

# KIC 008590274

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008590274-01	OBS	No	515.921915	313.782892	6354.8	11.273	50.6	10.0	0.62	5203	7.29	0.22
008590274-02	OBS	No	213.432748	300.331385	232.7	1.987	135.0	0.4	0.62	5203	0.98	0.71

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008590274-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_ZUMA_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008590274-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS

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

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

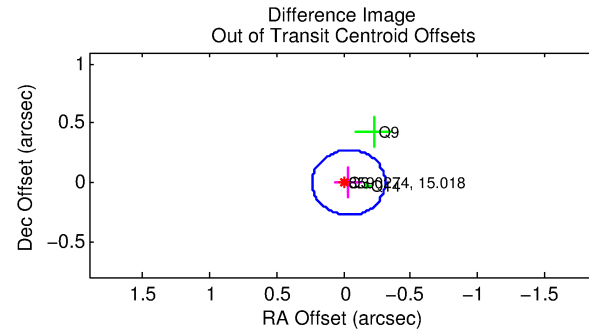
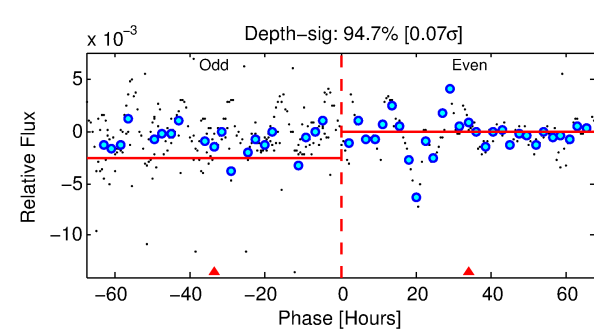
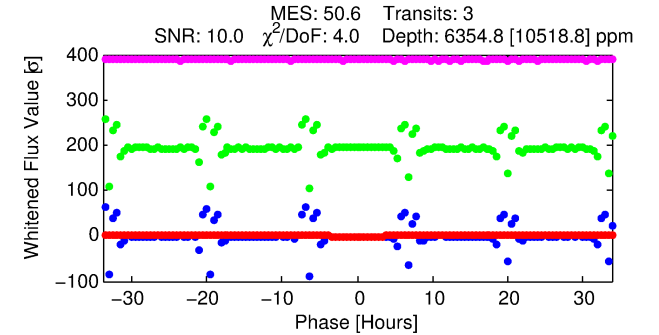
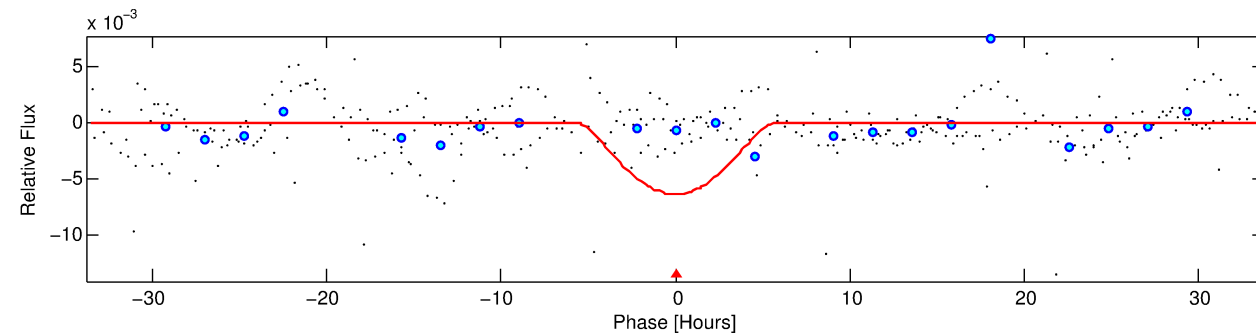
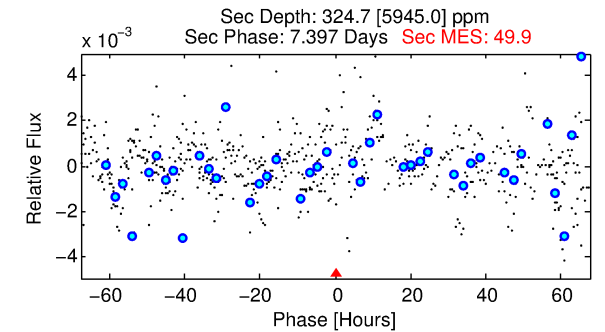
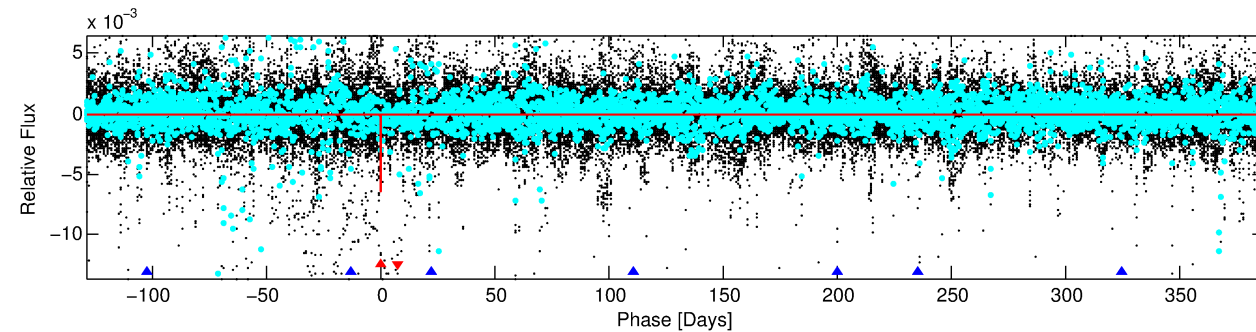
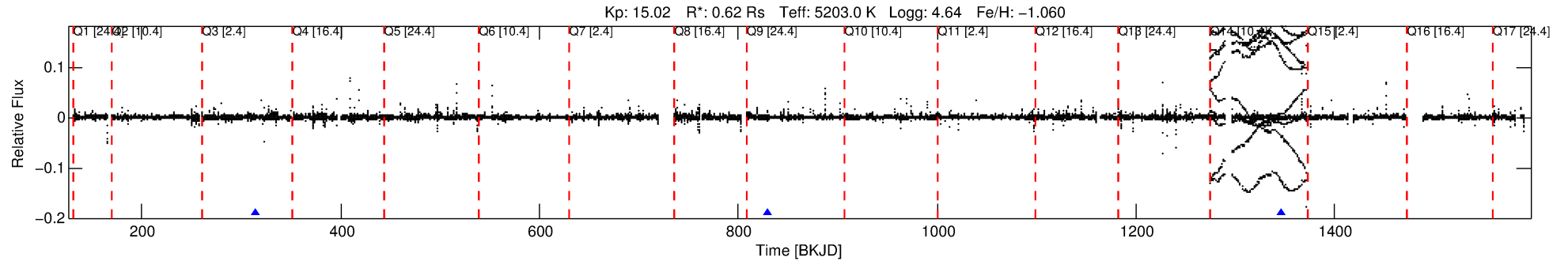
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008590274-01

No Significant Match Found

# DV One-Page Summary

KIC: 8590274 Candidate: 1 of 2 Period: 515.922 d



## DV Fit Results:

Period = 515.92191 [0.21308] d  
Epoch = 313.7829 [0.3319] BKJD  
Rp/R\* = 0.1077 [1.5197]  
a/R\* = 194.34 [725.46]  
b = 0.96 [2.68]  
Seff = 0.22 [0.04]  
Teq = 175 [8] K  
Rp = 7.29 [102.82] Re  
a = 1.0699 [0.0784] AU  
Ag = 3852.32 [129596.12] [0.03σ]  
Teffp = 2128 [17900] K [0.11σ]

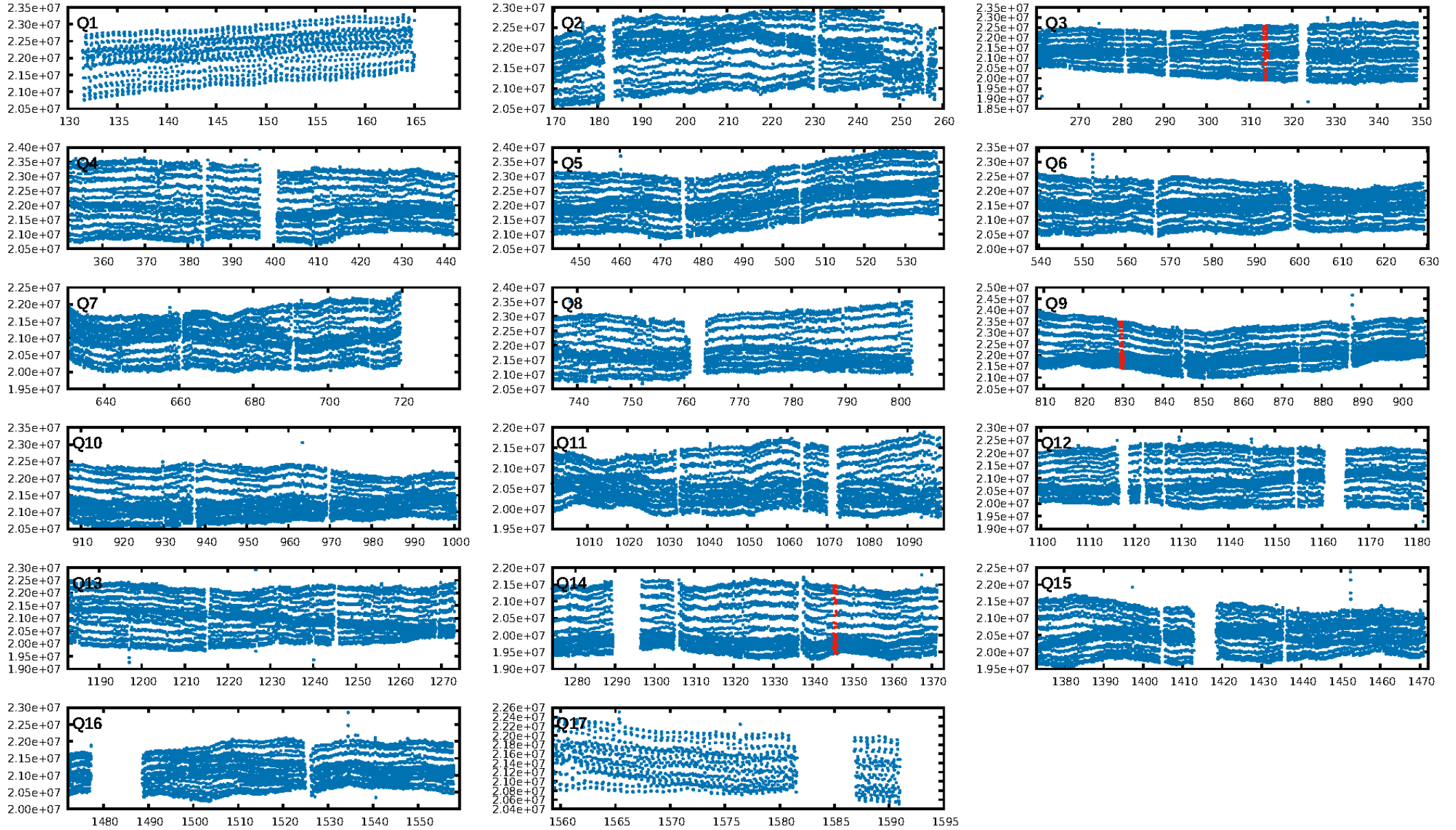
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [634.22σ]  
LongPeriod-sig: N/A  
**ModelChiSquare2-sig: 0.0%**  
**ModelChiSquareGof-sig: 0.0%**  
**Bootstrap-pfa: 5.86e-03**  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: 0.733**  
Centroid-sig: 16.1%  
**Centroid-so: 0.946 arcsec [4.77σ]**  
OotOffset-rm: 0.038 arcsec [0.41σ]  
KicOffset-rm: 0.201 arcsec [2.18σ]  
OotOffset-st: 1/1/0/1 [3]  
KicOffset-st: 1/1/0/1 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 1.00 [3/3]

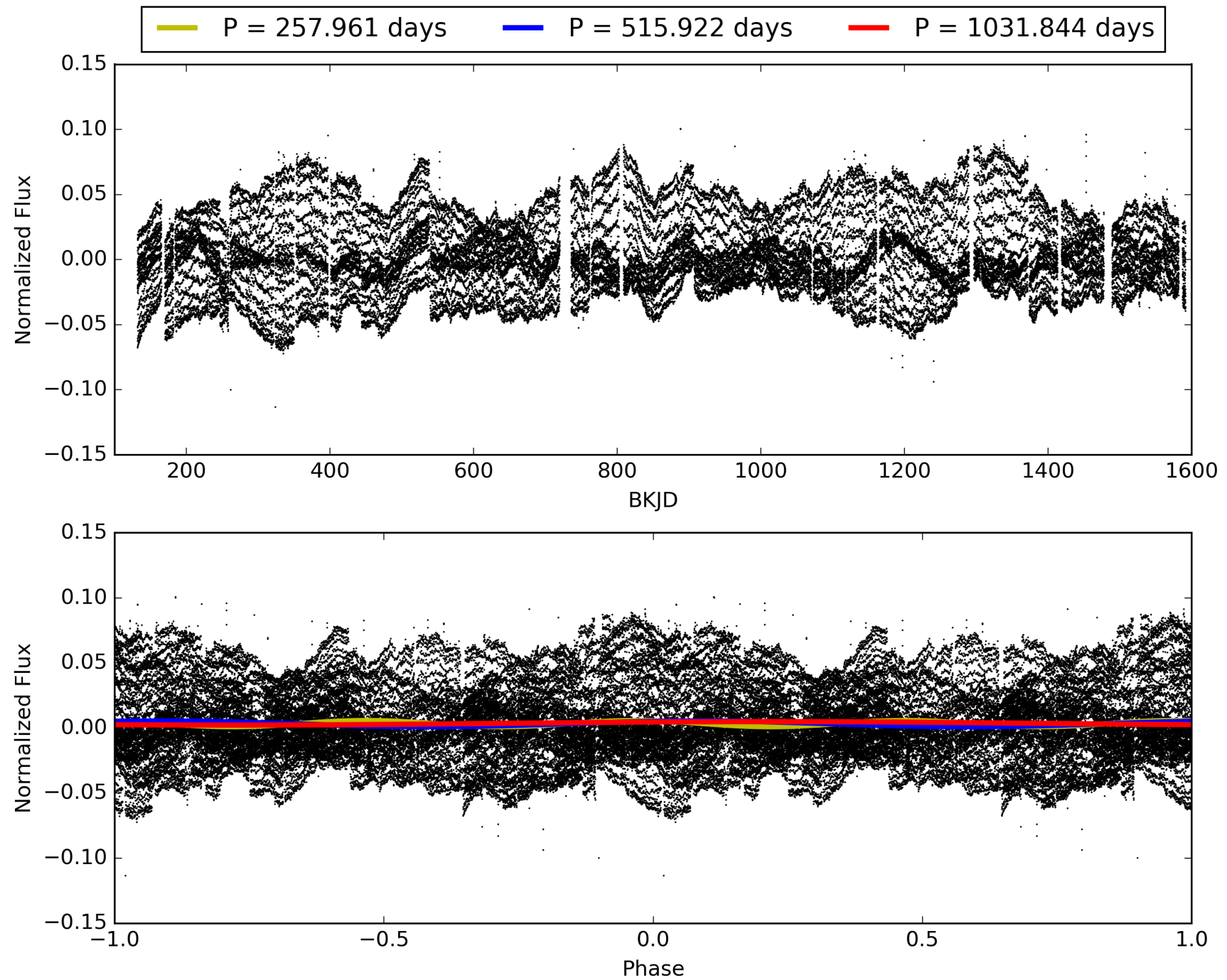
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 04:01:55 Z

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

# TCE 008590274-01, PDC Light Curves

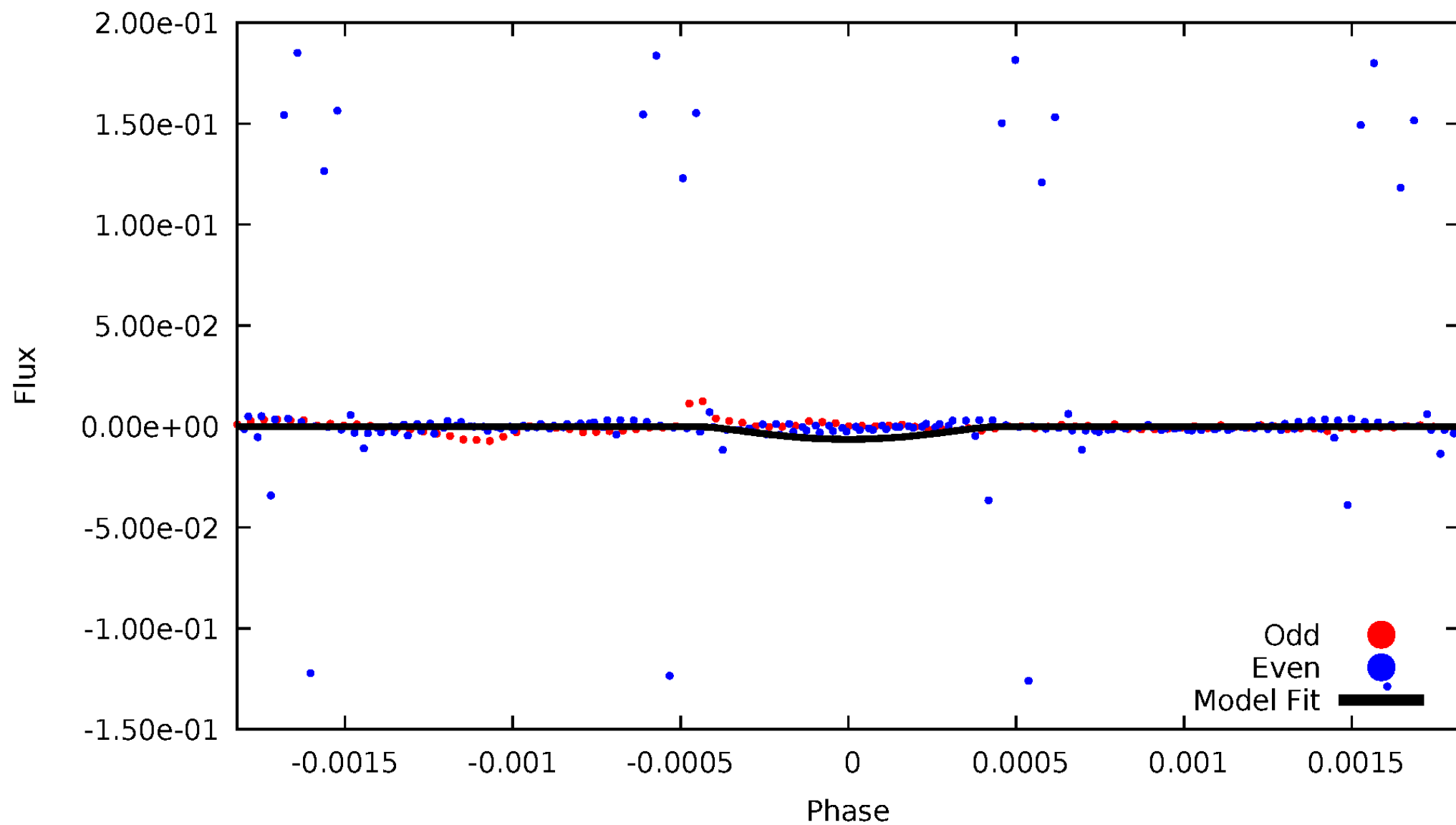


TCE 008590274-01



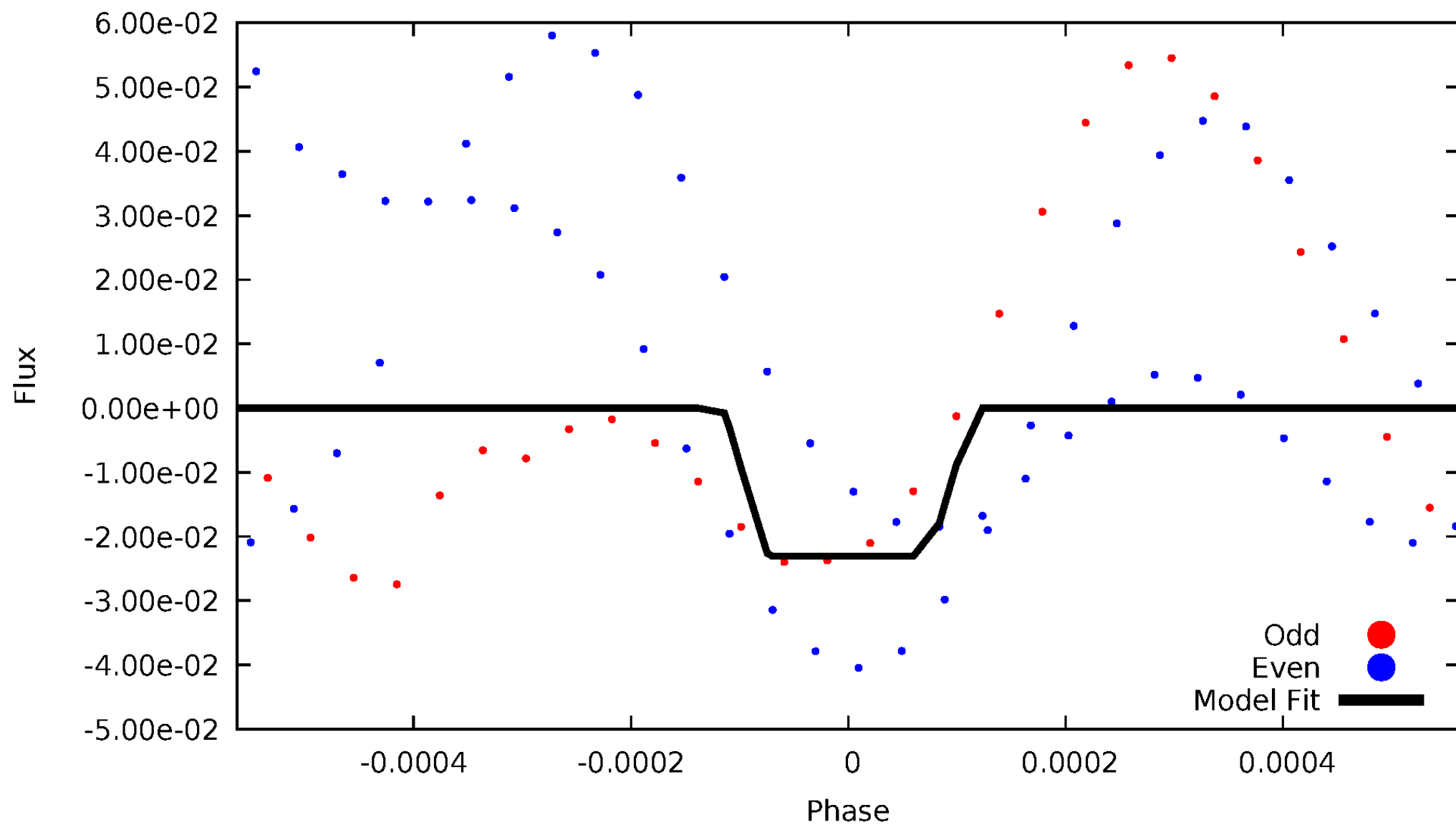
# DV Odd/Even

TCE 008590274-01



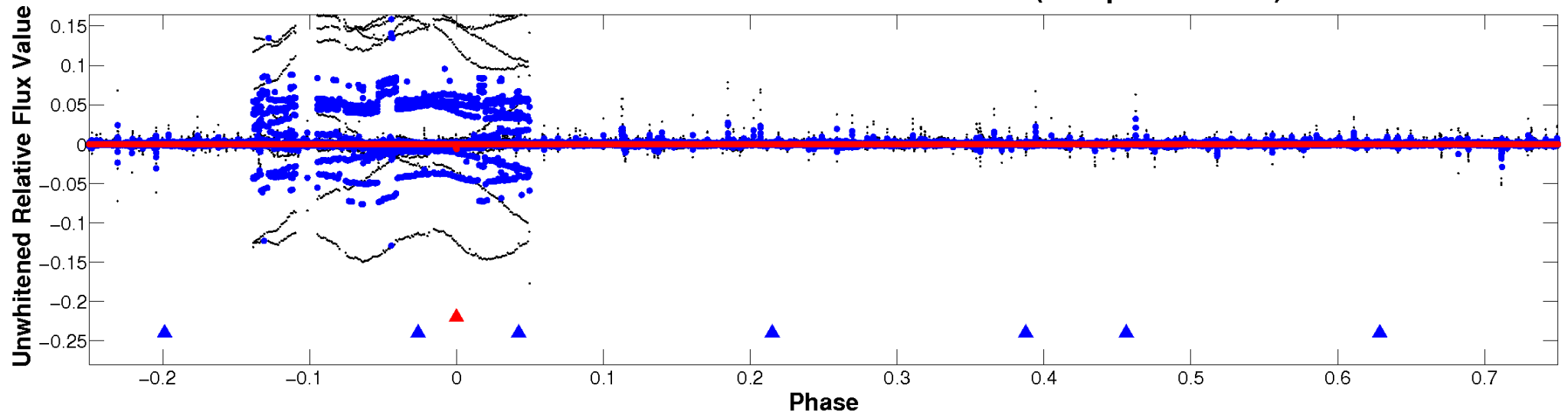
# ALT Odd/Even

TCE 008590274-01

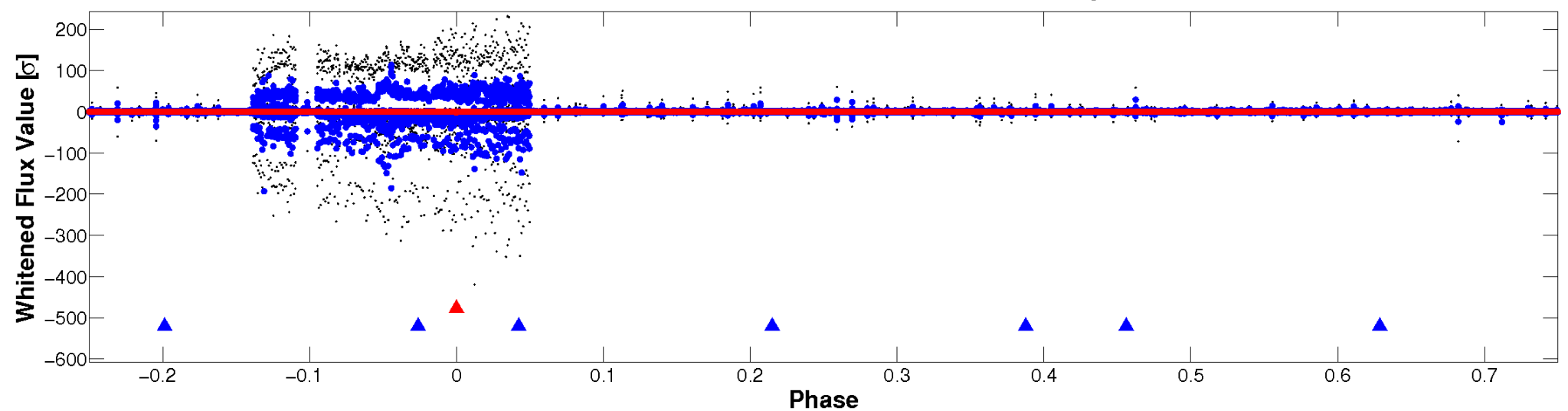


# Non-Whitened Vs. Whitened Light Curve

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

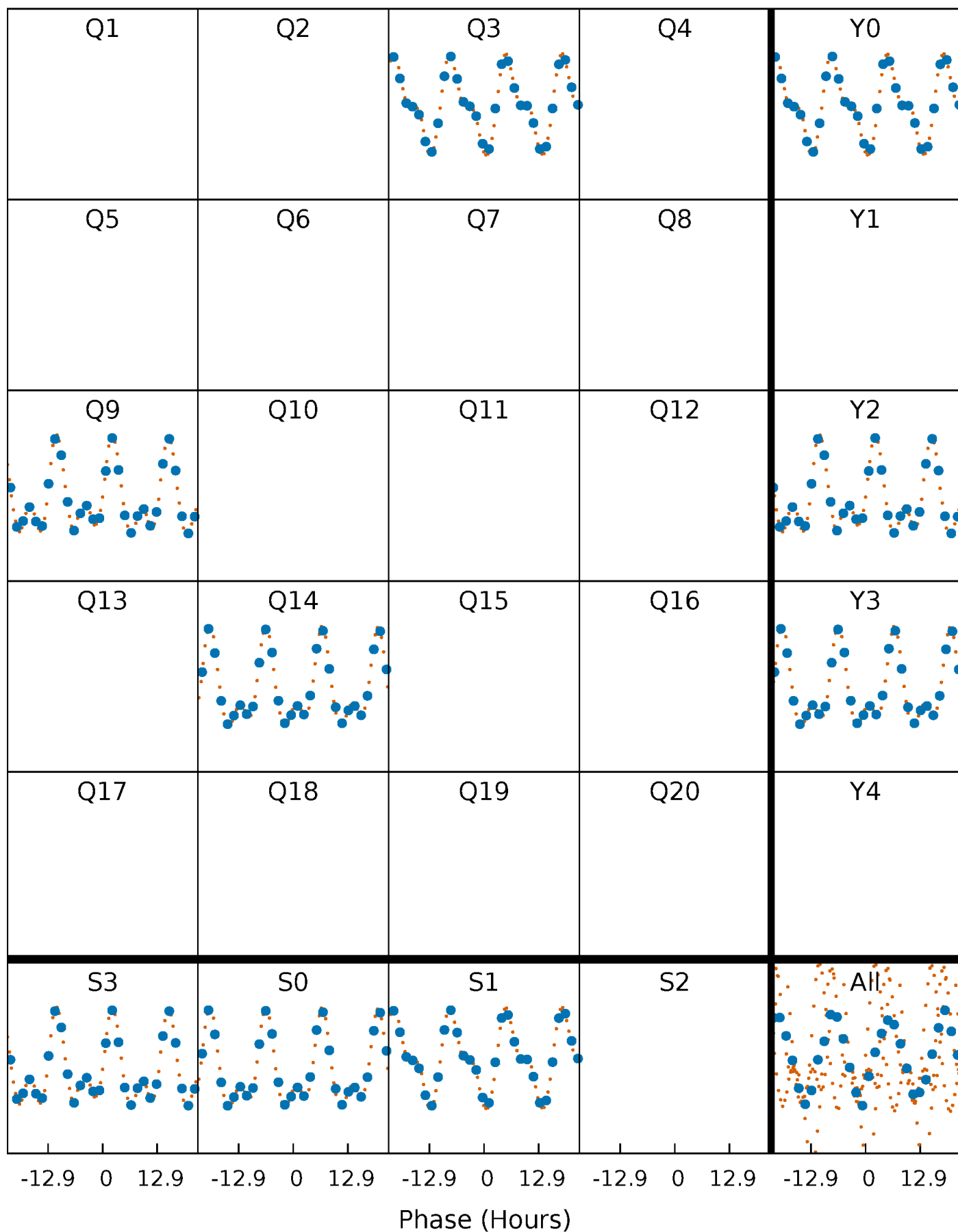


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

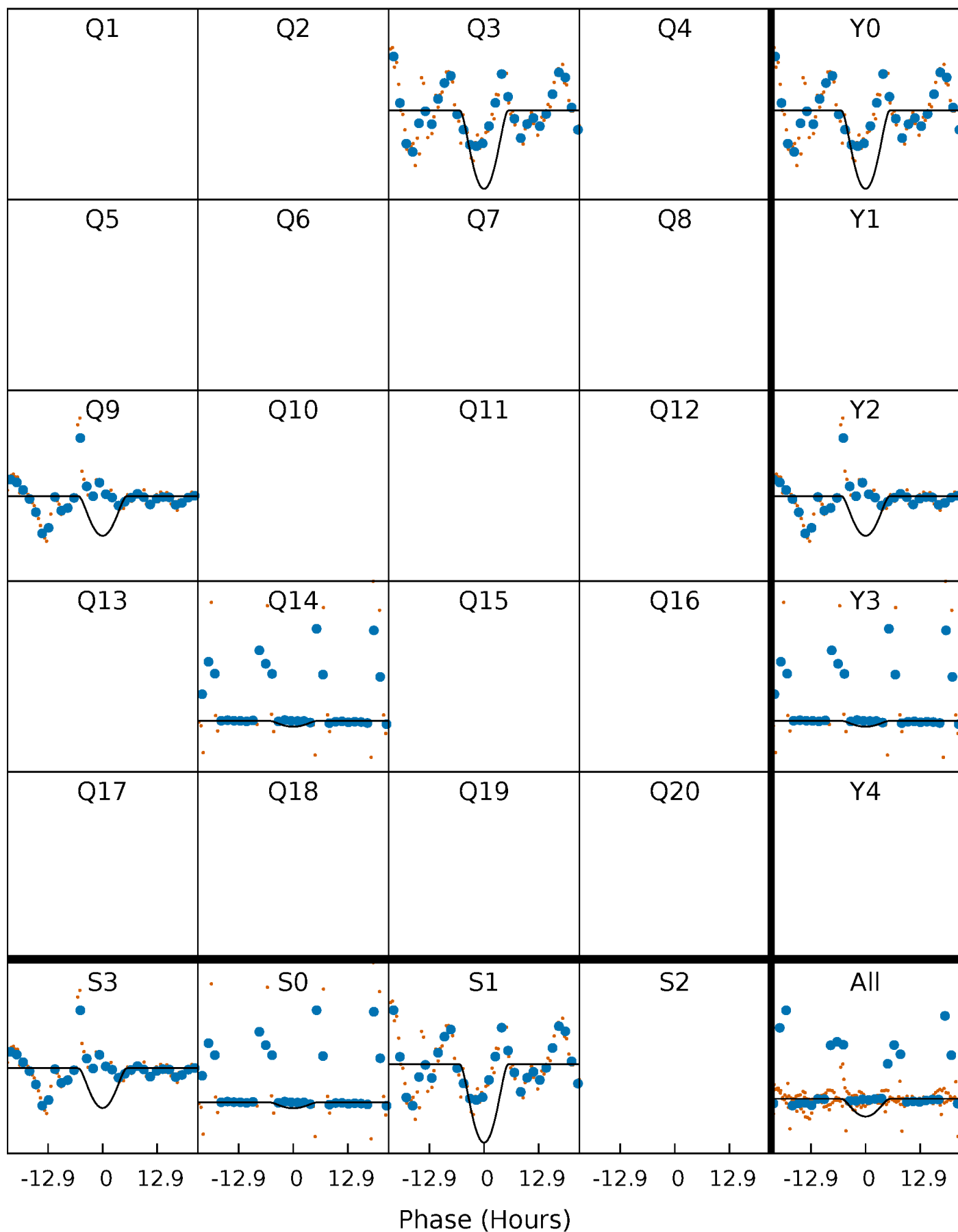
TCE 008590274-01 P=515.921915 Days  $T_0=313.782892$  (BKJD)





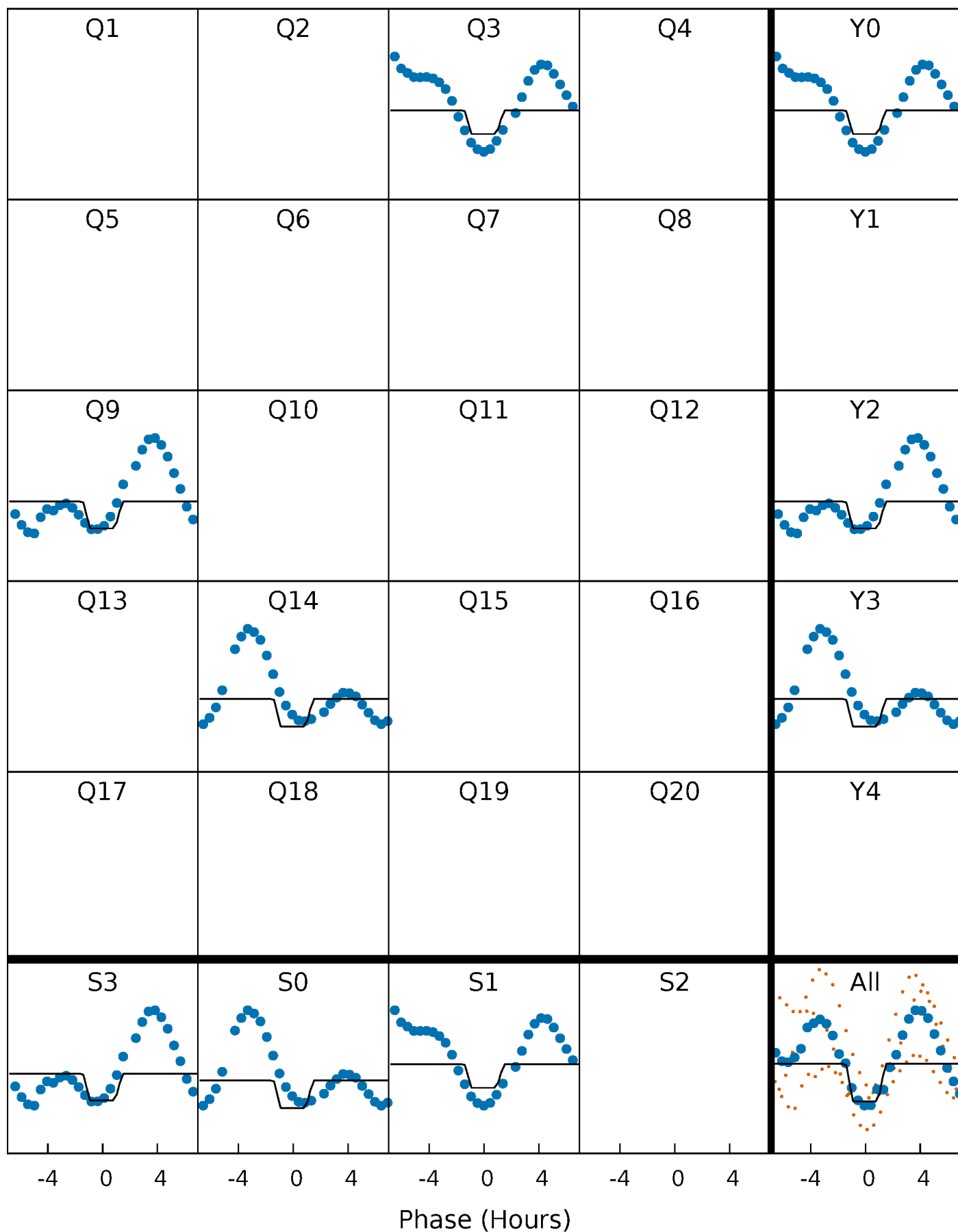
# DV Quarter-Phased Transit Curves

TCE 008590274-01 P=515.921915 Days  $T_0=313.782892$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

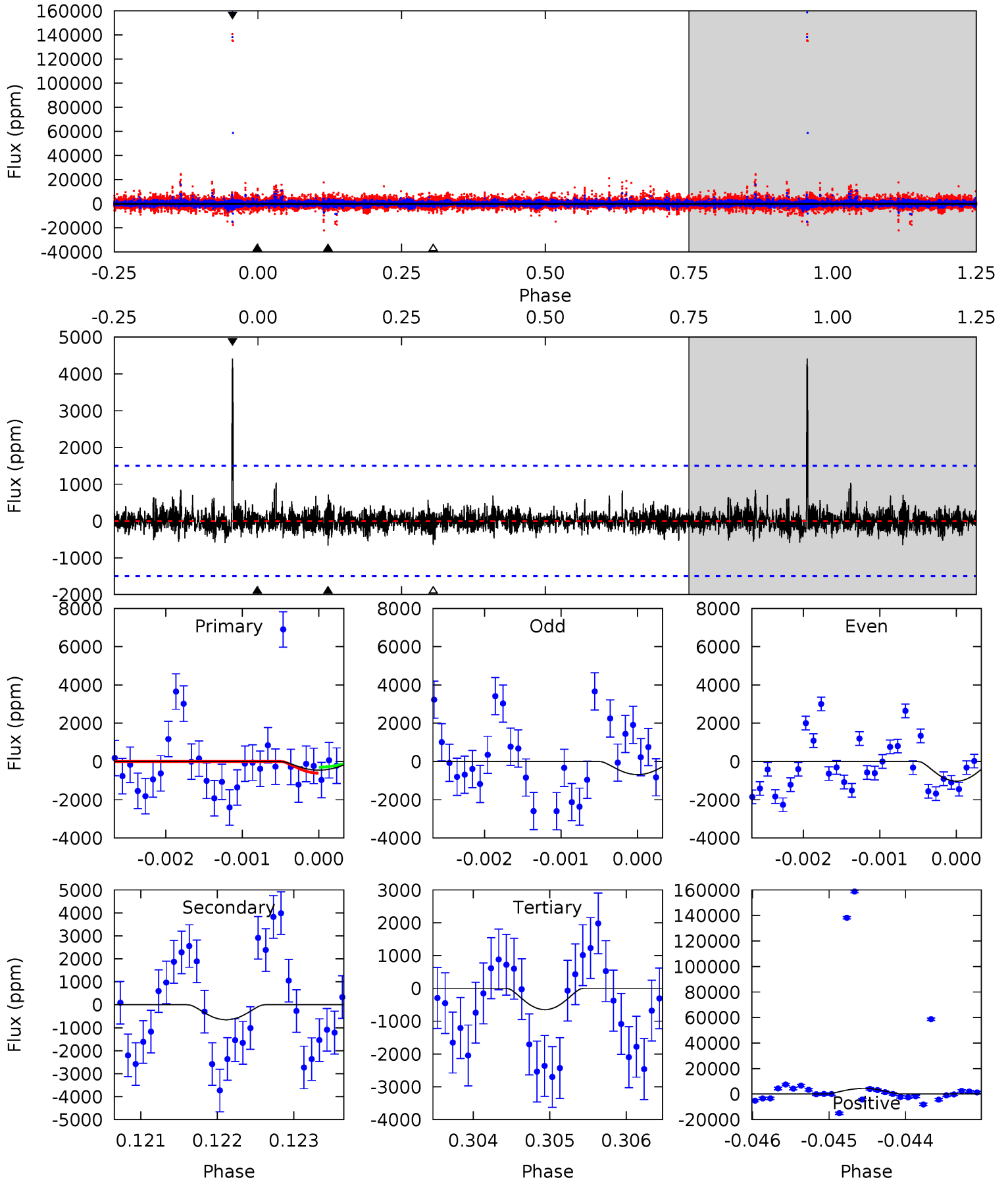
TCE 008590274-01 P=515.838411 Days  $T_0=313.815804$  (BKJD)



# DV Model-Shift Uniqueness Test

008590274-01, P = 515.921915 Days, E = 313.782892 Days

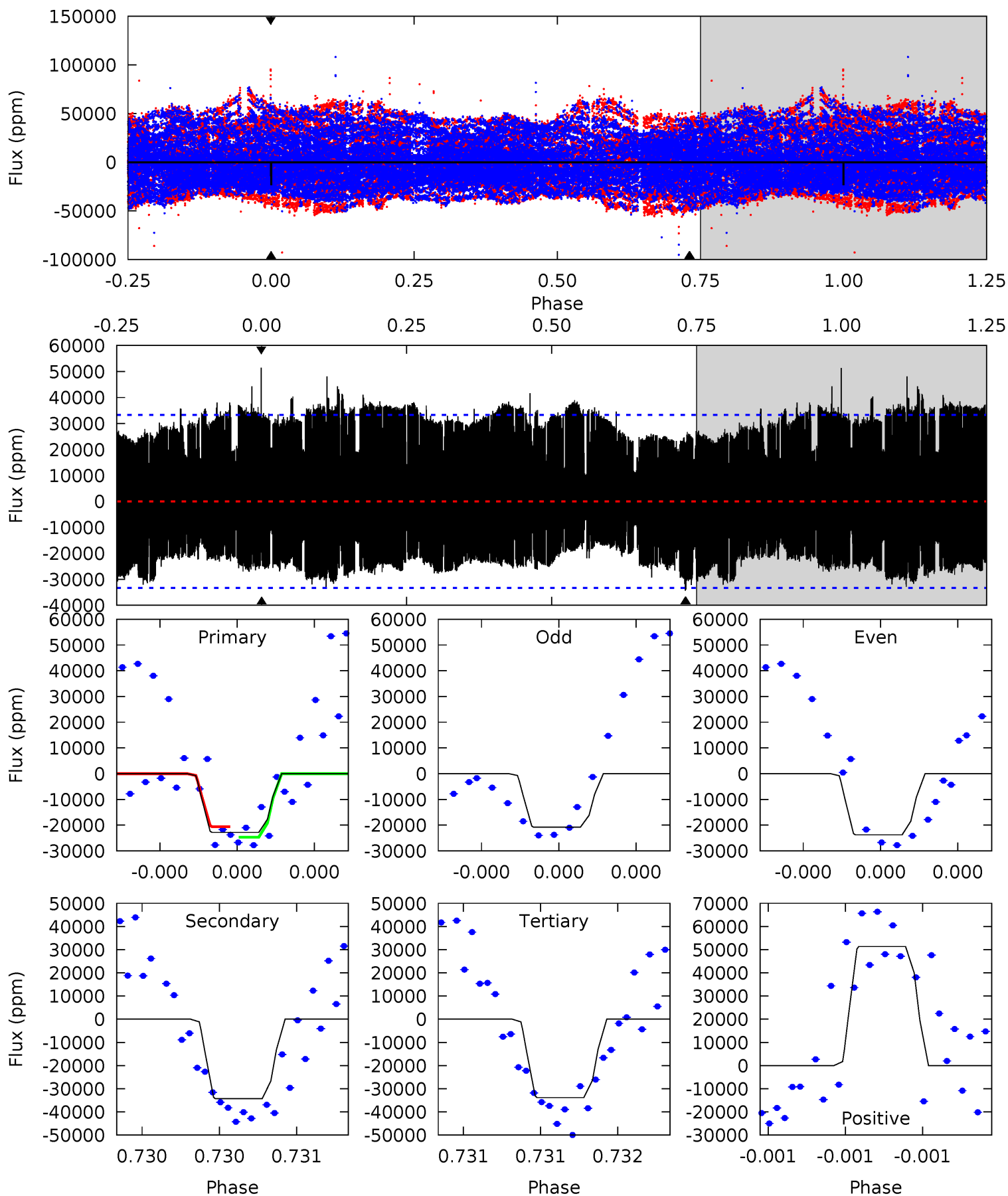
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.66	2.37	2.36	16.1	5.46	3.31	0.75	-0.70	-14.4	0.01	-13.7	0.50	1.71	0.87	0.56



# Alt Model-Shift Uniqueness Test

008590274-01, P = 515.838411 Days, E = 313.815804 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
3.92	5.90	5.81	8.82	5.72	3.70	2.76	-1.90	-4.91	0.09	-2.92	0.24	1.10	0.60	0.35



### Stellar Parameters For KIC 008590274

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5203^{+182}_{-164}$	$4.641^{+0.060}_{-0.045}$	$-1.060^{+0.350}_{-0.300}$	$0.620^{+0.053}_{-0.043}$	$0.614^{+0.057}_{-0.023}$	$3.624^{+0.874}_{-0.588}$
	+3%/-3%	+1%/-1%	+33%/-28%	+9%/-7%	+9%/-4%	+24%/-16%
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 008590274-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-652 \pm 275$	$68.96^{+73.98}_{-48.60}$	$243^{+10}_{-9}$	$1839^{+528}_{-243}$	$82^{+816}_{-64}$
Alt.	$-34340 \pm 5819$	$74.35^{+76.69}_{-50.89}$	$244^{+10}_{-9}$	$2856^{+1266}_{-478}$	$4143^{+37994}_{-3171}$

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

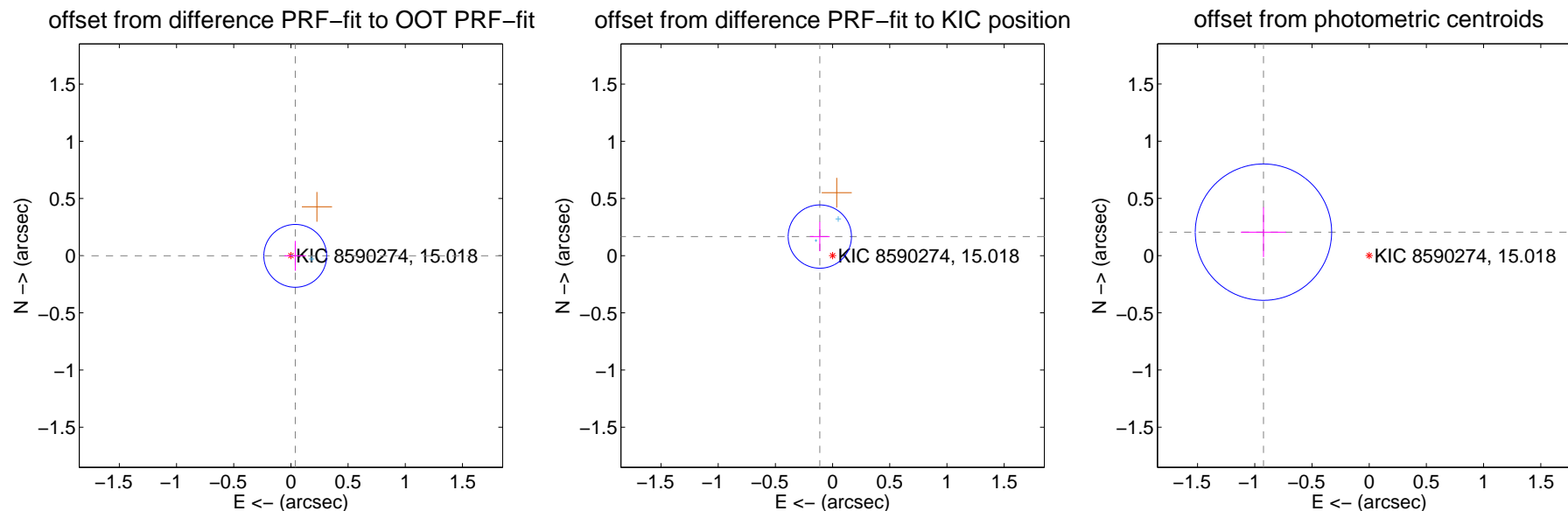
## DV Centroid Data

Supplemental centroid analysis for 008590274-01. Kepler magnitude: 15.02. Transit SNR 9.99

There are 2 quarters with good PRF difference image offsets

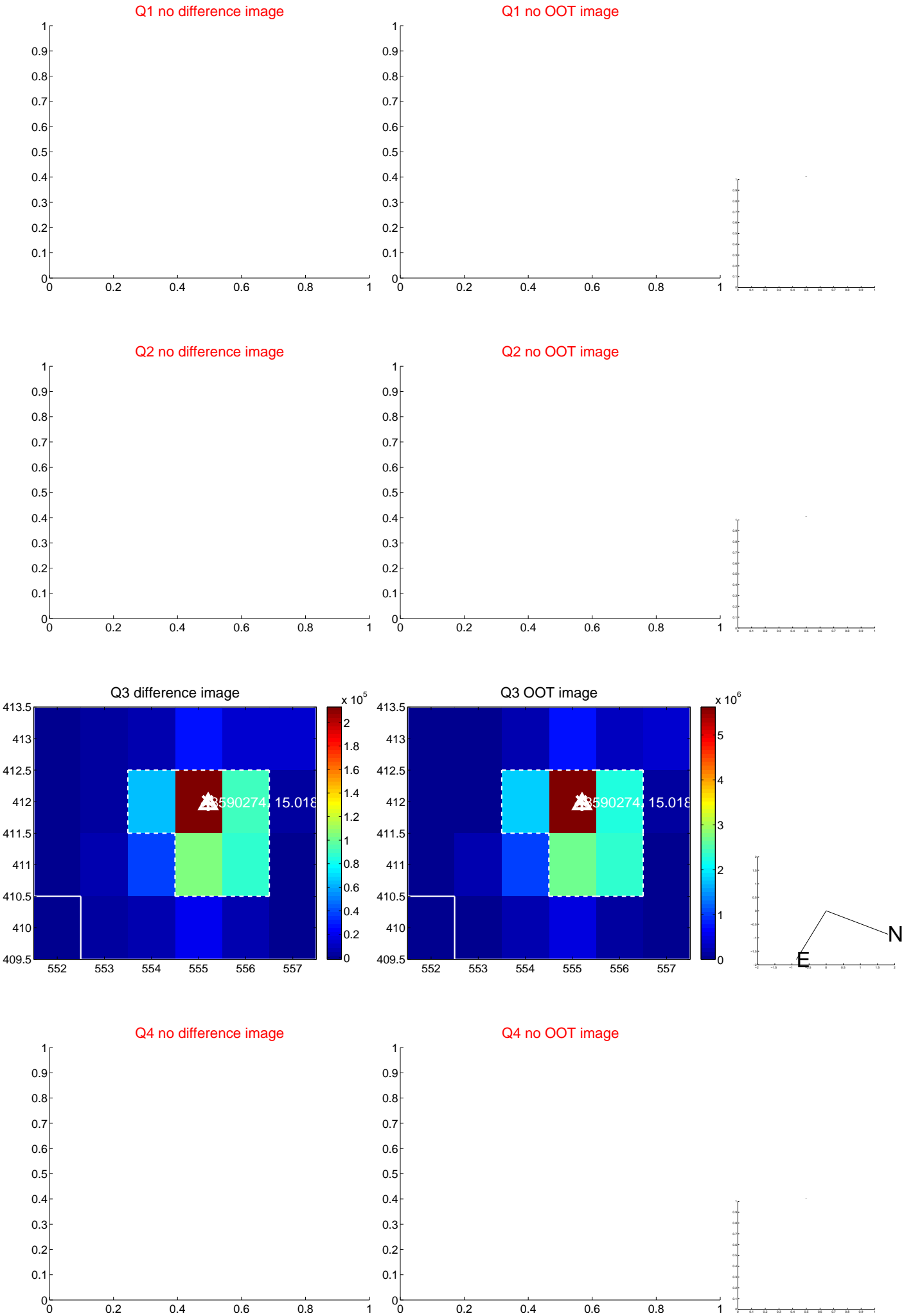
The direct PRF centroid is offset from the target star catalog position by about 0.37 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.038 \pm 0.092$	0.41	$-0.038 \pm 0.094$	$-0.002 \pm 0.131$
PRF-fit source offset from KIC position	$0.201 \pm 0.092$	2.18	$0.112 \pm 0.086$	$0.167 \pm 0.128$
photometric centroid source offset	$0.95 \pm 0.20$	4.77	$0.92 \pm 0.20$	$0.20 \pm 0.22$



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.

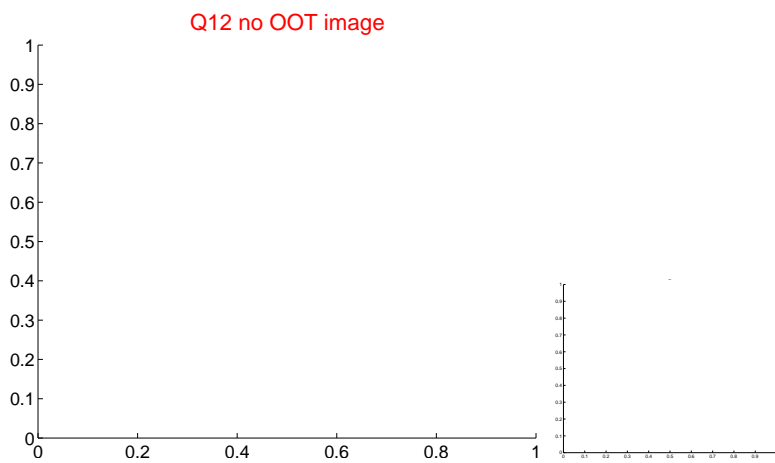
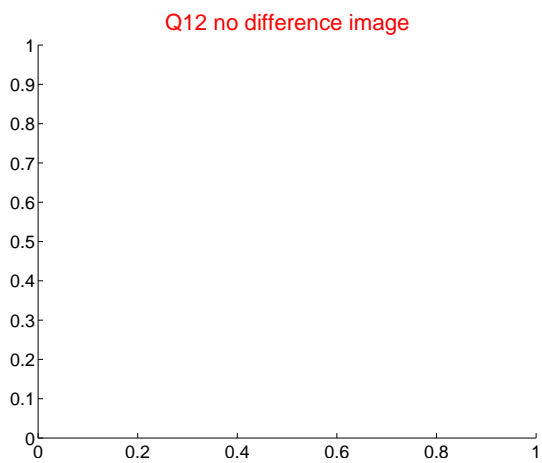
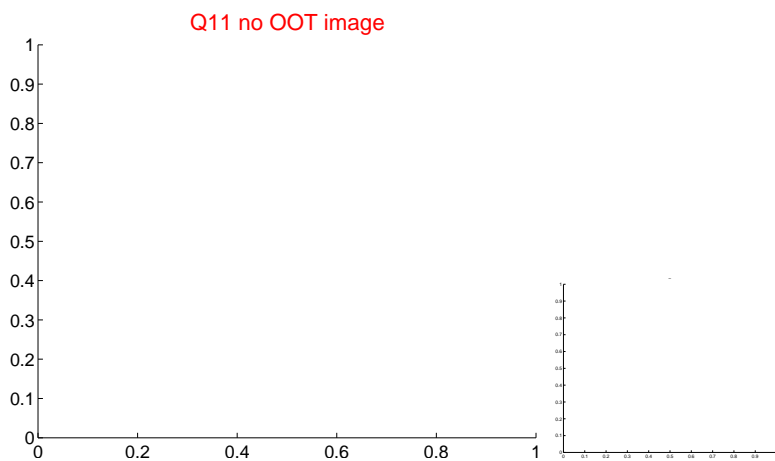
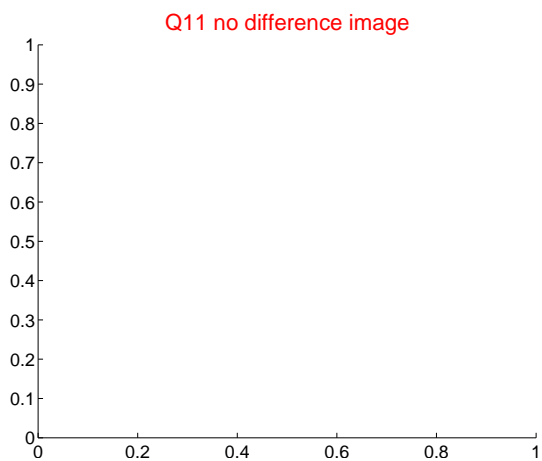
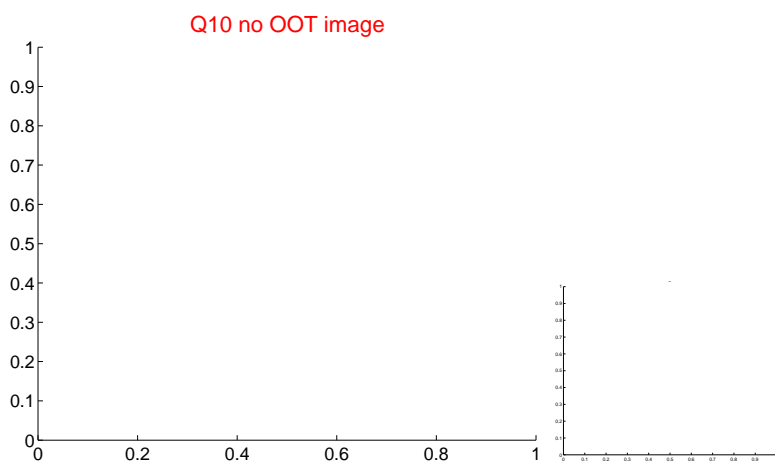
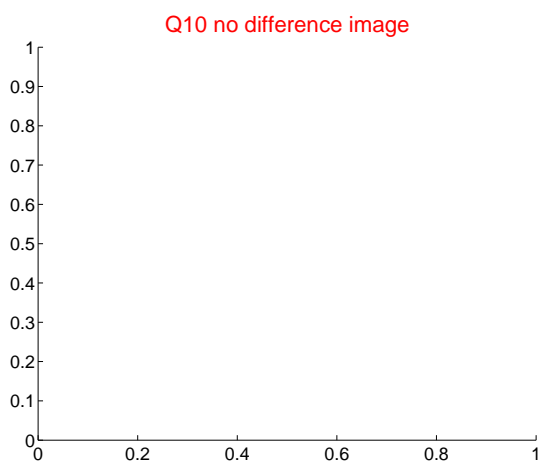
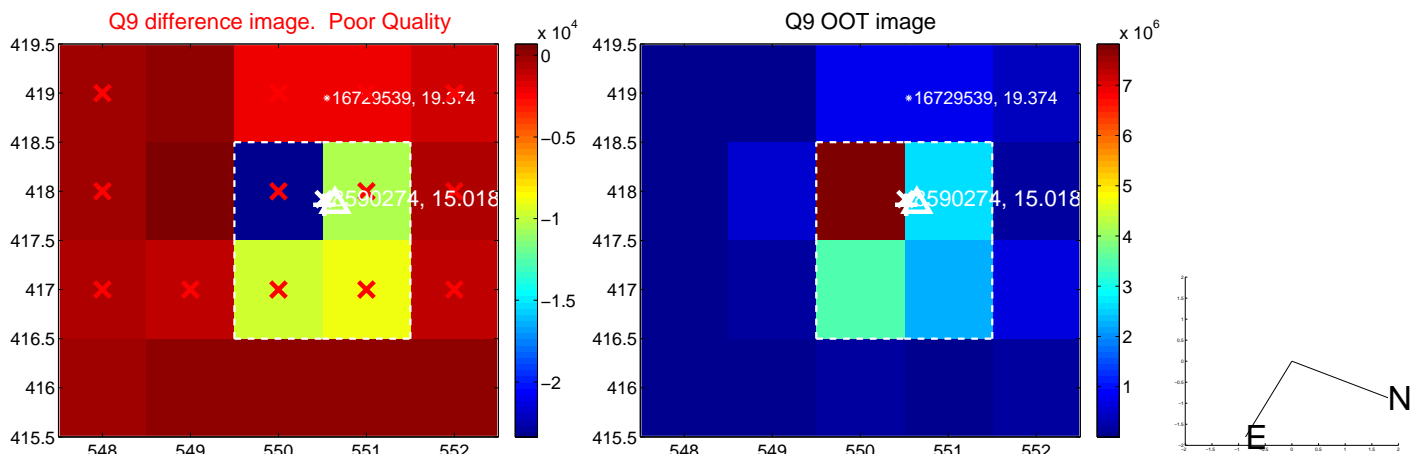


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

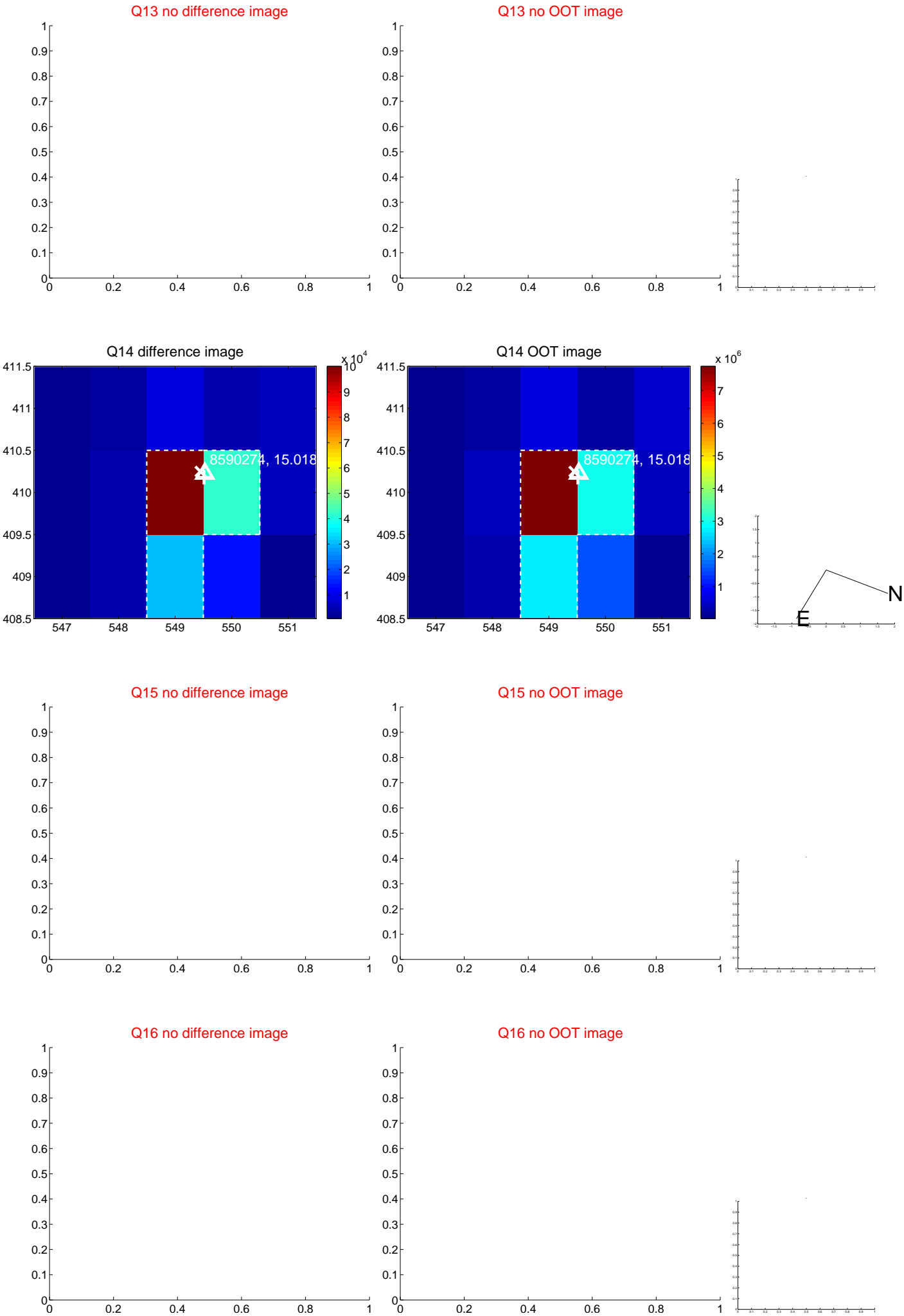




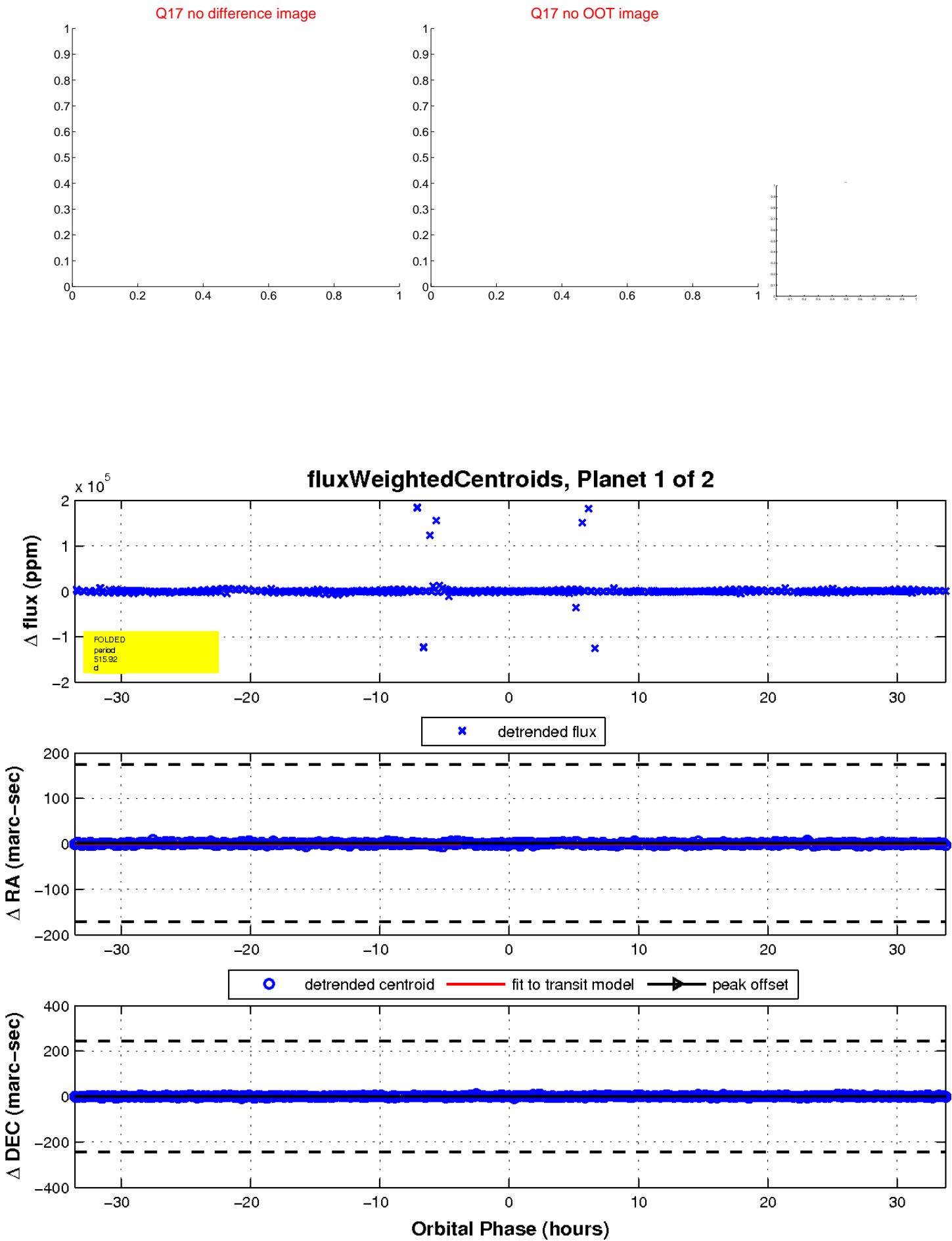
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



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

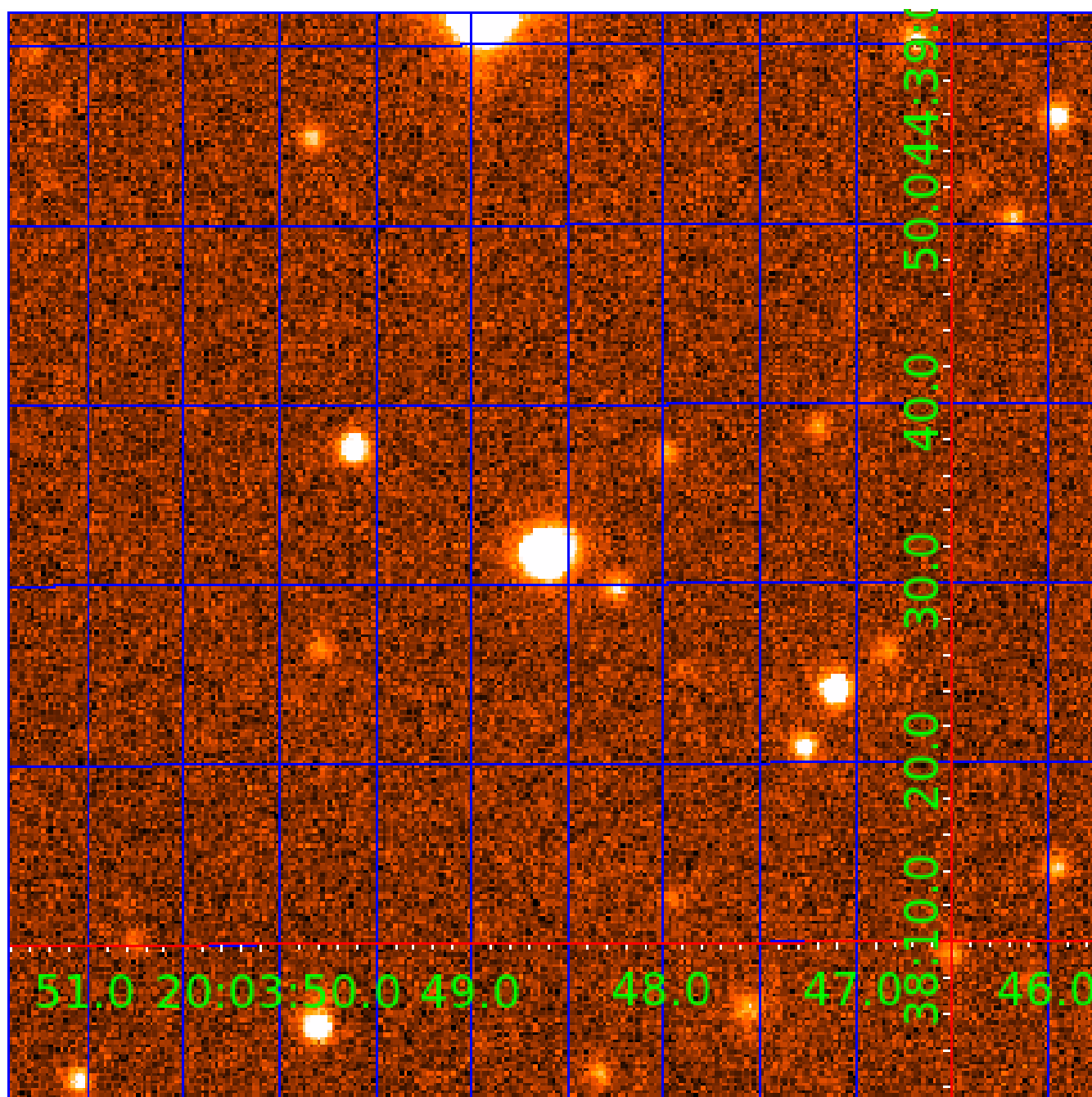


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 008590274

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008590274-01	OBS	No	515.921915	313.782892	6354.8	11.273	50.6	10.0	0.62	5203	7.29	0.22
008590274-02	OBS	No	213.432748	300.331385	232.7	1.987	135.0	0.4	0.62	5203	0.98	0.71

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008590274-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_ZUMA_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008590274-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS

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

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

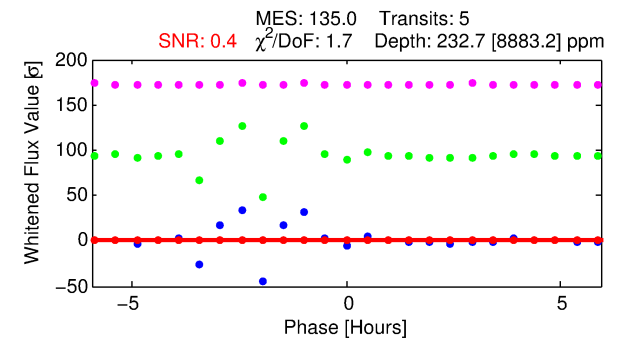
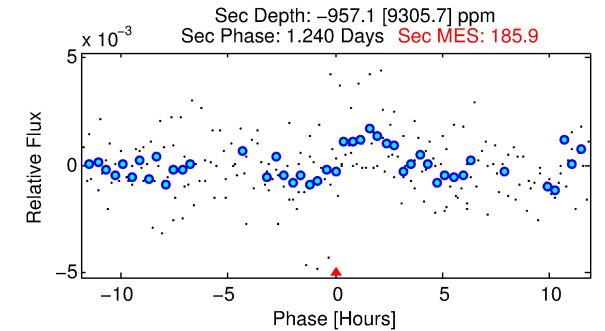
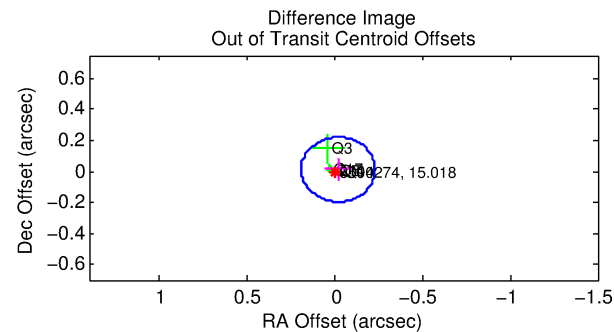
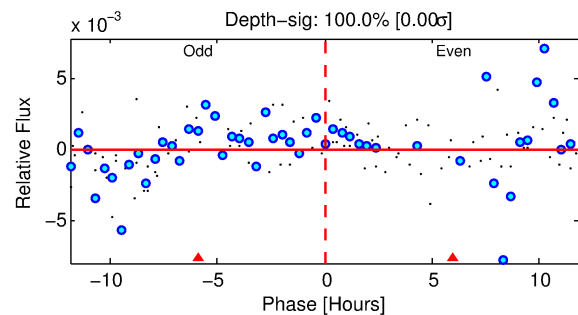
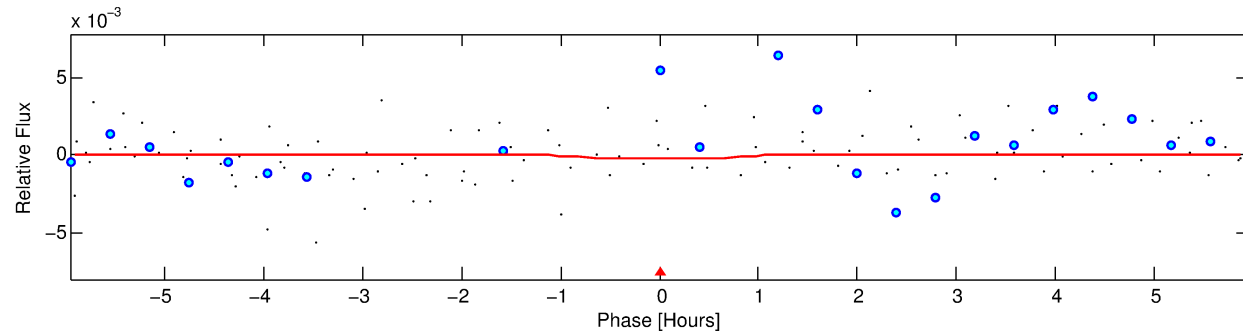
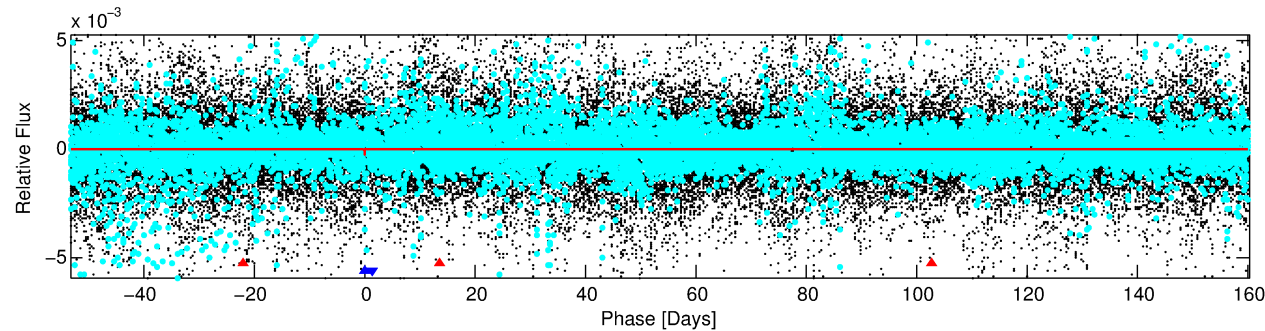
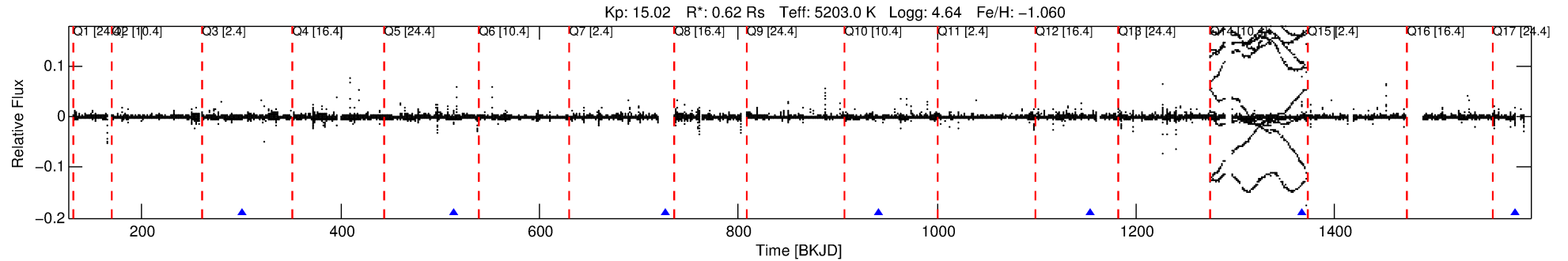
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008590274-02

No Significant Match Found

# DV One-Page Summary

KIC: 8590274 Candidate: 2 of 2 Period: 213.433 d



## DV Fit Results:

Period = 213.43275 [0.34425] d  
Epoch = 300.3314 [0.8596] BKJD  
Rp/R\* = 0.0146 [2.1152]  
a/R\* = 675.12 [446992.92]  
b = 0.59 [722.59]  
Seff = 0.72 [0.13]  
Teq = 235 [10] K  
Rp = 0.98 [143.11] Re  
a = 0.5940 [0.0435] AU  
Ag = N/A  
Teffp = N/A

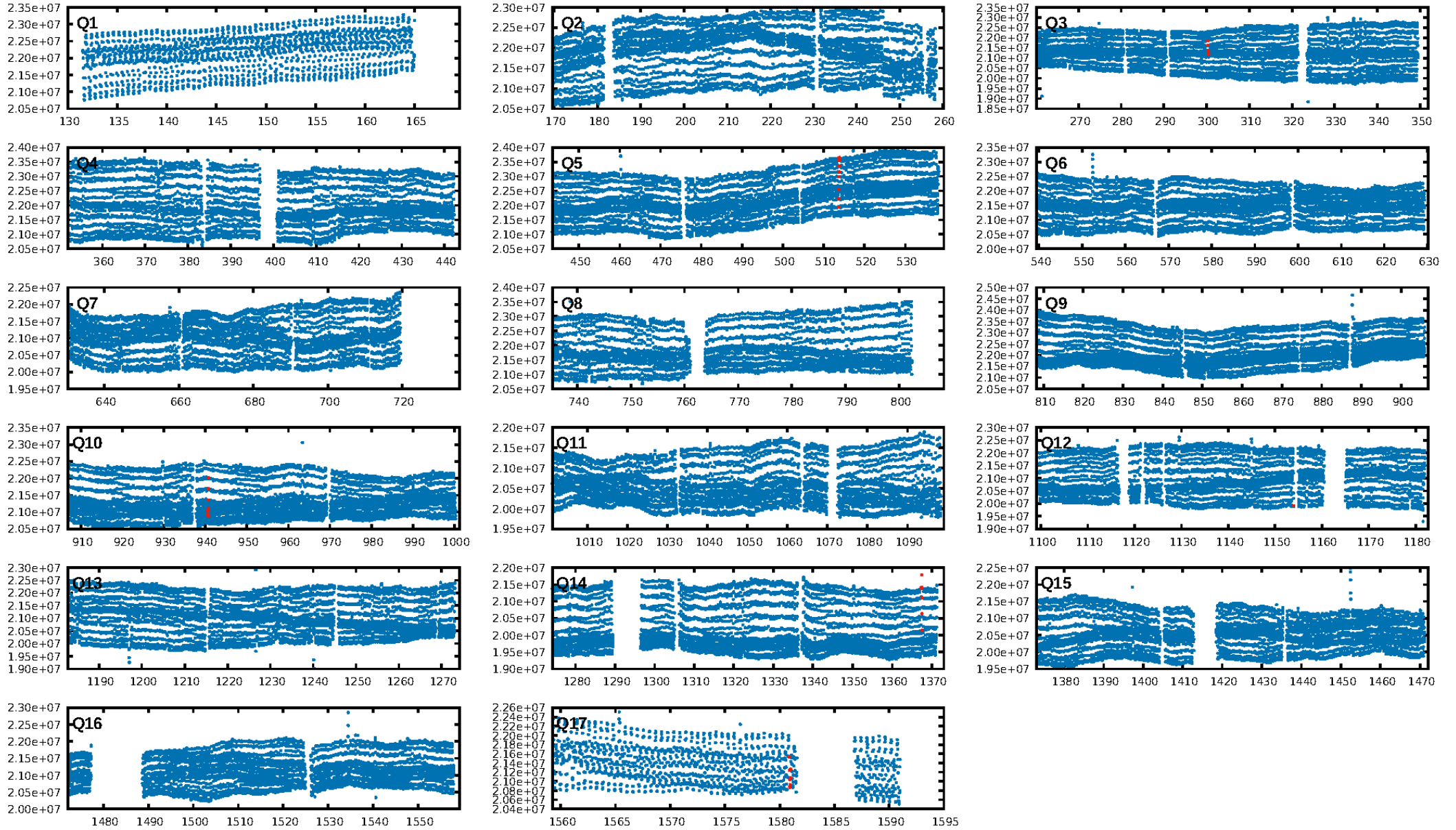
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [634.22σ]  
ModelChiSquare2-sig: 41.6%  
ModelChiSquareGof-sig: 87.9%  
Bootstrap-pfa: 1.09e-05  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: 5.128  
Centroid-sig: 46.1%  
Centroid-so: 8.913 arcsec [1.27σ]  
OotOffset-rm: 0.023 arcsec [0.33σ]  
OotOffset-st: 2/1/0/2 [5]  
KicOffset-rm: 0.316 arcsec [3.81σ]  
KicOffset-st: 2/1/0/2 [5]  
DiffImageQuality-fgm: 0.60 [3/5]  
DiffImageOverlap-fno: 1.00 [5/5]

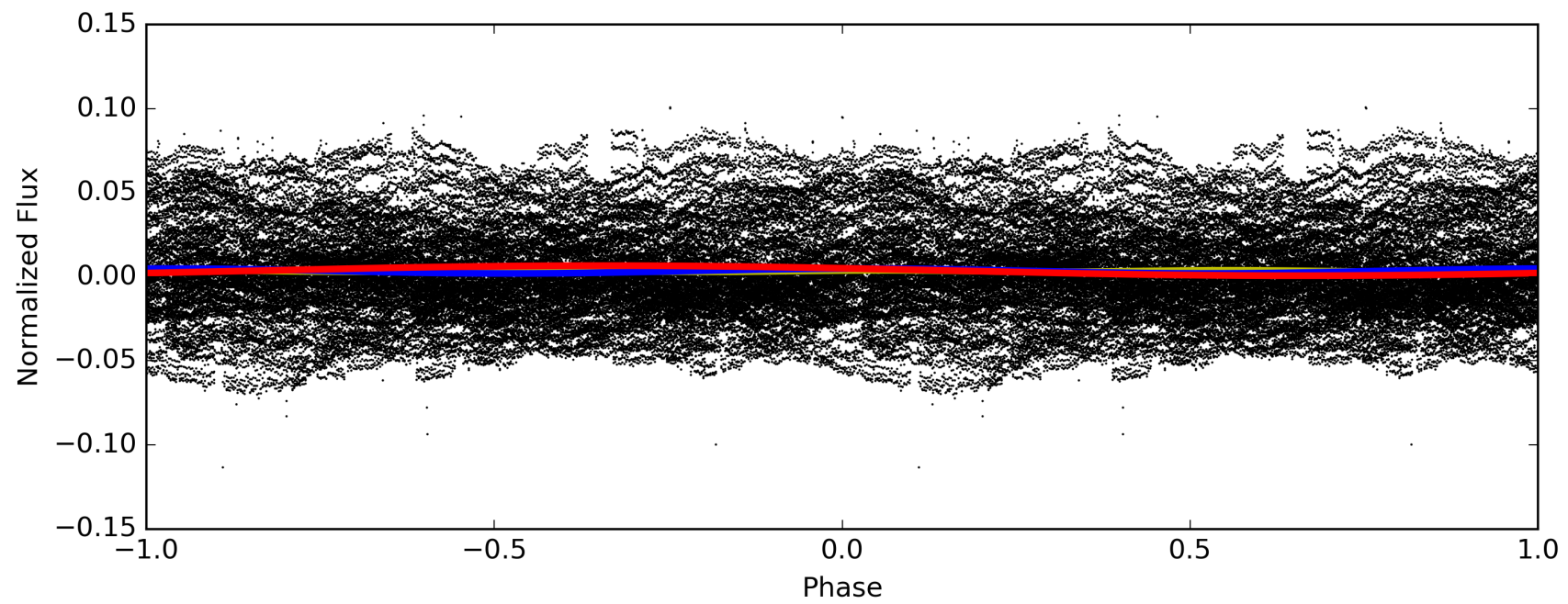
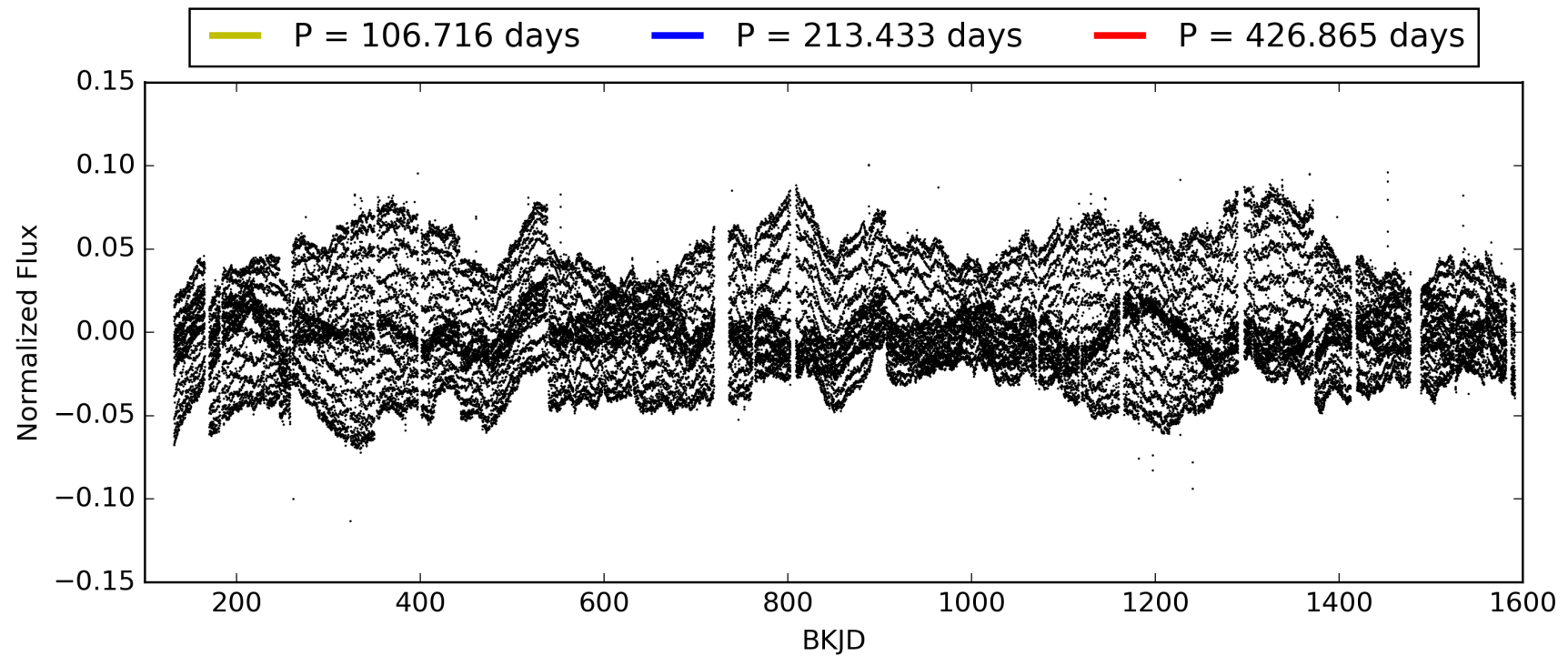
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 04:02:10 Z

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

# TCE 008590274-02, PDC Light Curves



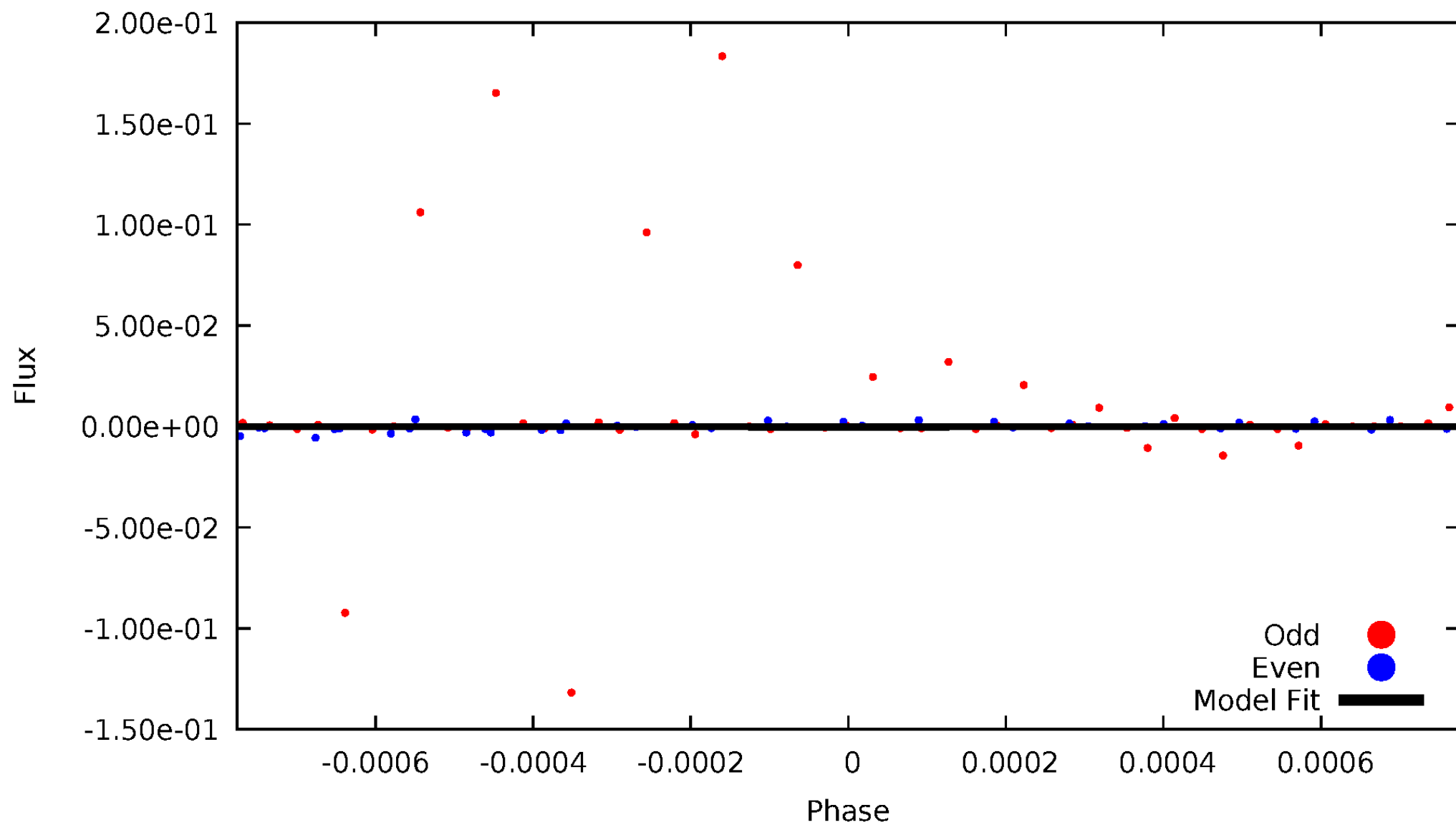
TCE 008590274-02





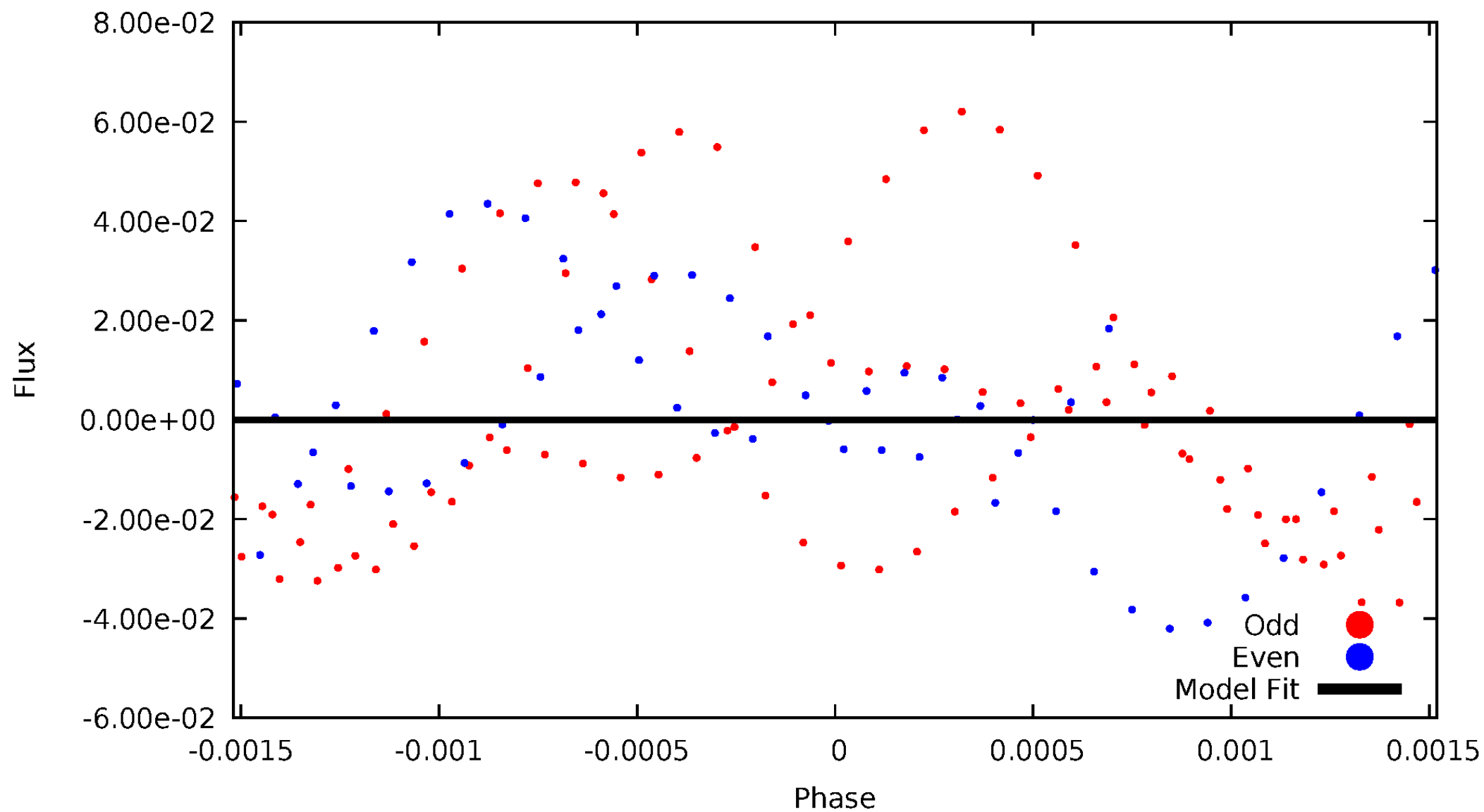
# DV Odd/Even

TCE 008590274-02



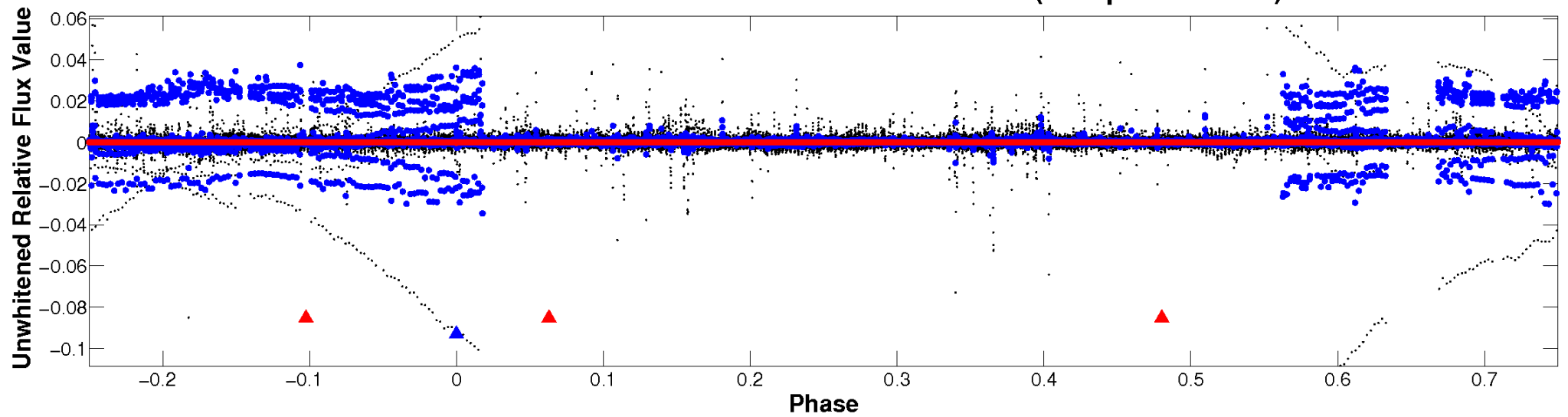
# ALT Odd/Even

TCE 008590274-02

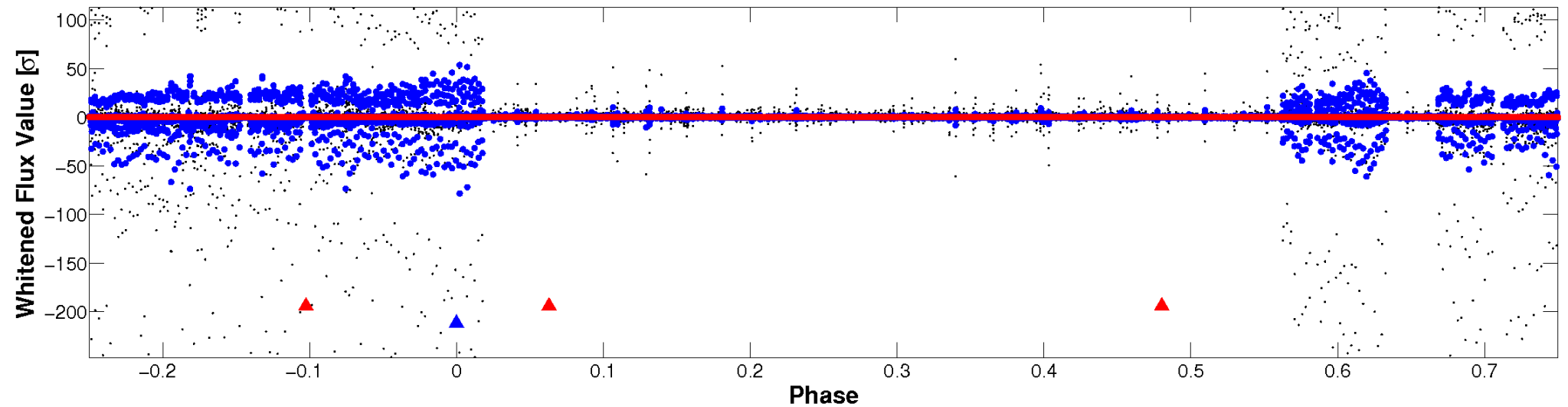


# Non-Whitened Vs. Whitened Light Curve

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

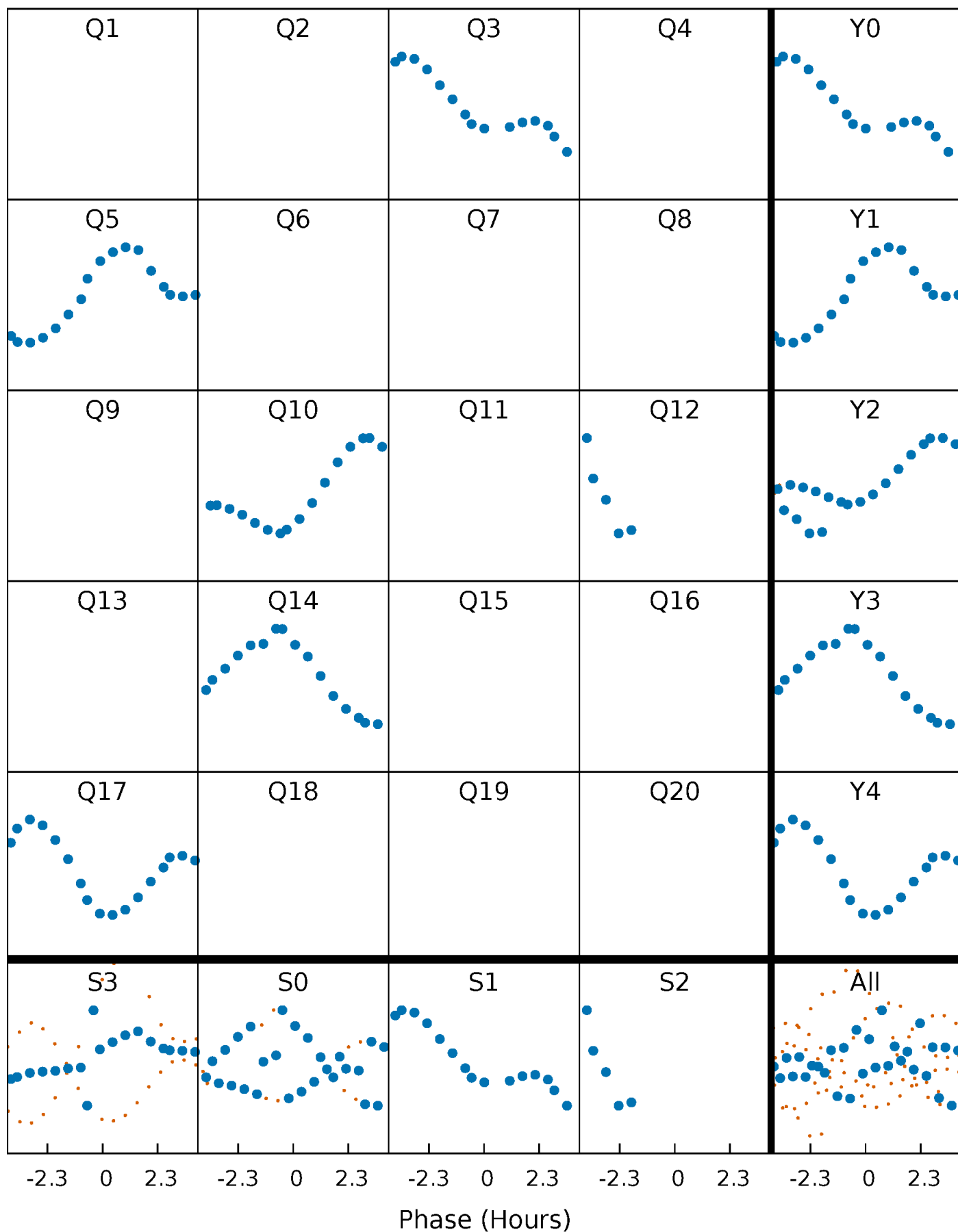


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



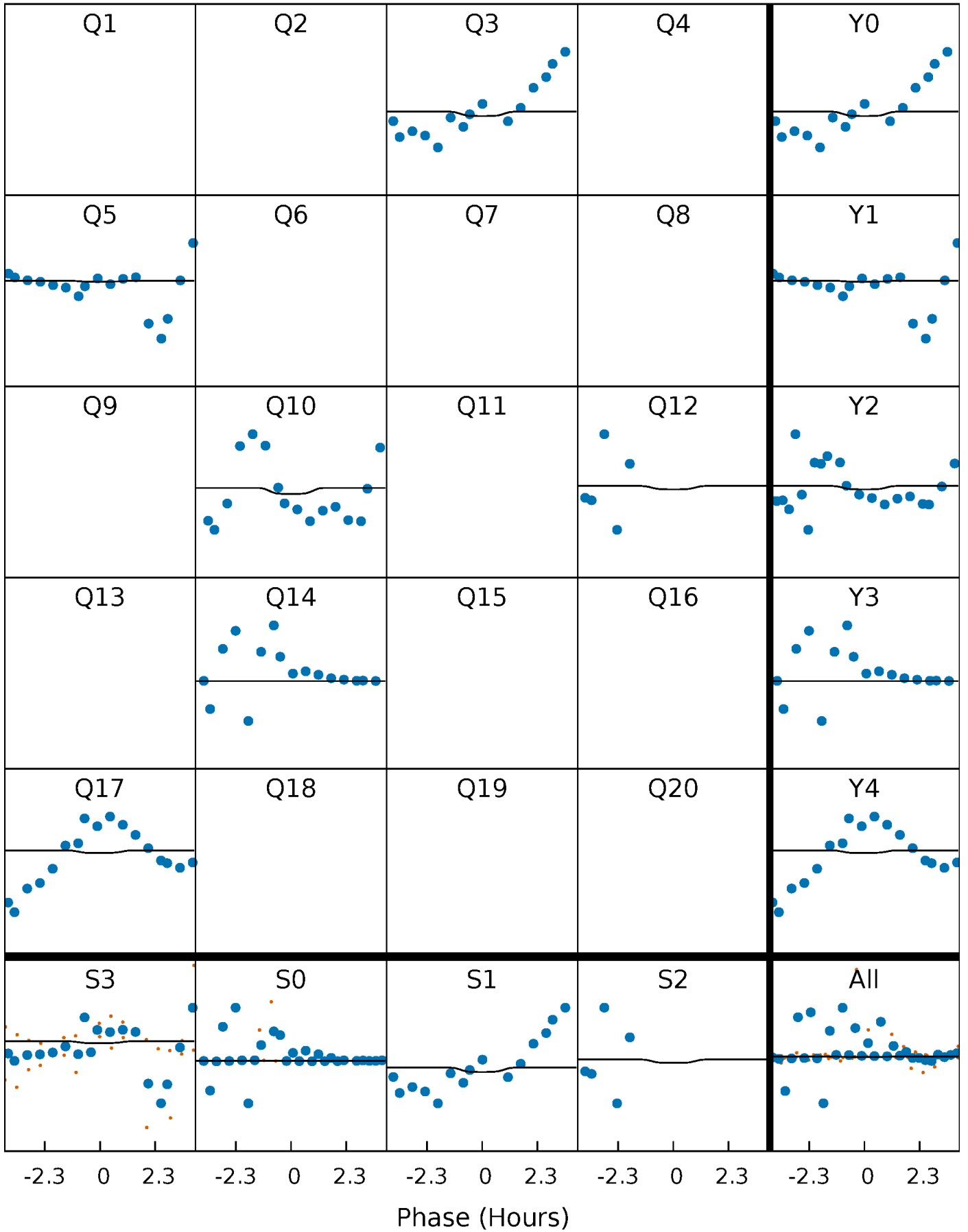
# PDC Quarter-Phased Transit Curves

TCE 008590274-02     $P=213.432748$  Days     $T_0=300.331385$  (BKJD)



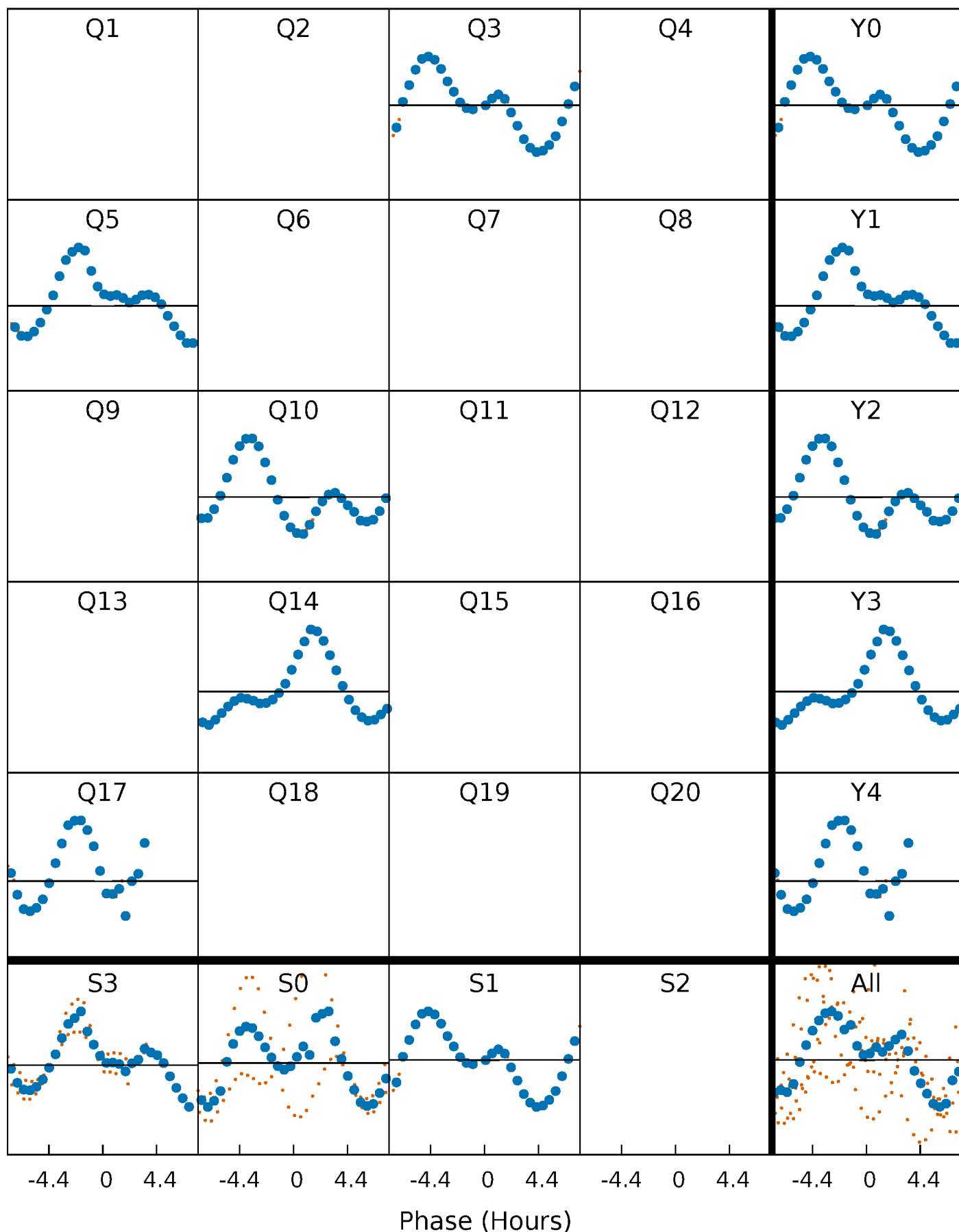
# DV Quarter-Phased Transit Curves

TCE 008590274-02     $P=213.432748$  Days     $T_0=300.331385$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

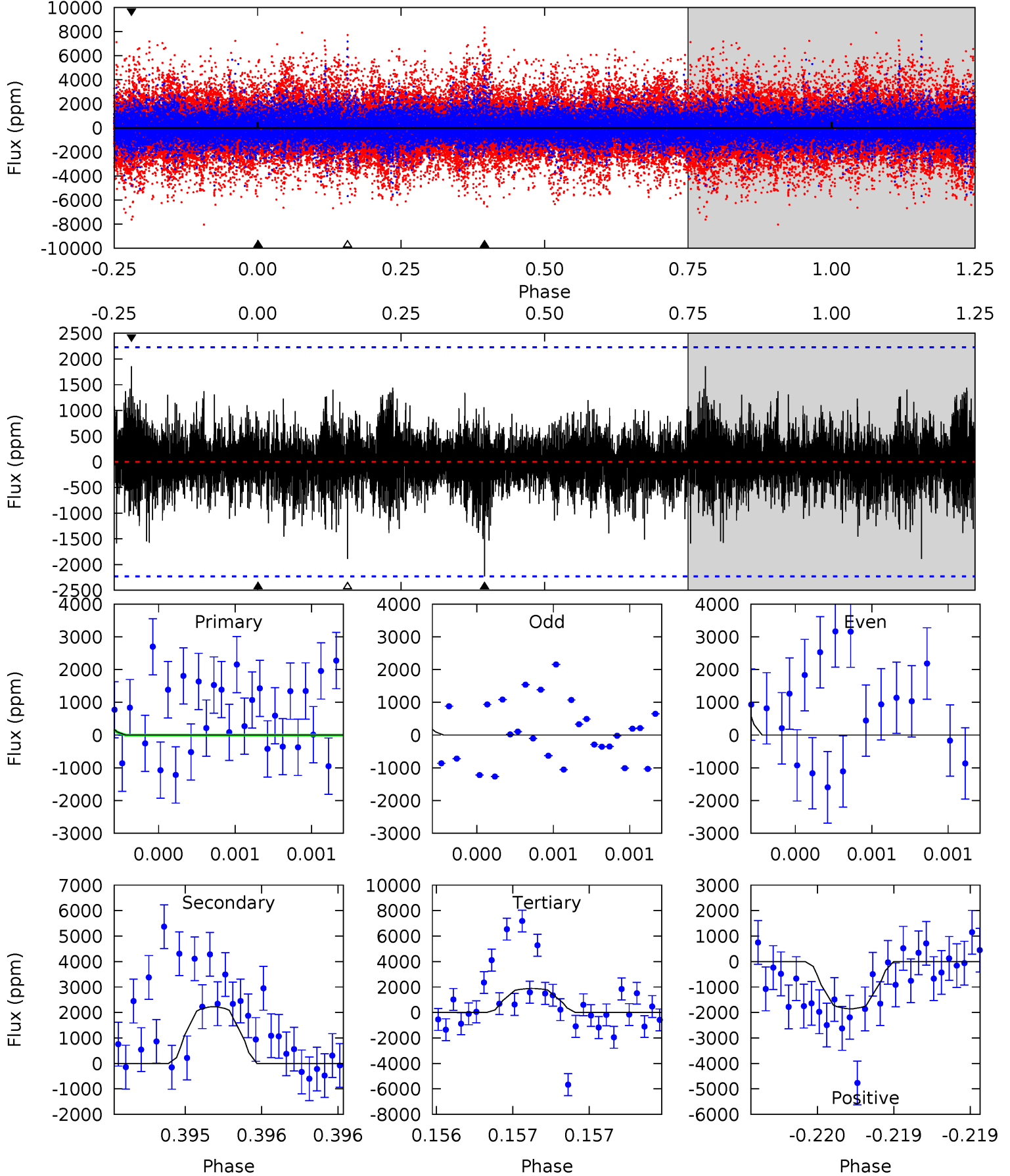
TCE 008590274-02 P=213.508885 Days  $T_0=300.379445$  (BKJD)



# DV Model-Shift Uniqueness Test

008590274-02, P = 213.432748 Days, E = 86.898637 Days

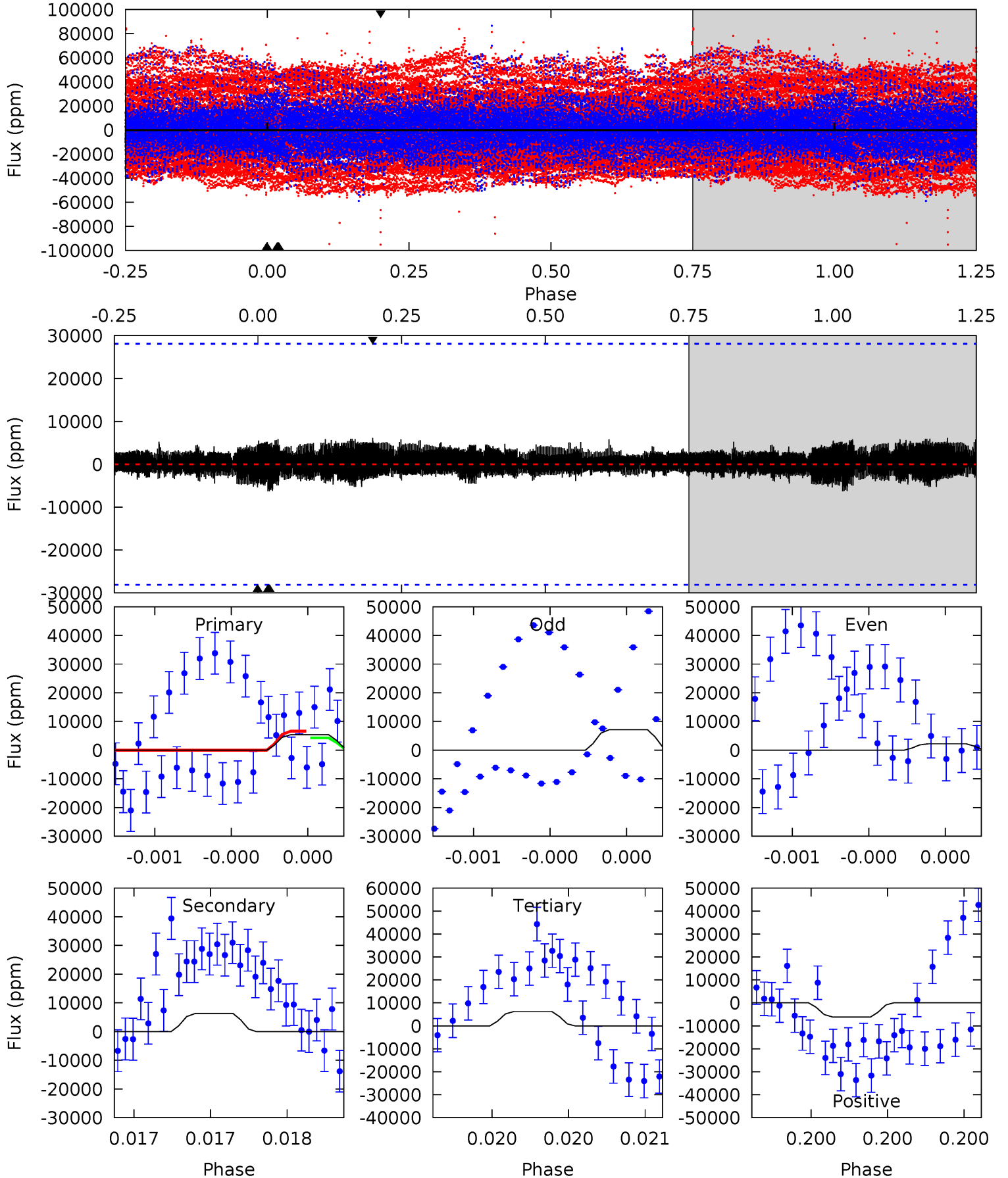
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.26	5.59	4.73	4.66	5.59	3.51	1.00	-3.47	-3.40	0.86	0.93	1.23	-181.4	0.45	0.10



# Alt Model-Shift Uniqueness Test

008590274-02, P = 213.508885 Days, E = 86.870560 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
1.07	1.25	1.24	1.22	5.58	3.50	0.43	-0.17	-0.15	0.01	0.03	0.49	1.21	0.49	0.23





### Stellar Parameters For KIC 008590274

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5203^{+182}_{-164}$	$4.641^{+0.060}_{-0.045}$	$-1.060^{+0.350}_{-0.300}$	$0.620^{+0.053}_{-0.043}$	$0.614^{+0.057}_{-0.023}$	$3.624^{+0.874}_{-0.588}$
	+3%/-3%	+1%/-1%	+33%/-28%	+9%/-7%	+9%/-4%	+24%/-16%
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 008590274-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-2227 \pm 399$	$98.49^{+100.05}_{-67.55}$	$327^{+14}_{-12}$	$1949^{+562}_{-261}$	$47^{+388}_{-36}$
Alt.	$-6293 \pm 5034$	$96.22^{+105.08}_{-69.19}$	$327^{+13}_{-13}$	$2141^{+880}_{-406}$	$119^{+1865}_{-105}$

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

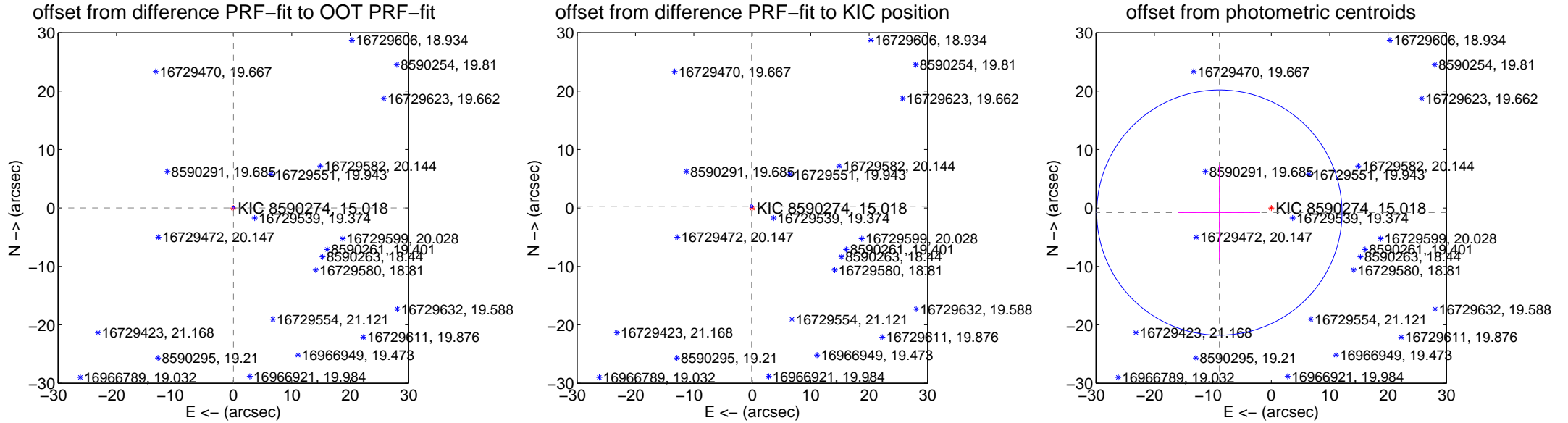
## DV Centroid Data

Supplemental centroid analysis for 008590274-02. Kepler magnitude: 15.02. Transit SNR 0.39

There are 3 quarters with good PRF difference image offsets

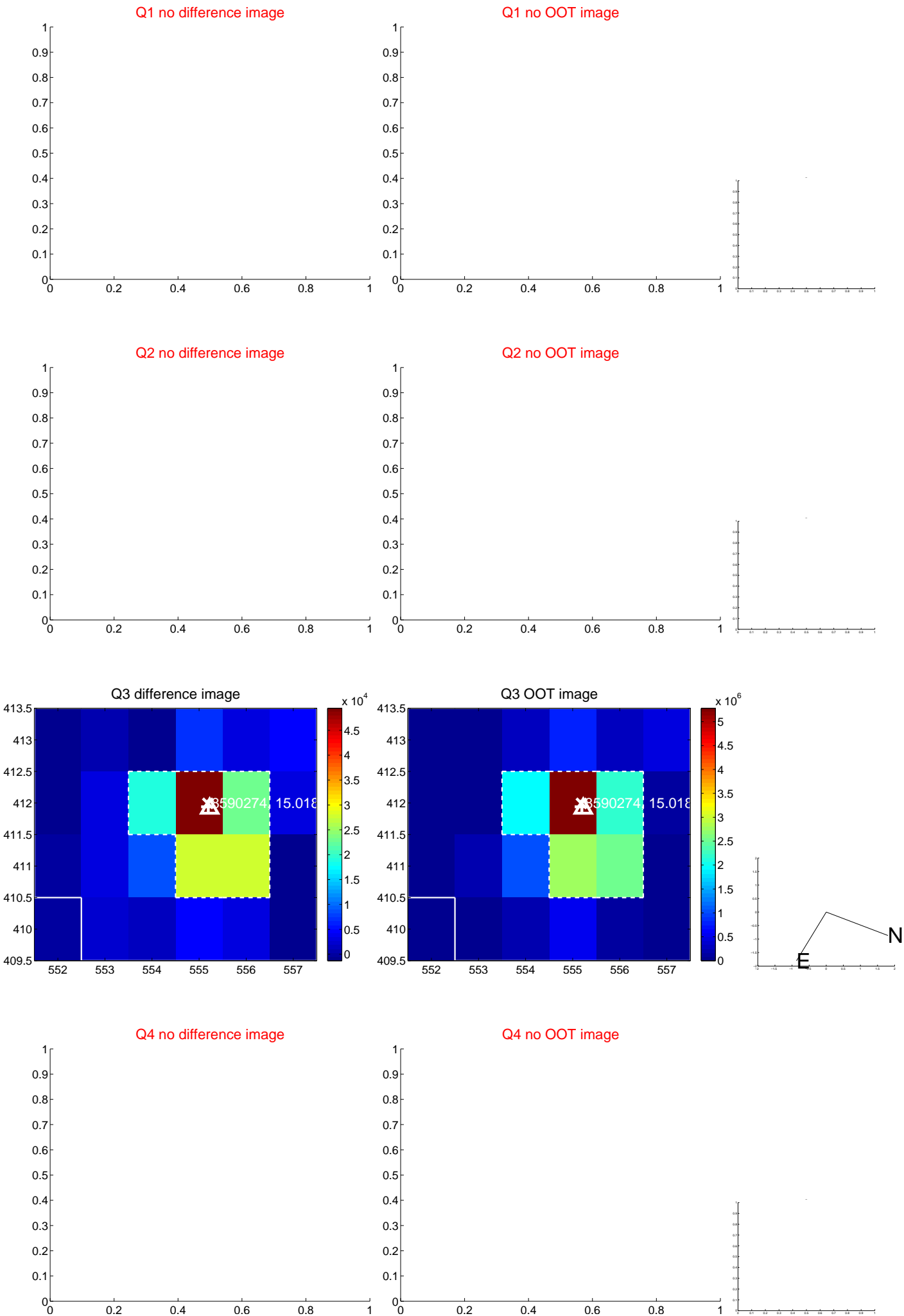
The direct PRF centroid is offset from the target star catalog position by about 0.26 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.023 \pm 0.070$	0.33	$-0.019 \pm 0.070$	$0.013 \pm 0.070$
PRF-fit source offset from KIC position	<b><math>0.316 \pm 0.083</math></b>	<b>3.81</b>	$0.120 \pm 0.084$	$0.292 \pm 0.083$
photometric centroid source offset	$8.91 \pm 7.00$	1.27	$8.88 \pm 6.99$	$-0.79 \pm 8.13$

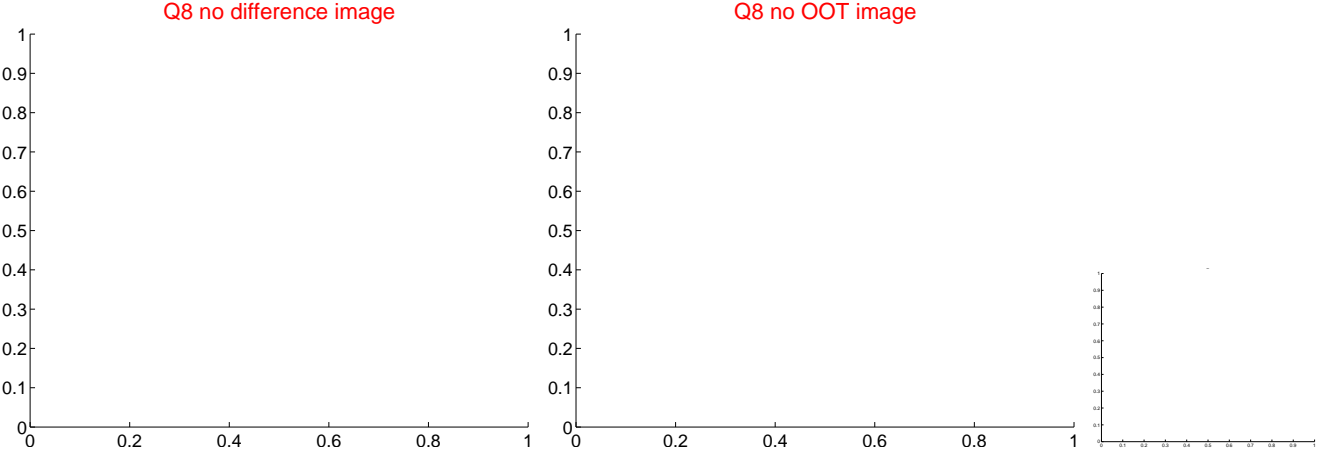
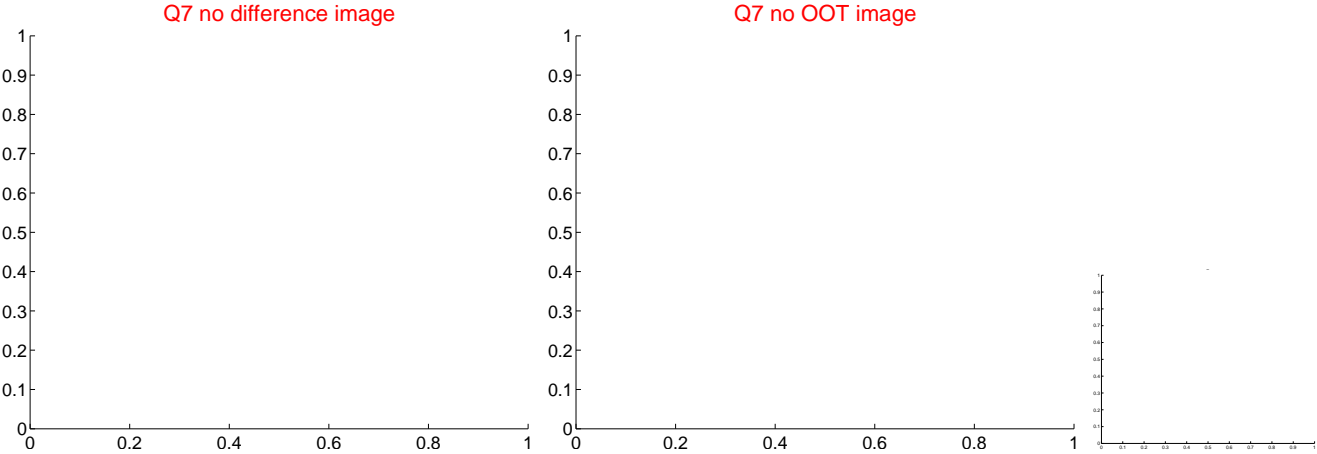
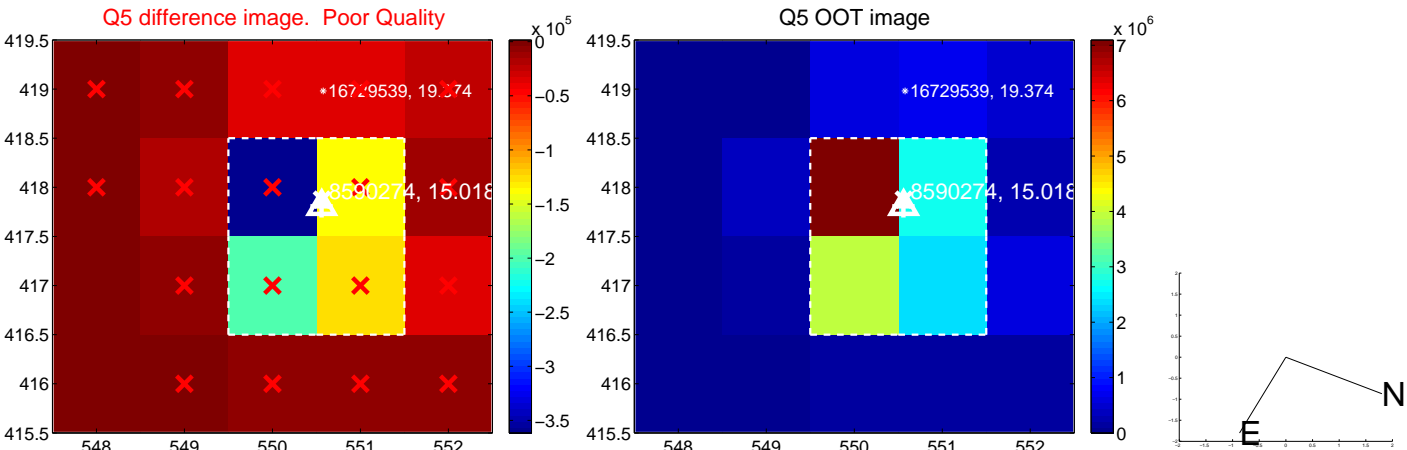


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

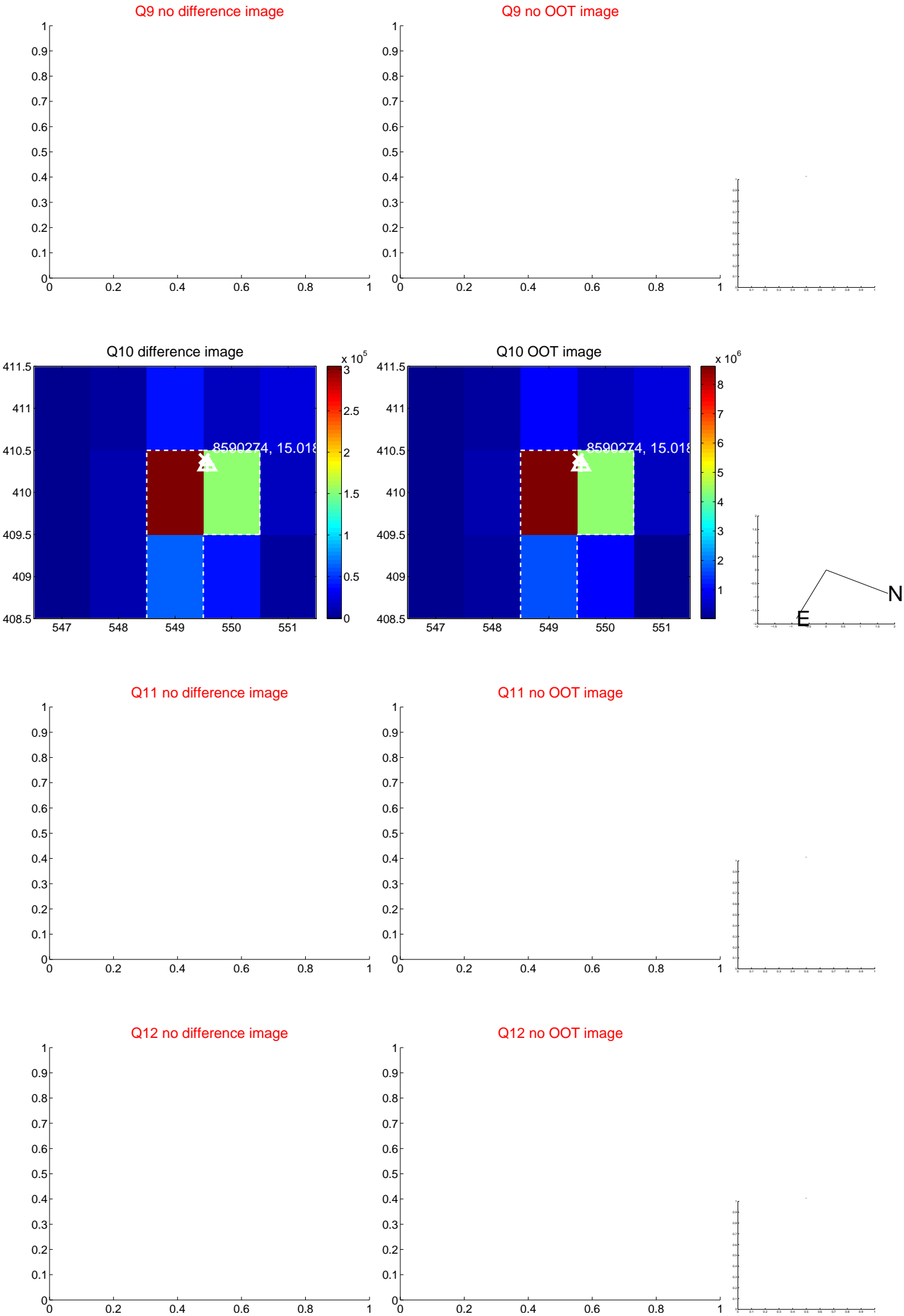
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



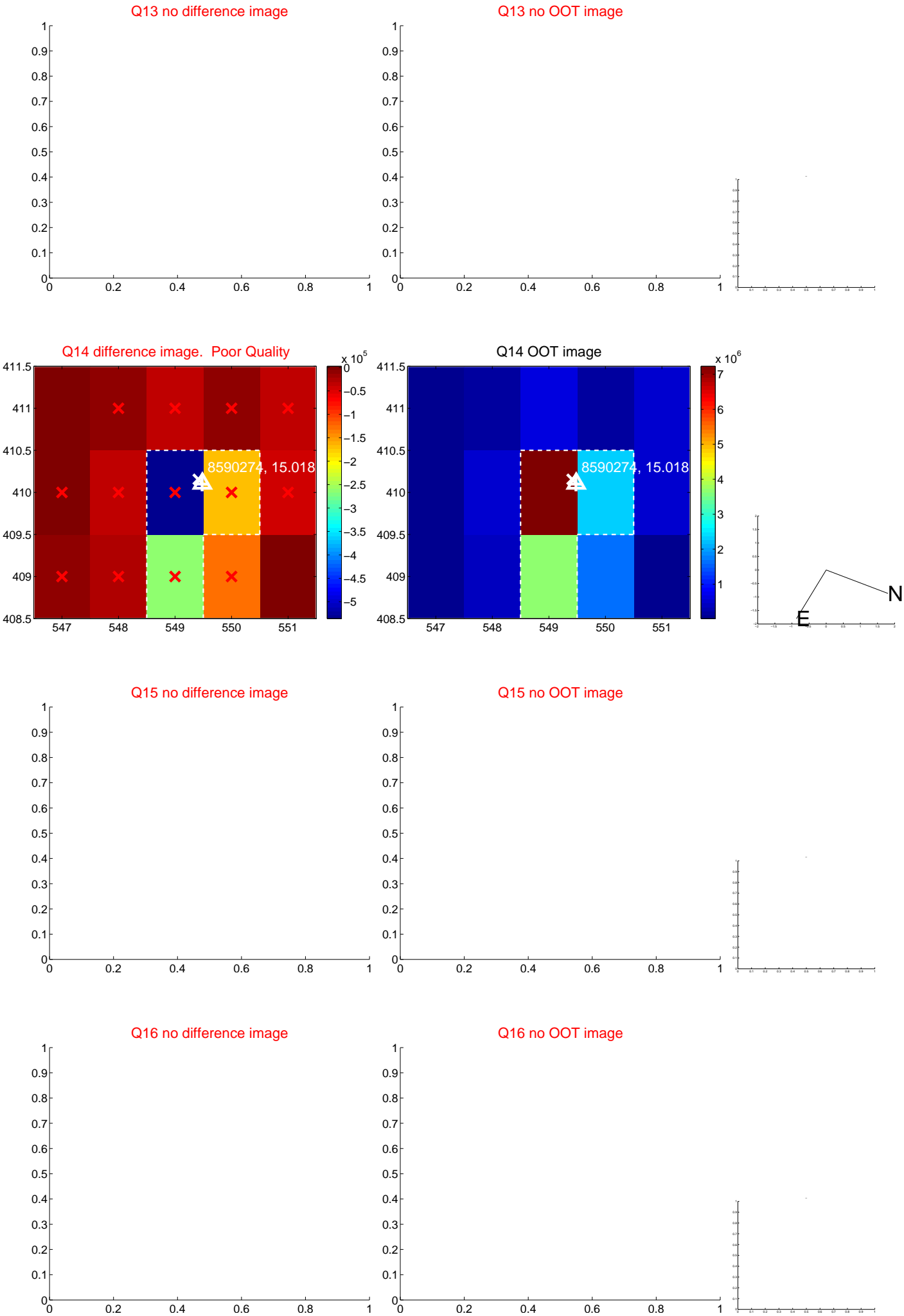
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



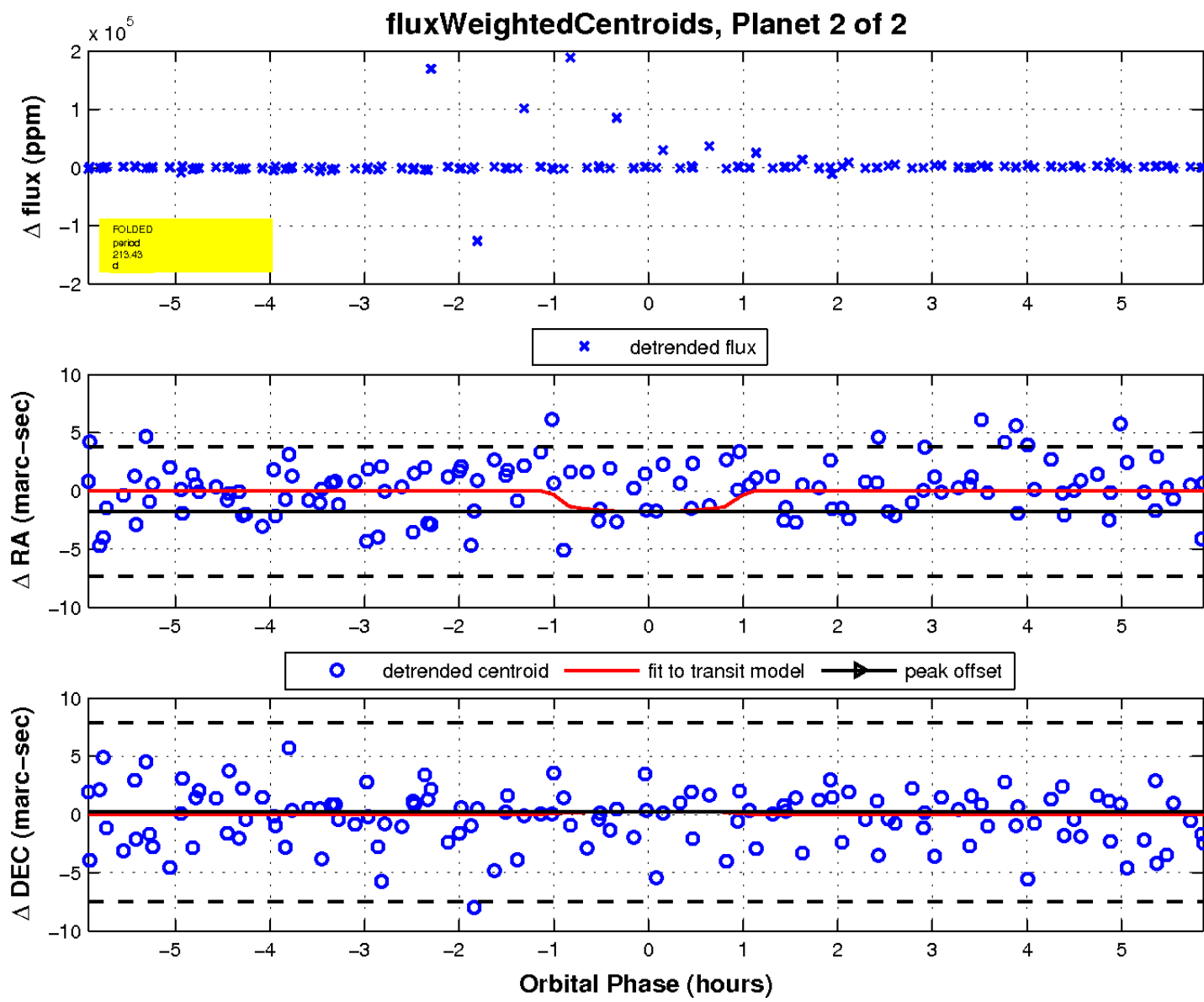
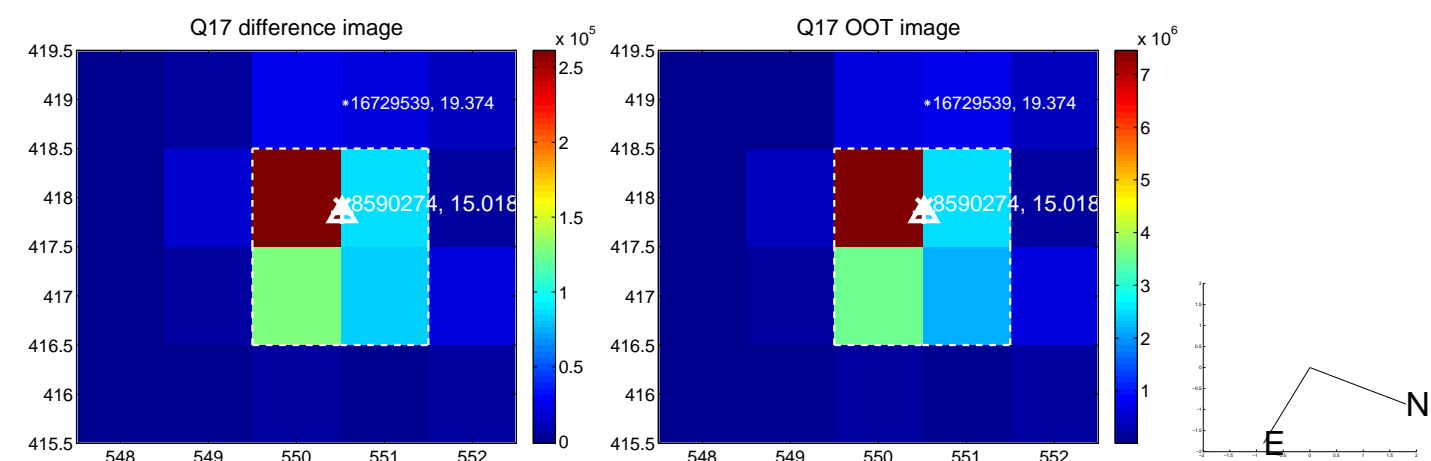
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

