

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004466180-01	OBS	No	0.563995	131.917877	0.0	1.069	9.6	0.0	3.11	7082	0.06	81576.47
004466180-02	OBS	No	2.557937	131.728417	41.1	10.798	8.3	7.8	3.11	7082	2.31	10866.23
004466180-03	OBS	No	201.318912	216.340817	646.3	4.790	8.5	8.7	3.11	7082	10.50	32.22
004466180-04	OBS	No	396.401111	355.734254	652.9	4.954	8.8	9.2	3.11	7082	15.03	13.05
004466180-05	OBS	No	394.653041	160.968997	695.7	6.085	9.0	8.7	3.11	7082	15.48	13.13
004466180-06	OBS	No	253.765919	260.372249	475.7	5.518	8.6	7.3	3.11	7082	7.00	23.66
004466180-07	OBS	No	110.793636	151.348018	614.3	3.227	8.6	7.9	3.11	7082	10.85	71.44
004466180-08	OBS	No	160.634372	143.491195	50.6	3.598	9.0	0.8	3.11	7082	2.56	43.53

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004466180-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
004466180-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
004466180-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
004466180-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
004466180-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004466180-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—TRANS_GAPPED—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
004466180-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
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**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

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

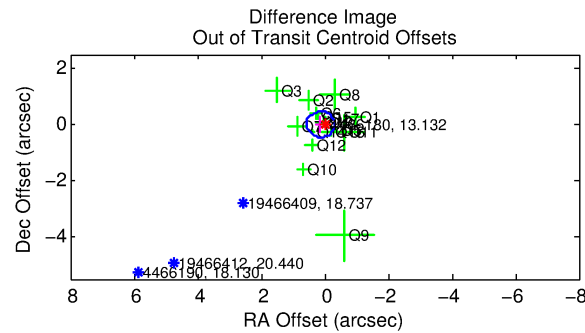
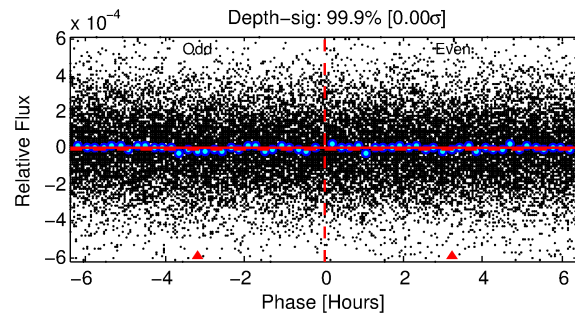
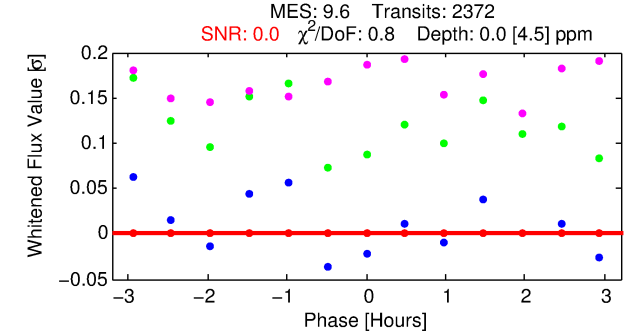
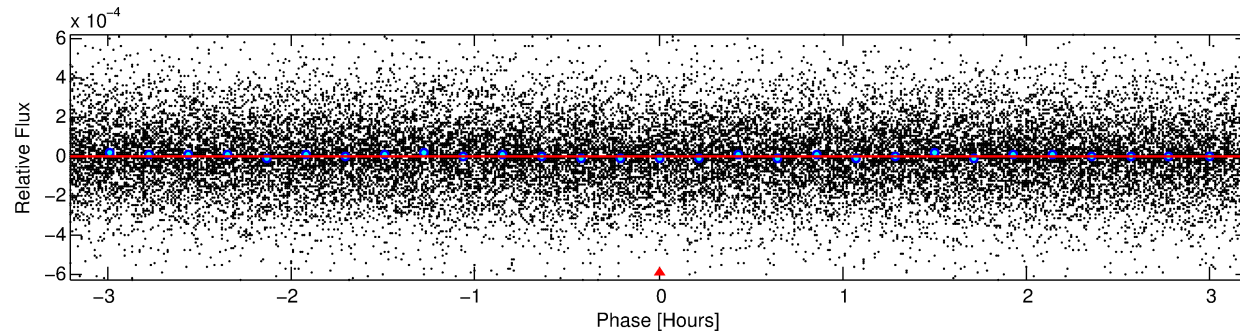
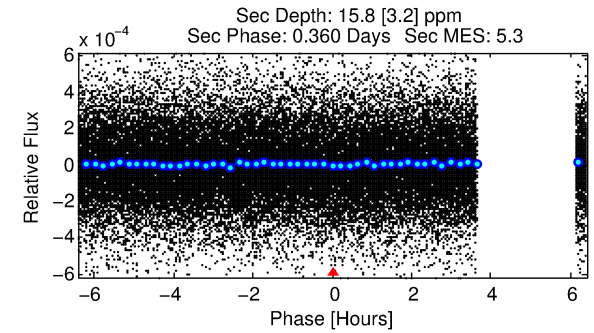
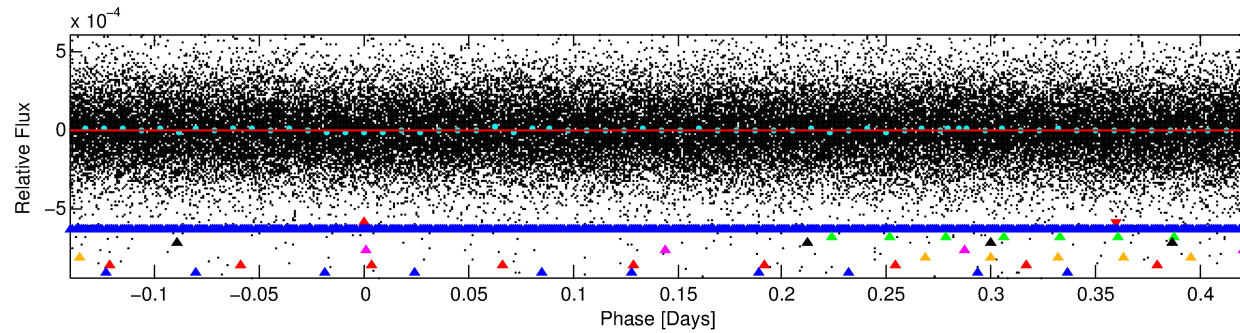
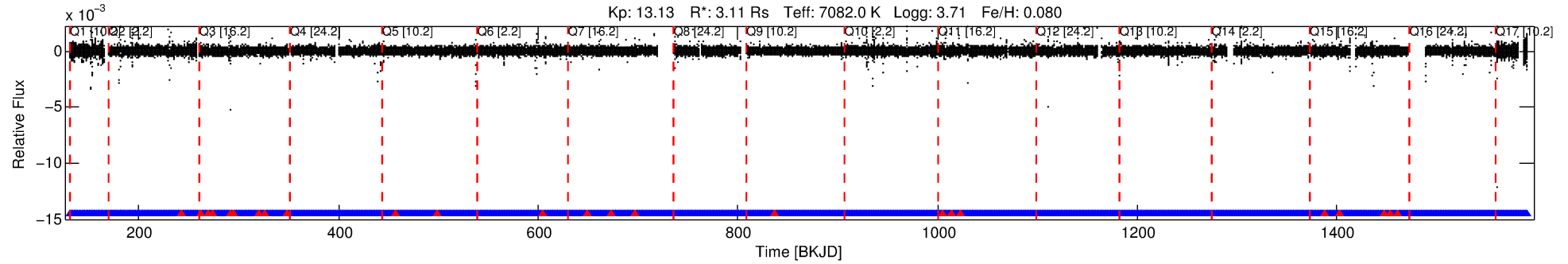
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 004466180-01

No Significant Match Found

# DV One-Page Summary

KIC: 4466180 Candidate: 1 of 8 Period: 0.564 d



## DV Fit Results:

Period = 0.56399 [0.00964] d  
Epoch = 131.9179 [1.4107] BKJD  
Rp/R\* = 0.0002 [0.0115]  
a/R\* = 4.07 [181.22]  
b = 0.00 [121888.36]  
Seff = 81576.47 [62411.54]  
Teq = 4309 [824] K  
Rp = 0.06 [3.89] Re  
a = 0.0163 [0.0074] AU  
Ag = 703.51 [95400.89] [0.01σ]  
Teffp = 34314 [1163430] K [0.03σ]

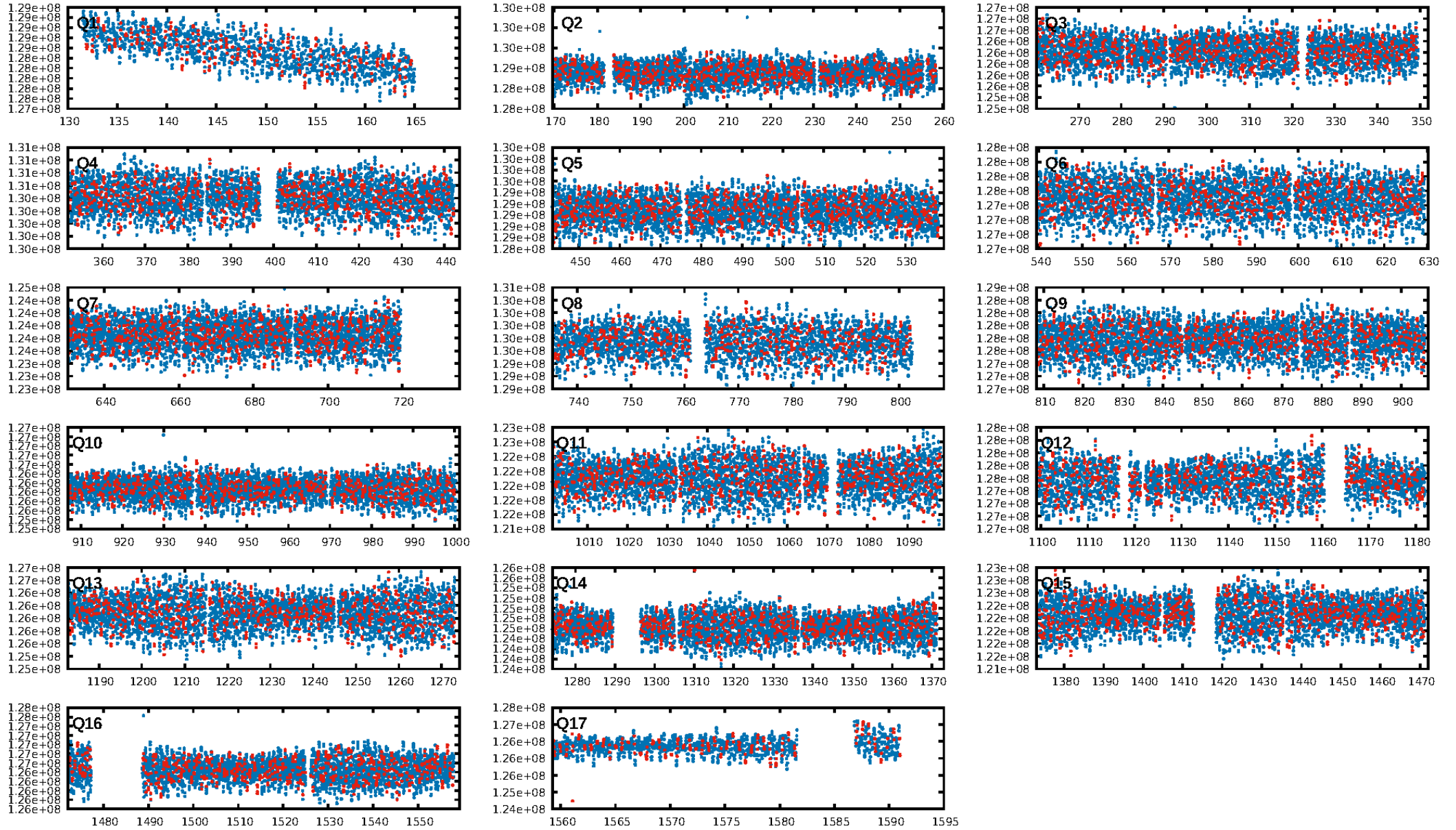
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [4.41σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.99 [2241/2265]  
GhostDiagnostic-chr: N/A  
Centroid-sig: N/A  
Centroid-so: N/A  
OotOffset-rm: 0.131 arcsec [0.87σ]  
KicOffset-rm: 0.041 arcsec [0.16σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.41 [7/17]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 05:54:09 Z

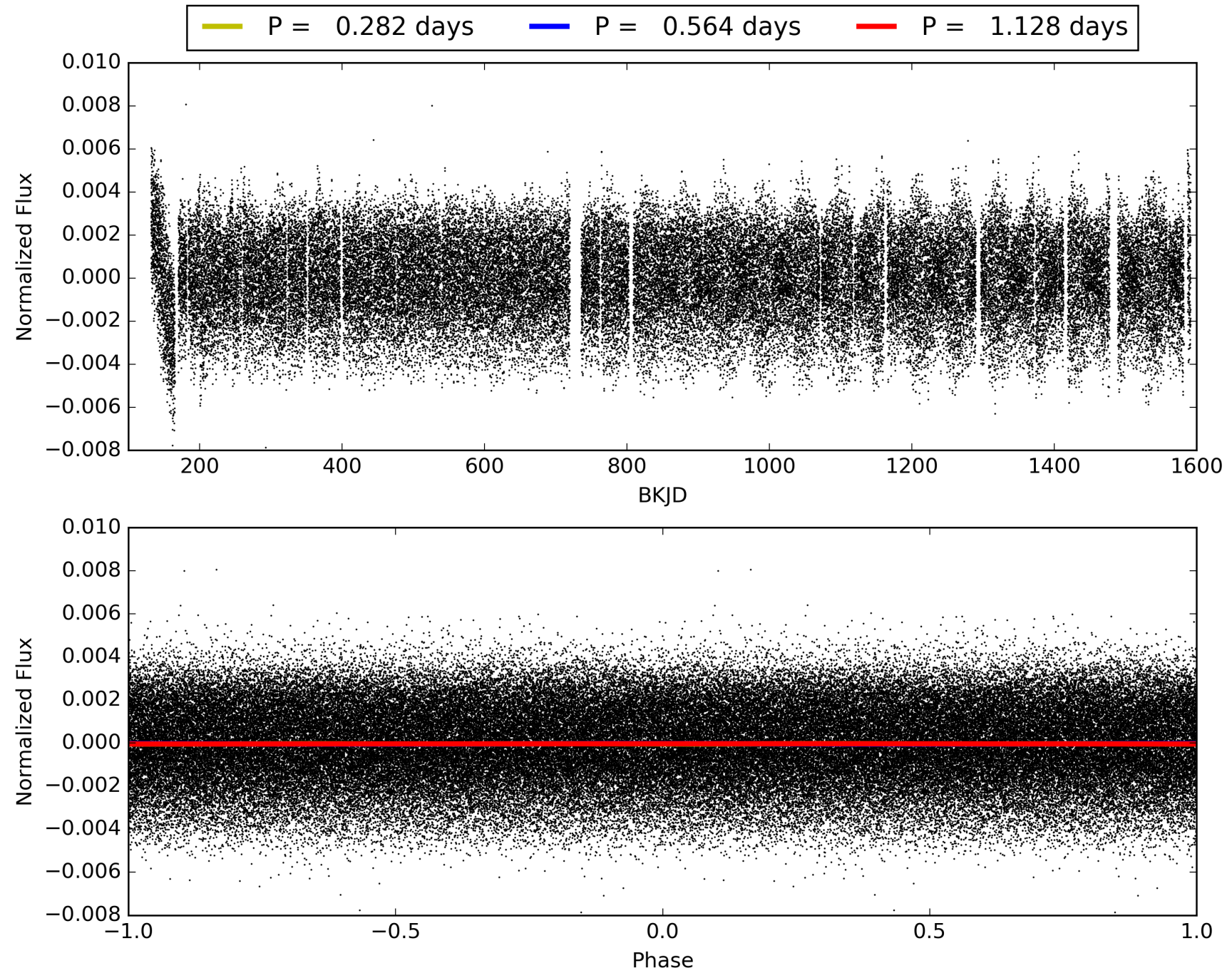
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 004466180-01, PDC Light Curves





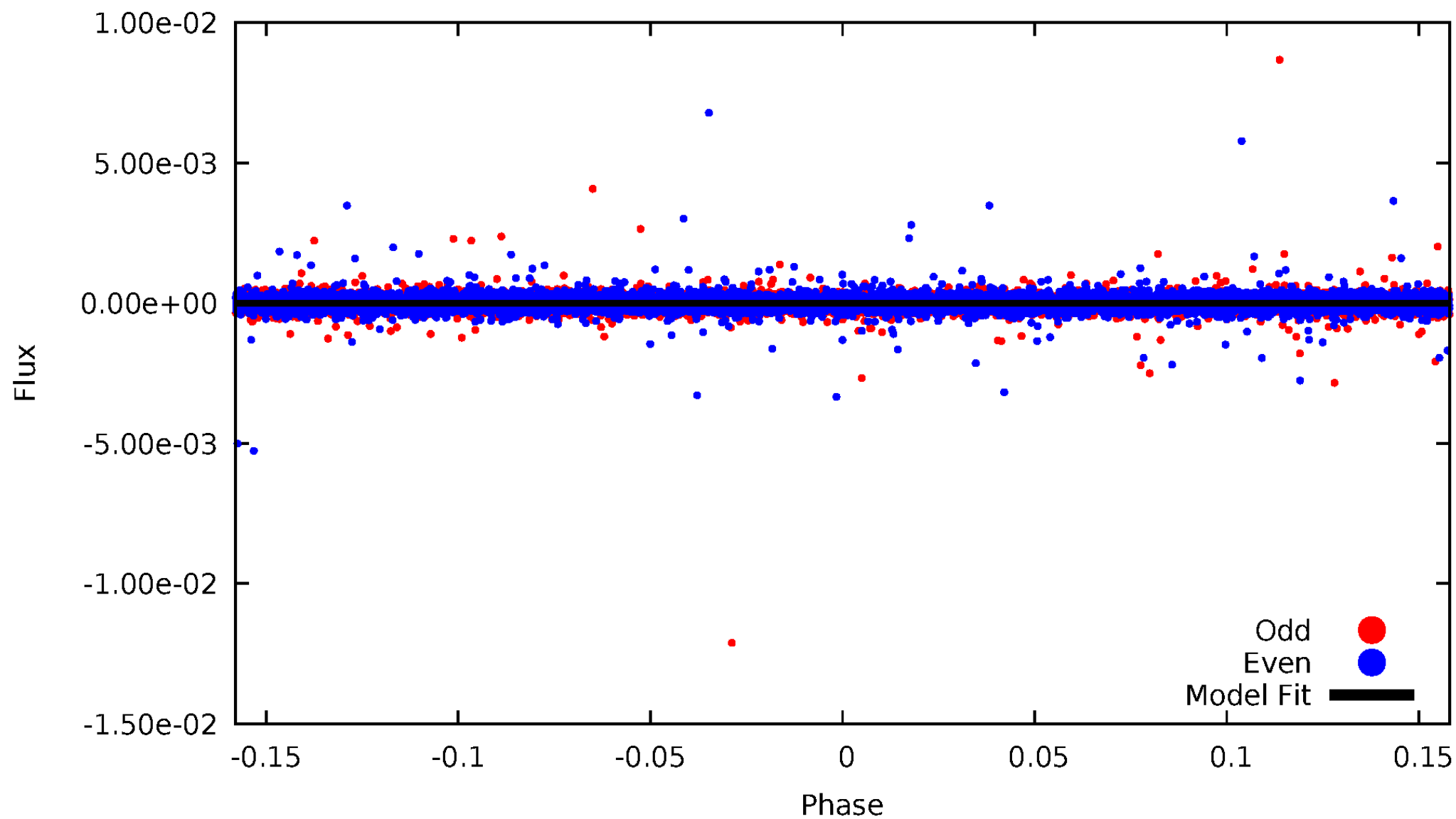
TCE 004466180-01





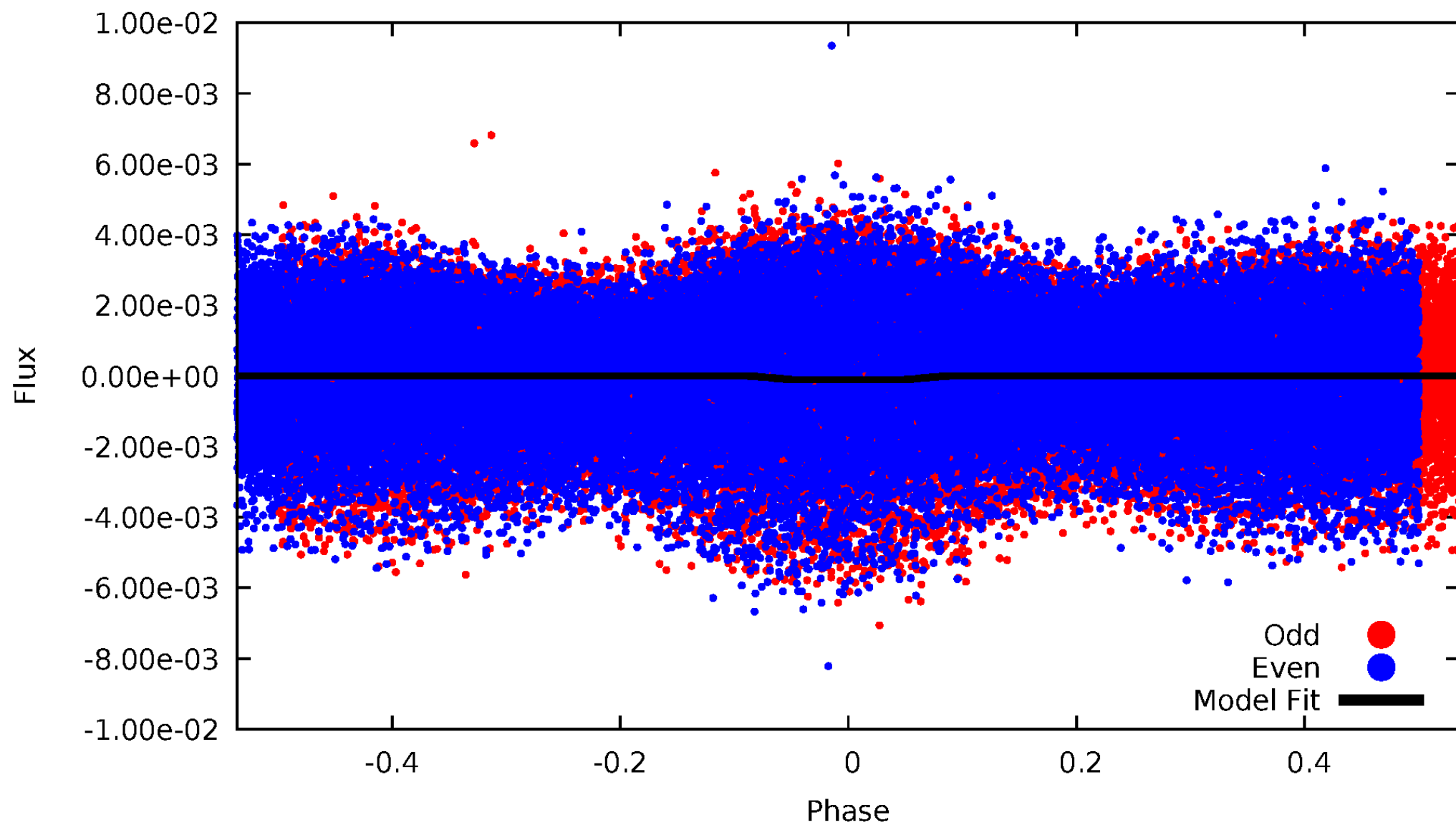
# DV Odd/Even

TCE 004466180-01



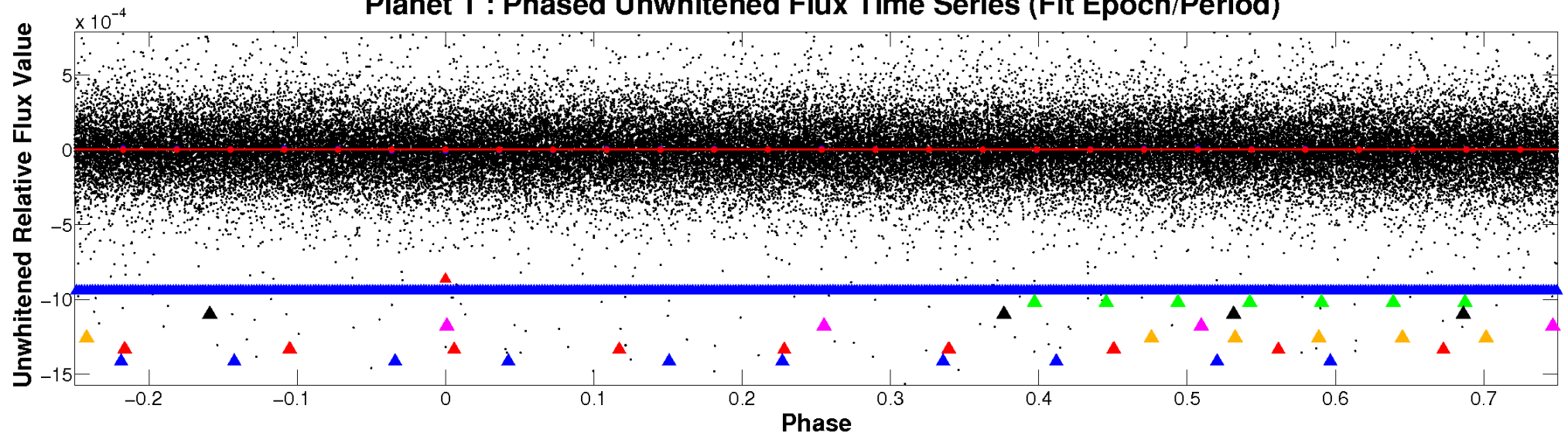
# ALT Odd/Even

TCE 004466180-01

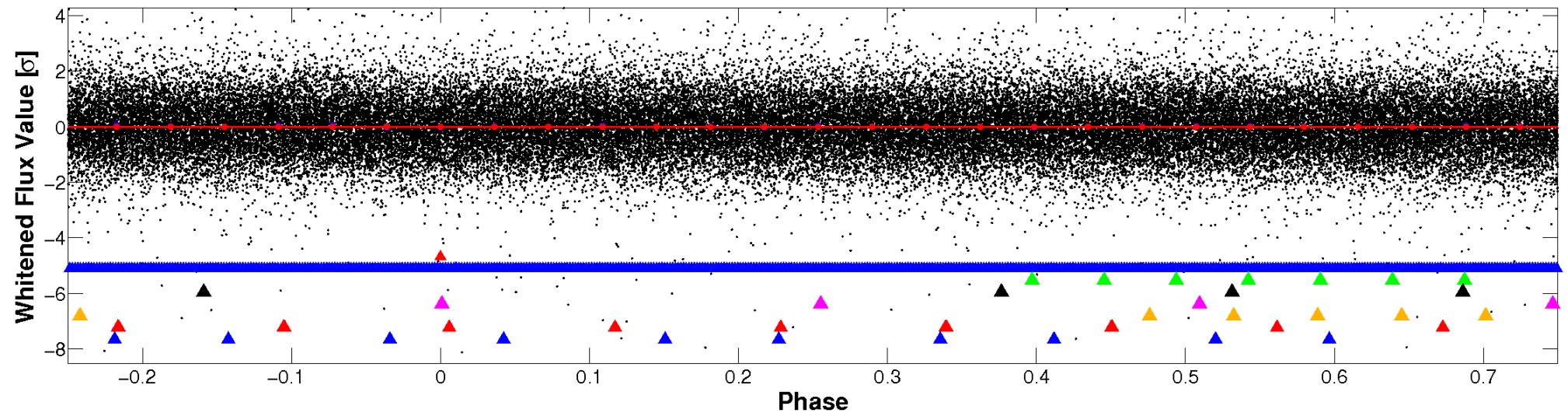


# Non-Whitened Vs. Whitened Light Curve

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



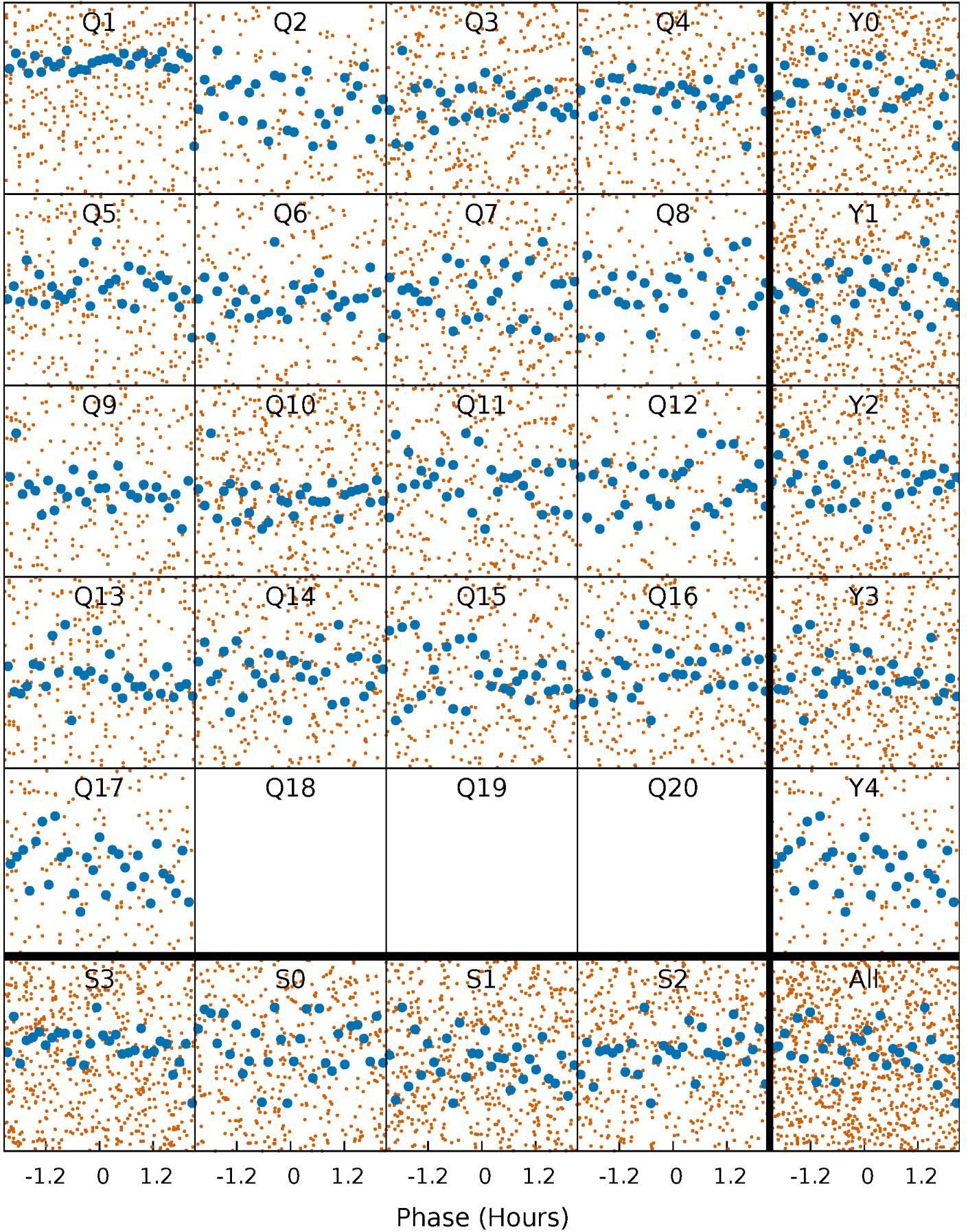
## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)





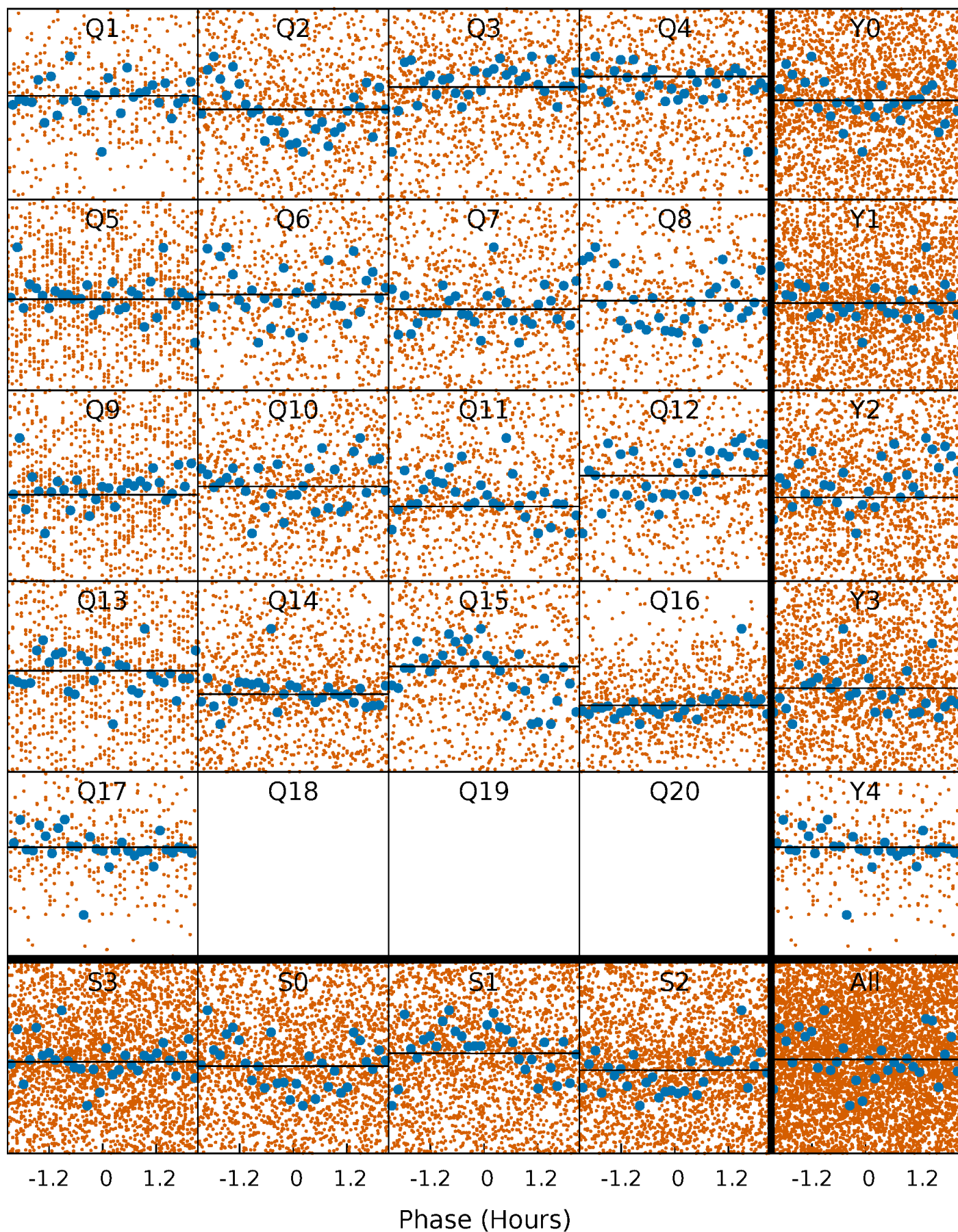
# PDC Quarter-Phased Transit Curves

TCE 004466180-01 P= 0.563995 Days  $T_0=131.917877$  (BKJD)



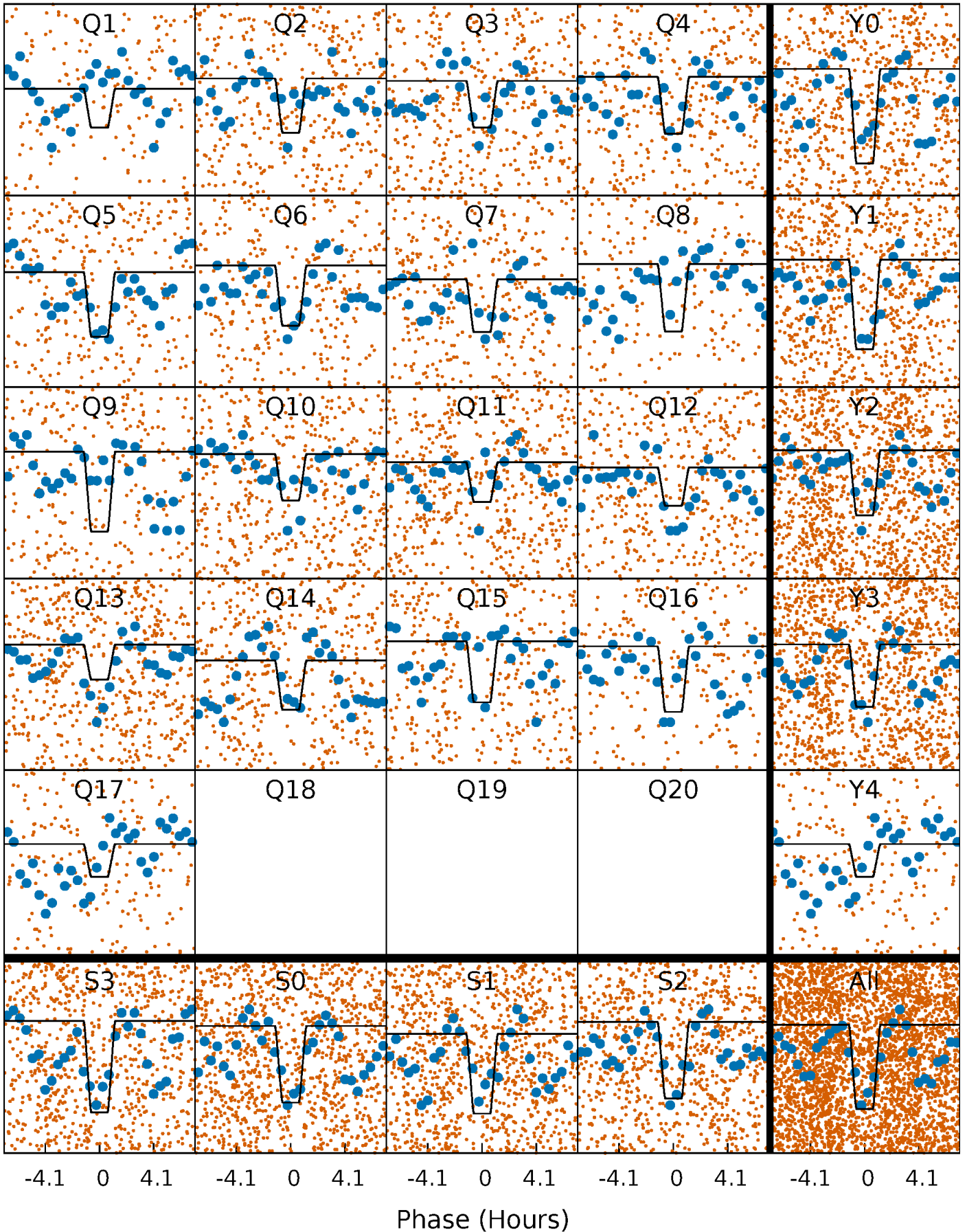
# DV Quarter-Phased Transit Curves

TCE 004466180-01 P= 0.563995 Days  $T_0=131.917877$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 004466180-01 P= 0.563406 Days  $T_0=132.009137$  (BKJD)

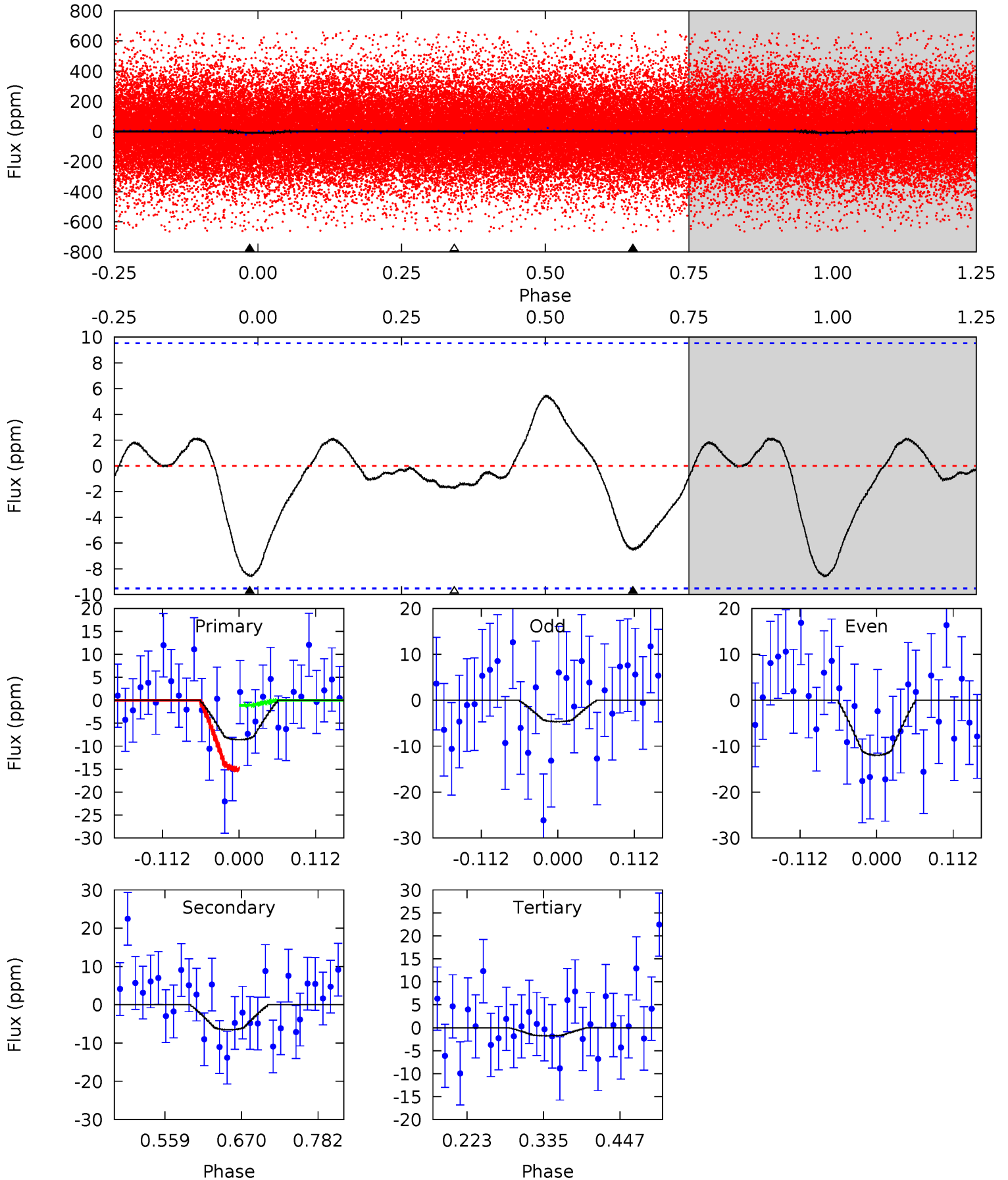




# DV Model-Shift Uniqueness Test

004466180-01, P = 0.563995 Days, E = 131.353882 Days

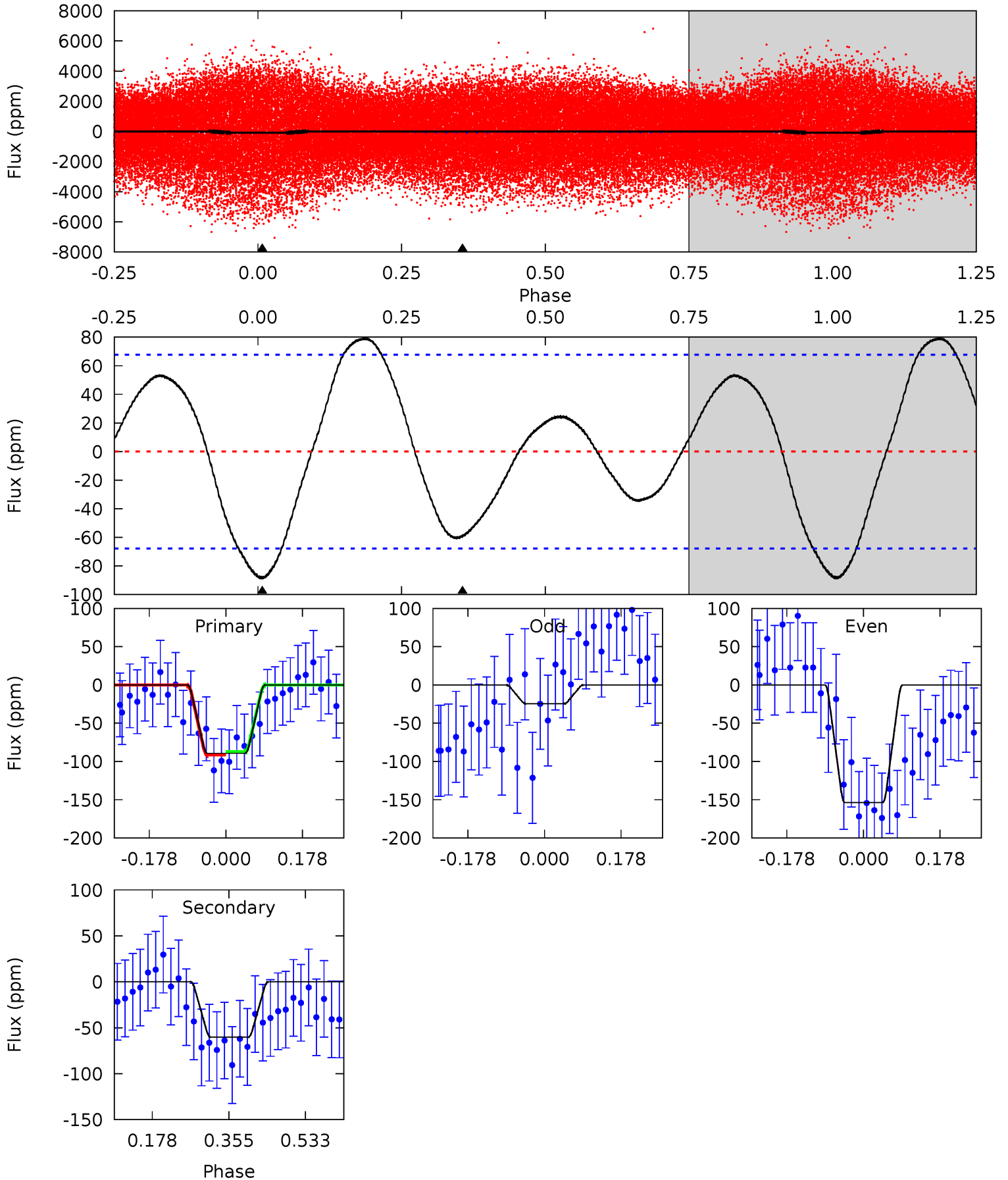
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.10	3.11	0.84	0	4.54	1.59	0.87	3.26	4.10	2.27	3.11	1.76	1.26	0.39	3.35



# Alt Model-Shift Uniqueness Test

004466180-01, P = 0.563406 Days, E = 131.445731 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
5.86	3.94	0	0	4.44	1.35	1.79	5.86	5.86	3.94	3.94	4.06	-12.9	0.47	0.17



### Stellar Parameters For KIC 004466180

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$\rho_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7082^{+195}_{-318}$	$3.715^{+0.442}_{-0.078}$	$0.080^{+0.200}_{-0.300}$	$3.109^{+0.472}_{-1.416}$	$1.828^{+0.179}_{-0.418}$	$0.086^{+0.349}_{-0.021}$
	+3%/-4%	+12%/-2%	+250%/-375%	+15%/-46%	+10%/-23%	+407%/-24%
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 004466180-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-7 \pm 2$	$2.29^{+2.81}_{-1.58}$	$5801^{+437}_{-678}$	$-3933^{+10729}_{-845}$	$0.164^{+1.490}_{-0.130}$
Alt.	$-60 \pm 15$	$4.01^{+3.22}_{-2.54}$	$5791^{+424}_{-612}$	$4417^{+4823}_{-8664}$	$0.562^{+3.433}_{-0.411}$

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



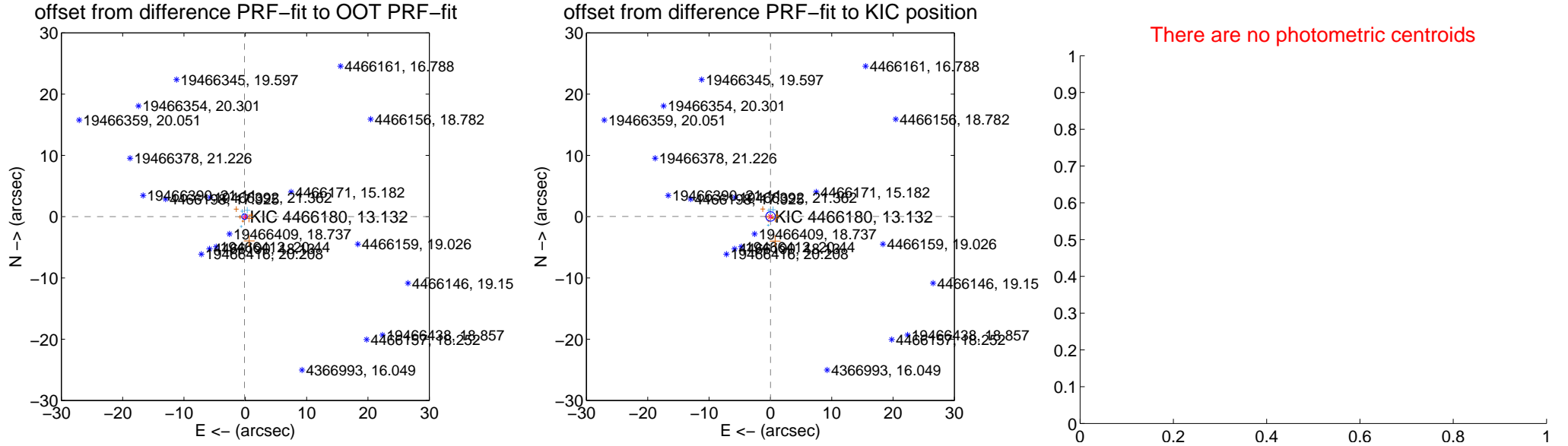
## DV Centroid Data

Supplemental centroid analysis for 004466180-01. Kepler magnitude: 13.13. Transit SNR 0.01

There are 7 quarters with good PRF difference image offsets

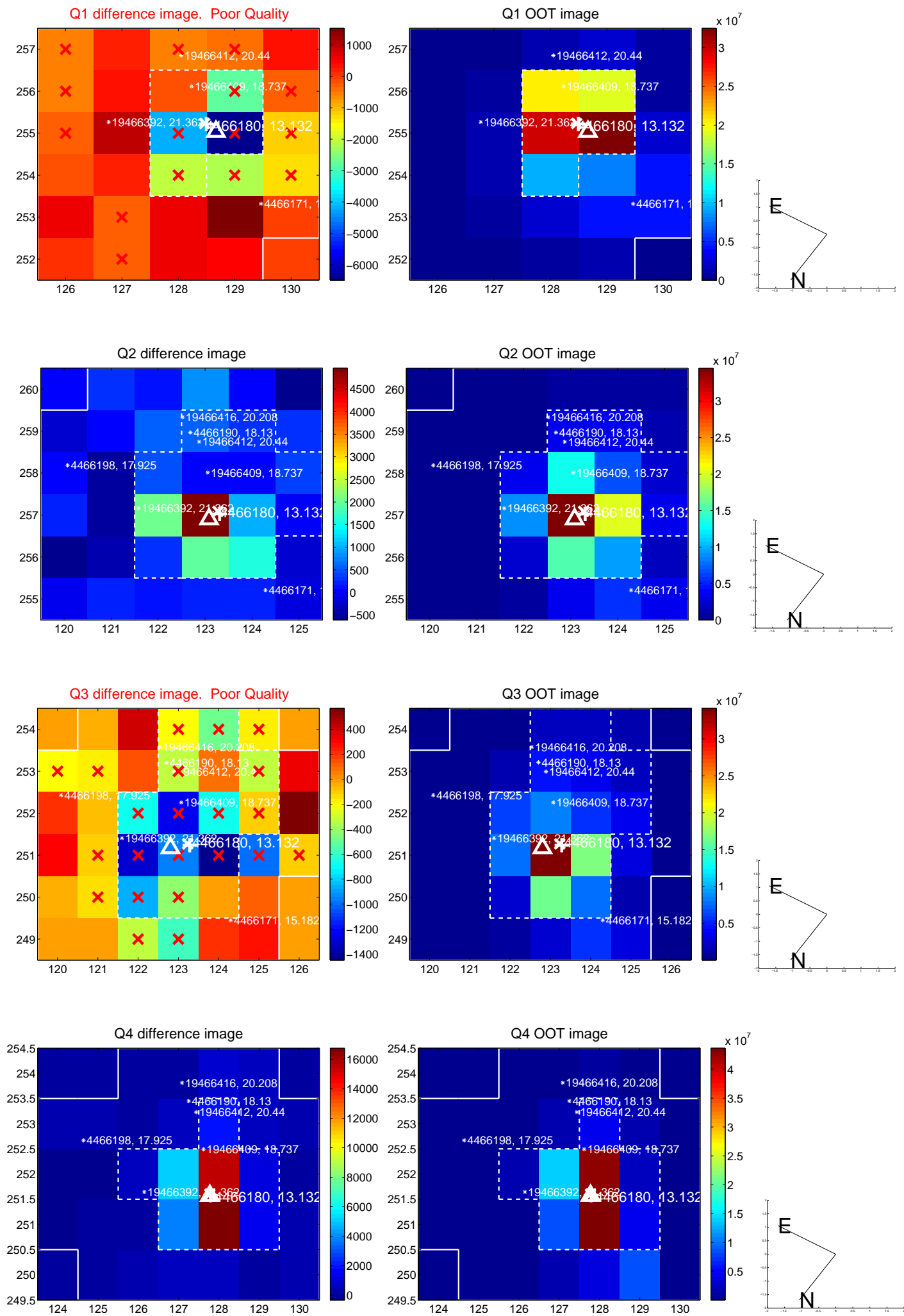
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.131 \pm 0.151$	0.87	$0.131 \pm 0.150$	$0.002 \pm 0.281$
PRF-fit source offset from KIC position	$0.041 \pm 0.257$	0.16	$-0.016 \pm 0.145$	$0.038 \pm 0.296$
photometric centroid source offset	—	—	—	—

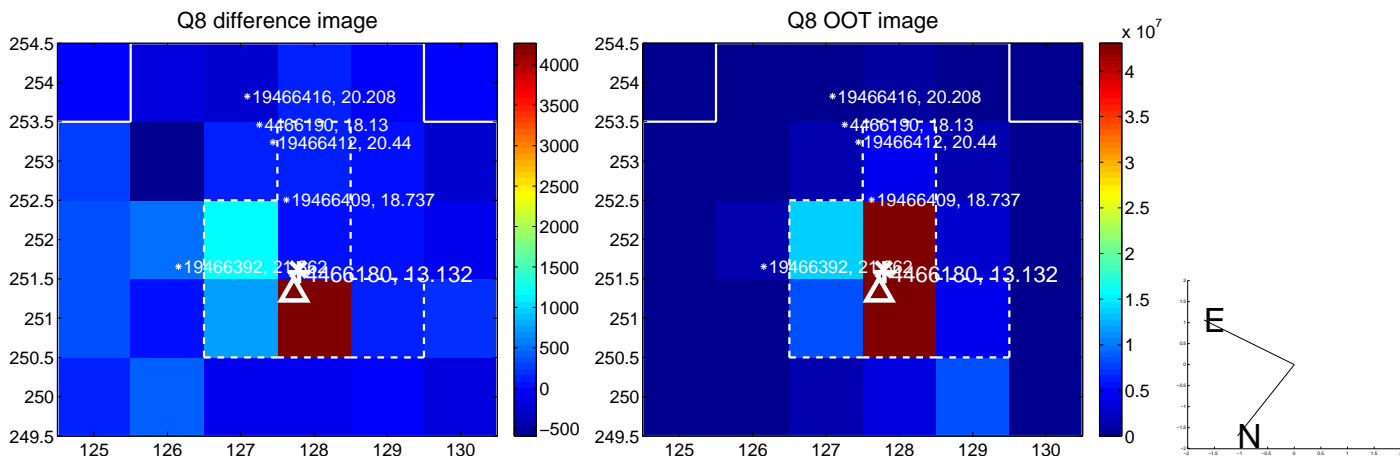
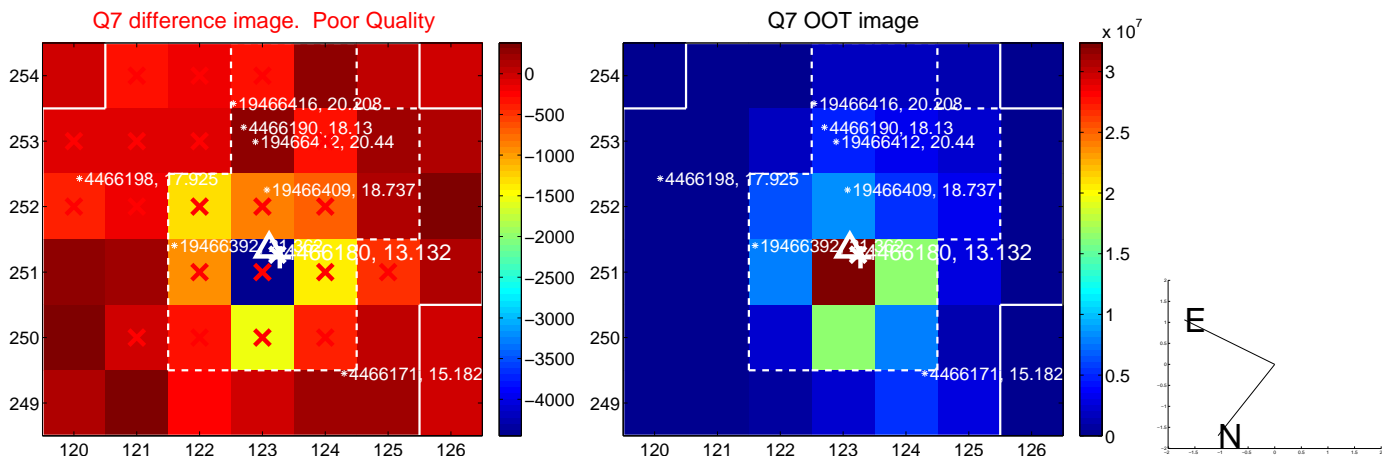
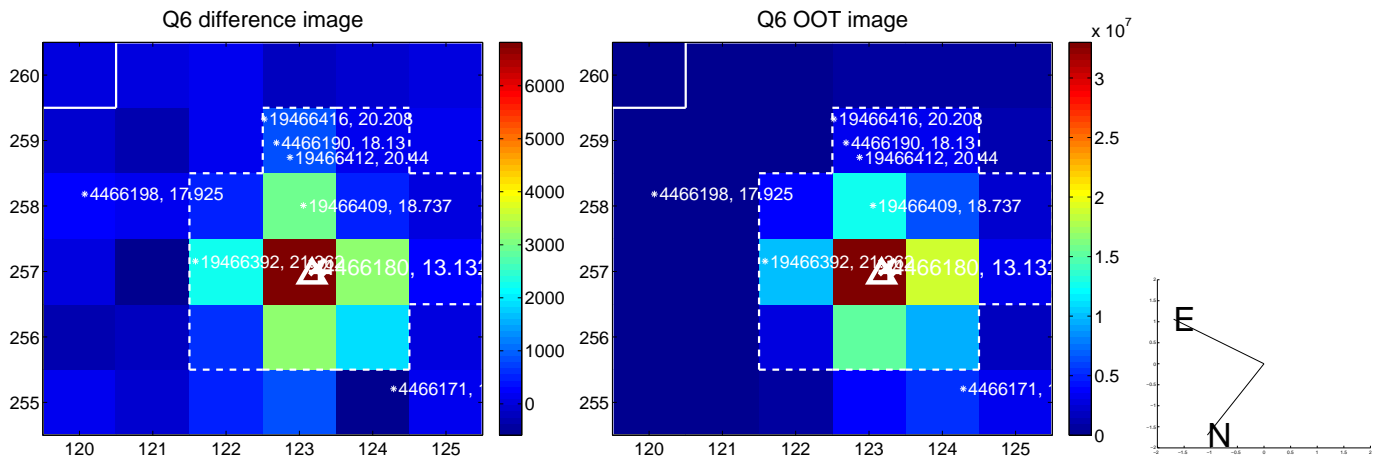
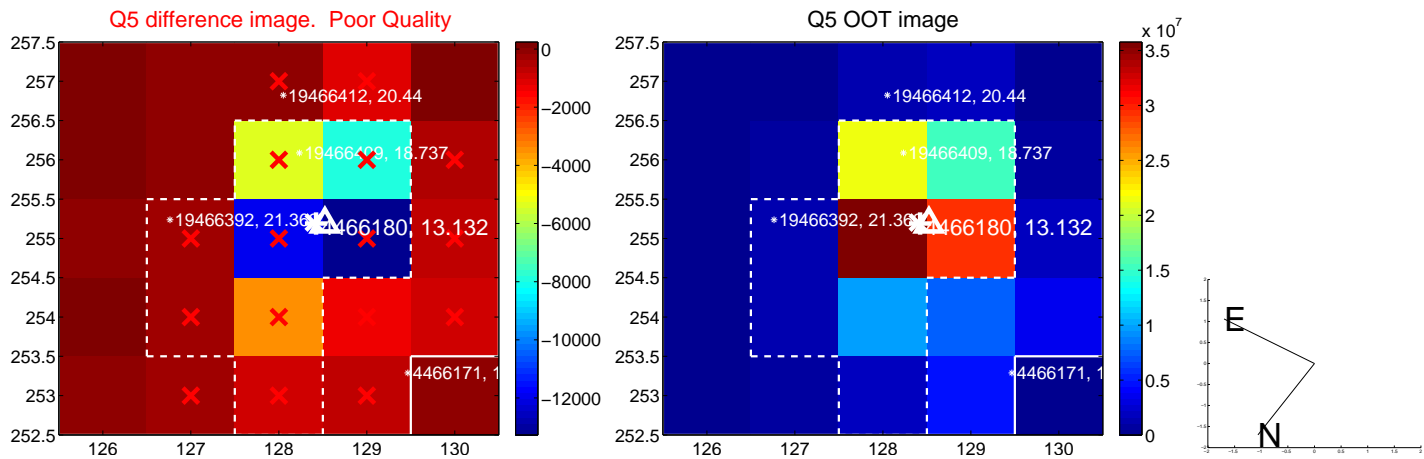


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

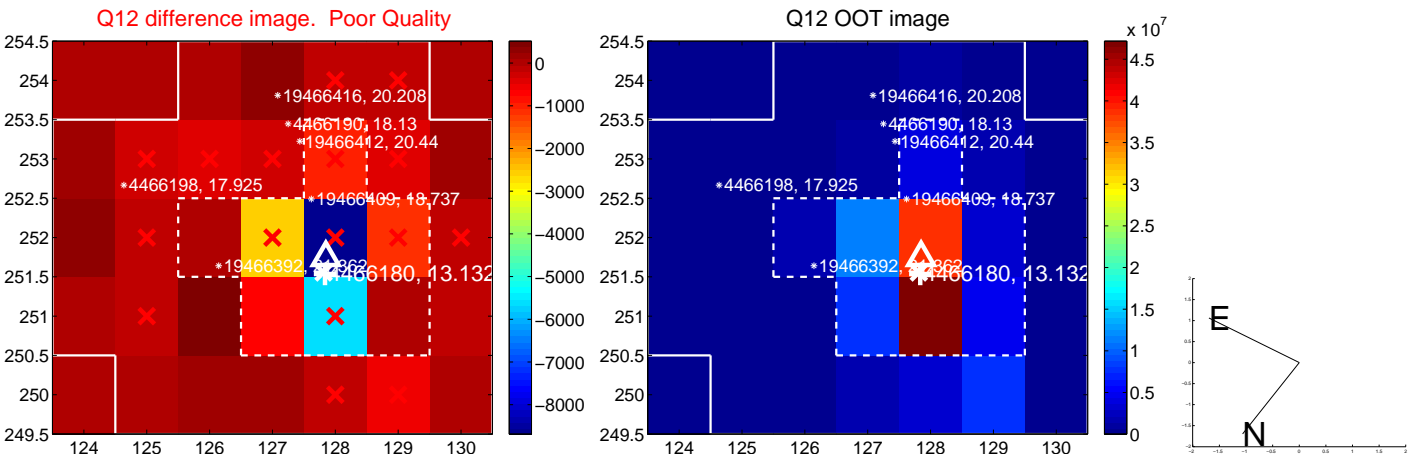
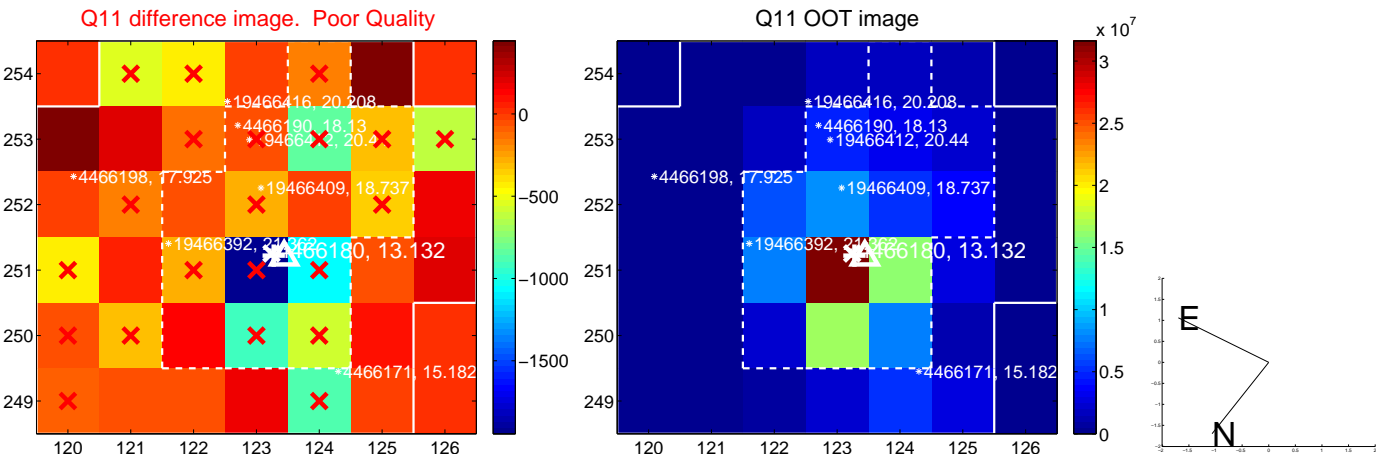
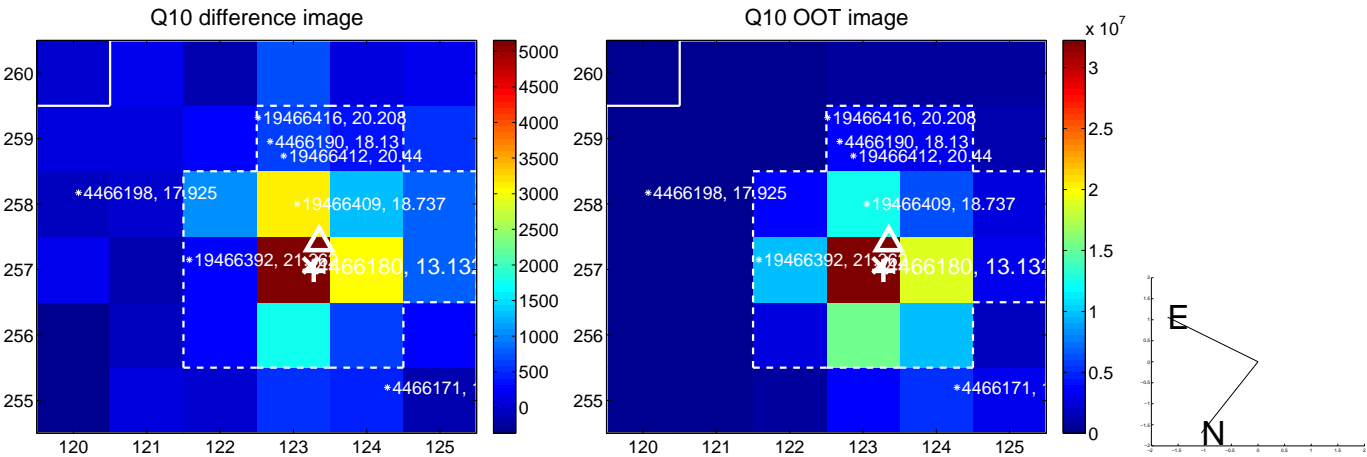
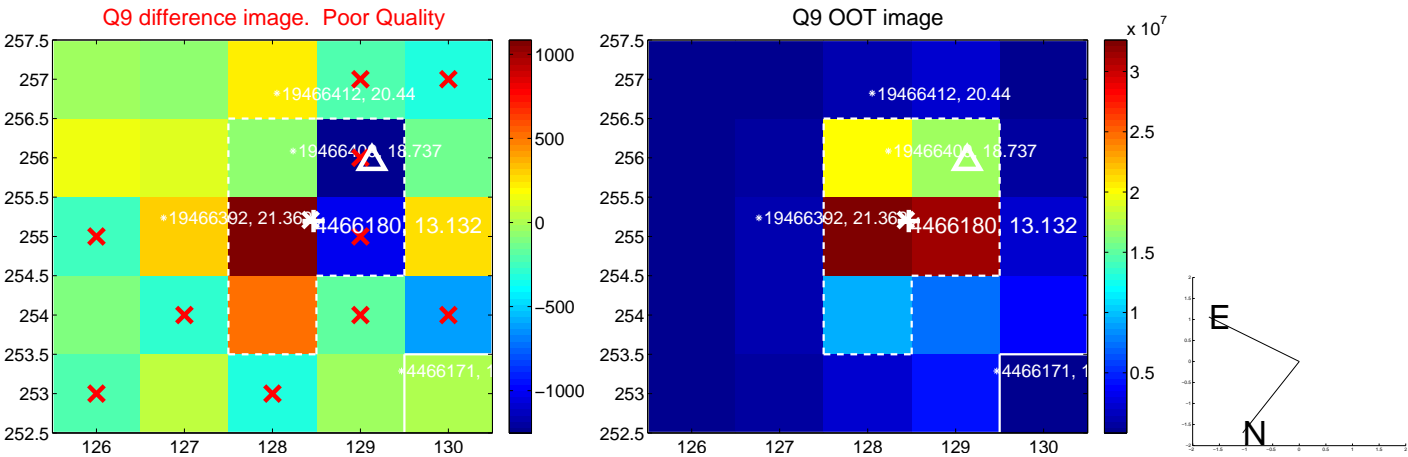


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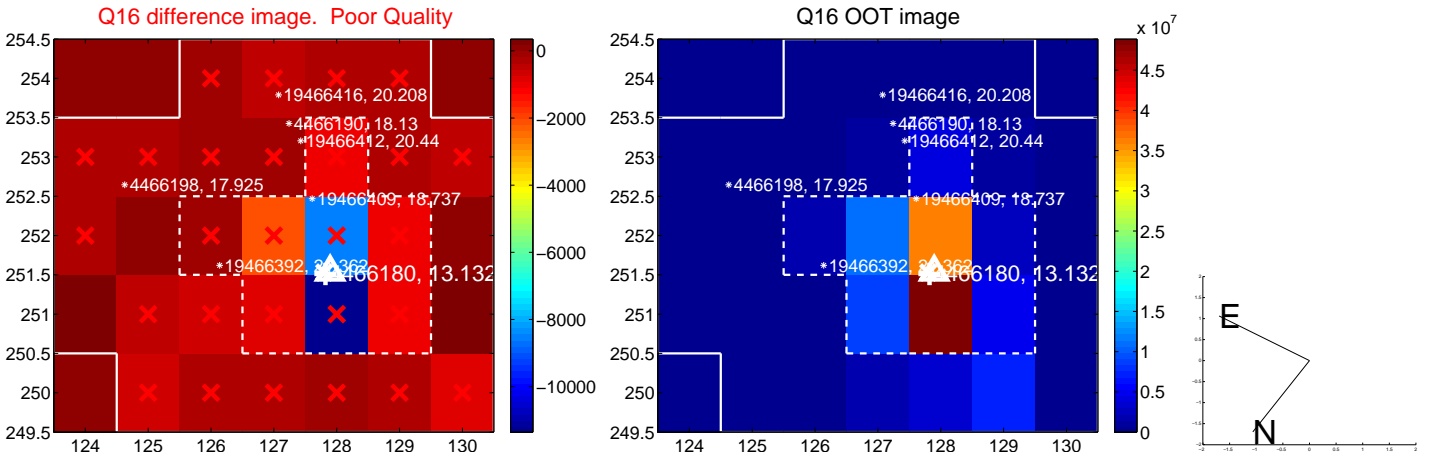
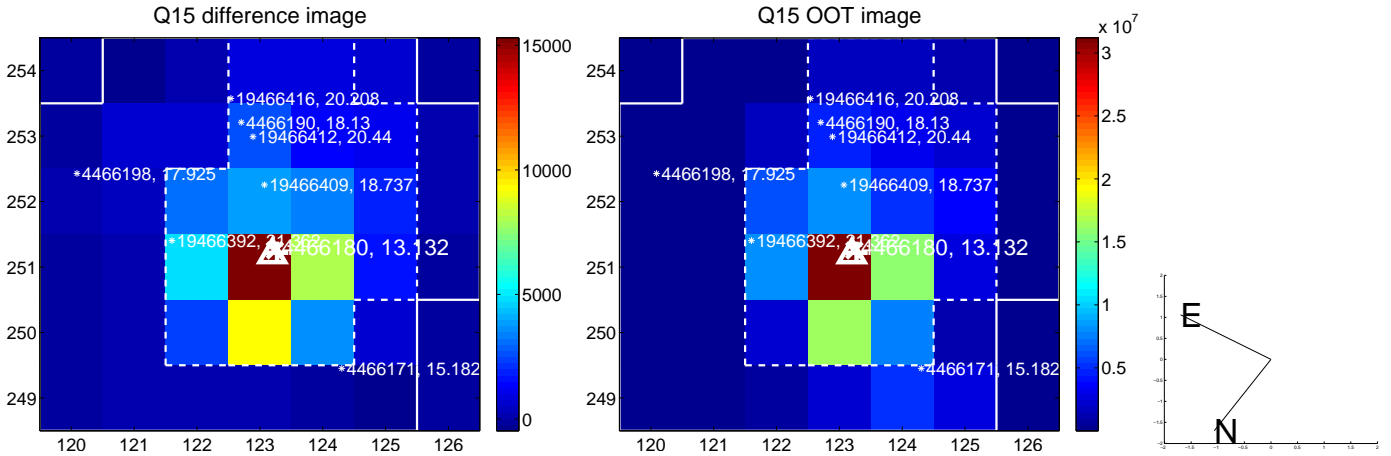
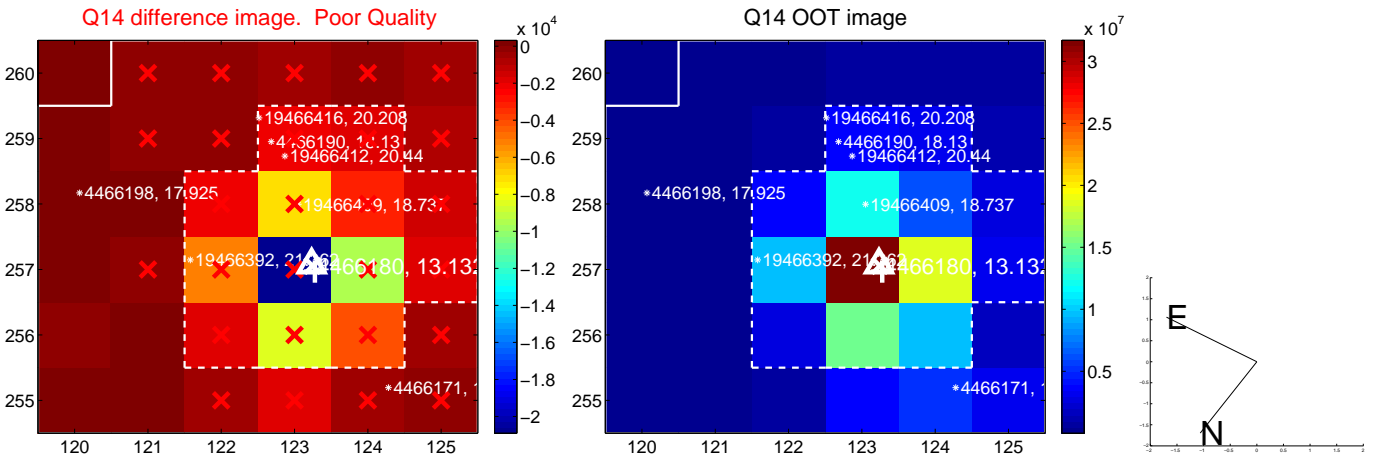
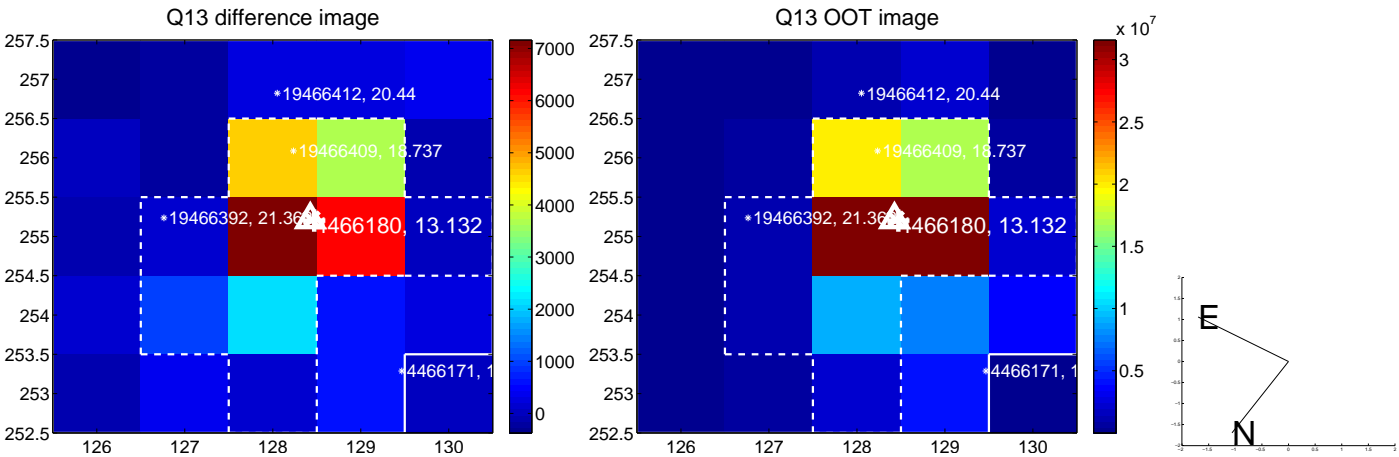




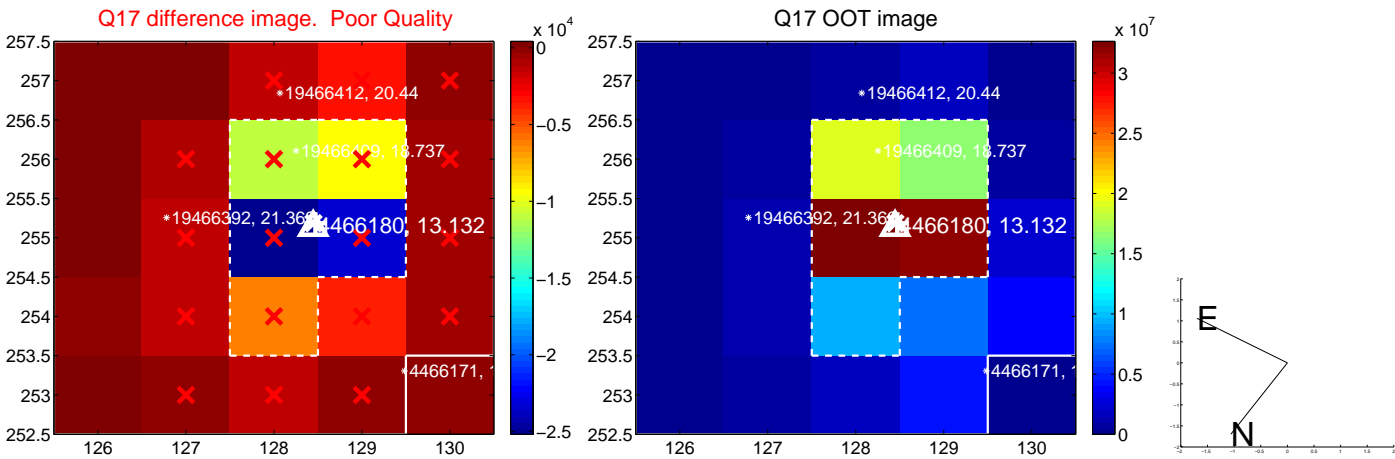
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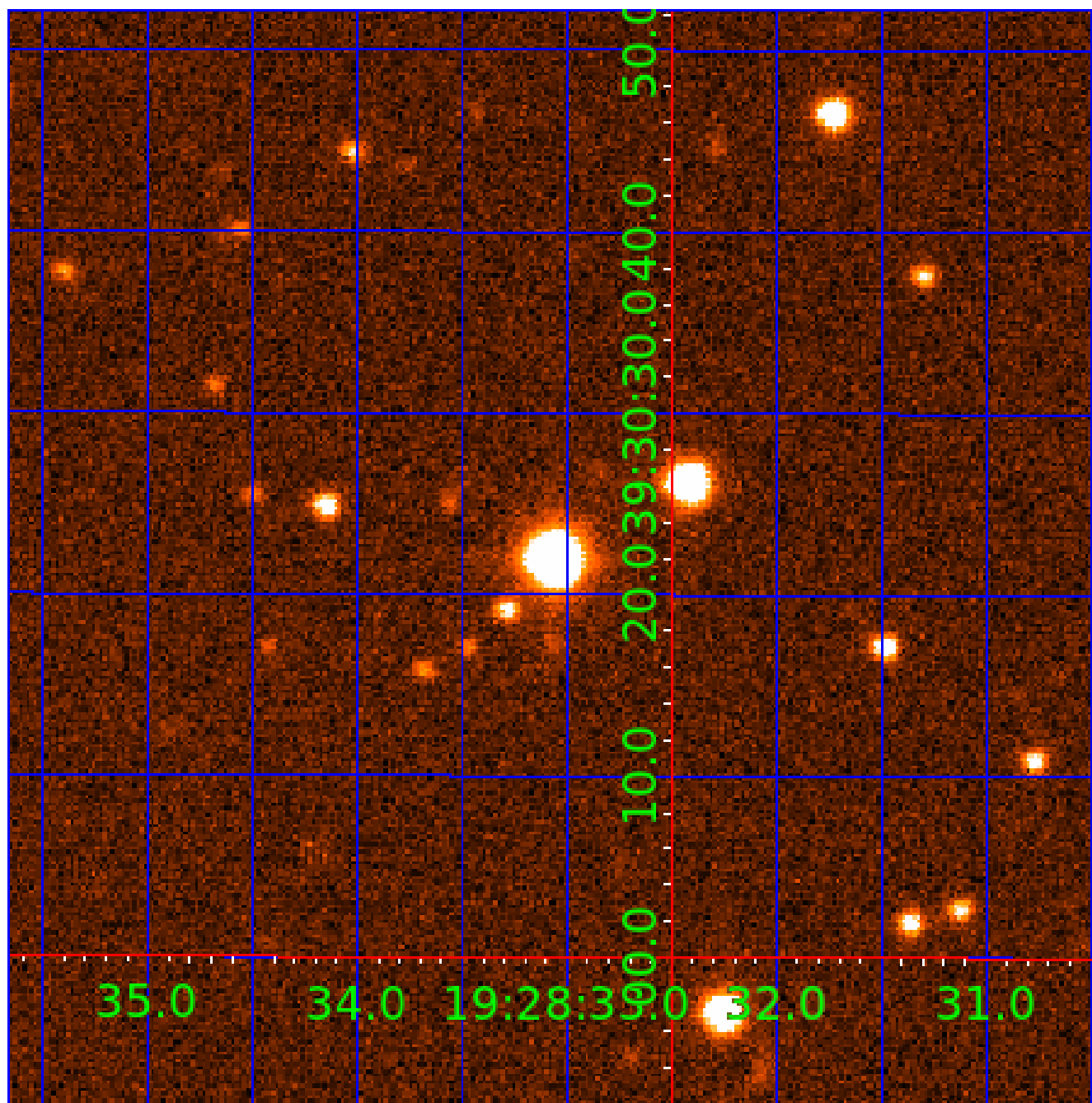
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folded centroid time series figure for this object.

UKIRT Image

Declination



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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.

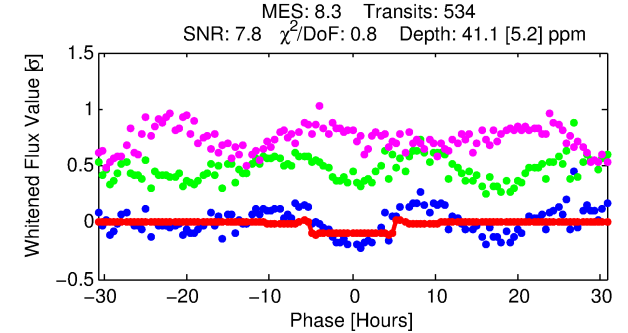
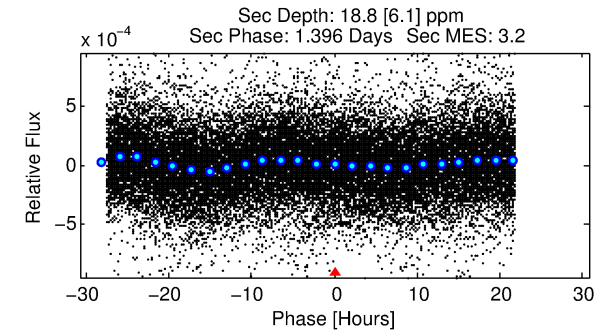
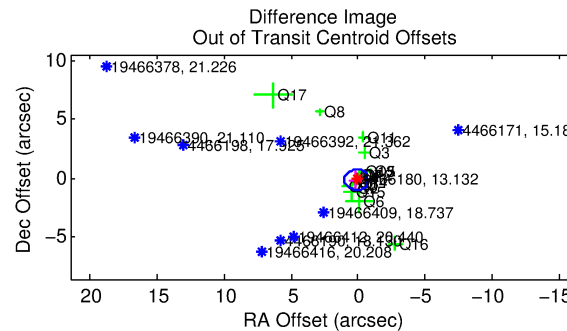
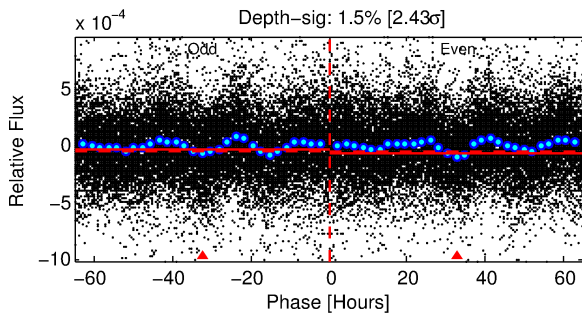
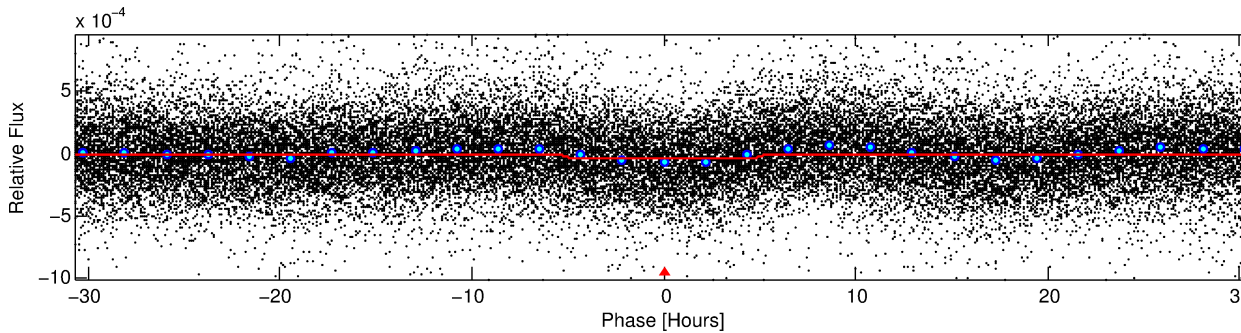
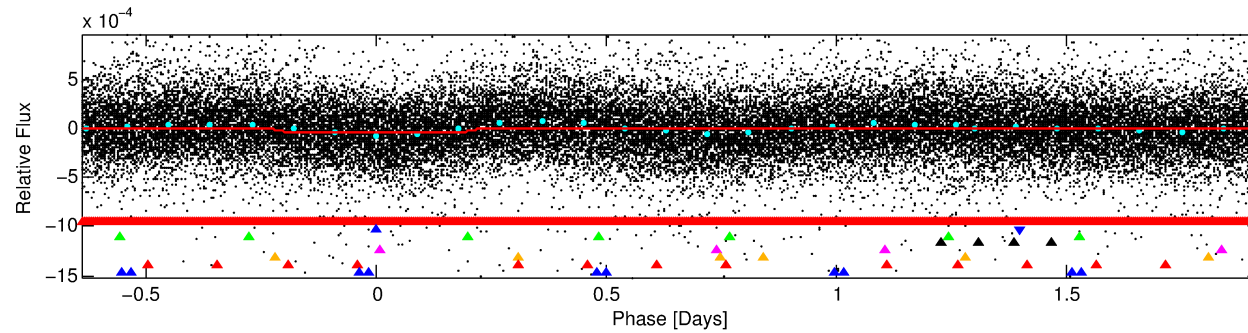
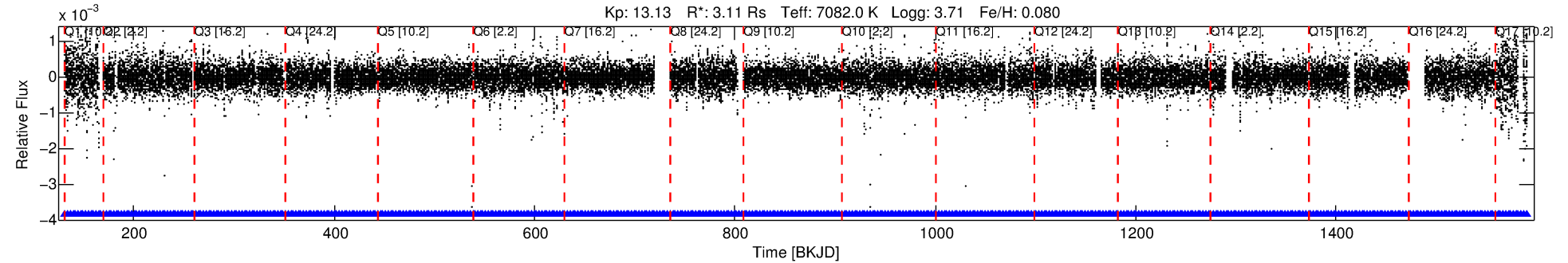
Ephemeris Match Information For 004466180-02

No Significant Match Found



# DV One-Page Summary

KIC: 4466180 Candidate: 2 of 8 Period: 2.558 d



## DV Fit Results:

Period = 2.55794 [0.00003] d  
Epoch = 131.7284 [0.0065] BKJD  
Rp/R\* = 0.0068 [0.0011]  
a/R\* = 1.25 [0.40]  
b = 0.90 [0.19]  
Seff = 10866.23 [8309.71]  
Teq = 2603 [498] K  
Rp = 2.31 [1.11] Re  
a = 0.0448 [0.0204] AU  
Ag = 3.88 [3.37] [0.85 $\sigma$ ]  
Teff = 5650 [685] K [3.60 $\sigma$ ]

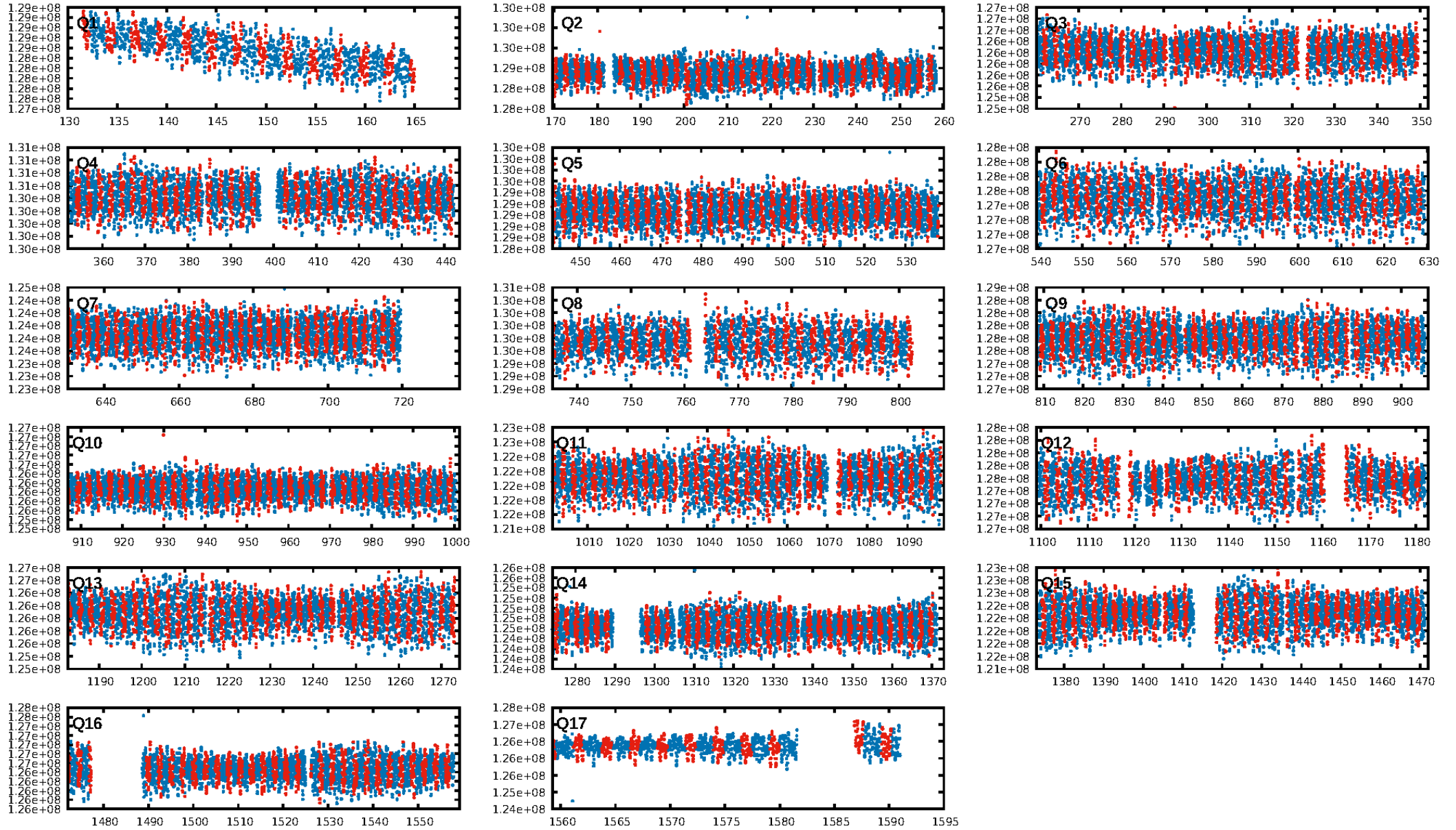
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [4.41 $\sigma$ ]  
LongPeriod-sig: 100.0% [230.50 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [509/509]  
GhostDiagnostic-chr: 1.095  
Centroid-sig: 0.0%  
Centroid-so: 1.169 arcsec [2.15 $\sigma$ ]  
OotOffset-rm: 0.169 arcsec [0.59 $\sigma$ ]  
KicOffset-rm: 0.207 arcsec [0.30 $\sigma$ ]  
OotOffset-st: 4/4/4/4 [16]  
KicOffset-st: 4/4/4/4 [16]  
DiffImageQuality-fgm: 0.69 [11/16]  
DiffImageOverlap-fno: 0.00 [0/17]

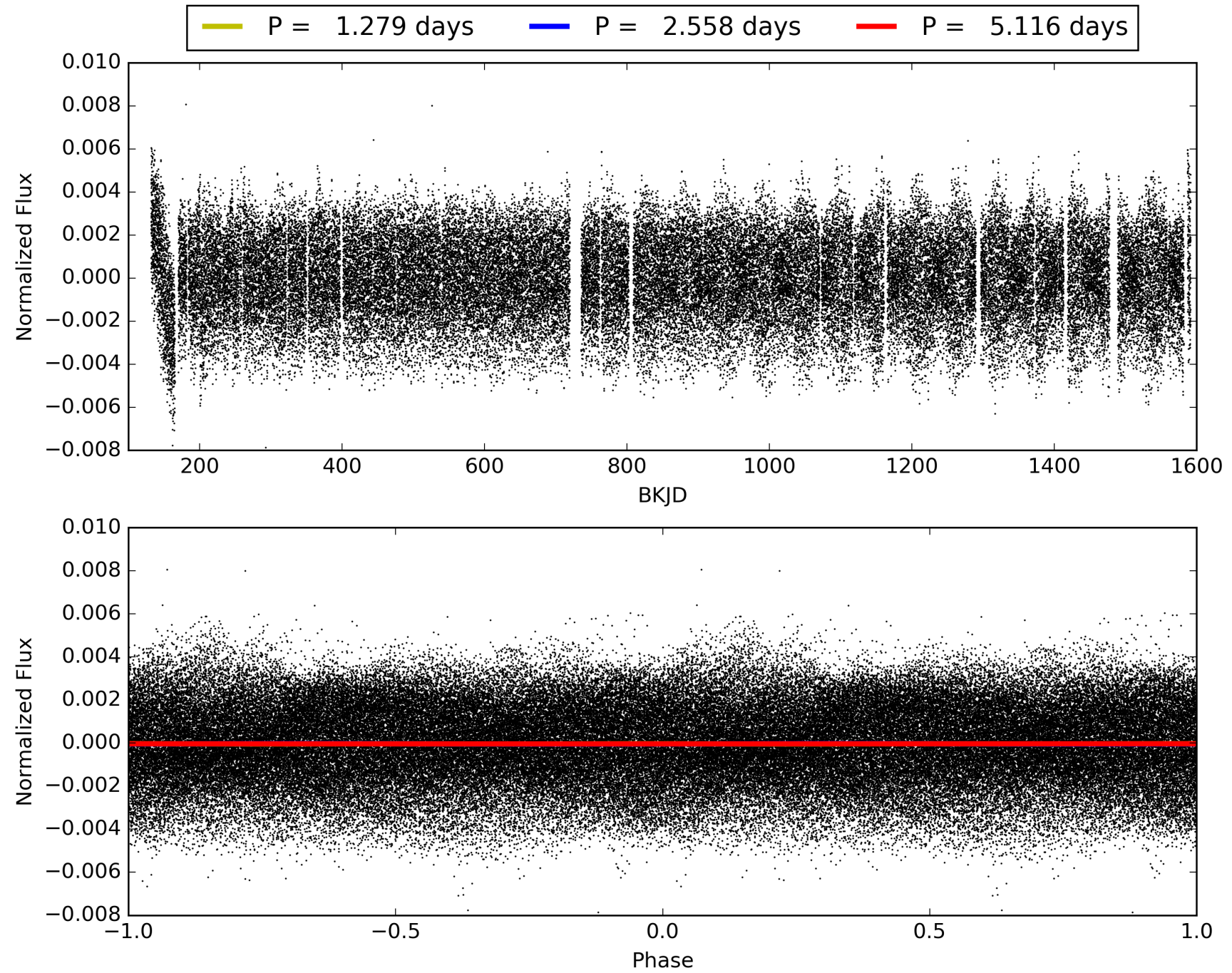
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 05:54:20 Z

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

# TCE 004466180-02, PDC Light Curves



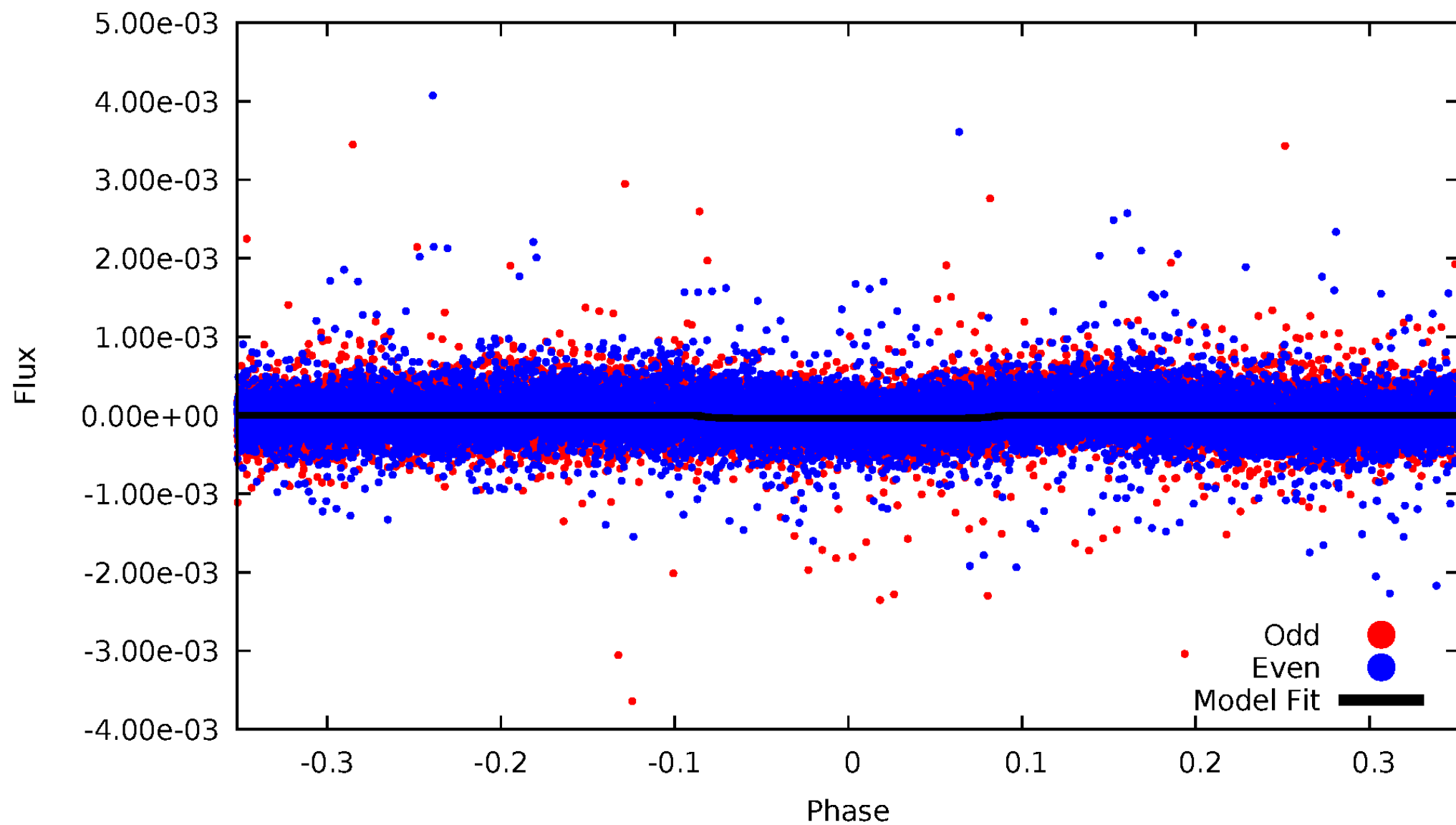
TCE 004466180-02





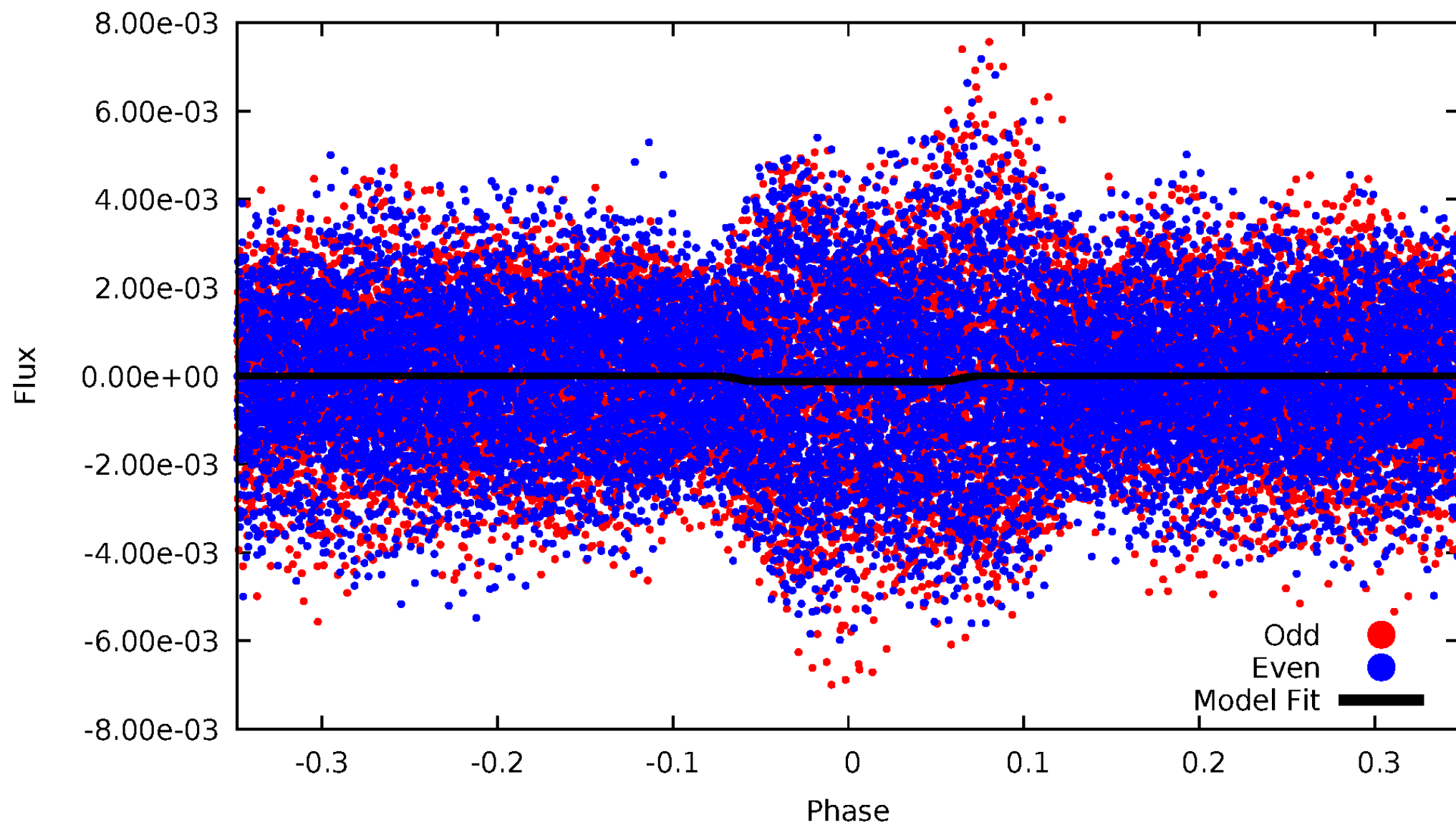
# DV Odd/Even

TCE 004466180-02



# ALT Odd/Even

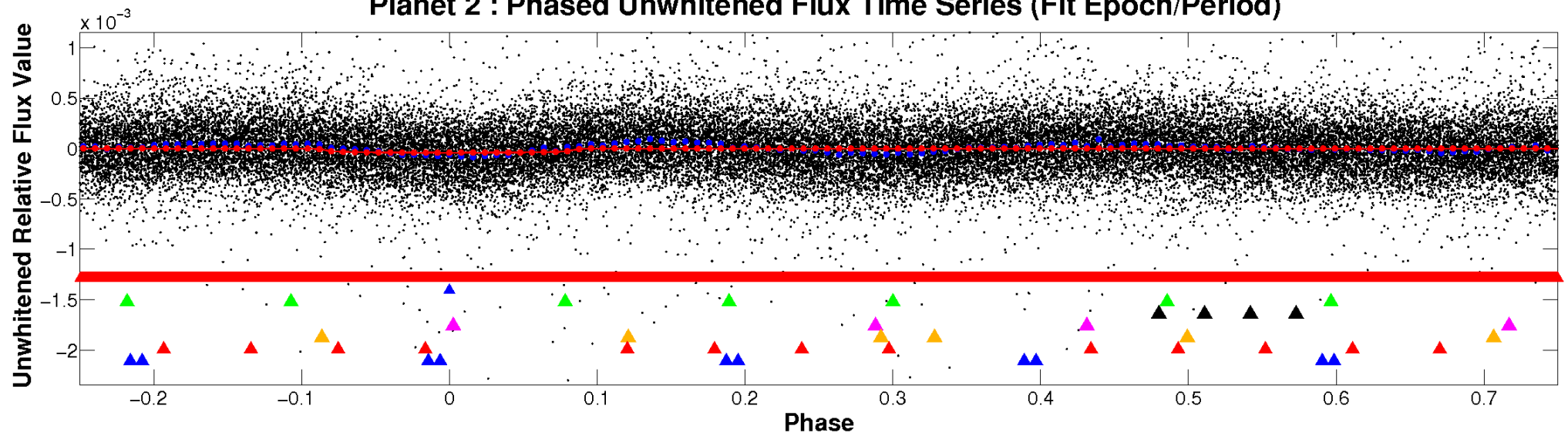
TCE 004466180-02



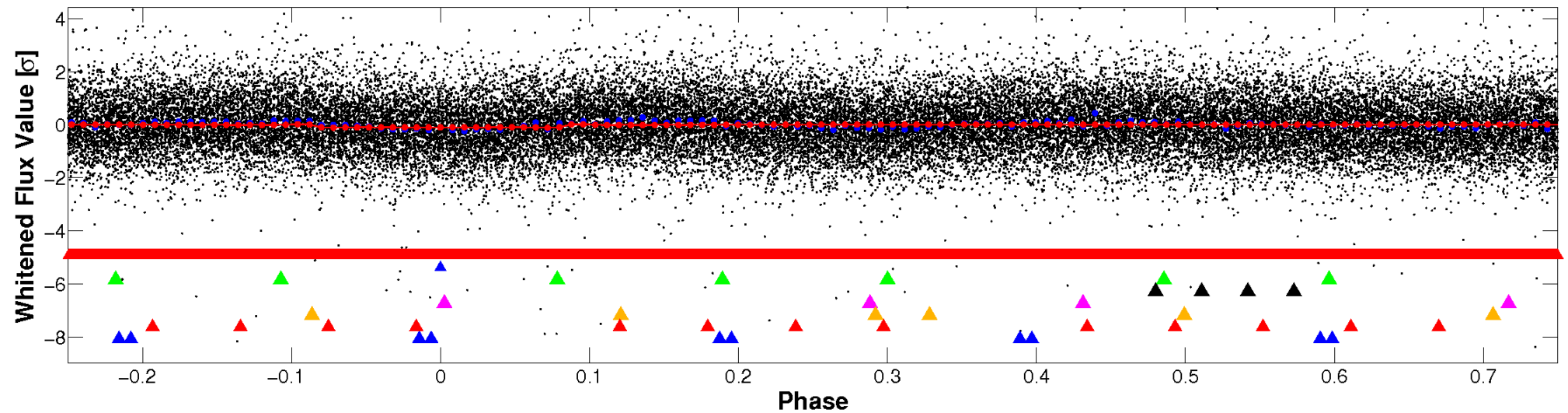


# Non-Whitened Vs. Whitened Light Curve

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

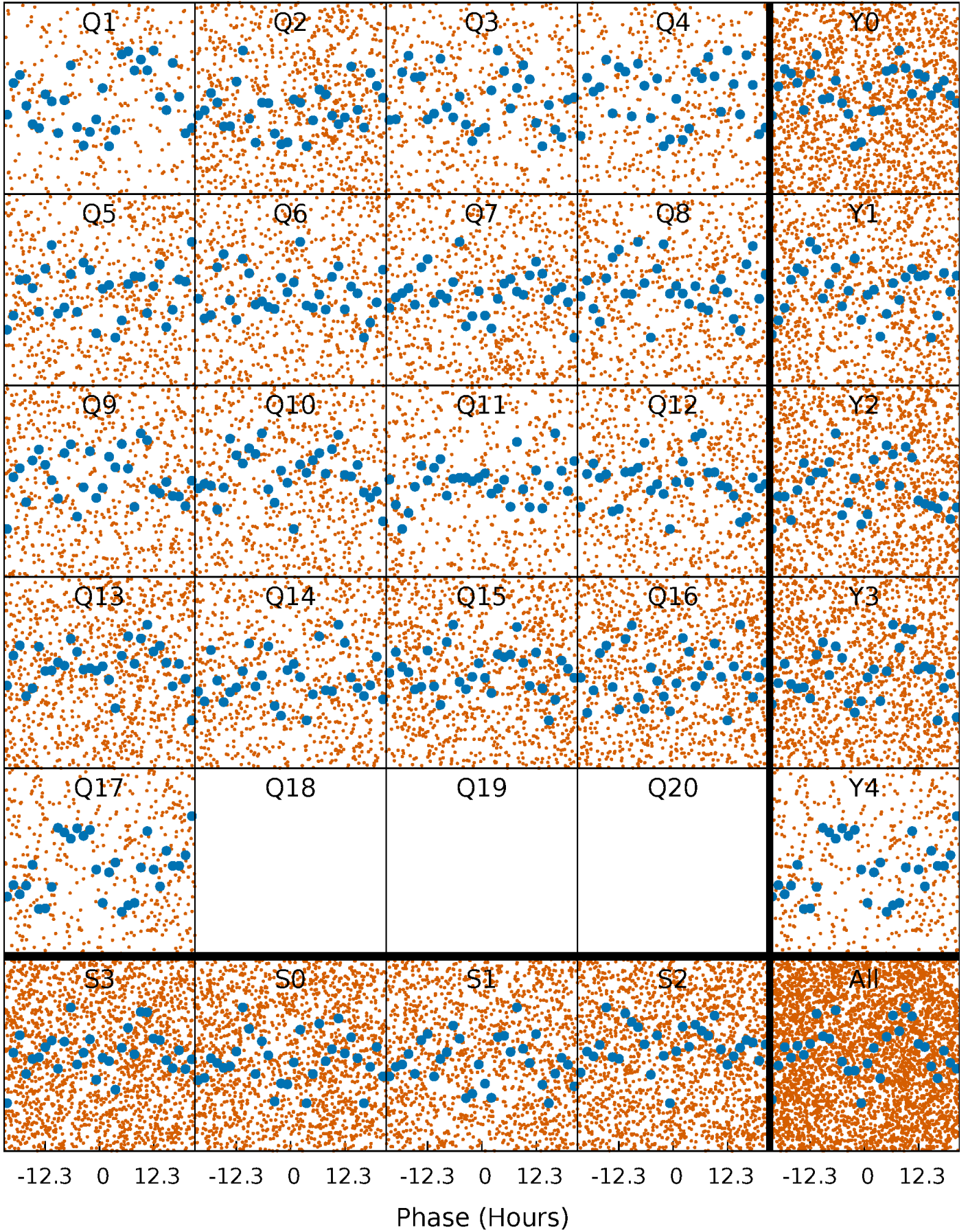


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

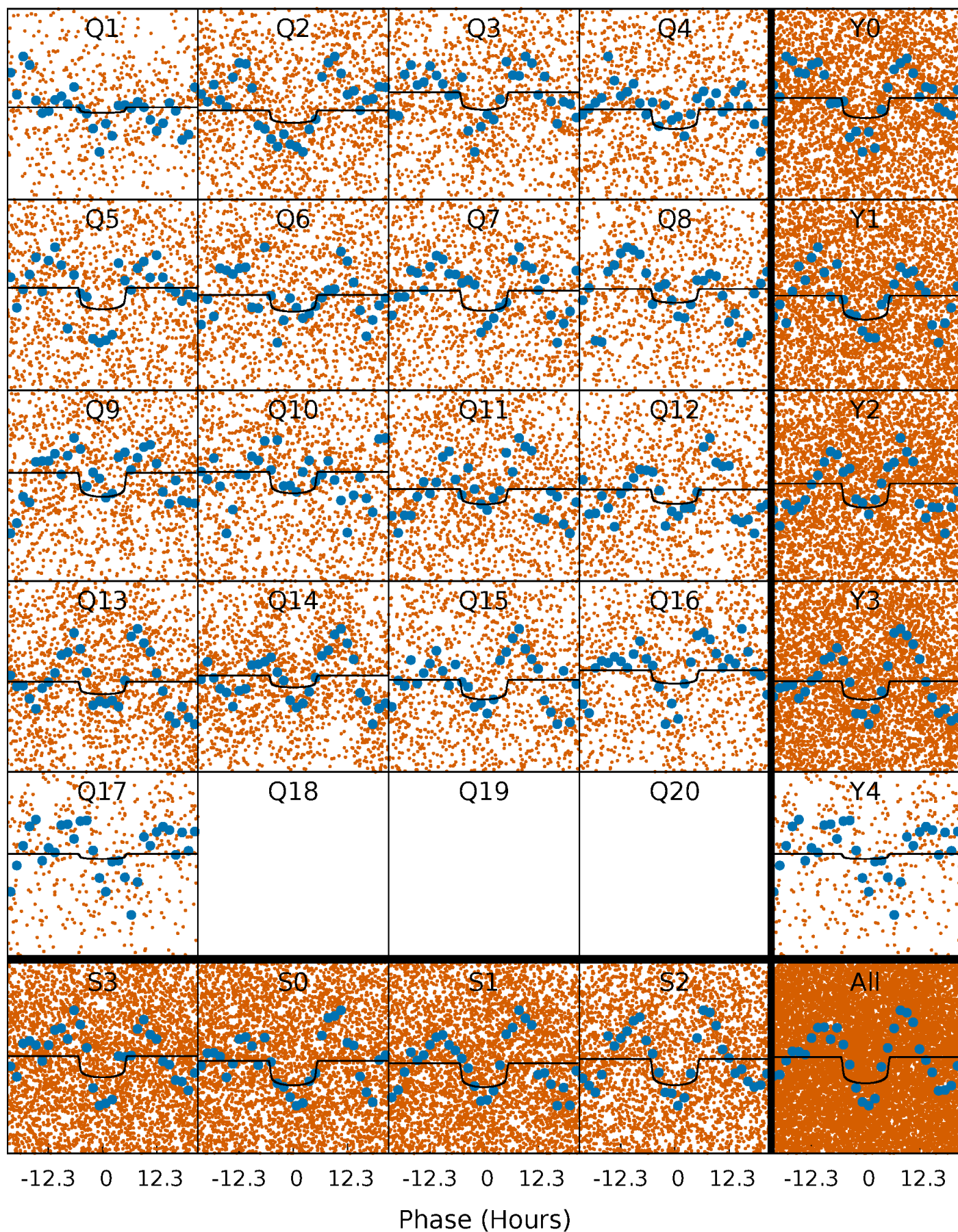
TCE 004466180-02   P= 2.557937 Days    $T_0=131.728417$  (BKJD)





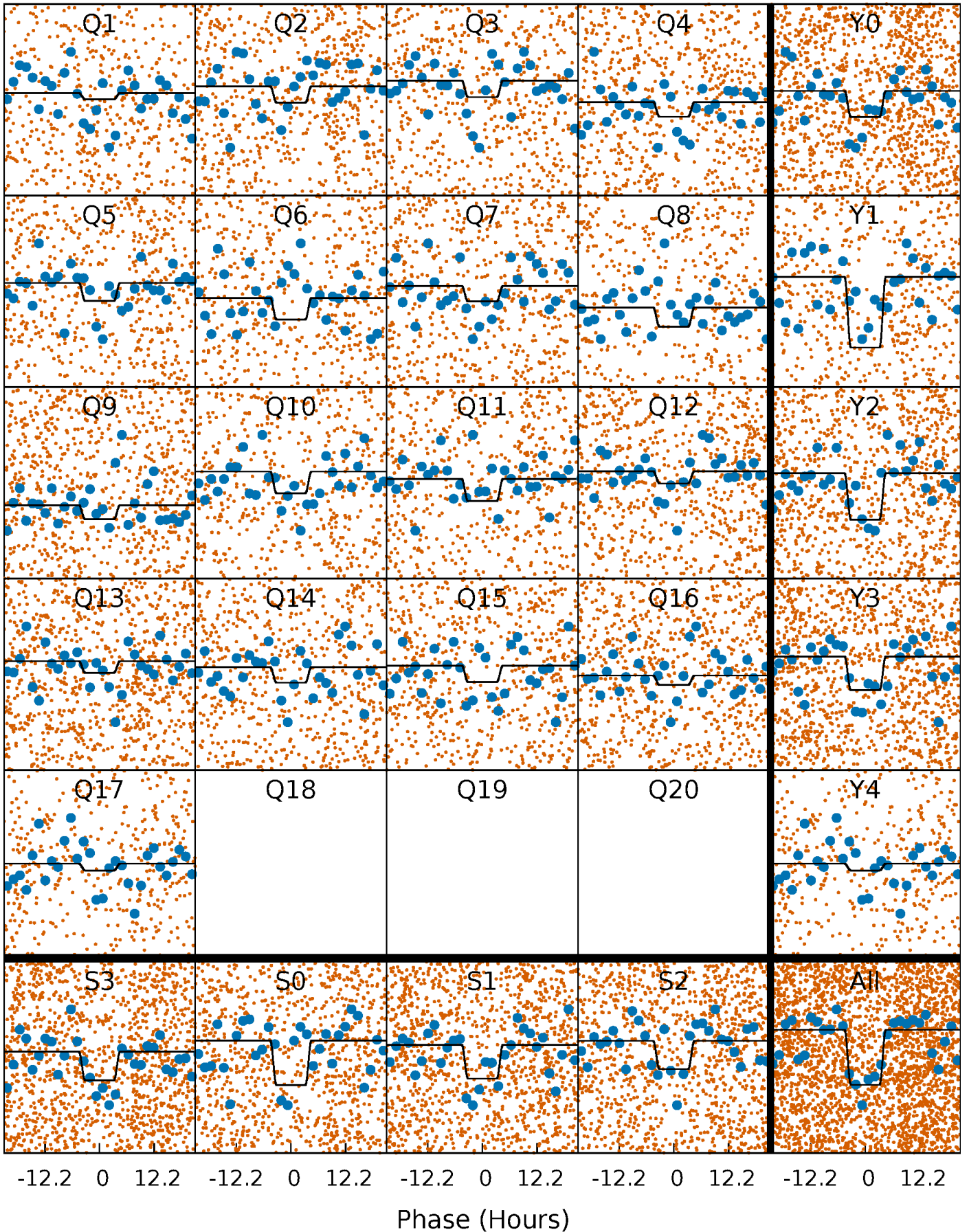
# DV Quarter-Phased Transit Curves

TCE 004466180-02   P= 2.557937 Days    $T_0=131.728417$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

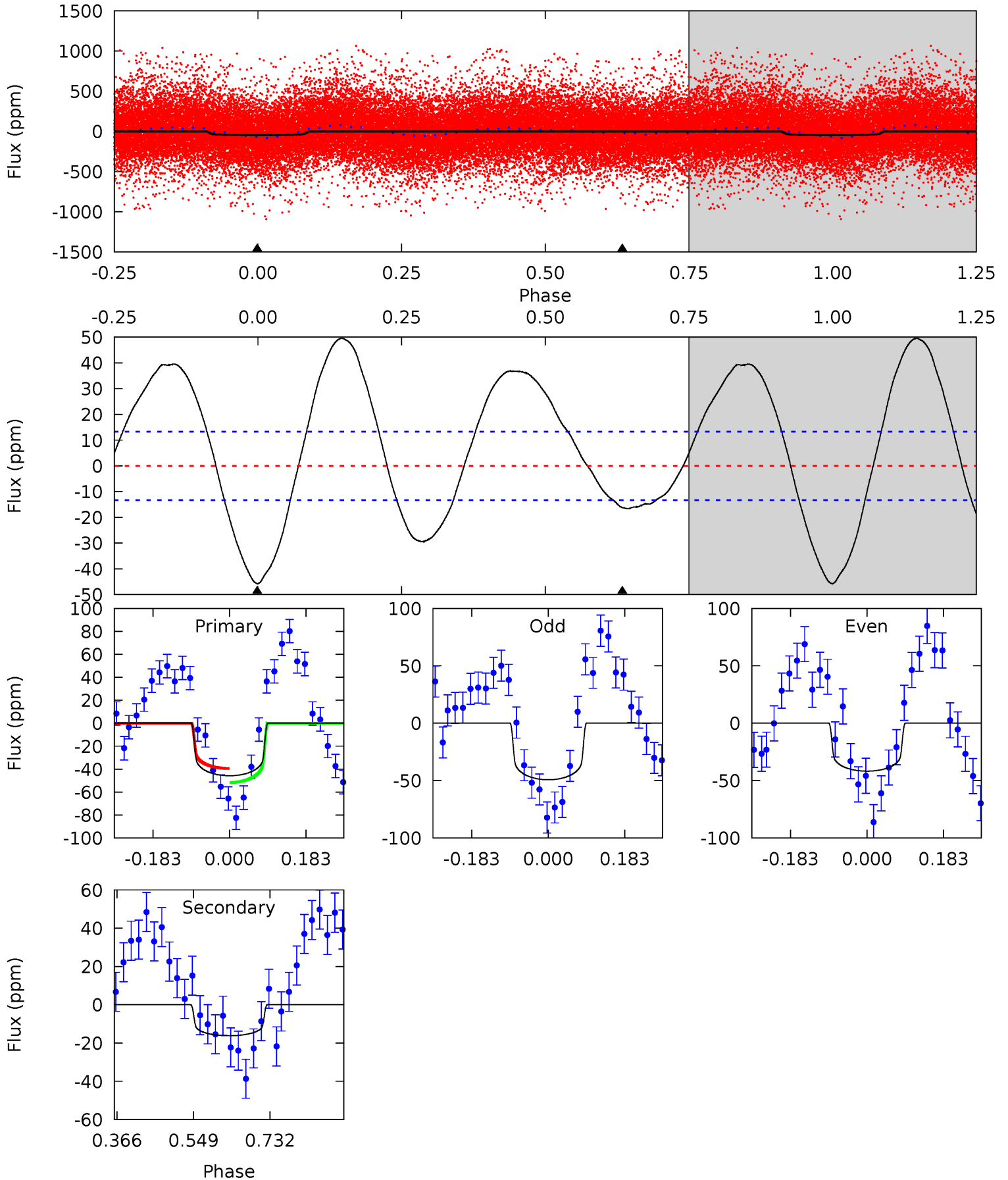
TCE 004466180-02 P= 2.557862 Days  $T_0=131.720702$  (BKJD)



# DV Model-Shift Uniqueness Test

004466180-02, P = 2.557937 Days, E = 129.170480 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
15.3	5.39	0	0	4.44	1.33	7.87	15.3	15.3	5.39	5.39	1.25	1.02	0.52	2.01

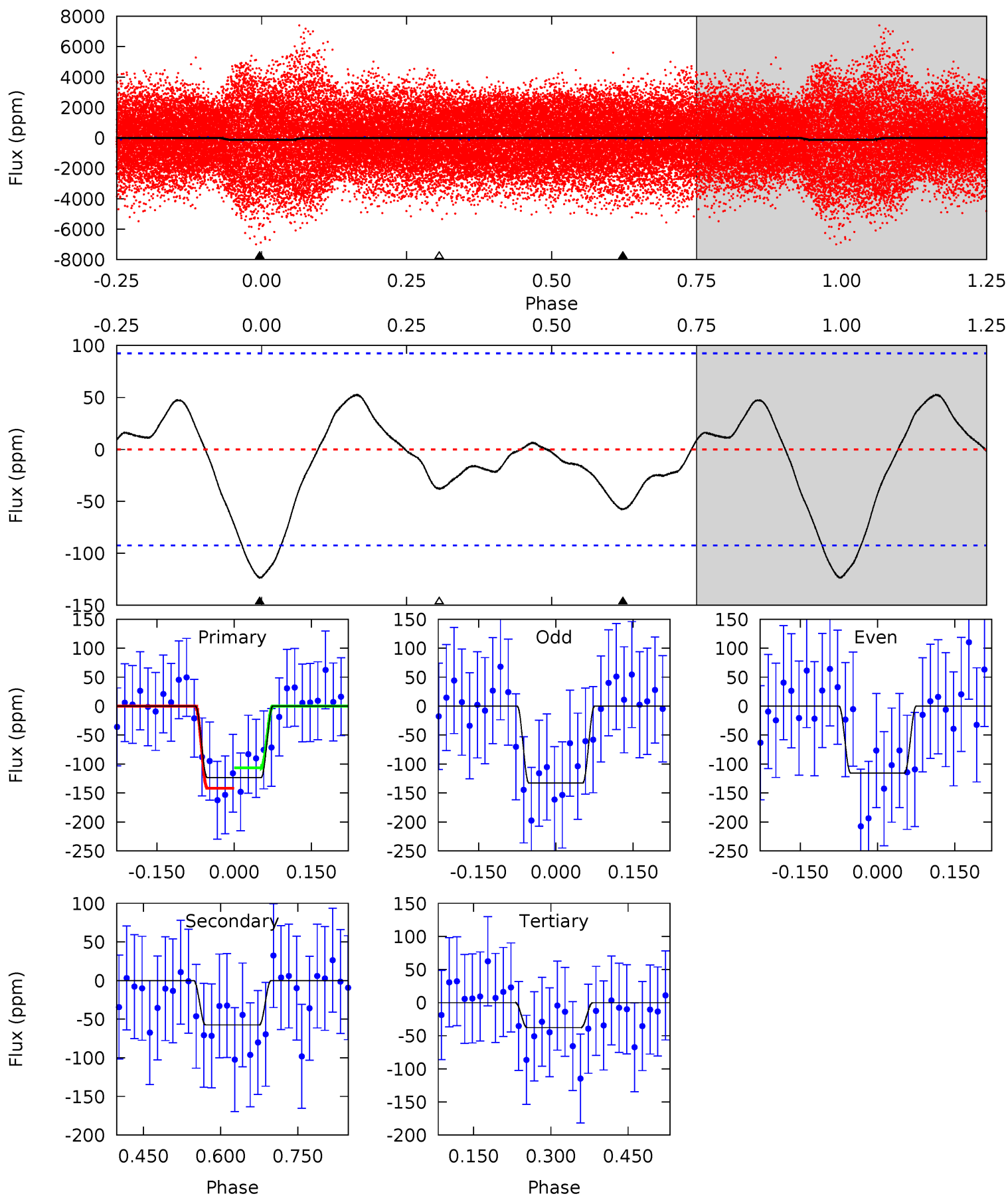




# Alt Model-Shift Uniqueness Test

004466180-02, P = 2.557862 Days, E = 129.162840 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
5.99	2.79	1.83	0	4.48	1.44	1.20	4.16	5.99	0.96	2.79	0.42	0.71	0.30	0.85



### Stellar Parameters For KIC 004466180

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7082^{+195}_{-318}$	$3.715^{+0.442}_{-0.078}$	$0.080^{+0.200}_{-0.300}$	$3.109^{+0.472}_{-1.416}$	$1.828^{+0.179}_{-0.418}$	$0.086^{+0.349}_{-0.021}$
	+3%/-4%	+12%/-2%	+250%/-375%	+15%/-46%	+10%/-23%	+407%/-24%
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 004466180-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-16 \pm 3$	$2.14^{+0.51}_{-0.59}$	$3495^{+276}_{-396}$	$5297^{+591}_{-490}$	$3.936^{+3.276}_{-1.512}$
Alt.	$-57 \pm 21$	$3.51^{+0.70}_{-0.80}$	$3525^{+240}_{-406}$	$5655^{+592}_{-575}$	$5.030^{+3.994}_{-1.992}$

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

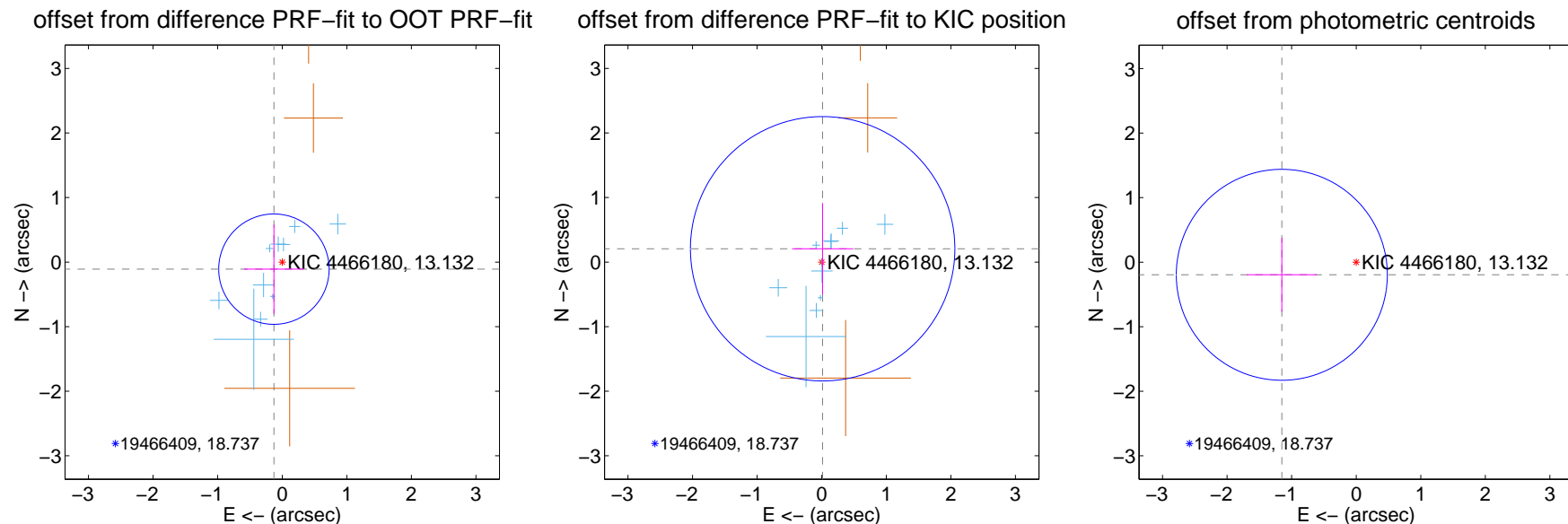
## DV Centroid Data

Supplemental centroid analysis for 004466180-02. Kepler magnitude: 13.13. Transit SNR 7.81

There are 11 quarters with good PRF difference image offsets

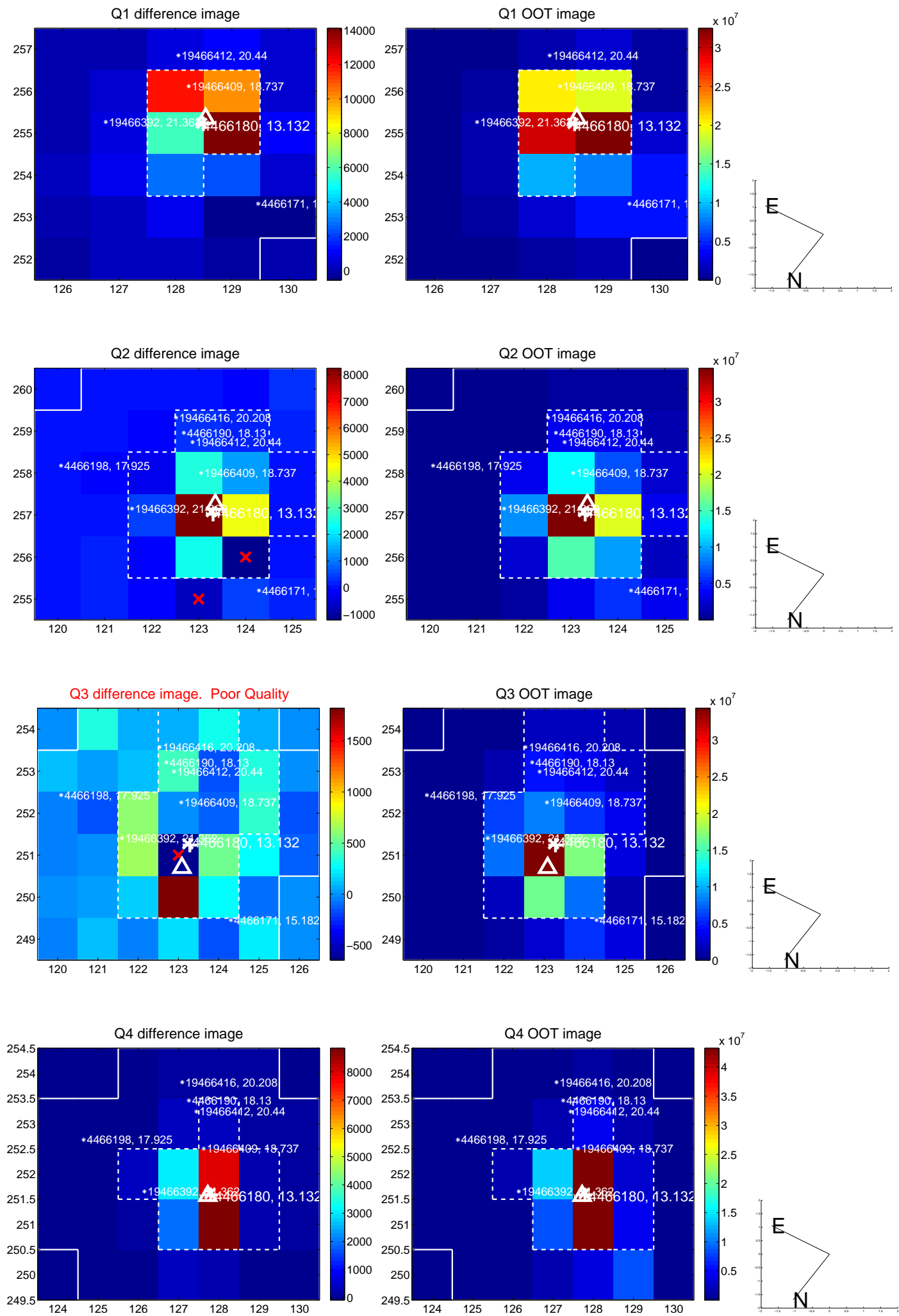
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.169 \pm 0.285$	0.59	$0.129 \pm 0.463$	$-0.109 \pm 0.690$
PRF-fit source offset from KIC position	$0.207 \pm 0.683$	0.30	$-0.014 \pm 0.473$	$0.207 \pm 0.708$
photometric centroid source offset	$1.17 \pm 0.54$	2.15	$1.15 \pm 0.54$	$-0.20 \pm 0.57$

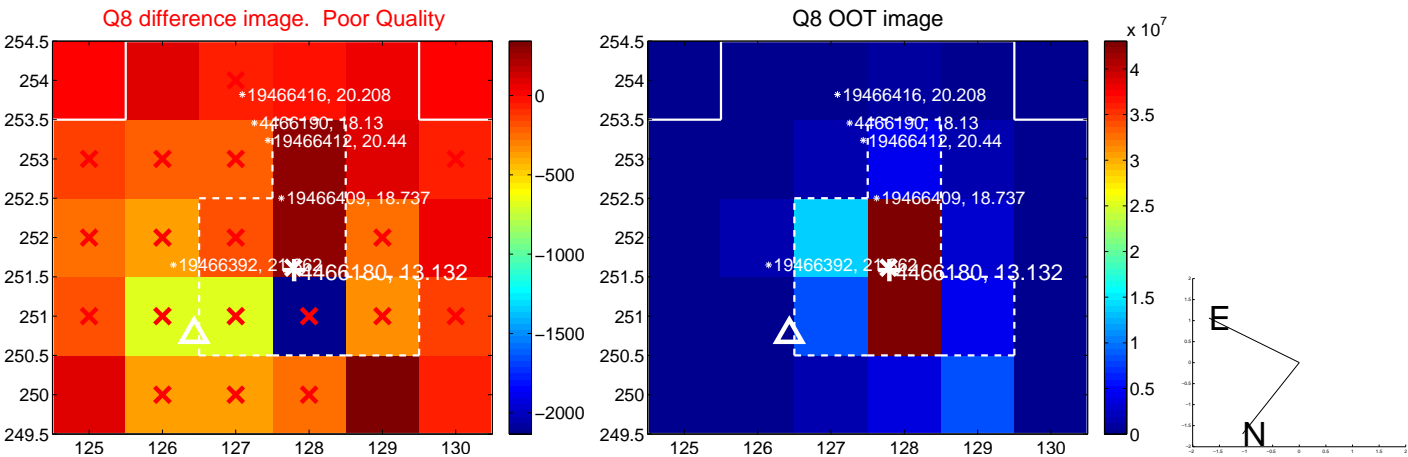
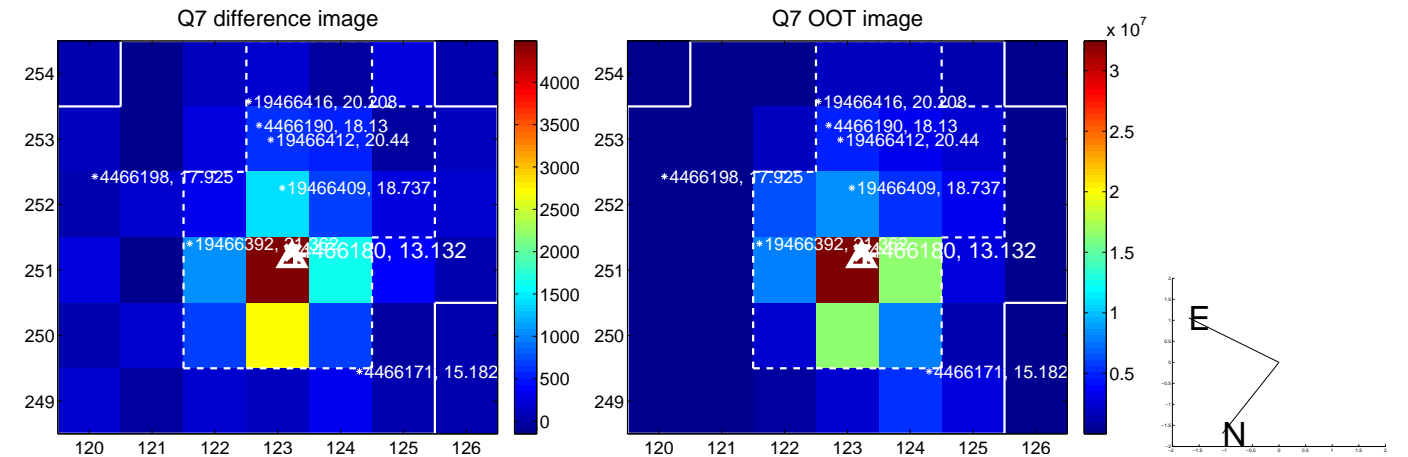
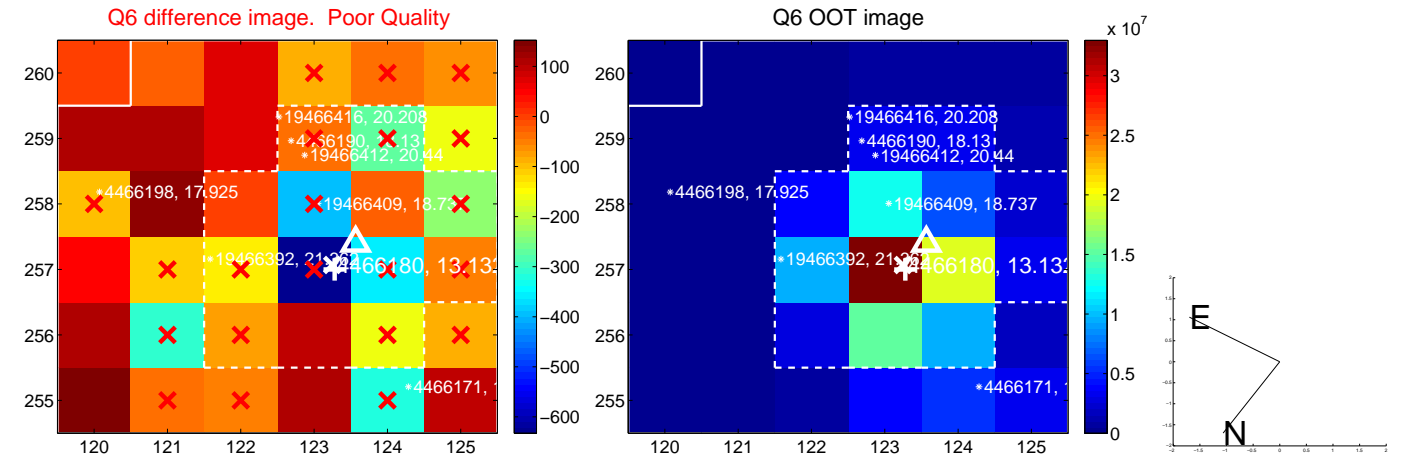
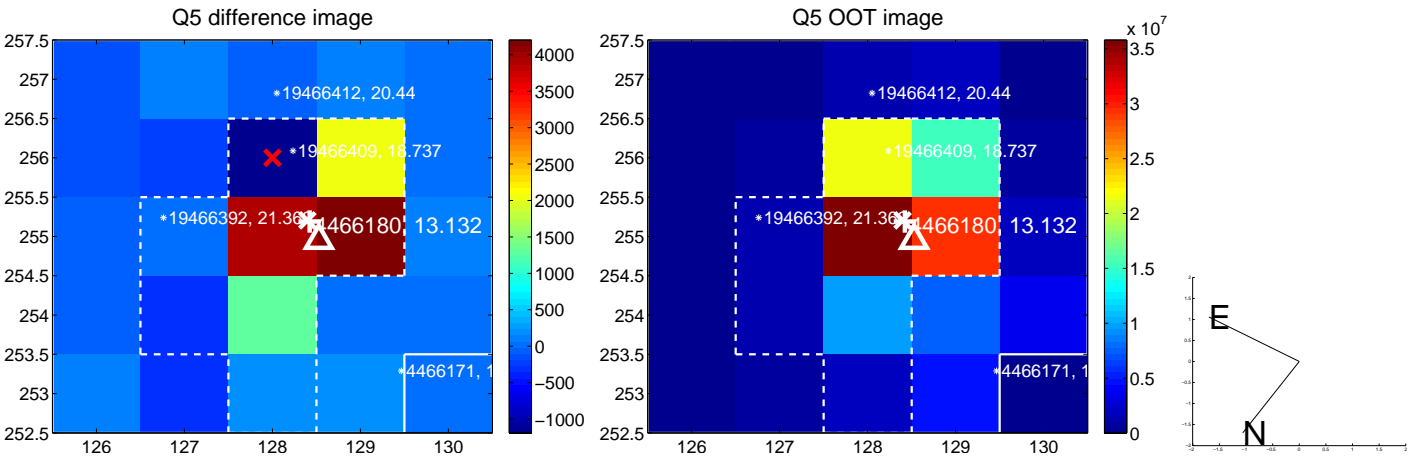


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

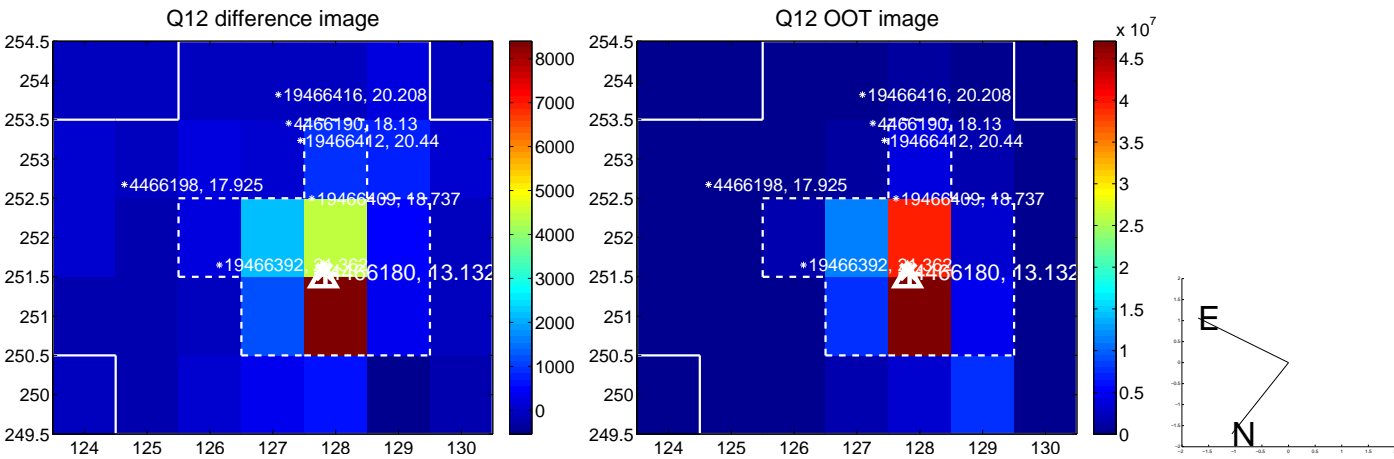
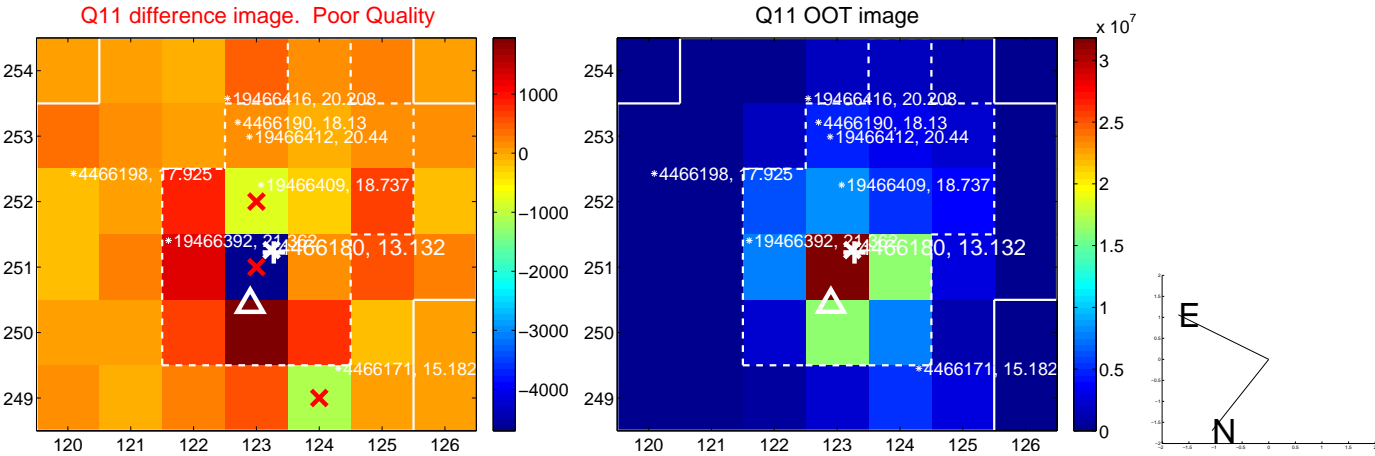
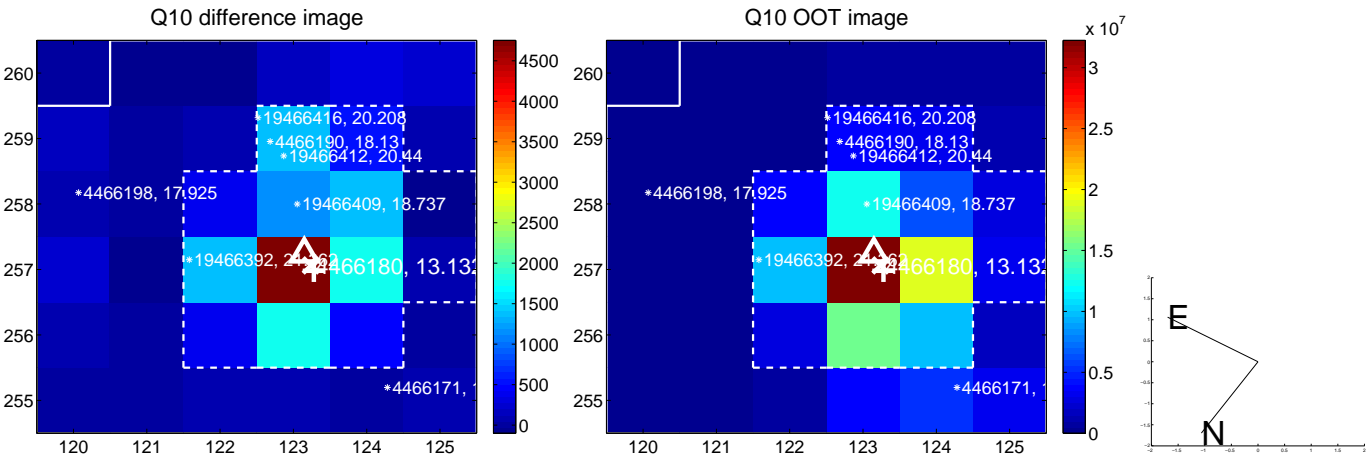
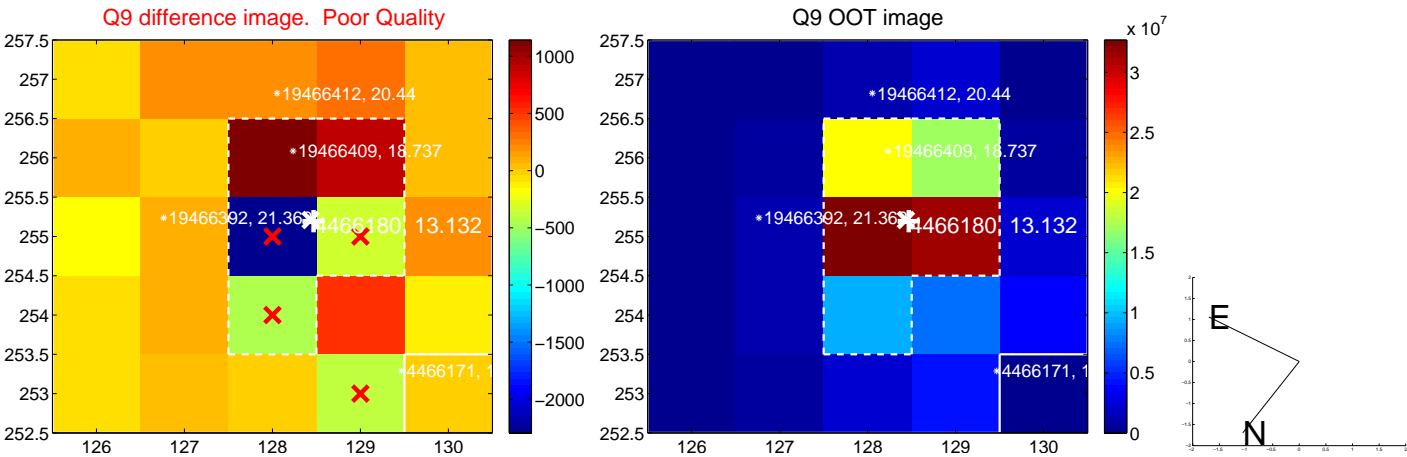


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

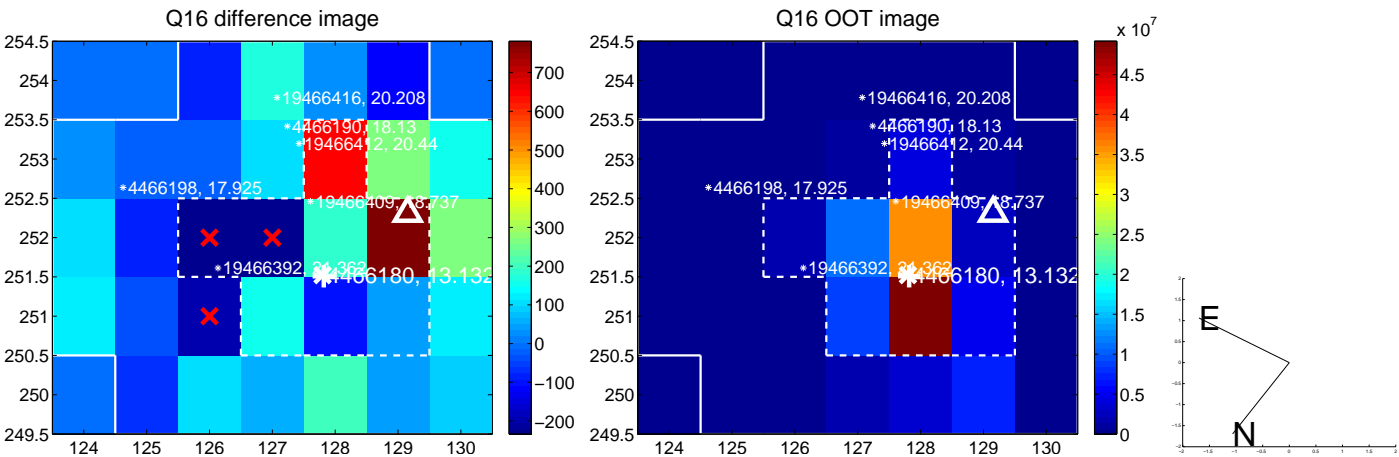
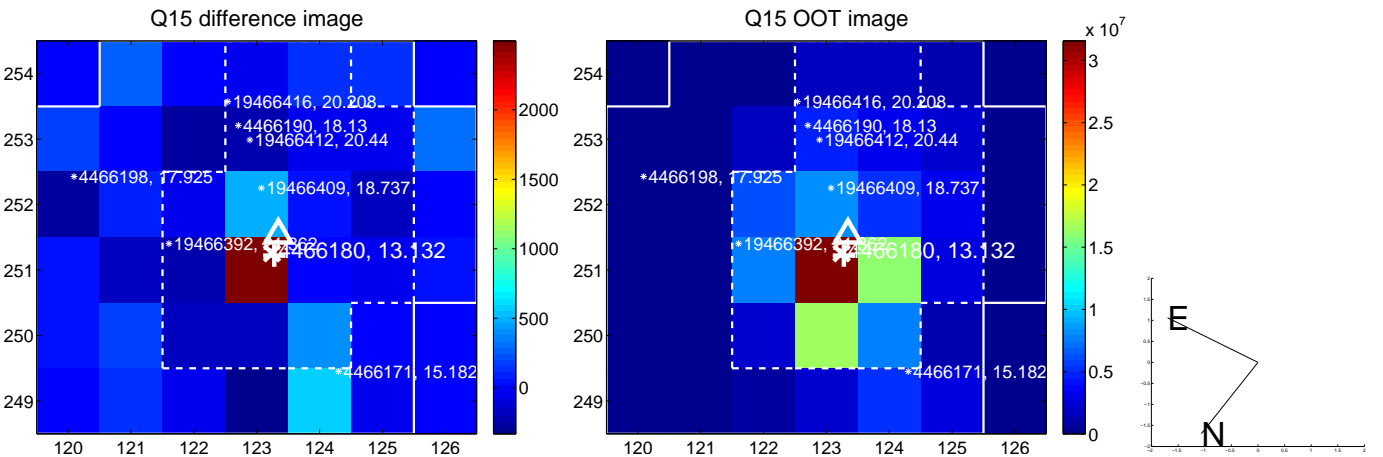
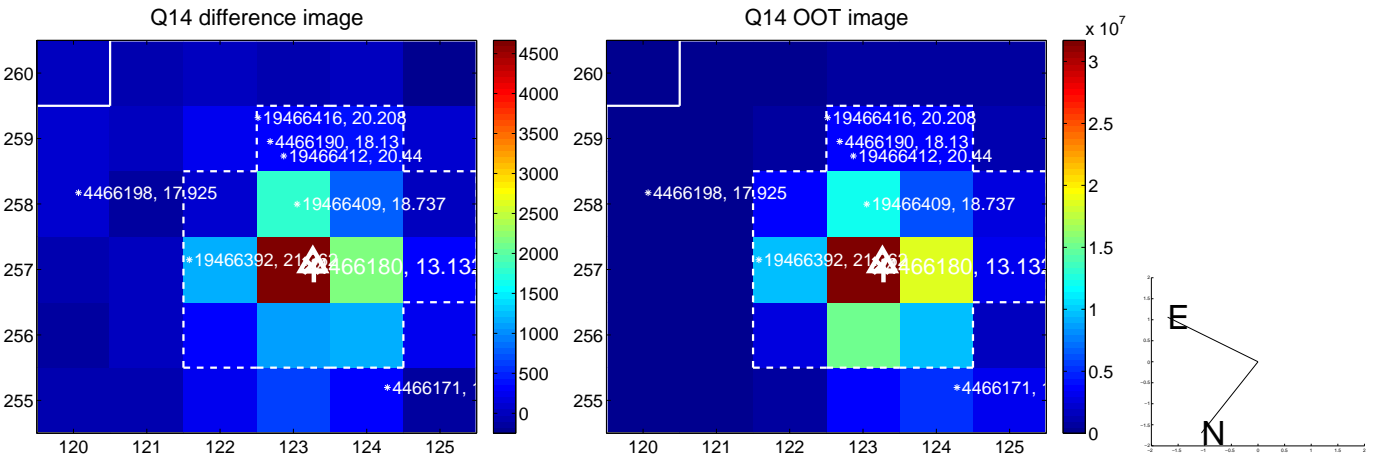
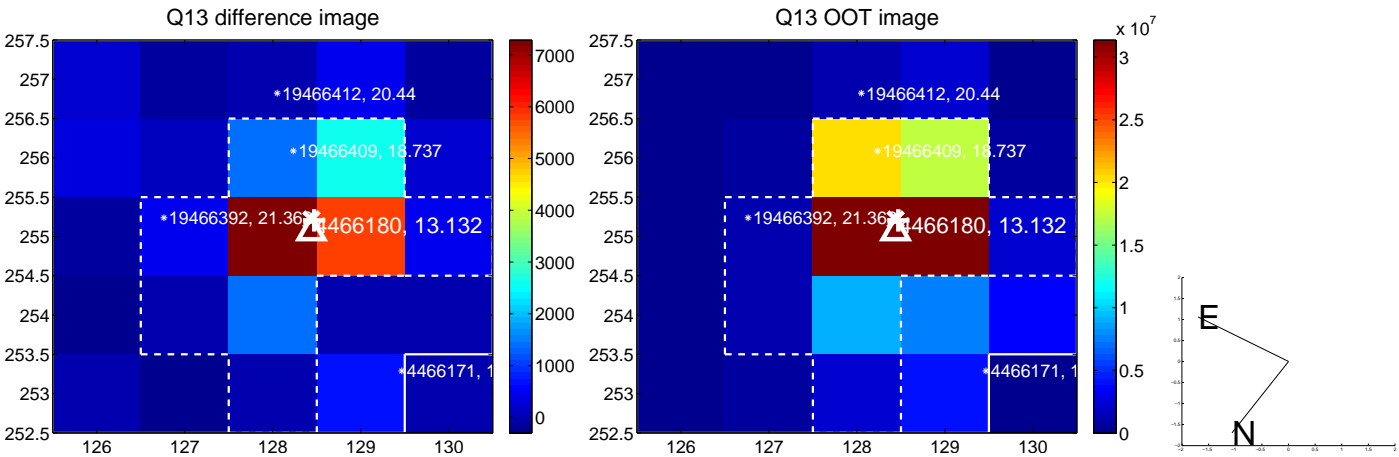




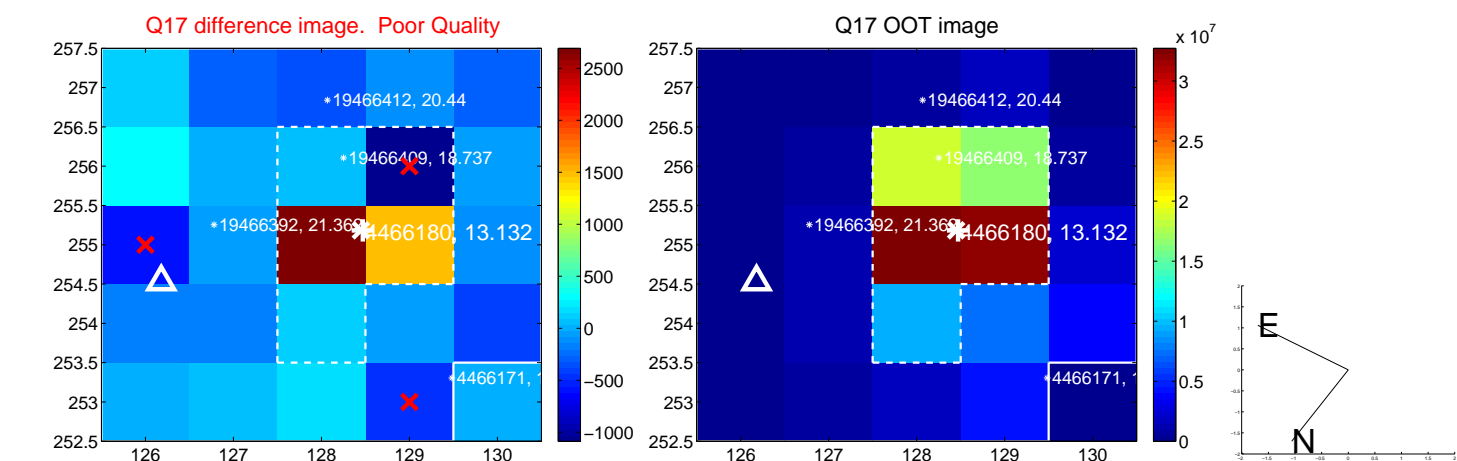
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



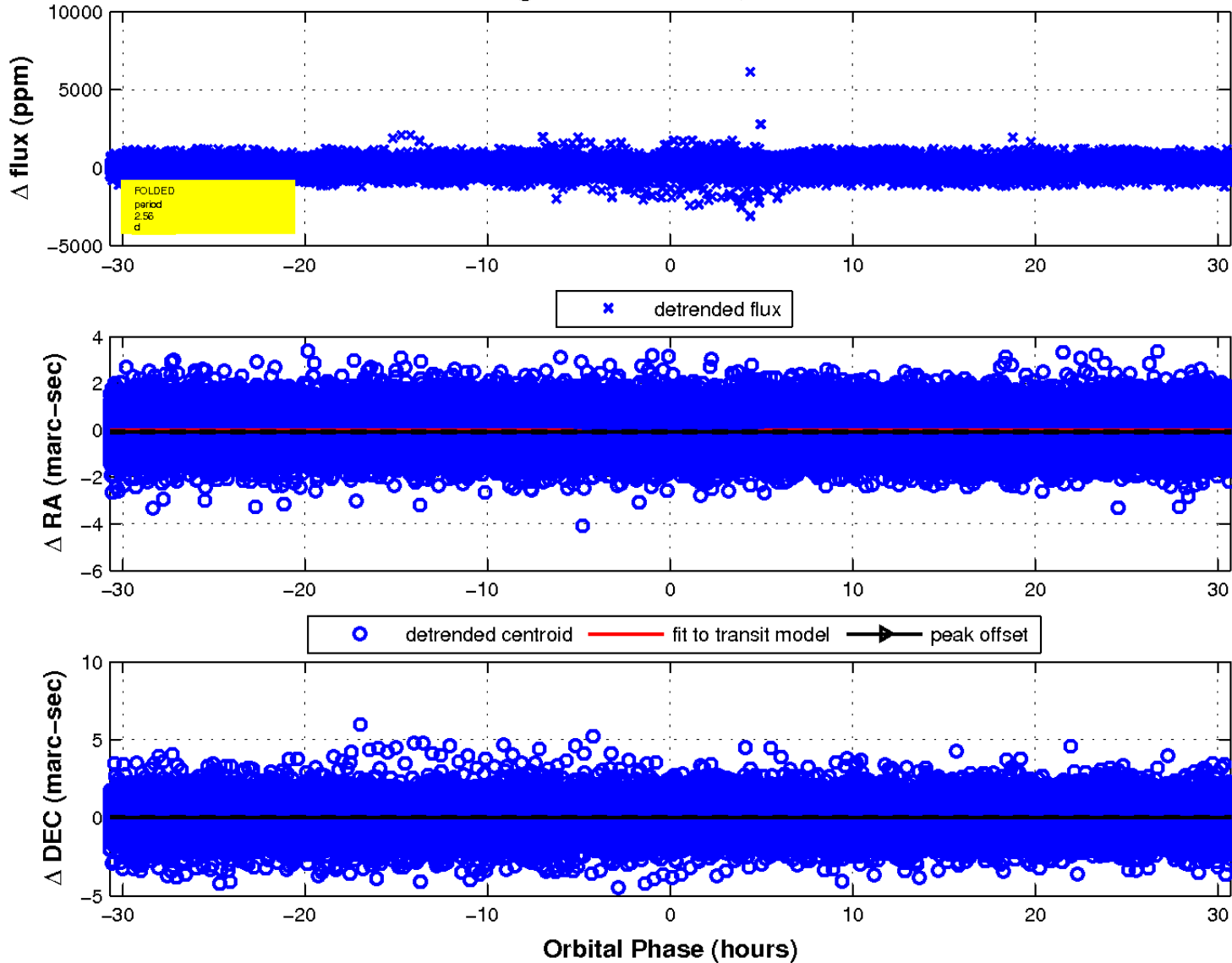
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

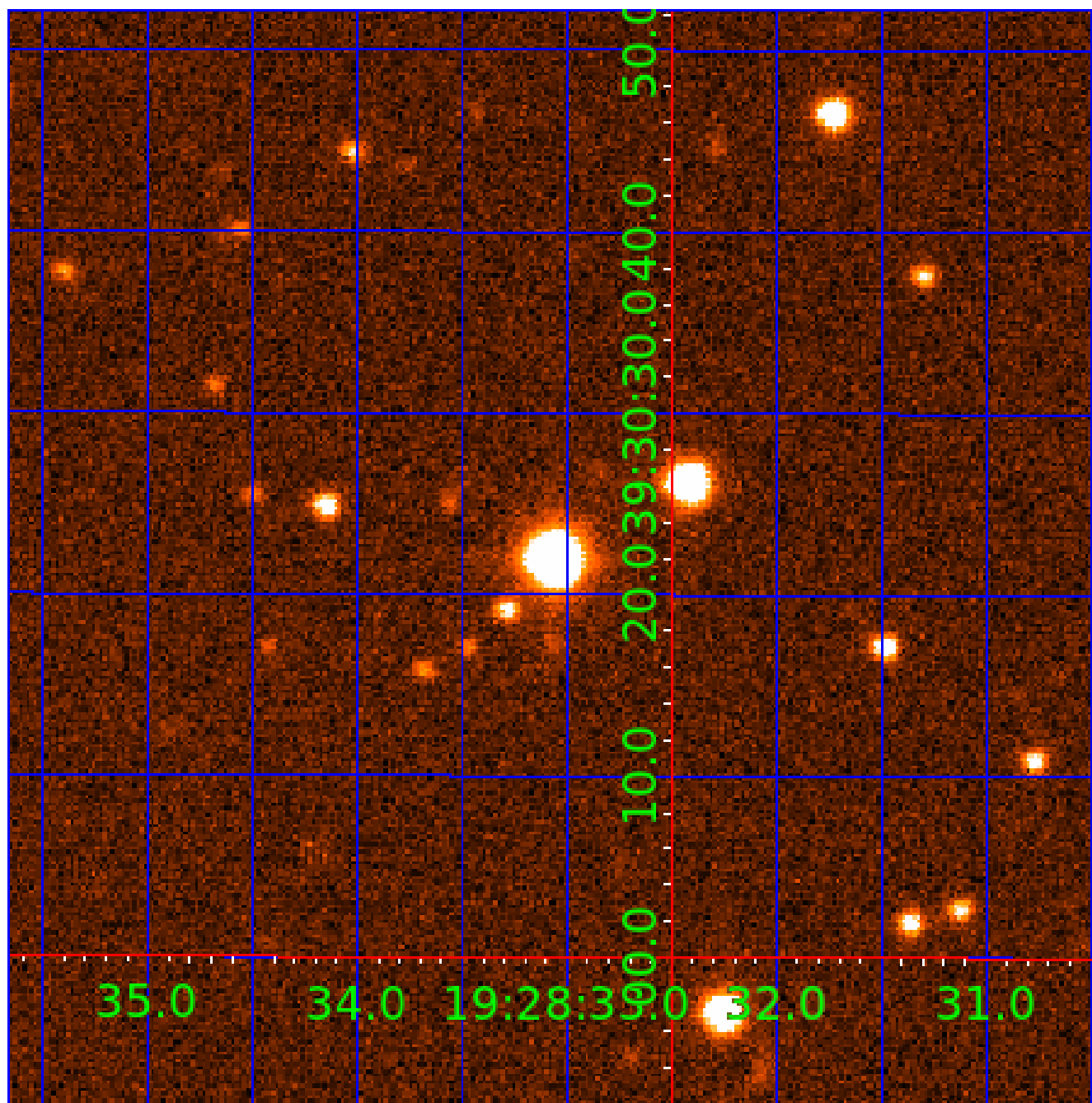


fluxWeightedCentroids, Planet 2 of 8



UKIRT Image

Declination



## KIC 004466180

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004466180-01	OBS	No	0.563995	131.917877	0.0	1.069	9.6	0.0	3.11	7082	0.06	81576.47
004466180-02	OBS	No	2.557937	131.728417	41.1	10.798	8.3	7.8	3.11	7082	2.31	10866.23
004466180-03	OBS	No	201.318912	216.340817	646.3	4.790	8.5	8.7	3.11	7082	10.50	32.22
004466180-04	OBS	No	396.401111	355.734254	652.9	4.954	8.8	9.2	3.11	7082	15.03	13.05
004466180-05	OBS	No	394.653041	160.968997	695.7	6.085	9.0	8.7	3.11	7082	15.48	13.13
004466180-06	OBS	No	253.765919	260.372249	475.7	5.518	8.6	7.3	3.11	7082	7.00	23.66
004466180-07	OBS	No	110.793636	151.348018	614.3	3.227	8.6	7.9	3.11	7082	10.85	71.44
004466180-08	OBS	No	160.634372	143.491195	50.6	3.598	9.0	0.8	3.11	7082	2.56	43.53

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004466180-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
004466180-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
004466180-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS
004466180-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT— MOD_POS_ALT—INCONSISTENT_TRANS
004466180-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT— MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004466180-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—TRANS_GAPPED—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT— MOD_TER_ALT—MOD_POS_ALT
004466180-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT— MOD_POS_ALT
004466180-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV— MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

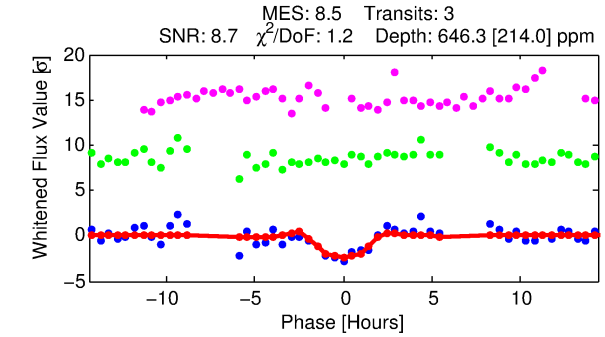
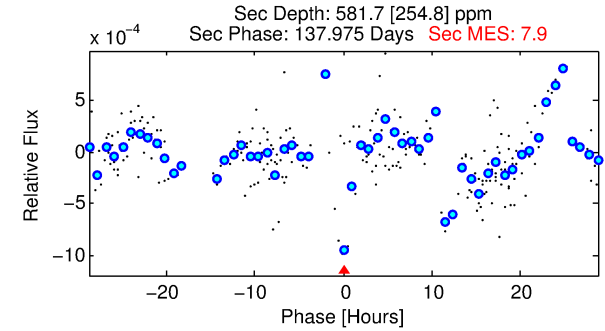
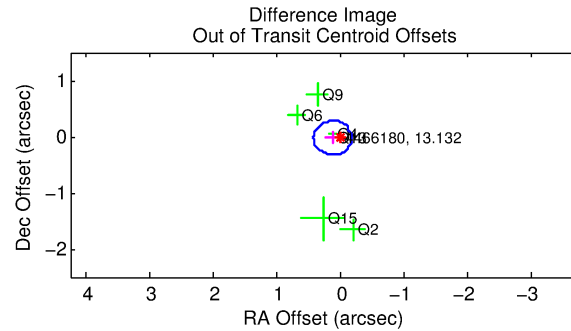
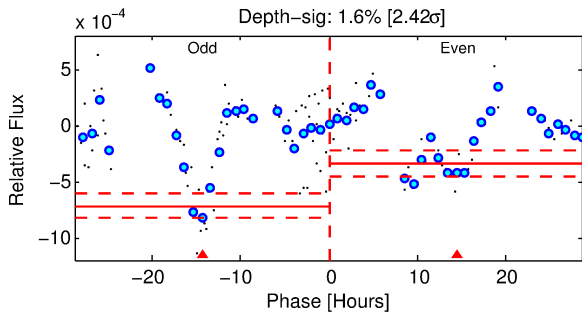
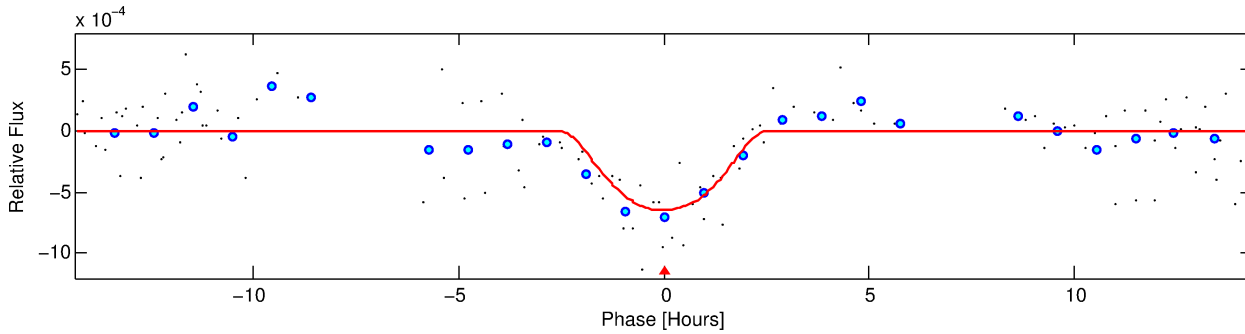
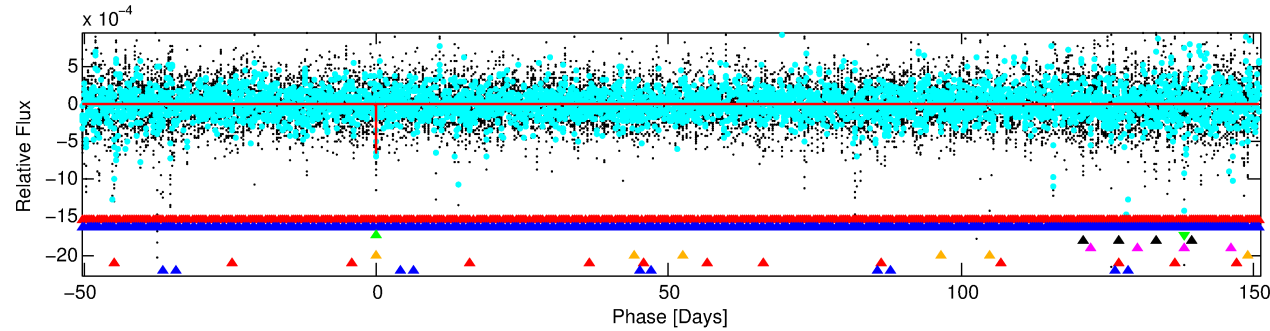
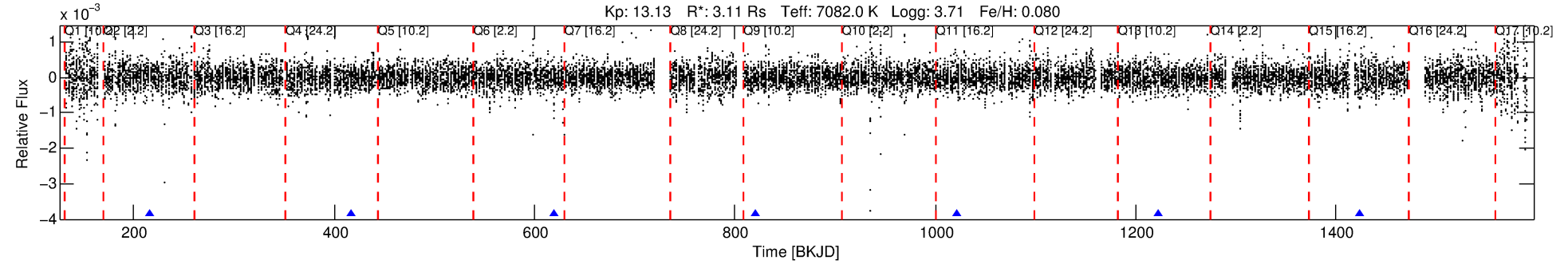
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 004466180-03

No Significant Match Found

# DV One-Page Summary

KIC: 4466180 Candidate: 3 of 8 Period: 201.319 d



## DV Fit Results:

Period = 201.31891 [0.00408] d  
Epoch = 216.3408 [0.0188] BKJD  
Rp/R\* = 0.0309 [0.0126]  
a/R\* = 107.65 [33.29]  
b = 0.97 [0.04]  
Seff = 32.22 [24.64]  
Teq = 608 [116] K  
Rp = 10.50 [6.42] Re  
a = 0.8223 [0.3744] AU  
Ag = 1962.77 [2332.21] [0.84 $\sigma$ ]  
Teffp = 6252 [1476] K [3.81 $\sigma$ ]

## DV Diagnostic Results:

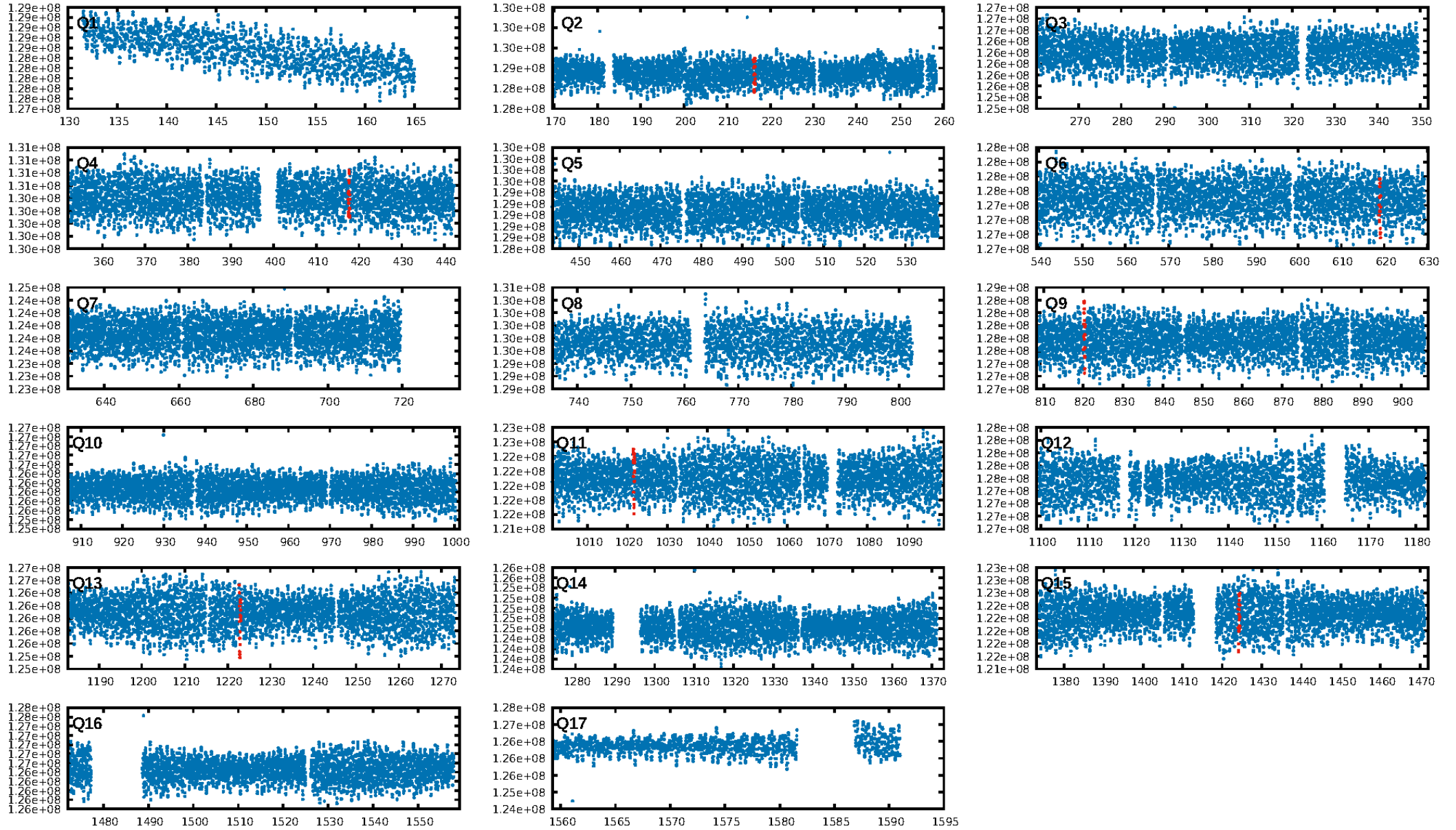
ShortPeriod-sig: 100.0% [162.99 $\sigma$ ]  
LongPeriod-sig: 100.0% [172.26 $\sigma$ ]  
ModelChiSquare2-sig: 0.4%  
ModelChiSquareGof-sig: 85.3%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: -1.083  
Centroid-sig: 86.8%  
Centroid-so: 0.471 arcsec [0.86 $\sigma$ ]  
OotOffset-rm: 0.128 arcsec [1.28 $\sigma$ ]  
OotOffset-st: 2/1/1/2 [6]  
KicOffset-rm: 0.031 arcsec [0.14 $\sigma$ ]  
KicOffset-st: 2/1/1/2 [6]  
DiffImageQuality-fgm: 0.50 [3/6]  
DiffImageOverlap-fno: 0.00 [0/6]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 05:54:29 Z

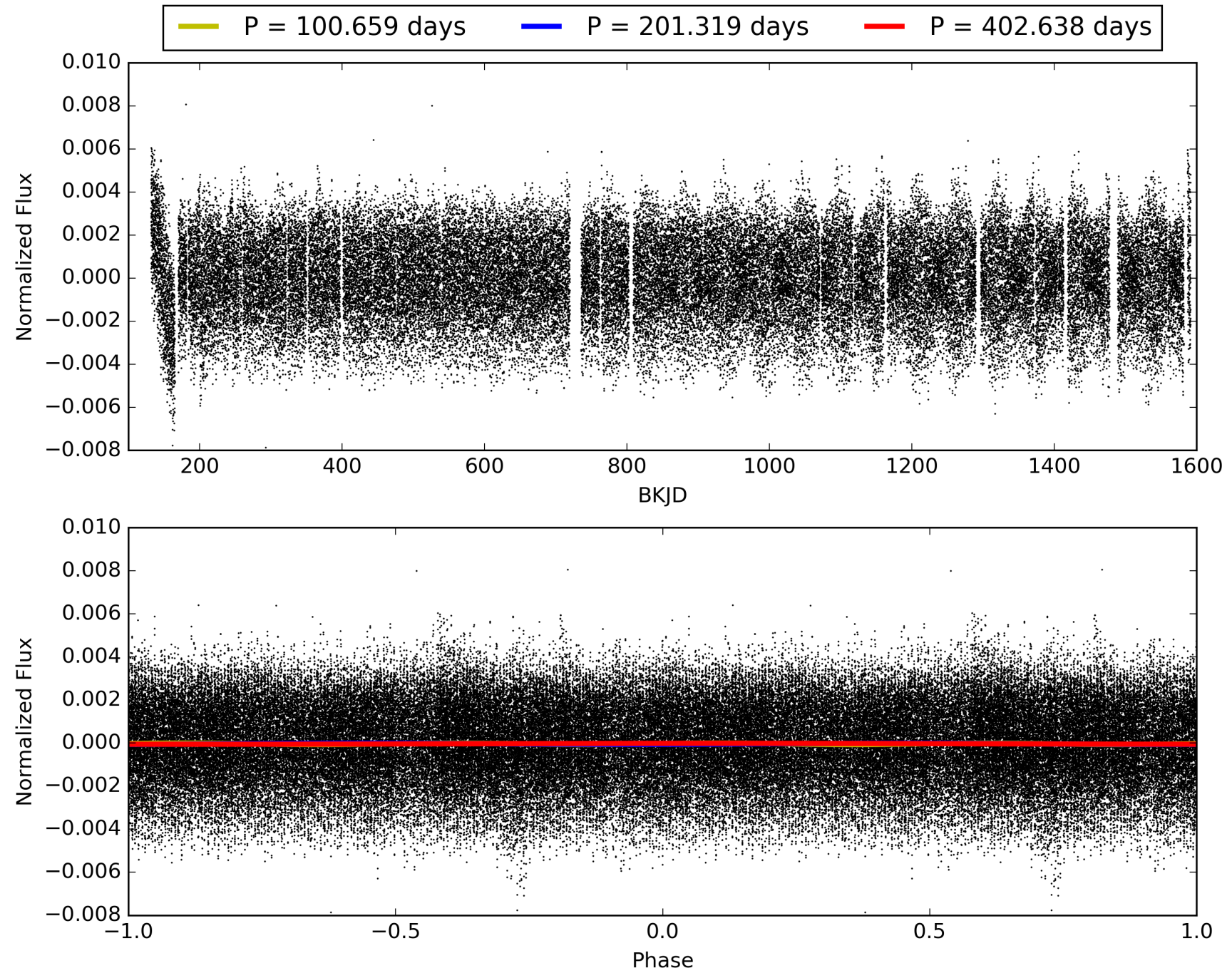
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 004466180-03, PDC Light Curves

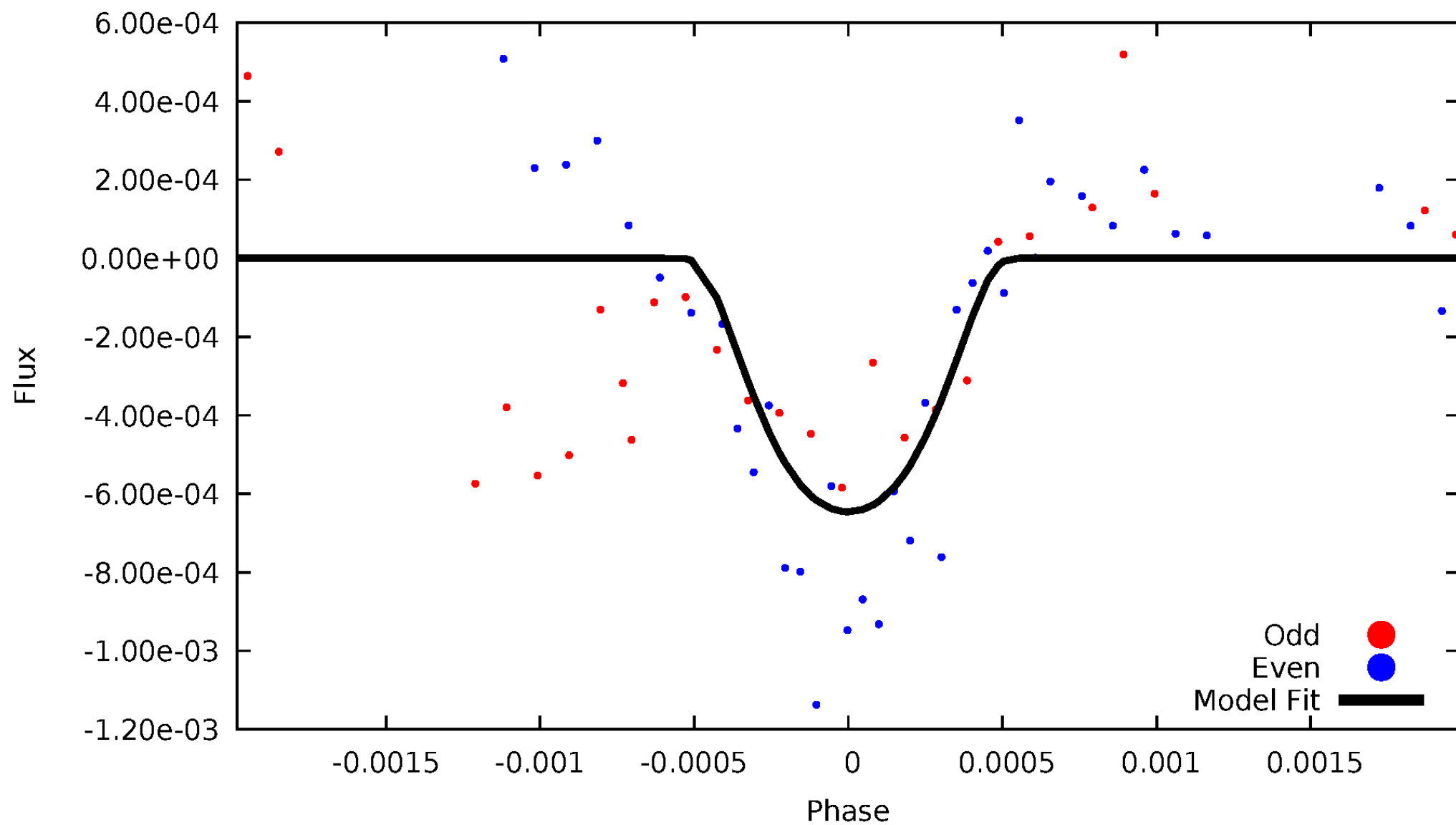


TCE 004466180-03



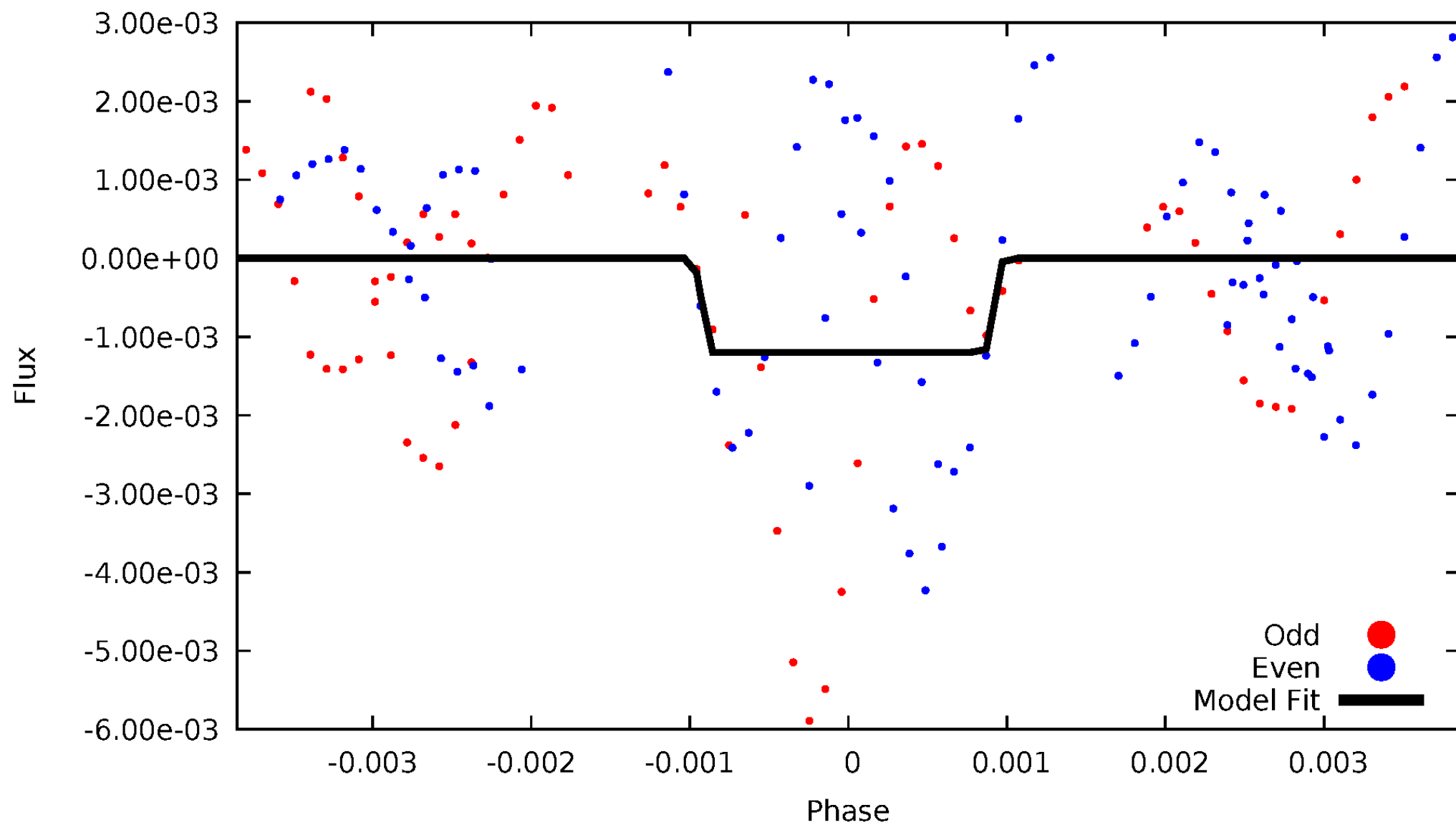
# DV Odd/Even

TCE 004466180-03



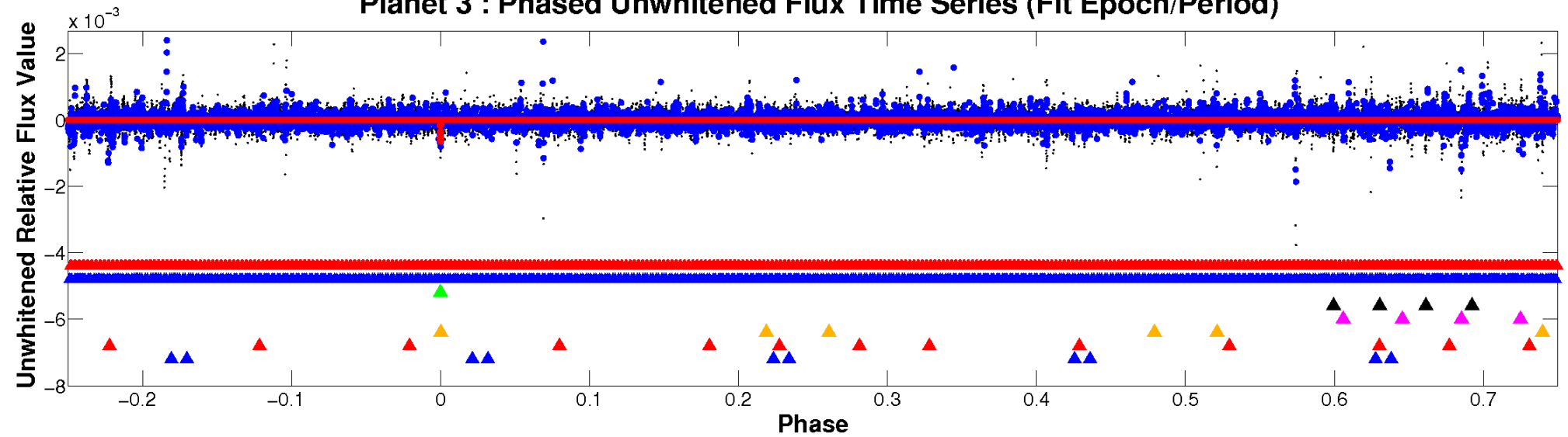
# ALT Odd/Even

TCE 004466180-03

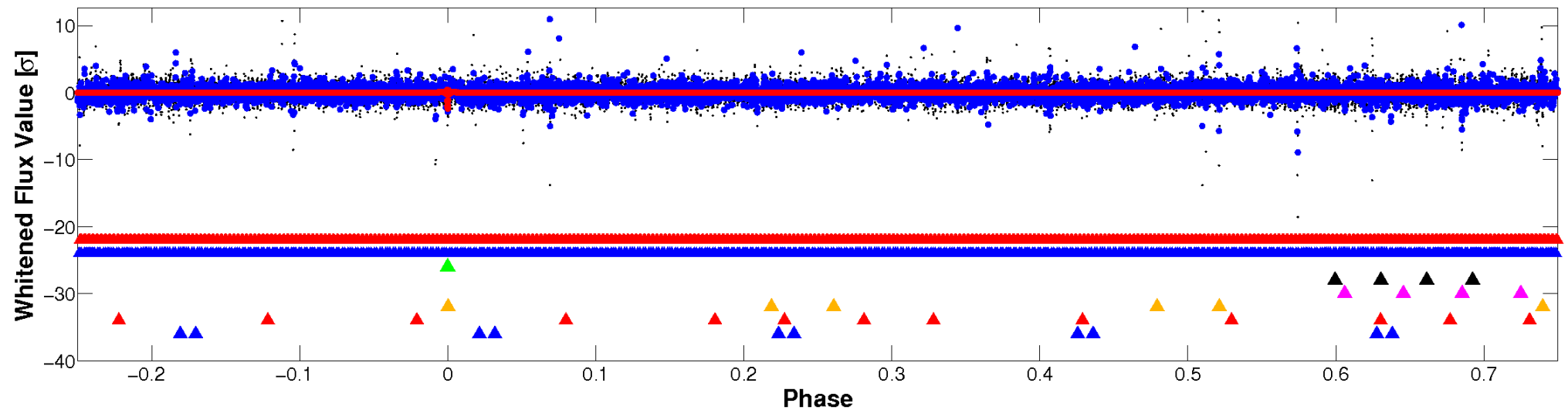


# Non-Whitened Vs. Whitened Light Curve

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

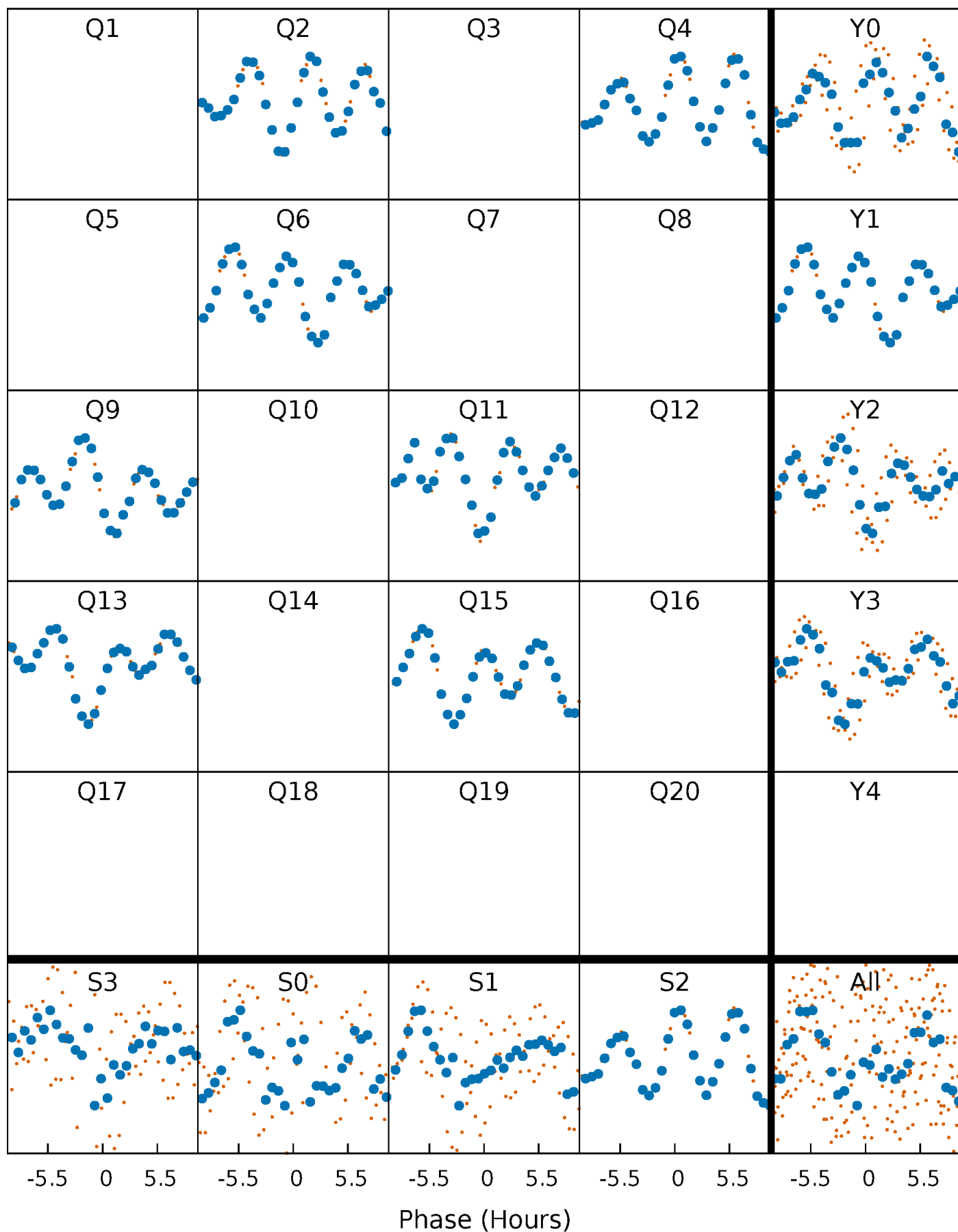


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

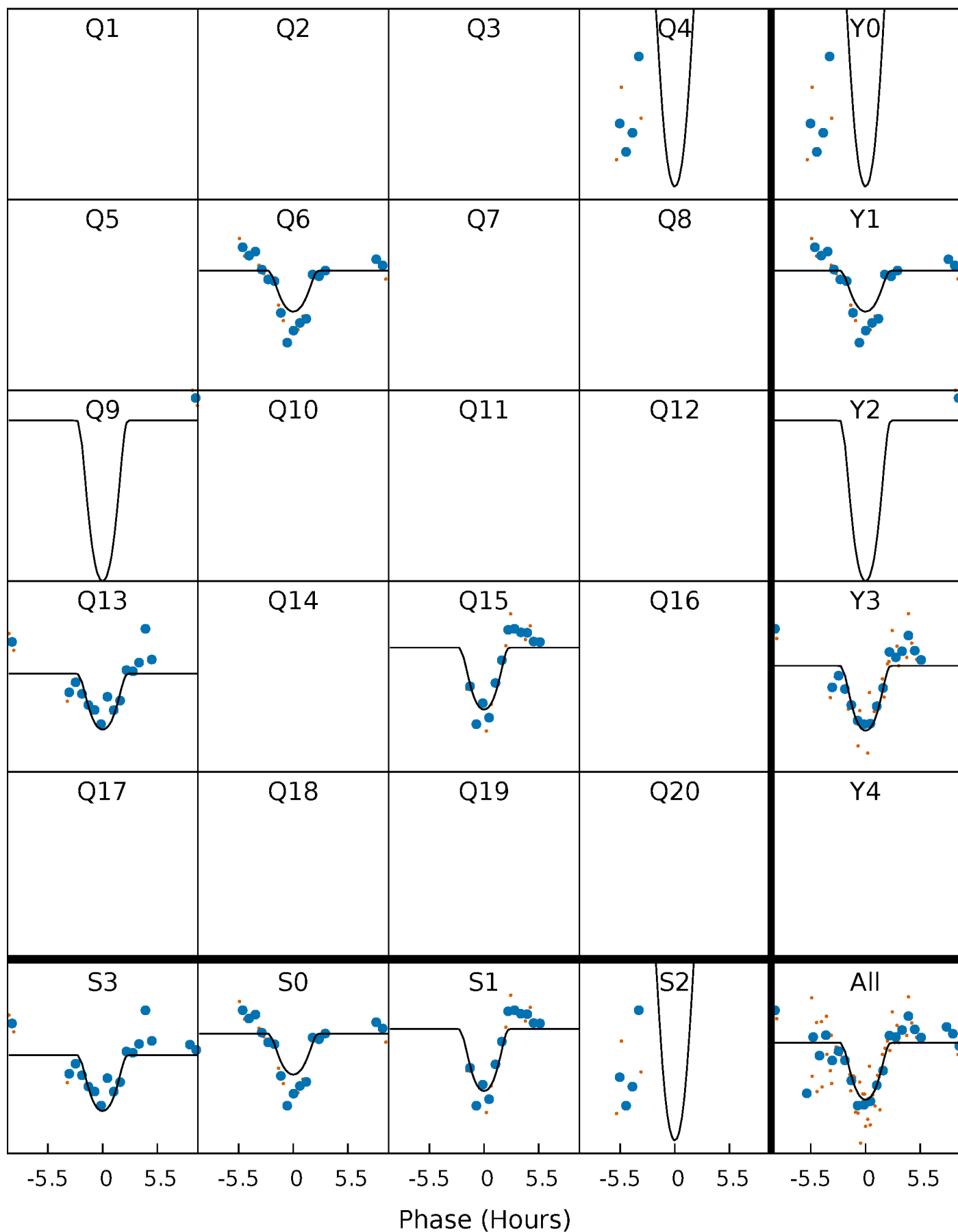
TCE 004466180-03 P=201.318912 Days  $T_0=216.340816$  (BKJD)





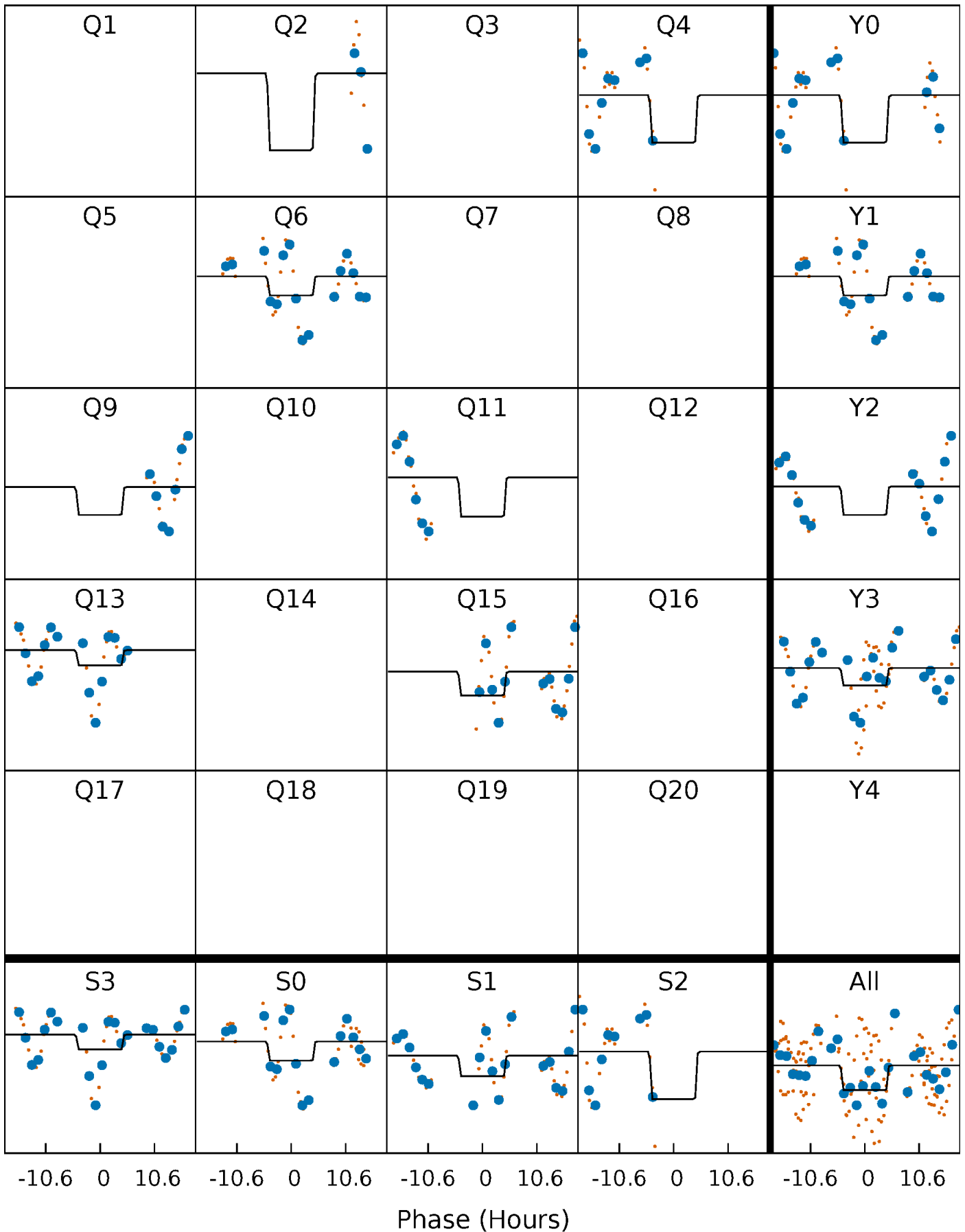
# DV Quarter-Phased Transit Curves

TCE 004466180-03 P=201.318912 Days  $T_0=216.340816$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

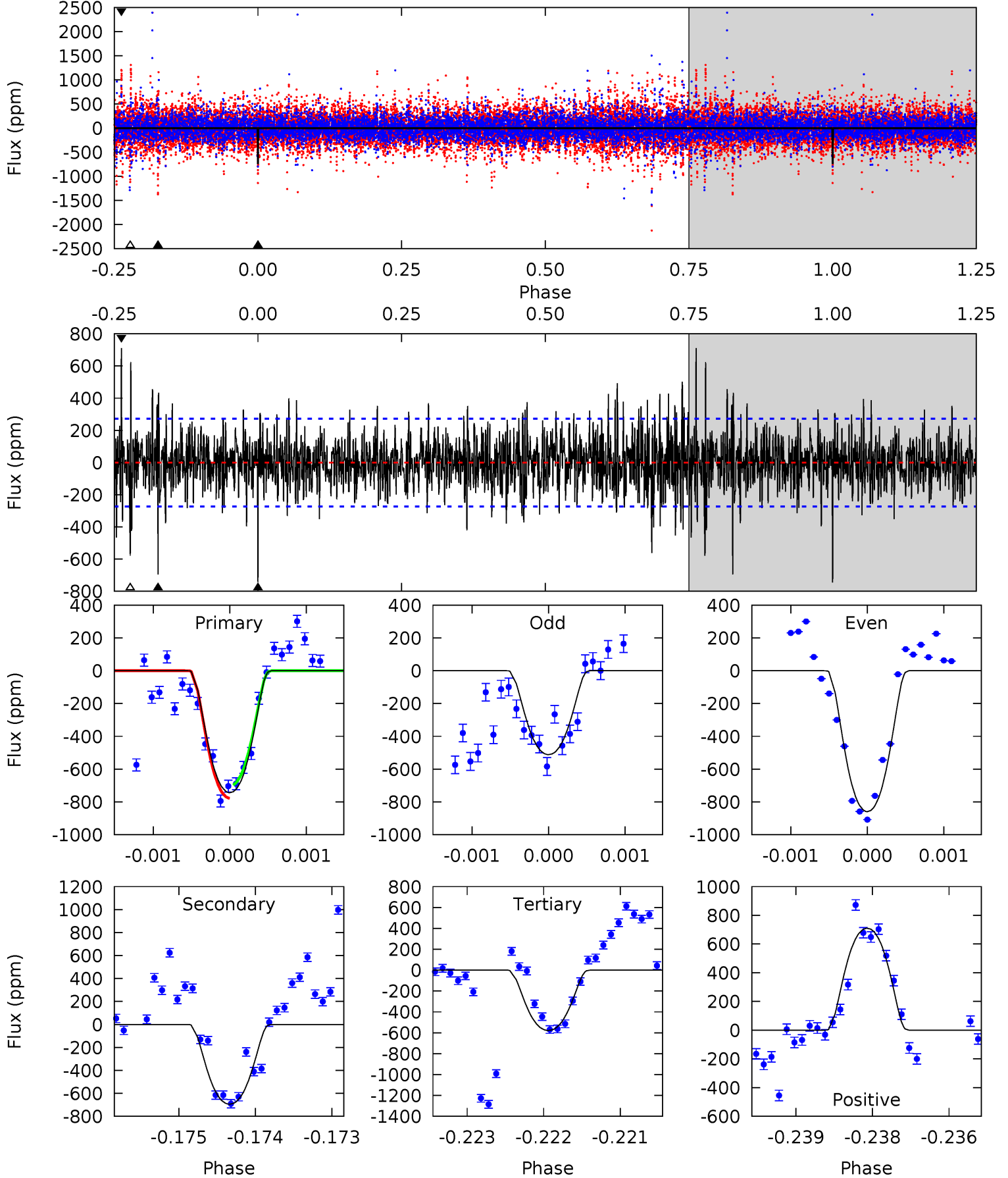
TCE 004466180-03 P=201.312373 Days  $T_0=216.357491$  (BKJD)



# DV Model-Shift Uniqueness Test

004466180-03, P = 201.318912 Days, E = 15.021904 Days

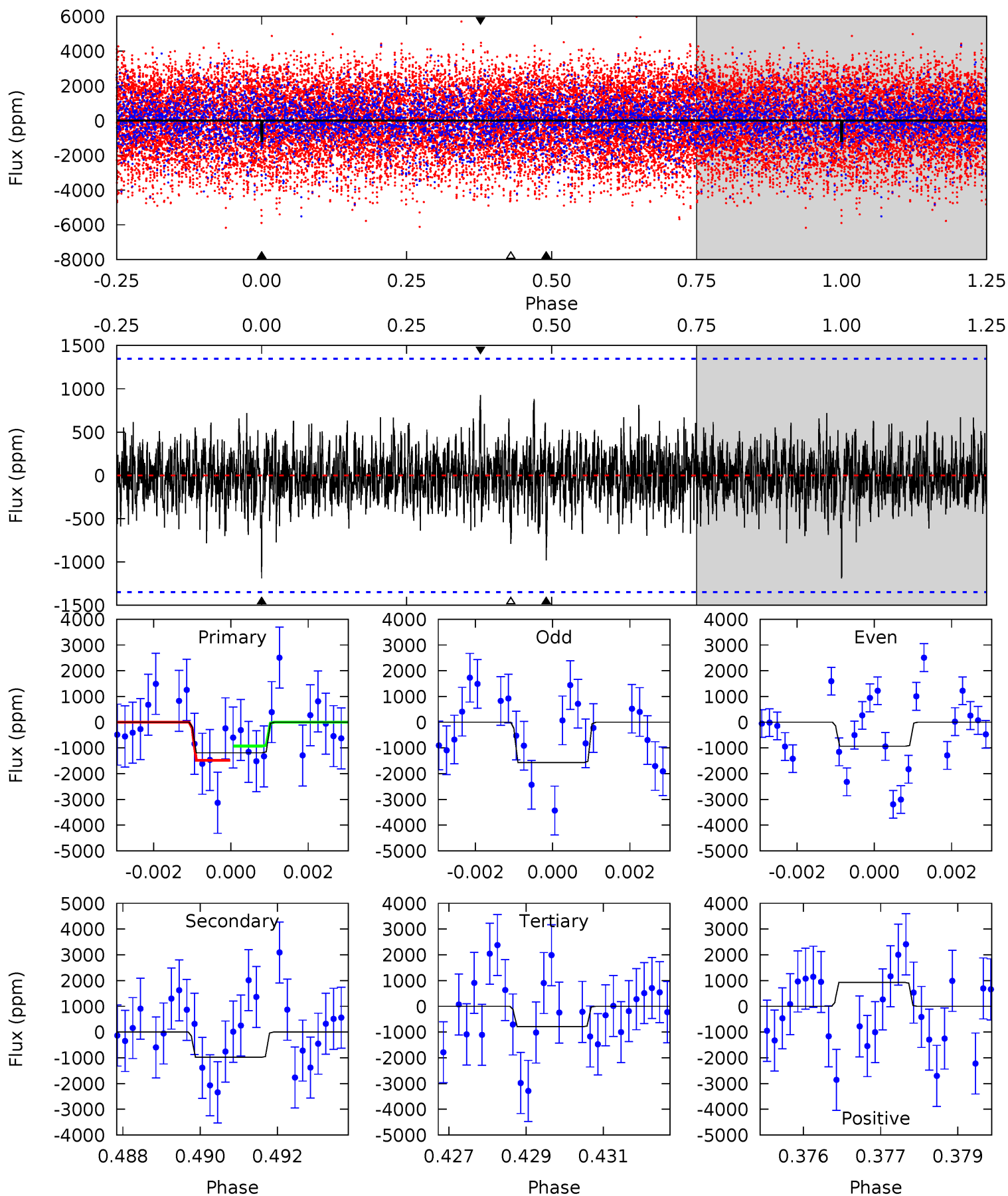
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.9	13.9	11.5	14.2	5.45	3.29	2.74	3.31	0.68	2.33	-0.30	3.28	1.06	0.49	0.81



# Alt Model-Shift Uniqueness Test

004466180-03, P = 201.312373 Days, E = 15.045118 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
4.70	3.88	3.13	3.67	5.34	3.10	0.92	1.57	1.03	0.75	0.20	1.23	0.97	0.44	1.10



### Stellar Parameters For KIC 004466180

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$\rho_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7082^{+195}_{-318}$	$3.715^{+0.442}_{-0.078}$	$0.080^{+0.200}_{-0.300}$	$3.109^{+0.472}_{-1.416}$	$1.828^{+0.179}_{-0.418}$	$0.086^{+0.349}_{-0.021}$
	+3%/-4%	+12%/-2%	+250%/-375%	+15%/-46%	+10%/-23%	+407%/-24%
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 004466180-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-695 \pm 50$	$9.24^{+4.80}_{-4.24}$	$818^{+57}_{-89}$	$6491^{+2646}_{-1071}$	$2978^{+6807}_{-1656}$
Alt.	$-980 \pm 253$	$10.32^{+4.38}_{-4.31}$	$817^{+58}_{-98}$	$6692^{+2041}_{-1009}$	$3293^{+6335}_{-1676}$

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

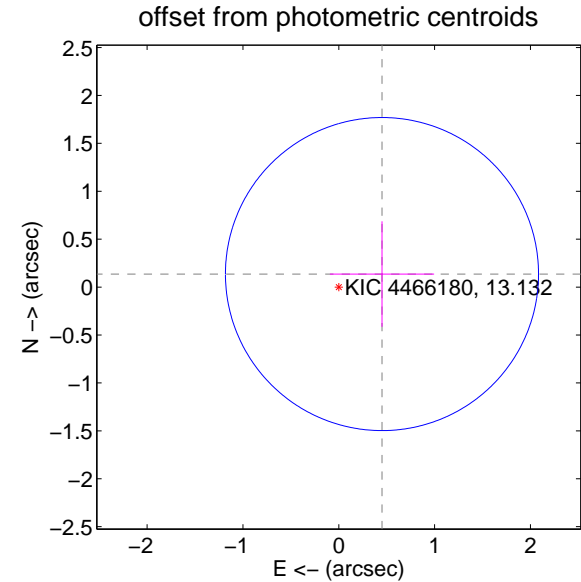
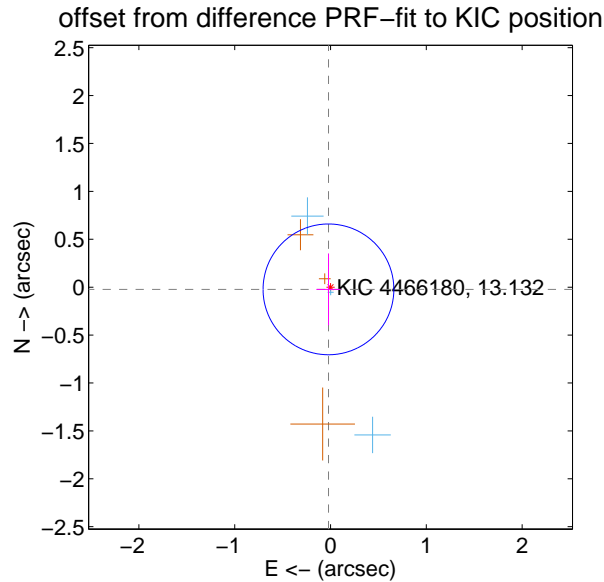
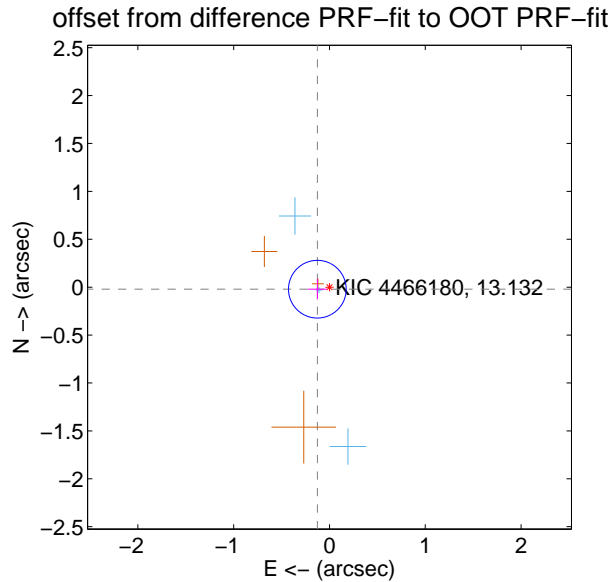
## DV Centroid Data

Supplemental centroid analysis for 004466180-03. Kepler magnitude: 13.13. Transit SNR 8.68

There are 3 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

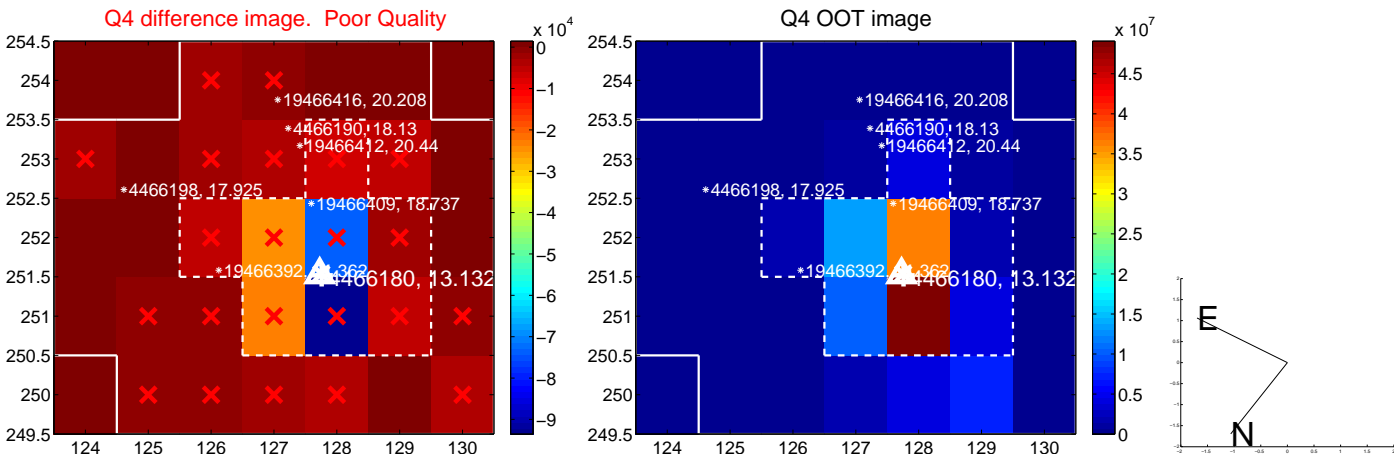
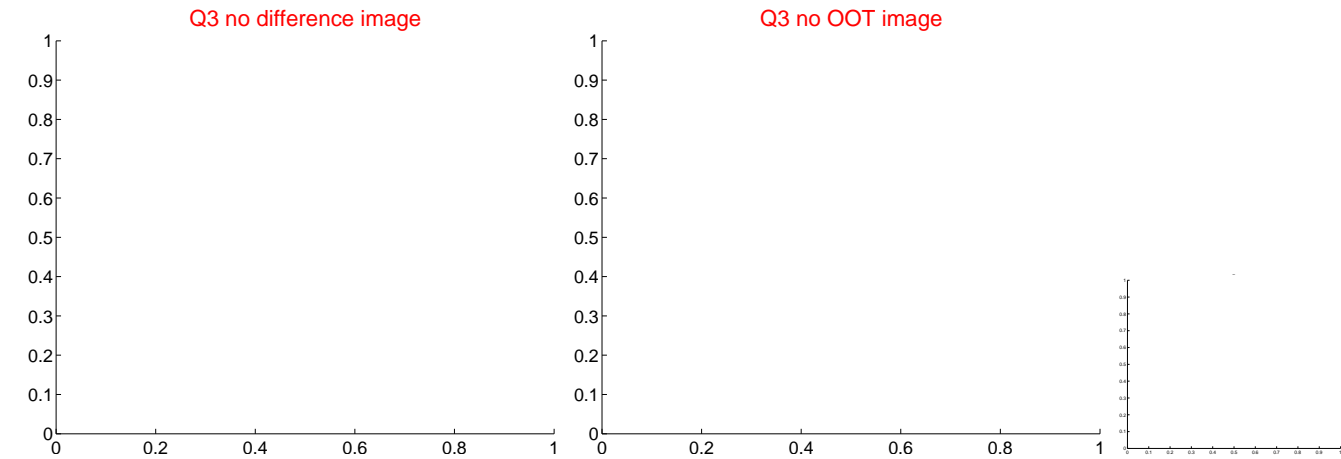
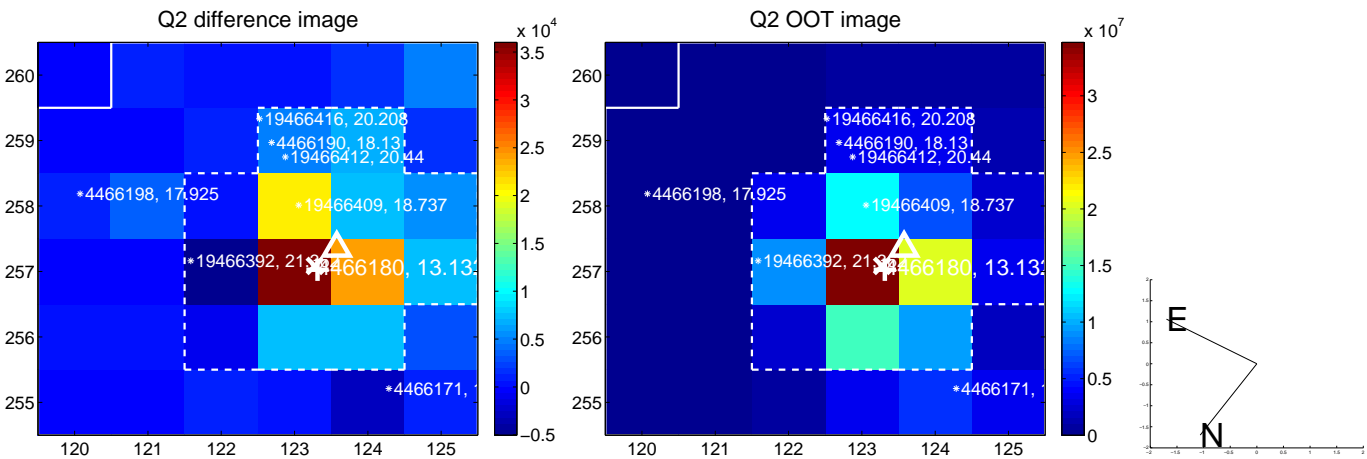
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.128 \pm 0.100$	1.28	$0.127 \pm 0.100$	$-0.021 \pm 0.107$
PRF-fit source offset from KIC position	$0.031 \pm 0.227$	0.14	$0.021 \pm 0.126$	$-0.023 \pm 0.375$
photometric centroid source offset	$0.47 \pm 0.54$	0.86	$-0.45 \pm 0.54$	$0.14 \pm 0.55$



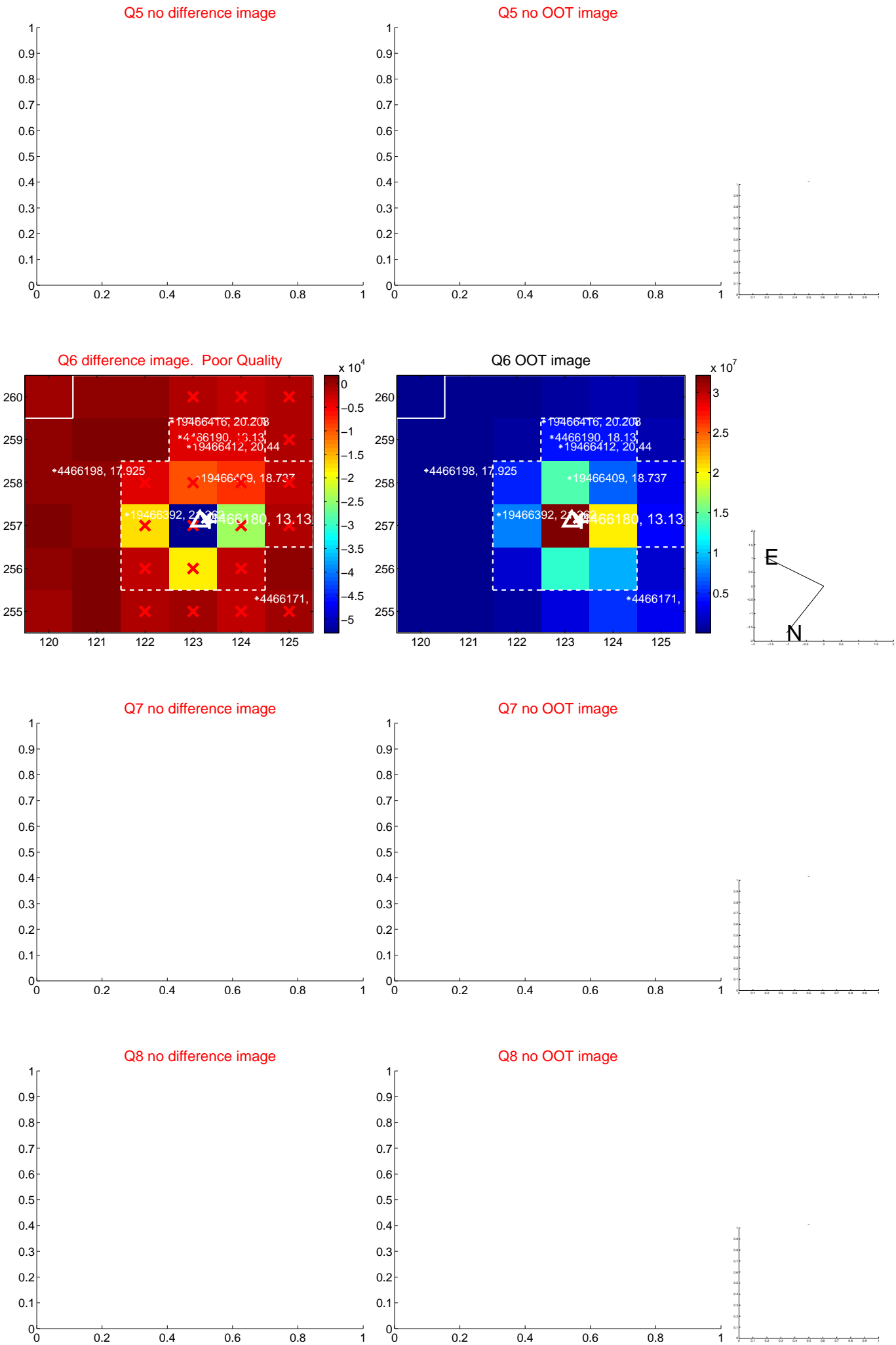
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



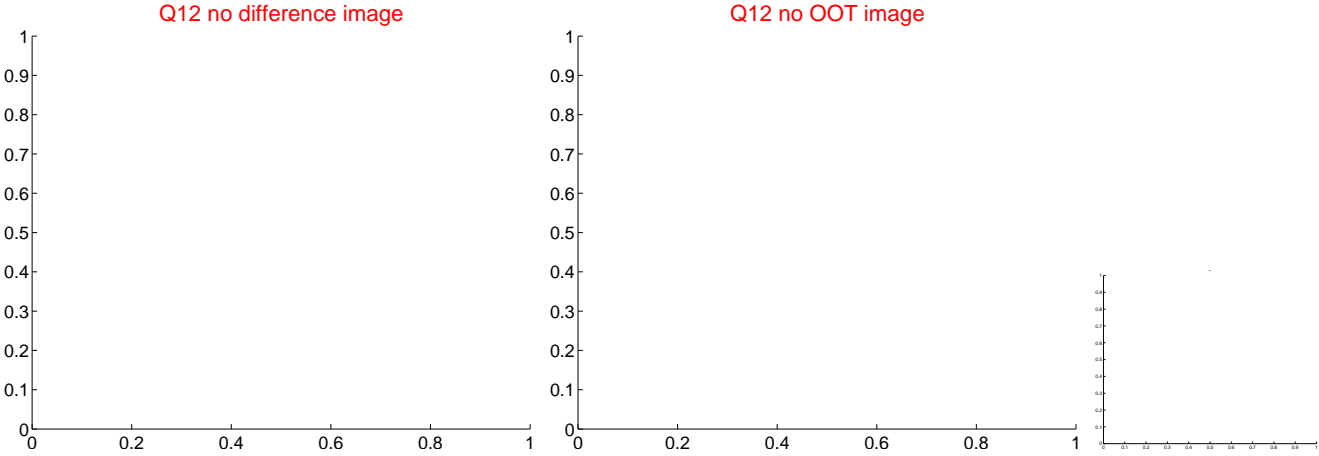
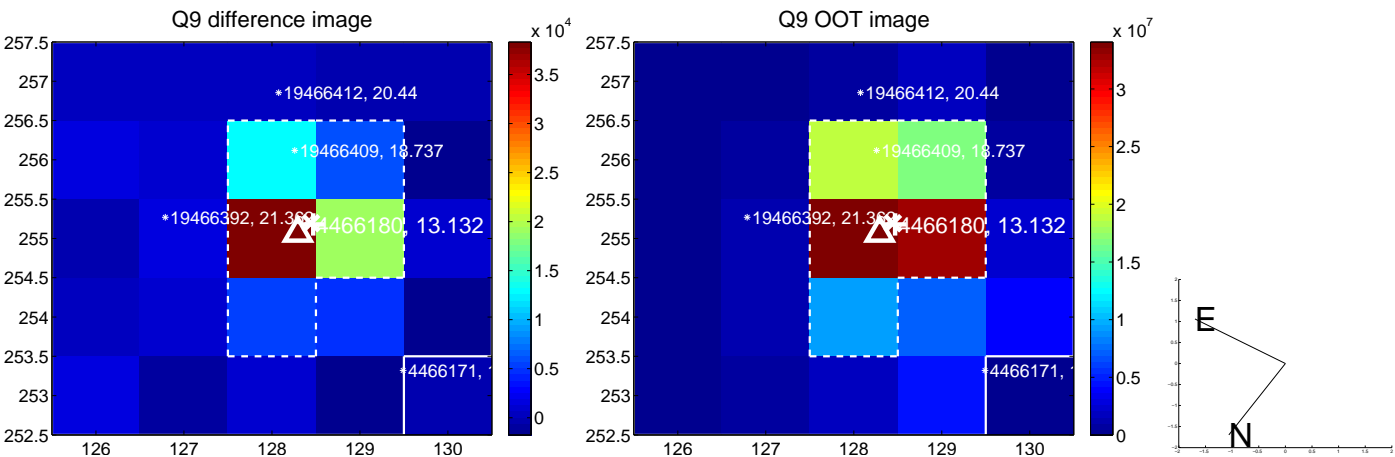
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



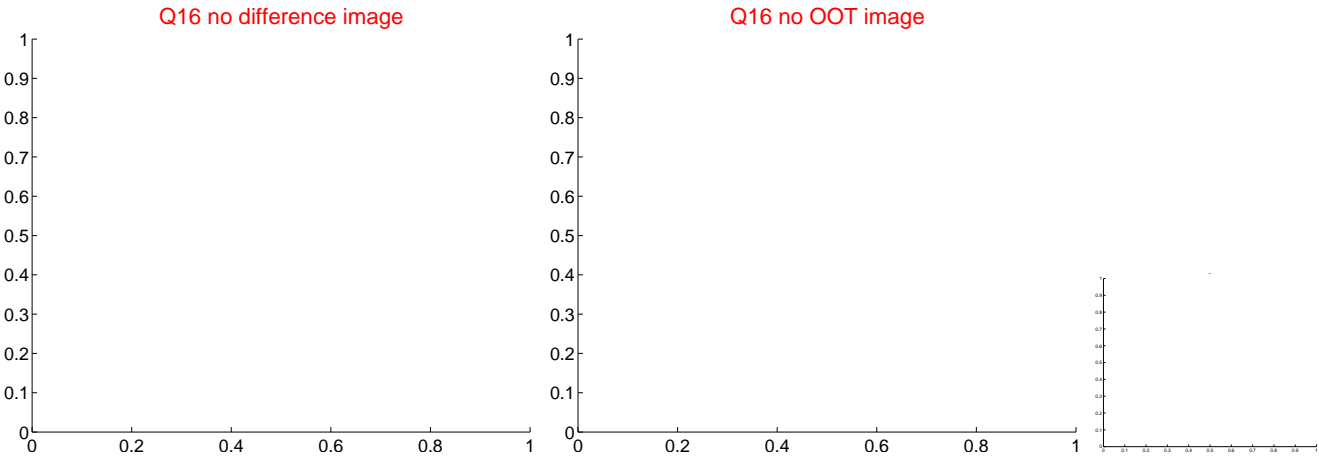
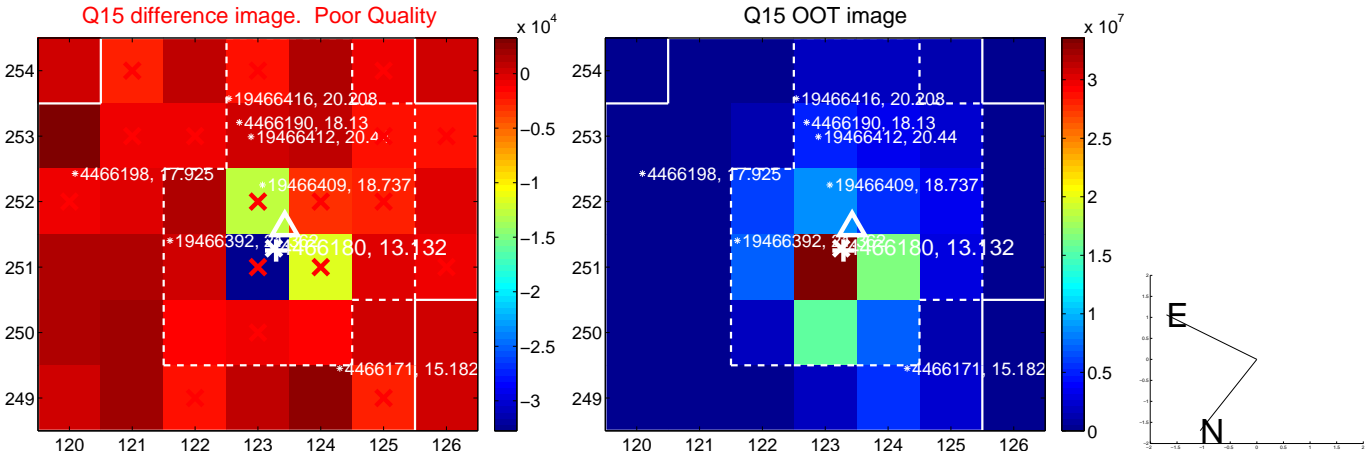
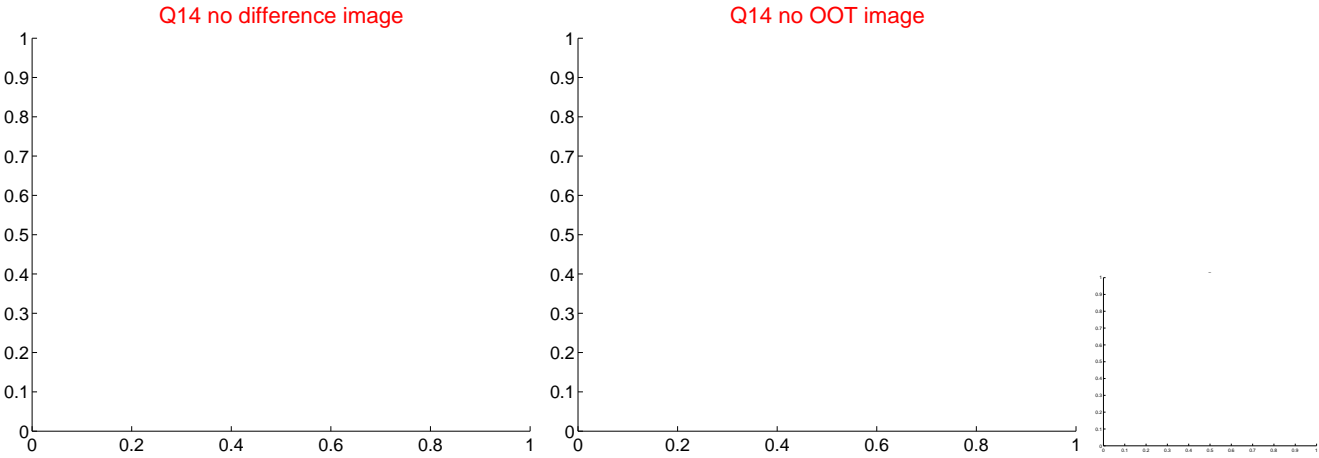
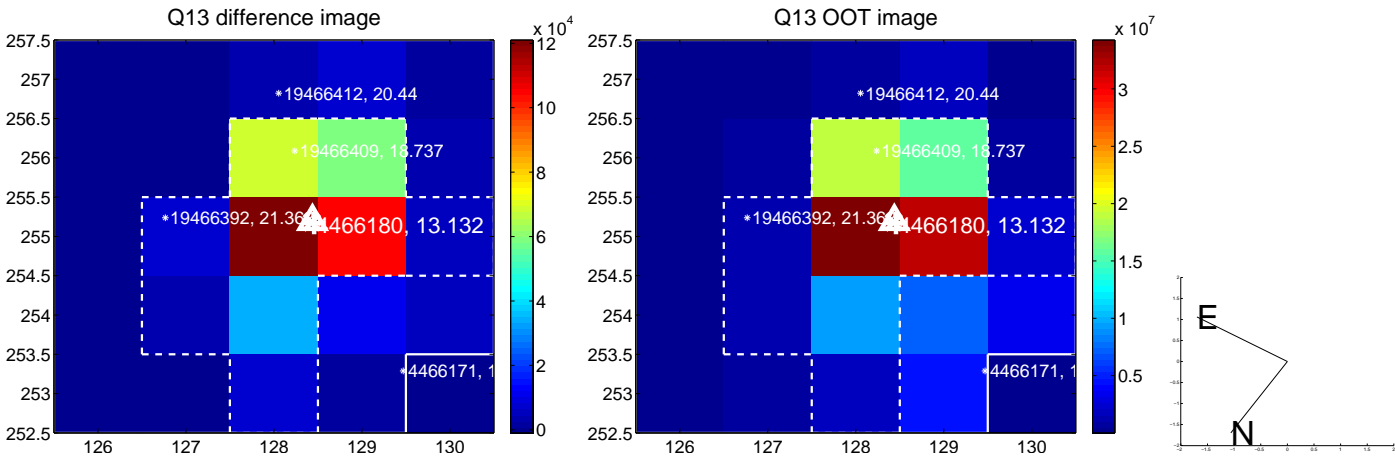
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



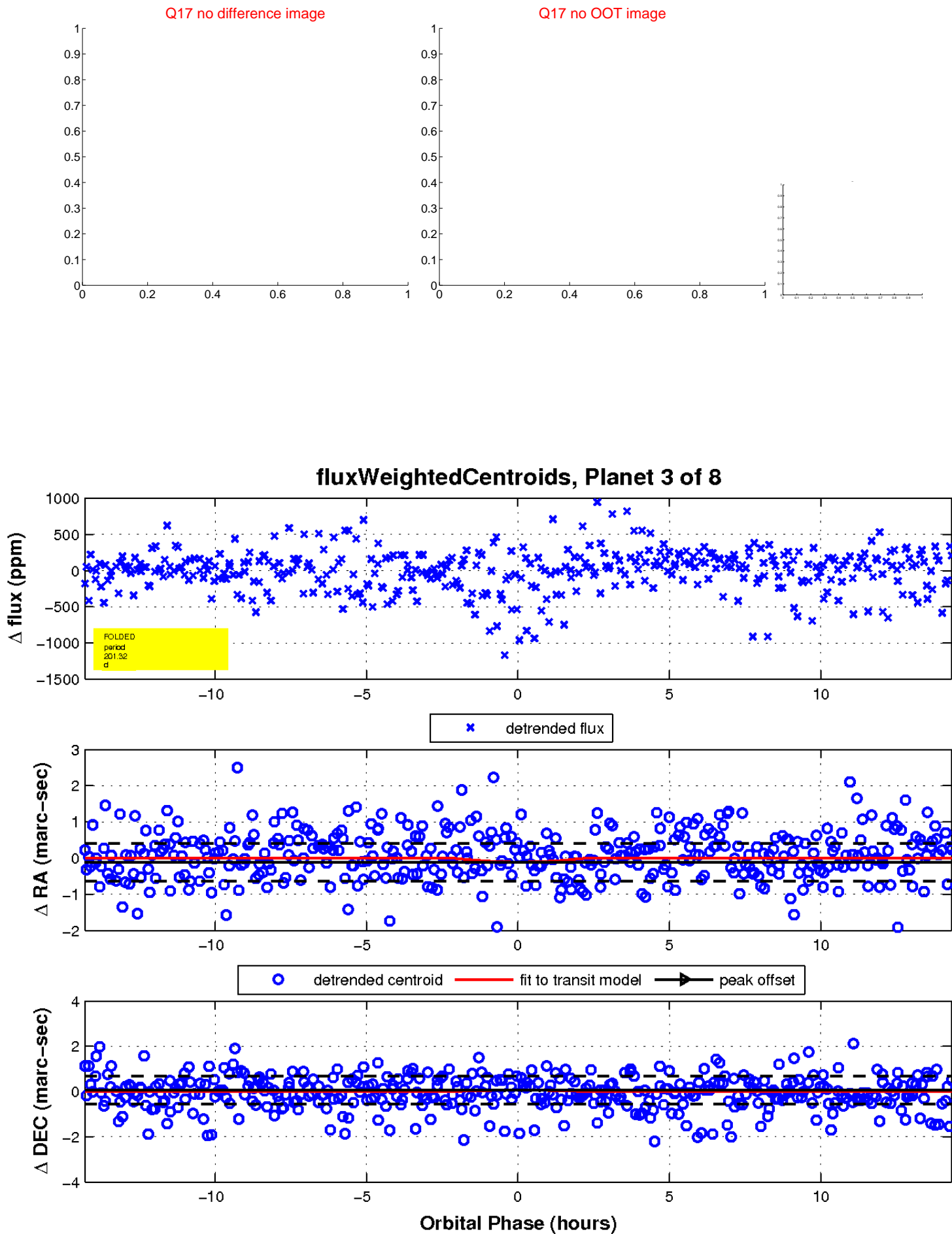
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



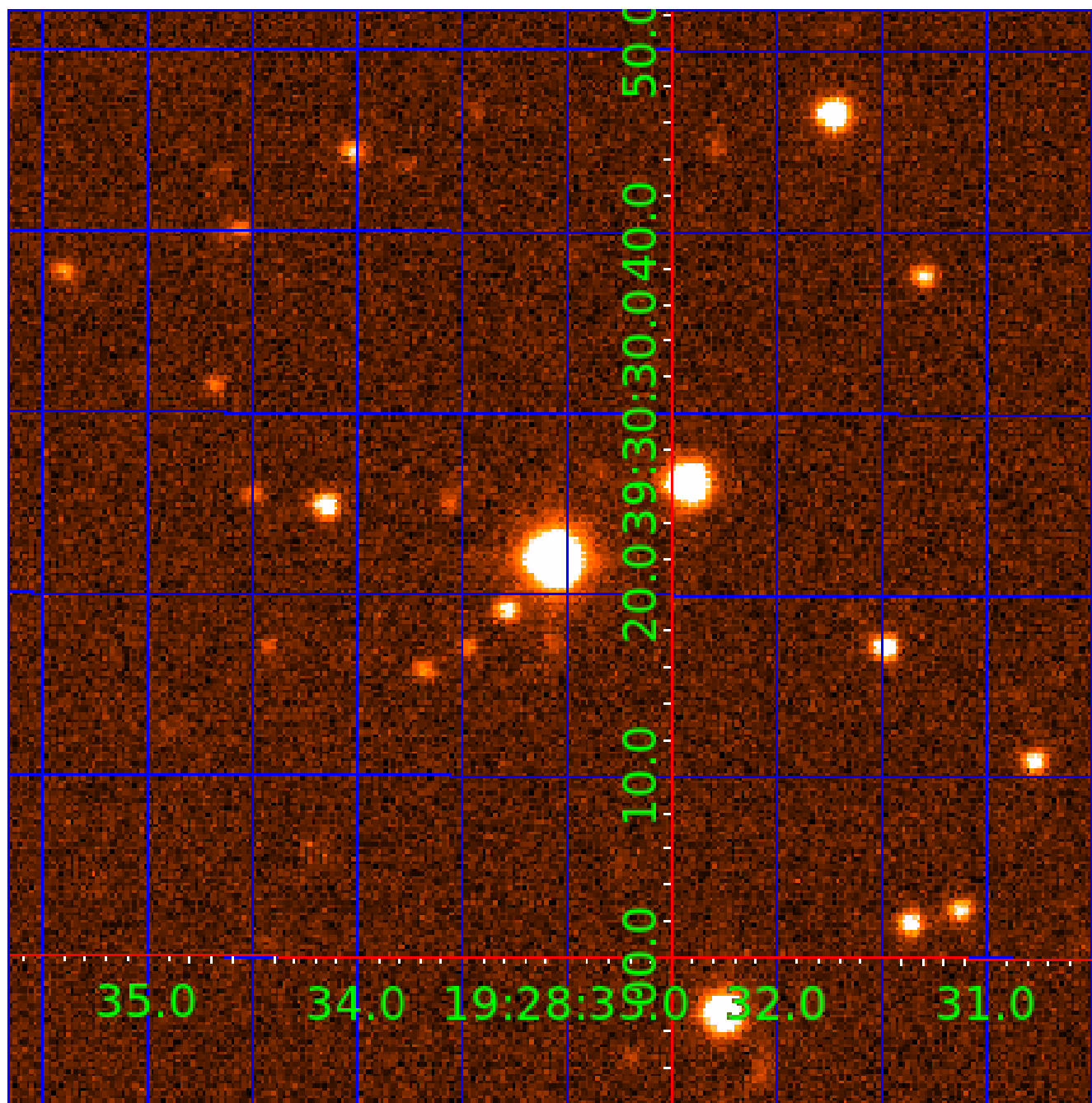
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image

Declination



## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004466180-01	OBS	No	0.563995	131.917877	0.0	1.069	9.6	0.0	3.11	7082	0.06	81576.47
004466180-02	OBS	No	2.557937	131.728417	41.1	10.798	8.3	7.8	3.11	7082	2.31	10866.23
004466180-03	OBS	No	201.318912	216.340817	646.3	4.790	8.5	8.7	3.11	7082	10.50	32.22
004466180-04	OBS	No	396.401111	355.734254	652.9	4.954	8.8	9.2	3.11	7082	15.03	13.05
004466180-05	OBS	No	394.653041	160.968997	695.7	6.085	9.0	8.7	3.11	7082	15.48	13.13
004466180-06	OBS	No	253.765919	260.372249	475.7	5.518	8.6	7.3	3.11	7082	7.00	23.66
004466180-07	OBS	No	110.793636	151.348018	614.3	3.227	8.6	7.9	3.11	7082	10.85	71.44
004466180-08	OBS	No	160.634372	143.491195	50.6	3.598	9.0	0.8	3.11	7082	2.56	43.53

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004466180-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
004466180-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
004466180-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS
004466180-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT— MOD_POS_ALT—INCONSISTENT_TRANS
004466180-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT— MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004466180-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—TRANS_GAPPED—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT— MOD_TER_ALT—MOD_POS_ALT
004466180-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT— MOD_POS_ALT
004466180-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV— MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

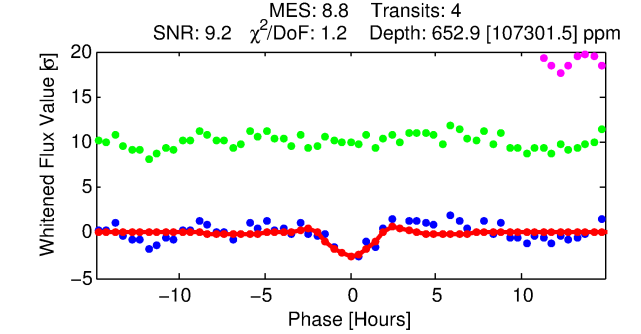
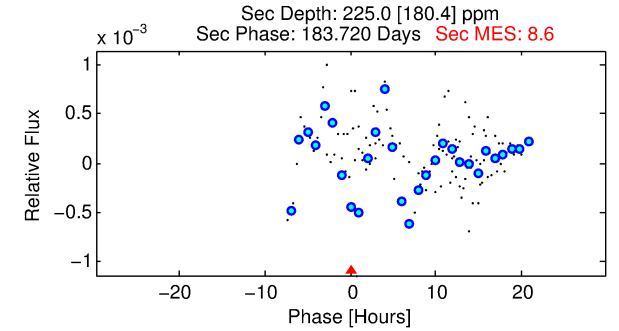
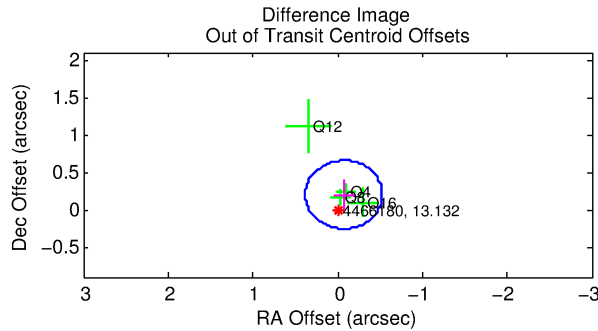
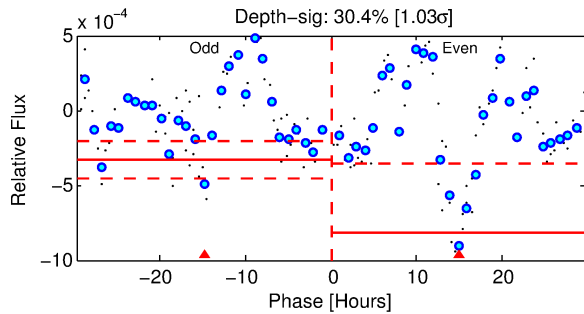
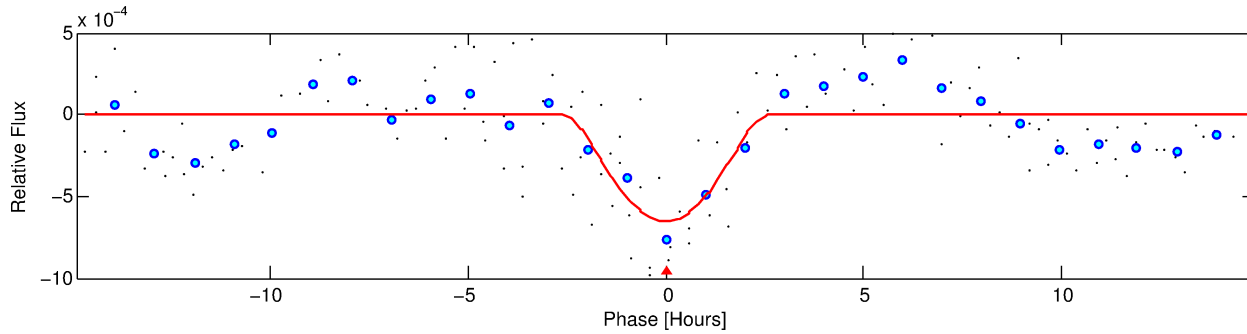
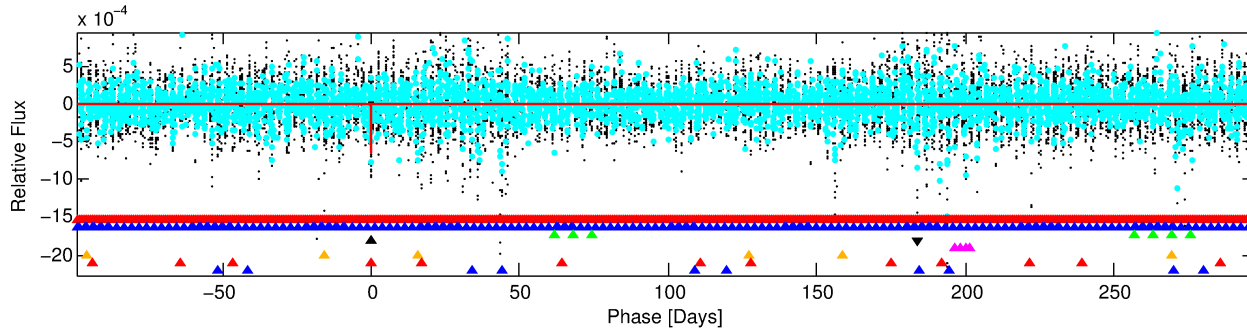
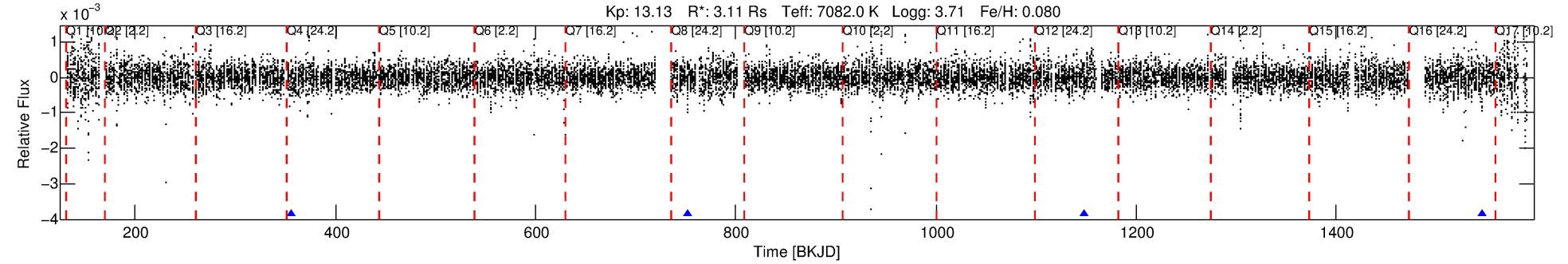
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 004466180-04

No Significant Match Found

# DV One-Page Summary

KIC: 4466180 Candidate: 4 of 8 Period: 396.401 d



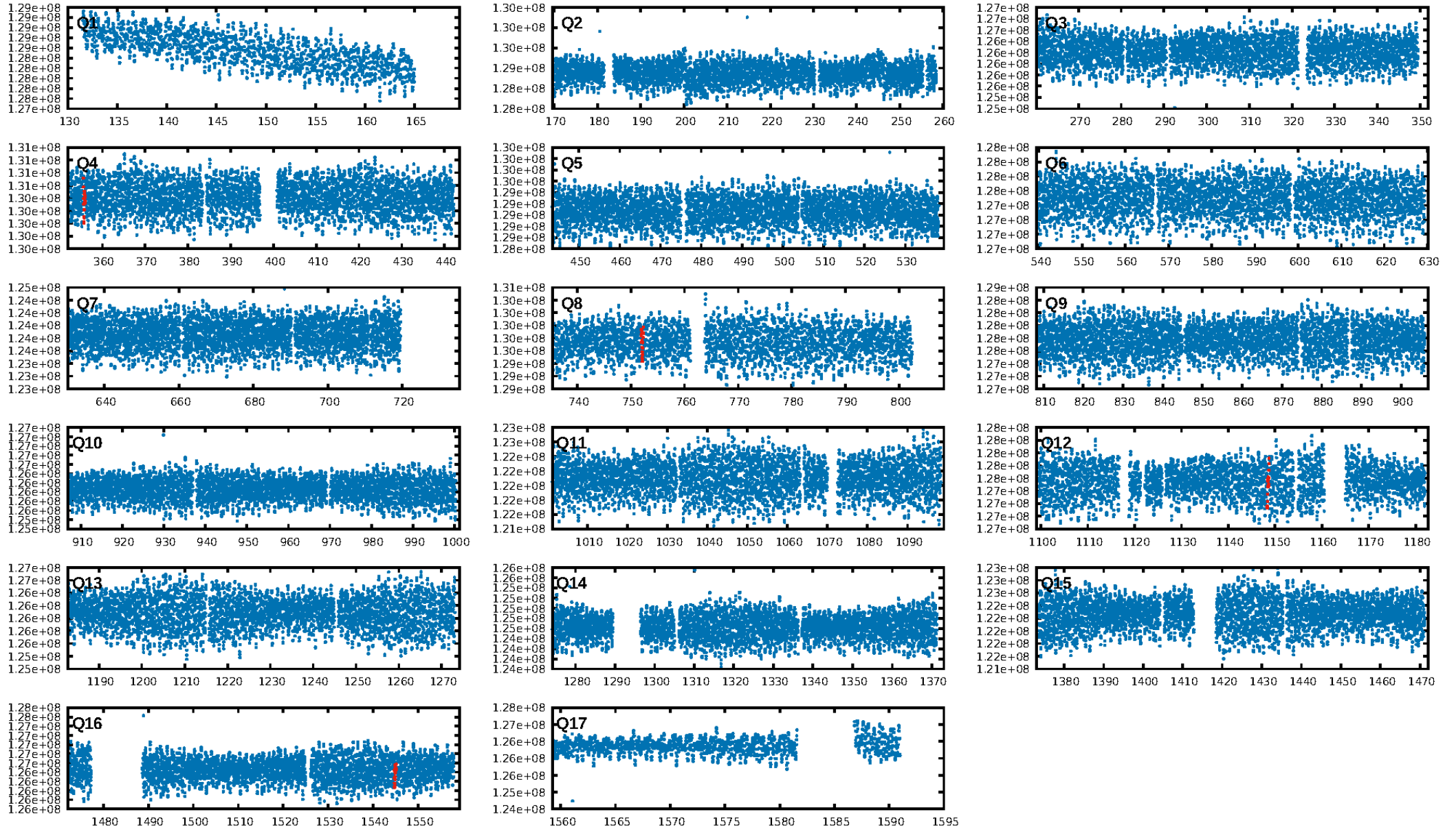
## DV Fit Results:

Period = 396.40111 [0.00689] d  
Epoch = 355.7343 [0.0143] BKJD  
Rp/R\* = 0.0443 [0.1448]  
a/R\* = 183.97 [152.95]  
b = 1.00 [4.78]  
Seff = 13.05 [9.98]  
Teq = 485 [93] K  
Rp = 15.03 [49.59] Re  
a = 1.2918 [0.5881] AU  
Ag = 914.52 [6060.30] [0.15 $\sigma$ ]  
Teffp = 4121 [6787] K [0.54 $\sigma$ ]

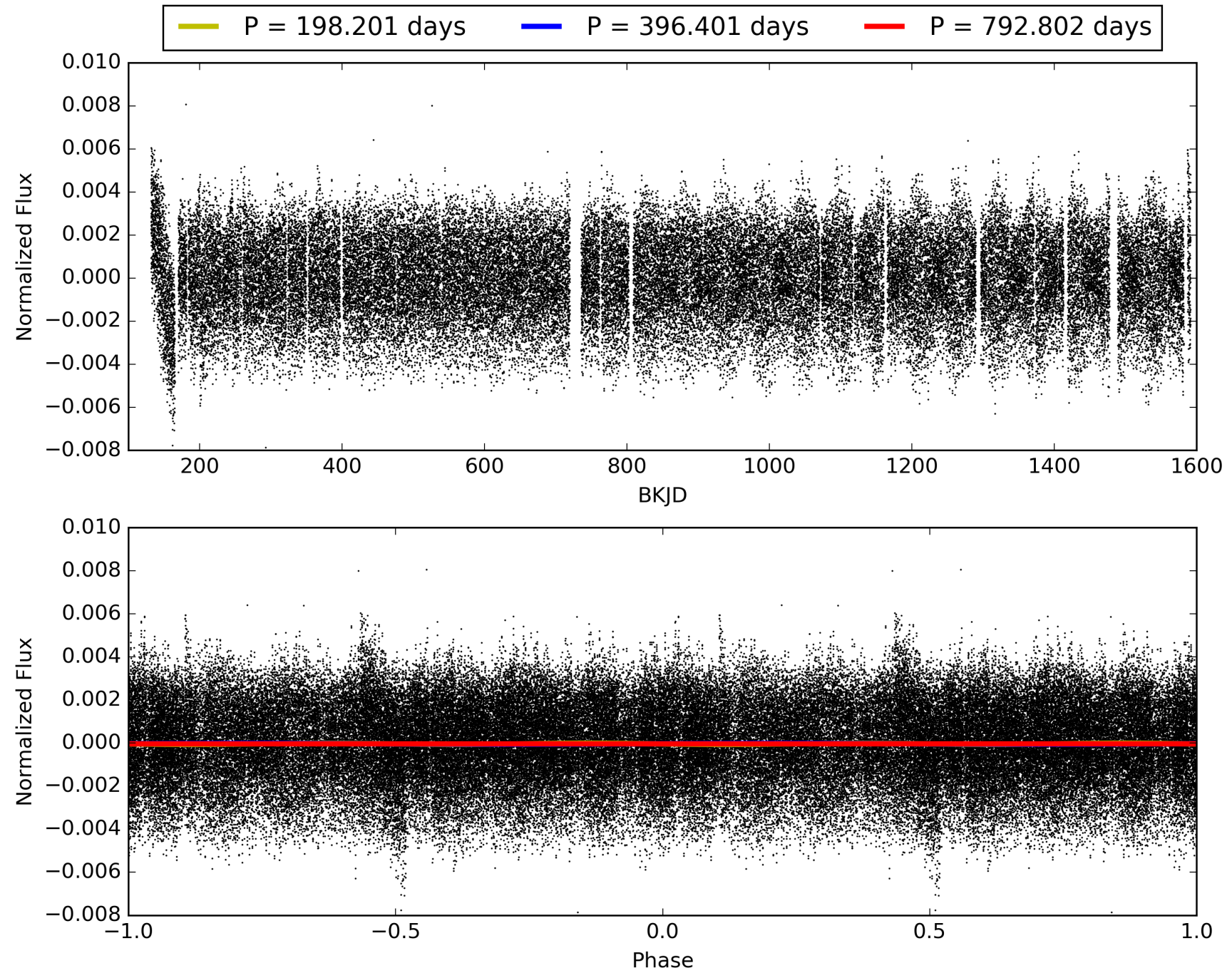
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [5.35 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 4.3%  
ModelChiSquareGof-sig: 94.5%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: 337.9  
Centroid-sig: 41.5%  
Centroid-so: 1.470 arcsec [1.91 $\sigma$ ]  
OotOffset-rm: 0.212 arcsec [1.40 $\sigma$ ]  
OotOffset-st: 0/0/4/0 [4]  
KicOffset-rm: 0.314 arcsec [2.64 $\sigma$ ]  
KicOffset-st: 0/0/4/0 [4]  
DiffImageQuality-fgm: 0.75 [3/4]  
DiffImageOverlap-fno: 0.00 [0/4]

# TCE 004466180-04, PDC Light Curves



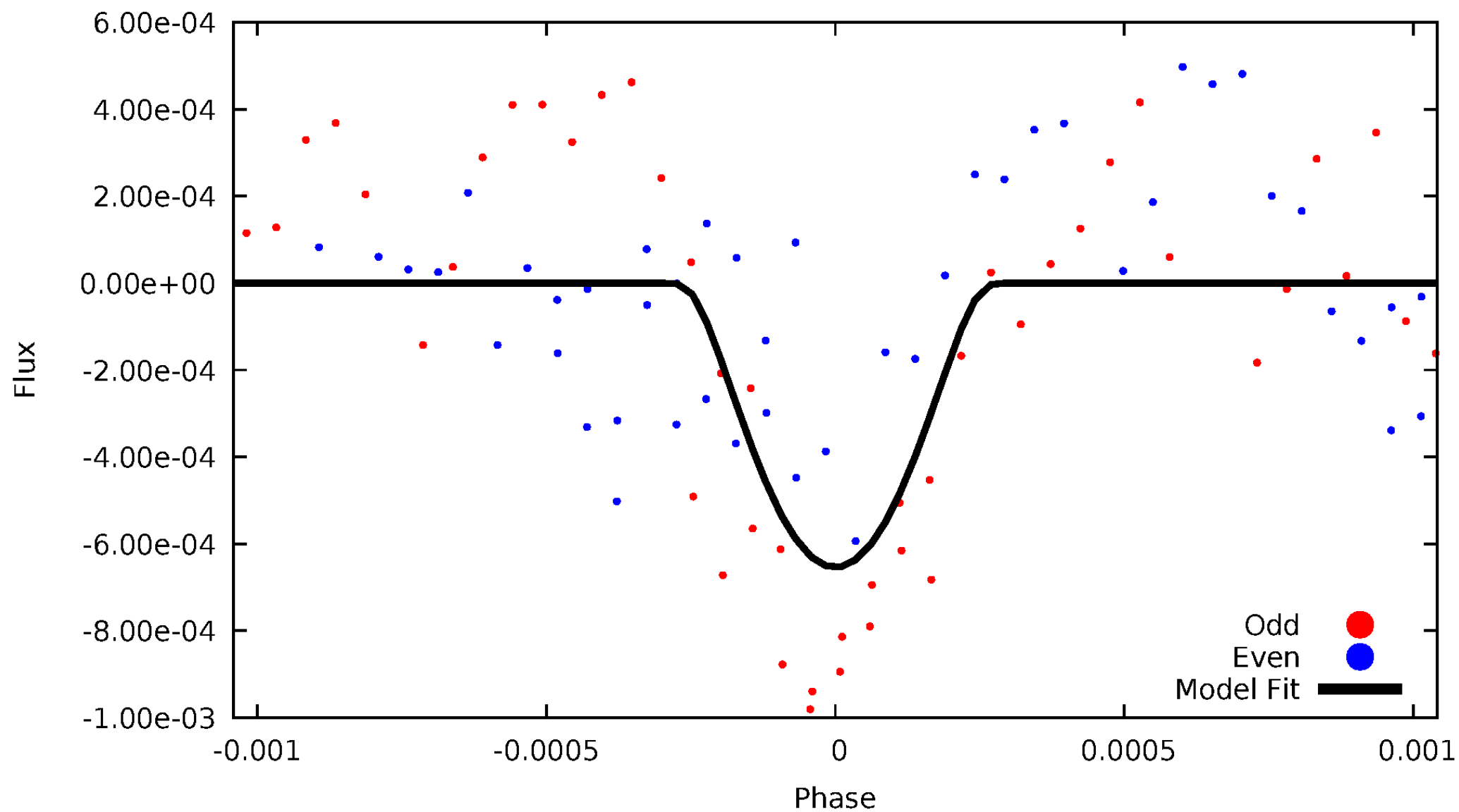
TCE 004466180-04





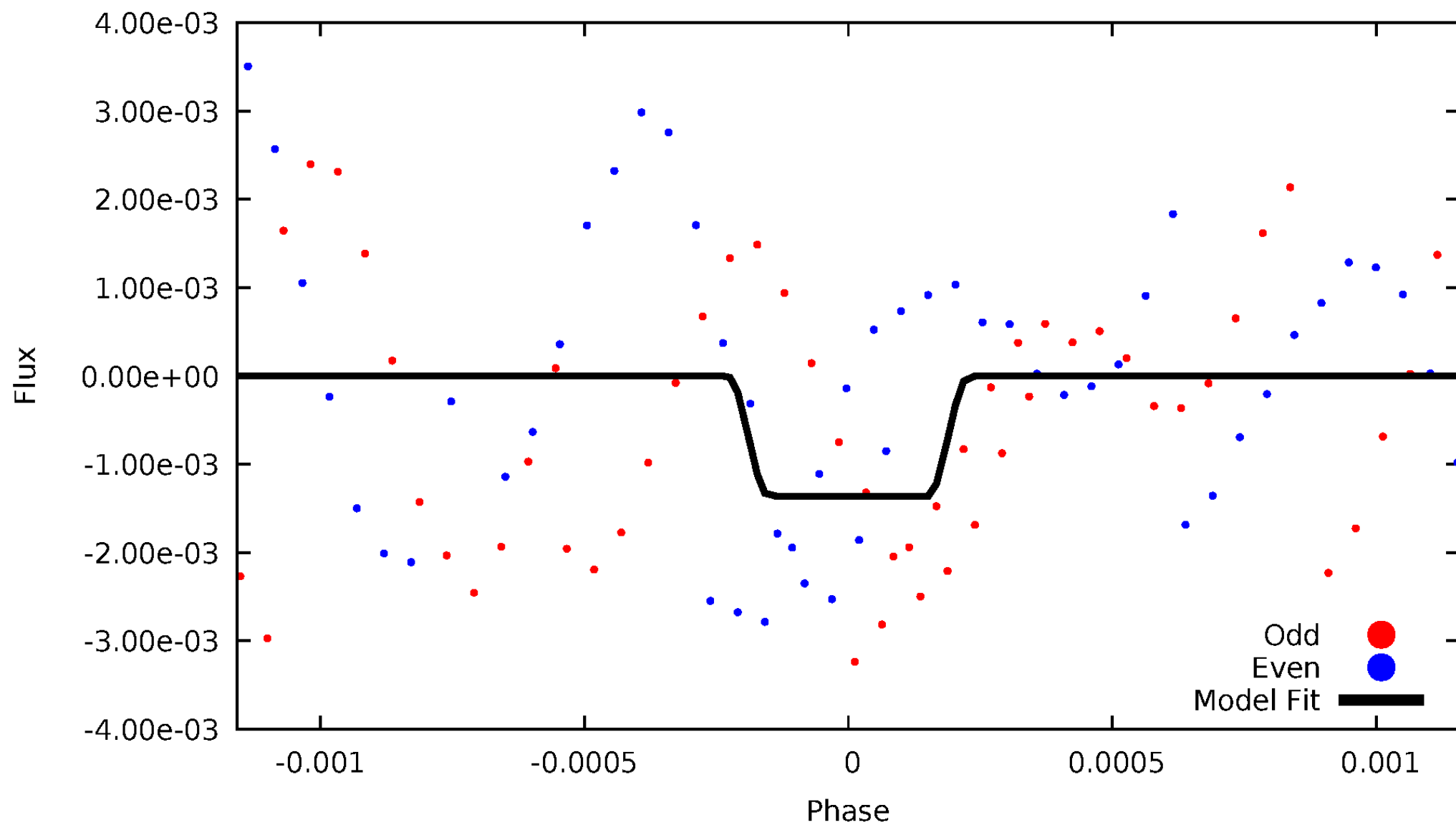
# DV Odd/Even

TCE 004466180-04



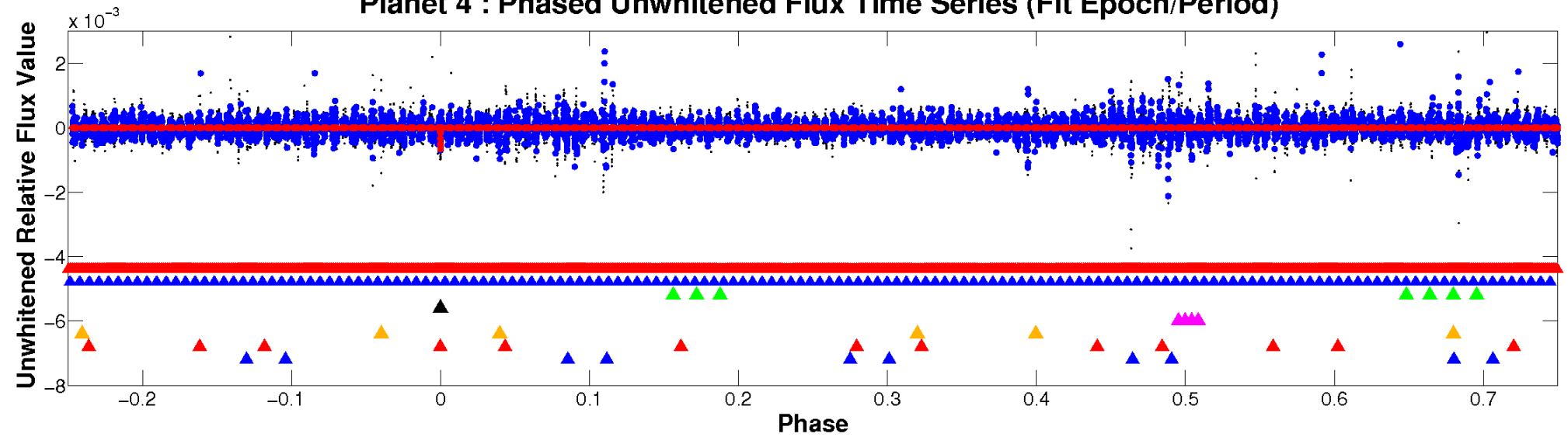
# ALT Odd/Even

TCE 004466180-04

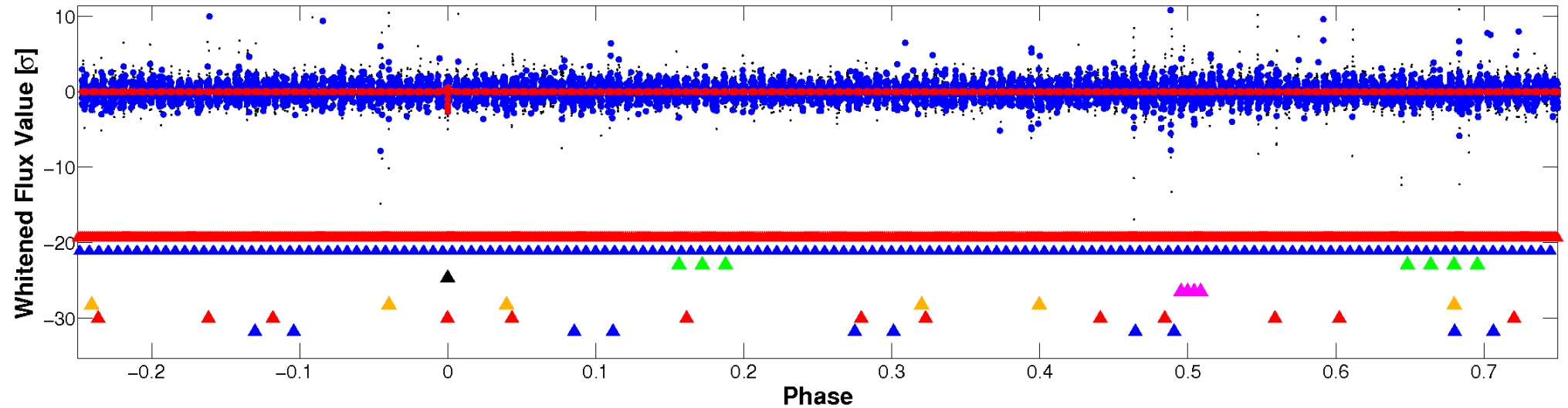


# Non-Whitened Vs. Whitened Light Curve

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

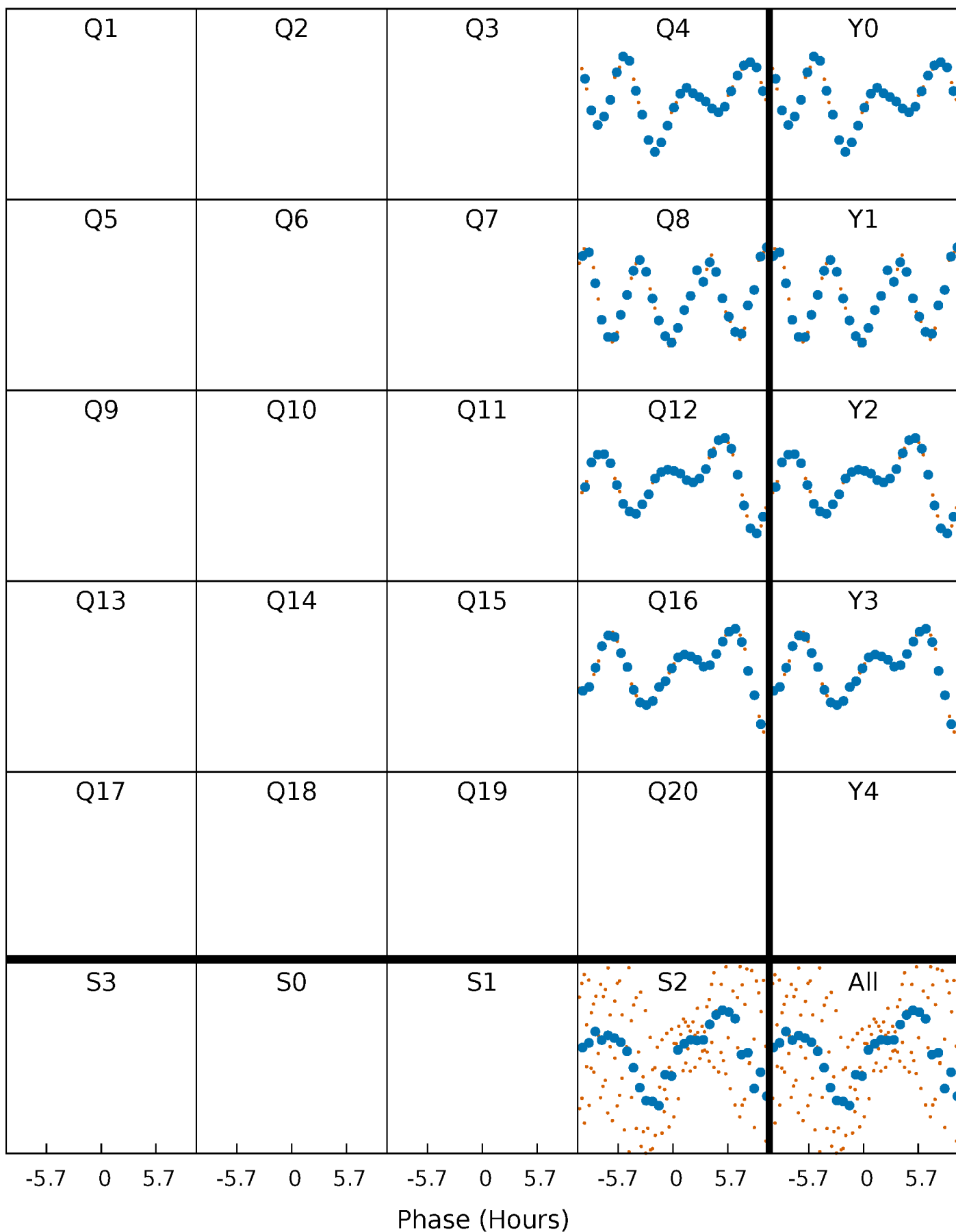


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



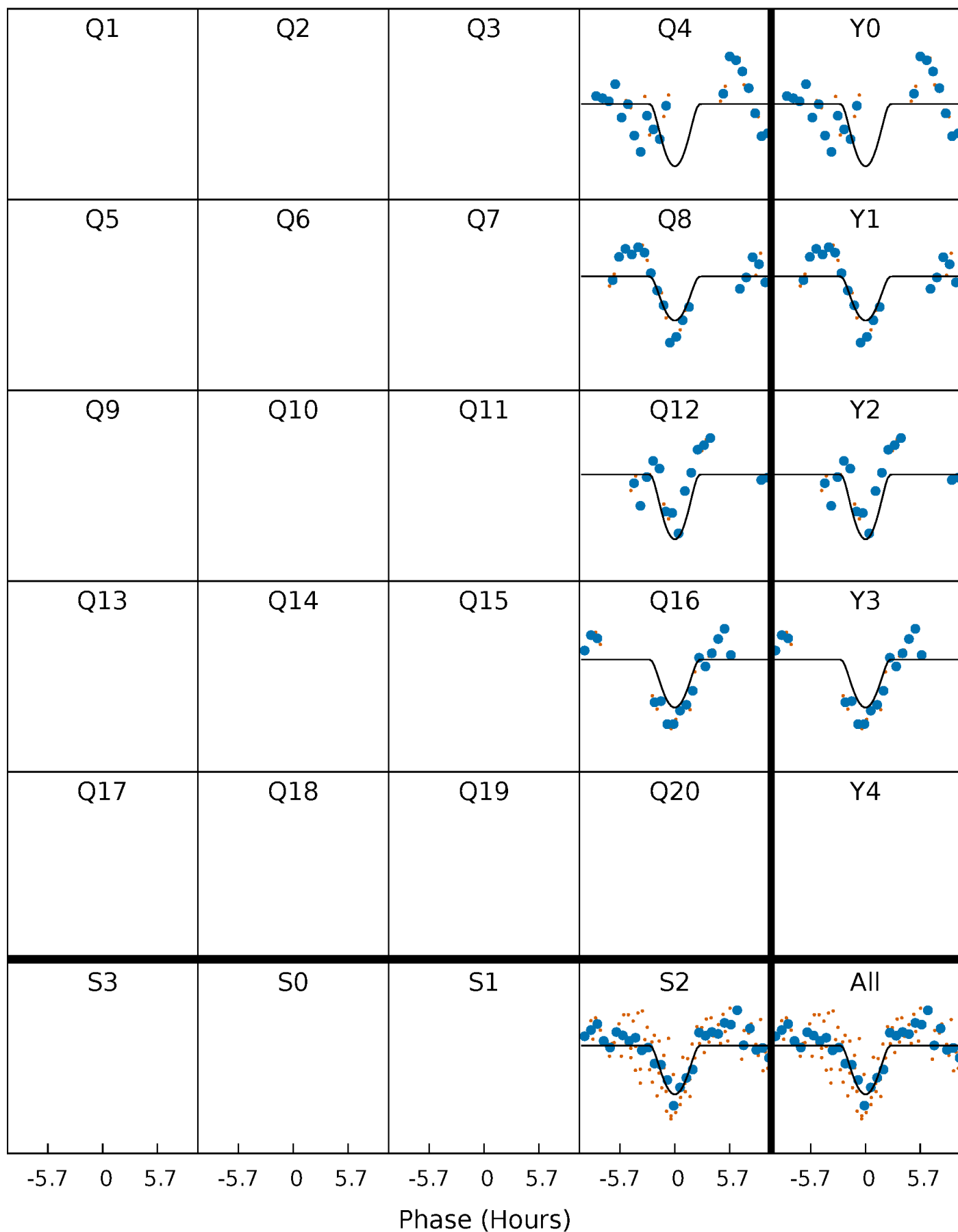
# PDC Quarter-Phased Transit Curves

TCE 004466180-04     $P=396.401112$  Days     $T_0=355.734254$  (BKJD)



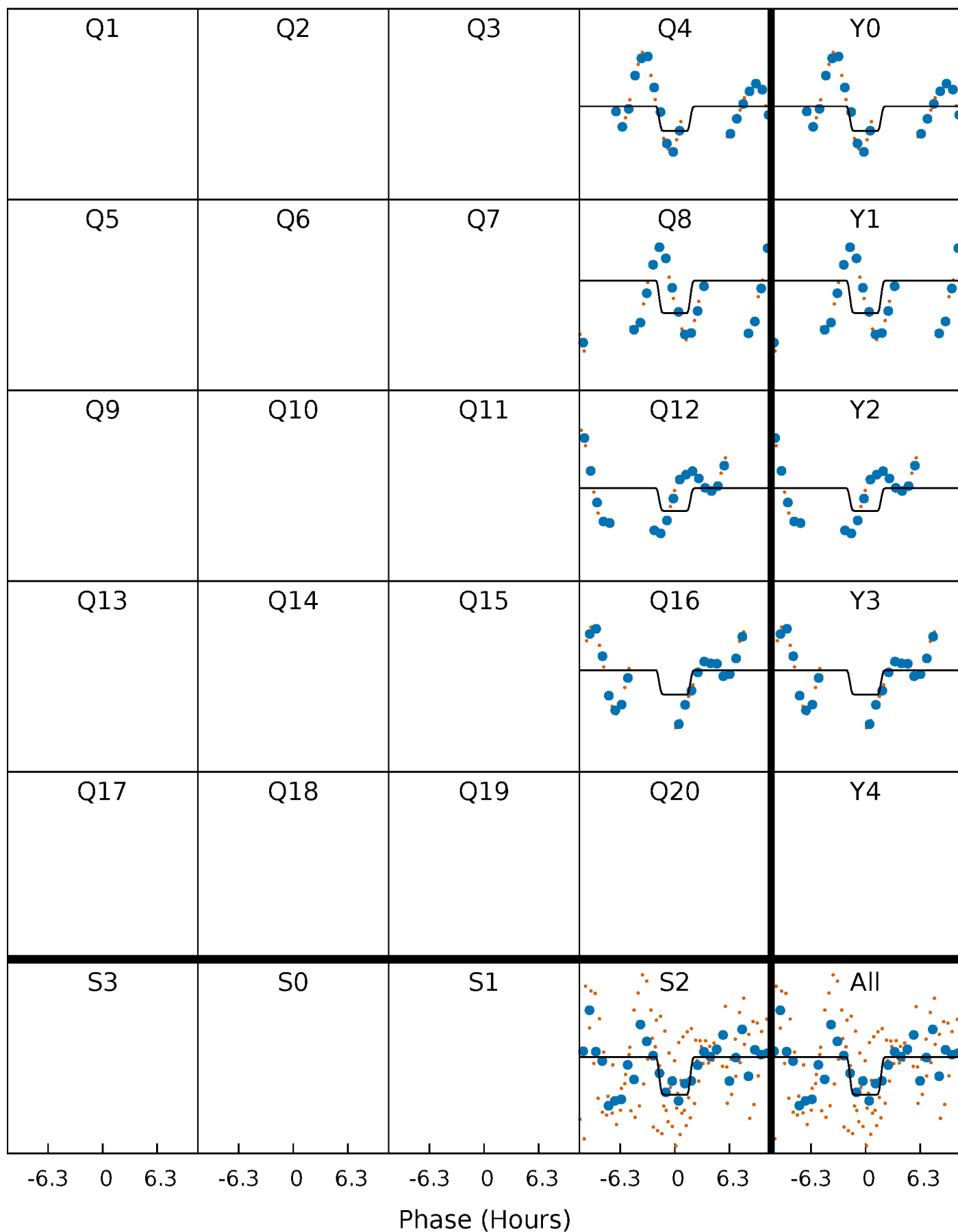
# DV Quarter-Phased Transit Curves

TCE 004466180-04     $P=396.401112$  Days     $T_0=355.734254$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 004466180-04     $P=396.385581$  Days     $T_0=355.678476$  (BKJD)

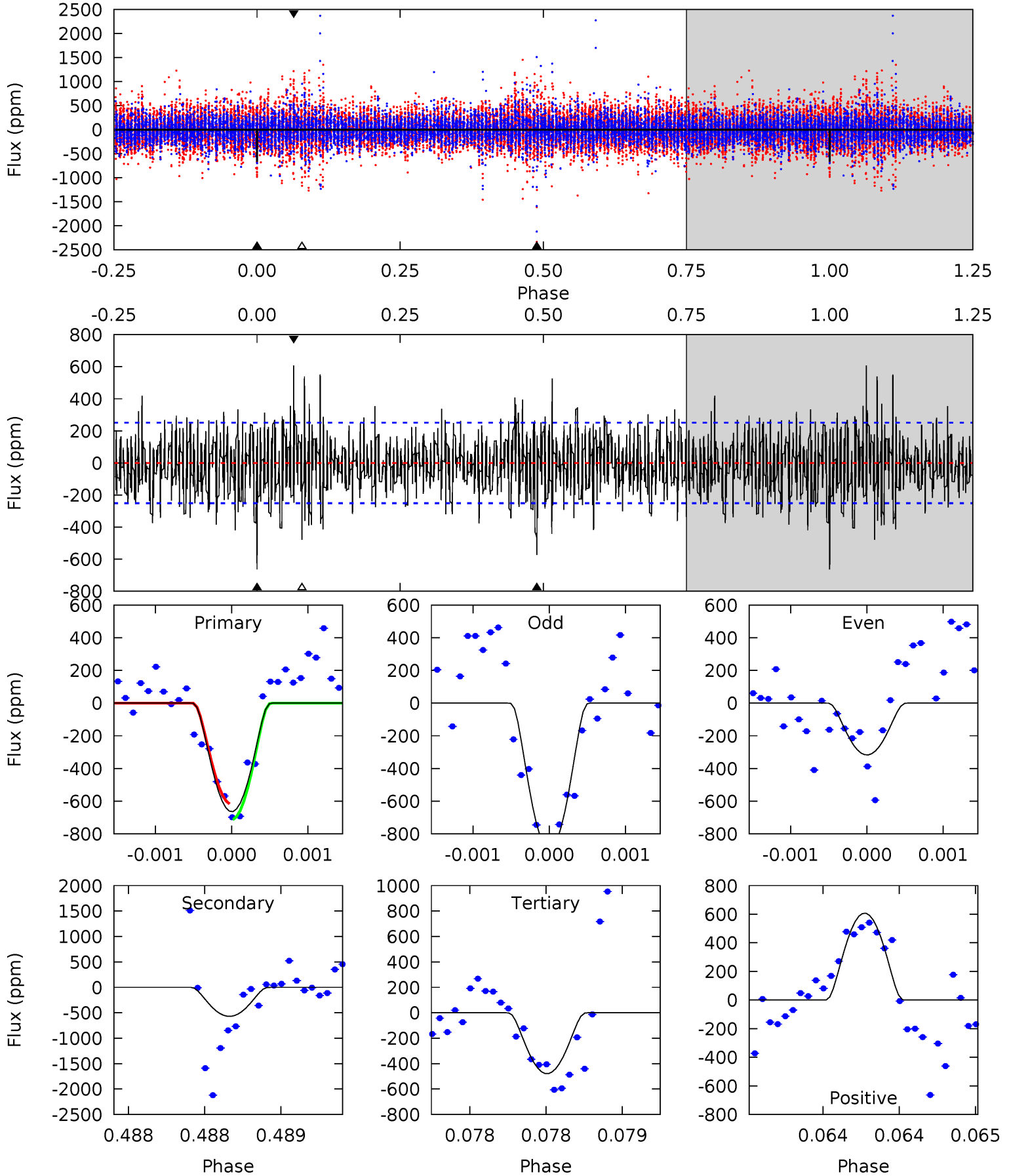




# DV Model-Shift Uniqueness Test

004466180-04, P = 396.401112 Days, E = 355.734254 Days

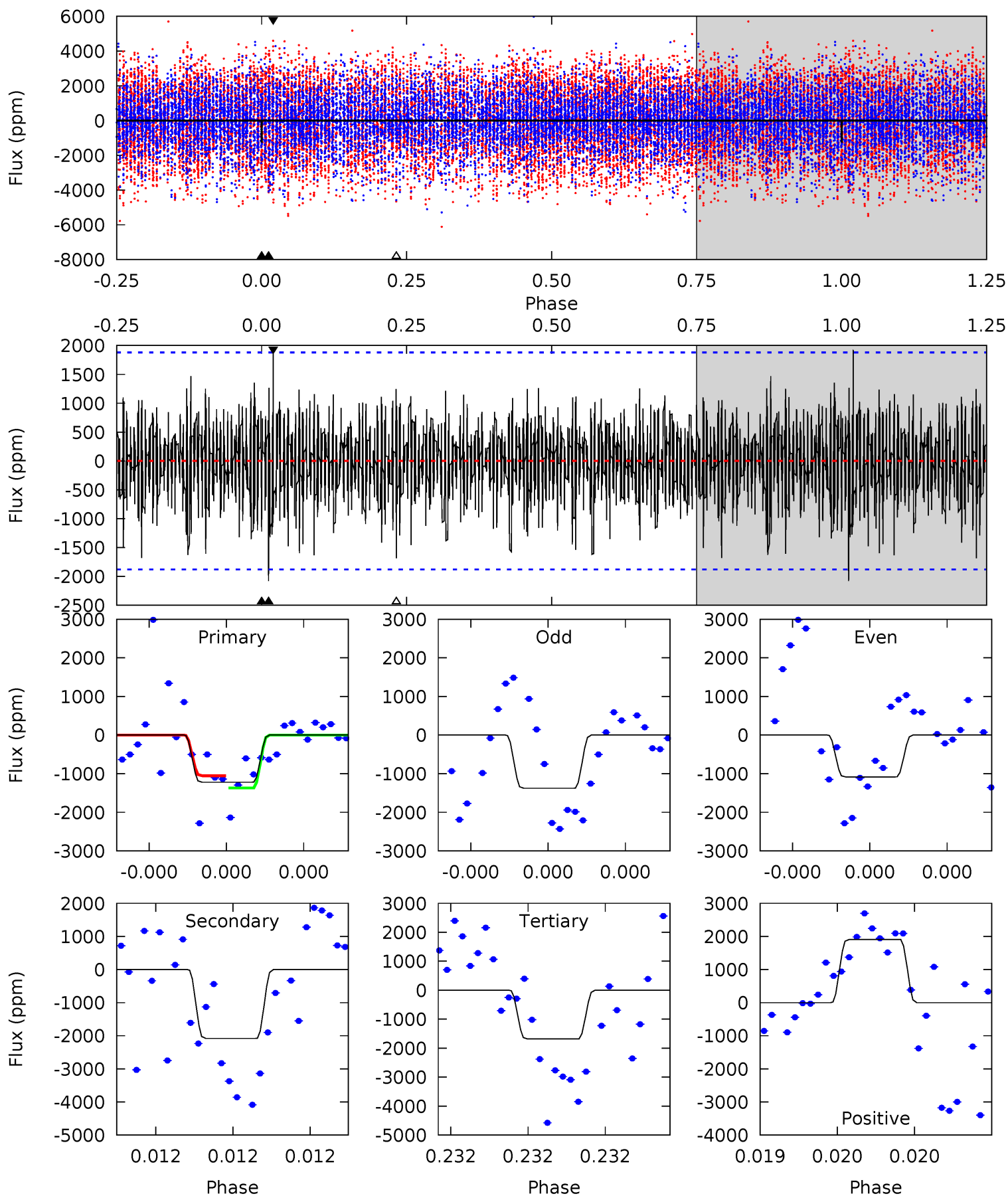
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.7	12.6	10.6	13.4	5.56	3.46	3.01	4.09	1.25	2.02	-0.82	6.21	0.95	0.48	1.04



# Alt Model-Shift Uniqueness Test

004466180-04, P = 396.385581 Days, E = 355.678476 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
3.64	6.20	5.01	5.69	5.60	3.52	1.48	-1.37	-2.05	1.19	0.51	0.44	1.08	0.48	0.47



### Stellar Parameters For KIC 004466180

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7082^{+195}_{-318}$	$3.715^{+0.442}_{-0.078}$	$0.080^{+0.200}_{-0.300}$	$3.109^{+0.472}_{-1.416}$	$1.828^{+0.179}_{-0.418}$	$0.086^{+0.349}_{-0.021}$
	+3%/-4%	+12%/-2%	+250%/-375%	+15%/-46%	+10%/-23%	+407%/-24%
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 004466180-04 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-570 \pm 45$	$33.69^{+37.52}_{-22.45}$	$652^{+46}_{-72}$	$3663^{+1932}_{-738}$	$457^{+3798}_{-353}$
Alt.	$-2081 \pm 336$	$32.68^{+32.62}_{-21.87}$	$644^{+52}_{-82}$	$4663^{+3226}_{-1025}$	$1835^{+14069}_{-1415}$

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

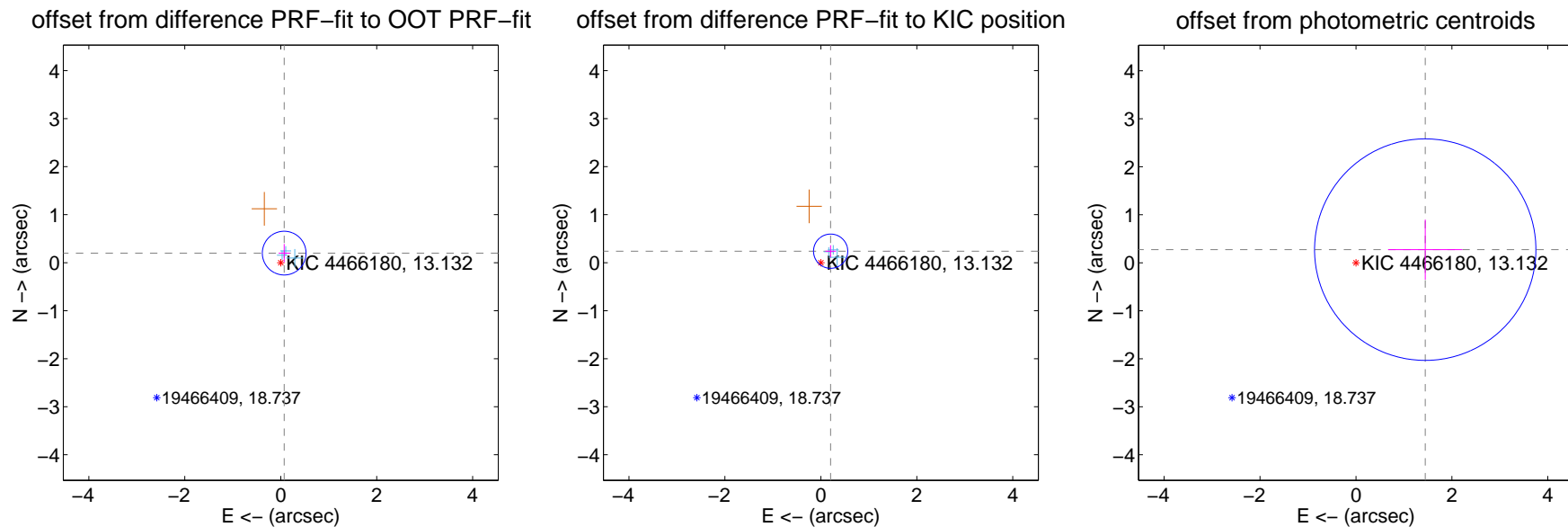
## DV Centroid Data

Supplemental centroid analysis for 004466180-04. Kepler magnitude: 13.13. Transit SNR 9.21

There are 3 quarters with good PRF difference image offsets

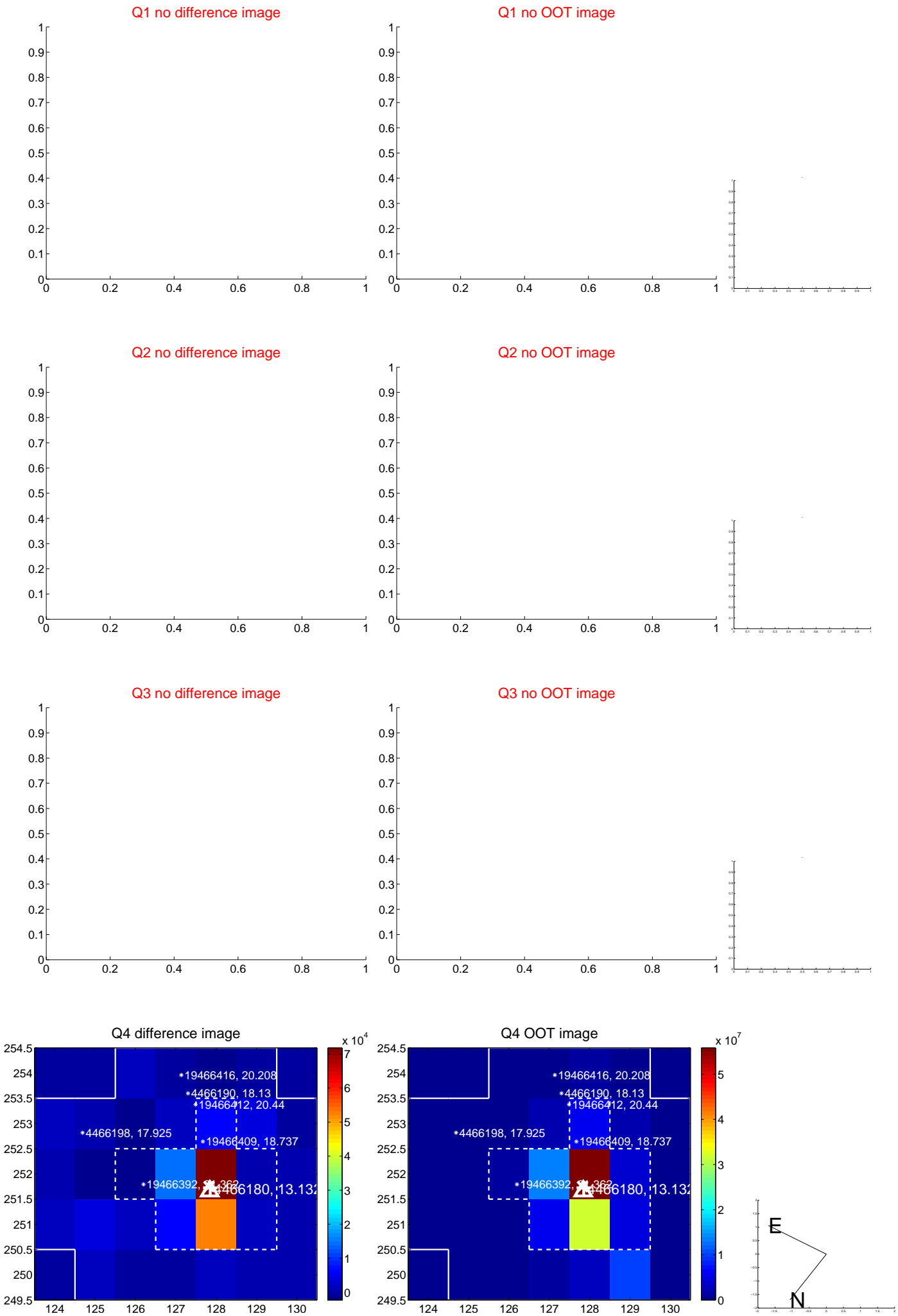
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.212 \pm 0.152$	1.40	$-0.072 \pm 0.115$	$0.199 \pm 0.189$
PRF-fit source offset from KIC position	$0.314 \pm 0.119$	2.64	$-0.204 \pm 0.111$	$0.240 \pm 0.125$
photometric centroid source offset	$1.47 \pm 0.77$	1.91	$-1.44 \pm 0.77$	$0.27 \pm 0.63$



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



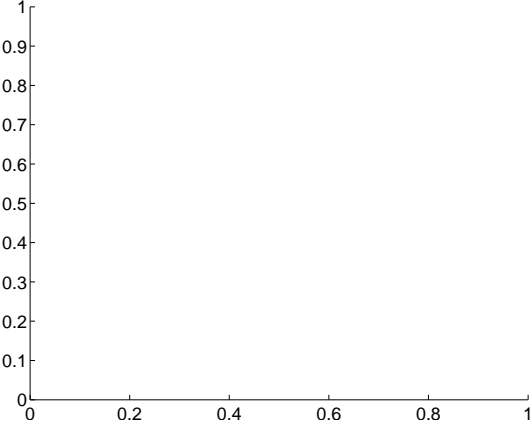
Q6 no difference image



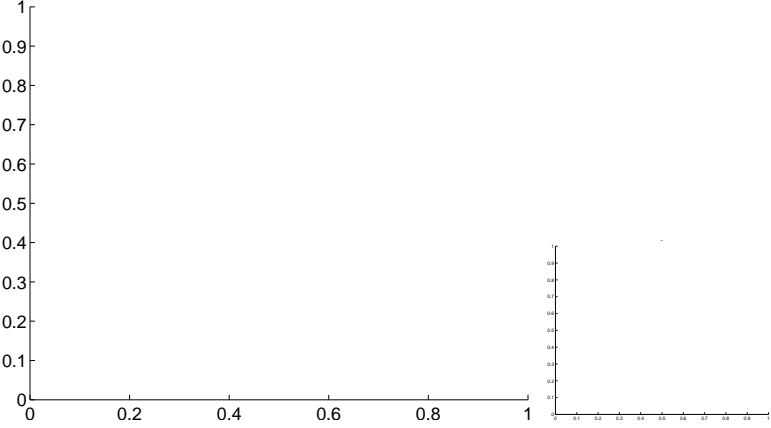
Q6 no OOT image



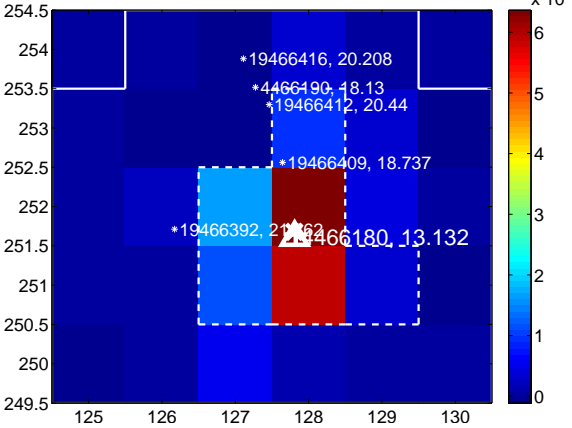
Q7 no difference image



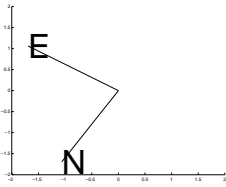
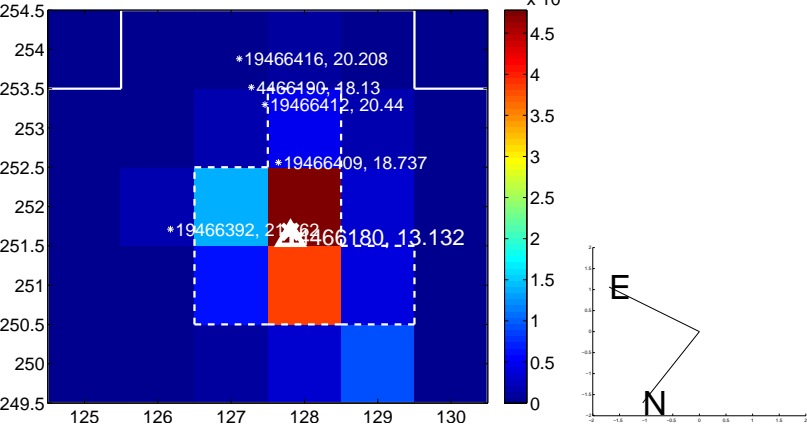
Q7 no OOT image



Q8 difference image

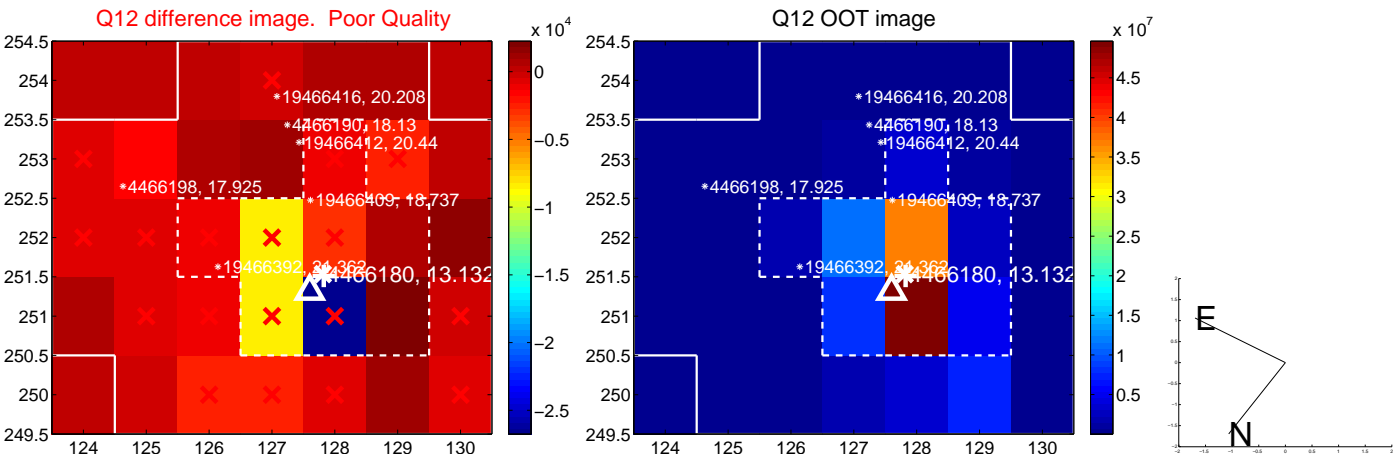


Q8 OOT image

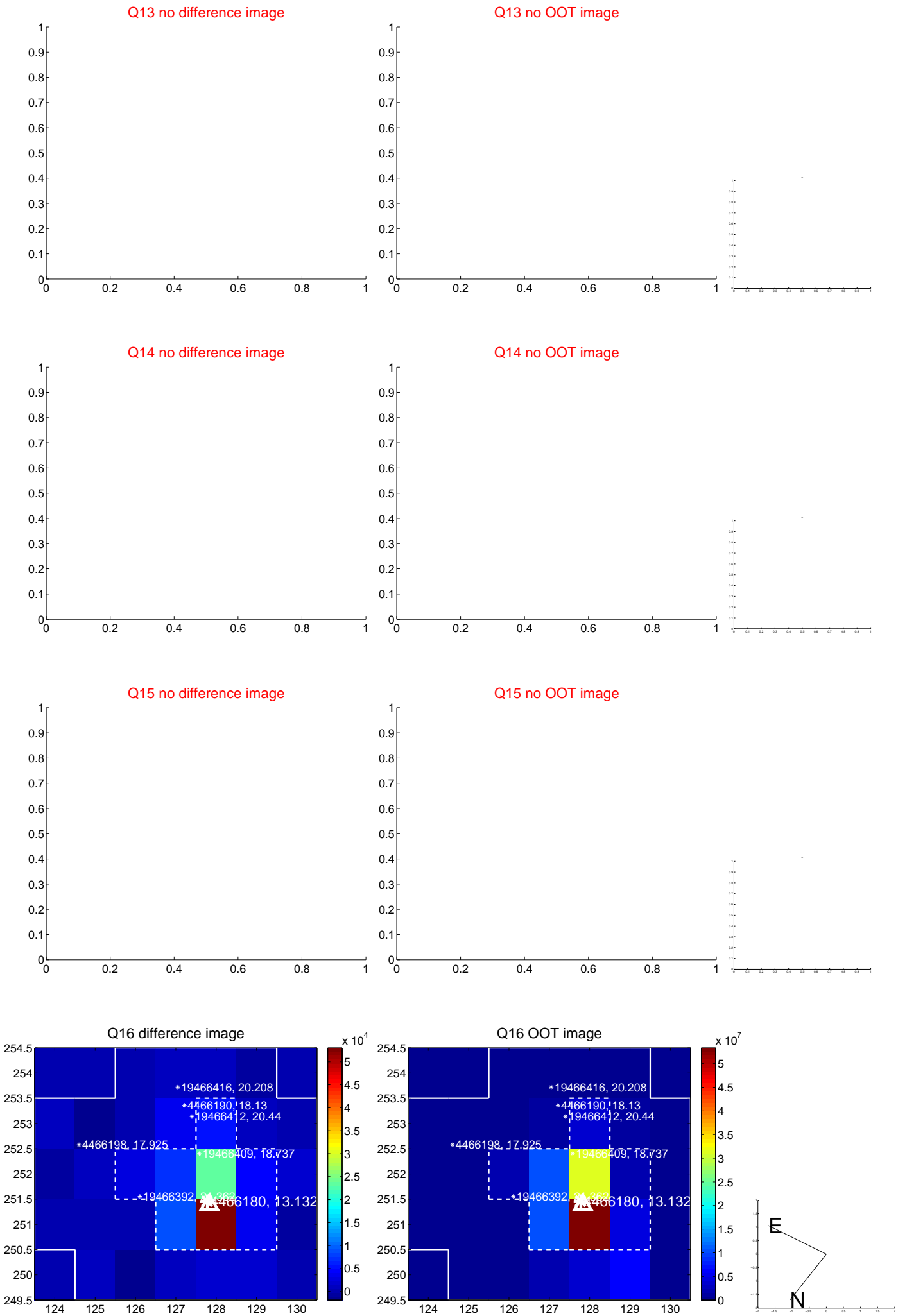




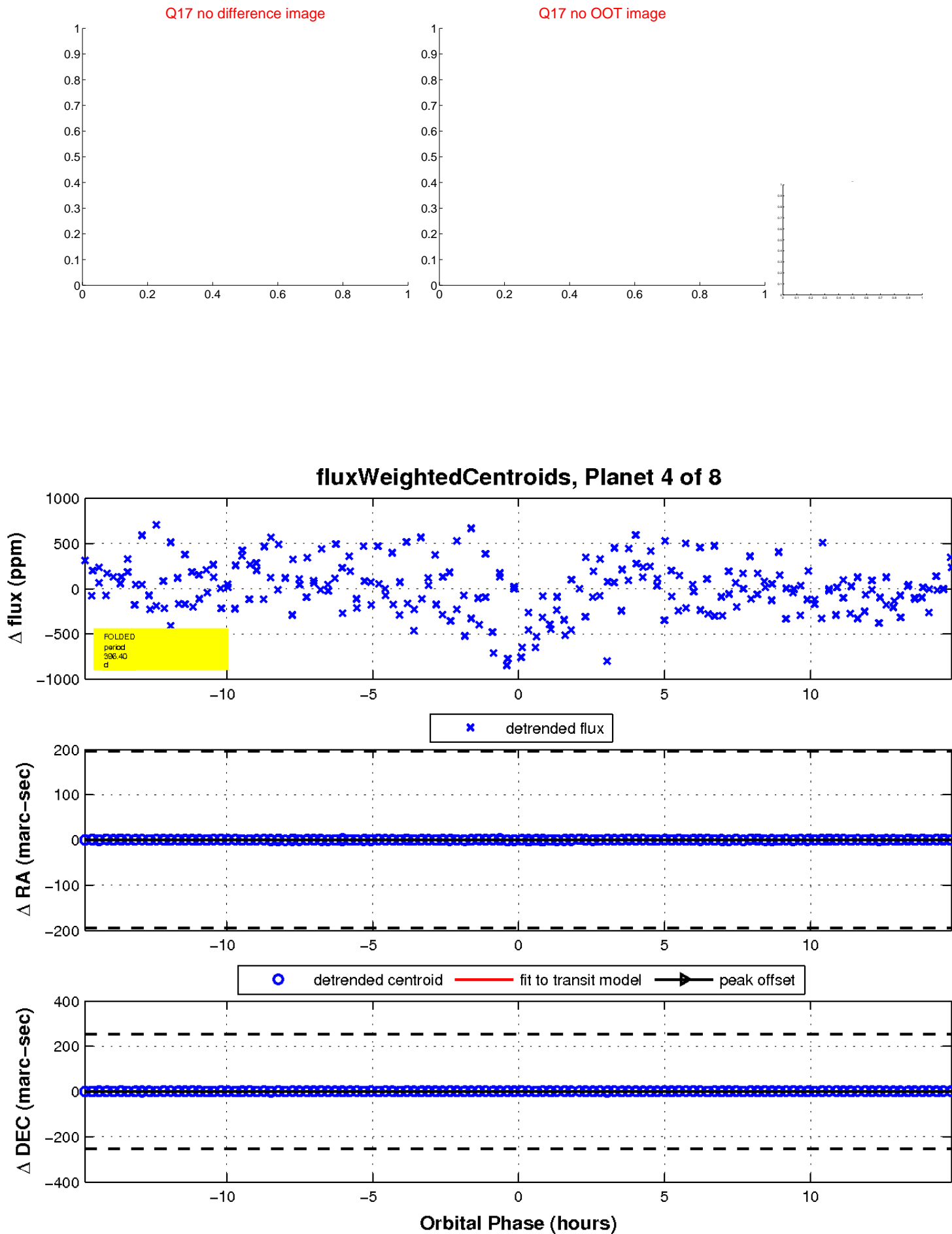
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

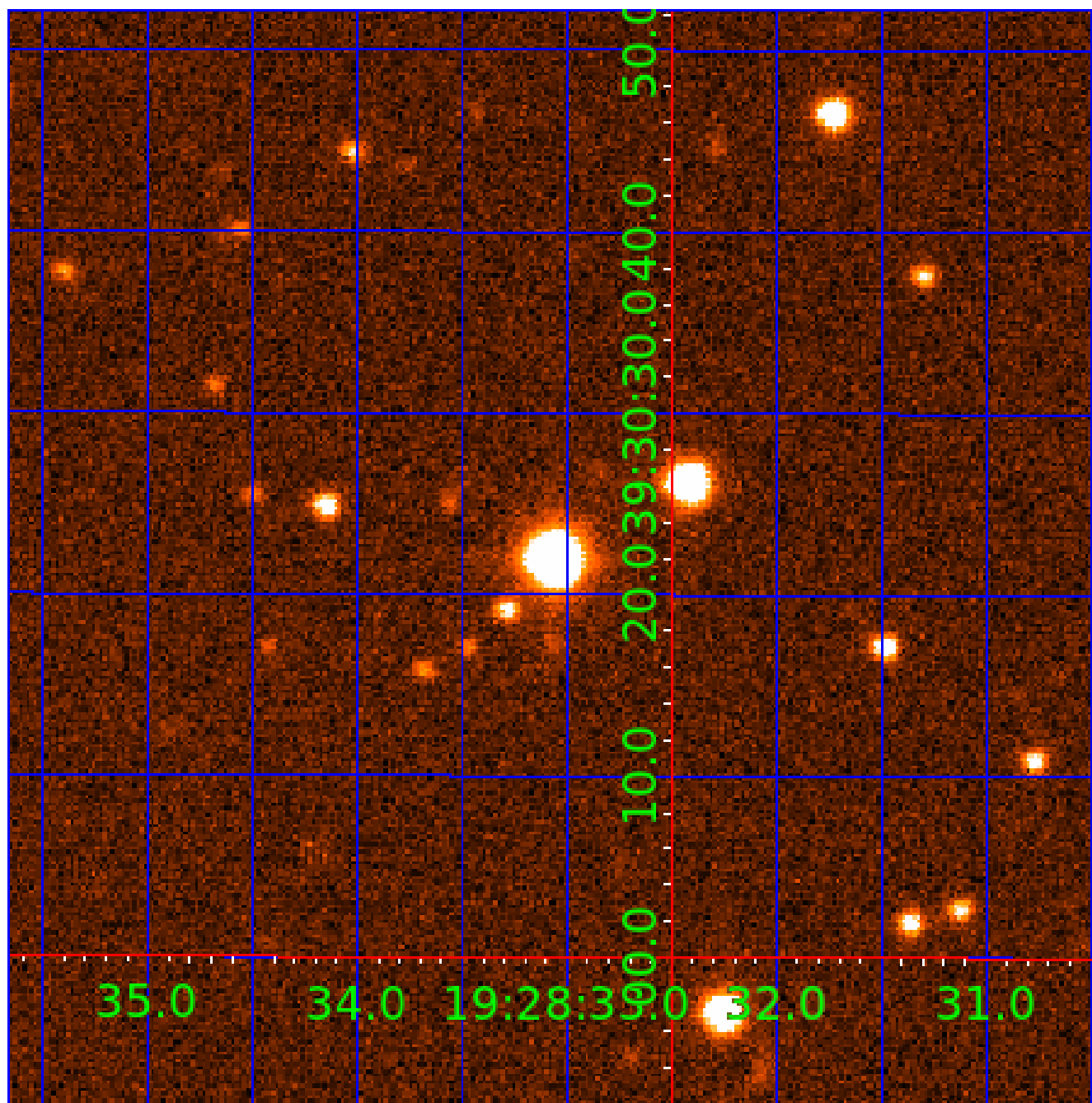


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004466180-01	OBS	No	0.563995	131.917877	0.0	1.069	9.6	0.0	3.11	7082	0.06	81576.47
004466180-02	OBS	No	2.557937	131.728417	41.1	10.798	8.3	7.8	3.11	7082	2.31	10866.23
004466180-03	OBS	No	201.318912	216.340817	646.3	4.790	8.5	8.7	3.11	7082	10.50	32.22
004466180-04	OBS	No	396.401111	355.734254	652.9	4.954	8.8	9.2	3.11	7082	15.03	13.05
004466180-05	OBS	No	394.653041	160.968997	695.7	6.085	9.0	8.7	3.11	7082	15.48	13.13
004466180-06	OBS	No	253.765919	260.372249	475.7	5.518	8.6	7.3	3.11	7082	7.00	23.66
004466180-07	OBS	No	110.793636	151.348018	614.3	3.227	8.6	7.9	3.11	7082	10.85	71.44
004466180-08	OBS	No	160.634372	143.491195	50.6	3.598	9.0	0.8	3.11	7082	2.56	43.53

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004466180-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
004466180-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
004466180-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS
004466180-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT— MOD_POS_ALT—INCONSISTENT_TRANS
004466180-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT— MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004466180-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—TRANS_GAPPED—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT— MOD_TER_ALT—MOD_POS_ALT
004466180-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT— MOD_POS_ALT
004466180-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV— MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

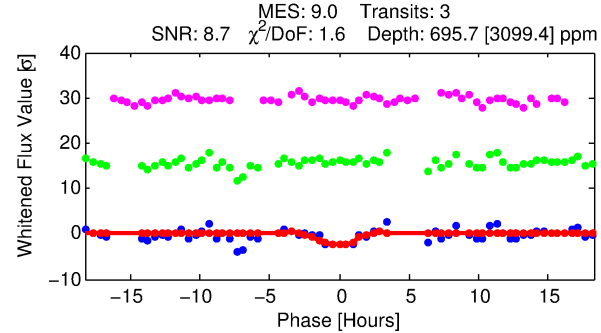
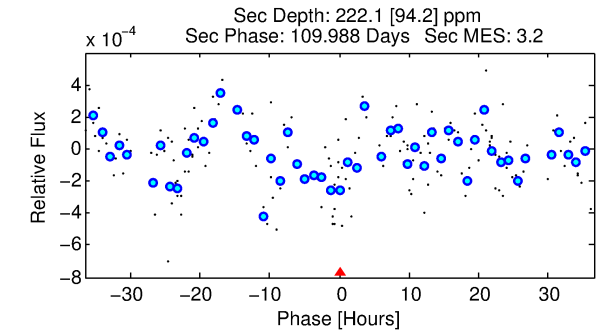
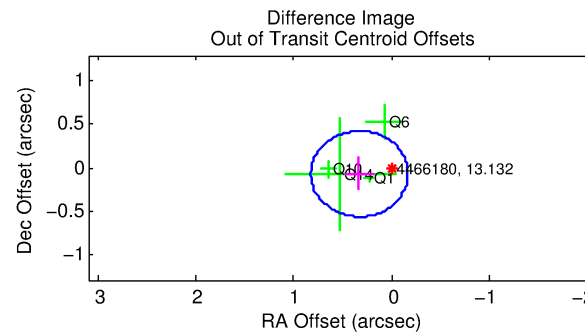
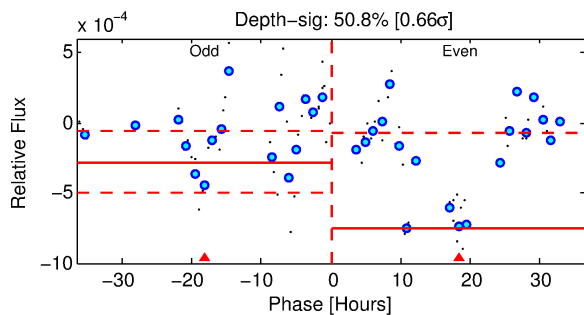
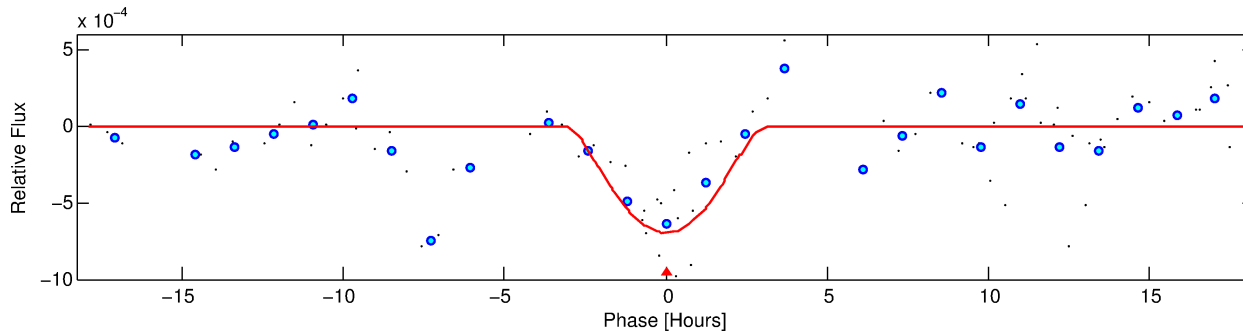
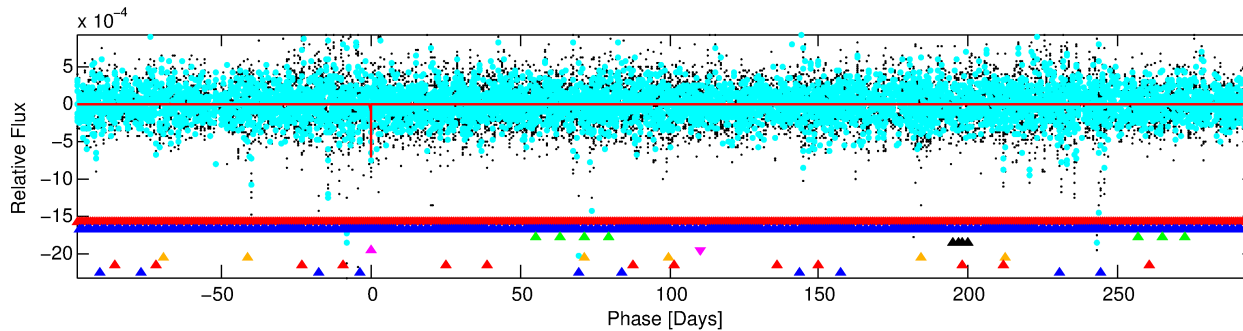
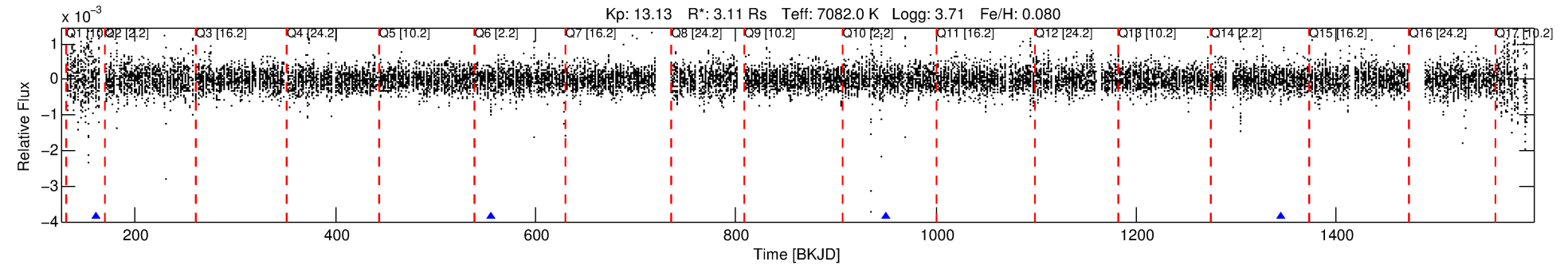
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 004466180-05

No Significant Match Found

# DV One-Page Summary

KIC: 4466180 Candidate: 5 of 8 Period: 394.653 d



## DV Fit Results:

Period = 394.65304 [0.01508] d  
Epoch = 160.9690 [0.0182] BKJD  
Rp/R\* = 0.0456 [0.2737]  
a/R\* = 151.38 [235.73]  
b = 1.00 [0.26]  
Seff = 13.13 [10.04]  
Teq = 485 [93] K  
Rp = 15.48 [93.14] Re  
a = 1.2880 [0.5864] AU  
Ag = 846.02 [10177.17] [0.08 $\sigma$ ]  
Teffp = 4048 [12150] K [0.29 $\sigma$ ]

## DV Diagnostic Results:

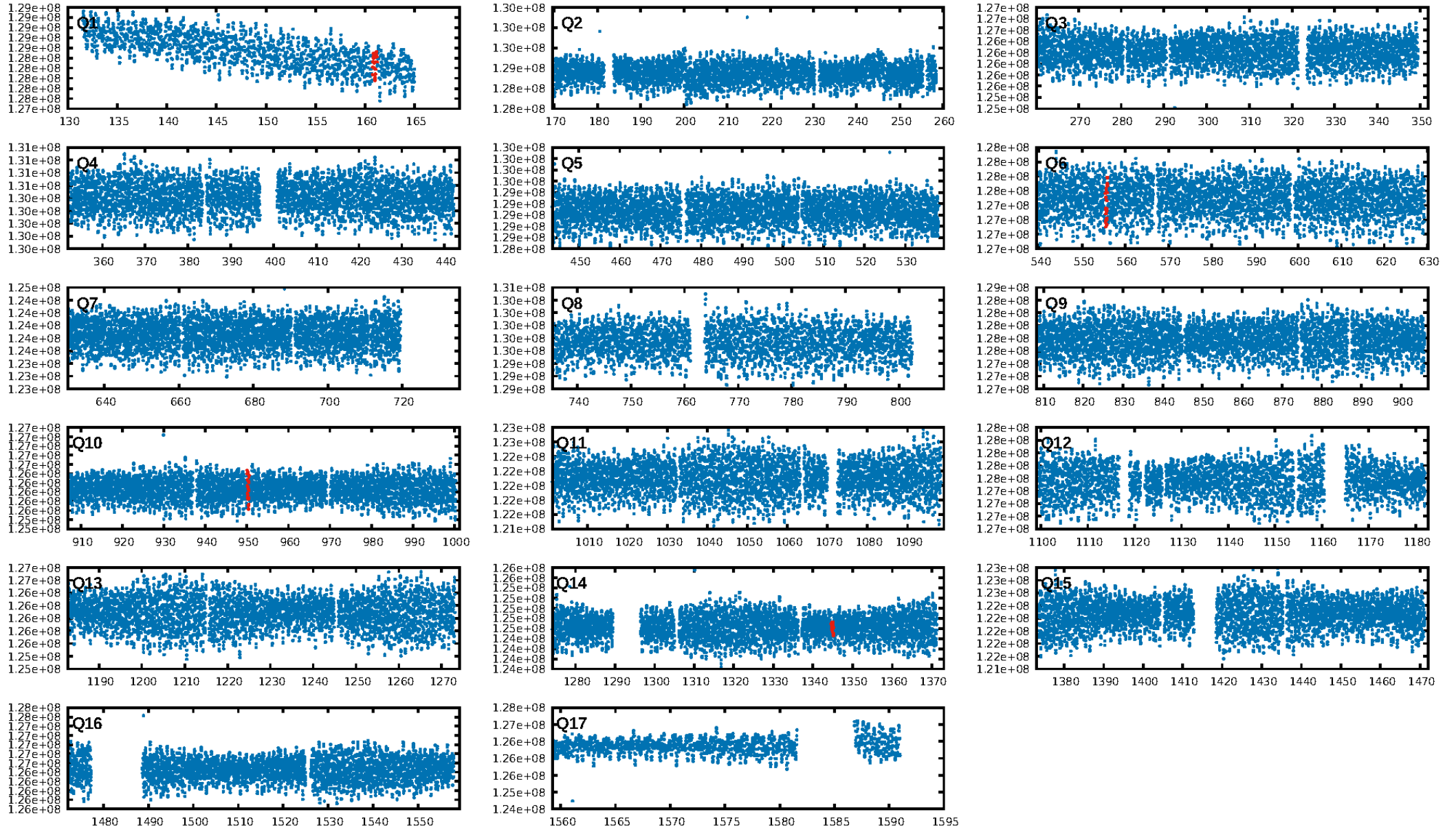
ShortPeriod-sig: 100.0% [411.64 $\sigma$ ]  
LongPeriod-sig: 100.0% [5.35 $\sigma$ ]  
ModelChiSquare2-sig: 2.5%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [2/2]  
**GhostDiagnostic-chr: 0.93**  
Centroid-sig: 9.4%  
Centroid-so: 0.510 arcsec [0.83 $\sigma$ ]  
OotOffset-rm: 0.336 arcsec [2.03 $\sigma$ ]  
KicOffset-rm: 0.158 arcsec [0.96 $\sigma$ ]  
OotOffset-st: 3/0/0/1 [4]  
KicOffset-st: 3/0/0/1 [4]  
DiffImageQuality-fgm: 0.50 [2/4]  
DiffImageOverlap-fno: 0.00 [0/4]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 05:54:42 Z

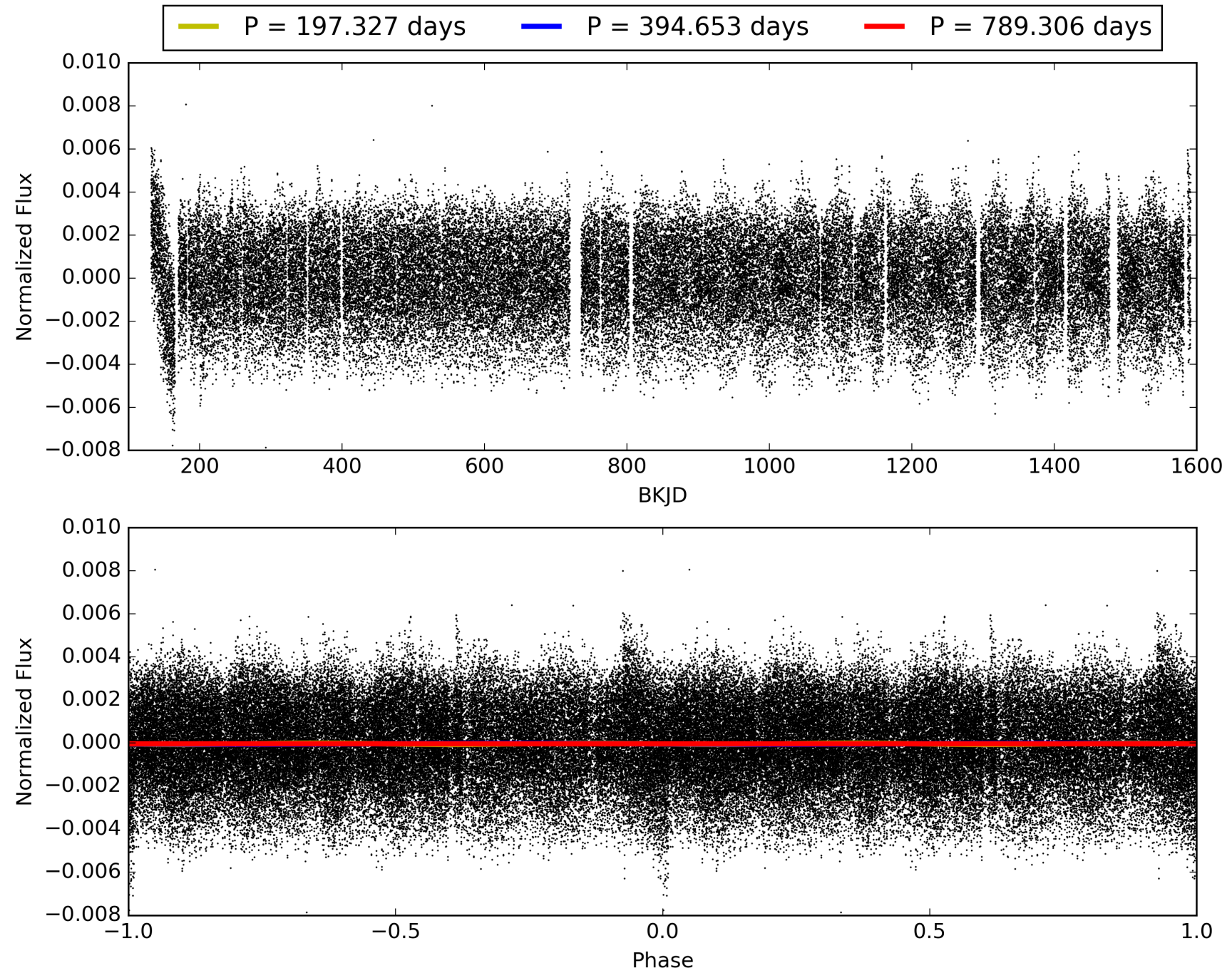
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 004466180-05, PDC Light Curves

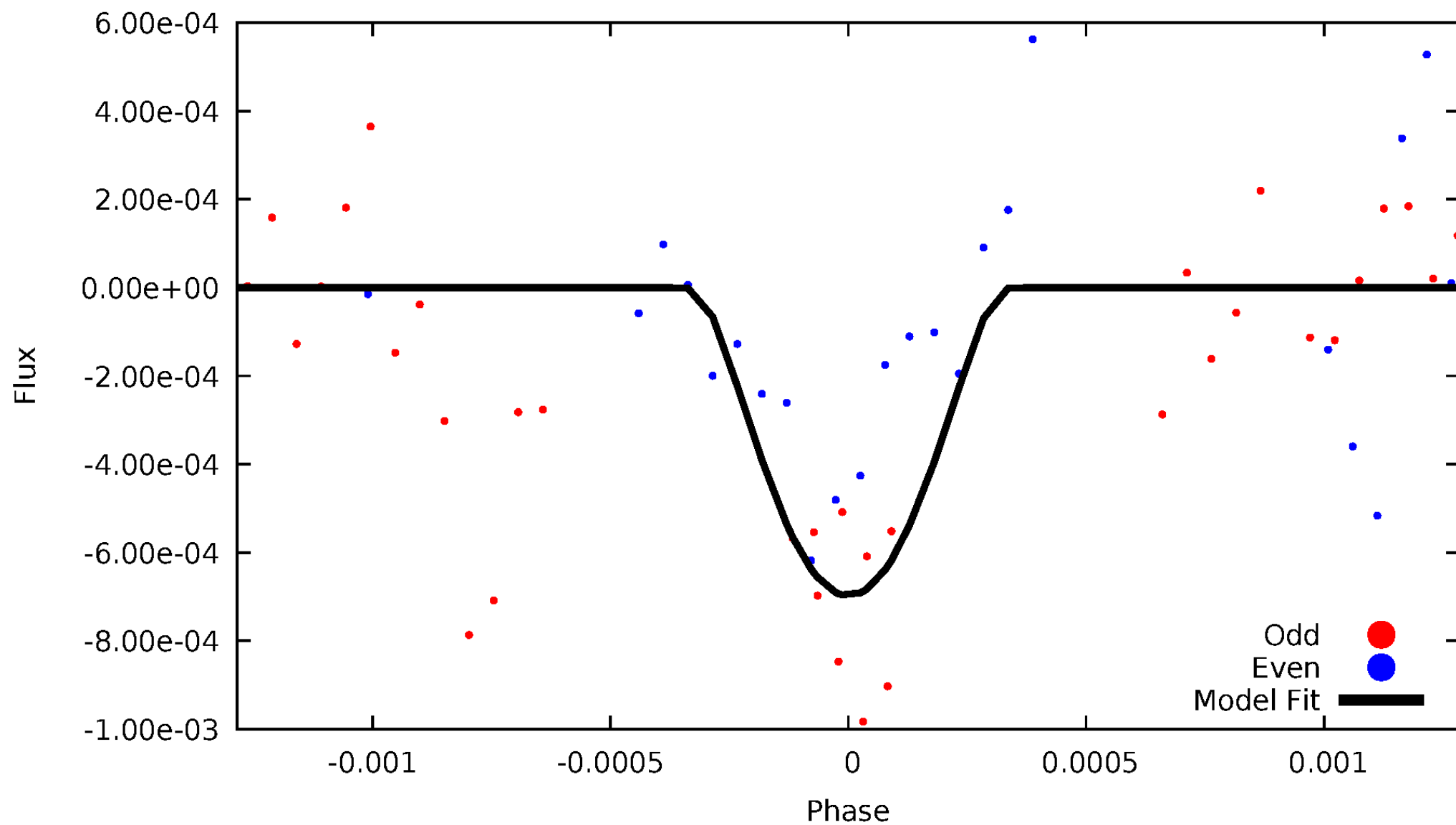


TCE 004466180-05



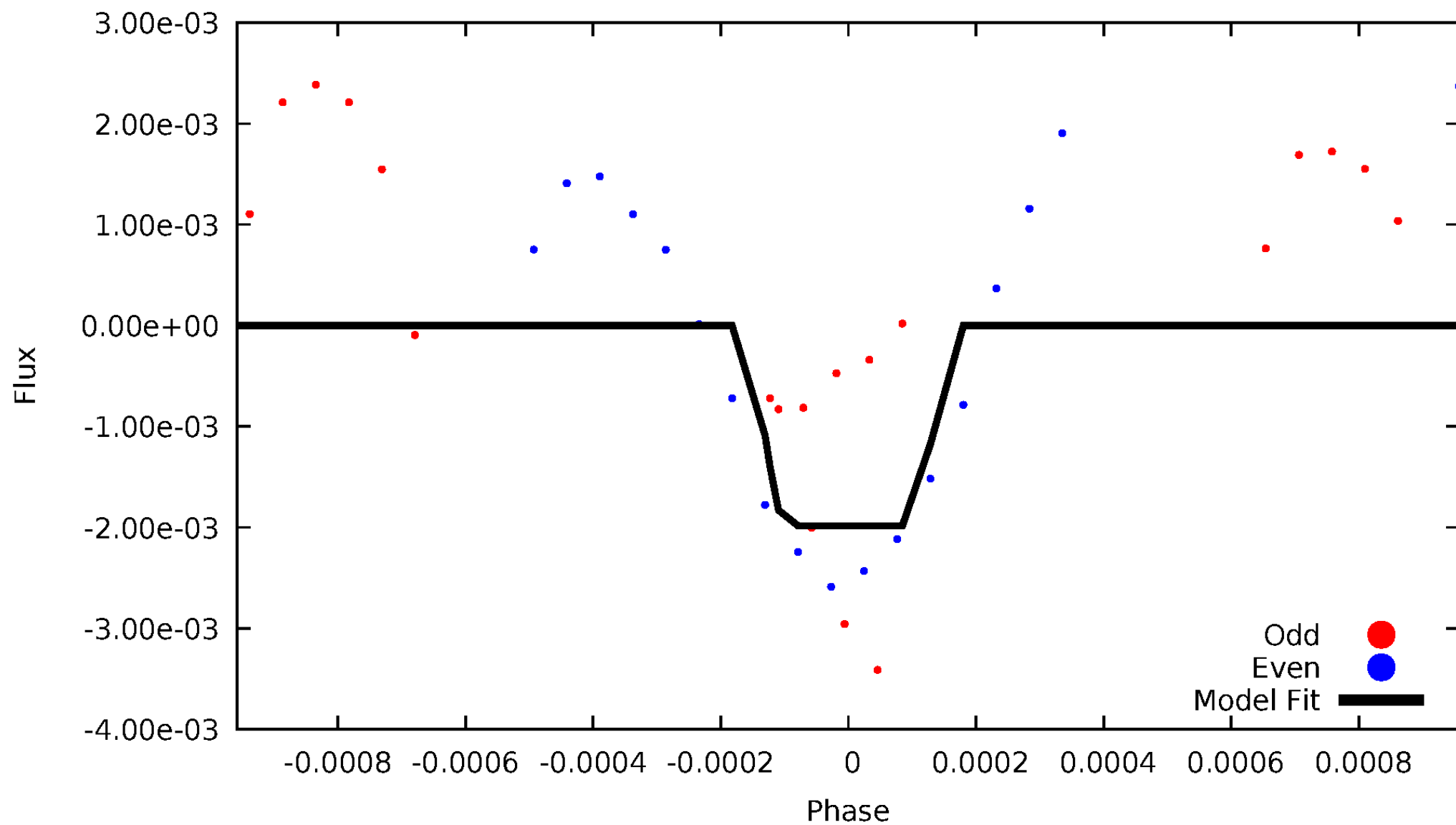
# DV Odd/Even

TCE 004466180-05



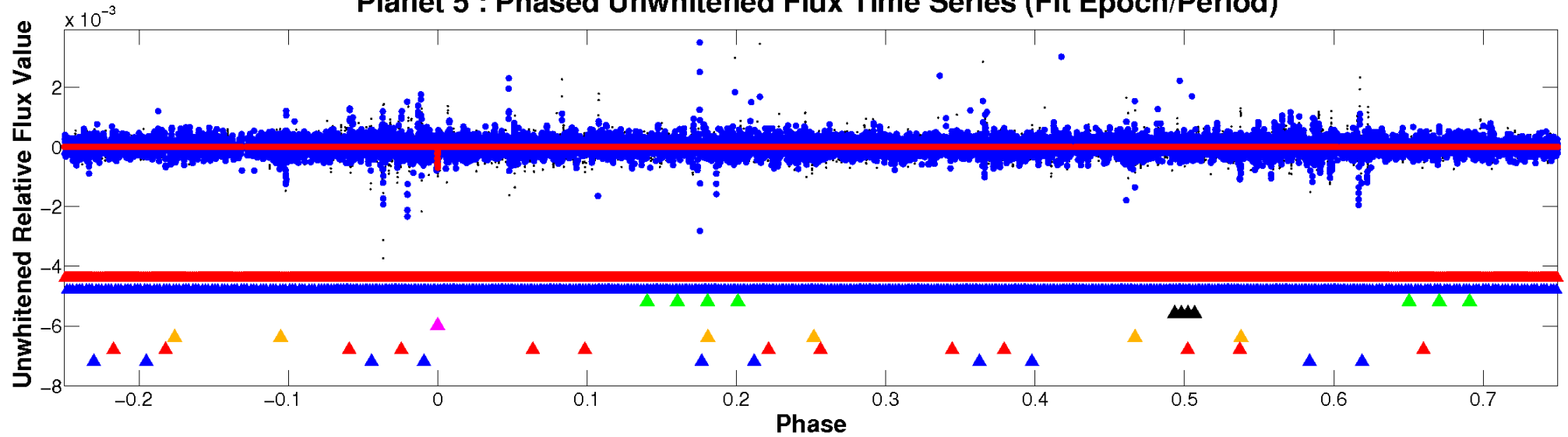
# ALT Odd/Even

TCE 004466180-05

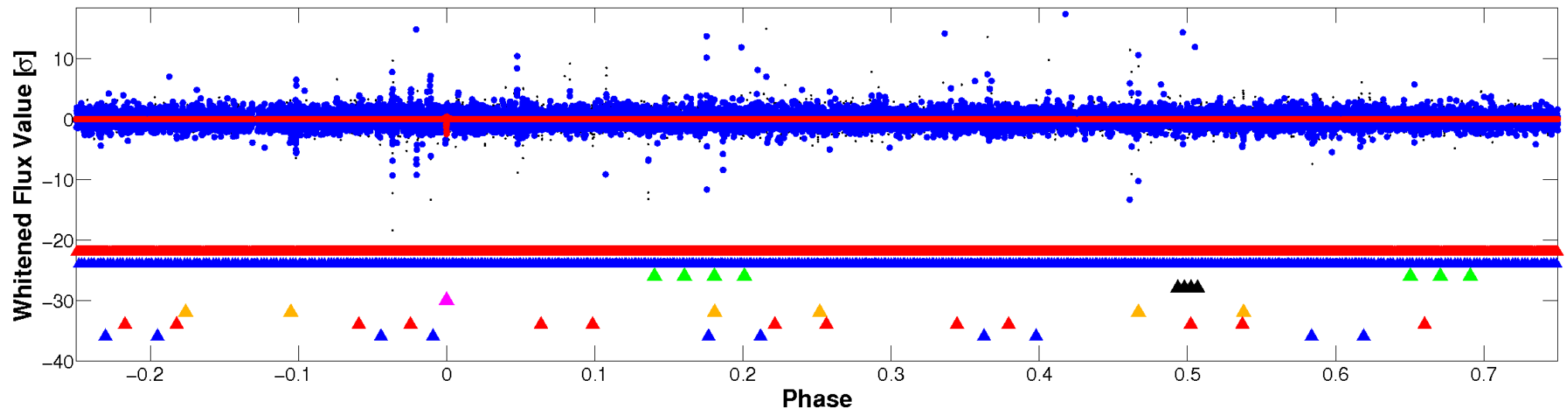


### Non-Whitened Vs. Whitened Light Curve

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

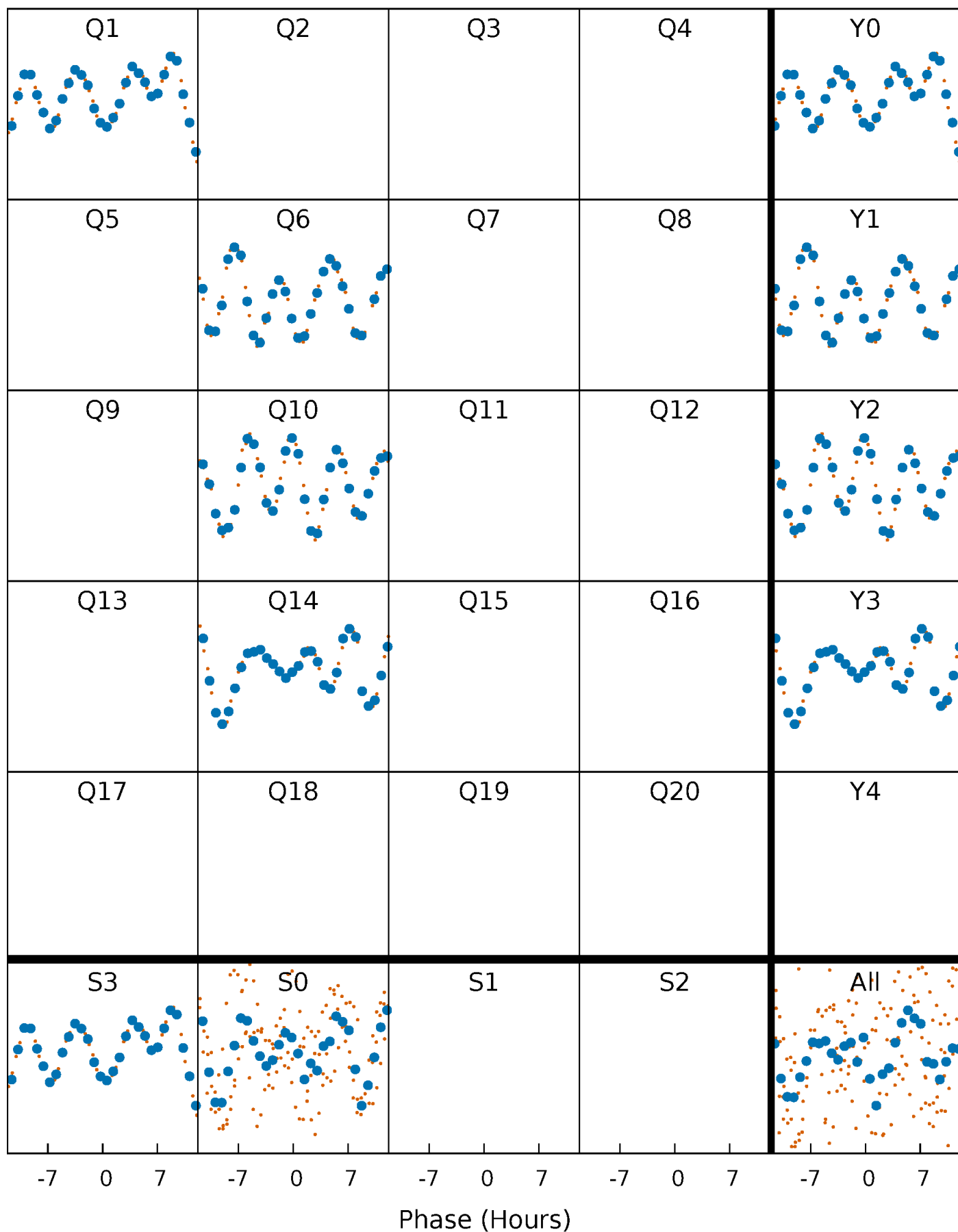


### Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

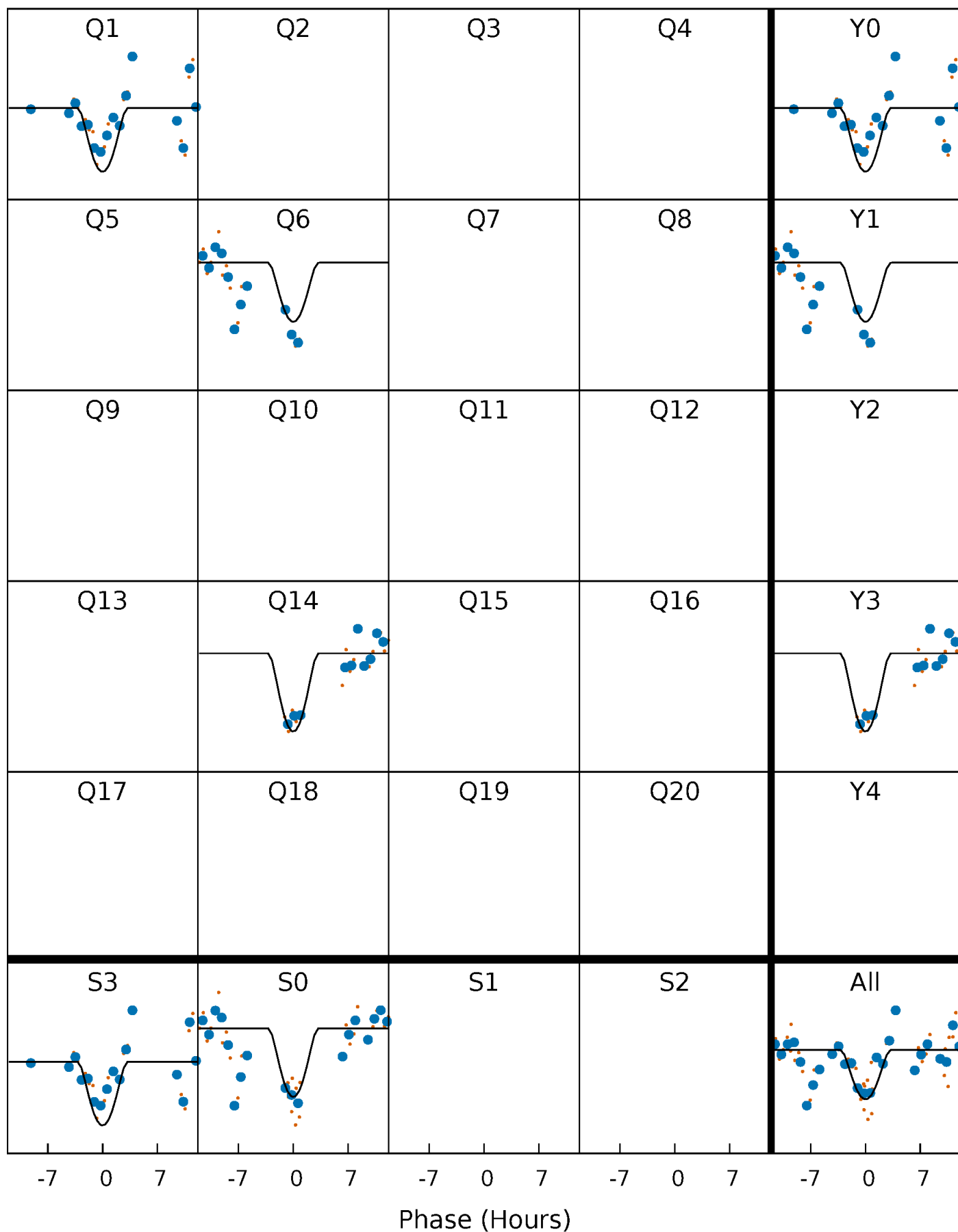
TCE 004466180-05     $P=394.653041$  Days     $T_0=160.968997$  (BKJD)





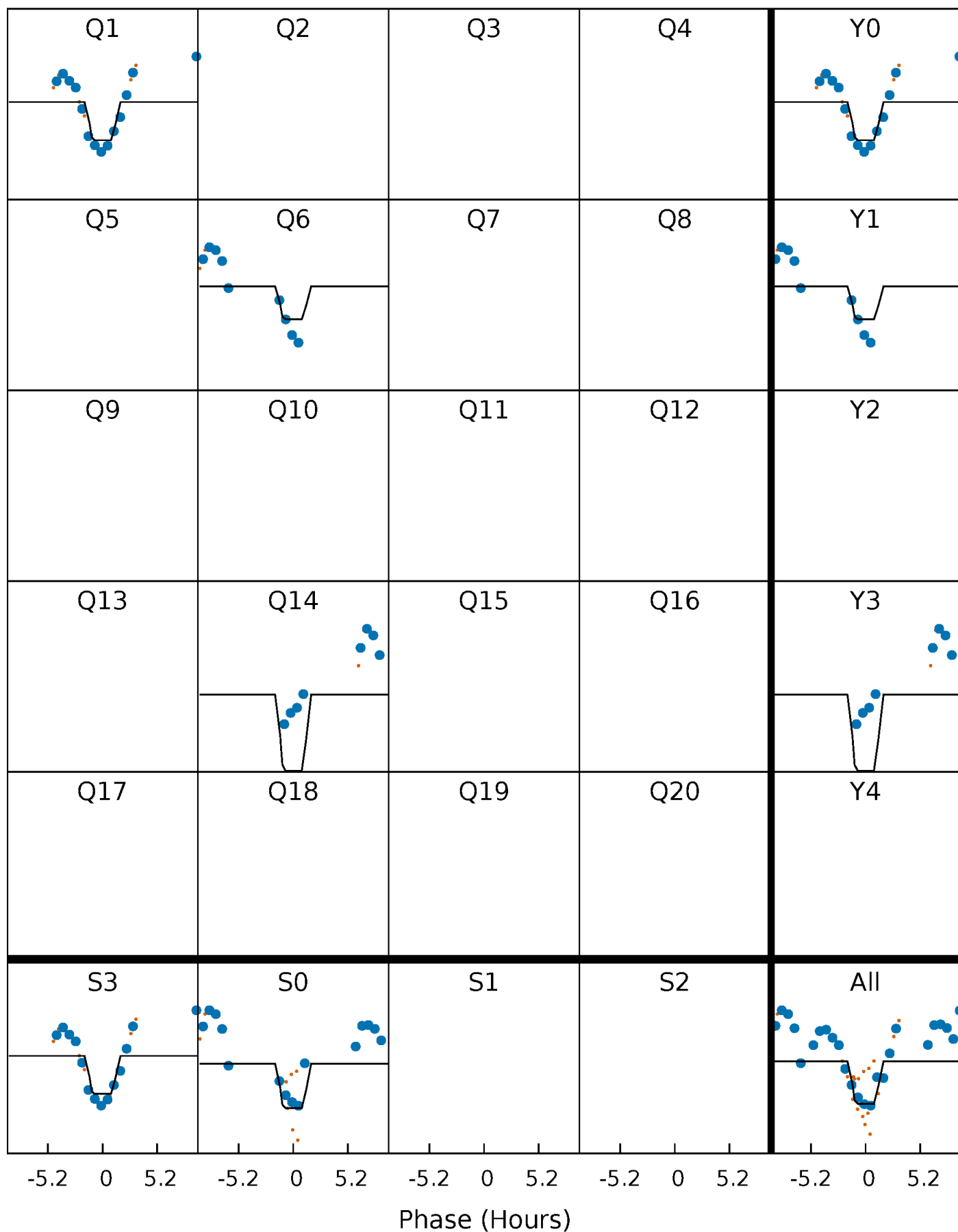
# DV Quarter-Phased Transit Curves

TCE 004466180-05     $P=394.653041$  Days     $T_0=160.968997$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

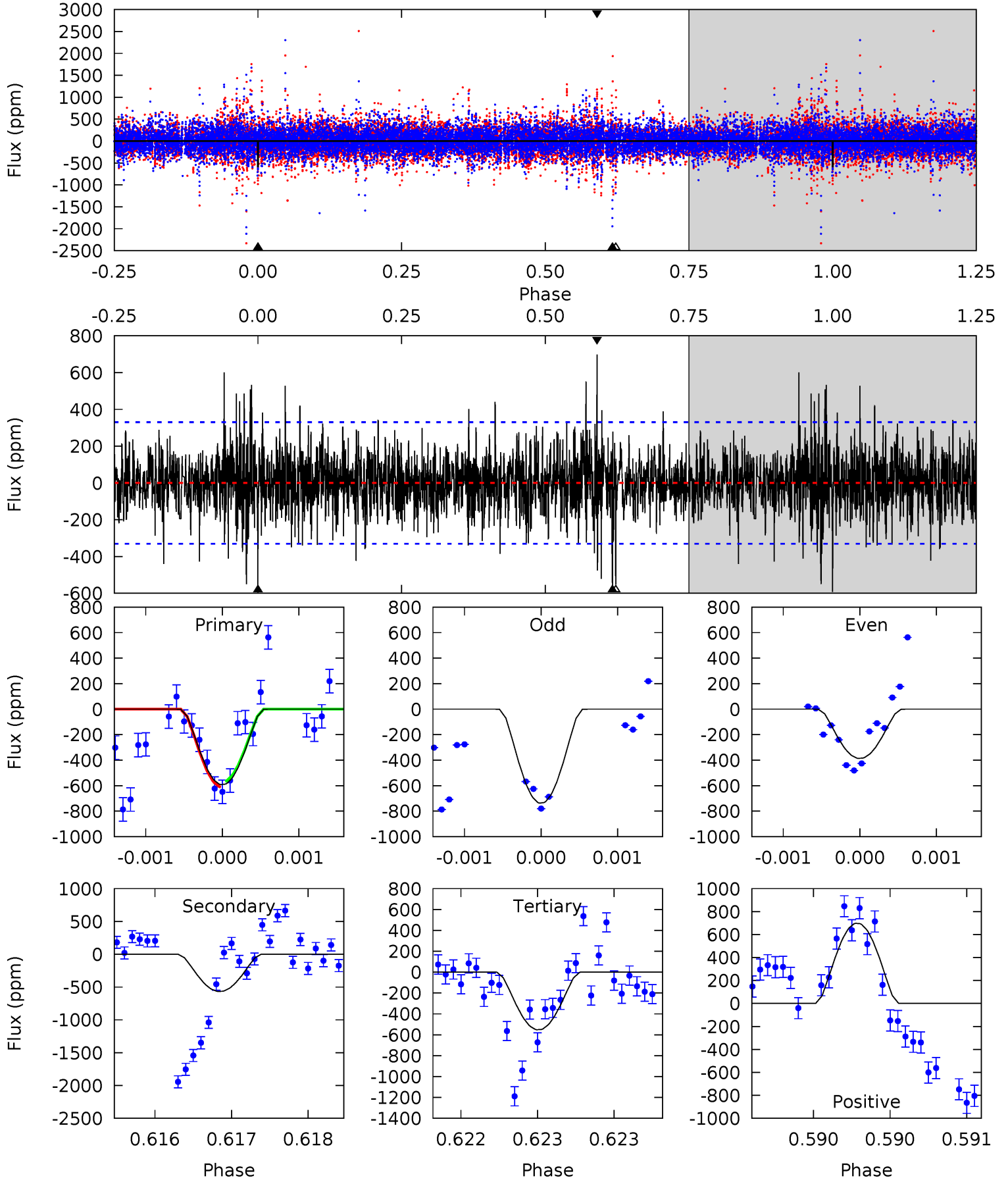
TCE 004466180-05     $P=394.646944$  Days     $T_0=160.989621$  (BKJD)



# DV Model-Shift Uniqueness Test

004466180-05, P = 394.653041 Days, E = 160.968997 Days

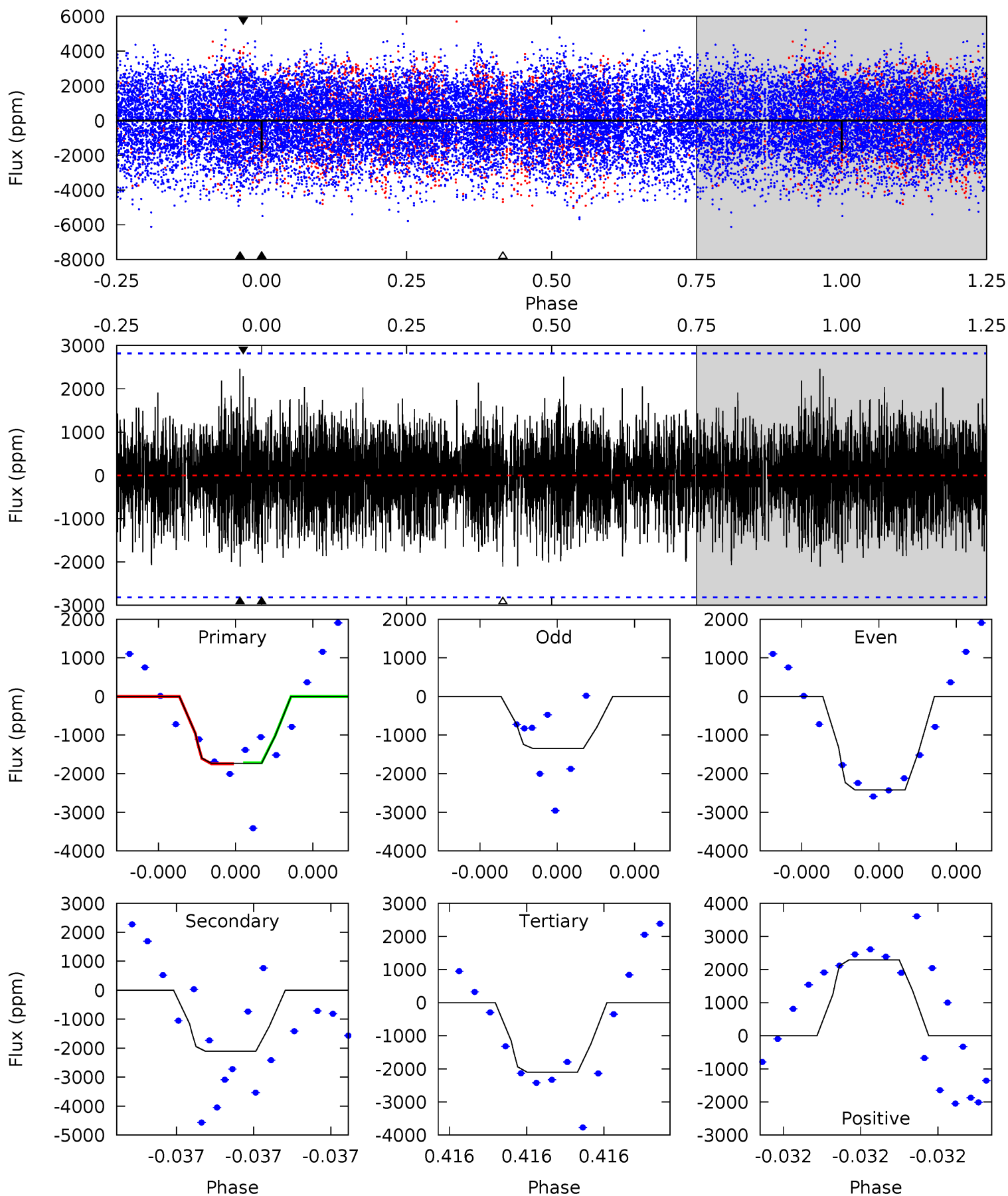
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.90	9.49	9.24	11.7	5.54	3.42	2.13	0.66	-1.79	0.25	-2.20	2.98	0.99	0.54	0.37



# Alt Model-Shift Uniqueness Test

004466180-05, P = 394.646944 Days, E = 160.989621 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
3.50	4.26	4.25	4.62	5.69	3.66	1.38	-0.75	-1.13	0.01	-0.37	1.10	0.74	0.54	0.03



### Stellar Parameters For KIC 004466180

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7082^{+195}_{-318}$	$3.715^{+0.442}_{-0.078}$	$0.080^{+0.200}_{-0.300}$	$3.109^{+0.472}_{-1.416}$	$1.828^{+0.179}_{-0.418}$	$0.086^{+0.349}_{-0.021}$
	+3%/-4%	+12%/-2%	+250%/-375%	+15%/-46%	+10%/-23%	+407%/-24%
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 004466180-05 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-567 \pm 60$	$59.79^{+65.47}_{-44.26}$	$654^{+45}_{-78}$	$3076^{+1596}_{-529}$	$145^{+1840}_{-112}$
Alt.	$-2108 \pm 495$	$59.51^{+67.42}_{-43.61}$	$652^{+46}_{-71}$	$3764^{+2743}_{-754}$	$546^{+6645}_{-424}$

$T_{max}$  = 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

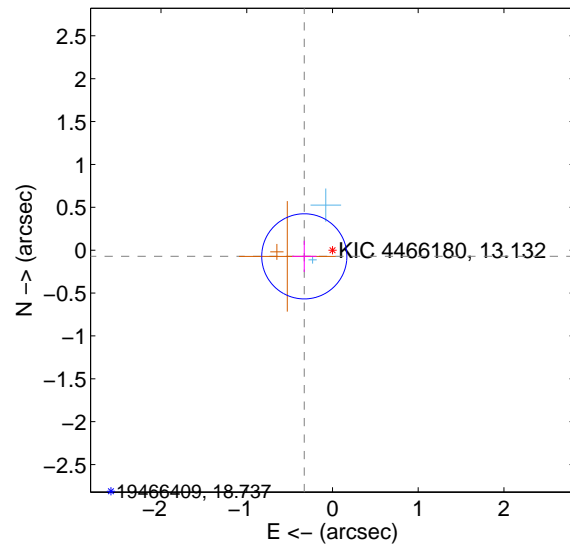
Supplemental centroid analysis for 004466180-05. Kepler magnitude: 13.13. Transit SNR 8.71

There are 2 quarters with good PRF difference image offsets

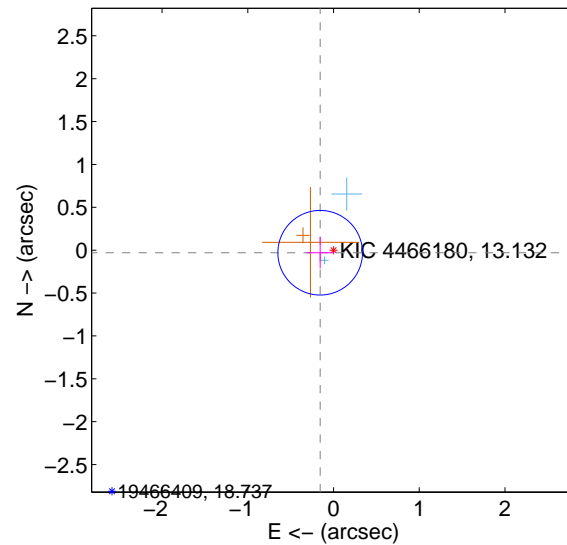
The direct PRF centroid is offset from the target star catalog position by about 0.30 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.336 \pm 0.166$	2.03	$0.329 \pm 0.142$	$-0.072 \pm 0.182$
PRF-fit source offset from KIC position	$0.158 \pm 0.164$	0.96	$0.155 \pm 0.164$	$-0.030 \pm 0.183$
photometric centroid source offset	$0.51 \pm 0.61$	0.83	$-0.15 \pm 0.65$	$-0.49 \pm 0.61$

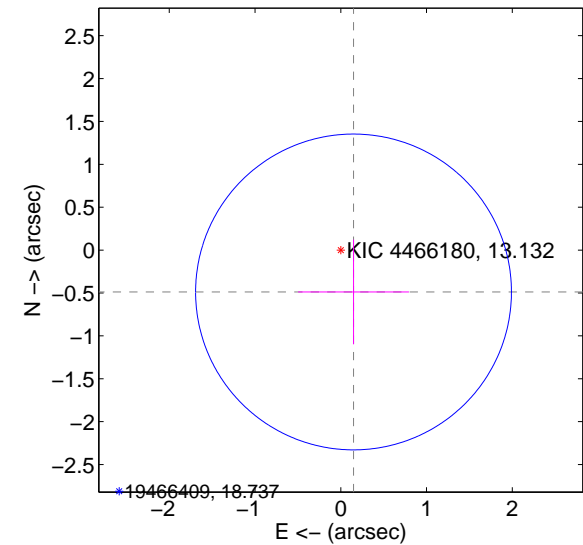
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



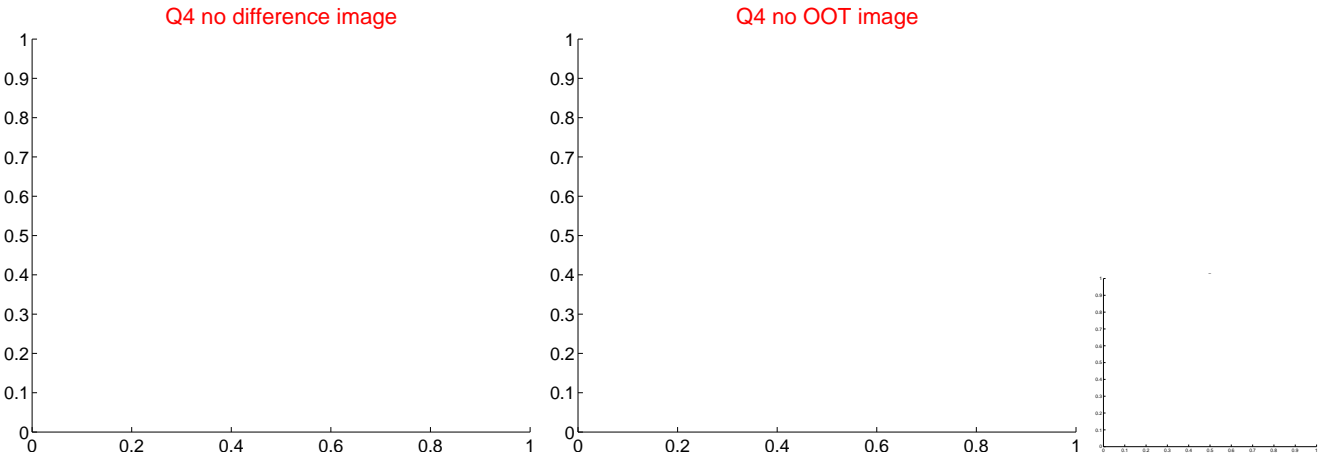
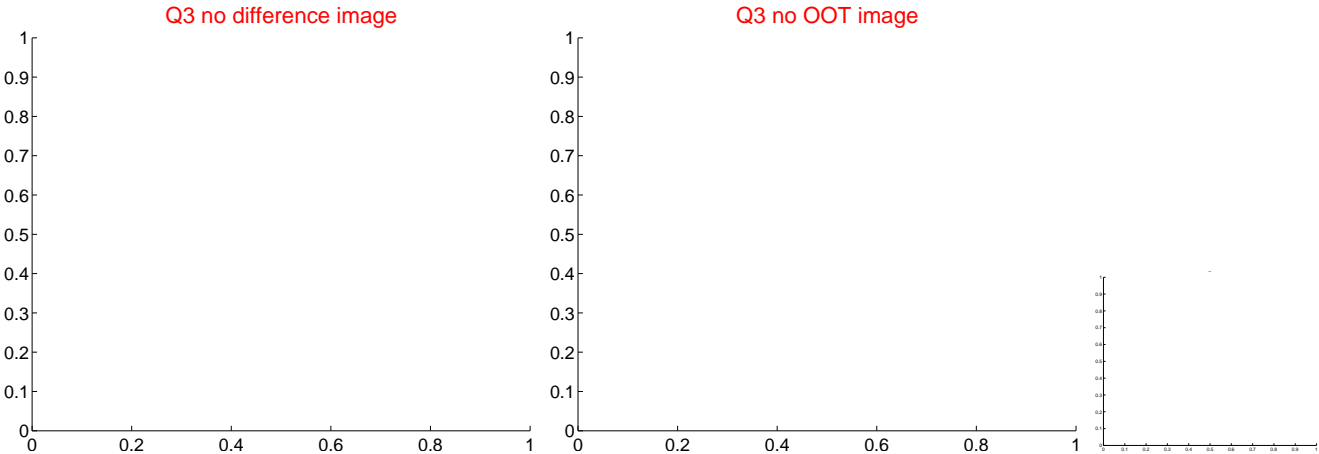
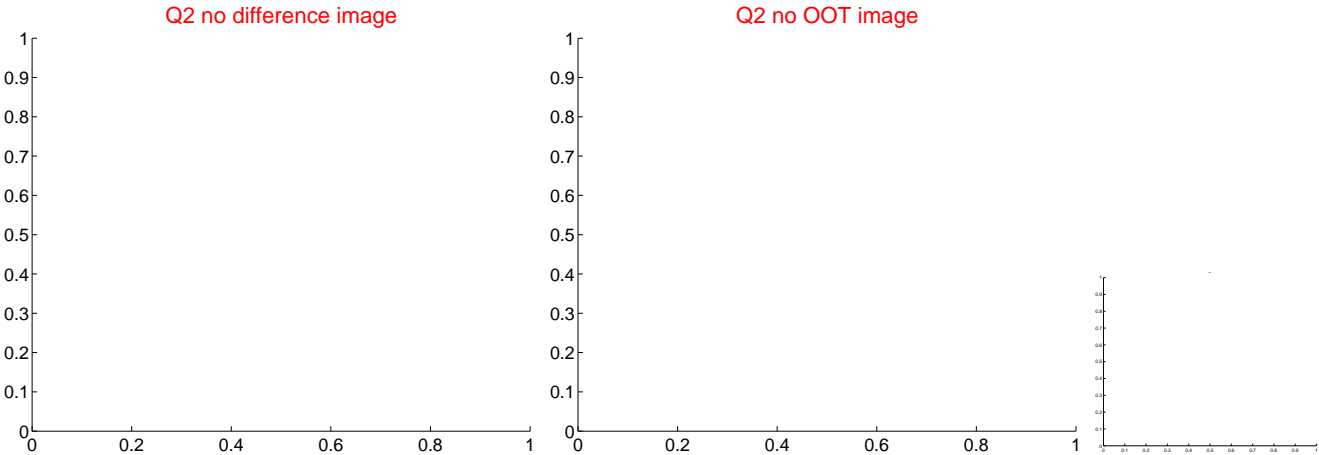
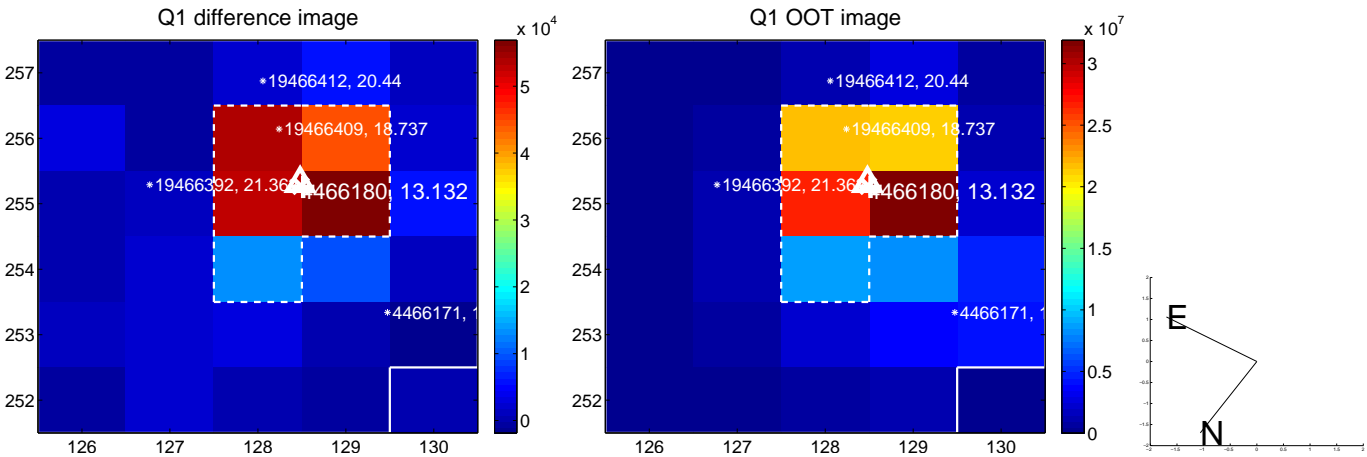
offset from photometric centroids



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.

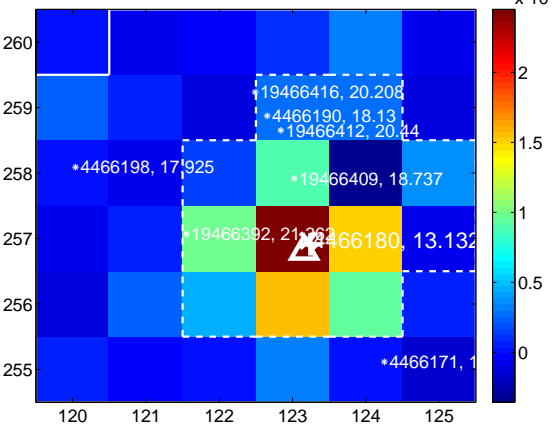
Q5 no difference image



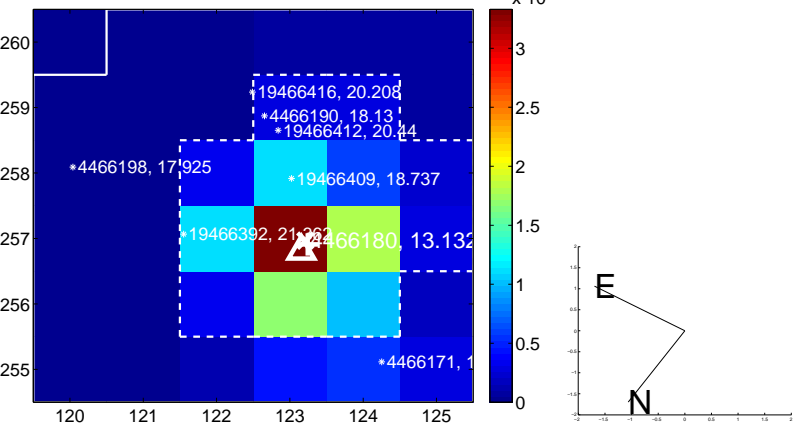
Q5 no OOT image



Q6 difference image



Q6 OOT image



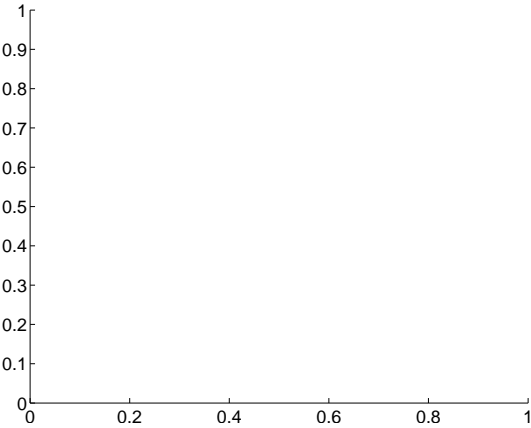
Q7 no difference image



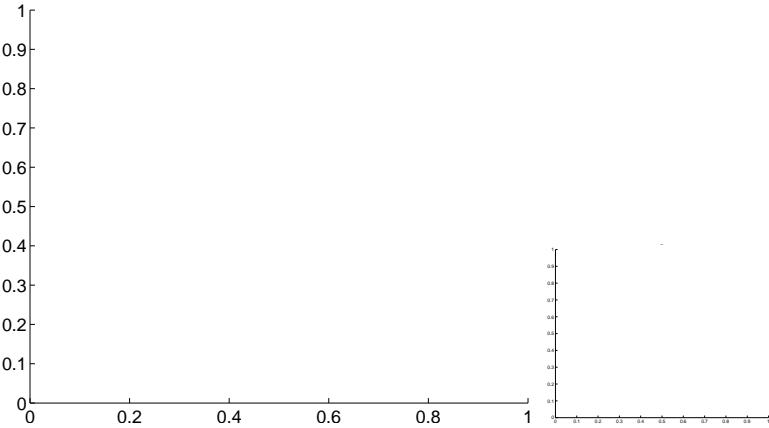
Q7 no OOT image



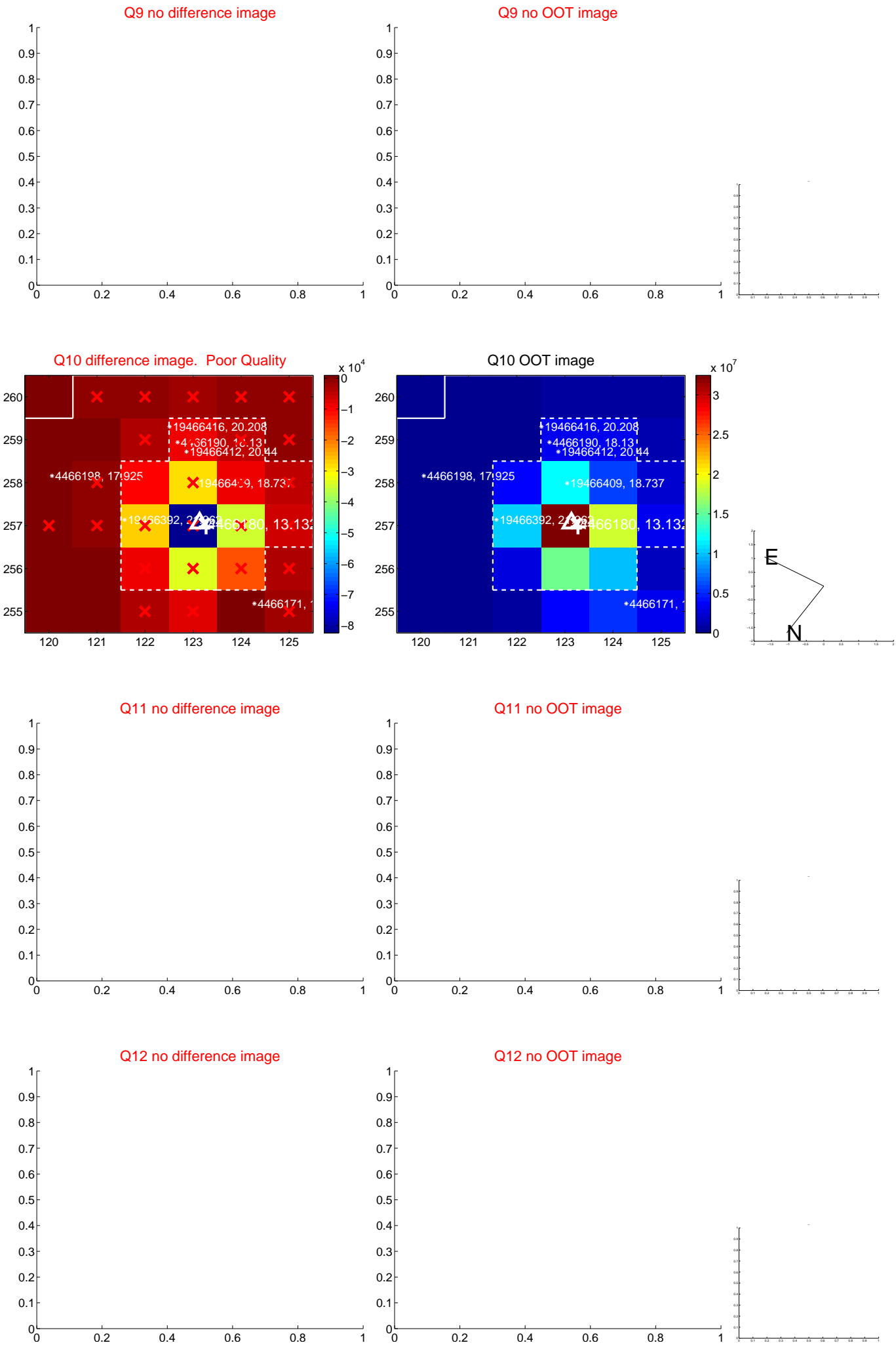
Q8 no difference image



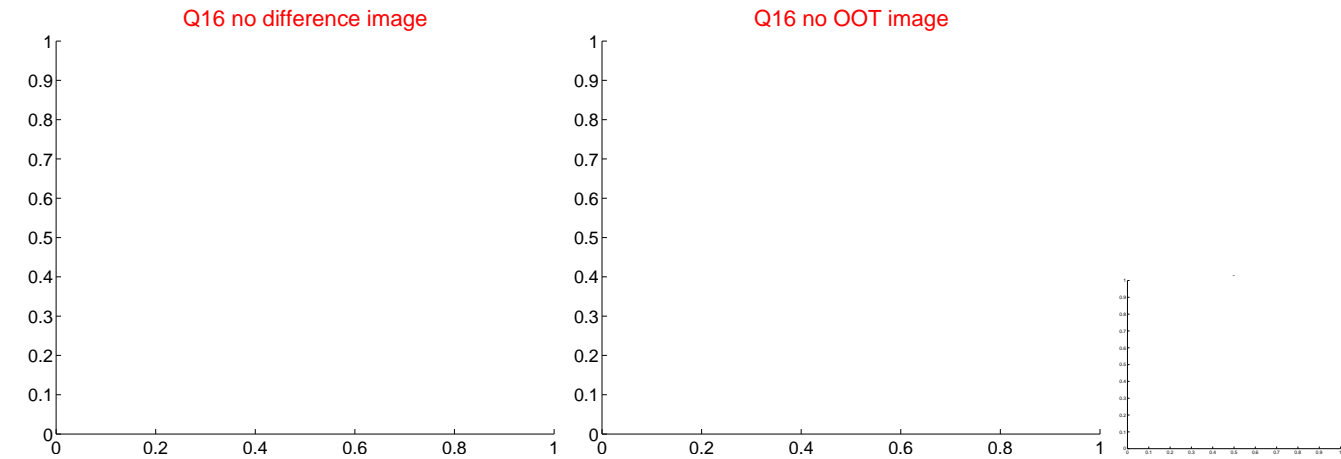
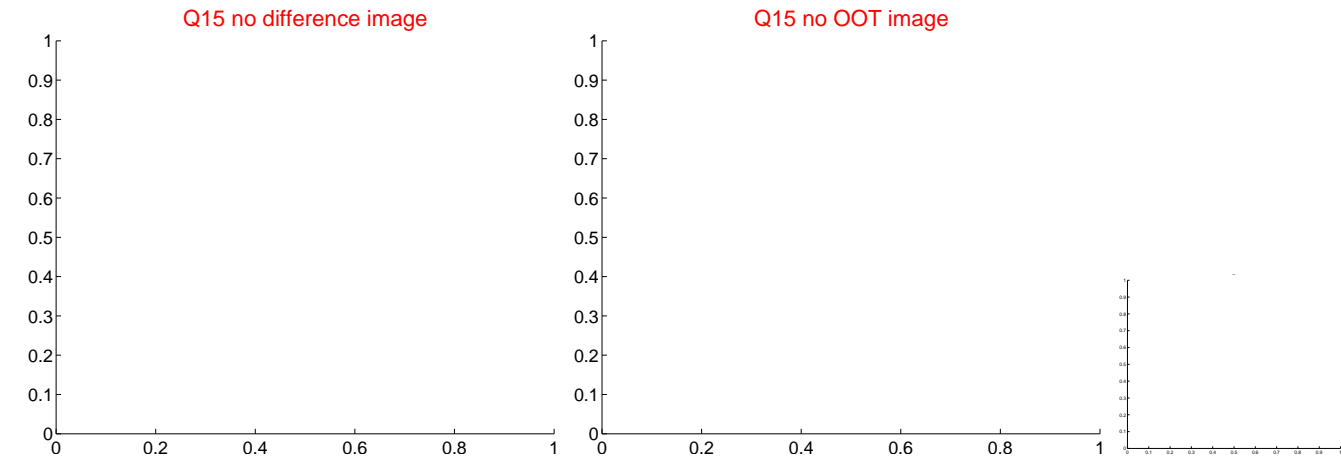
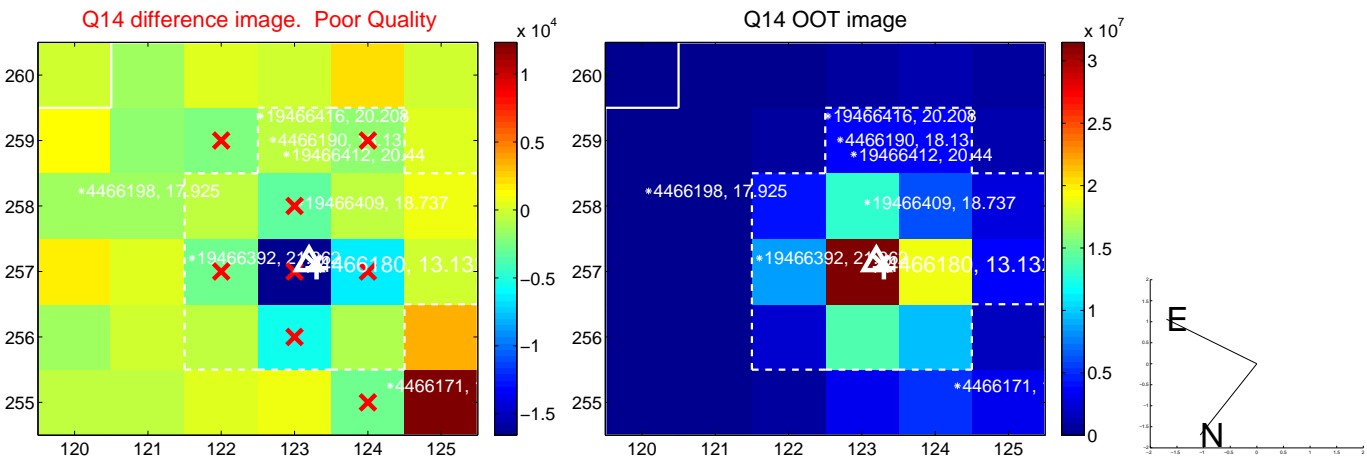
Q8 no OOT image



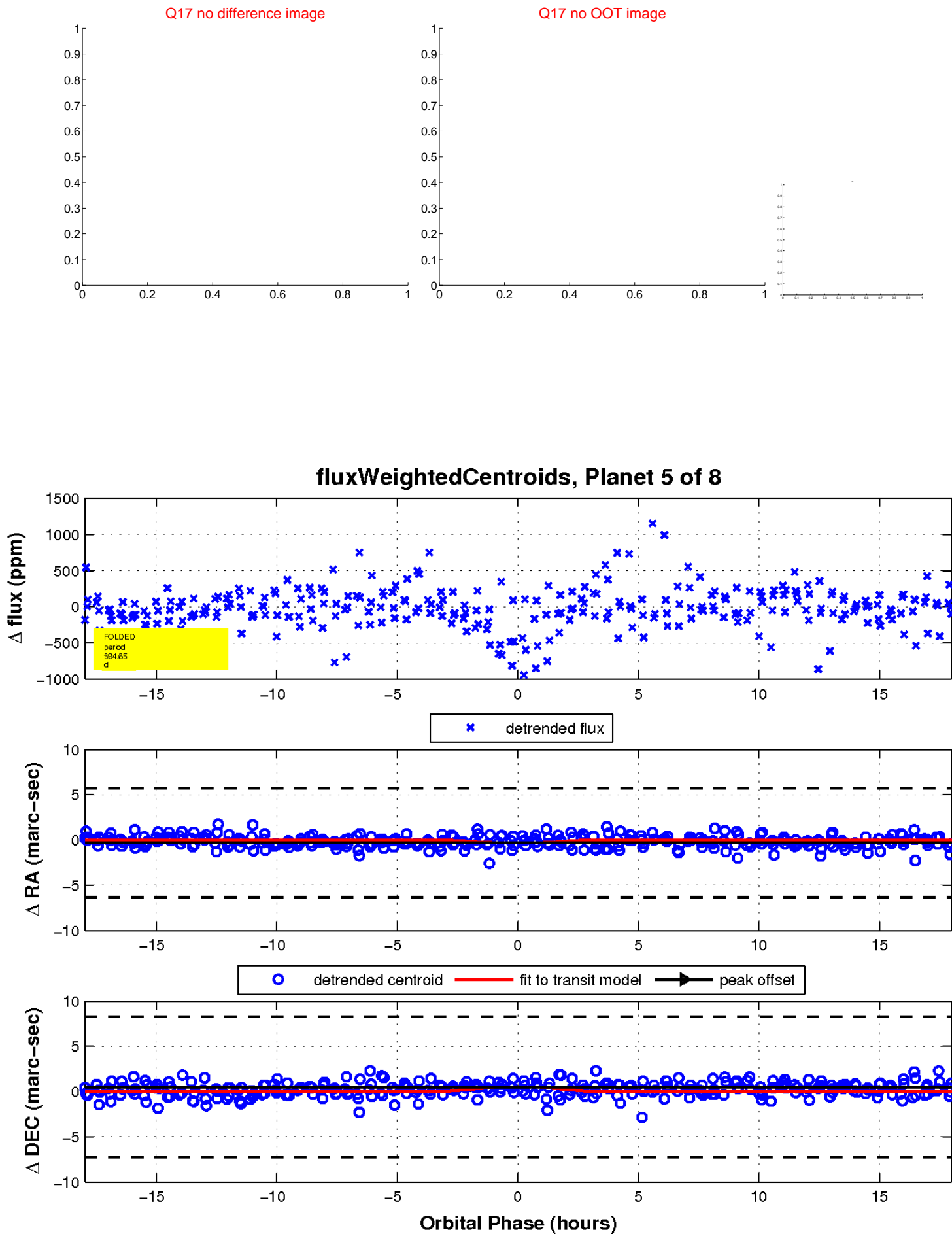
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

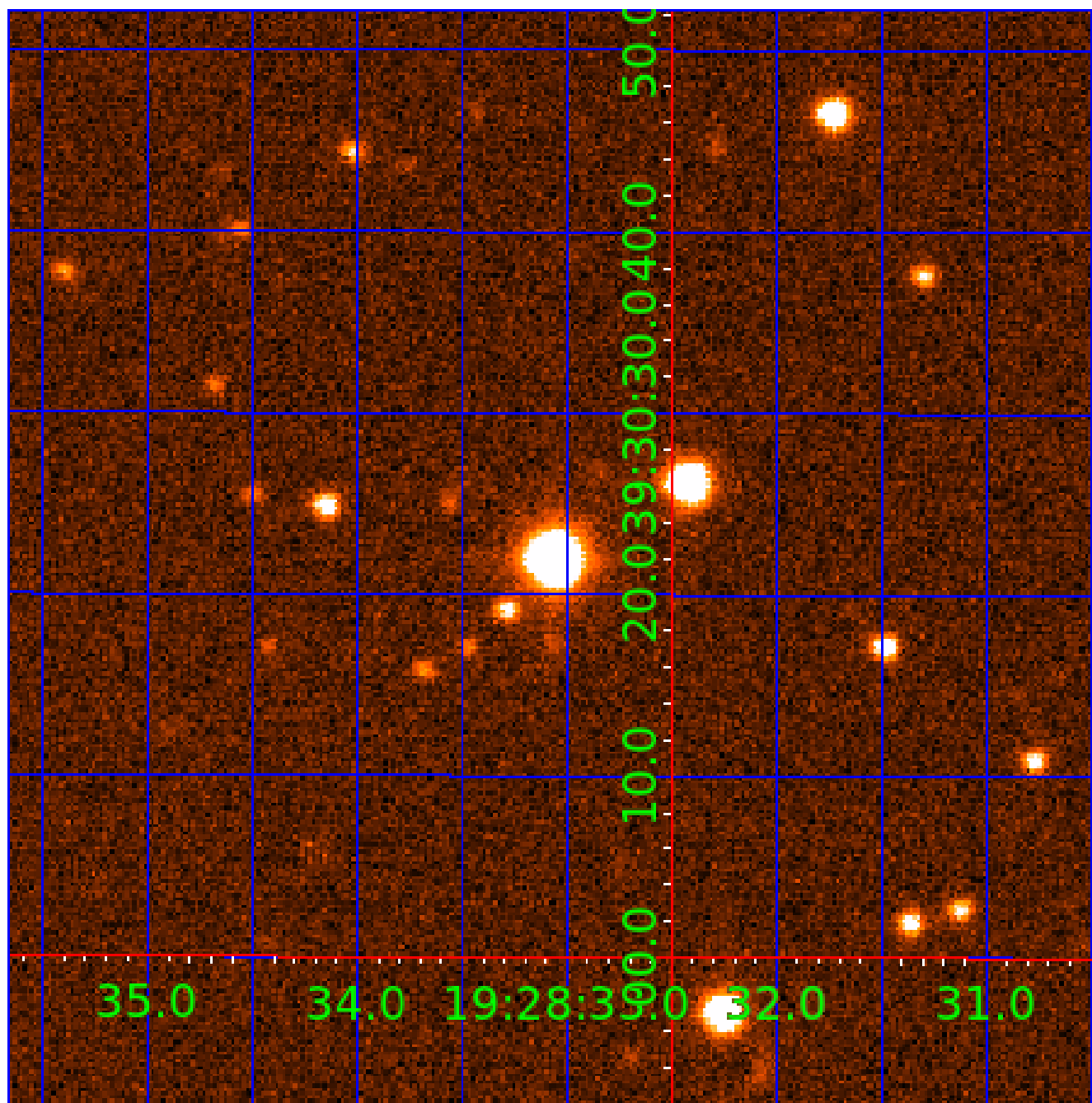


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004466180-01	OBS	No	0.563995	131.917877	0.0	1.069	9.6	0.0	3.11	7082	0.06	81576.47
004466180-02	OBS	No	2.557937	131.728417	41.1	10.798	8.3	7.8	3.11	7082	2.31	10866.23
004466180-03	OBS	No	201.318912	216.340817	646.3	4.790	8.5	8.7	3.11	7082	10.50	32.22
004466180-04	OBS	No	396.401111	355.734254	652.9	4.954	8.8	9.2	3.11	7082	15.03	13.05
004466180-05	OBS	No	394.653041	160.968997	695.7	6.085	9.0	8.7	3.11	7082	15.48	13.13
004466180-06	OBS	No	253.765919	260.372249	475.7	5.518	8.6	7.3	3.11	7082	7.00	23.66
004466180-07	OBS	No	110.793636	151.348018	614.3	3.227	8.6	7.9	3.11	7082	10.85	71.44
004466180-08	OBS	No	160.634372	143.491195	50.6	3.598	9.0	0.8	3.11	7082	2.56	43.53

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004466180-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
004466180-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
004466180-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
004466180-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
004466180-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004466180-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—TRANS_GAPPED—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
004466180-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
004466180-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

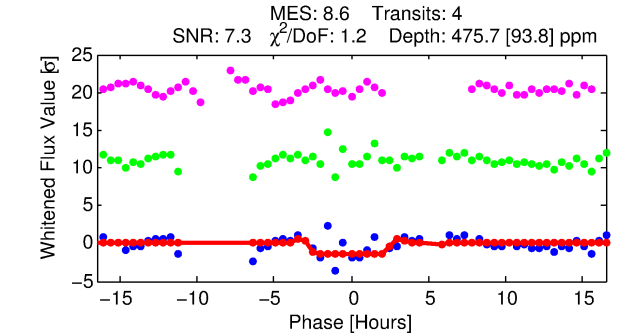
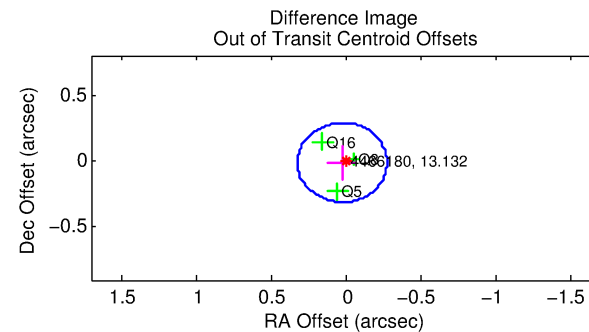
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 004466180-06

No Significant Match Found



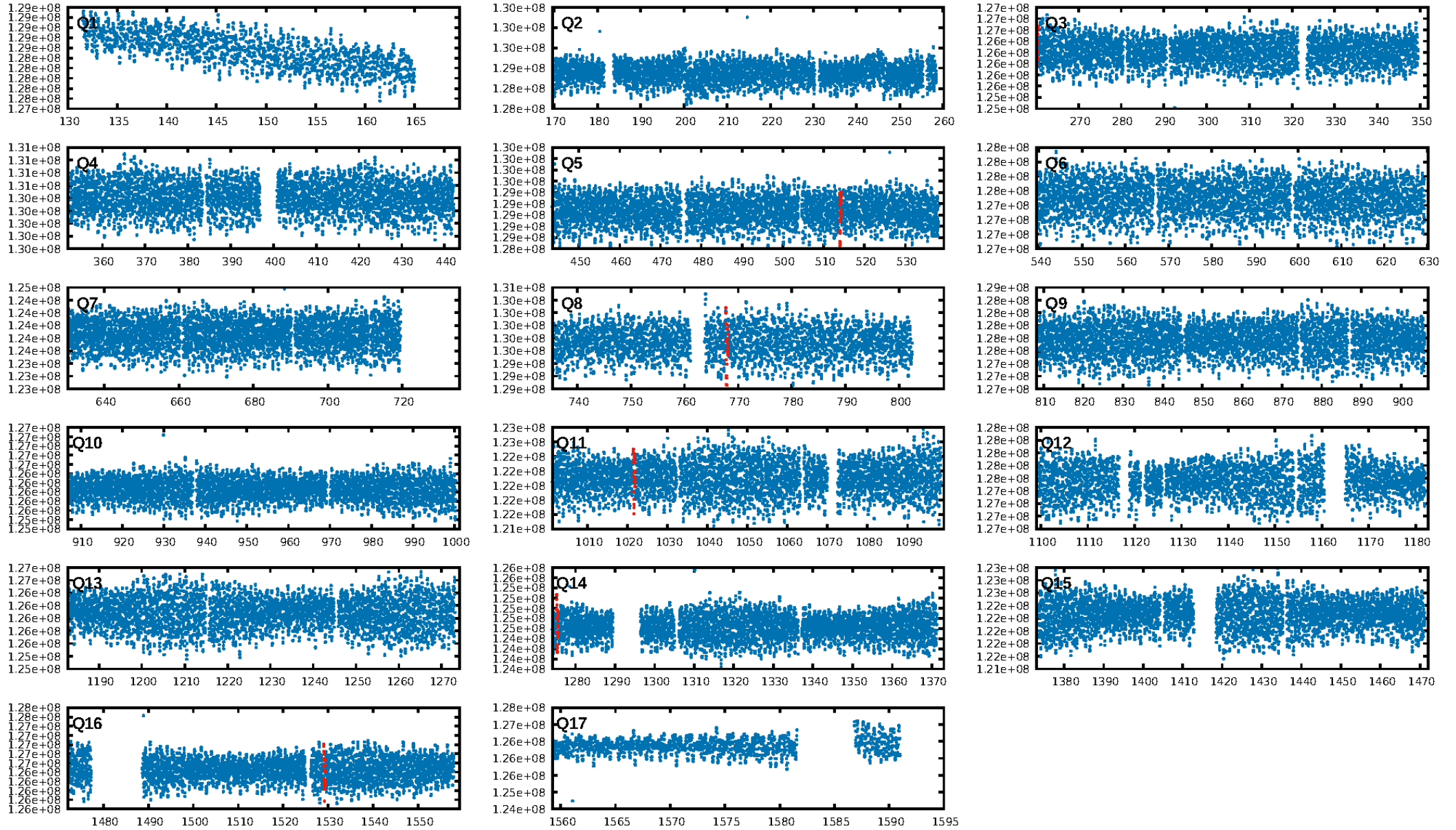
KIC: 4466180    Candidate: 6 of 8    Period: 253.766 d



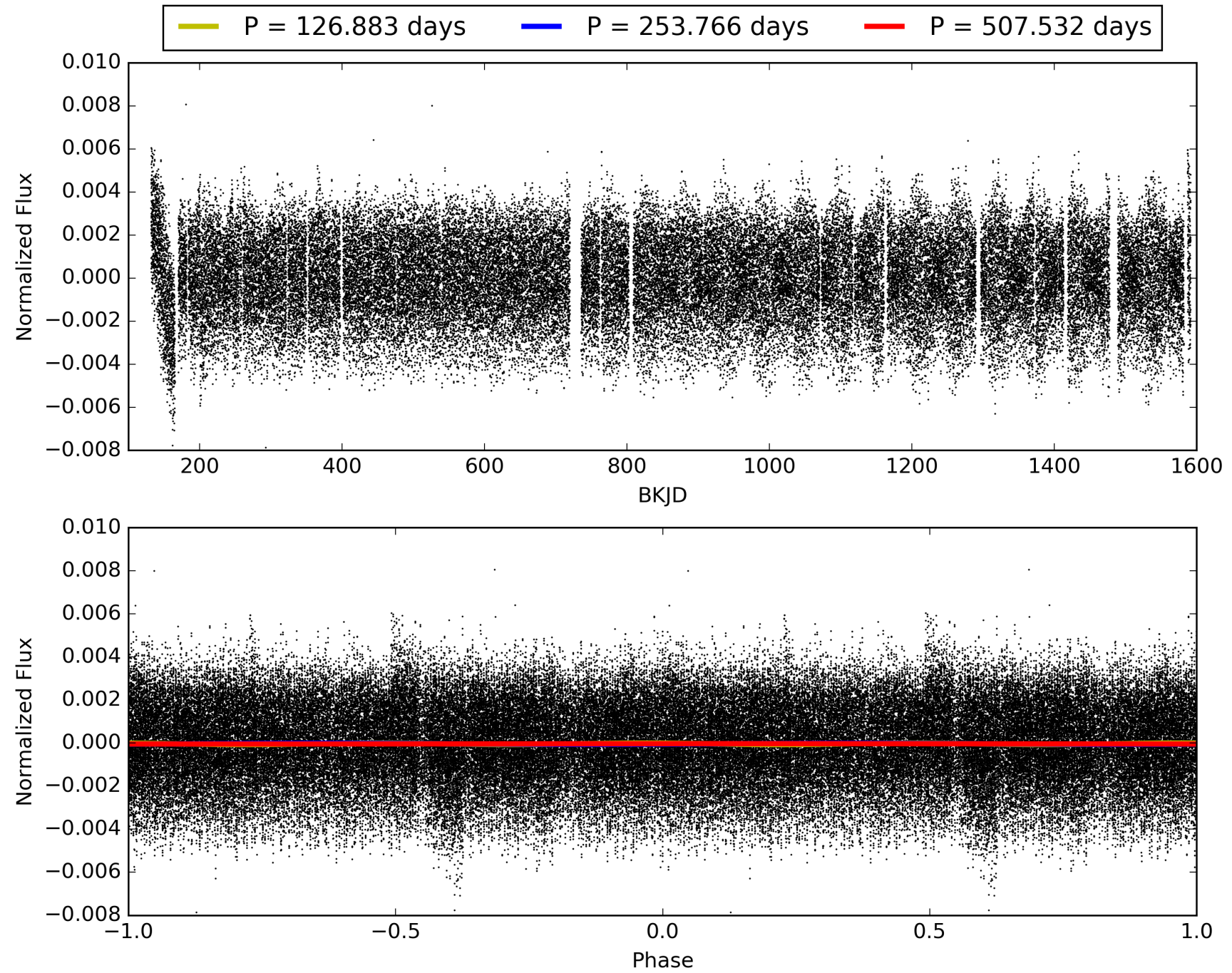
ShortPeriod-sig: 100.0% [172.26σ]  
 LongPeriod-sig: 100.0% [411.64σ]  
 ModelChiSquare2-sig: 64.4%  
 ModelChiSquareGof-sig: 99.8%  
 Bootstrap-pfa: N/A  
 RollingBand-fgt: 1.00 [4/4]  
 GhostDiagnostic-chr: 2.374

Centroid-sig: 11.3%  
 Centroid-so: 0.189 arcsec [0.31σ]  
 OotOffset-rm: 0.025 arcsec [0.25σ]  
 KicOffset-rm: 0.106 arcsec [0.85σ]  
 OotOffset-st: 0/0/2/1 [3]  
 KicOffset-st: 0/0/2/1 [3]  
 DiffImageQuality-fgm: 1.00 [3/3]  
 DiffImageOverlap-fno: 0.00 [0/3]

# TCE 004466180-06, PDC Light Curves

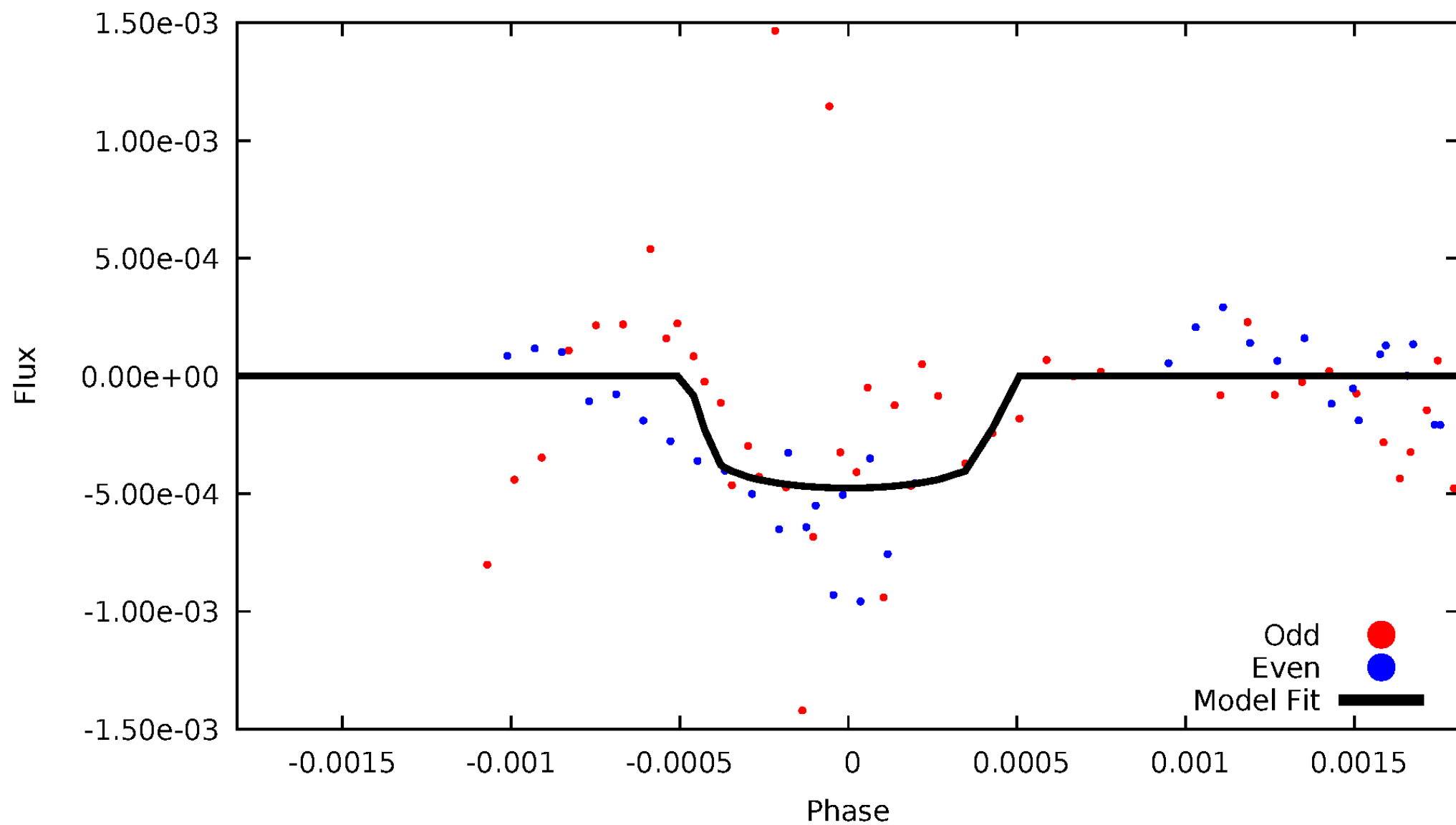


TCE 004466180-06



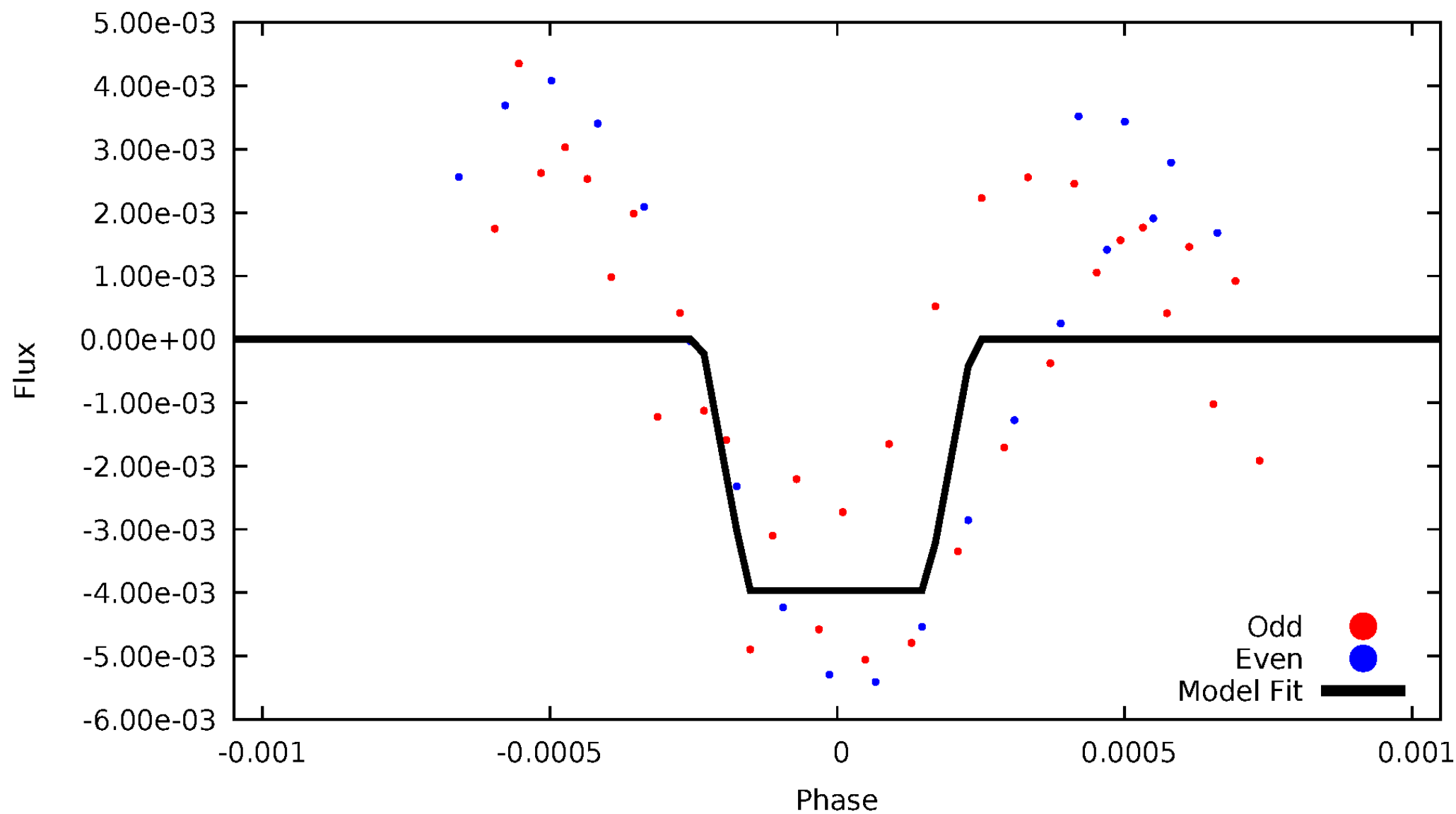
# DV Odd/Even

TCE 004466180-06



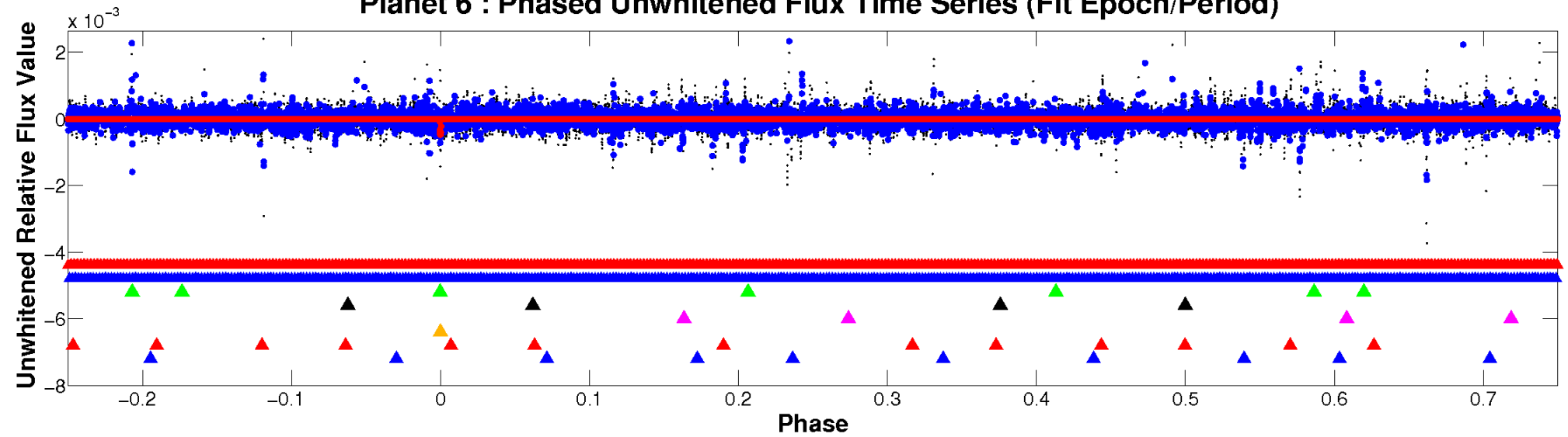
# ALT Odd/Even

TCE 004466180-06

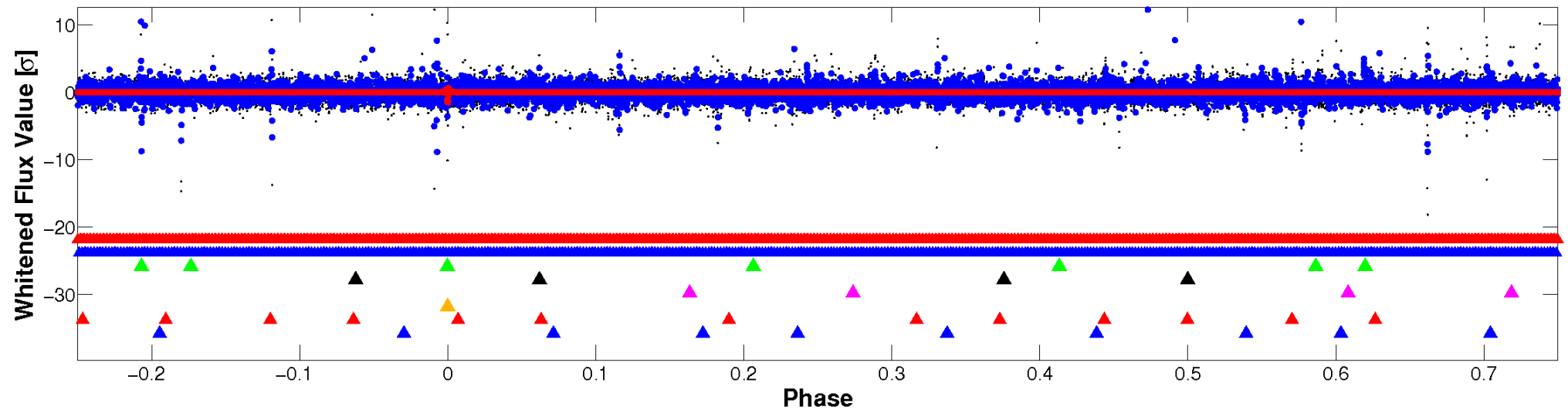


# Non-Whitened Vs. Whitened Light Curve

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

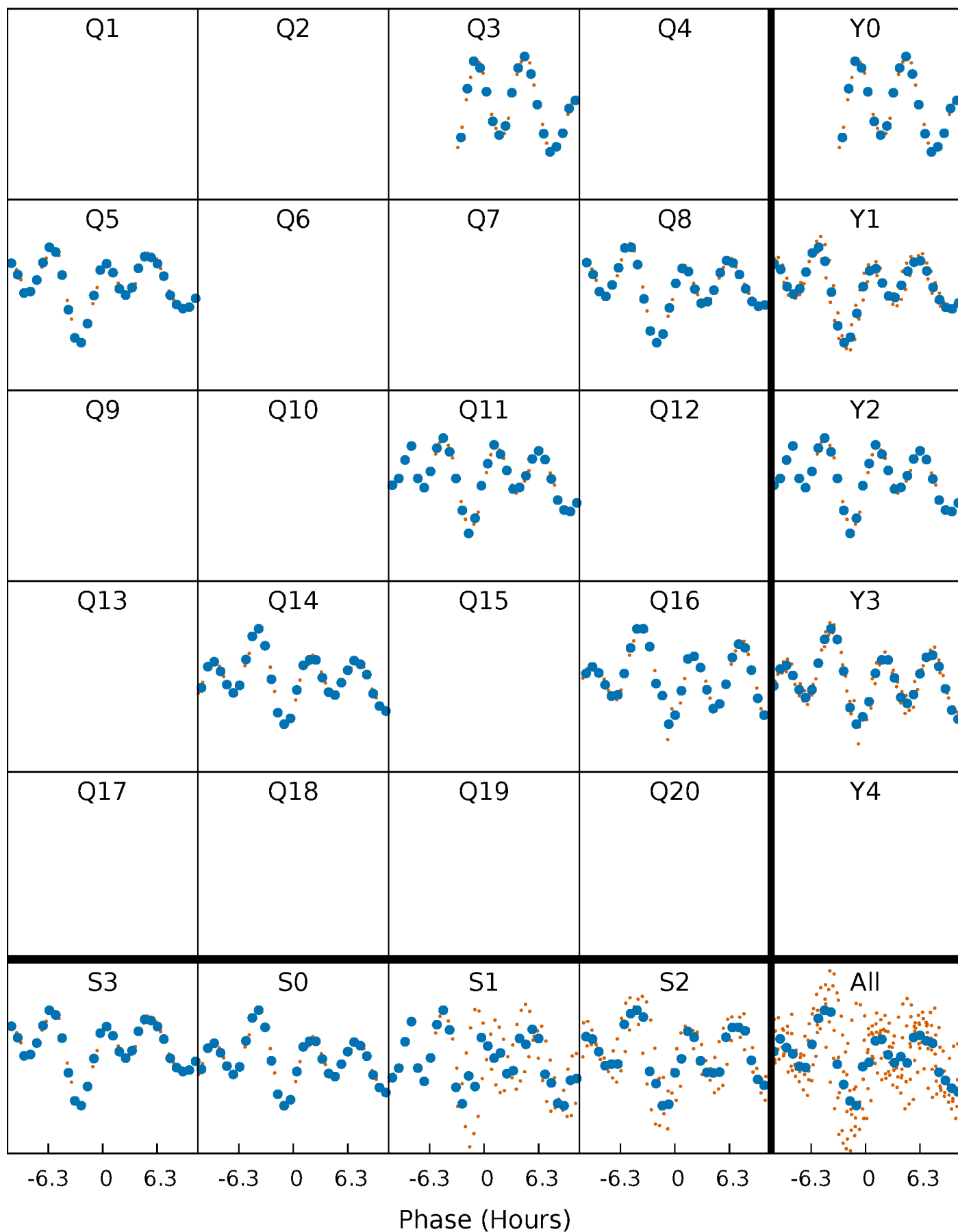


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

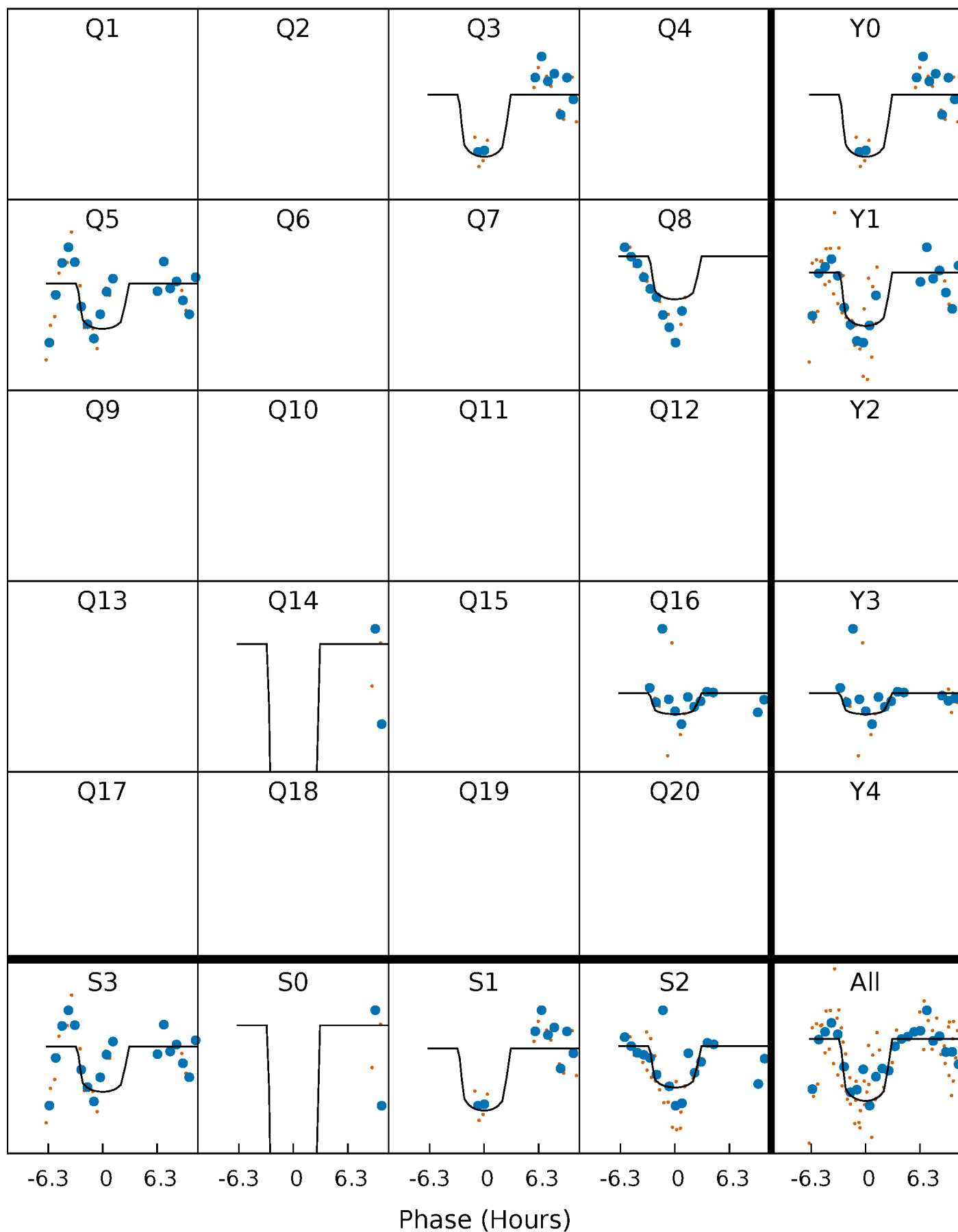
TCE 004466180-06     $P=253.765919$  Days     $T_0=260.372249$  (BKJD)





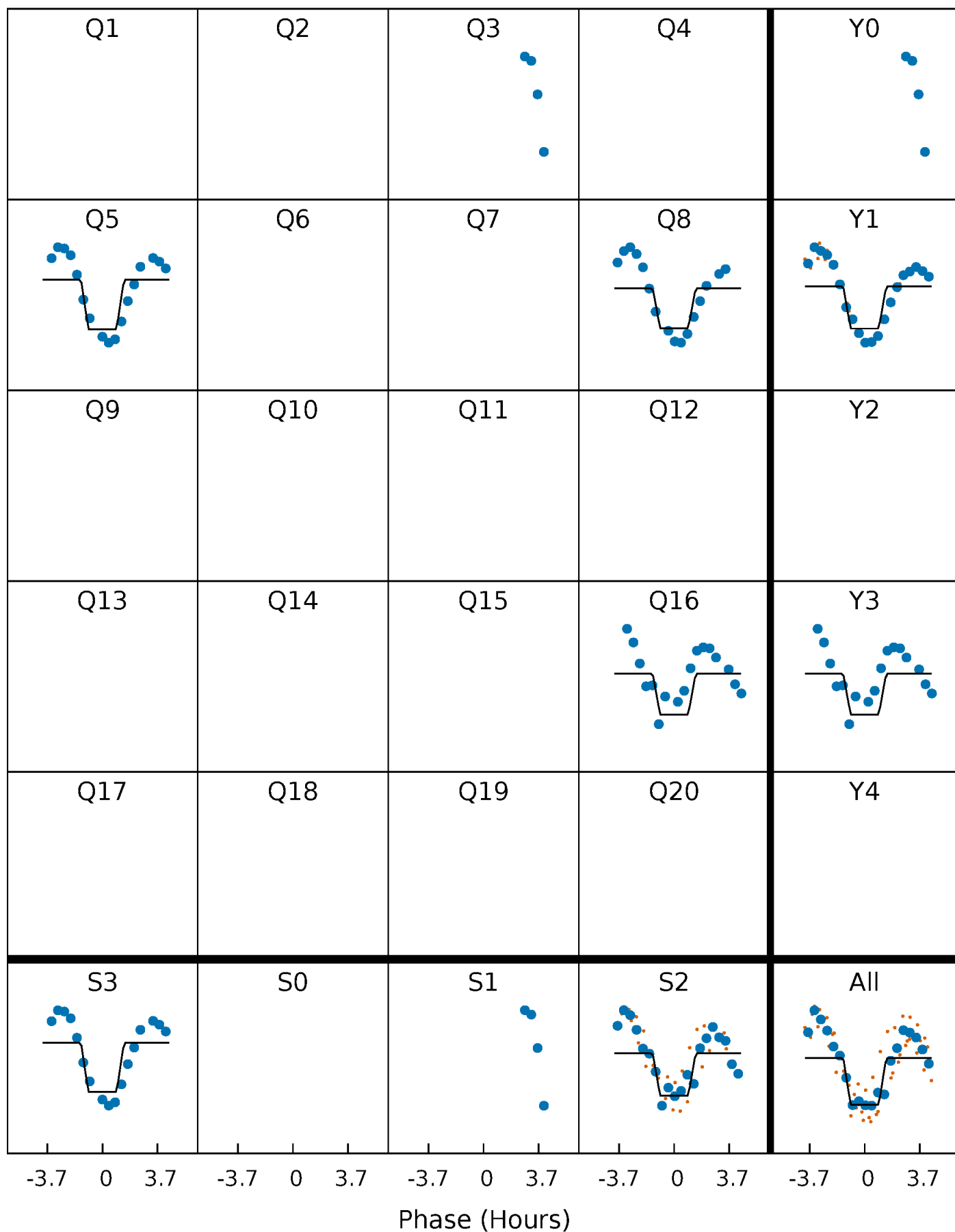
# DV Quarter-Phased Transit Curves

TCE 004466180-06     $P=253.765919$  Days     $T_0=260.372249$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

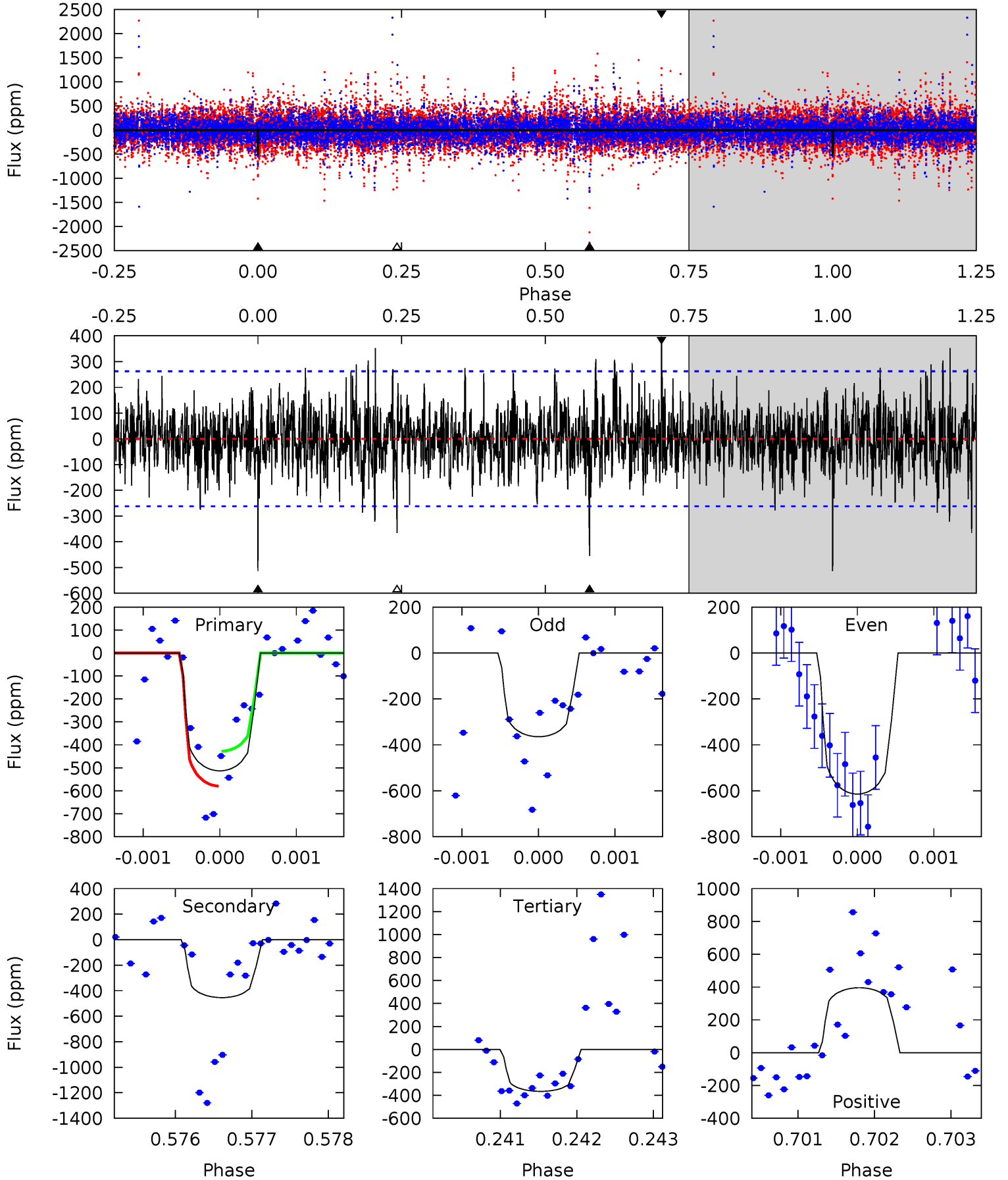
TCE 004466180-06 P=253.796970 Days  $T_0=260.220699$  (BKJD)



# DV Model-Shift Uniqueness Test

004466180-06, P = 253.765919 Days, E = 6.606330 Days

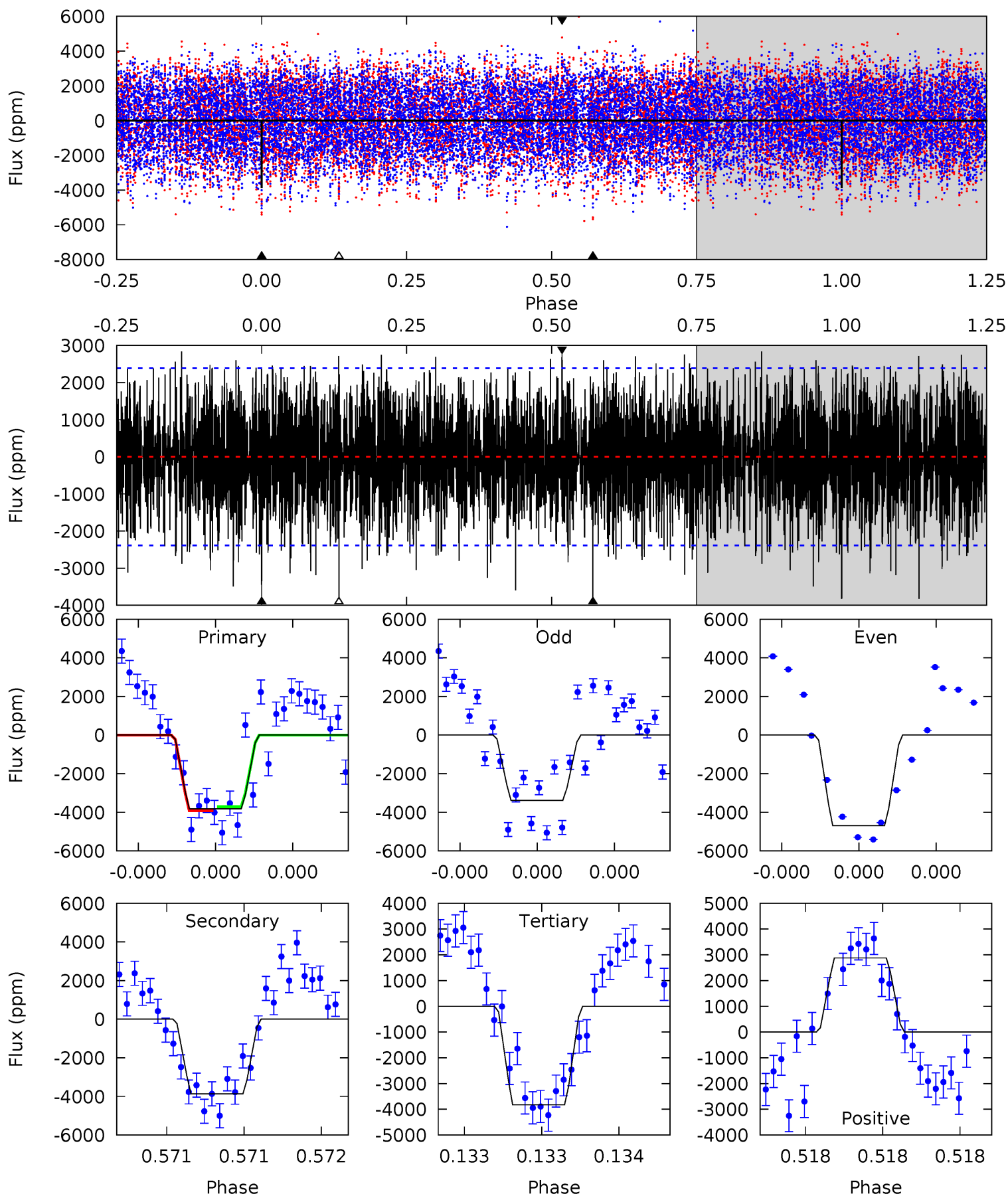
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.7	9.45	7.61	8.24	5.46	3.30	1.89	3.07	2.44	1.85	1.22	2.46	1.08	0.44	1.57



# Alt Model-Shift Uniqueness Test

004466180-06, P = 253.796970 Days, E = 6.423729 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
8.95	9.07	8.96	6.74	5.59	3.51	2.63	-0.01	2.21	0.11	2.33	1.48	0.87	0.43	0.25



### Stellar Parameters For KIC 004466180

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$\rho_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7082^{+195}_{-318}$	$3.715^{+0.442}_{-0.078}$	$0.080^{+0.200}_{-0.300}$	$3.109^{+0.472}_{-1.416}$	$1.828^{+0.179}_{-0.418}$	$0.086^{+0.349}_{-0.021}$
	+3%/-4%	+12%/-2%	+250%/-375%	+15%/-46%	+10%/-23%	+407%/-24%
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 004466180-06 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-454 \pm 48$	$11.84^{+10.82}_{-7.76}$	$756^{+54}_{-87}$	$5202^{+3777}_{-1127}$	$1654^{+11781}_{-1219}$
Alt.	$-3871 \pm 427$	$19.42^{+13.45}_{-10.82}$	$753^{+57}_{-93}$	$6859^{+4514}_{-1430}$	$5103^{+20859}_{-3248}$

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

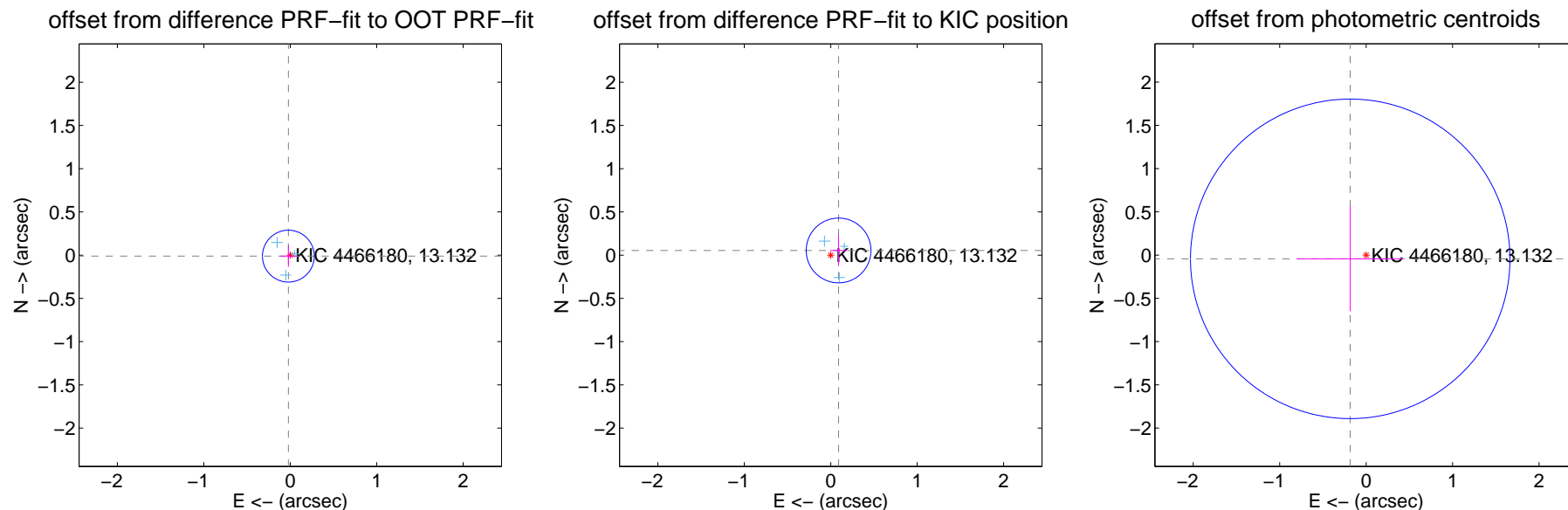
## DV Centroid Data

Supplemental centroid analysis for 004466180-06. Kepler magnitude: 13.13. Transit SNR 7.33

There are 3 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.025 \pm 0.100$	0.25	$0.022 \pm 0.092$	$-0.011 \pm 0.124$
PRF-fit source offset from KIC position	$0.106 \pm 0.125$	0.85	$-0.091 \pm 0.098$	$0.054 \pm 0.180$
photometric centroid source offset	$0.19 \pm 0.62$	0.31	$0.18 \pm 0.62$	$-0.04 \pm 0.60$



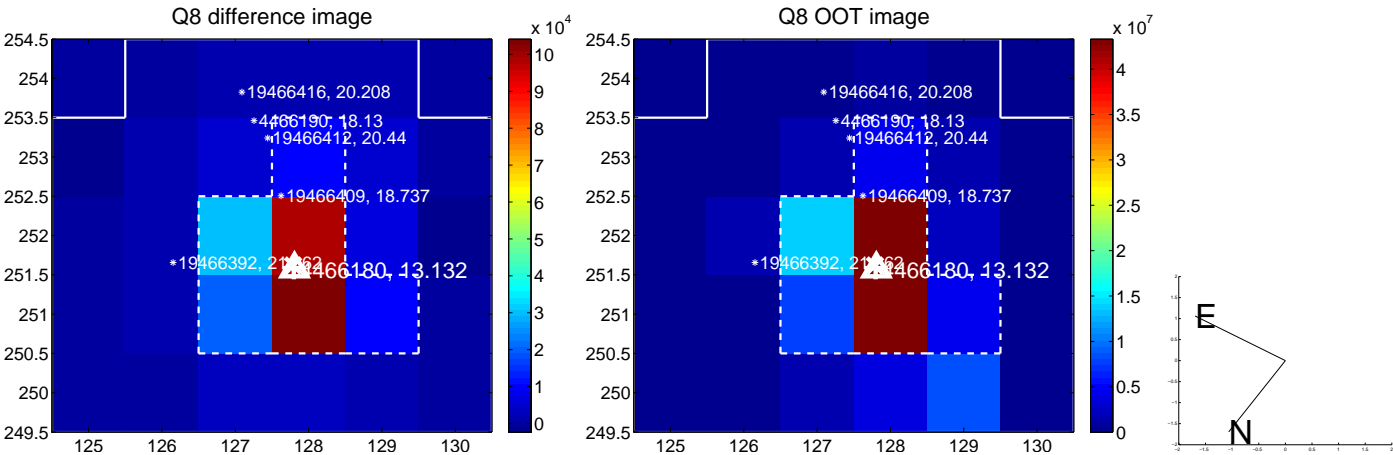
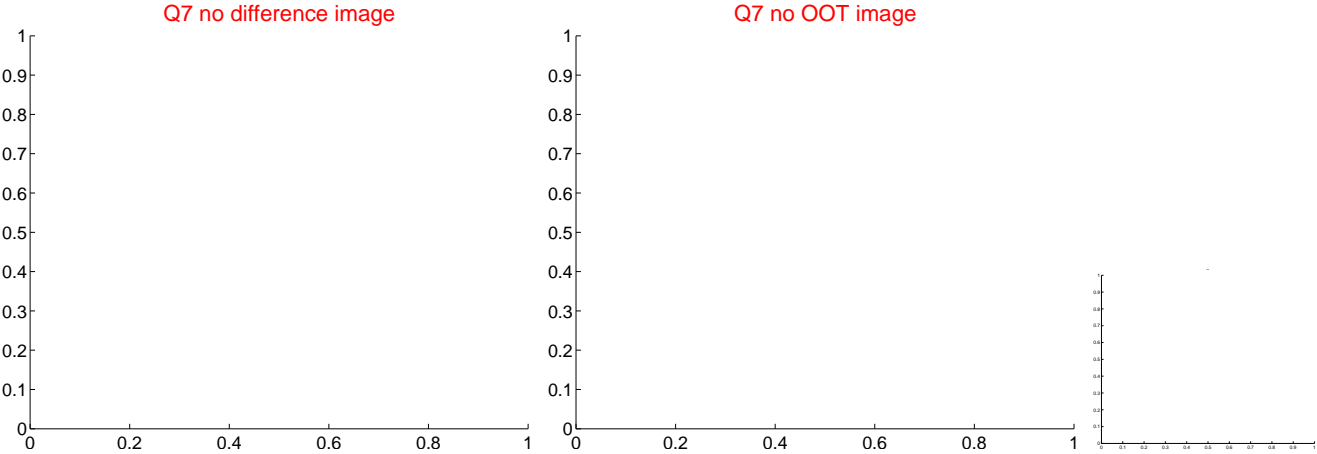
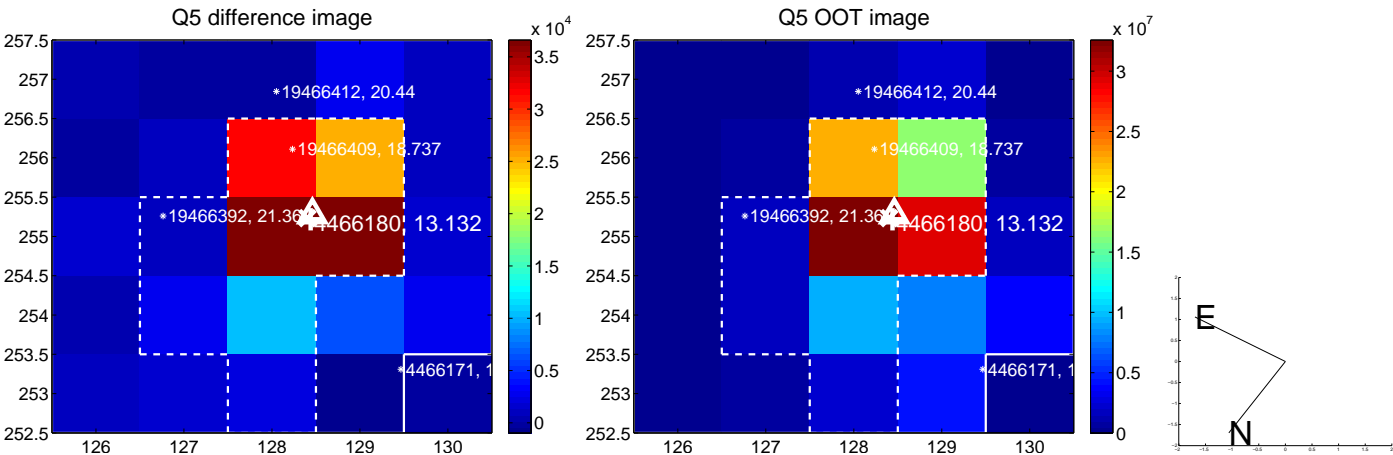
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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





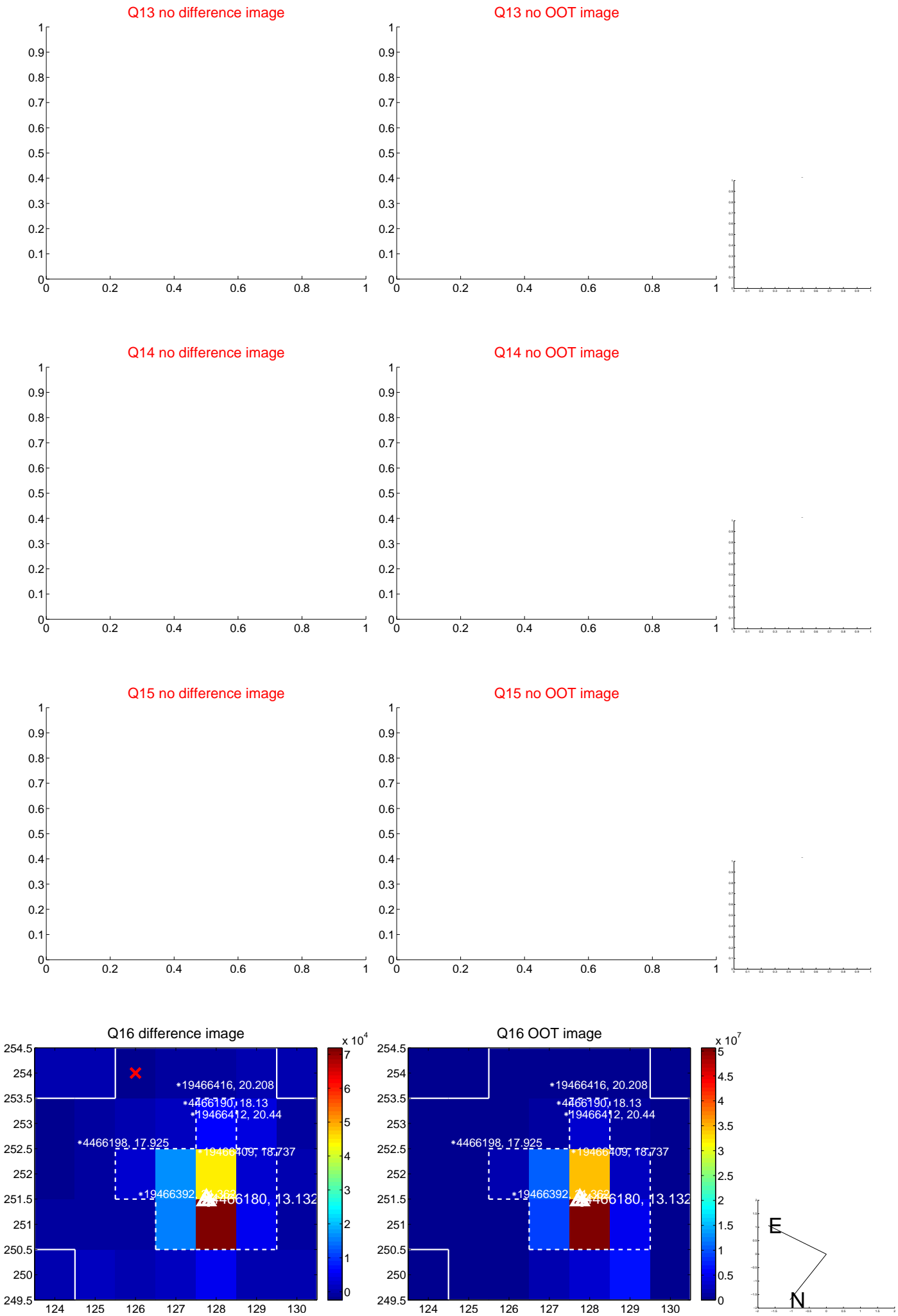
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



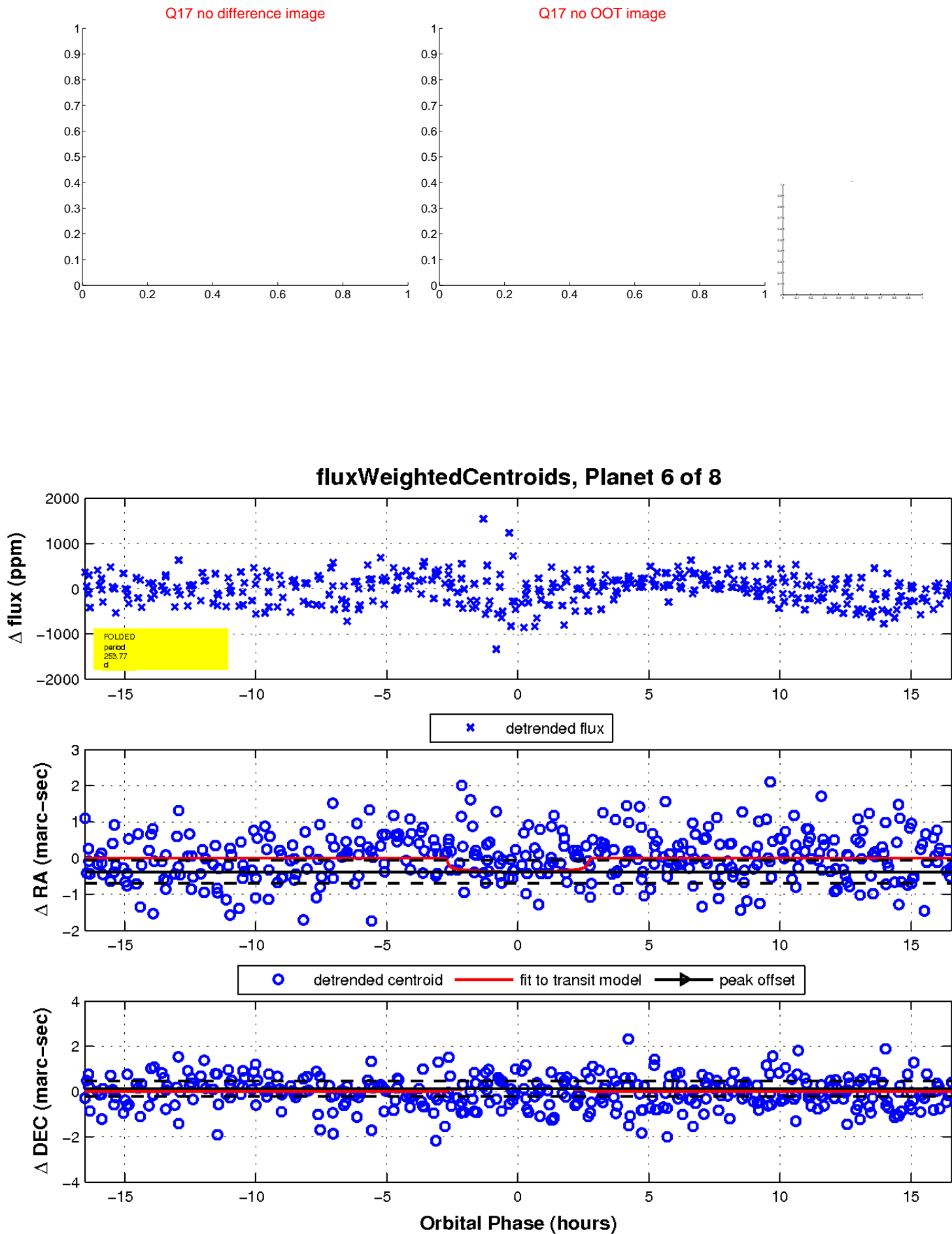
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

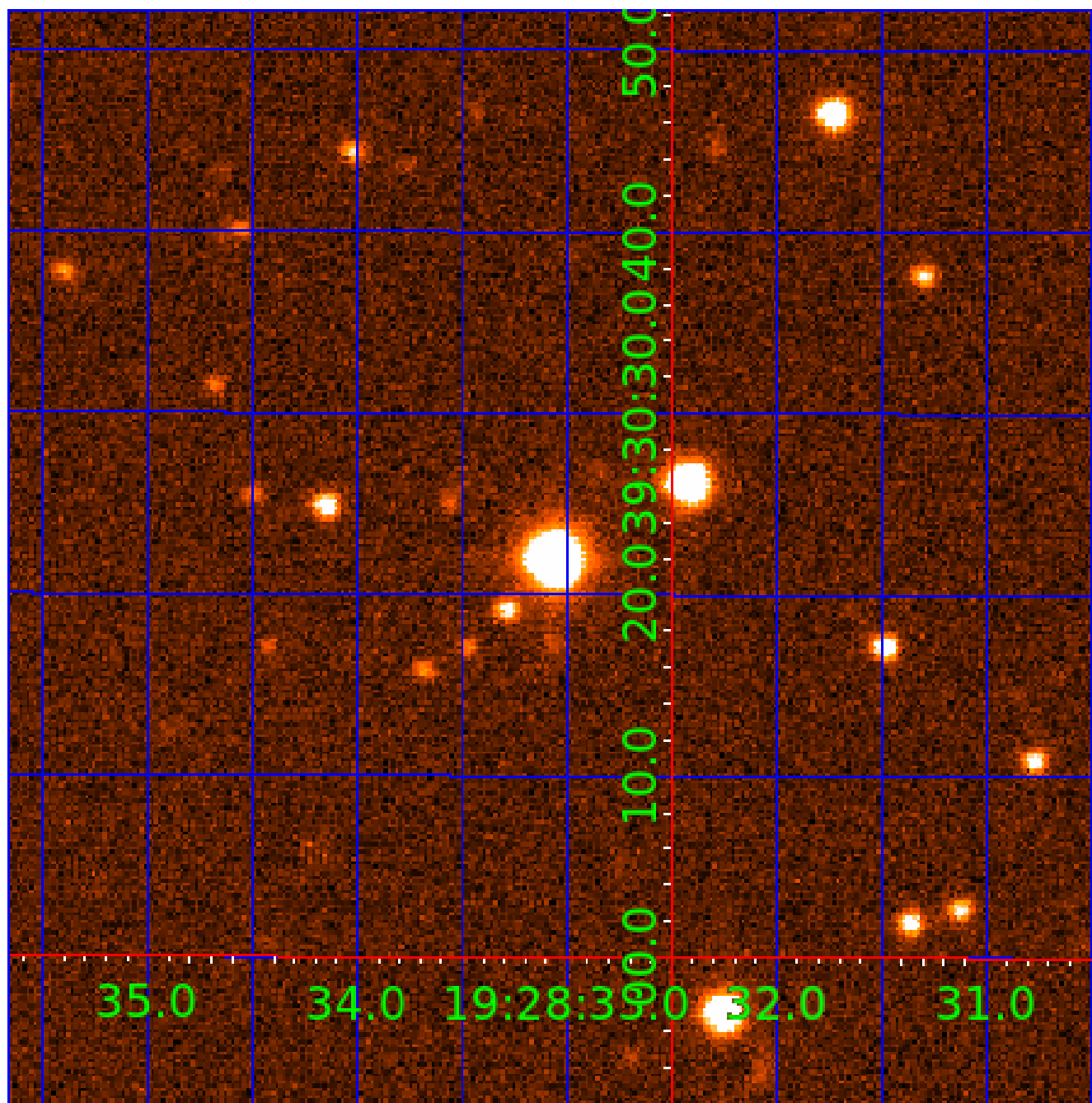


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004466180-01	OBS	No	0.563995	131.917877	0.0	1.069	9.6	0.0	3.11	7082	0.06	81576.47
004466180-02	OBS	No	2.557937	131.728417	41.1	10.798	8.3	7.8	3.11	7082	2.31	10866.23
004466180-03	OBS	No	201.318912	216.340817	646.3	4.790	8.5	8.7	3.11	7082	10.50	32.22
004466180-04	OBS	No	396.401111	355.734254	652.9	4.954	8.8	9.2	3.11	7082	15.03	13.05
004466180-05	OBS	No	394.653041	160.968997	695.7	6.085	9.0	8.7	3.11	7082	15.48	13.13
004466180-06	OBS	No	253.765919	260.372249	475.7	5.518	8.6	7.3	3.11	7082	7.00	23.66
004466180-07	OBS	No	110.793636	151.348018	614.3	3.227	8.6	7.9	3.11	7082	10.85	71.44
004466180-08	OBS	No	160.634372	143.491195	50.6	3.598	9.0	0.8	3.11	7082	2.56	43.53

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004466180-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
004466180-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
004466180-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
004466180-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
004466180-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004466180-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—TRANS_GAPPED—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
004466180-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
004466180-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

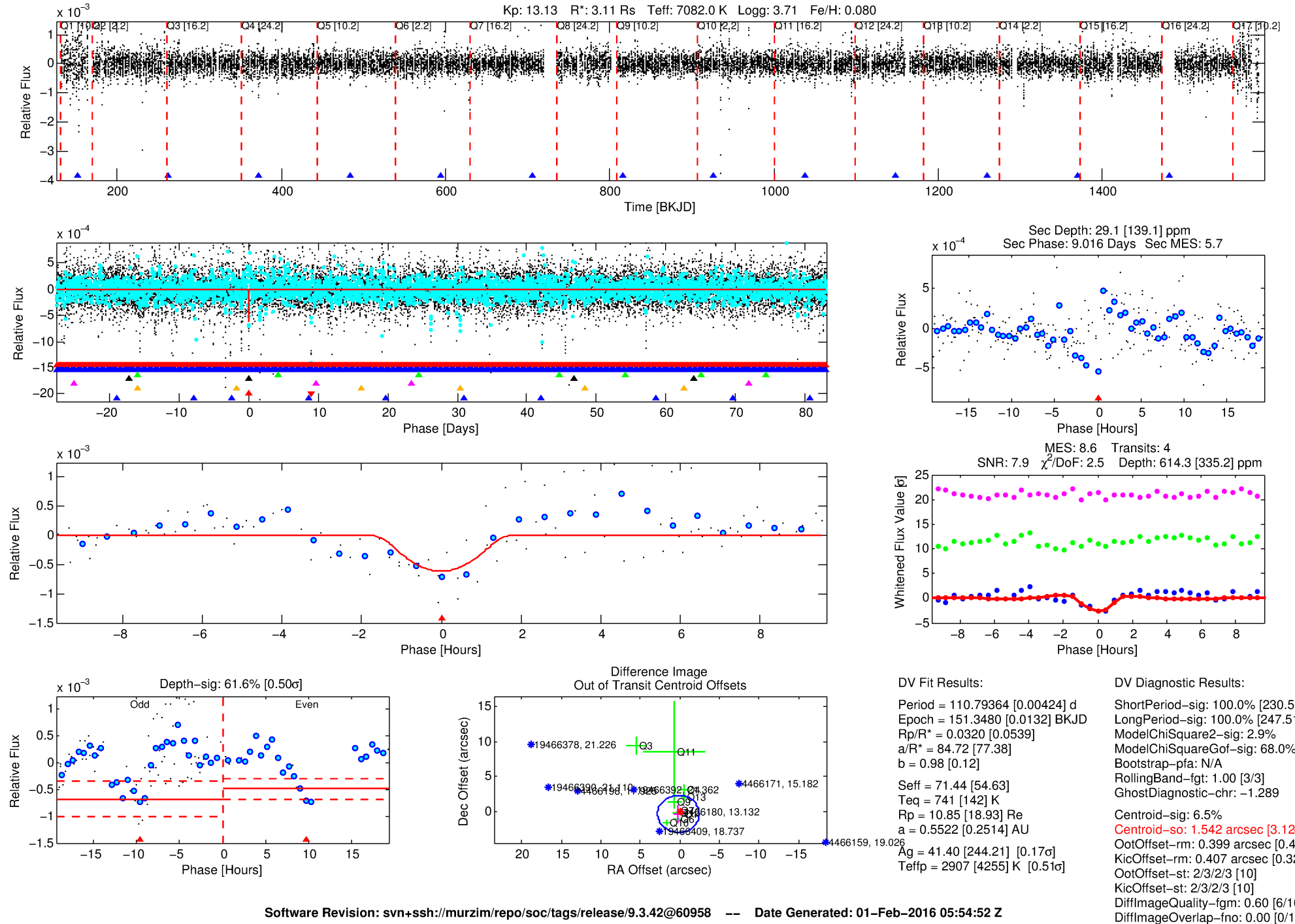
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 004466180-07

No Significant Match Found

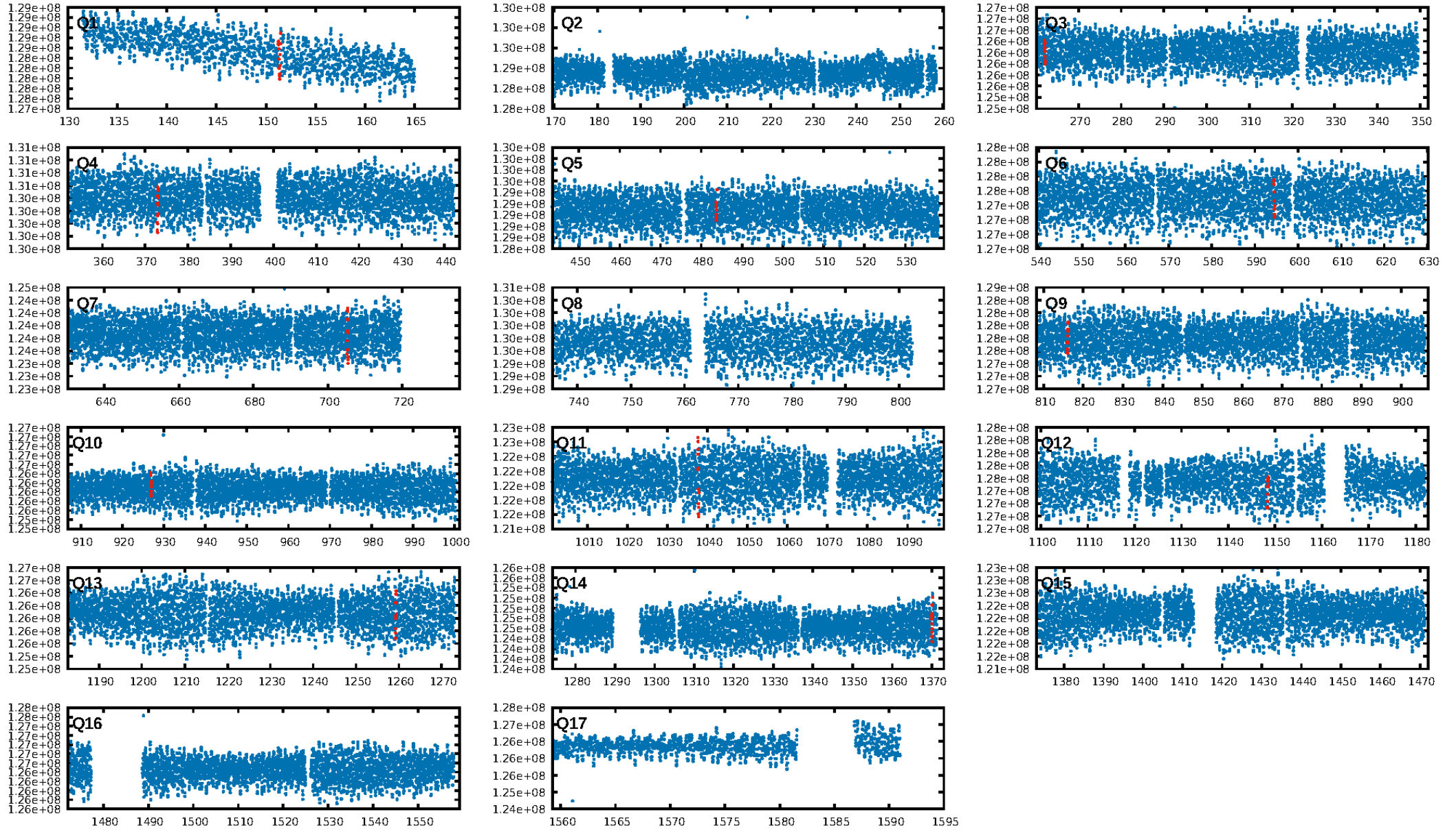
# DV One-Page Summary

KIC: 4466180 Candidate: 7 of 8 Period: 110.794 d

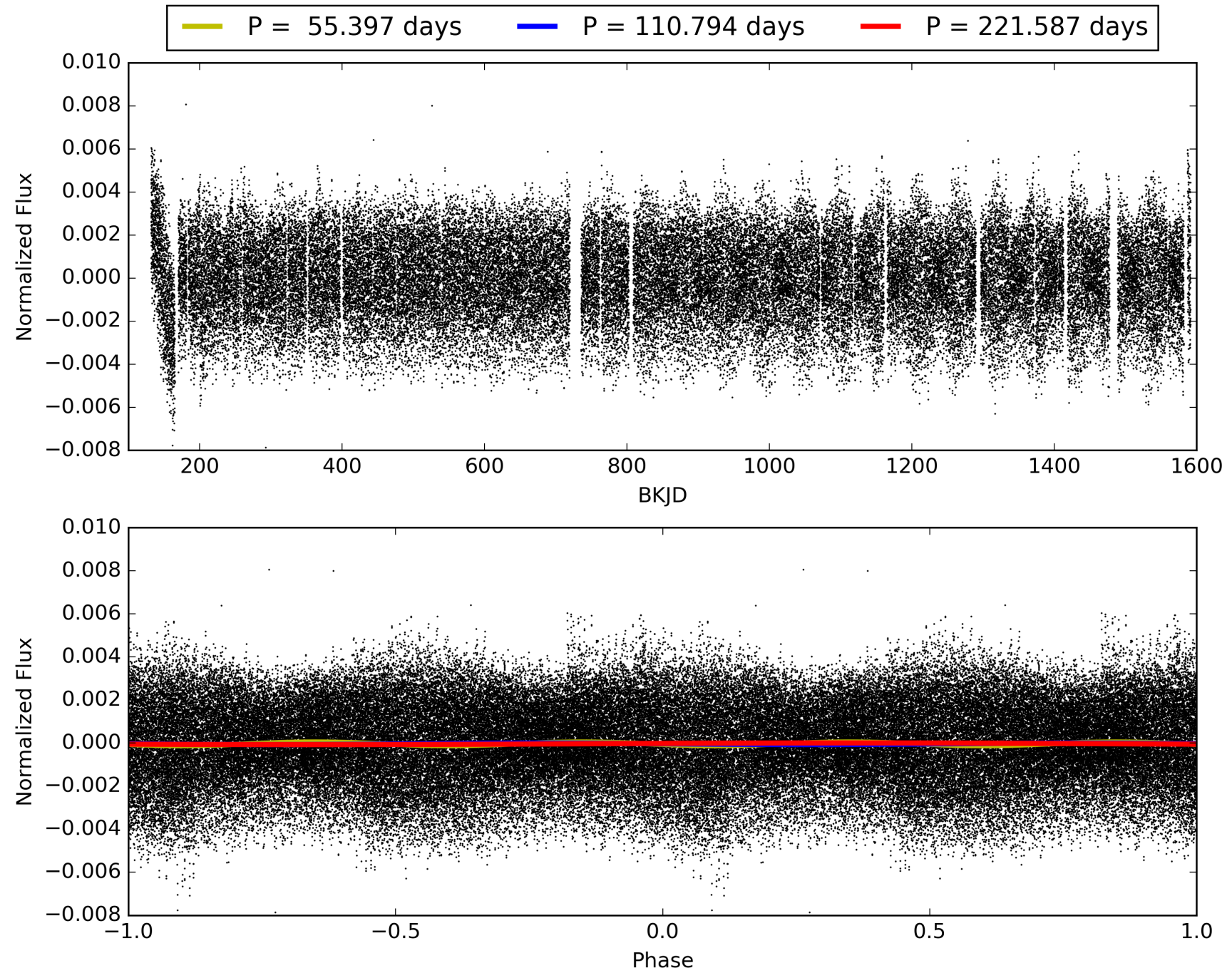




# TCE 004466180-07, PDC Light Curves

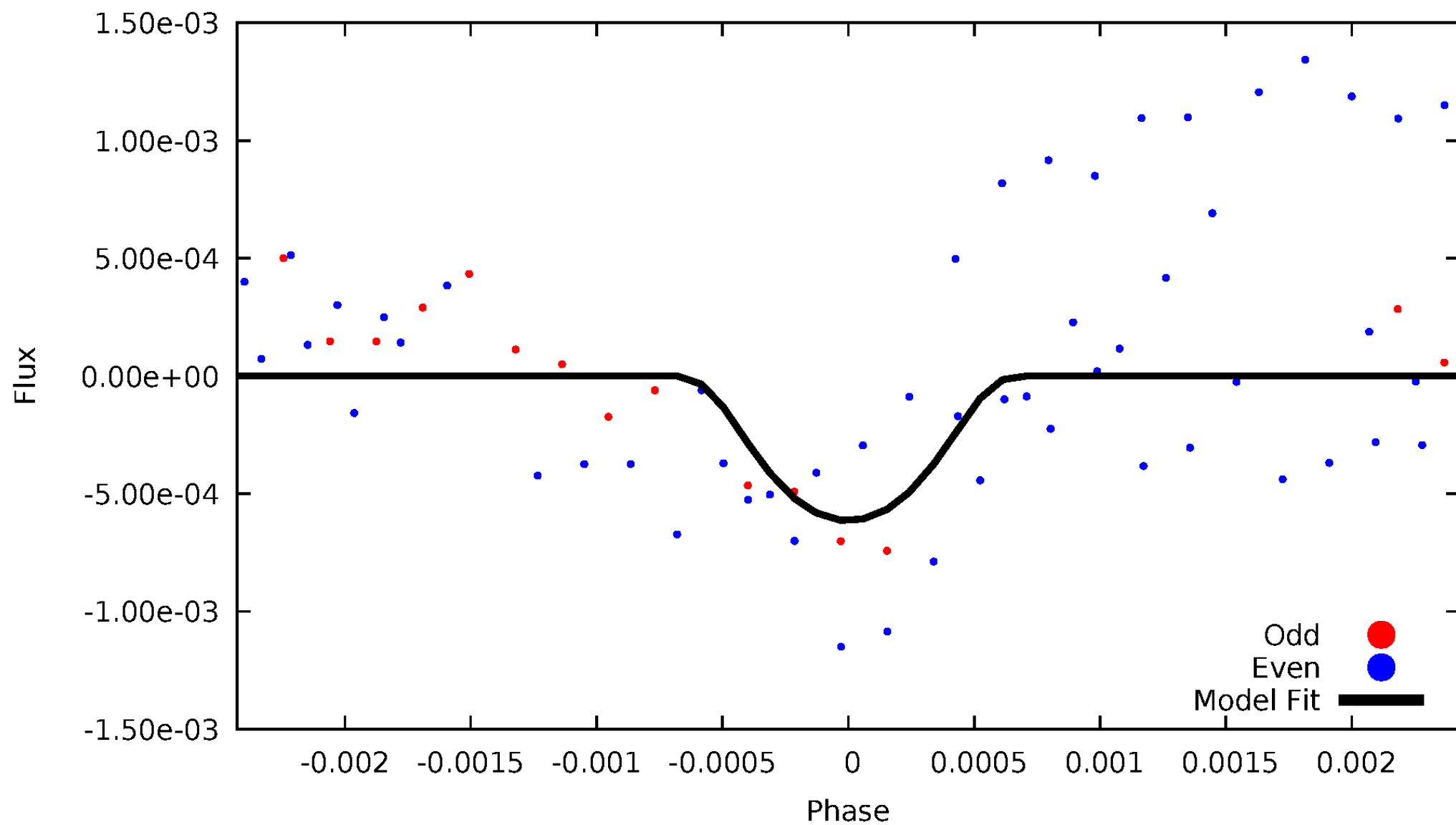


TCE 004466180-07



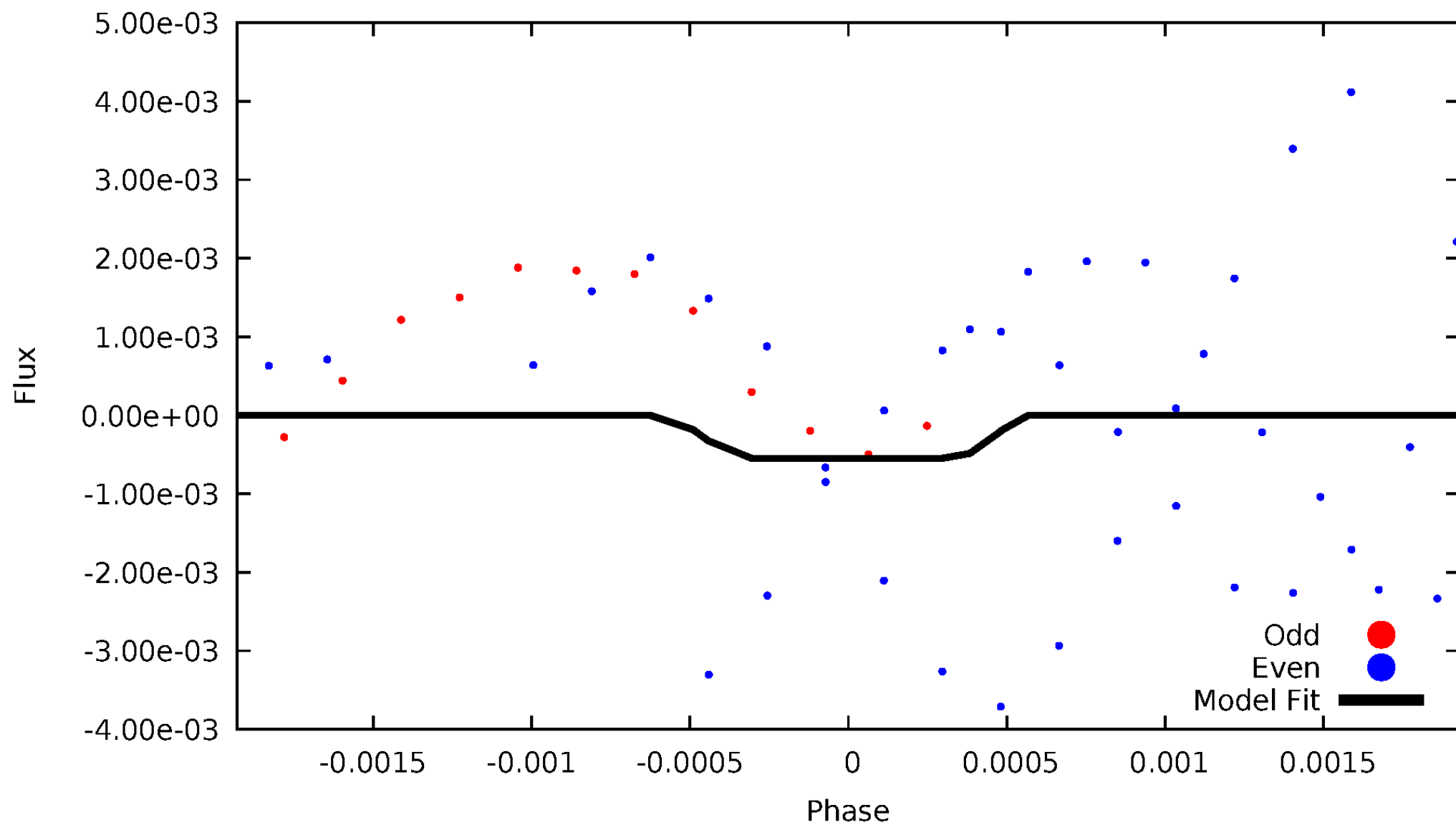
# DV Odd/Even

TCE 004466180-07



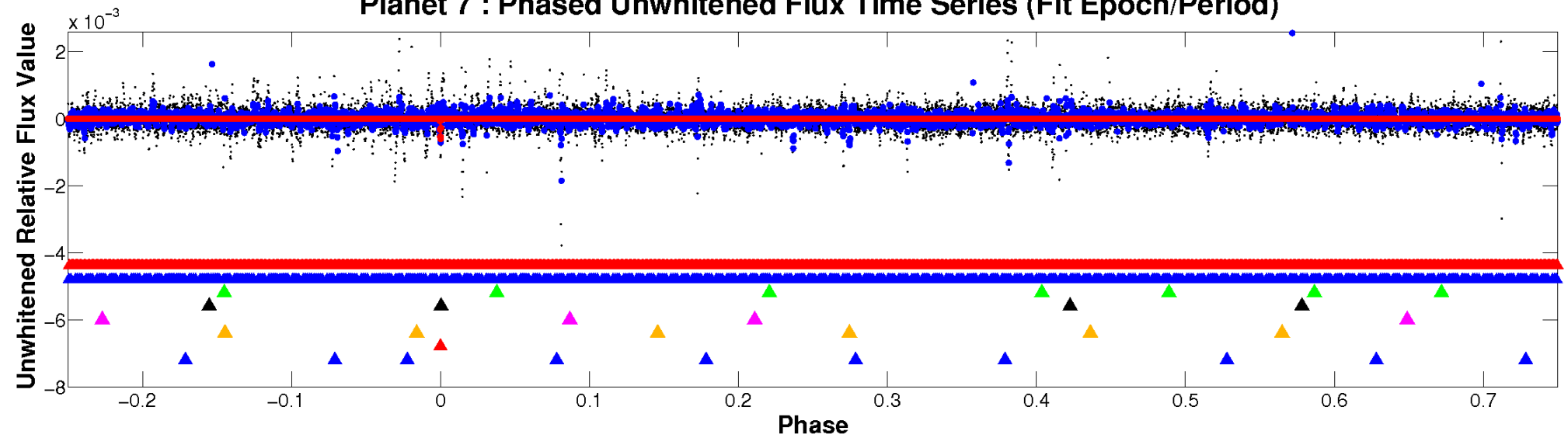
# ALT Odd/Even

TCE 004466180-07

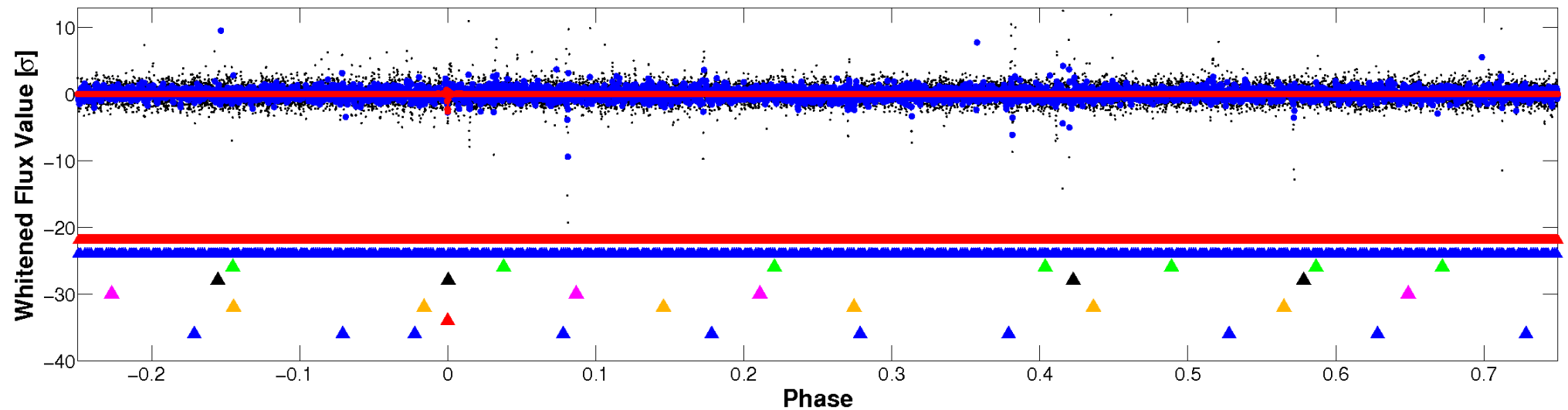


# Non-Whitened Vs. Whitened Light Curve

## Planet 7 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

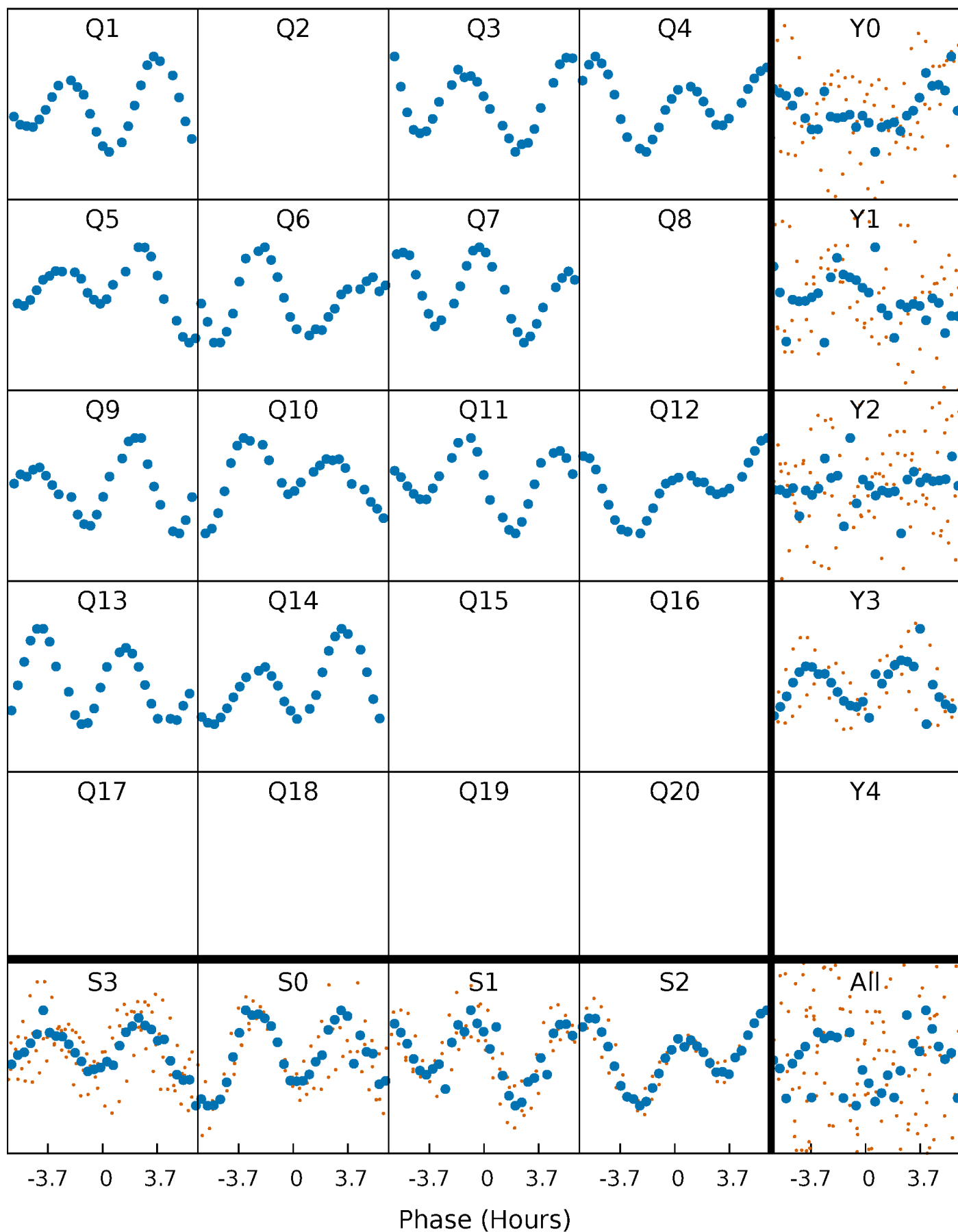


## Planet 7 : Phased Whitened Flux Time Series (Fit Epoch/Period)



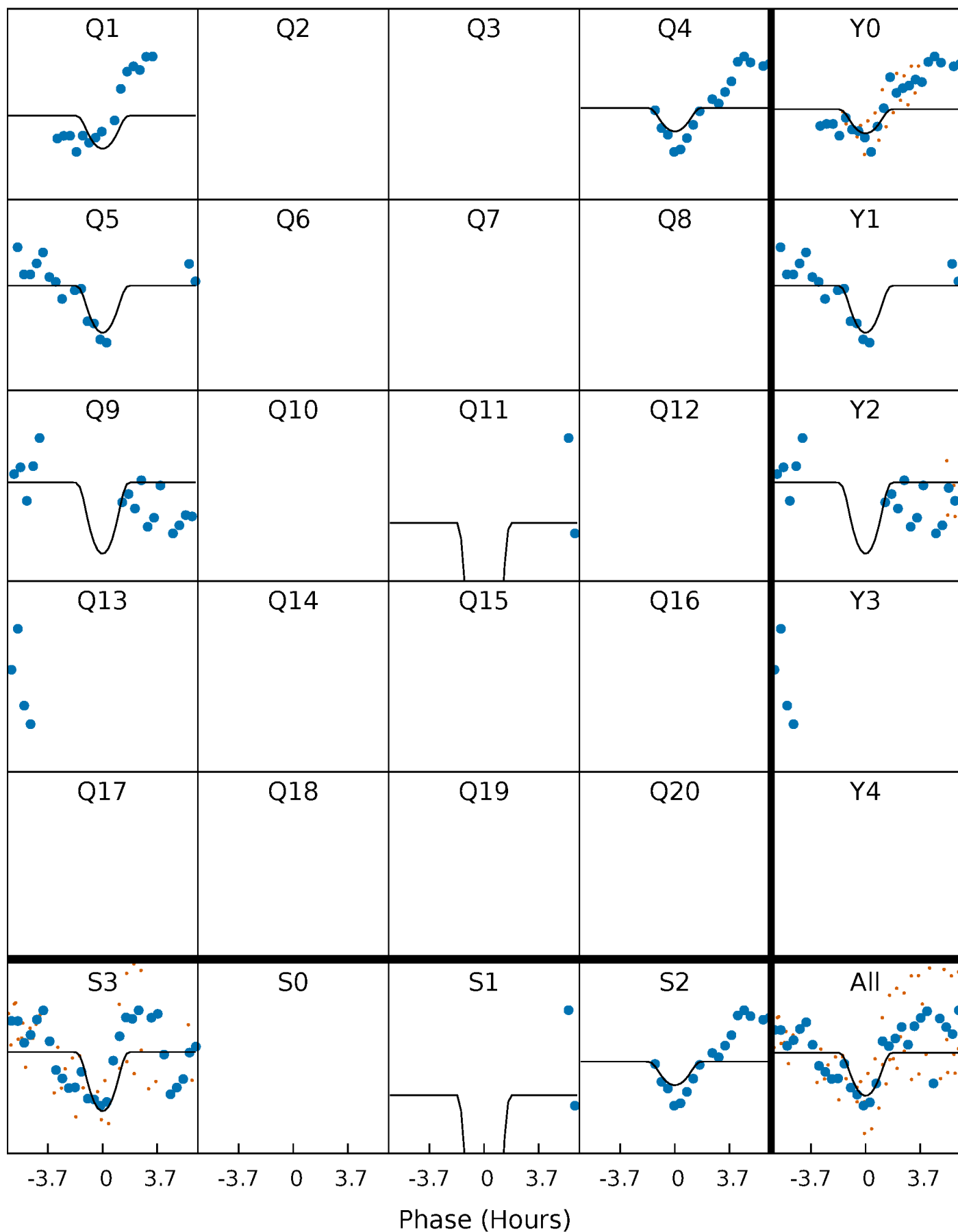
# PDC Quarter-Phased Transit Curves

TCE 004466180-07     $P=110.793636$  Days     $T_0=151.348018$  (BKJD)



# DV Quarter-Phased Transit Curves

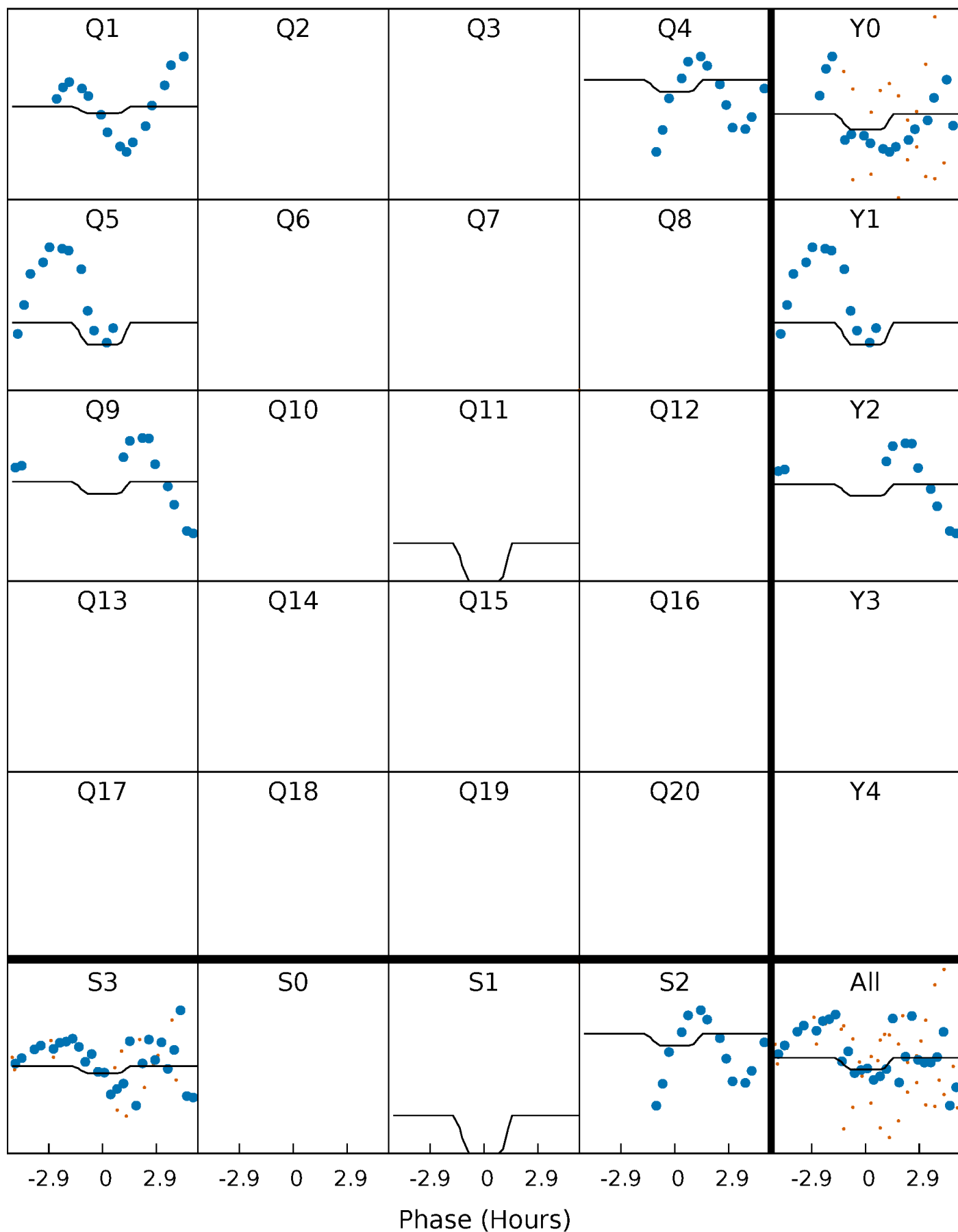
TCE 004466180-07     $P=110.793636$  Days     $T_0=151.348018$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

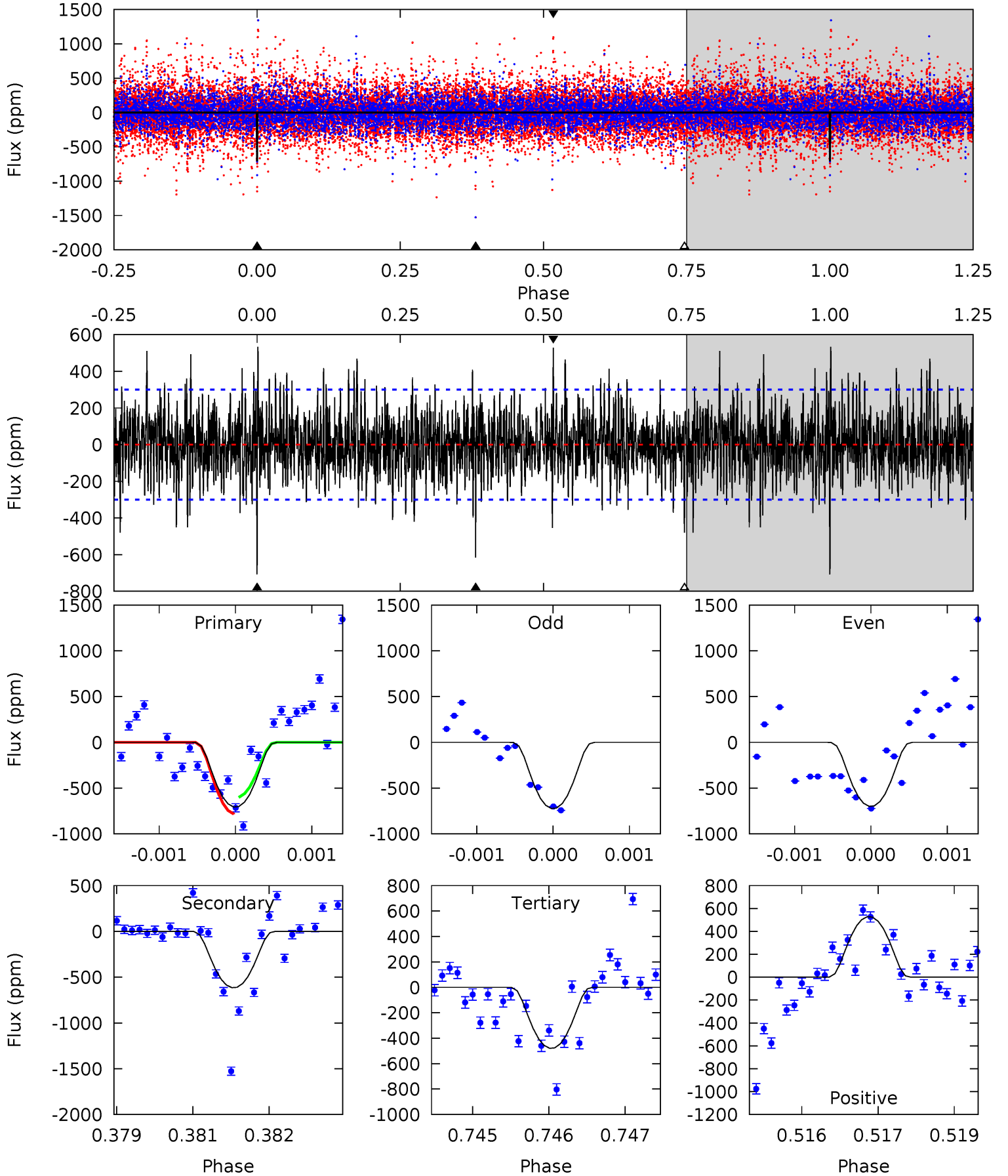
TCE 004466180-07 P=110.798992 Days  $T_0=151.321535$  (BKJD)



# DV Model-Shift Uniqueness Test

004466180-07,  $P = 110.793636$  Days,  $E = 40.554382$  Days

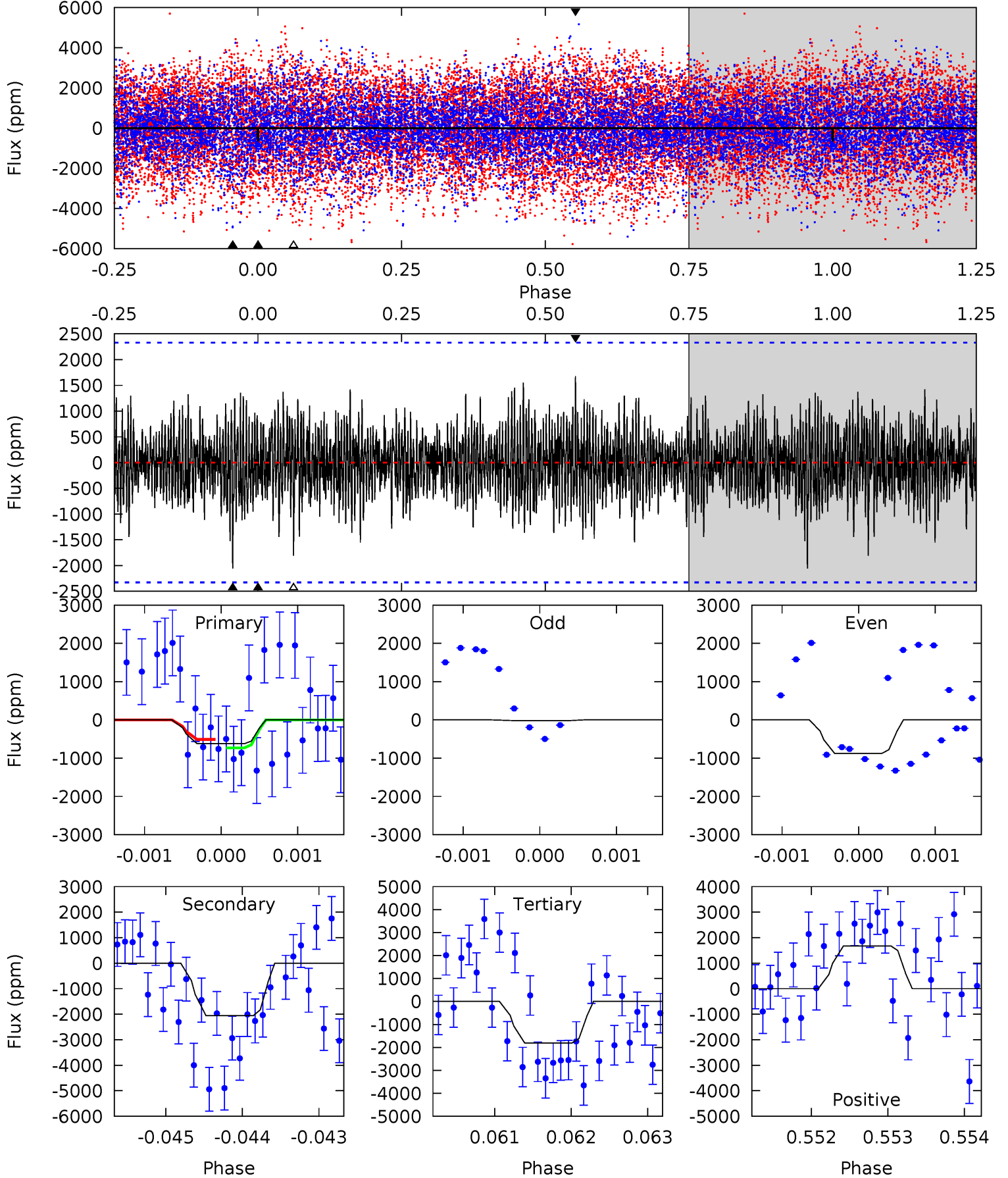
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.7	11.1	8.64	9.52	5.40	3.22	2.44	4.10	3.22	2.45	1.57	0.19	1.09	0.43	1.64



# Alt Model-Shift Uniqueness Test

004466180-07,  $P = 110.798992$  Days,  $E = 40.522543$  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
1.46	4.81	4.24	3.93	5.46	3.30	1.16	-2.78	-2.48	0.57	0.88	0.87	0.83	0.45	0.26



### Stellar Parameters For KIC 004466180

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$\rho_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7082^{+195}_{-318}$	$3.715^{+0.442}_{-0.078}$	$0.080^{+0.200}_{-0.300}$	$3.109^{+0.472}_{-1.416}$	$1.828^{+0.179}_{-0.418}$	$0.086^{+0.349}_{-0.021}$
	+3%/-4%	+12%/-2%	+250%/-375%	+15%/-46%	+10%/-23%	+407%/-24%
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 004466180-07 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-615 \pm 55$	$15.53^{+14.24}_{-10.00}$	$989^{+76}_{-114}$	$4904^{+3497}_{-1026}$	$424^{+2929}_{-312}$
Alt.	$-2053 \pm 427$	$13.47^{+13.72}_{-9.08}$	$997^{+73}_{-125}$	$6981^{+8382}_{-1990}$	$1730^{+15971}_{-1298}$

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

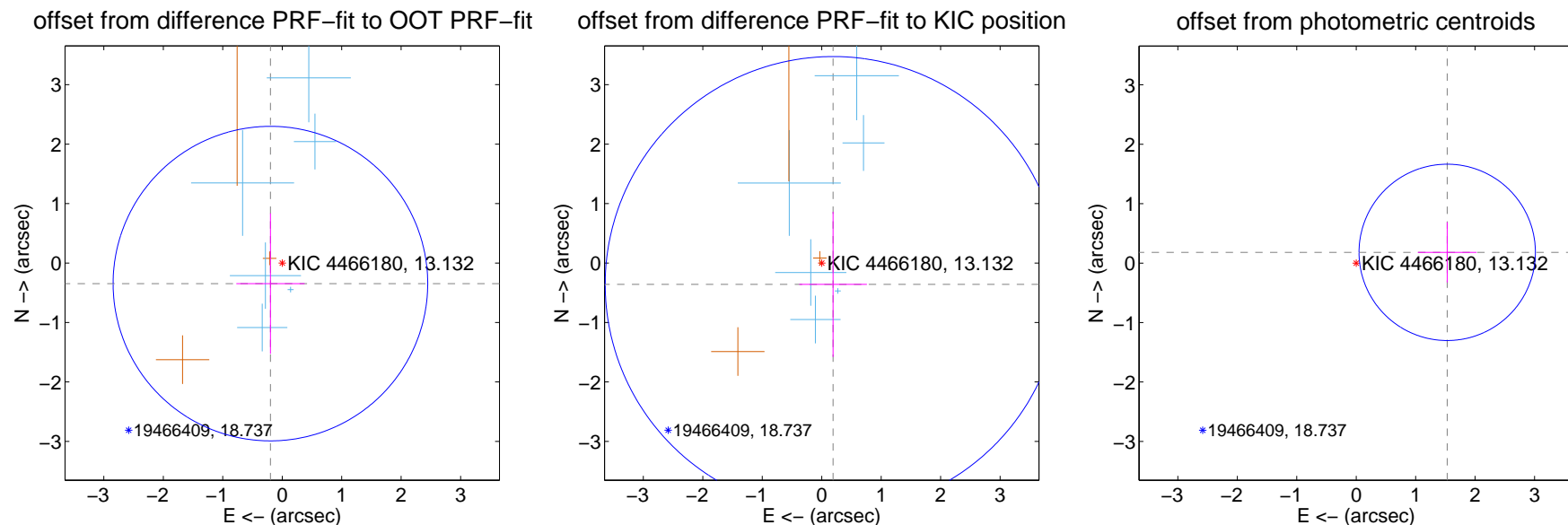
## DV Centroid Data

Supplemental centroid analysis for 004466180-07. Kepler magnitude: 13.13. Transit SNR 7.86

There are 6 quarters with good PRF difference image offsets

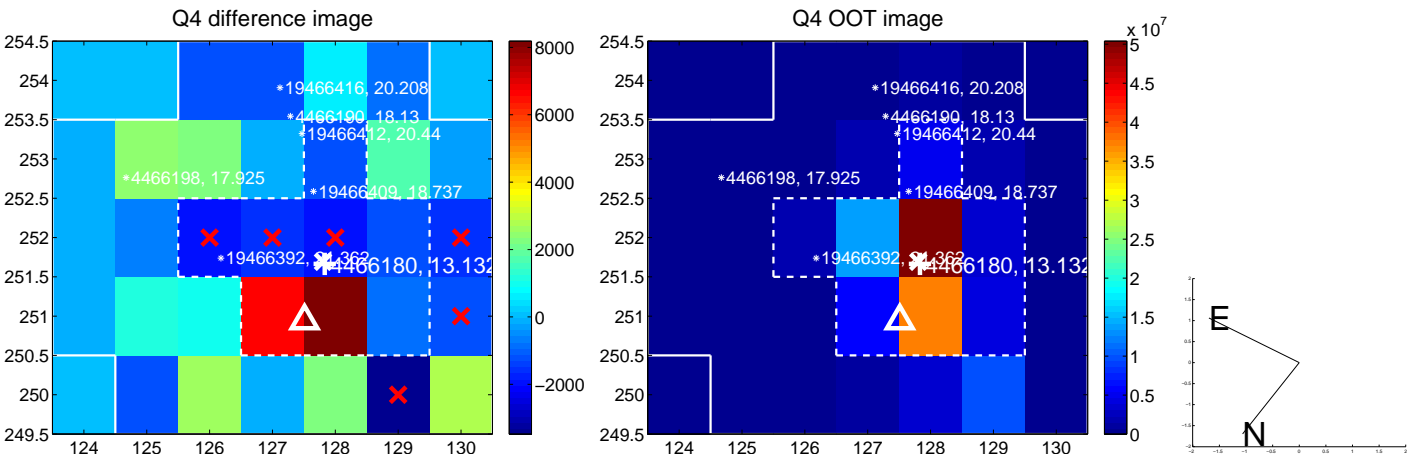
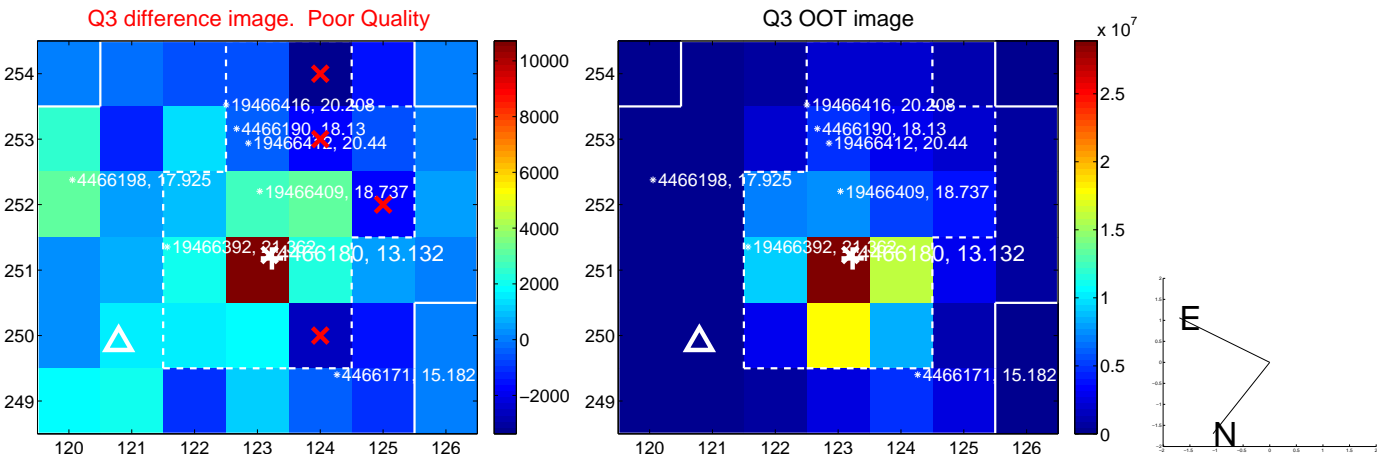
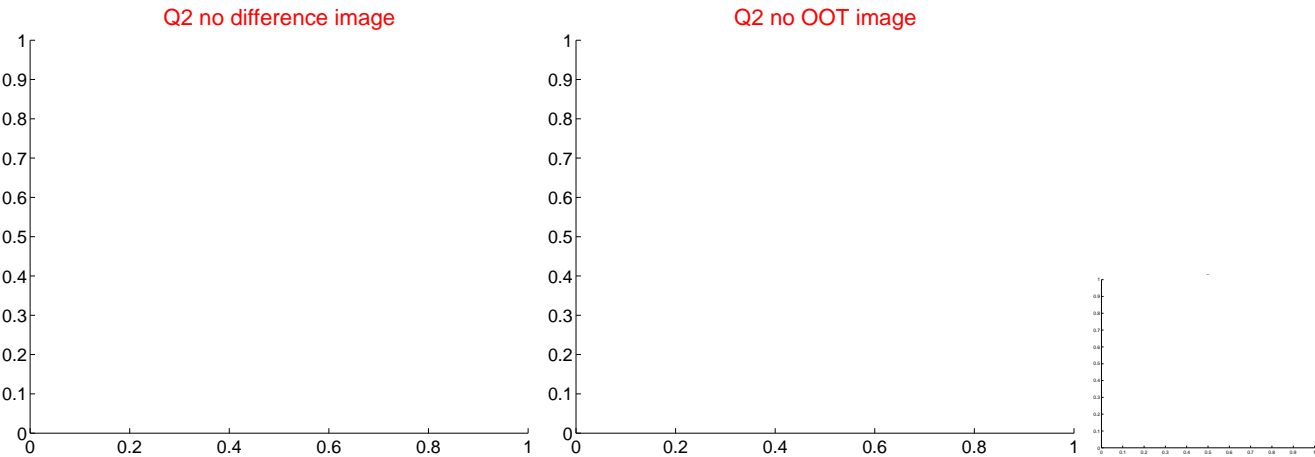
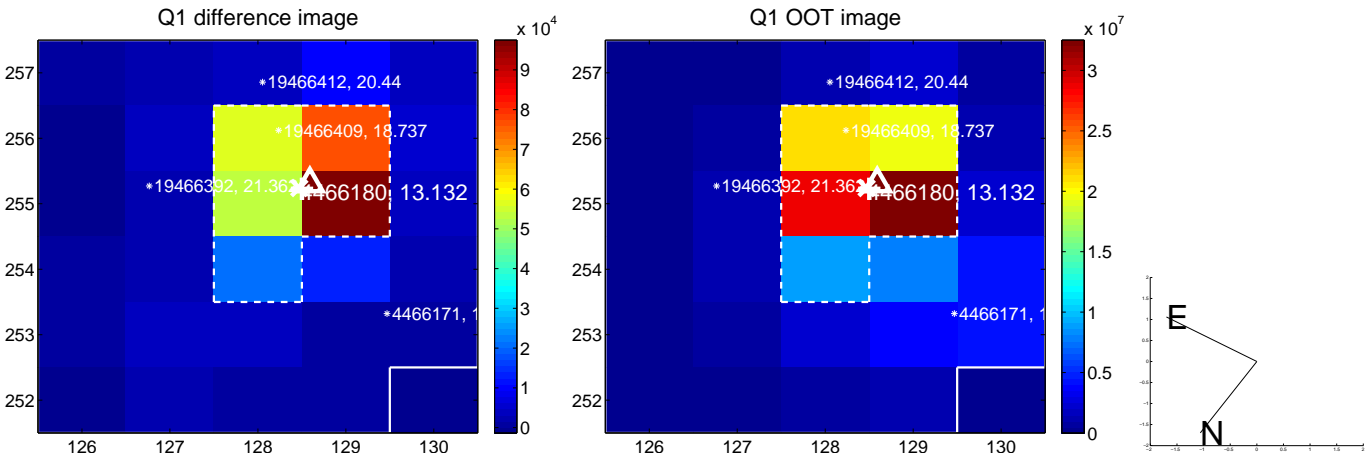
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.399 \pm 0.882$	0.45	$0.199 \pm 0.574$	$-0.346 \pm 1.182$
PRF-fit source offset from KIC position	$0.407 \pm 1.278$	0.32	$-0.191 \pm 0.569$	$-0.359 \pm 1.220$
photometric centroid source offset	$1.54 \pm 0.49$	3.12	$-1.53 \pm 0.49$	$0.18 \pm 0.51$

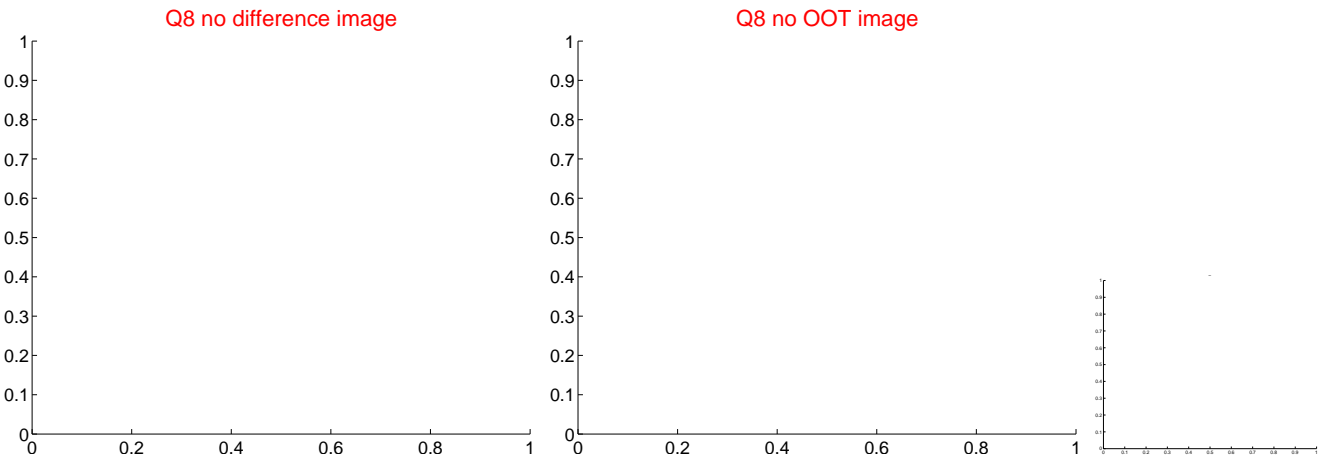
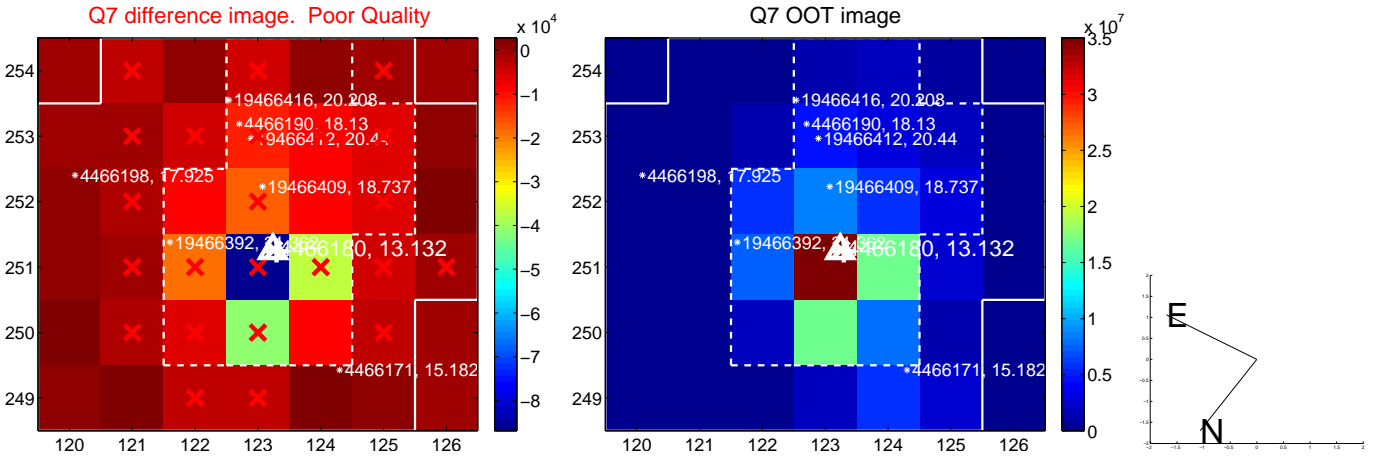
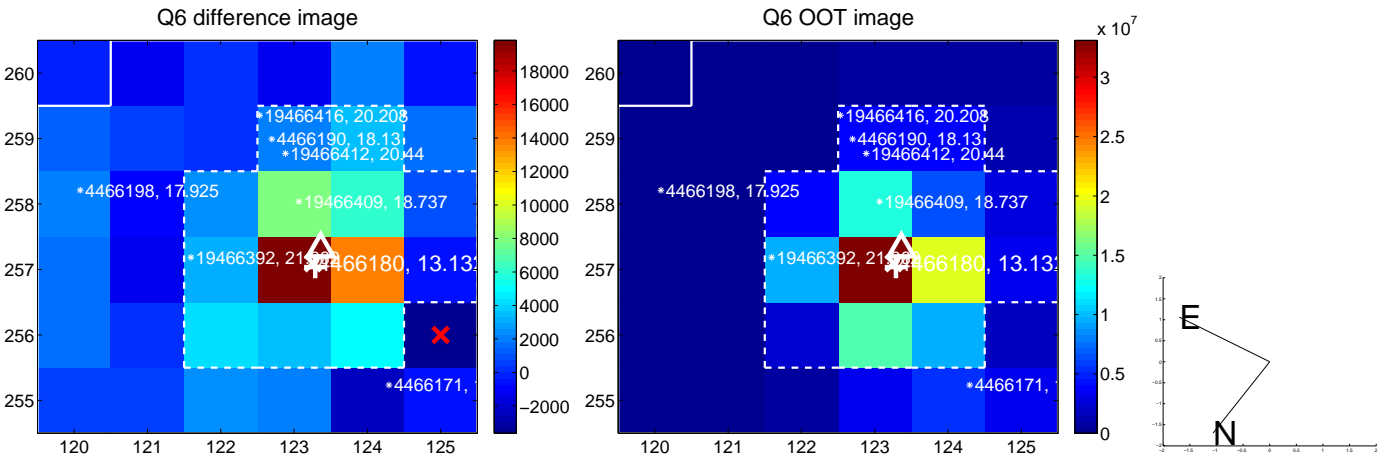
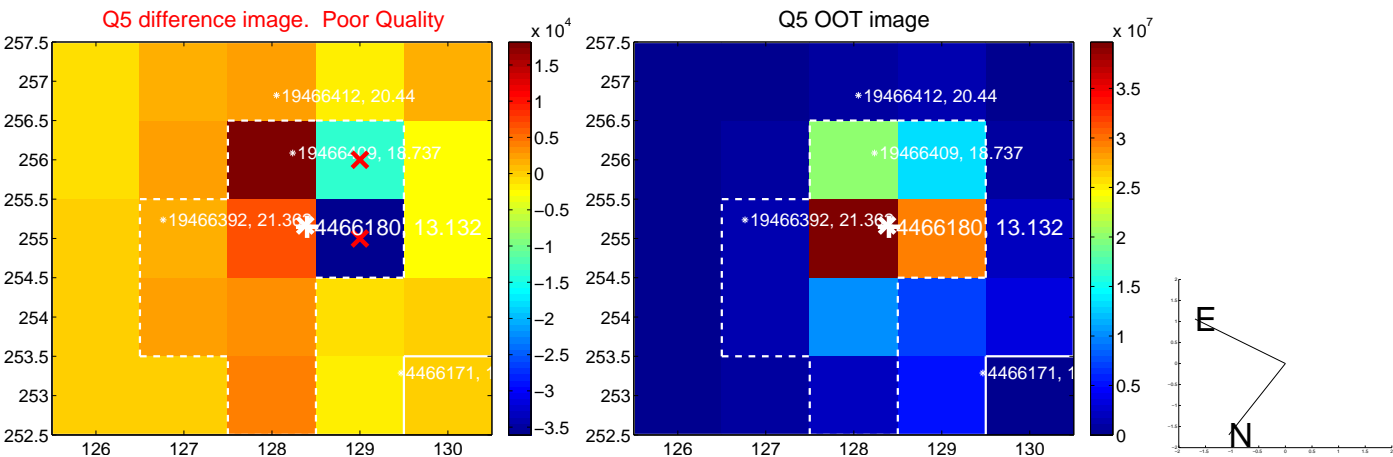


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

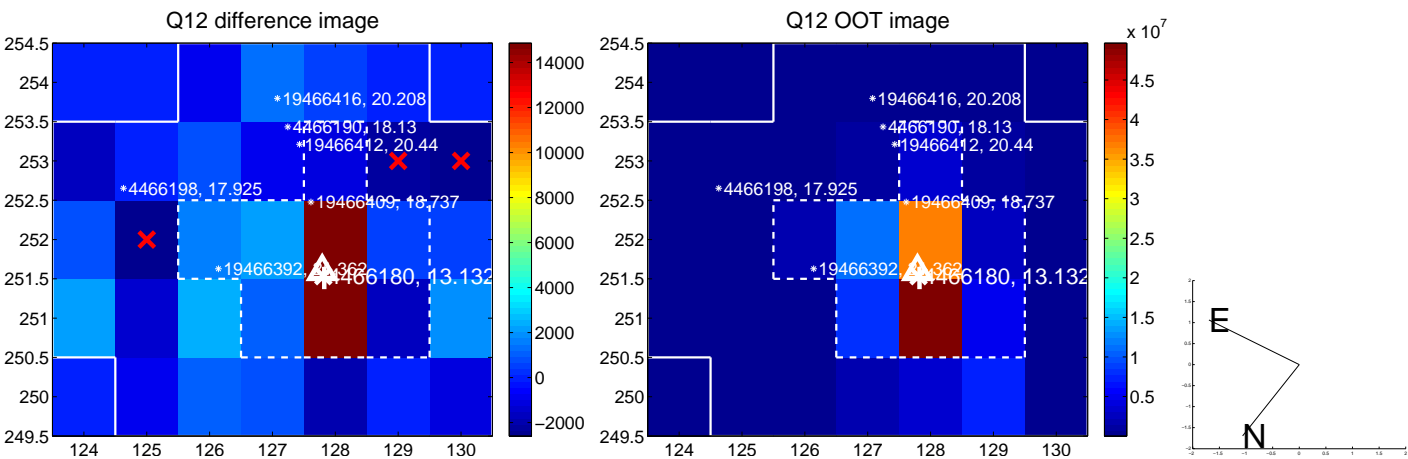
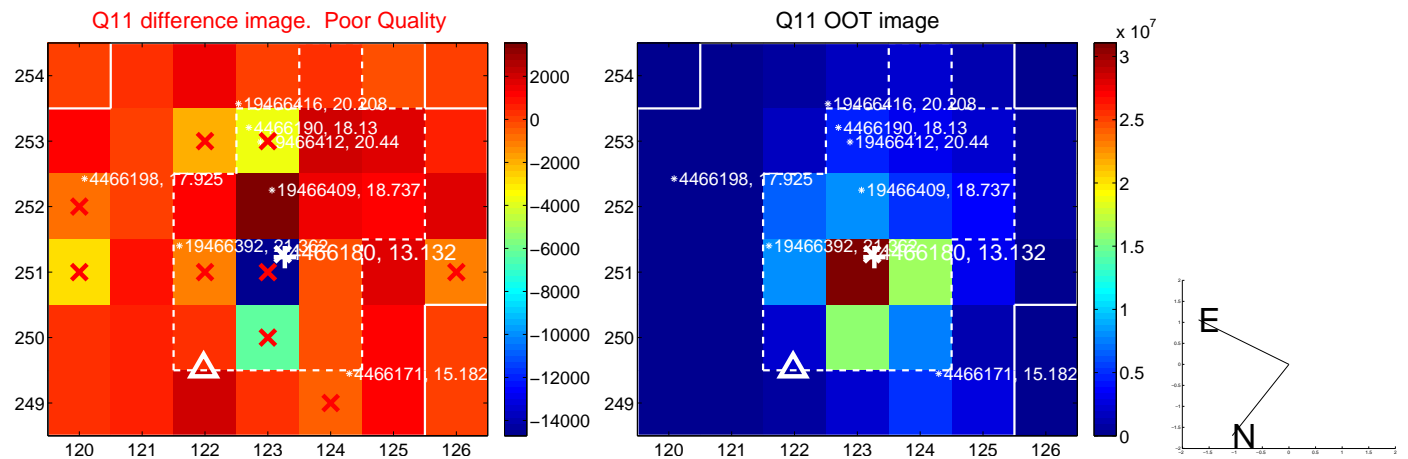
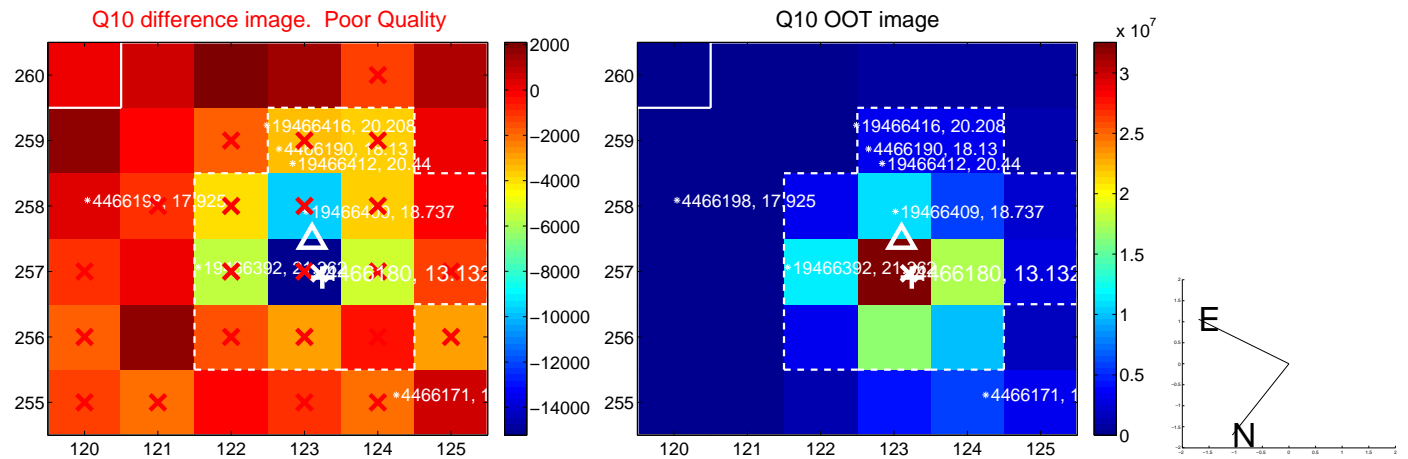
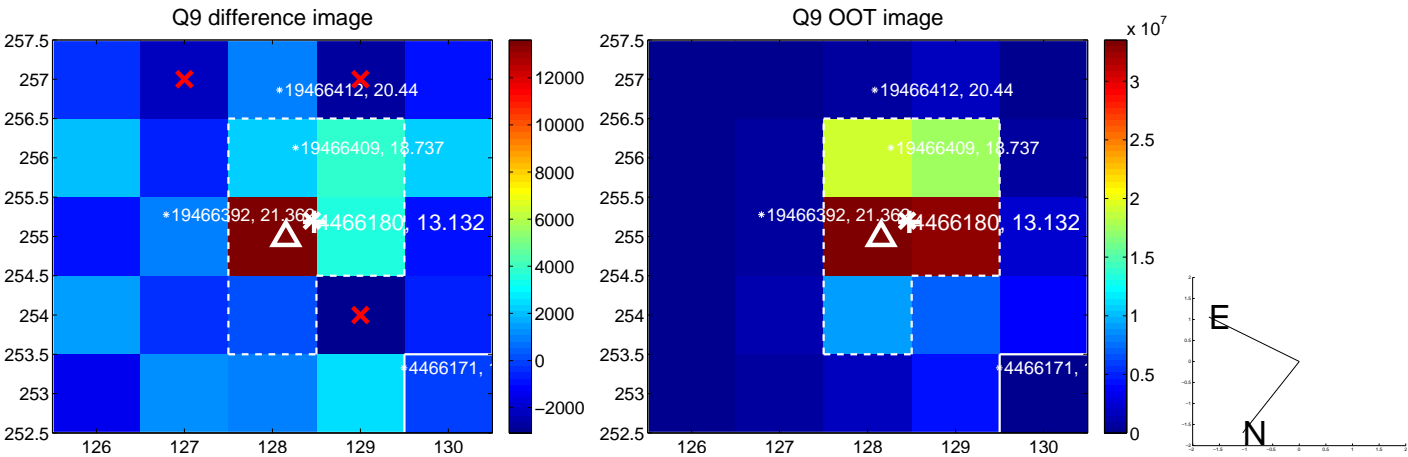


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

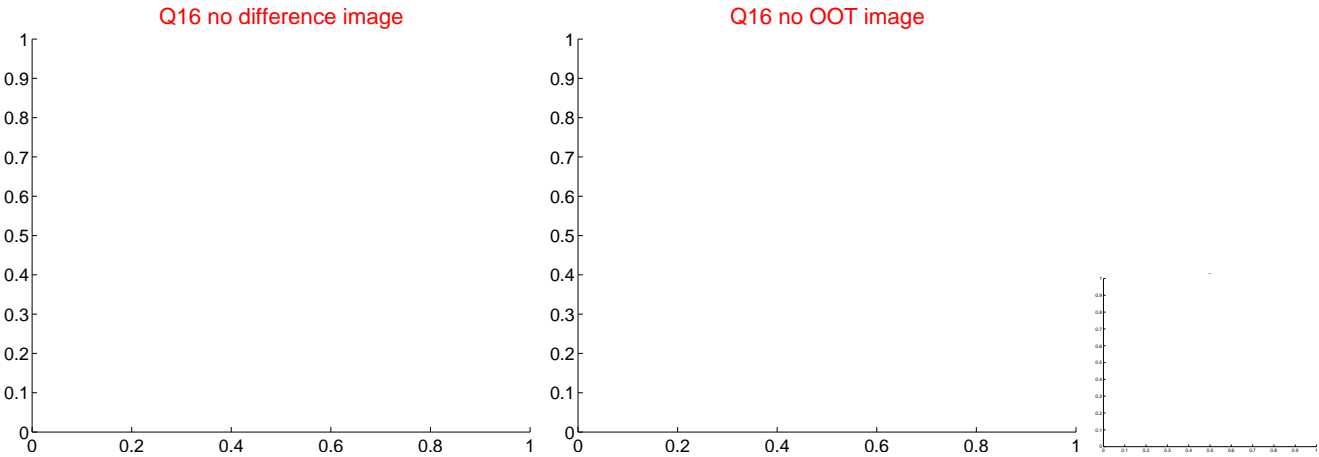
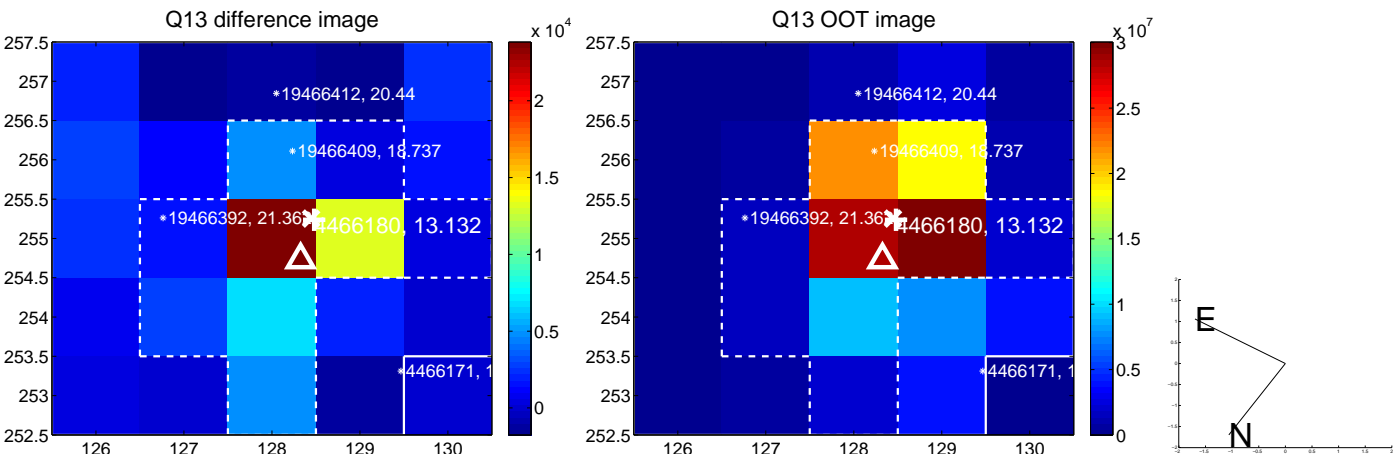




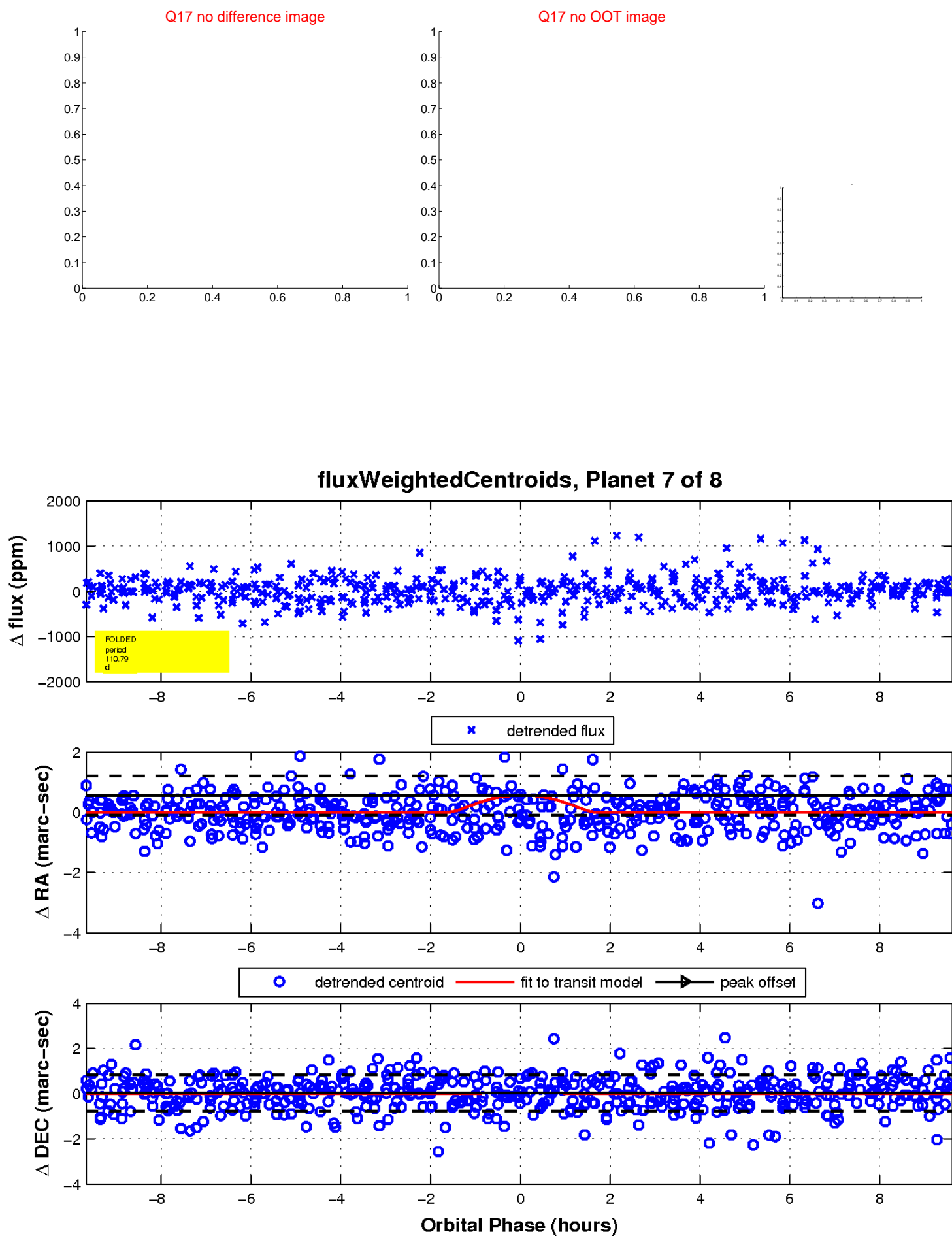
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

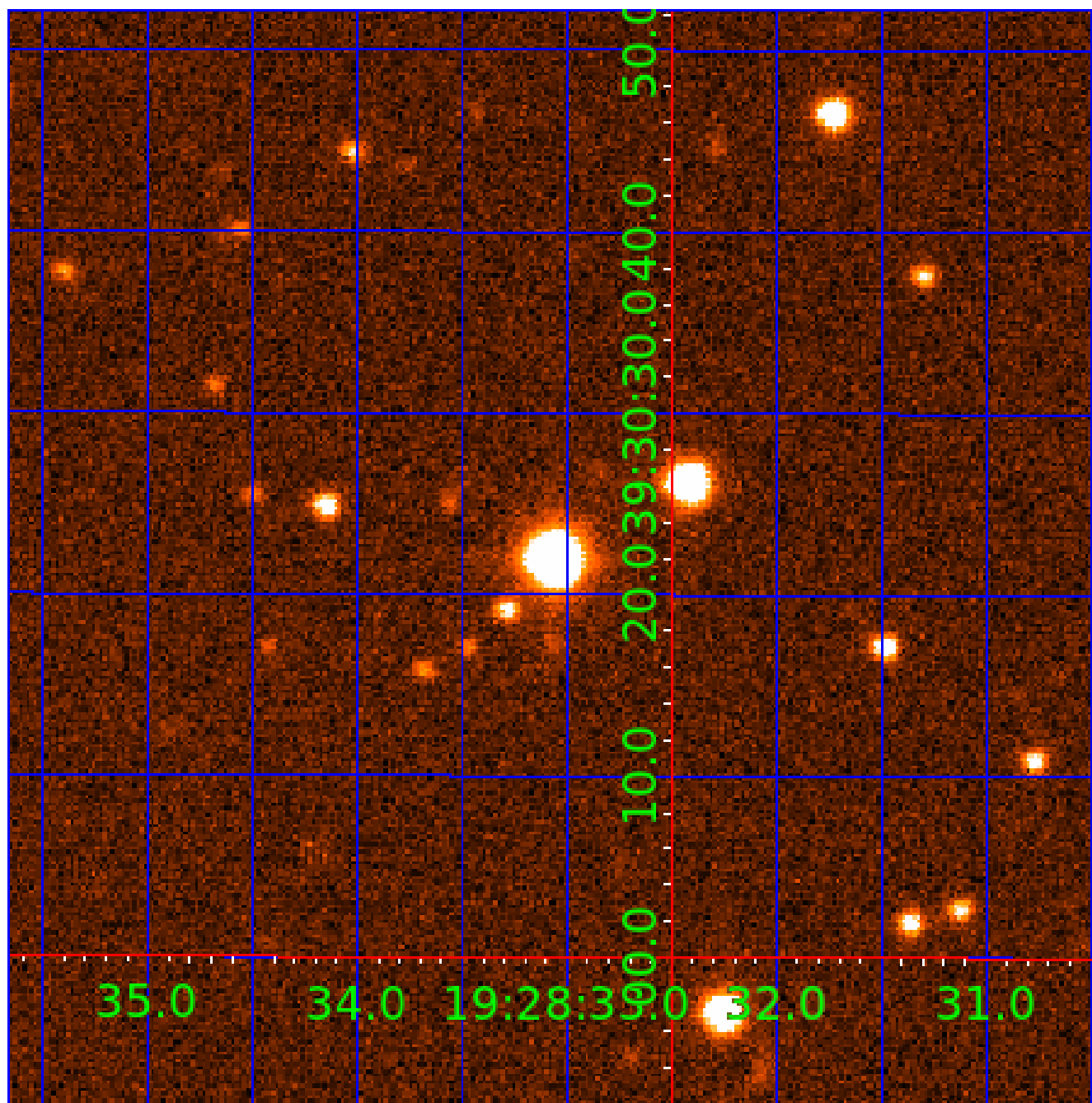


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004466180-01	OBS	No	0.563995	131.917877	0.0	1.069	9.6	0.0	3.11	7082	0.06	81576.47
004466180-02	OBS	No	2.557937	131.728417	41.1	10.798	8.3	7.8	3.11	7082	2.31	10866.23
004466180-03	OBS	No	201.318912	216.340817	646.3	4.790	8.5	8.7	3.11	7082	10.50	32.22
004466180-04	OBS	No	396.401111	355.734254	652.9	4.954	8.8	9.2	3.11	7082	15.03	13.05
004466180-05	OBS	No	394.653041	160.968997	695.7	6.085	9.0	8.7	3.11	7082	15.48	13.13
004466180-06	OBS	No	253.765919	260.372249	475.7	5.518	8.6	7.3	3.11	7082	7.00	23.66
004466180-07	OBS	No	110.793636	151.348018	614.3	3.227	8.6	7.9	3.11	7082	10.85	71.44
004466180-08	OBS	No	160.634372	143.491195	50.6	3.598	9.0	0.8	3.11	7082	2.56	43.53

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004466180-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
004466180-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
004466180-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
004466180-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
004466180-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004466180-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—TRANS_GAPPED—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
004466180-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
004466180-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

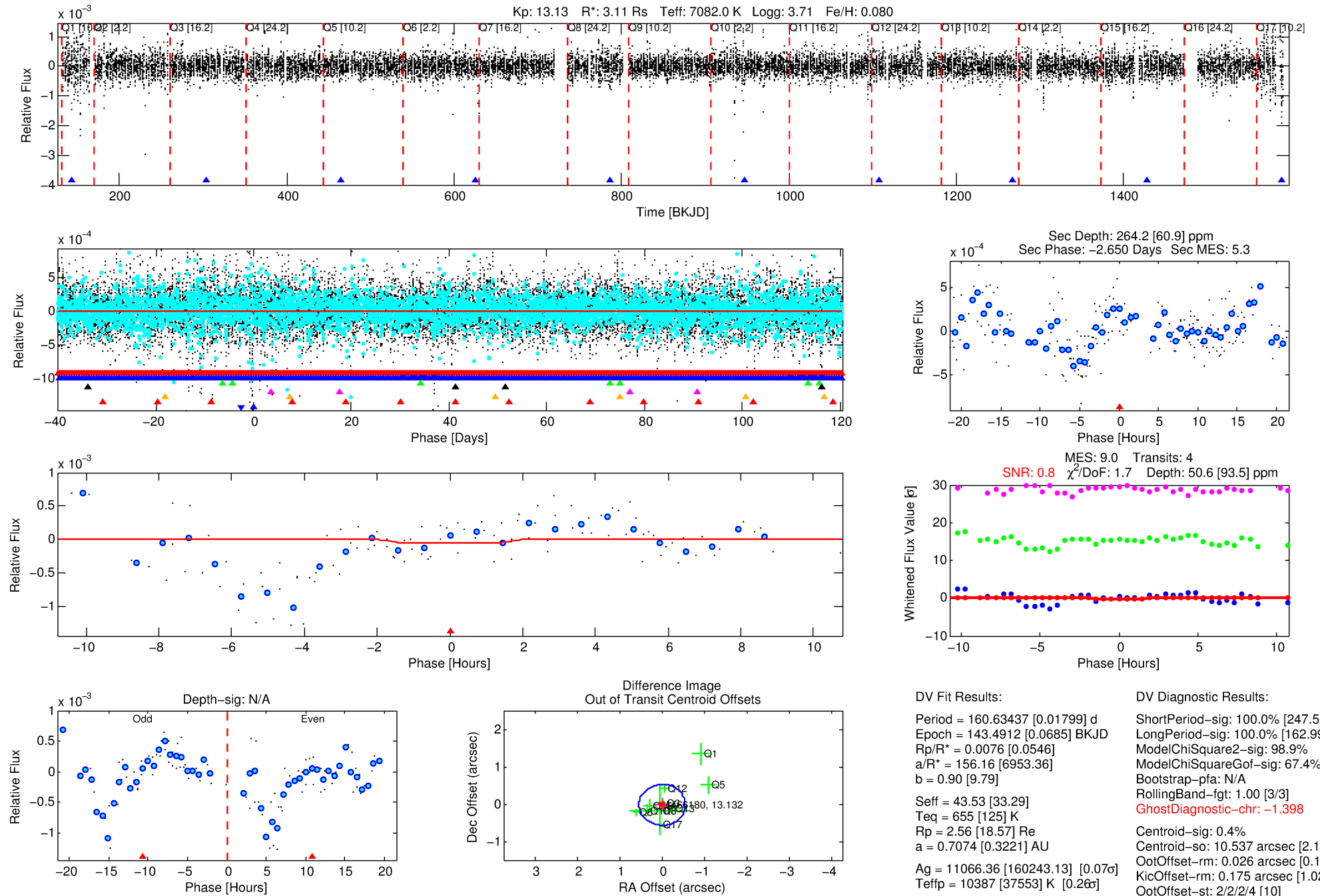
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 004466180-08

No Significant Match Found

# DV One-Page Summary

KIC: 4466180 Candidate: 8 of 8 Period: 160.634 d



## DV Fit Results:

Period = 160.63437 [0.01799] d  
Epoch = 143.4912 [0.0685] BKJD  
Rp/R\* = 0.0076 [0.0546]  
a/R\* = 156.16 [6953.36]  
b = 0.90 [9.79]  
Seff = 43.53 [33.29]  
Teff = 655 [125] K  
Rp = 2.56 [18.57] Re  
a = 0.7074 [0.3221] AU  
Ag = 11066.36 [160243.13] [0.07σ]  
Teffp = 10387 [37553] K [0.2σ]

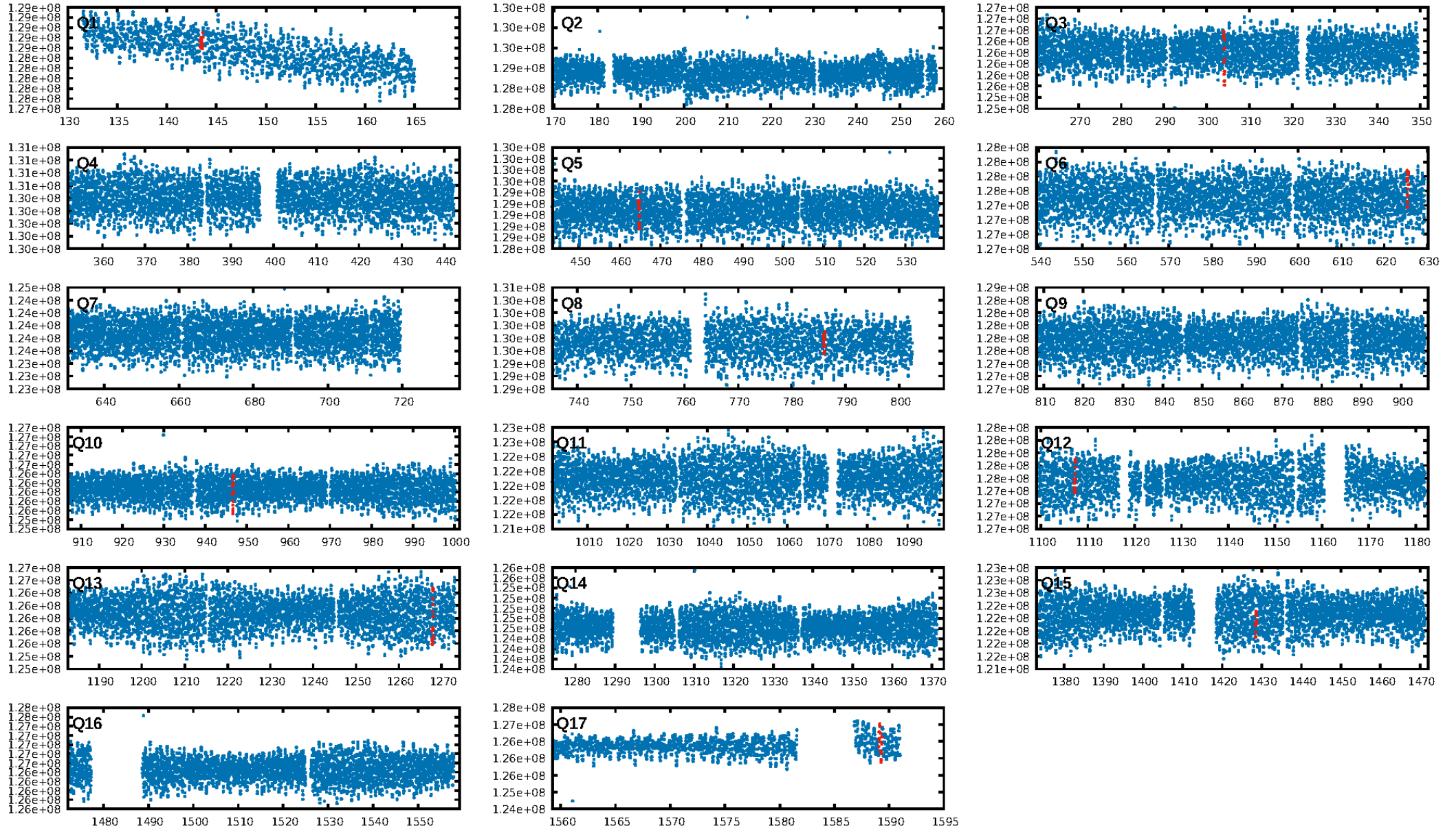
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [247.51σ]  
LongPeriod-sig: 100.0% [162.99σ]  
ModelChiSquare2-sig: 98.9%  
ModelChiSquareGof-sig: 67.4%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: -1.398  
Centroid-sig: 0.4%  
Centroid-so: 10.537 arcsec [2.10σ]  
OotOffset-rm: 0.026 arcsec [0.14σ]  
KicOffset-rm: 0.175 arcsec [1.02σ]  
OotOffset-st: 2/2/2/4 [10]  
KicOffset-st: 2/2/2/4 [10]  
DiffImageQuality-fgm: 0.50 [5/10]  
DiffImageOverlap-fno: 0.00 [0/10]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 05:54:57 Z

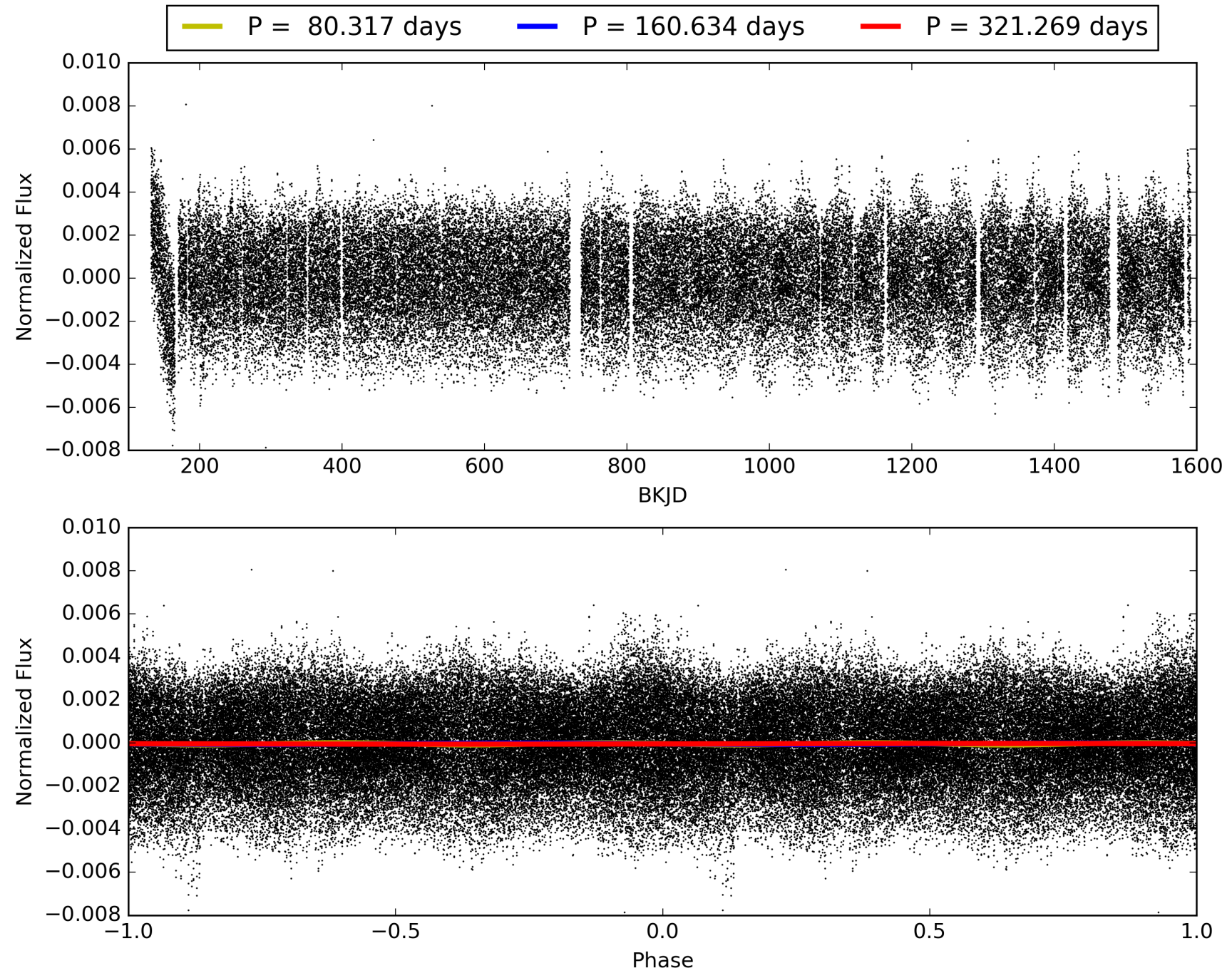
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 004466180-08, PDC Light Curves





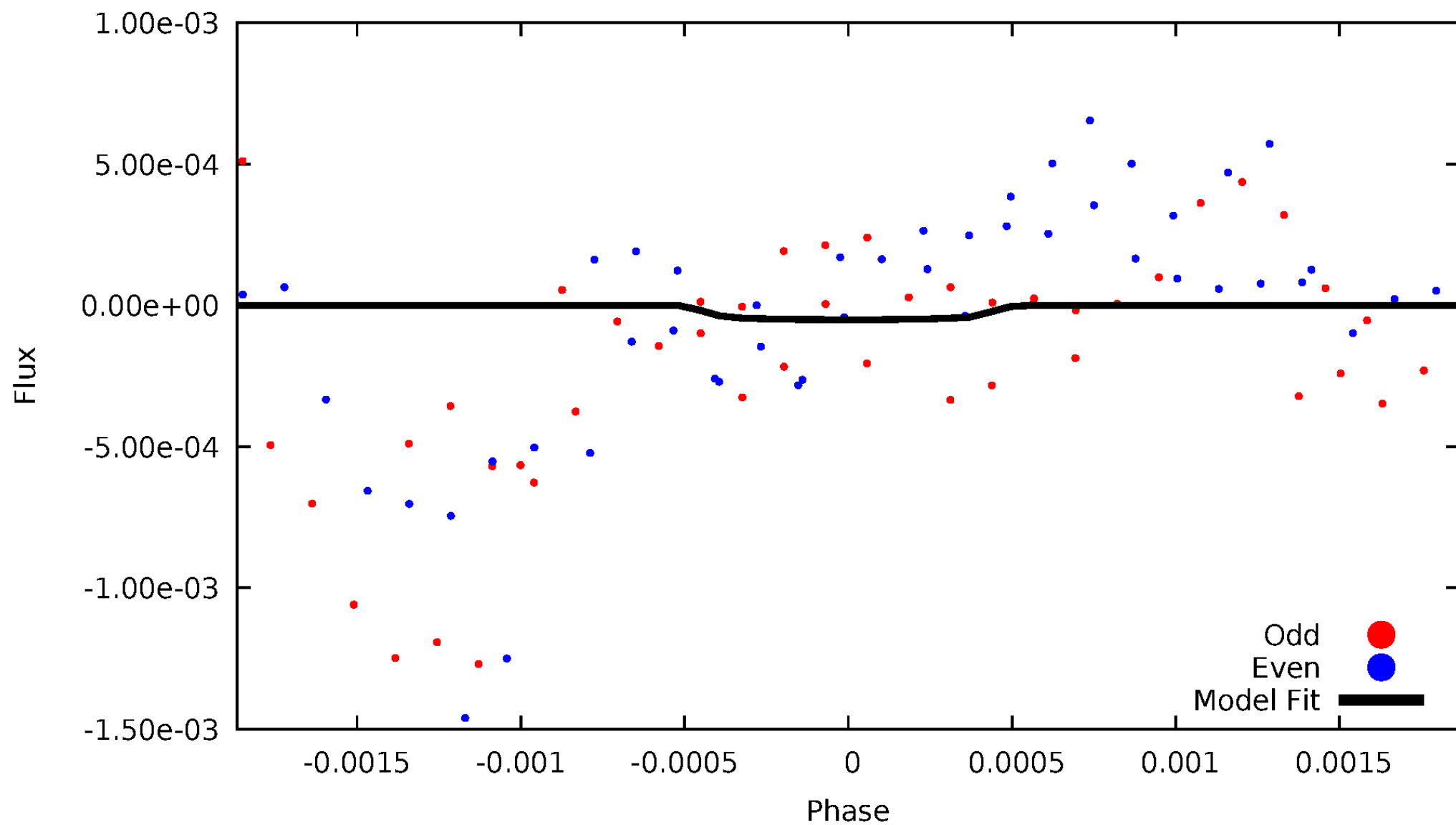
TCE 004466180-08





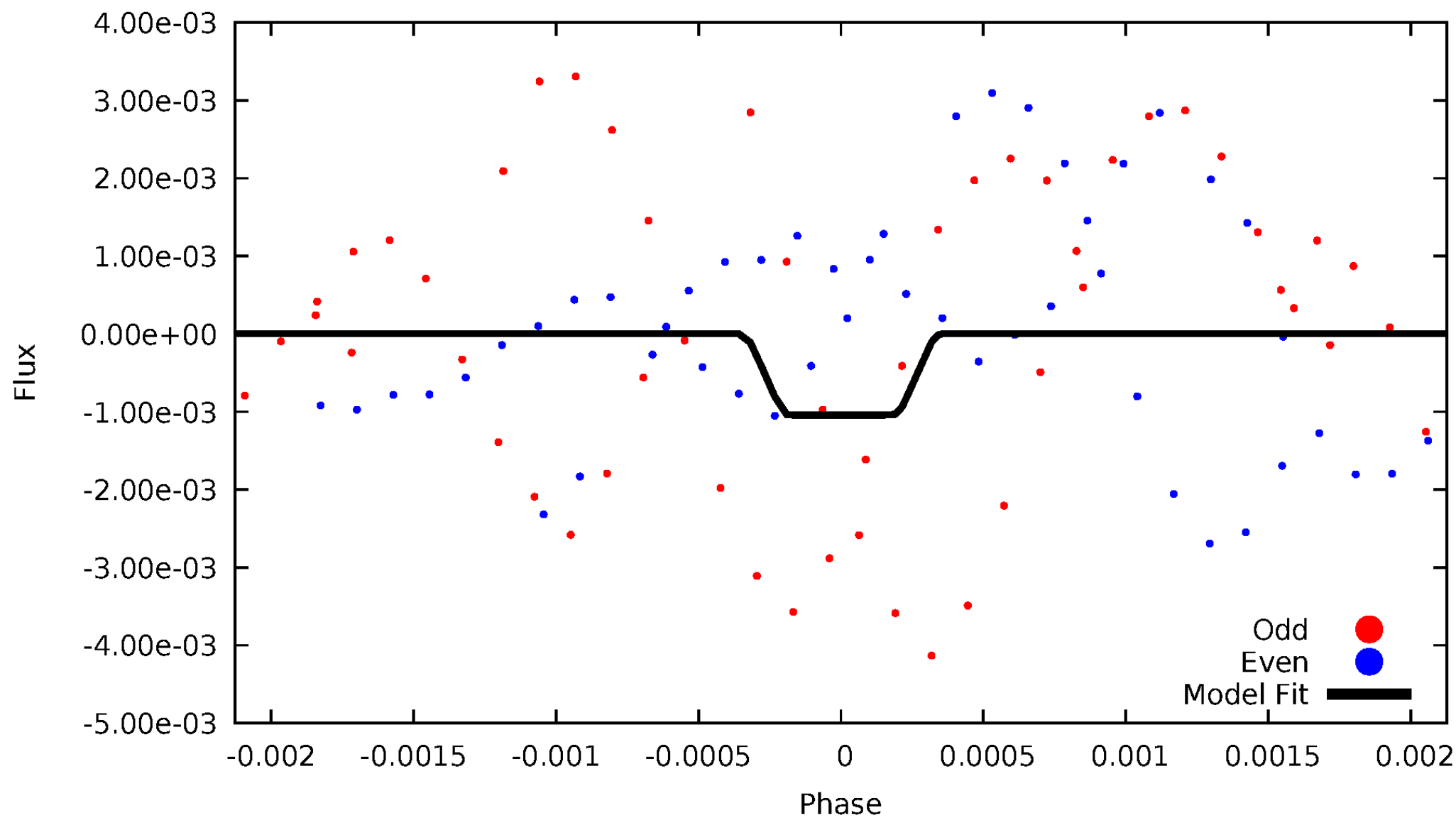
# DV Odd/Even

TCE 004466180-08



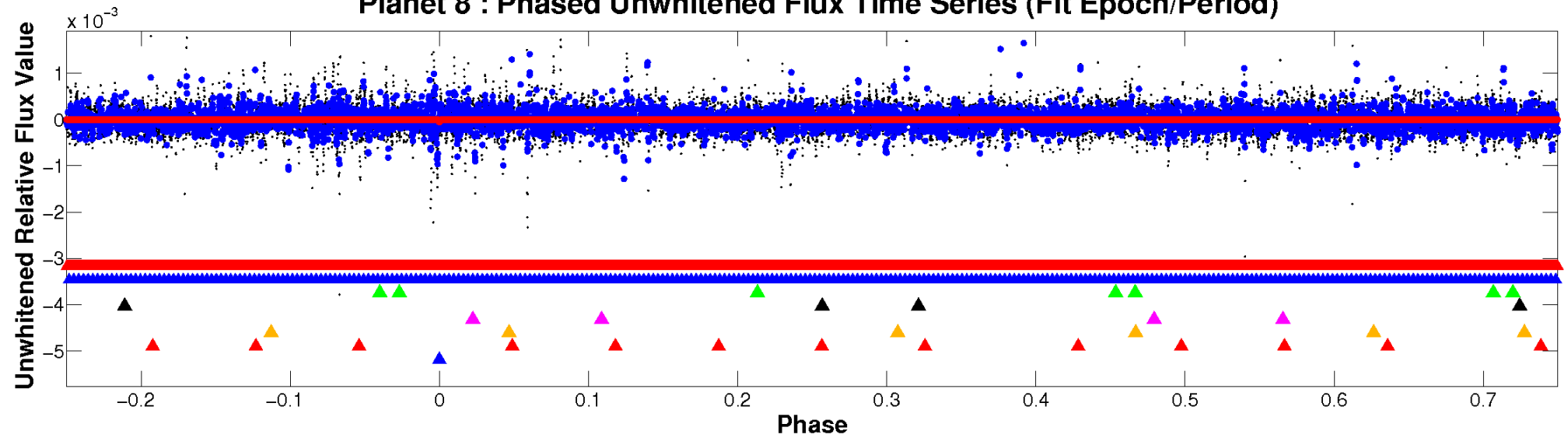
# ALT Odd/Even

TCE 004466180-08

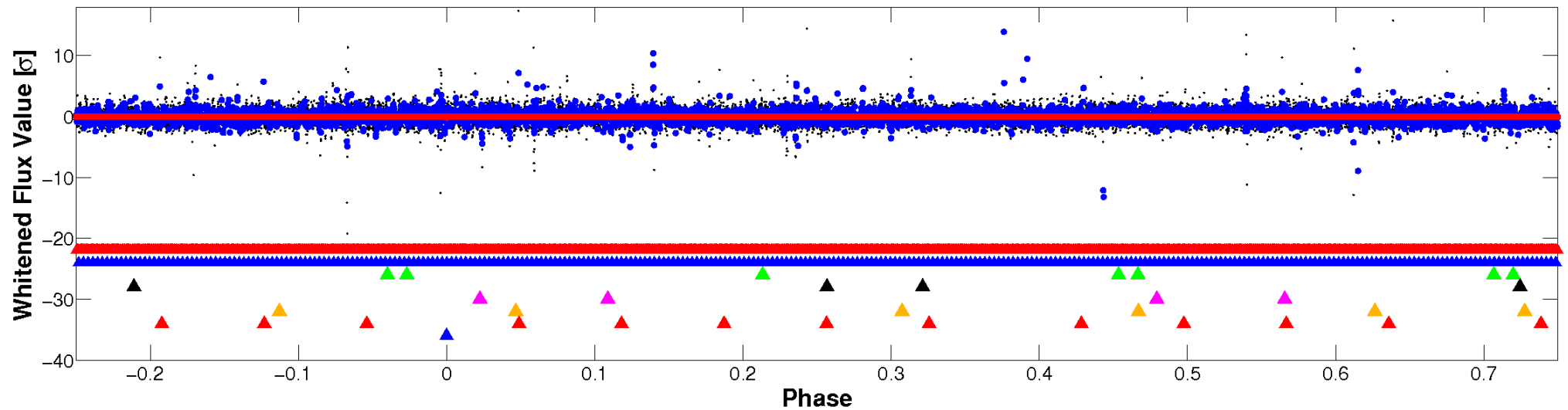


# Non-Whitened Vs. Whitened Light Curve

## Planet 8 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

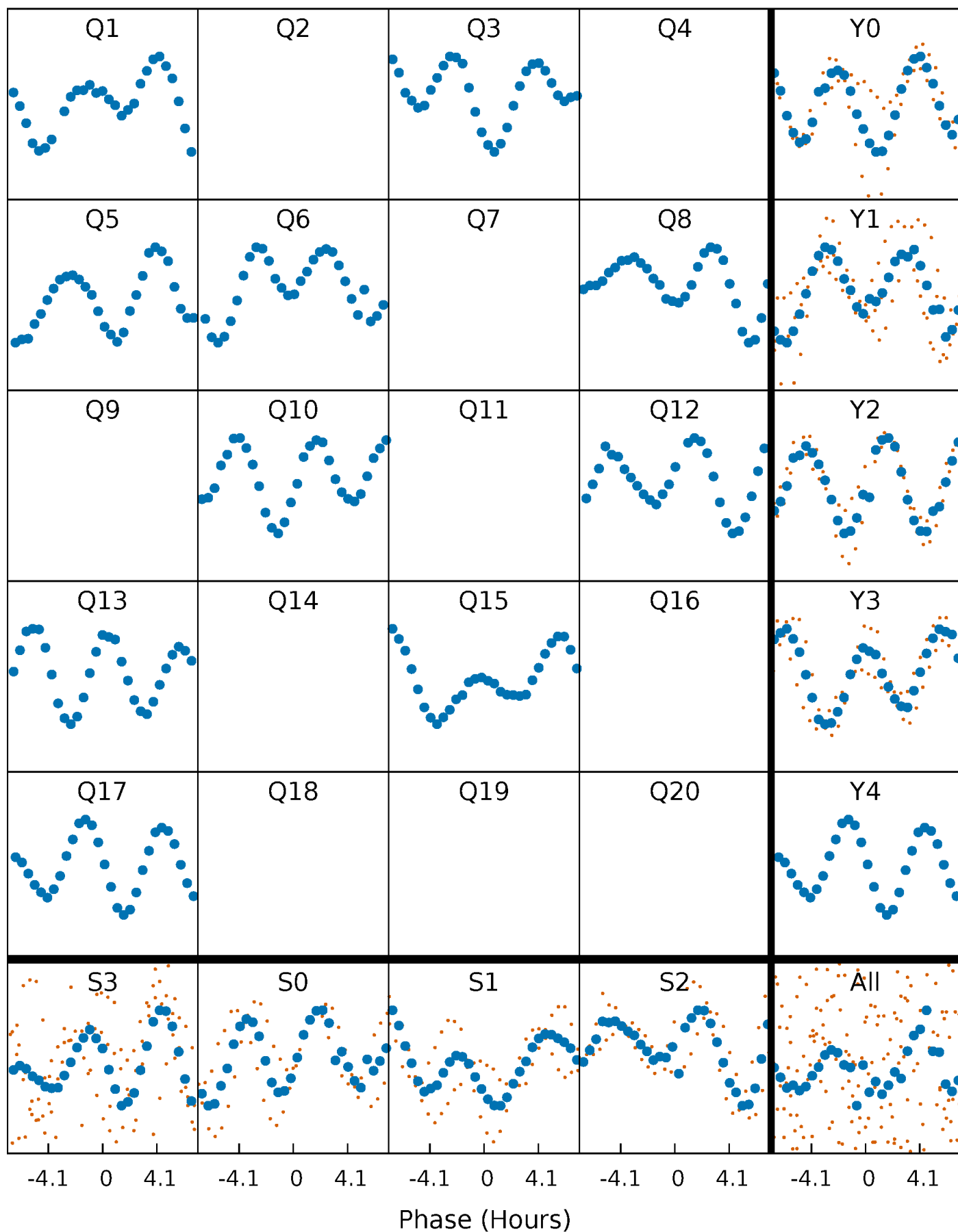


## Planet 8 : Phased Whitened Flux Time Series (Fit Epoch/Period)



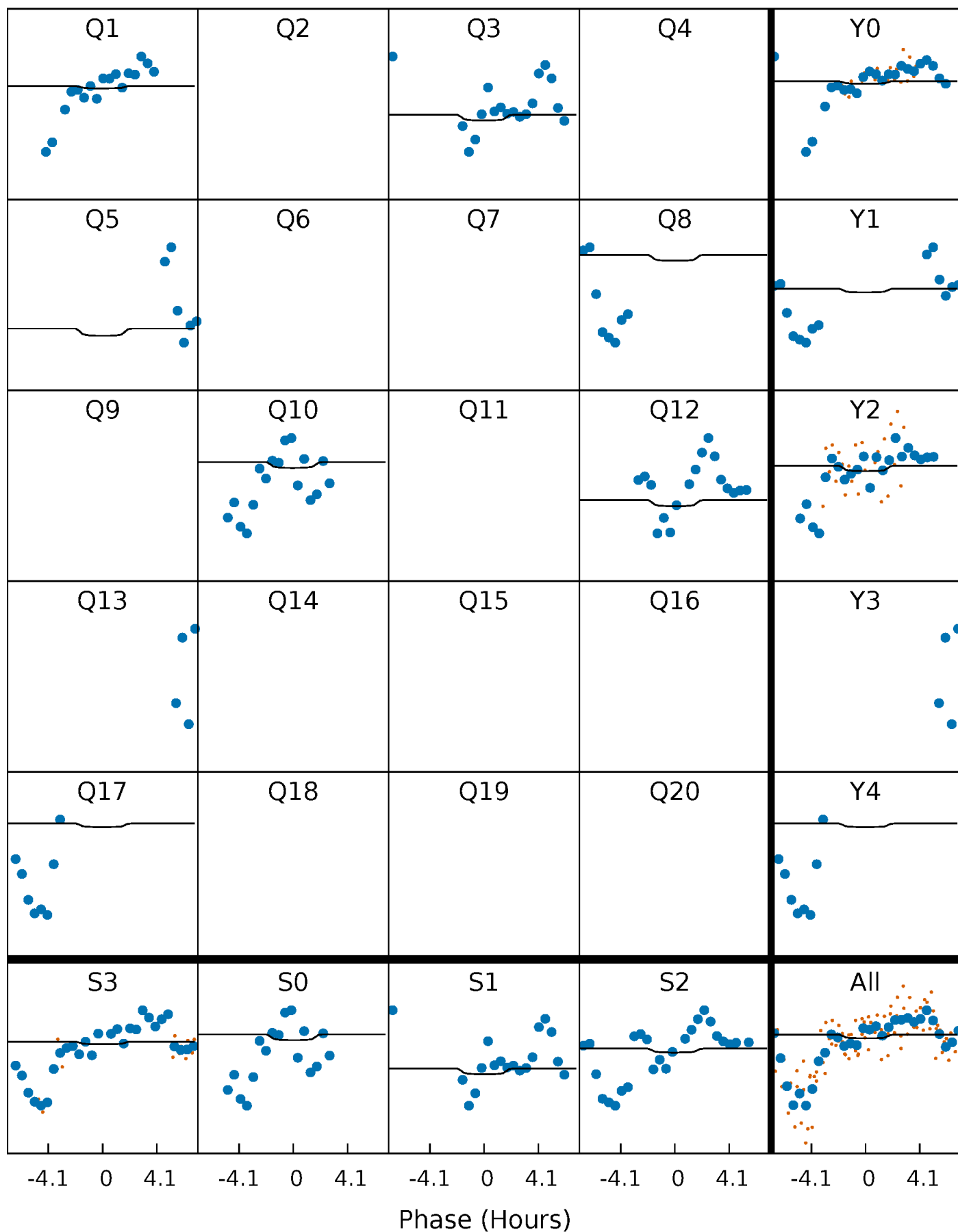
# PDC Quarter-Phased Transit Curves

TCE 004466180-08     $P=160.634372$  Days     $T_0=143.491195$  (BKJD)



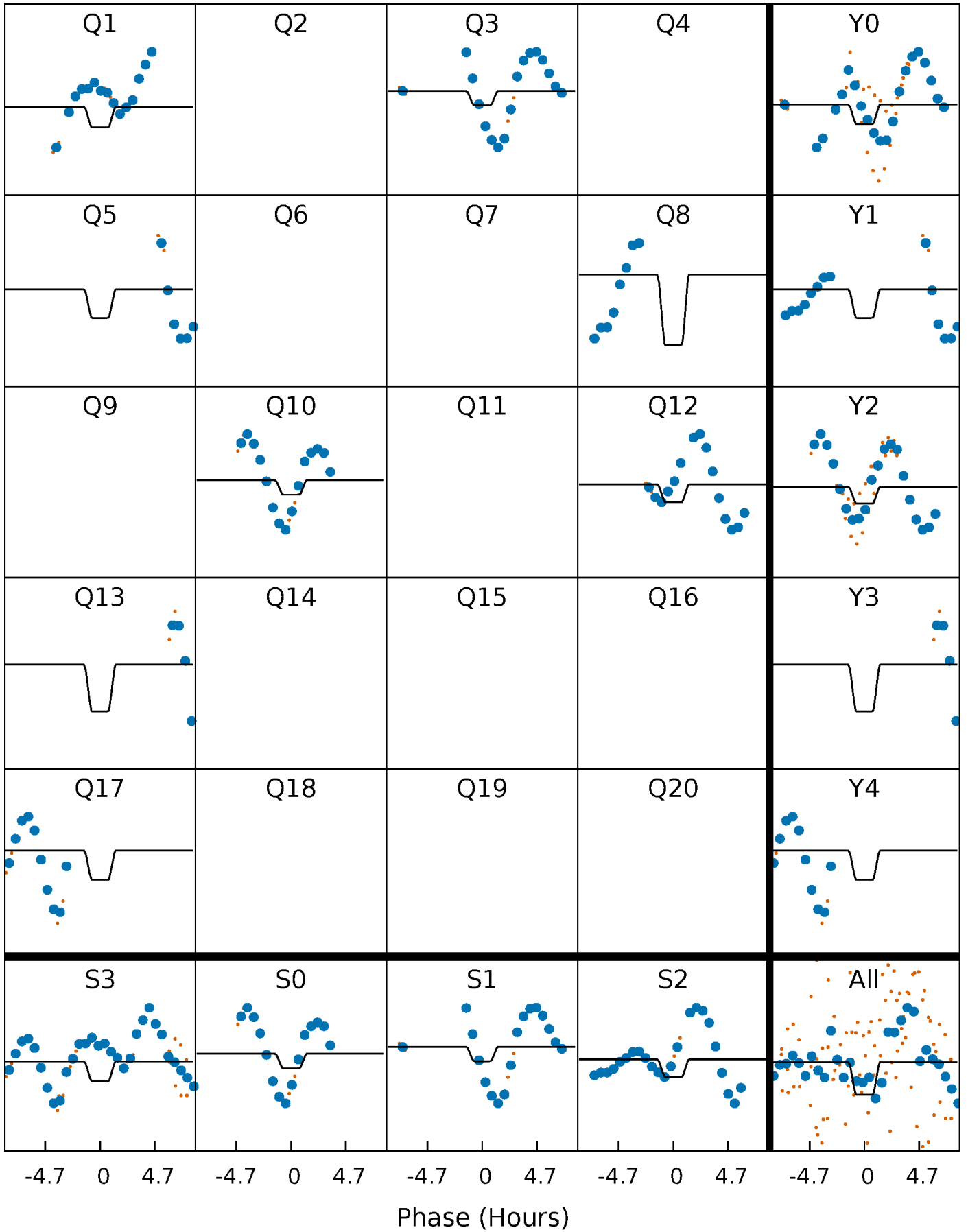
# DV Quarter-Phased Transit Curves

TCE 004466180-08 P=160.634372 Days  $T_0=143.491195$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

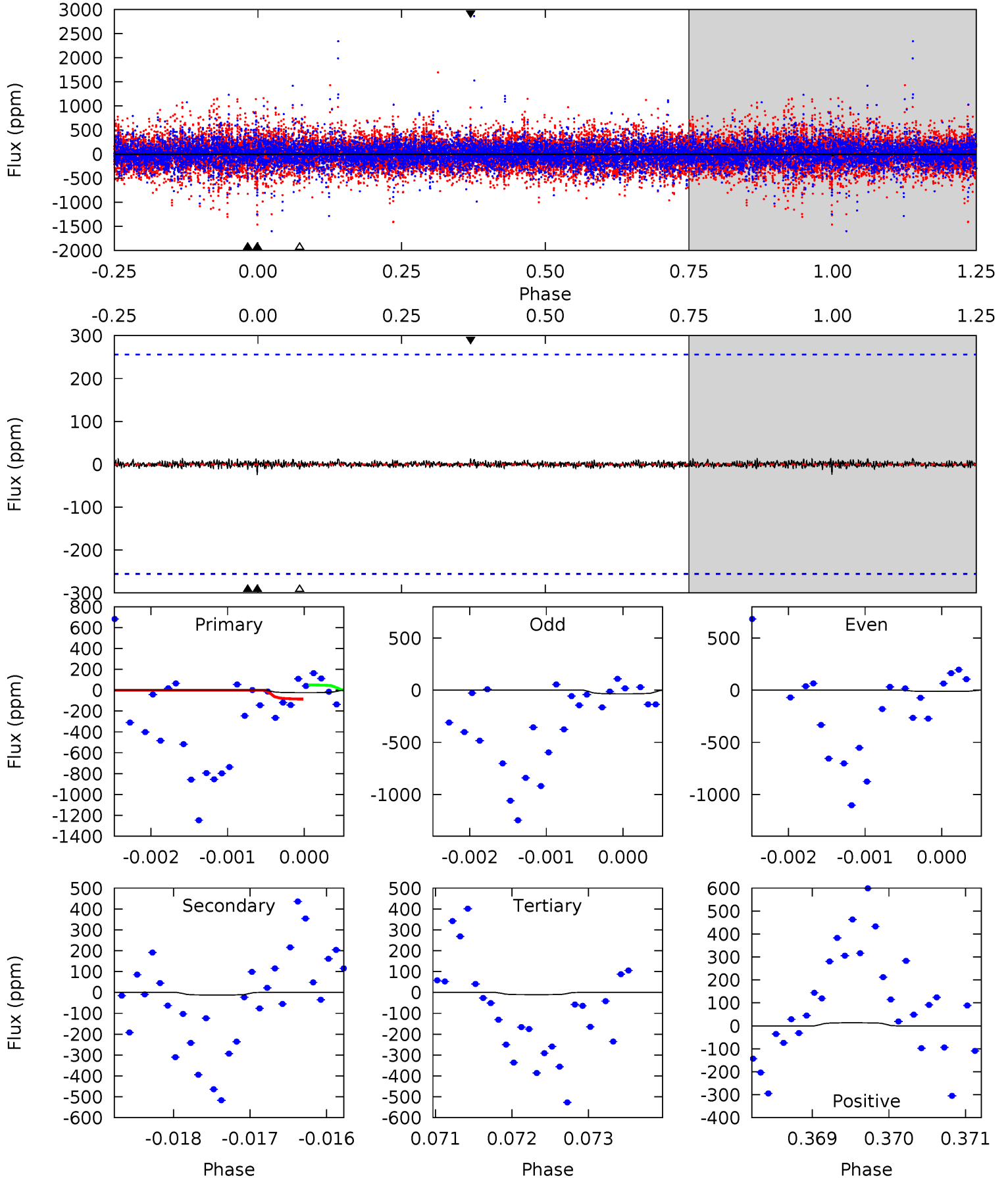
TCE 004466180-08 P=160.633416 Days  $T_0=143.470772$  (BKJD)



# DV Model-Shift Uniqueness Test

004466180-08, P = 160.634372 Days, E = 143.491195 Days

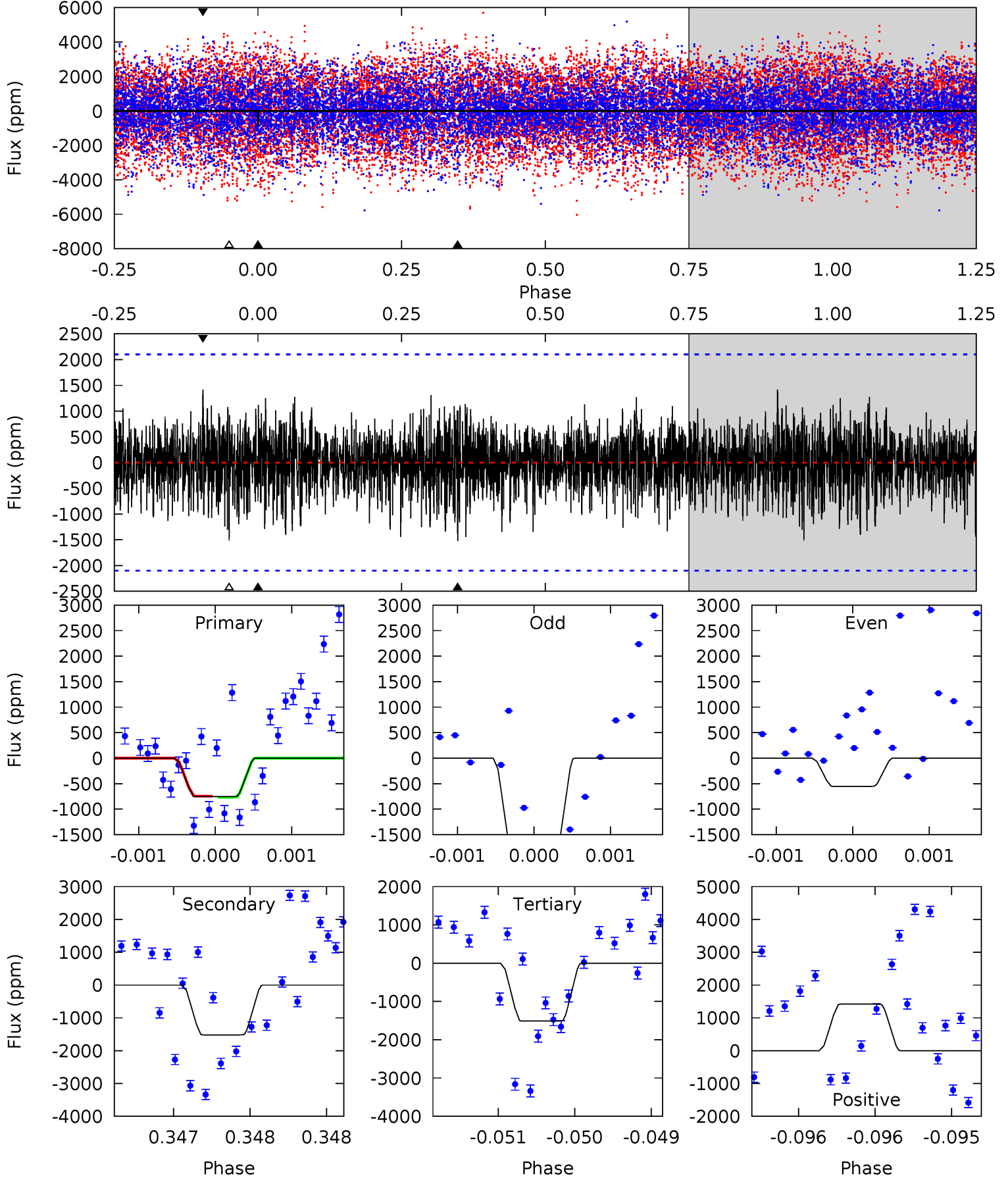
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.51	0.27	0.23	0.28	5.45	3.29	0.08	0.28	0.22	0.04	-0.02	0.24	0.71	0.36	0.37



# Alt Model-Shift Uniqueness Test

004466180-08, P = 160.633416 Days, E = 143.470772 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
1.98	4.00	3.97	3.73	5.52	3.40	1.13	-1.99	-1.75	0.03	0.27	1.87	0.96	0.48	0.03





### Stellar Parameters For KIC 004466180

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7082^{+195}_{-318}$	$3.715^{+0.442}_{-0.078}$	$0.080^{+0.200}_{-0.300}$	$3.109^{+0.472}_{-1.416}$	$1.828^{+0.179}_{-0.418}$	$0.086^{+0.349}_{-0.021}$
	+3%/-4%	+12%/-2%	+250%/-375%	+15%/-46%	+10%/-23%	+407%/-24%
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 004466180-08 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-12 \pm 47$	$12.54^{+13.59}_{-8.97}$	$877^{+67}_{-105}$	$2630^{+1439}_{-6001}$	$12^{+253}_{-94}$
Alt.	$-1522 \pm 380$	$15.18^{+16.75}_{-10.40}$	$875^{+67}_{-104}$	$6021^{+6561}_{-1579}$	$1819^{+16196}_{-1430}$

$T_{max}$  = 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

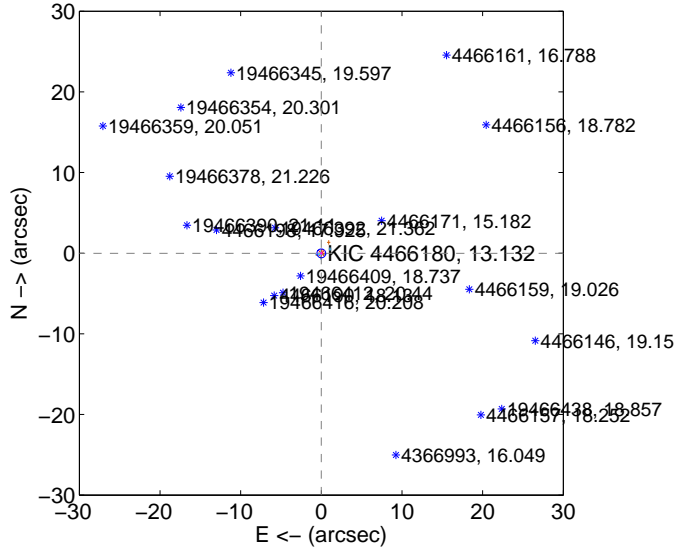
Supplemental centroid analysis for 004466180-08. Kepler magnitude: 13.13. Transit SNR 0.81

There are 5 quarters with good PRF difference image offsets

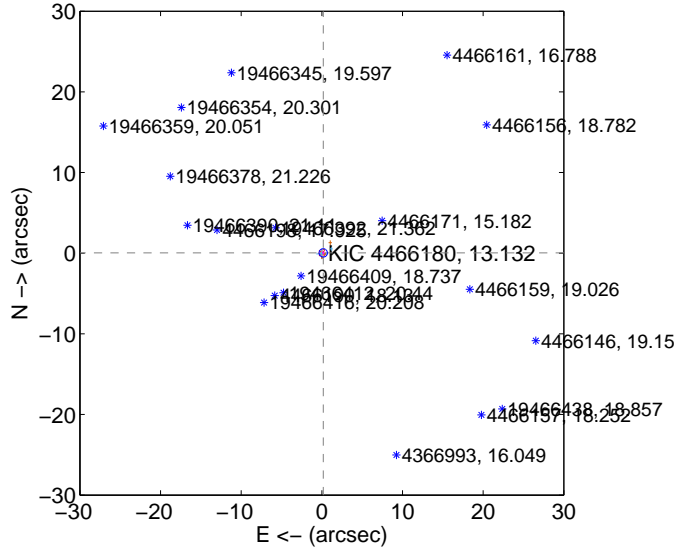
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.026 \pm 0.182$	0.14	$0.005 \pm 0.160$	$-0.026 \pm 0.164$
PRF-fit source offset from KIC position	$0.175 \pm 0.172$	1.02	$-0.171 \pm 0.151$	$0.034 \pm 0.168$
photometric centroid source offset	$10.54 \pm 5.01$	2.10	$-3.18 \pm 5.04$	$-10.05 \pm 5.01$

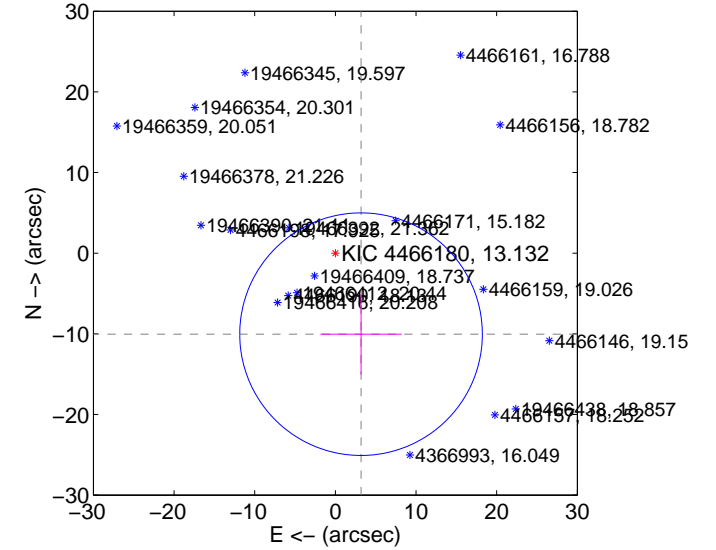
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

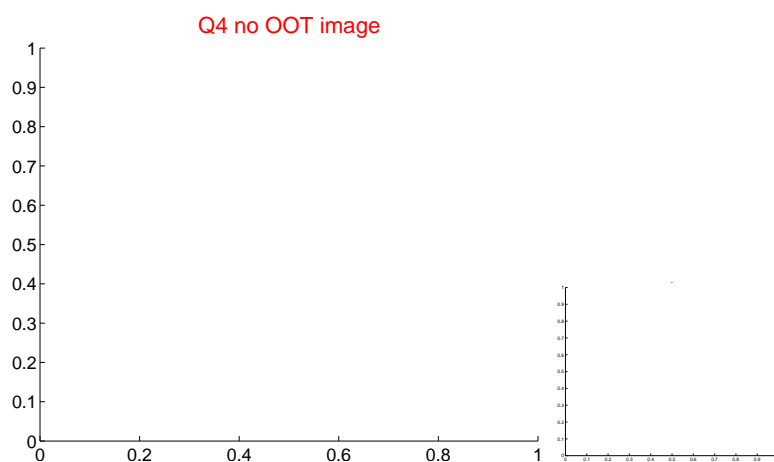
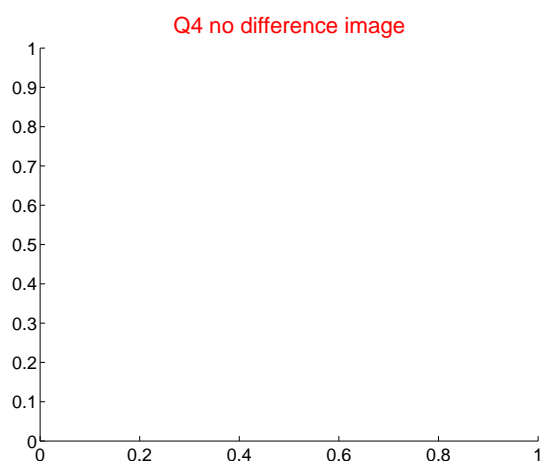
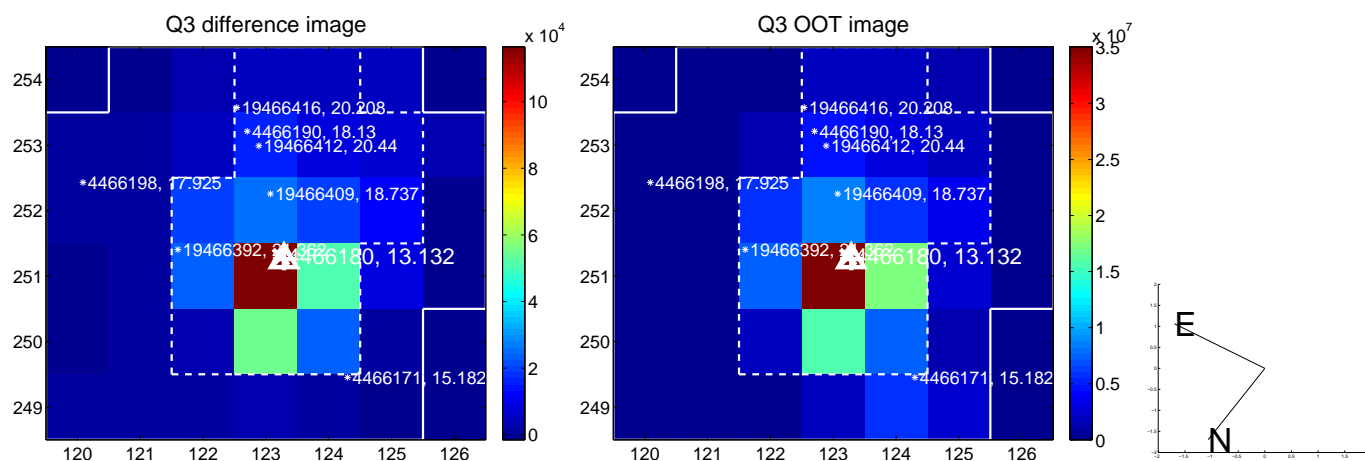
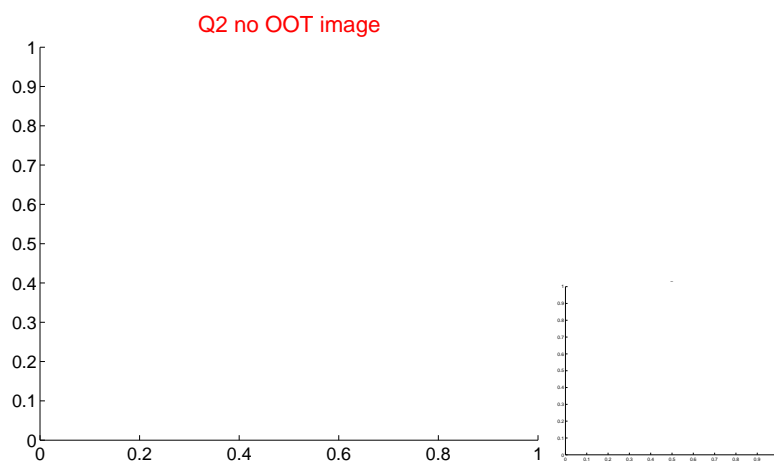
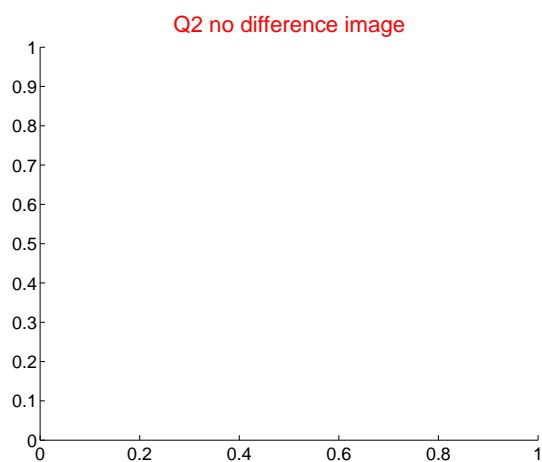
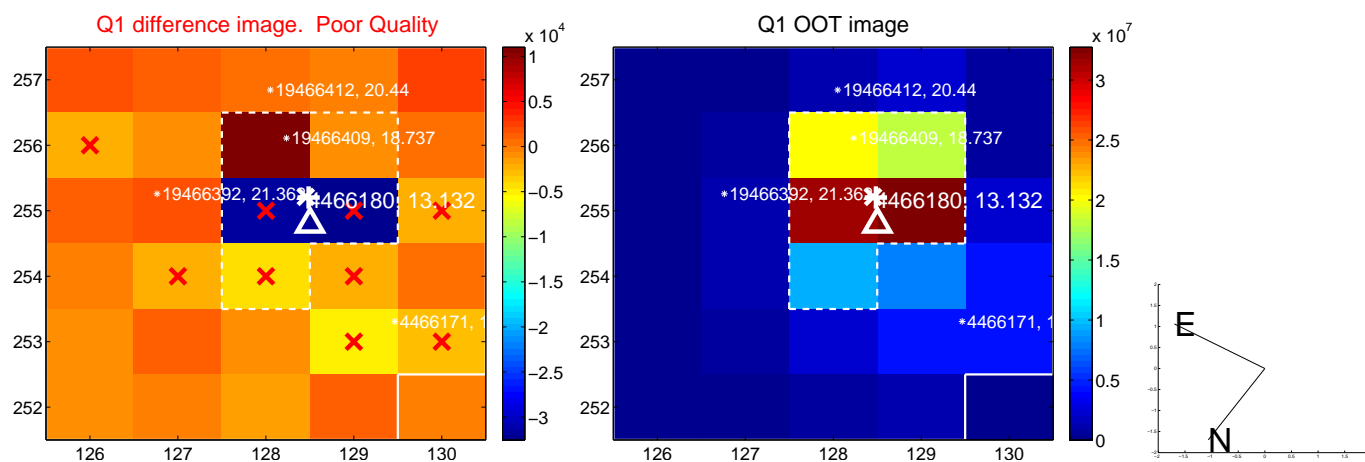


offset from photometric centroids

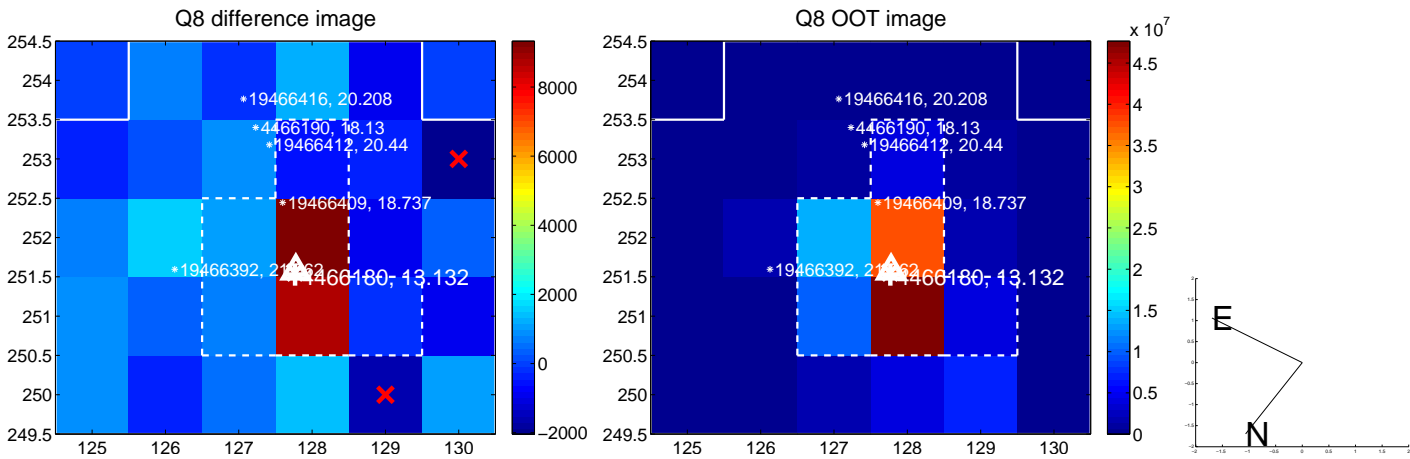
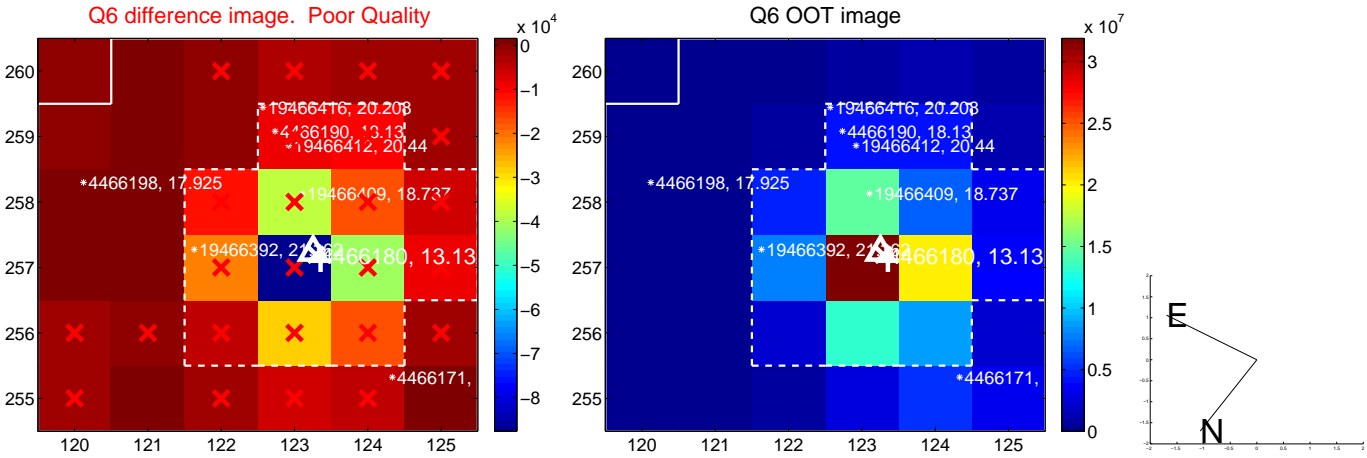
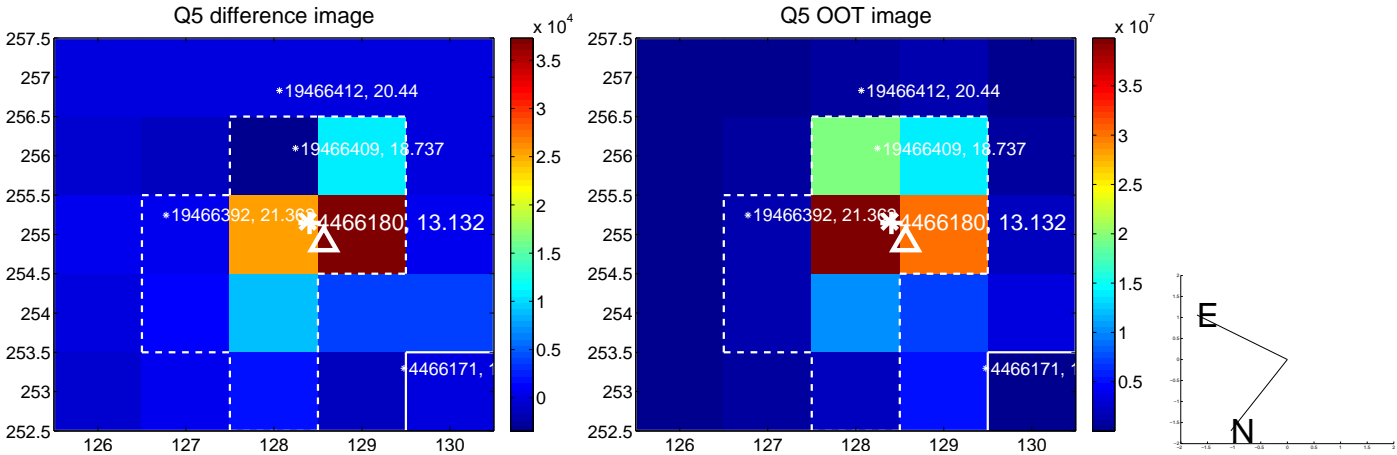


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

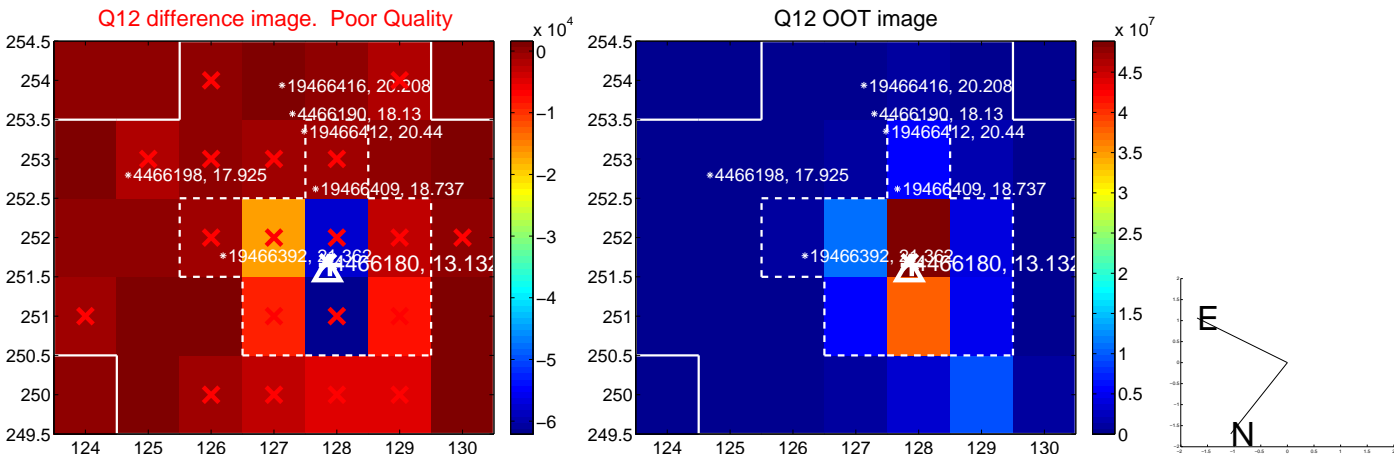
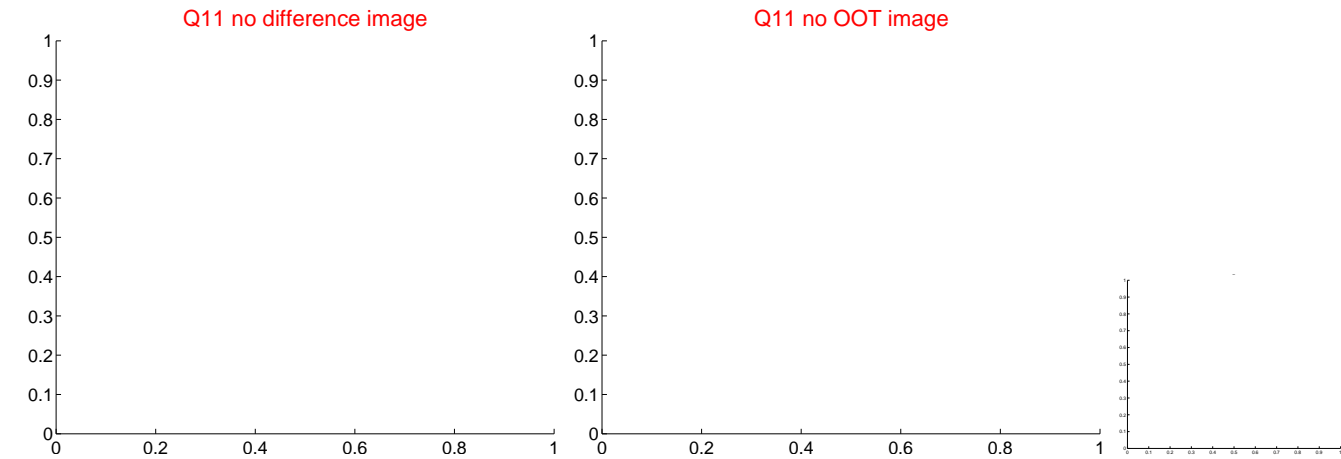
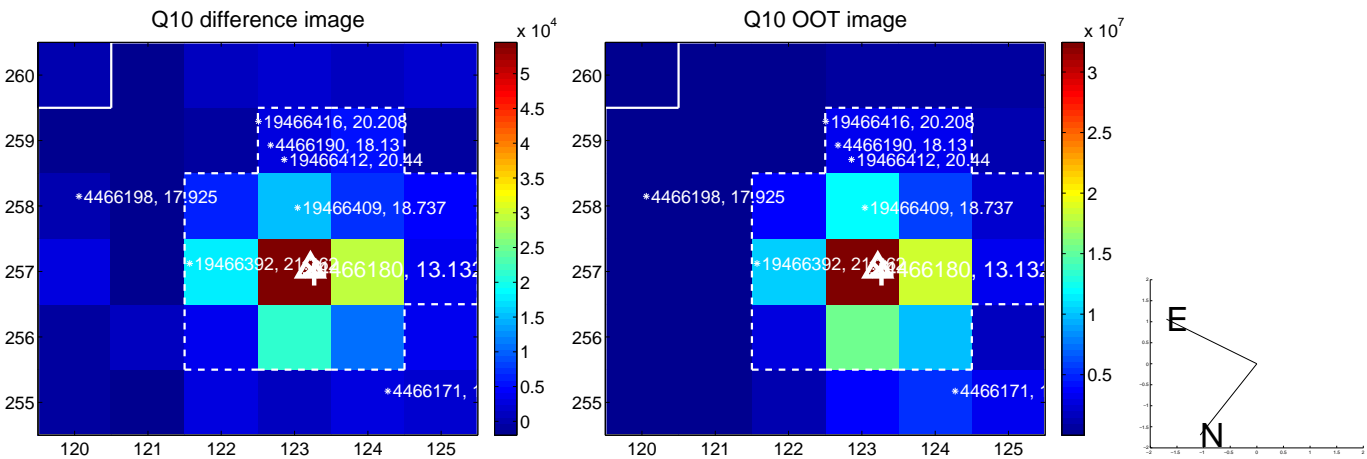
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



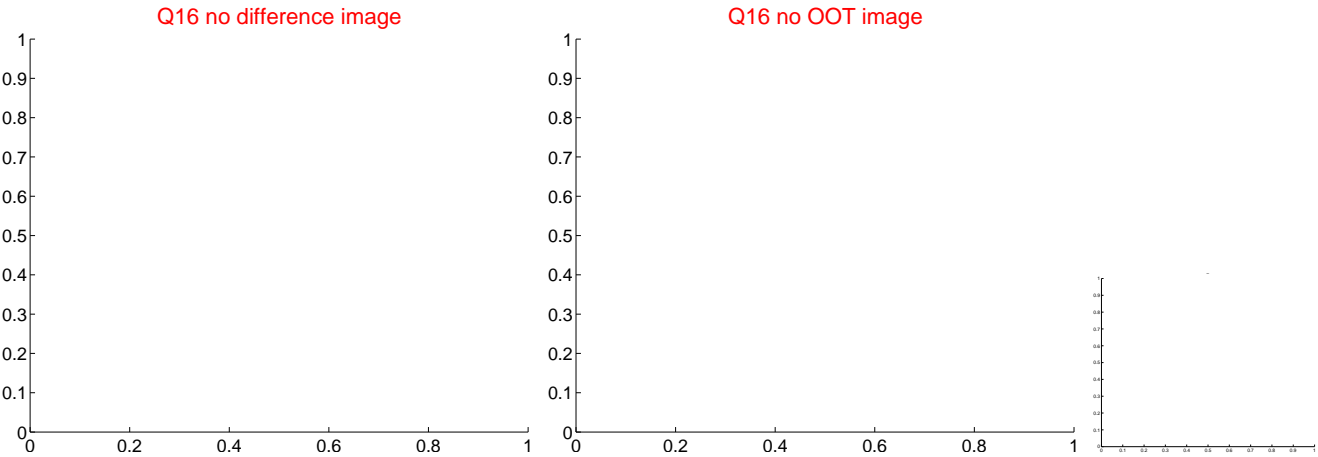
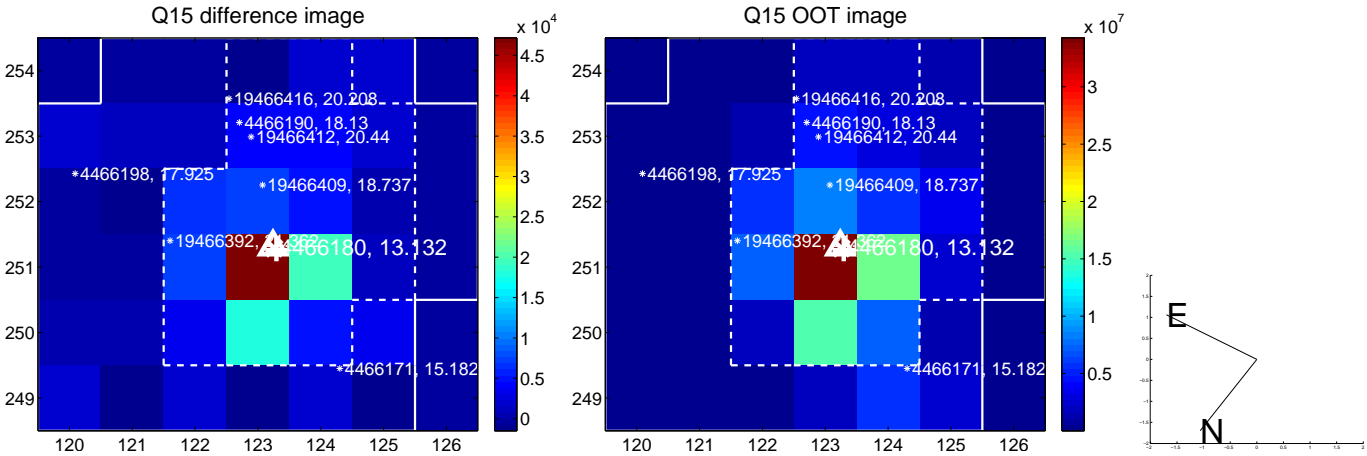
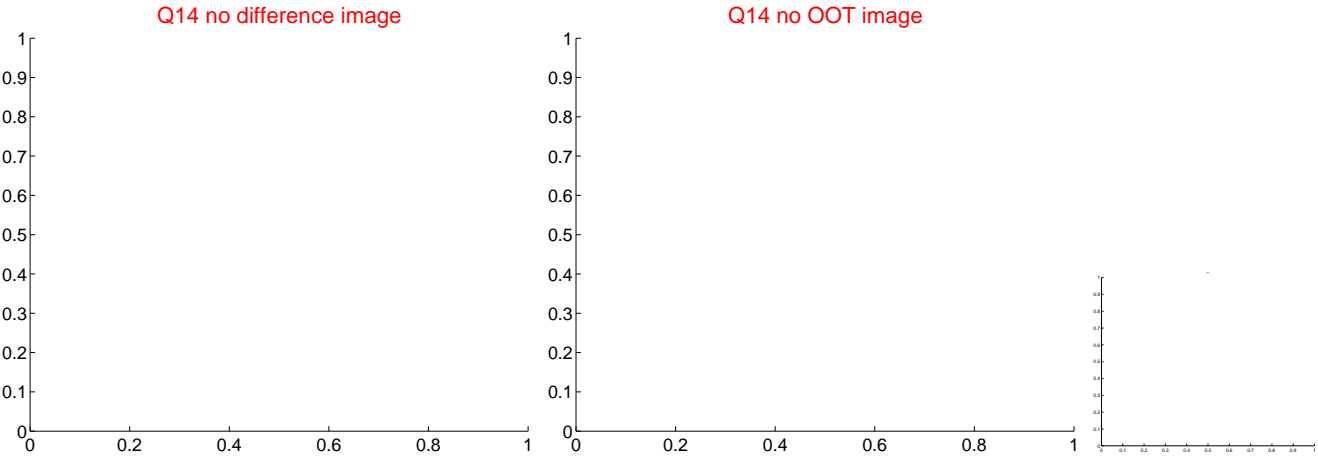
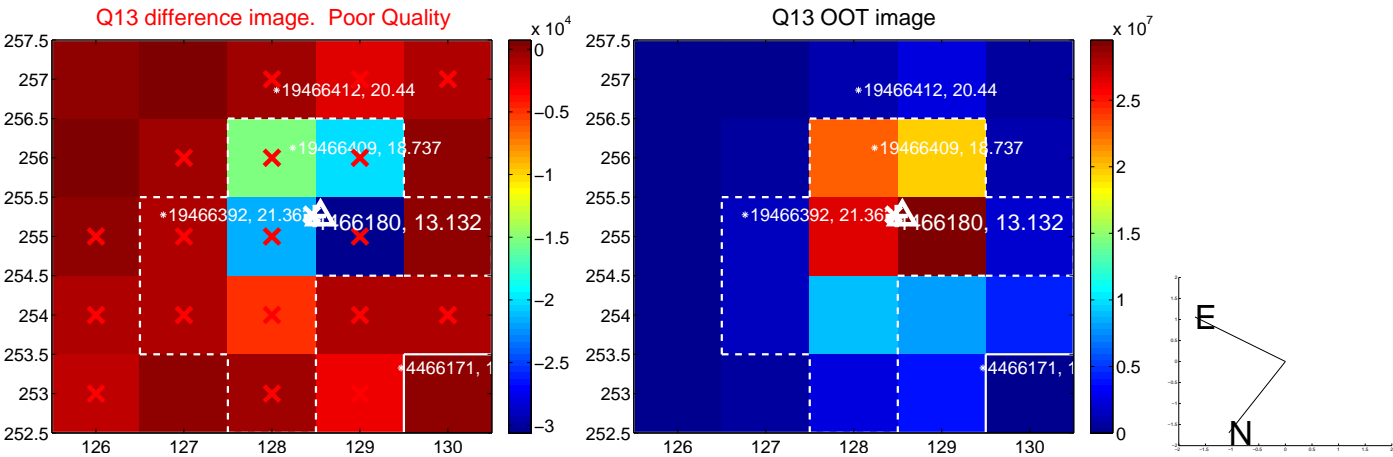
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



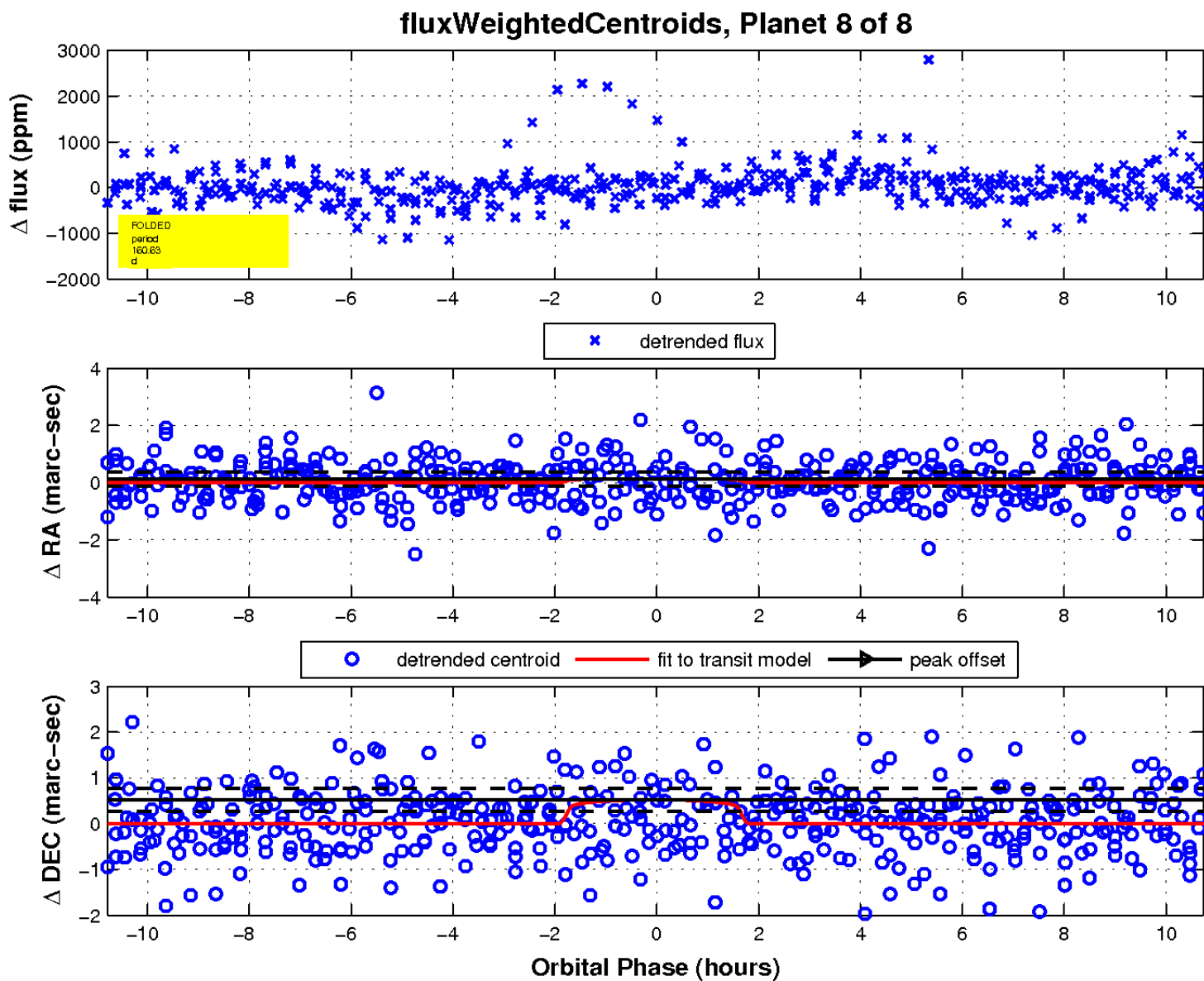
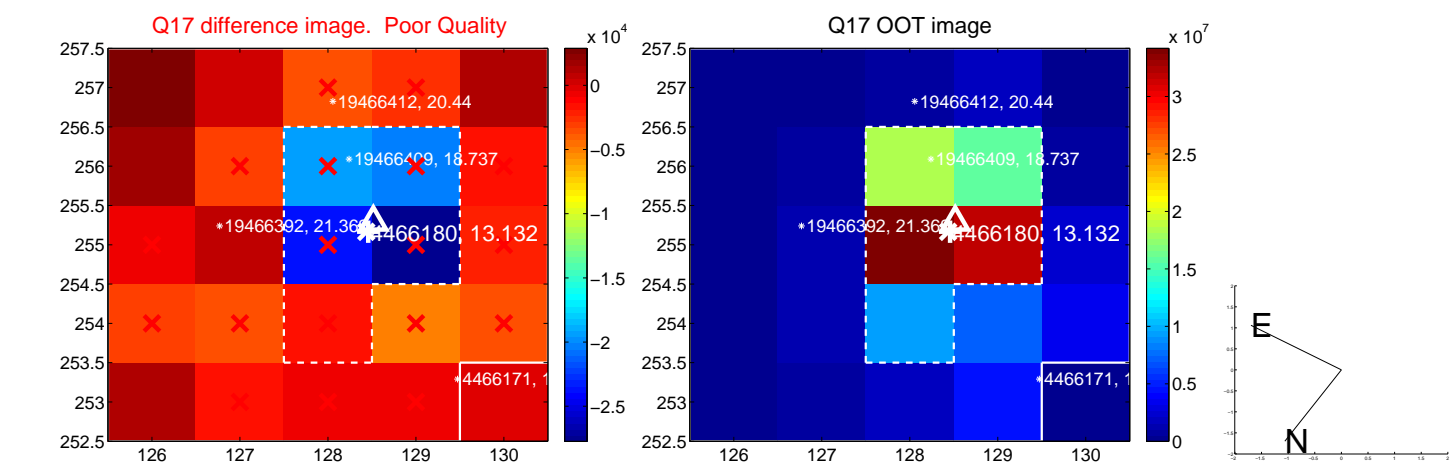
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

