

# KIC 005471769

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005471769-01	OBS	6011.01	12.425125	141.554872	107.3	25.104	10.9	13.3	0.83	5742	0.91	64.13
005471769-02	OBS	No	12.427265	133.804091	108.1	25.121	11.8	14.8	0.83	5742	0.90	64.12

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005471769-01	OBS	FP	0.00	1	0	1	1	LPP_DV—HALO_GHOST—EPHEM_MATCH
005471769-02	OBS	FP	0.00	1	0	1	1	LPP_DV—SAME_NTL_PERIOD—CENT_UNRESOLVED_OFFSET—HALO_GHOST—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.

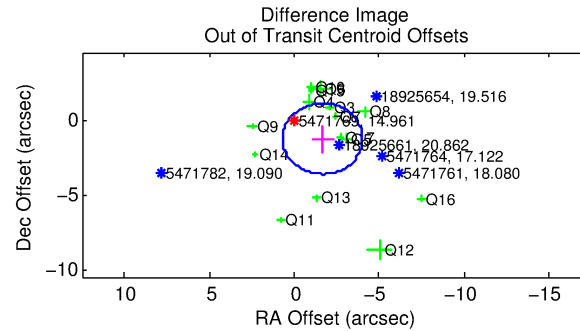
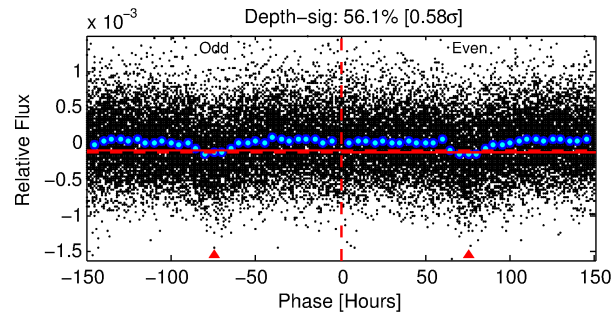
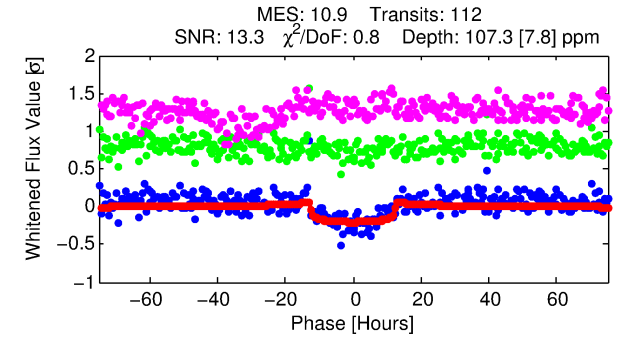
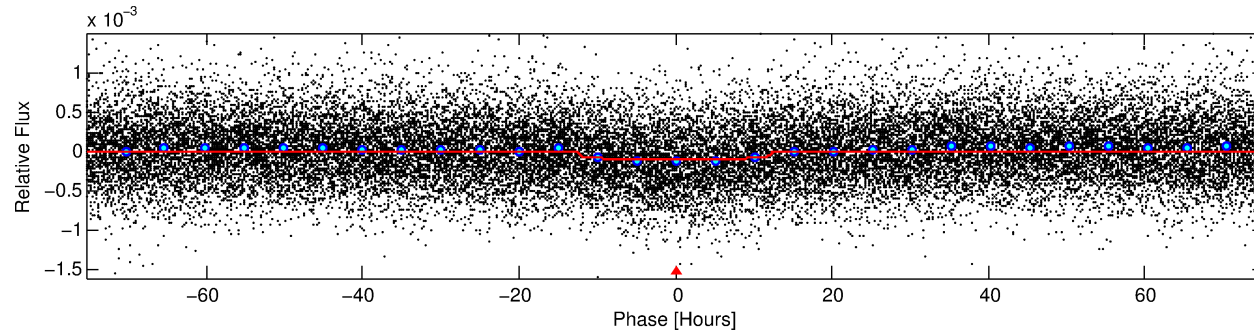
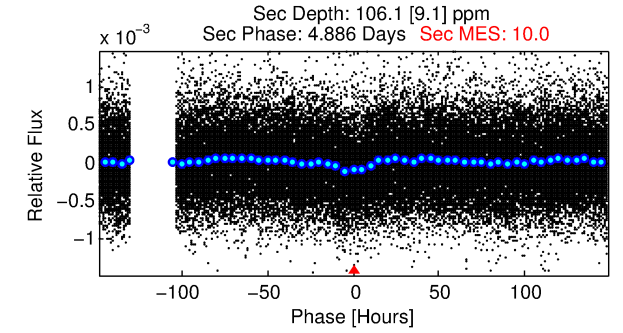
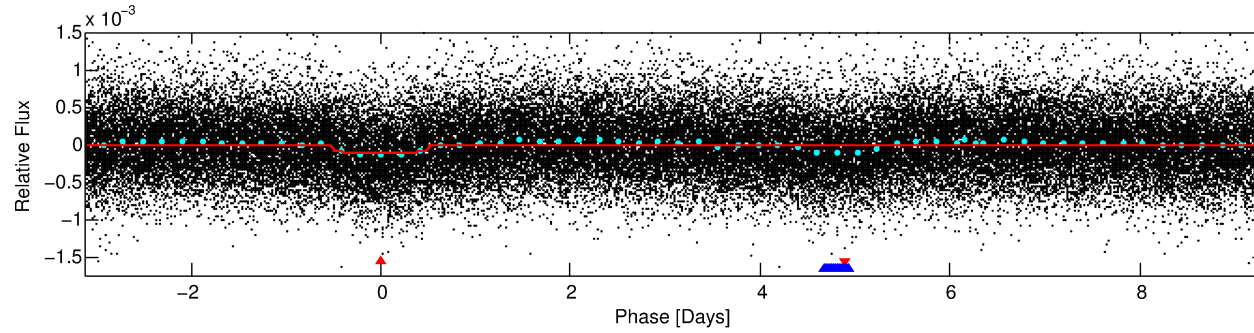
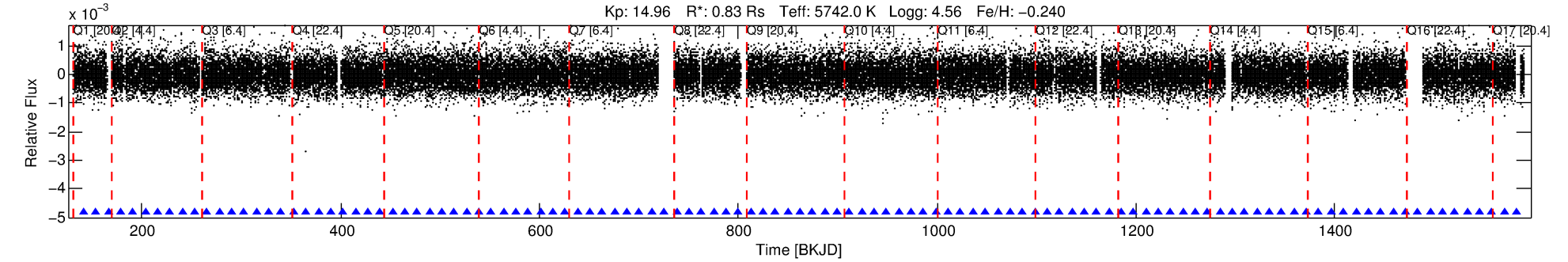
## Ephemeris Match Information For 005471769-01

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	$\sigma_P$	$\sigma_T$
005471769-01	5471769	V380-Cyg-pri	5385723	1:1	363.9	30	87	5.77	14.96	1354.50	Direct-PRF	0	1.71	0.43

**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: 5471769 Candidate: 1 of 2 Period: 12.425 d  
KOI: K06011.01 Corr: 0.976



## DV Fit Results:

Period = 12.42512 [0.00030] d  
Epoch = 141.5549 [0.0195] BKJD  
Rp/R\* = 0.0101 [0.0024]  
a/R\* = 2.96 [2.87]  
b = 0.67 [0.90]  
Seff = 64.13 [20.05]  
Teq = 722 [56] K  
Rp = 0.91 [0.31] Re  
a = 0.1019 [0.0206] AU  
Ag = 736.99 [422.39] [1.74σ]  
Teffp = 5813 [733] K [6.93σ]

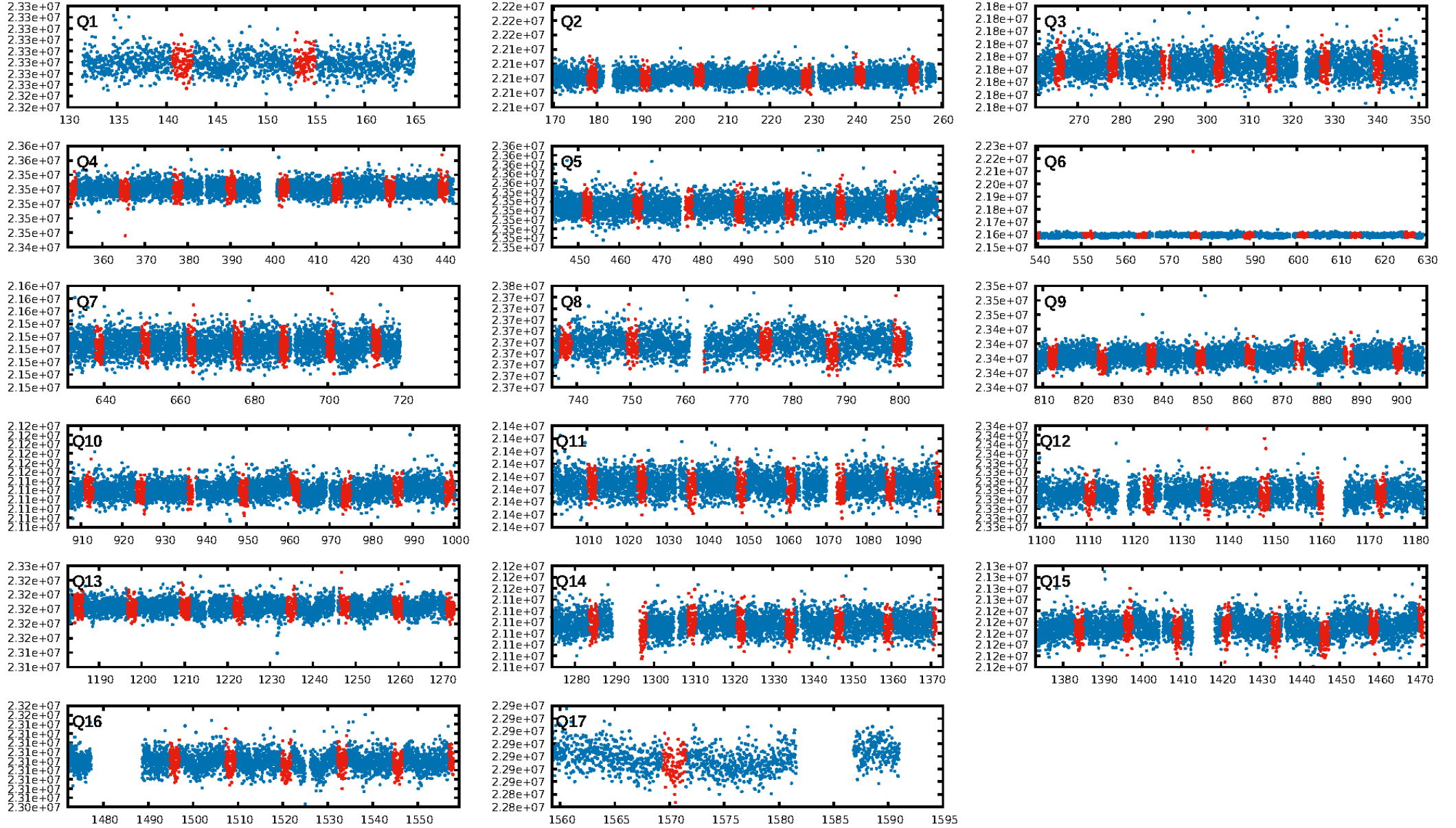
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.1% [0.00σ]  
ModelChiSquare2-sig: 62.3%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 4.22e-28  
RollingBand-fgt: 1.00 [109/109]  
GhostDiagnostic-chr: 0.02894  
Centroid-sig: 12.7%  
Centroid-so: 1.112 arcsec [1.25σ]  
OotOffset-rm: 2.097 arcsec [2.66σ]  
KicOffset-rm: 2.076 arcsec [2.62σ]  
OotOffset-st: 3/4/4/4 [15]  
KicOffset-st: 3/4/4/4 [15]  
DiffImageQuality-fgm: 0.40 [6/15]  
DiffImageOverlap-fno: 1.00 [17/17]

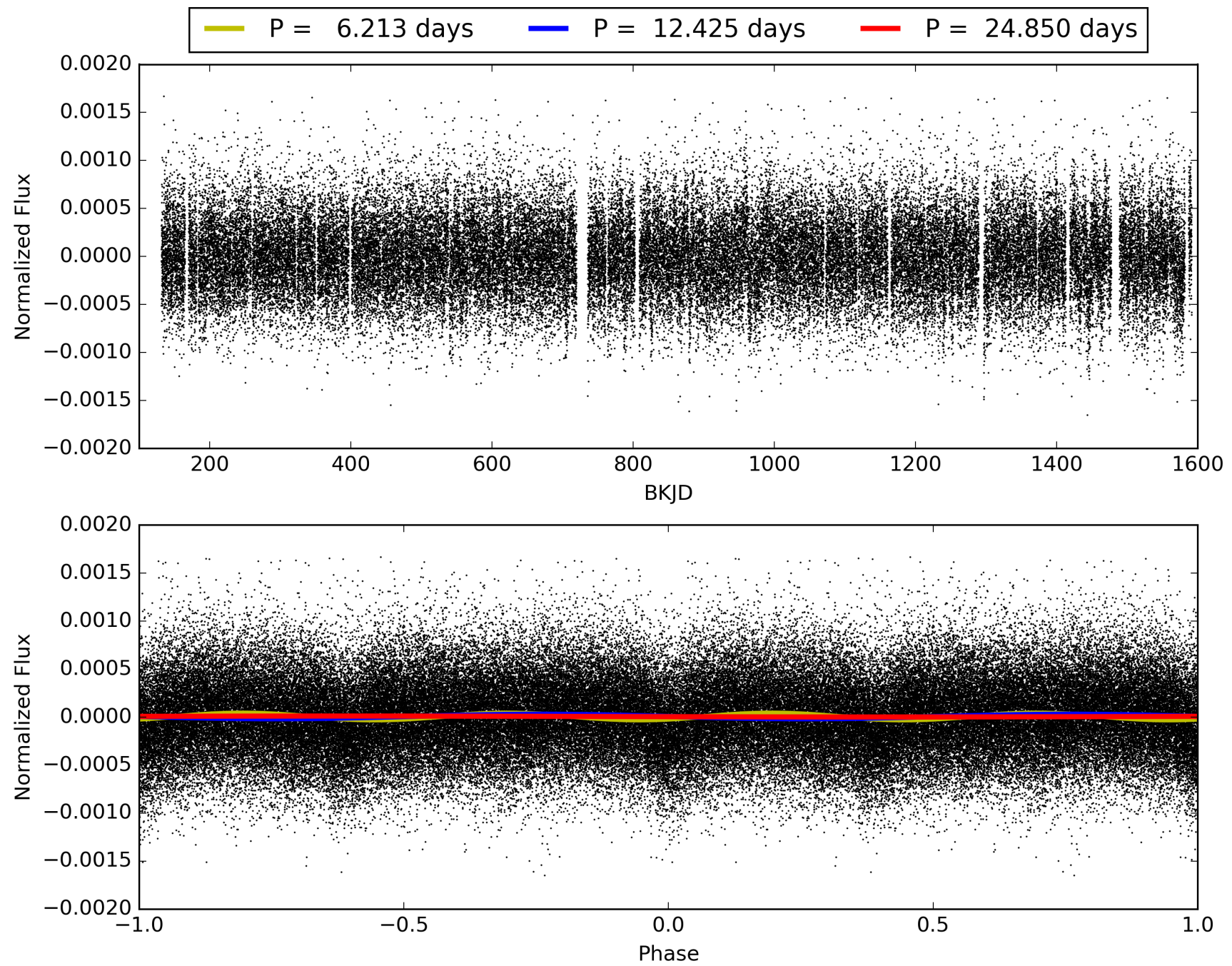
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 15:12:27 Z

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

# TCE 005471769-01, PDC Light Curves

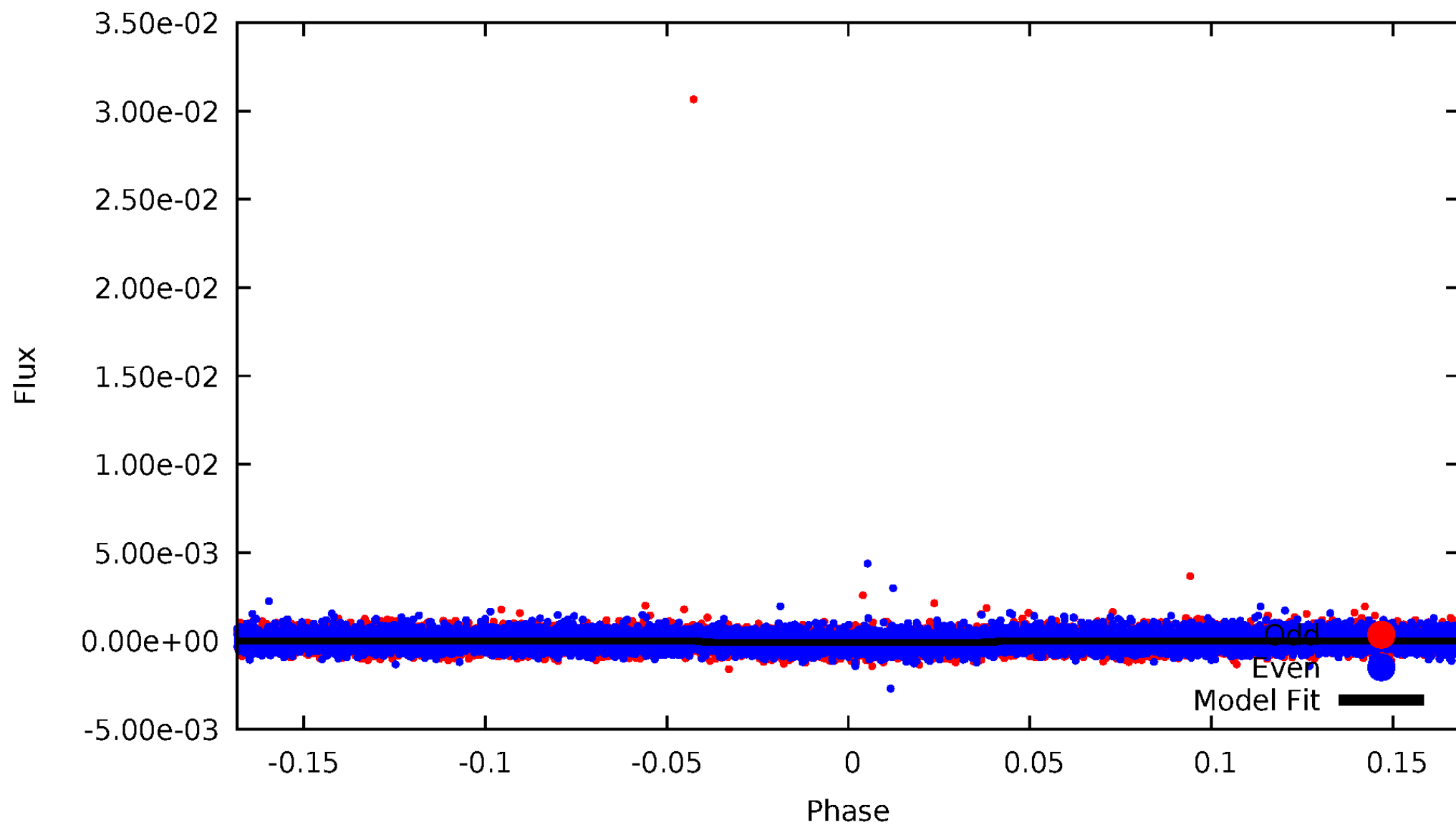


TCE 005471769-01



# DV Odd/Even

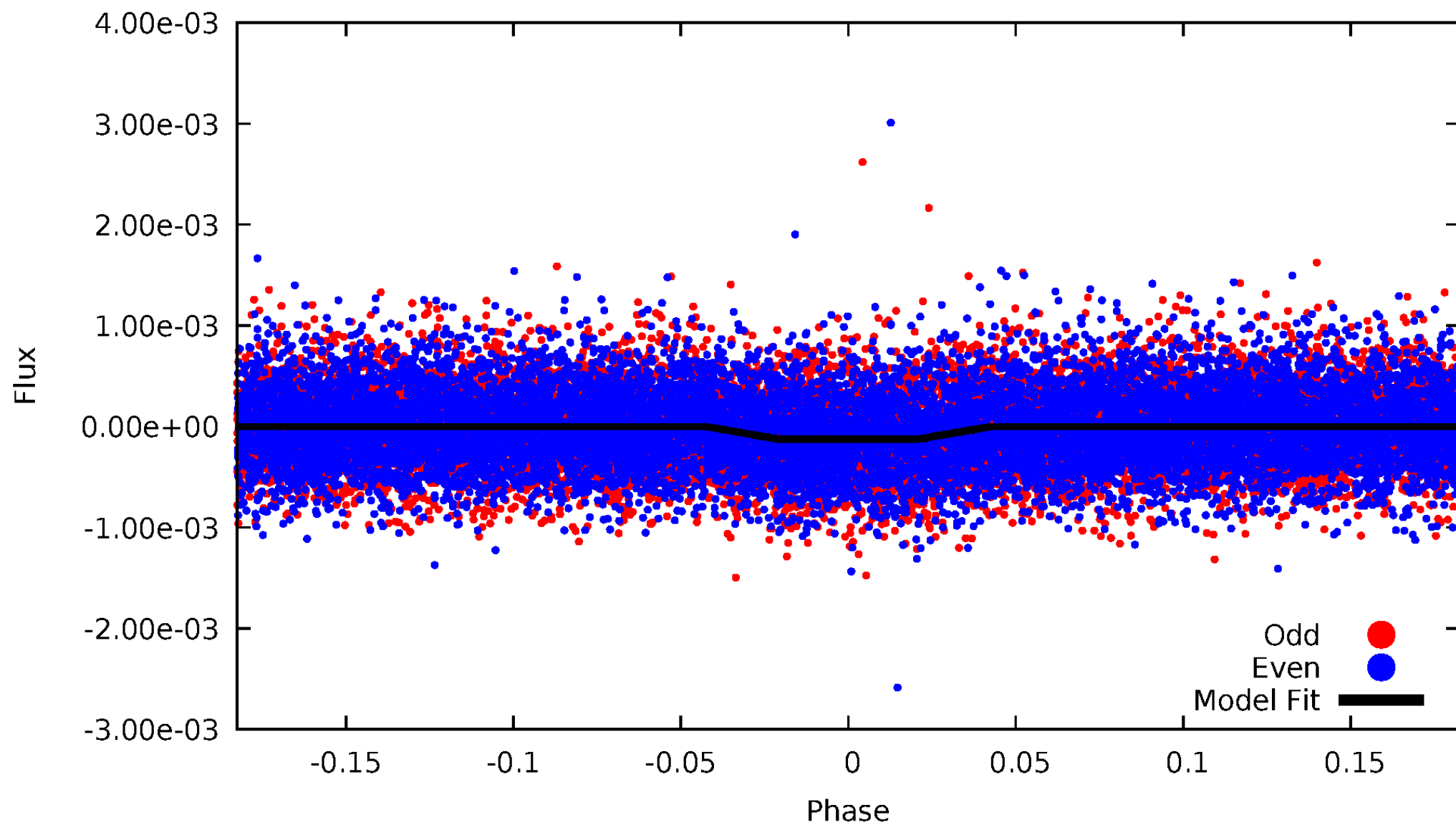
TCE 005471769-01



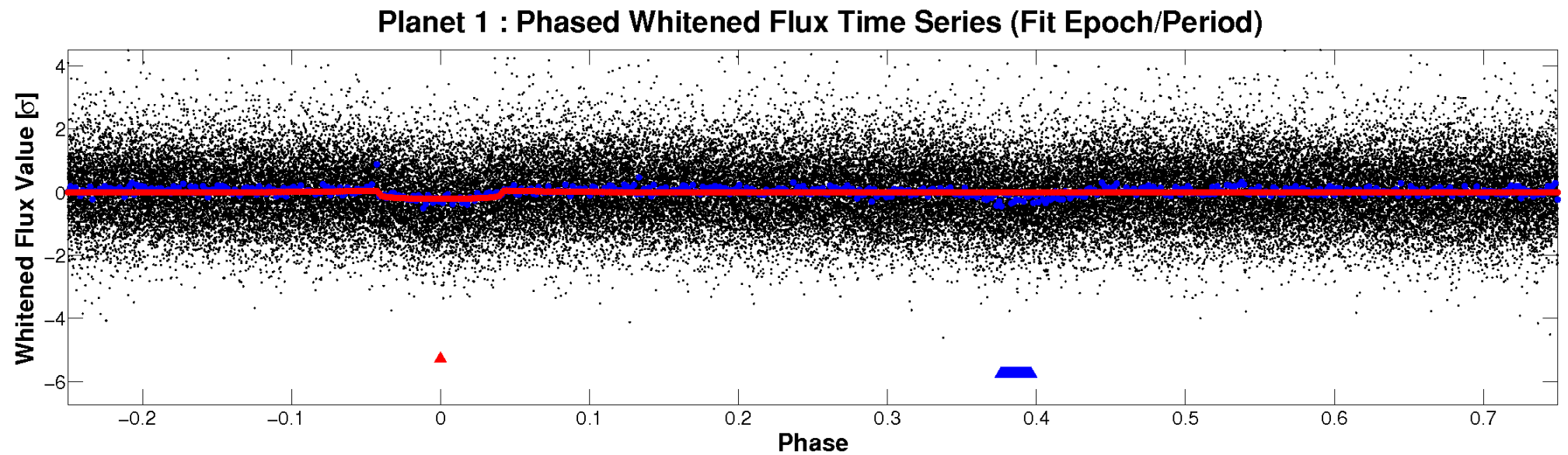
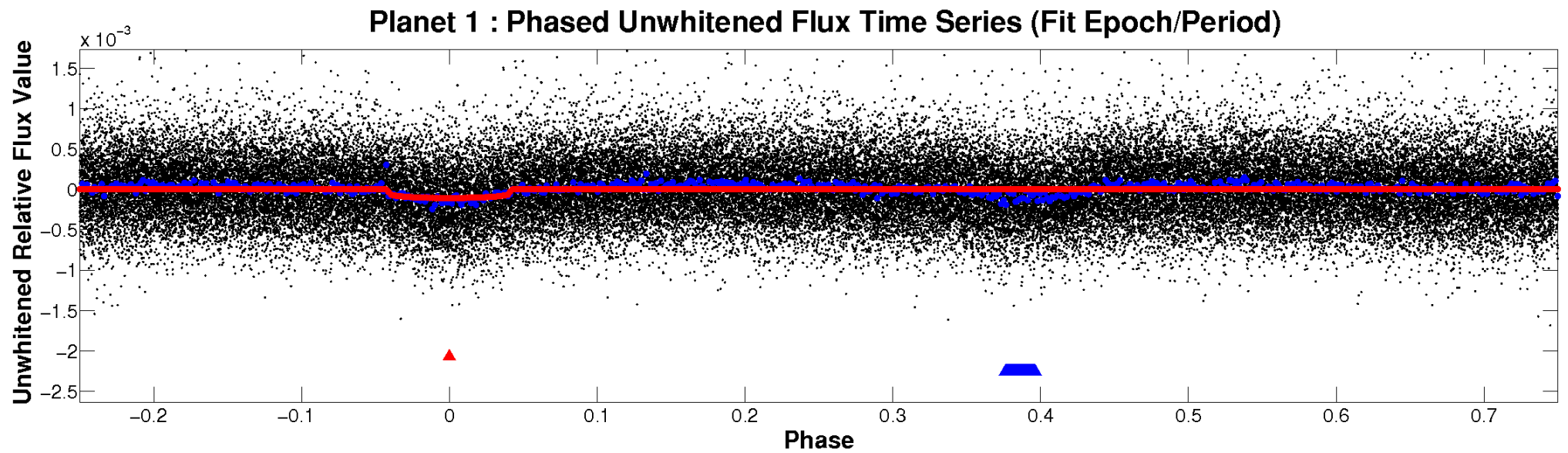


# ALT Odd/Even

TCE 005471769-01

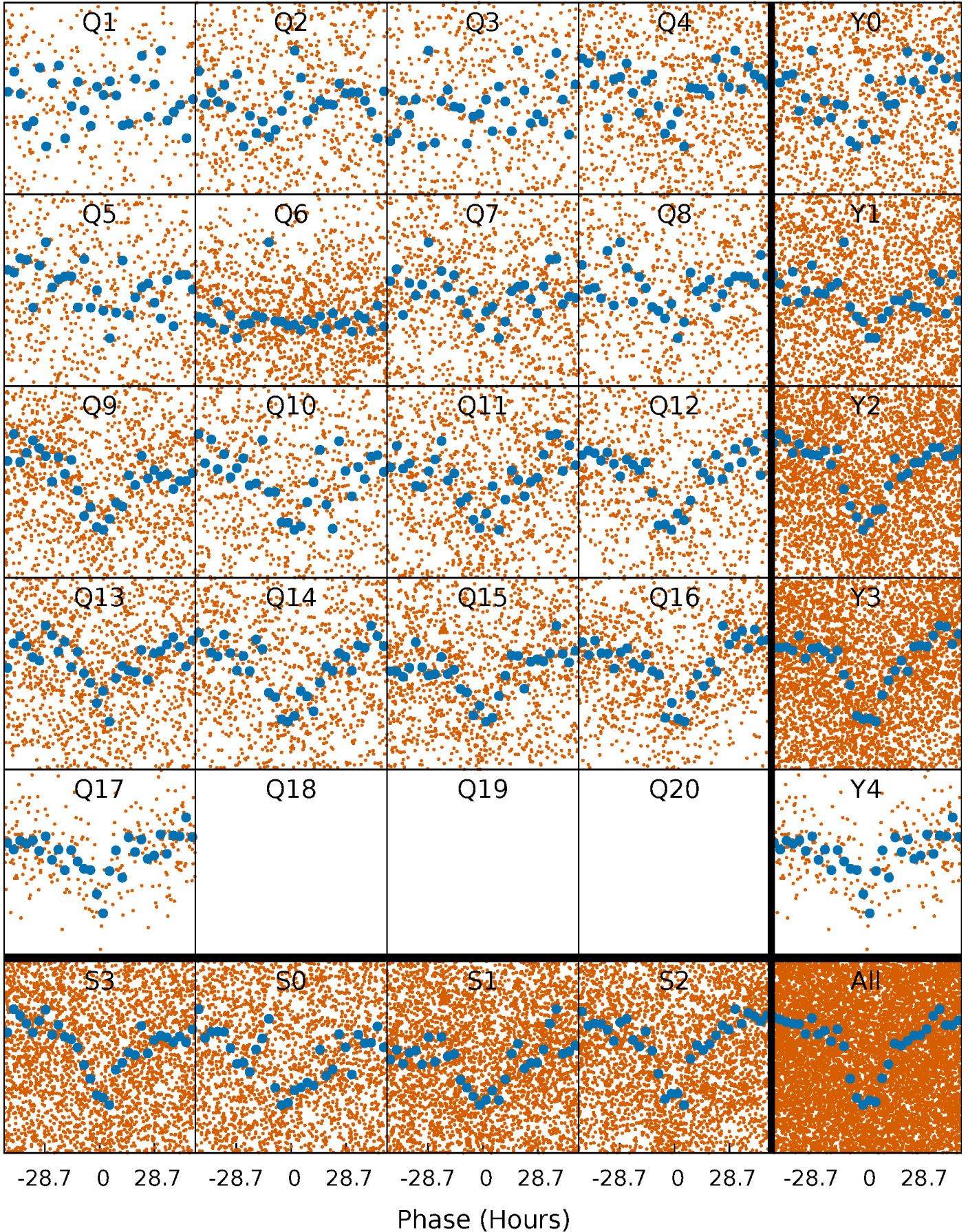


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

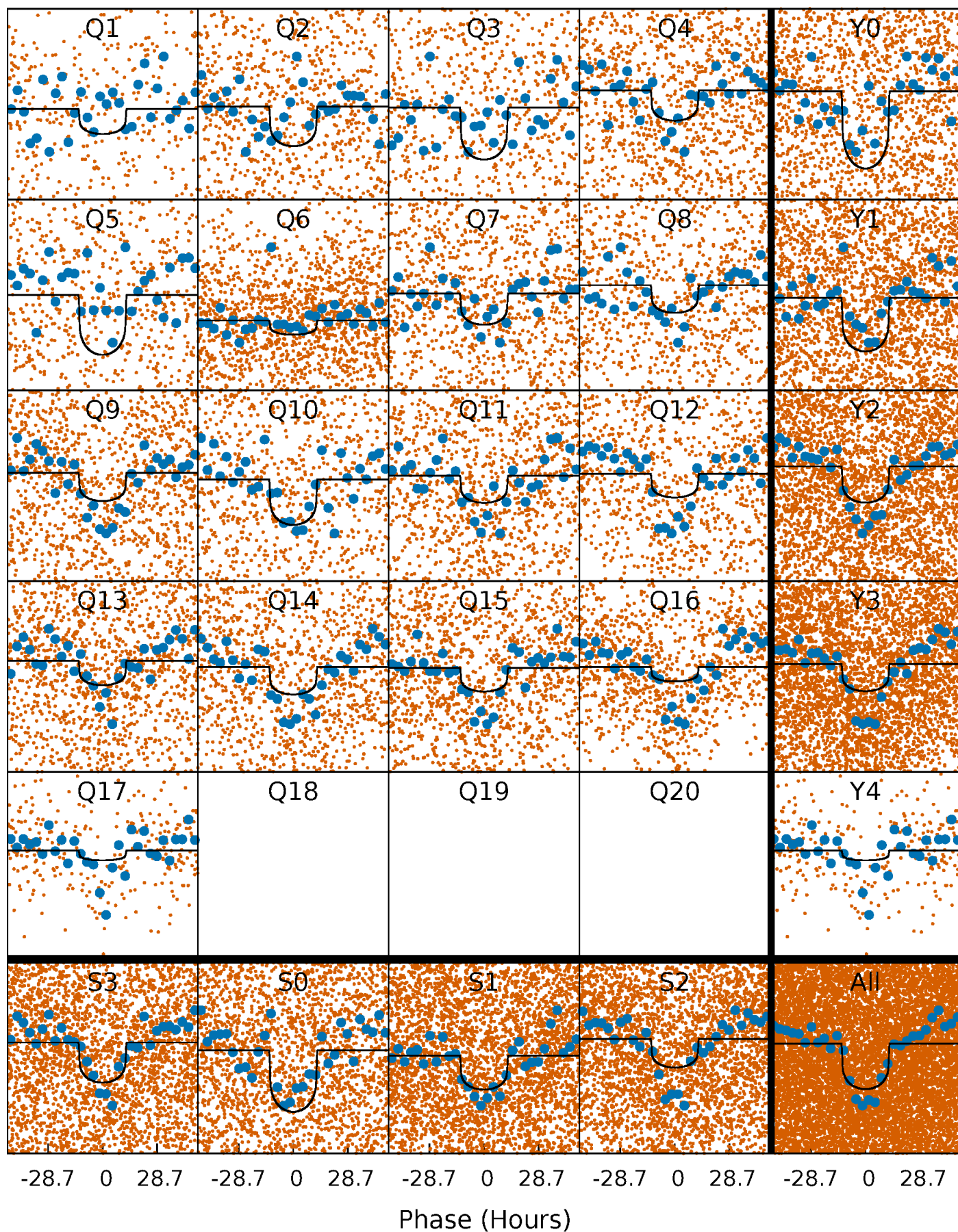
TCE 005471769-01 P= 12.425125 Days  $T_0=141.554872$  (BKJD)





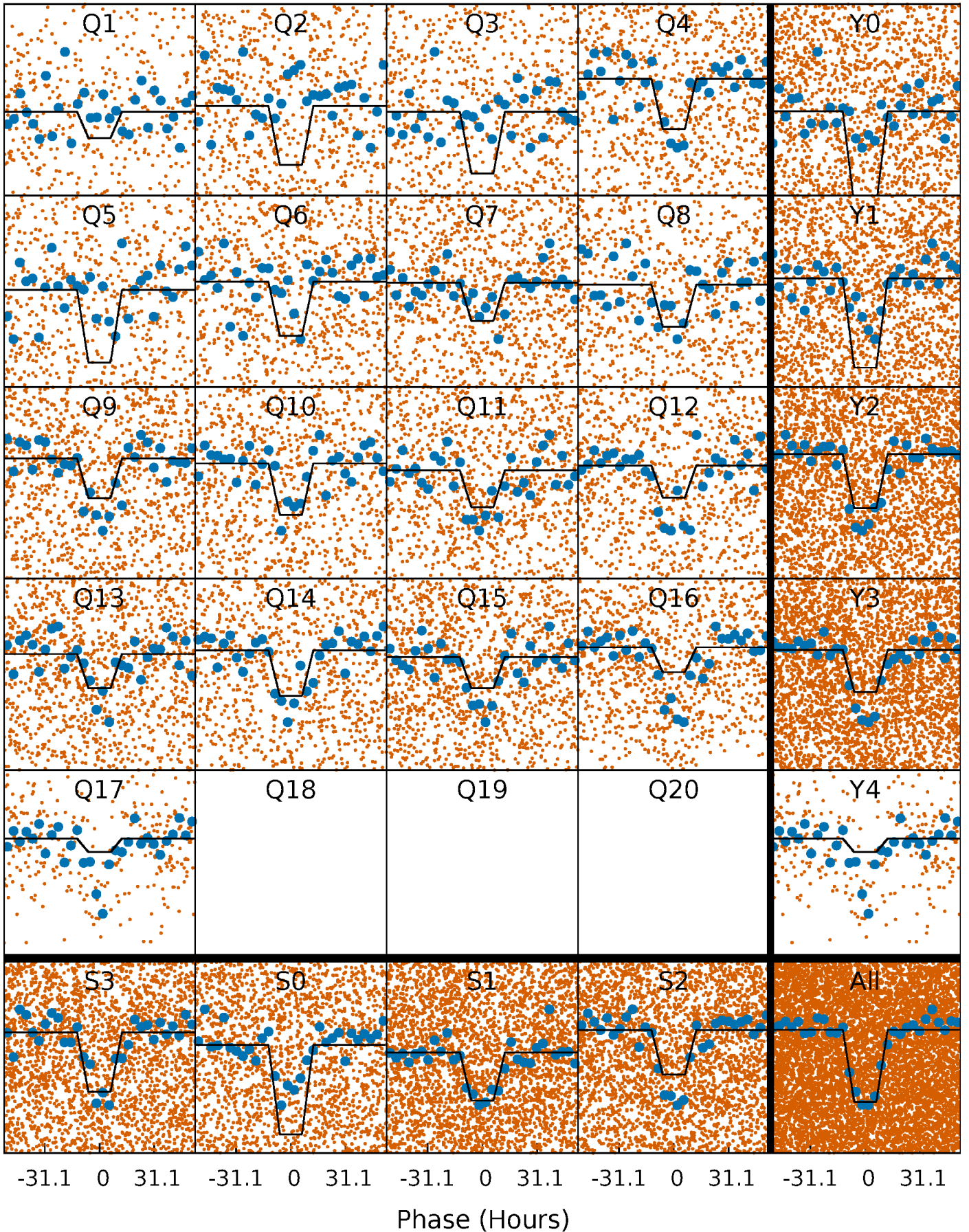
# DV Quarter-Phased Transit Curves

TCE 005471769-01 P= 12.425125 Days  $T_0=141.554872$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 005471769-01 P= 12.425672 Days  $T_0=141.506651$  (BKJD)

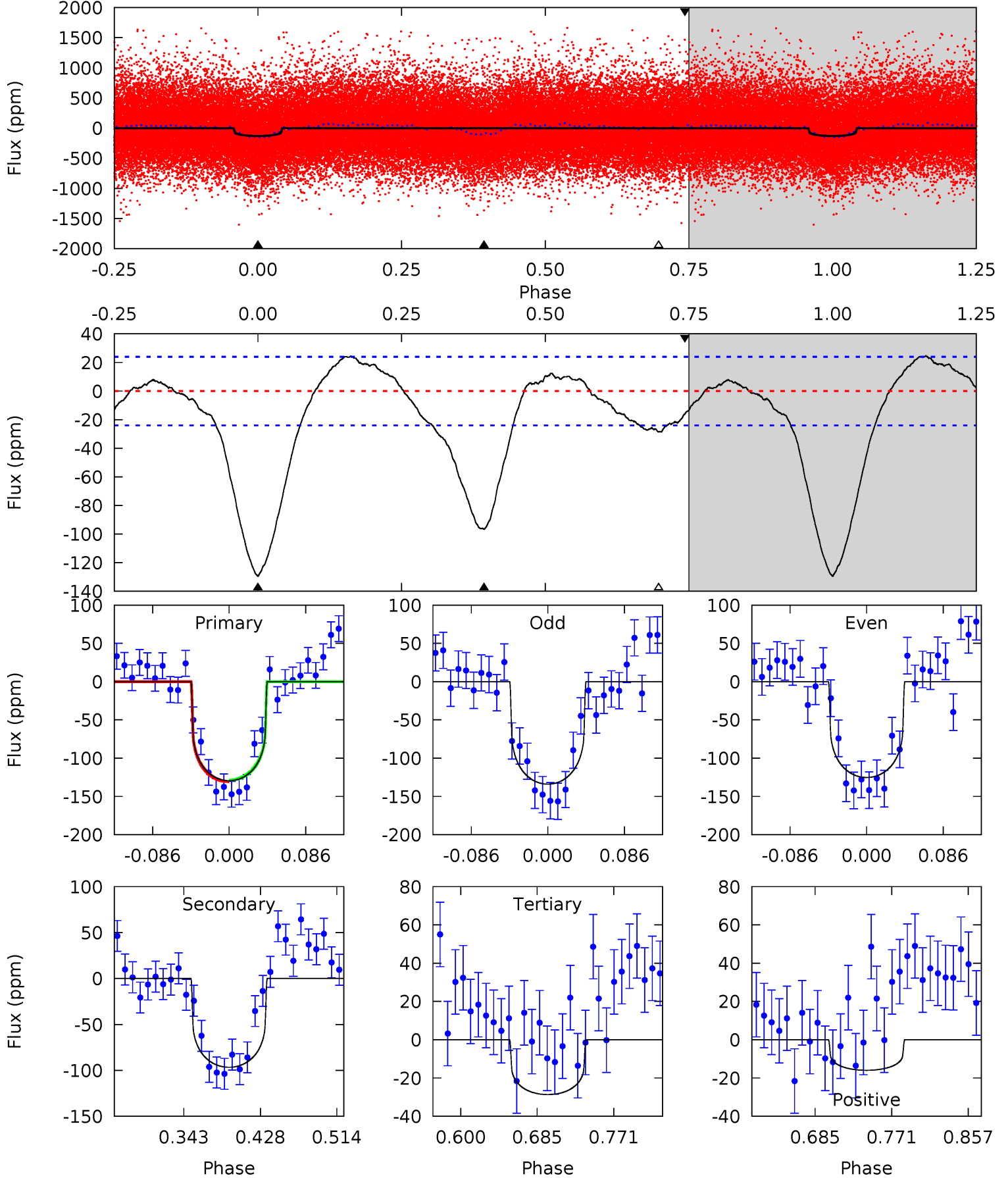




# DV Model-Shift Uniqueness Test

005471769-01, P = 12.425125 Days, E = 129.129747 Days

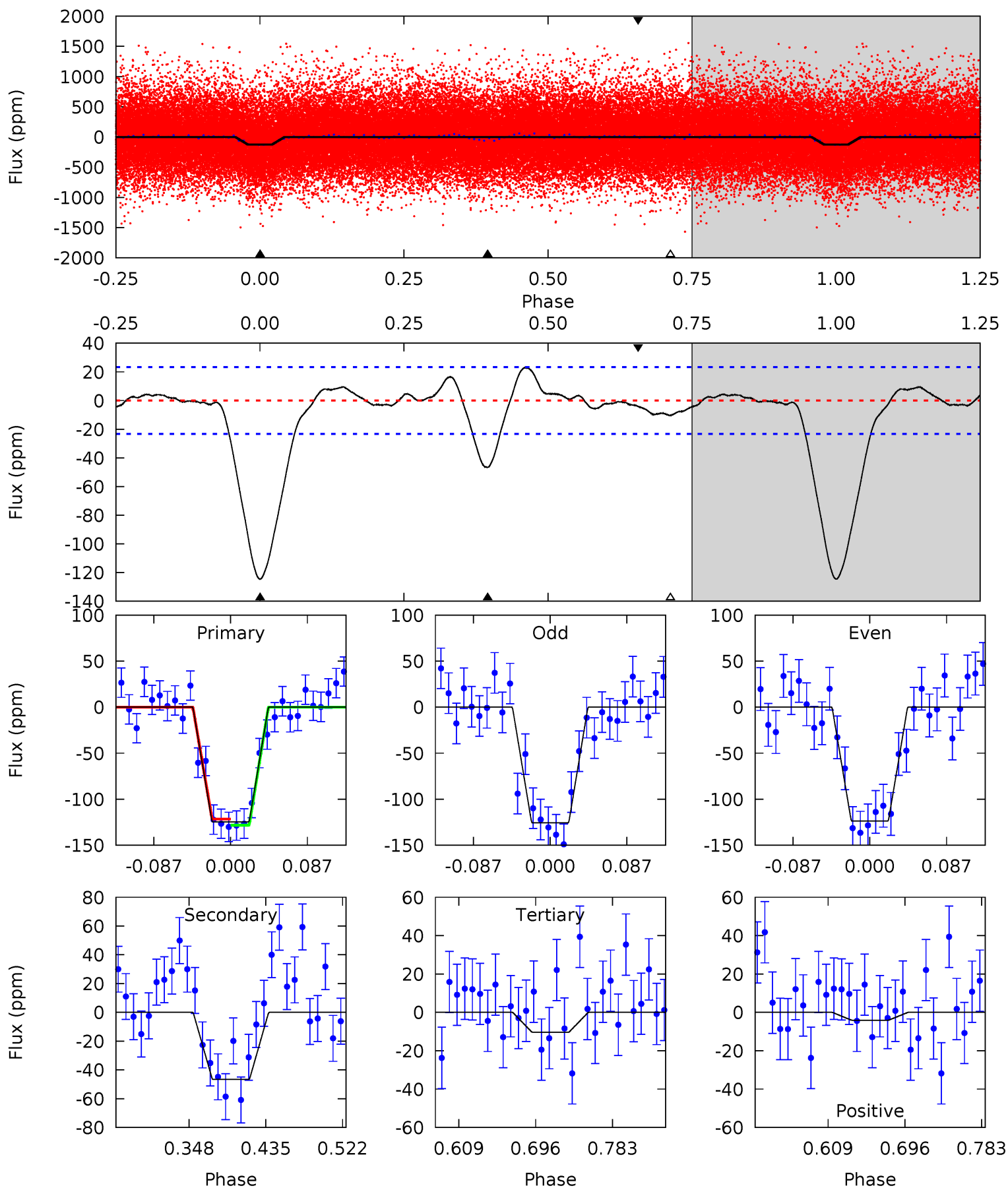
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
24.8	18.5	5.50	-3.06	4.60	1.72	2.75	19.3	27.9	13.0	21.6	0.84	1.06	0.16	0.19



# Alt Model-Shift Uniqueness Test

005471769-01, P = 12.425672 Days, E = 129.080979 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
24.6	9.20	2.04	-0.81	4.59	1.71	0.94	22.5	25.4	7.16	10.0	0.19	0.96	0.16	0.65





### Stellar Parameters For KIC 005471769

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5742^{+155}_{-155}$	$4.564^{+0.040}_{-0.160}$	$-0.240^{+0.300}_{-0.300}$	$0.827^{+0.199}_{-0.066}$	$0.921^{+0.090}_{-0.110}$	$2.292^{+0.469}_{-1.033}$
	+3%/-3%	+1%/-4%	+125%/-125%	+24%/-8%	+10%/-12%	+20%/-45%
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 005471769-01 / KOI 6011.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-97 \pm 5$	$0.95^{+0.25}_{-0.24}$	$1026^{+59}_{-42}$	$5642^{+799}_{-506}$	$594^{+479}_{-218}$
Alt.	$-47 \pm 5$	$1.04^{+0.27}_{-0.25}$	$1025^{+63}_{-44}$	$4630^{+583}_{-387}$	$241^{+168}_{-91}$

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

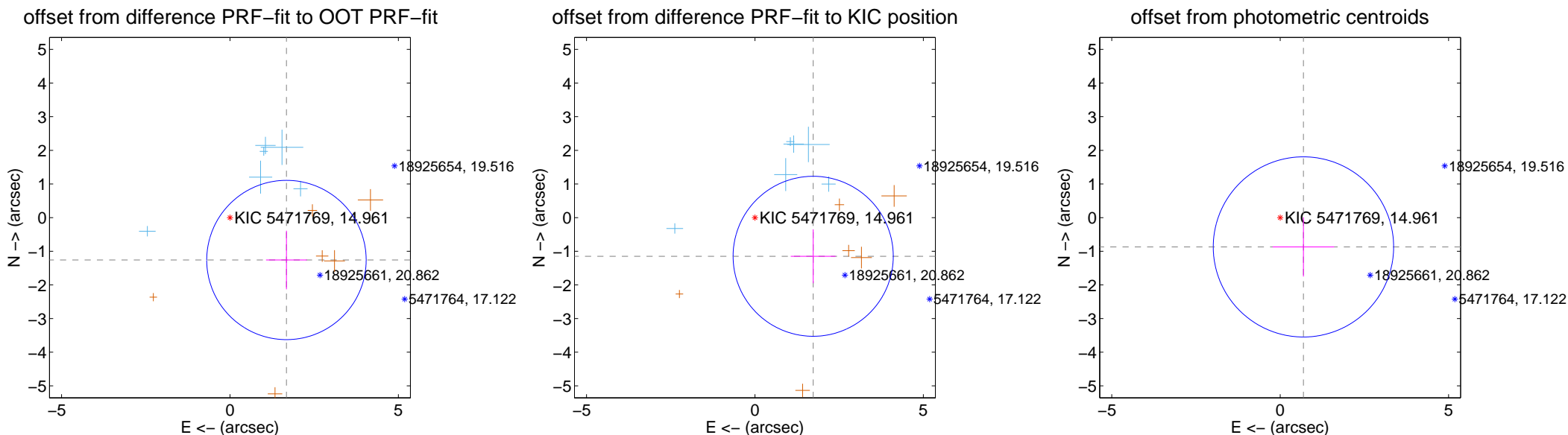
## DV Centroid Data

Supplemental centroid analysis for 005471769-01. Kepler magnitude: 14.96. Transit SNR 13.32

There are 6 quarters with good PRF difference image offsets

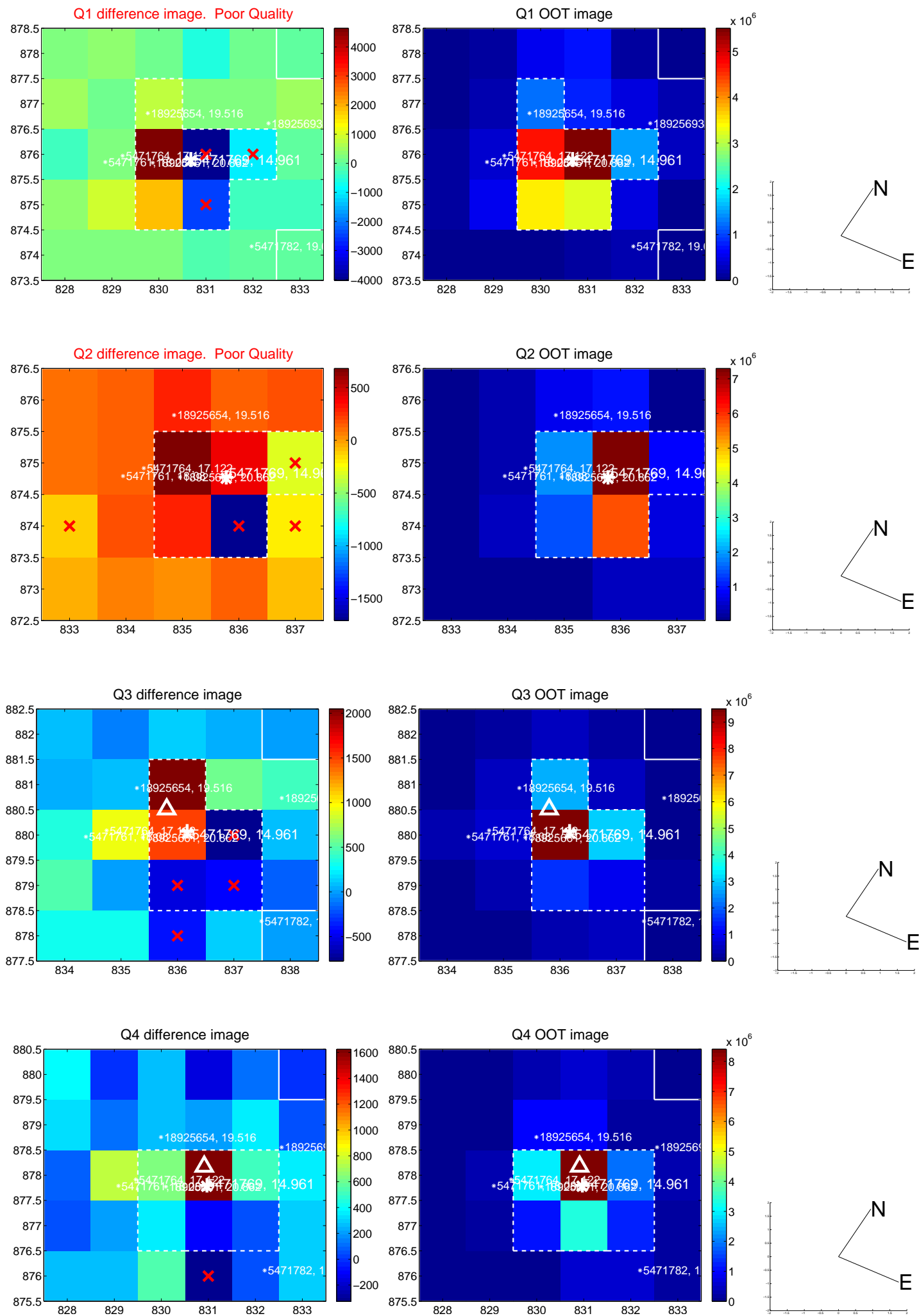
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.097 \pm 0.789$	2.66	$-1.677 \pm 0.606$	$-1.259 \pm 0.871$
PRF-fit source offset from KIC position	$2.076 \pm 0.793$	2.62	$-1.729 \pm 0.666$	$-1.149 \pm 0.800$
photometric centroid source offset	$1.11 \pm 0.89$	1.25	$-0.69 \pm 0.91$	$-0.87 \pm 0.88$

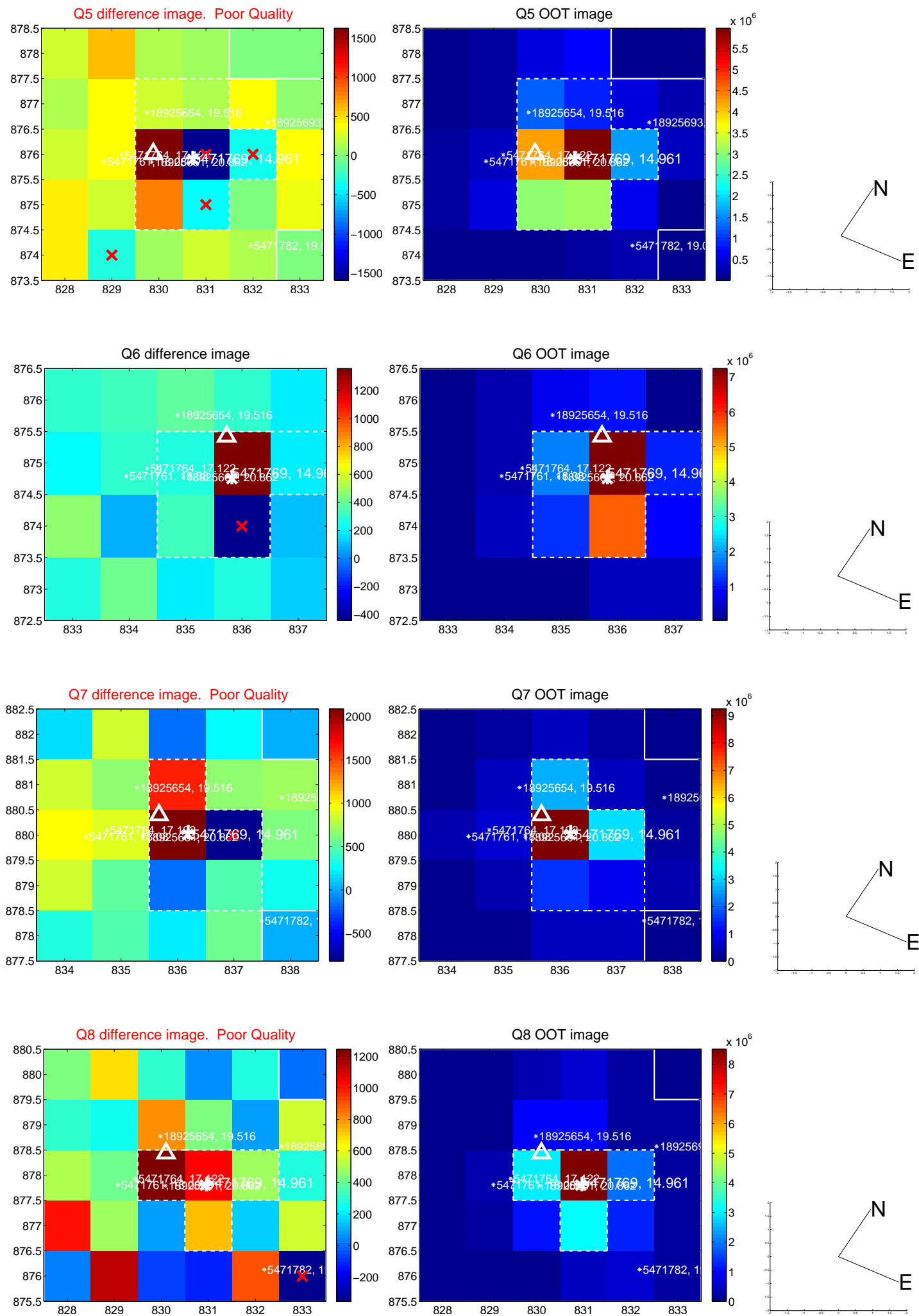


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

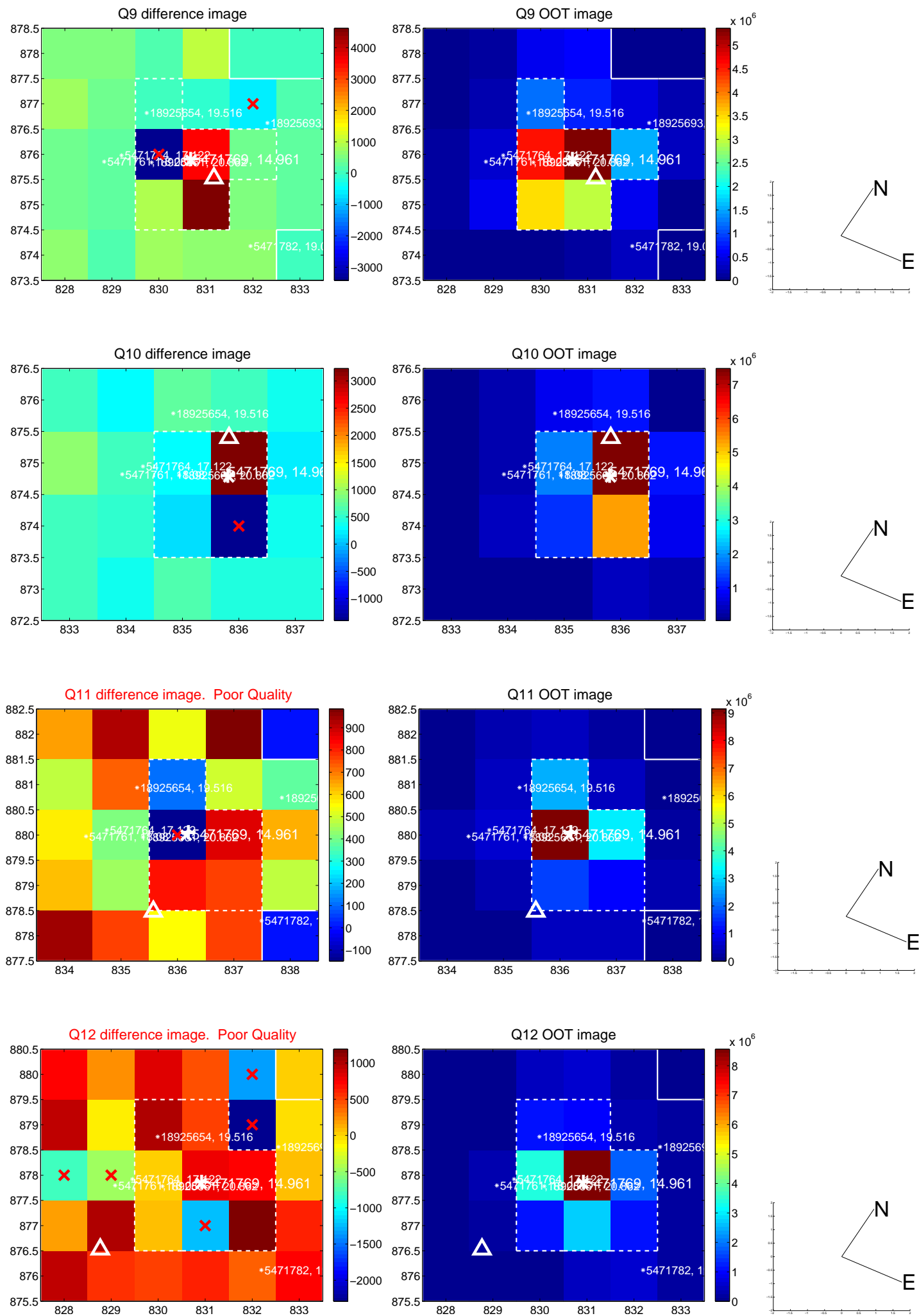


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

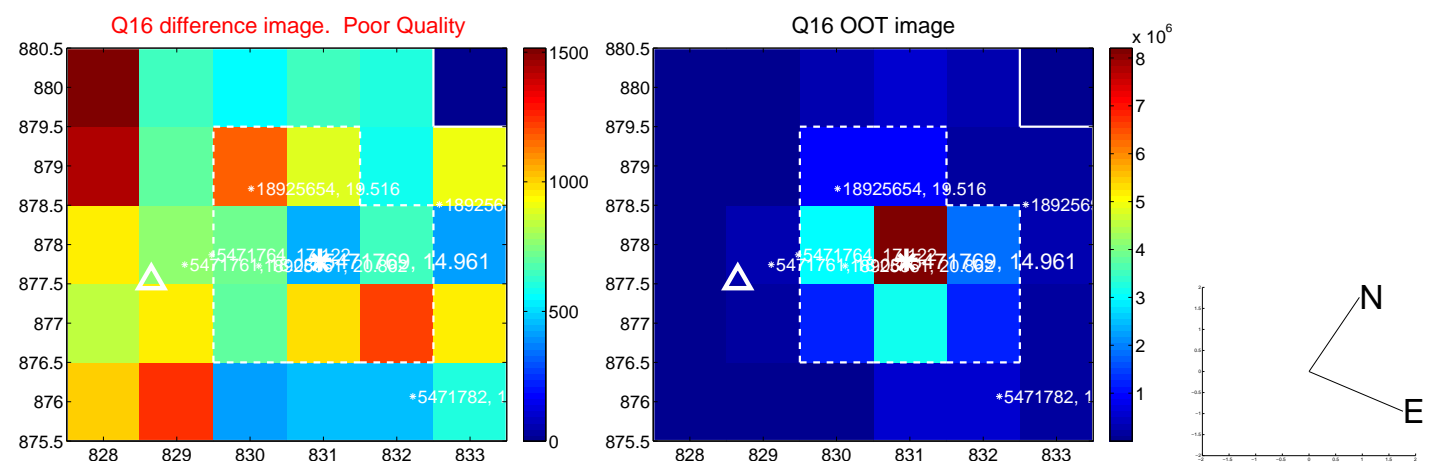
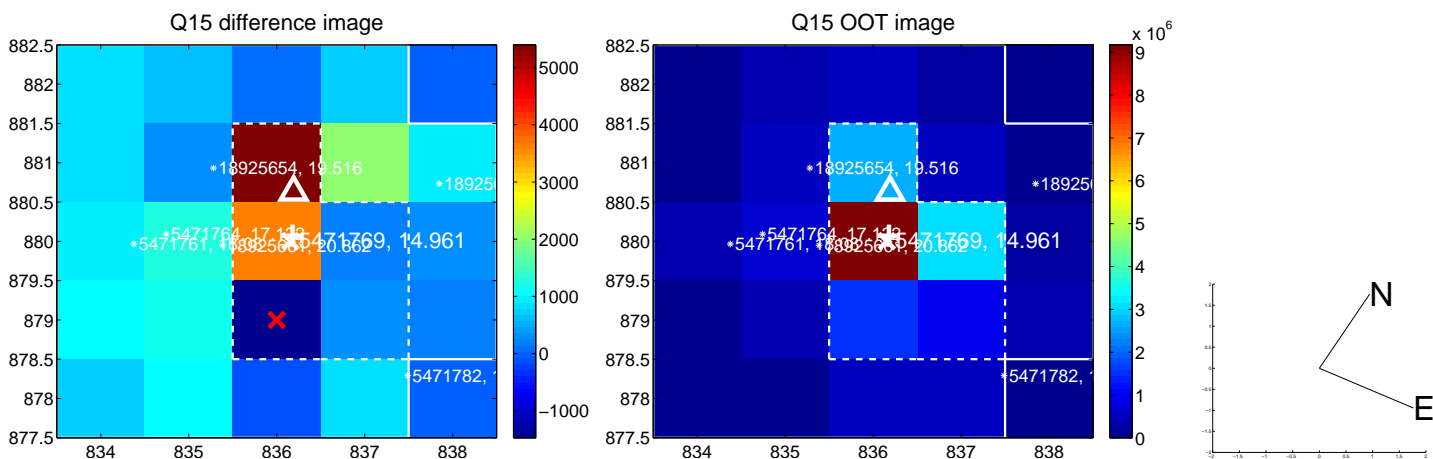
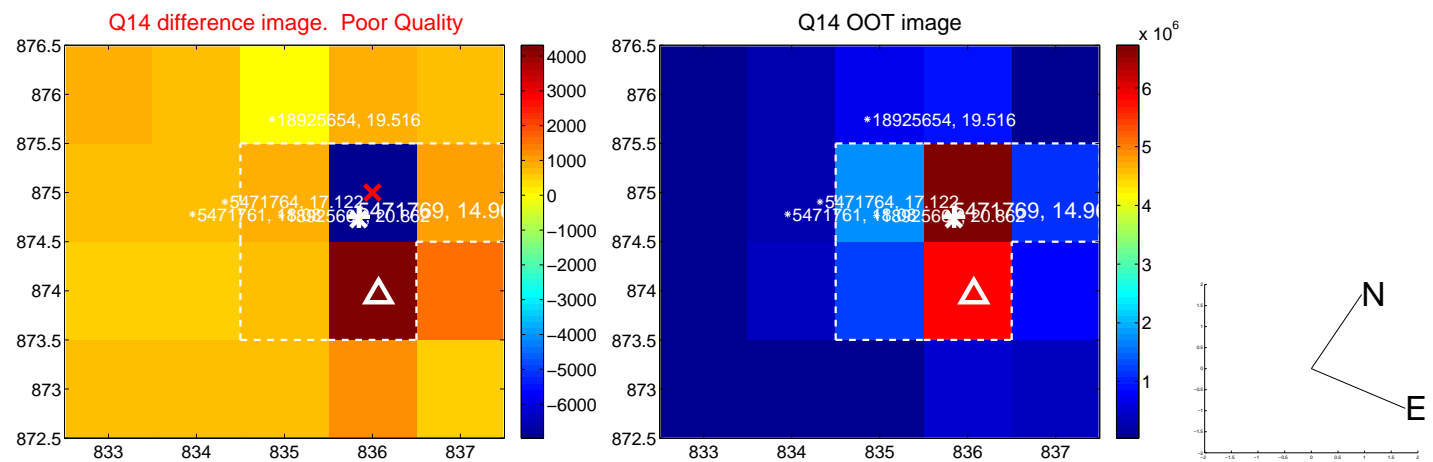
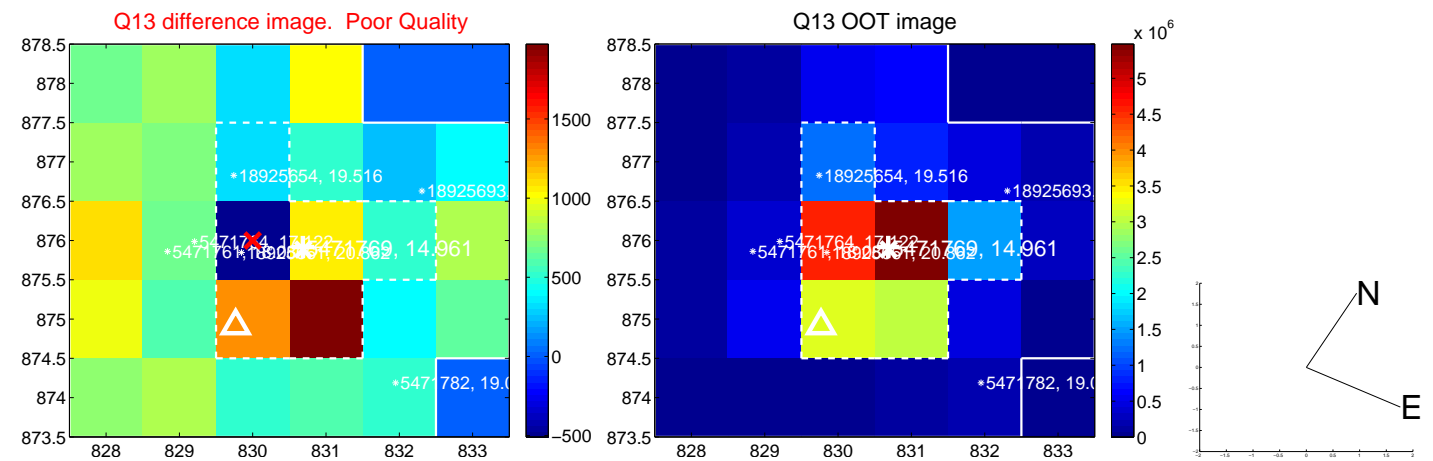




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



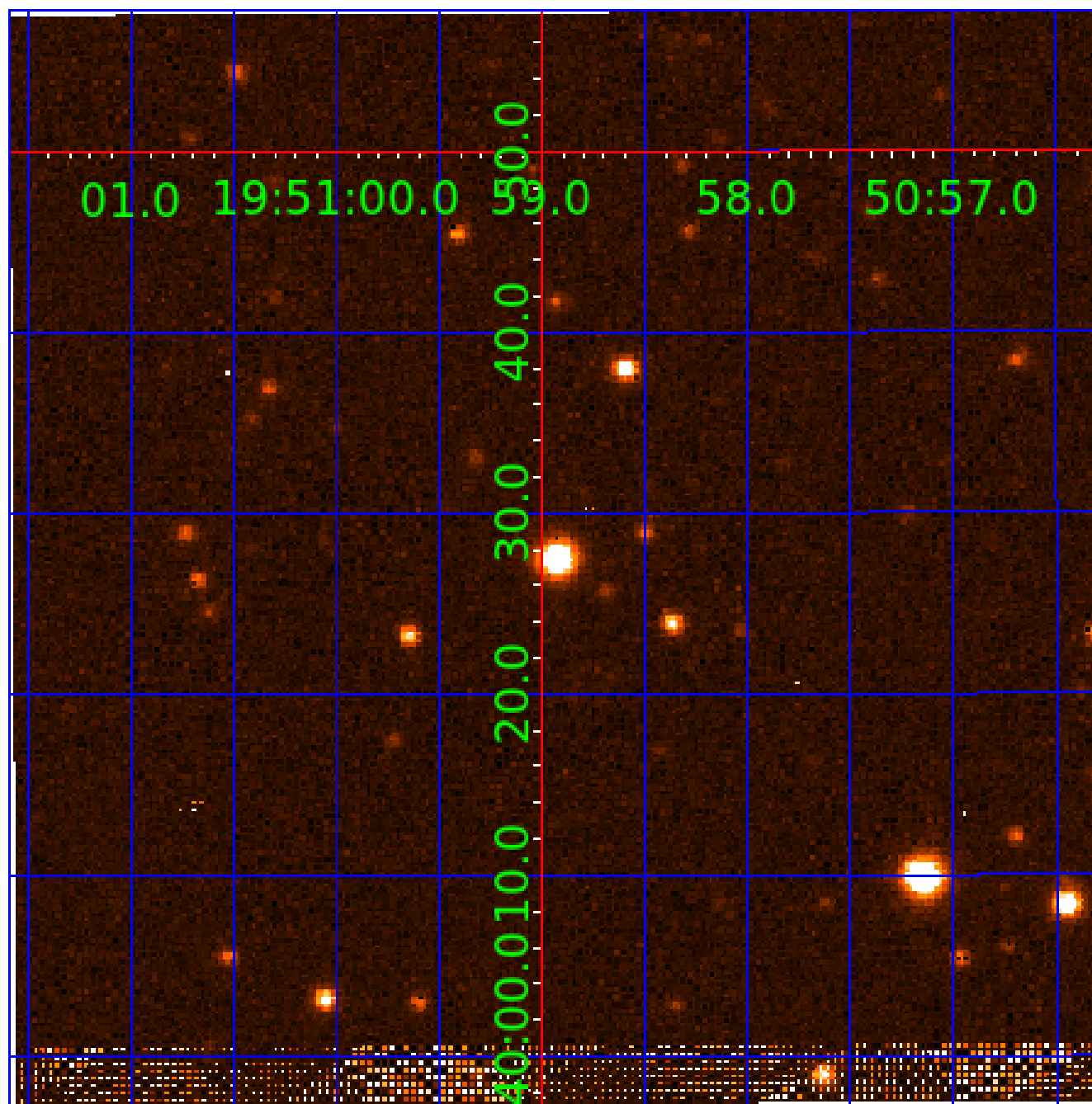
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image

Declination





# KIC 005471769

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005471769-01	OBS	6011.01	12.425125	141.554872	107.3	25.104	10.9	13.3	0.83	5742	0.91	64.13
005471769-02	OBS	No	12.427265	133.804091	108.1	25.121	11.8	14.8	0.83	5742	0.90	64.12

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005471769-01	OBS	FP	0.00	1	0	1	1	LPP_DV—HALO_GHOST—EPHEM_MATCH
005471769-02	OBS	FP	0.00	1	0	1	1	LPP_DV—SAME_NTL_PERIOD—CENT_UNRESOLVED_OFFSET—HALO_GHOST—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 005471769-02

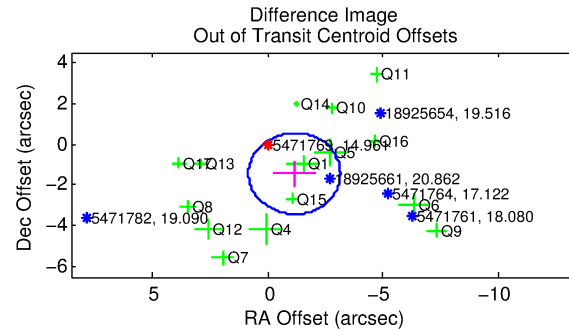
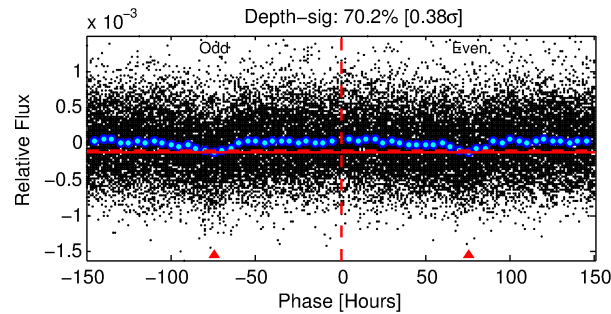
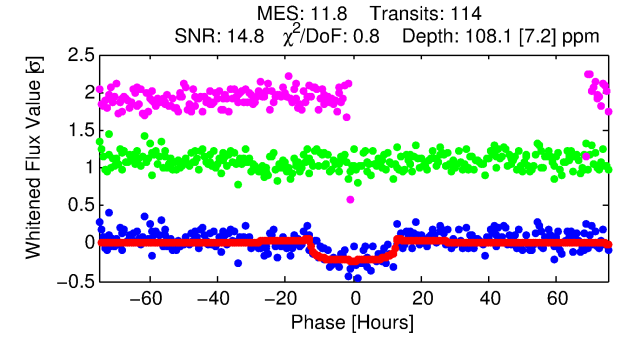
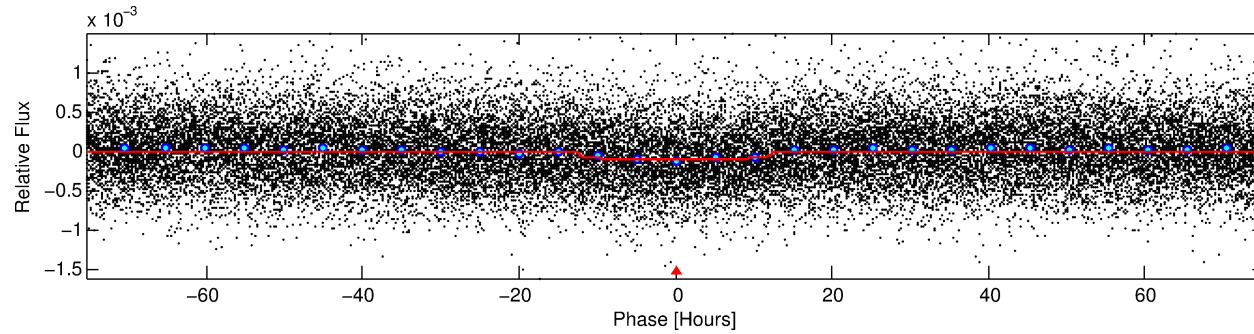
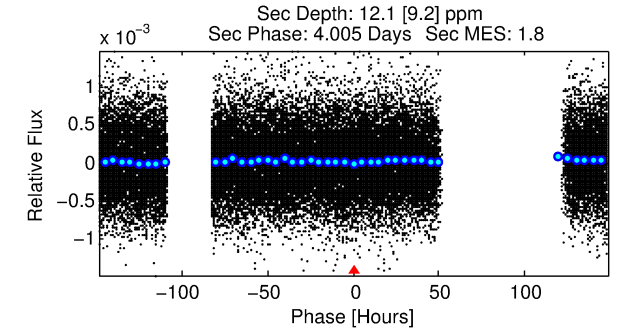
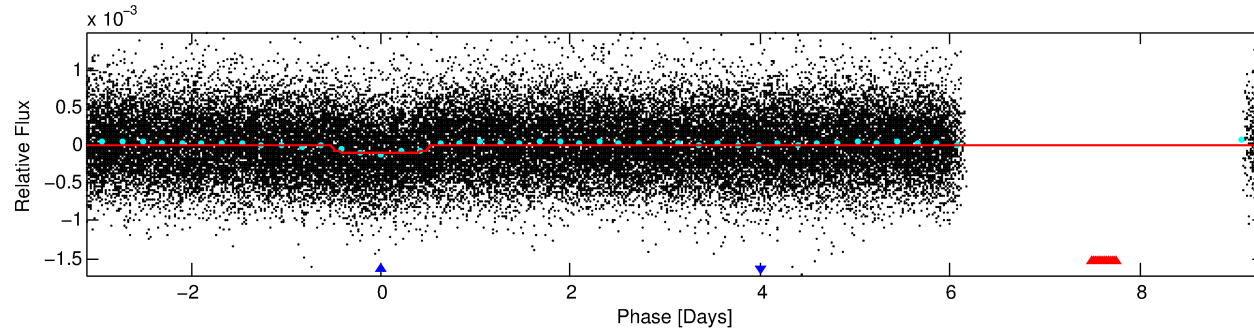
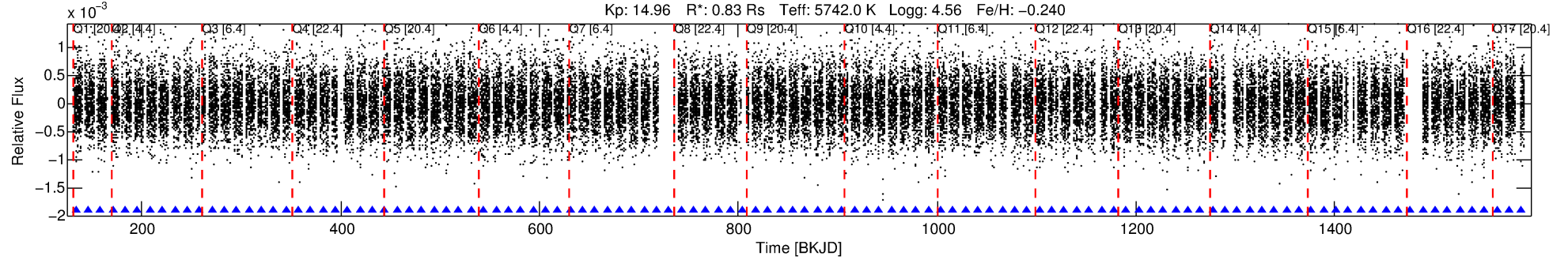
TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ( $''$ )	$\Delta$ Row	$\Delta$ Col	$m_2$	$m_1$	$D_2/D_1$	Mechanism	Flag	$\sigma_P$	$\sigma_T$
005471769-02	5471769	005471770-02	5471770	1:1	78.4	17	10	13.61	14.97	0.85	Direct-PRF	1	0.94	2.43

**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: 5471769 Candidate: 2 of 2 Period: 12.427 d

KOI: K06011 Corr: No Ephemeris Match



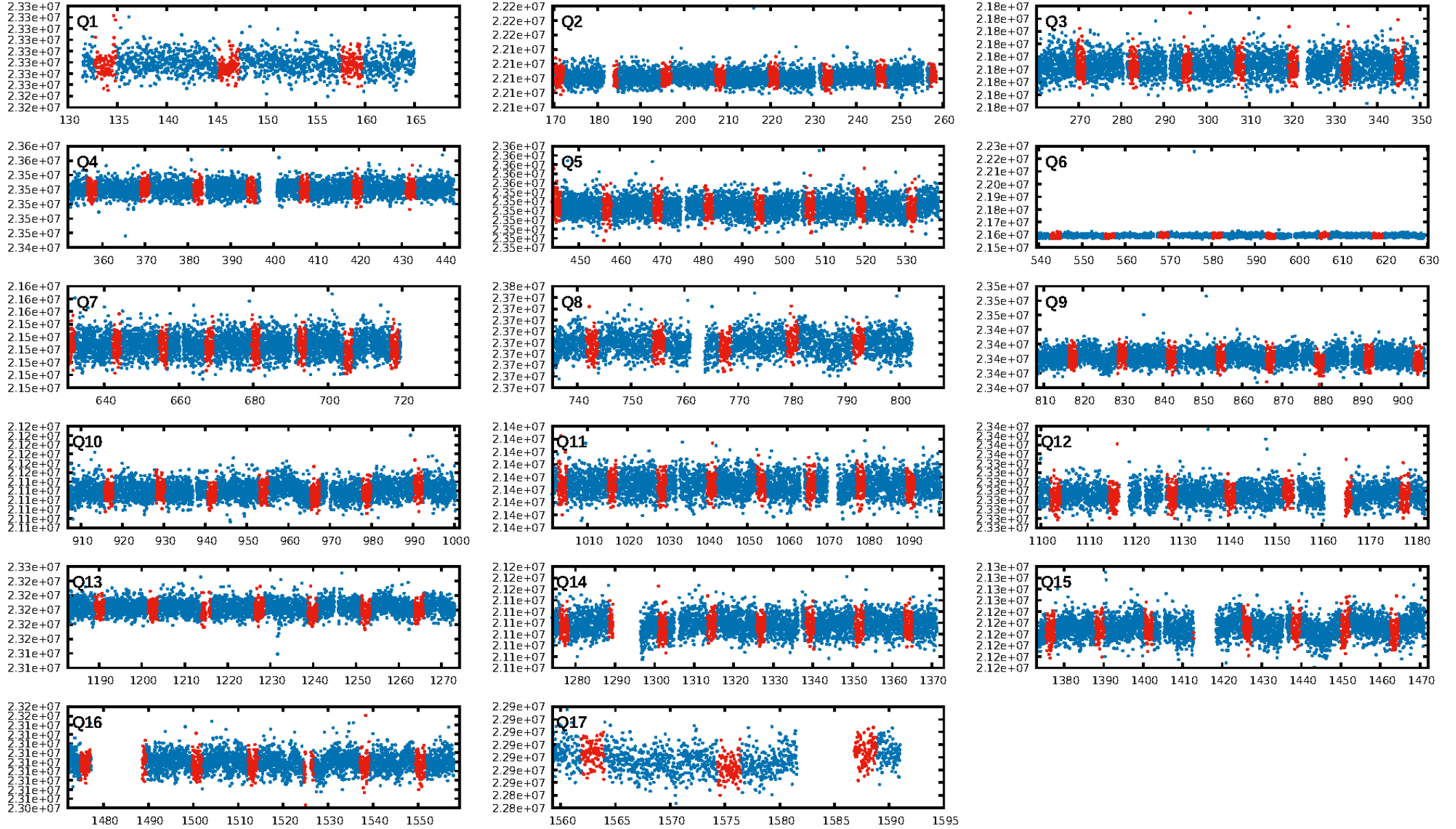
## DV Fit Results:

Period = 12.42727 [0.00029] d  
Epoch = 133.8041 [0.0187] BKJD  
Rp/R\* = 0.0100 [0.0028]  
a/R\* = 3.11 [3.50]  
b = 0.62 [1.25]  
Seff = 64.12 [20.04]  
Teff = 722 [56] K  
Rp = 0.90 [0.33] Re  
a = 0.1019 [0.0206] AU  
Ag = 85.25 [84.26] [1.00σ]  
Teffp = 3390 [805] K [3.31σ]

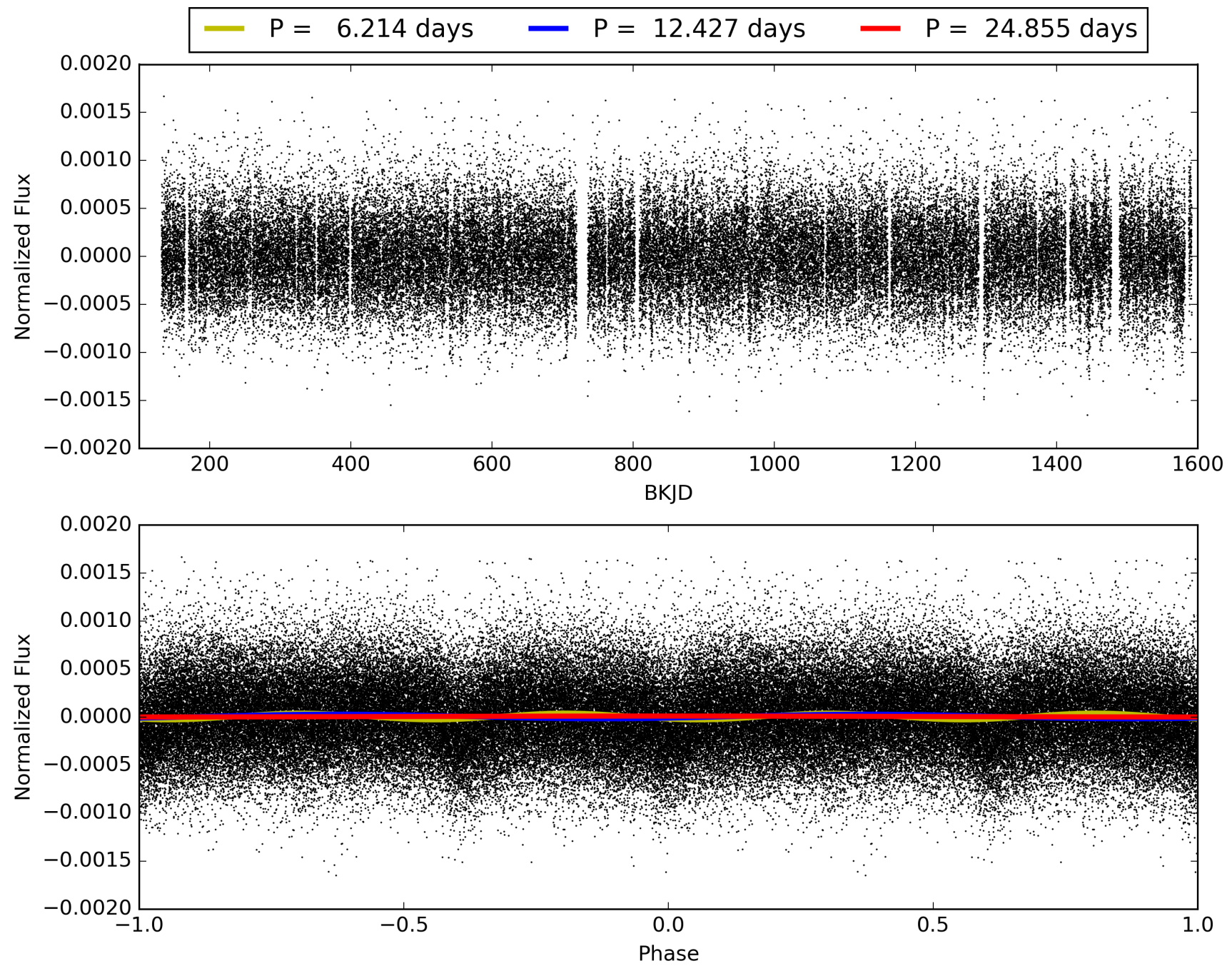
## DV Diagnostic Results:

ShortPeriod-sig: 0.1% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 17.6%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.17e-32  
RollingBand-fgt: 1.00 [108/108]  
GhostDiagnostic-chr: -0.2059  
Centroid-sig: 0.4%  
Centroid-so: 1.993 arcsec [2.24σ]  
OotOffset-rm: 1.846 arcsec [2.78σ]  
KicOffset-rm: 1.766 arcsec [2.87σ]  
OotOffset-st: 3/3/4/5 [15]  
KicOffset-st: 3/3/4/5 [15]  
DiffImageQuality-fgm: 0.20 [3/15]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 005471769-02, PDC Light Curves



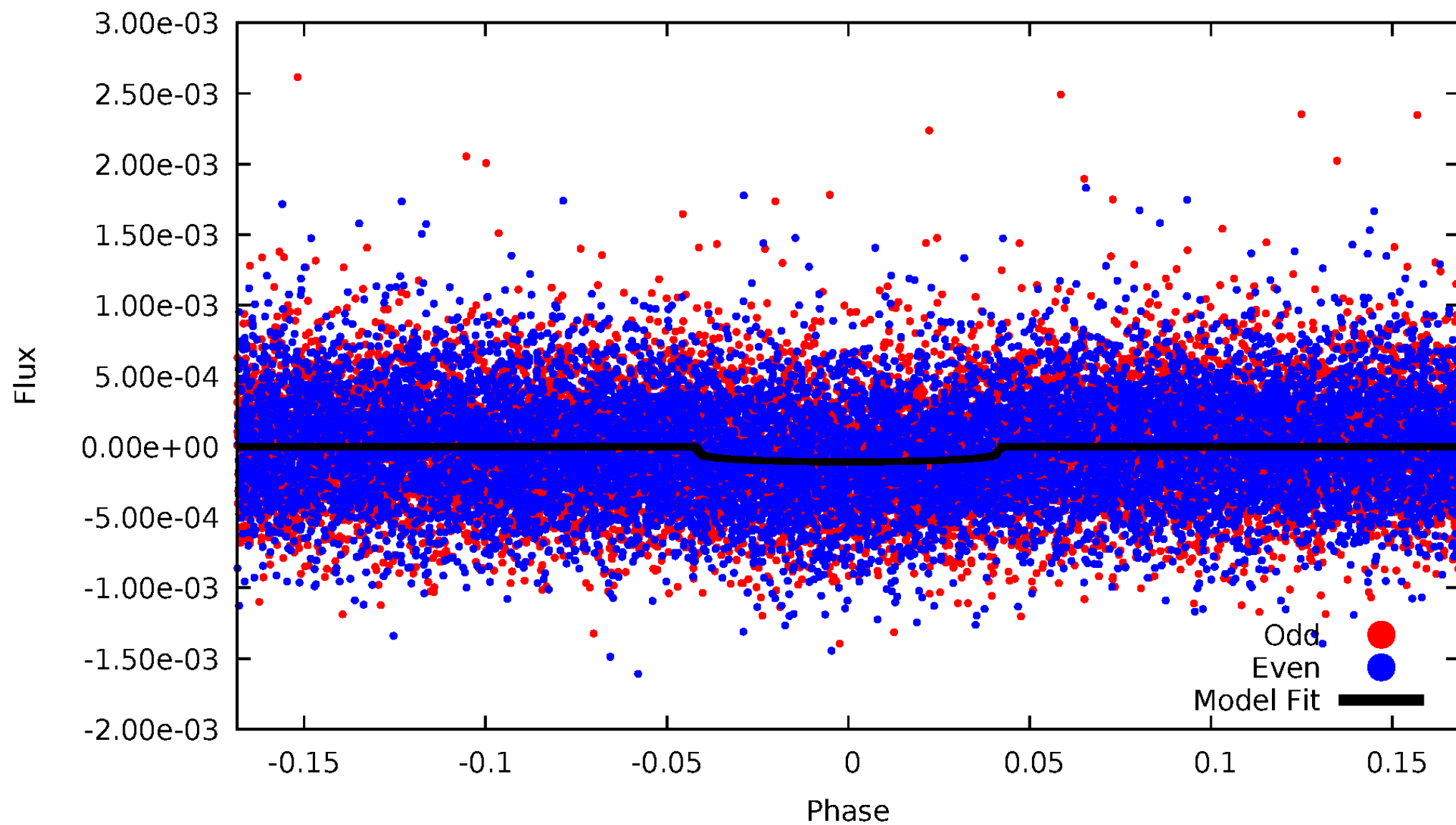
TCE 005471769-02





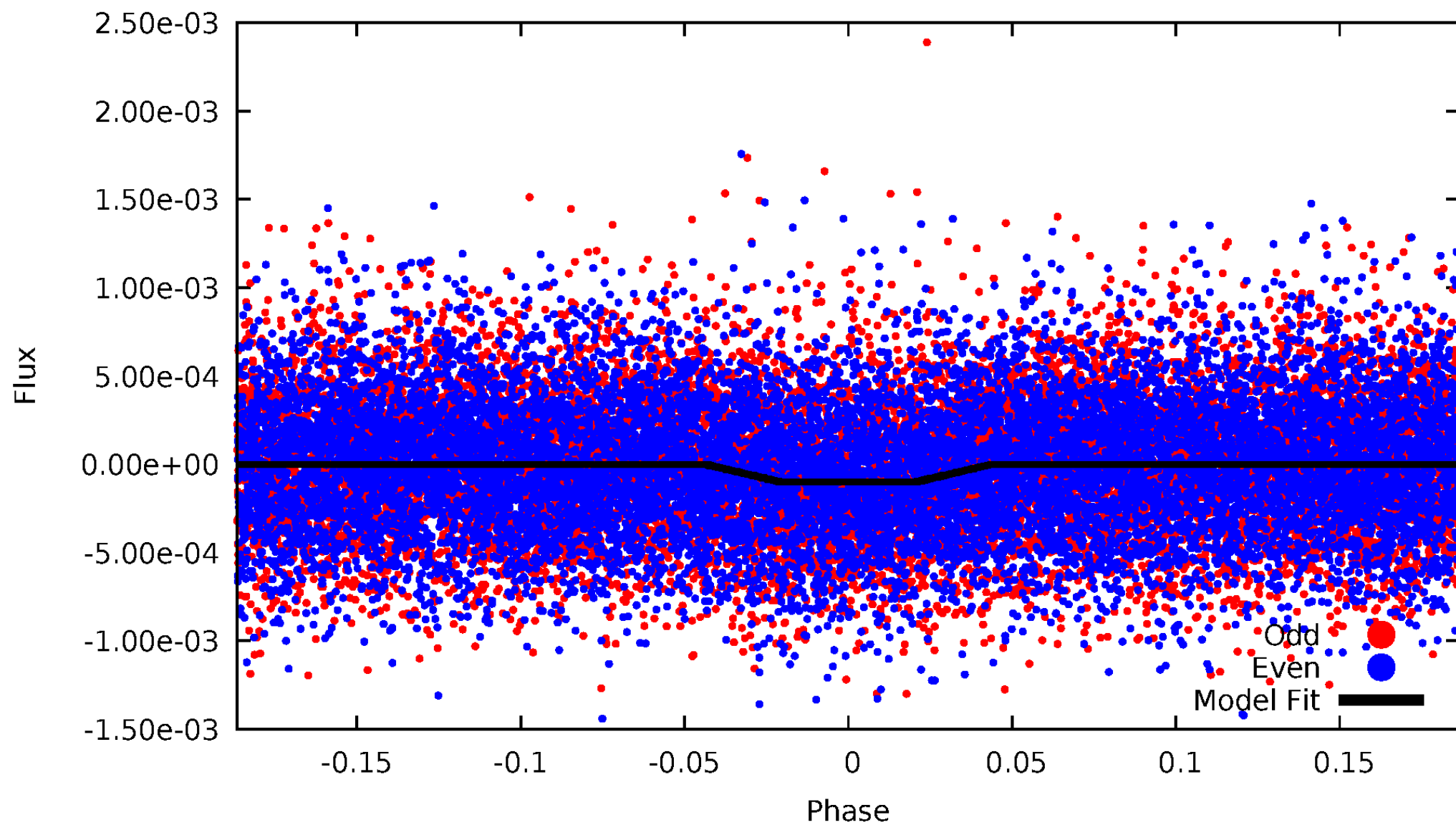
# DV Odd/Even

TCE 005471769-02



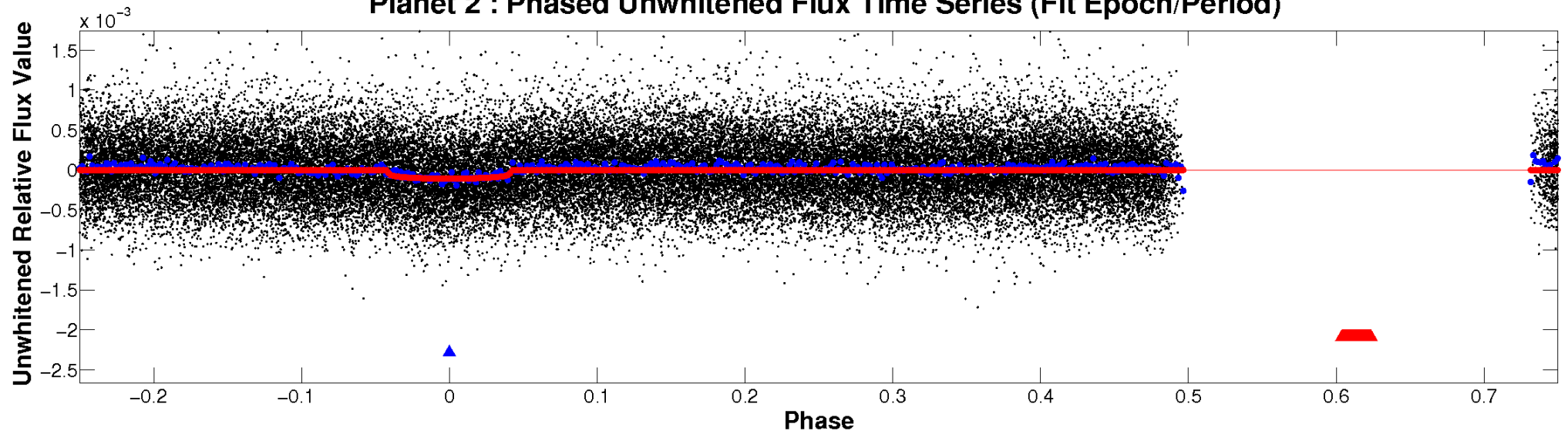
# ALT Odd/Even

TCE 005471769-02

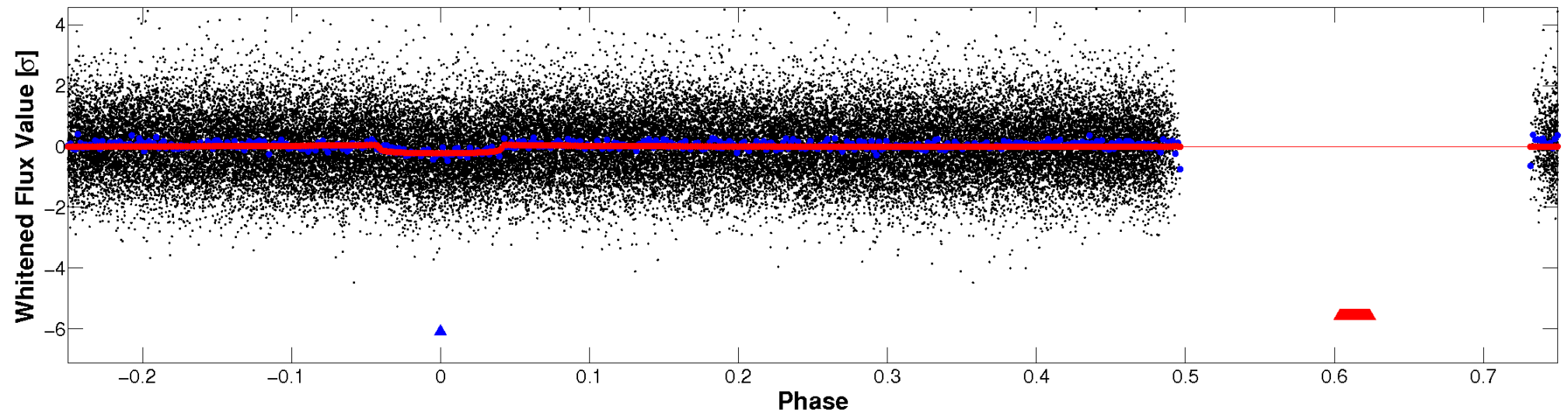


# Non-Whitened Vs. Whitened Light Curve

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

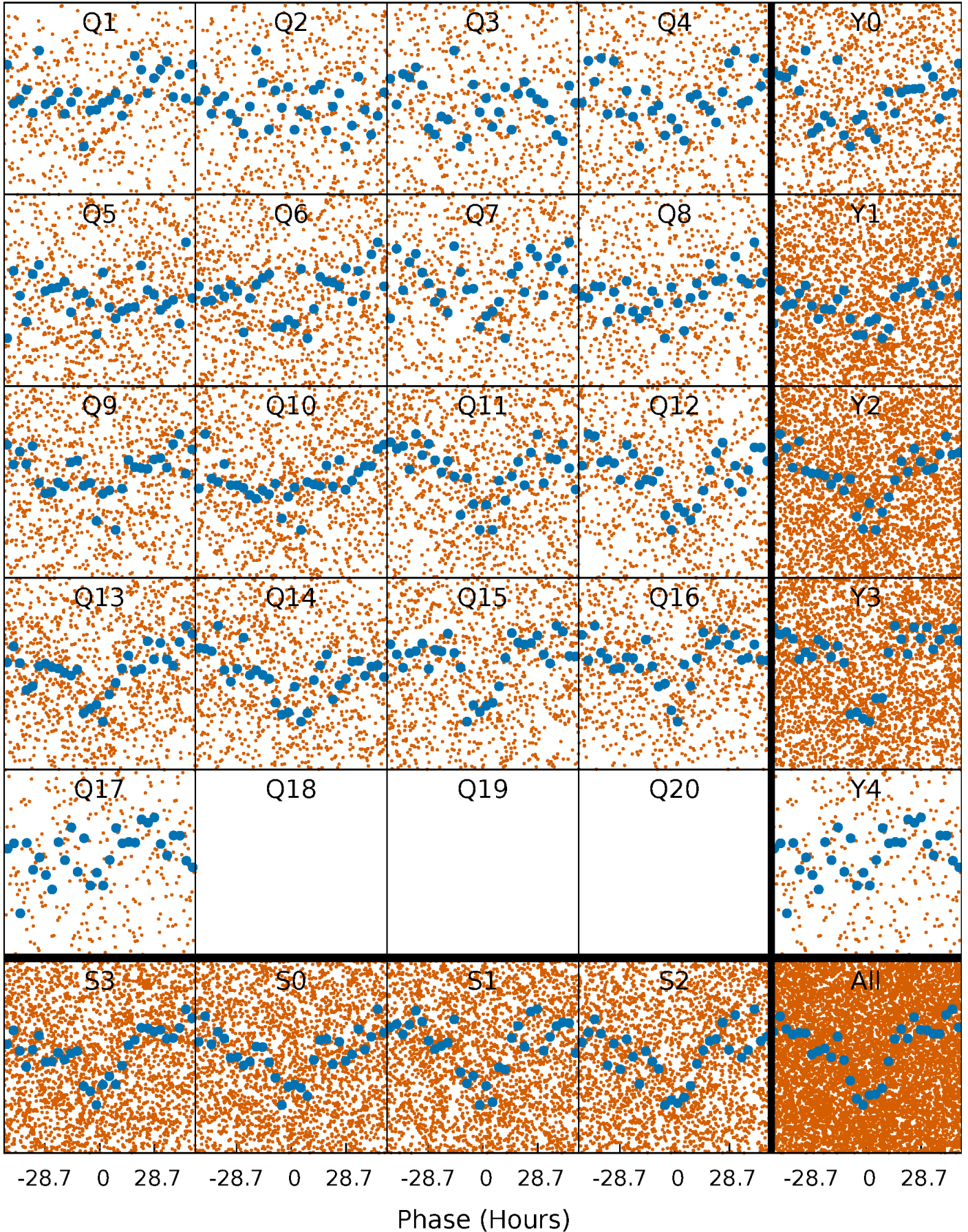


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

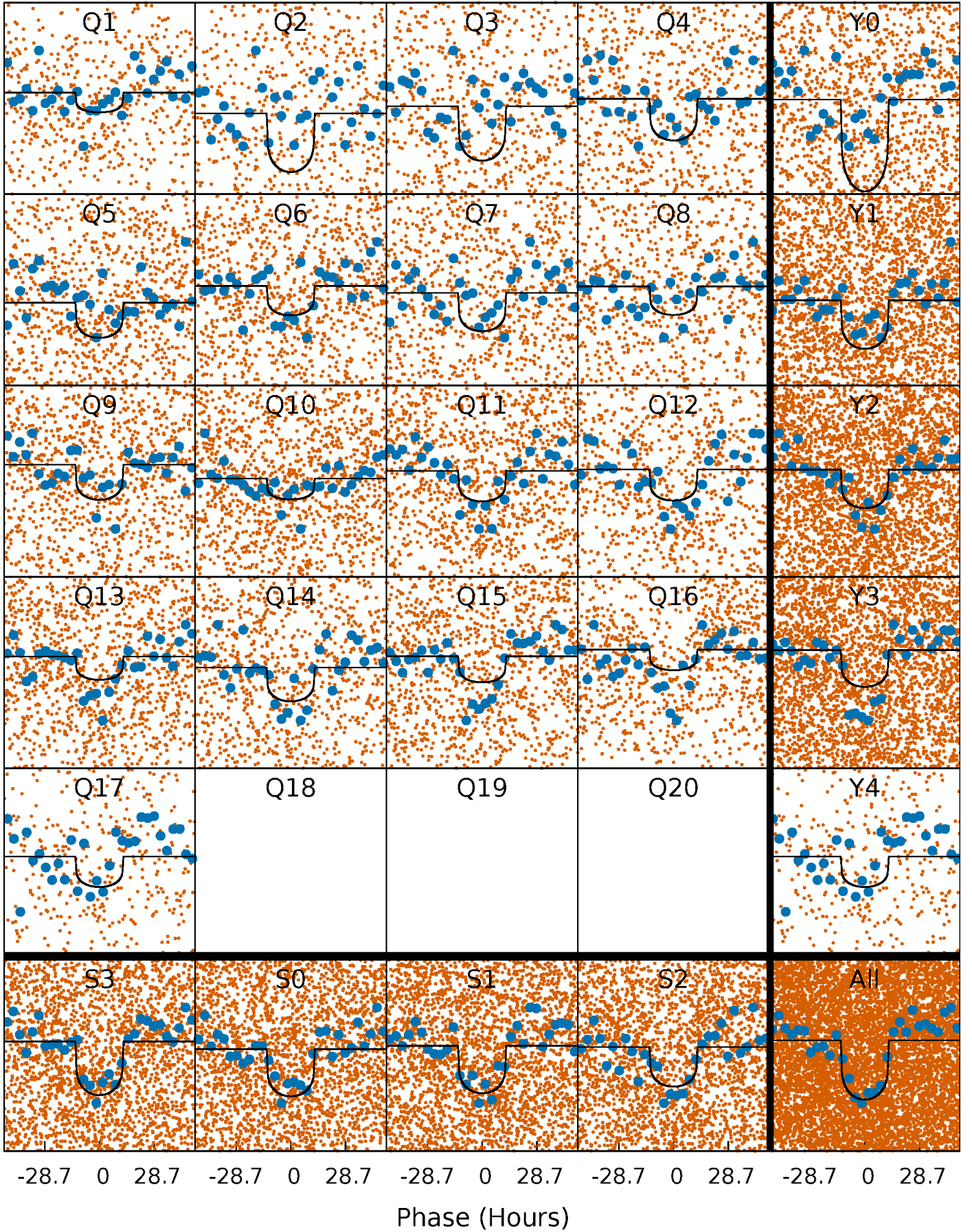
TCE 005471769-02 P= 12.427265 Days  $T_0=133.804091$  (BKJD)





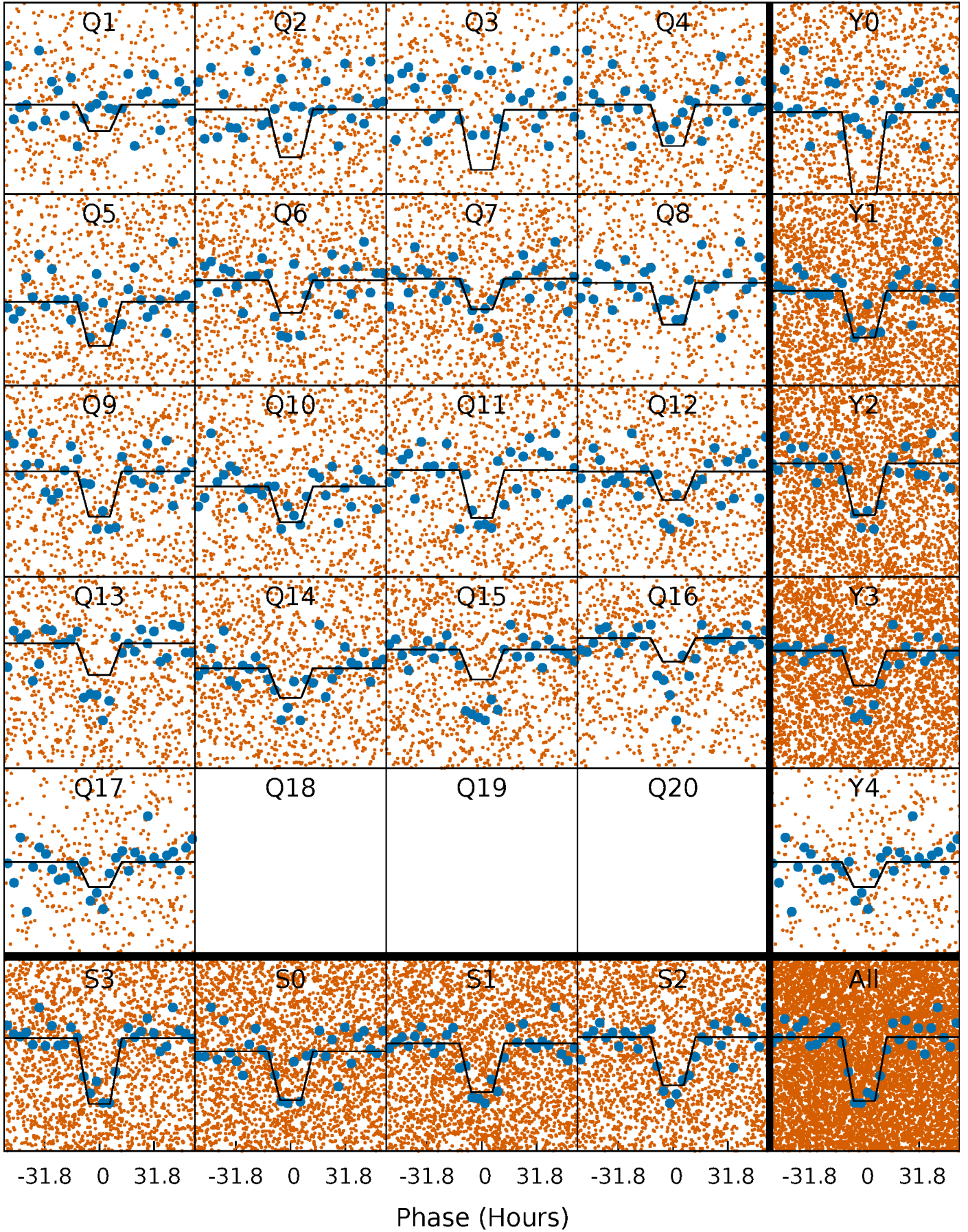
# DV Quarter-Phased Transit Curves

TCE 005471769-02     $P = 12.427265$  Days     $T_0 = 133.804091$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 005471769-02 P= 12.425672 Days  $T_0=133.963151$  (BKJD)

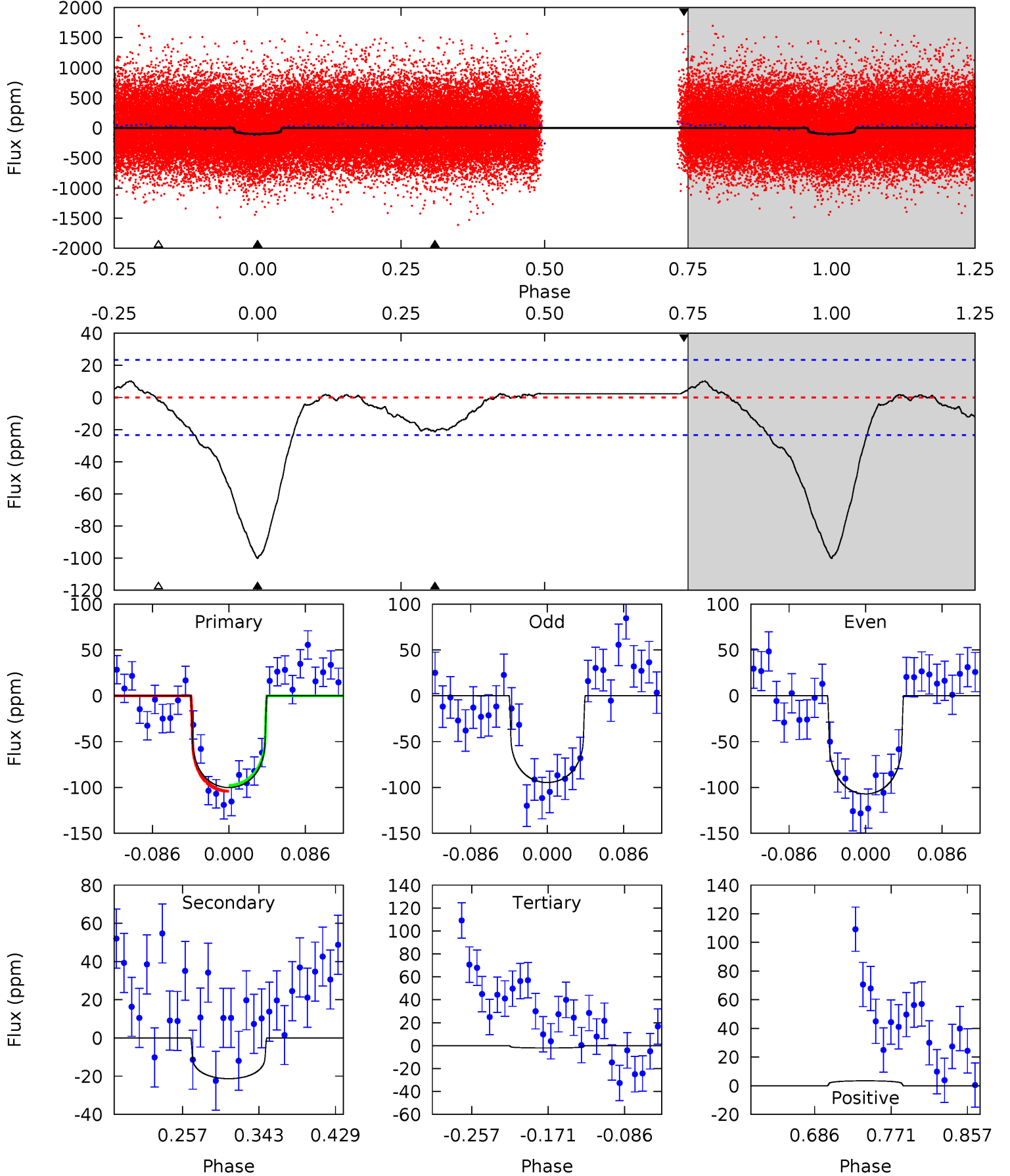




# DV Model-Shift Uniqueness Test

005471769-02,  $P = 12.427265$  Days,  $E = 121.376826$  Days

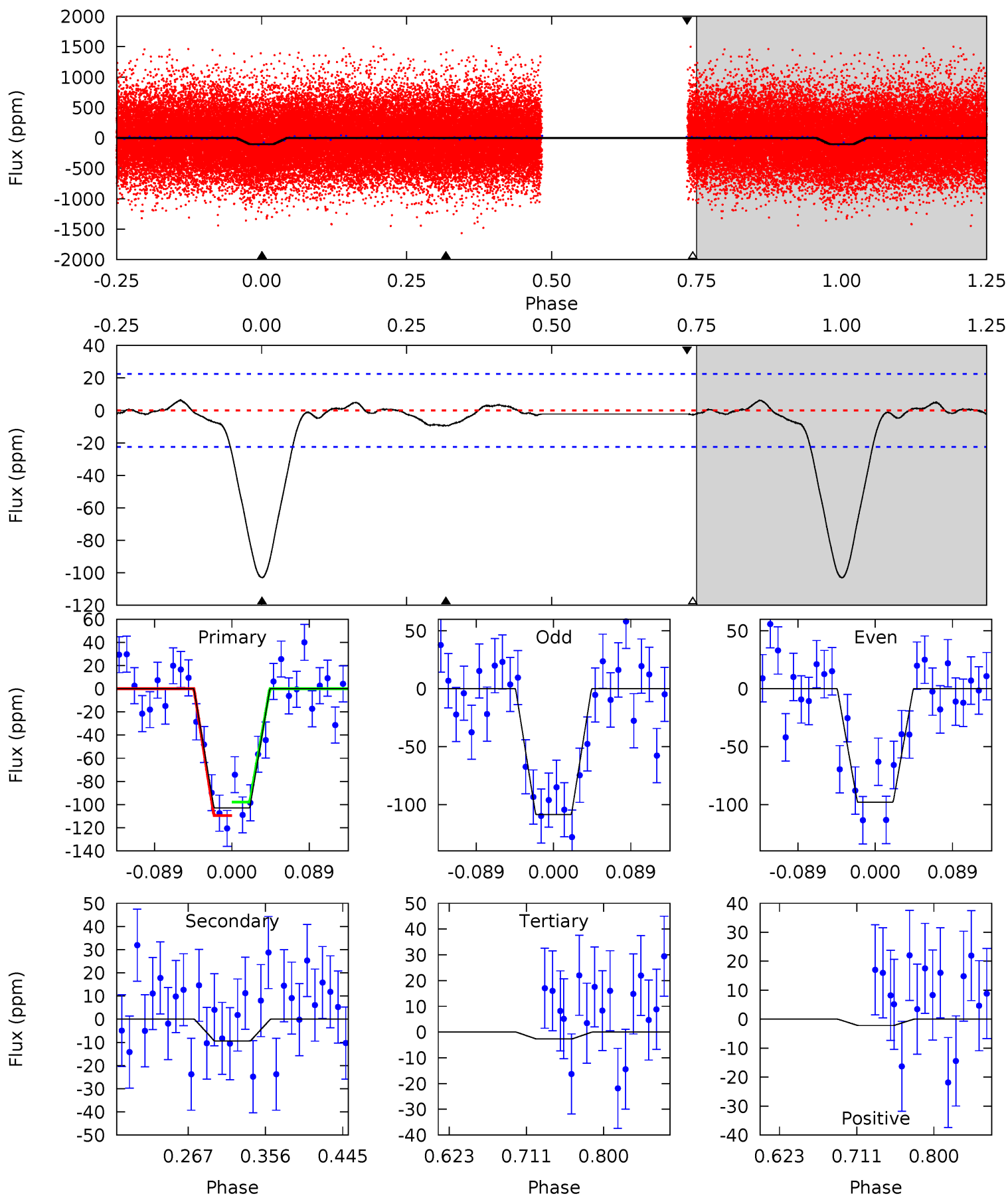
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.7	4.18	0.40	0.68	4.60	1.72	1.78	19.2	19.0	3.78	3.51	1.23	0.97	0.09	0.61



# Alt Model-Shift Uniqueness Test

005471769-02, P = 12.425672 Days, E = 121.537479 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
21.0	1.93	0.55	-0.45	4.59	1.70	0.53	20.5	21.5	1.38	2.38	1.08	1.02	0.06	1.19



### Stellar Parameters For KIC 005471769

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5742^{+155}_{-155}$	$4.564^{+0.040}_{-0.160}$	$-0.240^{+0.300}_{-0.300}$	$0.827^{+0.199}_{-0.066}$	$0.921^{+0.090}_{-0.110}$	$2.292^{+0.469}_{-1.033}$
	+3%/-3%	+1%/-4%	+125%/-125%	+24%/-8%	+10%/-12%	+20%/-45%
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 005471769-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-21 \pm 5$	$0.94^{+0.27}_{-0.28}$	$1026^{+61}_{-38}$	$4148^{+565}_{-390}$	$131^{+132}_{-57}$
Alt.	$-9 \pm 5$	$0.94^{+0.31}_{-0.26}$	$1032^{+57}_{-48}$	$3573^{+554}_{-449}$	$56^{+67}_{-33}$

$T_{max}$  = 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

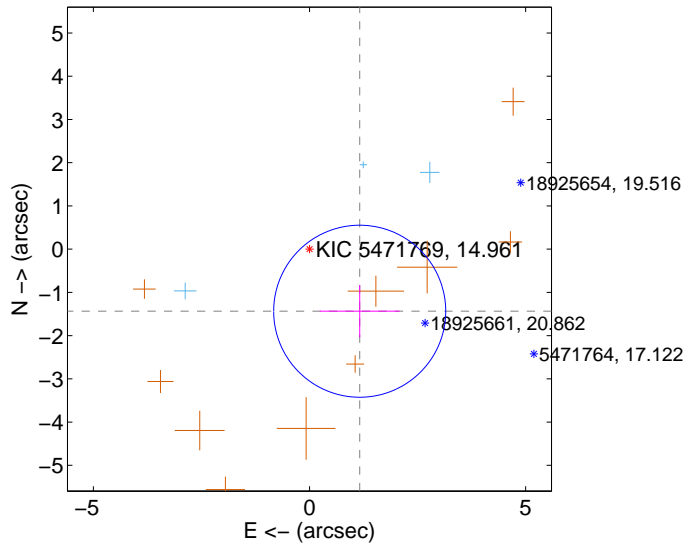
Supplemental centroid analysis for 005471769-02. Kepler magnitude: 14.96. Transit SNR 14.85

There are 3 quarters with good PRF difference image offsets

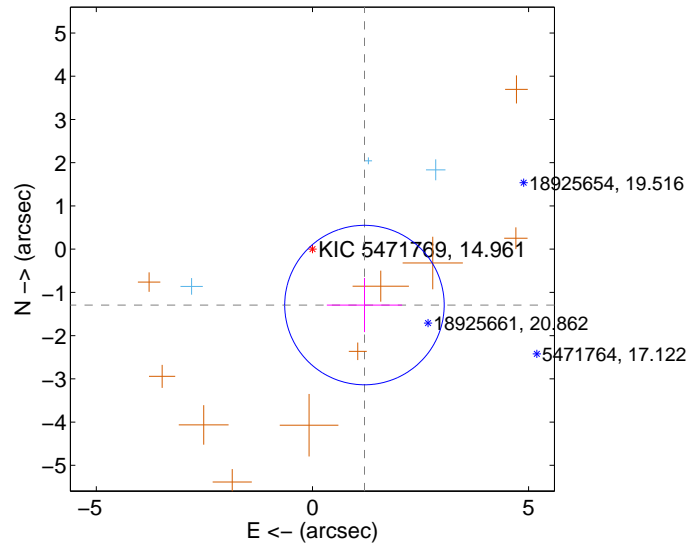
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.846 \pm 0.663$	2.78	$-1.161 \pm 0.923$	$-1.435 \pm 0.606$
PRF-fit source offset from KIC position	$1.766 \pm 0.615$	2.87	$-1.203 \pm 0.870$	$-1.293 \pm 0.627$
photometric centroid source offset	$1.99 \pm 0.89$	2.24	$-1.96 \pm 0.89$	$-0.34 \pm 0.86$

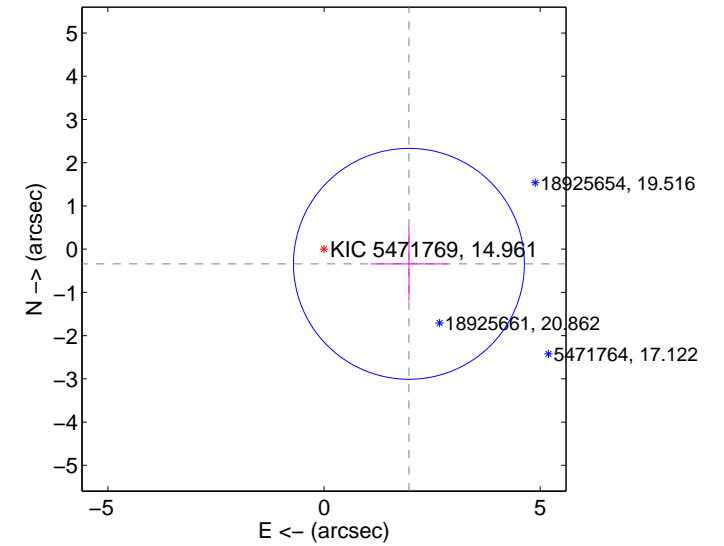
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

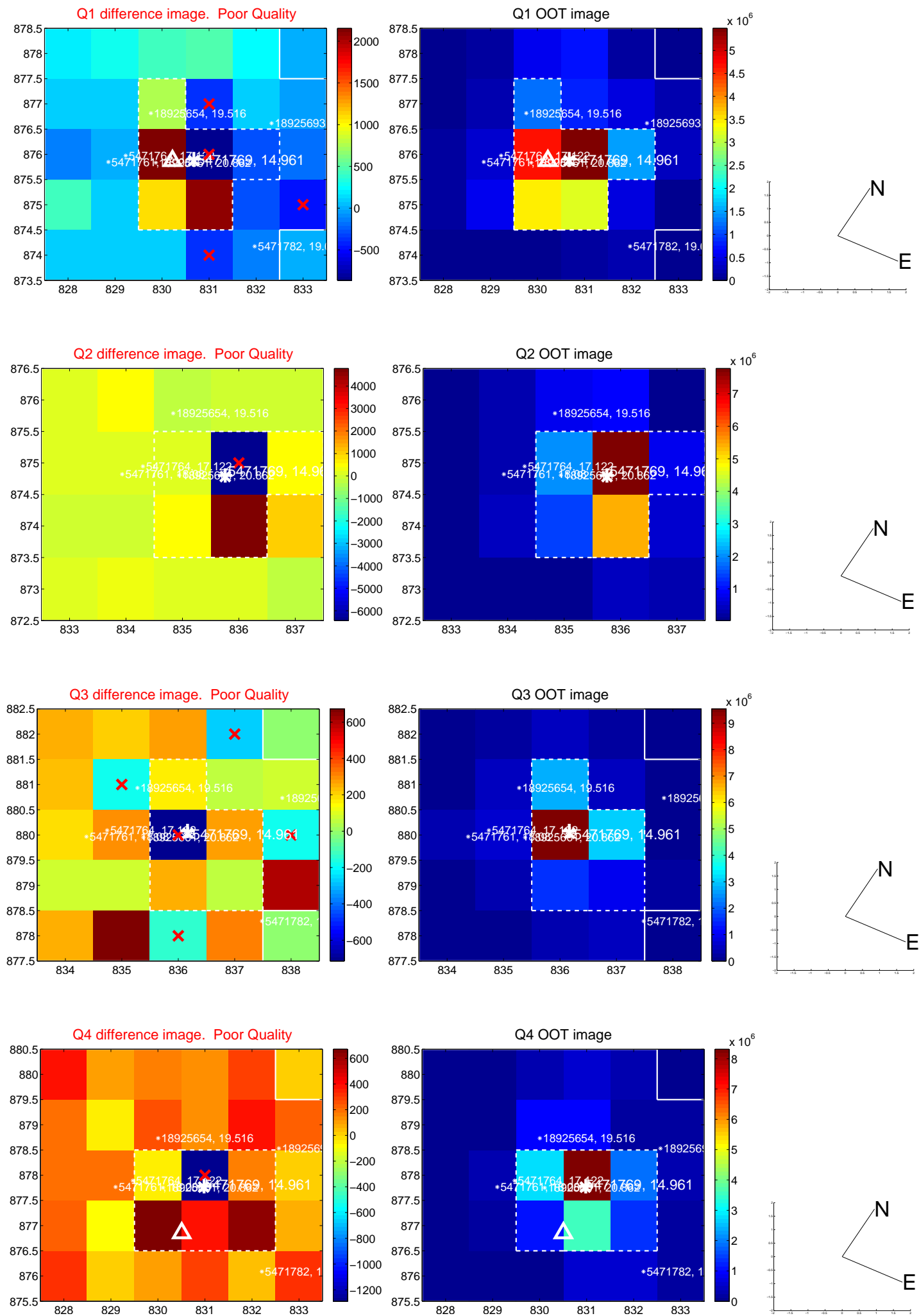


offset from photometric centroids

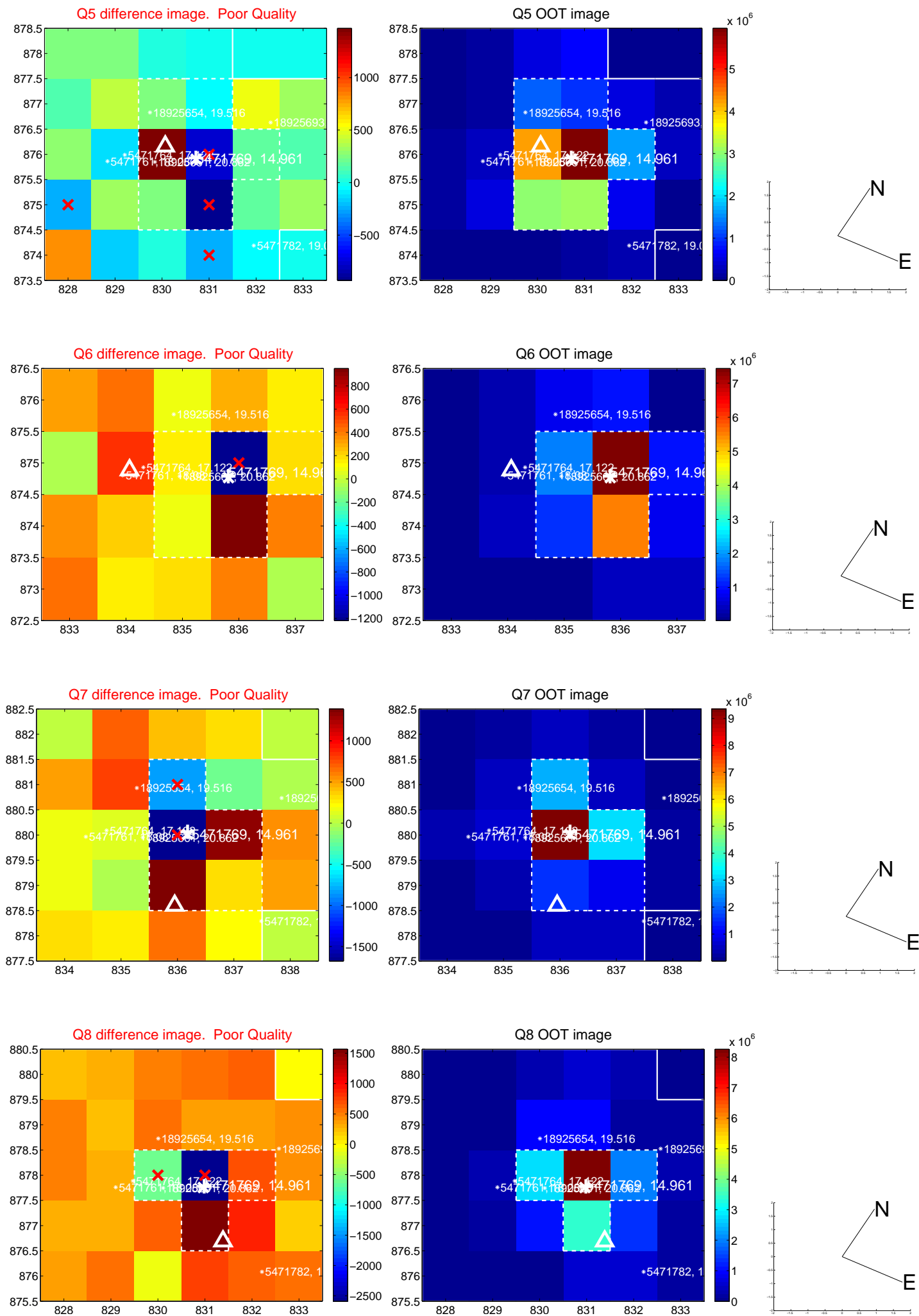


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

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

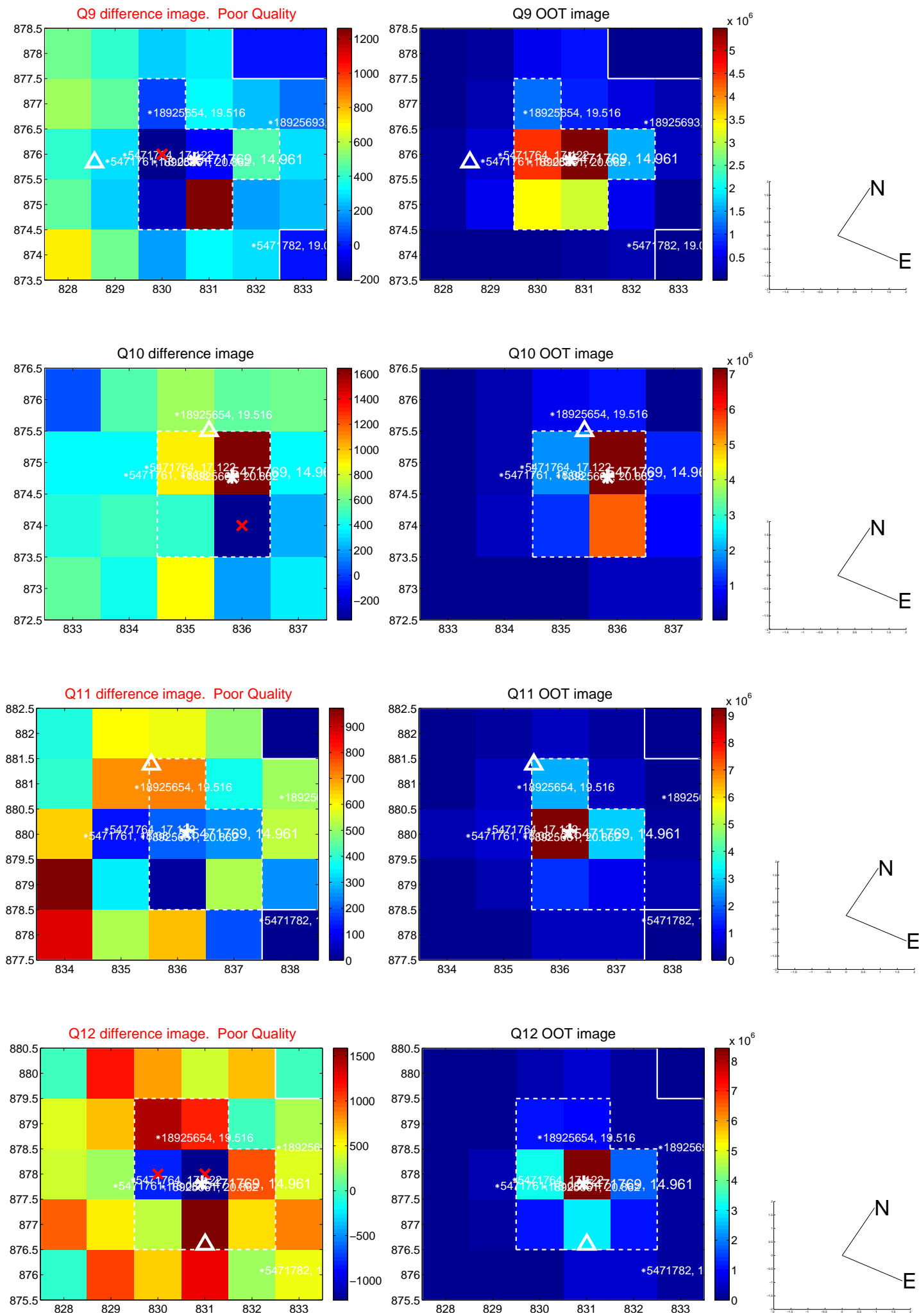


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





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







UKIRT Image

Declination

