

# KIC 005385150

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005385150-01	OBS	6001.01	12.426358	141.424817	139.7	22.627	10.7	11.9	0.89	5595	1.14	65.45
005385150-02	OBS	No	12.422630	134.270528	134.6	23.494	11.5	12.8	0.89	5595	1.10	65.48

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005385150-01	OBS	FP	0.00	1	0	1	1	LPP_DV—CENT_KIC_POS—HALO_GHOST—EPHEM_MATCH
005385150-02	OBS	FP	0.00	1	0	1	0	LPP_DV—SAME_NTL_PERIOD—HALO_GHOST

**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.

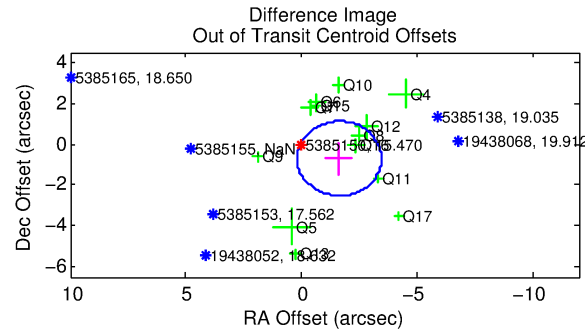
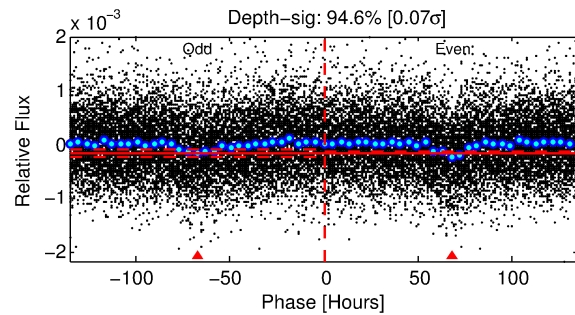
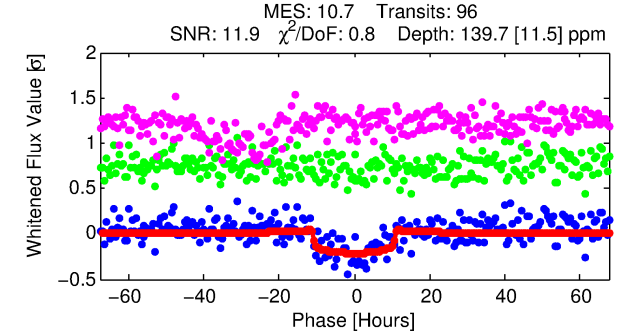
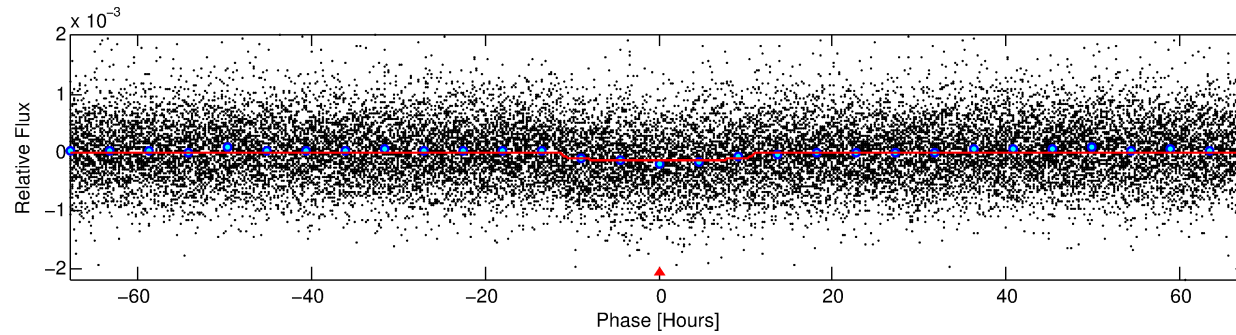
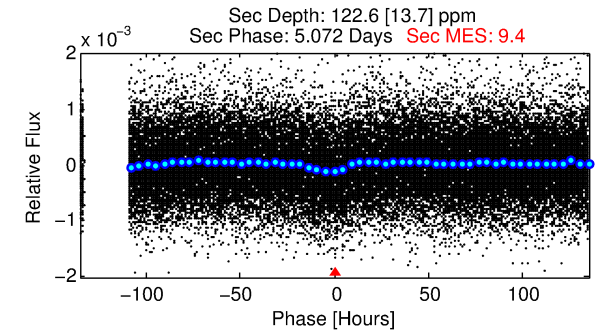
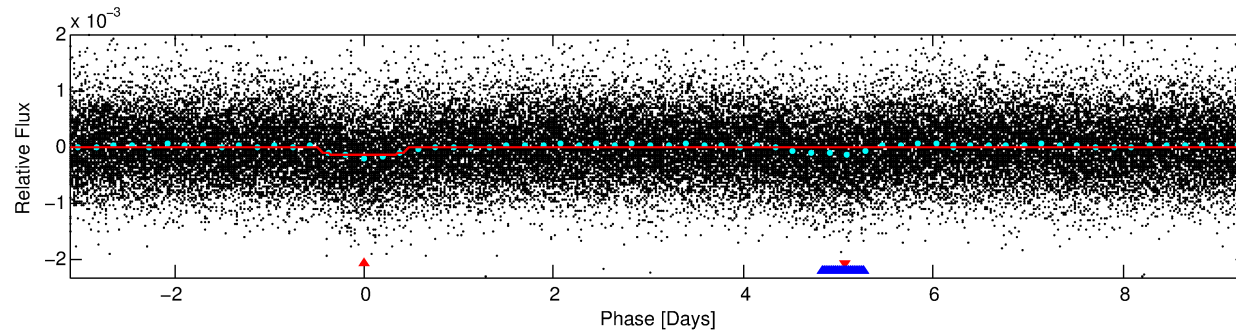
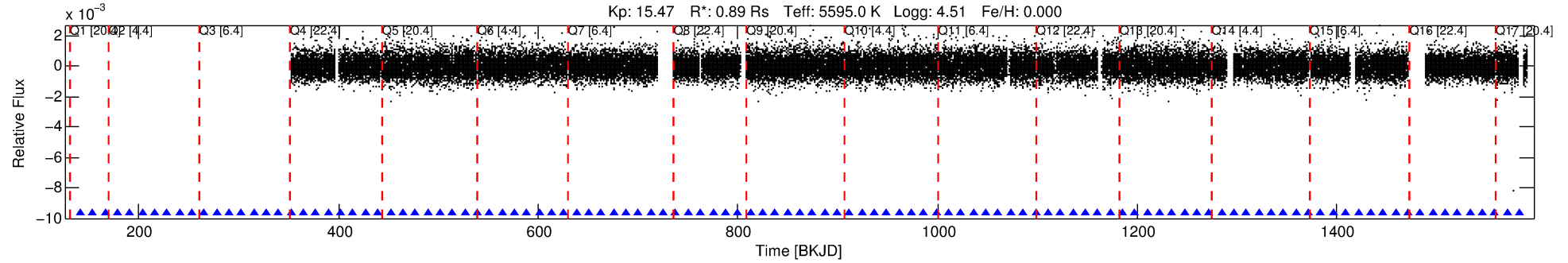
## Ephemeris Match Information For 005385150-01

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	$\sigma_P$	$\sigma_T$
005385150-01	5385150	V380-Cyg-pri	5385723	1:1	368.9	28	-88	5.77	15.47	1035.20	Direct-PRF	0	1.83	3.46

**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: 5385150 Candidate: 1 of 2 Period: 12.426 d  
KOI: K06001.01 Corr: 0.896



## DV Fit Results:

Period = 12.42636 [0.00041] d  
Epoch = 141.4248 [0.0286] BKJD  
Rp/R\* = 0.0118 [0.0028]  
a/R\* = 2.95 [2.58]  
b = 0.75 [0.57]  
Seff = 65.45 [23.02]  
Teq = 725 [64] K  
Rp = 1.14 [0.40] Re  
a = 0.1026 [0.0227] AU  
Ag = 546.92 [318.83] [1.71σ]  
Teffp = 5423 [680] K [6.88σ]

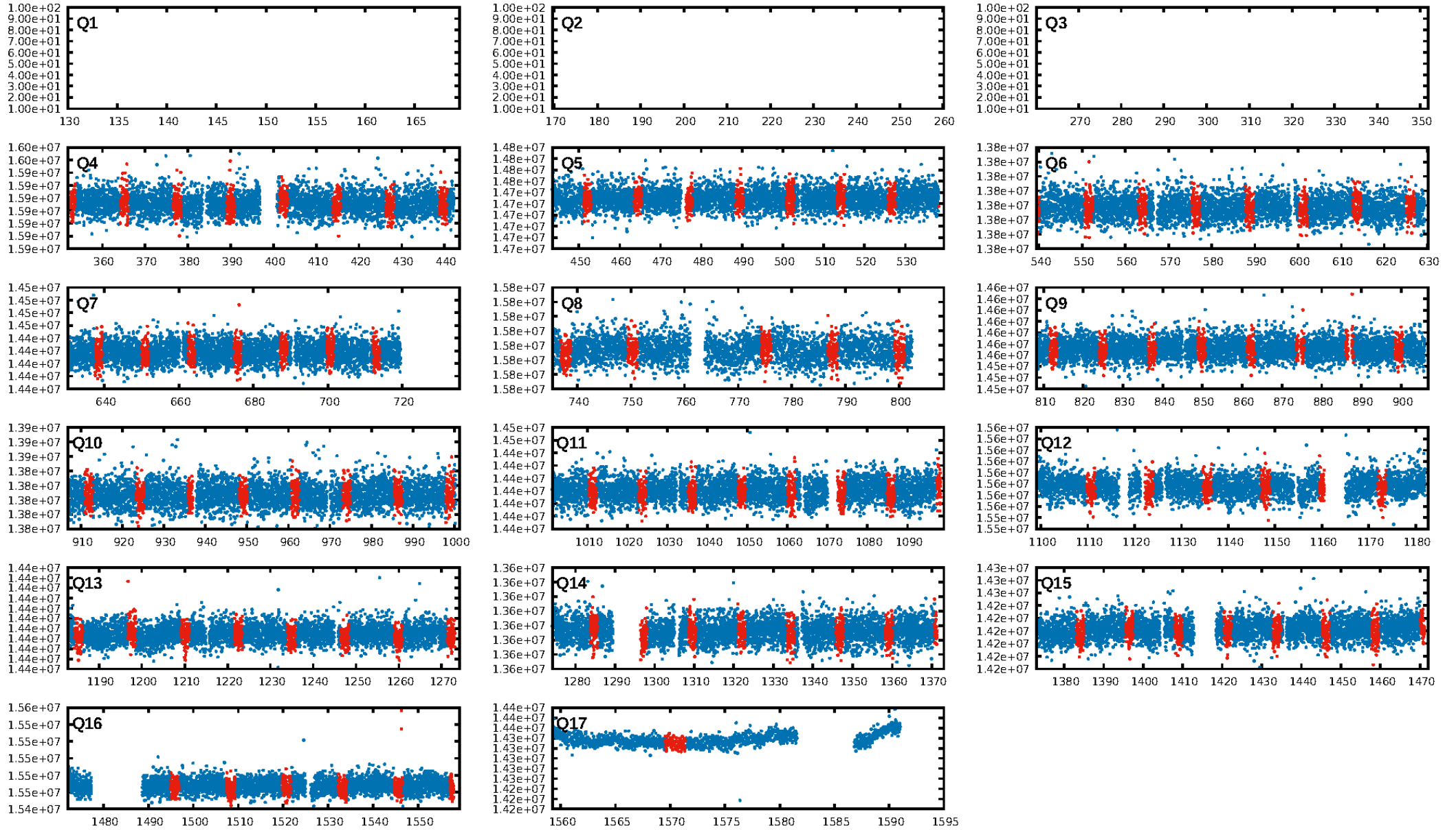
## DV Diagnostic Results:

ShortPeriod-sig: 0.2% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 73.7%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.47e-31  
RollingBand-fgt: 1.00 [95/95]  
GhostDiagnostic-chr: 0.1196  
Centroid-sig: 63.4%  
Centroid-so: 0.127 arcsec [0.16σ]  
OotOffset-rm: 1.771 arcsec [2.91σ]  
KicOffset-rm: 1.729 arcsec [2.99σ]  
OotOffset-st: 2/3/4/4 [13]  
KicOffset-st: 2/3/4/4 [13]  
DiffImageQuality-fgm: 0.31 [4/13]  
DiffImageOverlap-fno: 1.00 [14/14]

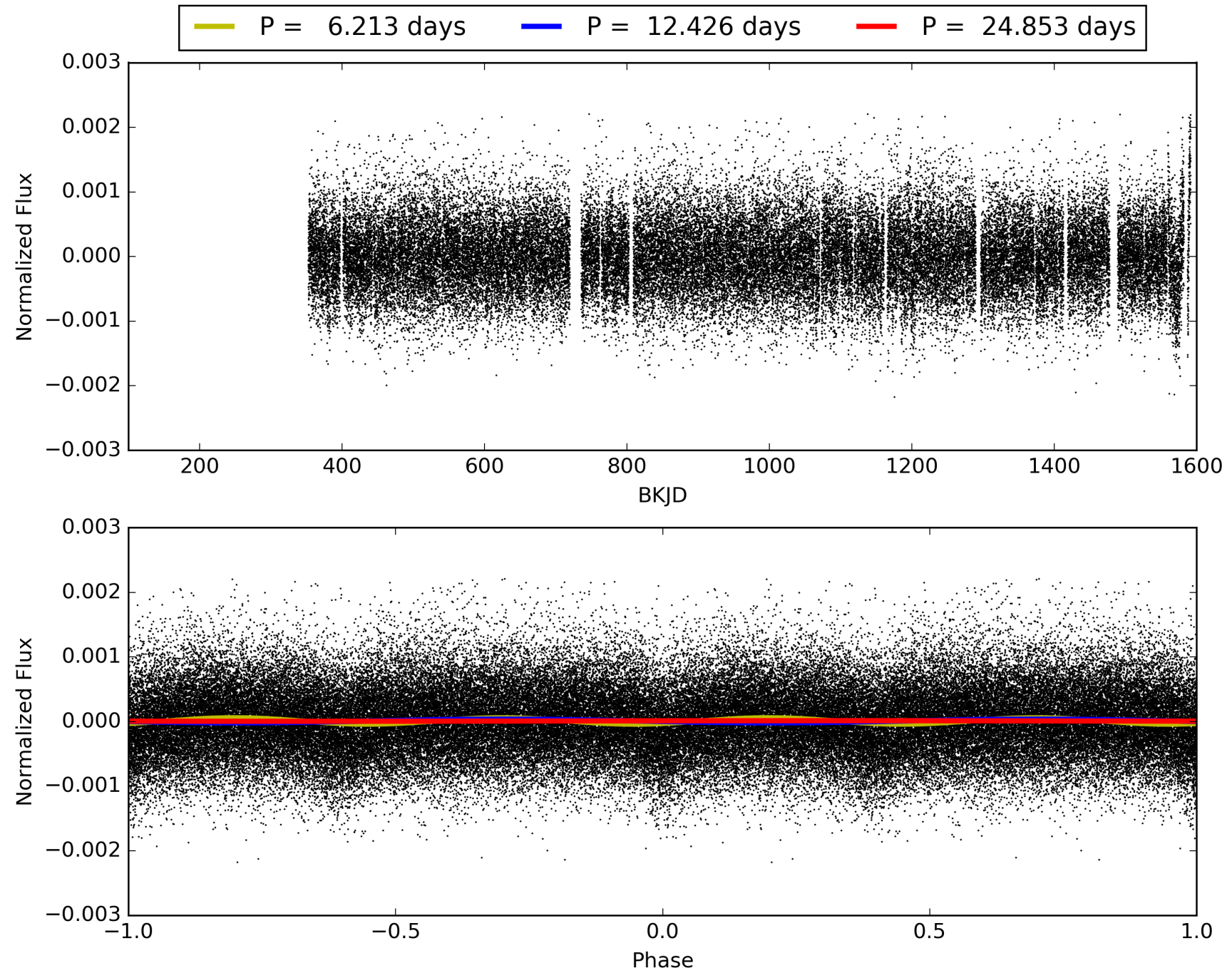
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 16:07:38 Z

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

# TCE 005385150-01, PDC Light Curves

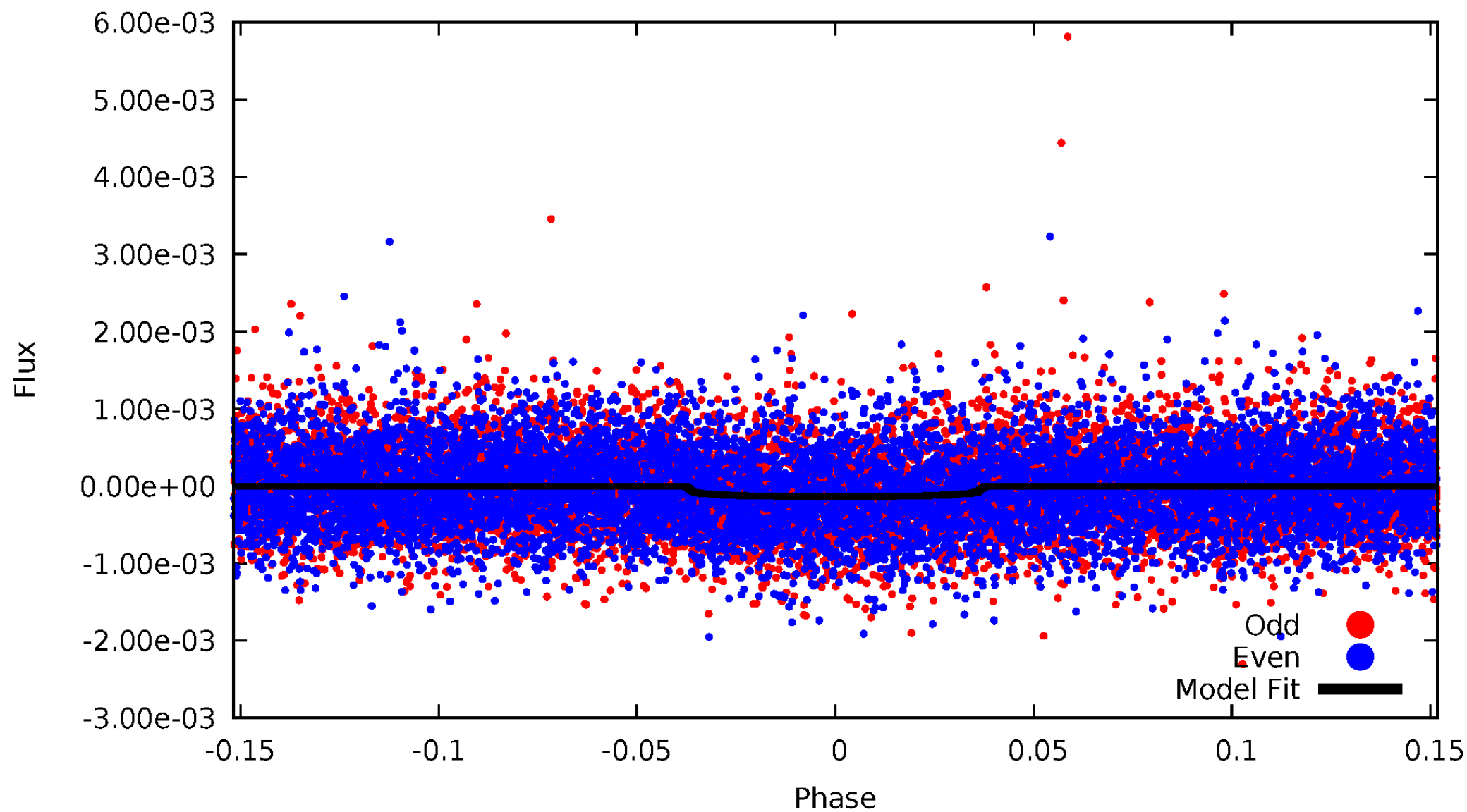


TCE 005385150-01



# DV Odd/Even

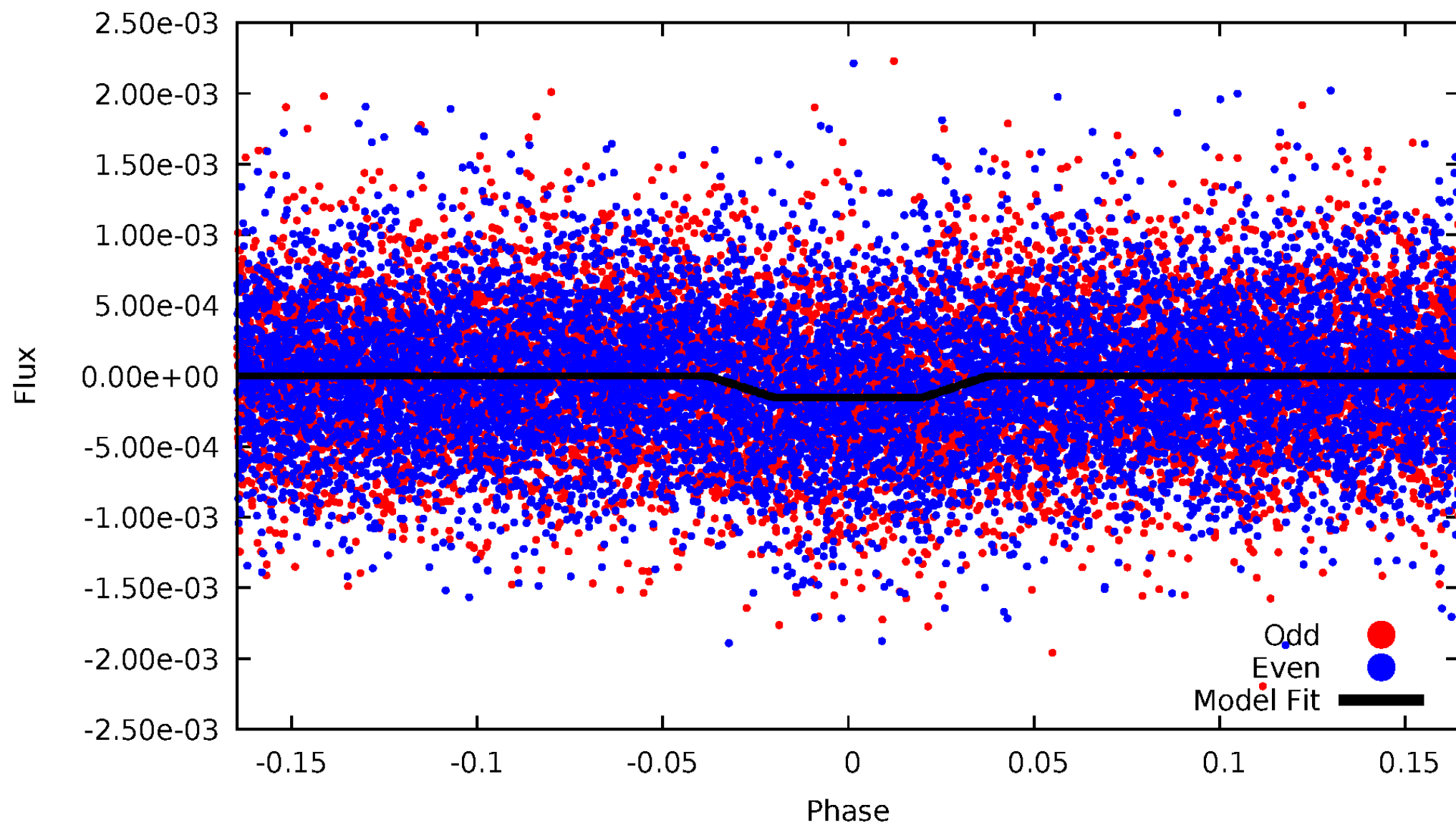
TCE 005385150-01





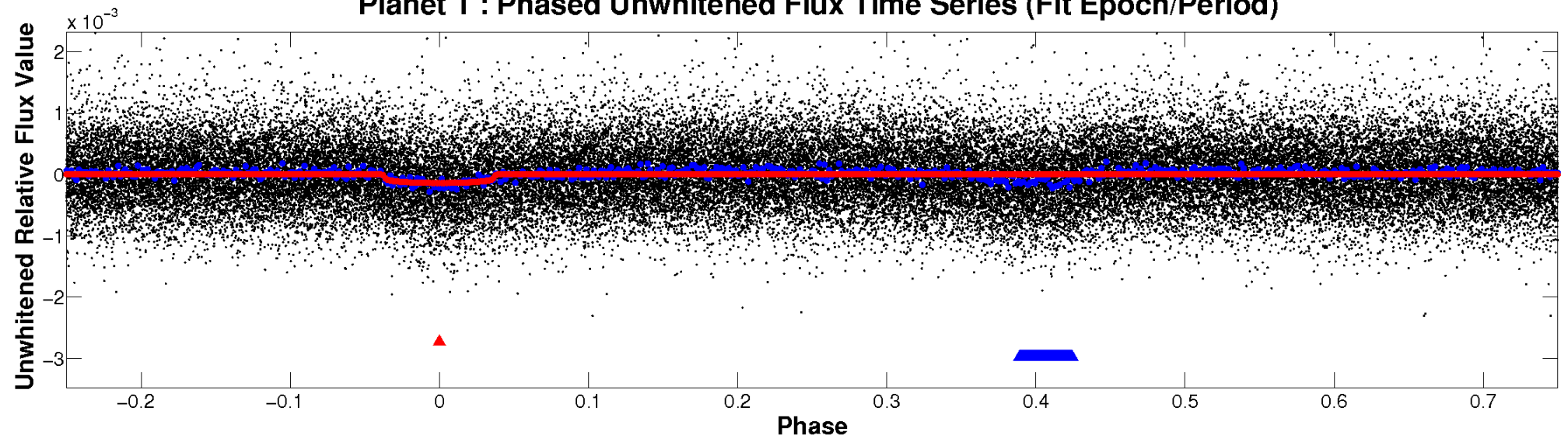
# ALT Odd/Even

TCE 005385150-01

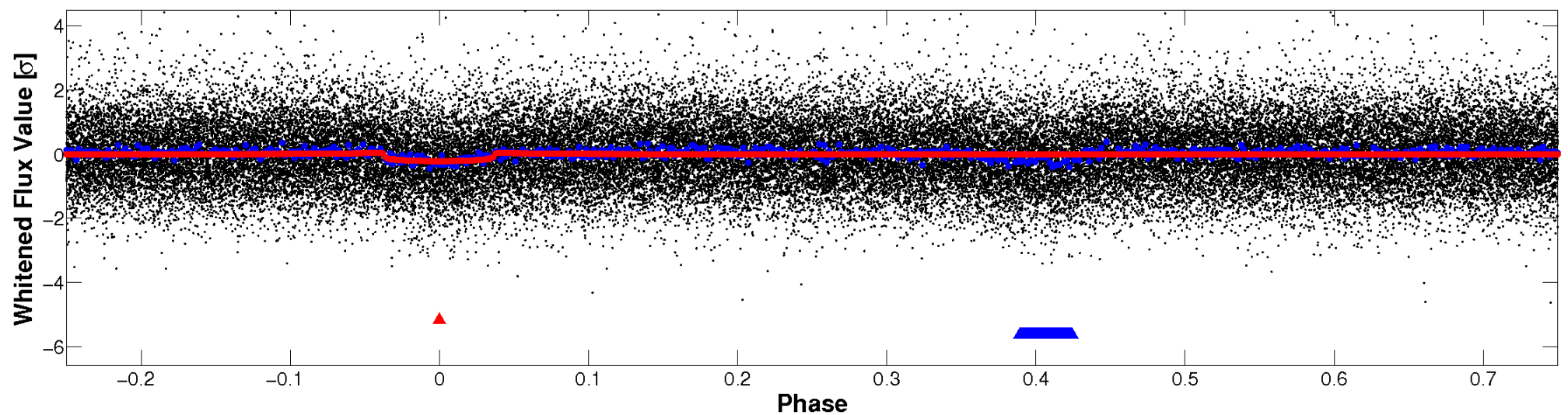


# Non-Whitened Vs. Whitened Light Curve

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

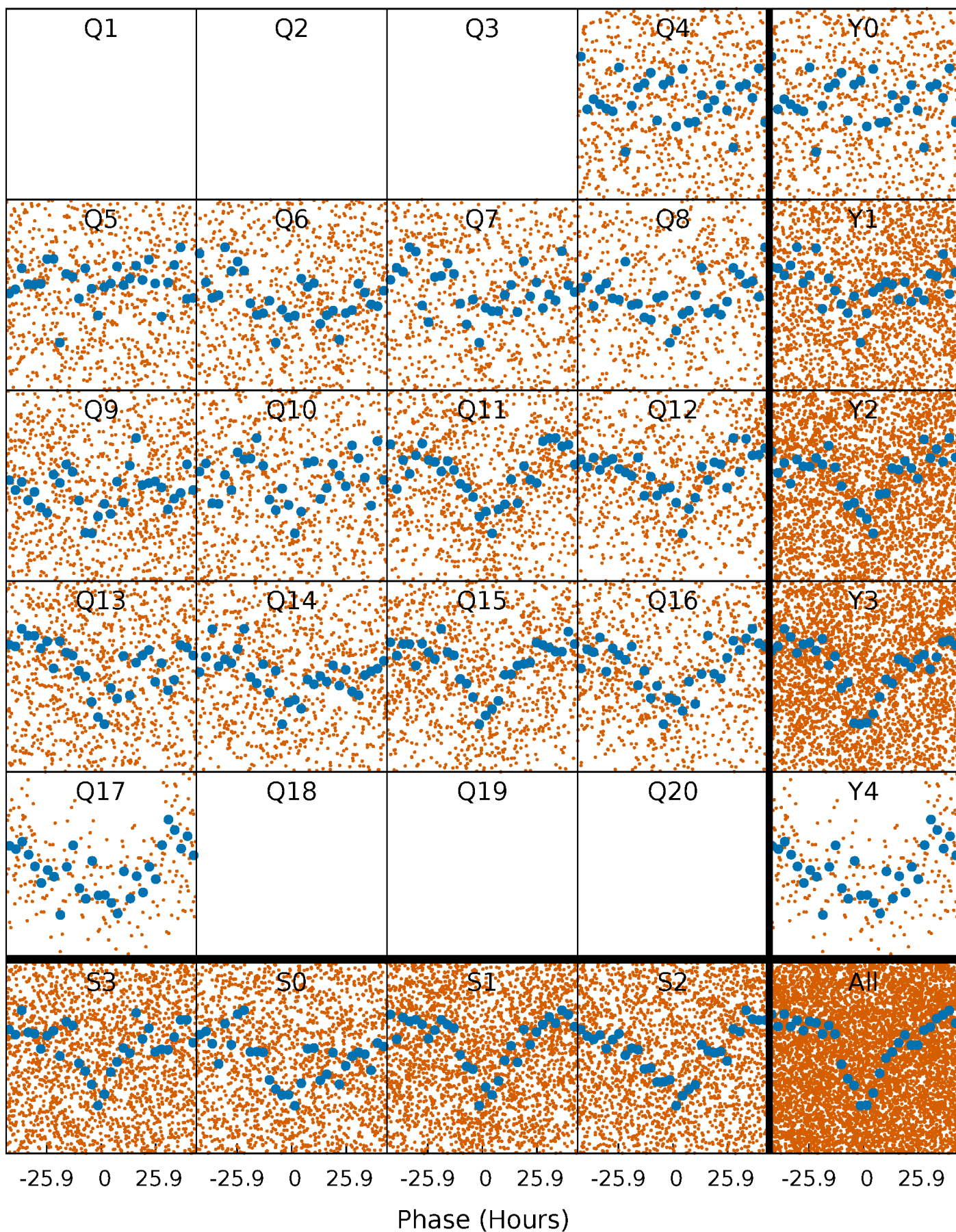


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

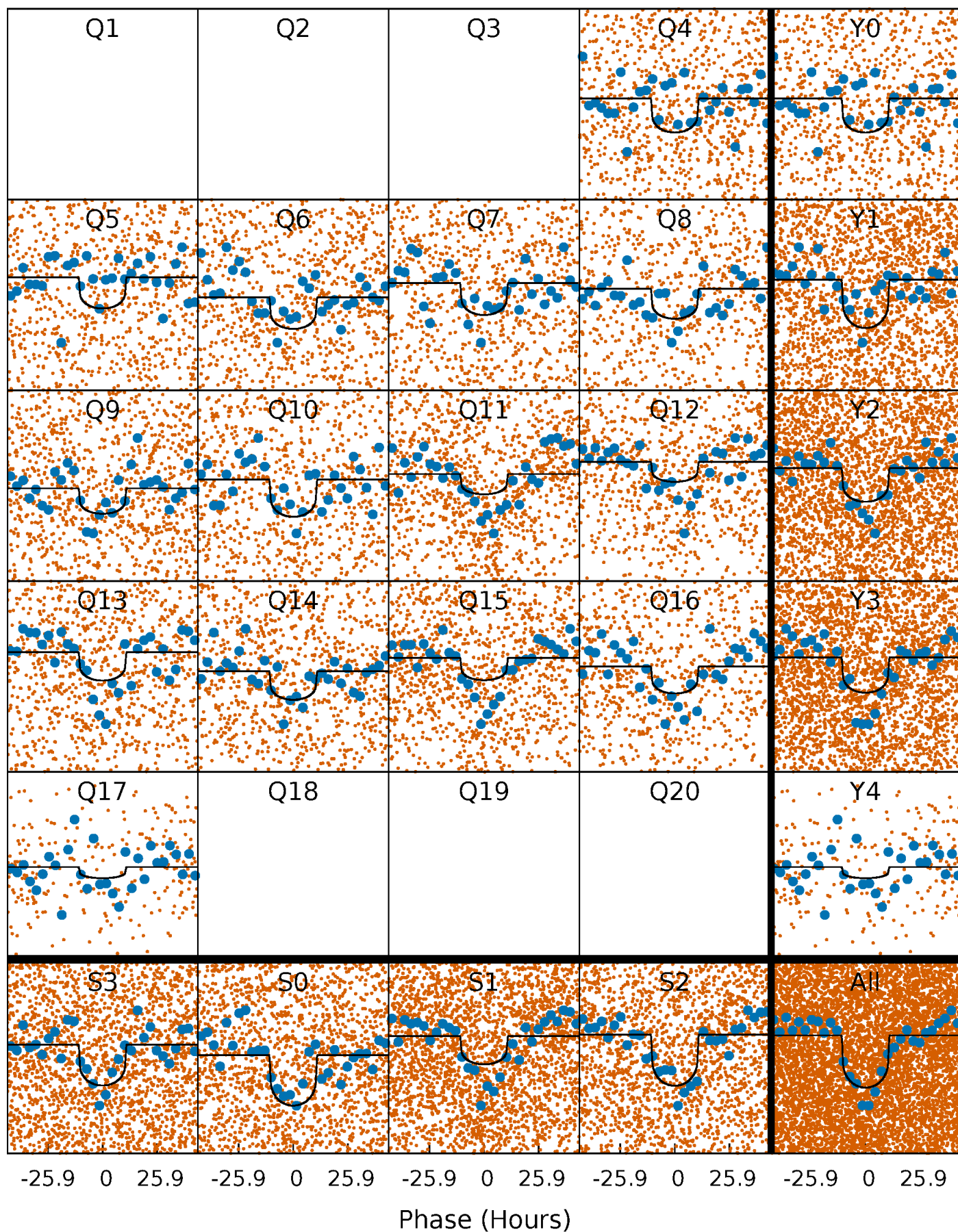
TCE 005385150-01 P= 12.426358 Days  $T_0=141.424817$  (BKJD)





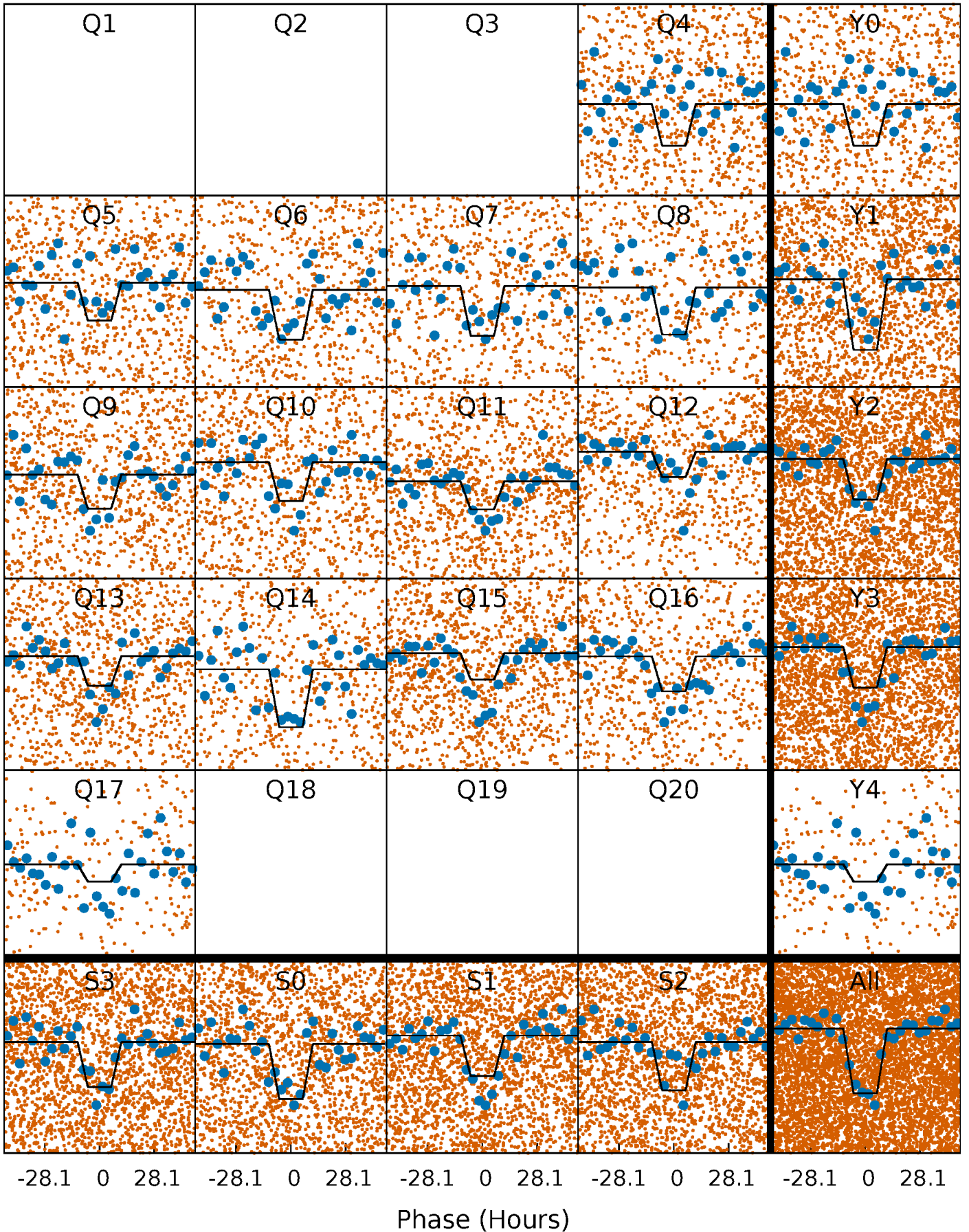
# DV Quarter-Phased Transit Curves

TCE 005385150-01 P= 12.426358 Days  $T_0=141.424817$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

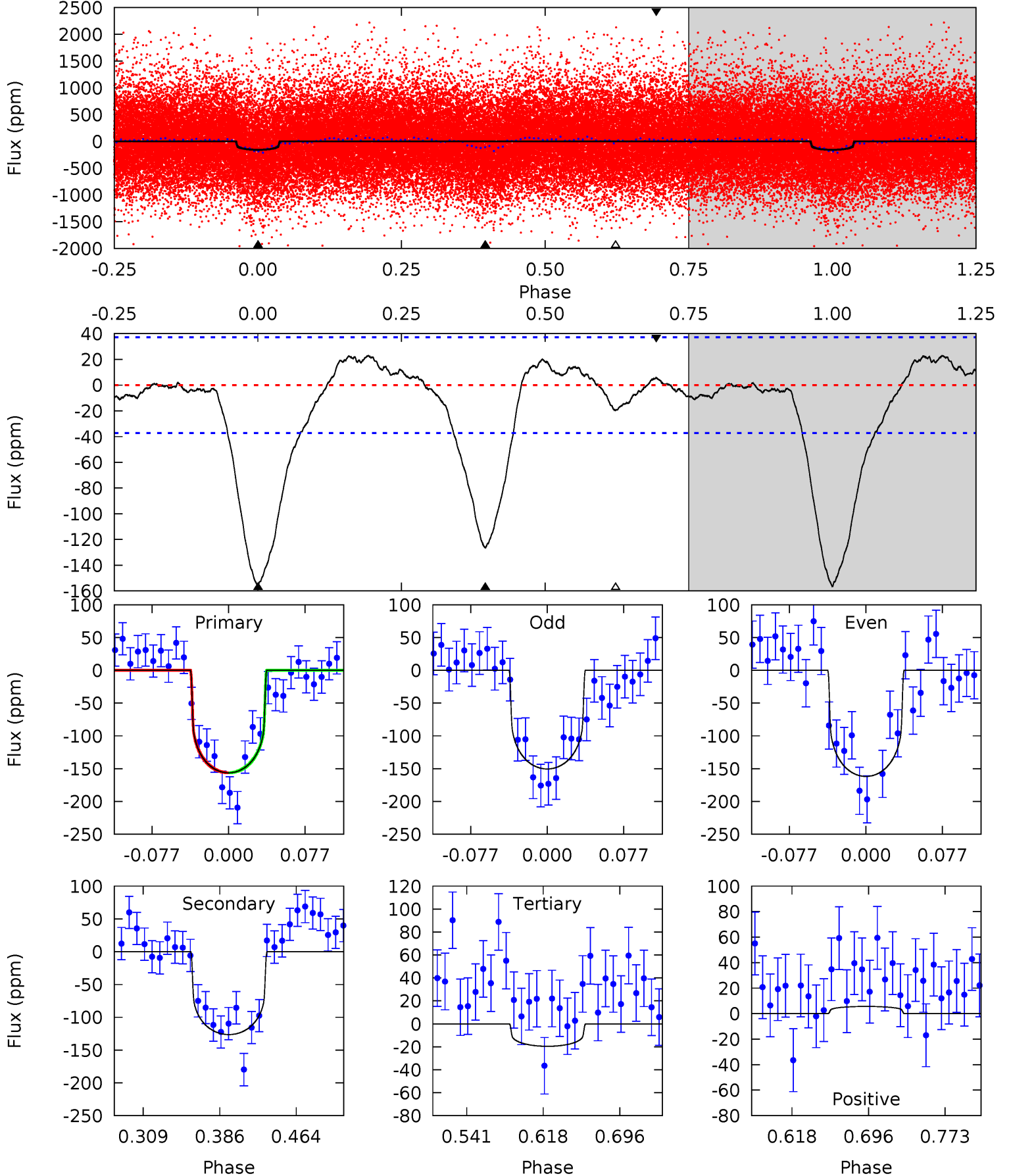
TCE 005385150-01 P= 12.427791 Days  $T_0=141.277185$  (BKJD)



# DV Model-Shift Uniqueness Test

005385150-01, P = 12.426358 Days, E = 141.424817 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
19.4	15.7	2.43	0.70	4.62	1.77	1.40	17.0	18.7	13.3	15.0	0.71	1.09	0.13	0.00

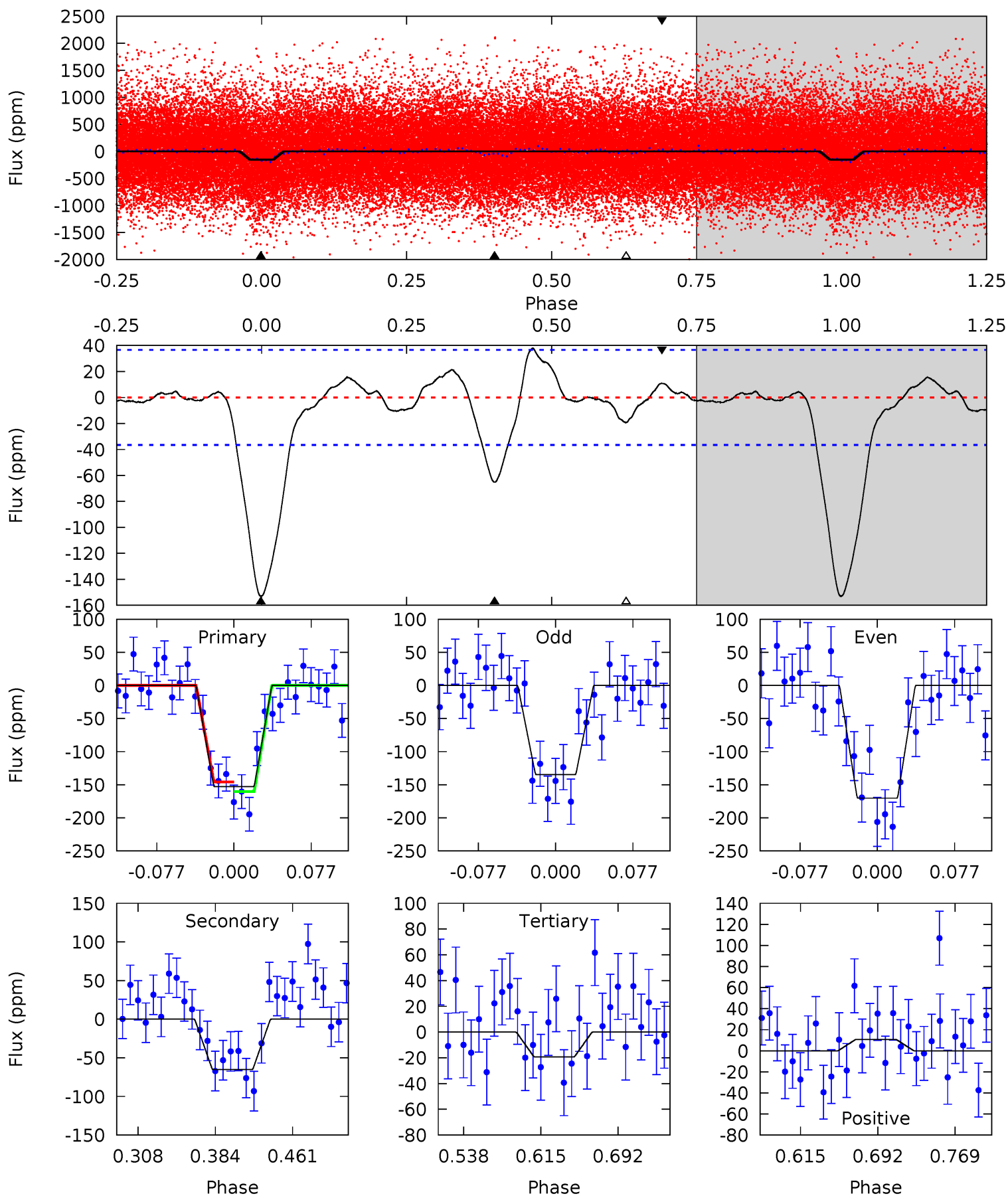




# Alt Model-Shift Uniqueness Test

005385150-01, P = 12.427791 Days, E = 141.277185 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
19.3	8.23	2.43	1.37	4.62	1.77	1.13	16.9	17.9	5.80	6.86	2.25	1.02	0.20	0.92





### Stellar Parameters For KIC 005385150

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5595^{+186}_{-186}$	$4.513^{+0.048}_{-0.180}$	$0.000^{+0.250}_{-0.300}$	$0.886^{+0.229}_{-0.098}$	$0.933^{+0.104}_{-0.095}$	$1.889^{+0.465}_{-0.915}$
	+3%/-3%	+1%/-4%	+inf%/-inf%	+26%/-11%	+11%/-10%	+25%/-48%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 005385150-01 / KOI 6001.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-126 \pm 8$	$1.19^{+0.31}_{-0.31}$	$1034^{+68}_{-50}$	$5488^{+812}_{-527}$	$512^{+415}_{-199}$
Alt.	$-65 \pm 8$	$1.25^{+0.33}_{-0.28}$	$1039^{+60}_{-49}$	$4684^{+550}_{-410}$	$237^{+167}_{-86}$

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

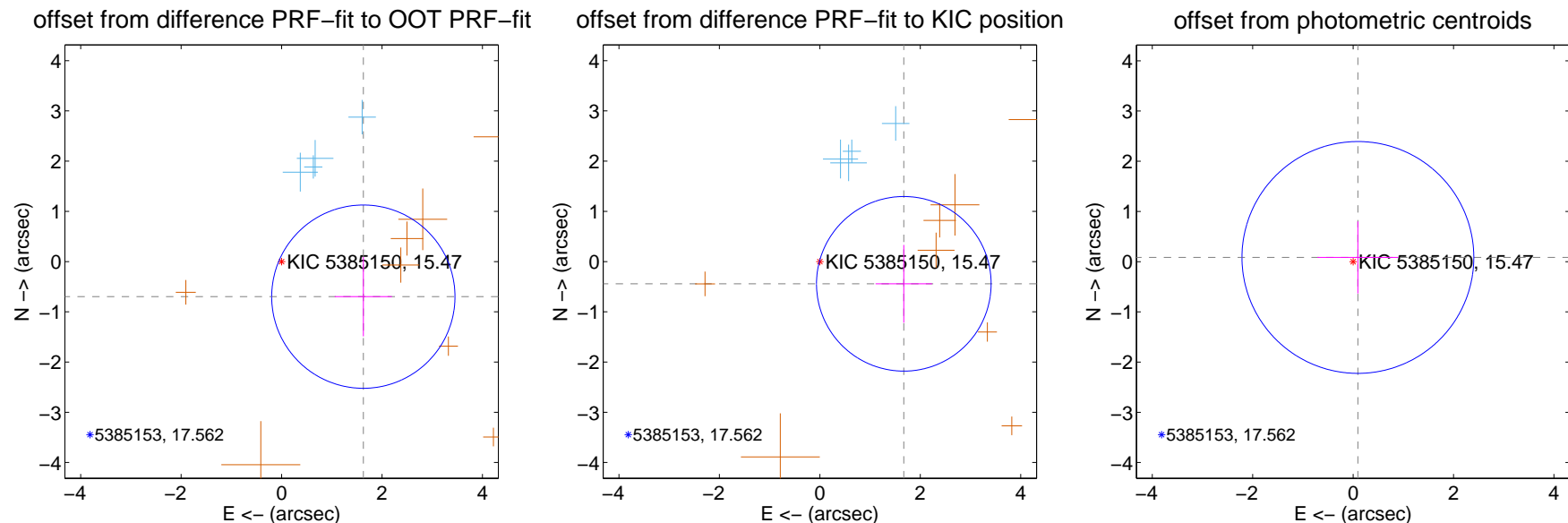
## DV Centroid Data

Supplemental centroid analysis for 005385150-01. Kepler magnitude: 15.47. Transit SNR 11.86

There are 4 quarters with good PRF difference image offsets

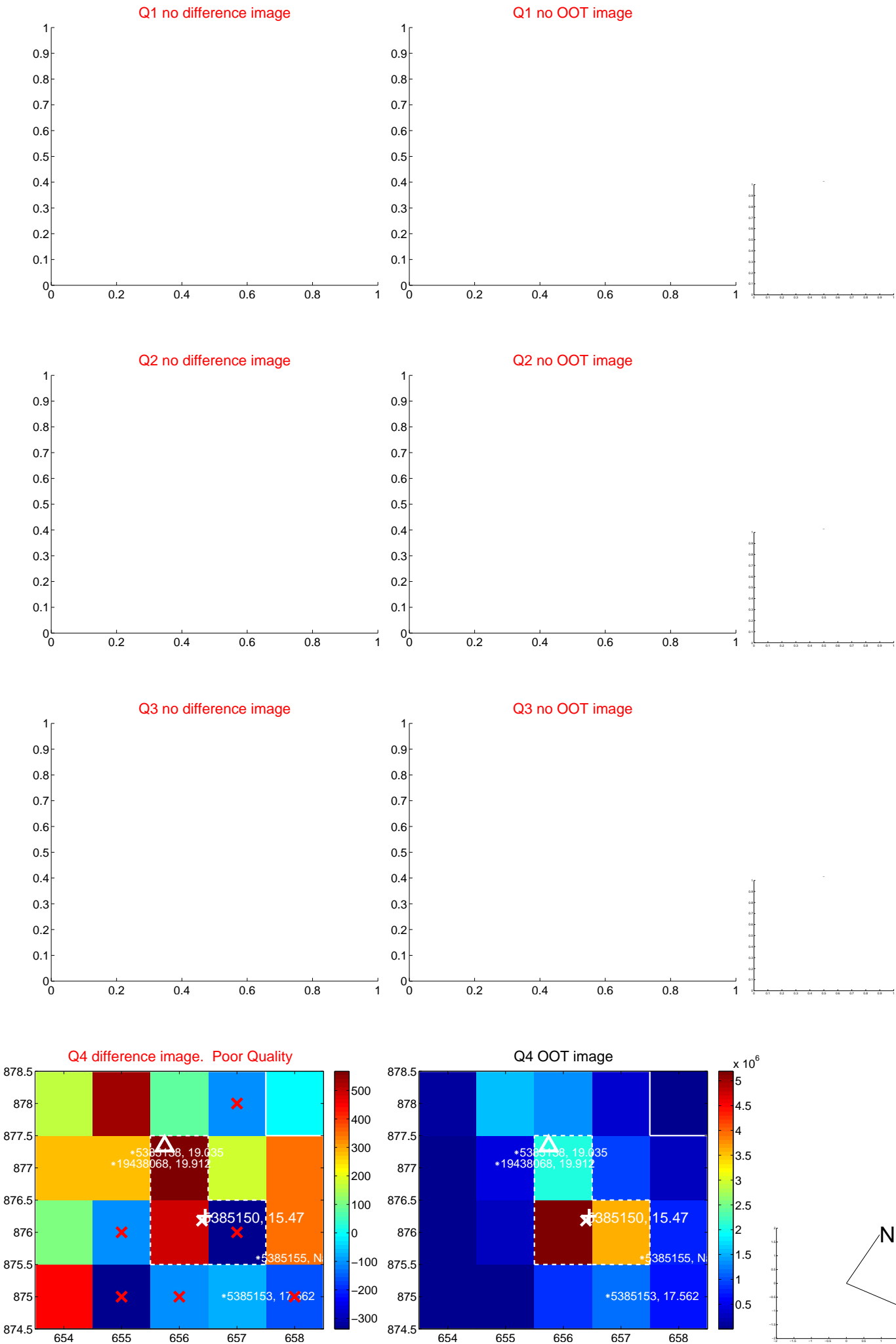
The direct PRF centroid is offset from the target star catalog position by about 0.45 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.771 \pm 0.608$	2.91	$-1.628 \pm 0.568$	$-0.698 \pm 0.790$
PRF-fit source offset from KIC position	$1.729 \pm 0.579$	2.99	$-1.672 \pm 0.563$	$-0.443 \pm 0.775$
photometric centroid source offset	$0.13 \pm 0.77$	0.16	$-0.10 \pm 0.81$	$0.08 \pm 0.72$

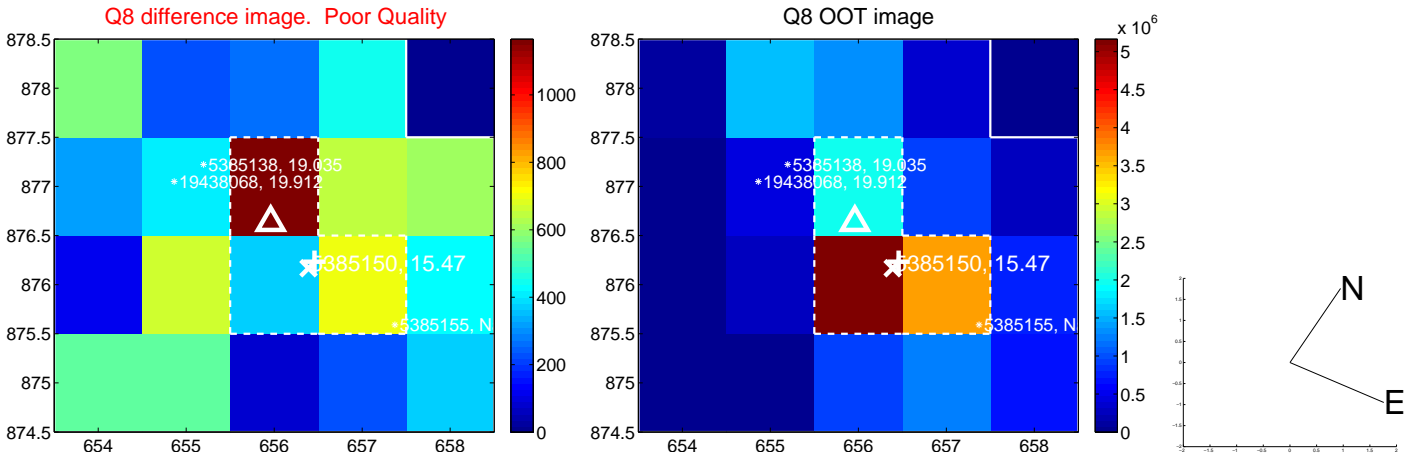
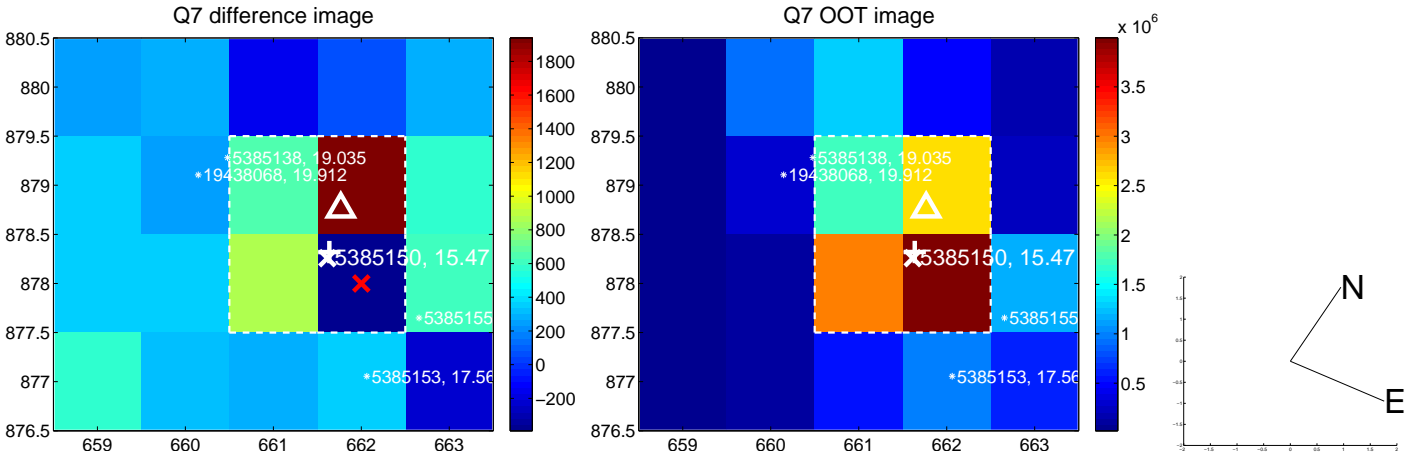
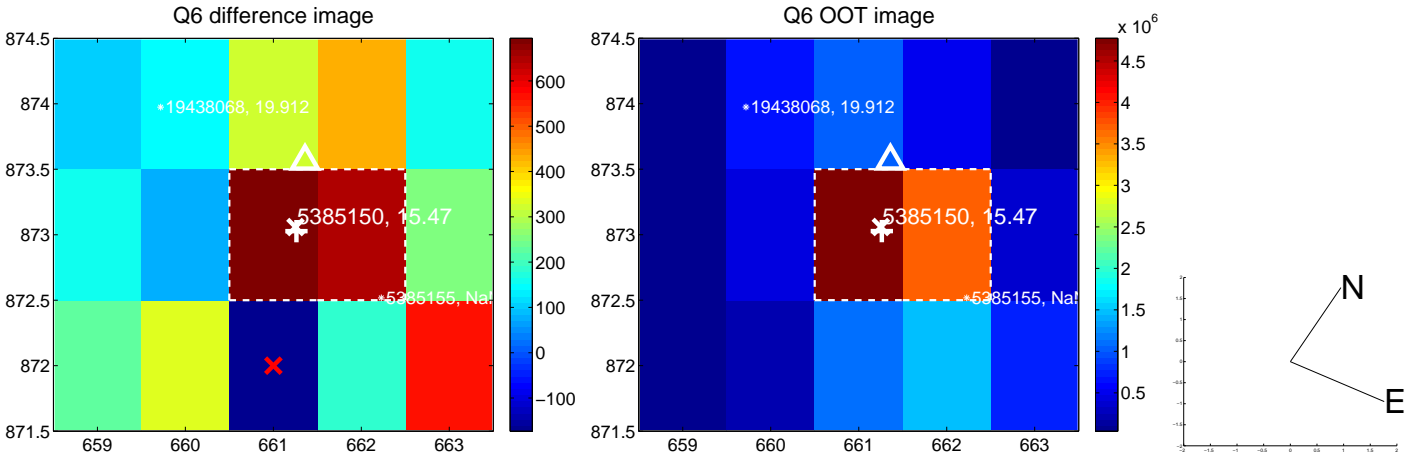
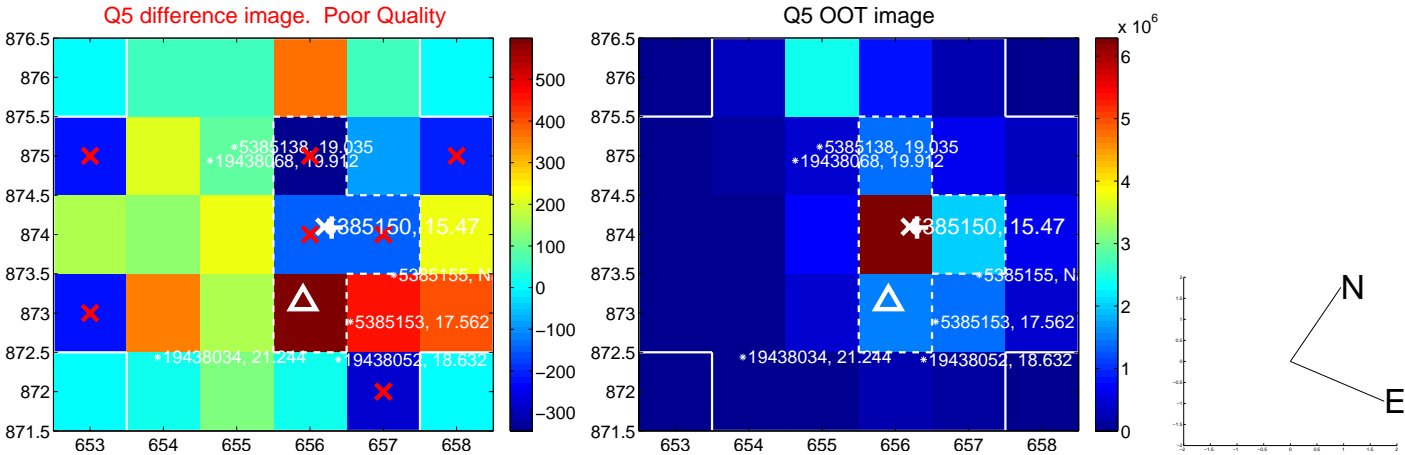


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: 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 ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

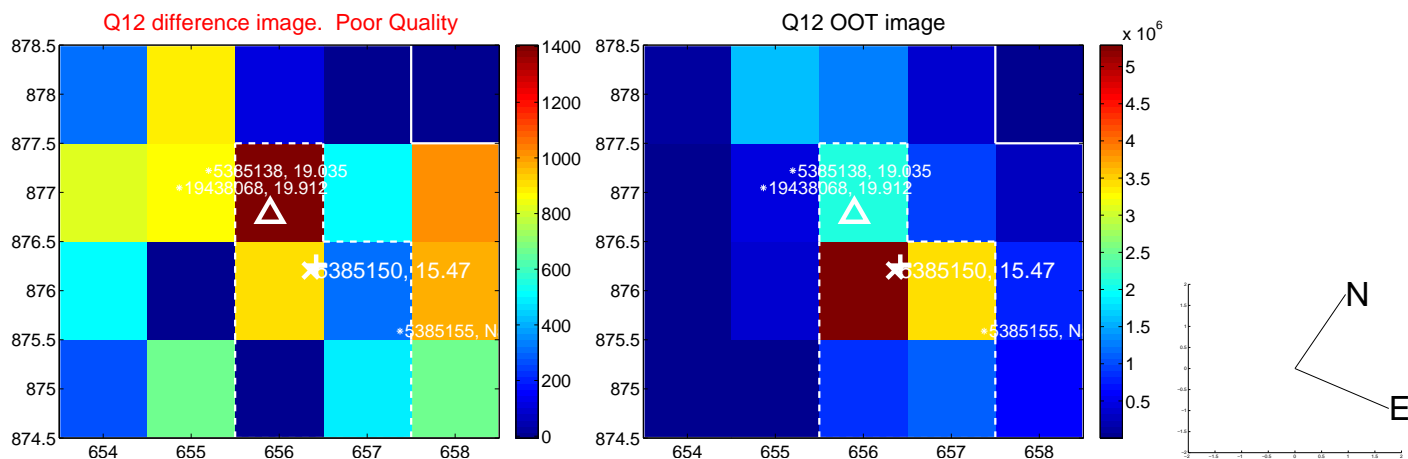
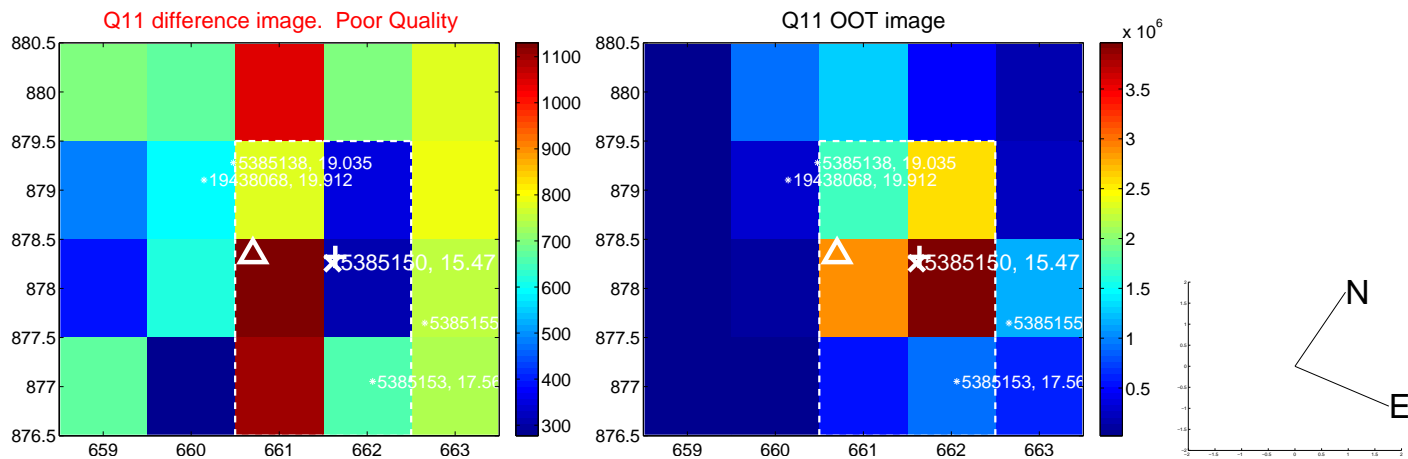
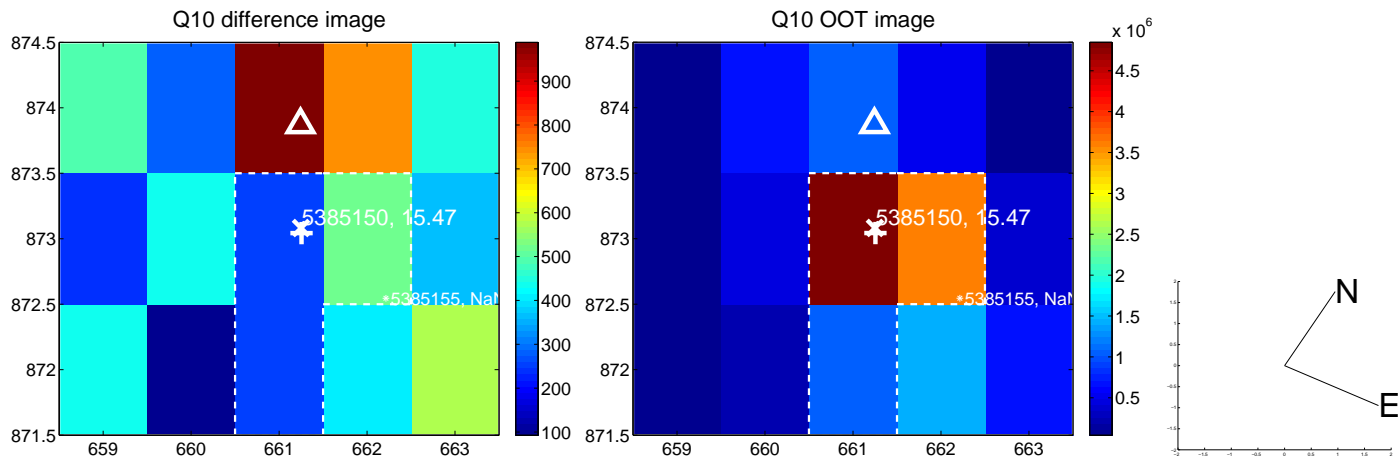
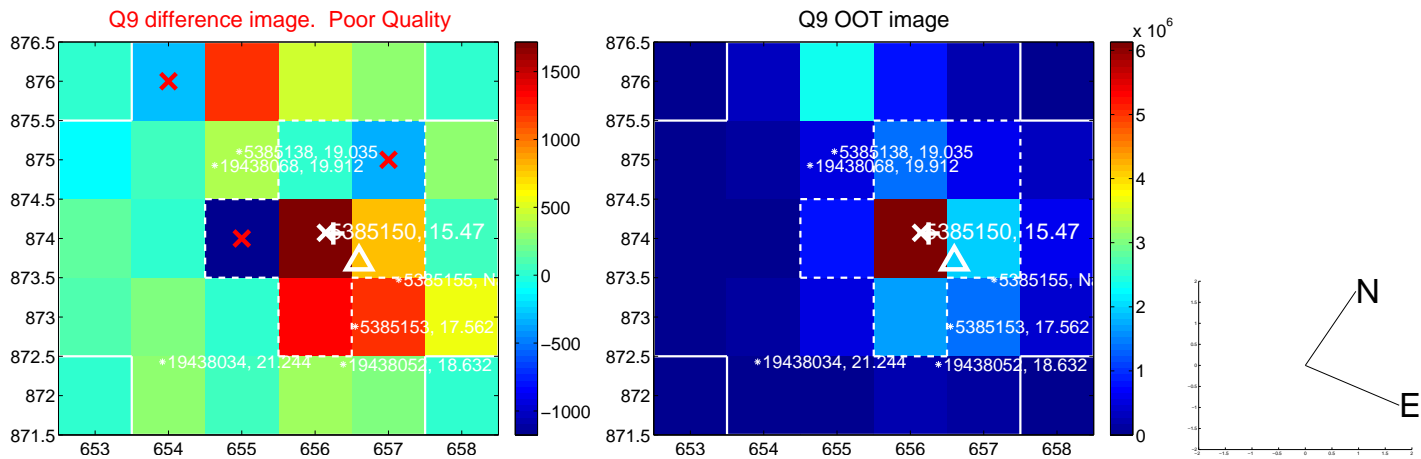


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

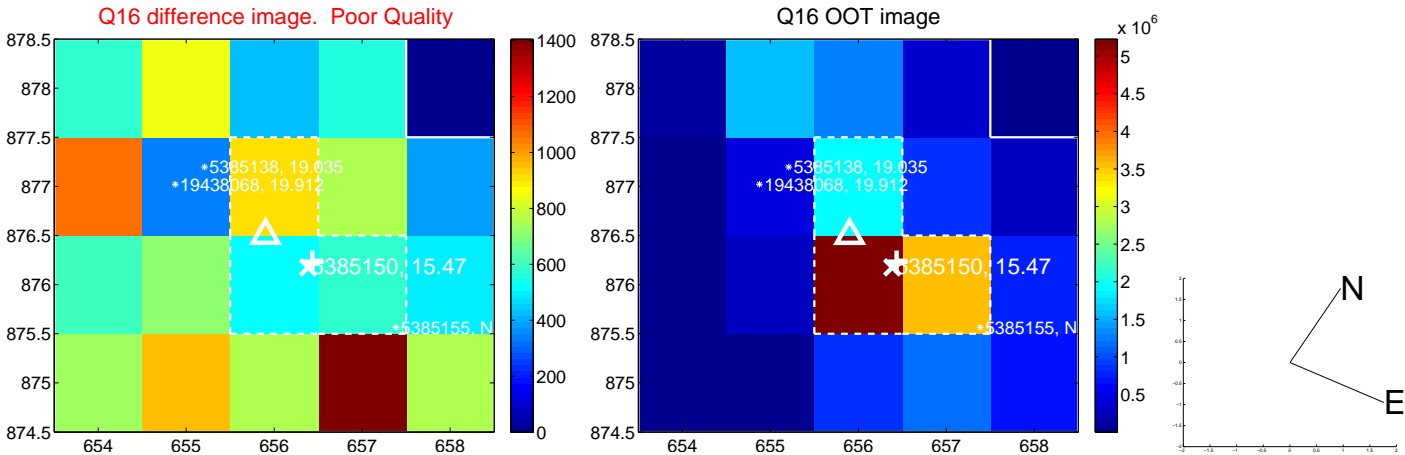
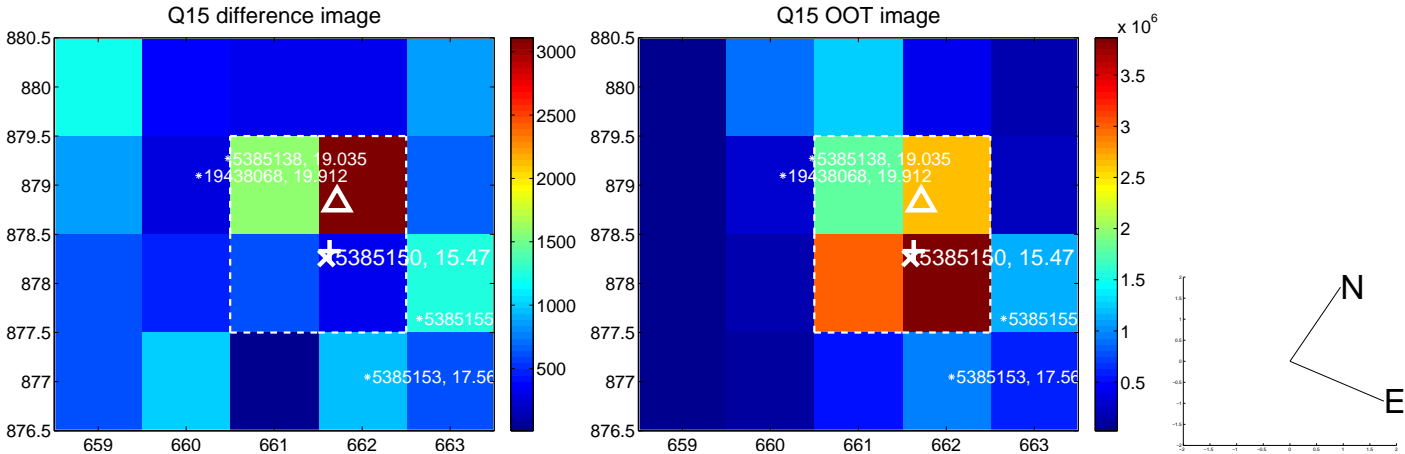
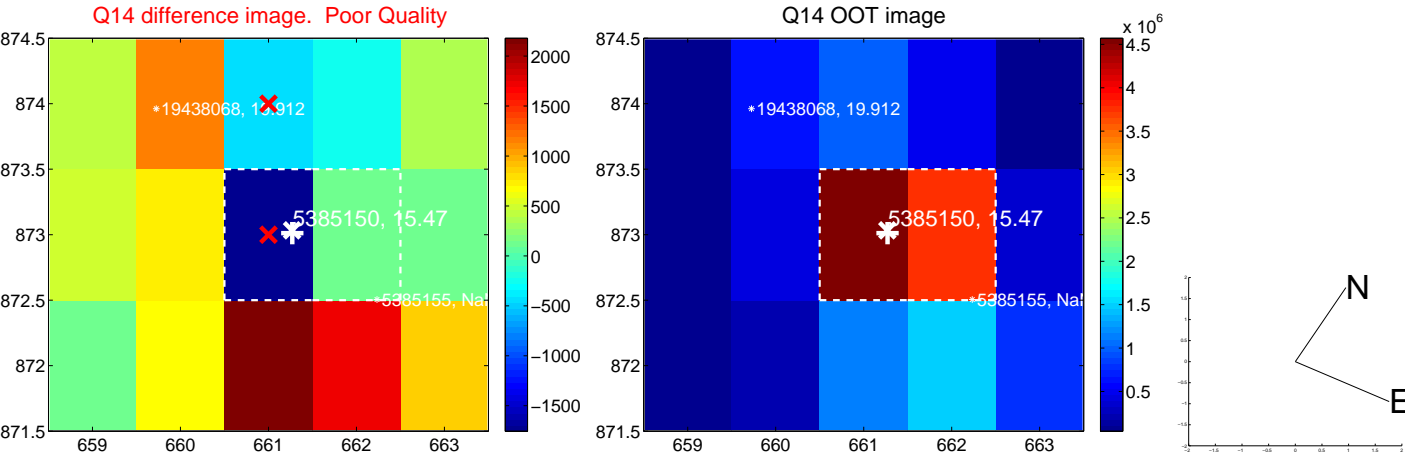
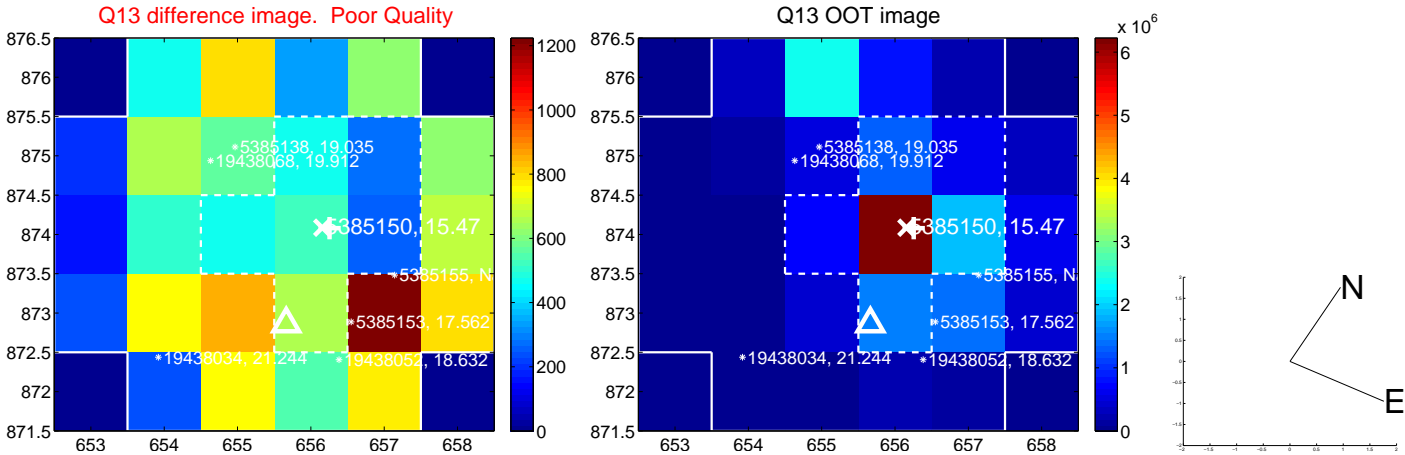




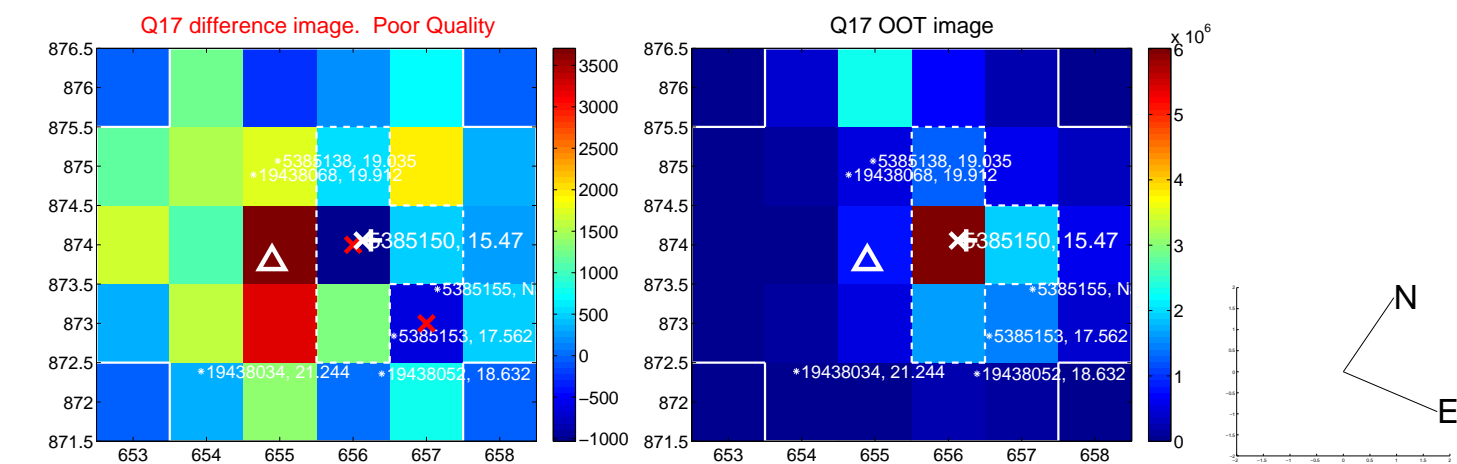
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



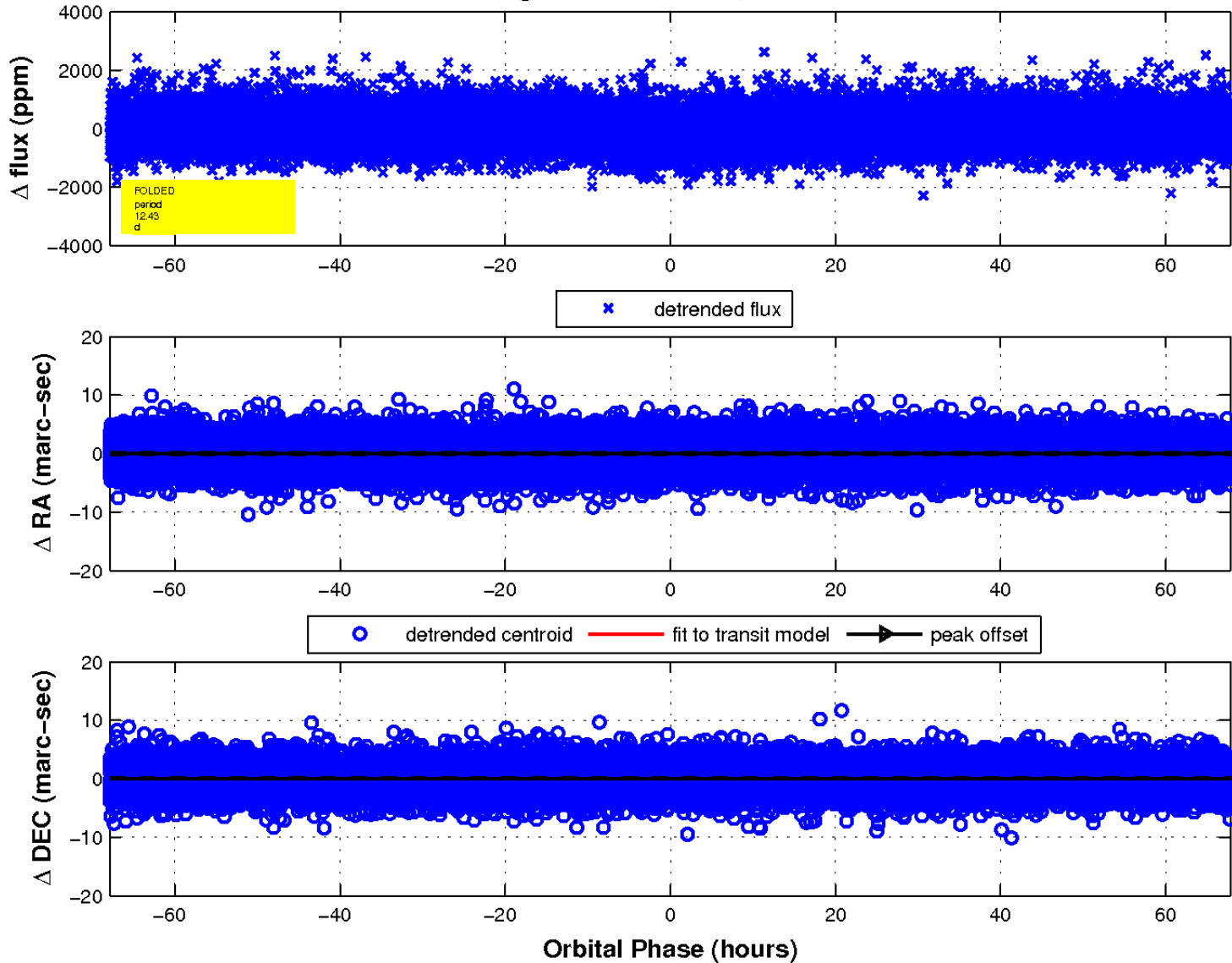
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

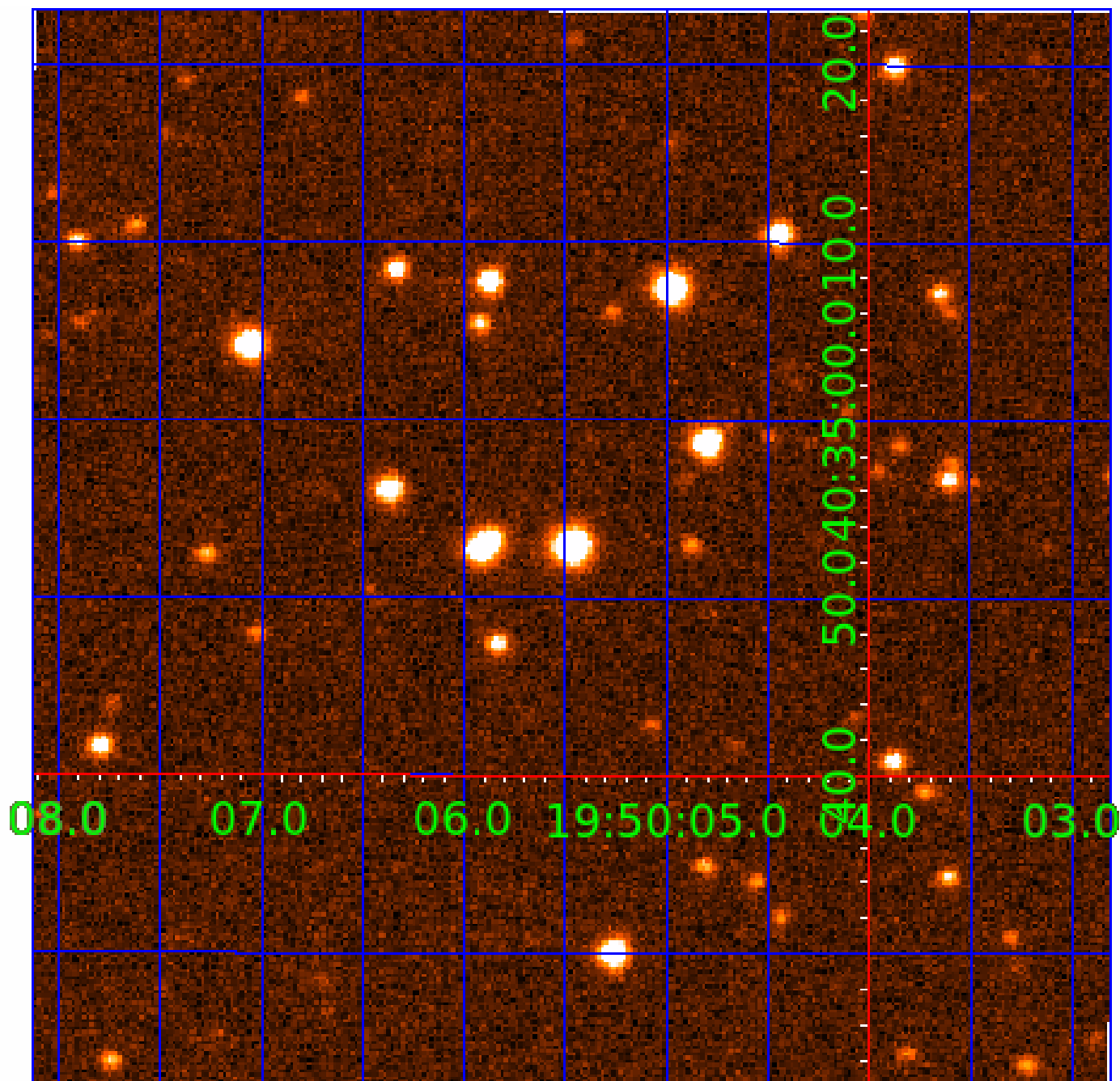


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination





# KIC 005385150

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005385150-01	OBS	6001.01	12.426358	141.424817	139.7	22.627	10.7	11.9	0.89	5595	1.14	65.45
005385150-02	OBS	No	12.422630	134.270528	134.6	23.494	11.5	12.8	0.89	5595	1.10	65.48

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005385150-01	OBS	FP	0.00	1	0	1	1	LPP_DV—CENT_KIC_POS—HALO_GHOST—EPHEM_MATCH
005385150-02	OBS	FP	0.00	1	0	1	0	LPP_DV—SAME_NTL_PERIOD—HALO_GHOST

**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 005385150-02

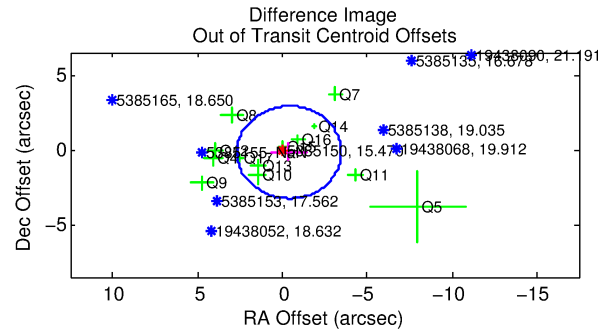
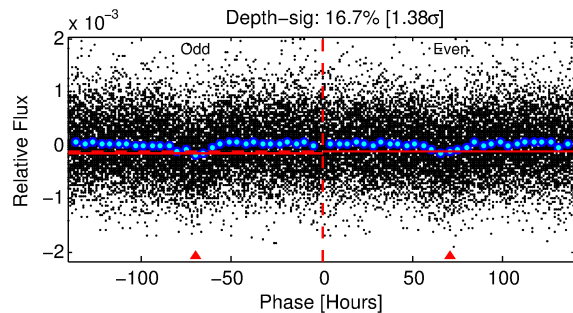
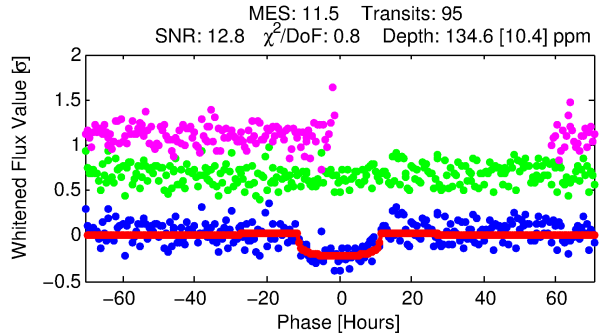
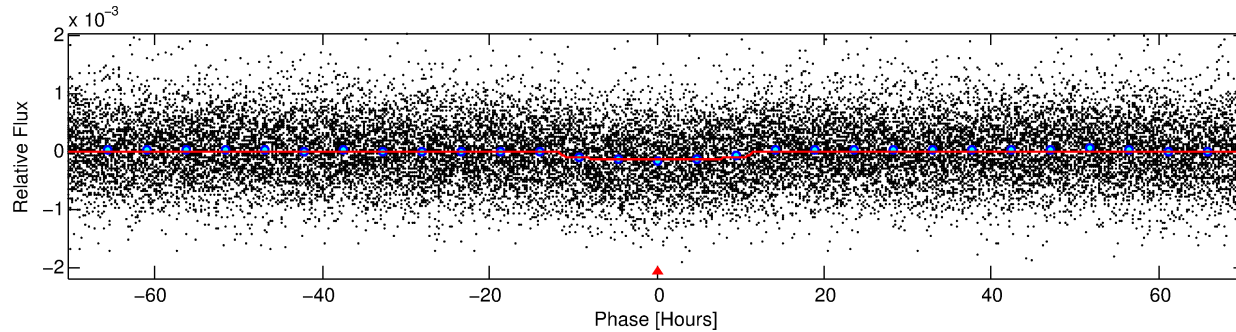
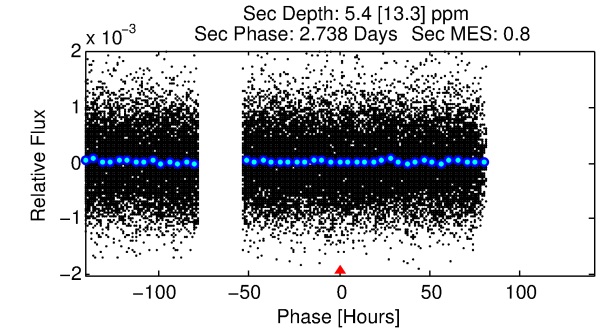
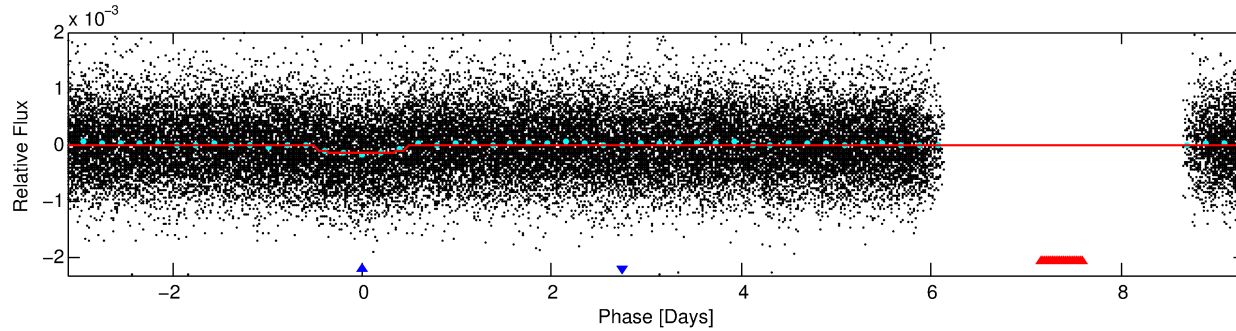
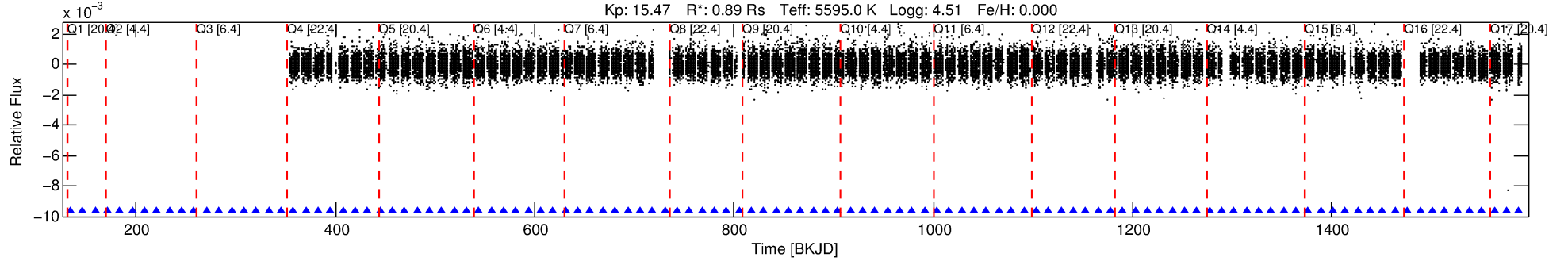
No Significant Match Found

# DV One-Page Summary

KIC: 5385150 Candidate: 2 of 2 Period: 12.423 d

KOI: K06001 Corr: No Ephemeris Match

Kp: 15.47 R\*: 0.89 Rs Teff: 5595.0 K Logg: 4.51 Fe/H: 0.000



## DV Fit Results:

Period = 12.42263 [0.00042] d  
Epoch = 134.2705 [0.0295] BKJD  
Rp/R\* = 0.0114 [0.0030]  
a/R\* = 2.98 [2.95]  
b = 0.72 [0.74]  
Seff = 65.48 [23.03]  
Teq = 725 [64] K  
Rp = 1.10 [0.41] Re  
a = 0.1026 [0.0227] AU  
Ag = 25.57 [65.09] [0.38σ]  
Teffp = 2522 [1594] K [1.13σ]

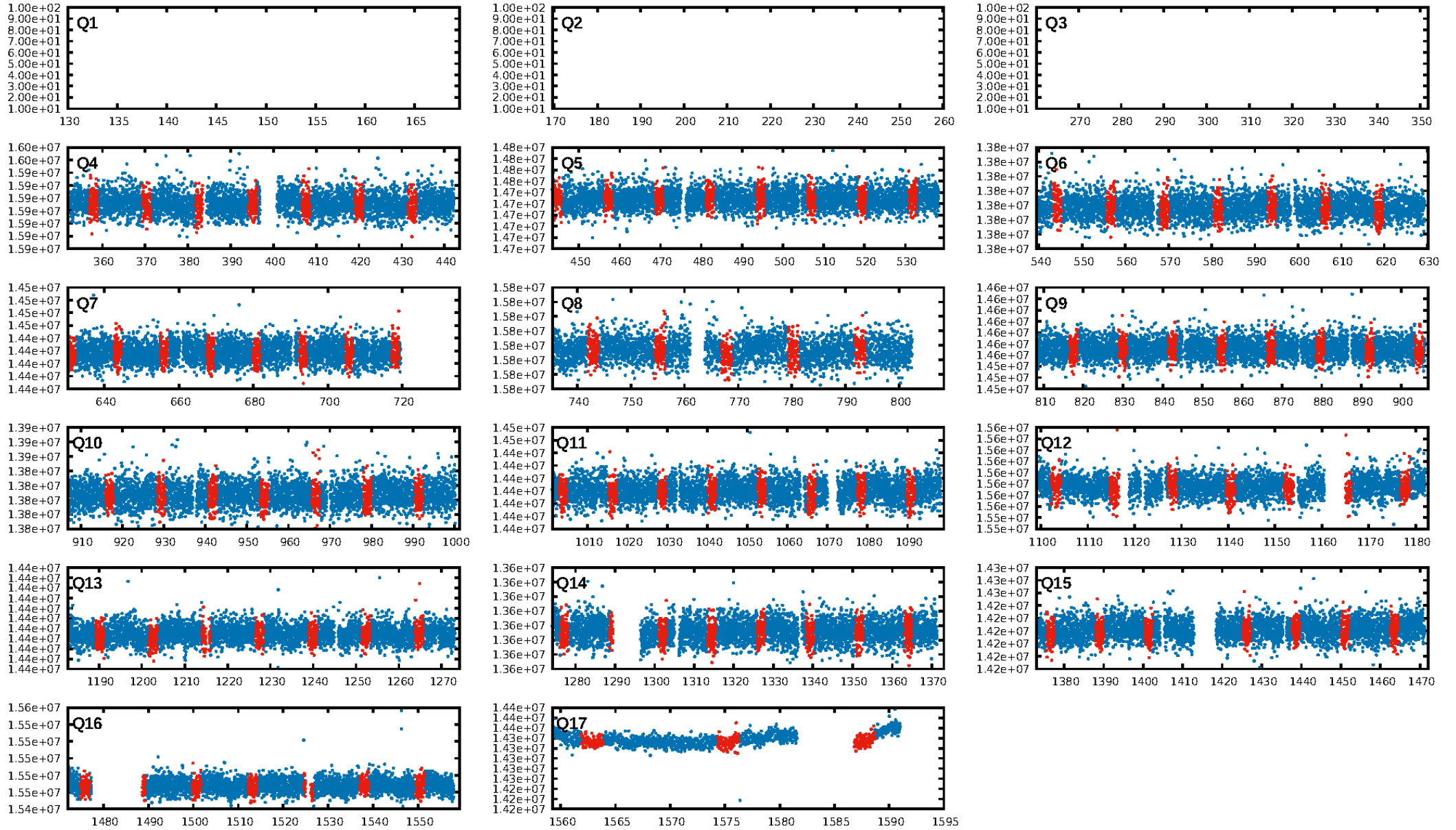
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.2% [0.00σ]  
ModelChiSquare2-sig: 67.5%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.59e-35  
RollingBand-fgt: 1.00 [92/92]  
GhostDiagnostic-chr: 0.08482  
Centroid-sig: 21.2%  
Centroid-so: 0.279 arcsec [0.37σ]  
OotOffset-rm: 0.437 arcsec [0.43σ]  
KicOffset-rm: 0.959 arcsec [1.61σ]  
OotOffset-st: 2/3/4/4 [13]  
KicOffset-st: 2/3/4/4 [13]  
DiffImageQuality-fgm: 0.15 [2/13]  
DiffImageOverlap-fno: 1.00 [14/14]

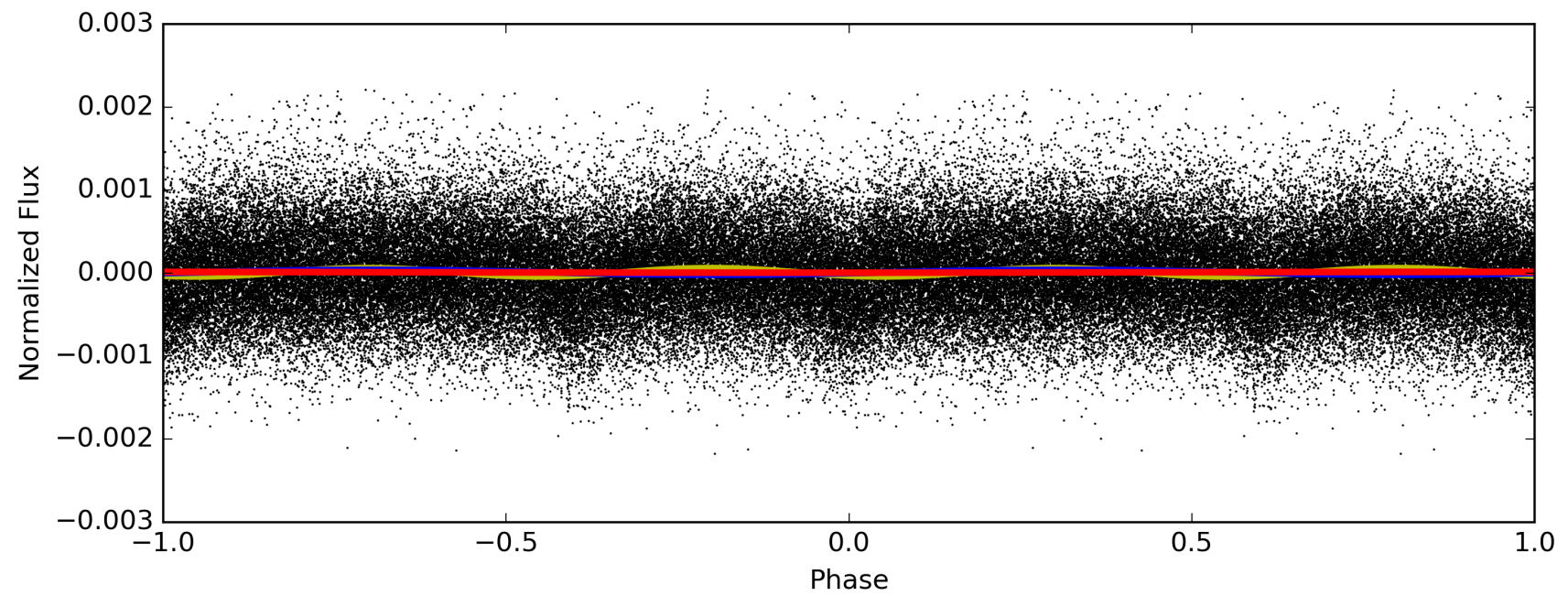
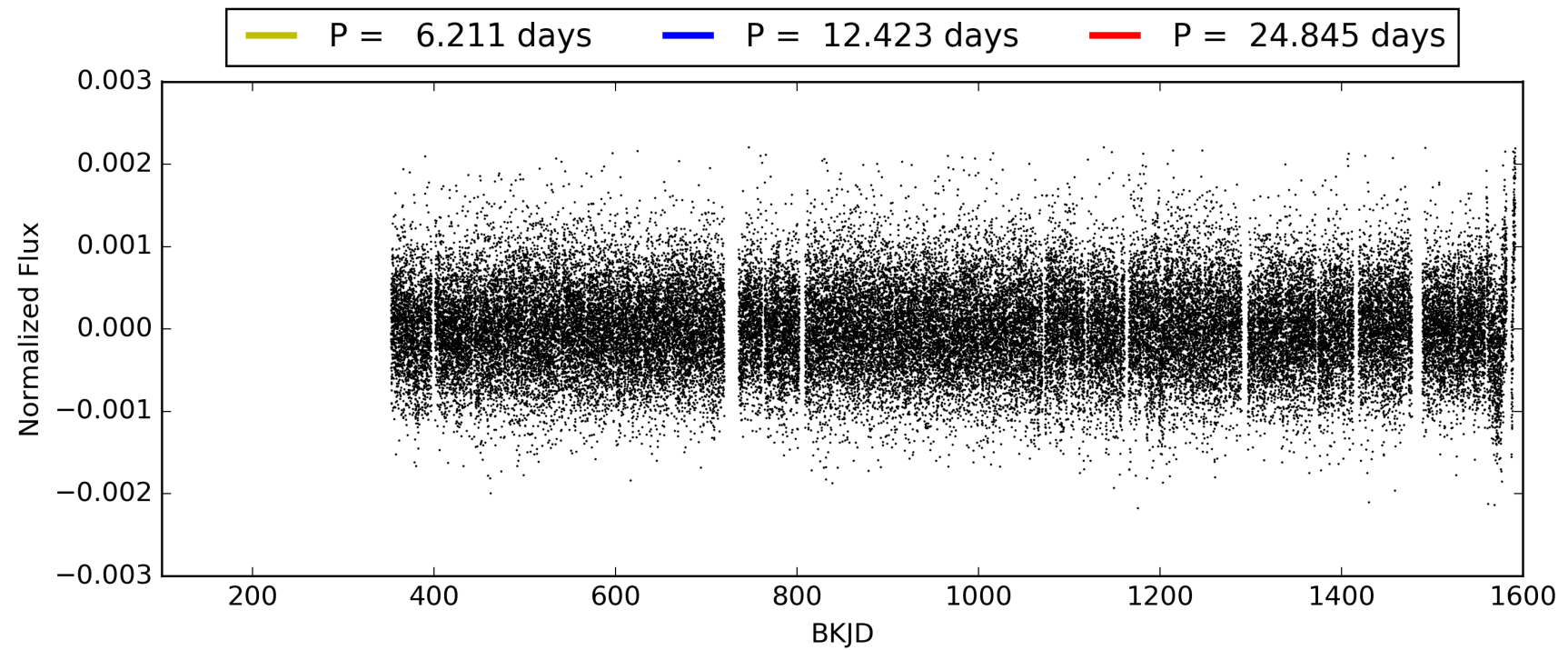
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 16:07:47 Z

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

# TCE 005385150-02, PDC Light Curves

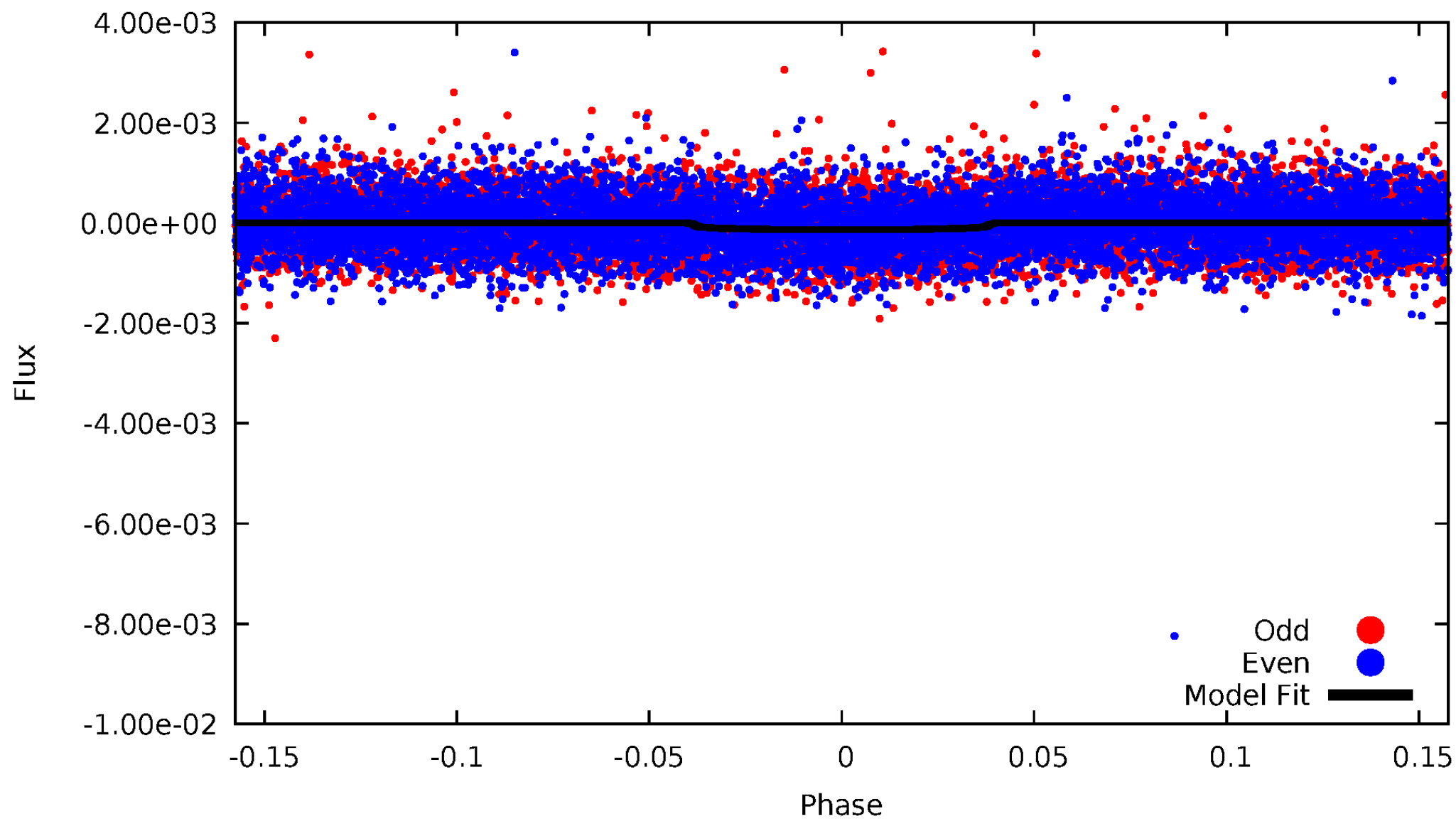


TCE 005385150-02



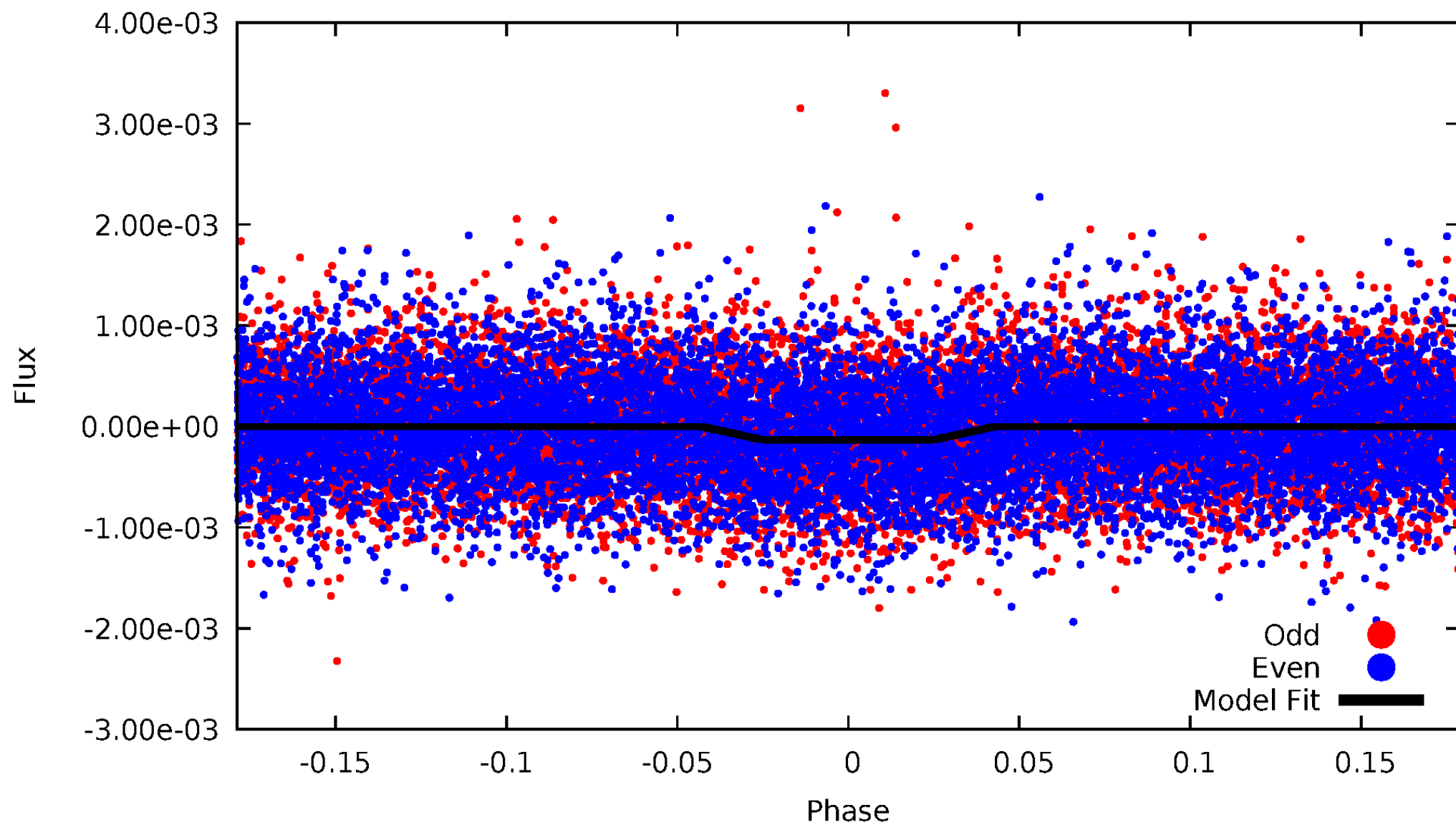
# DV Odd/Even

TCE 005385150-02



# ALT Odd/Even

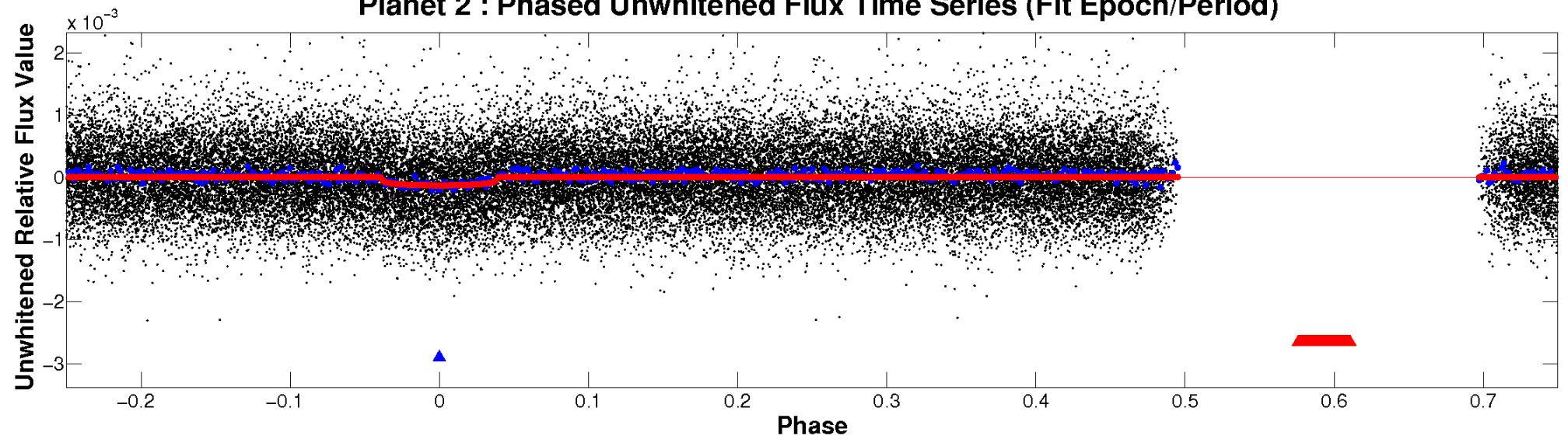
TCE 005385150-02



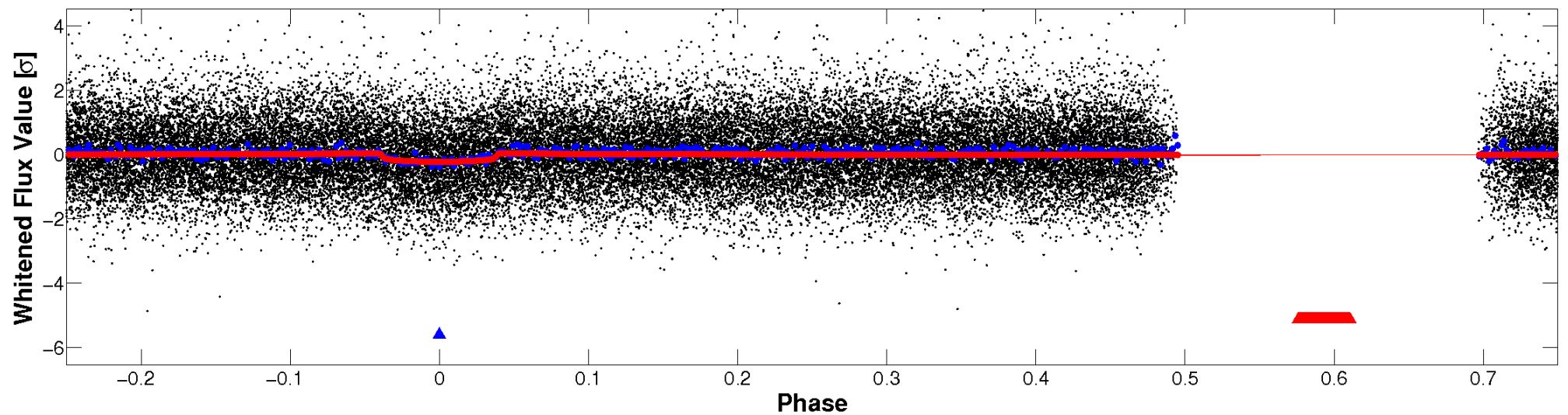


# Non-Whitened Vs. Whitened Light Curve

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

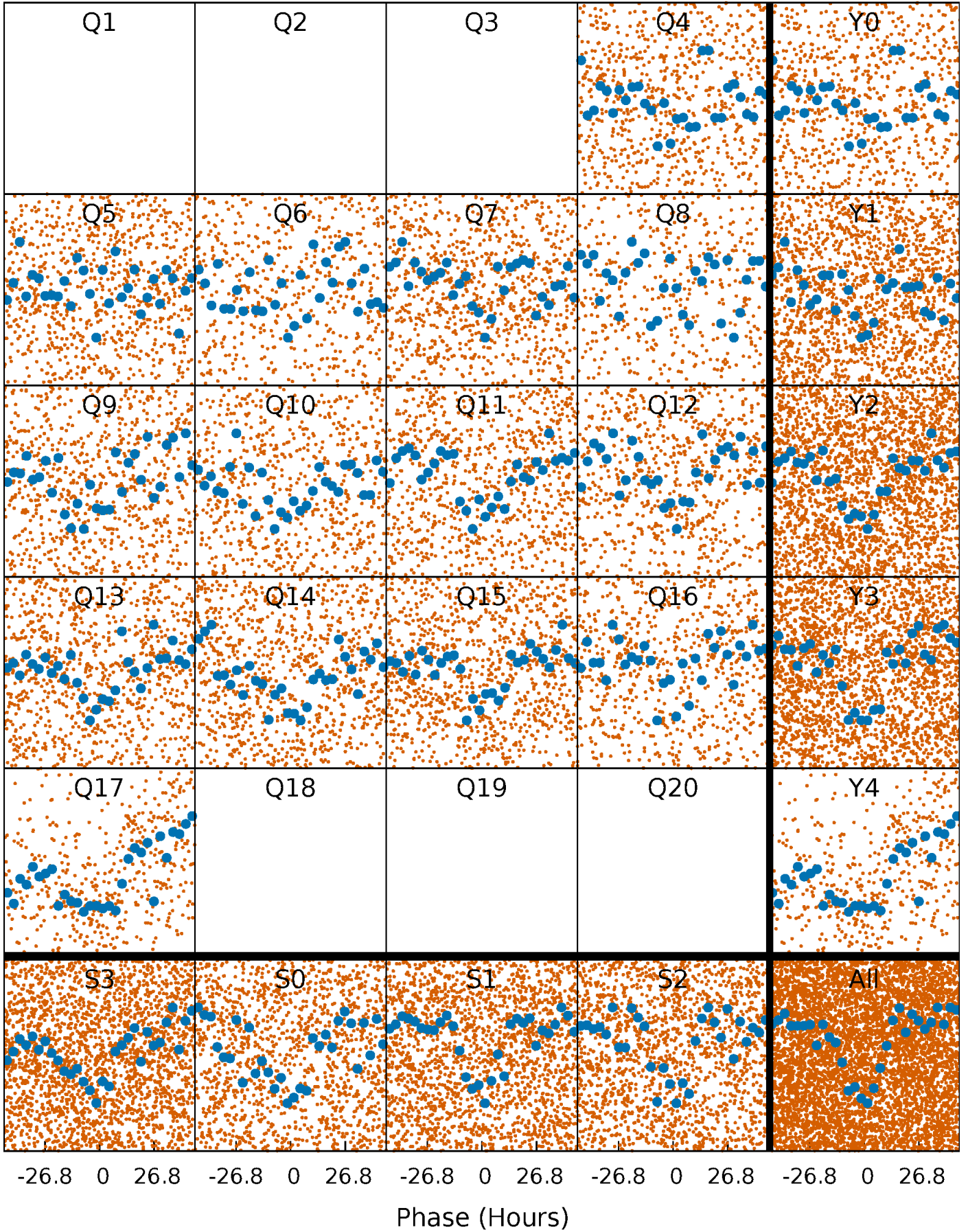


**Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



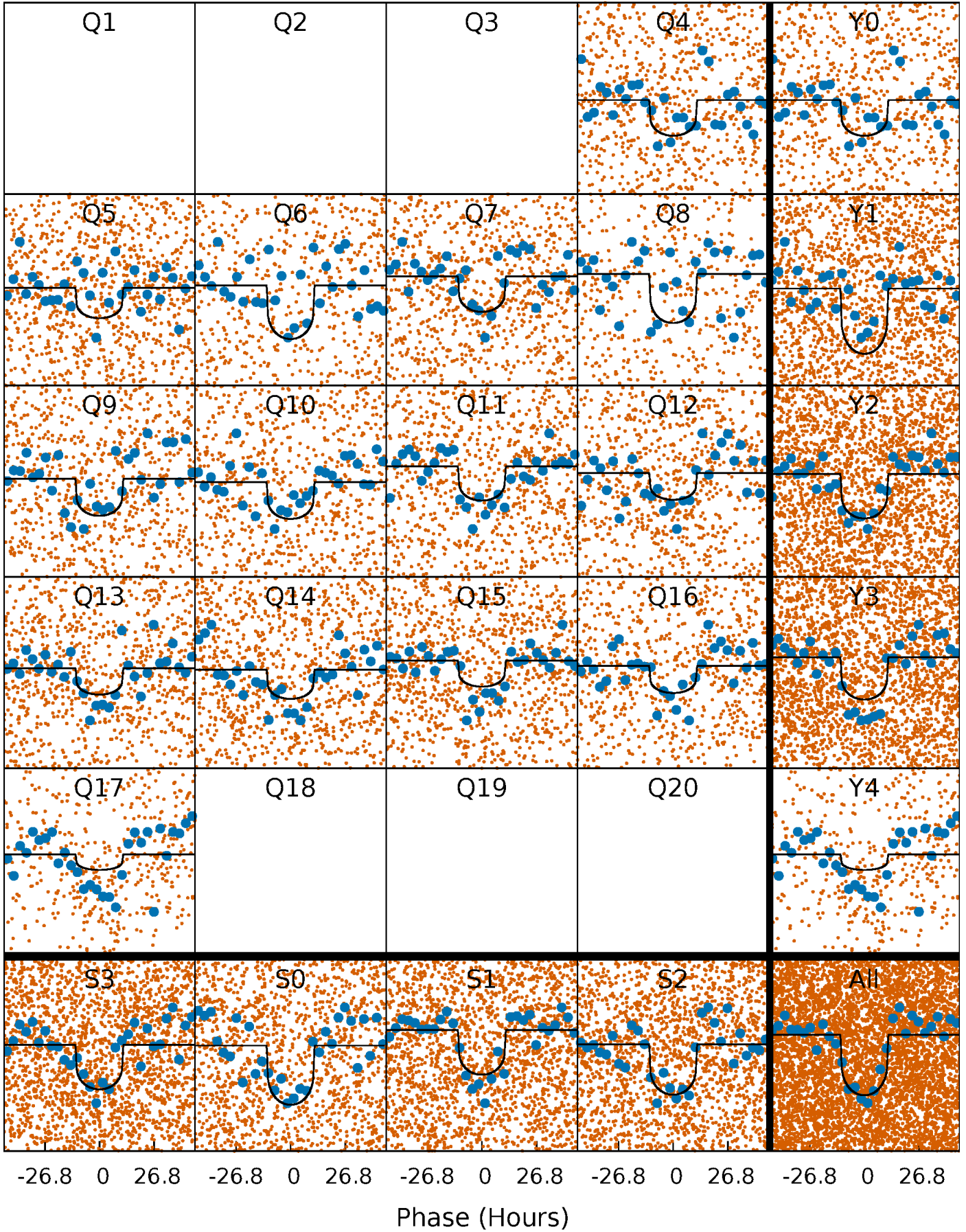
# PDC Quarter-Phased Transit Curves

TCE 005385150-02     $P = 12.422630$  Days     $T_0 = 134.270528$  (BKJD)



# DV Quarter-Phased Transit Curves

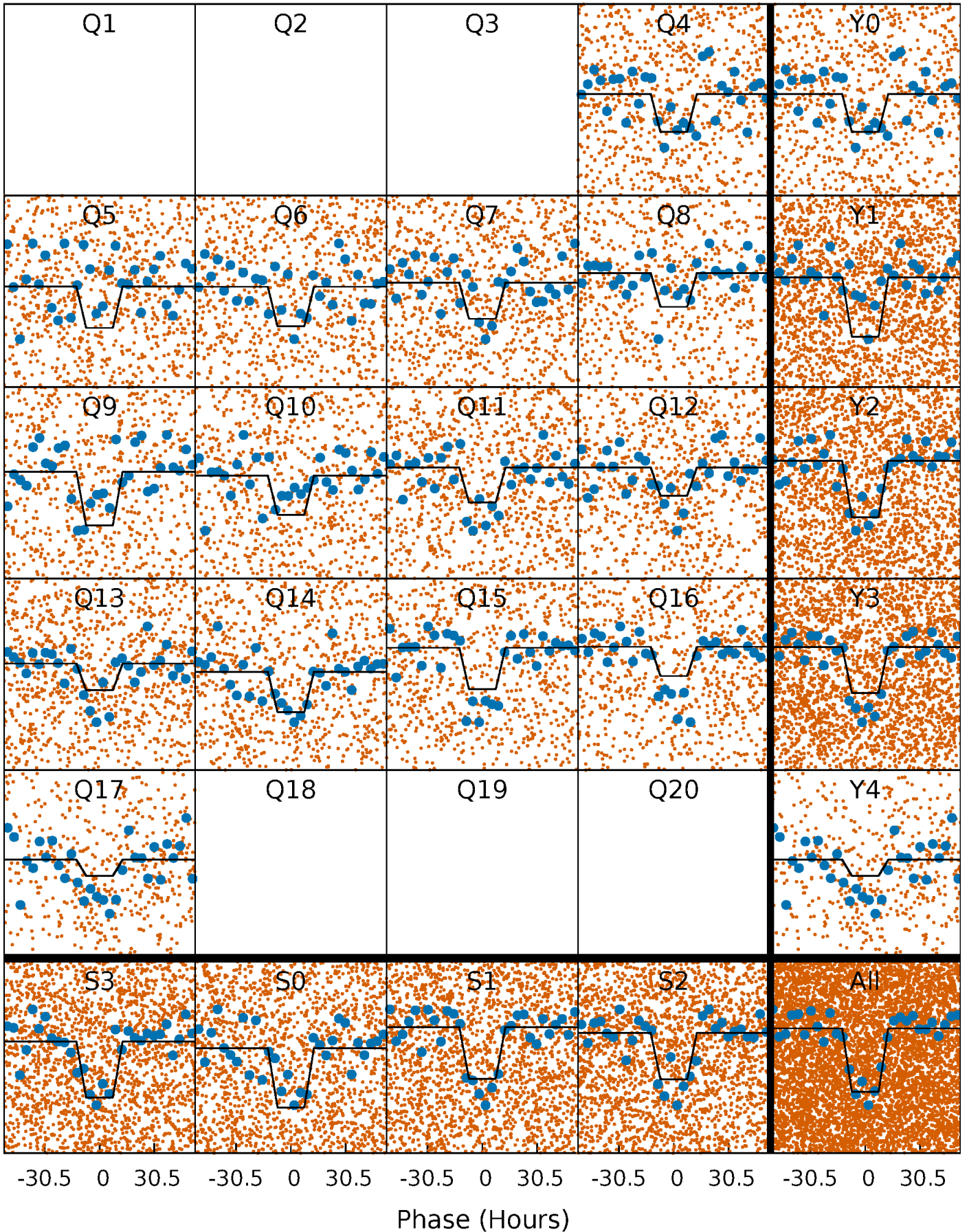
TCE 005385150-02 P= 12.422630 Days  $T_0=134.270528$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

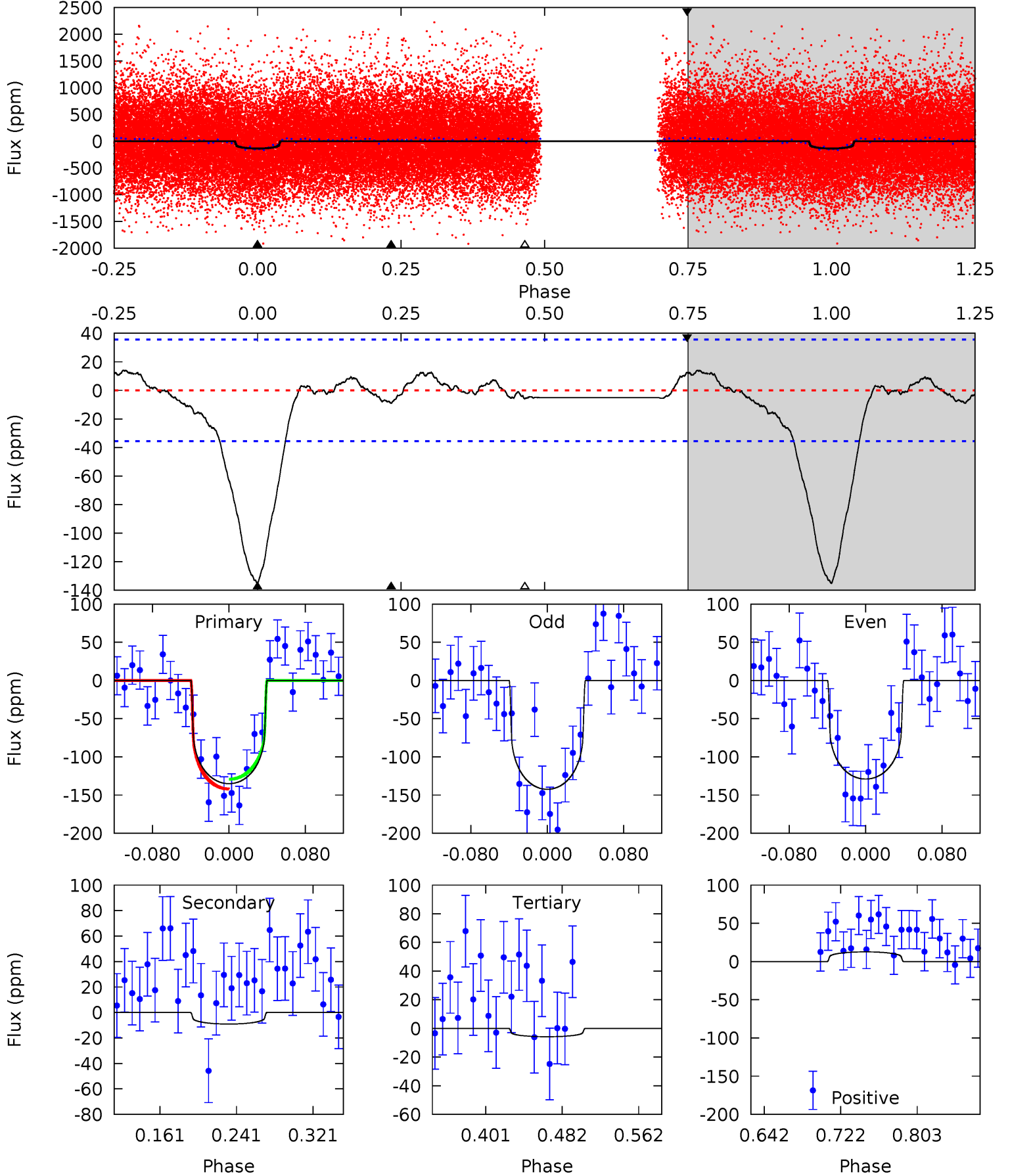
TCE 005385150-02 P= 12.423939 Days  $T_0=134.150030$  (BKJD)



# DV Model-Shift Uniqueness Test

005385150-02,  $P = 12.422630$  Days,  $E = 134.270528$  Days

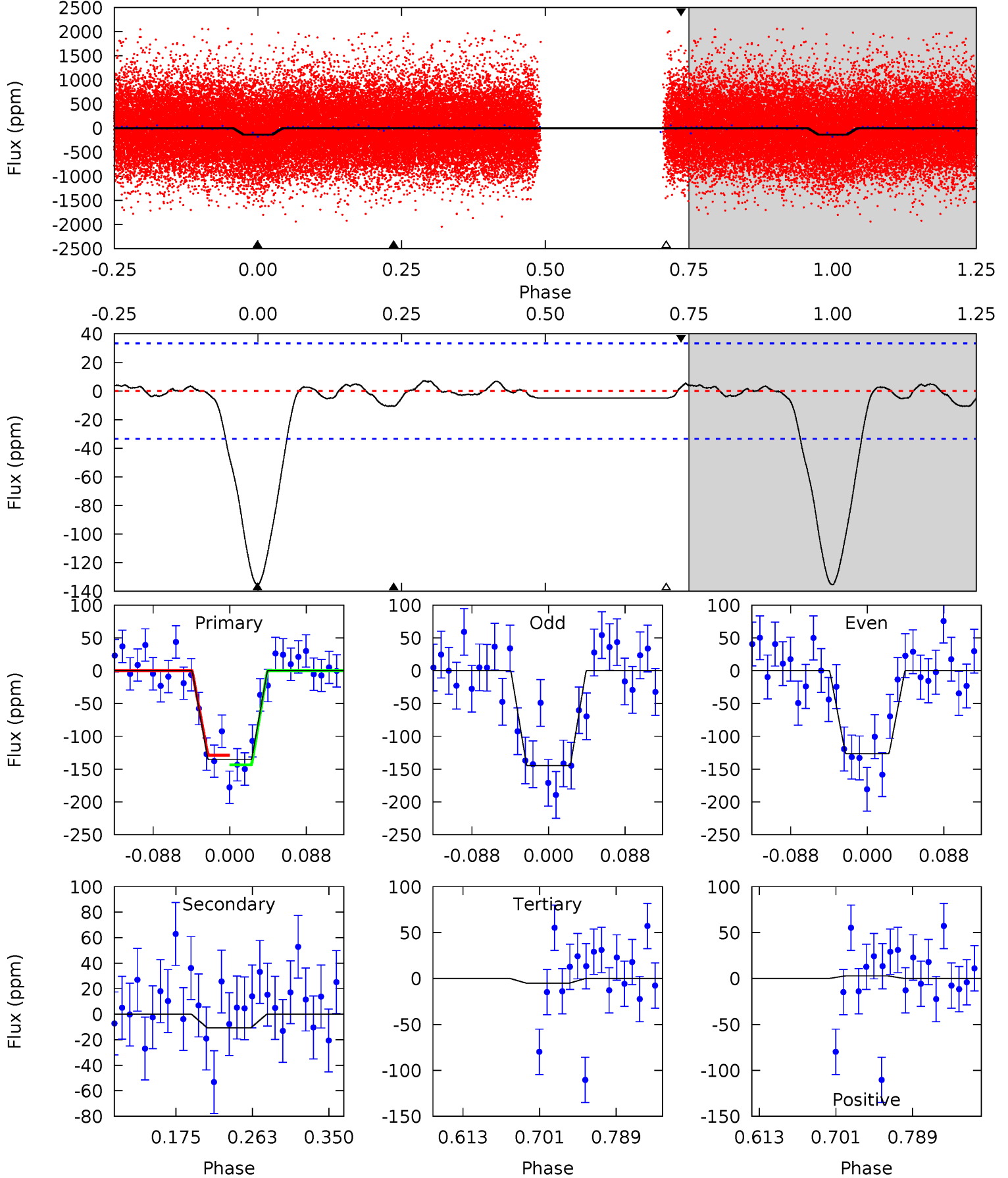
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.5	1.18	0.75	1.64	4.61	1.75	1.02	16.8	15.9	0.42	-0.46	0.87	1.13	0.09	0.82



# Alt Model-Shift Uniqueness Test

005385150-02, P = 12.423939 Days, E = 134.150030 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
18.6	1.47	0.69	0.38	4.59	1.71	0.40	18.0	18.3	0.78	1.08	1.26	0.75	0.05	1.01





### Stellar Parameters For KIC 005385150

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5595^{+186}_{-186}$	$4.513^{+0.048}_{-0.180}$	$0.000^{+0.250}_{-0.300}$	$0.886^{+0.229}_{-0.098}$	$0.933^{+0.104}_{-0.095}$	$1.889^{+0.465}_{-0.915}$
	+3%/-3%	+1%/-4%	+inf%/-inf%	+26%/-11%	+11%/-10%	+25%/-48%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 005385150-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-9 \pm 8$	$1.15^{+0.37}_{-0.31}$	$1040^{+64}_{-54}$	$3382^{+530}_{-1138}$	$37^{+58}_{-35}$
Alt.	$-11 \pm 7$	$1.16^{+0.33}_{-0.30}$	$1030^{+71}_{-47}$	$3422^{+543}_{-611}$	$42^{+59}_{-32}$

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

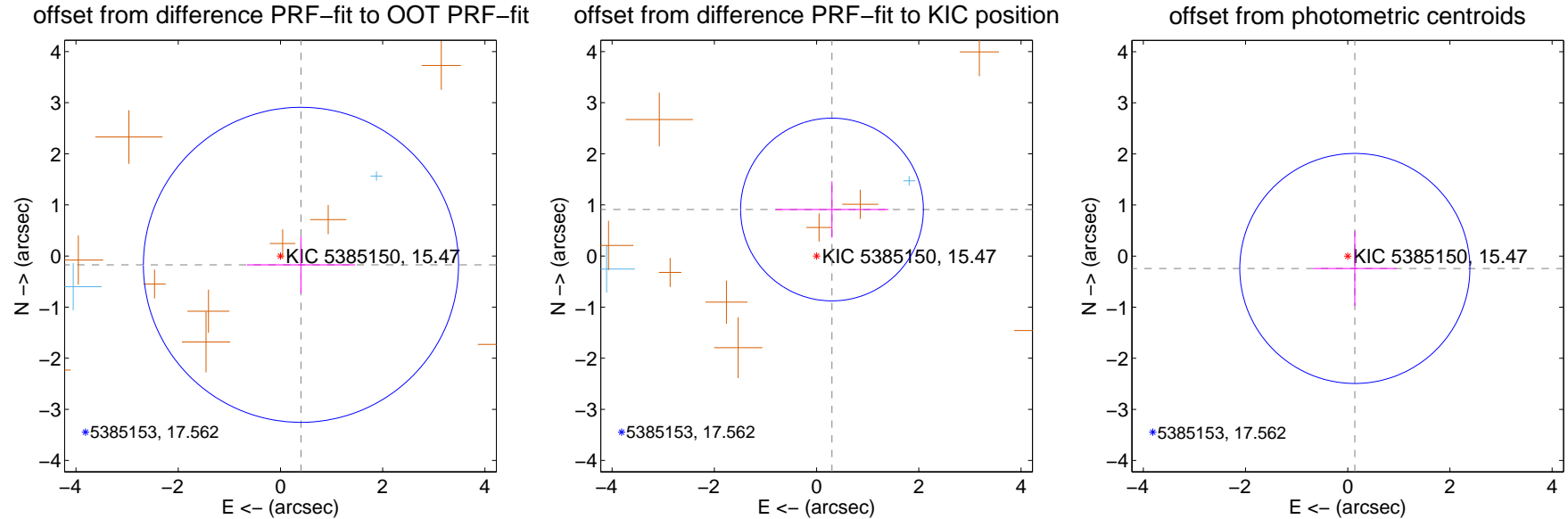
## DV Centroid Data

Supplemental centroid analysis for 005385150-02. Kepler magnitude: 15.47. Transit SNR 12.77

There are 2 quarters with good PRF difference image offsets

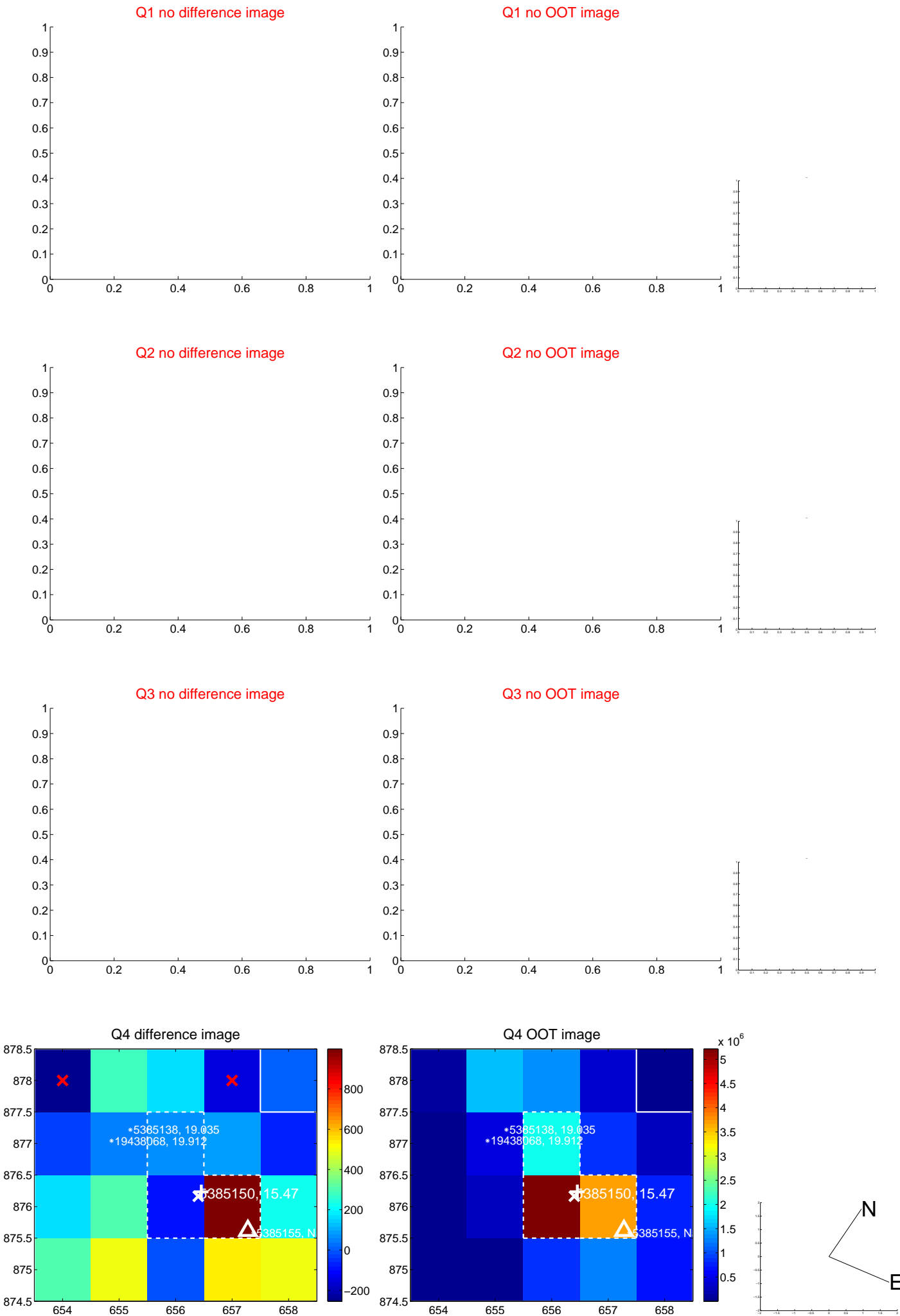
The direct PRF centroid is offset from the target star catalog position by about 0.46 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.437 \pm 1.027$	0.43	$-0.401 \pm 1.058$	$-0.172 \pm 0.553$
PRF-fit source offset from KIC position	$0.959 \pm 0.596$	1.61	$-0.301 \pm 1.105$	$0.910 \pm 0.552$
photometric centroid source offset	$0.28 \pm 0.75$	0.37	$-0.14 \pm 0.81$	$-0.24 \pm 0.73$

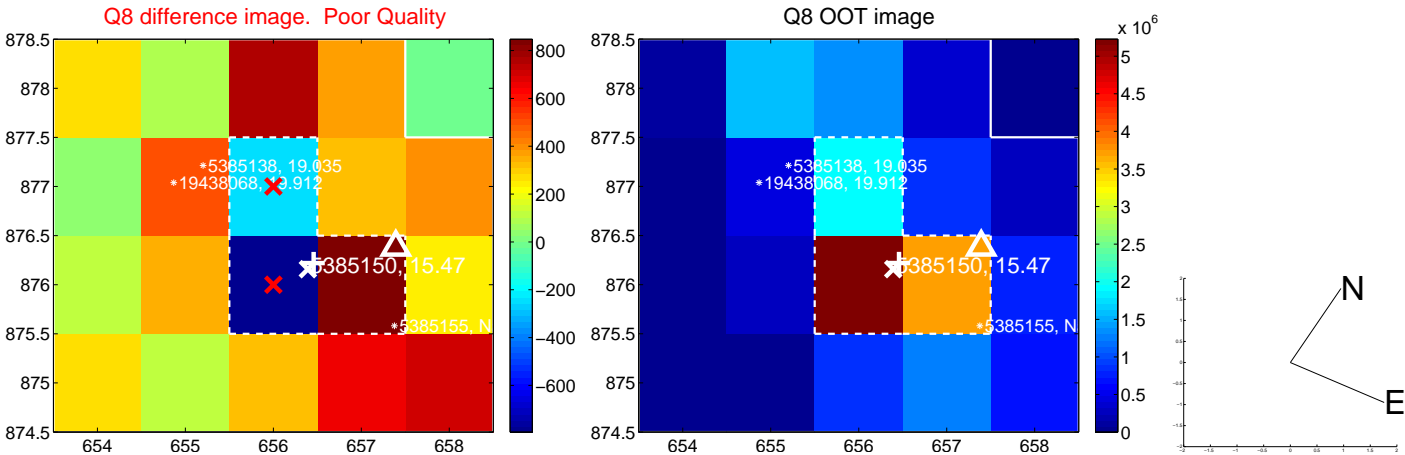
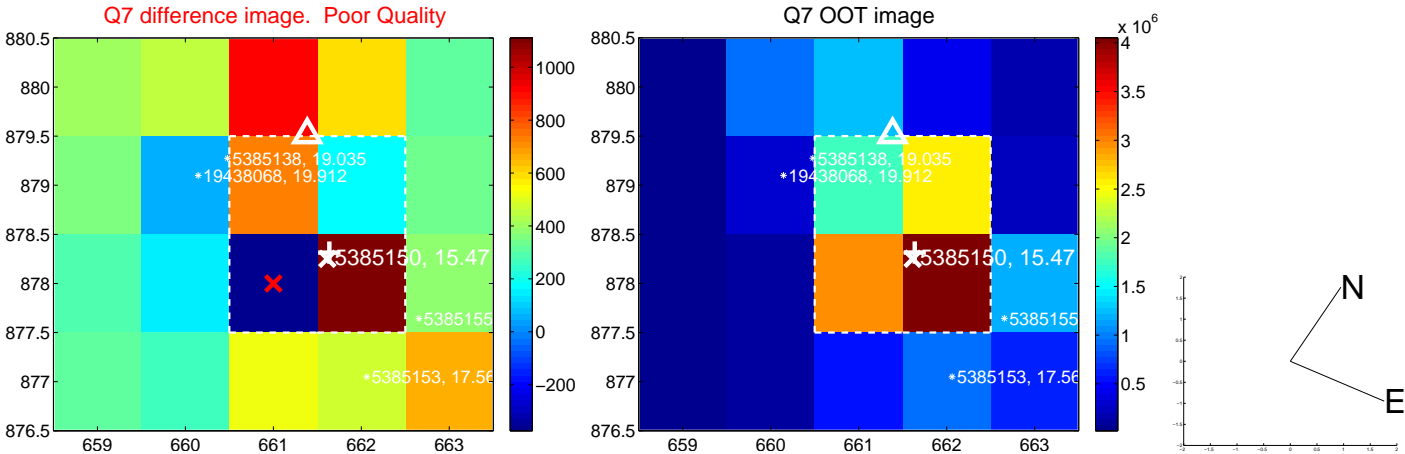
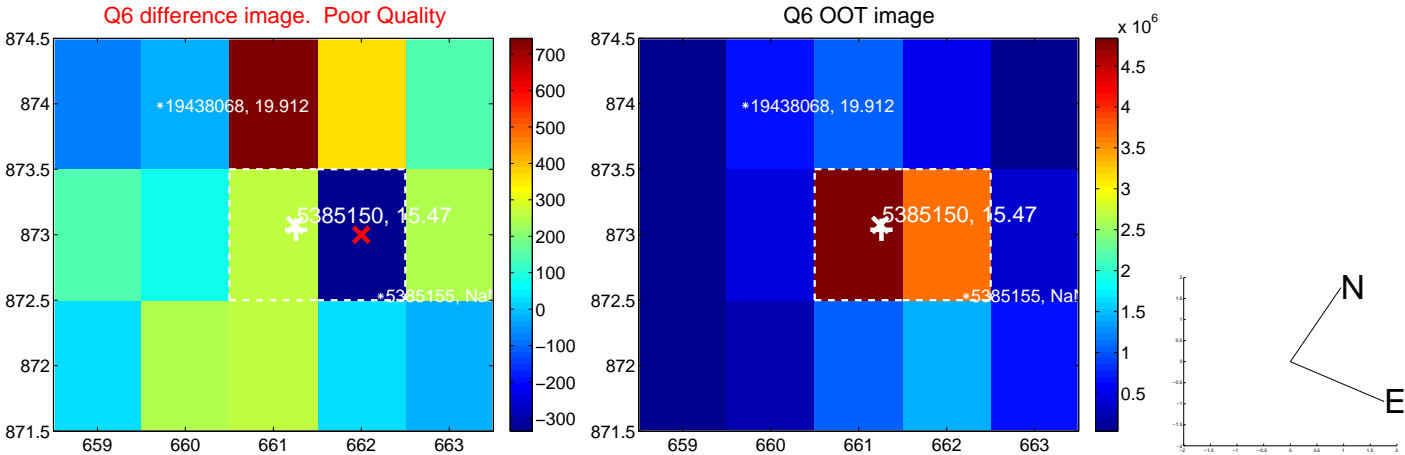
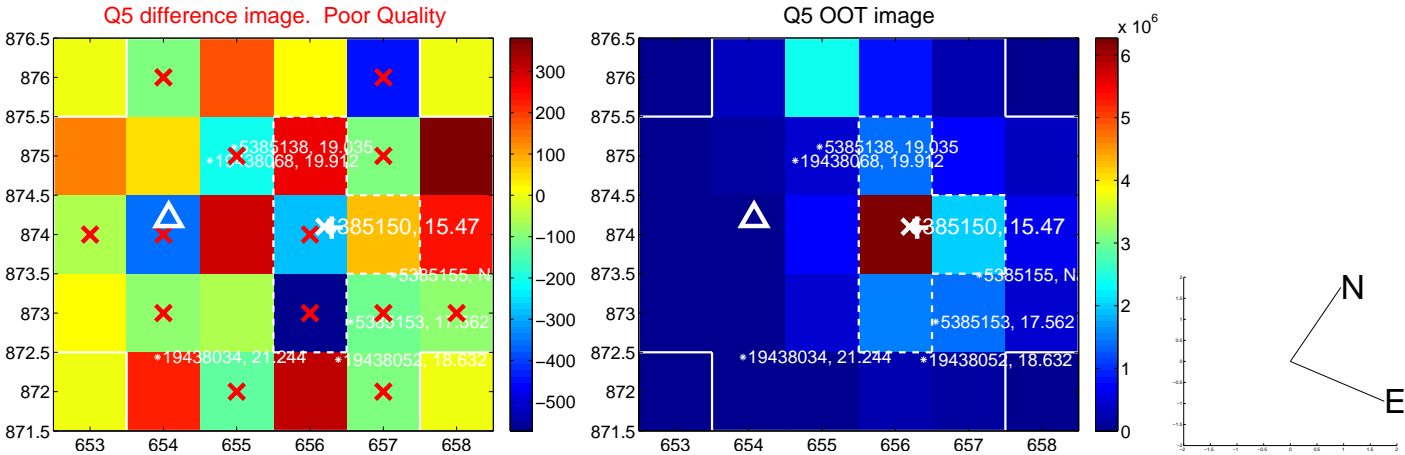


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

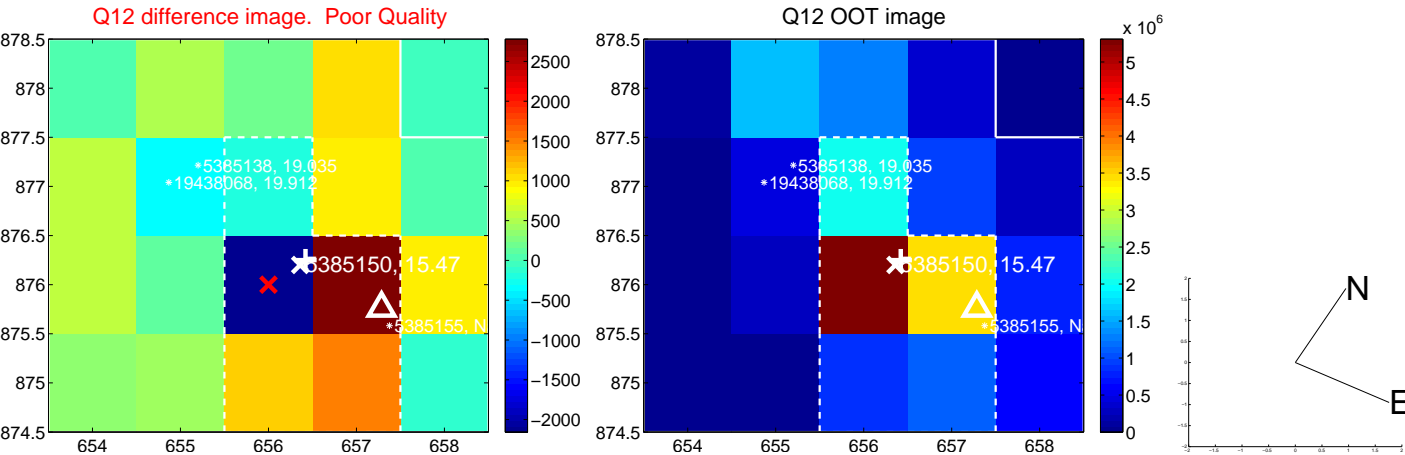
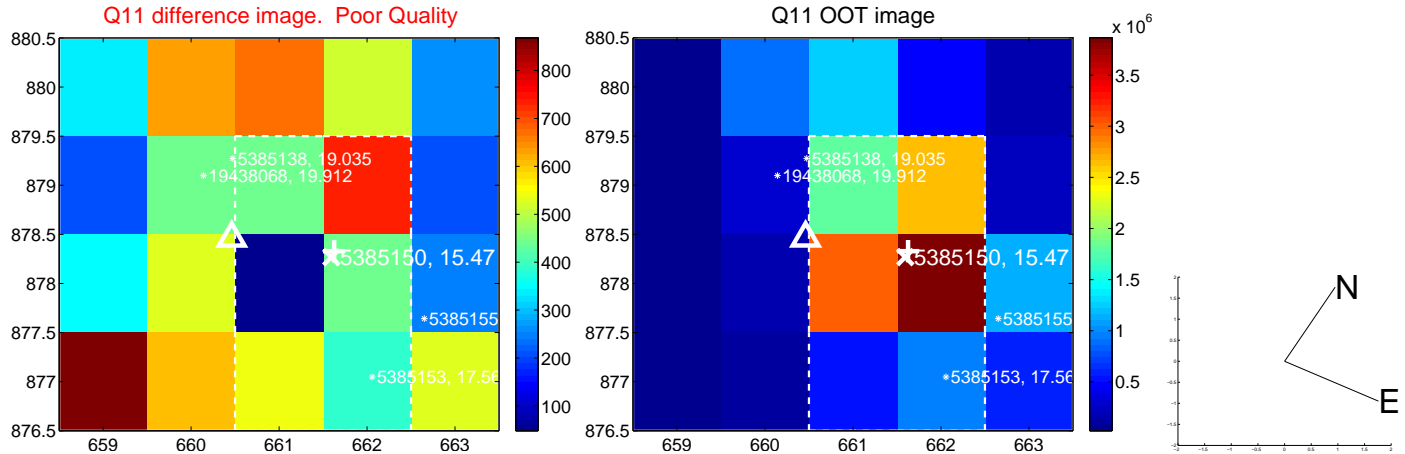
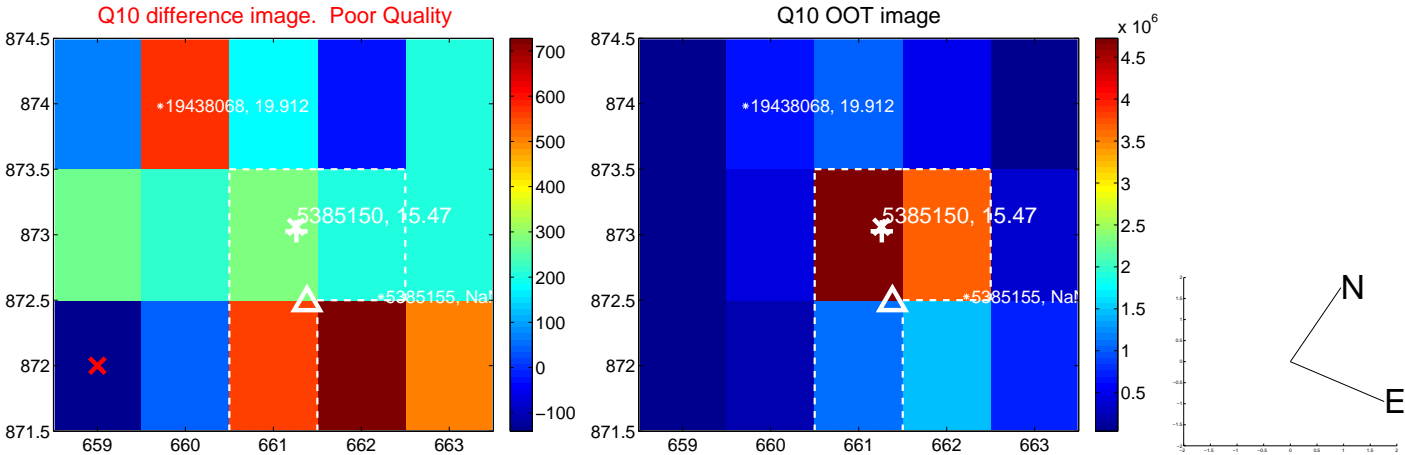
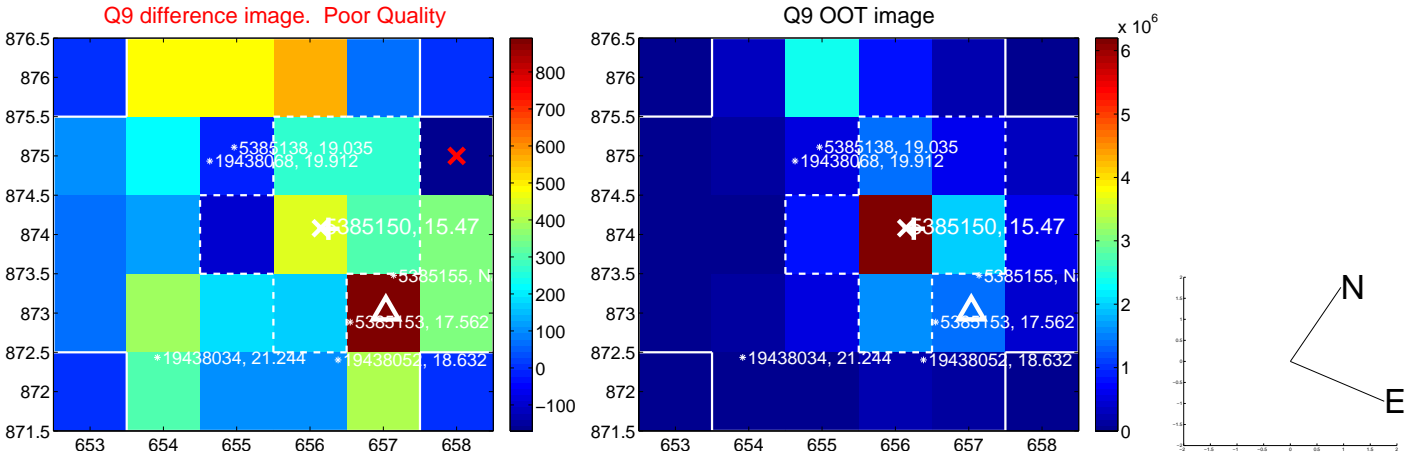
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



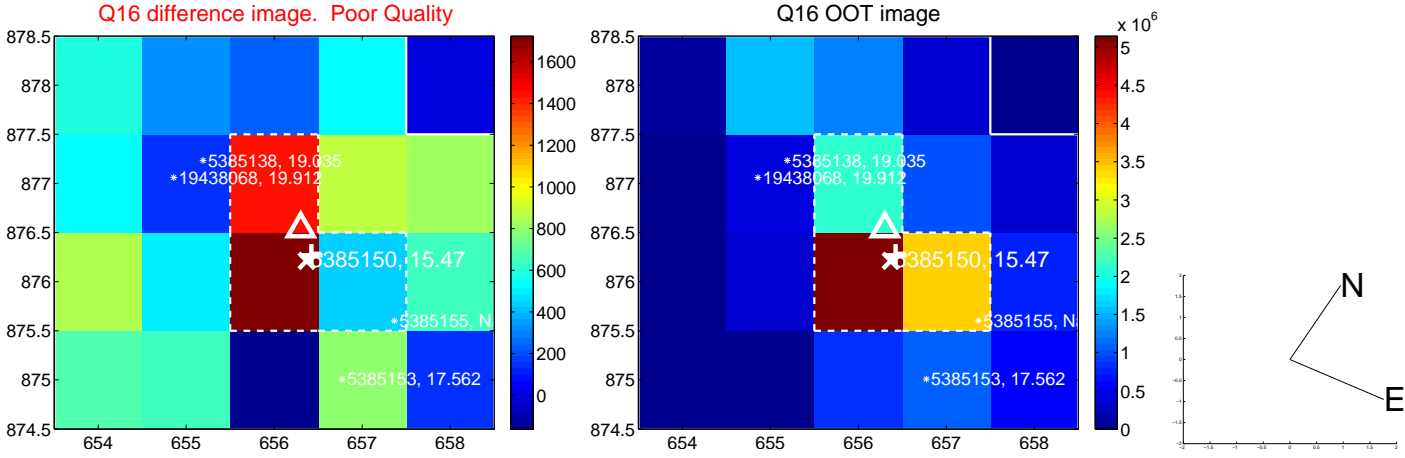
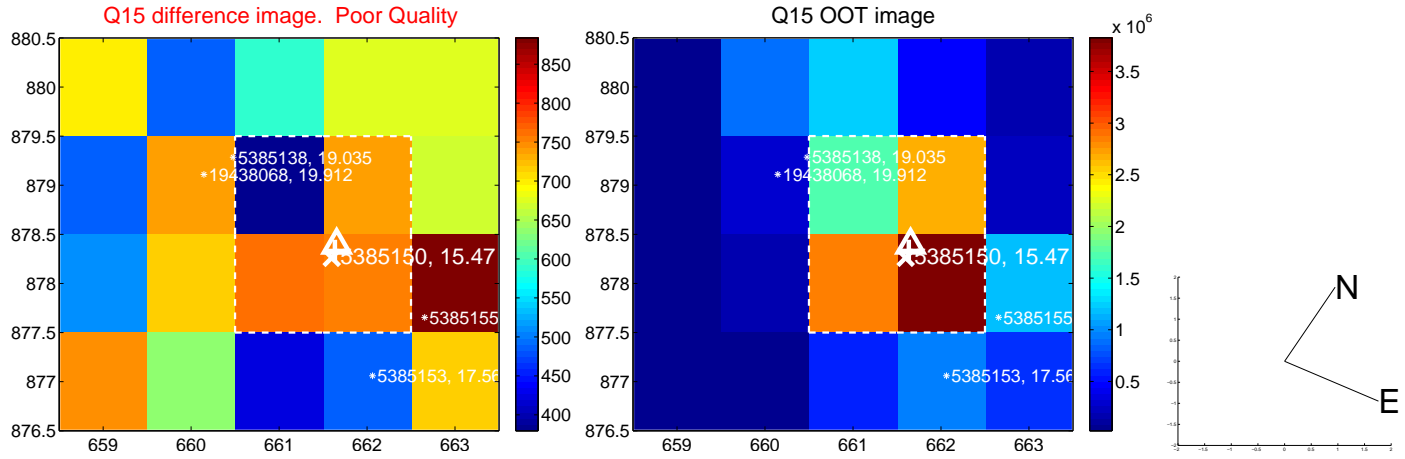
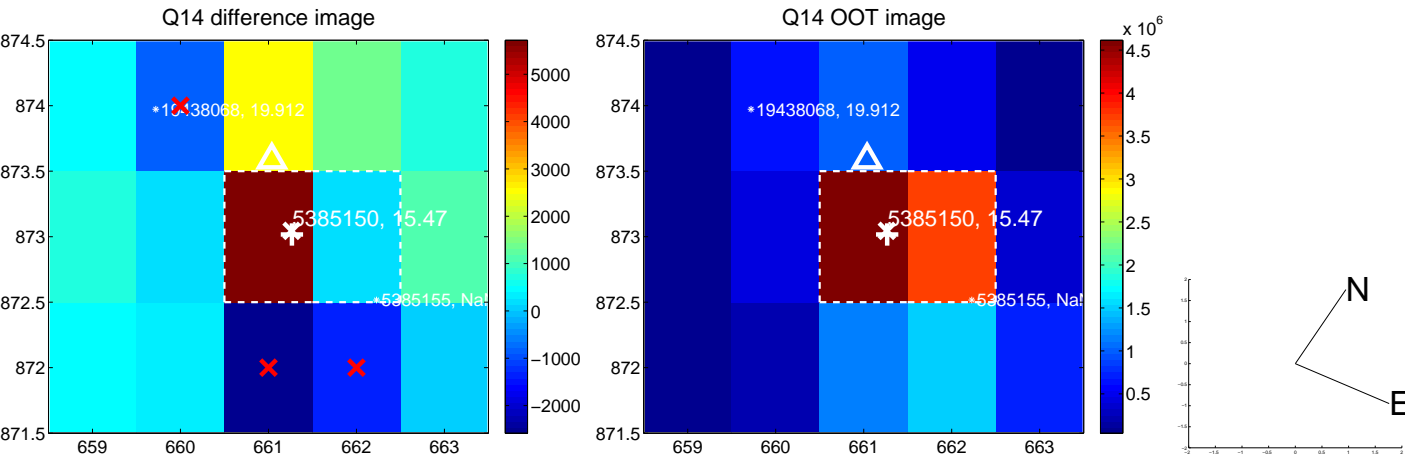
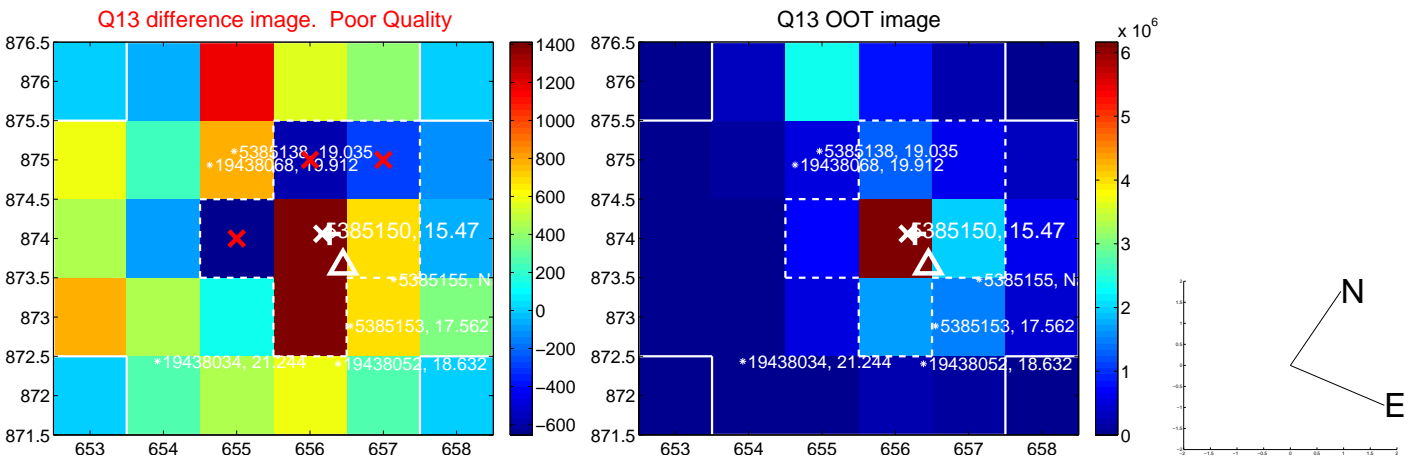
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

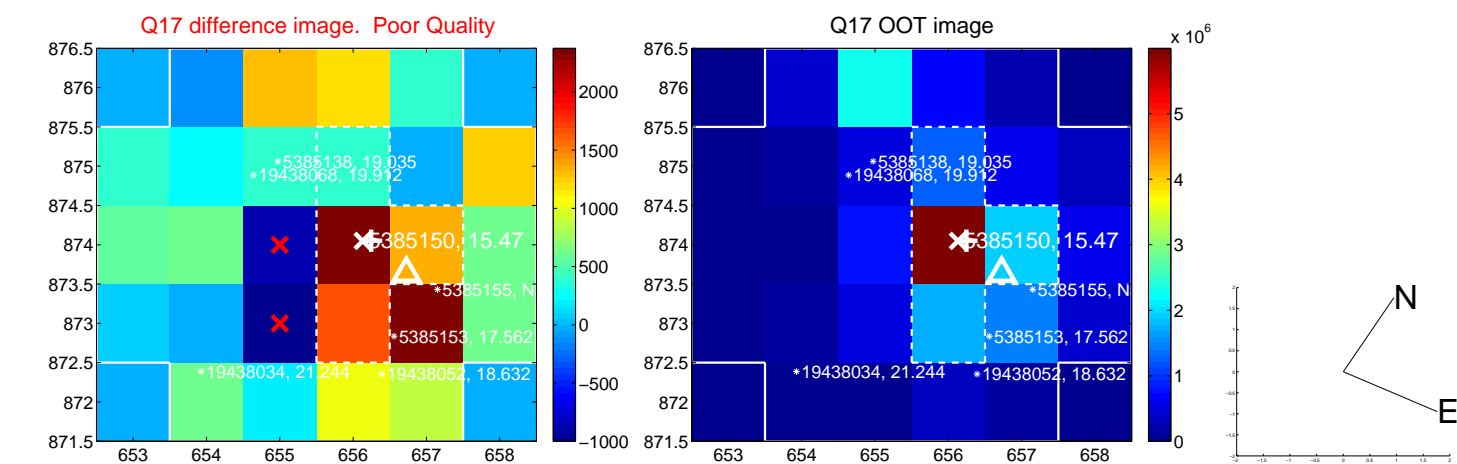


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

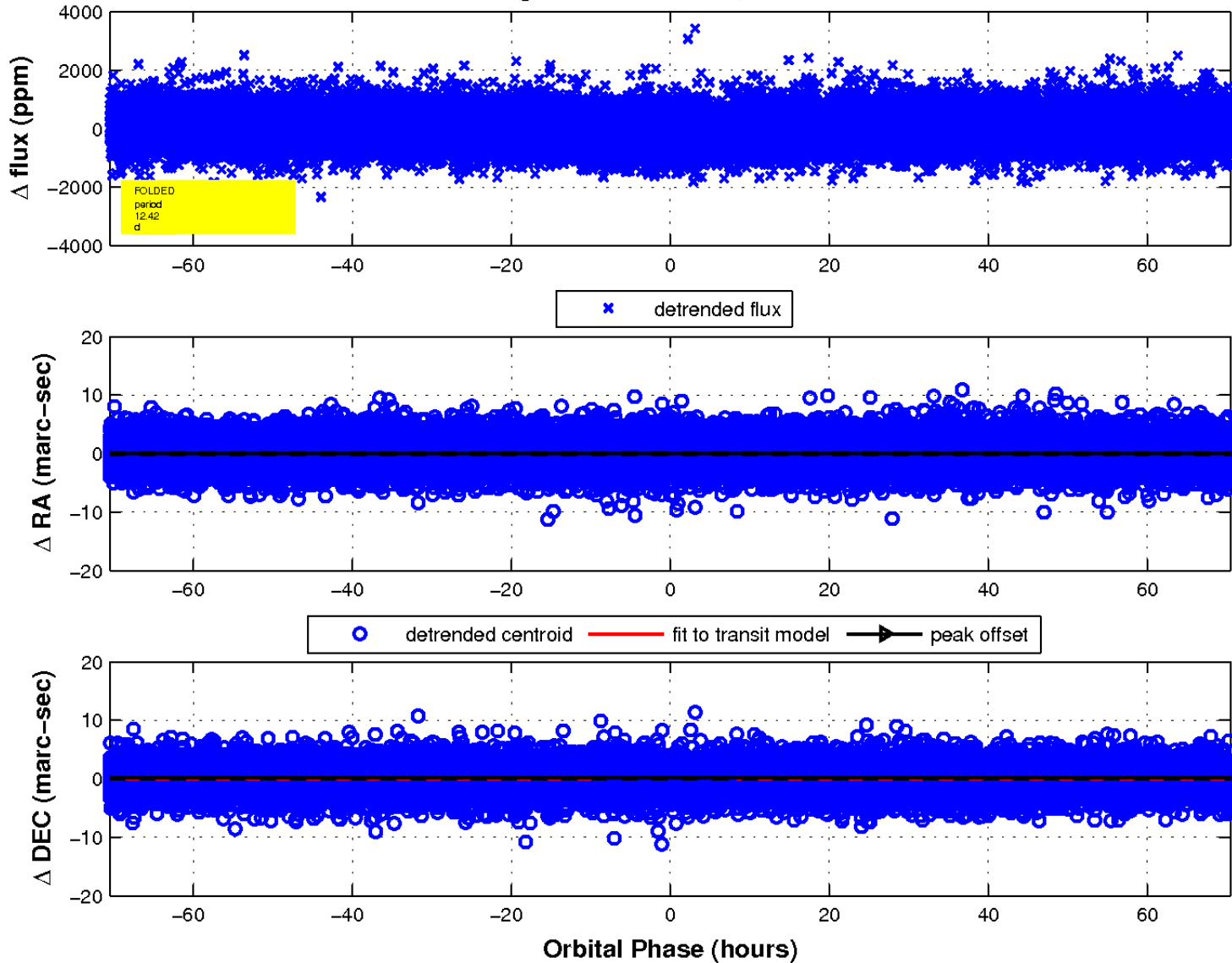




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

