

# KIC 006184894

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006184894-01	OBS	5245.01	7.202813	135.195192	1788.6	3.015	67.6	73.8	0.72	5388	3.39	94.11
006184894-02	OBS	No	456.612411	244.080267	1138.2	2.631	20.5	6.9	0.72	5388	2.79	0.37
006184894-03	OBS	No	224.010641	307.905250	873.4	3.785	17.0	3.8	0.72	5388	2.15	0.96
006184894-04	OBS	No	543.034285	423.725756	1286.8	11.881	18.2	4.4	0.72	5388	2.73	0.29
006184894-05	OBS	No	394.144185	258.523696	431.3	4.798	17.5	2.1	0.72	5388	1.55	0.45
006184894-06	OBS	No	449.479948	246.992497	1734.2	4.941	16.5	7.1	0.72	5388	3.01	0.38

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006184894-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
006184894-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006184894-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—INCONSISTENT_TRANS
006184894-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_SKYE_TRACKER—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
006184894-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_TRACKER—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV
006184894-06	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—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.

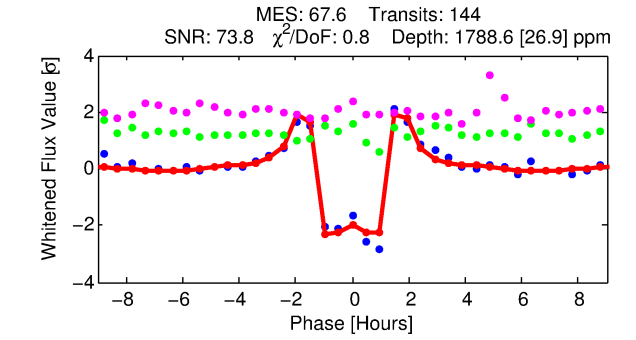
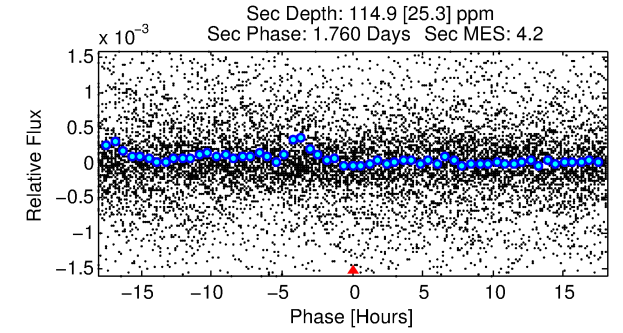
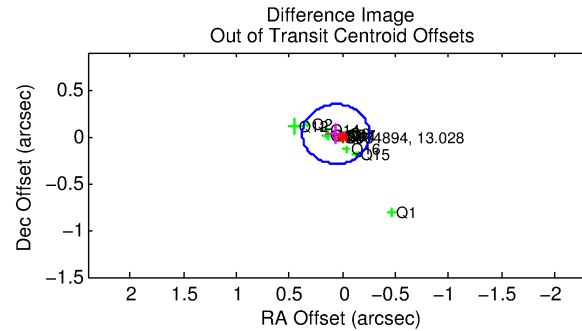
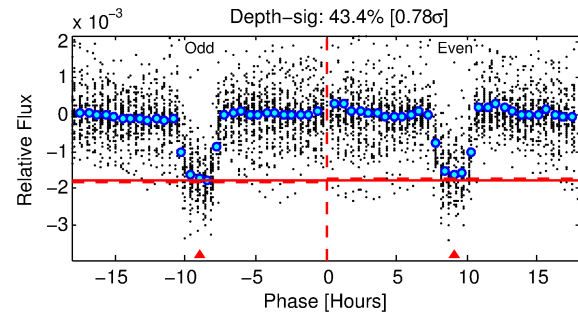
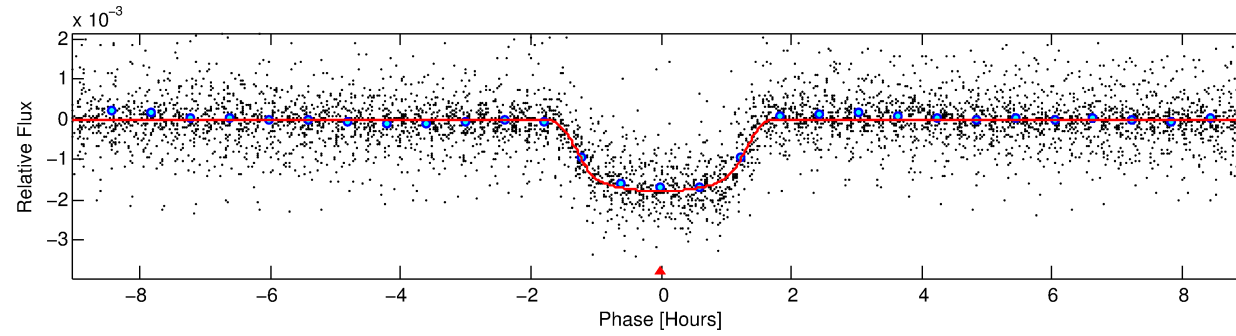
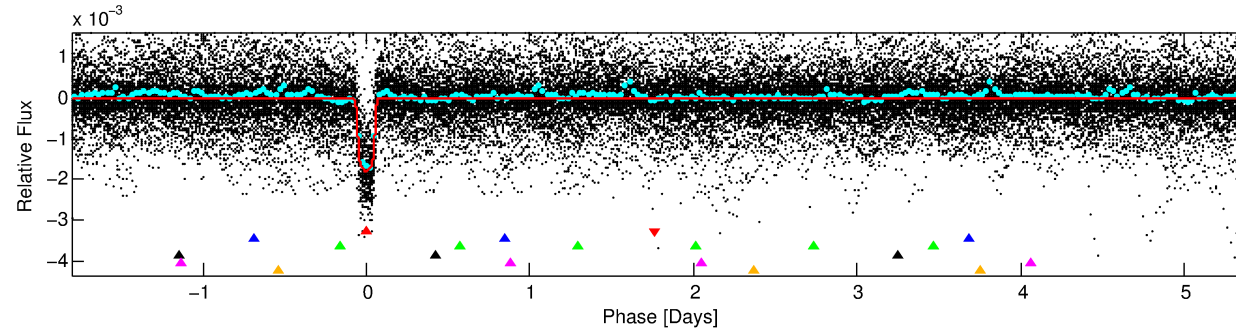
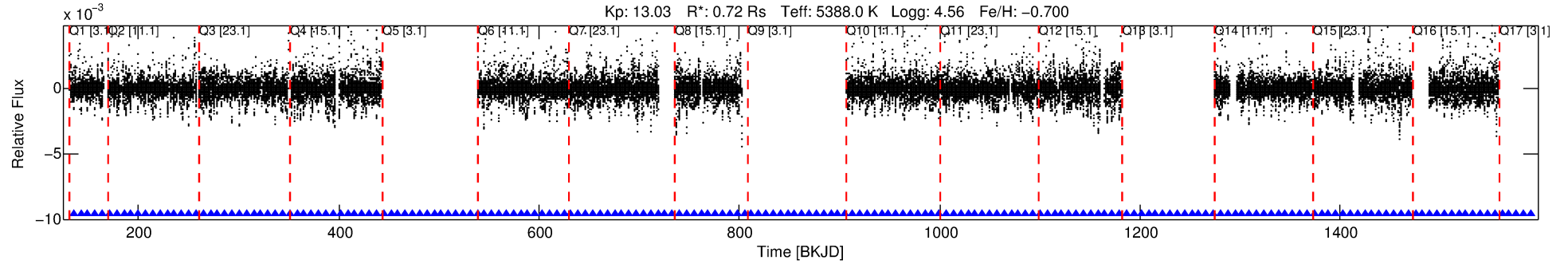
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 006184894-01

No Significant Match Found

# DV One-Page Summary

KIC: 6184894 Candidate: 1 of 6 Period: 7.203 d  
KOI: K05245.01 Corr: 0.978



## DV Fit Results:

Period = 7.20281 [0.00000] d  
Epoch = 135.1952 [0.0003] BKJD  
Rp/R\* = 0.0433 [0.0010]  
a/R\* = 12.03 [1.01]  
b = 0.81 [0.04]  
Seff = 94.11 [18.43]  
Teq = 794 [39] K  
Rp = 3.39 [0.39] Re  
a = 0.0642 [0.0065] AU  
Ag = 22.72 [6.21] [3.50 $\sigma$ ]  
Teffp = 2681 [171] K [10.77 $\sigma$ ]

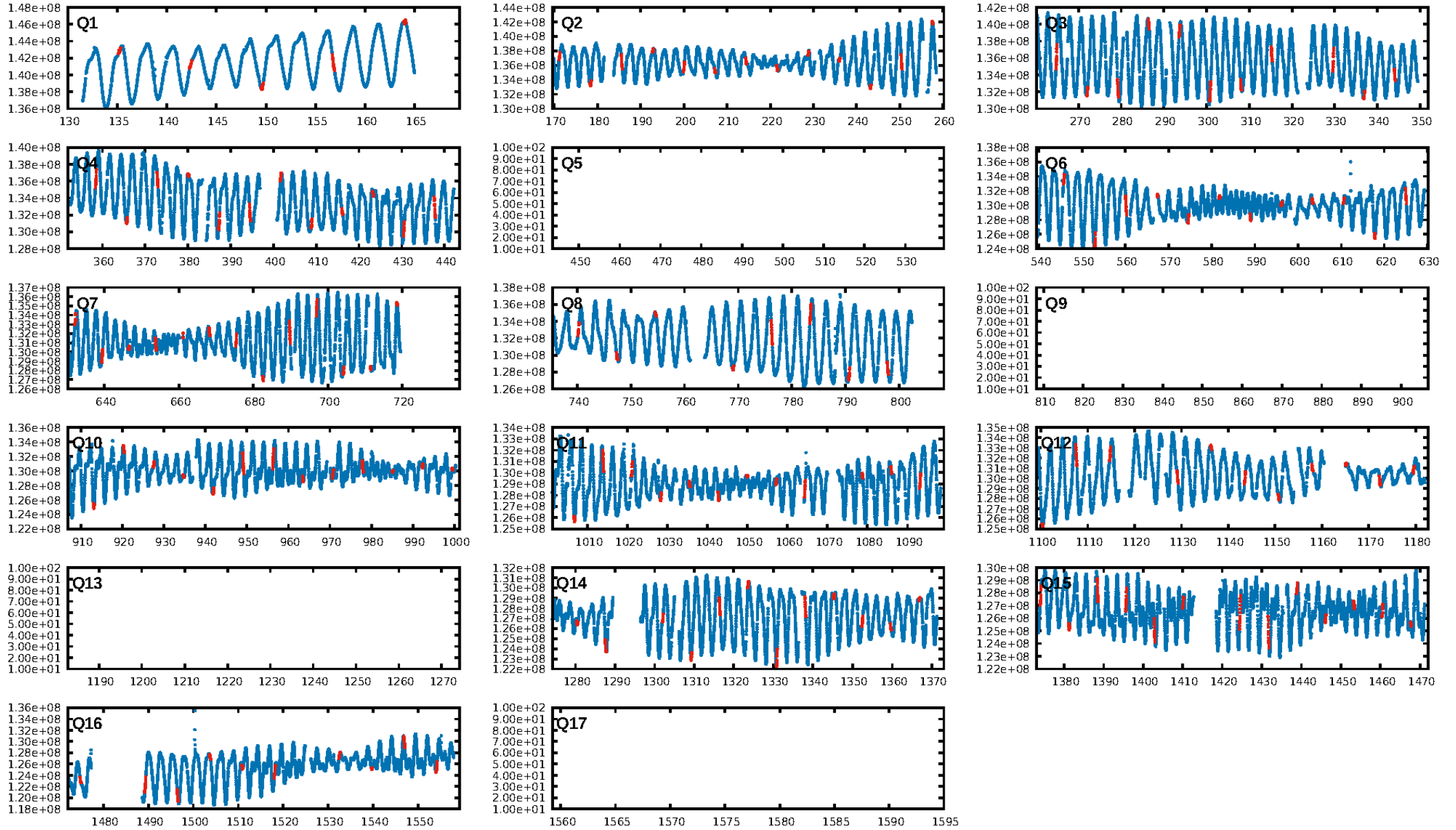
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [1075.26 $\sigma$ ]  
ModelChiSquare2-sig: 99.7%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [139/139]  
GhostDiagnostic-chr: 1.117  
Centroid-sig: 51.0%  
Centroid-so: 0.060 arcsec [1.40 $\sigma$ ]  
OotOffset-rm: 0.065 arcsec [0.61 $\sigma$ ]  
OotOffset-st: 4/4/4/1 [13]  
KicOffset-rm: 0.147 arcsec [1.36 $\sigma$ ]  
KicOffset-st: 4/4/4/1 [13]  
DiffImageQuality-fgm: 1.00 [13/13]  
DiffImageOverlap-fno: 1.00 [13/13]

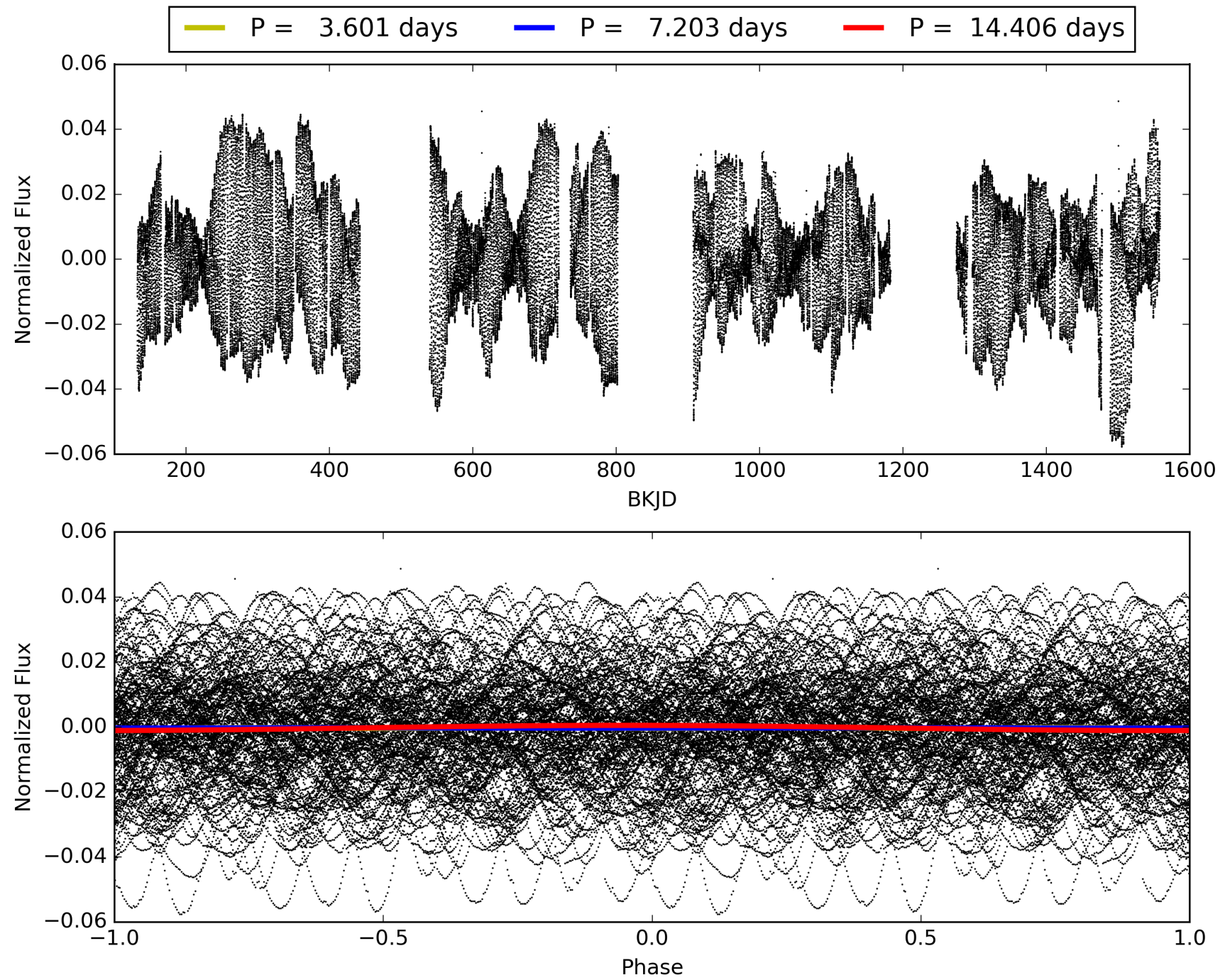
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 07:55:23 Z

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

# TCE 006184894-01, PDC Light Curves



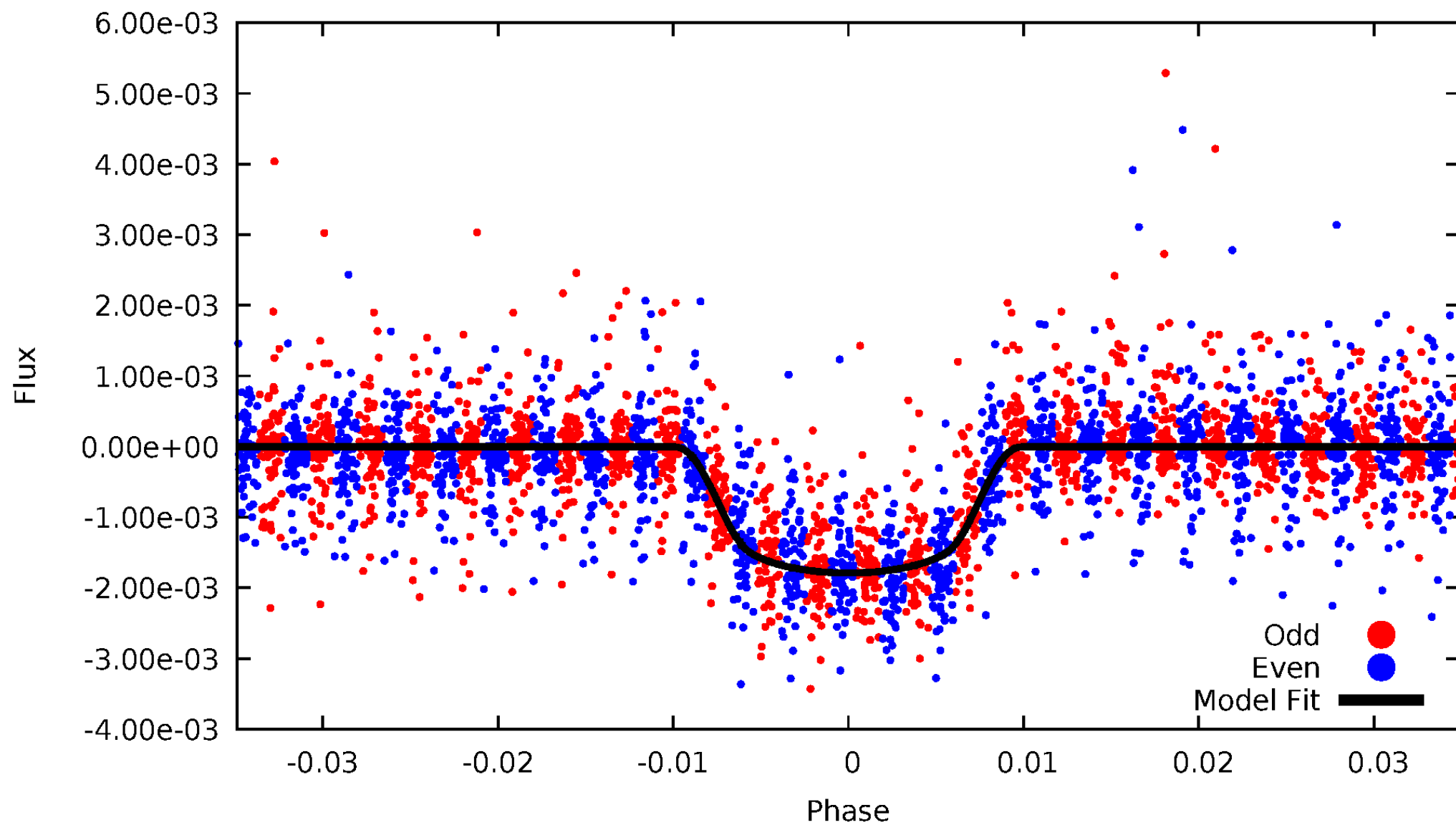
TCE 006184894-01





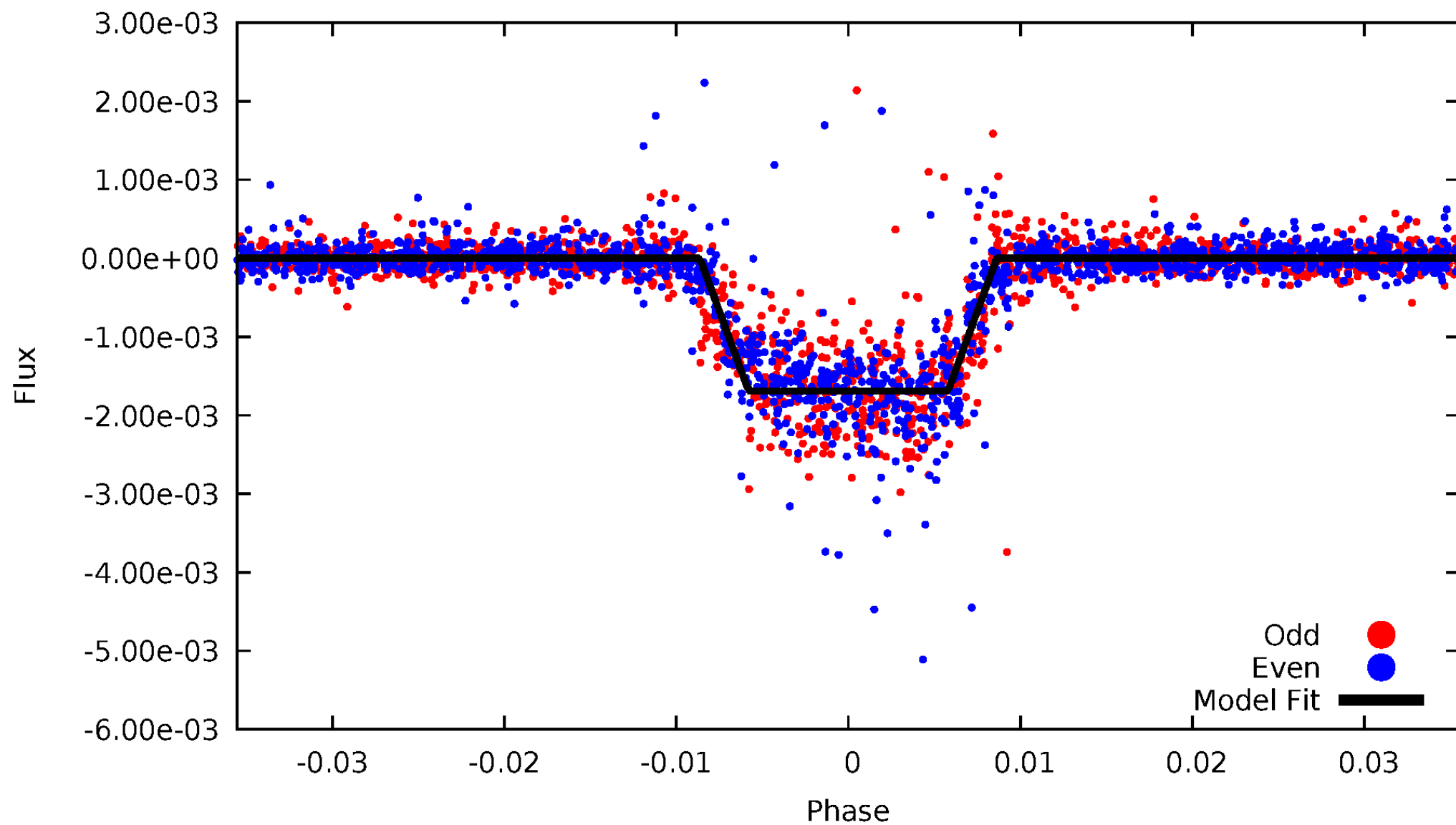
# DV Odd/Even

TCE 006184894-01



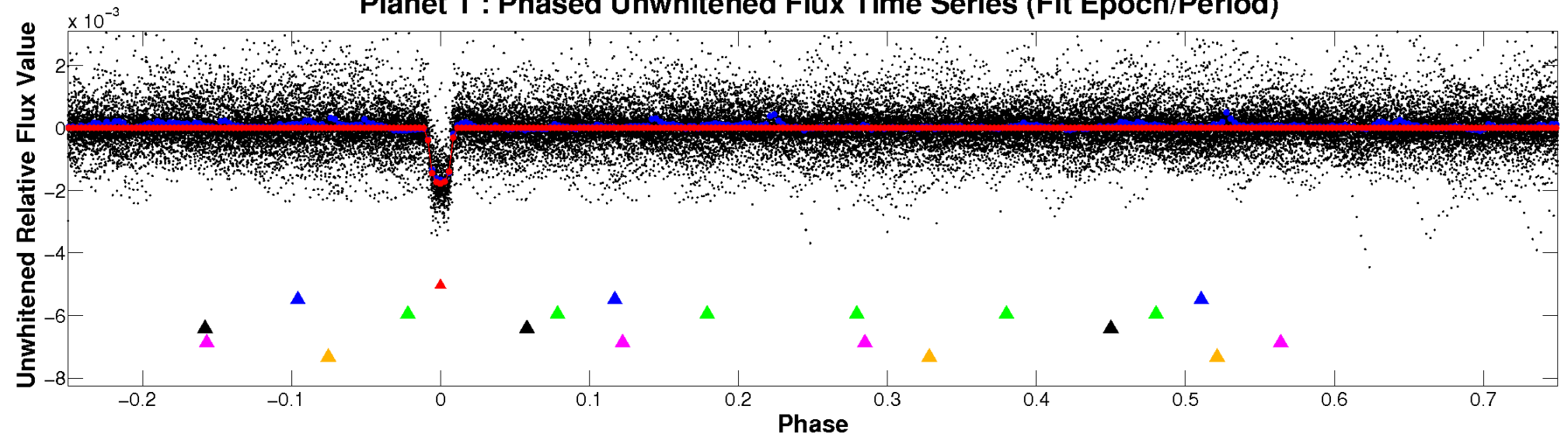
# ALT Odd/Even

TCE 006184894-01

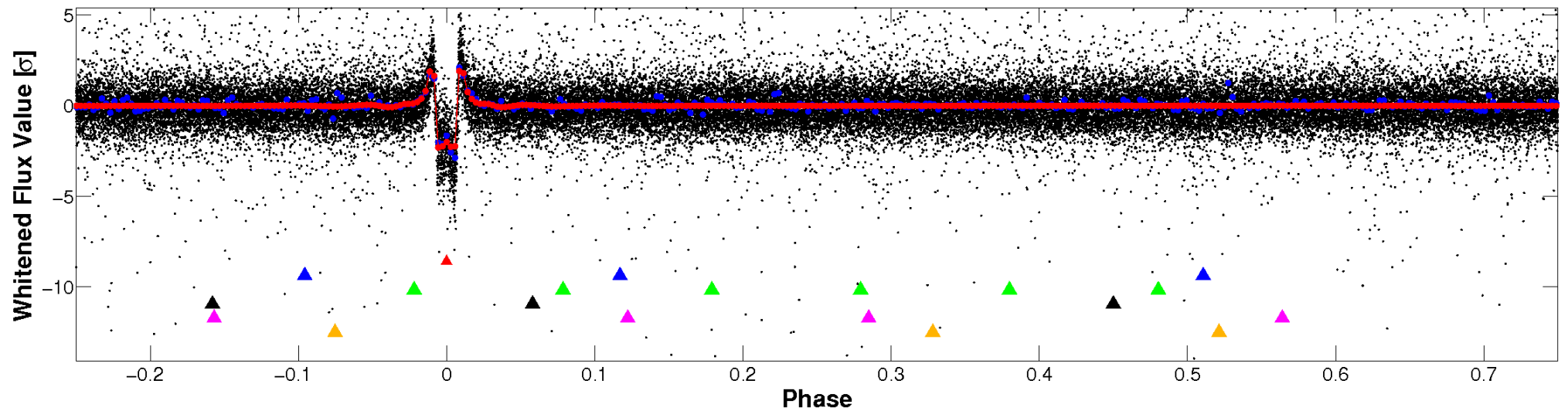


# Non-Whitened Vs. Whitened Light Curve

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

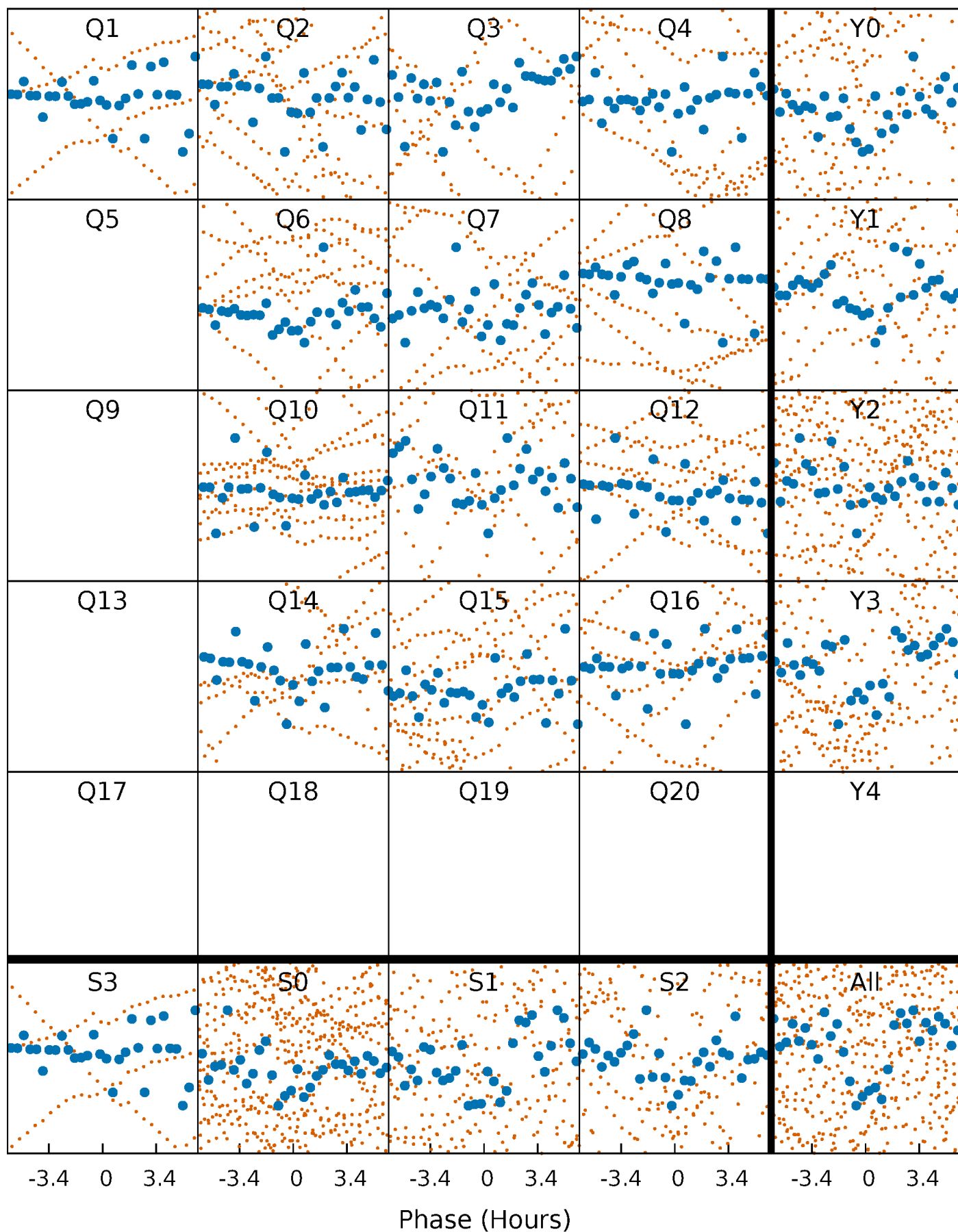


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

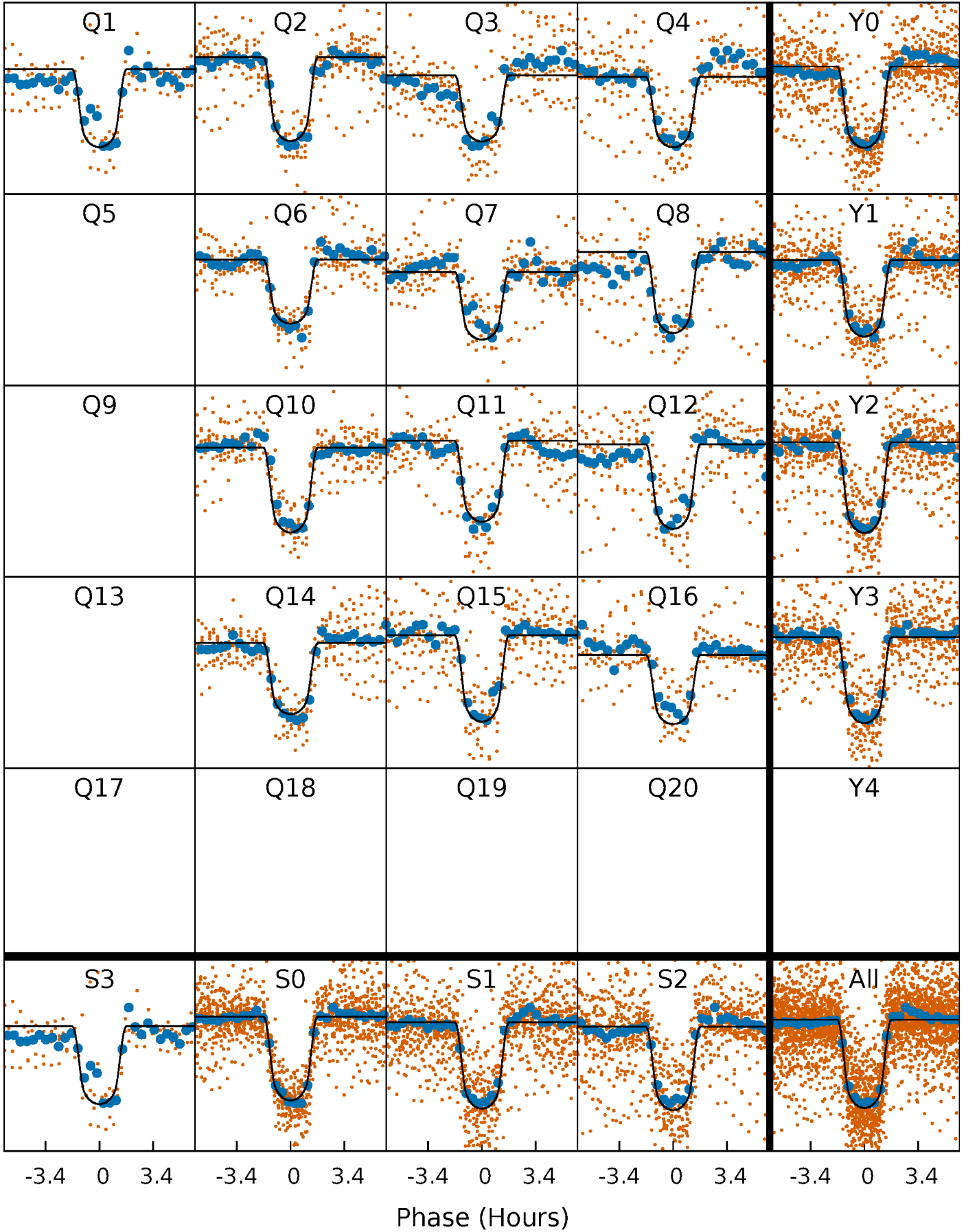
TCE 006184894-01 P= 7.202813 Days  $T_0=135.195192$  (BKJD)





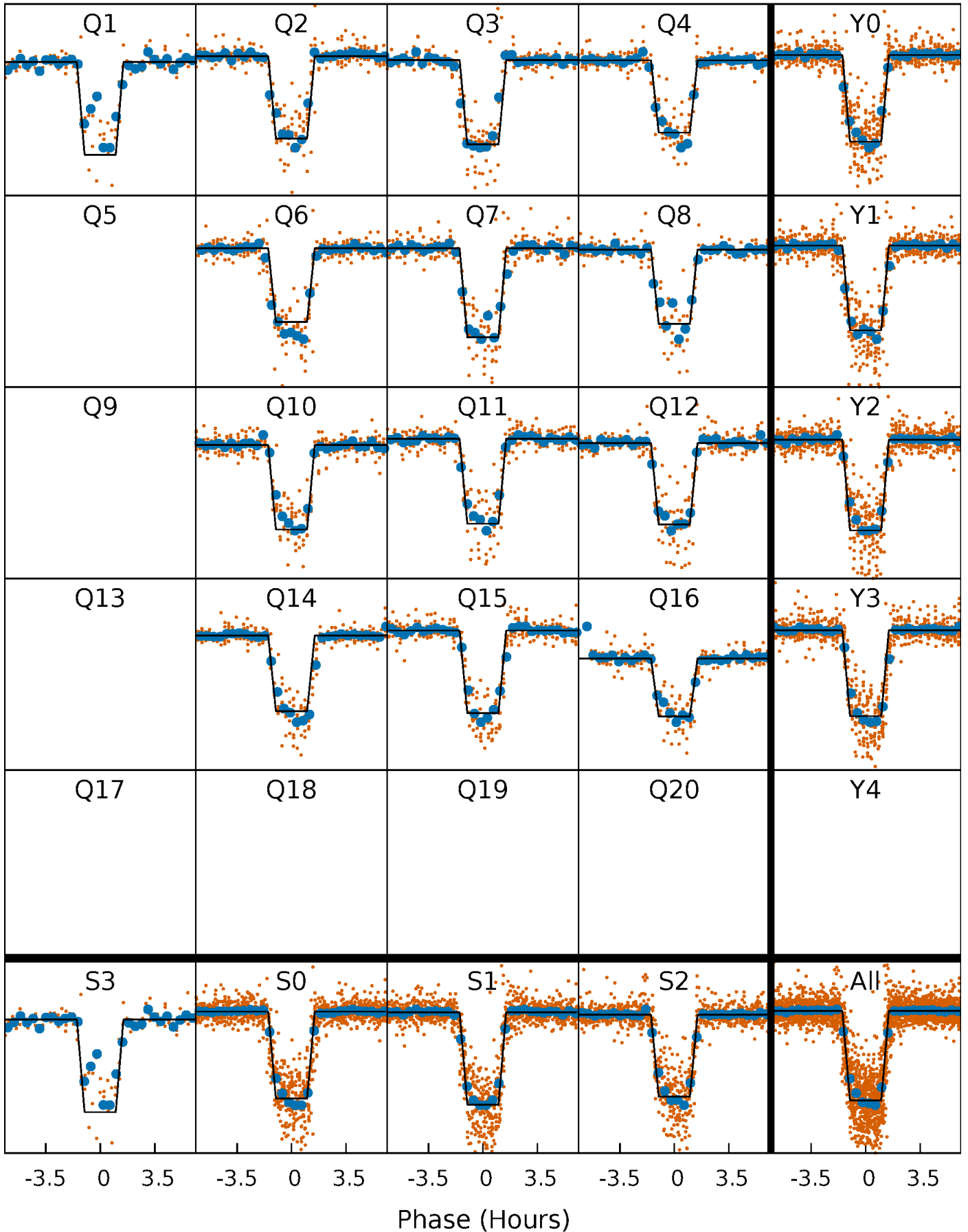
# DV Quarter-Phased Transit Curves

TCE 006184894-01 P= 7.202813 Days  $T_0=135.195192$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

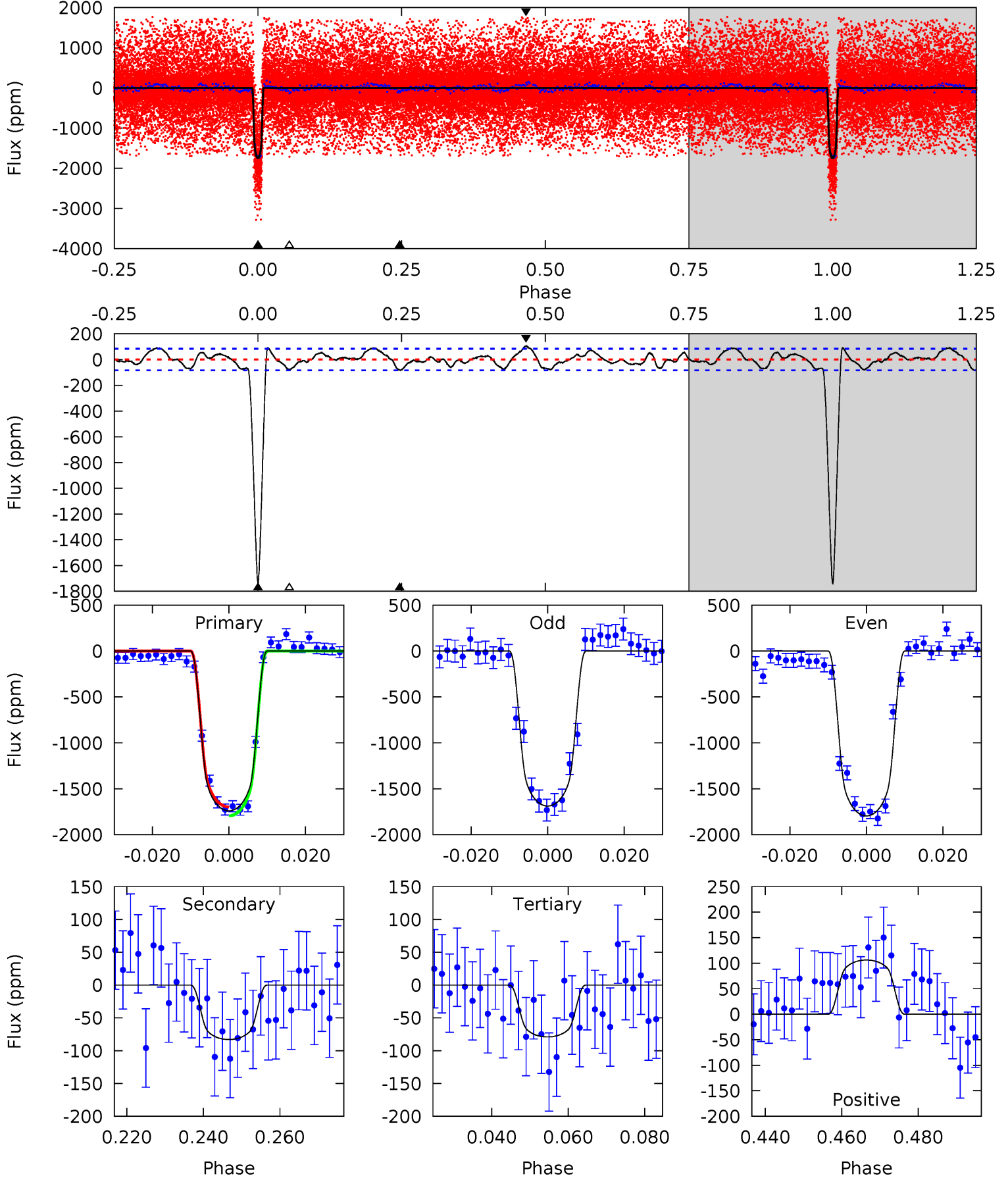
TCE 006184894-01 P= 7.202752 Days  $T_0=135.201703$  (BKJD)



# DV Model-Shift Uniqueness Test

006184894-01, P = 7.202813 Days, E = 127.992379 Days

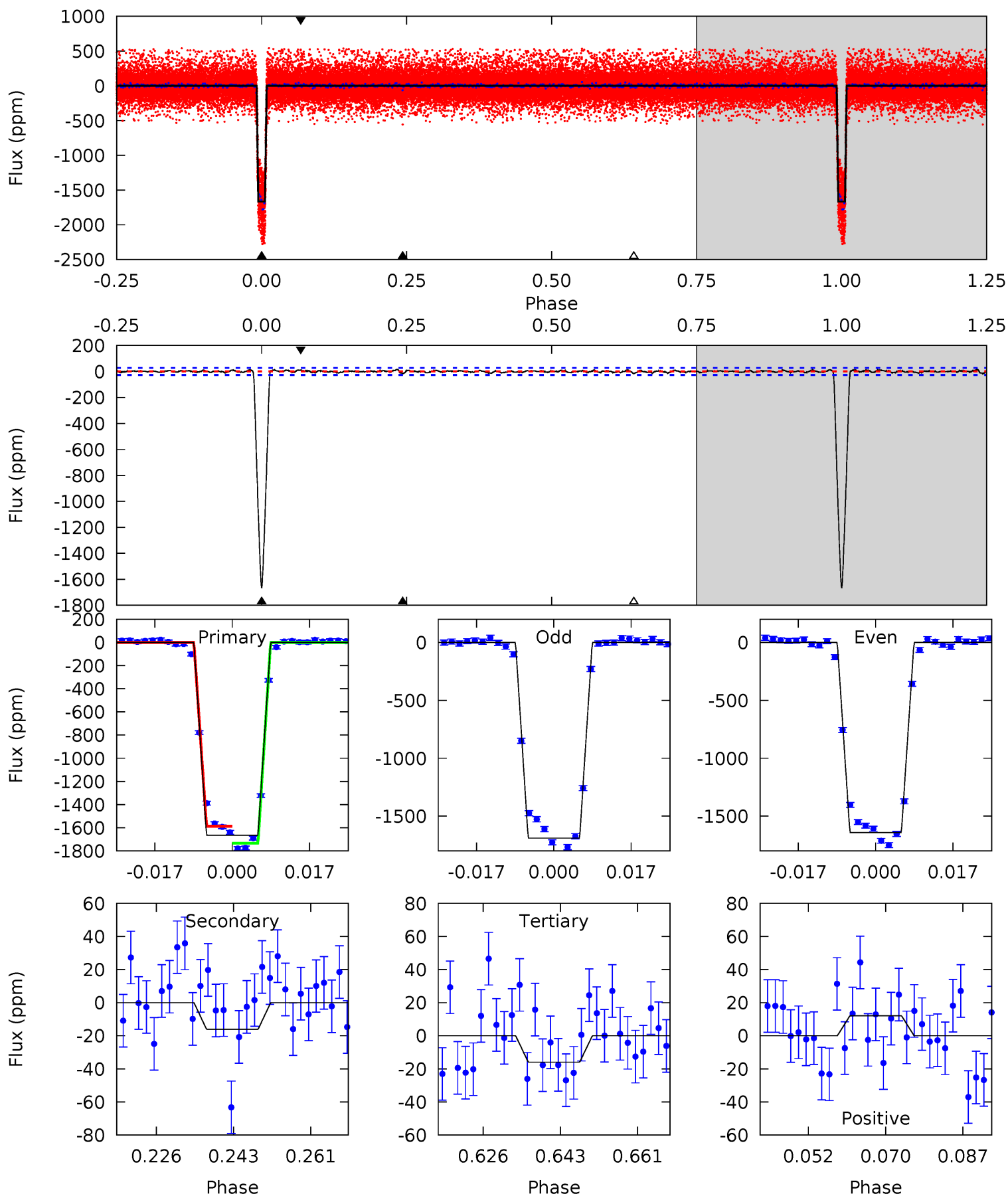
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
101.2	4.83	4.60	6.18	4.89	2.33	2.37	96.6	95.1	0.23	-1.35	3.17	0.97	0.06	2.83



# Alt Model-Shift Uniqueness Test

006184894-01, P = 7.202752 Days, E = 127.998951 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
296.4	2.87	2.84	2.16	4.92	2.38	0.93	293.6	294.2	0.04	0.71	4.32	1.03	0.01	13.1





### Stellar Parameters For KIC 006184894

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5388^{+161}_{-145}$	$4.560^{+0.088}_{-0.064}$	$-0.700^{+0.300}_{-0.300}$	$0.717^{+0.082}_{-0.074}$	$0.681^{+0.085}_{-0.034}$	$2.603^{+0.922}_{-0.572}$
	+3%/-3%	+2%/-1%	+43%/-43%	+11%/-10%	+12%/-5%	+35%/-22%
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 006184894-01 / KOI 5245.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-83 \pm 17$	$3.41^{+0.22}_{-0.22}$	$1107^{+44}_{-41}$	$3084^{+107}_{-112}$	$16^{+5}_{-4}$
Alt.	$-16 \pm 6$	$3.23^{+0.24}_{-0.22}$	$1107^{+50}_{-45}$	$2492^{+112}_{-136}$	$3.533^{+1.355}_{-1.231}$

$T_{max}$  = 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  $A_{obs} \gg 1.0$

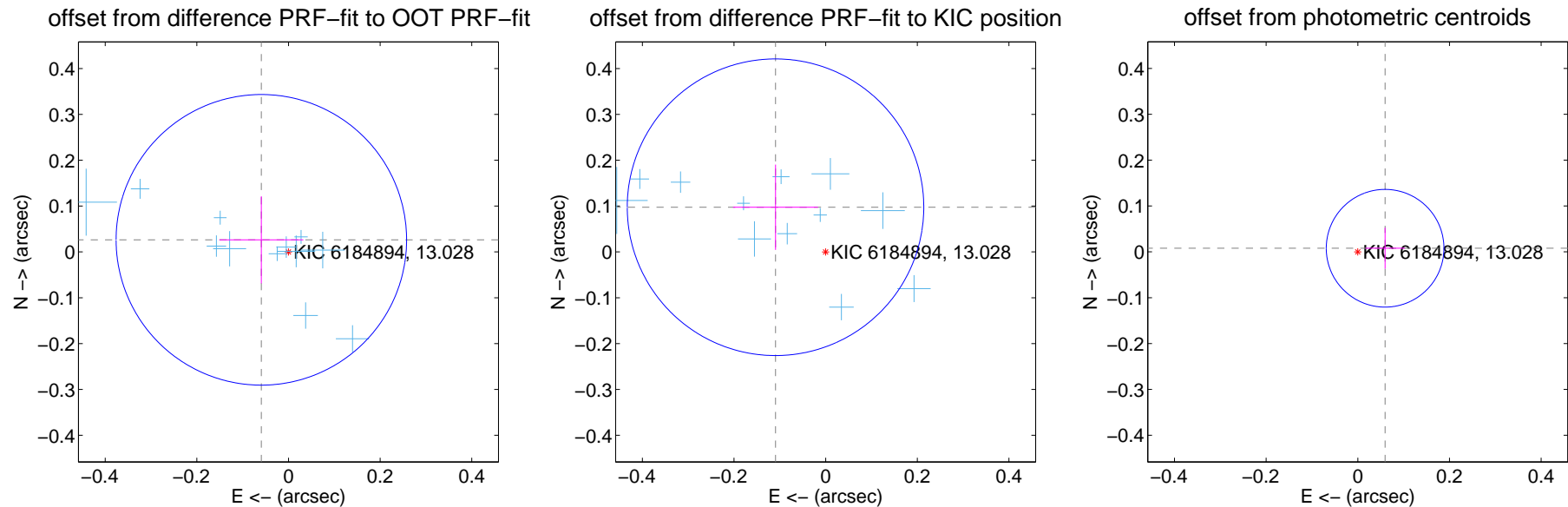
## DV Centroid Data

Supplemental centroid analysis for 006184894-01. Kepler magnitude: 13.03. Transit SNR 73.76

There are 13 quarters with good PRF difference image offsets

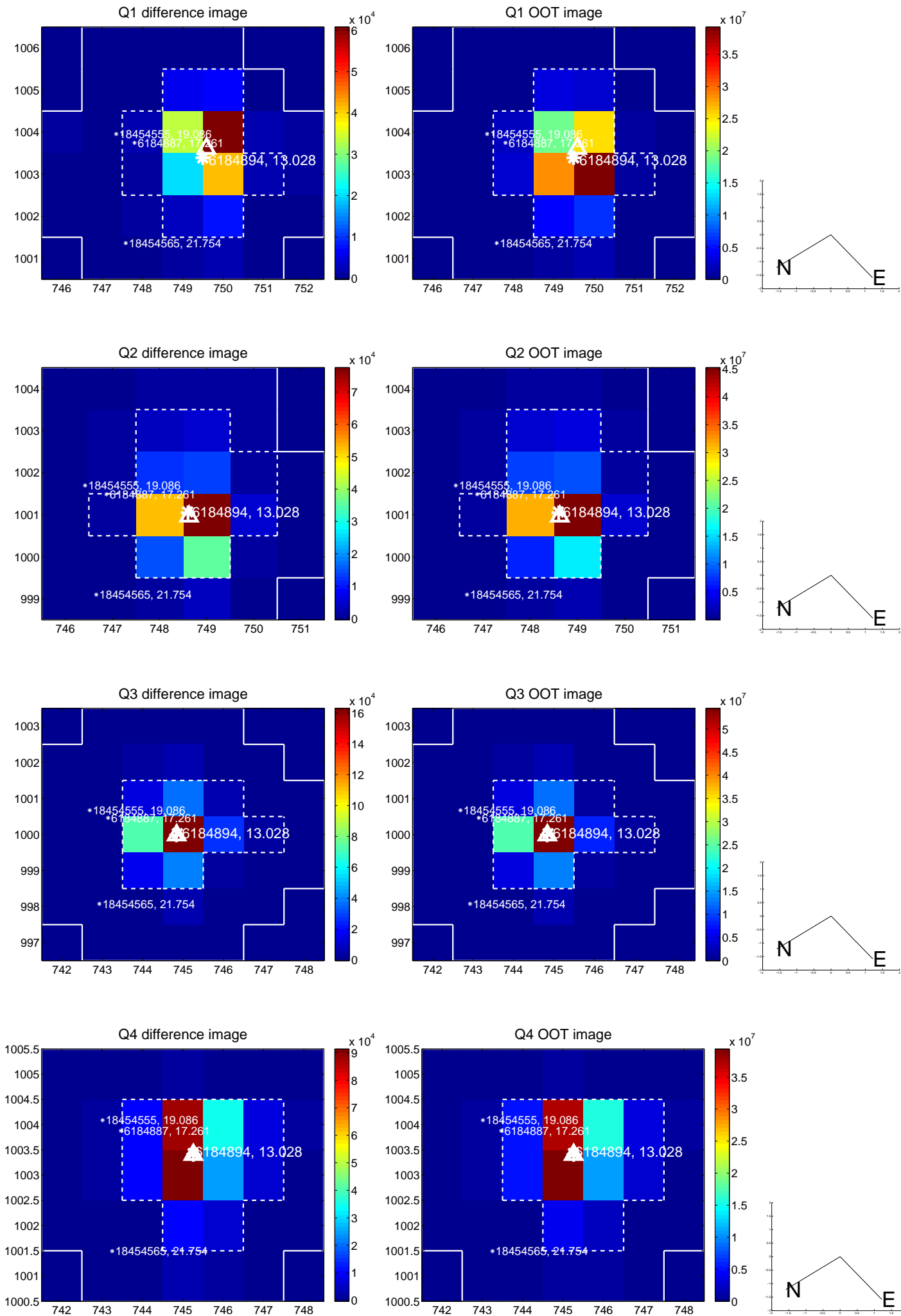
The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.065 \pm 0.106$	0.61	$0.059 \pm 0.092$	$0.026 \pm 0.095$
PRF-fit source offset from KIC position	$0.147 \pm 0.108$	1.36	$0.109 \pm 0.093$	$0.097 \pm 0.093$
photometric centroid source offset	$0.06 \pm 0.04$	1.40	$-0.06 \pm 0.04$	$0.01 \pm 0.04$

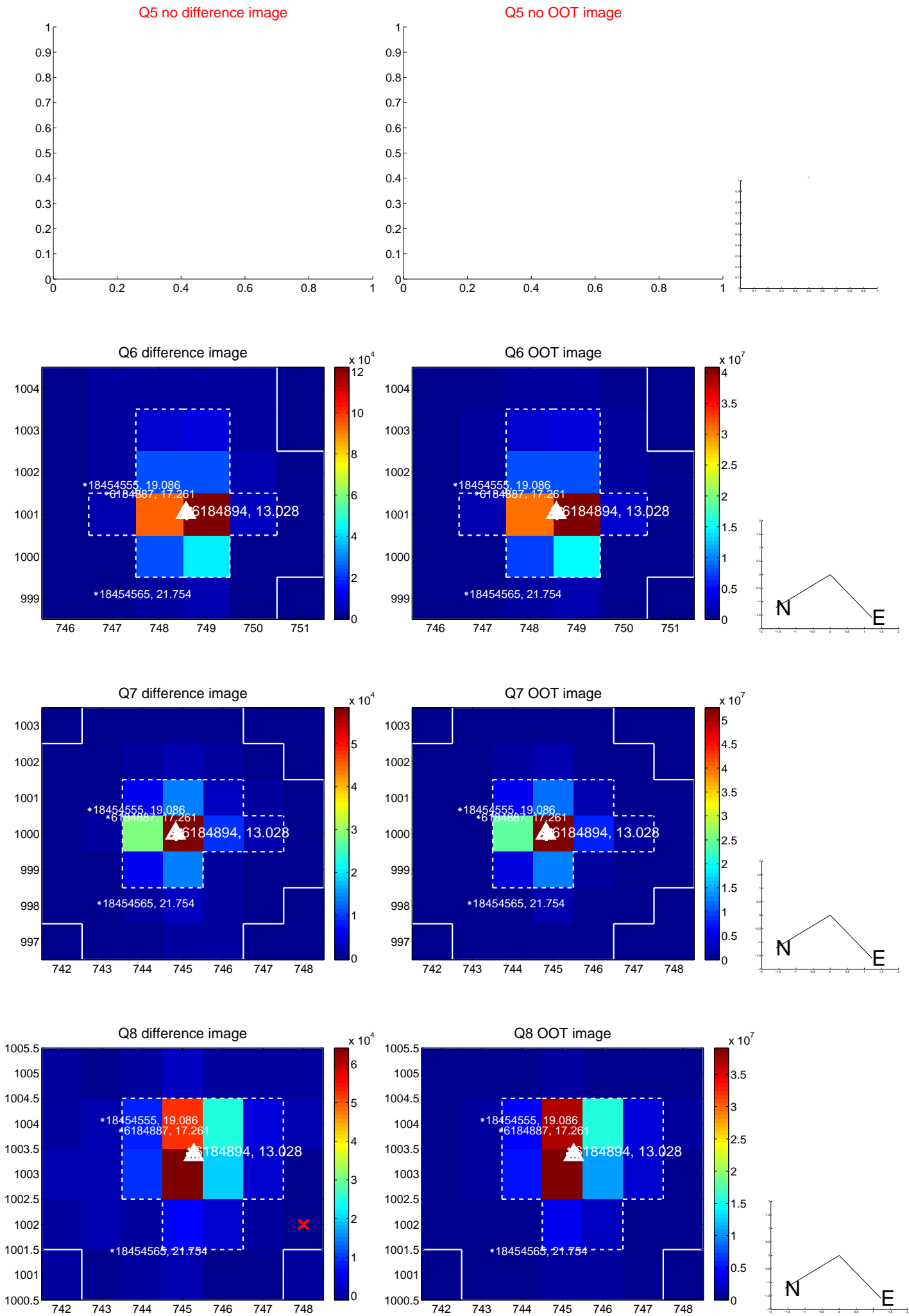


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

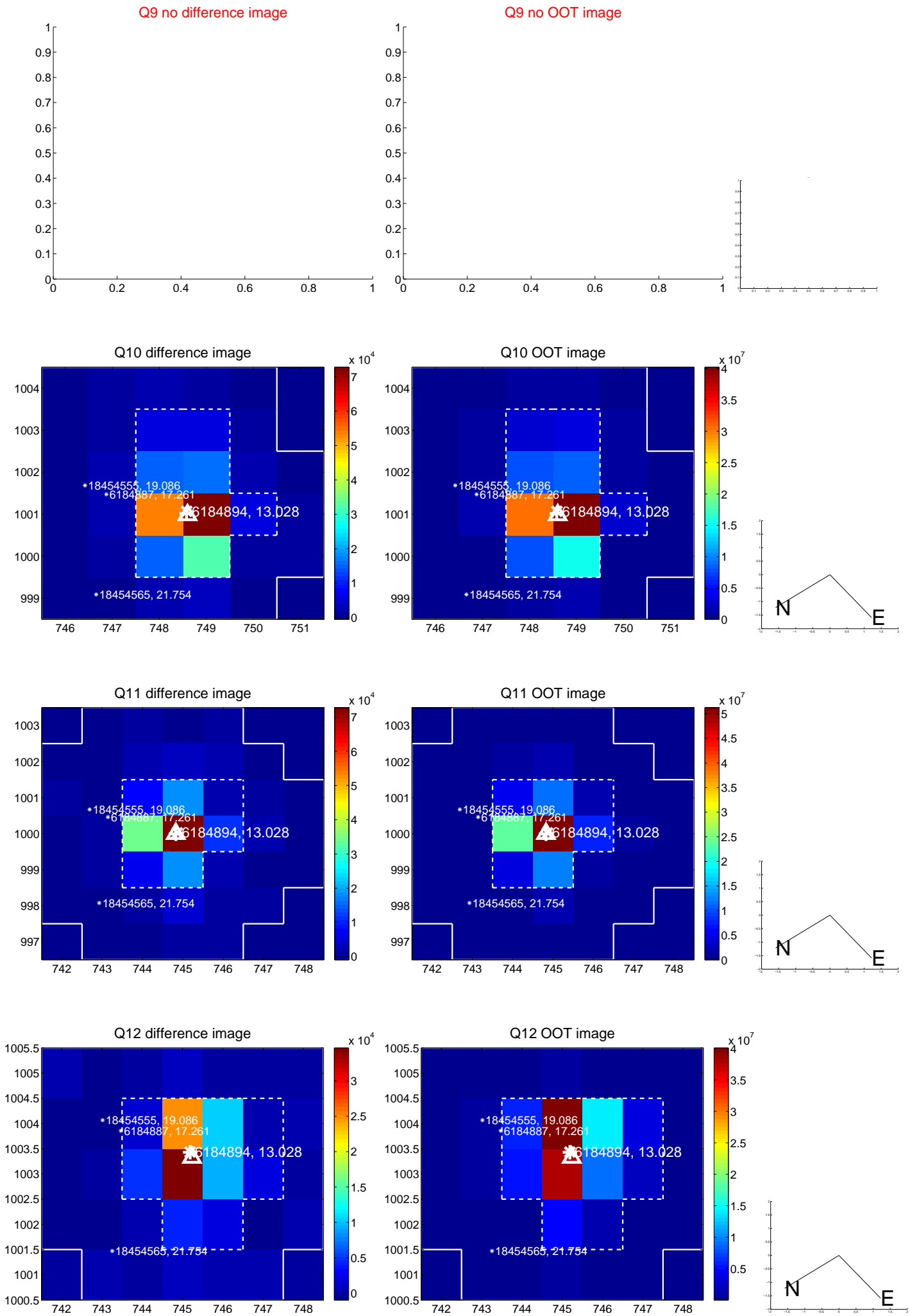


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

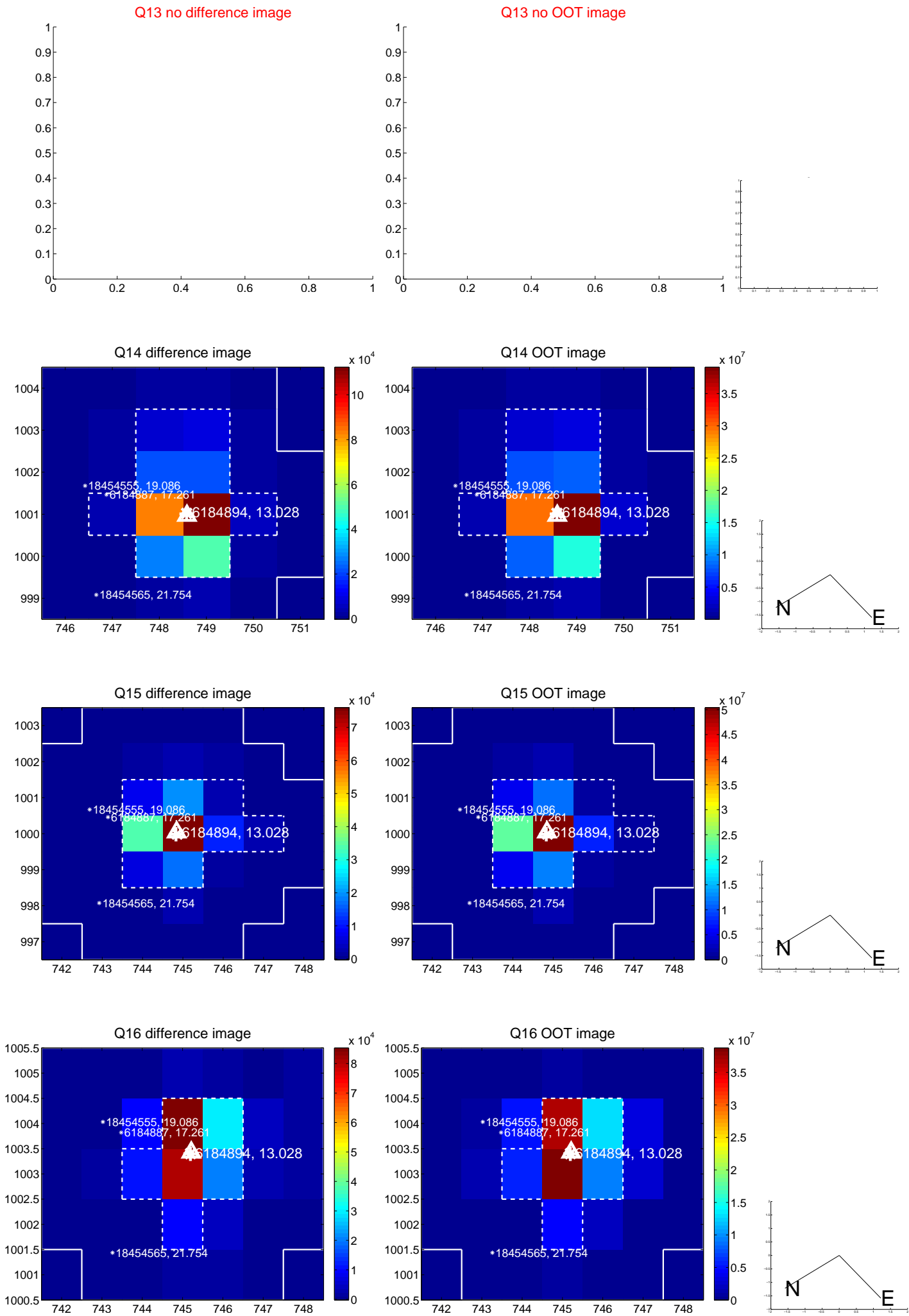




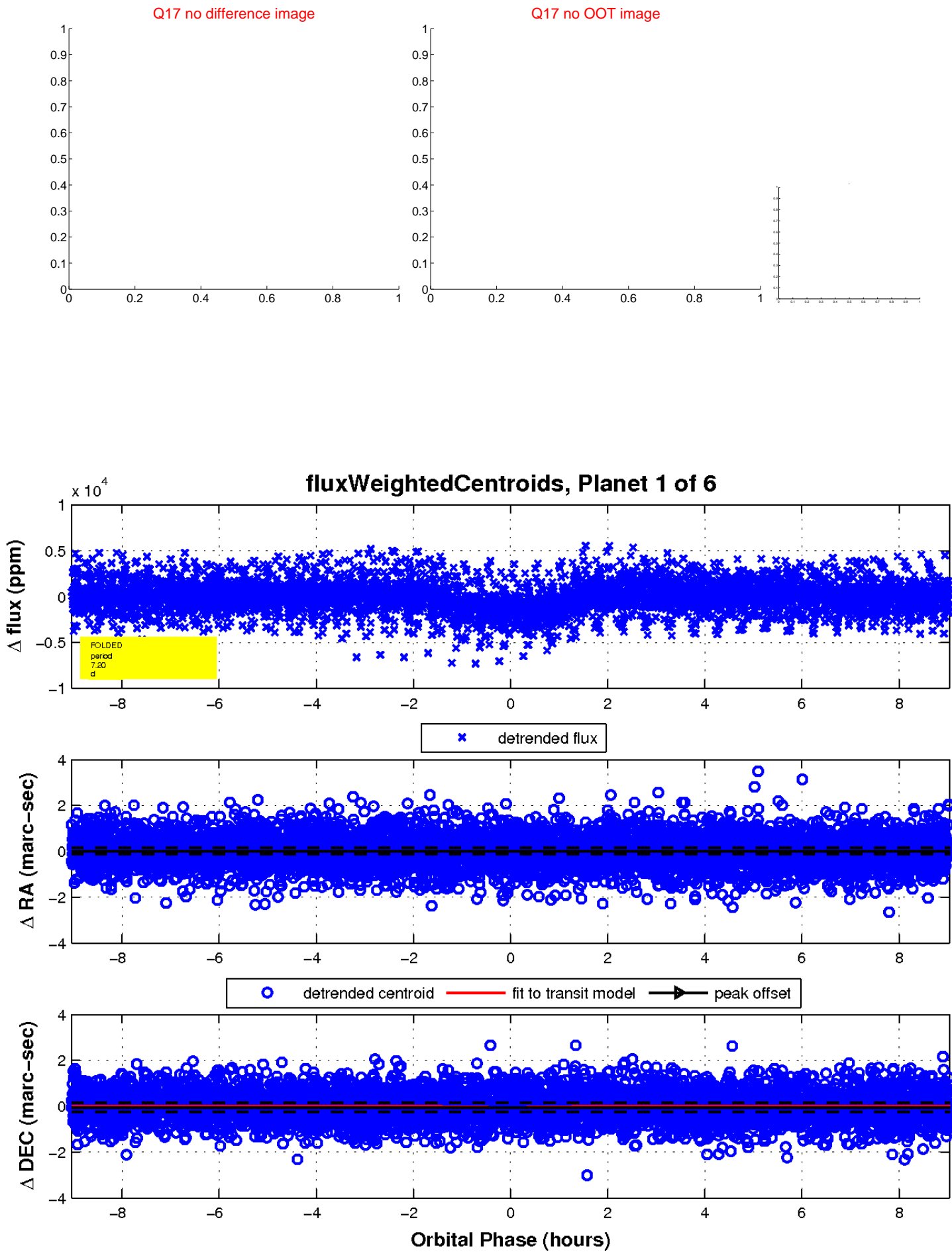
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

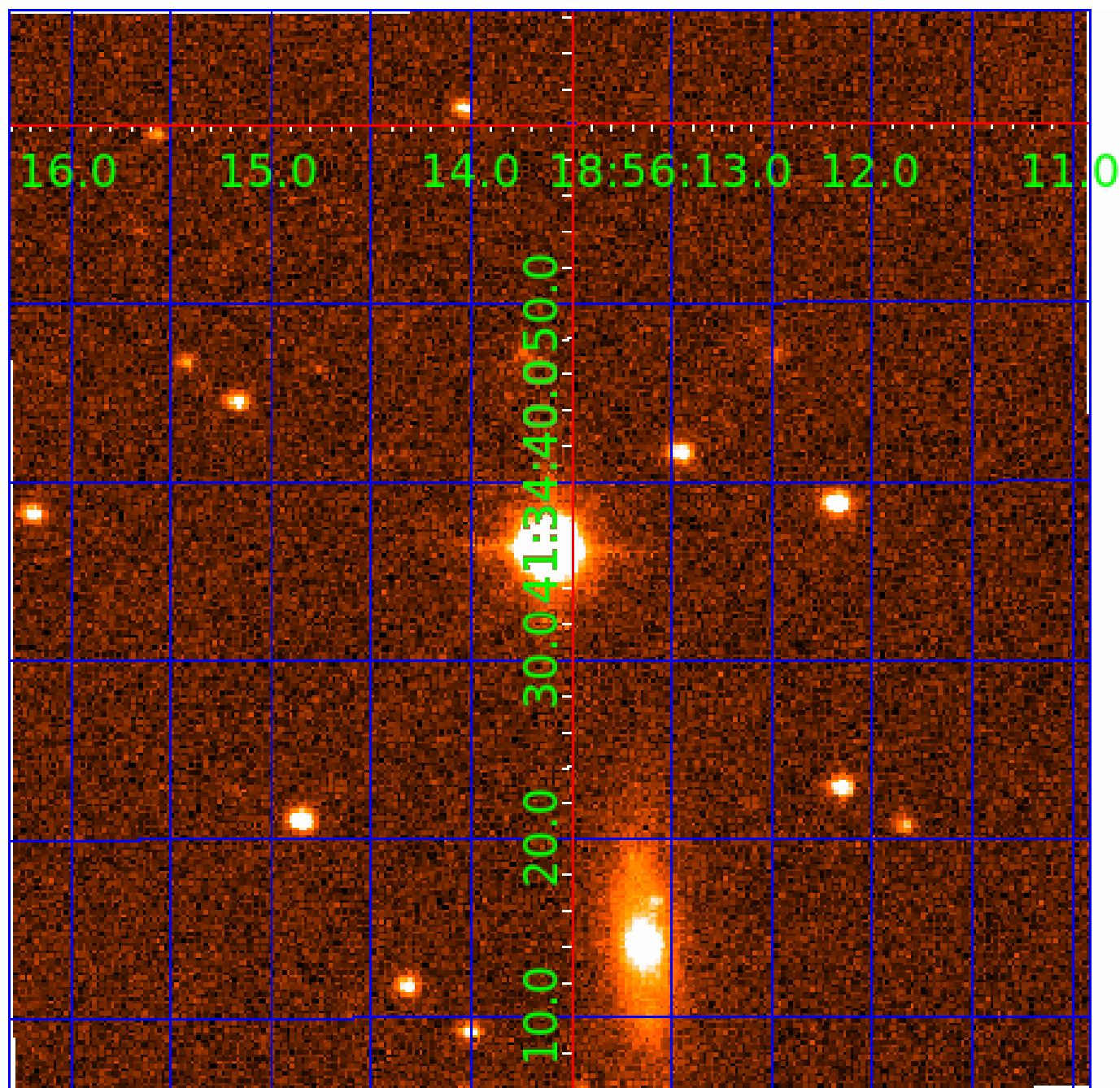


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 006184894

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006184894-01	OBS	5245.01	7.202813	135.195192	1788.6	3.015	67.6	73.8	0.72	5388	3.39	94.11
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006184894-05	OBS	No	394.144185	258.523696	431.3	4.798	17.5	2.1	0.72	5388	1.55	0.45
006184894-06	OBS	No	449.479948	246.992497	1734.2	4.941	16.5	7.1	0.72	5388	3.01	0.38

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006184894-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
006184894-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006184894-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—INCONSISTENT_TRANS
006184894-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_SKYE_TRACKER—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
006184894-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_TRACKER—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV
006184894-06	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—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.

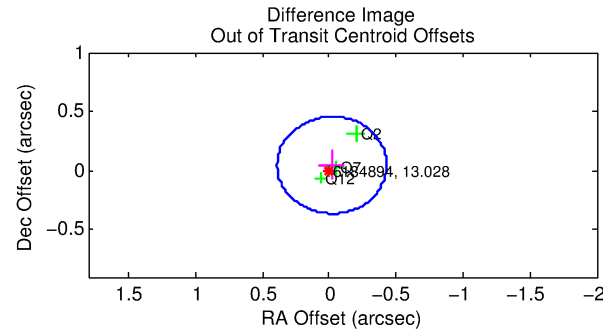
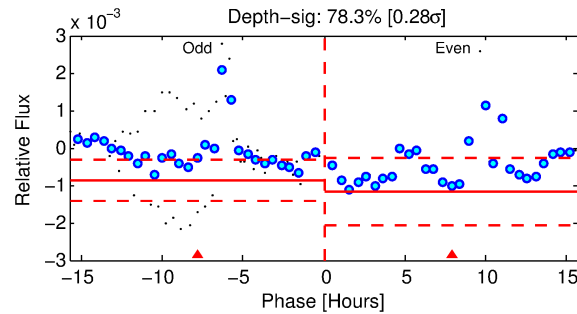
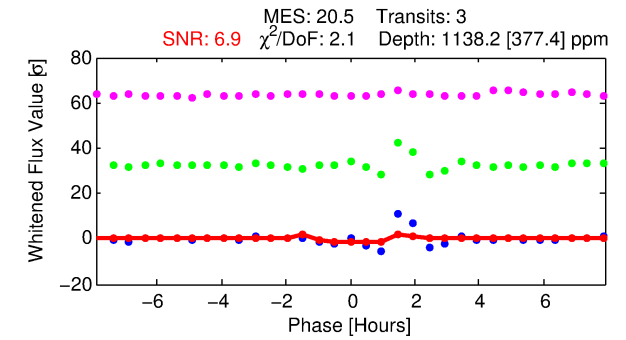
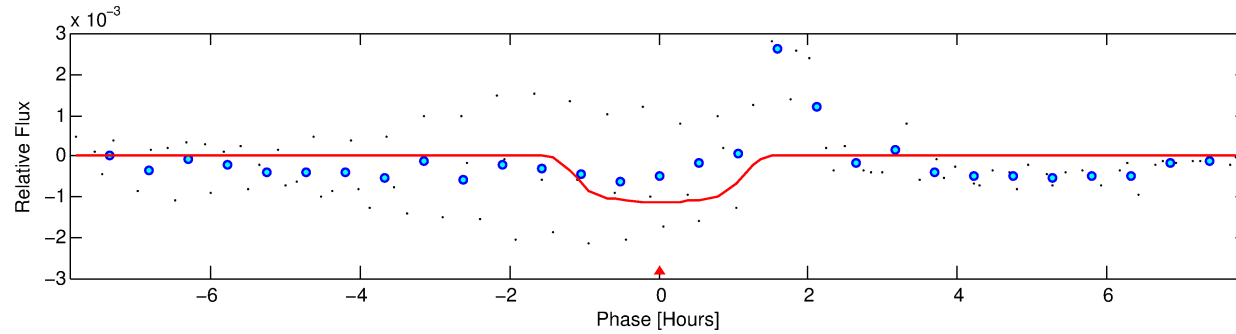
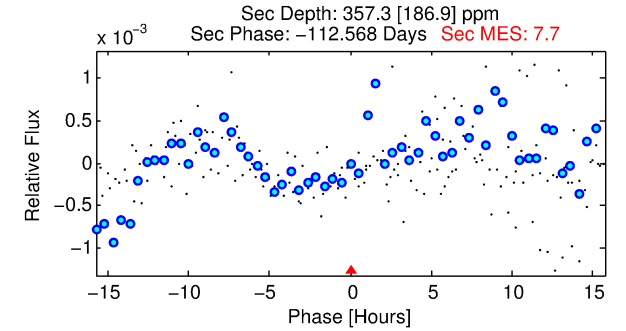
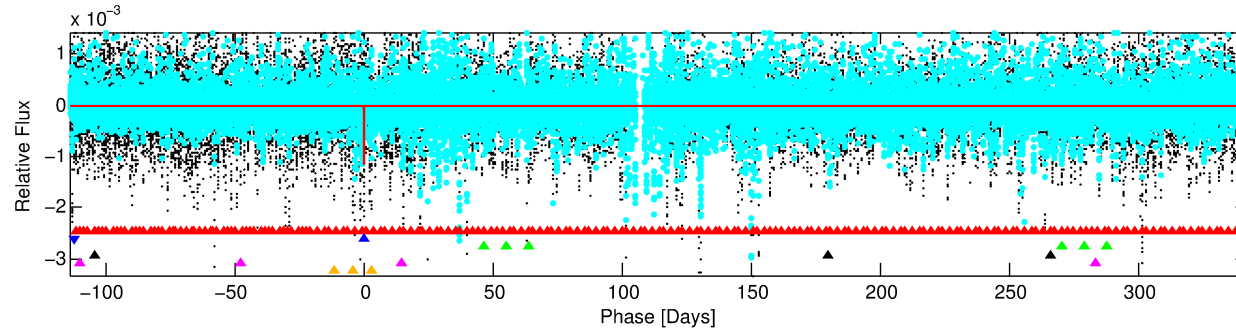
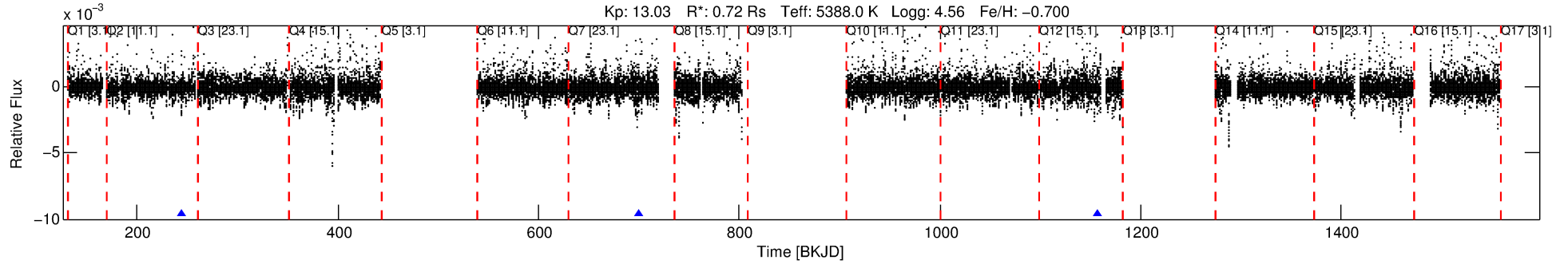
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 006184894-02

No Significant Match Found

# DV One-Page Summary

KIC: 6184894 Candidate: 2 of 6 Period: 456.612 d  
KOI: K05245 Corr: No Ephemeris Match



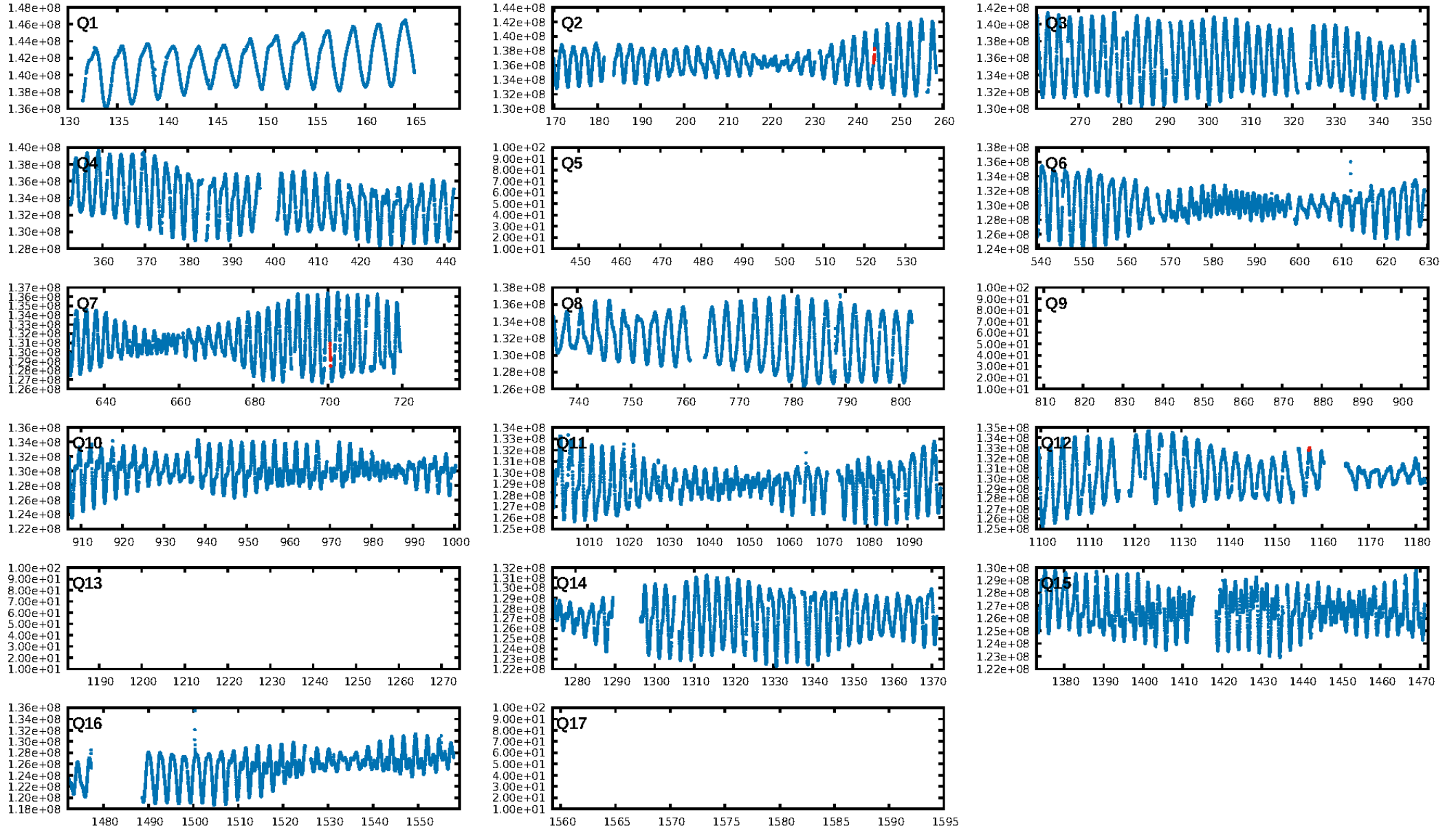
## DV Fit Results:

Period = 456.61241 [0.00578] d  
Epoch = 244.0803 [0.0057] BKJD  
Rp/R\* = 0.0357 [0.0151]  
a/R\* = 760.05 [1106.56]  
b = 0.86 [0.43]  
Seff = 0.37 [0.07]  
Teq = 199 [10] K  
Rp = 2.79 [1.22] Re  
a = 1.0211 [0.1040] AU  
Ag = 26287.51 [26436.27] [0.99 $\sigma$ ]  
Teffp = 3921 [981] K [3.79 $\sigma$ ]

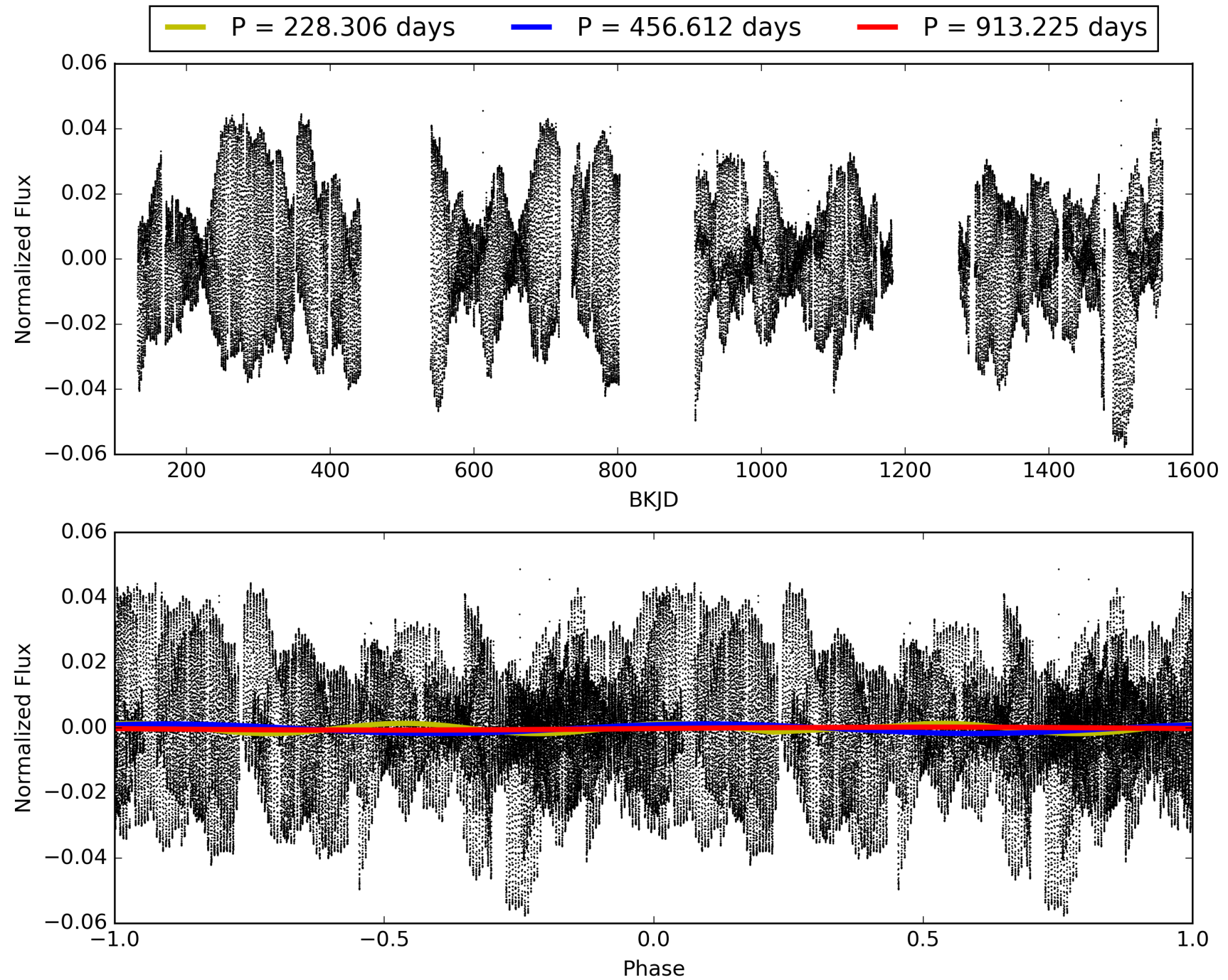
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [30.58 $\sigma$ ]  
LongPeriod-sig: 100.0% [170.44 $\sigma$ ]  
ModelChiSquare2-sig: 0.5%  
ModelChiSquareGof-sig: 22.2%  
Bootstrap-pfa: 1.42e-14  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 9.259  
Centroid-sig: 55.1%  
Centroid-so: 0.359 arcsec [0.68 $\sigma$ ]  
OotOffset-rm: 0.050 arcsec [0.36 $\sigma$ ]  
OotOffset-st: 1/1/1/0 [3]  
KicOffset-rm: 0.072 arcsec [0.52 $\sigma$ ]  
KicOffset-st: 1/1/1/0 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 1.00 [3/3]

# TCE 006184894-02, PDC Light Curves

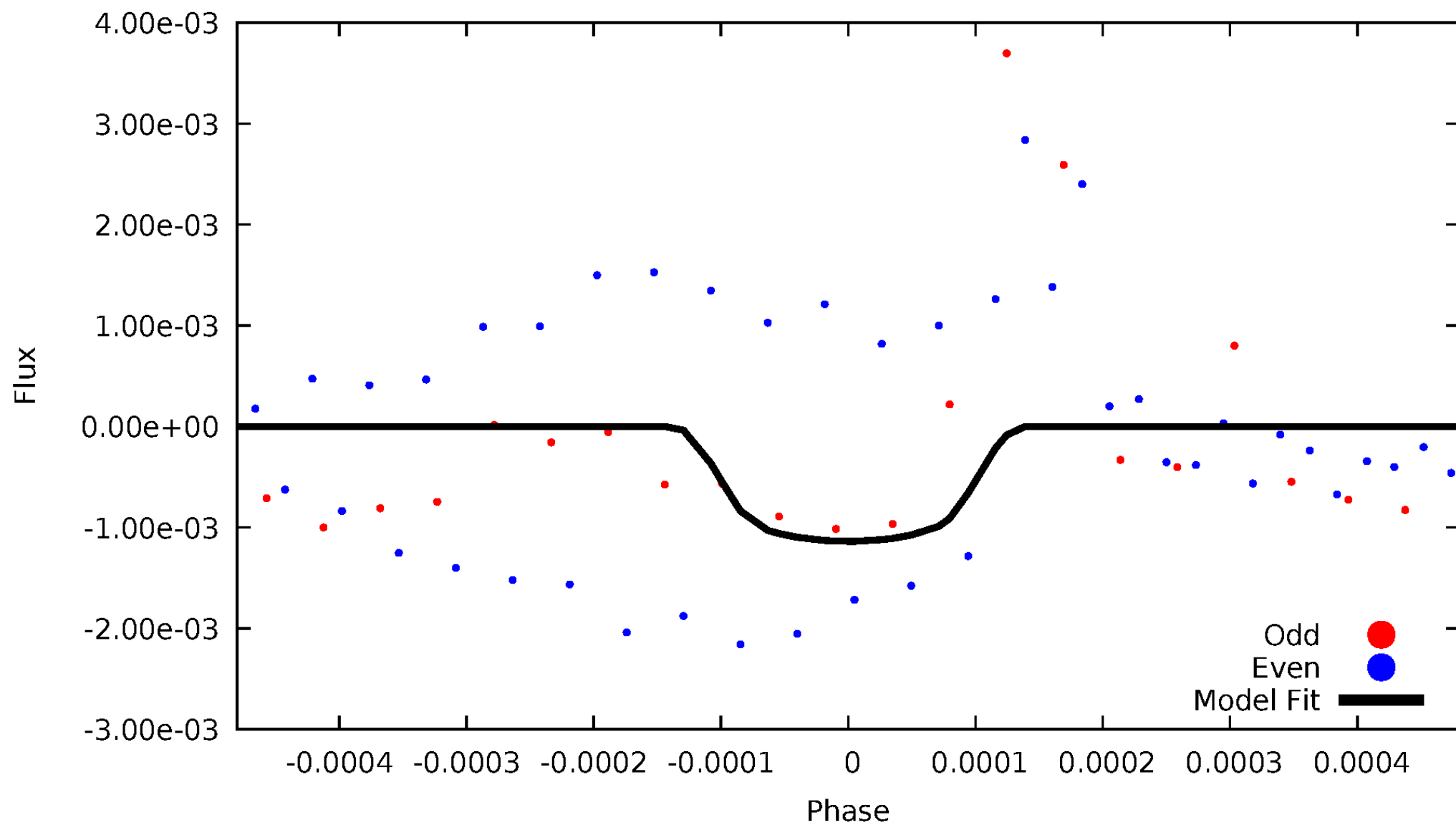


TCE 006184894-02



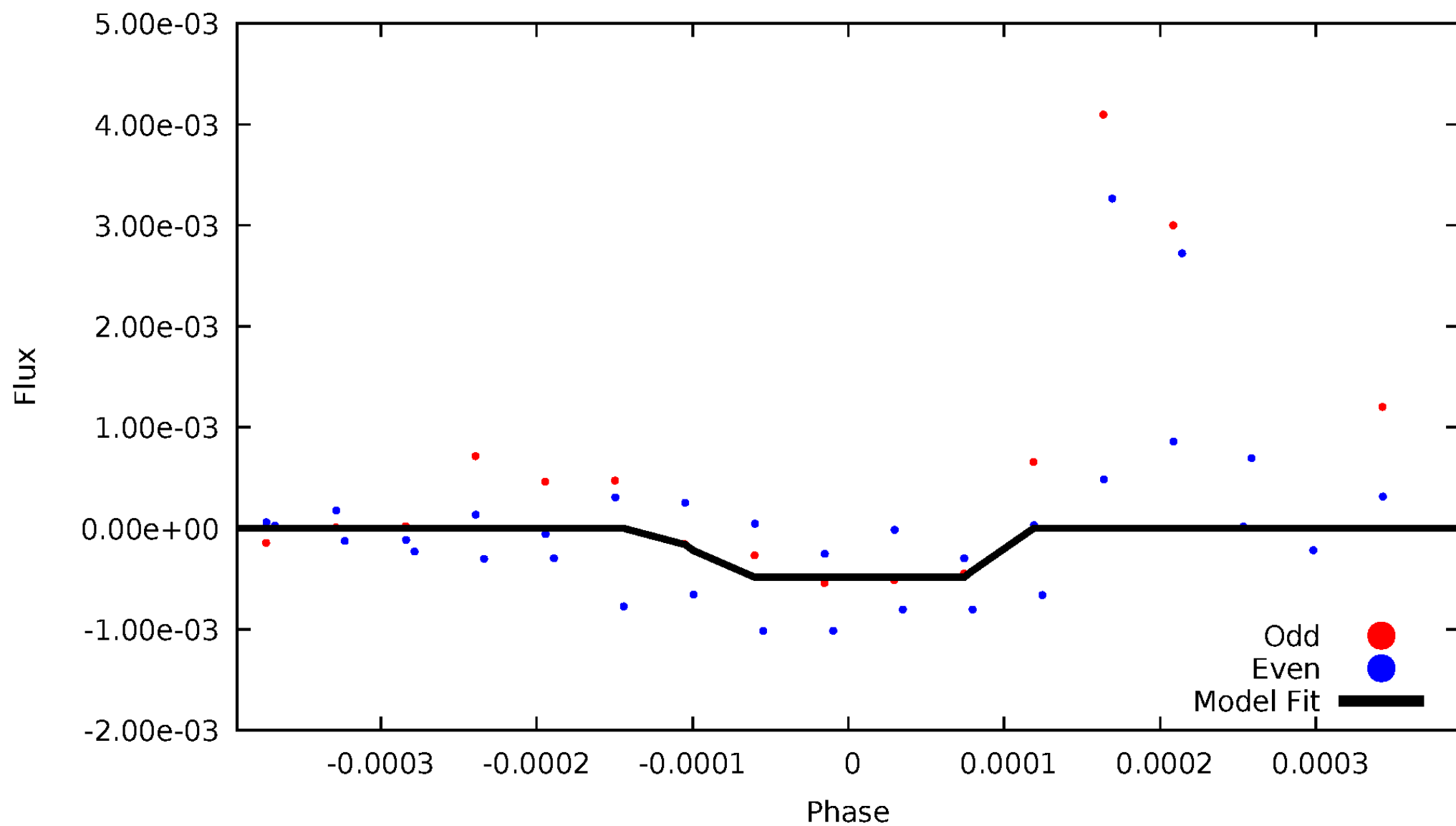
# DV Odd/Even

TCE 006184894-02



# ALT Odd/Even

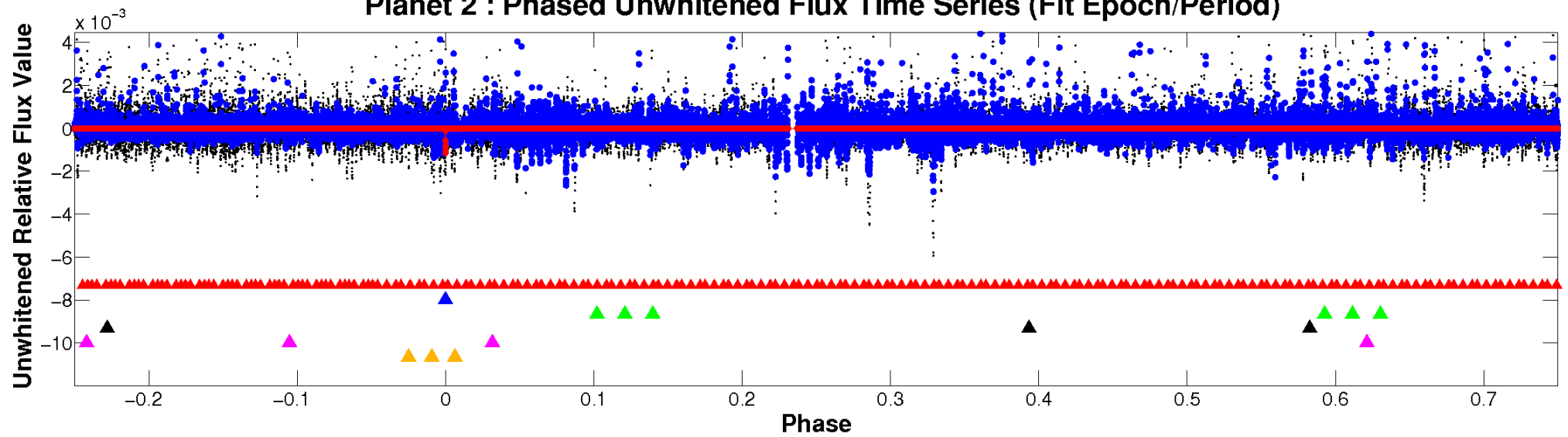
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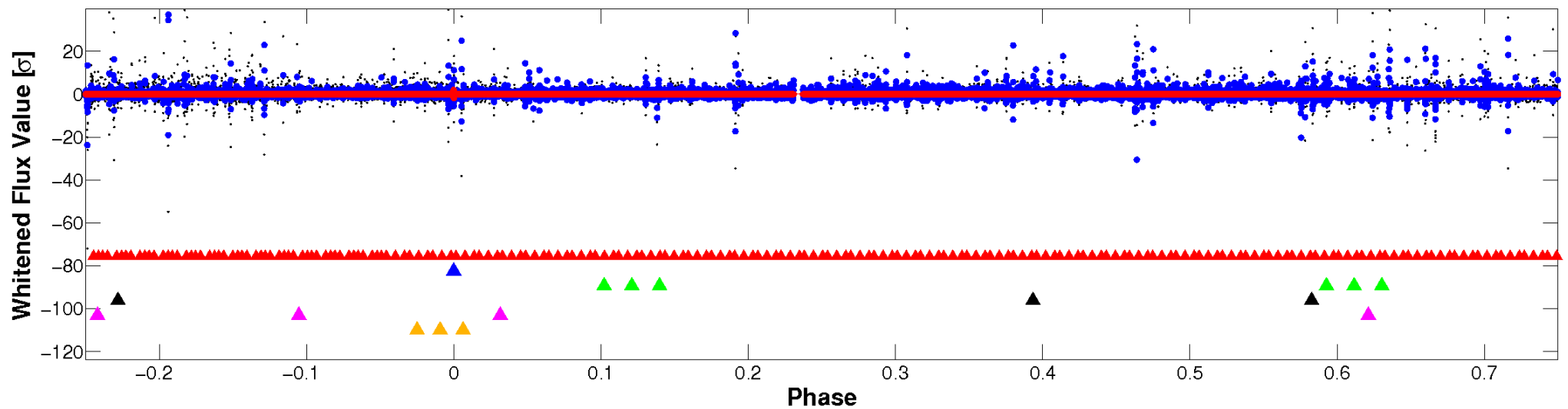


# Non-Whitened Vs. Whitened Light Curve

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

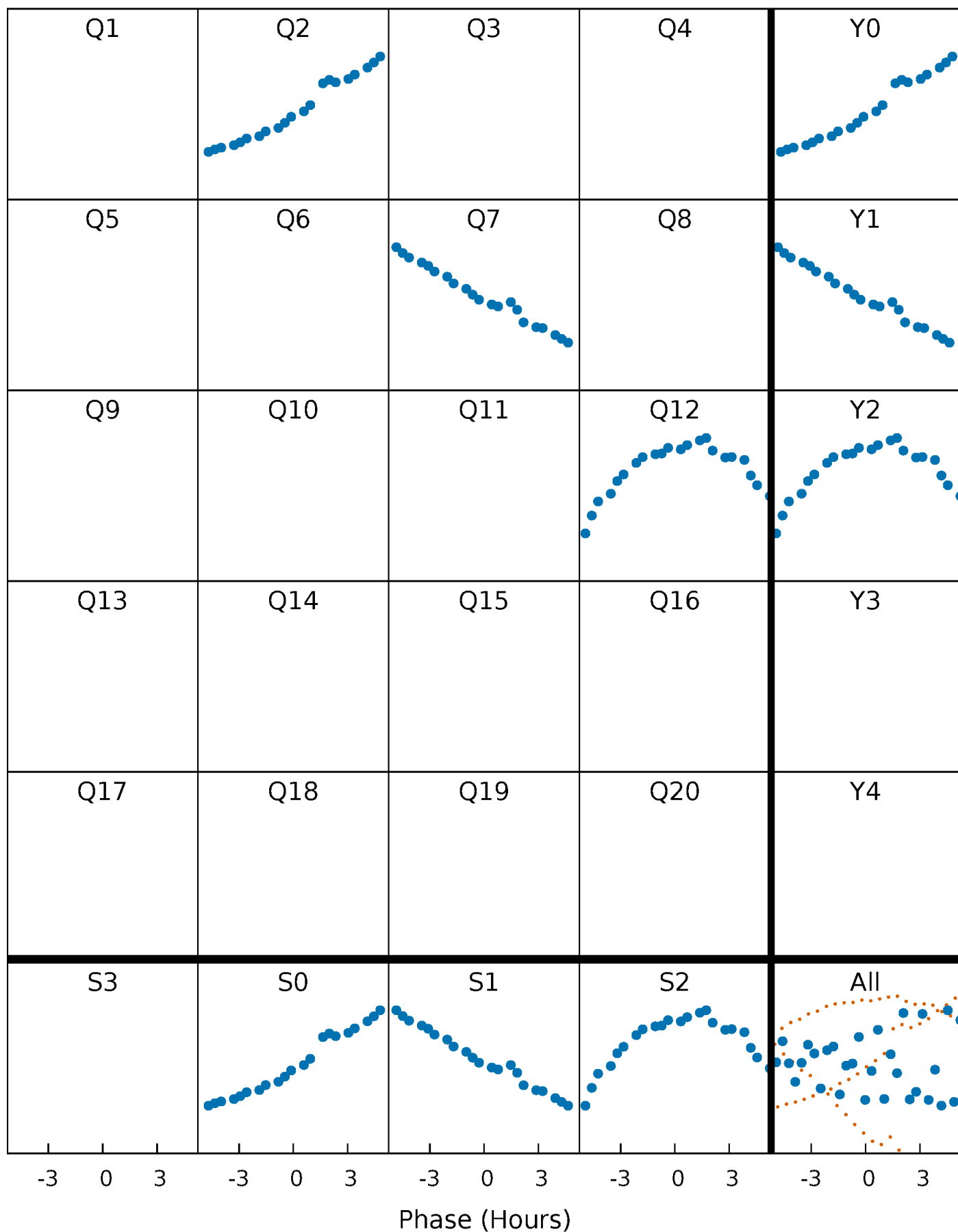


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



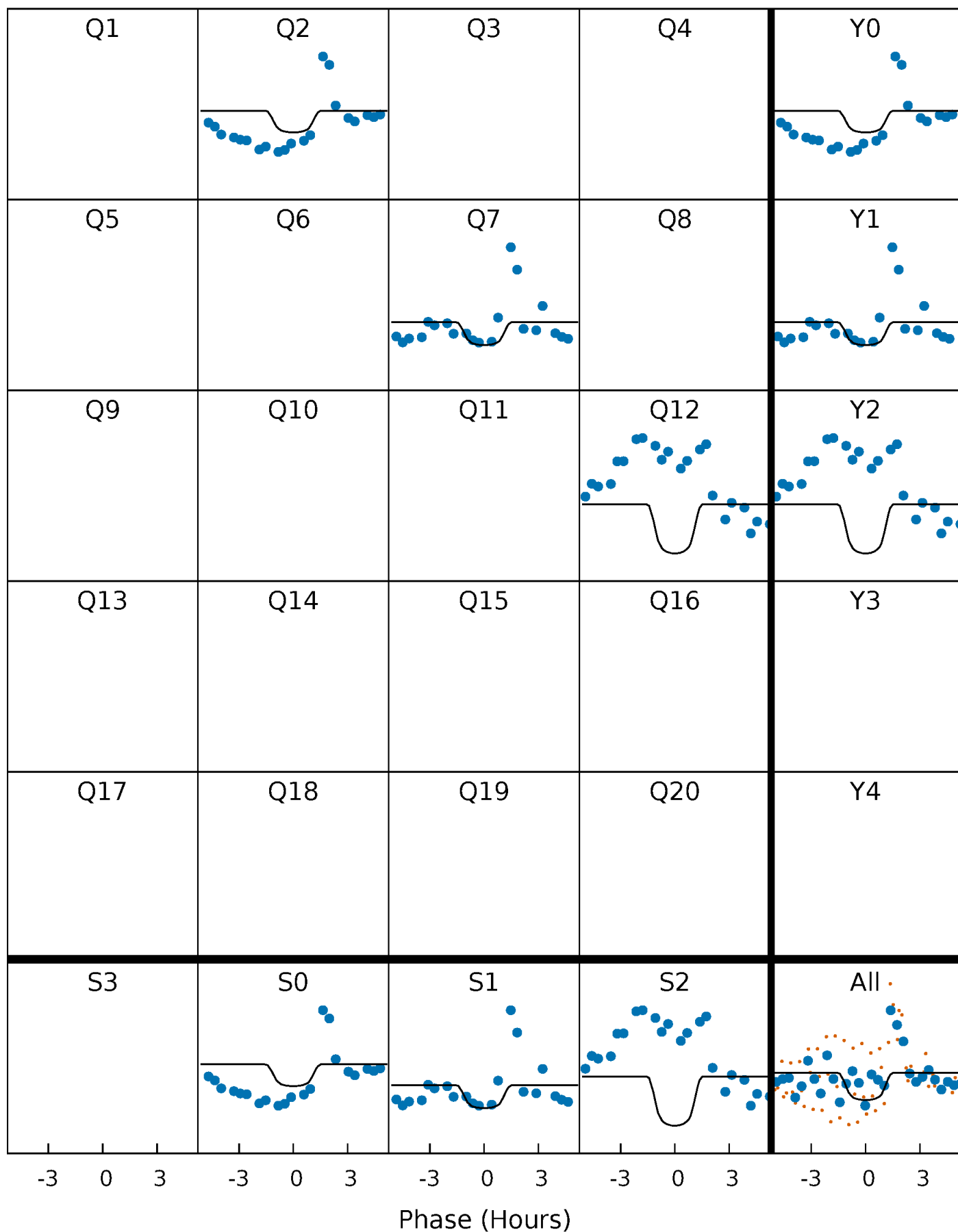
# PDC Quarter-Phased Transit Curves

TCE 006184894-02 P=456.612411 Days  $T_0=244.080267$  (BKJD)



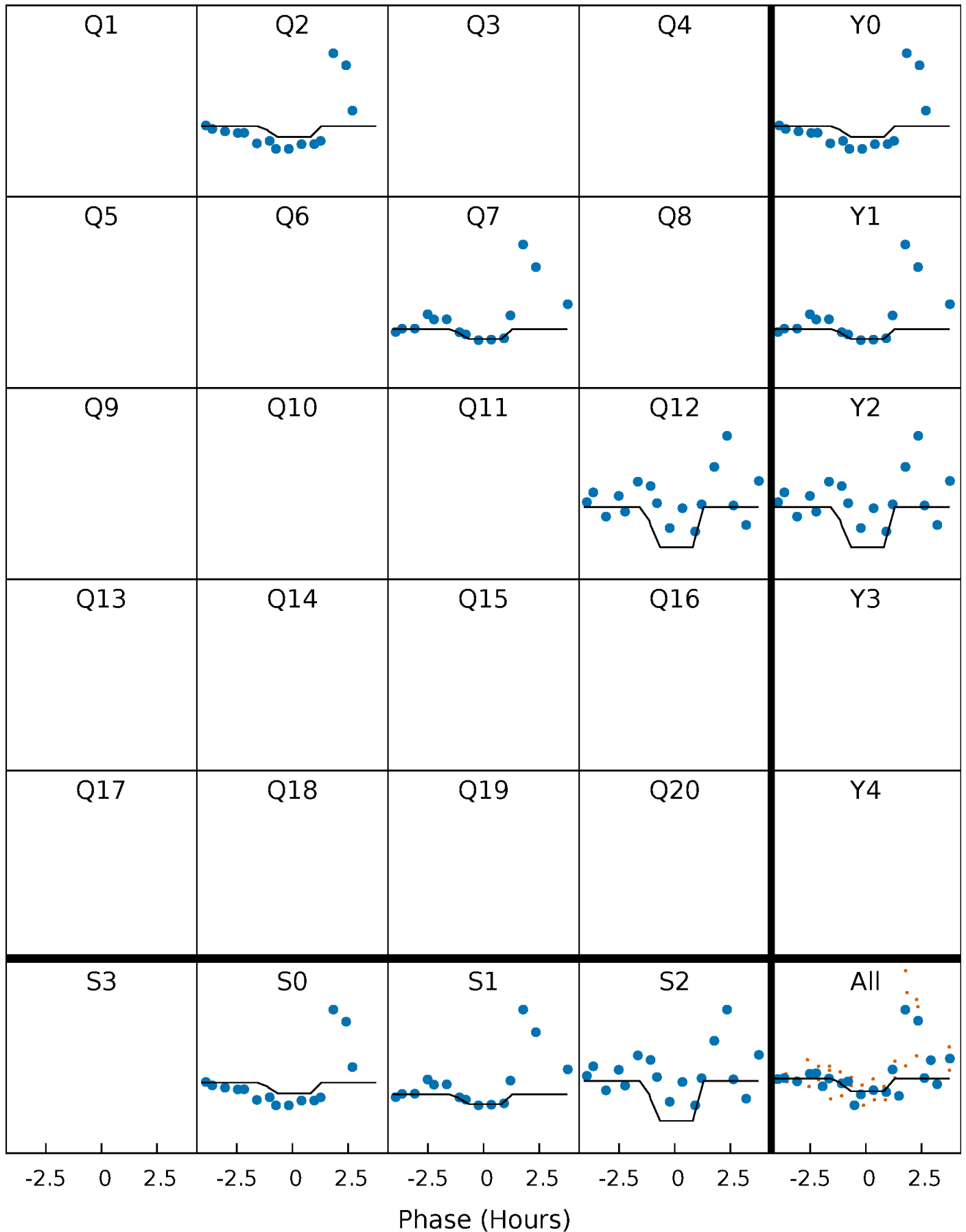
# DV Quarter-Phased Transit Curves

TCE 006184894-02 P=456.612411 Days  $T_0=244.080267$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

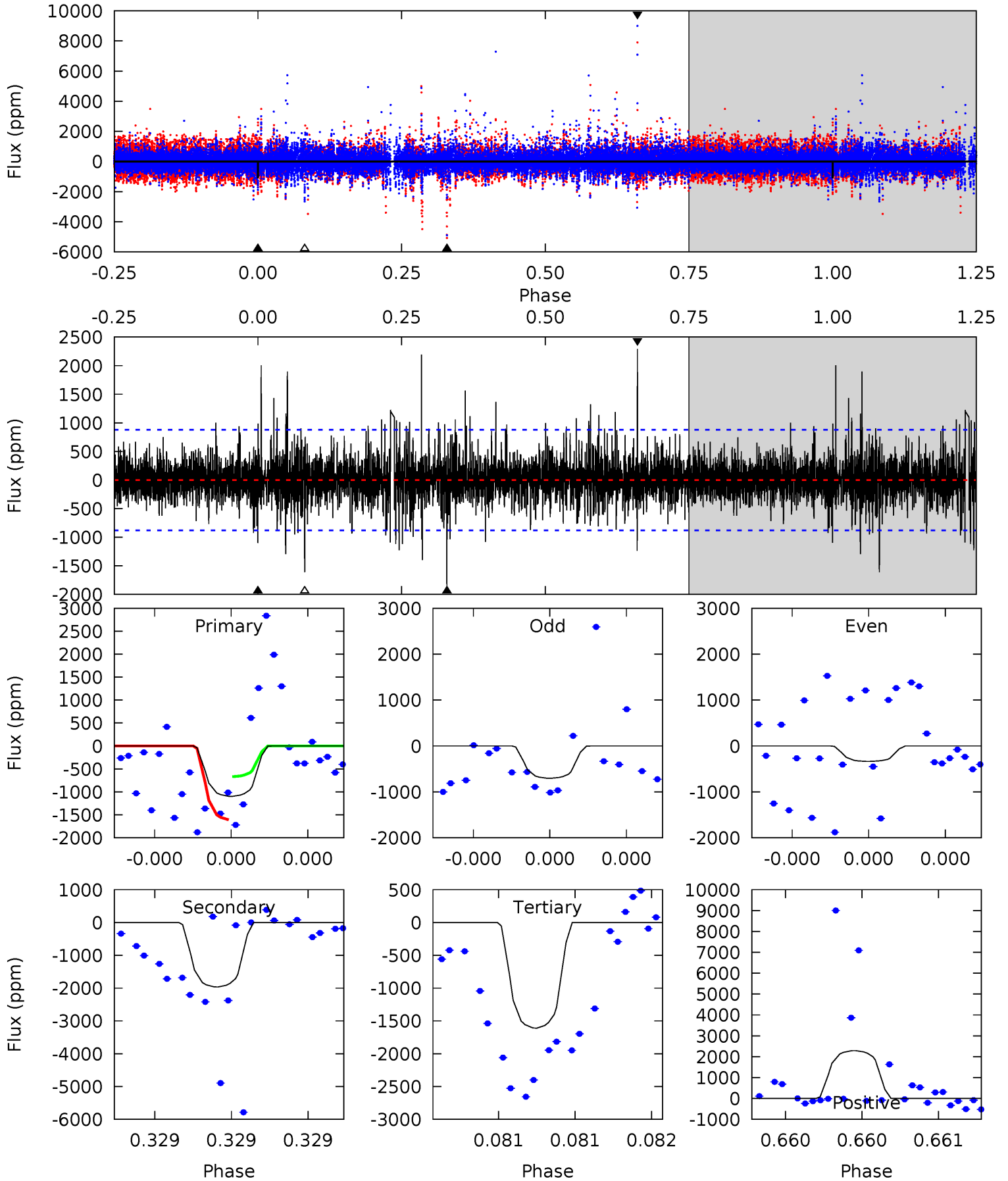
TCE 006184894-02 P=456.608332 Days  $T_0=244.066457$  (BKJD)



# DV Model-Shift Uniqueness Test

006184894-02, P = 456.612411 Days, E = 244.080267 Days

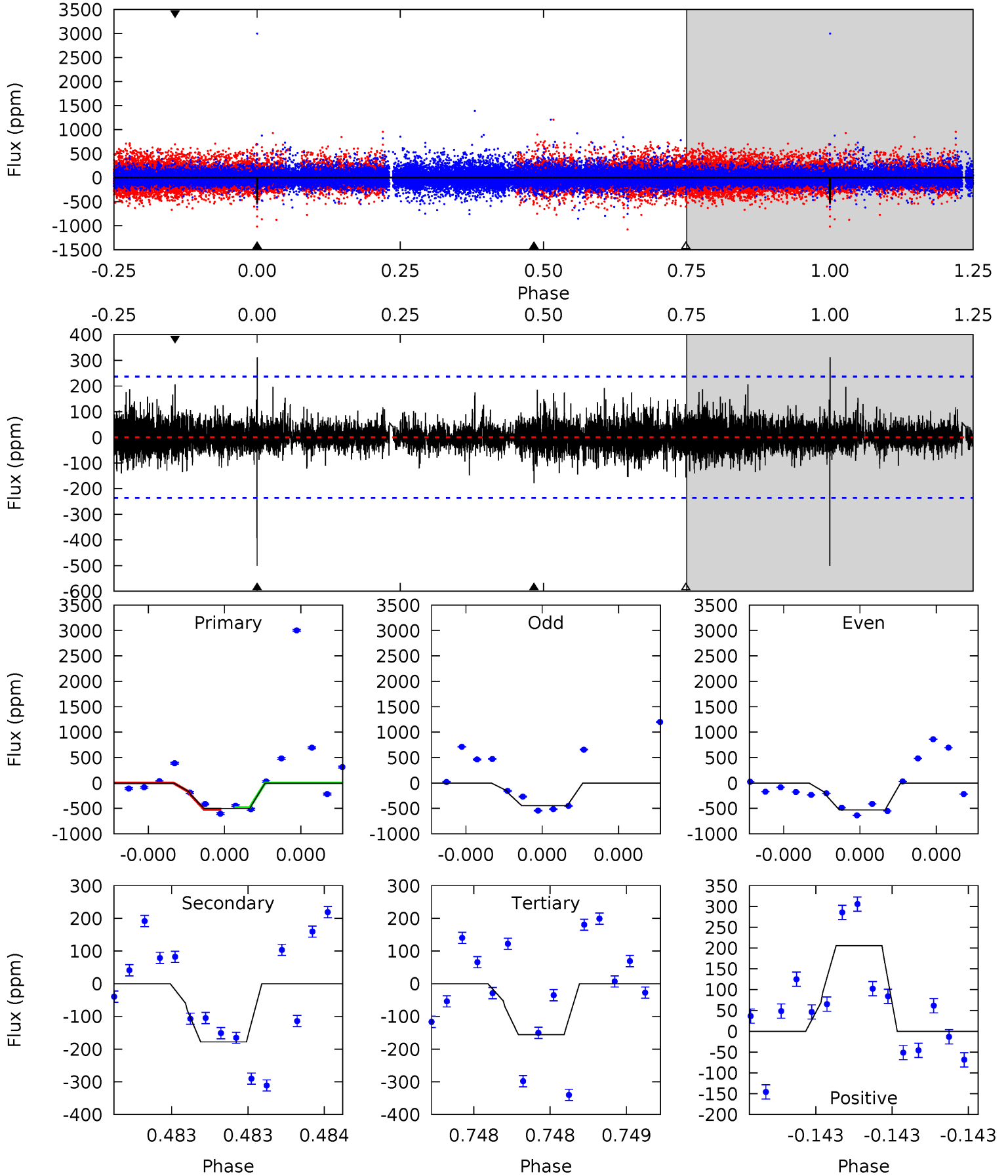
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.08	12.7	10.4	14.8	5.67	3.62	1.64	-3.30	-7.69	2.29	-2.09	0.92	0.72	0.54	2.99



# Alt Model-Shift Uniqueness Test

006184894-02, P = 456.608332 Days, E = 244.066457 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.1	4.30	3.77	4.96	5.71	3.69	0.86	8.32	7.13	0.54	-0.66	0.75	1.14	0.38	0.40



### Stellar Parameters For KIC 006184894

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5388^{+161}_{-145}$	$4.560^{+0.088}_{-0.064}$	$-0.700^{+0.300}_{-0.300}$	$0.717^{+0.082}_{-0.074}$	$0.681^{+0.085}_{-0.034}$	$2.603^{+0.922}_{-0.572}$
	+3%/-3%	+2%/-1%	+43%/-43%	+11%/-10%	+12%/-5%	+35%/-22%
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 006184894-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-1966 \pm 155$	$2.86^{+1.15}_{-1.15}$	$277^{+12}_{-11}$	$5913^{+1883}_{-904}$	$139012^{+268962}_{-69290}$
Alt.	$-178 \pm 41$	$1.79^{+1.14}_{-0.97}$	$278^{+12}_{-11}$	$4336^{+1699}_{-702}$	$32763^{+120905}_{-21223}$

$T_{max}$  = 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

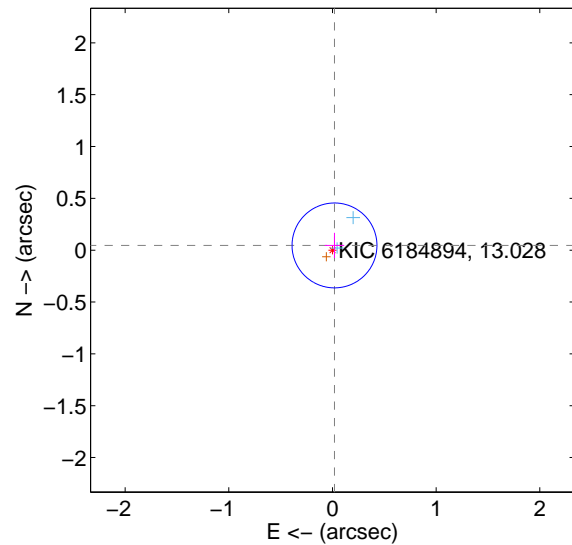
Supplemental centroid analysis for 006184894-02. Kepler magnitude: 13.03. Transit SNR 6.88

There are 2 quarters with good PRF difference image offsets

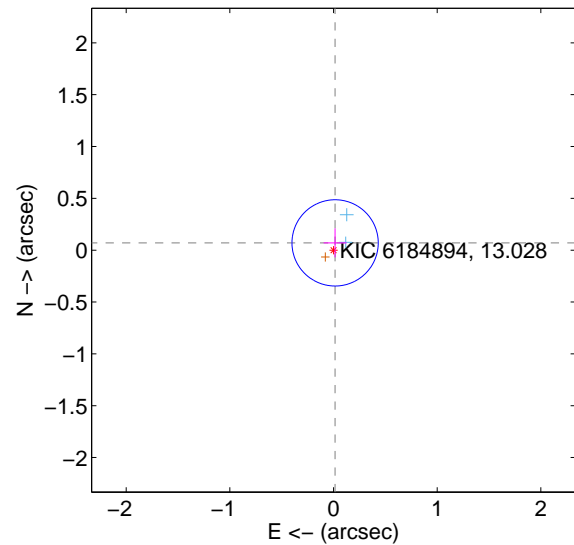
The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.050 \pm 0.136$	0.36	$-0.020 \pm 0.094$	$0.046 \pm 0.122$
PRF-fit source offset from KIC position	$0.072 \pm 0.139$	0.52	$-0.015 \pm 0.111$	$0.070 \pm 0.140$
photometric centroid source offset	$0.36 \pm 0.53$	0.68	$-0.29 \pm 0.52$	$0.21 \pm 0.54$

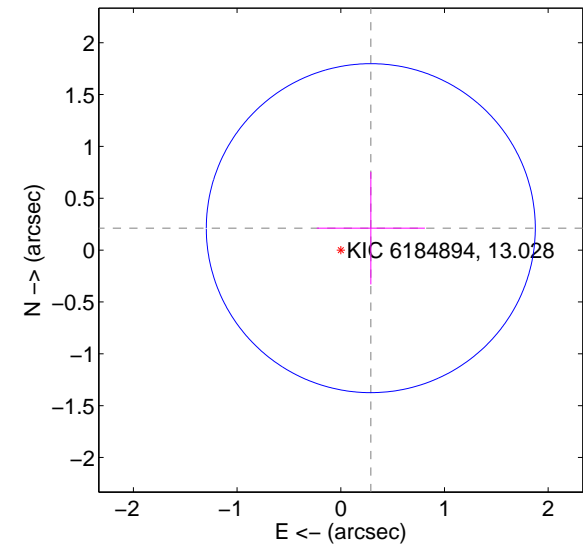
offset from difference PRF-fit to OOT PRF-fit



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- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . 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.

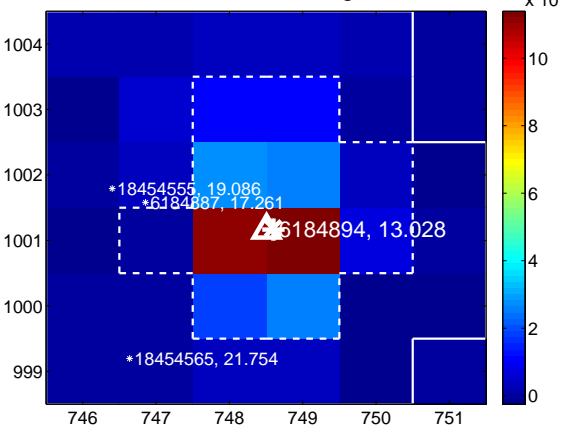
Q1 no difference image



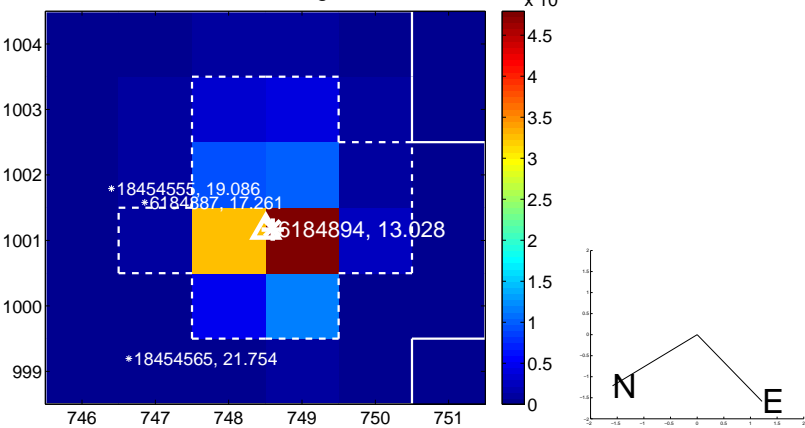
Q1 no OOT image



Q2 difference image



Q2 OOT image



Q3 no difference image



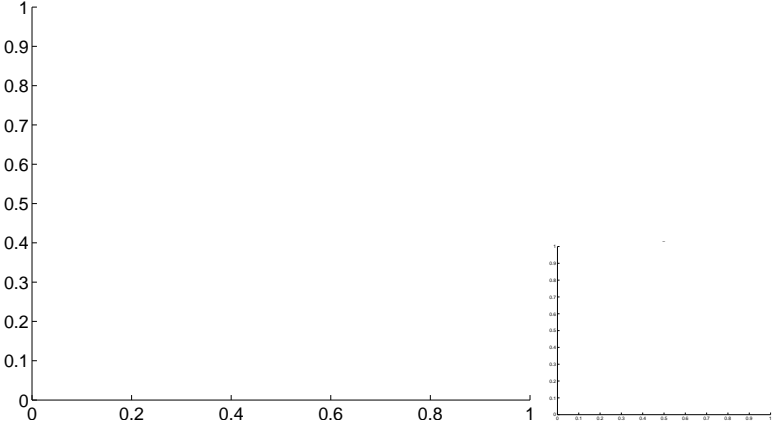
Q3 no OOT image



Q4 no difference image



Q4 no OOT image



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

Q5 no difference image



Q5 no OOT image



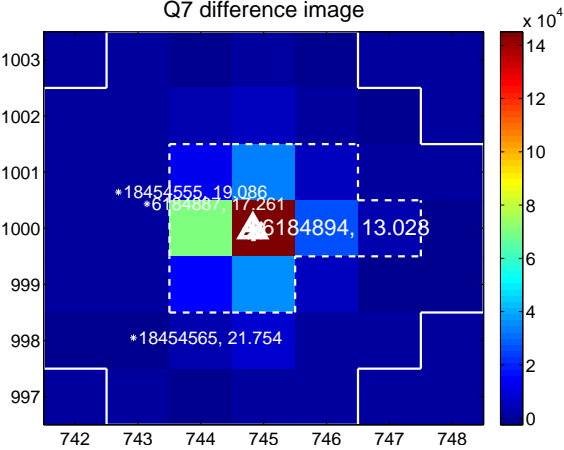
Q6 no difference image



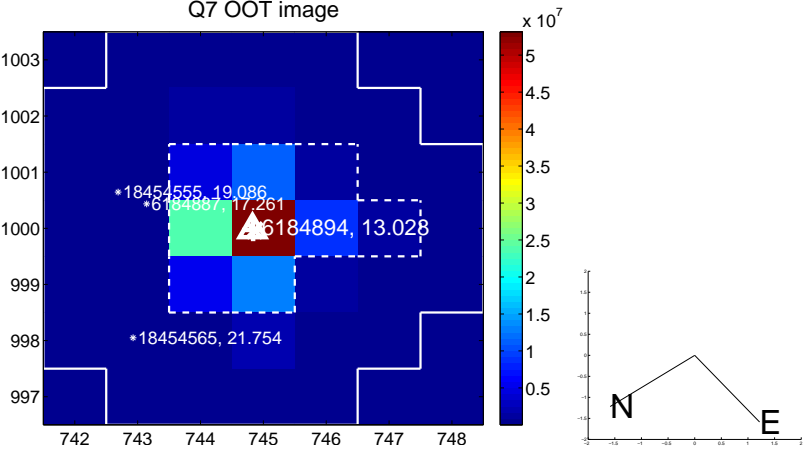
Q6 no OOT image



Q7 difference image



Q7 OOT image



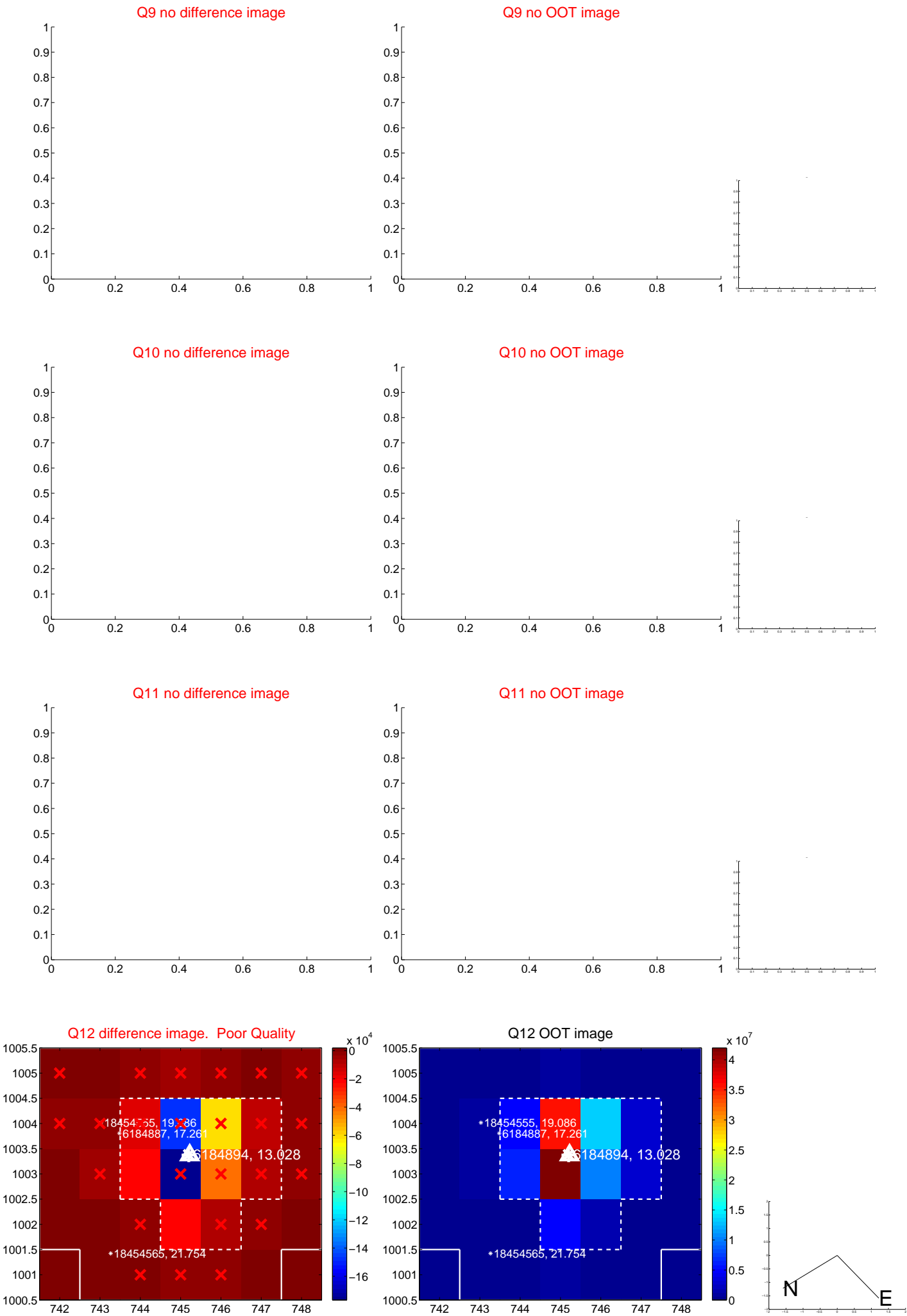
Q8 no difference image



Q8 no OOT image



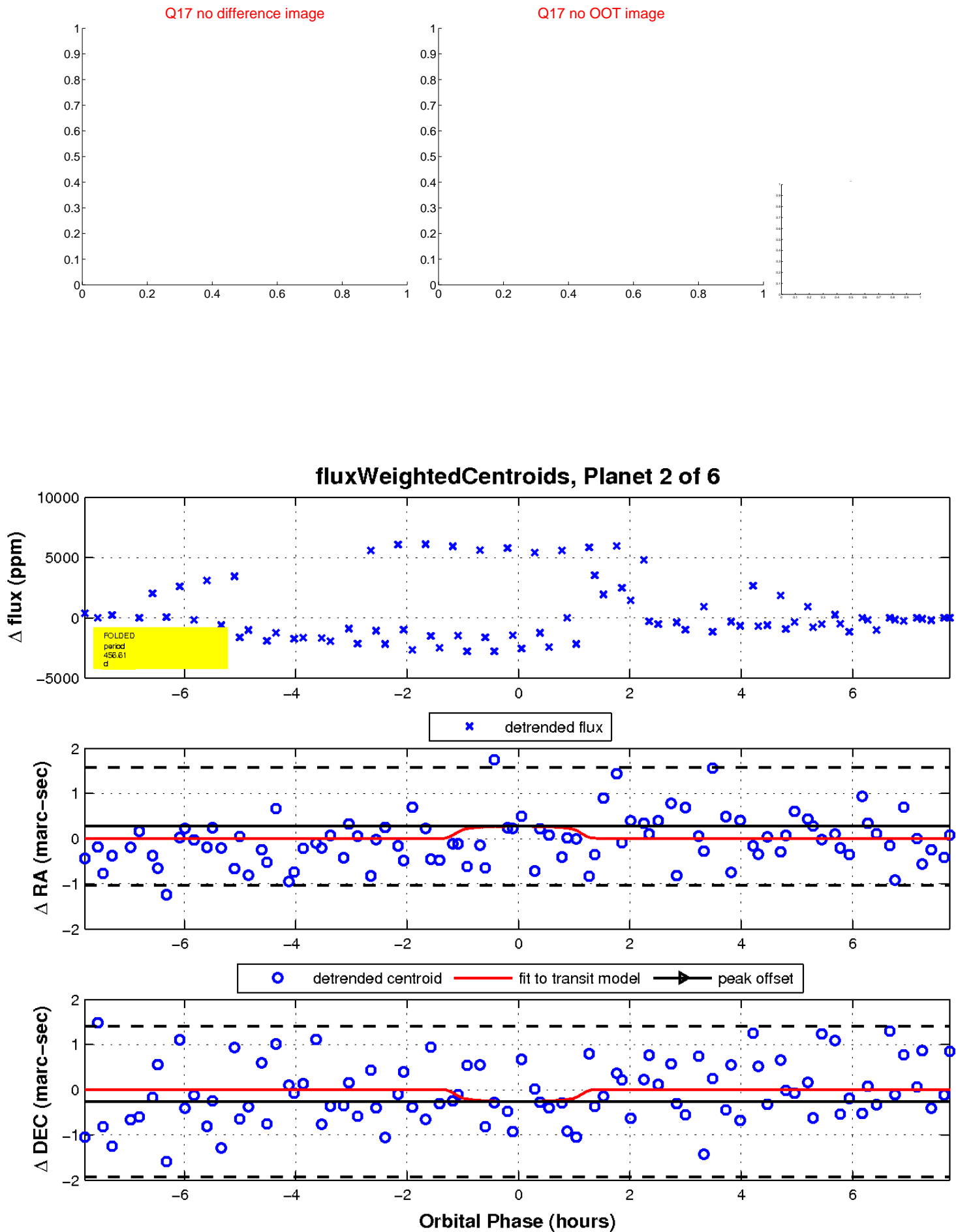
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

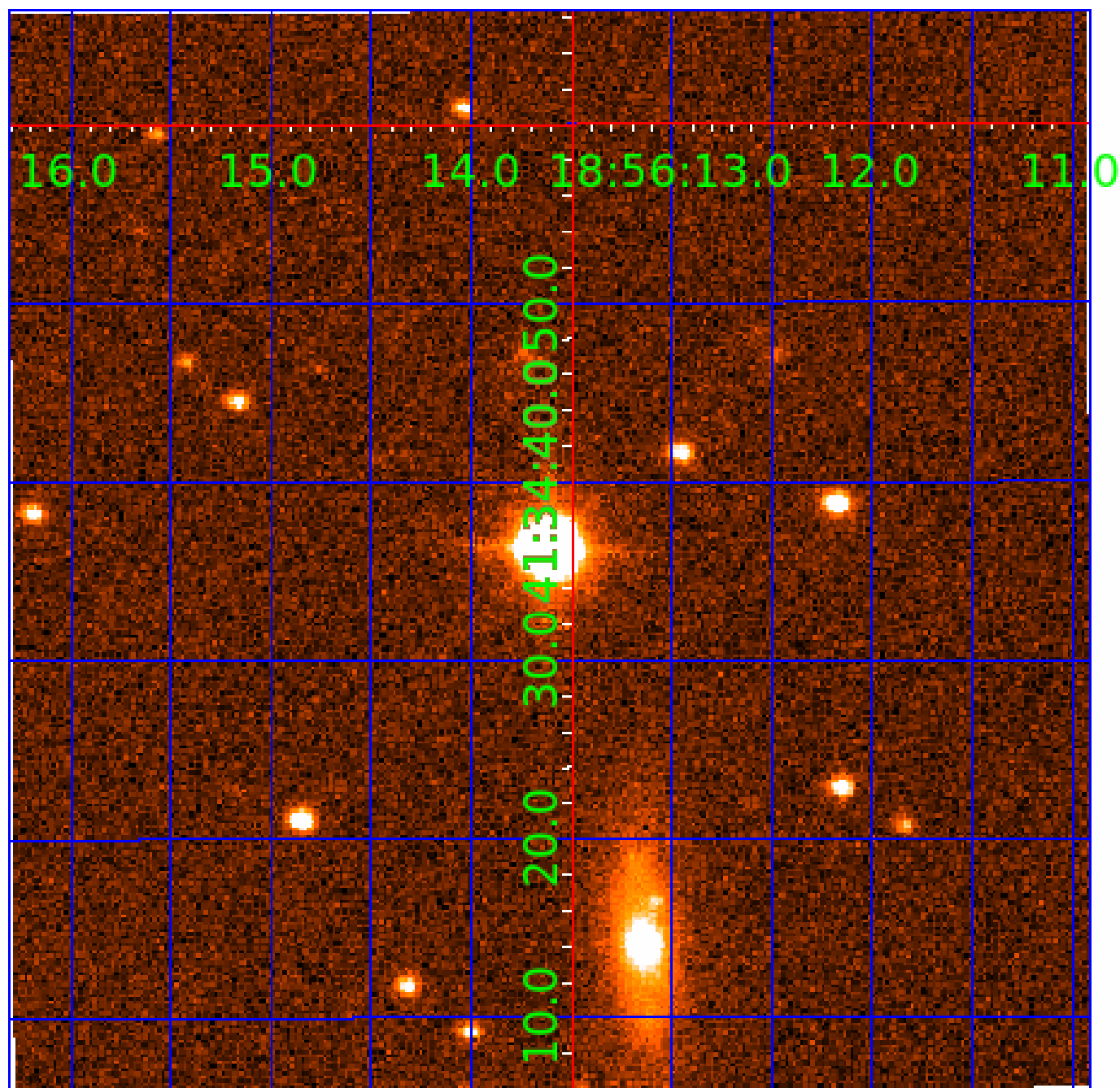


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 006184894

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006184894-01	OBS	5245.01	7.202813	135.195192	1788.6	3.015	67.6	73.8	0.72	5388	3.39	94.11
006184894-02	OBS	No	456.612411	244.080267	1138.2	2.631	20.5	6.9	0.72	5388	2.79	0.37
006184894-03	OBS	No	224.010641	307.905250	873.4	3.785	17.0	3.8	0.72	5388	2.15	0.96
006184894-04	OBS	No	543.034285	423.725756	1286.8	11.881	18.2	4.4	0.72	5388	2.73	0.29
006184894-05	OBS	No	394.144185	258.523696	431.3	4.798	17.5	2.1	0.72	5388	1.55	0.45
006184894-06	OBS	No	449.479948	246.992497	1734.2	4.941	16.5	7.1	0.72	5388	3.01	0.38

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006184894-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
006184894-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006184894-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—INCONSISTENT_TRANS
006184894-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_SKYE_TRACKER—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
006184894-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_TRACKER—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV
006184894-06	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—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](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 006184894-03

No Significant Match Found

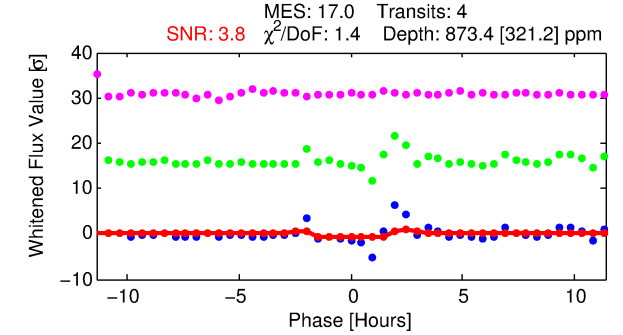
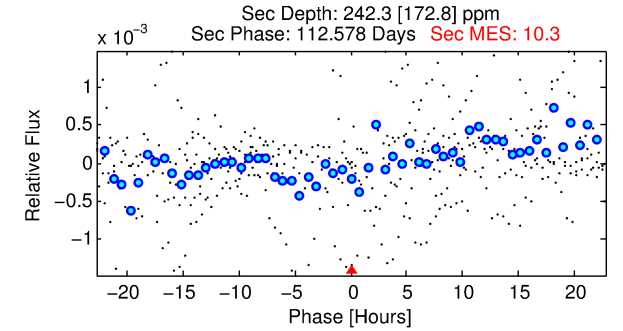
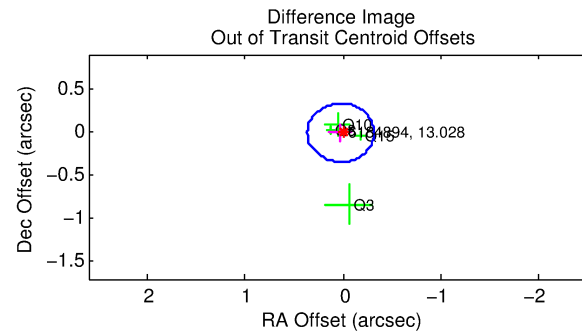
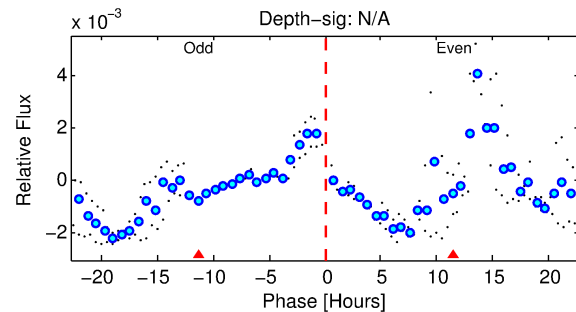
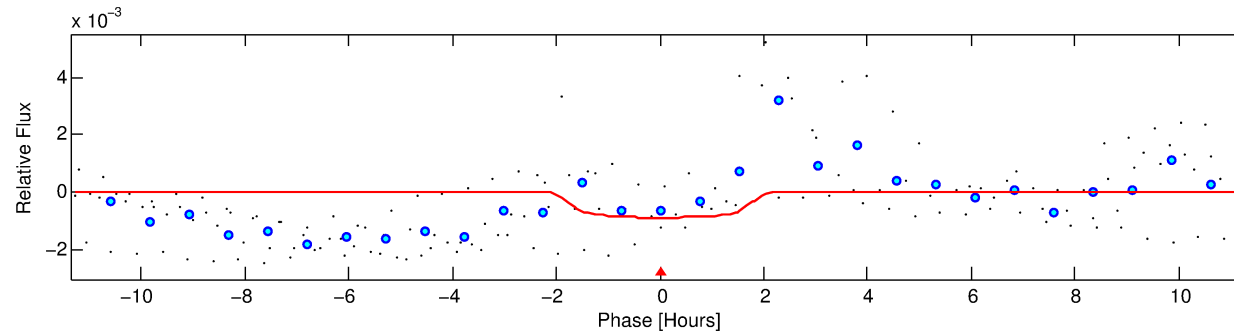
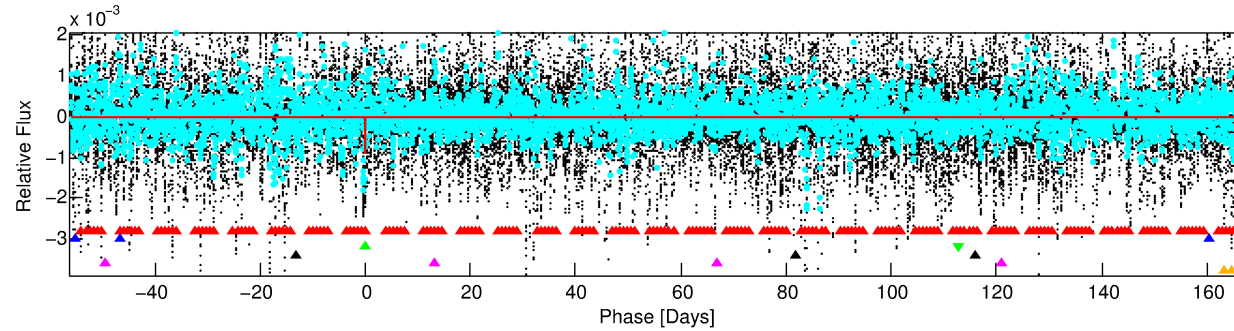
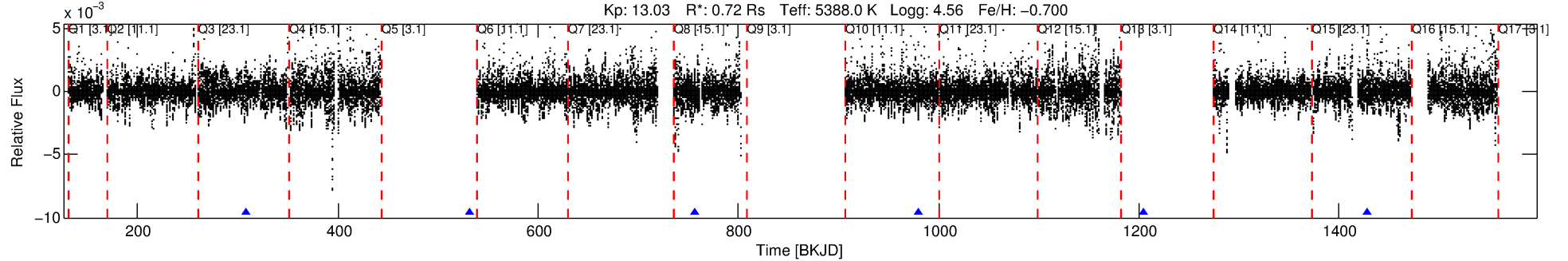


# DV One-Page Summary

KIC: 6184894 Candidate: 3 of 6 Period: 224.011 d

KOI: K05245 Corr: No Ephemeris Match

Kp: 13.03 R\*: 0.72 Rs Teff: 5388.0 K Logg: 4.56 Fe/H: -0.700



## DV Fit Results:

Period = 224.01064 [0.00386] d  
Epoch = 307.9052 [0.0119] BKJD  
Rp/R\* = 0.0275 [0.0961]  
a/R\* = 417.85 [6316.20]  
b = 0.45 [27.17]  
Seff = 0.96 [0.19]  
Teq = 253 [12] K  
Rp = 2.15 [7.52] Re  
a = 0.6352 [0.0647] AU  
Ag = 11635.80 [81799.28] [0.14σ]  
Teffp = 4055 [7127] K [0.53σ]

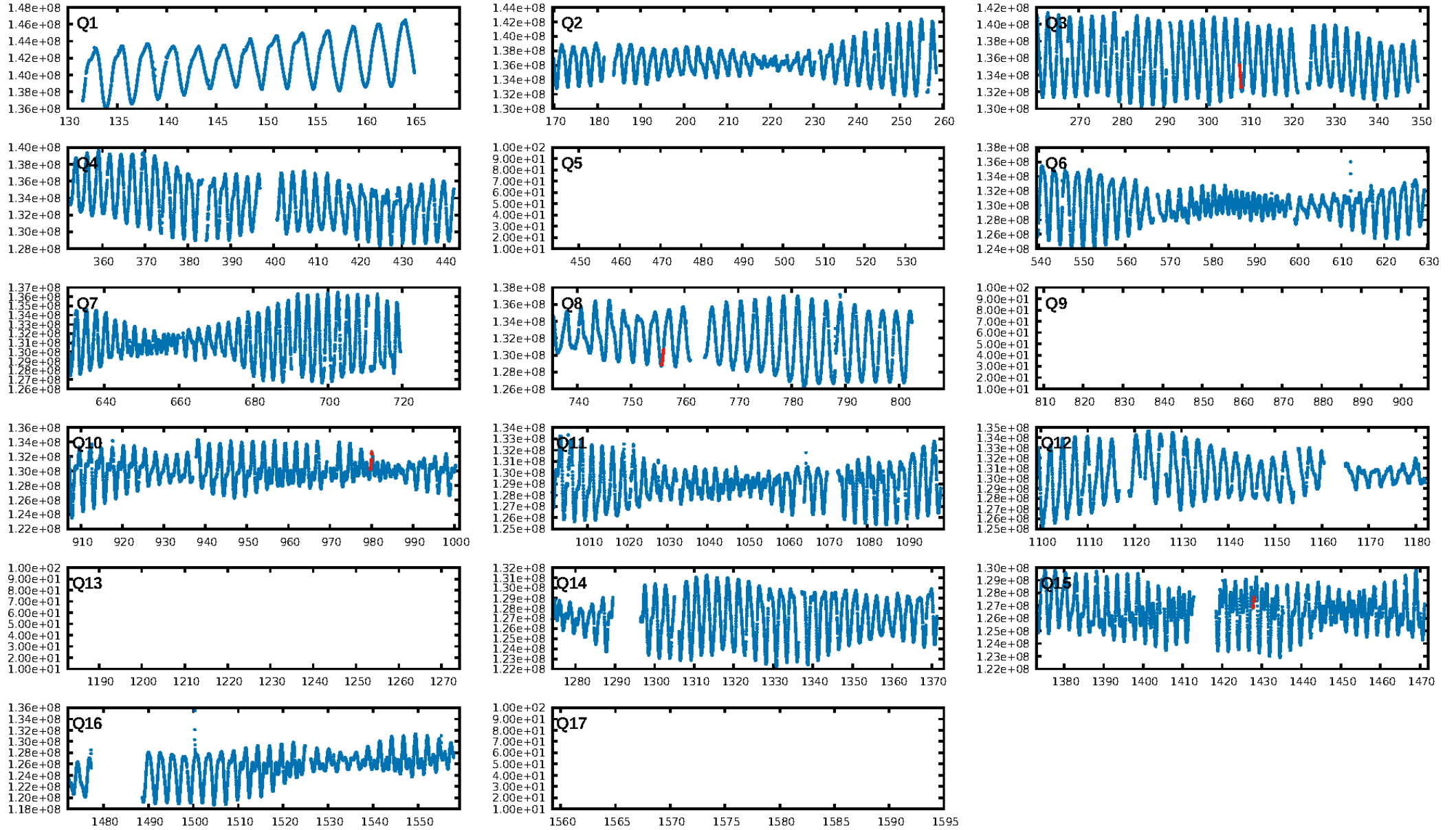
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [1075.26σ]  
LongPeriod-sig: 100.0% [668.12σ]  
ModelChiSquare2-sig: 4.6%  
ModelChiSquareGof-sig: 92.9%  
Bootstrap-pfa: 5.01e-13  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: -1.149  
Centroid-sig: 68.5%  
Centroid-so: 0.300 arcsec [0.59σ]  
OotOffset-rm: 0.026 arcsec [0.23σ]  
KicOffset-rm: 0.067 arcsec [0.40σ]  
OotOffset-st: 1/2/1/0 [4]  
KicOffset-st: 1/2/1/0 [4]  
DiffImageQuality-fgm: 0.75 [3/4]  
DiffImageOverlap-fno: 0.75 [3/4]

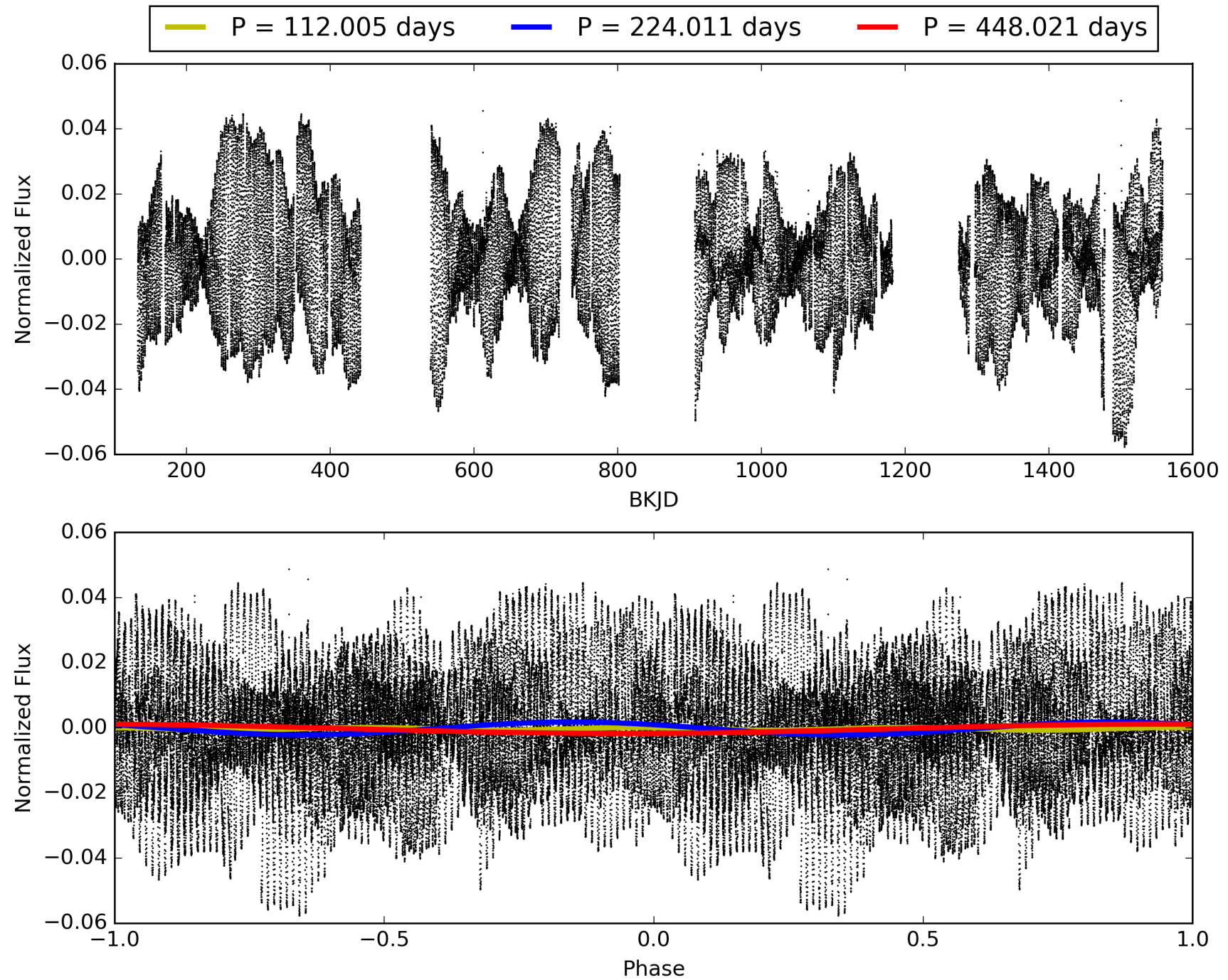
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 07:55:52 Z

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

# TCE 006184894-03, PDC Light Curves

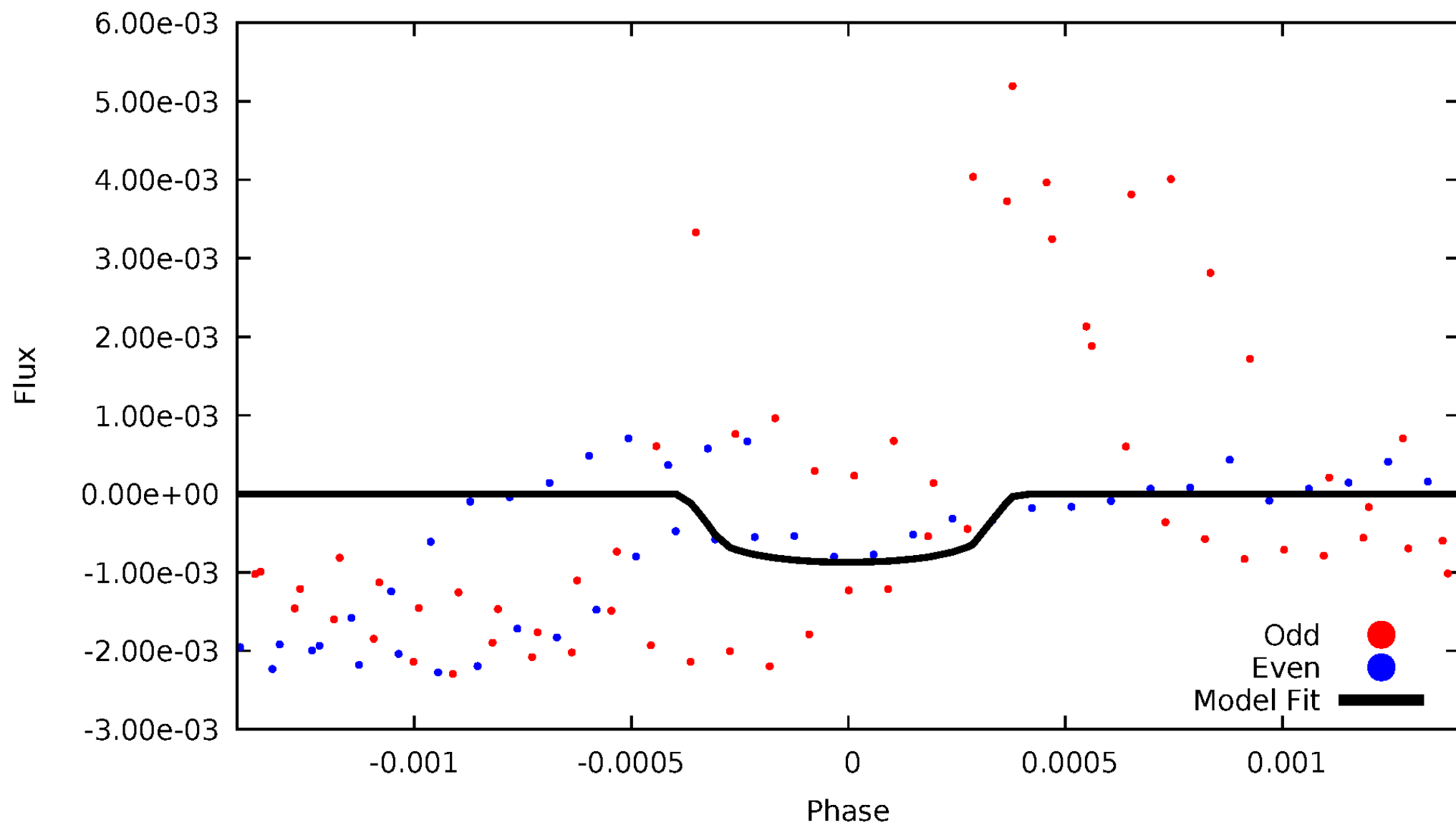


TCE 006184894-03



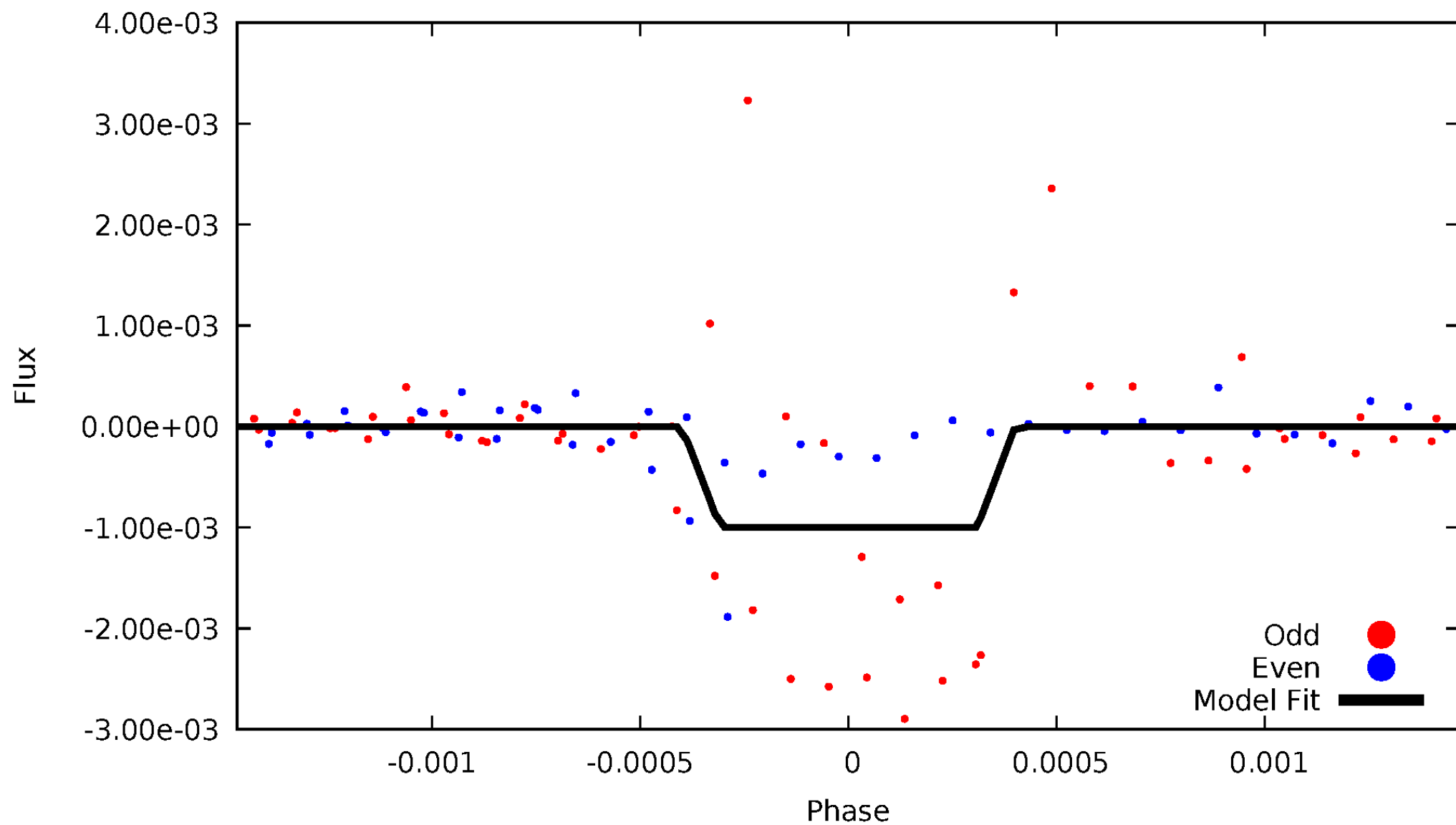
# DV Odd/Even

TCE 006184894-03



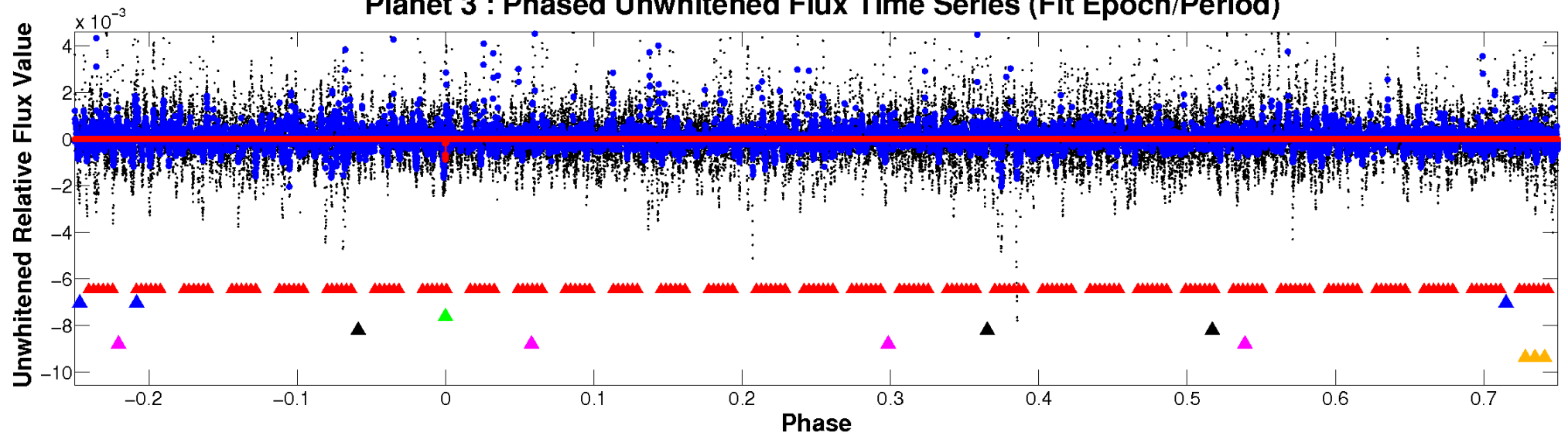
# ALT Odd/Even

TCE 006184894-03

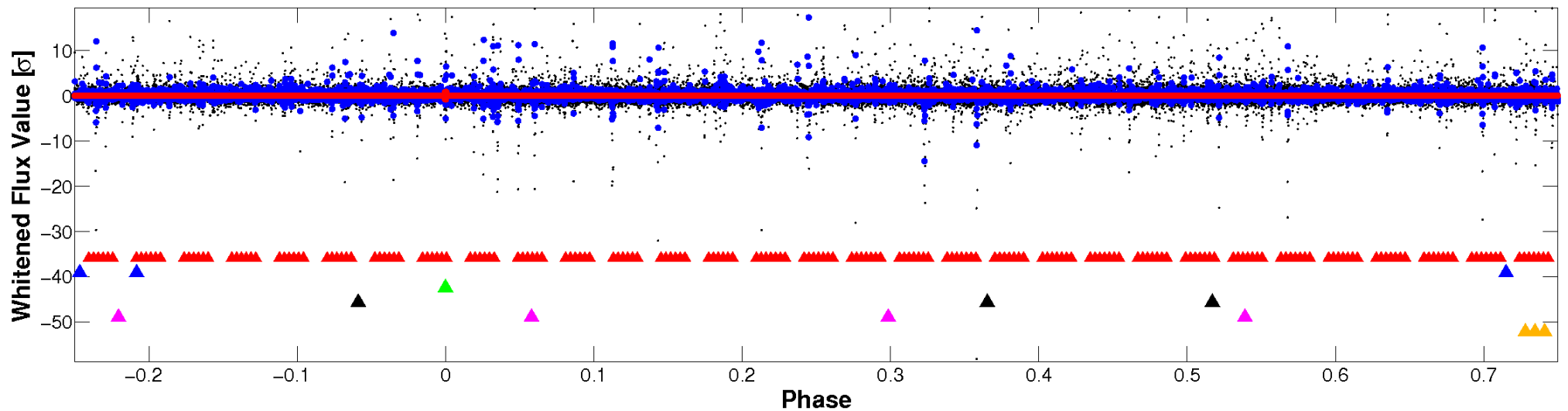


# Non-Whitened Vs. Whitened Light Curve

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

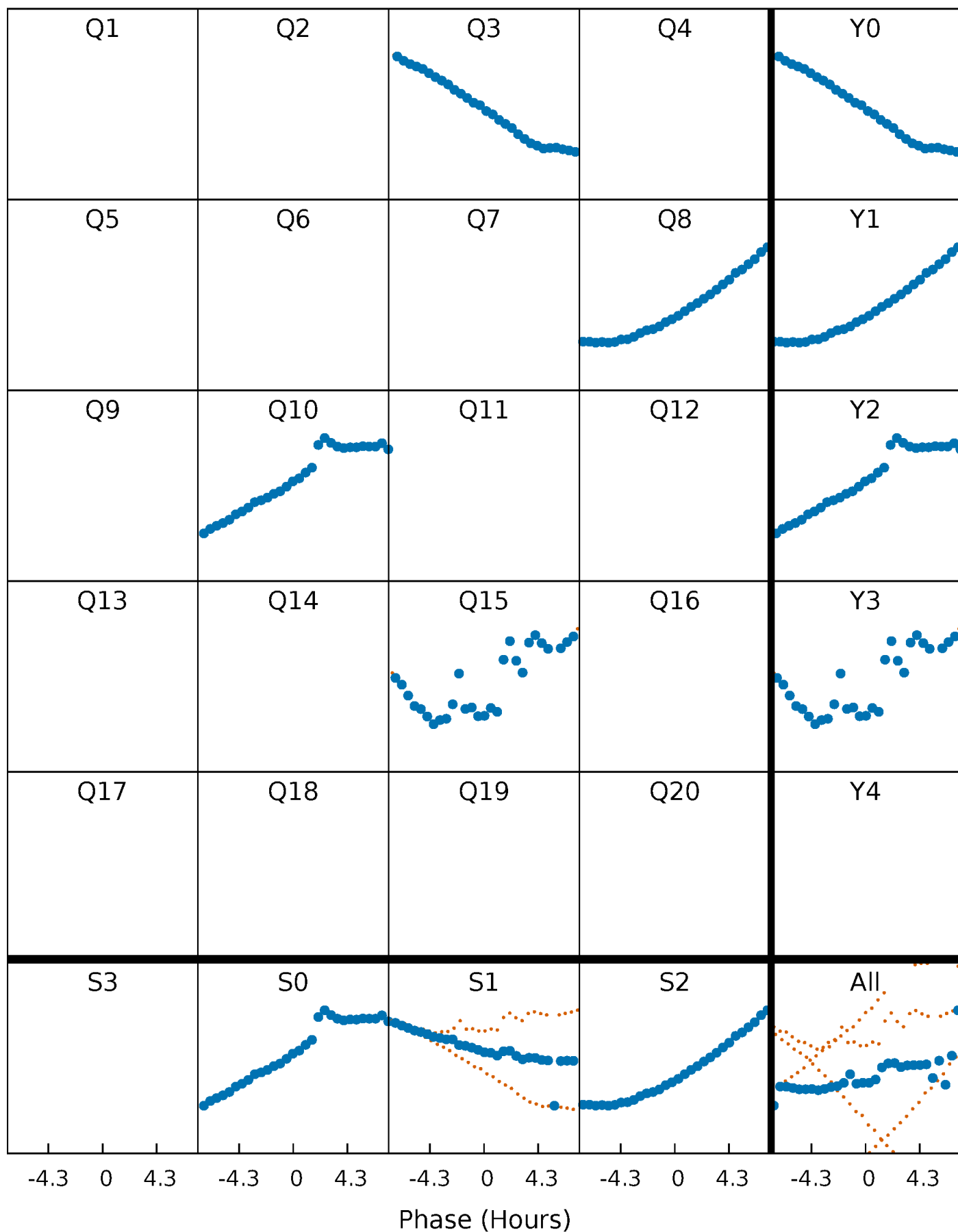


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

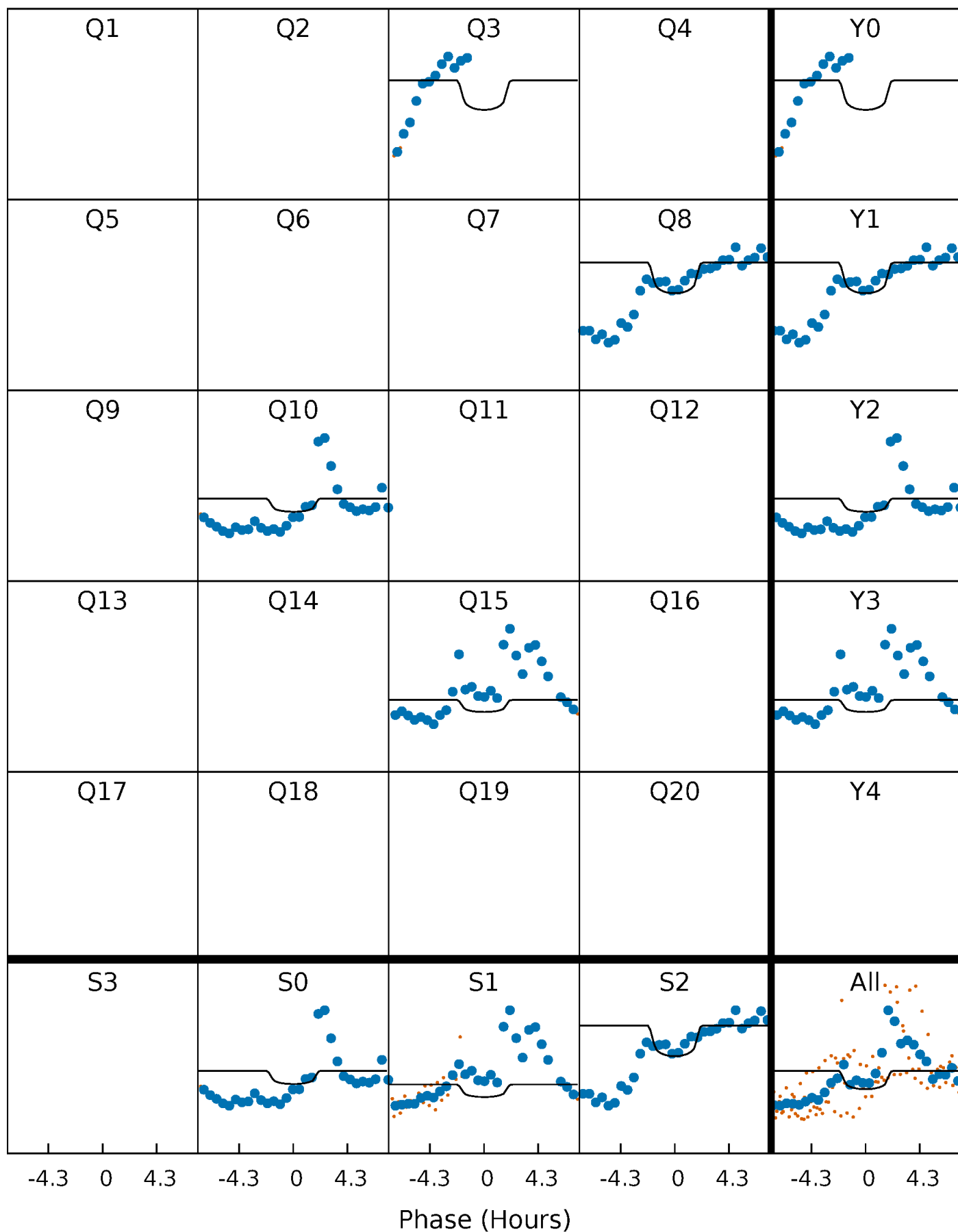
TCE 006184894-03 P=224.010641 Days  $T_0=307.905250$  (BKJD)





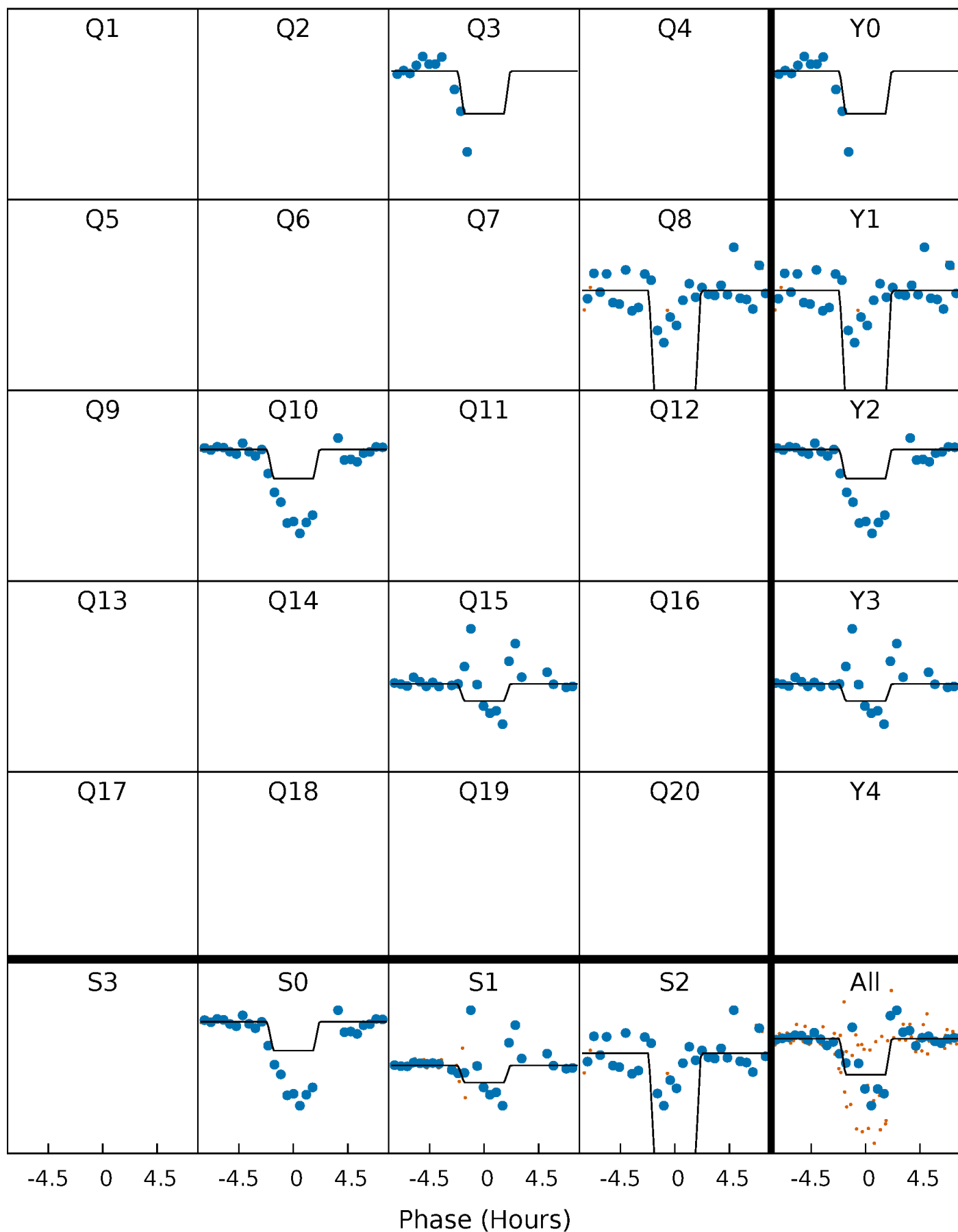
# DV Quarter-Phased Transit Curves

TCE 006184894-03 P=224.010641 Days  $T_0=307.905250$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

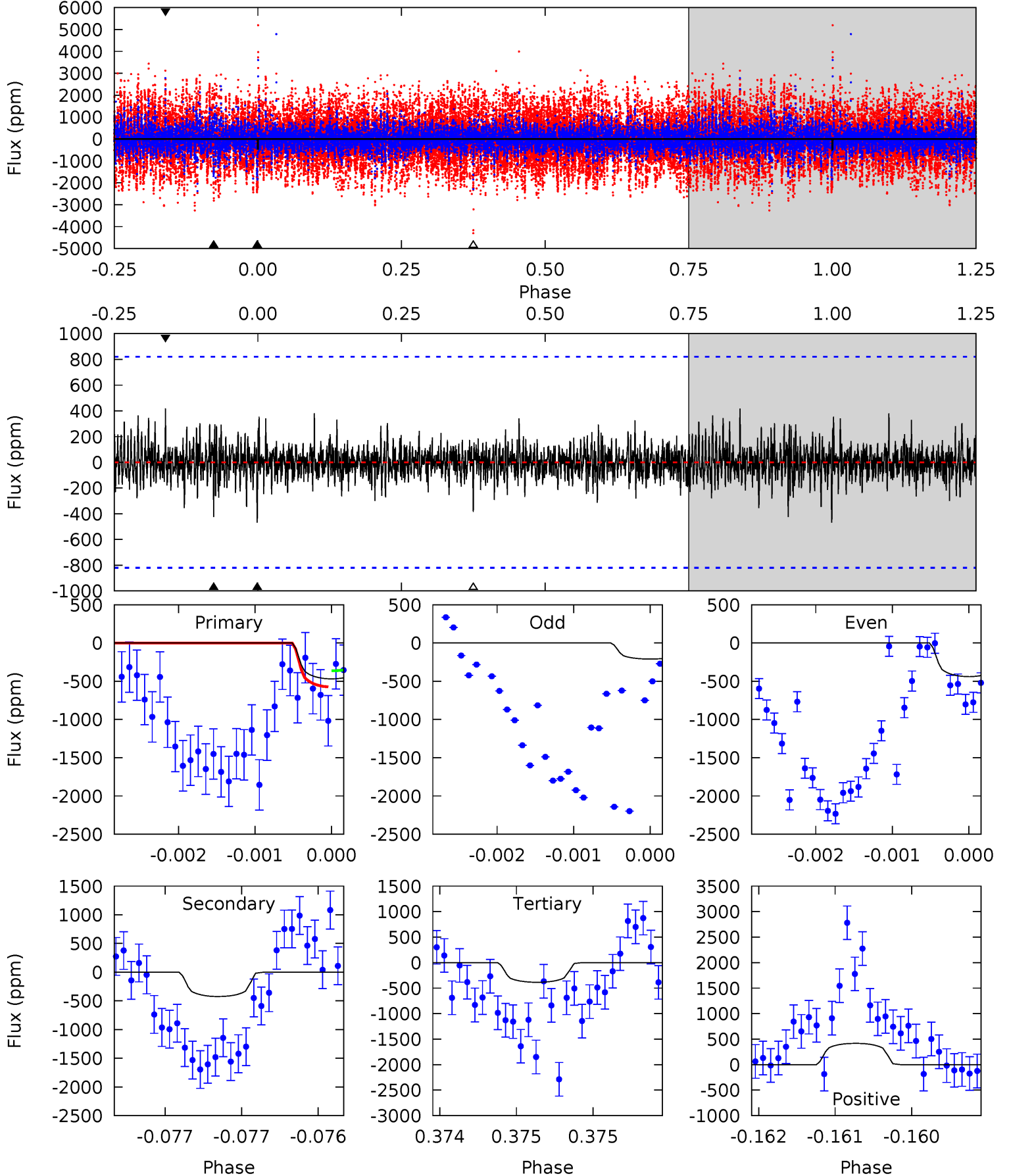
TCE 006184894-03 P=224.003153 Days  $T_0=307.918036$  (BKJD)



# DV Model-Shift Uniqueness Test

006184894-03, P = 224.010641 Days, E = 83.894609 Days

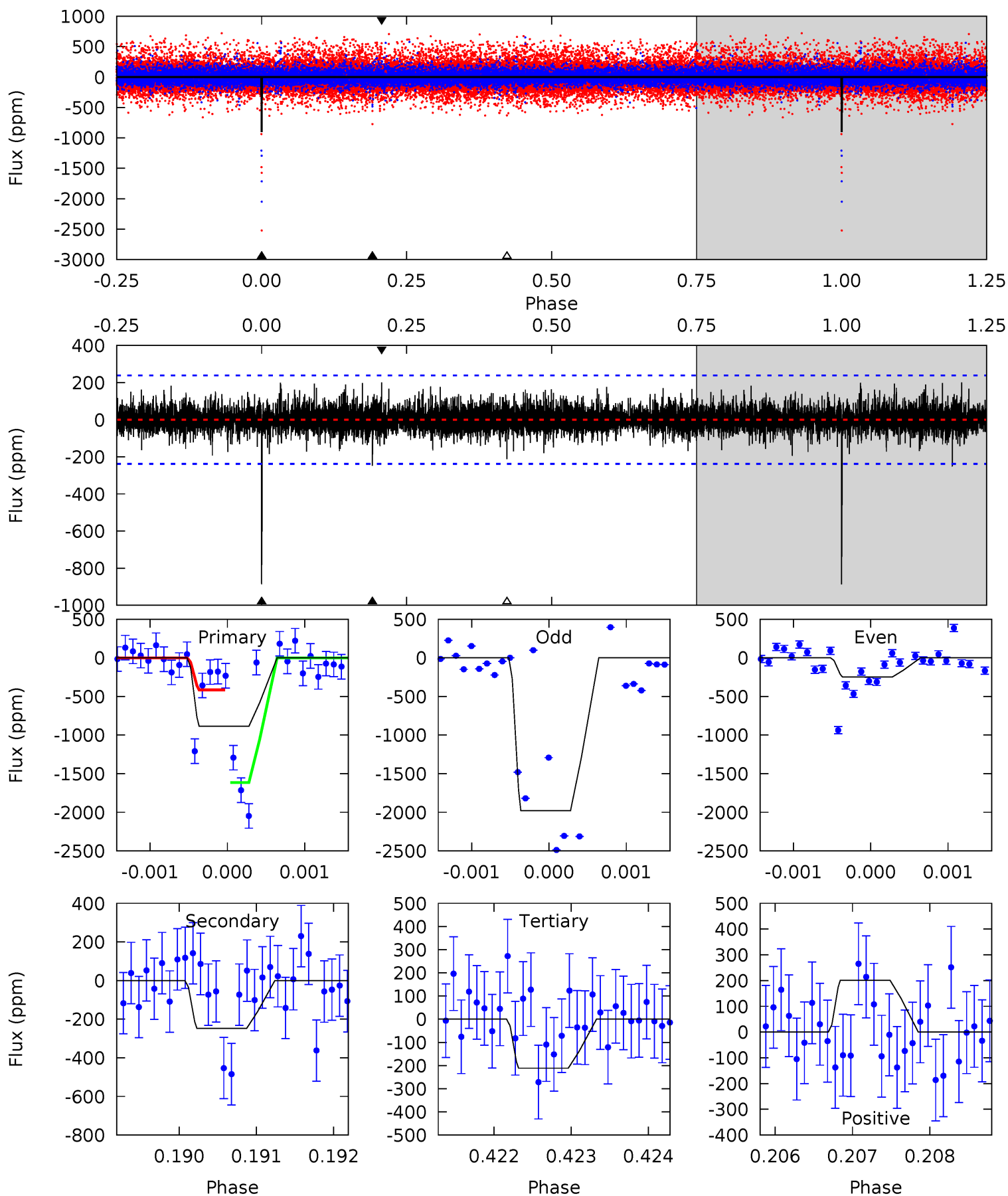
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.15	2.84	2.58	2.80	5.50	3.36	0.63	0.56	0.35	0.26	0.05	0.69	-0.14	0.47	0.71



# Alt Model-Shift Uniqueness Test

006184894-03,  $P = 224.003153$  Days,  $E = 83.914883$  Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.4	5.69	4.86	4.63	5.49	3.35	1.04	15.6	15.8	0.83	1.06	23.9	1.05	0.18	13.7



### Stellar Parameters For KIC 006184894

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5388^{+161}_{-145}$	$4.560^{+0.088}_{-0.064}$	$-0.700^{+0.300}_{-0.300}$	$0.717^{+0.082}_{-0.074}$	$0.681^{+0.085}_{-0.034}$	$2.603^{+0.922}_{-0.572}$
	+3%/-3%	+2%/-1%	+43%/-43%	+11%/-10%	+12%/-5%	+35%/-22%
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 006184894-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-424 \pm 149$	$6.08^{+5.89}_{-4.15}$	$351^{+15}_{-14}$	$3259^{+1761}_{-558}$	$2368^{+23013}_{-1775}$
Alt.	$-247 \pm 43$	$6.01^{+6.24}_{-3.91}$	$352^{+15}_{-14}$	$3046^{+1323}_{-520}$	$1484^{+11348}_{-1128}$

$T_{max}$  = 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  $A_{obs} \gg 1.0$

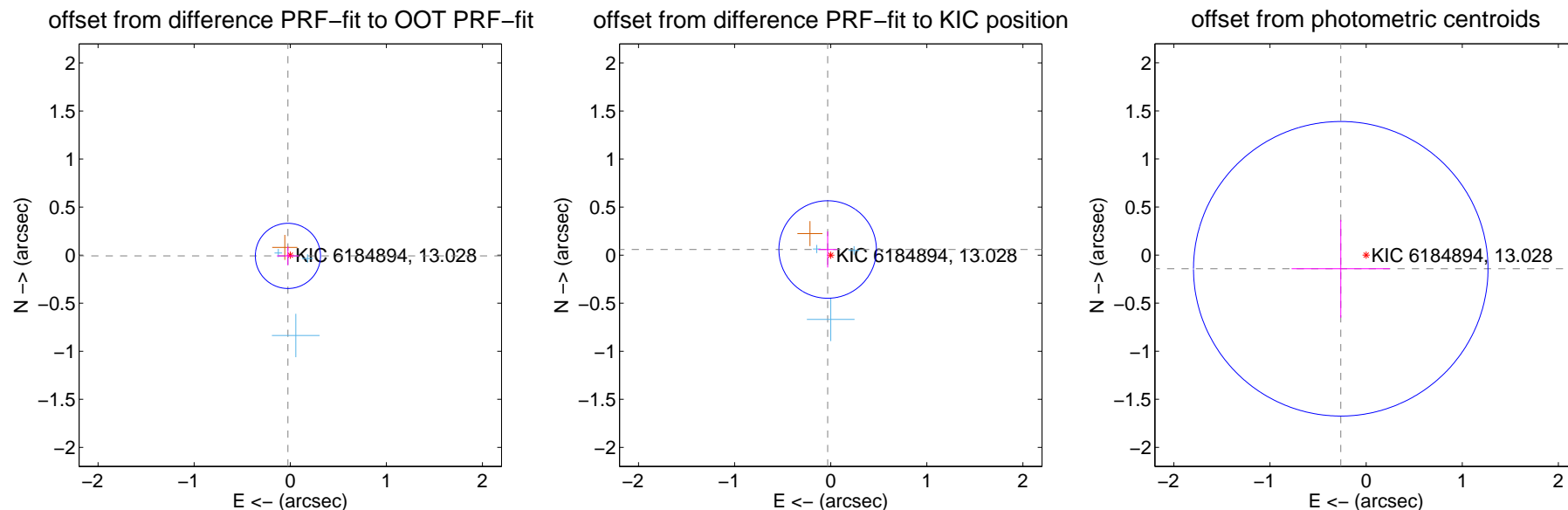
## DV Centroid Data

Supplemental centroid analysis for 006184894-03. Kepler magnitude: 13.03. Transit SNR 3.78

There are 3 quarters with good PRF difference image offsets

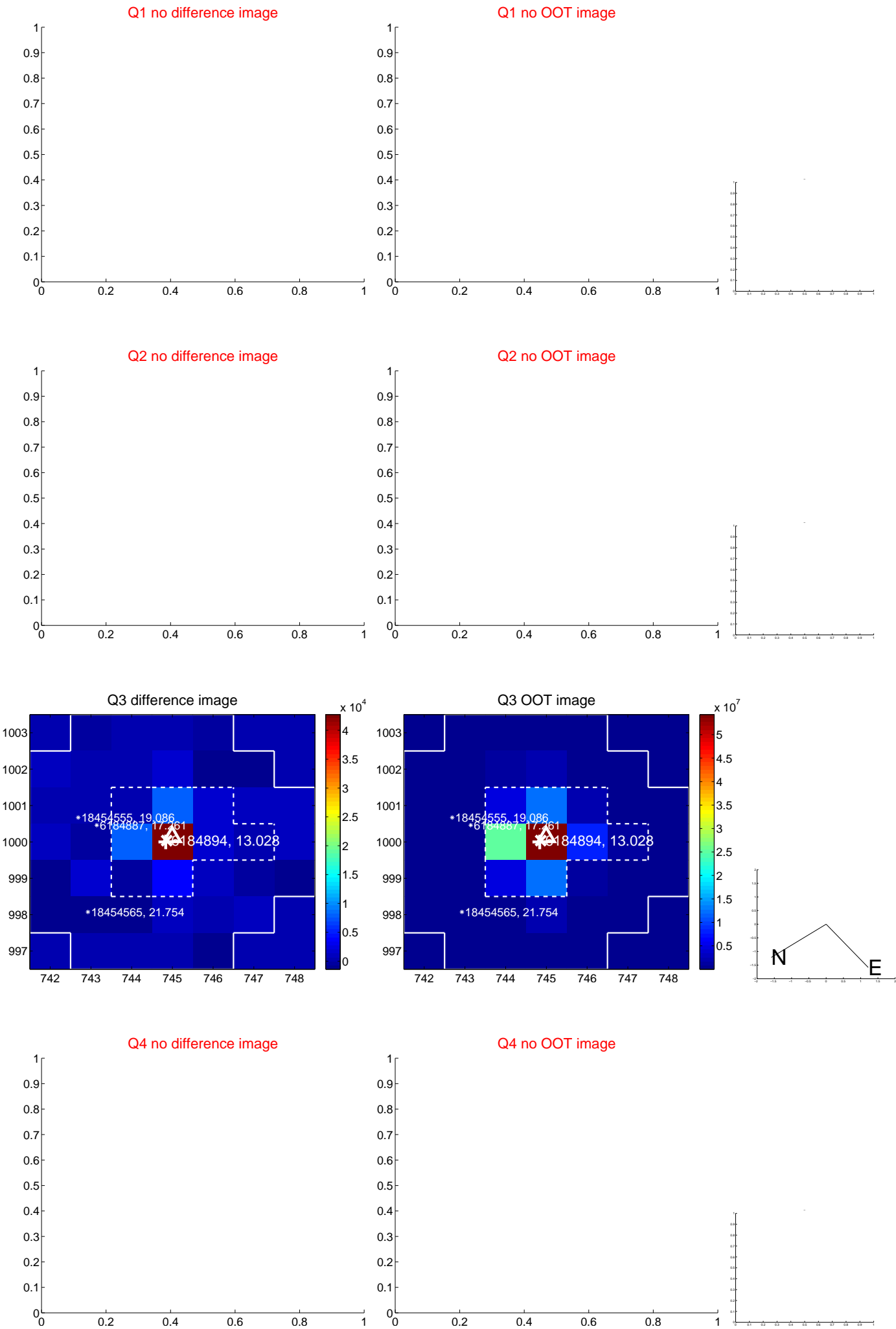
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.026 \pm 0.113$	0.23	$0.024 \pm 0.114$	$-0.008 \pm 0.098$
PRF-fit source offset from KIC position	$0.067 \pm 0.169$	0.40	$0.032 \pm 0.097$	$0.059 \pm 0.188$
photometric centroid source offset	$0.30 \pm 0.51$	0.59	$0.26 \pm 0.51$	$-0.14 \pm 0.51$



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- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . 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 no difference image



Q6 no OOT image



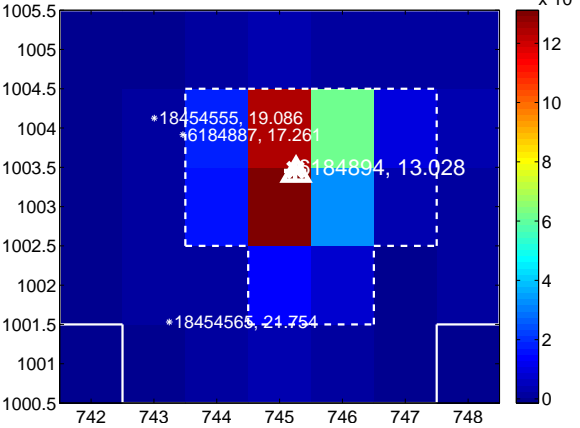
Q7 no difference image



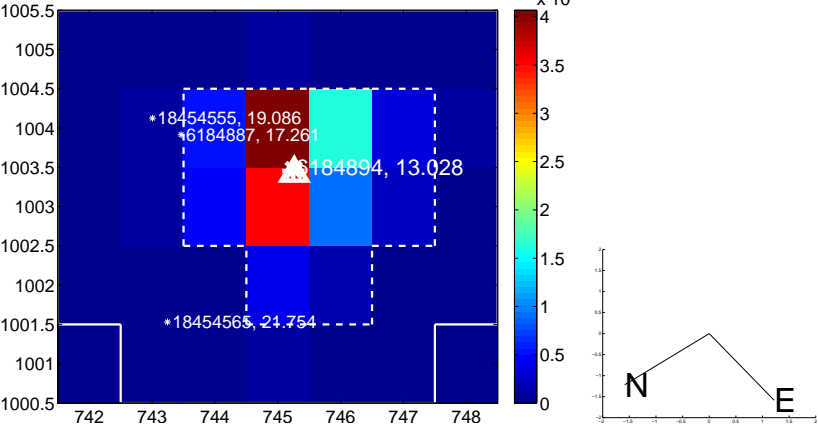
Q7 no OOT image



Q8 difference image

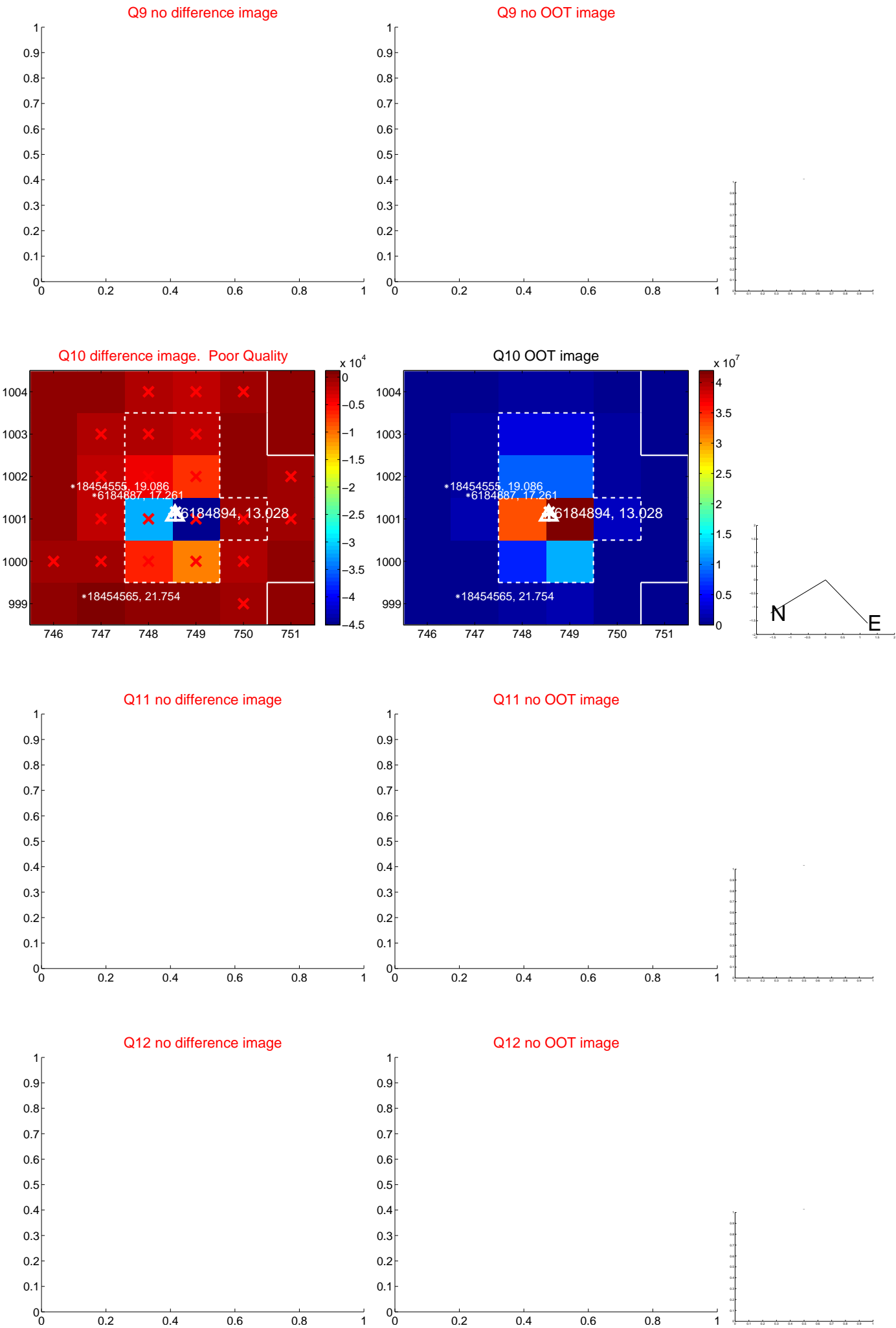


Q8 OOT image

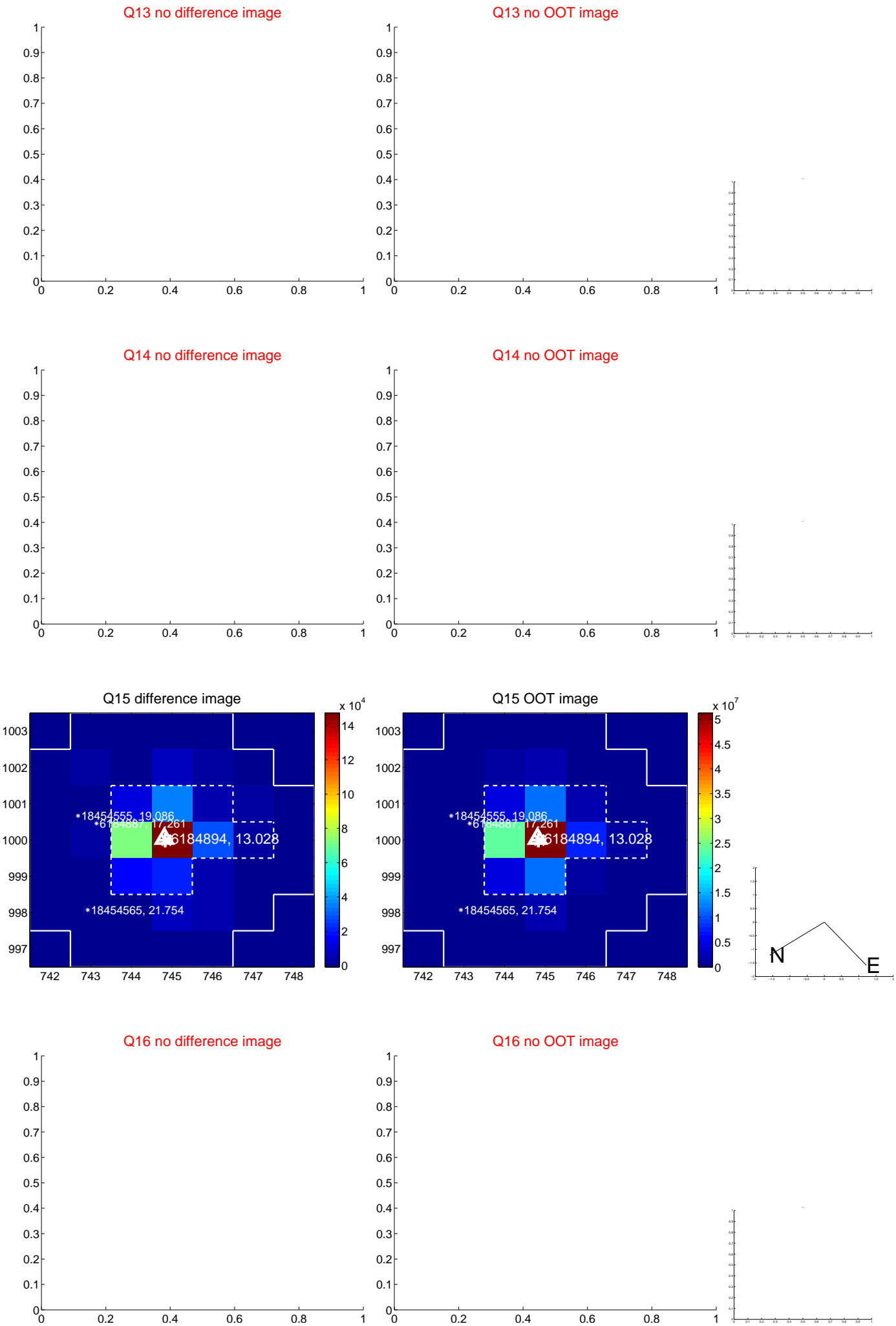




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



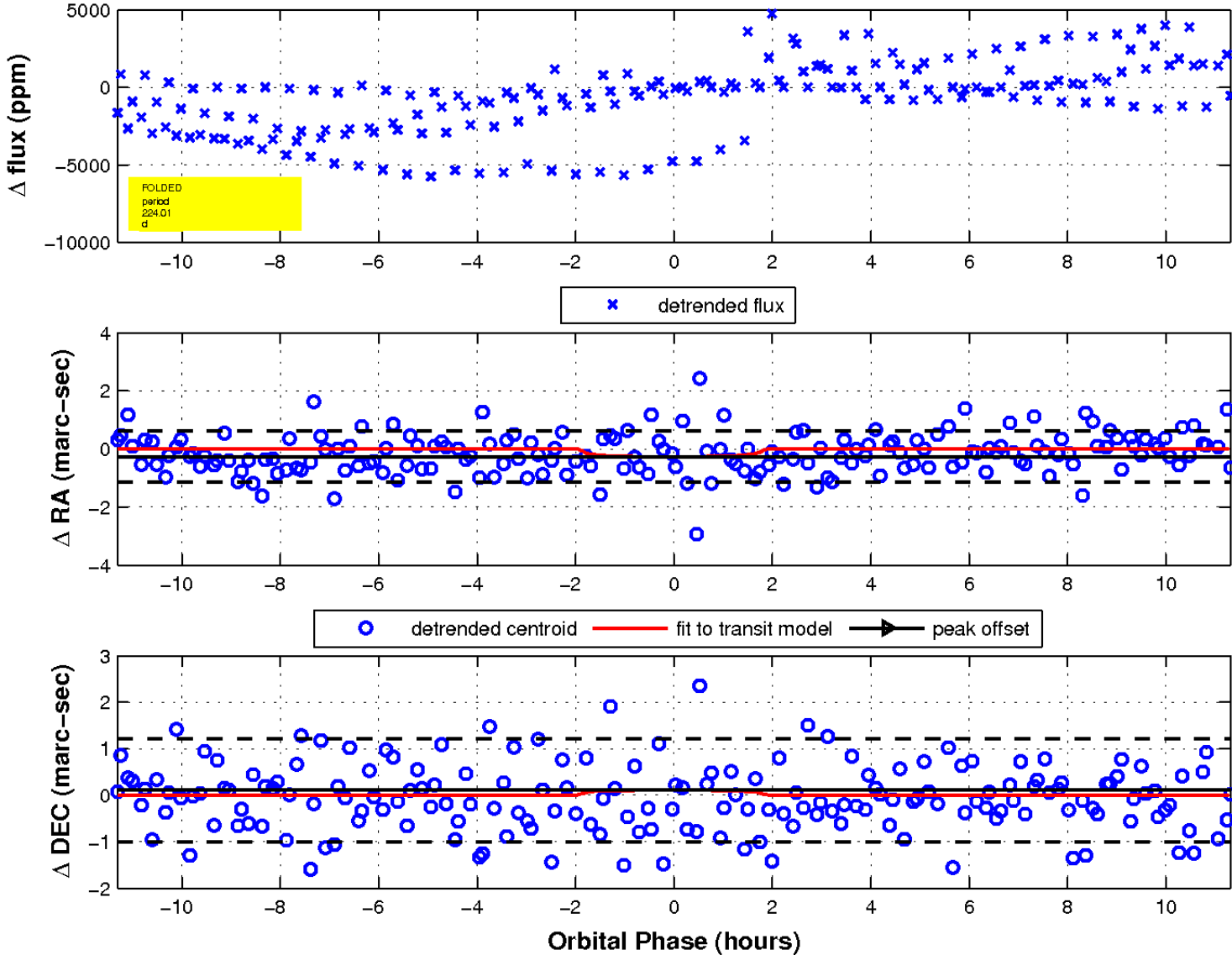
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

Q17 no difference image

Q17 no OOT image

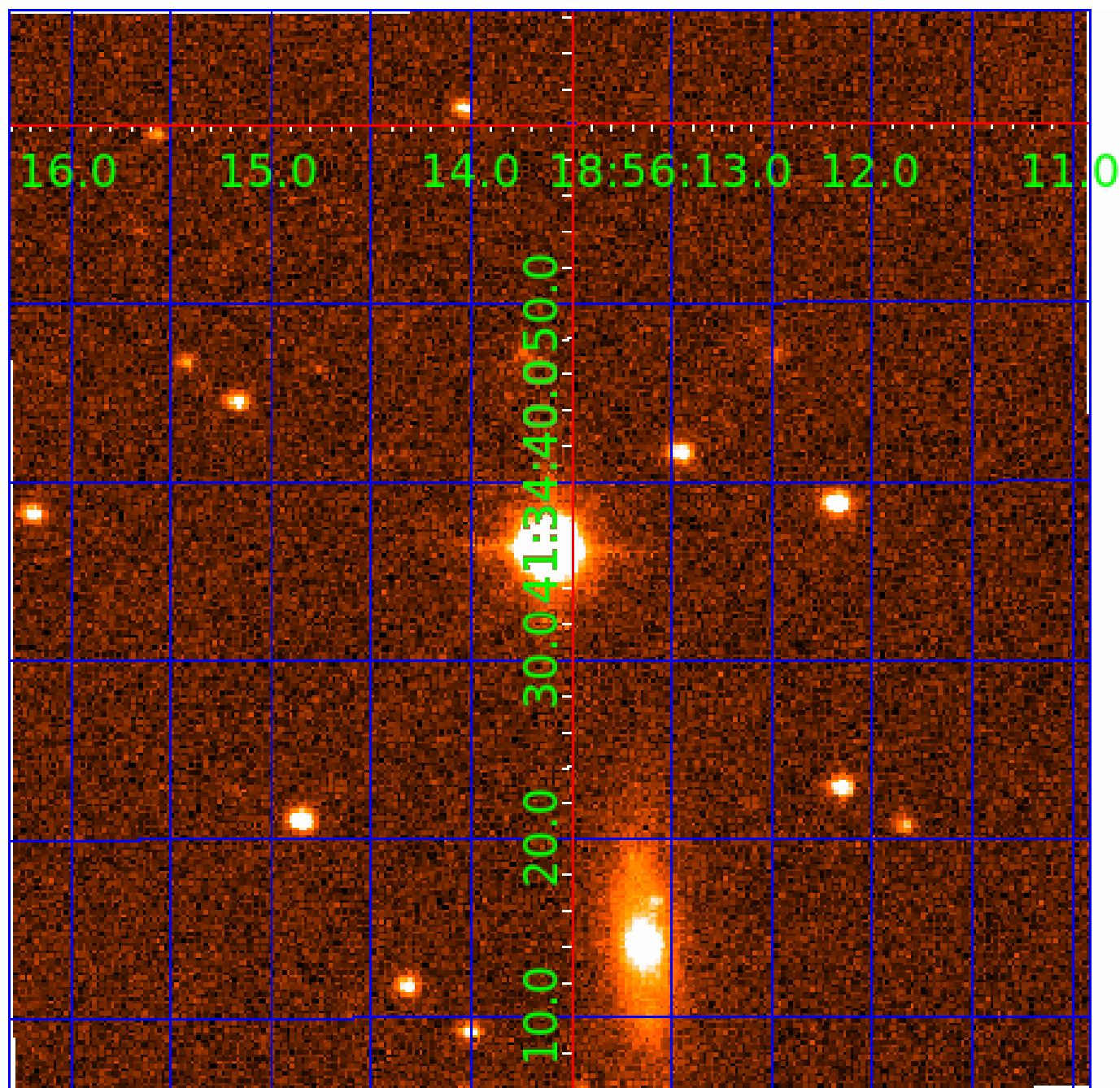


fluxWeightedCentroids, Planet 3 of 6



UKIRT Image

Declination



# KIC 006184894

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006184894-01	OBS	5245.01	7.202813	135.195192	1788.6	3.015	67.6	73.8	0.72	5388	3.39	94.11
006184894-02	OBS	No	456.612411	244.080267	1138.2	2.631	20.5	6.9	0.72	5388	2.79	0.37
006184894-03	OBS	No	224.010641	307.905250	873.4	3.785	17.0	3.8	0.72	5388	2.15	0.96
006184894-04	OBS	No	543.034285	423.725756	1286.8	11.881	18.2	4.4	0.72	5388	2.73	0.29
006184894-05	OBS	No	394.144185	258.523696	431.3	4.798	17.5	2.1	0.72	5388	1.55	0.45
006184894-06	OBS	No	449.479948	246.992497	1734.2	4.941	16.5	7.1	0.72	5388	3.01	0.38

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006184894-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
006184894-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006184894-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—INCONSISTENT_TRANS
006184894-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_SKYE_TRACKER—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
006184894-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_TRACKER—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV
006184894-06	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—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](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 006184894-04

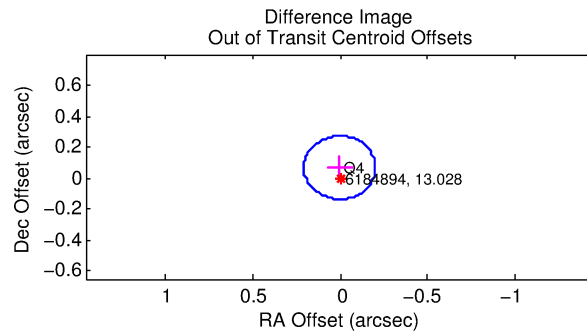
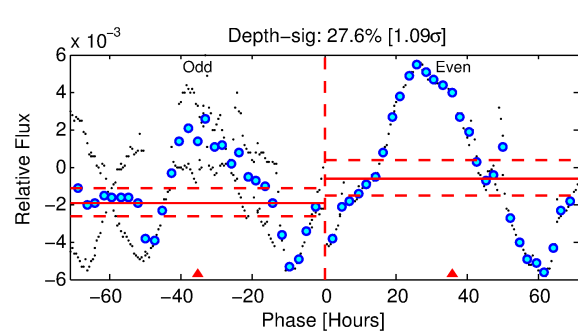
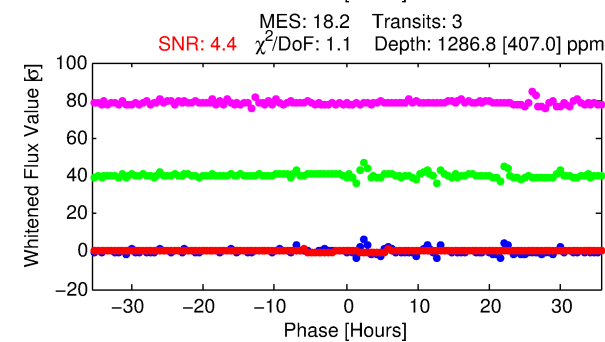
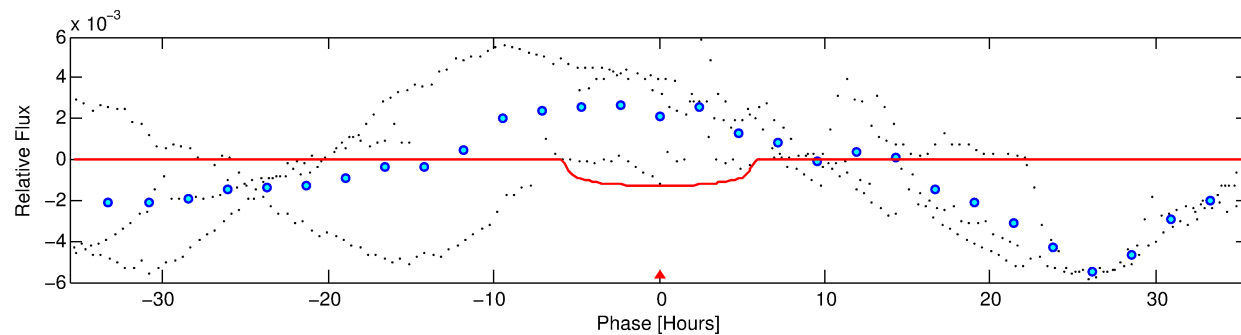
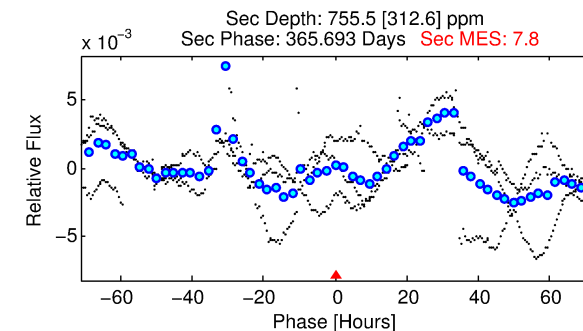
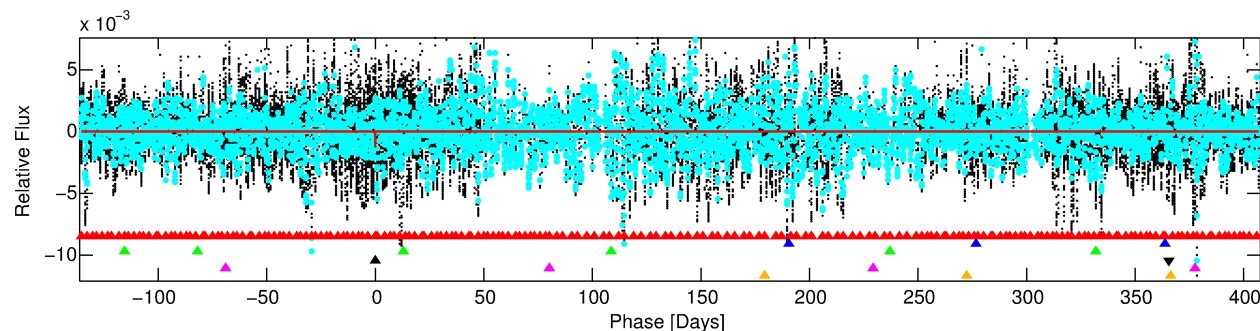
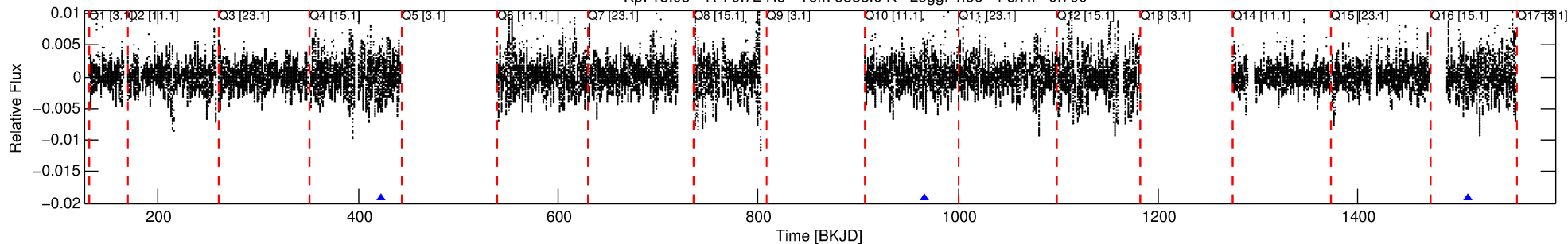
No Significant Match Found

# DV One-Page Summary

KIC: 6184894 Candidate: 4 of 6 Period: 543.034 d

KOI: K05245 Corr: No Ephemeris Match

Kp: 13.03 R\*: 0.72 Rs Teff: 5388.0 K Logg: 4.56 Fe/H: -0.700



## DV Fit Results:

Period = 543.03428 [0.00756] d  
Epoch = 423.7258 [0.0104] BKJD  
Rp/R\* = 0.0349 [0.0077]  
a/R\* = 270.25 [133.01]  
b = 0.69 [0.37]  
Seff = 0.30 [0.06]  
Teq = 188 [9] K  
Rp = 2.73 [0.68] Re  
a = 1.1462 [0.1168] AU  
Ag = 73065.14 [45623.22] [1.60σ]  
Teff = 4779 [737] K [6.23σ]

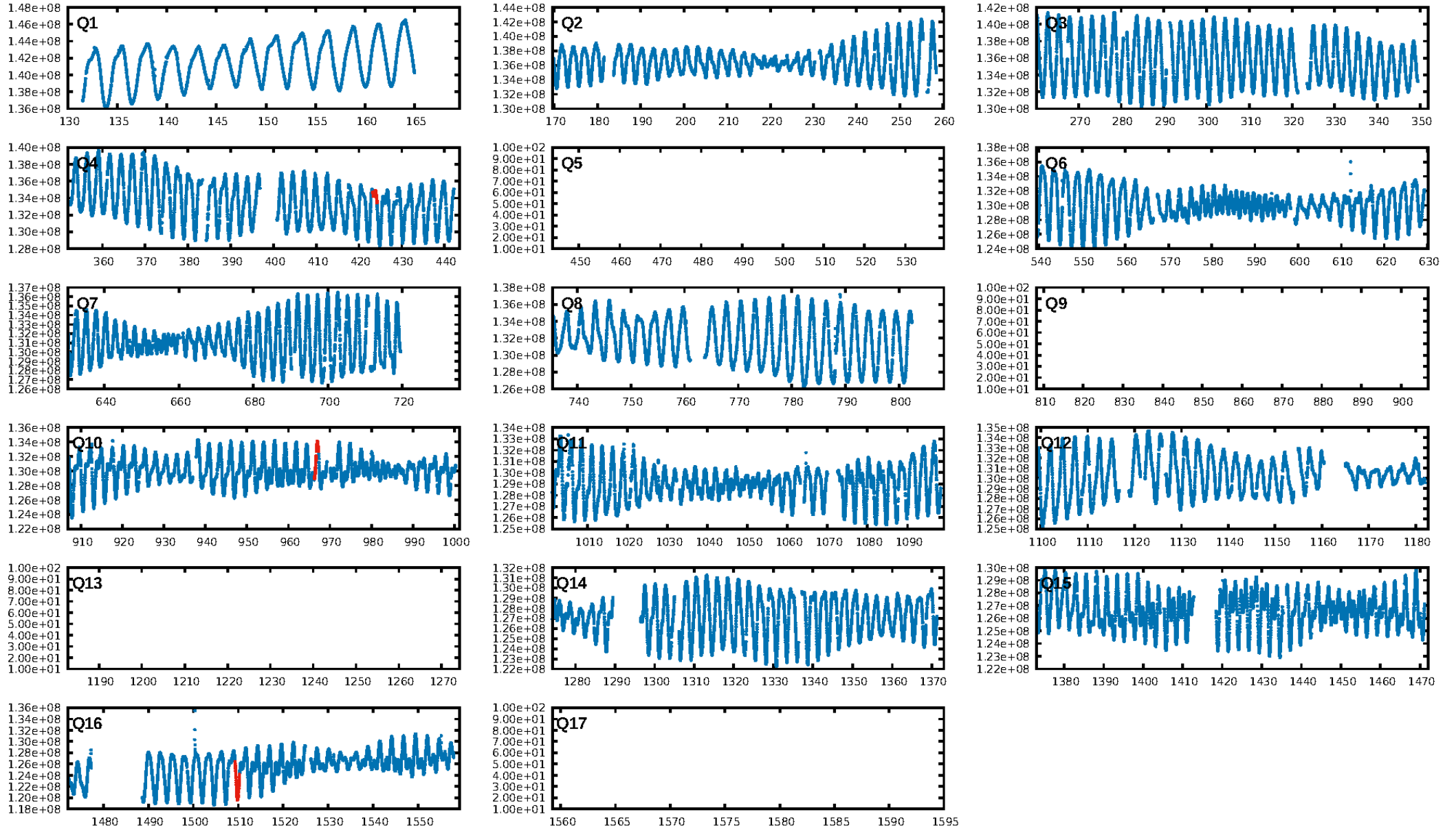
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [170.44σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 23.1%  
ModelChiSquareGof-sig: 91.2%  
Bootstrap-pfa: 9.07e-11  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: -0.3847  
Centroid-sig: 0.0%  
Centroid-so: 0.828 arcsec [2.53σ]  
OotOffset-rm: 0.069 arcsec [1.02σ]  
KicOffset-rm: 0.094 arcsec [1.38σ]  
OotOffset-st: 0/0/1/0 [1]  
KicOffset-st: 0/0/1/0 [1]  
DiffImageQuality-fgm: 0.00 [0/1]  
DiffImageOverlap-fno: 0.00 [0/1]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 07:56:00 Z

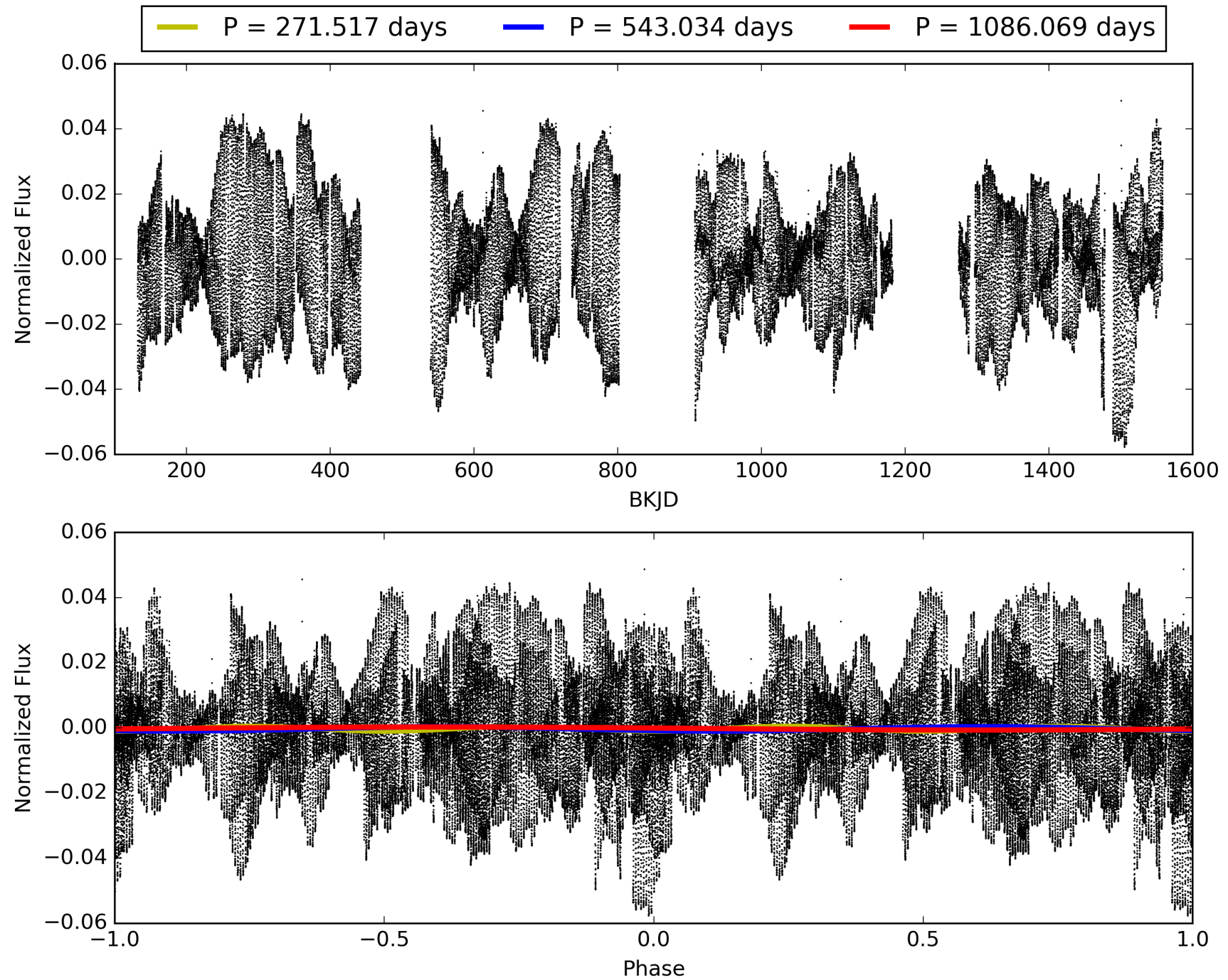
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 006184894-04, PDC Light Curves





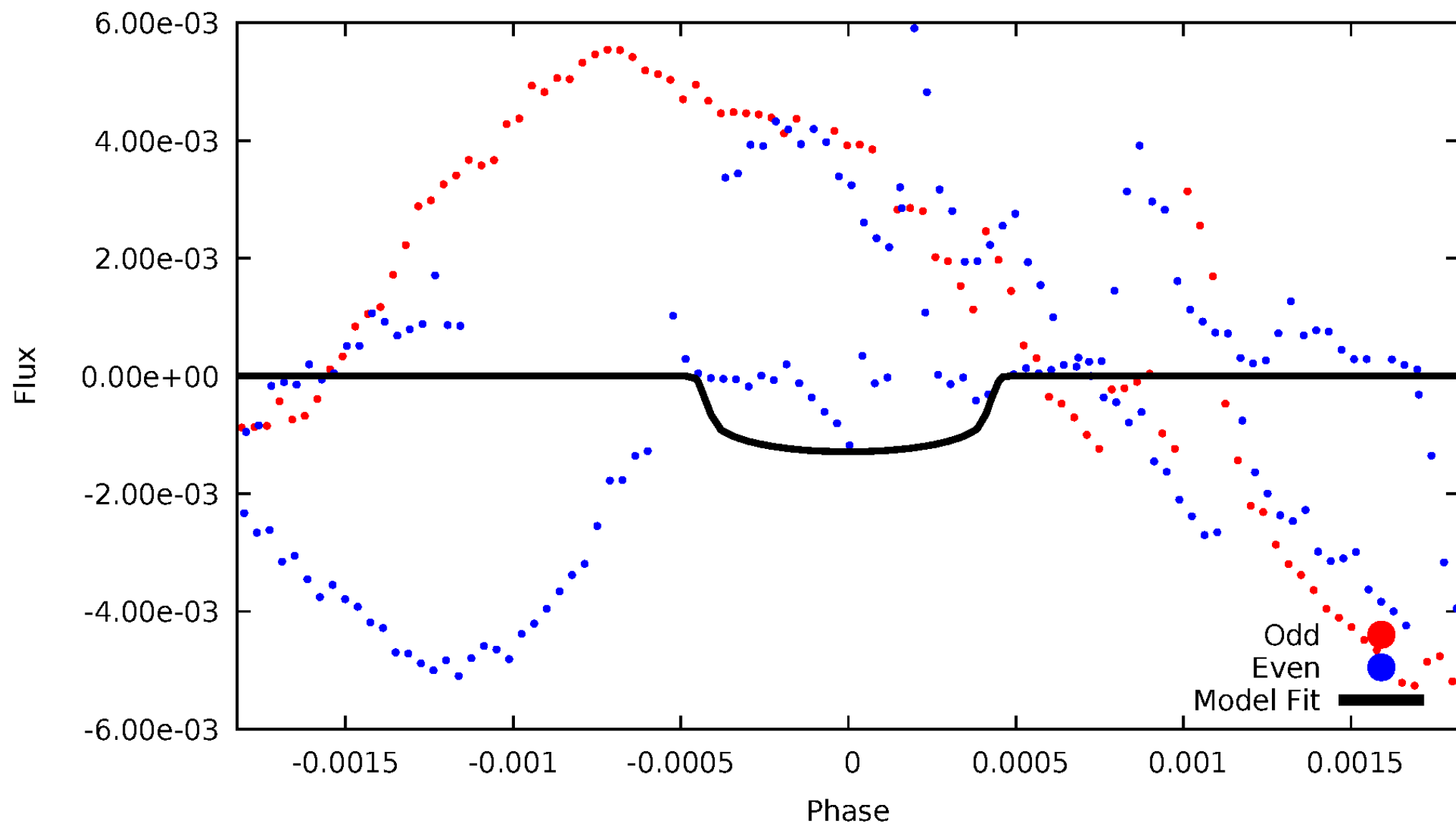
TCE 006184894-04





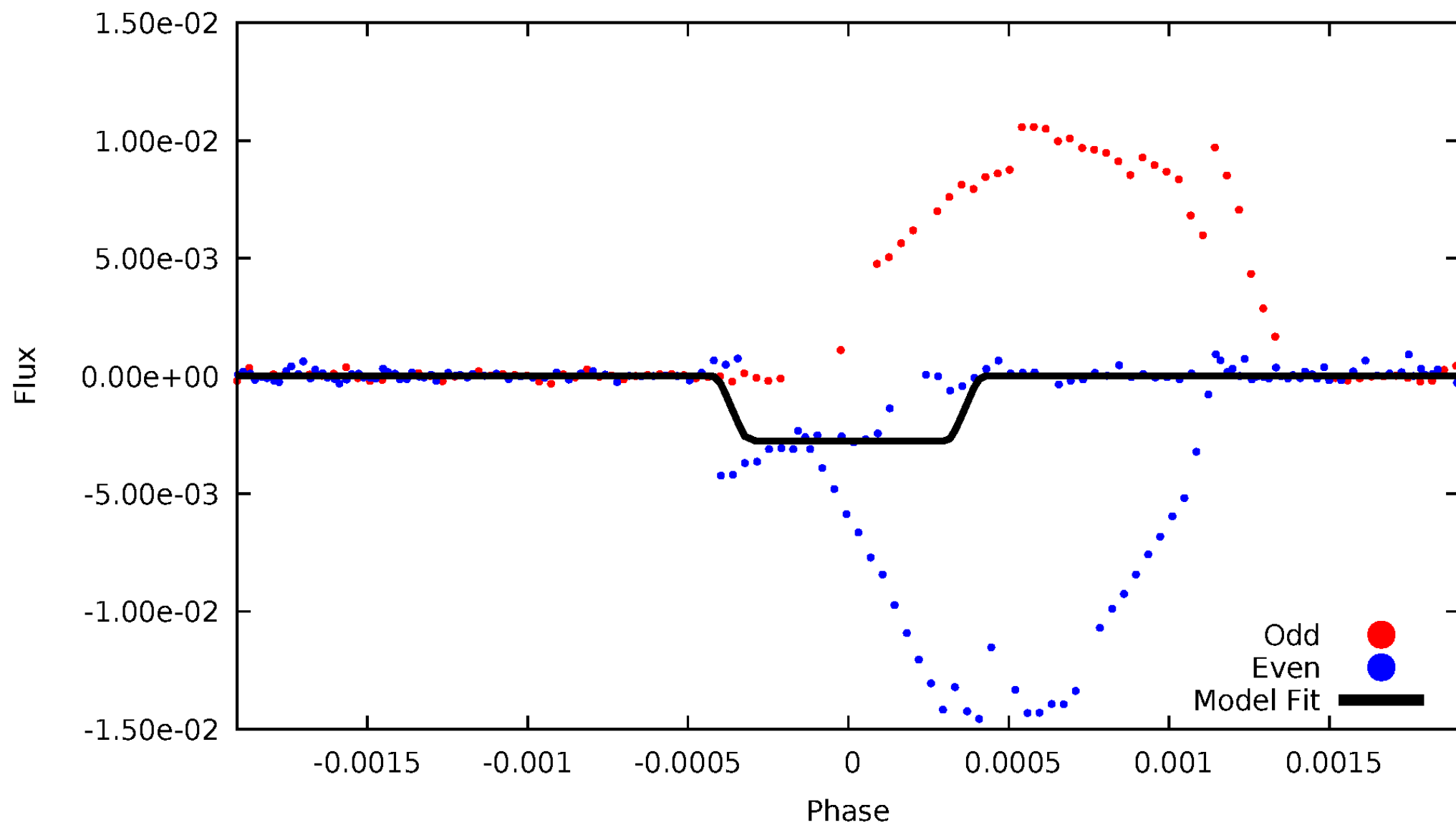
# DV Odd/Even

TCE 006184894-04



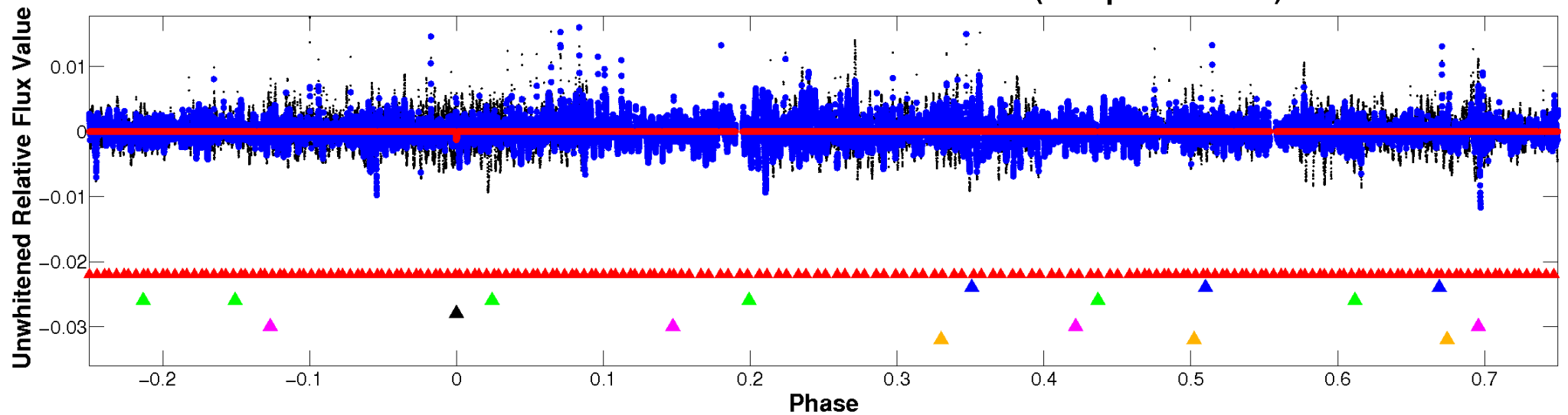
# ALT Odd/Even

TCE 006184894-04

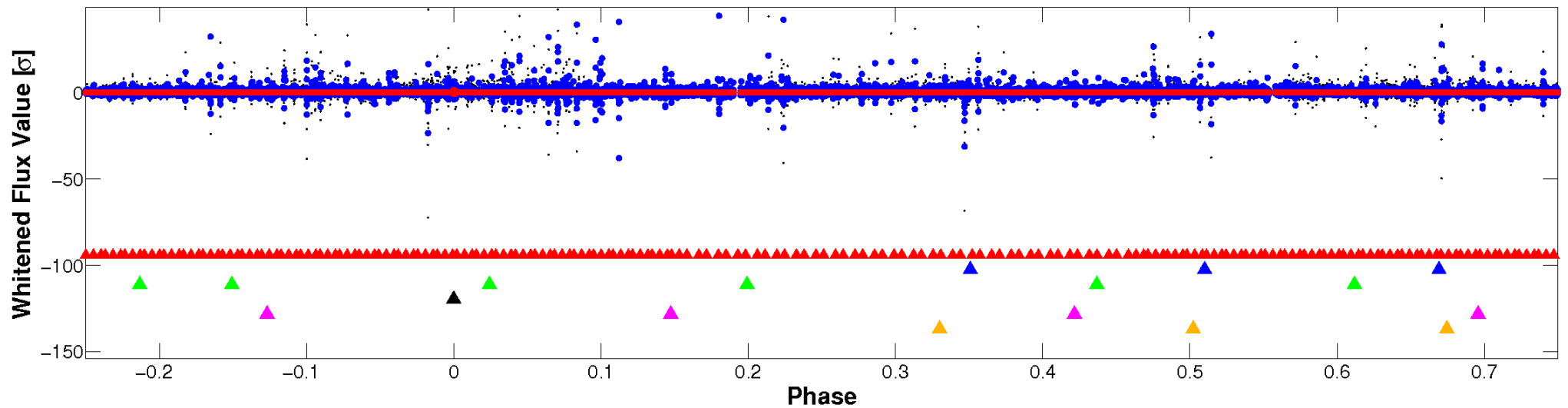


# Non-Whitened Vs. Whitened Light Curve

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

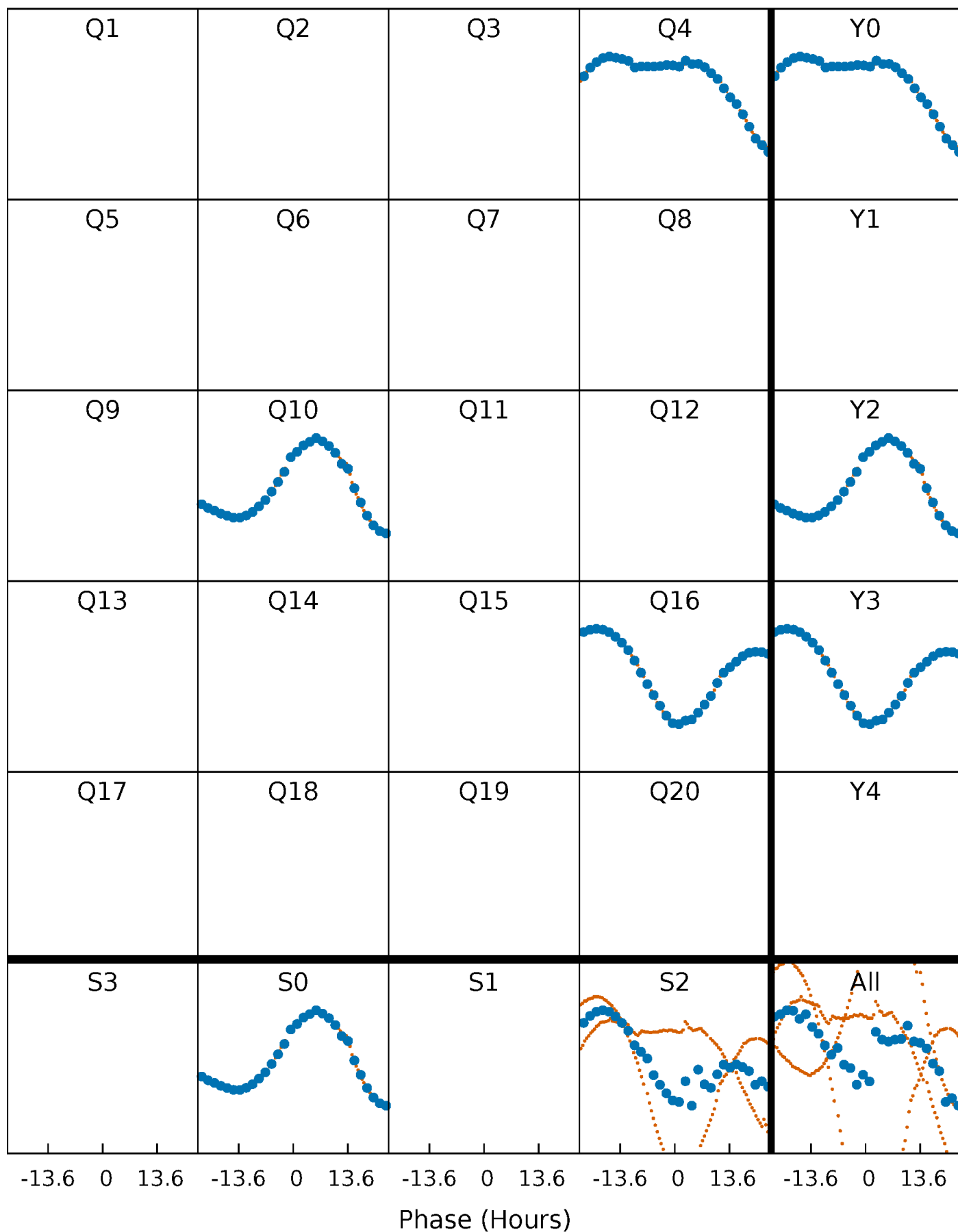


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



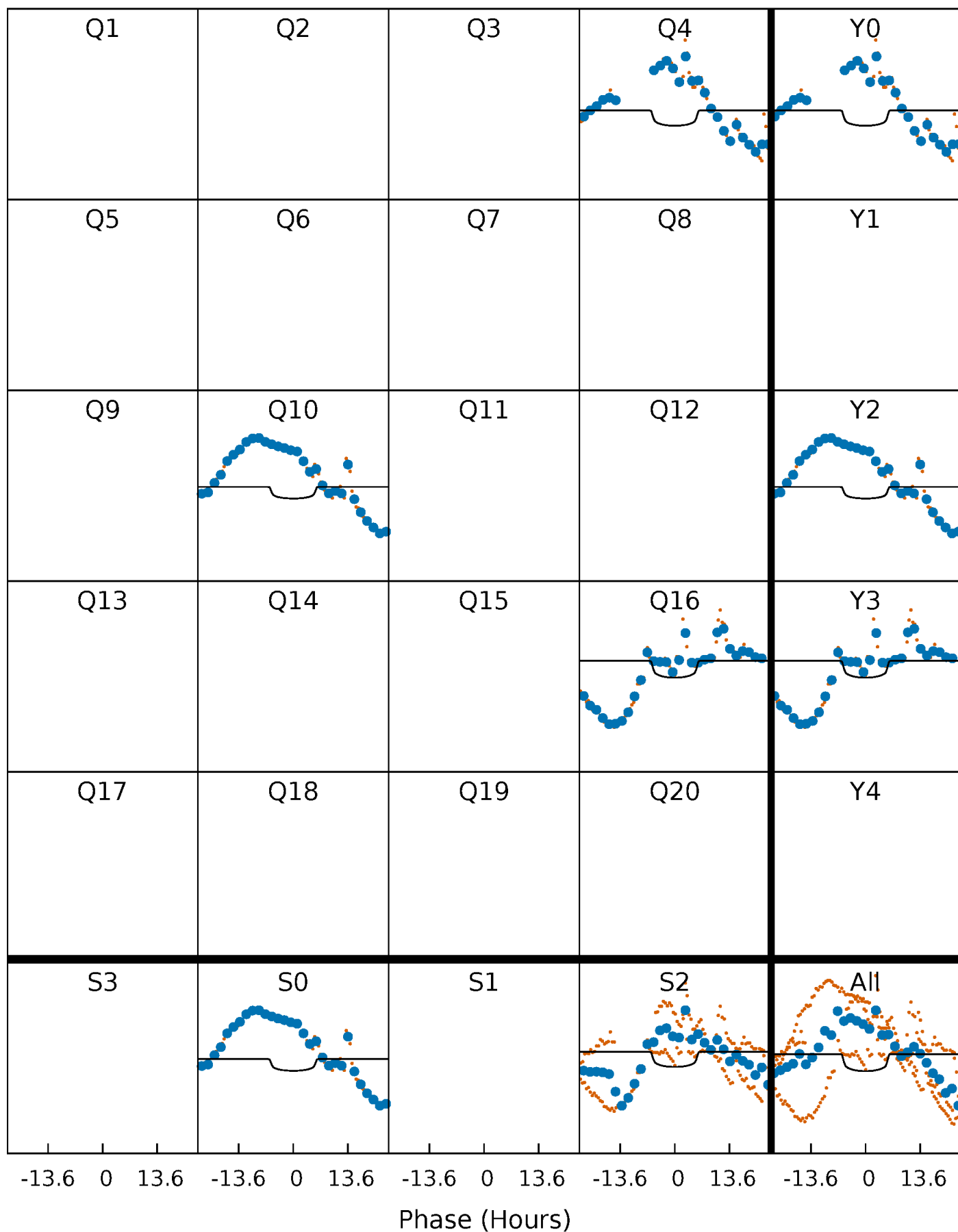
# PDC Quarter-Phased Transit Curves

TCE 006184894-04 P=543.034285 Days  $T_0=423.725756$  (BKJD)



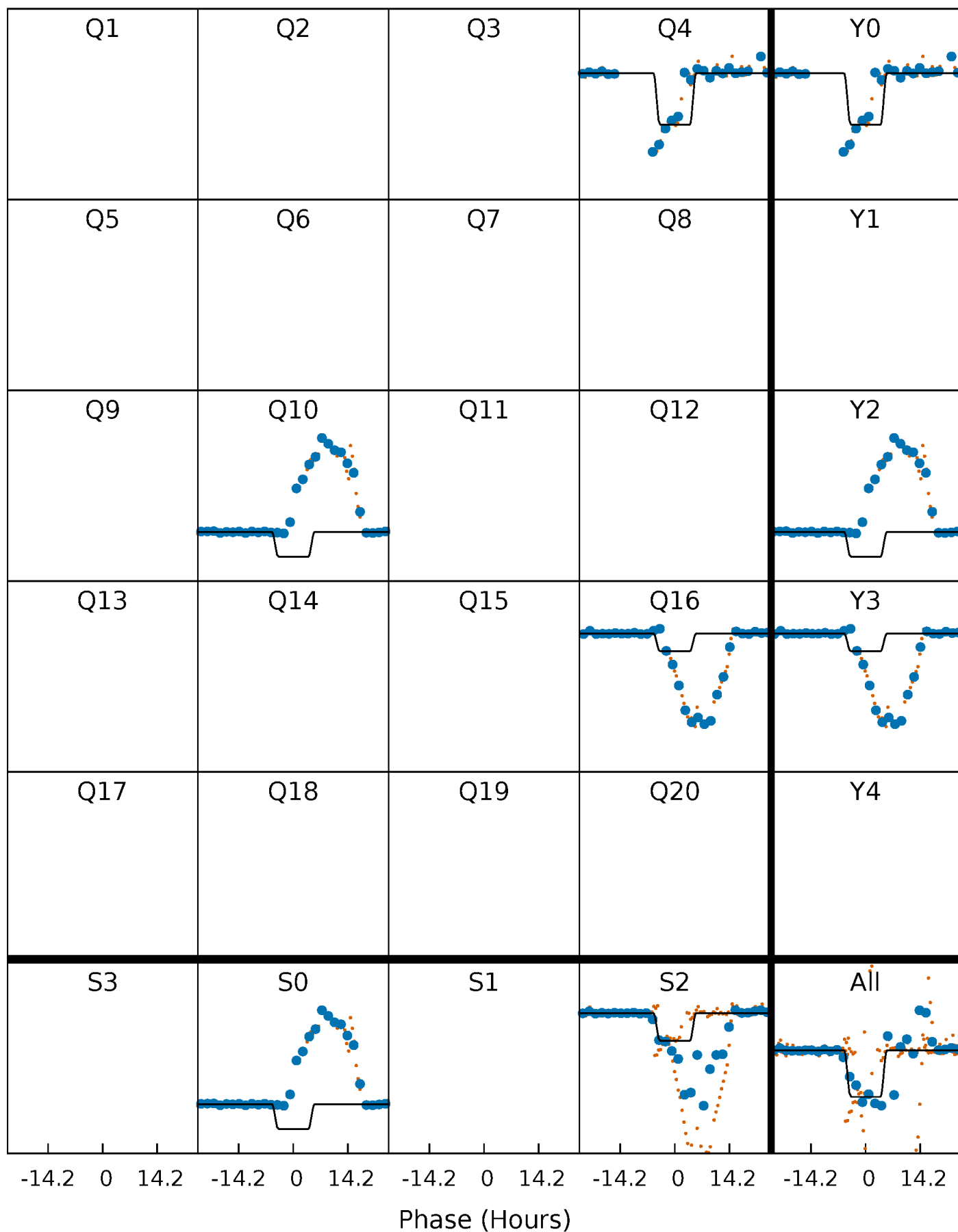
# DV Quarter-Phased Transit Curves

TCE 006184894-04 P=543.034285 Days  $T_0=423.725756$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

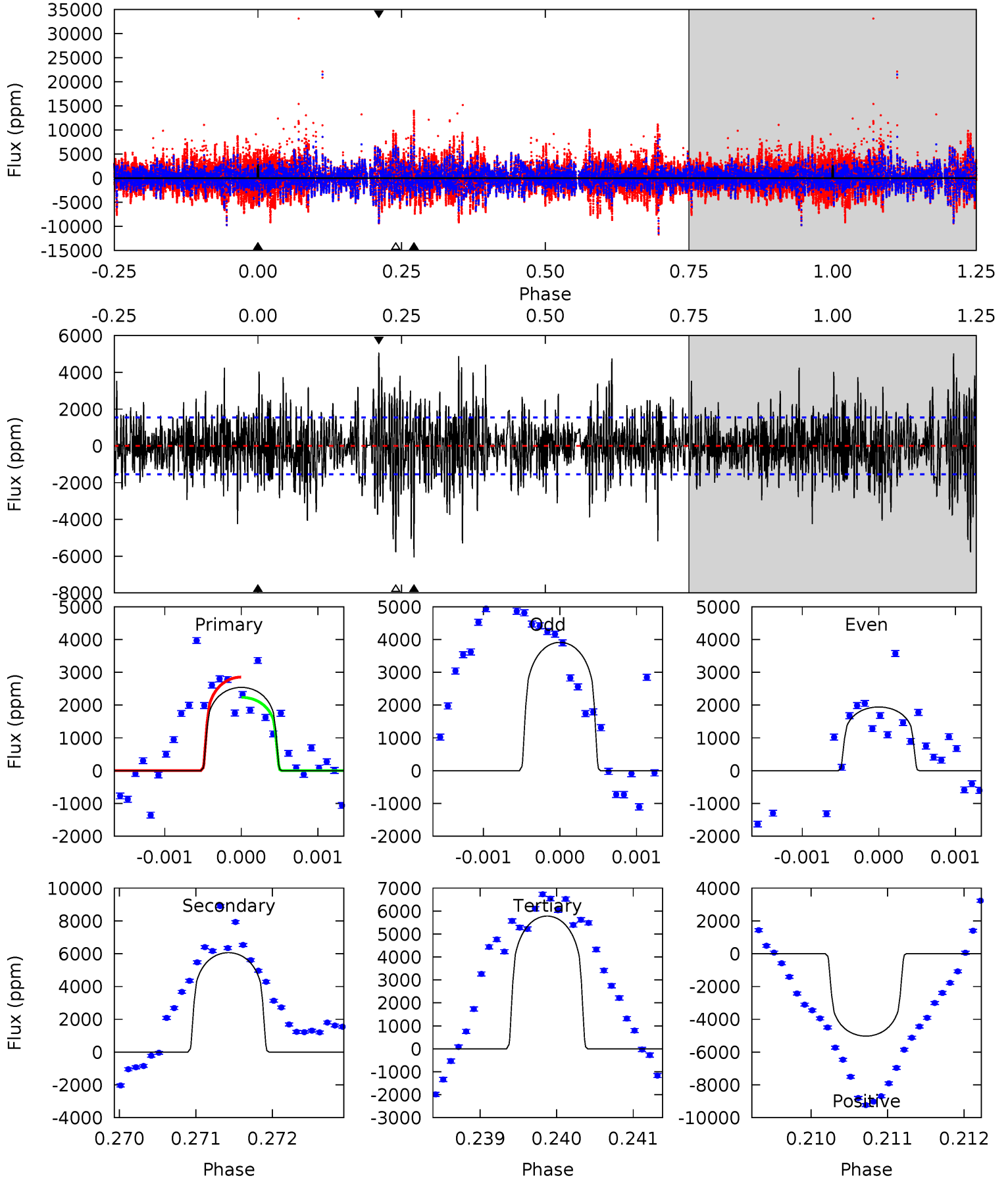
TCE 006184894-04 P=542.946934 Days  $T_0=423.742236$  (BKJD)



# DV Model-Shift Uniqueness Test

006184894-04, P = 543.034285 Days, E = 423.725756 Days

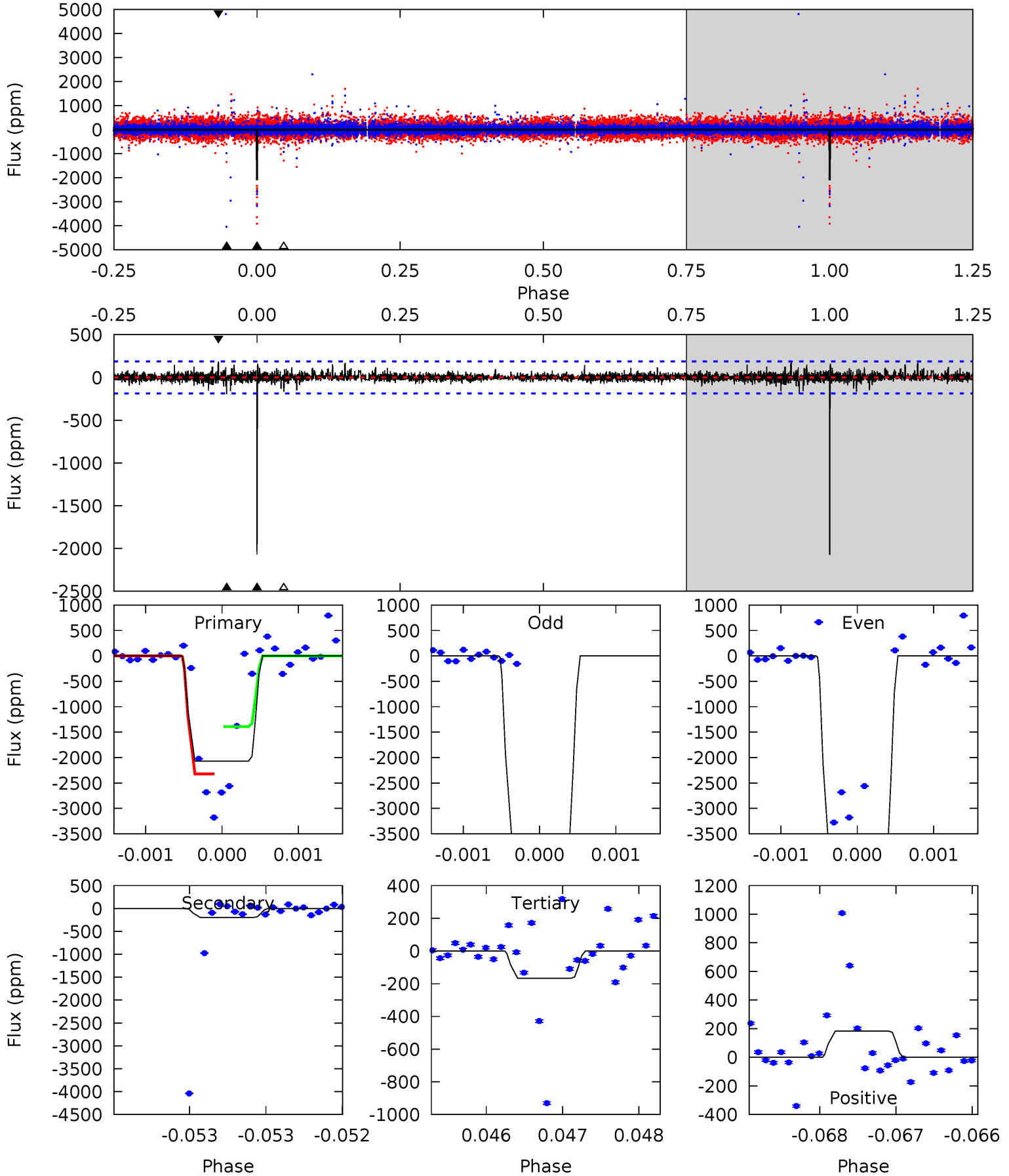
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.99	21.5	20.5	17.8	5.47	3.32	4.64	-11.5	-8.80	0.99	3.67	3.05	0.68	0.45	1.09



# Alt Model-Shift Uniqueness Test

006184894-04, P = 542.946934 Days, E = 423.742236 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
60.5	5.66	4.86	5.35	5.49	3.35	0.74	55.6	55.1	0.80	0.31	5.71	0.96	0.08	0





### Stellar Parameters For KIC 006184894

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5388^{+161}_{-145}$	$4.560^{+0.088}_{-0.064}$	$-0.700^{+0.300}_{-0.300}$	$0.717^{+0.082}_{-0.074}$	$0.681^{+0.085}_{-0.034}$	$2.603^{+0.922}_{-0.572}$
	+3%/-3%	+2%/-1%	+43%/-43%	+11%/-10%	+12%/-5%	+35%/-22%
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 006184894-04 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-6063 \pm 283$	$2.72^{+0.65}_{-0.60}$	$262^{+10}_{-10}$	$8325^{+1513}_{-1056}$	$598293^{+415137}_{-205256}$
Alt.	$-194 \pm 34$	$4.12^{+0.70}_{-0.64}$	$262^{+10}_{-10}$	$3313^{+200}_{-173}$	$8559^{+3627}_{-2584}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature

$T_{\text{obs}}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

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

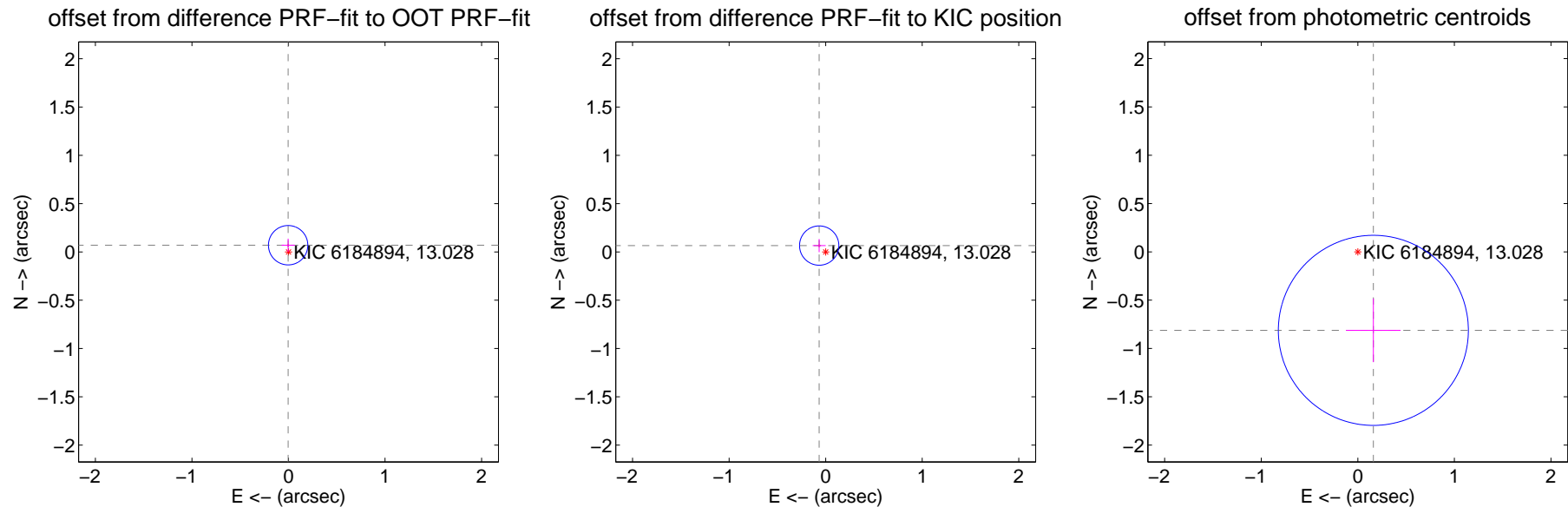
## DV Centroid Data

Supplemental centroid analysis for 006184894-04. Kepler magnitude: 13.03. Transit SNR 4.41

There are 0 quarters with good PRF difference image offsets

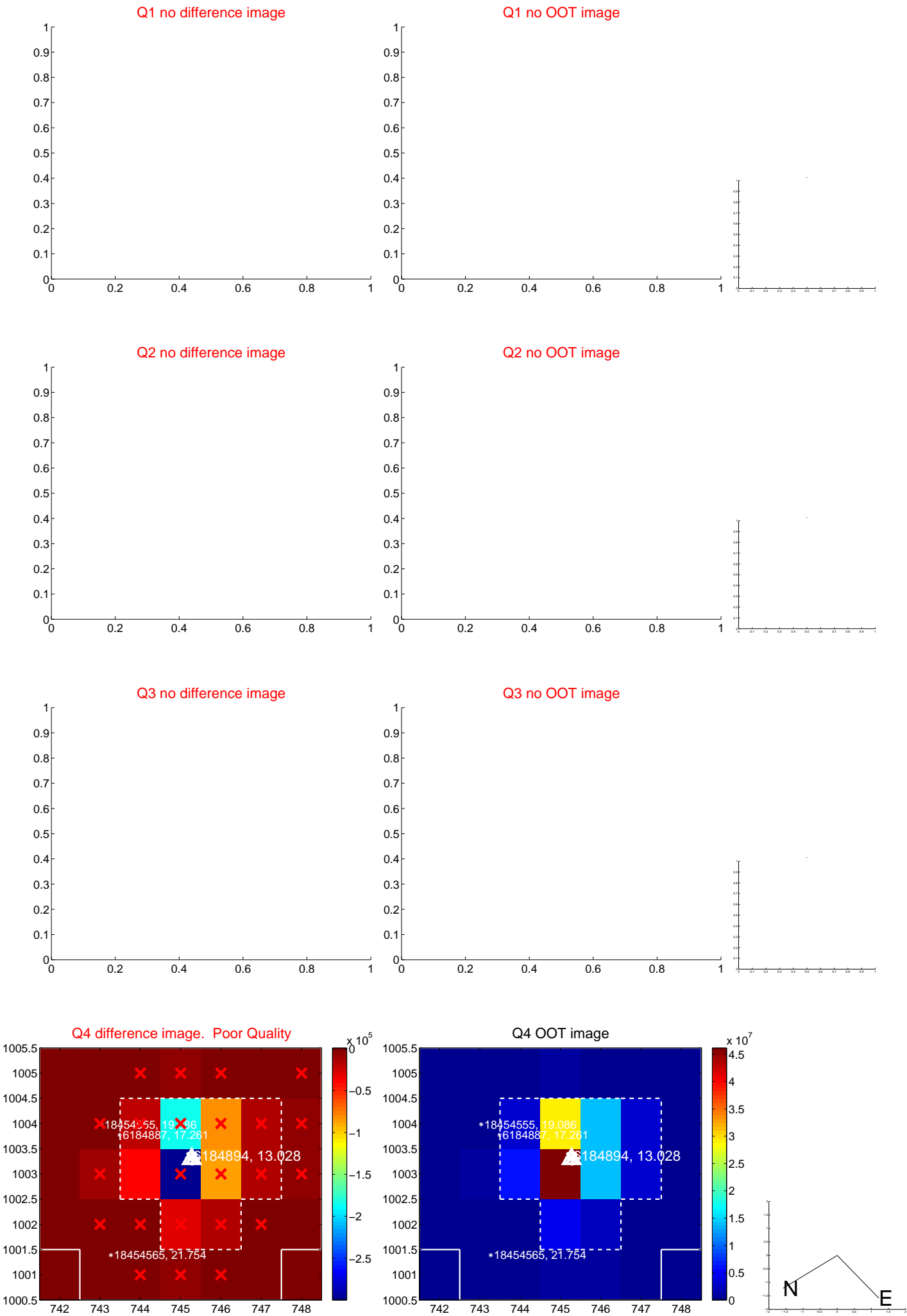
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.069 \pm 0.068$	1.02	$0.004 \pm 0.068$	$0.069 \pm 0.068$
PRF-fit source offset from KIC position	$0.094 \pm 0.068$	1.38	$0.067 \pm 0.068$	$0.066 \pm 0.068$
photometric centroid source offset	$0.83 \pm 0.33$	2.53	$-0.16 \pm 0.28$	$-0.81 \pm 0.33$



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- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . 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.



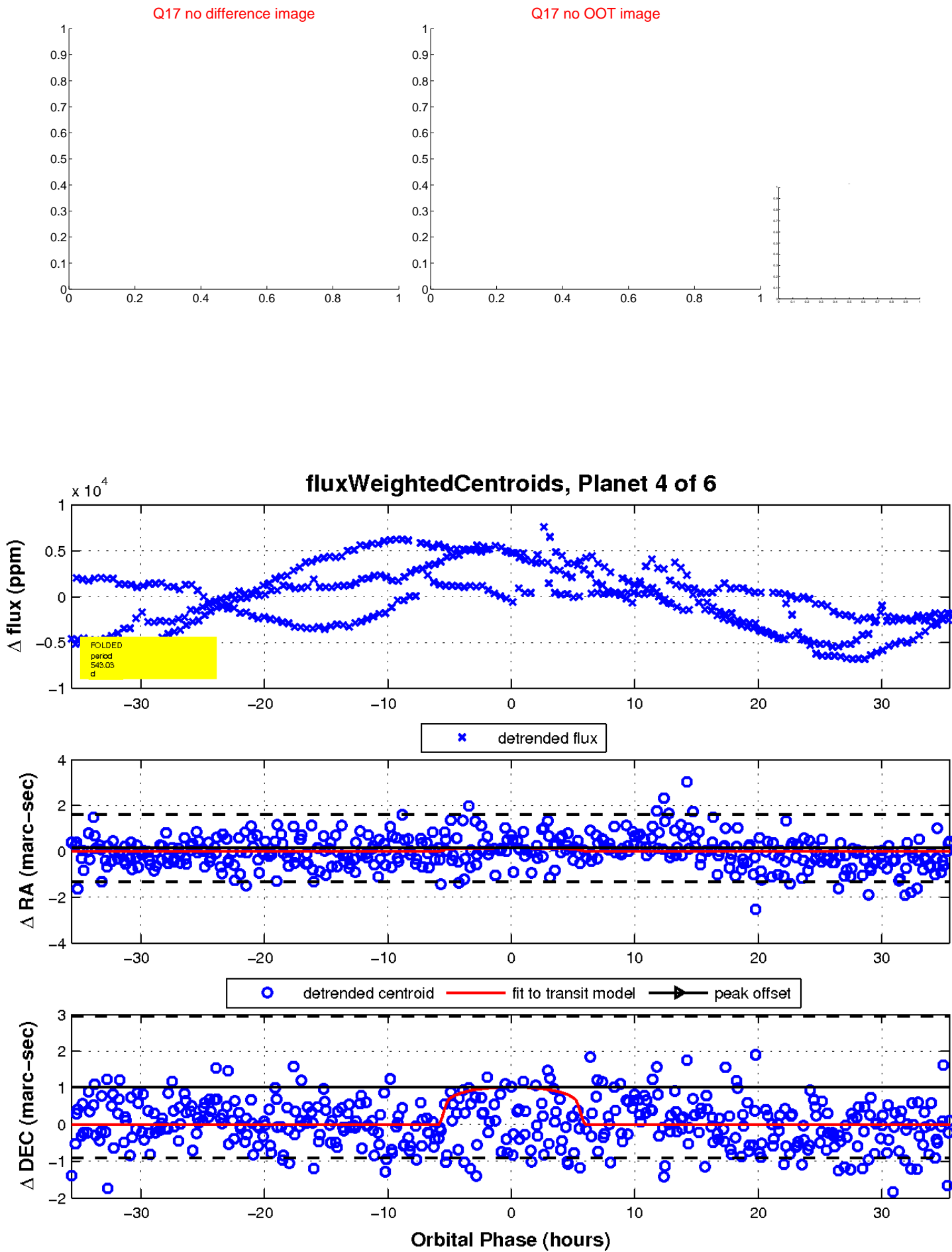
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

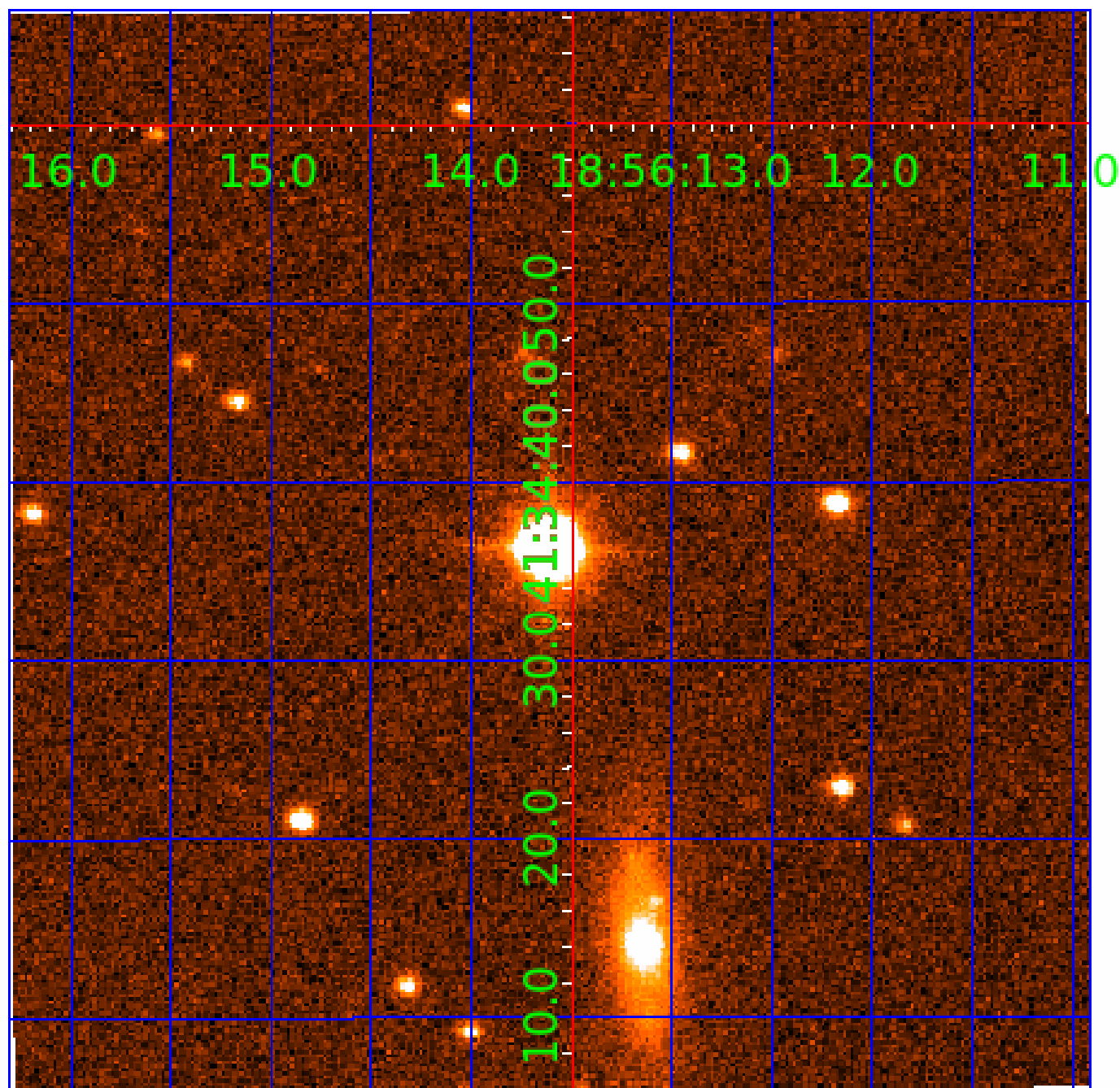


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 006184894

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006184894-01	OBS	5245.01	7.202813	135.195192	1788.6	3.015	67.6	73.8	0.72	5388	3.39	94.11
006184894-02	OBS	No	456.612411	244.080267	1138.2	2.631	20.5	6.9	0.72	5388	2.79	0.37
006184894-03	OBS	No	224.010641	307.905250	873.4	3.785	17.0	3.8	0.72	5388	2.15	0.96
006184894-04	OBS	No	543.034285	423.725756	1286.8	11.881	18.2	4.4	0.72	5388	2.73	0.29
006184894-05	OBS	No	394.144185	258.523696	431.3	4.798	17.5	2.1	0.72	5388	1.55	0.45
006184894-06	OBS	No	449.479948	246.992497	1734.2	4.941	16.5	7.1	0.72	5388	3.01	0.38

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006184894-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
006184894-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006184894-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—INCONSISTENT_TRANS
006184894-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_SKYE_TRACKER—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
006184894-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_TRACKER—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV
006184894-06	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—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](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

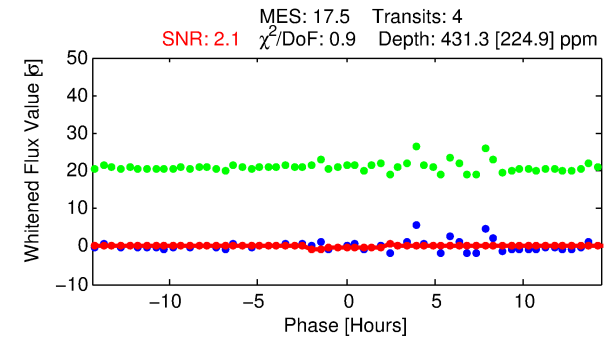
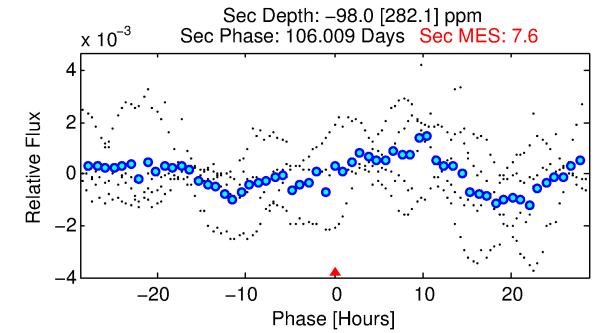
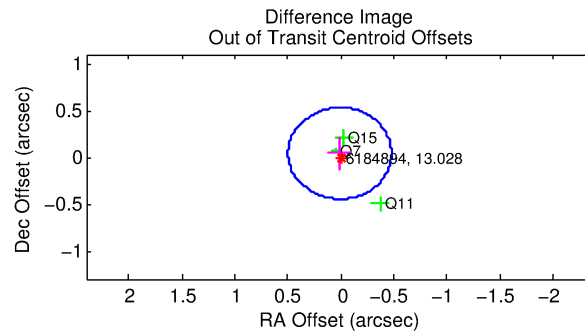
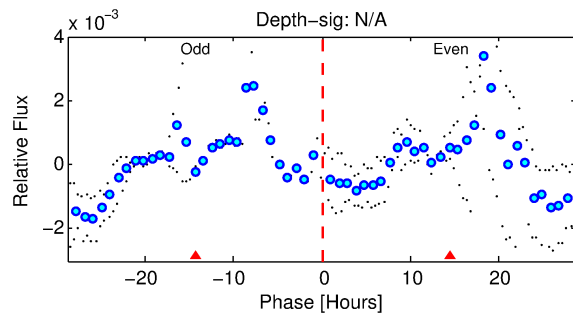
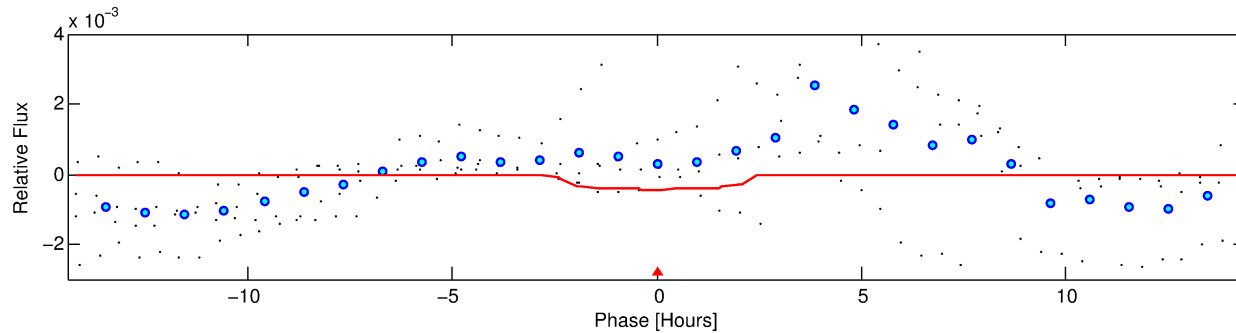
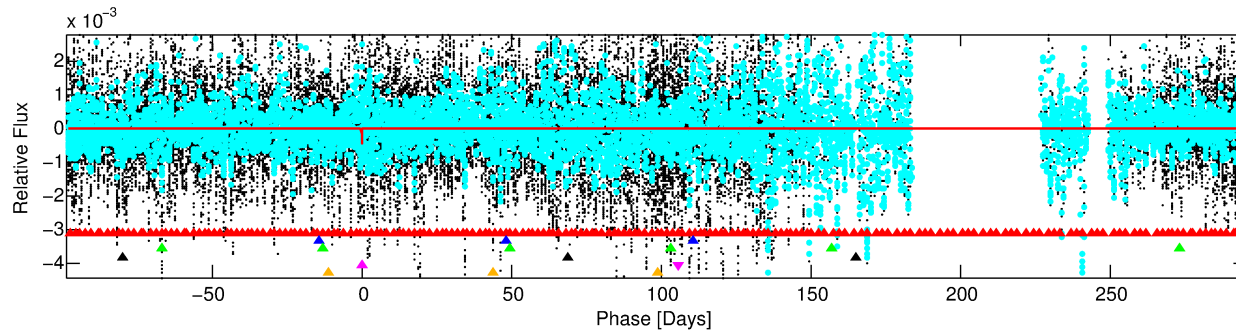
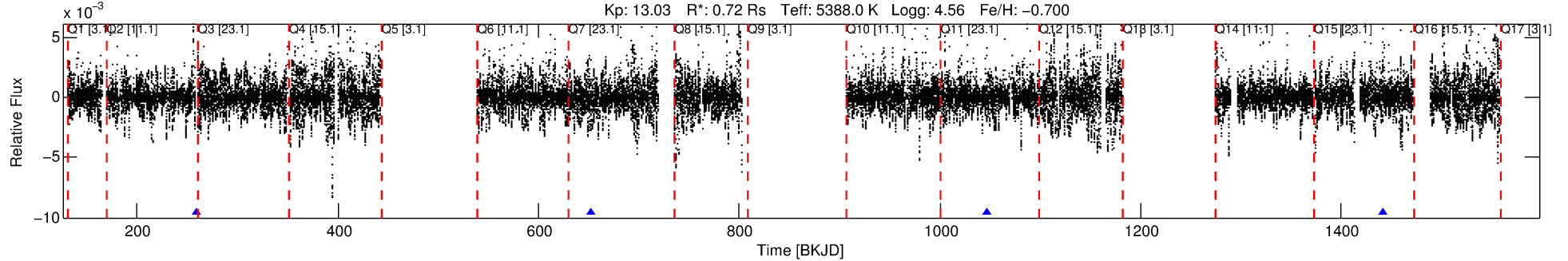
Ephemeris Match Information For 006184894-05

No Significant Match Found

# DV One-Page Summary

KIC: 6184894 Candidate: 5 of 6 Period: 394.144 d  
KOI: K05245 Corr: No Ephemeris Match

Kp: 13.03 R\*: 0.72 Rs Teff: 5388.0 K Logg: 4.56 Fe/H: -0.700



## DV Fit Results:

Period = 394.14418 [0.00862] d  
Epoch = 258.5237 [0.0181] BKJD  
Rp/R\* = 0.0198 [0.0595]  
a/R\* = 516.02 [6863.53]  
b = 0.60 [14.14]  
Seff = 0.45 [0.09]  
Teq = 209 [10] K  
Rp = 1.55 [4.66] Re  
a = 0.9257 [0.0943] AU  
Ag = N/A  
Teffp = N/A

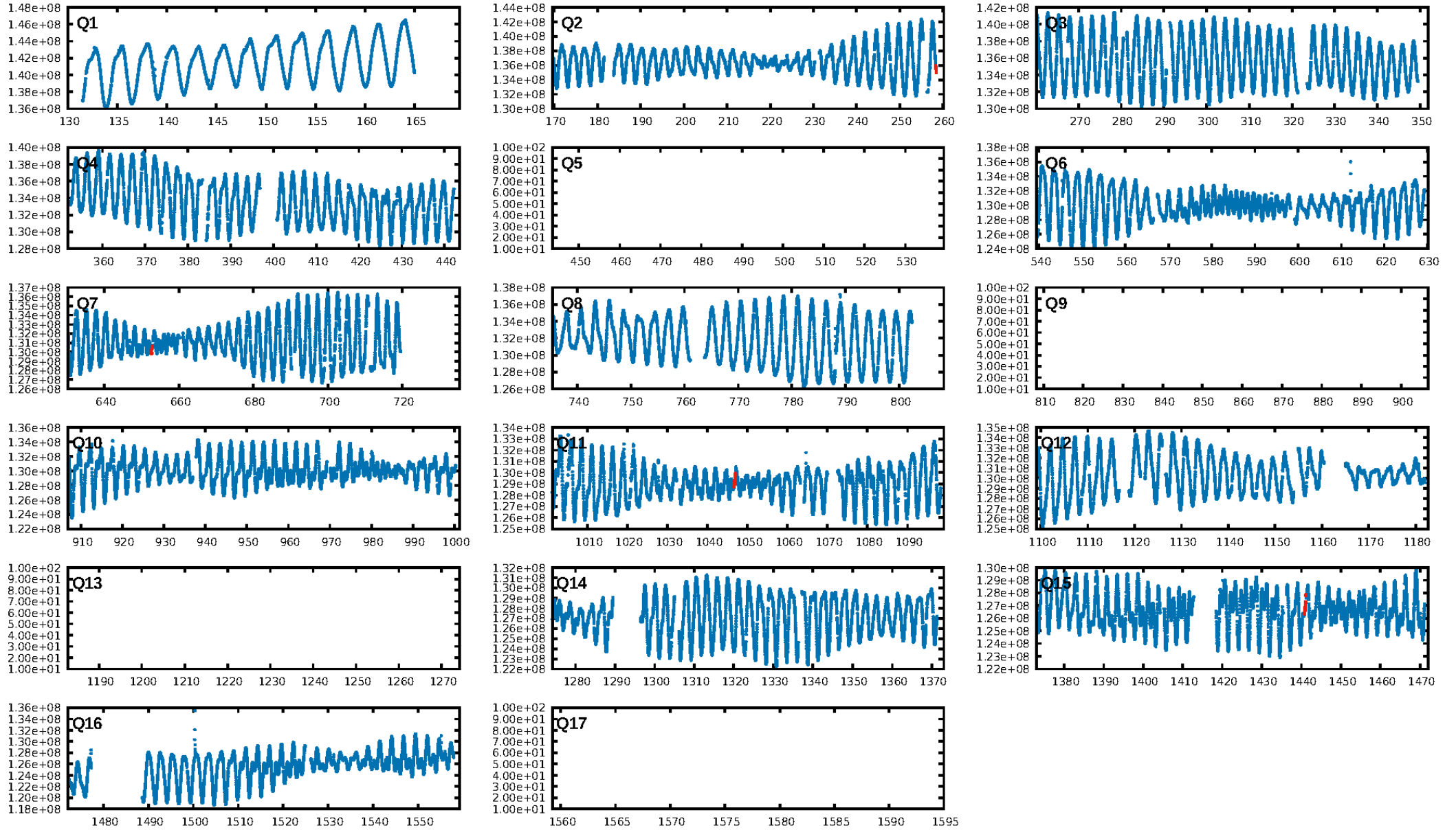
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [668.12σ]  
LongPeriod-sig: 100.0% [192.84σ]  
ModelChiSquare2-sig: 59.0%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 1.45e-11**  
RollingBand-fgt: 1.00 [4/4]  
**GhostDiagnostic-chr: 1.234**  
Centroid-sig: 98.2%  
Centroid-so: 0.117 arcsec [0.12σ]  
OotOffset-rm: 0.043 arcsec [0.27σ]  
KicOffset-rm: 0.149 arcsec [0.90σ]  
OotOffset-st: 0/3/0/0 [3]  
KicOffset-st: 0/3/0/0 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 1.00 [3/3]

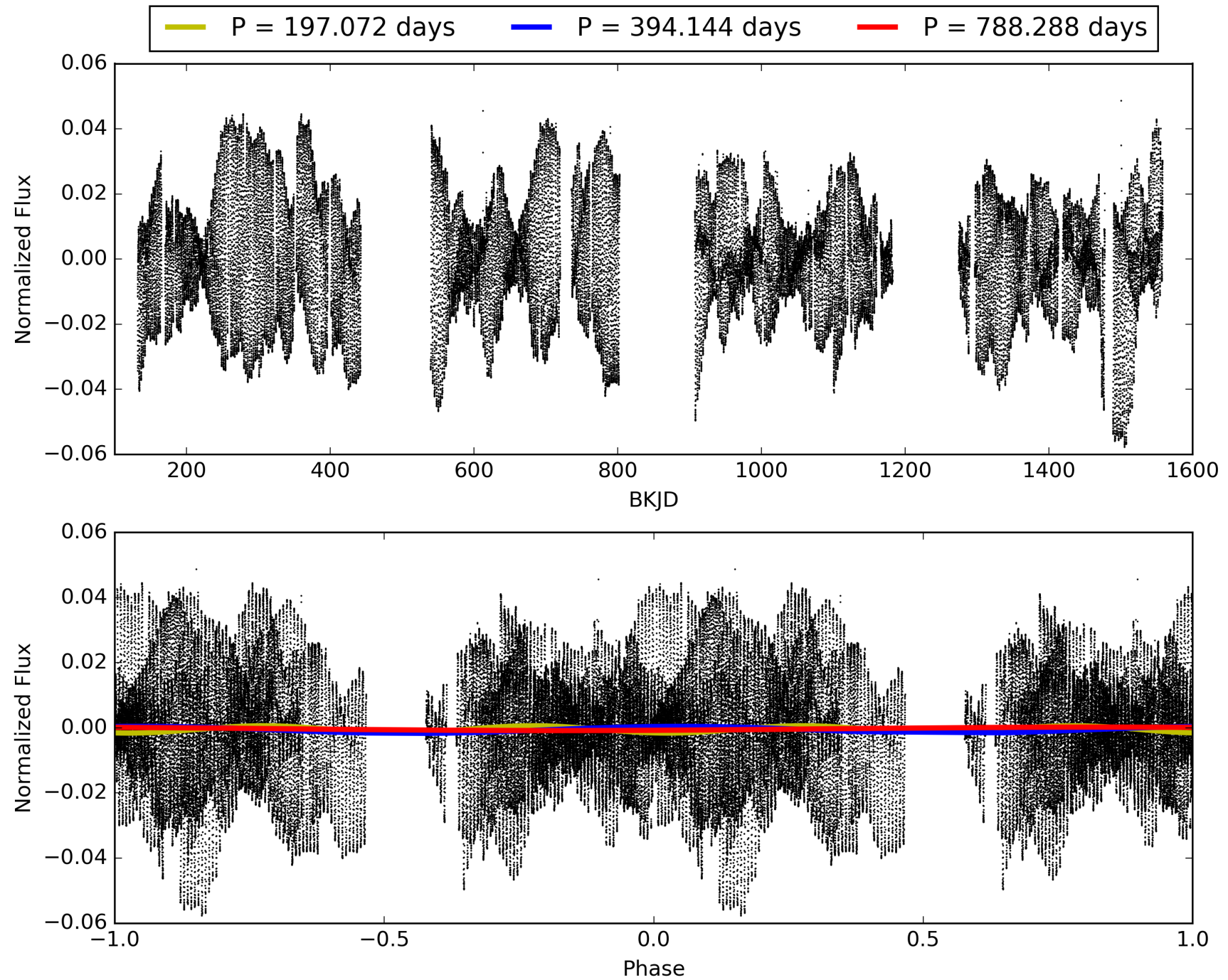
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 07:56:11 Z

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

# TCE 006184894-05, PDC Light Curves

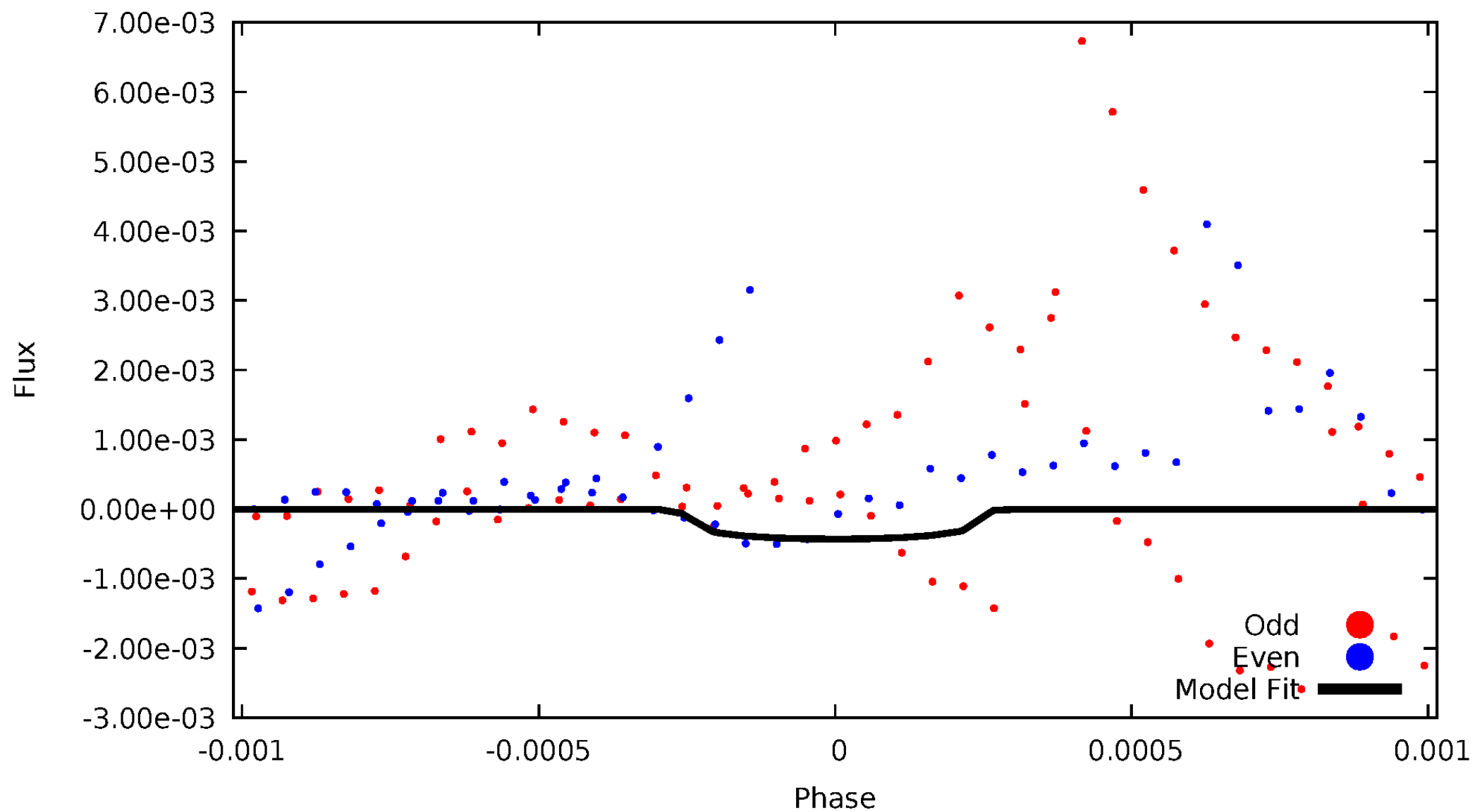


TCE 006184894-05



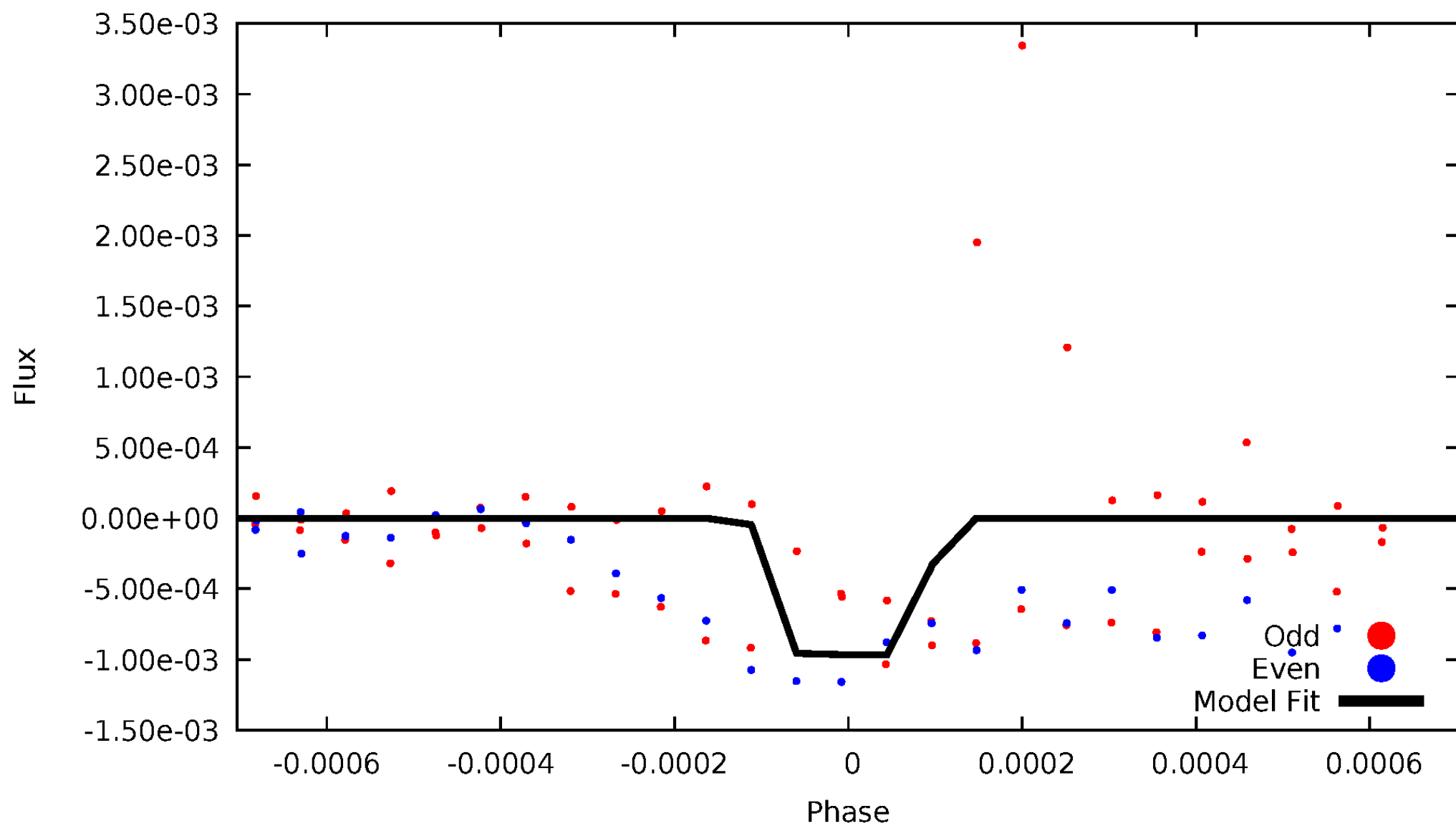
# DV Odd/Even

TCE 006184894-05



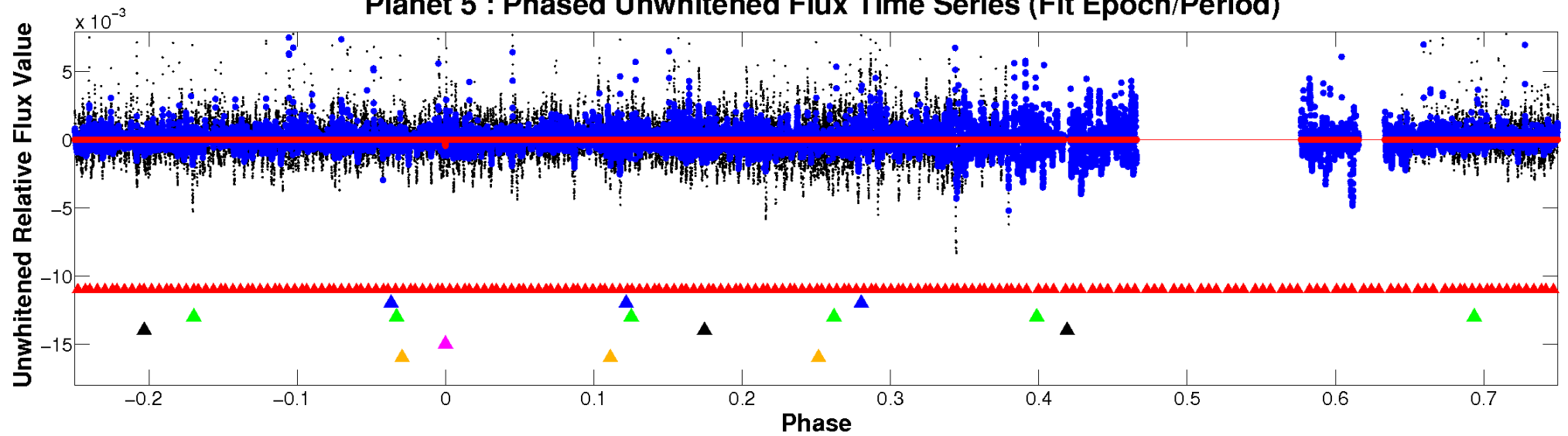
# ALT Odd/Even

TCE 006184894-05

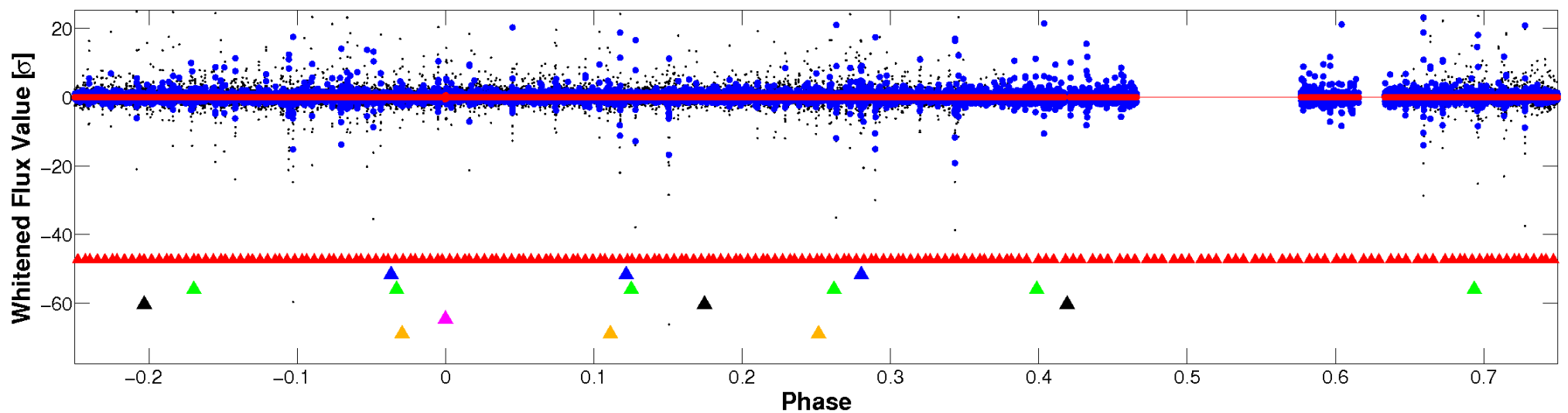


# Non-Whitened Vs. Whitened Light Curve

## Planet 5 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

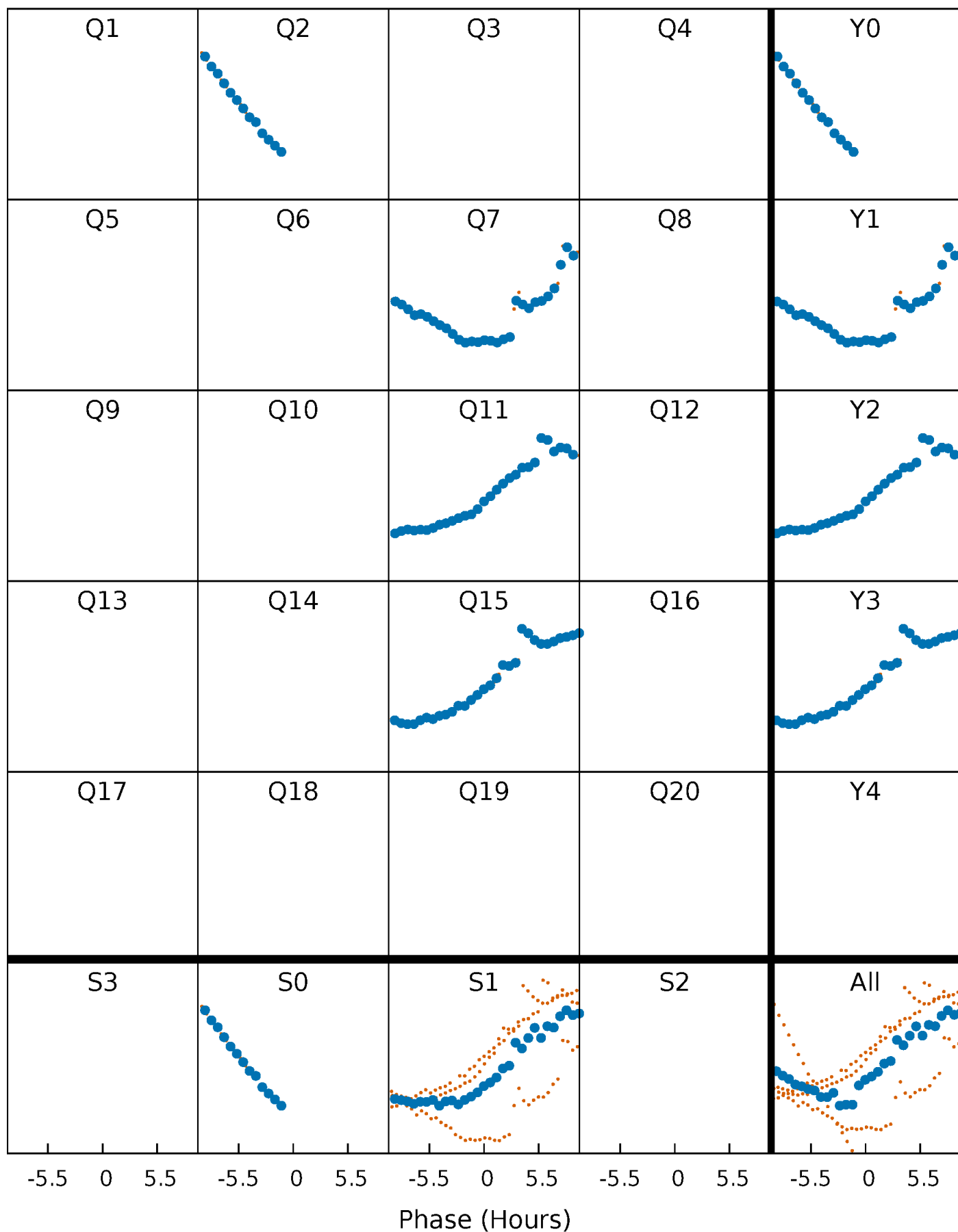


## Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

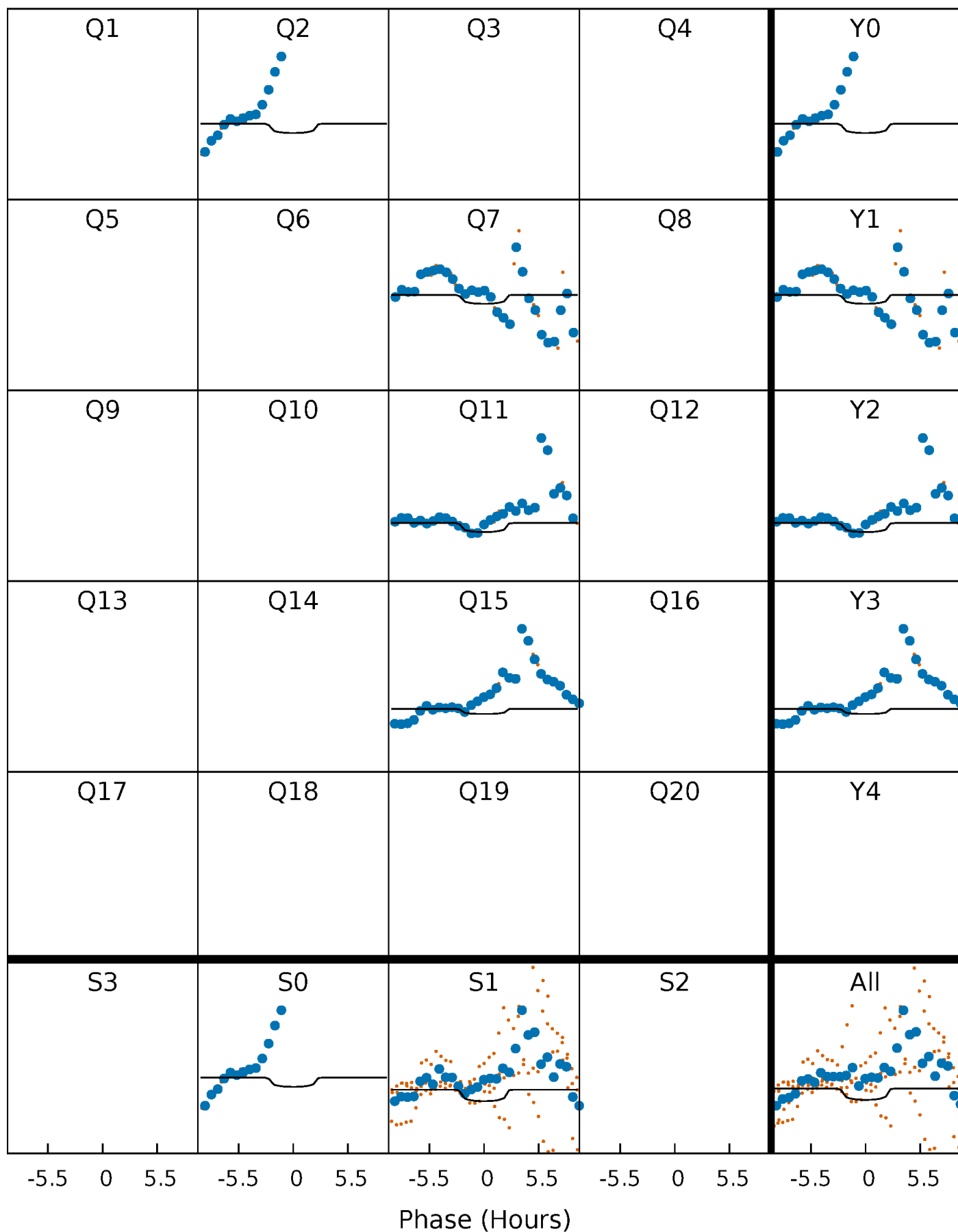
TCE 006184894-05     $P=394.144185$  Days     $T_0=258.523696$  (BKJD)





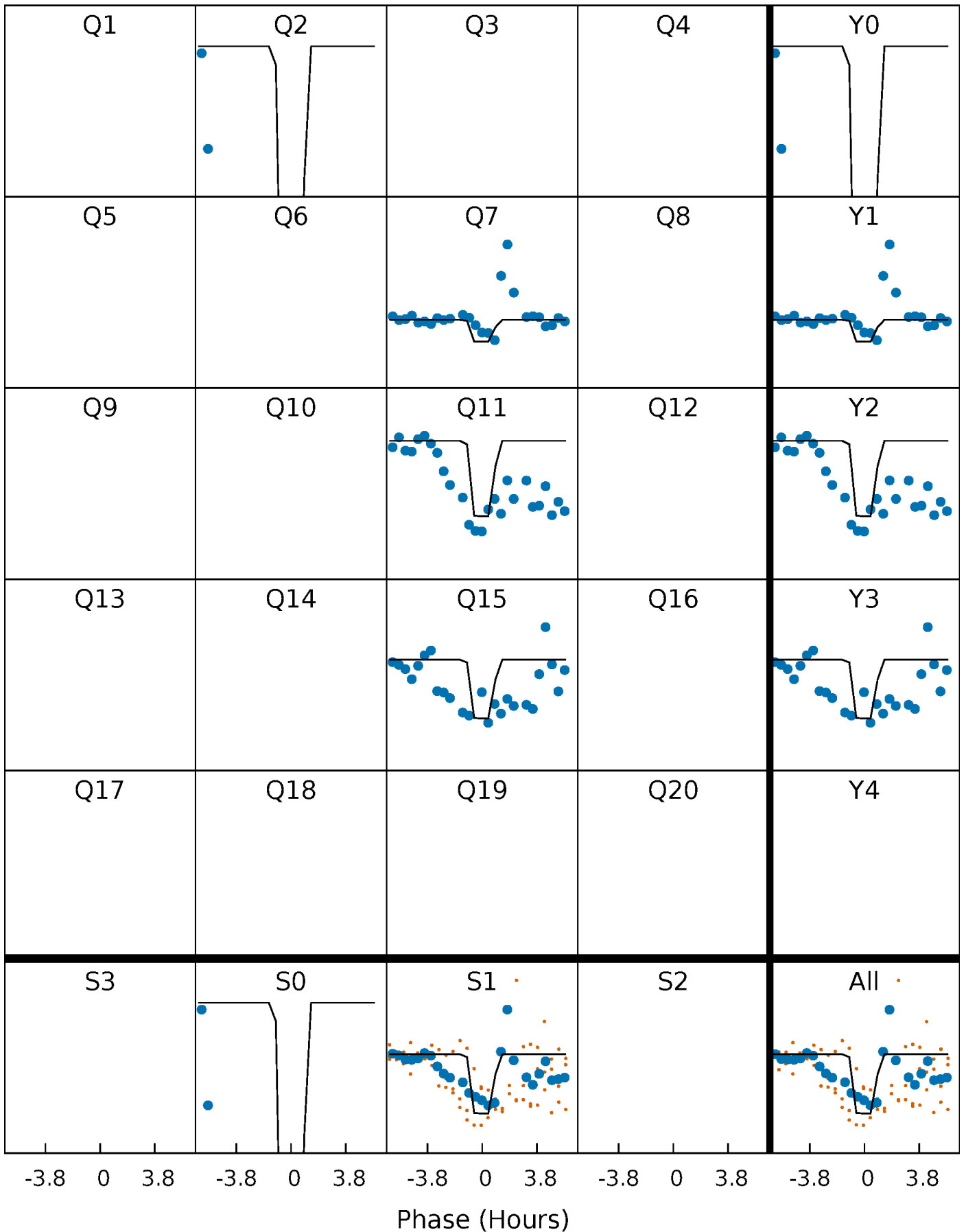
# DV Quarter-Phased Transit Curves

TCE 006184894-05     $P=394.144185$  Days     $T_0=258.523696$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

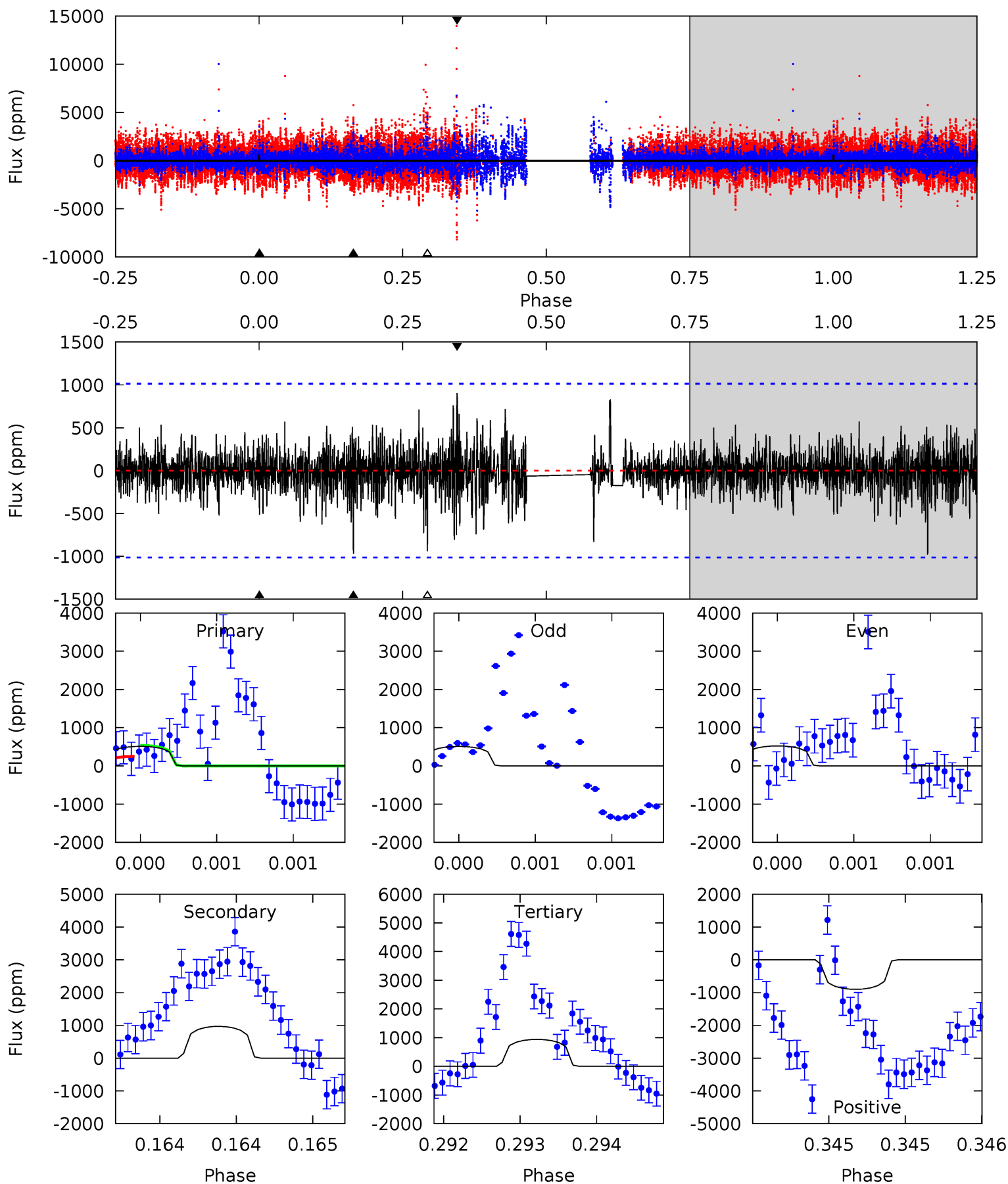
TCE 006184894-05 P=394.061205 Days  $T_0=258.674307$  (BKJD)



# DV Model-Shift Uniqueness Test

006184894-05, P = 394.144185 Days, E = 258.523696 Days

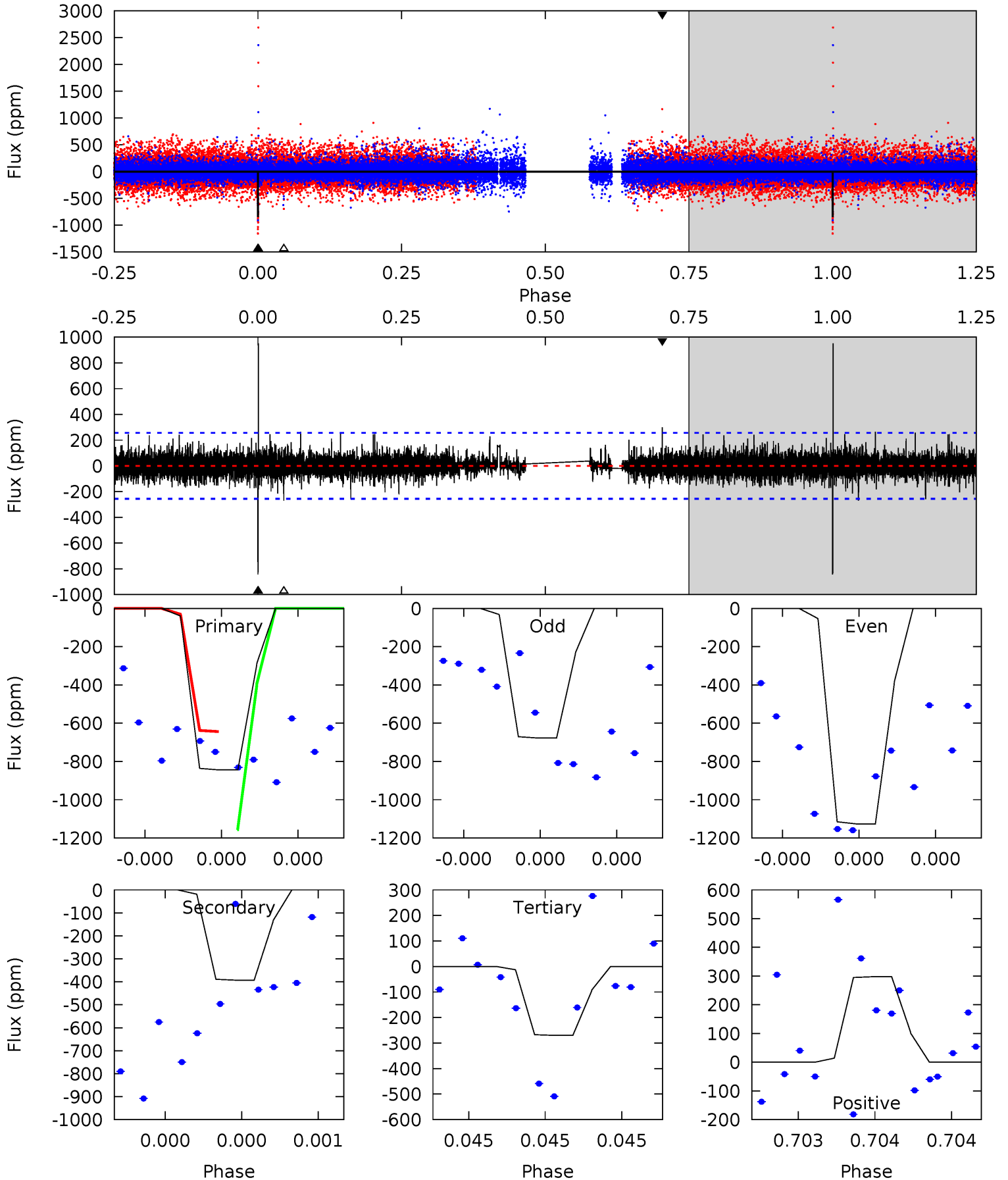
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.81	5.31	5.15	4.94	5.55	3.45	1.01	-2.34	-2.13	0.17	0.37	0.03	1.87	0.48	0.78



# Alt Model-Shift Uniqueness Test

006184894-05, P = 394.061205 Days, E = 258.674307 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.9	8.78	6.03	6.65	5.72	3.71	1.13	12.8	12.2	2.75	2.12	4.45	0.97	0.53	5.17



### Stellar Parameters For KIC 006184894

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5388^{+161}_{-145}$	$4.560^{+0.088}_{-0.064}$	$-0.700^{+0.300}_{-0.300}$	$0.717^{+0.082}_{-0.074}$	$0.681^{+0.085}_{-0.034}$	$2.603^{+0.922}_{-0.572}$
	+3%/-3%	+2%/-1%	+43%/-43%	+11%/-10%	+12%/-5%	+35%/-22%
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 006184894-05 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-970 \pm 183$	$3.79^{+3.43}_{-2.50}$	$291^{+13}_{-12}$	$4492^{+3041}_{-956}$	$32149^{+246594}_{-23673}$
Alt.	$-393 \pm 45$	$4.26^{+3.95}_{-3.00}$	$291^{+12}_{-11}$	$3654^{+2328}_{-652}$	$10456^{+108239}_{-7701}$

$T_{max}$  = 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  $A_{obs} \gg 1.0$

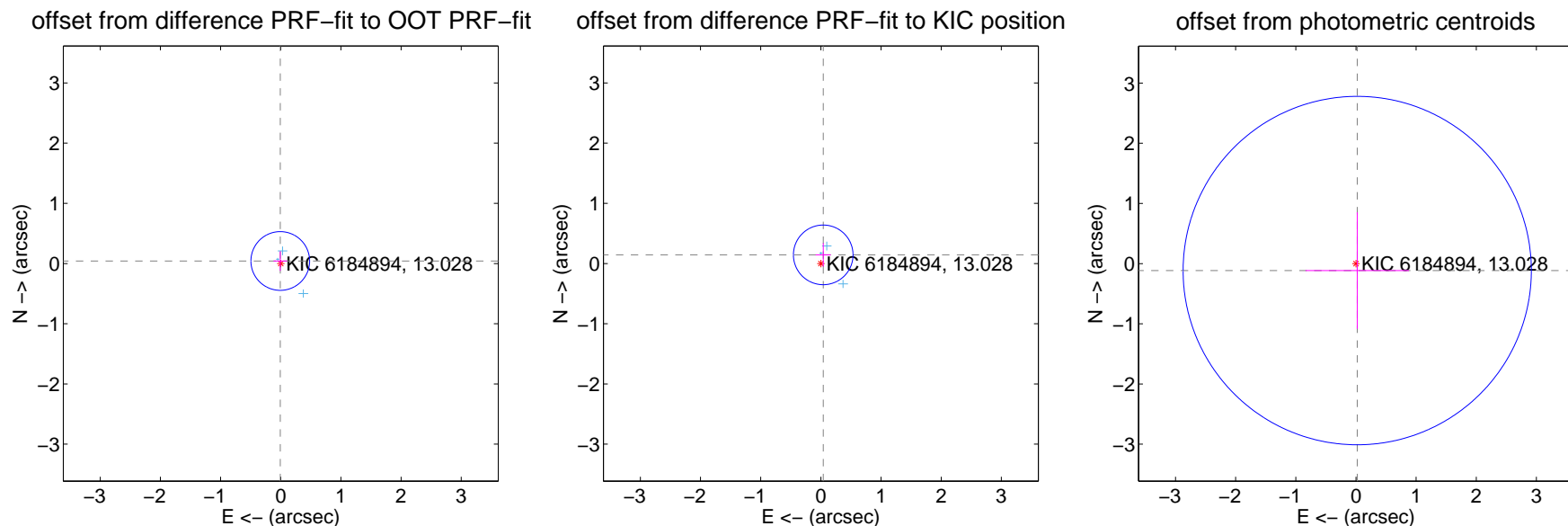
## DV Centroid Data

Supplemental centroid analysis for 006184894-05. Kepler magnitude: 13.03. Transit SNR 2.10

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 / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.043 \pm 0.163$	0.27	$0.008 \pm 0.112$	$0.042 \pm 0.164$
PRF-fit source offset from KIC position	$0.149 \pm 0.165$	0.90	$-0.039 \pm 0.125$	$0.144 \pm 0.196$
photometric centroid source offset	$0.12 \pm 0.96$	0.12	$-0.02 \pm 0.86$	$-0.12 \pm 0.97$



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- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . 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



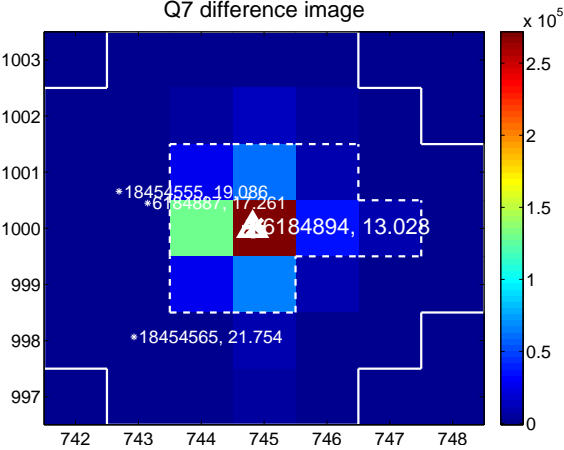
Q6 no difference image



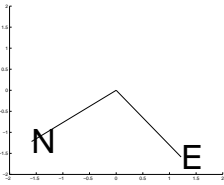
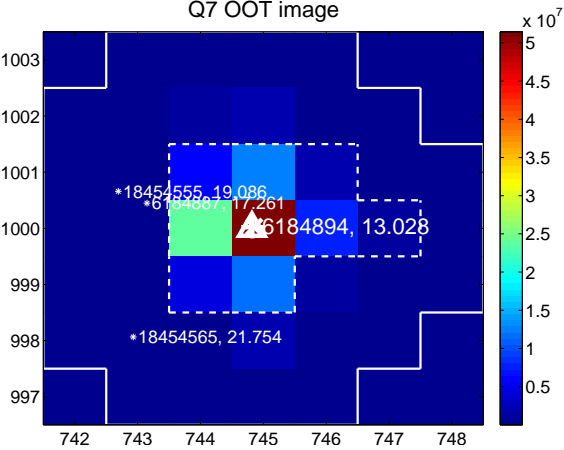
Q6 no OOT image



Q7 difference image



Q7 OOT image



Q8 no difference image

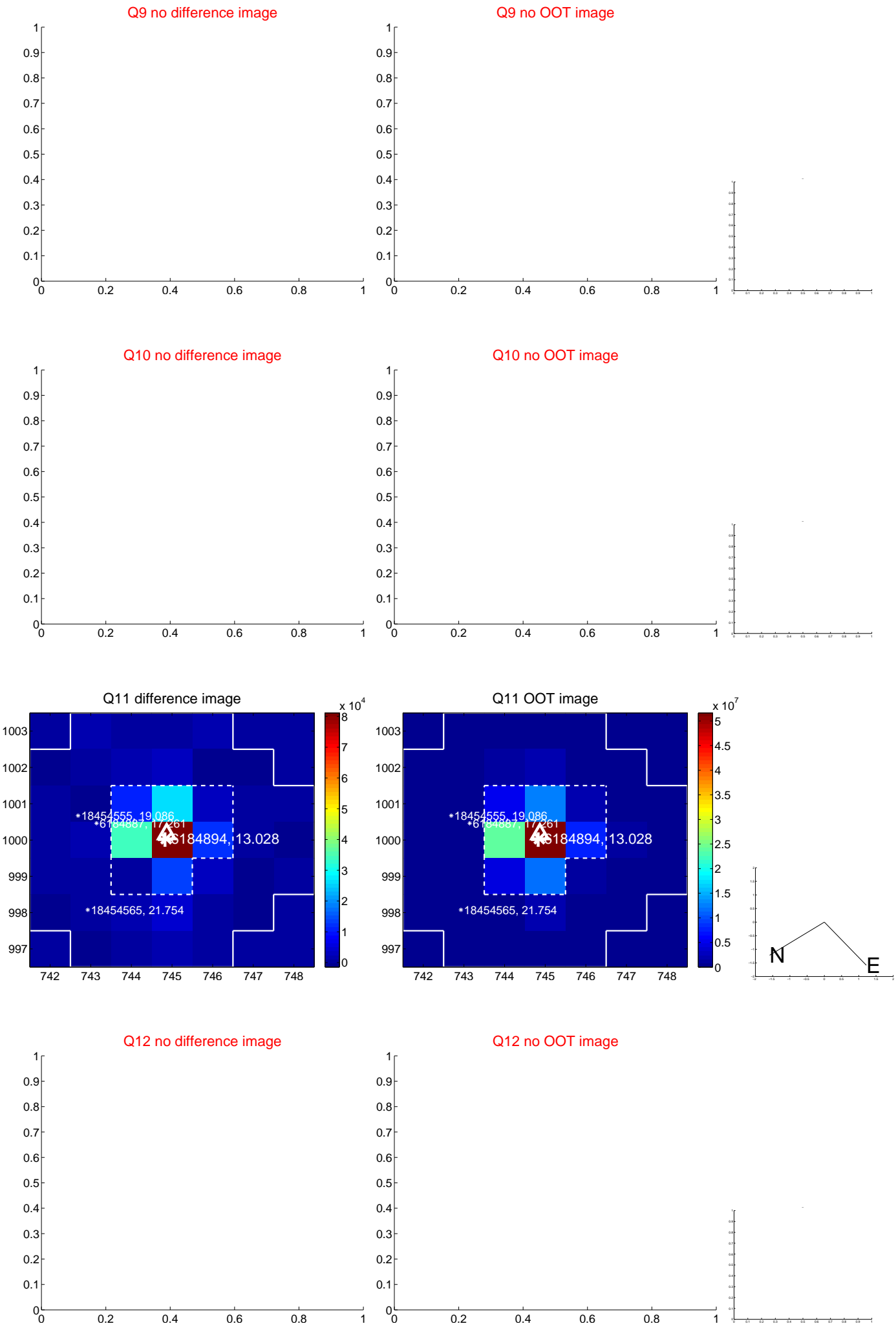


Q8 no OOT image

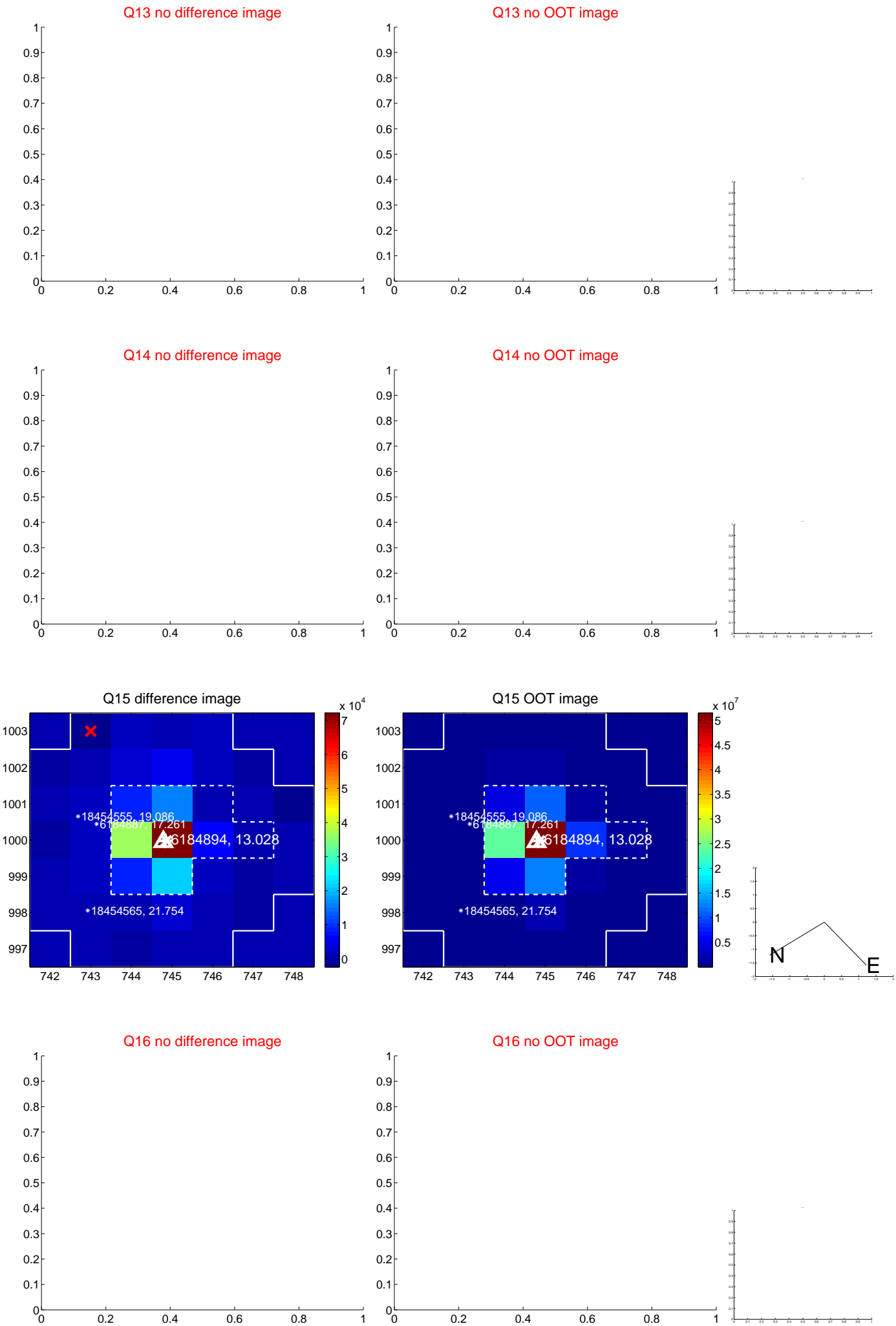




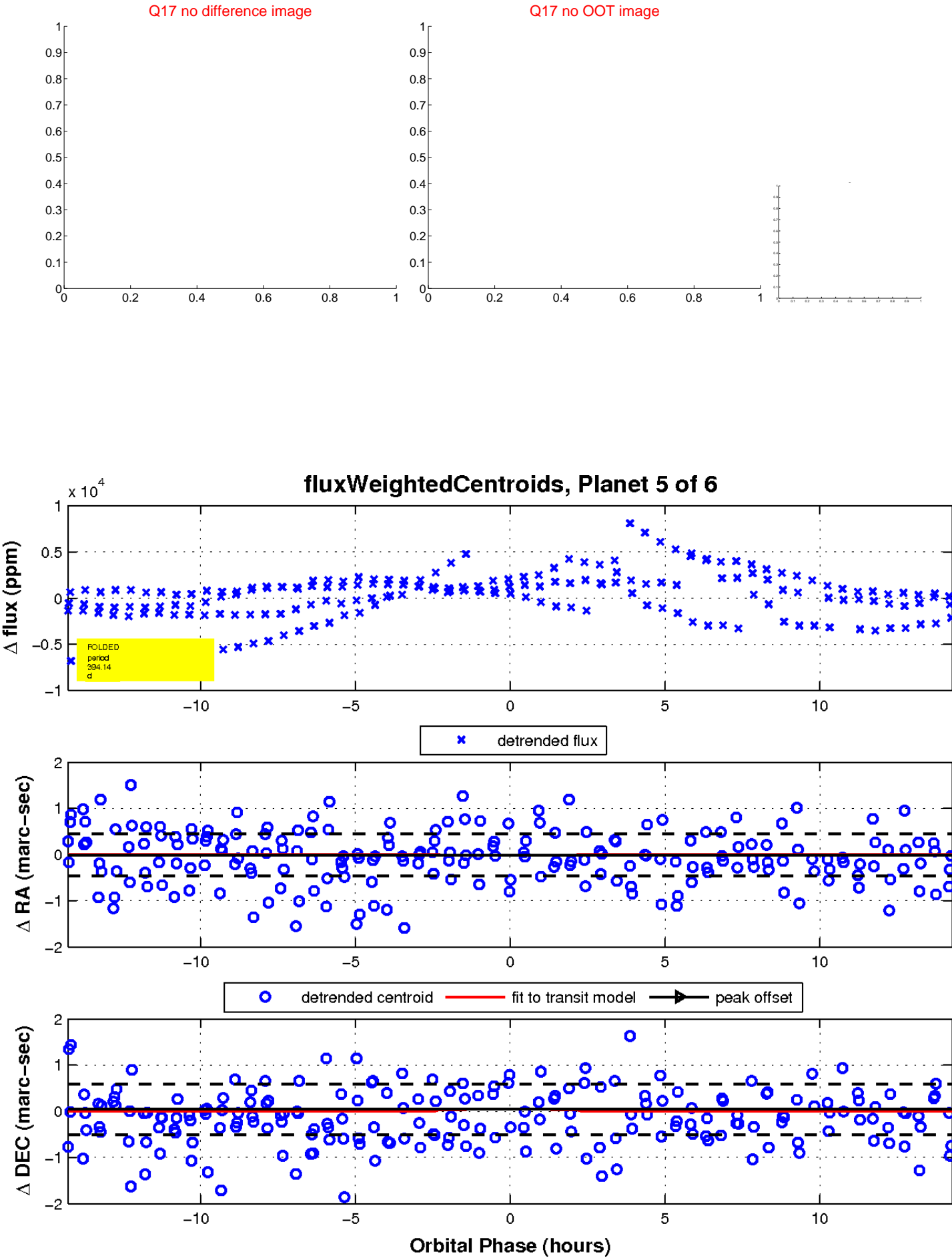
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

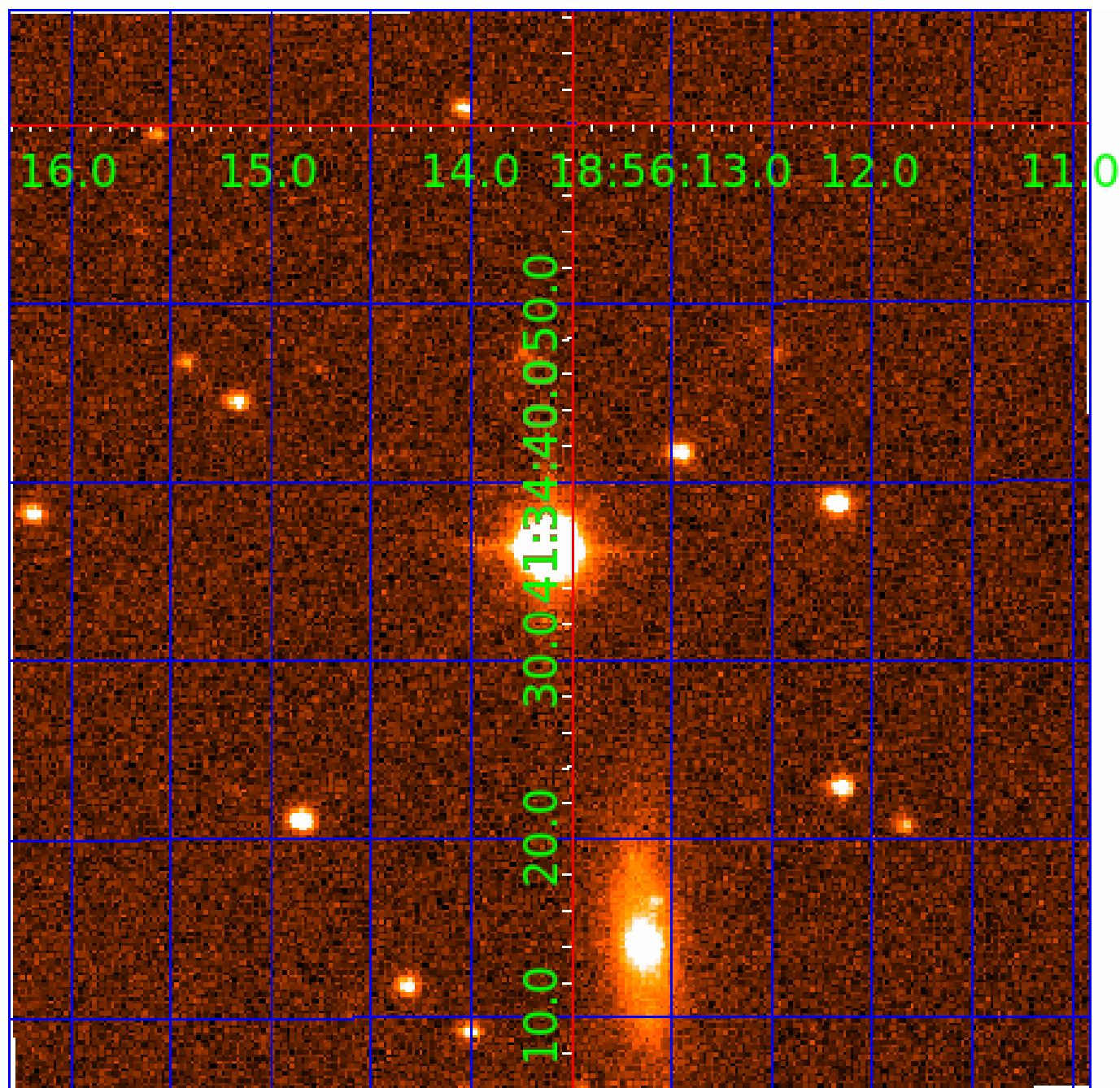


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 006184894

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006184894-01	OBS	5245.01	7.202813	135.195192	1788.6	3.015	67.6	73.8	0.72	5388	3.39	94.11
006184894-02	OBS	No	456.612411	244.080267	1138.2	2.631	20.5	6.9	0.72	5388	2.79	0.37
006184894-03	OBS	No	224.010641	307.905250	873.4	3.785	17.0	3.8	0.72	5388	2.15	0.96
006184894-04	OBS	No	543.034285	423.725756	1286.8	11.881	18.2	4.4	0.72	5388	2.73	0.29
006184894-05	OBS	No	394.144185	258.523696	431.3	4.798	17.5	2.1	0.72	5388	1.55	0.45
006184894-06	OBS	No	449.479948	246.992497	1734.2	4.941	16.5	7.1	0.72	5388	3.01	0.38

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006184894-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
006184894-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006184894-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—INCONSISTENT_TRANS
006184894-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_SKYE_TRACKER—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
006184894-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_TRACKER—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV
006184894-06	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—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](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

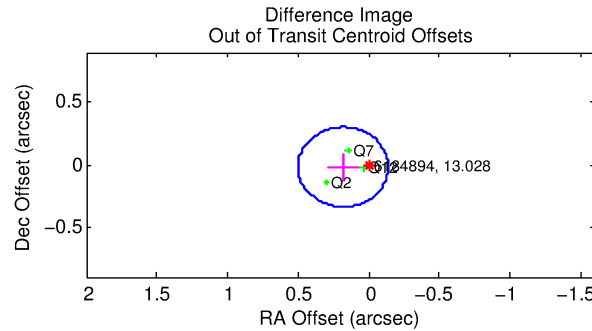
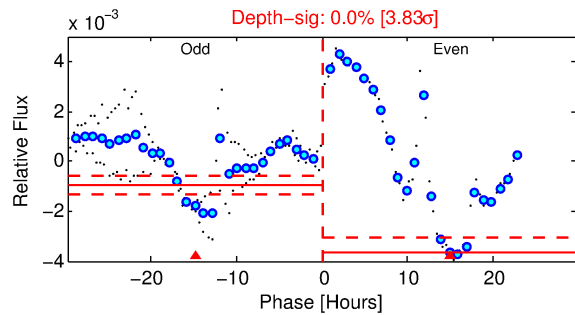
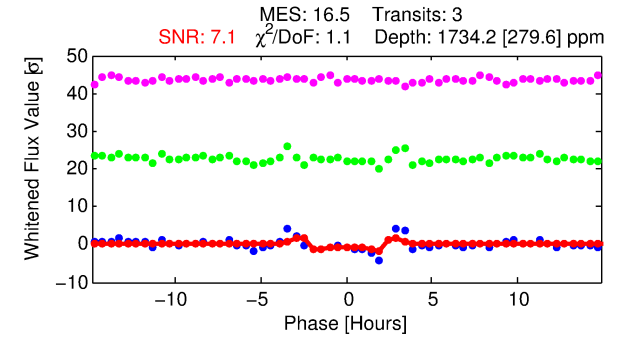
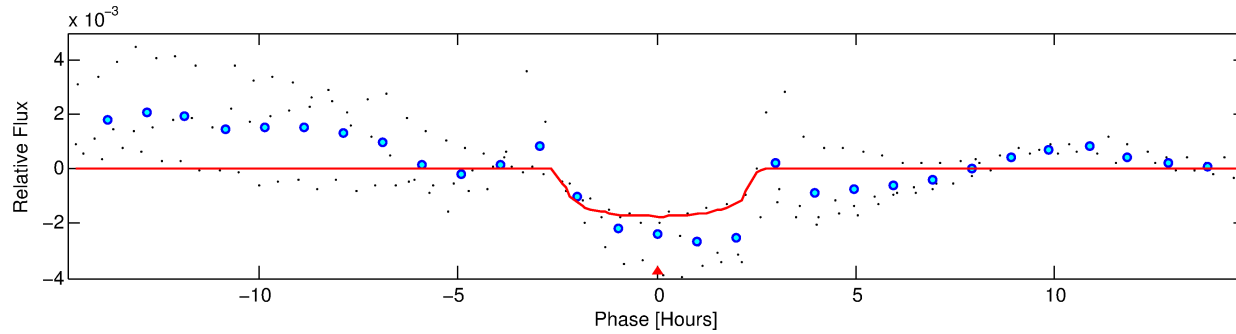
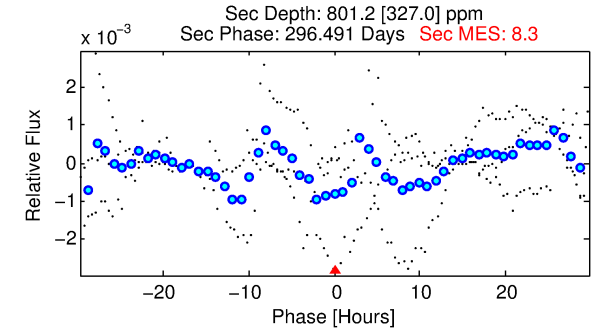
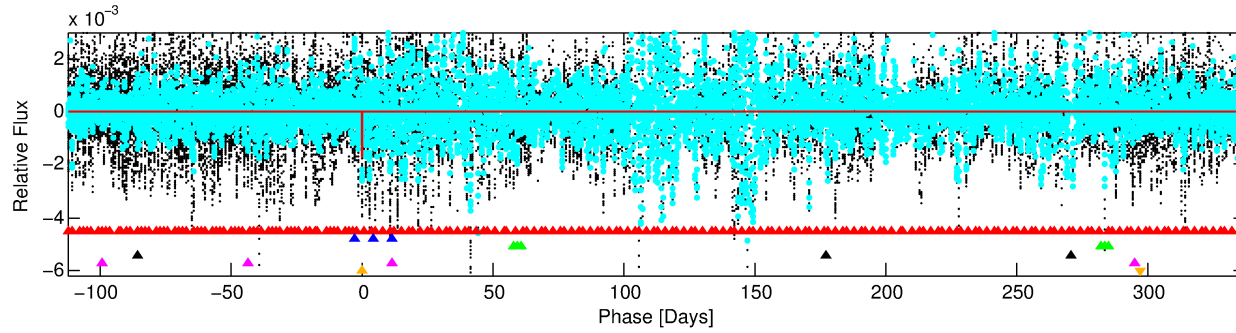
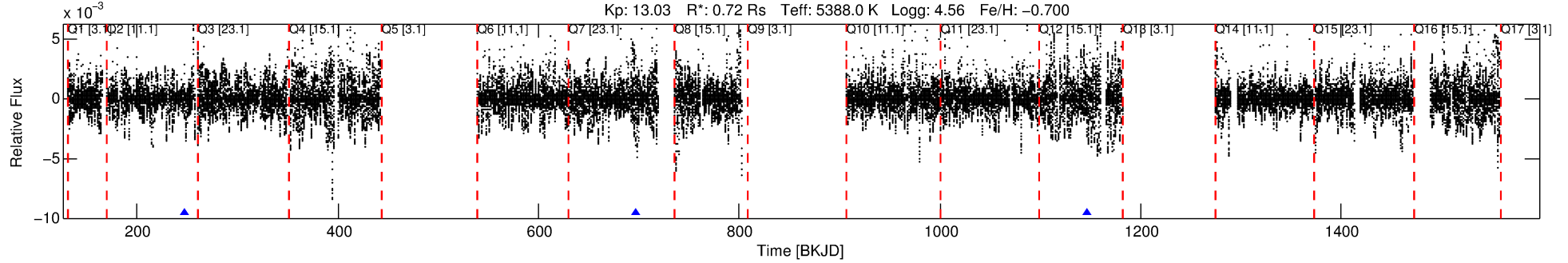
Ephemeris Match Information For 006184894-06

No Significant Match Found

# DV One-Page Summary

KIC: 6184894 Candidate: 6 of 6 Period: 449.480 d  
KOI: K05245 Corr: No Ephemeris Match

Kp: 13.03 R\*: 0.72 Rs Teff: 5388.0 K Logg: 4.56 Fe/H: -0.700



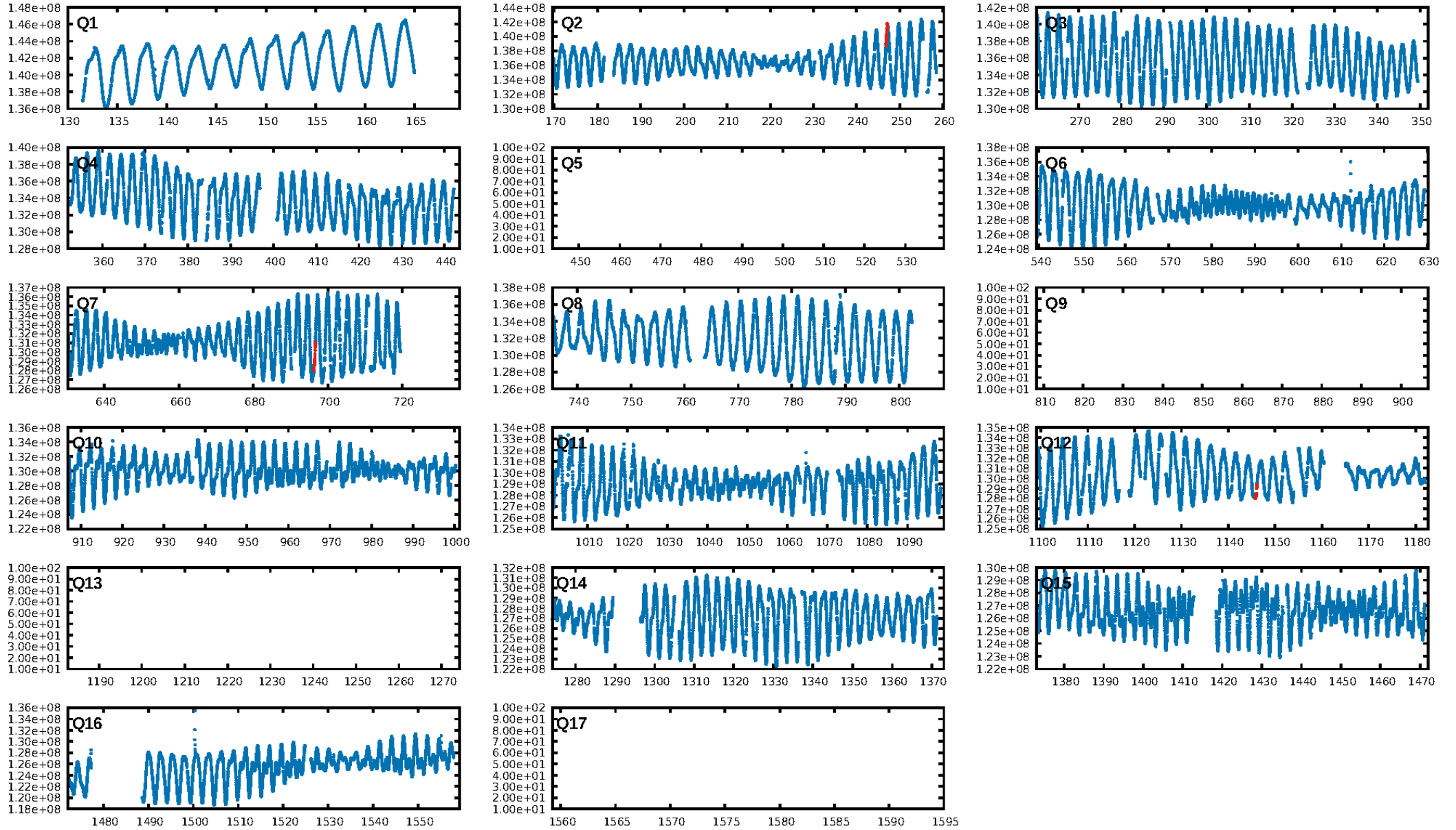
## DV Fit Results:

Period = 449.47995 [0.00298] d  
Epoch = 246.9925 [0.0035] BKJD  
Rp/R\* = 0.0385 [0.0244]  
a/R\* = 667.91 [1742.12]  
b = 0.39 [5.64]  
Seff = 0.38 [0.07]  
Teq = 200 [10] K  
Rp = 3.01 [1.94] Re  
a = 1.0105 [0.1029] AU  
Ag = 49670.66 [66698.28] [0.74σ]  
Teffp = 4622 [1547] K [2.86σ]

## DV Diagnostic Results:

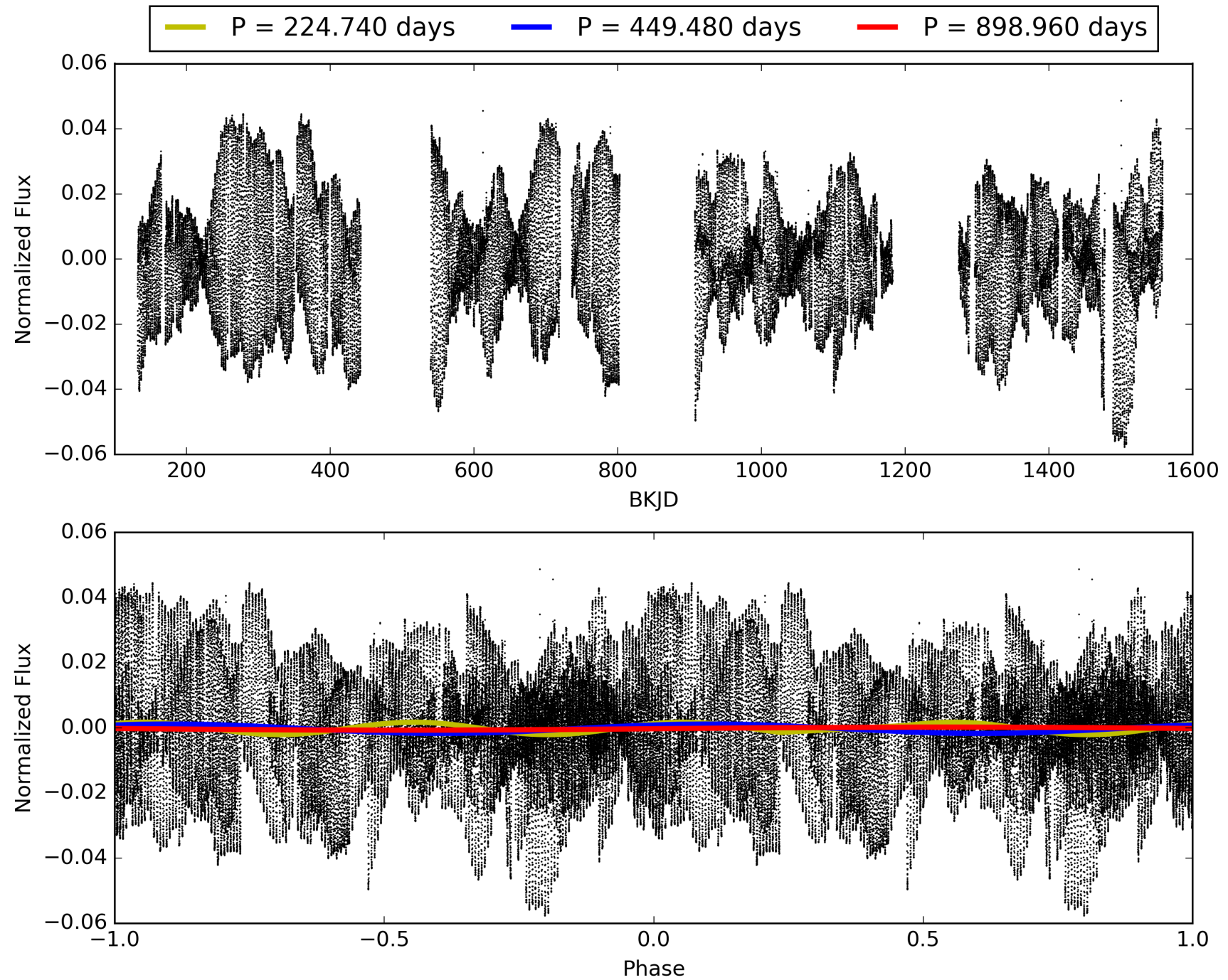
ShortPeriod-sig: 100.0% [192.84σ]  
LongPeriod-sig: 100.0% [30.58σ]  
ModelChiSquare2-sig: 1.1%  
ModelChiSquareGof-sig: 61.3%  
Bootstrap-pfa: 3.52e-10  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 0.07077  
Centroid-sig: 9.3%  
Centroid-so: 0.315 arcsec [1.17σ]  
OotOffset-rm: 0.184 arcsec [1.73σ]  
OotOffset-st: 1/1/1/0 [3]  
KicOffset-rm: 0.183 arcsec [1.22σ]  
KicOffset-st: 1/1/1/0 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 1.00 [3/3]

# TCE 006184894-06, PDC Light Curves





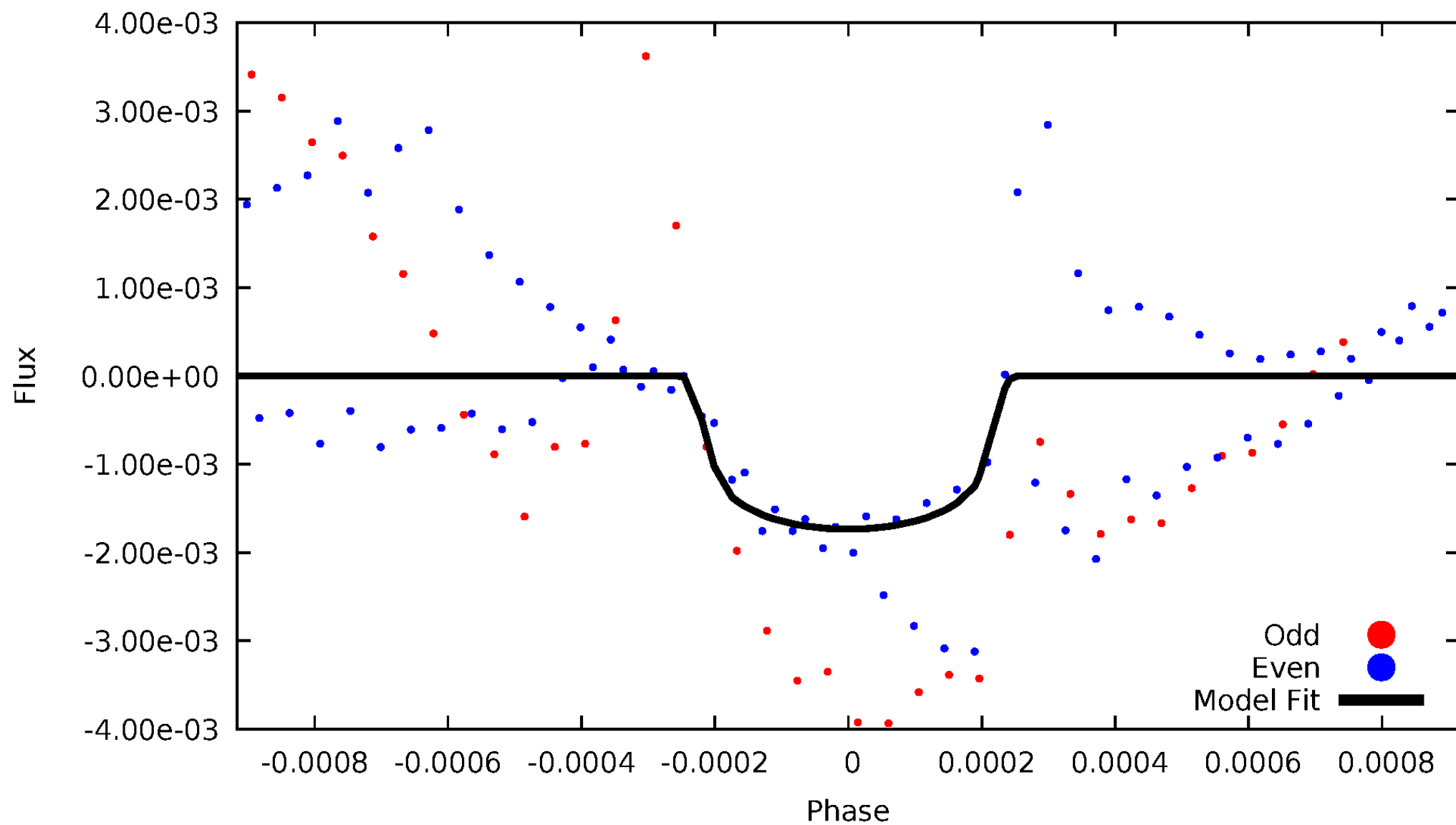
TCE 006184894-06





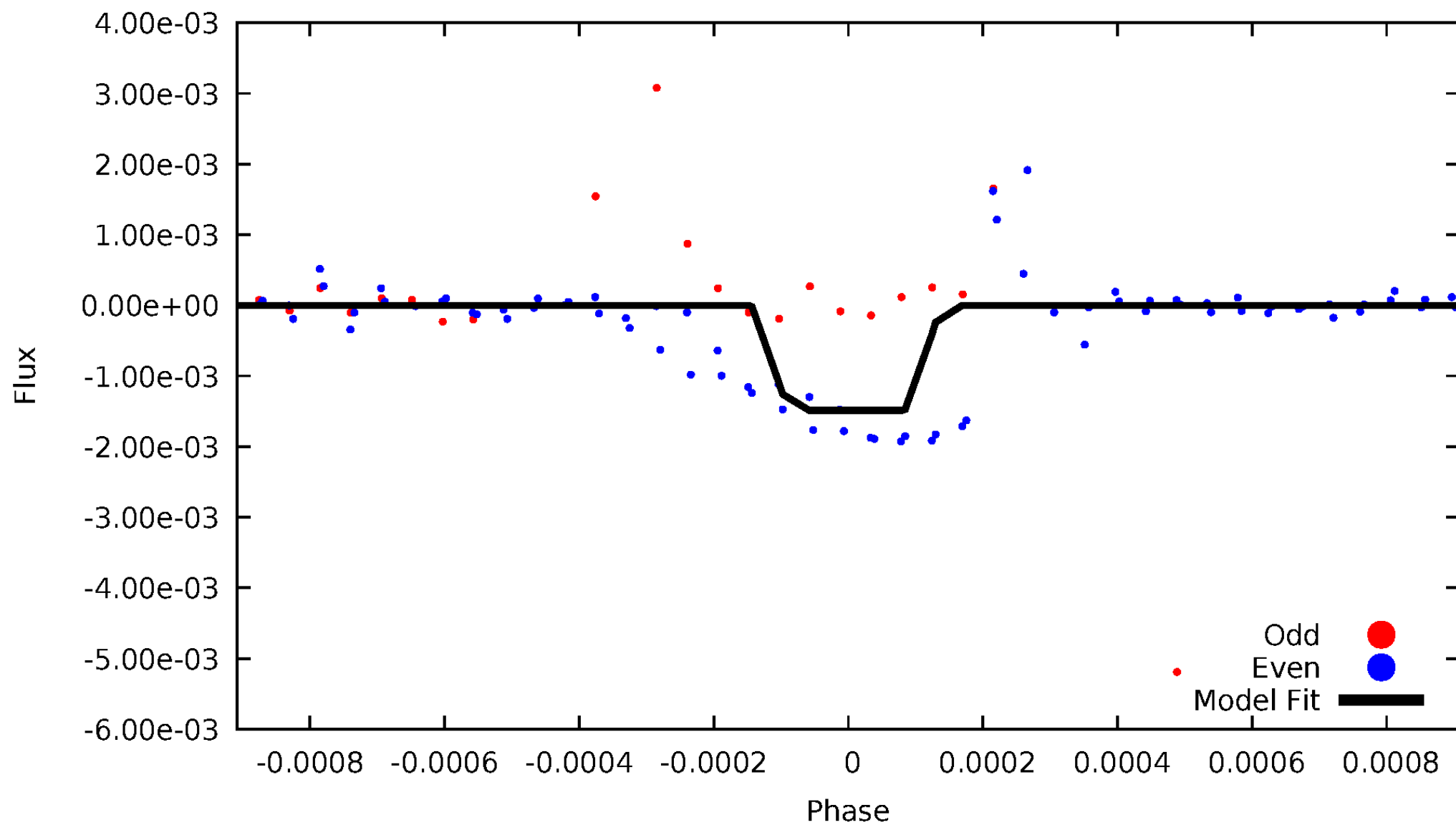
# DV Odd/Even

TCE 006184894-06



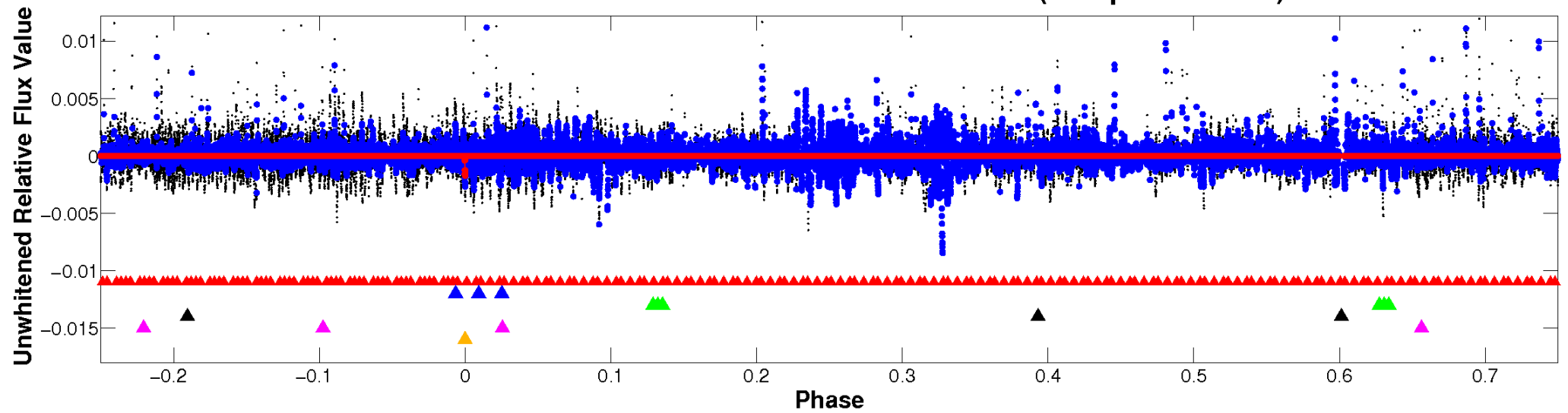
# ALT Odd/Even

TCE 006184894-06

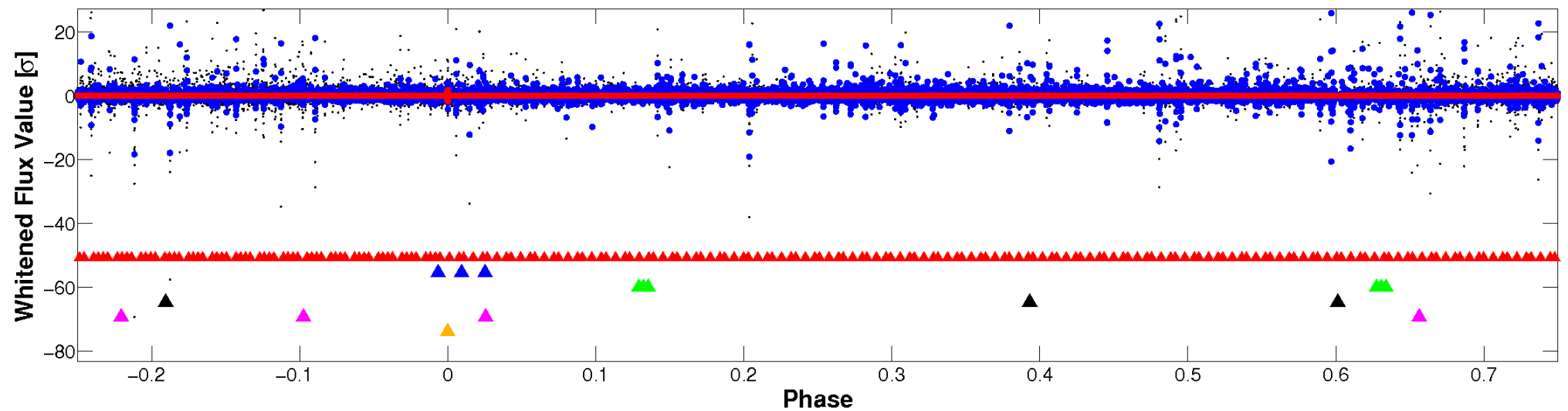


# Non-Whitened Vs. Whitened Light Curve

## Planet 6 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

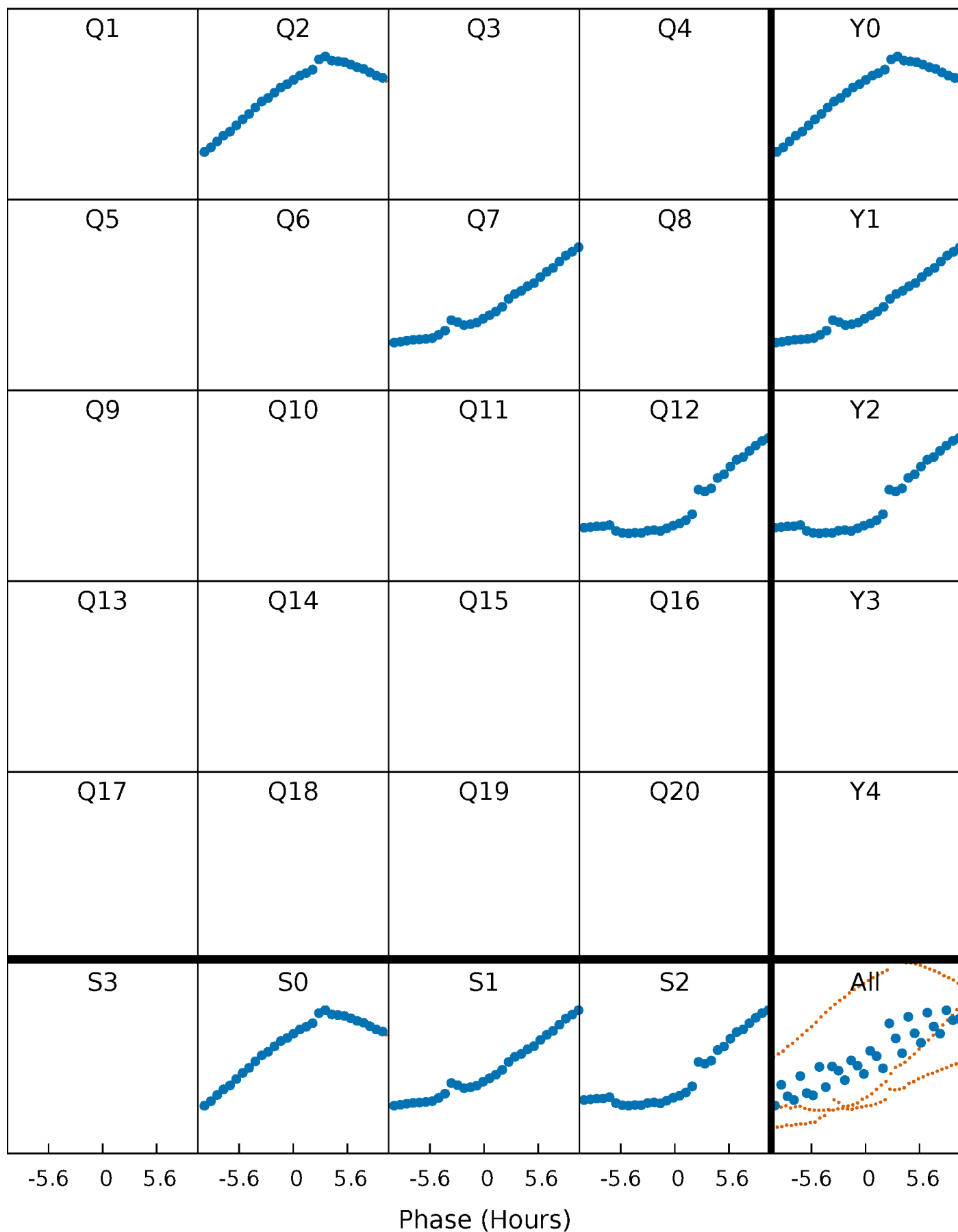


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



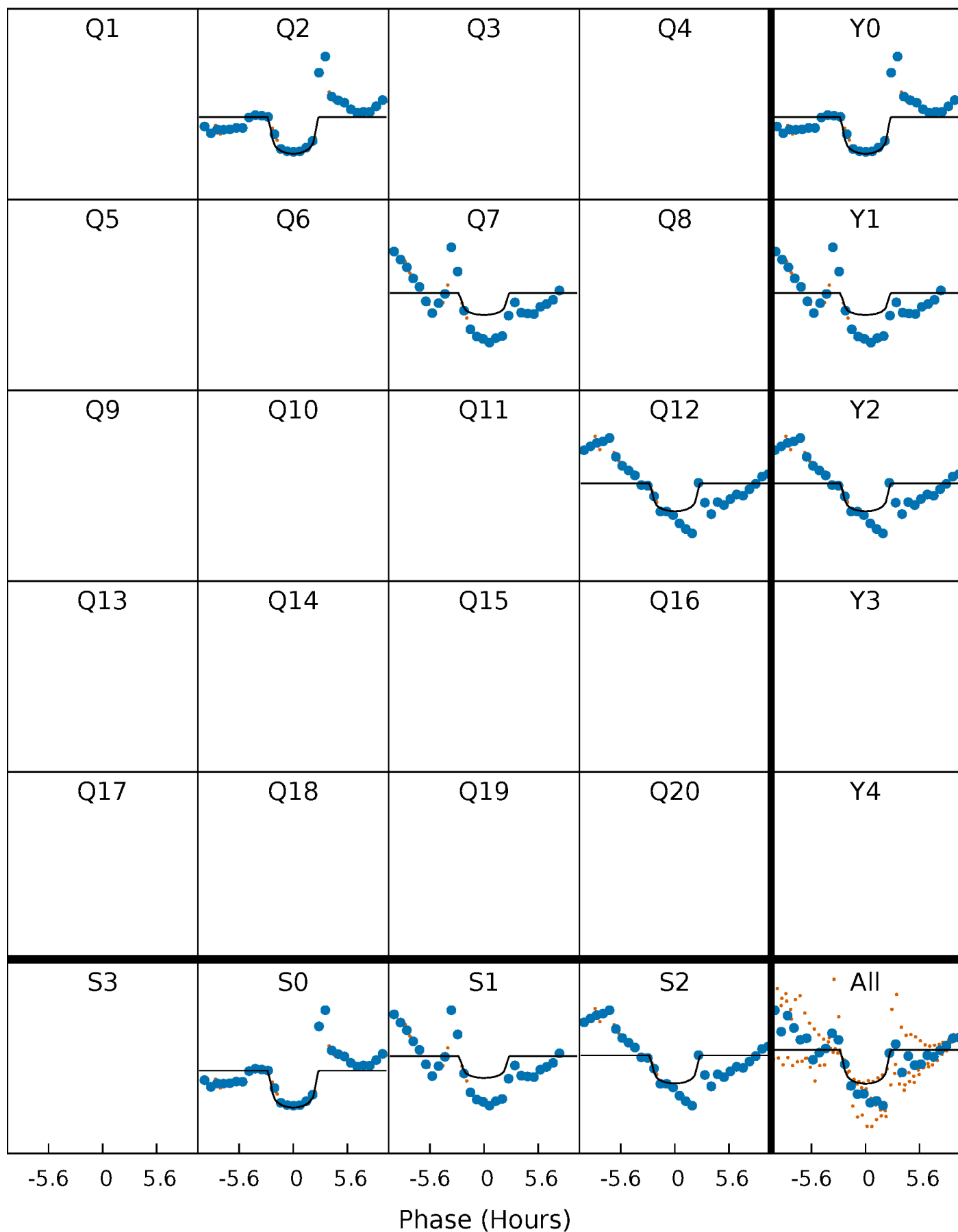
# PDC Quarter-Phased Transit Curves

TCE 006184894-06     $P=449.479948$  Days     $T_0=246.992497$  (BKJD)



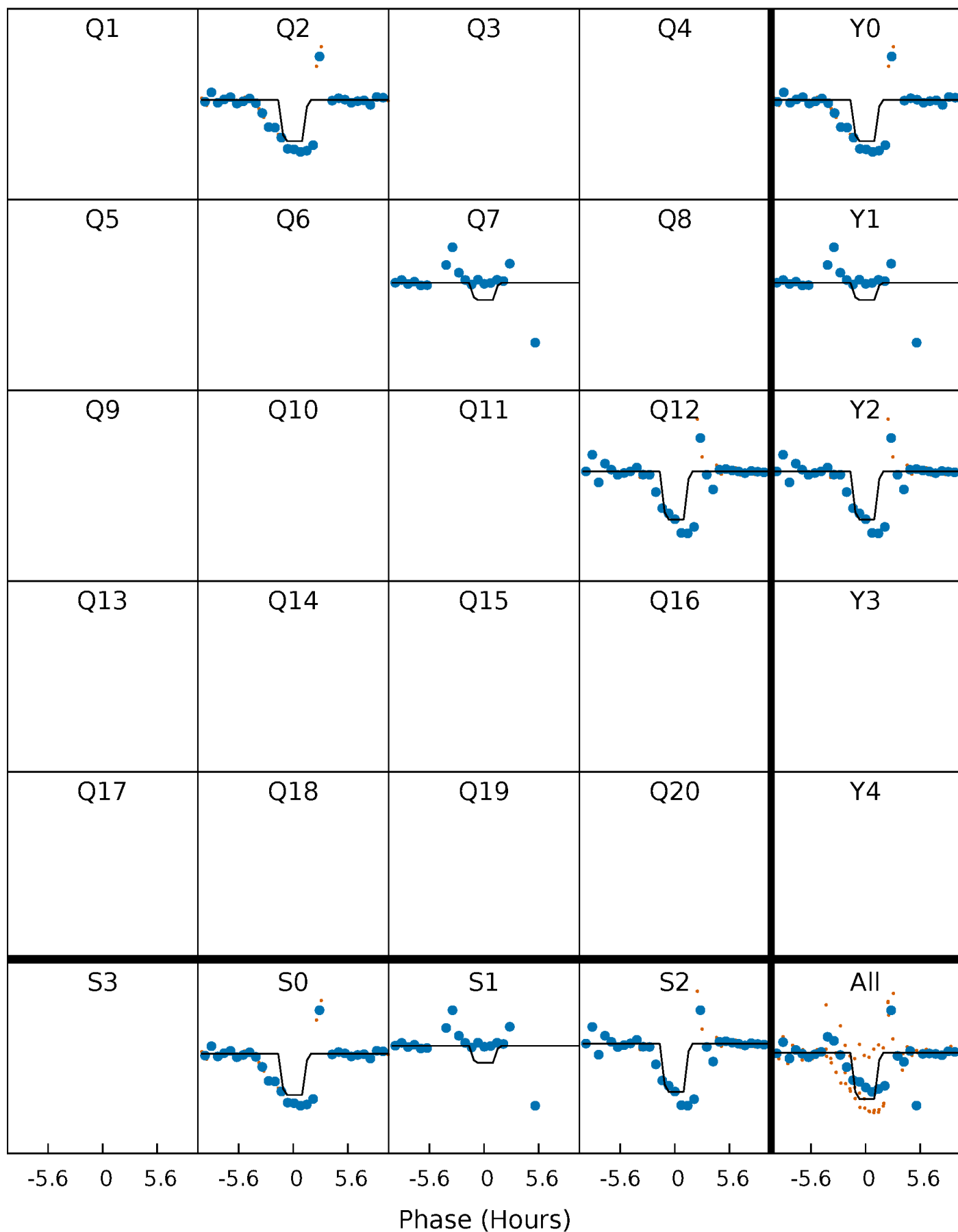
# DV Quarter-Phased Transit Curves

TCE 006184894-06 P=449.479948 Days  $T_0=246.992497$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

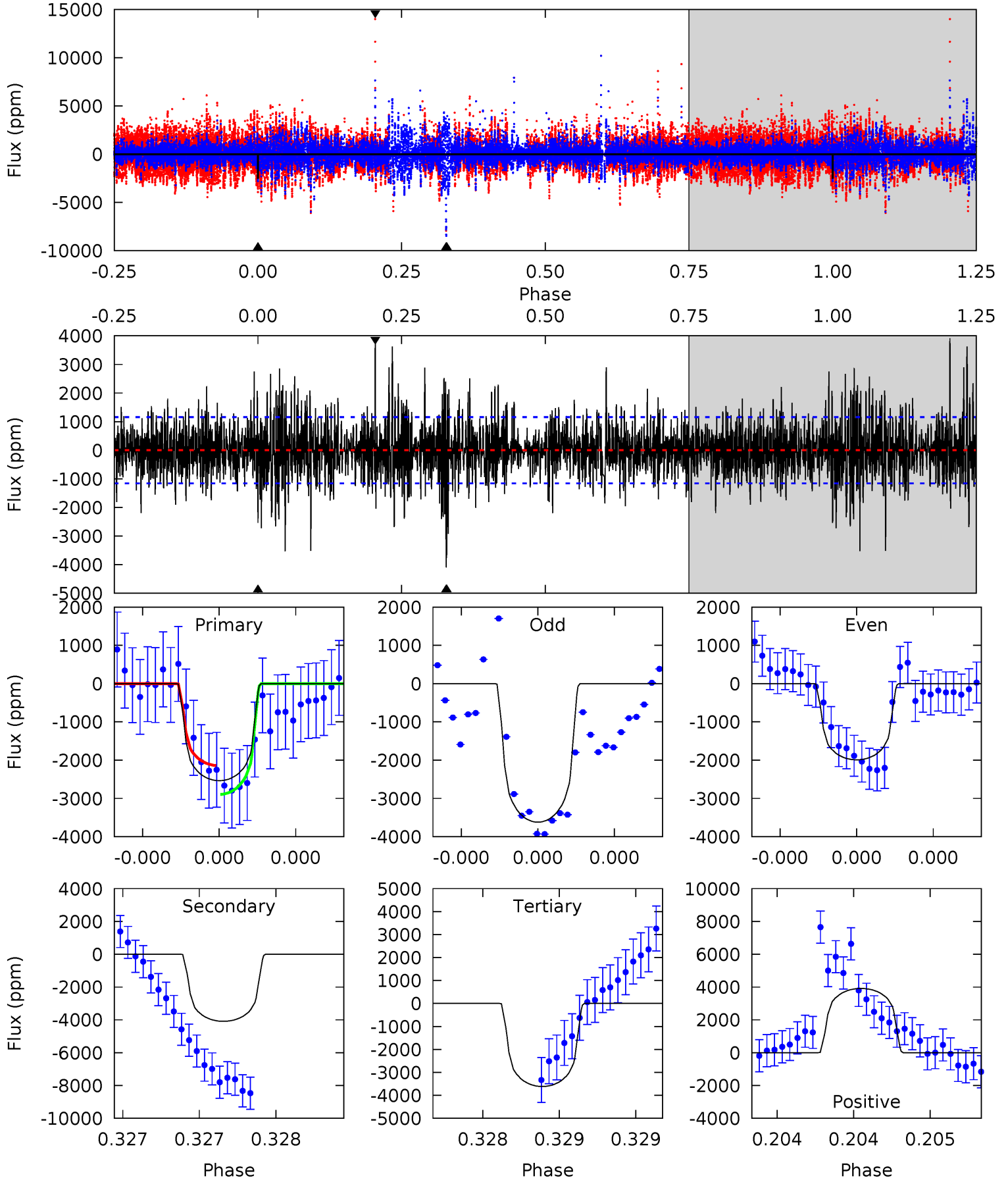
TCE 006184894-06 P=449.477019 Days  $T_0=247.007324$  (BKJD)



# DV Model-Shift Uniqueness Test

006184894-06, P = 449.479948 Days, E = 246.992497 Days

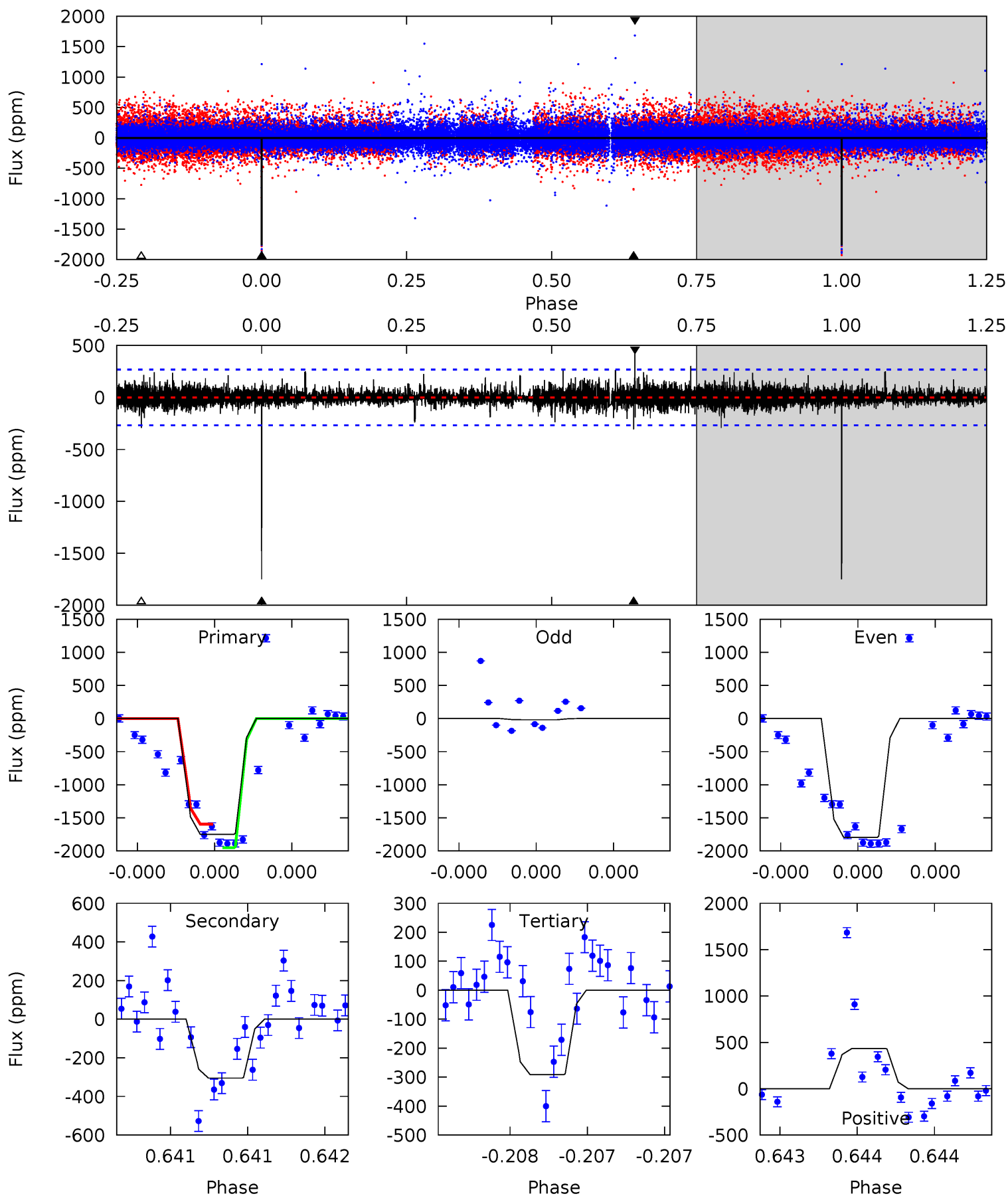
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.3	19.8	17.5	18.9	5.59	3.50	3.49	-5.23	-6.67	2.29	0.84	3.38	1.05	0.49	1.81



# Alt Model-Shift Uniqueness Test

006184894-06, P = 449.477019 Days, E = 247.007324 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
36.9	6.43	6.14	9.14	5.65	3.60	0.99	30.8	27.8	0.29	-2.71	18.5	0.69	0.20	3.82





### Stellar Parameters For KIC 006184894

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5388^{+161}_{-145}$	$4.560^{+0.088}_{-0.064}$	$-0.700^{+0.300}_{-0.300}$	$0.717^{+0.082}_{-0.074}$	$0.681^{+0.085}_{-0.034}$	$2.603^{+0.922}_{-0.572}$
	+3%/-3%	+2%/-1%	+43%/-43%	+11%/-10%	+12%/-5%	+35%/-22%
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 006184894-06 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-4088 \pm 207$	$3.24^{+1.81}_{-1.83}$	$279^{+11}_{-11}$	$6714^{+4892}_{-1311}$	$226446^{+926132}_{-133181}$
Alt.	$-305 \pm 47$	$3.24^{+1.91}_{-1.84}$	$279^{+12}_{-11}$	$3850^{+1535}_{-549}$	$16282^{+72433}_{-10040}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature

$T_{\text{obs}}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

$A_{\text{obs}}$  = 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

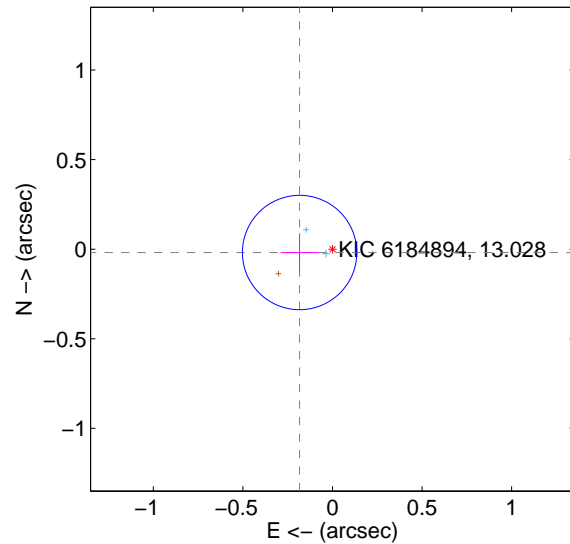
Supplemental centroid analysis for 006184894-06. Kepler magnitude: 13.03. Transit SNR 7.06

There are 2 quarters with good PRF difference image offsets

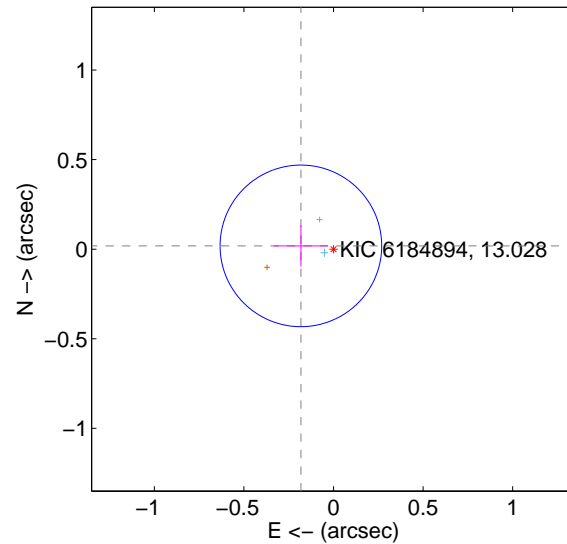
The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.184 \pm 0.106$	1.73	$0.184 \pm 0.106$	$-0.019 \pm 0.107$
PRF-fit source offset from KIC position	$0.183 \pm 0.150$	1.22	$0.182 \pm 0.151$	$0.018 \pm 0.115$
photometric centroid source offset	$0.32 \pm 0.27$	1.17	$0.16 \pm 0.27$	$-0.27 \pm 0.27$

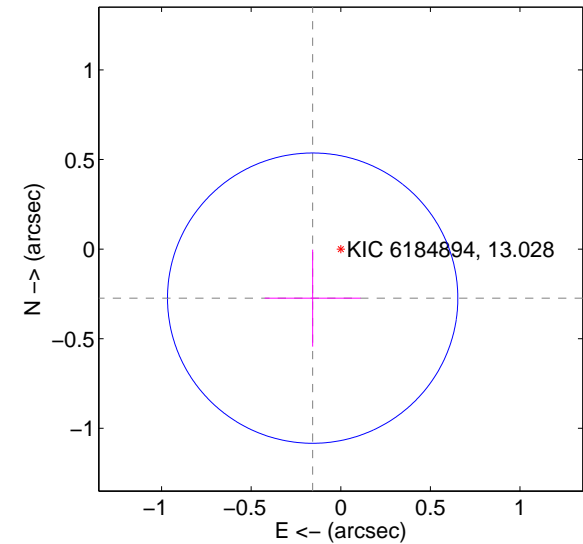
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

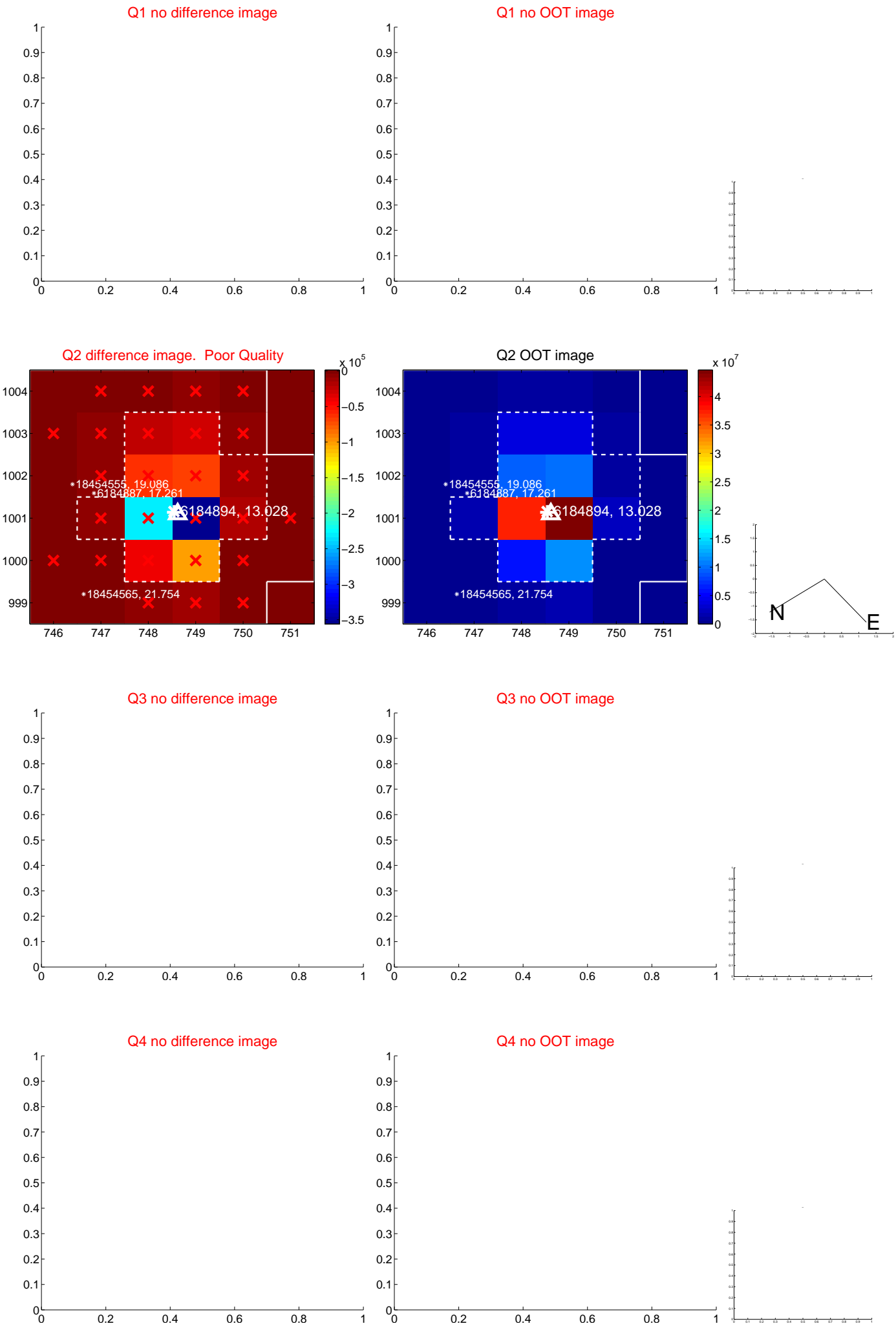


offset from photometric centroids



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- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . 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



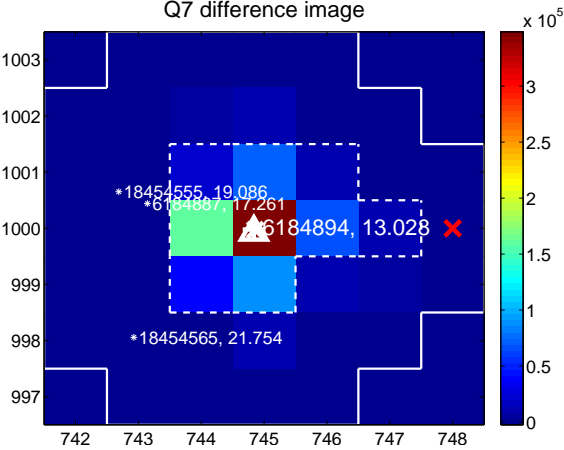
Q6 no difference image



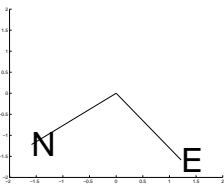
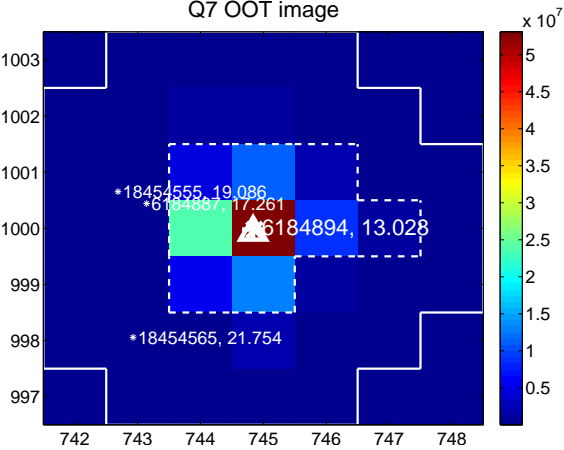
Q6 no OOT image



Q7 difference image



Q7 OOT image



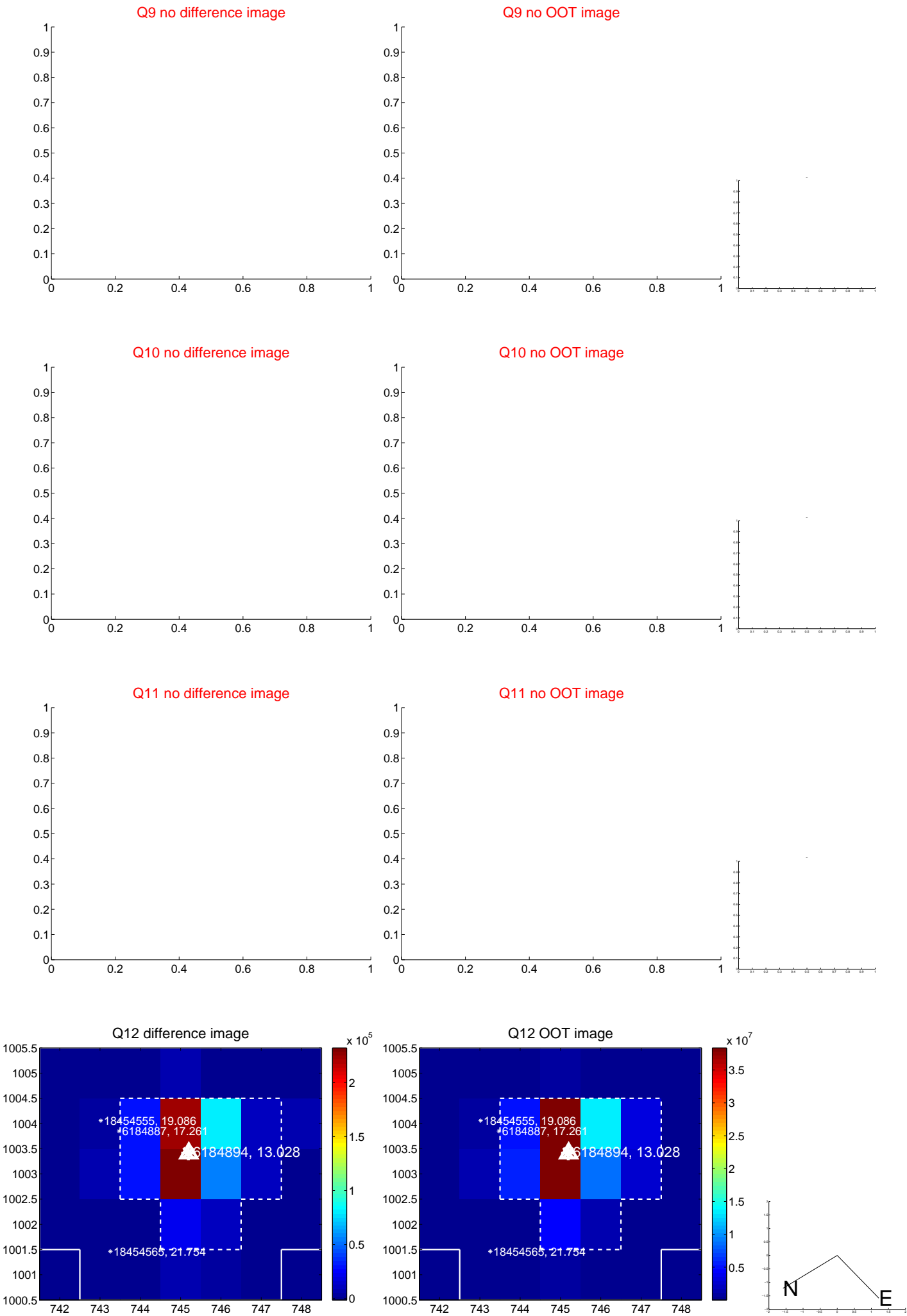
Q8 no difference image



Q8 no OOT image



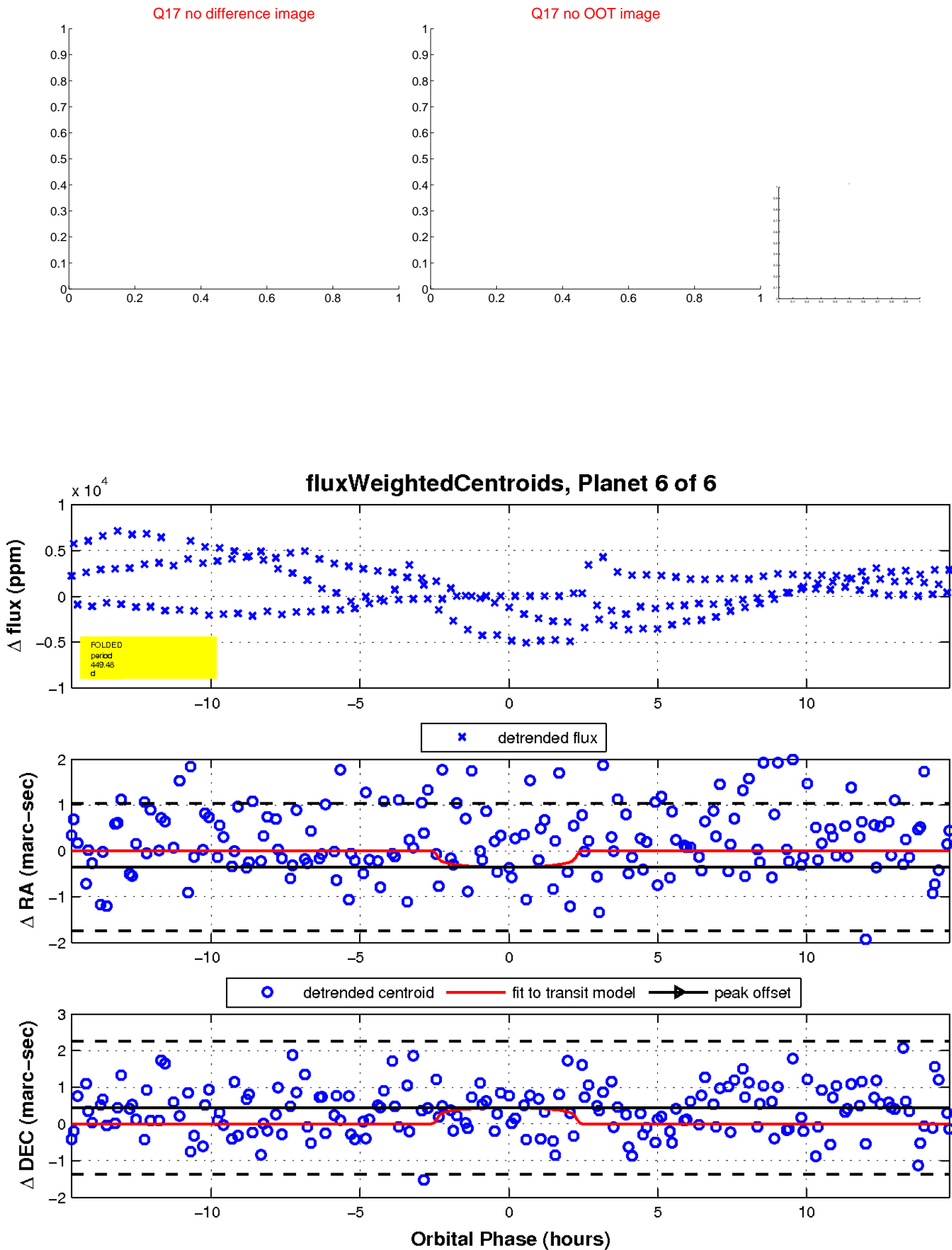
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

