

# KIC 007541659

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007541659-01	OBS	No	1.845285	133.244623	18.6	3.386	10.7	8.2	2.21	6608	1.08	7679.61
007541659-02	OBS	No	1.845312	132.192852	2.7	12.439	9.4	1.9	2.21	6608	0.42	7679.46

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007541659-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
007541659-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD

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

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

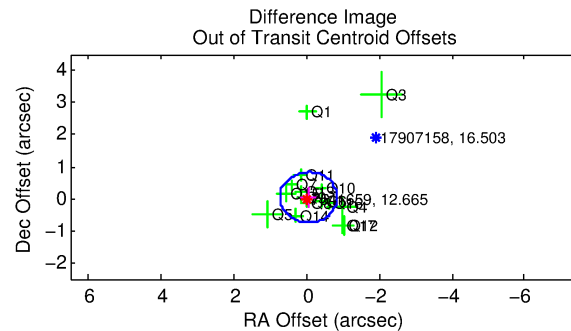
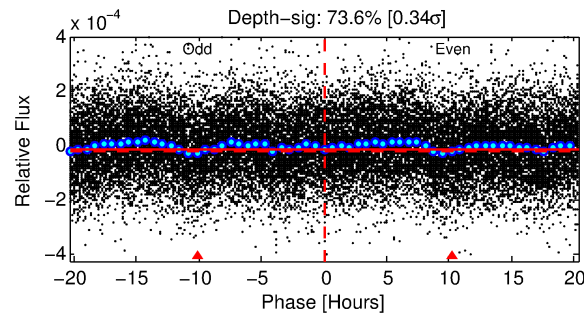
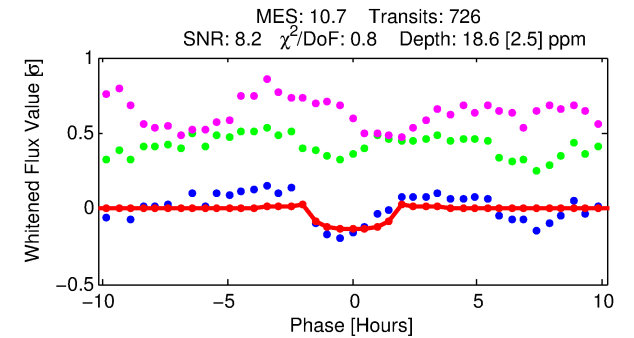
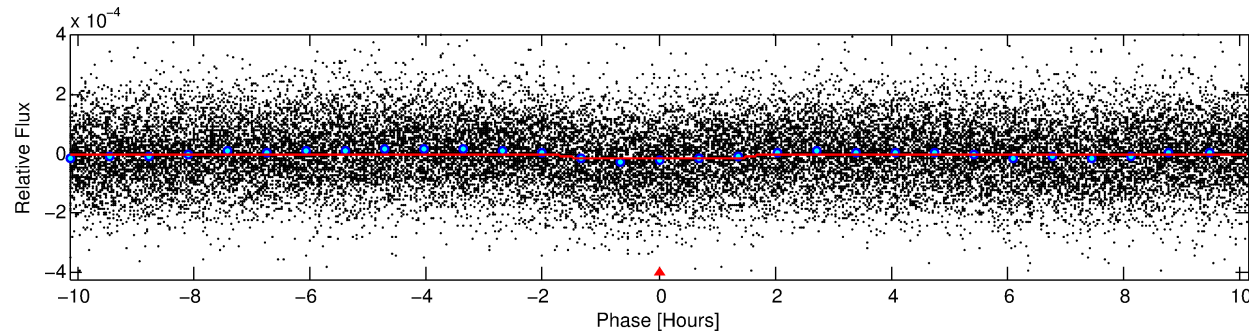
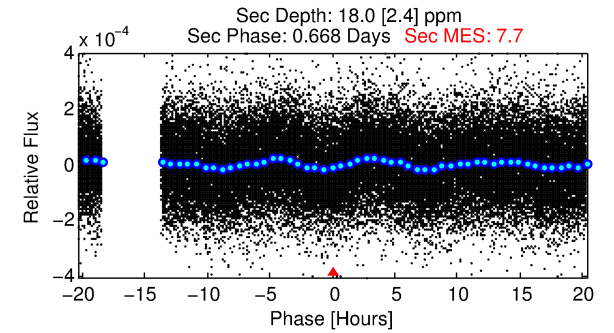
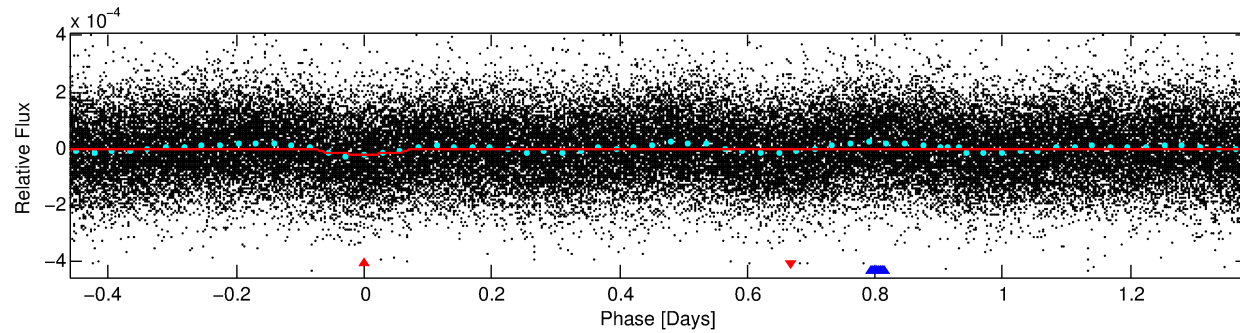
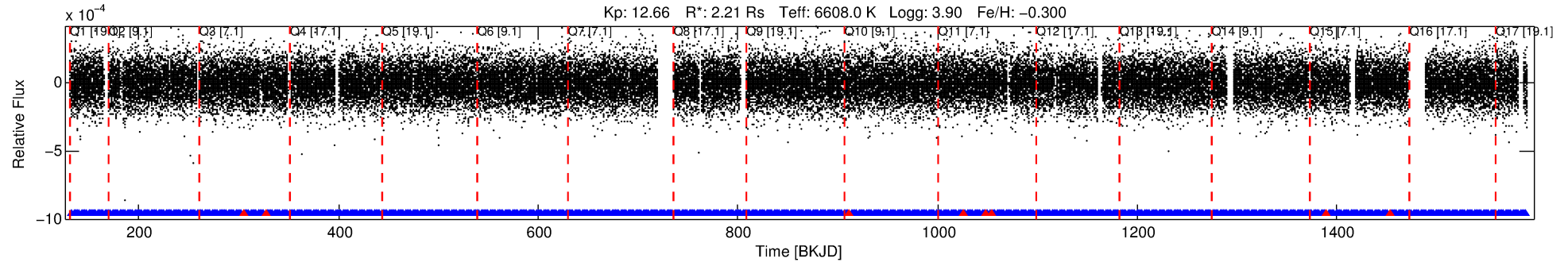
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007541659-01

No Significant Match Found

# DV One-Page Summary

KIC: 7541659 Candidate: 1 of 2 Period: 1.845 d



## DV Fit Results:

Period = 1.84529 [0.00002] d  
Epoch = 133.2446 [0.0042] BKJD  
Rp/R\* = 0.0045 [0.0013]  
a/R\* = 2.38 [3.16]  
b = 0.85 [0.51]  
Seff = 7679.61 [3941.38]  
Teq = 2387 [306] K  
Rp = 1.08 [0.49] Re  
a = 0.0330 [0.0106] AU  
Ag = 9.24 [7.07] [1.17σ]  
Teffp = 6434 [962] K [4.01σ]

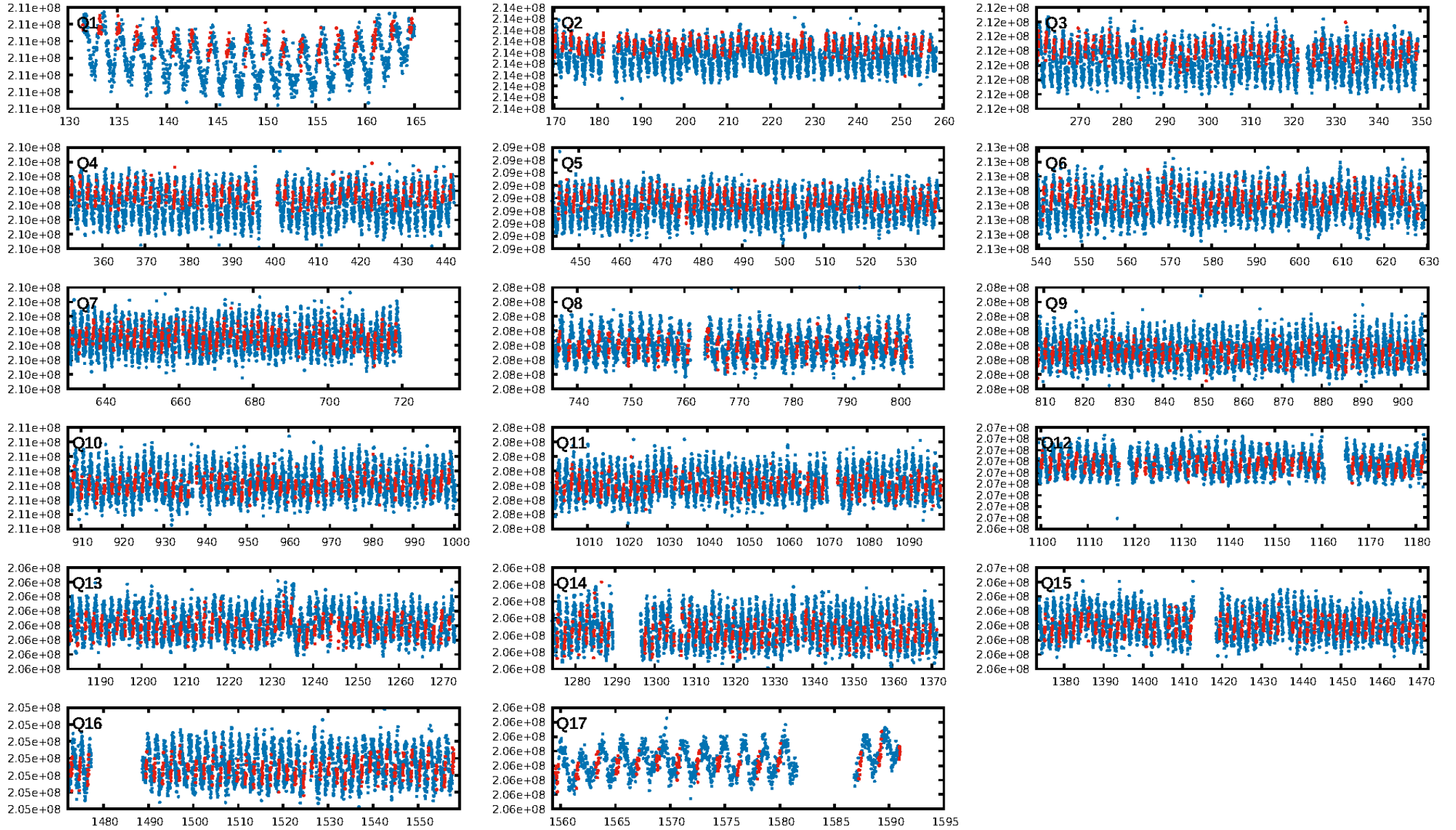
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 3.34e-104  
RollingBand-fgt: 0.99 [685/693]  
GhostDiagnostic-chr: 1.052  
Centroid-sig: 15.9%  
Centroid-so: 1.215 arcsec [1.28σ]  
OotOffset-rm: 0.069 arcsec [0.26σ]  
KicOffset-rm: 0.113 arcsec [0.48σ]  
OotOffset-st: 3/4/4/5 [16]  
KicOffset-st: 3/4/4/5 [16]  
DiffImageQuality-fgm: 0.88 [14/16]  
DiffImageOverlap-fno: 1.00 [17/17]

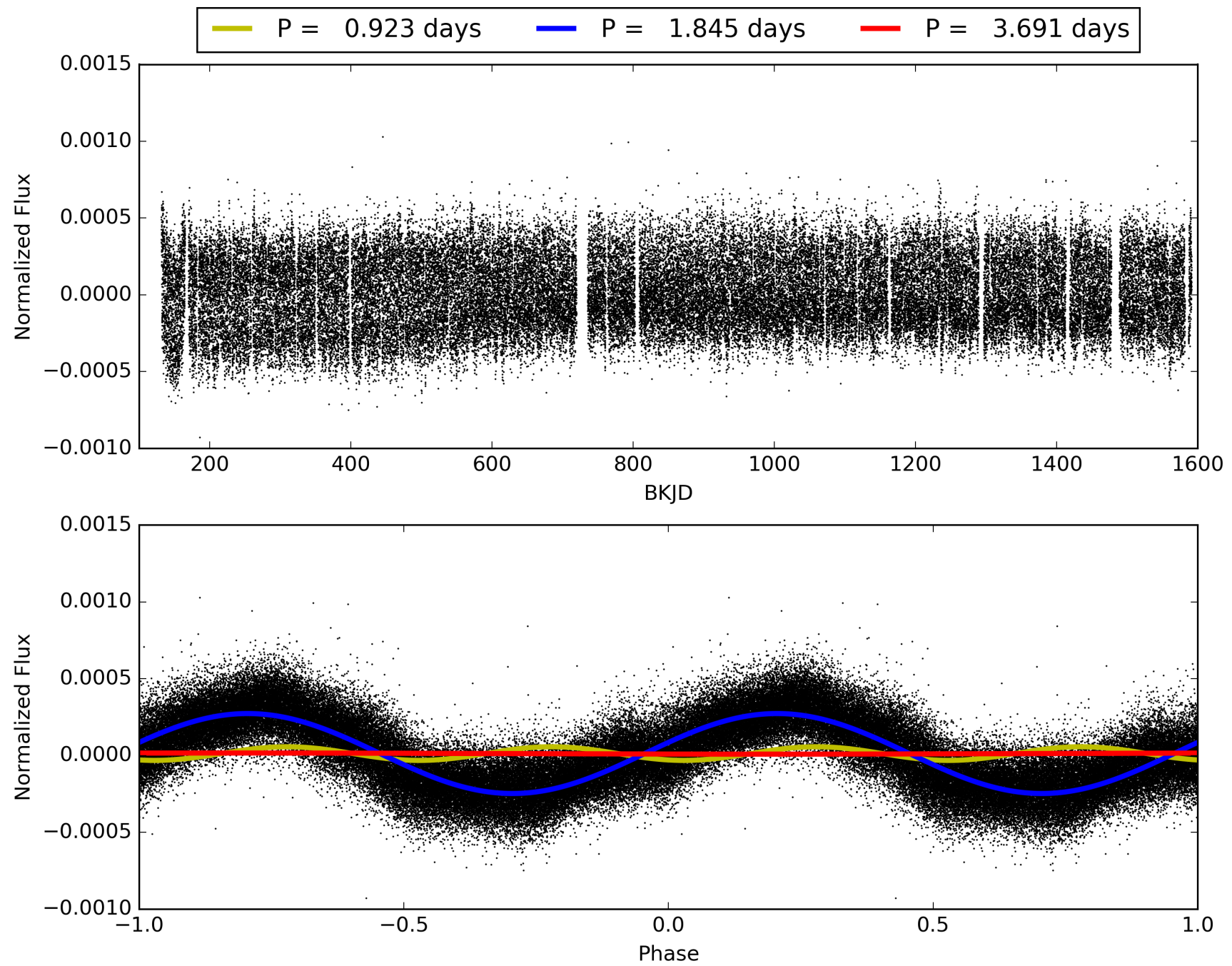
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 21:13:04 Z

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

# TCE 007541659-01, PDC Light Curves

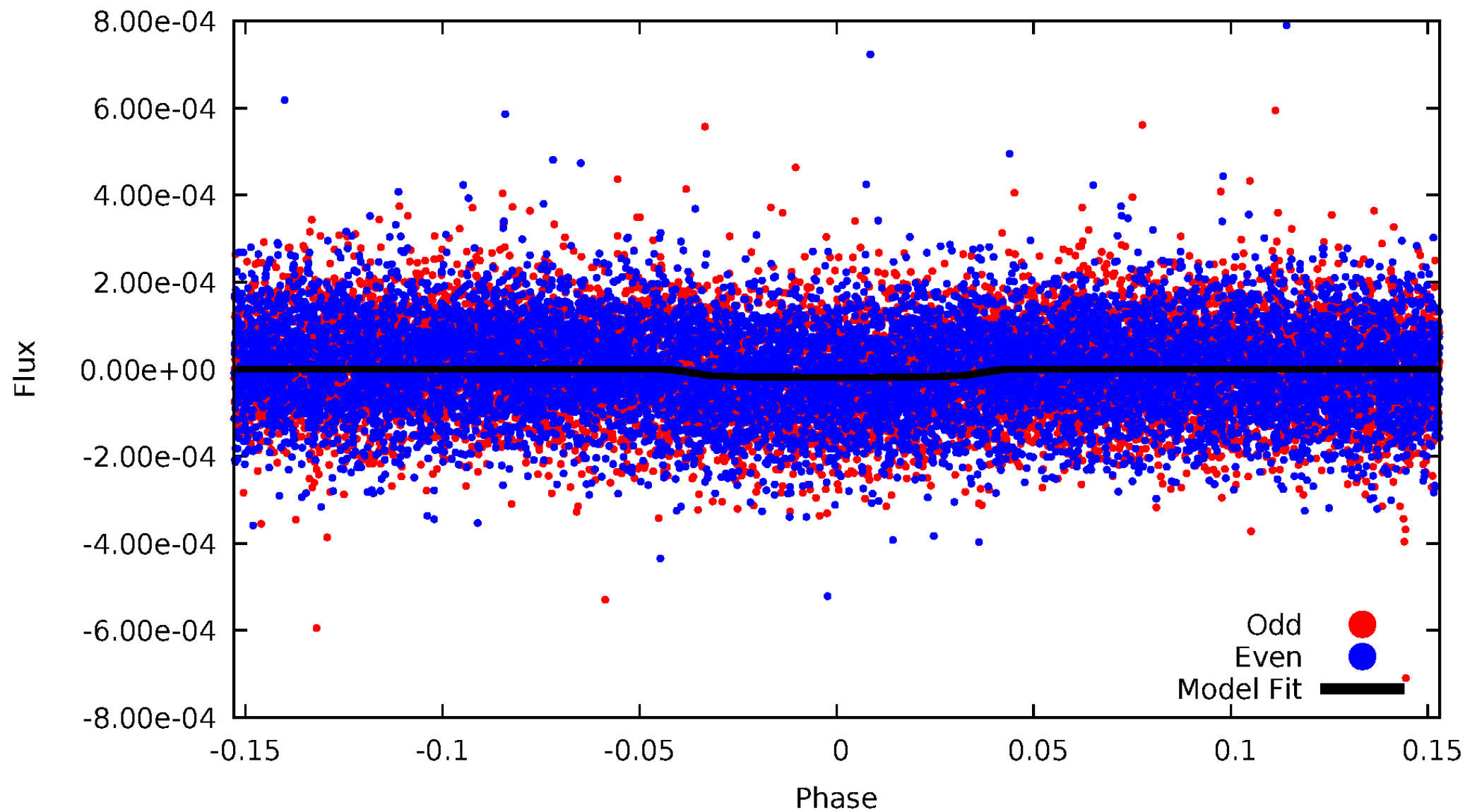


TCE 007541659-01



# DV Odd/Even

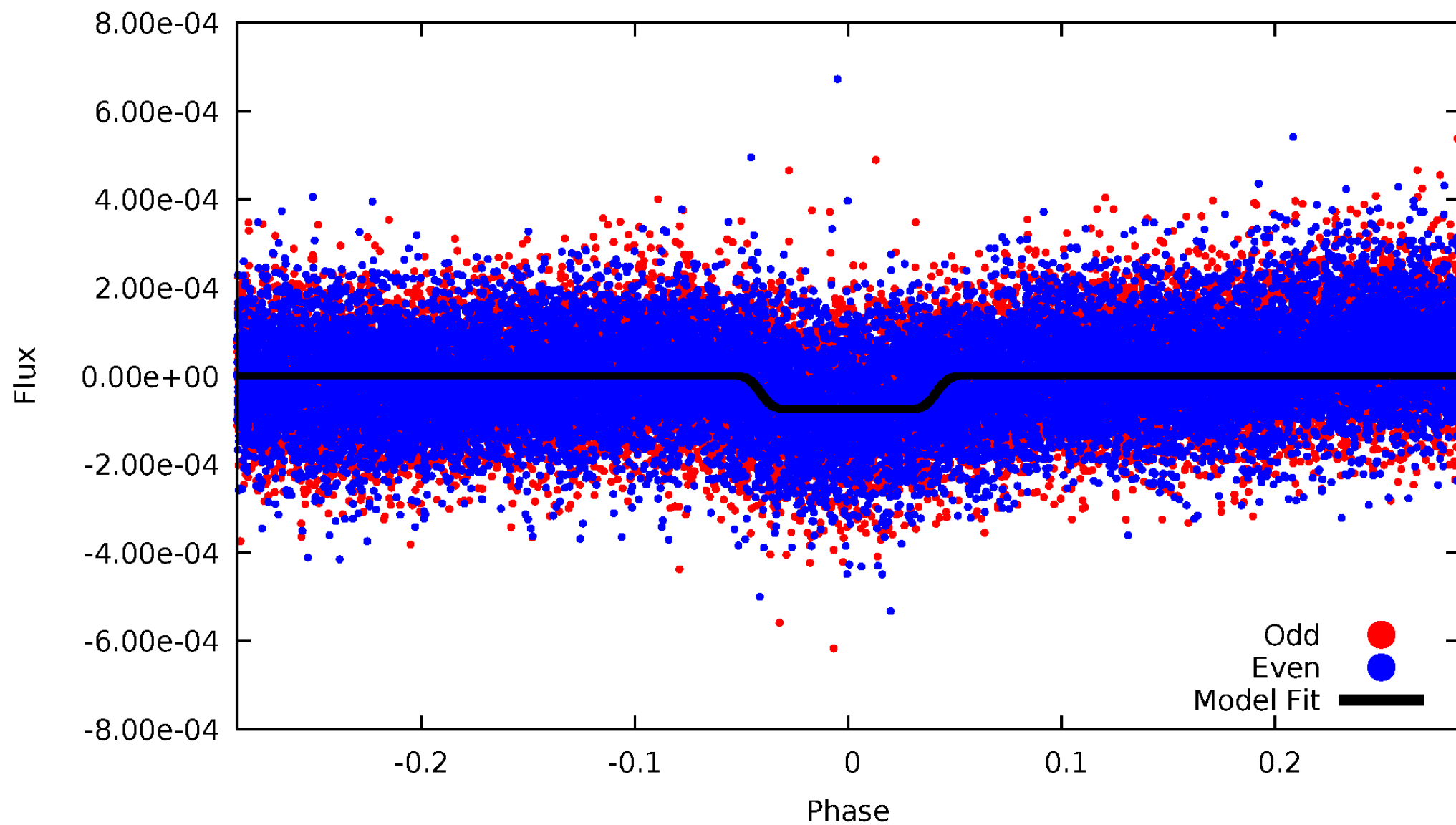
TCE 007541659-01





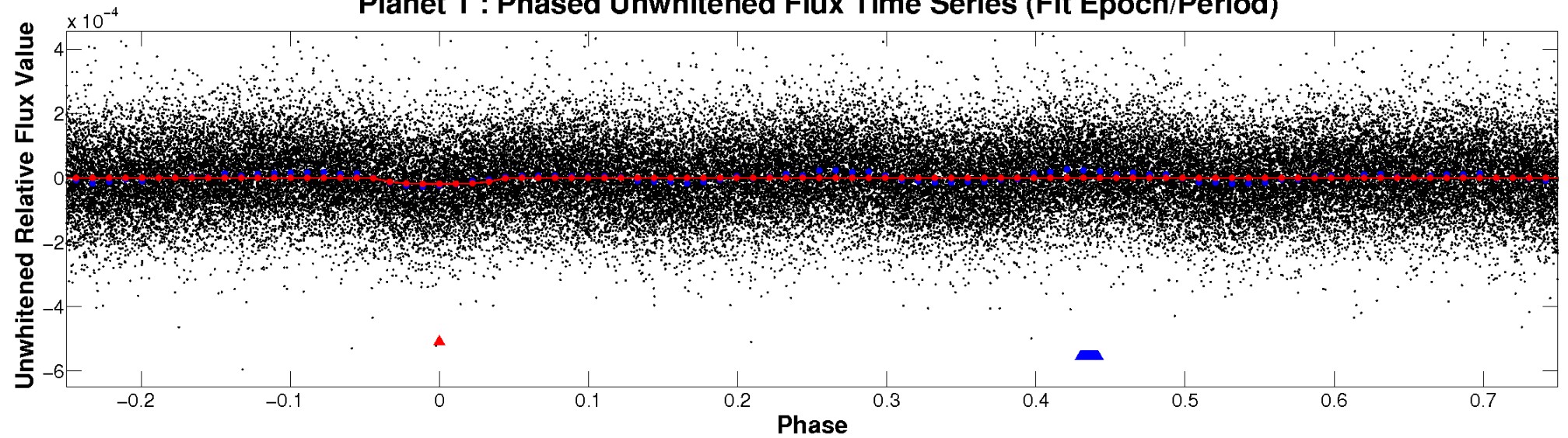
# ALT Odd/Even

TCE 007541659-01

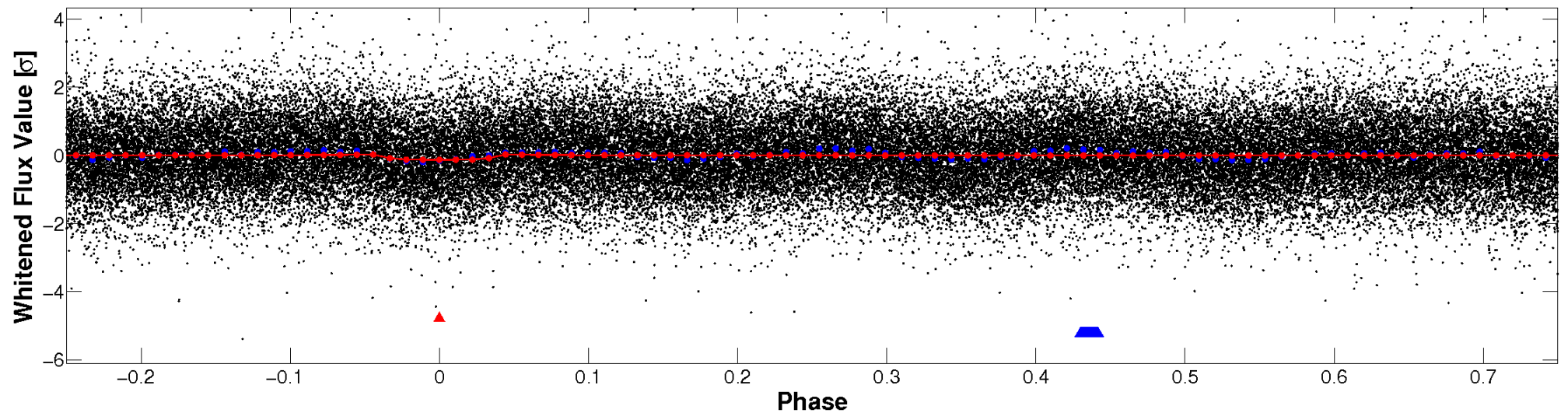


# Non-Whitened Vs. Whitened Light Curve

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

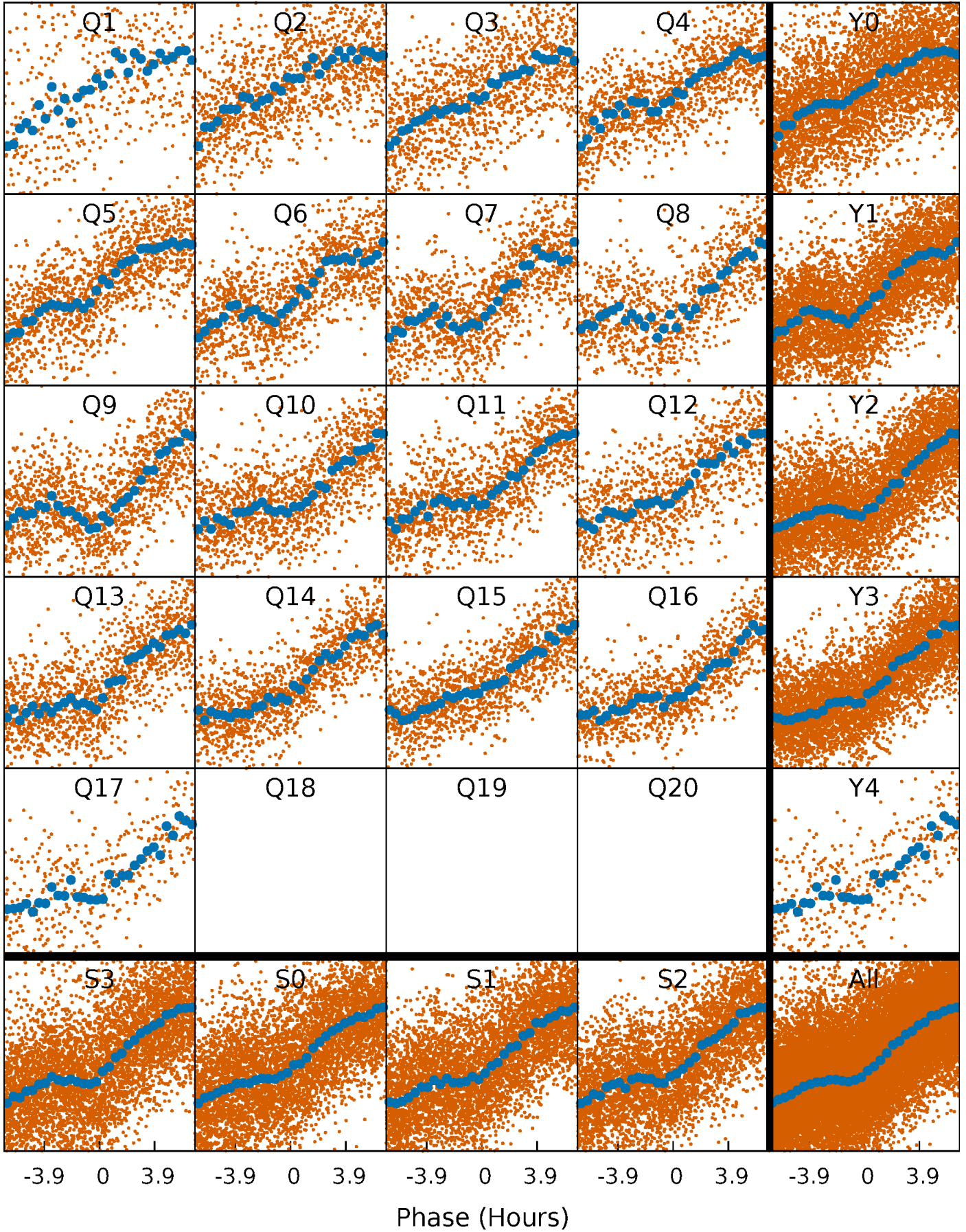


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

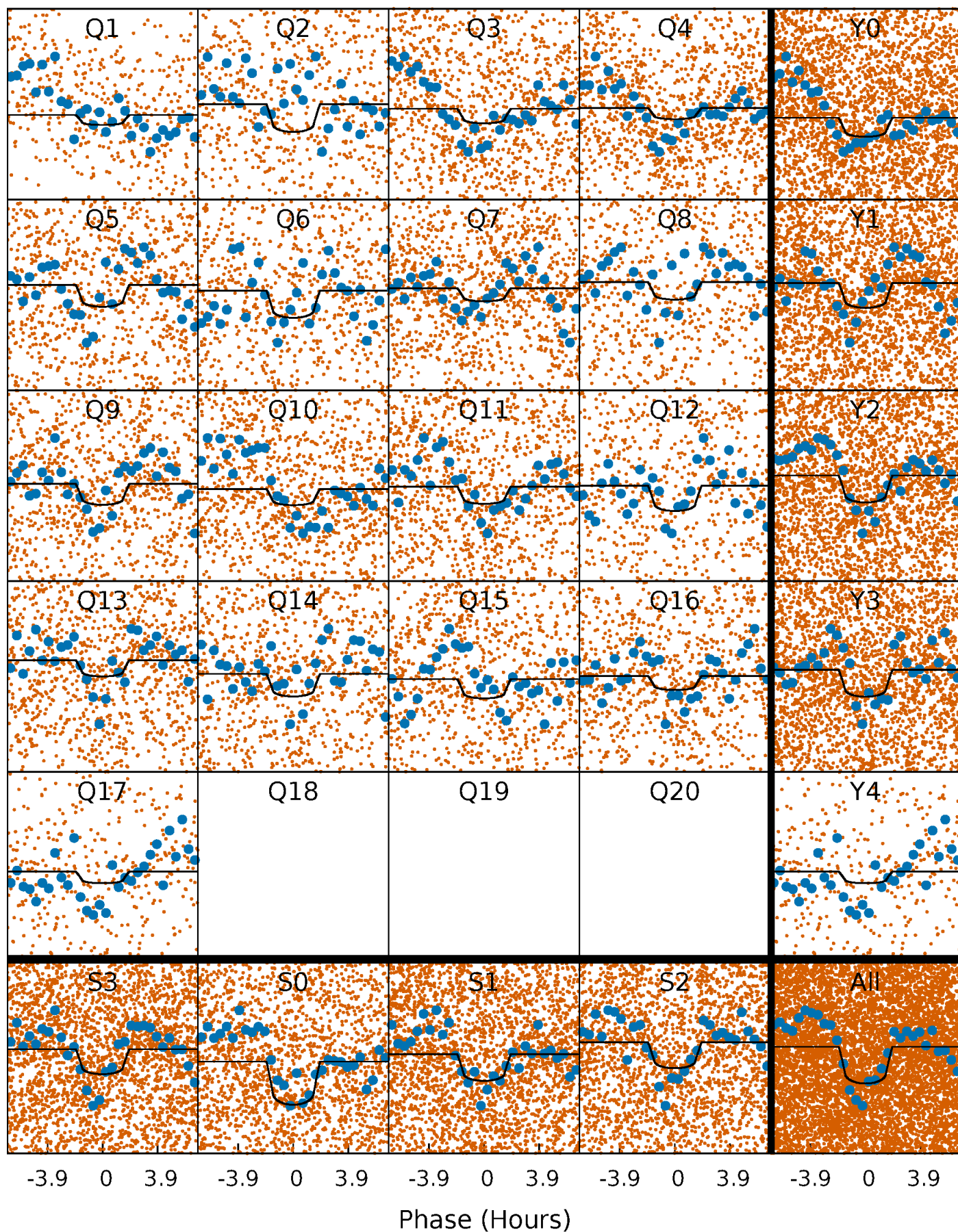
TCE 007541659-01 P= 1.845285 Days  $T_0=133.244623$  (BKJD)





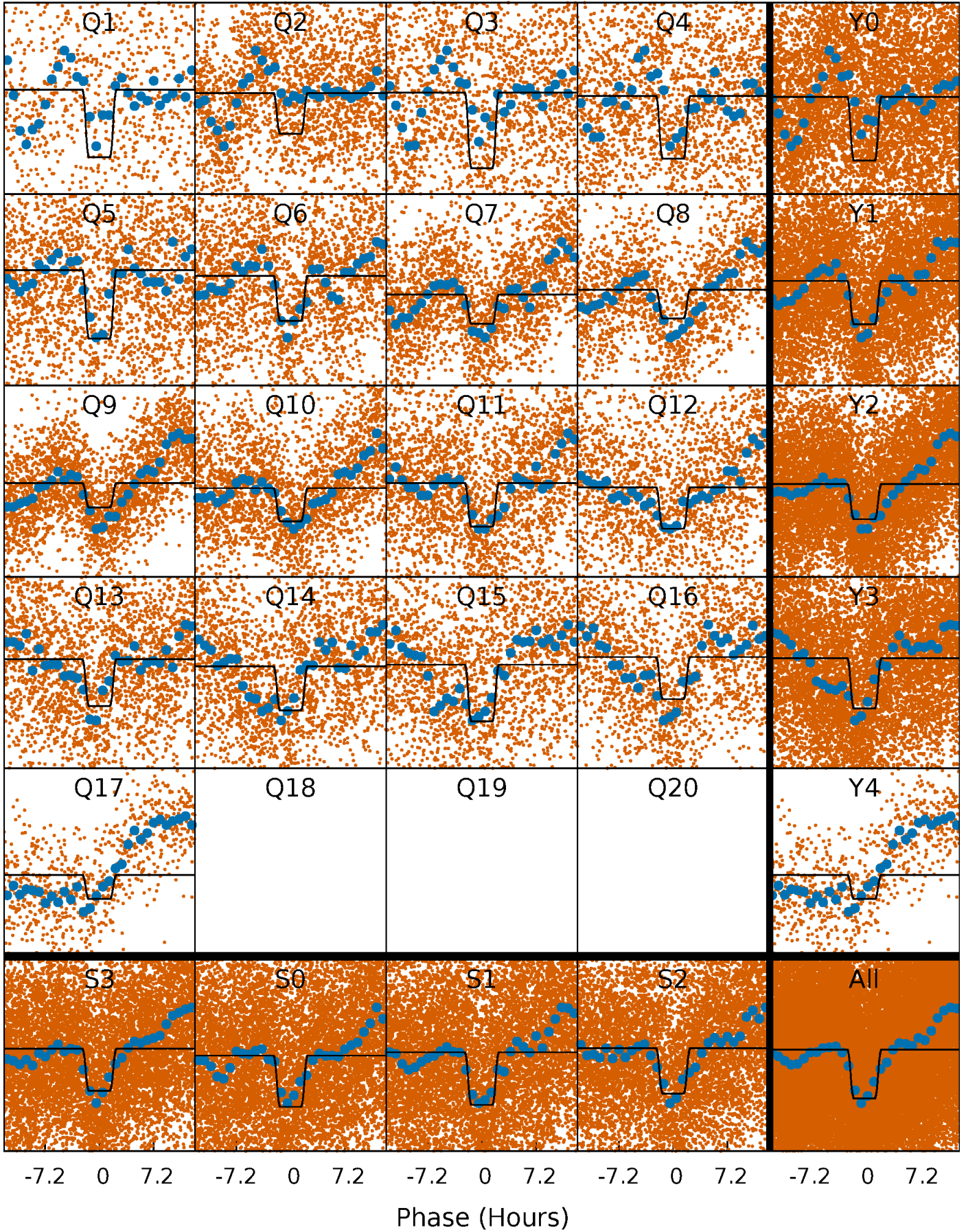
# DV Quarter-Phased Transit Curves

TCE 007541659-01 P= 1.845285 Days  $T_0=133.244623$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 007541659-01 P= 1.845417 Days  $T_0=133.187254$  (BKJD)

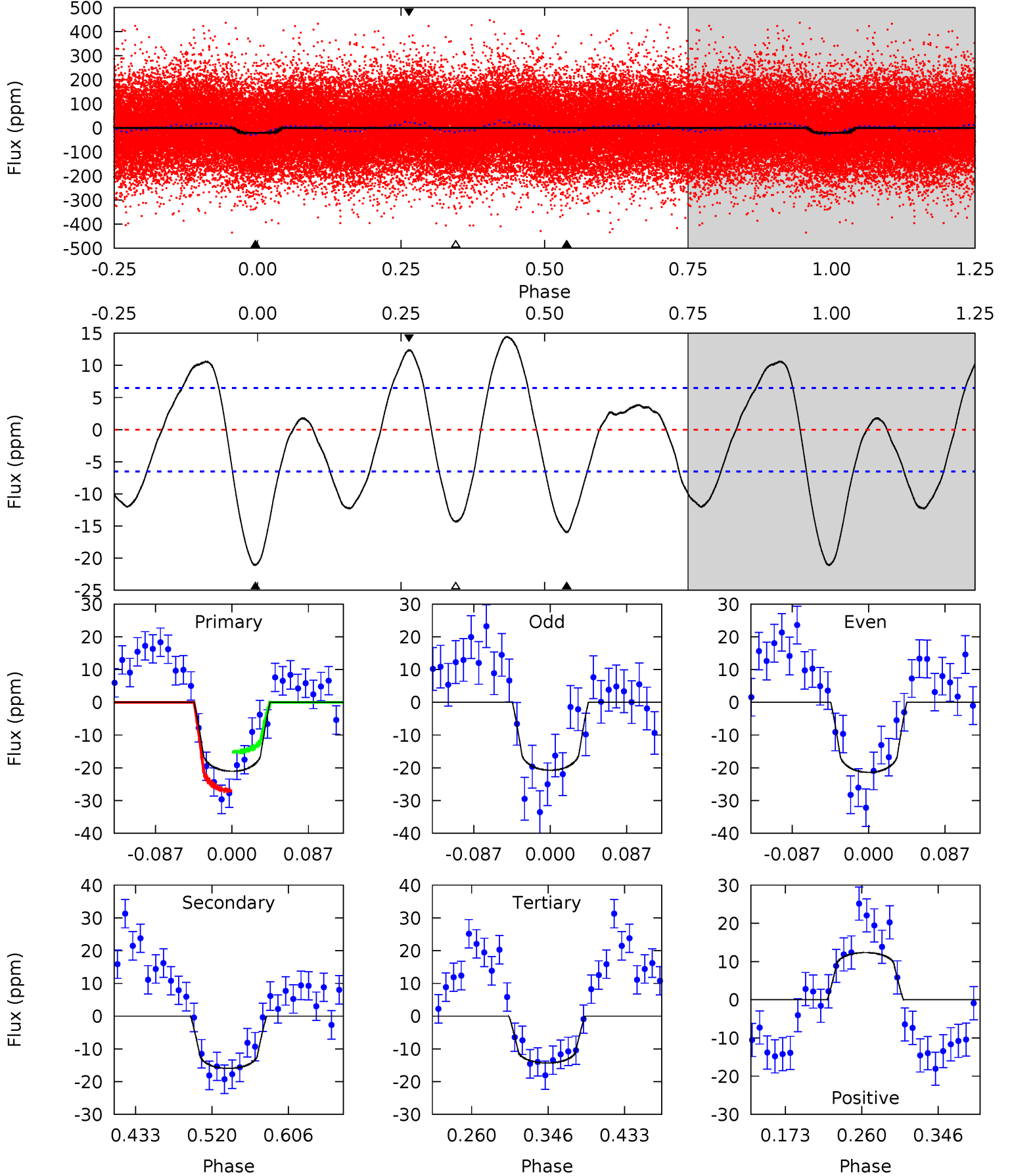




# DV Model-Shift Uniqueness Test

007541659-01, P = 1.845285 Days, E = 131.399338 Days

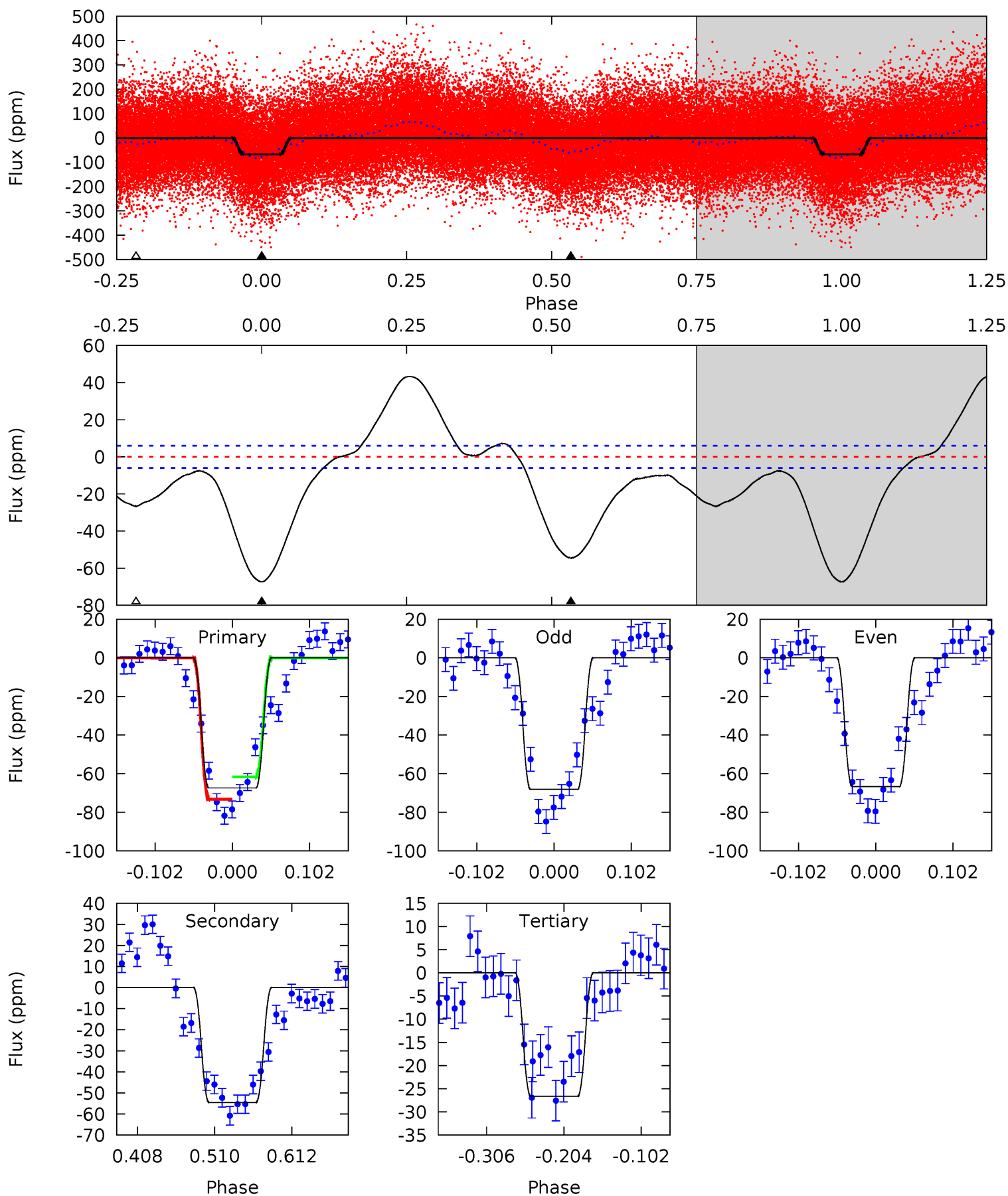
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.9	11.3	10.1	8.74	4.59	1.71	5.80	4.78	6.17	1.16	2.55	0.23	0.94	0.41	4.23



# Alt Model-Shift Uniqueness Test

007541659-01, P = 1.845417 Days, E = 131.341837 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
51.3	41.5	20.2	0	4.56	1.64	14.8	31.0	51.3	21.2	41.5	0.54	0.99	0.39	4.39





### Stellar Parameters For KIC 007541659

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6608^{+180}_{-220}$	$3.897^{+0.285}_{-0.114}$	$-0.300^{+0.300}_{-0.250}$	$2.215^{+0.417}_{-0.774}$	$1.411^{+0.200}_{-0.301}$	$0.183^{+0.340}_{-0.067}$
	+3%/-3%	+7%/-3%	+100%/-83%	+19%/-35%	+14%/-21%	+186%/-37%
Source	PHO1	FLK73	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 007541659-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-16 \pm 1$	$1.02^{+0.38}_{-0.34}$	$3277^{+232}_{-283}$	$6197^{+1372}_{-800}$	$9.039^{+11.570}_{-4.109}$
Alt.	$-55 \pm 1$	$1.99^{+0.45}_{-0.47}$	$3283^{+204}_{-297}$	$6058^{+567}_{-420}$	$8.377^{+5.228}_{-2.791}$

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

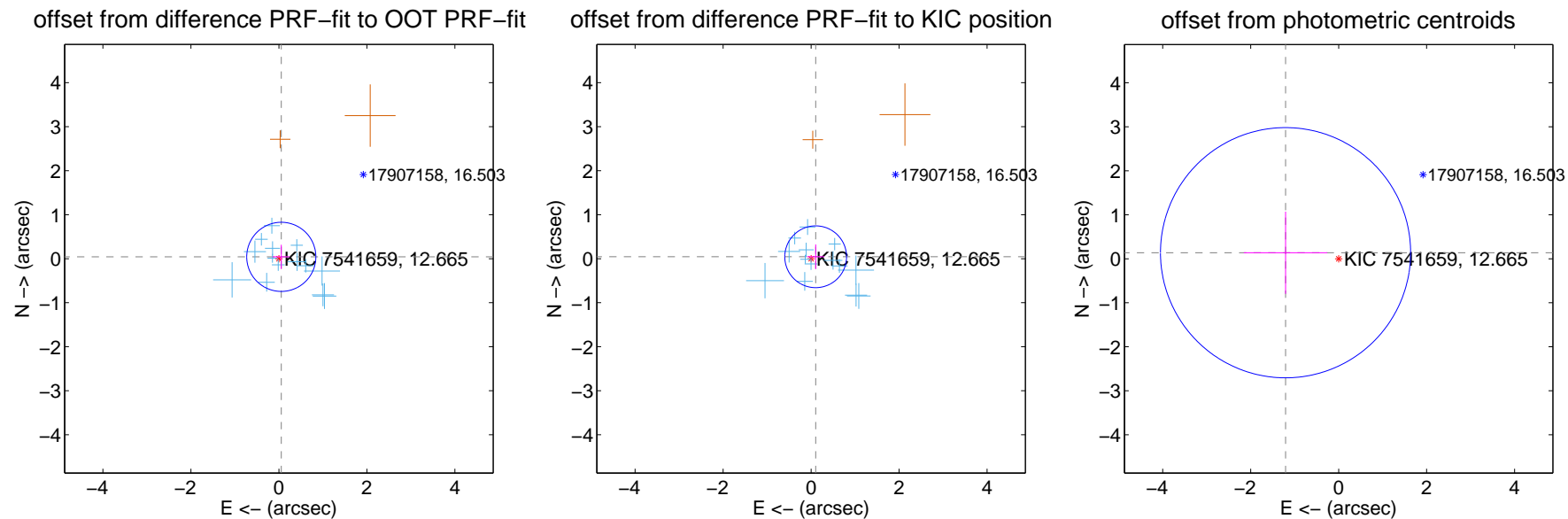
## DV Centroid Data

Supplemental centroid analysis for 007541659-01. Kepler magnitude: 12.66. Transit SNR 8.17

There are 14 quarters with good PRF difference image offsets

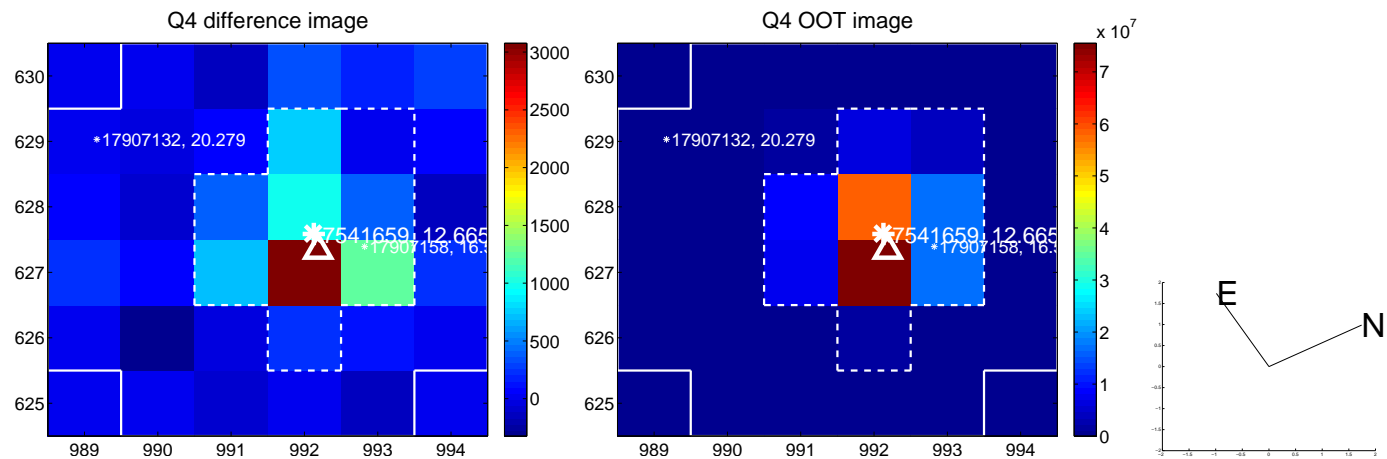
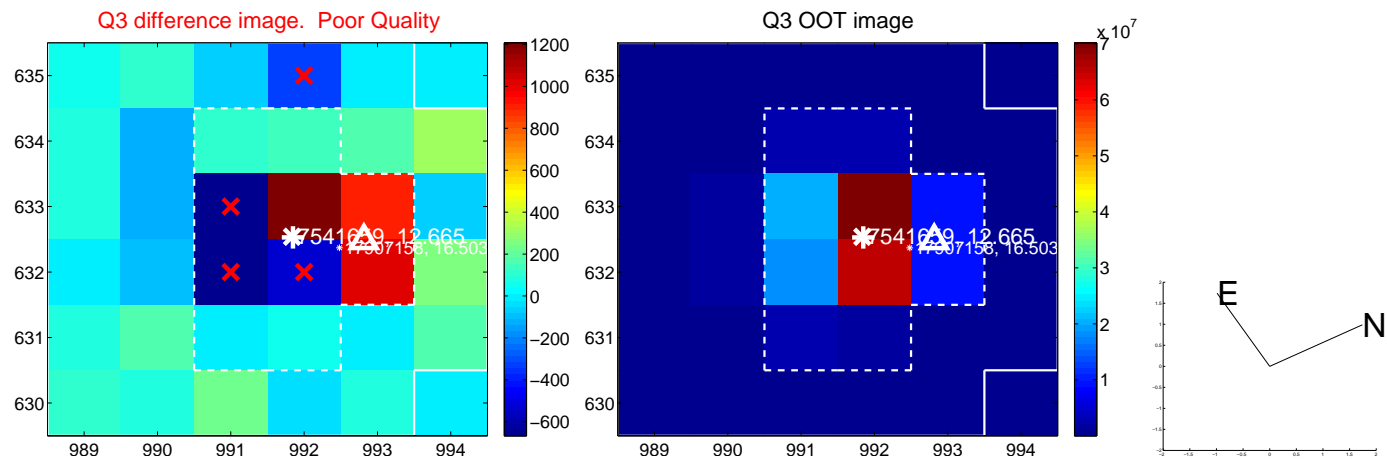
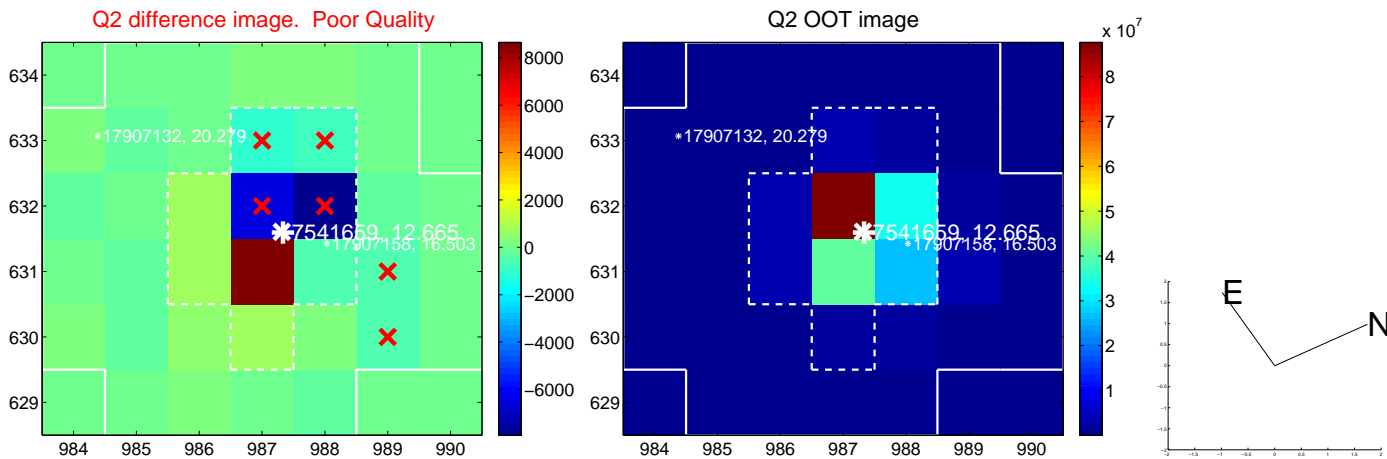
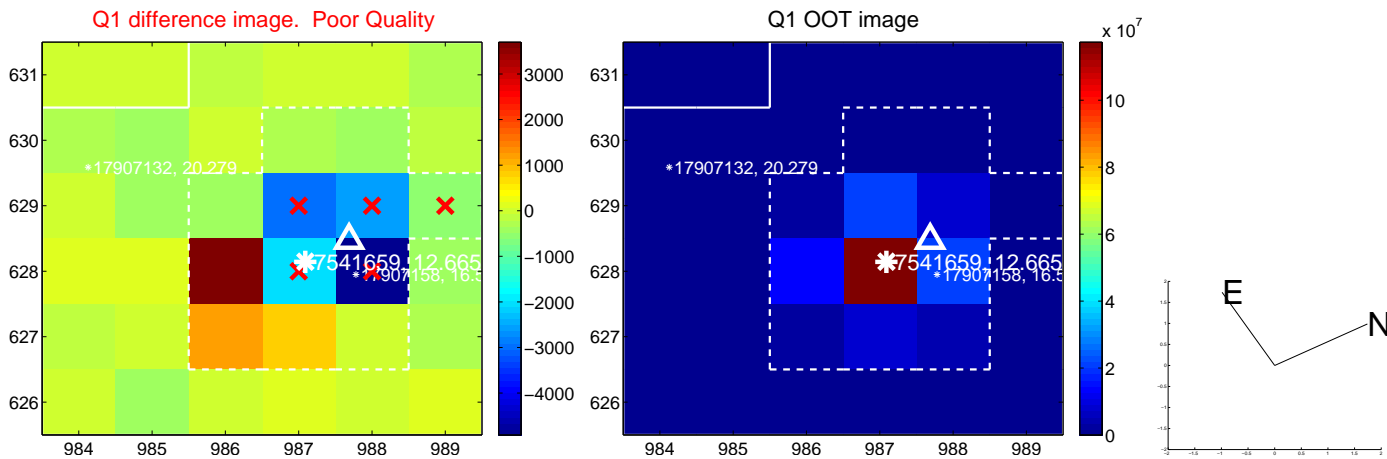
The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.069 \pm 0.262$	0.26	$-0.054 \pm 0.195$	$0.042 \pm 0.276$
PRF-fit source offset from KIC position	$0.113 \pm 0.234$	0.48	$-0.104 \pm 0.197$	$0.044 \pm 0.281$
photometric centroid source offset	$1.21 \pm 0.95$	1.28	$1.21 \pm 0.95$	$0.14 \pm 0.93$

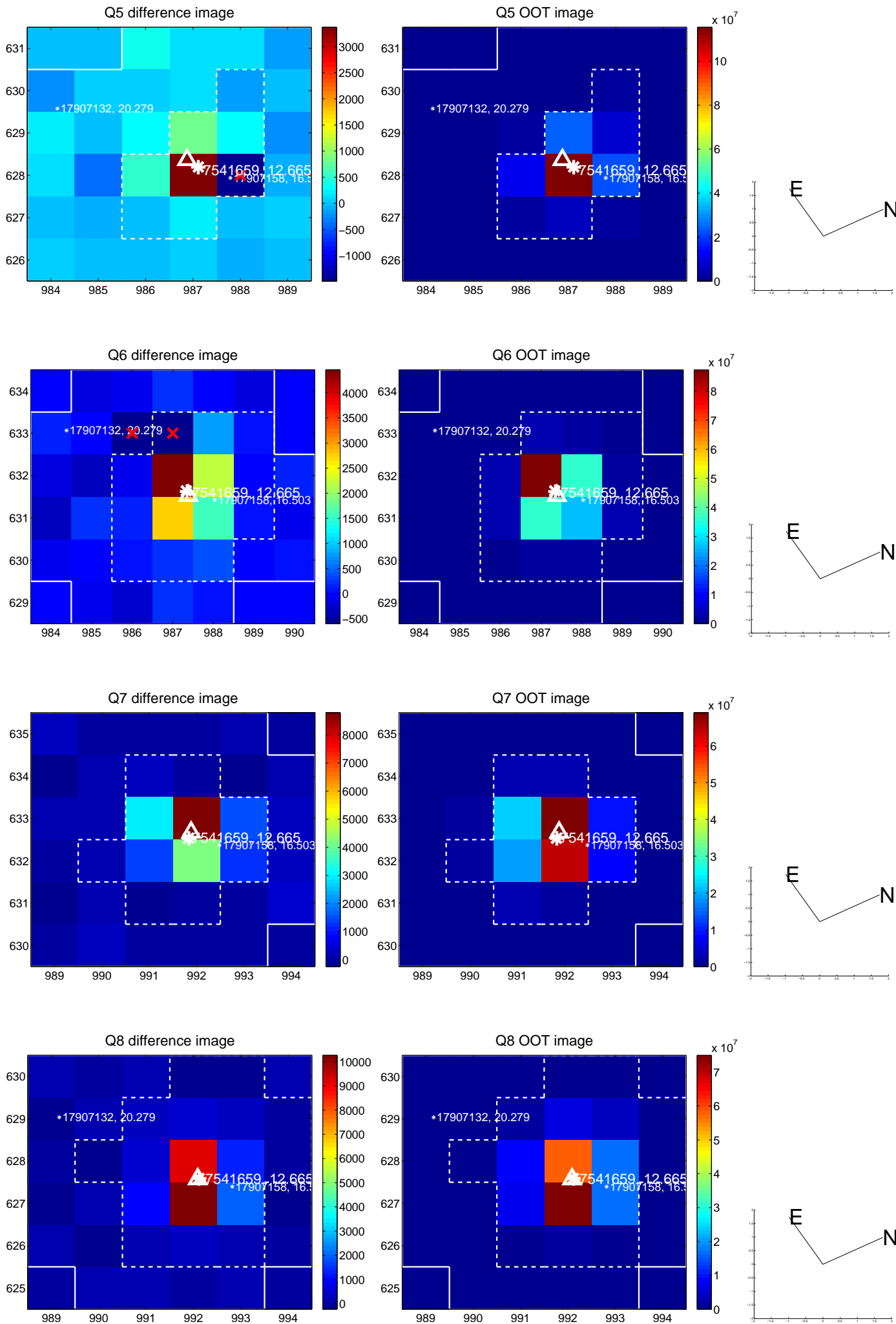


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

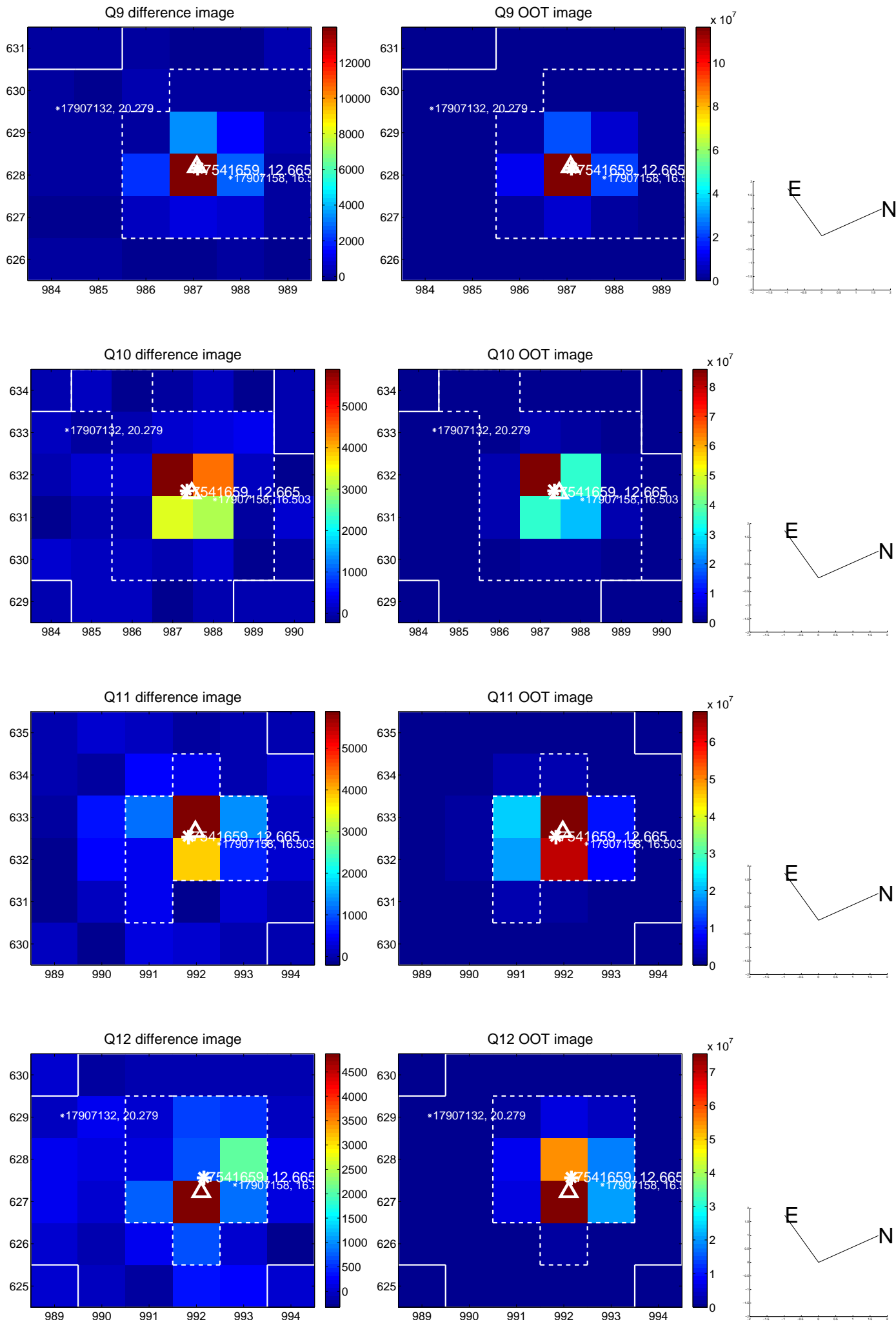


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

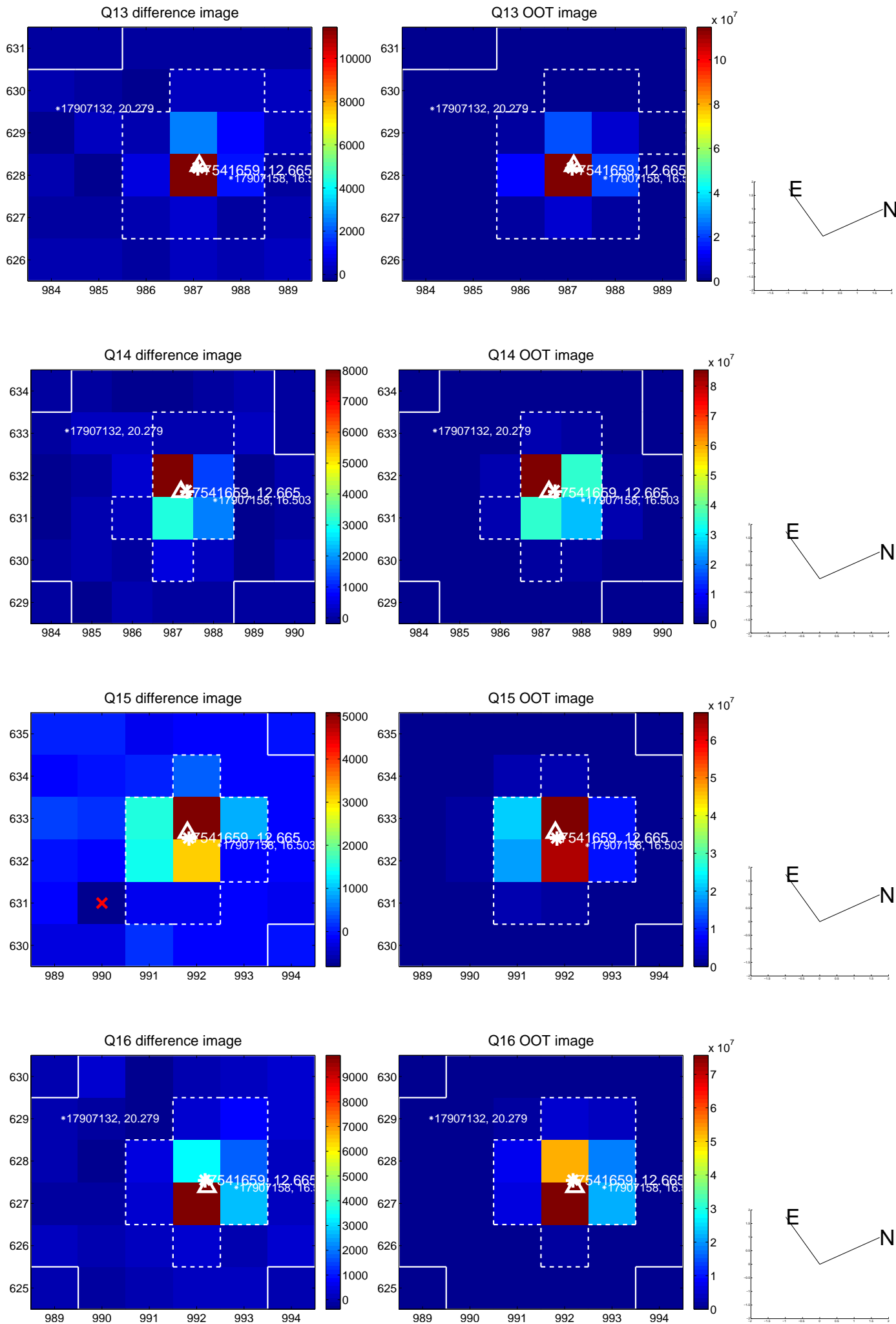




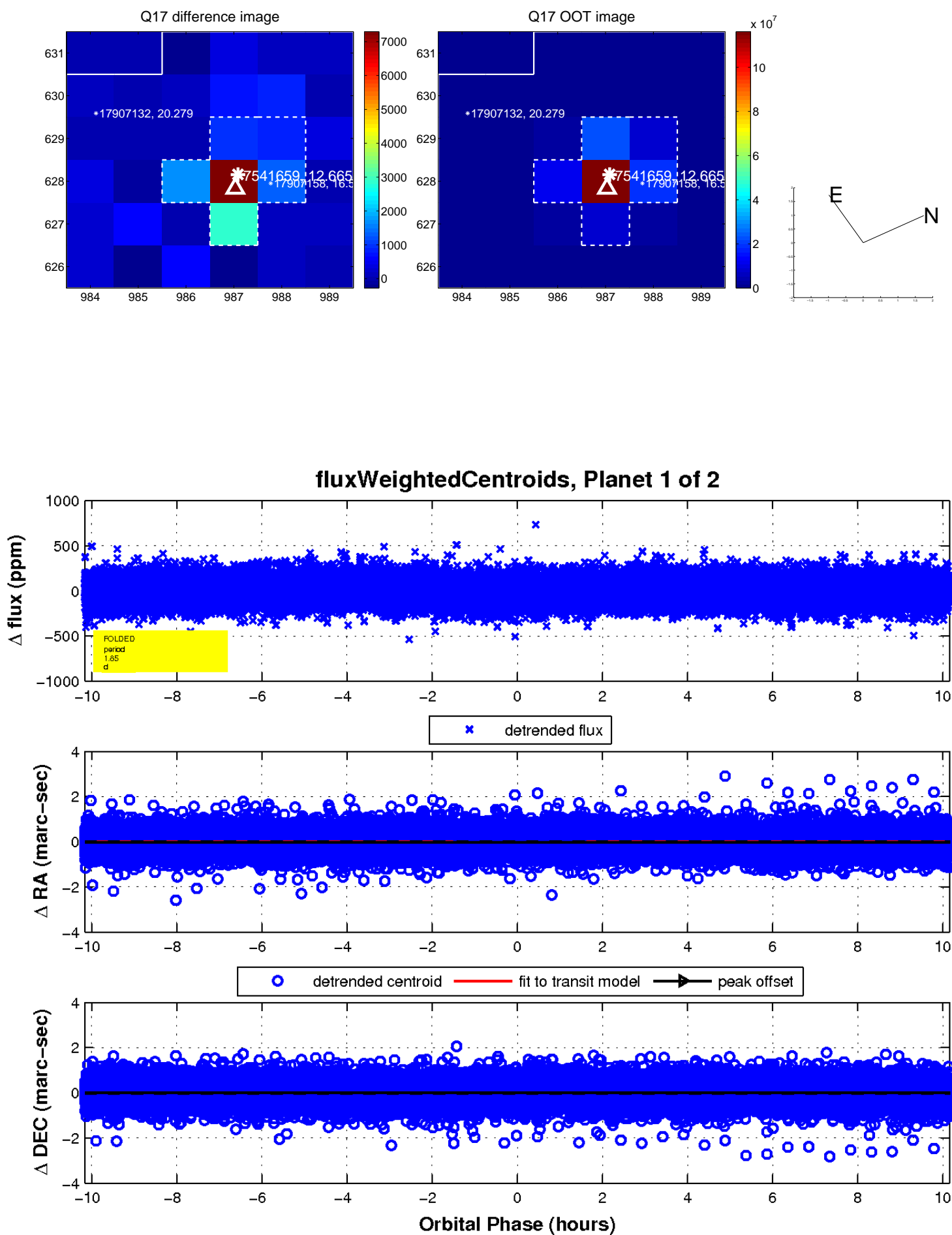
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

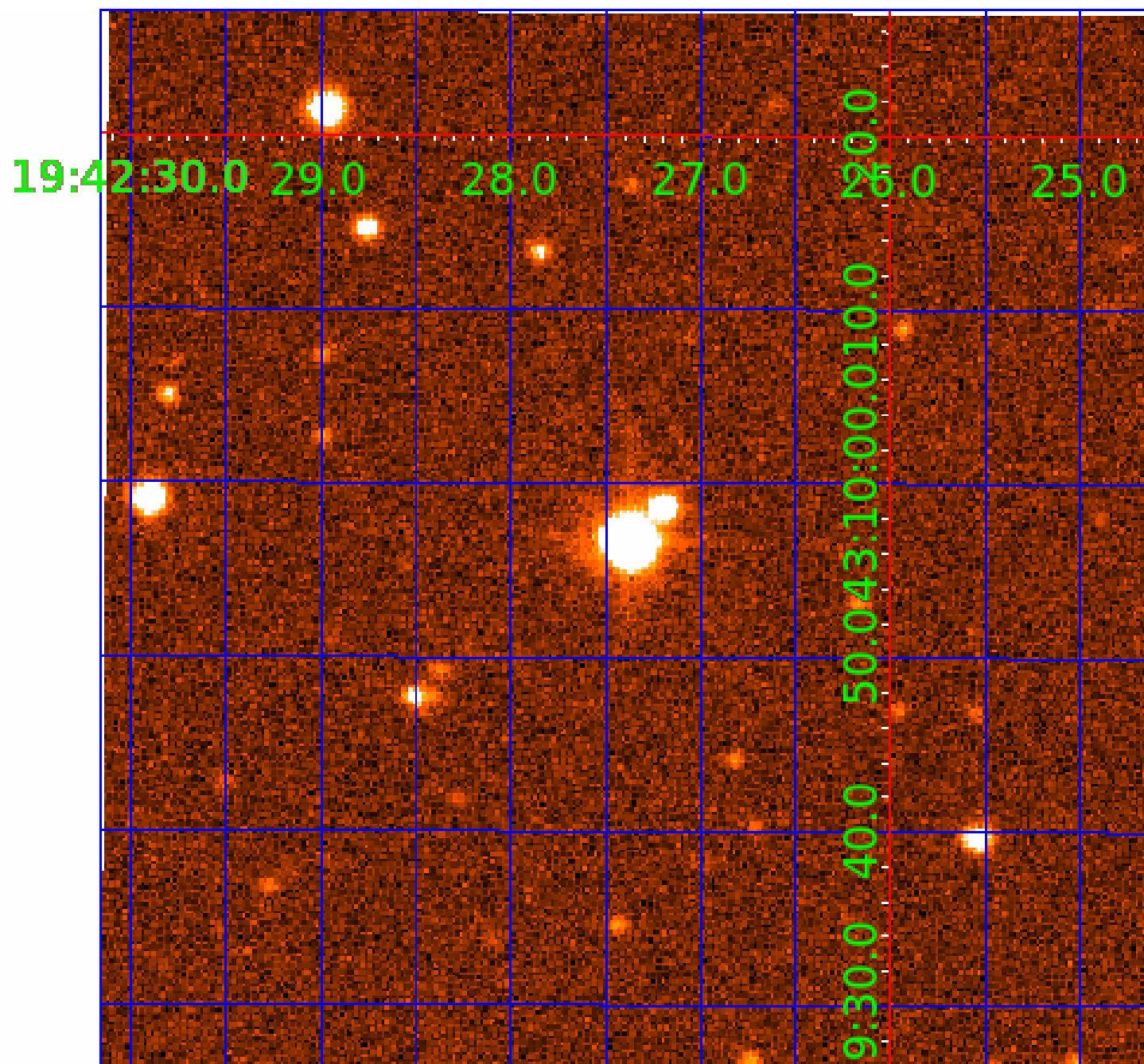


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination





# KIC 007541659

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007541659-01	OBS	No	1.845285	133.244623	18.6	3.386	10.7	8.2	2.21	6608	1.08	7679.61
007541659-02	OBS	No	1.845312	132.192852	2.7	12.439	9.4	1.9	2.21	6608	0.42	7679.46

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007541659-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
007541659-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD

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

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

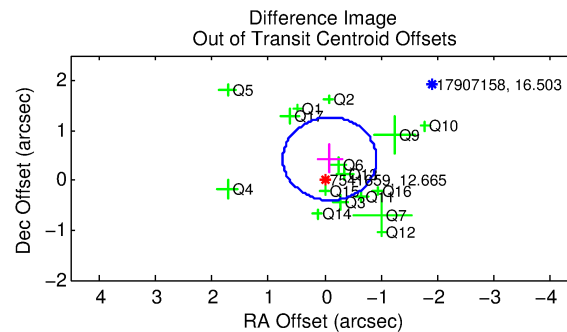
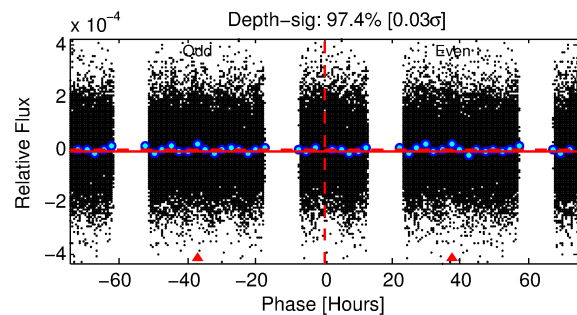
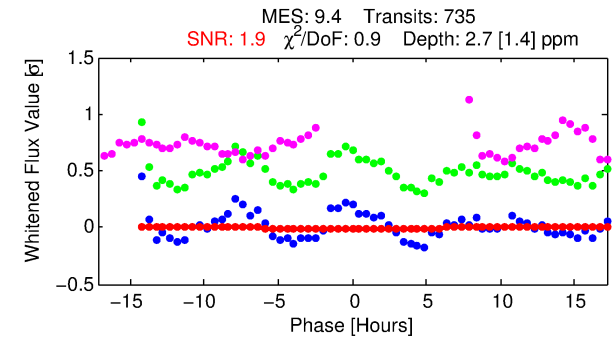
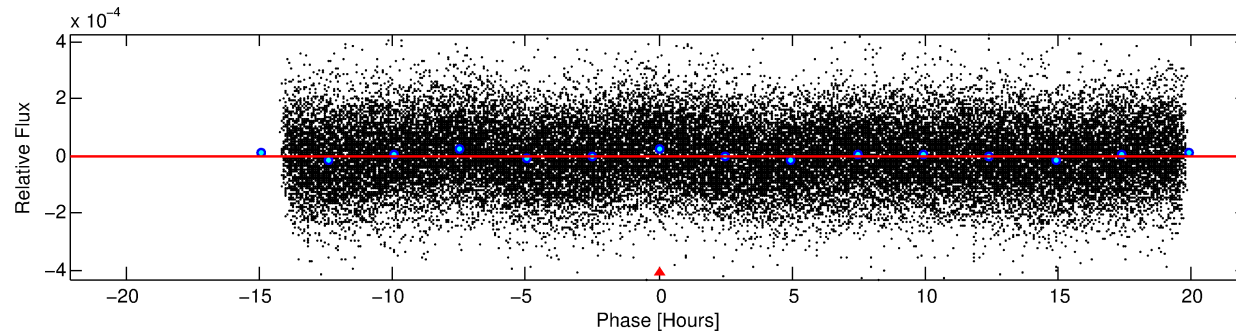
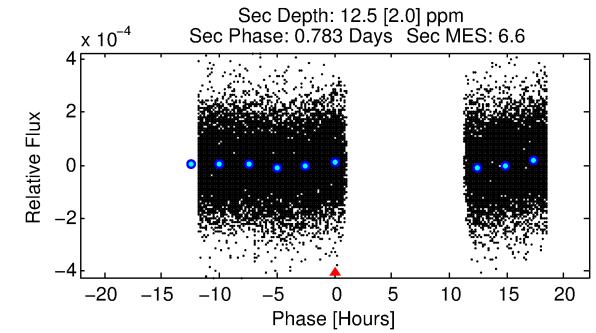
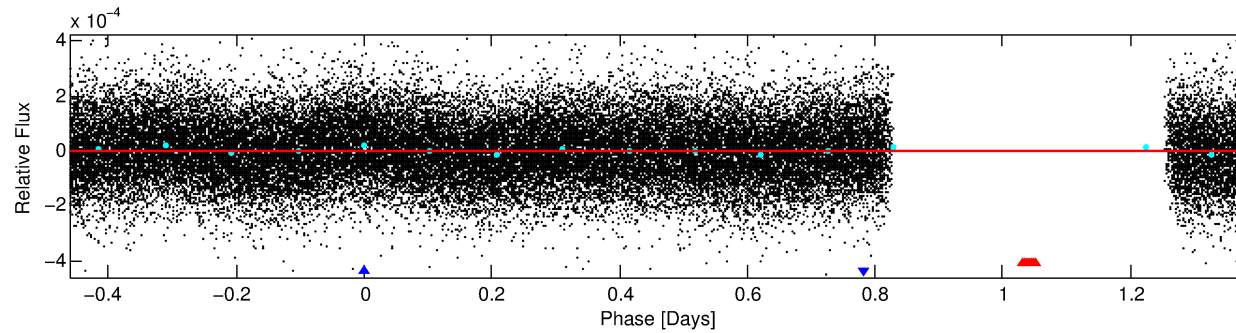
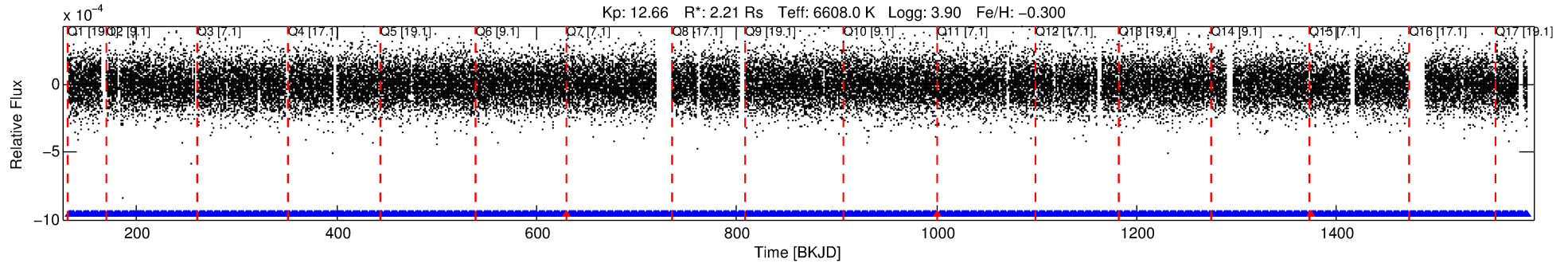
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007541659-02

No Significant Match Found

# DV One-Page Summary

KIC: 7541659 Candidate: 2 of 2 Period: 1.845 d



## DV Fit Results:

Period = 1.84531 [0.00014] d  
Epoch = 132.1929 [0.0372] BKJD  
Rp/R\* = 0.0017 [0.0023]  
a/R\* = 1.07 [1.09]  
b = 0.89 [1.87]  
Seff = 7679.46 [3941.31]  
Teq = 2387 [306] K  
Rp = 0.42 [0.58] Re  
a = 0.0330 [0.0106] AU  
Ag = 42.97 [117.56] [0.36σ]  
Teffp = 9449 [6363] K [1.11σ]

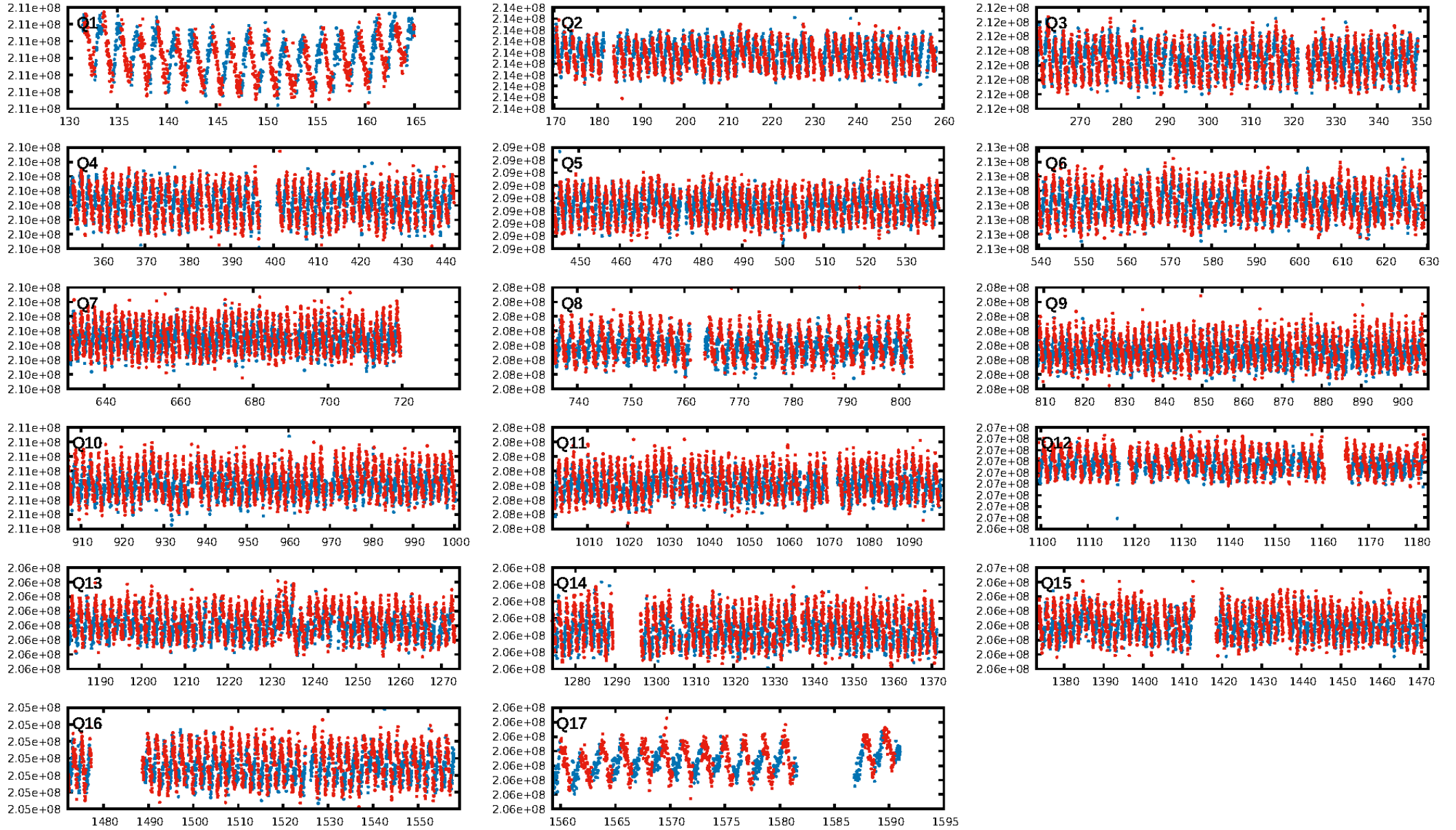
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 7.14e-50  
RollingBand-fgt: 1.00 [700/703]  
GhostDiagnostic-chr: N/A  
Centroid-sig: N/A  
Centroid-so: N/A  
OotOffset-rm: 0.436 arcsec [1.58σ]  
KicOffset-rm: 0.463 arcsec [1.70σ]  
OotOffset-st: 4/4/3/5 [16]  
KicOffset-st: 4/4/3/5 [16]  
DiffImageQuality-fgm: 0.44 [7/16]  
DiffImageOverlap-fno: 0.00 [0/17]

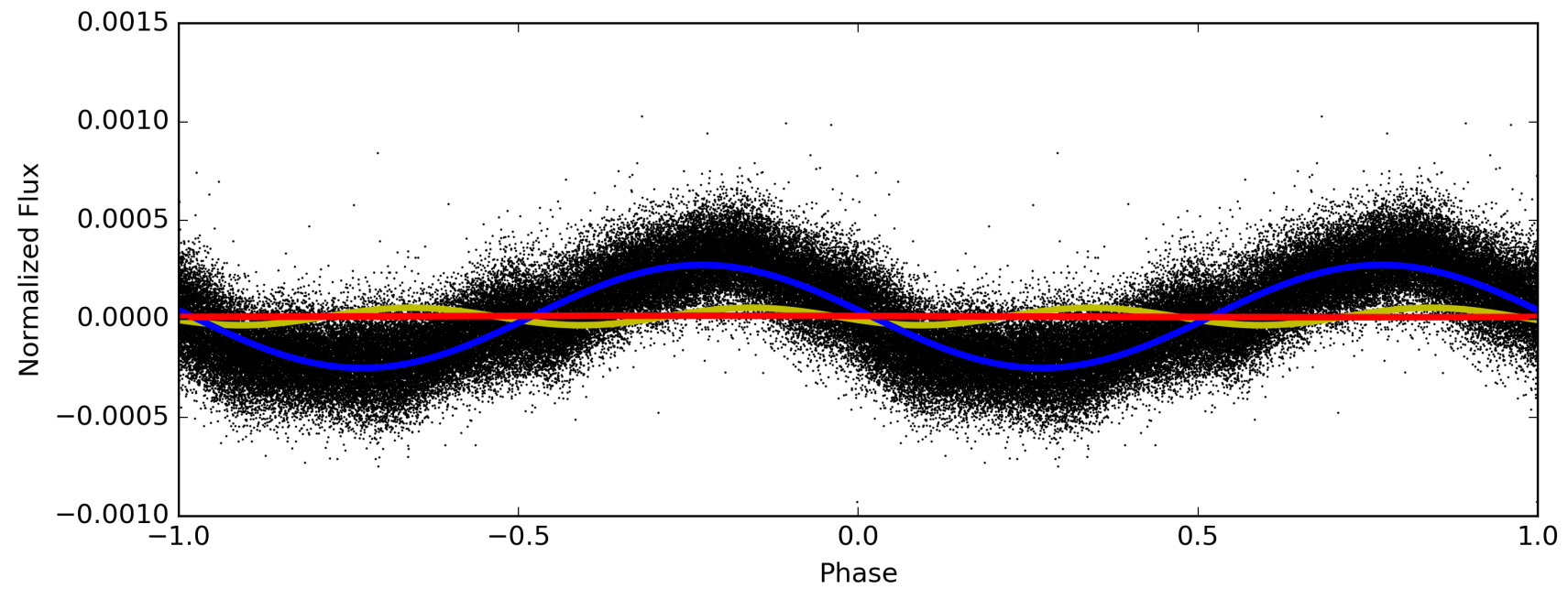
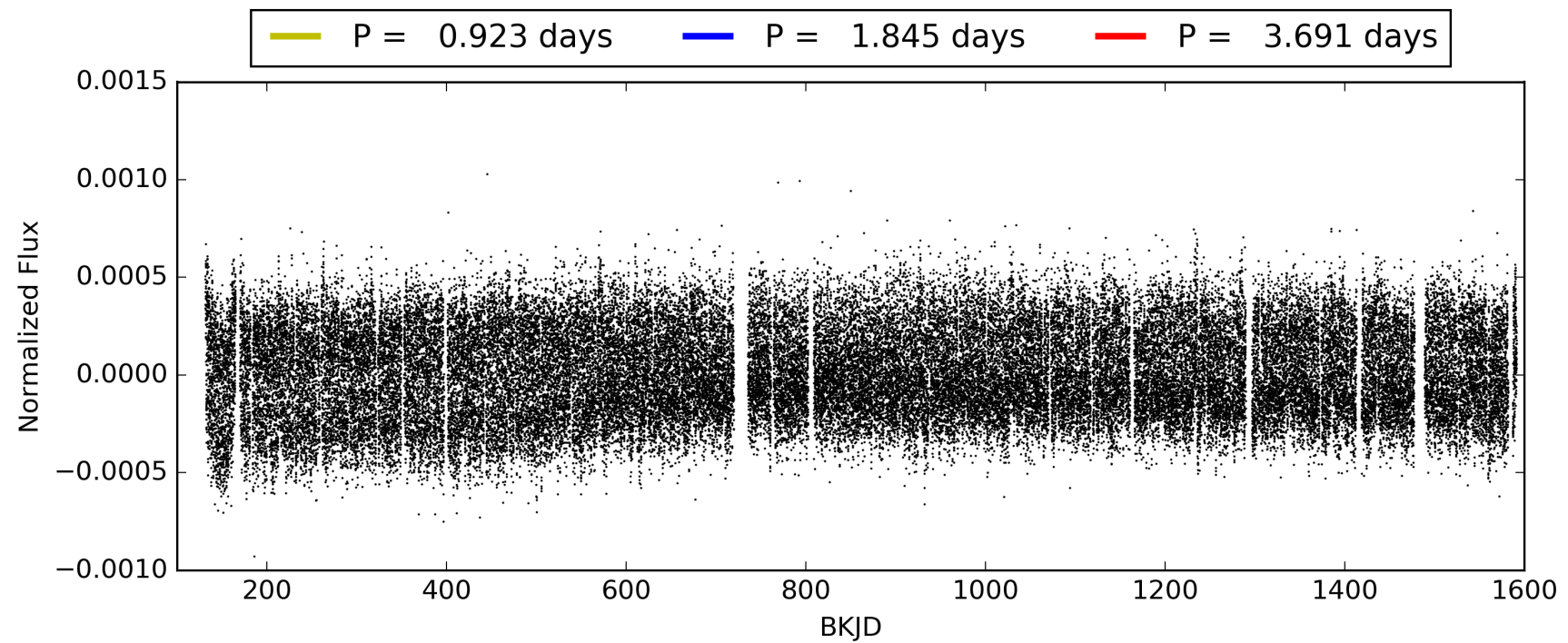
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 21:13:16 Z

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

# TCE 007541659-02, PDC Light Curves



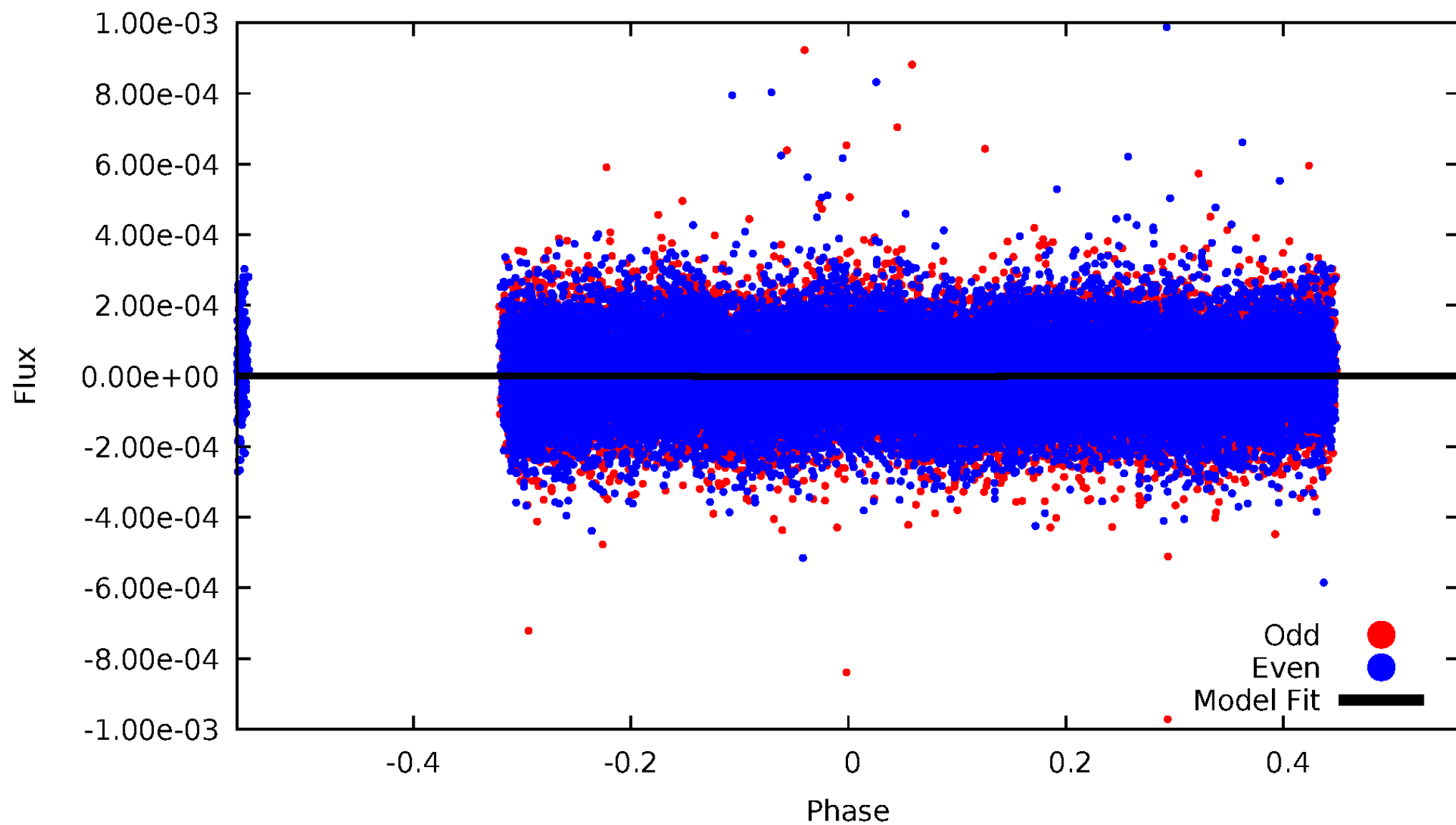
TCE 007541659-02





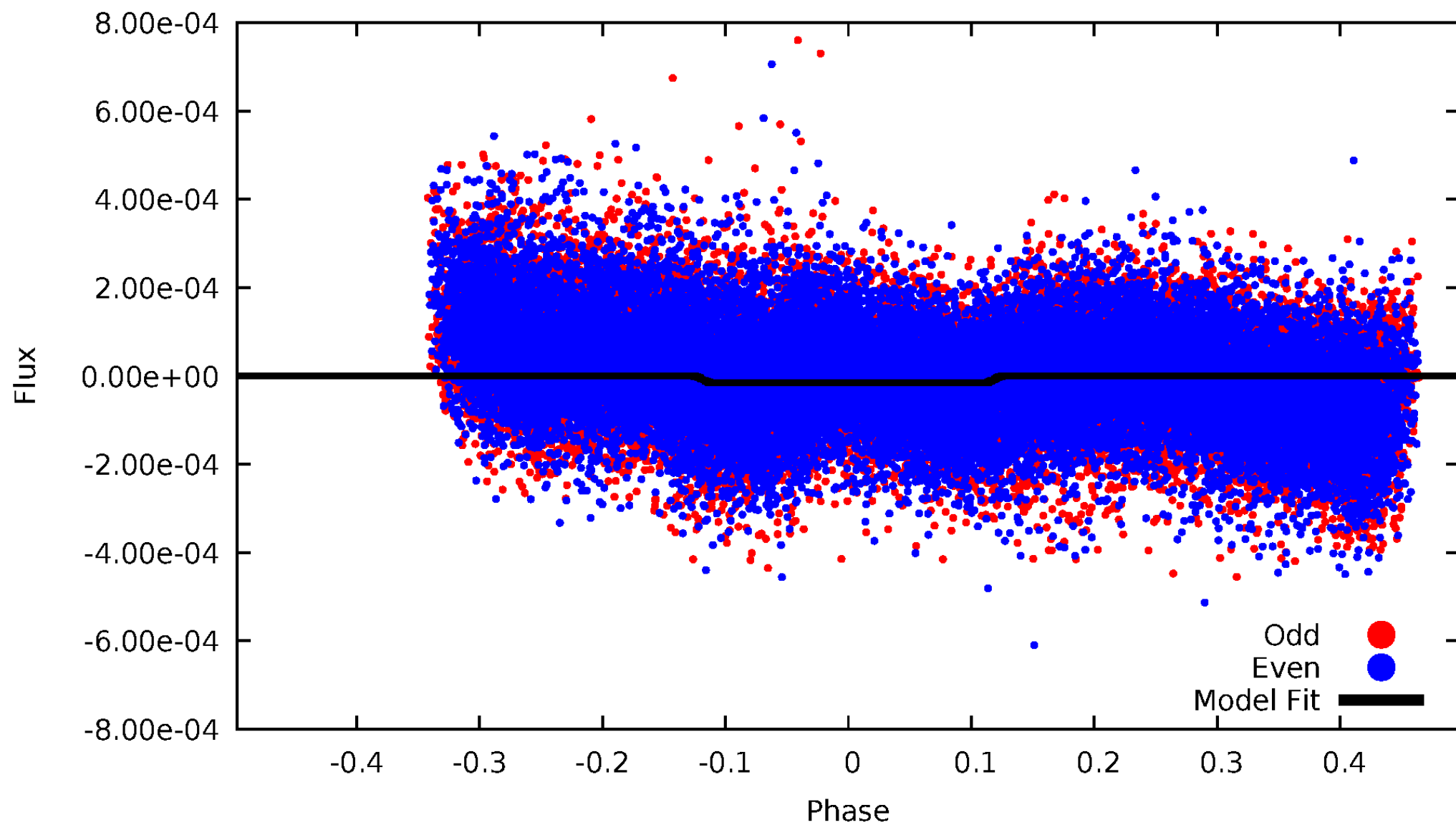
# DV Odd/Even

TCE 007541659-02



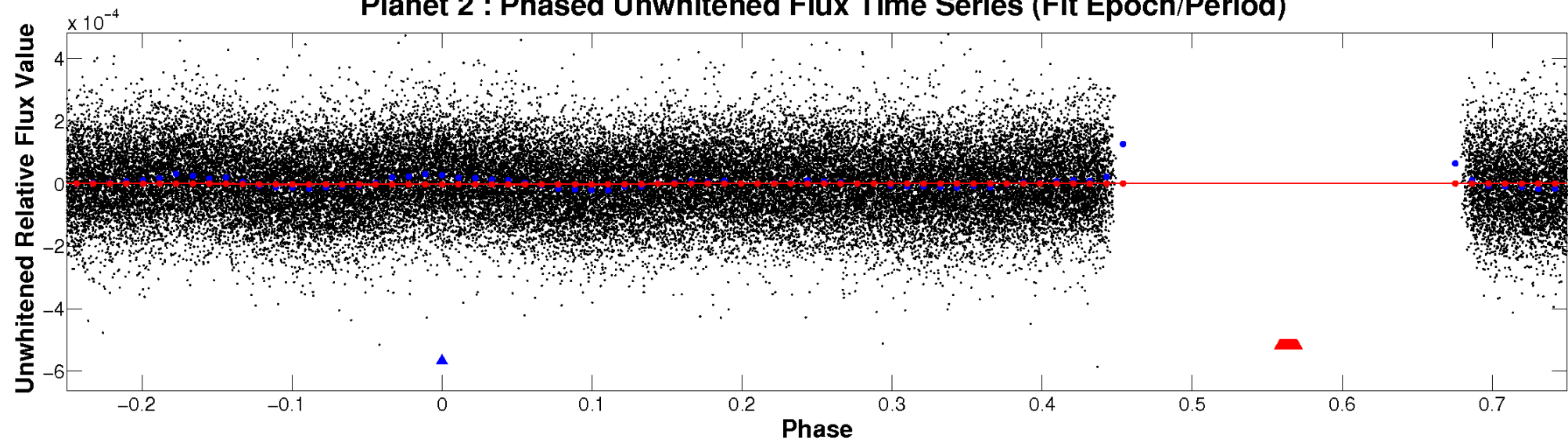
# ALT Odd/Even

TCE 007541659-02

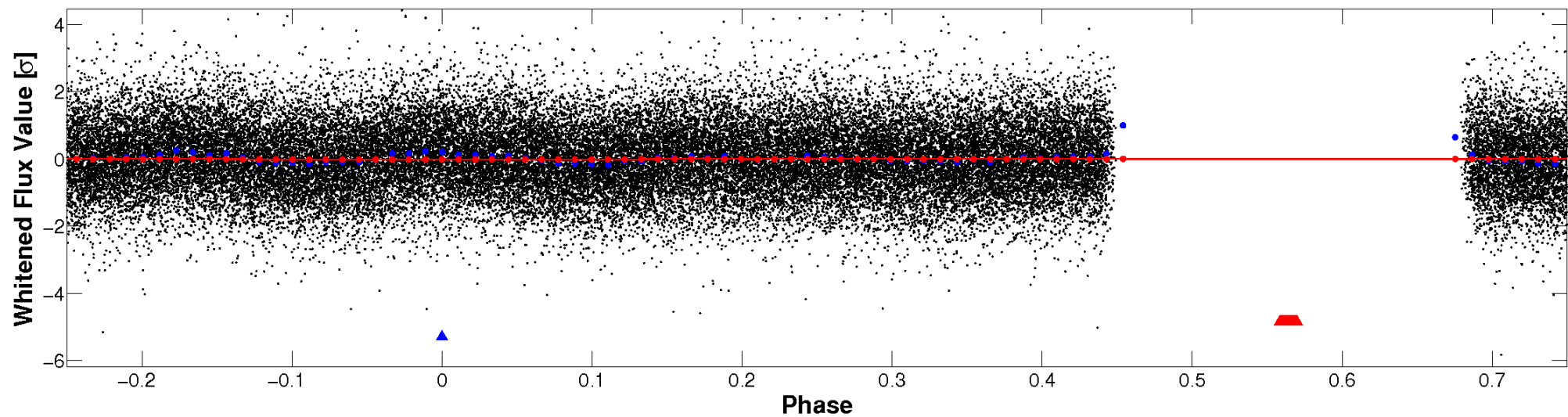


# Non-Whitened Vs. Whitened Light Curve

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

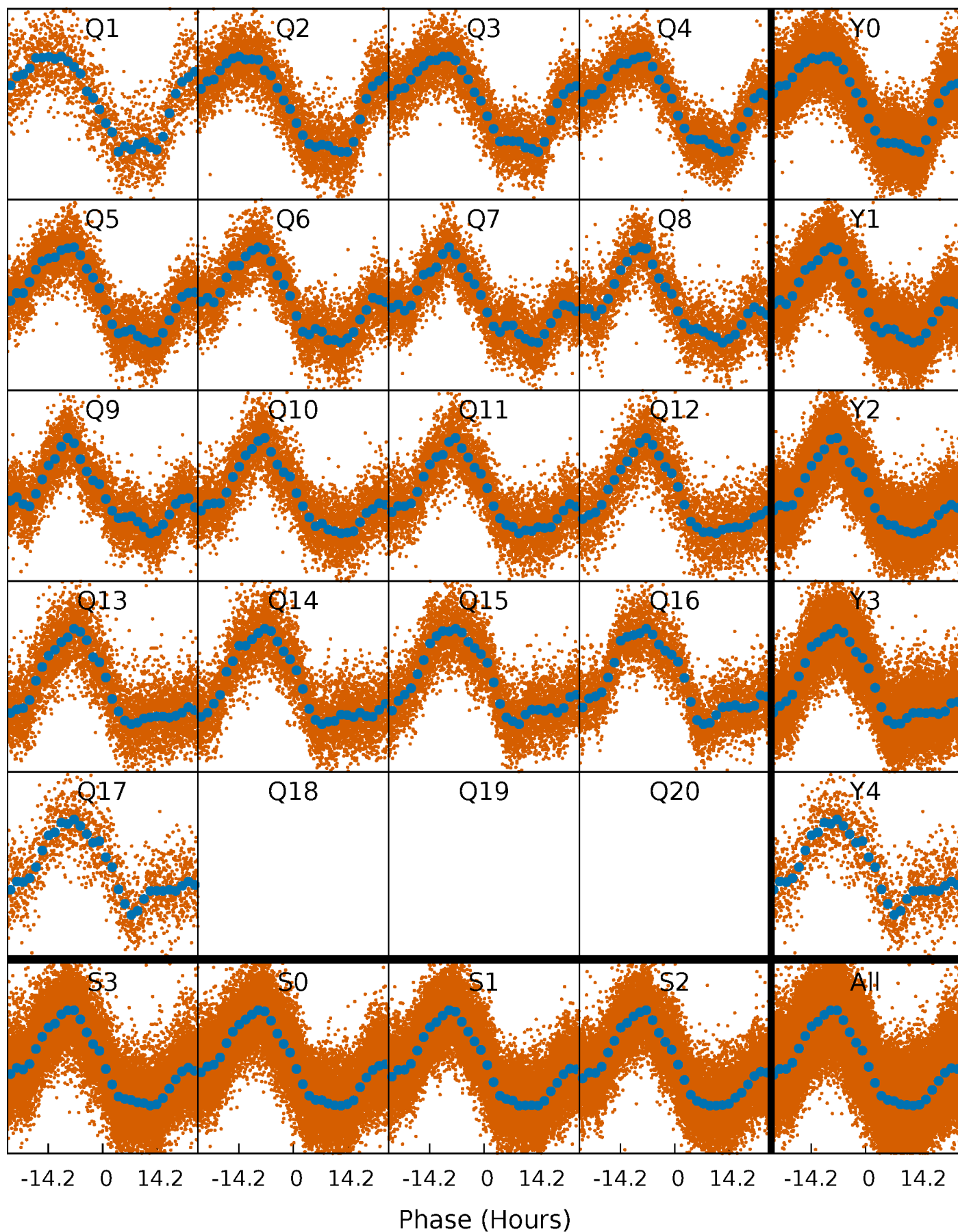


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



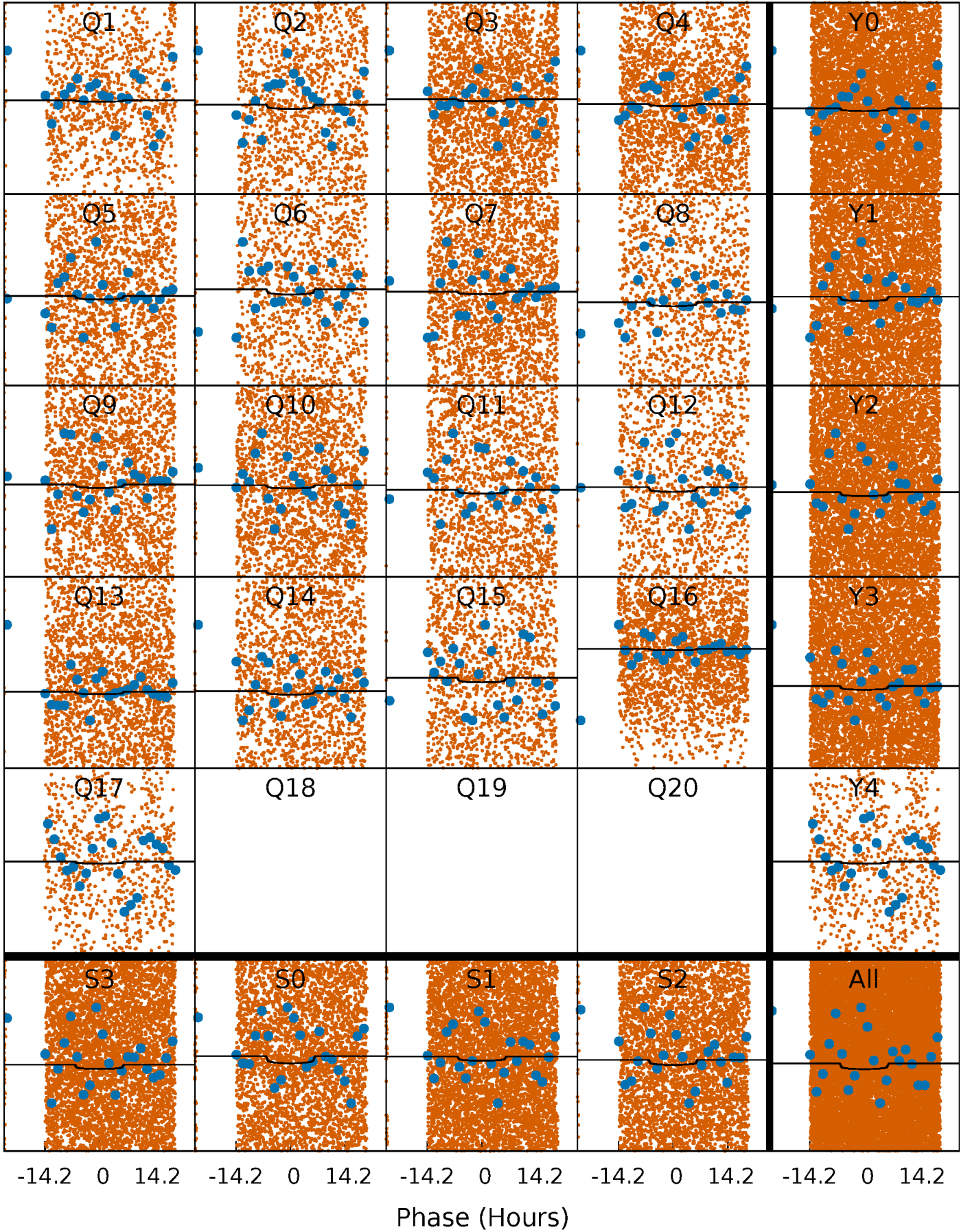
# PDC Quarter-Phased Transit Curves

TCE 007541659-02 P= 1.845312 Days  $T_0=132.192852$  (BKJD)



# DV Quarter-Phased Transit Curves

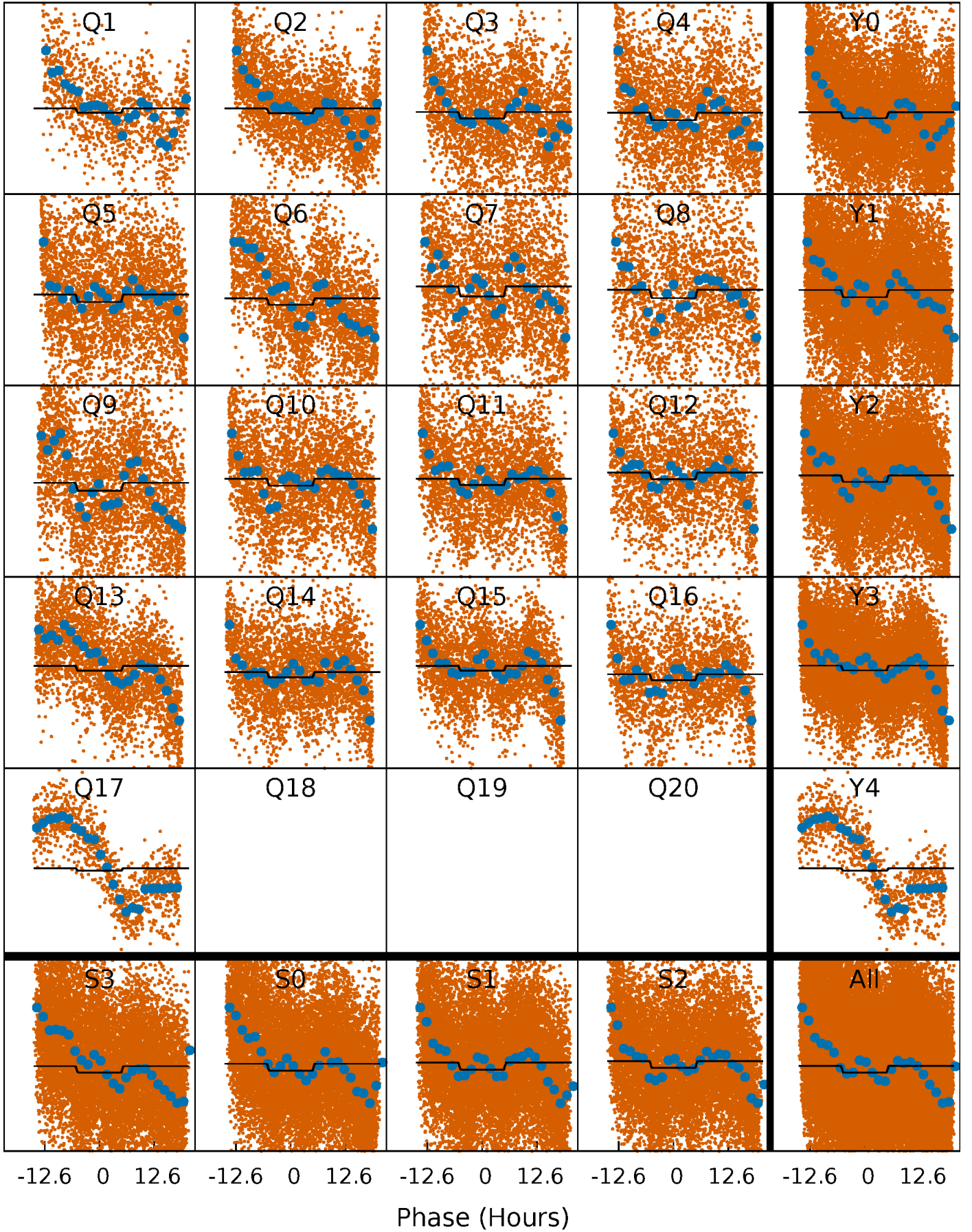
TCE 007541659-02   P= 1.845312 Days    $T_0=132.192852$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 007541659-02   P= 1.845398 Days    $T_0=132.164537$  (BKJD)

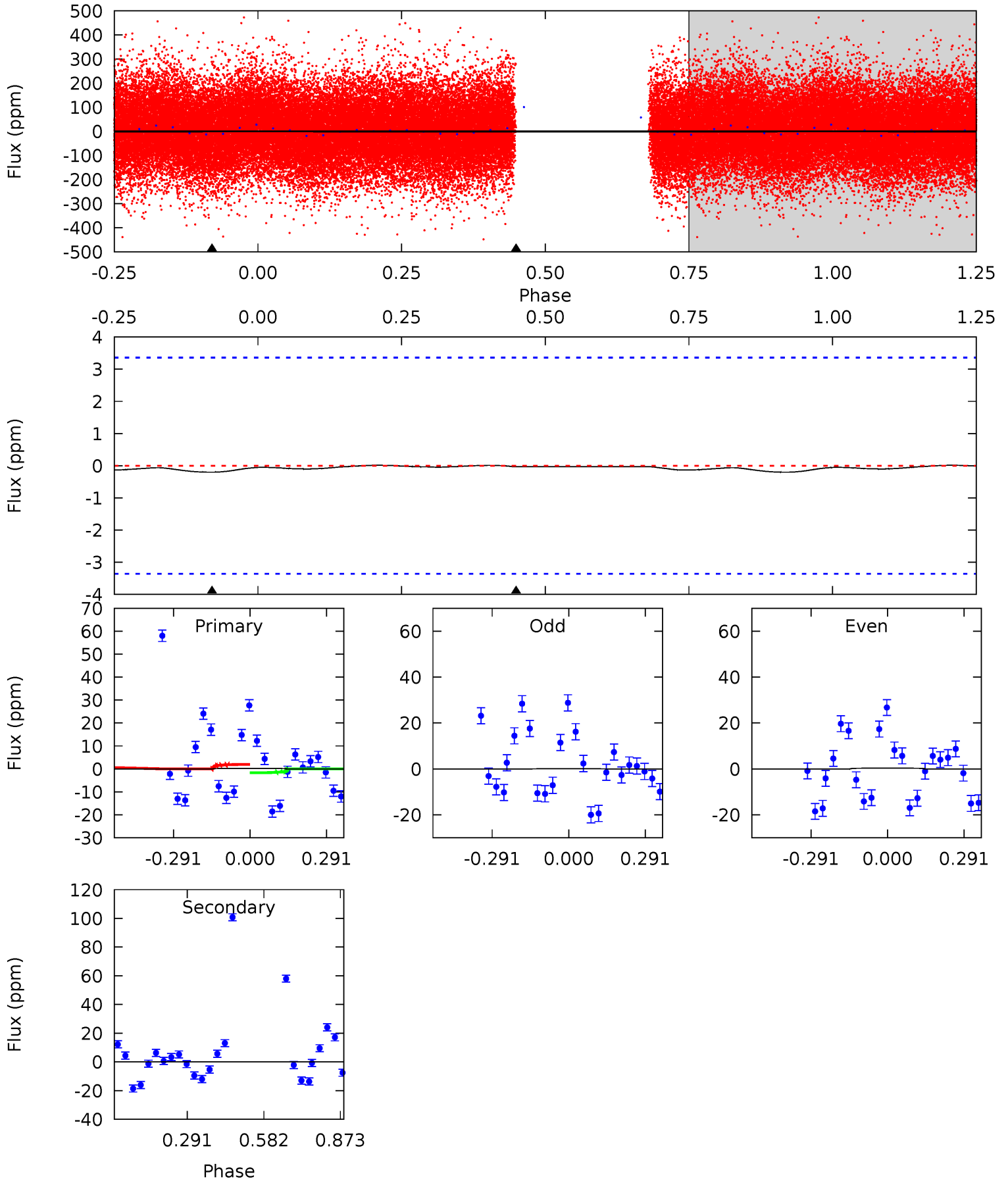




# DV Model-Shift Uniqueness Test

007541659-02, P = 1.845312 Days, E = 130.347540 Days

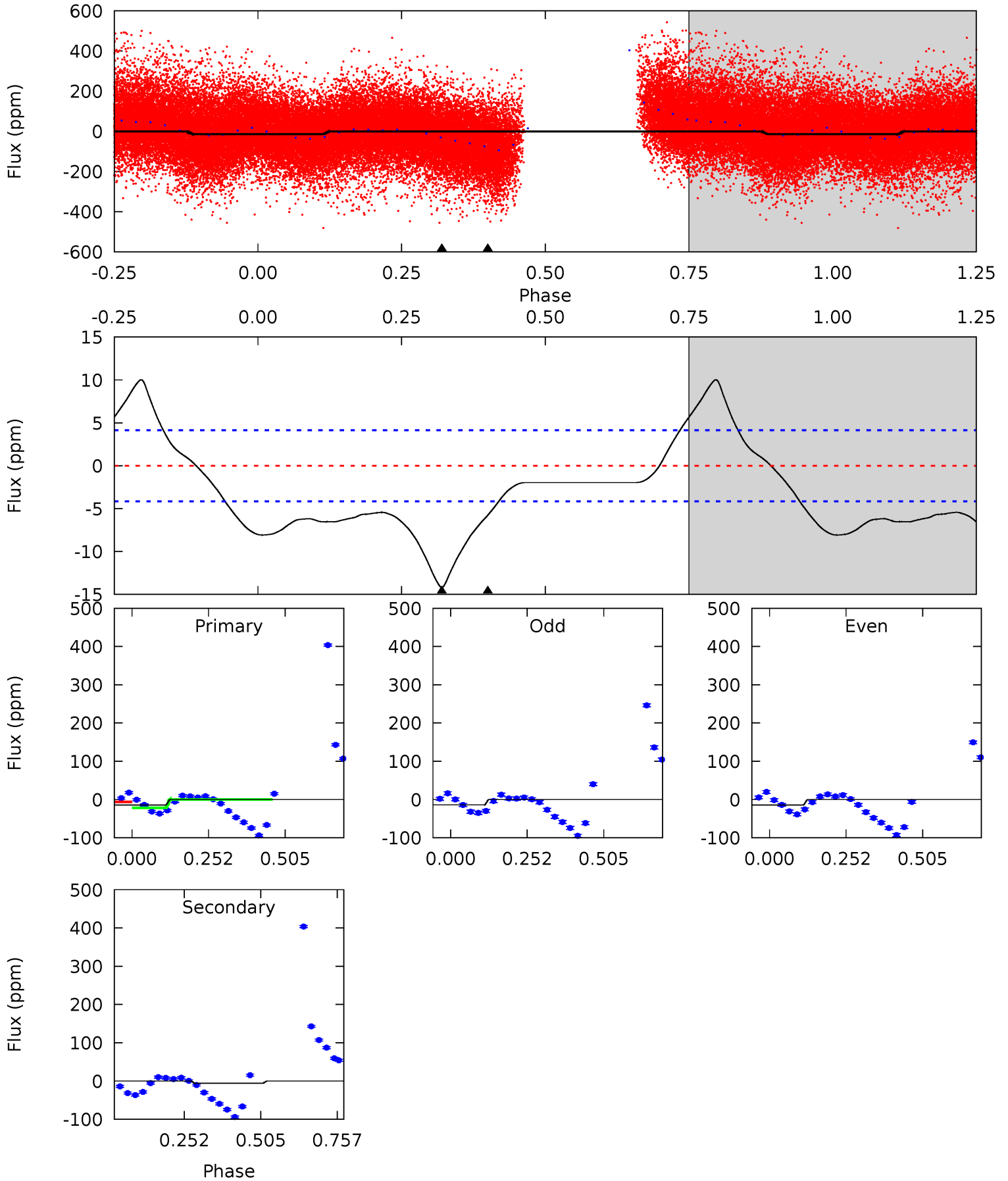
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.26	0.04	0	0	4.34	1.06	0.02	0.26	0.26	0.04	0.04	0.18	4.76	0.08	0.18



# Alt Model-Shift Uniqueness Test

007541659-02, P = 1.845398 Days, E = 130.319139 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.0	6.06	0	0	4.37	1.14	6.00	15.0	15.0	6.06	6.06	0.09	0.93	0.41	7.34



### Stellar Parameters For KIC 007541659

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6608^{+180}_{-220}$	$3.897^{+0.285}_{-0.114}$	$-0.300^{+0.300}_{-0.250}$	$2.215^{+0.417}_{-0.774}$	$1.411^{+0.200}_{-0.301}$	$0.183^{+0.340}_{-0.067}$
	+3%/-3%	+7%/-3%	+100%/-83%	+19%/-35%	+14%/-21%	+186%/-37%
Source	PHO1	FLK73	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 007541659-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-0 \pm 1$	$0.54^{+0.44}_{-0.37}$	$3277^{+219}_{-296}$	$-3264^{+7740}_{-1613}$	$-0.010^{+2.421}_{-3.211}$
Alt.	$-6 \pm 1$	$0.93^{+0.56}_{-0.46}$	$3289^{+210}_{-298}$	$5050^{+2299}_{-973}$	$4.079^{+11.523}_{-2.615}$

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

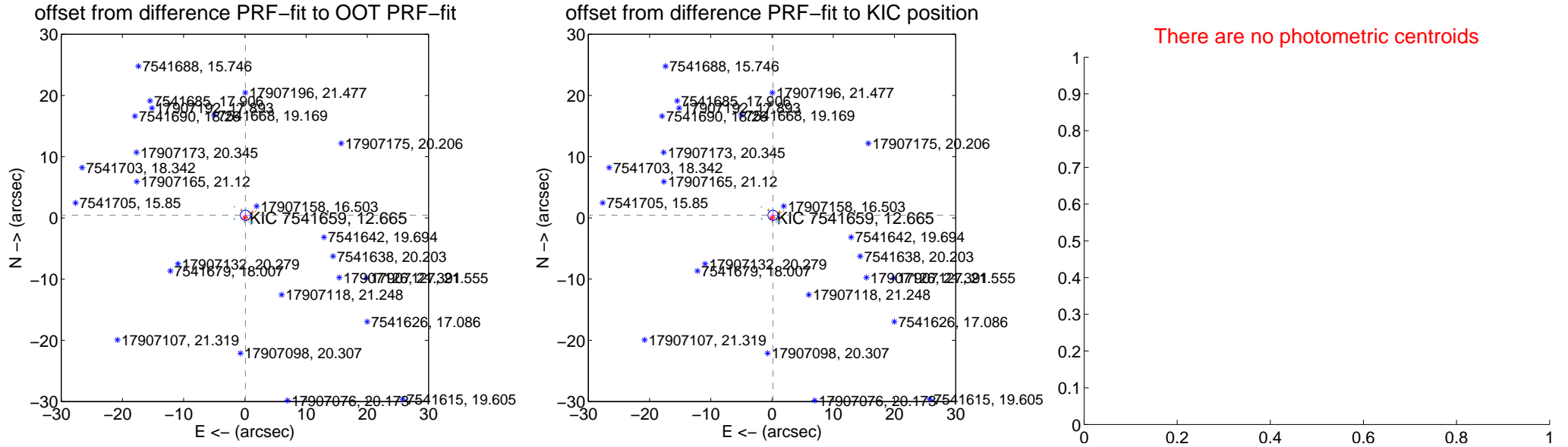
## DV Centroid Data

Supplemental centroid analysis for 007541659-02. Kepler magnitude: 12.66. Transit SNR 1.93

There are 7 quarters with good PRF difference image offsets

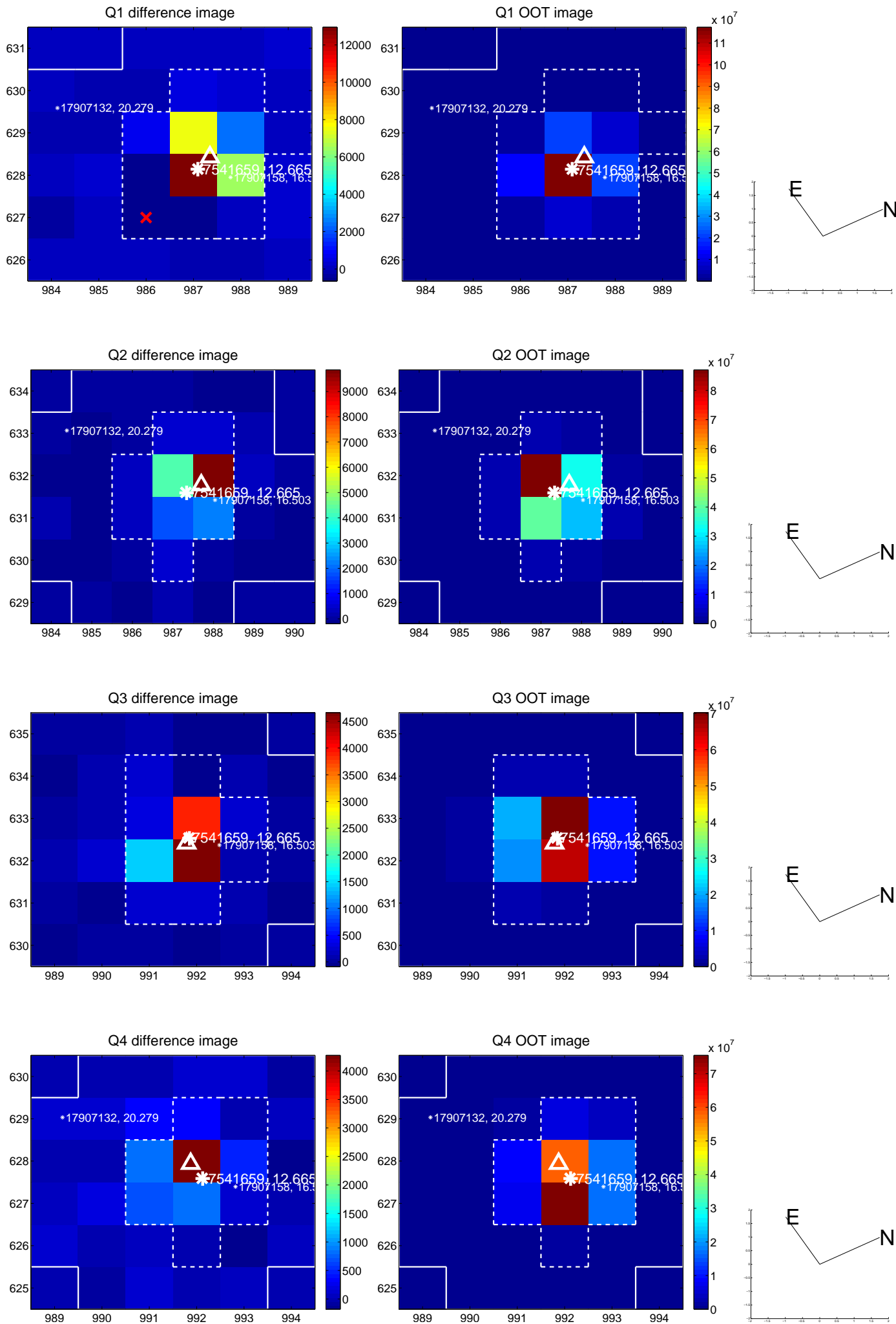
The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.436 \pm 0.276$	1.58	$-0.089 \pm 0.215$	$0.427 \pm 0.279$
PRF-fit source offset from KIC position	$0.463 \pm 0.272$	1.70	$-0.153 \pm 0.214$	$0.437 \pm 0.278$
photometric centroid source offset	—	—	—	—

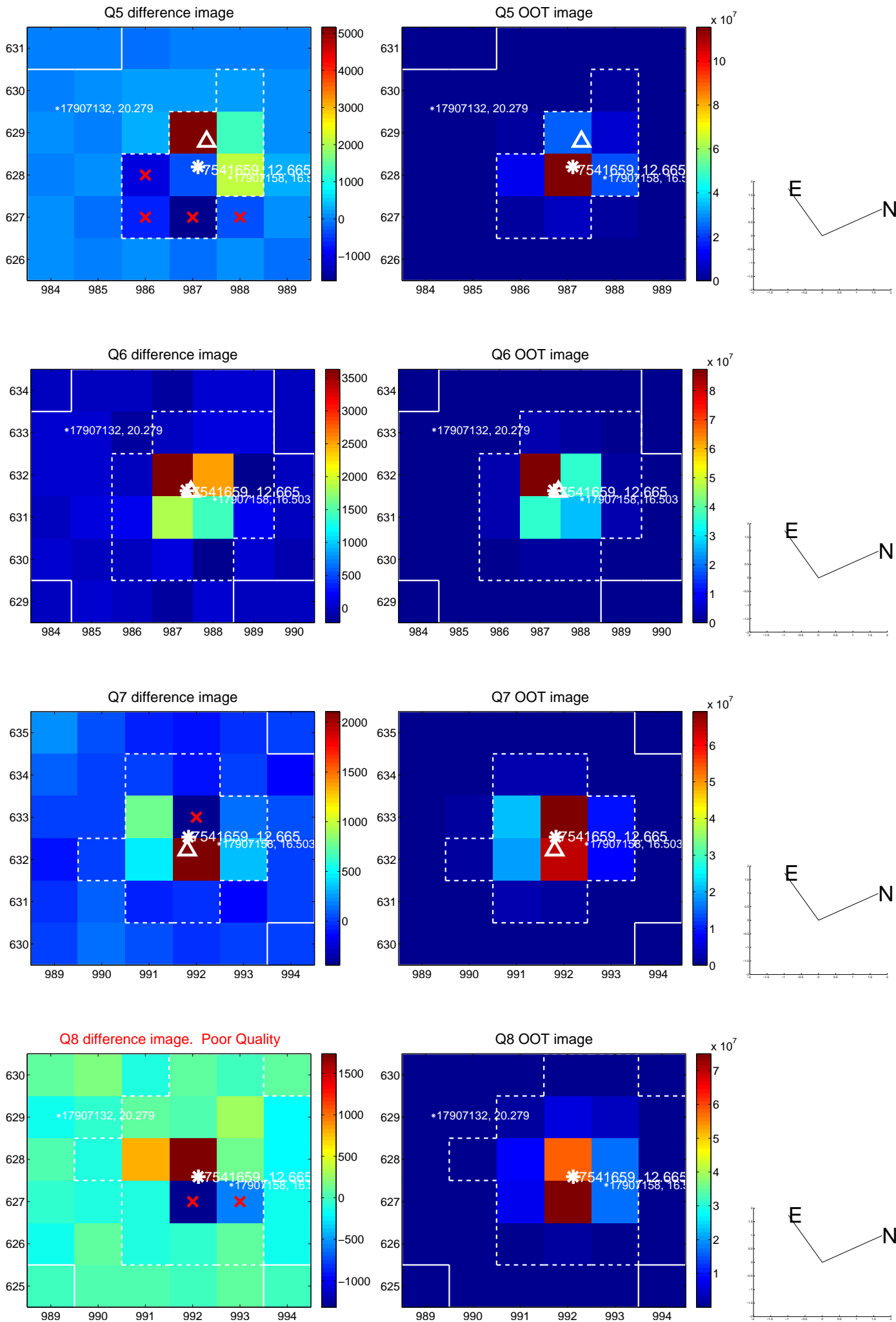


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

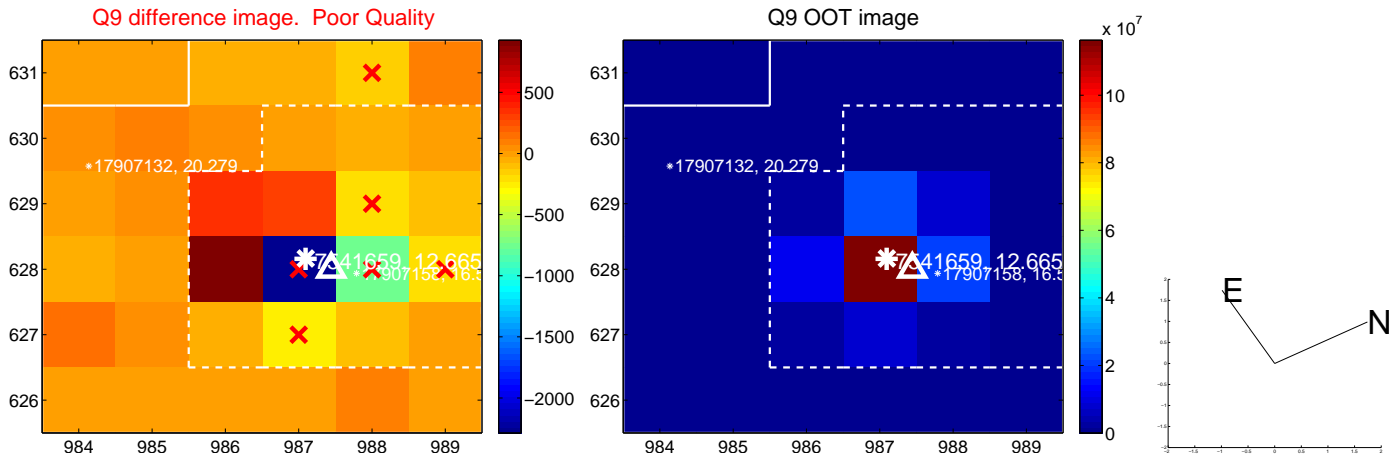


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



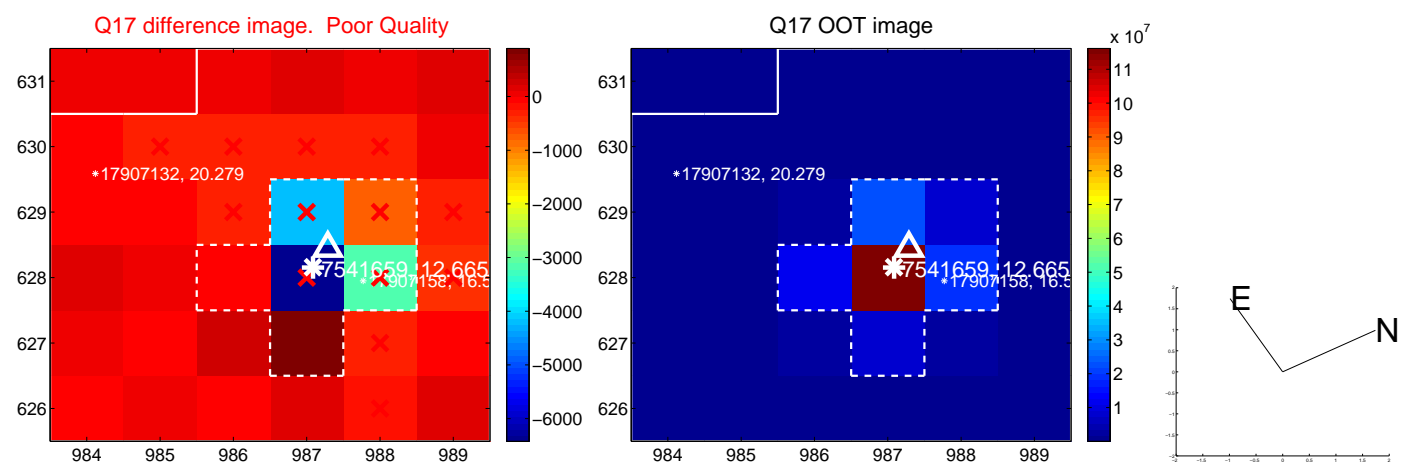


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





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



folded centroid time series figure for this object.

# UKIRT Image

Declination

