

# KIC 007366258

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007366258-01	OBS	0880.02	51.540507	174.044052	3631.9	6.420	112.1	111.6	0.93	5427	5.47	9.69
007366258-02	OBS	0880.01	26.444373	141.232690	1847.1	4.643	68.0	68.5	0.93	5427	4.87	23.59
007366258-03	OBS	0880.03	5.902239	136.783514	661.2	3.055	43.2	47.9	0.93	5427	2.81	174.23
007366258-04	OBS	0880.04	2.382946	132.698229	257.4	2.199	23.5	26.3	0.93	5427	1.68	583.88

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007366258-01	OBS	PC	0.98	0	0	0	0	NO_COMMENT
007366258-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT
007366258-03	OBS	PC	1.00	0	0	0	0	NO_COMMENT
007366258-04	OBS	PC	1.00	0	0	0	0	NO_COMMENT

**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.

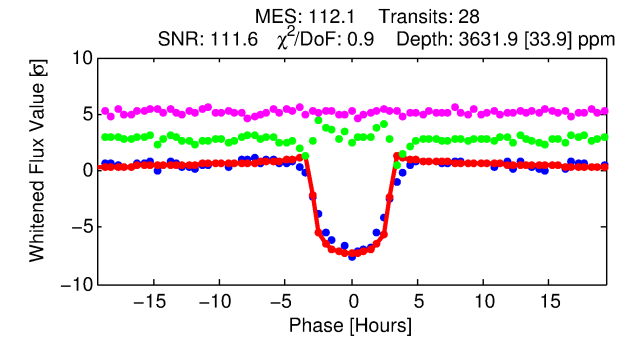
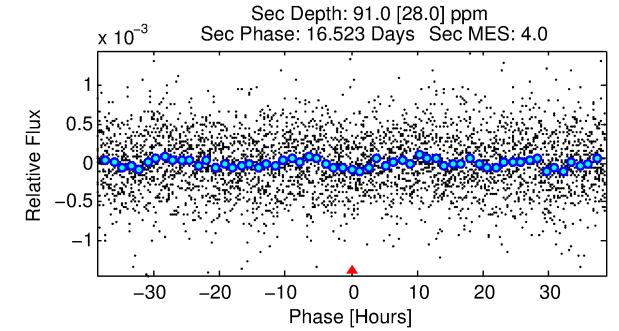
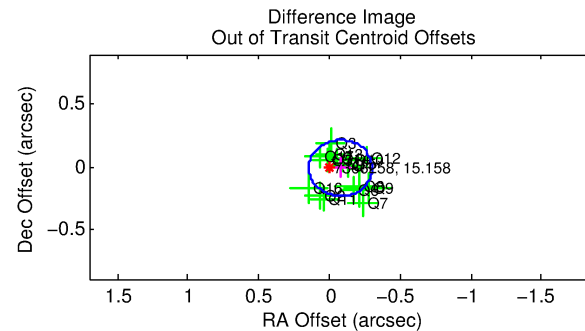
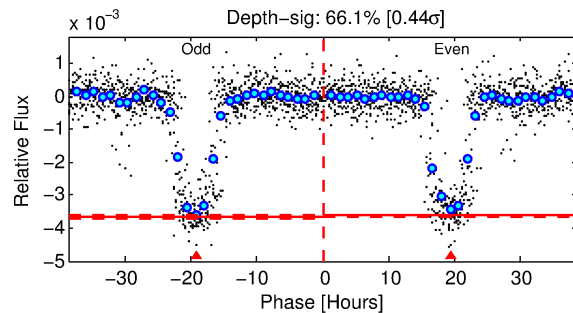
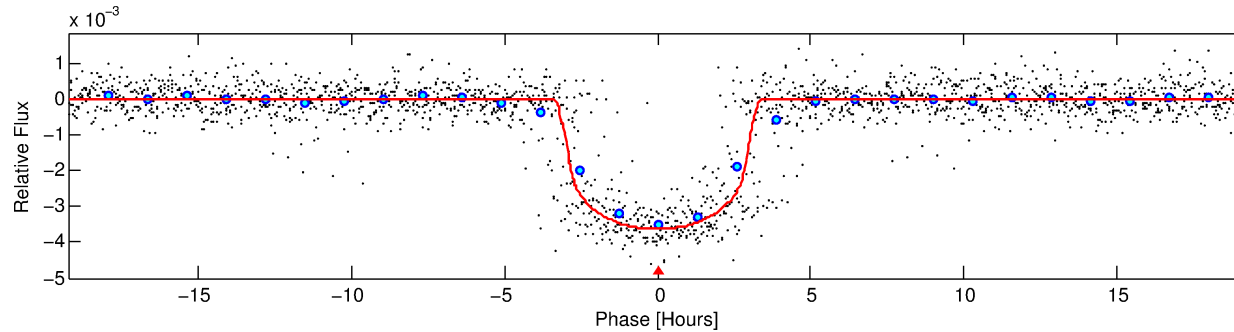
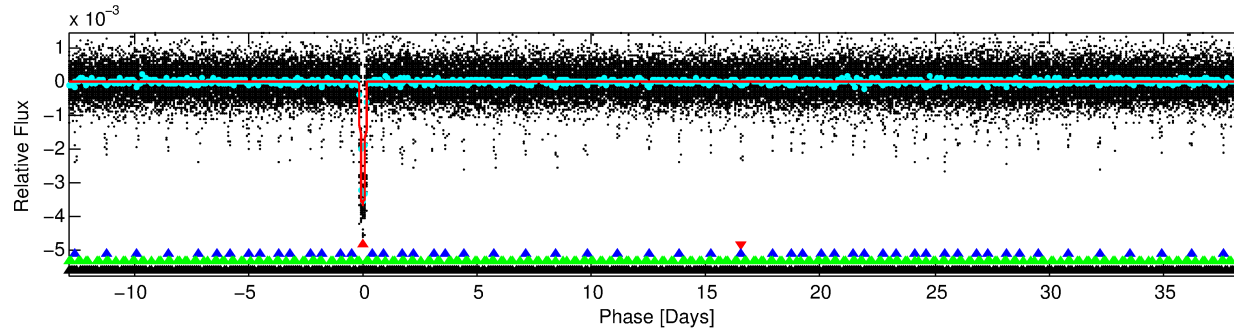
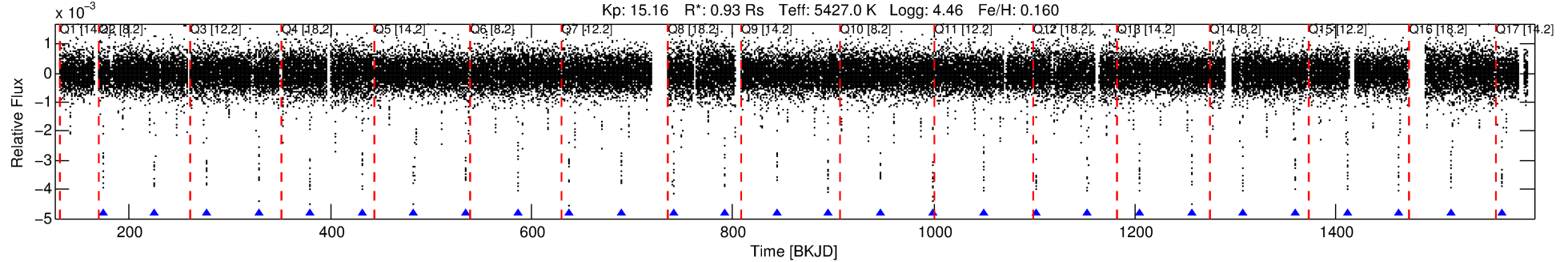
Ephemeris Match Information For 007366258-01

No Significant Match Found

# DV One-Page Summary

KIC: 7366258 Candidate: 1 of 4 Period: 51.541 d  
KOI: K00880.02 Name: Kepler-82c Corr: 0.975

Kp: 15.16 R\*: 0.93 Rs Teff: 5427.0 K Logg: 4.46 Fe/H: 0.160



## DV Fit Results:

Period = 51.54051 [0.00006] d  
Epoch = 174.0441 [0.0010] BKJD  
Rp/R\* = 0.0540 [0.0039]  
a/R\* = 64.64 [17.76]  
b = 0.02 [15.94]  
Seff = 9.69 [1.68]  
Teq = 450 [20] K  
Rp = 5.47 [0.73] Re  
a = 0.2631 [0.0265] AU  
Ag = 115.72 [43.30] [2.65σ]  
Teffp = 2281 [200] K [9.13σ]

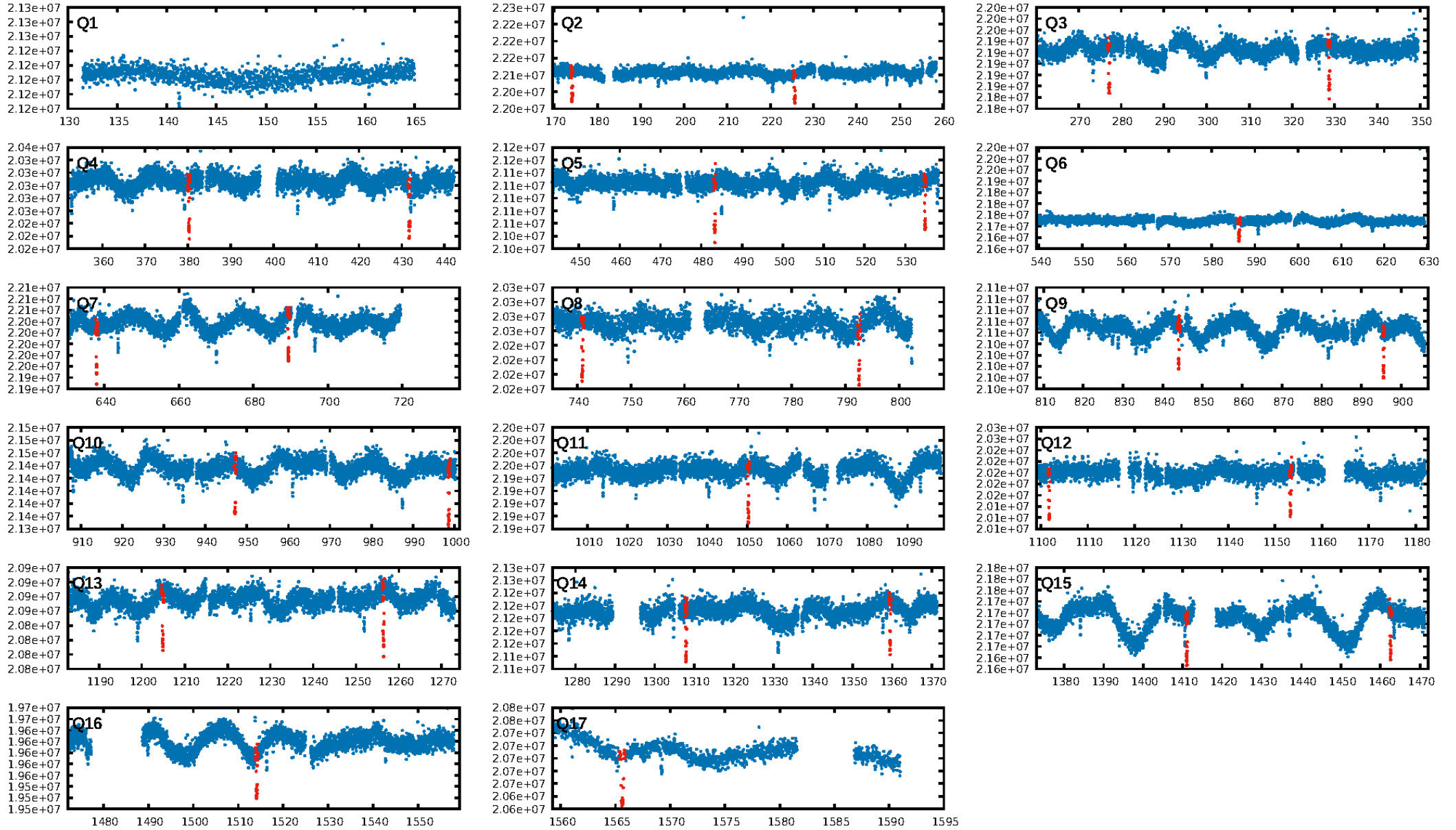
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [76.02σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 86.6%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [27/27]  
GhostDiagnostic-chr: 4.307  
Centroid-sig: 0.0%  
Centroid-so: 0.446 arcsec [4.98σ]  
OotOffset-rm: 0.079 arcsec [1.06σ]  
KicOffset-rm: 0.093 arcsec [1.21σ]  
OotOffset-st: 4/4/4/4 [16]  
KicOffset-st: 4/4/4/4 [16]  
DiffImageQuality-fgm: 1.00 [16/16]  
DiffImageOverlap-fno: 0.62 [10/16]

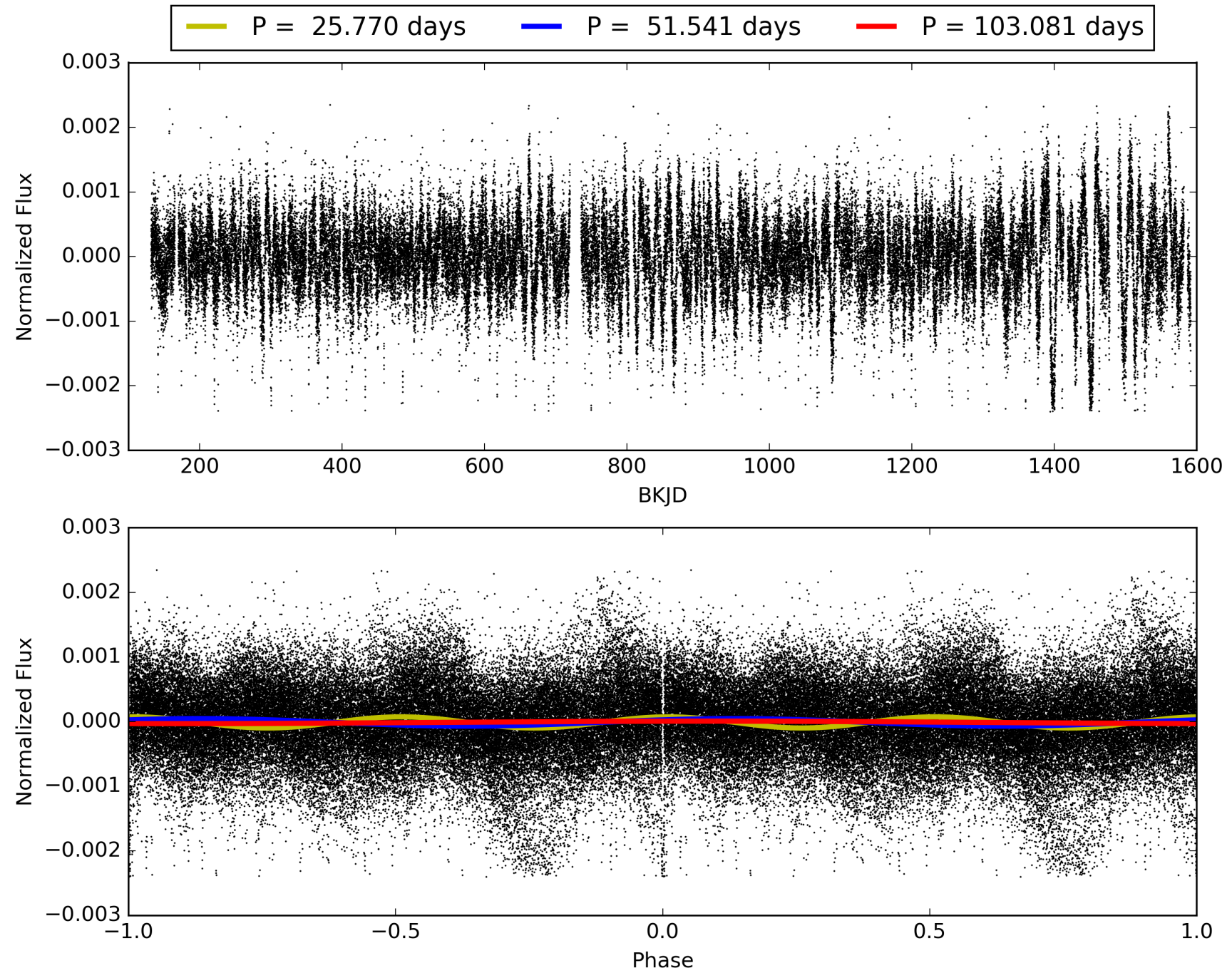
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 23:25:32 Z

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

# TCE 007366258-01, PDC Light Curves



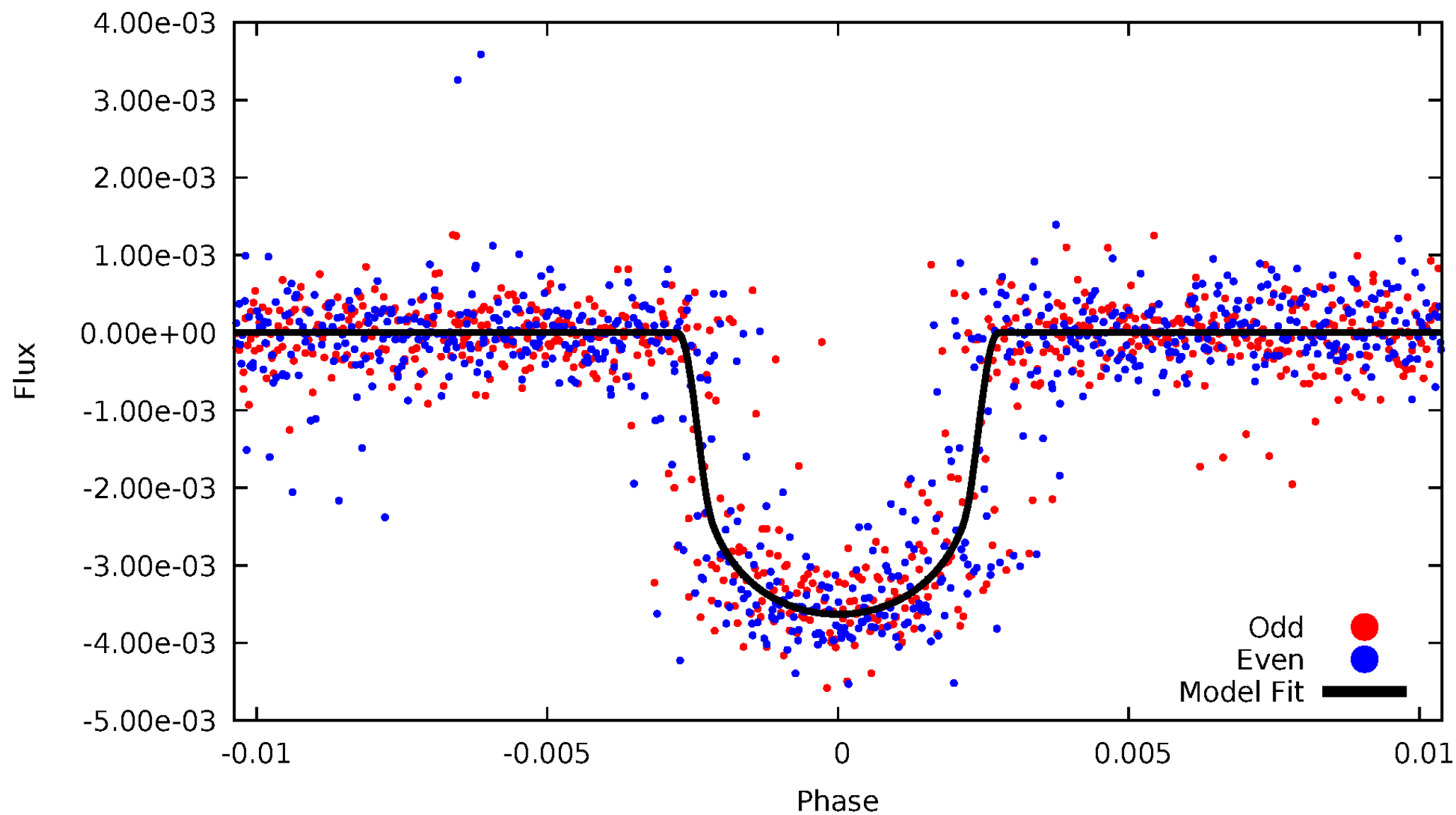
TCE 007366258-01





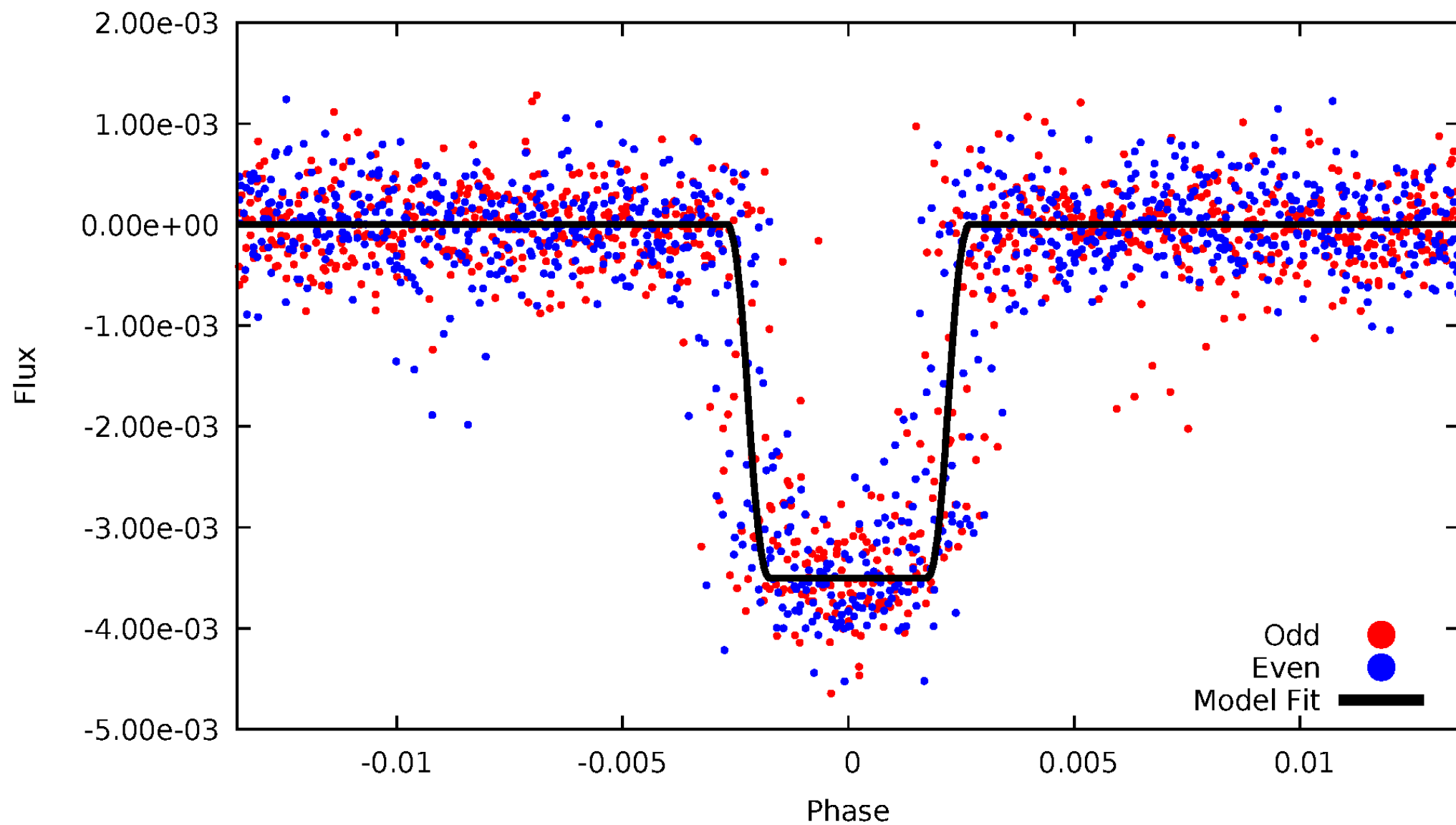
# DV Odd/Even

TCE 007366258-01



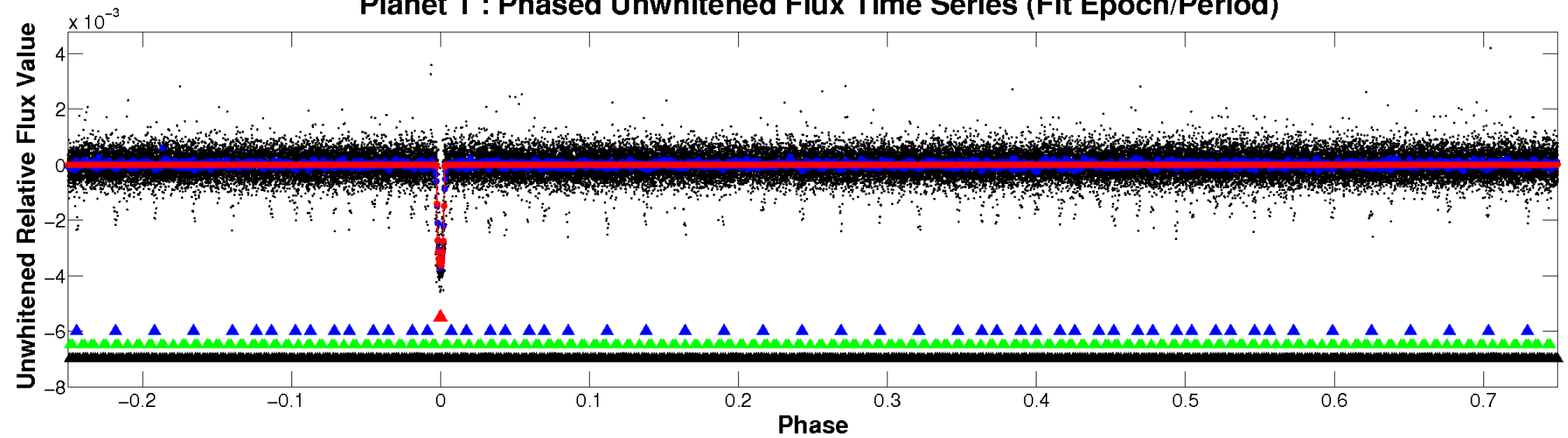
# ALT Odd/Even

TCE 007366258-01

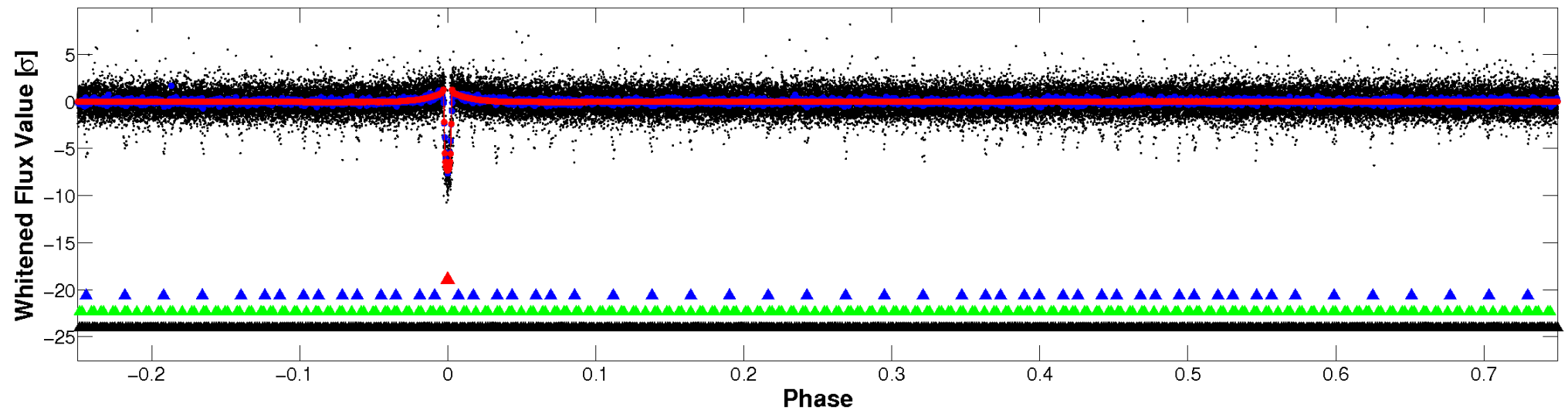


# Non-Whitened Vs. Whitened Light Curve

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

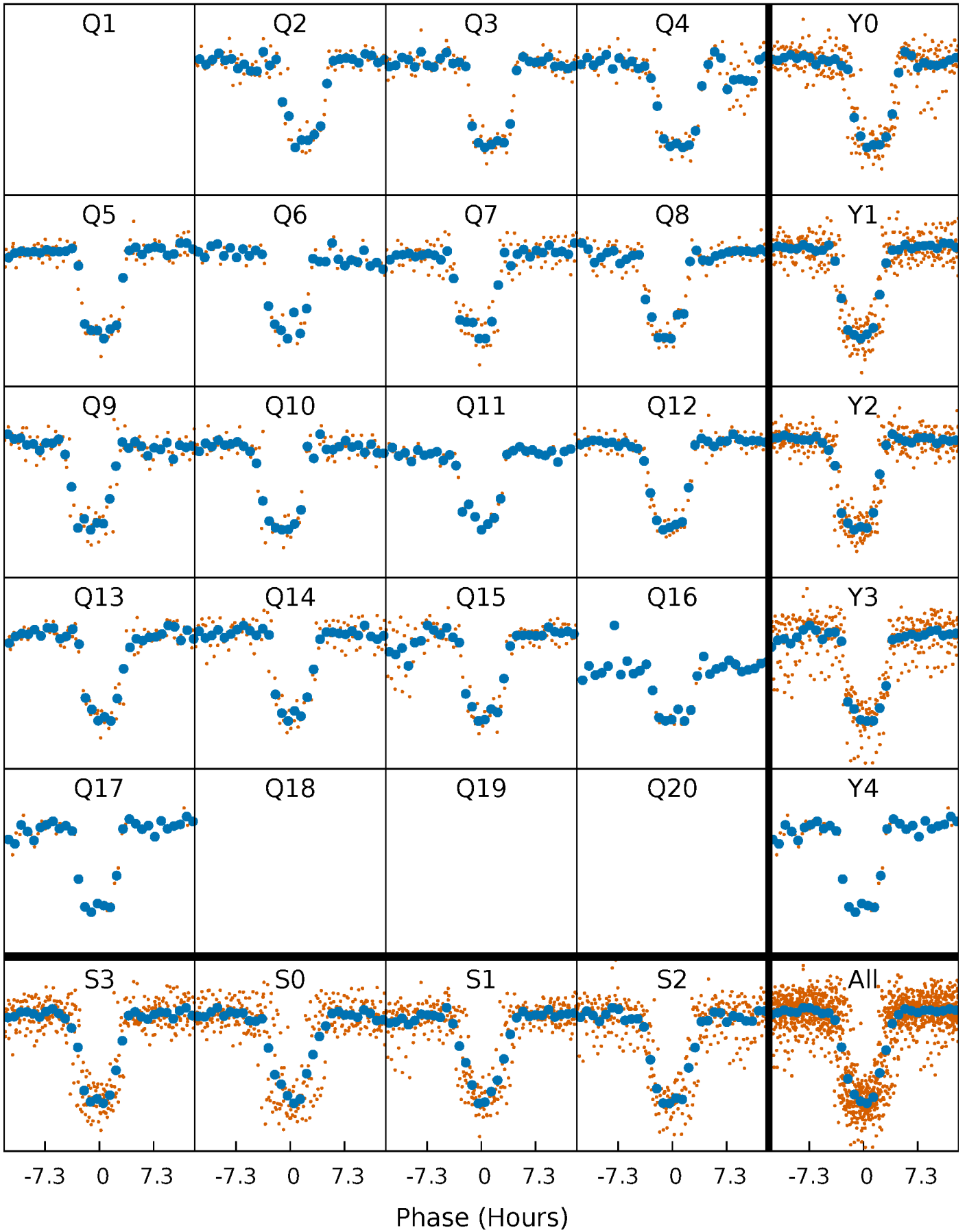


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



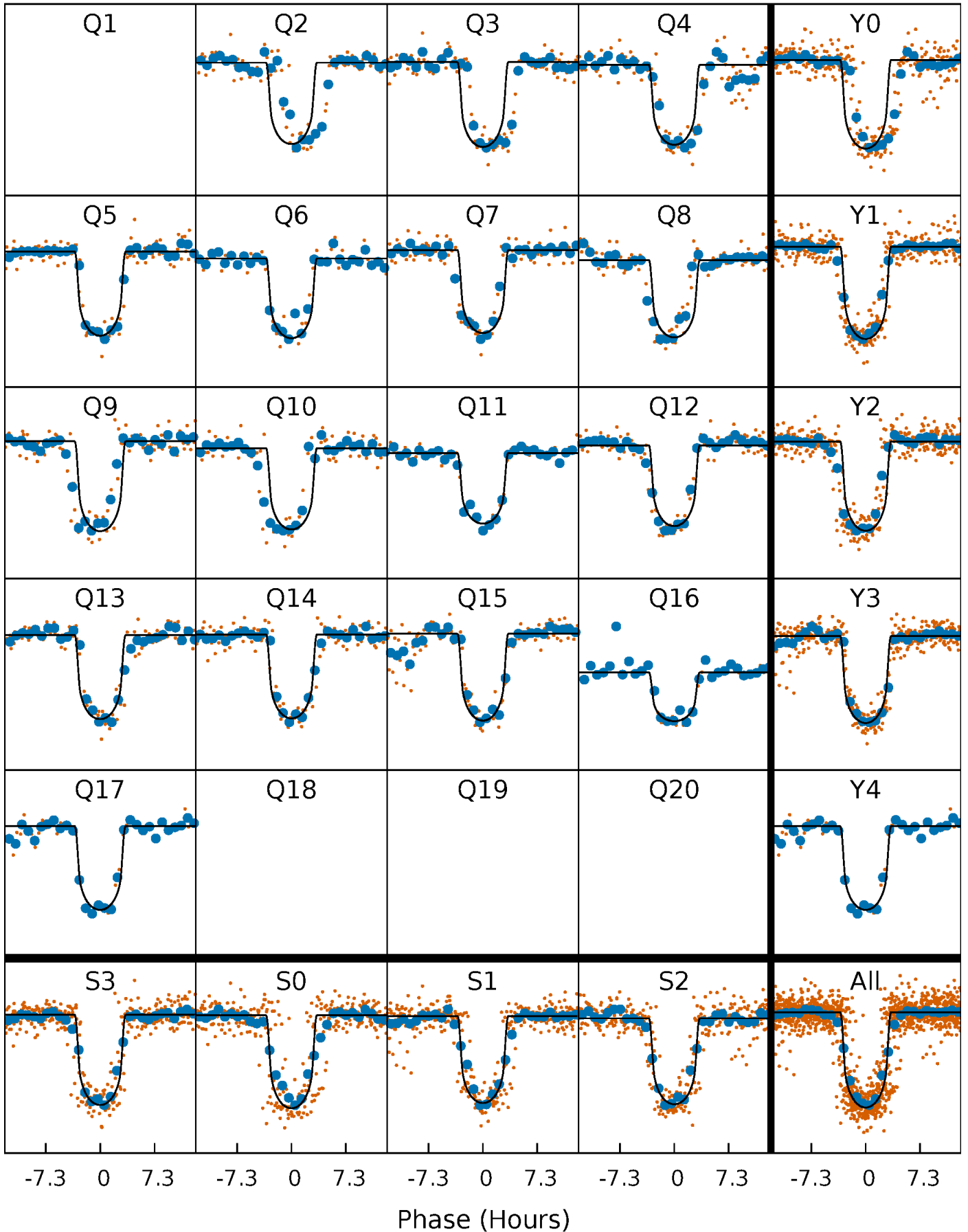
# PDC Quarter-Phased Transit Curves

TCE 007366258-01 P= 51.540507 Days  $T_0=174.044052$  (BKJD)



# DV Quarter-Phased Transit Curves

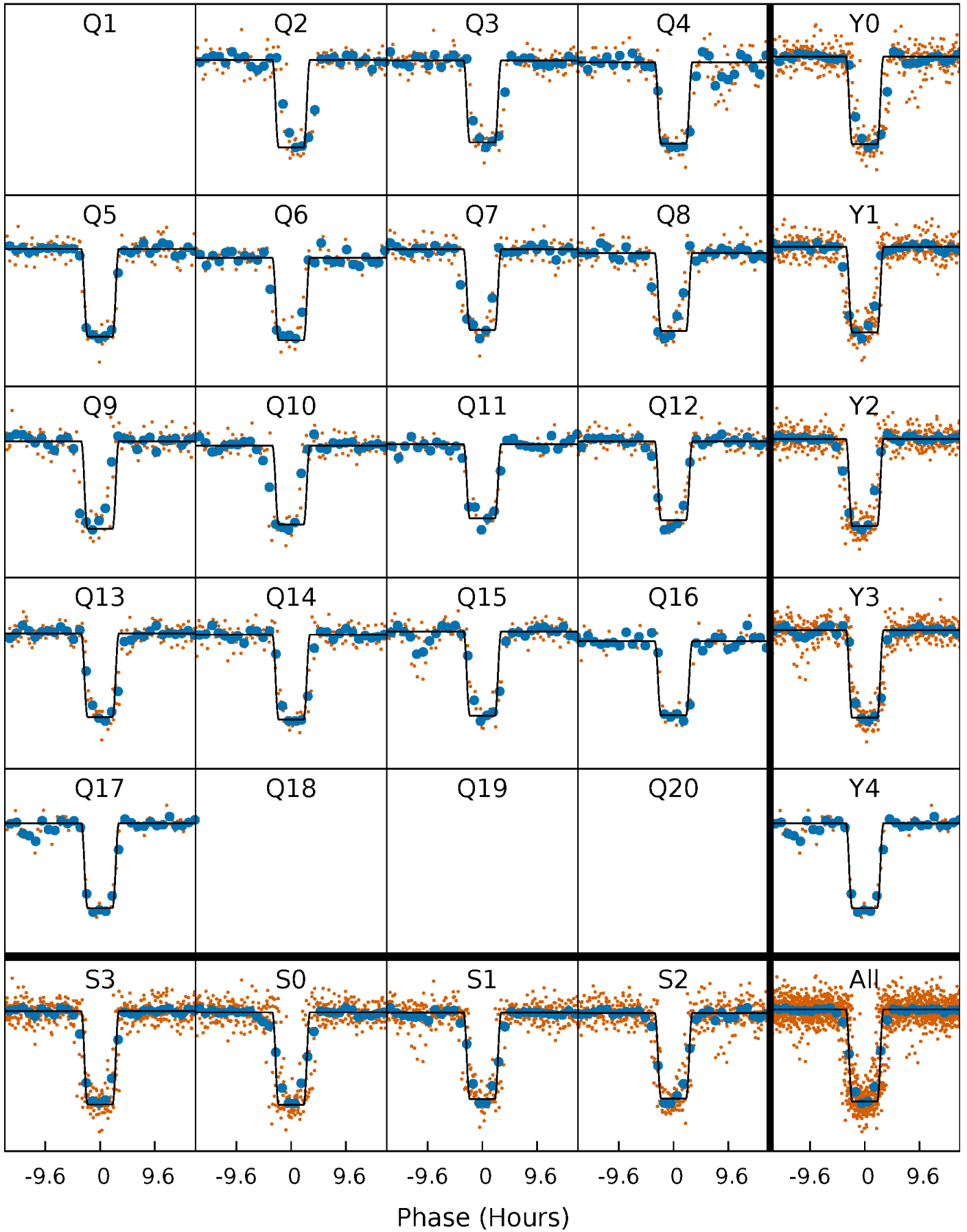
TCE 007366258-01 P= 51.540507 Days  $T_0=174.044052$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

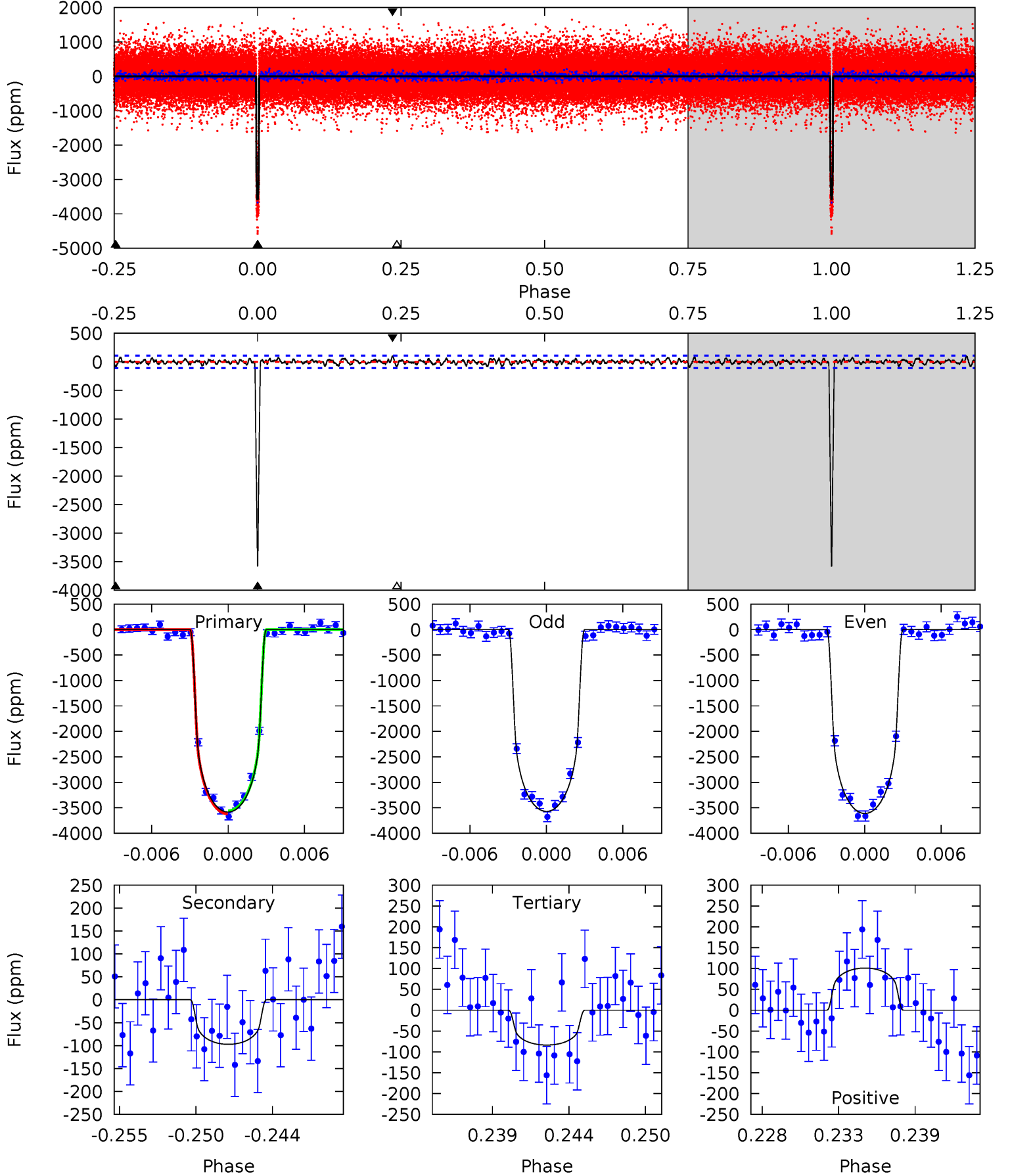
TCE 007366258-01 P= 51.539291 Days  $T_0=174.064887$  (BKJD)



# DV Model-Shift Uniqueness Test

007366258-01, P = 51.540507 Days, E = 122.503545 Days

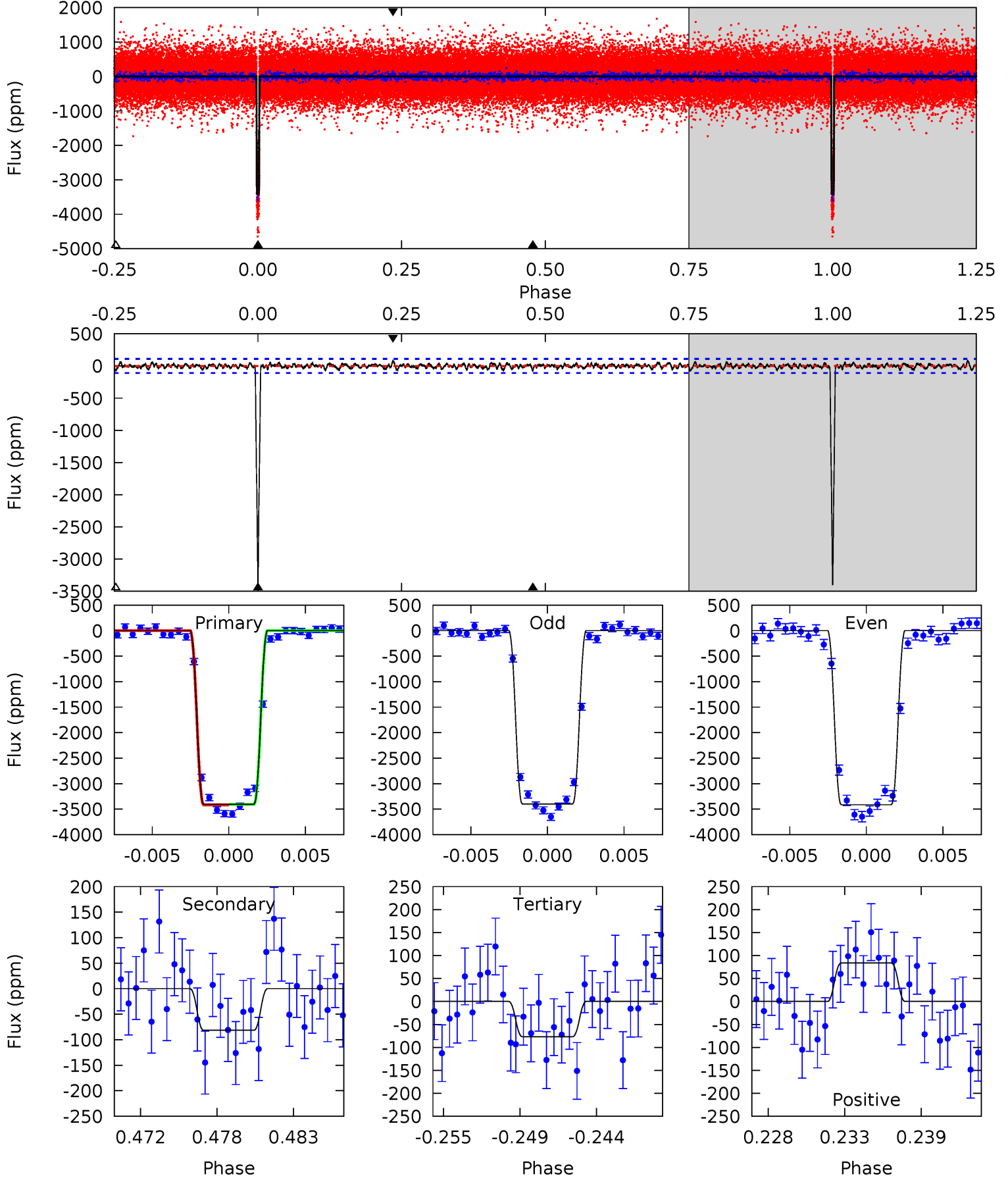
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
169.8	4.61	3.96	4.79	5.14	2.77	1.34	165.8	165.0	0.64	-0.18	0.96	0.97	0.03	1.42



# Alt Model-Shift Uniqueness Test

007366258-01, P = 51.539291 Days, E = 122.525596 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
160.0	3.83	3.61	3.93	5.15	2.79	1.10	156.4	156.1	0.23	-0.10	0.30	0.99	0.02	0.22



### Stellar Parameters For KIC 007366258

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5427^{+108}_{-108}$	$4.463^{+0.064}_{-0.088}$	$0.160^{+0.150}_{-0.150}$	$0.929^{+0.104}_{-0.069}$	$0.915^{+0.051}_{-0.051}$	$1.608^{+0.398}_{-0.421}$
	+2%/-2%	+1%/-2%	+94%/-94%	+11%/-7%	+6%/-6%	+25%/-26%
Source	SPE58	SPE58	SPE58	DSEP		

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

### Secondary Eclipse Parameters for KIC 007366258-01 / KOI 0880.02

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-97 \pm 21$	$5.50^{+0.54}_{-0.48}$	$630^{+23}_{-19}$	$2982^{+117}_{-124}$	$121^{+37}_{-32}$
Alt.	$-82 \pm 21$	$6.03^{+0.57}_{-0.49}$	$630^{+23}_{-20}$	$2833^{+123}_{-133}$	$83^{+30}_{-24}$

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

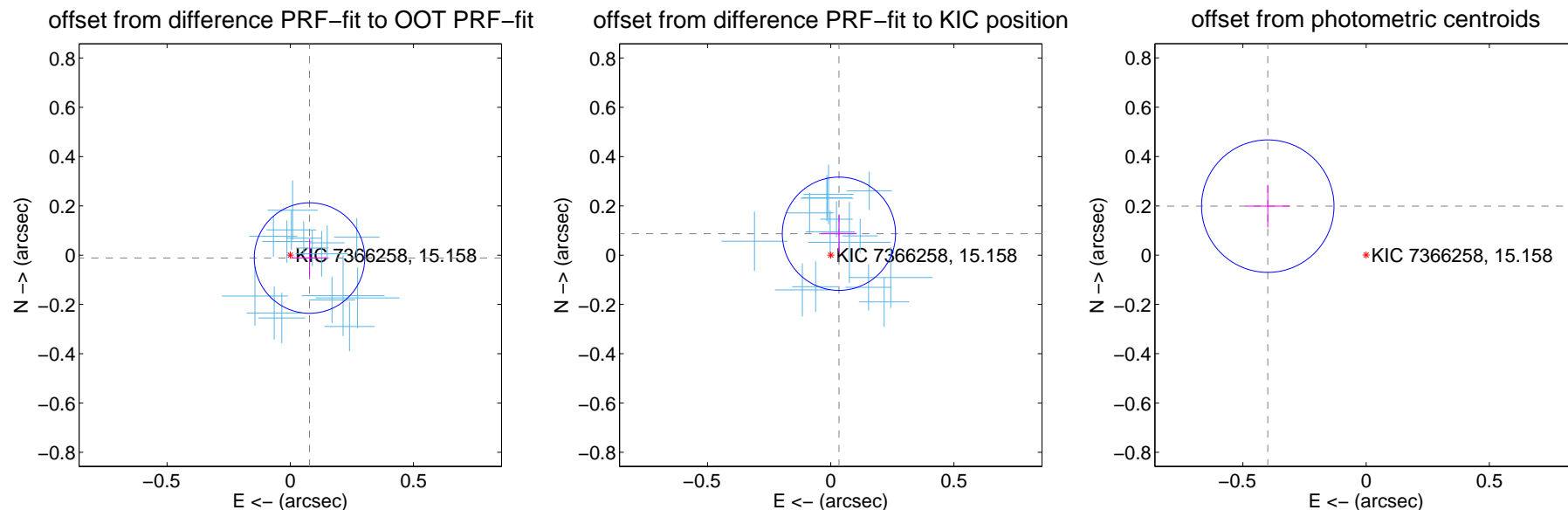
## DV Centroid Data

Supplemental centroid analysis for 007366258-01. Kepler magnitude: 15.16. Transit SNR 111.60

There are 16 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

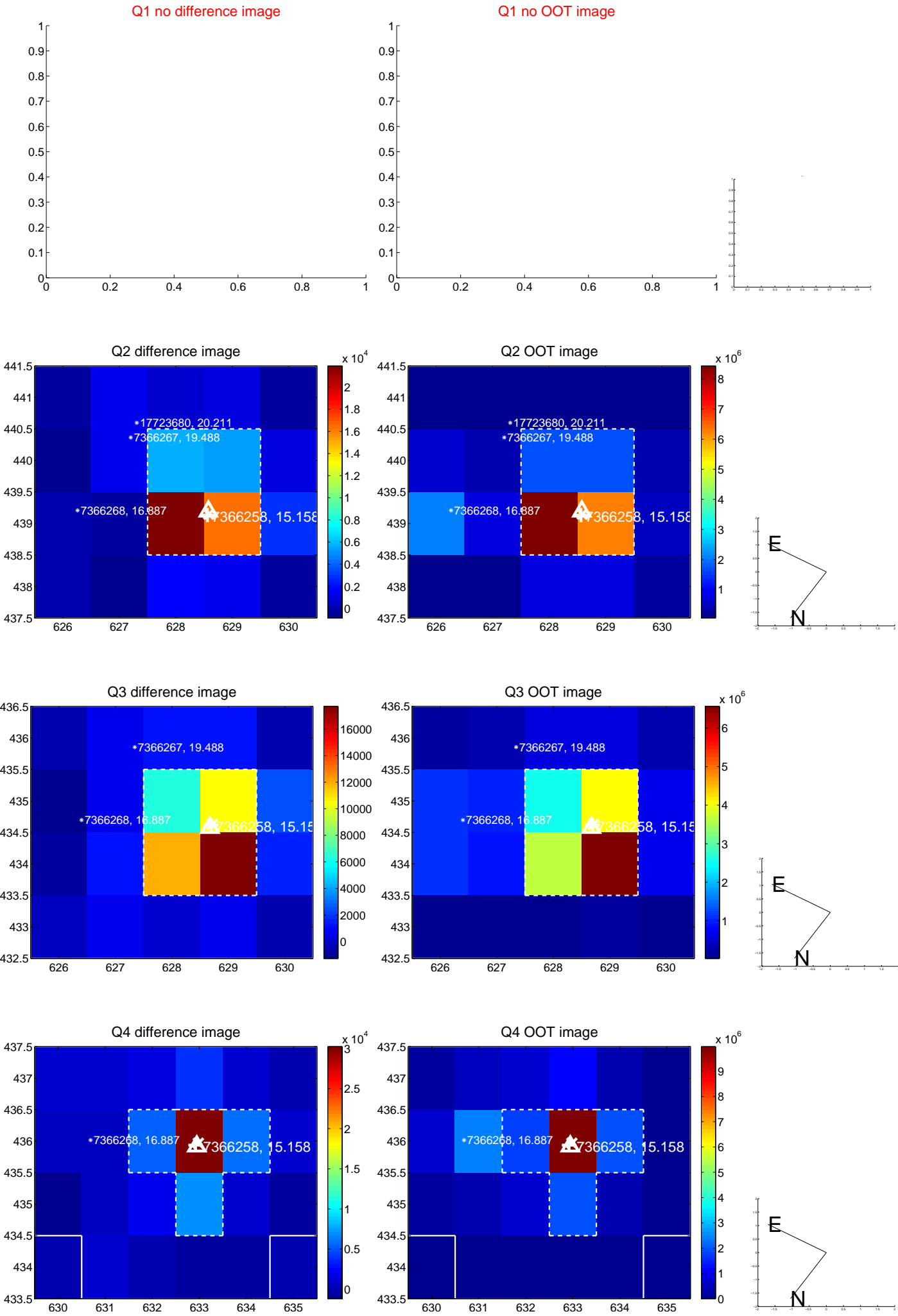
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.079 \pm 0.075$	1.06	$-0.078 \pm 0.074$	$-0.012 \pm 0.077$
PRF-fit source offset from KIC position	$0.093 \pm 0.077$	1.21	$-0.033 \pm 0.073$	$0.087 \pm 0.077$
photometric centroid source offset	$0.45 \pm 0.09$	4.98	$0.40 \pm 0.09$	$0.20 \pm 0.09$



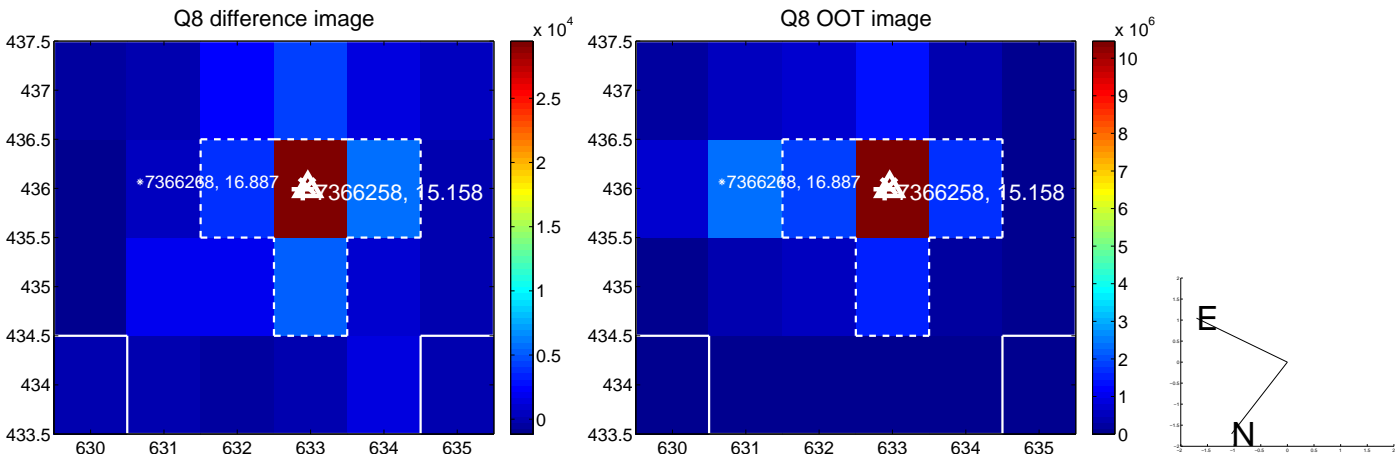
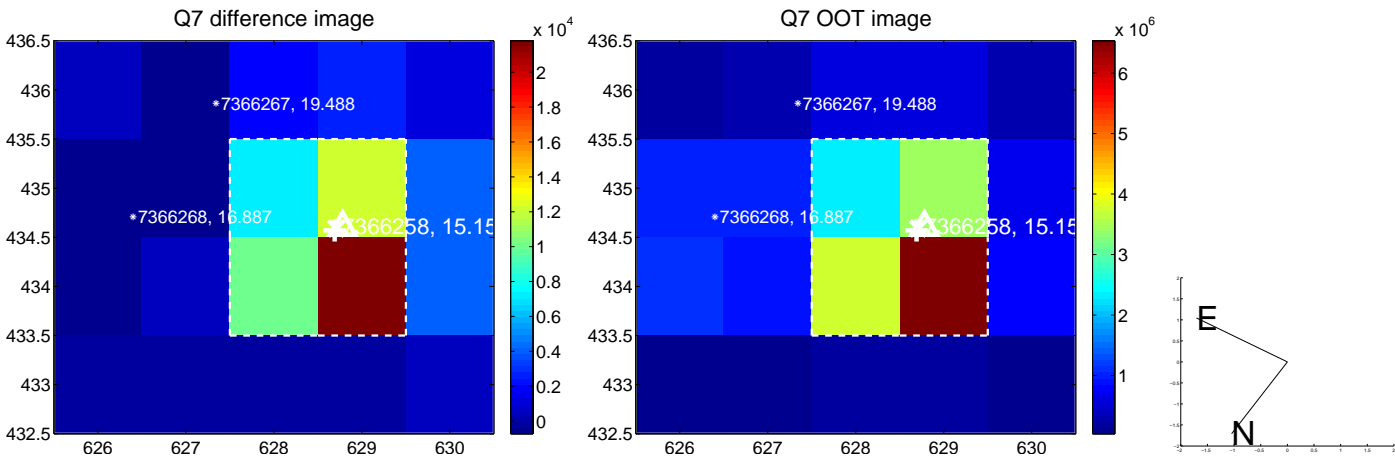
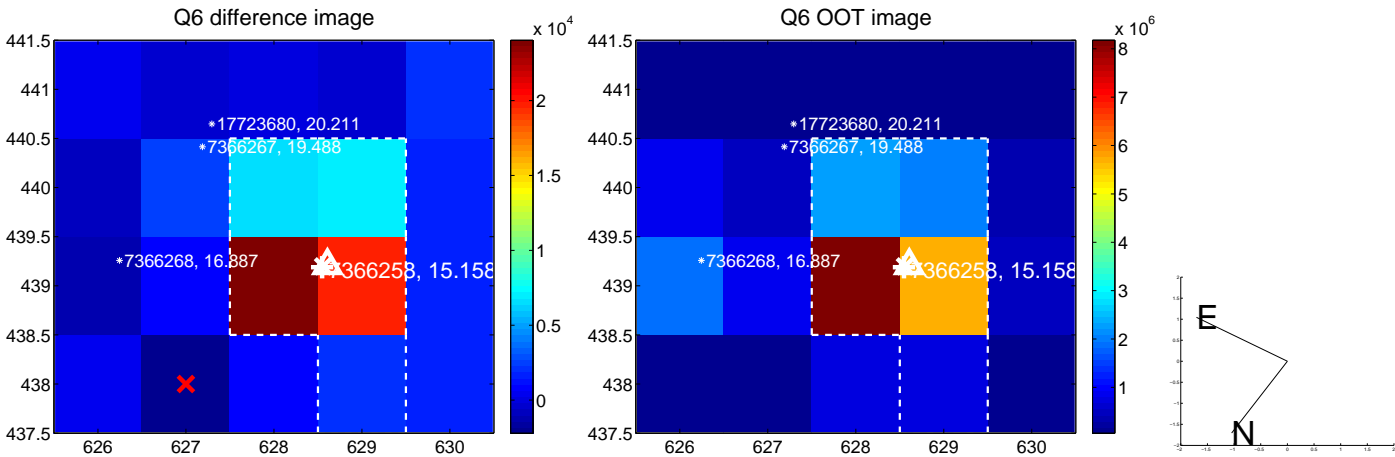
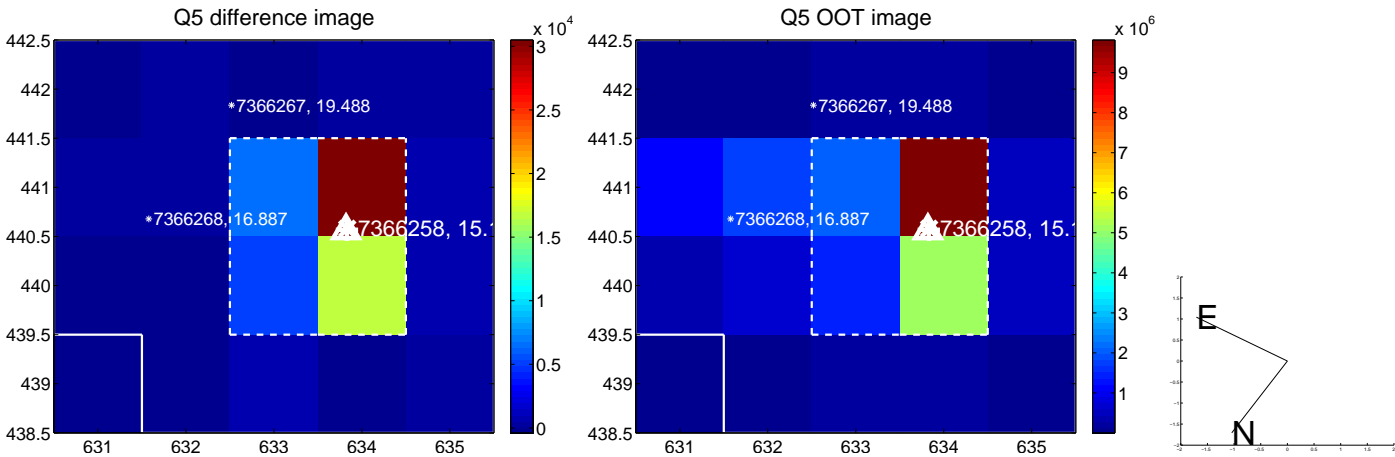
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



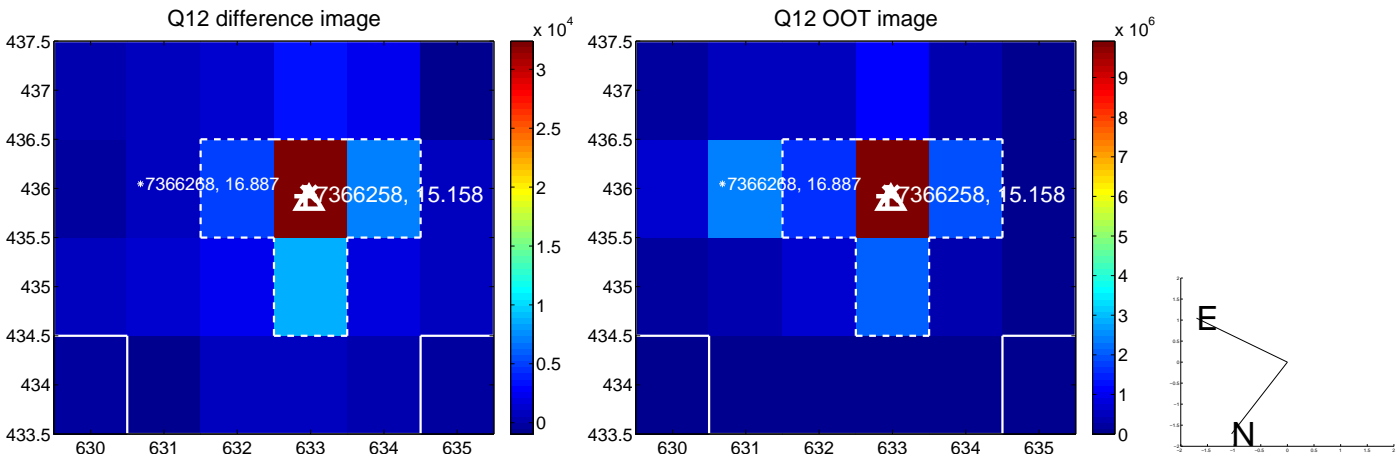
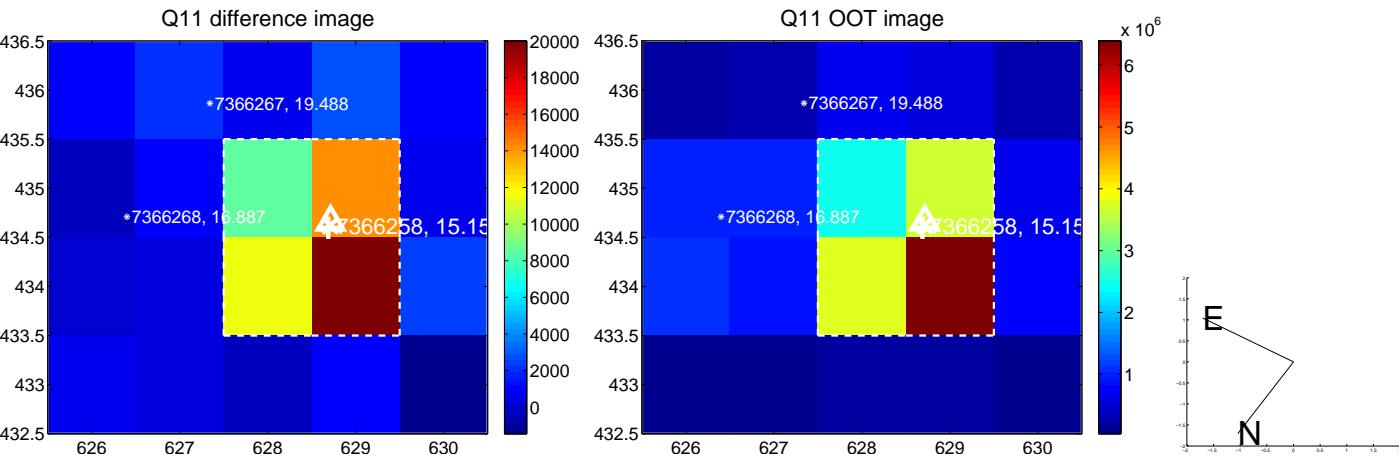
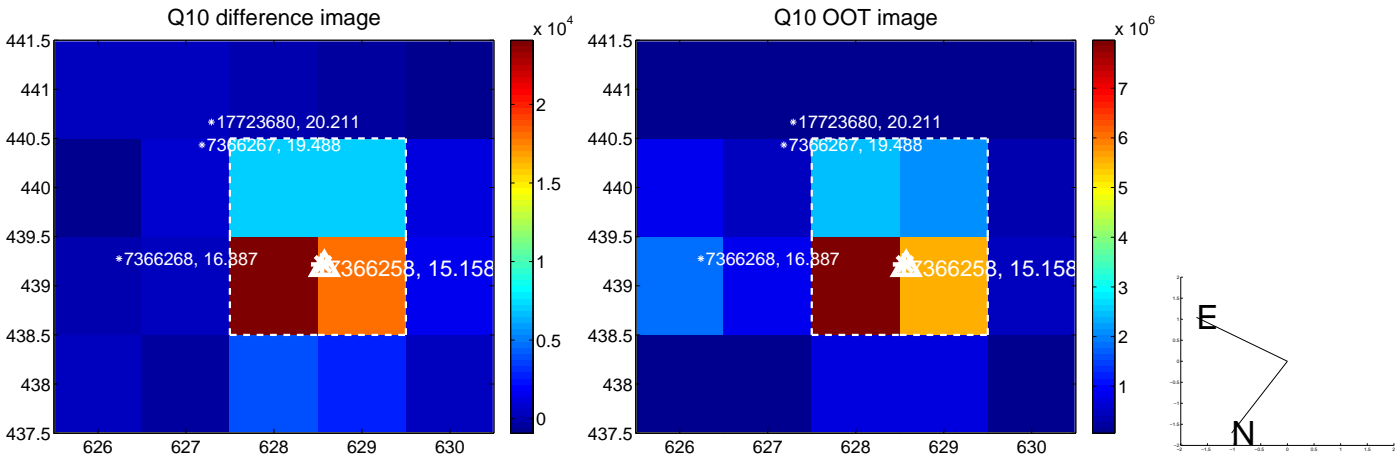
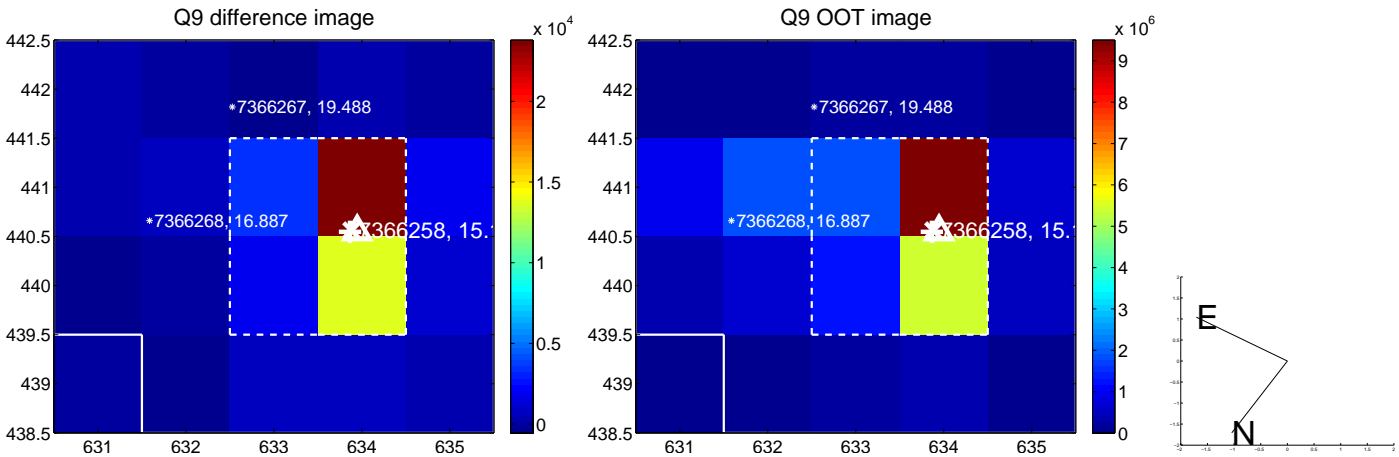
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



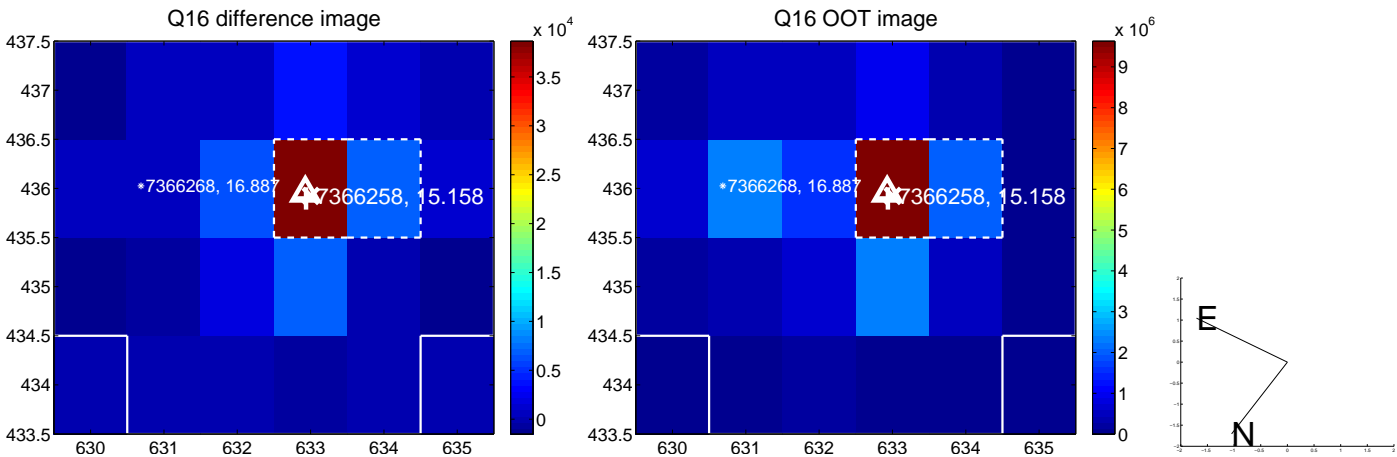
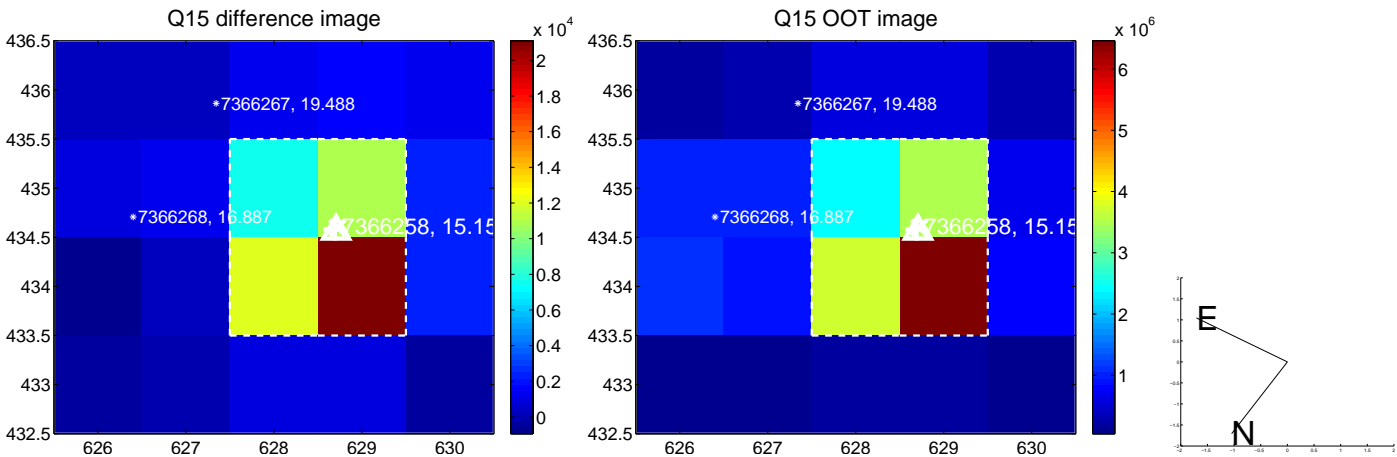
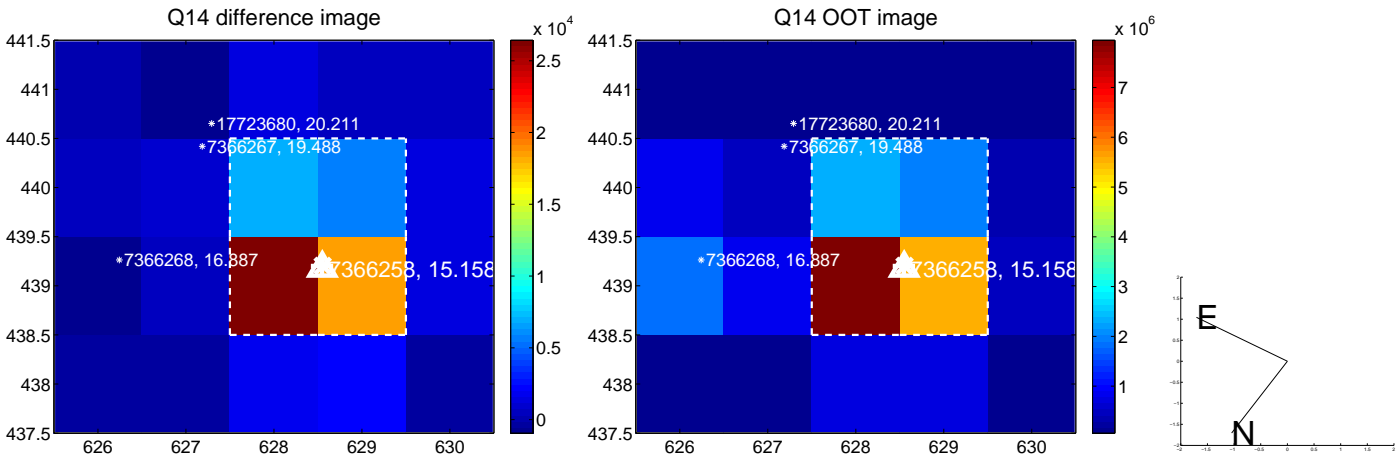
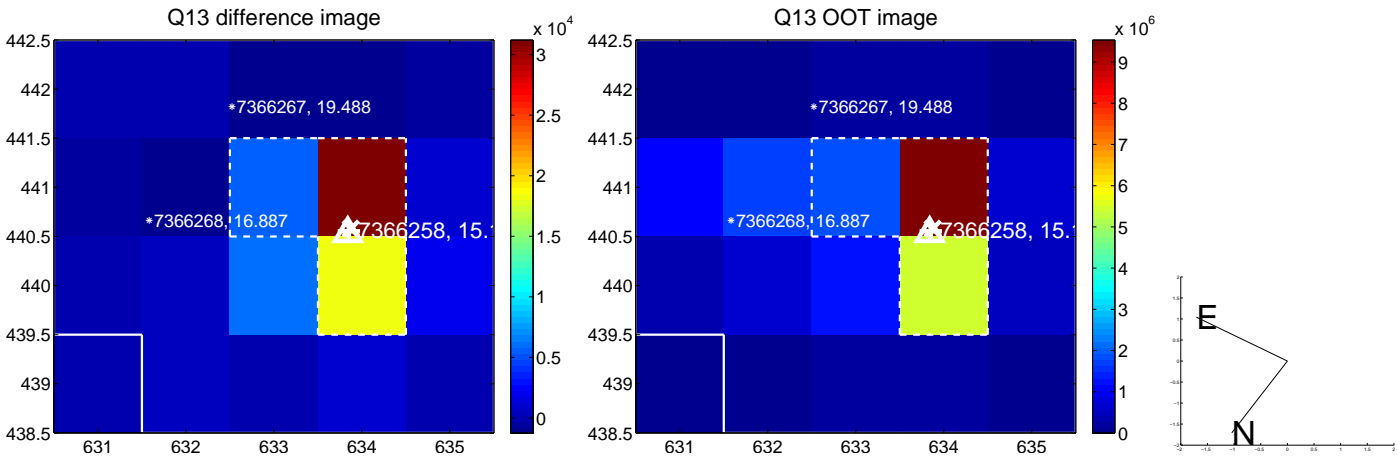
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



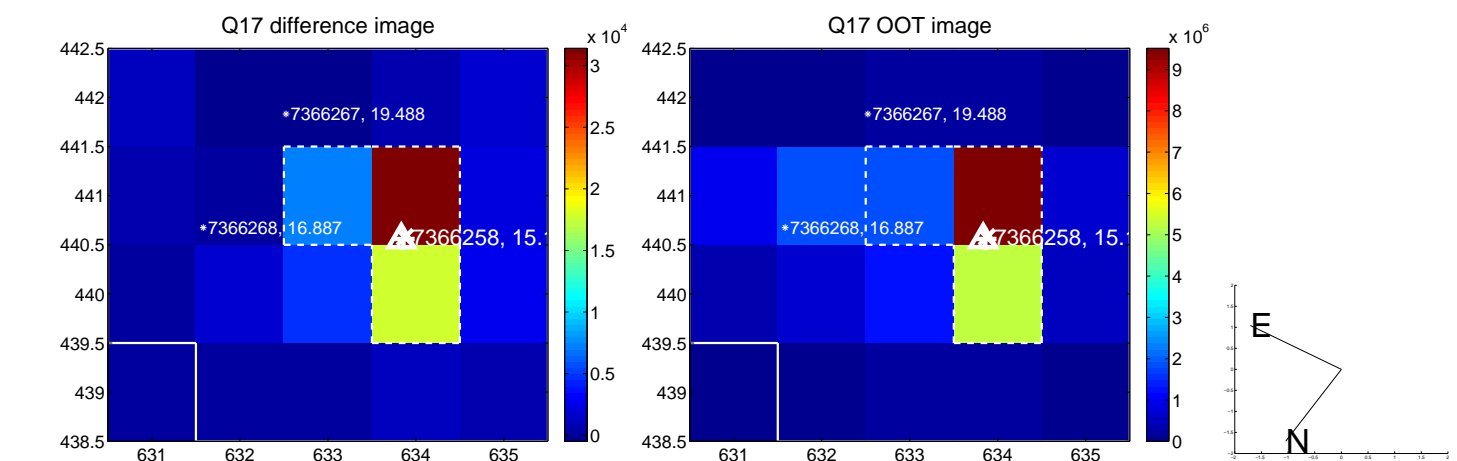
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



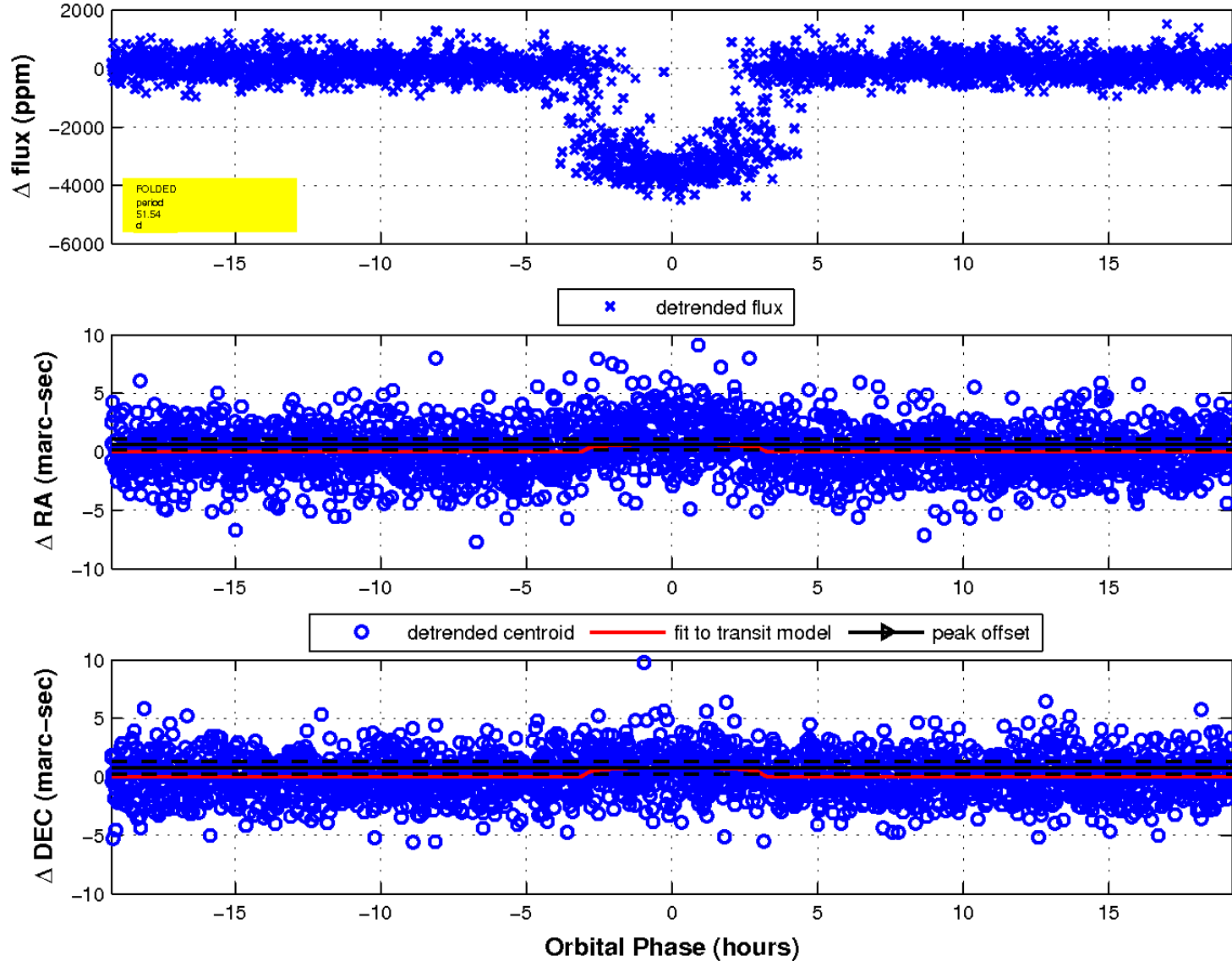
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



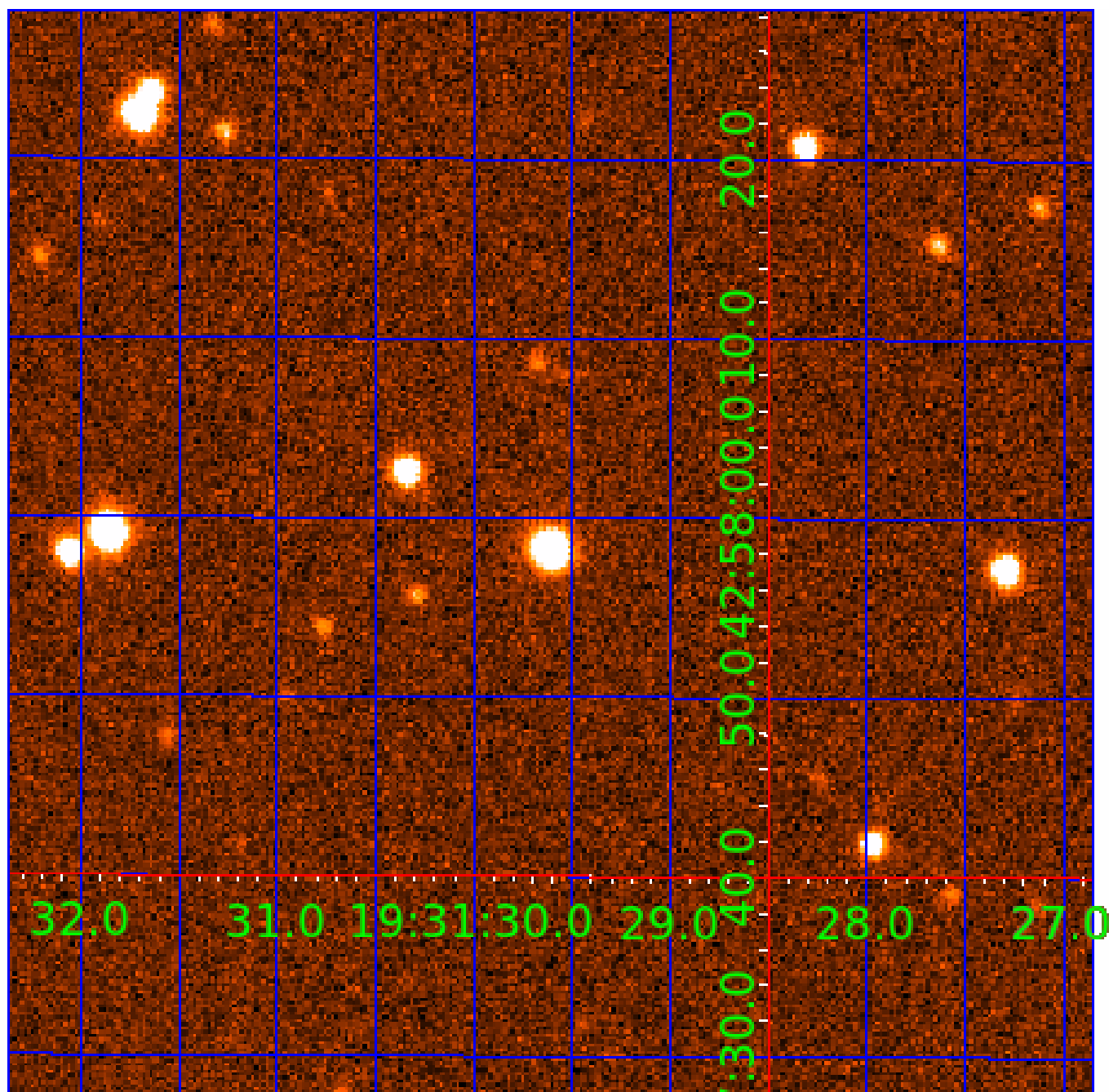
fluxWeightedCentroids, Planet 1 of 4





UKIRT Image

Declination



# KIC 007366258

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007366258-01	OBS	0880.02	51.540507	174.044052	3631.9	6.420	112.1	111.6	0.93	5427	5.47	9.69
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007366258-03	OBS	0880.03	5.902239	136.783514	661.2	3.055	43.2	47.9	0.93	5427	2.81	174.23
007366258-04	OBS	0880.04	2.382946	132.698229	257.4	2.199	23.5	26.3	0.93	5427	1.68	583.88

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007366258-01	OBS	PC	0.98	0	0	0	0	NO_COMMENT
007366258-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT
007366258-03	OBS	PC	1.00	0	0	0	0	NO_COMMENT
007366258-04	OBS	PC	1.00	0	0	0	0	NO_COMMENT

**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.

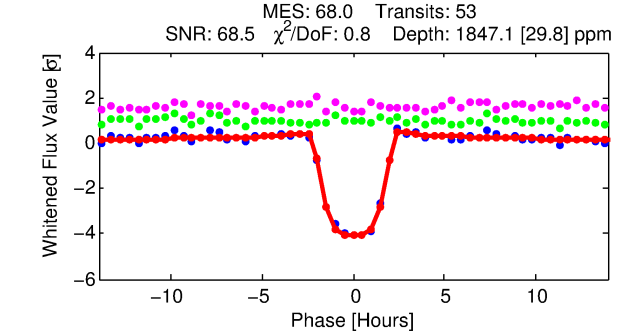
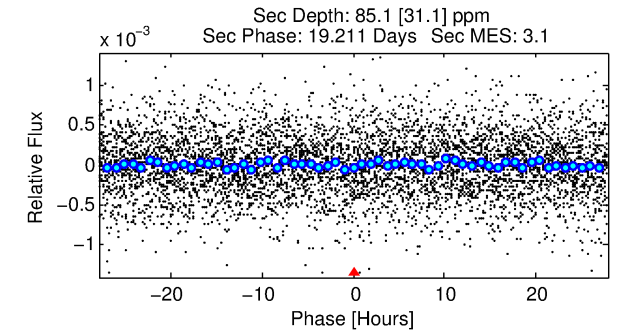
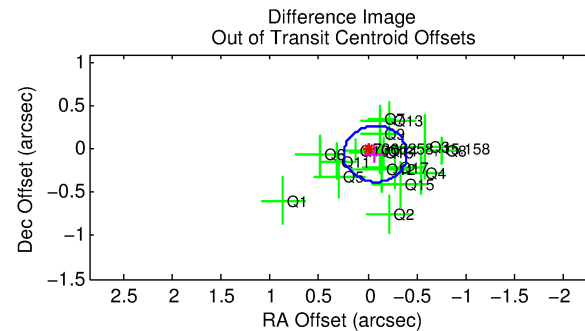
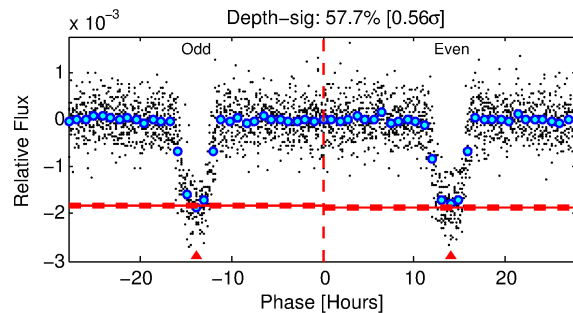
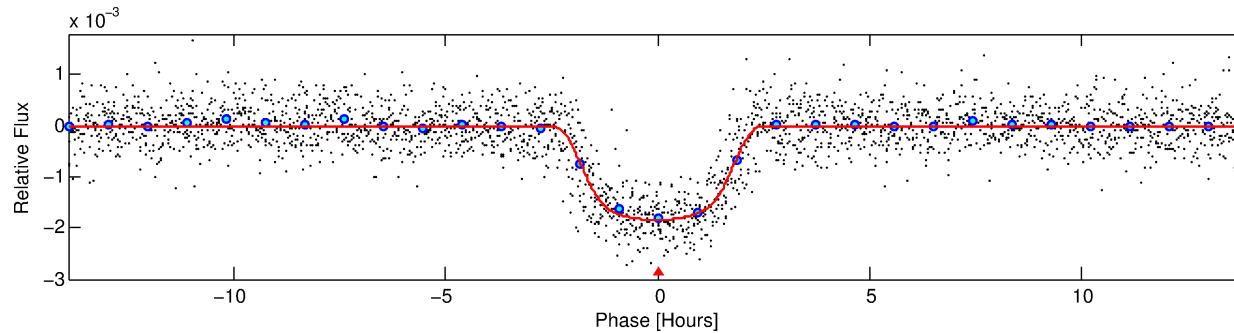
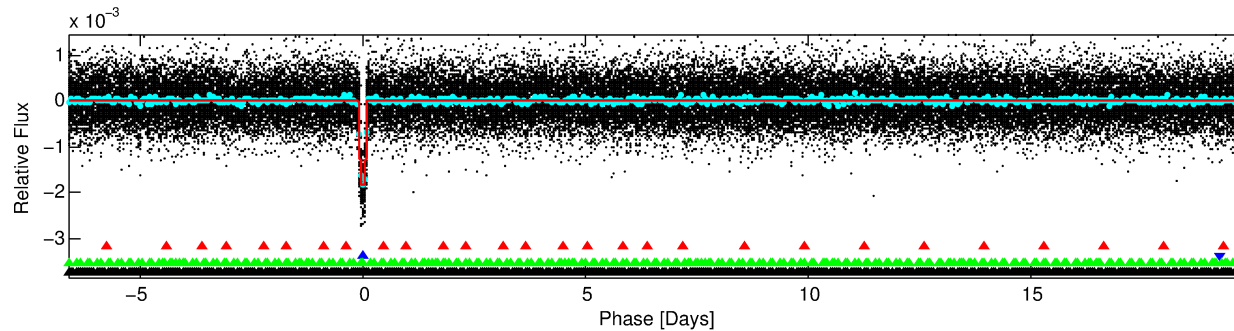
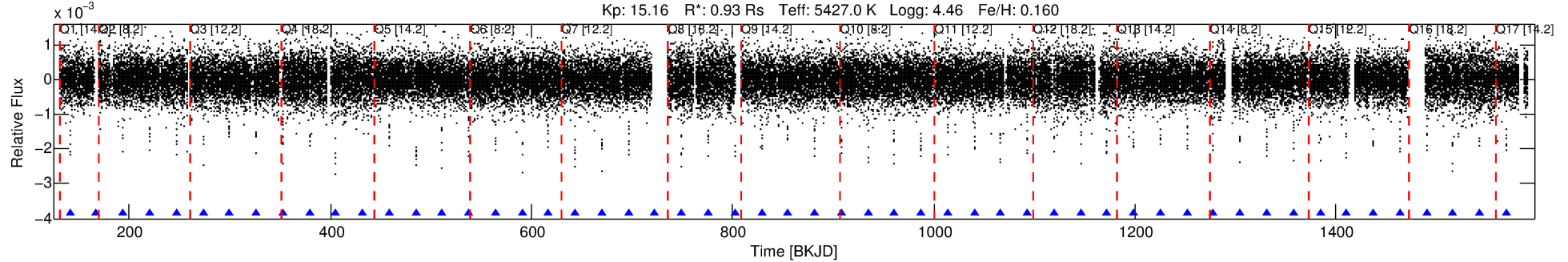
Ephemeris Match Information For 007366258-02

No Significant Match Found

# DV One-Page Summary

KIC: 7366258 Candidate: 2 of 4 Period: 26.444 d  
KOI: K00880.01 Name: Kepler-82b Corr: 0.968

Kp: 15.16 R\*: 0.93 Rs Teff: 5427.0 K Logg: 4.46 Fe/H: 0.160



## DV Fit Results:

Period = 26.44437 [0.00005] d  
Epoch = 141.2327 [0.0015] BKJD  
Rp/R\* = 0.0480 [0.0008]  
a/R\* = 22.70 [1.15]  
b = 0.91 [0.01]  
Seff = 23.59 [4.10]  
Teff = 562 [24] K  
Rp = 4.87 [0.55] Re  
a = 0.1686 [0.0170] AU  
Ag = 56.11 [22.37] [2.46σ]  
Teffp = 2378 [224] K [8.08σ]

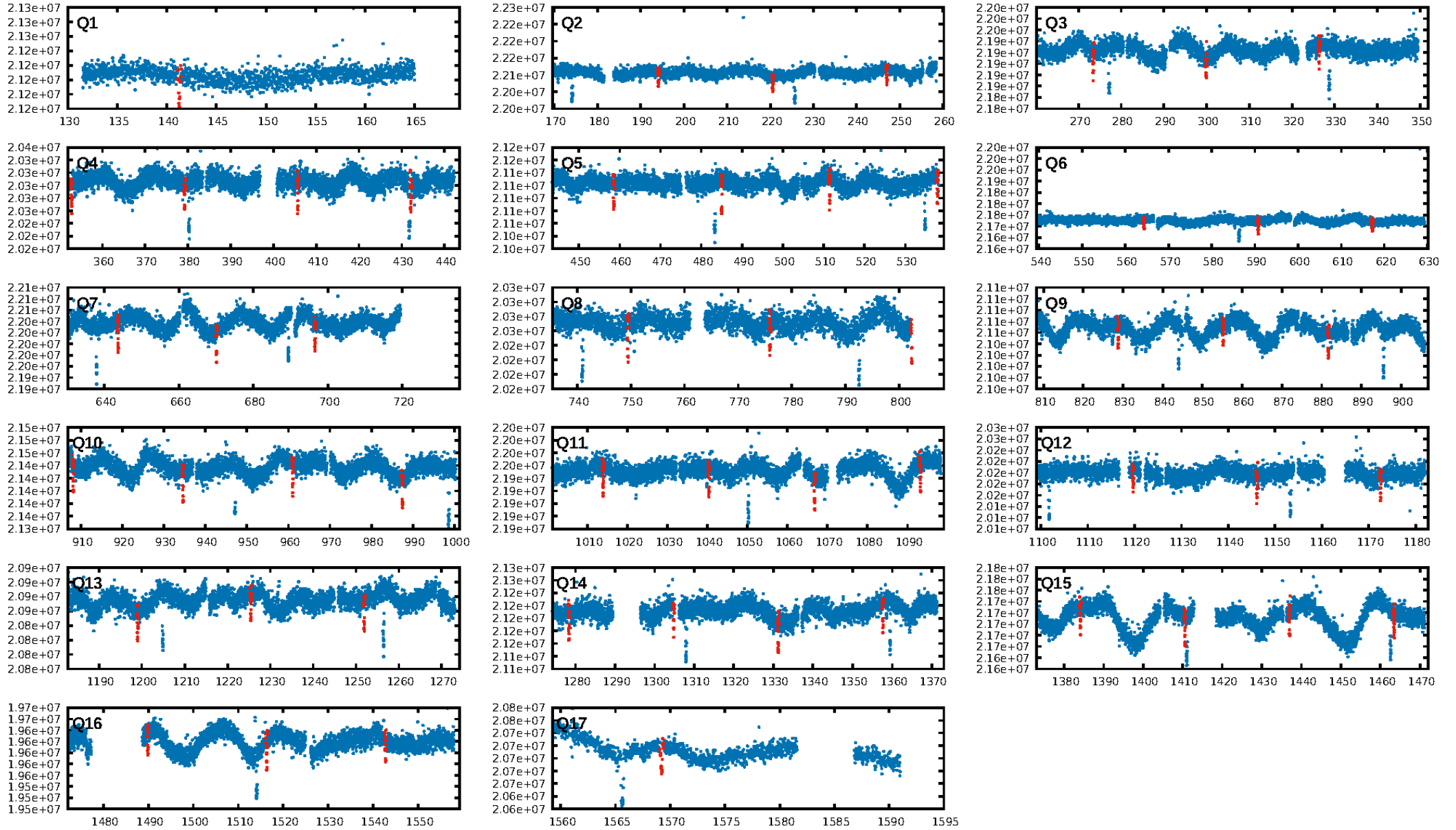
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [88.70σ]  
LongPeriod-sig: 100.0% [76.02σ]  
ModelChiSquare2-sig: 86.5%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [51/51]  
GhostDiagnostic-chr: 4.585  
Centroid-sig: 0.1%  
Centroid-so: 0.310 arcsec [1.97σ]  
OotOffset-rm: 0.091 arcsec [0.85σ]  
KicOffset-rm: 0.071 arcsec [0.59σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 0.82 [14/17]

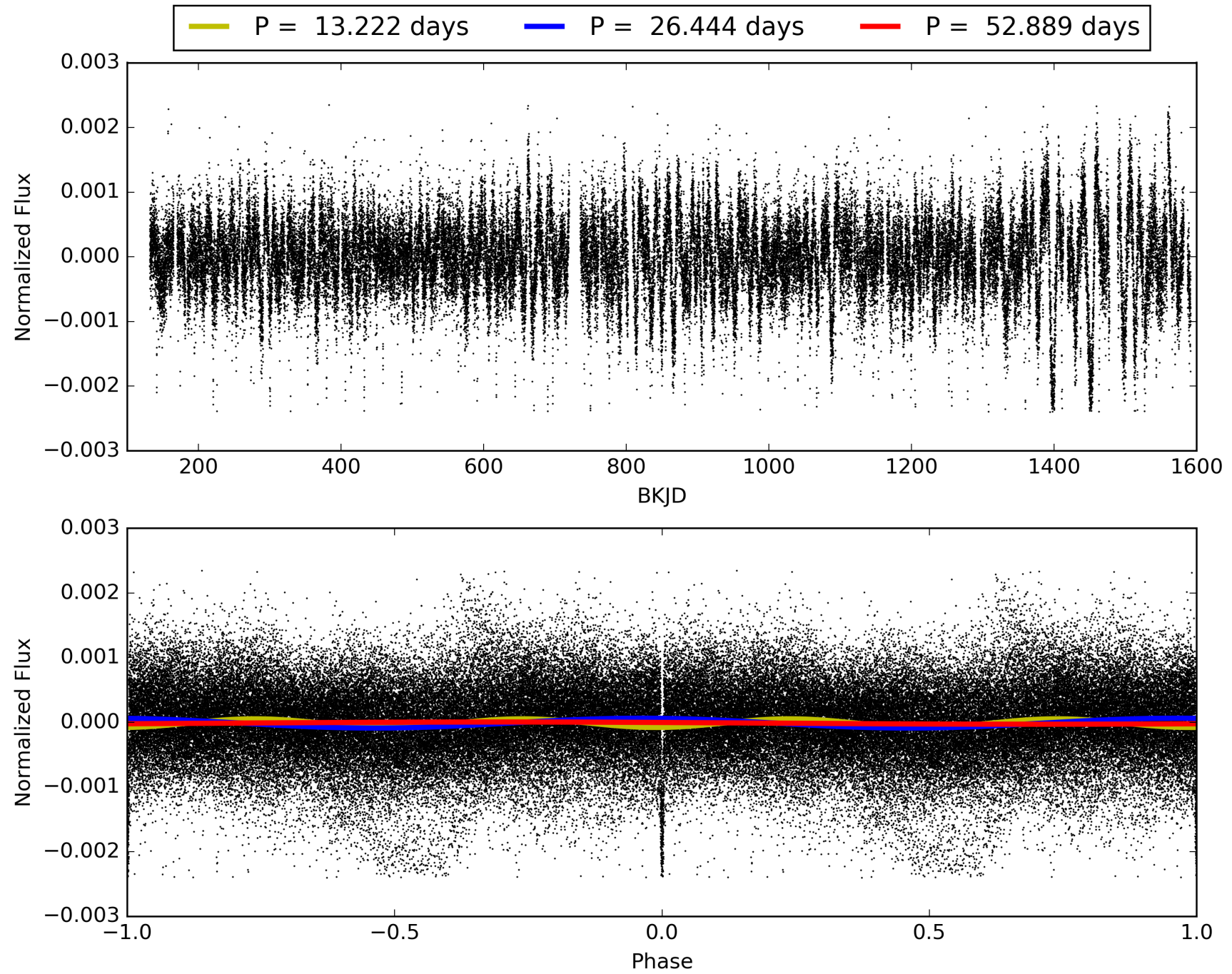
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 23:25:39 Z

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

# TCE 007366258-02, PDC Light Curves



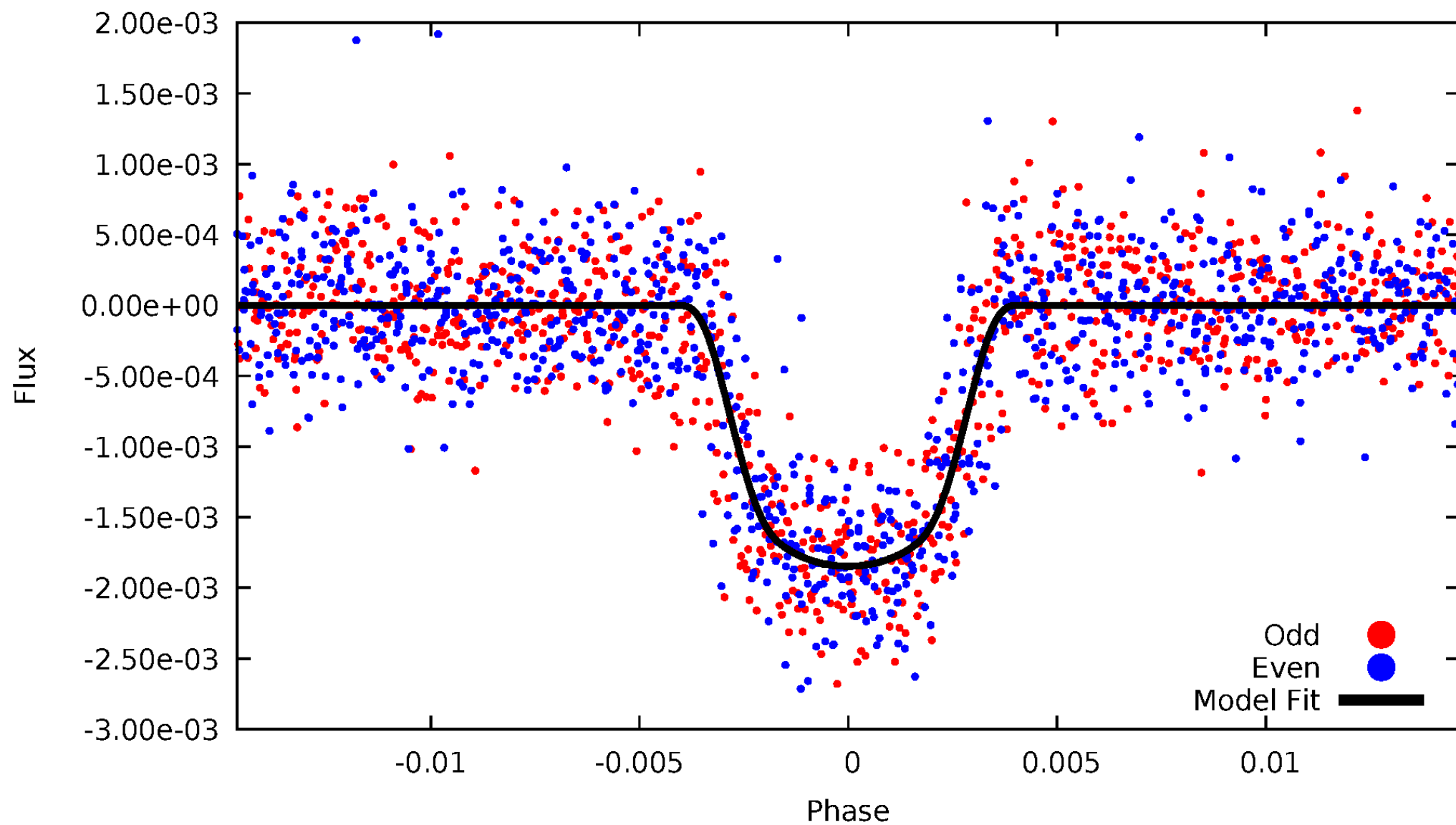
TCE 007366258-02





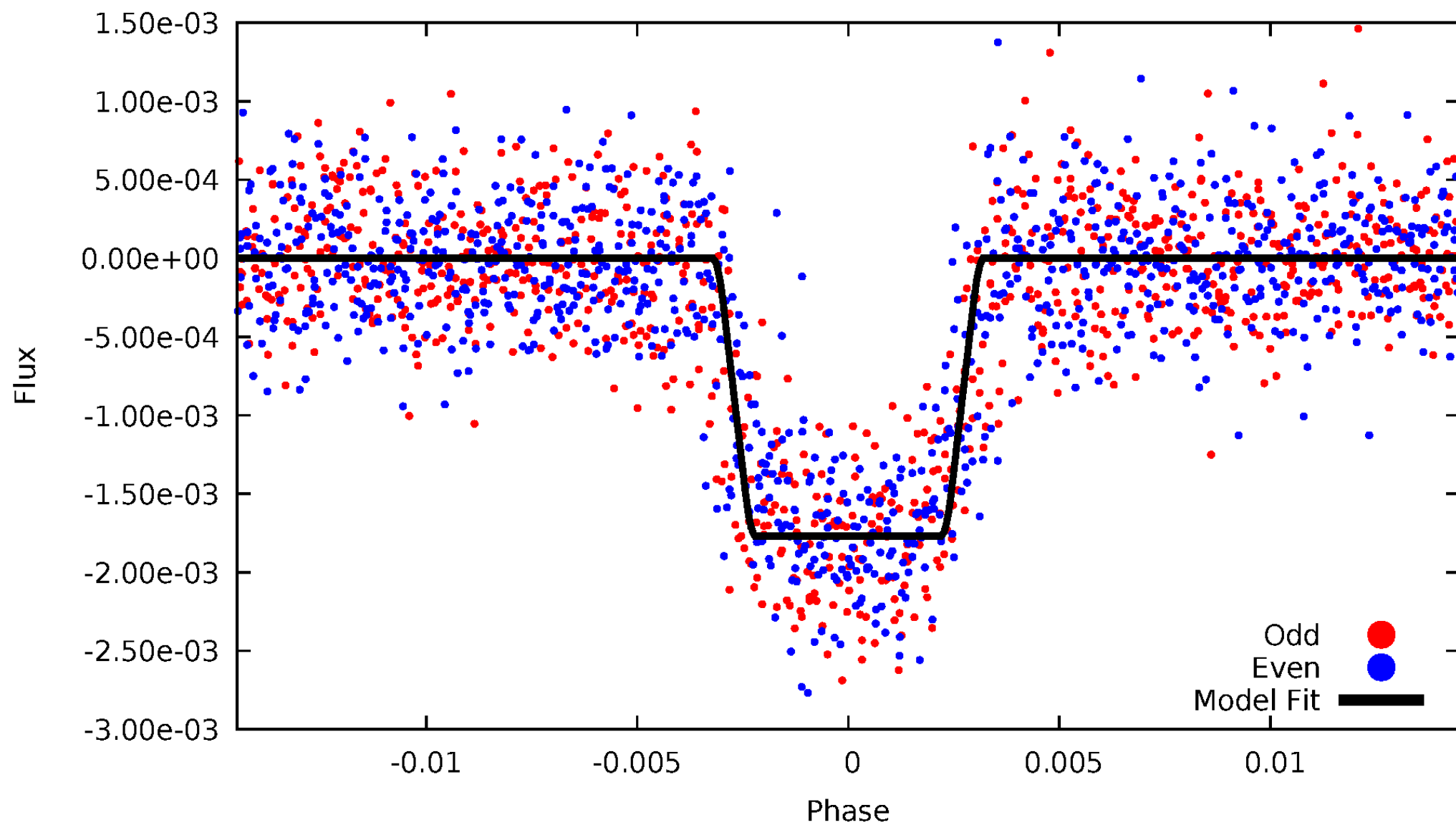
DV Odd/Even

TCE 007366258-02



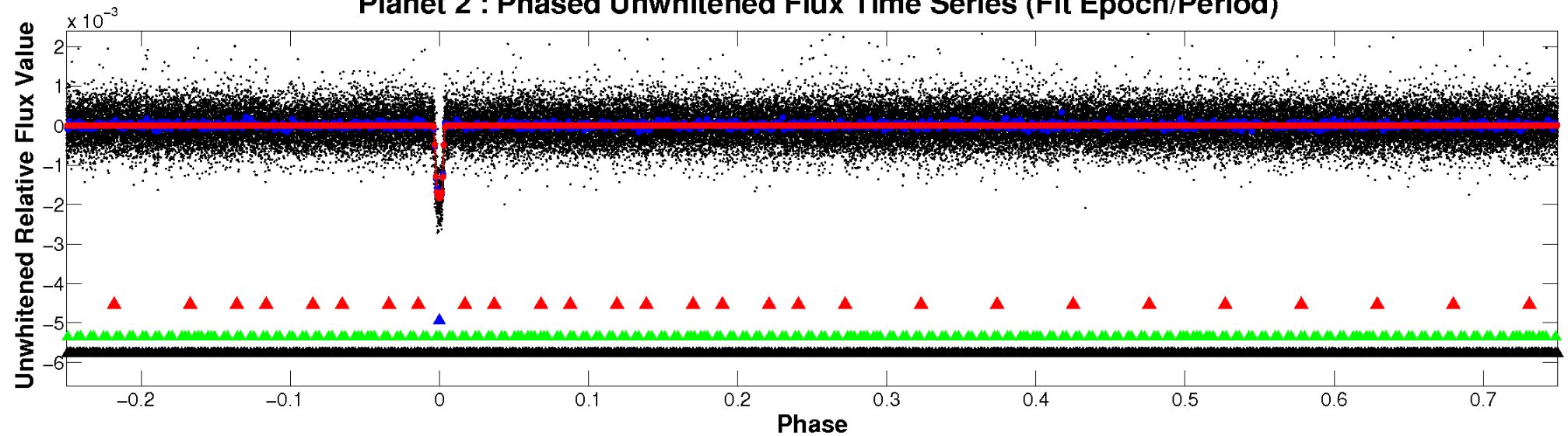
# ALT Odd/Even

TCE 007366258-02

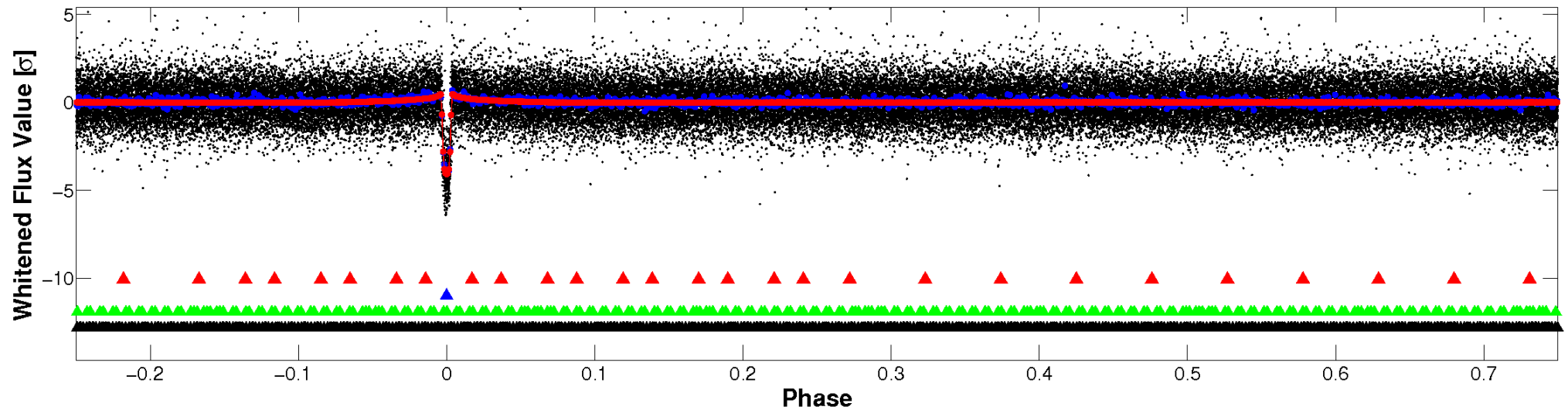


# Non-Whitened Vs. Whitened Light Curve

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

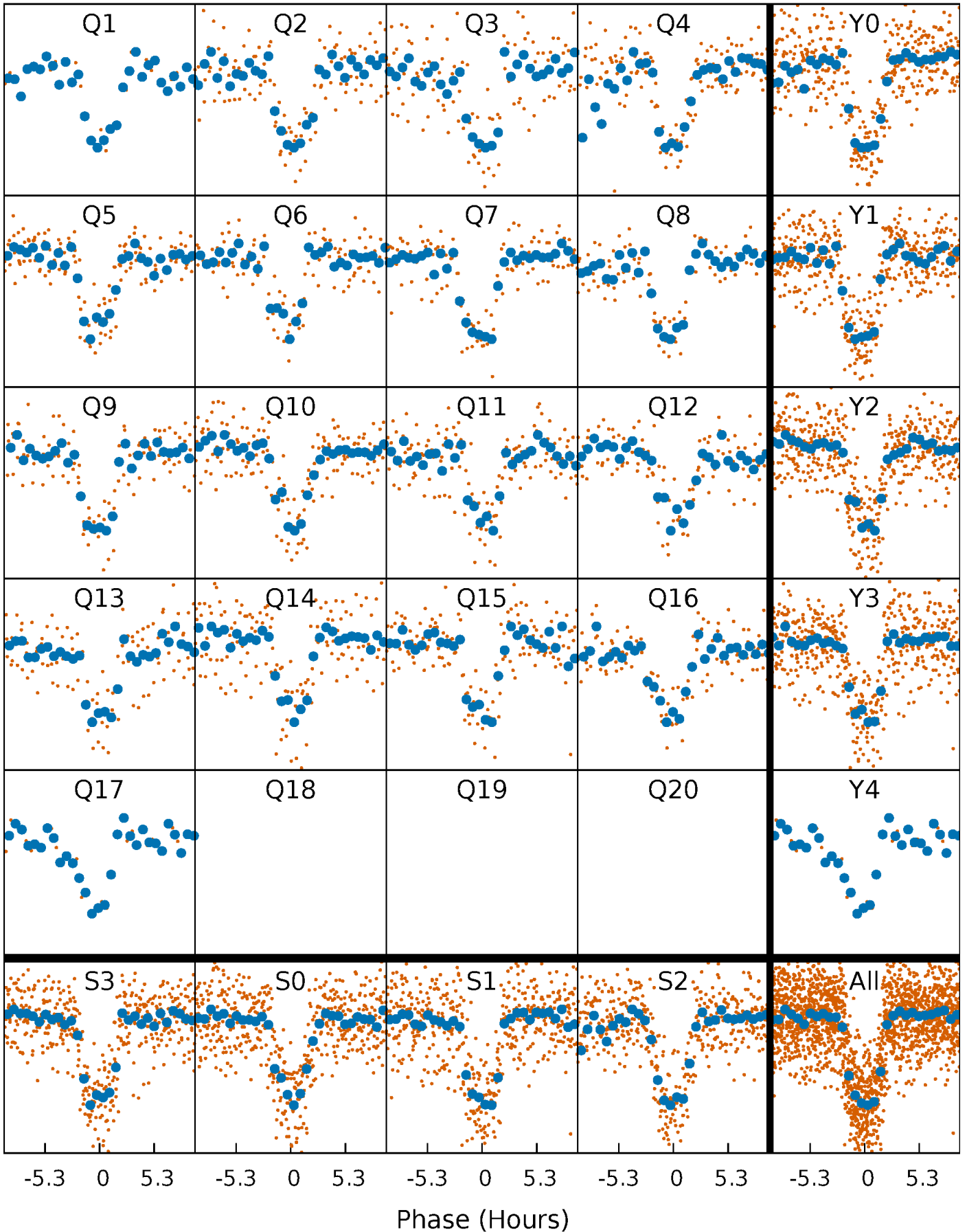


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



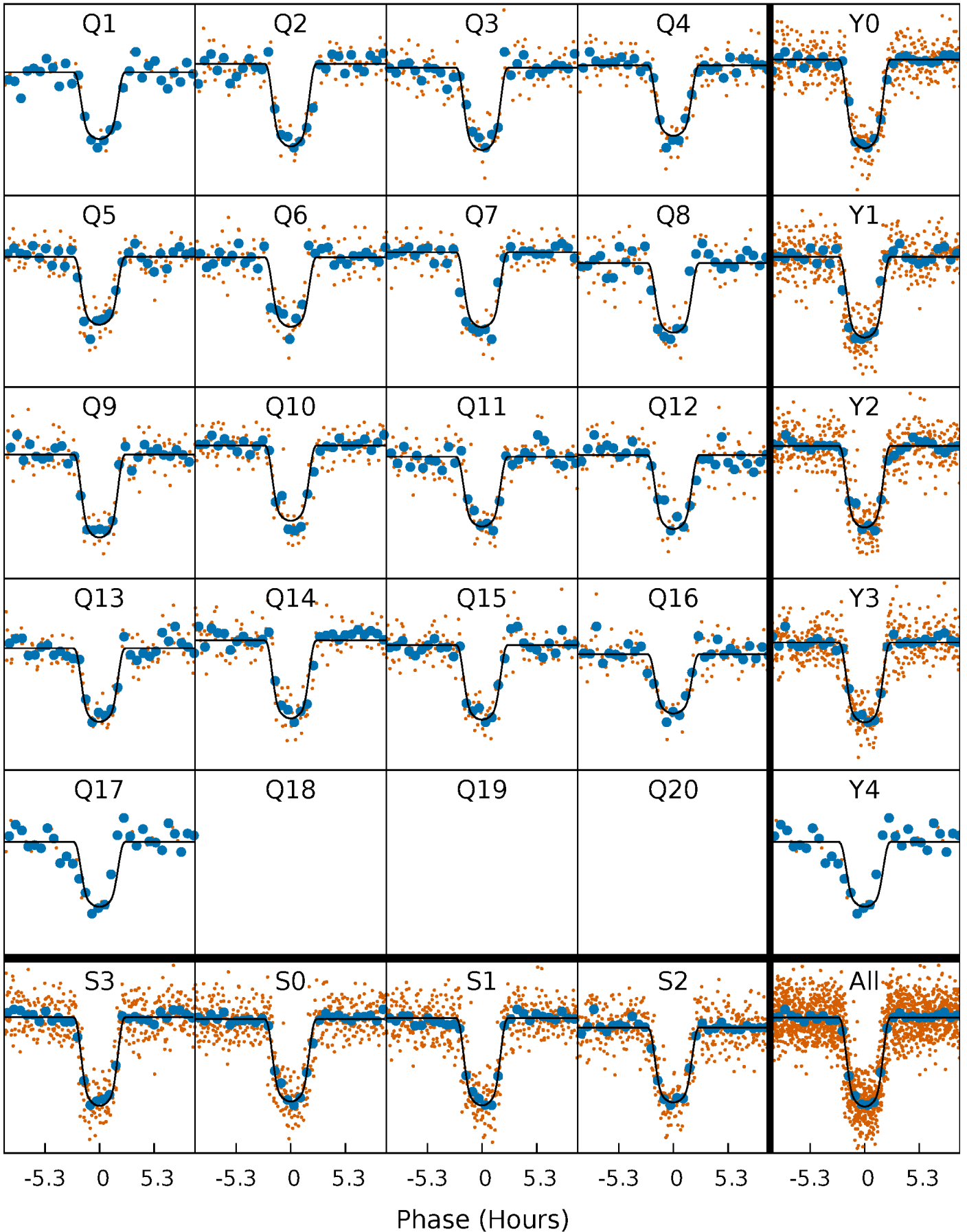
# PDC Quarter-Phased Transit Curves

TCE 007366258-02   P= 26.444373 Days    $T_0=141.232690$  (BKJD)



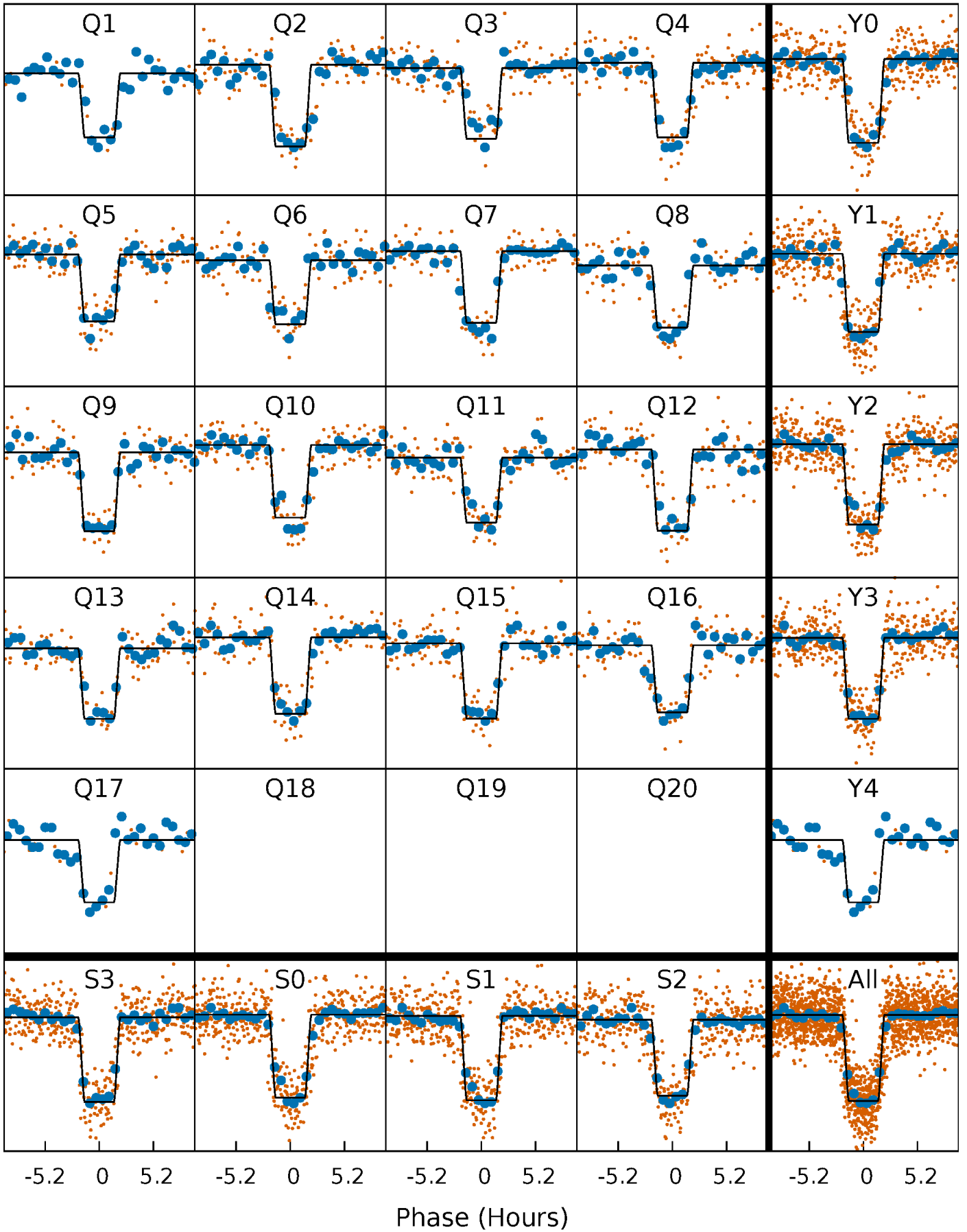
# DV Quarter-Phased Transit Curves

TCE 007366258-02   P= 26.444373 Days    $T_0=141.232690$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

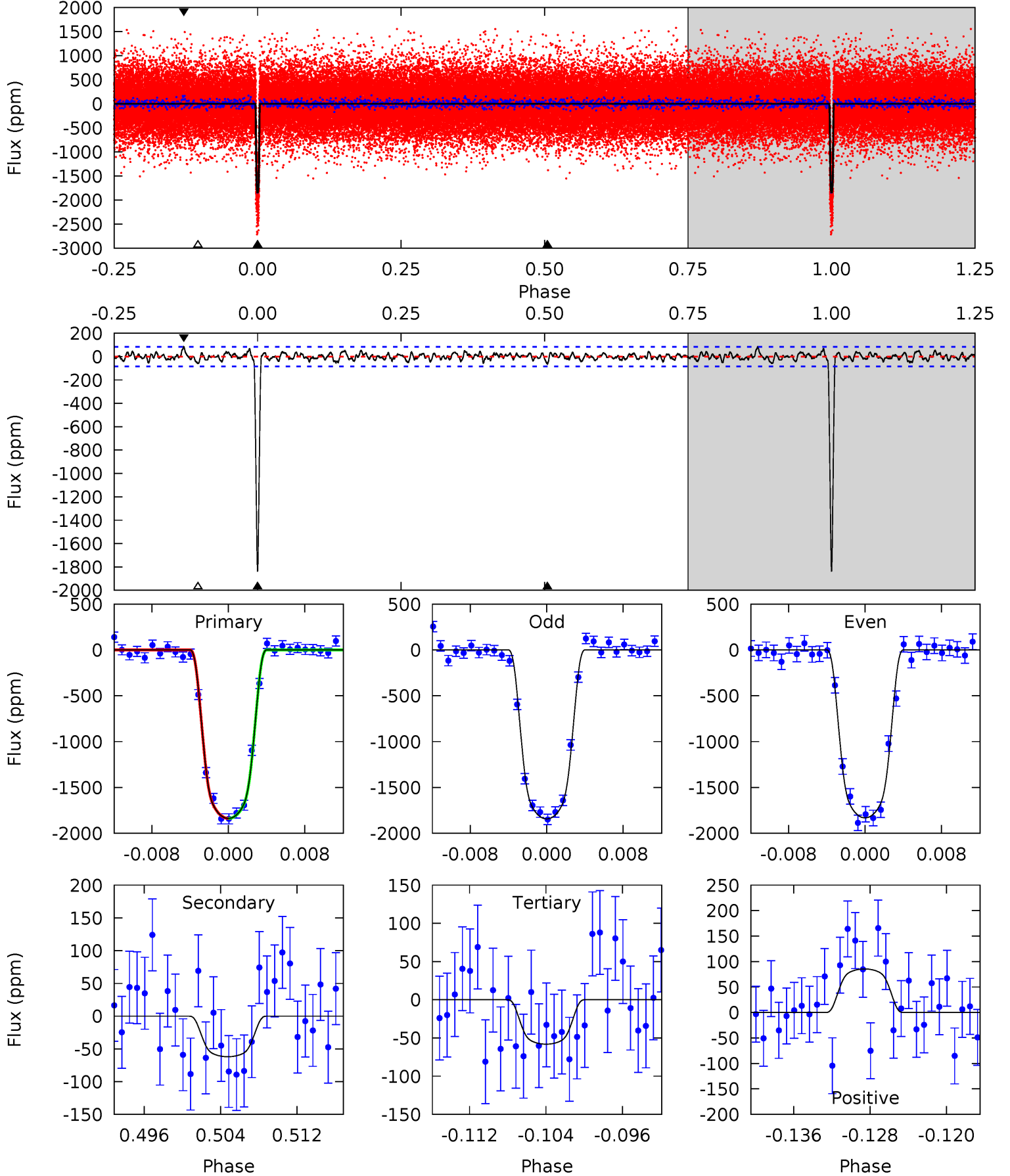
TCE 007366258-02 P= 26.444573 Days  $T_0=141.226030$  (BKJD)



# DV Model-Shift Uniqueness Test

007366258-02,  $P = 26.444373$  Days,  $E = 114.788317$  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
111.2	3.75	3.52	5.17	5.07	2.65	1.31	107.7	106.1	0.23	-1.42	0.35	1.01	0.04	0.04

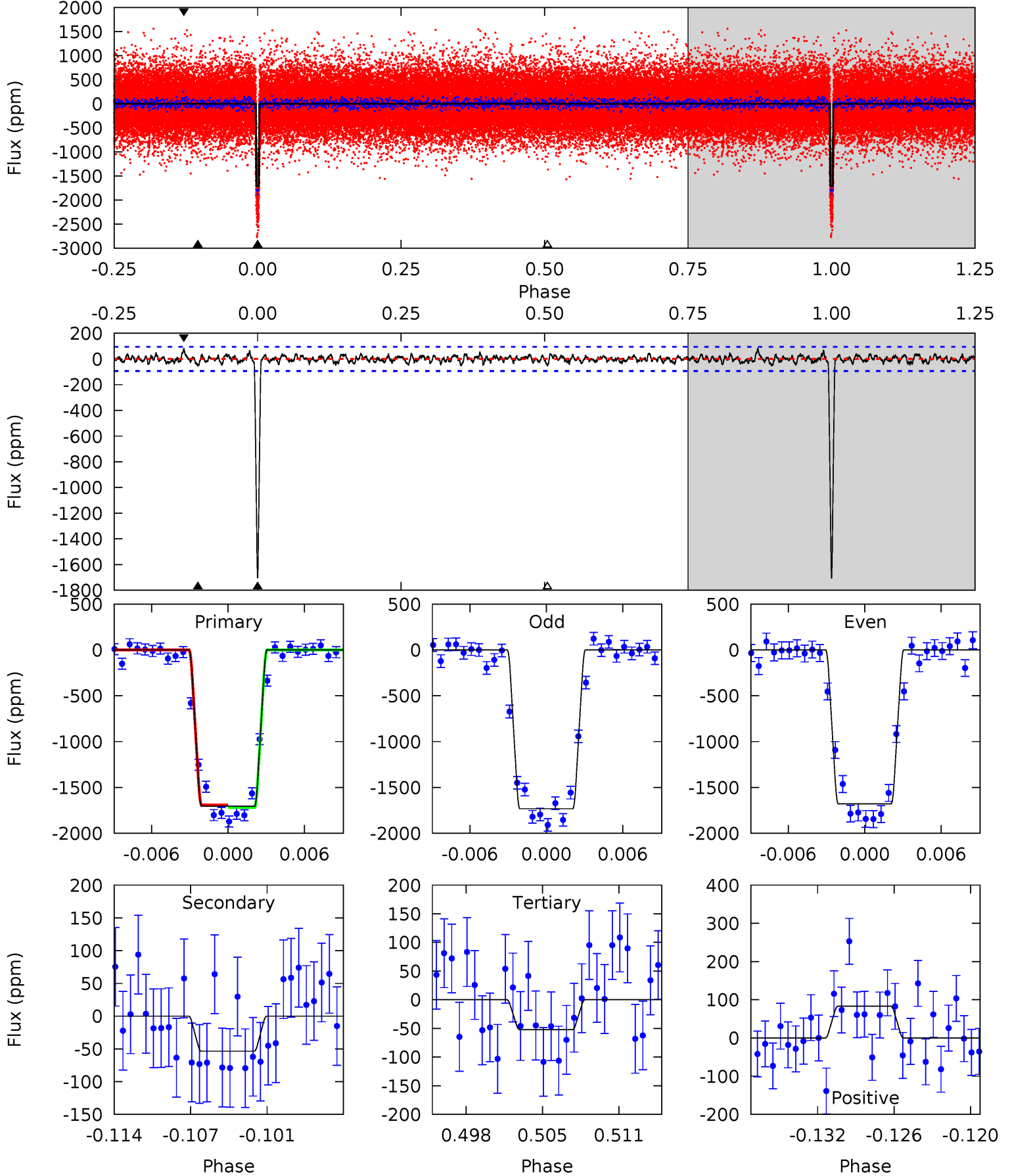




# Alt Model-Shift Uniqueness Test

007366258-02,  $P = 26.444573$  Days,  $E = 114.781457$  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
92.8	2.91	2.83	4.51	5.11	2.73	1.03	89.9	88.2	0.08	-1.61	1.50	1.03	0.05	0.82





### Stellar Parameters For KIC 007366258

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5427^{+108}_{-108}$	$4.463^{+0.064}_{-0.088}$	$0.160^{+0.150}_{-0.150}$	$0.929^{+0.104}_{-0.069}$	$0.915^{+0.051}_{-0.051}$	$1.608^{+0.398}_{-0.421}$
	+2%/-2%	+1%/-2%	+94%/-94%	+11%/-7%	+6%/-6%	+25%/-26%
Source	SPE58	SPE58	SPE58	DSEP		

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

### Secondary Eclipse Parameters for KIC 007366258-02 / KOI 0880.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-62 \pm 17$	$4.90^{+0.32}_{-0.25}$	$786^{+27}_{-23}$	$2893^{+100}_{-119}$	$40^{+13}_{-10}$
Alt.	$-53 \pm 18$	$4.26^{+0.29}_{-0.21}$	$786^{+26}_{-25}$	$2930^{+142}_{-176}$	$45^{+18}_{-17}$

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

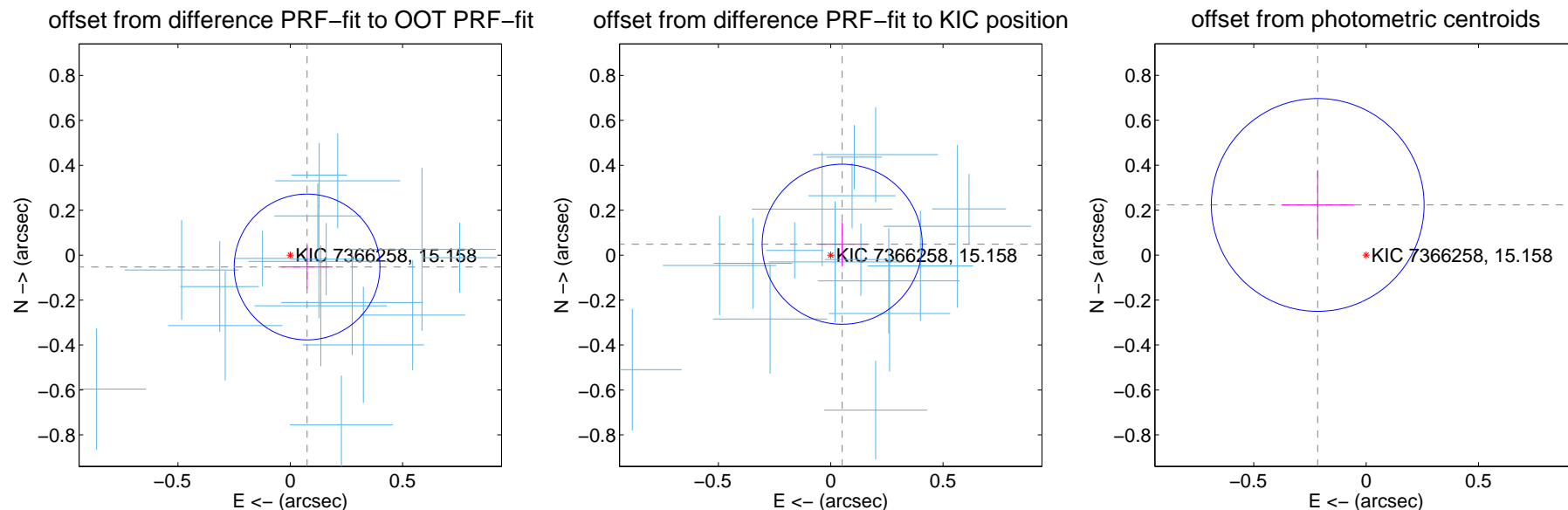
## DV Centroid Data

Supplemental centroid analysis for 007366258-02. Kepler magnitude: 15.16. Transit SNR 68.55

There are 17 quarters with good PRF difference image offsets

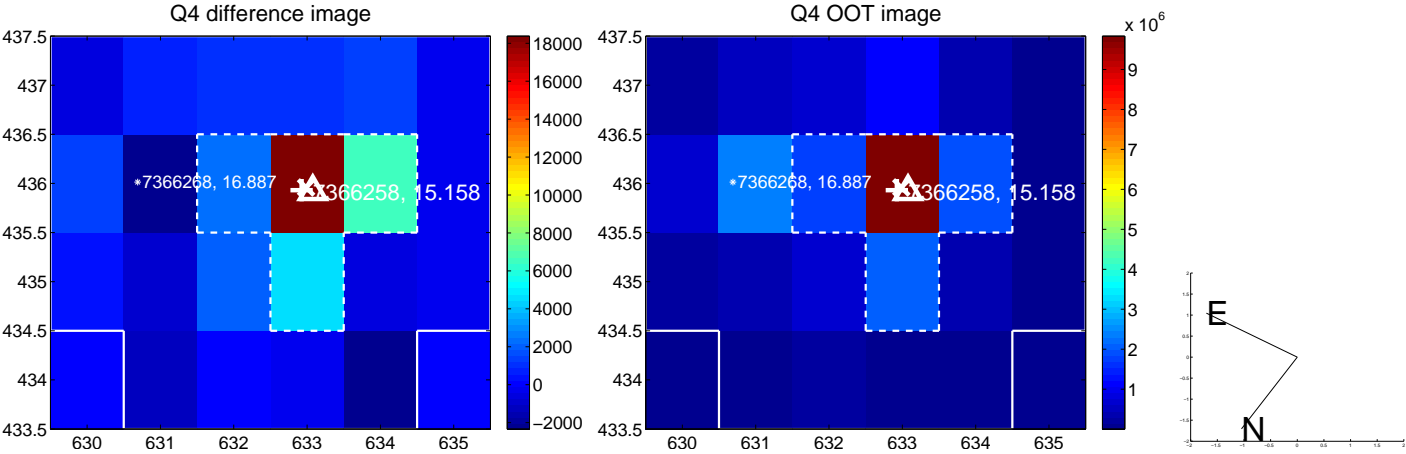
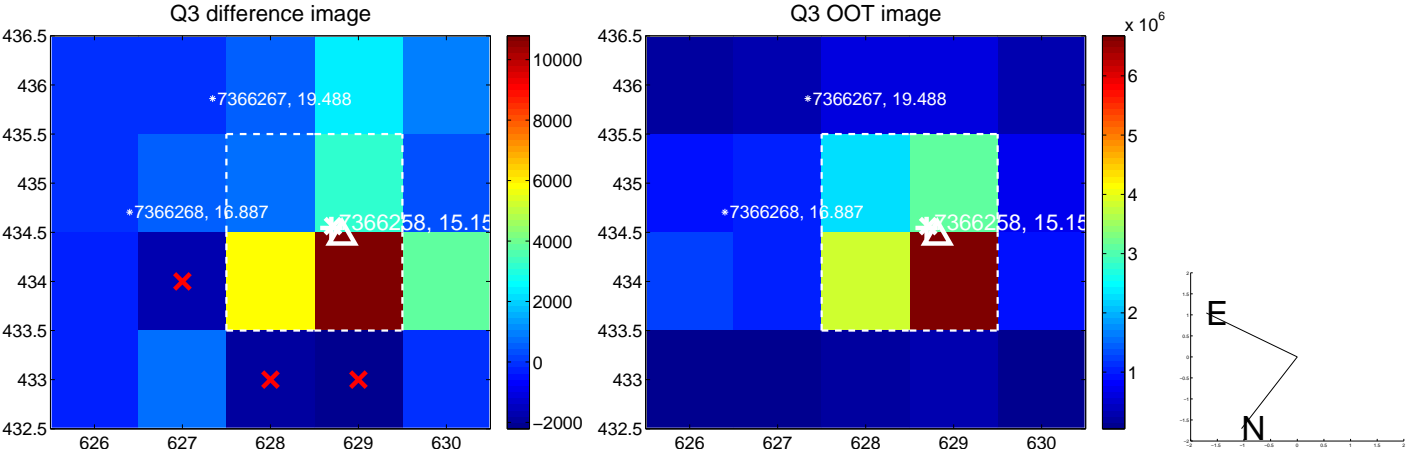
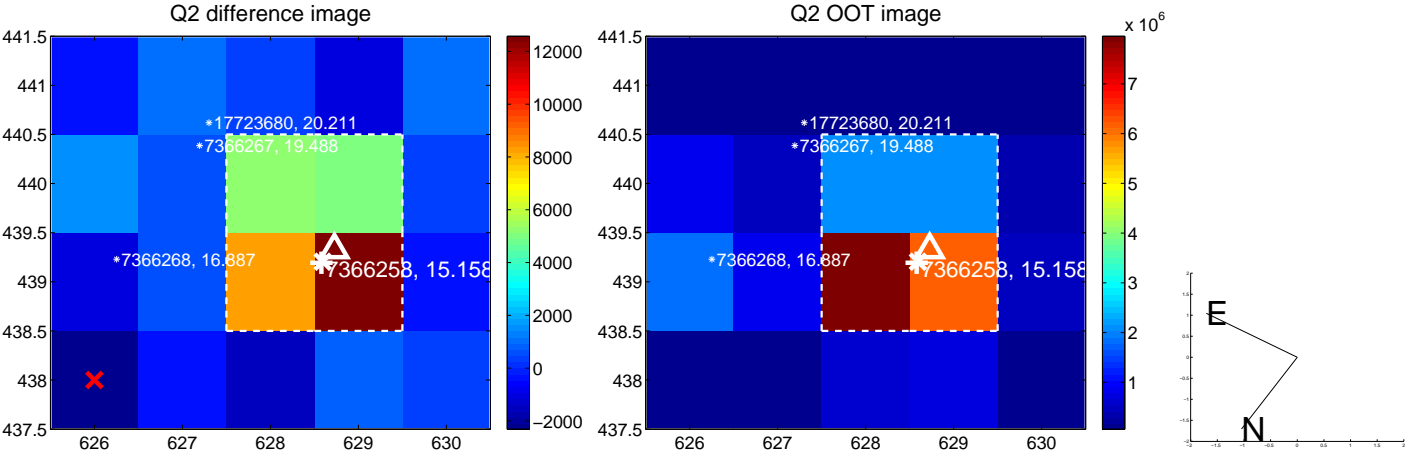
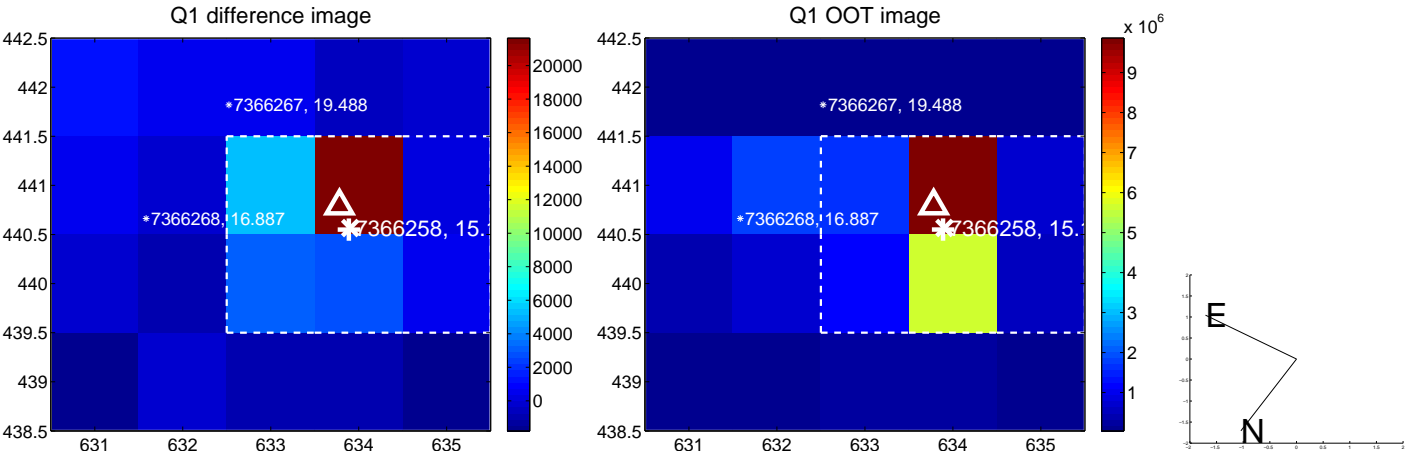
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.091 \pm 0.108$	0.85	$-0.075 \pm 0.114$	$-0.053 \pm 0.096$
PRF-fit source offset from KIC position	$0.071 \pm 0.119$	0.59	$-0.051 \pm 0.114$	$0.049 \pm 0.098$
photometric centroid source offset	$0.31 \pm 0.16$	1.97	$0.22 \pm 0.16$	$0.22 \pm 0.15$

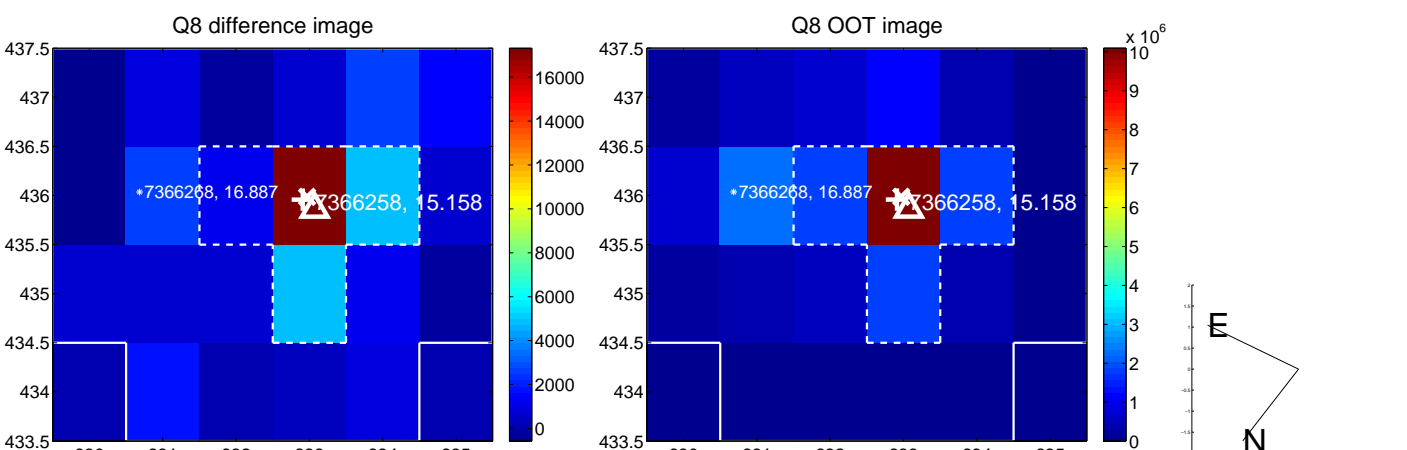
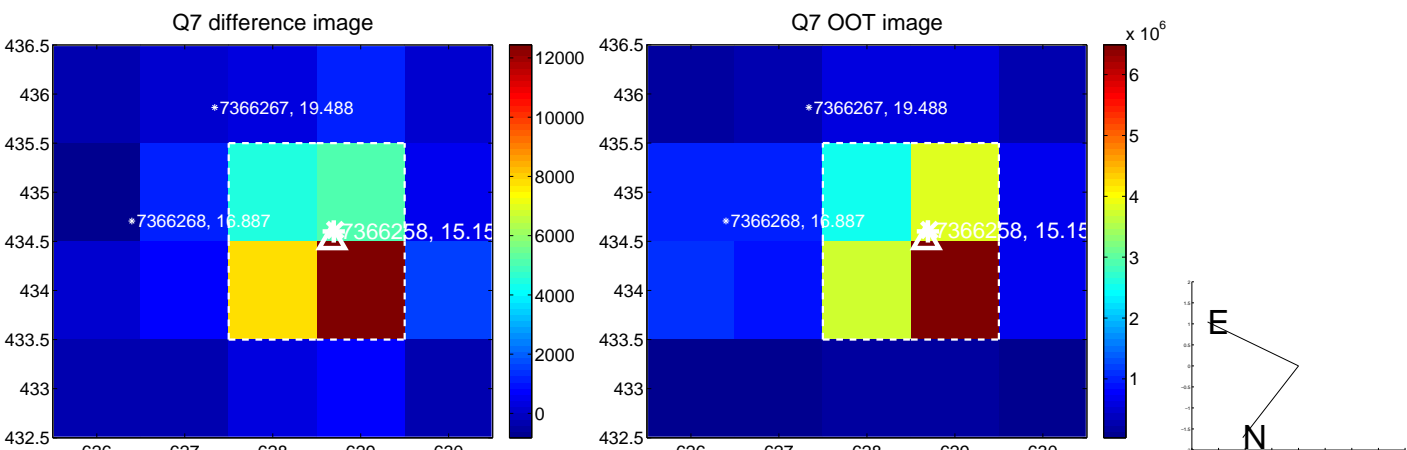
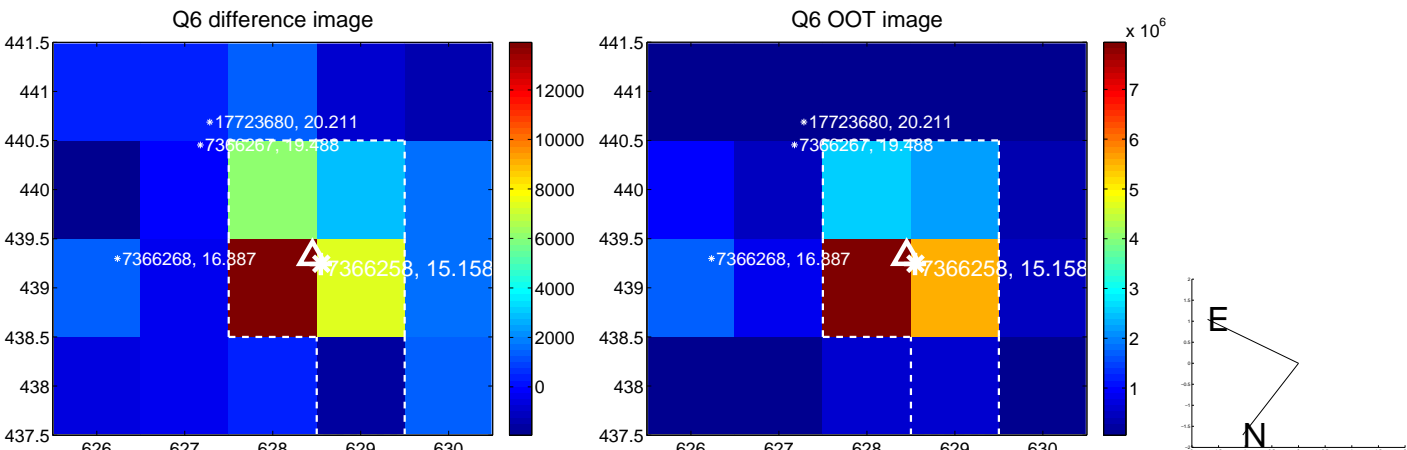
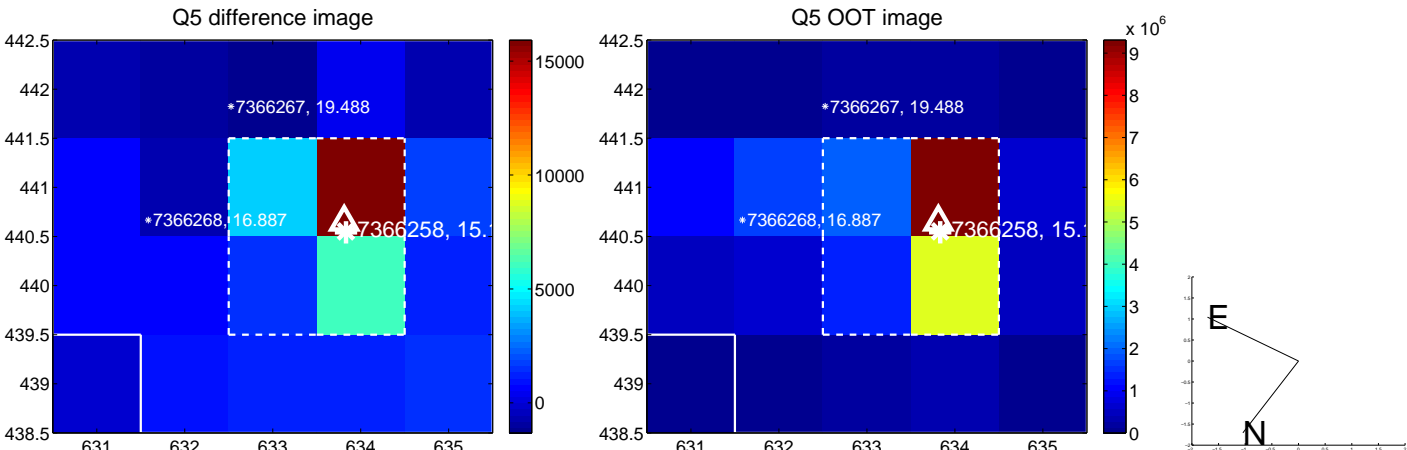


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

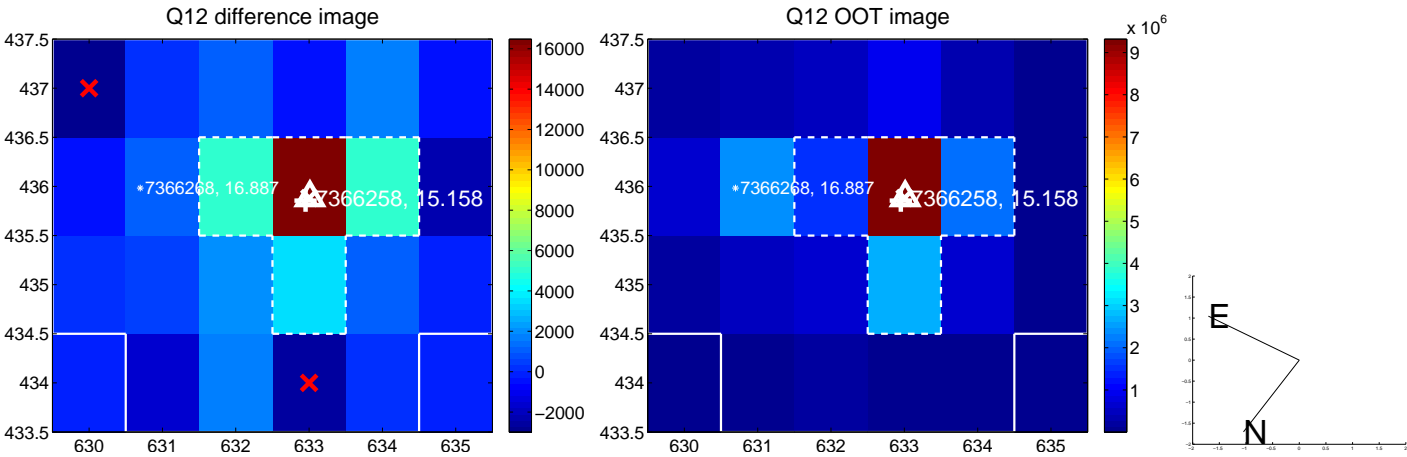
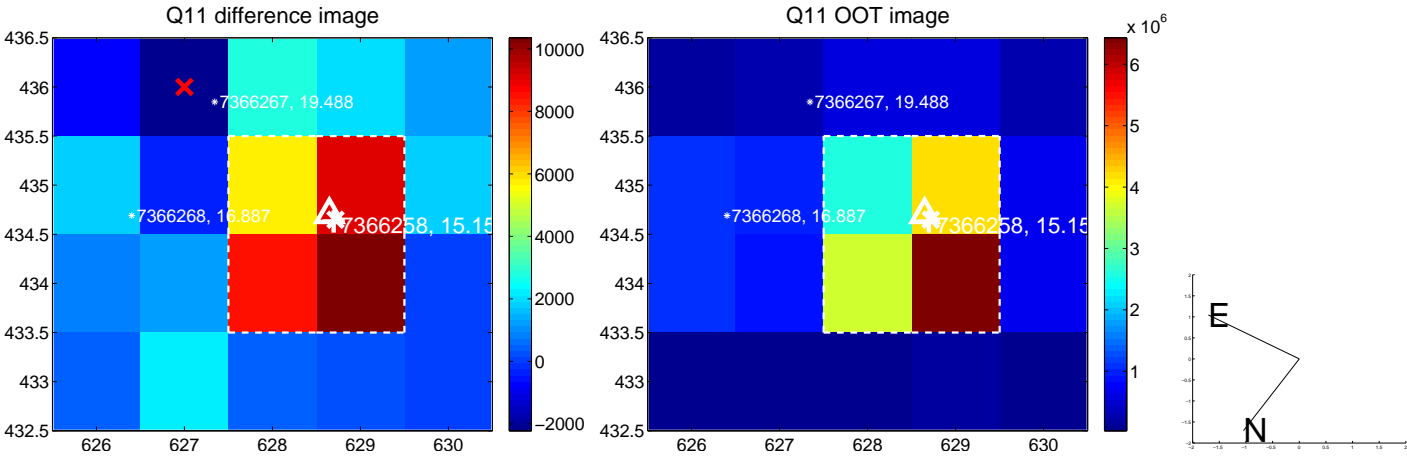
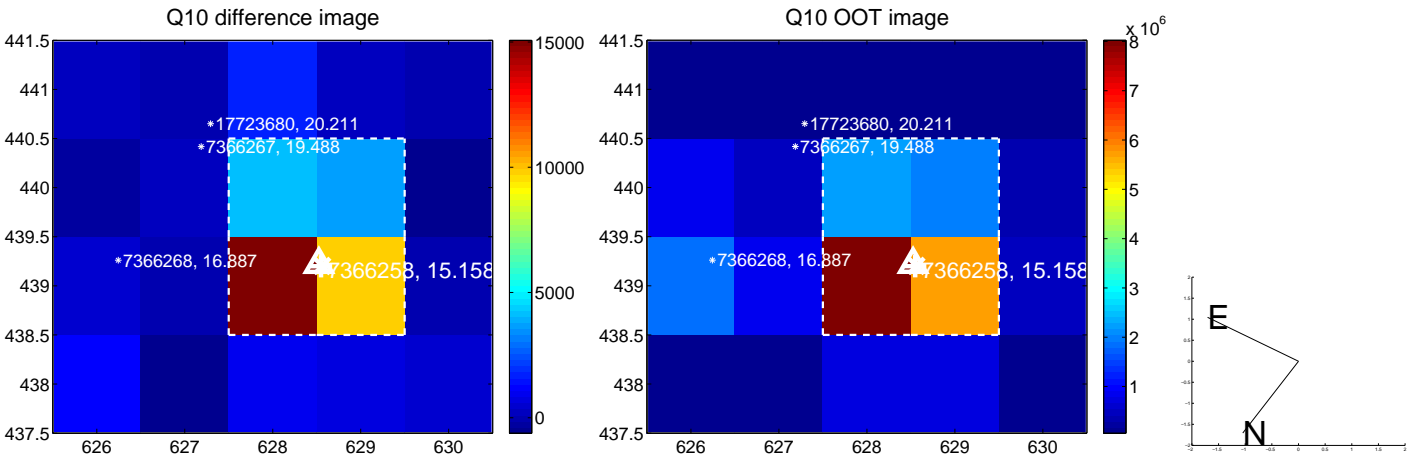
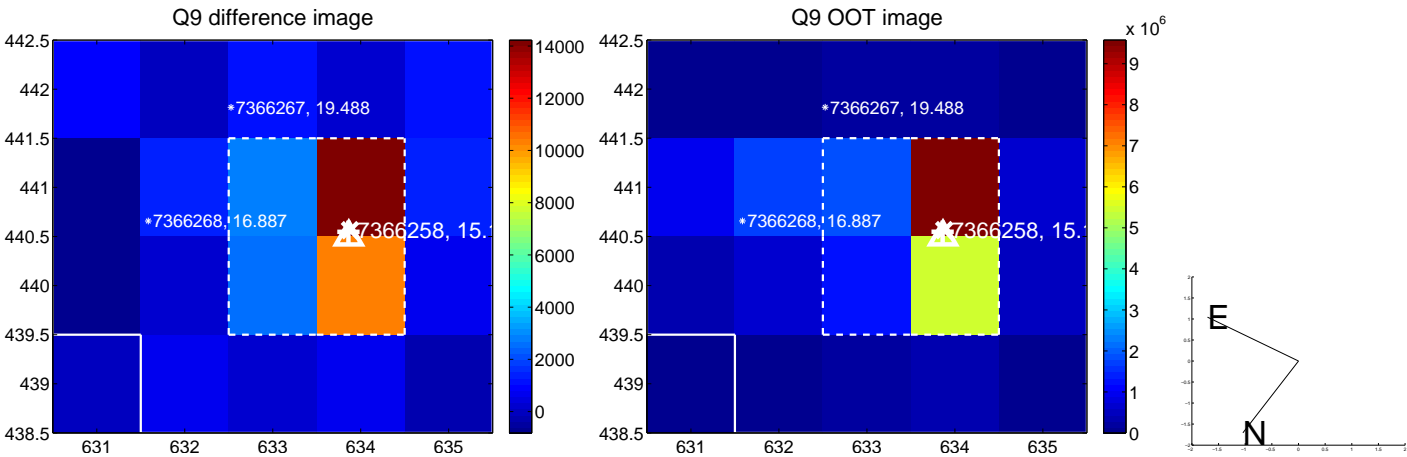
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



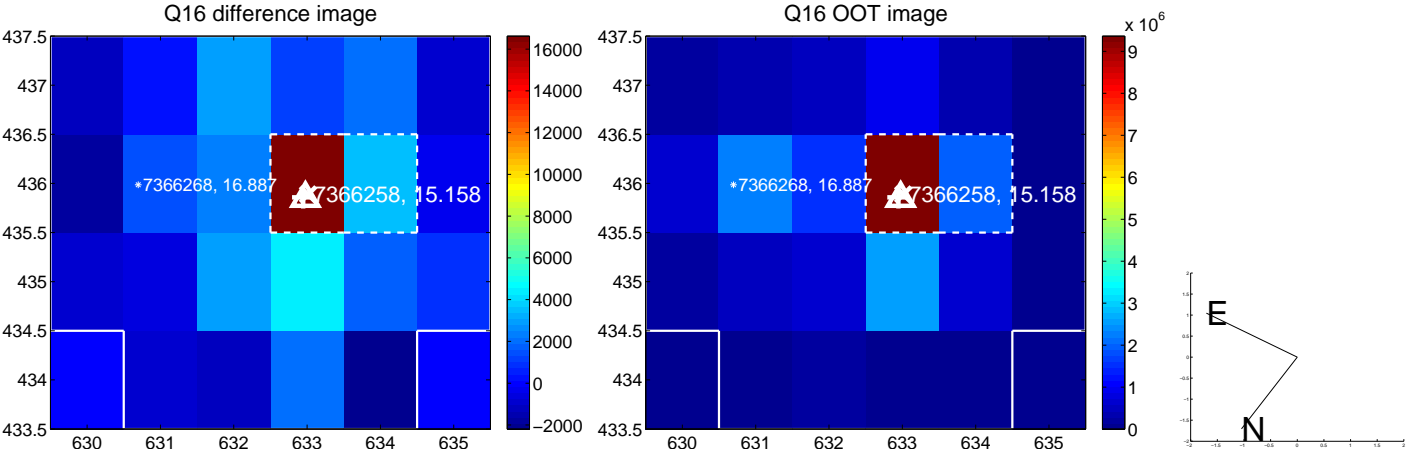
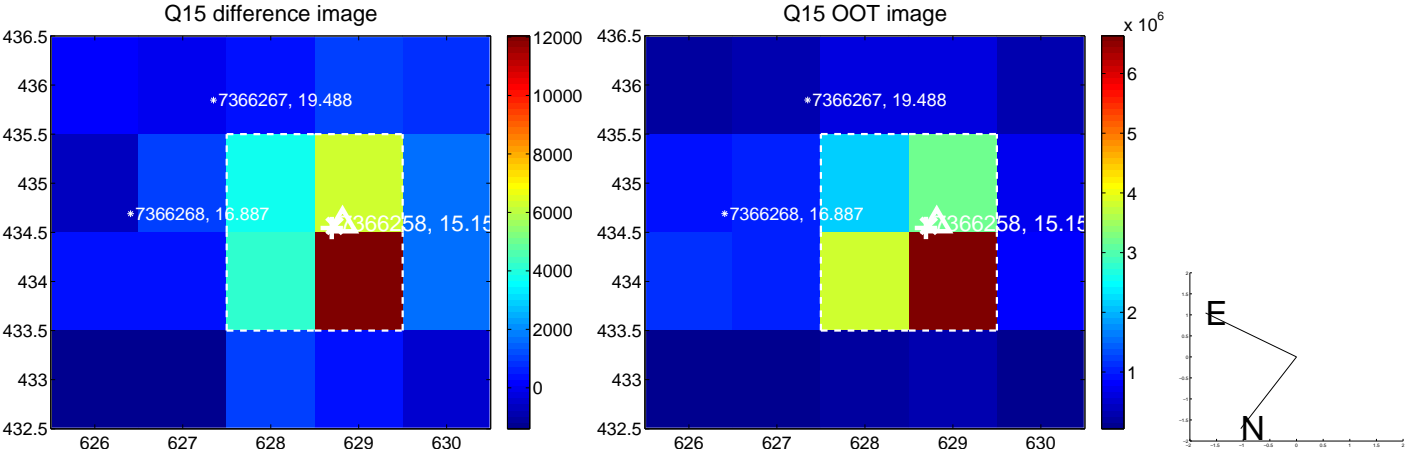
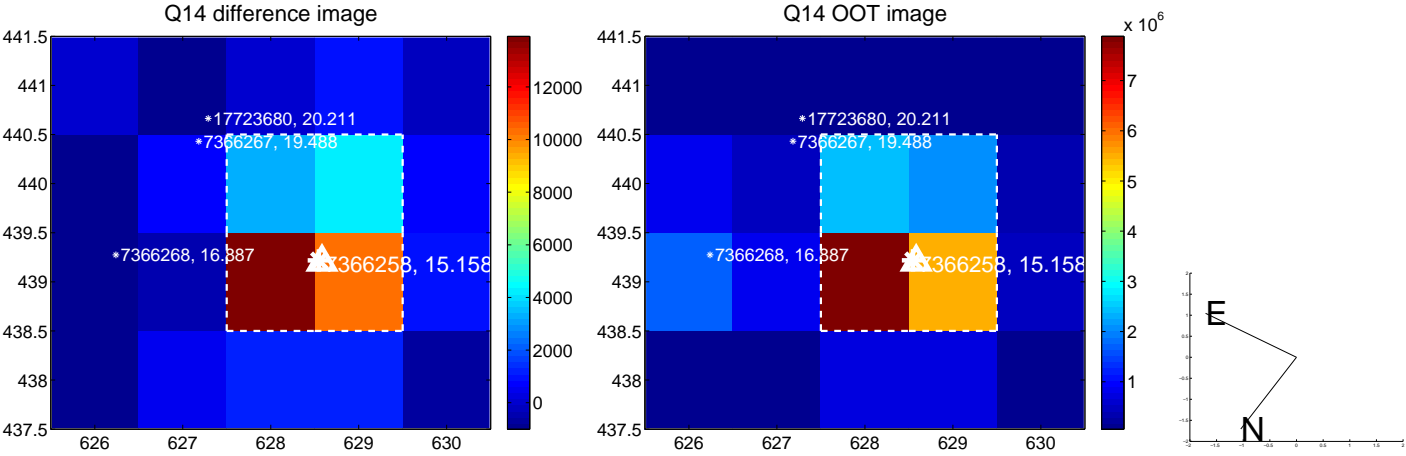
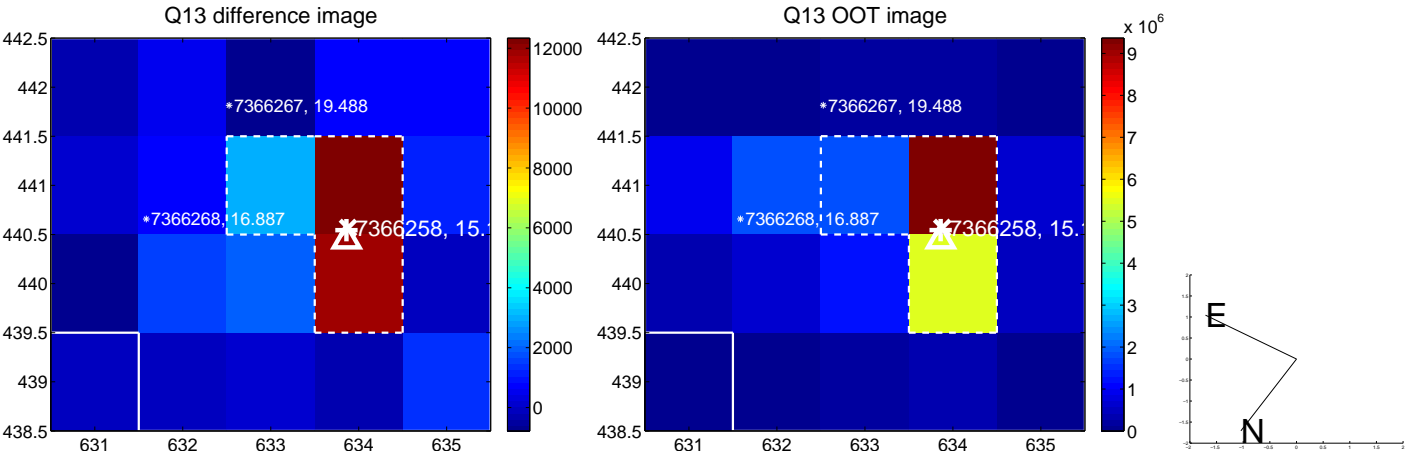
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



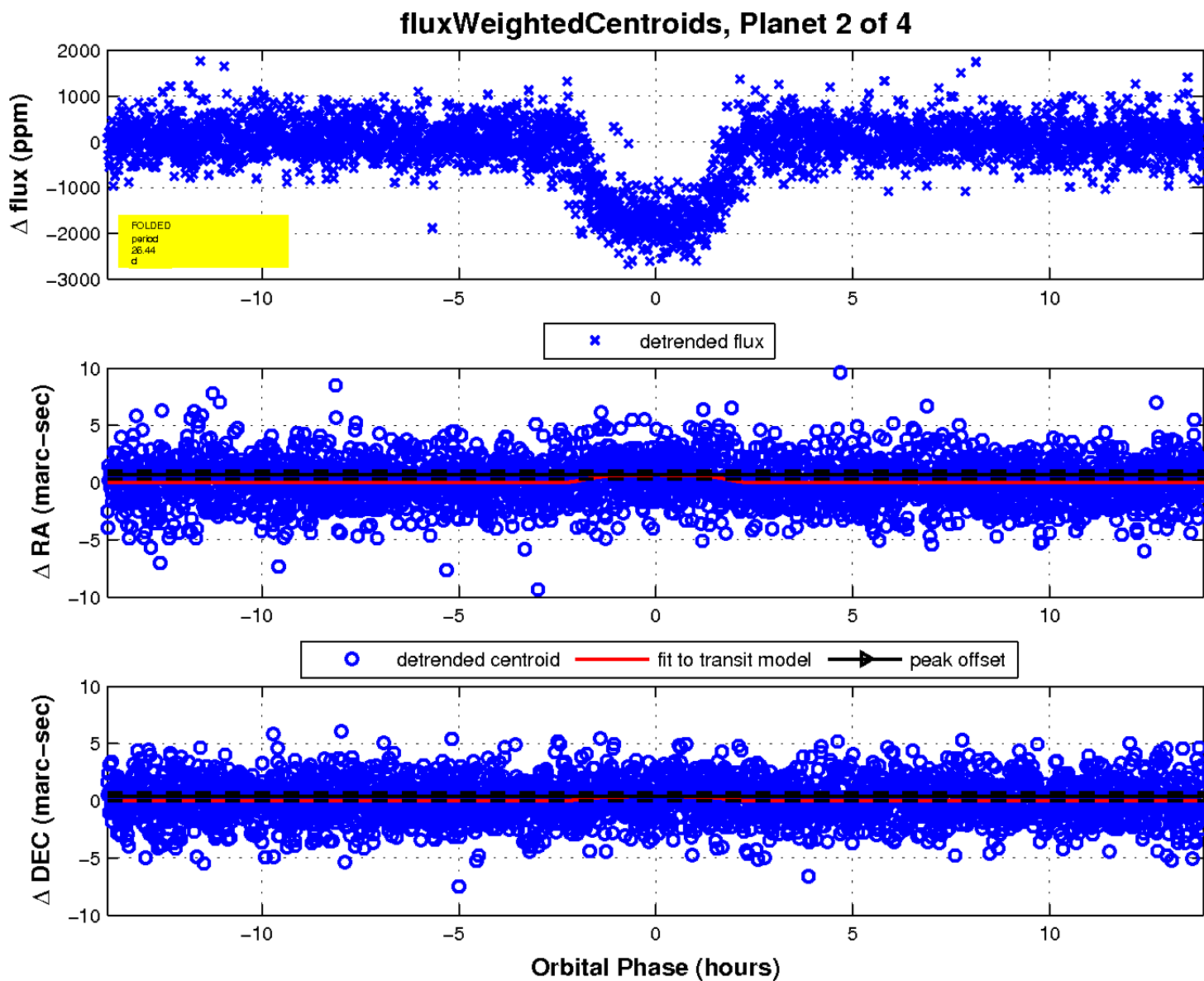
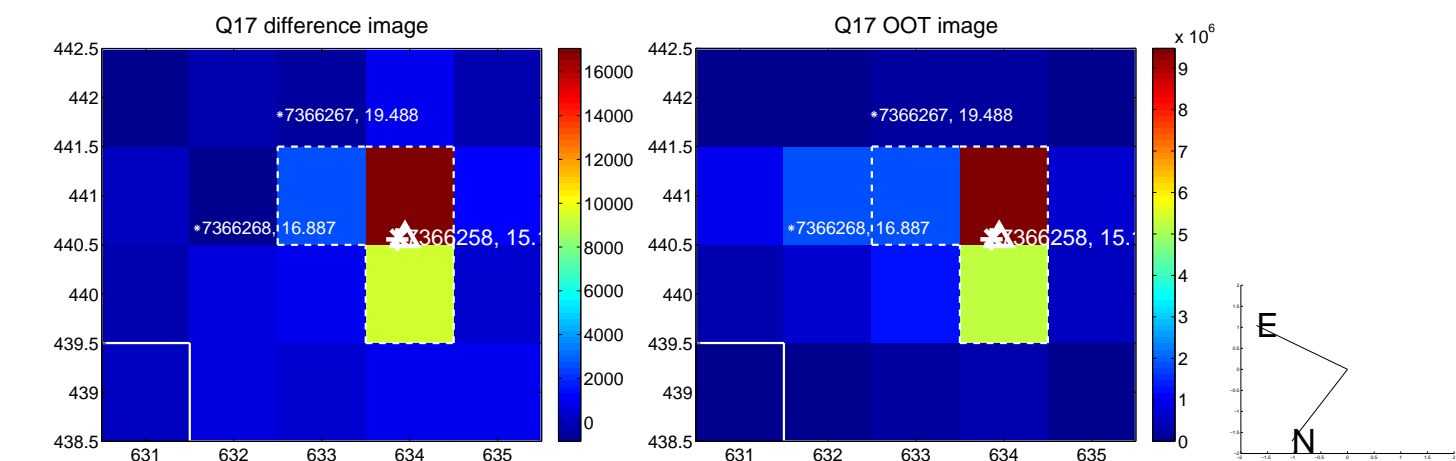
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

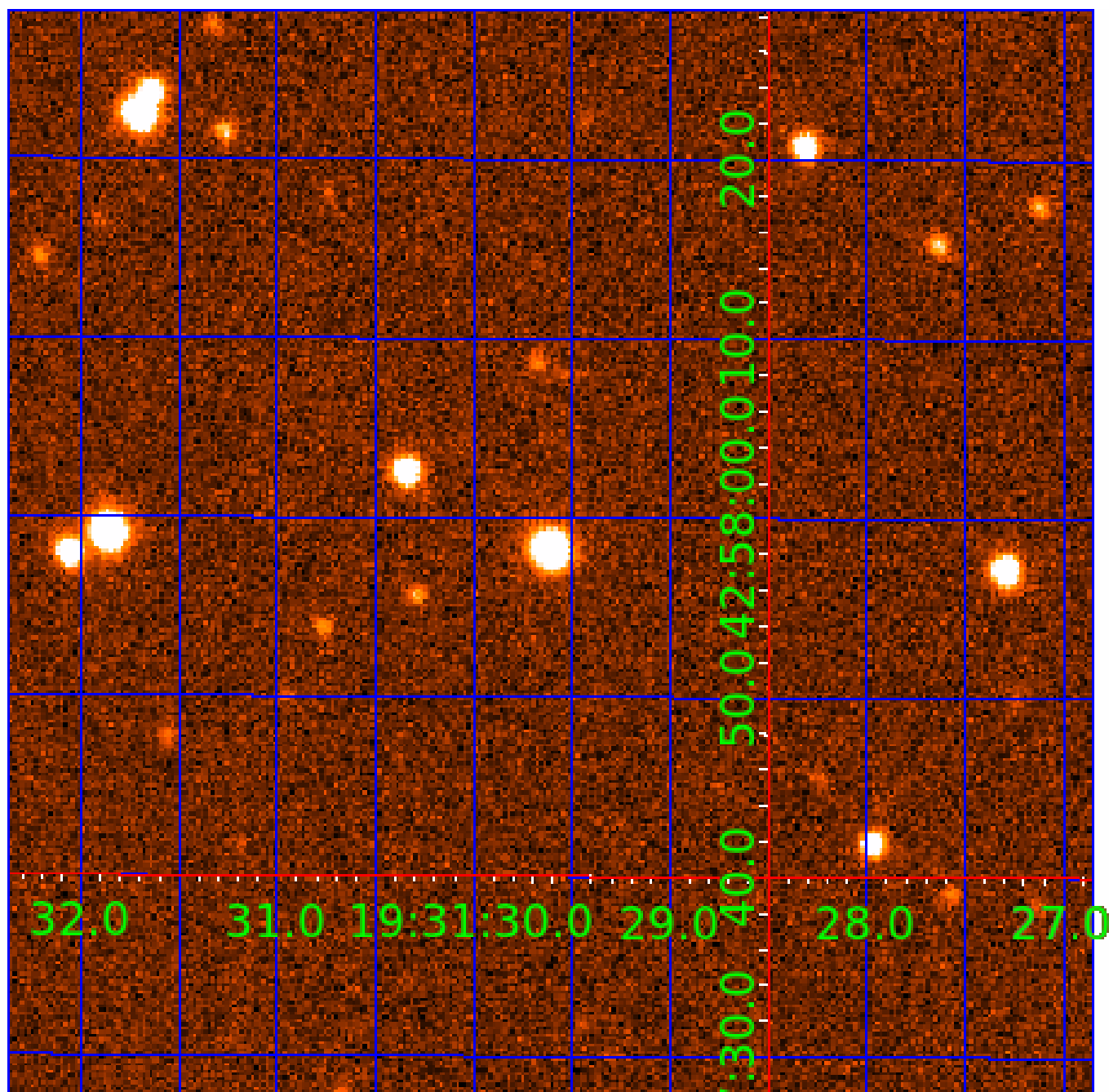


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 007366258

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007366258-01	OBS	0880.02	51.540507	174.044052	3631.9	6.420	112.1	111.6	0.93	5427	5.47	9.69
007366258-02	OBS	0880.01	26.444373	141.232690	1847.1	4.643	68.0	68.5	0.93	5427	4.87	23.59
007366258-03	OBS	0880.03	5.902239	136.783514	661.2	3.055	43.2	47.9	0.93	5427	2.81	174.23
007366258-04	OBS	0880.04	2.382946	132.698229	257.4	2.199	23.5	26.3	0.93	5427	1.68	583.88

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007366258-01	OBS	PC	0.98	0	0	0	0	NO_COMMENT
007366258-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT
007366258-03	OBS	PC	1.00	0	0	0	0	NO_COMMENT
007366258-04	OBS	PC	1.00	0	0	0	0	NO_COMMENT

**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.

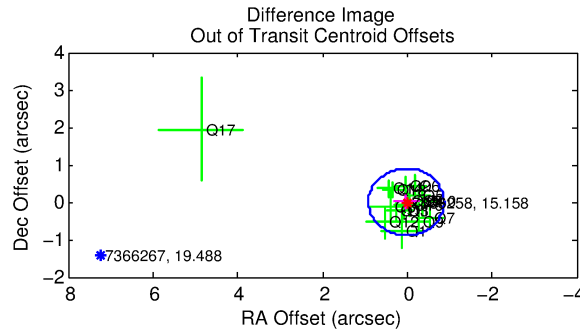
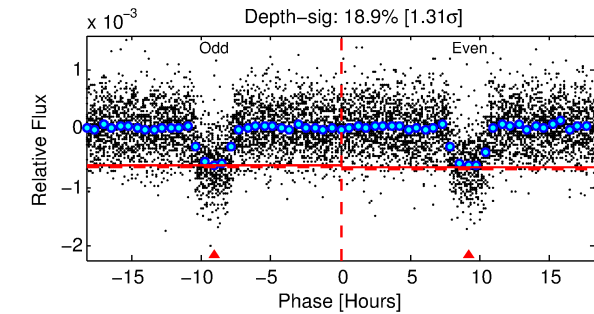
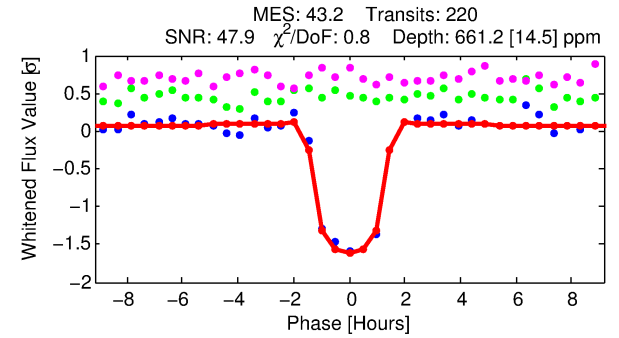
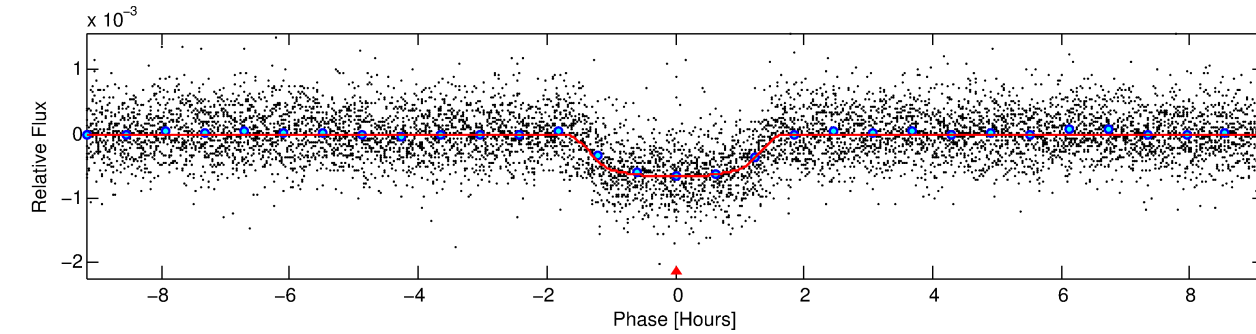
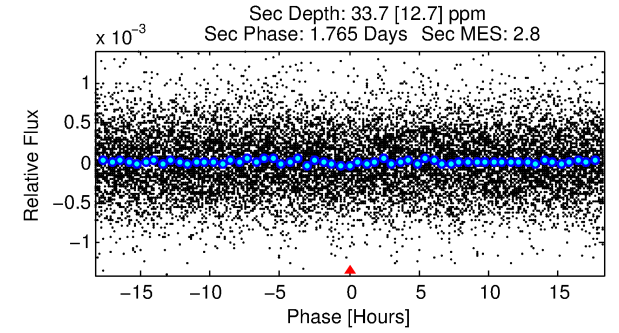
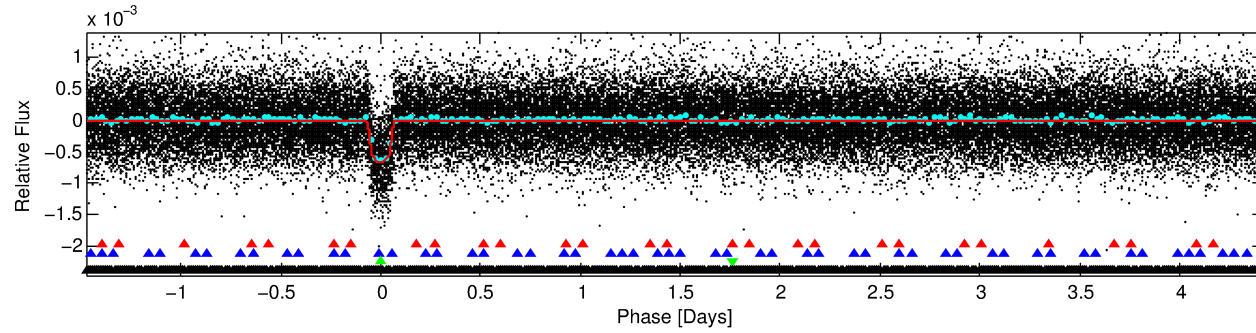
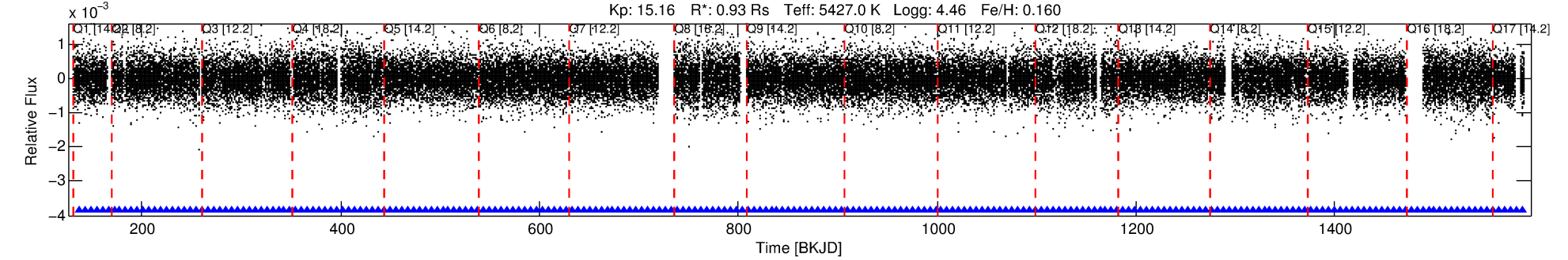
Ephemeris Match Information For 007366258-03

No Significant Match Found

# DV One-Page Summary

KIC: 7366258 Candidate: 3 of 4 Period: 5.902 d  
KOI: K00880.03 Name: Kepler-82e Corr: 0.969

Kp: 15.16 R\*: 0.93 Rs Teff: 5427.0 K Logg: 4.46 Fe/H: 0.160



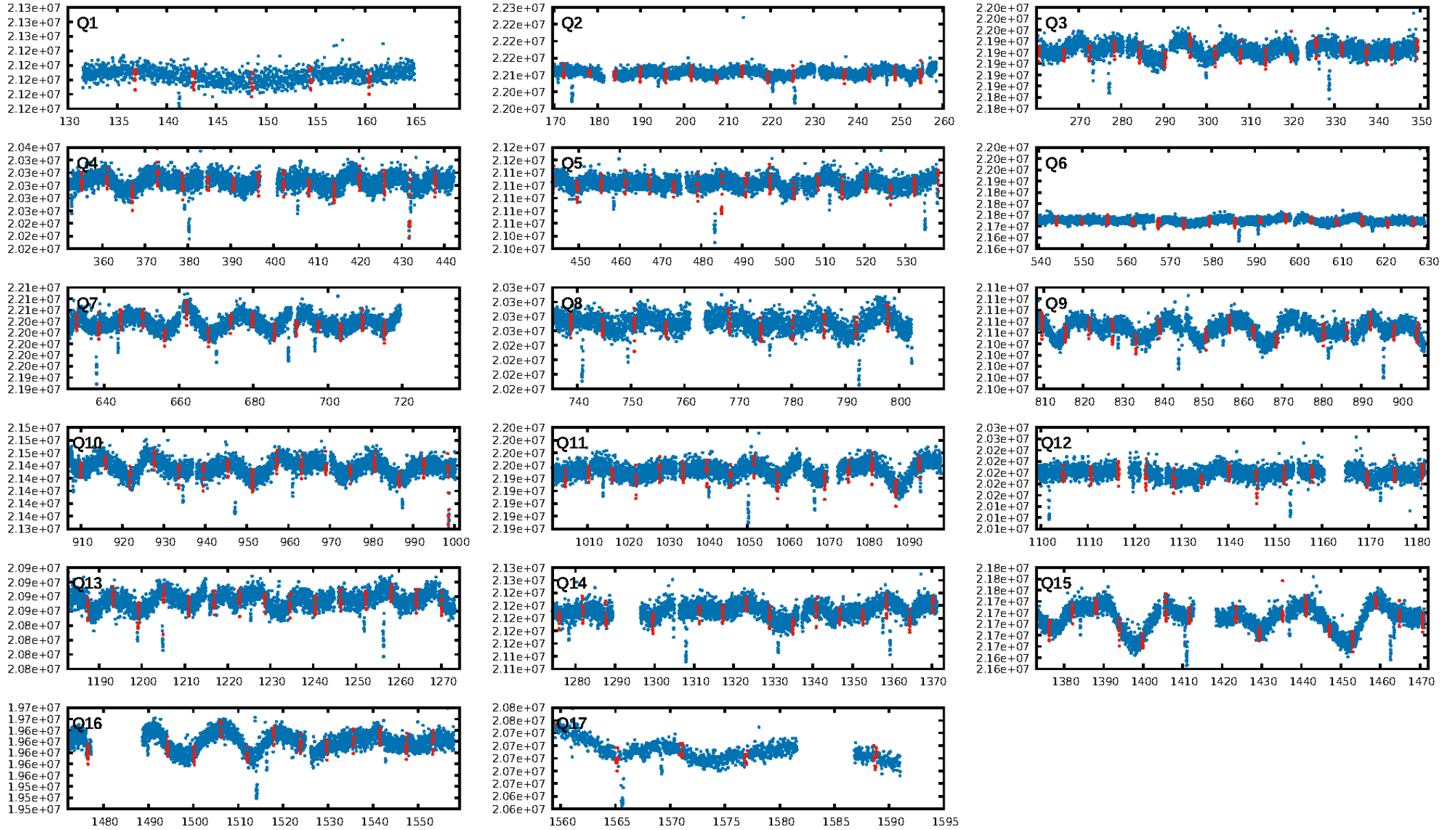
## DV Fit Results:

Period = 5.90224 [0.00001] d  
Epoch = 136.7835 [0.0011] BKJD  
Rp/R\* = 0.0278 [0.0024]  
a/R\* = 7.97 [2.75]  
b = 0.88 [0.09]  
Seff = 174.23 [30.25]  
Teff = 926 [40] K  
Rp = 2.81 [0.40] Re  
a = 0.0620 [0.0062] AU  
Ag = 9.03 [3.98] [2.02σ]  
Teffp = 2483 [261] K [5.89σ]

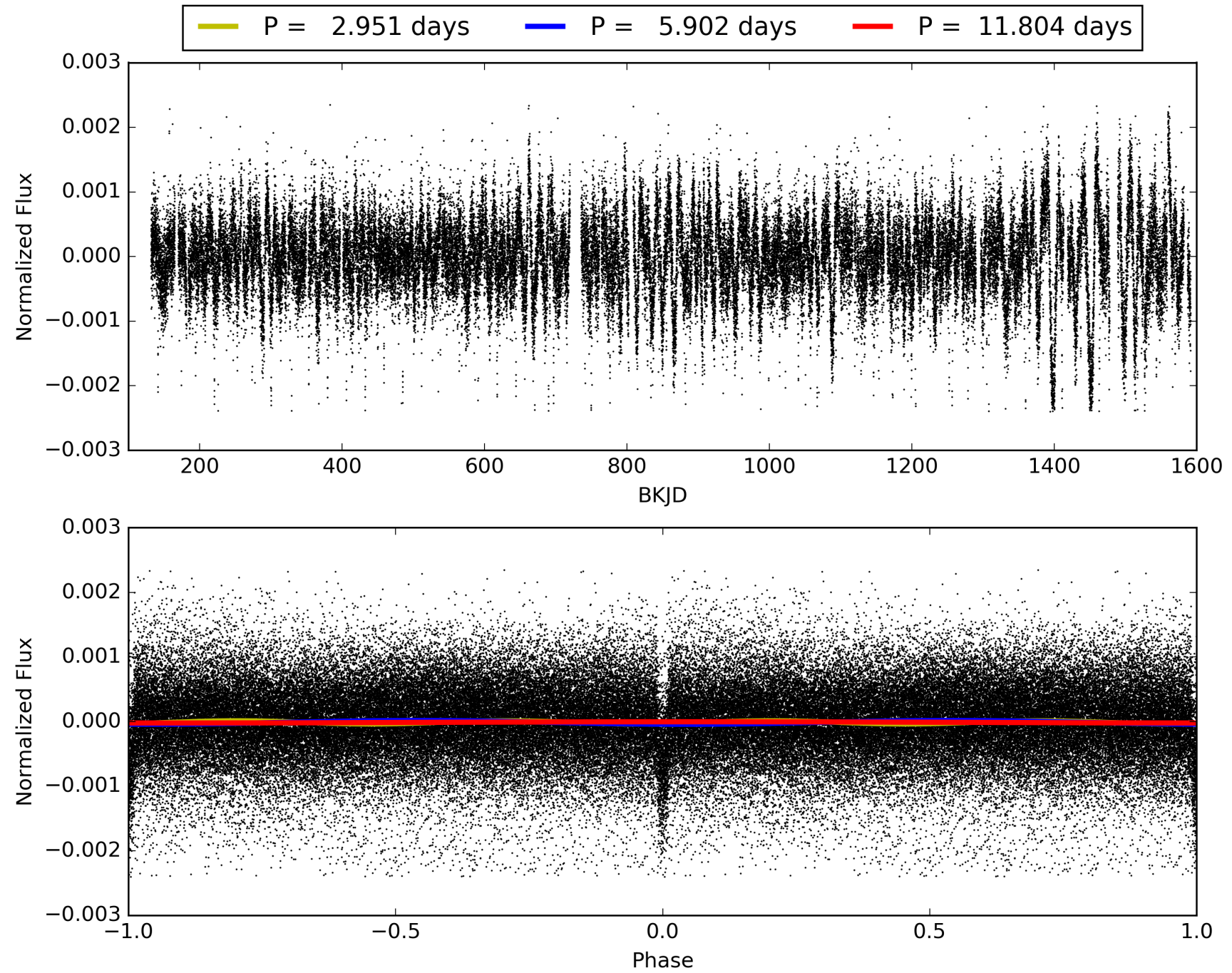
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [22.44σ]  
LongPeriod-sig: 100.0% [88.70σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [210/210]  
GhostDiagnostic-chr: 5.05  
Centroid-sig: 0.0%  
Centroid-so: 0.102 arcsec [0.41σ]  
OotOffset-rm: 0.024 arcsec [0.08σ]  
KicOffset-rm: 0.121 arcsec [0.43σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.94 [16/17]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 007366258-03, PDC Light Curves

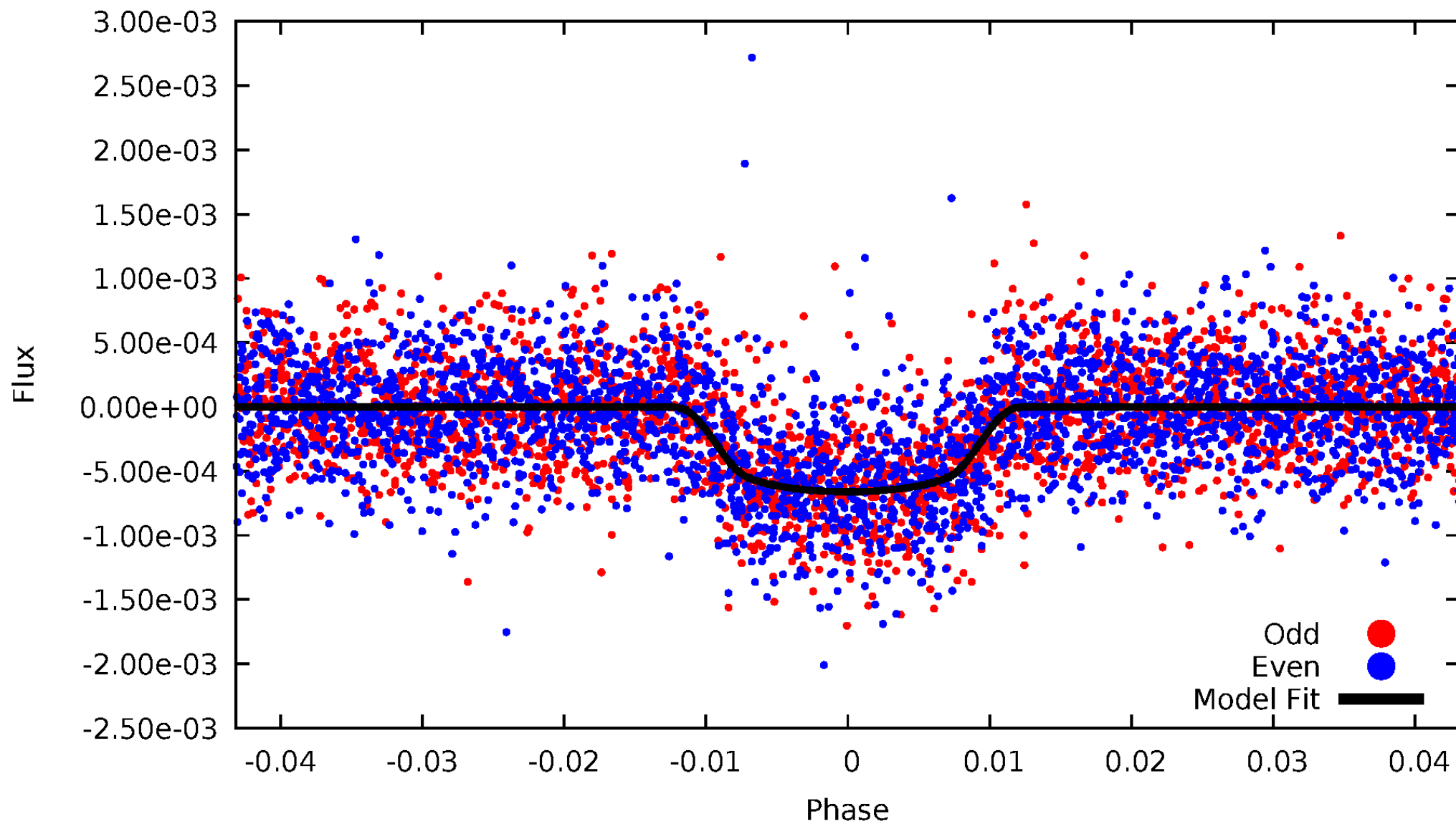


TCE 007366258-03



# DV Odd/Even

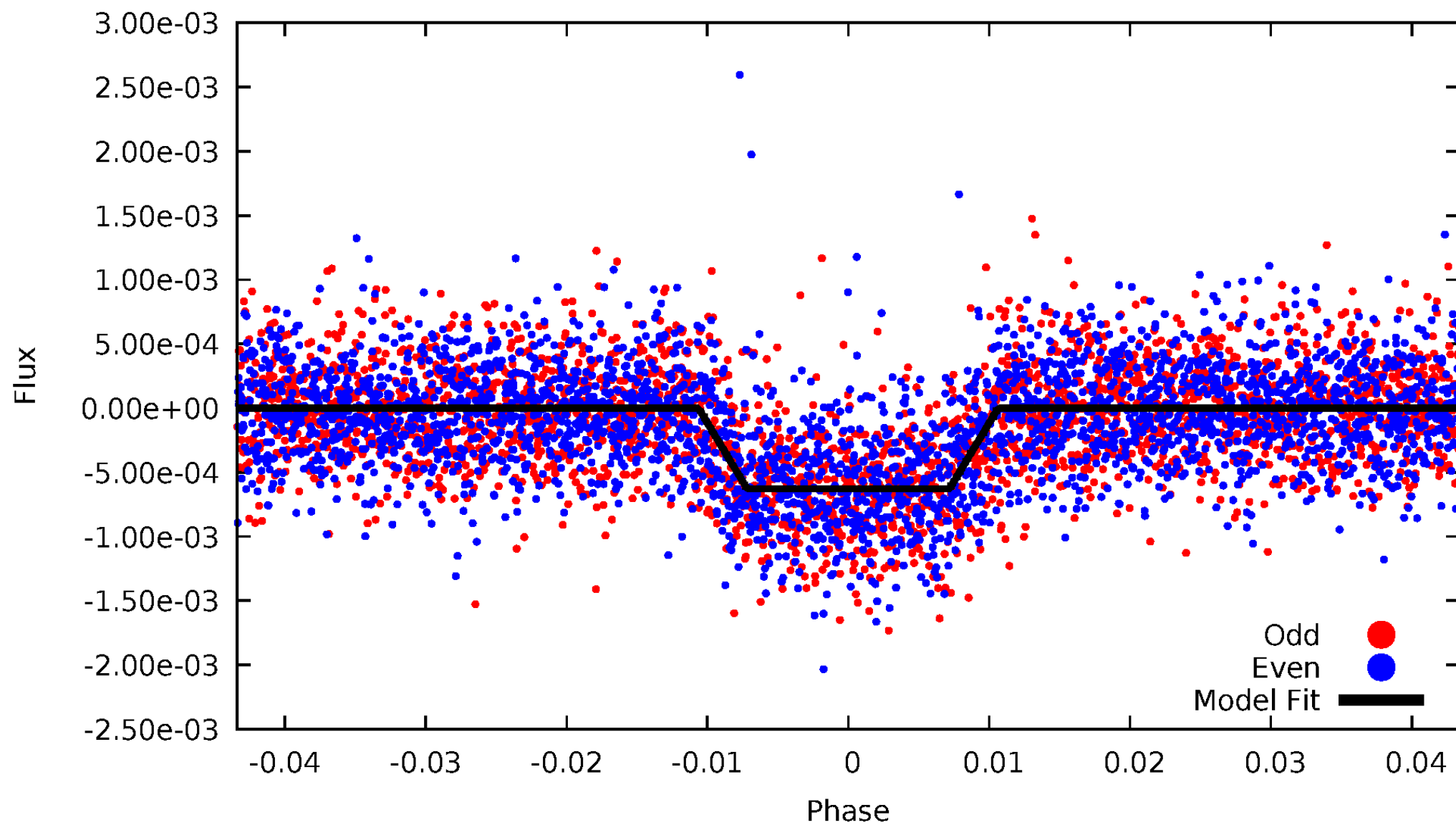
TCE 007366258-03





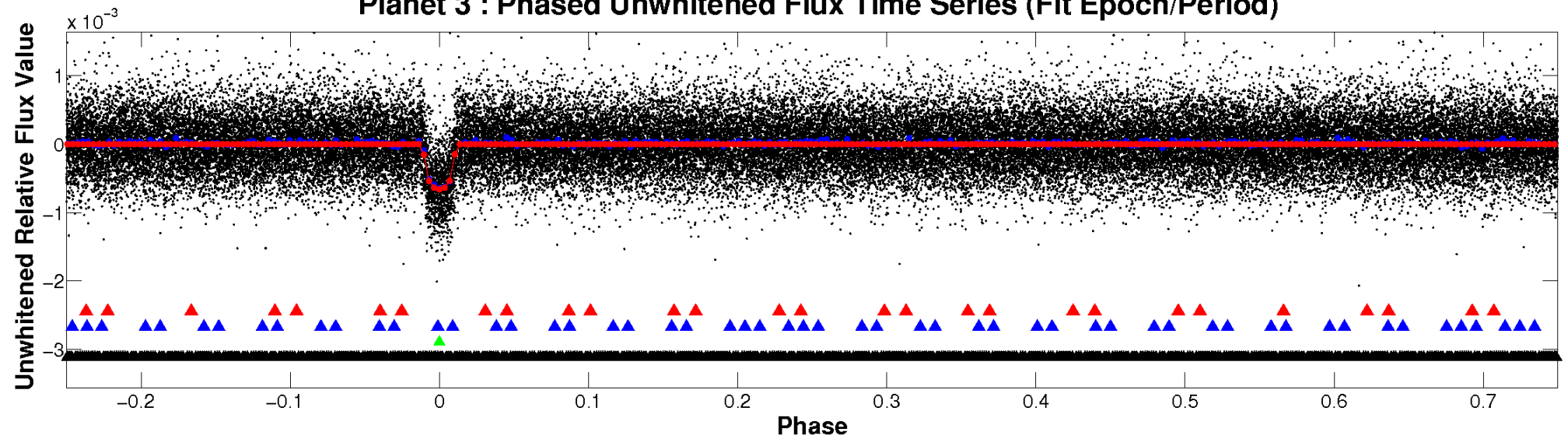
# ALT Odd/Even

TCE 007366258-03

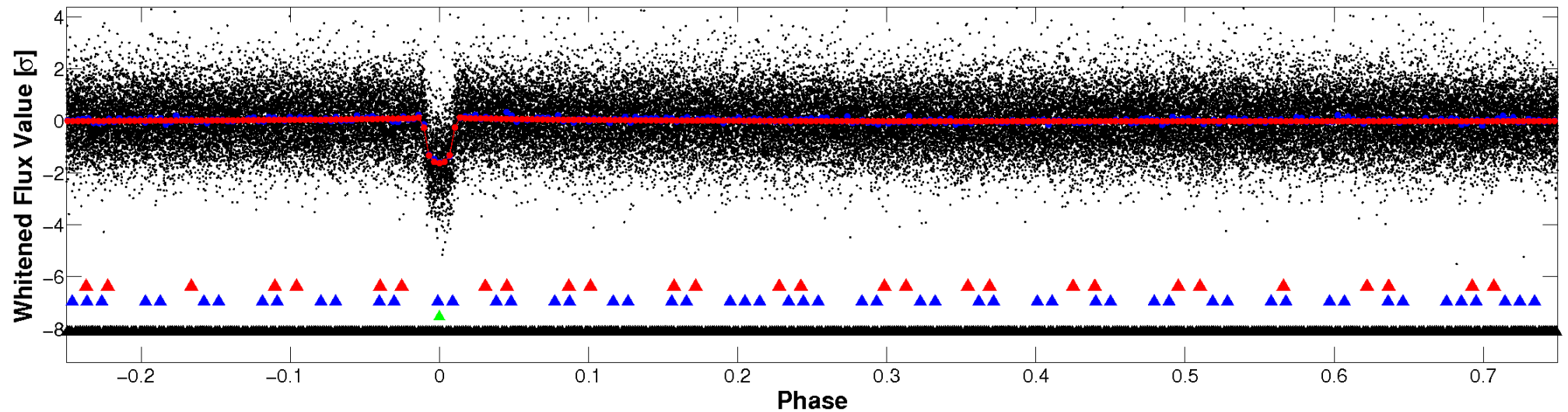


# Non-Whitened Vs. Whitened Light Curve

## Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

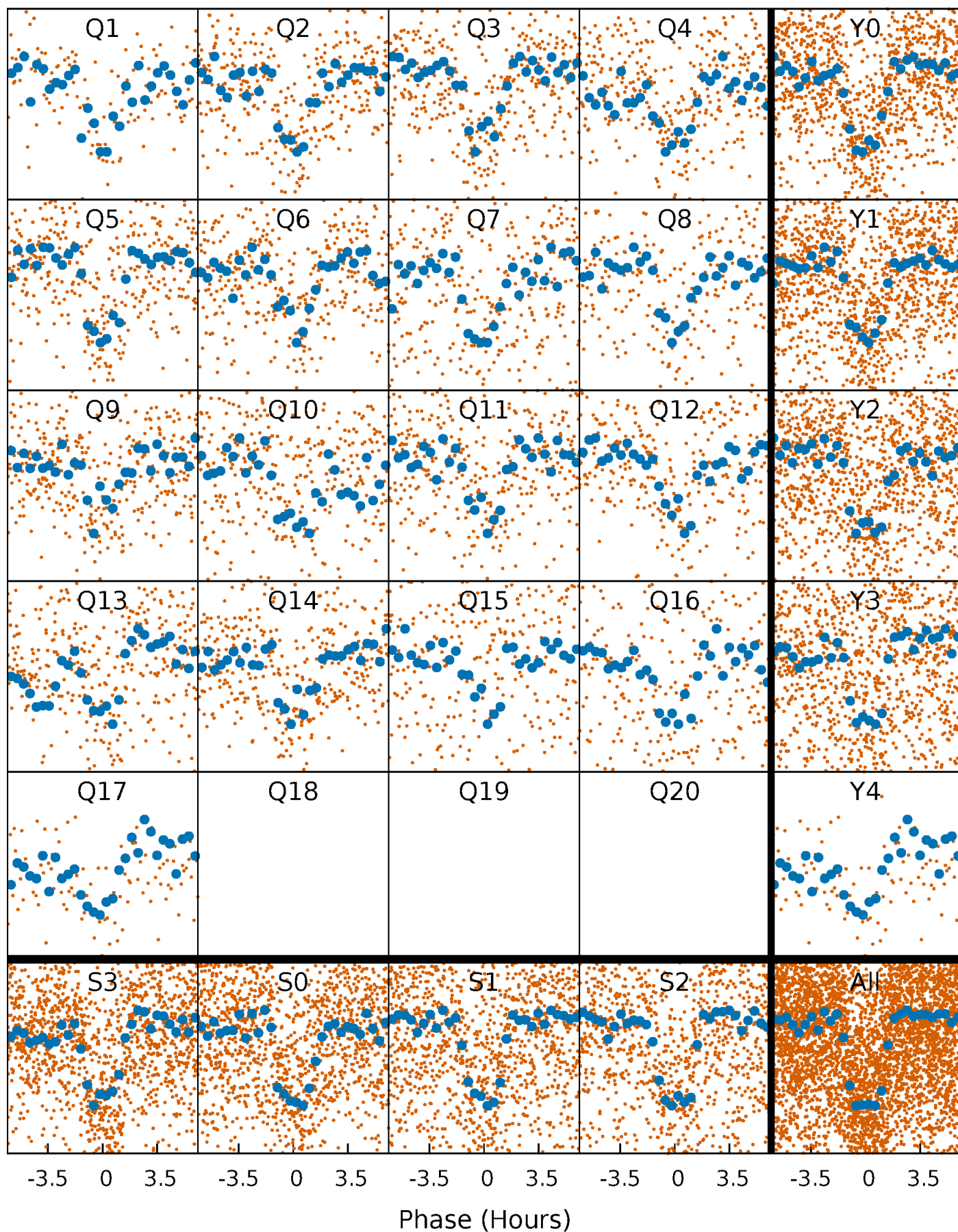


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

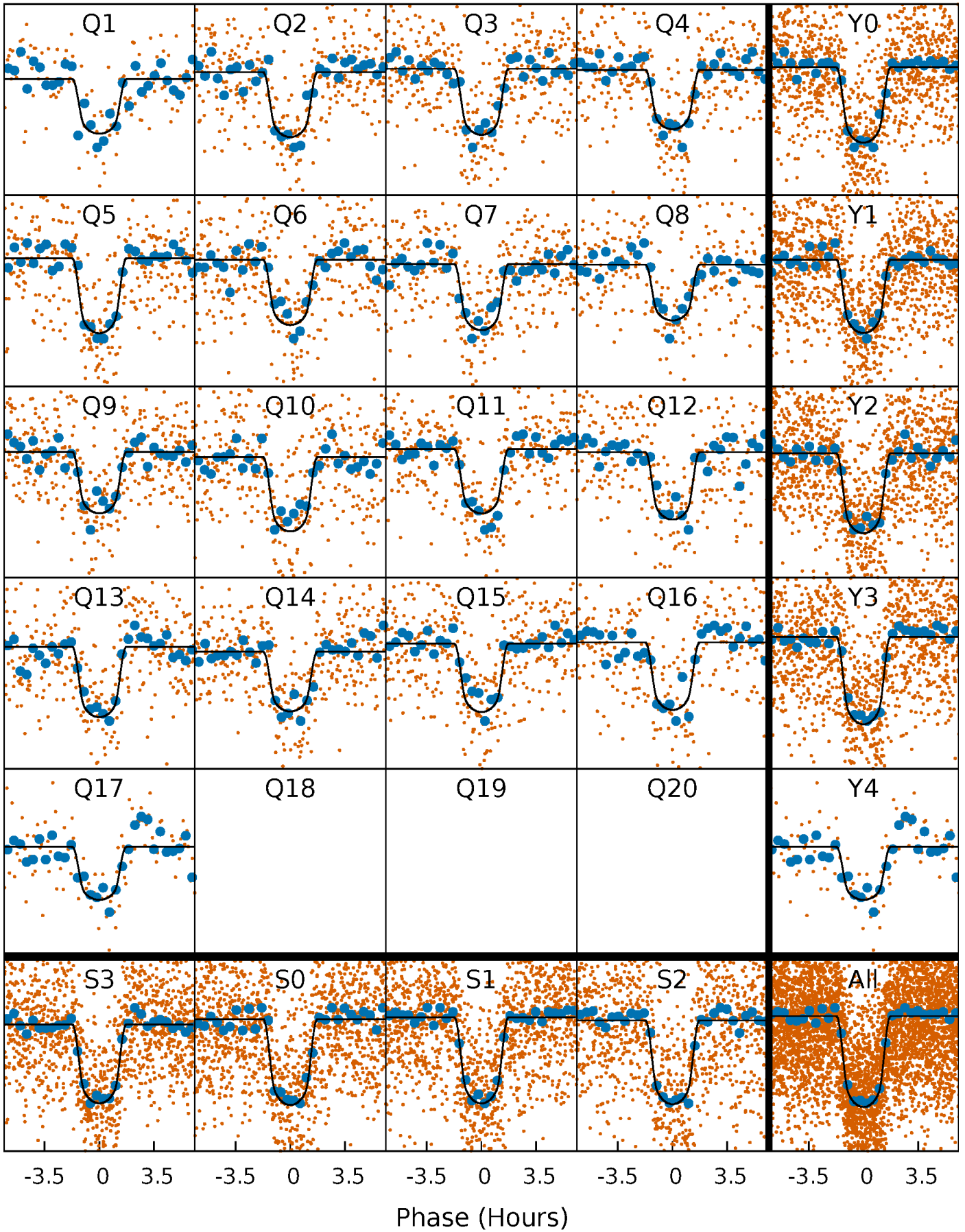
TCE 007366258-03 P= 5.902239 Days  $T_0=136.783514$  (BKJD)





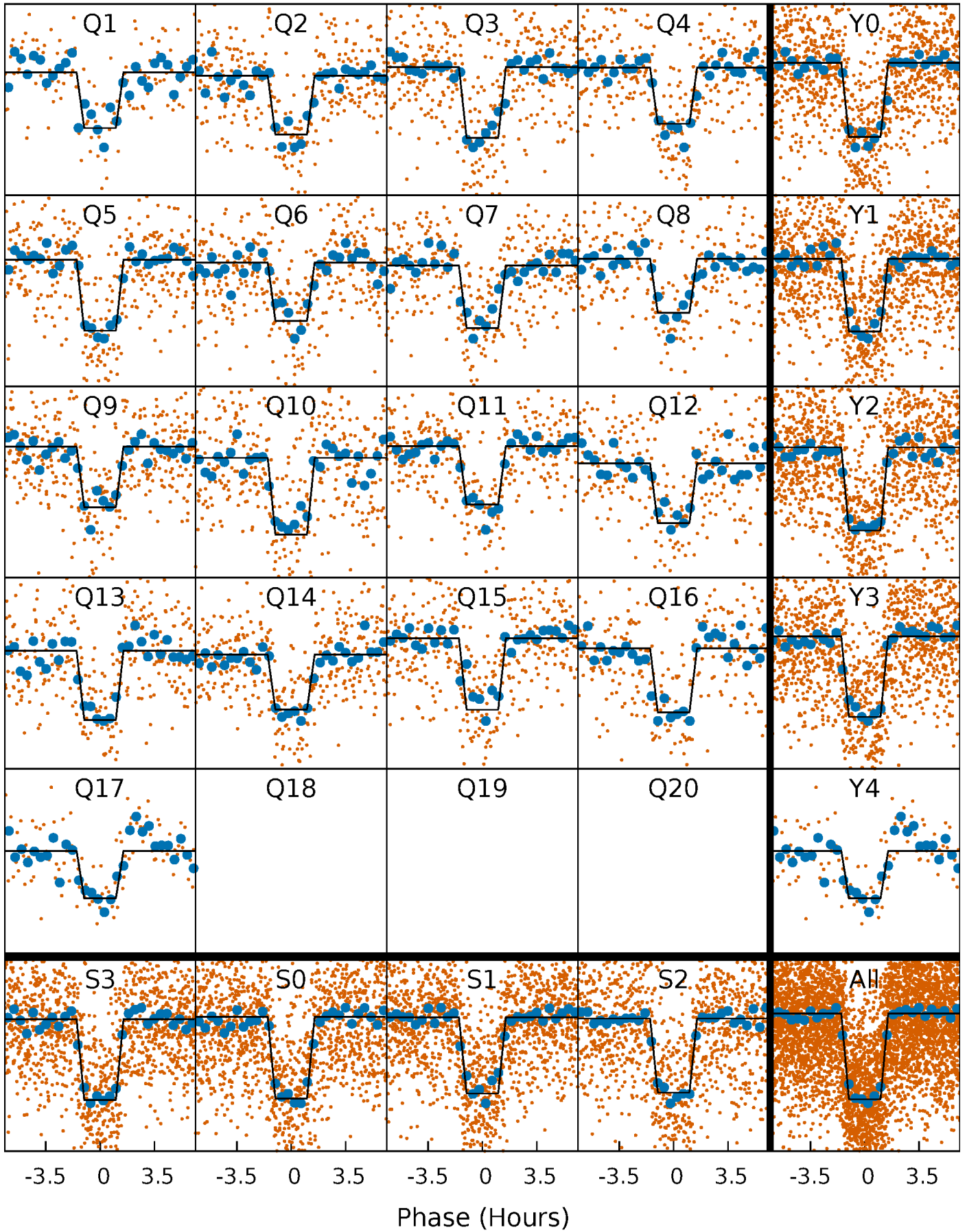
# DV Quarter-Phased Transit Curves

TCE 007366258-03 P= 5.902239 Days  $T_0=136.783514$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

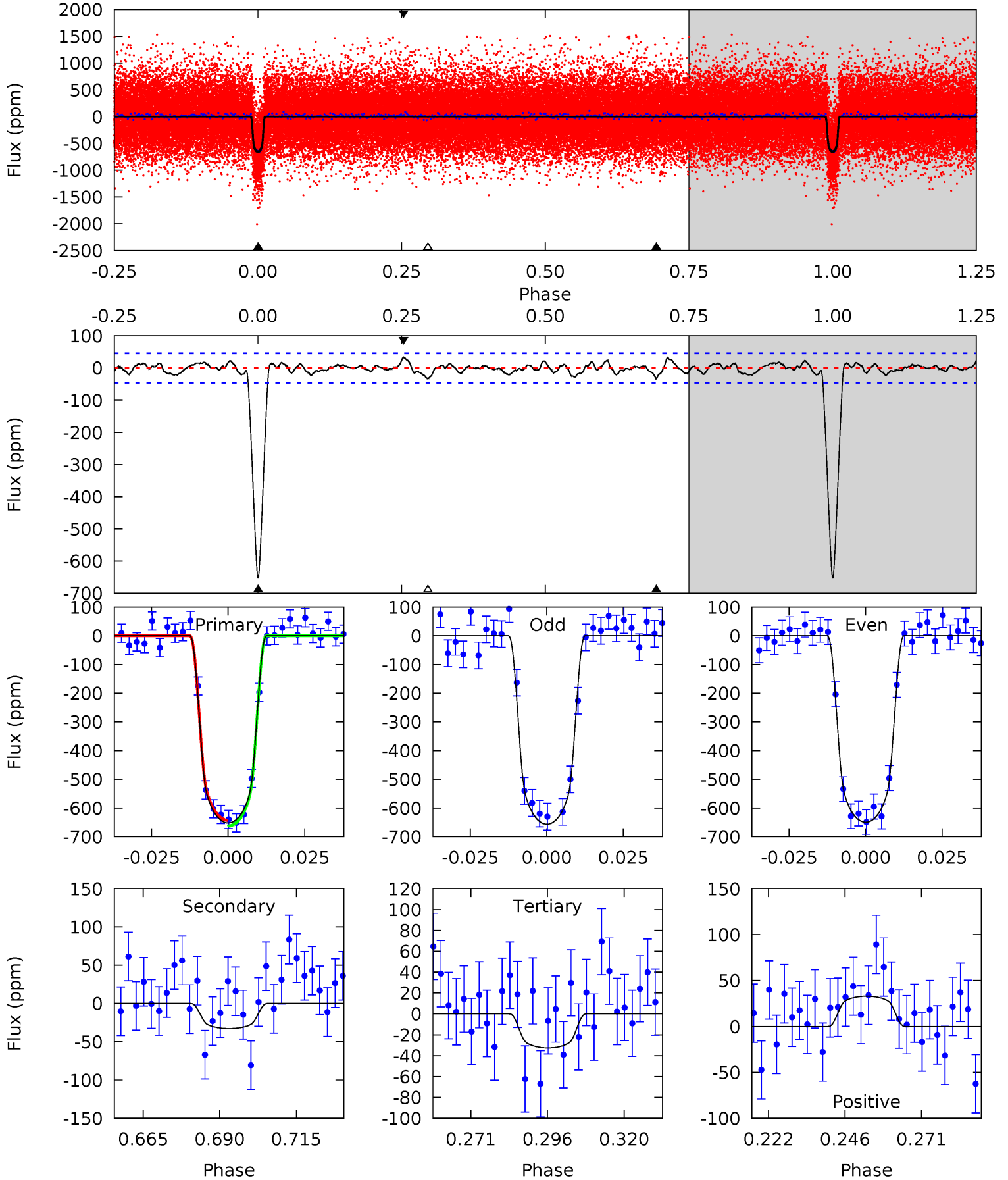
TCE 007366258-03 P= 5.902282 Days  $T_0=136.779542$  (BKJD)



# DV Model-Shift Uniqueness Test

007366258-03, P = 5.902239 Days, E = 130.881275 Days

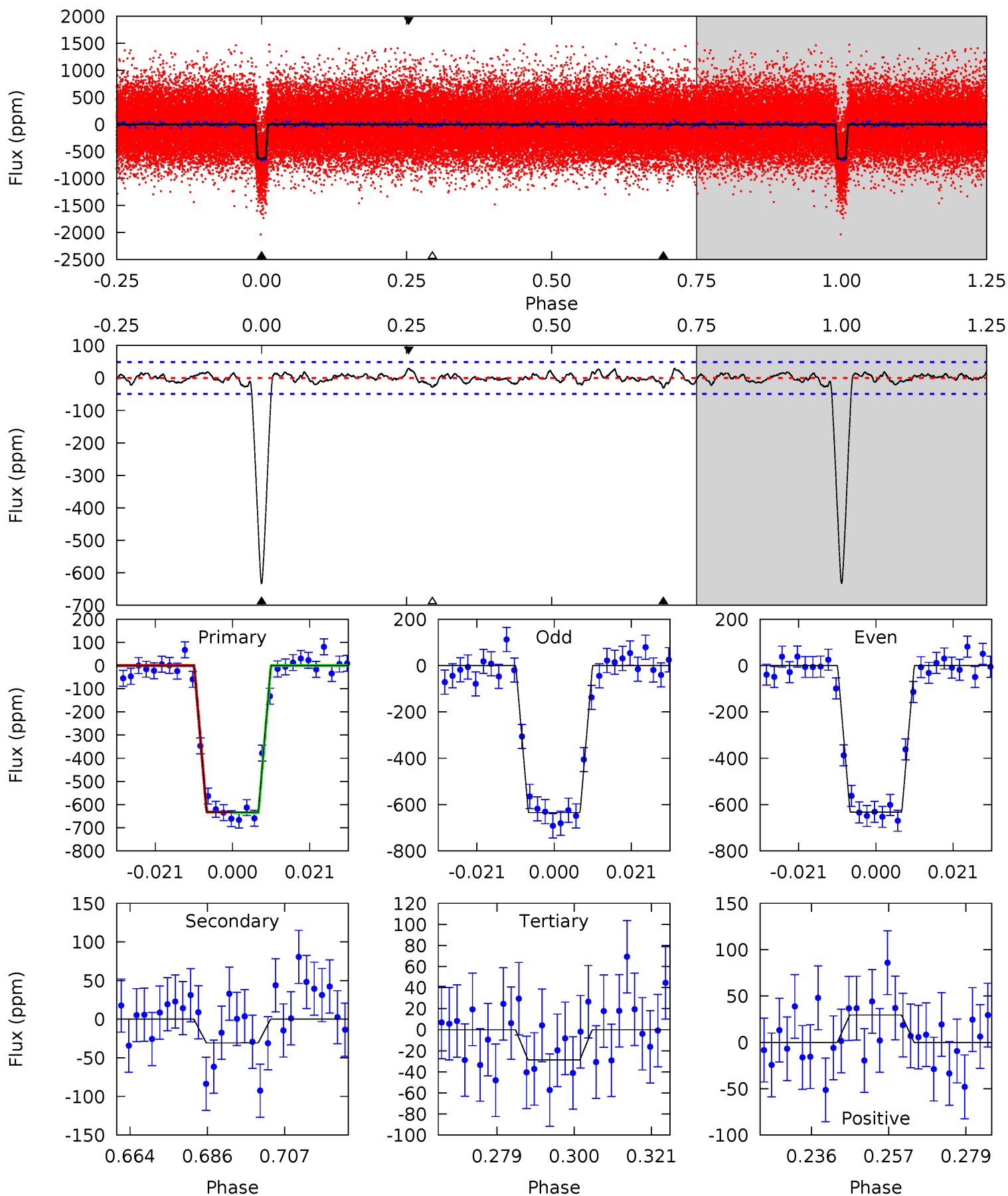
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
69.0	3.47	3.45	3.48	4.85	2.25	1.23	65.6	65.5	0.02	-0.01	0.37	1.01	0.05	1.03



# Alt Model-Shift Uniqueness Test

007366258-03, P = 5.902282 Days, E = 130.877260 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
62.7	3.06	2.85	2.93	4.88	2.30	1.10	59.8	59.8	0.21	0.13	0.10	0.97	0.04	0



### Stellar Parameters For KIC 007366258

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5427^{+108}_{-108}$	$4.463^{+0.064}_{-0.088}$	$0.160^{+0.150}_{-0.150}$	$0.929^{+0.104}_{-0.069}$	$0.915^{+0.051}_{-0.051}$	$1.608^{+0.398}_{-0.421}$
	+2%/-2%	+1%/-2%	+94%/-94%	+11%/-7%	+6%/-6%	+25%/-26%
Source	SPE58	SPE58	SPE58	DSEP		

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

### Secondary Eclipse Parameters for KIC 007366258-03 / KOI 0880.03

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-33 \pm 9$	$2.85^{+0.28}_{-0.29}$	$1298^{+48}_{-40}$	$3074^{+159}_{-173}$	$8.571^{+3.589}_{-2.759}$
Alt.	$-31 \pm 10$	$2.54^{+0.30}_{-0.28}$	$1295^{+47}_{-38}$	$3143^{+180}_{-199}$	$10^{+4}_{-4}$

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

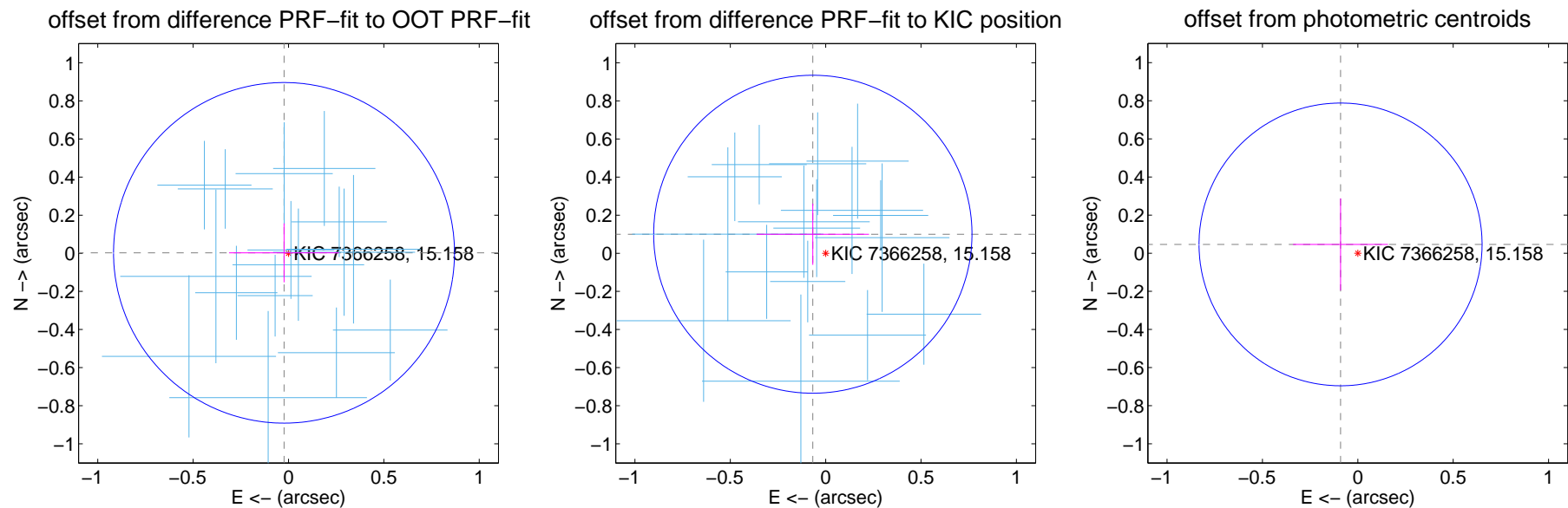
## DV Centroid Data

Supplemental centroid analysis for 007366258-03. Kepler magnitude: 15.16. Transit SNR 47.88

There are 16 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

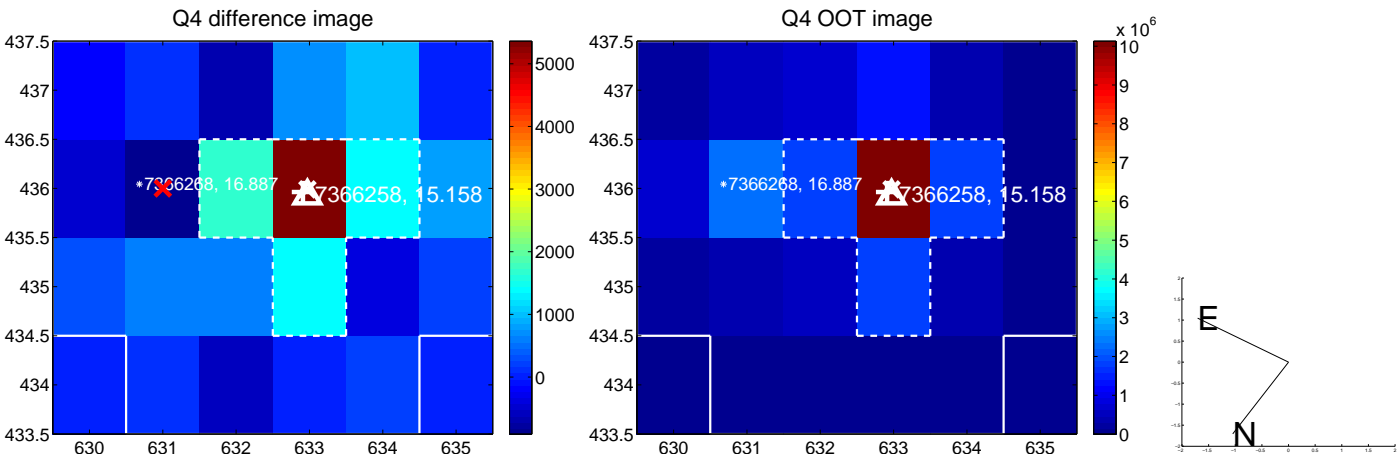
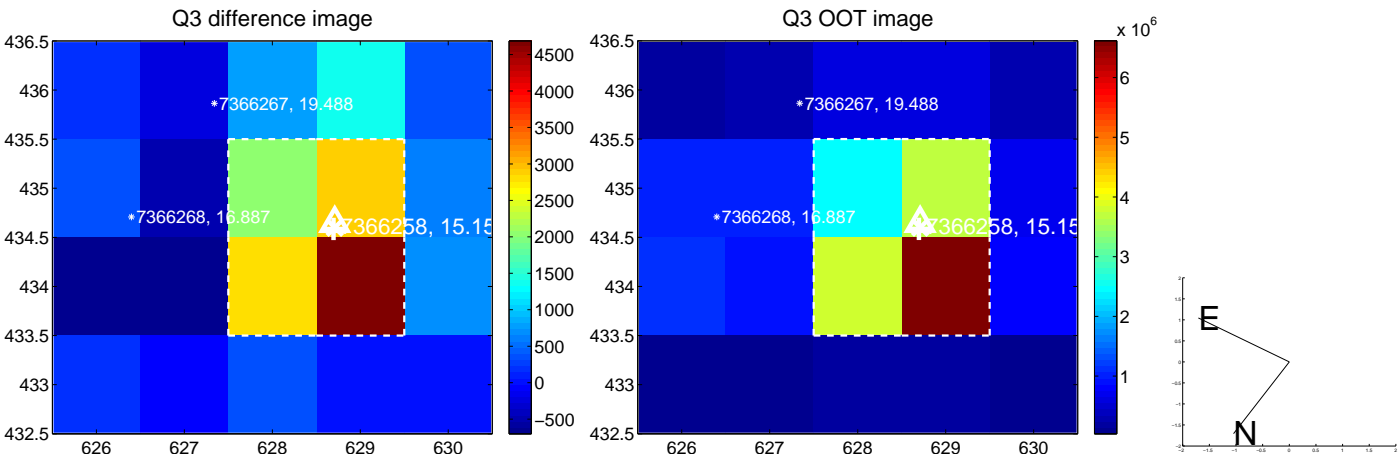
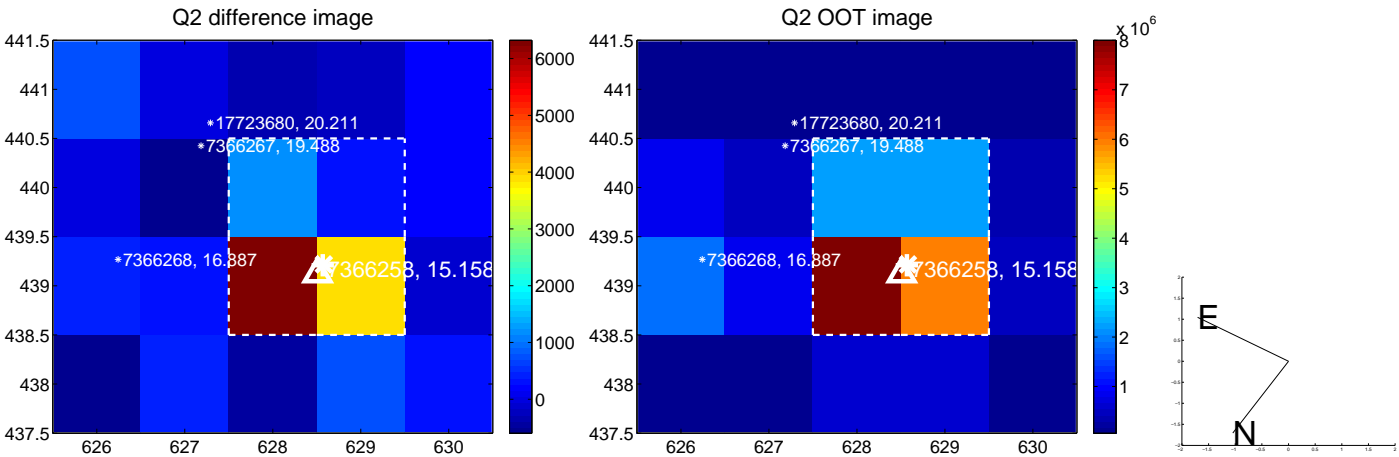
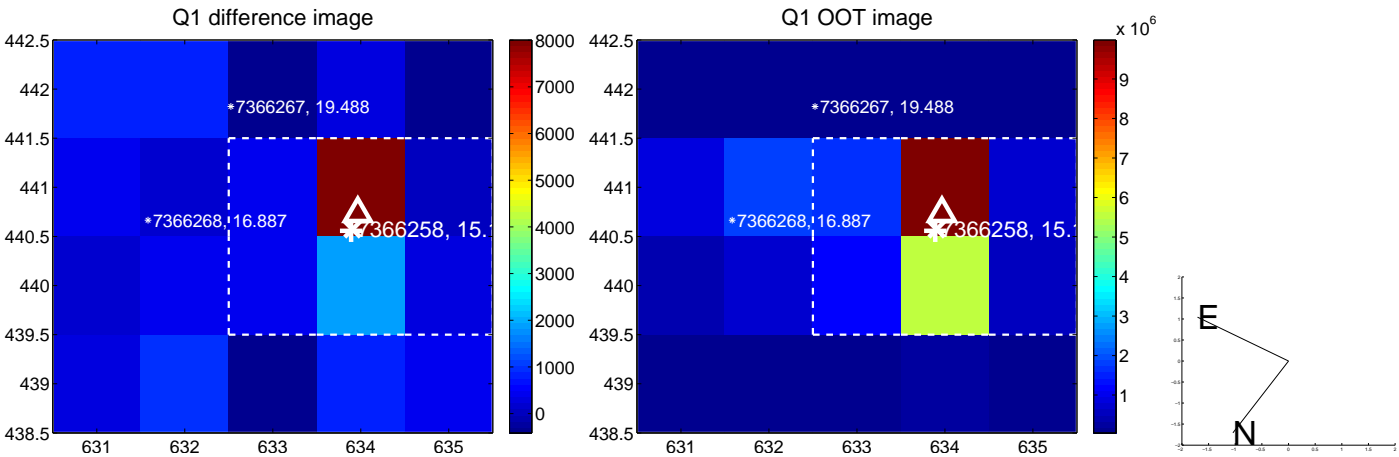
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.024 \pm 0.298$	0.08	$0.023 \pm 0.288$	$0.002 \pm 0.155$
PRF-fit source offset from KIC position	$0.121 \pm 0.278$	0.43	$0.067 \pm 0.295$	$0.100 \pm 0.161$
photometric centroid source offset	$0.10 \pm 0.25$	0.41	$0.09 \pm 0.25$	$0.05 \pm 0.24$



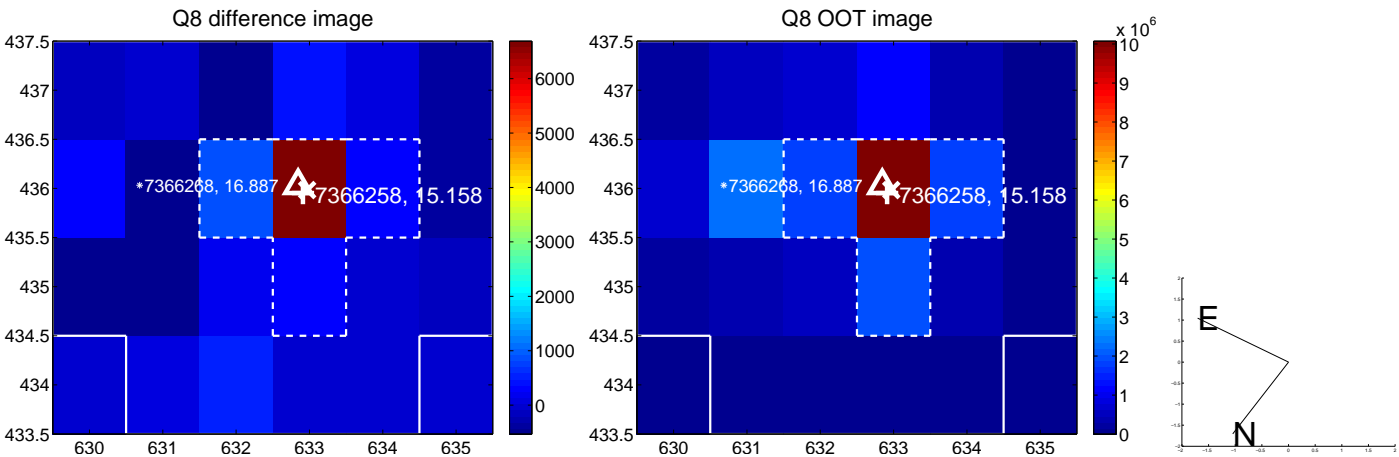
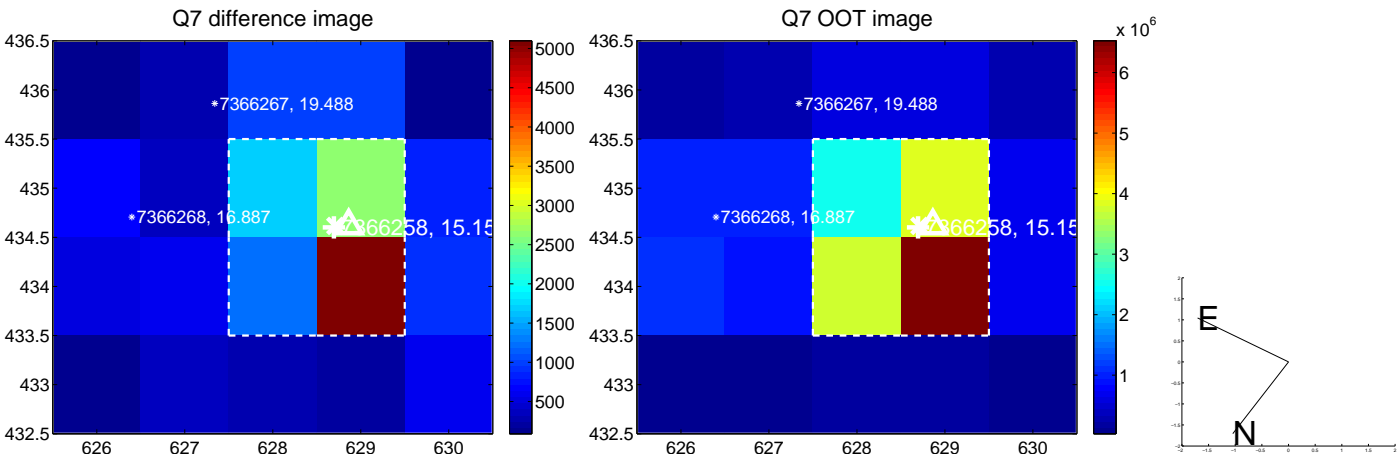
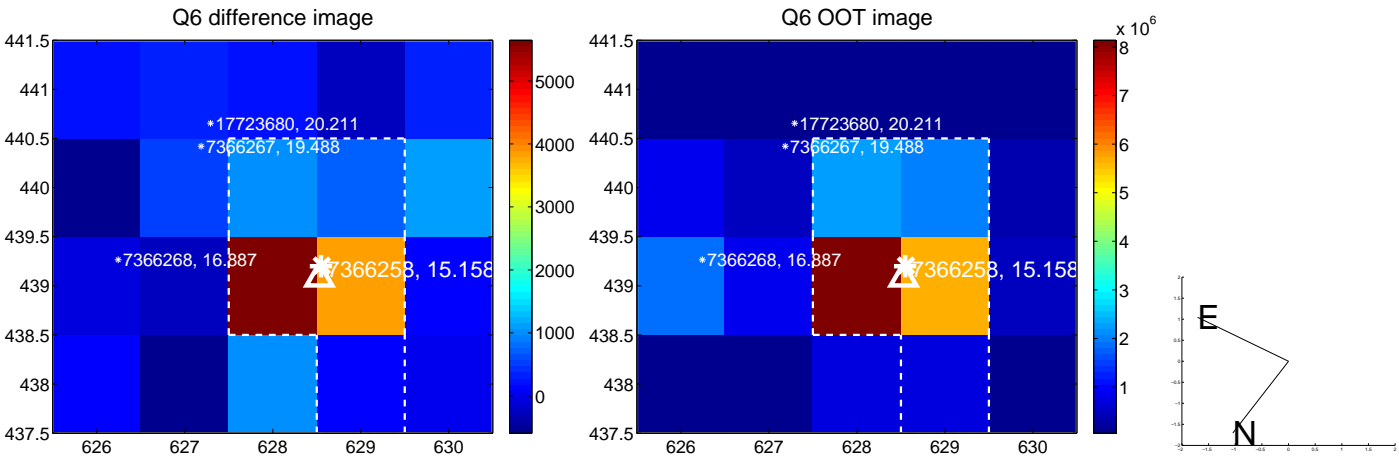
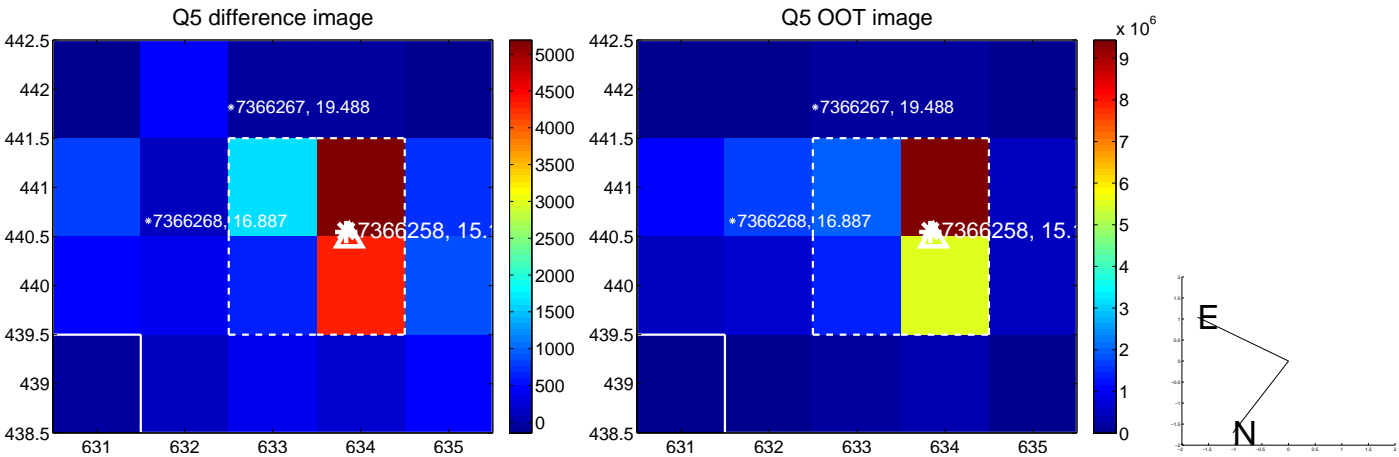
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

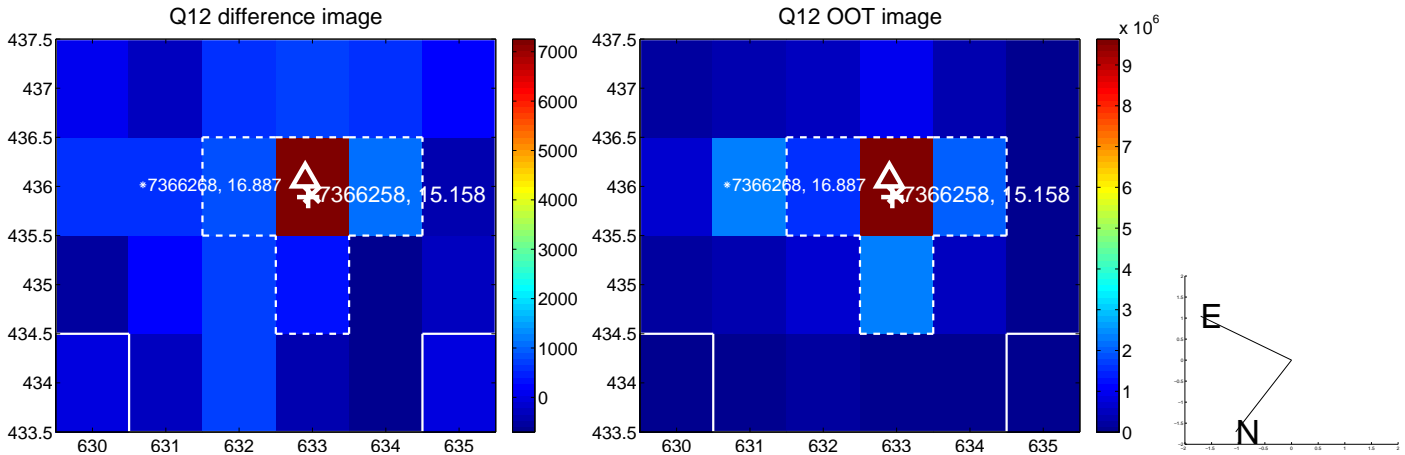
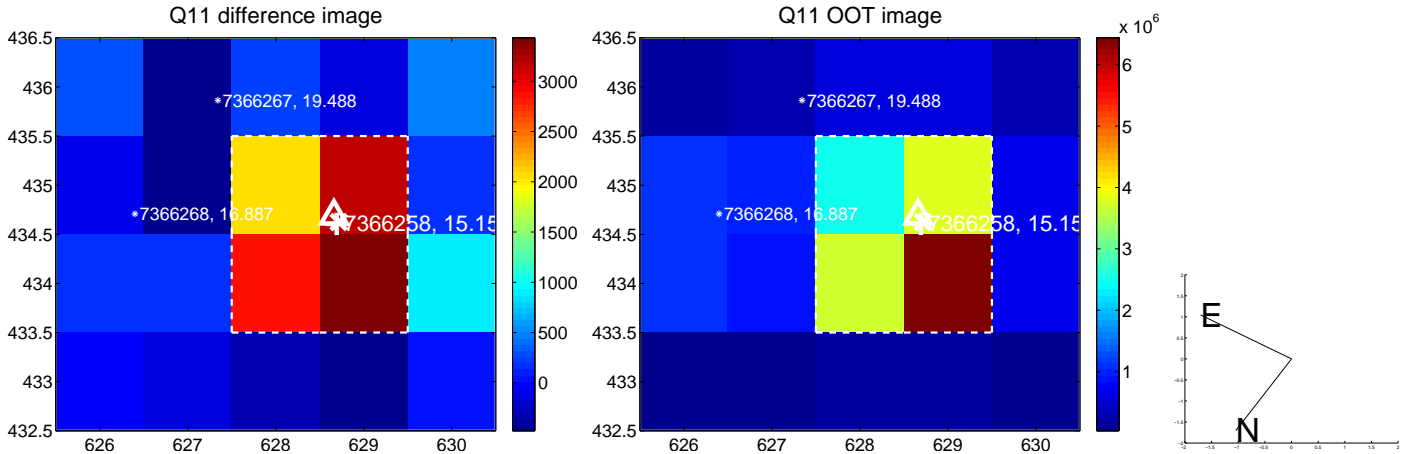
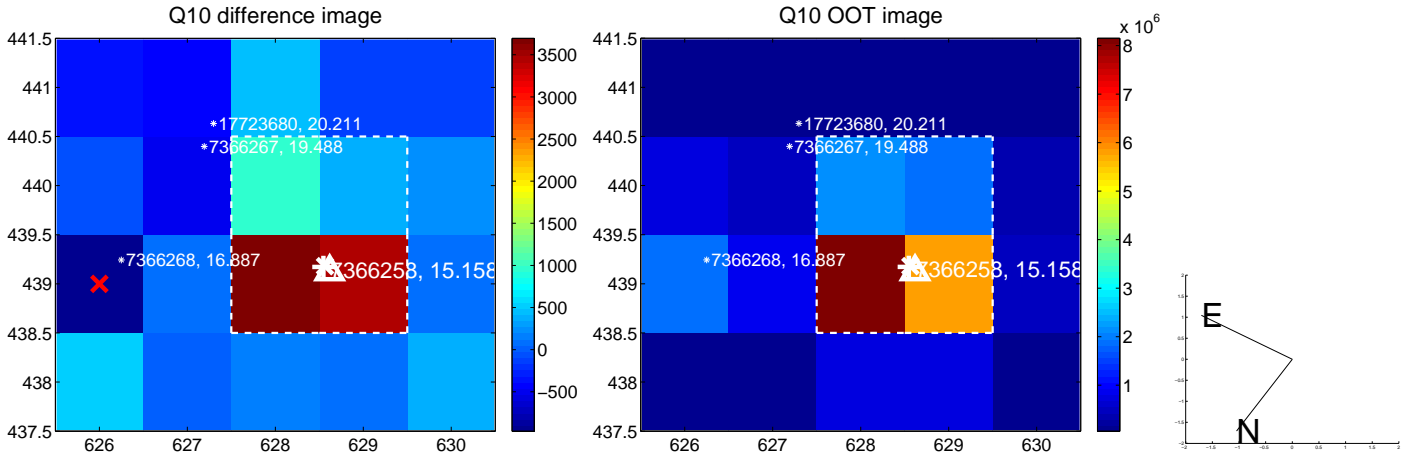
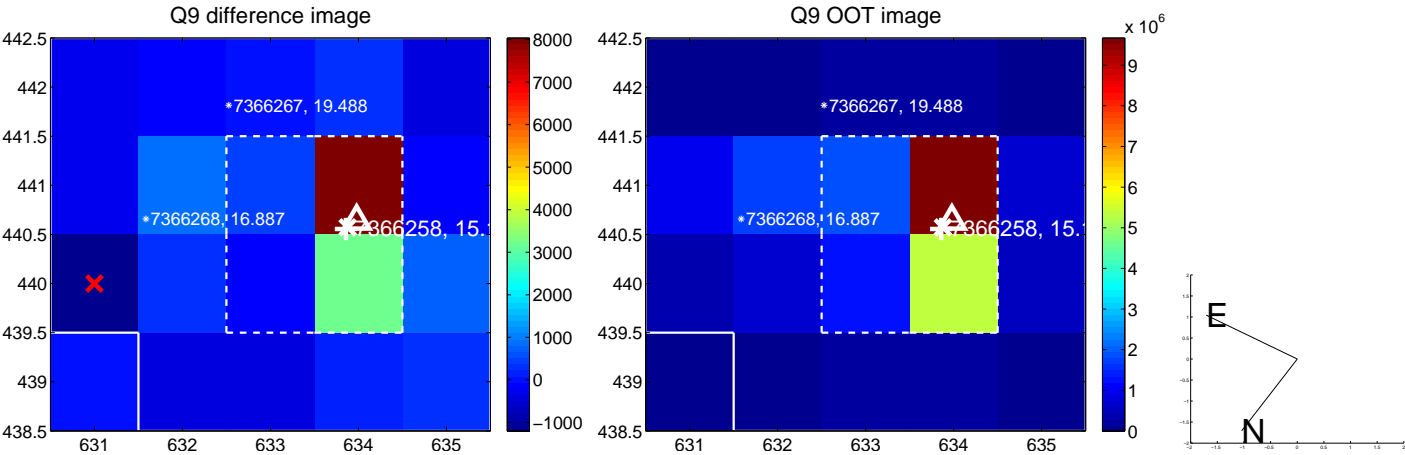


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

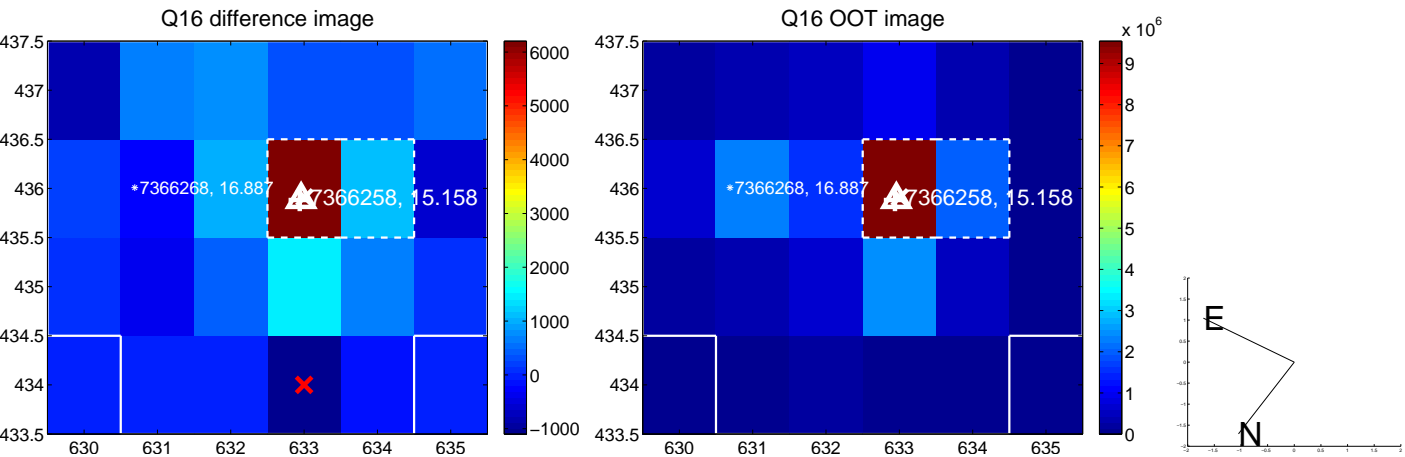
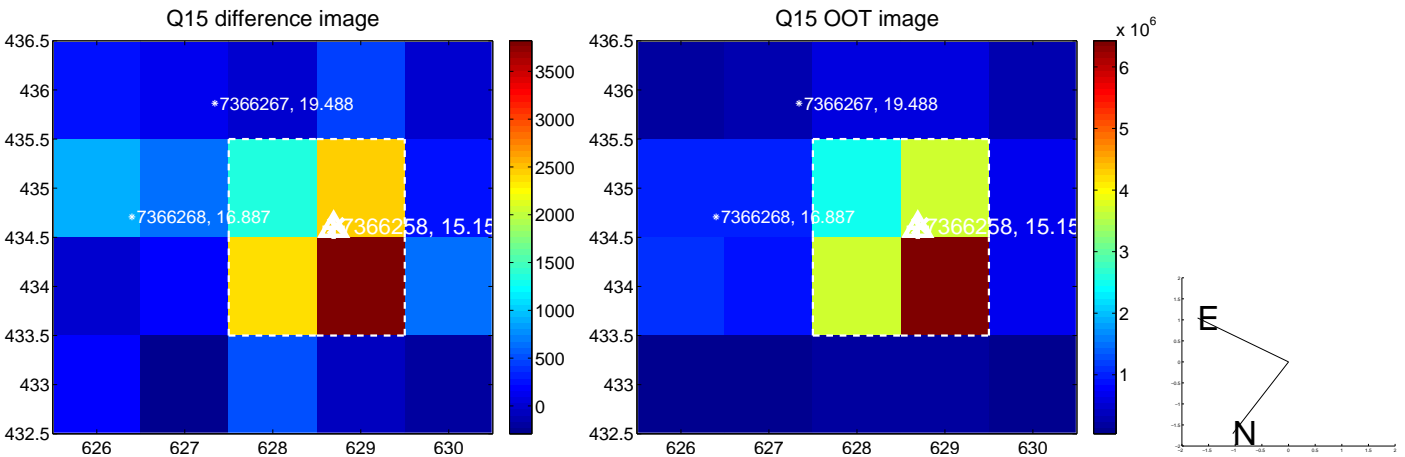
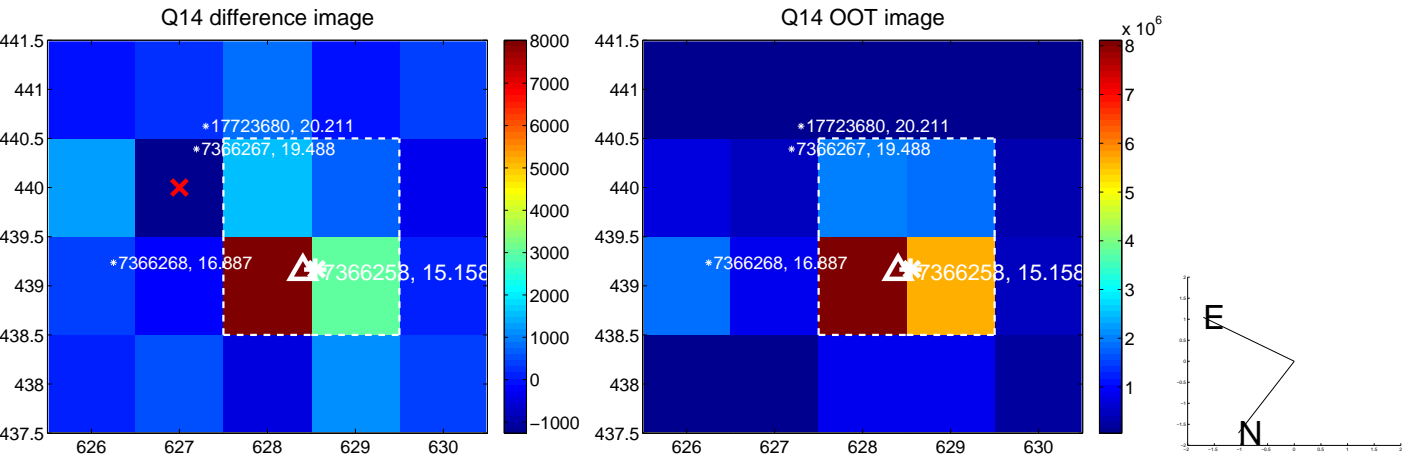
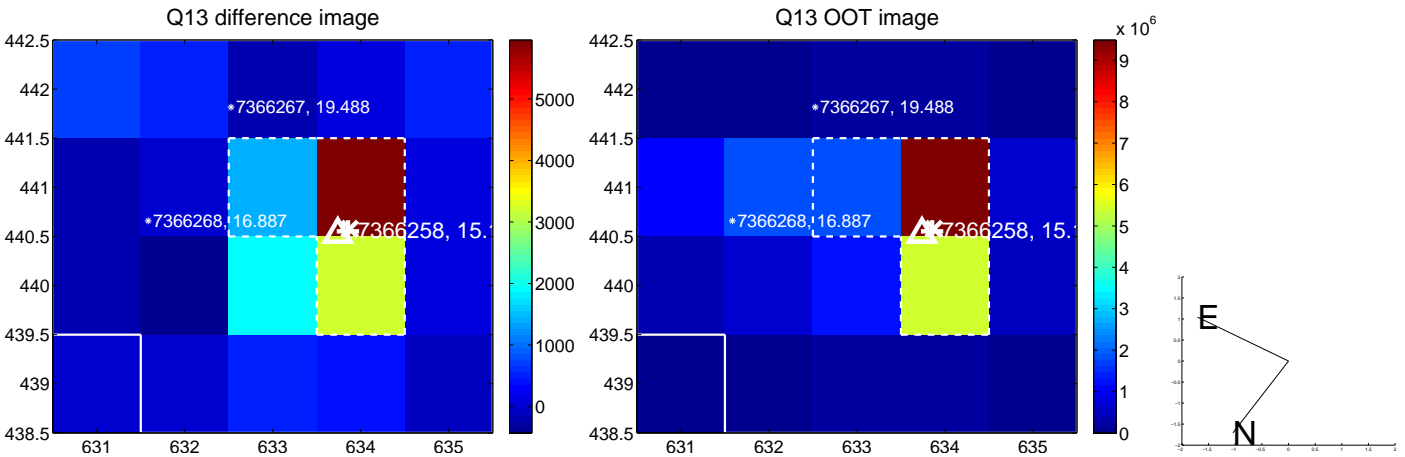




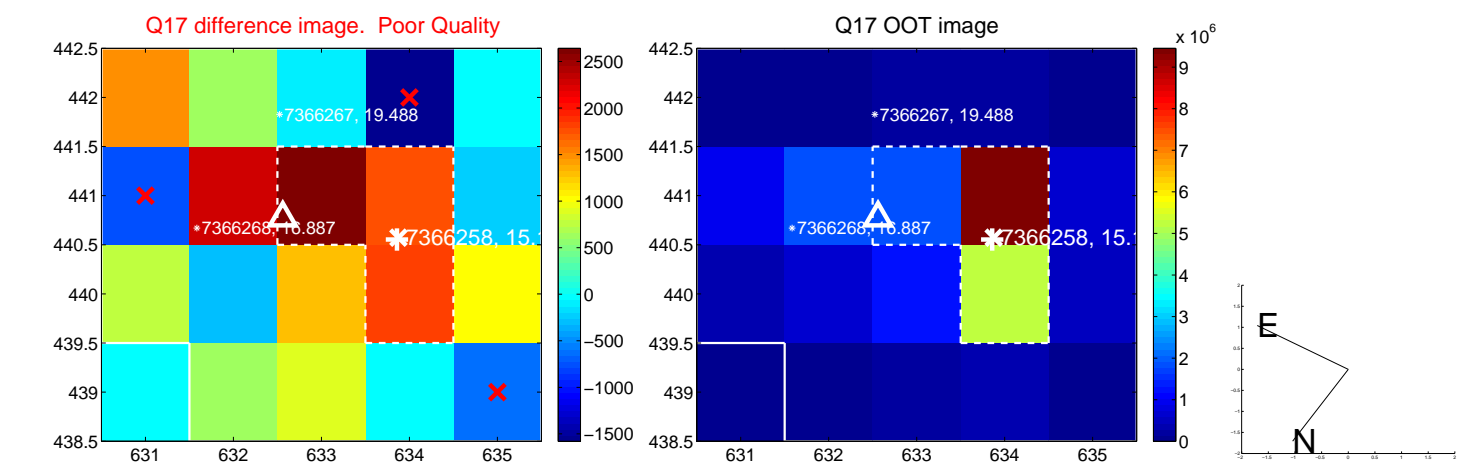
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



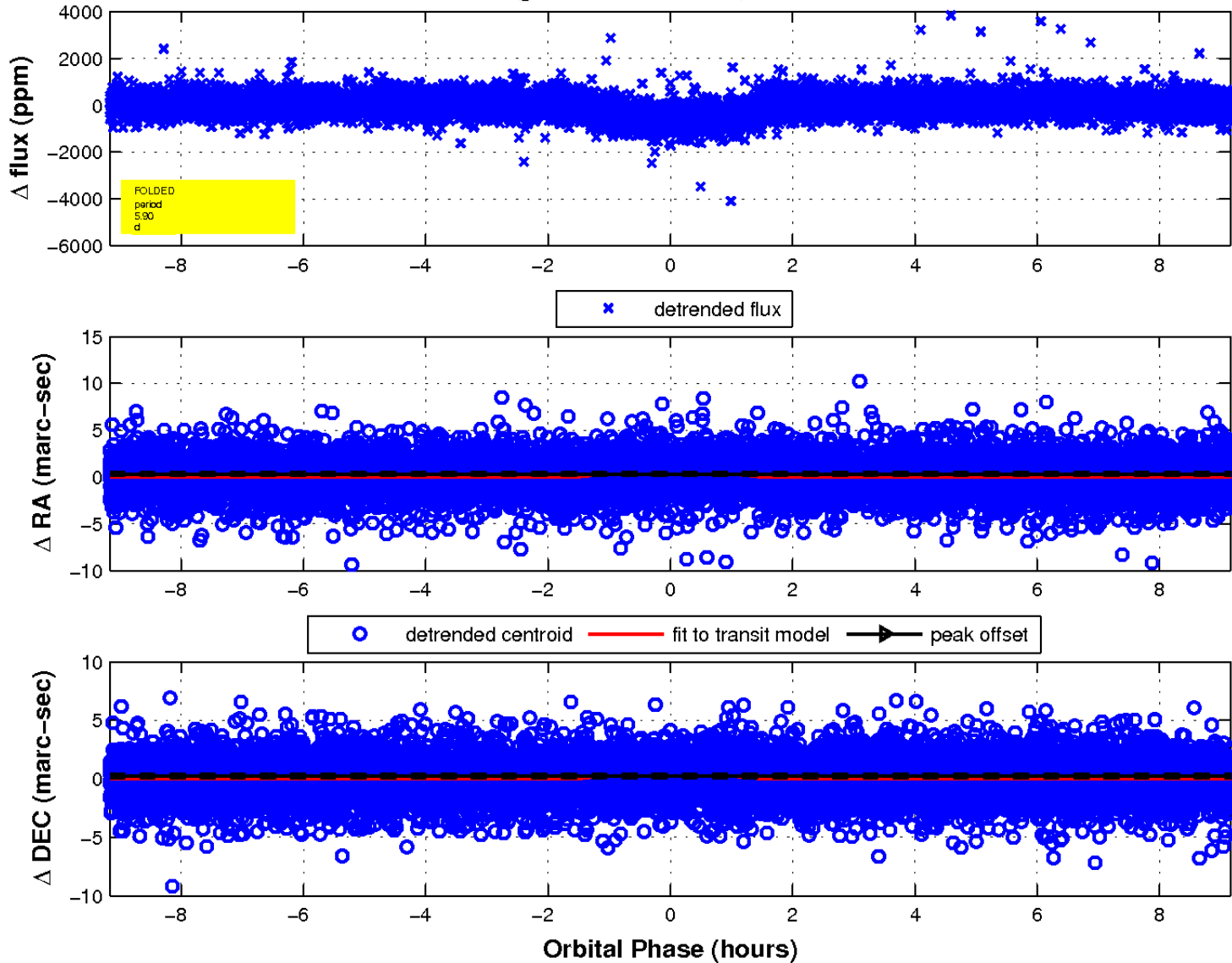
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

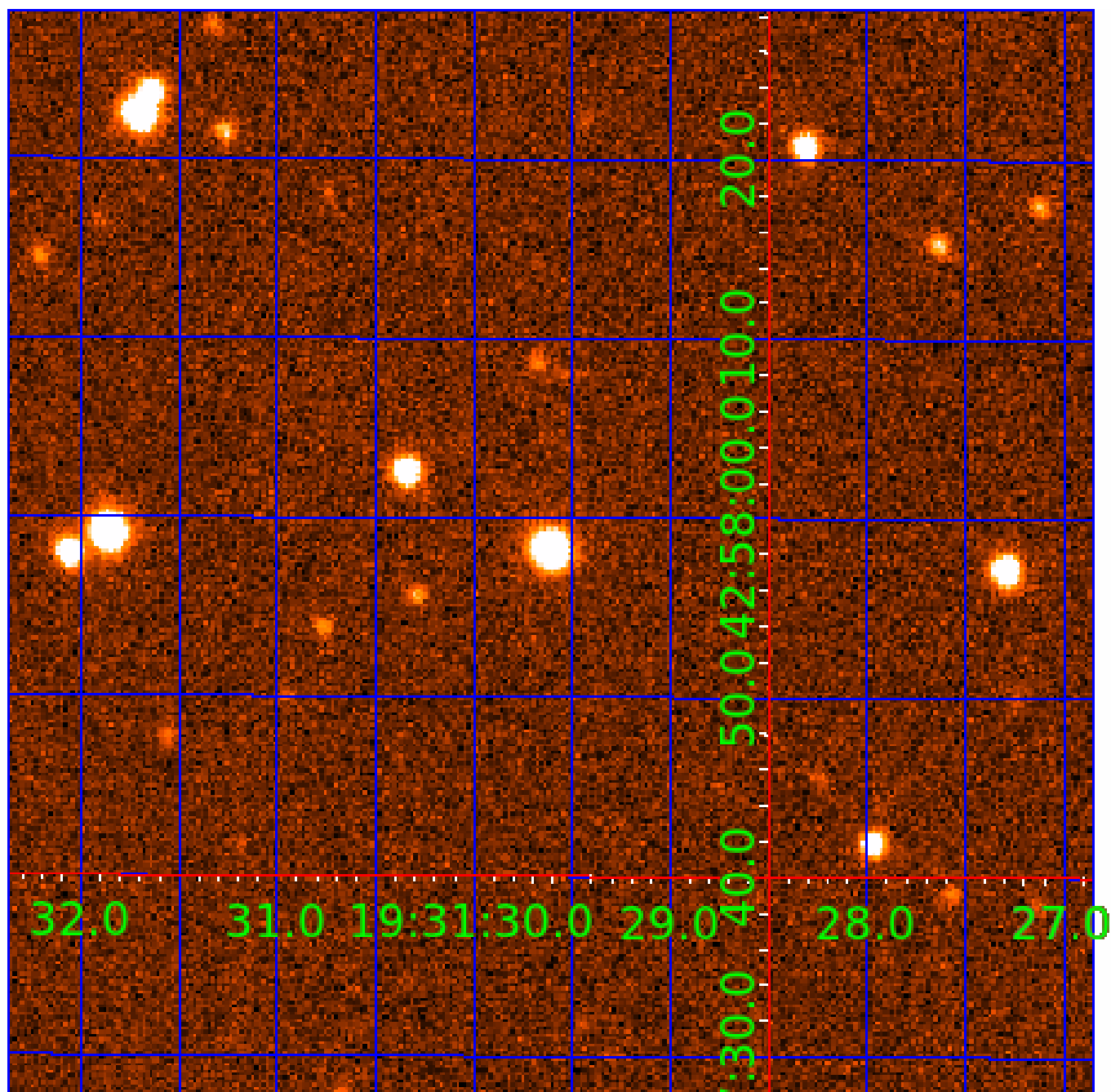


fluxWeightedCentroids, Planet 3 of 4



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# KIC 007366258

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007366258-01	OBS	0880.02	51.540507	174.044052	3631.9	6.420	112.1	111.6	0.93	5427	5.47	9.69
007366258-02	OBS	0880.01	26.444373	141.232690	1847.1	4.643	68.0	68.5	0.93	5427	4.87	23.59
007366258-03	OBS	0880.03	5.902239	136.783514	661.2	3.055	43.2	47.9	0.93	5427	2.81	174.23
007366258-04	OBS	0880.04	2.382946	132.698229	257.4	2.199	23.5	26.3	0.93	5427	1.68	583.88

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007366258-01	OBS	PC	0.98	0	0	0	0	NO_COMMENT
007366258-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT
007366258-03	OBS	PC	1.00	0	0	0	0	NO_COMMENT
007366258-04	OBS	PC	1.00	0	0	0	0	NO_COMMENT

**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.

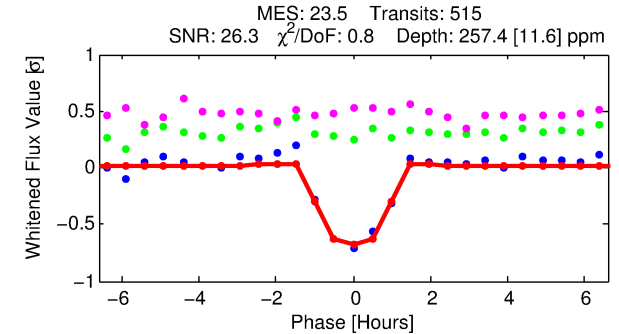
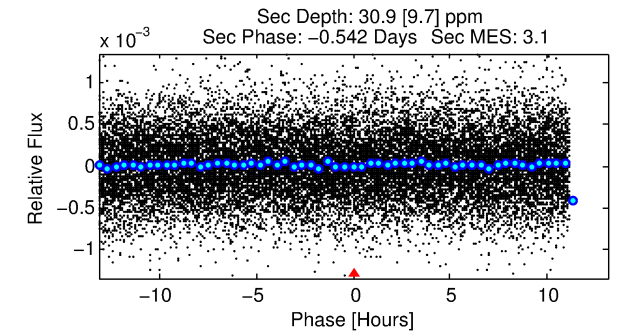
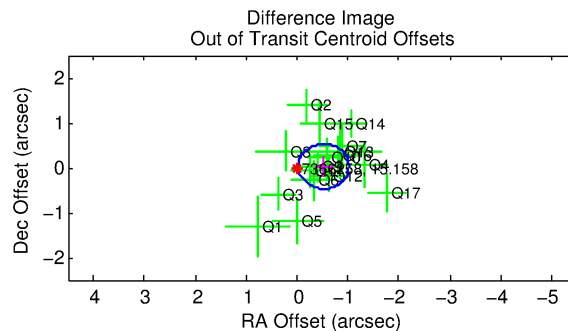
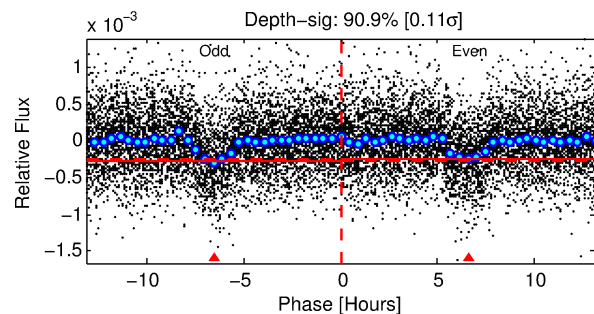
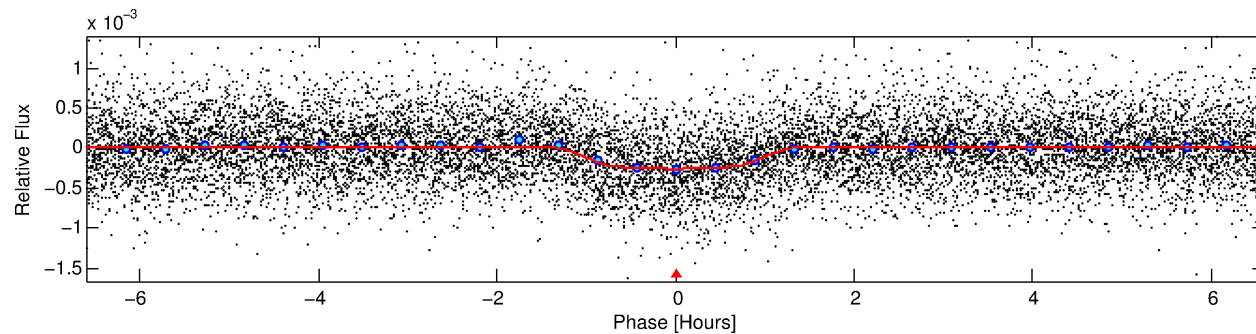
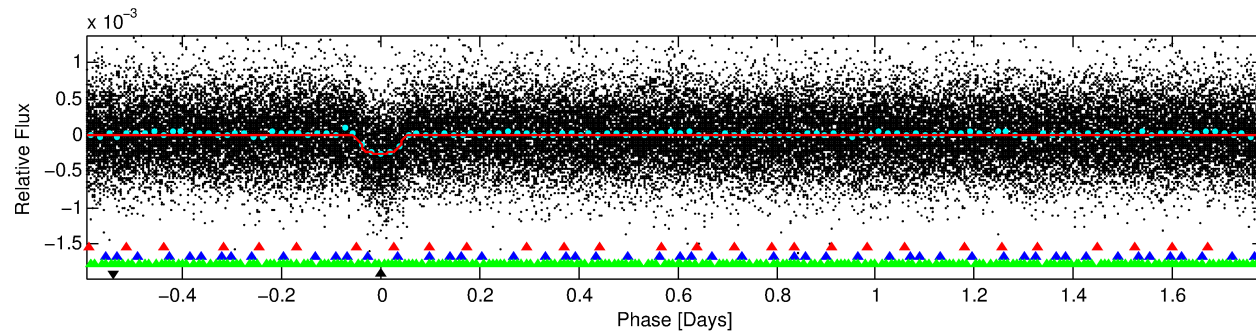
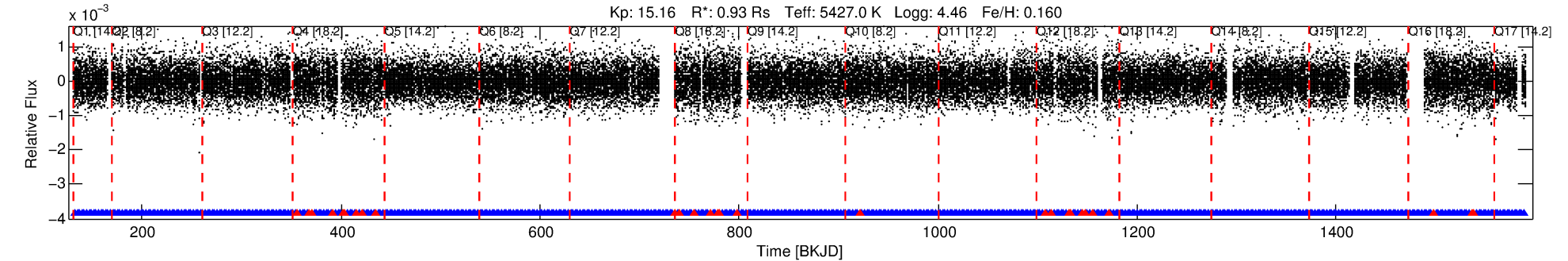
Ephemeris Match Information For 007366258-04

No Significant Match Found

# DV One-Page Summary

KIC: 7366258 Candidate: 4 of 4 Period: 2.383 d  
KOI: K00880.04 Name: Kepler-82d Corr: 0.970

Kp: 15.16 R\*: 0.93 Rs Teff: 5427.0 K Logg: 4.46 Fe/H: 0.160



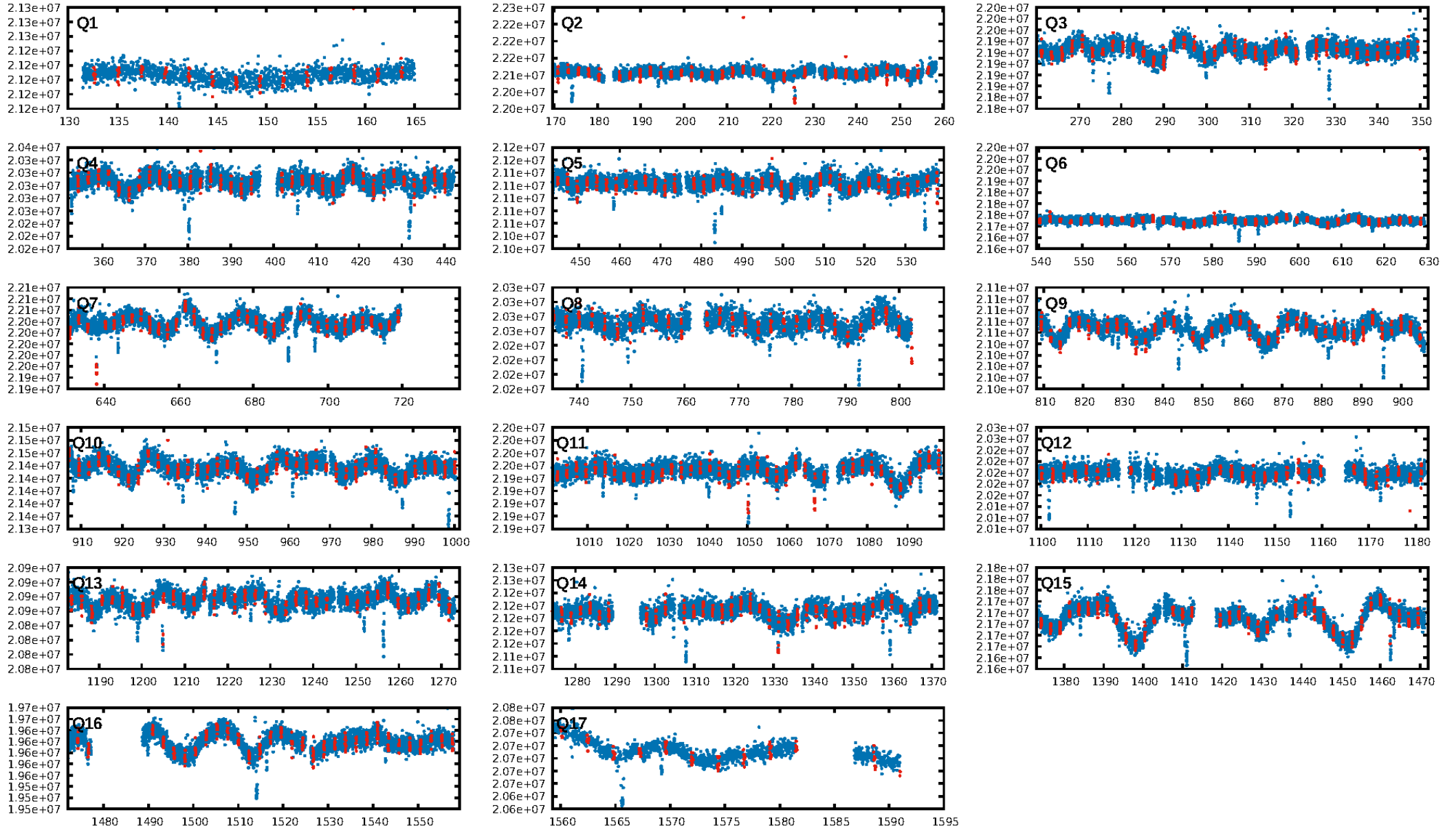
## DV Fit Results:

Period = 2.38295 [0.00001] d  
Epoch = 132.6982 [0.0013] BKJD  
Rp/R\* = 0.0166 [0.0076]  
a/R\* = 5.06 [9.01]  
b = 0.82 [0.76]  
Seff = 583.88 [101.39]  
Teff = 1253 [54] K  
Rp = 1.68 [0.80] Re  
a = 0.0339 [0.0034] AU  
Ag = 6.88 [6.77] [0.87σ]  
Teffp = 3138 [765] K [2.46σ]

## DV Diagnostic Results:

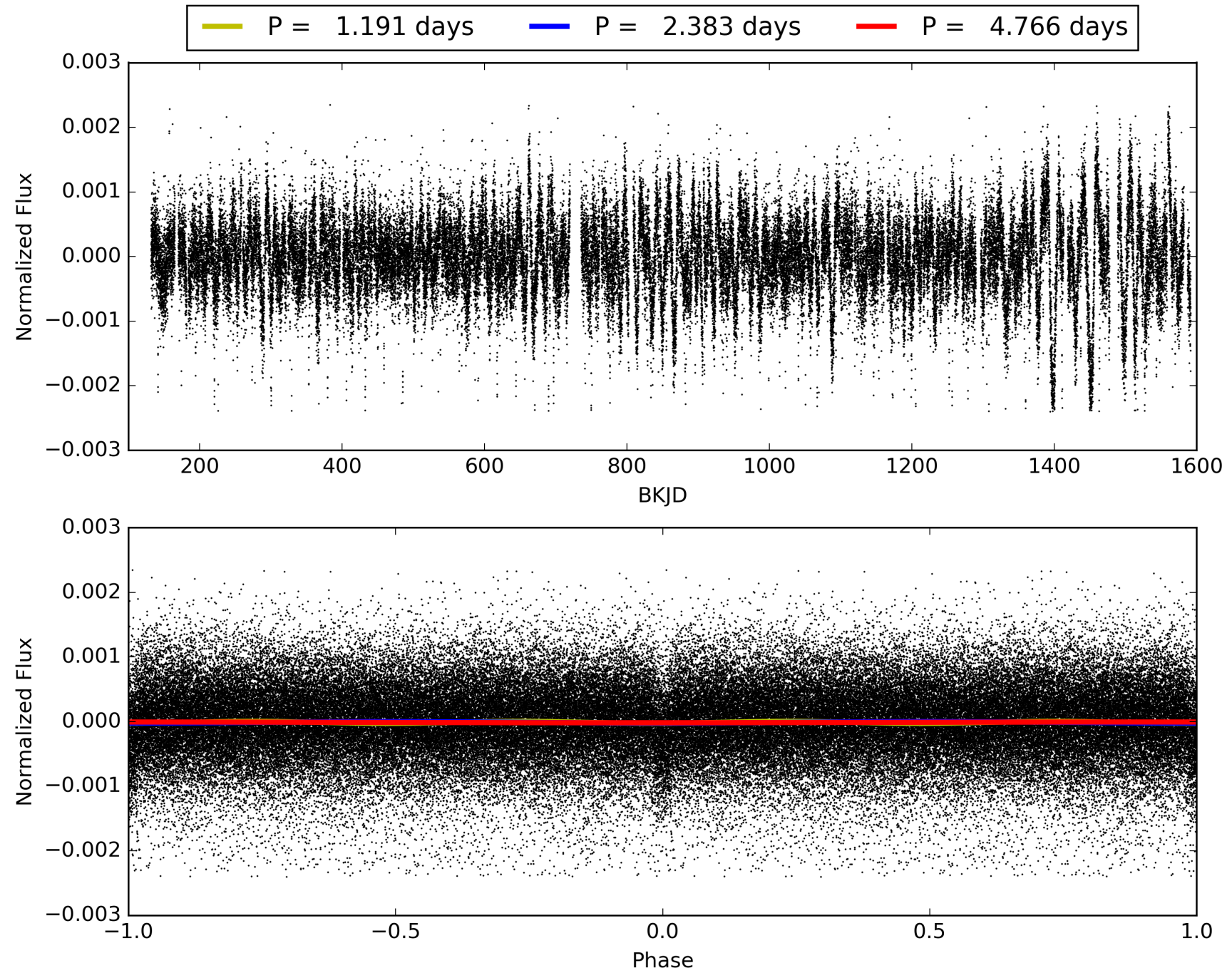
ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [22.44σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.21e-121  
RollingBand-fgt: 0.94 [463/491]  
GhostDiagnostic-chr: 3.898  
Centroid-sig: 0.2%  
Centroid-so: 0.980 arcsec [2.14σ]  
OotOffset-rm: 0.521 arcsec [3.14σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-rm: 0.478 arcsec [2.59σ]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 007366258-04, PDC Light Curves





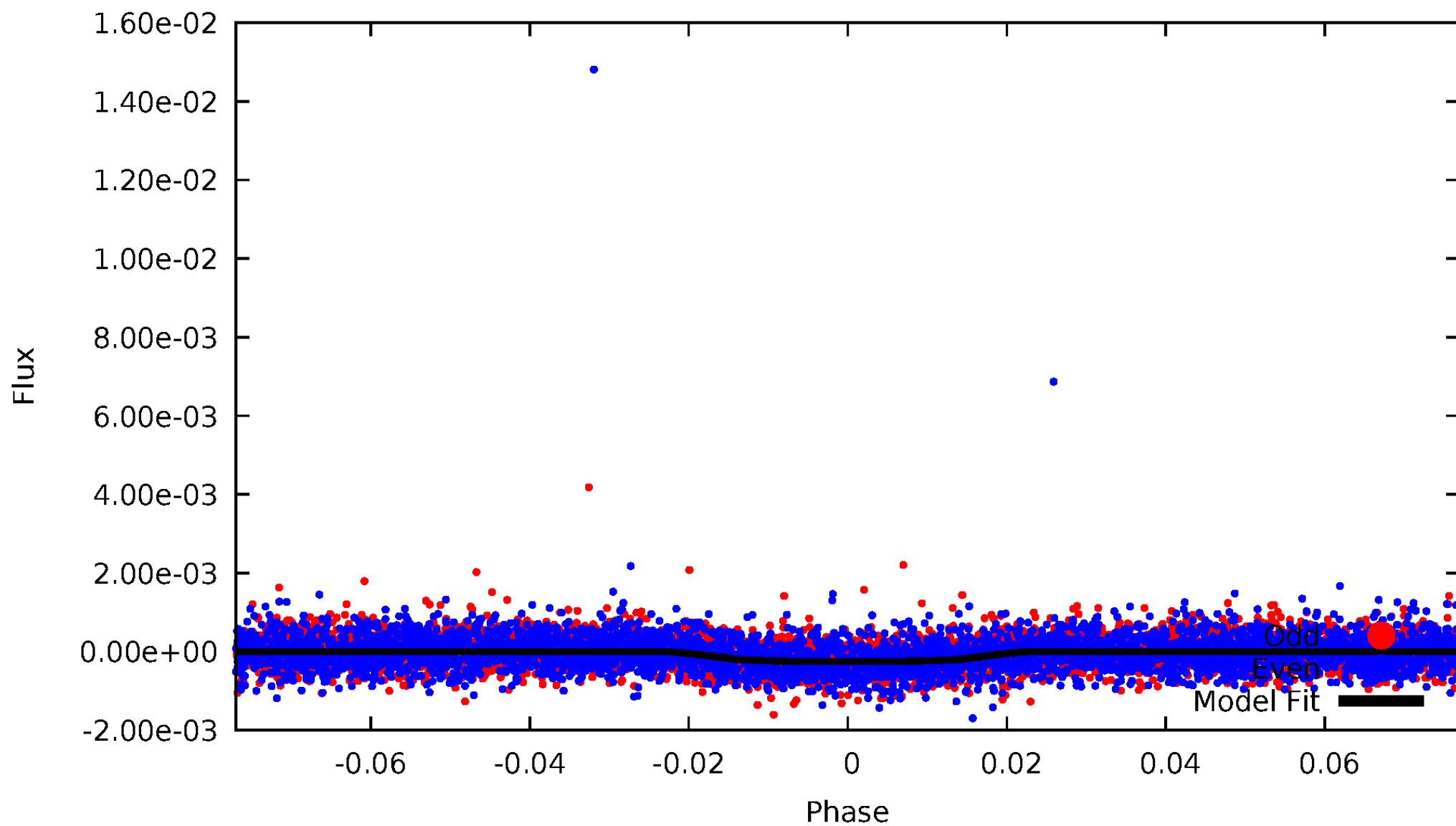
TCE 007366258-04





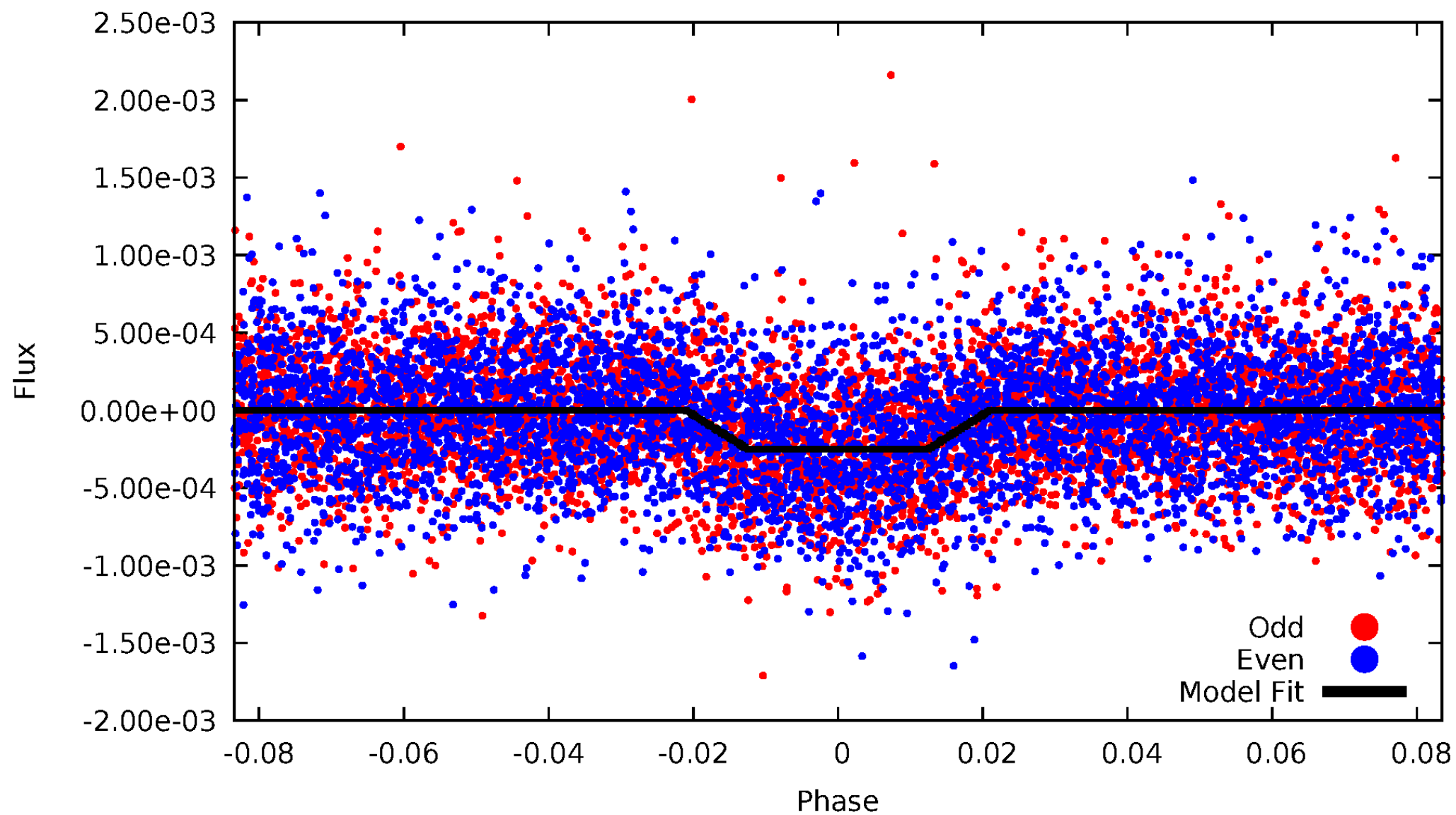
# DV Odd/Even

TCE 007366258-04



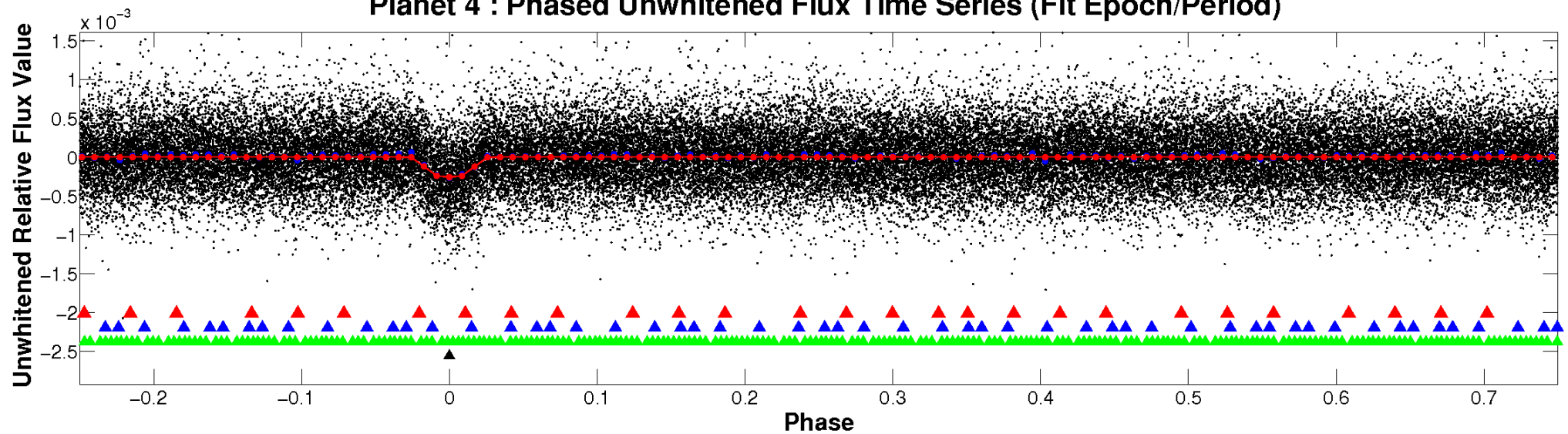
# ALT Odd/Even

TCE 007366258-04

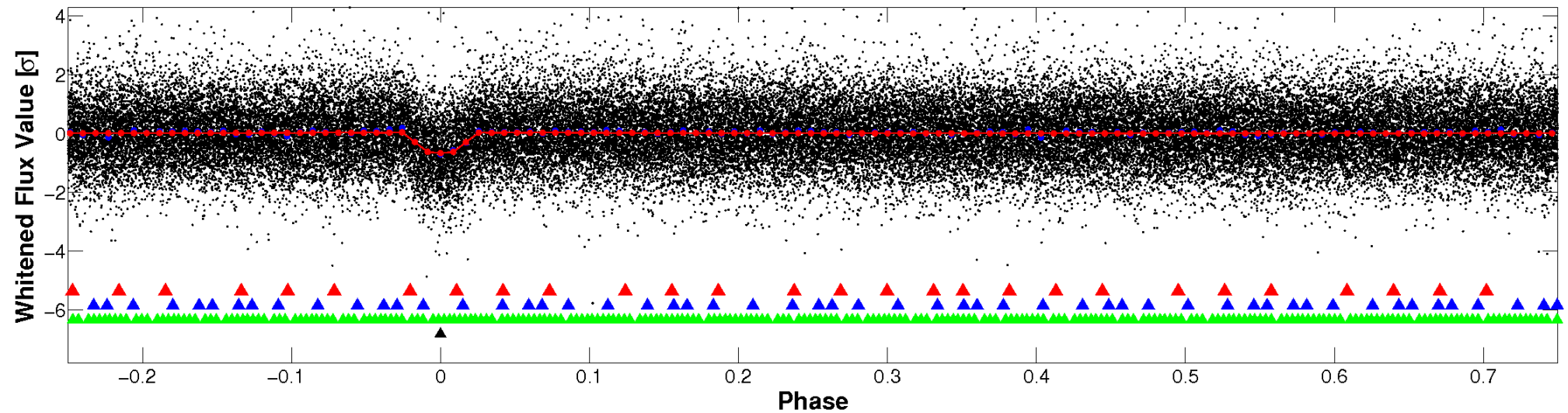


# Non-Whitened Vs. Whitened Light Curve

## Planet 4 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

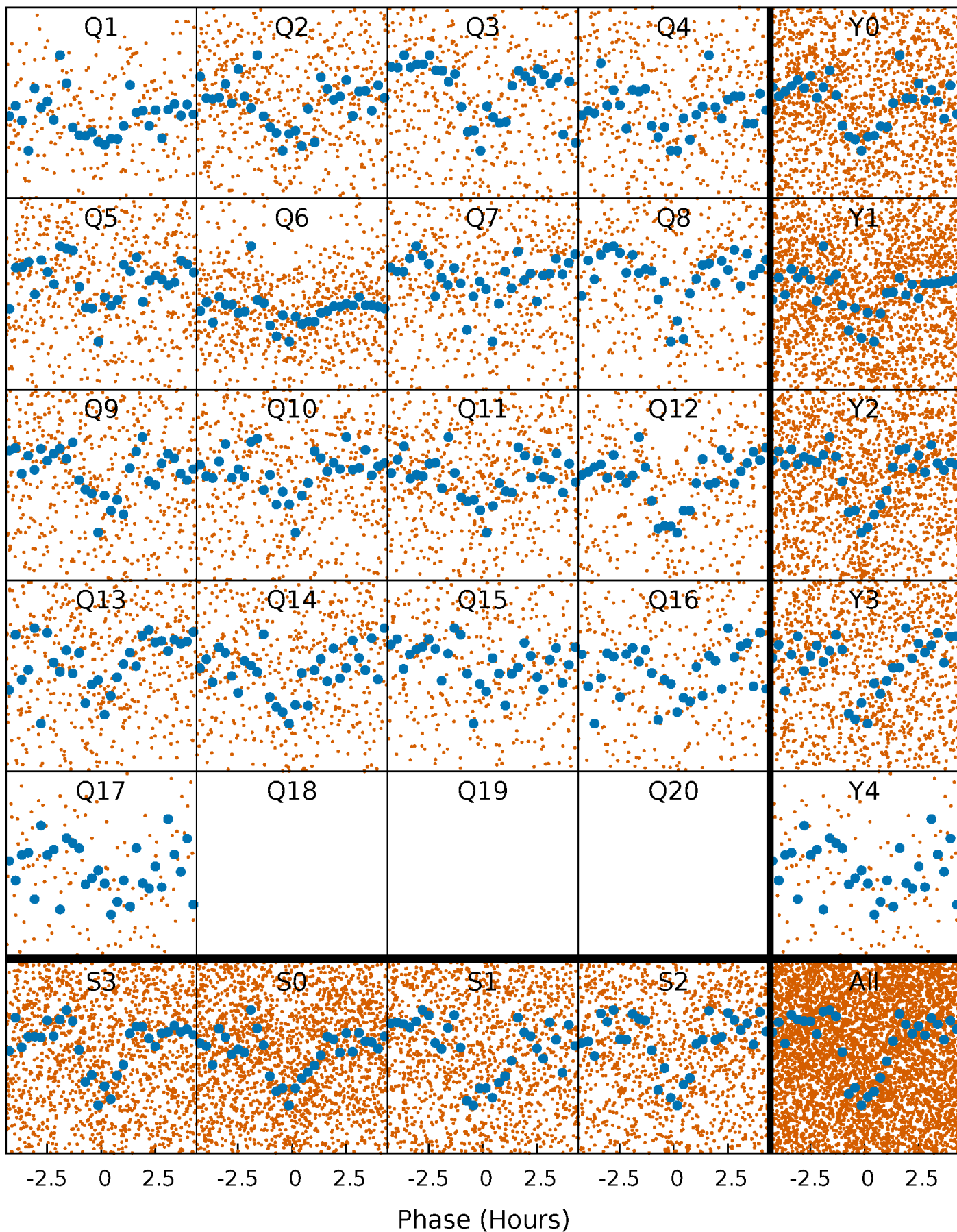


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

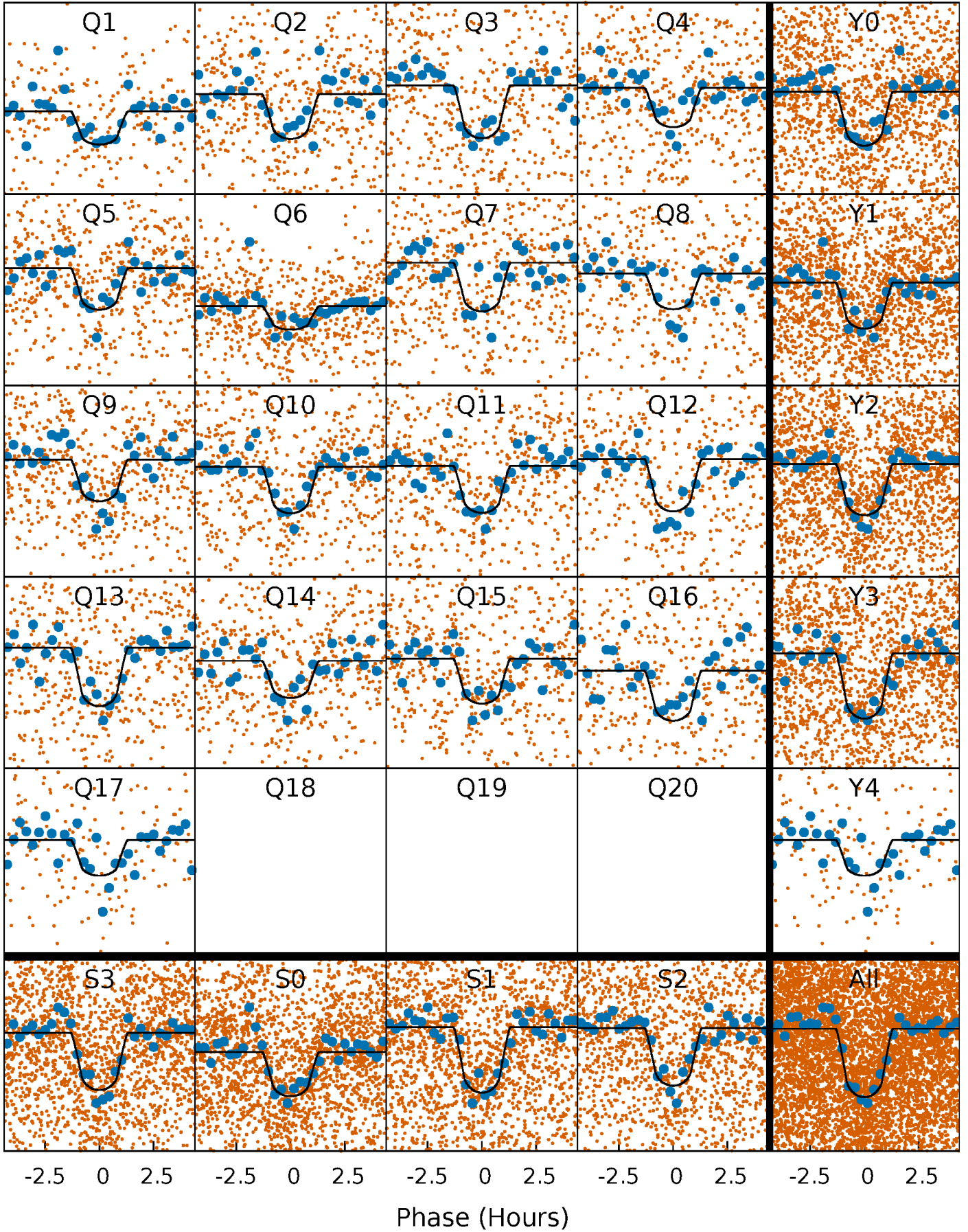
TCE 007366258-04   P= 2.382946 Days    $T_0=132.698229$  (BKJD)





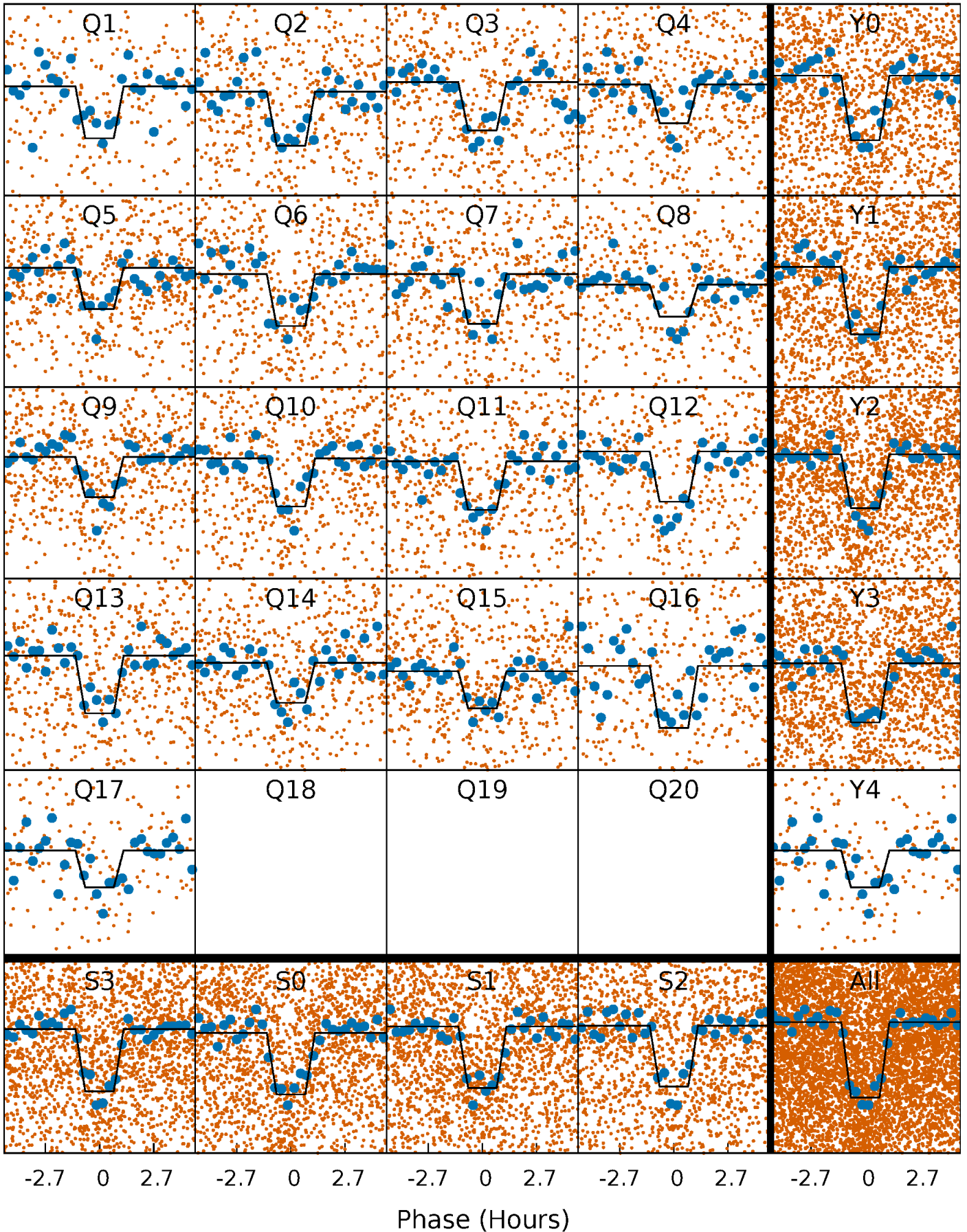
# DV Quarter-Phased Transit Curves

TCE 007366258-04   P= 2.382946 Days    $T_0=132.698229$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

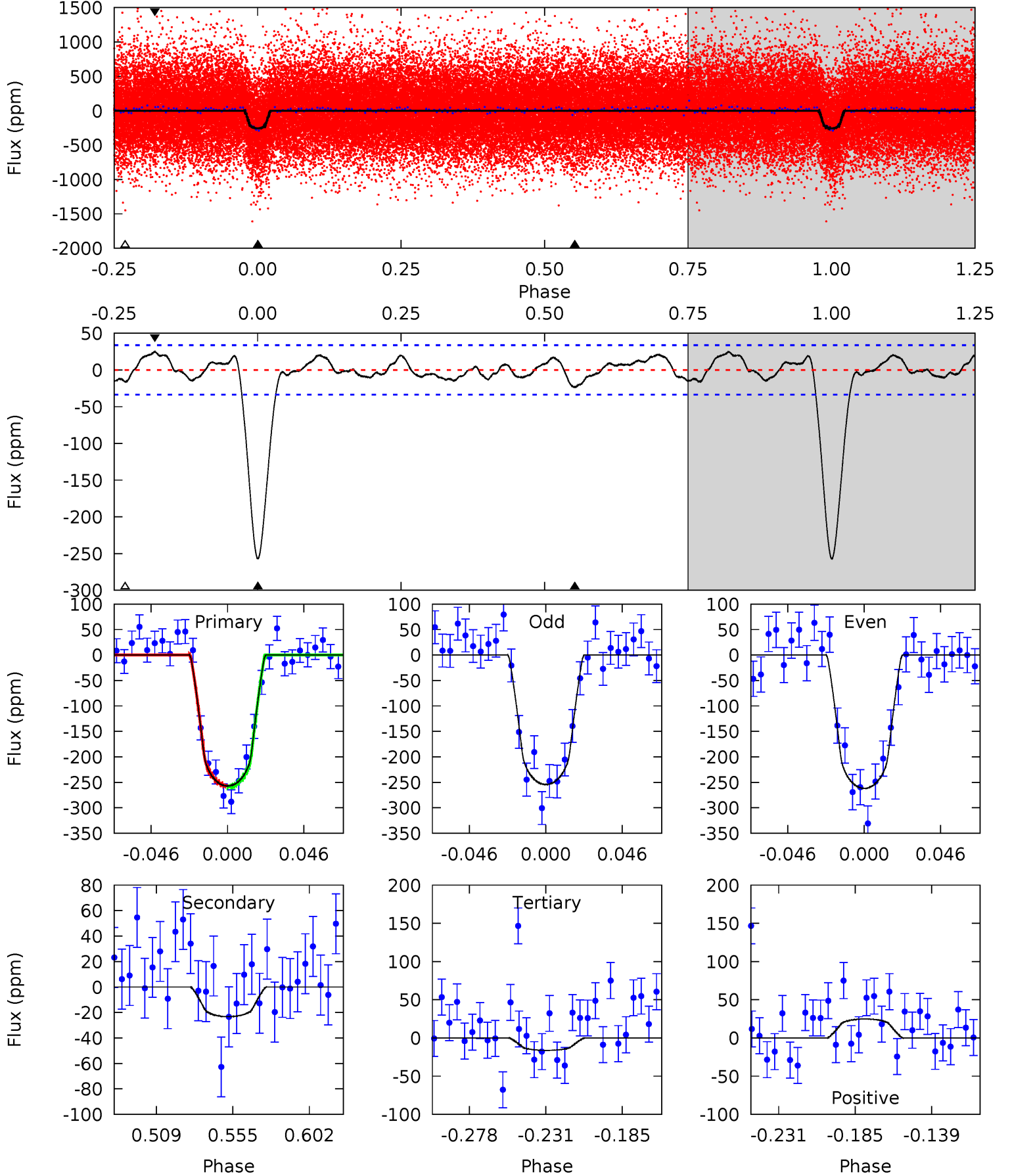
TCE 007366258-04   P= 2.382953 Days    $T_0=132.696679$  (BKJD)



# DV Model-Shift Uniqueness Test

007366258-04, P = 2.382946 Days, E = 130.315283 Days

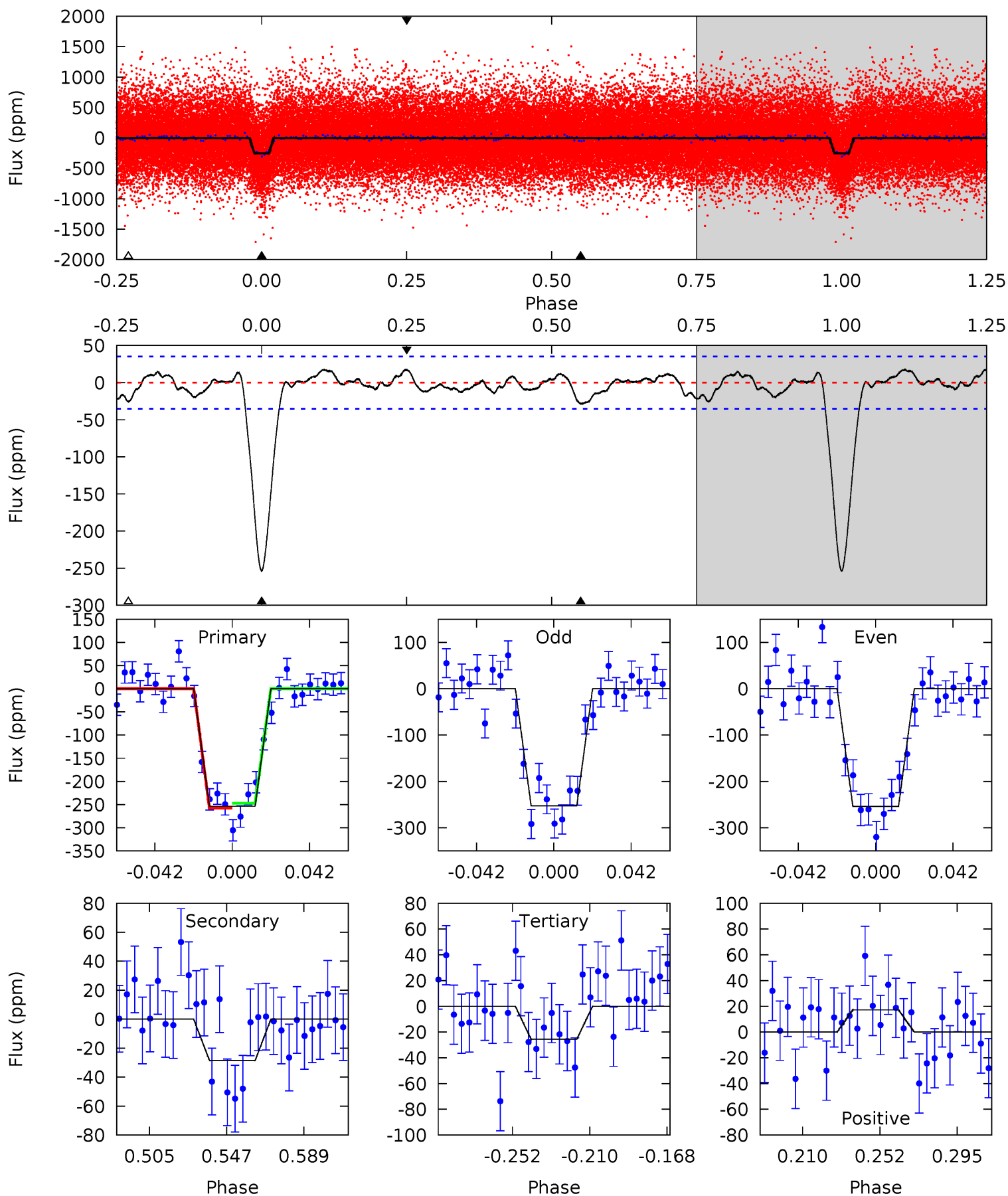
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
36.1	3.27	2.27	3.49	4.72	1.99	1.45	33.8	32.6	1.00	-0.22	0.53	0.97	0.09	0.20



# Alt Model-Shift Uniqueness Test

007366258-04, P = 2.382953 Days, E = 130.313726 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
34.2	3.84	3.45	2.32	4.74	2.03	1.20	30.7	31.9	0.39	1.52	0.08	1.00	0.06	0.72





### Stellar Parameters For KIC 007366258

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5427^{+108}_{-108}$	$4.463^{+0.064}_{-0.088}$	$0.160^{+0.150}_{-0.150}$	$0.929^{+0.104}_{-0.069}$	$0.915^{+0.051}_{-0.051}$	$1.608^{+0.398}_{-0.421}$
	+2%/-2%	+1%/-2%	+94%/-94%	+11%/-7%	+6%/-6%	+25%/-26%
Source	SPE58	SPE58	SPE58	DSEP		

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

### Secondary Eclipse Parameters for KIC 007366258-04 / KOI 0880.04

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-23 \pm 7$	$1.68^{+0.77}_{-0.76}$	$1752^{+63}_{-54}$	$3403^{+824}_{-454}$	$5.155^{+12.745}_{-2.974}$
Alt.	$-28 \pm 7$	$1.66^{+0.79}_{-0.80}$	$1756^{+61}_{-54}$	$3505^{+959}_{-418}$	$6.375^{+16.518}_{-3.578}$

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

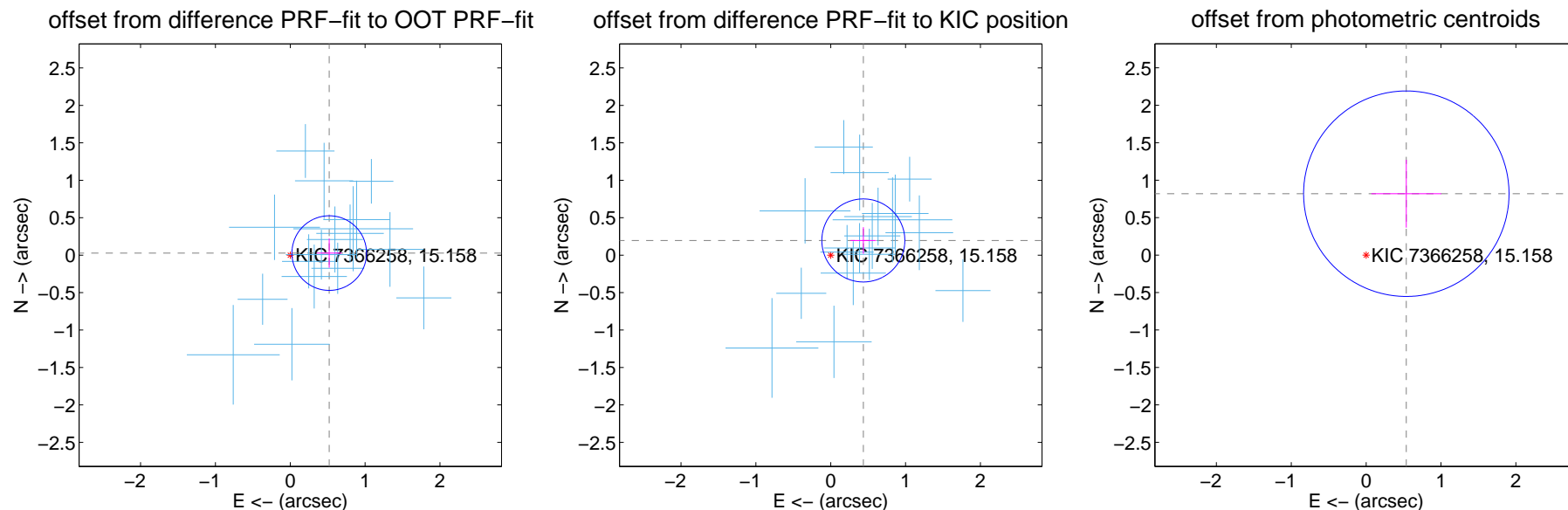
## DV Centroid Data

Supplemental centroid analysis for 007366258-04. Kepler magnitude: 15.16. Transit SNR 26.25

There are 17 quarters with good PRF difference image offsets

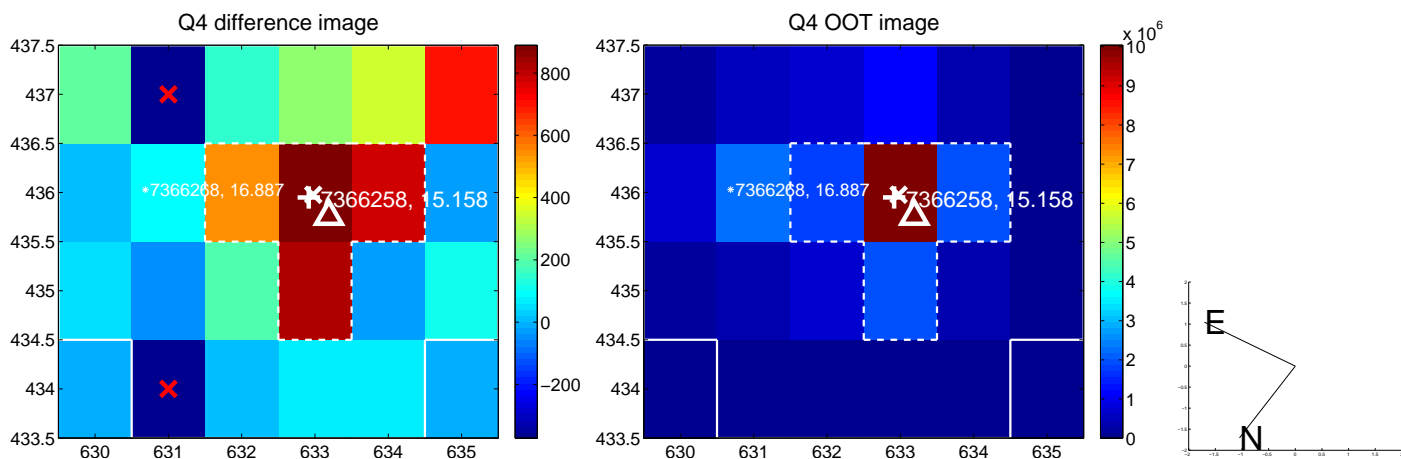
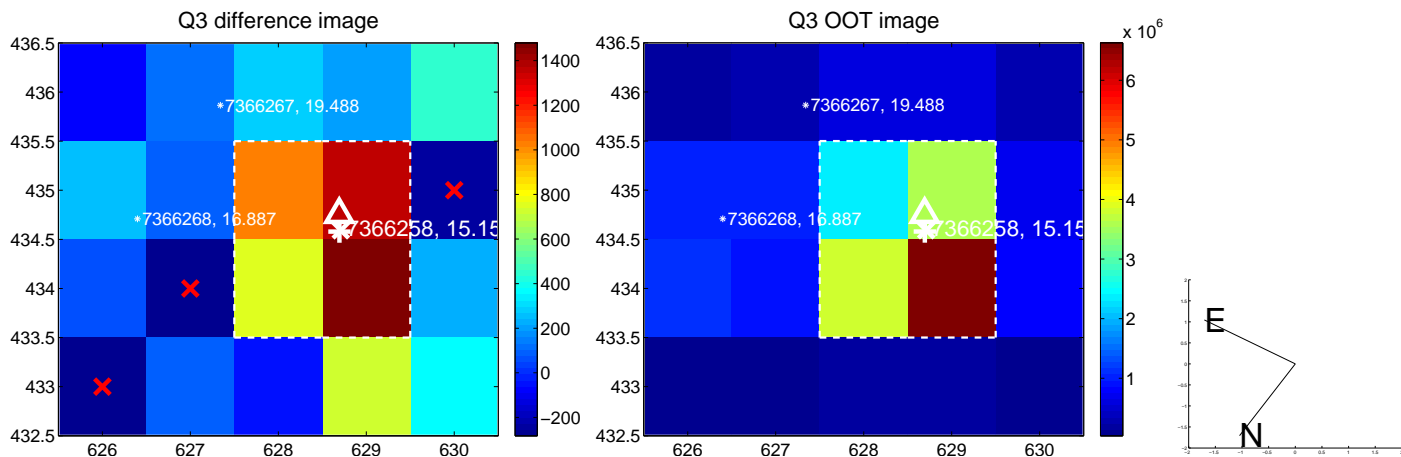
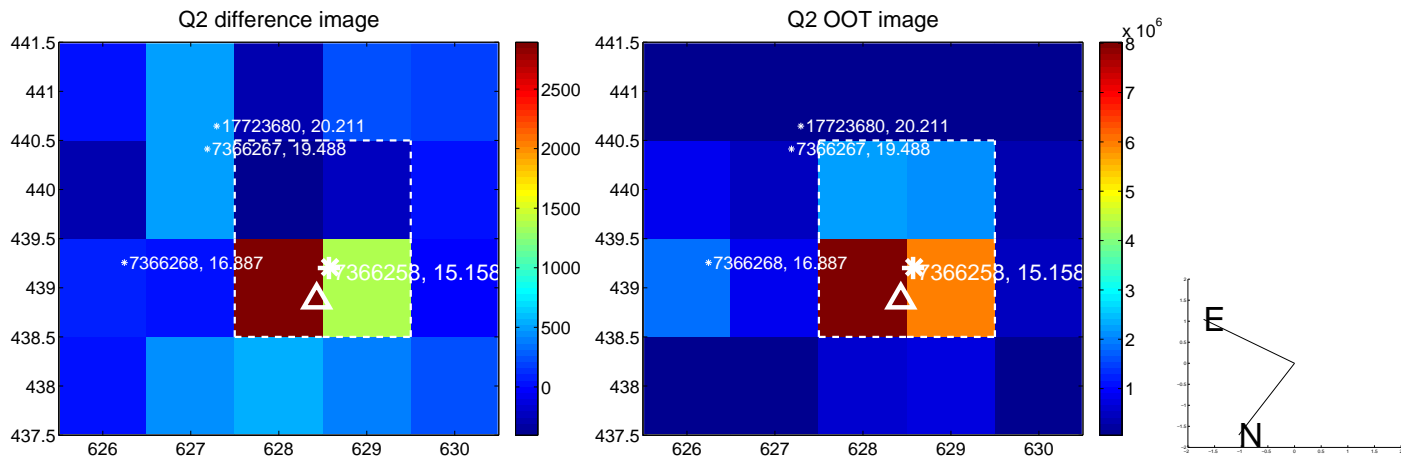
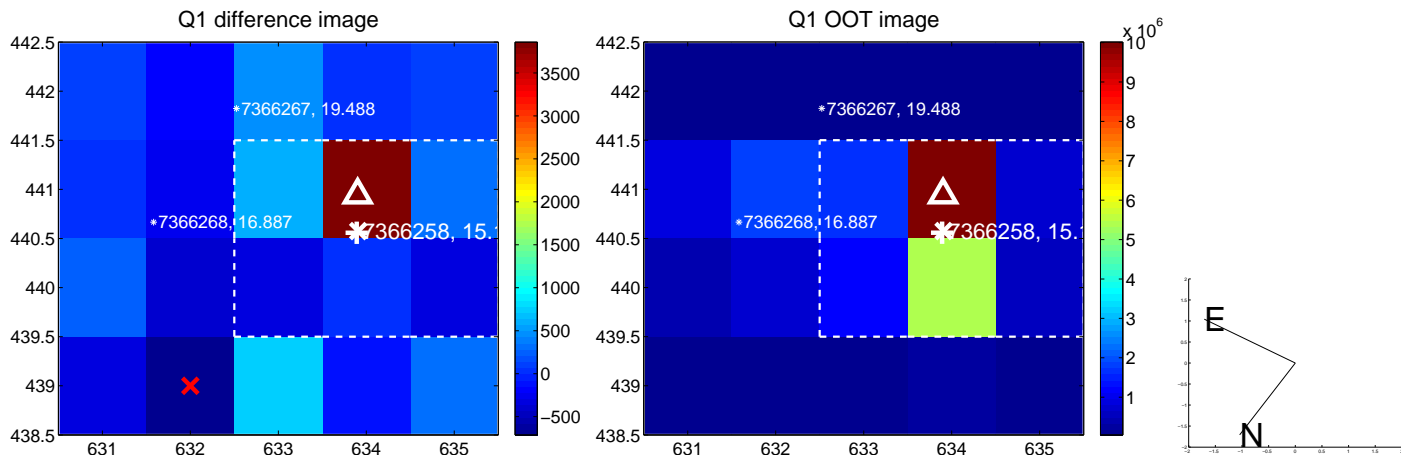
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>0.521 \pm 0.166</math></b>	<b>3.14</b>	$-0.520 \pm 0.166$	$0.028 \pm 0.195$
PRF-fit source offset from KIC position	$0.478 \pm 0.185$	2.59	$-0.435 \pm 0.169$	$0.196 \pm 0.176$
photometric centroid source offset	$0.98 \pm 0.46$	2.14	$-0.54 \pm 0.47$	$0.82 \pm 0.45$

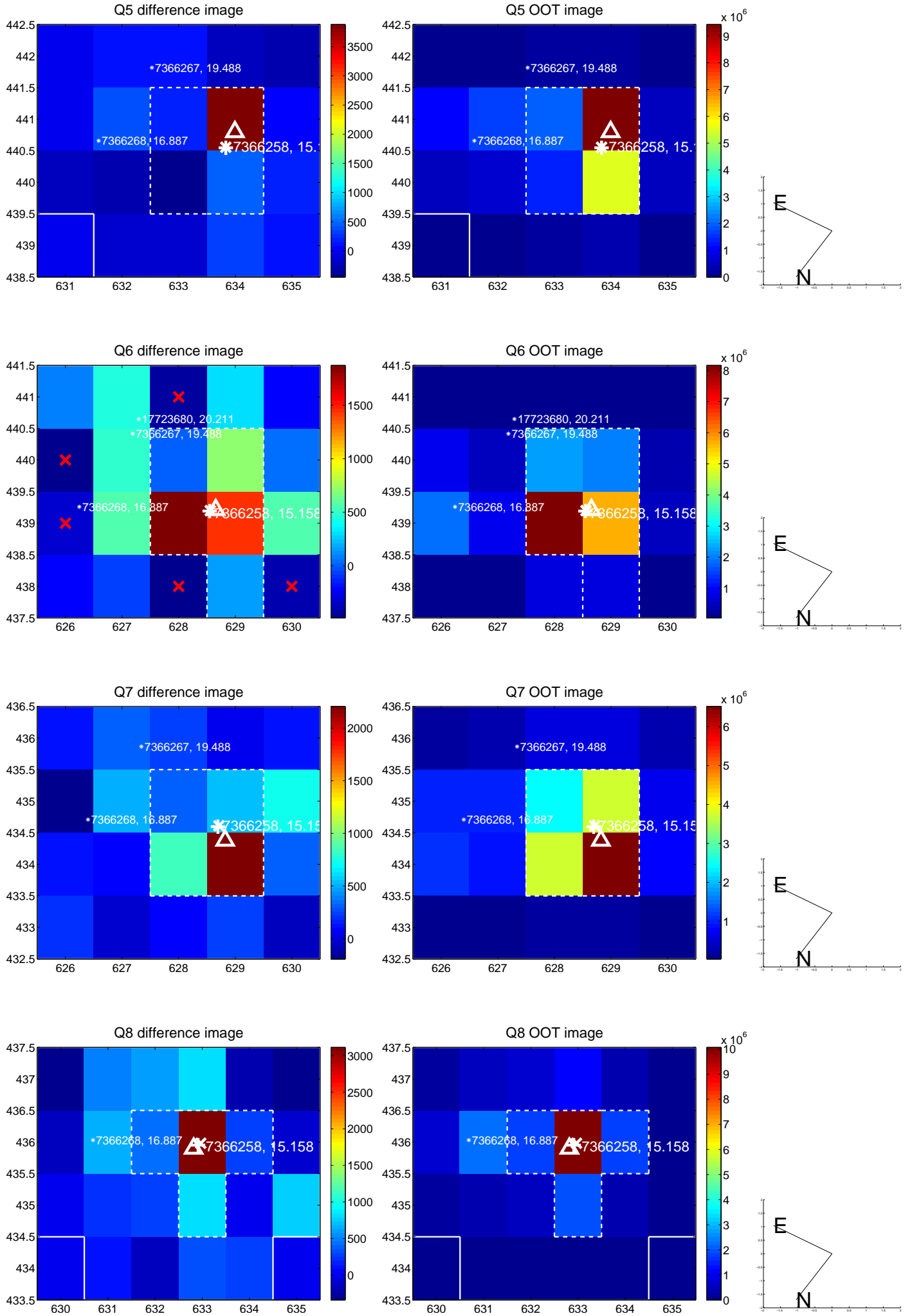


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

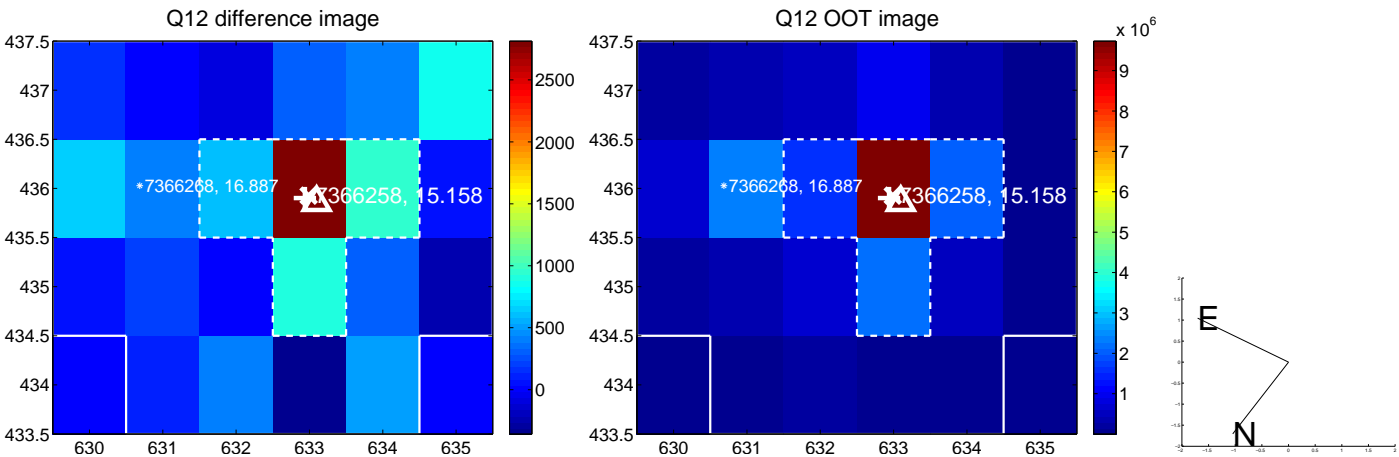
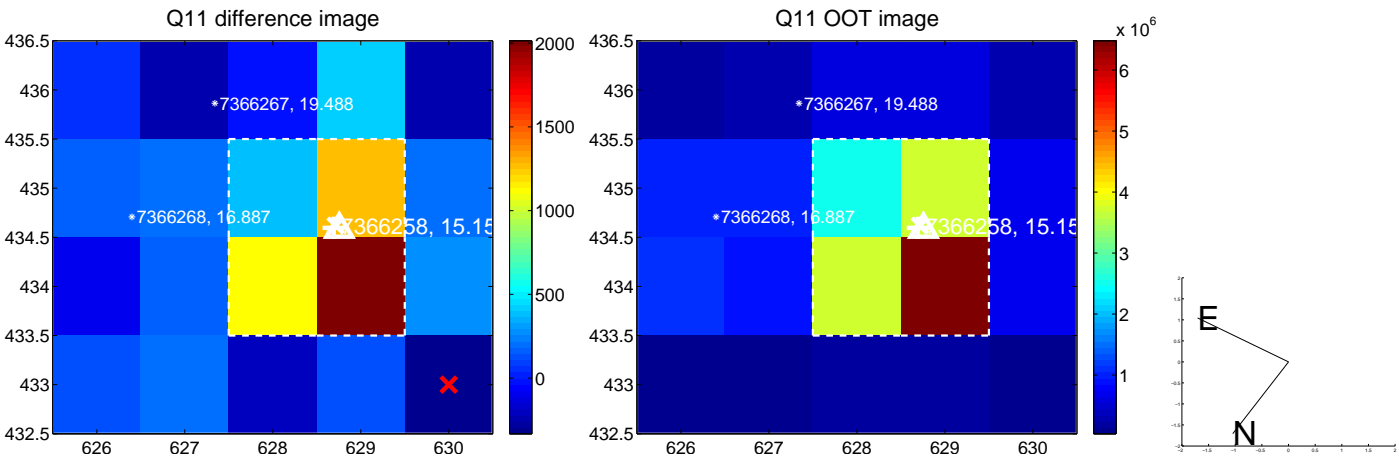
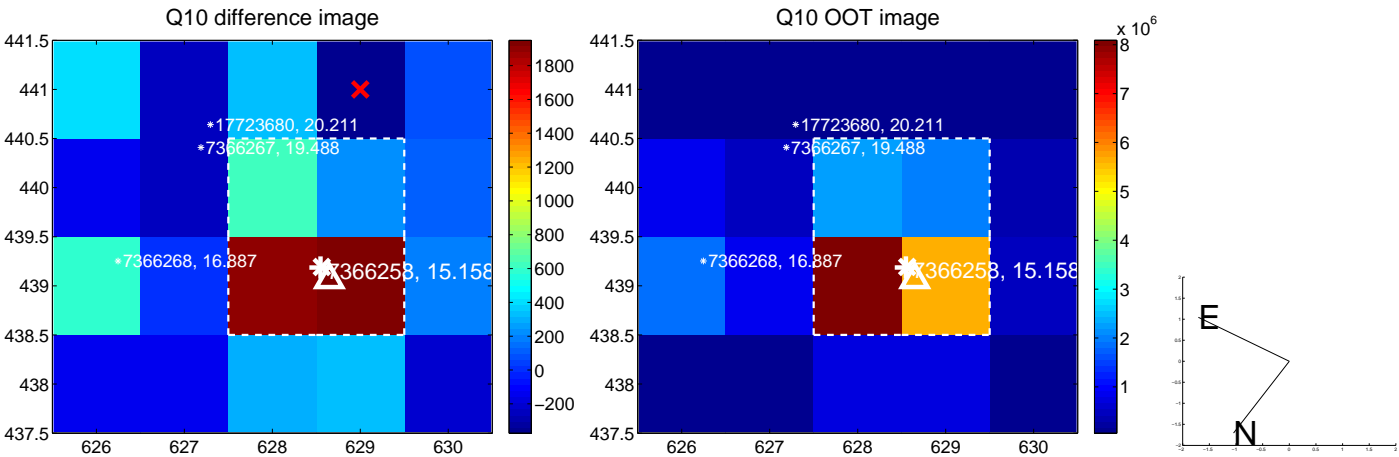
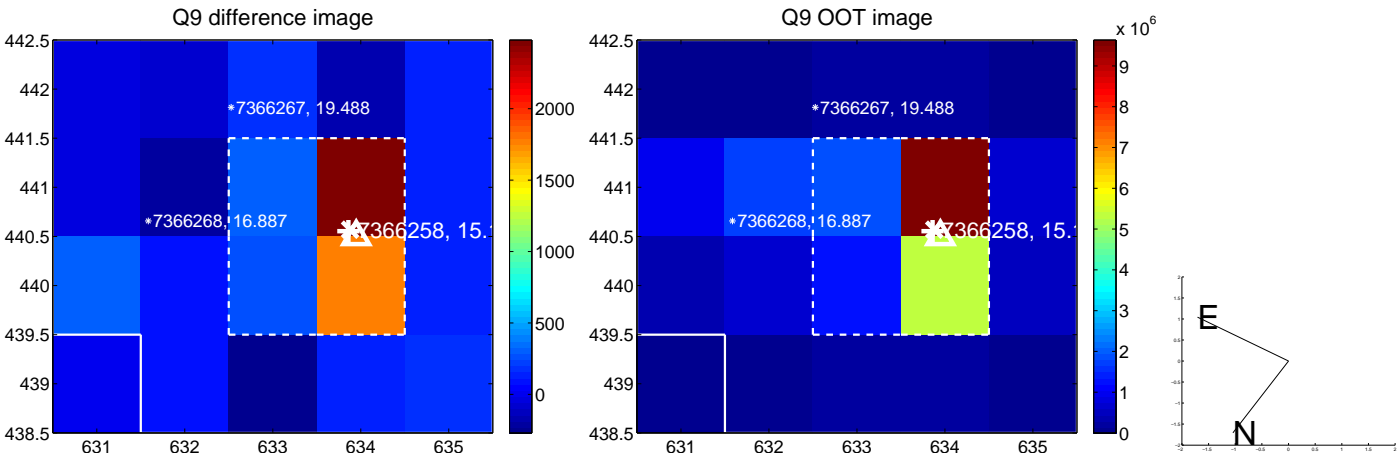
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



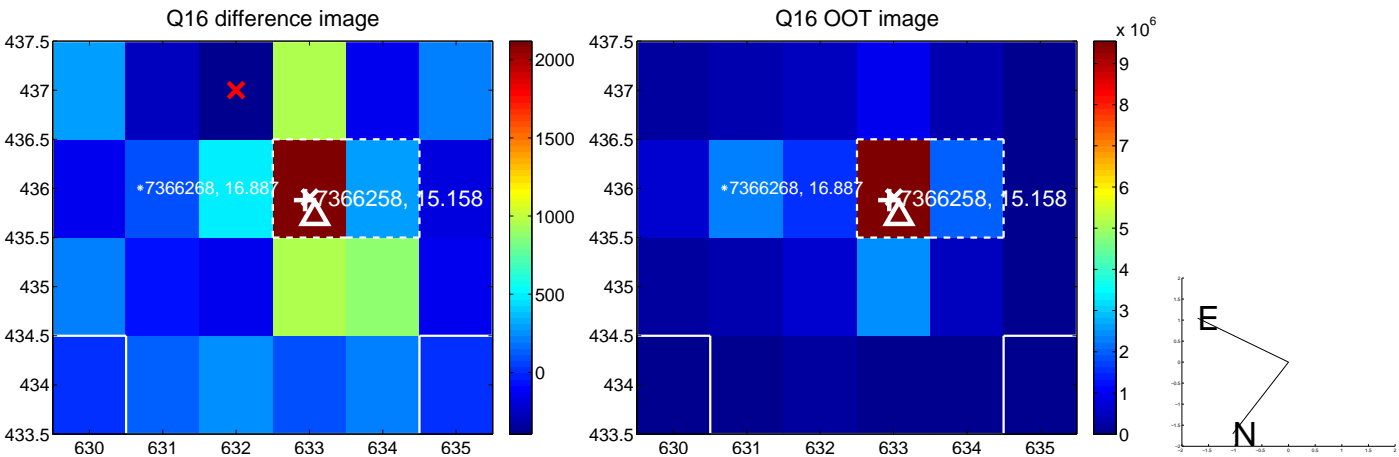
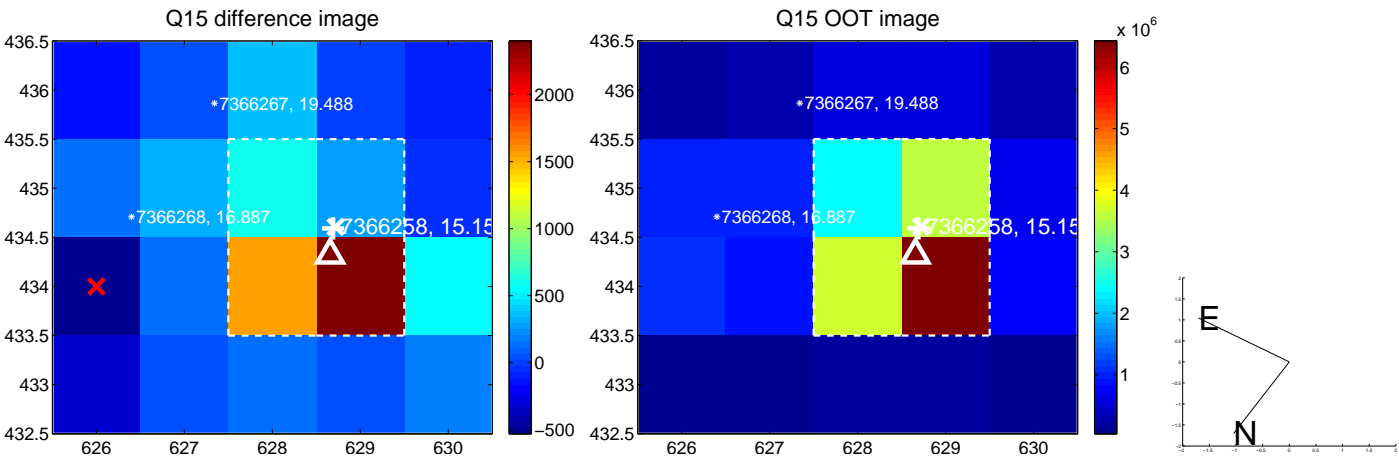
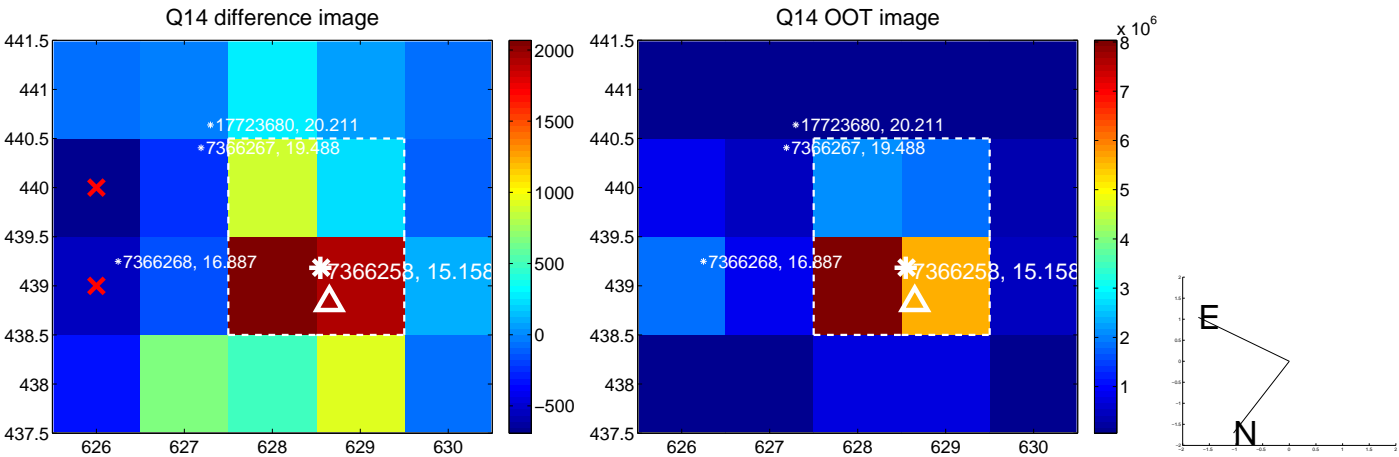
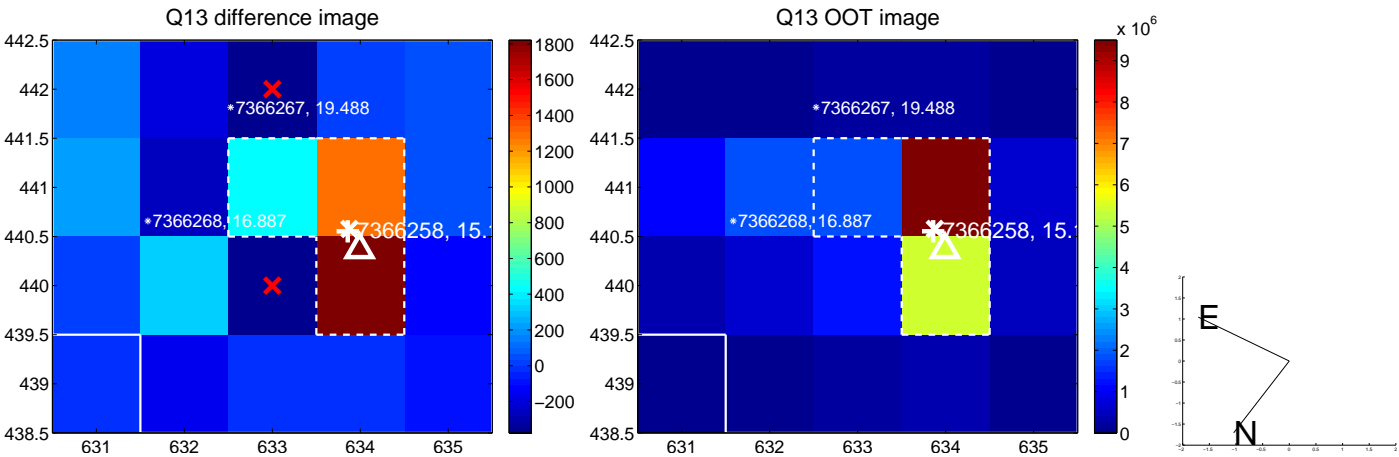
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



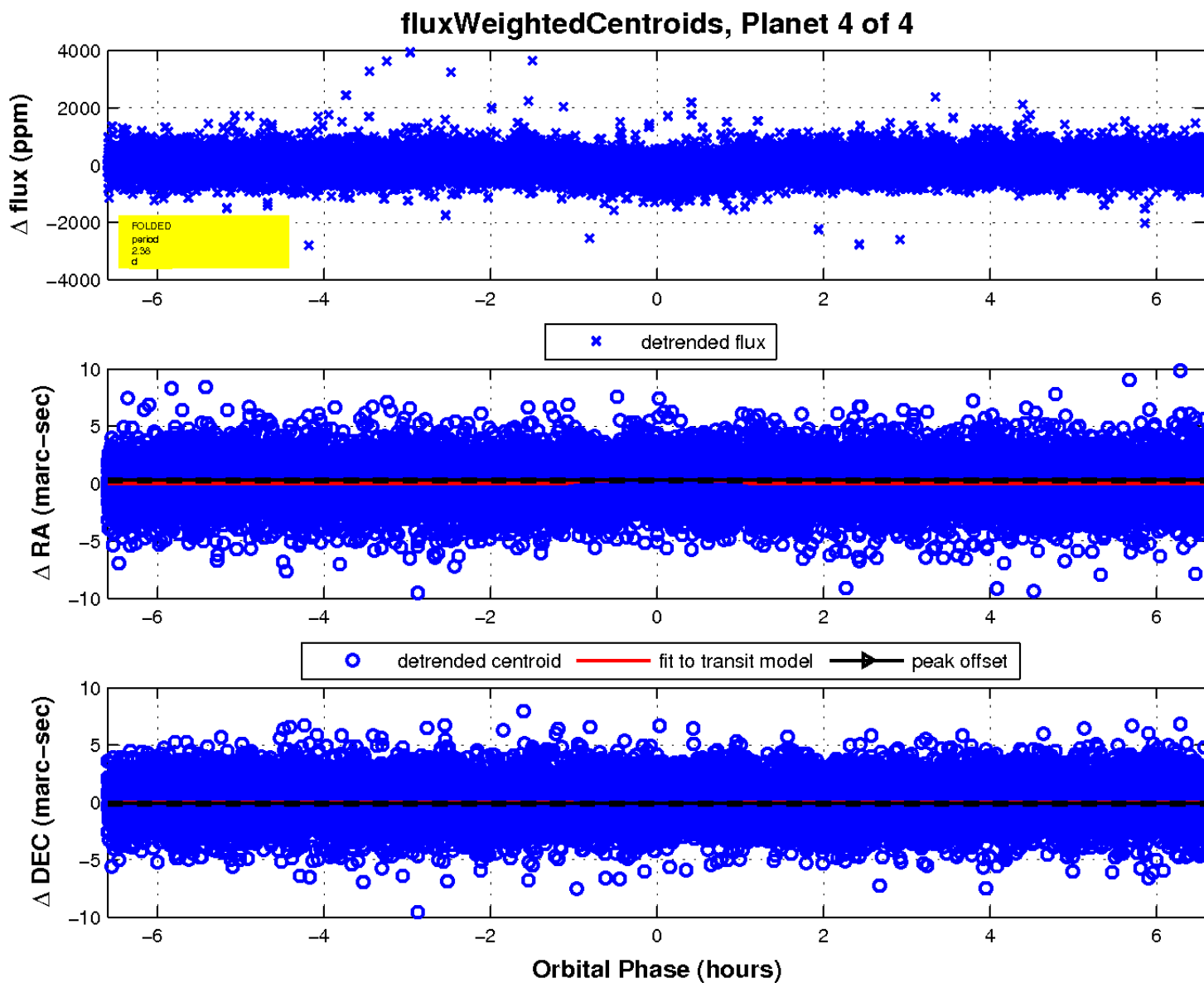
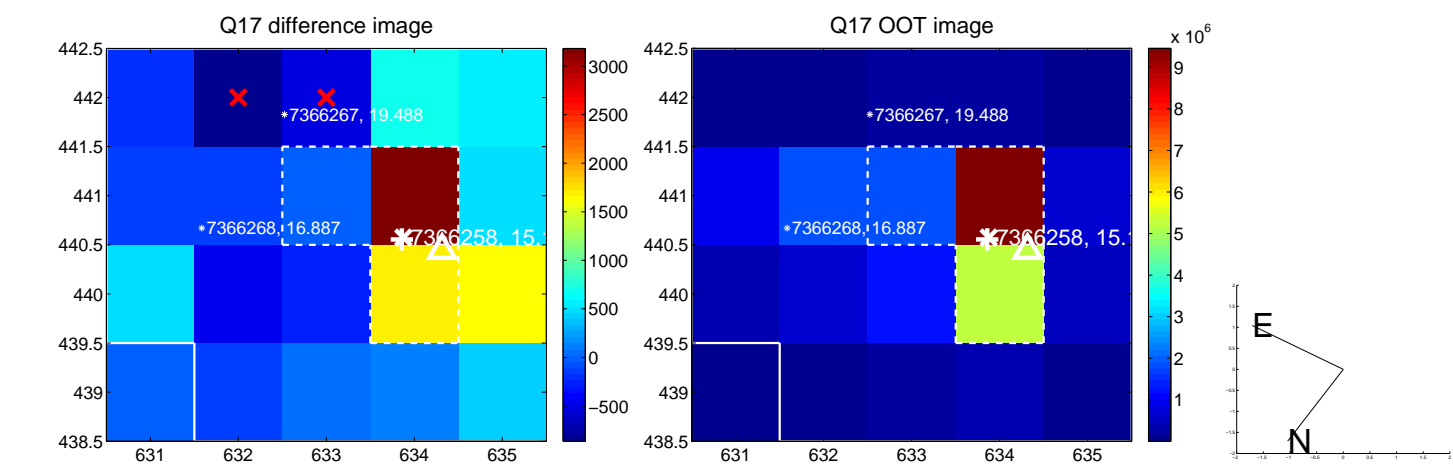
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

