

# KIC 008004558

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008004558-01	OBS	No	303.301560	433.724331	1655.5	2.137	13.1	7.5	2.45	7899	10.88	18.75
008004558-02	OBS	No	0.512625	131.670859	116.3	1.257	11.5	13.4	2.45	7899	3.08	93113.34
008004558-03	OBS	No	0.512680	131.750302	0.6	0.568	9.1	0.0	2.45	7899	0.19	93100.01
008004558-04	OBS	No	1.237640	132.655273	269.7	4.500	9.2	-1.0	2.45	7899	4.08	28748.76

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008004558-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008004558-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_KIC_POS
008004558-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD—CENT_KIC_POS
008004558-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_NOFITS

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

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

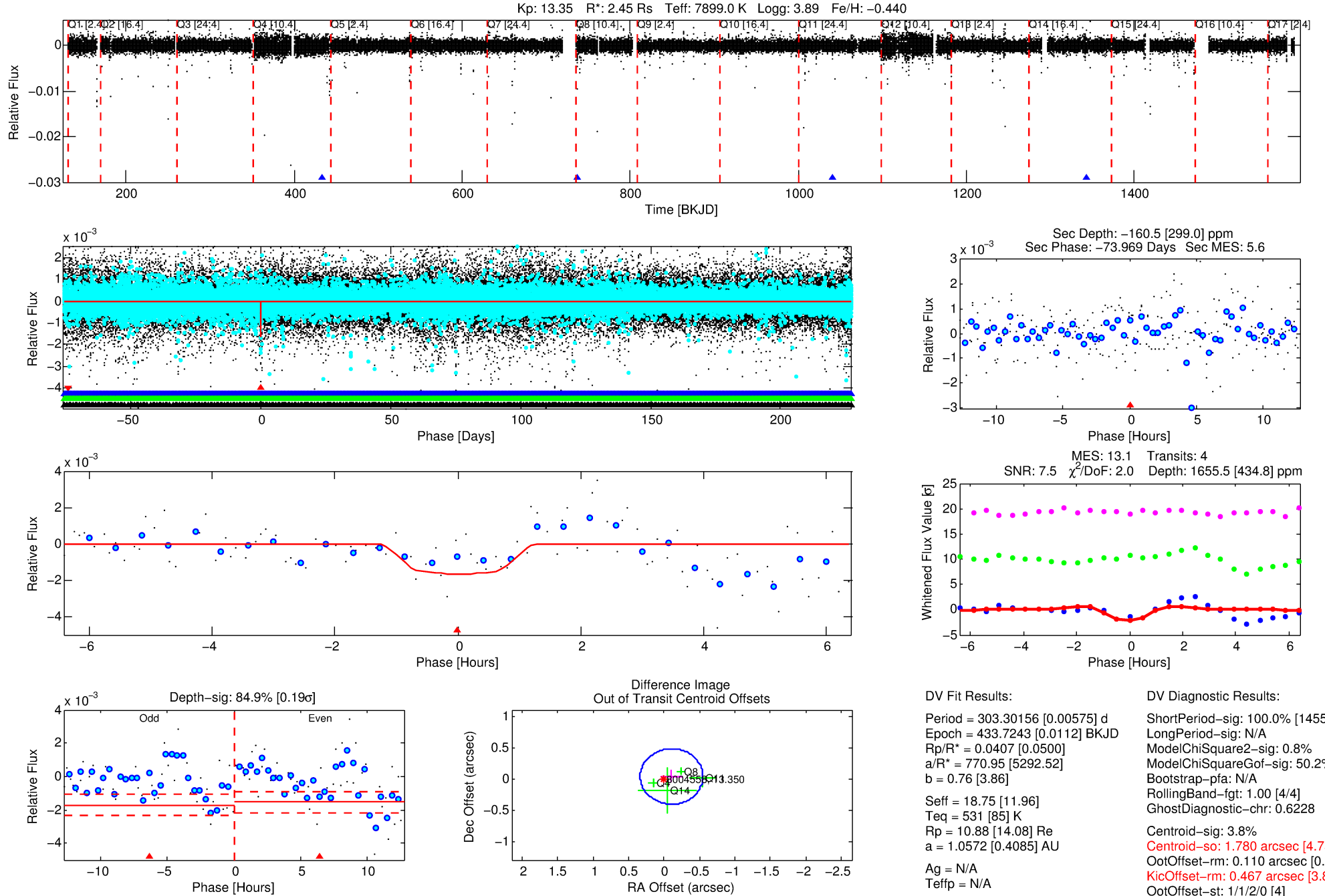
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008004558-01

No Significant Match Found

# DV One-Page Summary

KIC: 8004558 Candidate: 1 of 4 Period: 303.302 d



## DV Fit Results:

Period = 303.30156 [0.00575] d  
Epoch = 433.7243 [0.0112] BKJD  
Rp/R\* = 0.0407 [0.0500]  
a/R\* = 770.95 [5292.52]  
b = 0.76 [3.86]  
Seff = 18.75 [11.96]  
Teq = 531 [85] K  
Rp = 10.88 [14.08] Re  
a = 1.0572 [0.4085] AU  
Ag = N/A  
Teffp = N/A

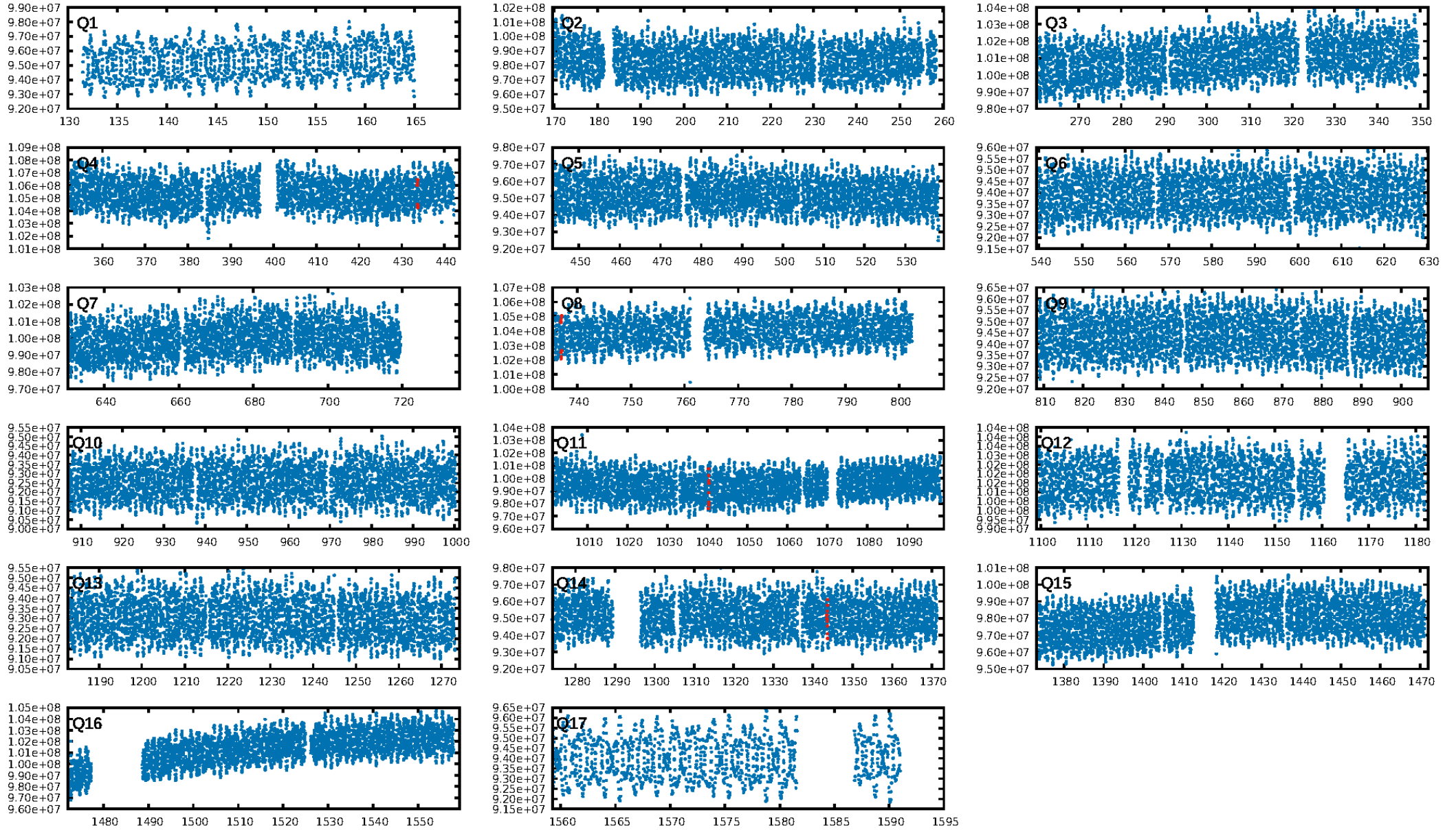
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [1455.21σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.8%  
ModelChiSquareGoF-sig: 50.2%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: 0.6228  
Centroid-sig: 3.8%  
Centroid-so: 1.780 arcsec [4.73σ]  
OotOffset-rm: 0.110 arcsec [0.75σ]  
KicOffset-rm: 0.467 arcsec [3.87σ]  
OotOffset-st: 1/1/2/0 [4]  
KicOffset-st: 1/1/2/0 [4]  
DiffImageQuality-fgm: 0.50 [2/4]  
DiffImageOverlap-fno: 0.00 [0/4]

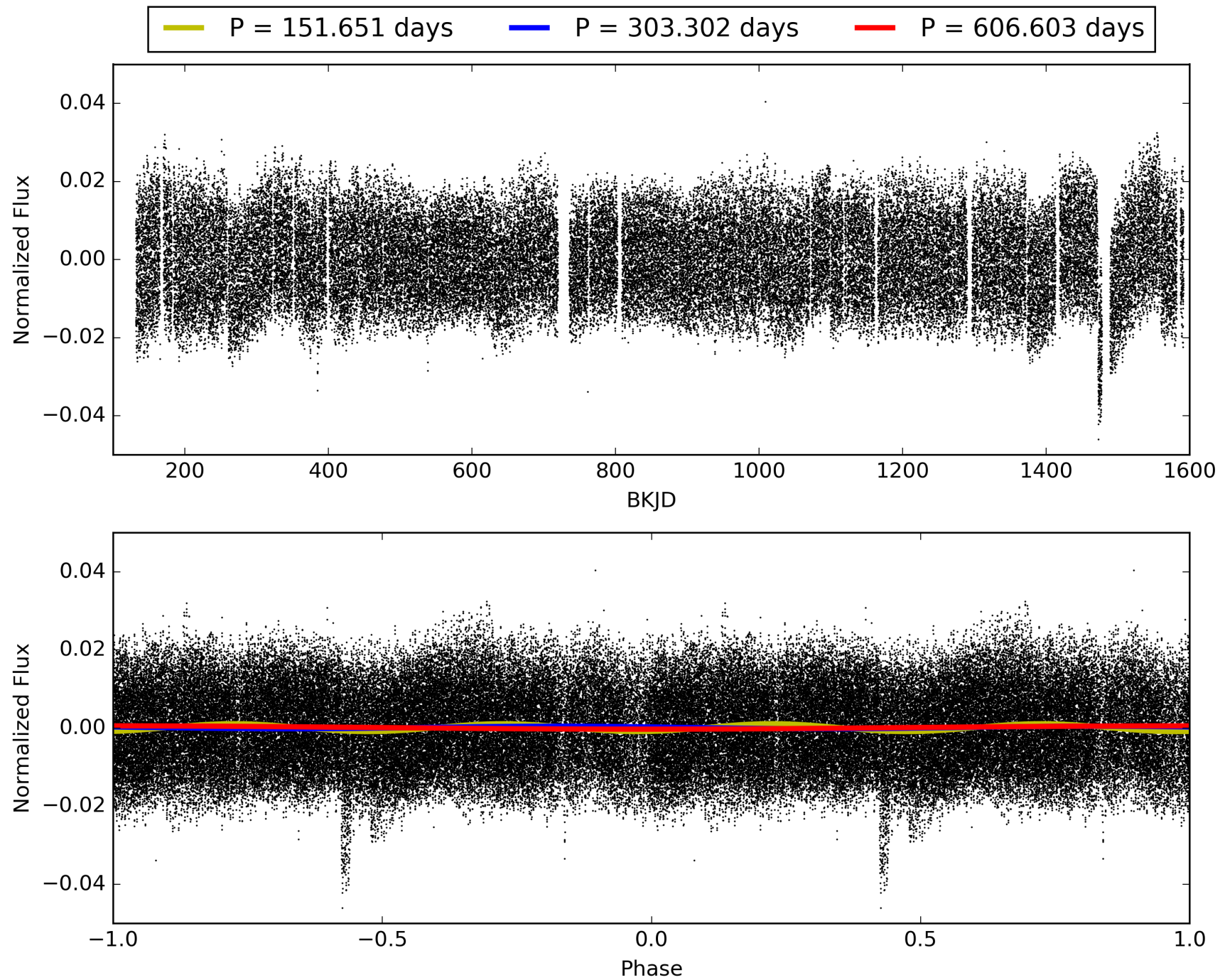
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 15:36:15 Z

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

# TCE 008004558-01, PDC Light Curves



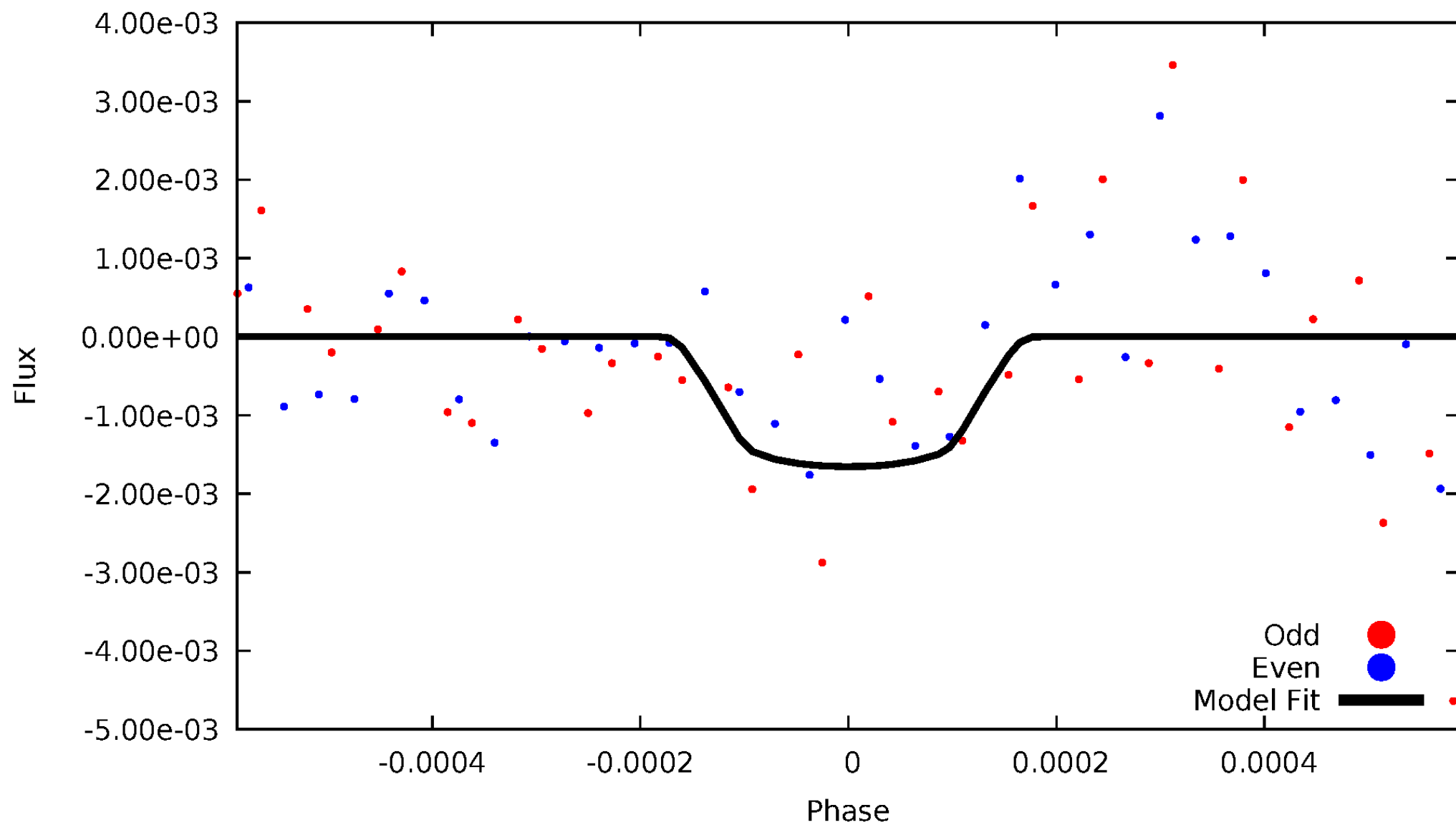
TCE 008004558-01





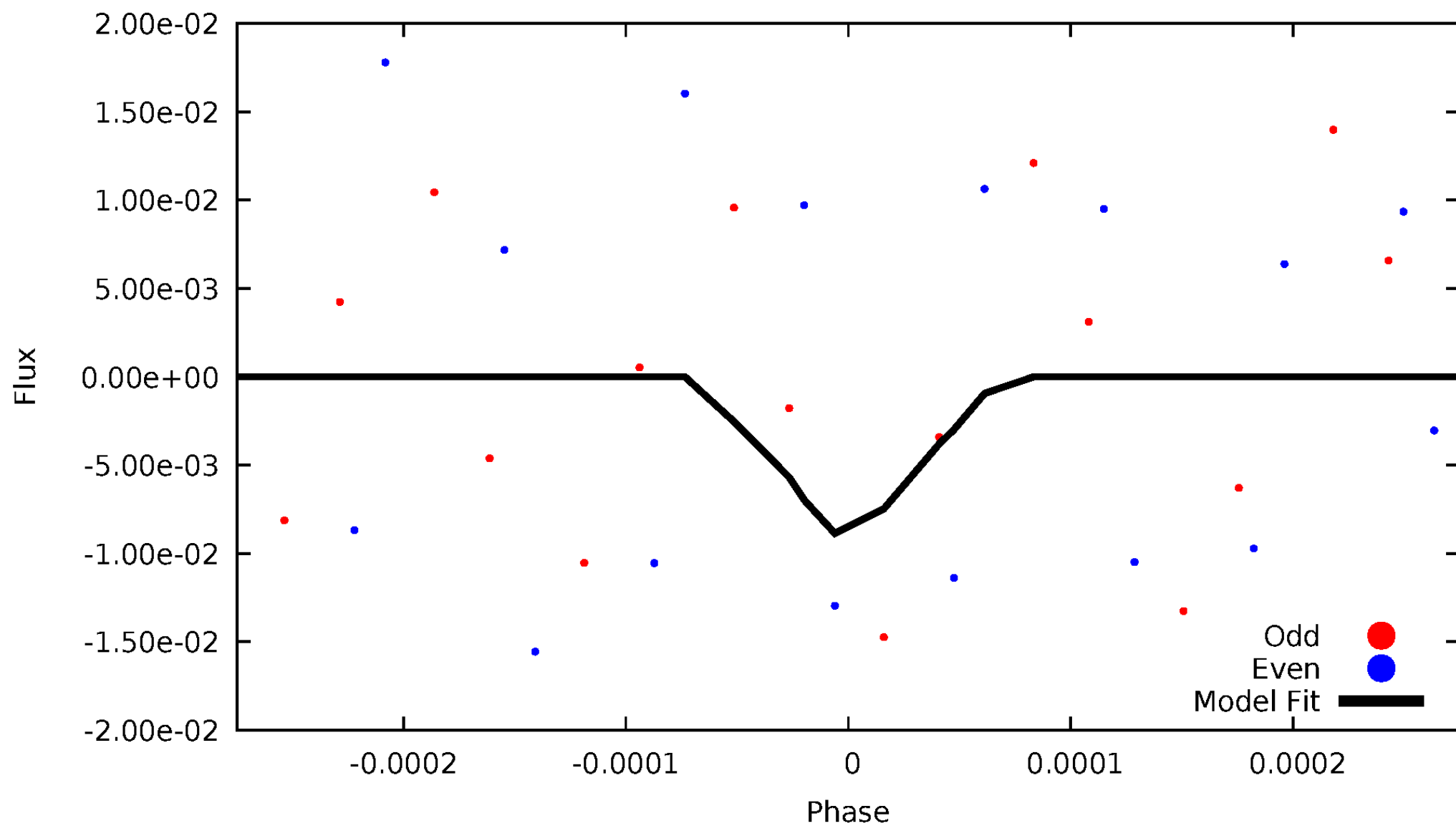
# DV Odd/Even

TCE 008004558-01

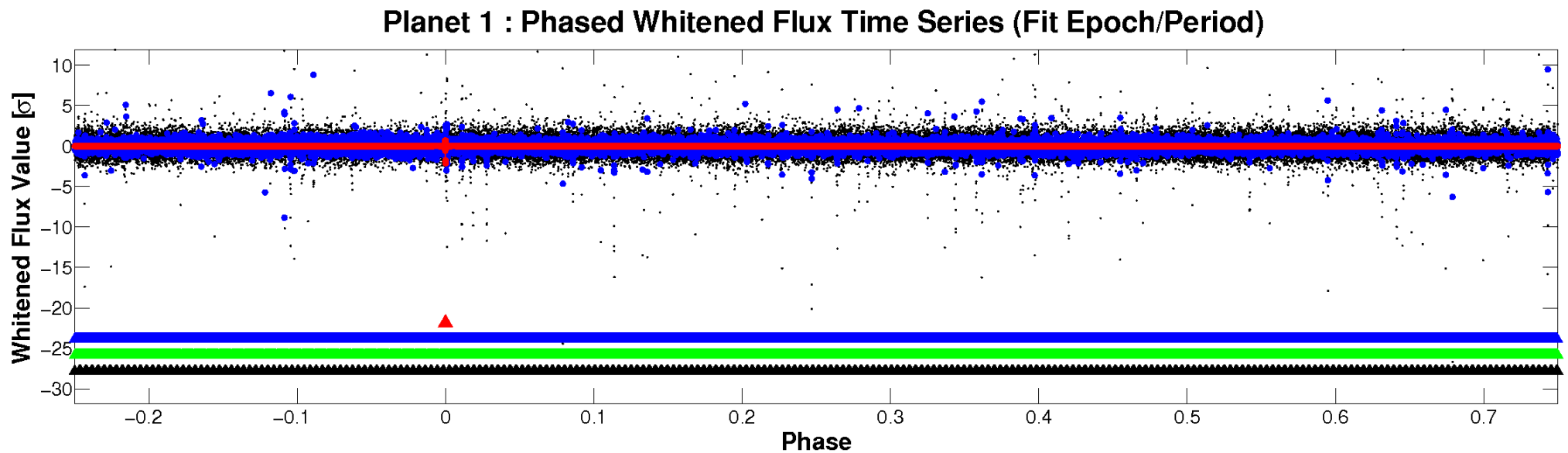
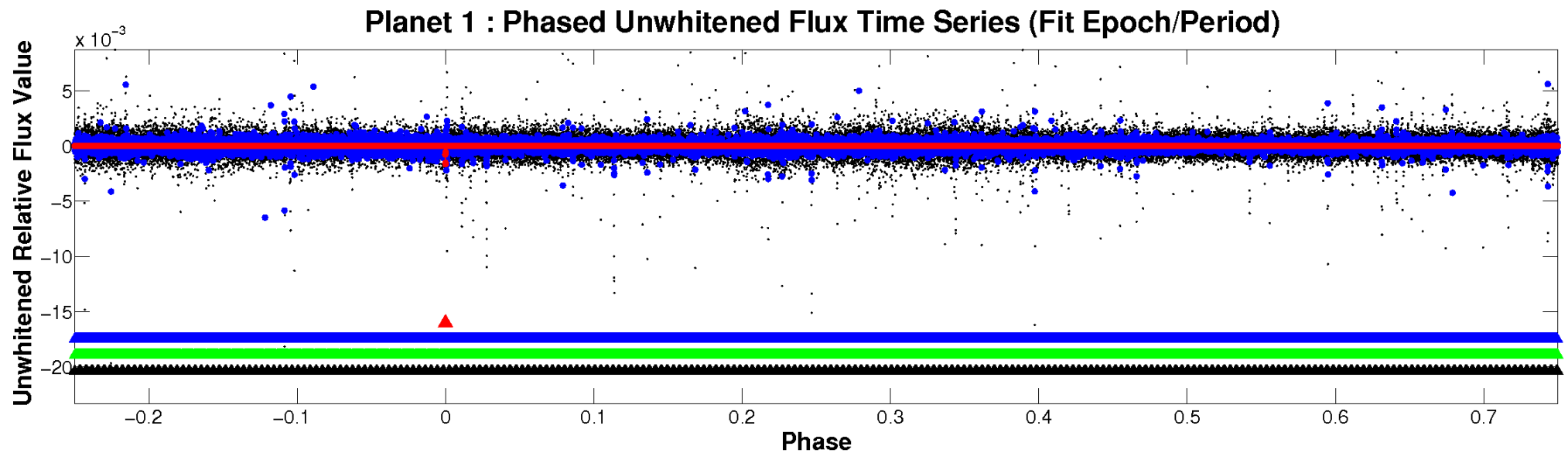


# ALT Odd/Even

TCE 008004558-01

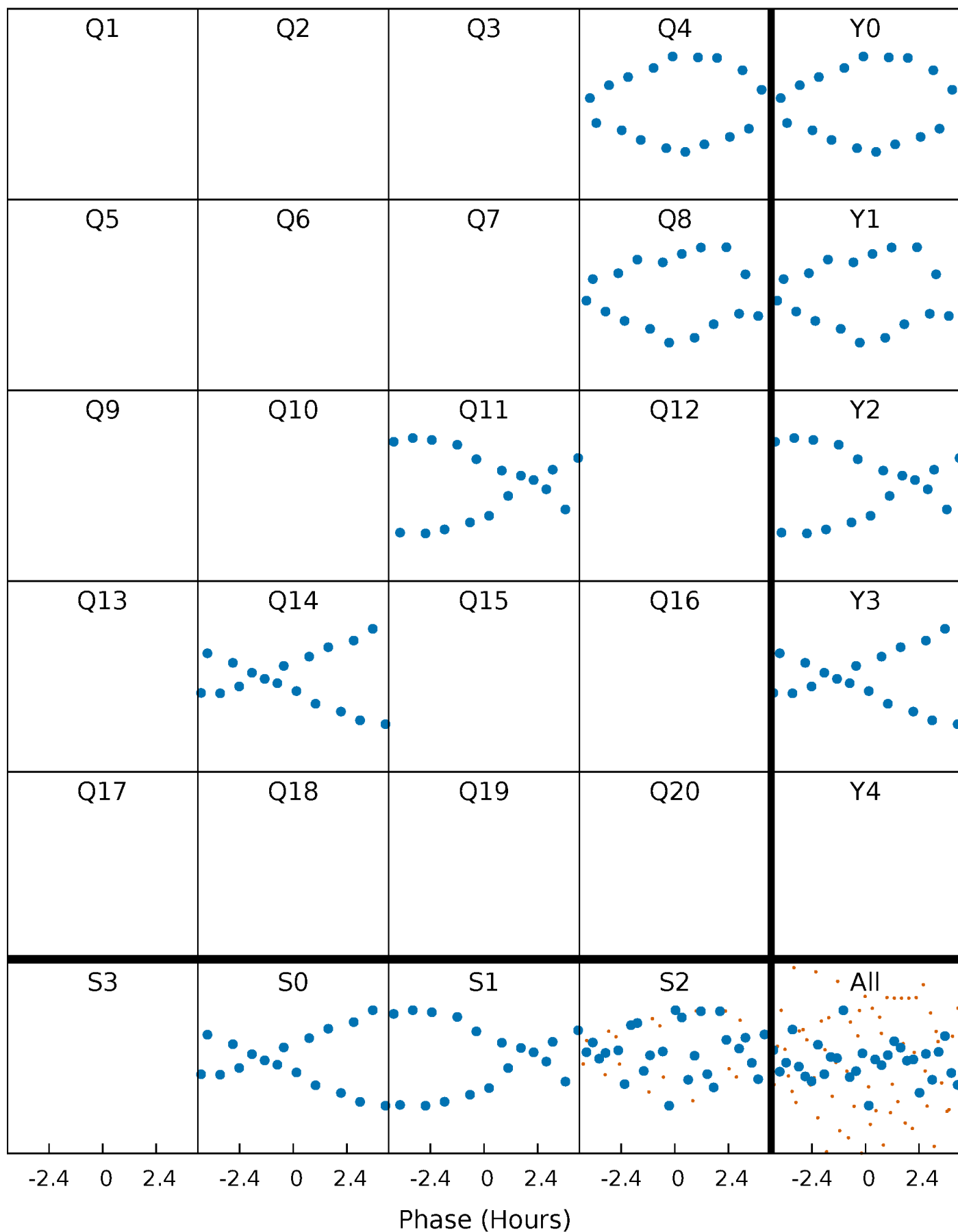


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

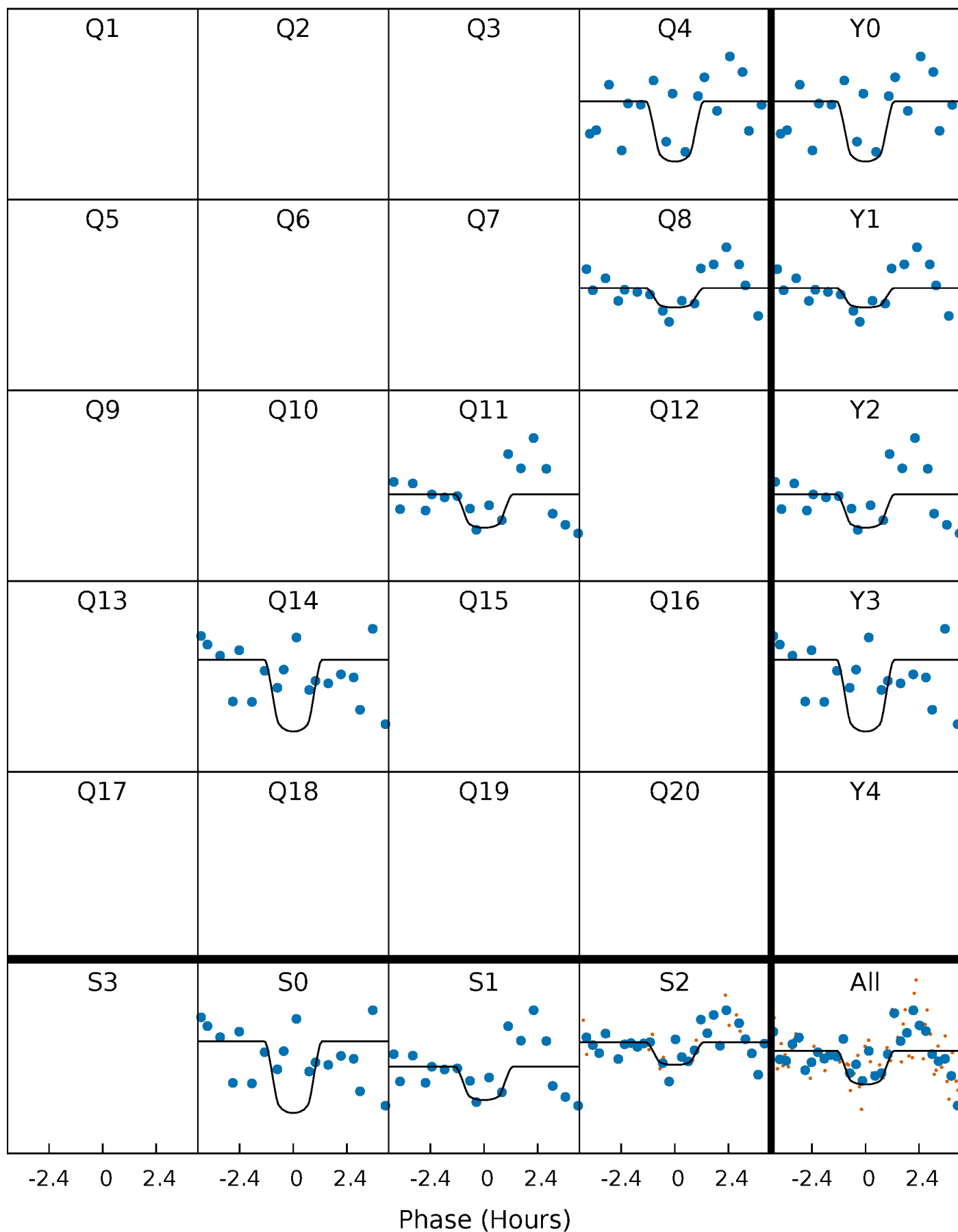
TCE 008004558-01 P=303.301560 Days  $T_0=433.724331$  (BKJD)





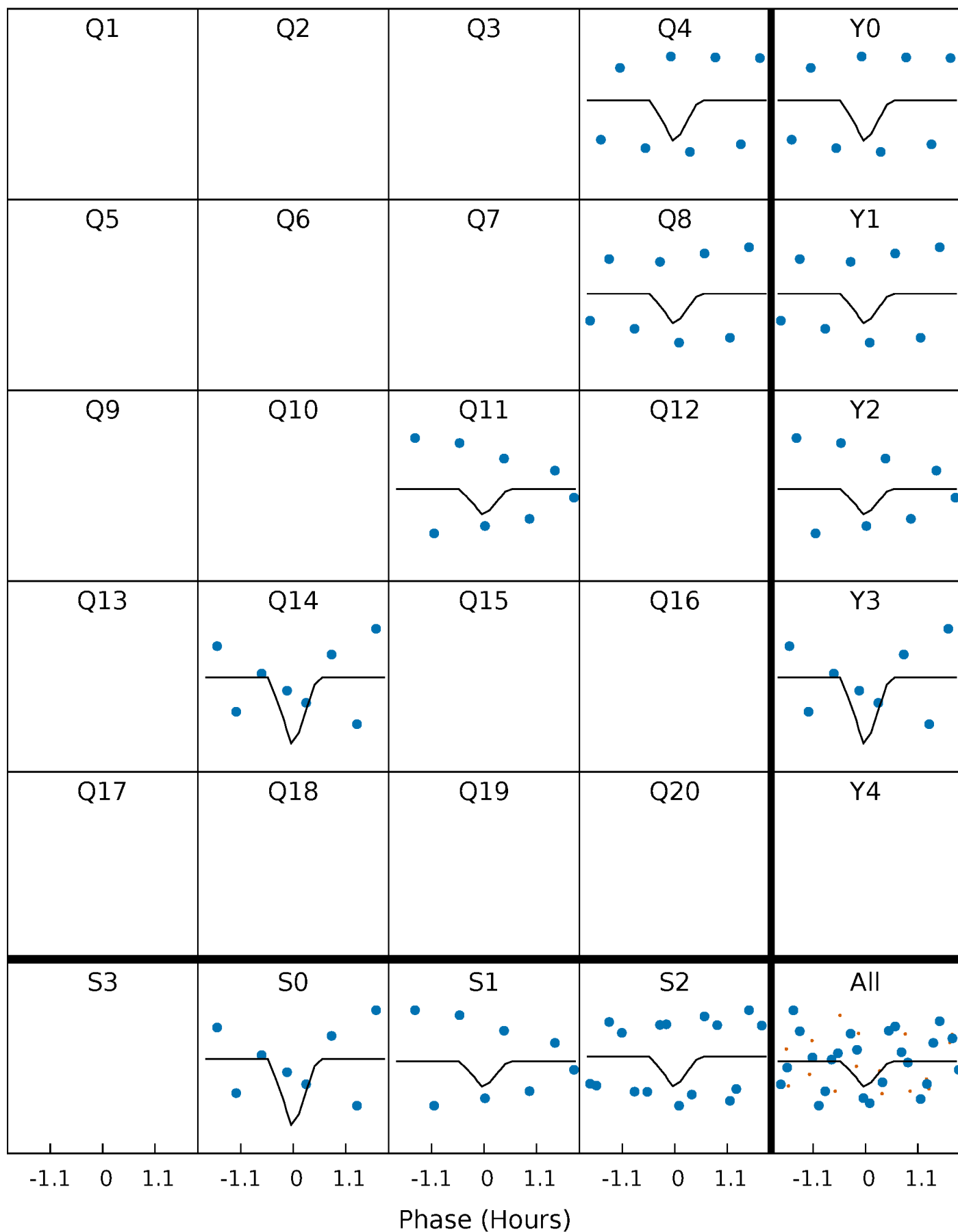
# DV Quarter-Phased Transit Curves

TCE 008004558-01 P=303.301560 Days  $T_0=433.724331$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

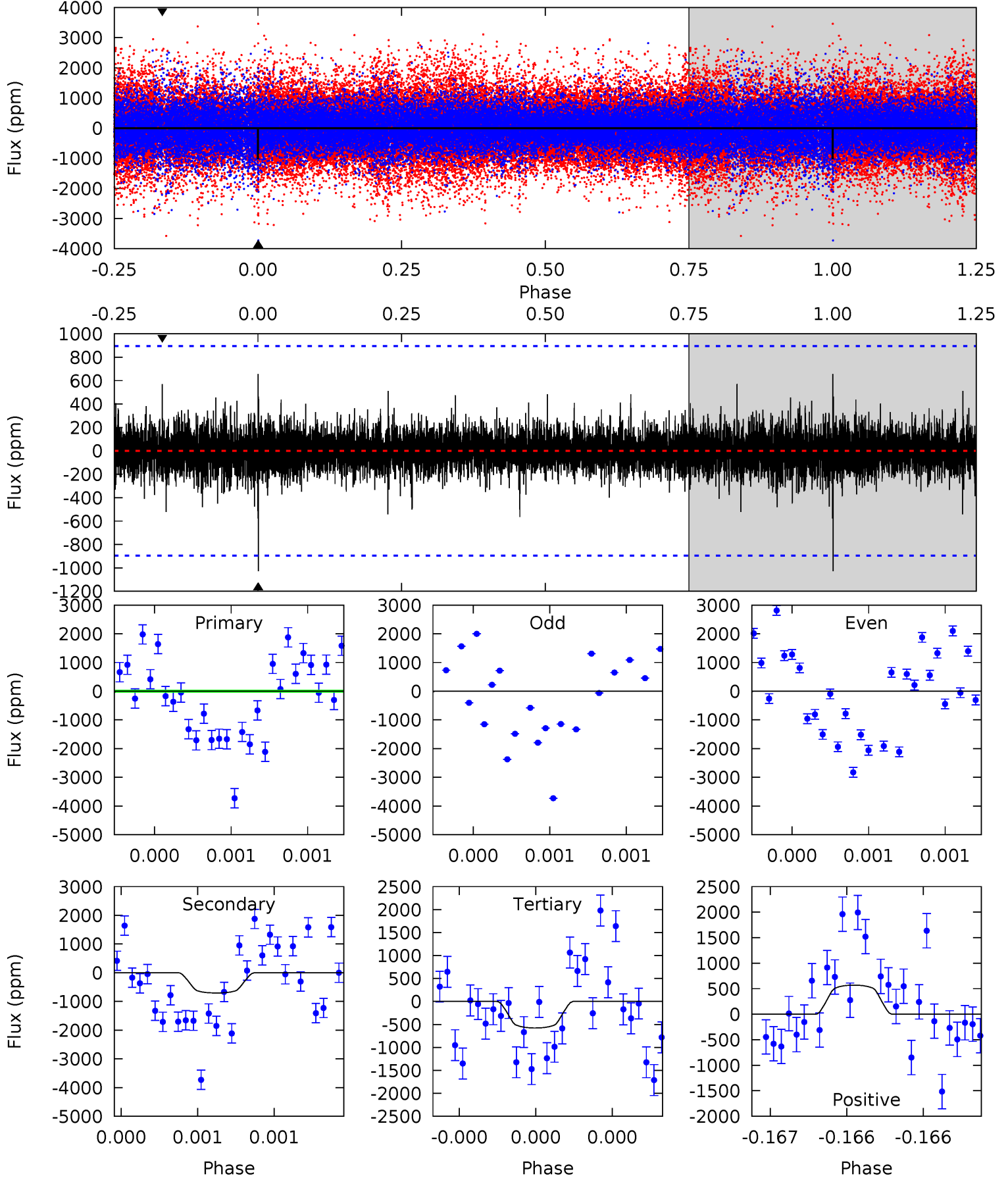
TCE 008004558-01 P=303.284065 Days  $T_0=433.729417$  (BKJD)



# DV Model-Shift Uniqueness Test

008004558-01, P = 303.301560 Days, E = 130.422771 Days

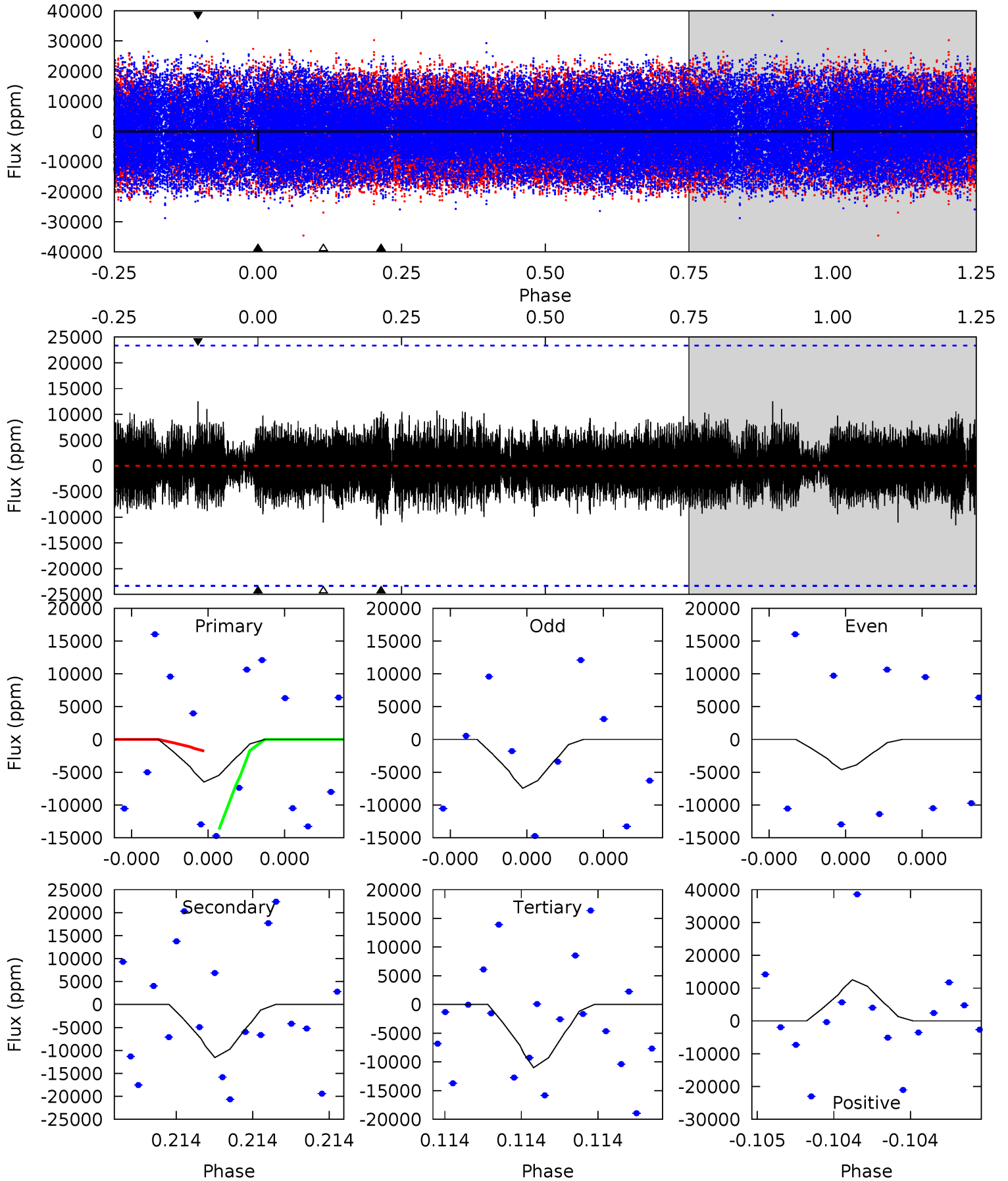
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.45	4.44	3.63	3.58	5.63	3.57	0.73	2.82	2.87	0.81	0.85	0.81	1.15	0.39	1.26



# Alt Model-Shift Uniqueness Test

008004558-01, P = 303.284065 Days, E = 130.445352 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
1.62	2.88	2.74	3.13	5.83	3.86	0.76	-1.12	-1.51	0.14	-0.24	0.35	0.72	0.52	1.49





### Stellar Parameters For KIC 008004558

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7899^{+223}_{-335}$	$3.893^{+0.360}_{-0.090}$	$-0.440^{+0.250}_{-0.300}$	$2.451^{+0.355}_{-0.993}$	$1.713^{+0.173}_{-0.403}$	$0.164^{+0.439}_{-0.059}$
	+3%/-4%	+9%/-2%	+57%/-68%	+14%/-41%	+10%/-24%	+268%/-36%
Source	KIC0	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 008004558-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	-706 $\pm$ 159	$13.27^{+11.48}_{-8.81}$	$721^{+45}_{-71}$	$5370^{+4466}_{-1158}$	$2411^{+17657}_{-1742}$
Alt.	-11551 $\pm$ 4007	$23.78^{+14.63}_{-10.94}$	$723^{+46}_{-69}$	$8316^{+5365}_{-2067}$	$12269^{+31343}_{-7885}$

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

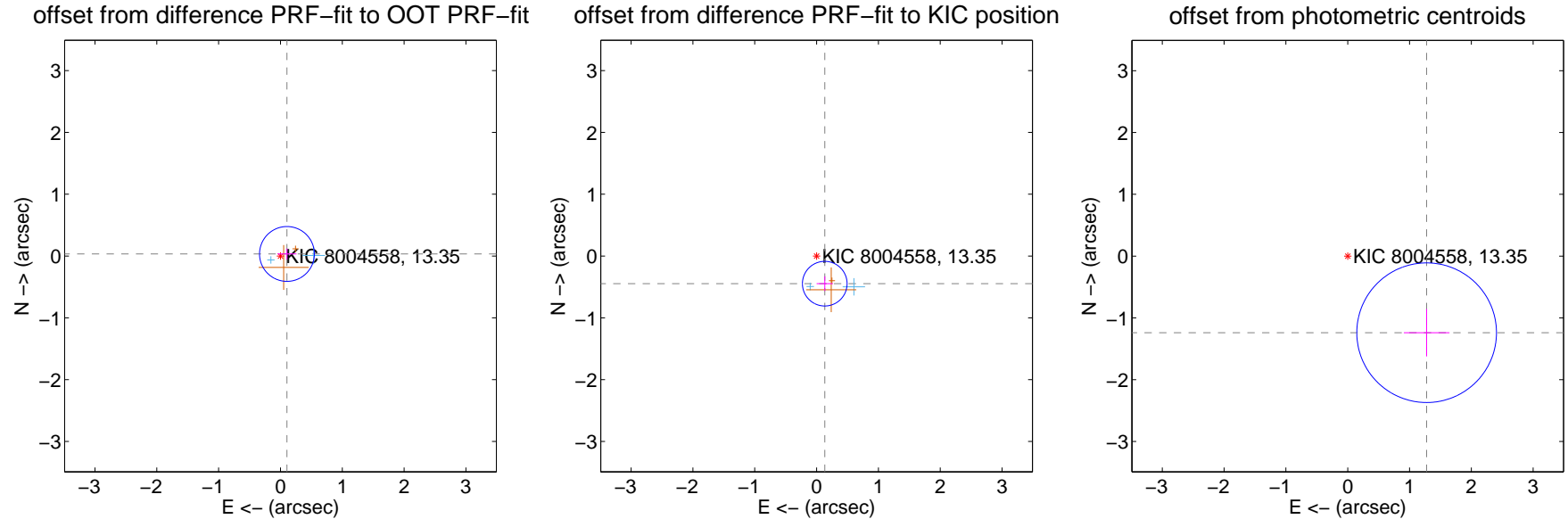
## DV Centroid Data

Supplemental centroid analysis for 008004558-01. Kepler magnitude: 13.35. Transit SNR 7.53

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.41 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.110 \pm 0.148$	0.75	$-0.105 \pm 0.153$	$0.034 \pm 0.089$
PRF-fit source offset from KIC position	$0.467 \pm 0.120$	3.87	$-0.132 \pm 0.131$	$-0.447 \pm 0.119$
photometric centroid source offset	$1.78 \pm 0.38$	4.73	$-1.28 \pm 0.37$	$-1.24 \pm 0.38$



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

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

Q1 no difference image



Q1 no OOT image



Q2 no difference image



Q2 no OOT image



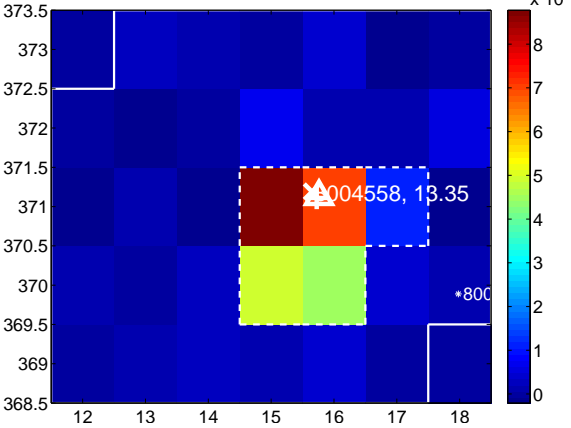
Q3 no difference image



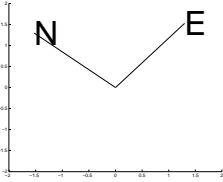
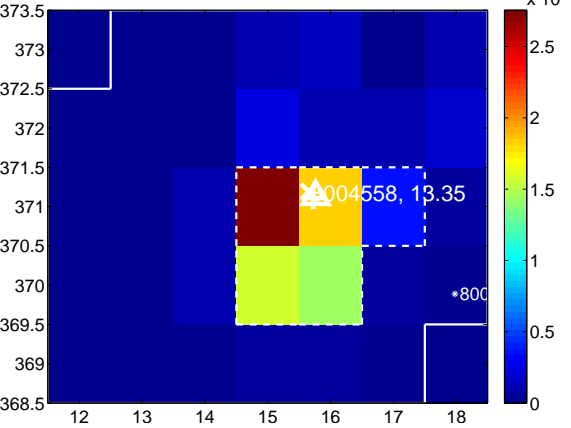
Q3 no OOT image



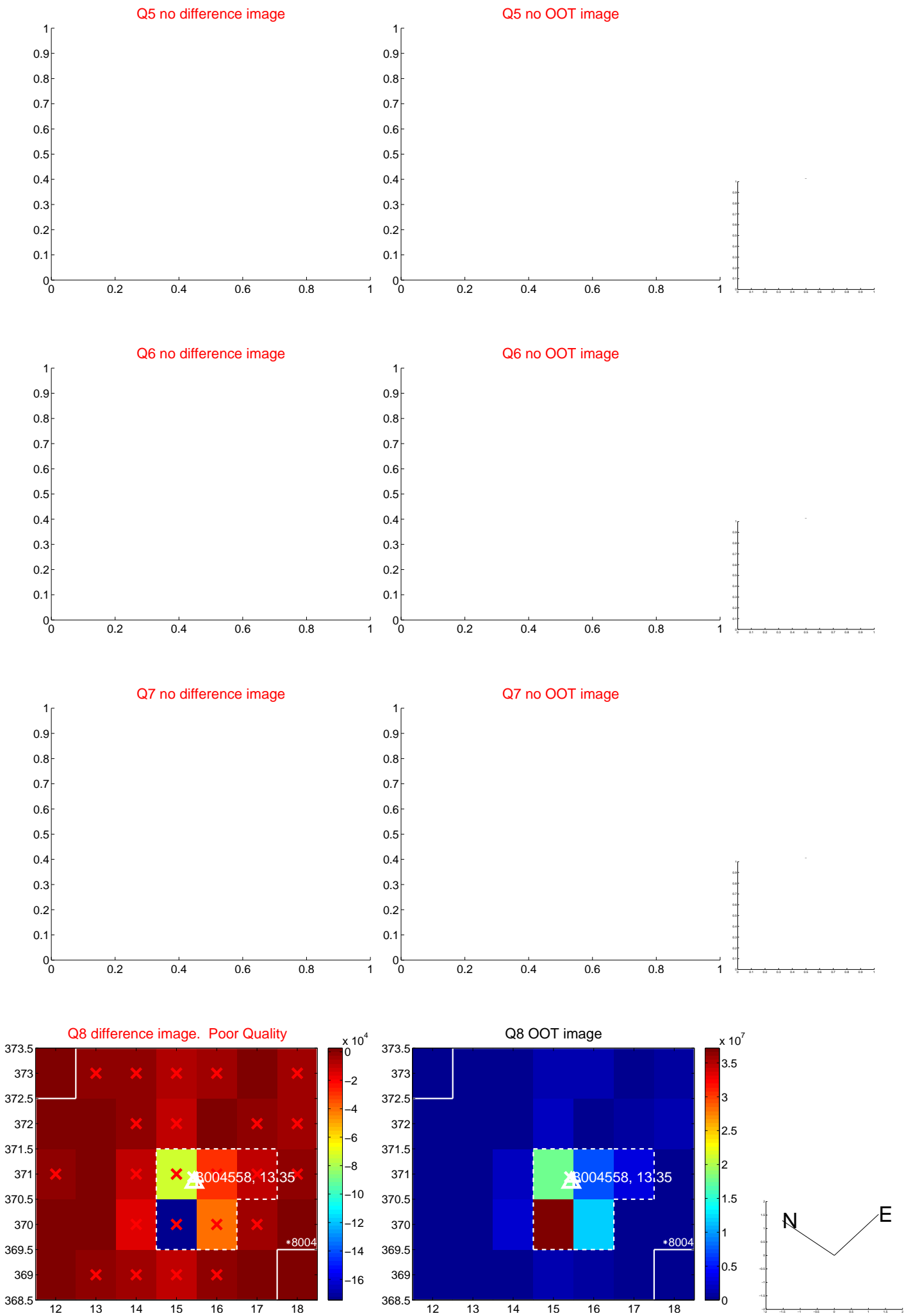
Q4 difference image



Q4 OOT image

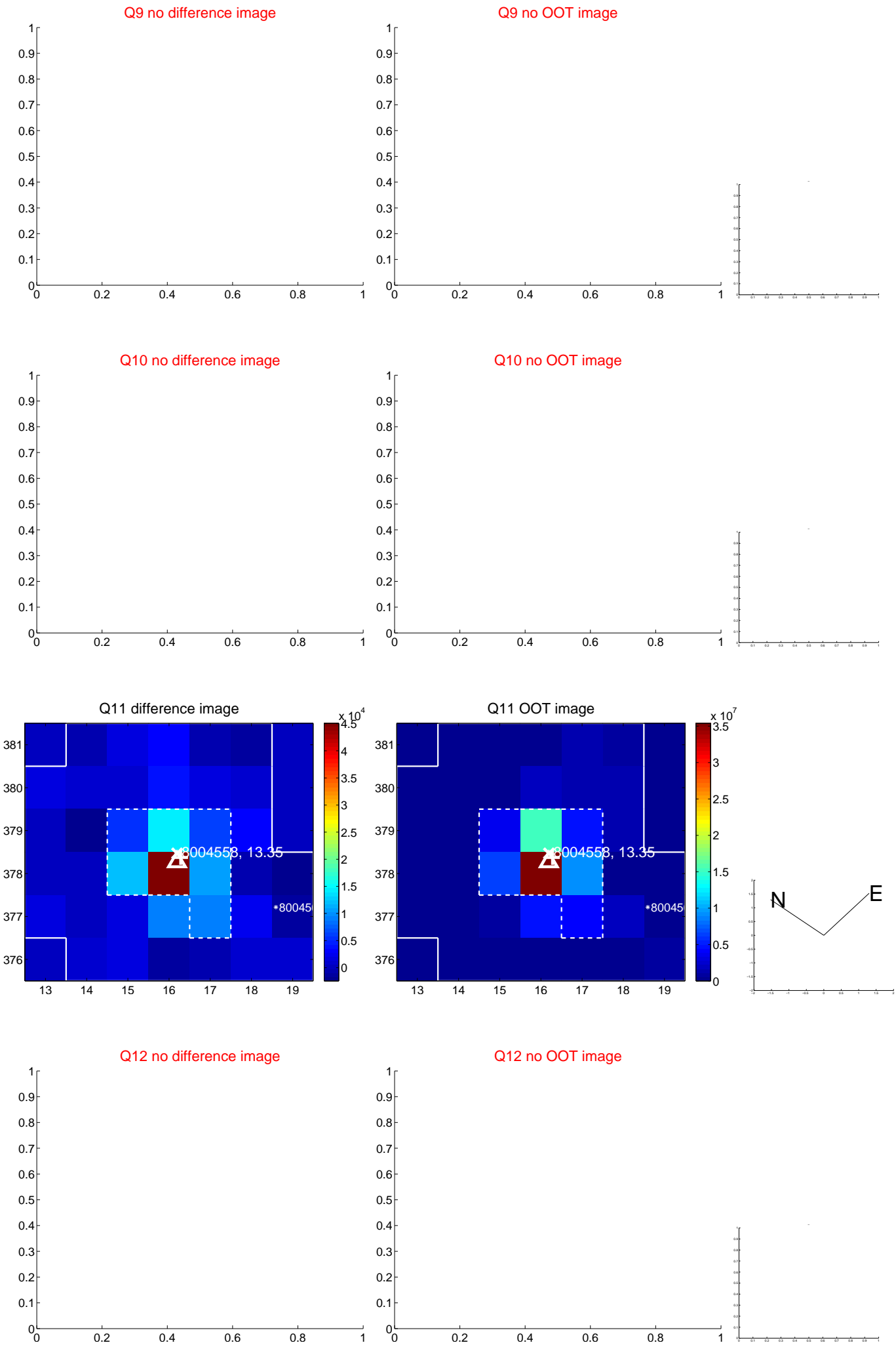


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

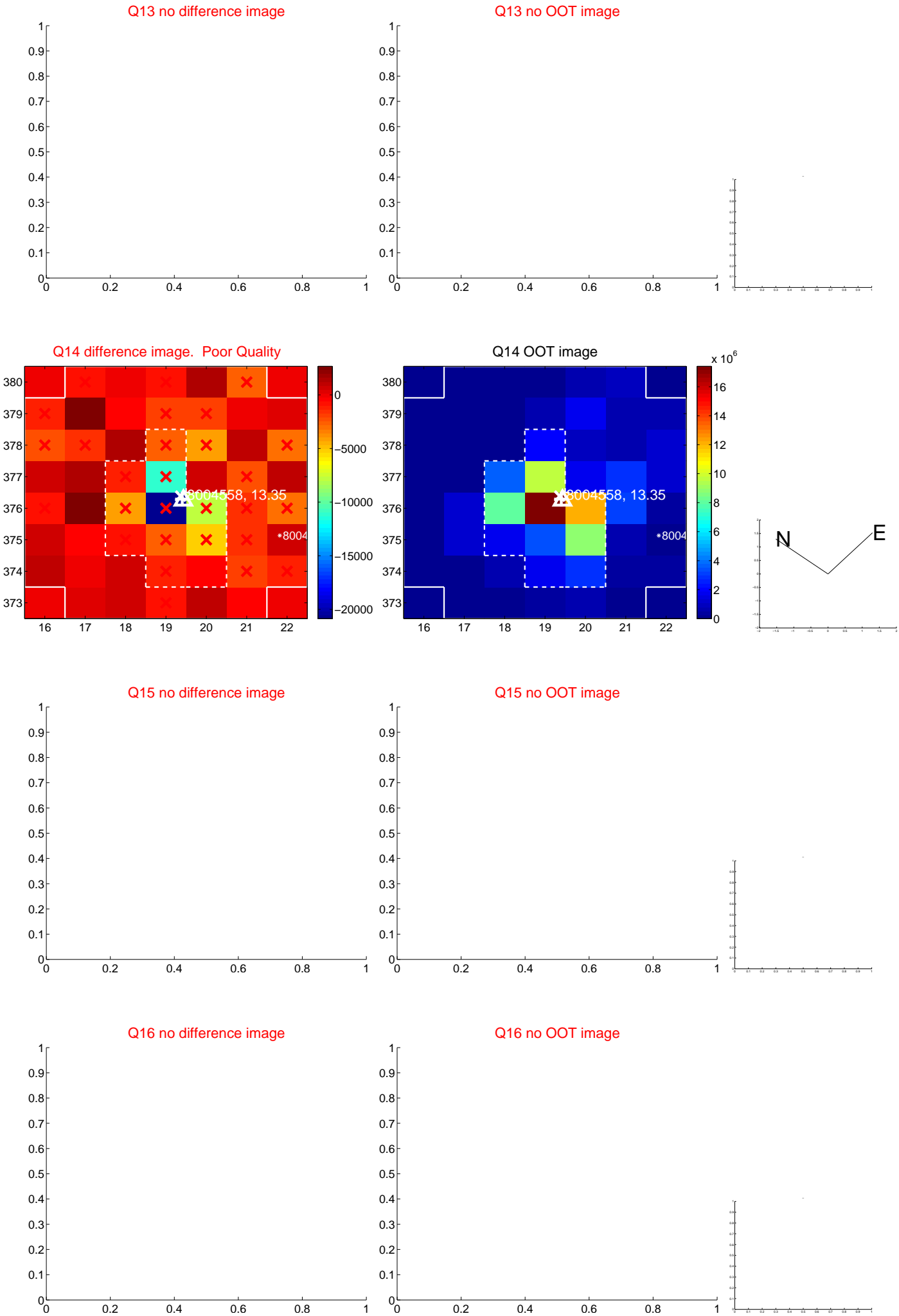




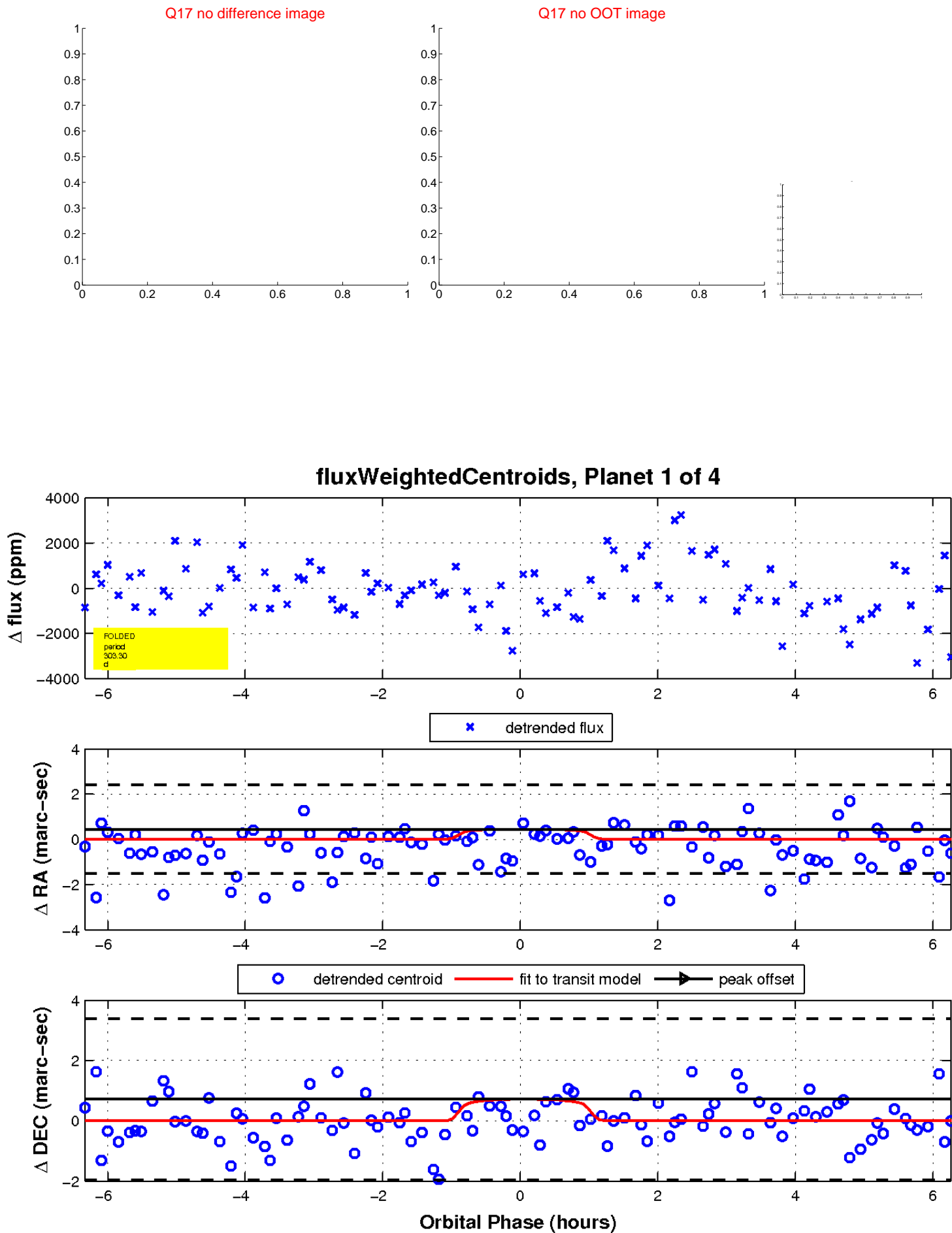
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

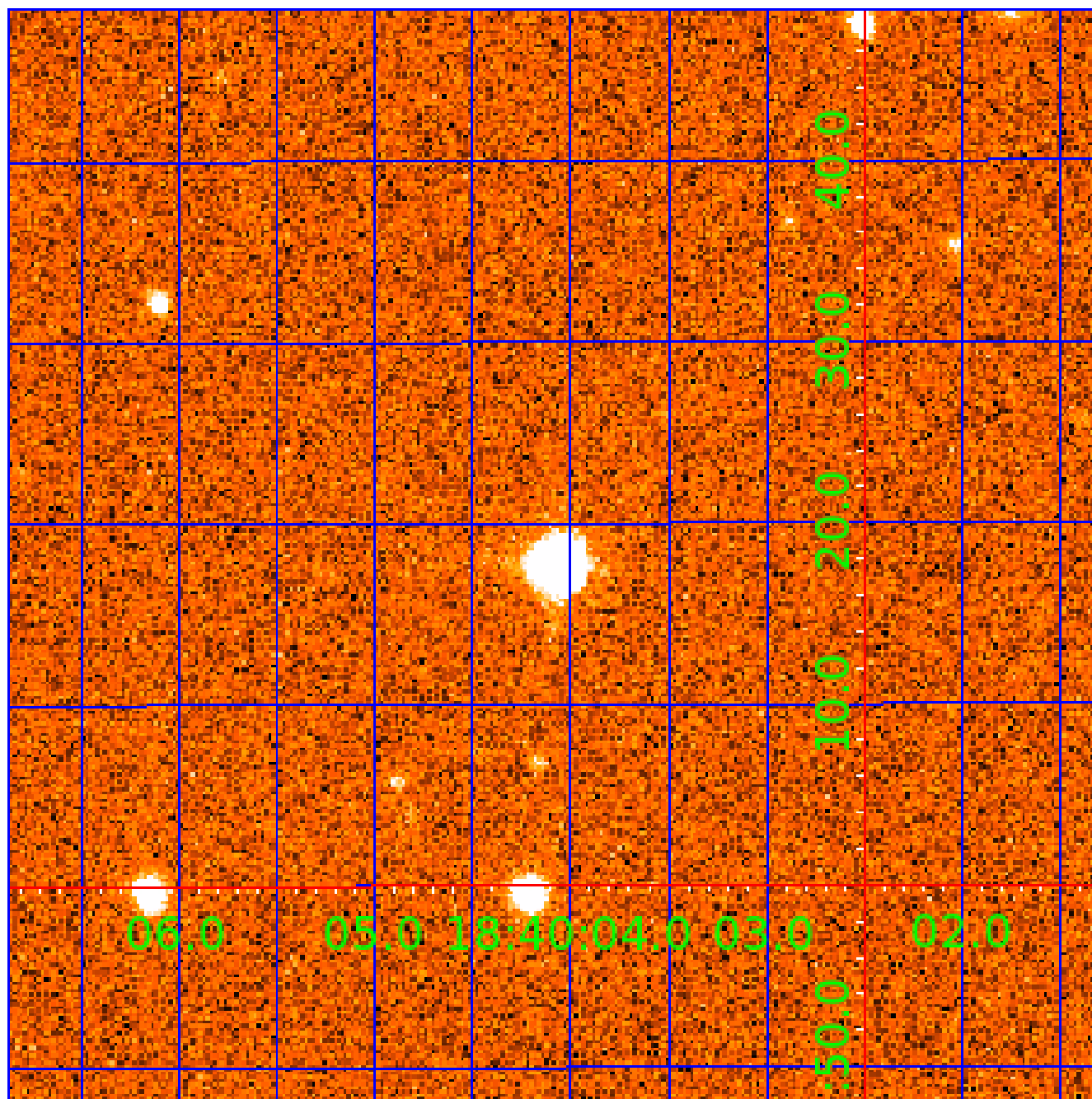


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination





# KIC 008004558

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008004558-01	OBS	No	303.301560	433.724331	1655.5	2.137	13.1	7.5	2.45	7899	10.88	18.75
008004558-02	OBS	No	0.512625	131.670859	116.3	1.257	11.5	13.4	2.45	7899	3.08	93113.34
008004558-03	OBS	No	0.512680	131.750302	0.6	0.568	9.1	0.0	2.45	7899	0.19	93100.01
008004558-04	OBS	No	1.237640	132.655273	269.7	4.500	9.2	-1.0	2.45	7899	4.08	28748.76

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008004558-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008004558-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_KIC_POS
008004558-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD—CENT_KIC_POS
008004558-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_NOFITS

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

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

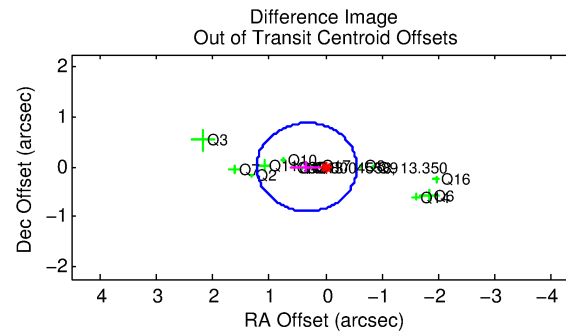
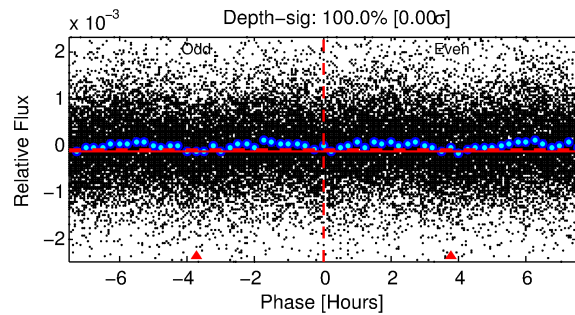
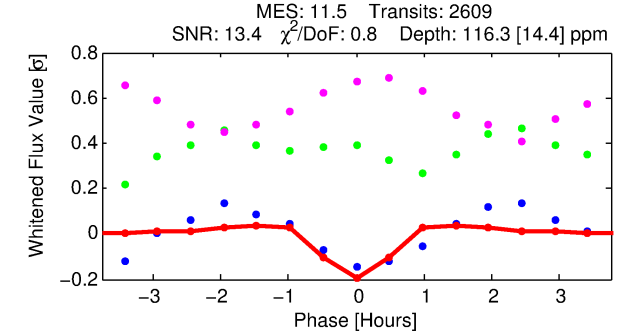
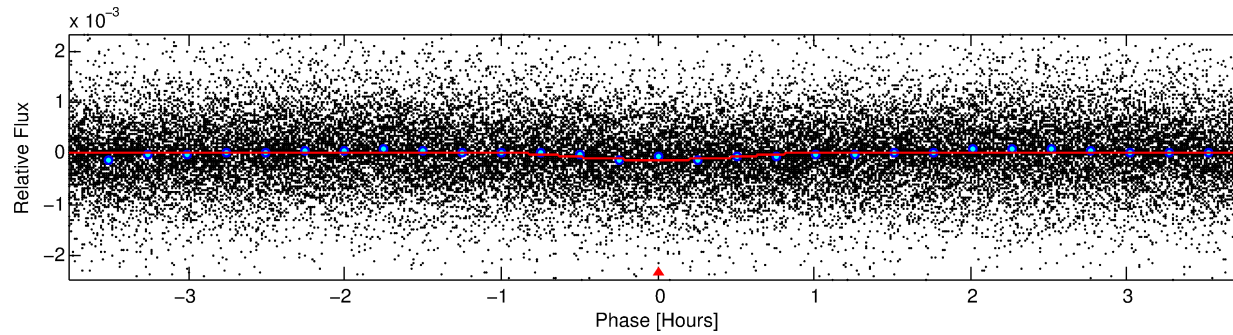
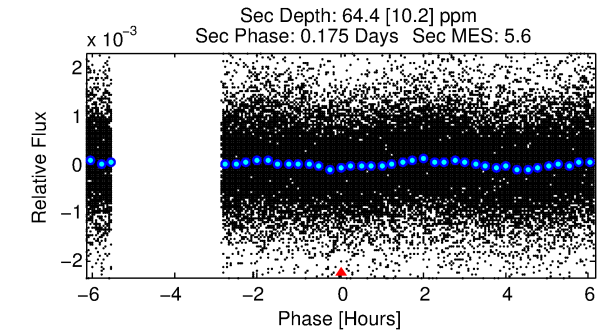
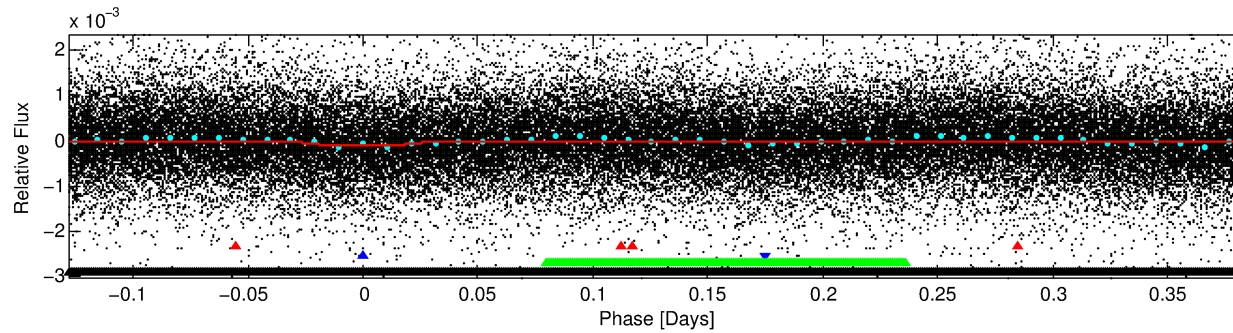
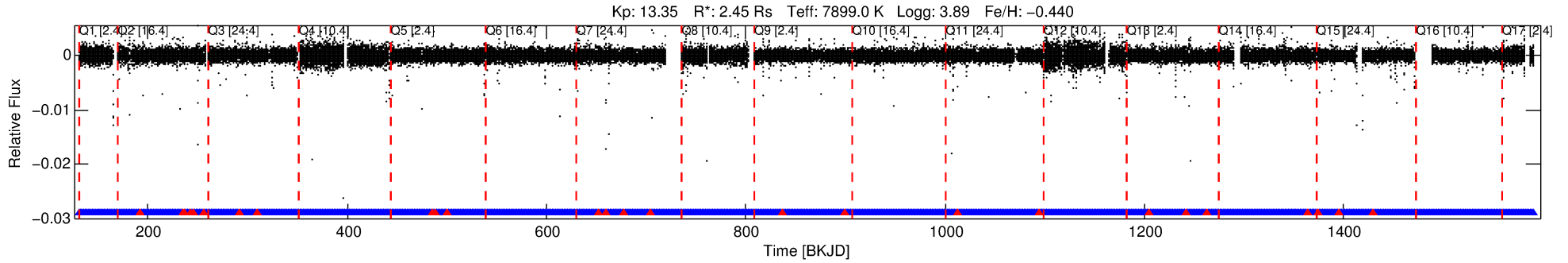
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008004558-02

No Significant Match Found

# DV One-Page Summary

KIC: 8004558 Candidate: 2 of 4 Period: 0.513 d



## DV Fit Results:

Period = 0.51263 [0.00001] d  
Epoch = 131.6709 [0.0014] BKJD  
Rp/R\* = 0.0115 [0.0057]  
a/R\* = 1.72 [3.49]  
b = 0.90 [0.66]  
Seff = 93113.34 [59411.73]  
Teff = 4454 [711] K  
Rp = 3.08 [1.97] Re  
a = 0.0150 [0.0058] AU  
Ag = 0.84 [0.98] [-0.17σ]  
Teffp = 6589 [1667] K [1.18σ]

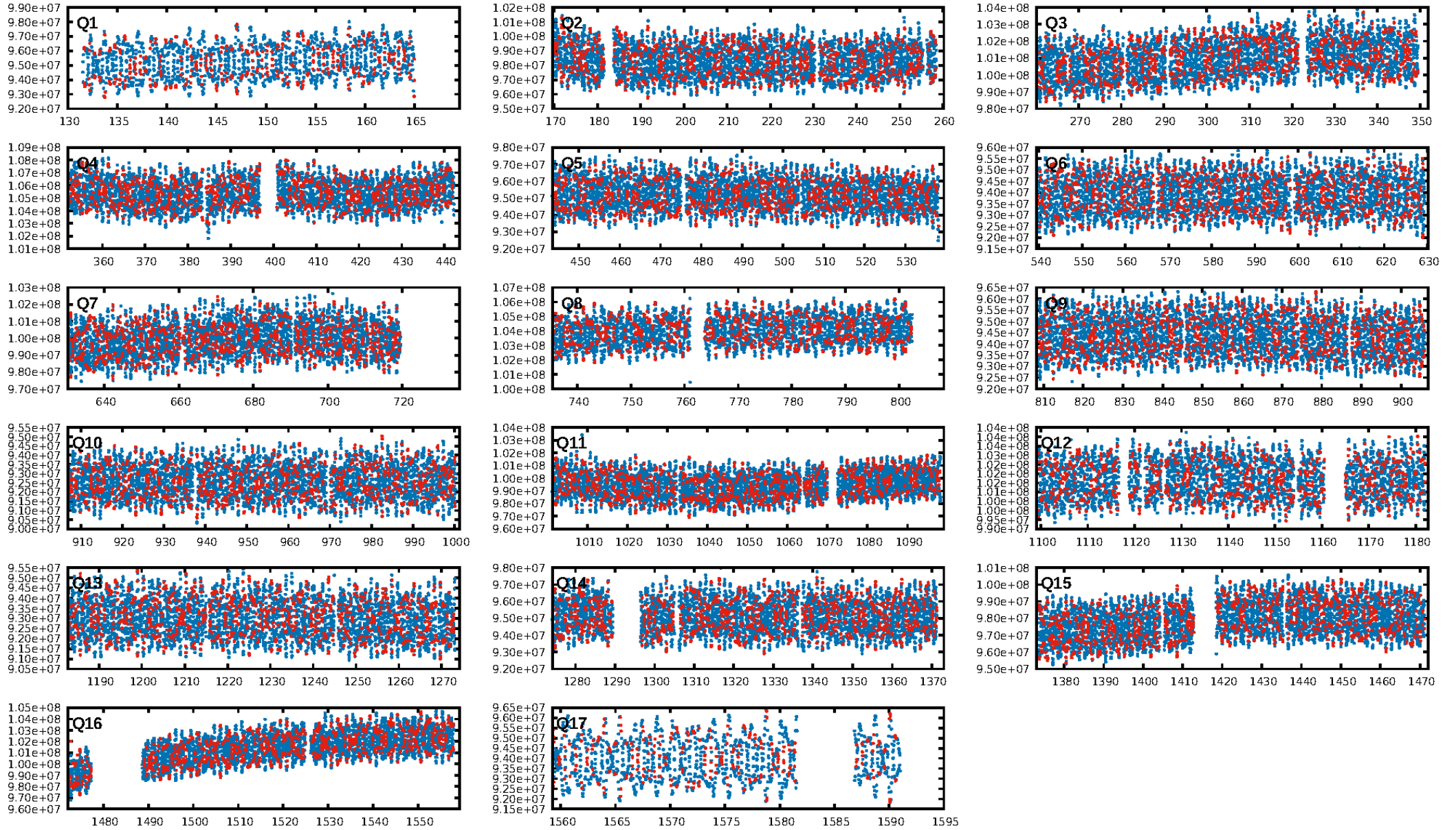
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.1% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.99 [2464/2491]  
GhostDiagnostic-chr: 3.456  
Centroid-sig: 0.0%  
Centroid-so: 1.624 arcsec [5.04σ]  
OotOffset-rm: 0.332 arcsec [1.13σ]  
KicOffset-rm: 0.627 arcsec [4.94σ]  
OotOffset-st: 4/3/4/5 [16]  
KicOffset-st: 4/3/4/5 [16]  
DiffImageQuality-fgm: 0.44 [7/16]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 15:36:24 Z

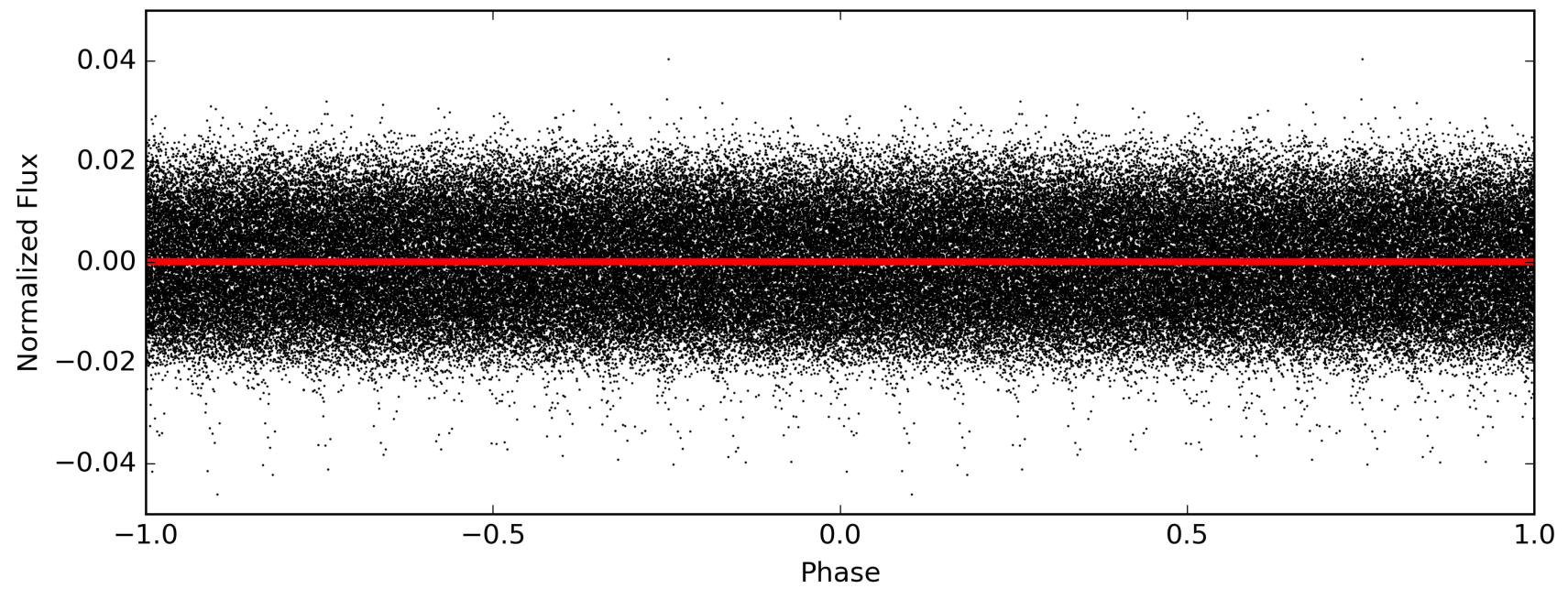
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008004558-02, PDC Light Curves



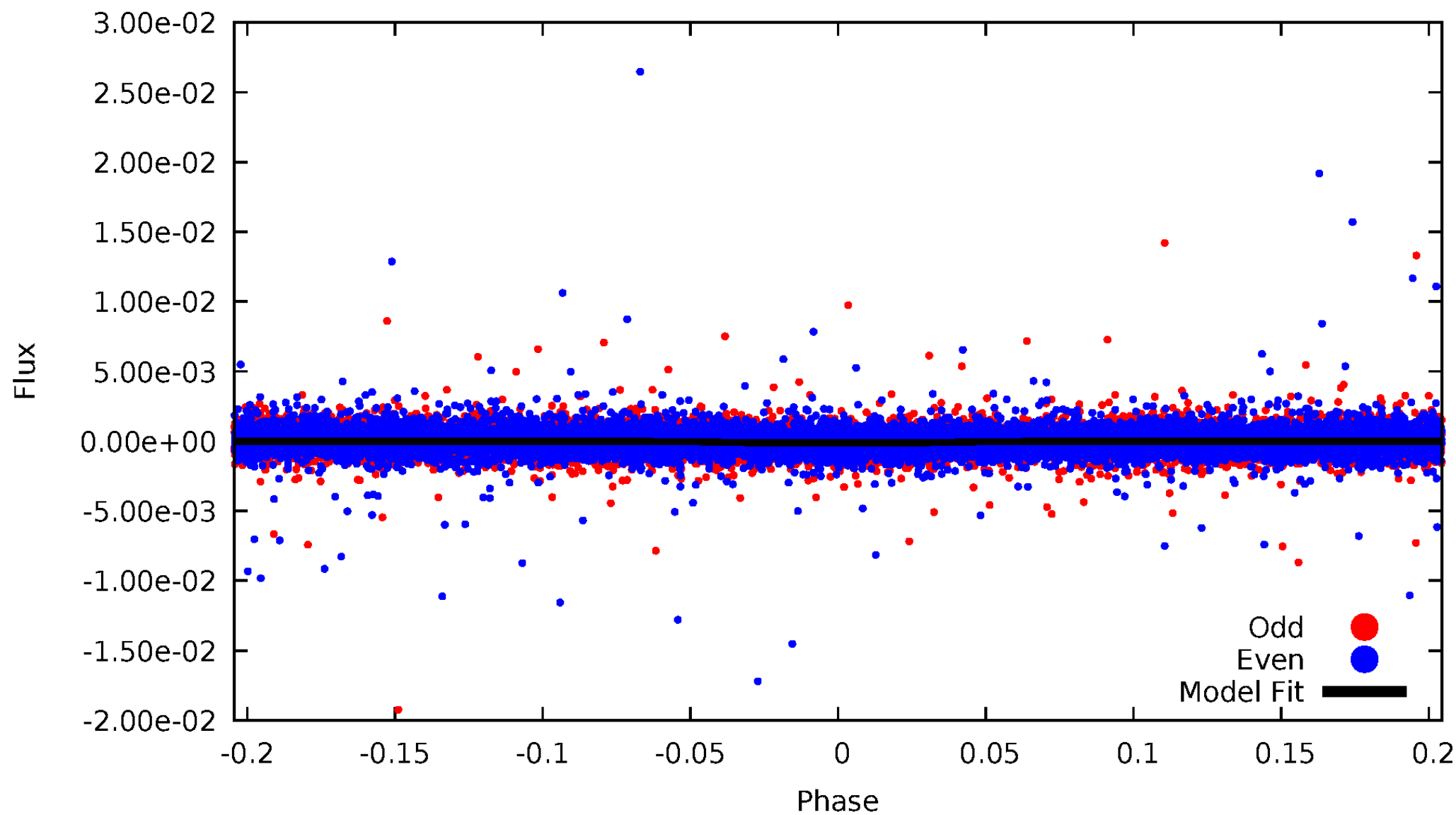


— P = 0.256 days      — P = 0.513 days      — P = 1.025 days



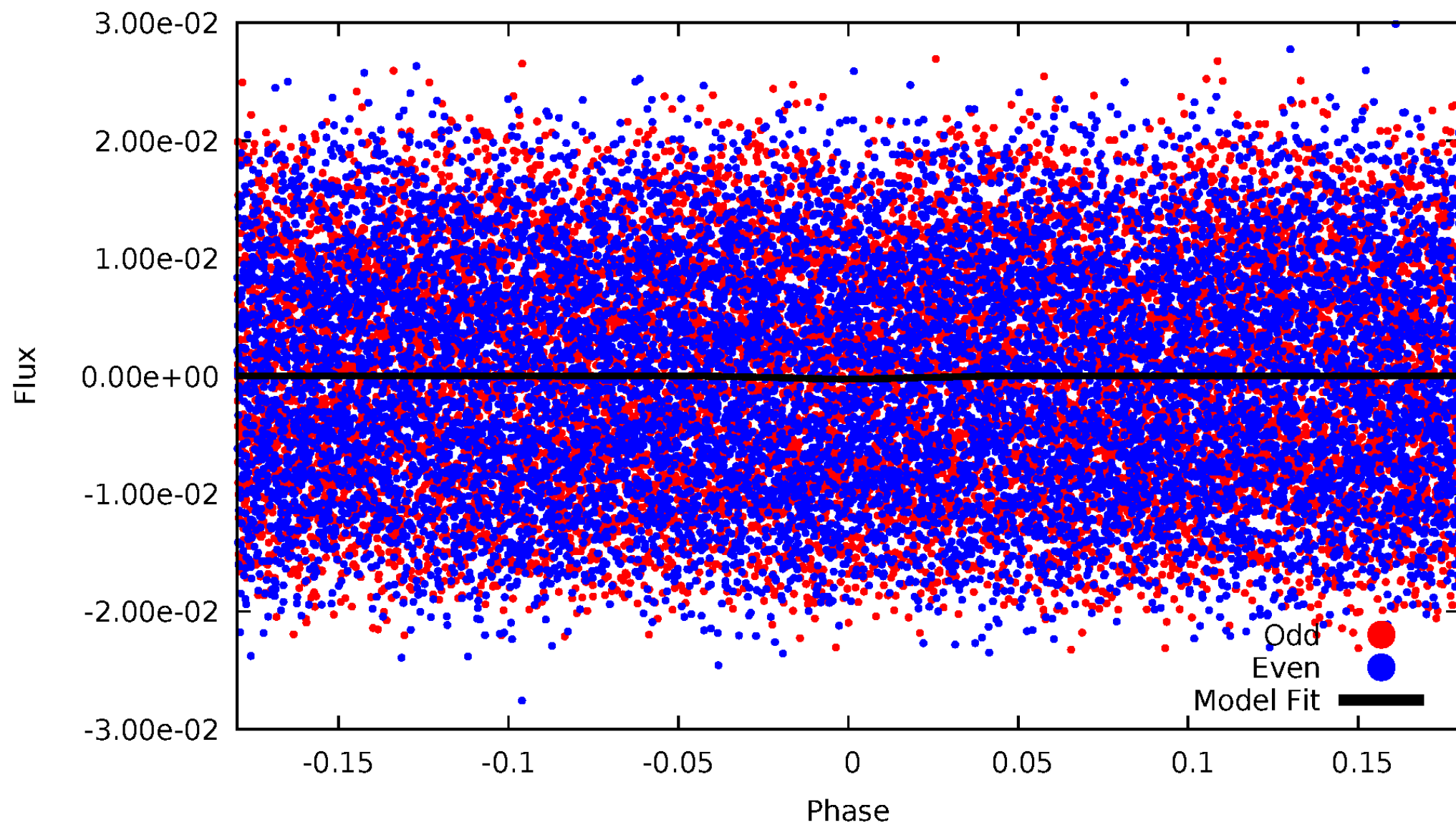
# DV Odd/Even

TCE 008004558-02



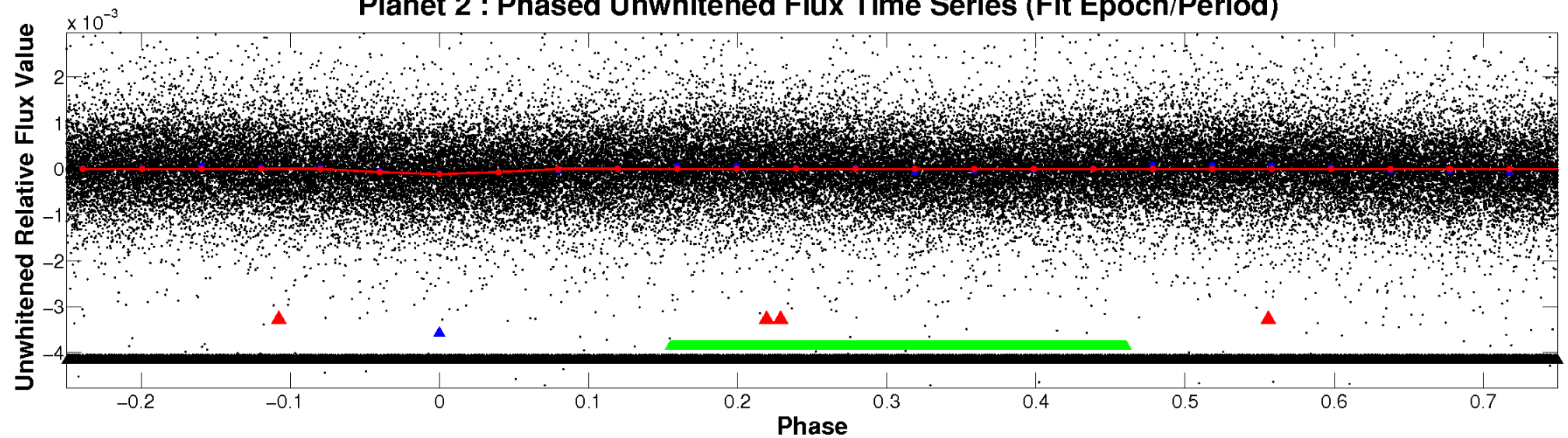
# ALT Odd/Even

TCE 008004558-02

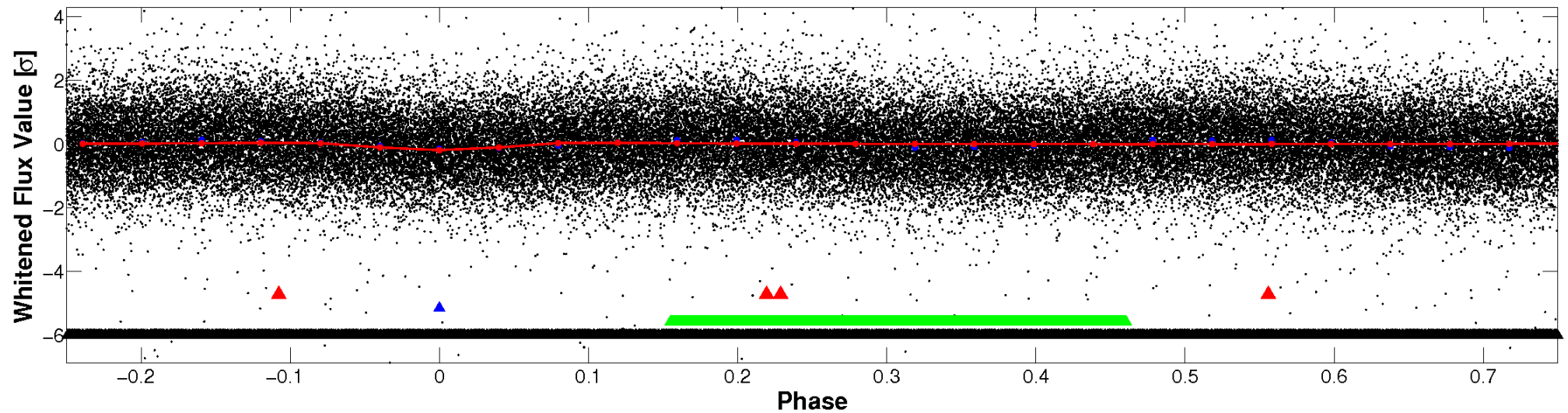


# Non-Whitened Vs. Whitened Light Curve

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



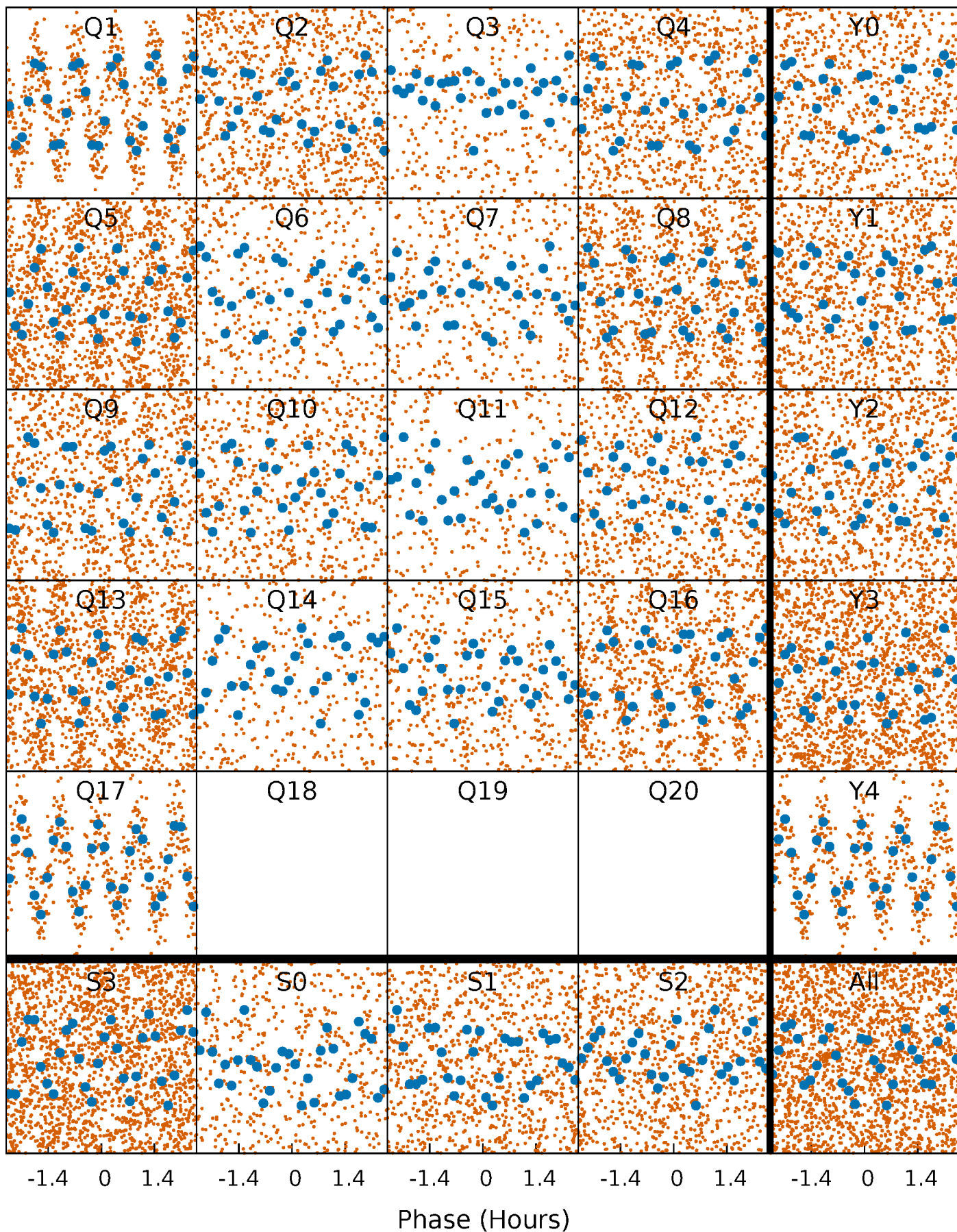
## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

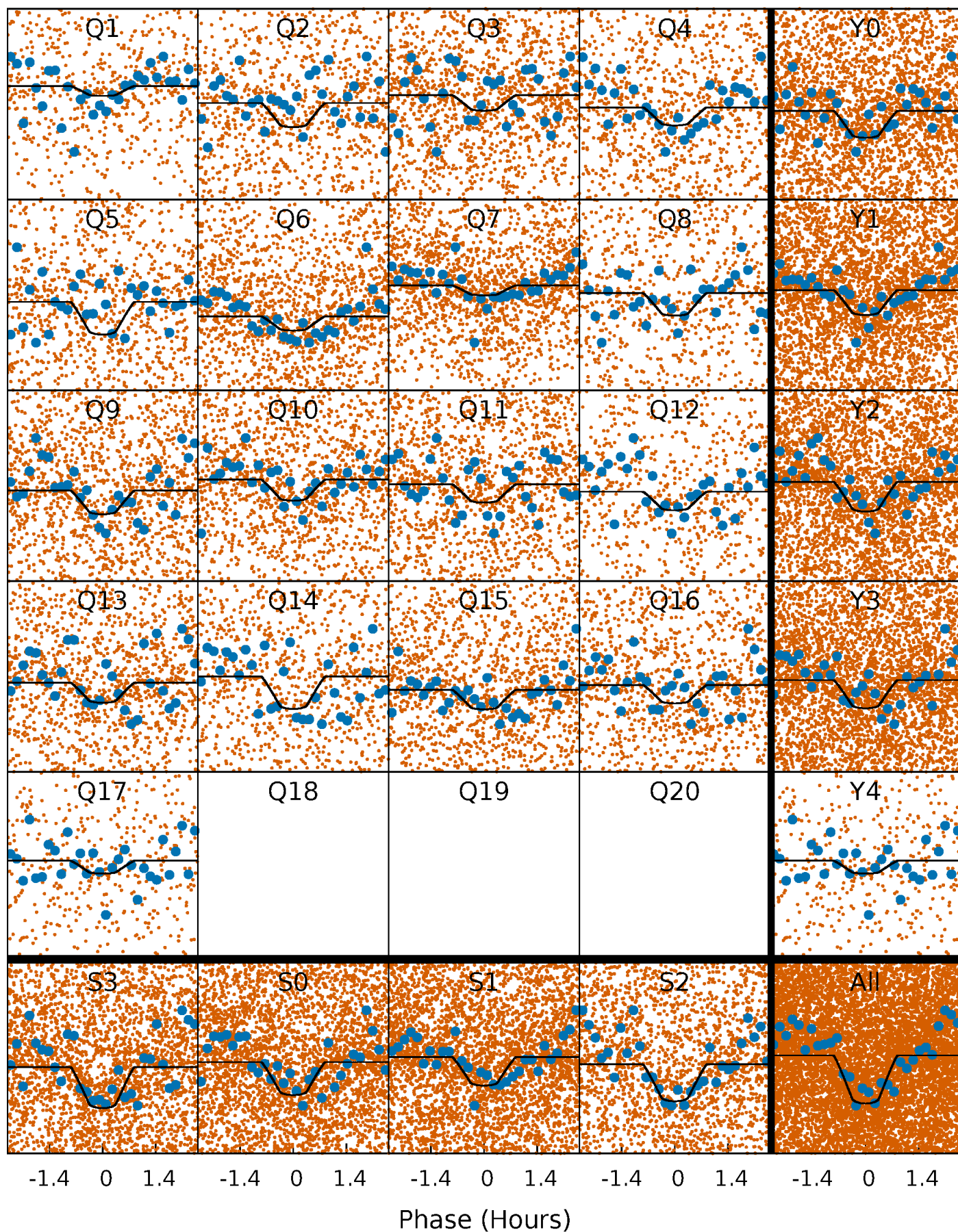
TCE 008004558-02 P= 0.512625 Days  $T_0=131.670859$  (BKJD)





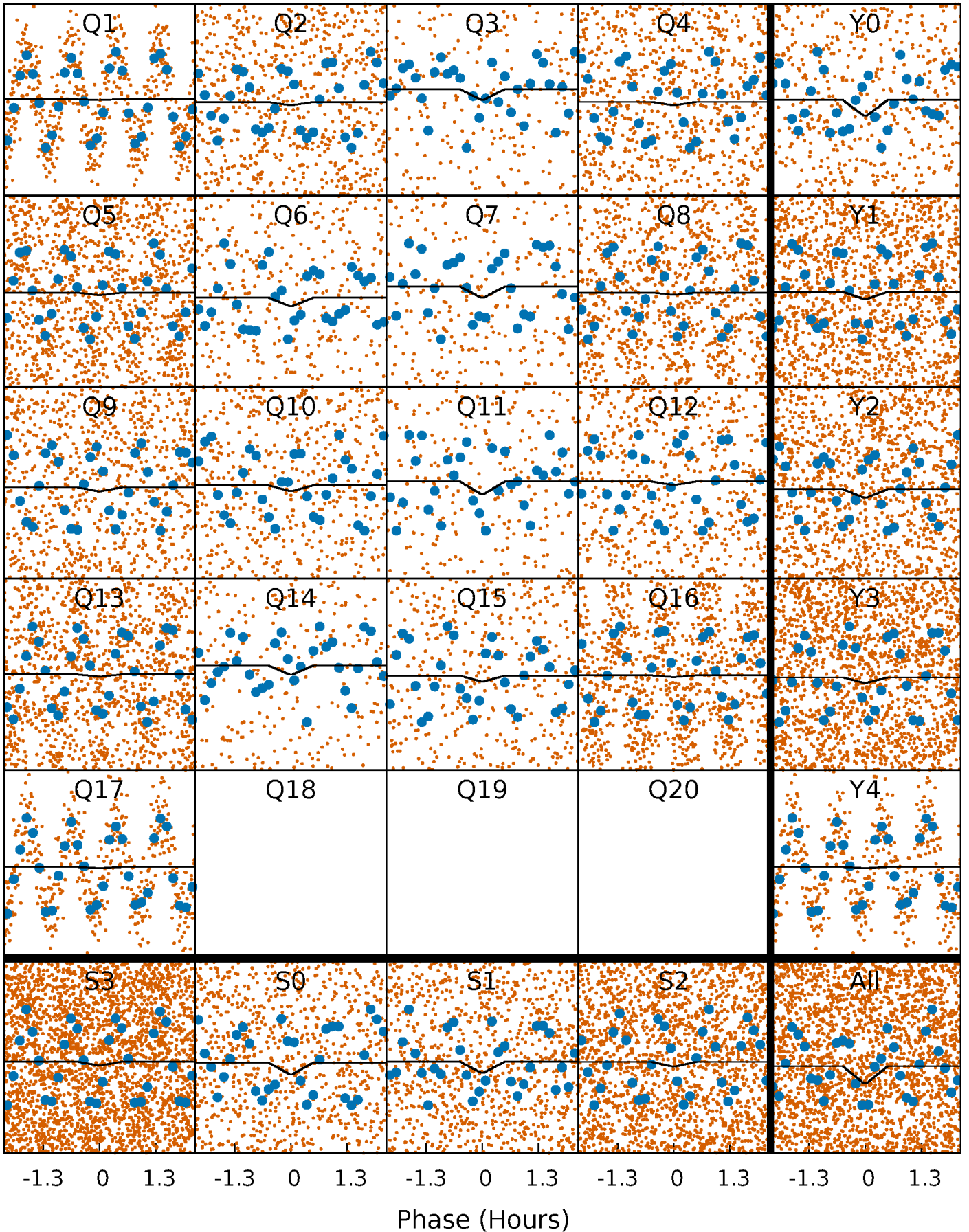
# DV Quarter-Phased Transit Curves

TCE 008004558-02 P= 0.512625 Days  $T_0=131.670859$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

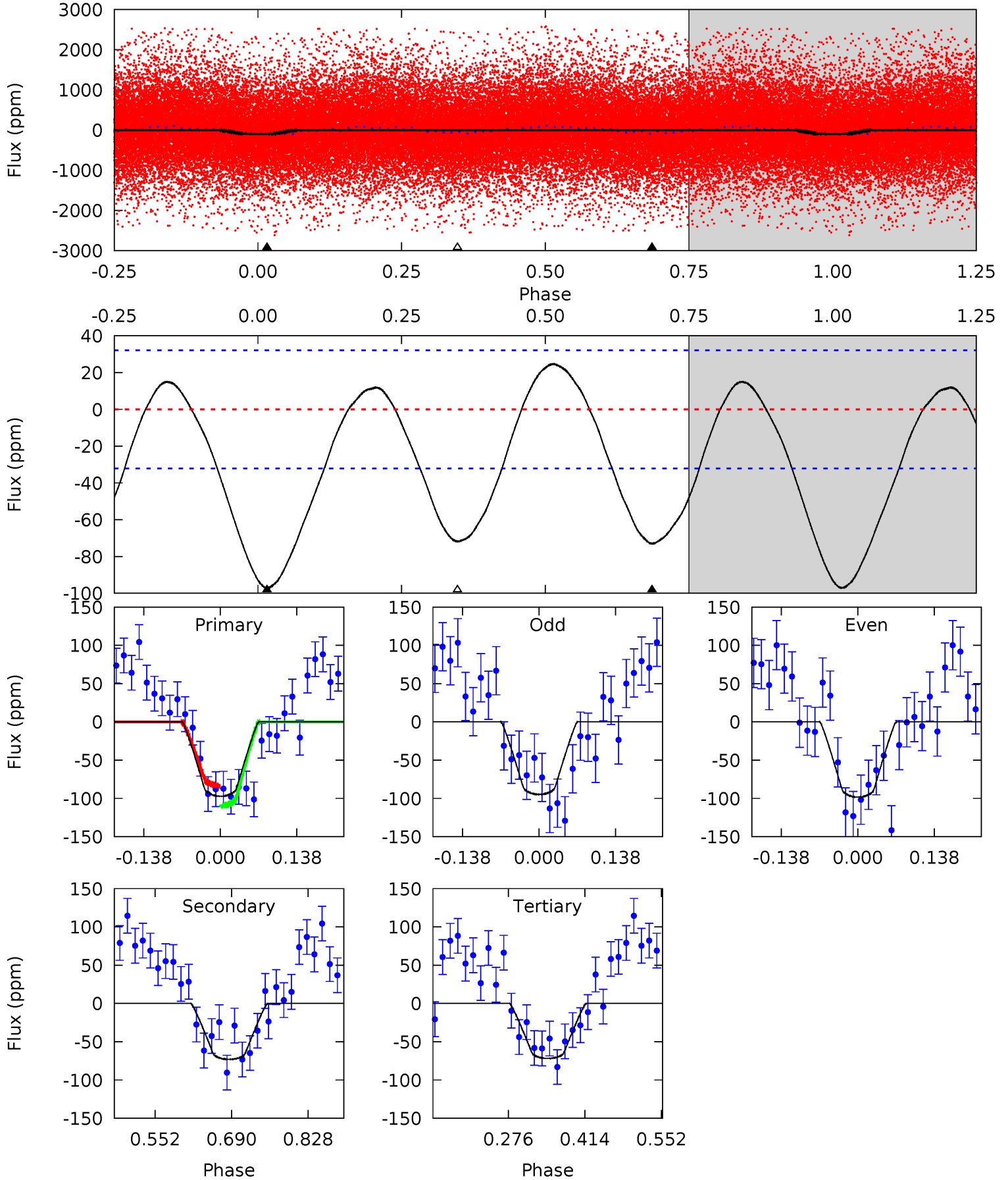
TCE 008004558-02 P= 0.512633 Days  $T_0=131.671313$  (BKJD)



# DV Model-Shift Uniqueness Test

008004558-02, P = 0.512625 Days, E = 131.158234 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
13.6	10.2	10.0	0	4.50	1.48	4.52	3.53	13.6	0.17	10.2	0.24	1.04	0.20	1.85

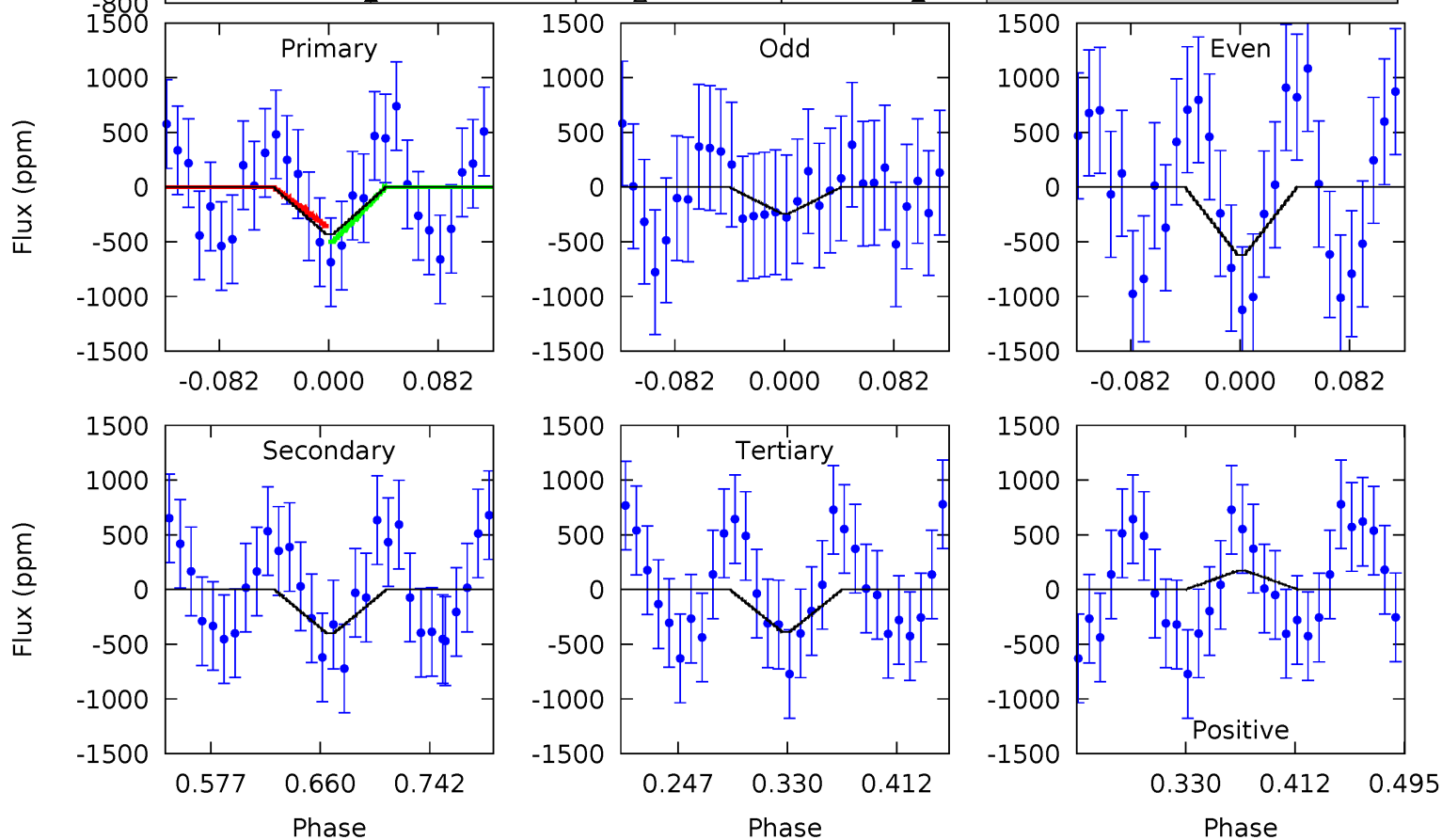
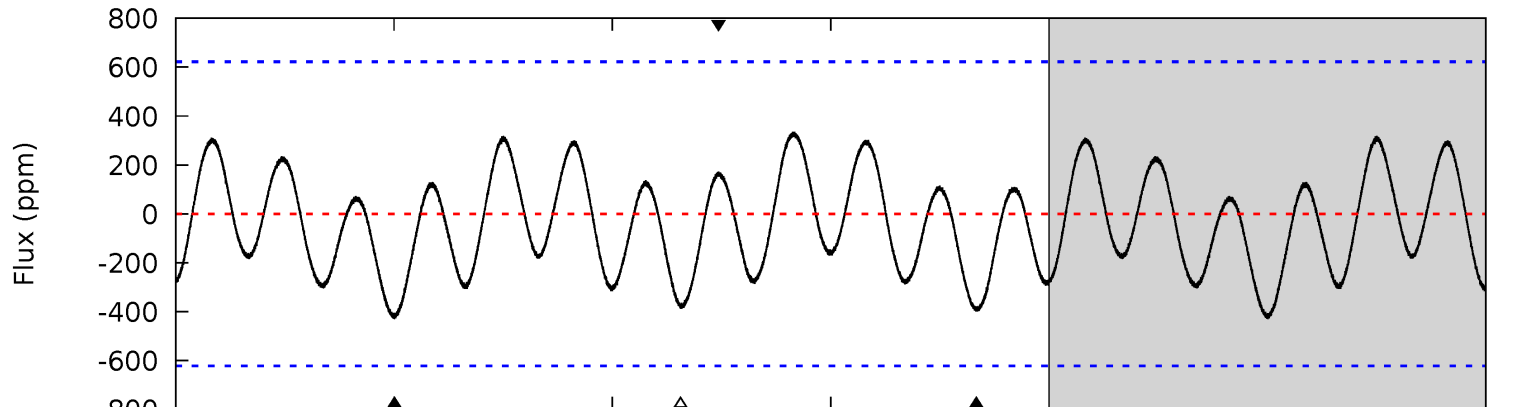
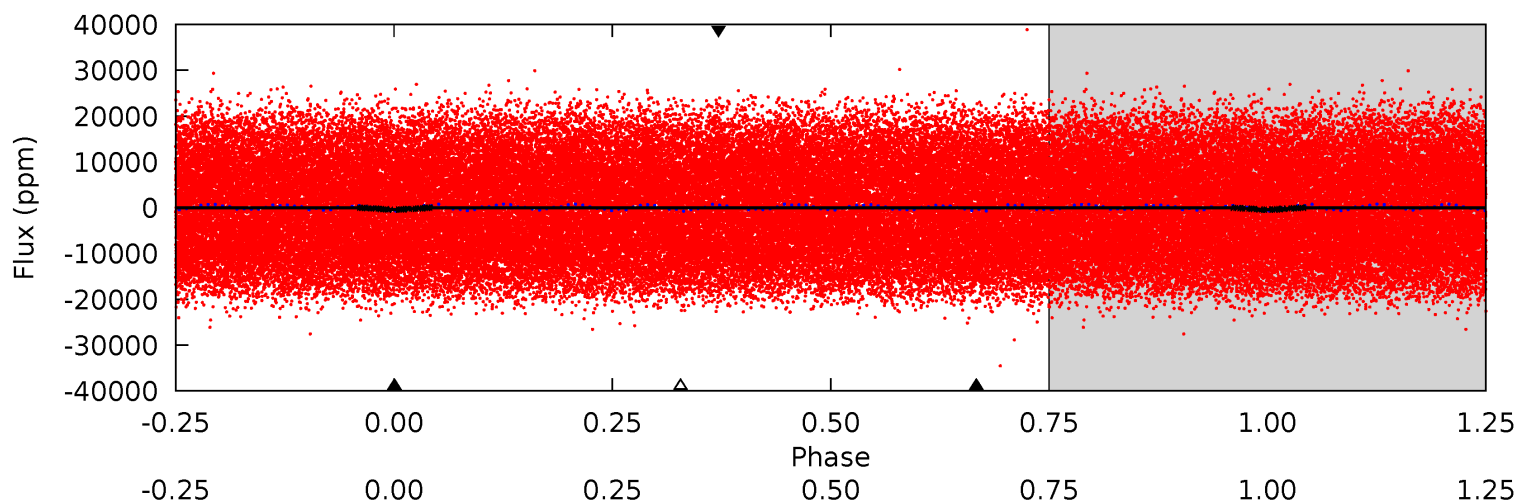




# Alt Model-Shift Uniqueness Test

008004558-02, P = 0.512633 Days, E = 131.158680 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
3.19	2.96	2.88	1.27	4.61	1.74	1.41	0.32	1.92	0.08	1.69	1.40	1.03	0.44	0.53



### Stellar Parameters For KIC 008004558

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7899^{+223}_{-335}$	$3.893^{+0.360}_{-0.090}$	$-0.440^{+0.250}_{-0.300}$	$2.451^{+0.355}_{-0.993}$	$1.713^{+0.173}_{-0.403}$	$0.164^{+0.439}_{-0.059}$
	+3%/-4%	+9%/-2%	+57%/-68%	+14%/-41%	+10%/-24%	+268%/-36%
Source	KIC0	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 008004558-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-73 \pm 7$	$2.88^{+1.63}_{-1.39}$	$6091^{+407}_{-627}$	$5993^{+3053}_{-1682}$	$1.066^{+2.885}_{-0.628}$
Alt.	$-400 \pm 135$	$3.91^{+1.80}_{-1.40}$	$6086^{+406}_{-646}$	$8666^{+3563}_{-2128}$	$3.008^{+5.045}_{-1.730}$

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

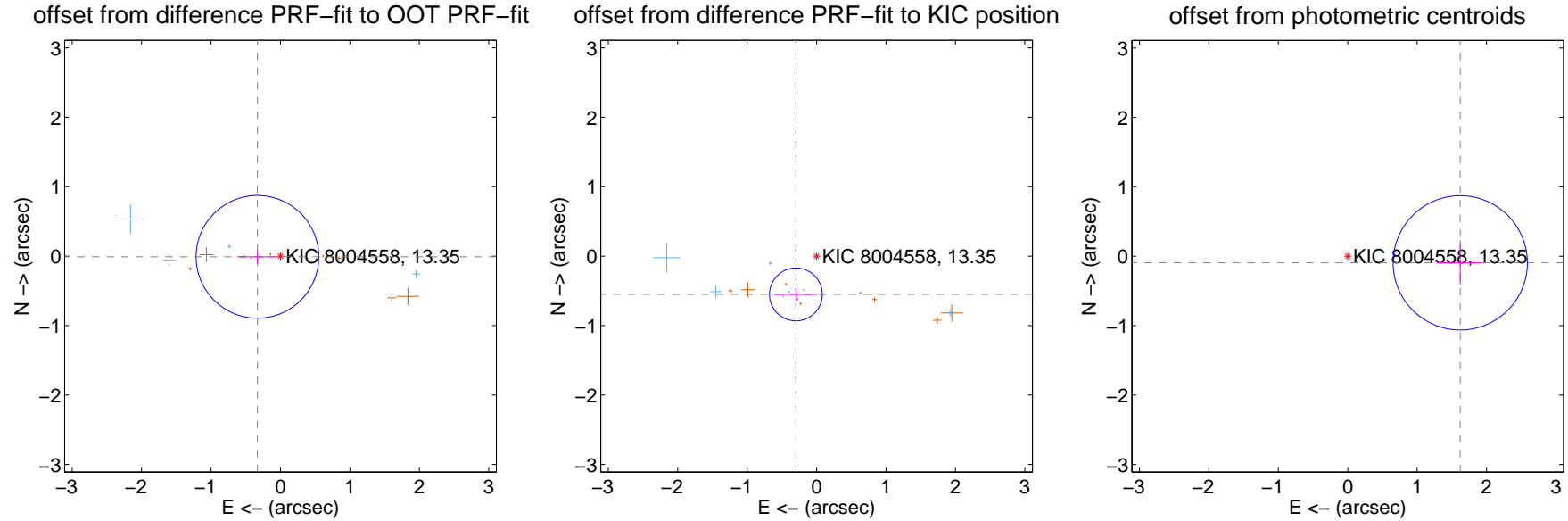
## DV Centroid Data

Supplemental centroid analysis for 008004558-02. Kepler magnitude: 13.35. Transit SNR 13.42

There are 7 quarters with good PRF difference image offsets

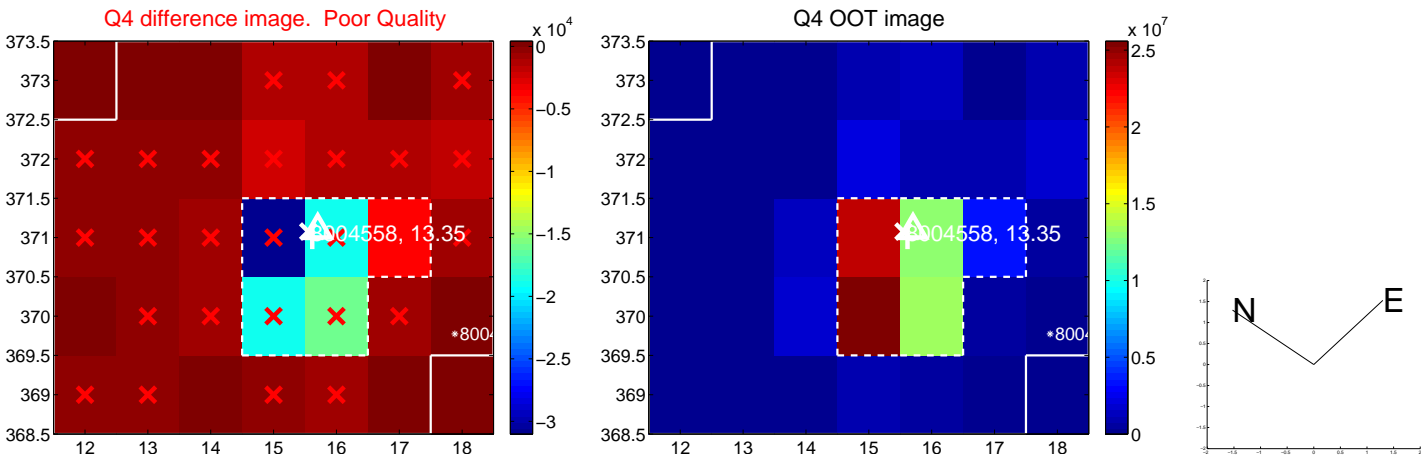
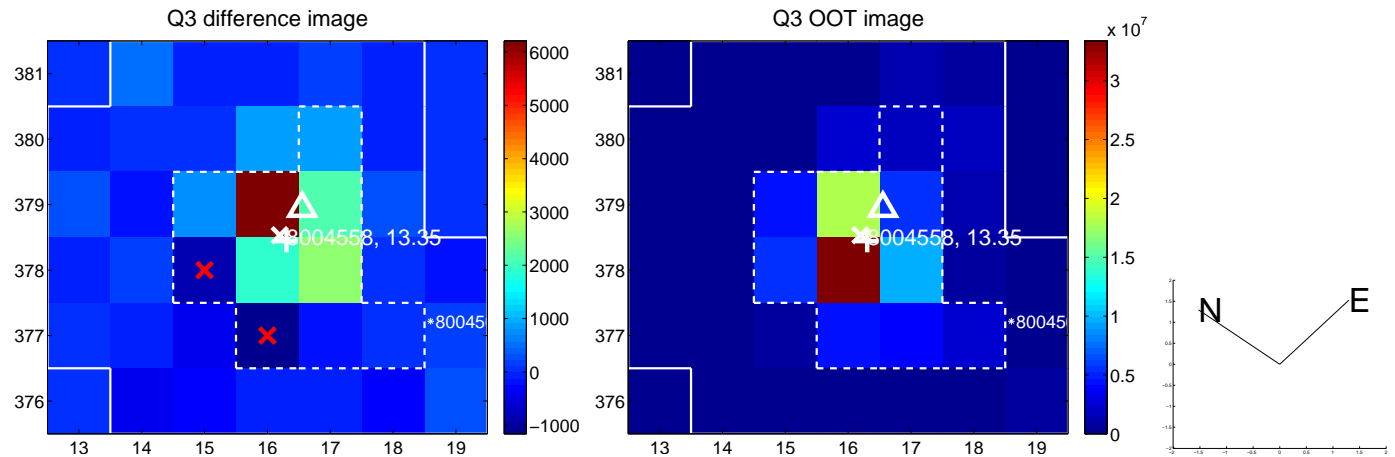
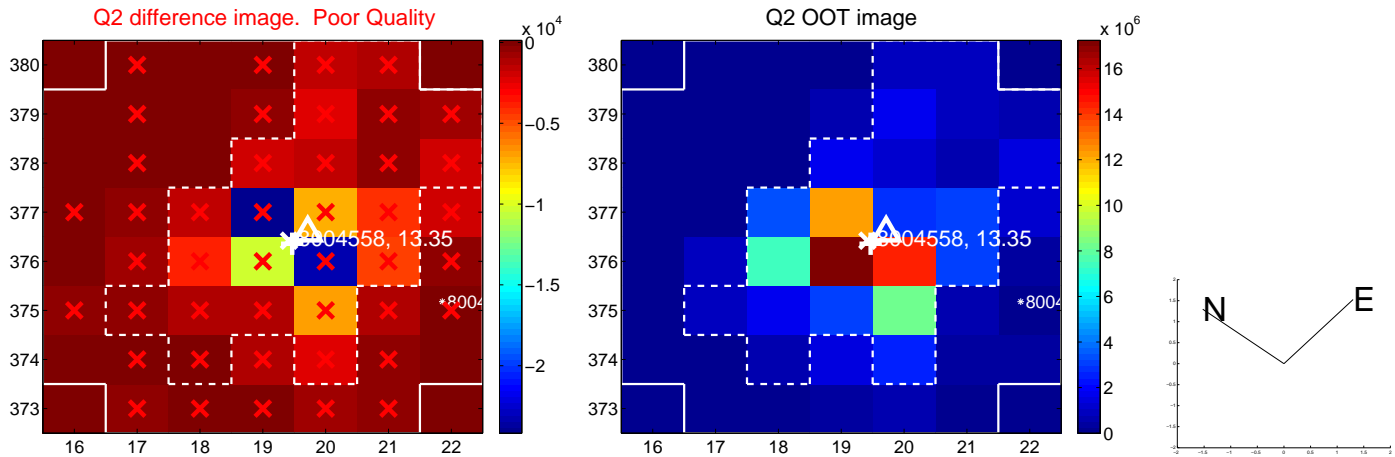
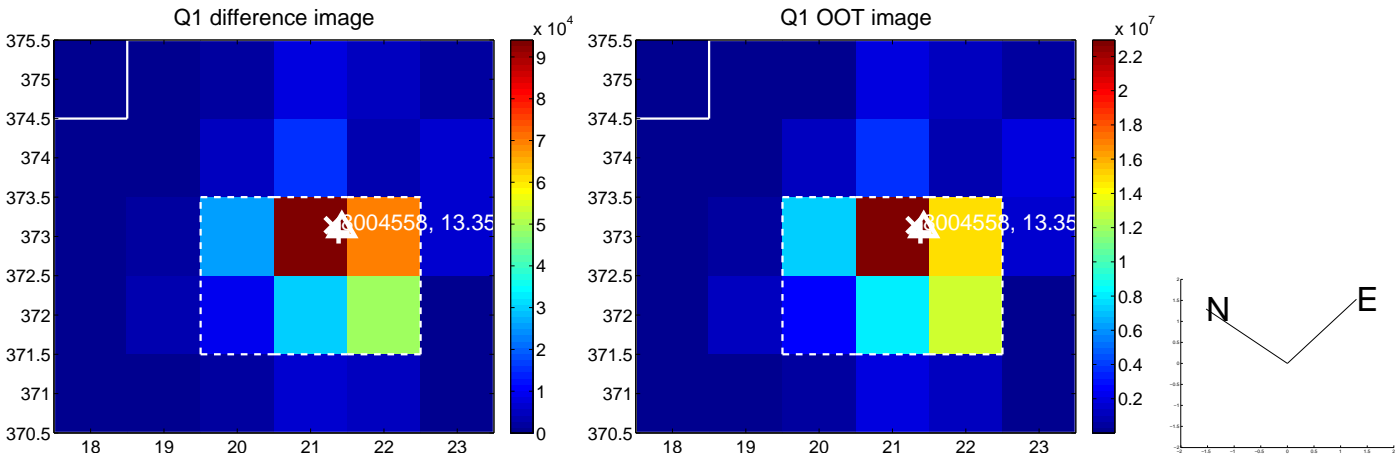
The direct PRF centroid is offset from the target star catalog position by about 0.72 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.332 \pm 0.294$	1.13	$0.332 \pm 0.296$	$-0.010 \pm 0.091$
PRF-fit source offset from KIC position	$0.627 \pm 0.127$	4.94	$0.298 \pm 0.312$	$-0.552 \pm 0.089$
photometric centroid source offset	$1.62 \pm 0.32$	5.04	$-1.62 \pm 0.32$	$-0.10 \pm 0.32$

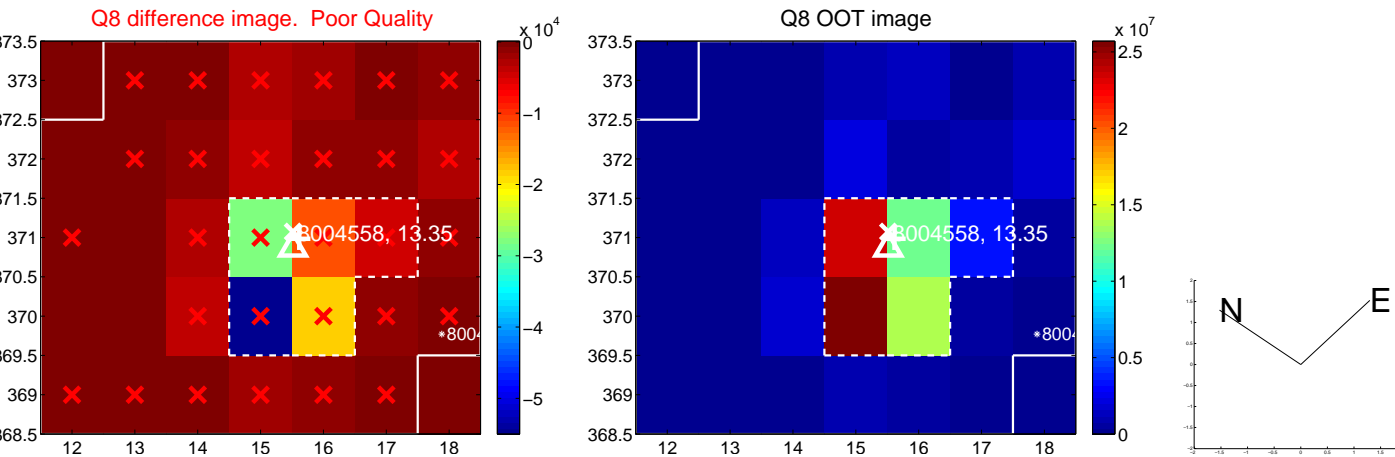
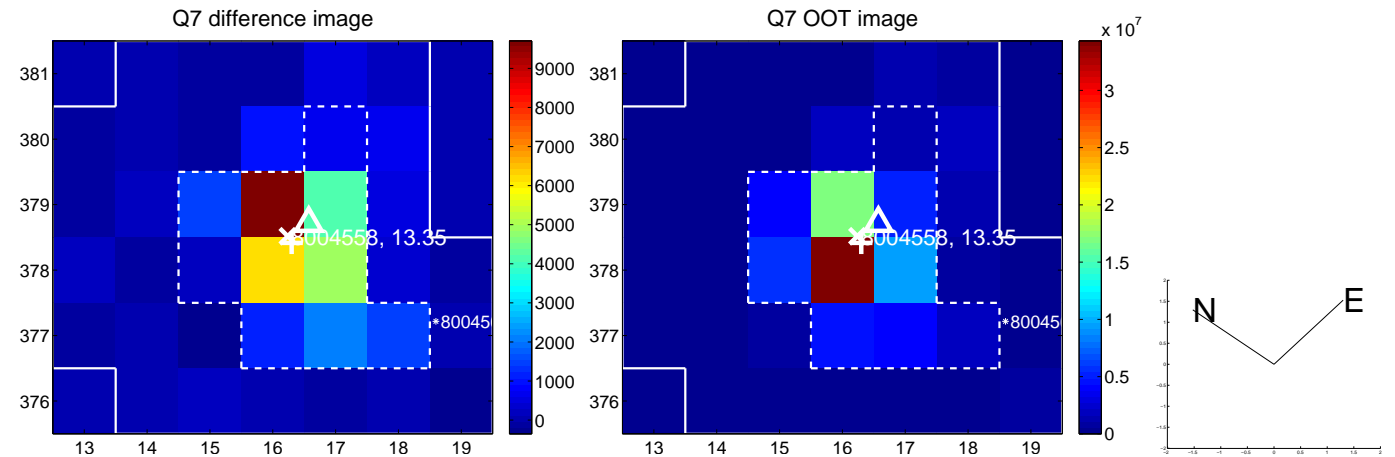
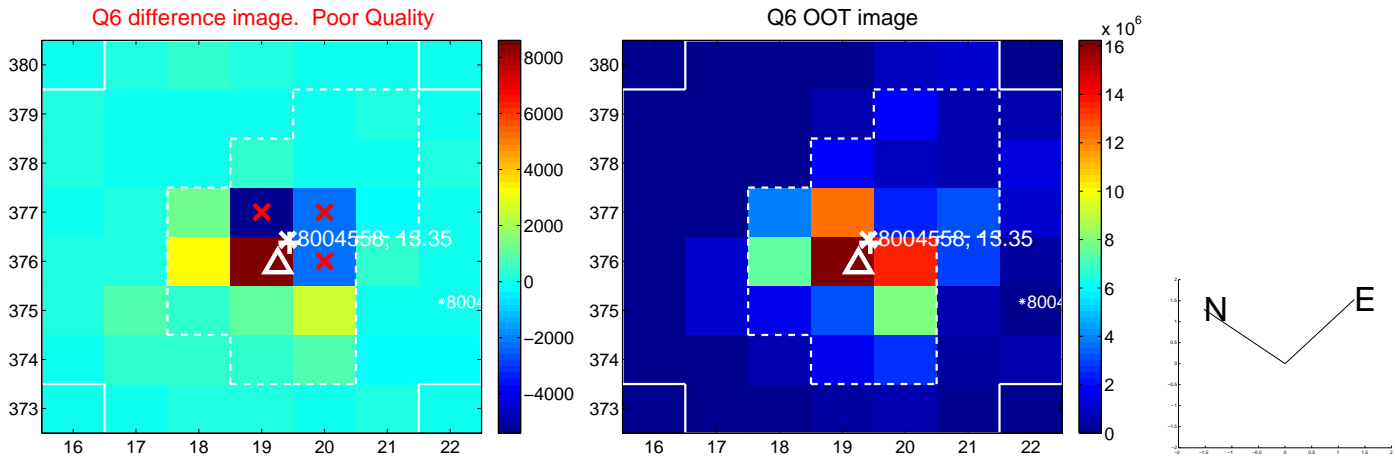
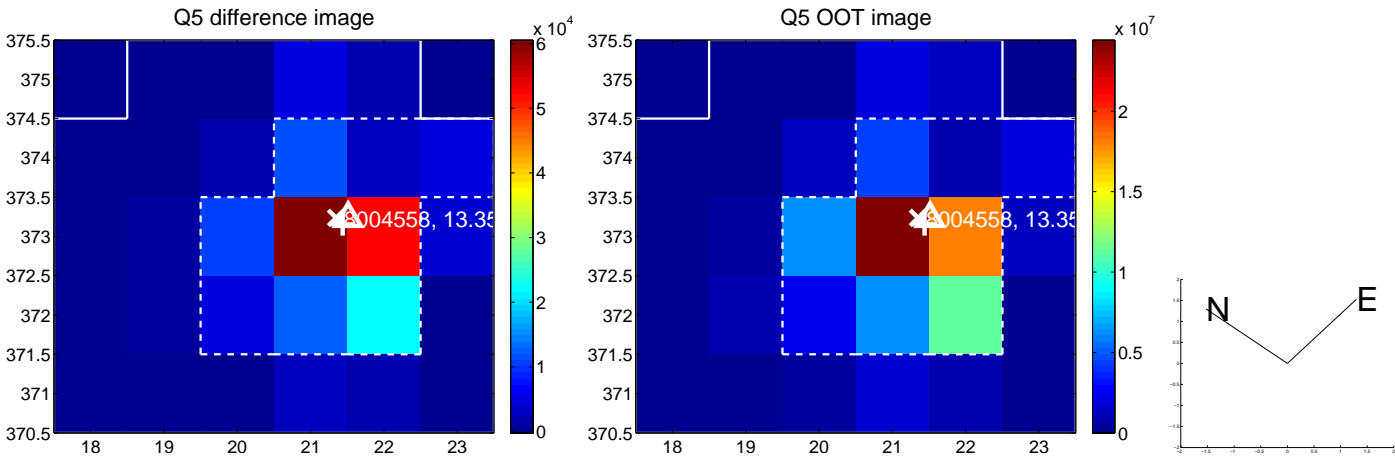


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

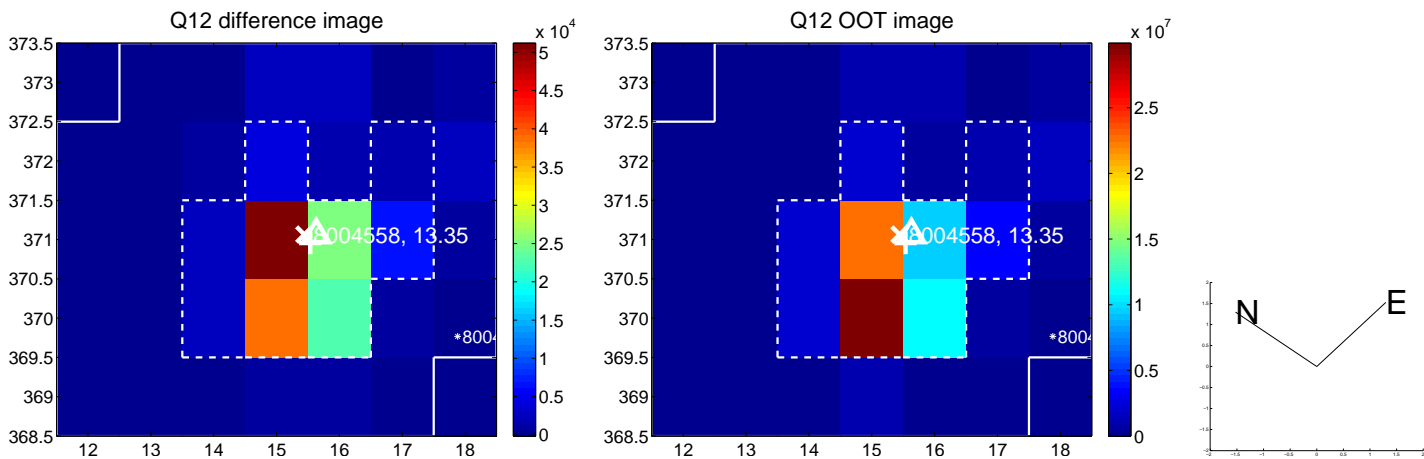
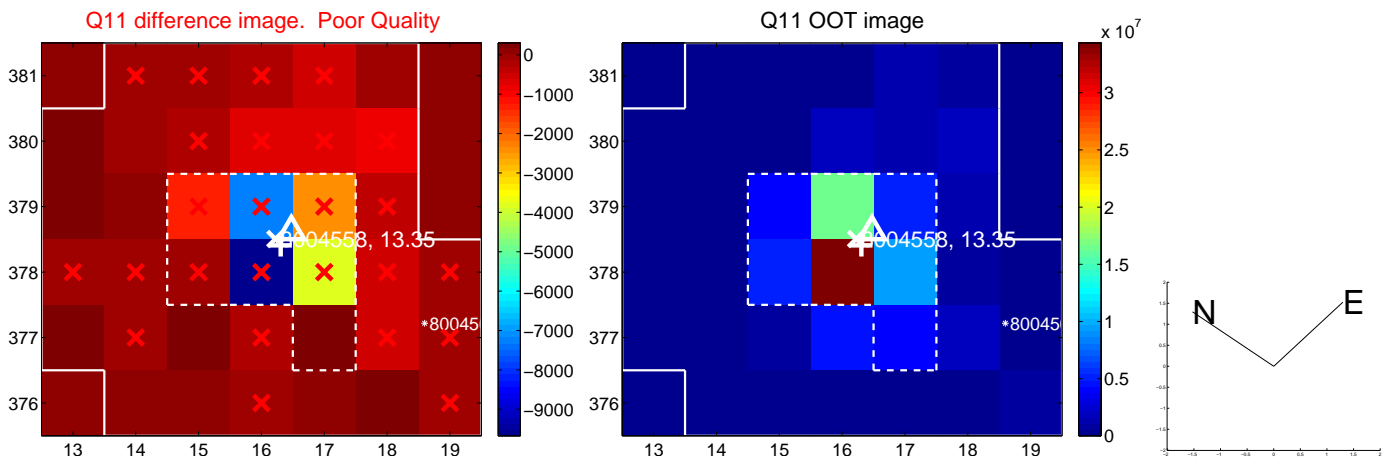
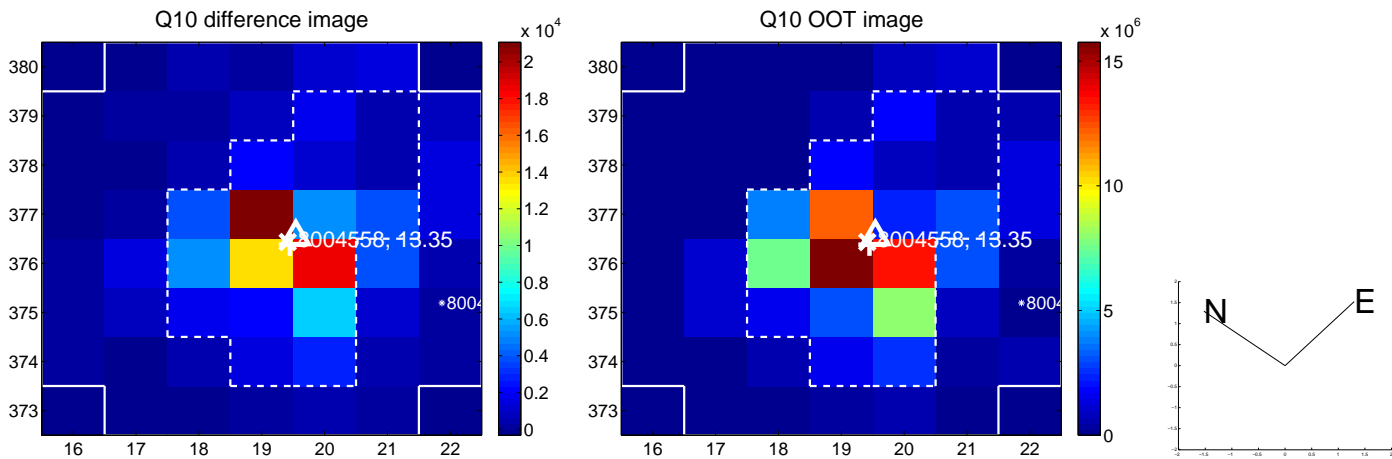
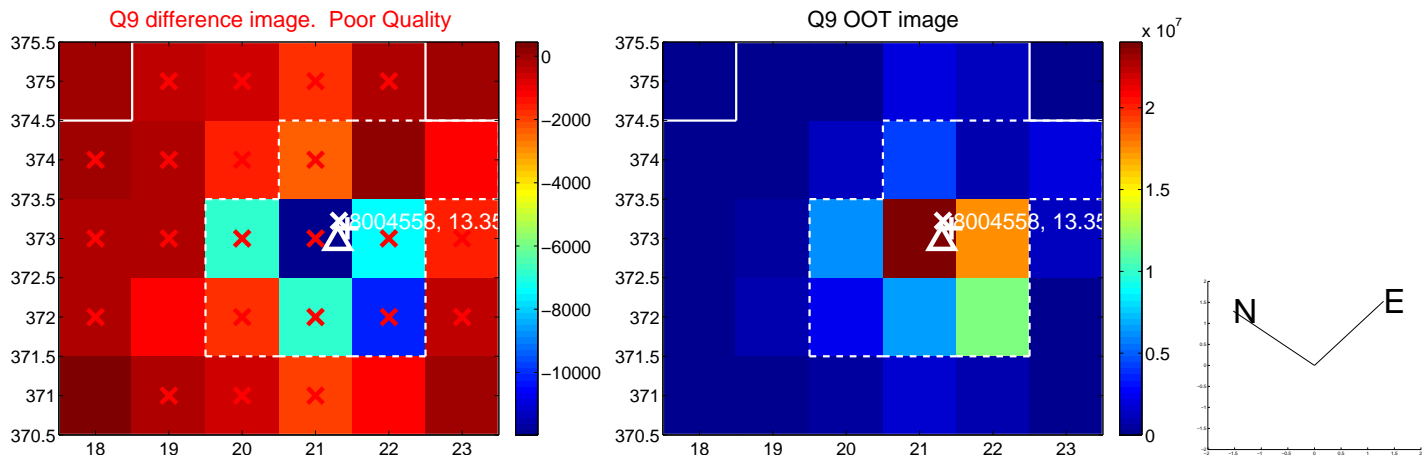


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

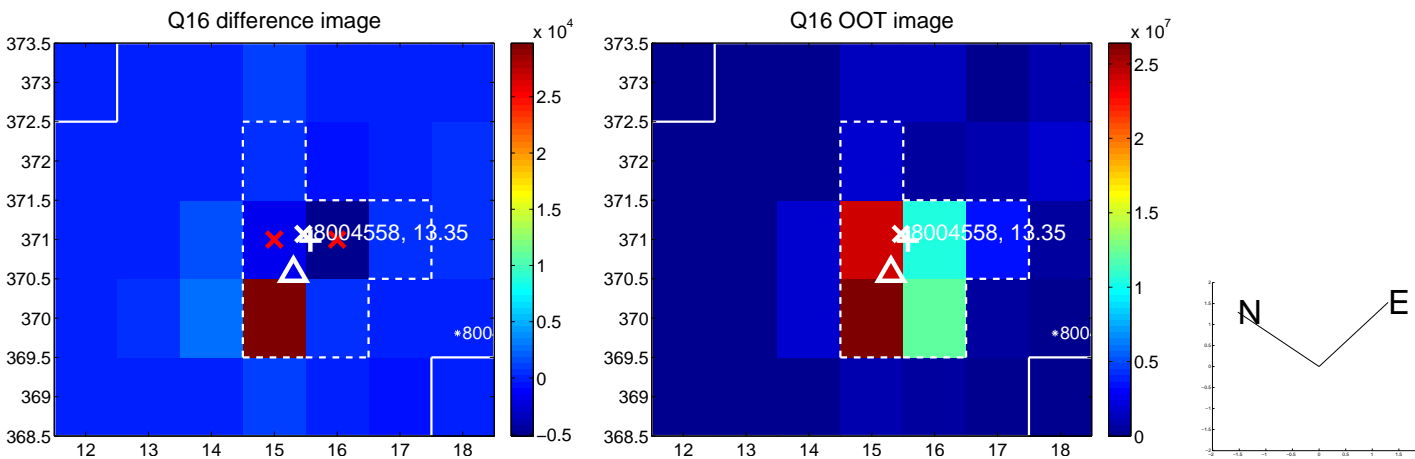
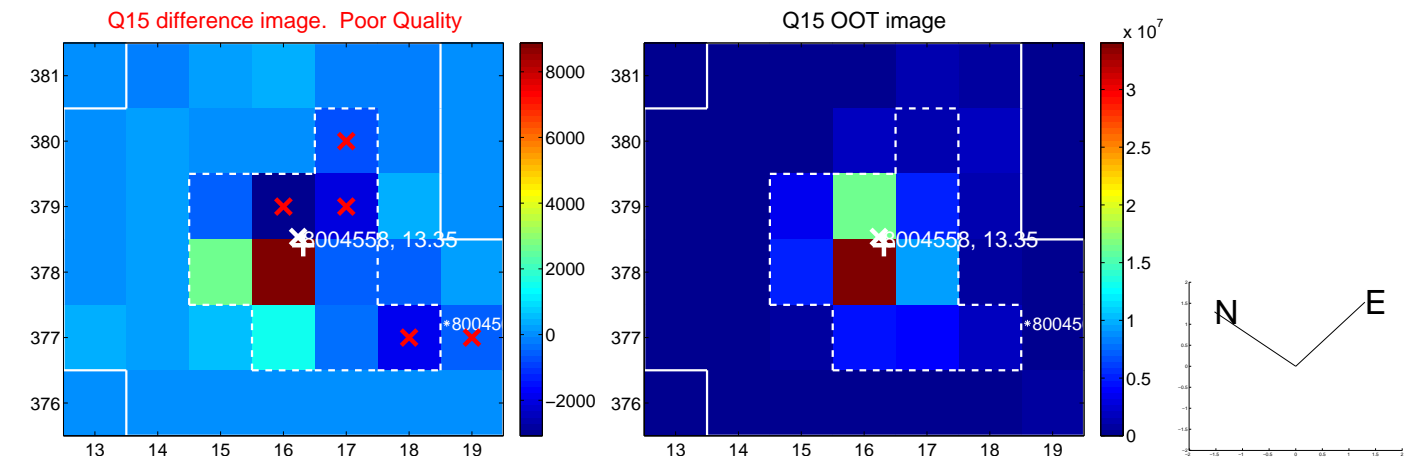
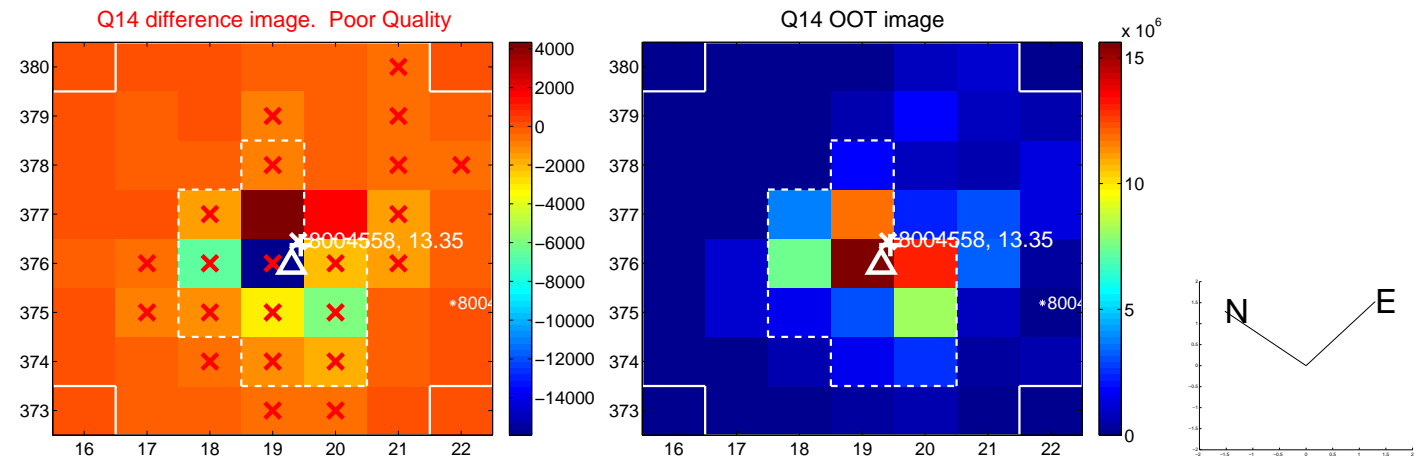
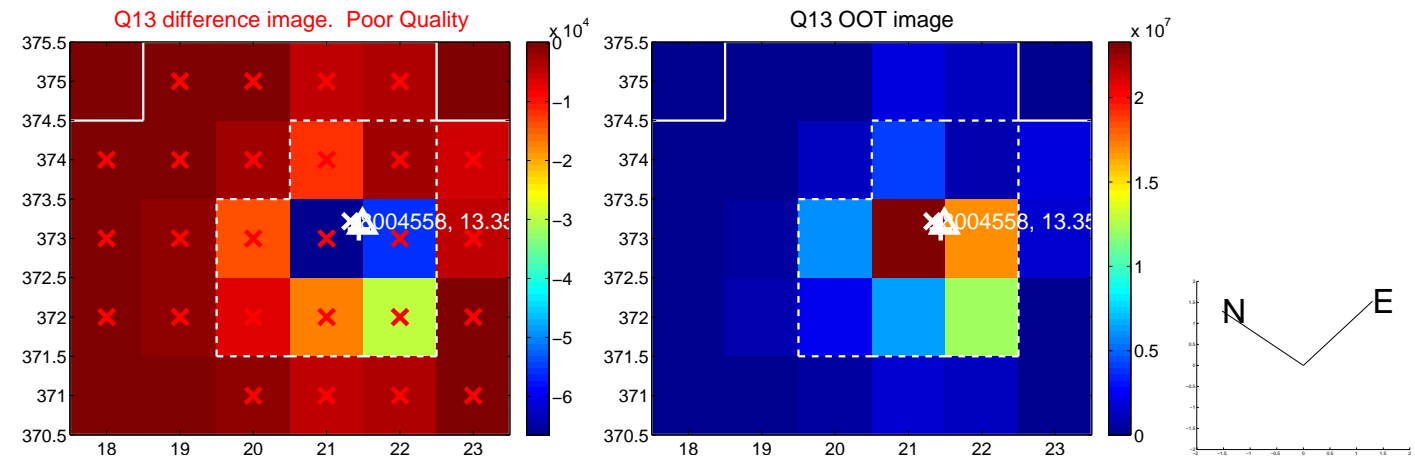




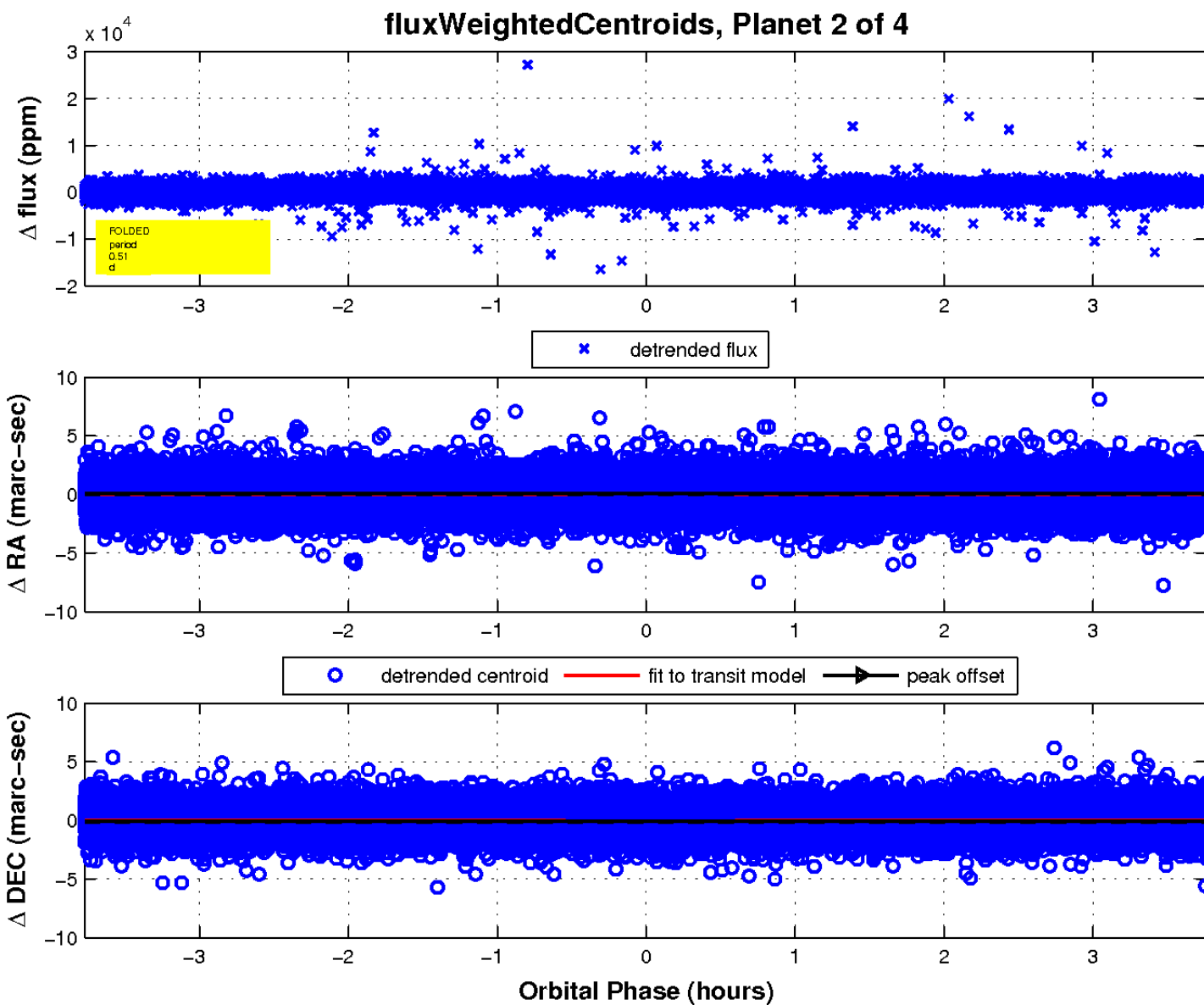
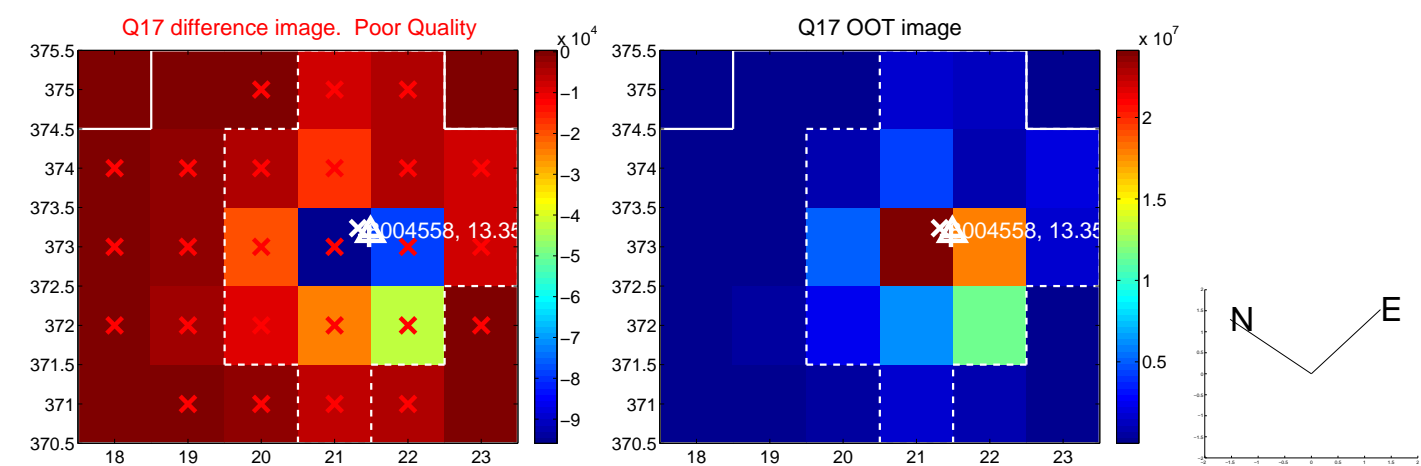
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

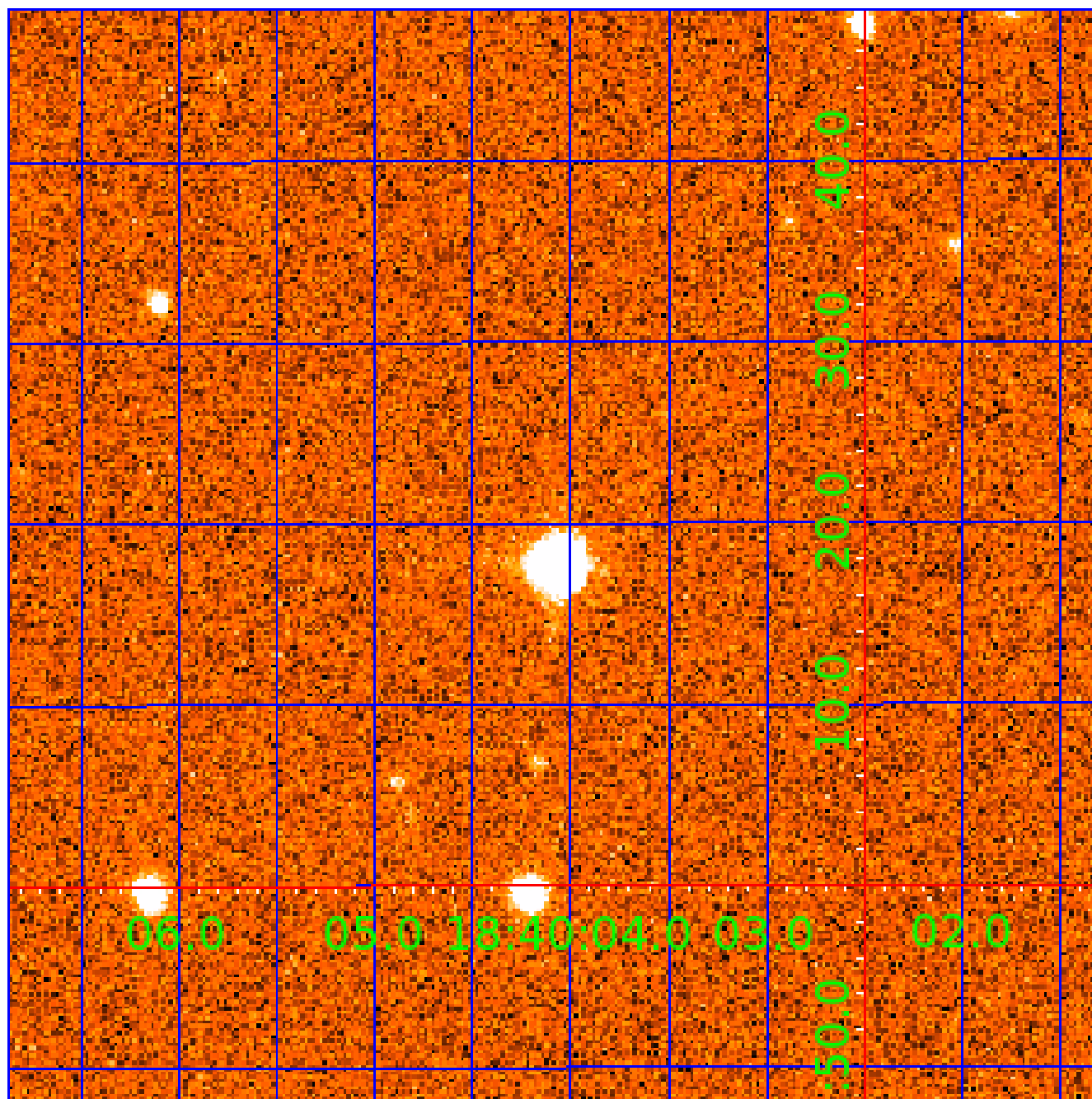


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 008004558

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008004558-01	OBS	No	303.301560	433.724331	1655.5	2.137	13.1	7.5	2.45	7899	10.88	18.75
008004558-02	OBS	No	0.512625	131.670859	116.3	1.257	11.5	13.4	2.45	7899	3.08	93113.34
008004558-03	OBS	No	0.512680	131.750302	0.6	0.568	9.1	0.0	2.45	7899	0.19	93100.01
008004558-04	OBS	No	1.237640	132.655273	269.7	4.500	9.2	-1.0	2.45	7899	4.08	28748.76

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008004558-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008004558-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_KIC_POS
008004558-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD—CENT_KIC_POS
008004558-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_NOFITS

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

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

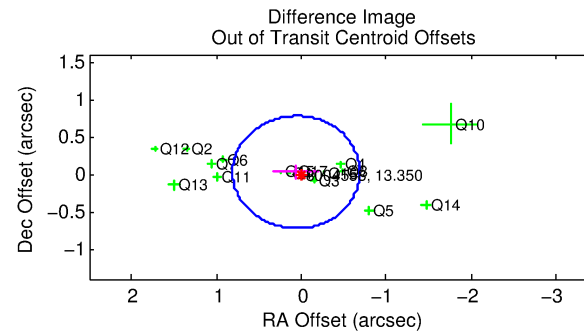
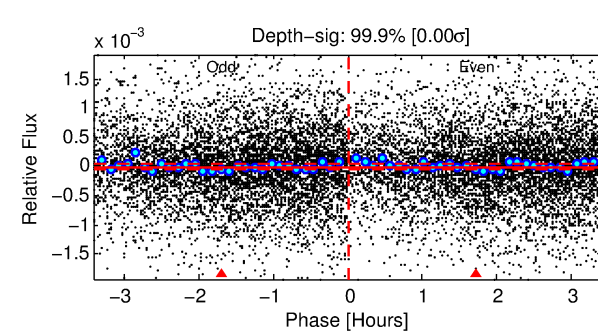
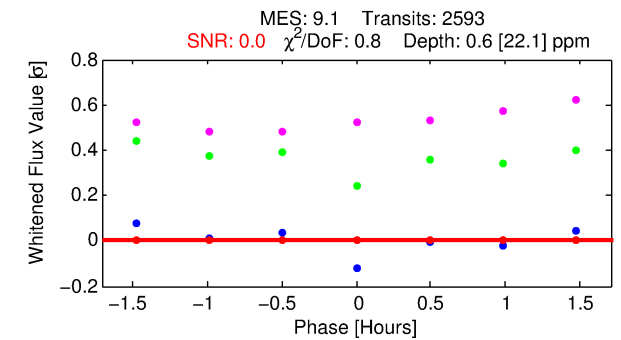
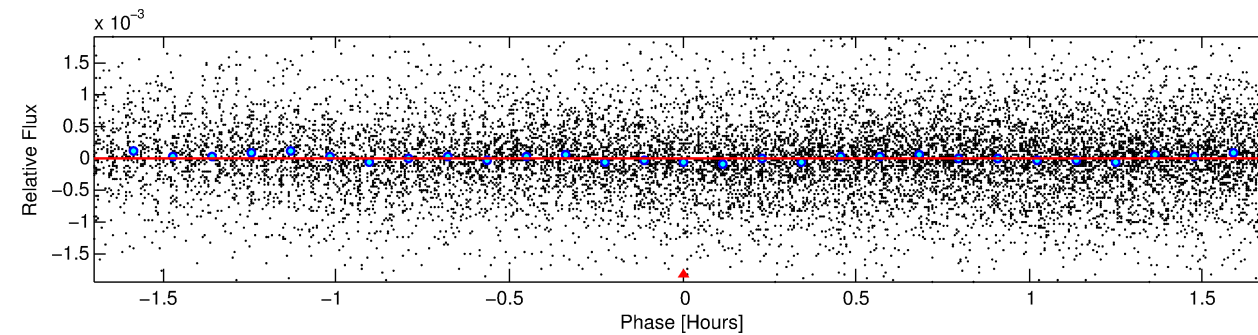
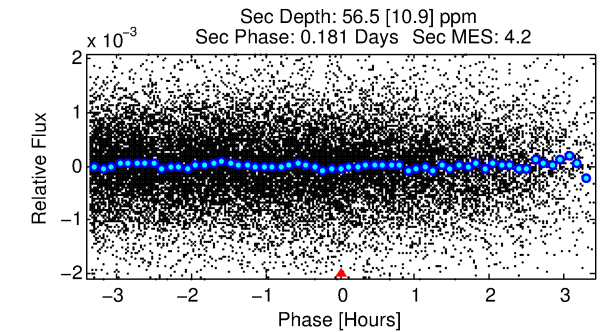
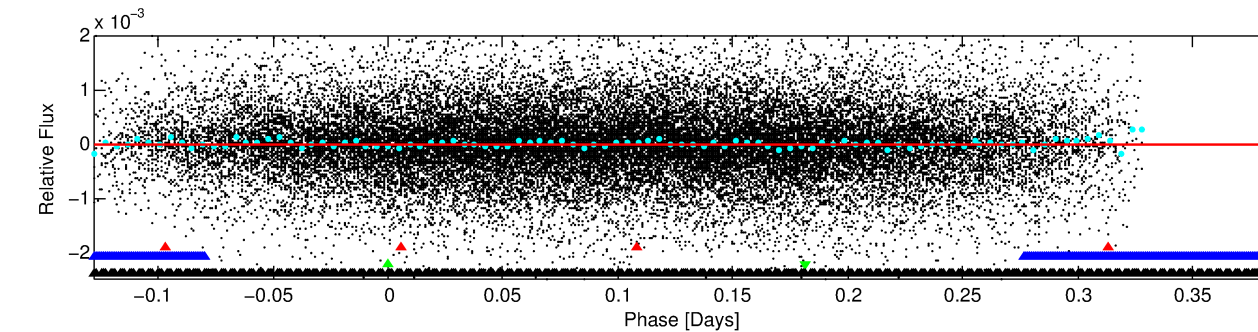
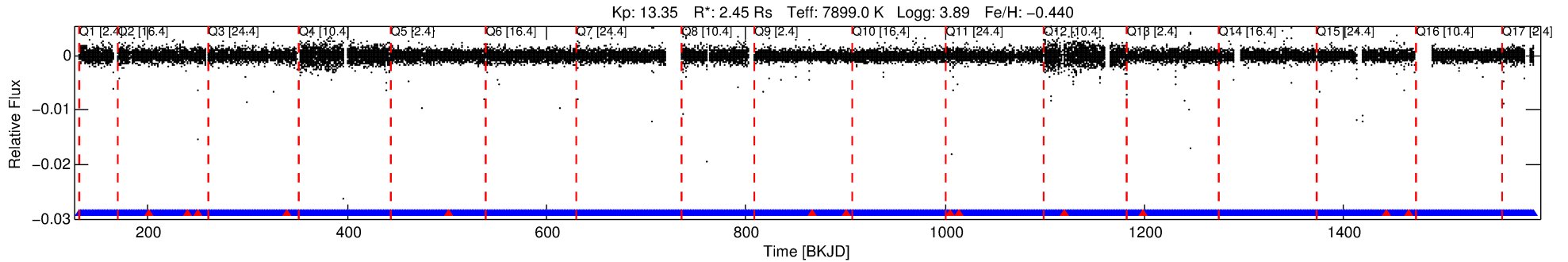
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008004558-03

No Significant Match Found

# DV One-Page Summary

KIC: 8004558 Candidate: 3 of 4 Period: 0.513 d



## DV Fit Results:

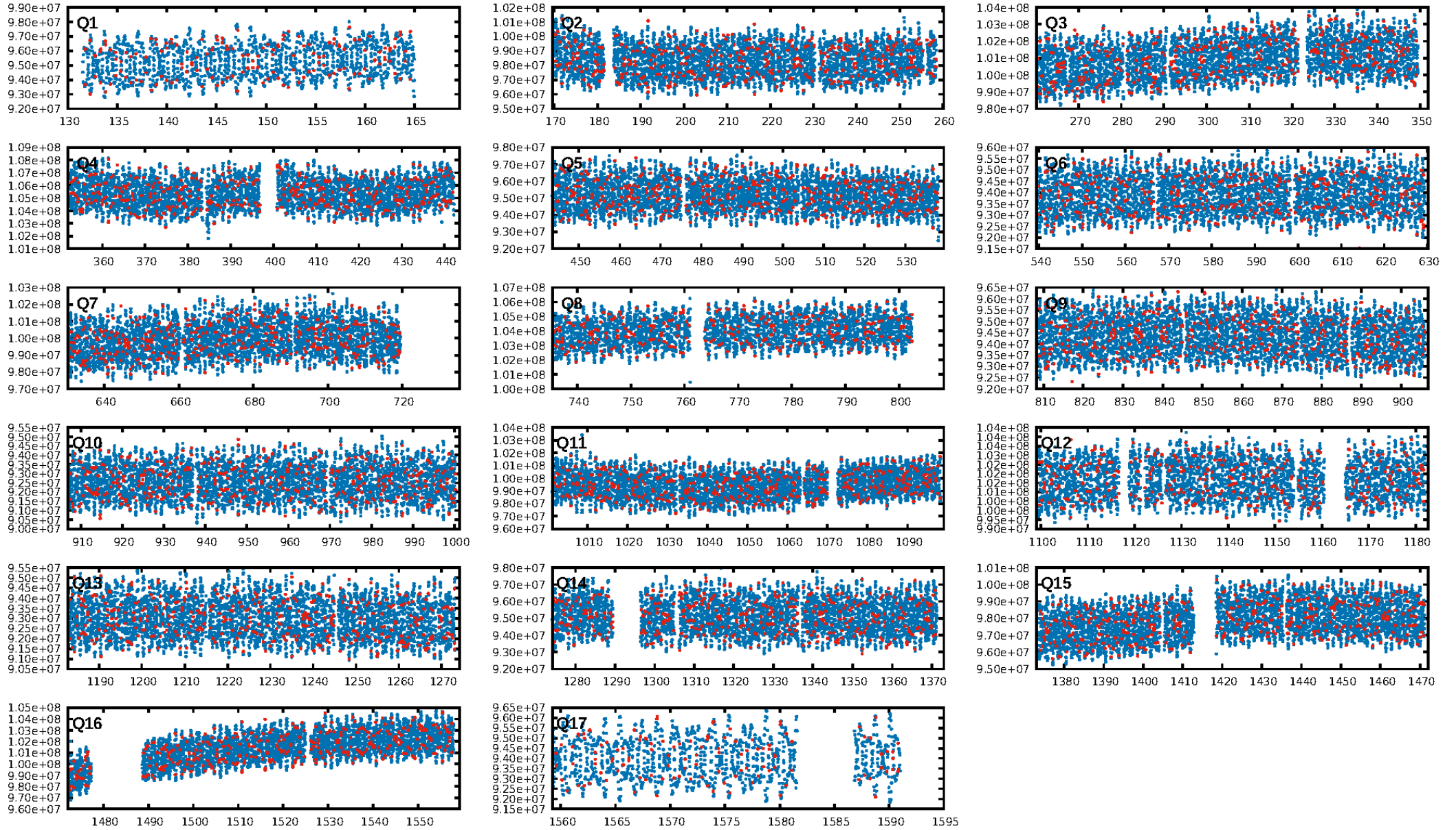
Period = 0.51268 [0.00295] d  
Epoch = 131.7503 [0.3277] BKJD  
Rp/R\* = 0.0007 [0.0211]  
a/R\* = 6.60 [797.35]  
b = 0.31 [367.91]  
Seff = 93100.01 [59407.54]  
Teq = 4454 [711] K  
Rp = 0.19 [5.66] Re  
a = 0.0150 [0.0058] AU  
Ag = 190.21 [11214.23] [0.02σ]  
Teffp = 25575 [376963] K [0.06σ]

## DV Diagnostic Results:

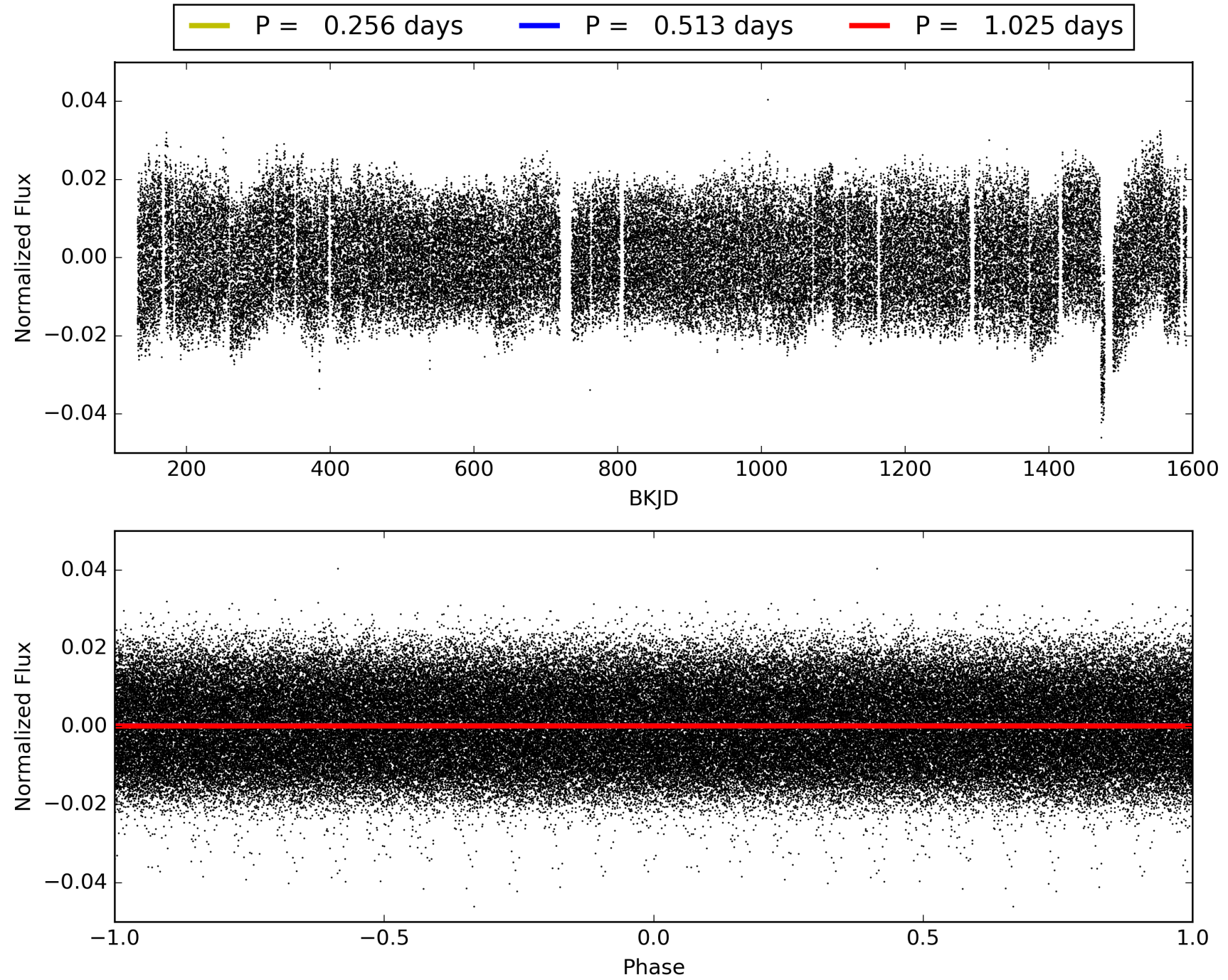
ShortPeriod-sig: 0.1% [0.00σ]  
LongPeriod-sig: 100.0% [3.84σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.99 [2470/2483]  
GhostDiagnostic-chr: N/A  
Centroid-sig: N/A  
Centroid-so: N/A  
OotOffset-rm: 0.064 arcsec [0.26σ]  
OotOffset-st: 4/4/4/4 [16]  
KicOffset-rm: 0.501 arcsec [4.55σ]  
KicOffset-st: 4/4/4/4 [16]  
DiffImageQuality-fgm: 0.38 [6/16]  
DiffImageOverlap-fno: 0.00 [0/17]



# TCE 008004558-03, PDC Light Curves



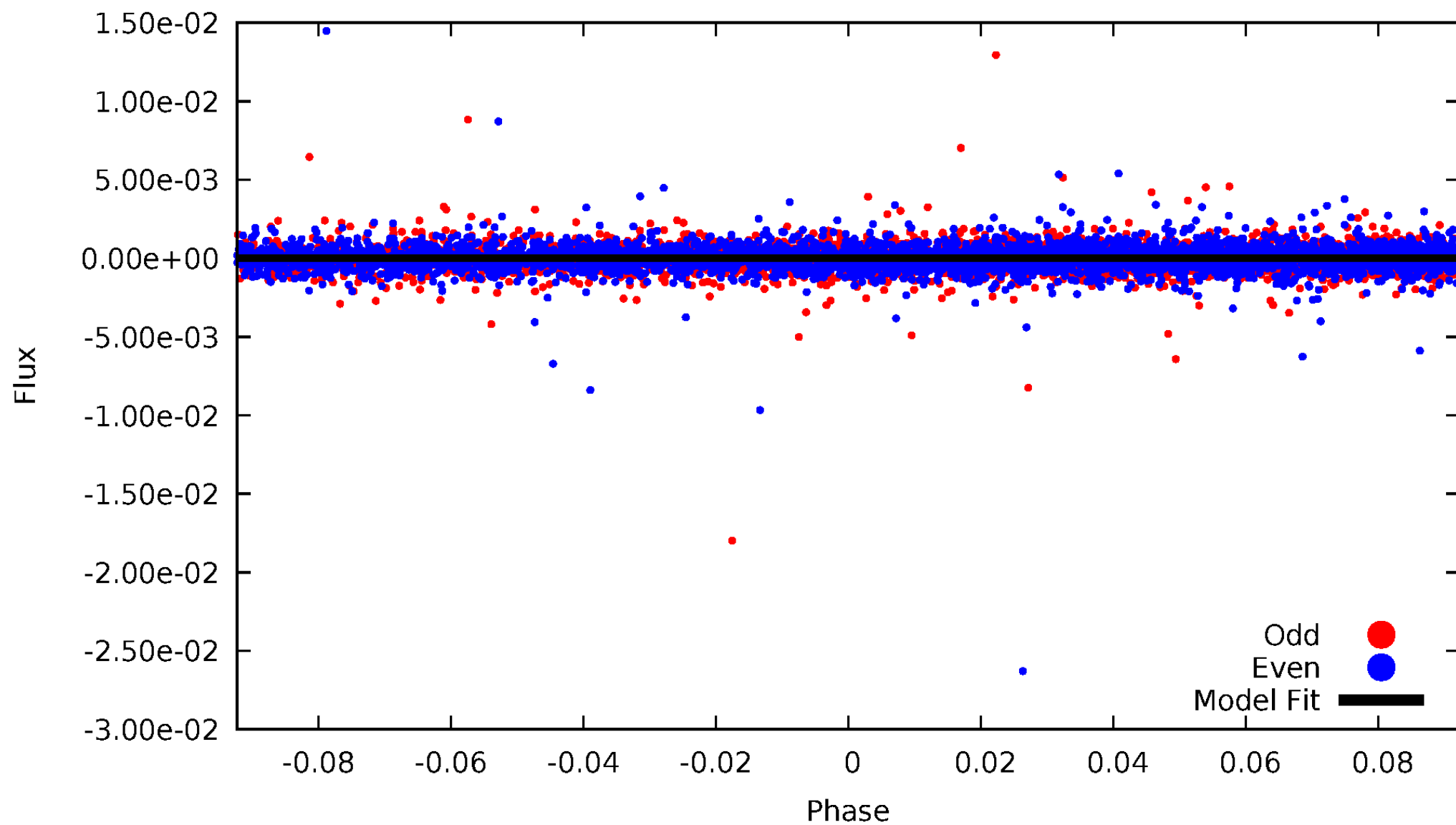
TCE 008004558-03





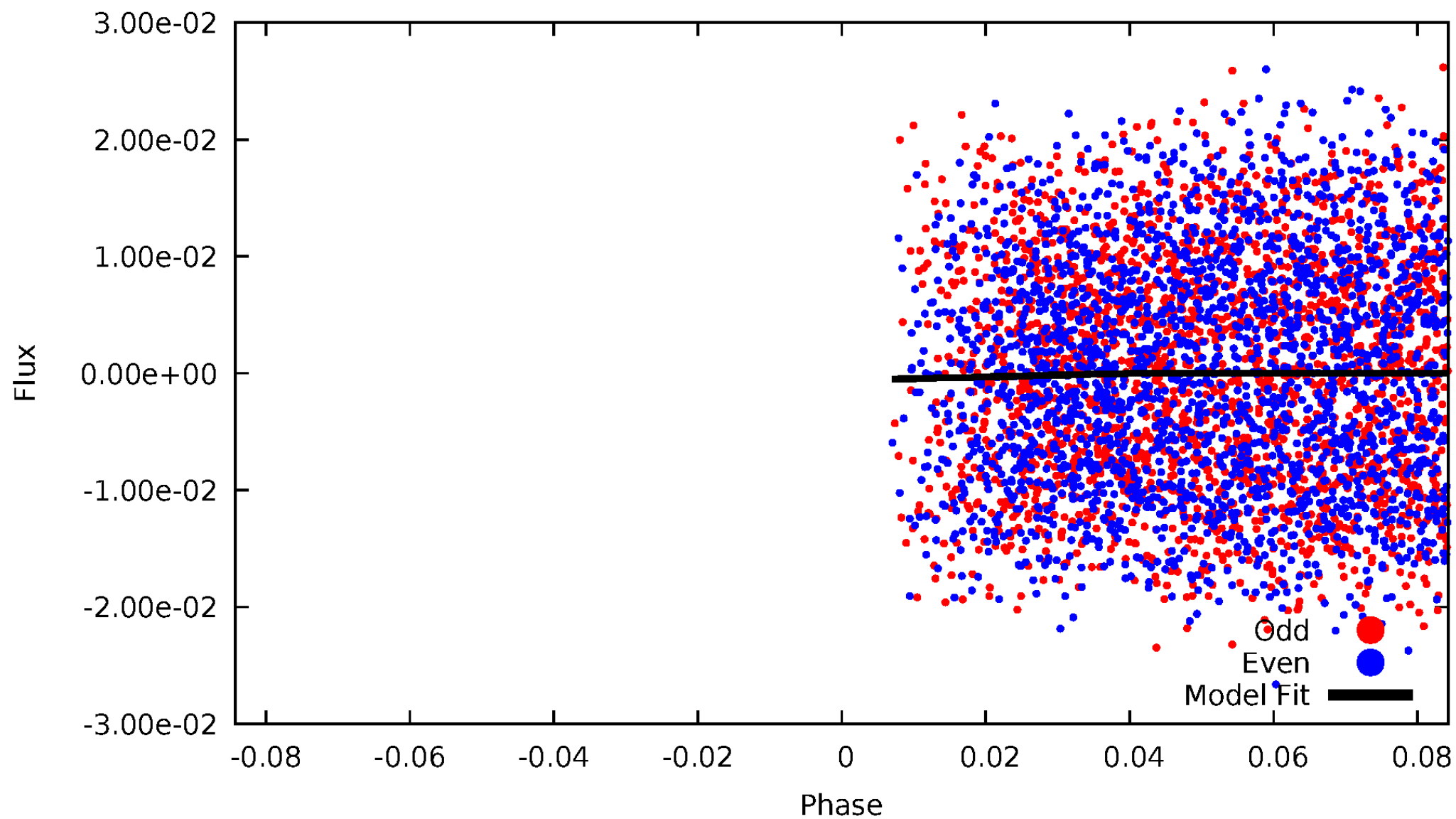
DV Odd/Even

TCE 008004558-03

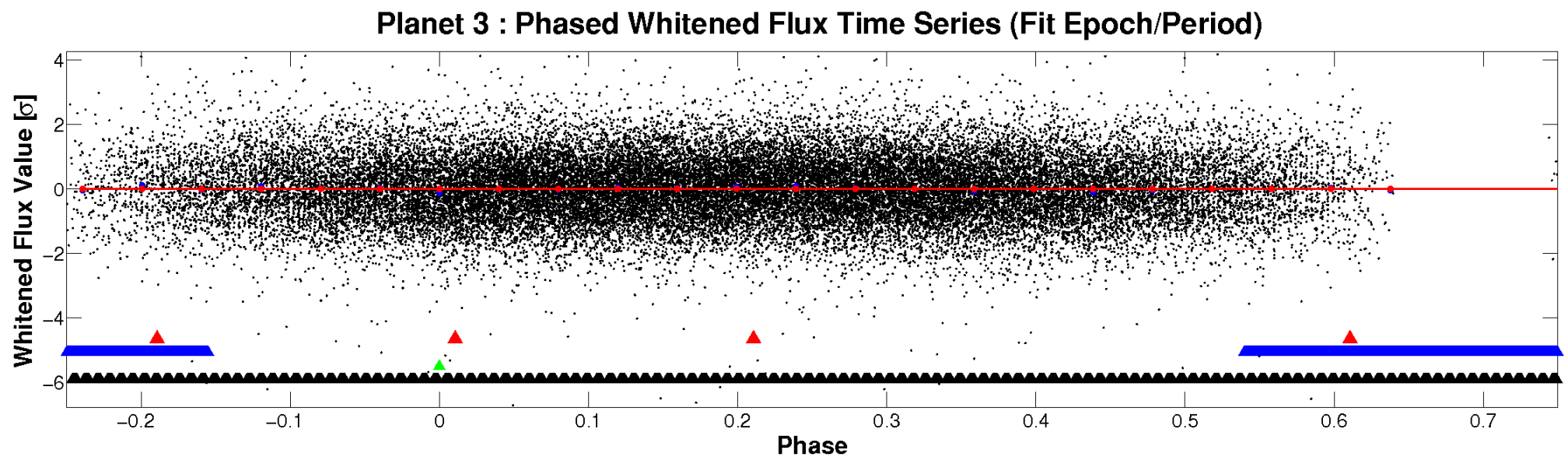
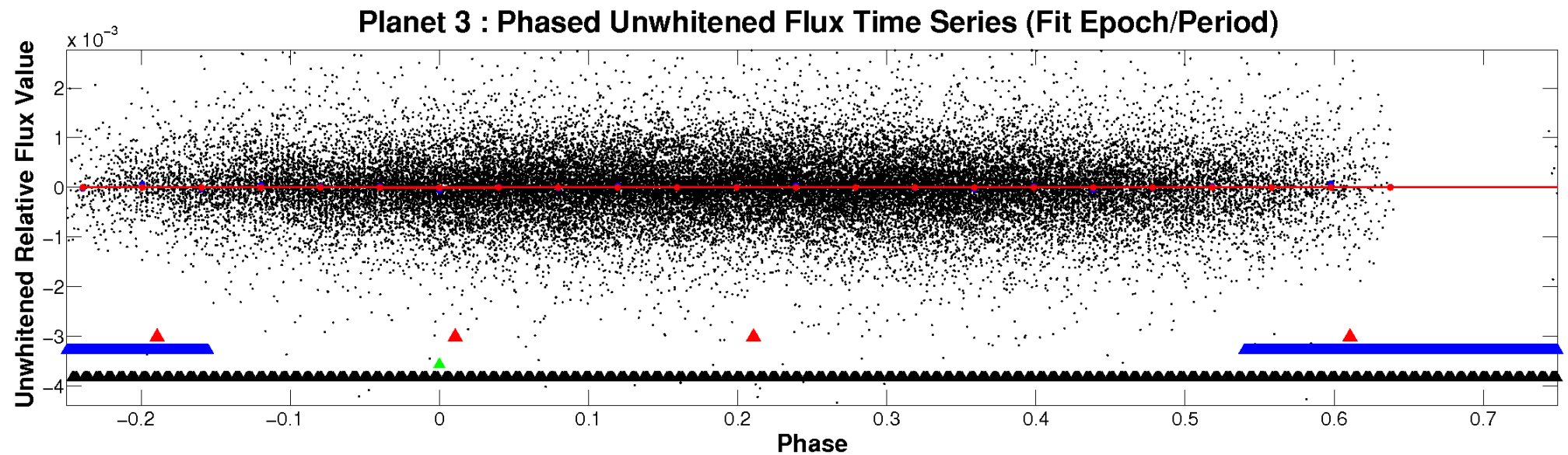


# ALT Odd/Even

TCE 008004558-03

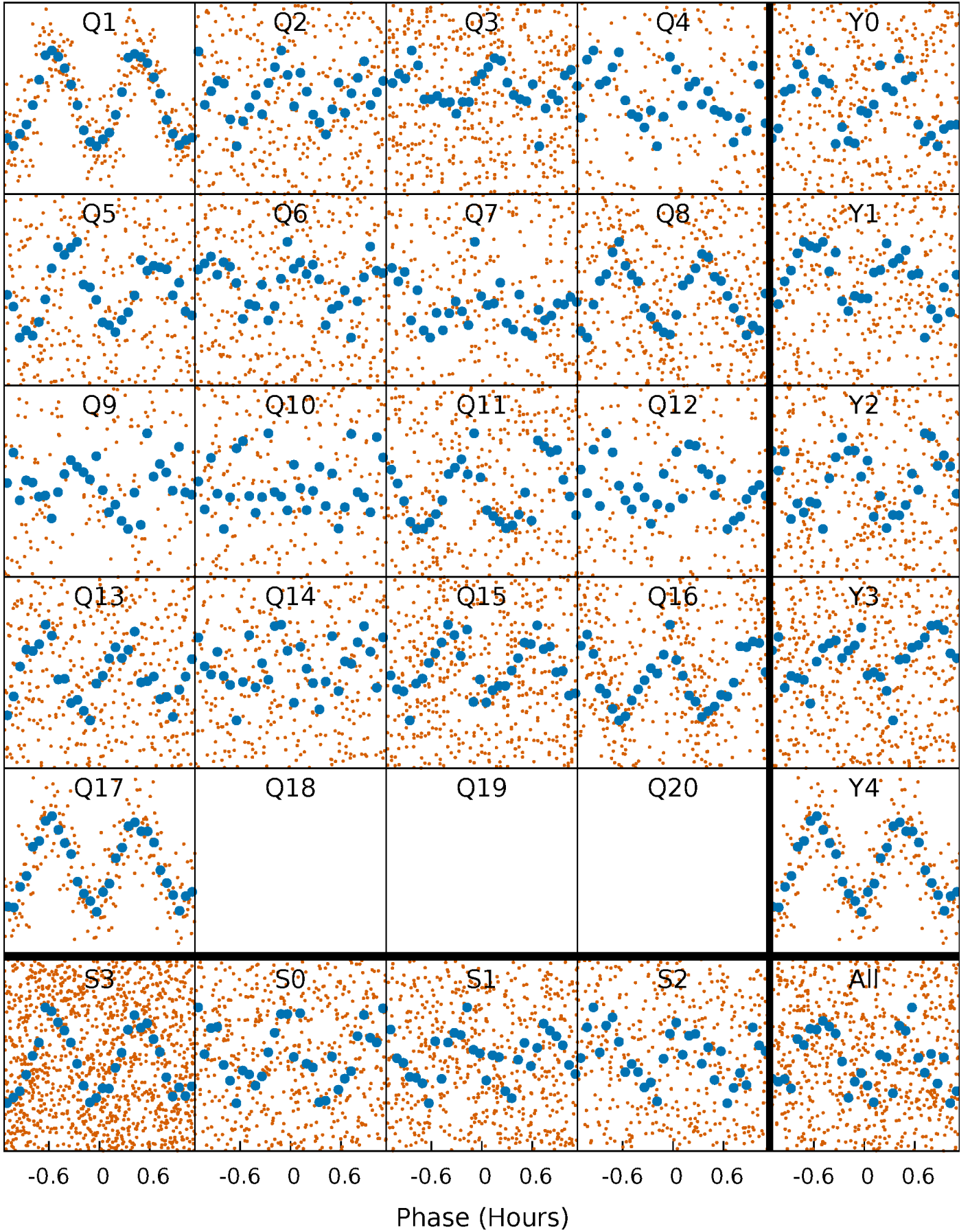


# Non-Whitened Vs. Whitened Light Curve



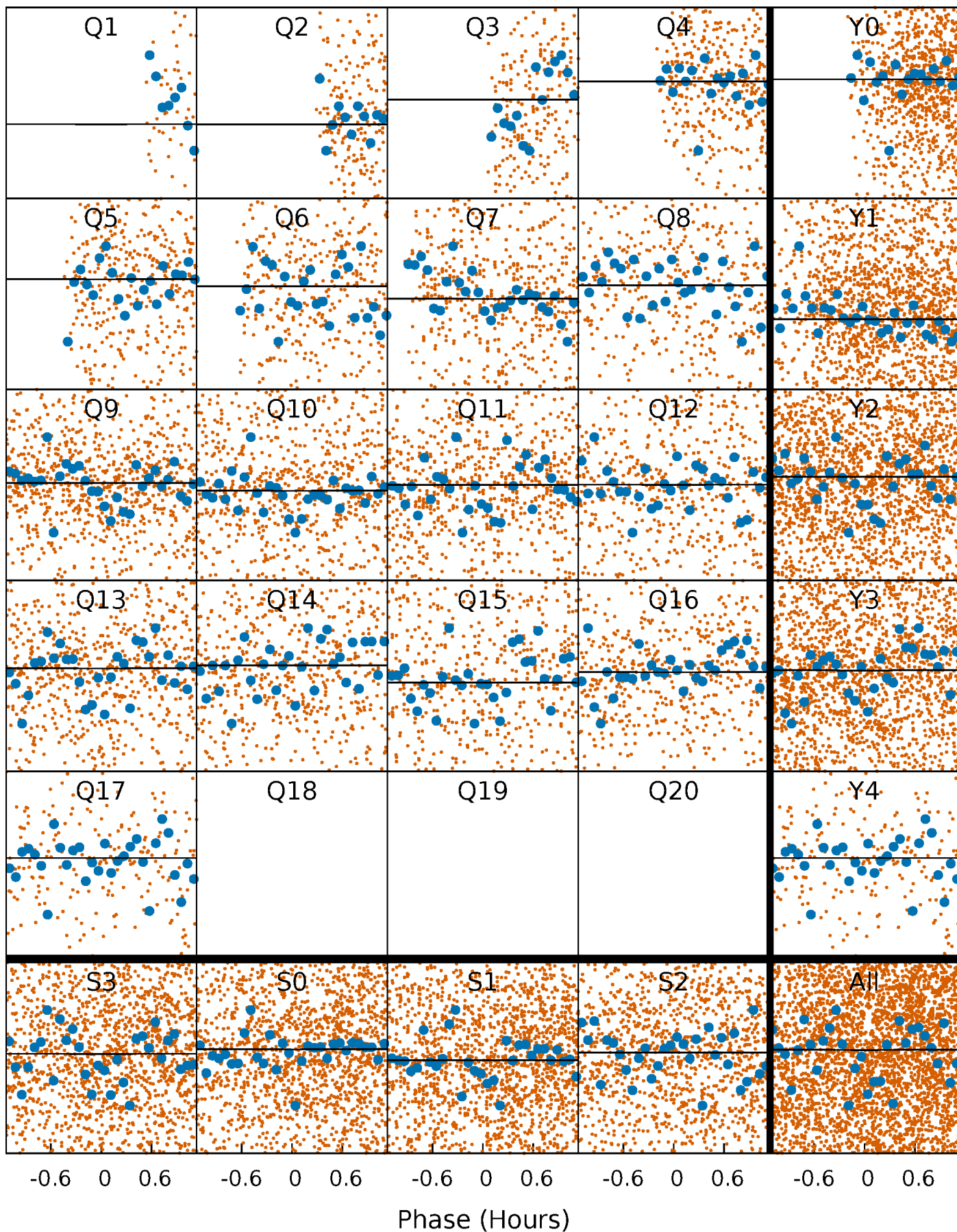
# PDC Quarter-Phased Transit Curves

TCE 008004558-03   P= 0.512680 Days    $T_0=131.750302$  (BKJD)



# DV Quarter-Phased Transit Curves

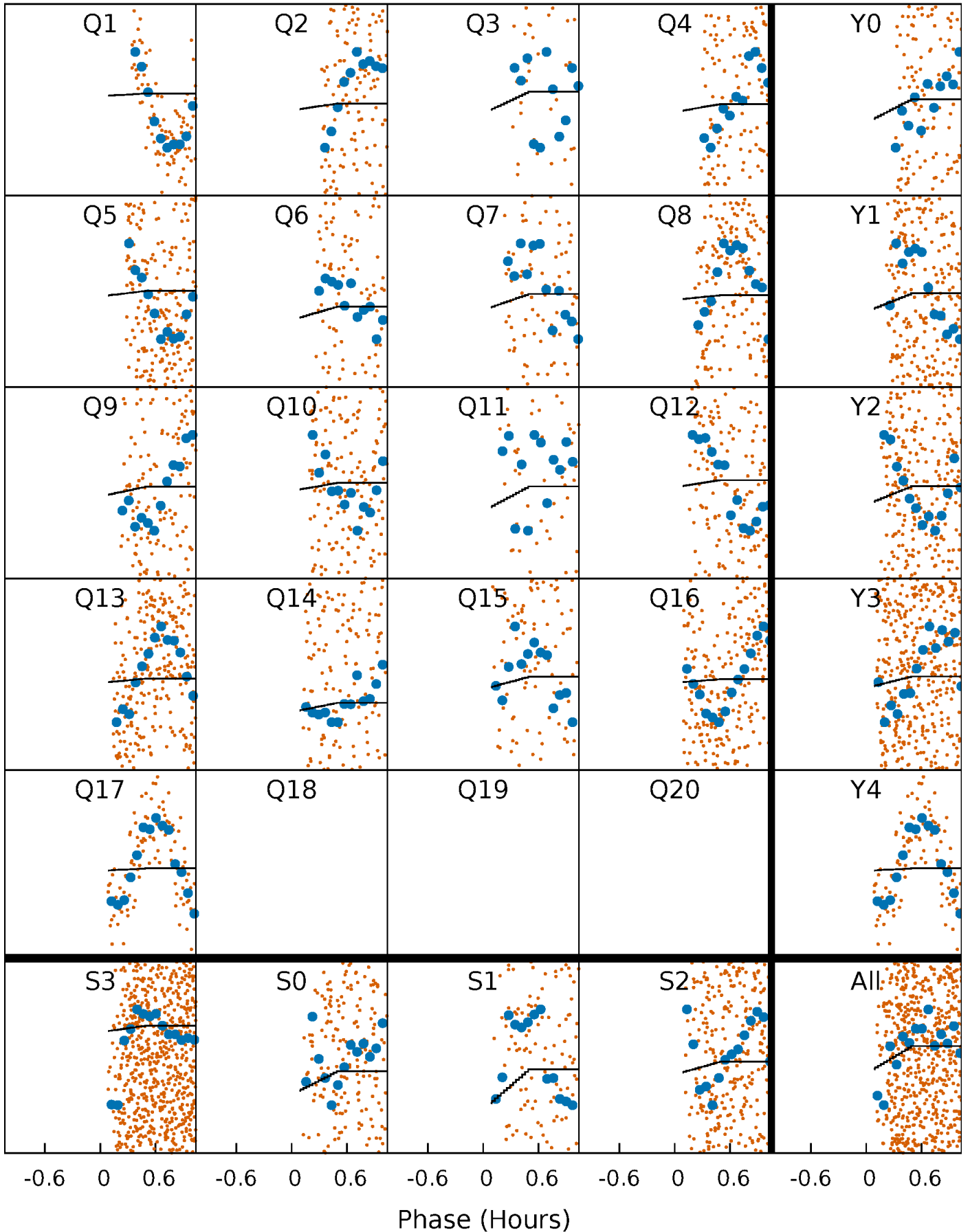
TCE 008004558-03 P= 0.512680 Days  $T_0=131.750302$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

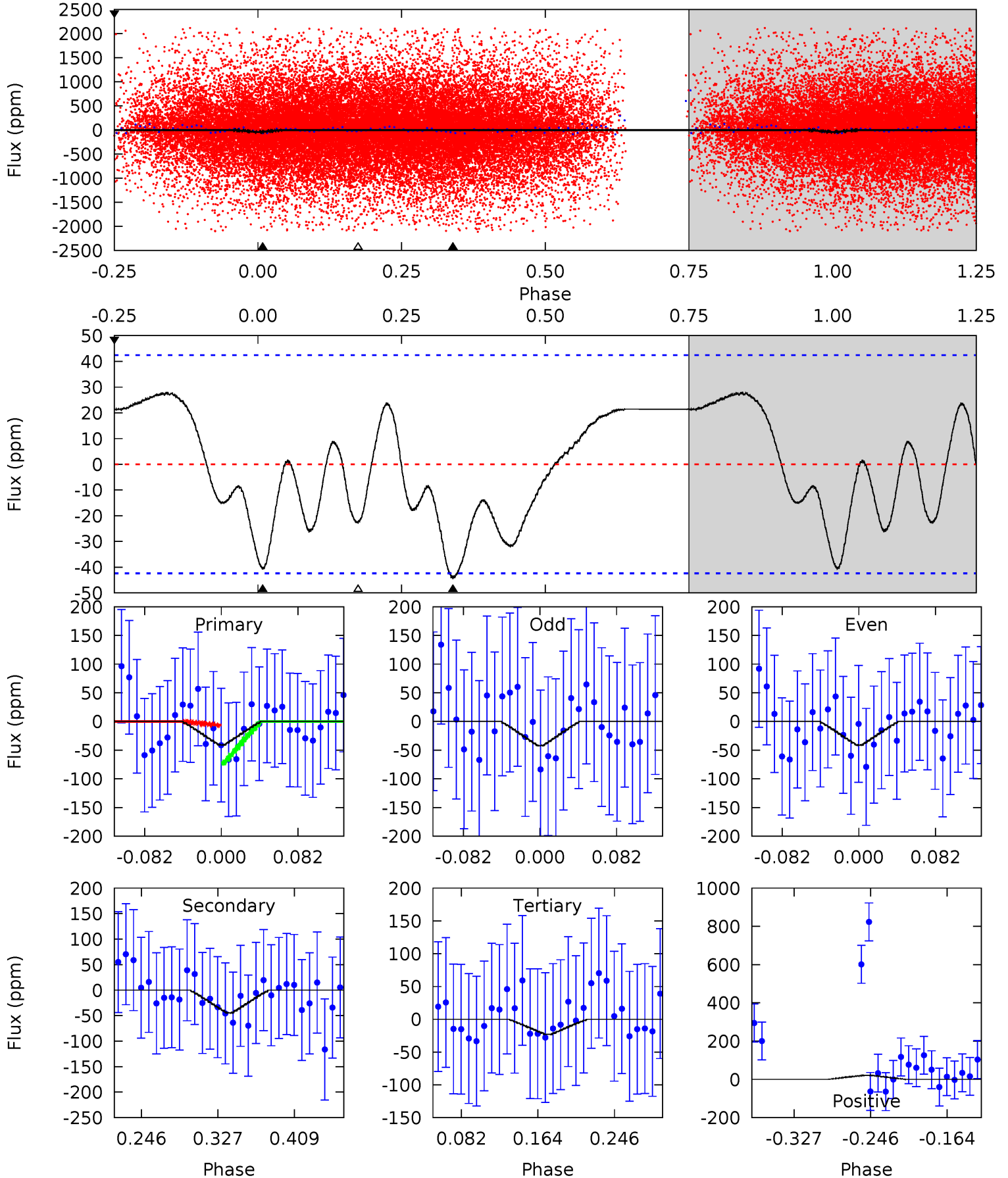
TCE 008004558-03 P= 0.512629 Days  $T_0=131.760732$  (BKJD)



# DV Model-Shift Uniqueness Test

008004558-03, P = 0.512680 Days, E = 131.237622 Days

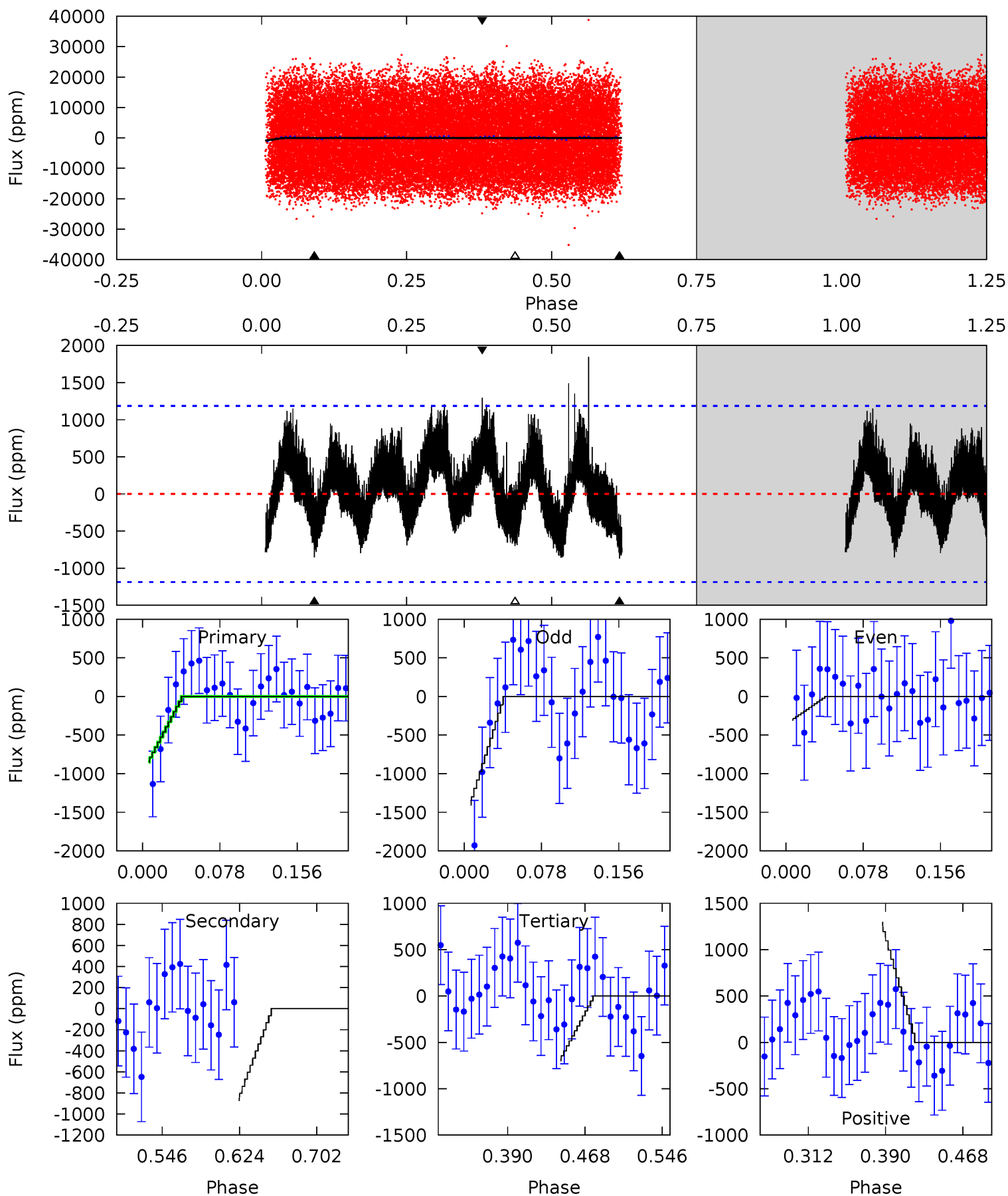
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.45	4.85	2.50	2.35	4.61	1.74	1.89	1.94	2.09	2.35	2.49	0.05	1.07	0.39	3.64



# Alt Model-Shift Uniqueness Test

008004558-03, P = 0.512629 Days, E = 131.248103 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
3.32	3.39	2.72	5.04	4.62	1.76	1.40	0.60	-1.71	0.67	-1.65	2.13	0	0.68	0





### Stellar Parameters For KIC 008004558

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7899^{+223}_{-335}$	$3.893^{+0.360}_{-0.090}$	$-0.440^{+0.250}_{-0.300}$	$2.451^{+0.355}_{-0.993}$	$1.713^{+0.173}_{-0.403}$	$0.164^{+0.439}_{-0.059}$
	+3%/-4%	+9%/-2%	+57%/-68%	+14%/-41%	+10%/-24%	+268%/-36%
Source	KIC0	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 008004558-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-45 \pm 9$	$3.62^{+3.82}_{-2.60}$	$6057^{+410}_{-610}$	$3939^{+6296}_{-8510}$	$0.394^{+4.353}_{-0.295}$
Alt.	$-871 \pm 257$	$6.61^{+5.60}_{-4.03}$	$6105^{+382}_{-610}$	$7782^{+9516}_{-2648}$	$2.229^{+13.198}_{-1.560}$

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

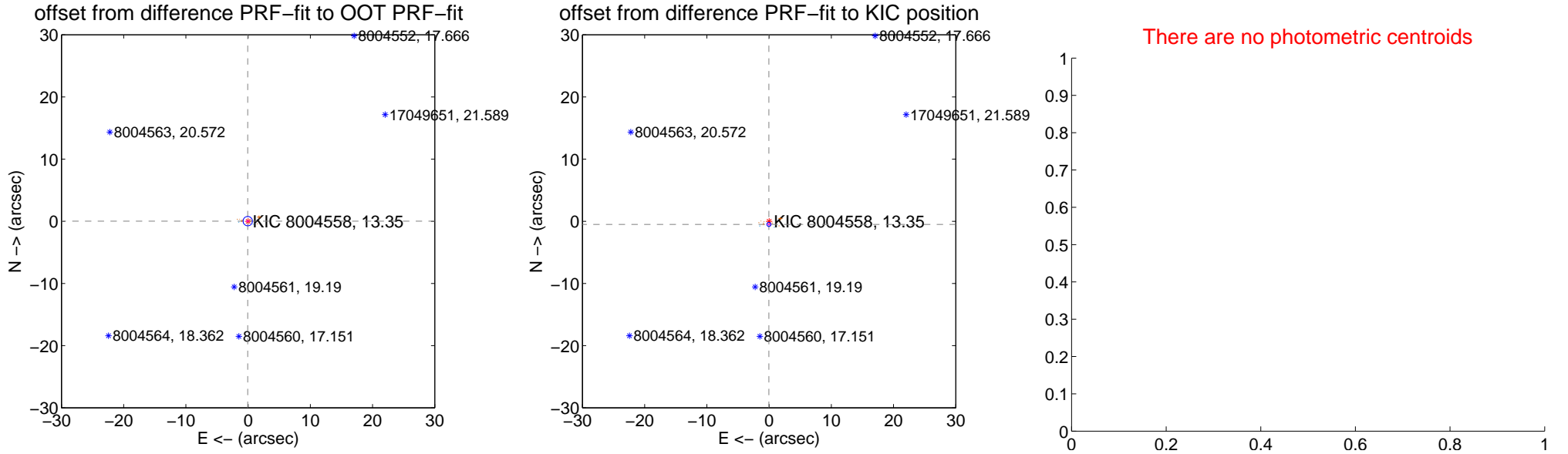
## DV Centroid Data

Supplemental centroid analysis for 008004558-03. Kepler magnitude: 13.35. Transit SNR 0.04

There are 6 quarters with good PRF difference image offsets

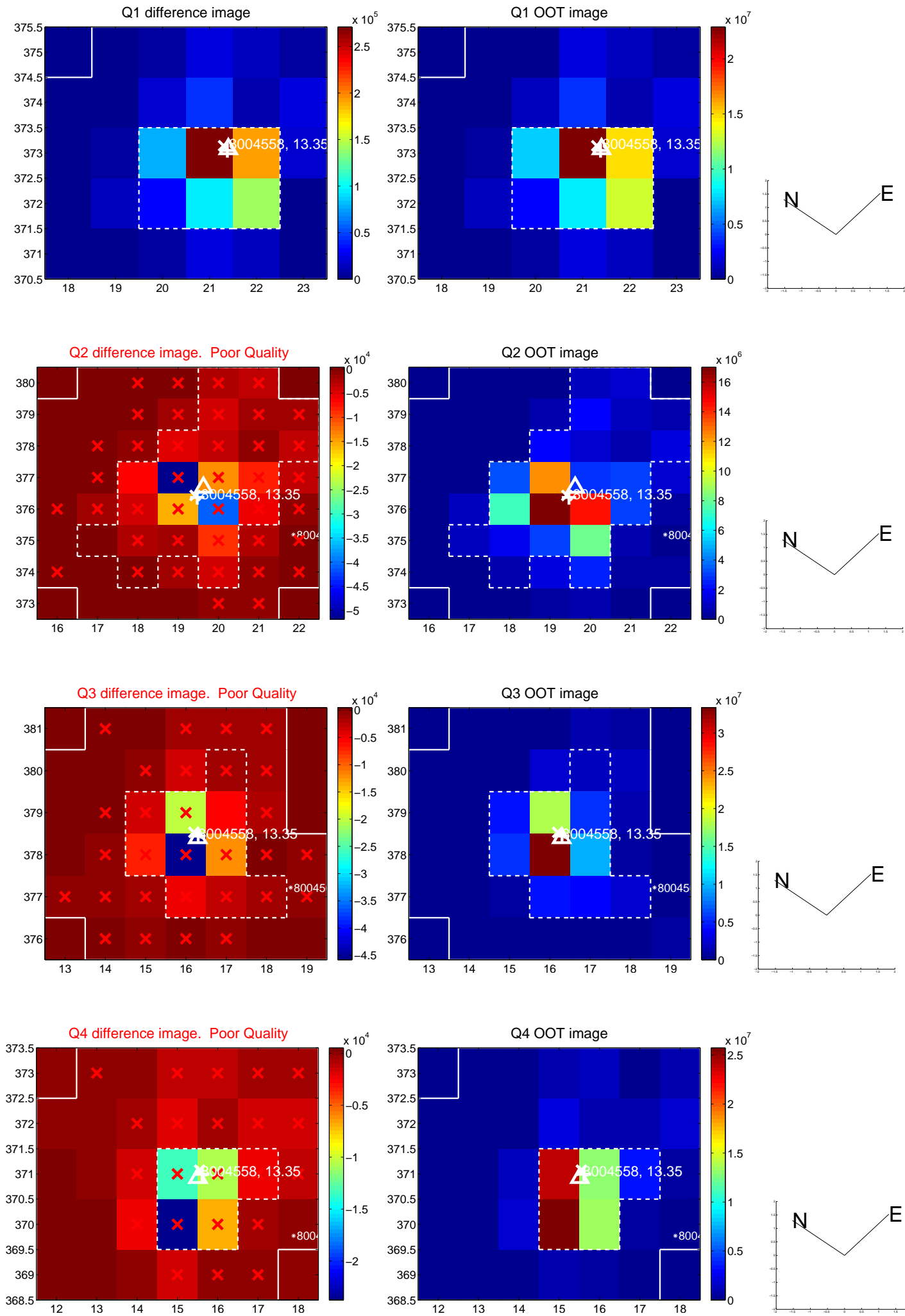
The direct PRF centroid is offset from the target star catalog position by about 0.72 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.064 \pm 0.250$	0.26	$0.058 \pm 0.266$	$0.027 \pm 0.095$
PRF-fit source offset from KIC position	$0.501 \pm 0.110$	4.55	$0.036 \pm 0.251$	$-0.500 \pm 0.109$
photometric centroid source offset	—	—	—	—

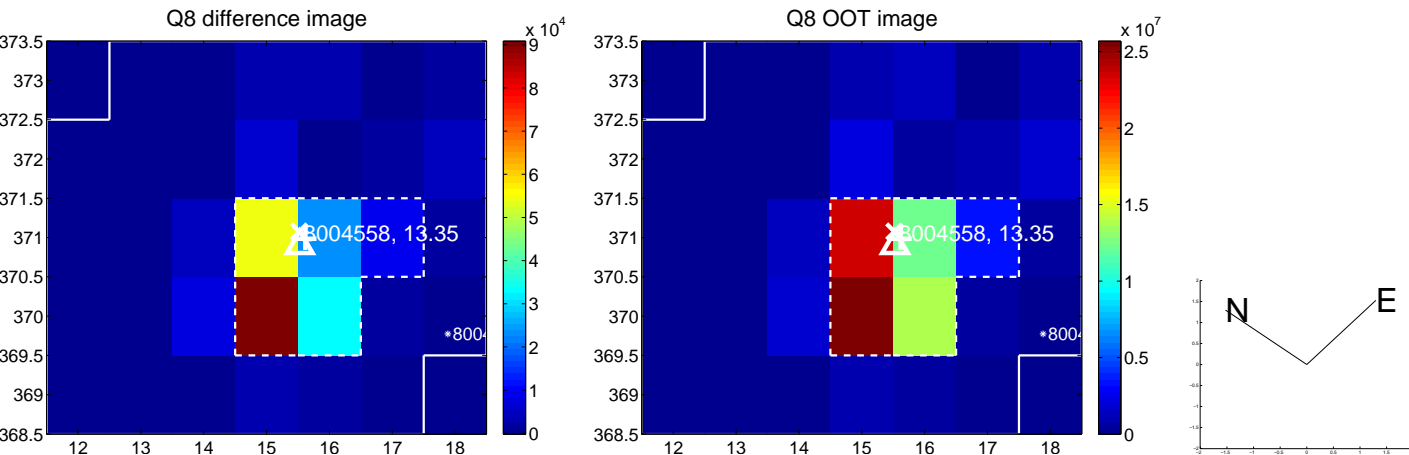
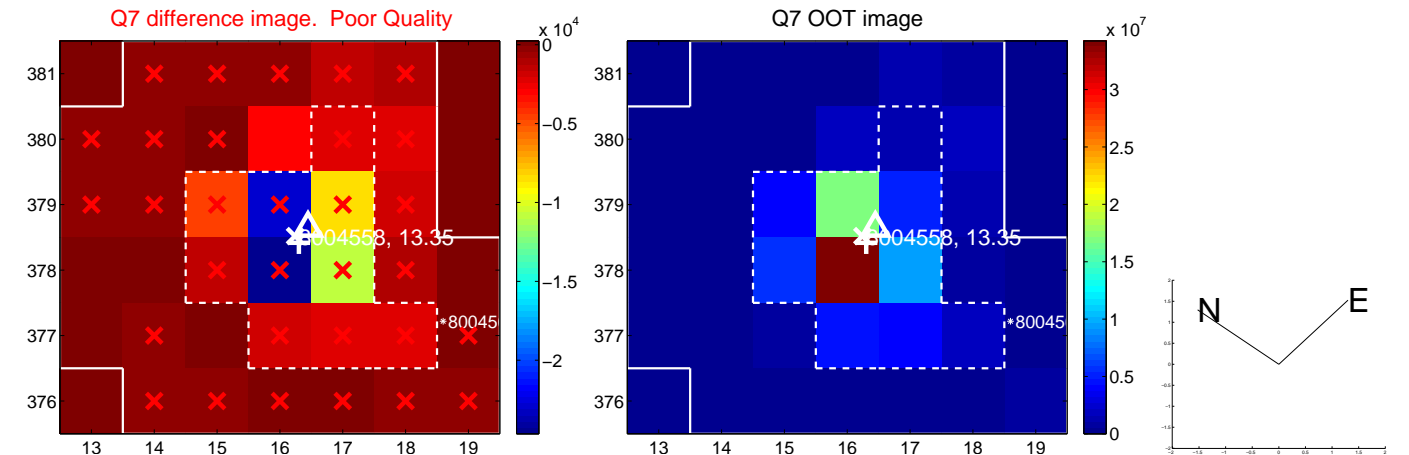
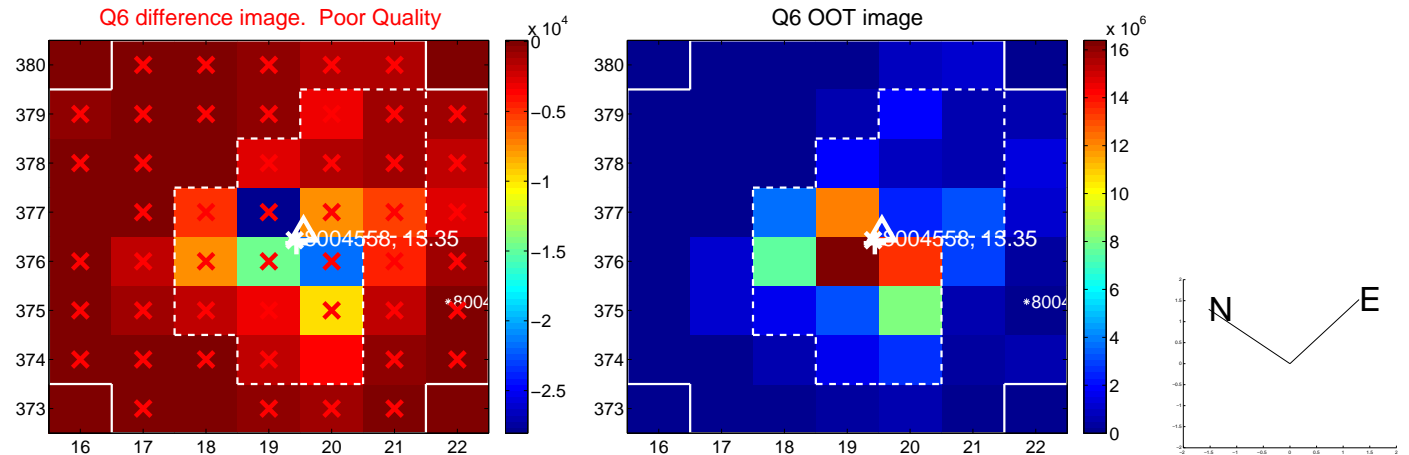
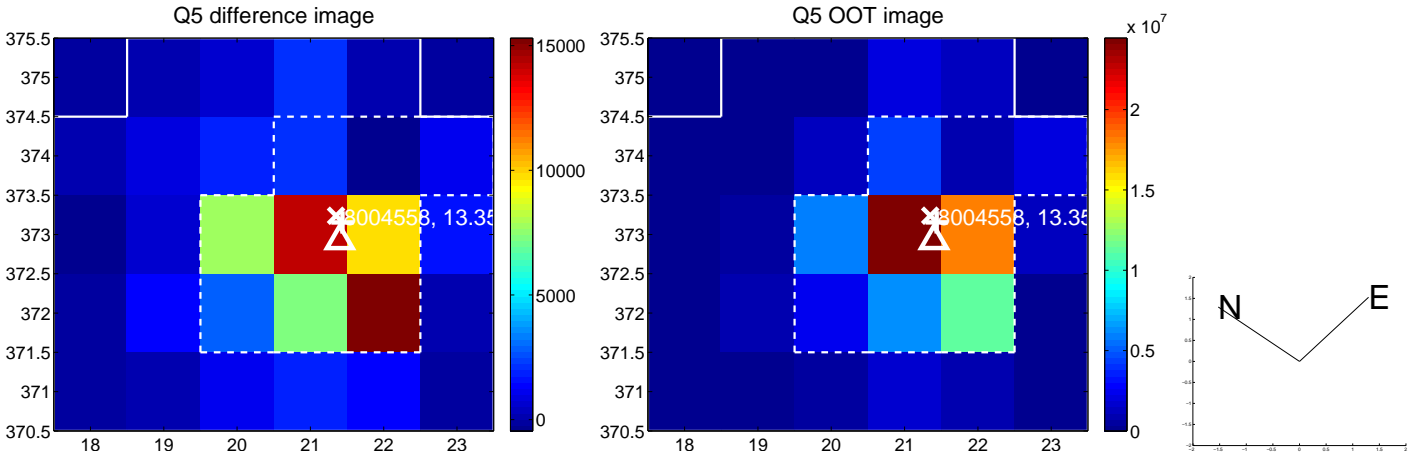


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

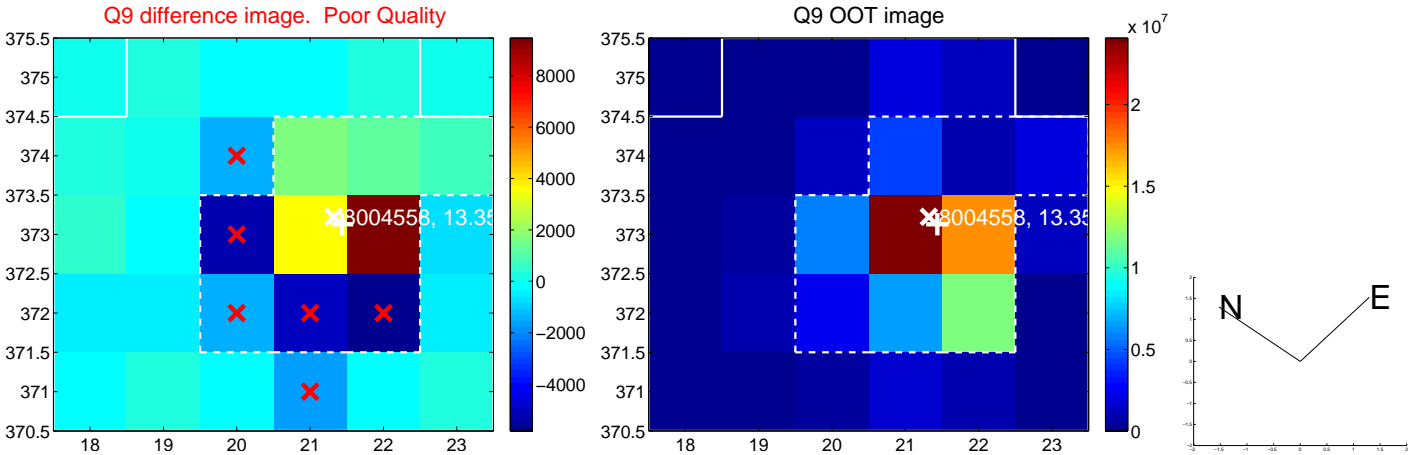
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



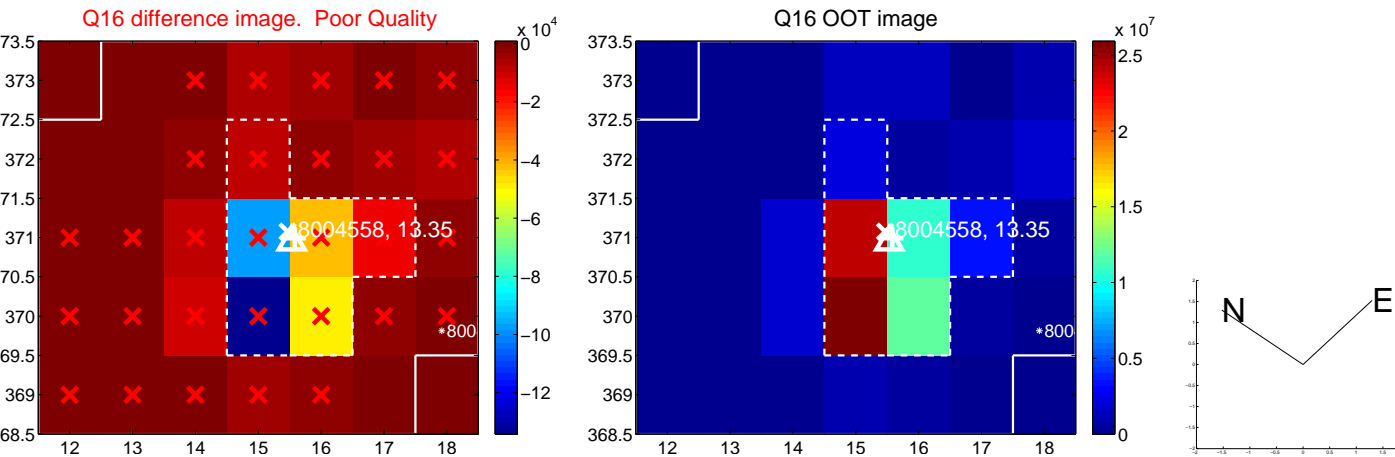
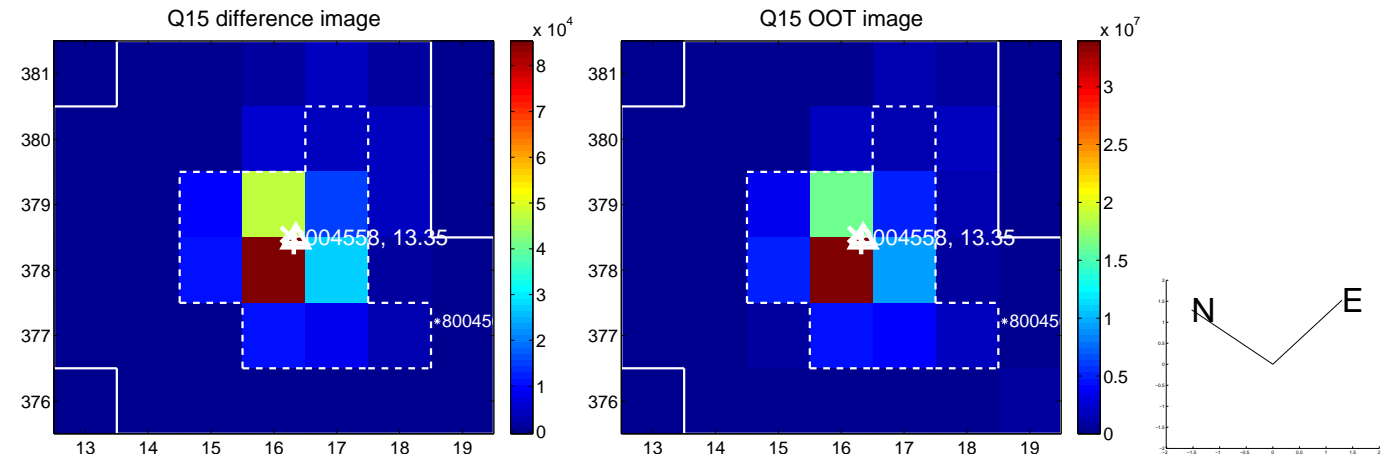
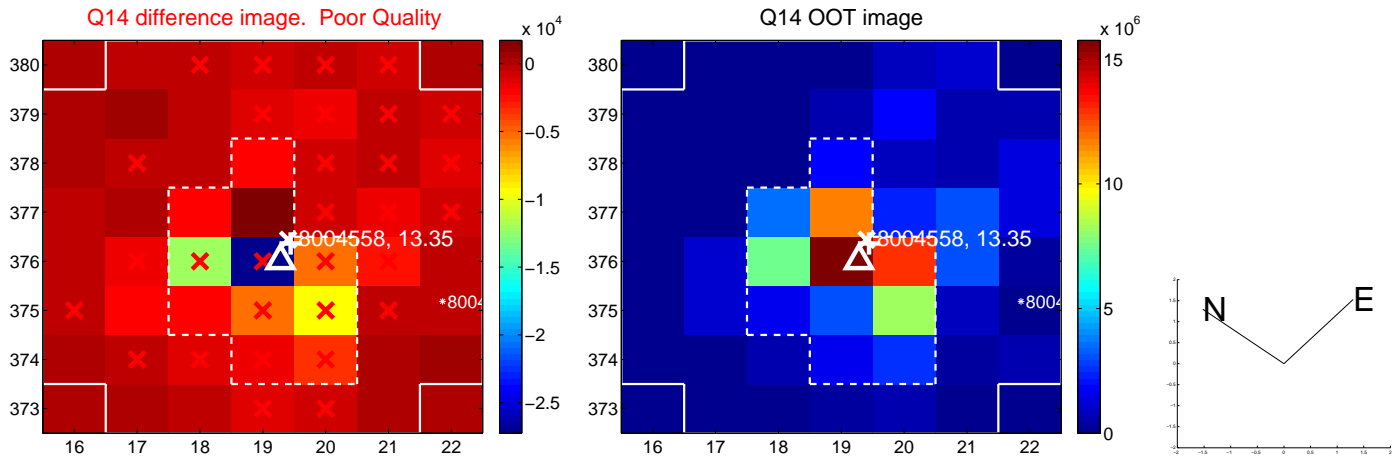
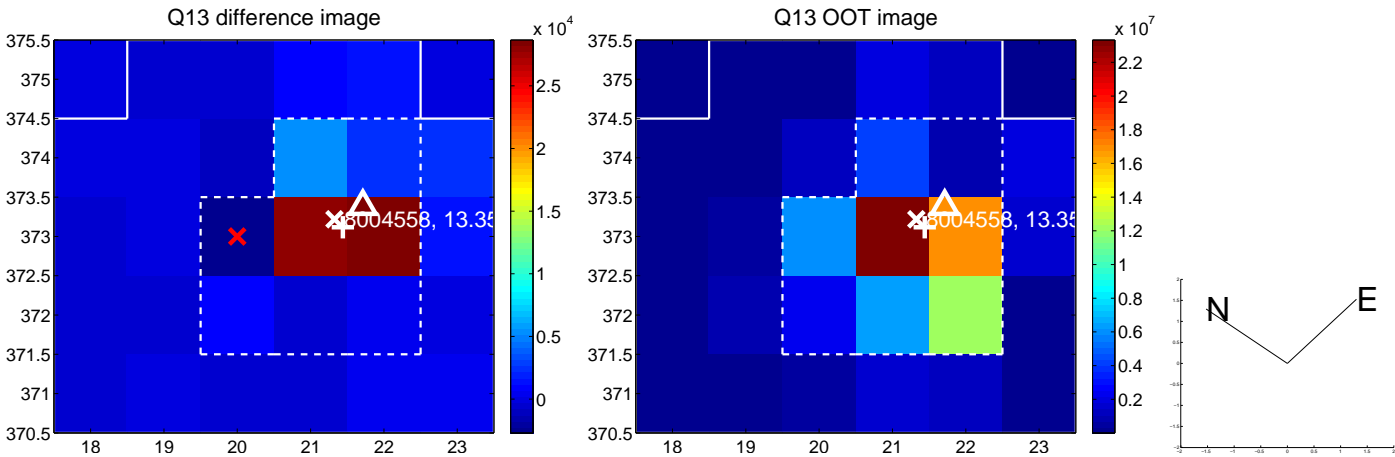
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

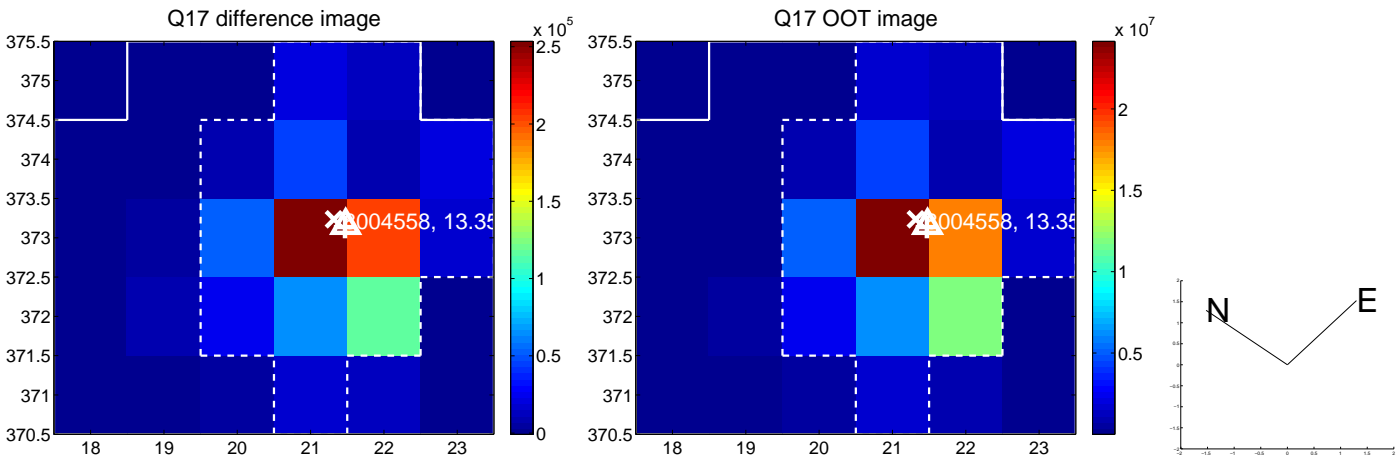


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





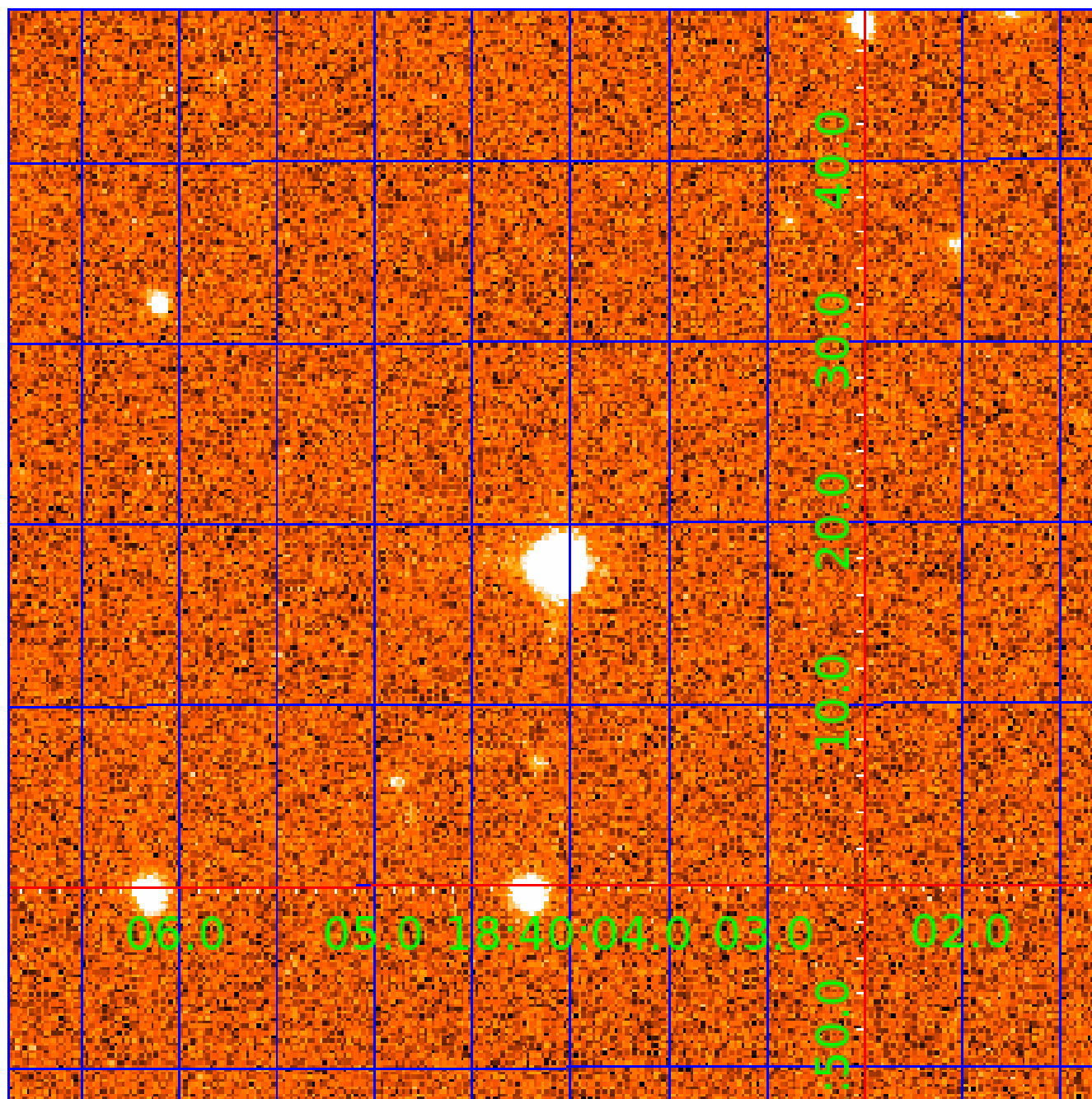
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



folded centroid time series figure for this object.

UKIRT Image

Declination



# KIC 008004558

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008004558-01	OBS	No	303.301560	433.724331	1655.5	2.137	13.1	7.5	2.45	7899	10.88	18.75
008004558-02	OBS	No	0.512625	131.670859	116.3	1.257	11.5	13.4	2.45	7899	3.08	93113.34
008004558-03	OBS	No	0.512680	131.750302	0.6	0.568	9.1	0.0	2.45	7899	0.19	93100.01
008004558-04	OBS	No	1.237640	132.655273	269.7	4.500	9.2	-1.0	2.45	7899	4.08	28748.76

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008004558-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008004558-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_KIC_POS
008004558-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD—CENT_KIC_POS
008004558-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_NOFITS

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

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

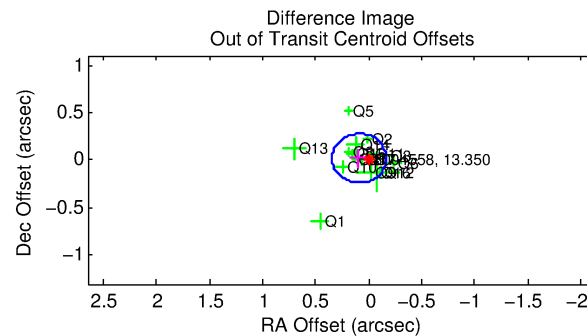
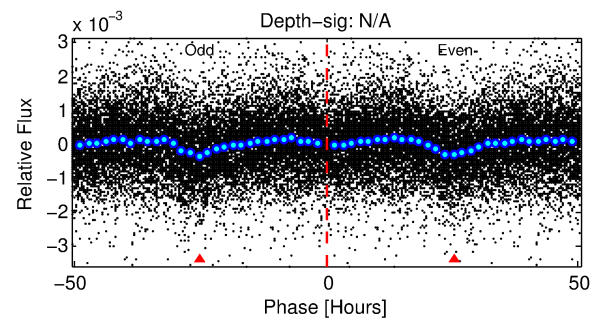
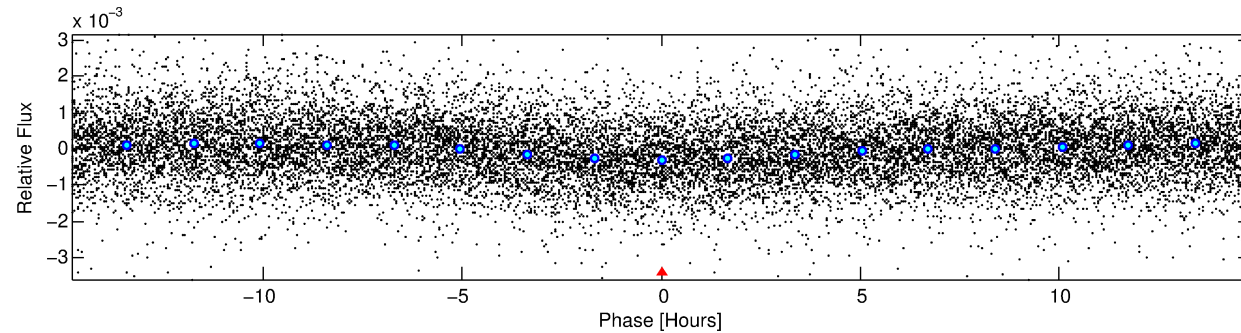
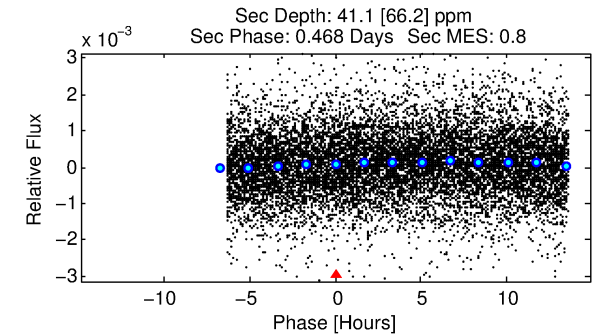
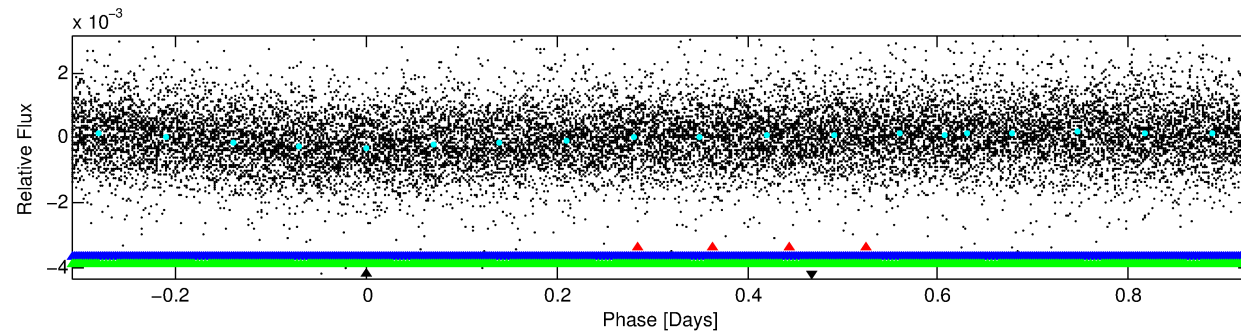
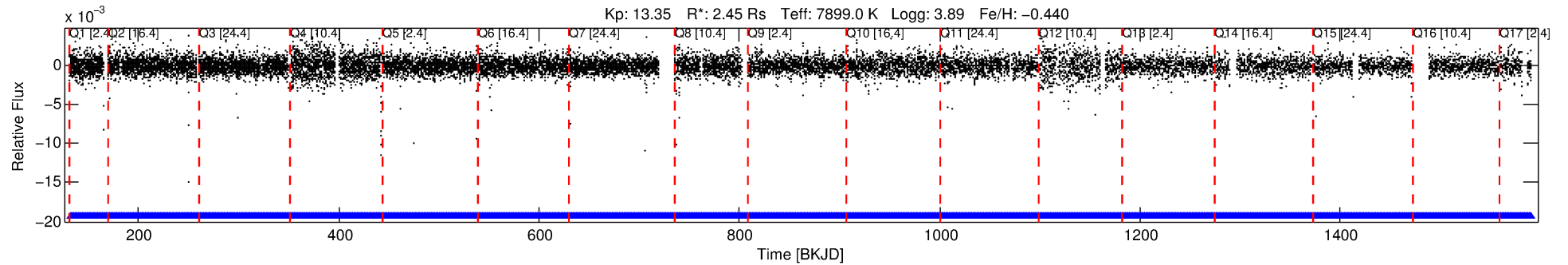
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008004558-04

No Significant Match Found

# DV One-Page Summary

KIC: 8004558 Candidate: 4 of 4 Period: 1.238 d



## TPS TCE Results:

Period = 1.23764 d  
Epoch = 132.6553 BKJD

DV fit results are unavailable

## DV Diagnostic Results:

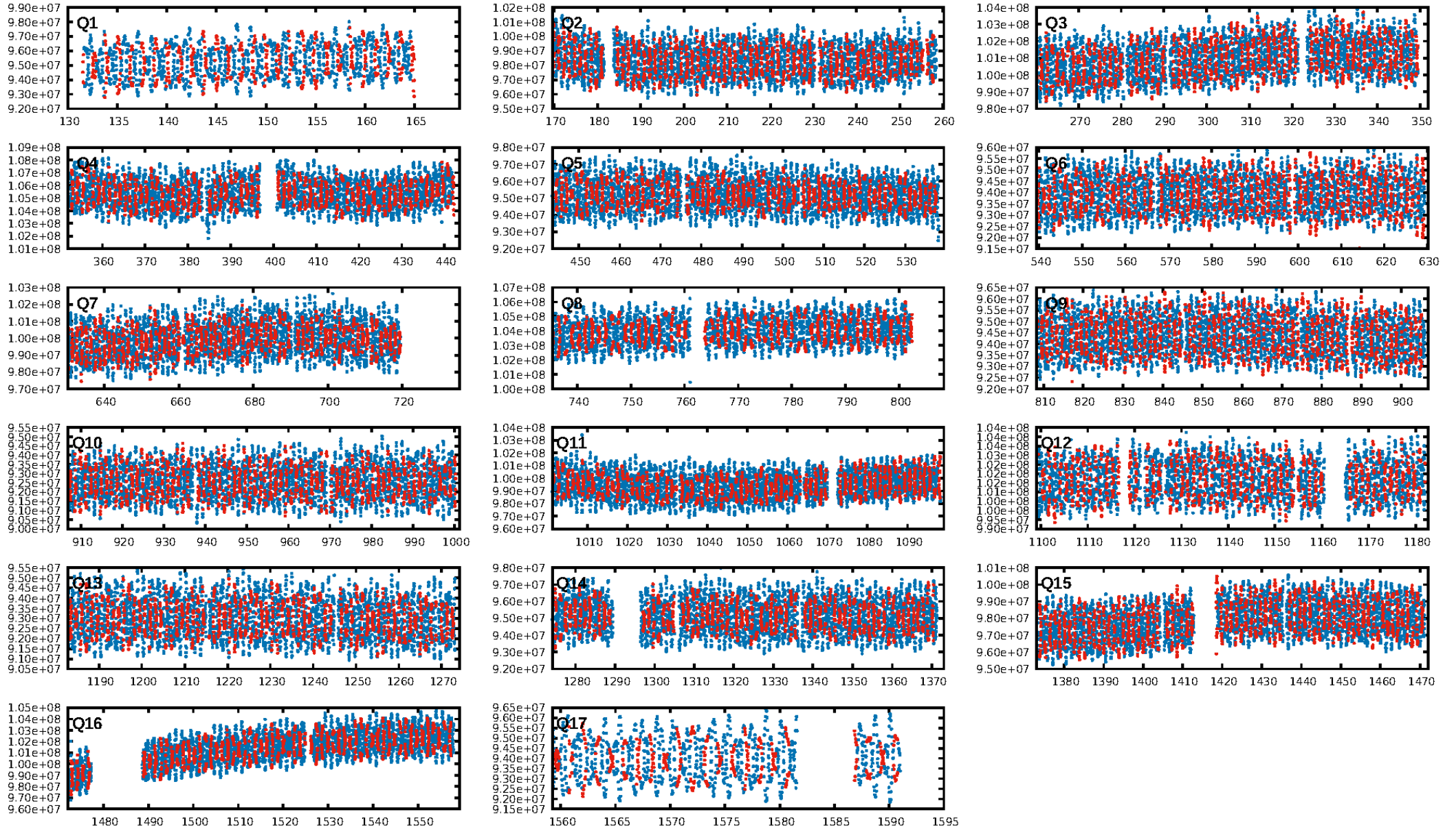
ShortPeriod-sig: 100.0% [3.84 $\sigma$ ]  
LongPeriod-sig: 100.0% [1455.21 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [996/996]  
GhostDiagnostic-chr: 1.078

Centroid-sig: 0.0%  
Centroid-so: 1.176 arcsec [23.09 $\sigma$ ]  
OotOffset-rm: 0.095 arcsec [1.10 $\sigma$ ]  
KicOffset-rm: 0.434 arcsec [4.61 $\sigma$ ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 15:36:43 Z

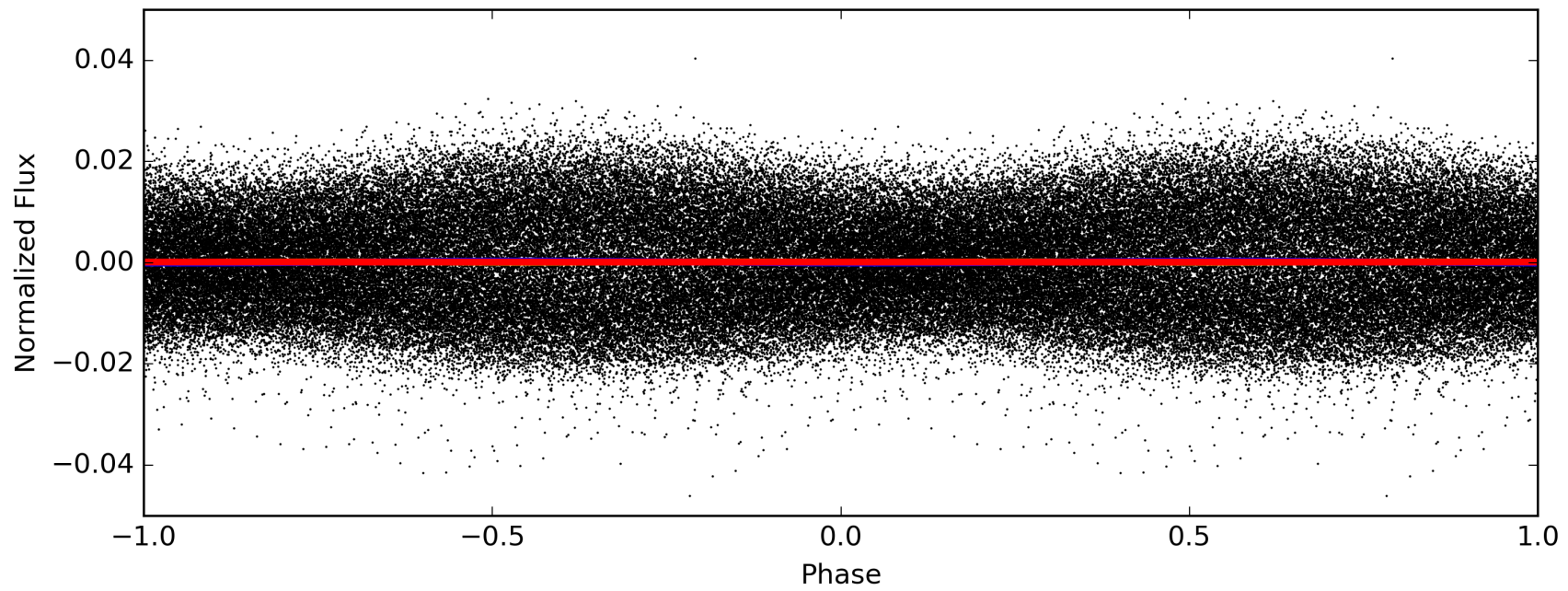
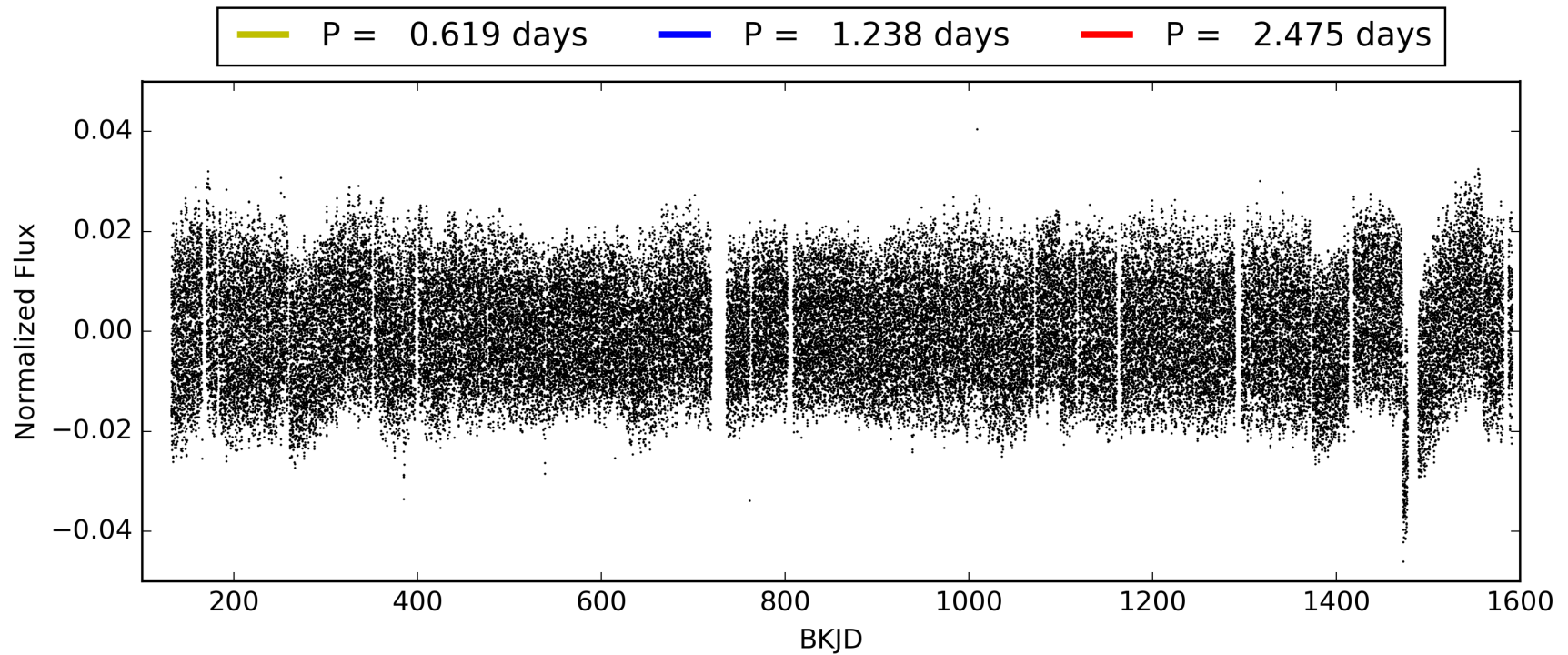
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008004558-04, PDC Light Curves





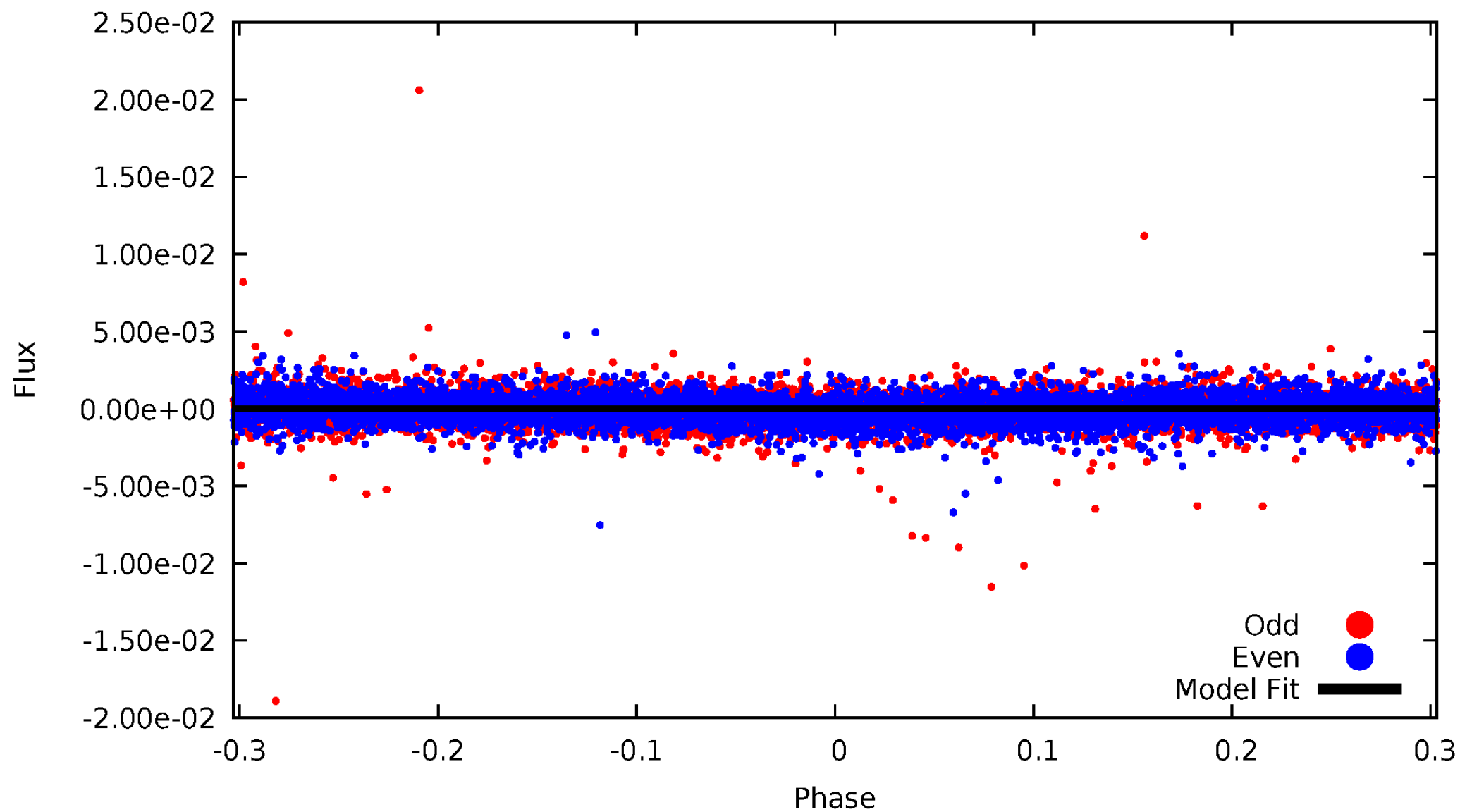
TCE 008004558-04





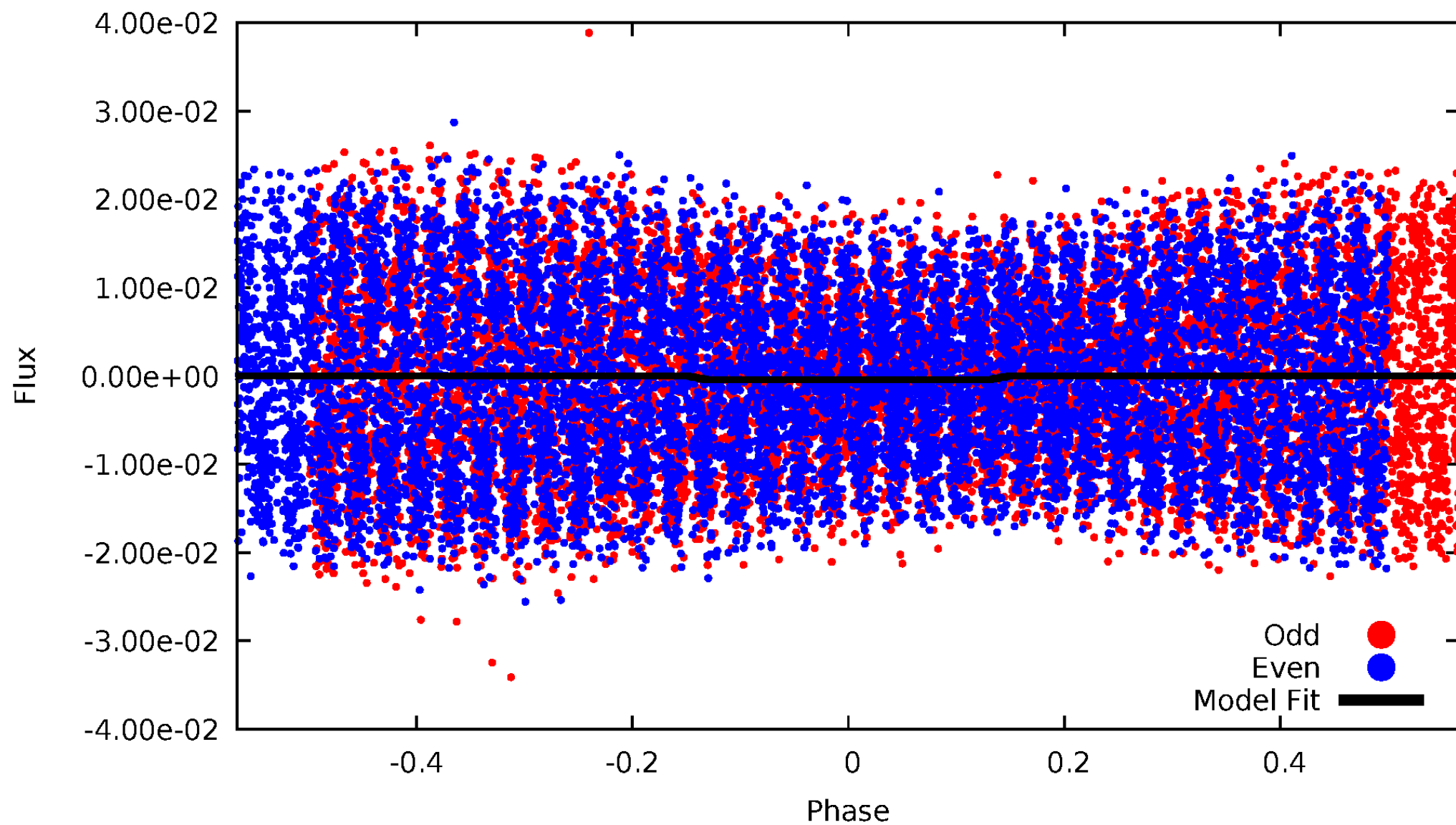
# DV Odd/Even

TCE 008004558-04



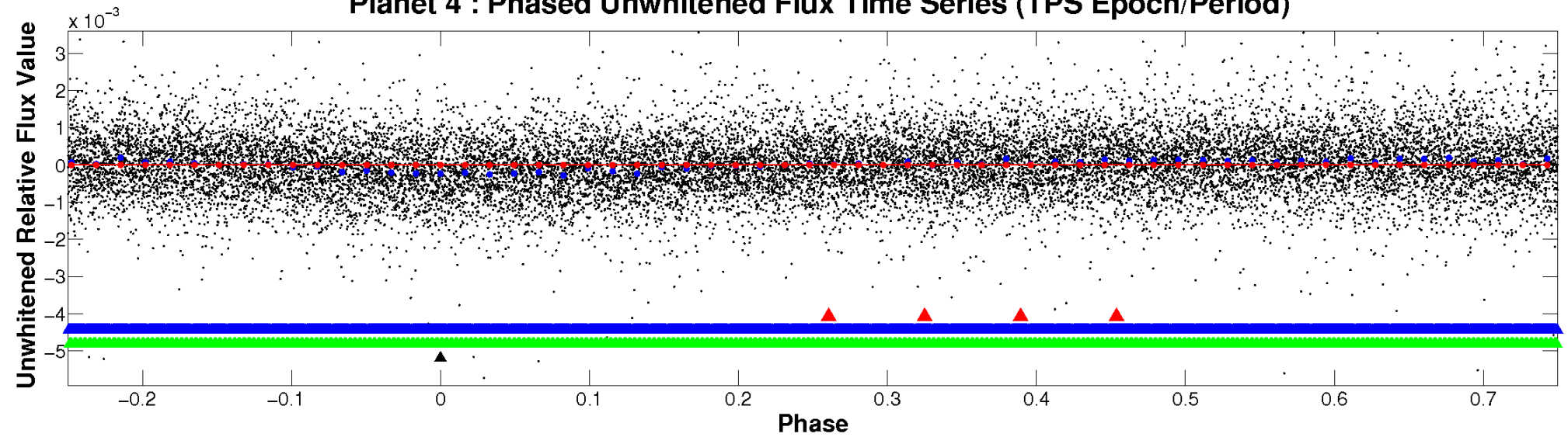
# ALT Odd/Even

TCE 008004558-04



# Non-Whitened Vs. Whitened Light Curve

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

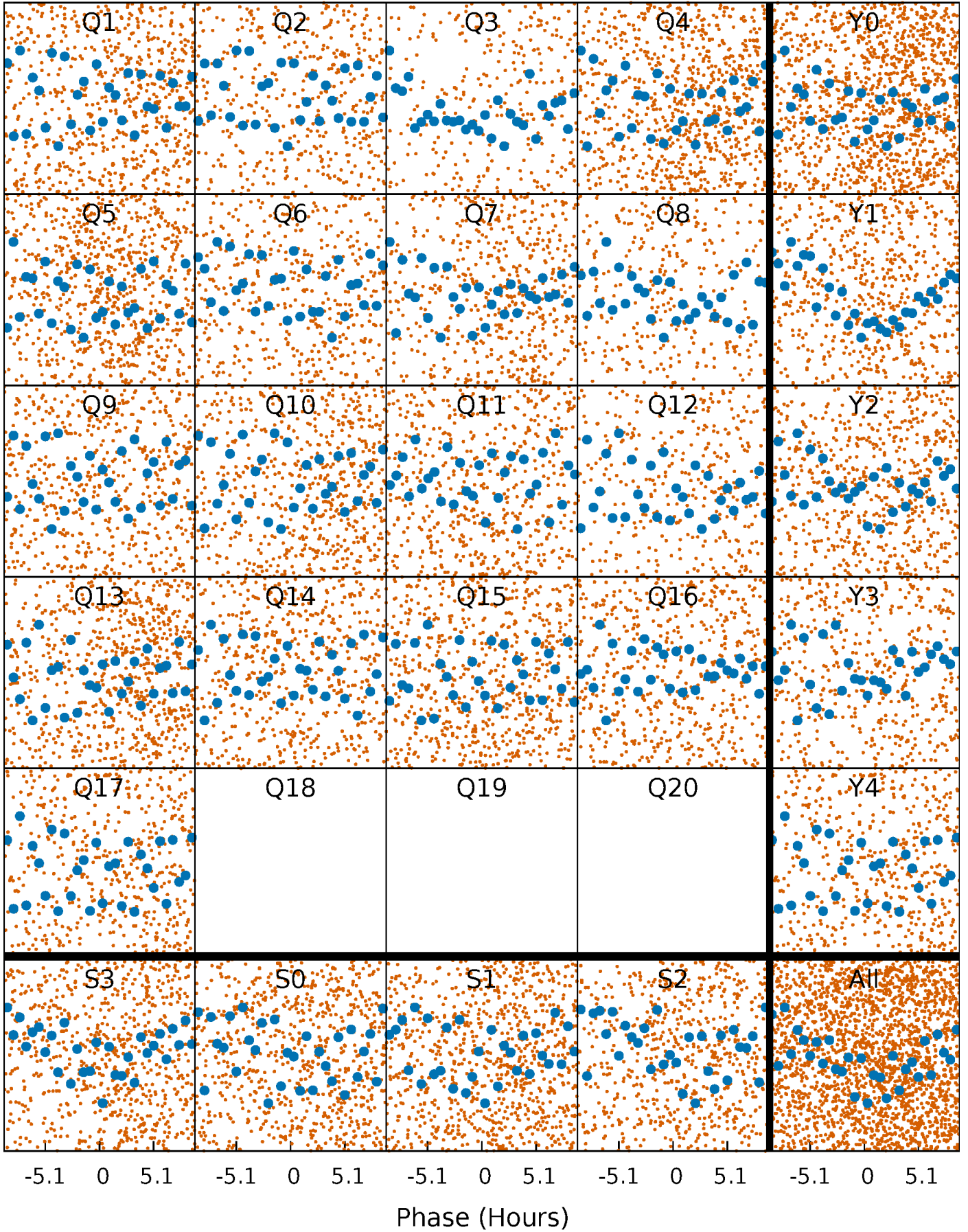


**Planet 4 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



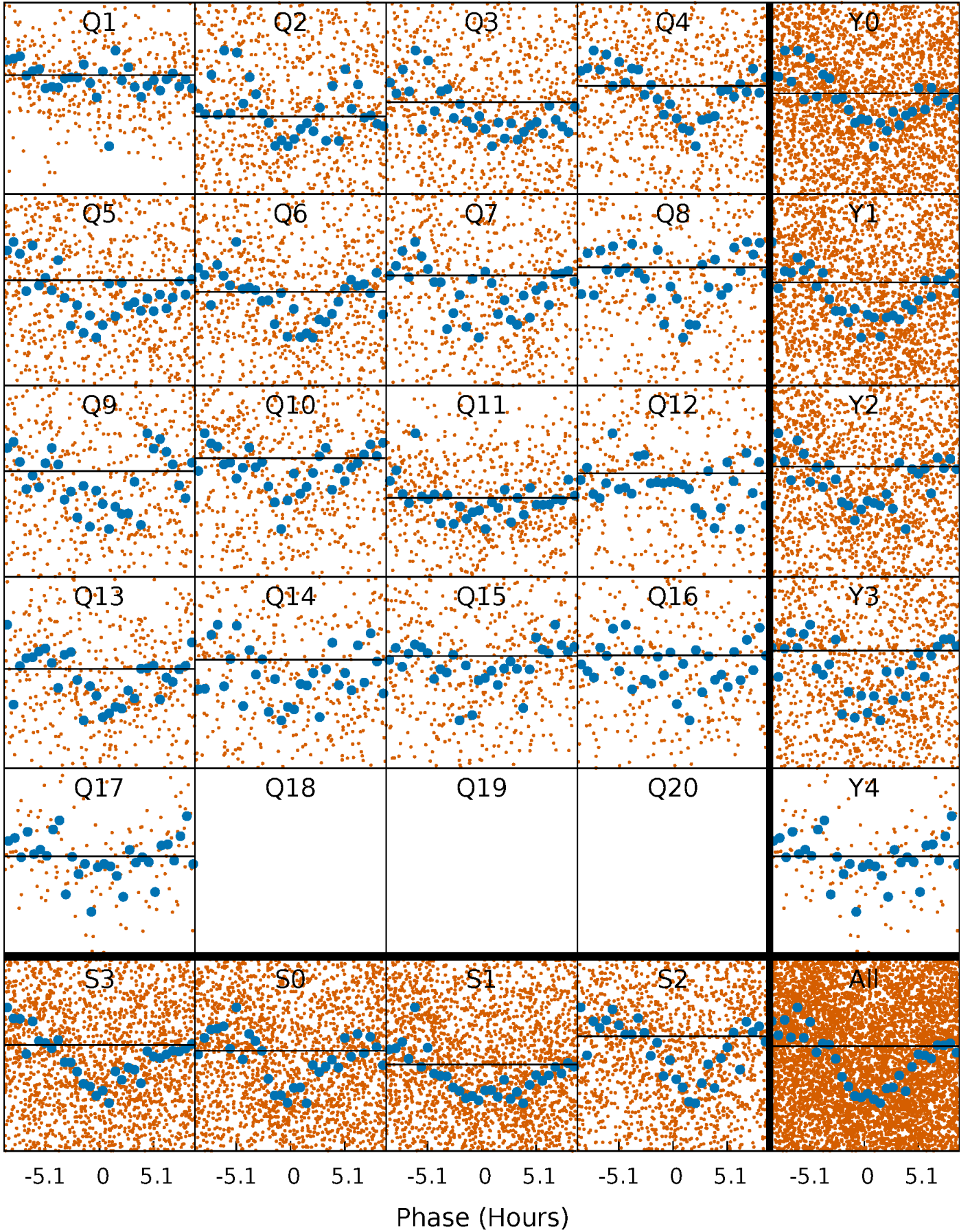
# PDC Quarter-Phased Transit Curves

TCE 008004558-04   P= 1.237640 Days    $T_0=132.655273$  (BKJD)



# DV Quarter-Phased Transit Curves

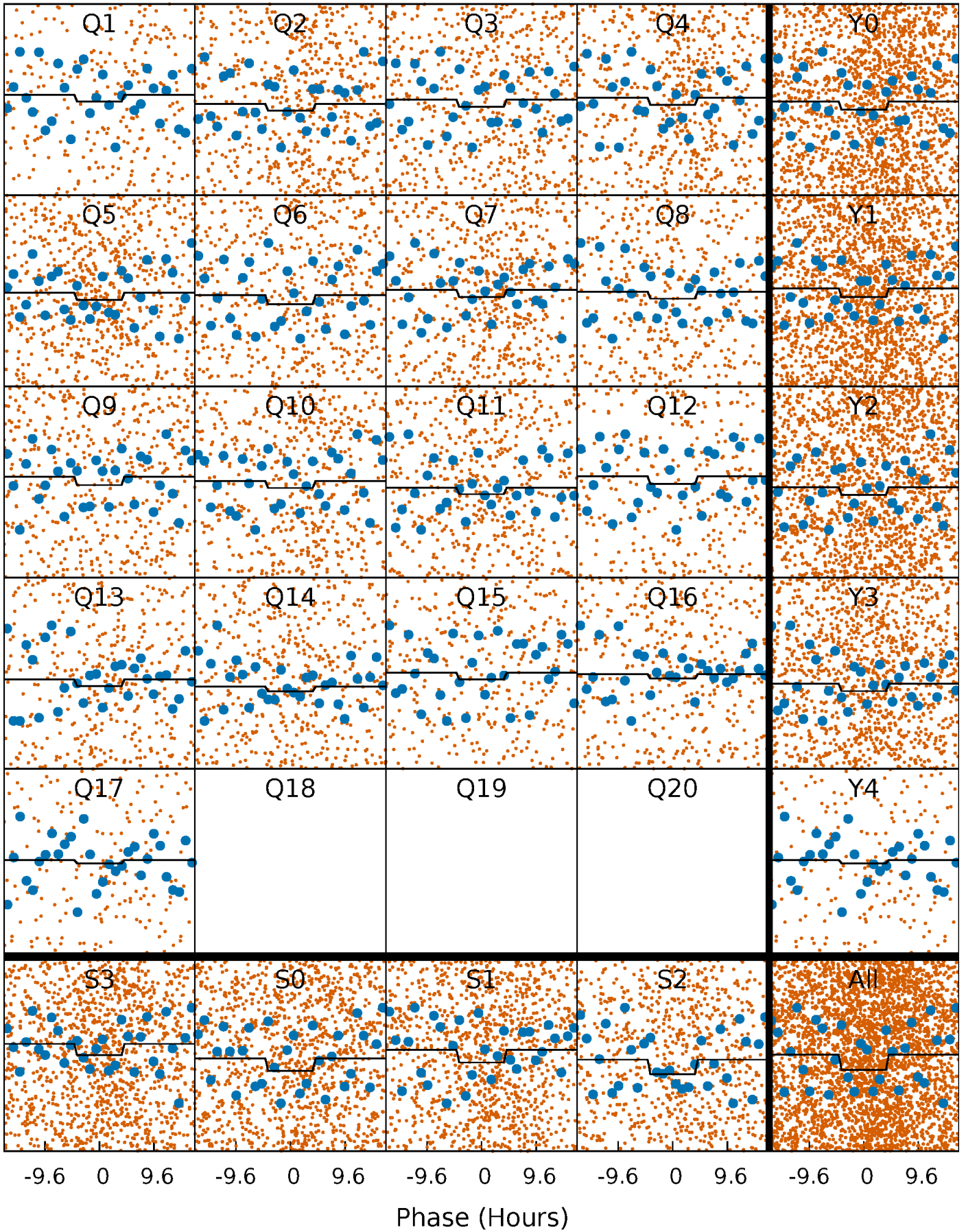
TCE 008004558-04     $P = 1.237640$  Days     $T_0 = 132.655273$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 008004558-04 P= 1.237640 Days  $T_0=132.693235$  (BKJD)

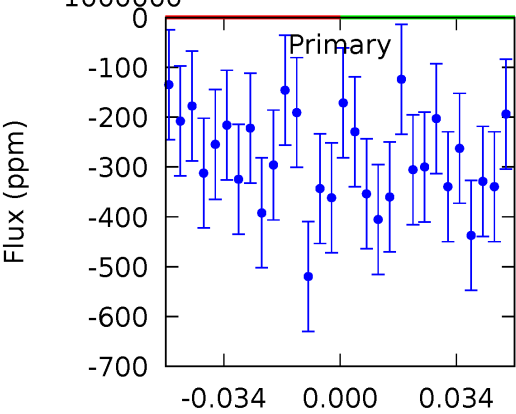
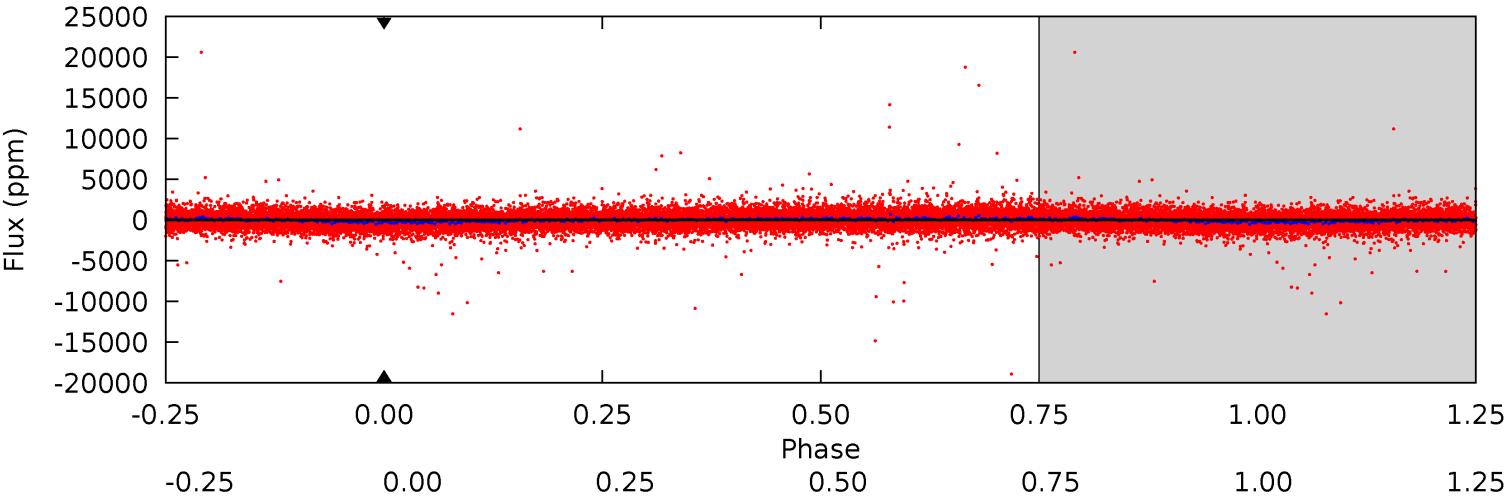




DV Model-Shift Uniqueness Test

008004558-04, P = 1.237640 Days, E = 131.417633 Days

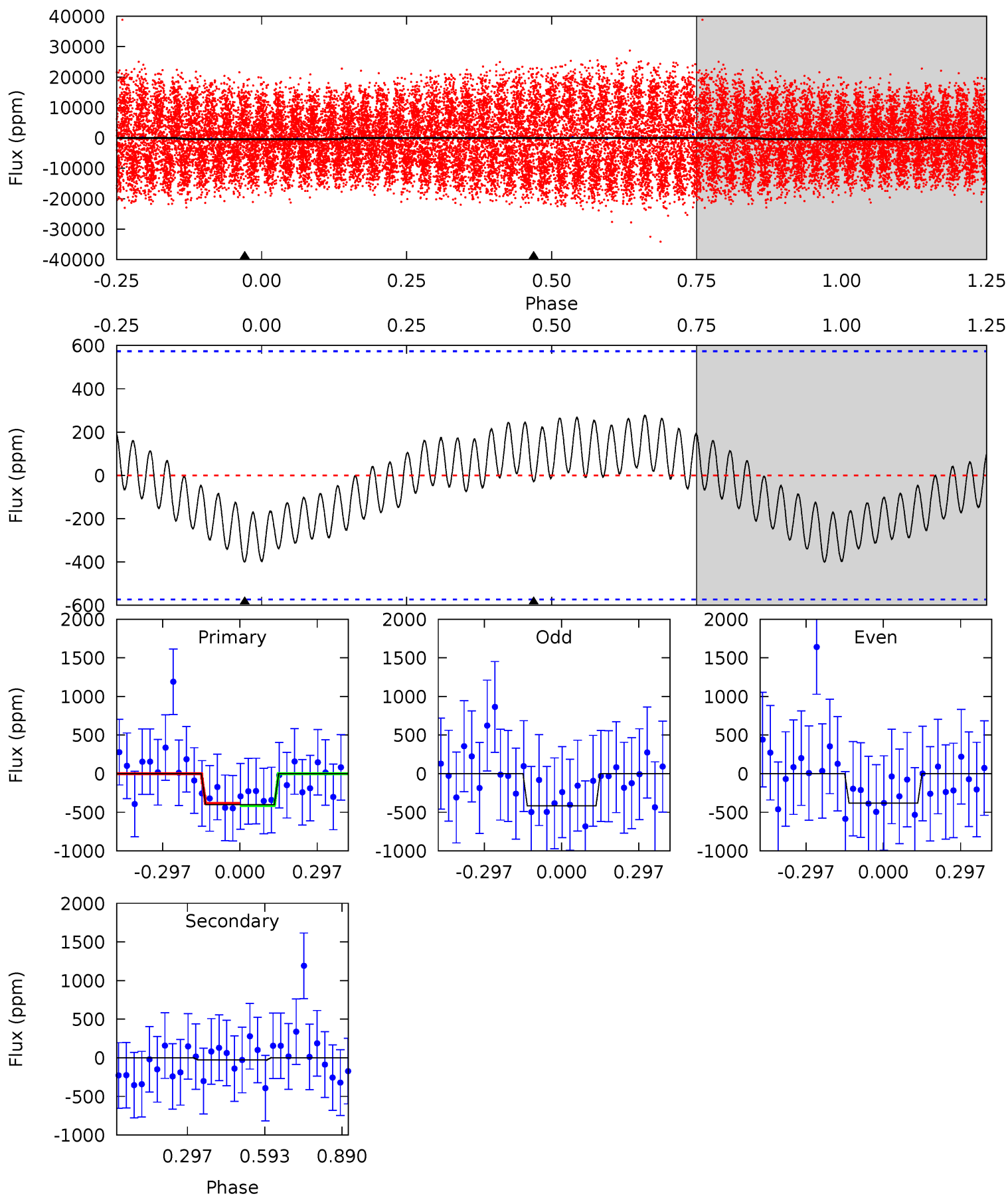
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

008004558-04, P = 1.237640 Days, E = 131.455595 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
3.02	0.21	0	0	4.33	1.04	0.82	3.02	3.02	0.21	0.21	0.15	1.18	0.41	0.12



### Stellar Parameters For KIC 008004558

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7899^{+223}_{-335}$	$3.893^{+0.360}_{-0.090}$	$-0.440^{+0.250}_{-0.300}$	$2.451^{+0.355}_{-0.993}$	$1.713^{+0.173}_{-0.403}$	$0.164^{+0.439}_{-0.059}$
	+3%/-4%	+9%/-2%	+57%/-68%	+14%/-41%	+10%/-24%	+268%/-36%
Source	KIC0	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 008004558-04 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$0 \pm 1000000$	$17.67^{+19.01}_{-12.51}$	$4519^{+308}_{-472}$	$4904^{+44242}_{-44520}$	$1.255^{+261.438}_{-184.438}$
Alt.	$-28 \pm 132$	$18.76^{+19.36}_{-13.33}$	$4536^{+298}_{-458}$	$-3900^{+7279}_{-375}$	$0.015^{+0.435}_{-0.171}$

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

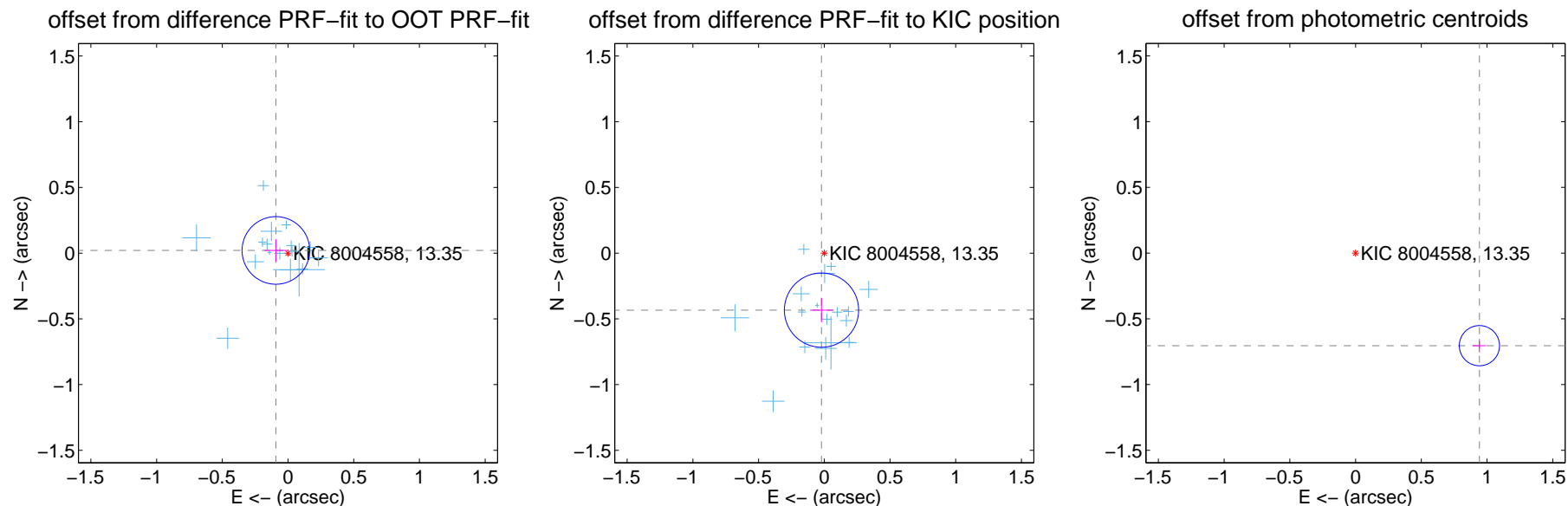
## DV Centroid Data

Supplemental centroid analysis for 008004558-04. Kepler magnitude: 13.35. Transit SNR -1.00

There are 17 quarters with good PRF difference image offsets

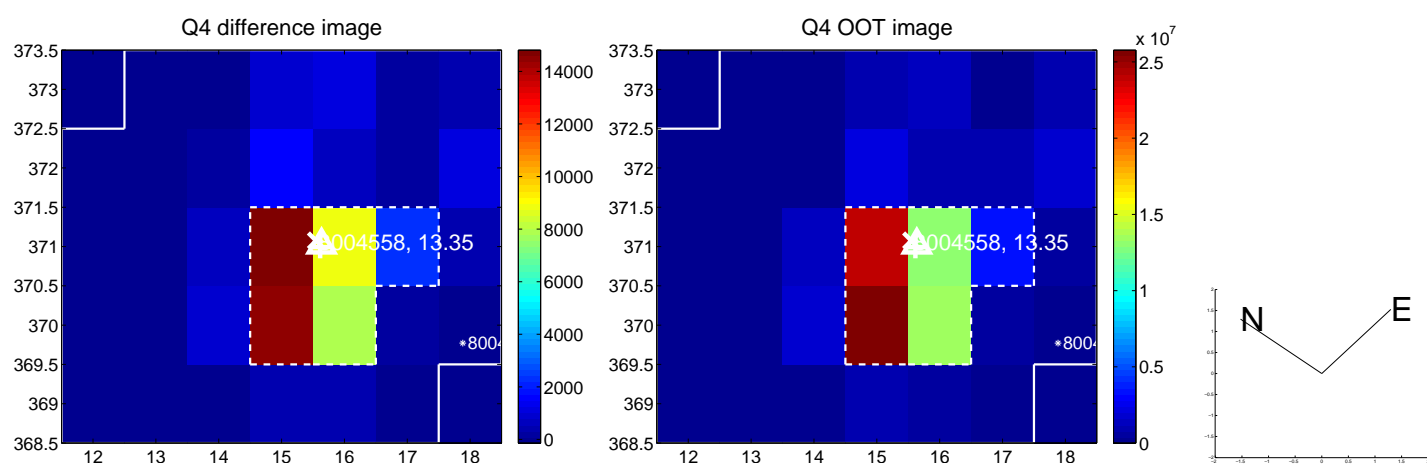
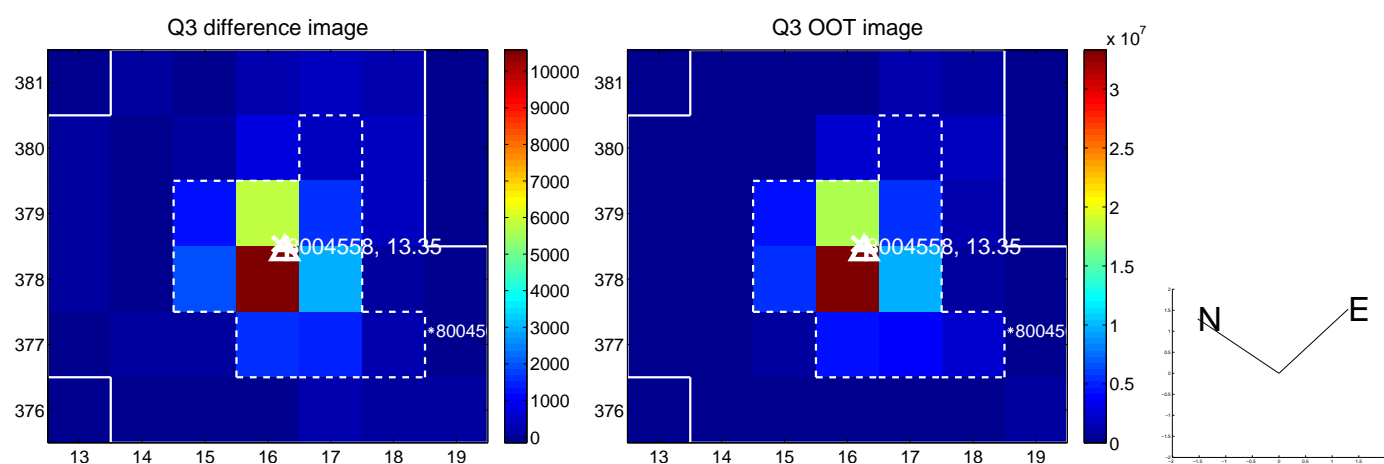
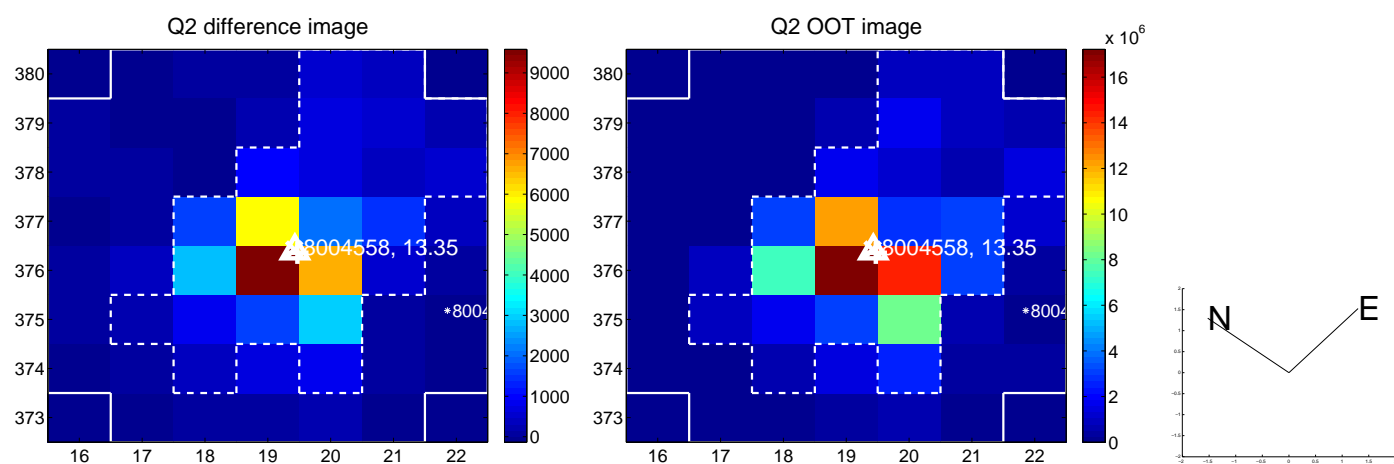
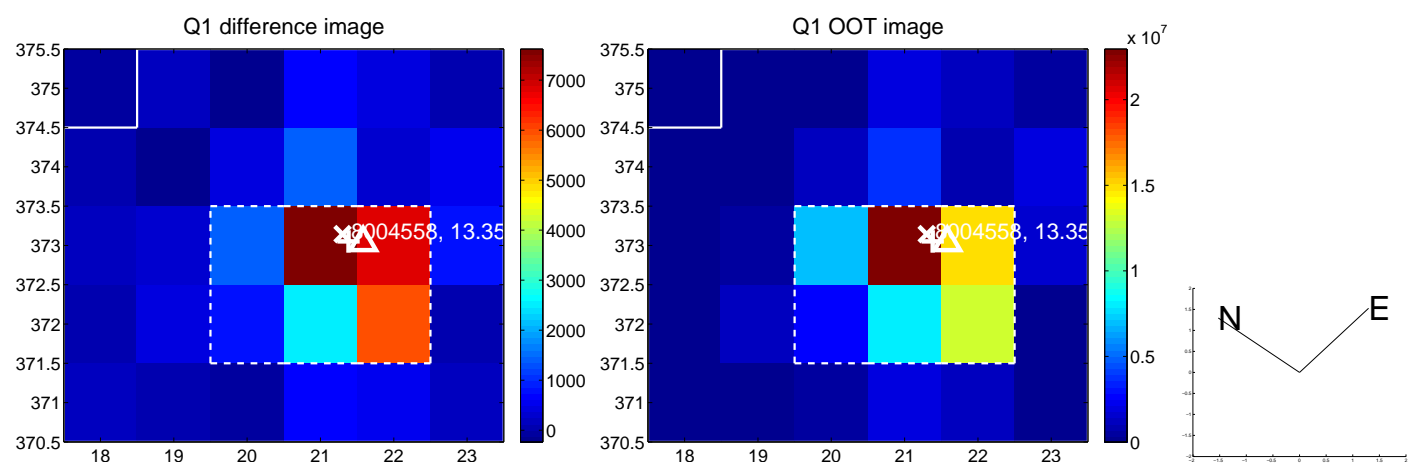
The direct PRF centroid is offset from the target star catalog position by about 0.72 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.095 \pm 0.086$	1.10	$0.092 \pm 0.087$	$0.021 \pm 0.086$
PRF-fit source offset from KIC position	$0.434 \pm 0.094$	4.61	$0.021 \pm 0.086$	$-0.433 \pm 0.094$
photometric centroid source offset	$1.18 \pm 0.05$	23.09	$-0.94 \pm 0.05$	$-0.70 \pm 0.05$

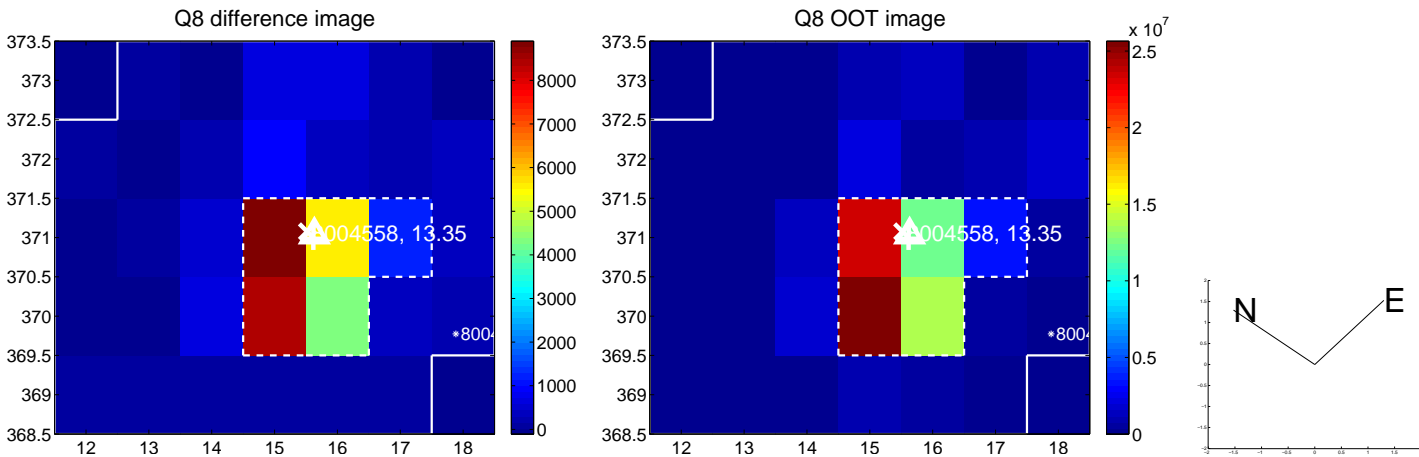
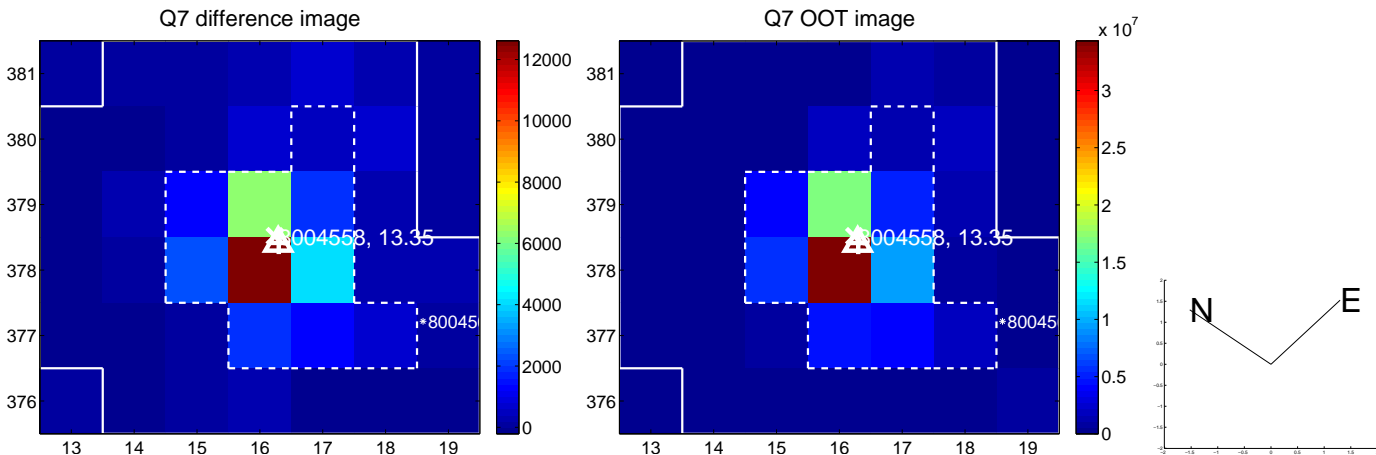
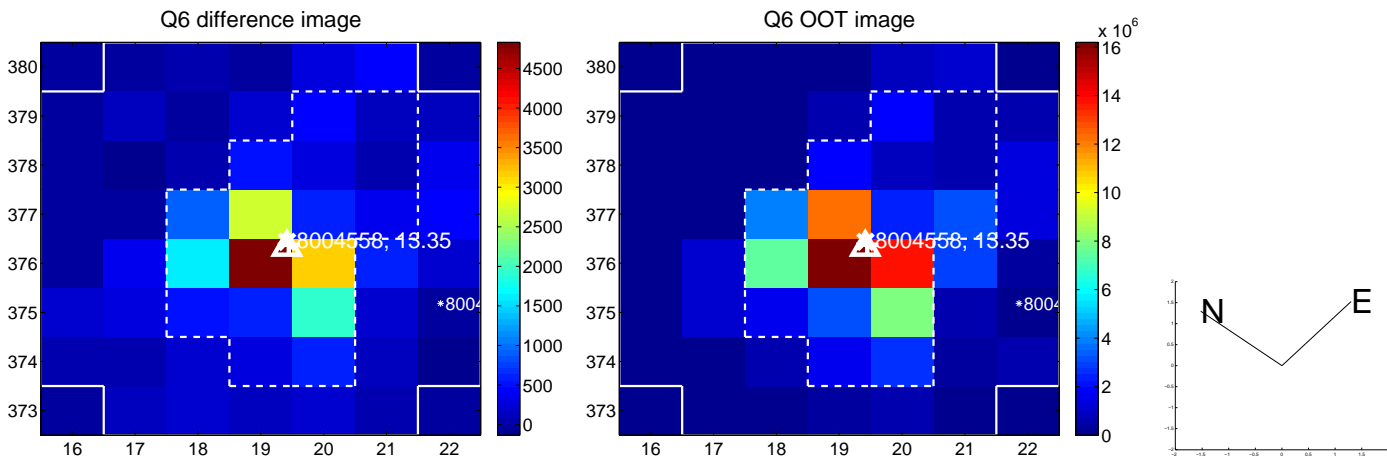
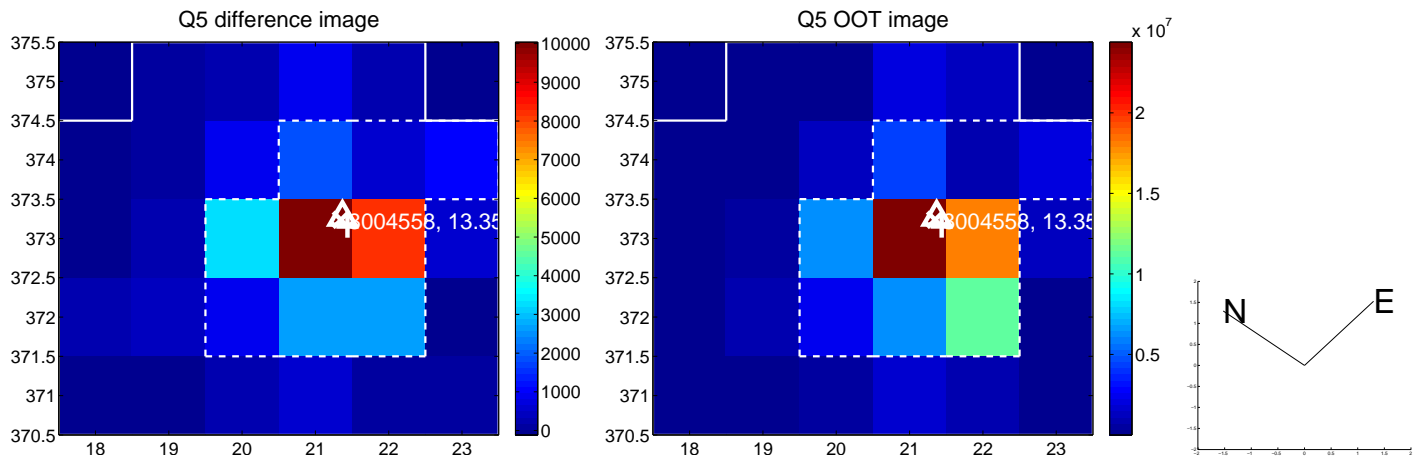


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

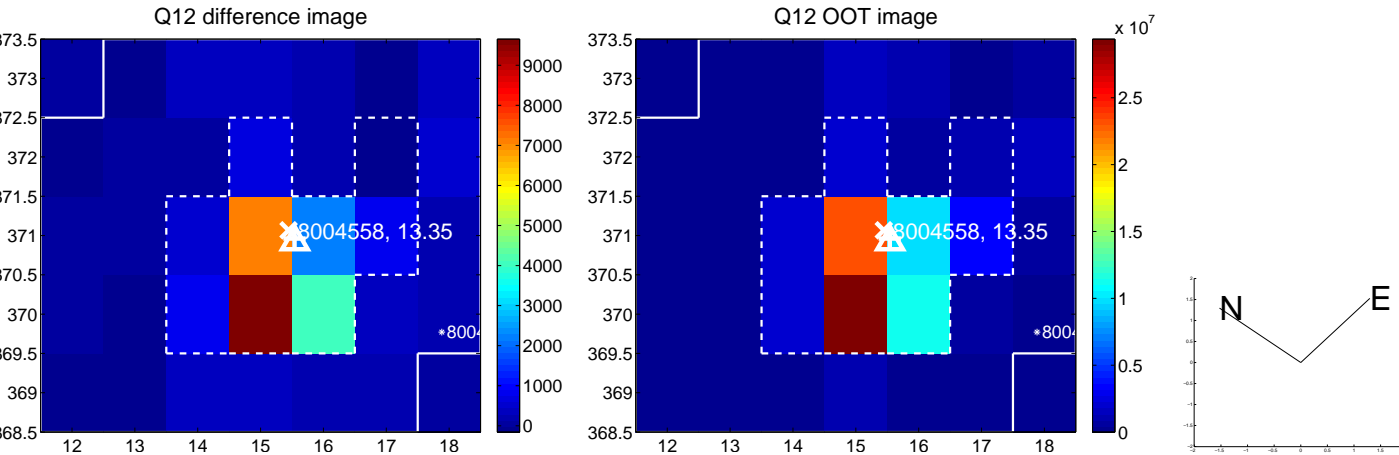
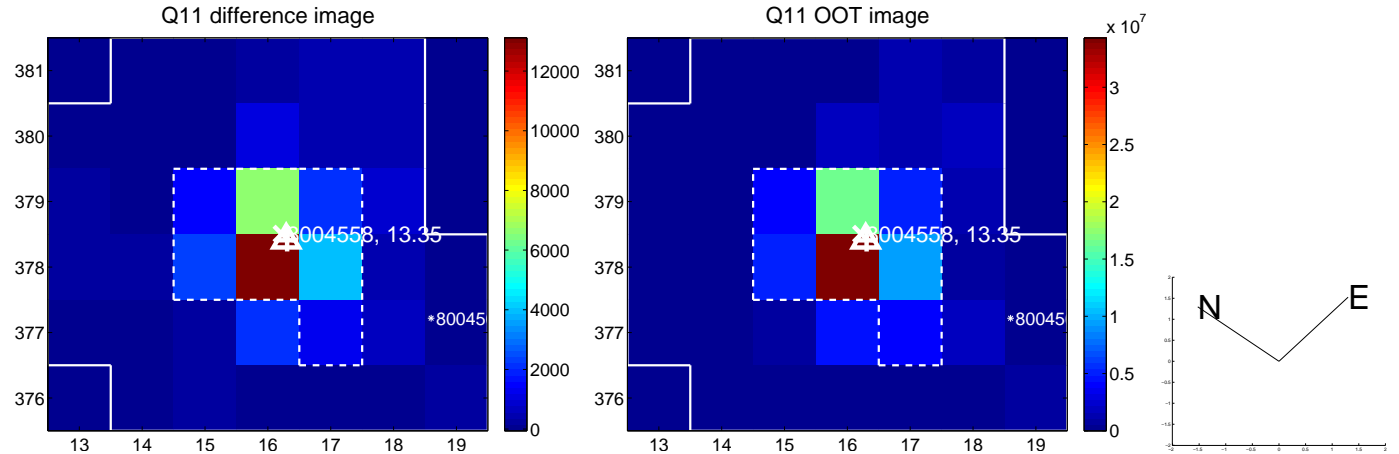
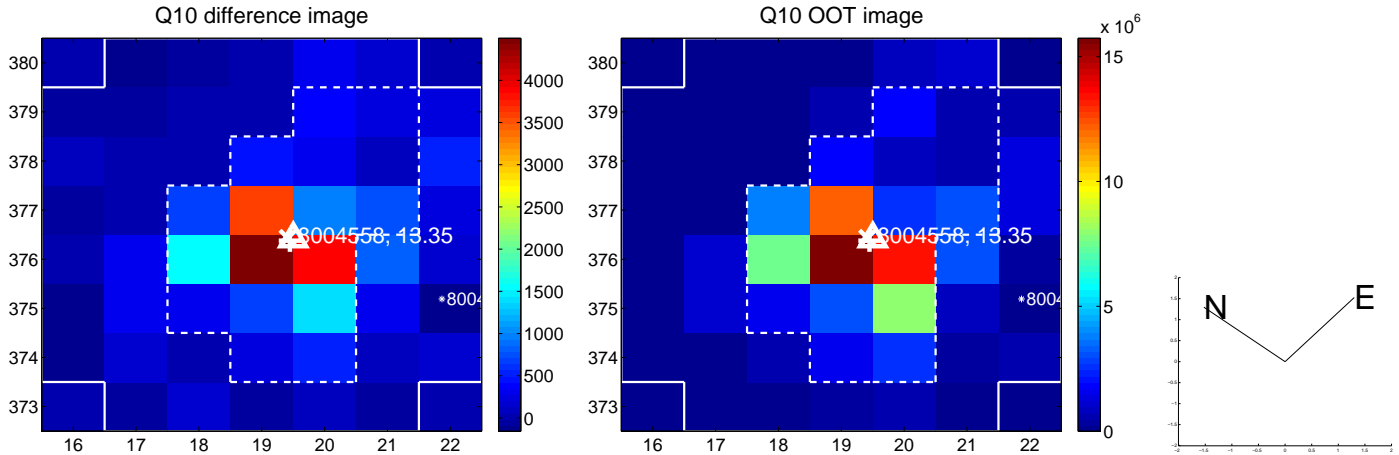
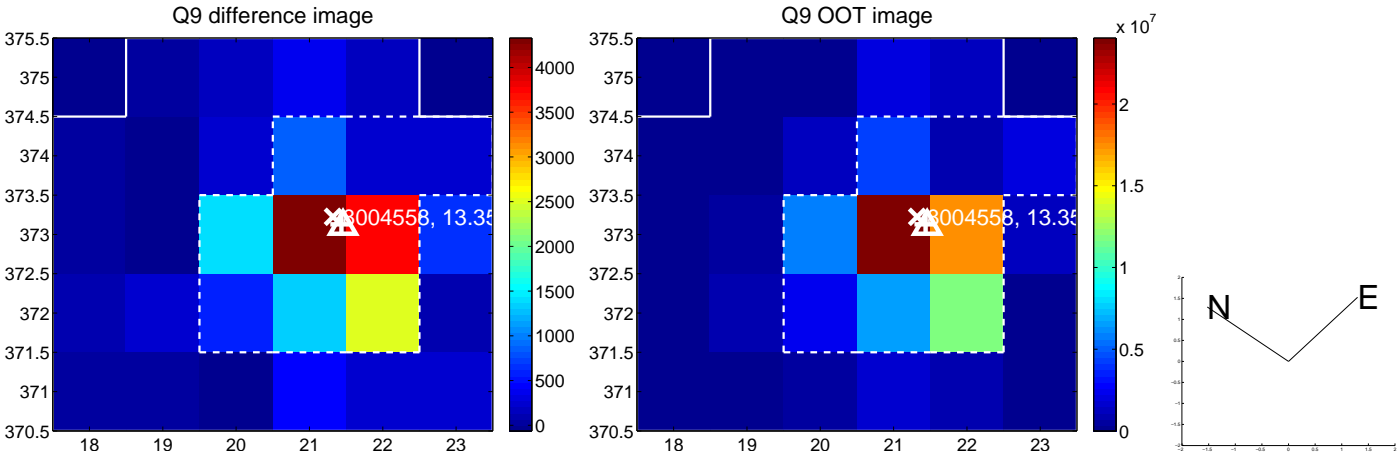


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

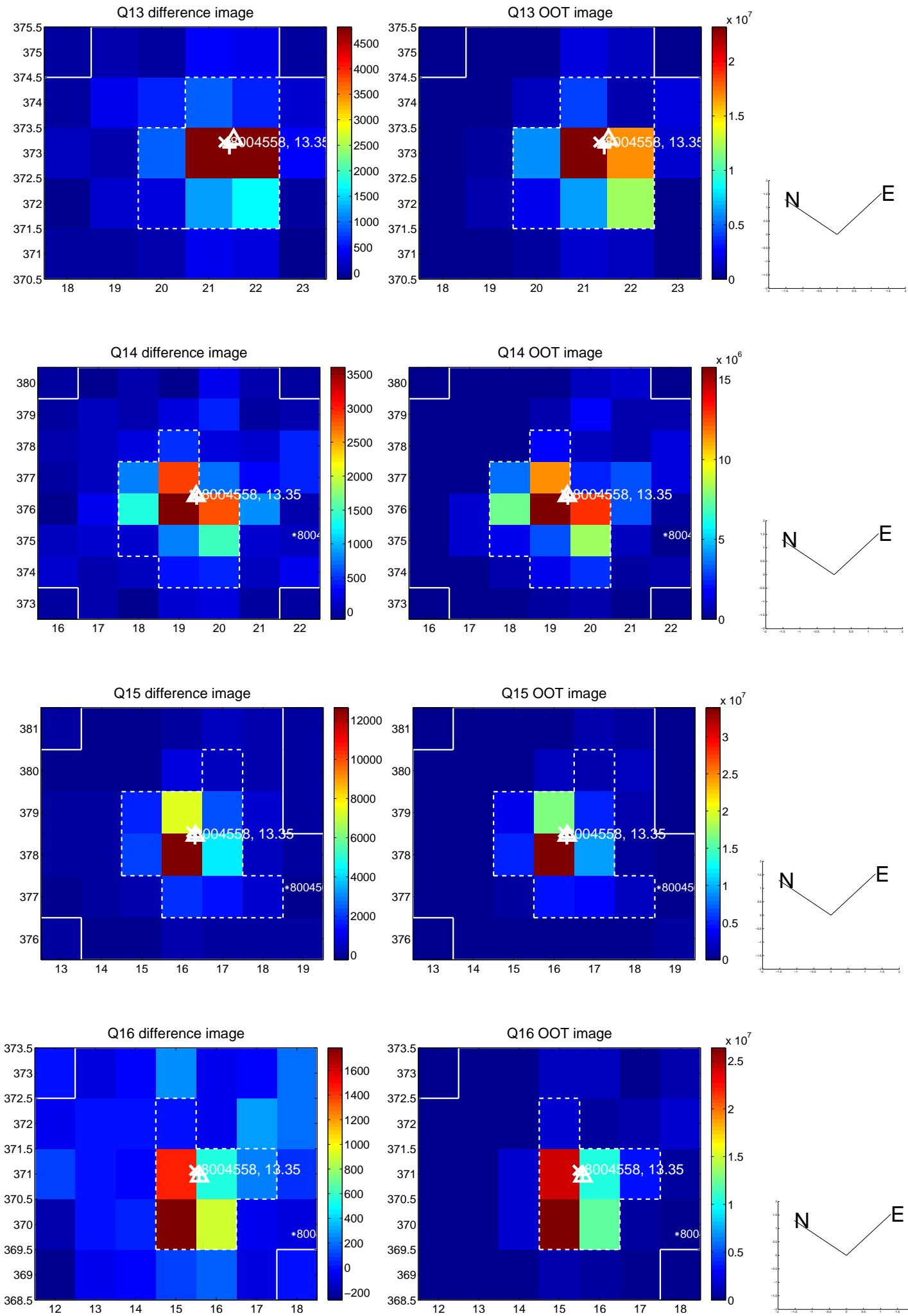




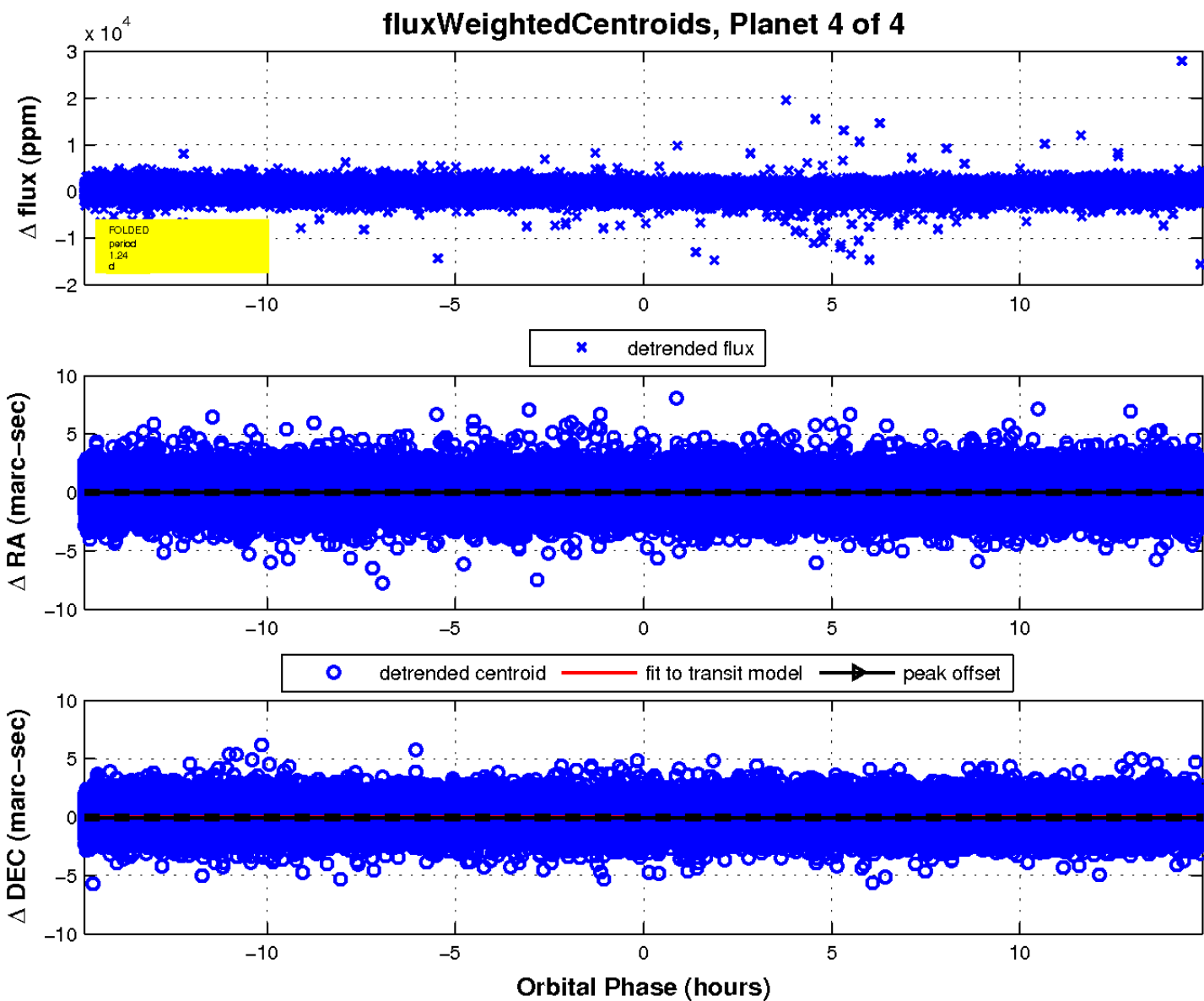
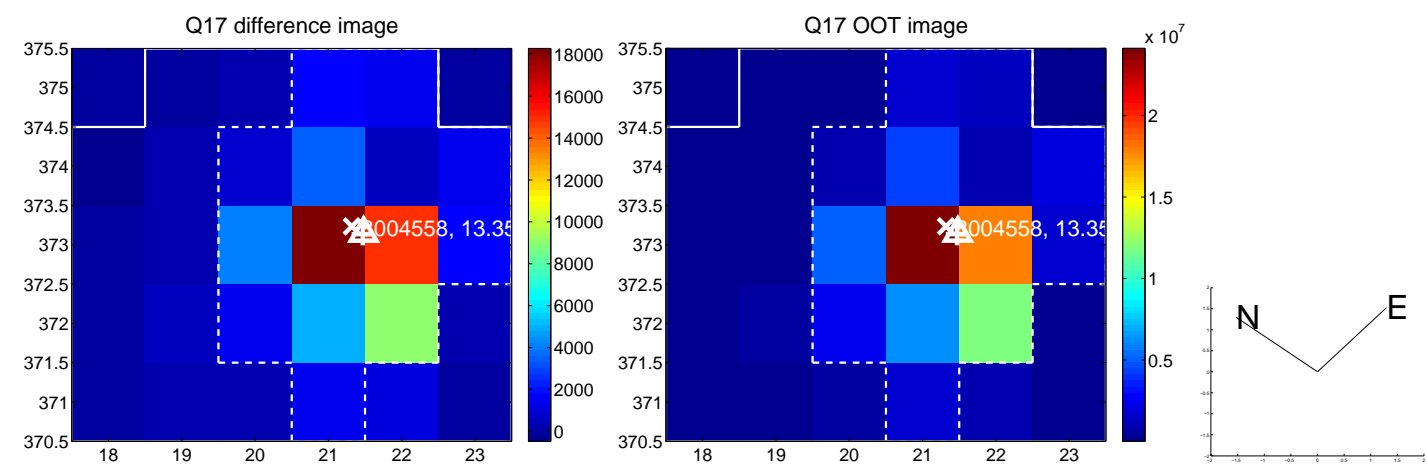
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

