

KIC 010815729

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})
010815729-01	OBS	No	350.271134	151.741524	1905.6	3.254	23.8	13.0	1.80	5221	8.34	2.47
010815729-02	OBS	No	600.600988	317.474647	2034.5	12.126	13.3	6.9	1.80	5221	7.94	1.20
010815729-03	OBS	No	456.857929	149.047001	1151.5	7.450	19.2	5.1	1.80	5221	5.97	1.73
010815729-04	OBS	No	225.698771	177.183150	1050.7	2.901	14.7	7.2	1.80	5221	5.89	4.44

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010815729-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—MOD_POS_ALT—INCONSISTENT_TRANS
010815729-02	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
010815729-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
010815729-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—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.

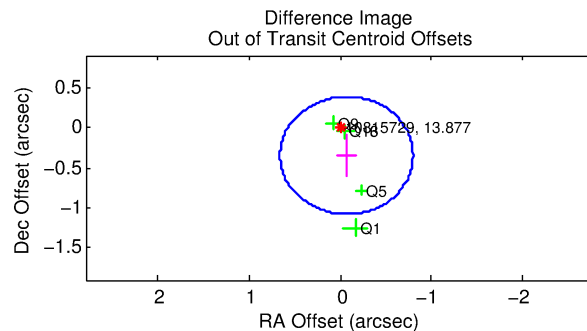
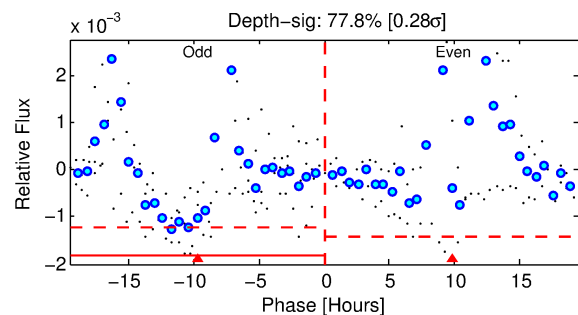
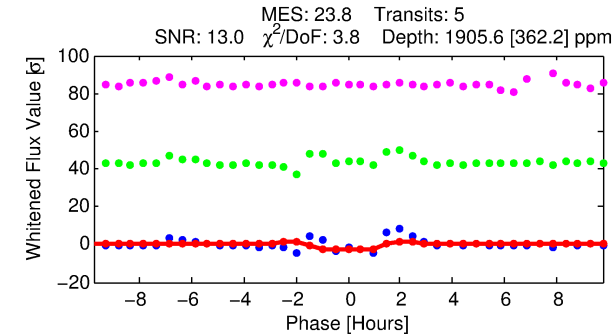
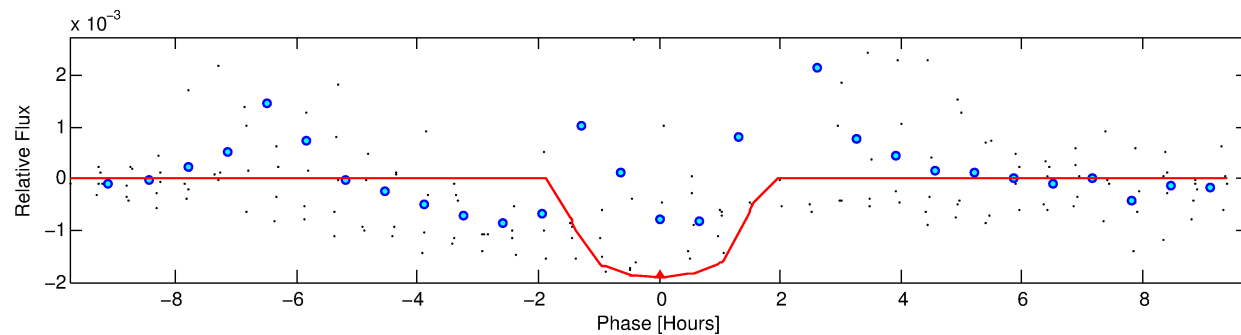
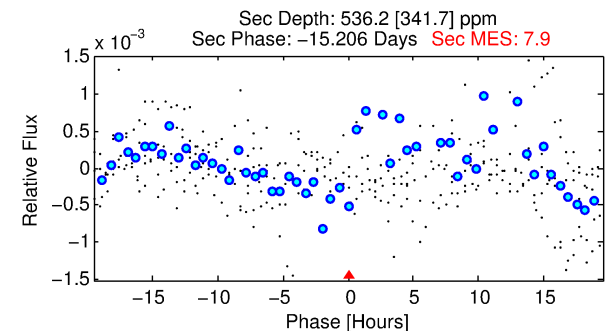
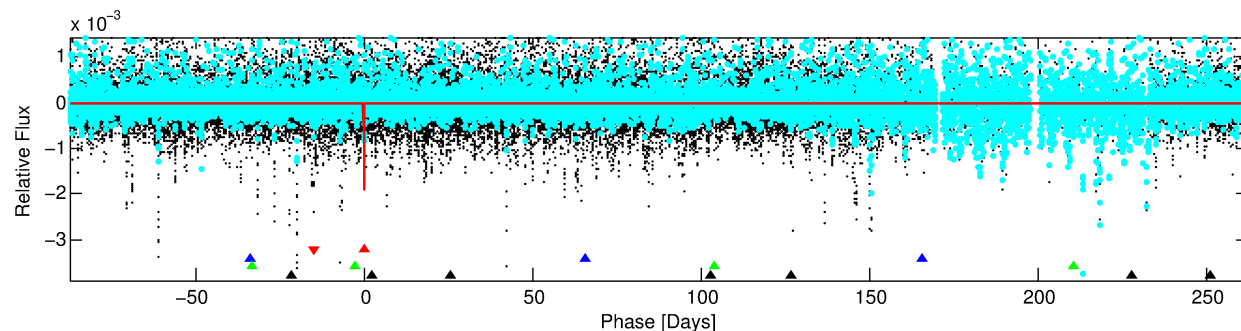
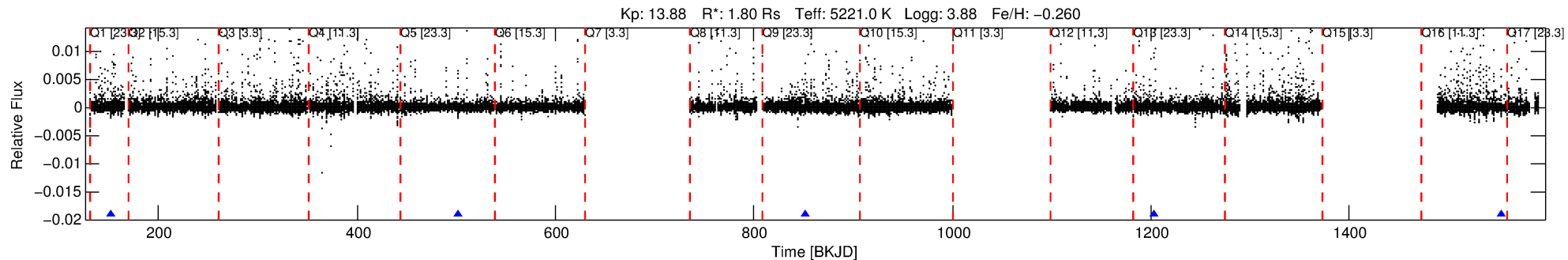
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010815729-01

No Significant Match Found

DV One-Page Summary

KIC: 10815729 Candidate: 1 of 4 Period: 350.271 d



DV Fit Results:

Period = 350.27113 [0.00273] d
Epoch = 151.7415 [0.0072] BKJD
Rp/R* = 0.0425 [0.1252]
a/R* = 647.87 [7315.69]
b = 0.68 [9.02]
Seff = 2.47 [2.77]
Teq = 320 [90] K
Rp = 8.34 [25.12] Re
a = 0.9343 [0.6166] AU
Ag = 3702.52 [22355.57] [0.17σ]
Teffp = 3856 [5722] K [0.62σ]

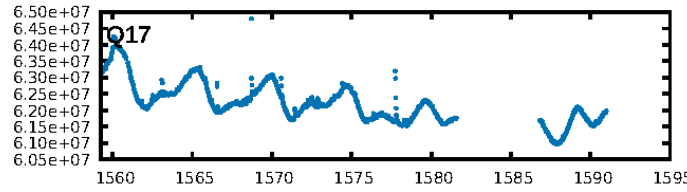
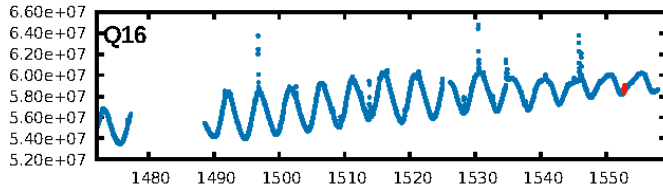
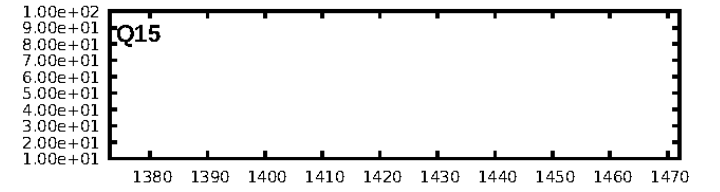
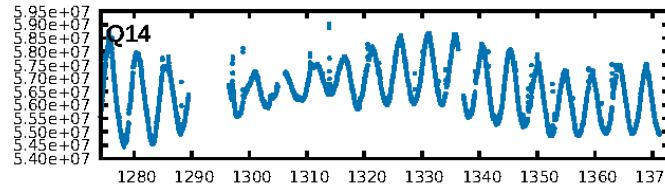
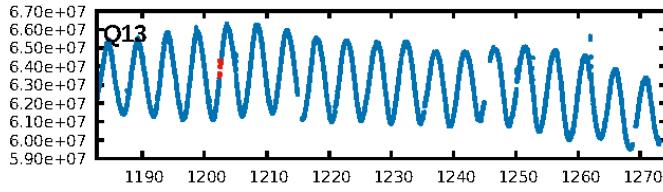
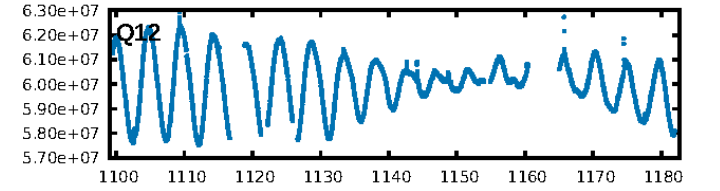
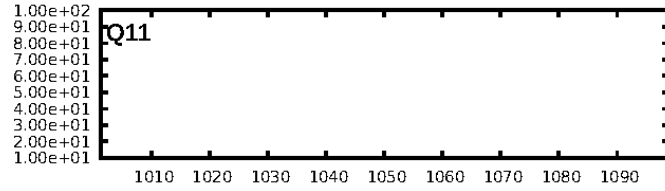
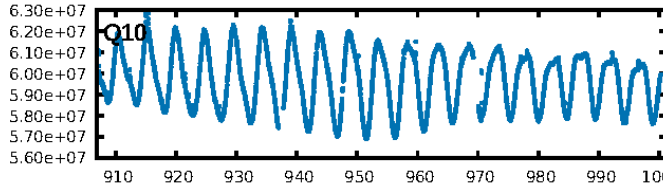
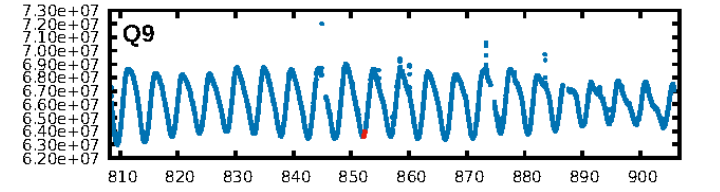
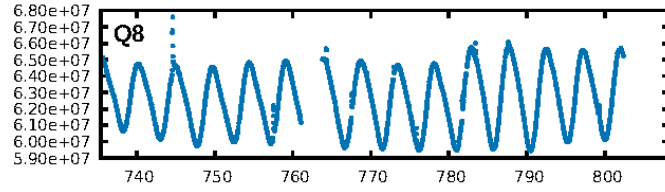
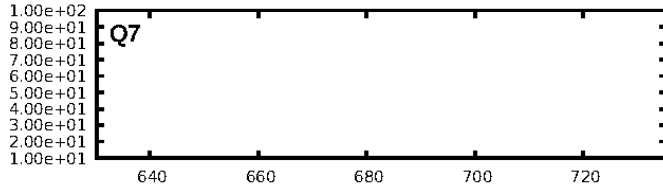
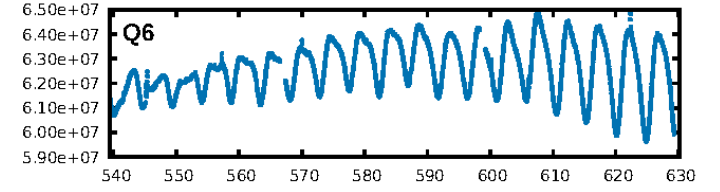
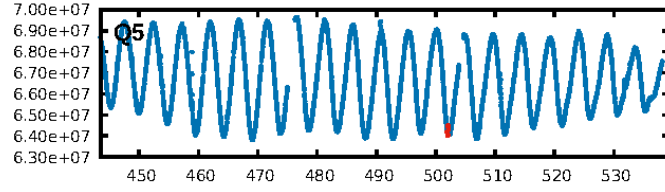
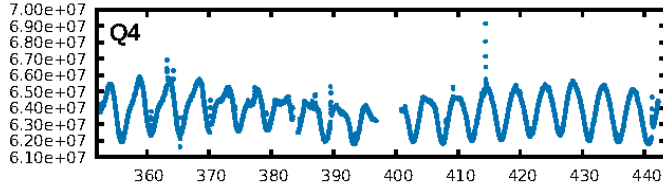
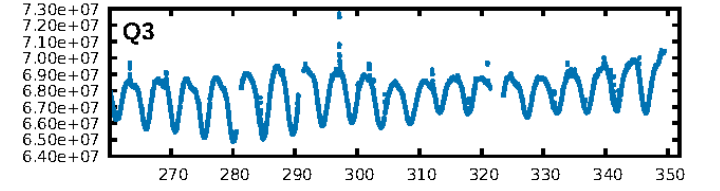
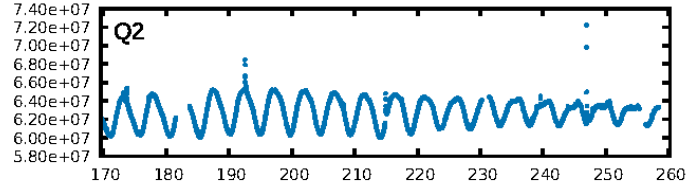
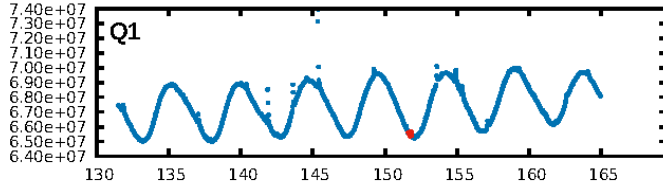
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [685.80σ]
LongPeriod-sig: 100.0% [314.64σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 0.0%
Bootstrap-pfa: 3.22e-20
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 3.892
Centroid-sig: 76.0%
Centroid-so: 0.043 arcsec [0.13σ]
OotOffset-rm: 0.355 arcsec [1.46σ]
KicOffset-rm: 0.397 arcsec [1.51σ]
OotOffset-st: 0/0/1/4 [5]
KicOffset-st: 0/0/1/4 [5]
DiffImageQuality-fgm: 0.80 [4/5]
DiffImageOverlap-fno: 1.00 [5/5]

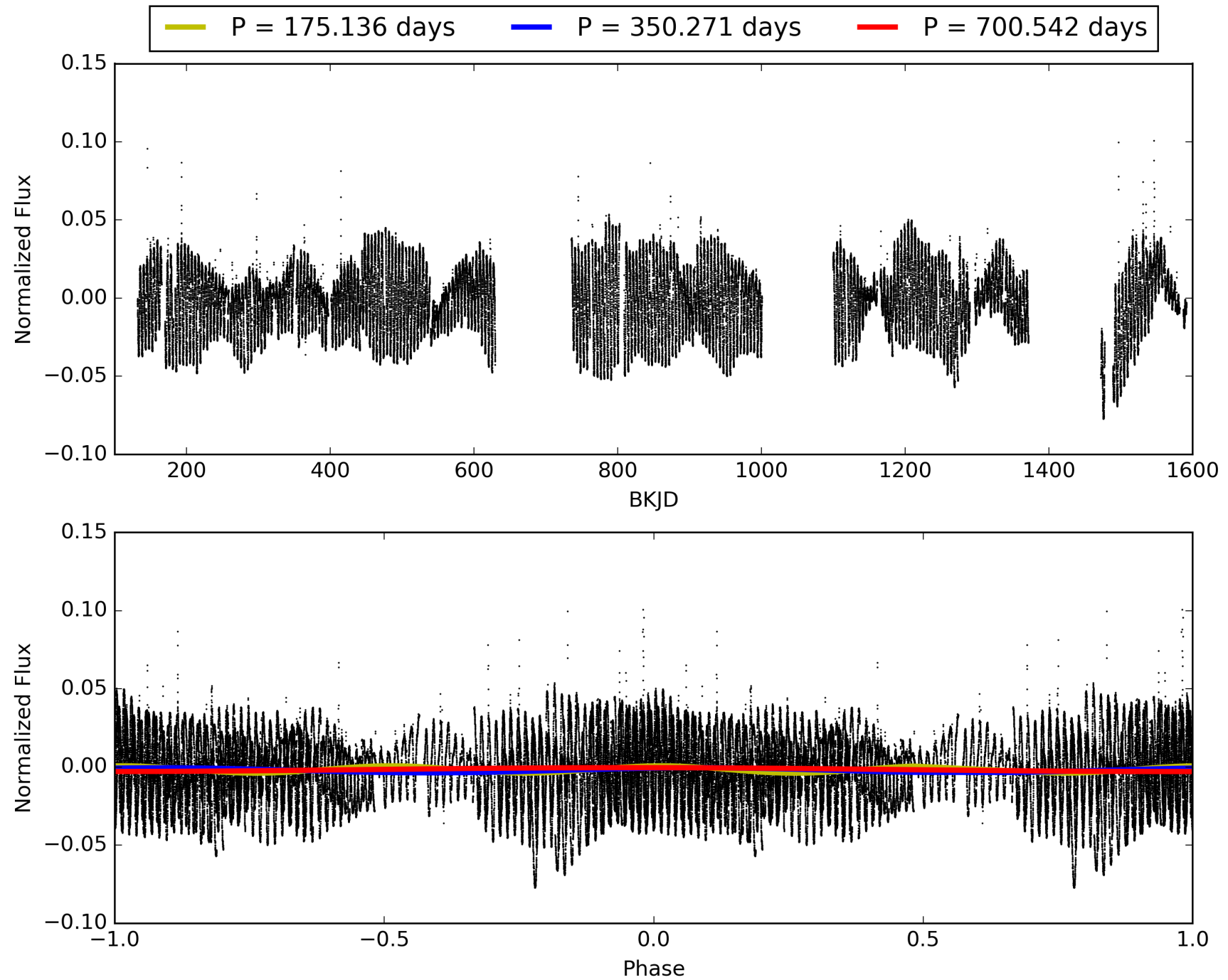
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 010815729-01, PDC Light Curves

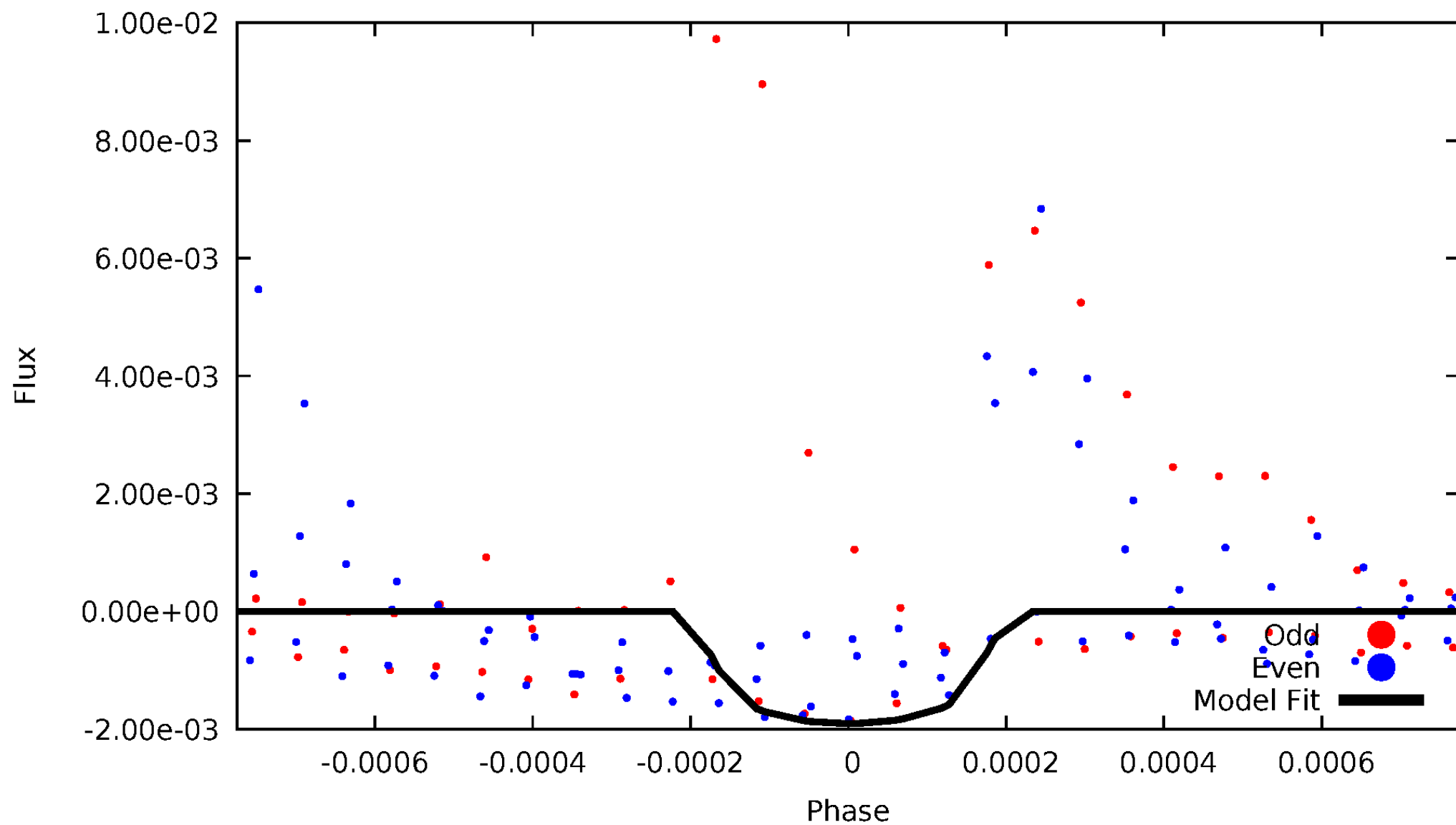


TCE 010815729-01



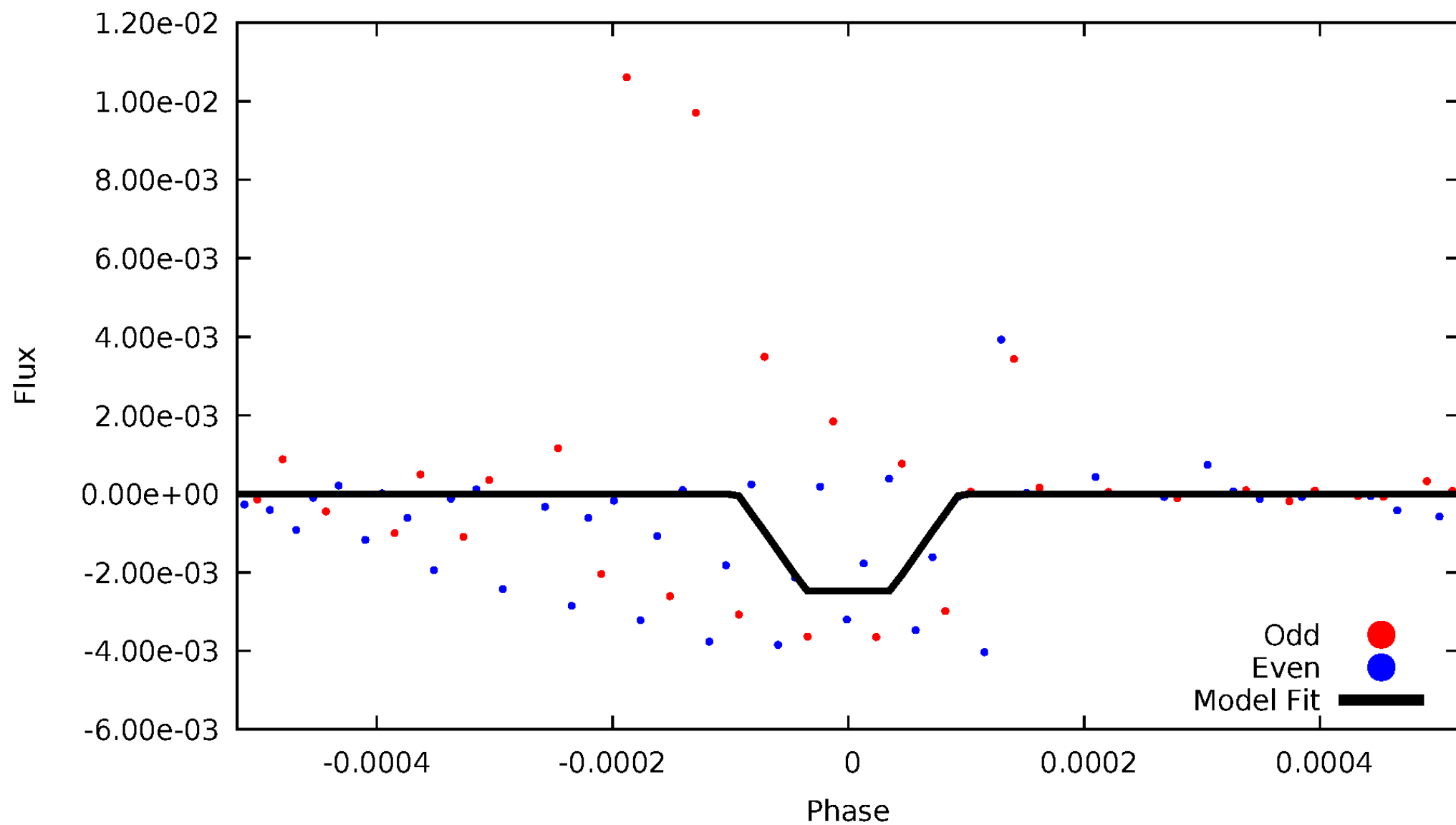
DV Odd/Even

TCE 010815729-01



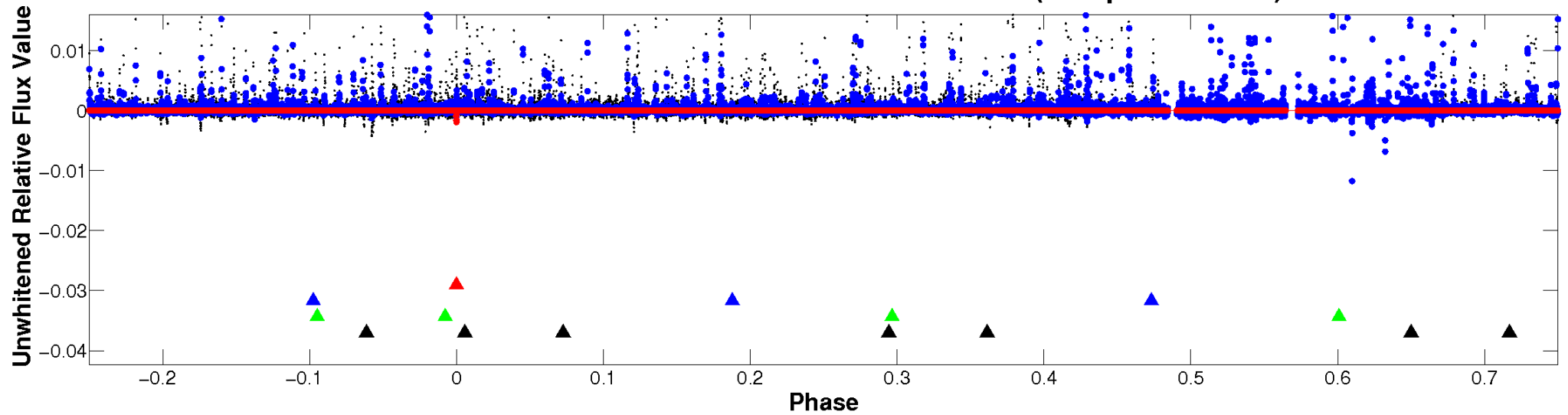
ALT Odd/Even

TCE 010815729-01

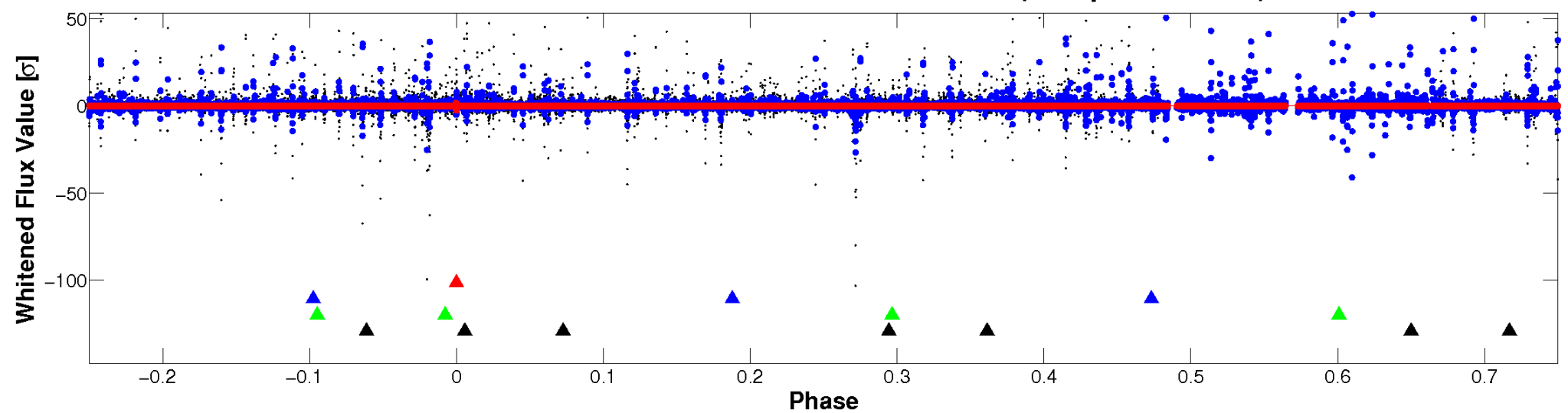


Non-Whitened Vs. Whitened Light Curve

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

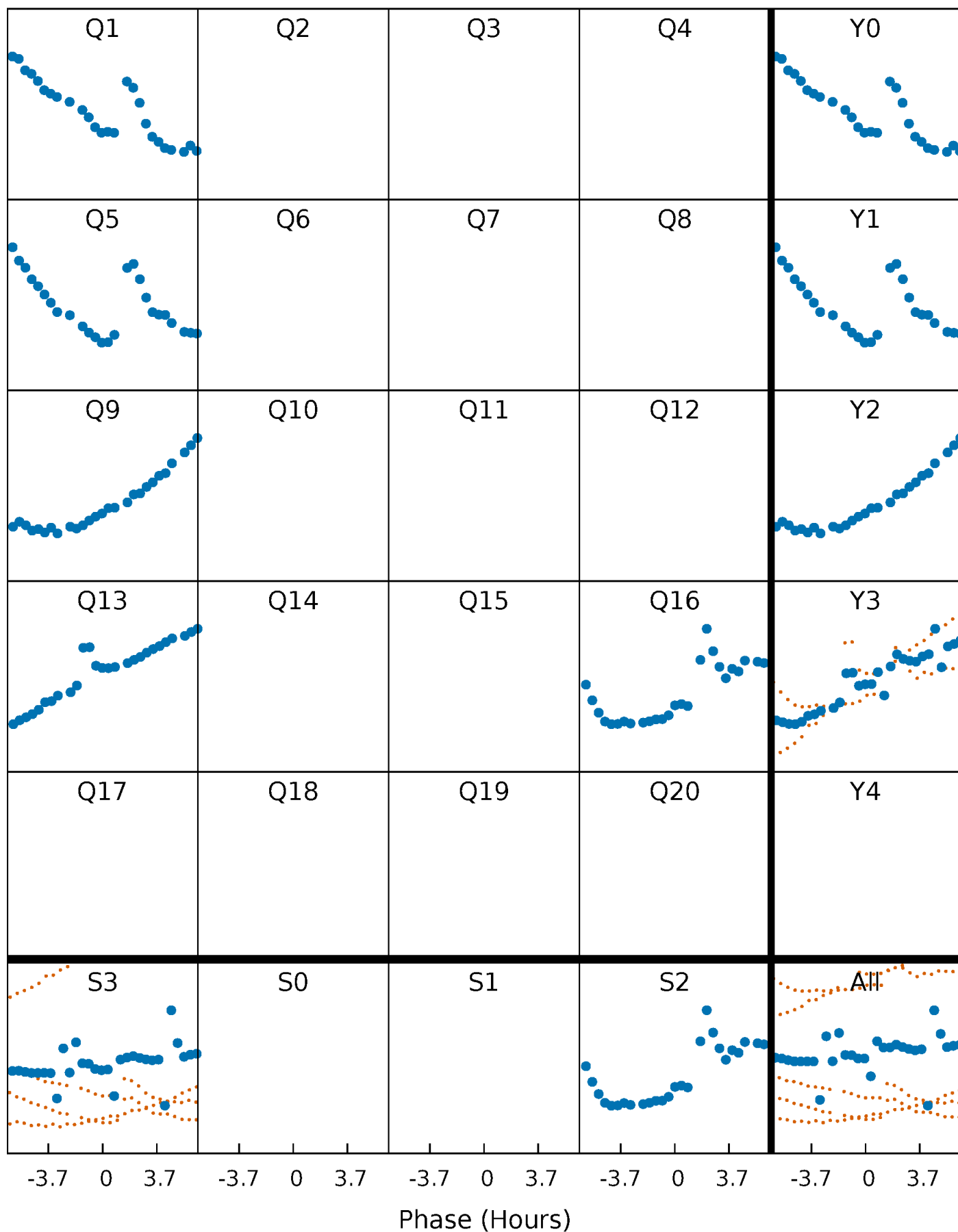


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



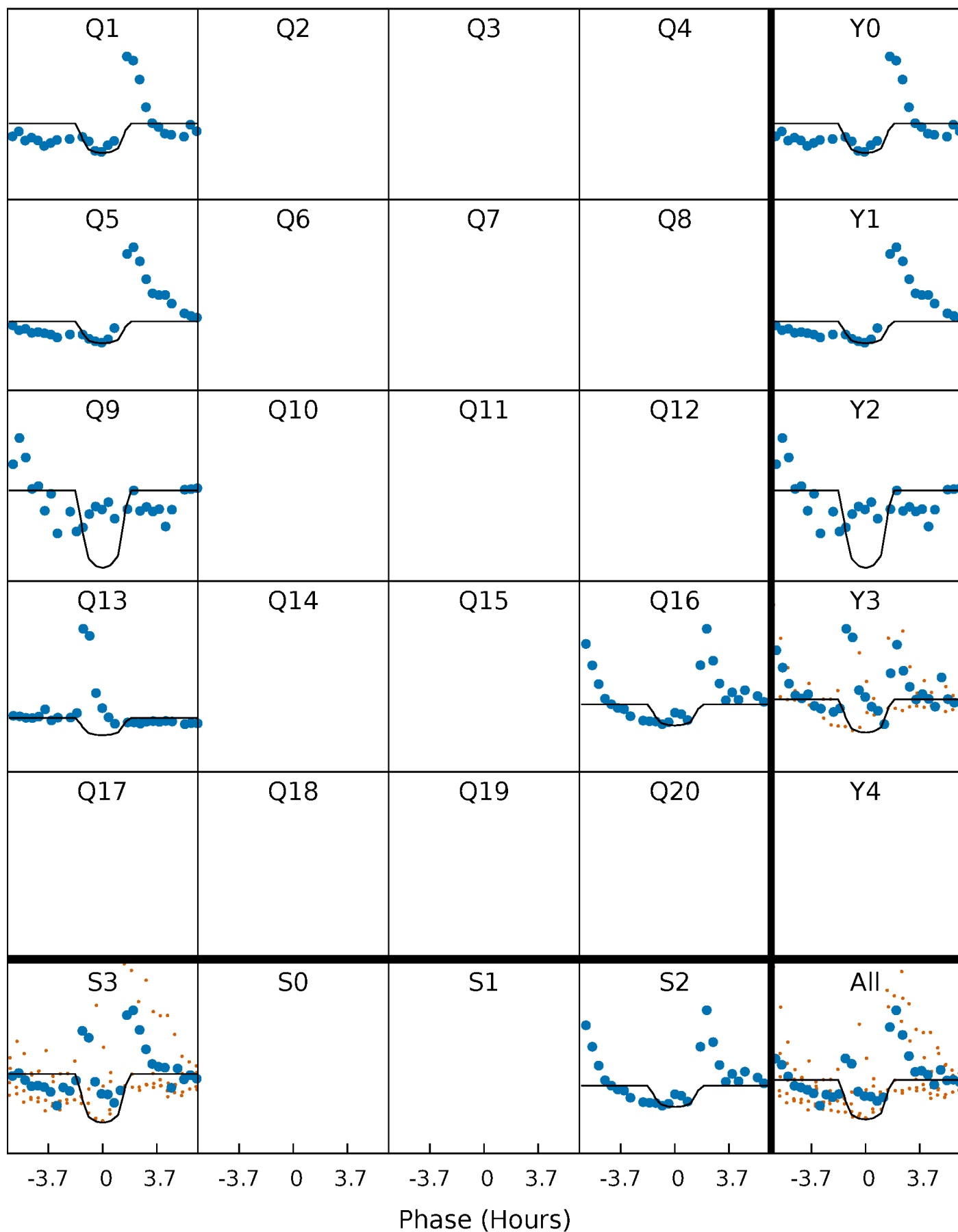
PDC Quarter-Phased Transit Curves

TCE 010815729-01 P=350.271134 Days $T_0=151.741523$ (BKJD)



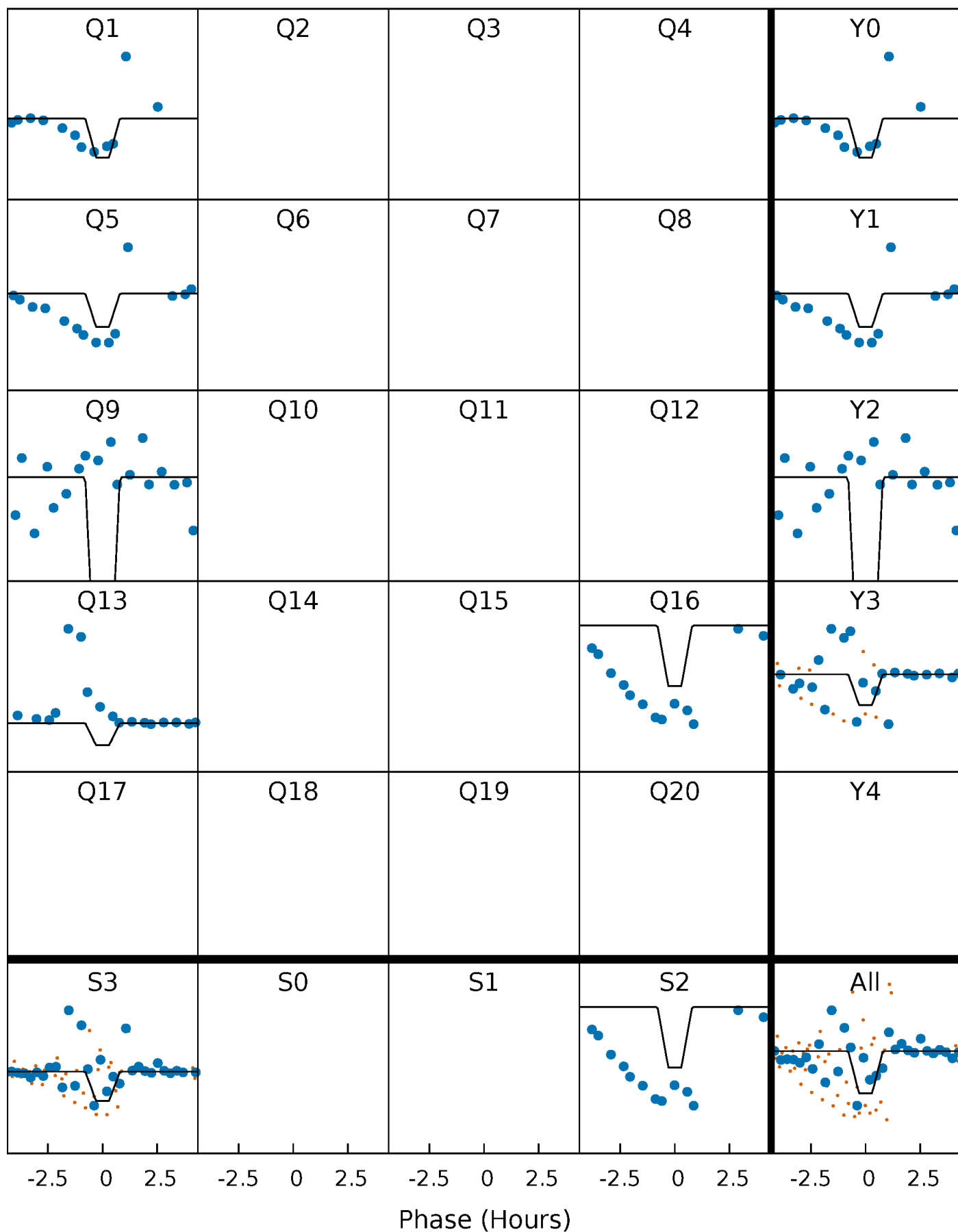
DV Quarter-Phased Transit Curves

TCE 010815729-01 P=350.271134 Days $T_0=151.741523$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

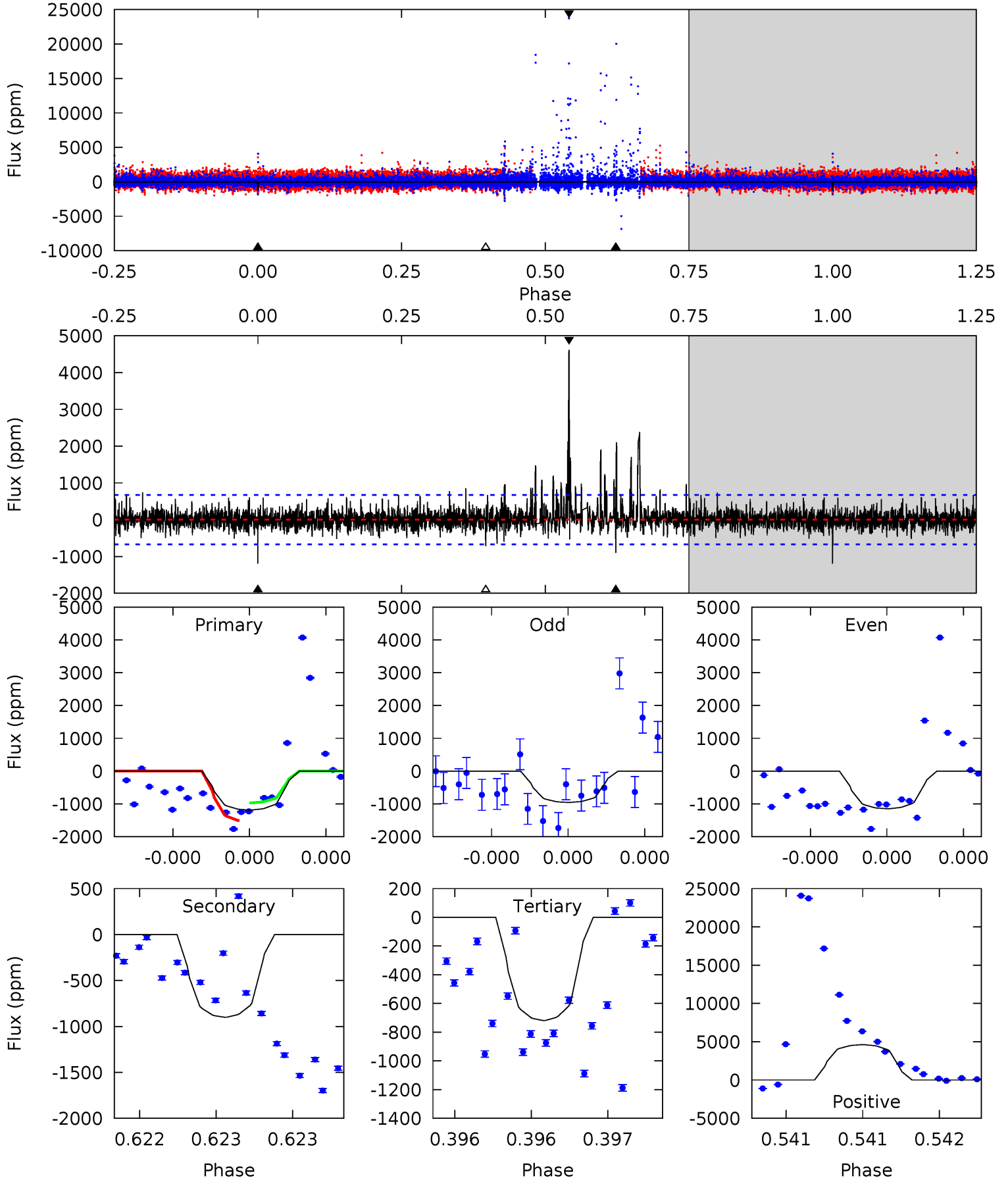
TCE 010815729-01 P=350.268183 Days $T_0=151.757625$ (BKJD)



DV Model-Shift Uniqueness Test

010815729-01, P = 350.271134 Days, E = 151.741523 Days

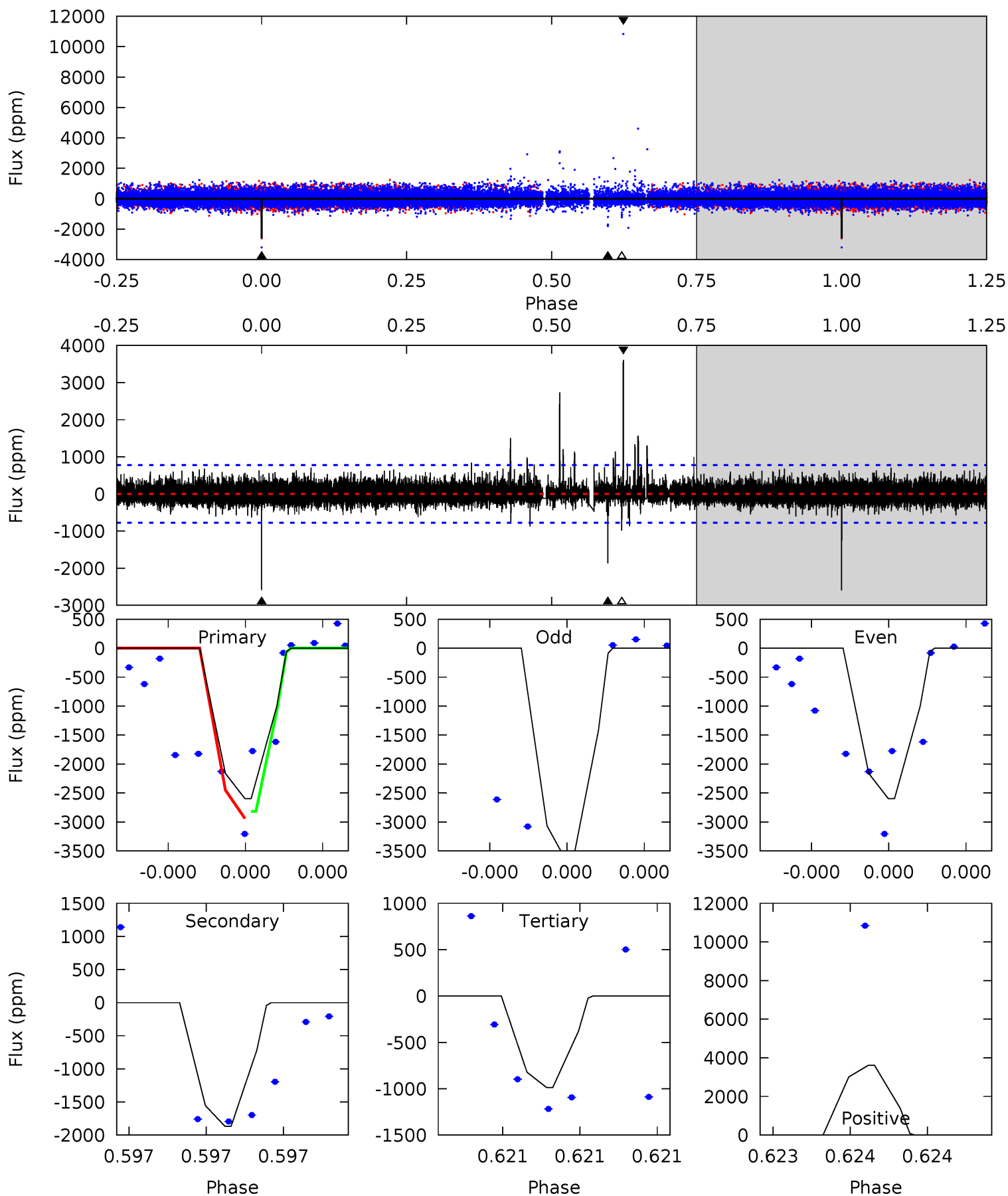
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.95	7.54	6.02	38.7	5.63	3.57	1.86	3.93	-28.7	1.52	-31.1	0.50	0.15	0.80	2.12



Alt Model-Shift Uniqueness Test

010815729-01, P = 350.268183 Days, E = 151.757625 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.3	13.8	7.33	26.8	5.75	3.75	1.19	11.9	-7.52	6.52	-12.9	4.21	0.72	0.58	0.50



Stellar Parameters For KIC 010815729

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5221^{+174}_{-142}	$3.875^{+0.676}_{-0.364}$	$-0.260^{+0.350}_{-0.250}$	$1.800^{+1.101}_{-1.101}$	$0.886^{+0.197}_{-0.131}$	$0.214^{+2.605}_{-0.148}$
	+3%/-3%	+17%/-9%	+135%/-96%	+61%/-61%	+22%/-15%	+1216%/-69%
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 010815729-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-900 ± 119	$19.37^{+23.73}_{-13.63}$	444^{+71}_{-79}	3329^{+1623}_{-598}	1207^{+11432}_{-972}
Alt.	-1866 ± 135	$20.83^{+21.11}_{-14.63}$	442^{+71}_{-67}	3658^{+2160}_{-668}	2070^{+20685}_{-1561}

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

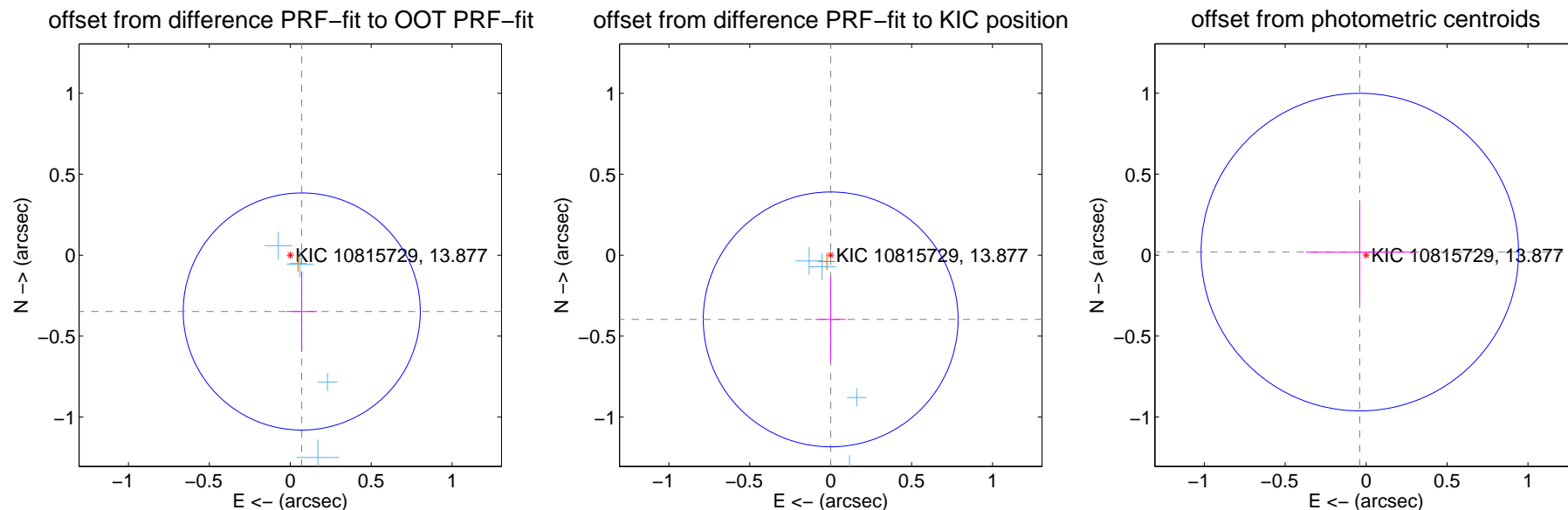
DV Centroid Data

Supplemental centroid analysis for 010815729-01. Kepler magnitude: 13.88. Transit SNR 13.01

There are 4 quarters with good PRF difference image offsets

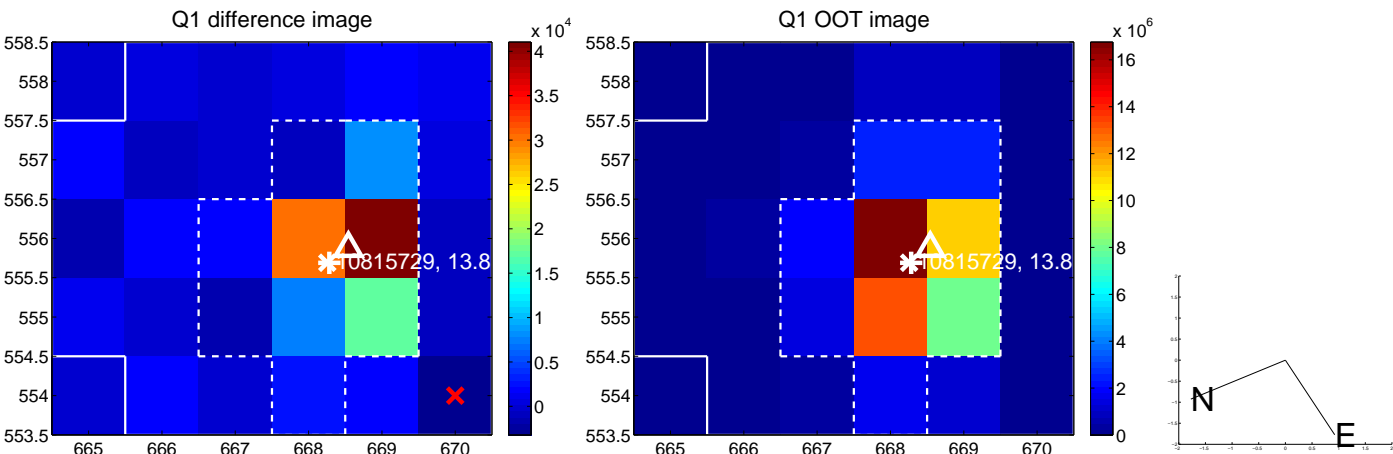
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.355 ± 0.244	1.46	-0.071 ± 0.094	-0.348 ± 0.248
PRF-fit source offset from KIC position	0.397 ± 0.262	1.51	0.000 ± 0.093	-0.397 ± 0.262
photometric centroid source offset	0.04 ± 0.33	0.13	0.04 ± 0.33	0.02 ± 0.31

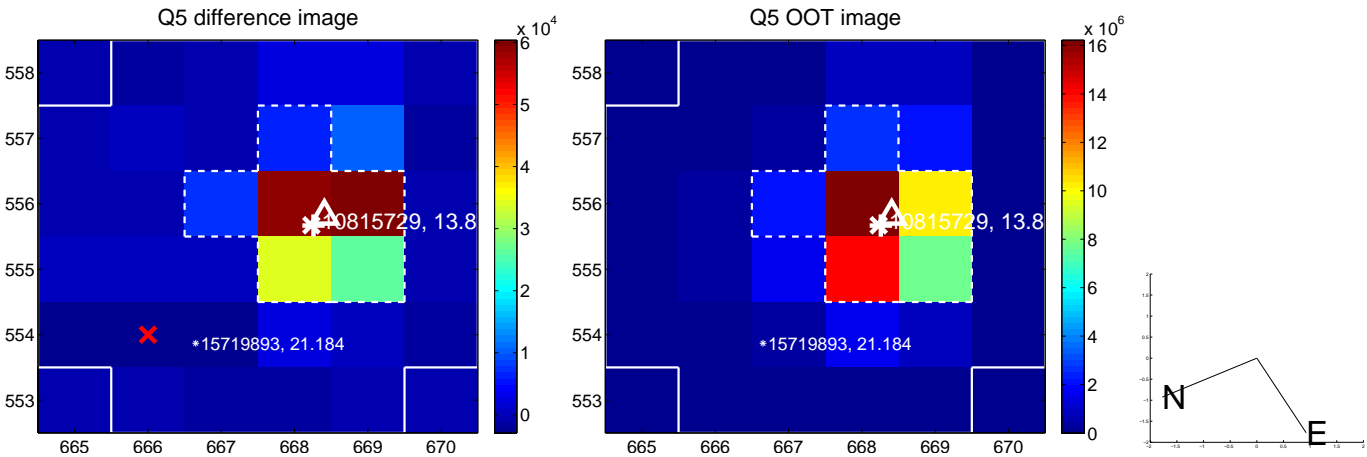


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

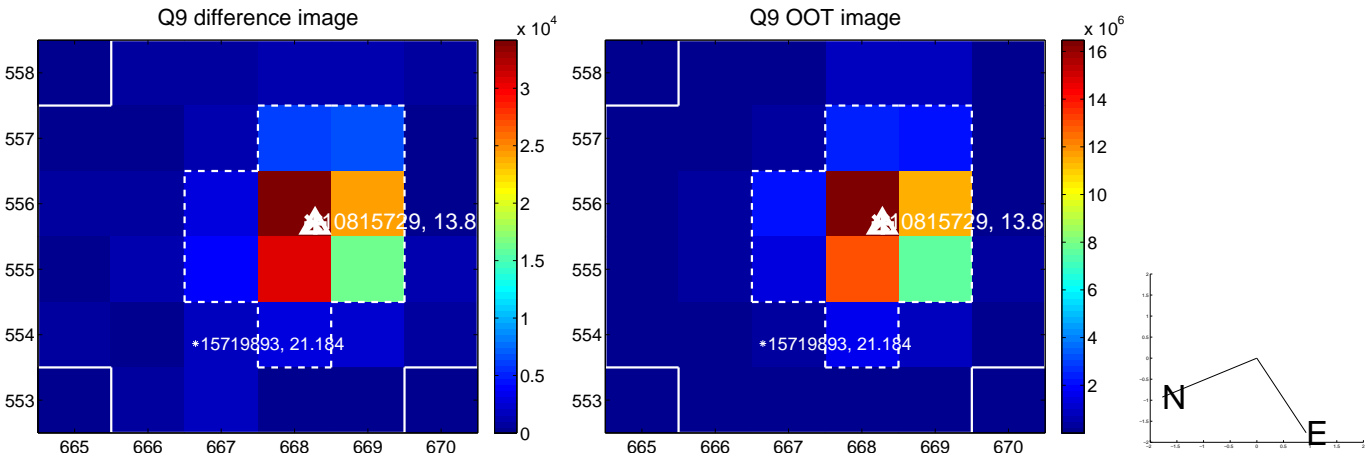
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



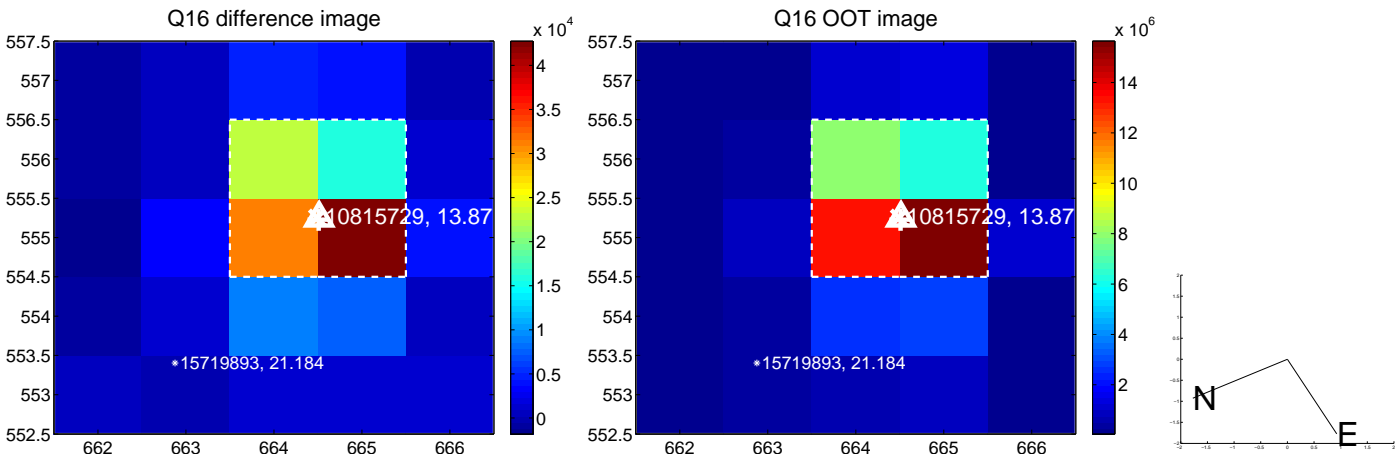
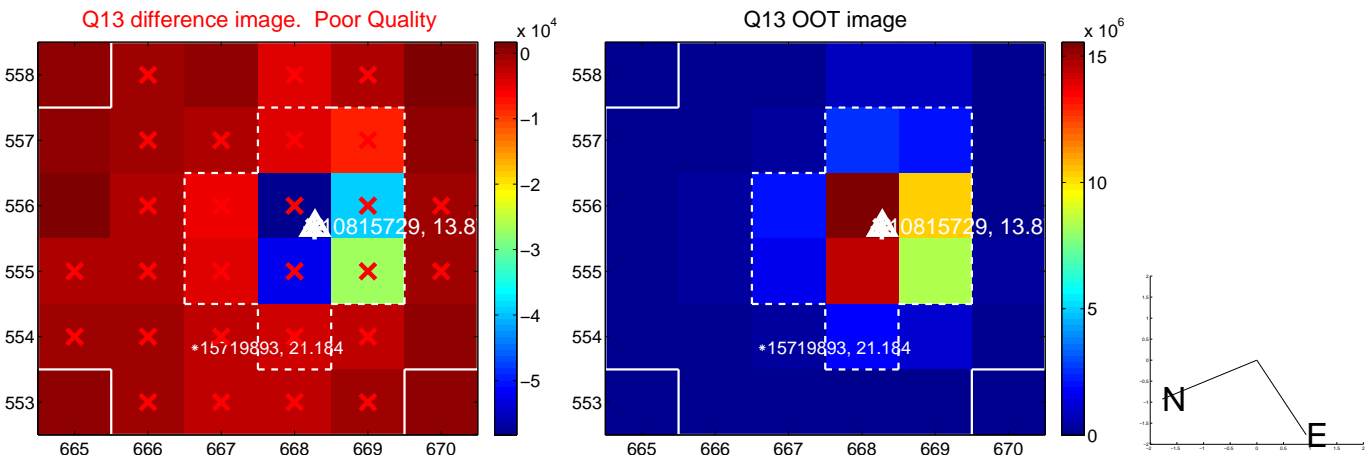
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



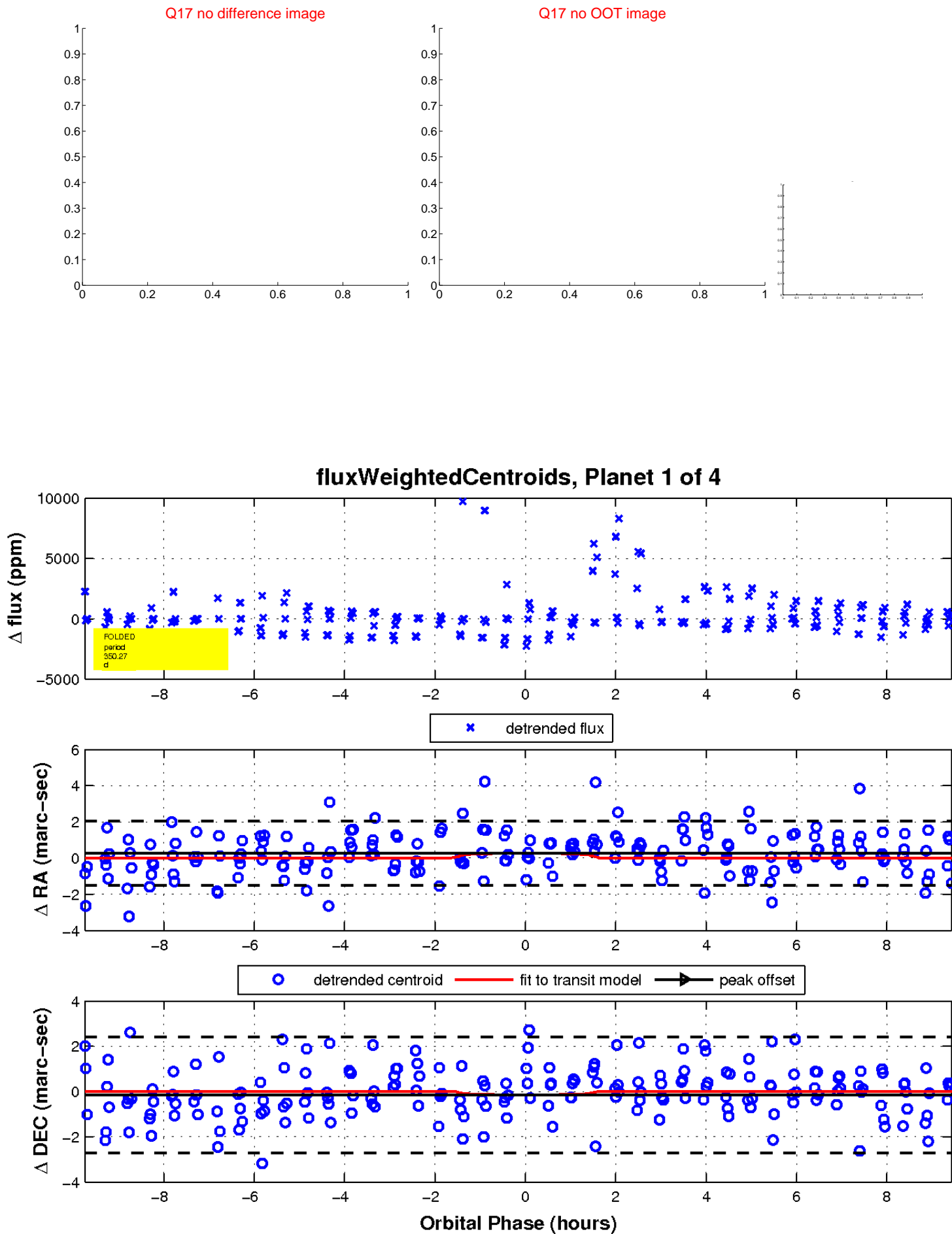
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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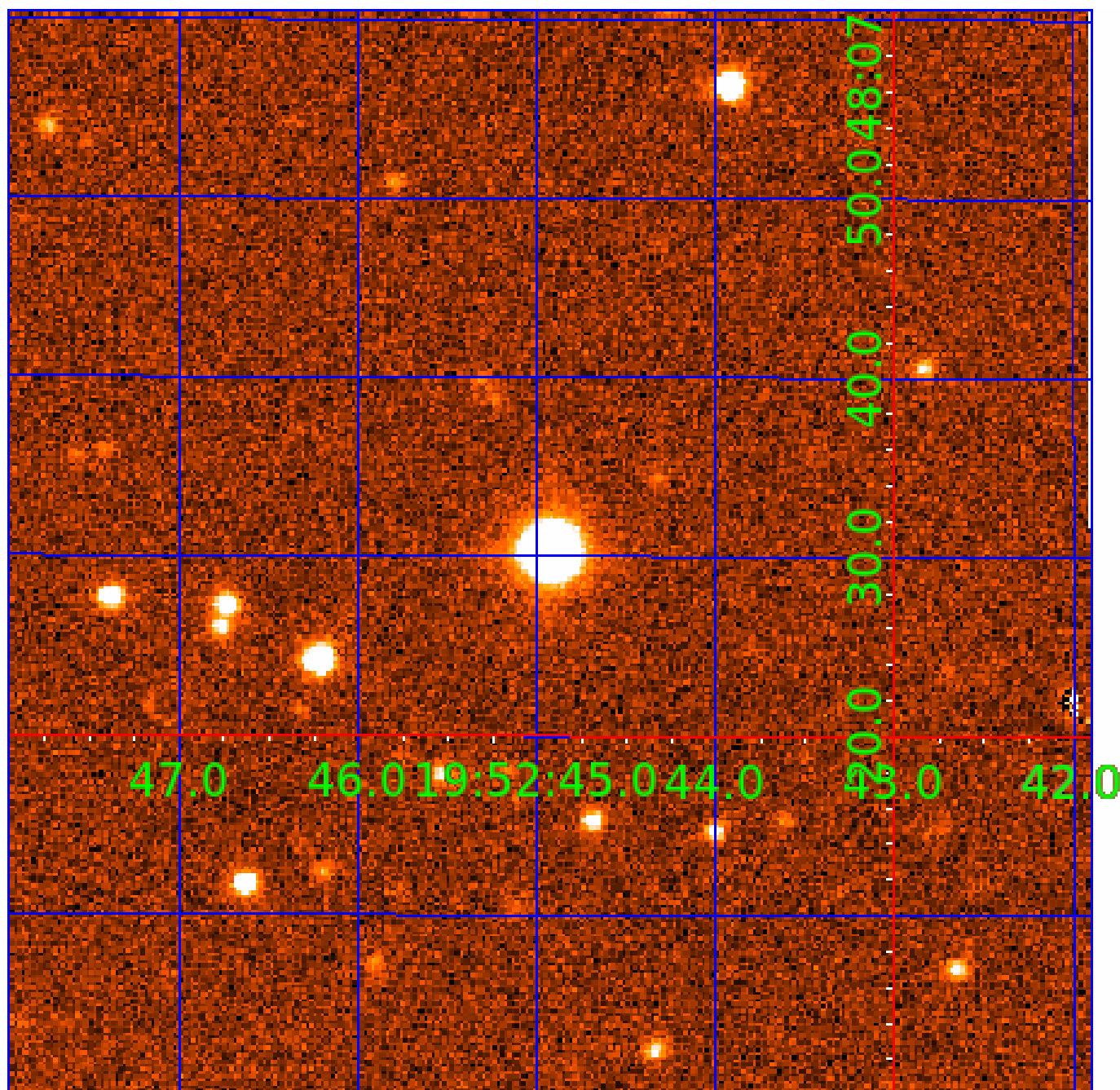


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010815729

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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010815729-02	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
010815729-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
010815729-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—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.

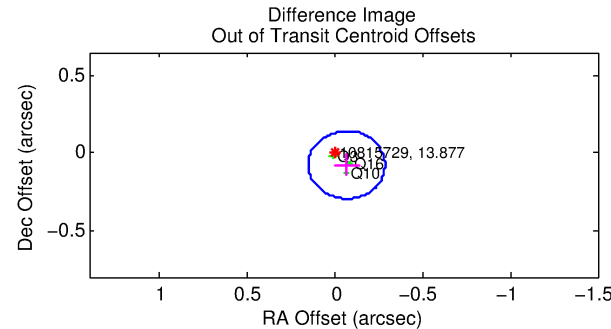
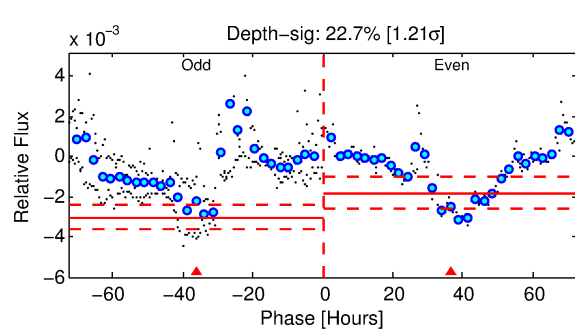
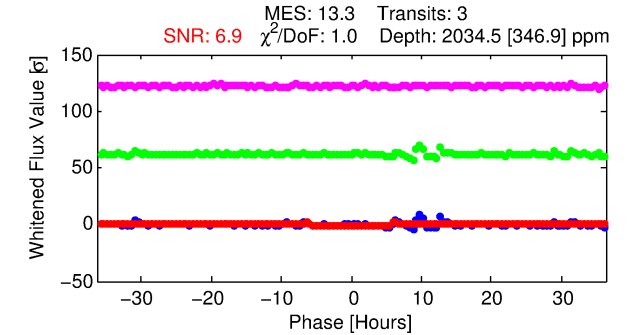
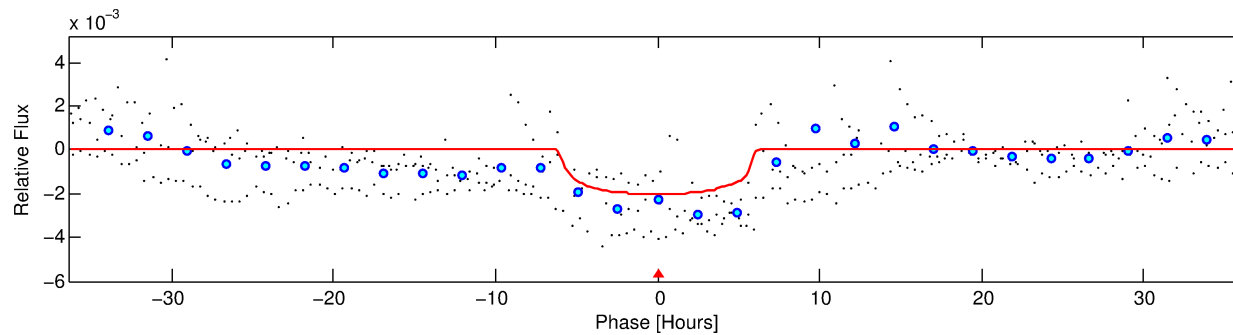
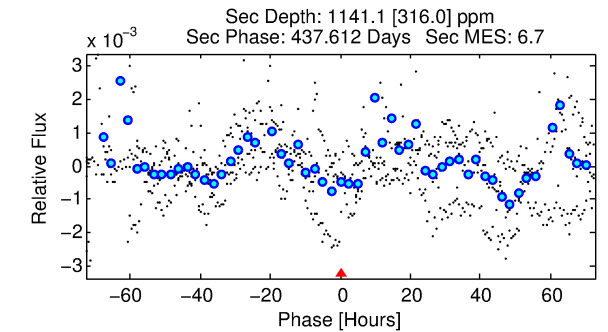
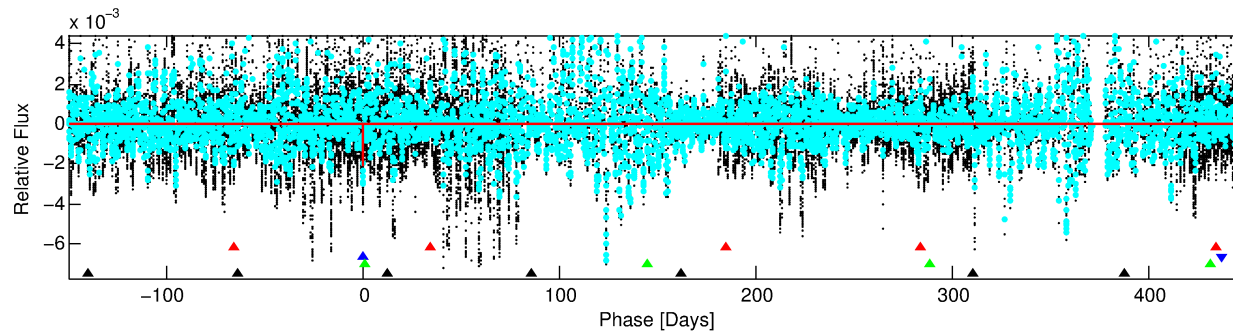
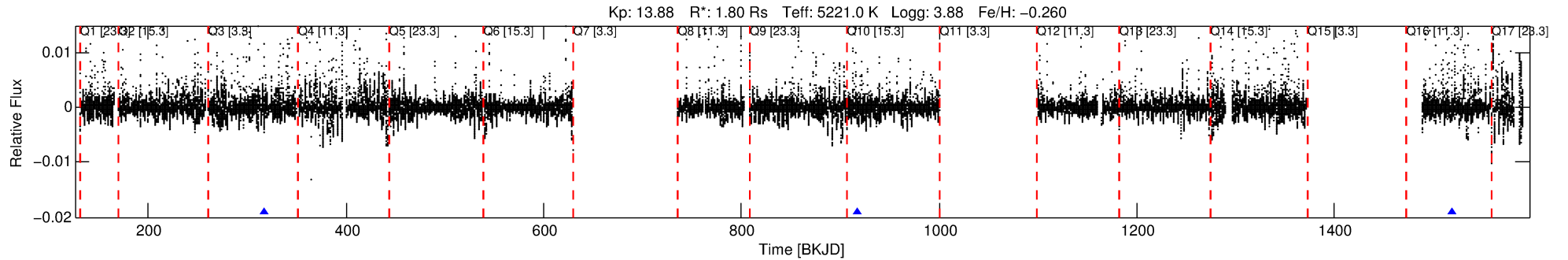
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010815729-02

No Significant Match Found

DV One-Page Summary

KIC: 10815729 Candidate: 2 of 4 Period: 600.601 d



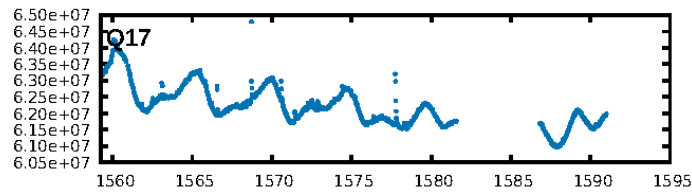
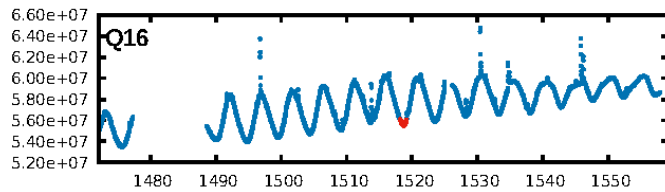
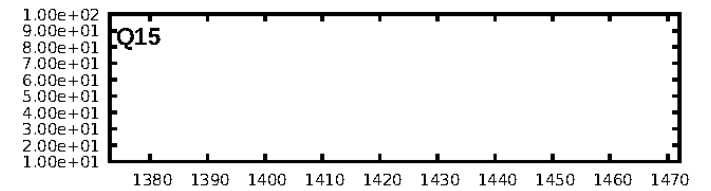
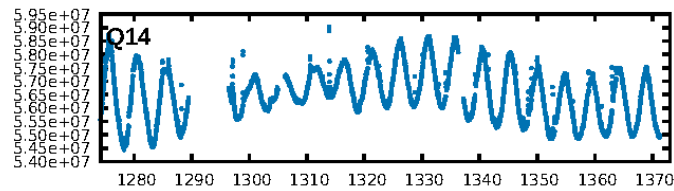
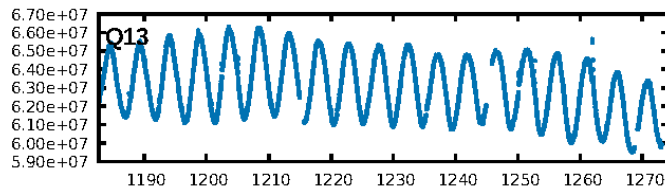
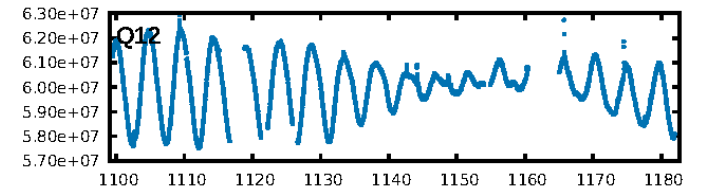
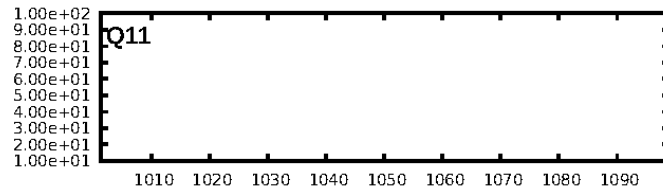
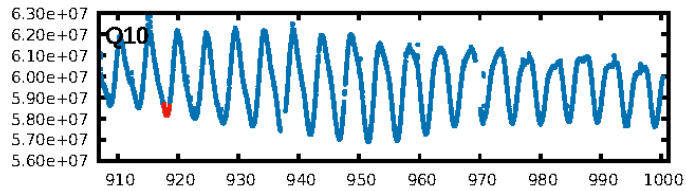
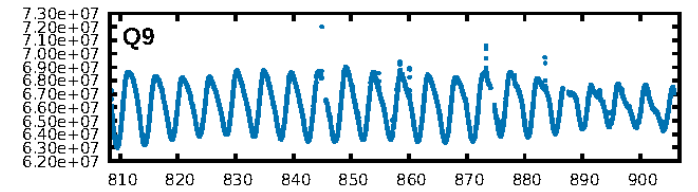
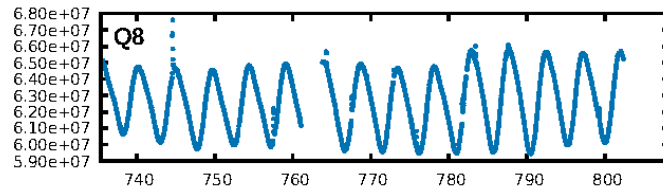
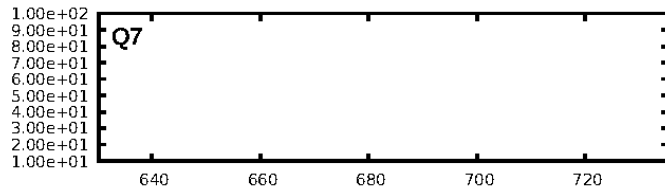
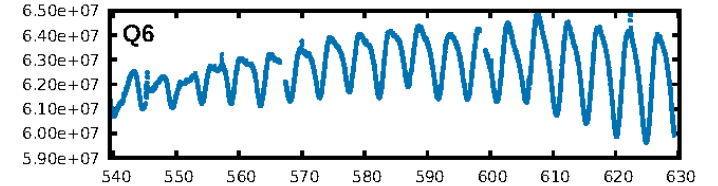
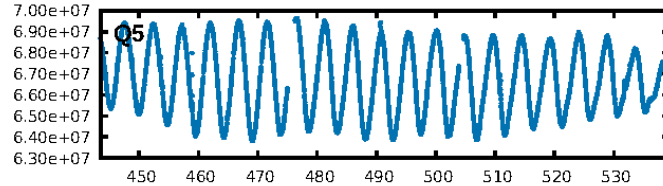
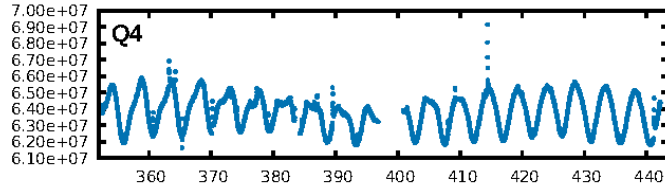
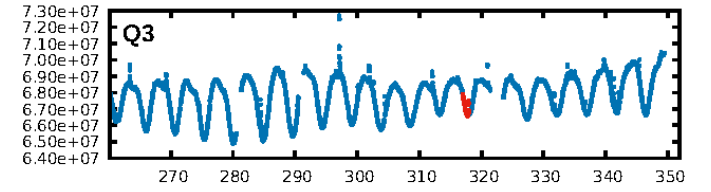
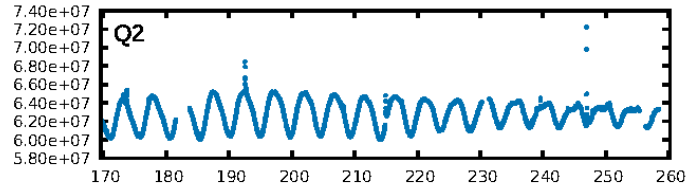
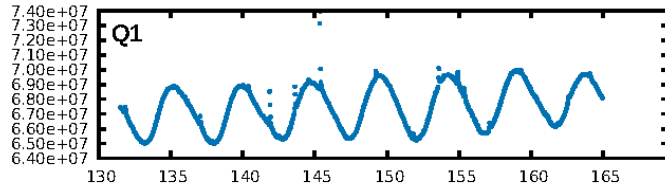
DV Fit Results:

Period = 600.60099 [0.00483] d
Epoch = 317.4746 [0.0064] BKJD
Rp/R* = 0.0404 [0.0100]
a/R* = 392.88 [316.34]
b = 0.07 [12.27]
Seff = 1.20 [1.35]
Teff = 267 [75] K
Rp = 7.94 [5.24] Re
a = 1.3385 [0.8833] AU
Ag = 17838.79 [22297.99] [0.80σ]
Teffp = 4773 [693] K [6.47σ]

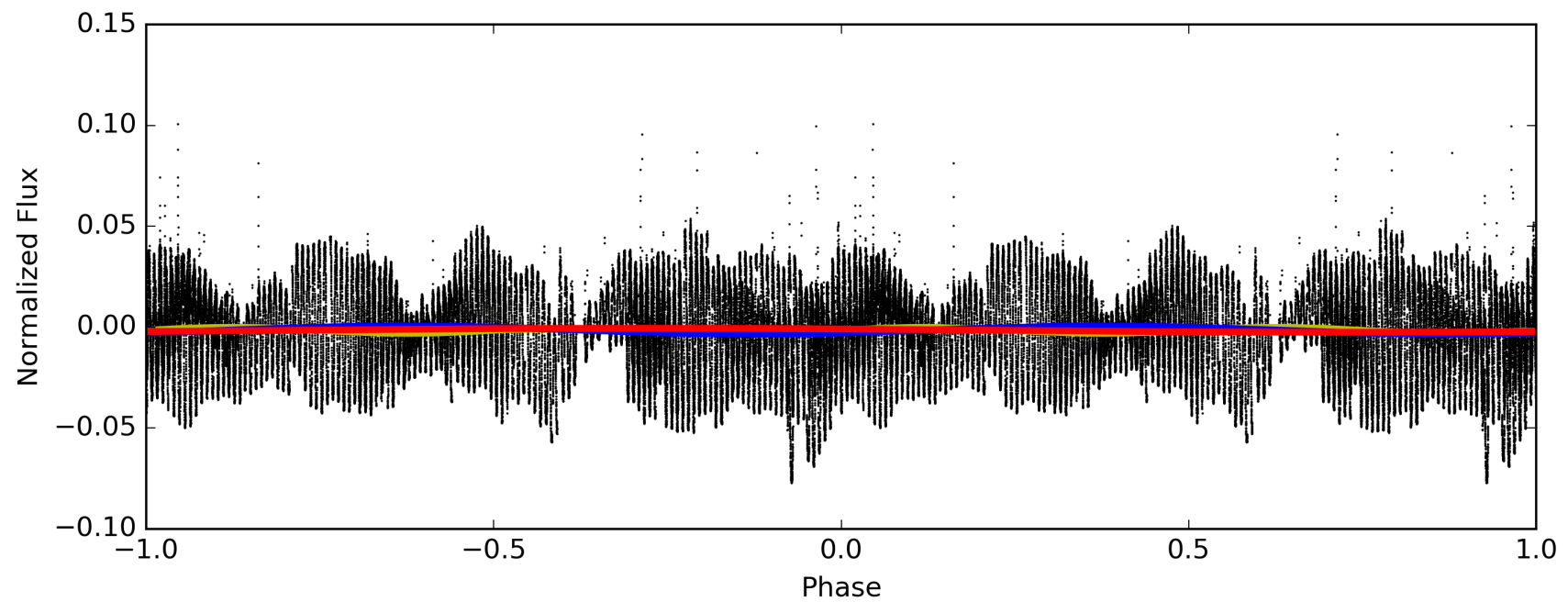
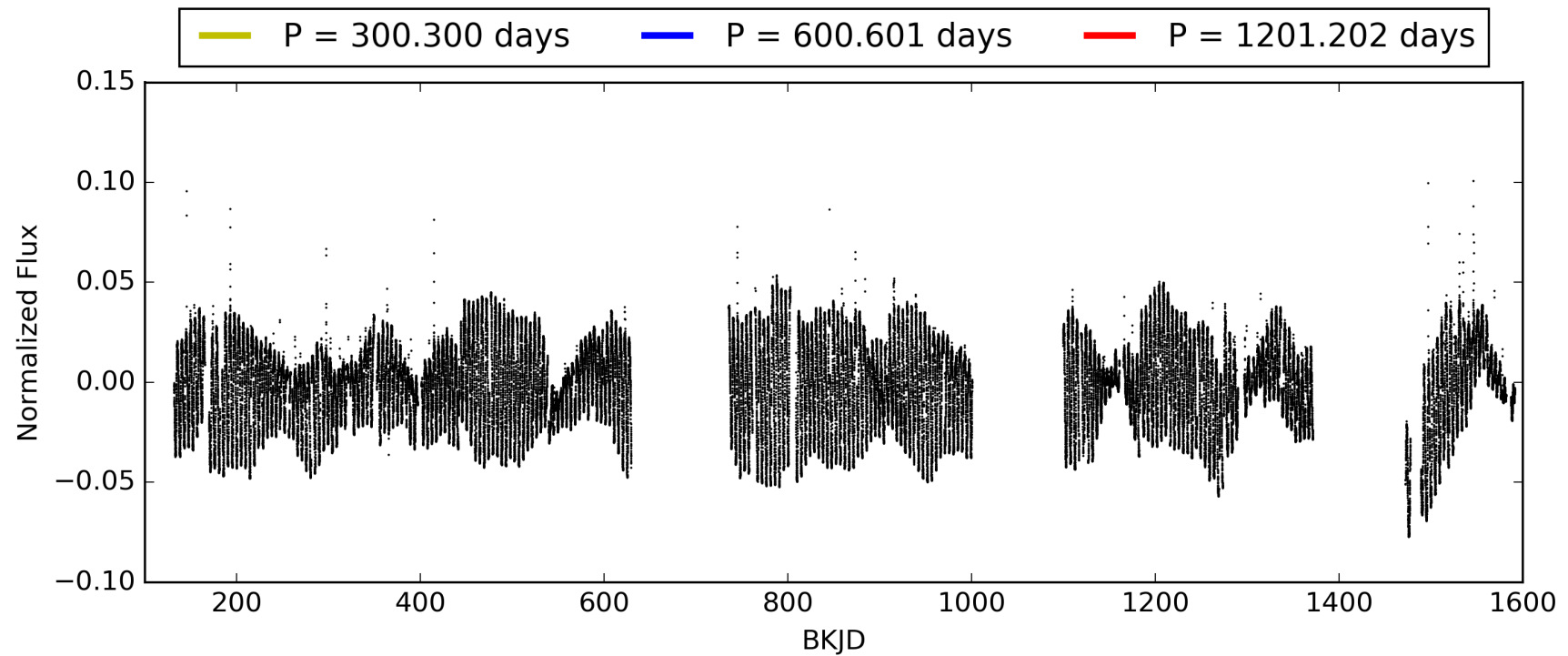
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [242.39σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 32.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 3.77e-08
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.8718
Centroid-sig: 28.6%
Centroid-so: 0.211 arcsec [0.71σ]
OotOffset-rm: 0.102 arcsec [1.40σ]
KicOffset-rm: 0.090 arcsec [1.29σ]
OotOffset-st: 1/1/1/0 [3]
KicOffset-st: 1/1/1/0 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 0.67 [2/3]

TCE 010815729-02, PDC Light Curves

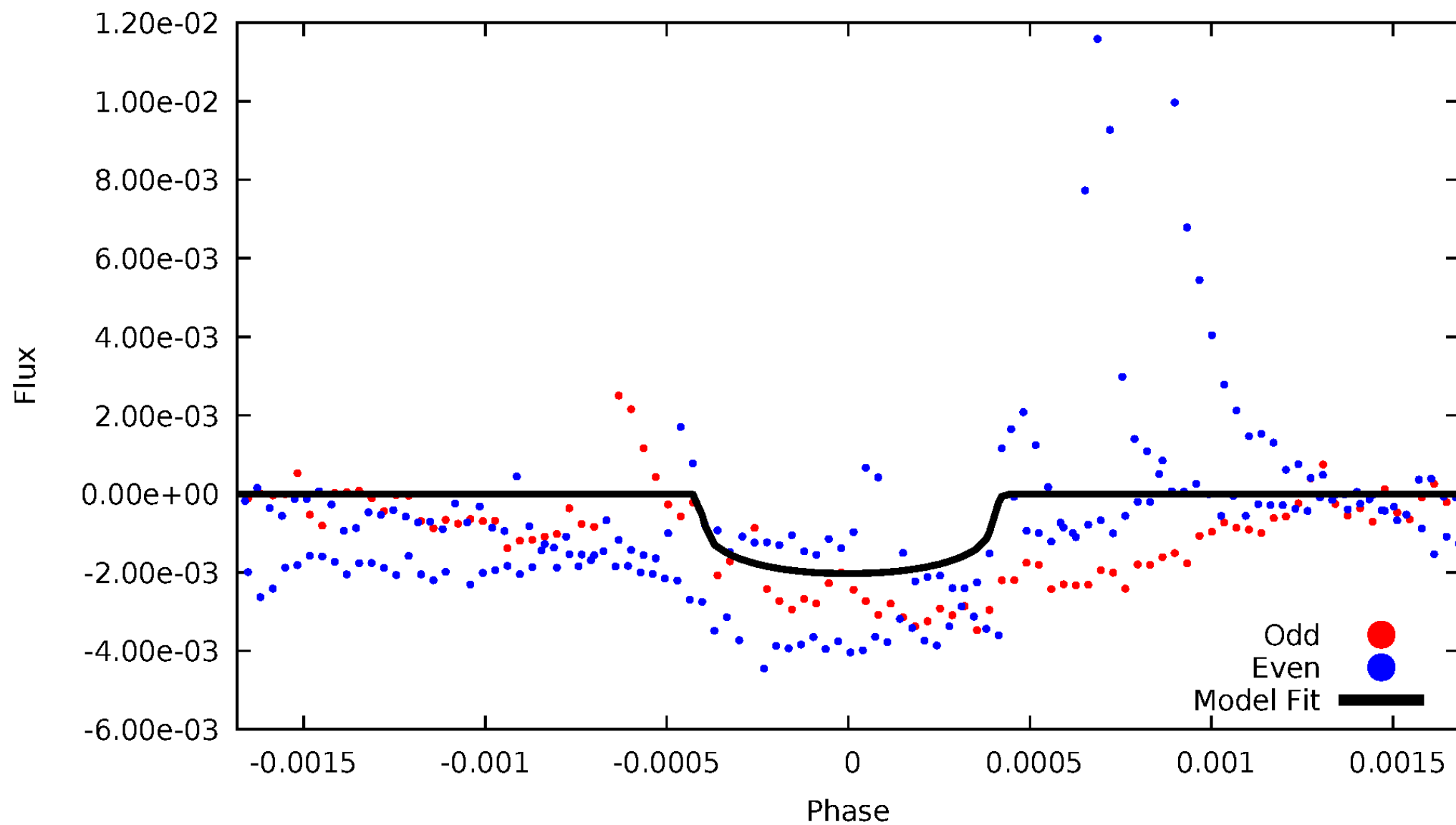


TCE 010815729-02



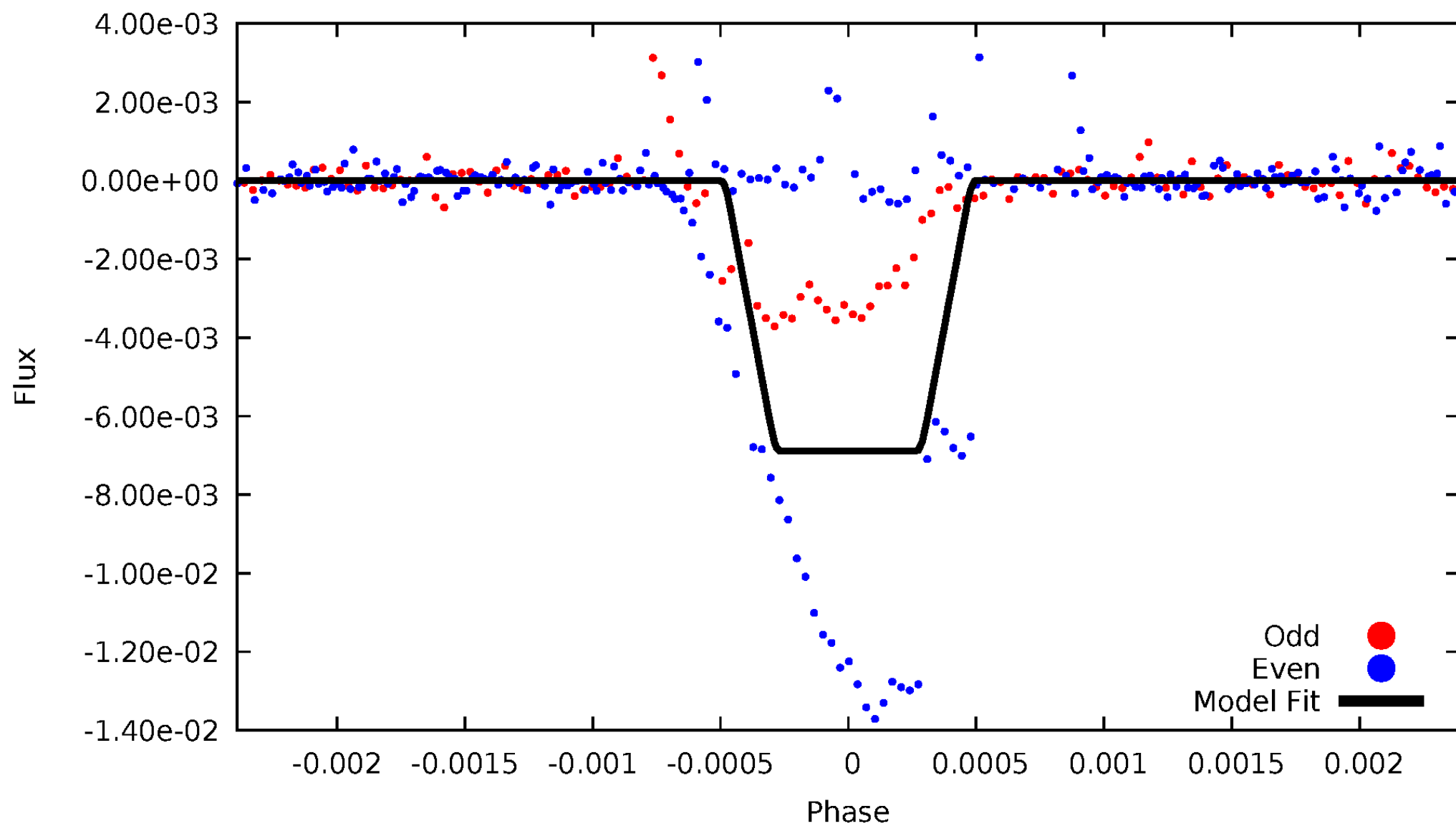
DV Odd/Even

TCE 010815729-02



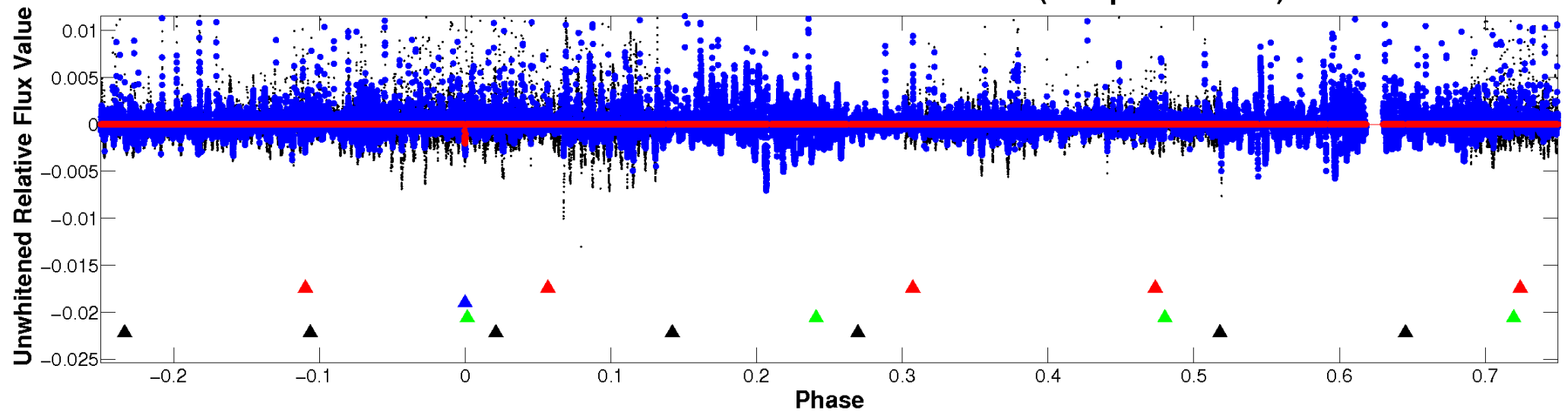
ALT Odd/Even

TCE 010815729-02

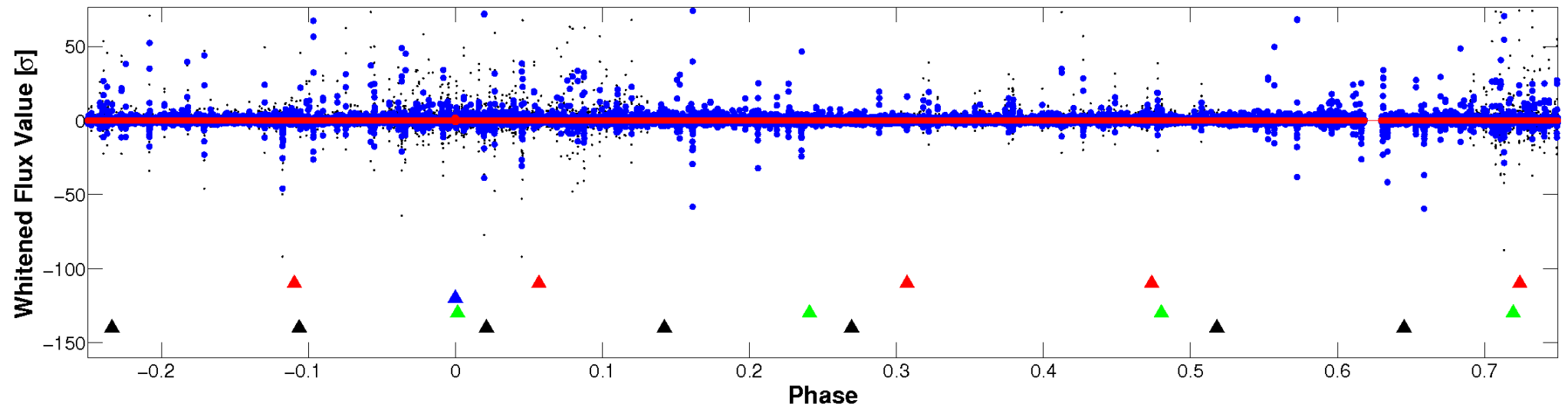


Non-Whitened Vs. Whitened Light Curve

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

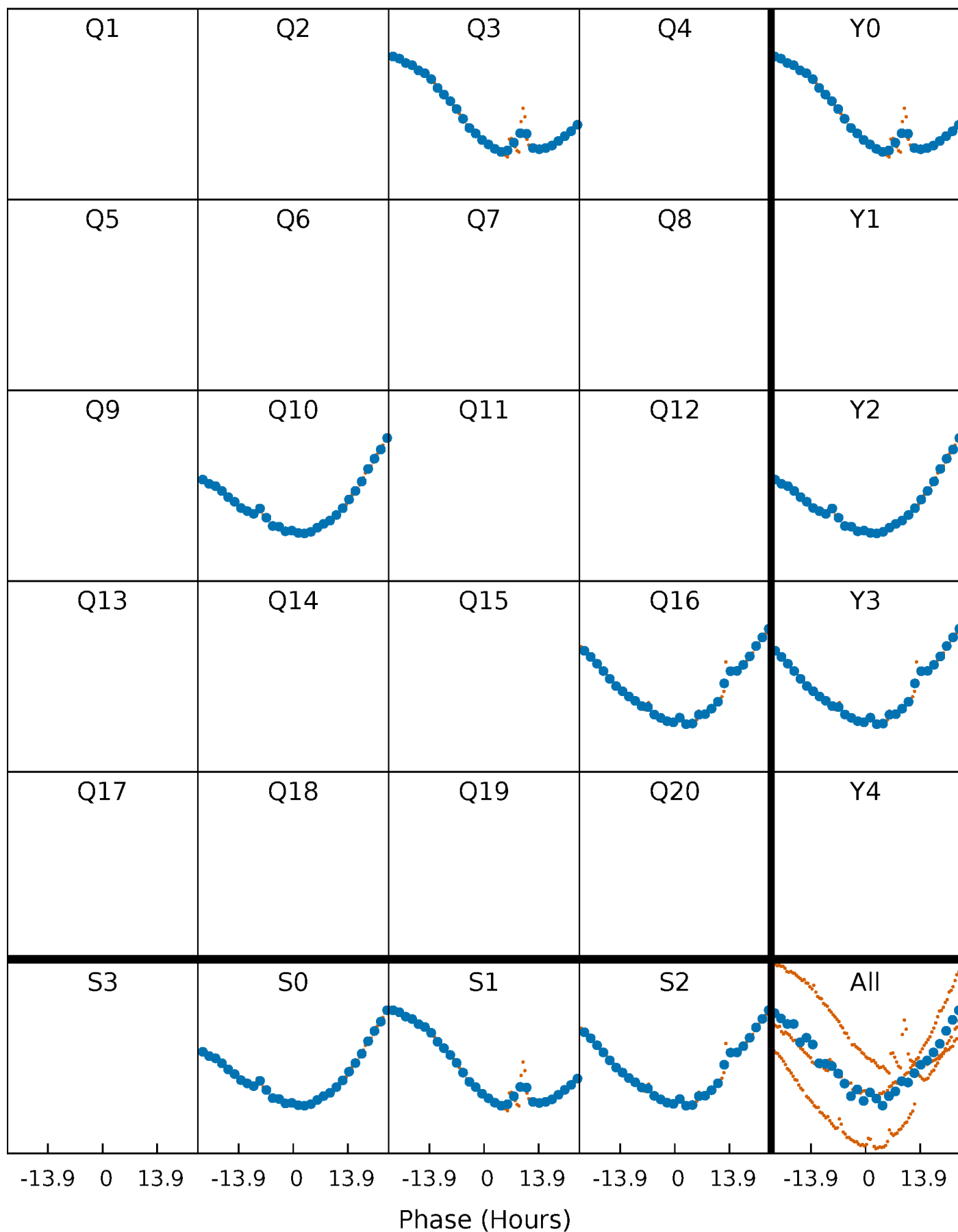


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



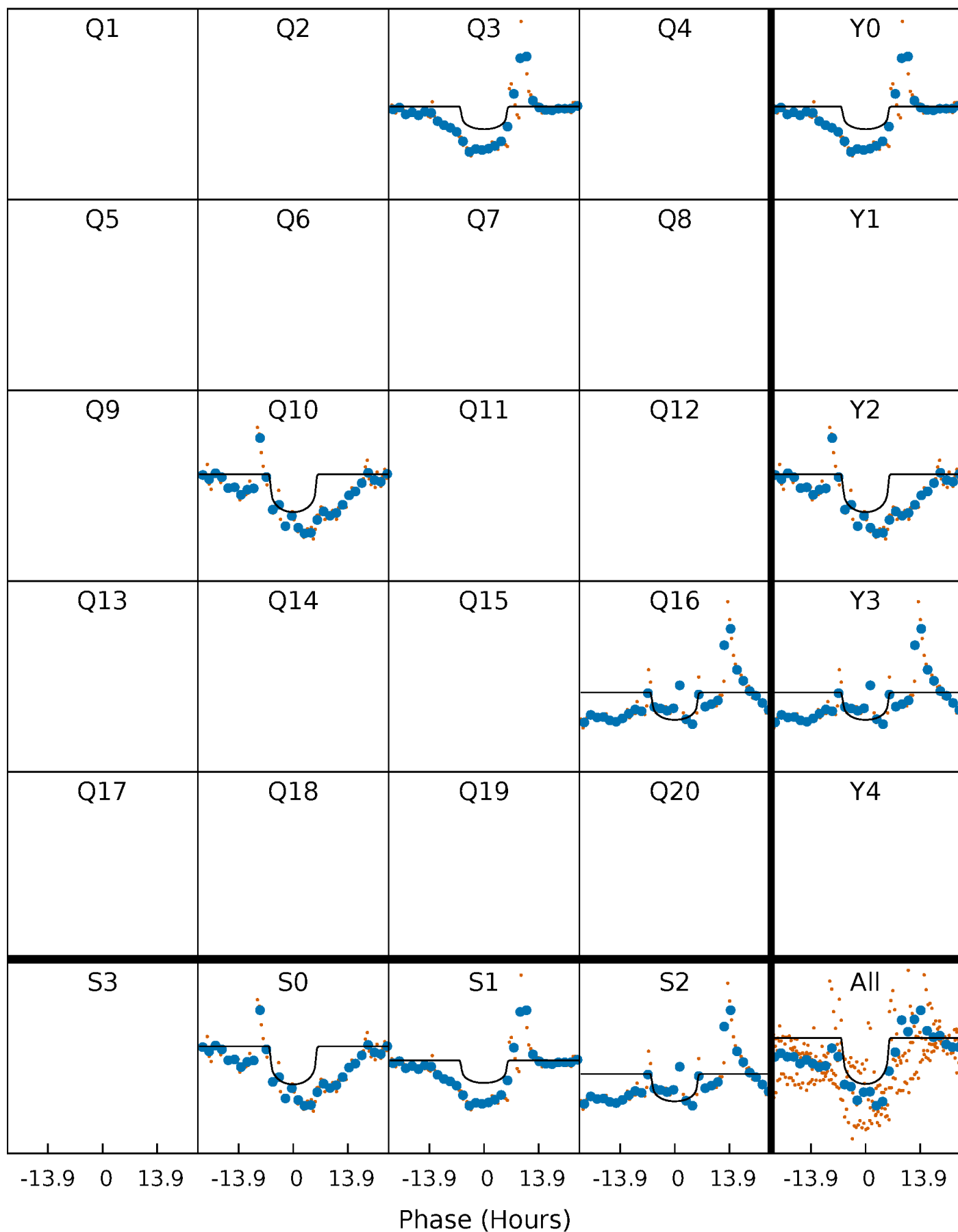
PDC Quarter-Phased Transit Curves

TCE 010815729-02 P=600.600988 Days $T_0=317.474648$ (BKJD)



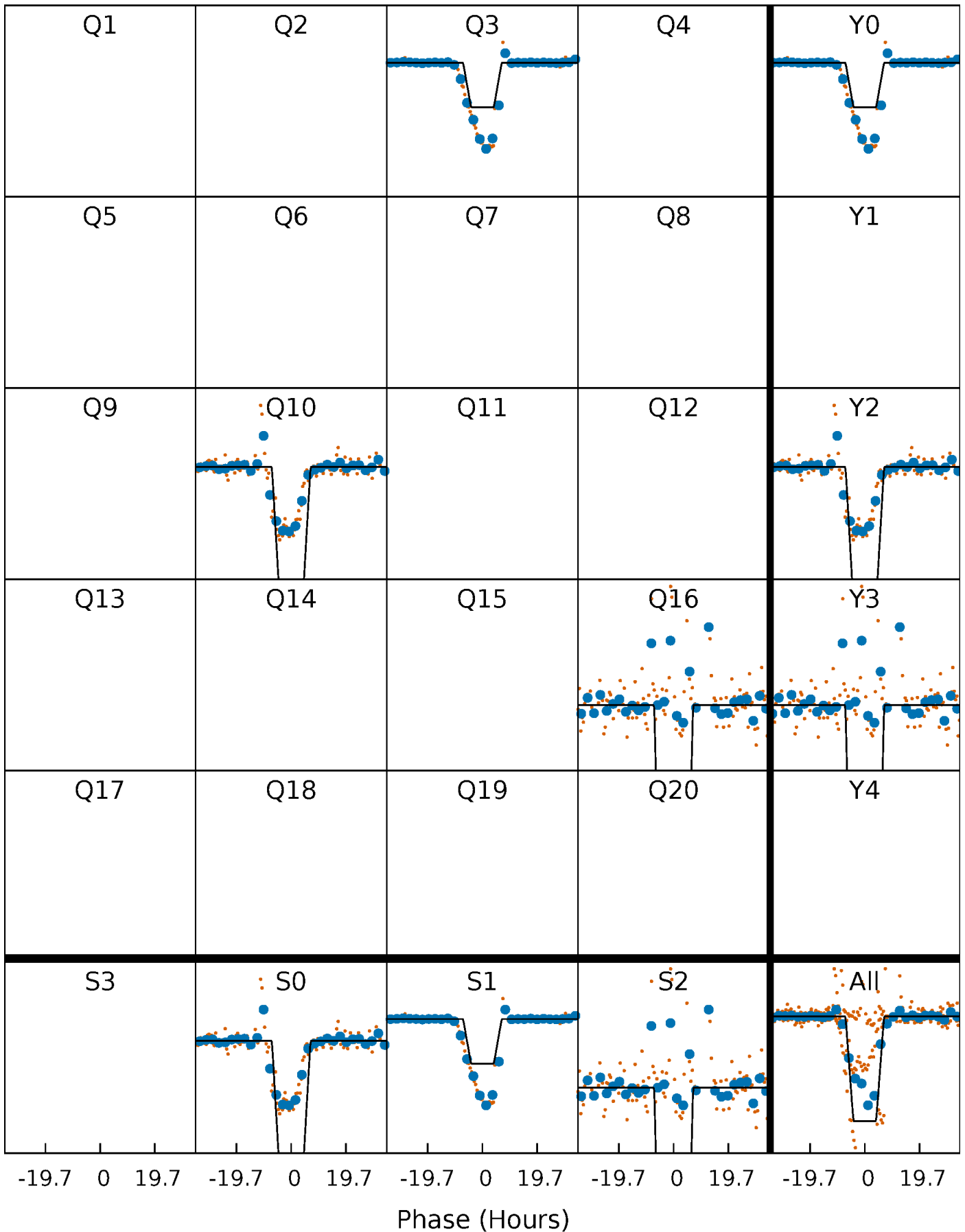
DV Quarter-Phased Transit Curves

TCE 010815729-02 P=600.600988 Days $T_0=317.474648$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

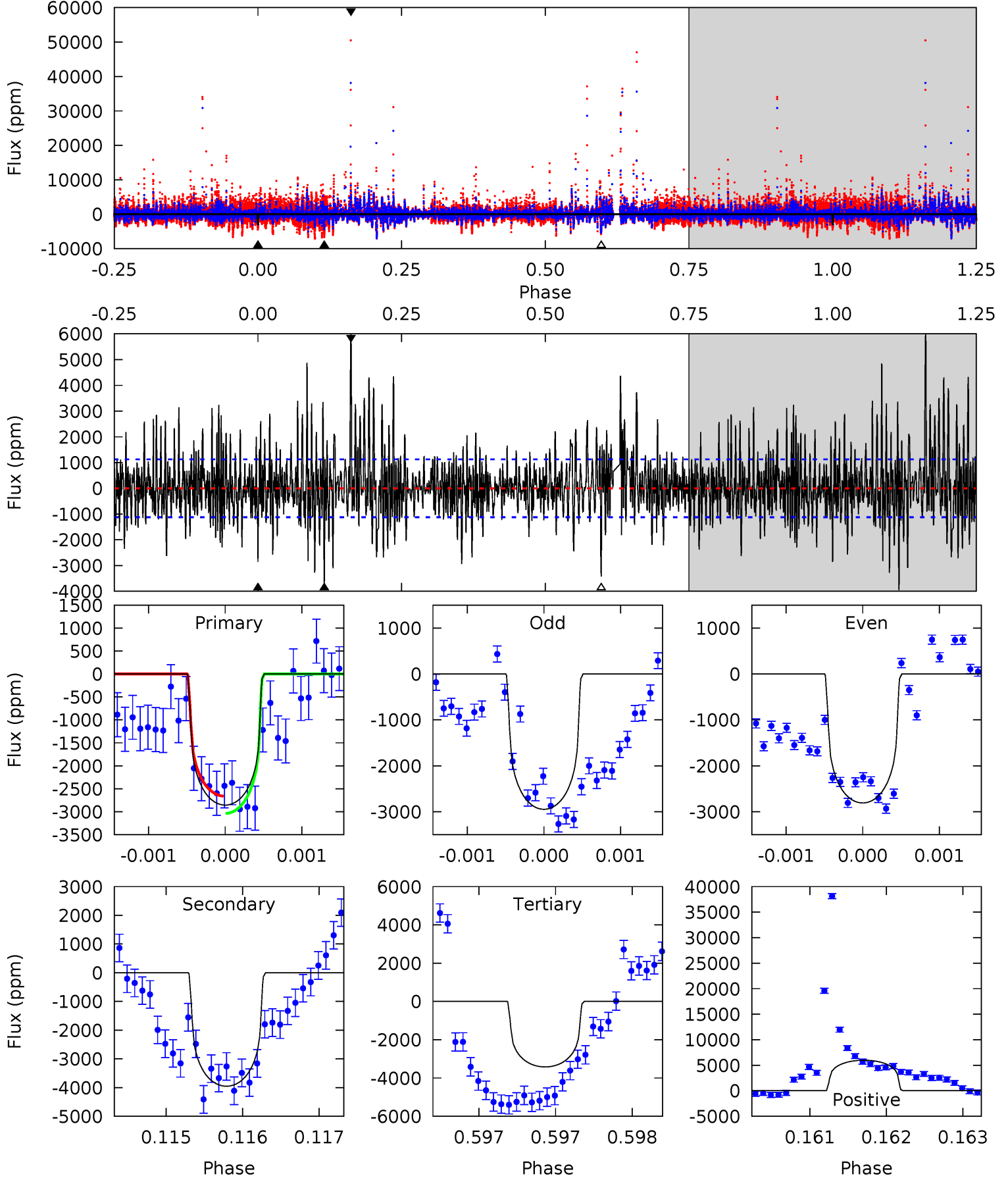
TCE 010815729-02 P=600.596818 Days $T_0=317.558461$ (BKJD)



DV Model-Shift Uniqueness Test

010815729-02, P = 600.600988 Days, E = 317.474648 Days

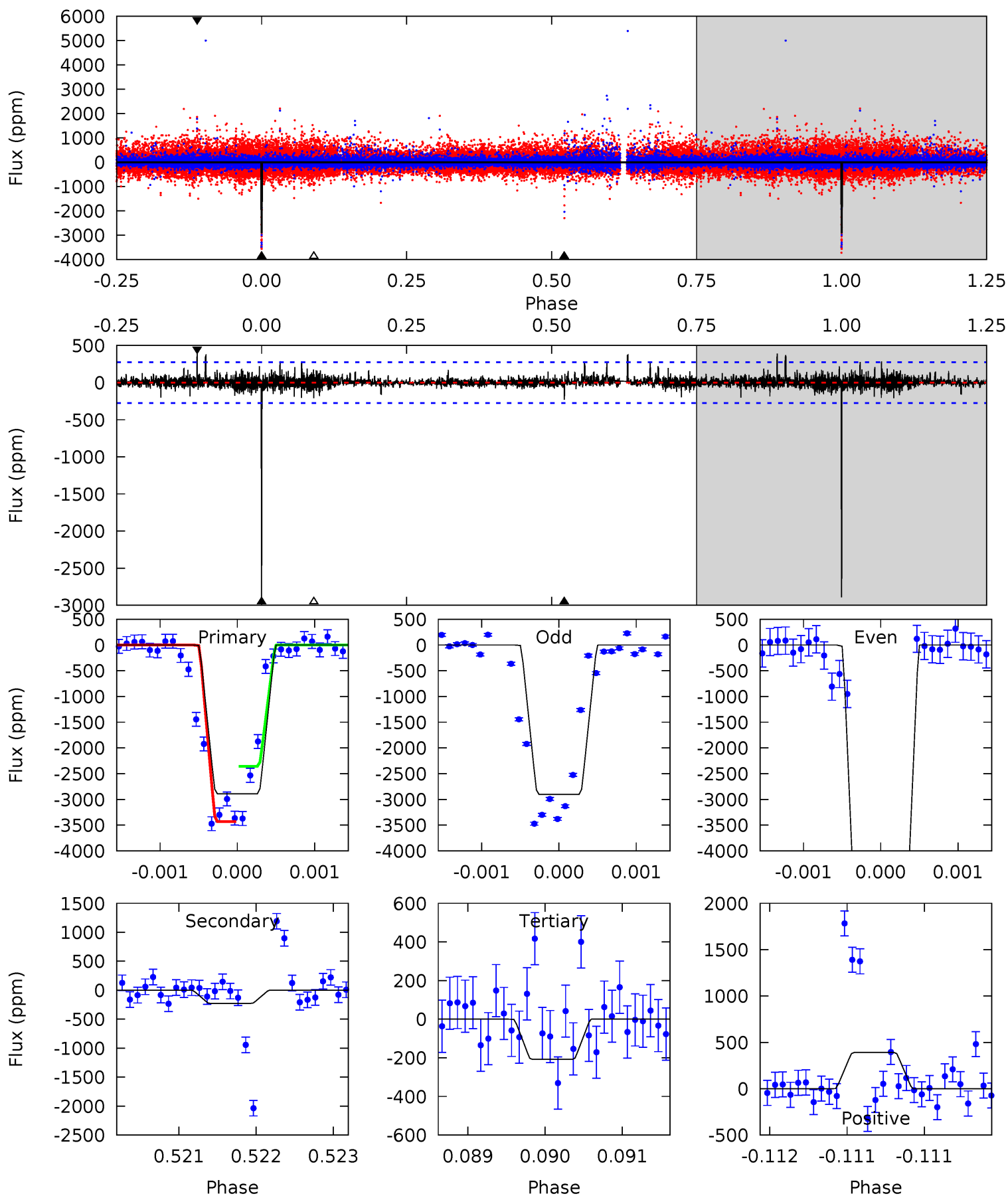
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.9	19.2	16.6	29.1	5.47	3.33	4.82	-2.75	-15.2	2.59	-9.87	0.28	0.97	0.60	0.92



Alt Model-Shift Uniqueness Test

010815729-02, P = 600.596818 Days, E = 317.558461 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
57.2	4.50	4.12	7.73	5.45	3.29	0.84	53.1	49.5	0.37	-3.23	51.5	1.62	0.12	10.4



Stellar Parameters For KIC 010815729

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5221^{+174}_{-142}	$3.875^{+0.676}_{-0.364}$	$-0.260^{+0.350}_{-0.250}$	$1.800^{+1.101}_{-1.101}$	$0.886^{+0.197}_{-0.131}$	$0.214^{+2.605}_{-0.148}$
	+3%/-3%	+17%/-9%	+135%/-96%	+61%/-61%	+22%/-15%	+1216%/-69%
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 010815729-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-3953 ± 206	$7.81^{+3.58}_{-3.06}$	371^{+59}_{-66}	6494^{+1113}_{-646}	$67533^{+106773}_{-36671}$
Alt.	-227 ± 51	$15.69^{+6.27}_{-4.61}$	368^{+64}_{-59}	2911^{+145}_{-140}	888^{+1096}_{-444}

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

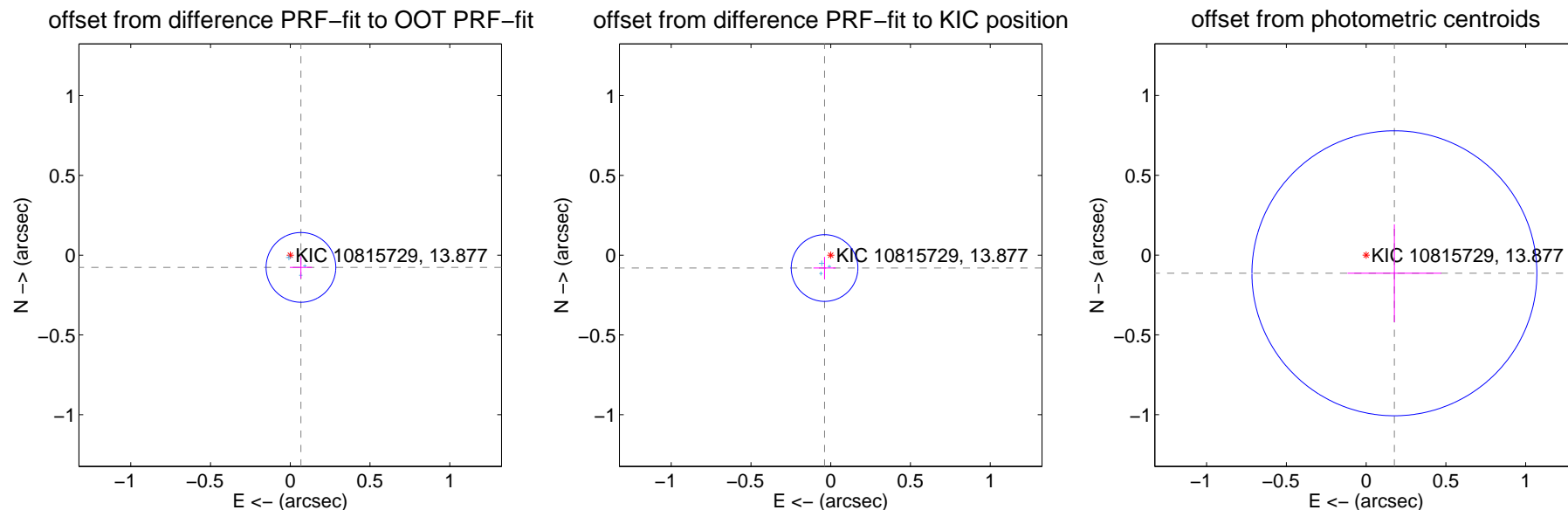
DV Centroid Data

Supplemental centroid analysis for 010815729-02. Kepler magnitude: 13.88. Transit SNR 6.87

There are 3 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.102 ± 0.073	1.40	-0.067 ± 0.070	-0.077 ± 0.071
PRF-fit source offset from KIC position	0.090 ± 0.070	1.29	0.039 ± 0.070	-0.081 ± 0.070
photometric centroid source offset	0.21 ± 0.30	0.71	-0.18 ± 0.29	-0.11 ± 0.31



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.

Q1 no difference image



Q1 no OOT image



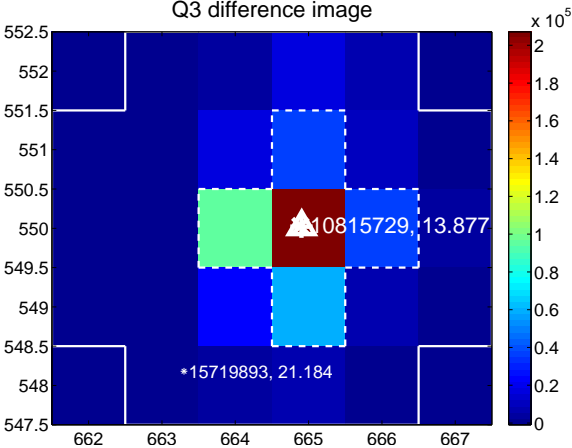
Q2 no difference image



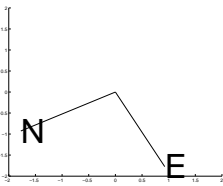
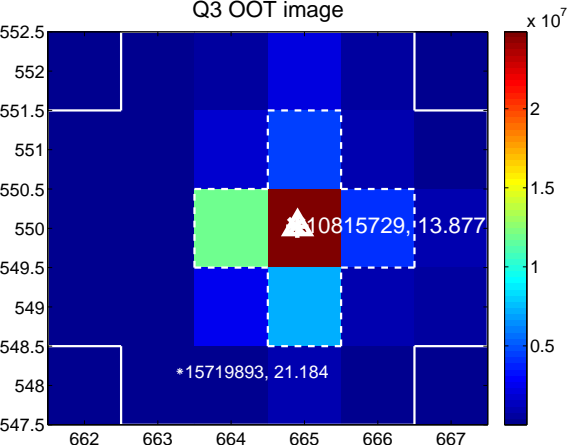
Q2 no OOT image



Q3 difference image



Q3 OOT image



Q4 no difference image



Q4 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.

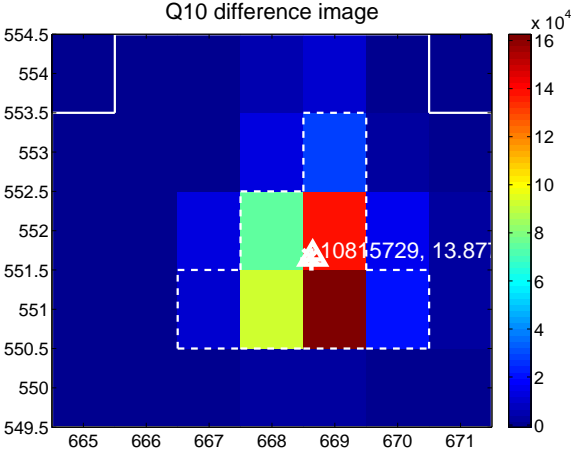
Q9 no difference image



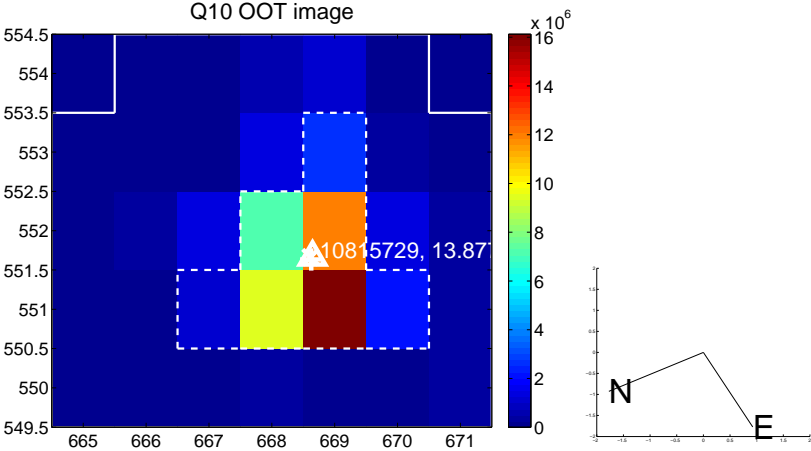
Q9 no OOT image



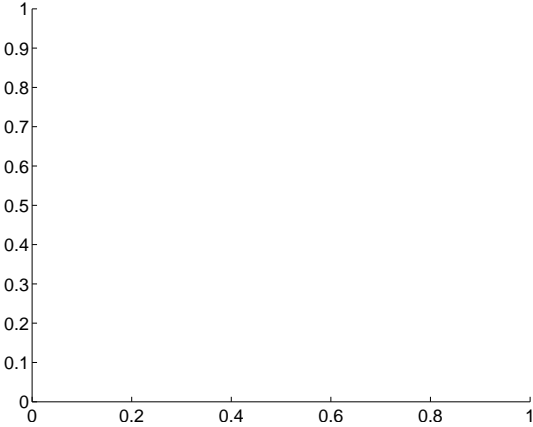
Q10 difference image



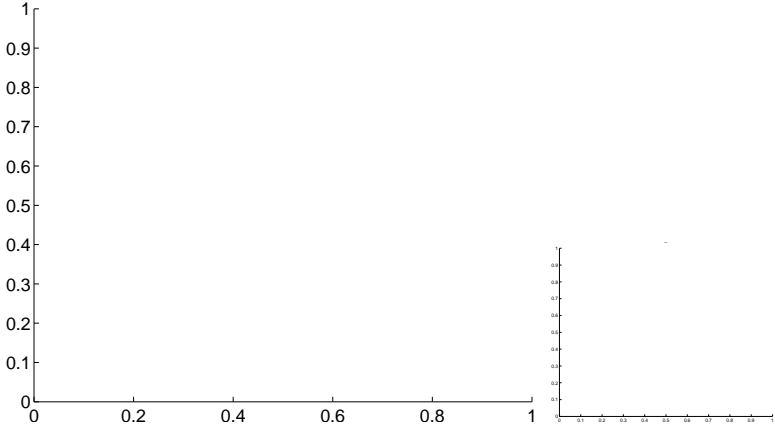
Q10 OOT image



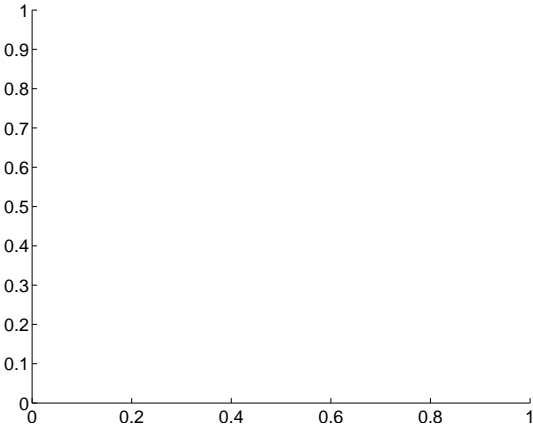
Q11 no difference image



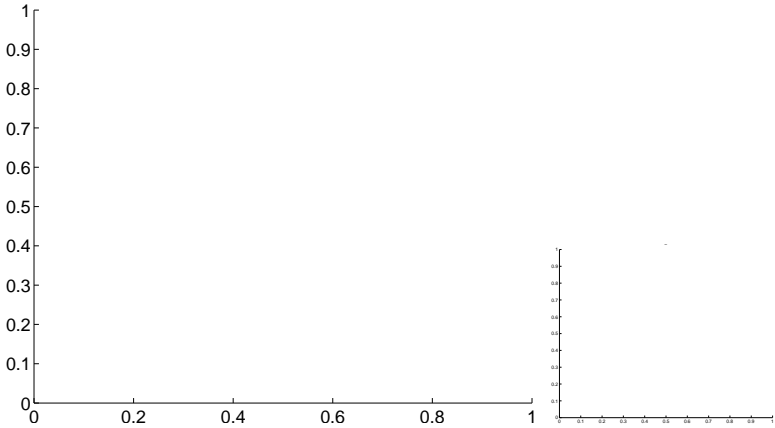
Q11 no OOT image



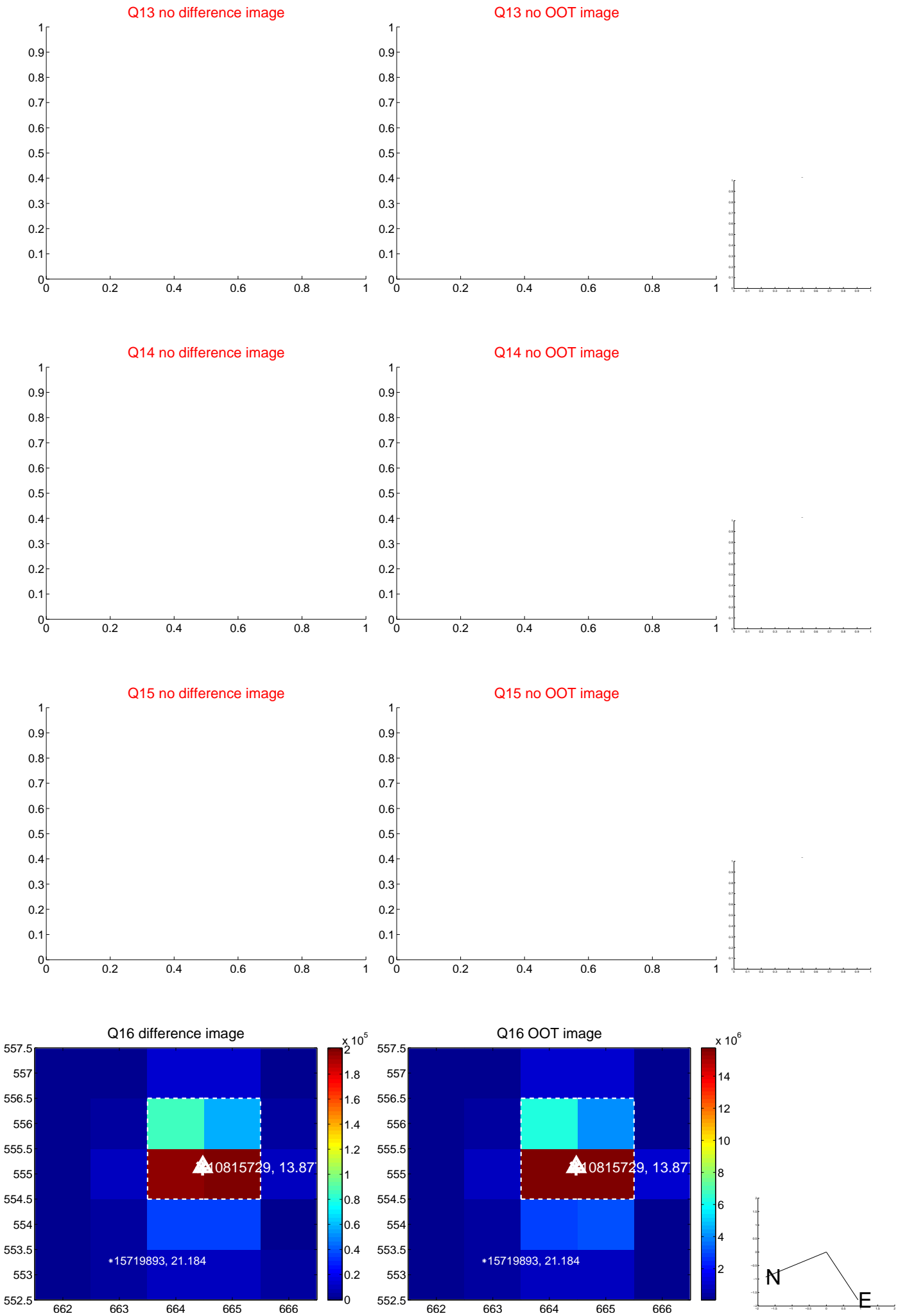
Q12 no difference image



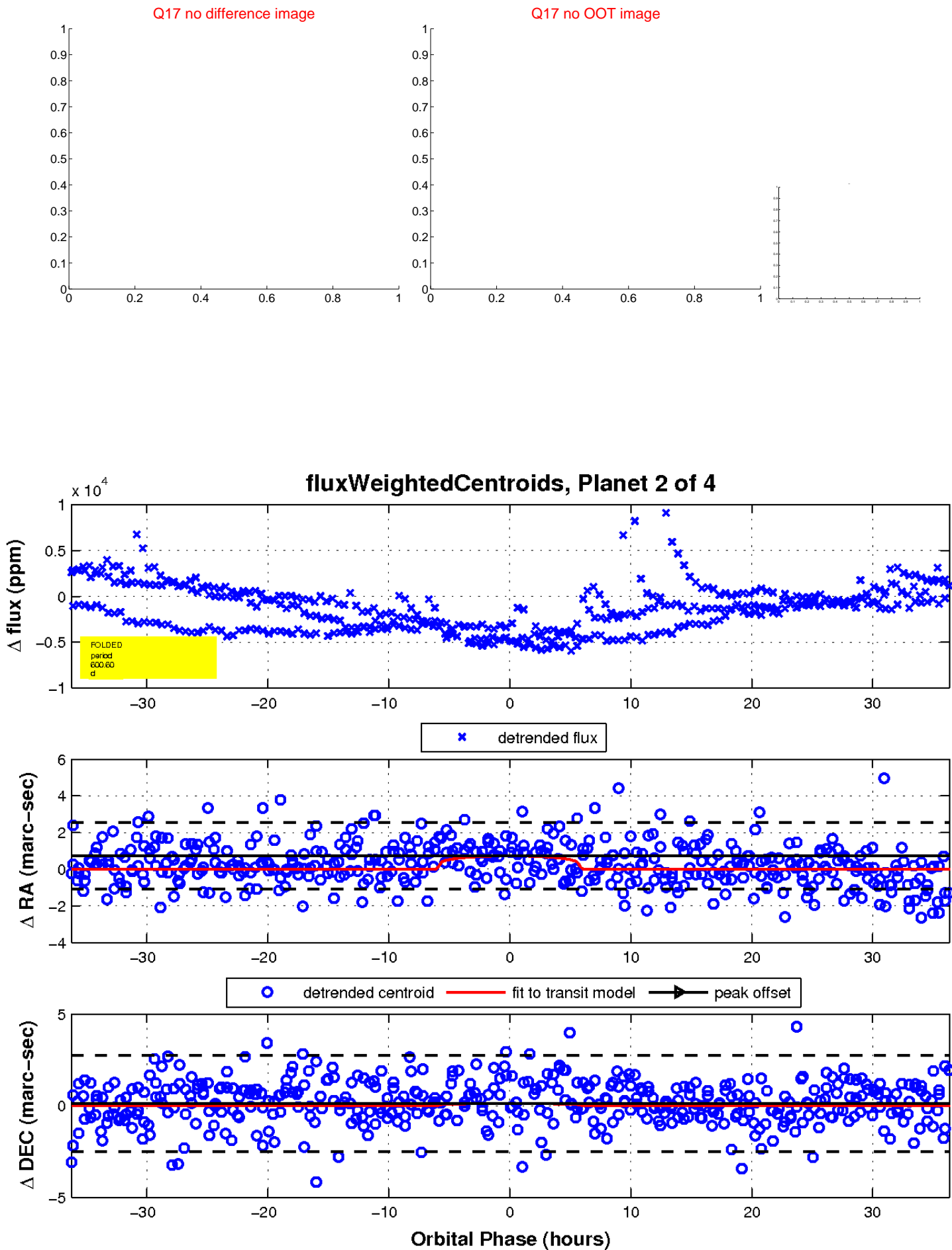
Q12 no OOT image



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

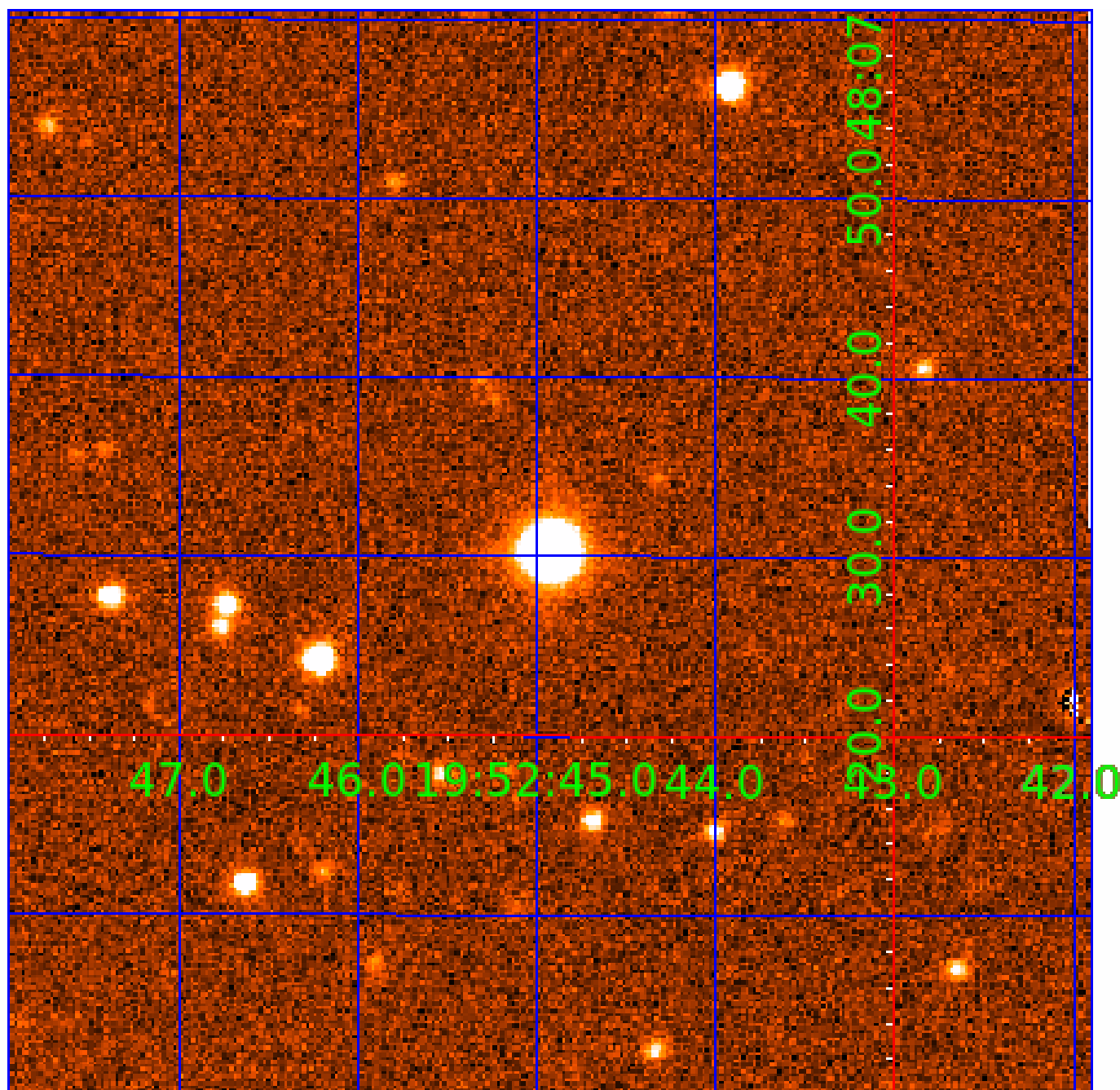


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010815729

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})
010815729-01	OBS	No	350.271134	151.741524	1905.6	3.254	23.8	13.0	1.80	5221	8.34	2.47
010815729-02	OBS	No	600.600988	317.474647	2034.5	12.126	13.3	6.9	1.80	5221	7.94	1.20
010815729-03	OBS	No	456.857929	149.047001	1151.5	7.450	19.2	5.1	1.80	5221	5.97	1.73
010815729-04	OBS	No	225.698771	177.183150	1050.7	2.901	14.7	7.2	1.80	5221	5.89	4.44

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010815729-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—MOD_POS_ALT—INCONSISTENT_TRANS
010815729-02	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
010815729-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
010815729-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—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.

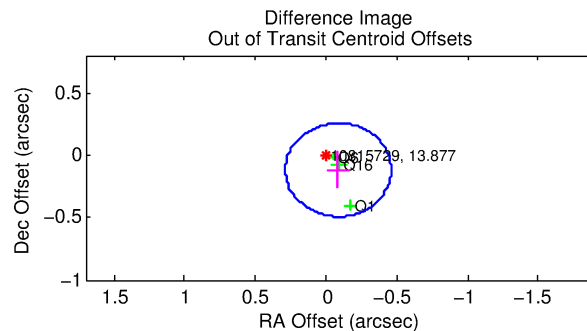
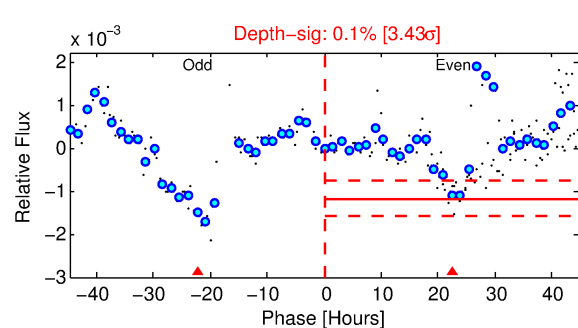
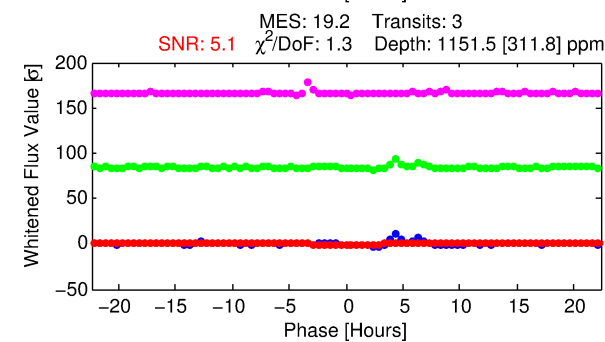
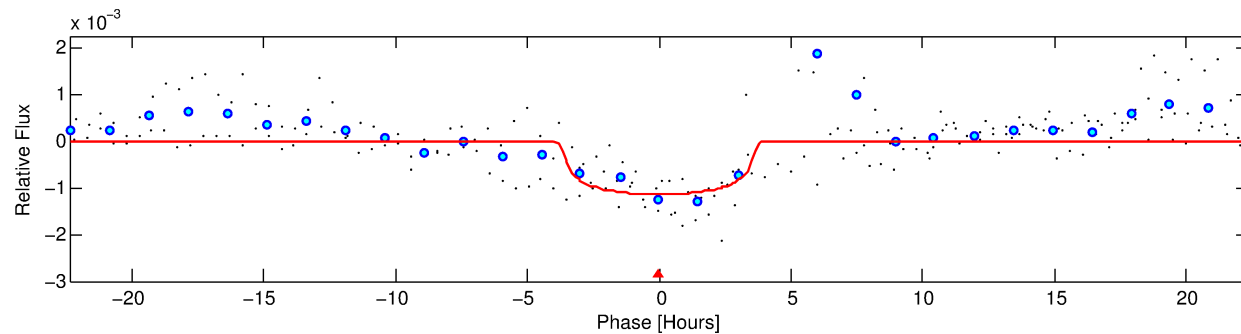
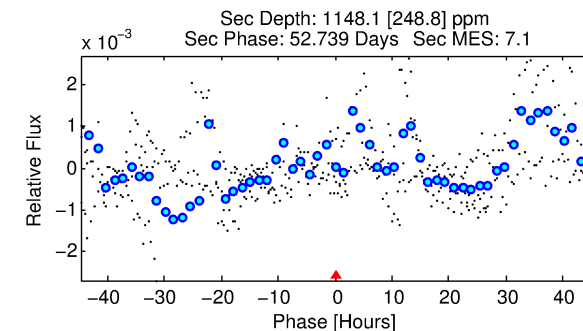
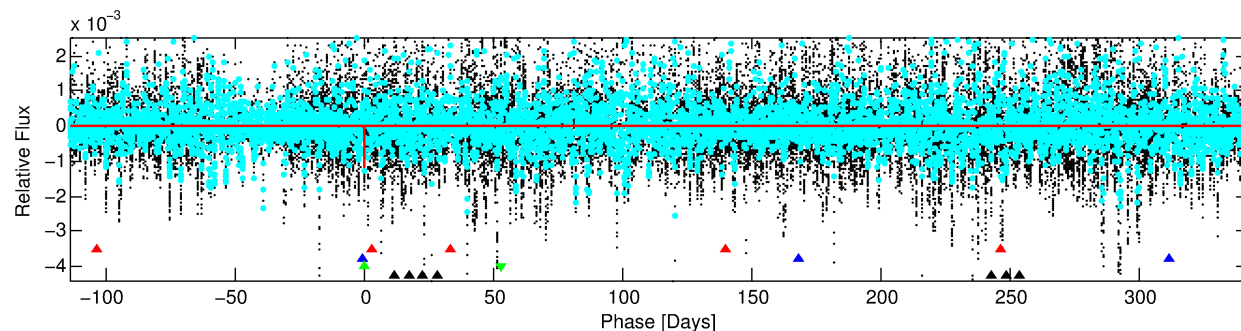
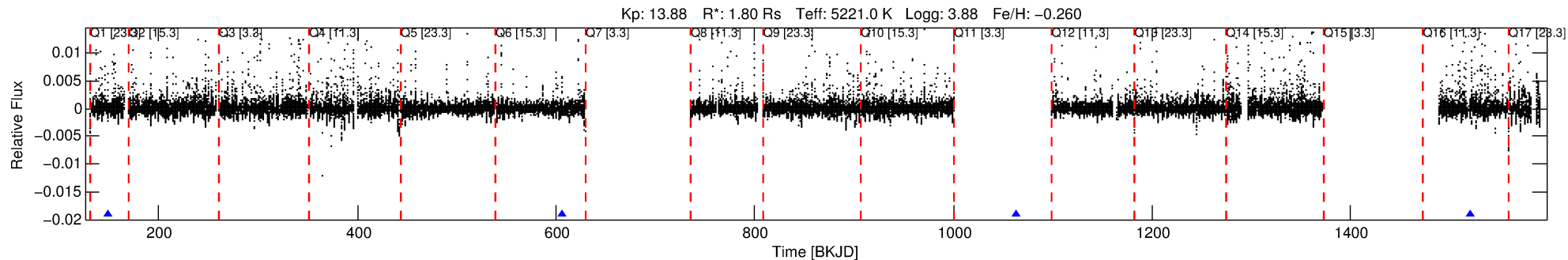
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010815729-03

No Significant Match Found

DV One-Page Summary

KIC: 10815729 Candidate: 3 of 4 Period: 456.858 d



DV Fit Results:

Period = 456.85793 [0.00553] d
Epoch = 149.0470 [0.0097] BKJD
Rp/R* = 0.0304 [0.0436]
a/R* = 482.60 [2572.21]
b = 0.02 [293.20]
Seff = 1.73 [1.95]
Teq = 293 [82] K
Rp = 5.97 [9.32] Re
a = 1.1153 [0.7360] AU
Ag = 22037.93 [68056.78] [0.32 σ]
Teff = 5512 [3973] K [1.31 σ]

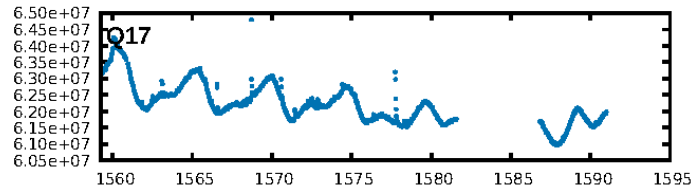
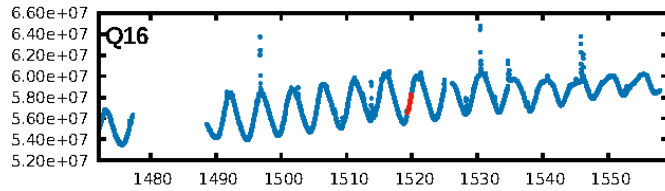
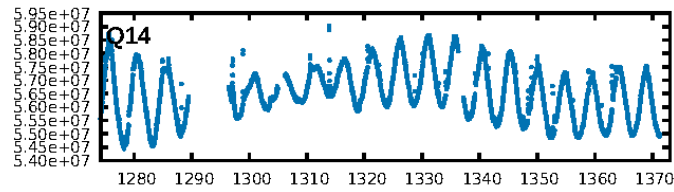
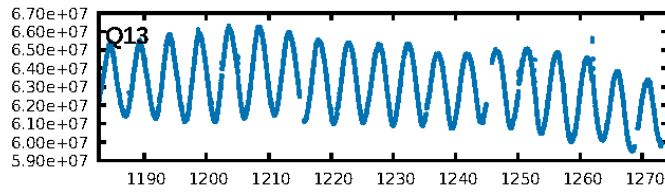
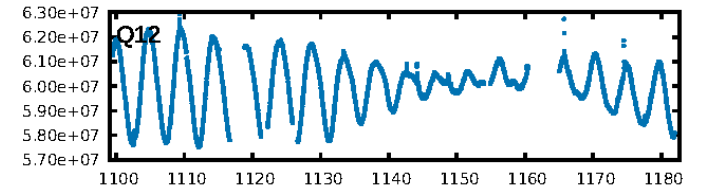
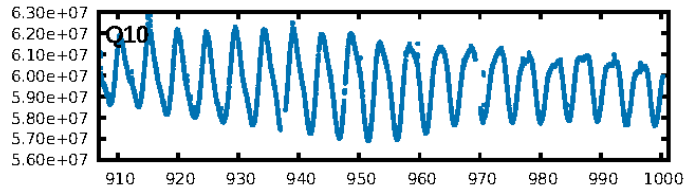
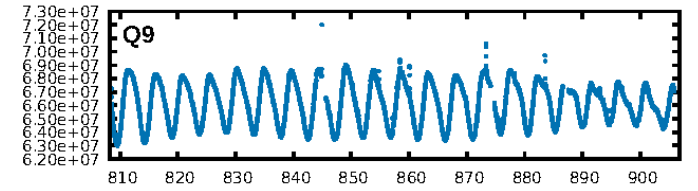
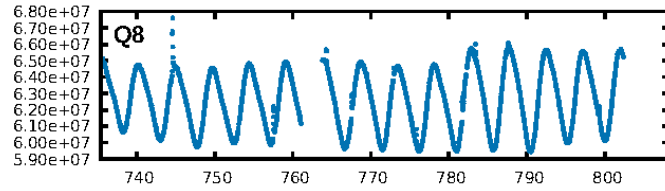
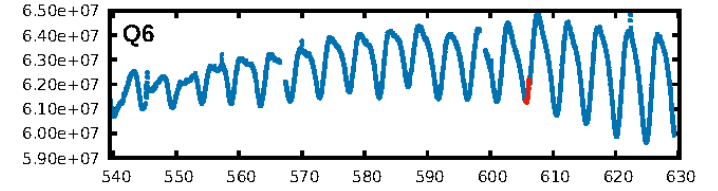
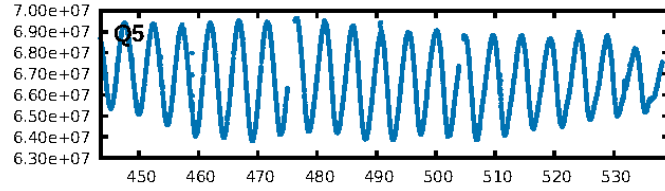
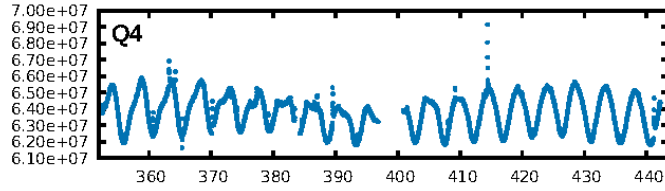
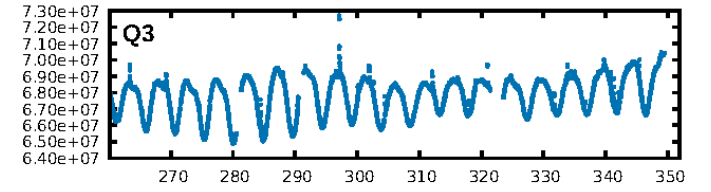
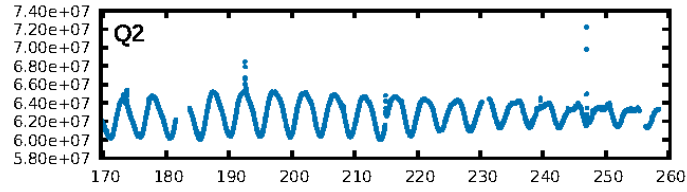
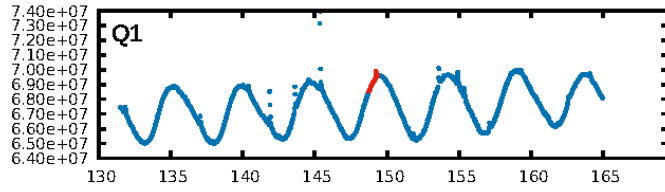
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [314.64 σ]
LongPeriod-sig: 100.0% [242.39 σ]
ModelChiSquare2-sig: 8.4%
ModelChiSquareGof-sig: 80.2%
Bootstrap-pfa: 7.14e-14
RollingBand-fgt: 1.00 [2/2]
GhostDiagnostic-chr: -0.1825
Centroid-sig: 19.8%
Centroid-so: 0.558 arcsec [1.12 σ]
OotOffset-rm: 0.147 arcsec [1.18 σ]
OotOffset-st: 1/0/1/1 [3]
KicOffset-rm: 0.136 arcsec [0.80 σ]
KicOffset-st: 1/0/1/1 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [3/3]

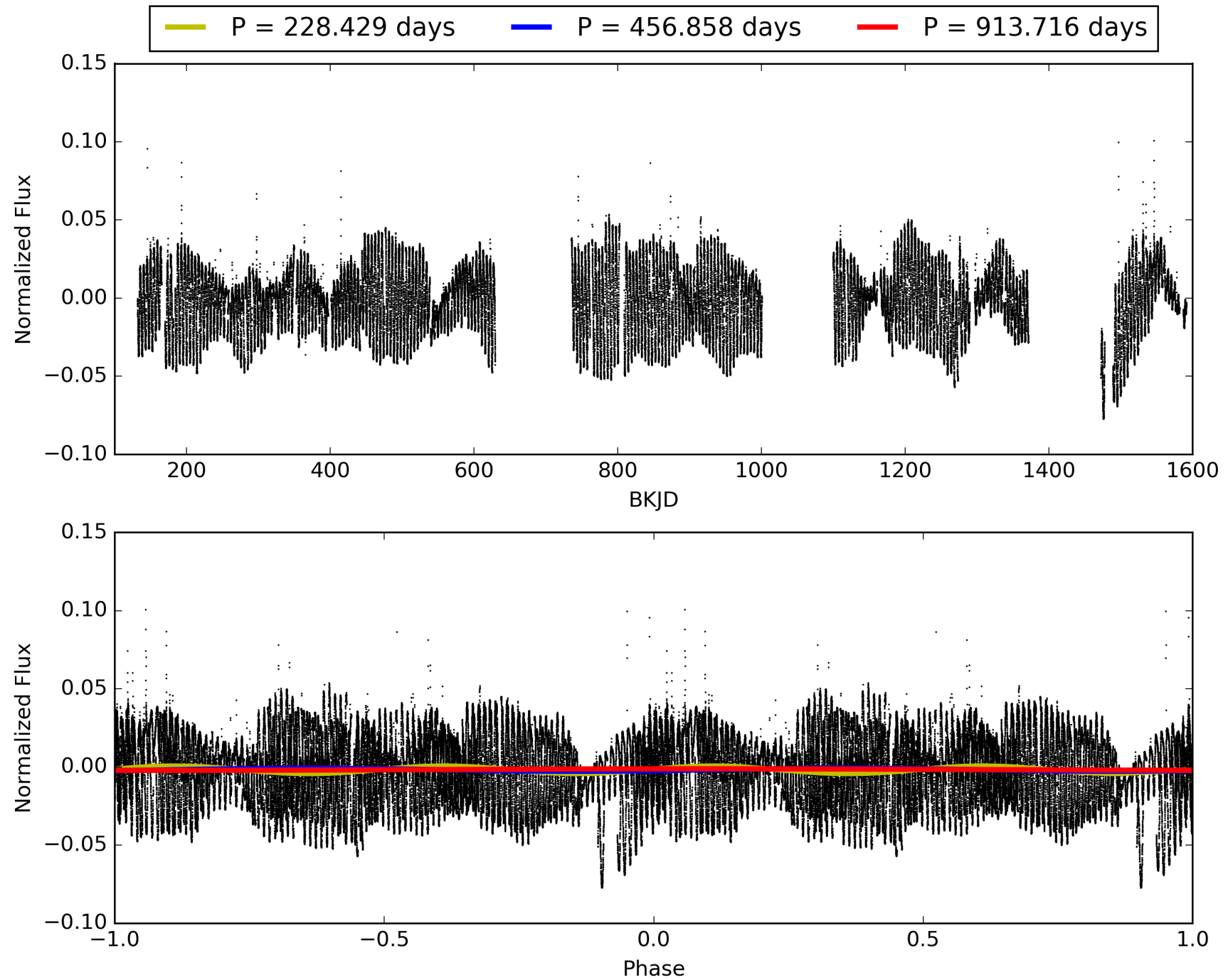
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 10:19:56 Z

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

TCE 010815729-03, PDC Light Curves

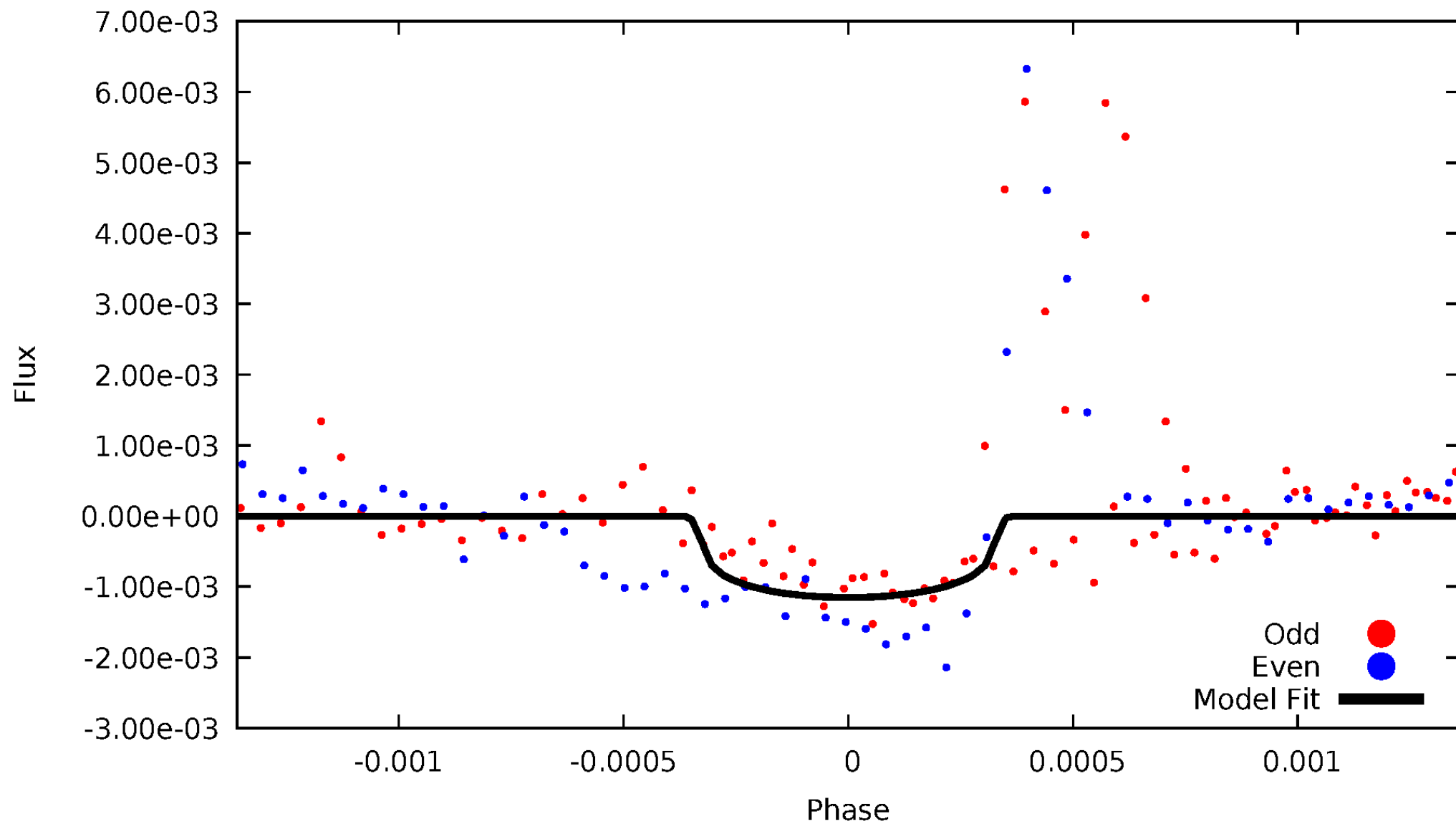


TCE 010815729-03



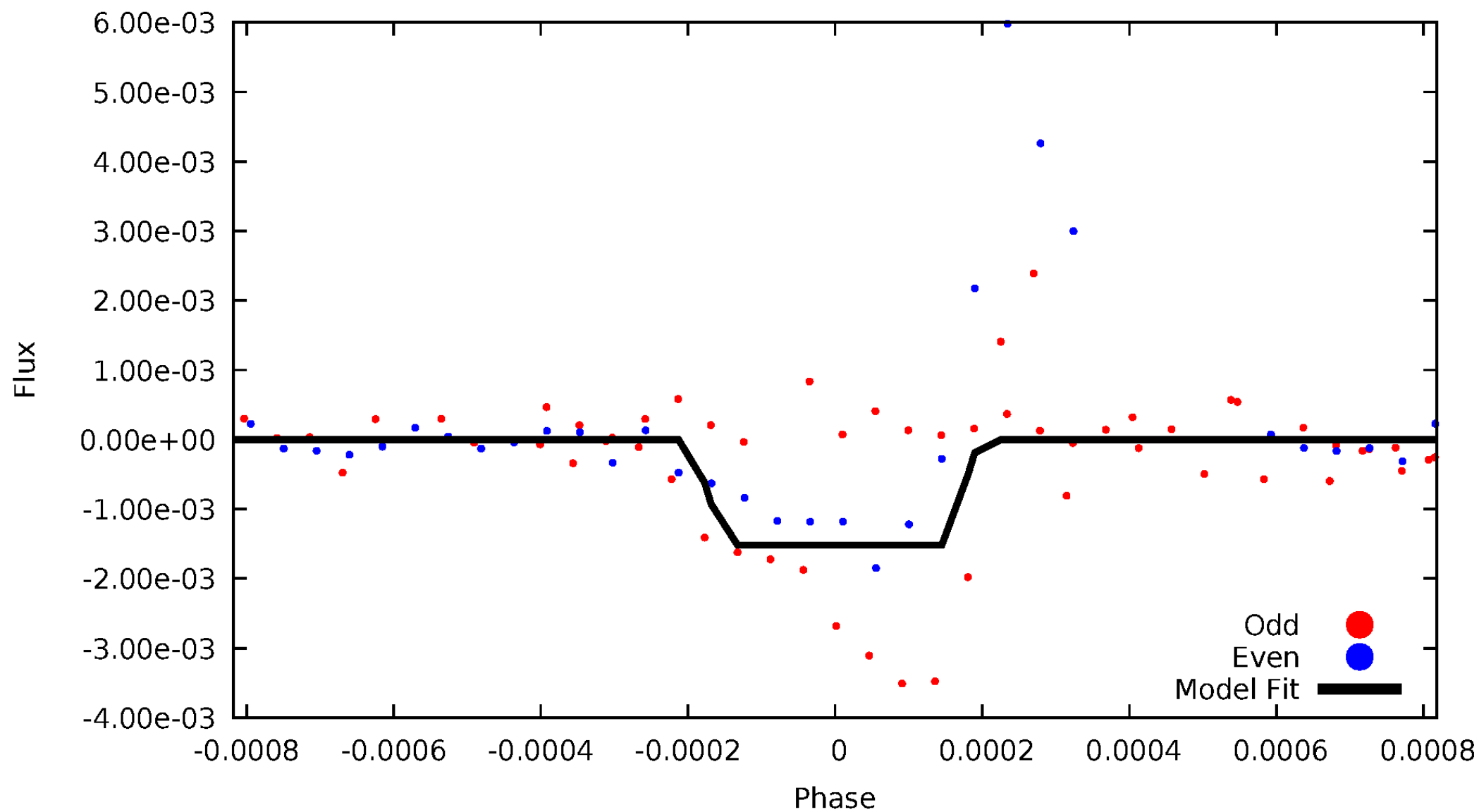
DV Odd/Even

TCE 010815729-03



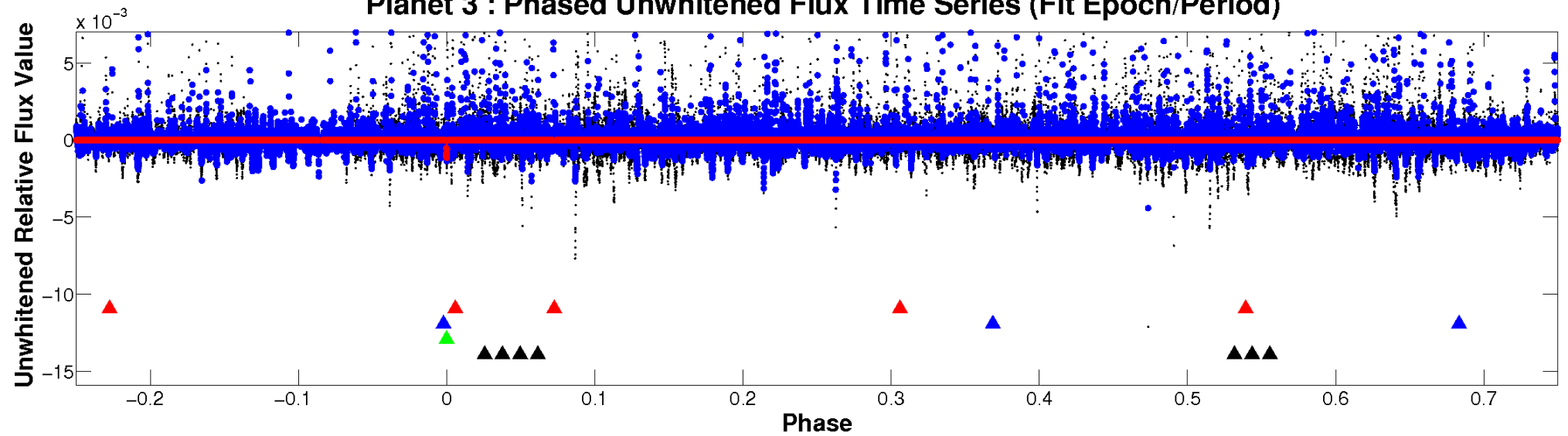
ALT Odd/Even

TCE 010815729-03

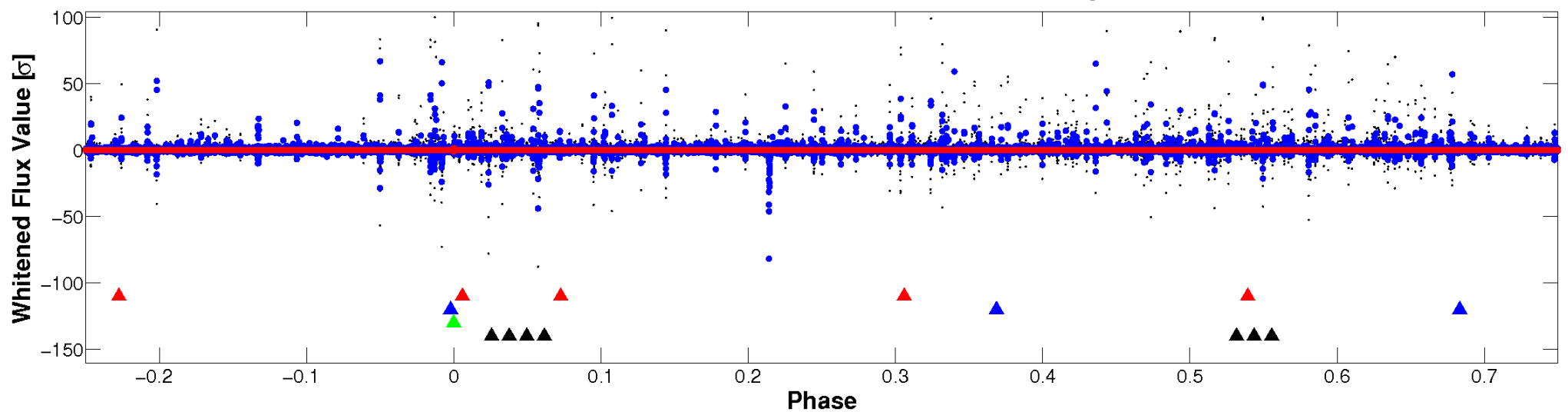


Non-Whitened Vs. Whitened Light Curve

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

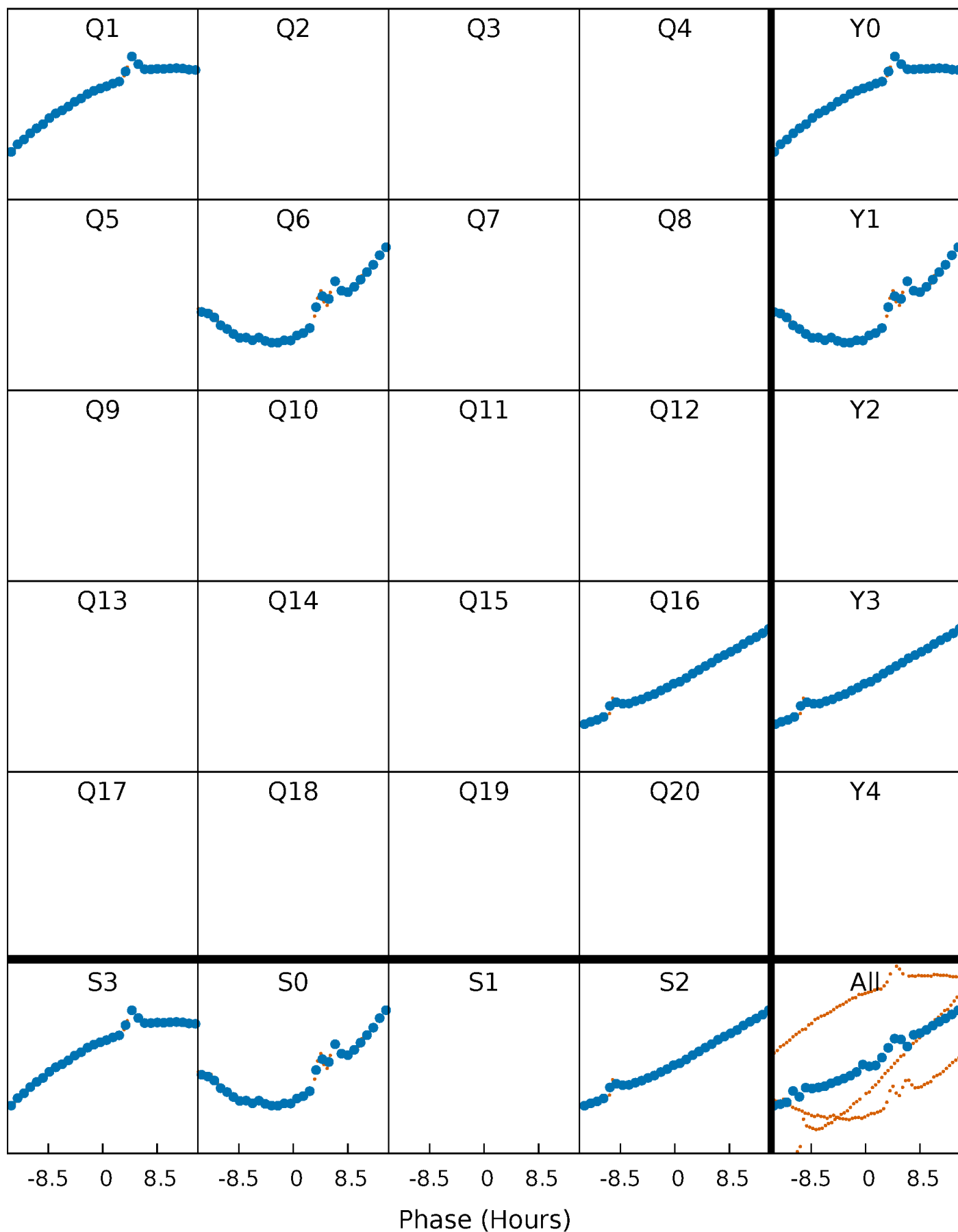


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



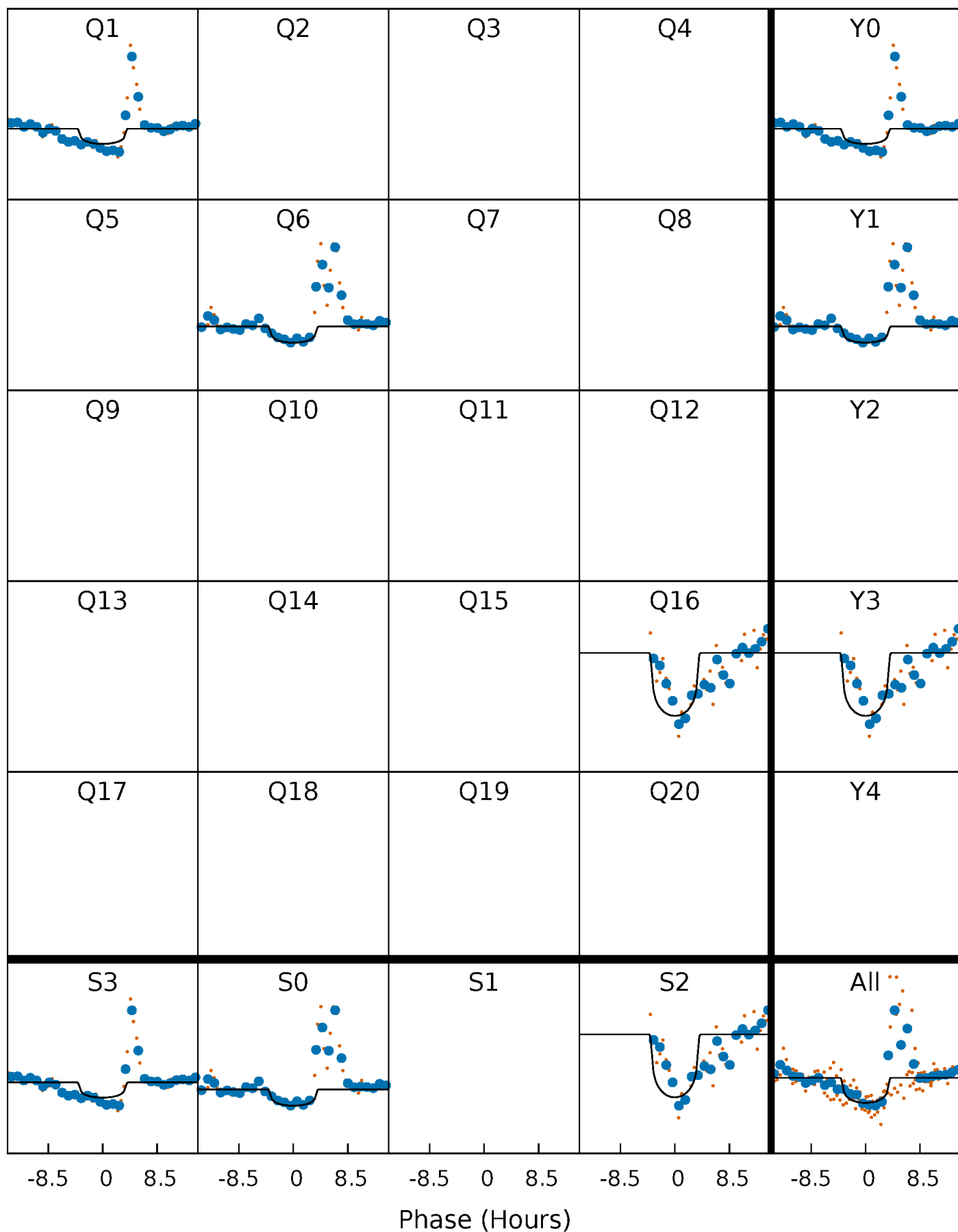
PDC Quarter-Phased Transit Curves

TCE 010815729-03 P=456.857930 Days $T_0=149.047001$ (BKJD)



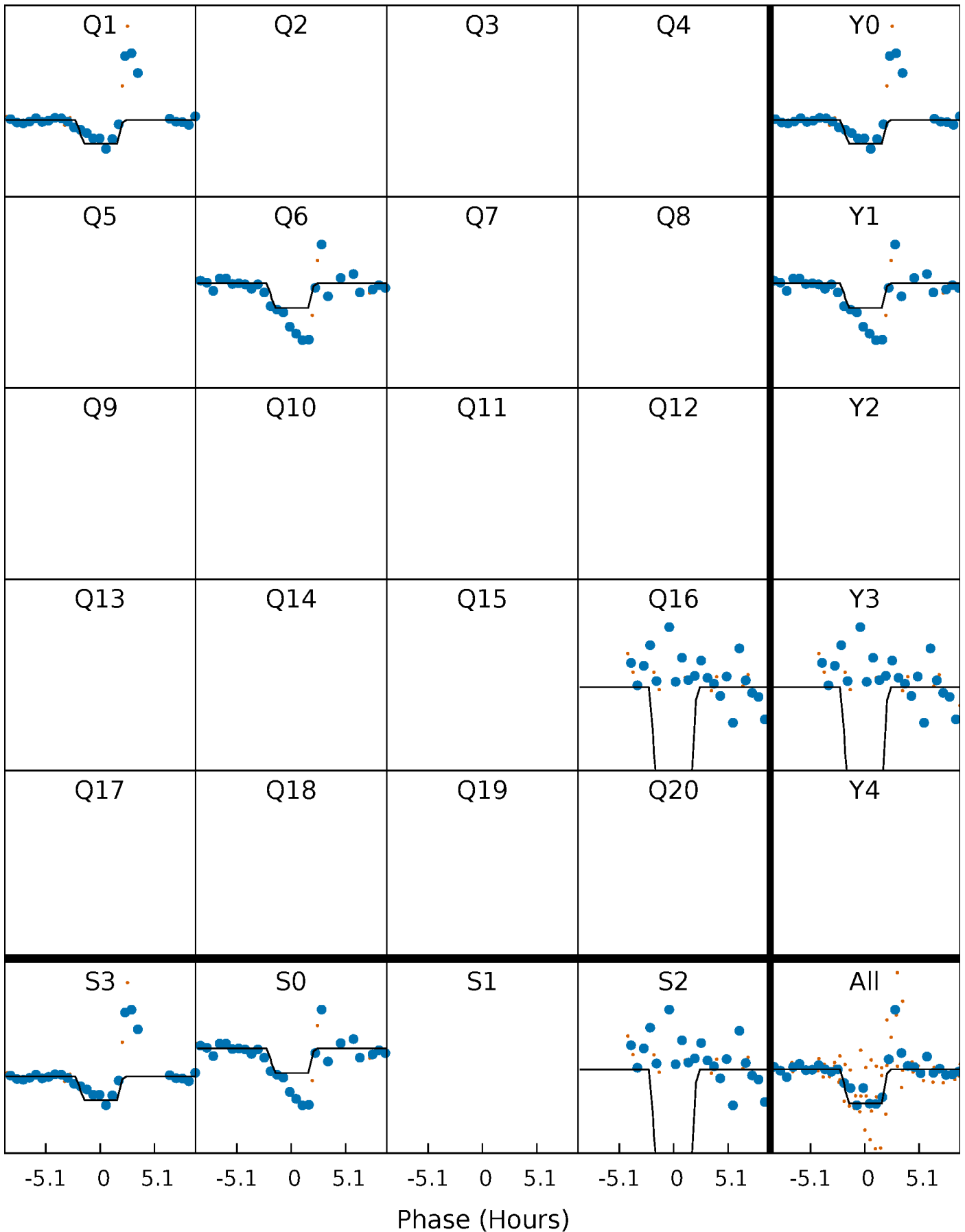
DV Quarter-Phased Transit Curves

TCE 010815729-03 $P=456.857930$ Days $T_0=149.047001$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

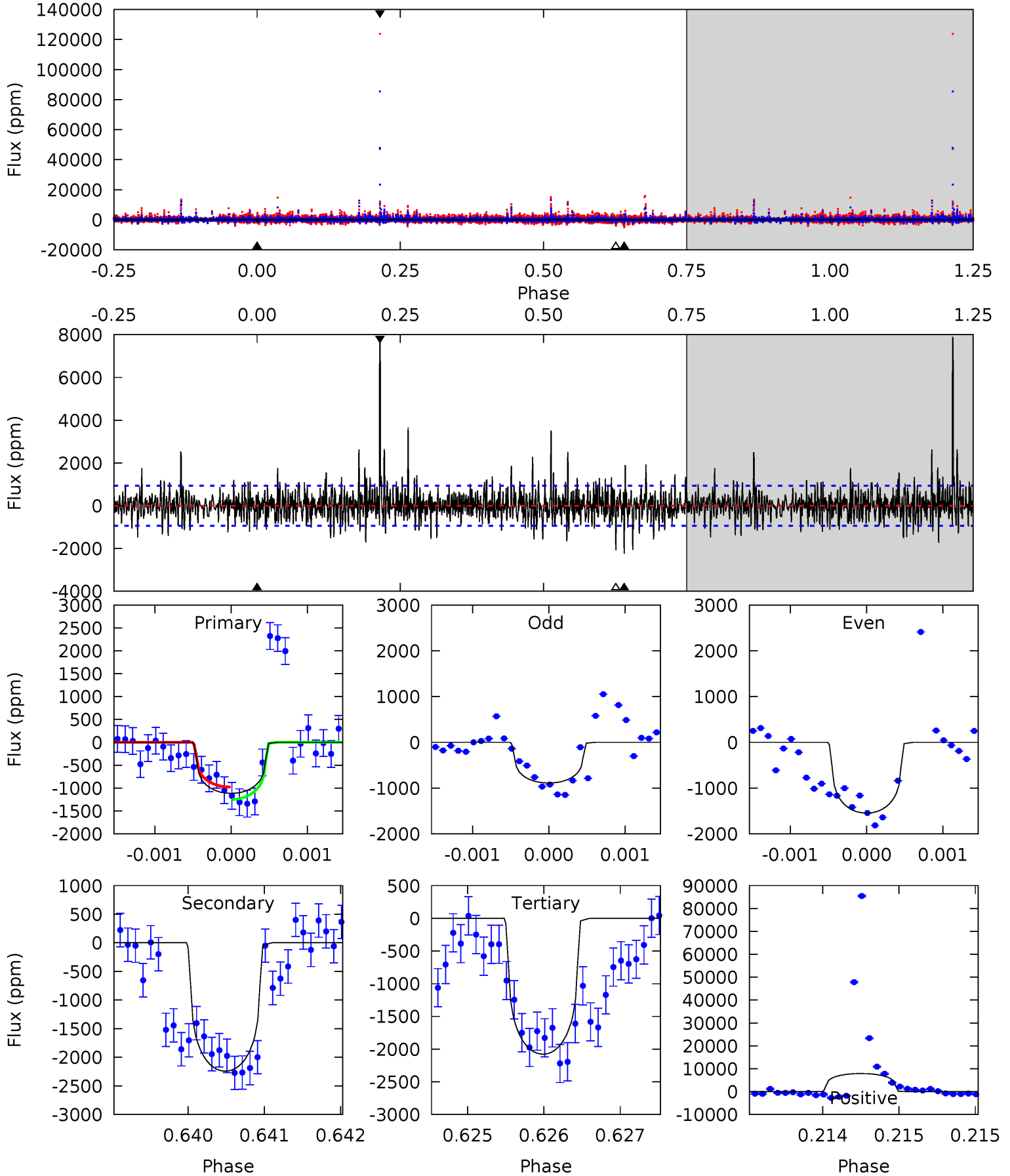
TCE 010815729-03 $P=456.839912$ Days $T_0=149.121128$ (BKJD)



DV Model-Shift Uniqueness Test

010815729-03, P = 456.857930 Days, E = 149.047001 Days

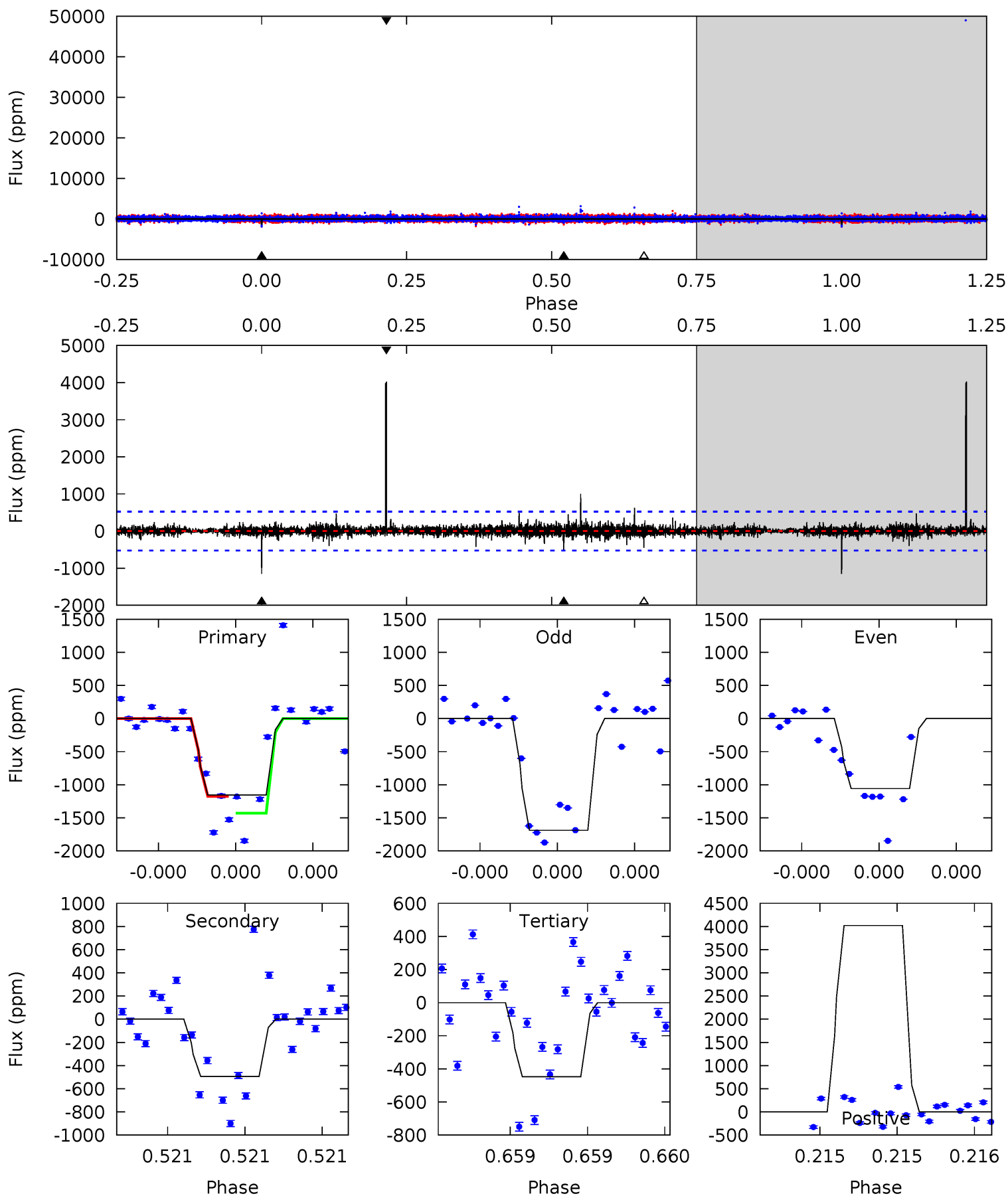
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.56	13.2	12.2	46.5	5.51	3.38	3.27	-5.67	-39.9	0.97	-33.3	1.34	1.24	0.78	0.81



Alt Model-Shift Uniqueness Test

010815729-03, P = 456.839912 Days, E = 149.121128 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.4	5.31	4.82	43.3	5.63	3.56	1.00	7.62	-30.8	0.50	-38.0	3.46	1.08	0.78	1.37



Stellar Parameters For KIC 010815729

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5221^{+174}_{-142}	$3.875^{+0.676}_{-0.364}$	$-0.260^{+0.350}_{-0.250}$	$1.800^{+1.101}_{-1.101}$	$0.886^{+0.197}_{-0.131}$	$0.214^{+2.605}_{-0.148}$
	+3%/-3%	+17%/-9%	+135%/-96%	+61%/-61%	+22%/-15%	+1216%/-69%
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 010815729-03 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-2242 ± 170	$8.19^{+8.57}_{-5.72}$	408^{+66}_{-74}	5382^{+4432}_{-1208}	$23553^{+245494}_{-18193}$
Alt.	-494 ± 93	$8.90^{+8.58}_{-5.85}$	404^{+63}_{-65}	3899^{+1758}_{-709}	4289^{+30660}_{-3243}

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 $A_{obs} \gg 1.0$

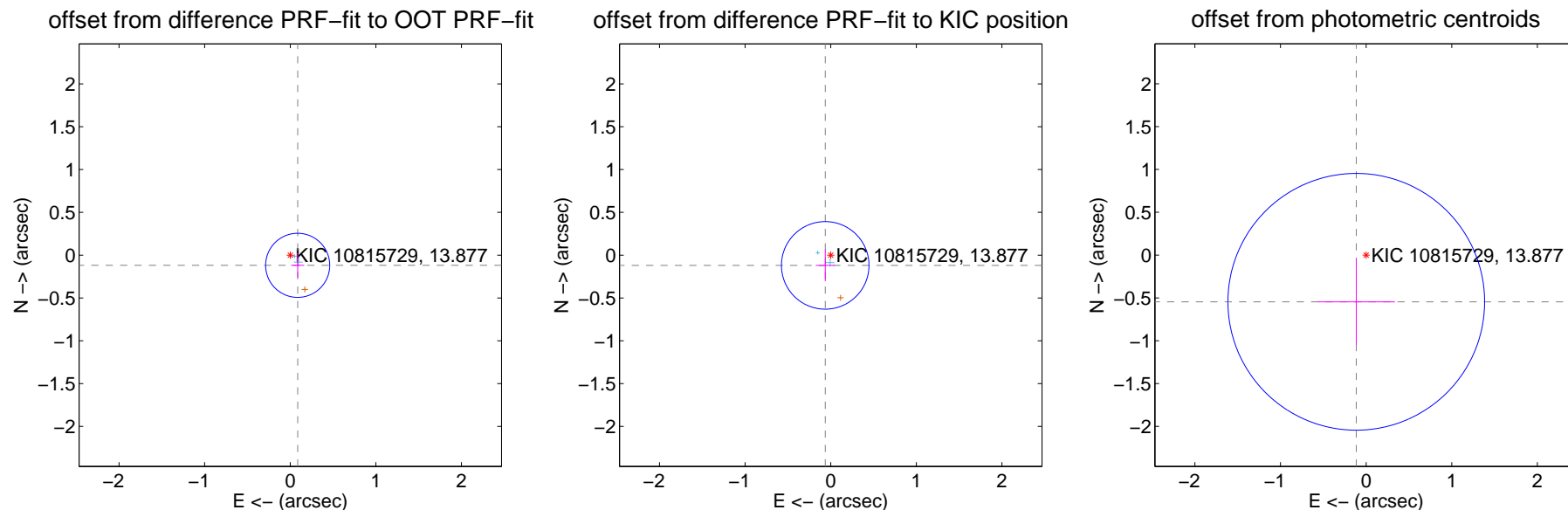
DV Centroid Data

Supplemental centroid analysis for 010815729-03. Kepler magnitude: 13.88. Transit SNR 5.13

There are 2 quarters with good PRF difference image offsets

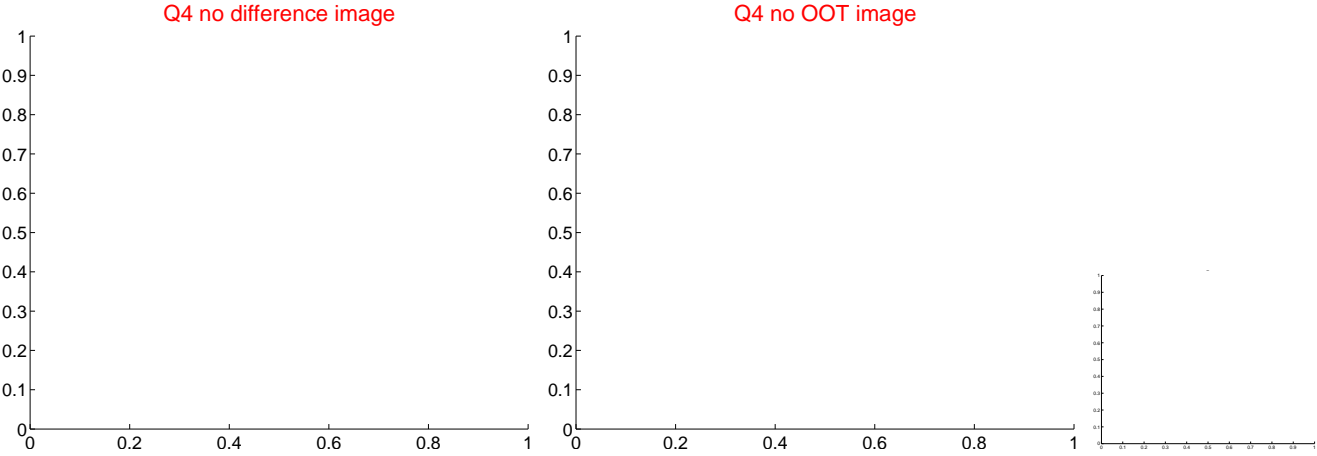
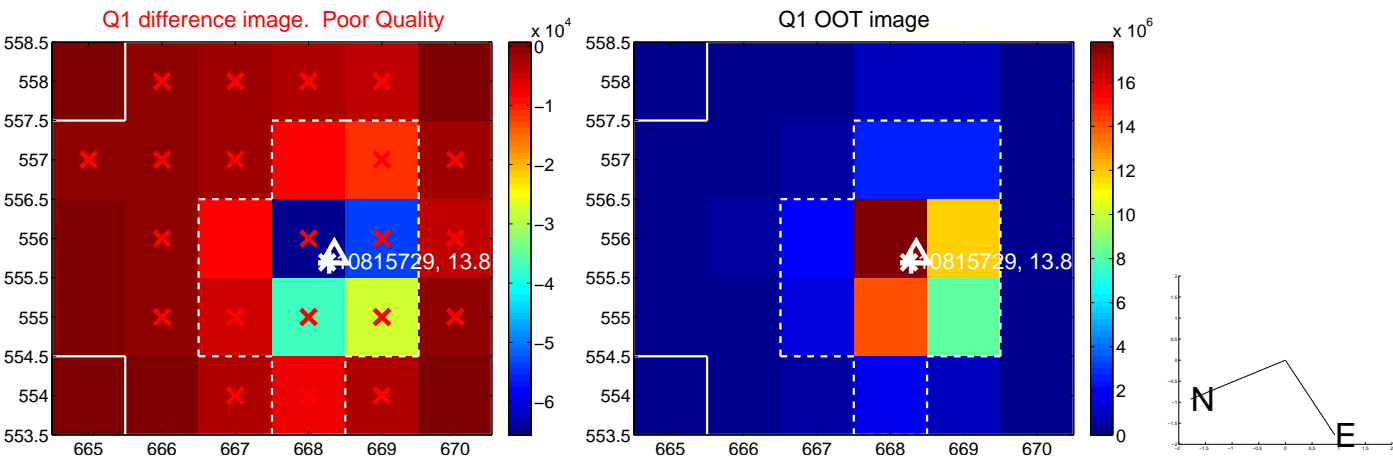
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.147 ± 0.125	1.18	-0.087 ± 0.077	-0.119 ± 0.144
PRF-fit source offset from KIC position	0.136 ± 0.170	0.80	0.064 ± 0.110	-0.119 ± 0.184
photometric centroid source offset	0.56 ± 0.50	1.12	0.12 ± 0.45	-0.55 ± 0.50



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.

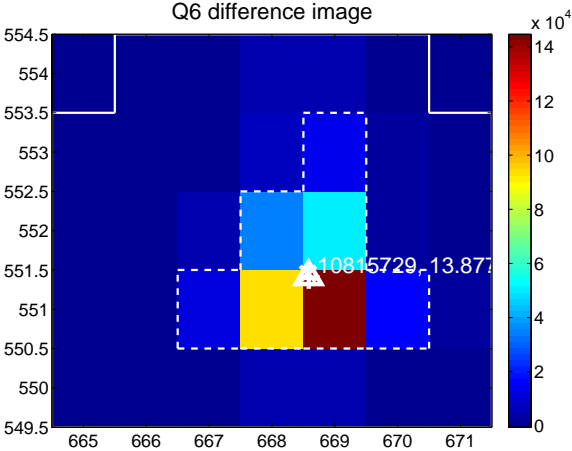
Q5 no difference image



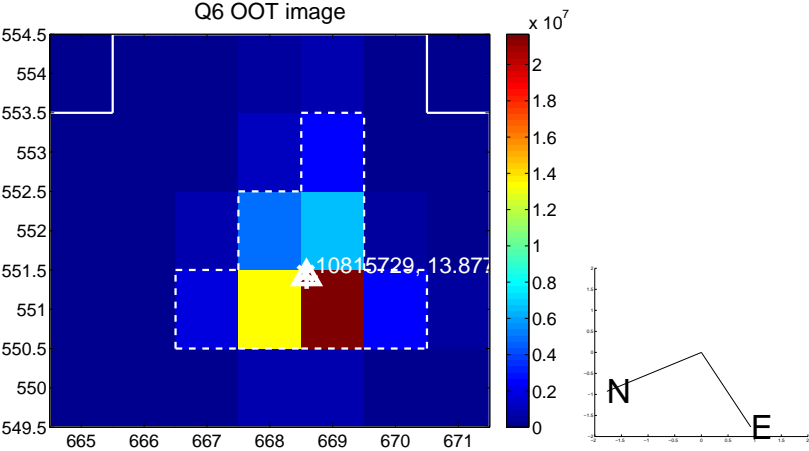
Q5 no OOT image



Q6 difference image



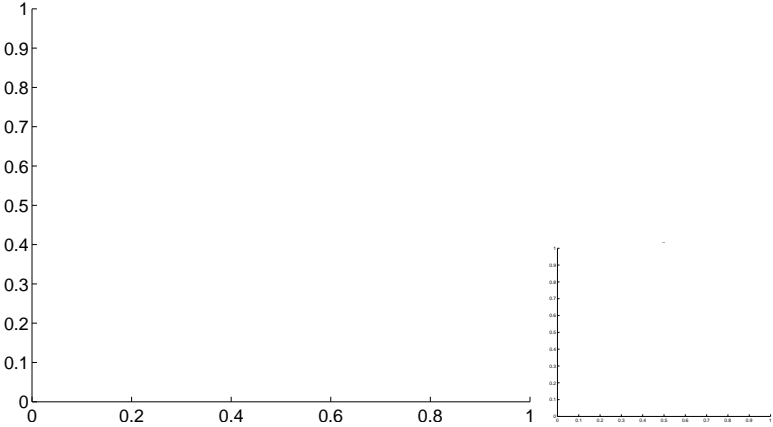
Q6 OOT image



Q7 no difference image



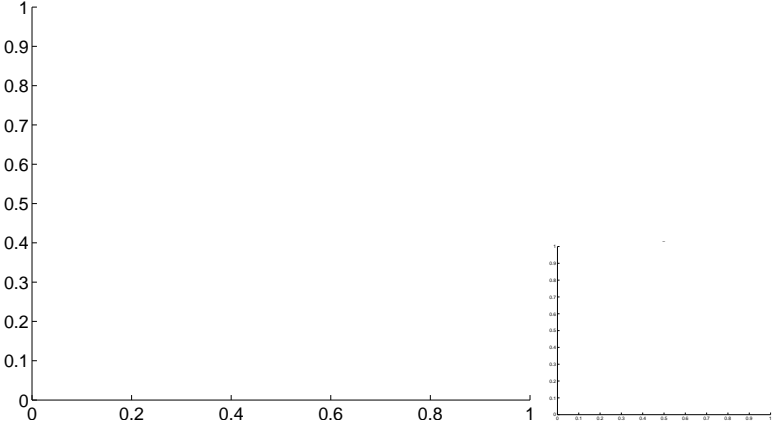
Q7 no OOT image



Q8 no difference image



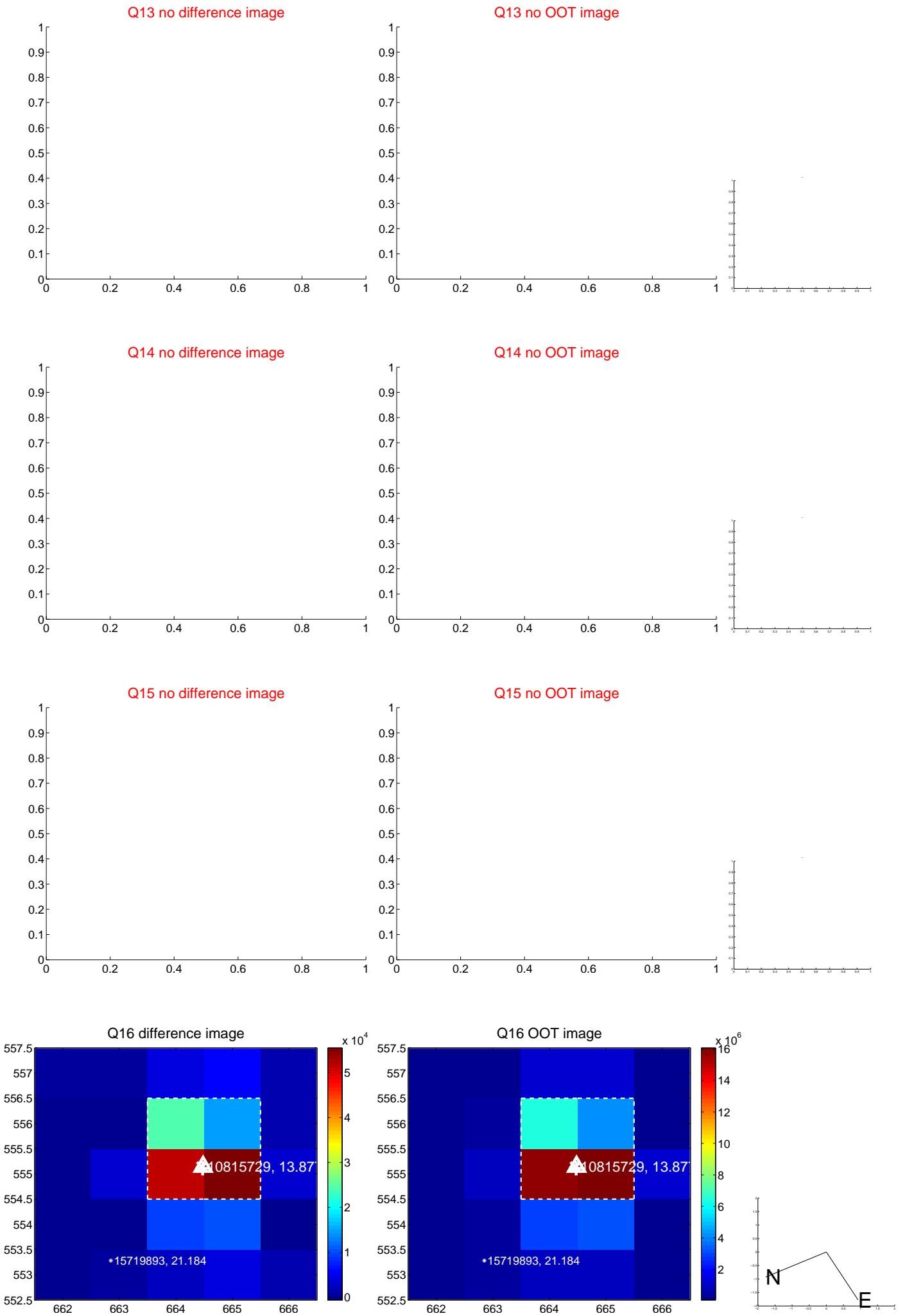
Q8 no OOT image



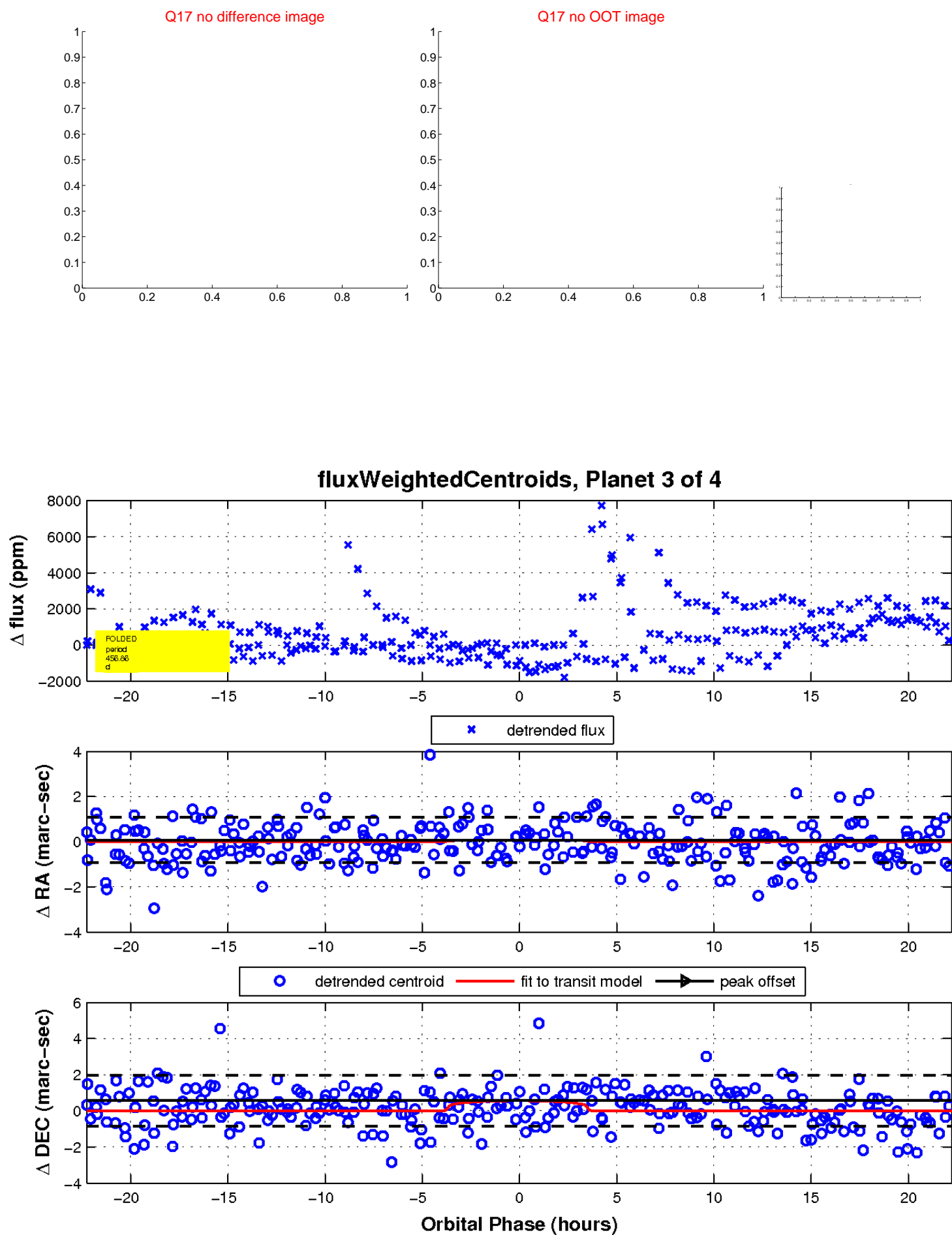
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

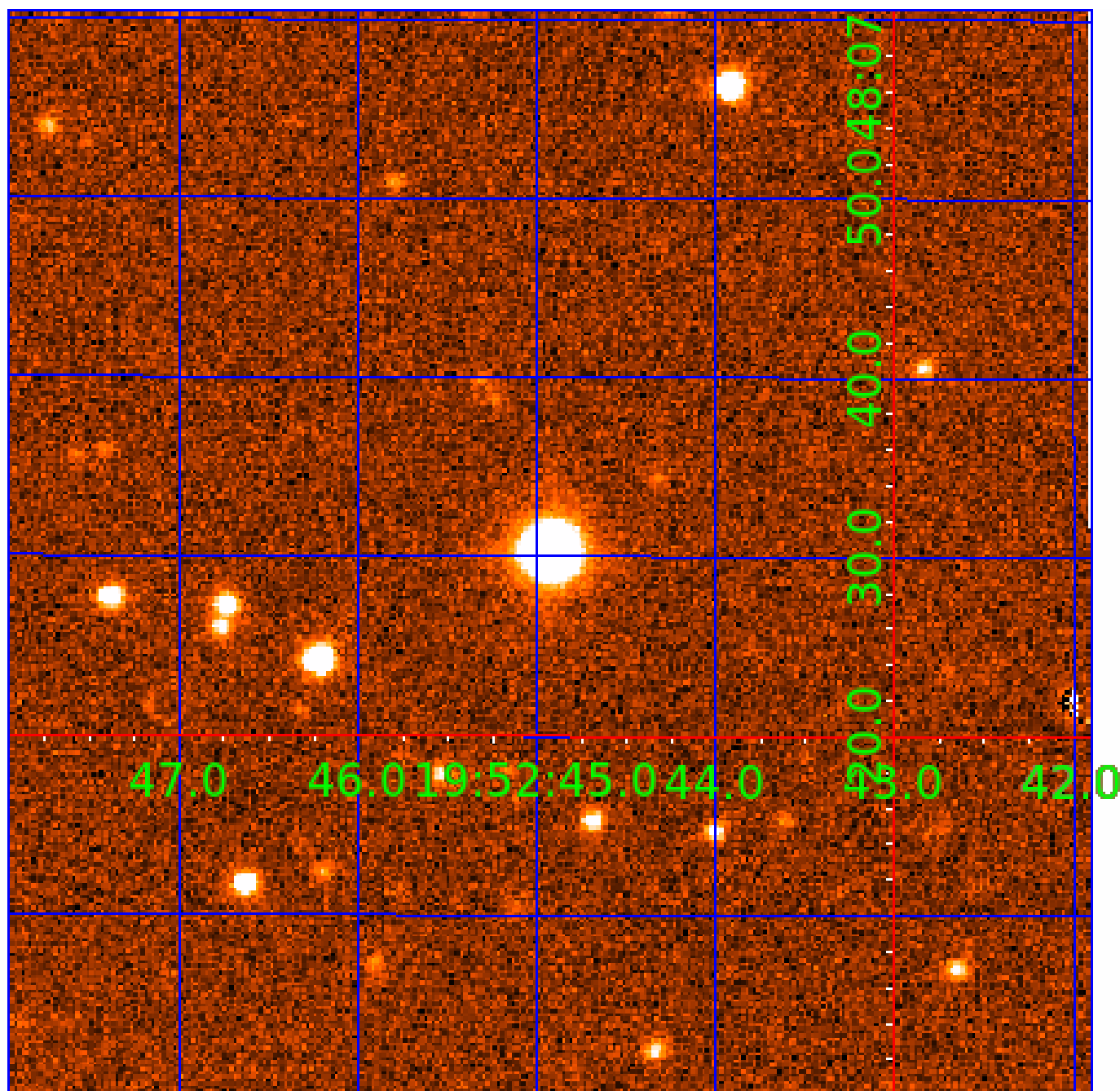


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010815729

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})
010815729-01	OBS	No	350.271134	151.741524	1905.6	3.254	23.8	13.0	1.80	5221	8.34	2.47
010815729-02	OBS	No	600.600988	317.474647	2034.5	12.126	13.3	6.9	1.80	5221	7.94	1.20
010815729-03	OBS	No	456.857929	149.047001	1151.5	7.450	19.2	5.1	1.80	5221	5.97	1.73
010815729-04	OBS	No	225.698771	177.183150	1050.7	2.901	14.7	7.2	1.80	5221	5.89	4.44

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010815729-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—MOD_POS_ALT—INCONSISTENT_TRANS
010815729-02	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
010815729-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_POS_ALT—INCONSISTENT_TRANS— CENT_FEW_DIFFS—HALO_GHOST
010815729-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—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.

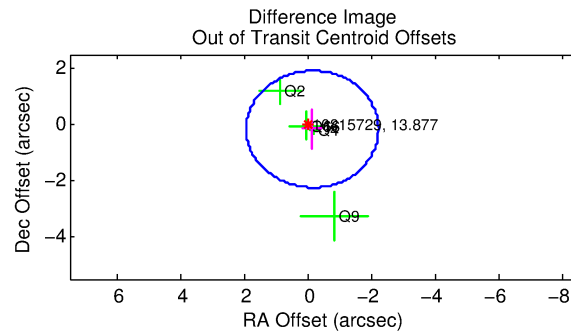
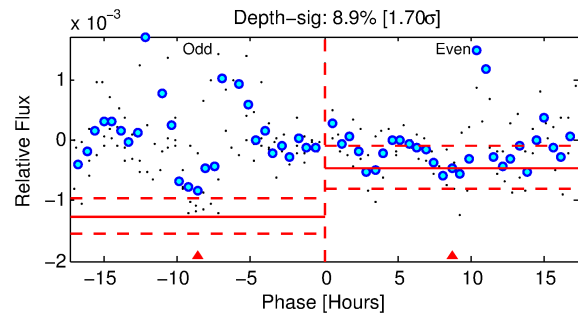
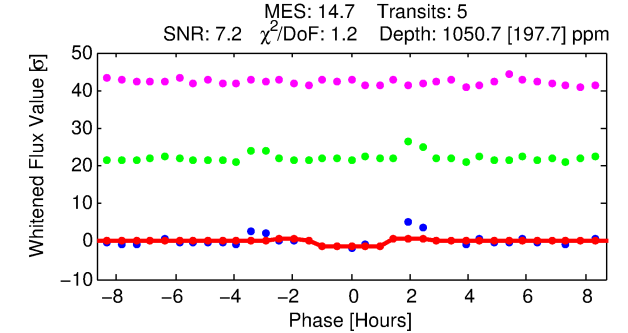
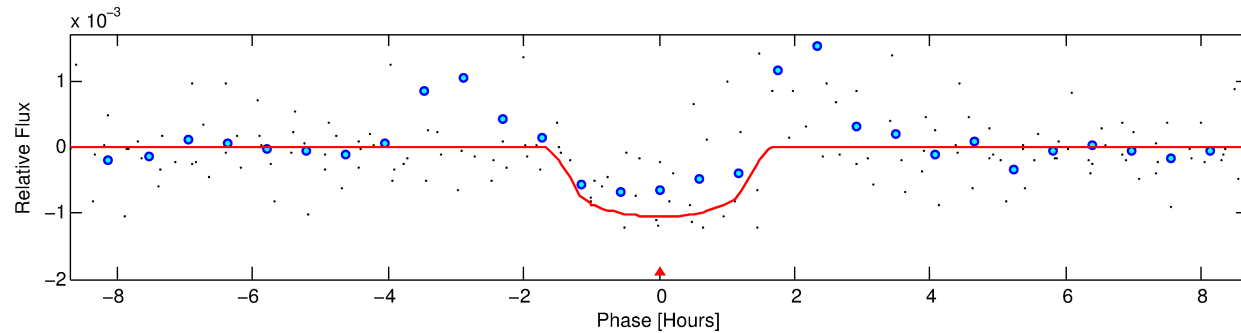
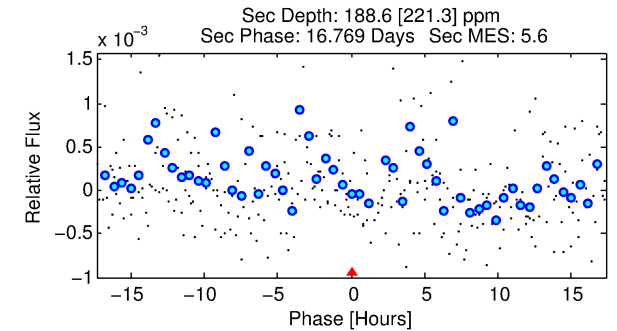
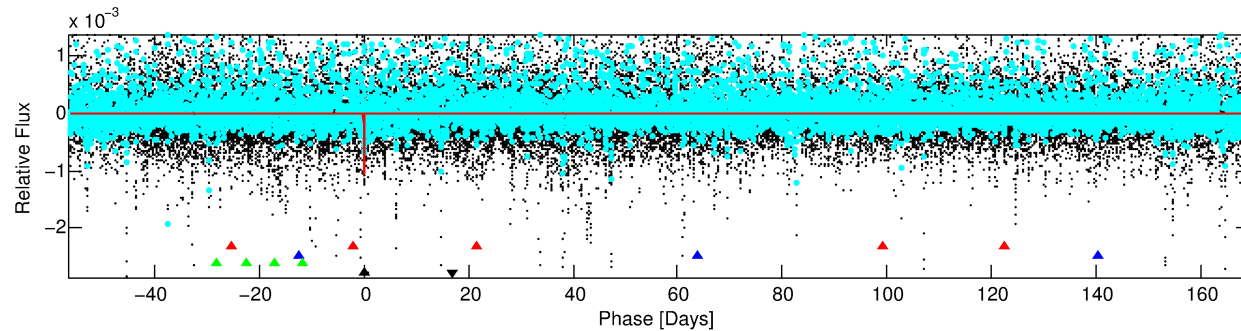
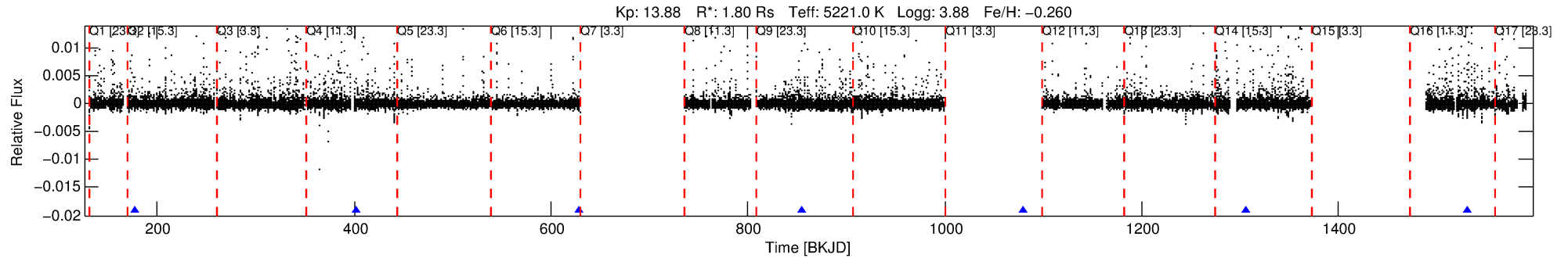
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010815729-04

No Significant Match Found

DV One-Page Summary

KIC: 10815729 Candidate: 4 of 4 Period: 225.699 d



DV Fit Results:

Period = 225.69877 [0.00180] d
Epoch = 177.1831 [0.0056] BKJD
Rp/R* = 0.0300 [0.0716]
a/R* = 547.48 [4980.33]
b = 0.46 [15.73]
Seff = 4.44 [4.99]
Teq = 370 [104] K
Rp = 5.89 [14.52] Re
a = 0.6970 [0.4600] AU
Ag = 1453.51 [7332.20] [0.20σ]
Teffp = 3534 [4348] K [0.73σ]

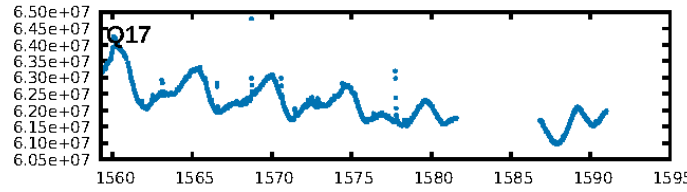
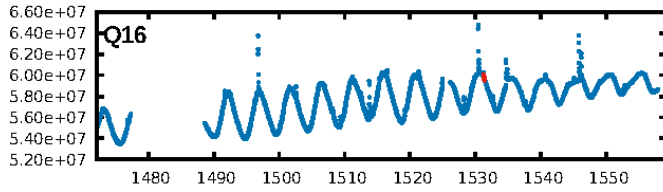
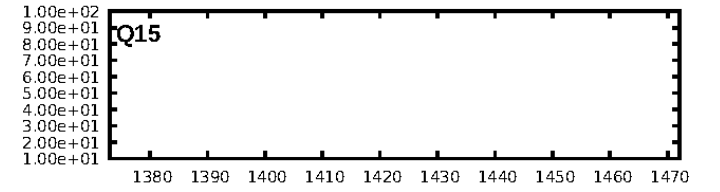
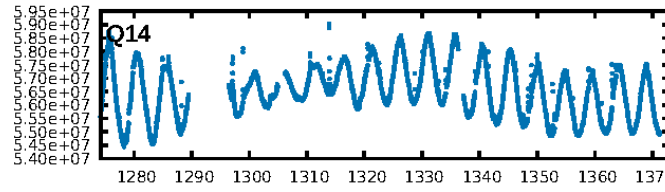
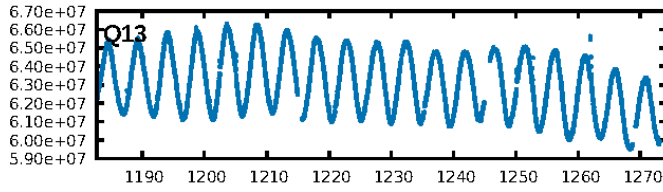
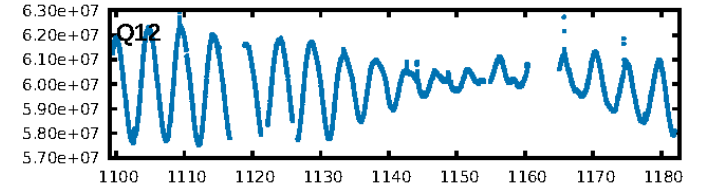
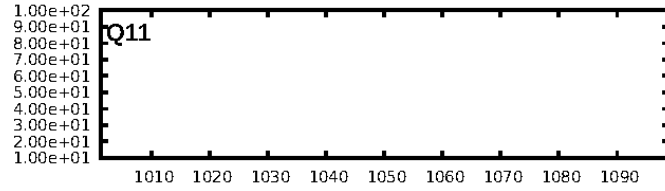
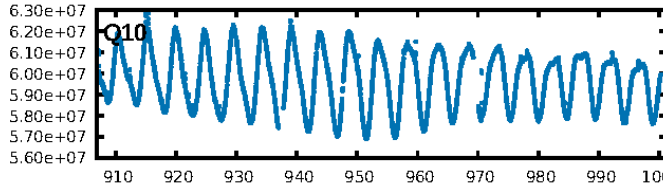
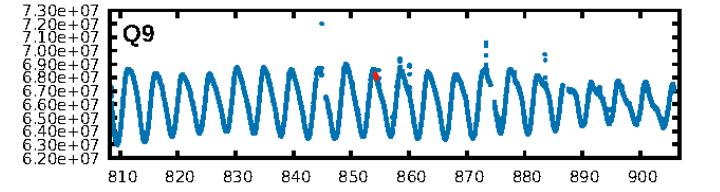
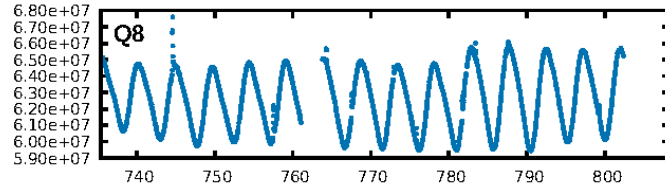
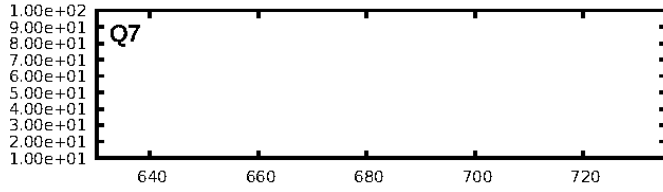
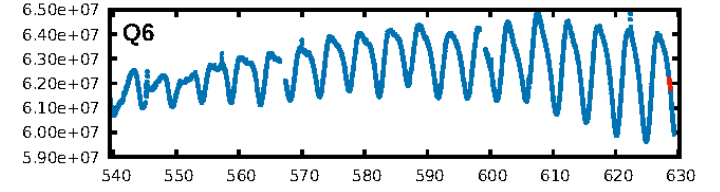
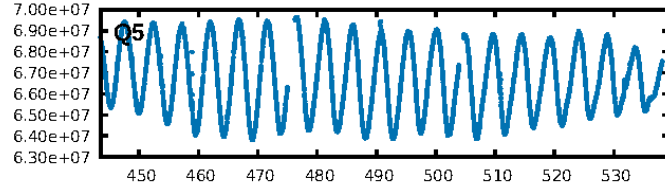
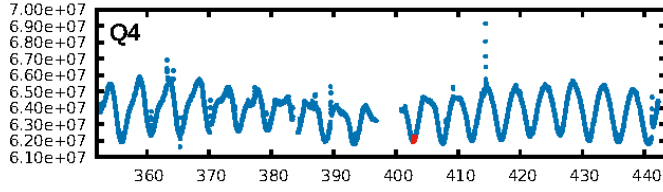
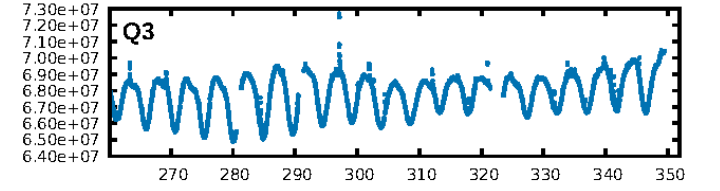
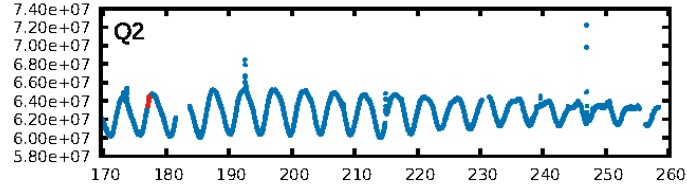
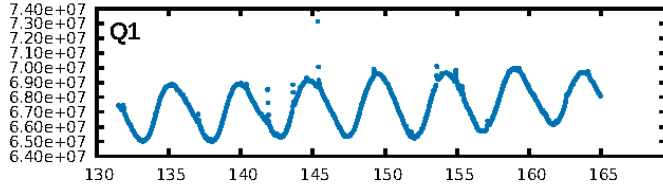
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [685.80σ]
ModelChiSquare2-sig: 5.9%
ModelChiSquareGof-sig: 61.0%
Bootstrap-pfa: 1.57e-11
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: 0.2196
Centroid-sig: 48.7%
Centroid-so: 0.408 arcsec [0.66σ]
OotOffset-rm: 0.208 arcsec [0.30σ]
OotOffset-st: 2/0/2/1 [5]
KicOffset-rm: 0.154 arcsec [0.22σ]
KicOffset-st: 2/0/2/1 [5]
DiffImageQuality-fgm: 0.60 [3/5]
DiffImageOverlap-fno: 1.00 [5/5]

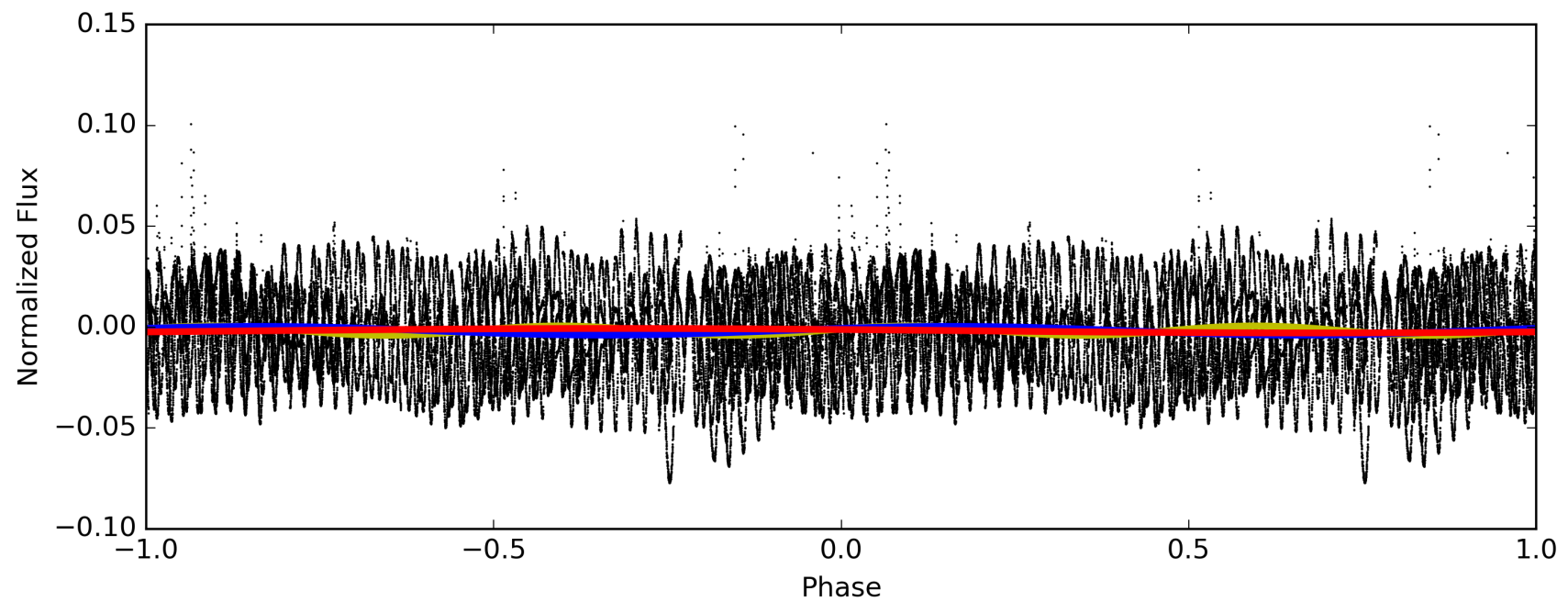
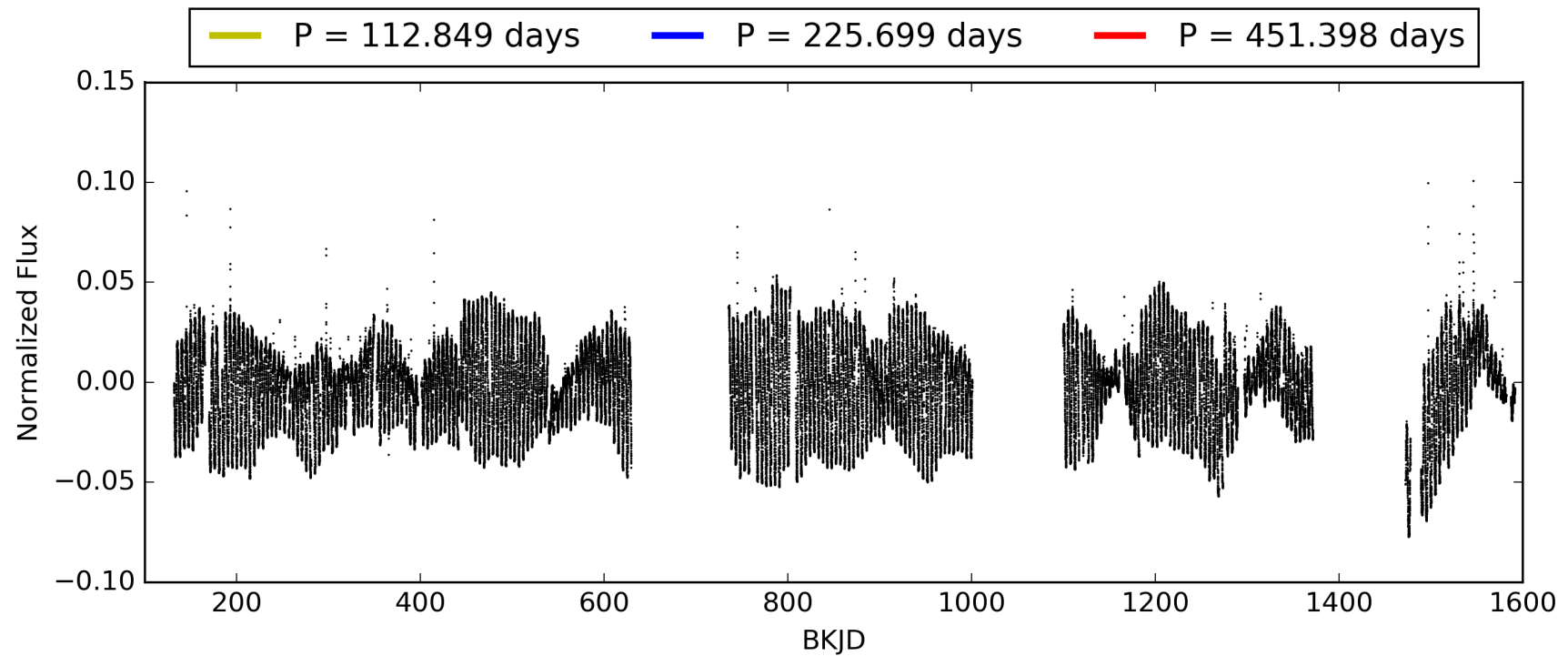
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 10:20:07 Z

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

TCE 010815729-04, PDC Light Curves

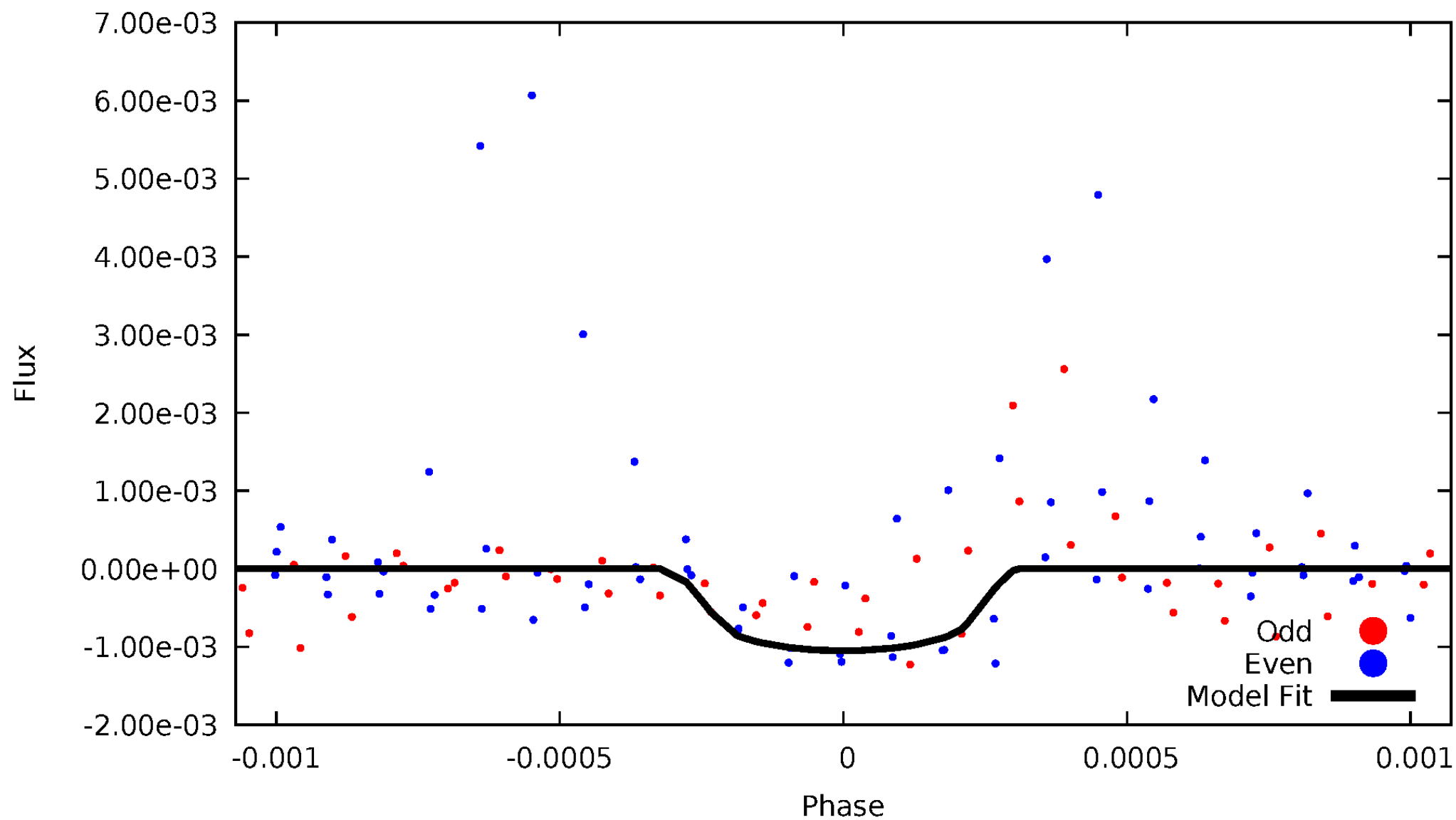


TCE 010815729-04



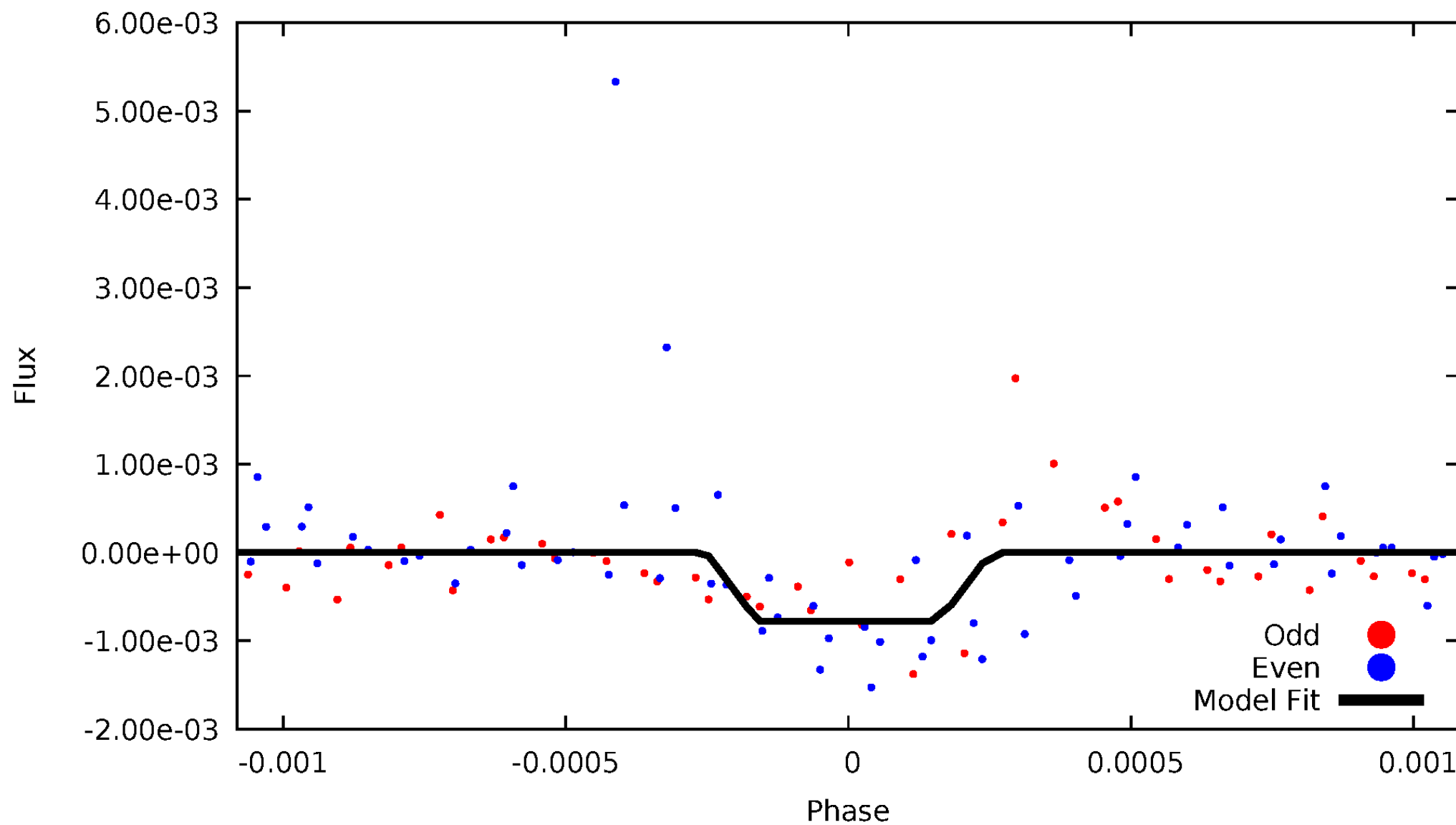
DV Odd/Even

TCE 010815729-04



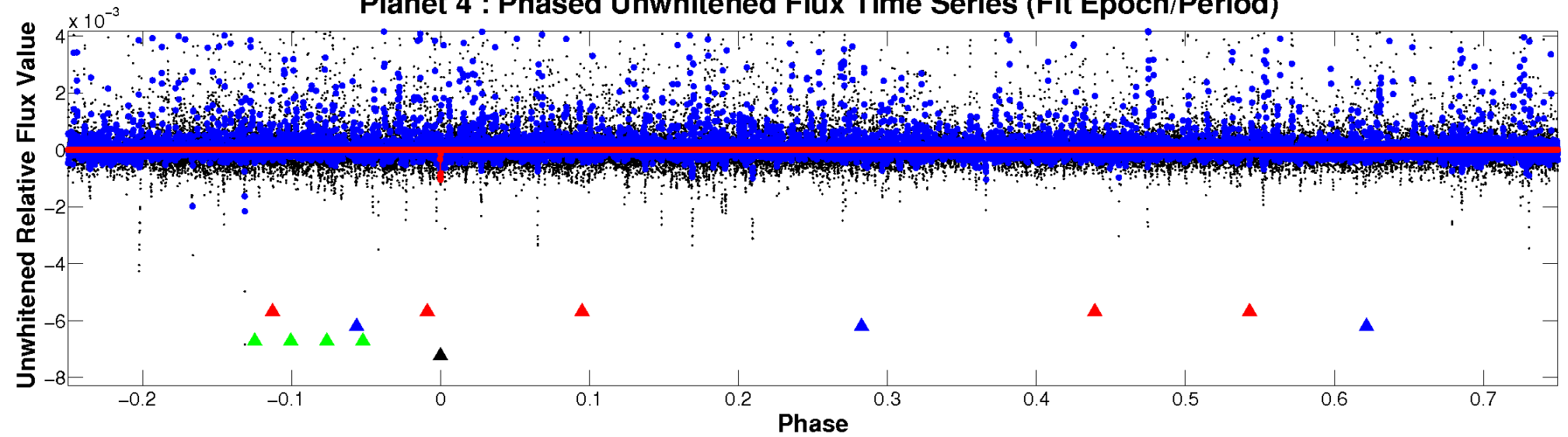
ALT Odd/Even

TCE 010815729-04

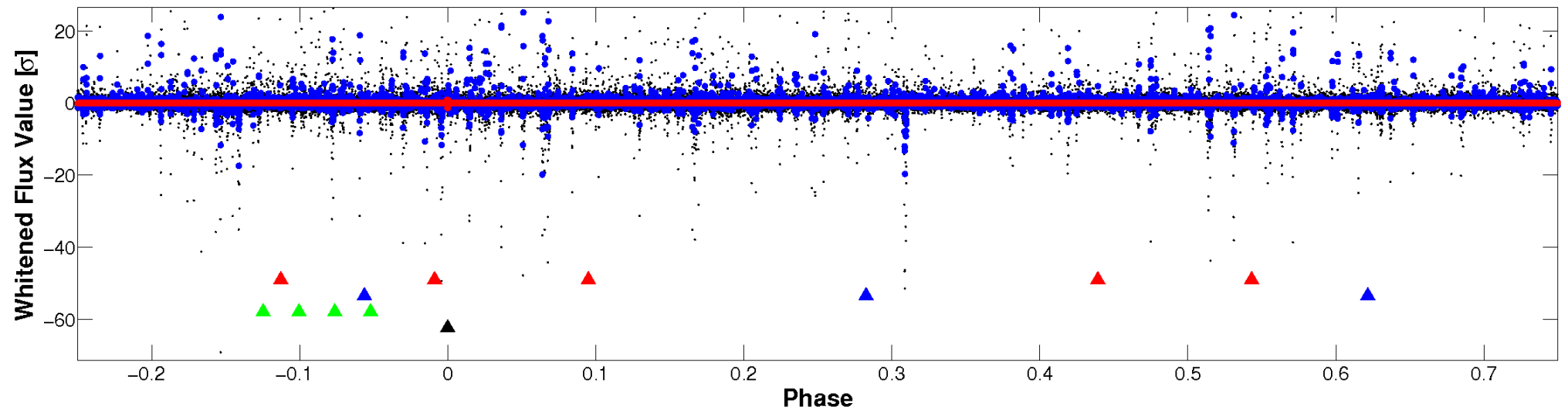


Non-Whitened Vs. Whitened Light Curve

Planet 4 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

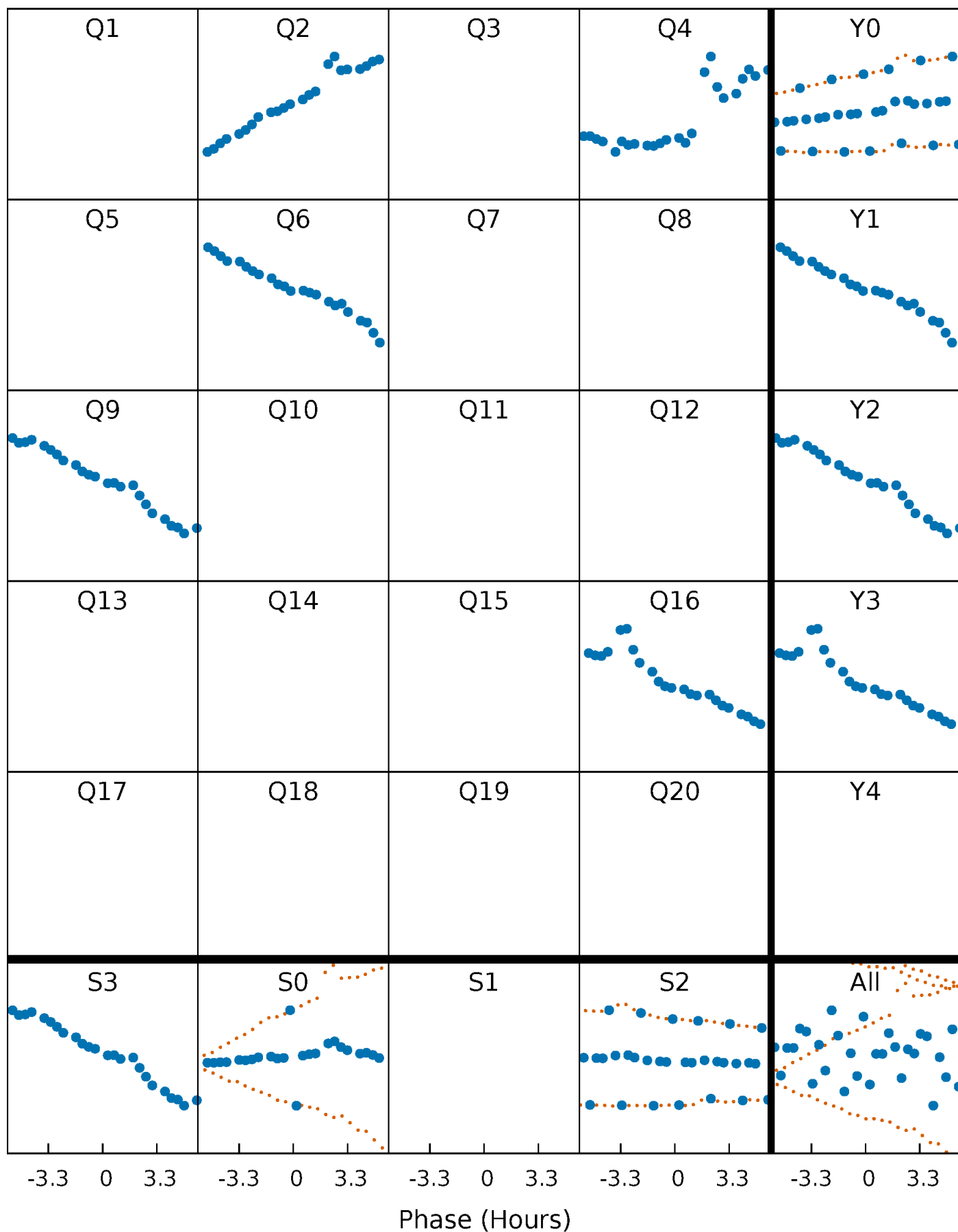


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



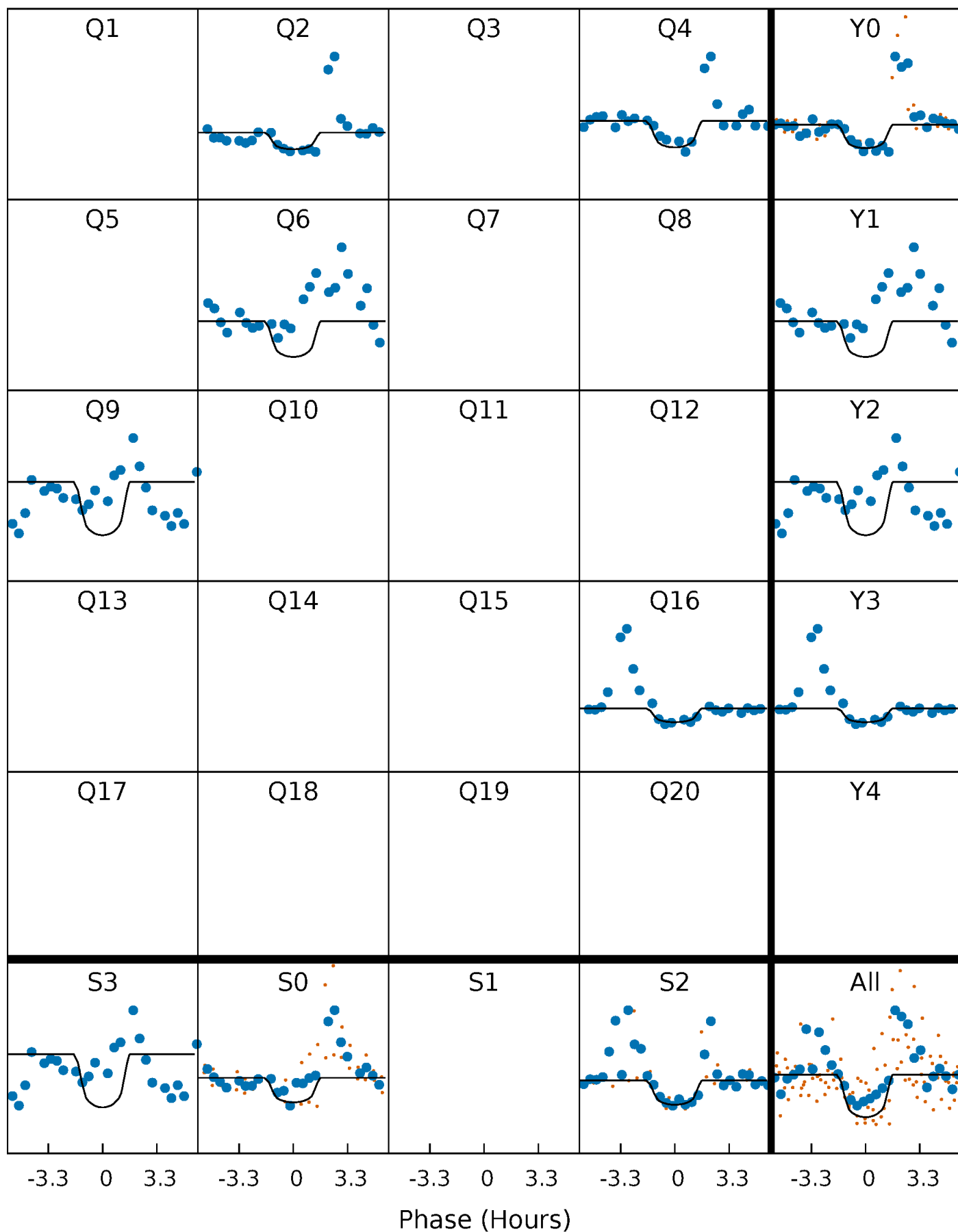
PDC Quarter-Phased Transit Curves

TCE 010815729-04 P=225.698771 Days $T_0=177.183150$ (BKJD)



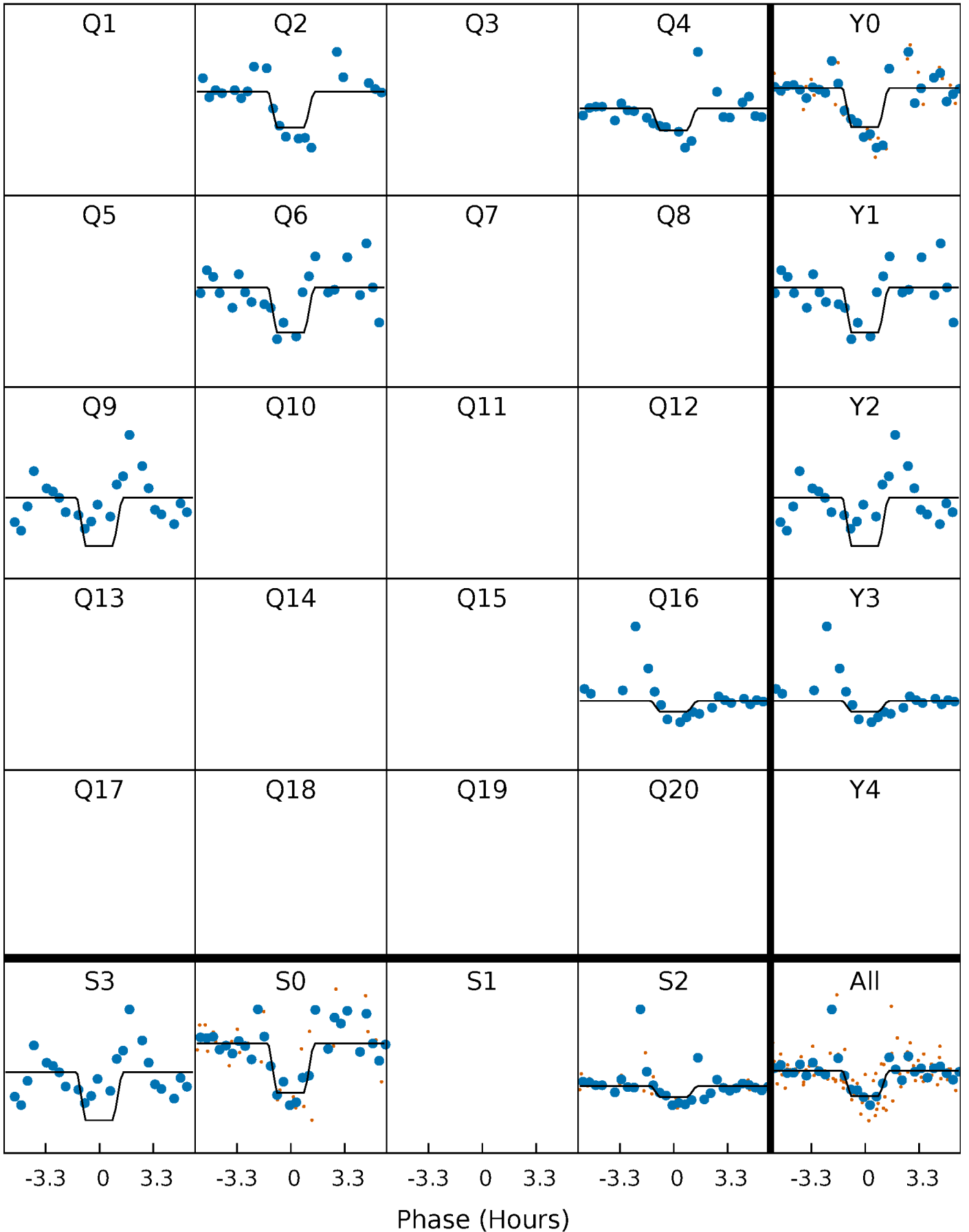
DV Quarter-Phased Transit Curves

TCE 010815729-04 P=225.698771 Days $T_0=177.183150$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

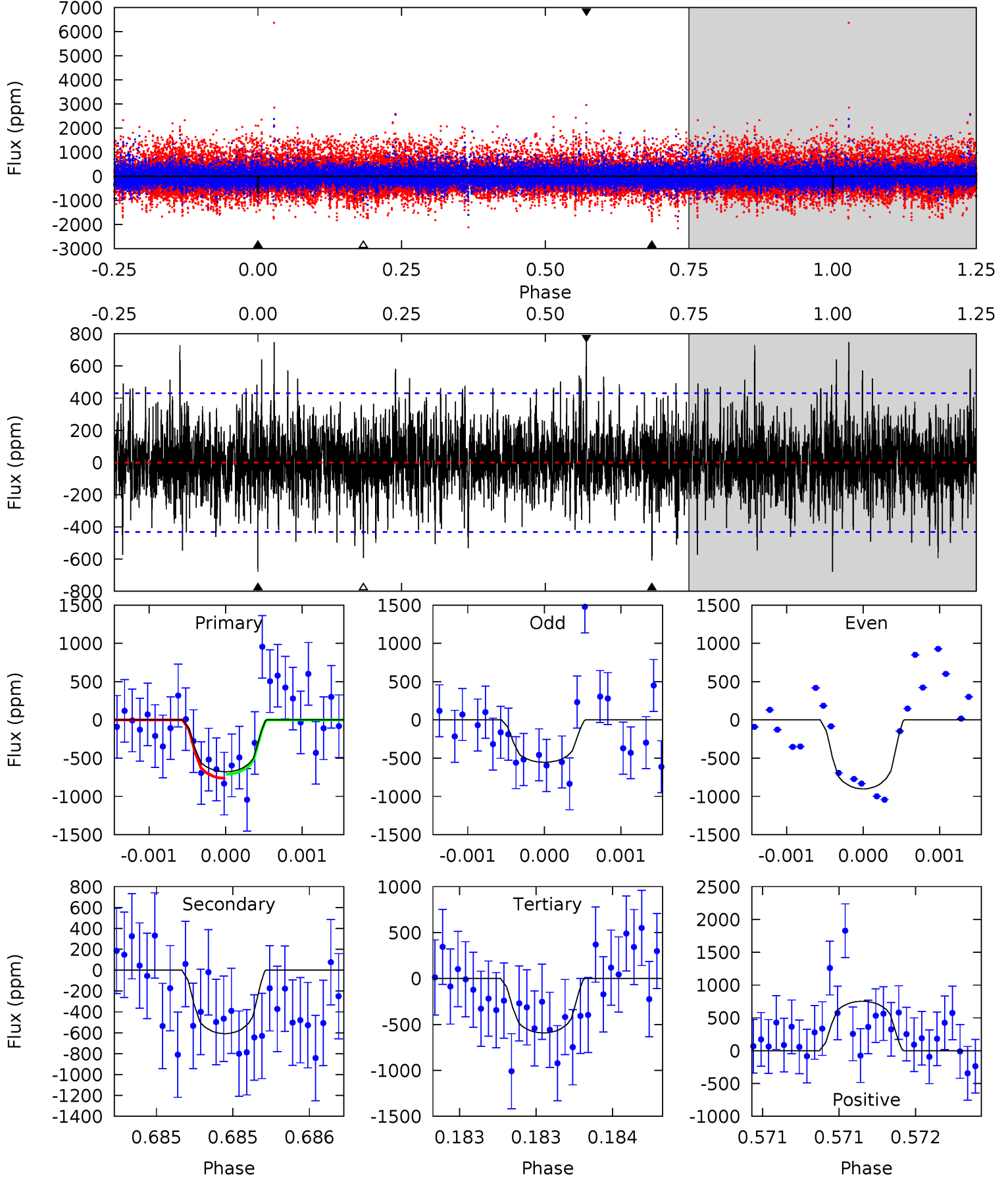
TCE 010815729-04 P=225.692439 Days $T_0=177.190147$ (BKJD)



DV Model-Shift Uniqueness Test

010815729-04, P = 225.698771 Days, E = 177.183150 Days

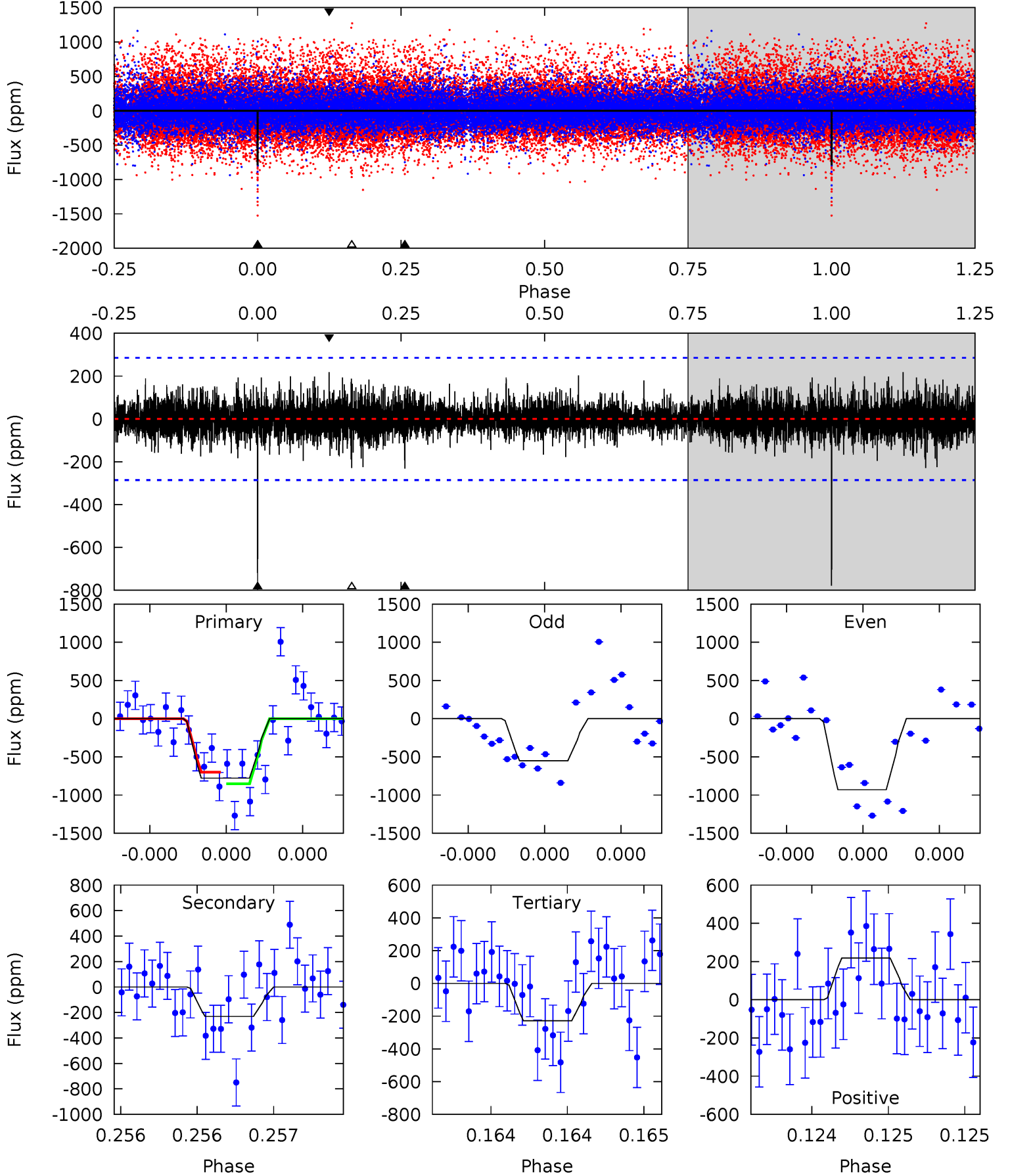
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.73	7.84	7.63	9.71	5.55	3.44	1.99	1.10	-0.98	0.20	-1.87	1.91	0.71	0.53	0.35



Alt Model-Shift Uniqueness Test

010815729-04, P = 225.692439 Days, E = 177.190147 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	4.51	4.46	4.28	5.58	3.49	1.00	10.8	10.9	0.05	0.24	3.46	0.79	0.22	1.47



Stellar Parameters For KIC 010815729

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5221^{+174}_{-142}	$3.875^{+0.676}_{-0.364}$	$-0.260^{+0.350}_{-0.250}$	$1.800^{+1.101}_{-1.101}$	$0.886^{+0.197}_{-0.131}$	$0.214^{+2.605}_{-0.148}$
	+3%/-3%	+17%/-9%	+135%/-96%	+61%/-61%	+22%/-15%	+1216%/-69%
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 010815729-04 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-609 ± 78	$10.91^{+13.69}_{-7.58}$	518^{+83}_{-93}	3723^{+2171}_{-699}	1354^{+12847}_{-1071}
Alt.	-231 ± 51	$10.63^{+14.19}_{-7.41}$	520^{+83}_{-82}	3226^{+1573}_{-581}	534^{+6009}_{-442}

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 $A_{obs} \gg 1.0$

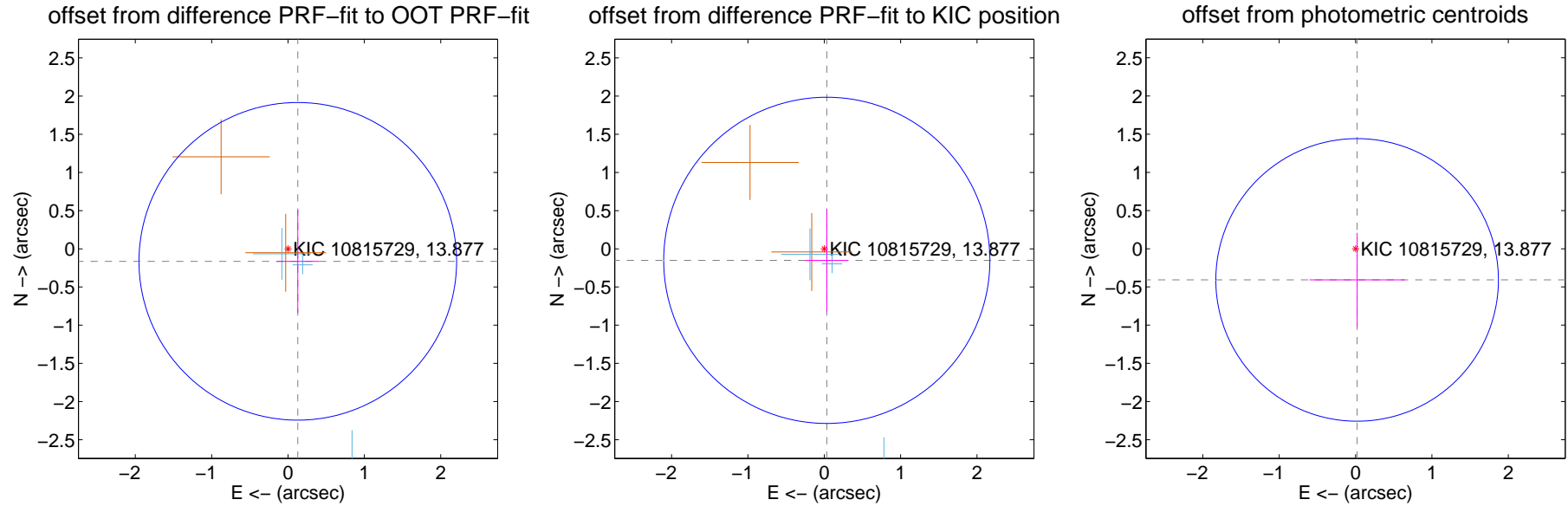
DV Centroid Data

Supplemental centroid analysis for 010815729-04. Kepler magnitude: 13.88. Transit SNR 7.17

There are 3 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.208 ± 0.693	0.30	-0.128 ± 0.280	-0.164 ± 0.675
PRF-fit source offset from KIC position	0.154 ± 0.712	0.22	-0.033 ± 0.284	-0.151 ± 0.672
photometric centroid source offset	0.41 ± 0.62	0.66	-0.02 ± 0.62	-0.41 ± 0.62



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.

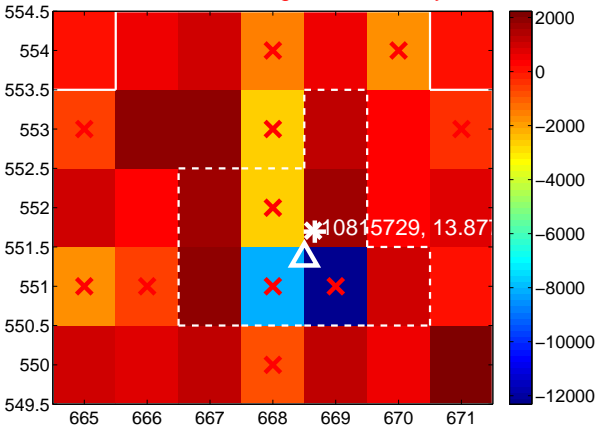
Q1 no difference image



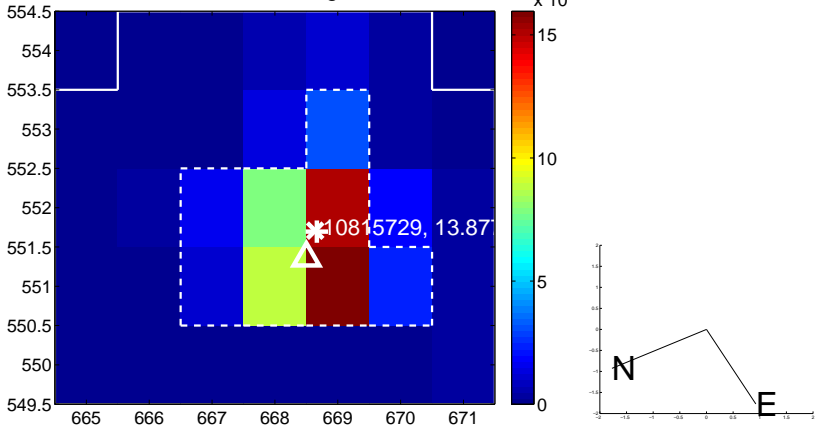
Q1 no OOT image



Q2 difference image. Poor Quality



Q2 OOT image



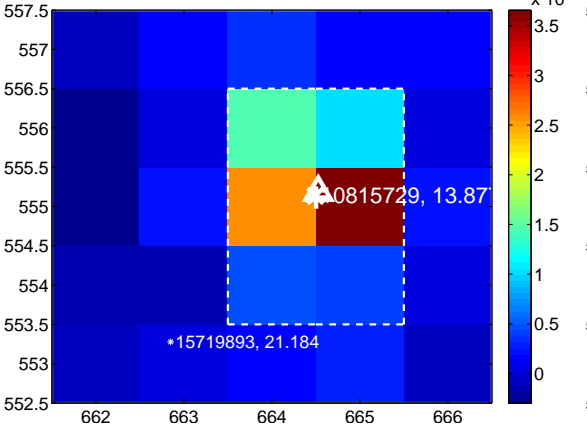
Q3 no difference image



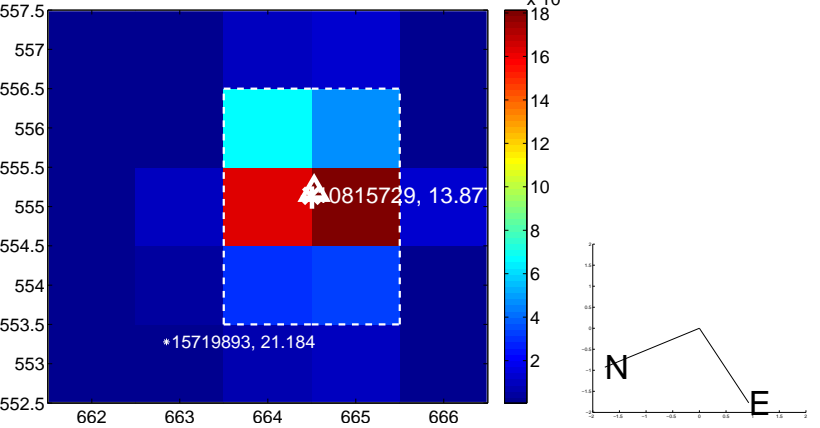
Q3 no OOT image



Q4 difference image



Q4 OOT image



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

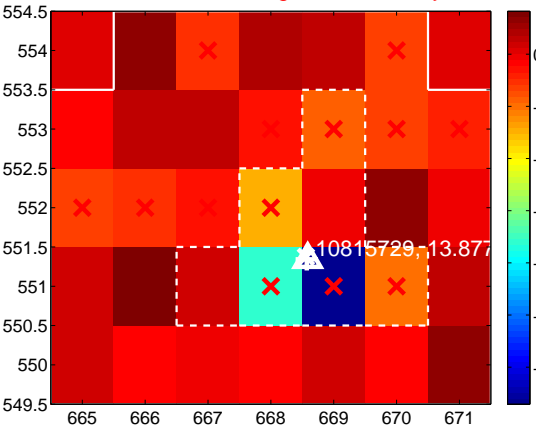
Q5 no difference image



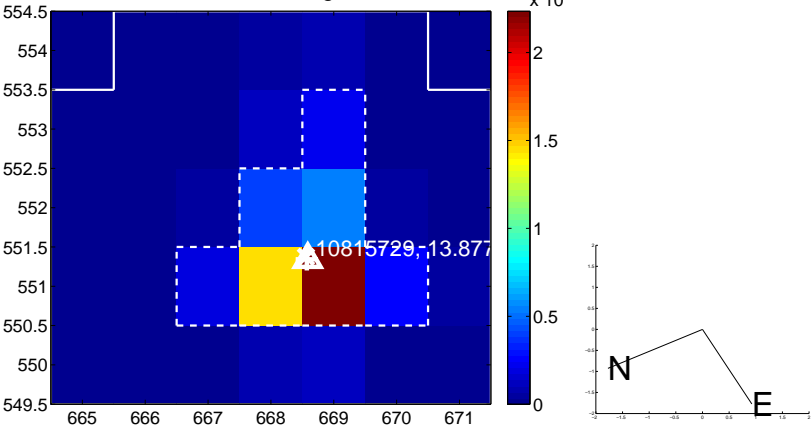
Q5 no OOT image



Q6 difference image. Poor Quality



Q6 OOT image



Q7 no difference image



Q7 no OOT image



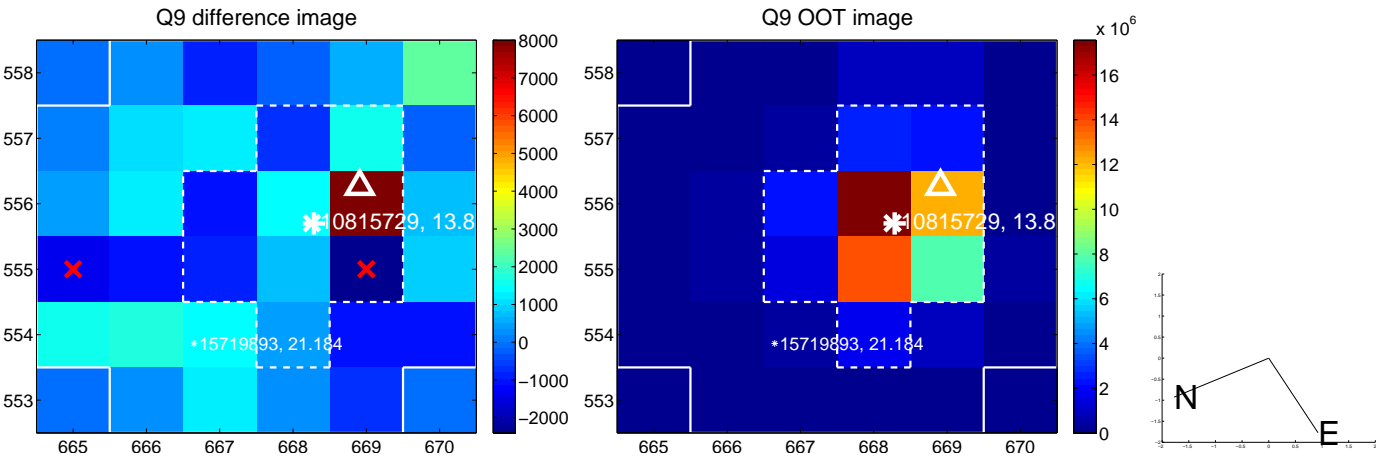
Q8 no difference image



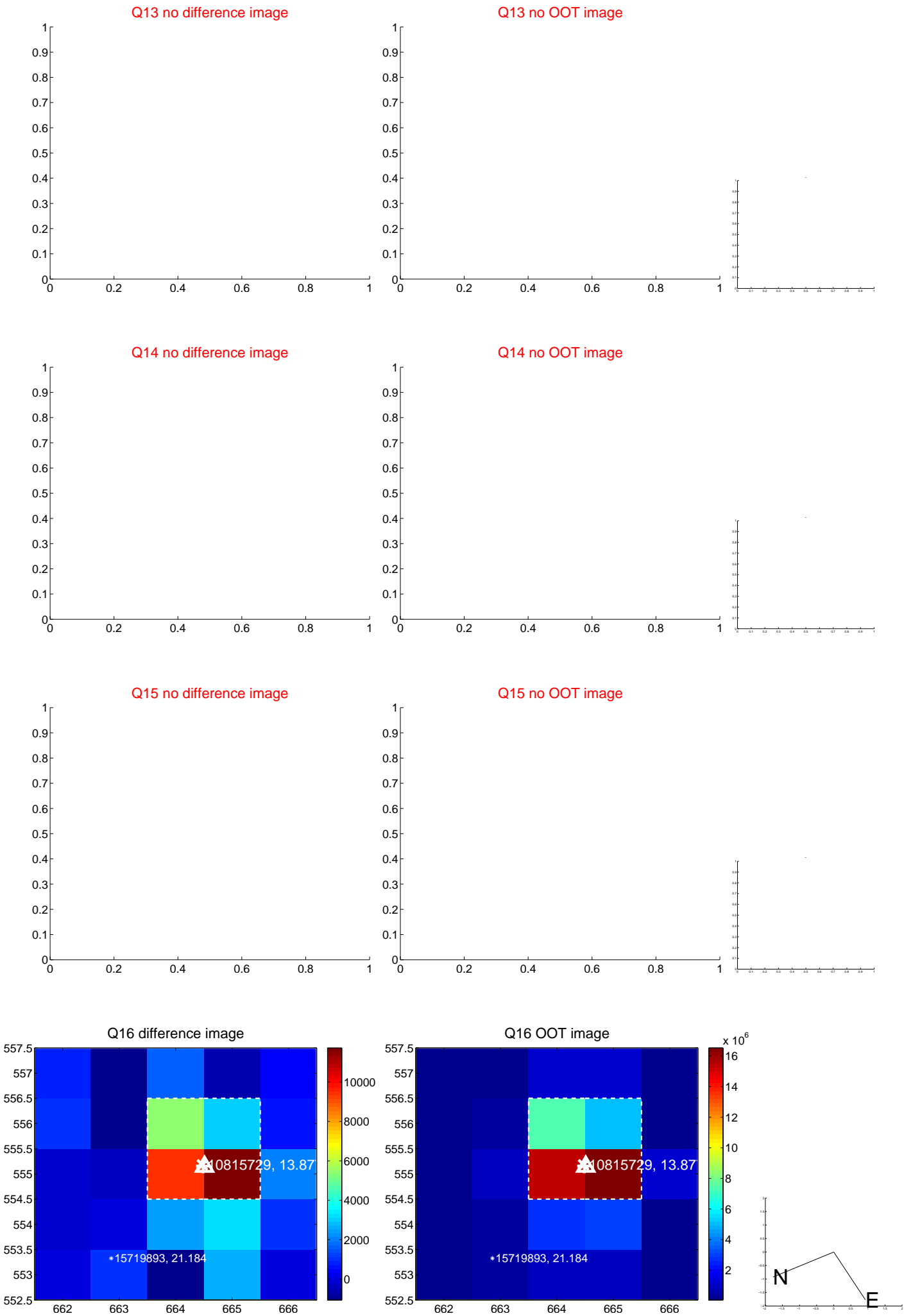
Q8 no OOT image



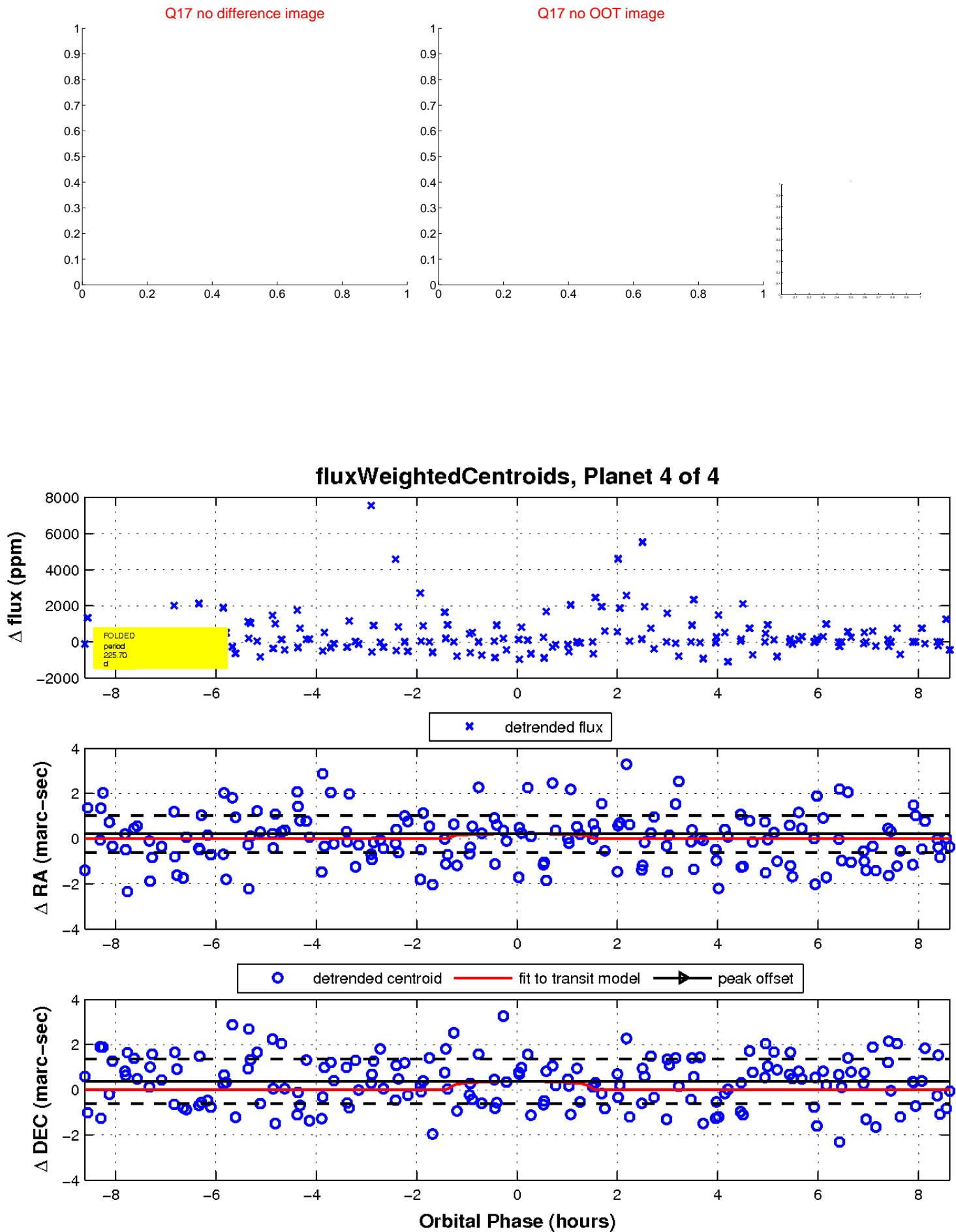
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



UKIRT Image

Declination

