

# KIC 005041847

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005041847-01	OBS	No	1.371775	132.090905	334.6	2.969	80.9	34.6	0.99	5762	3.04	1738.90
005041847-02	OBS	4085.01	0.914466	132.120369	4338.2	1.500	141.0	-1.0	0.99	5762	6.49	2986.03

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005041847-01	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
005041847-02	OBS	FP	0.00	1	0	0	1	LPP_DV—MOD_NONUNIQ_ALT—CENT_NOFITS—EPHEM_MATCH

**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.

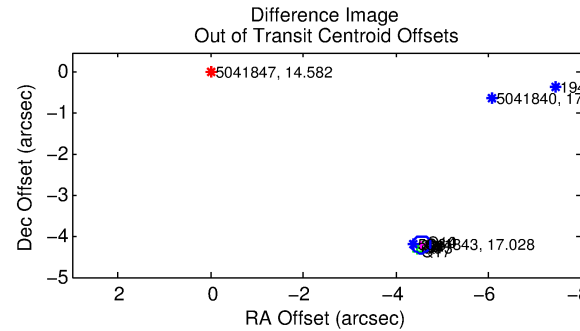
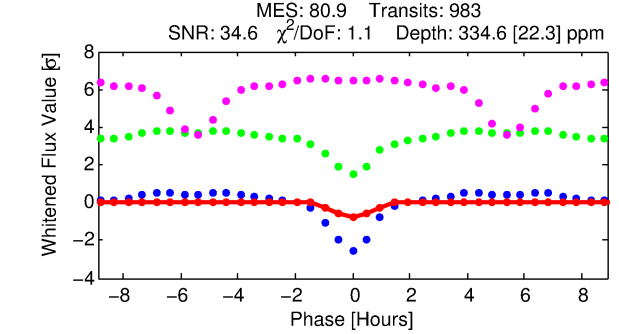
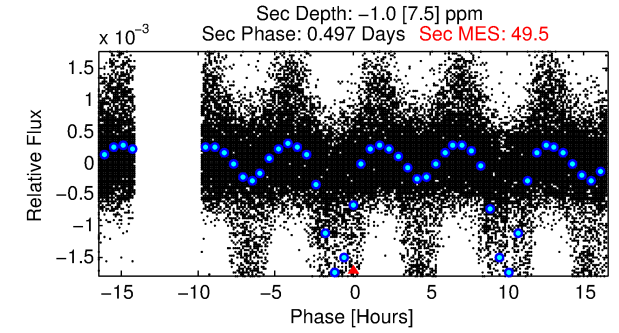
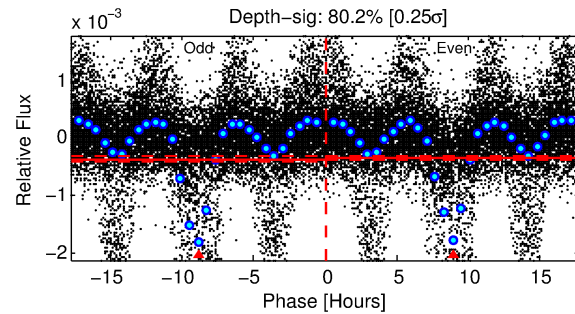
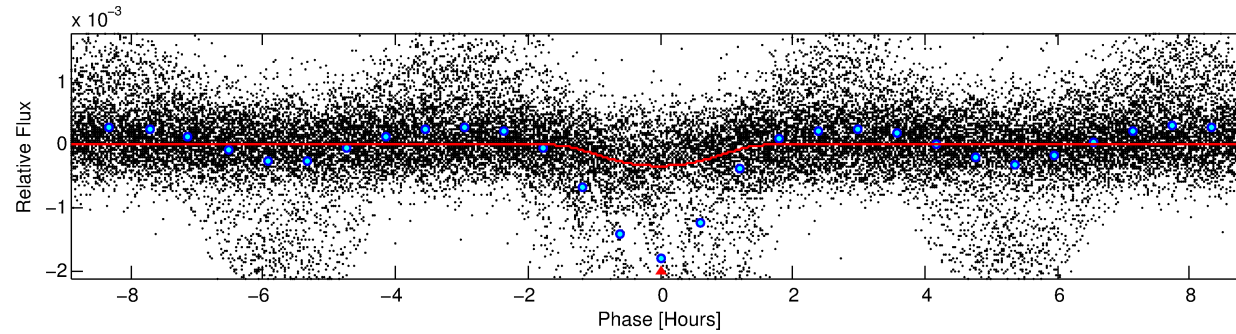
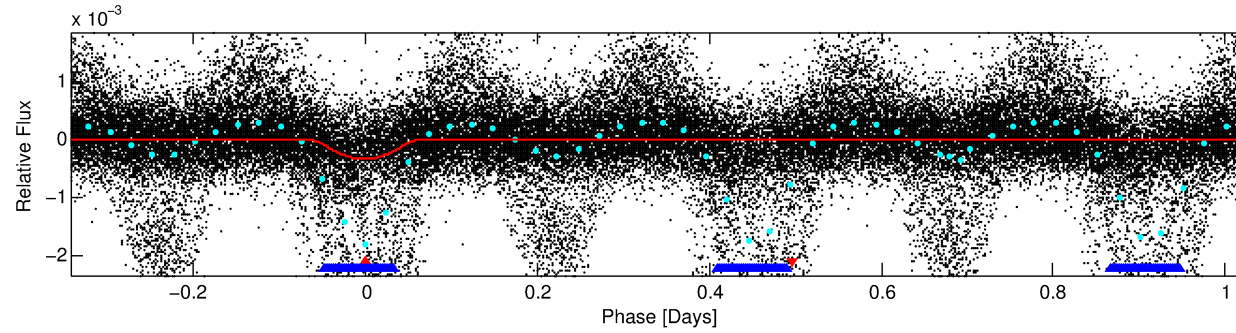
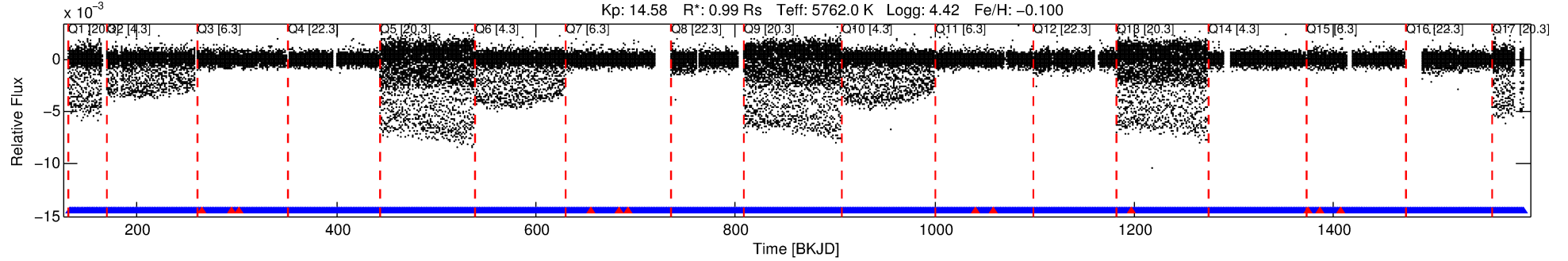
## Ephemeris Match Information For 005041847-01

No Significant Match Found

# DV One-Page Summary

KIC: 5041847 Candidate: 1 of 2 Period: 1.372 d  
KOI: K04085 Corr: No Ephemeris Match

Kp: 14.58 R\*: 0.99 Rs Teff: 5762.0 K Logg: 4.42 Fe/H: -0.100



## DV Fit Results:

Period = 1.37177 [0.00000] d  
Epoch = 132.0909 [0.0012] BKJD  
Rp/R\* = 0.0281 [0.0154]  
a/R\* = 1.40 [0.12]  
b = 0.99 [0.03]  
Seff = 1738.90 [650.41]  
Teq = 1647 [154] K  
Rp = 3.04 [1.87] Re  
a = 0.0236 [0.0057] AU  
Ag = N/A  
Teffp = N/A

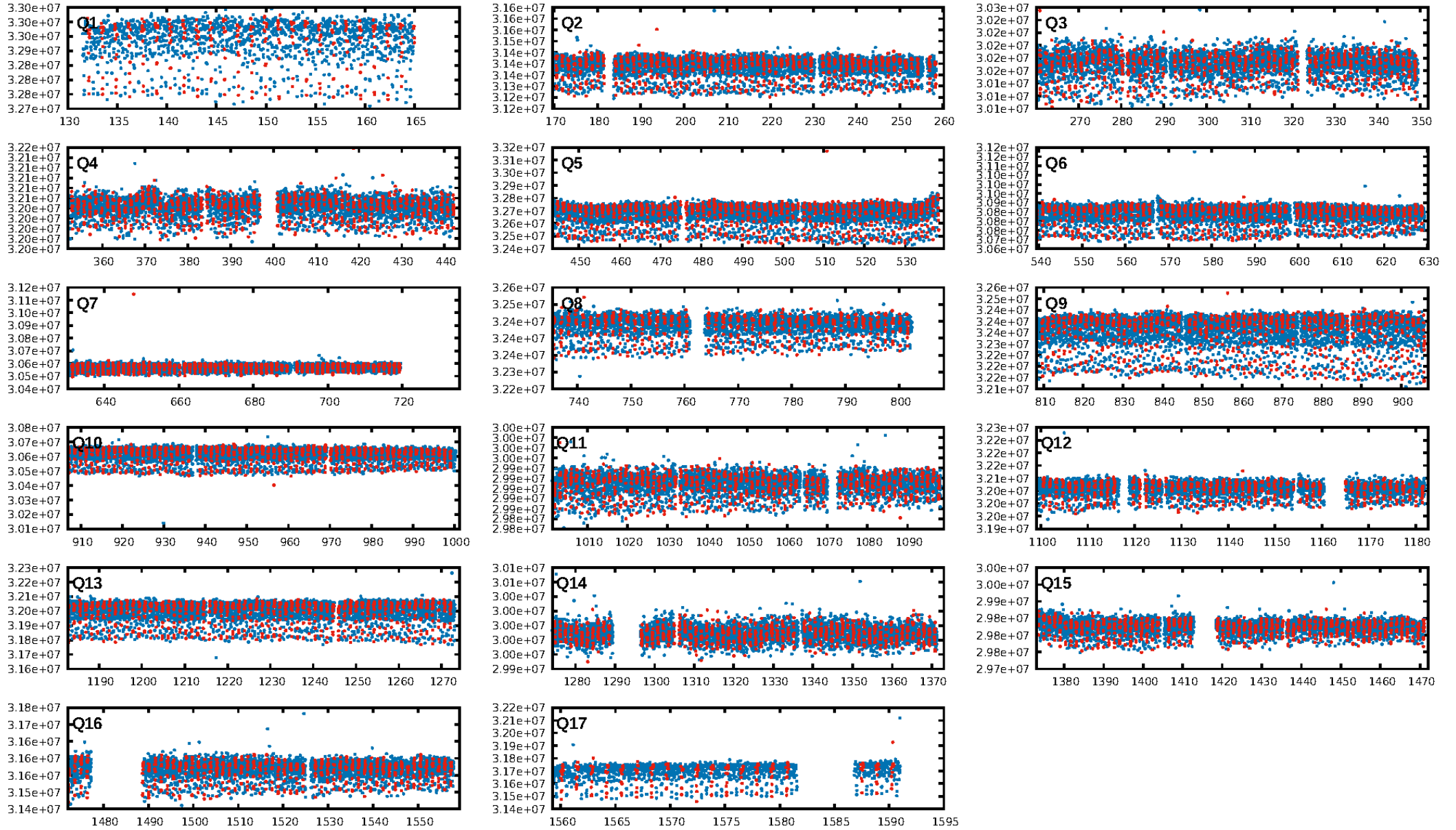
## DV Diagnostic Results:

ShortPeriod-sig: 99.9% [3.30σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.99 [926/939]  
GhostDiagnostic-chr: N/A  
Centroid-sig: N/A  
Centroid-so: N/A  
OotOffset-rm: 6.185 arcsec [89.65σ]  
KicOffset-rm: 6.520 arcsec [91.56σ]  
OotOffset-st: 4/0/0/5 [9]  
KicOffset-st: 4/0/0/5 [9]  
DiffImageQuality-fgm: 1.00 [9/9]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 19:13:49 Z

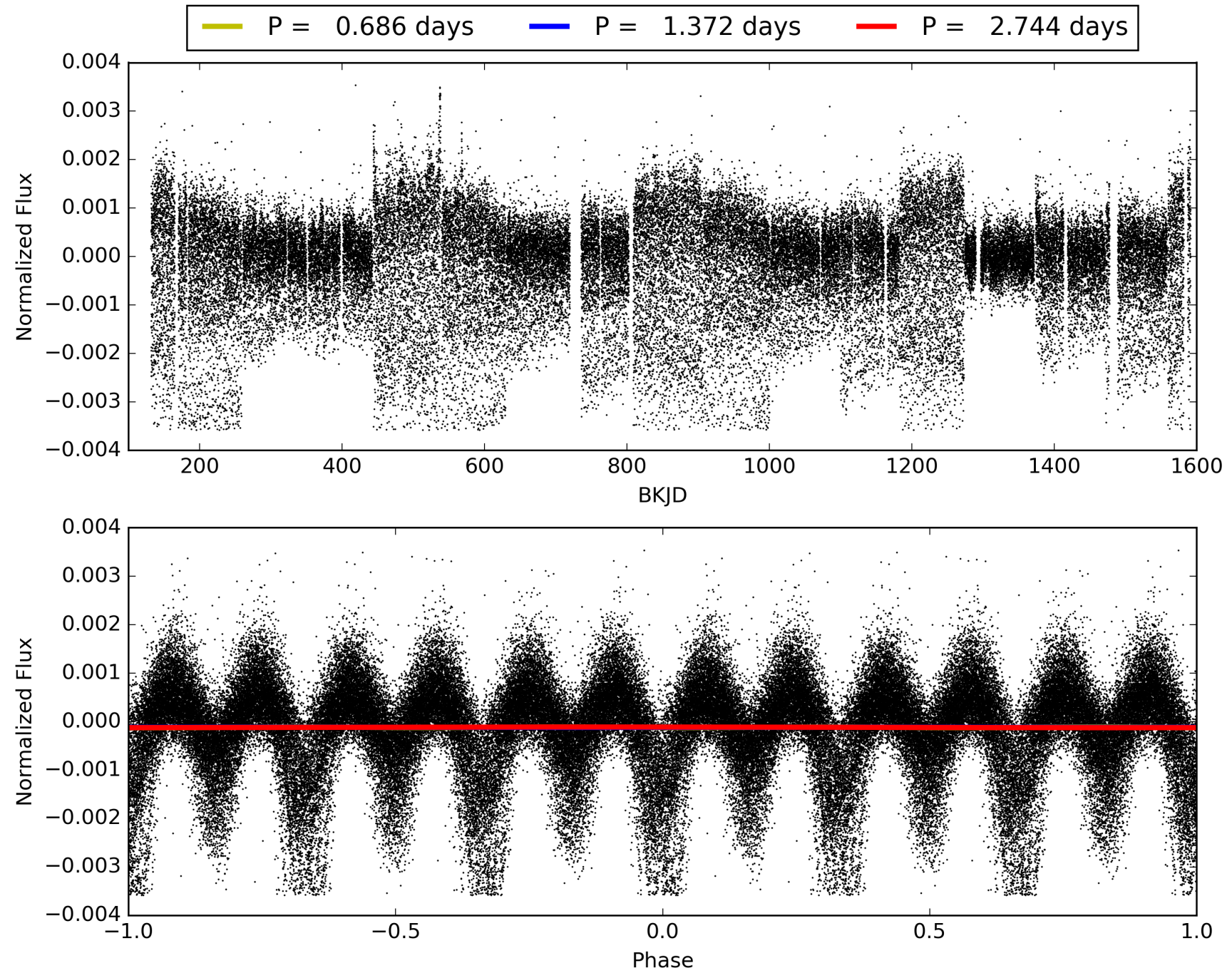
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005041847-01, PDC Light Curves



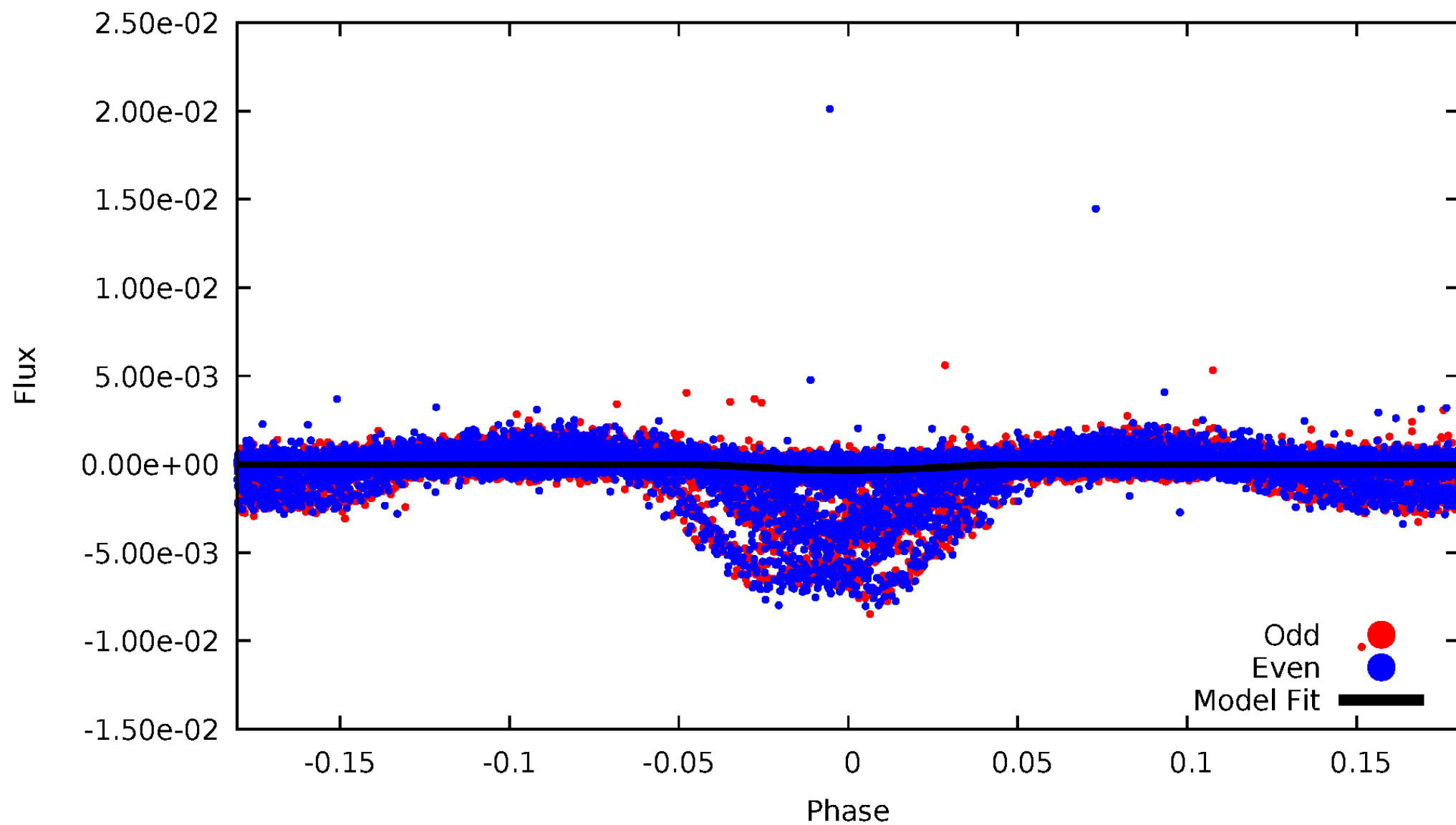


TCE 005041847-01



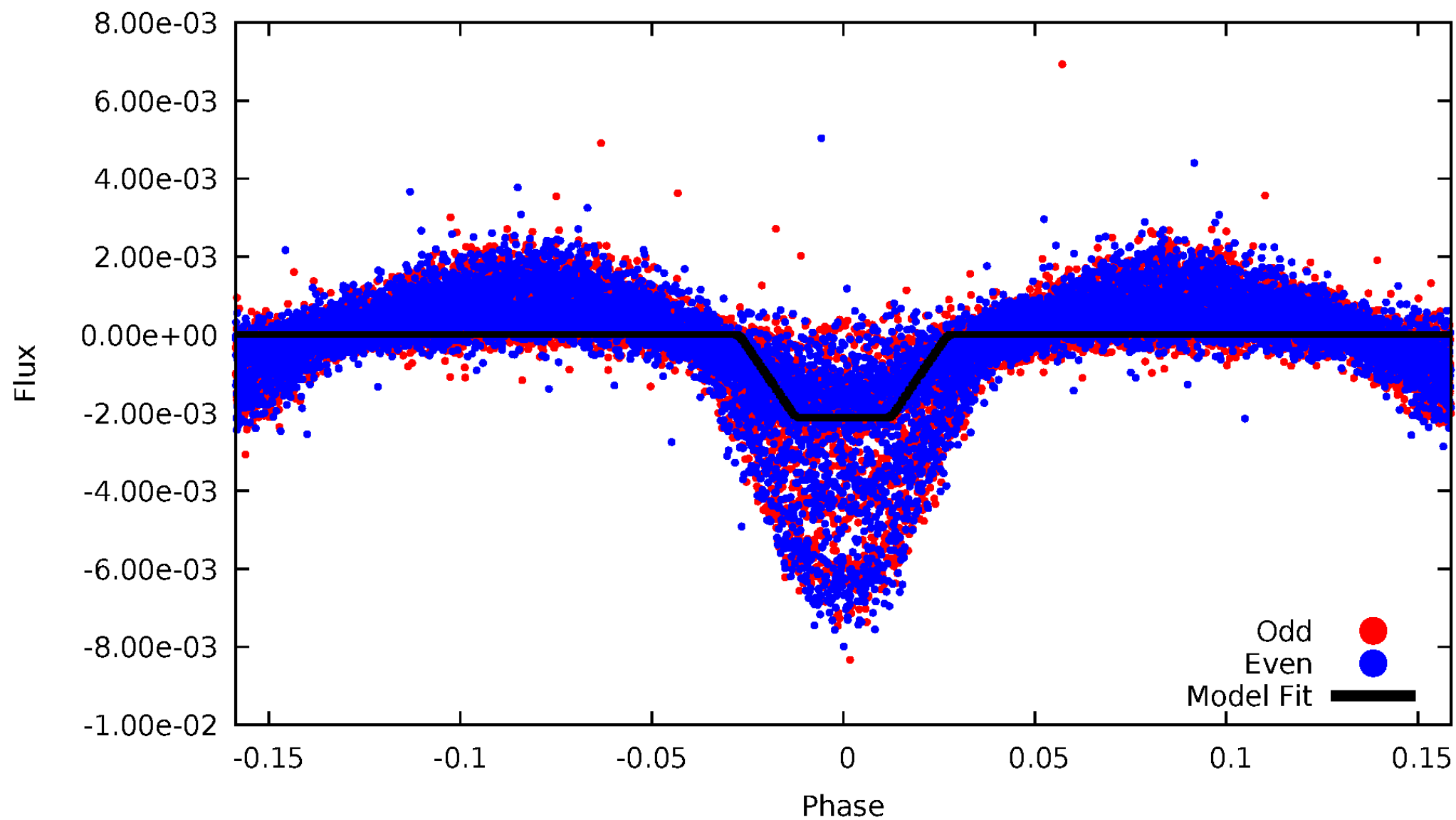
# DV Odd/Even

TCE 005041847-01



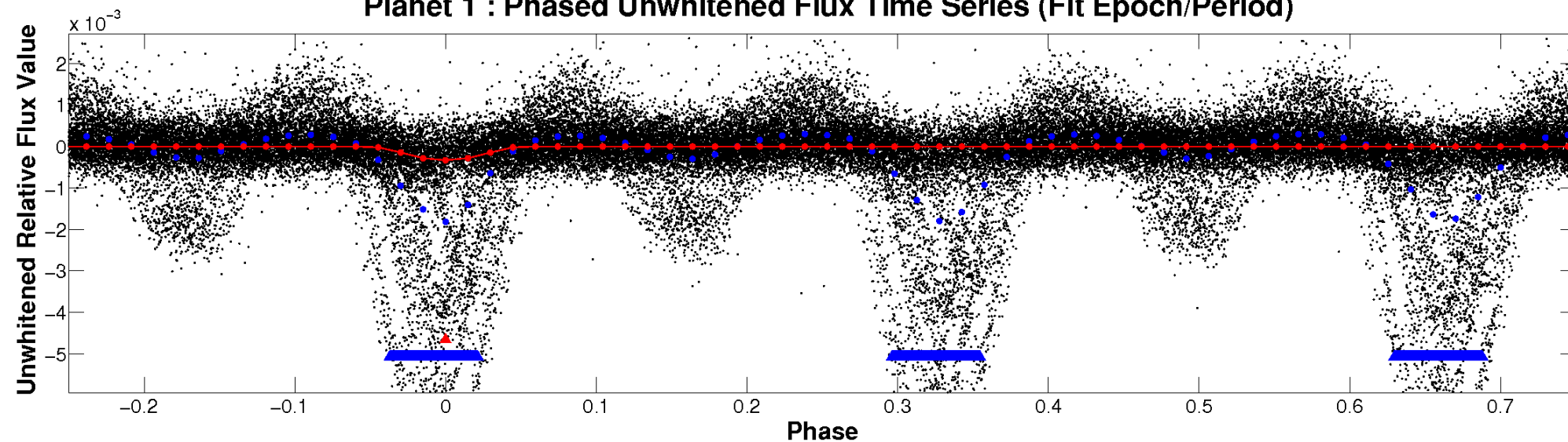
# ALT Odd/Even

TCE 005041847-01

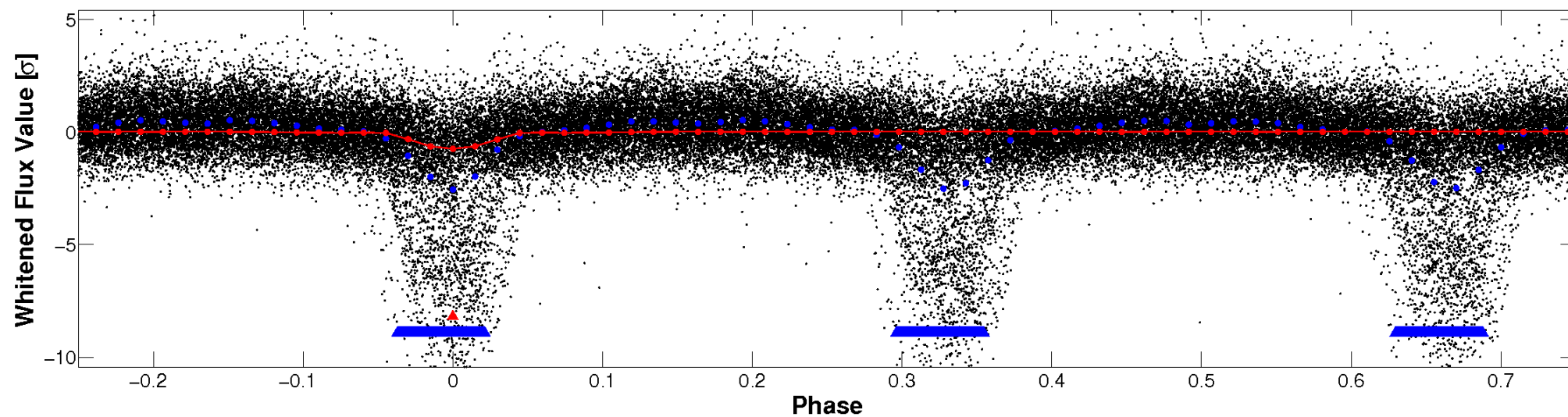


# Non-Whitened Vs. Whitened Light Curve

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

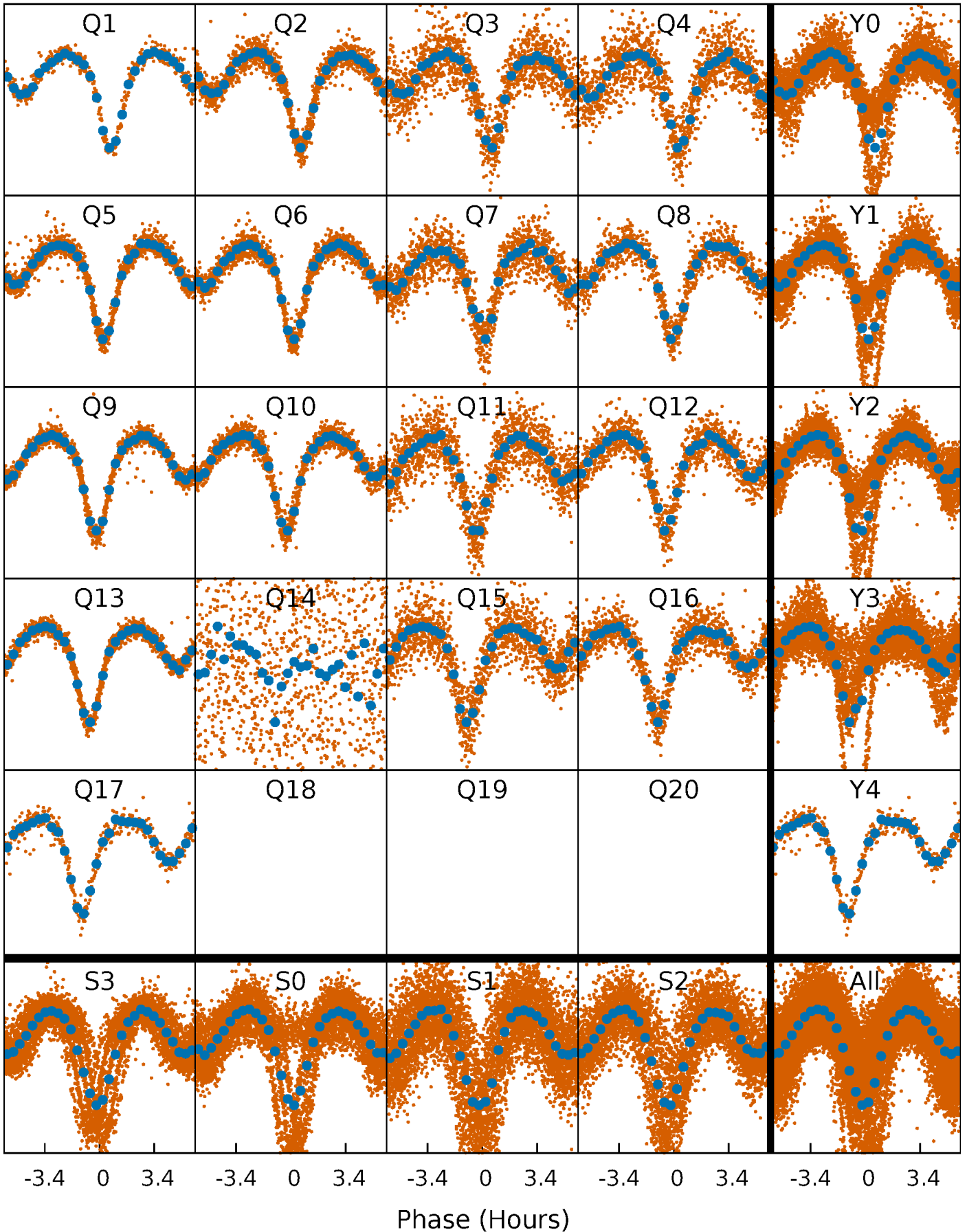


## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

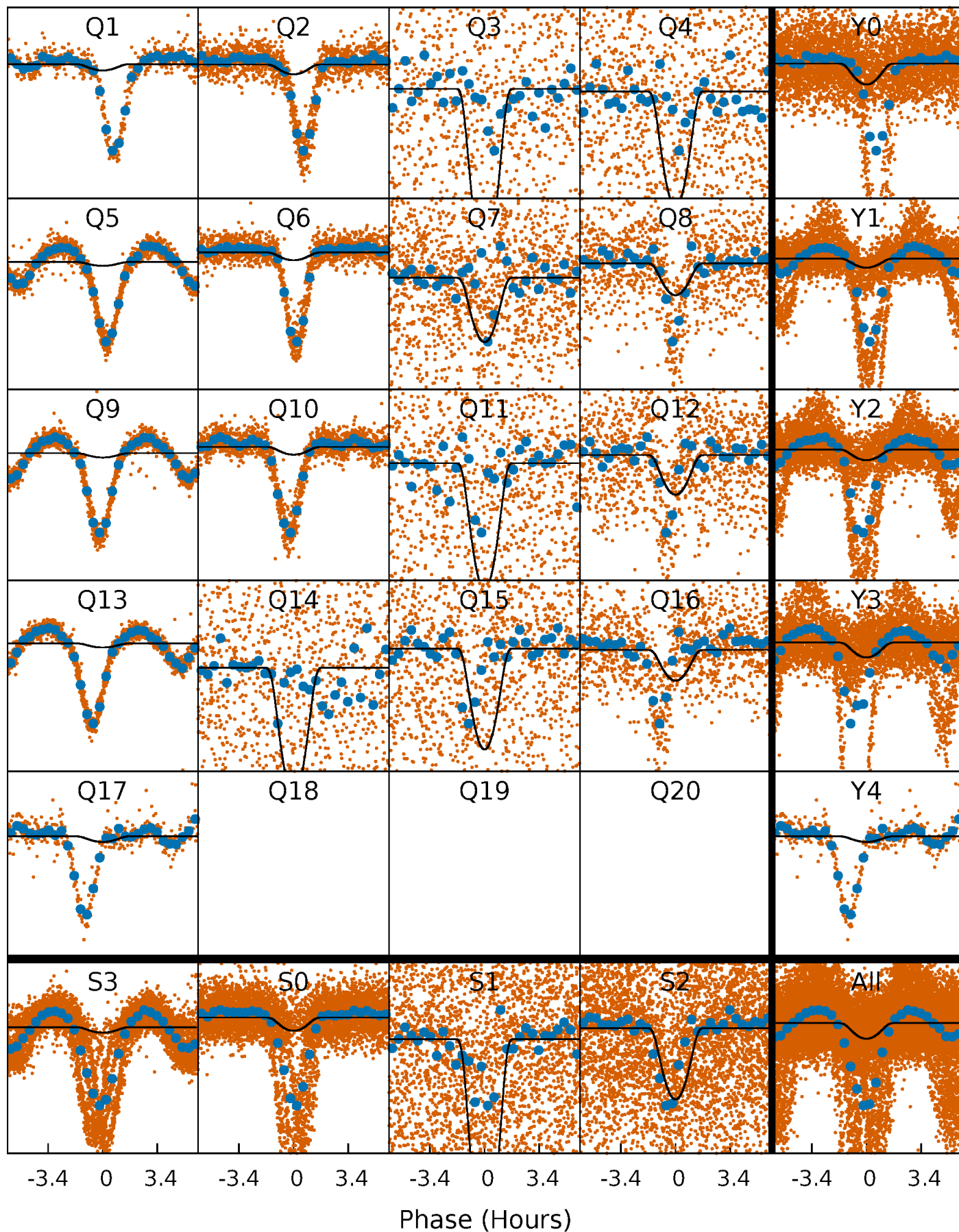
TCE 005041847-01   P= 1.371775 Days    $T_0=132.090905$  (BKJD)





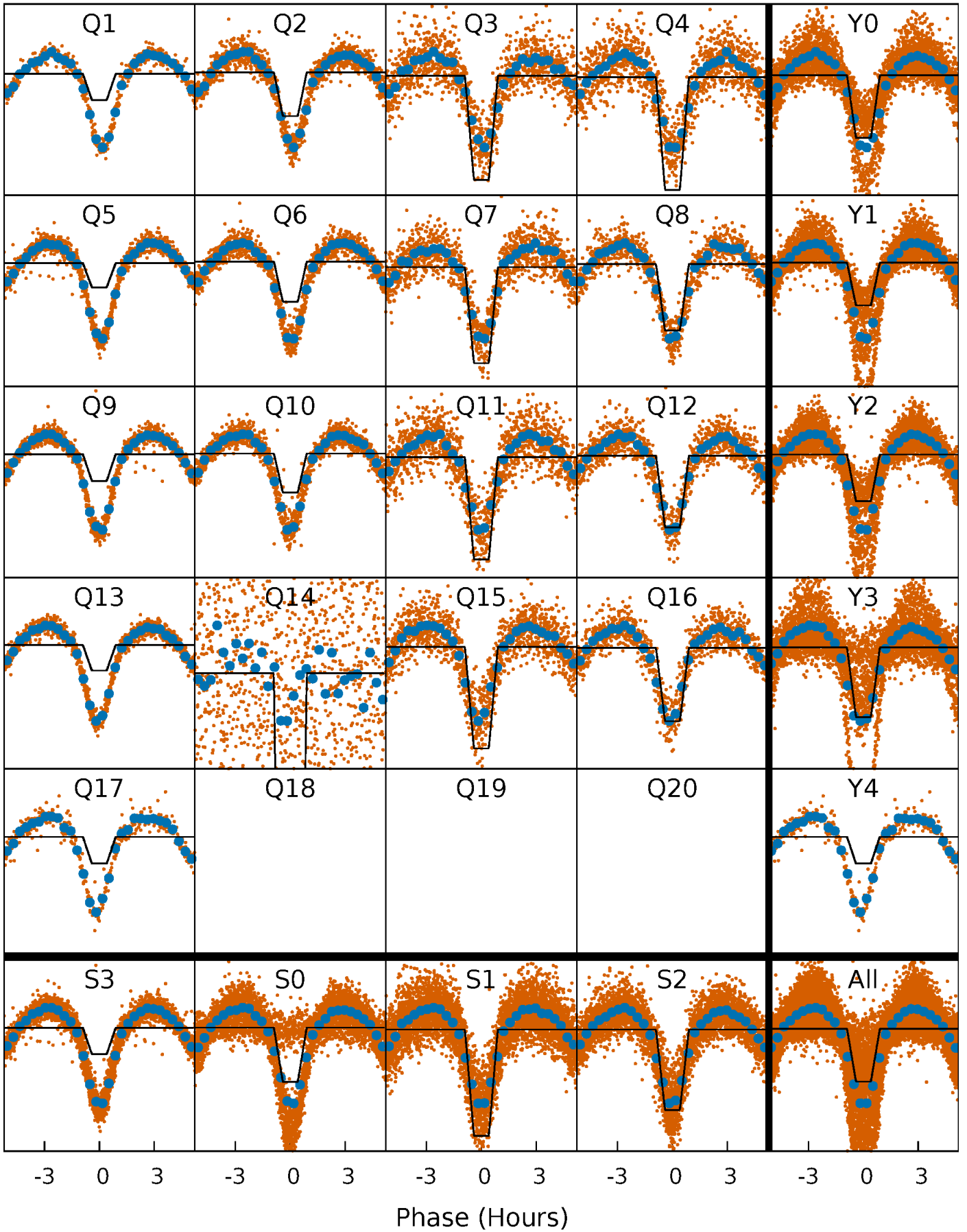
# DV Quarter-Phased Transit Curves

TCE 005041847-01 P= 1.371775 Days  $T_0=132.090905$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

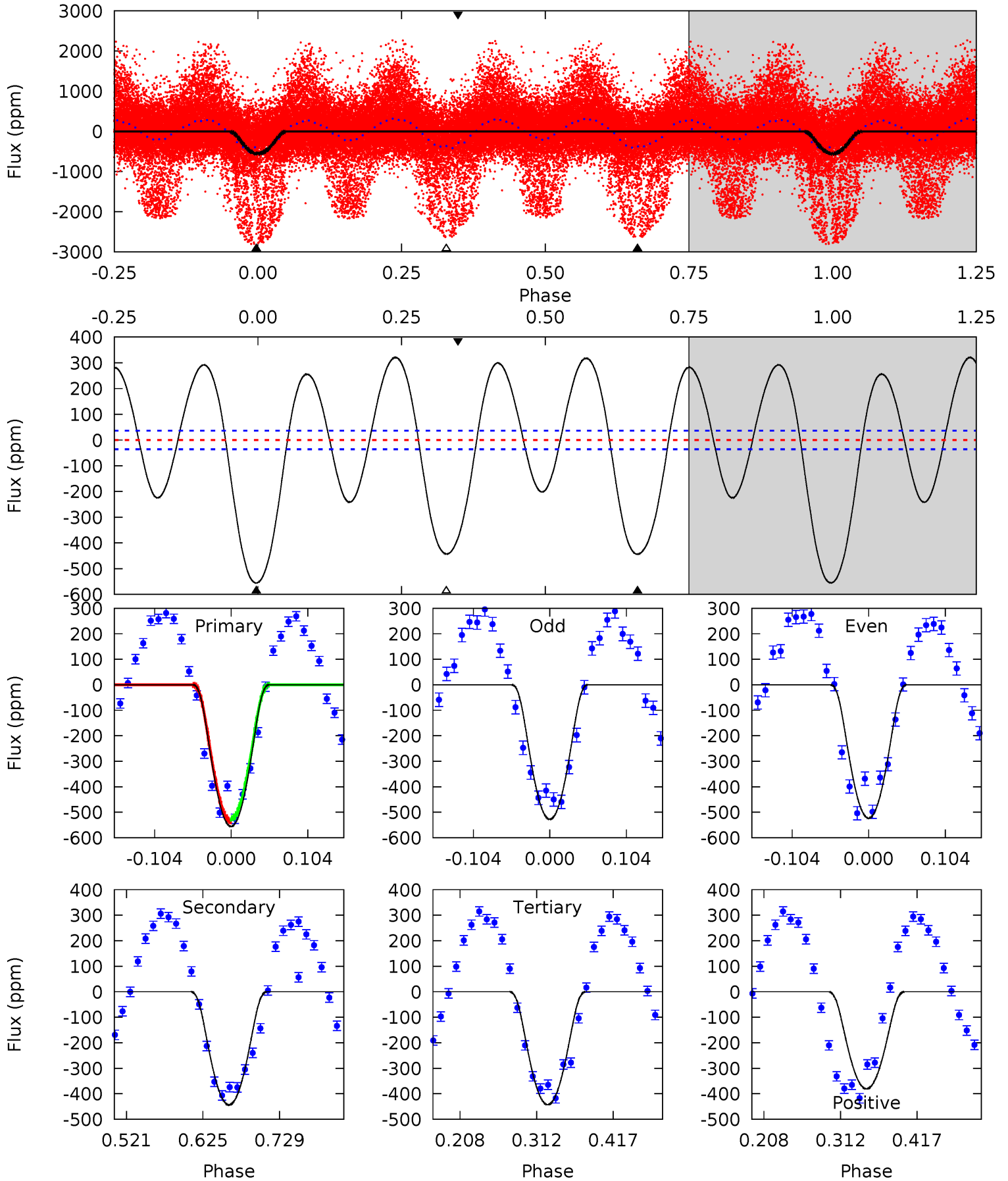
TCE 005041847-01 P= 1.371715 Days  $T_0=132.114762$  (BKJD)



# DV Model-Shift Uniqueness Test

005041847-01, P = 1.371775 Days, E = 130.719130 Days

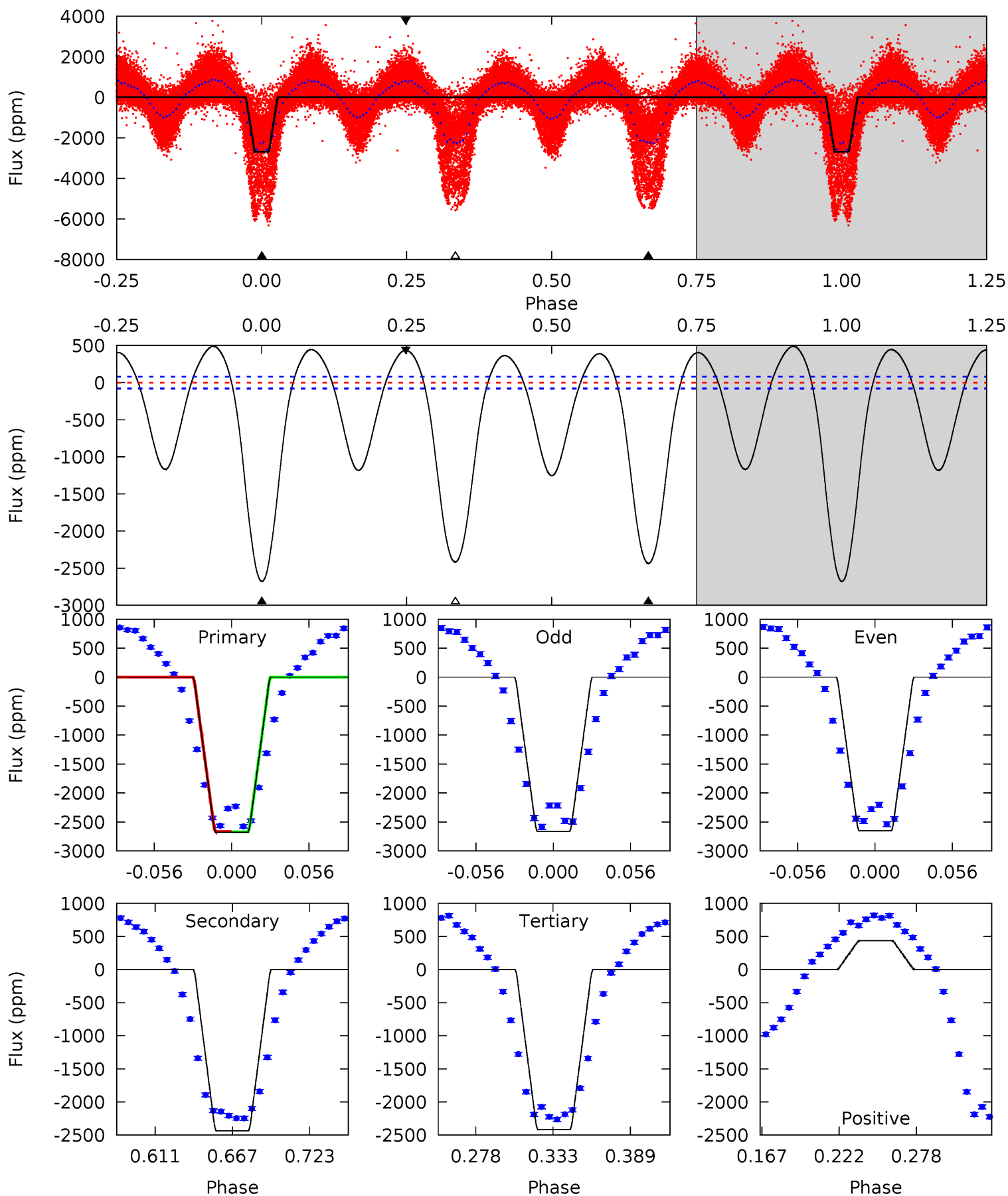
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
69.9	55.8	55.7	-47.9	4.56	1.63	25.9	14.2	117.8	0.09	103.7	0.30	3.37	0.37	0.71



# Alt Model-Shift Uniqueness Test

005041847-01, P = 1.371715 Days, E = 130.743047 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
157.7	143.4	142.3	25.6	4.69	1.91	41.8	15.4	132.0	1.11	117.8	0.31	1.33	0.15	0



### Stellar Parameters For KIC 005041847

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5762^{+156}_{-173}$	$4.415^{+0.105}_{-0.195}$	$-0.100^{+0.300}_{-0.300}$	$0.989^{+0.281}_{-0.141}$	$0.927^{+0.125}_{-0.091}$	$1.349^{+0.603}_{-0.668}$
	+3%/-3%	+2%/-4%	+300%/-300%	+28%/-14%	+13%/-10%	+45%/-50%
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 005041847-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-443 \pm 8$	$3.23^{+1.81}_{-1.56}$	$2321^{+181}_{-120}$	$4941^{+2071}_{-786}$	$13^{+37}_{-8}$
Alt.	$-2436 \pm 17$	$5.12^{+2.04}_{-1.63}$	$2331^{+162}_{-134}$	$5897^{+1457}_{-783}$	$28^{+34}_{-13}$

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



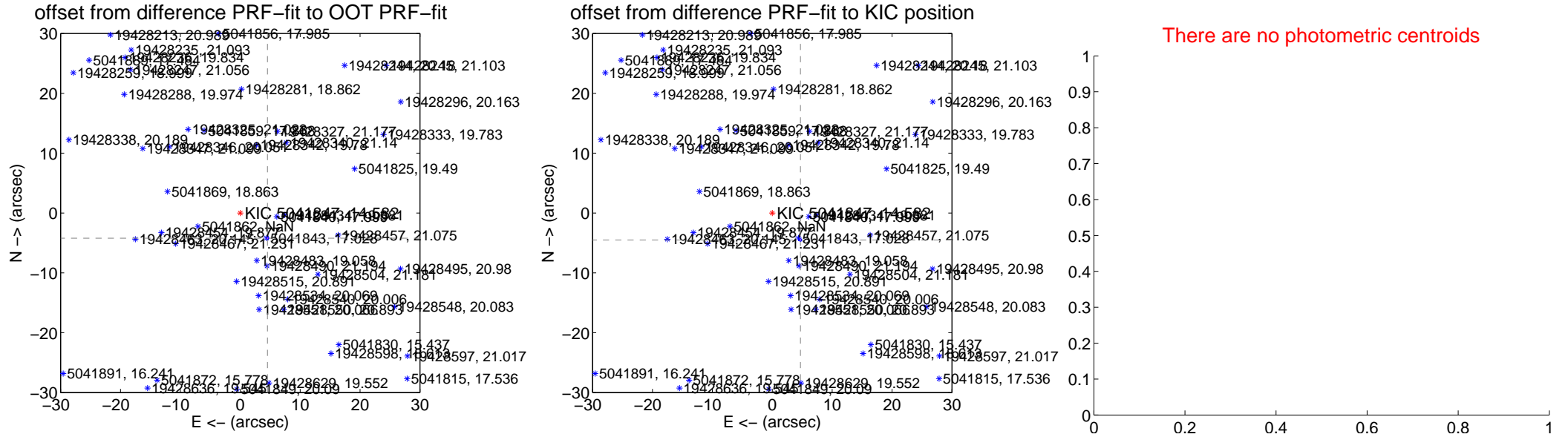
## DV Centroid Data

Supplemental centroid analysis for 005041847-01. Kepler magnitude: 14.58. Transit SNR 34.62

There are 9 quarters with good PRF difference image offsets

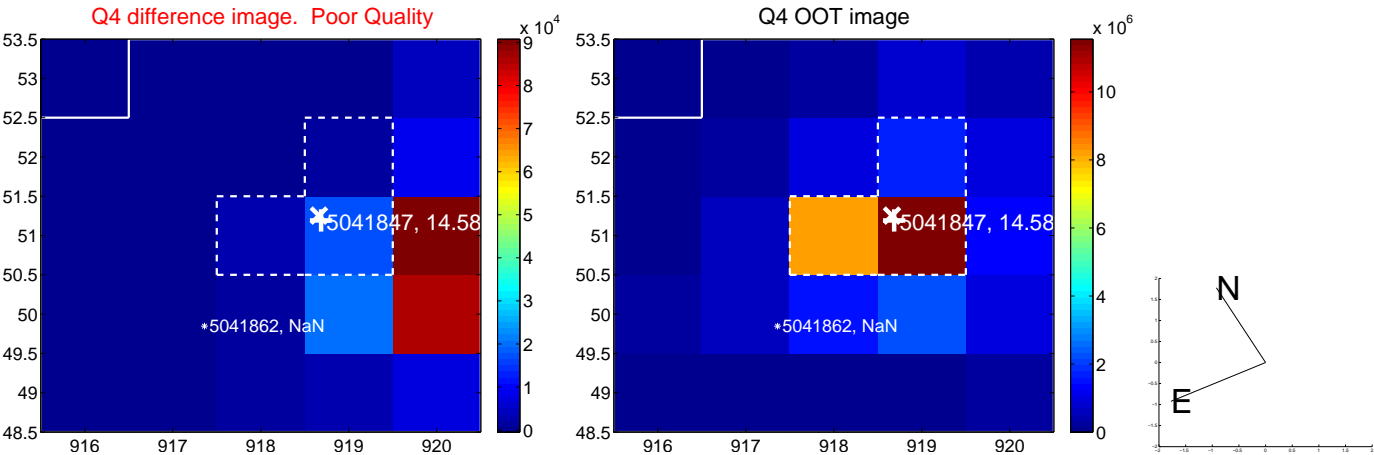
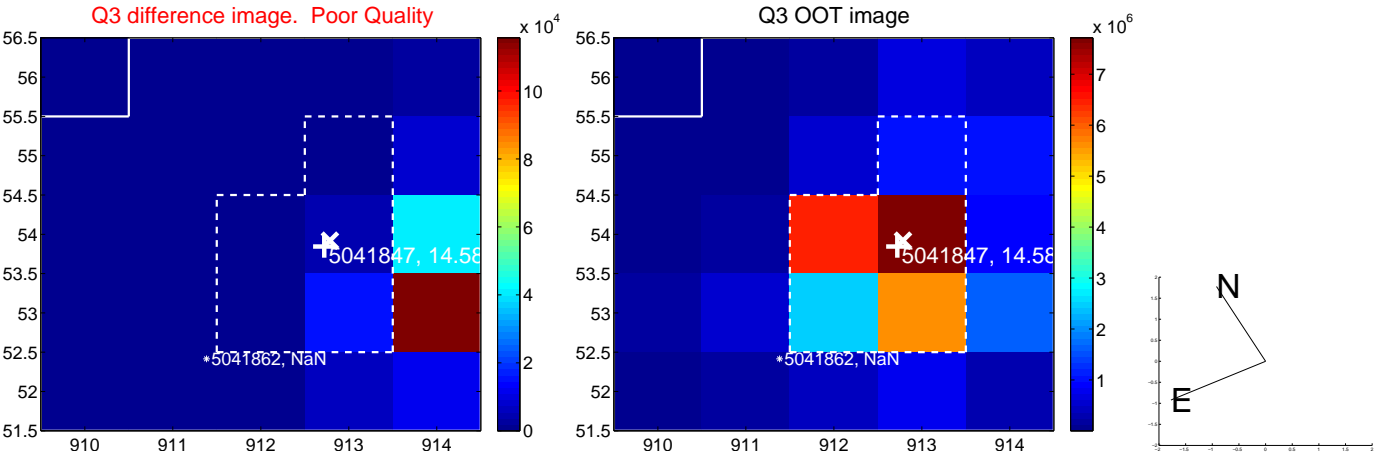
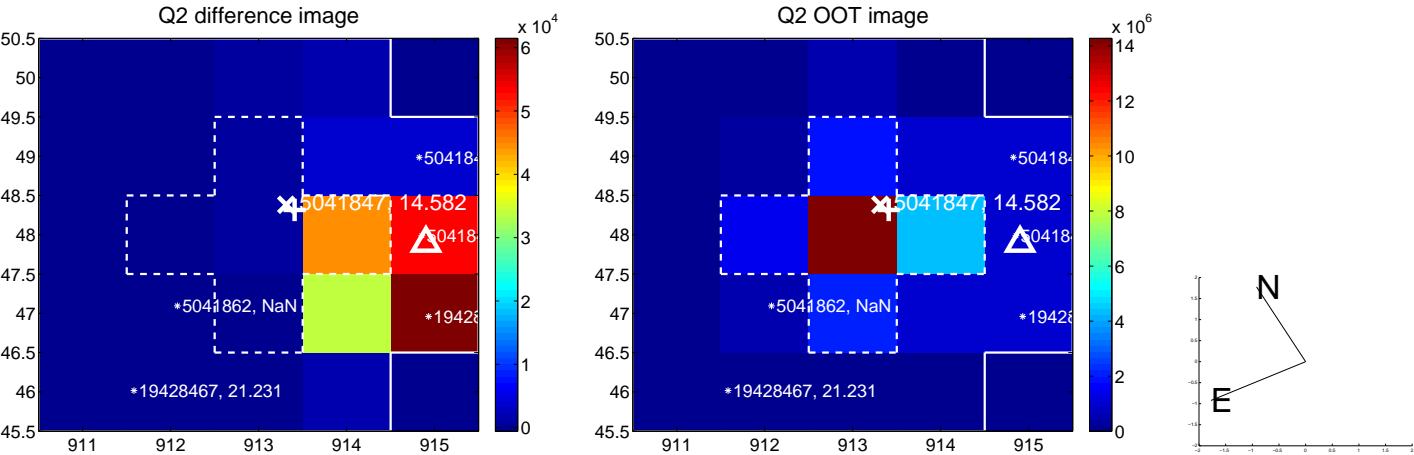
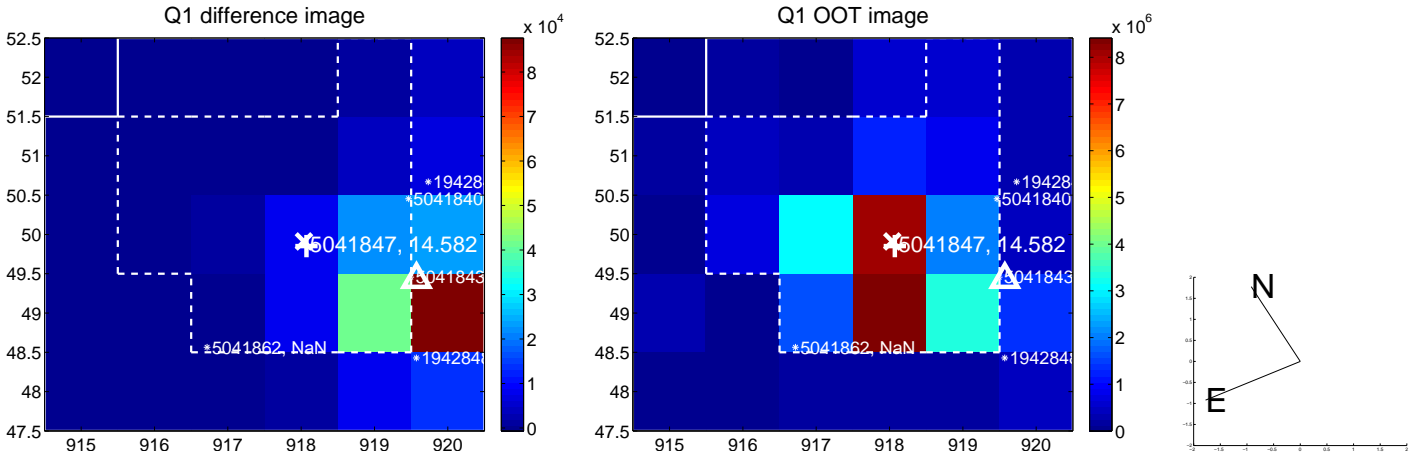
The direct PRF centroid is offset from the target star catalog position by about 0.33 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	6.185 $\pm$ 0.069	89.65	-4.535 $\pm$ 0.069	-4.205 $\pm$ 0.068
PRF-fit source offset from KIC position	6.520 $\pm$ 0.071	91.56	-4.707 $\pm$ 0.073	-4.511 $\pm$ 0.071
photometric centroid source offset	—	—	—	—

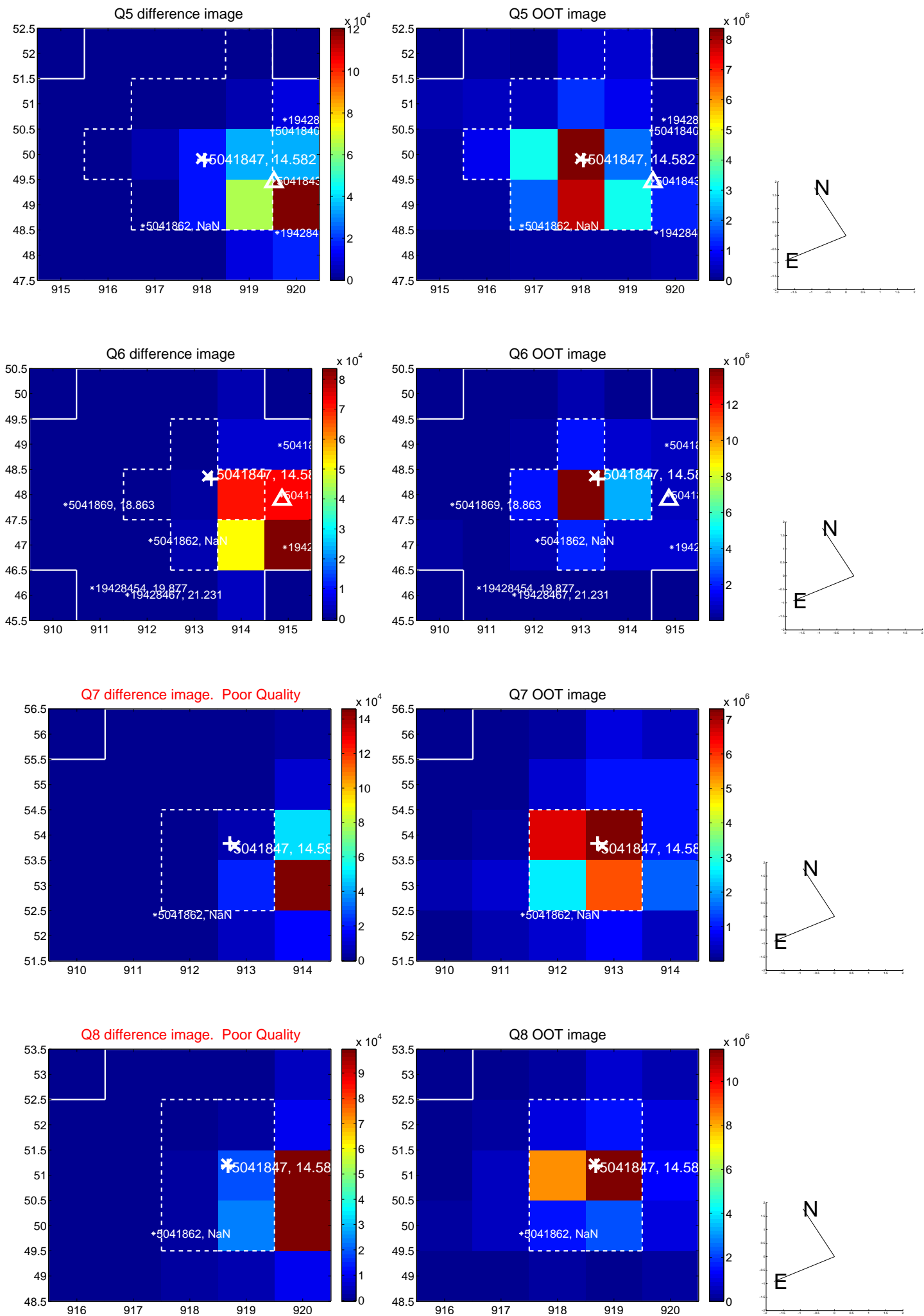


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

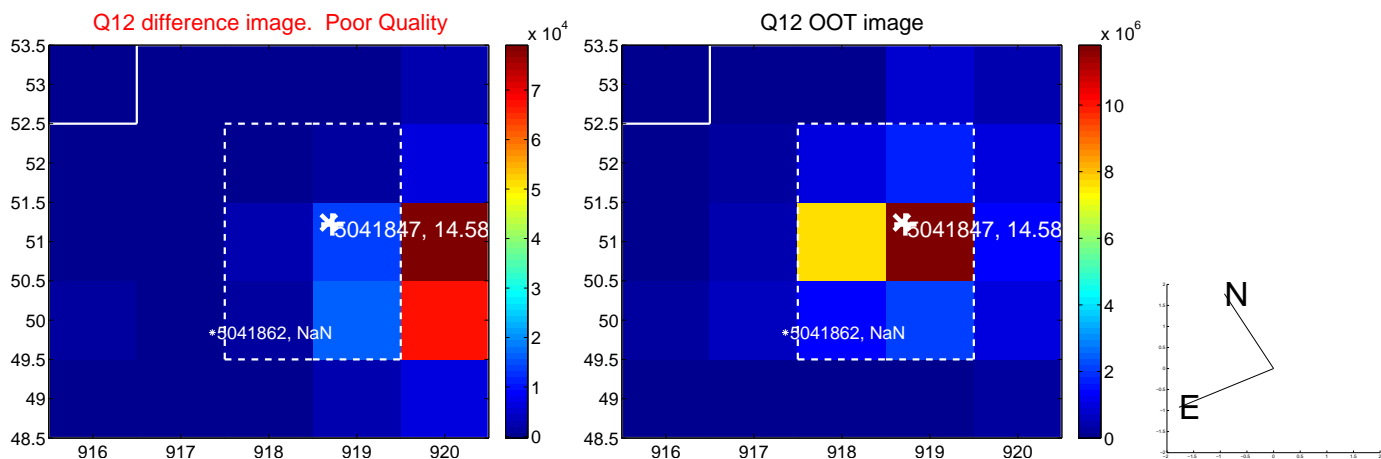
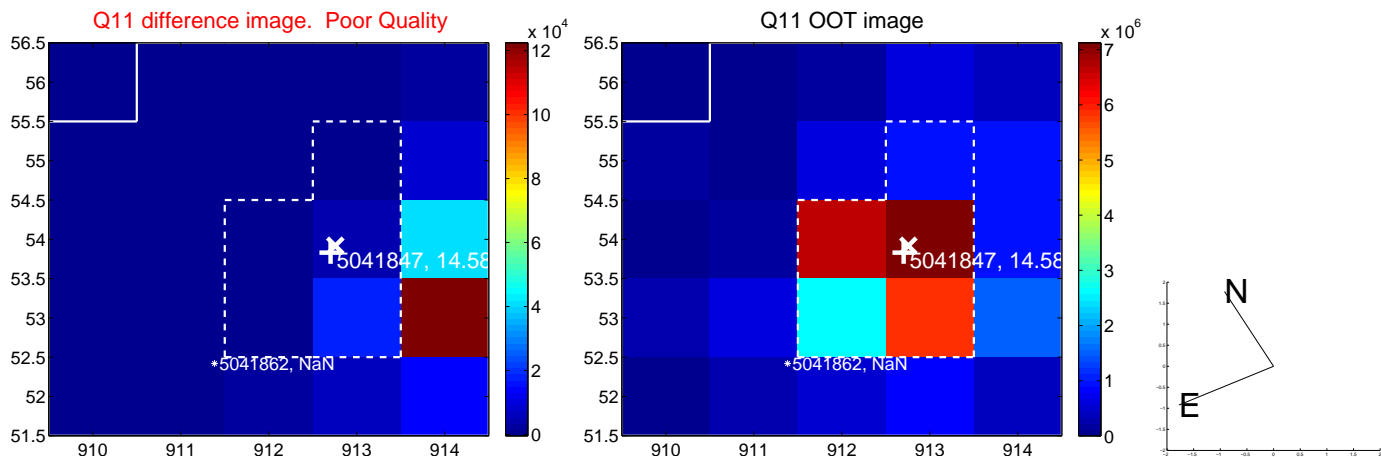
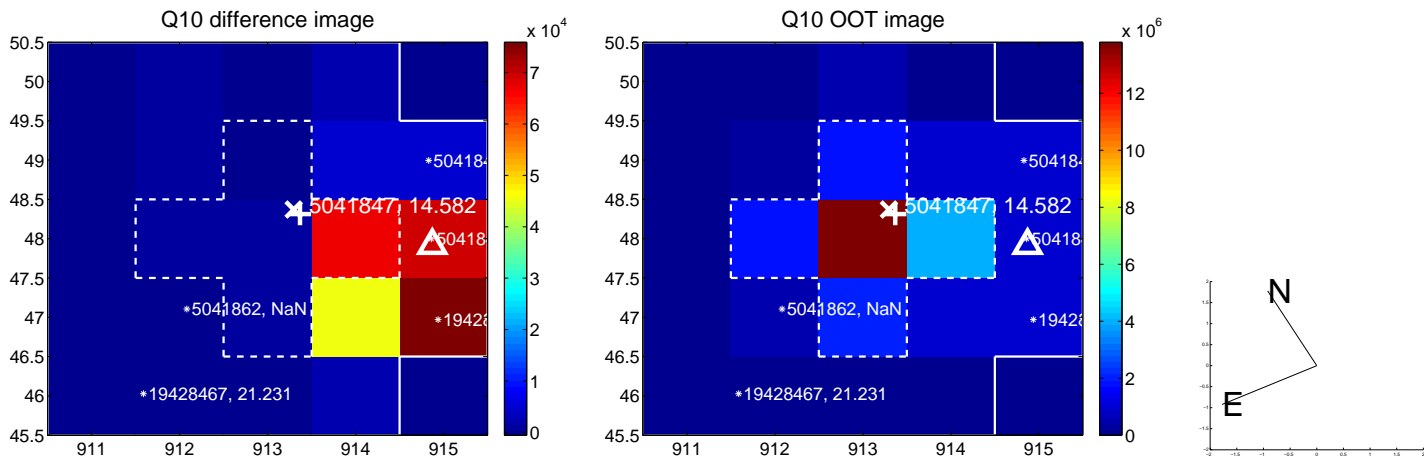
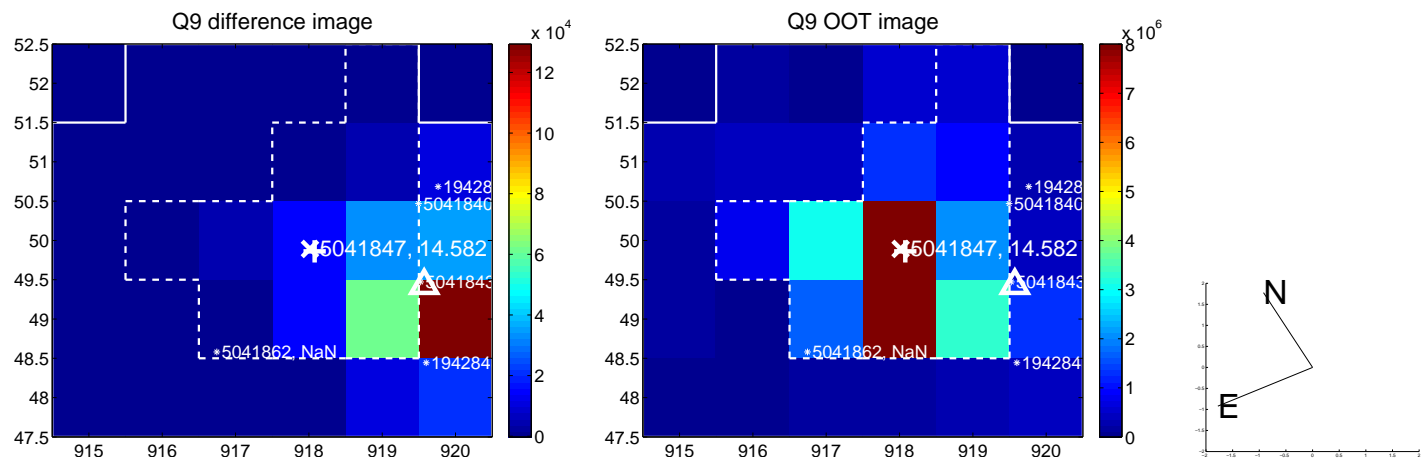
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



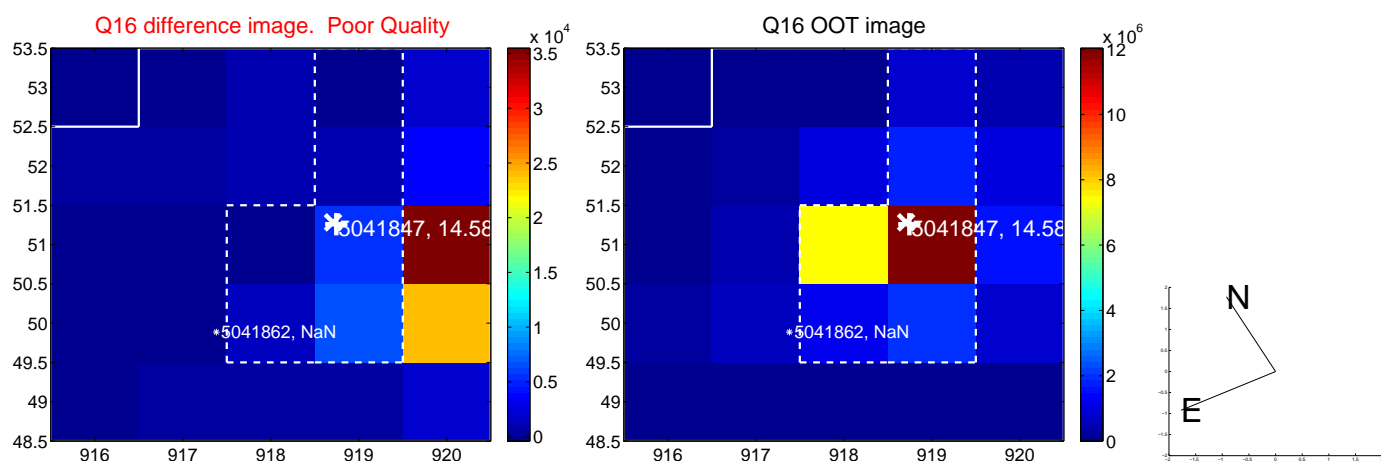
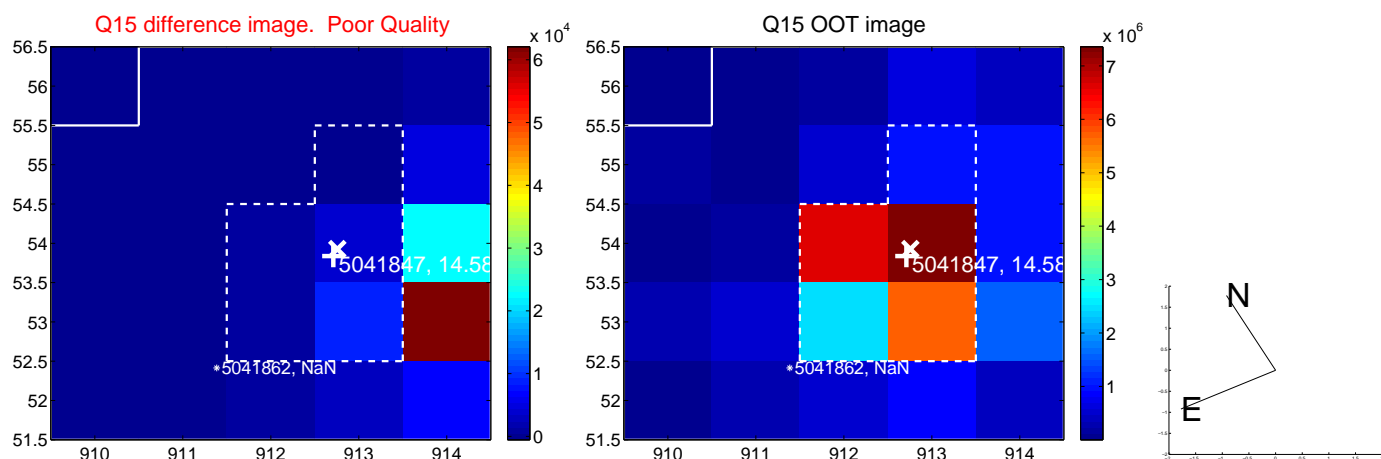
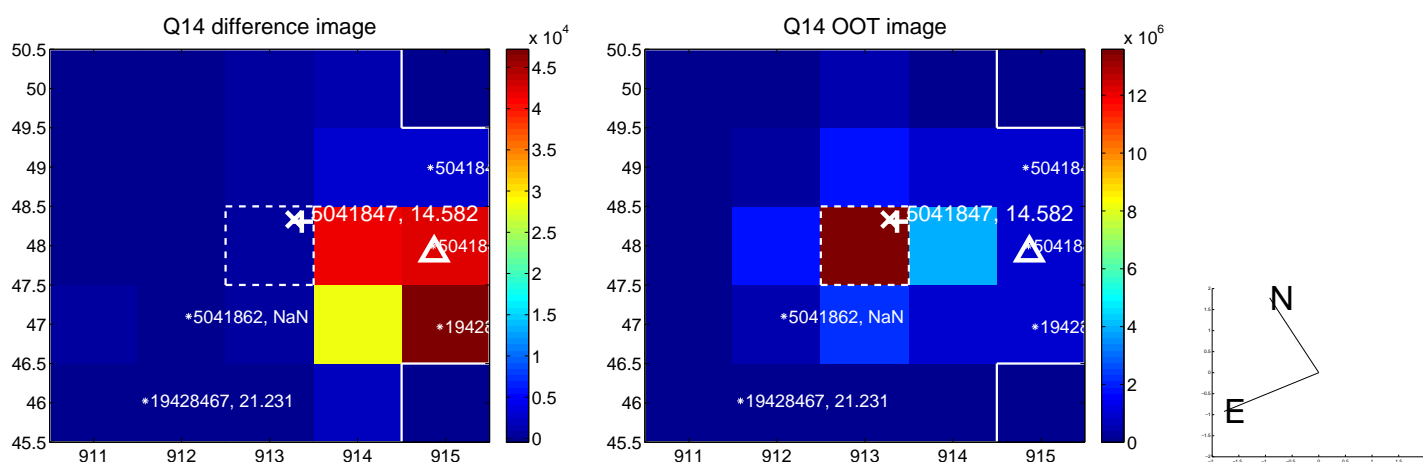
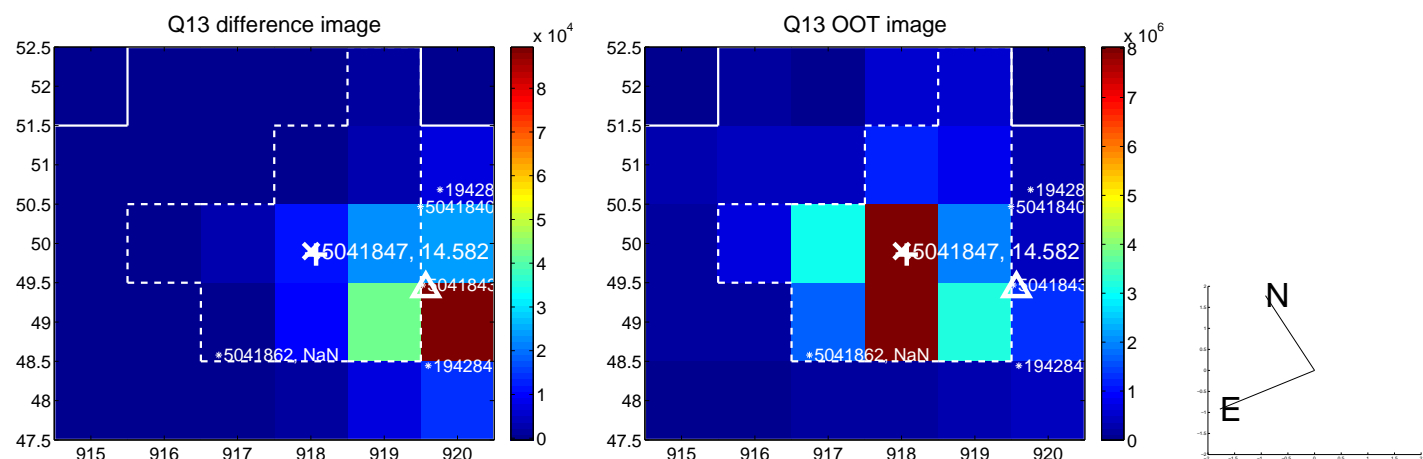
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

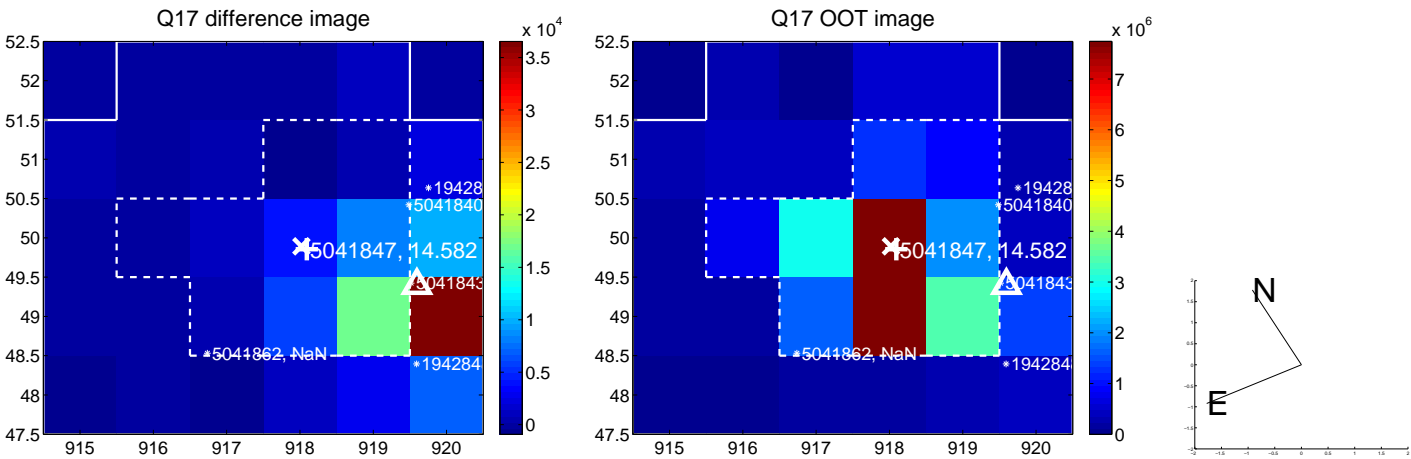


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





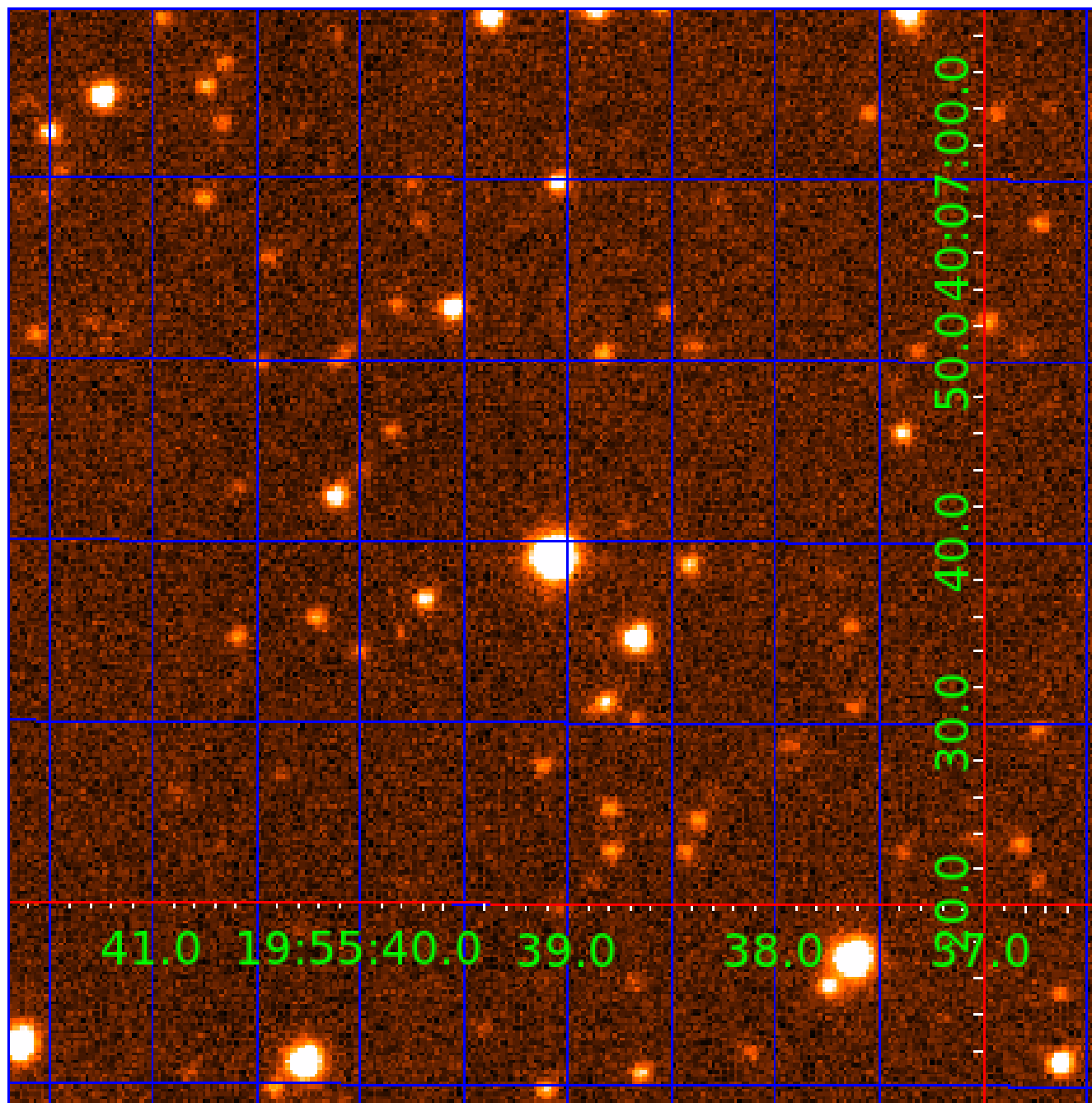
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



folded centroid time series figure for this object.

UKIRT Image

Declination



# KIC 005041847

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005041847-01	OBS	No	1.371775	132.090905	334.6	2.969	80.9	34.6	0.99	5762	3.04	1738.90
005041847-02	OBS	4085.01	0.914466	132.120369	4338.2	1.500	141.0	-1.0	0.99	5762	6.49	2986.03

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005041847-01	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
005041847-02	OBS	FP	0.00	1	0	0	1	LPP_DV—MOD_NONUNIQ_ALT—CENT_NOFITS—EPHEM_MATCH

**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 005041847-02

TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ( $''$ )	$\Delta$ Row	$\Delta$ Col	$m_2$	$m_1$	$D_2/D_1$	Mechanism	Flag	$\sigma_P$	$\sigma_T$
005041847-02	5041847	005041843-pri	5041843	2:1	6.1	1	-2	17.03	14.58	31.03	Direct-PRF	0	0.73	0.13

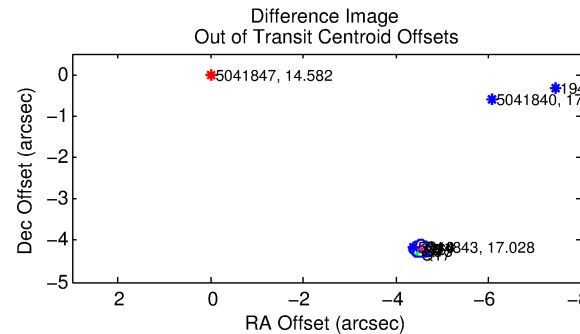
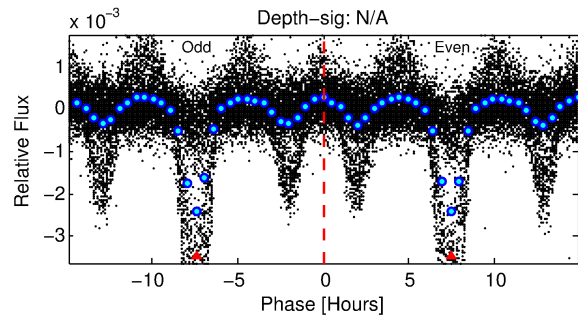
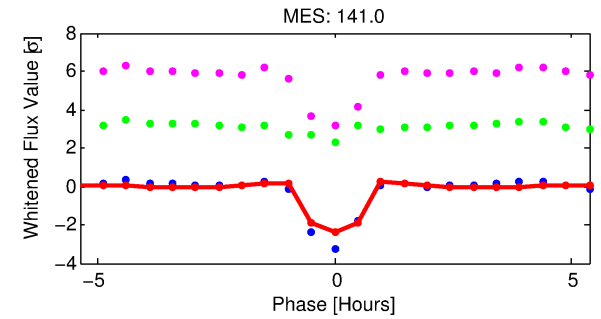
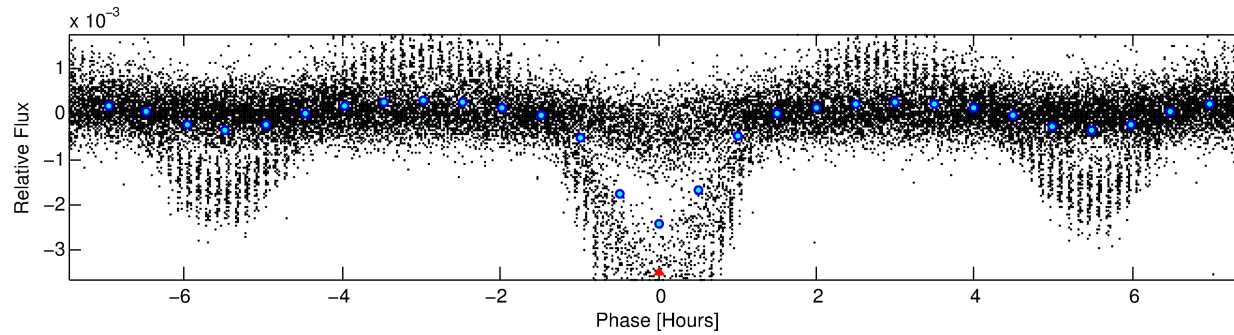
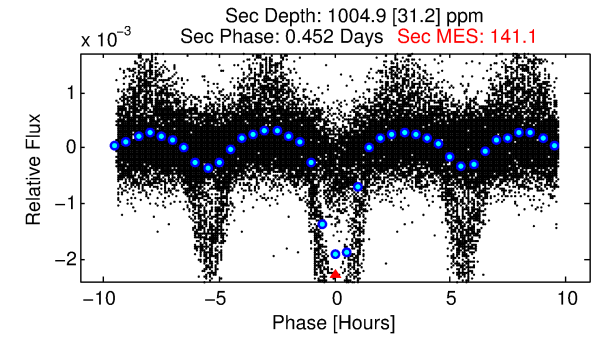
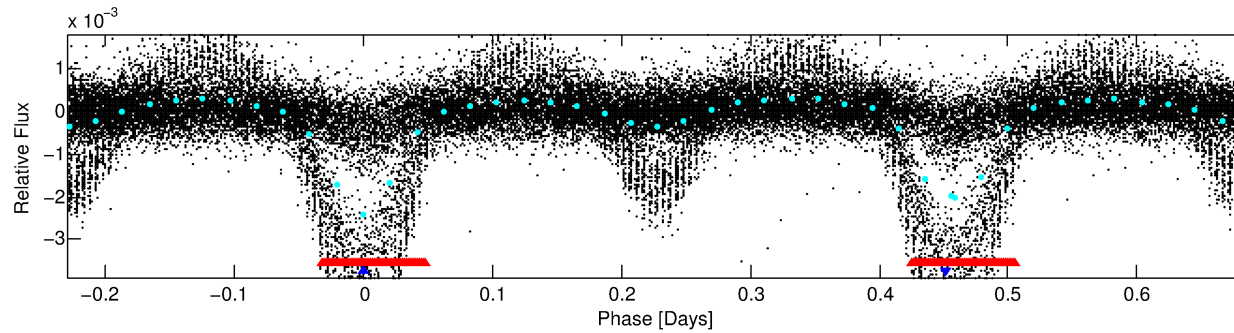
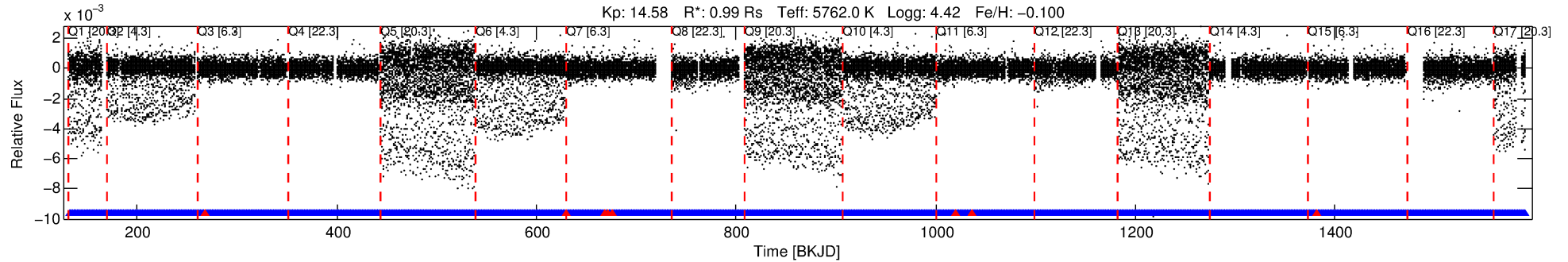
**Notes:**  $P_1:P_2$  is the period ratio. Dist is the distance in arcseconds.  $\Delta$ Row and  $\Delta$ Col are the number of pixels apart in row and column.  $m_2$  and  $m_1$  are the magnitudes of the parent and child.  $D_2/D_1$  is the parent's transit depth divided by the child's.  $\sigma_P$  and  $\sigma_T$  are the significance of the match in period and epoch. For a match to be considered significant  $\sigma_P < 5.0$  and  $\sigma_T < 5.0$ . Matches which have  $\sigma_P$  and  $\sigma_T$  very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

# DV One-Page Summary

KIC: 5041847 Candidate: 2 of 2 Period: 0.914 d

KOI: K04085 Corr: No Ephemeris Match

Kp: 14.58 R\*: 0.99 Rs Teff: 5762.0 K Logg: 4.42 Fe/H: -0.100



TPS TCE Results:

Period = 0.91447 d  
Epoch = 132.1204 BKJD

DV fit results are unavailable

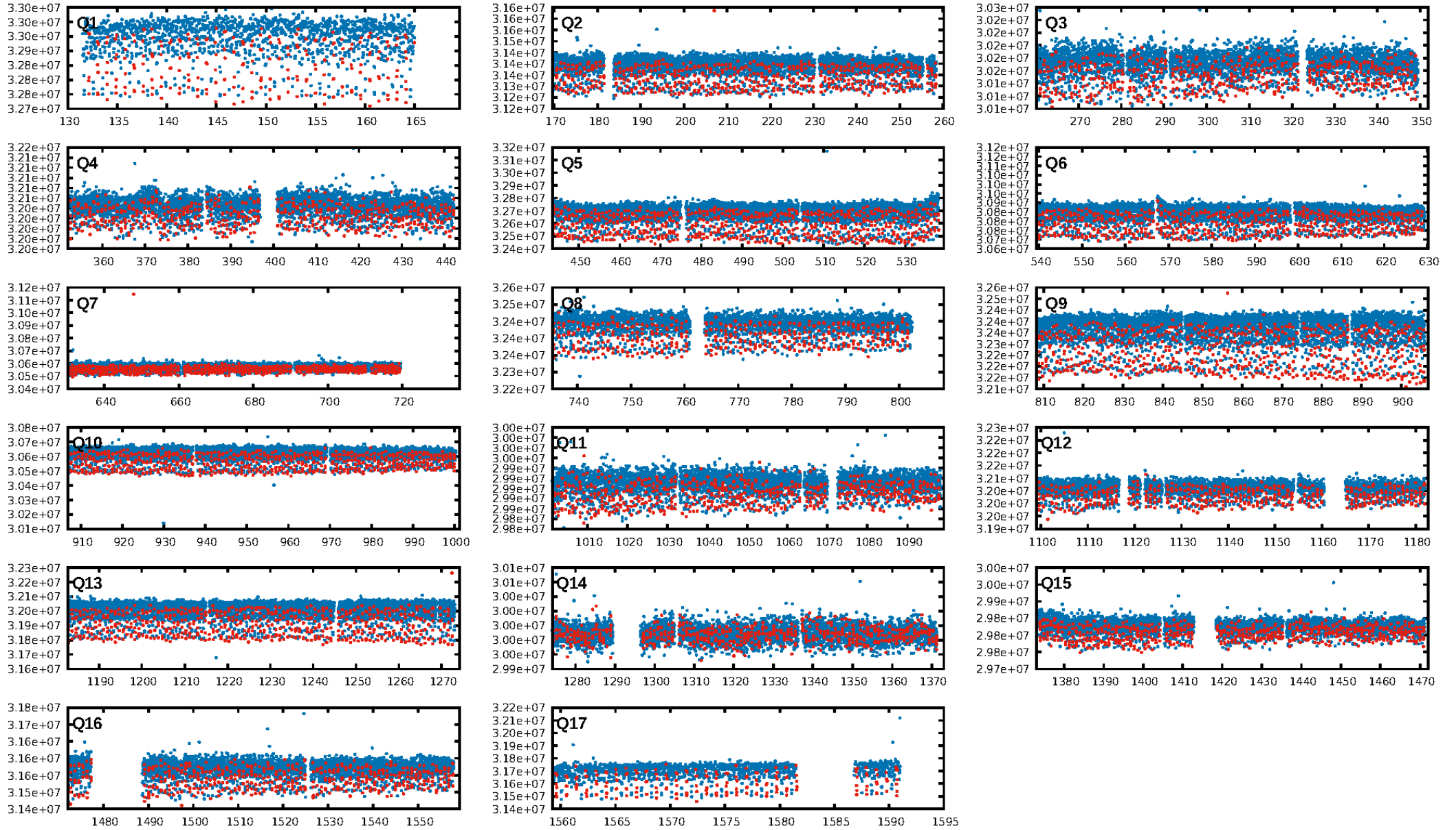
DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 99.9% [3.30σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.99 [918/926]  
GhostDiagnostic-chr: N/A  
Centroid-sig: N/A  
Centroid-so: N/A  
OotOffset-rm: 6.178 arcsec [90.36σ]  
KicOffset-rm: 6.531 arcsec [92.08σ]  
OotOffset-st: 4/0/0/5 [9]  
KicOffset-st: 4/0/0/5 [9]  
DiffImageQuality-fgm: 1.00 [9/9]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 19:13:58 Z

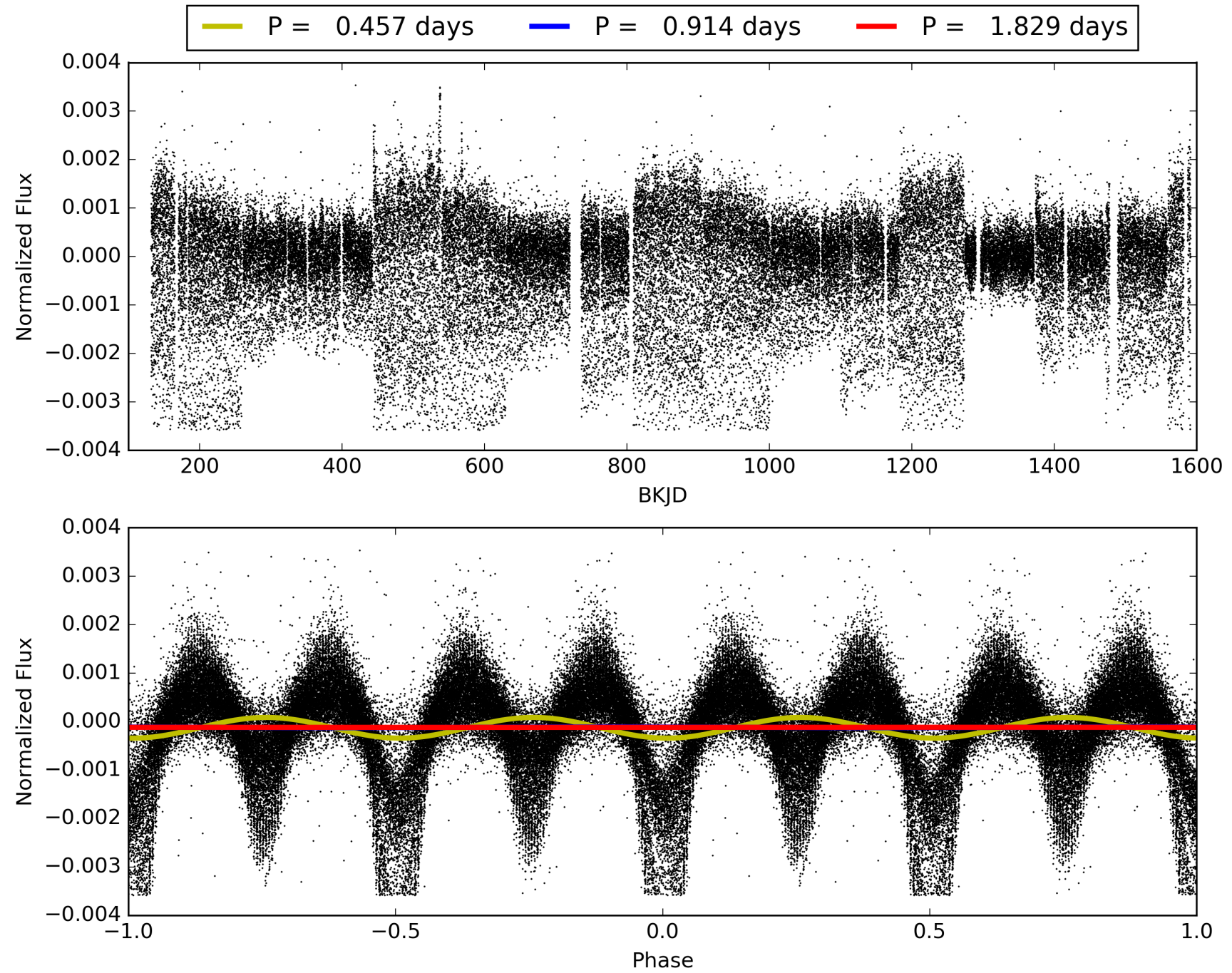
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005041847-02, PDC Light Curves



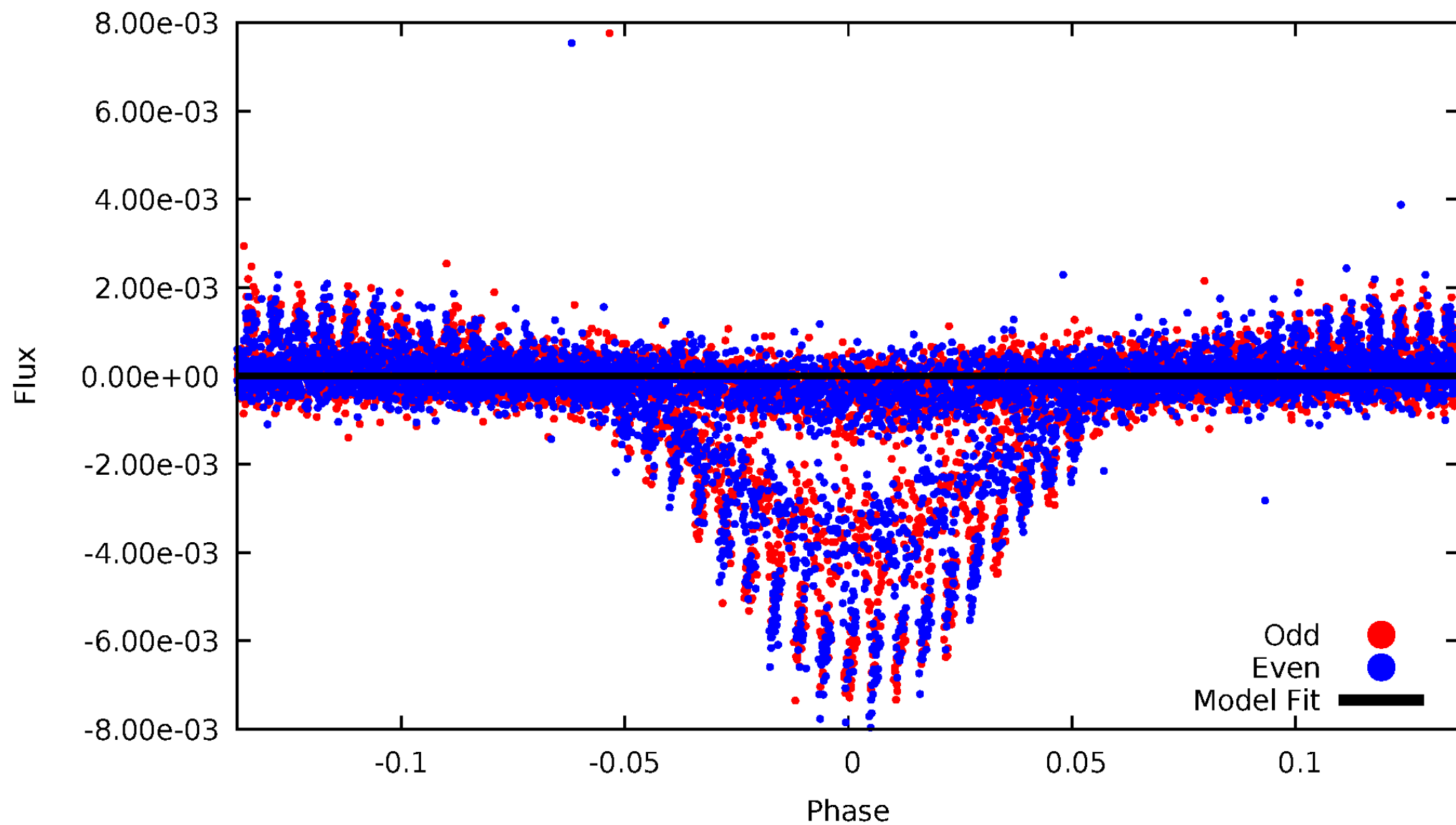


TCE 005041847-02



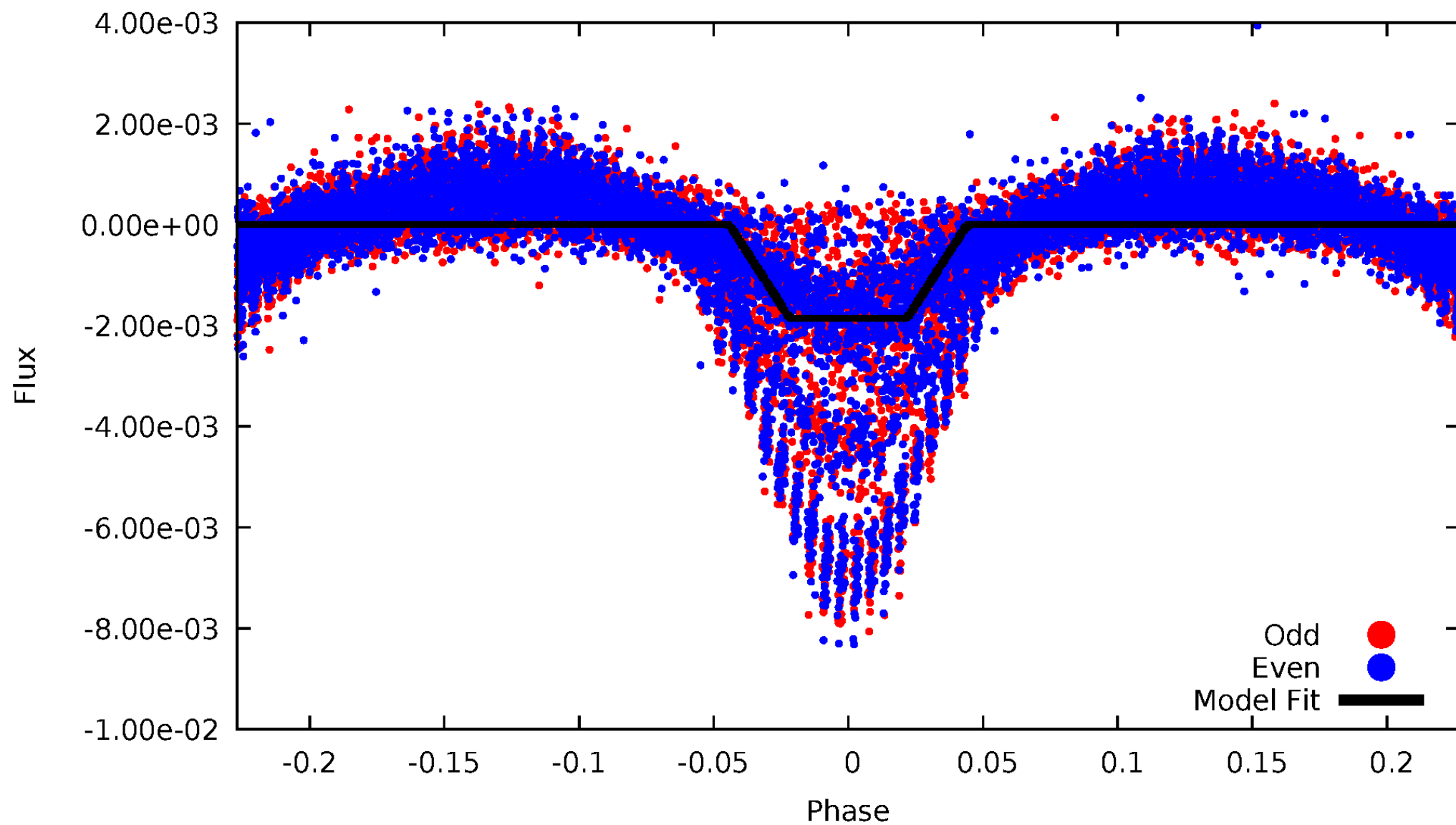
# DV Odd/Even

TCE 005041847-02



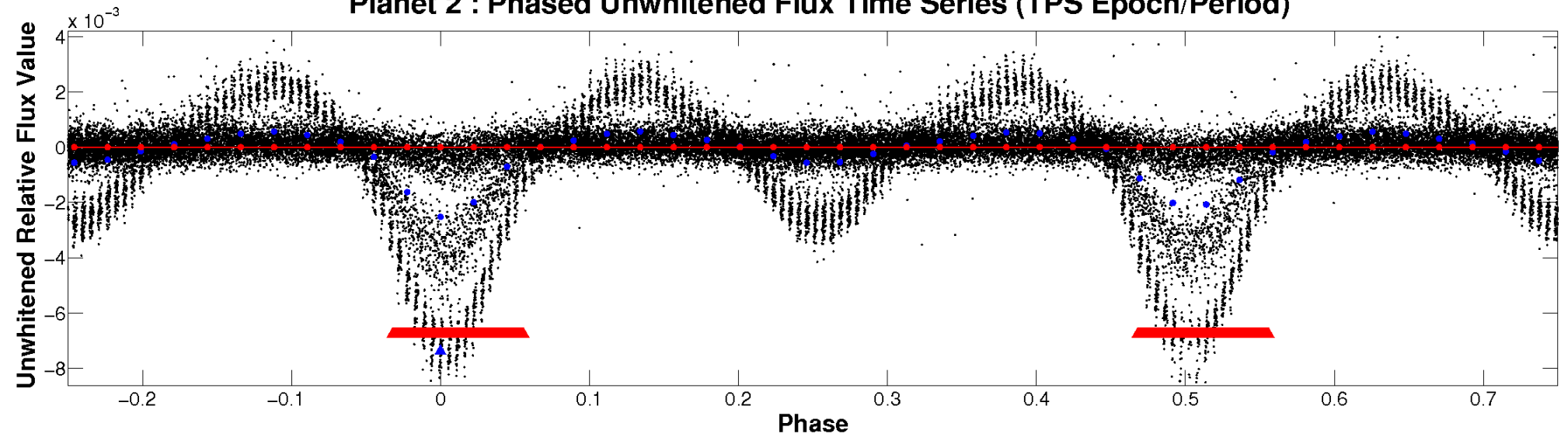
# ALT Odd/Even

TCE 005041847-02

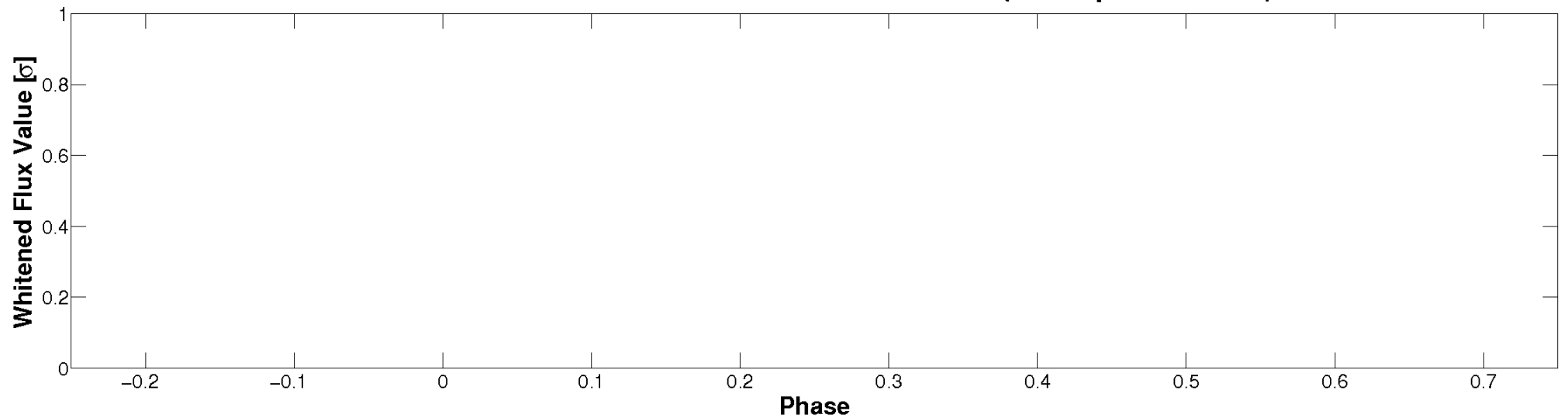


# Non-Whitened Vs. Whitened Light Curve

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

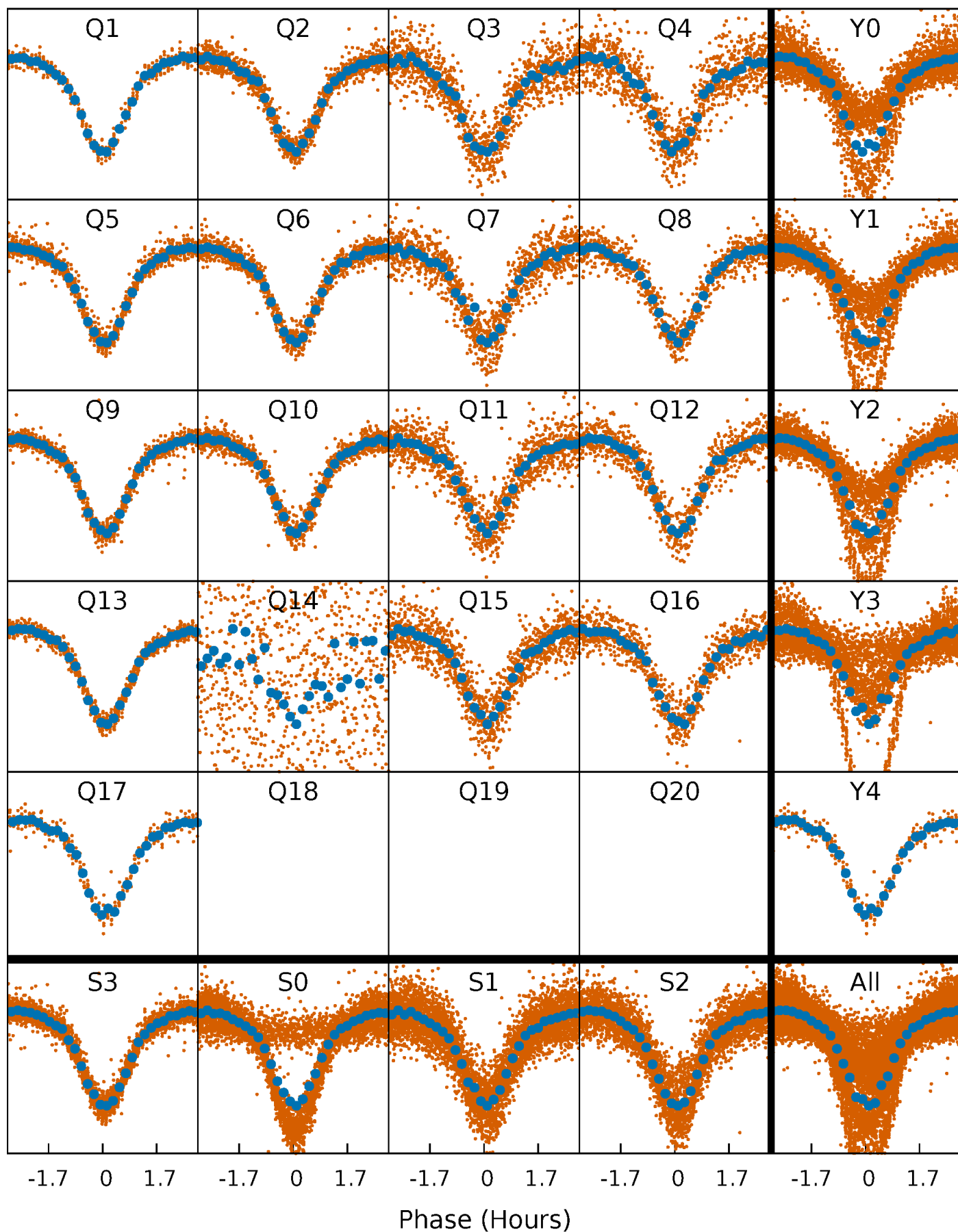


**Planet 2 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



# PDC Quarter-Phased Transit Curves

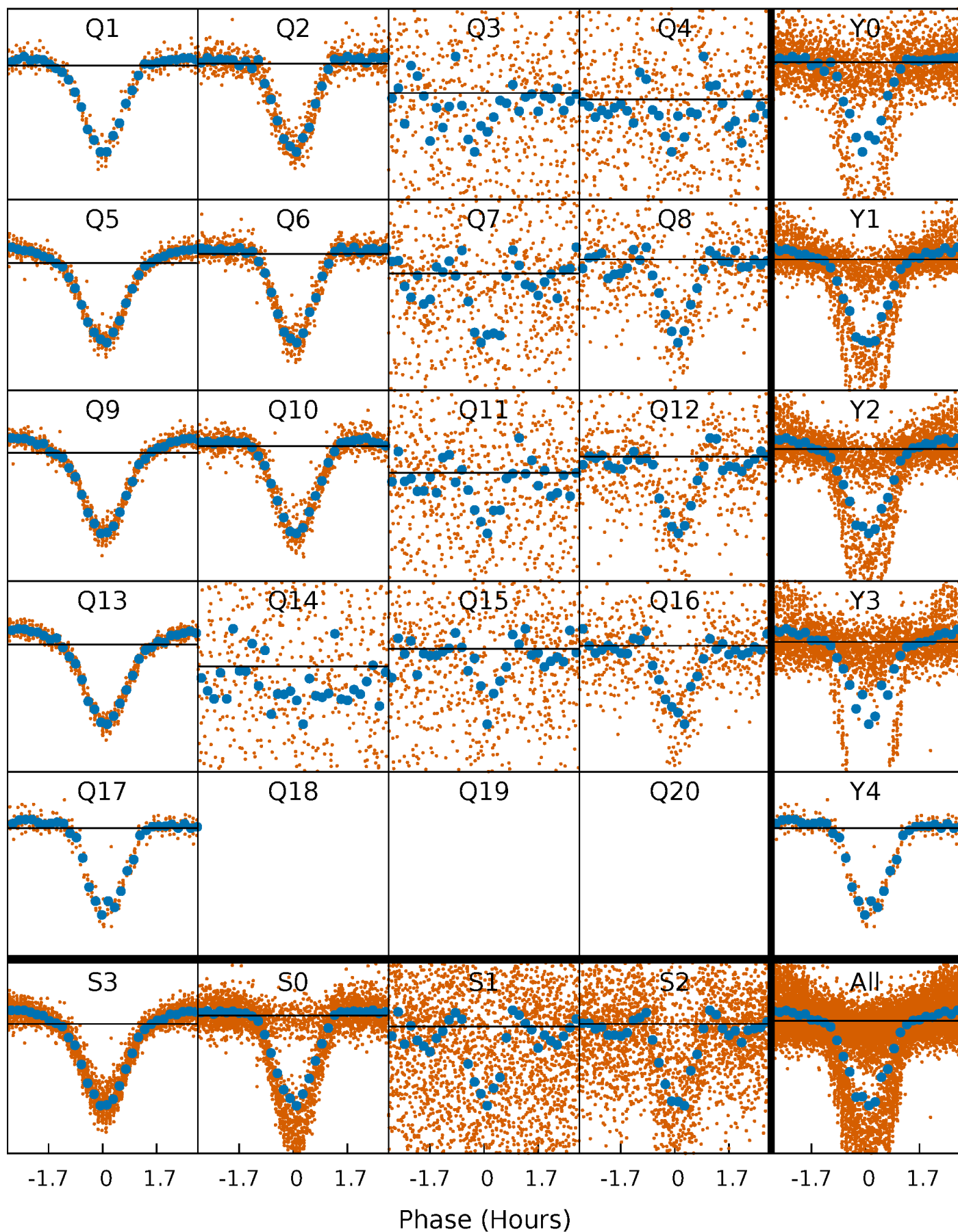
TCE 005041847-02   P= 0.914466 Days    $T_0=132.120369$  (BKJD)





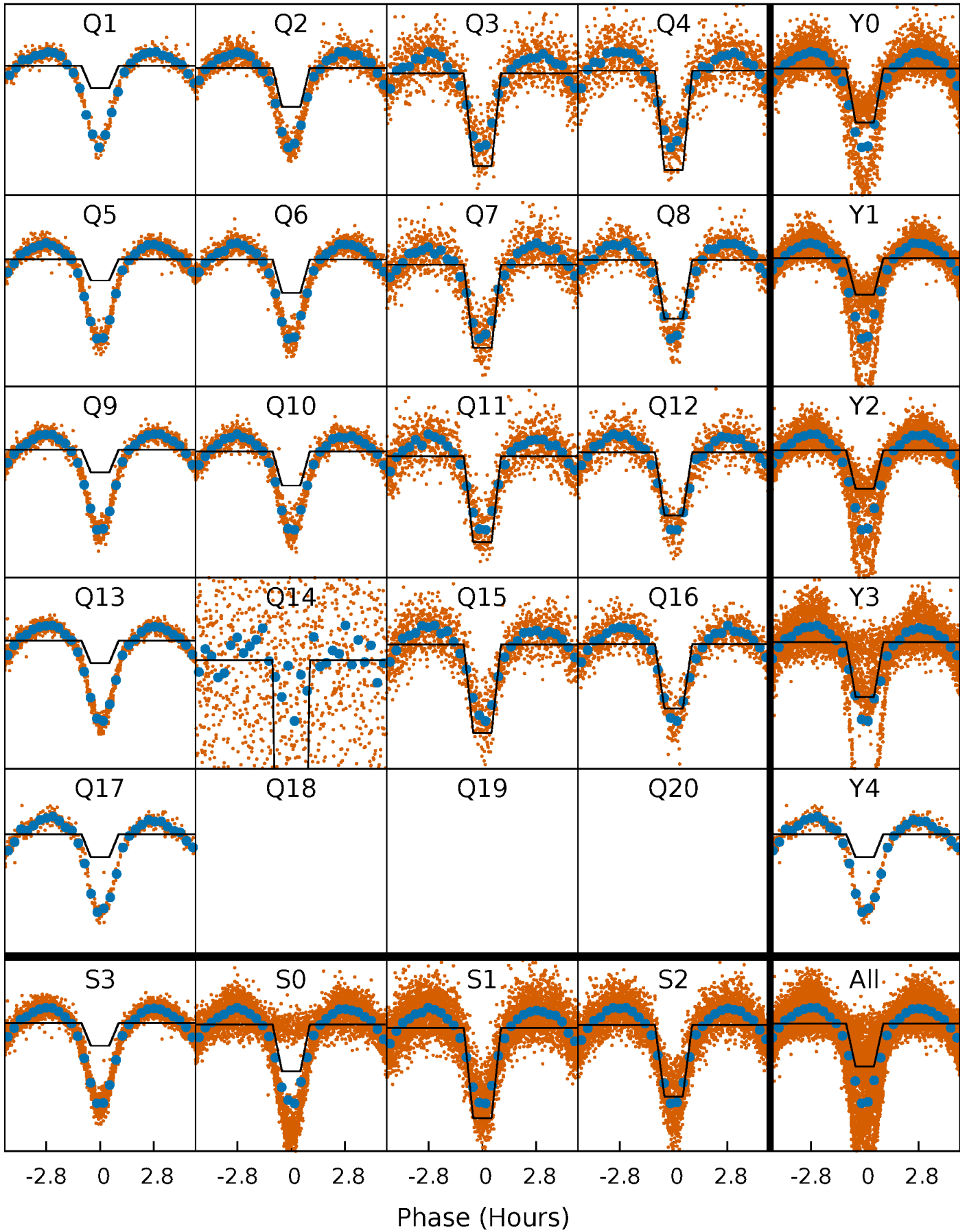
# DV Quarter-Phased Transit Curves

TCE 005041847-02   P= 0.914466 Days    $T_0=132.120369$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

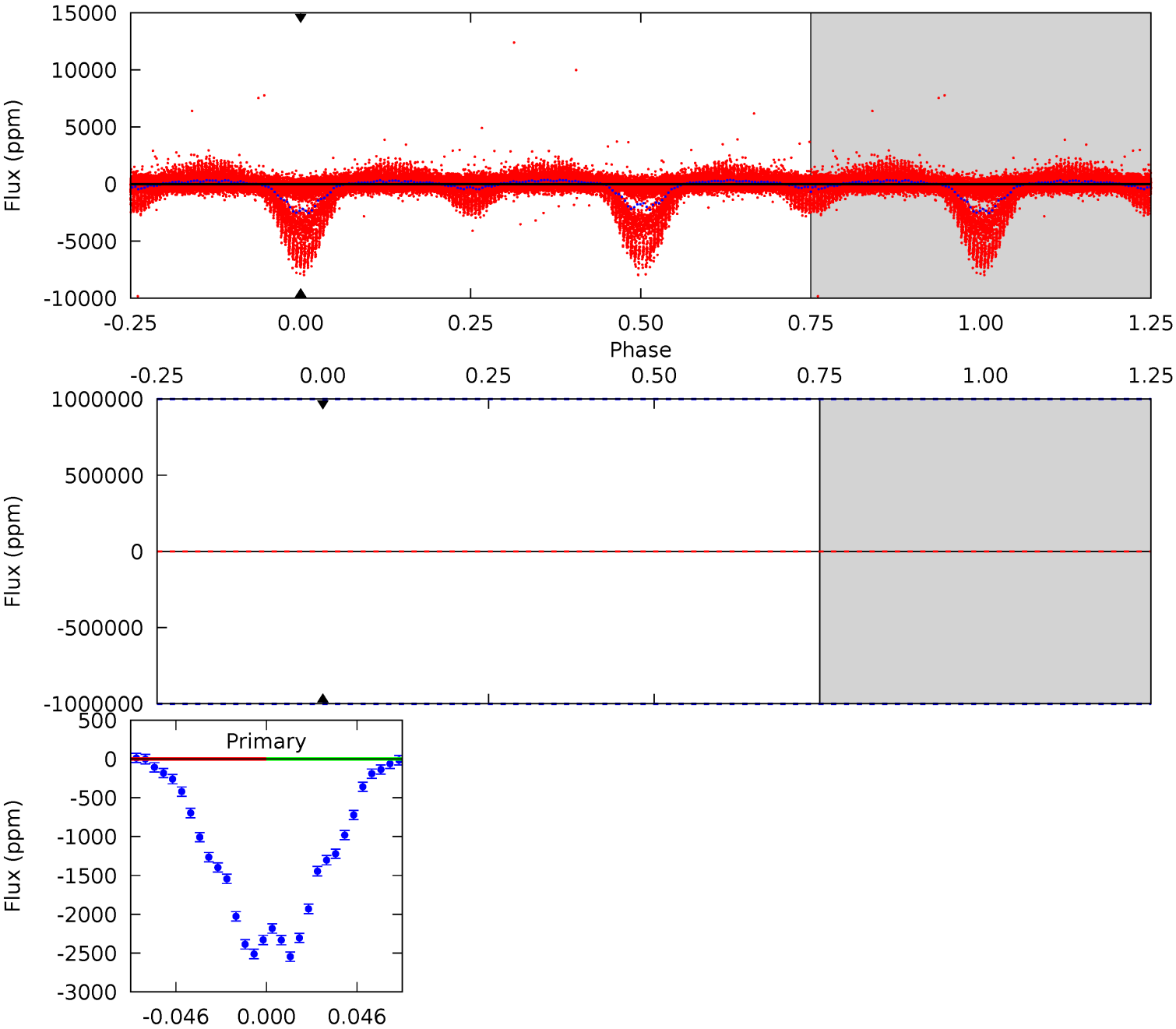
TCE 005041847-02   P= 0.914466 Days    $T_0=132.123028$  (BKJD)



# DV Model-Shift Uniqueness Test

005041847-02, P = 0.914466 Days, E = 131.205903 Days

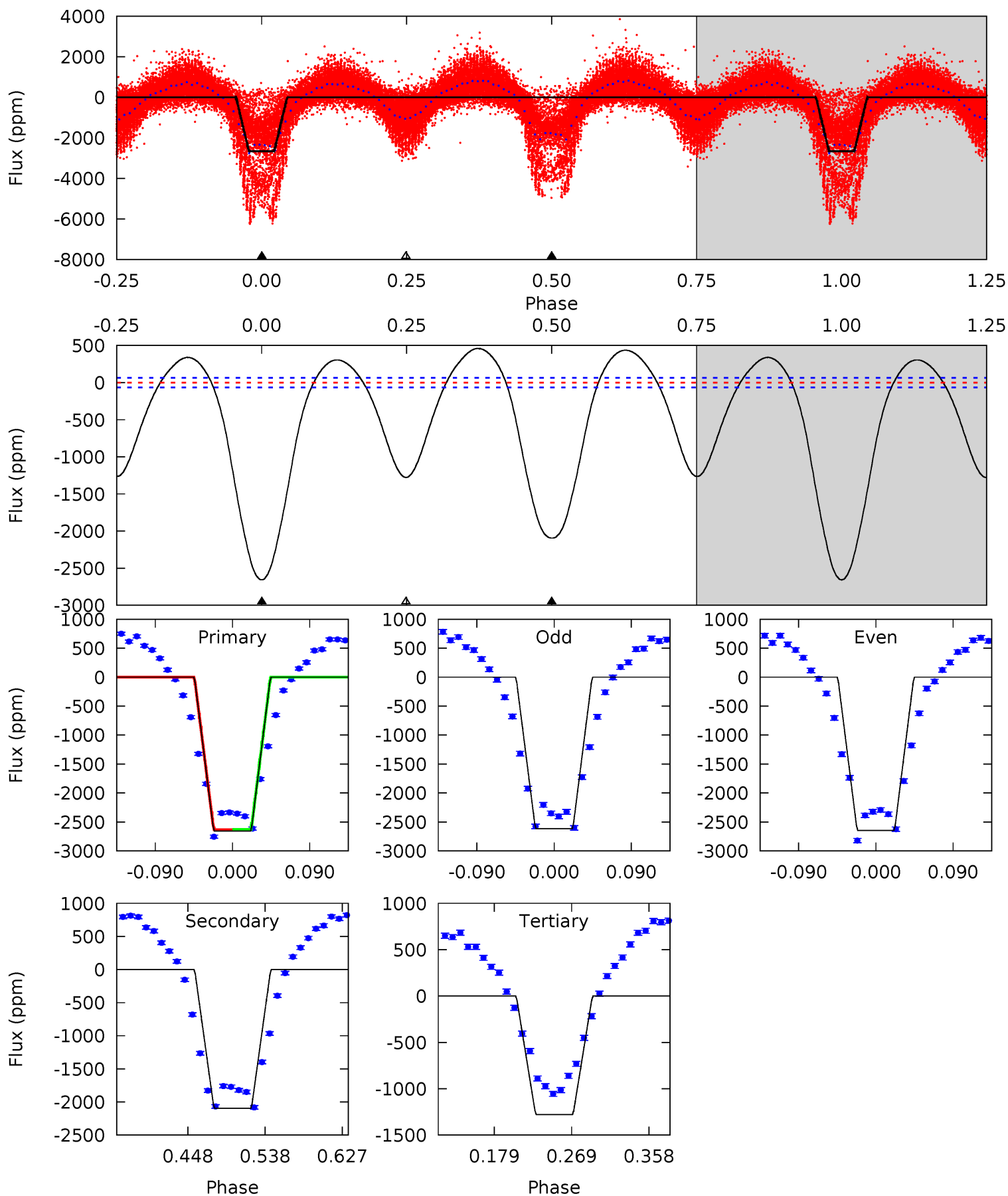
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

005041847-02, P = 0.914466 Days, E = 131.208562 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
190.1	149.9	91.4	0	4.59	1.70	41.8	98.7	190.1	58.5	149.9	1.12	1.37	0.15	0.02



### Stellar Parameters For KIC 005041847

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5762^{+156}_{-173}$	$4.415^{+0.105}_{-0.195}$	$-0.100^{+0.300}_{-0.300}$	$0.989^{+0.281}_{-0.141}$	$0.927^{+0.125}_{-0.091}$	$1.349^{+0.603}_{-0.668}$
	+3%/-3%	+2%/-4%	+300%/-300%	+28%/-14%	+13%/-10%	+45%/-50%
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 005041847-02 / KOI 4085.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$0 \pm 1000000$	$10.16^{+9.69}_{-7.06}$	$2666^{+197}_{-157}$	$-4189^{+20897}_{-13301}$	$-3.126^{+297.606}_{-350.379}$
Alt.	$-2095 \pm 14$	$9.95^{+9.83}_{-7.01}$	$2659^{+194}_{-136}$	$4256^{+3378}_{-986}$	$3.724^{+39.569}_{-2.726}$

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

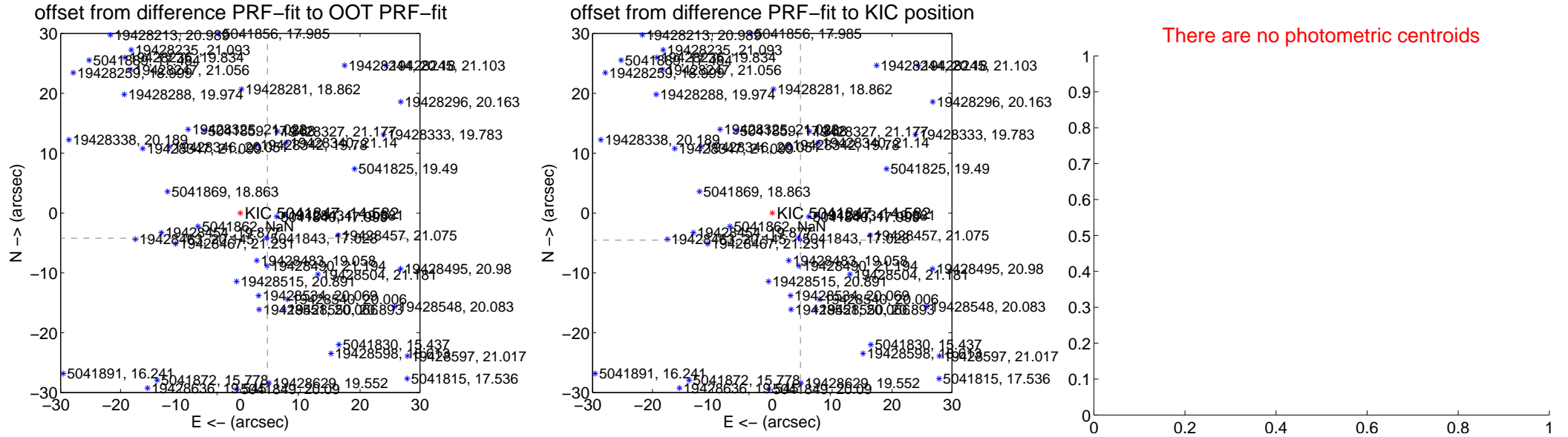
## DV Centroid Data

Supplemental centroid analysis for 005041847-02. Kepler magnitude: 14.58. Transit SNR -1.00

There are 9 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.32 arcsec

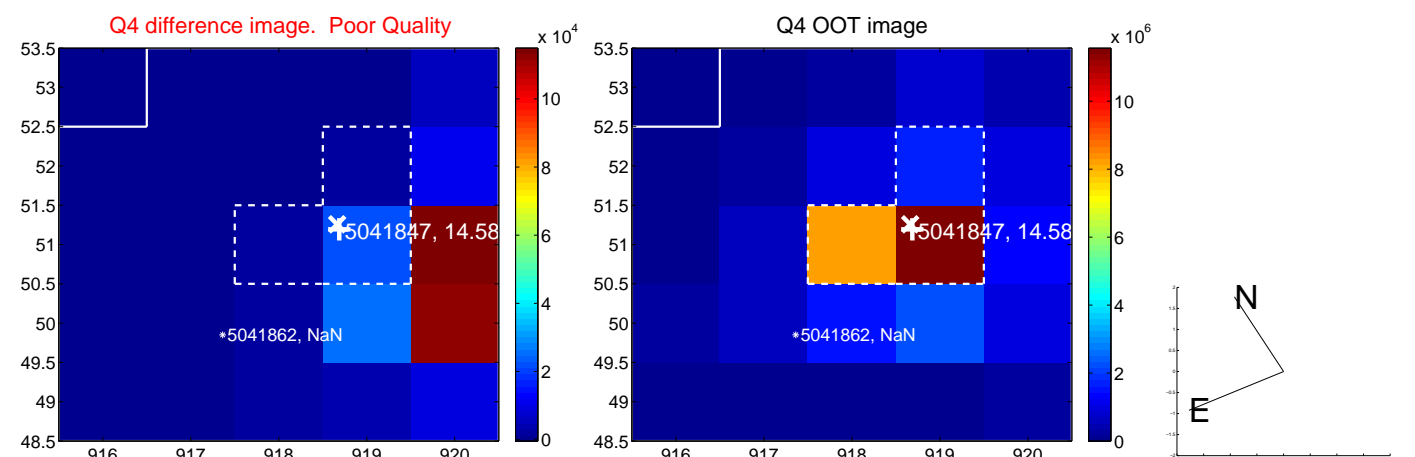
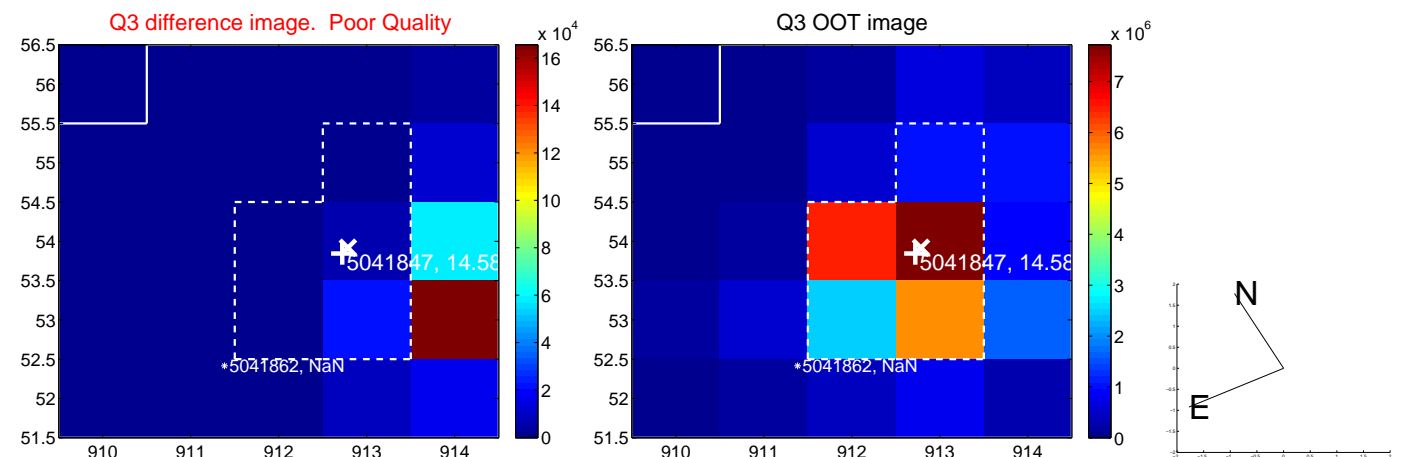
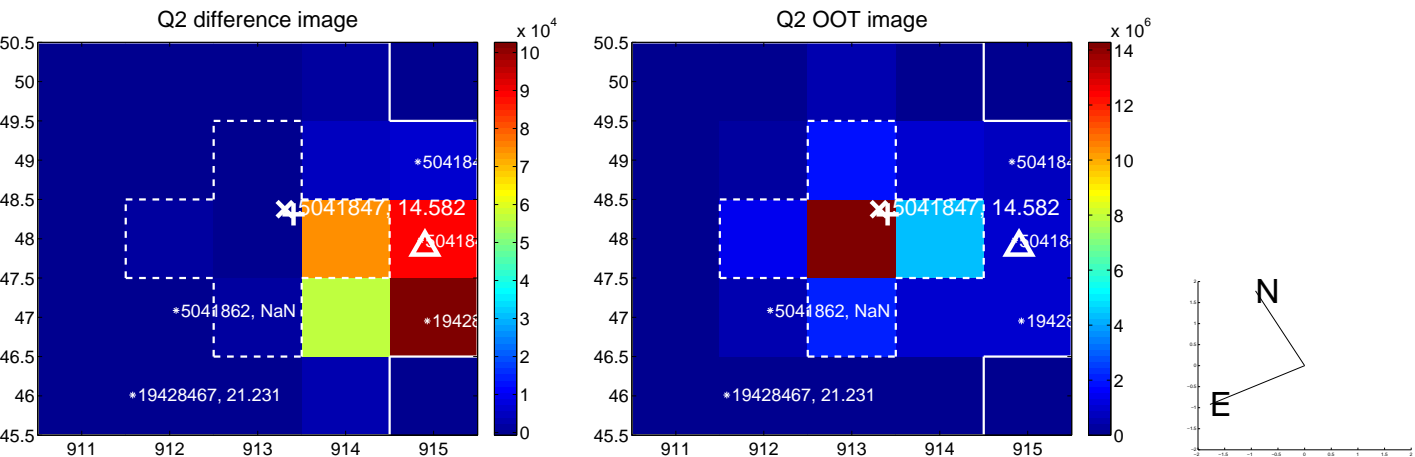
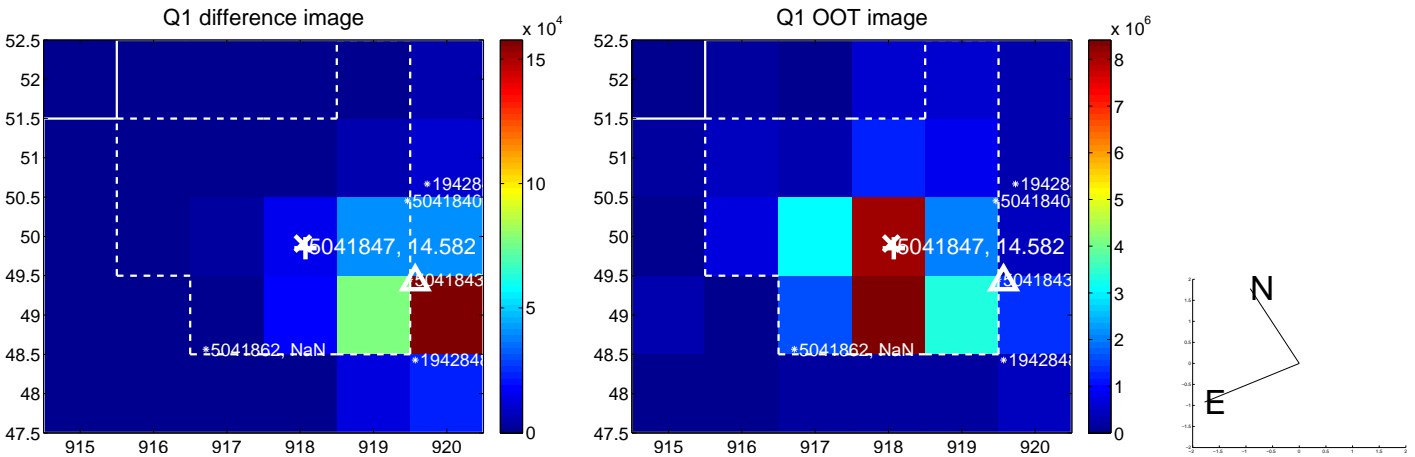
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b>6.178 <math>\pm</math> 0.068</b>	<b>90.36</b>	-4.523 $\pm$ 0.069	-4.209 $\pm$ 0.068
PRF-fit source offset from KIC position	<b>6.531 <math>\pm</math> 0.071</b>	<b>92.08</b>	-4.702 $\pm$ 0.074	-4.532 $\pm$ 0.069
photometric centroid source offset	—	—	—	—



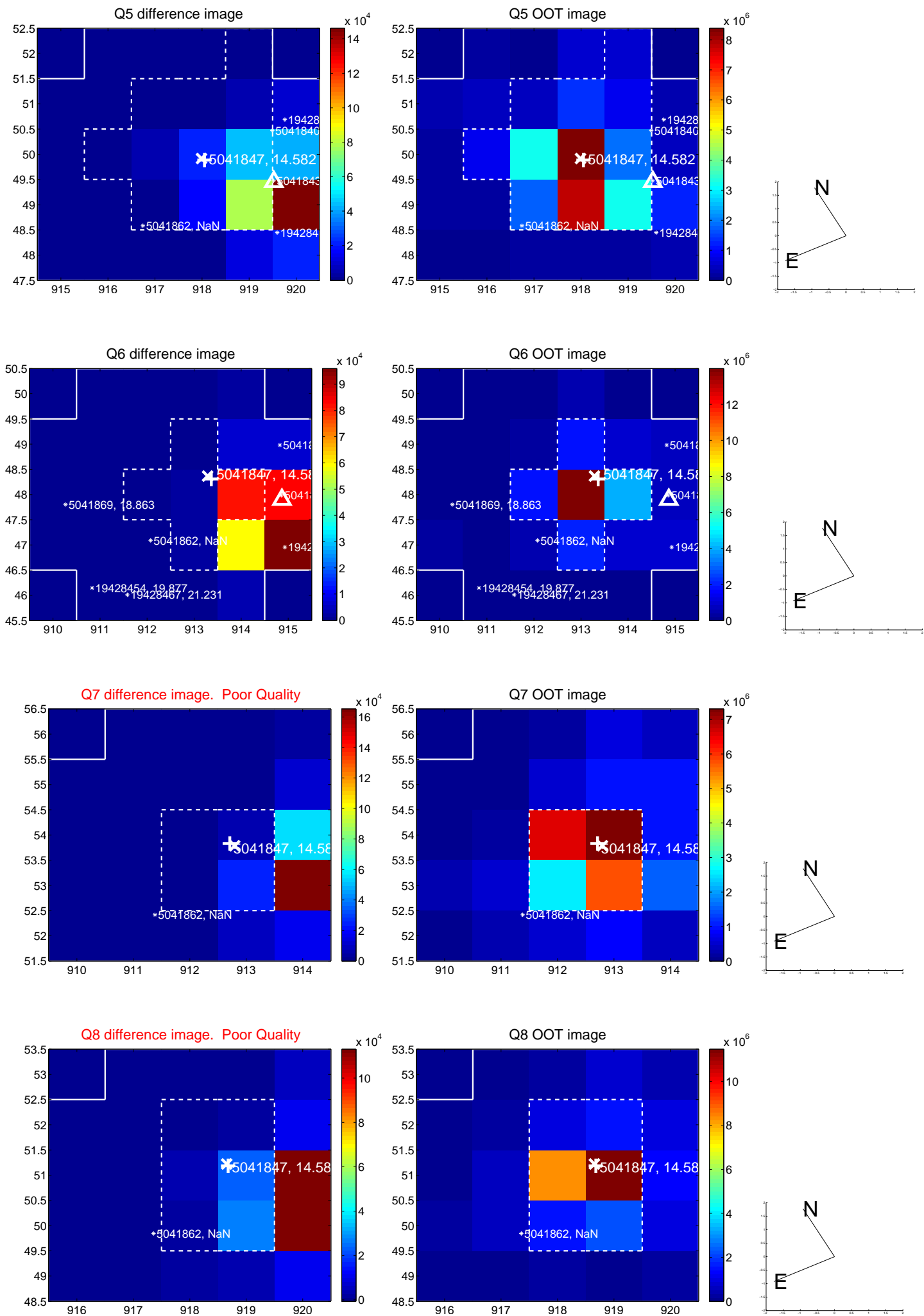
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



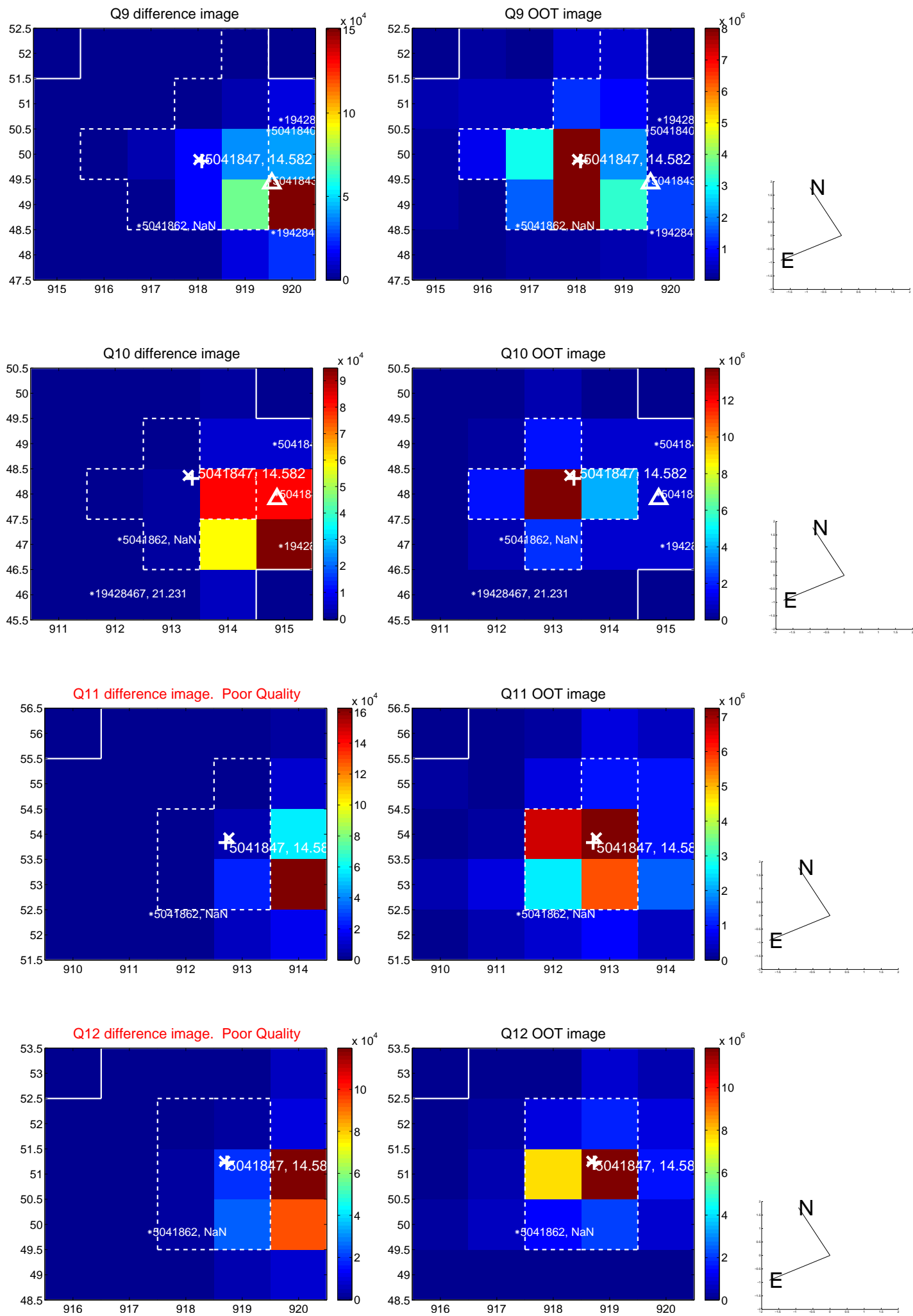
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



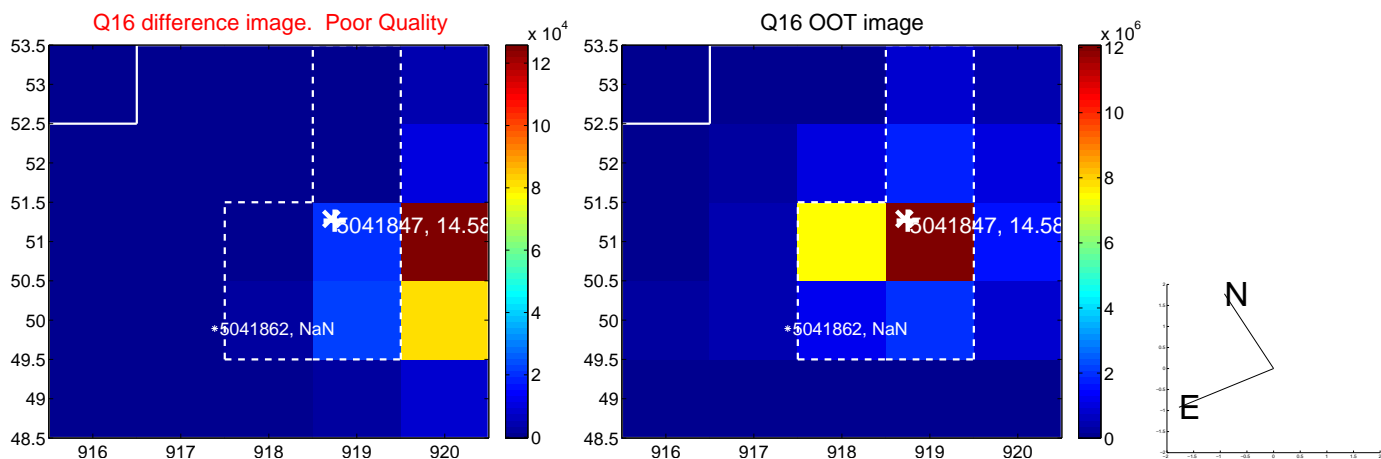
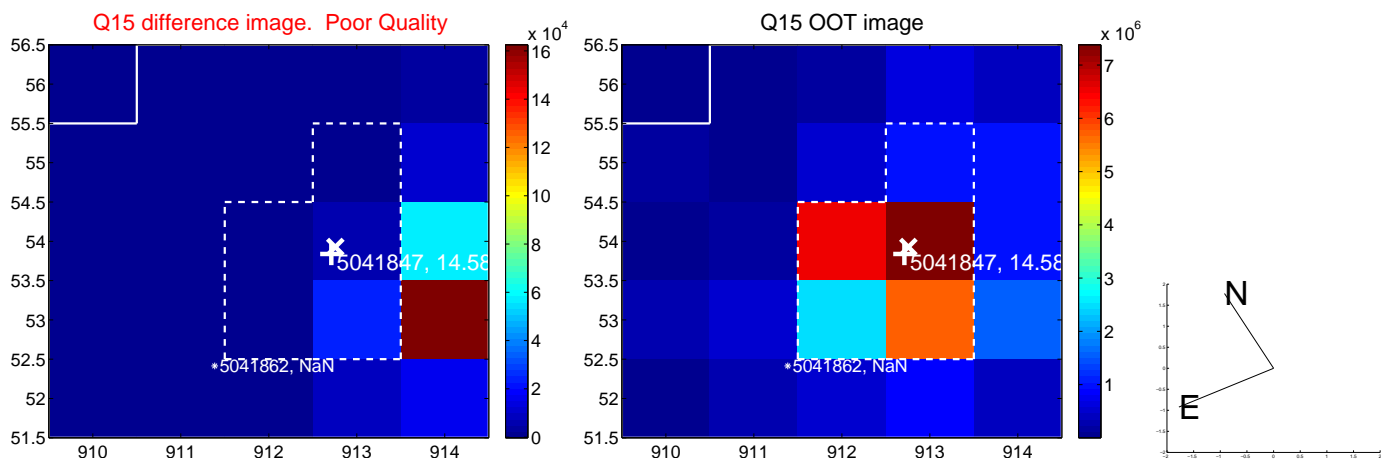
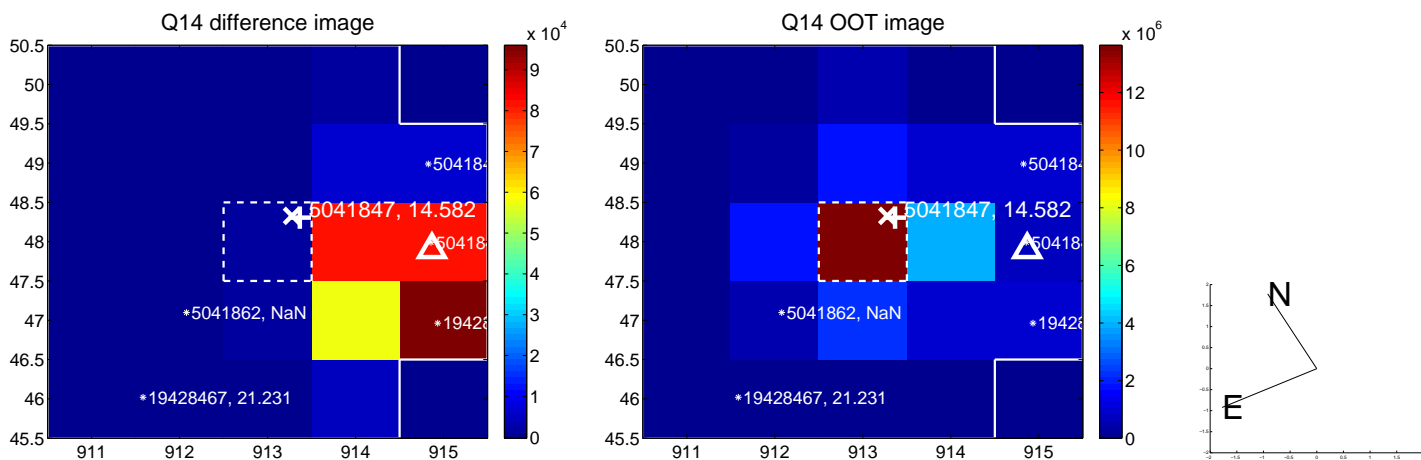
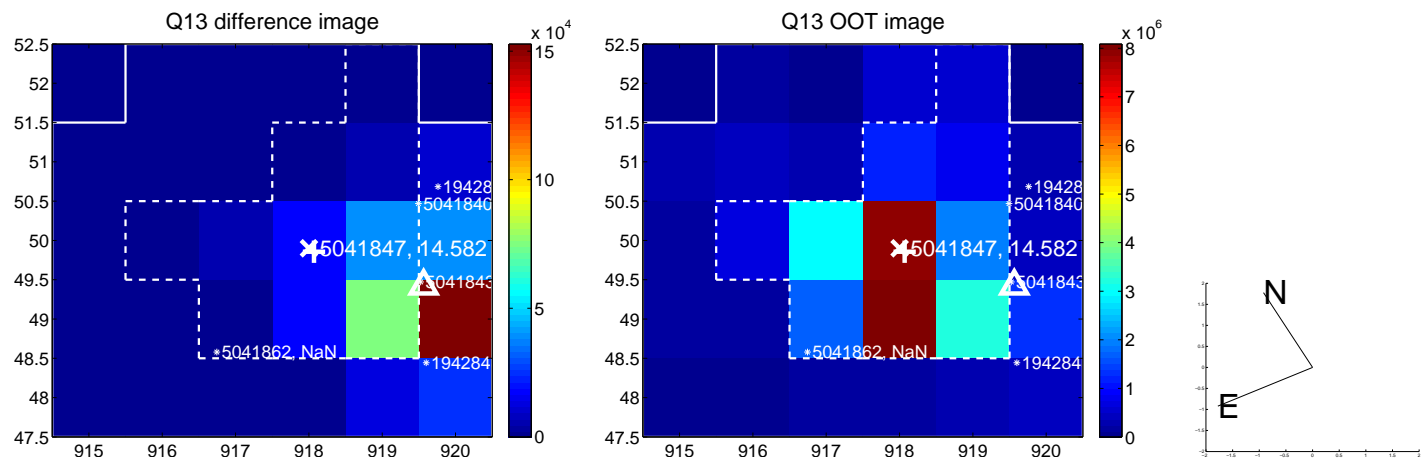
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



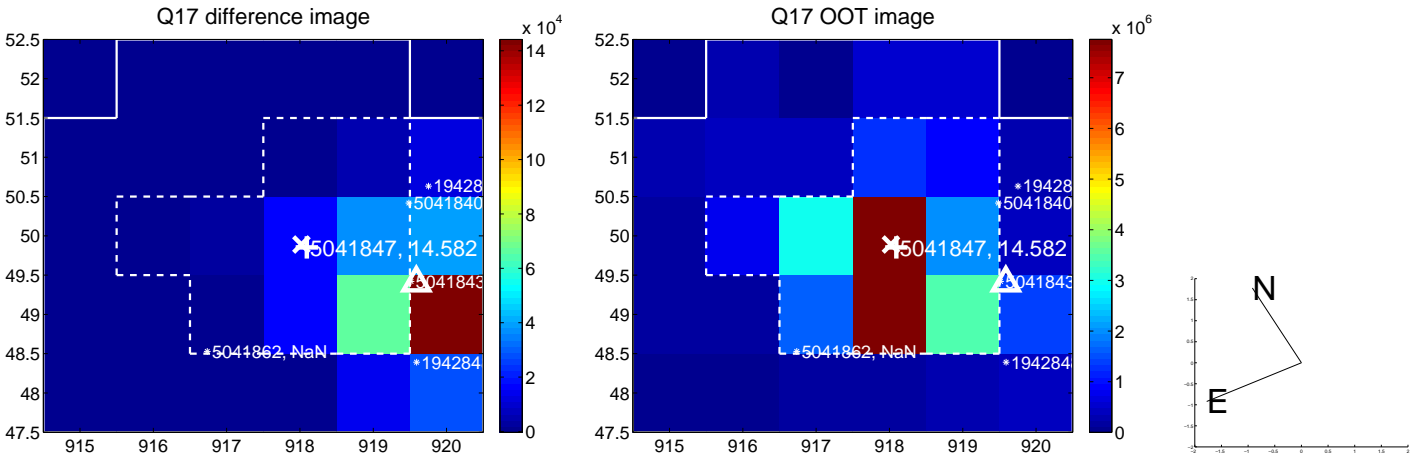
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

