

# KIC 007461354

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007461354-01	OBS	No	1.816173	133.121618	17.6	4.363	9.0	8.7	2.74	7126	1.33	13667.54
007461354-02	OBS	No	2.724256	132.681633	19.2	4.788	8.3	8.7	2.74	7126	1.29	7959.81

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007461354-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
007461354-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_KIC_POS

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

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

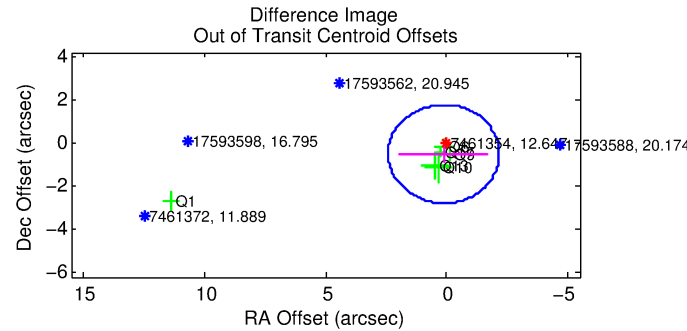
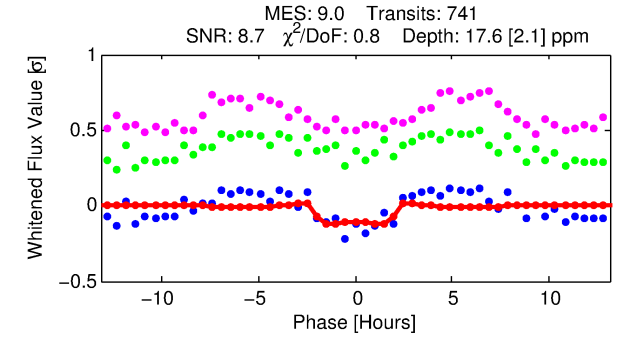
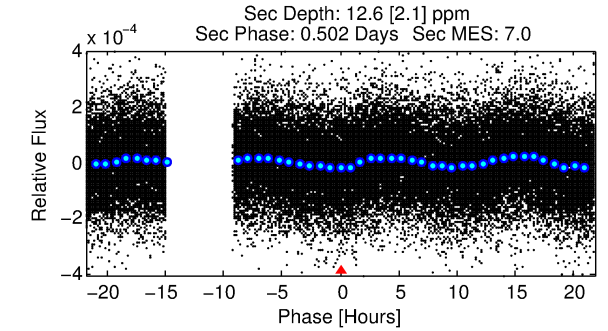
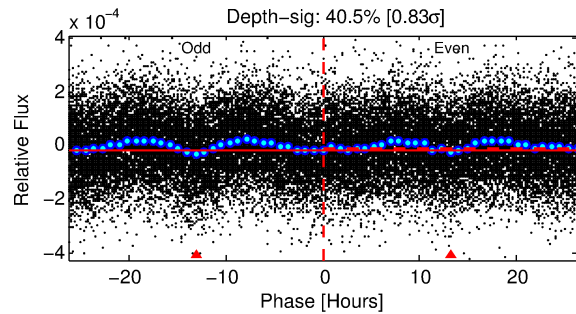
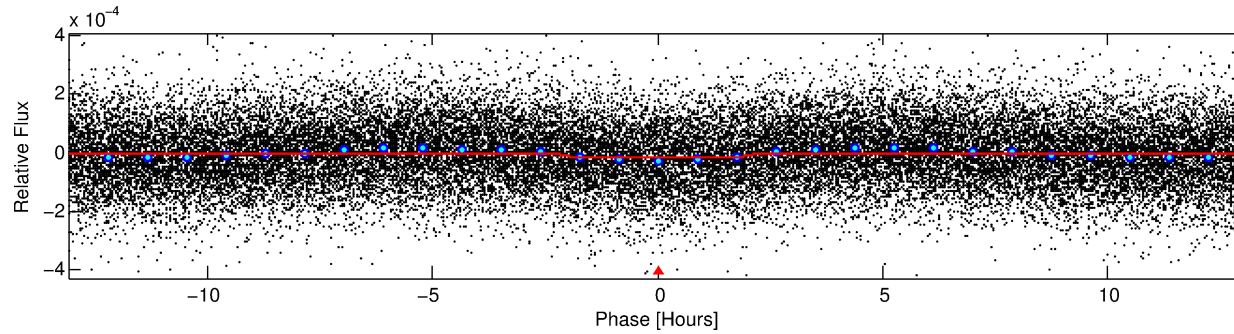
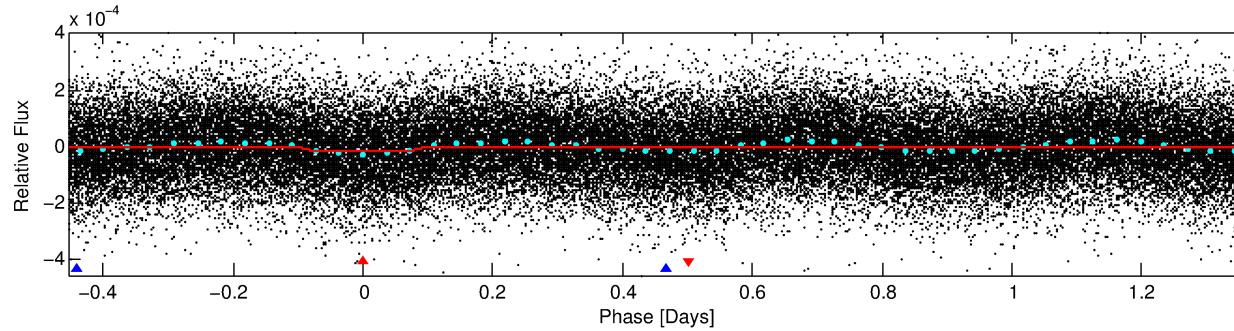
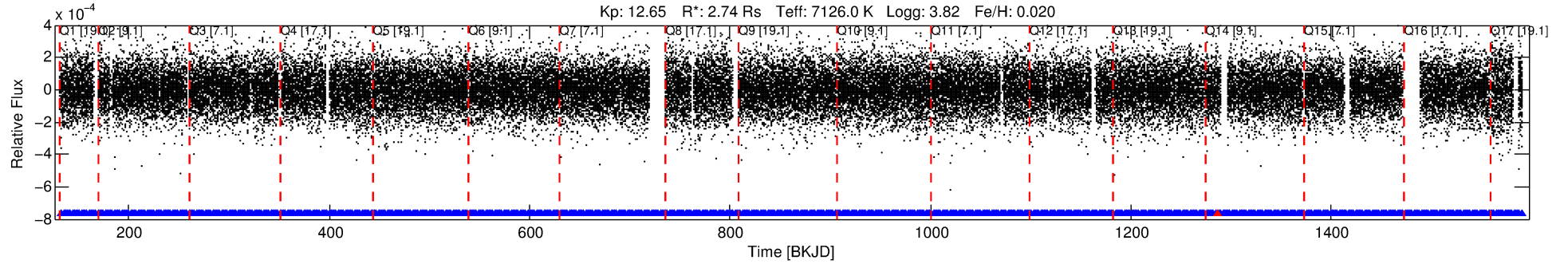
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007461354-01

No Significant Match Found

# DV One-Page Summary

KIC: 7461354 Candidate: 1 of 2 Period: 1.816 d



## DV Fit Results:

Period = 1.81617 [0.00002] d  
Epoch = 133.1216 [0.0043] BKJD  
Rp/R\* = 0.0045 [0.0012]  
a/R\* = 1.70 [1.87]  
b = 0.90 [0.36]  
Seff = 13667.54 [6364.87]  
Teq = 2757 [321] K  
Rp = 1.33 [0.55] Re  
a = 0.0356 [0.0101] AU  
Ag = 4.97 [3.57] [1.11 $\sigma$ ]  
Teffp = 6363 [937] K [3.64 $\sigma$ ]

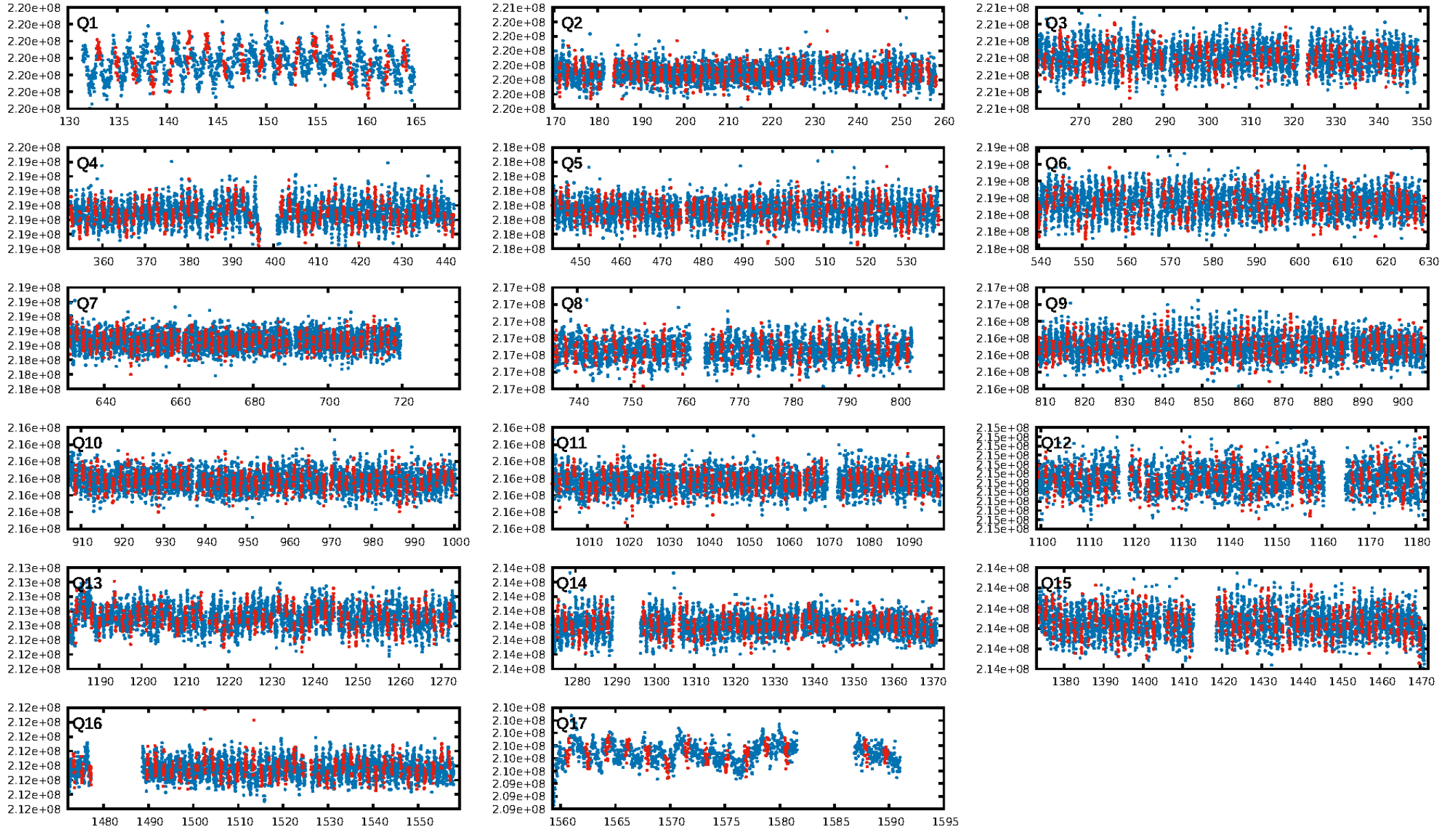
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 99.9% [3.36 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 4.78e-15  
RollingBand-fgt: 1.00 [708/709]  
GhostDiagnostic-chr: -4.373  
Centroid-sig: 0.0%  
Centroid-so: 2.521 arcsec [2.20 $\sigma$ ]  
OotOffset-rm: 0.517 arcsec [0.67 $\sigma$ ]  
KicOffset-rm: 0.616 arcsec [1.09 $\sigma$ ]  
OotOffset-st: 2/0/0/4 [6]  
KicOffset-st: 2/2/0/4 [8]  
DiffImageQuality-fgm: 0.50 [4/8]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 00:55:47 Z

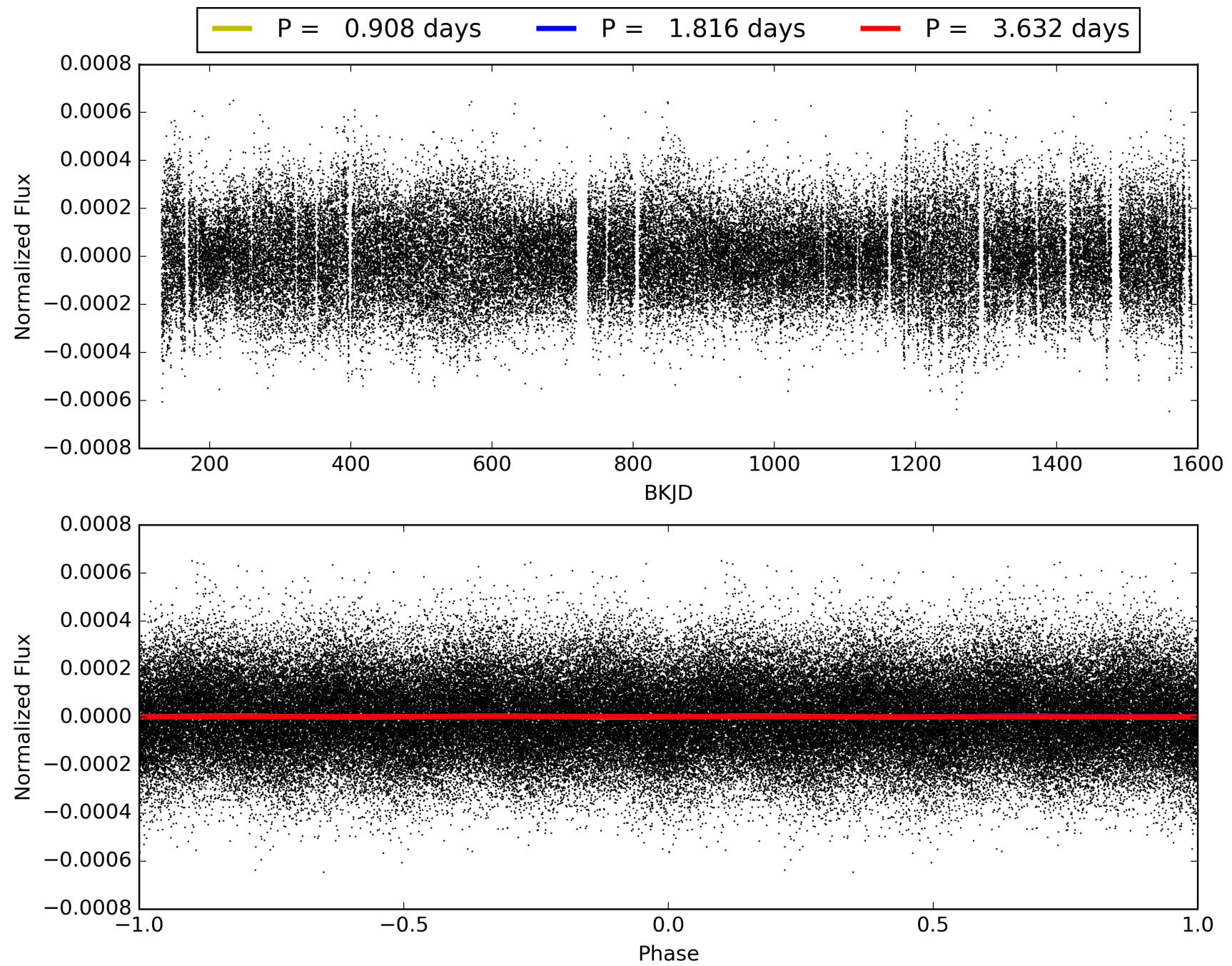
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 007461354-01, PDC Light Curves



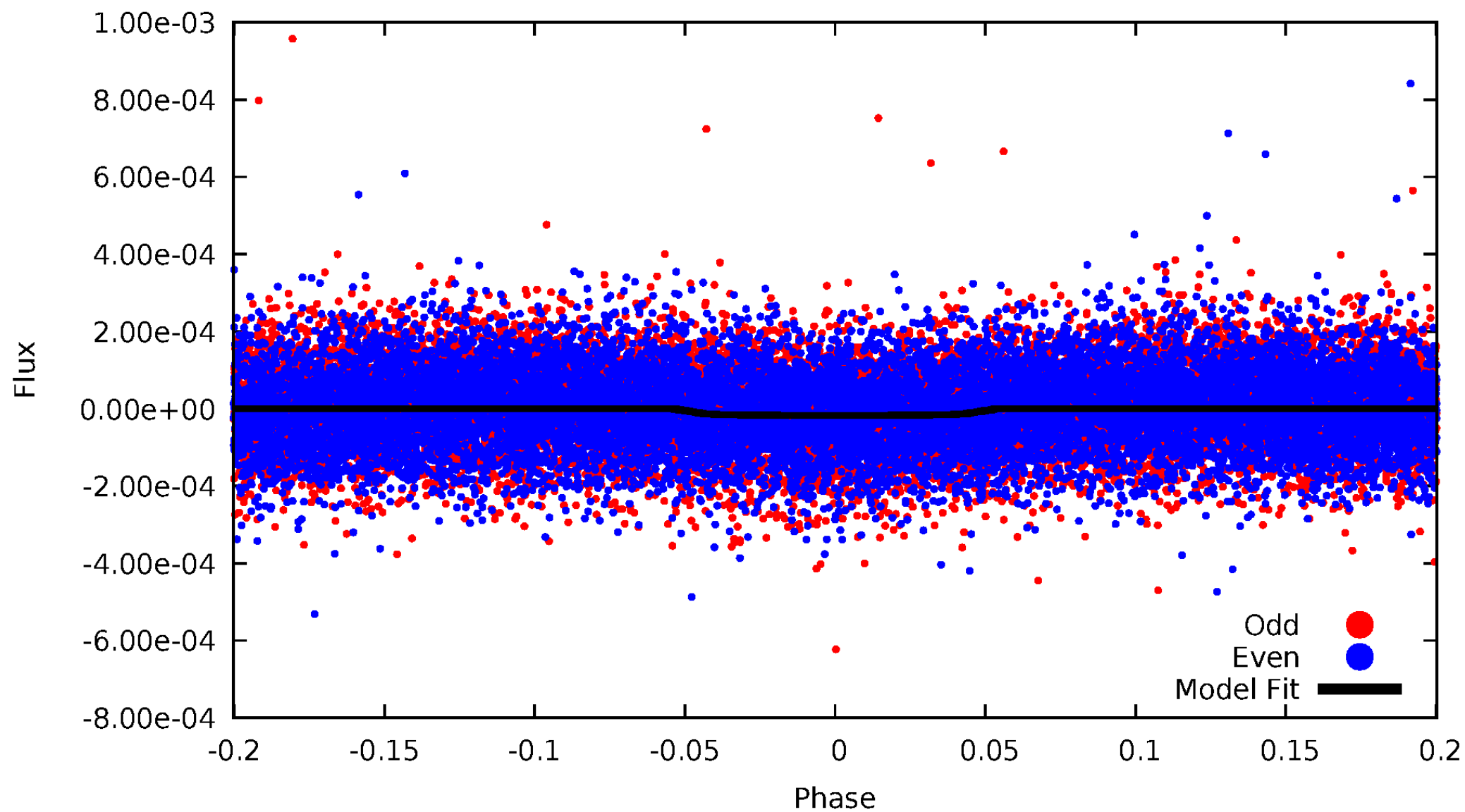


TCE 007461354-01



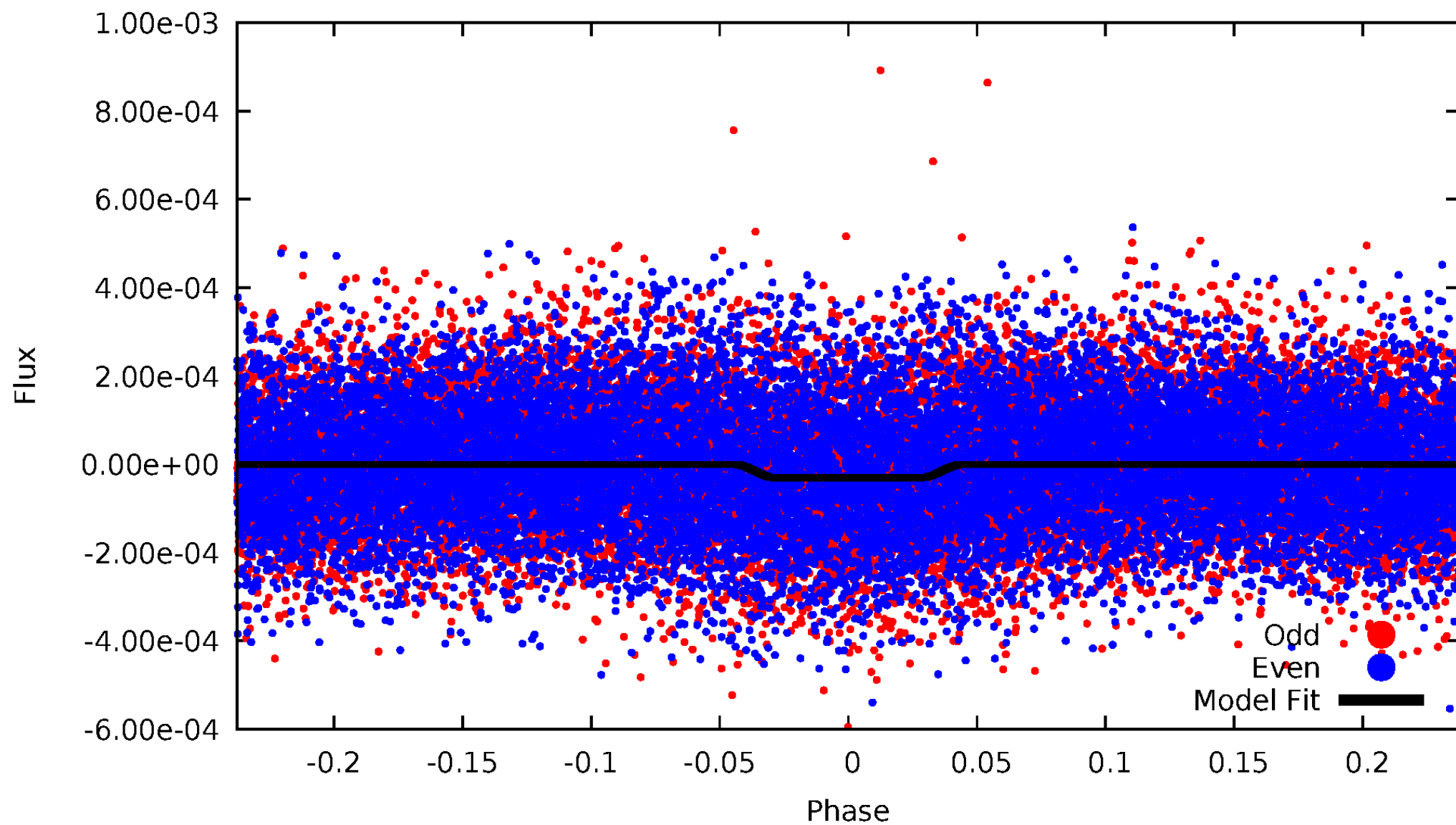
# DV Odd/Even

TCE 007461354-01



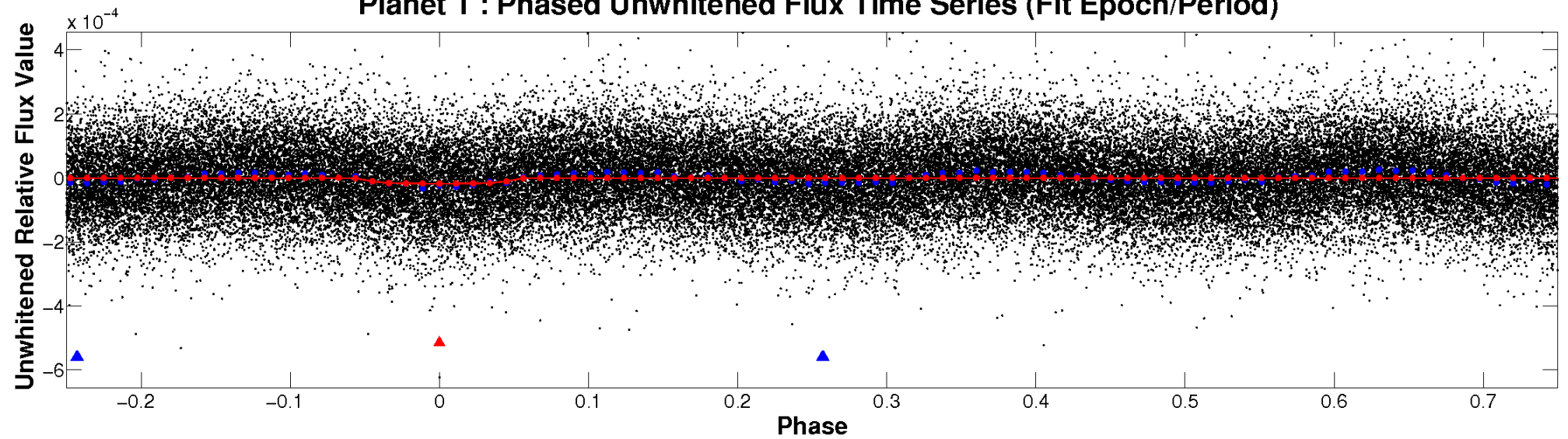
# ALT Odd/Even

TCE 007461354-01

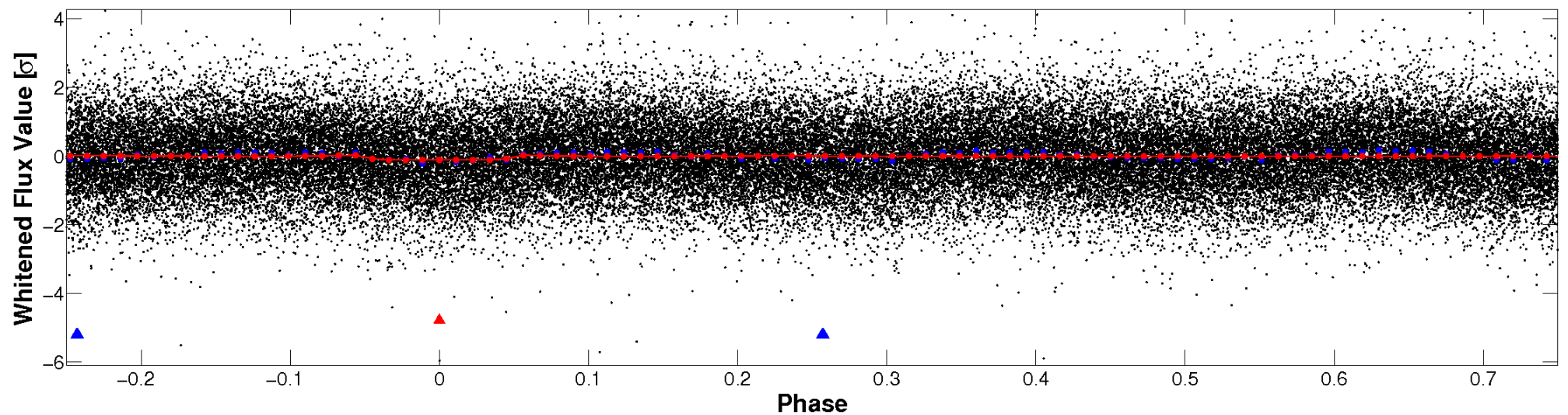


# Non-Whitened Vs. Whitened Light Curve

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



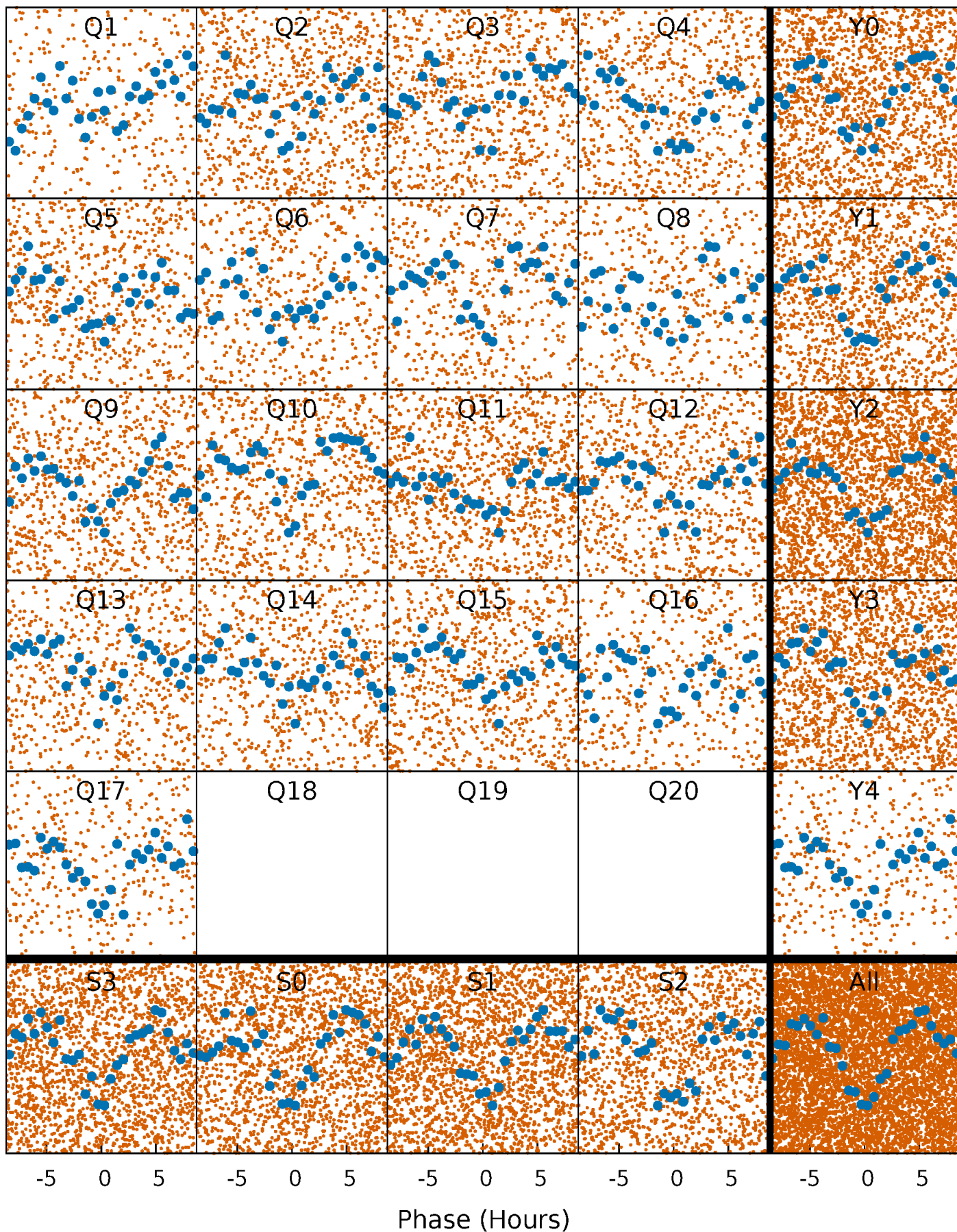
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

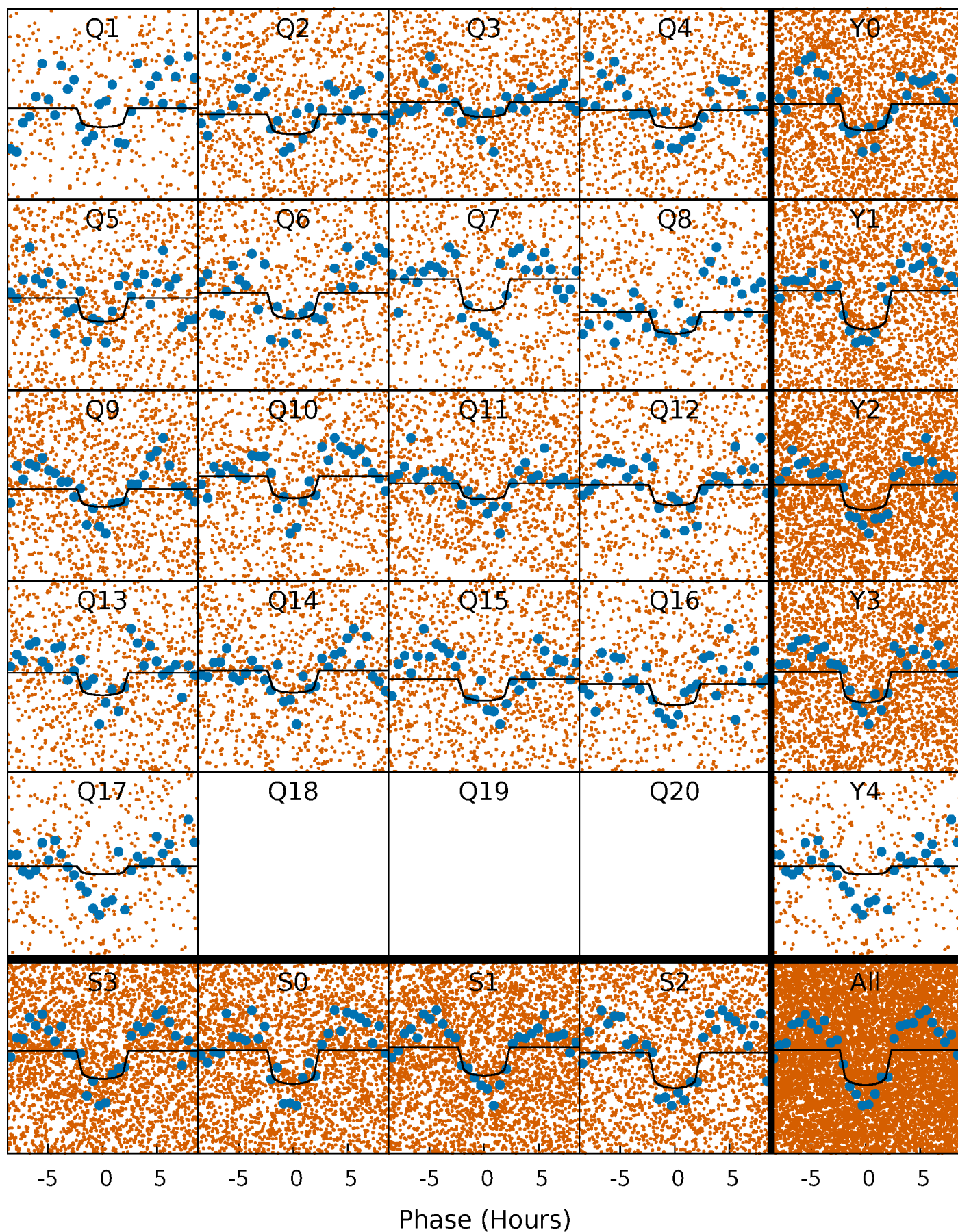
TCE 007461354-01 P= 1.816173 Days  $T_0=133.121618$  (BKJD)





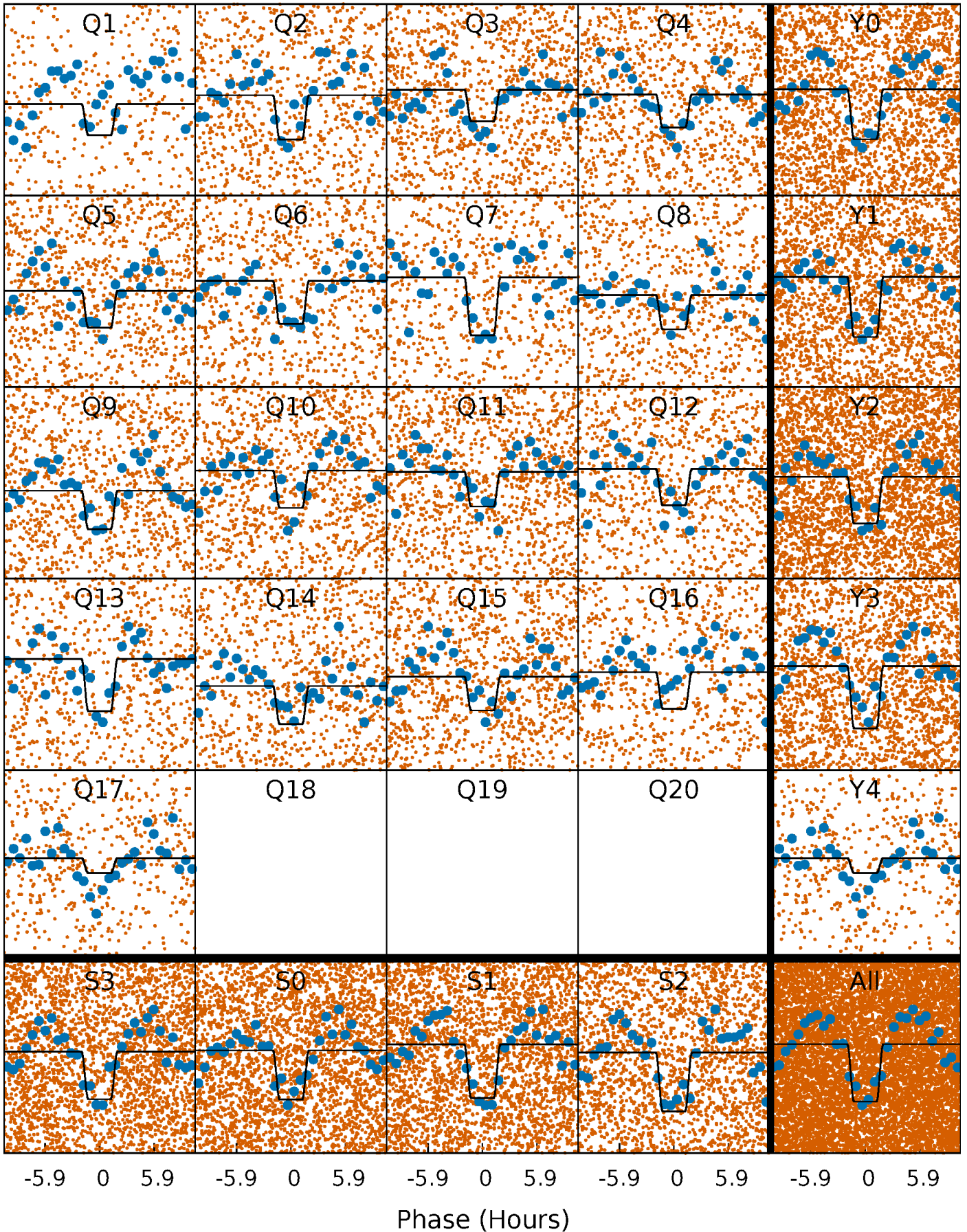
# DV Quarter-Phased Transit Curves

TCE 007461354-01 P= 1.816173 Days  $T_0=133.121618$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 007461354-01 P= 1.816183 Days  $T_0=133.117396$  (BKJD)

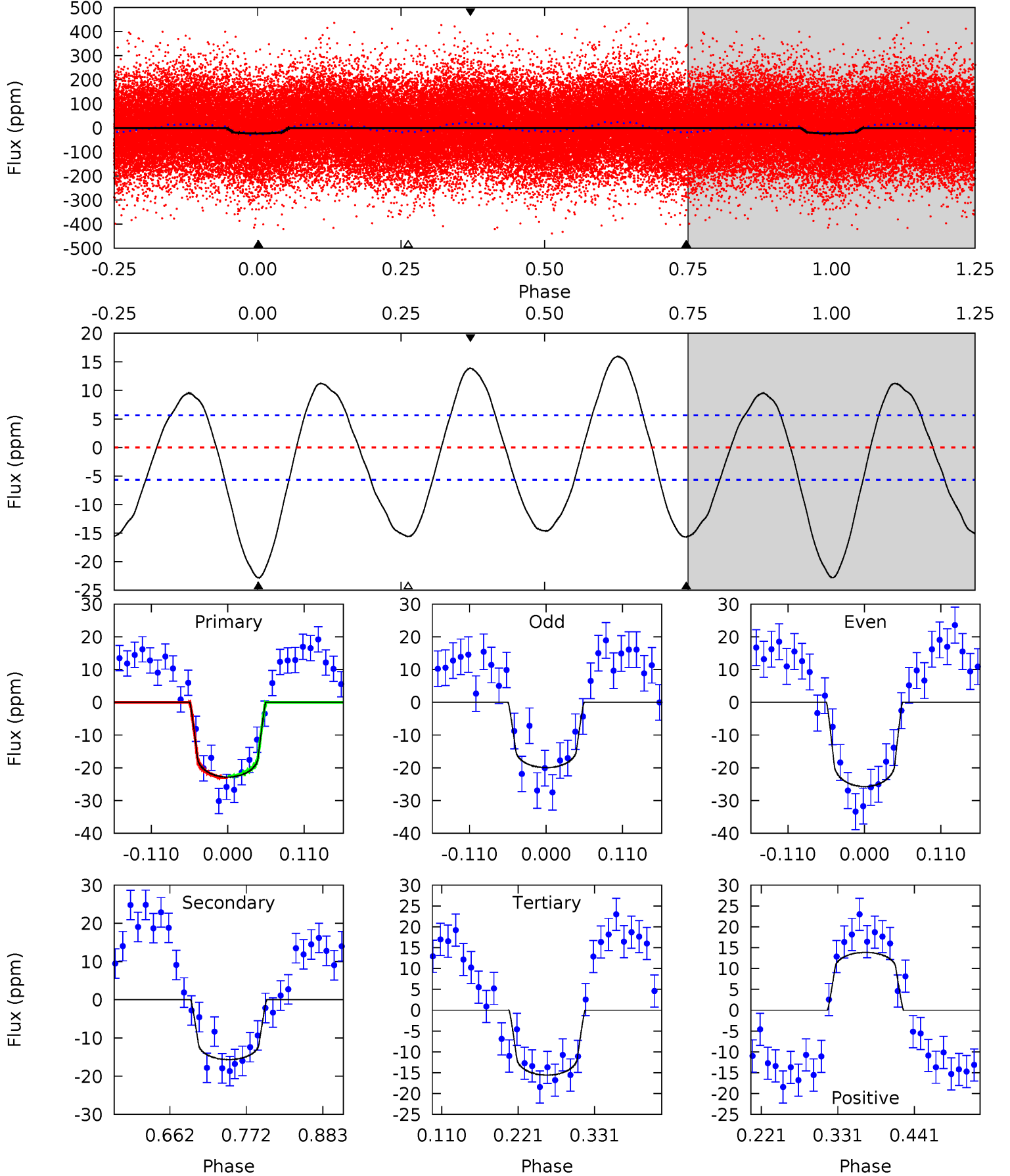




# DV Model-Shift Uniqueness Test

007461354-01, P = 1.816173 Days, E = 131.305445 Days

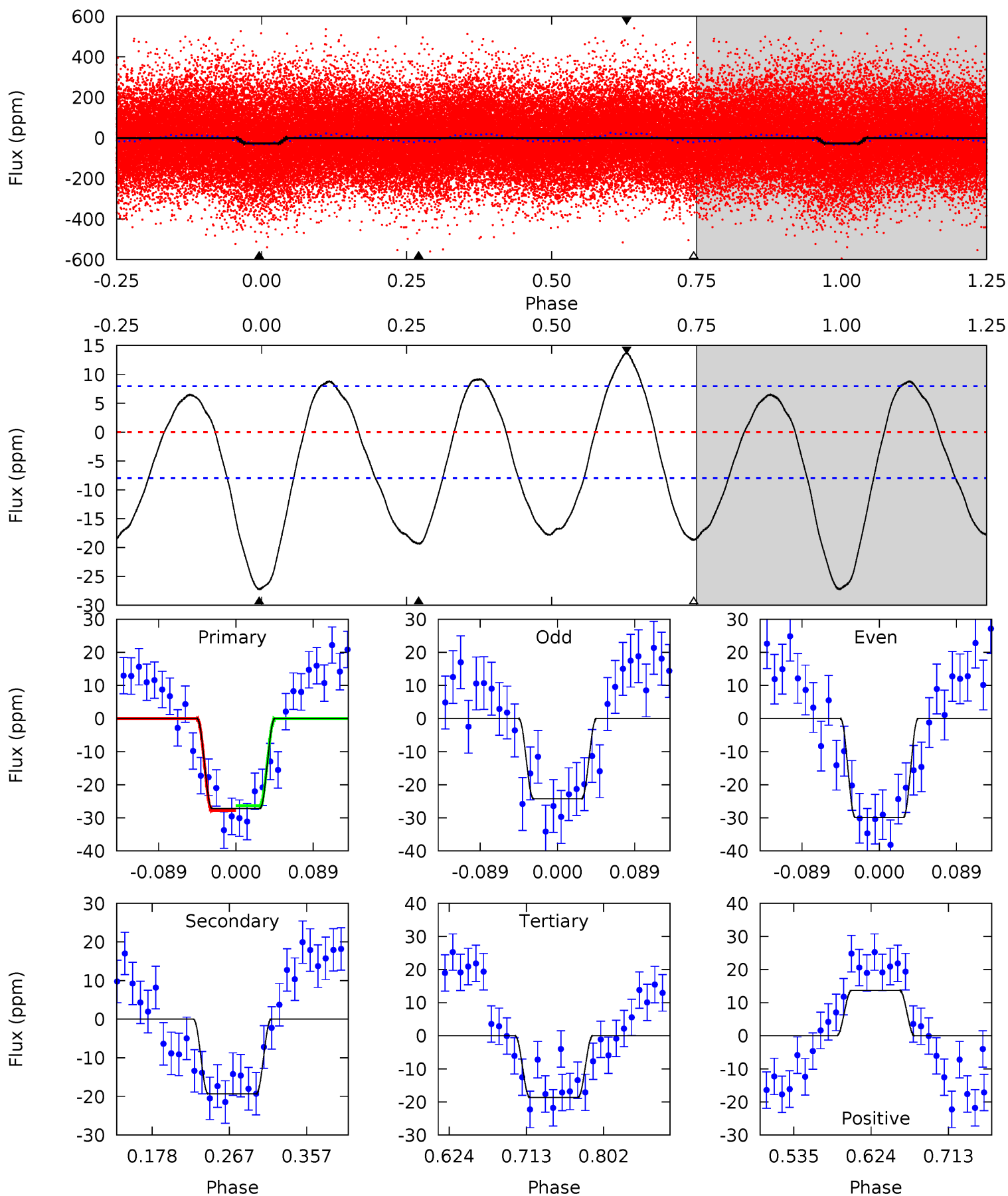
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.4	12.6	12.5	11.1	4.54	1.60	8.19	5.83	7.21	0.06	1.45	2.33	0.94	0.41	0.21



# Alt Model-Shift Uniqueness Test

007461354-01, P = 1.816183 Days, E = 131.301213 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
15.7	11.2	10.8	7.91	4.59	1.70	5.79	4.94	7.80	0.39	3.25	1.64	0.78	0.33	0.43





### Stellar Parameters For KIC 007461354

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7126^{+174}_{-273}$	$3.824^{+0.252}_{-0.108}$	$0.020^{+0.250}_{-0.300}$	$2.738^{+0.463}_{-0.859}$	$1.822^{+0.162}_{-0.379}$	$0.125^{+0.217}_{-0.041}$
	+2%/-4%	+7%/-3%	+1250%/-1500%	+17%/-31%	+9%/-21%	+173%/-33%
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 007461354-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-16 \pm 1$	$1.28^{+0.42}_{-0.39}$	$3786^{+236}_{-310}$	$6500^{+1371}_{-788}$	$6.479^{+6.546}_{-2.708}$
Alt.	$-19 \pm 2$	$1.59^{+0.43}_{-0.40}$	$3811^{+200}_{-292}$	$6160^{+996}_{-634}$	$5.210^{+3.856}_{-1.966}$

$T_{max}$  = 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

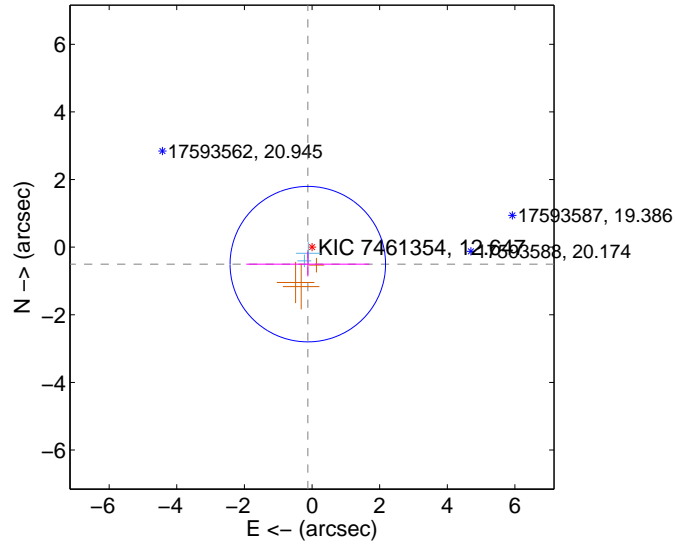
Supplemental centroid analysis for 007461354-01. Kepler magnitude: 12.65. Transit SNR 8.70

There are 4 quarters with good PRF difference image offsets

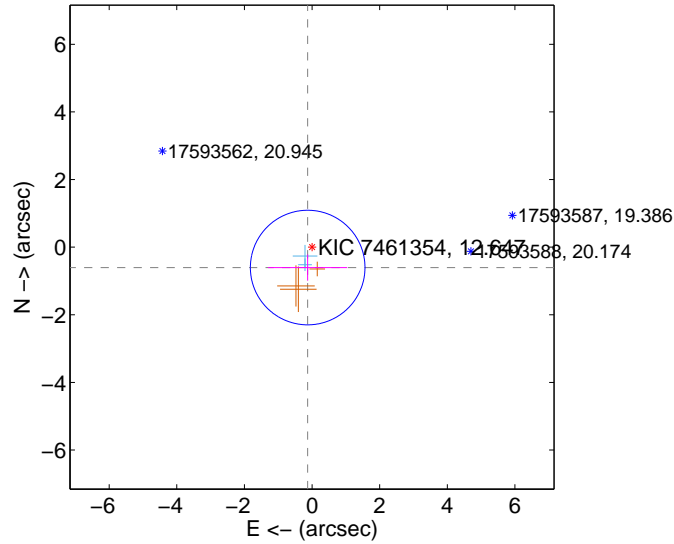
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.517 \pm 0.766$	0.67	$0.125 \pm 1.819$	$-0.502 \pm 0.364$
PRF-fit source offset from KIC position	$0.616 \pm 0.565$	1.09	$0.129 \pm 1.172$	$-0.603 \pm 0.389$
photometric centroid source offset	$2.52 \pm 1.15$	2.20	$-2.46 \pm 1.16$	$-0.57 \pm 0.76$

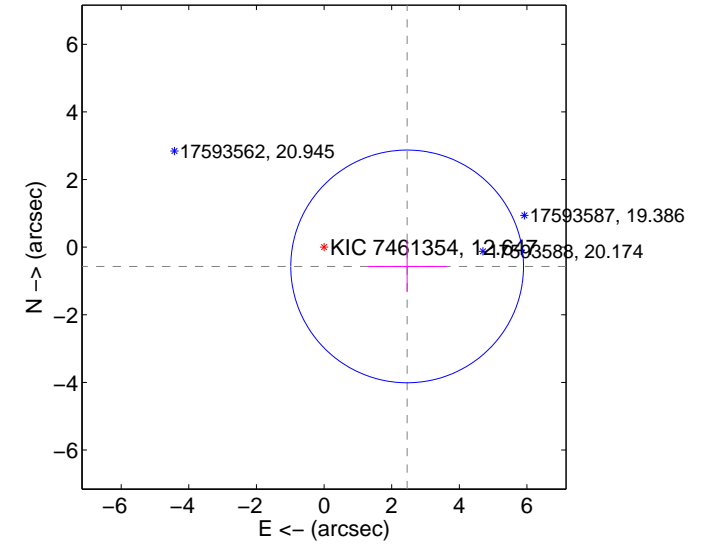
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

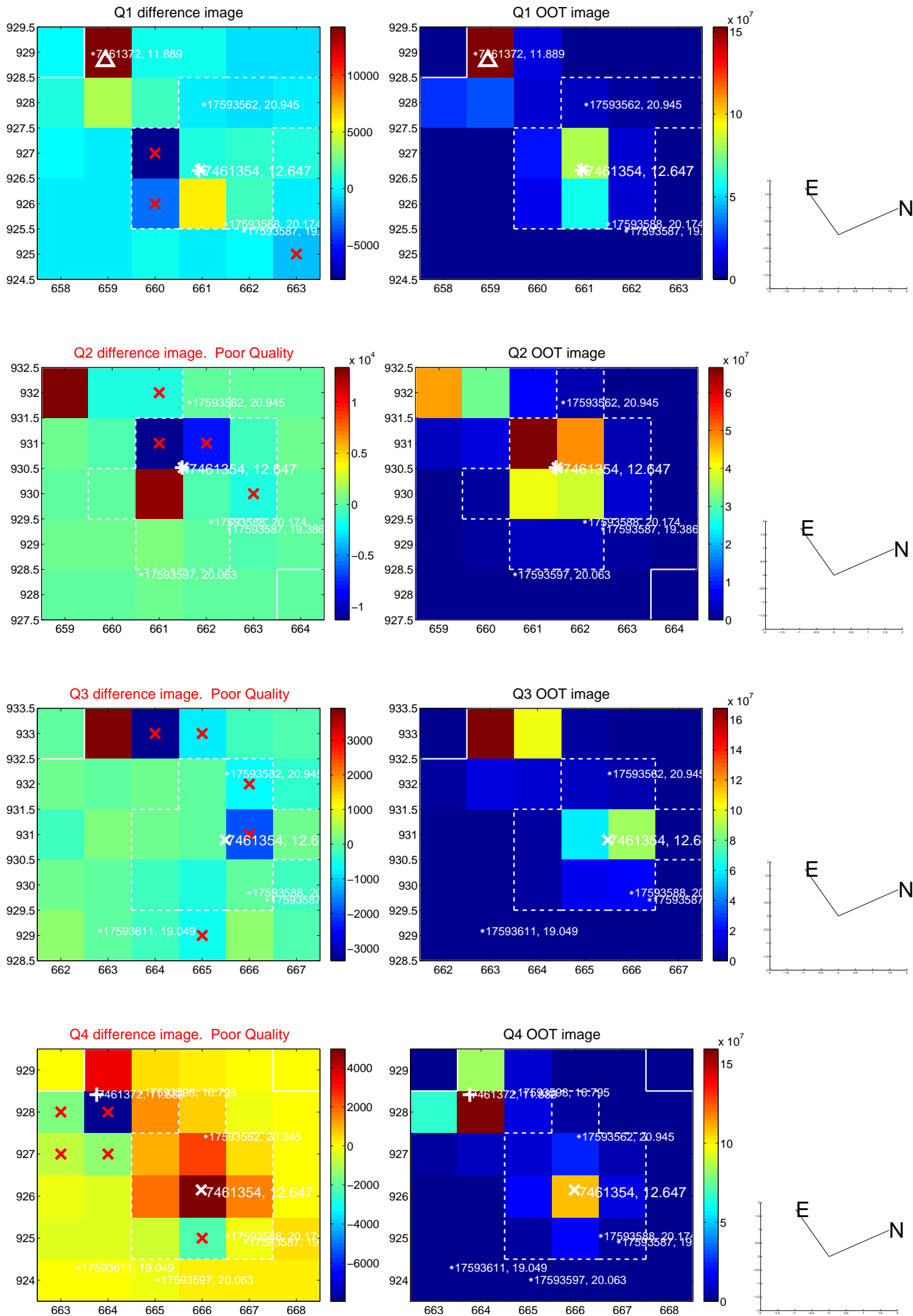


offset from photometric centroids

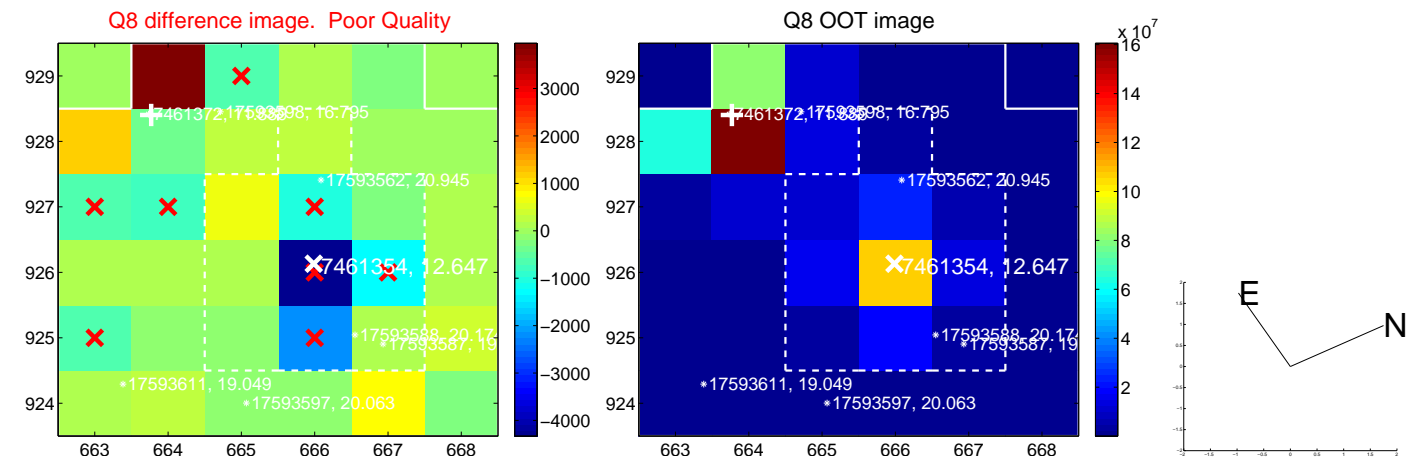
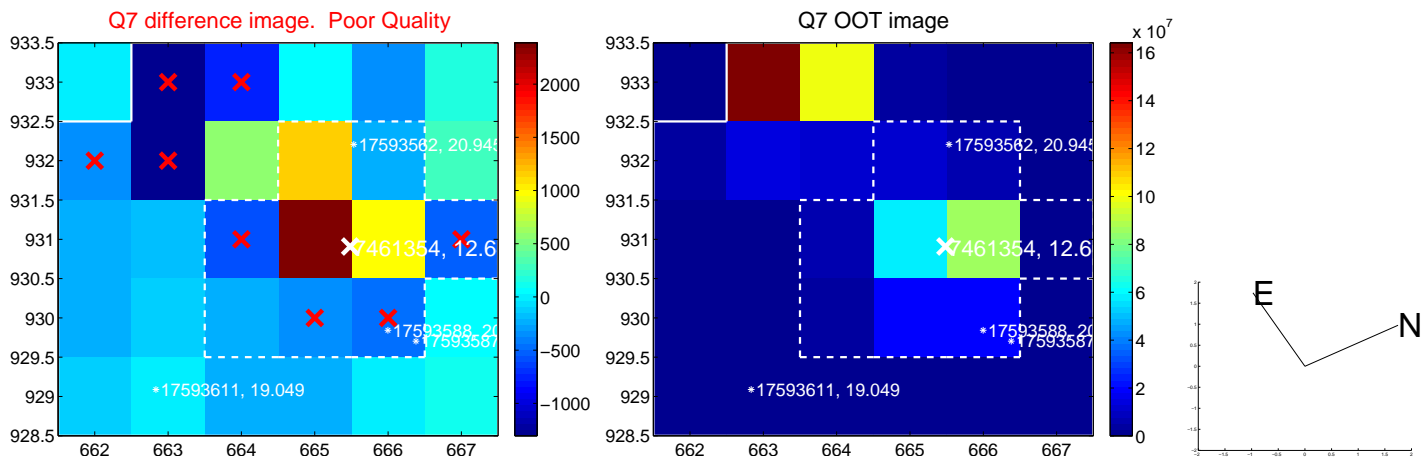
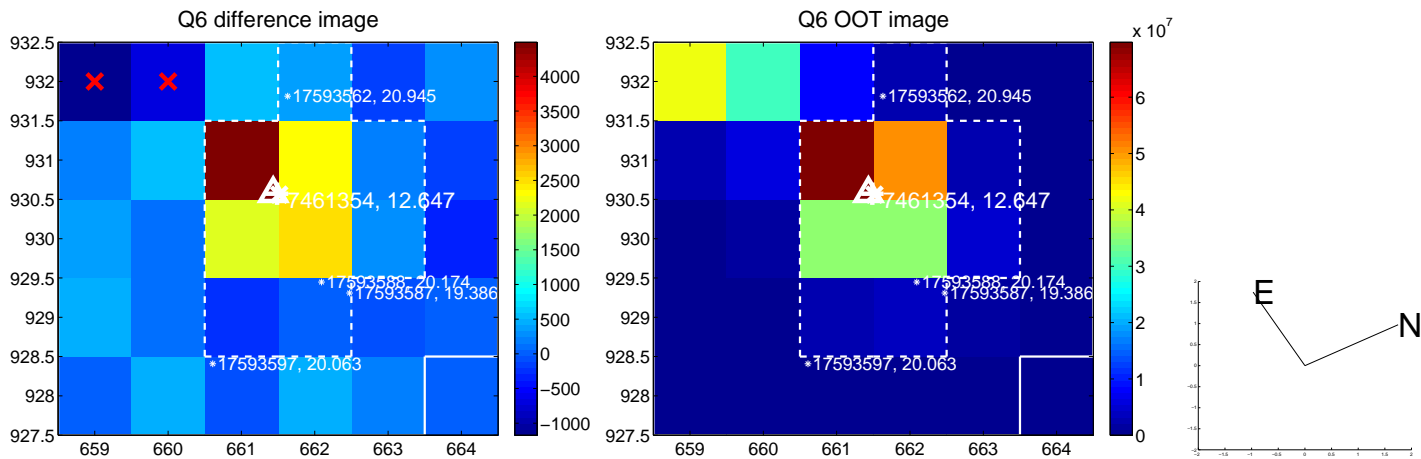
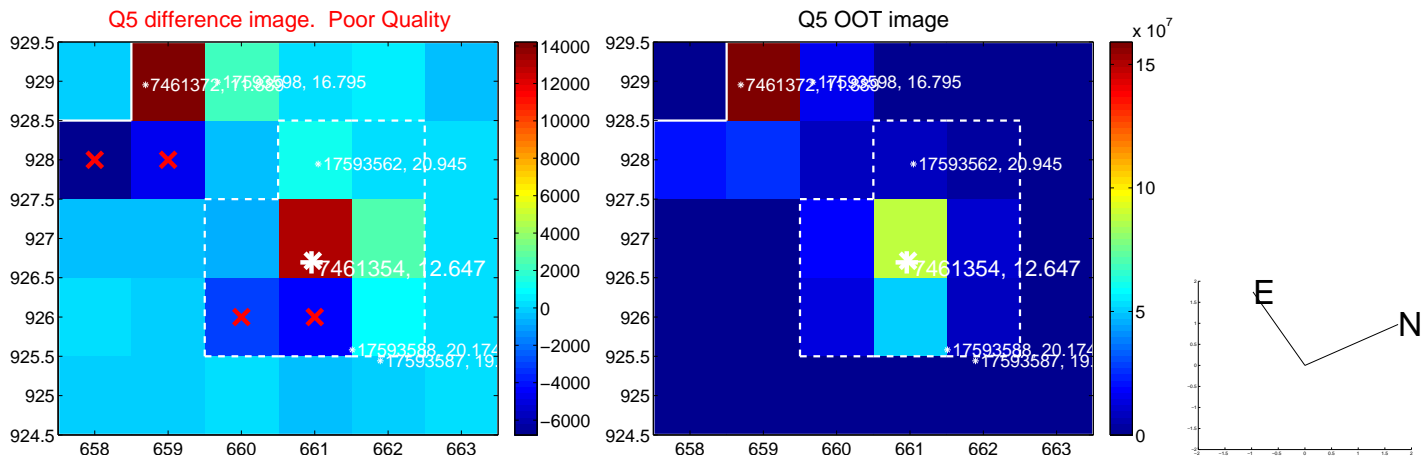


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



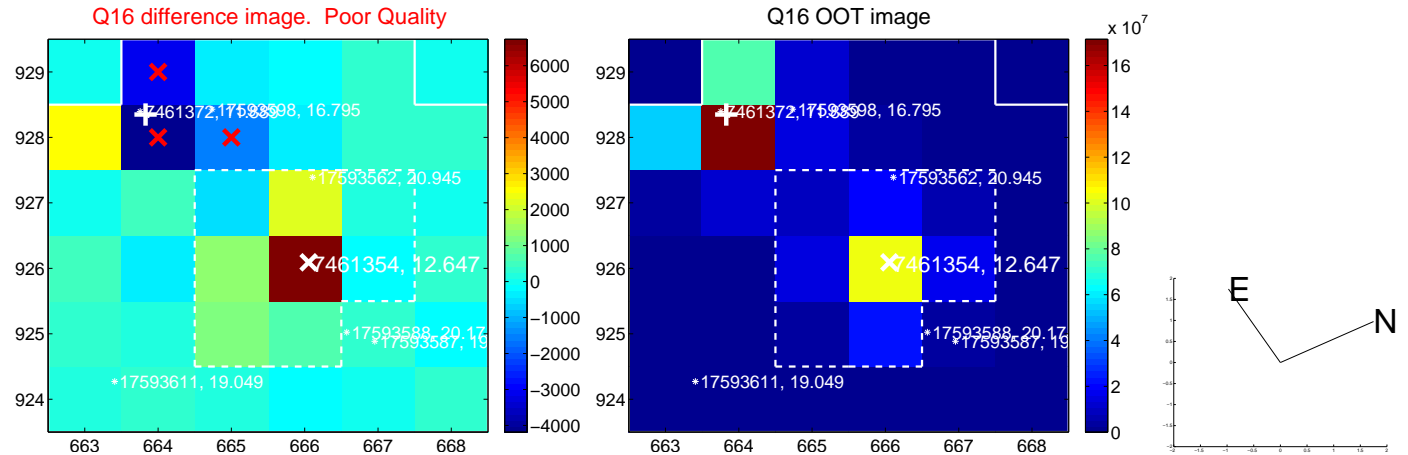
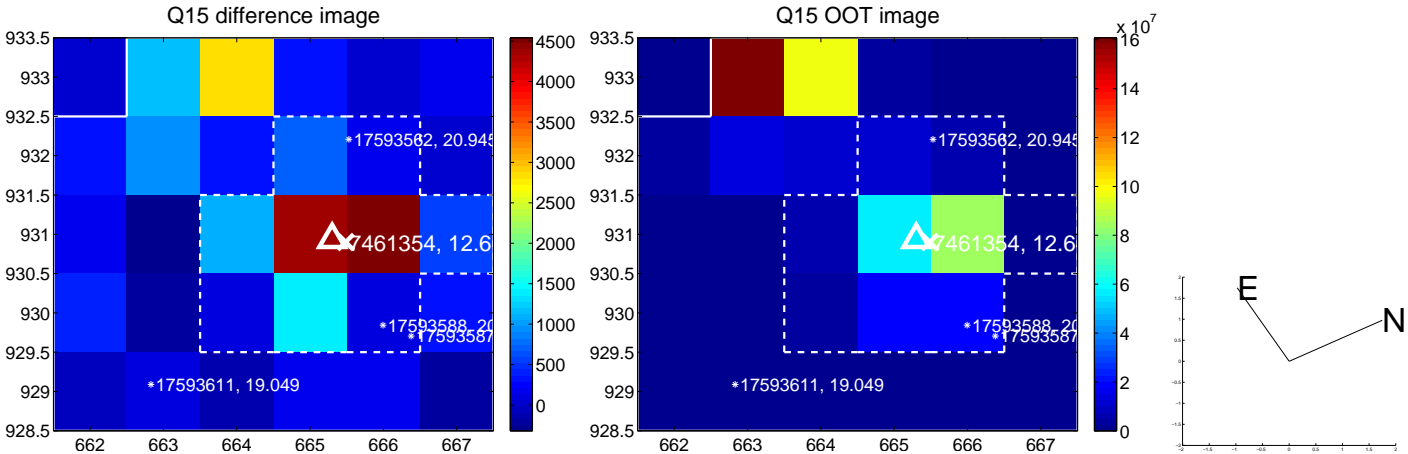
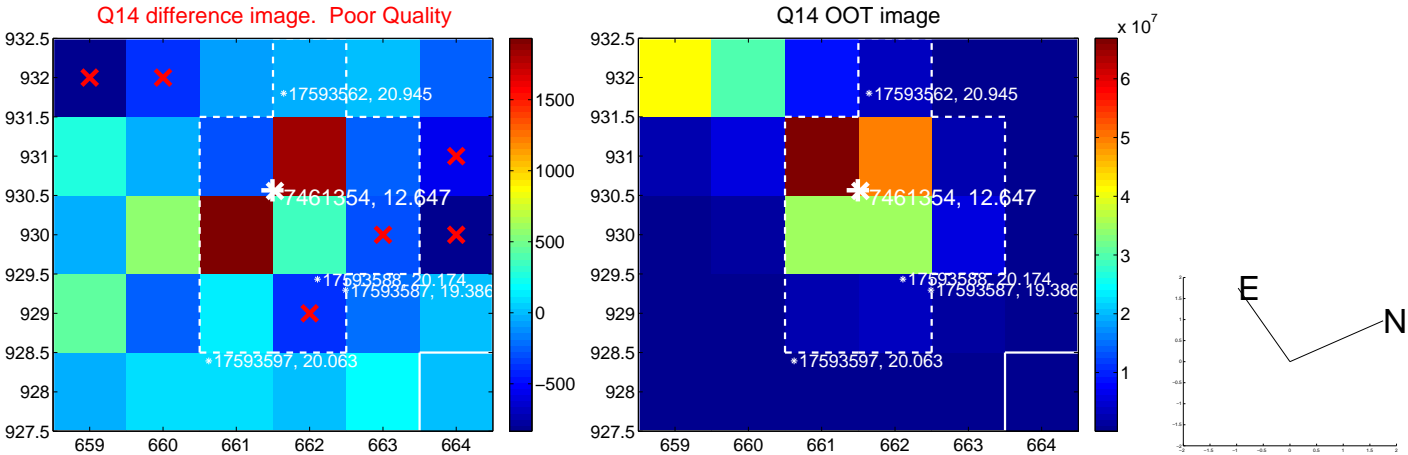
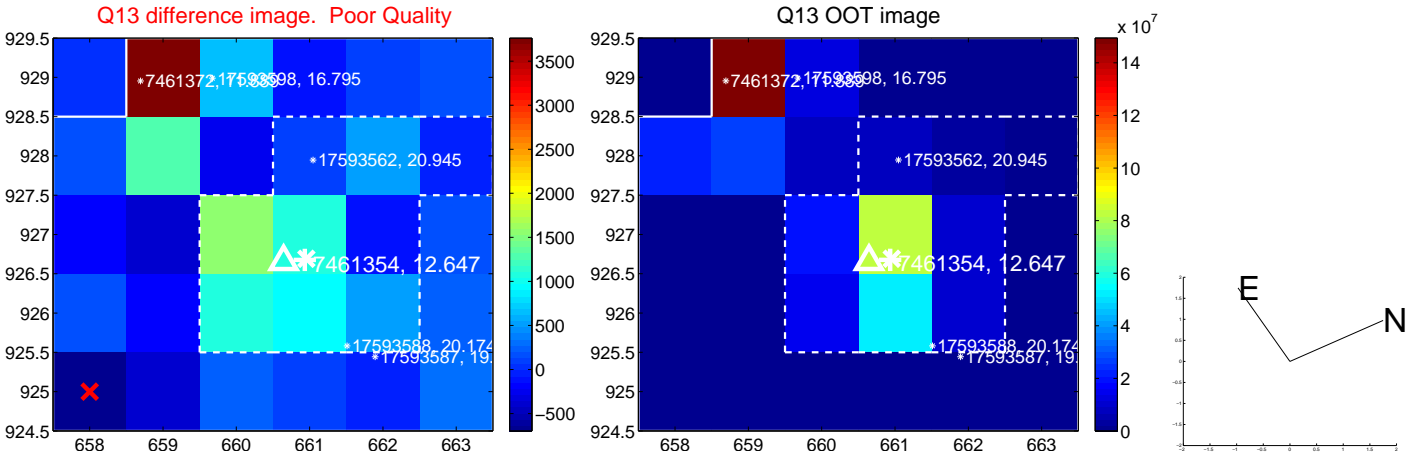
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



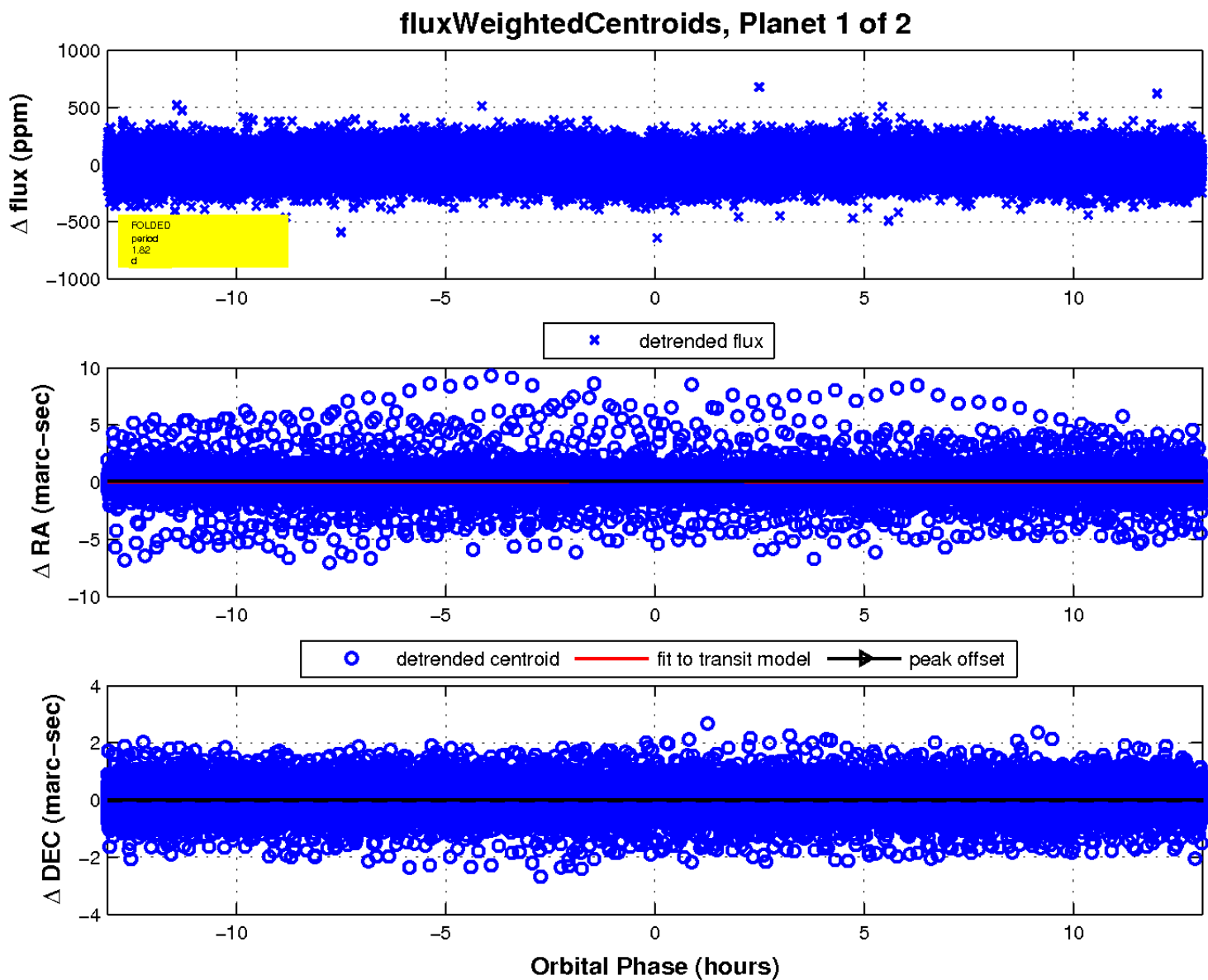
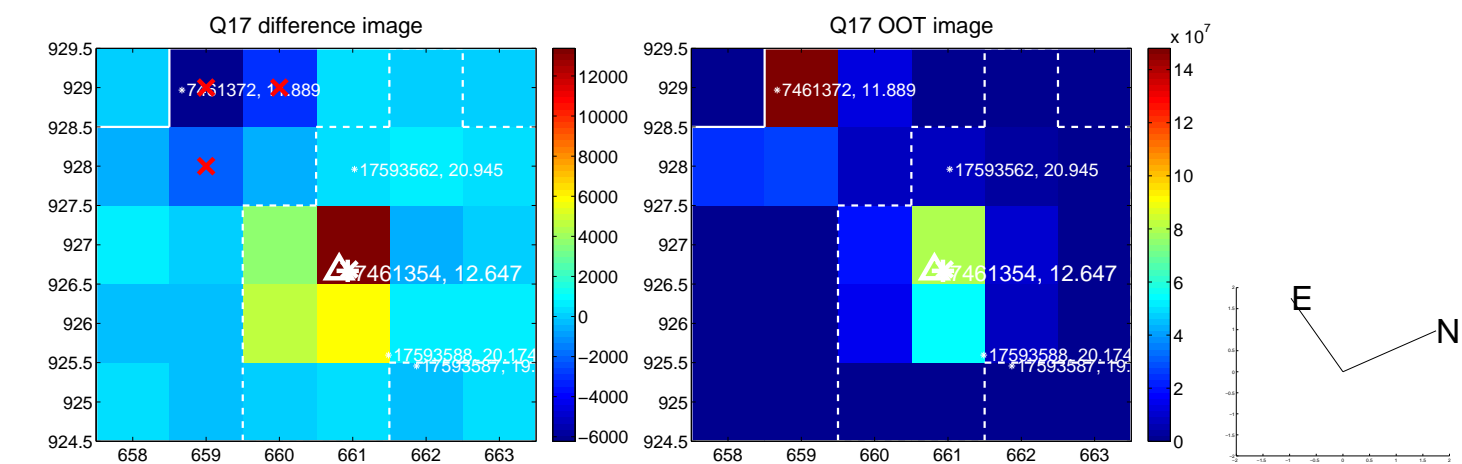




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

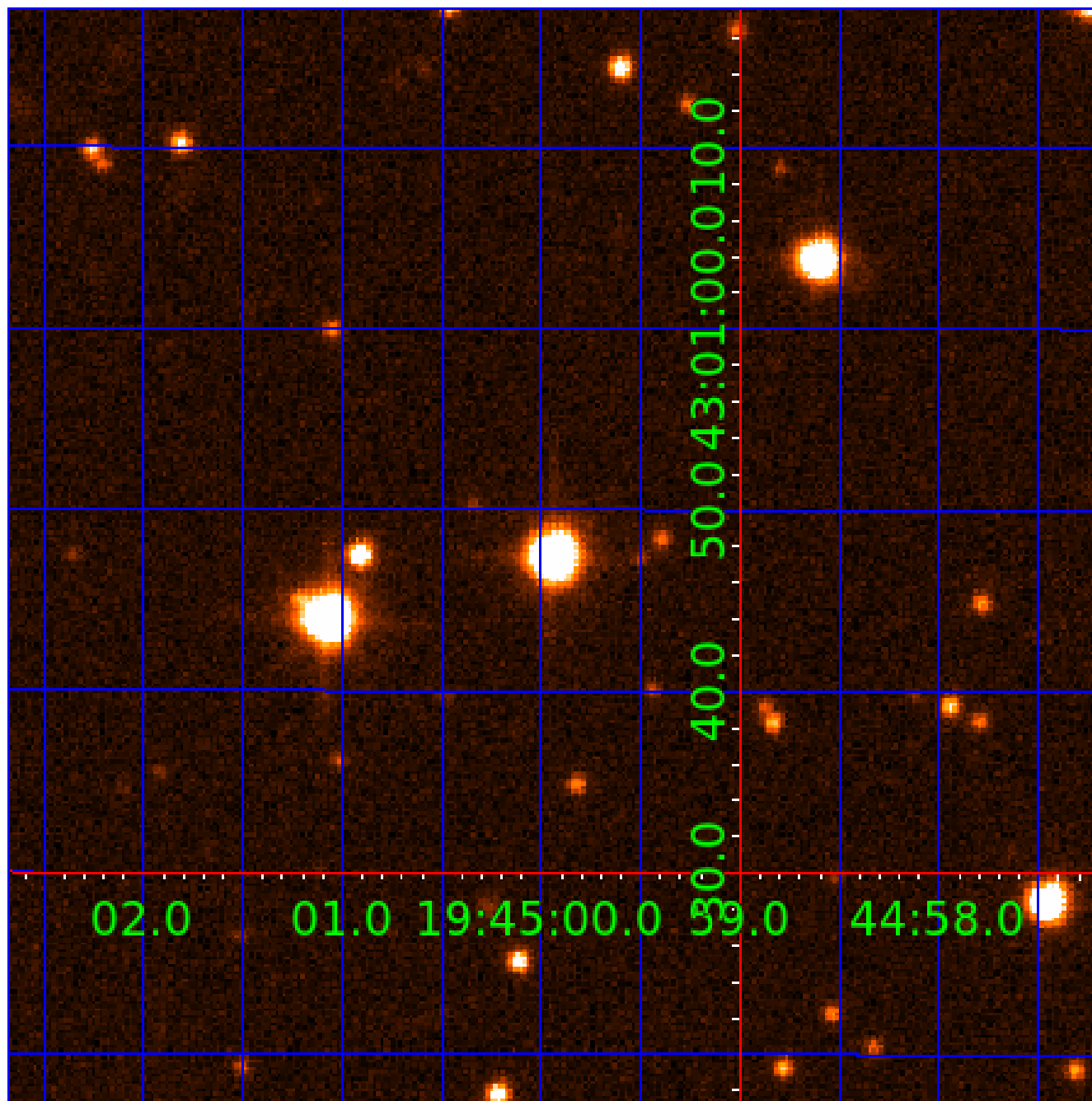


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 007461354

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007461354-01	OBS	No	1.816173	133.121618	17.6	4.363	9.0	8.7	2.74	7126	1.33	13667.54
007461354-02	OBS	No	2.724256	132.681633	19.2	4.788	8.3	8.7	2.74	7126	1.29	7959.81

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007461354-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
007461354-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_KIC_POS

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

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

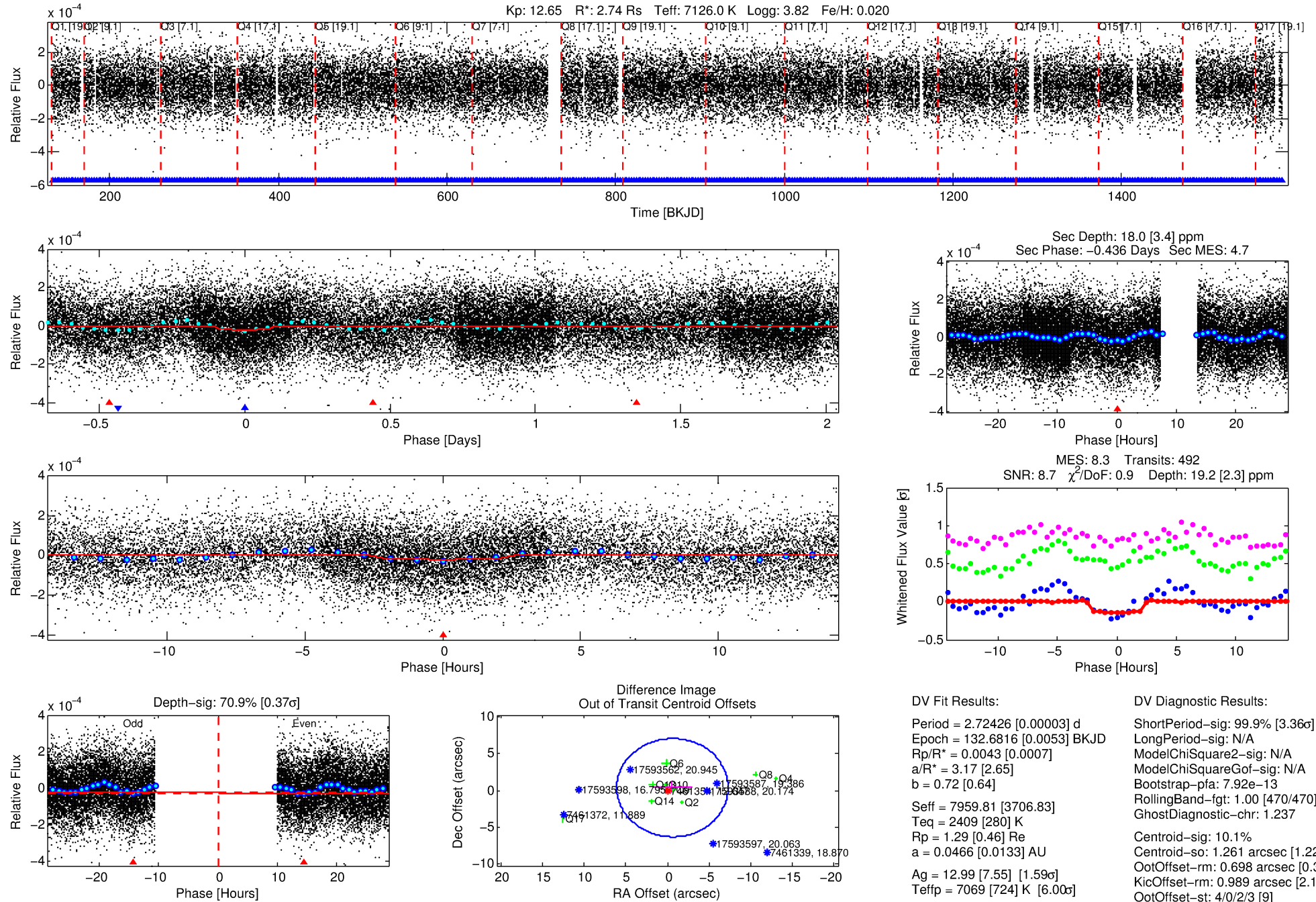
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007461354-02

No Significant Match Found

# DV One-Page Summary

KIC: 7461354 Candidate: 2 of 2 Period: 2.724 d



## DV Fit Results:

Period = 2.72426 [0.00003] d  
Epoch = 132.6816 [0.0053] BKJD  
Rp/R\* = 0.0043 [0.0007]  
a/R\* = 3.17 [2.65]  
b = 0.72 [0.64]  
Seff = 7959.81 [3706.83]  
Teq = 2409 [280] K  
Rp = 1.29 [0.46] Re  
a = 0.0466 [0.0133] AU  
Ag = 12.99 [7.55] [1.59σ]  
Teffp = 7069 [724] K [6.00σ]

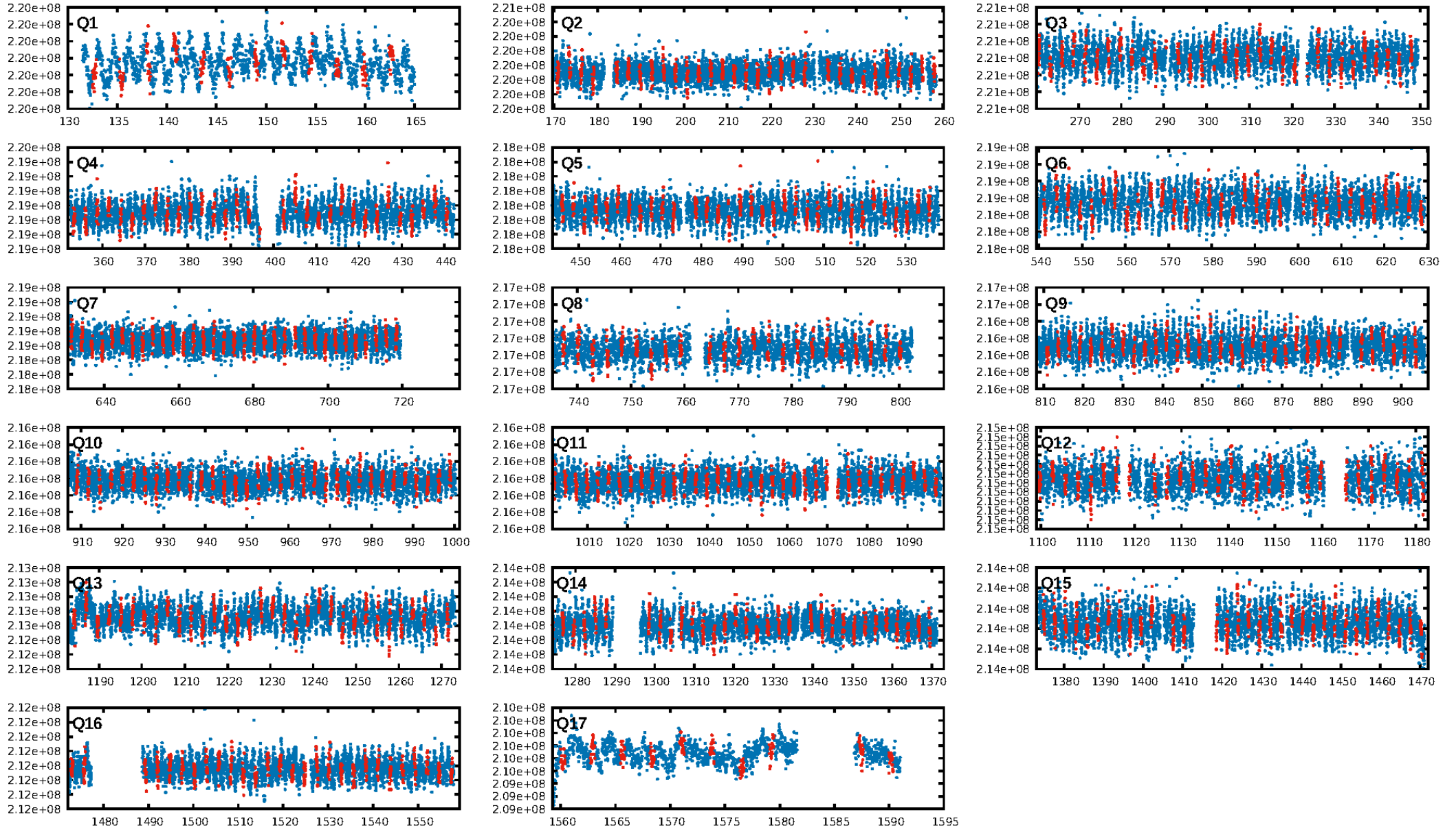
## DV Diagnostic Results:

ShortPeriod-sig: 99.9% [3.36σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 7.92e-13  
RollingBand-fgt: 1.00 [470/470]  
GhostDiagnostic-chr: 1.237  
Centroid-sig: 10.1%  
Centroid-so: 1.261 arcsec [1.22σ]  
OotOffset-rm: 0.698 arcsec [0.31σ]  
KicOffset-rm: 0.989 arcsec [2.14σ]  
OotOffset-st: 4/0/2/3 [9]  
KicOffset-st: 4/4/2/3 [13]  
DiffImageQuality-fgm: 0.77 [10/13]  
DiffImageOverlap-fno: 0.00 [0/17]

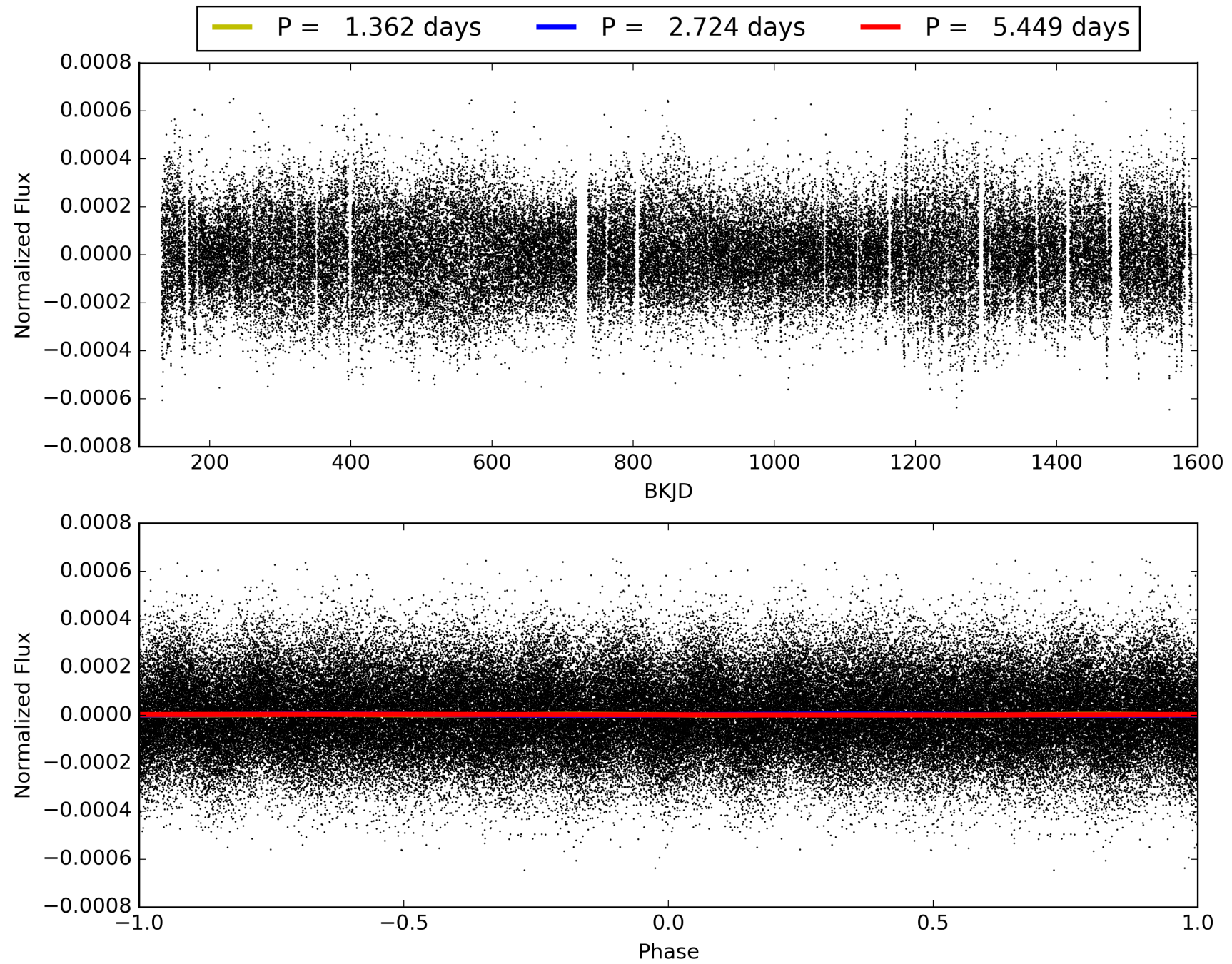
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 00:55:57 Z

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

# TCE 007461354-02, PDC Light Curves



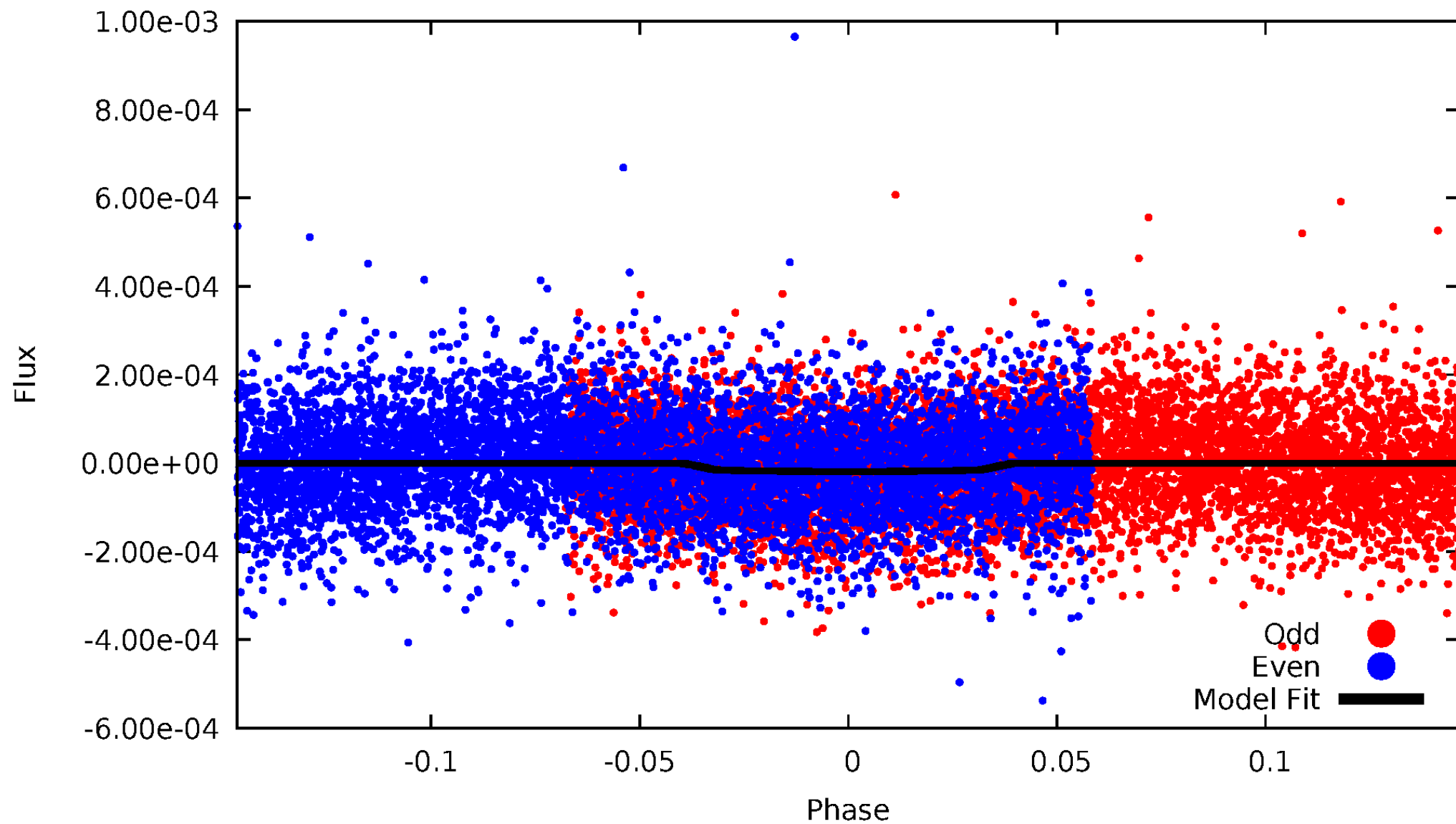
TCE 007461354-02





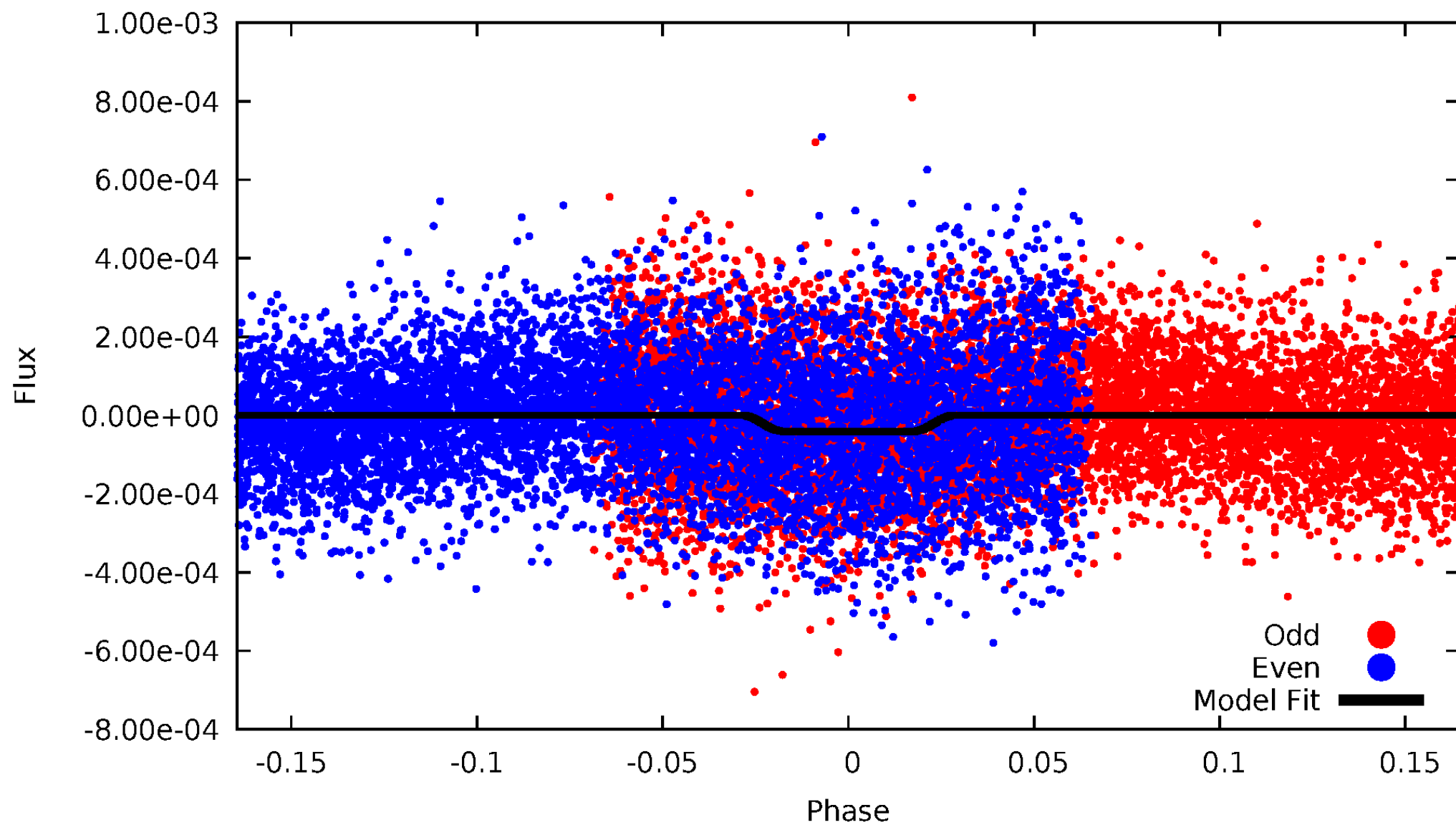
# DV Odd/Even

TCE 007461354-02



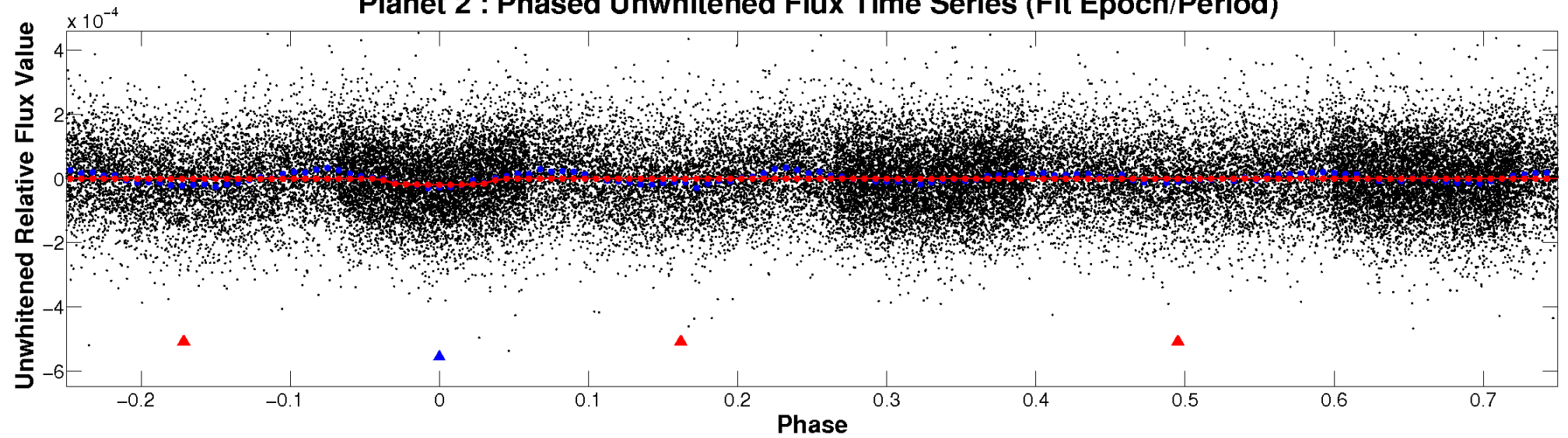
# ALT Odd/Even

TCE 007461354-02

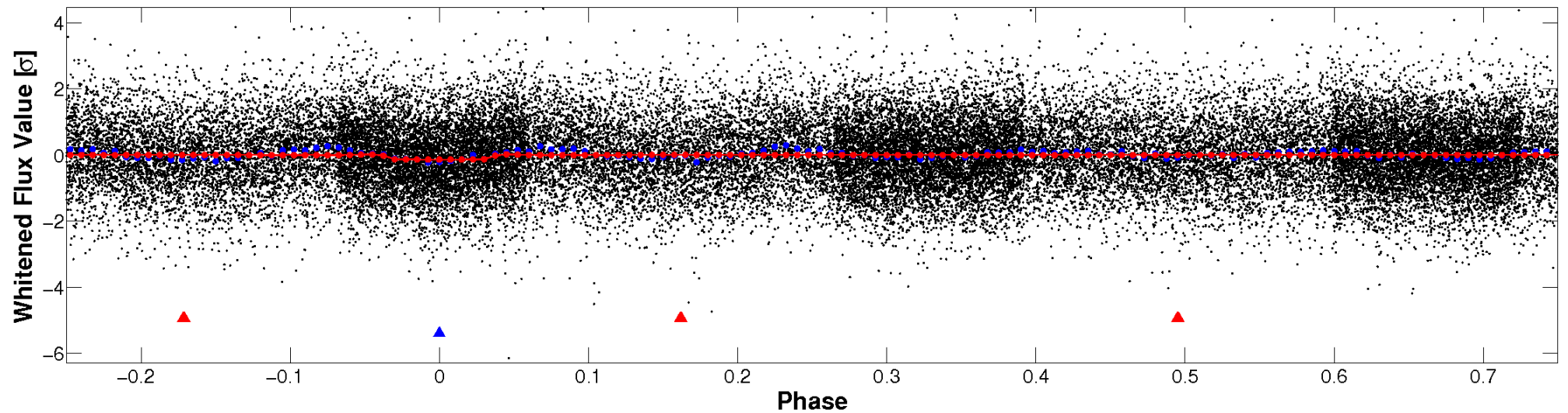


# Non-Whitened Vs. Whitened Light Curve

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

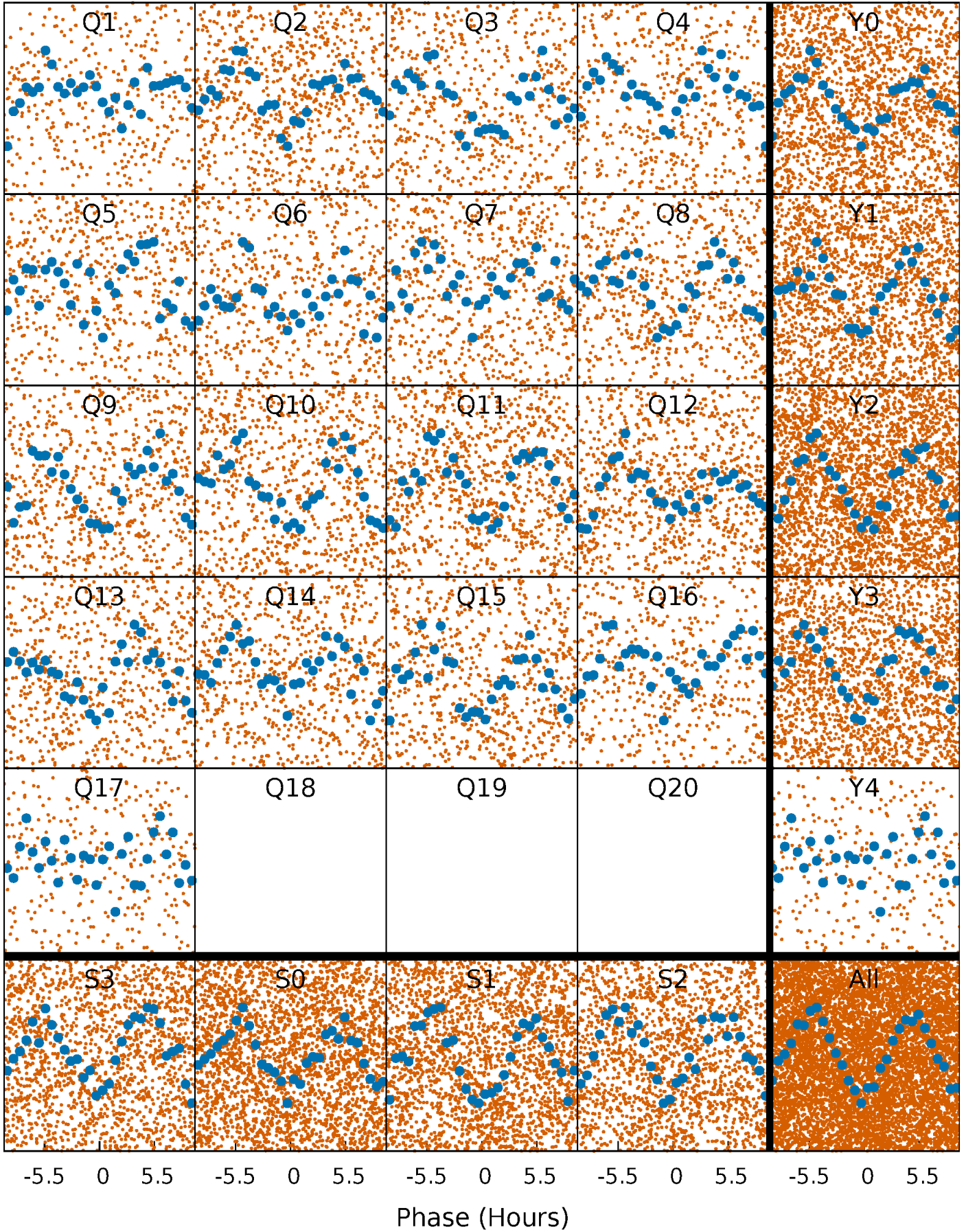


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

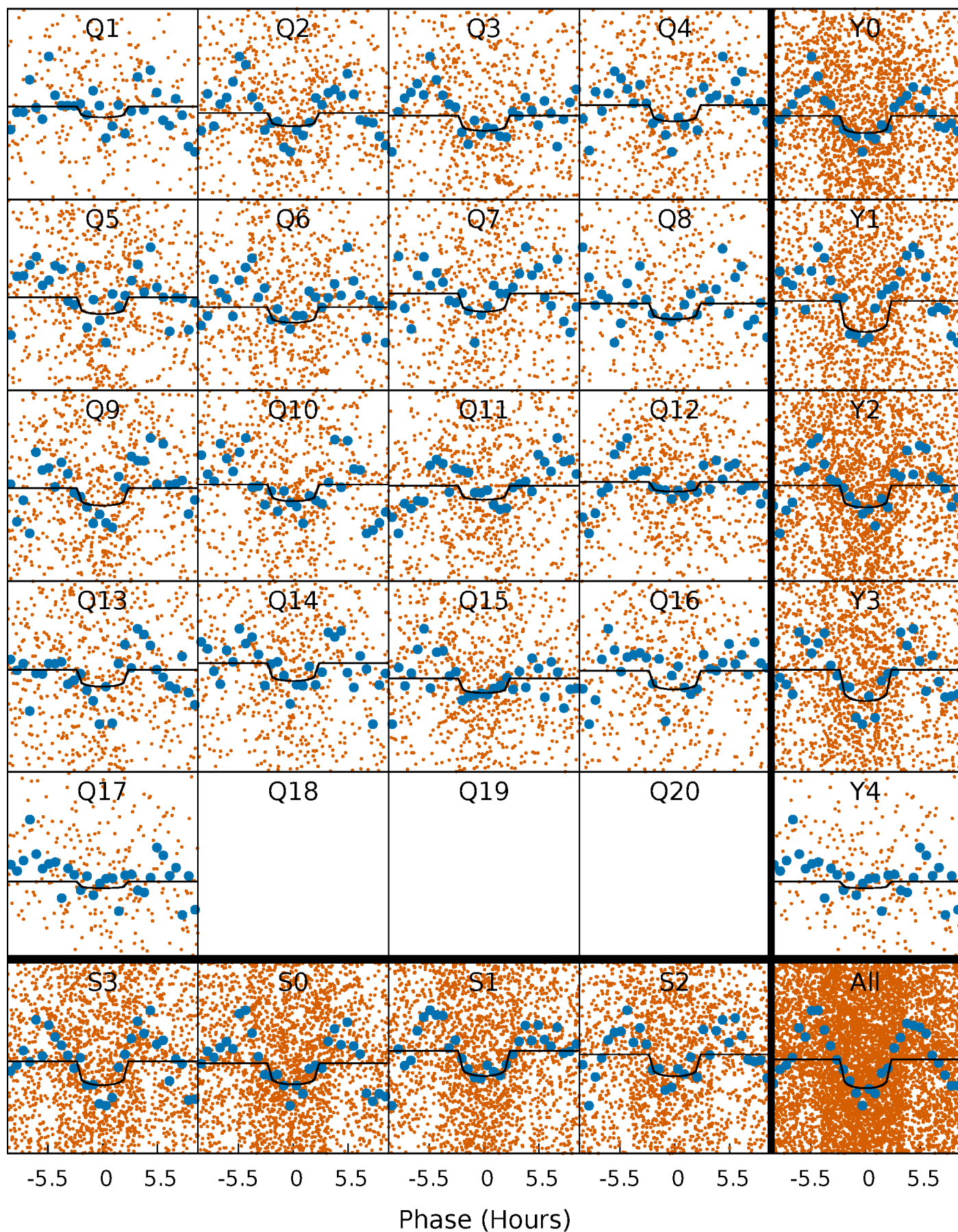
TCE 007461354-02 P= 2.724256 Days  $T_0=132.681633$  (BKJD)





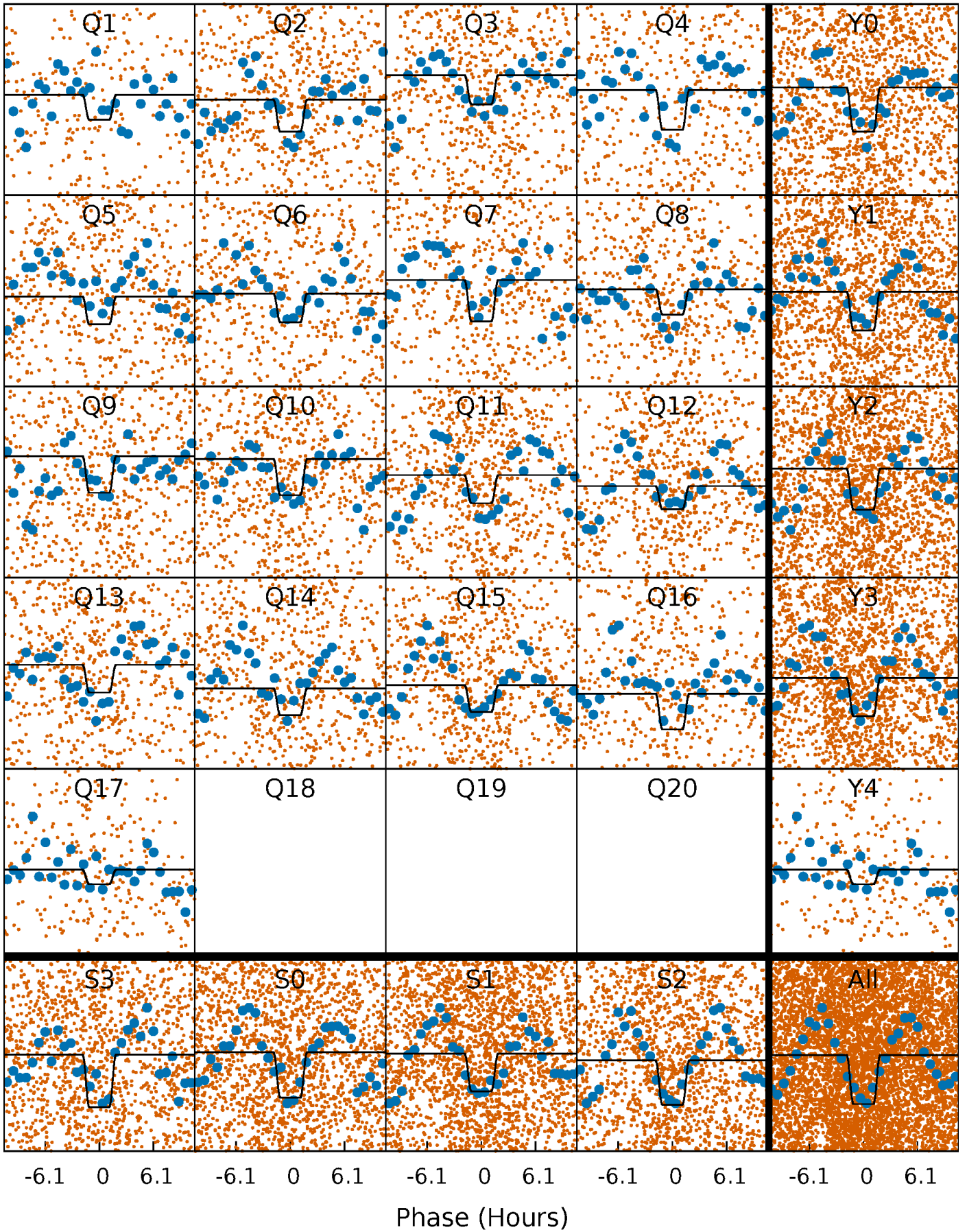
# DV Quarter-Phased Transit Curves

TCE 007461354-02   P= 2.724256 Days    $T_0=132.681633$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 007461354-02 P= 2.724313 Days  $T_0=132.658095$  (BKJD)

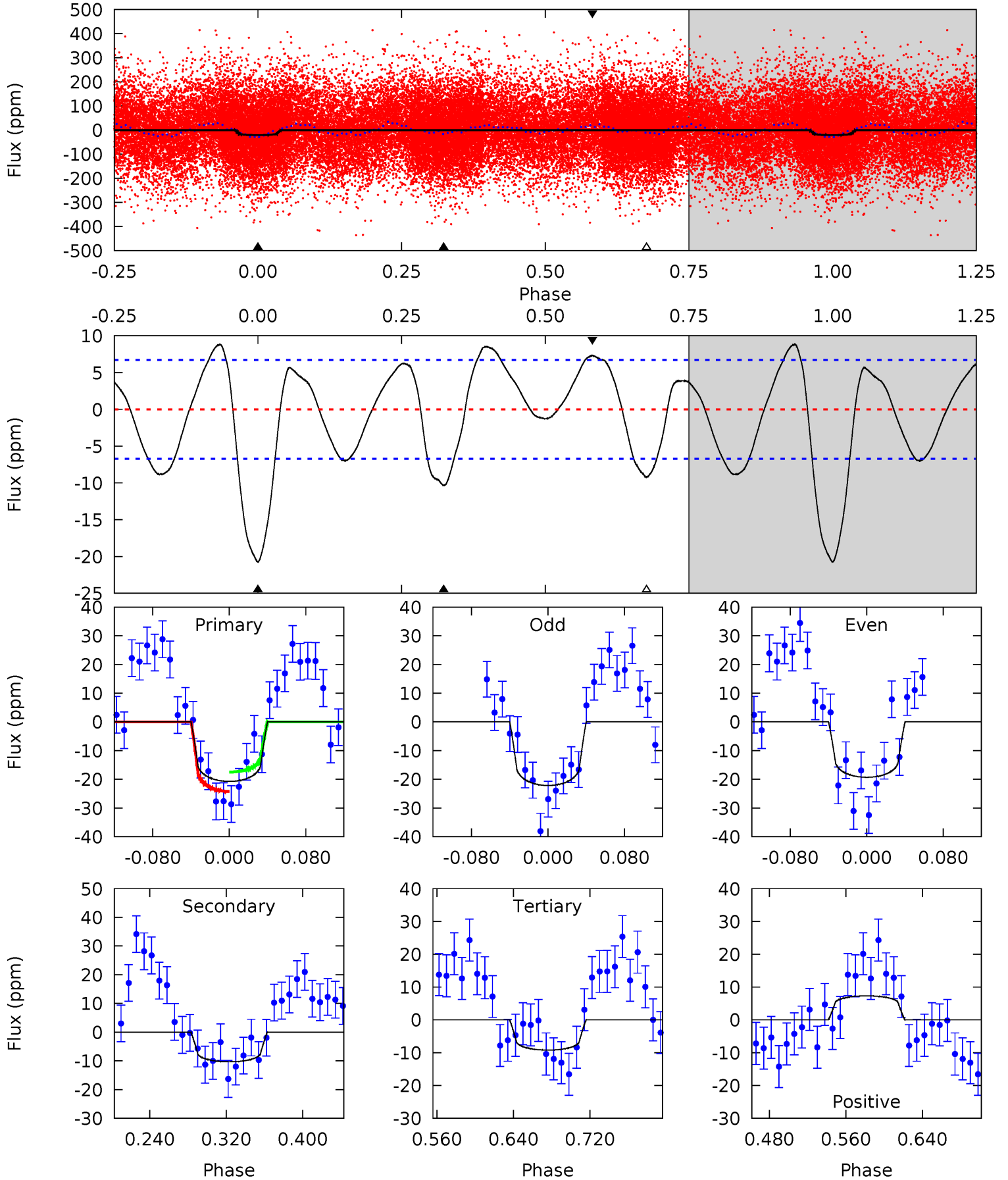




# DV Model-Shift Uniqueness Test

007461354-02, P = 2.724256 Days, E = 129.957377 Days

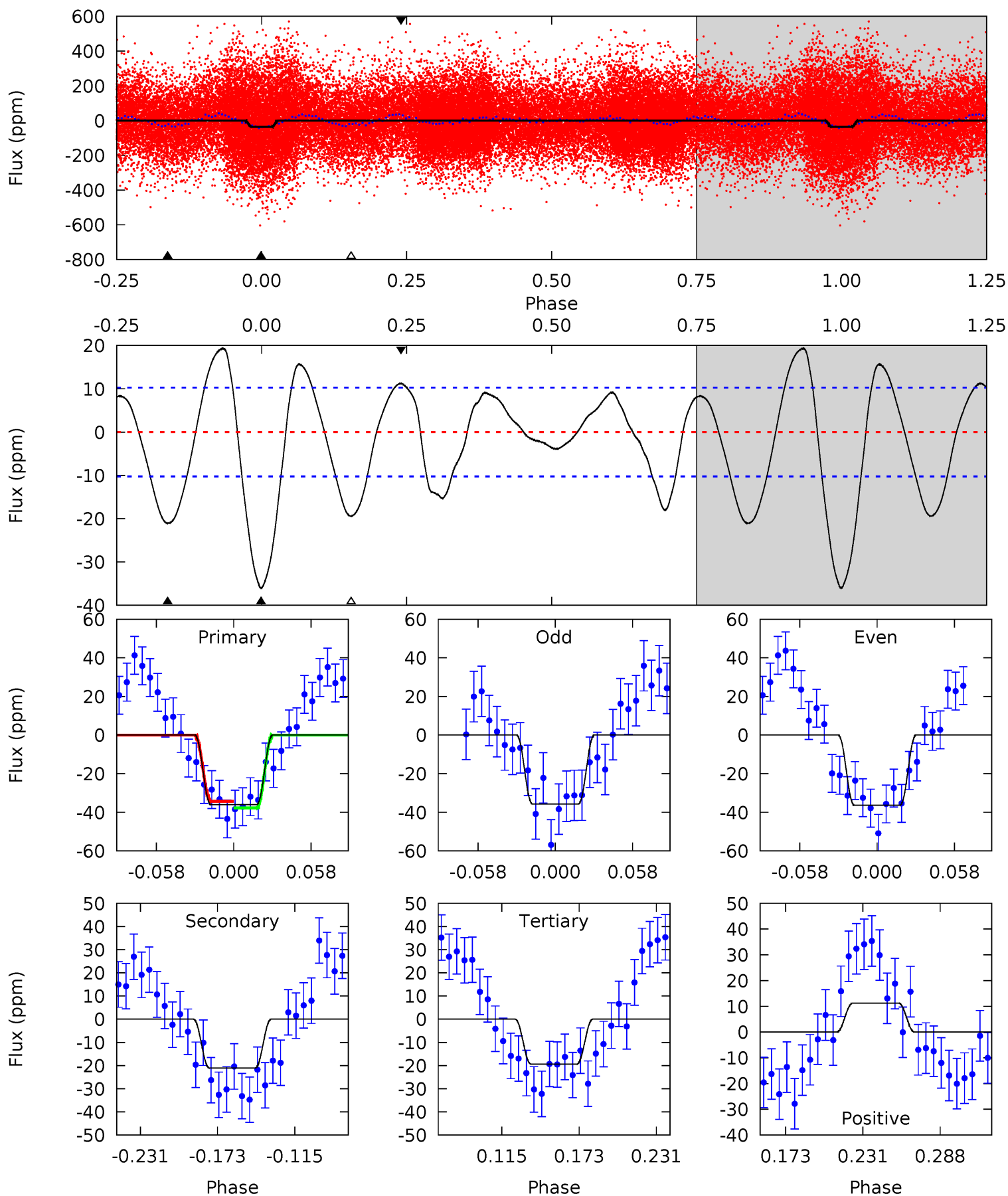
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.2	7.08	6.32	5.01	4.61	1.75	3.47	7.91	9.22	0.76	2.07	0.98	1.14	0.30	2.32



# Alt Model-Shift Uniqueness Test

007461354-02, P = 2.724313 Days, E = 129.933782 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
16.5	9.63	8.86	5.13	4.68	1.90	4.40	7.61	11.3	0.77	4.50	0.14	0.84	0.35	0.77



### Stellar Parameters For KIC 007461354

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7126^{+174}_{-273}$	$3.824^{+0.252}_{-0.108}$	$0.020^{+0.250}_{-0.300}$	$2.738^{+0.463}_{-0.859}$	$1.822^{+0.162}_{-0.379}$	$0.125^{+0.217}_{-0.041}$
	+2%/-4%	+7%/-3%	+1250%/-1500%	+17%/-31%	+9%/-21%	+173%/-33%
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 007461354-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-10 \pm 1$	$1.24^{+0.29}_{-0.26}$	$3308^{+207}_{-268}$	$5993^{+599}_{-522}$	$7.808^{+4.914}_{-2.592}$
Alt.	$-21 \pm 2$	$1.85^{+0.35}_{-0.34}$	$3309^{+208}_{-272}$	$5865^{+391}_{-379}$	$7.177^{+3.365}_{-1.916}$

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

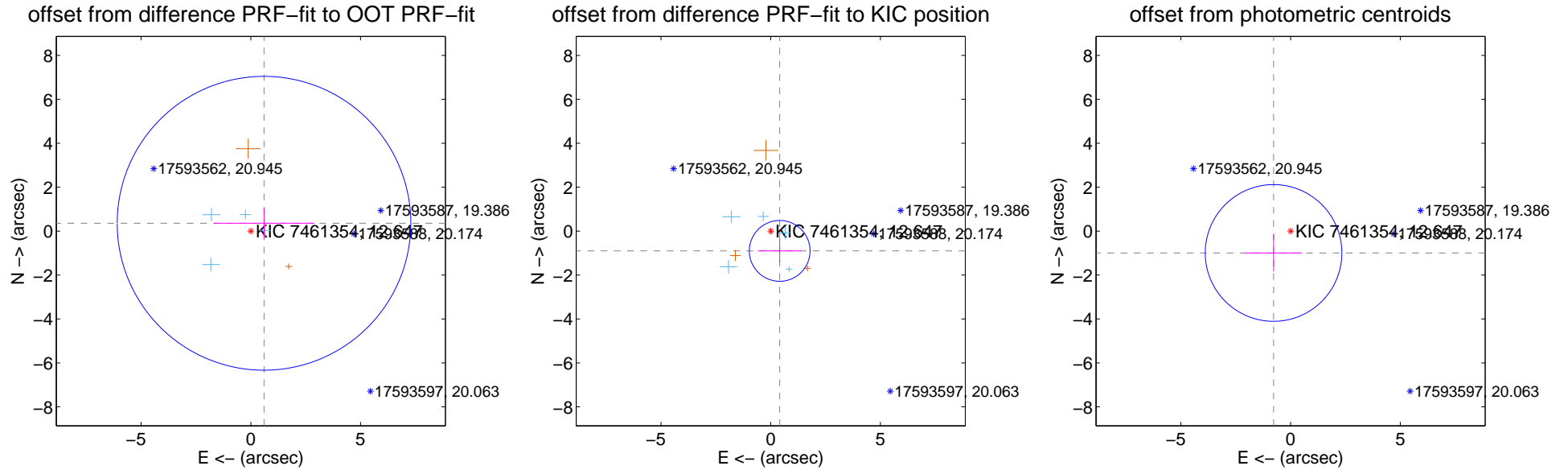
## DV Centroid Data

Supplemental centroid analysis for 007461354-02. Kepler magnitude: 12.65. Transit SNR 8.70

There are 10 quarters with good PRF difference image offsets

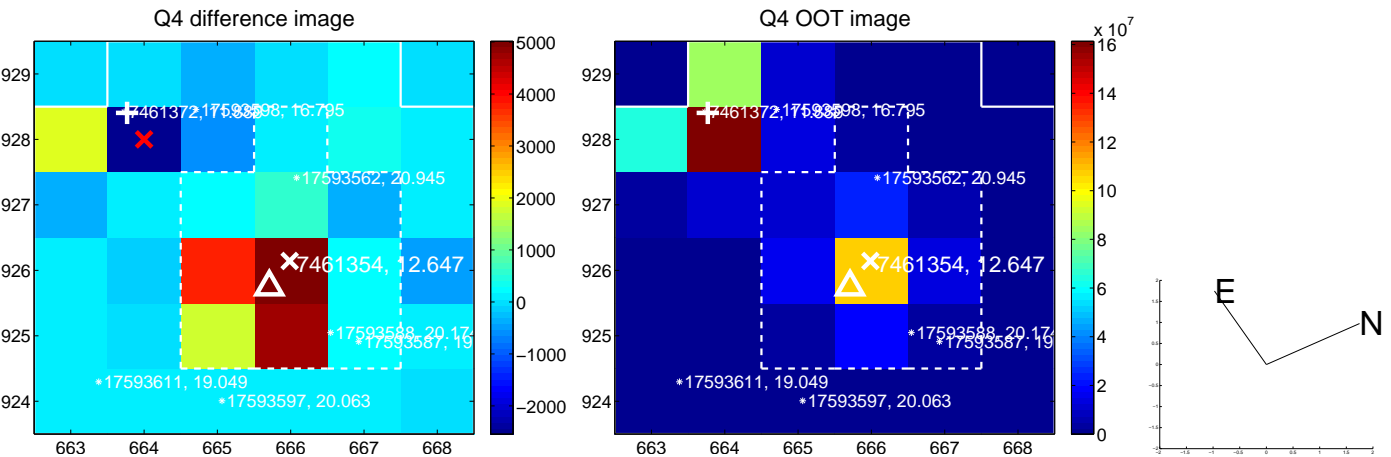
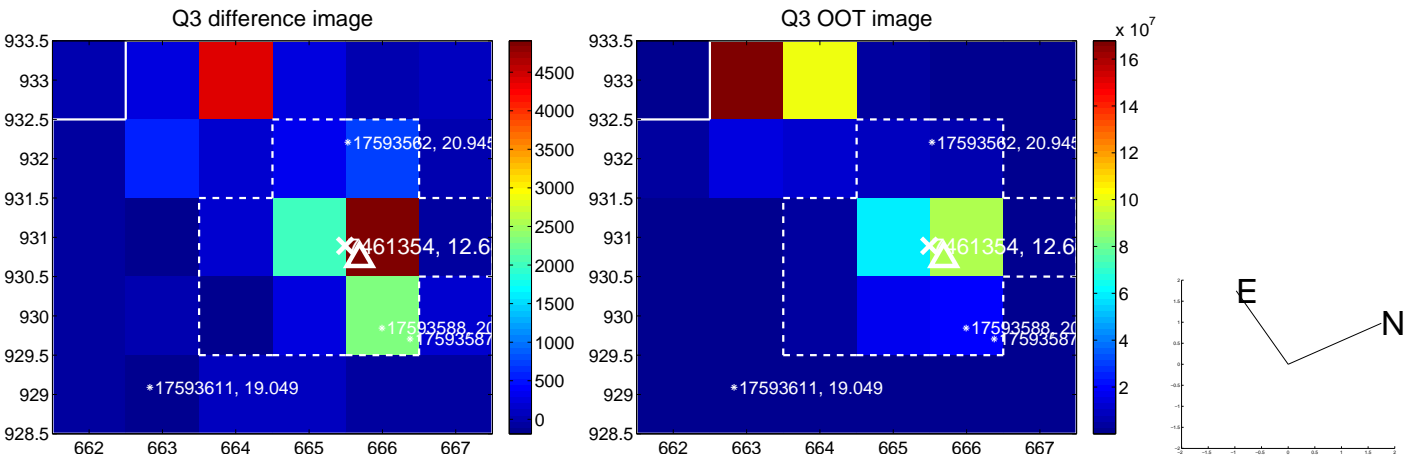
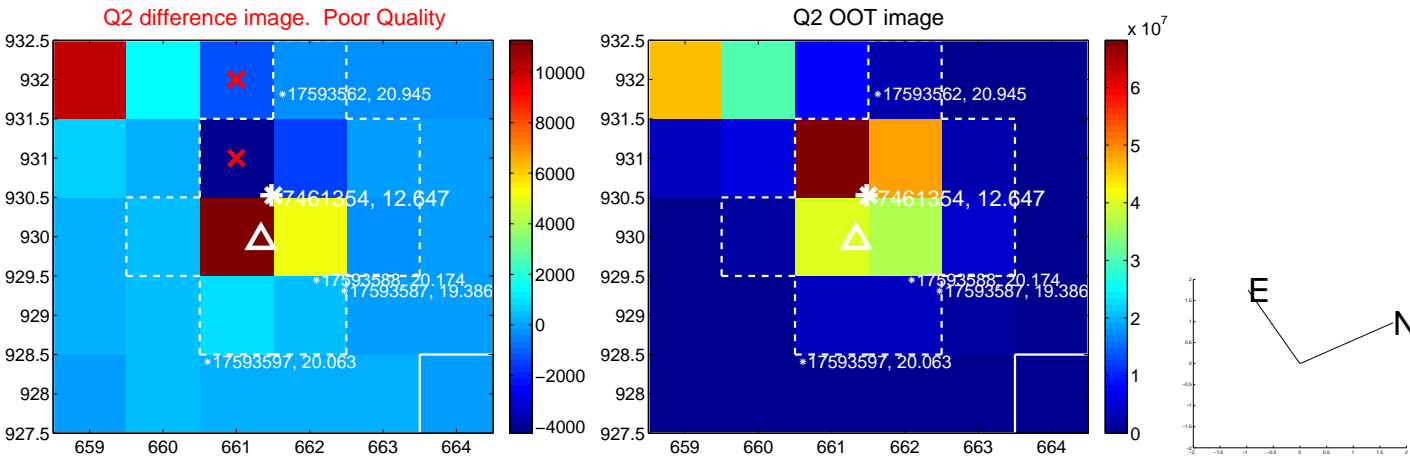
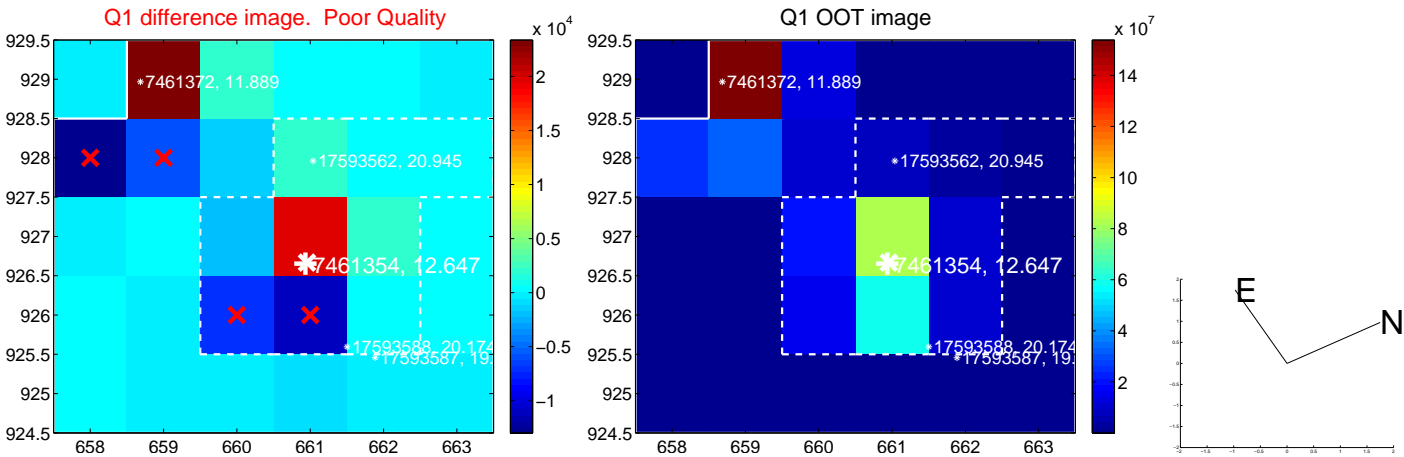
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.698 \pm 2.230$	0.31	$-0.600 \pm 2.284$	$0.357 \pm 0.691$
PRF-fit source offset from KIC position	$0.989 \pm 0.461$	2.14	$-0.409 \pm 0.995$	$-0.900 \pm 0.540$
photometric centroid source offset	$1.26 \pm 1.04$	1.22	$0.78 \pm 1.30$	$-0.99 \pm 0.84$

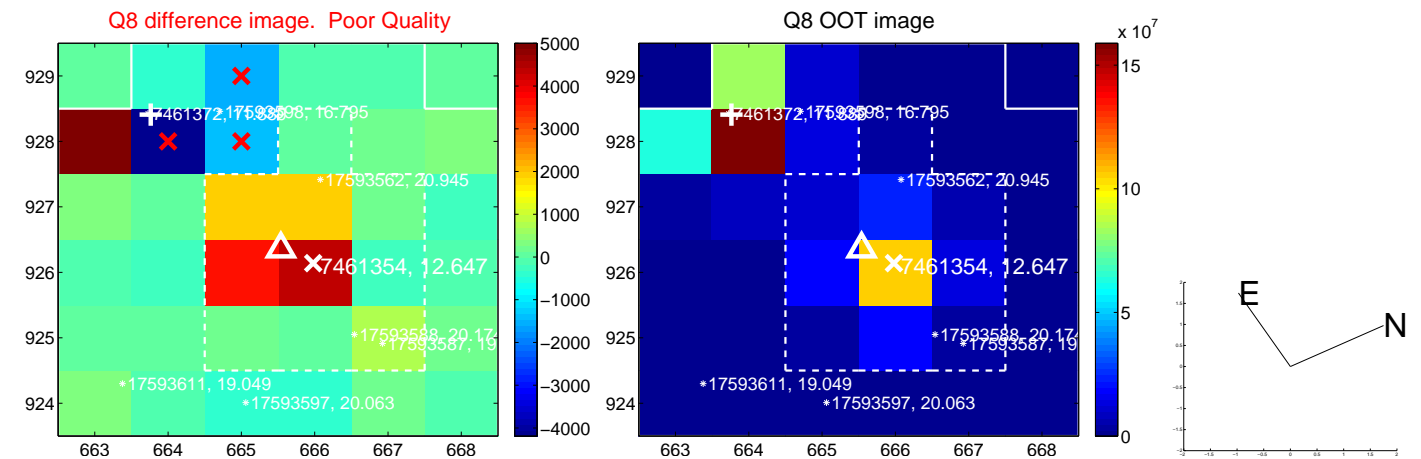
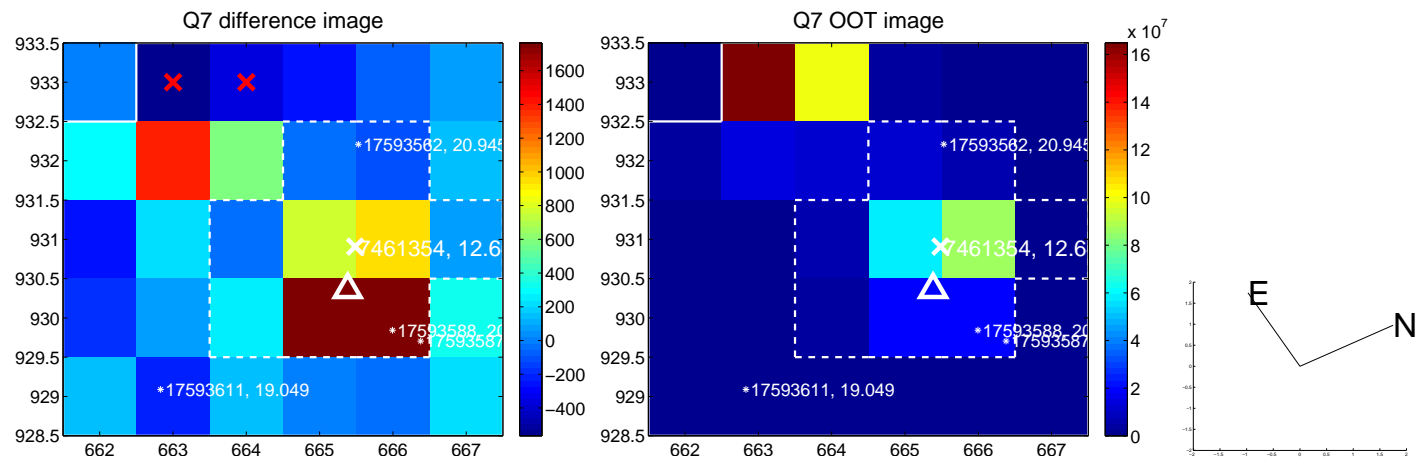
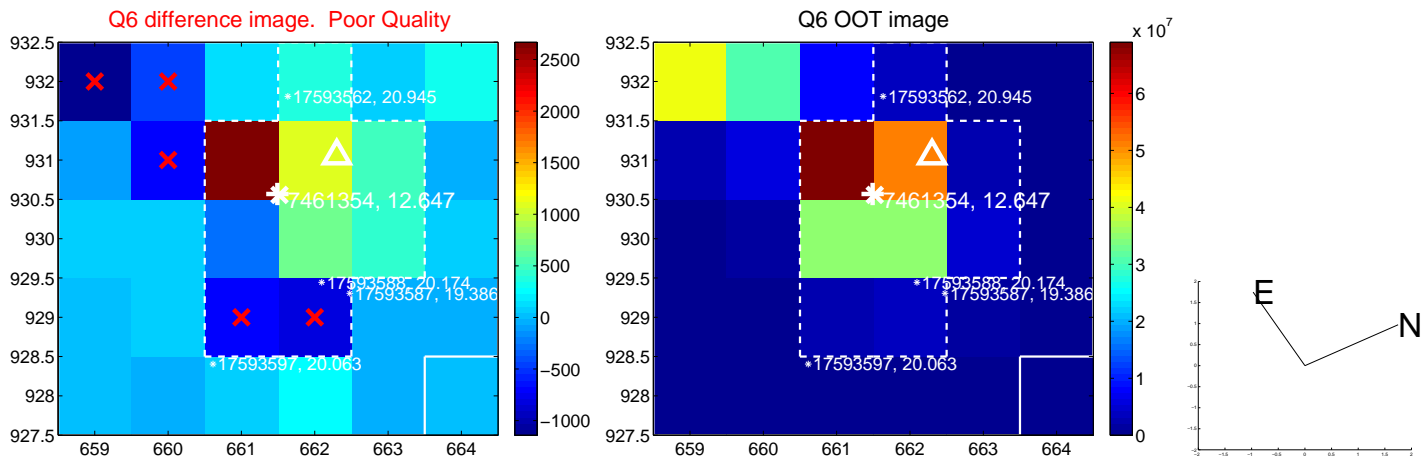
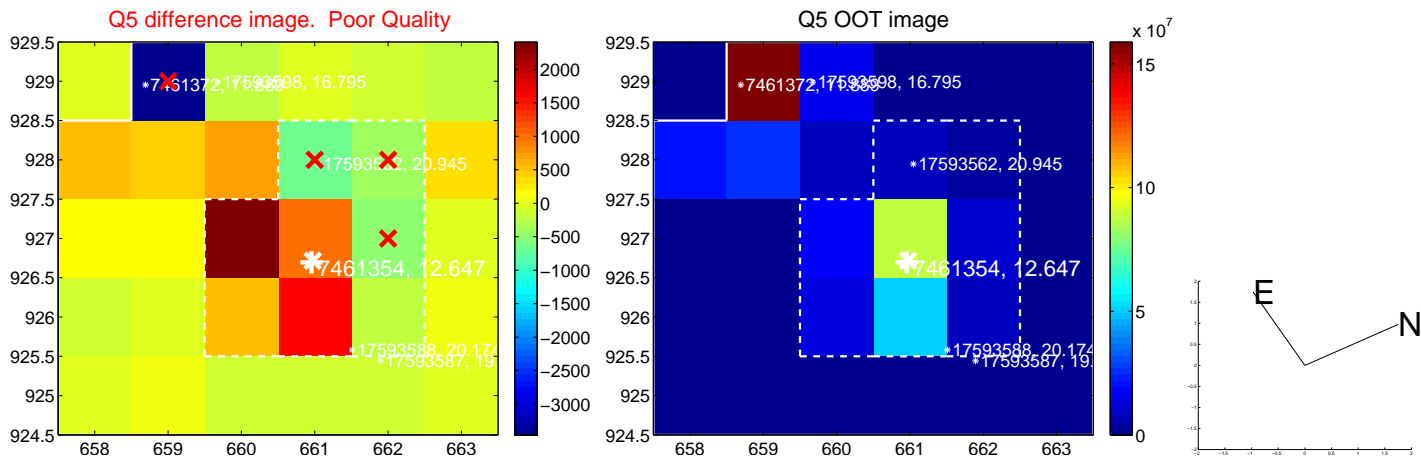


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

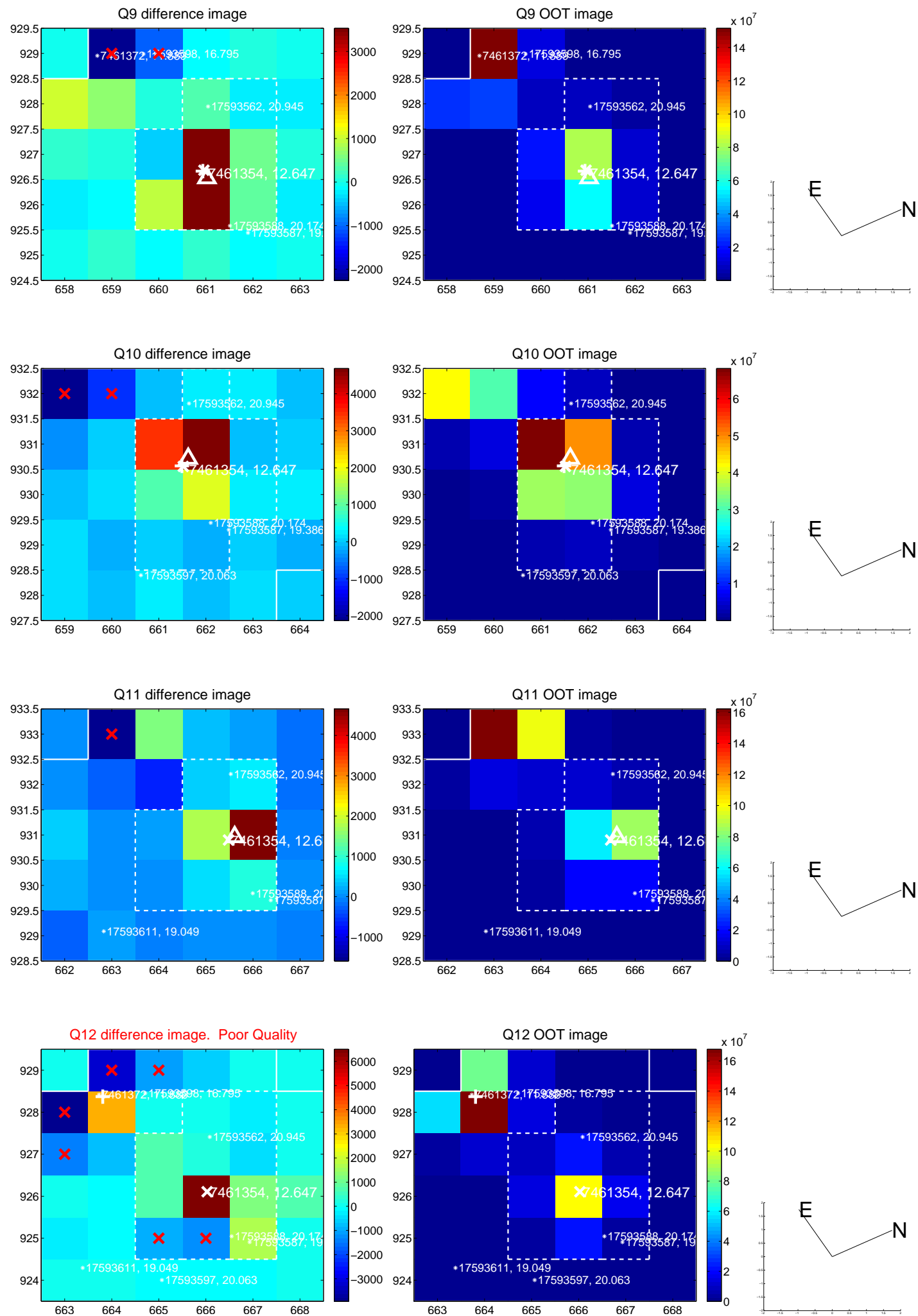


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

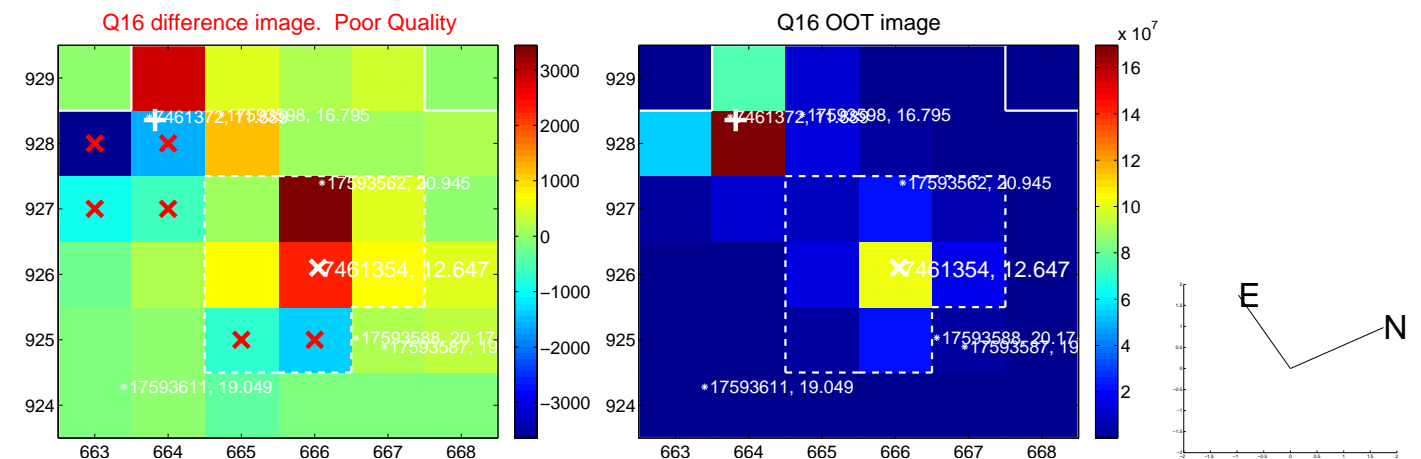
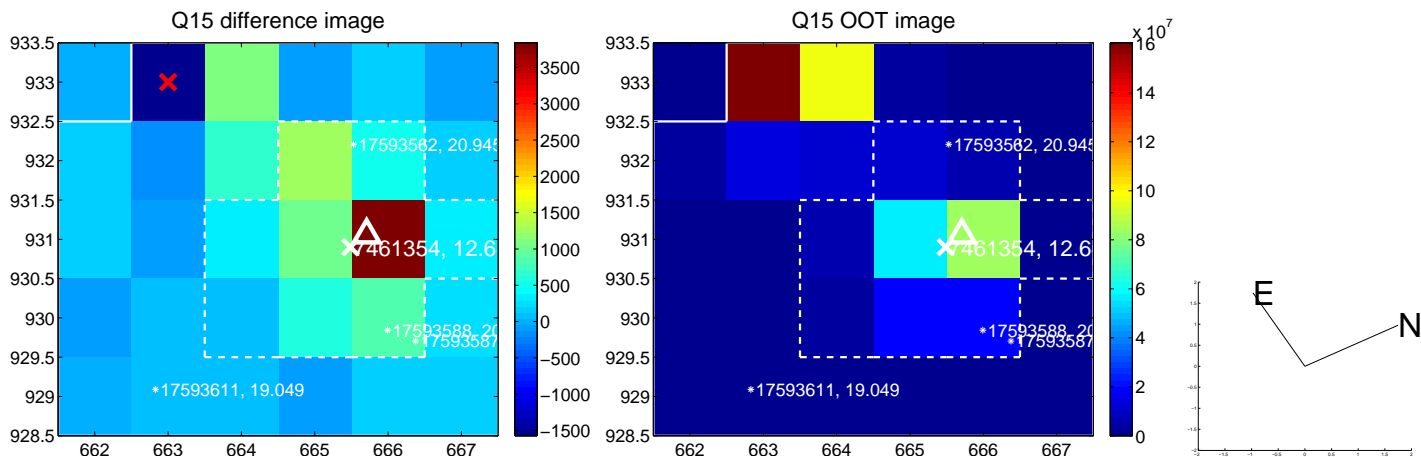
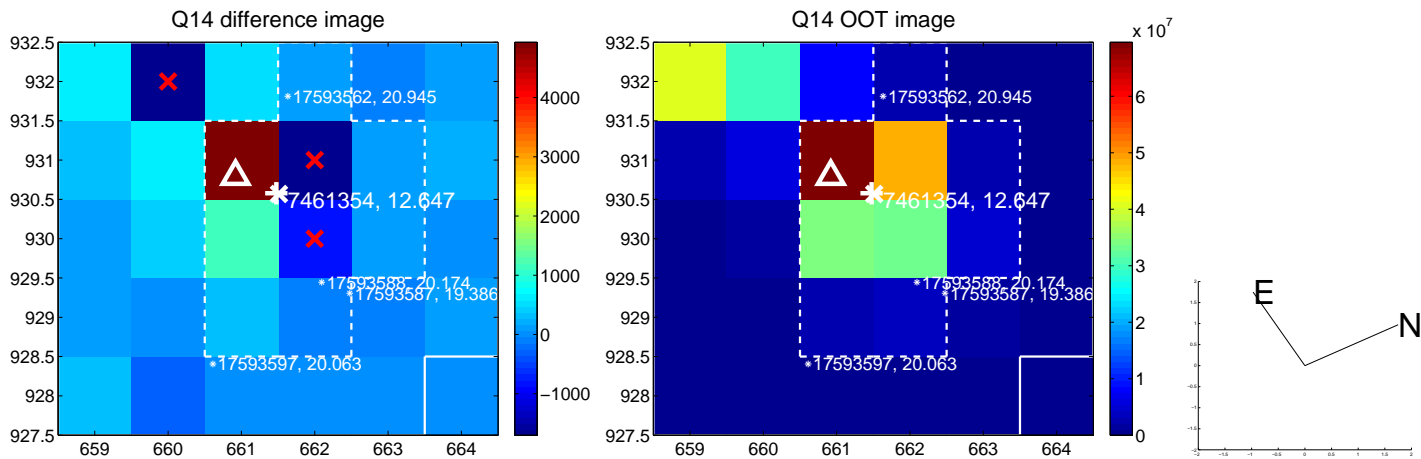
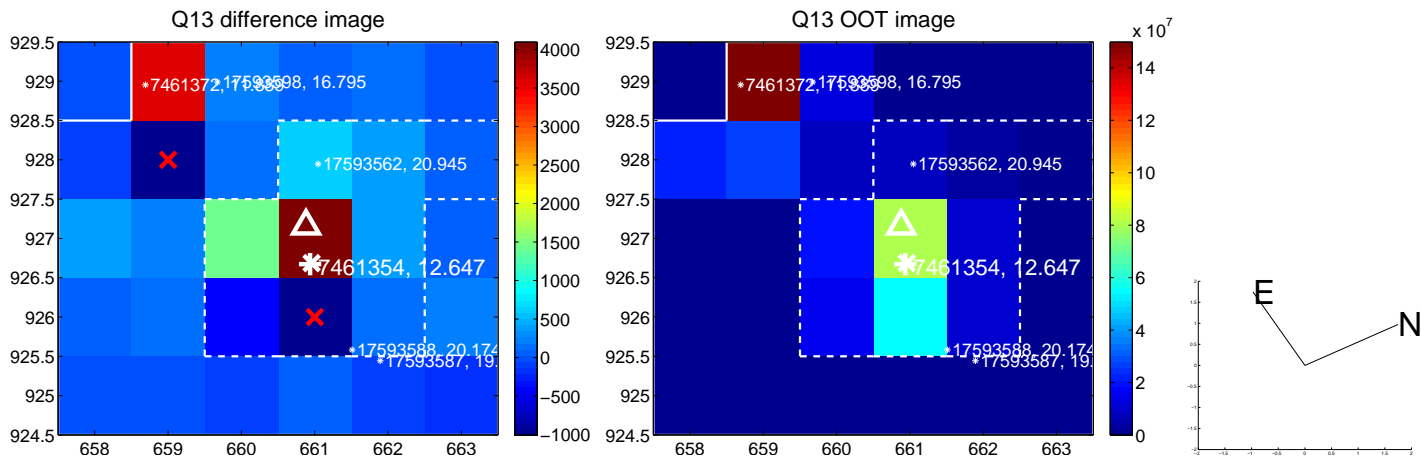




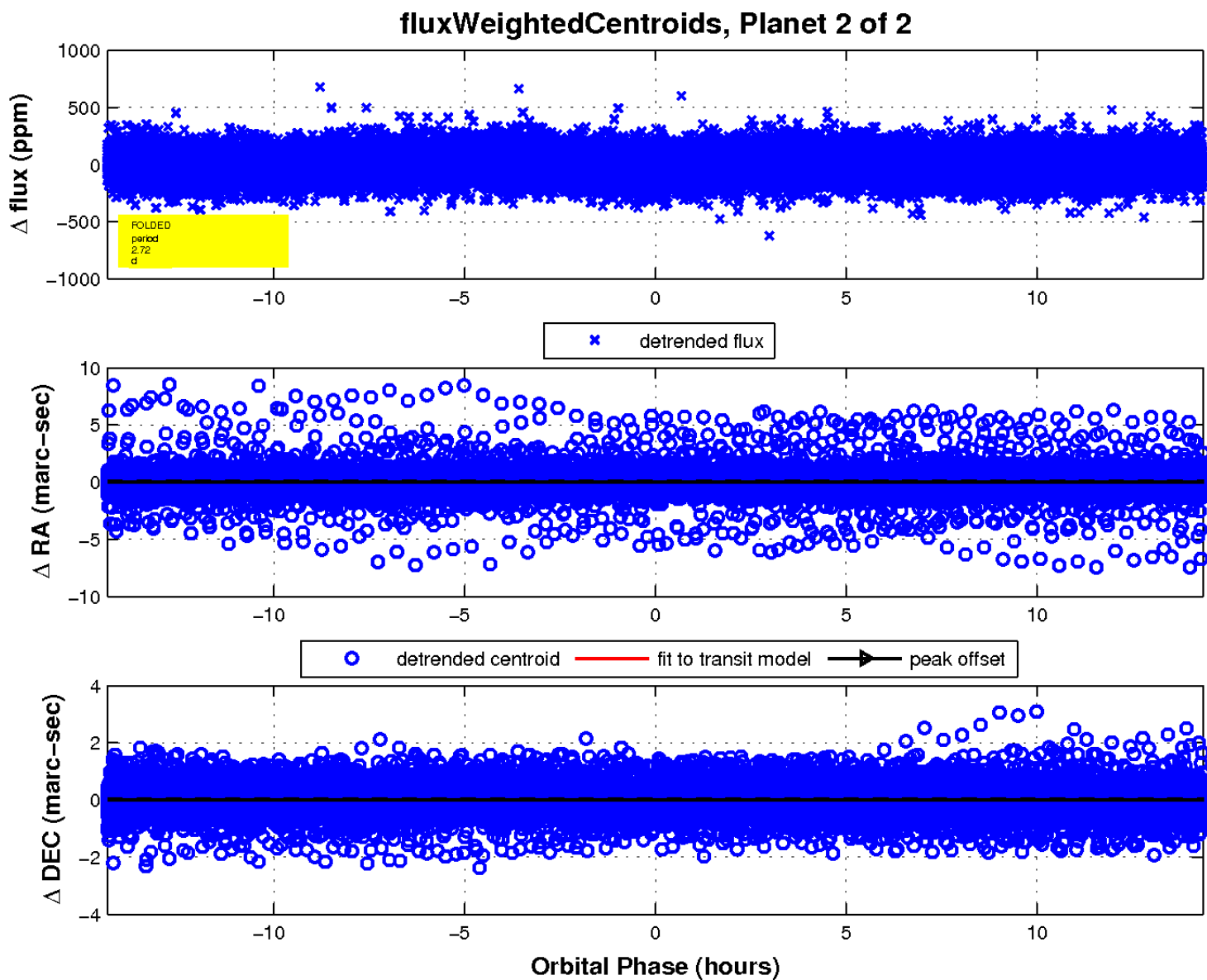
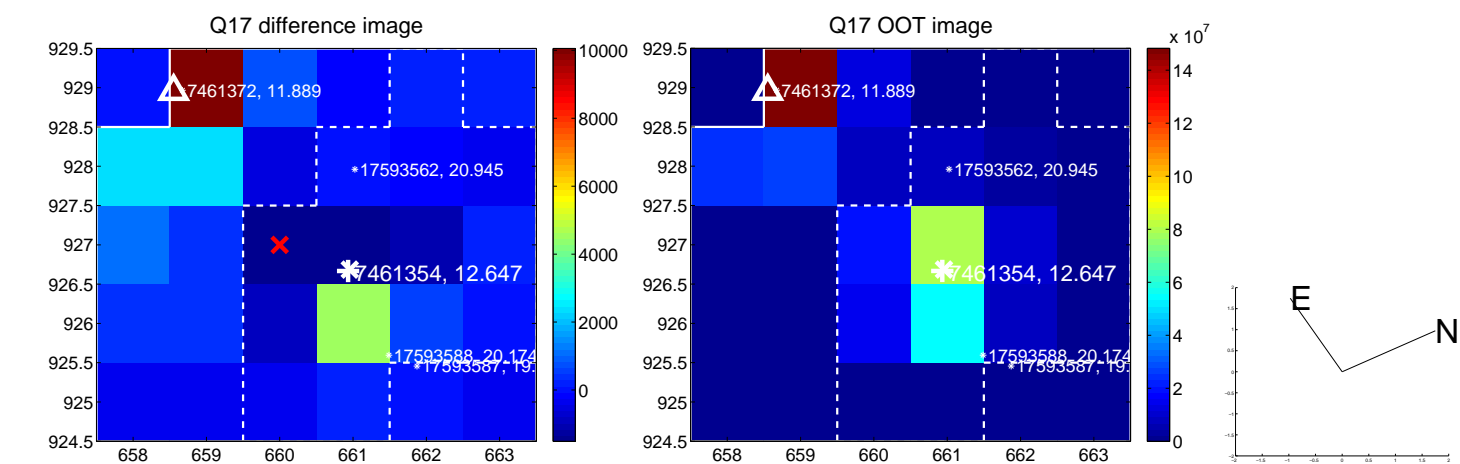
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UKIRT Image

Declination

