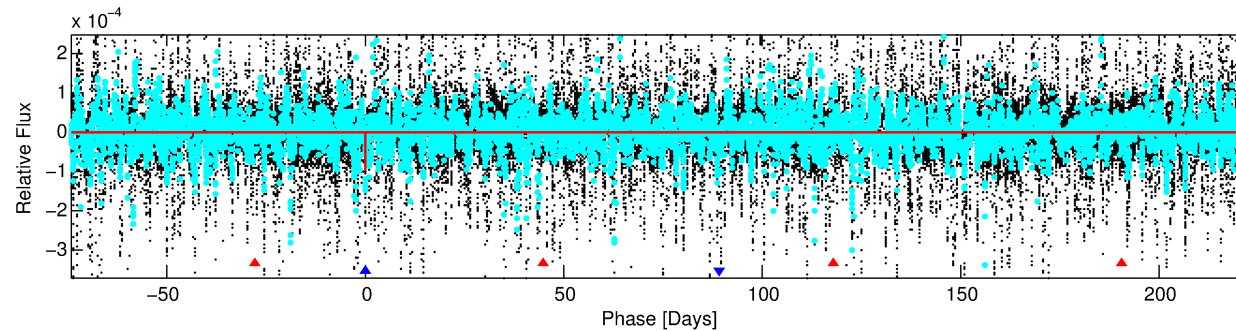
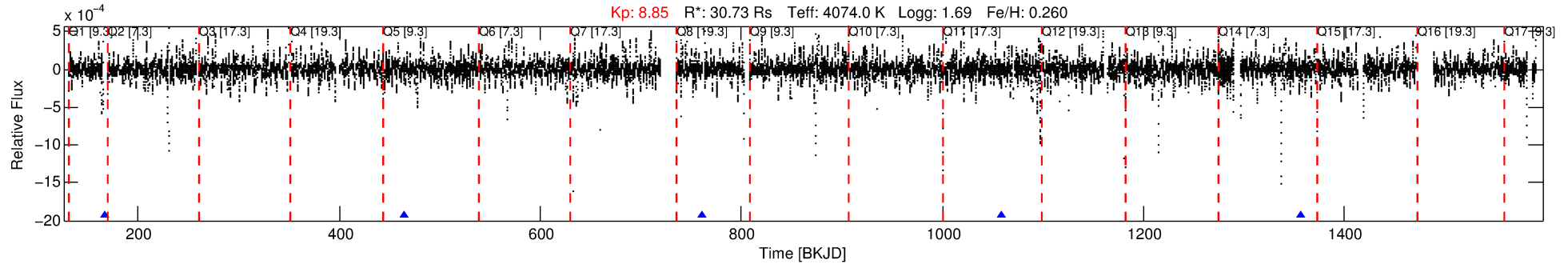
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004742716-02

No Significant Match Found

DV One-Page Summary

KIC: 4742716 Candidate: 2 of 2 Period: 297.229 d



DV Fit Results:

Period = 297.22935 [0.00308] d
Epoch = 167.2415 [0.0085] BKJD
Rp/R* = 0.0085 [0.0097]
a/R* = 703.09 [1961.81]
b = 0.06 [45.53]
Seff = 217.38 [121.56]
Teq = 979 [137] K
Rp = 28.54 [34.14] Re
a = 1.0354 [0.3605] AU
Ag = 14.79 [37.43] [0.37 sigma]
Teffp = 2969 [1837] K [1.08 sigma]

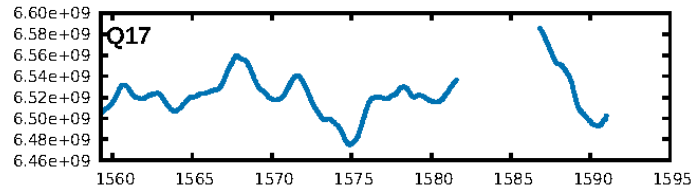
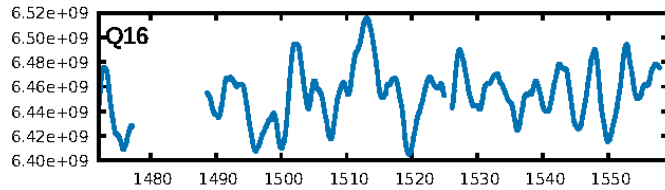
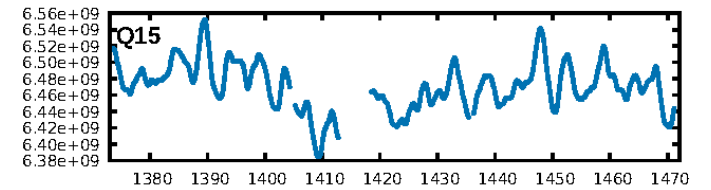
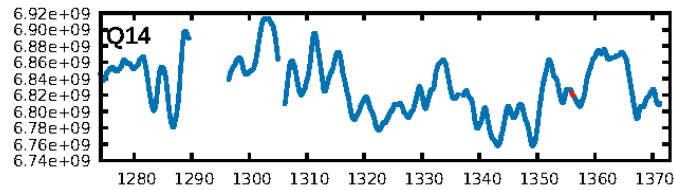
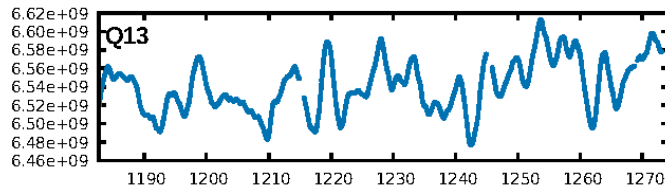
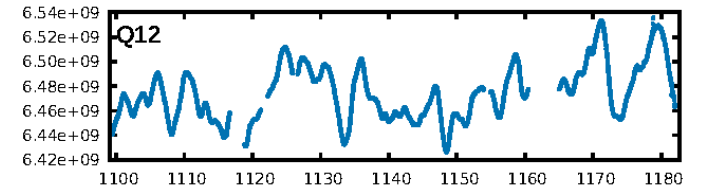
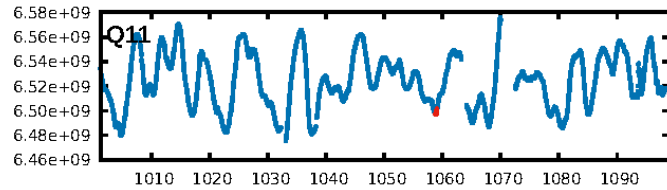
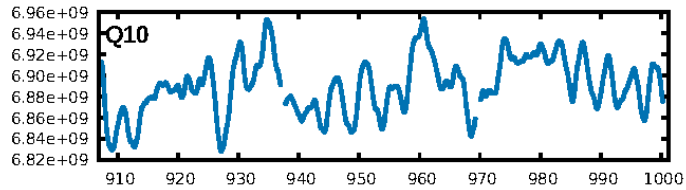
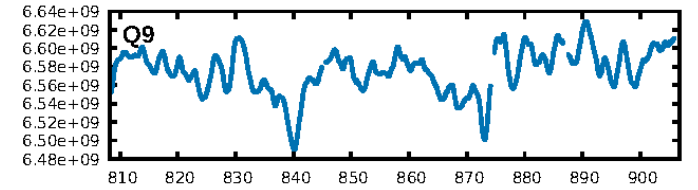
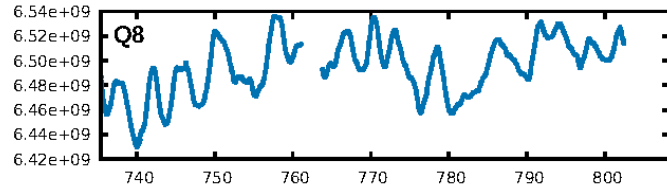
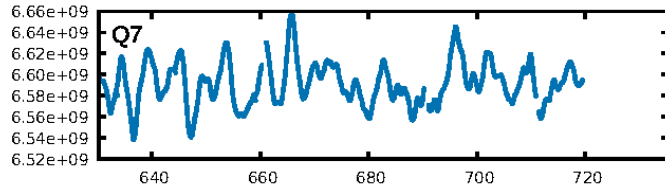
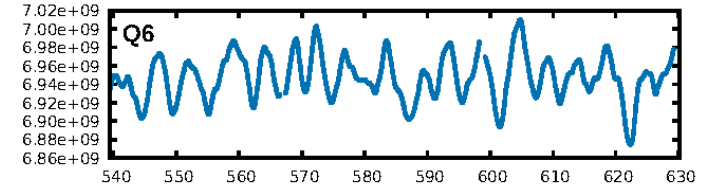
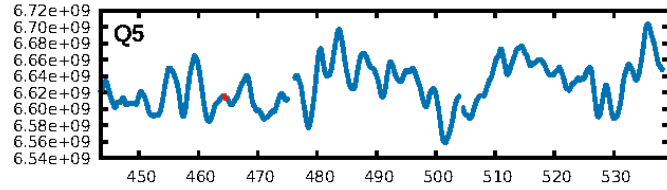
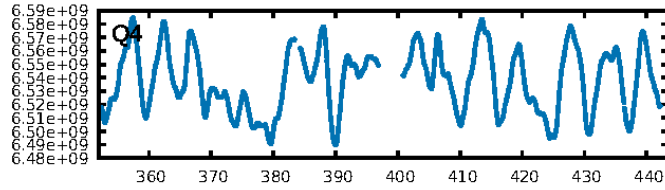
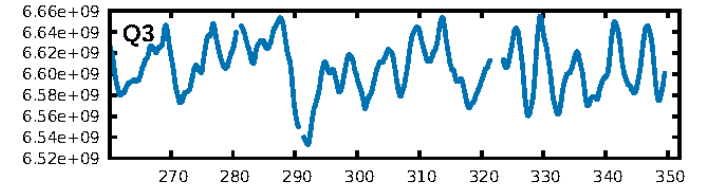
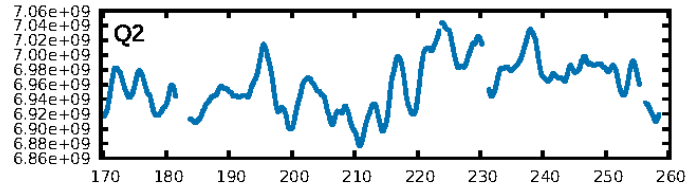
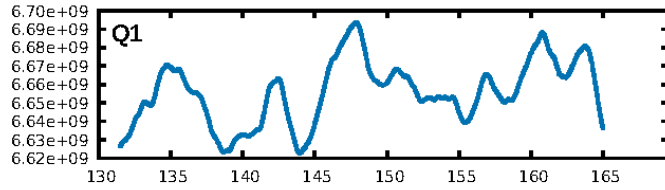
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [475.67 sigma]
ModelChiSquare2-sig: 21.2%
ModelChiSquareGof-sig: 76.9%
Bootstrap-pfa: 1.73e-06
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: N/A
Centroid-sig: 10.1%
Centroid-so: 10.176 arcsec [1.15 sigma]
OotOffset-rm: 12.240 arcsec [3.51 sigma]
KicOffset-rm: 14.257 arcsec [5.08 sigma]
OotOffset-st: 1/1/0/1 [3]
KicOffset-st: 1/1/0/1 [3]
DiffImageQuality-fgm: 0.00 [0/3]
DiffImageOverlap-fno: 1.00 [3/3]

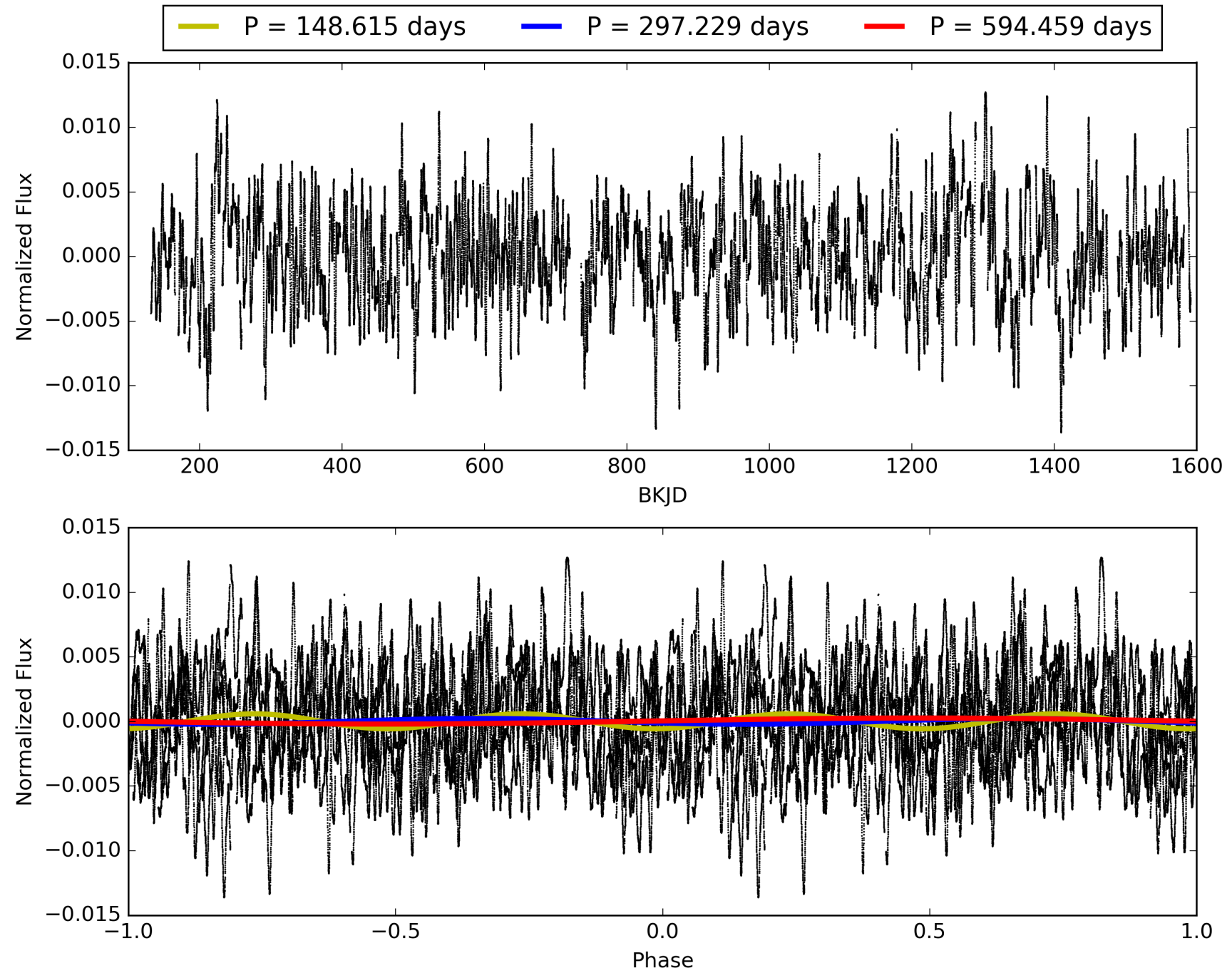
Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 06:36:18 Z

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

TCE 004742716-02, PDC Light Curves

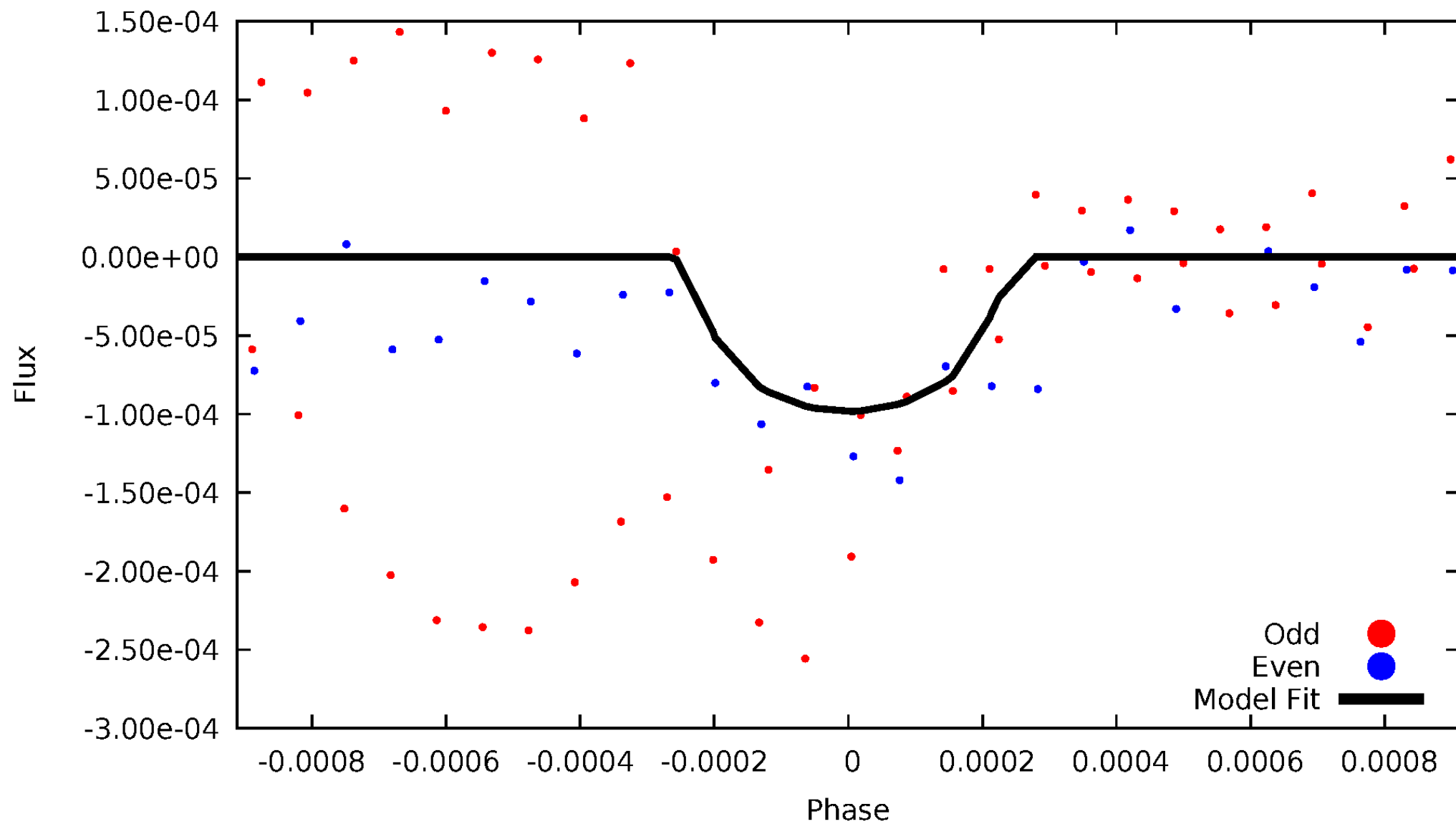


TCE 004742716-02



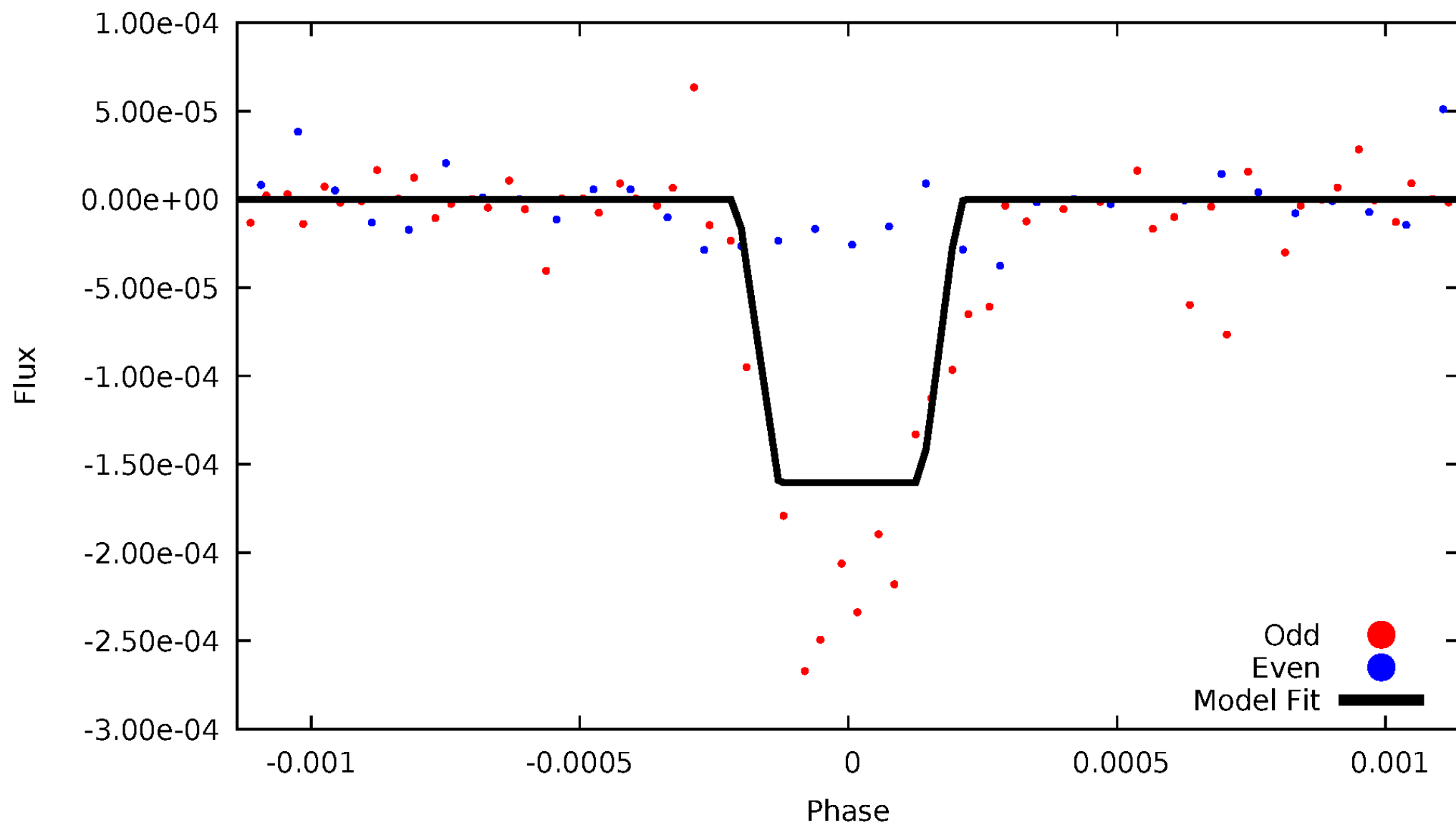
DV Odd/Even

TCE 004742716-02



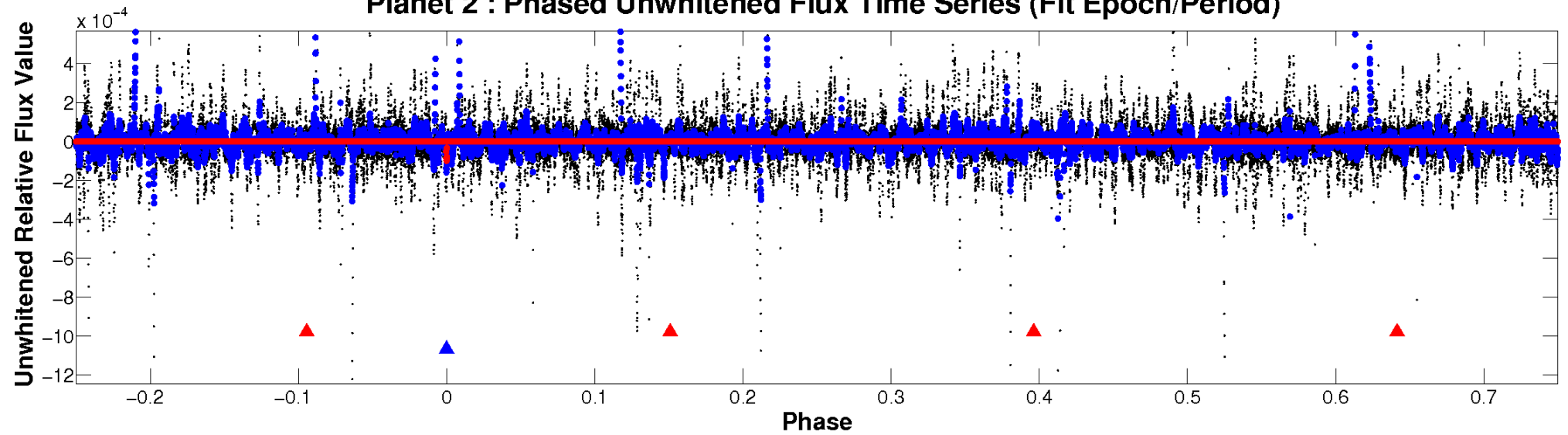
ALT Odd/Even

TCE 004742716-02

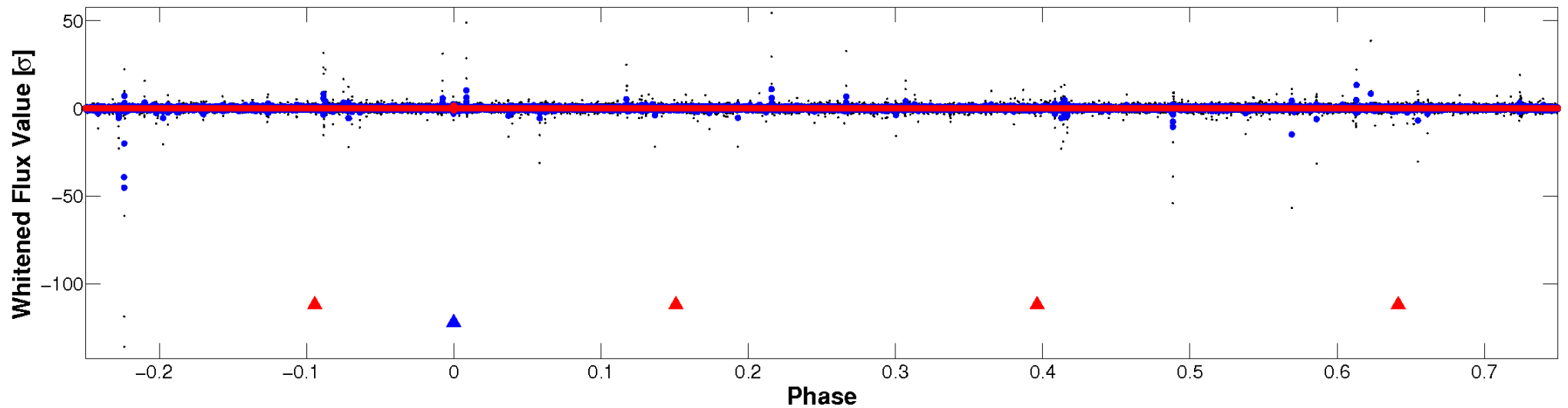


Non-Whitened Vs. Whitened Light Curve

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

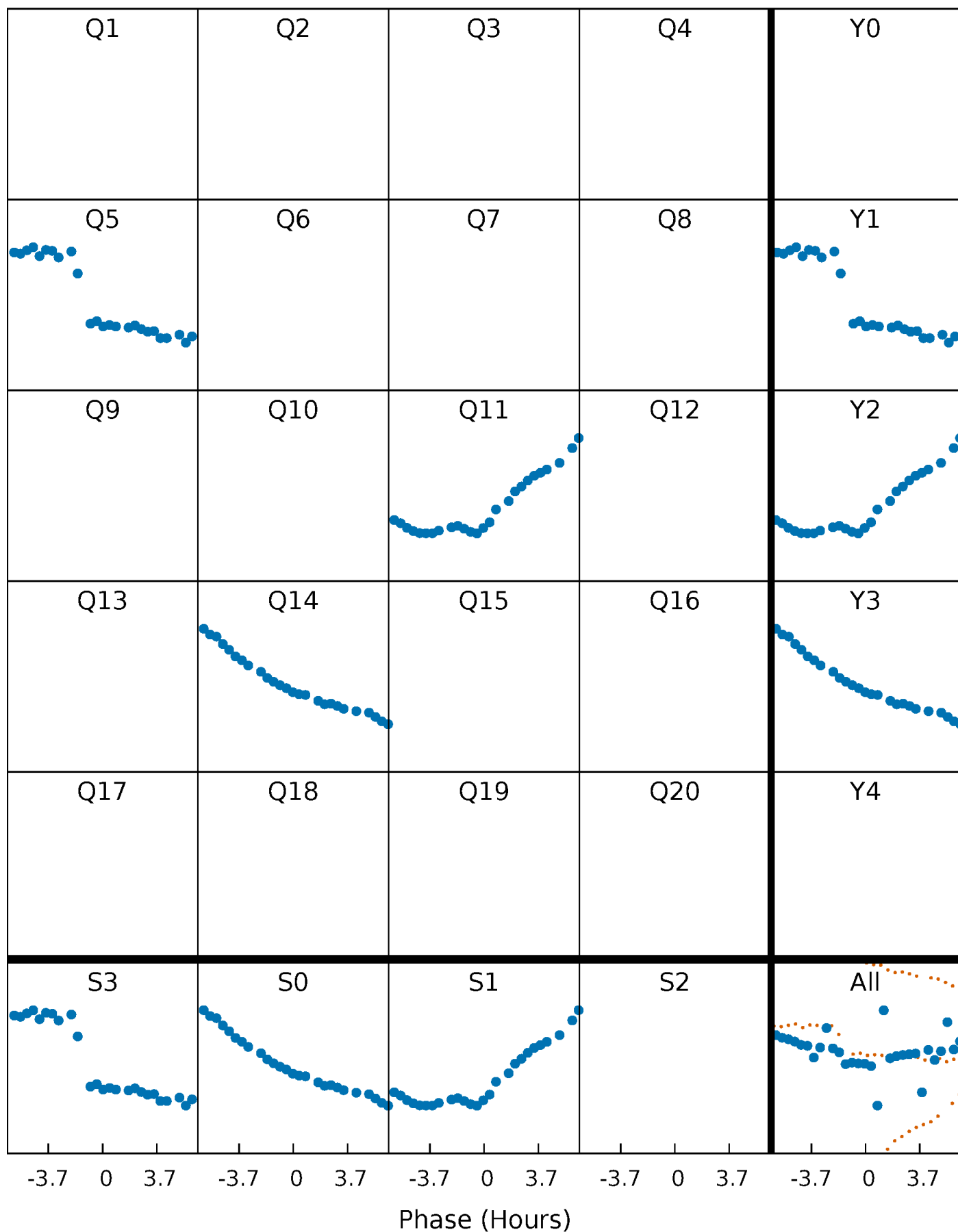


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



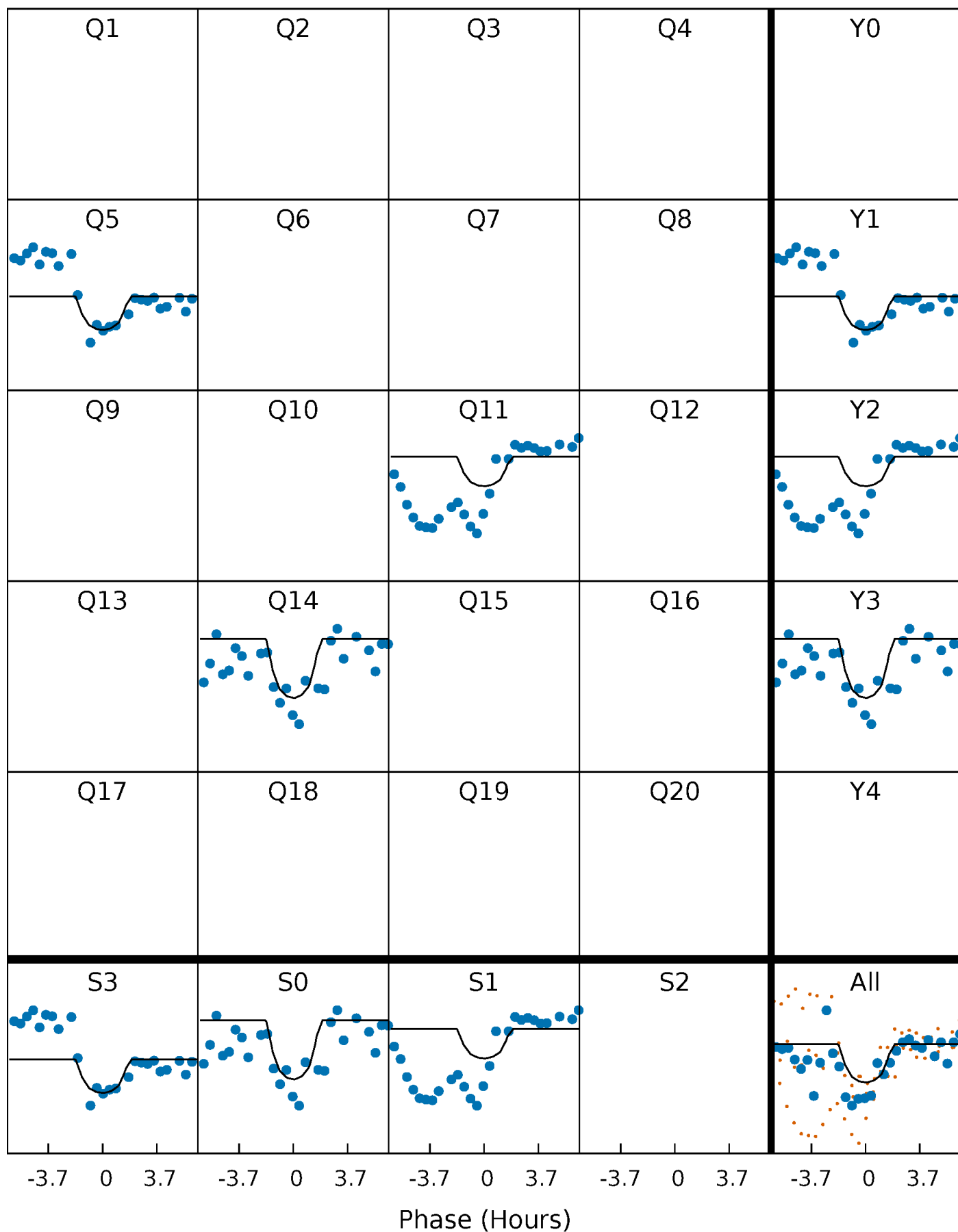
PDC Quarter-Phased Transit Curves

TCE 004742716-02 $P=297.229347$ Days $T_0=167.241530$ (BKJD)



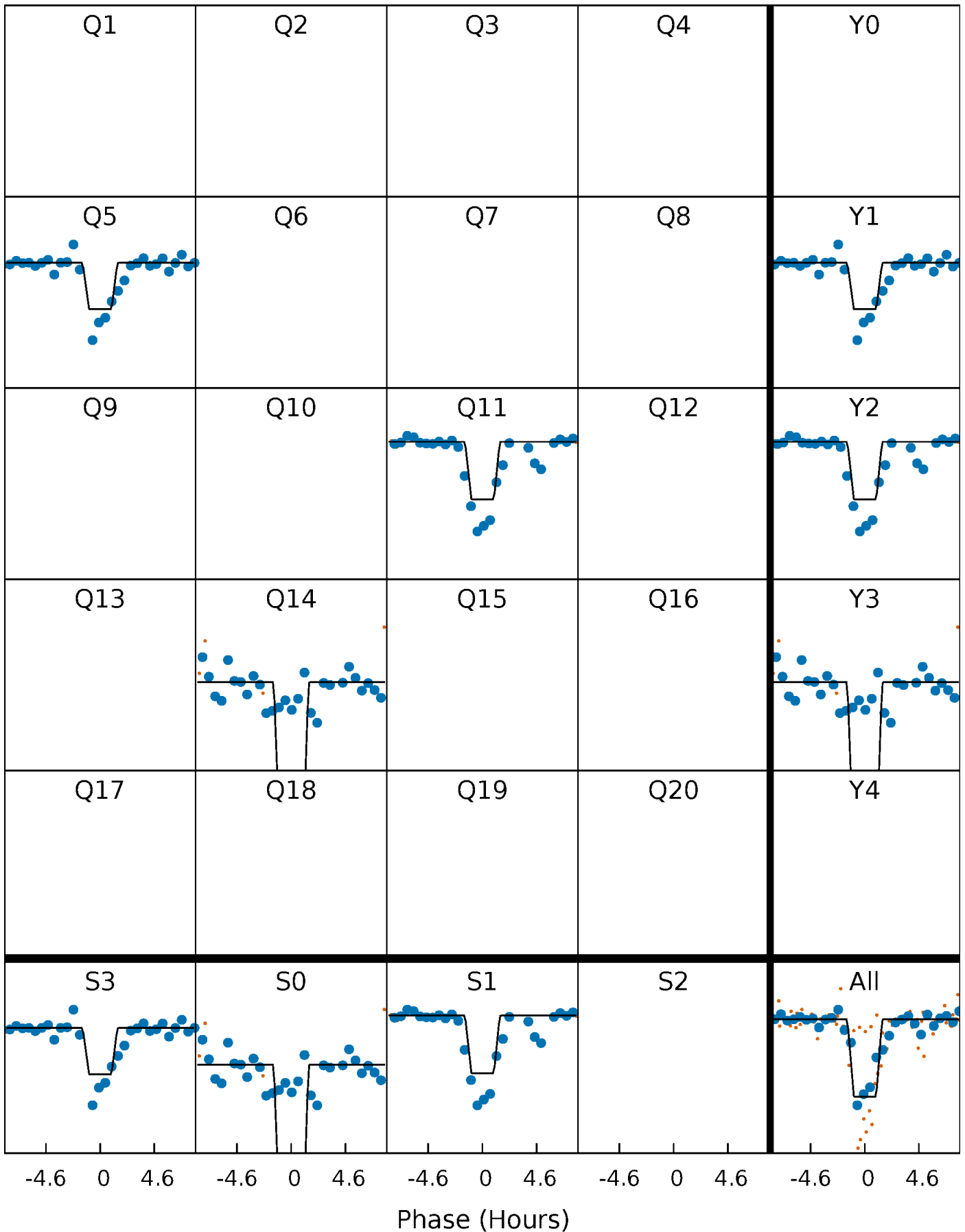
DV Quarter-Phased Transit Curves

TCE 004742716-02 P=297.229347 Days $T_0=167.241530$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

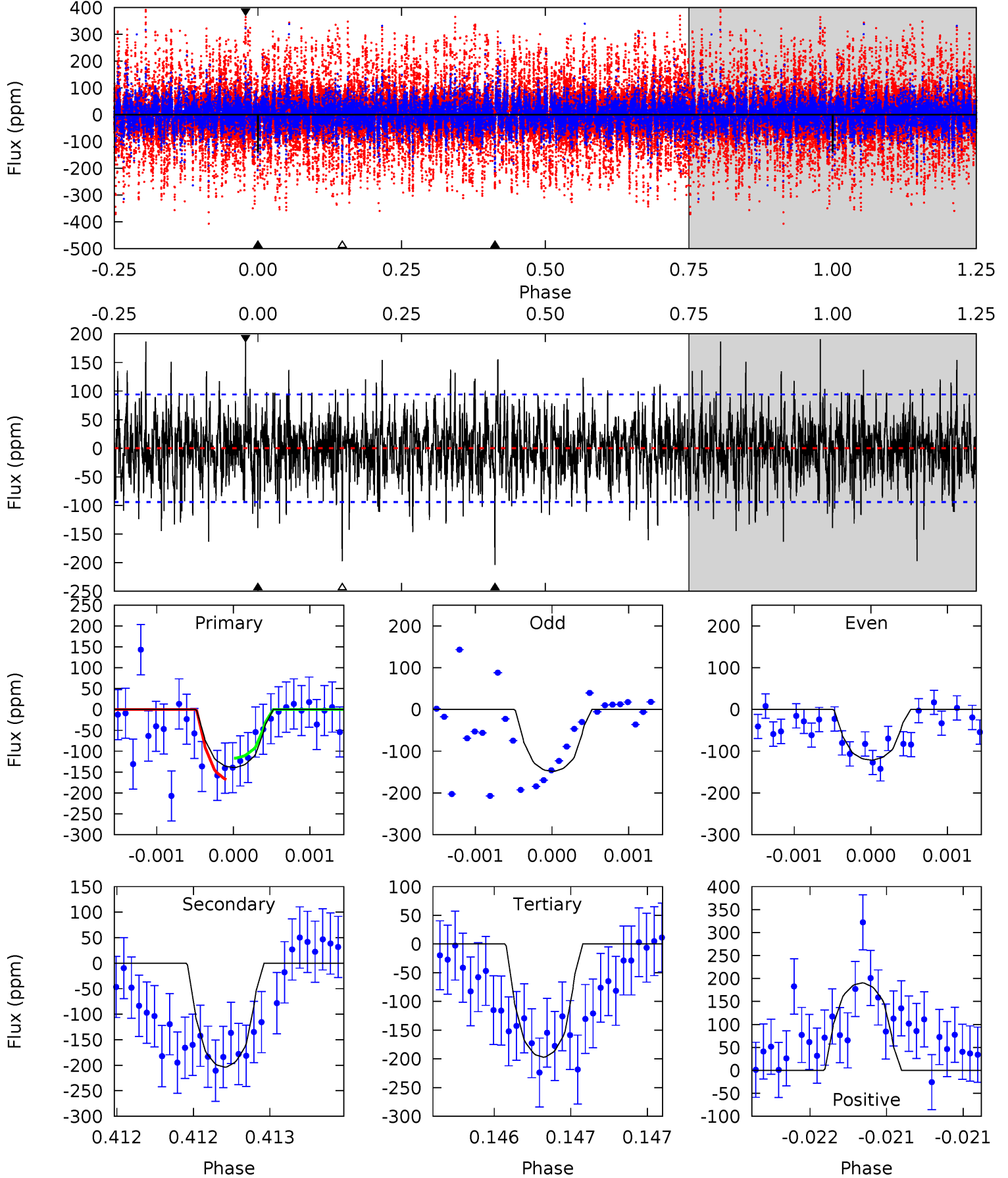
TCE 004742716-02 P=297.233171 Days $T_0=167.226407$ (BKJD)



DV Model-Shift Uniqueness Test

004742716-02, P = 297.229347 Days, E = 167.241530 Days

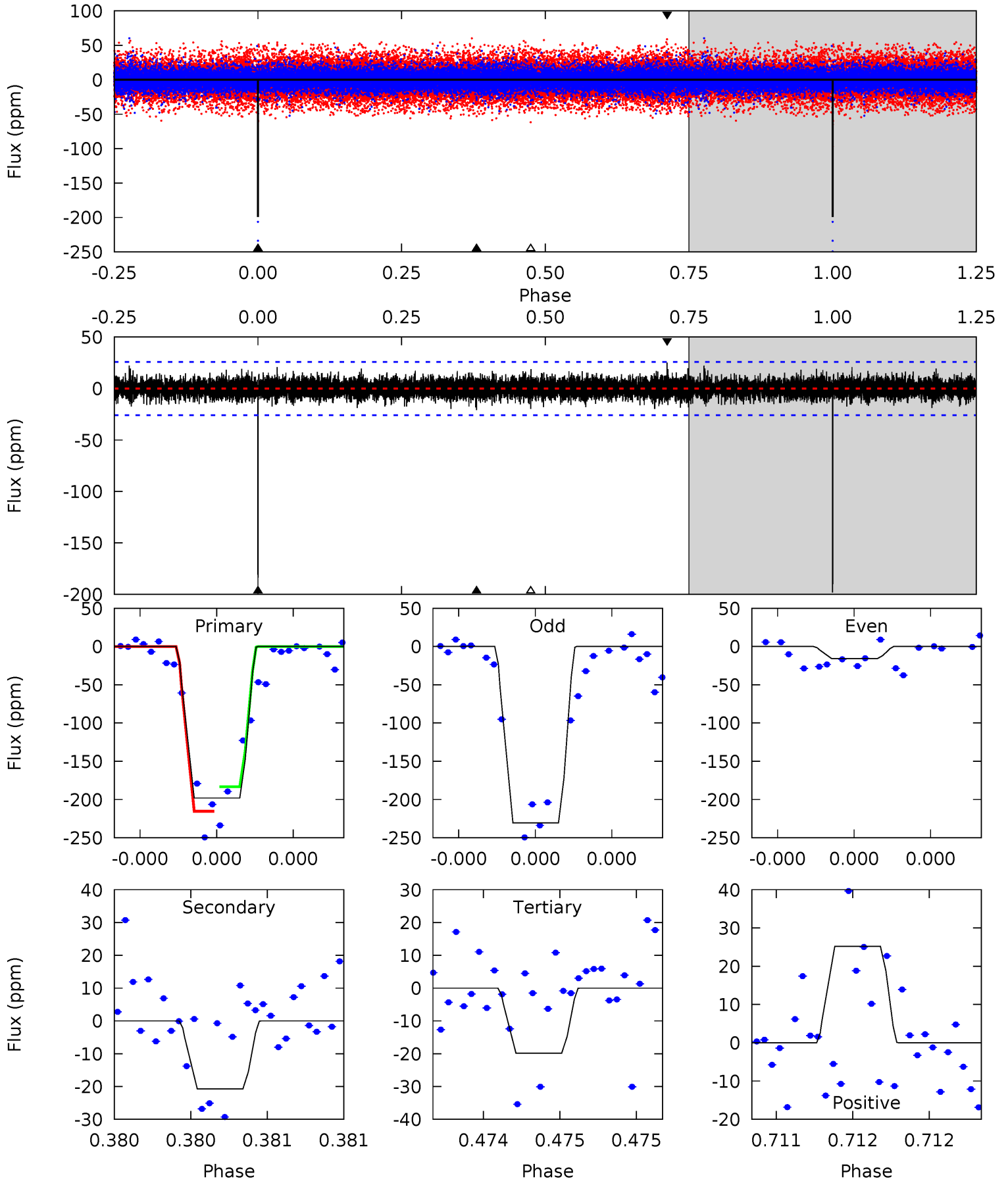
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.23	12.0	11.7	11.3	5.56	3.46	2.35	-3.42	-3.03	0.39	0.79	0.70	1.14	0.48	1.49



Alt Model-Shift Uniqueness Test

004742716-02, P = 297.233171 Days, E = 167.226407 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
42.9	4.49	4.31	5.46	5.61	3.53	1.02	38.6	37.5	0.19	-0.97	28.1	0.71	0.11	3.32



Stellar Parameters For KIC 004742716

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4074^{+142}_{-113}	$1.687^{+0.312}_{-0.208}$	$0.260^{+0.150}_{-0.250}$	$30.729^{+8.739}_{-11.652}$	$1.676^{+0.209}_{-0.523}$	$0.000^{+0.000}_{-0.000}$
	+3%/-3%	+18%/-12%	+58%/-96%	+28%/-38%	+12%/-31%	+233%/-47%
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 004742716-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-204 ± 17	$34.72^{+29.33}_{-22.42}$	1374^{+125}_{-122}	4547^{+3003}_{-880}	96^{+664}_{-68}
Alt.	-21 ± 5	$44.09^{+32.59}_{-24.69}$	1368^{+126}_{-134}	2845^{+828}_{-368}	$5.970^{+23.961}_{-4.078}$

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

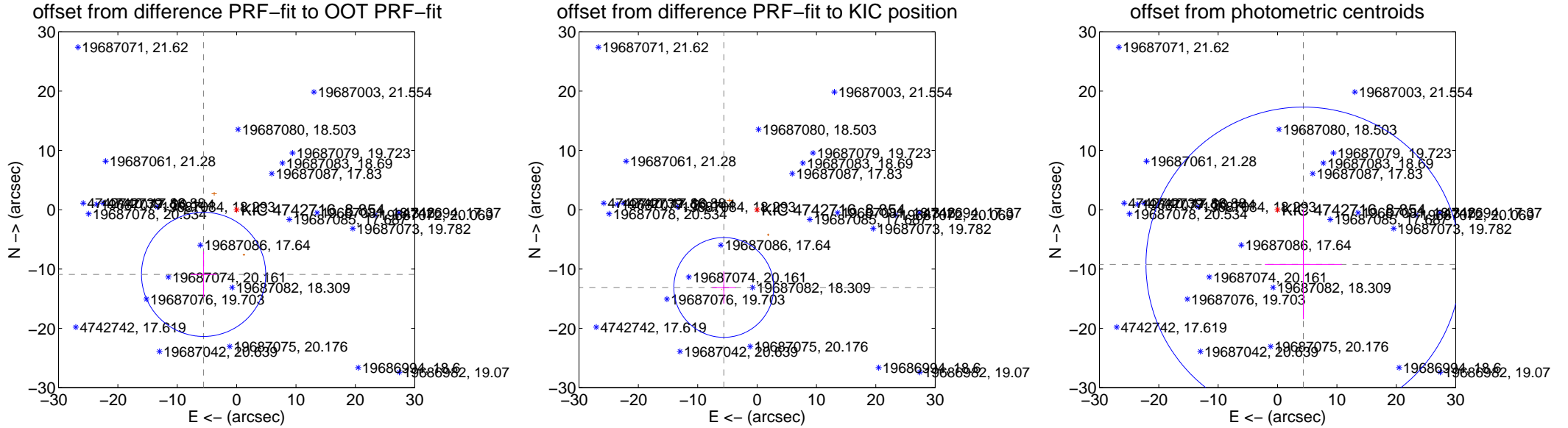
DV Centroid Data

Supplemental centroid analysis for 004742716-02. **Kepler magnitude: 8.85.** Transit SNR 5.67

There are 0 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 1.40 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	12.240 ± 3.488	3.51	5.559 ± 2.168	-10.905 ± 3.877
PRF-fit source offset from KIC position	14.257 ± 2.804	5.08	5.606 ± 1.987	-13.108 ± 2.744
photometric centroid source offset	10.18 ± 8.84	1.15	-4.35 ± 6.48	-9.20 ± 9.28

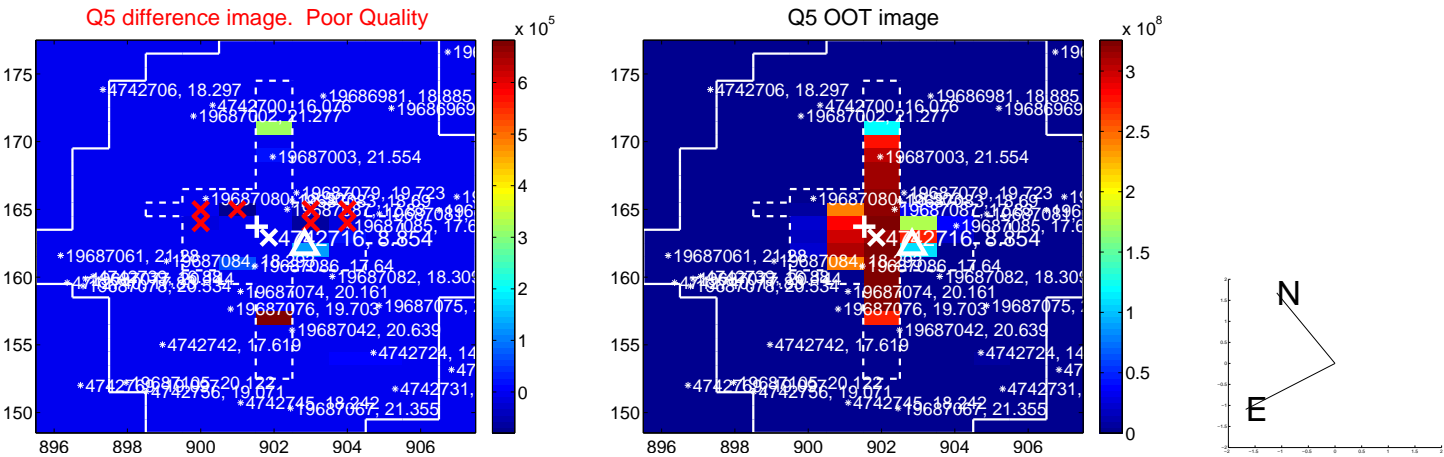


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

Q9 no difference image



Q9 no OOT image



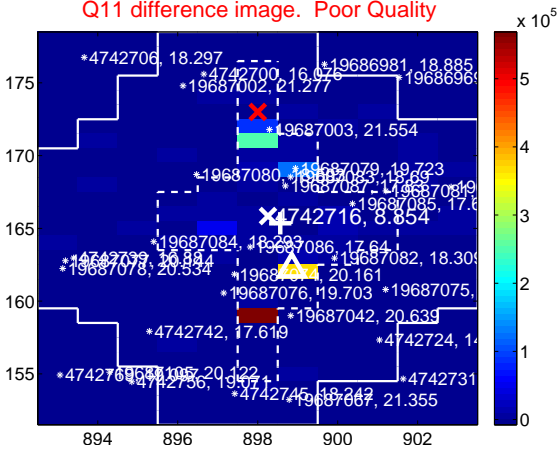
Q10 no difference image



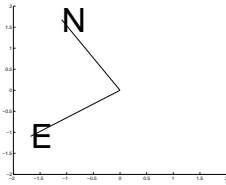
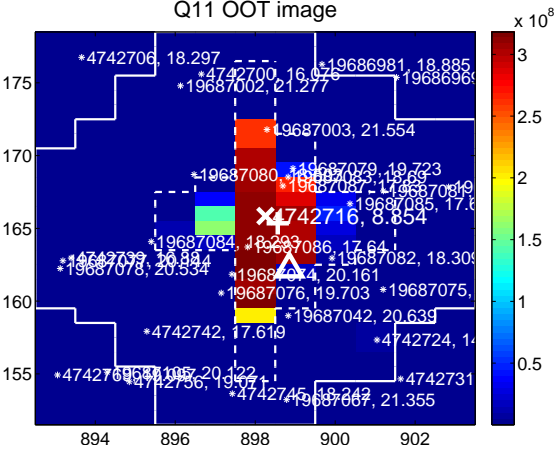
Q10 no OOT image



Q11 difference image. Poor Quality



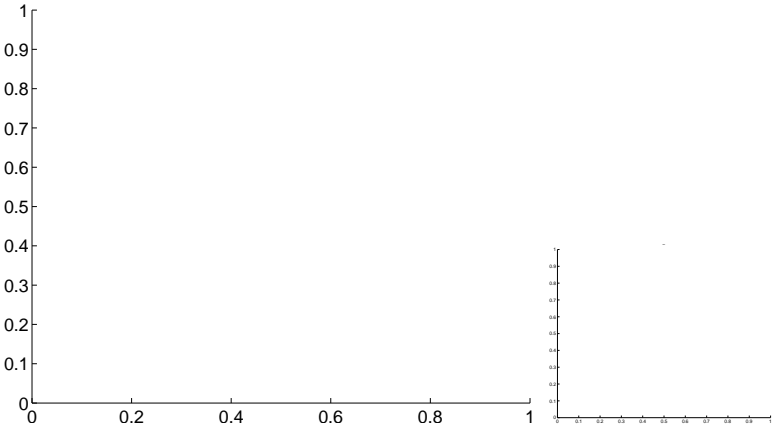
Q11 OOT image



Q12 no difference image



Q12 no OOT image



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

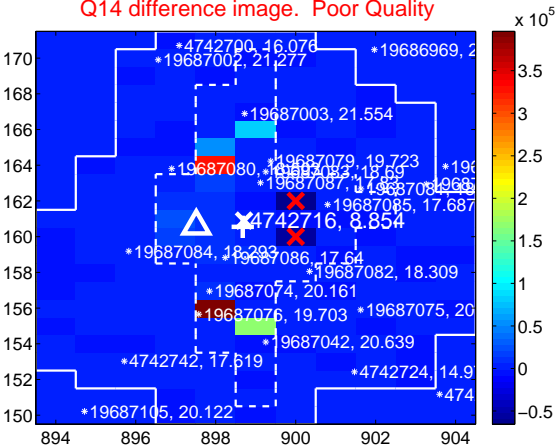
Q13 no difference image



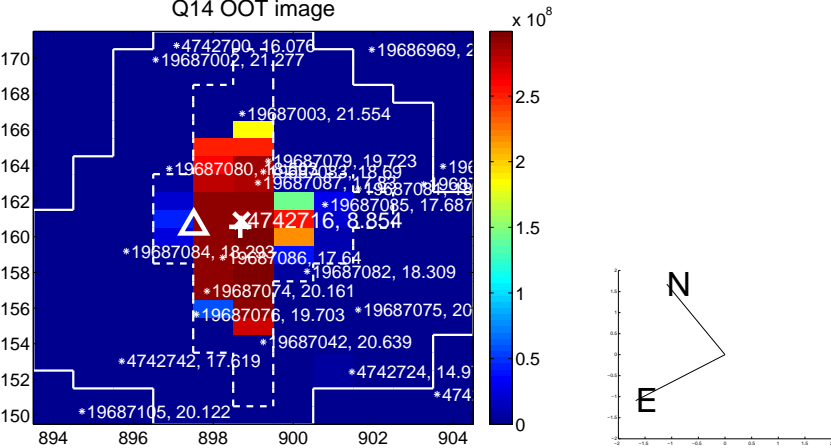
Q13 no OOT image



Q14 difference image. Poor Quality



Q14 OOT image



Q15 no difference image



Q15 no OOT image



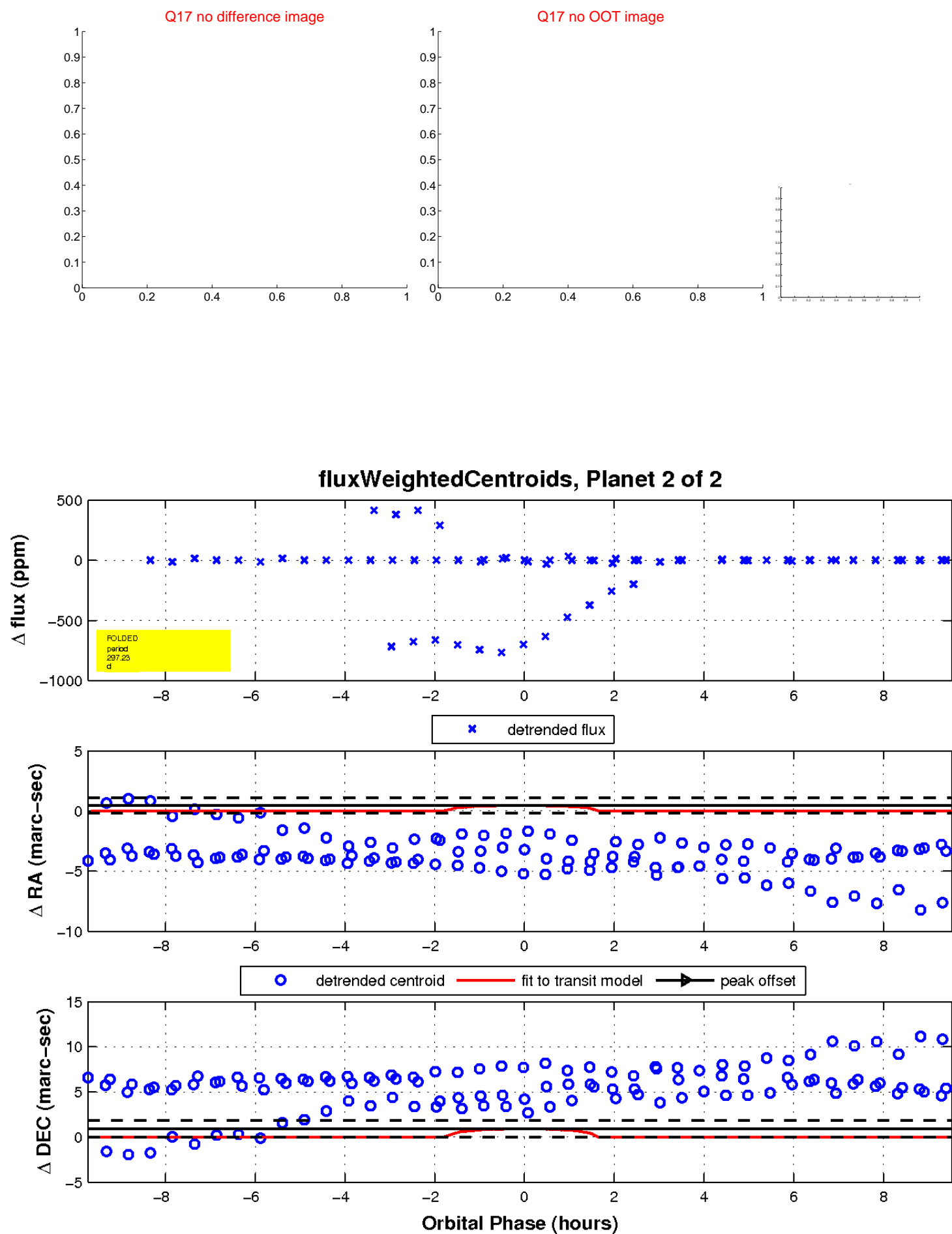
Q16 no difference image



Q16 no OOT image



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



UKIRT Image

Declination

