

KIC 012217907

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})
012217907-01	OBS	7516.01	43.204590	146.597999	202473.7	15.037	9013.3	6216.7	0.93	6003	43.15	17.19
012217907-02	OBS	No	43.204594	160.912558	57054.7	7.489	2094.1	1498.4	0.93	6003	23.36	17.19
012217907-03	OBS	No	301.124361	304.213965	350.2	8.996	24.7	4.4	0.93	6003	1.84	1.29
012217907-04	OBS	No	441.722769	184.372953	964.5	17.531	11.5	12.3	0.93	6003	3.39	0.78

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012217907-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—MOD_ODDEVEN_DV—MOD_ODDEVEN_ALT—HAS_SEC_TCE
012217907-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
012217907-03	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
012217907-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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 012217907-01

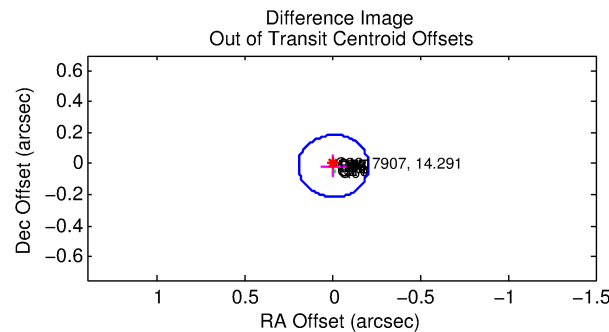
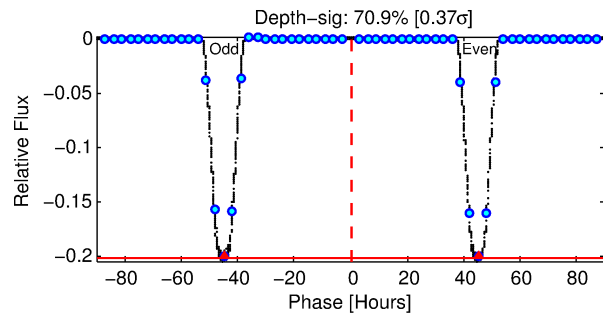
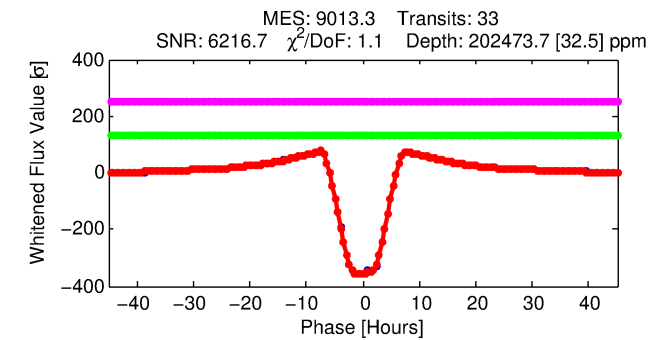
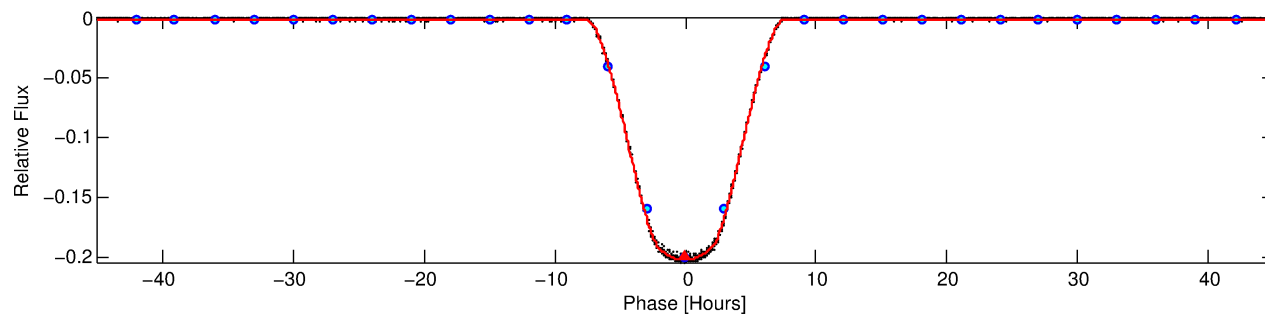
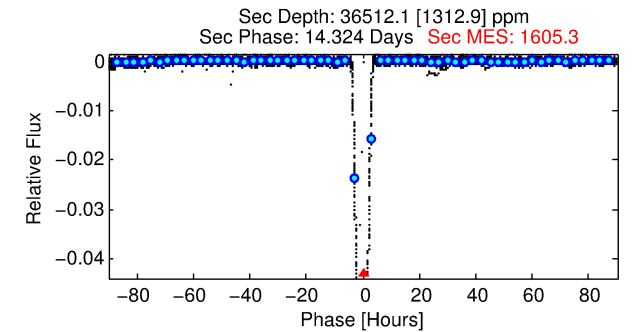
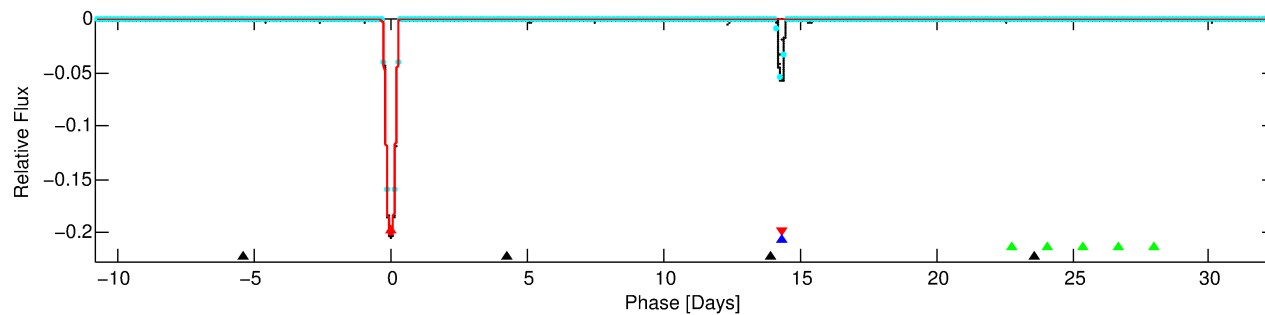
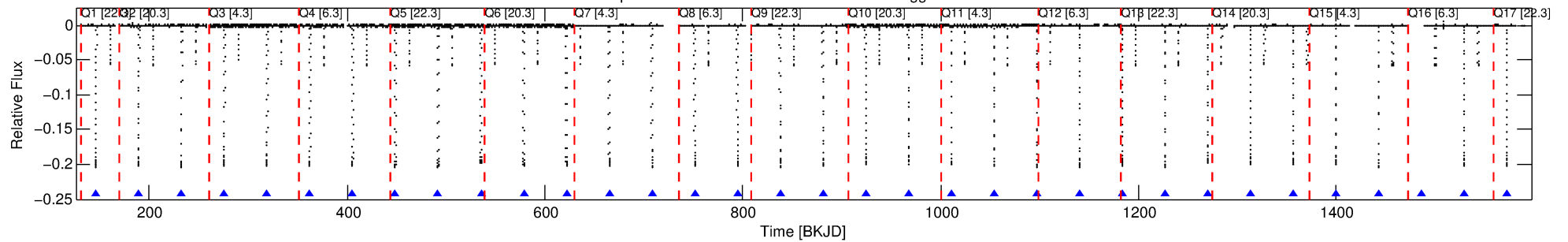
No Significant Match Found

DV One-Page Summary

KIC: 12217907 Candidate: 1 of 4 Period: 43.205 d

KOI: K07516.01 Corr: 0.999

Kp: 14.29 R*: 0.93 Rs Teff: 6003.0 K Logg: 4.51 Fe/H: -0.140



DV Fit Results:

Period = 43.20459 [0.00000] d
Epoch = 146.5980 [0.0000] BKJD
Rp/R* = 0.4243 [0.0001]
a/R* = 30.02 [0.01]
b = 0.40 [0.00]
Seff = 17.19 [7.60]
Teff = 519 [57] K
Rp = 43.15 [14.21] Re
a = 0.2425 [0.0682] AU
Ag = 634.18 [263.84] [2.40σ]
Teffp = 4028 [159] K [20.81σ]

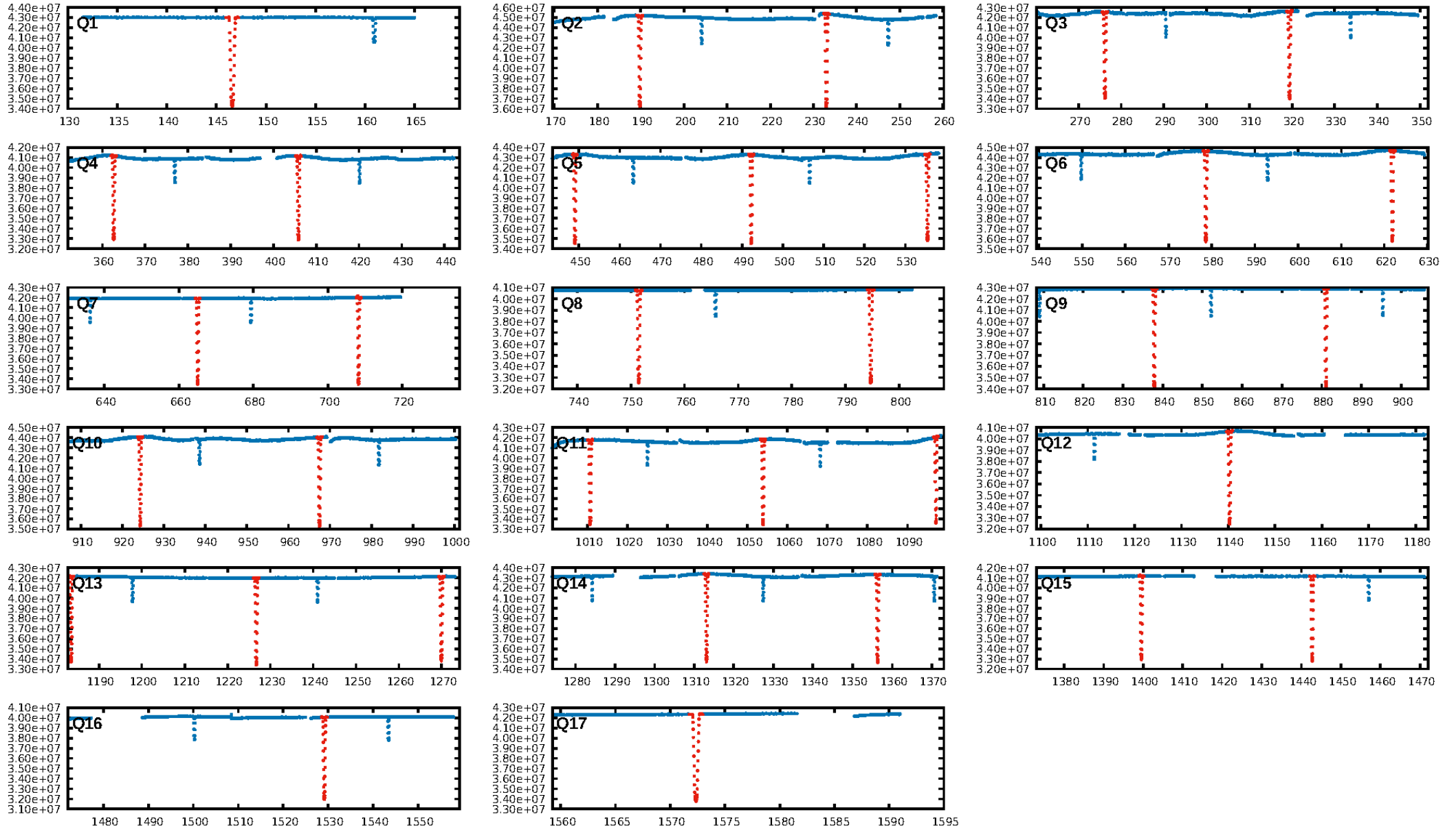
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGoF-sig: 0.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [31/31]
GhostDiagnostic-chr: 3.69
Centroid-sig: 0.0%
Centroid-so: 0.645 arcsec [602.18σ]
OotOffset-rm: 0.015 arcsec [0.23σ]
KicOffset-rm: 0.072 arcsec [1.07σ]
OotOffset-st: 4/4/4/4 [16]
KicOffset-st: 4/4/4/4 [16]
DiffImageQuality-fgm: 1.00 [16/16]
DiffImageOverlap-fno: 1.00 [16/16]

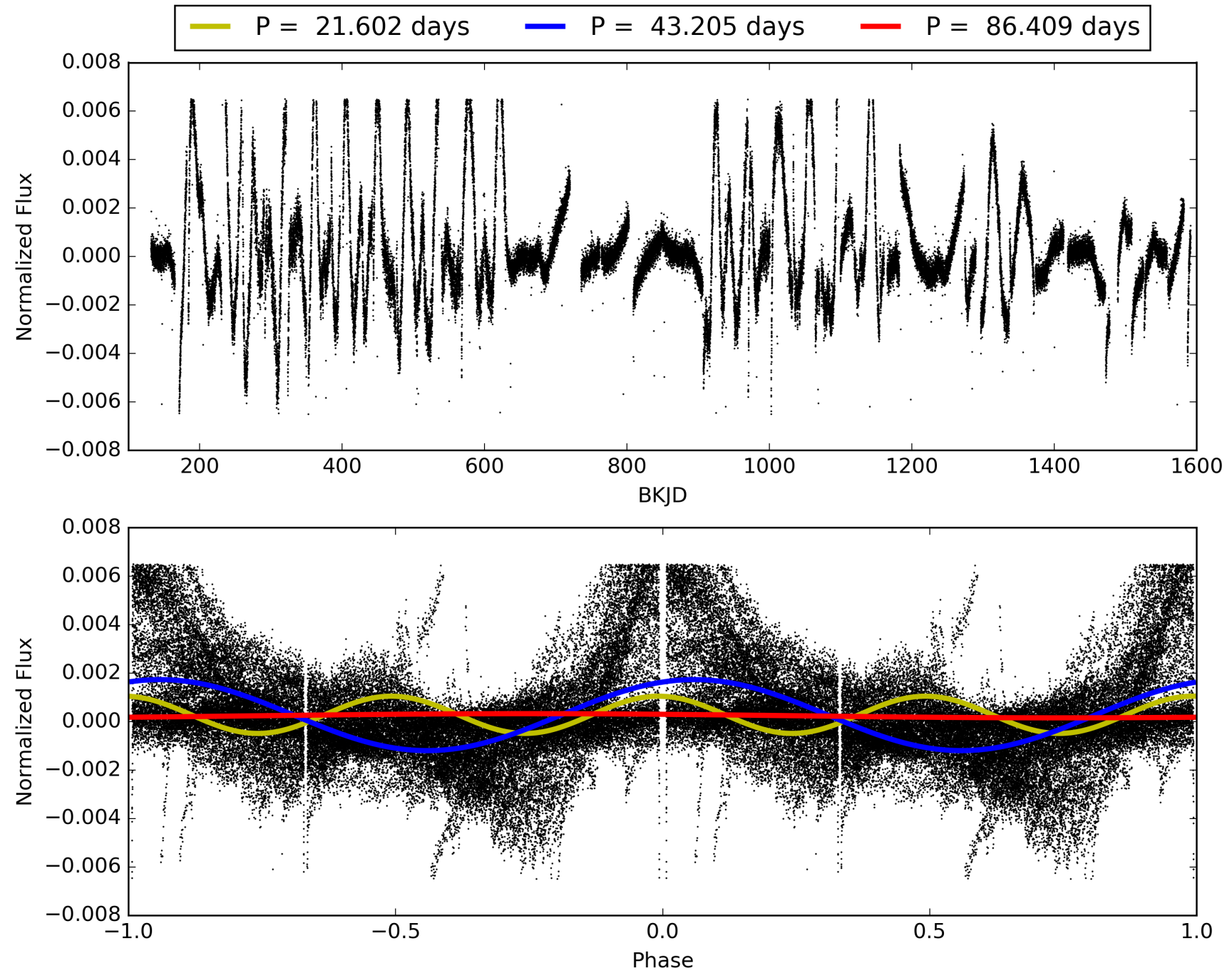
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 02:35:55 Z

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

TCE 012217907-01, PDC Light Curves

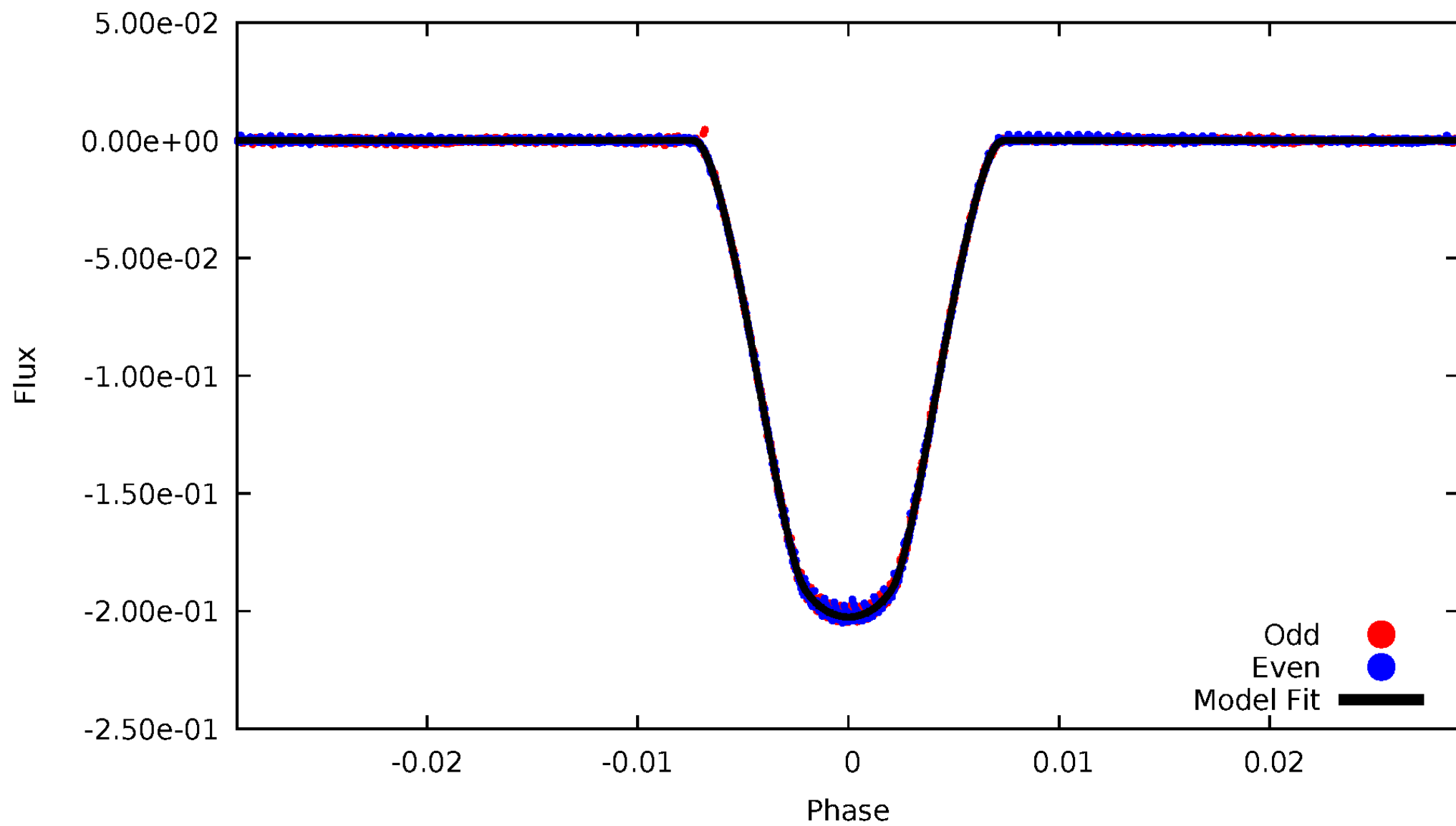


TCE 012217907-01



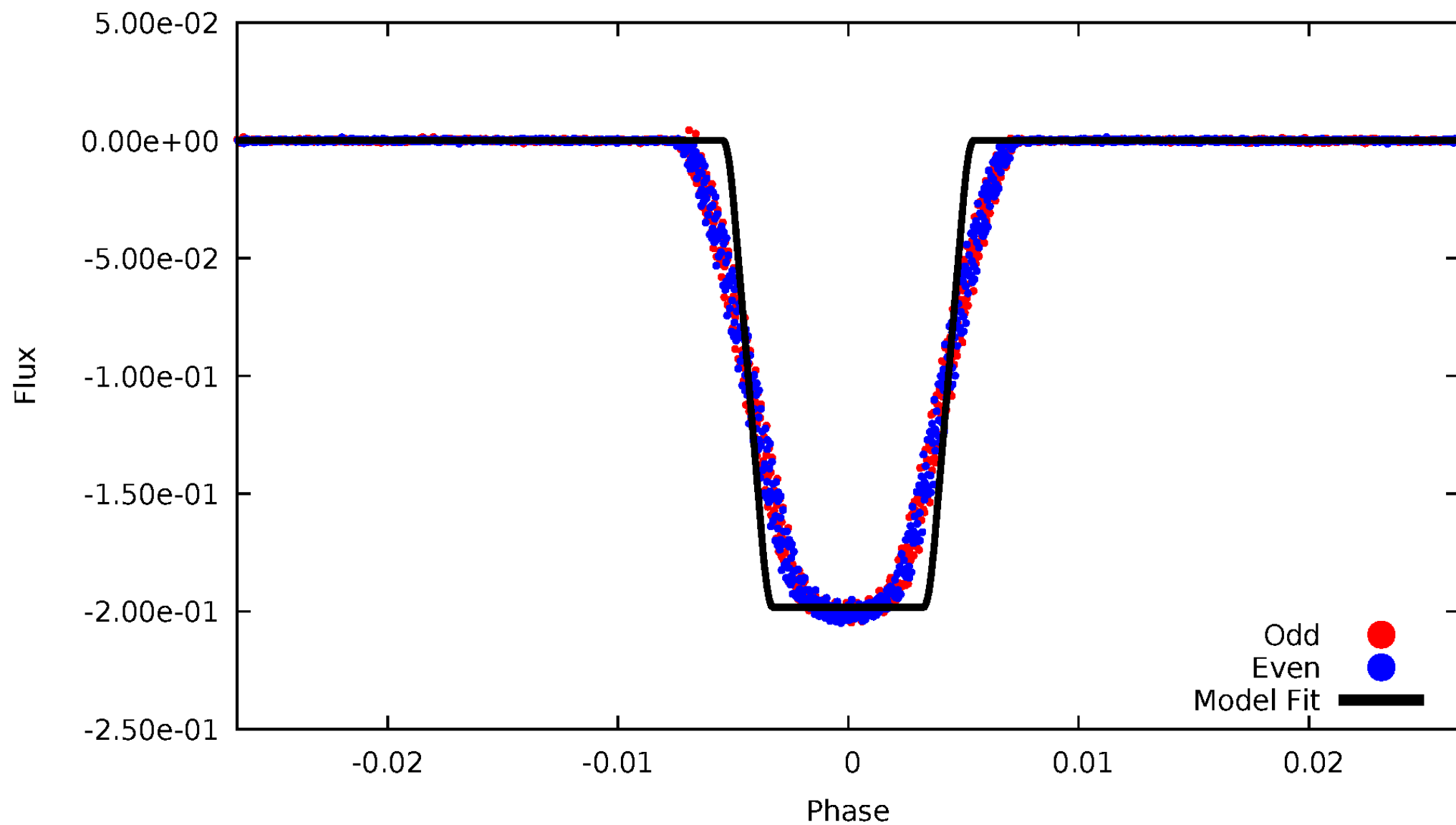
DV Odd/Even

TCE 012217907-01



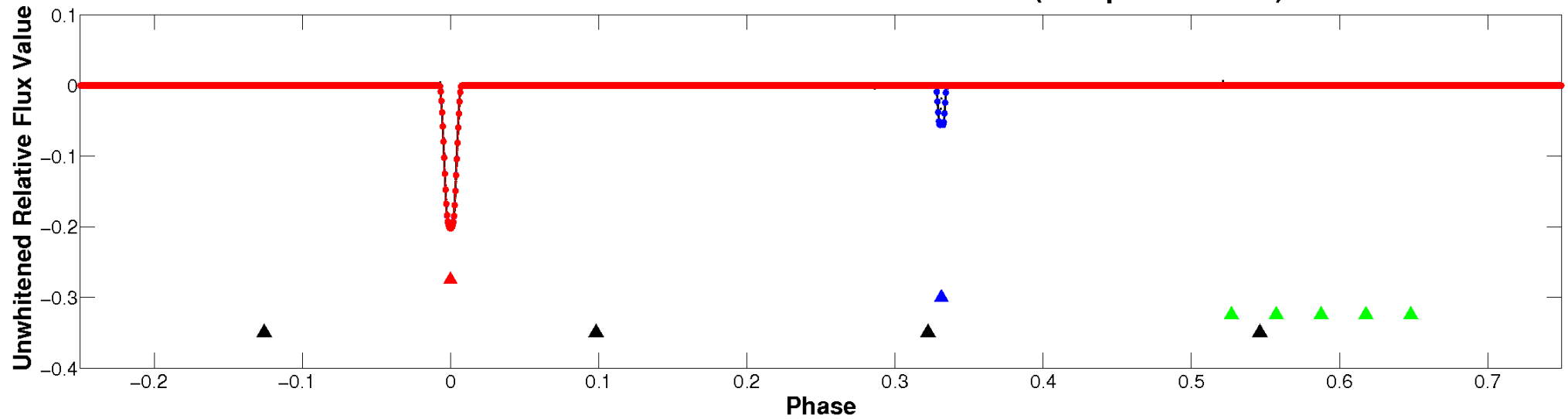
ALT Odd/Even

TCE 012217907-01

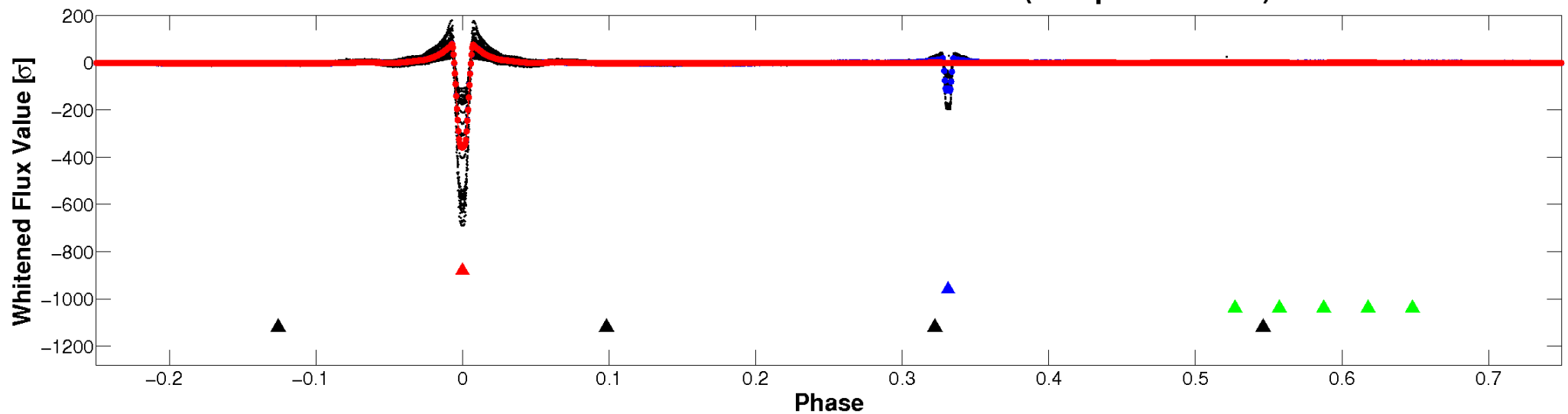


Non-Whitened Vs. Whitened Light Curve

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

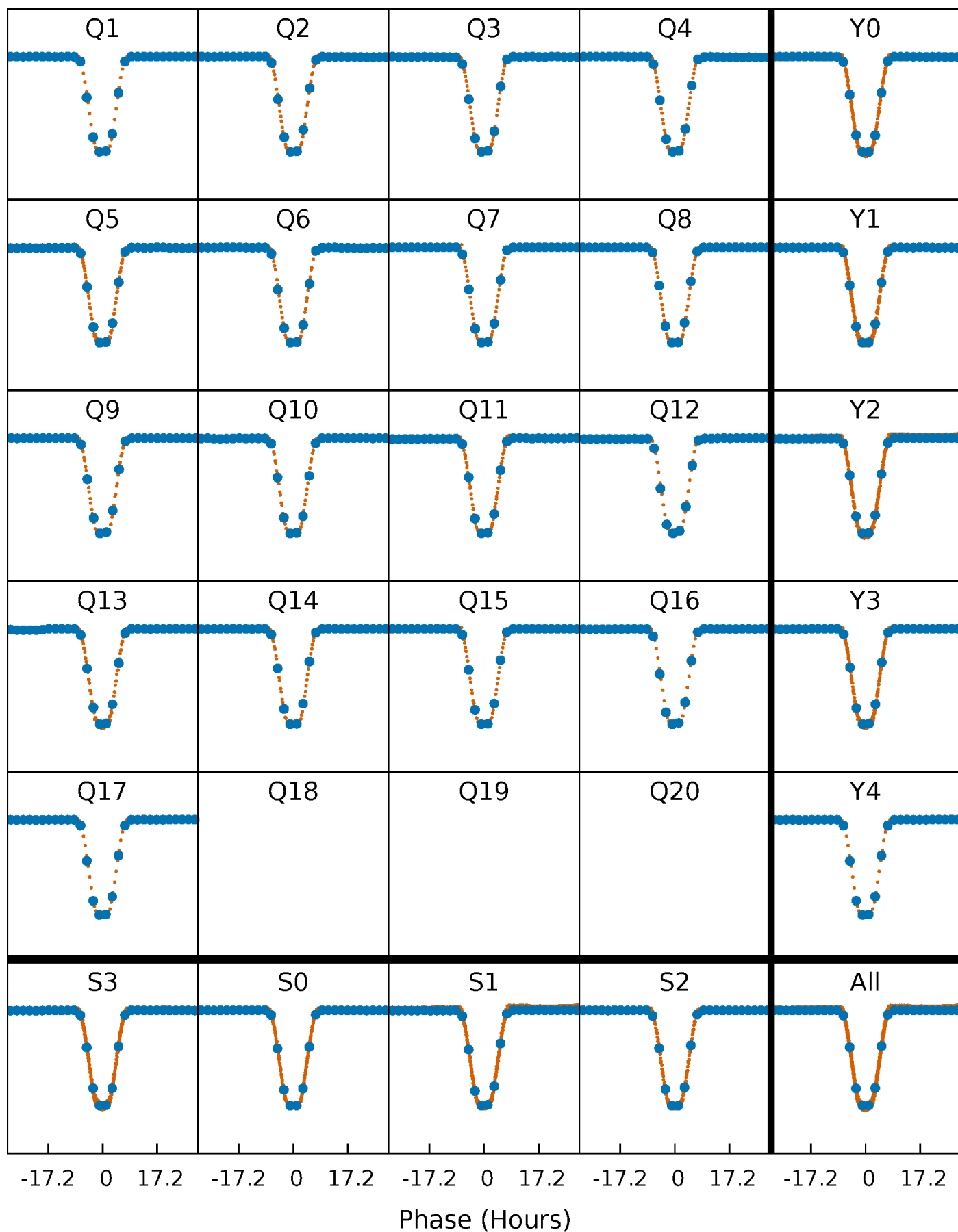


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



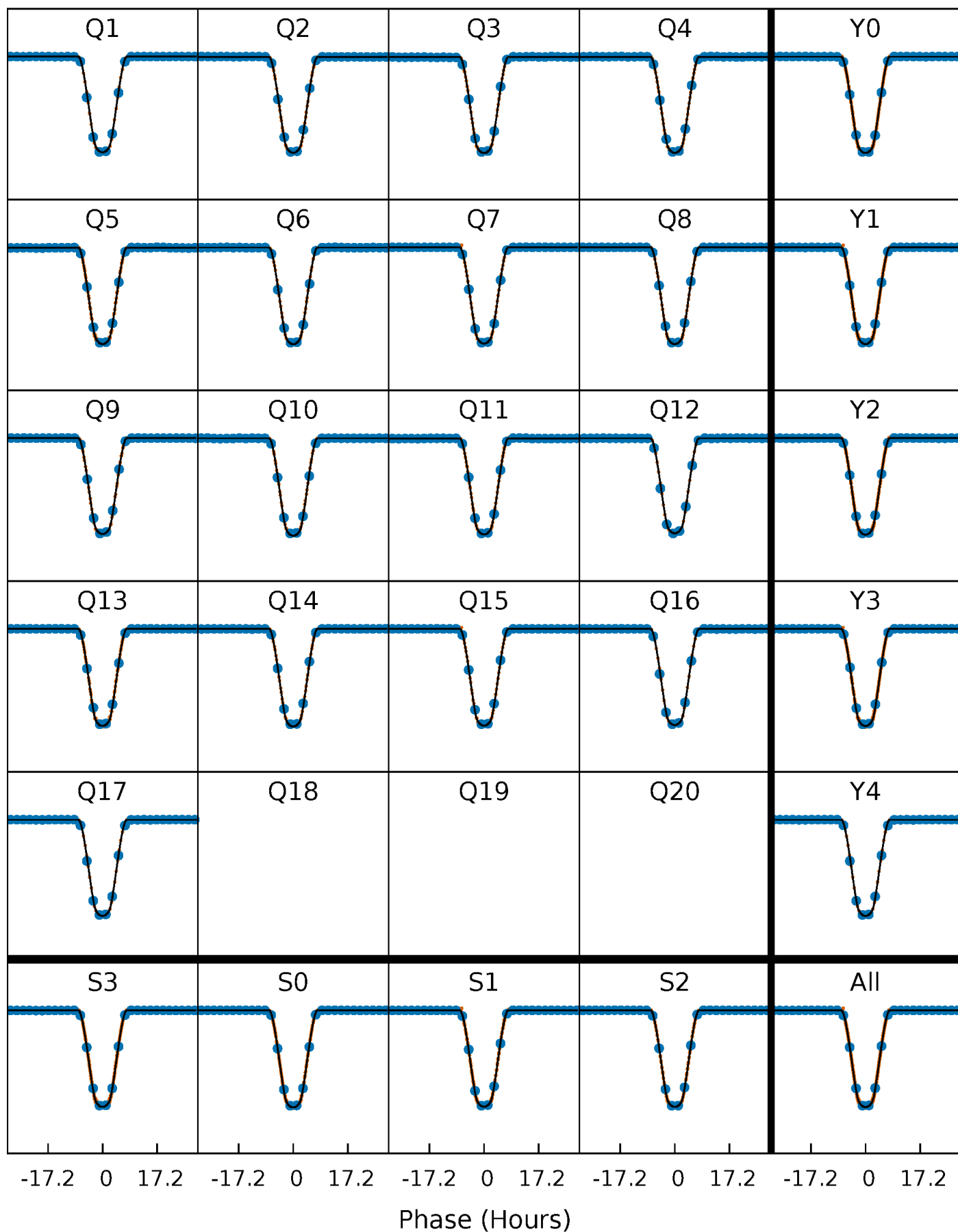
PDC Quarter-Phased Transit Curves

TCE 012217907-01 P= 43.204590 Days $T_0=146.597999$ (BKJD)



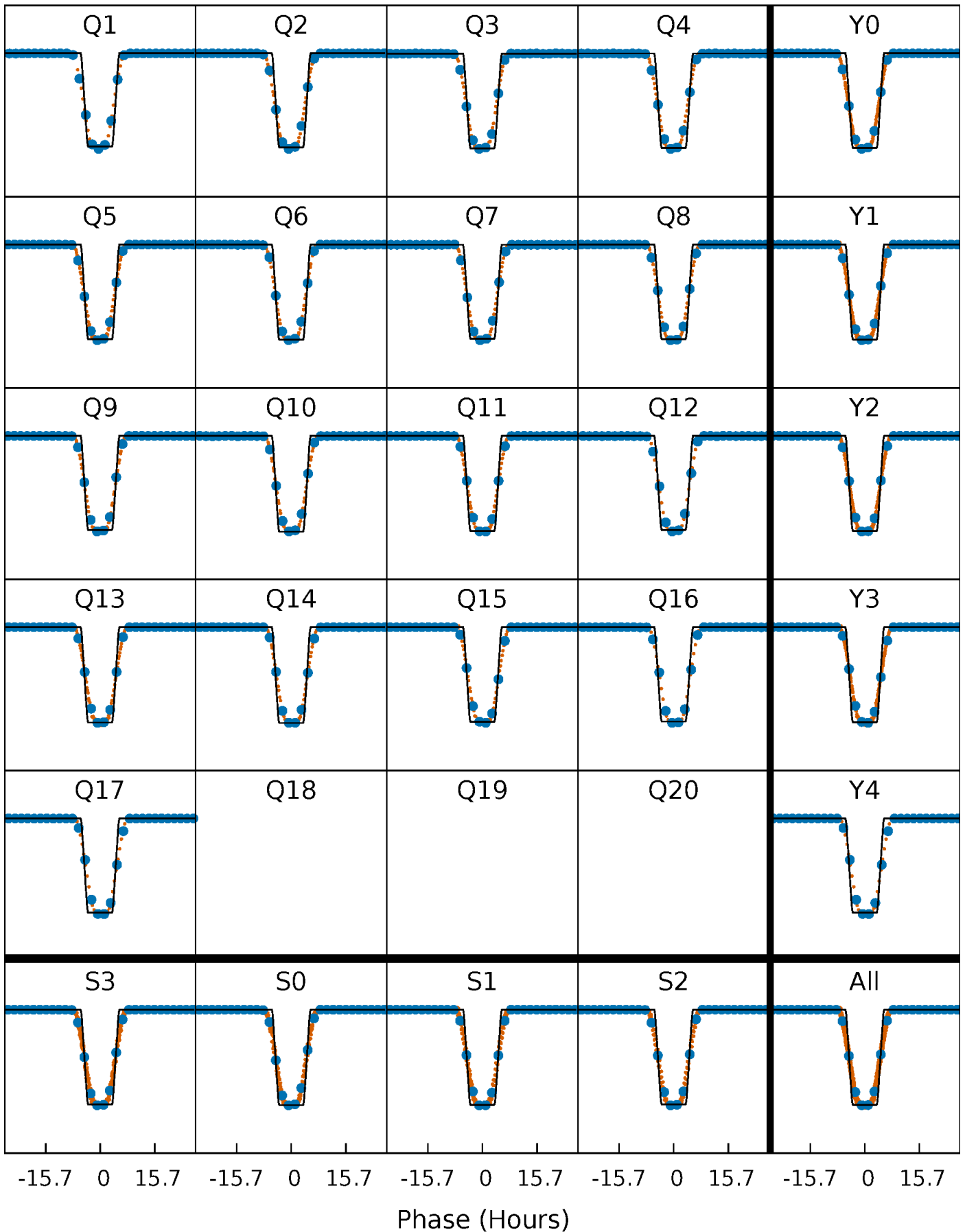
DV Quarter-Phased Transit Curves

TCE 012217907-01 P= 43.204590 Days $T_0=146.597999$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

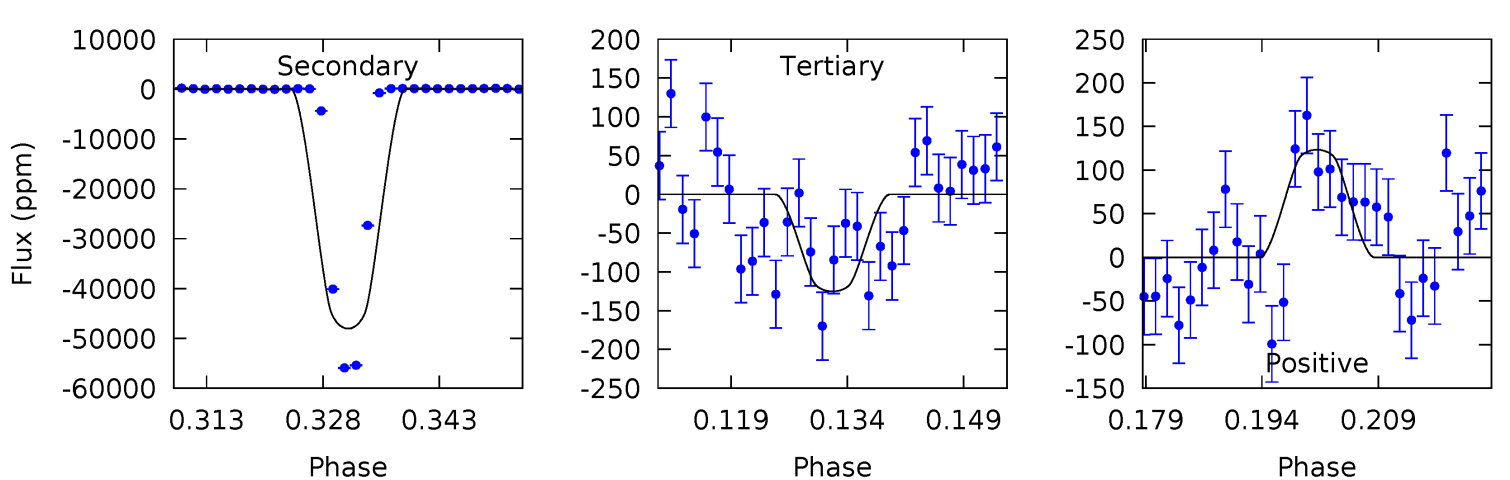
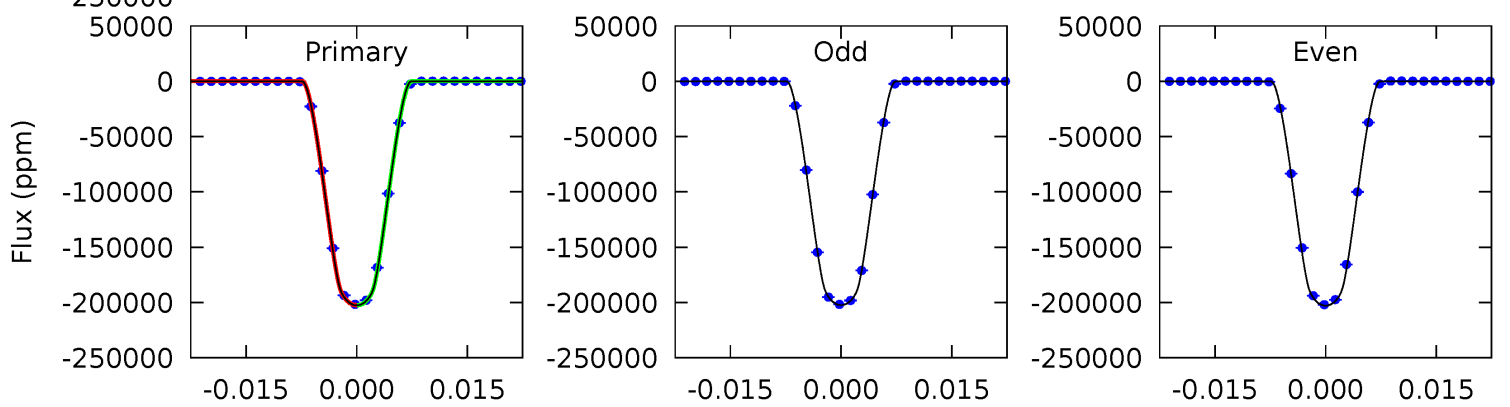
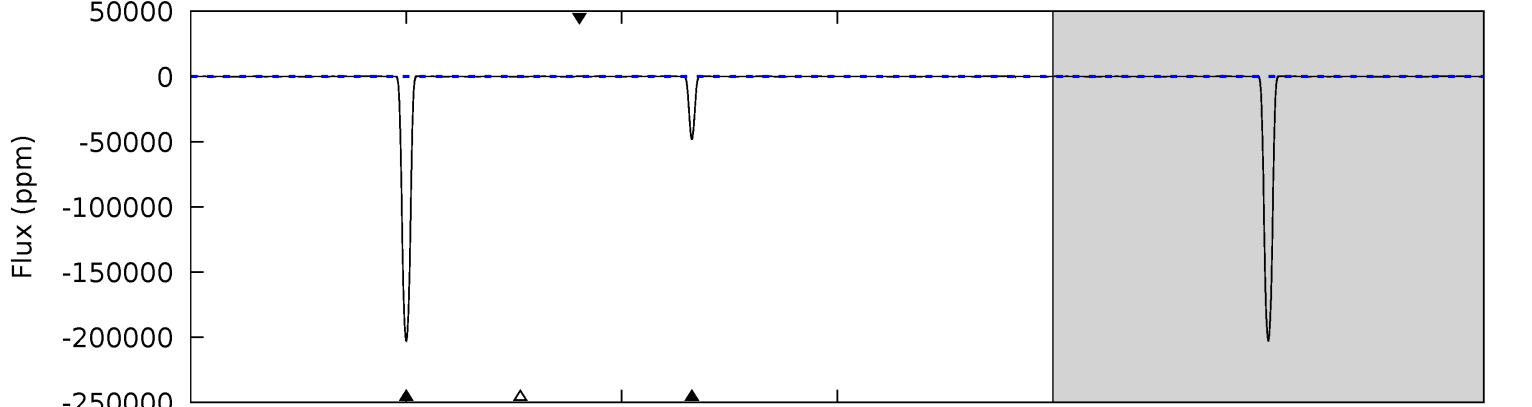
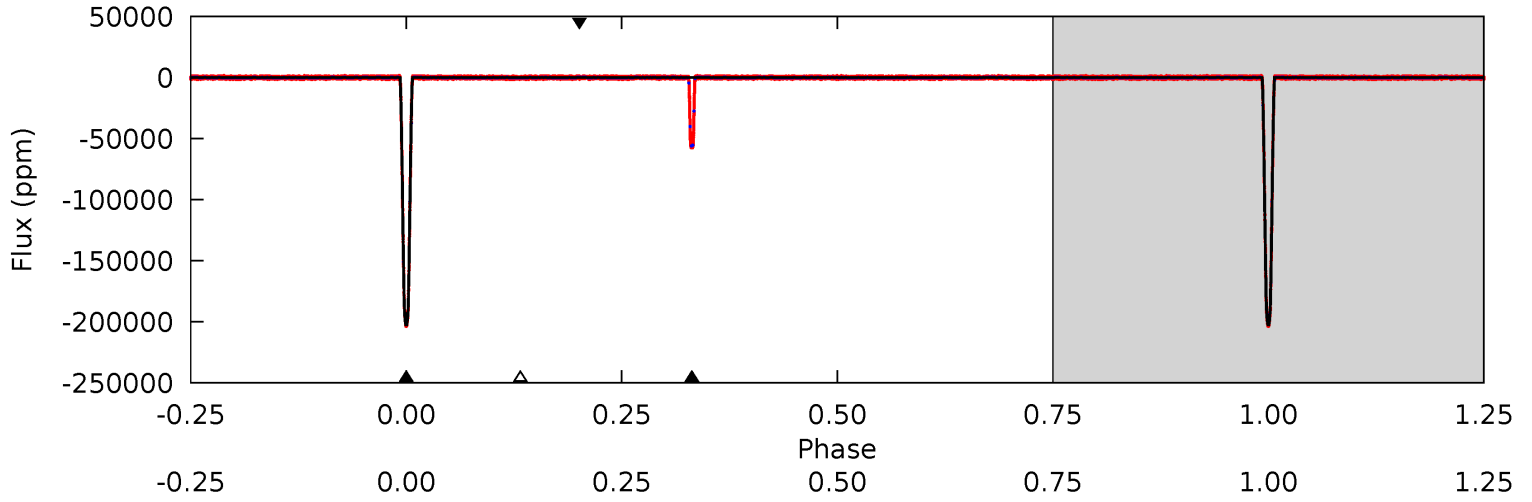
TCE 012217907-01 P= 43.203629 Days $T_0=146.614941$ (BKJD)



DV Model-Shift Uniqueness Test

012217907-01, P = 43.204590 Days, E = 103.393409 Days

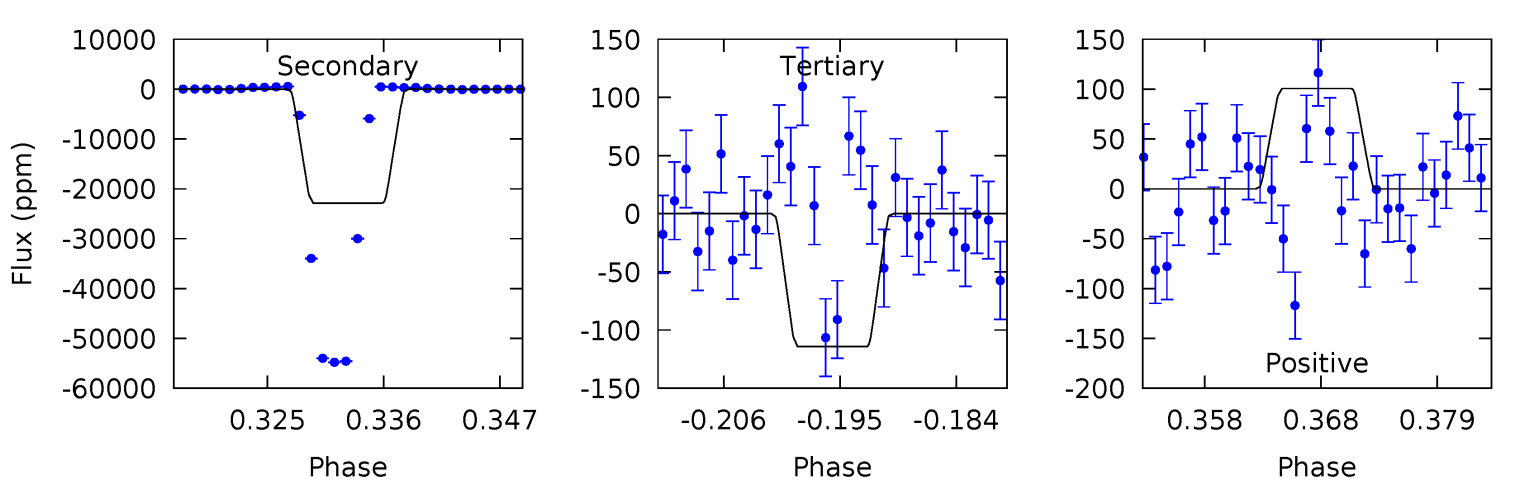
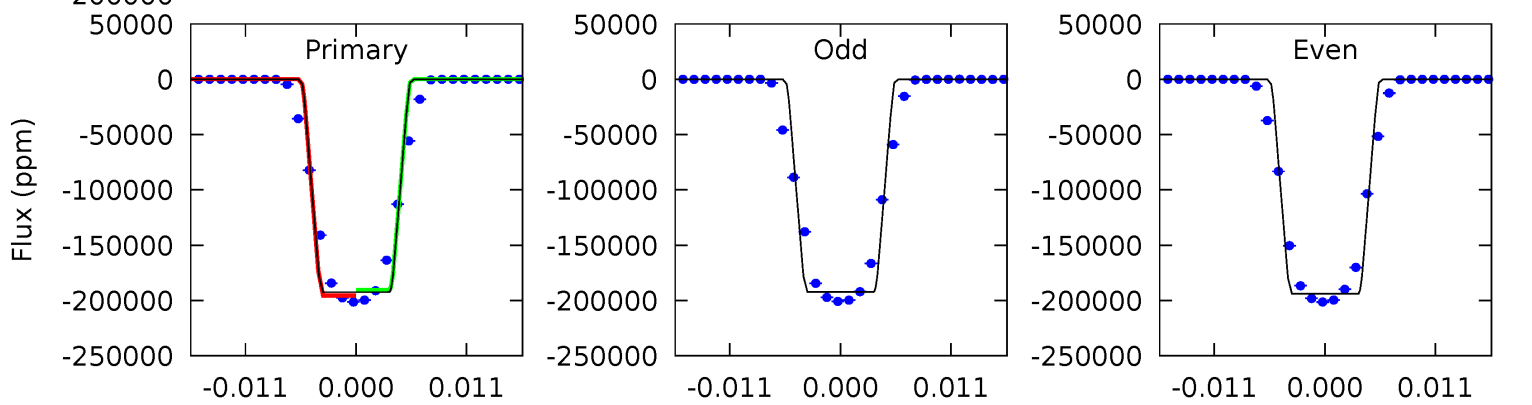
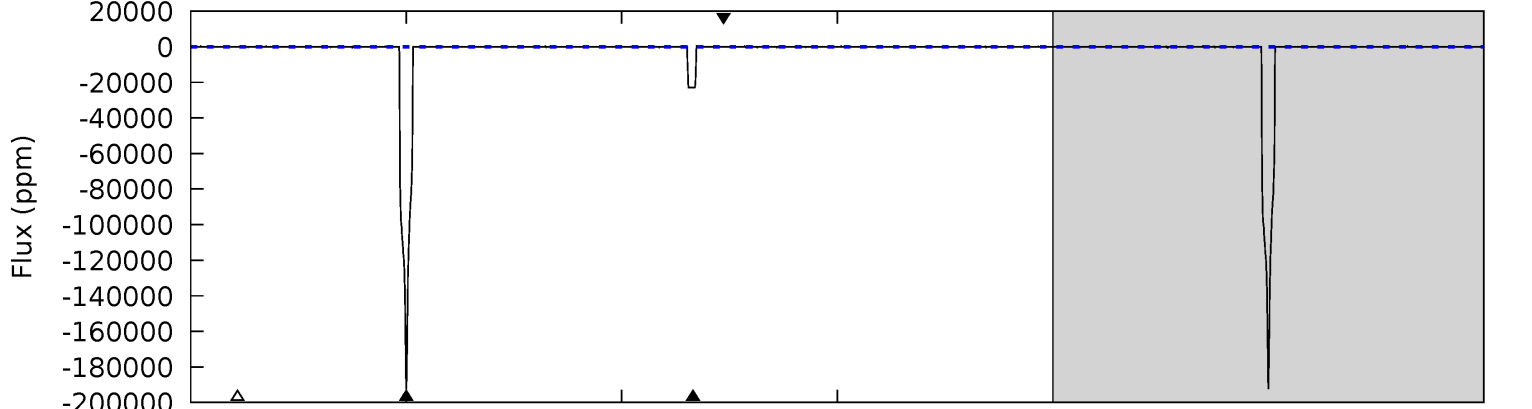
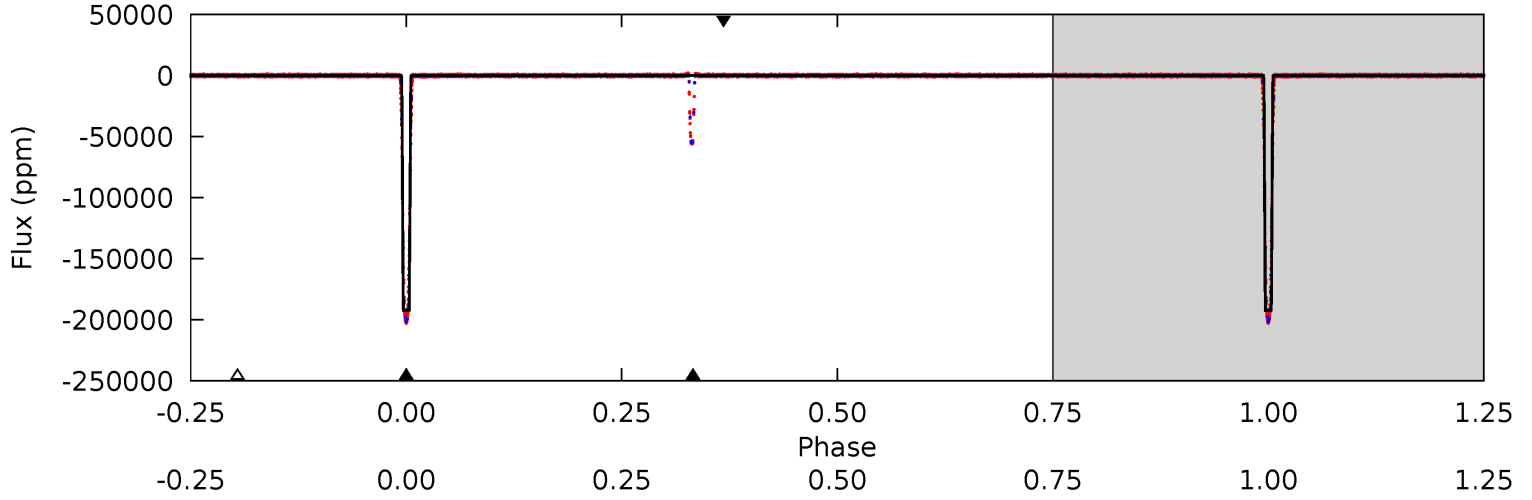
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13739	3258	8.49	8.37	4.95	2.43	3.46	13730	13730	3250	3250	16.6	1.00	0.00	0.24



Alt Model-Shift Uniqueness Test

012217907-01, P = 43.203629 Days, E = 103.411312 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7532	895.2	4.47	3.94	5.01	2.55	1.32	7528	7528	890.7	891.2	34.5	1.00	0.00	0



Stellar Parameters For KIC 012217907

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6003^{+188}_{-230}	$4.507^{+0.054}_{-0.229}$	$-0.140^{+0.300}_{-0.300}$	$0.932^{+0.307}_{-0.082}$	$1.019^{+0.142}_{-0.142}$	$1.772^{+0.401}_{-0.992}$
	+3%/-4%	+1%/-5%	+214%/-214%	+33%/-9%	+14%/-14%	+23%/-56%
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 012217907-01 / KOI 7516.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-48039 ± 15	$44.04^{+8.02}_{-3.17}$	741^{+53}_{-39}	4544^{+109}_{-139}	815^{+122}_{-201}
Alt.	-22868 ± 26	$46.57^{+7.62}_{-3.52}$	741^{+56}_{-41}	3877^{+87}_{-111}	339^{+53}_{-79}

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 $A_{obs} \gg 1.0$

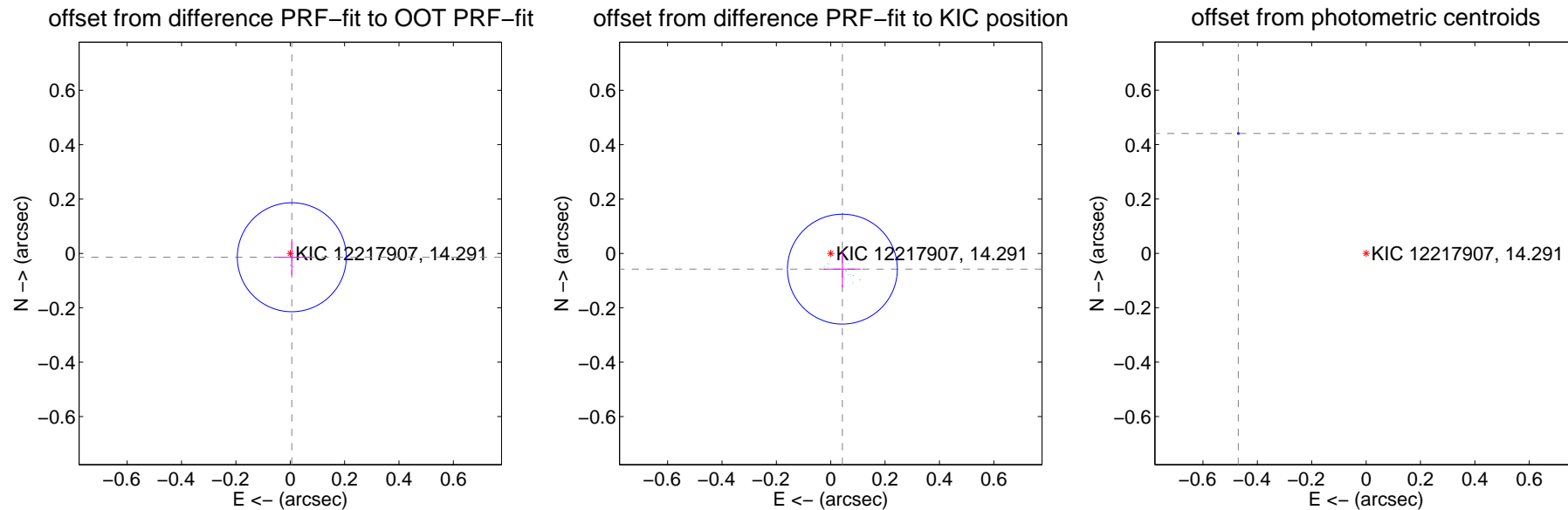
DV Centroid Data

Supplemental centroid analysis for 012217907-01. Kepler magnitude: 14.29. Transit SNR 6216.74

There are 16 quarters with good PRF difference image offsets

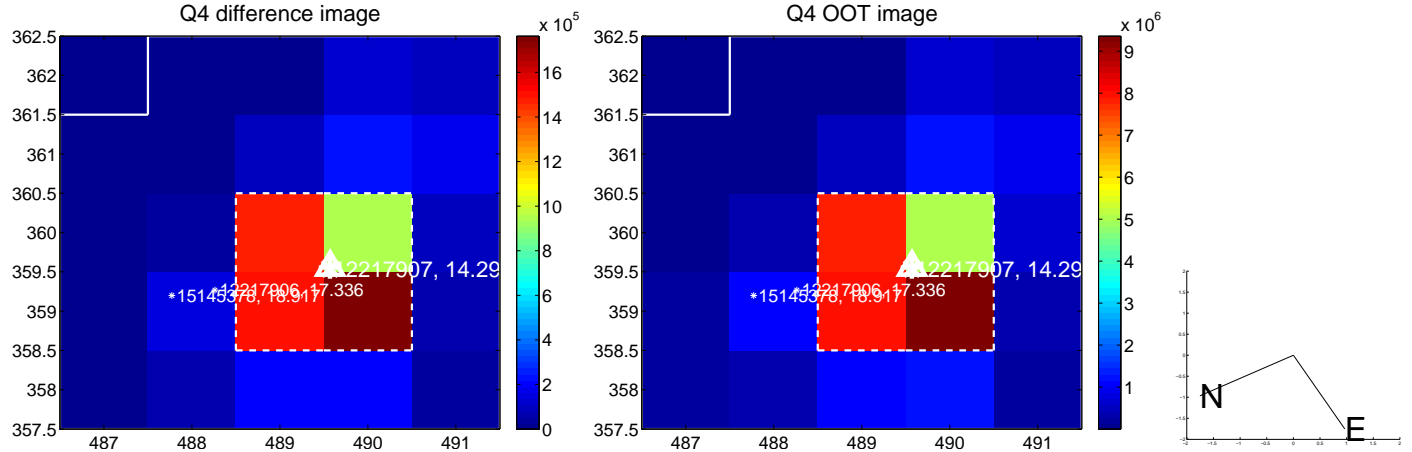
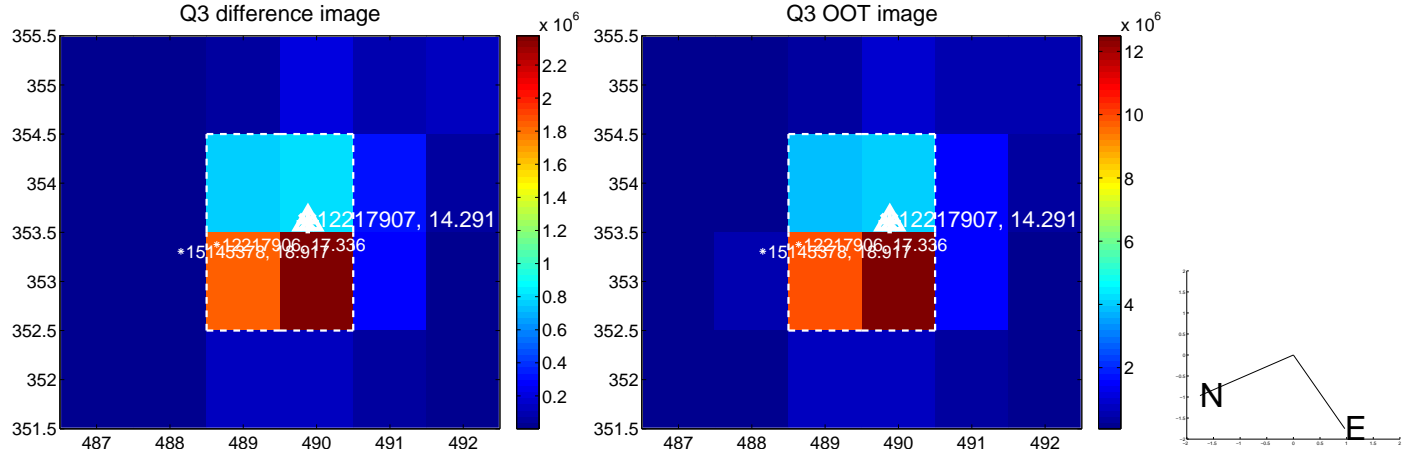
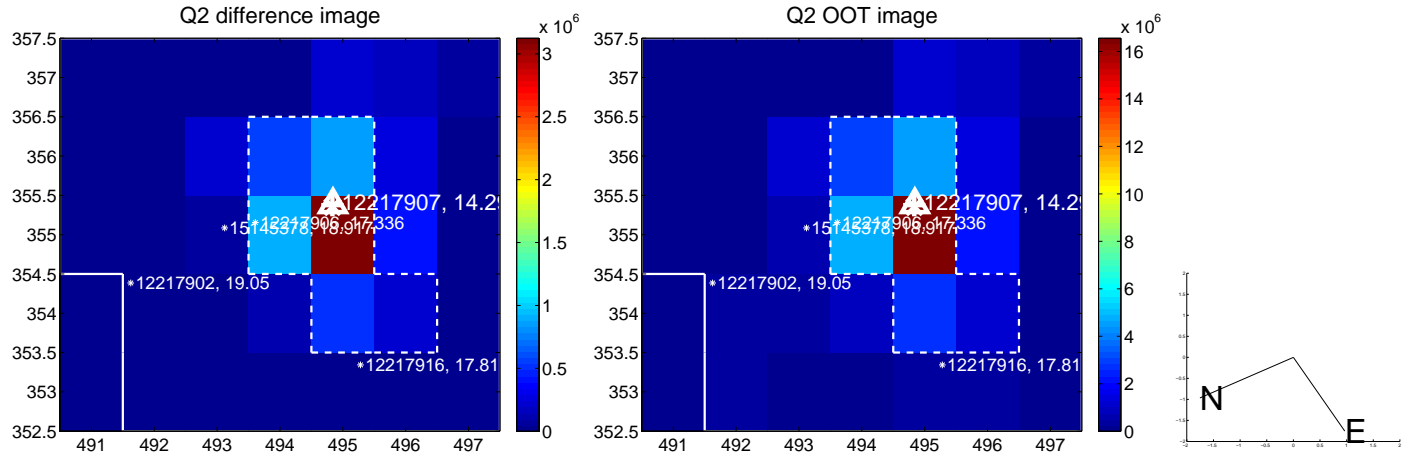
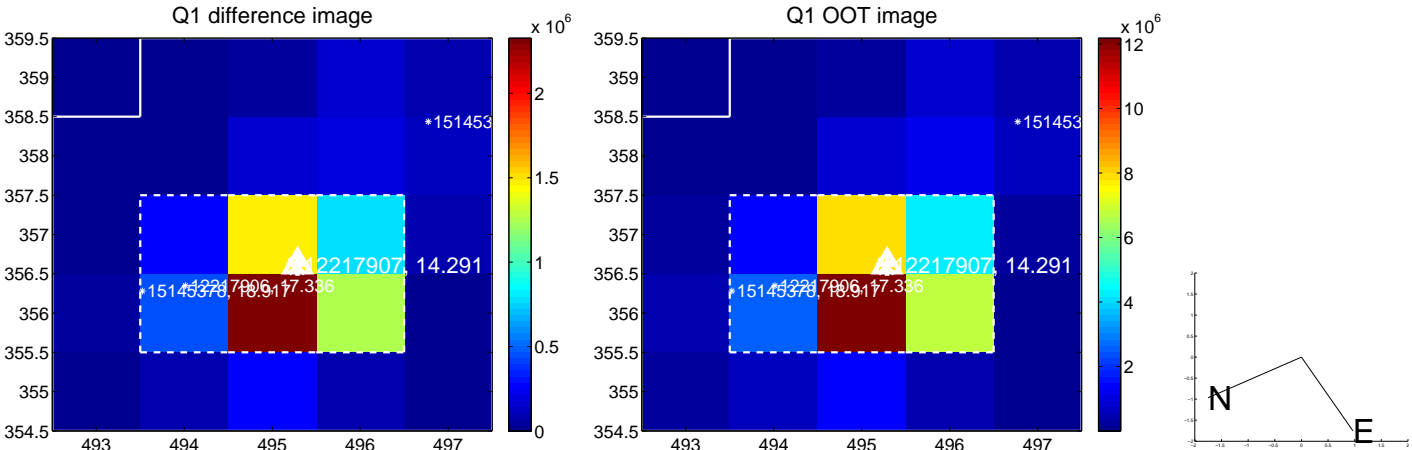
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.015 ± 0.067	0.23	-0.006 ± 0.067	-0.014 ± 0.067
PRF-fit source offset from KIC position	0.072 ± 0.067	1.07	-0.043 ± 0.067	-0.058 ± 0.067
photometric centroid source offset	0.64 ± 0.00	602.18	0.47 ± 0.00	0.44 ± 0.00

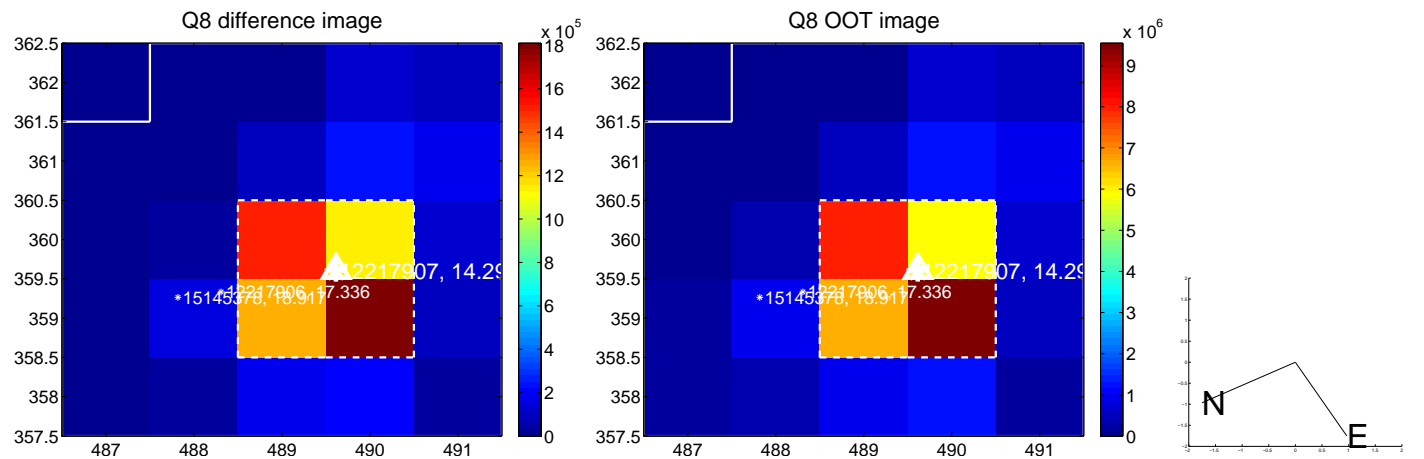
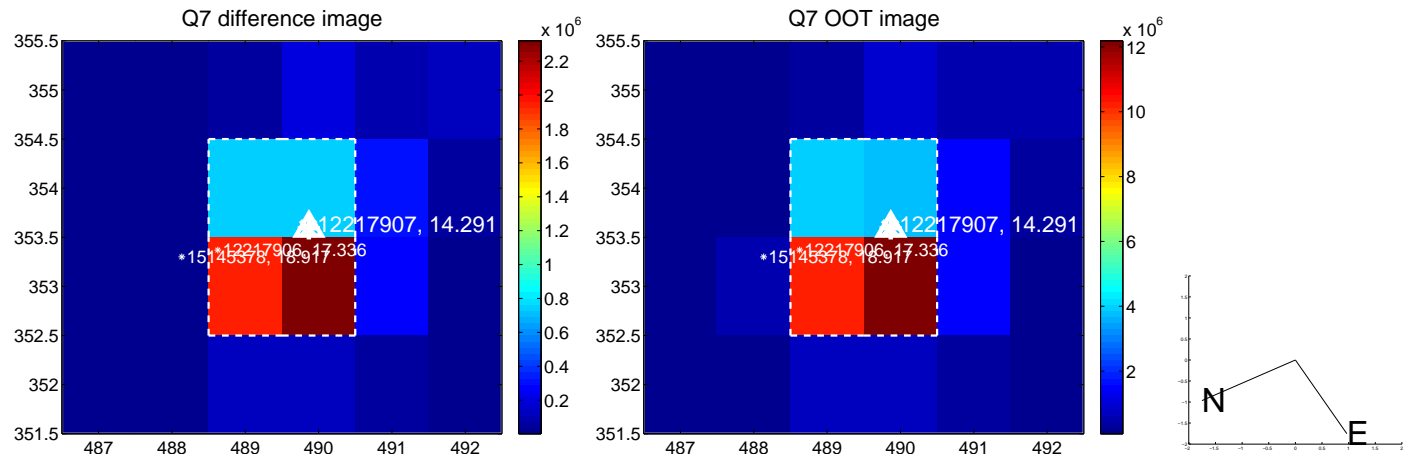
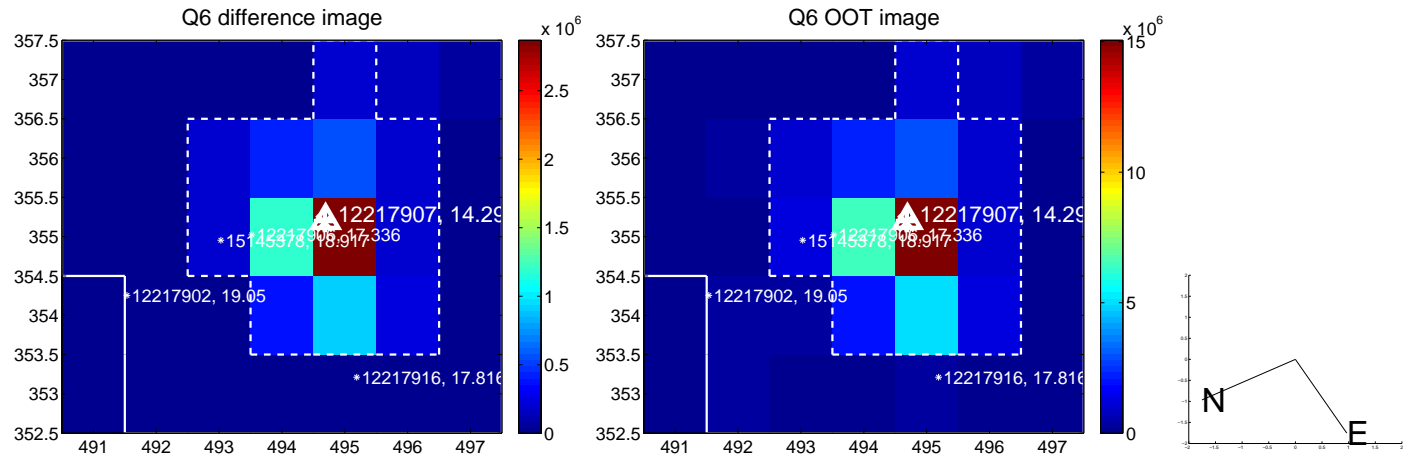
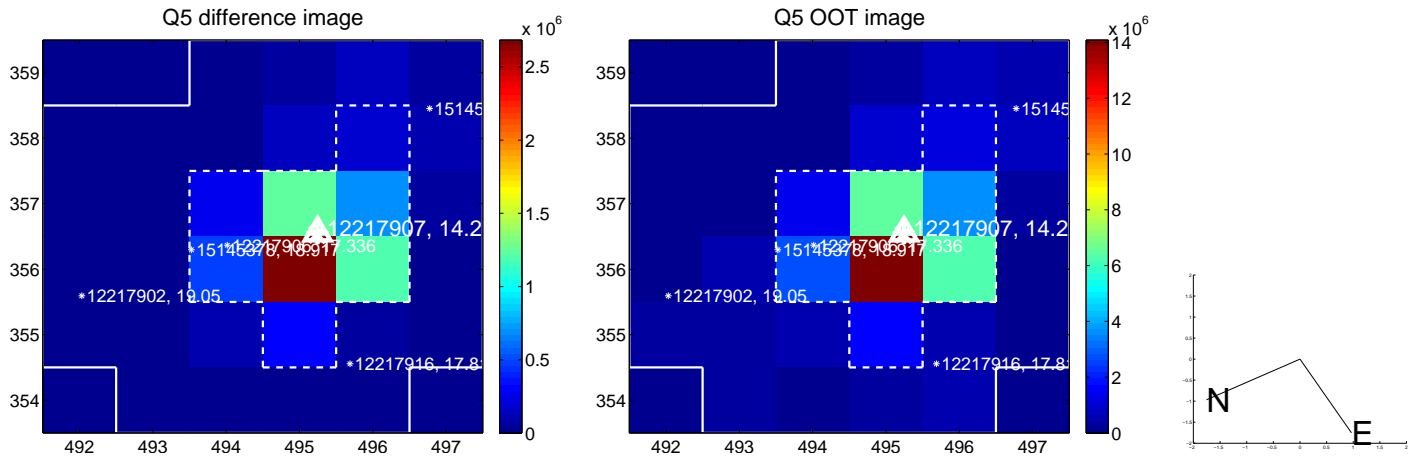


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

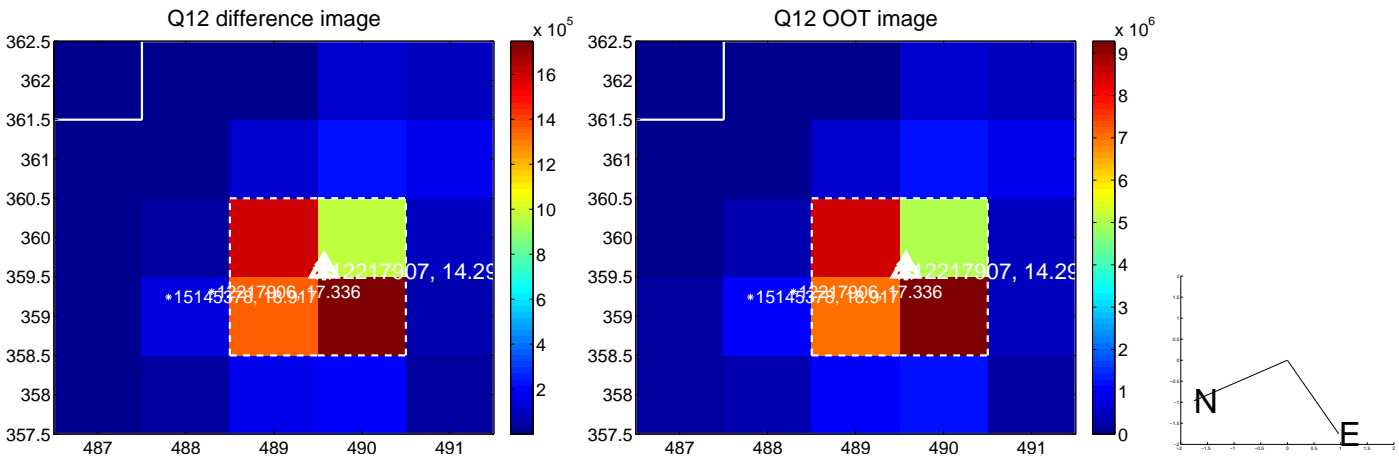
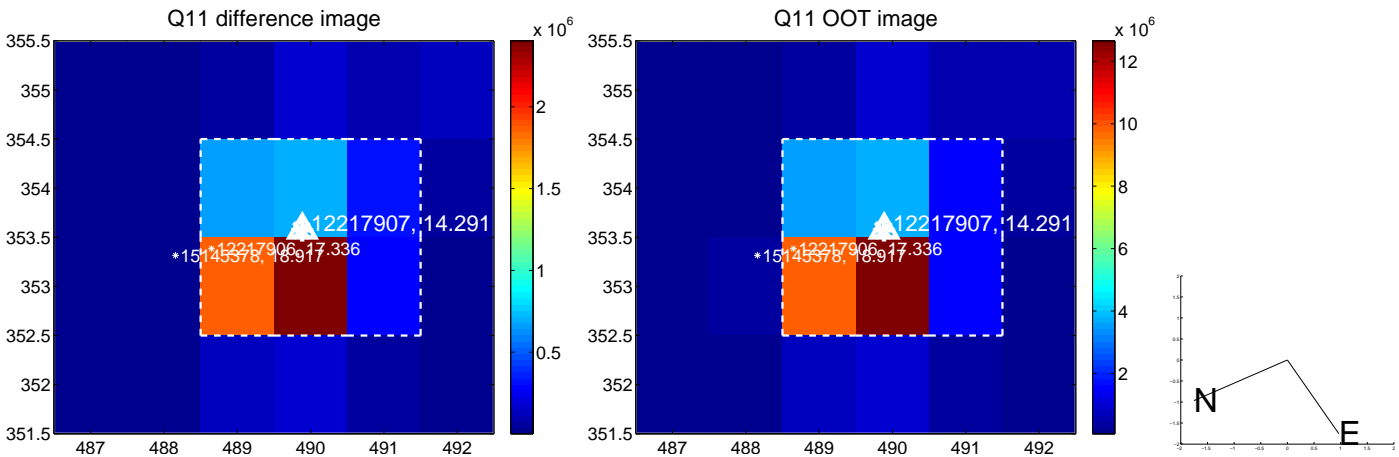
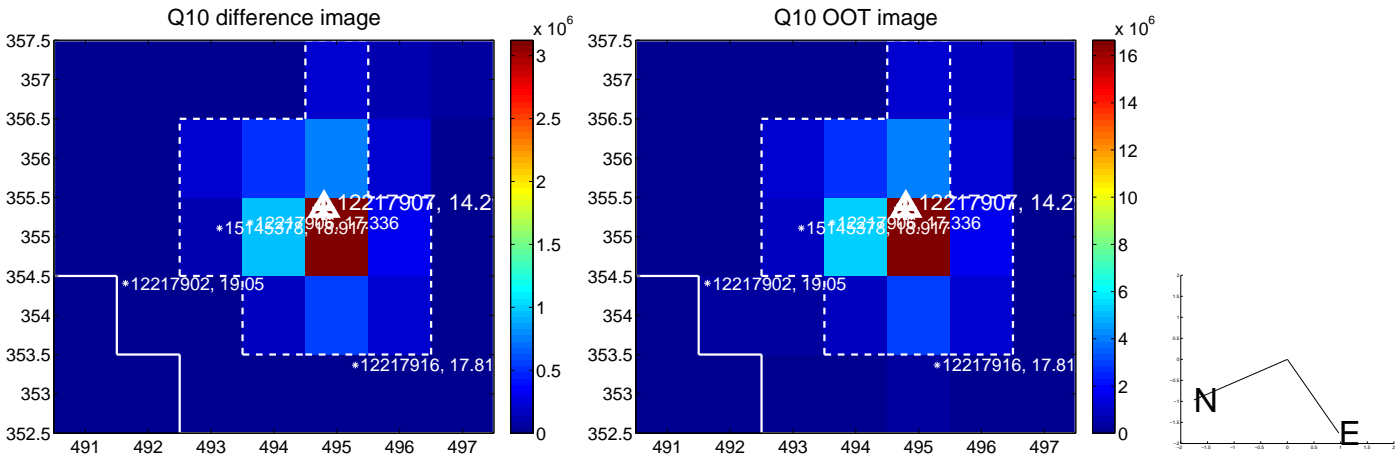
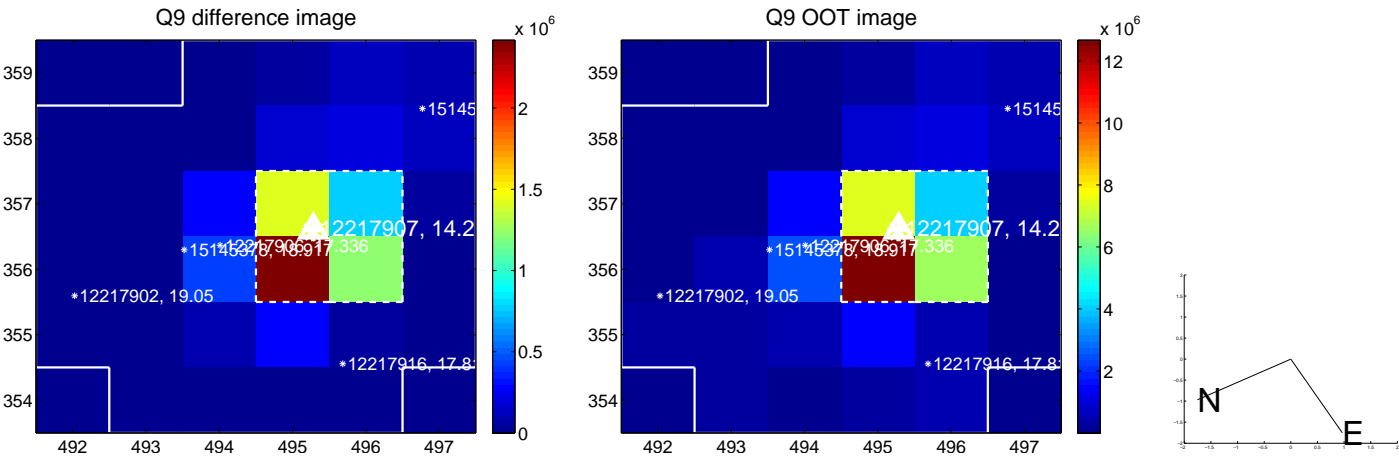
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



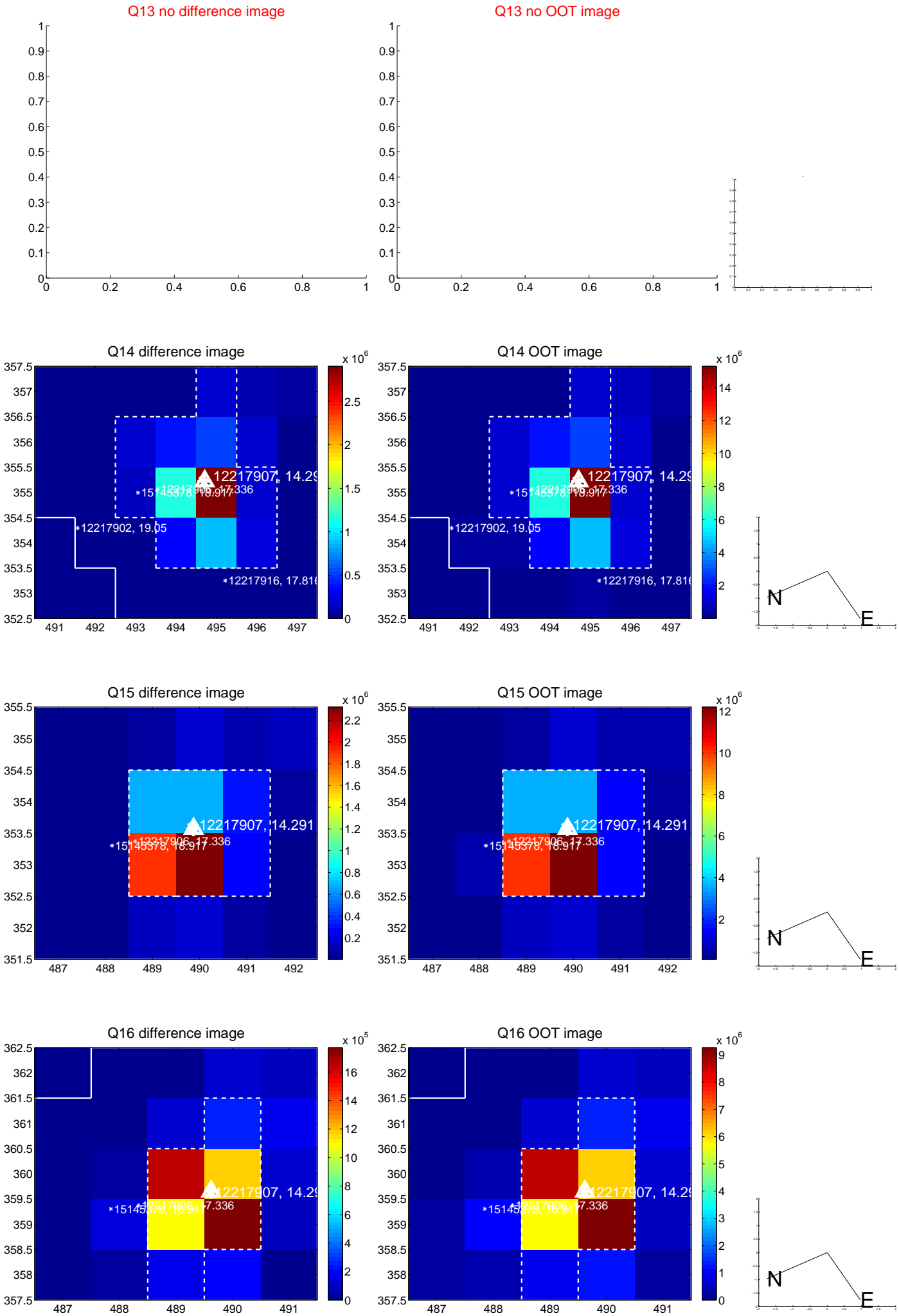
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



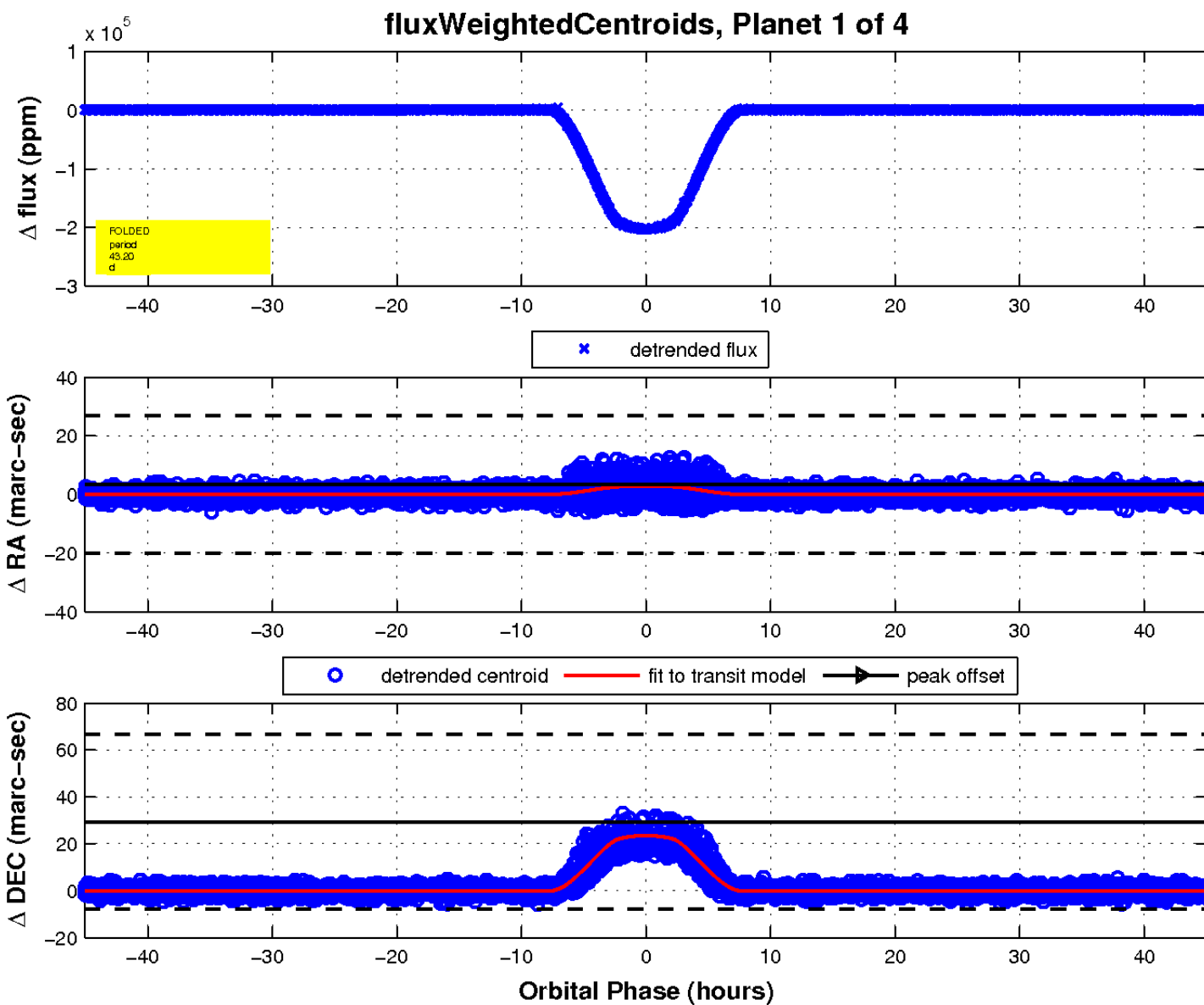
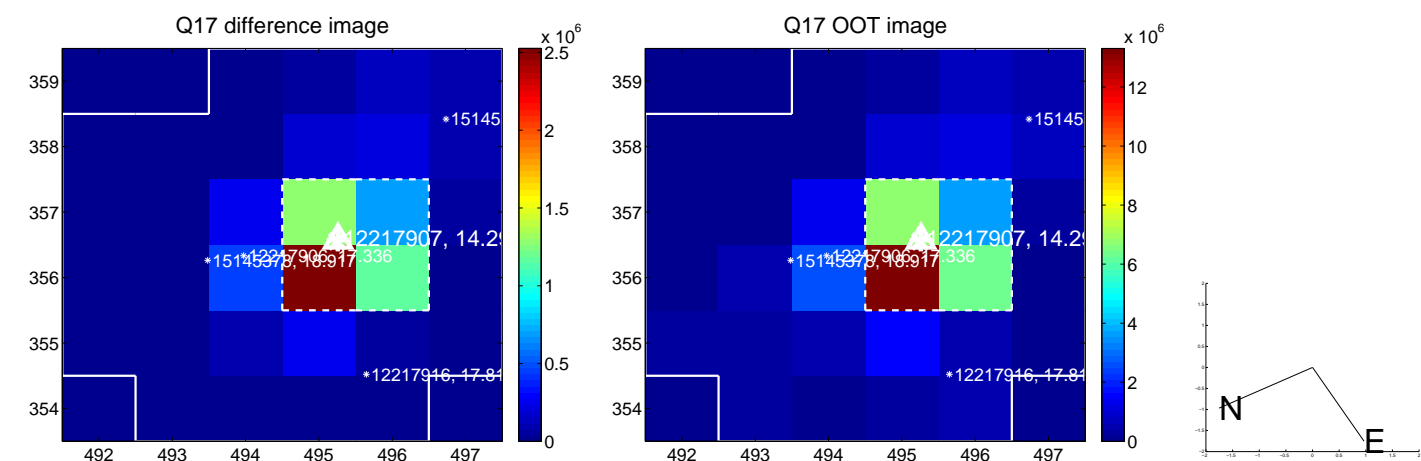
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

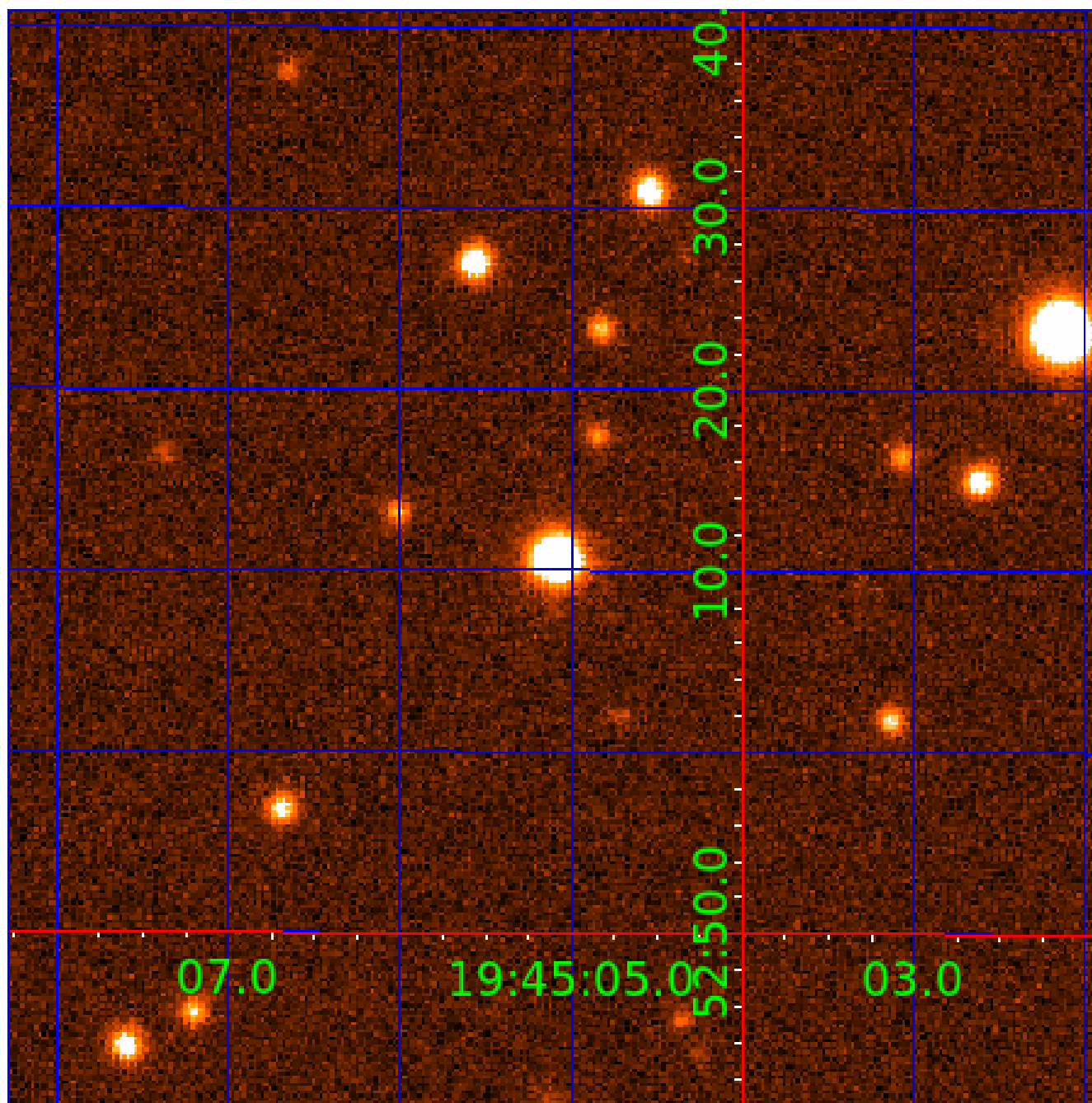


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 012217907

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})
012217907-01	OBS	7516.01	43.204590	146.597999	202473.7	15.037	9013.3	6216.7	0.93	6003	43.15	17.19
012217907-02	OBS	No	43.204594	160.912558	57054.7	7.489	2094.1	1498.4	0.93	6003	23.36	17.19
012217907-03	OBS	No	301.124361	304.213965	350.2	8.996	24.7	4.4	0.93	6003	1.84	1.29
012217907-04	OBS	No	441.722769	184.372953	964.5	17.531	11.5	12.3	0.93	6003	3.39	0.78

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012217907-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—MOD_ODDEVEN_DV—MOD_ODDEVEN_ALT—HAS_SEC_TCE
012217907-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
012217907-03	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
012217907-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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.

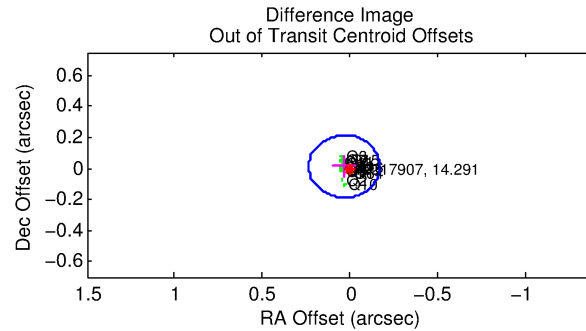
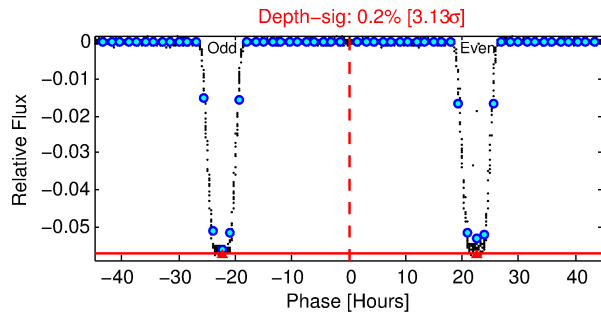
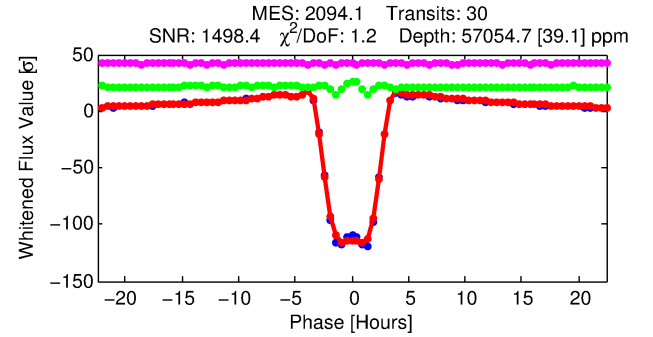
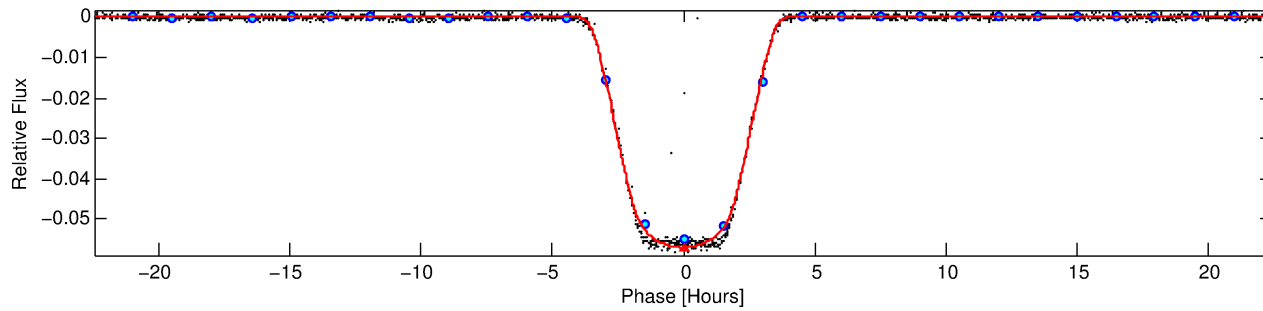
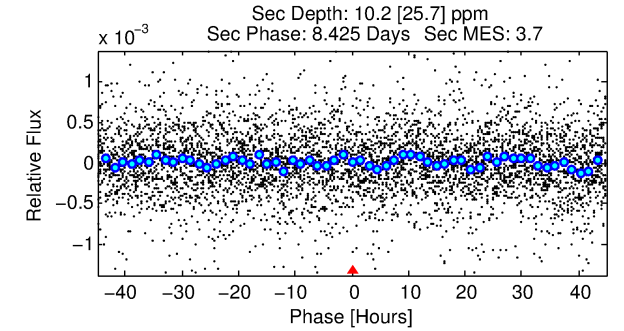
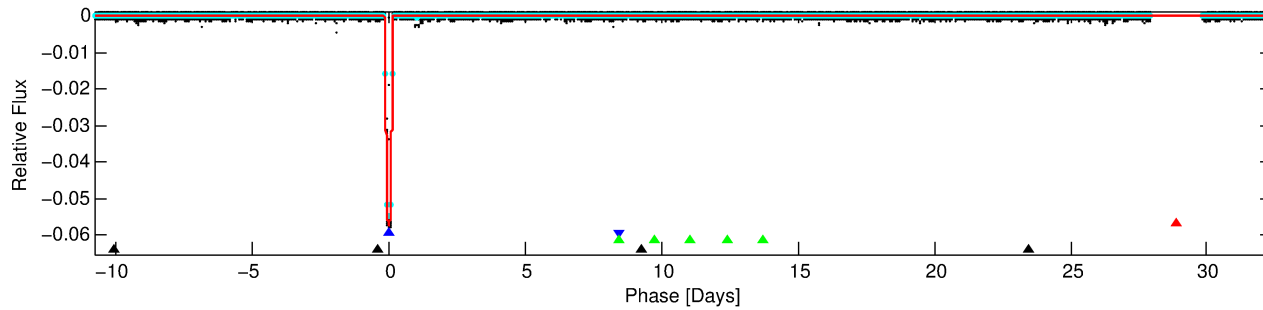
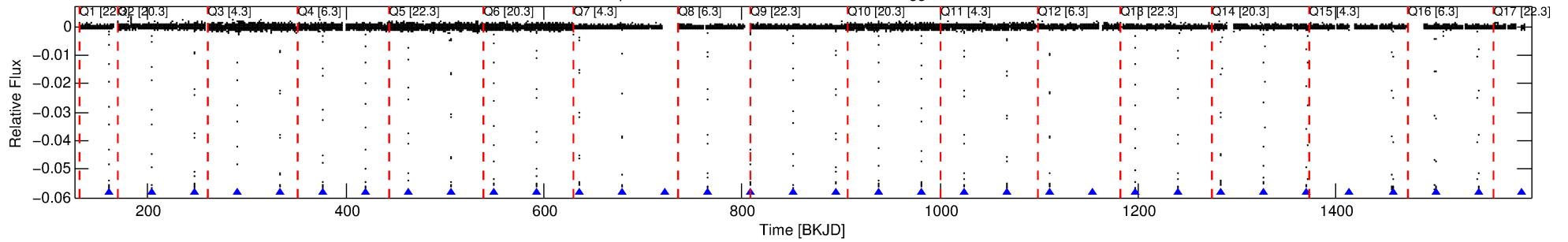
Ephemeris Match Information For 012217907-02

No Significant Match Found

DV One-Page Summary

KIC: 12217907 Candidate: 2 of 4 Period: 43.205 d
KOI: K07516 Corr: No Ephemeris Match

Kp: 14.29 R*: 0.93 Rs Teff: 6003.0 K Logg: 4.51 Fe/H: -0.140



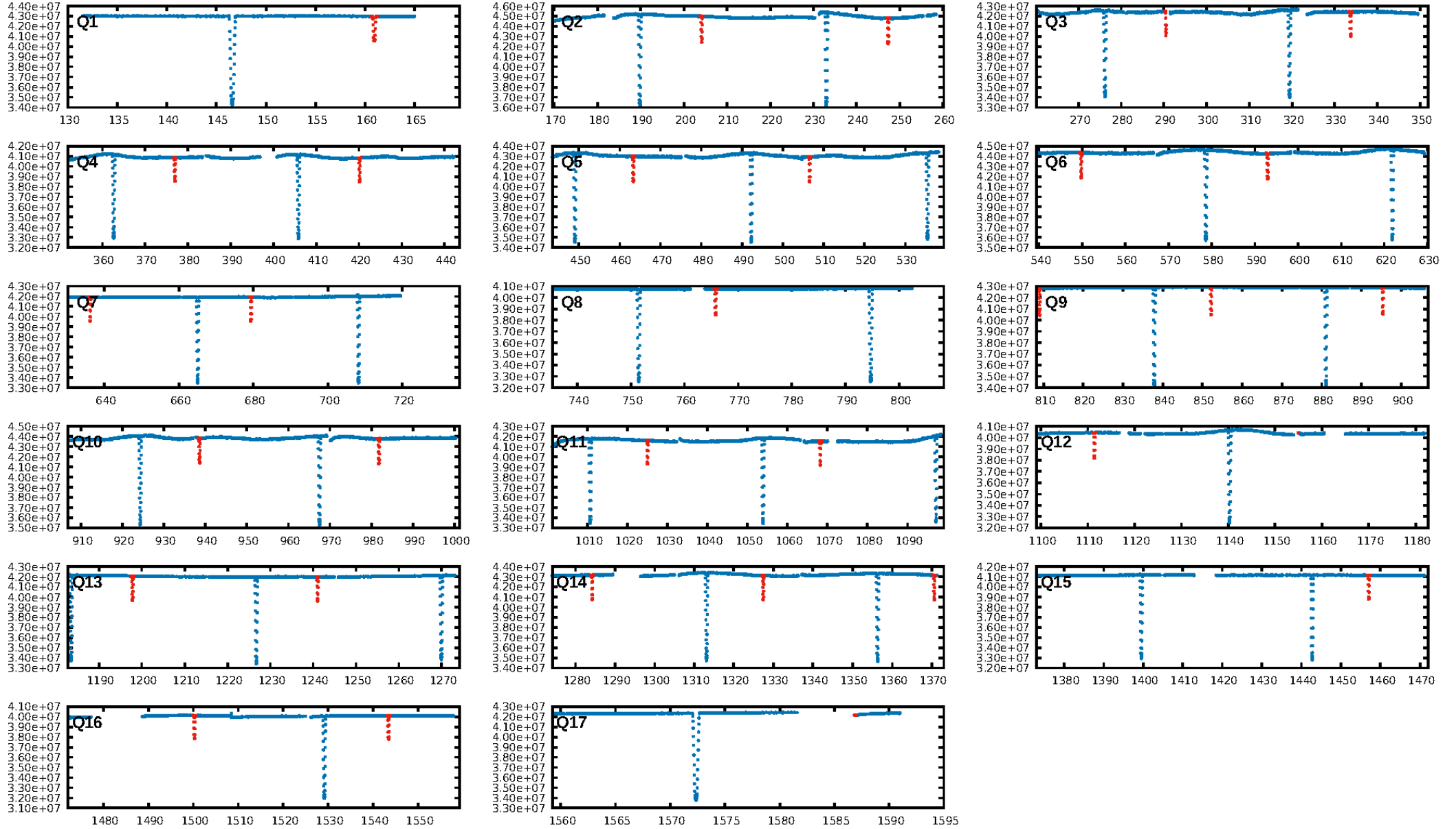
DV Fit Results:

Period = 43.20459 [0.00001] d
Epoch = 160.9126 [0.0001] BKJD
Rp/R* = 0.2297 [0.0001]
a/R* = 47.46 [0.06]
b = 0.59 [0.00]
Seff = 17.19 [7.60]
Teff = 519 [57] K
Rp = 23.36 [7.69] Re
a = 0.2425 [0.0682] AU
Ag = 0.60 [1.54] [-0.26σ]
Teffp = 708 [447] K [0.42σ]

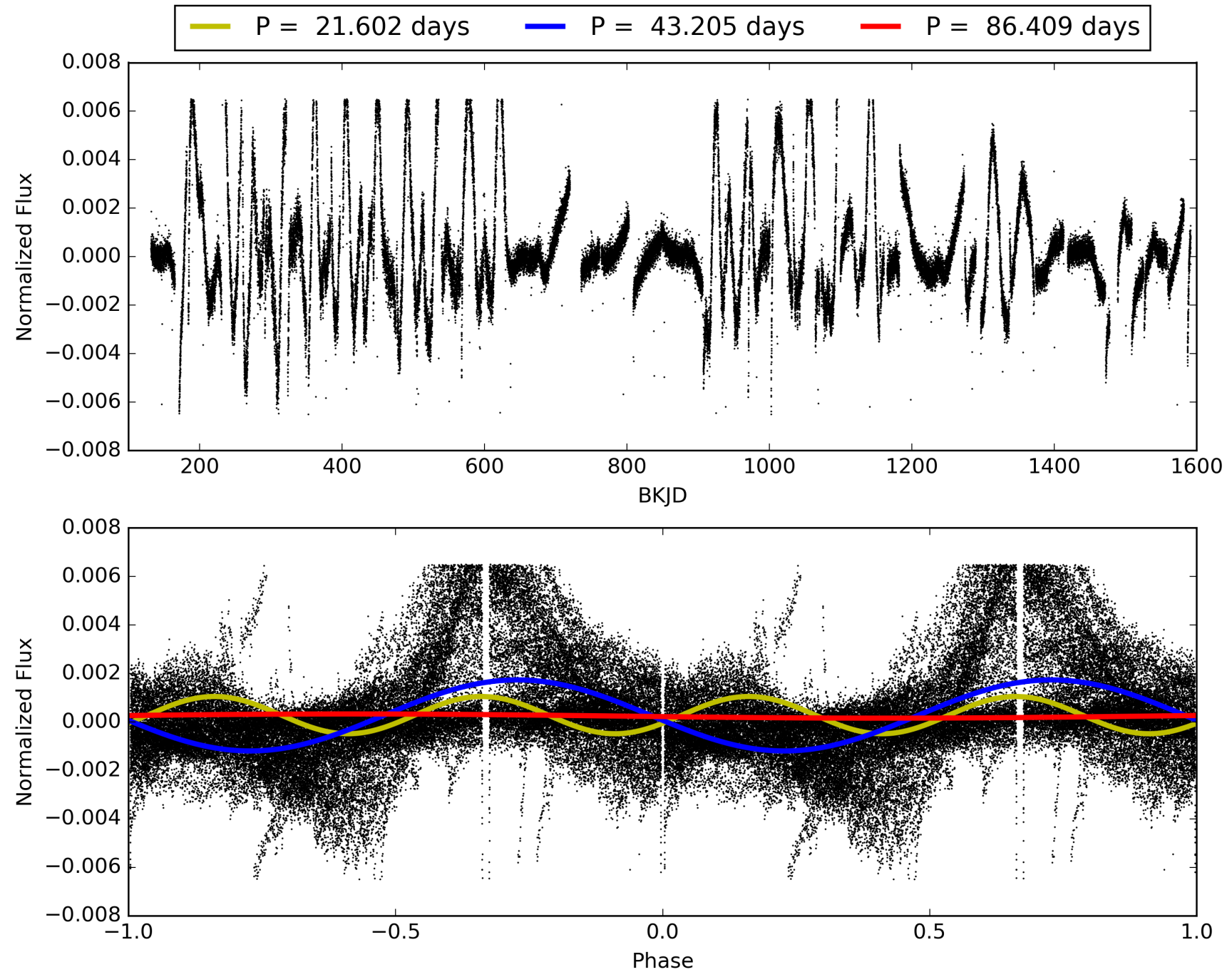
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: 100.0% [528.86σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 14.9%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [29/29]
GhostDiagnostic-chr: 3.126
Centroid-sig: 0.0%
Centroid-so: 0.702 arcsec [146.67σ]
OotOffset-rm: 0.036 arcsec [0.54σ]
KicOffset-rm: 0.041 arcsec [0.60σ]
OotOffset-st: 4/4/4/3 [15]
KicOffset-st: 4/4/4/3 [15]
DiffImageQuality-fgm: 1.00 [15/15]
DiffImageOverlap-fno: 1.00 [15/15]

TCE 012217907-02, PDC Light Curves

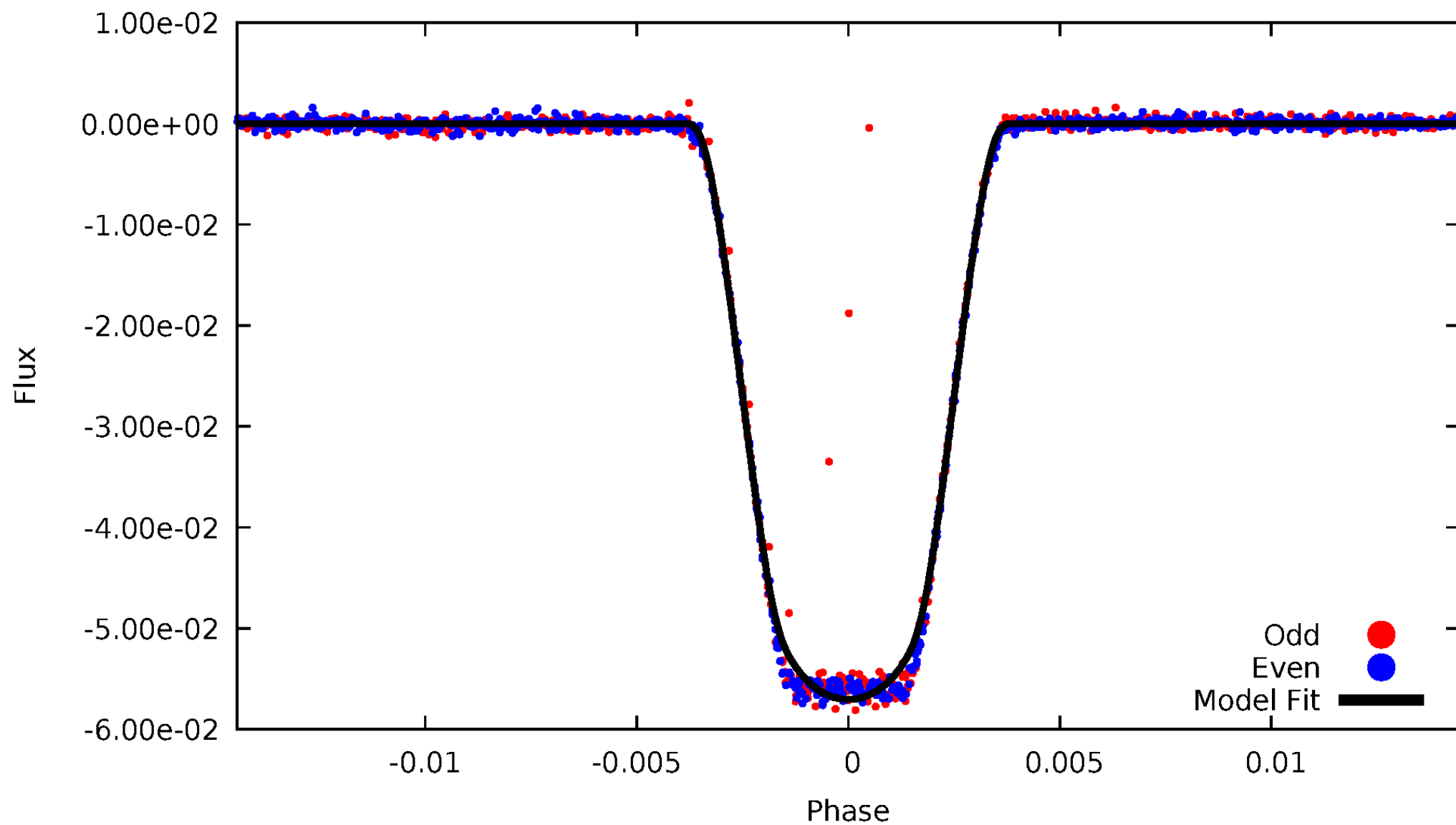


TCE 012217907-02



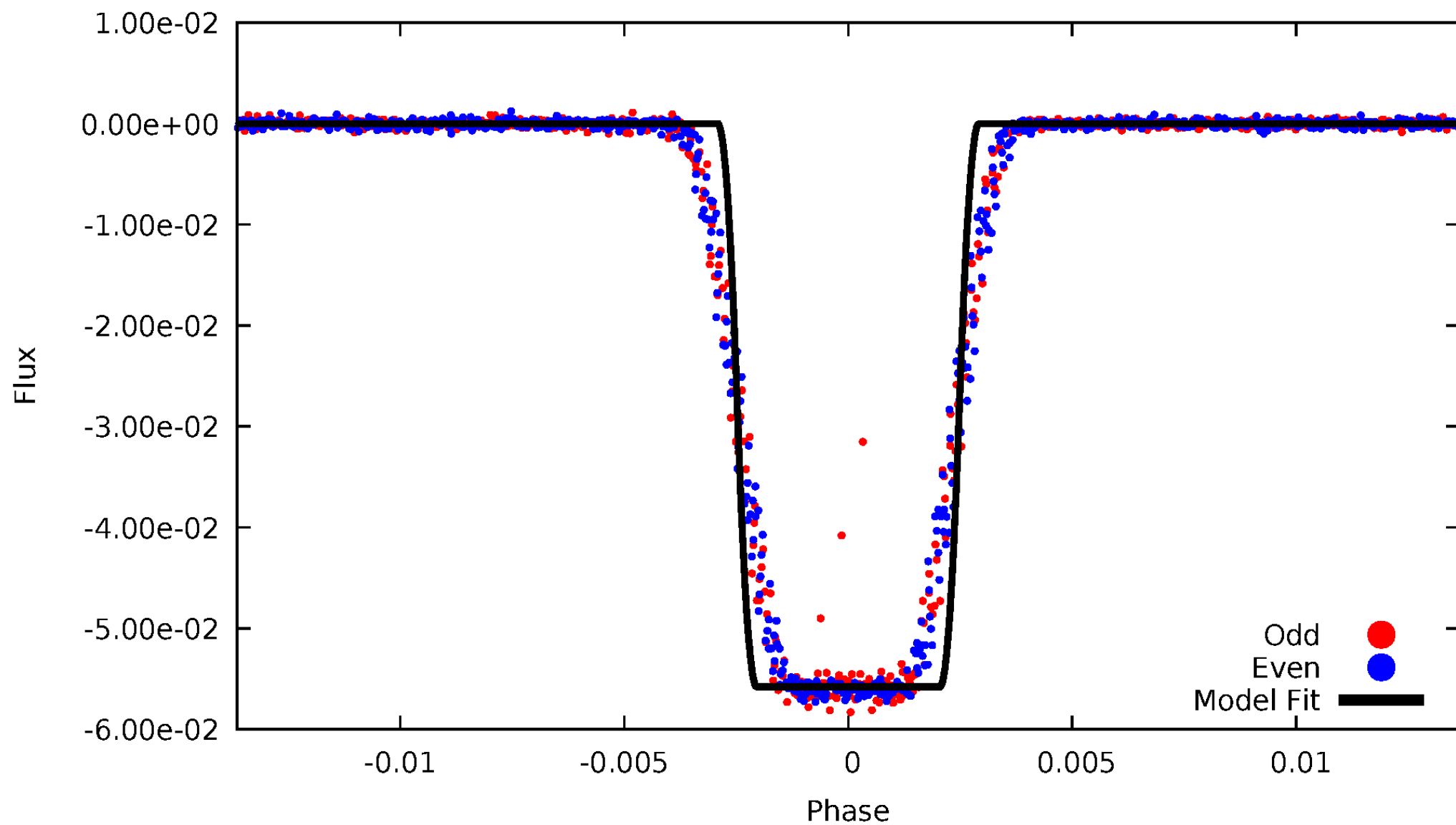
DV Odd/Even

TCE 012217907-02



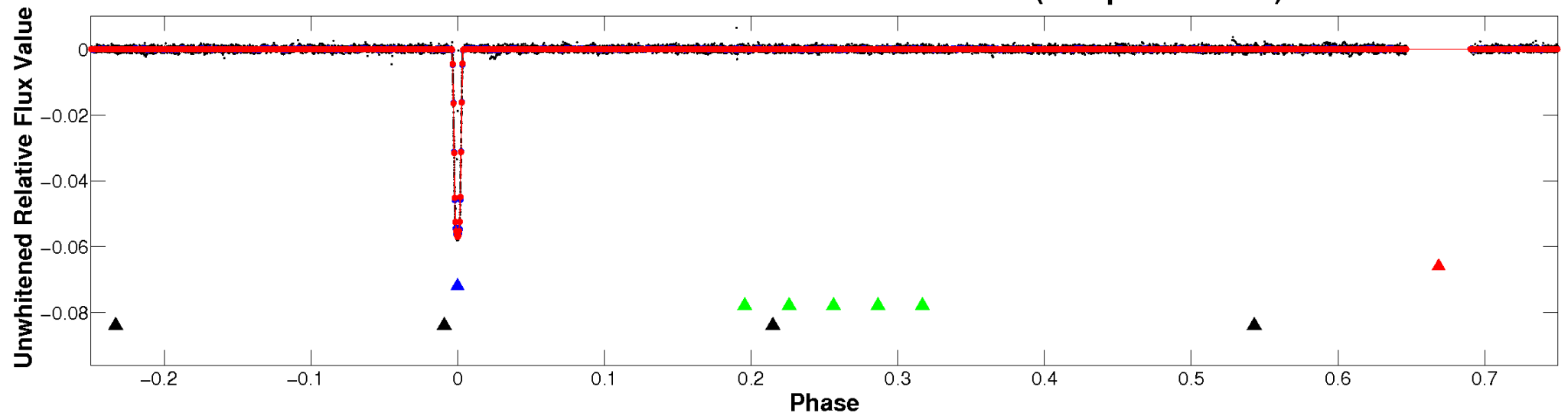
ALT Odd/Even

TCE 012217907-02

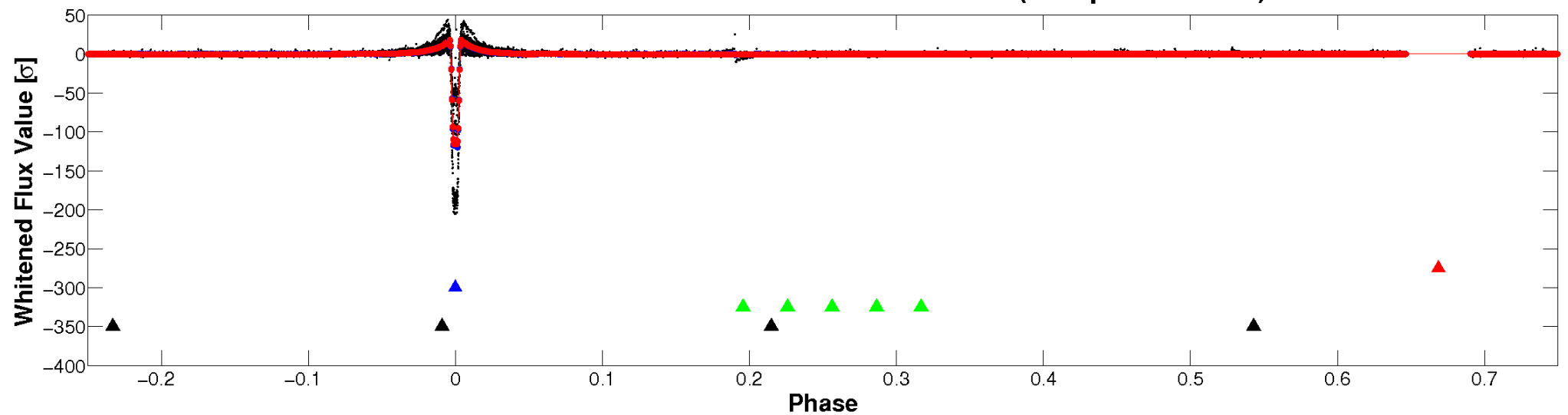


Non-Whitened Vs. Whitened Light Curve

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

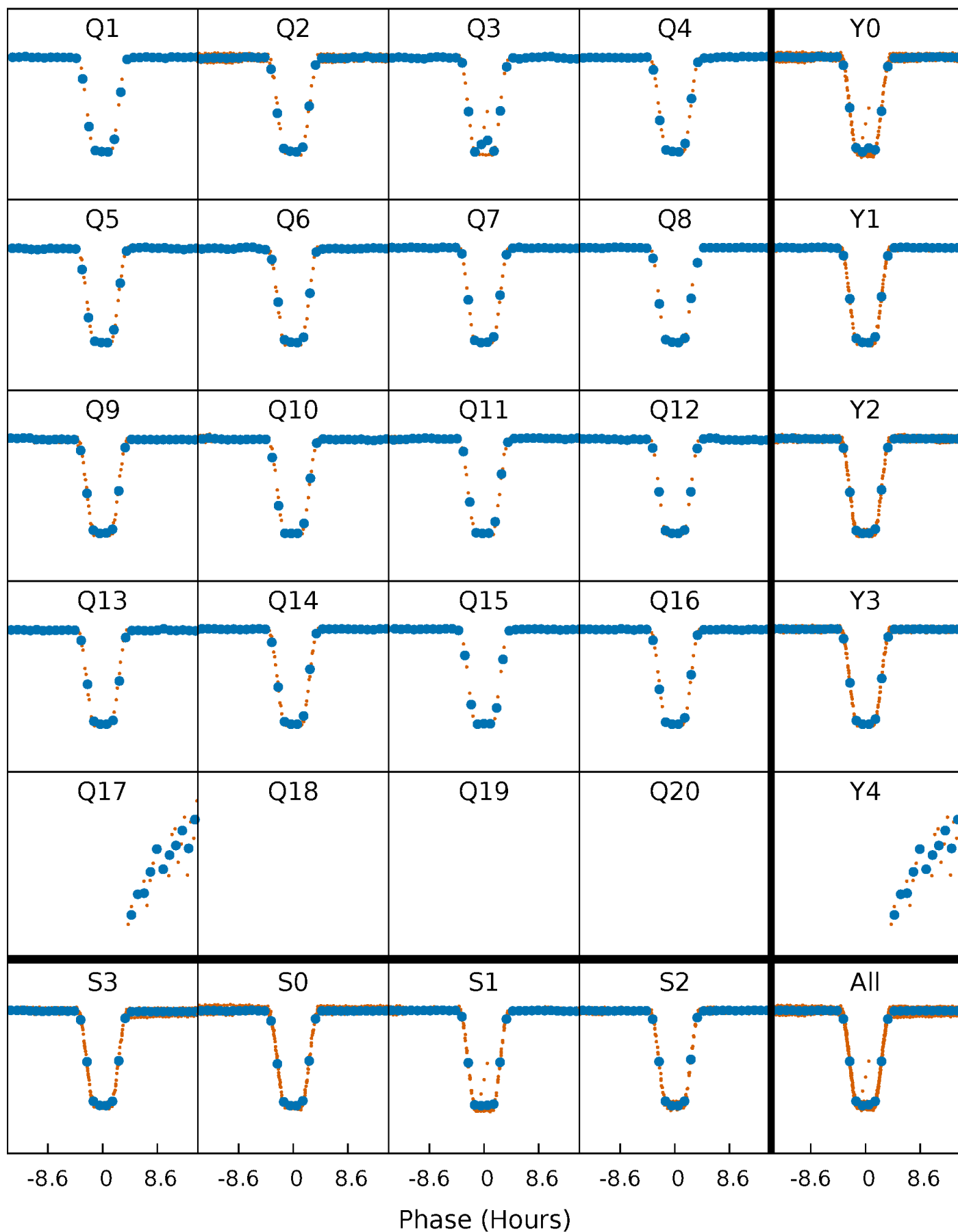


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



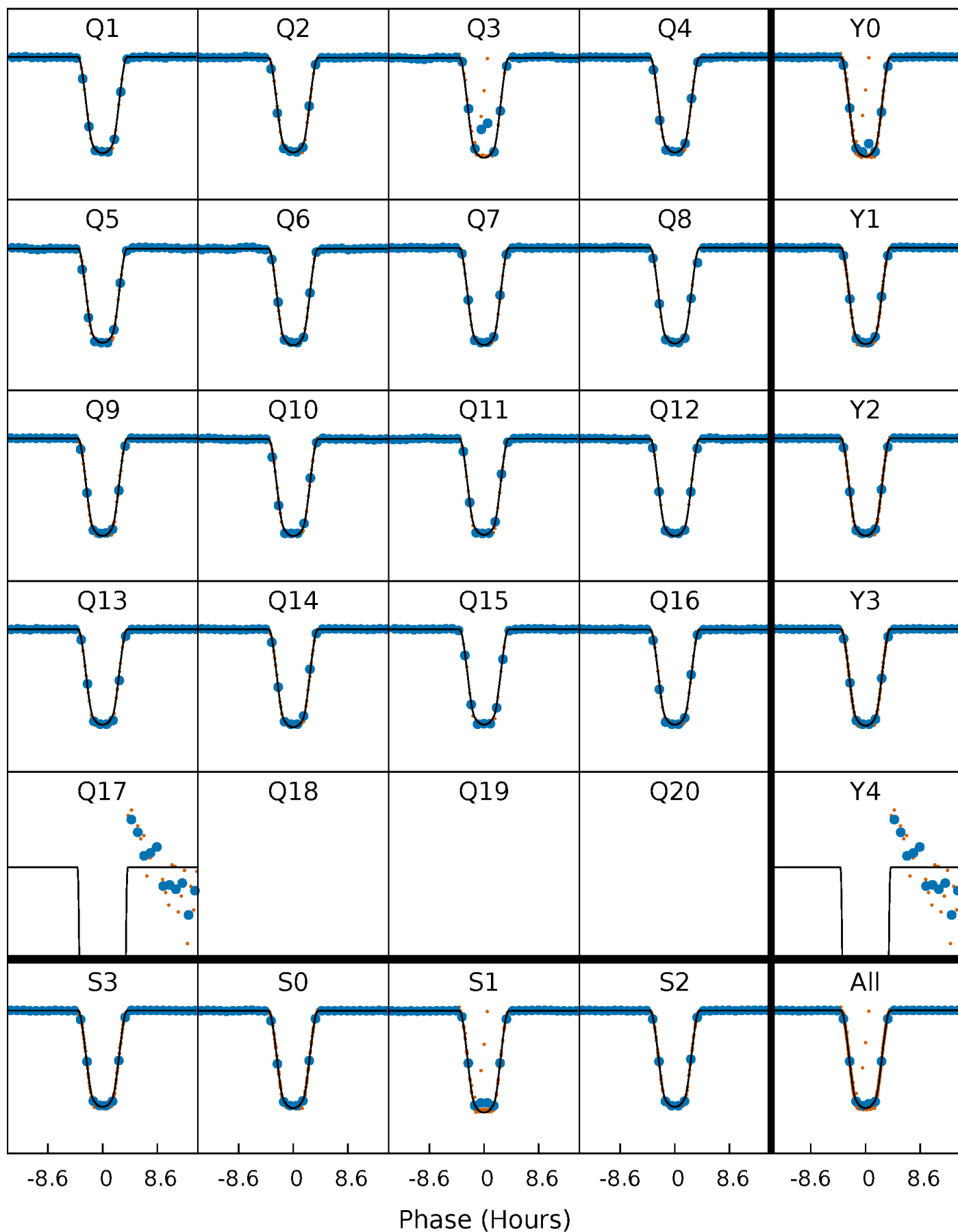
PDC Quarter-Phased Transit Curves

TCE 012217907-02 P= 43.204594 Days $T_0=160.912558$ (BKJD)



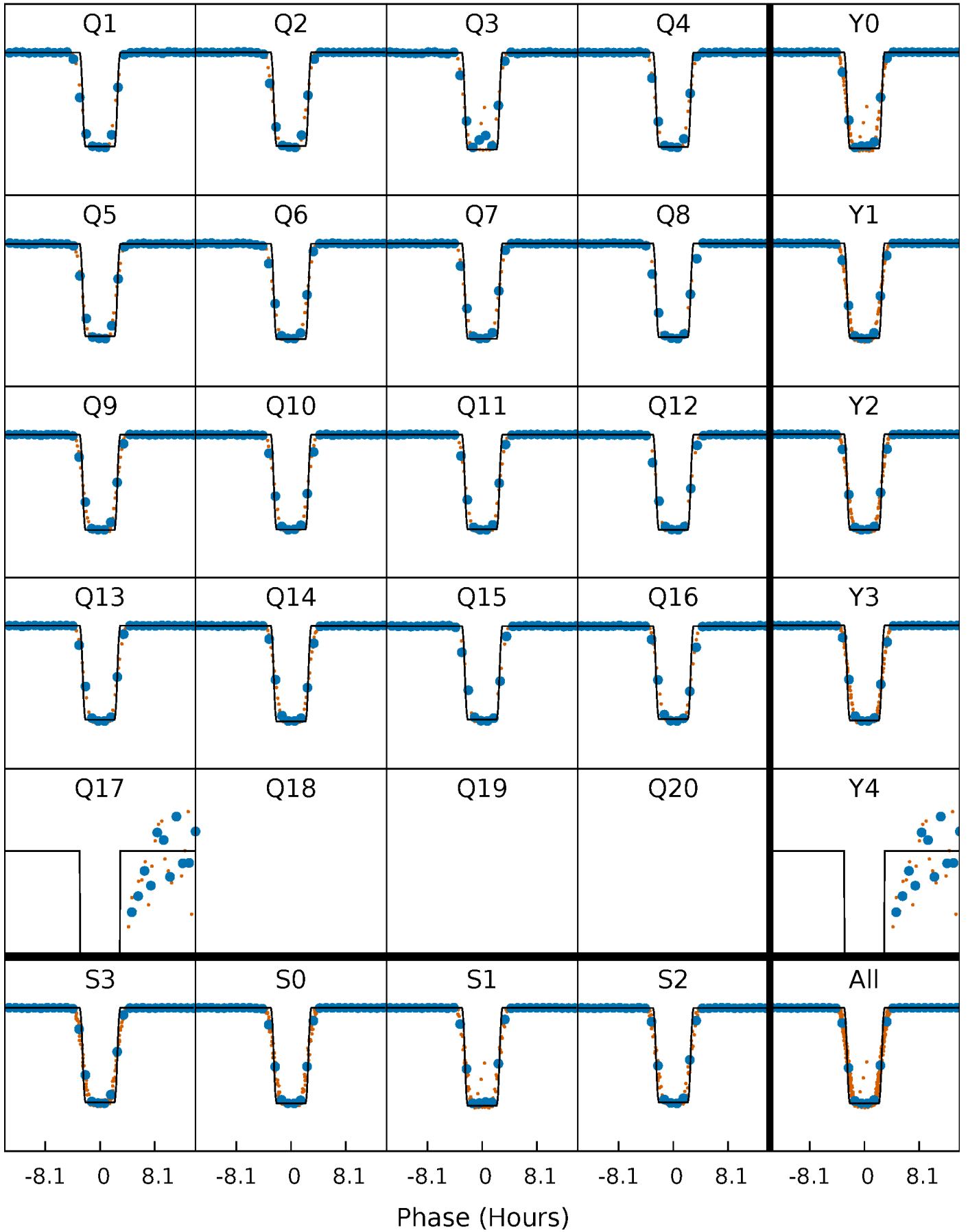
DV Quarter-Phased Transit Curves

TCE 012217907-02 P= 43.204594 Days $T_0=160.912558$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

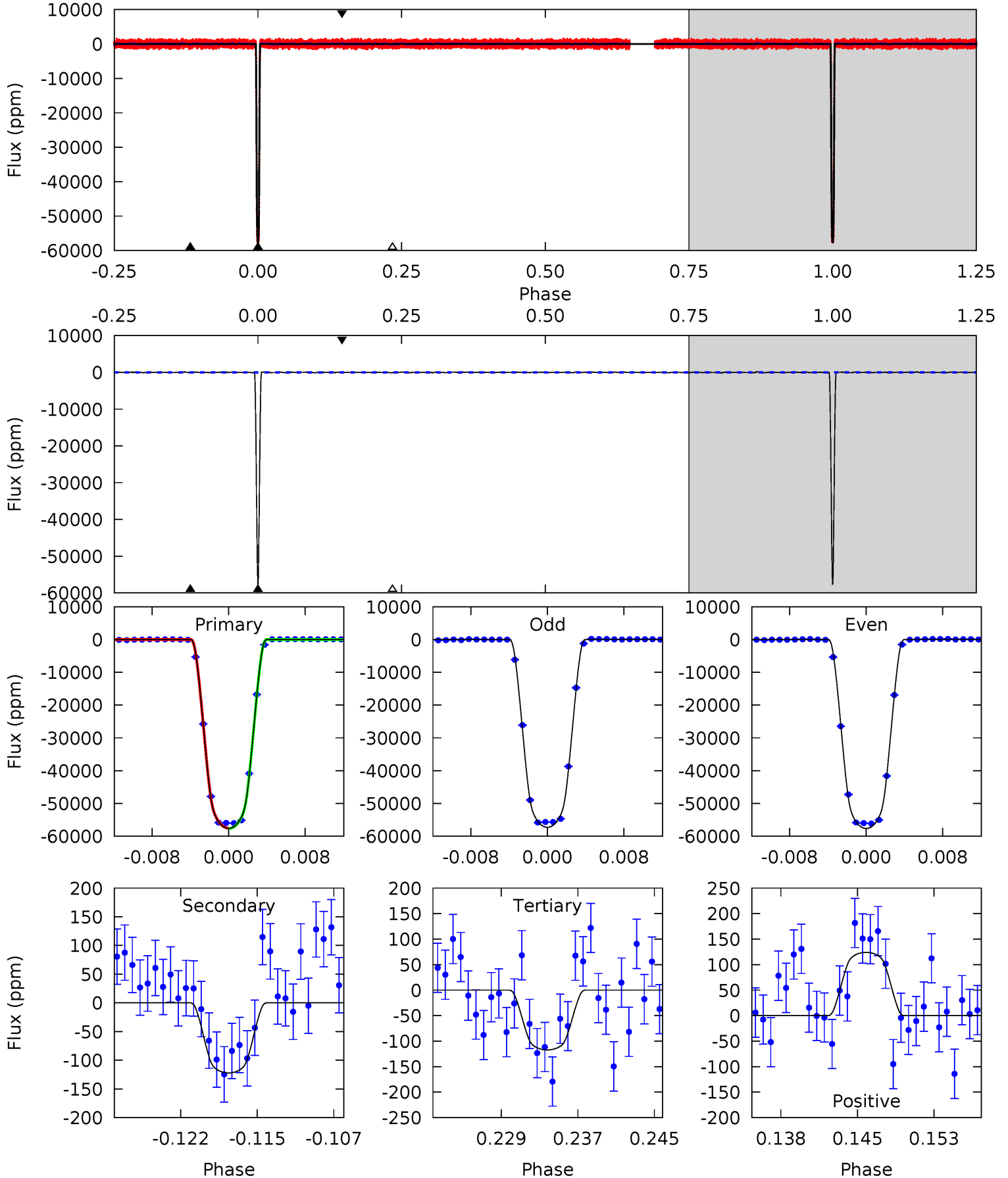
TCE 012217907-02 P= 43.204081 Days $T_0=160.921226$ (BKJD)



DV Model-Shift Uniqueness Test

012217907-02, P = 43.204594 Days, E = 117.707964 Days

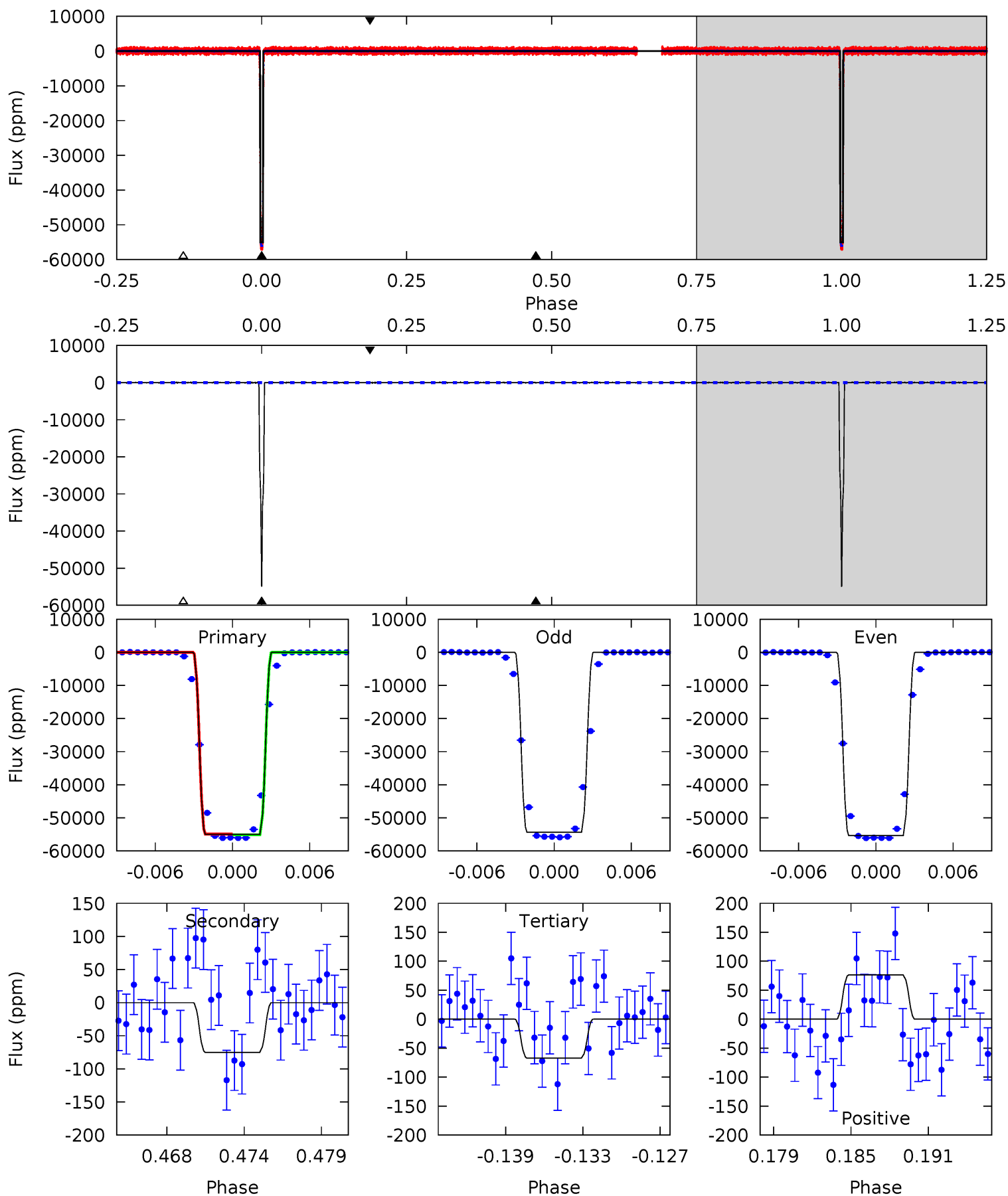
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3106	6.58	6.32	6.69	5.08	2.67	2.34	3100	3099	0.26	-0.11	9.41	0.99	0.00	3.62



Alt Model-Shift Uniqueness Test

012217907-02, P = 43.204081 Days, E = 117.717145 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2578	3.52	3.15	3.58	5.13	2.76	1.04	2575	2575	0.37	-0.06	22.5	1.00	0.00	5.60



Stellar Parameters For KIC 012217907

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6003^{+188}_{-230}	$4.507^{+0.054}_{-0.229}$	$-0.140^{+0.300}_{-0.300}$	$0.932^{+0.307}_{-0.082}$	$1.019^{+0.142}_{-0.142}$	$1.772^{+0.401}_{-0.992}$
	+3%/-4%	+1%/-5%	+214%/-214%	+33%/-9%	+14%/-14%	+23%/-56%
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 012217907-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-122 ± 19	$23.68^{+4.71}_{-1.56}$	740^{+55}_{-36}	2237^{+54}_{-57}	$6.520^{+1.706}_{-1.784}$
Alt.	-75 ± 21	$24.49^{+4.64}_{-1.75}$	742^{+56}_{-41}	2098^{+70}_{-74}	$3.674^{+1.490}_{-1.238}$

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 $A_{obs} \gg 1.0$

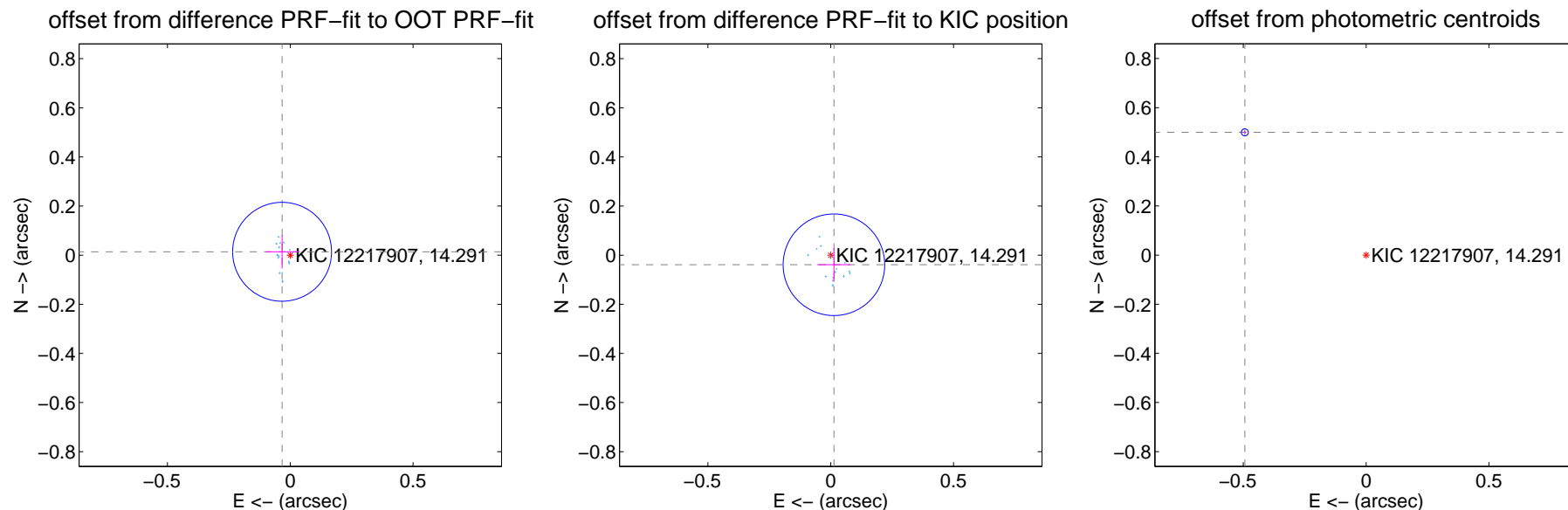
DV Centroid Data

Supplemental centroid analysis for 012217907-02. Kepler magnitude: 14.29. Transit SNR 1498.36

There are 15 quarters with good PRF difference image offsets

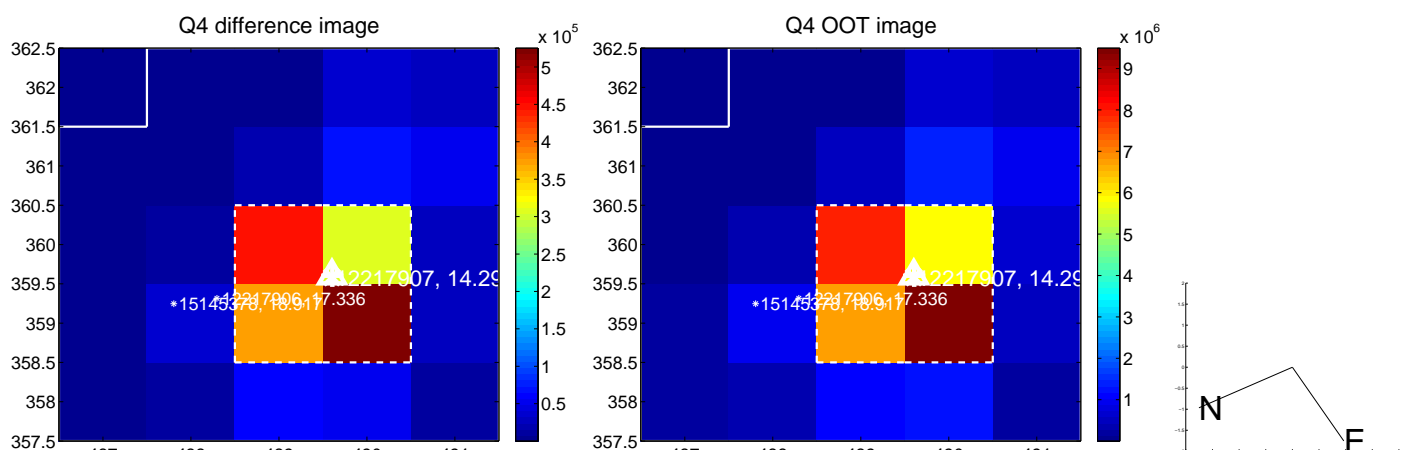
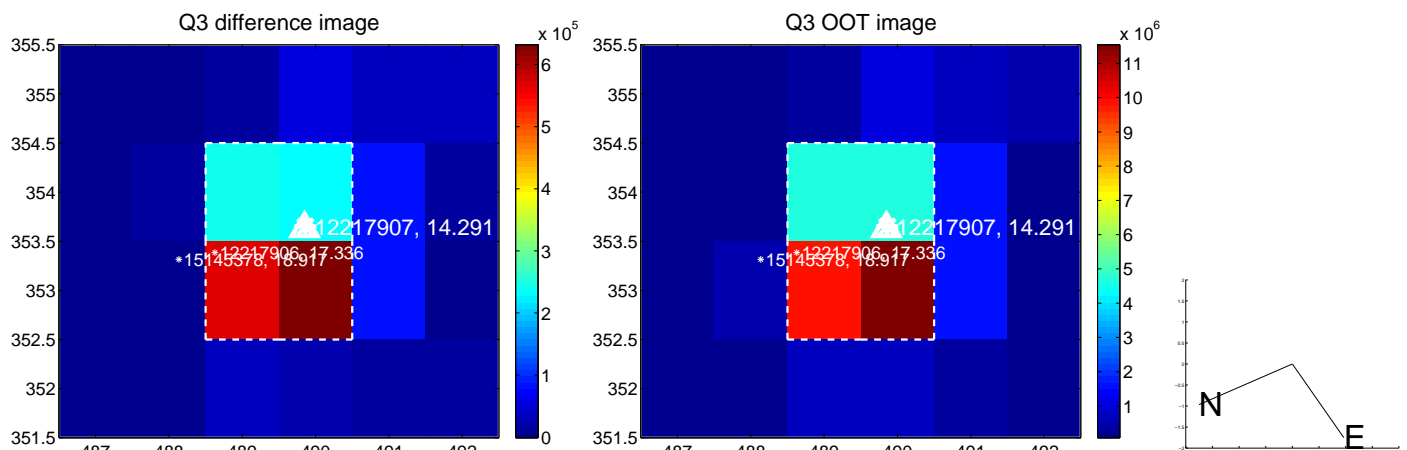
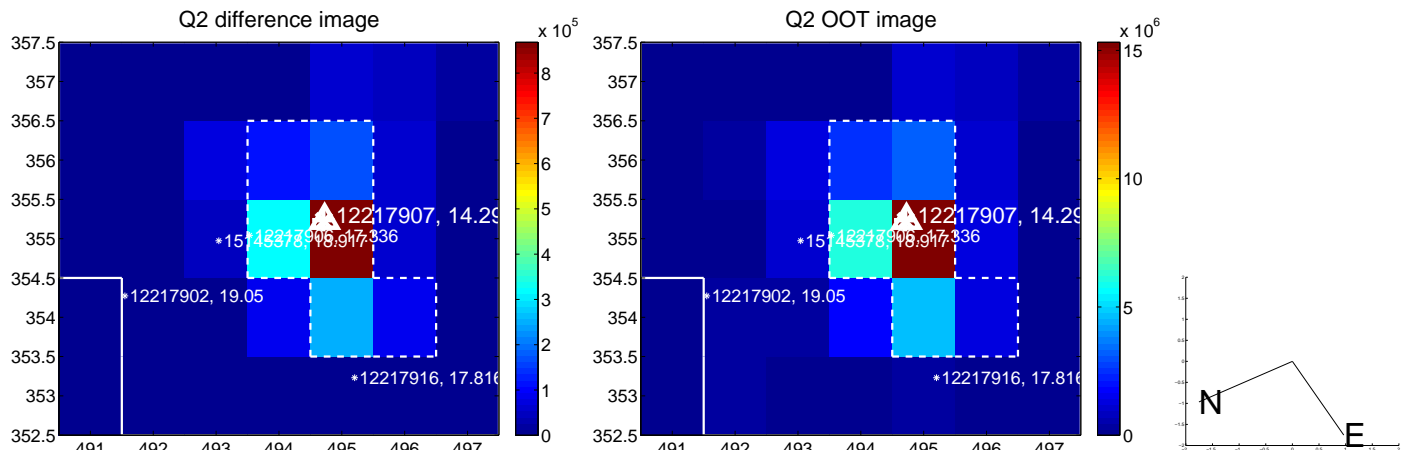
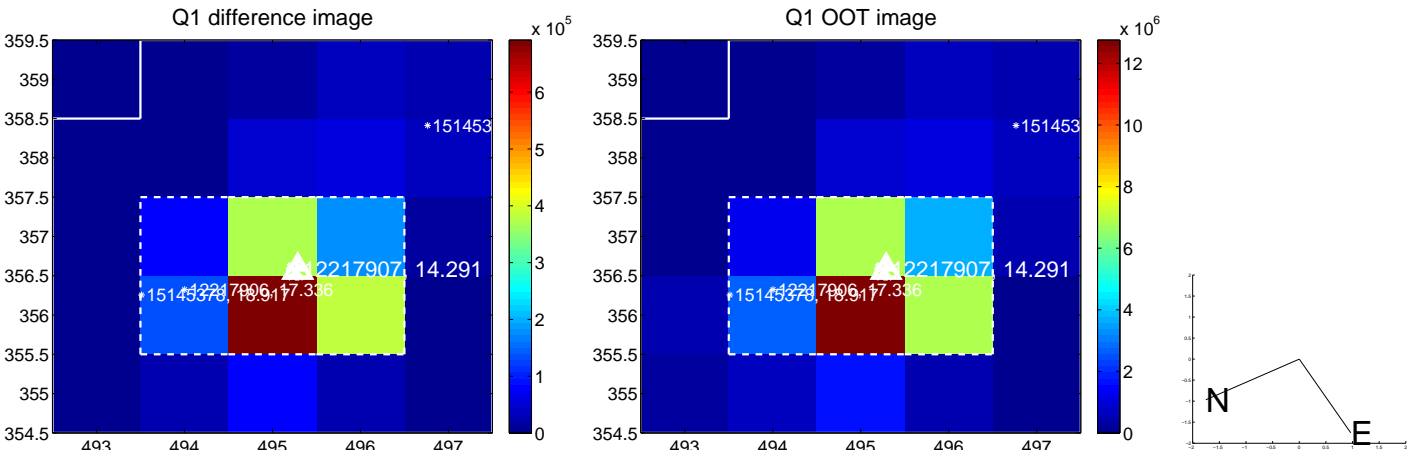
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.036 ± 0.067	0.54	0.033 ± 0.067	0.014 ± 0.068
PRF-fit source offset from KIC position	0.041 ± 0.069	0.60	-0.013 ± 0.068	-0.039 ± 0.068
photometric centroid source offset	0.70 ± 0.00	146.67	0.49 ± 0.00	0.50 ± 0.00

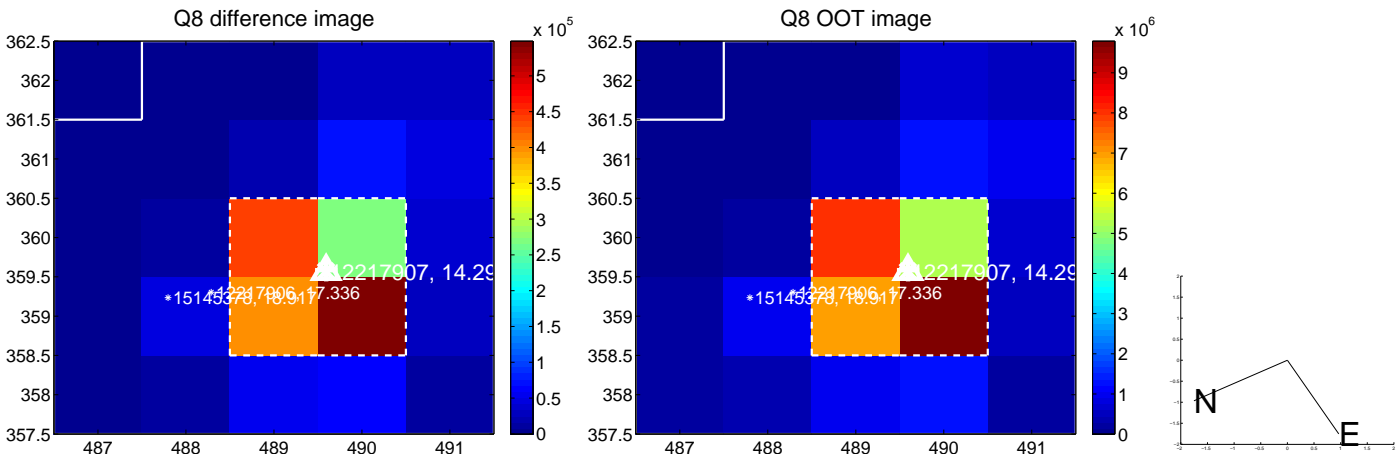
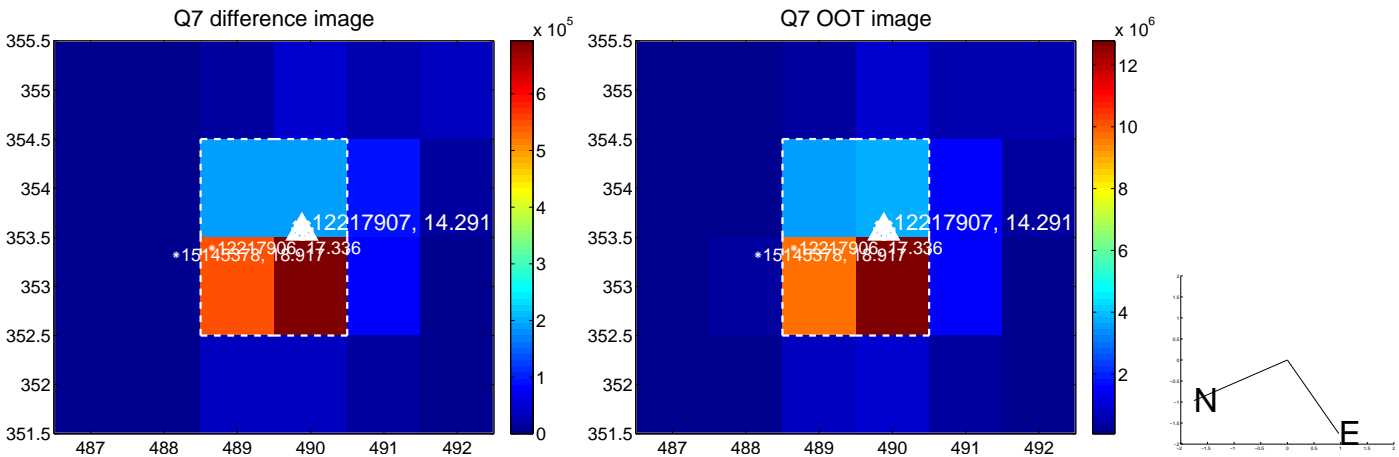
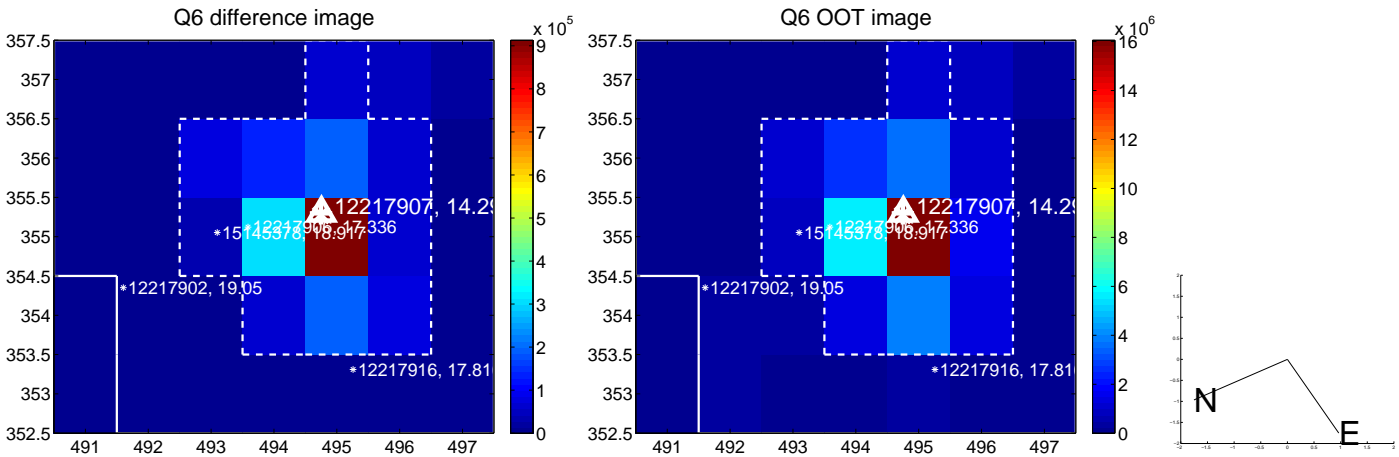
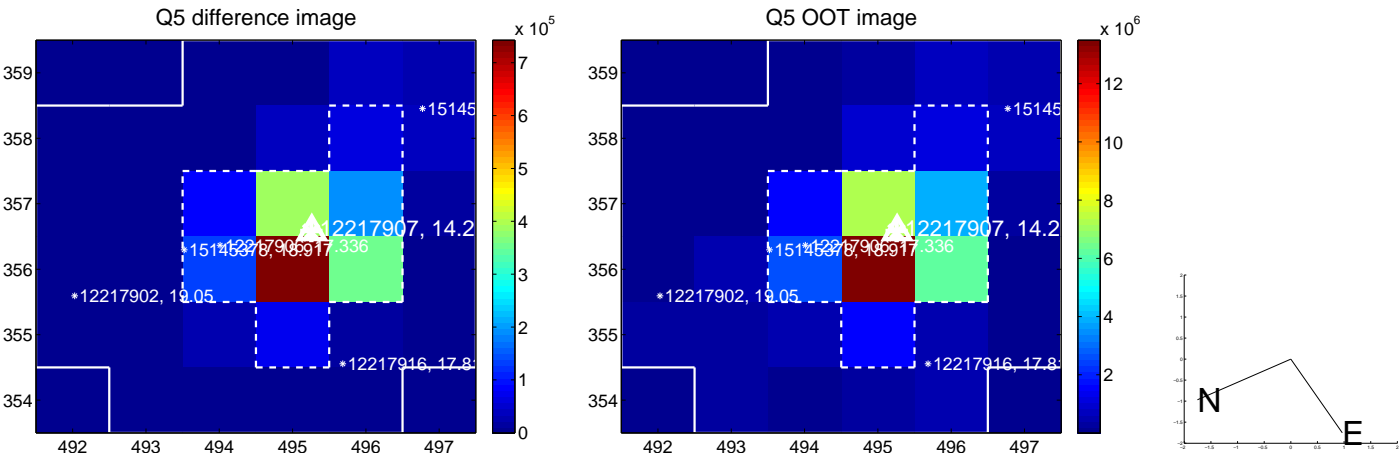


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

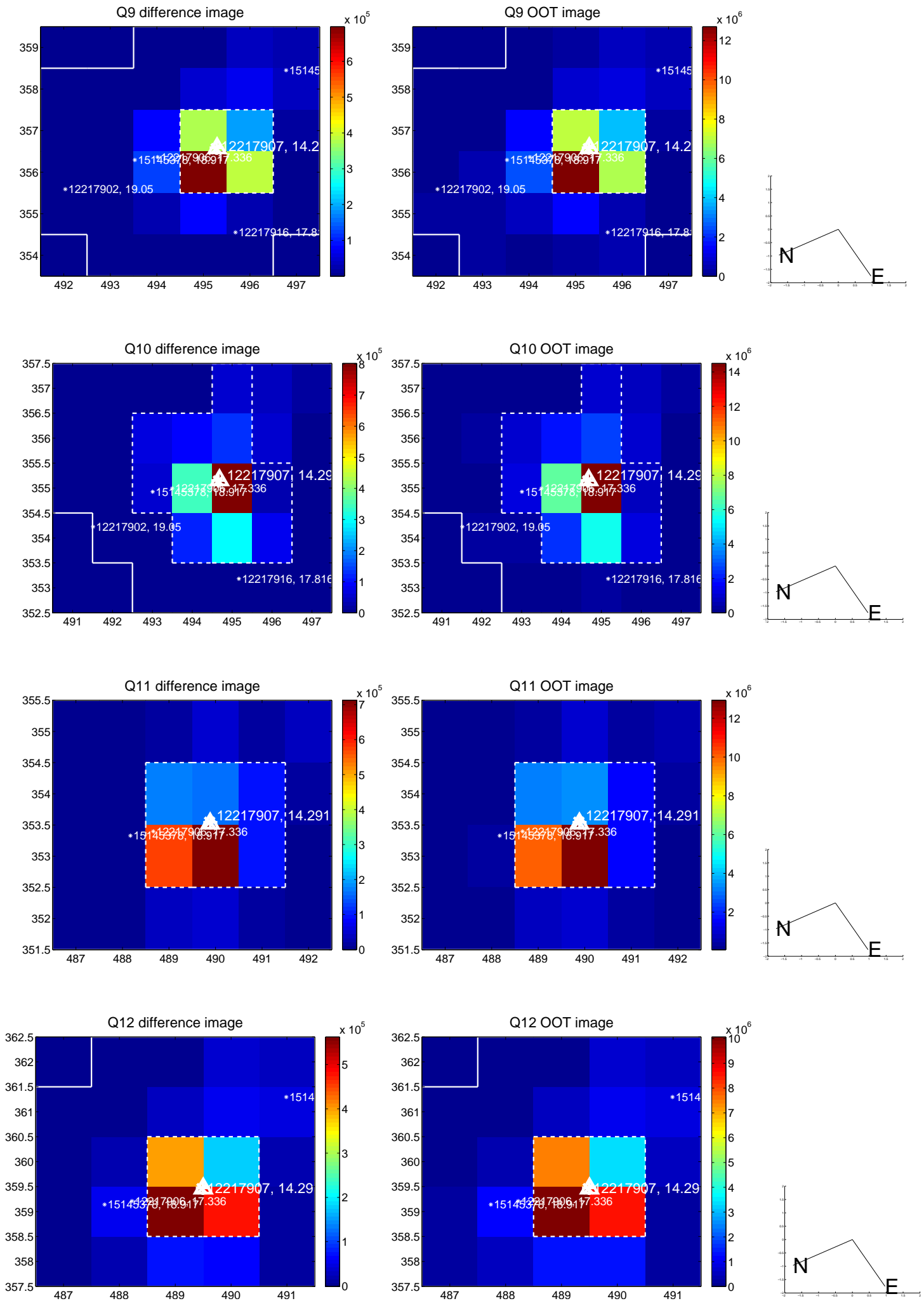
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



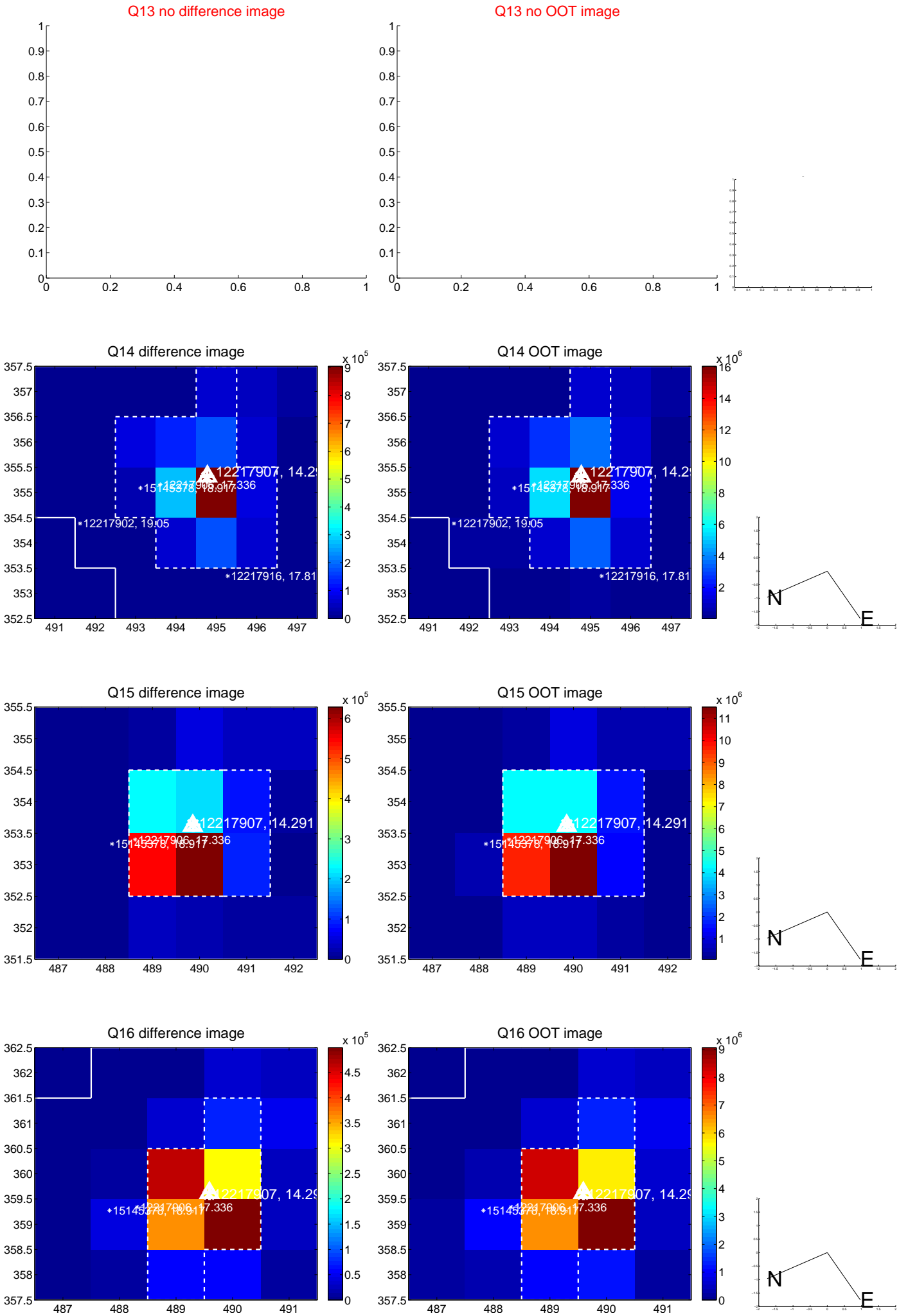
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



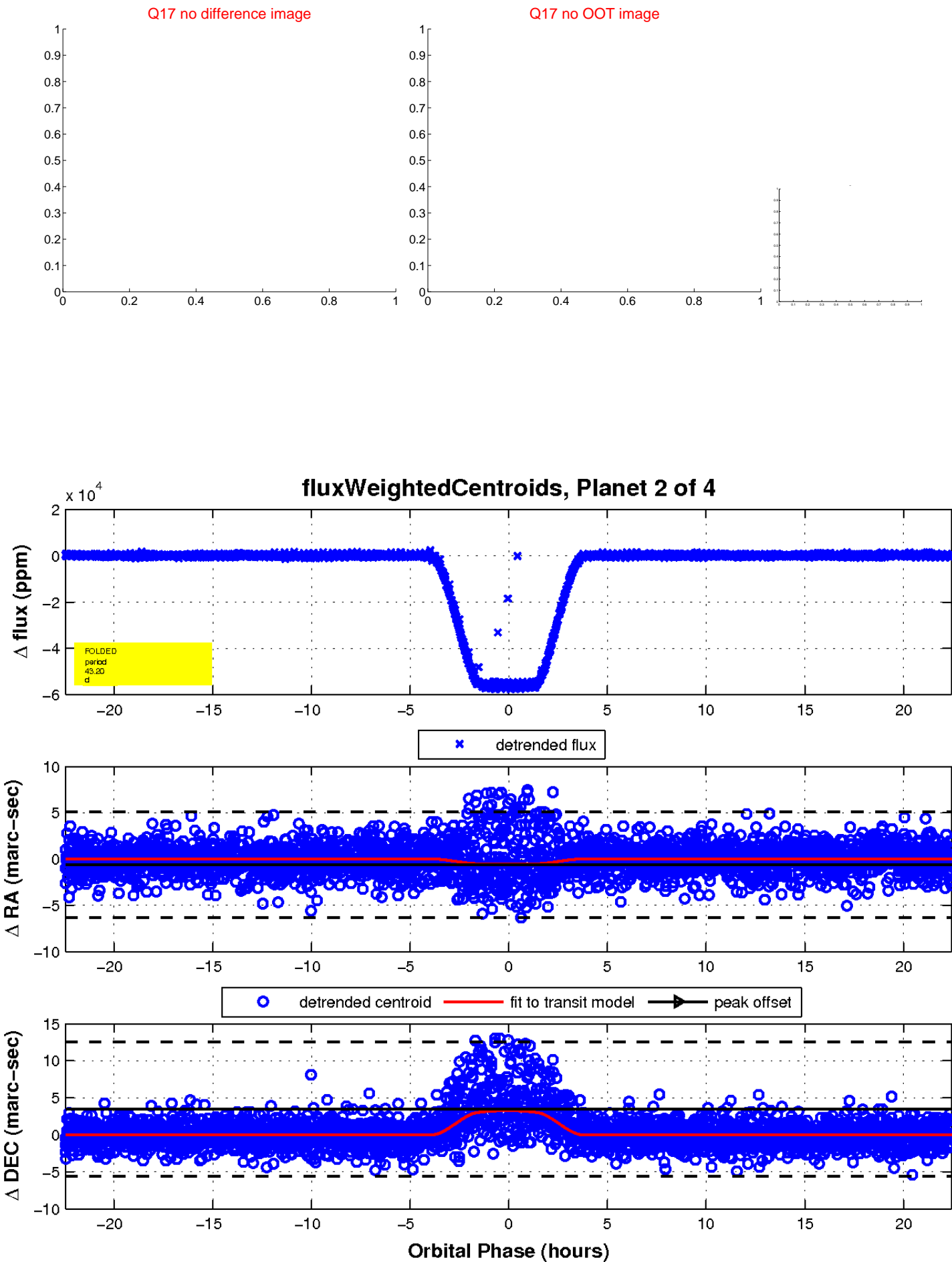
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

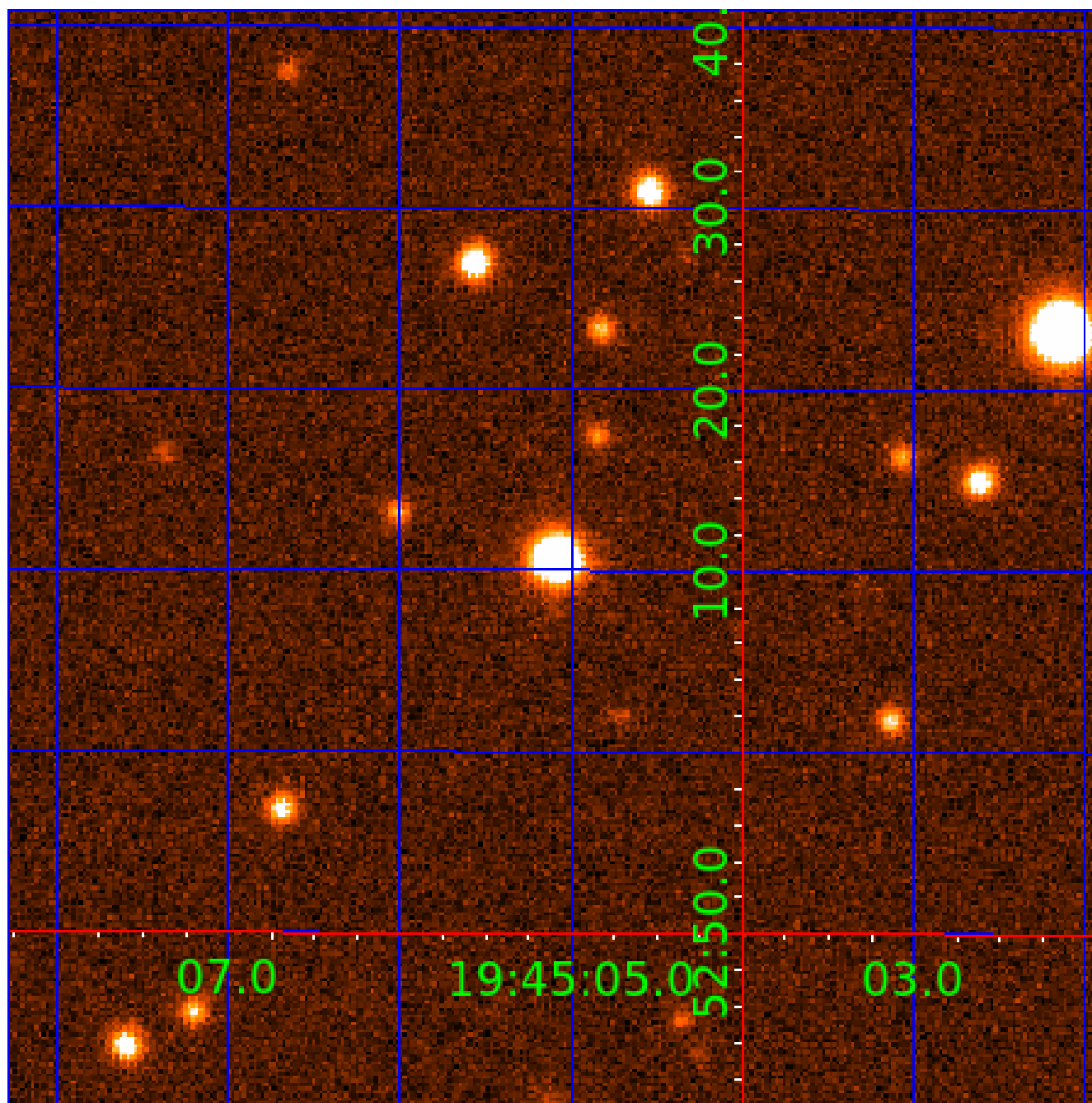


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 012217907

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})
012217907-01	OBS	7516.01	43.204590	146.597999	202473.7	15.037	9013.3	6216.7	0.93	6003	43.15	17.19
012217907-02	OBS	No	43.204594	160.912558	57054.7	7.489	2094.1	1498.4	0.93	6003	23.36	17.19
012217907-03	OBS	No	301.124361	304.213965	350.2	8.996	24.7	4.4	0.93	6003	1.84	1.29
012217907-04	OBS	No	441.722769	184.372953	964.5	17.531	11.5	12.3	0.93	6003	3.39	0.78

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012217907-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—MOD_ODDEVEN_DV—MOD_ODDEVEN_ALT—HAS_SEC_TCE
012217907-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
012217907-03	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
012217907-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

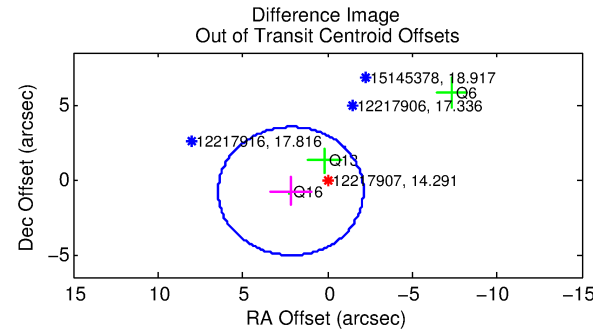
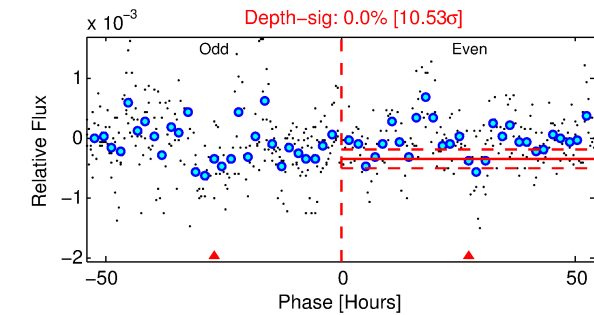
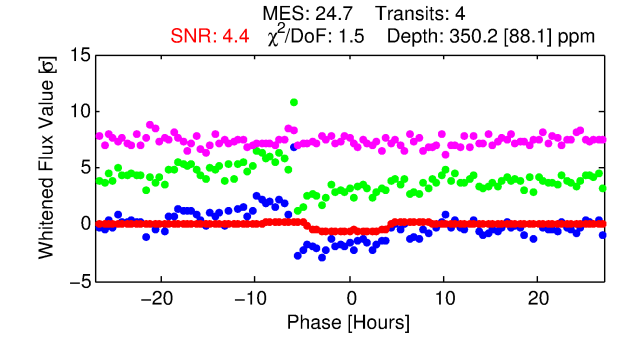
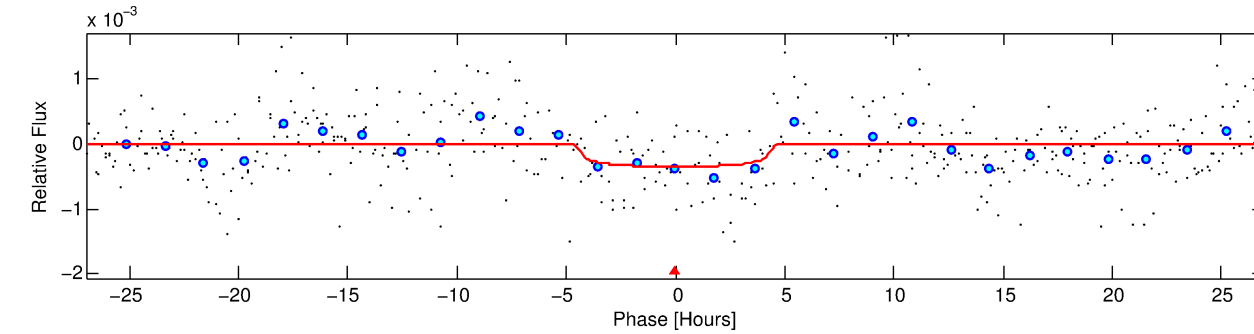
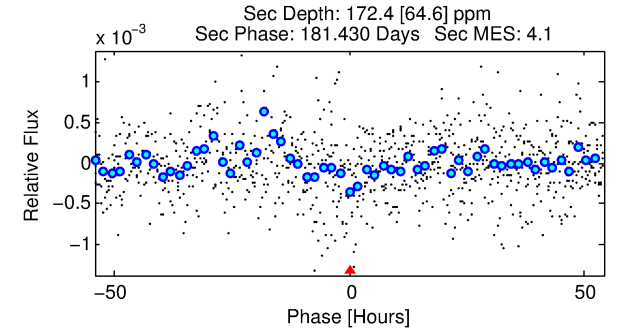
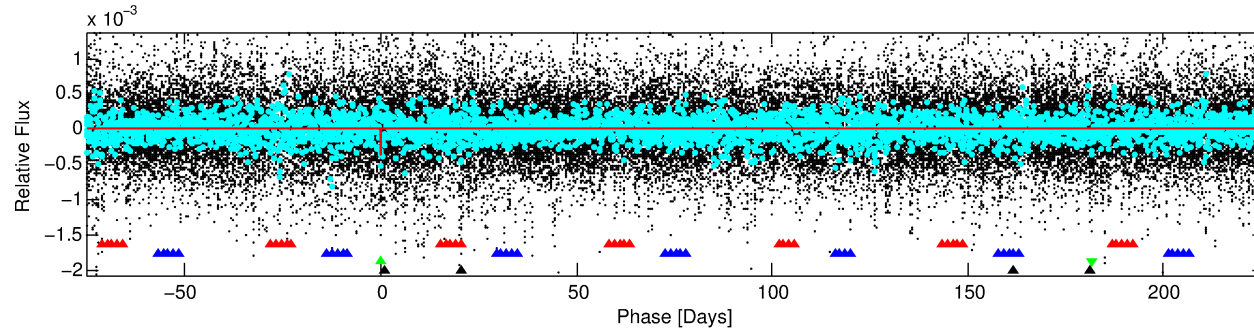
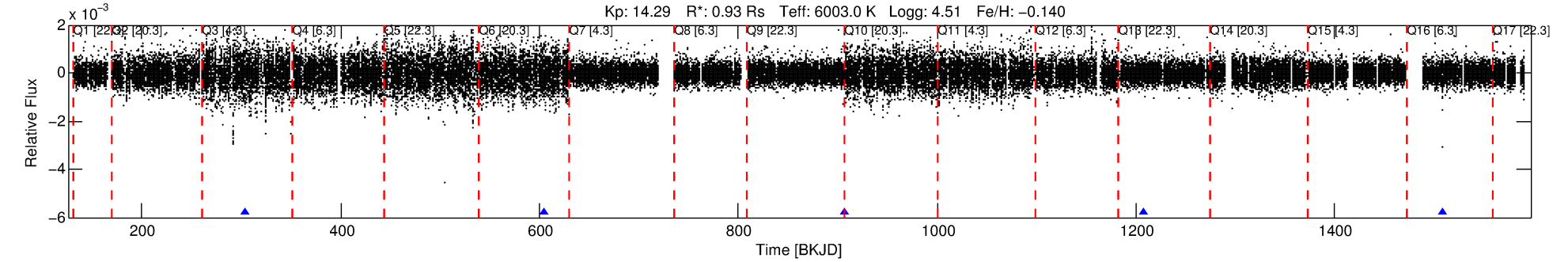
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012217907-03

No Significant Match Found

DV One-Page Summary

KIC: 12217907 Candidate: 3 of 4 Period: 301.124 d
KOI: K07516 Corr: No Ephemeris Match



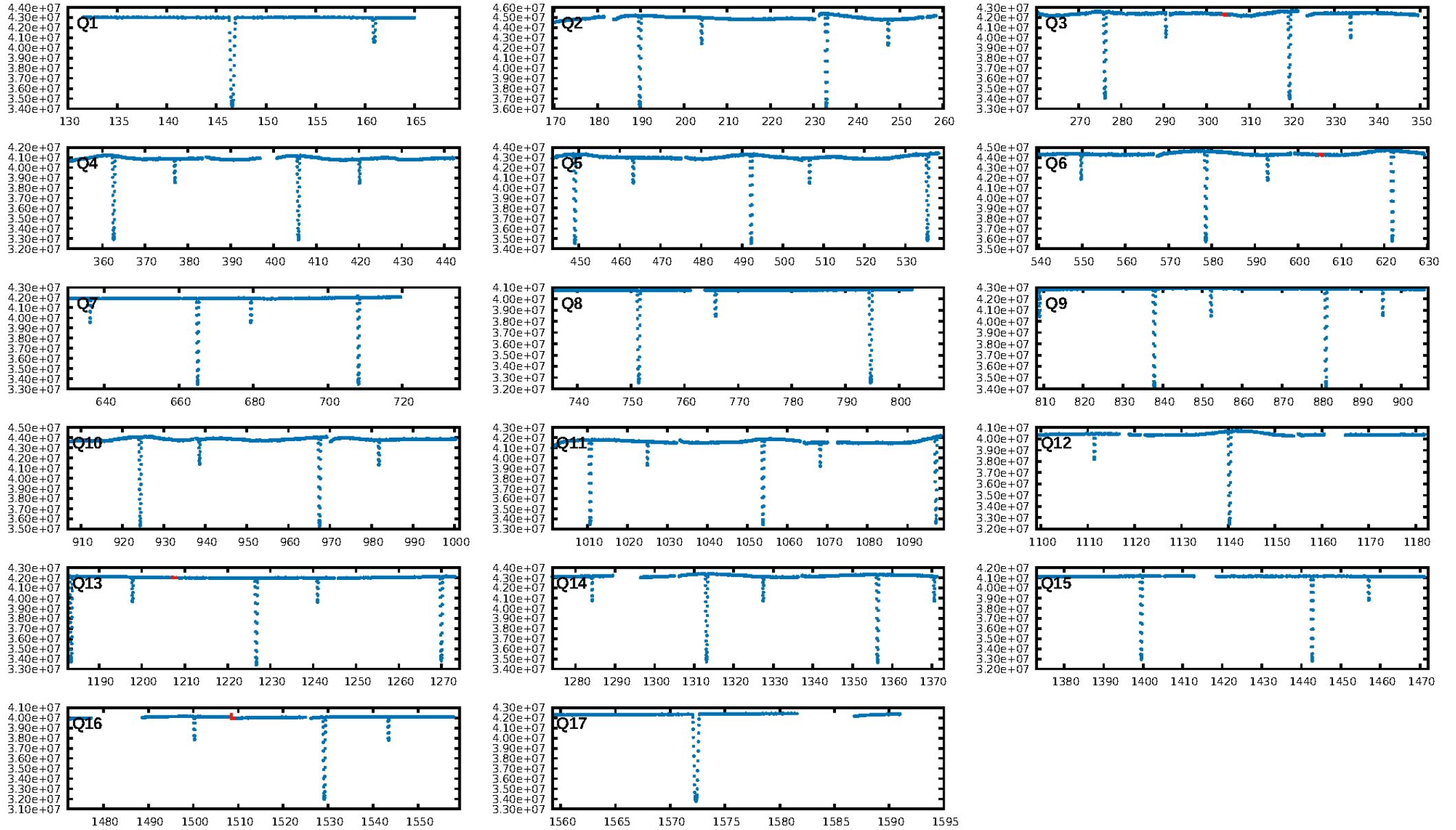
DV Fit Results:

Period = 301.12436 [0.01062] d
Epoch = 304.2140 [0.0323] BKJD
Rp/R* = 0.0181 [0.0331]
a/R* = 200.63 [1772.98]
b = 0.65 [7.95]
Seff = 1.29 [0.57]
Teff = 272 [30] K
Rp = 1.84 [3.42] Re
a = 0.8847 [0.2489] AU
Ag = 21945.73 [81337.62] [0.27 σ]
Teffp = 5115 [4714] K [1.03 σ]

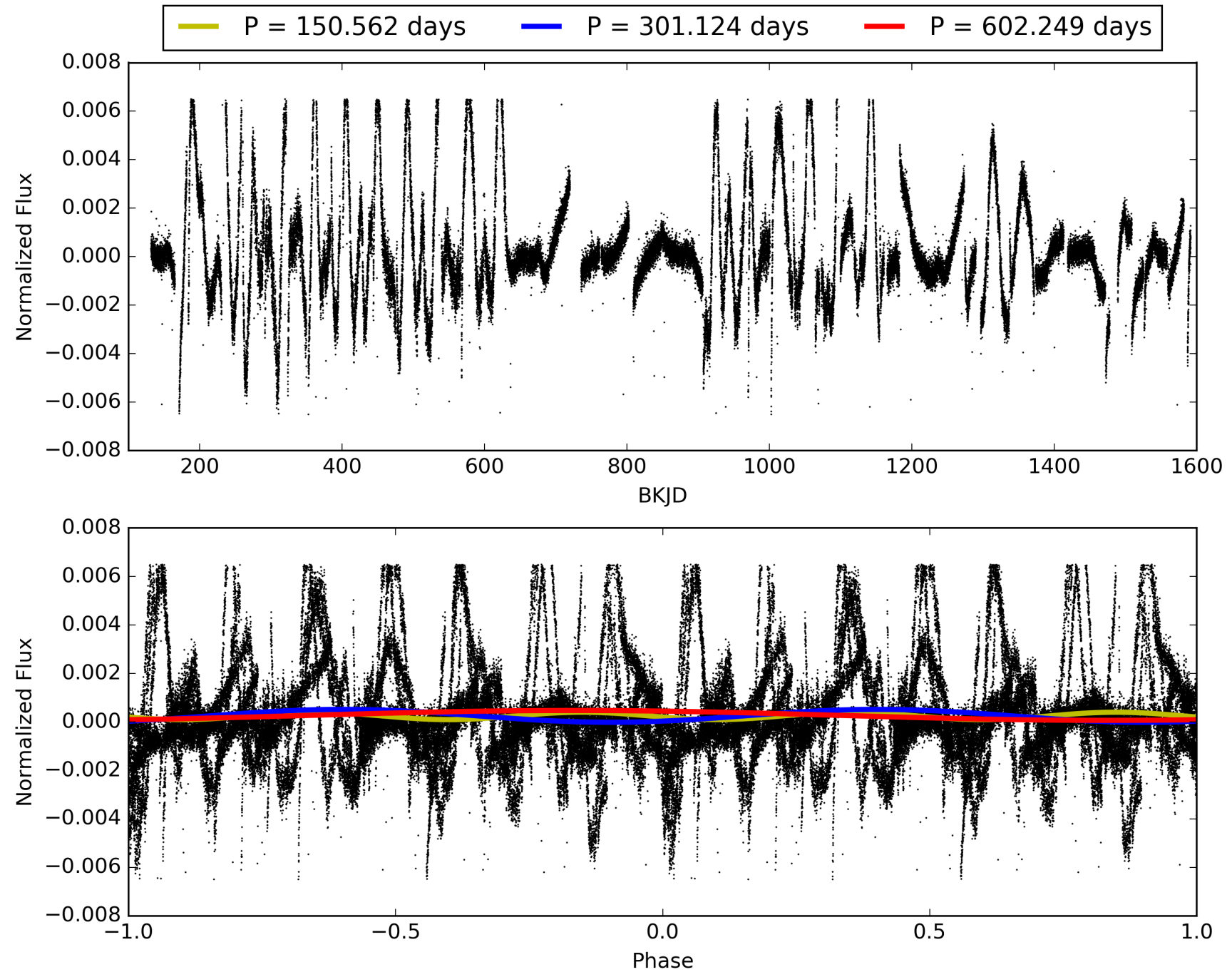
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [528.86 σ]
LongPeriod-sig: 100.0% [171.25 σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 97.9%
Bootstrap-pfa: 1.31e-64
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 9.662
Centroid-sig: 18.0%
Centroid-so: 2.732 arcsec [1.56 σ]
OotOffset-rm: 2.292 arcsec [1.60 σ]
KicOffset-rm: 2.253 arcsec [0.79 σ]
OotOffset-st: 1/0/1/1 [3]
KicOffset-st: 1/0/1/1 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 0.75 [3/4]

TCE 012217907-03, PDC Light Curves

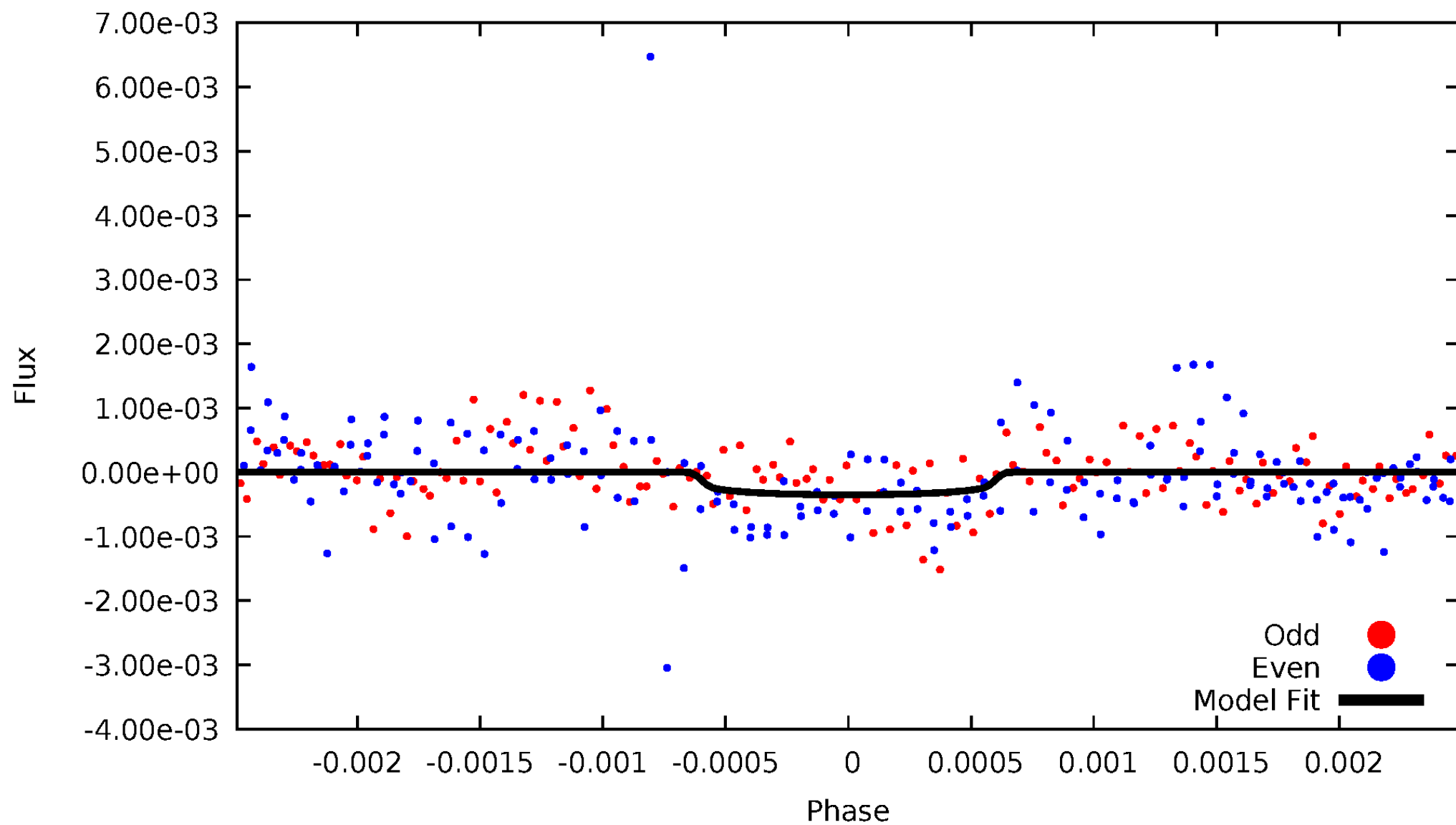


TCE 012217907-03



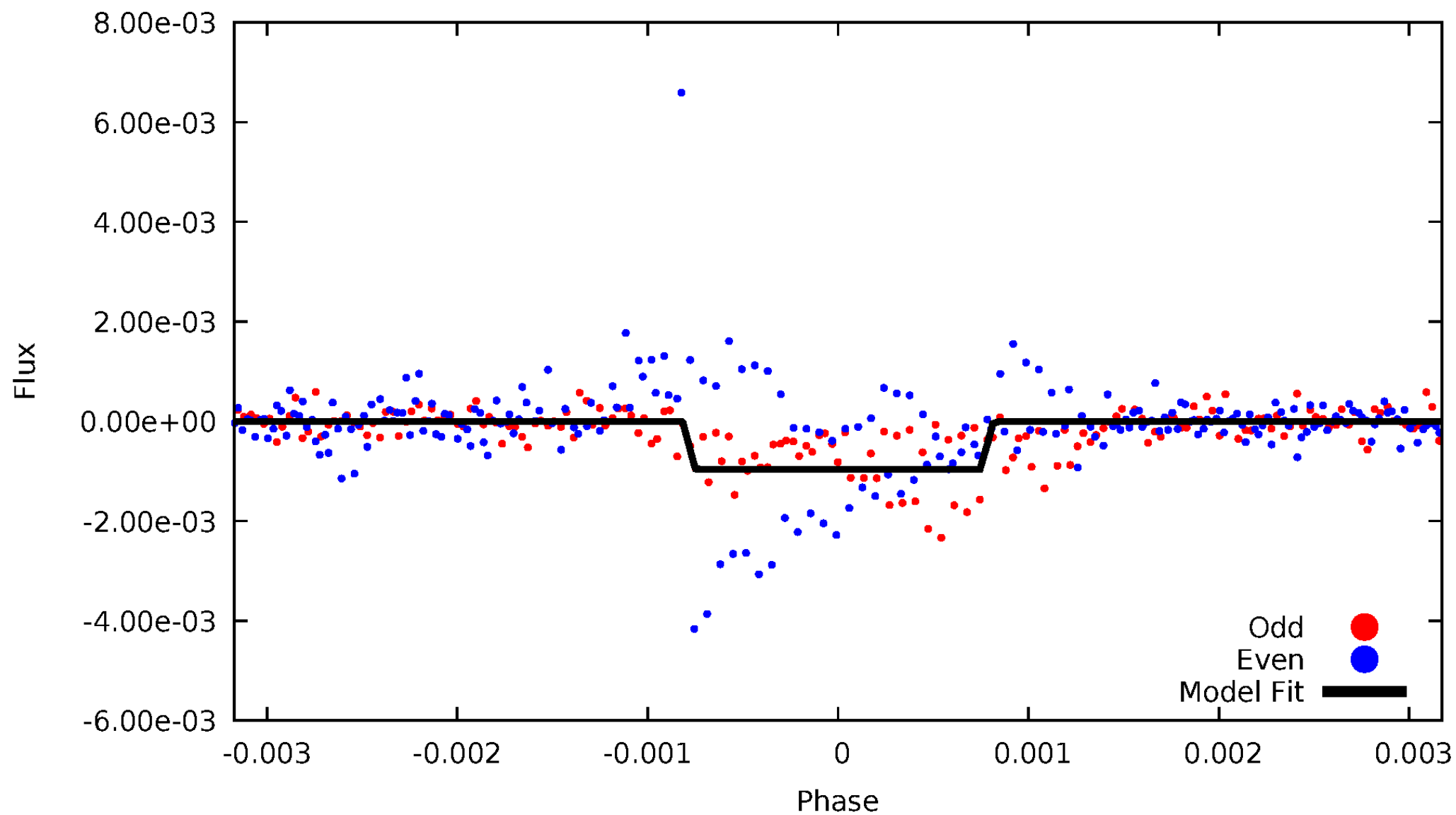
DV Odd/Even

TCE 012217907-03



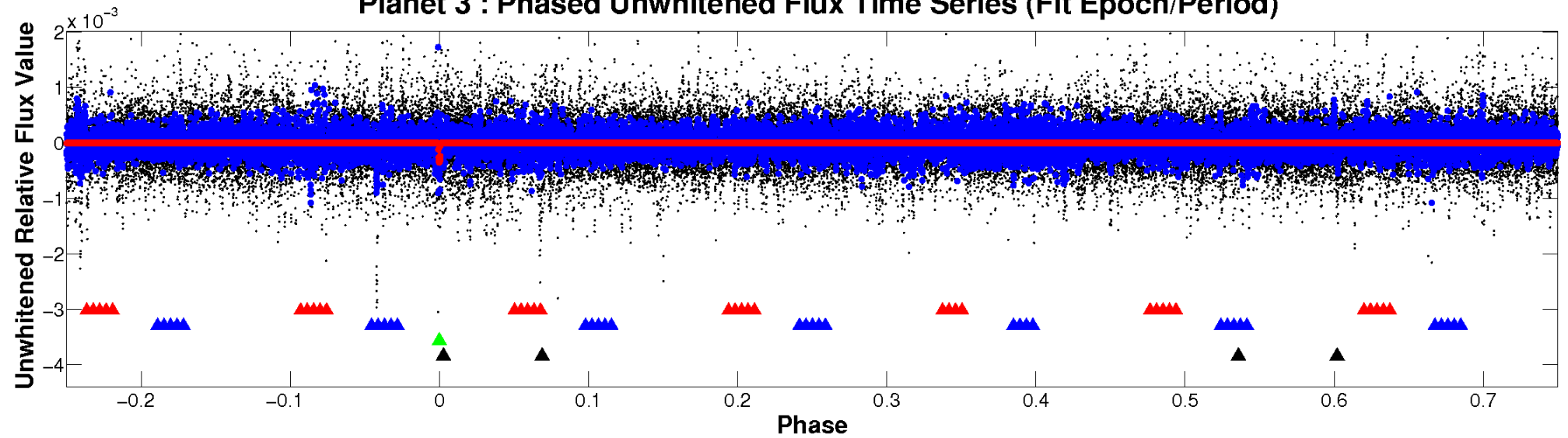
ALT Odd/Even

TCE 012217907-03

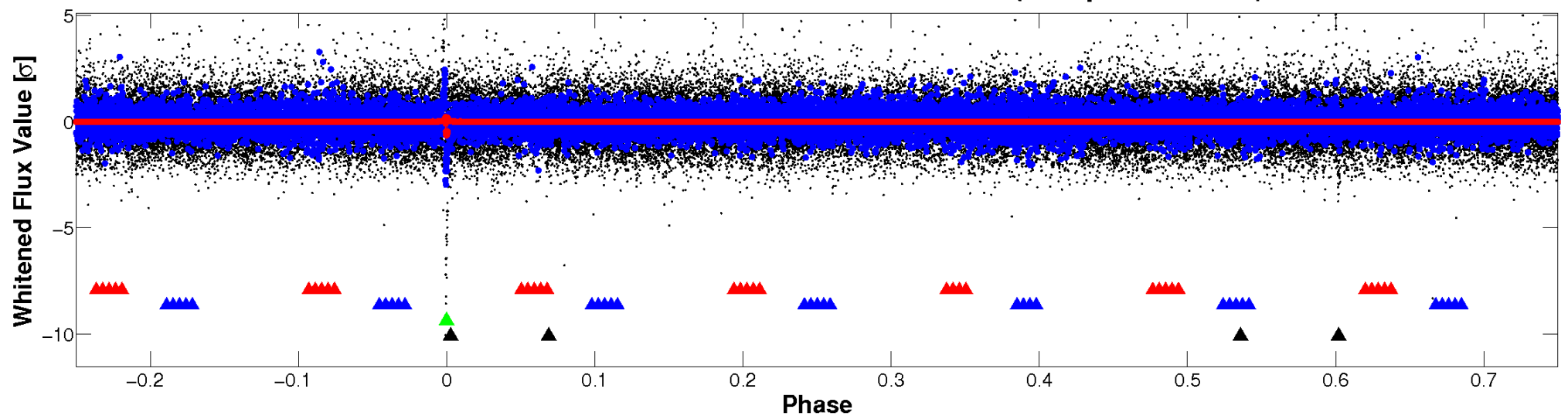


Non-Whitened Vs. Whitened Light Curve

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

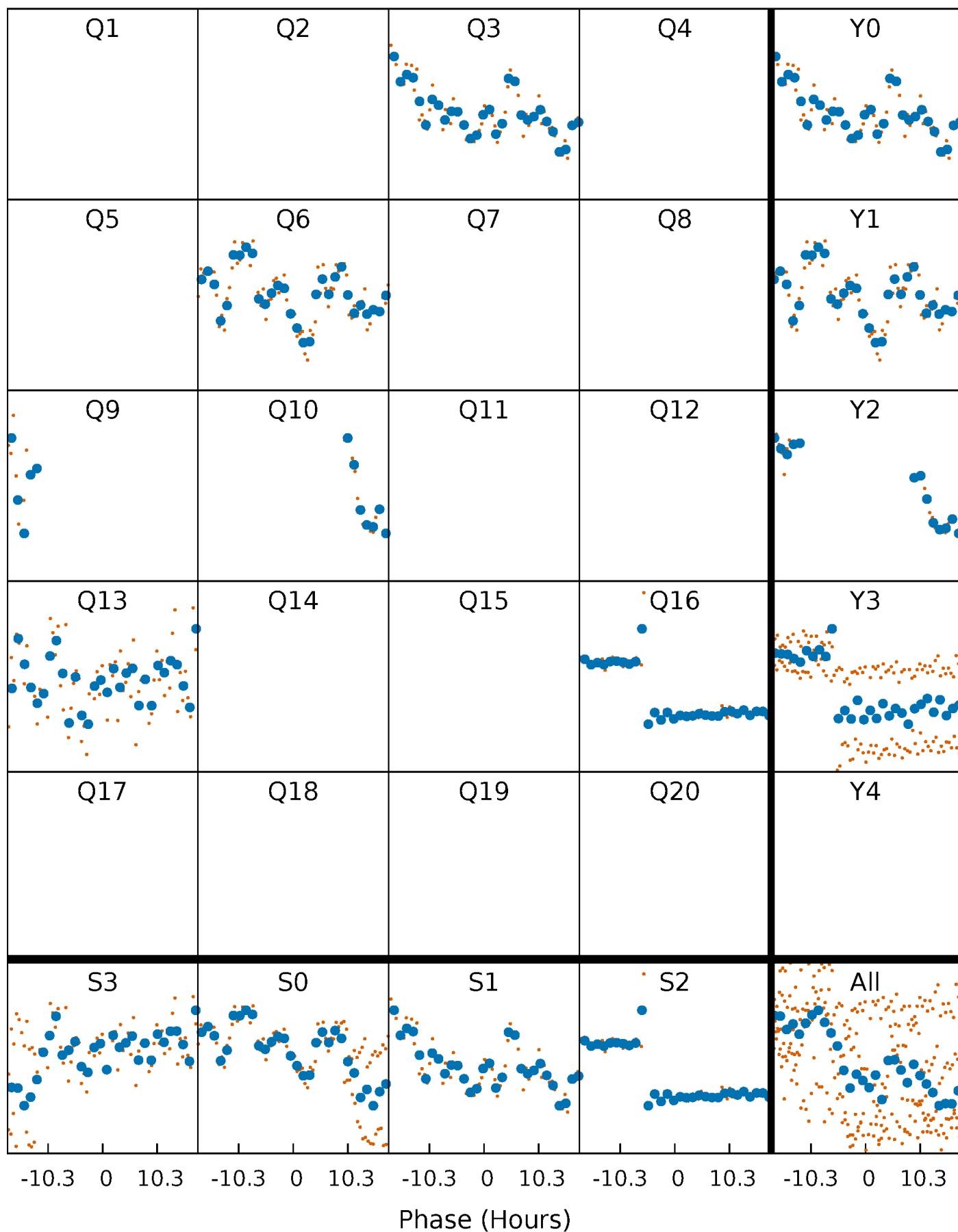


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



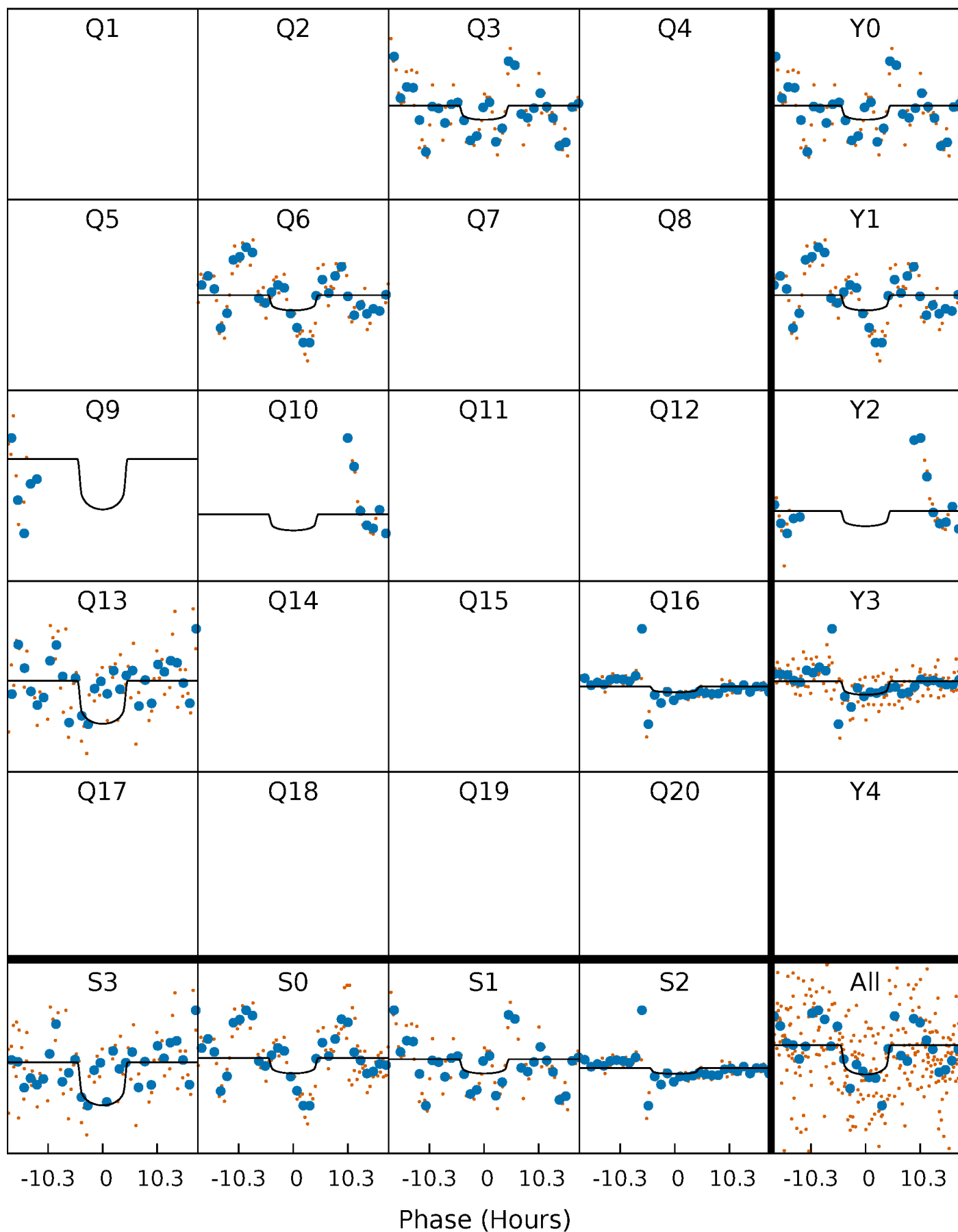
PDC Quarter-Phased Transit Curves

TCE 012217907-03 $P=301.124361$ Days $T_0=304.213965$ (BKJD)



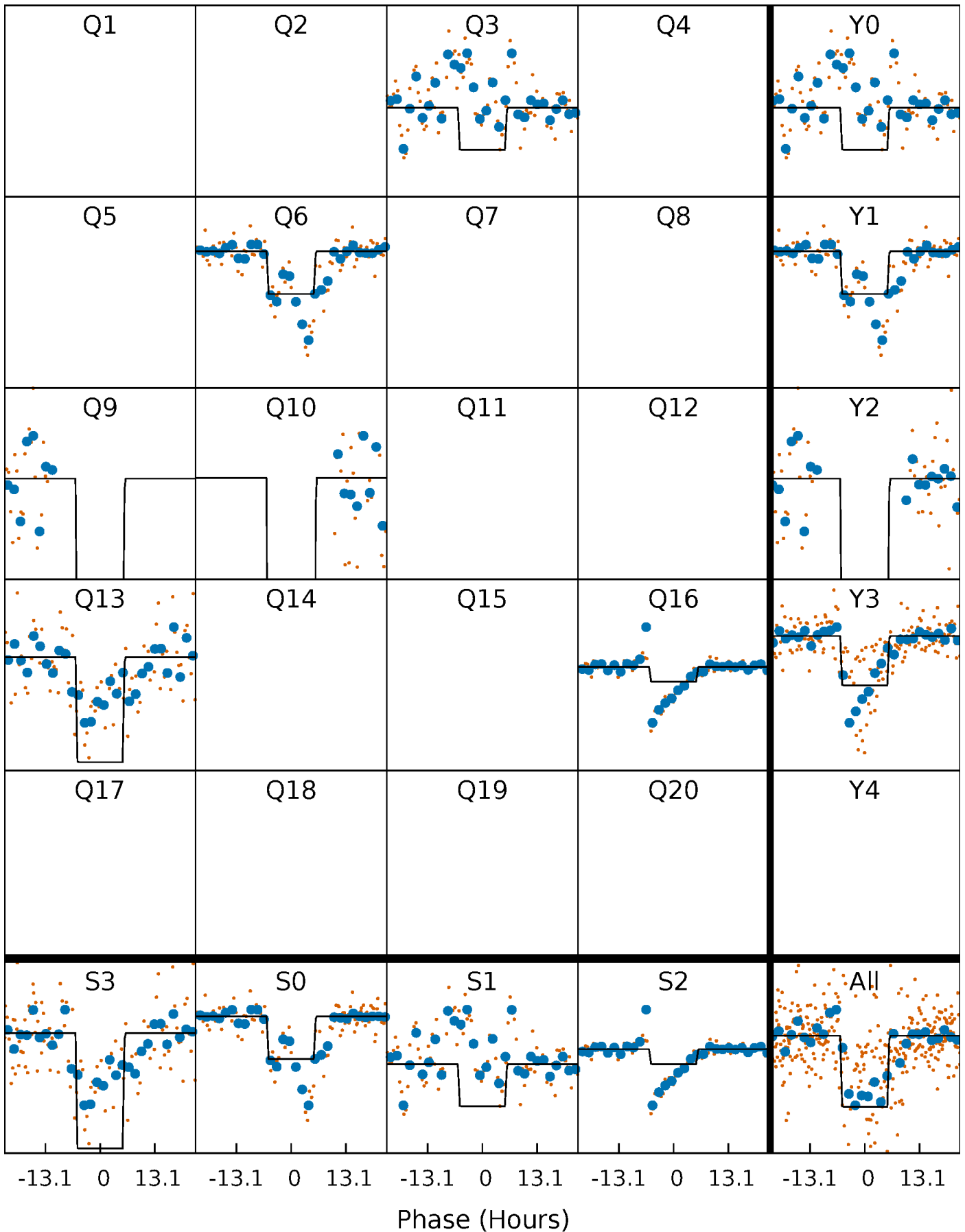
DV Quarter-Phased Transit Curves

TCE 012217907-03 $P=301.124361$ Days $T_0=304.213965$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

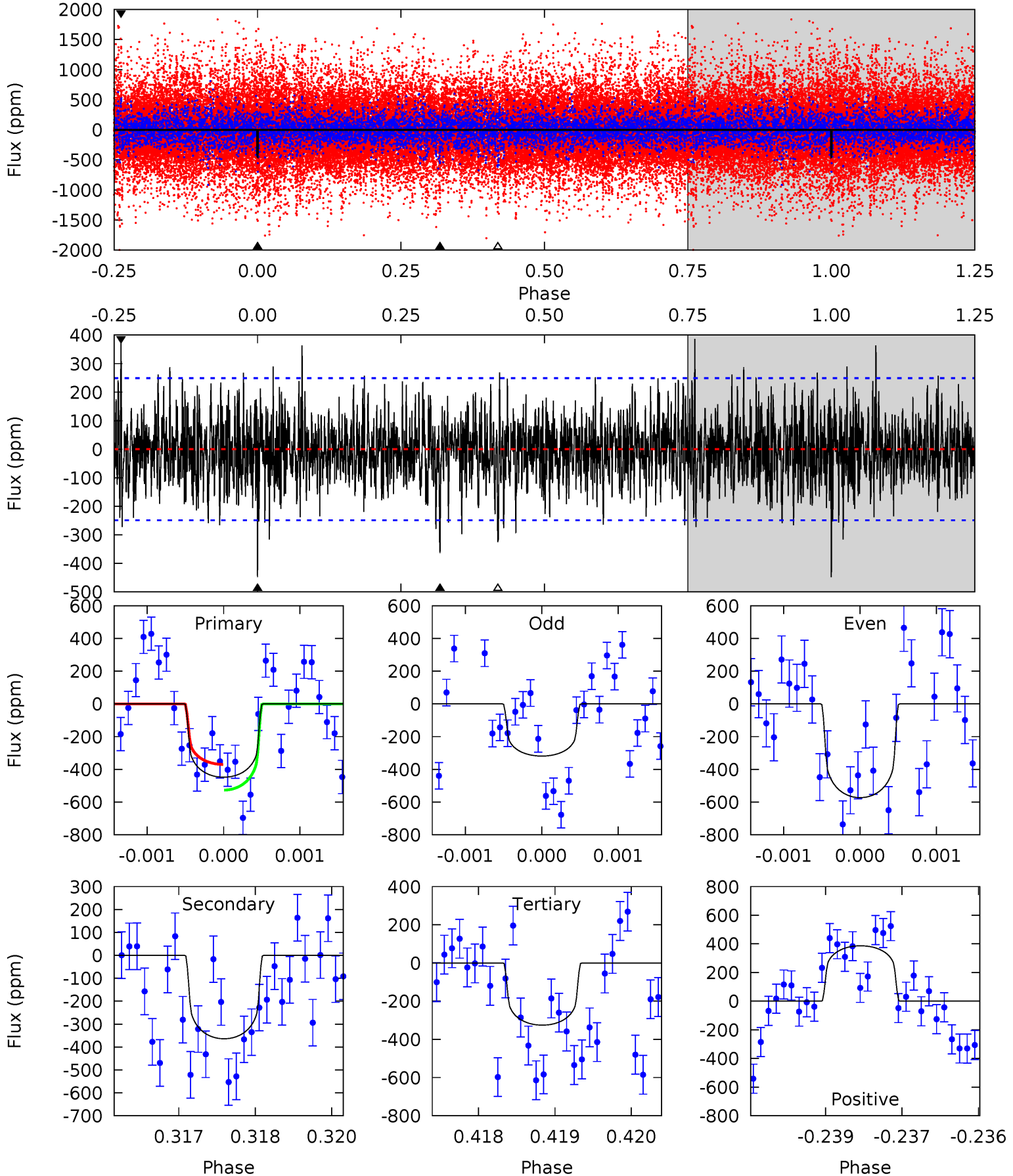
TCE 012217907-03 $P=301.142996$ Days $T_0=304.144469$ (BKJD)



DV Model-Shift Uniqueness Test

012217907-03, P = 301.124361 Days, E = 3.089604 Days

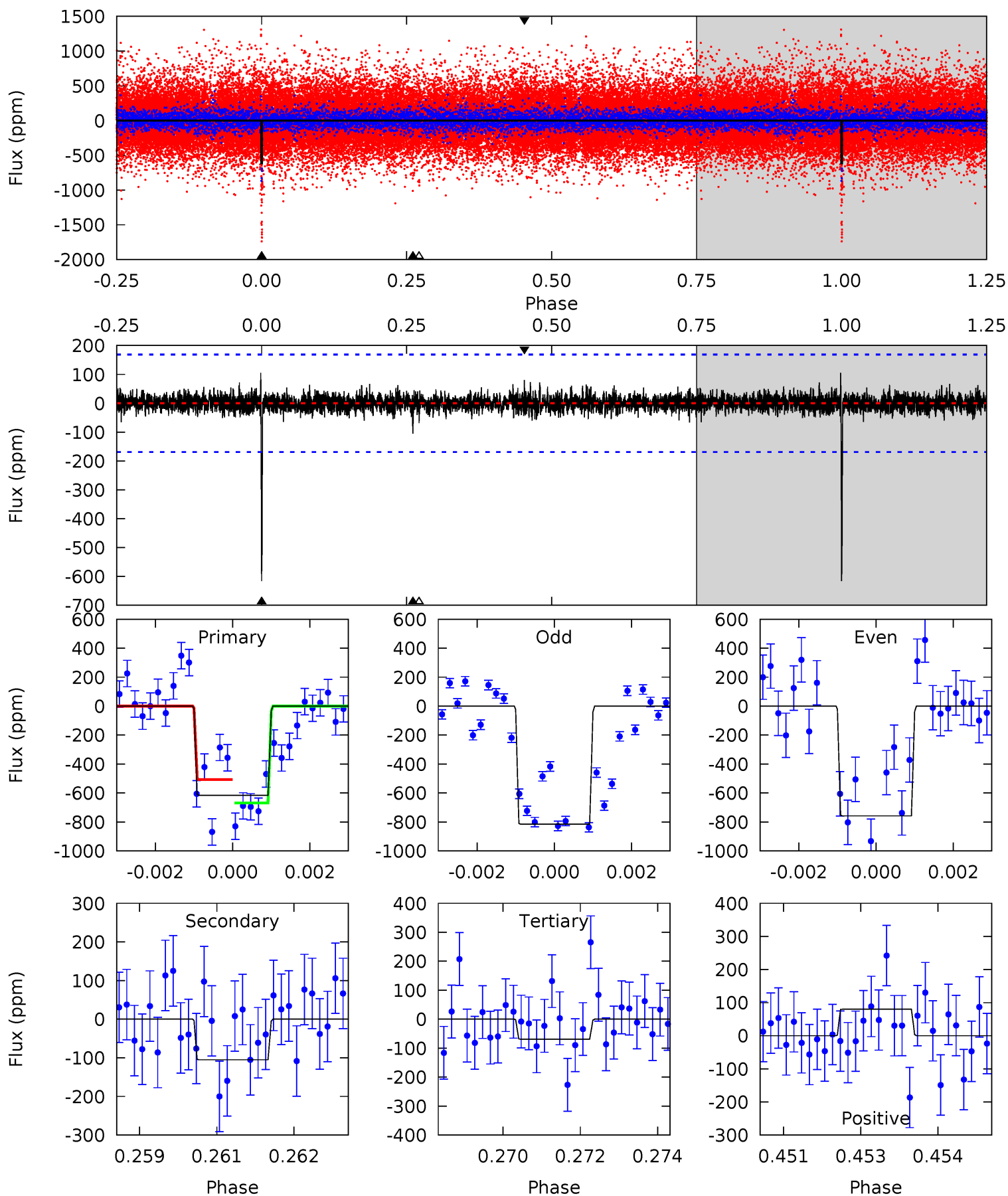
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.74	7.91	7.07	8.40	5.41	3.22	1.98	2.66	1.33	0.84	-0.49	2.73	0.87	0.46	1.71



Alt Model-Shift Uniqueness Test

012217907-03, P = 301.142996 Days, E = 3.001473 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.6	3.34	2.18	2.54	5.36	3.15	0.56	17.4	17.0	1.15	0.79	1.04	1.01	0.15	2.53



Stellar Parameters For KIC 012217907

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6003^{+188}_{-230}	$4.507^{+0.054}_{-0.229}$	$-0.140^{+0.300}_{-0.300}$	$0.932^{+0.307}_{-0.082}$	$1.019^{+0.142}_{-0.142}$	$1.772^{+0.401}_{-0.992}$
	+3%/-4%	+1%/-5%	+214%/-214%	+33%/-9%	+14%/-14%	+23%/-56%
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 012217907-03 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-364 ± 46	$3.23^{+3.20}_{-2.17}$	387^{+27}_{-20}	4821^{+3556}_{-1053}	$14215^{+121729}_{-10556}$
Alt.	-105 ± 31	$3.88^{+3.37}_{-2.65}$	388^{+28}_{-21}	3614^{+1941}_{-610}	2775^{+25153}_{-1959}

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 $A_{obs} \gg 1.0$

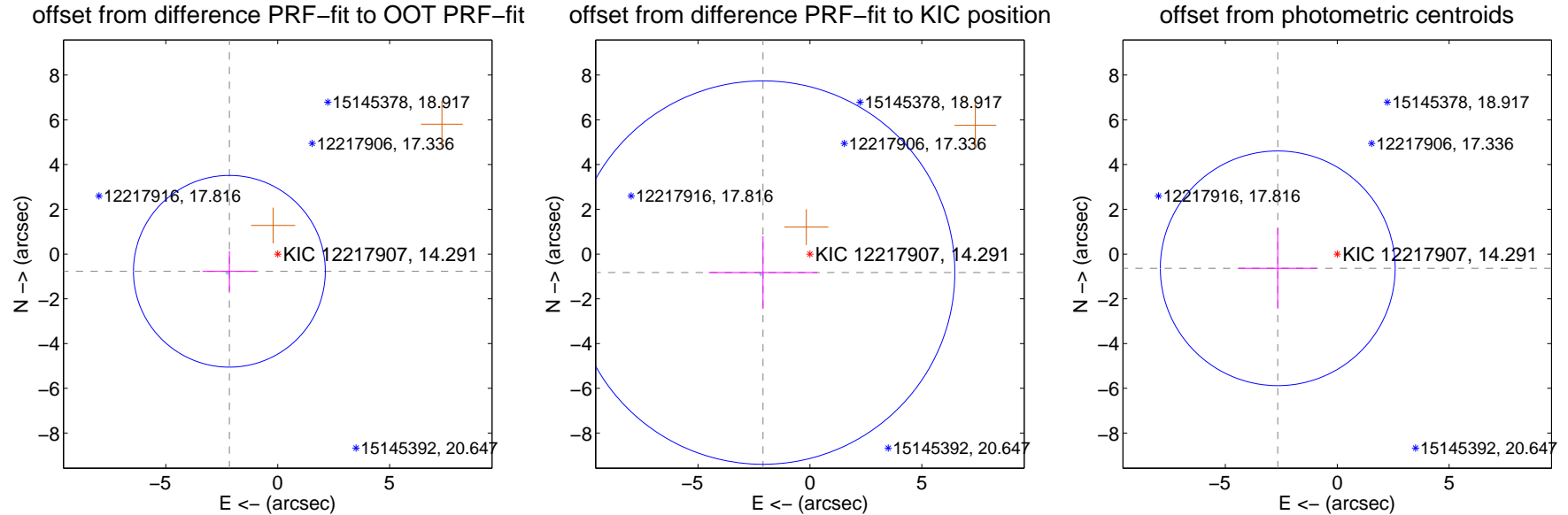
DV Centroid Data

Supplemental centroid analysis for 012217907-03. Kepler magnitude: 14.29. Transit SNR 4.39

There are 1 quarters with good PRF difference image offsets

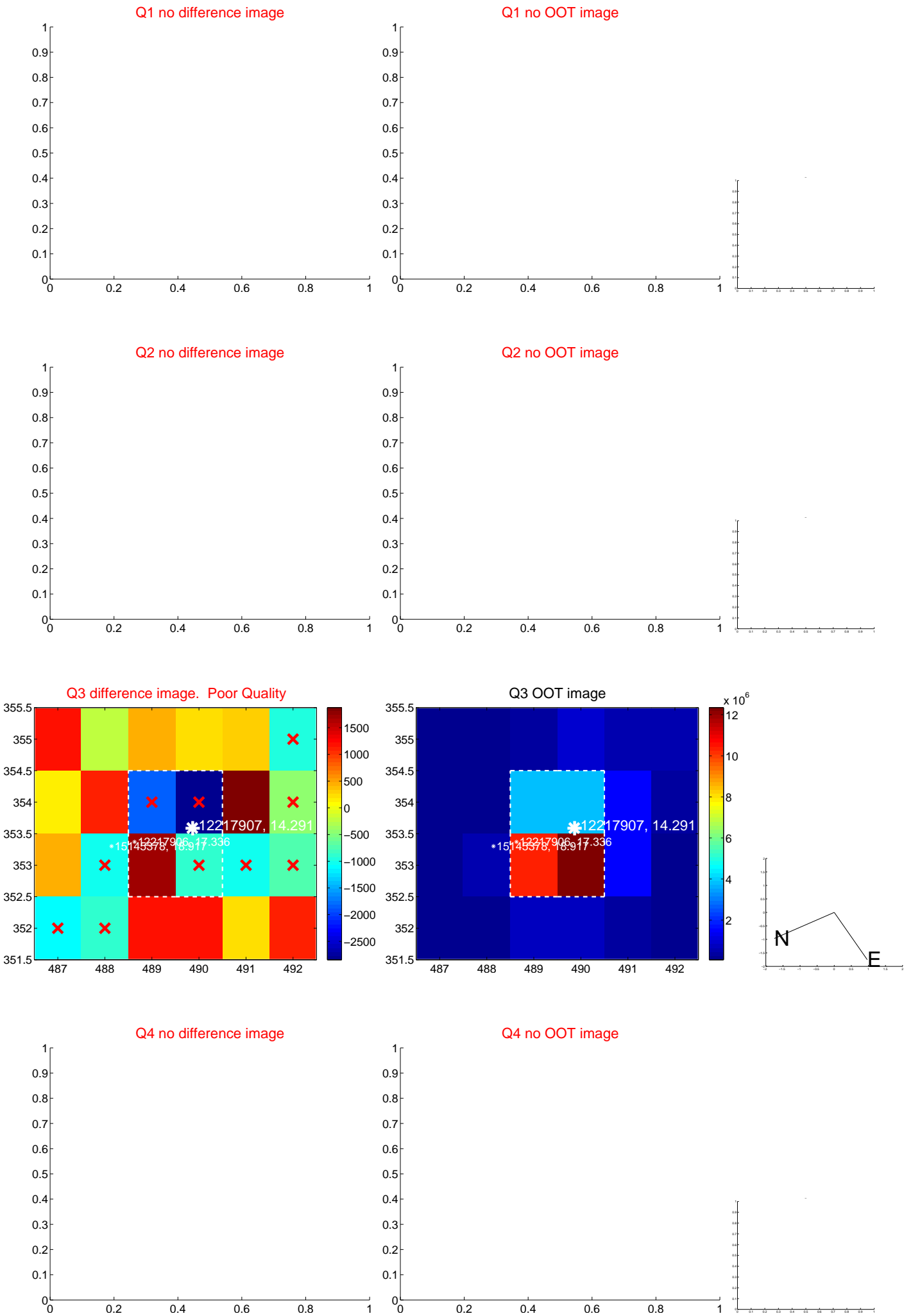
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.292 ± 1.428	1.60	2.159 ± 1.199	-0.770 ± 0.898
PRF-fit source offset from KIC position	2.253 ± 2.856	0.79	2.095 ± 2.430	-0.829 ± 1.628
photometric centroid source offset	2.73 ± 1.75	1.56	2.66 ± 1.74	-0.64 ± 1.81

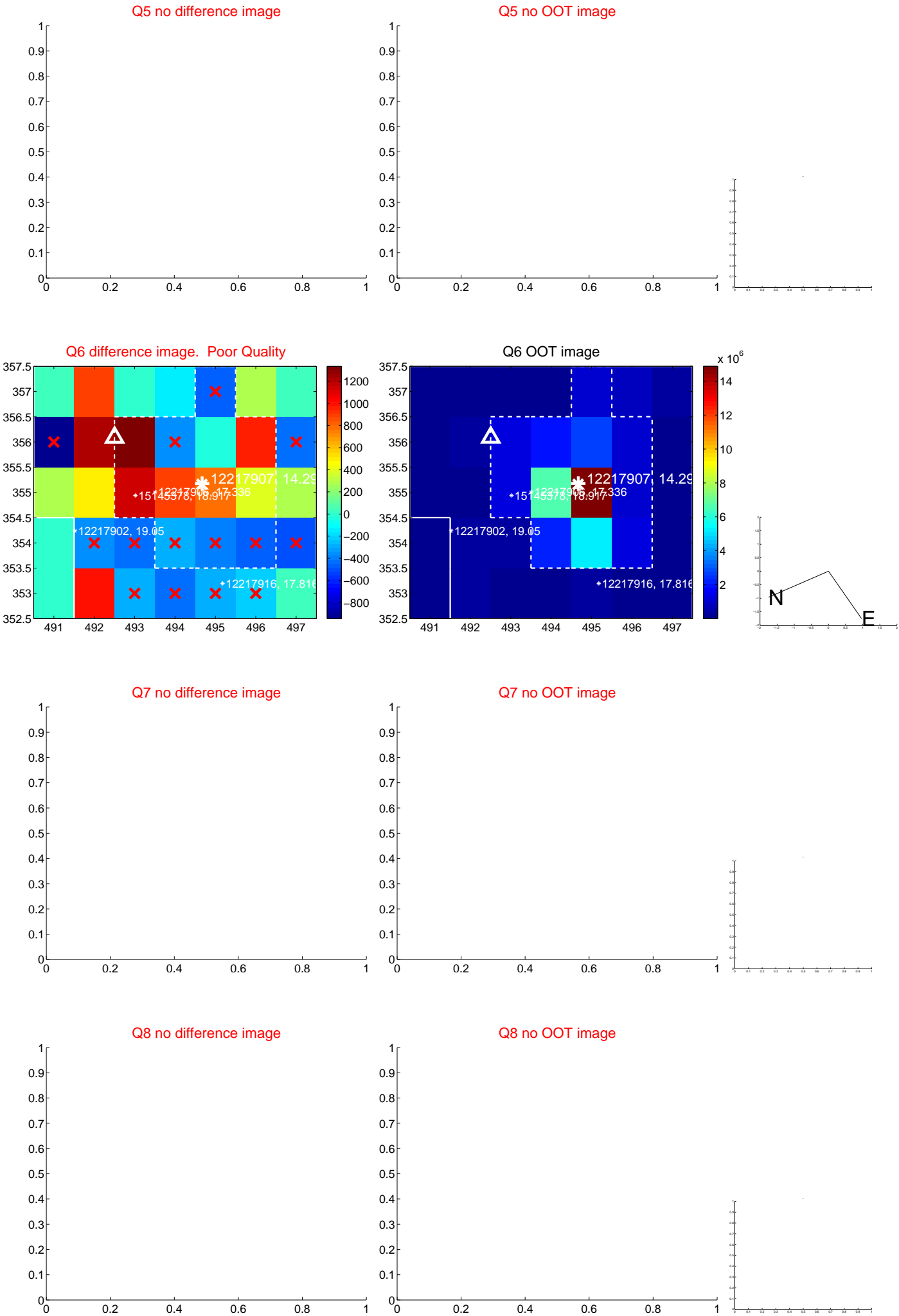


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

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



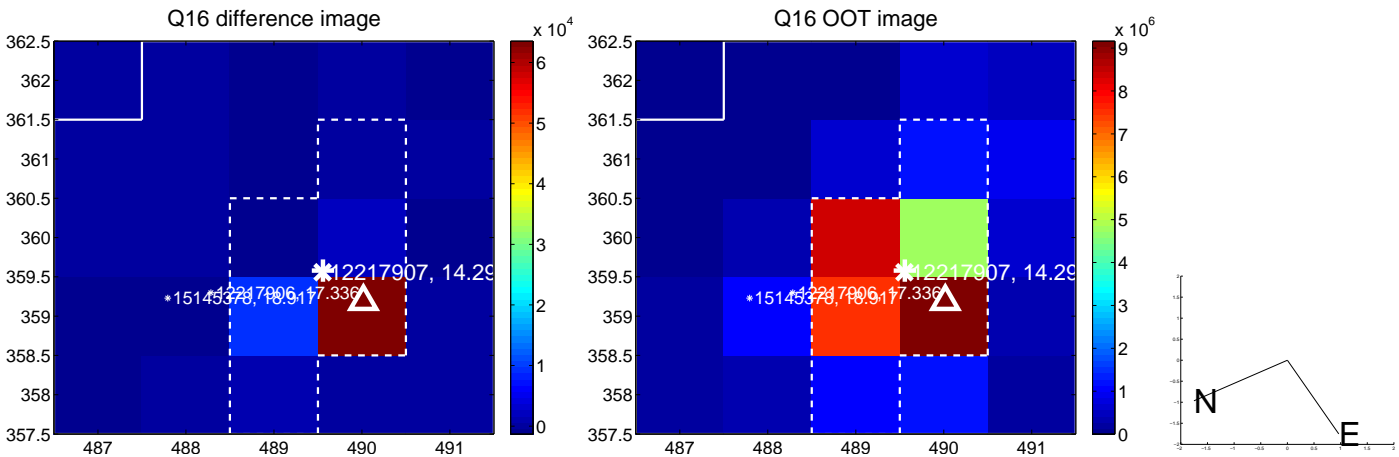
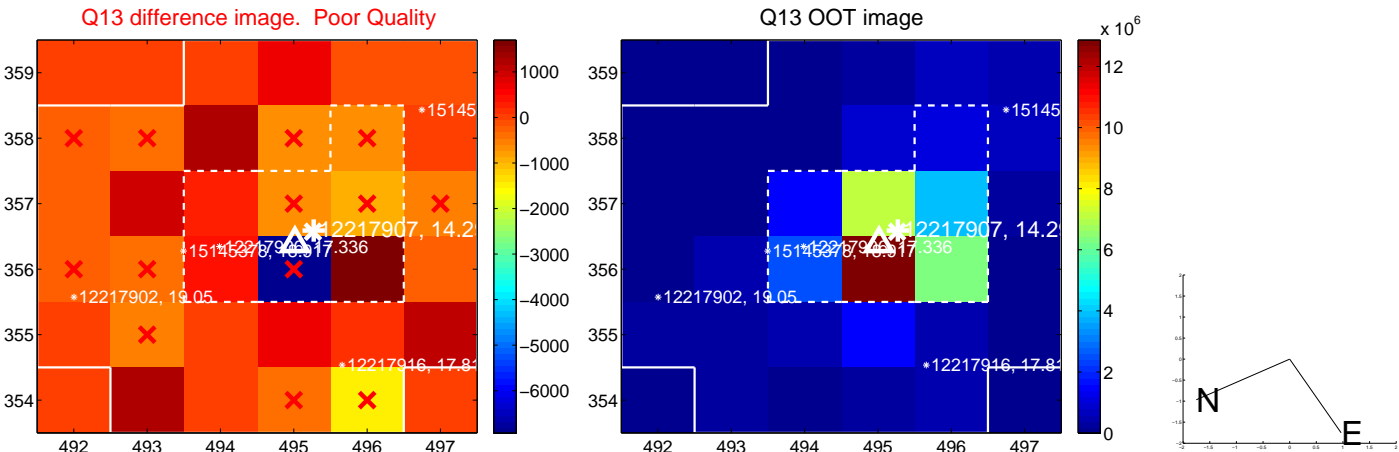
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



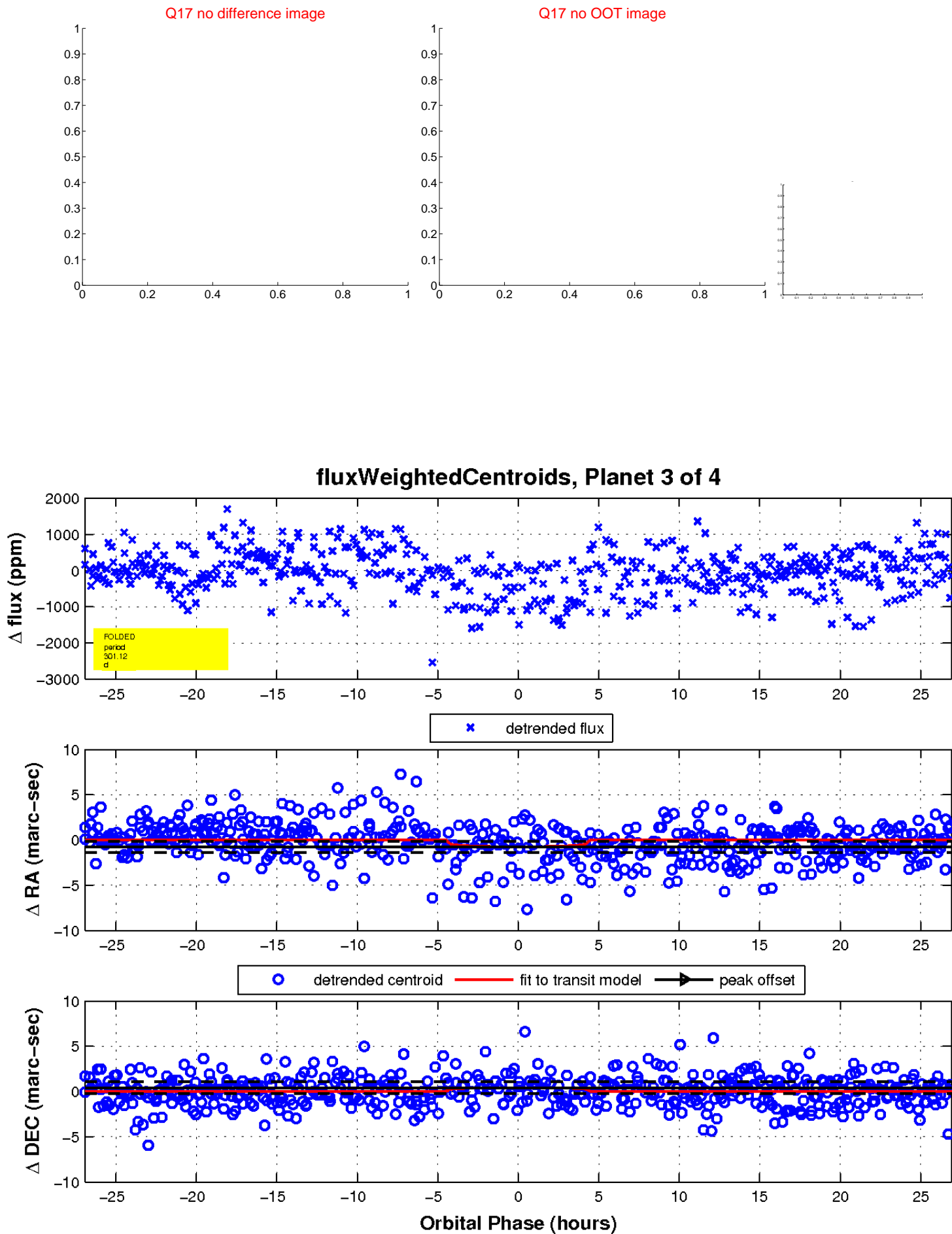
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

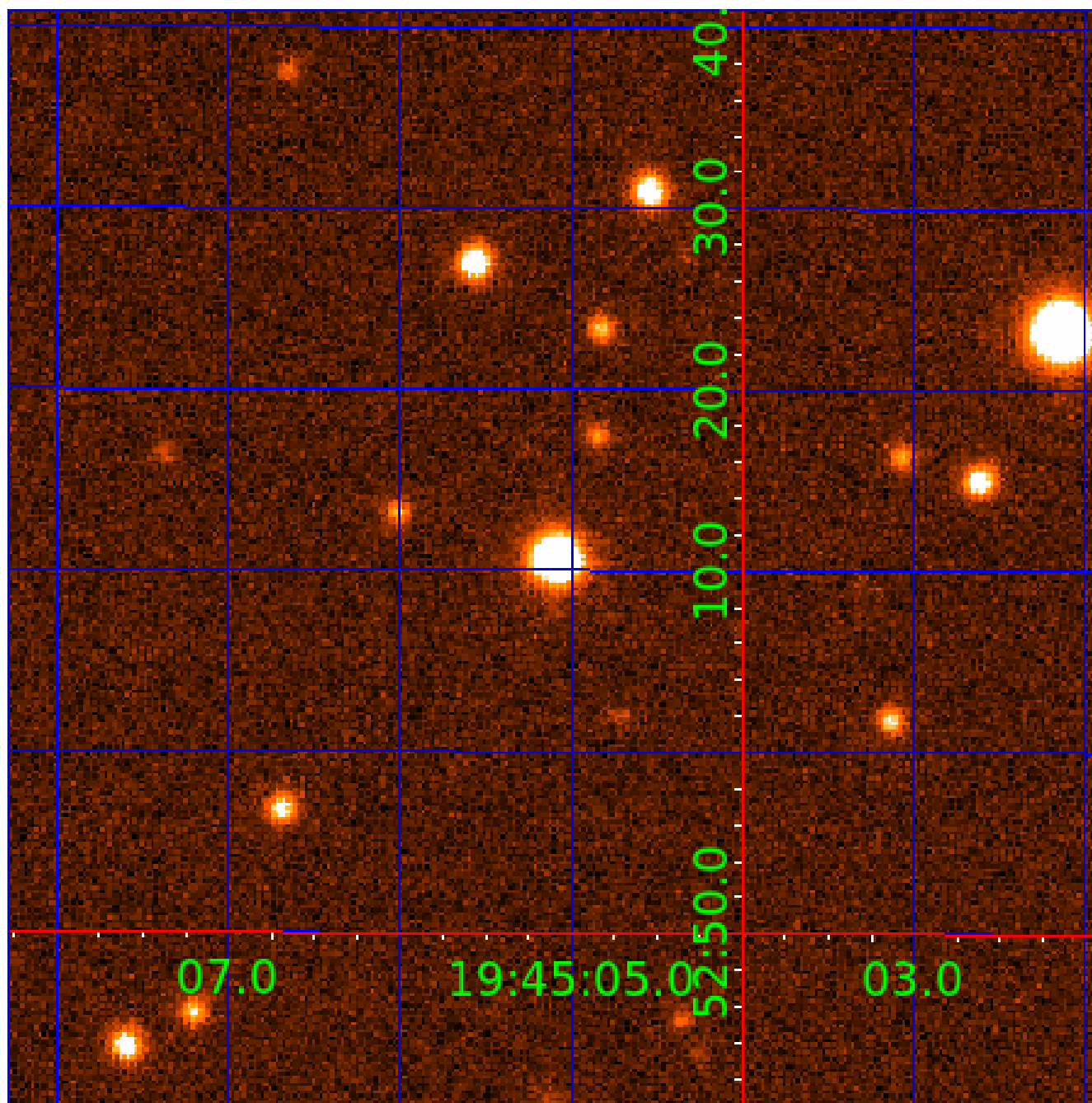


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 012217907

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})
012217907-01	OBS	7516.01	43.204590	146.597999	202473.7	15.037	9013.3	6216.7	0.93	6003	43.15	17.19
012217907-02	OBS	No	43.204594	160.912558	57054.7	7.489	2094.1	1498.4	0.93	6003	23.36	17.19
012217907-03	OBS	No	301.124361	304.213965	350.2	8.996	24.7	4.4	0.93	6003	1.84	1.29
012217907-04	OBS	No	441.722769	184.372953	964.5	17.531	11.5	12.3	0.93	6003	3.39	0.78

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012217907-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—MOD_ODDEVEN_DV—MOD_ODDEVEN_ALT—HAS_SEC_TCE
012217907-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
012217907-03	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
012217907-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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.

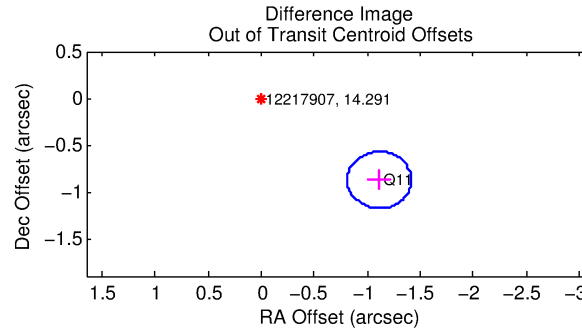
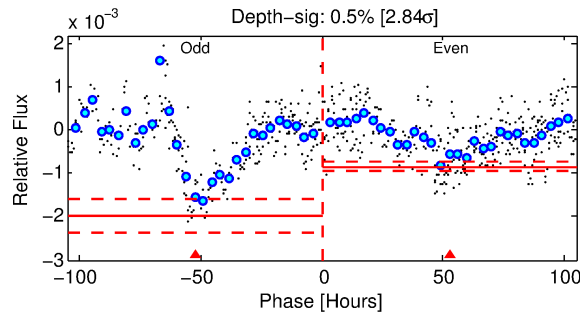
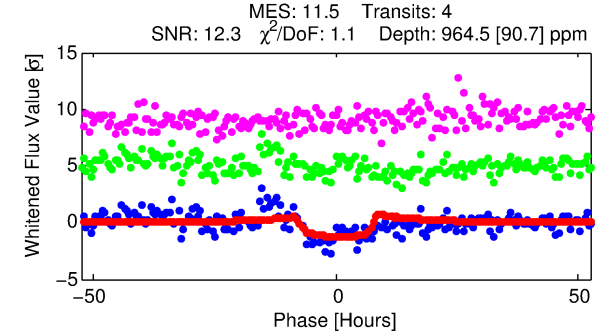
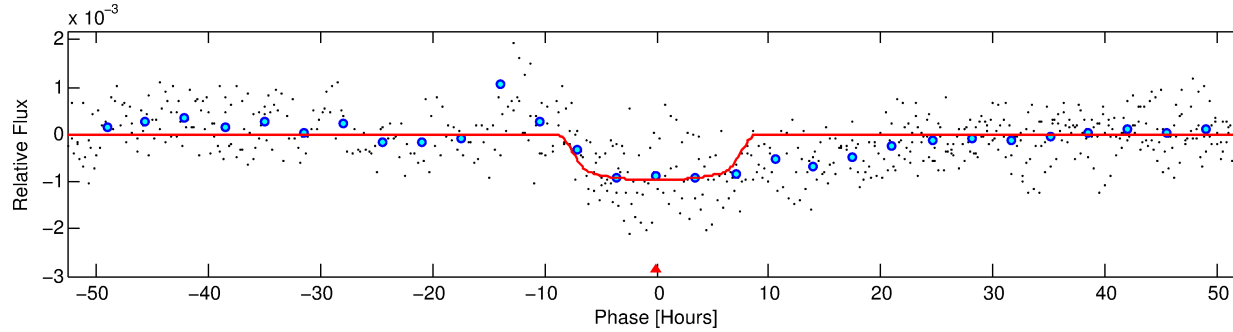
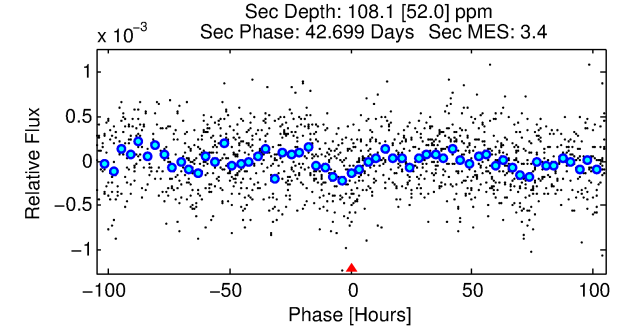
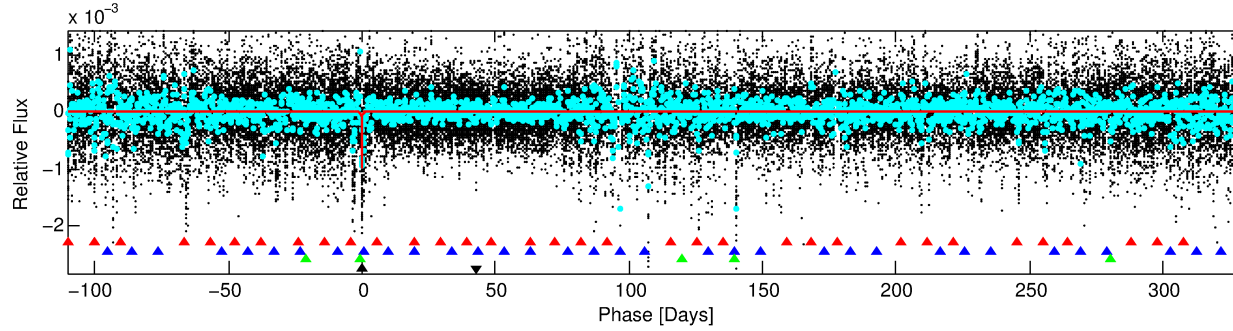
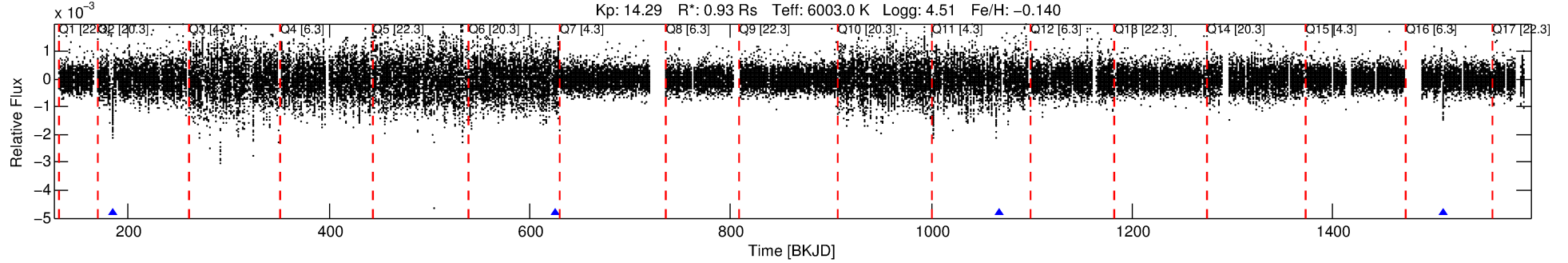
Ephemeris Match Information For 012217907-04

No Significant Match Found

DV One-Page Summary

KIC: 12217907 Candidate: 4 of 4 Period: 441.723 d
KOI: K07516 Corr: No Ephemeris Match

Kp: 14.29 R*: 0.93 Rs Teff: 6003.0 K Logg: 4.51 Fe/H: -0.140



DV Fit Results:

Period = 441.72277 [0.01075] d
Epoch = 184.3730 [0.0213] BKJD
Rp/R* = 0.0333 [0.0024]
a/R* = 100.94 [25.14]
b = 0.89 [0.06]
Seff = 0.77 [0.34]
Teq = 239 [26] K
Rp = 3.39 [1.14] Re
a = 1.1422 [0.3213] AU
Ag = 6762.38 [4405.34] [1.53σ]
Teff = 3354 [441] K [7.06σ]

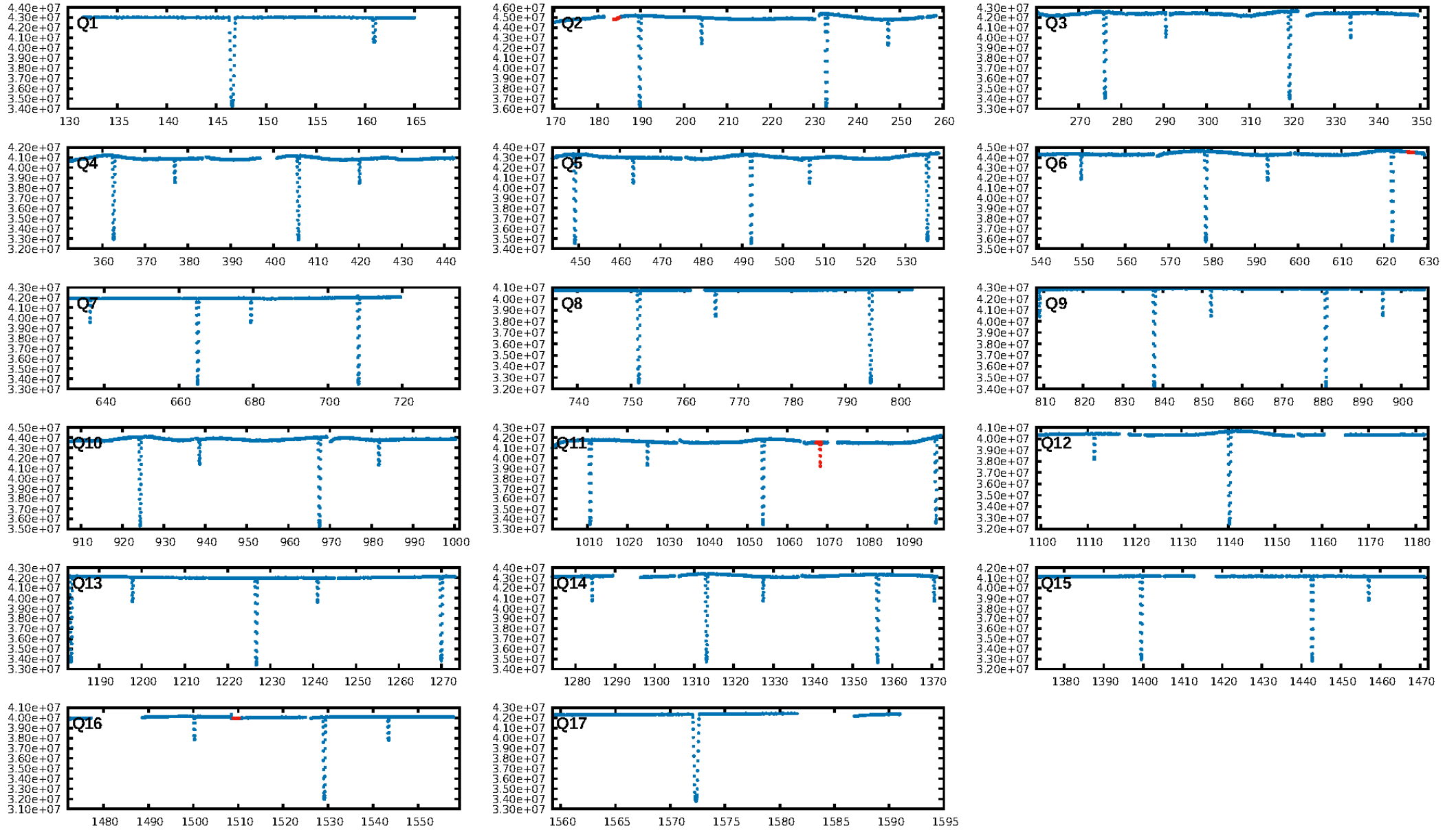
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [171.25σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 99.9%
Bootstrap-pfa: 8.82e-20
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: -2.066
Centroid-sig: 6.5%
Centroid-so: 1.046 arcsec [1.95σ]
OotOffset-rm: 1.414 arcsec [13.99σ]
KicOffset-rm: 1.425 arcsec [14.11σ]
OotOffset-st: 0/1/0/0 [1]
KicOffset-st: 0/1/0/0 [1]
DiffImageQuality-fgm: 0.00 [0/1]
DiffImageOverlap-fno: 0.50 [1/2]

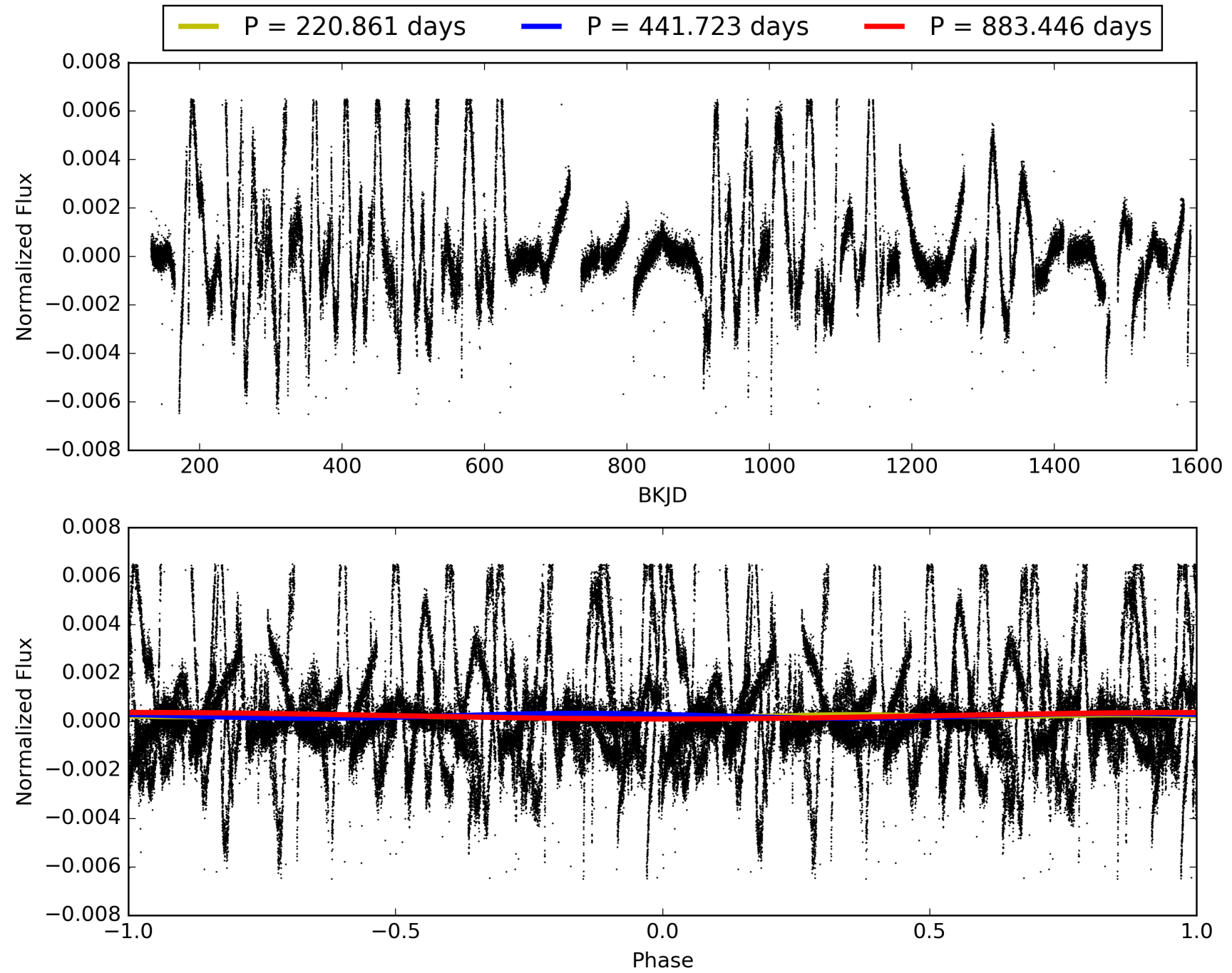
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 02:36:20 Z

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

TCE 012217907-04, PDC Light Curves

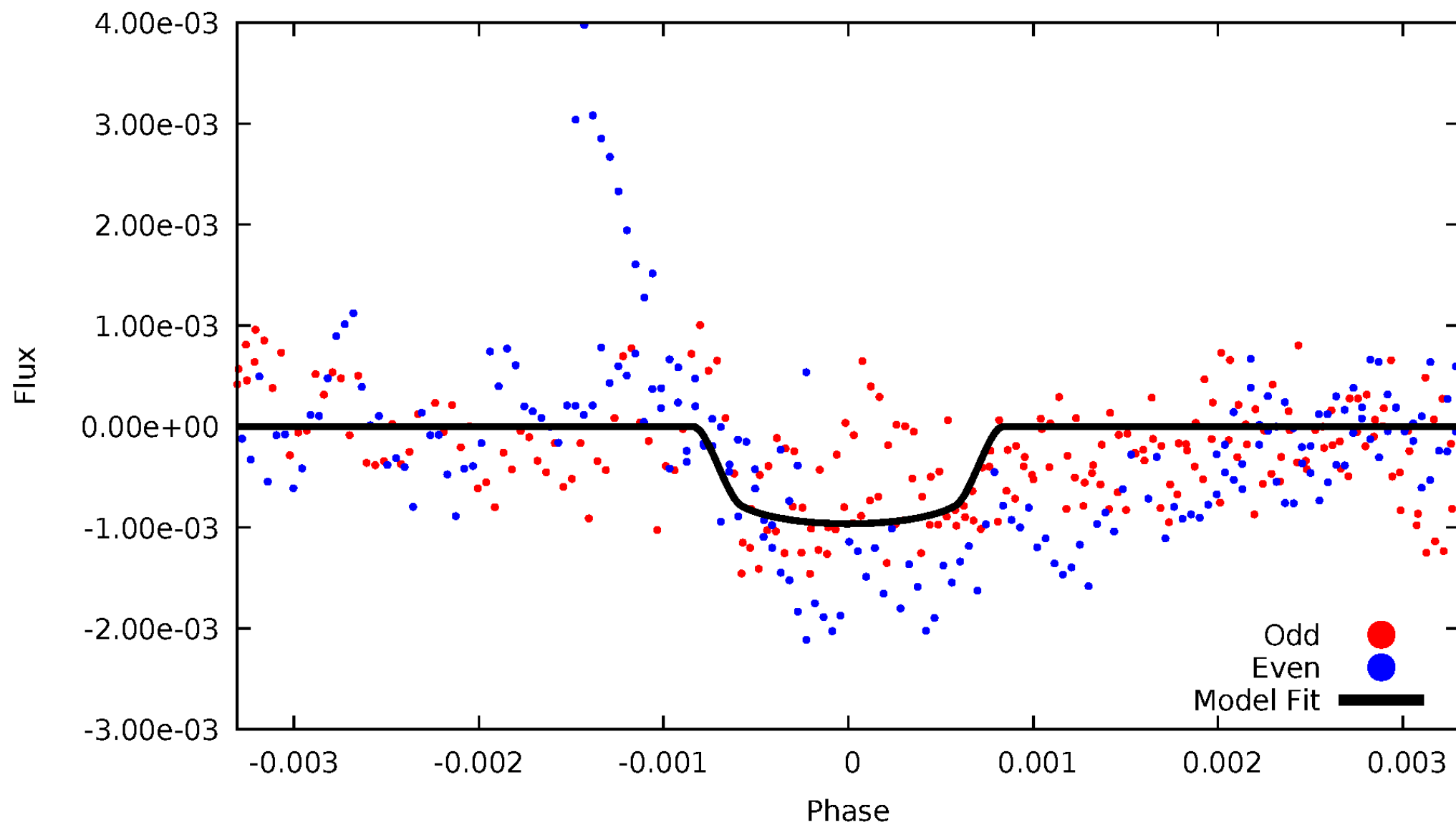


TCE 012217907-04



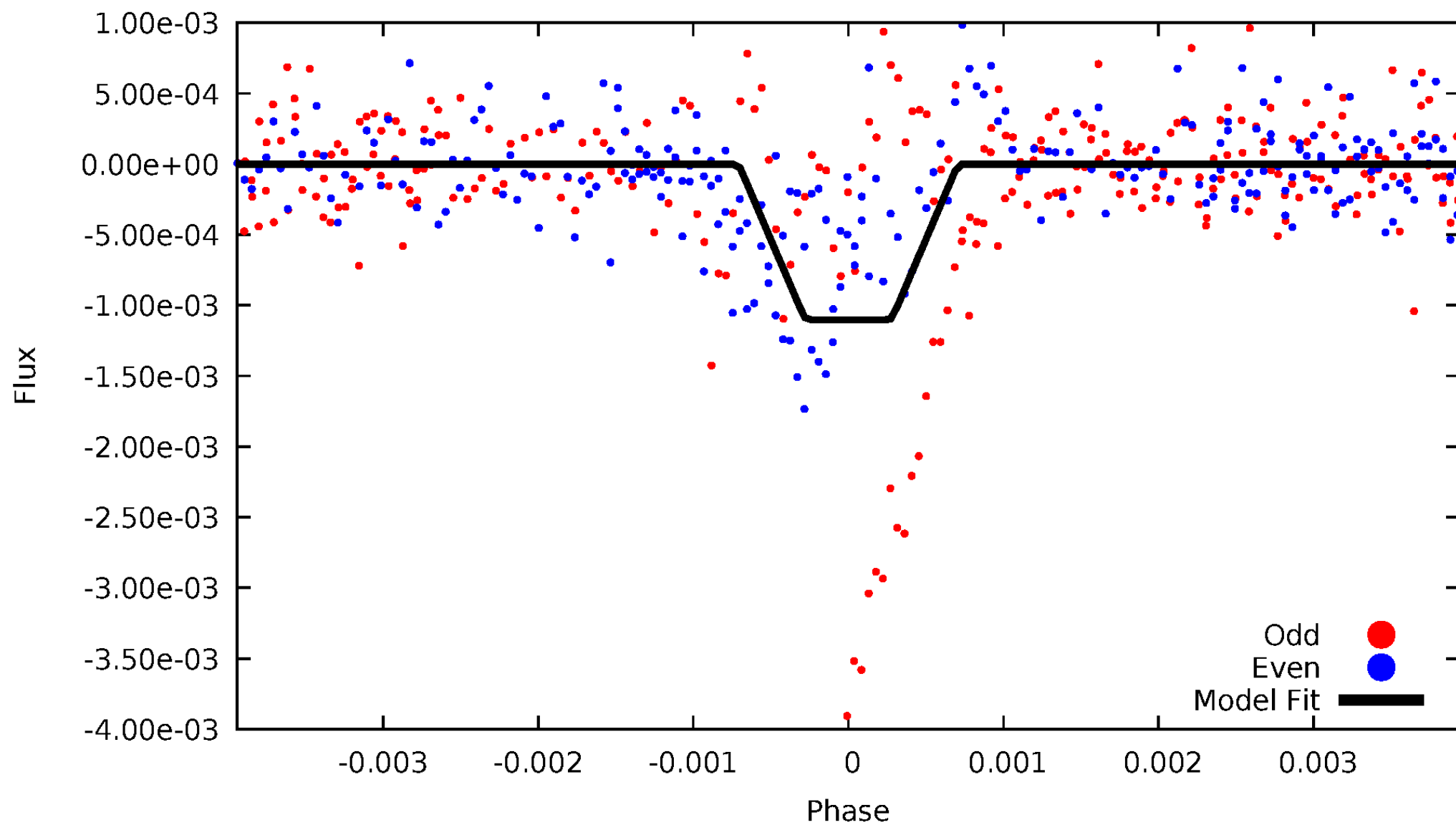
DV Odd/Even

TCE 012217907-04



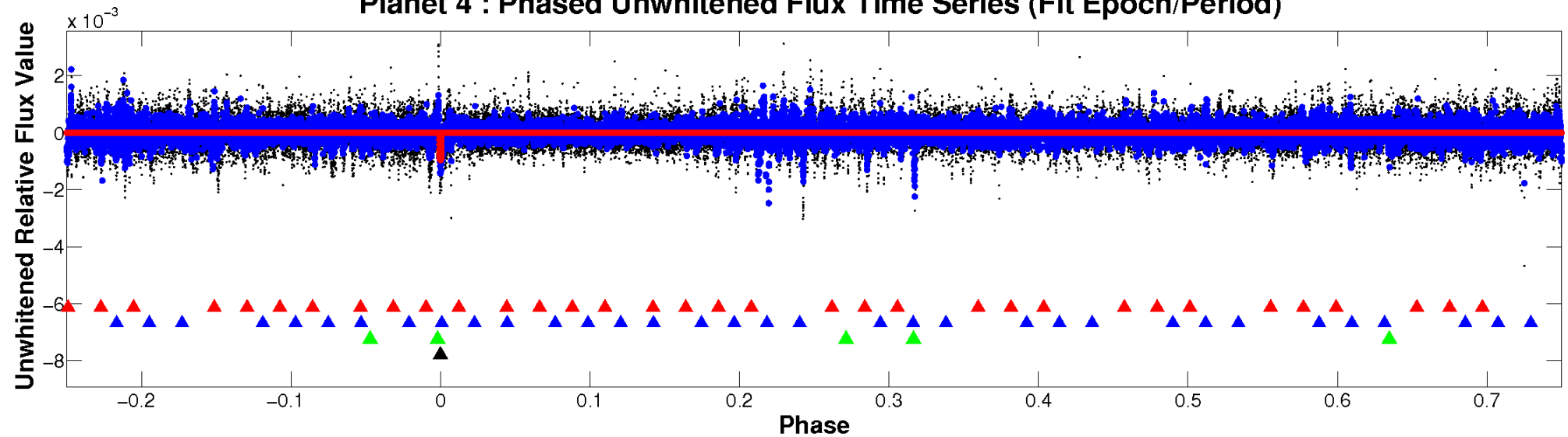
ALT Odd/Even

TCE 012217907-04

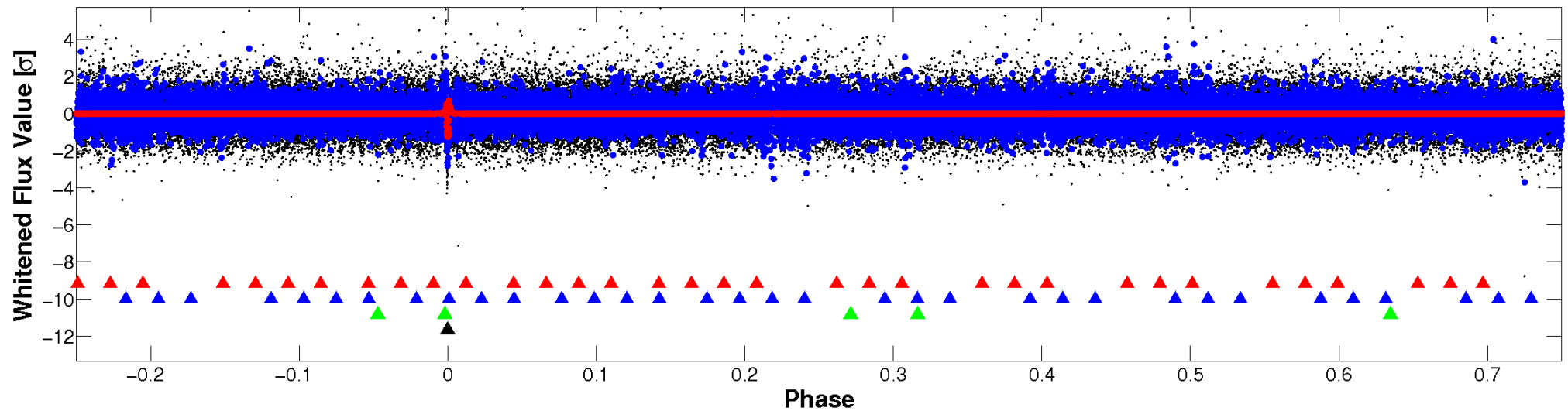


Non-Whitened Vs. Whitened Light Curve

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

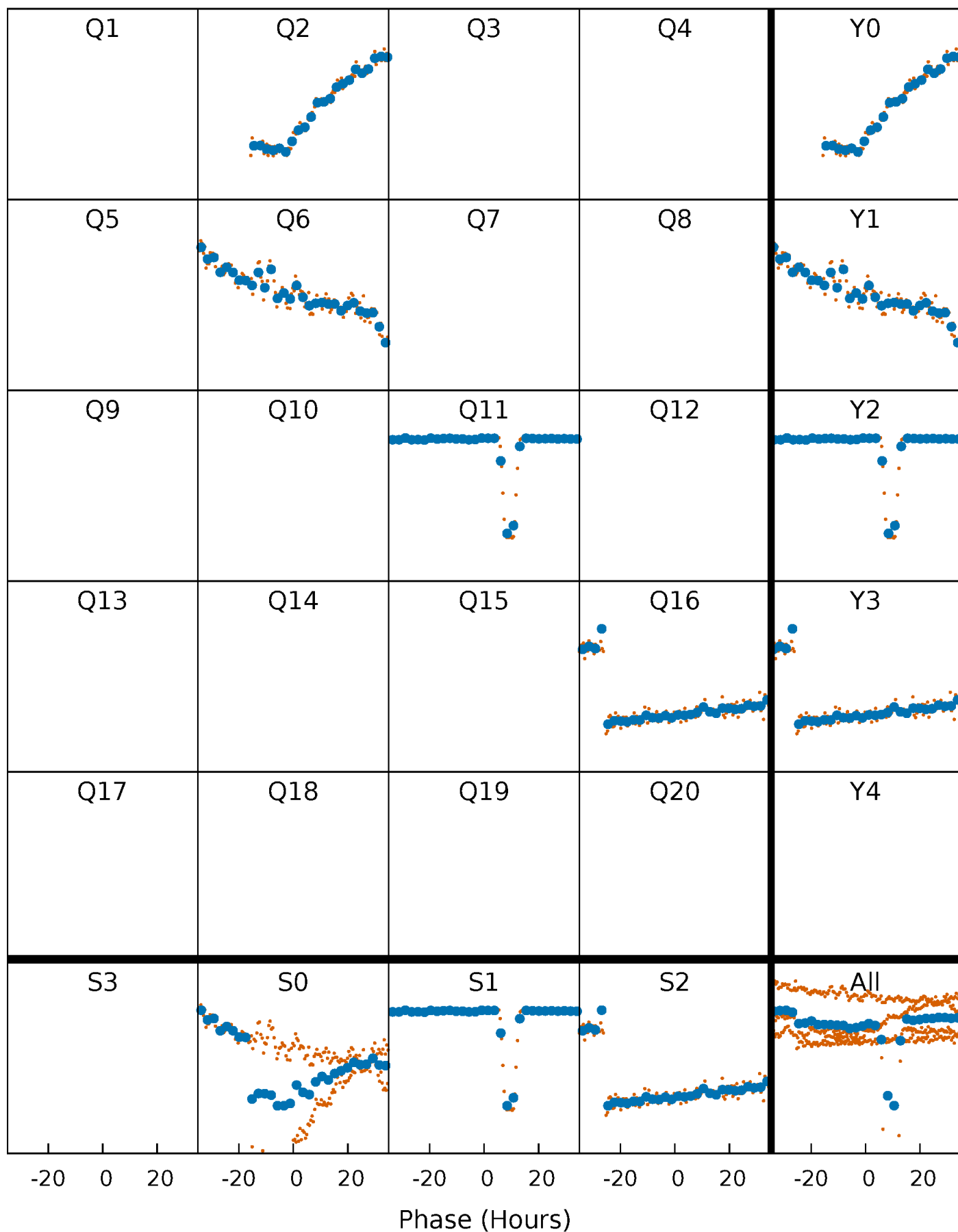


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



PDC Quarter-Phased Transit Curves

TCE 012217907-04 P=441.722769 Days $T_0=184.372952$ (BKJD)



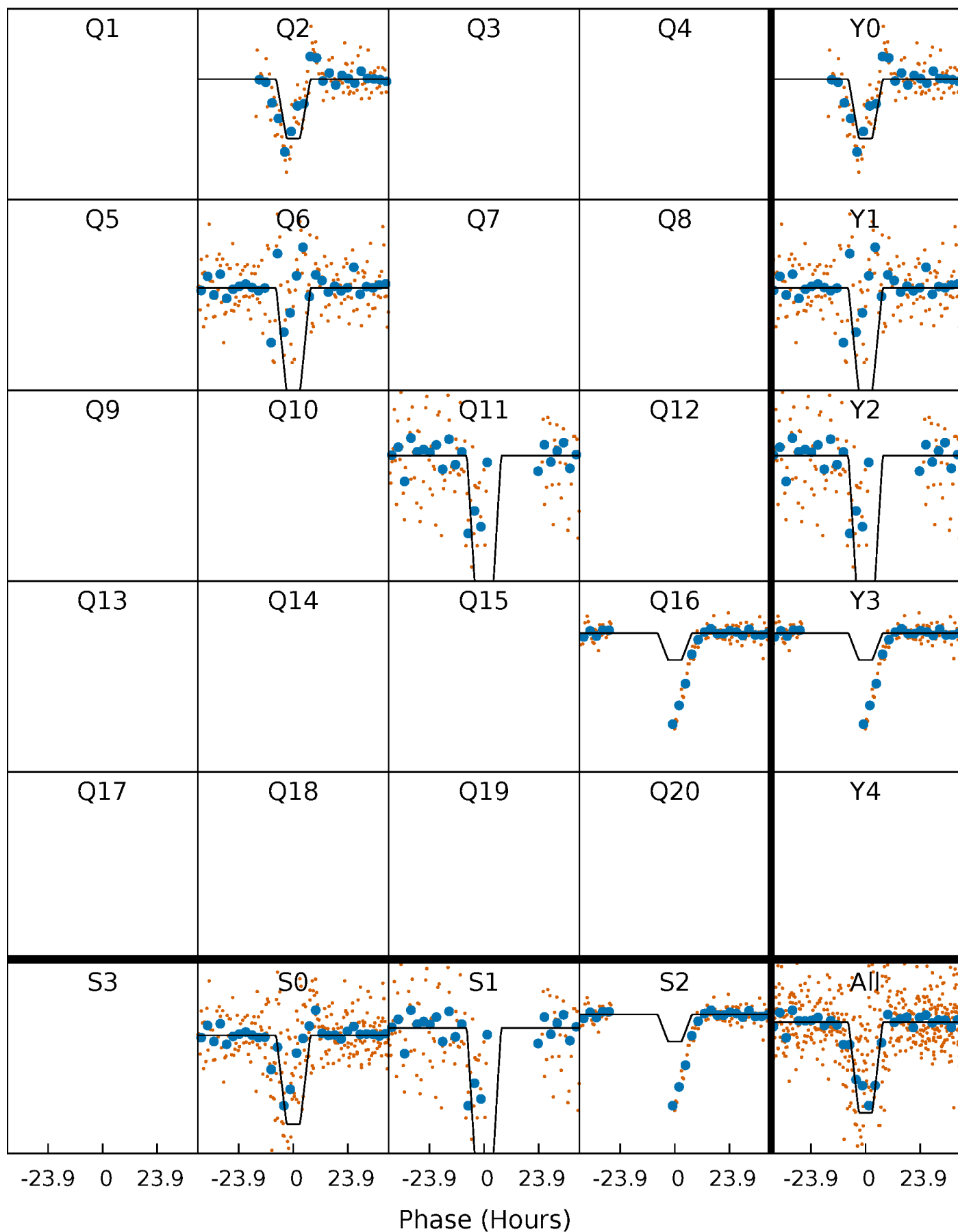
DV Quarter-Phased Transit Curves

TCE 012217907-04 $P=441.722769$ Days $T_0=184.372952$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

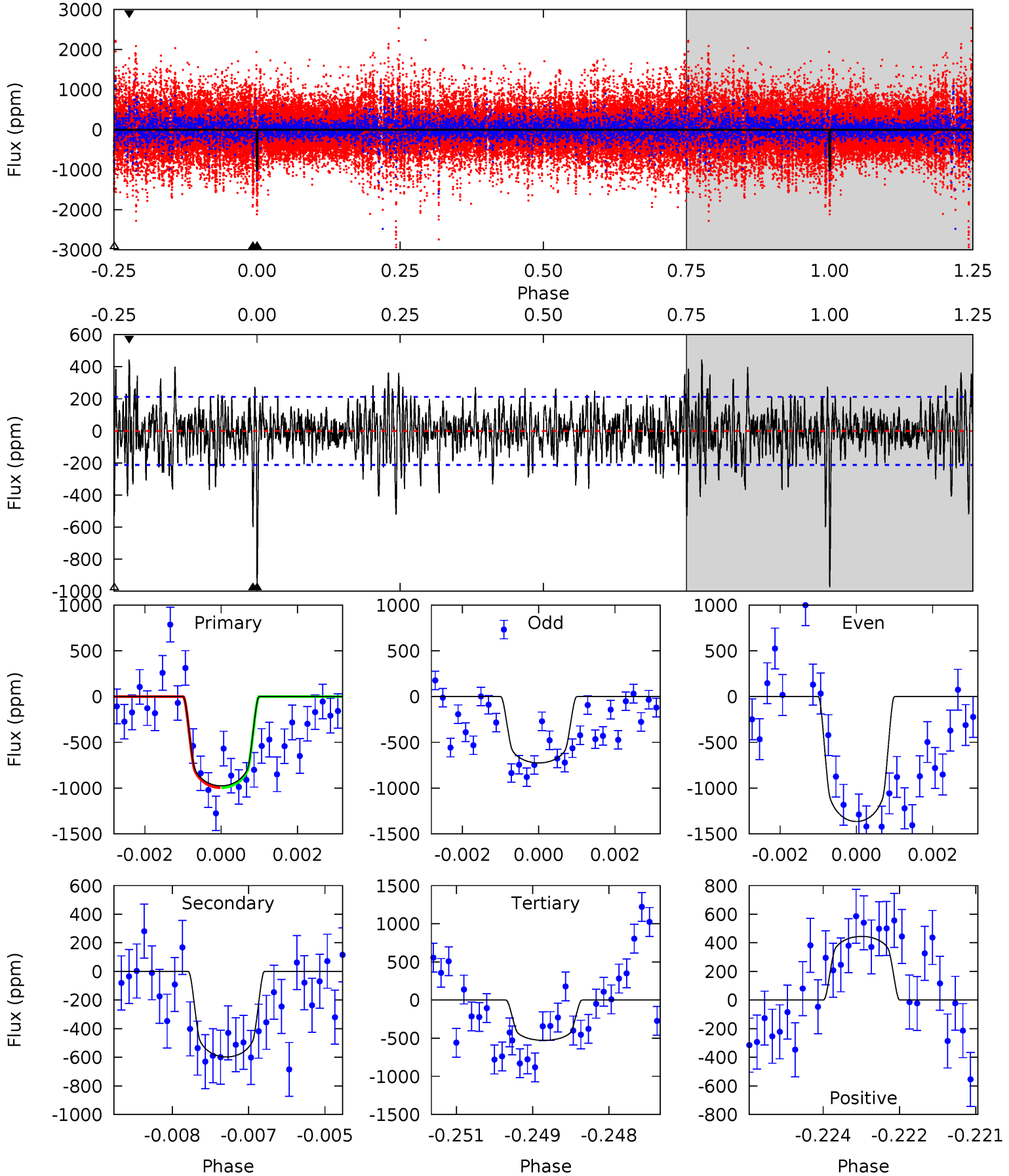
TCE 012217907-04 P=441.630532 Days $T_0=184.397966$ (BKJD)



DV Model-Shift Uniqueness Test

012217907-04, P = 441.722769 Days, E = 184.372952 Days

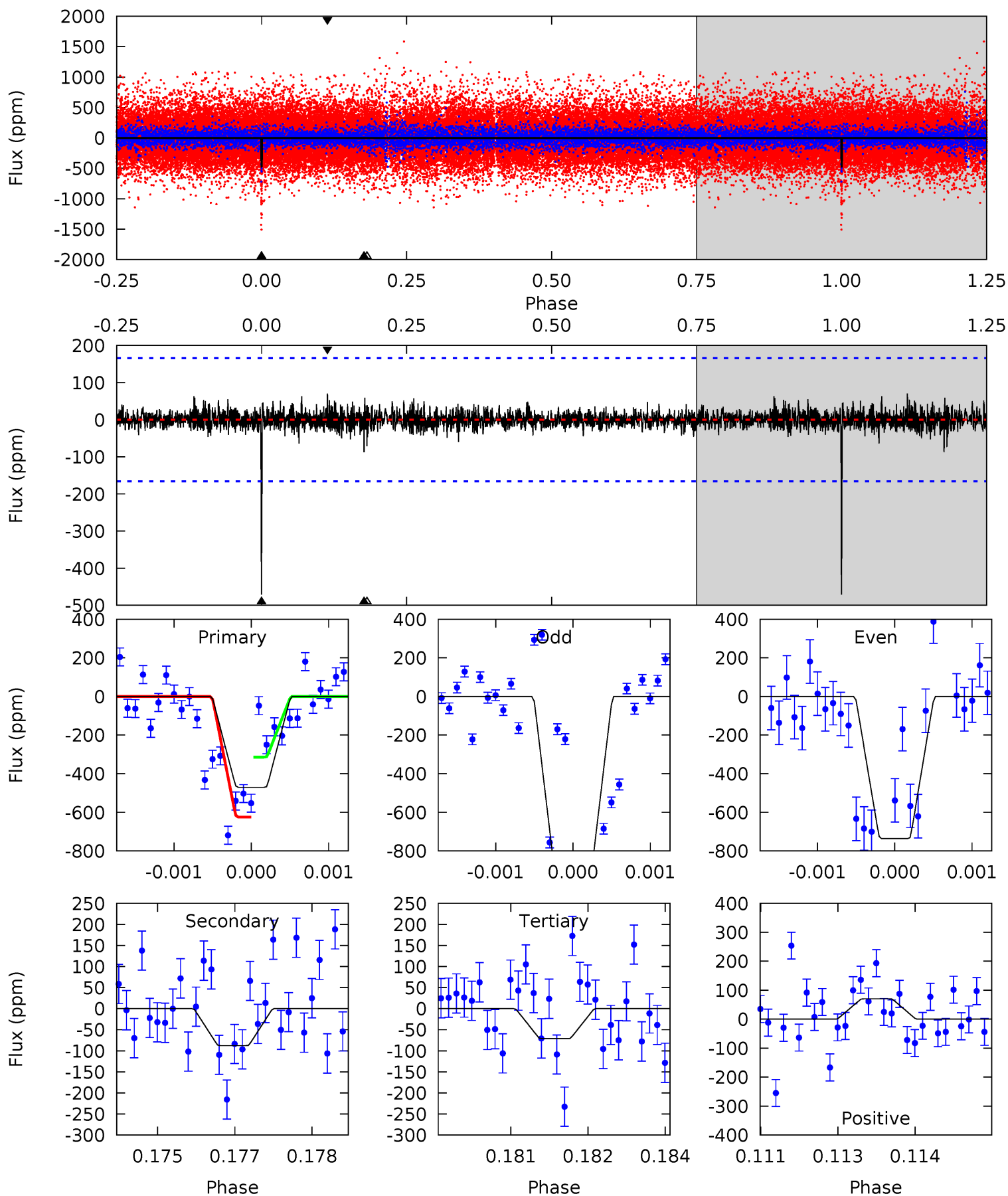
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
24.6	15.1	13.3	11.2	5.36	3.14	2.87	11.3	13.4	1.76	3.87	7.81	1.13	0.31	0.01



Alt Model-Shift Uniqueness Test

012217907-04, P = 441.630532 Days, E = 184.397966 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.3	2.85	2.31	2.28	5.39	3.20	0.50	13.0	13.0	0.54	0.57	5.39	1.68	0.13	4.97



Stellar Parameters For KIC 012217907

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6003^{+188}_{-230}	$4.507^{+0.054}_{-0.229}$	$-0.140^{+0.300}_{-0.300}$	$0.932^{+0.307}_{-0.082}$	$1.019^{+0.142}_{-0.142}$	$1.772^{+0.401}_{-0.992}$
	+3%/-4%	+1%/-5%	+214%/-214%	+33%/-9%	+14%/-14%	+23%/-56%
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 012217907-04 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-598 ± 40	$3.50^{+0.68}_{-0.40}$	342^{+26}_{-19}	5199^{+240}_{-263}	34148^{+8947}_{-9789}
Alt.	-88 ± 31	$3.48^{+0.73}_{-0.38}$	342^{+28}_{-18}	3624^{+209}_{-274}	4826^{+2239}_{-2041}

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

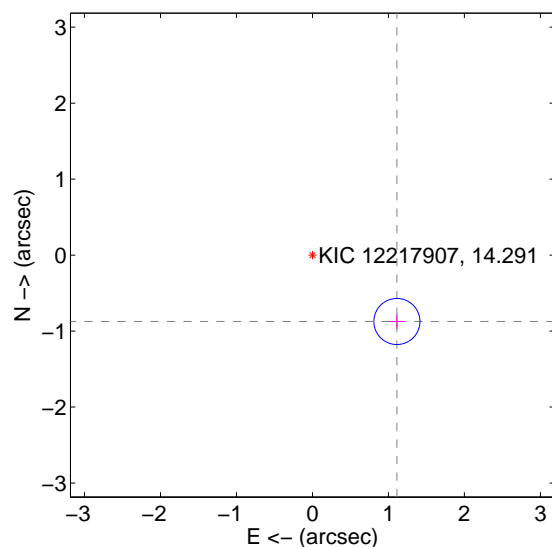
Supplemental centroid analysis for 012217907-04. Kepler magnitude: 14.29. Transit SNR 12.35

There are 0 quarters with good PRF difference image offsets

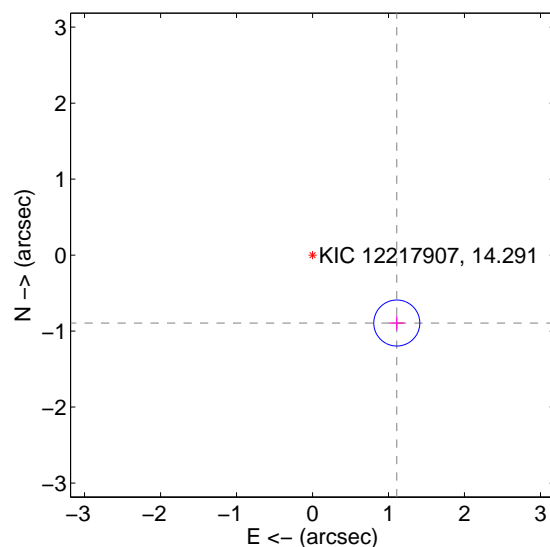
The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.414 ± 0.101	13.99	-1.112 ± 0.104	-0.874 ± 0.096
PRF-fit source offset from KIC position	1.425 ± 0.101	14.11	-1.109 ± 0.104	-0.894 ± 0.096
photometric centroid source offset	1.05 ± 0.54	1.95	-0.55 ± 0.53	0.89 ± 0.54

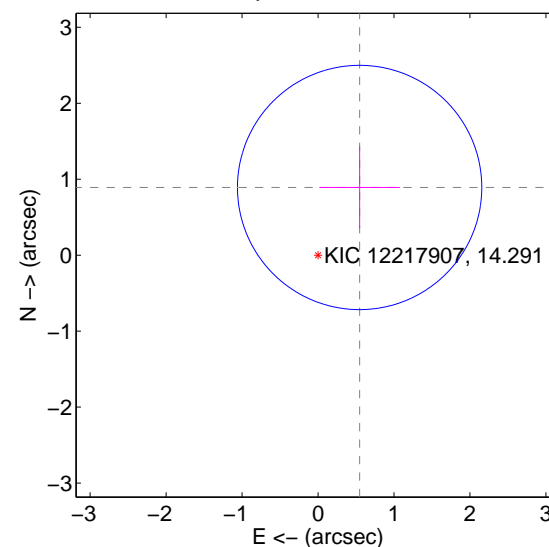
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

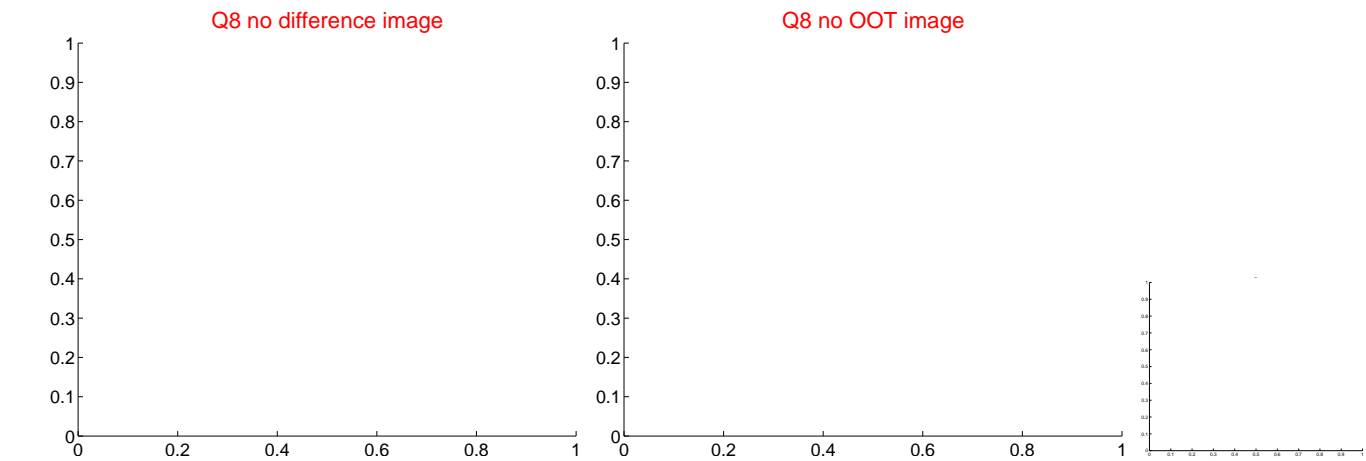
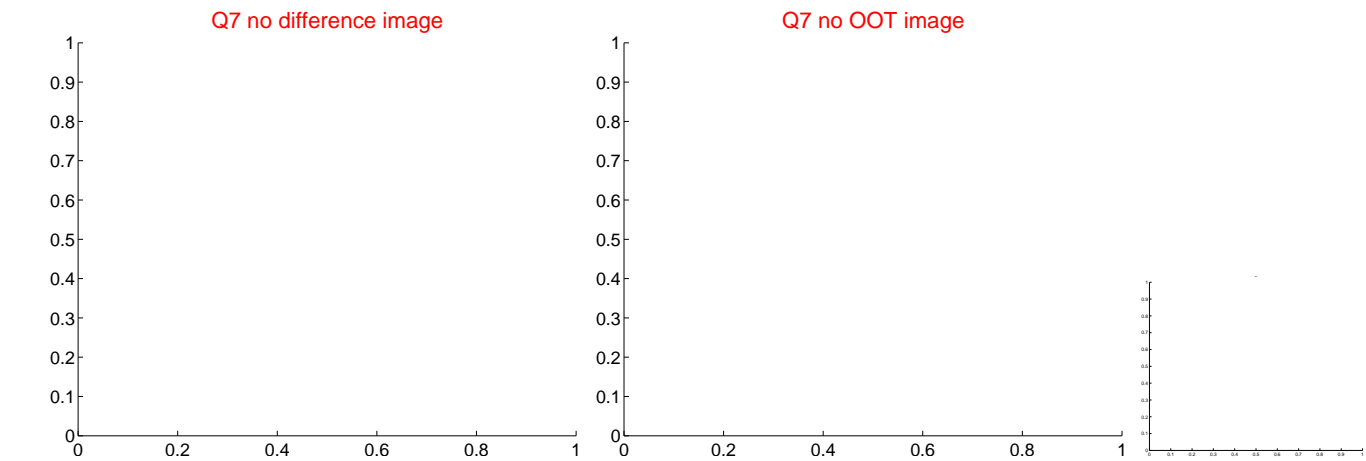
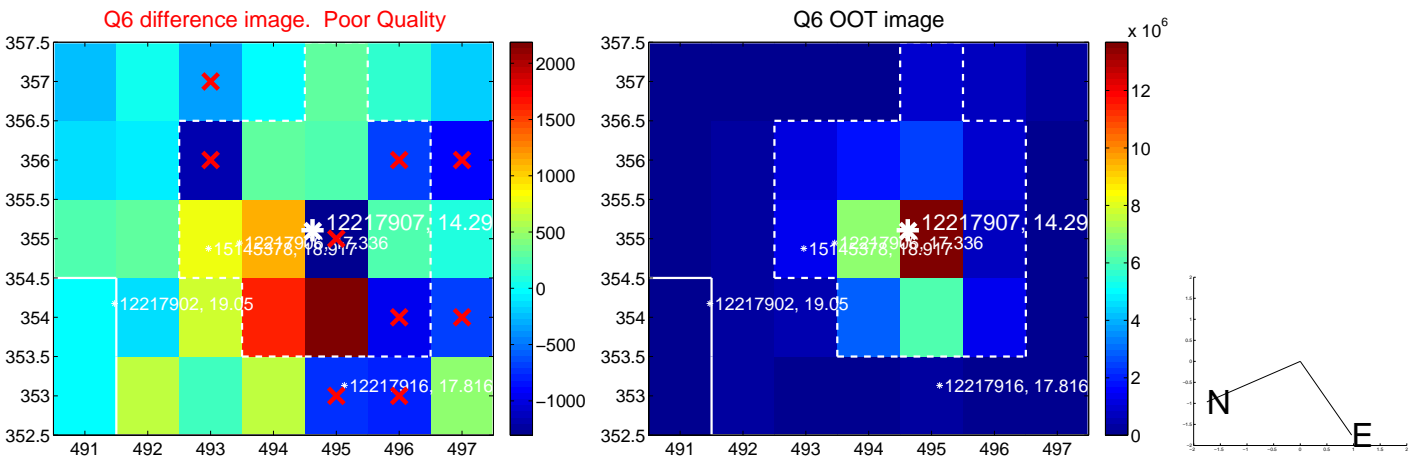
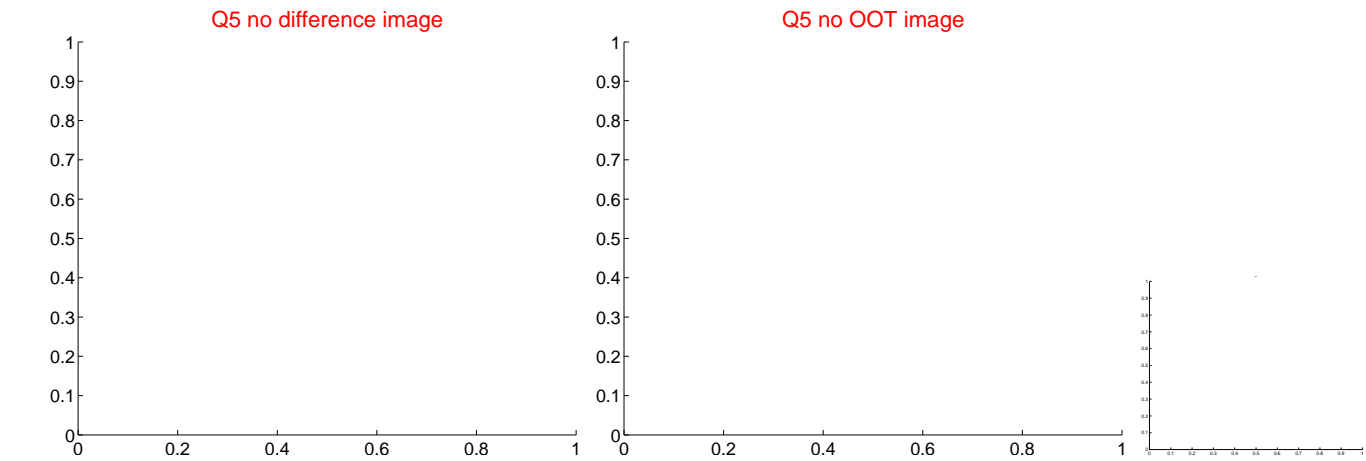


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

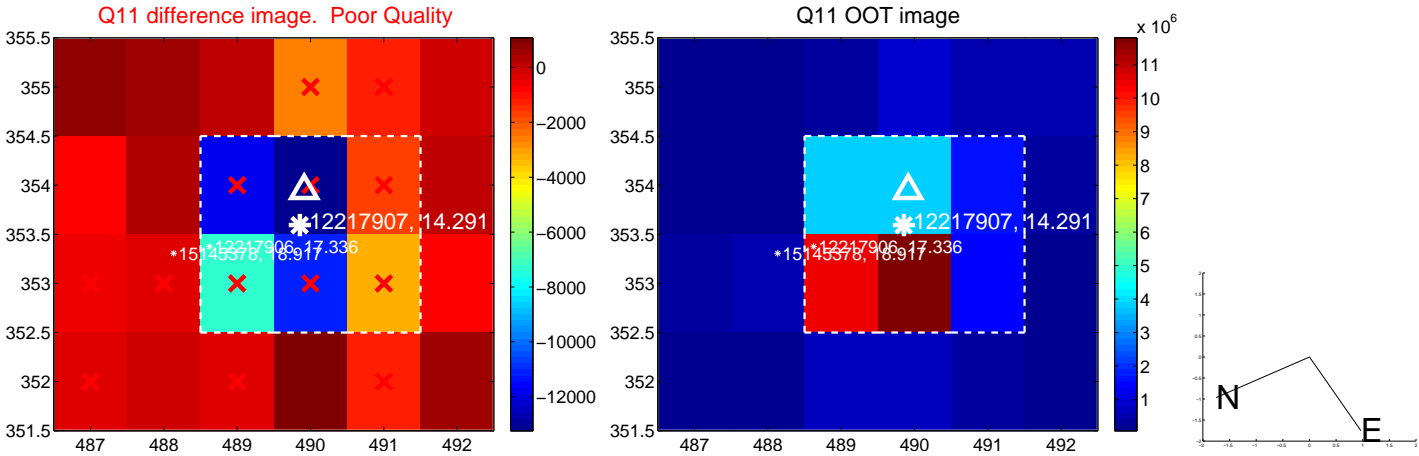
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



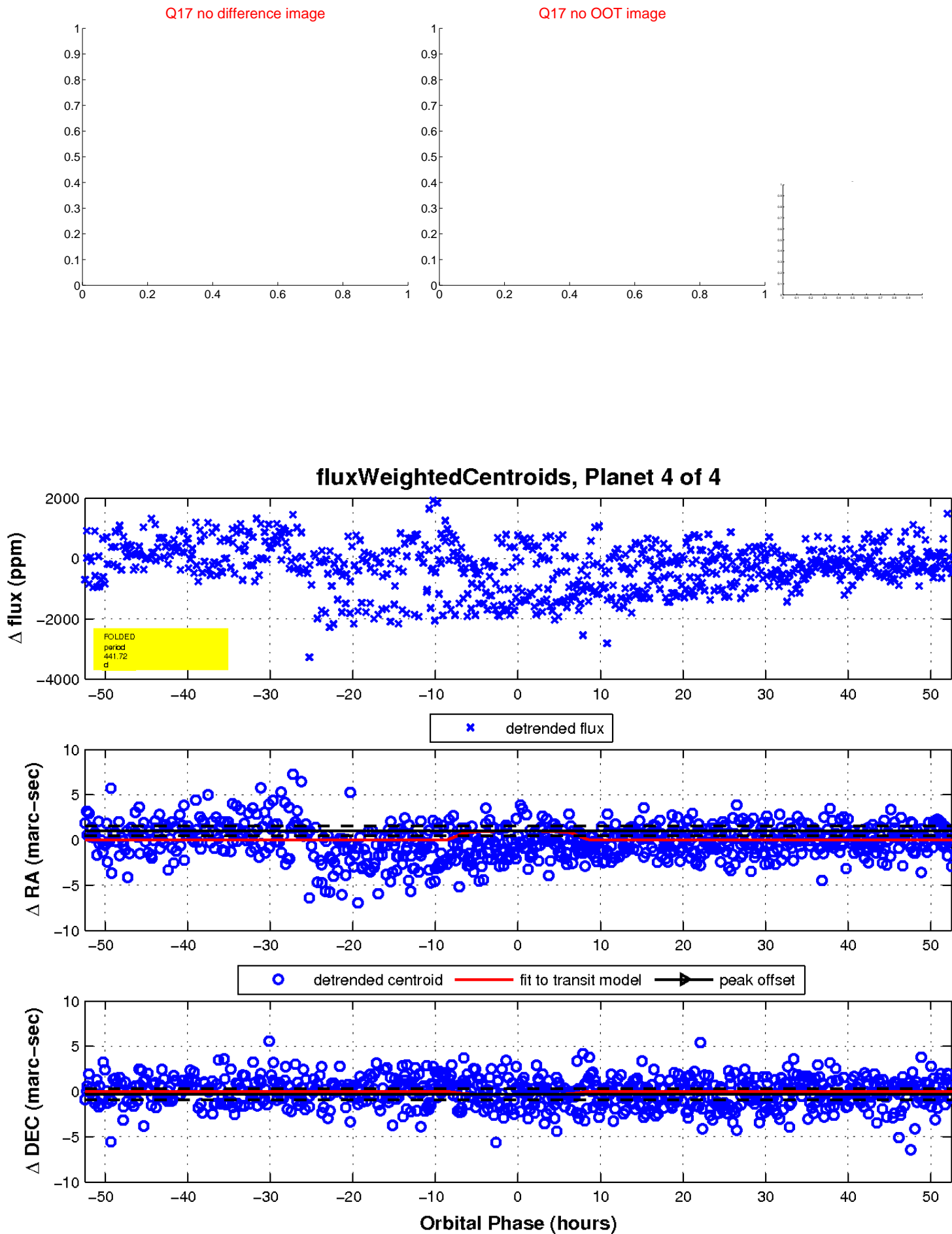
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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



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



UKIRT Image

Declination

