

# KIC 004937435

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004937435-01	OBS	No	0.505736	131.930441	245.9	0.975	10.4	10.2	3.43	8018	5.51	0.00
004937435-02	OBS	No	0.505736	131.685441	224.5	1.193	10.4	10.4	3.43	8018	6.03	0.00

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004937435-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
004937435-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD

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

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

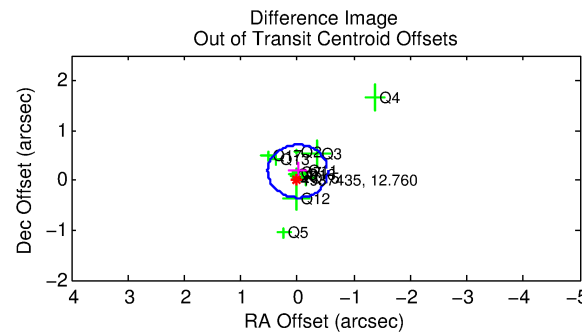
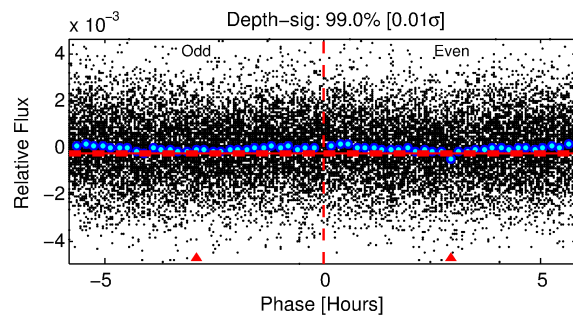
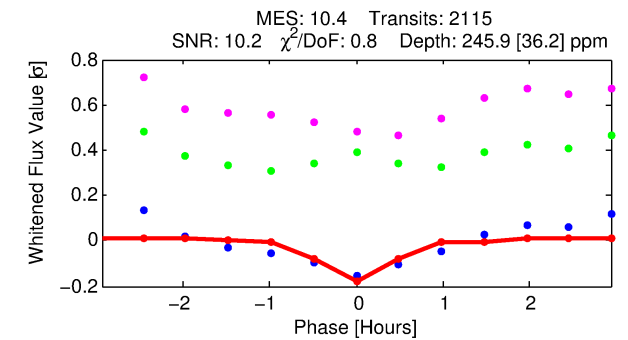
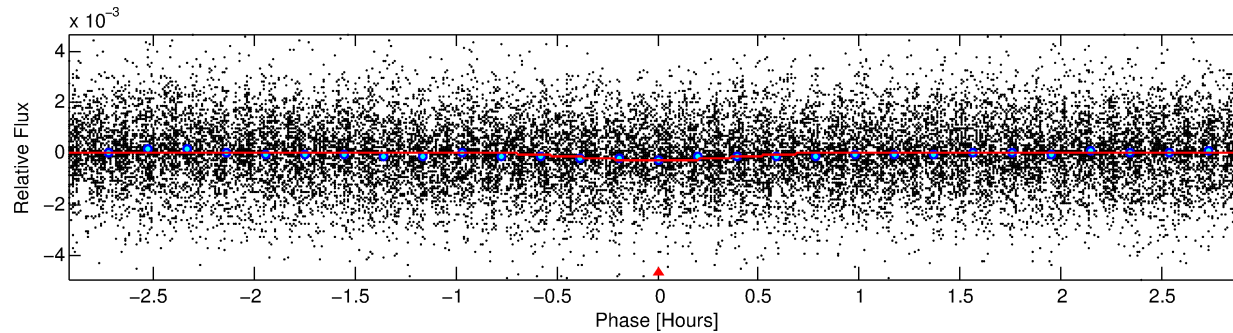
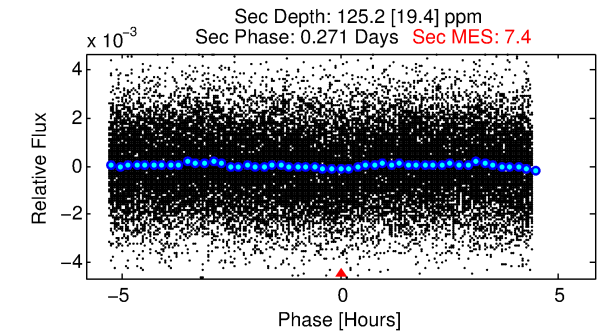
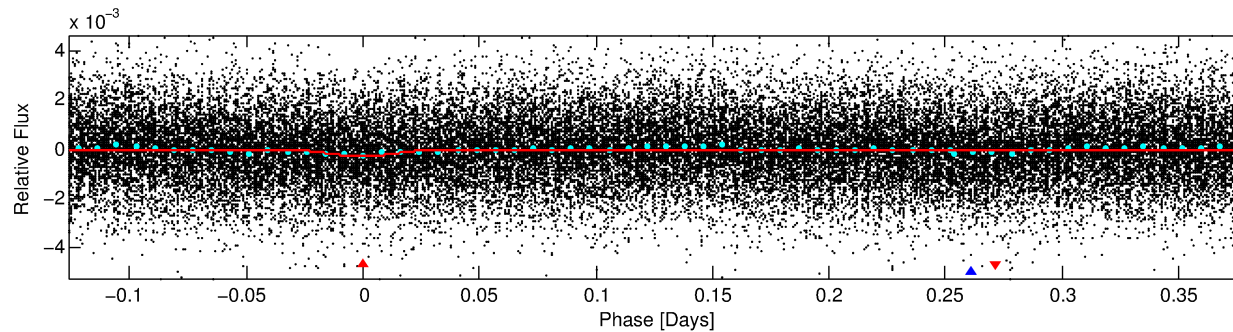
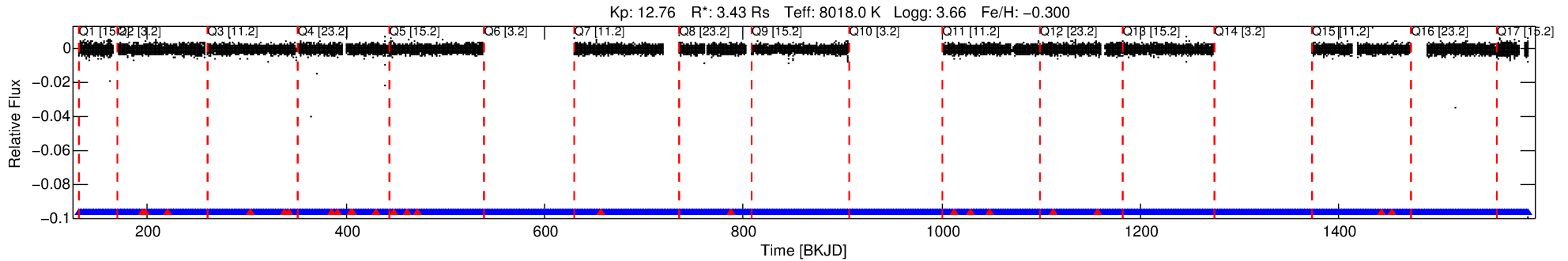
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 004937435-01

No Significant Match Found

# DV One-Page Summary

KIC: 4937435 Candidate: 1 of 2 Period: 0.506 d



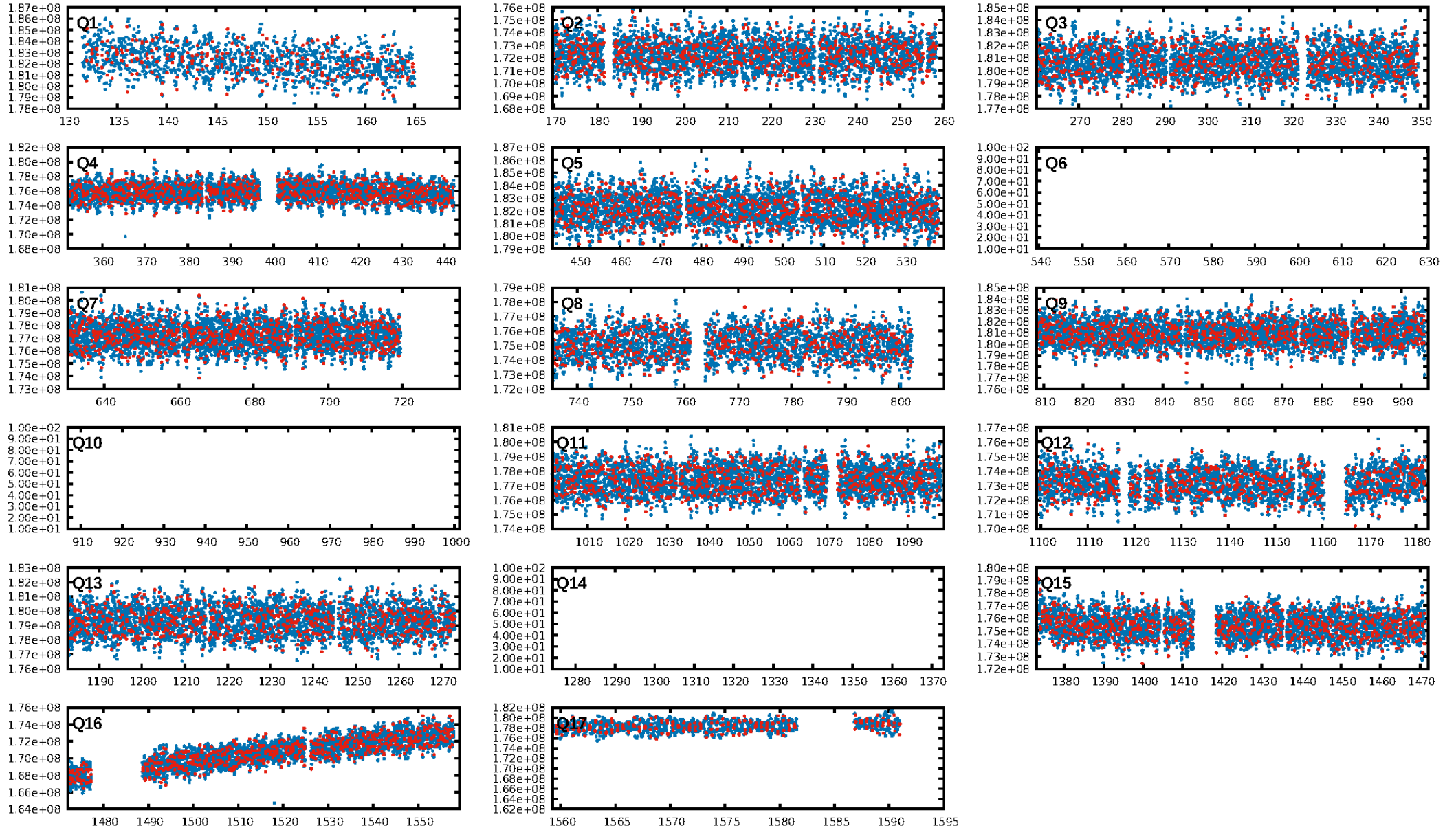
## DV Fit Results:

Period = 0.50574 [0.00001] d  
Epoch = 131.9304 [0.0018] BKJD  
Rp/R\* = 0.0147 [0.0129]  
a/R\* = 3.90 [17.67]  
b = 0.29 [15.12]  
Seff = N/A  
Teq = N/A  
Rp = 5.51 [5.51] Re  
a = N/A  
Ag = N/A  
Teffp = N/A

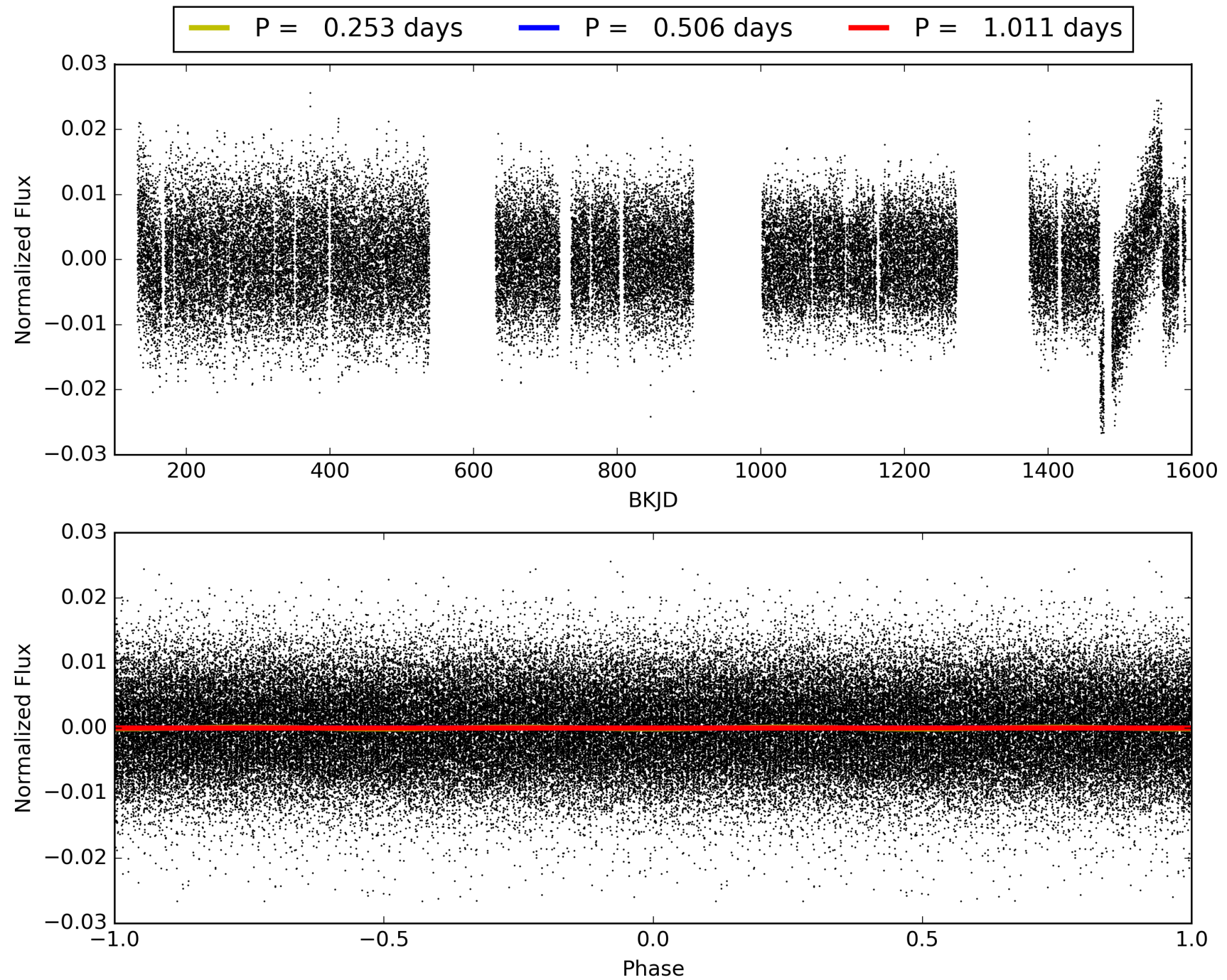
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 4.56e-43  
RollingBand-fgt: 0.99 [1973/1996]  
GhostDiagnostic-chr: 2.383  
Centroid-sig: 0.0%  
Centroid-so: 0.171 arcsec [1.44σ]  
OotOffset-rm: 0.177 arcsec [1.00σ]  
KicOffset-rm: 0.018 arcsec [0.09σ]  
OotOffset-st: 1/4/4/4 [13]  
KicOffset-st: 1/4/4/4 [13]  
DiffImageQuality-fgm: 0.85 [11/13]  
DiffImageOverlap-fno: 0.00 [0/14]

# TCE 004937435-01, PDC Light Curves

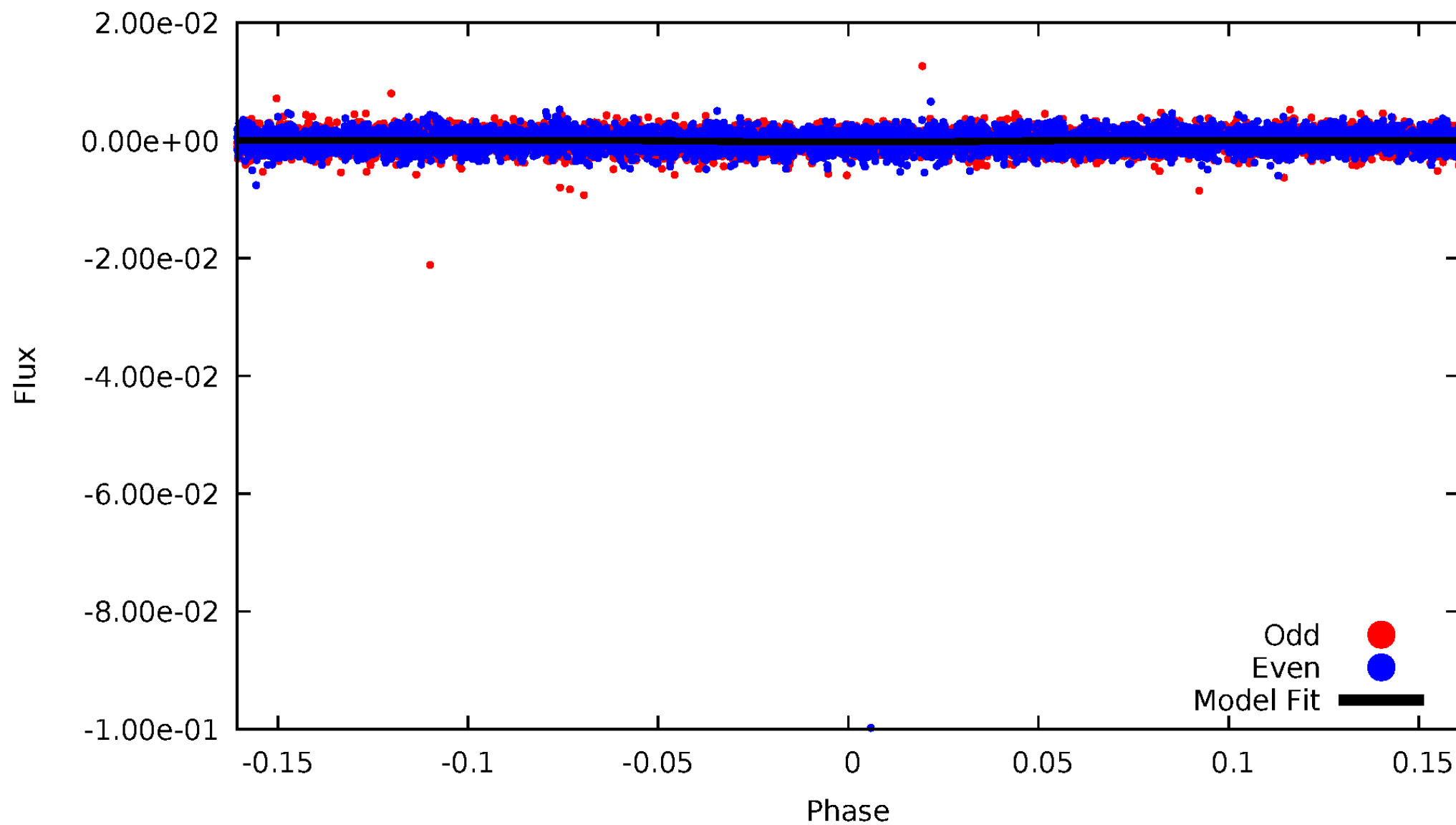


TCE 004937435-01



# DV Odd/Even

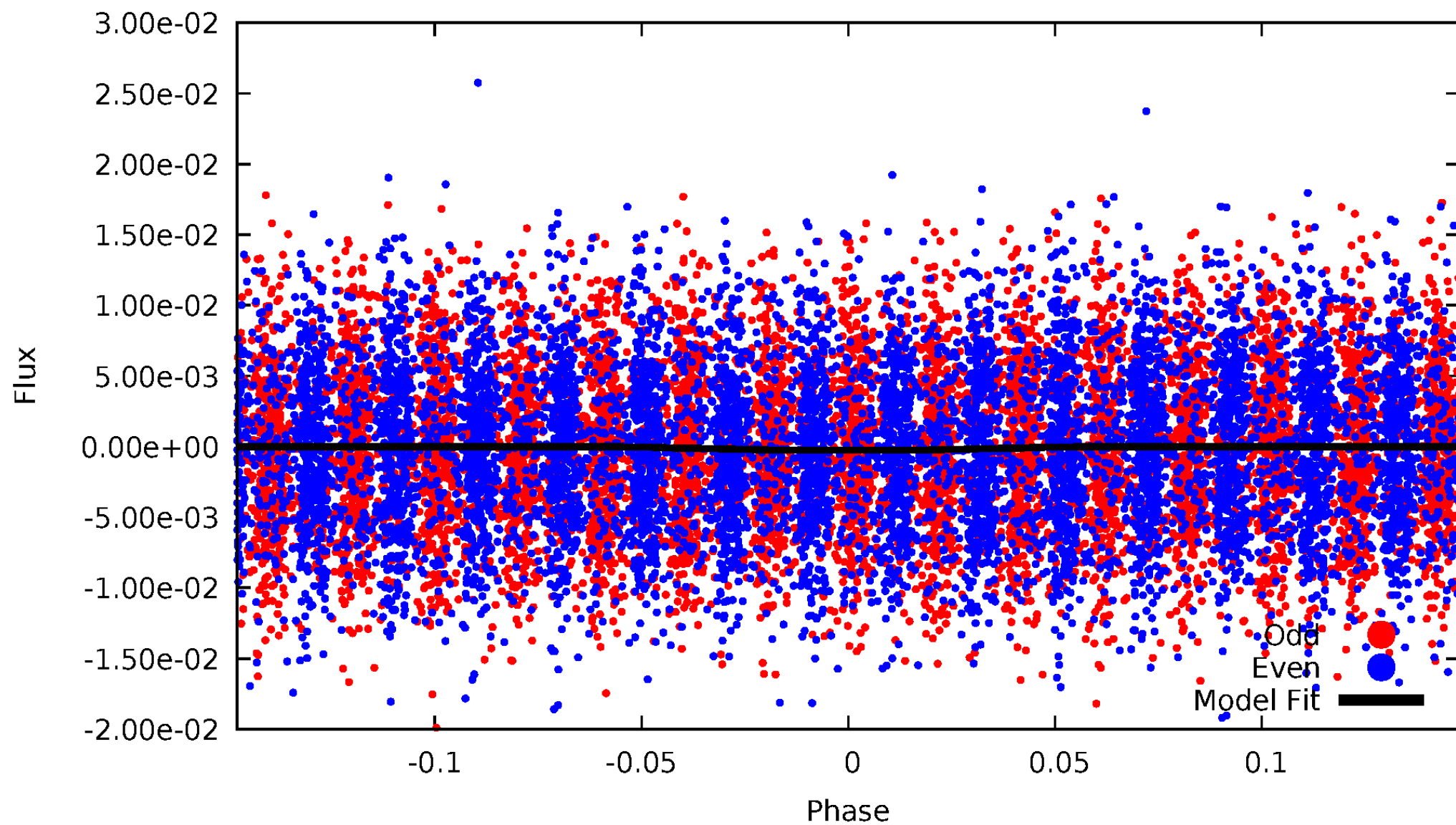
TCE 004937435-01





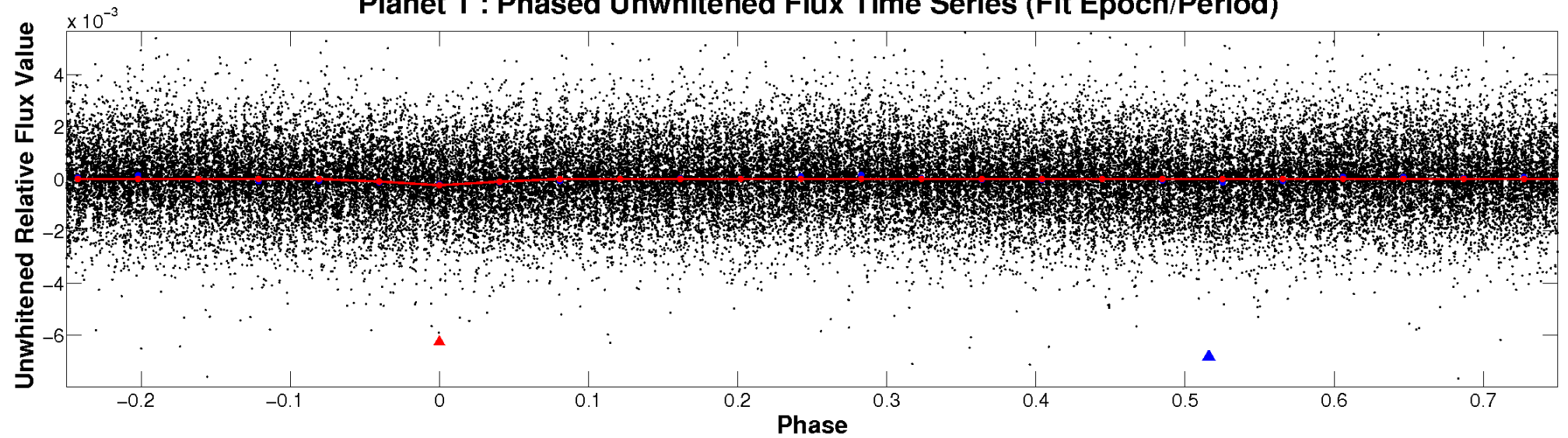
# ALT Odd/Even

TCE 004937435-01

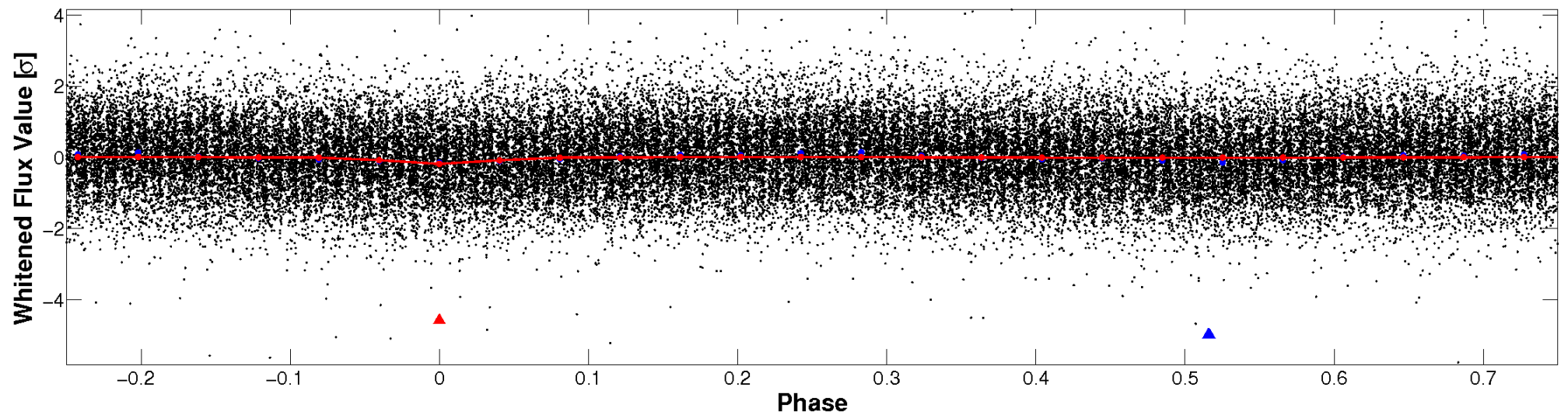


# Non-Whitened Vs. Whitened Light Curve

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

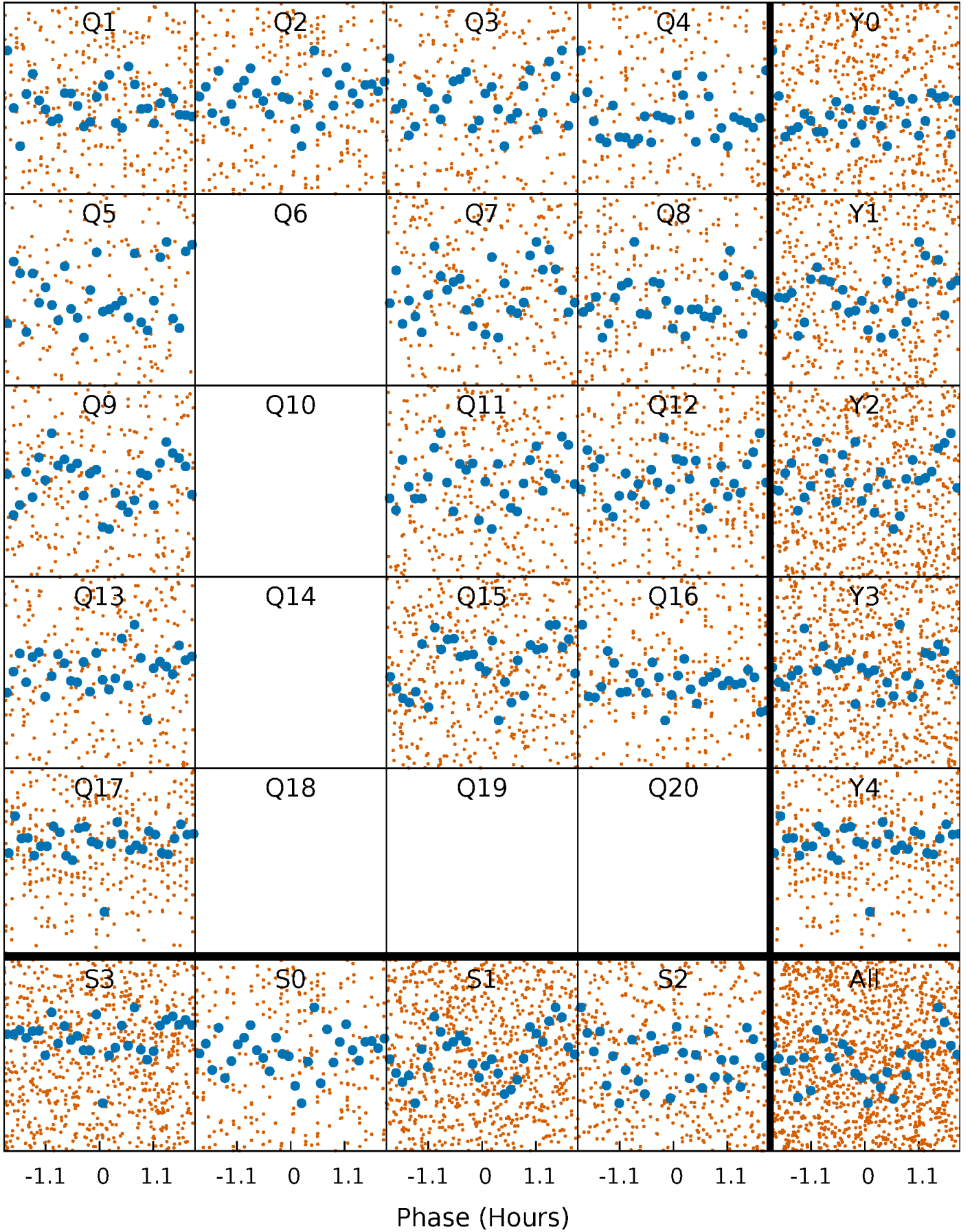


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

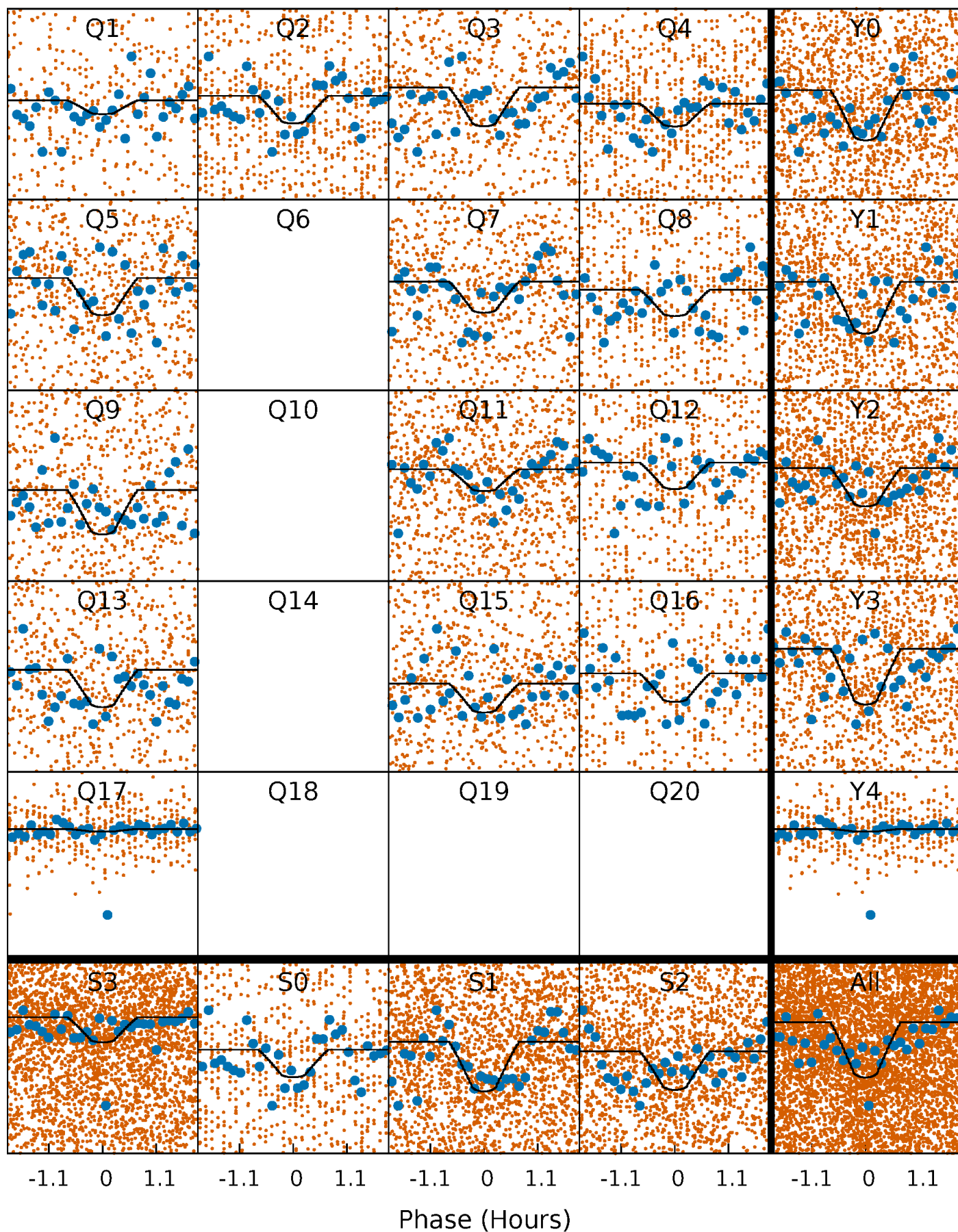
TCE 004937435-01   P= 0.505736 Days    $T_0=131.930441$  (BKJD)





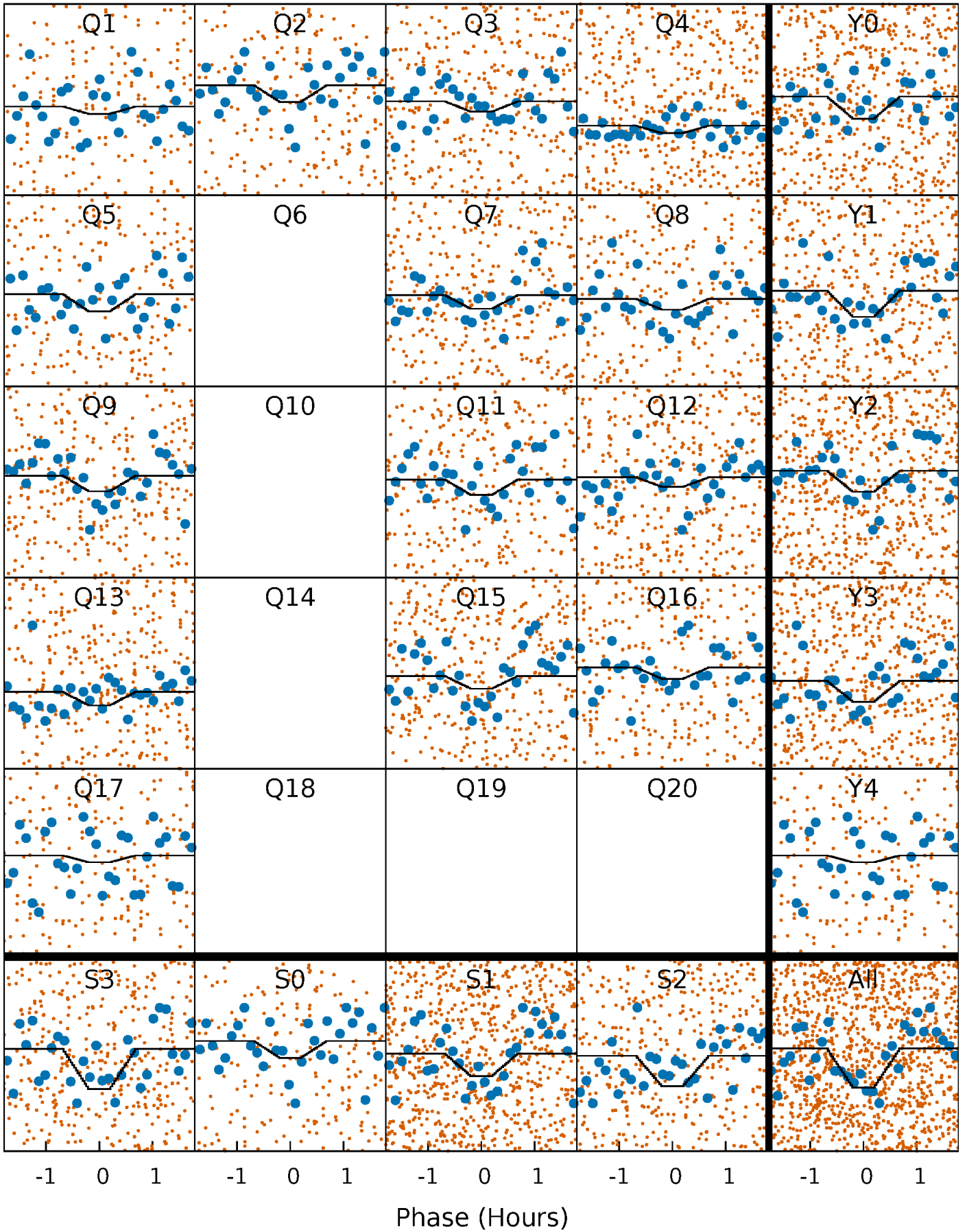
# DV Quarter-Phased Transit Curves

TCE 004937435-01 P= 0.505736 Days  $T_0=131.930441$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

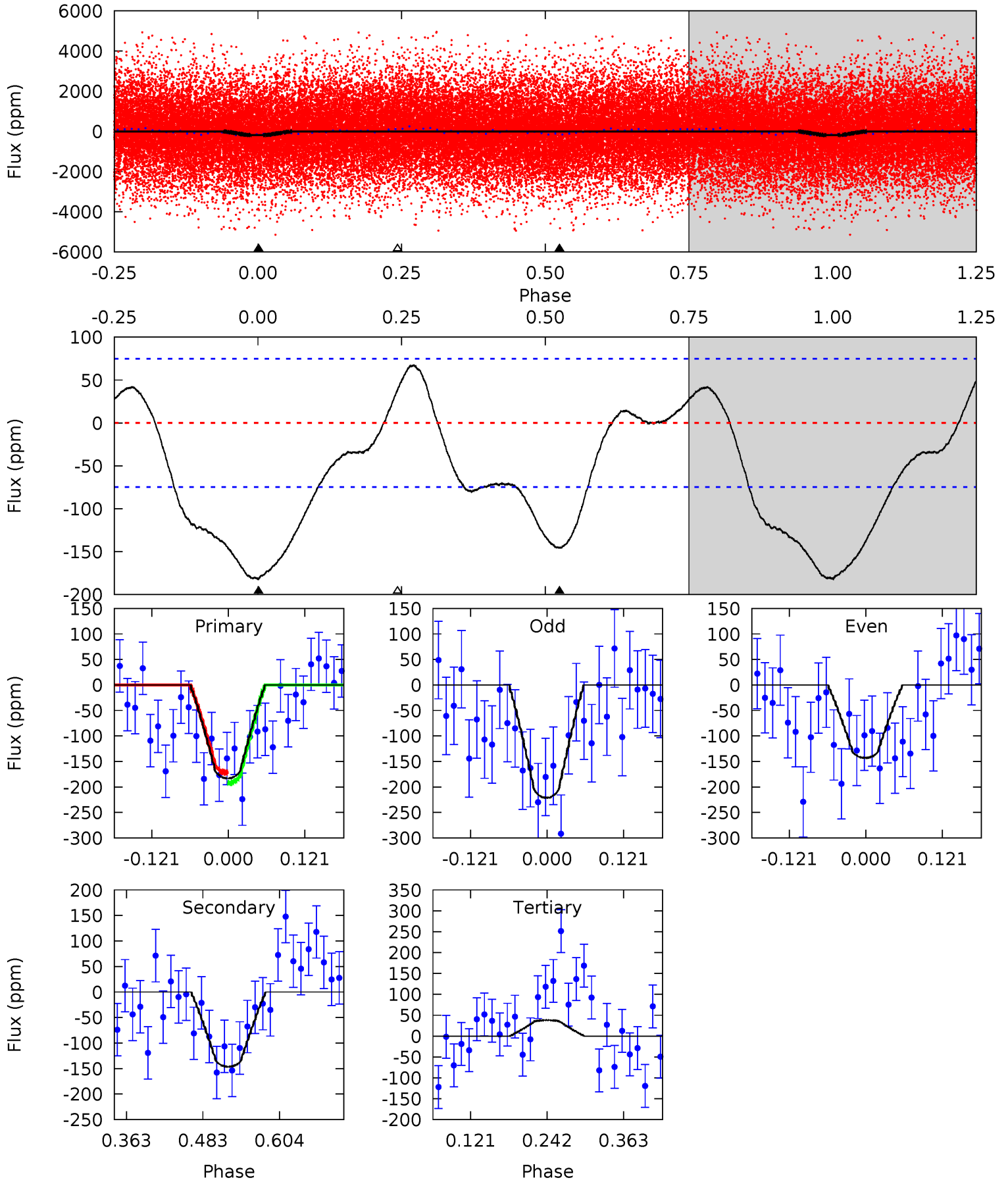
TCE 004937435-01 P= 0.505744 Days  $T_0=131.931573$  (BKJD)



# DV Model-Shift Uniqueness Test

004937435-01, P = 0.505736 Days, E = 131.424705 Days

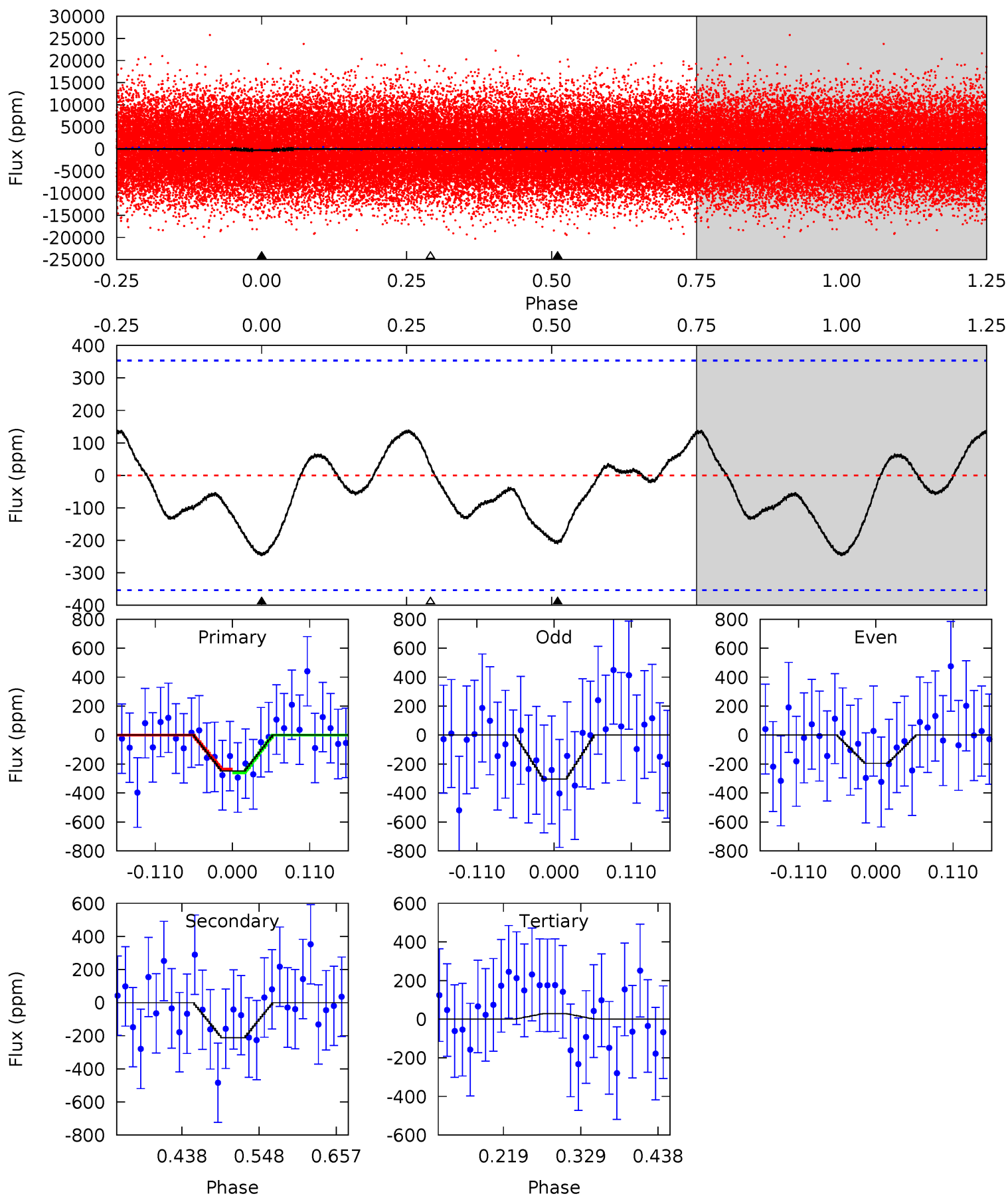
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.1	8.86	-2.31	0	4.52	1.55	2.68	13.4	11.1	11.2	8.86	2.38	0.95	0.27	0.62



# Alt Model-Shift Uniqueness Test

004937435-01, P = 0.505744 Days, E = 131.425829 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
3.20	2.73	-0.37	0	4.55	1.60	1.03	3.57	3.20	3.10	2.73	0.69	1.06	0.36	0.17





### Stellar Parameters For KIC 004937435

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$8018^{+223}_{-334}$	$3.662^{+0.456}_{-0.085}$	$-0.300^{+0.200}_{-0.300}$	$3.430^{+0.703}_{-1.641}$	$1.972^{+0.251}_{-0.459}$	$0.069^{+0.325}_{-0.025}$
	+3%/-4%	+12%/-2%	+67%/-100%	+20%/-48%	+13%/-23%	+473%/-36%
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 004937435-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-146 \pm 17$	$5.79^{+4.51}_{-3.72}$	$7036^{+514}_{-881}$	$5348^{+6185}_{-9995}$	$0.585^{+3.734}_{-0.399}$
Alt.	$-212 \pm 78$	$5.98^{+4.48}_{-3.43}$	$6987^{+568}_{-830}$	$5935^{+6442}_{-10166}$	$0.760^{+3.422}_{-0.536}$

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

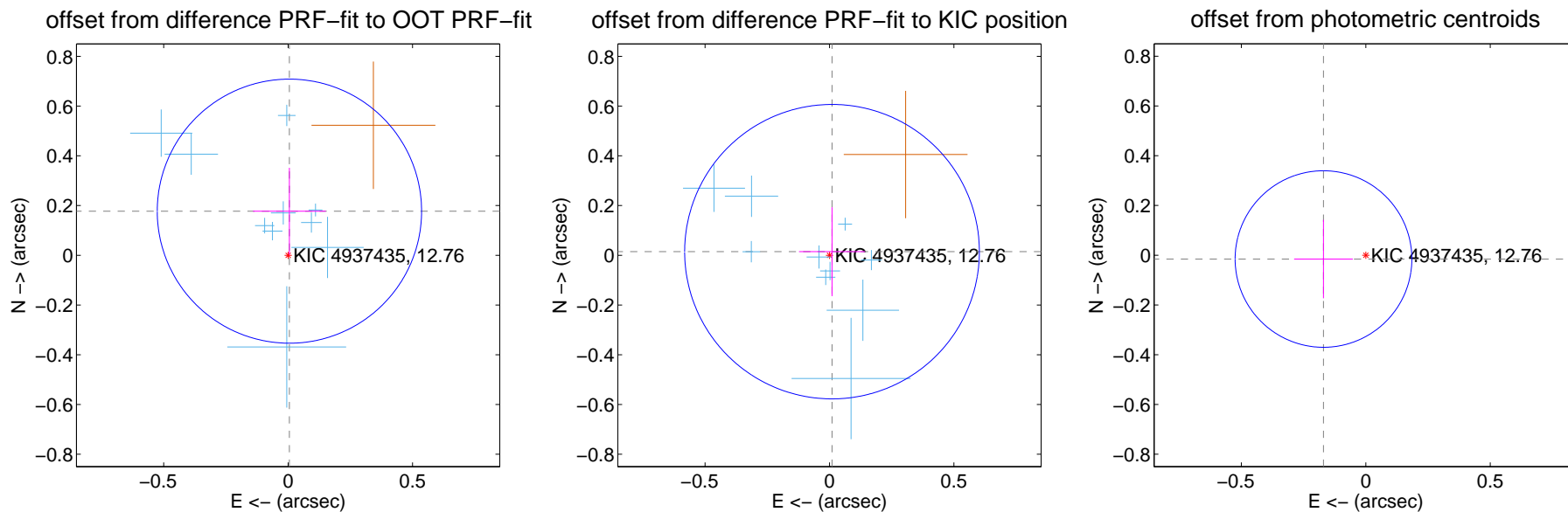
## DV Centroid Data

Supplemental centroid analysis for 004937435-01. Kepler magnitude: 12.76. Transit SNR 10.20

There are 11 quarters with good PRF difference image offsets

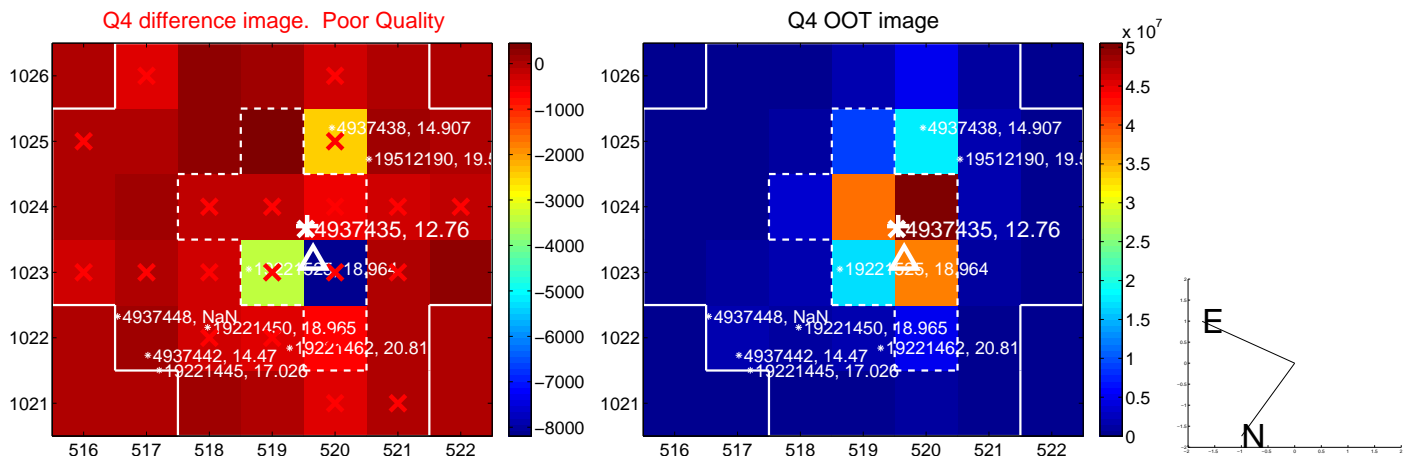
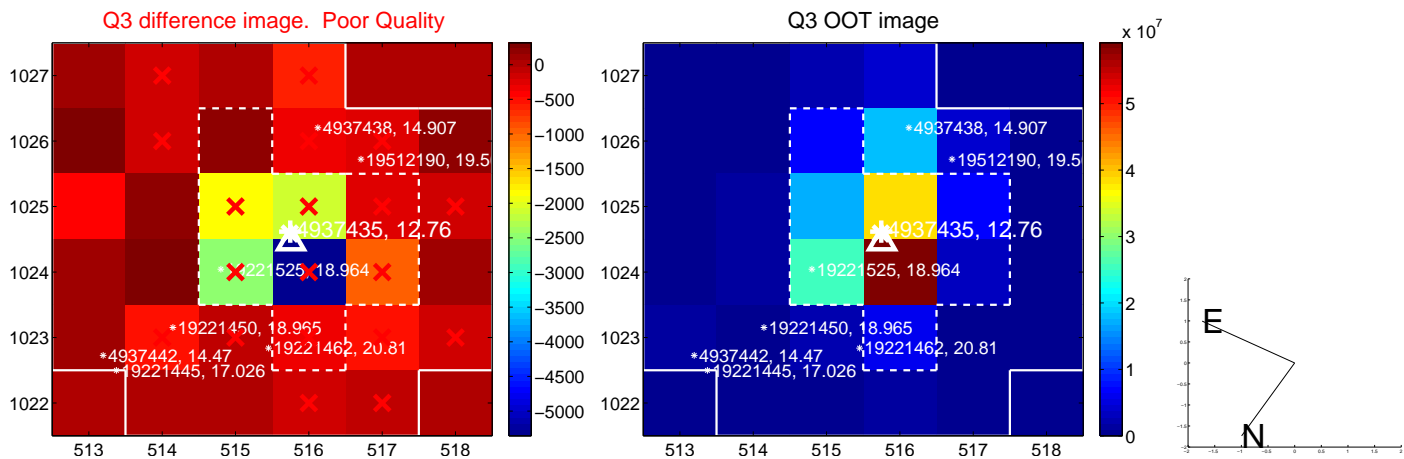
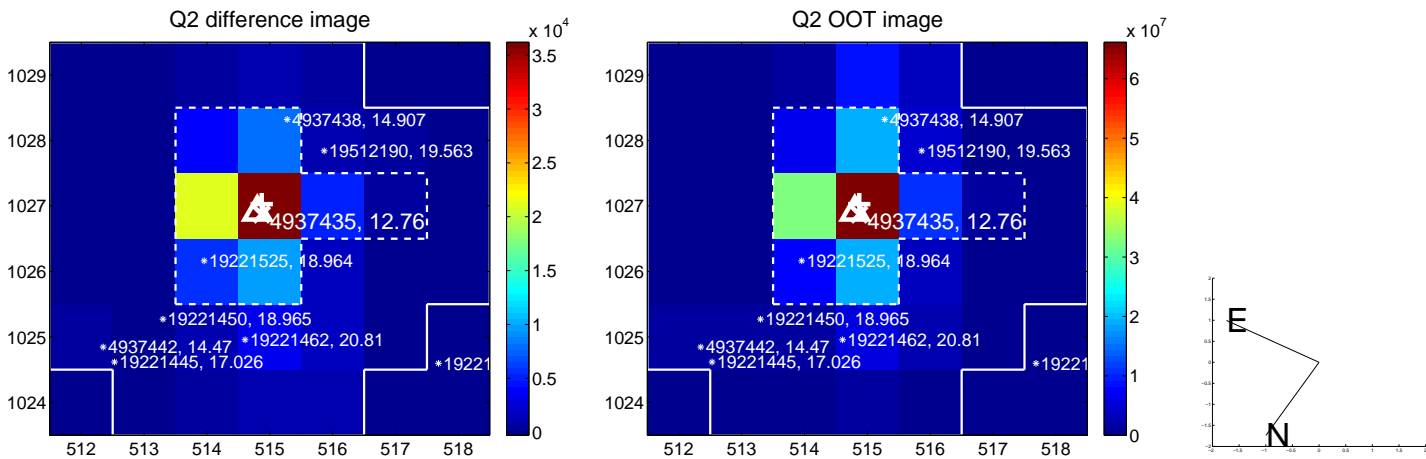
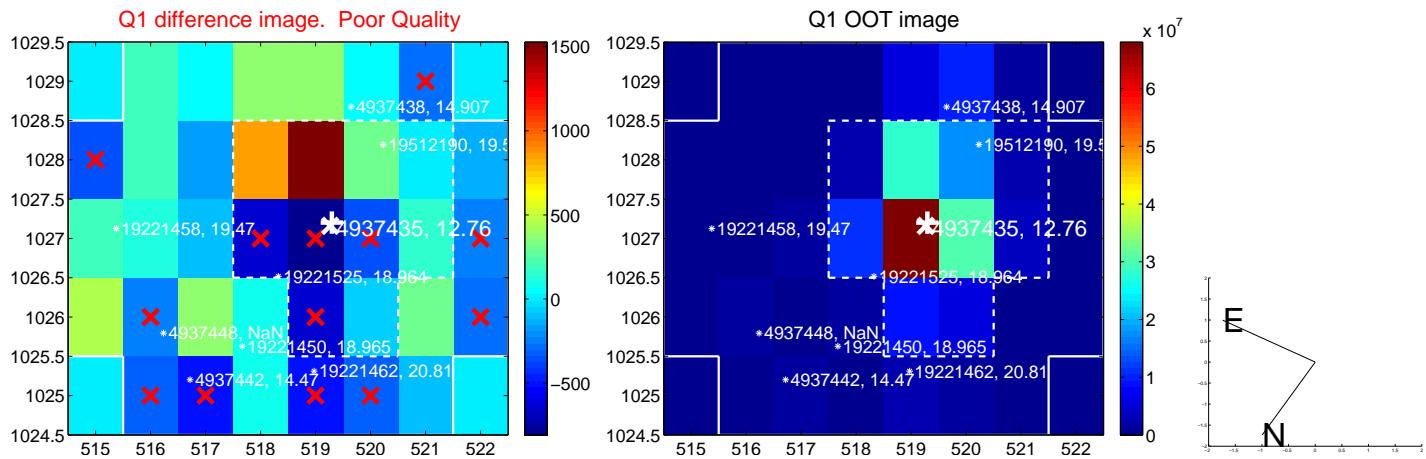
The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.177 \pm 0.177$	1.00	$-0.005 \pm 0.146$	$0.177 \pm 0.175$
PRF-fit source offset from KIC position	$0.018 \pm 0.197$	0.09	$-0.010 \pm 0.132$	$0.015 \pm 0.179$
photometric centroid source offset	$0.17 \pm 0.12$	1.44	$0.17 \pm 0.12$	$-0.02 \pm 0.16$

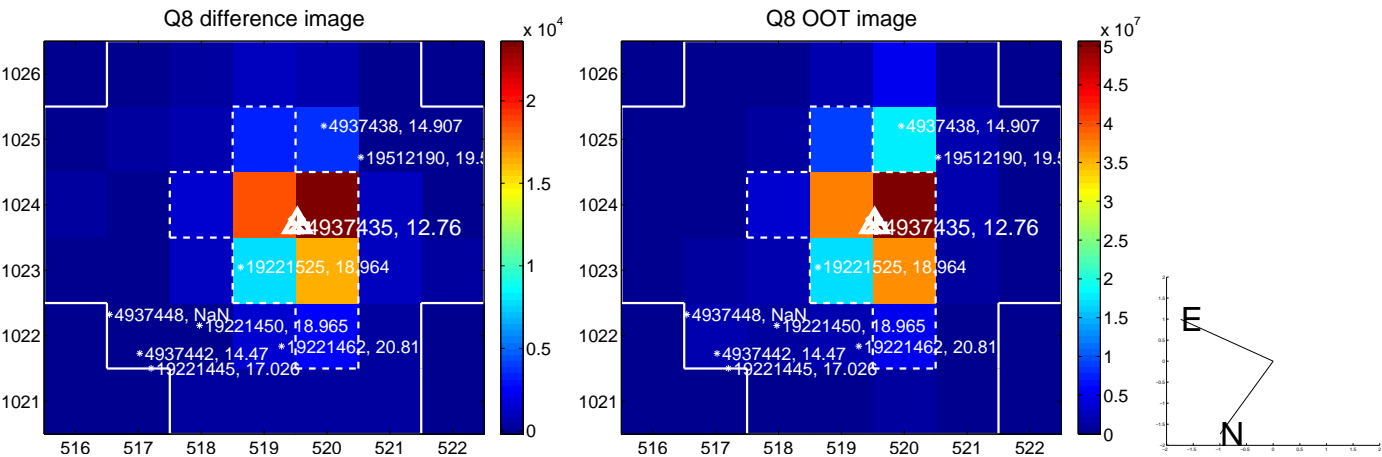
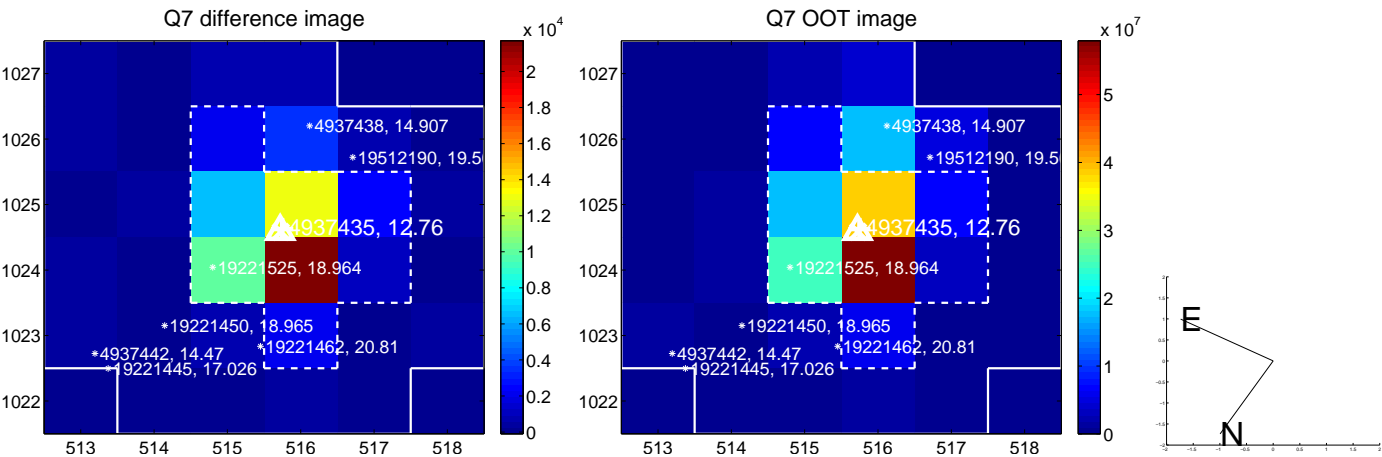
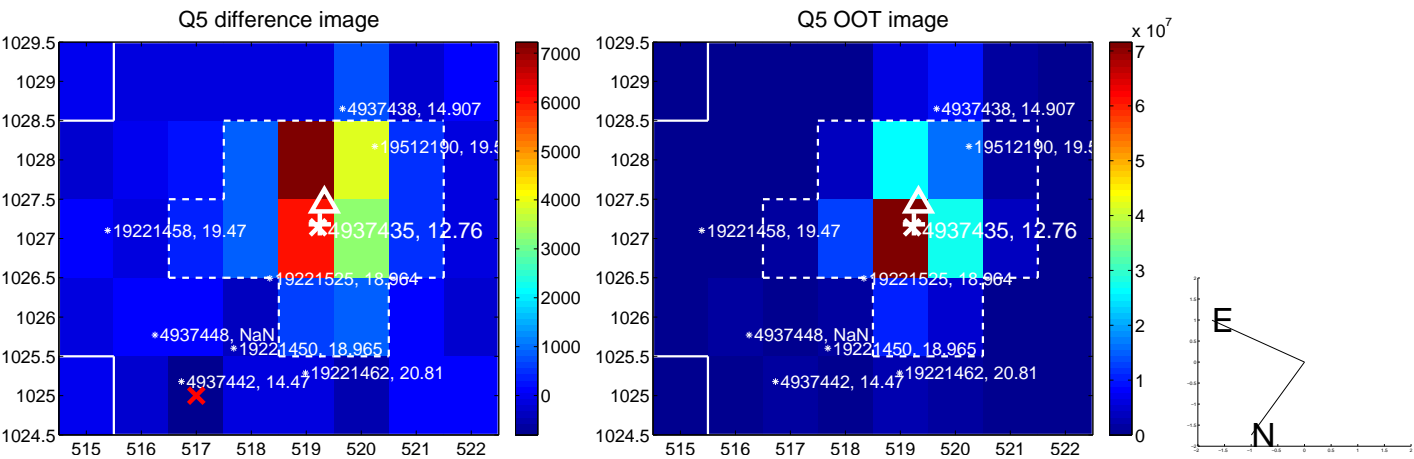


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

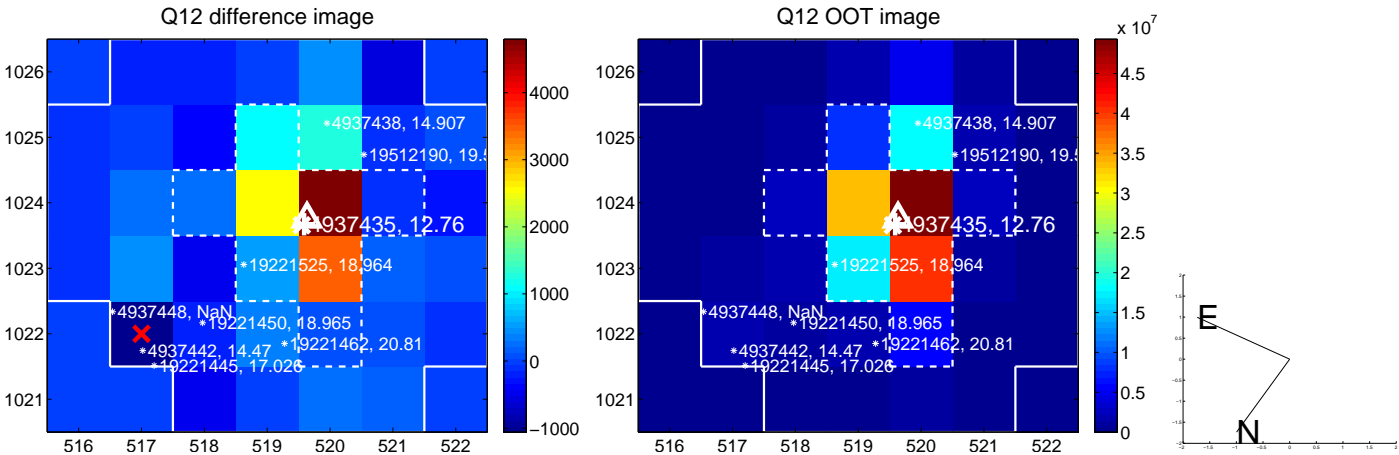
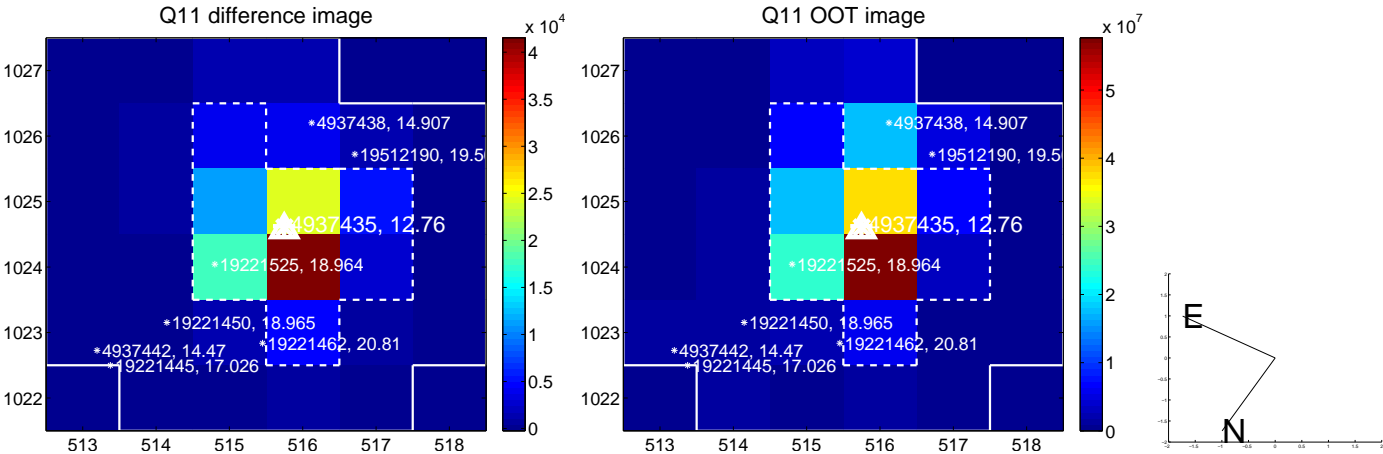
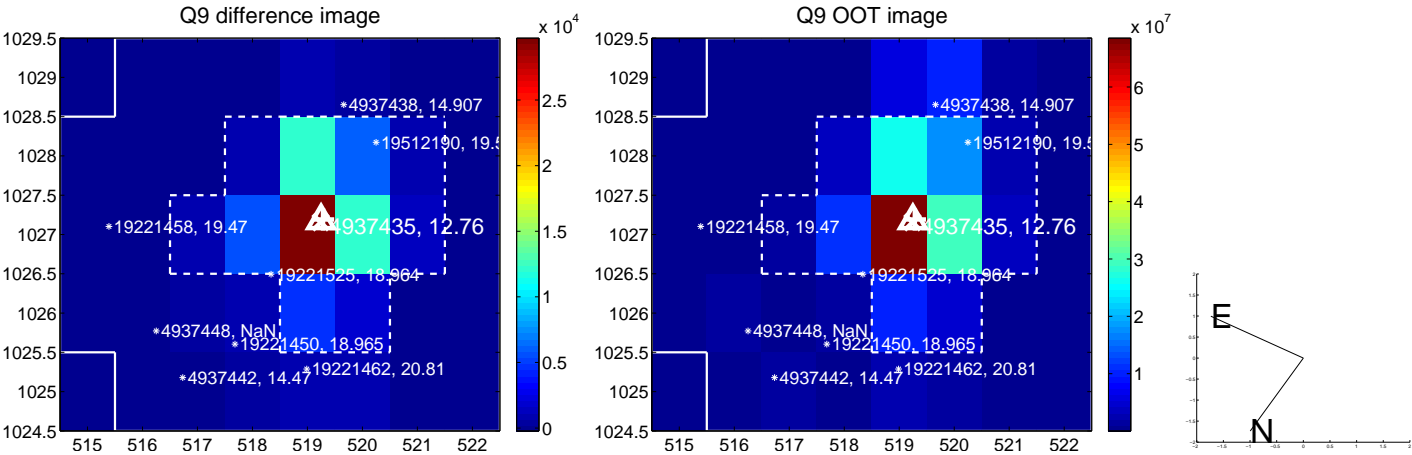


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

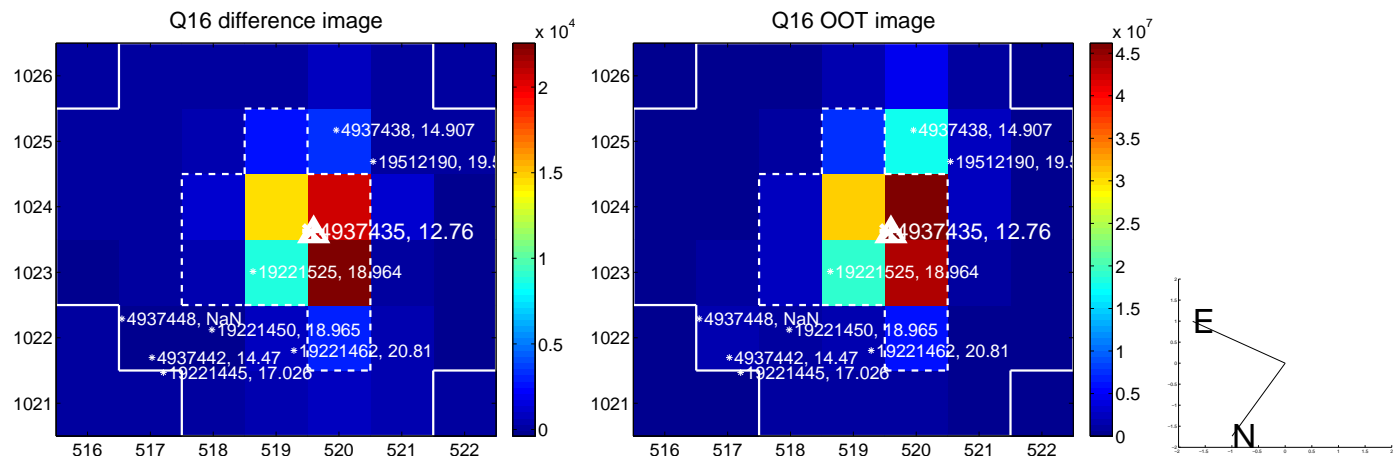
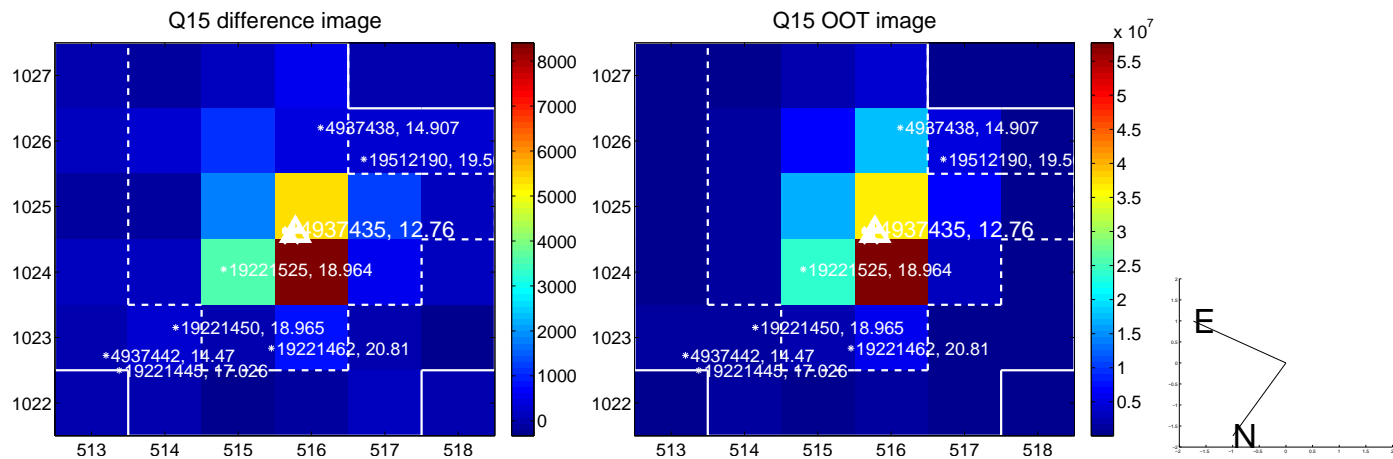
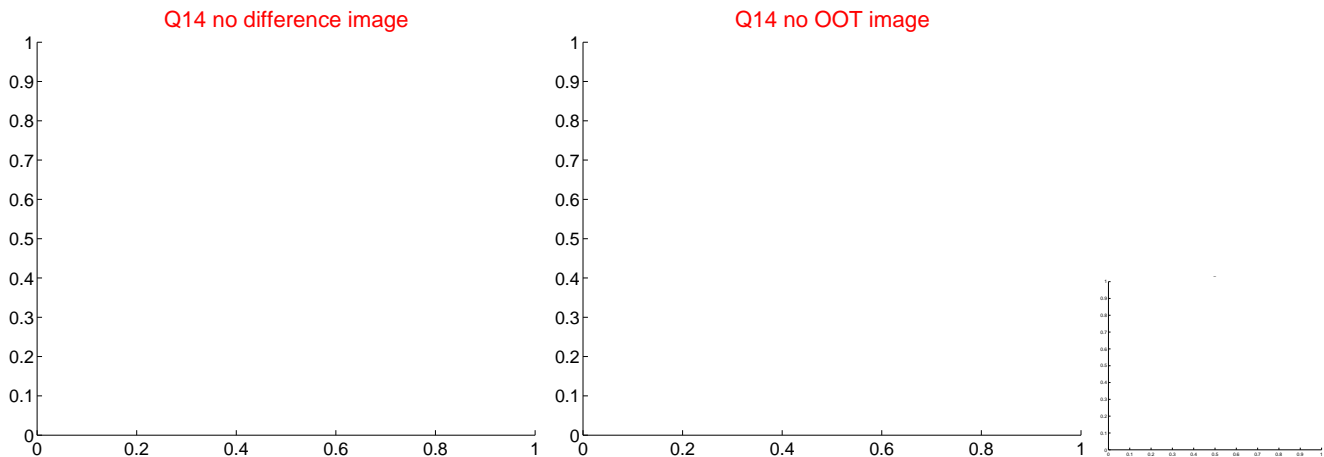
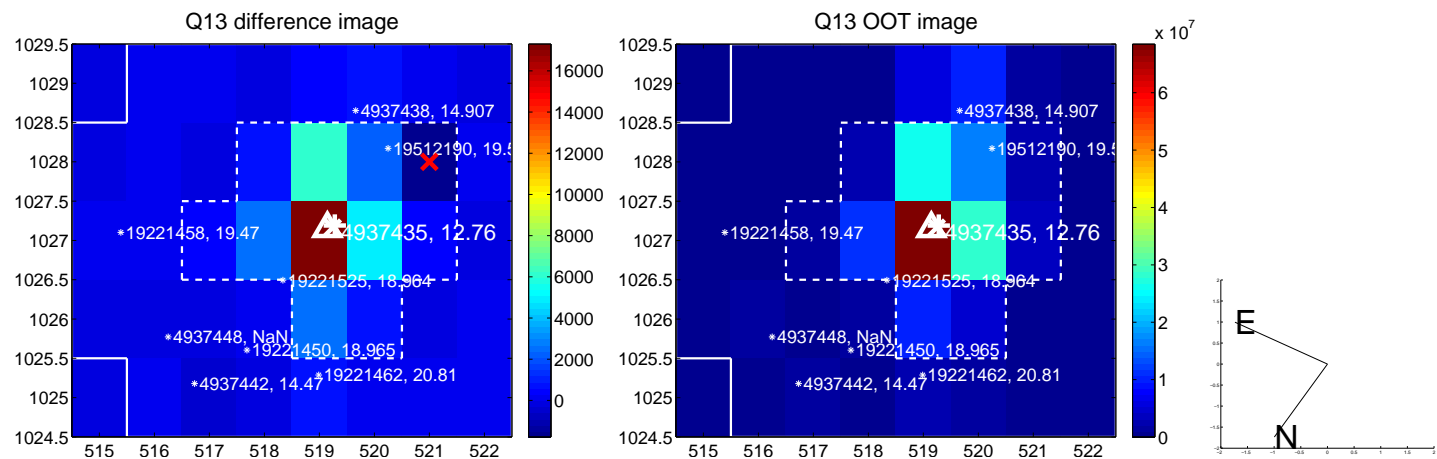




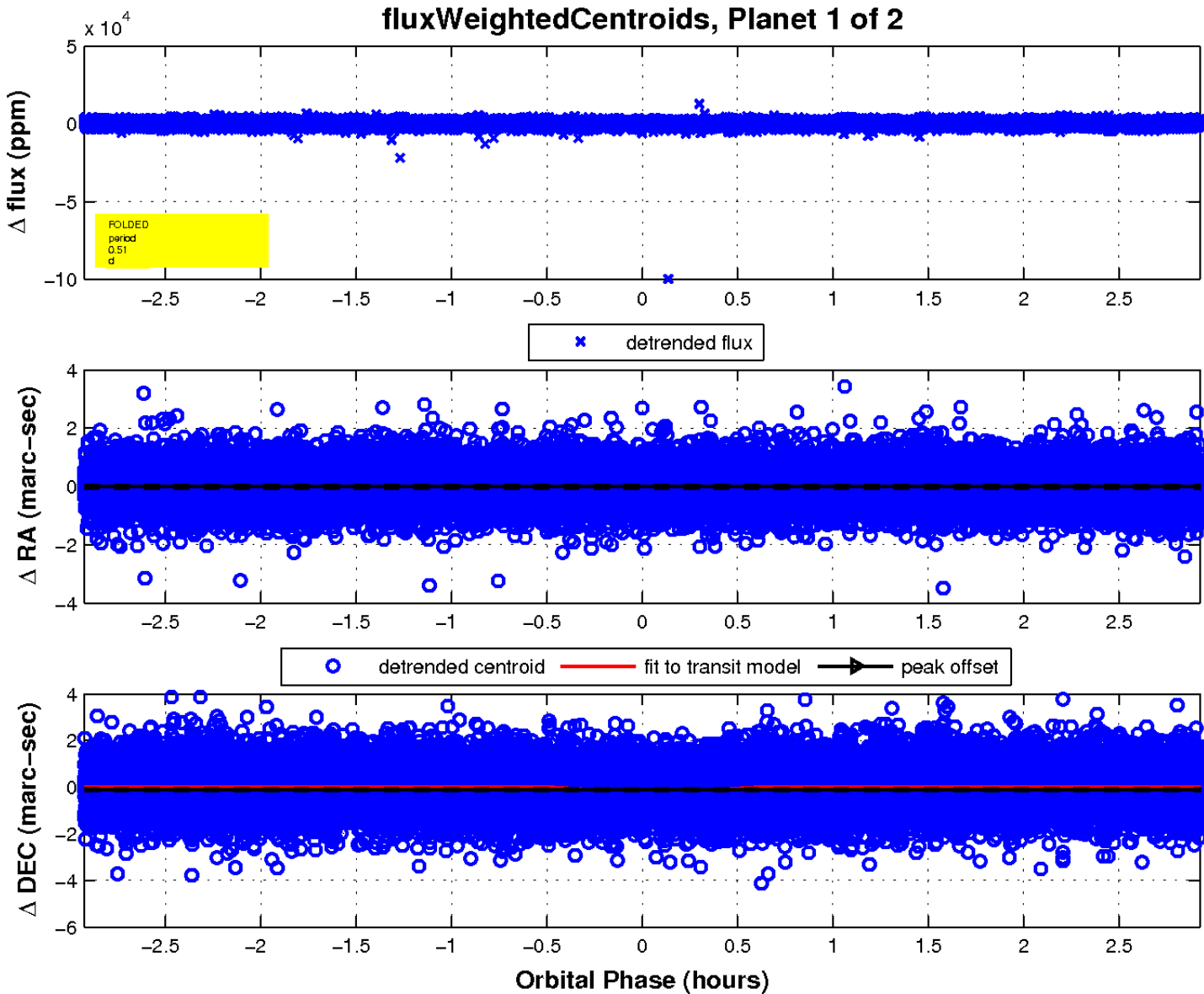
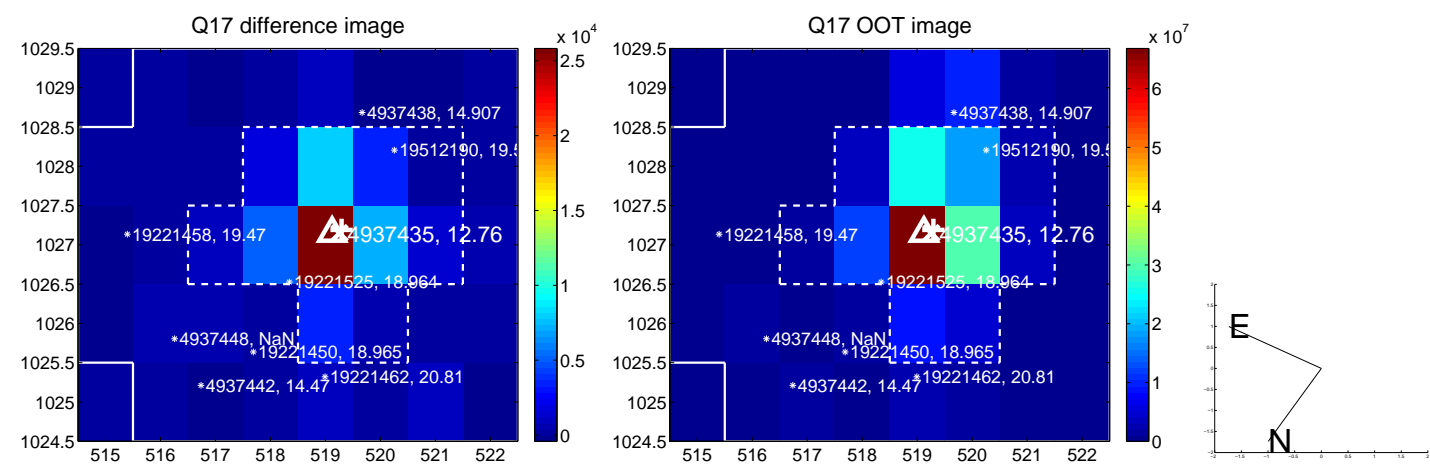
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



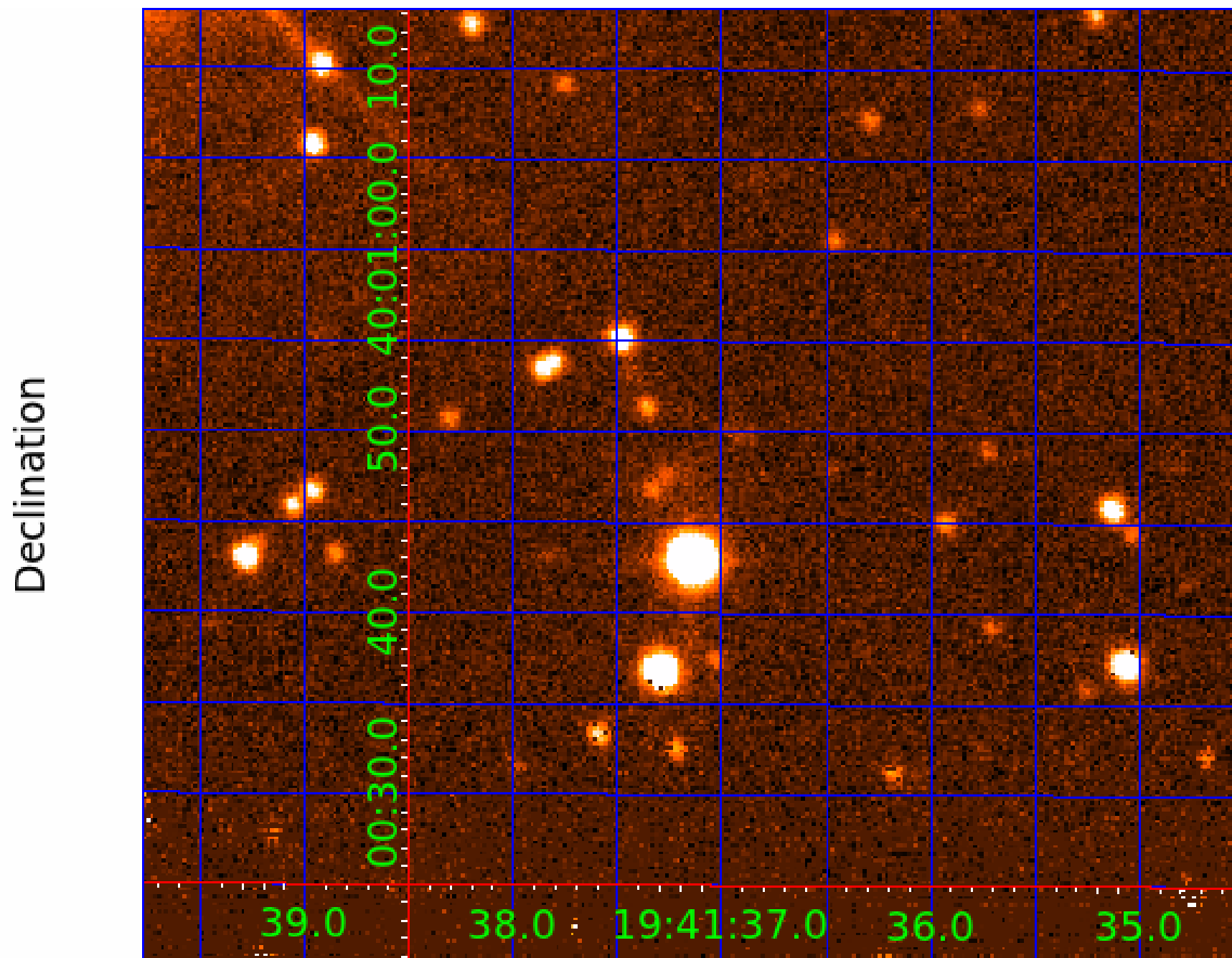
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image





# KIC 004937435

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004937435-01	OBS	No	0.505736	131.930441	245.9	0.975	10.4	10.2	3.43	8018	5.51	0.00
004937435-02	OBS	No	0.505736	131.685441	224.5	1.193	10.4	10.4	3.43	8018	6.03	0.00

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004937435-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
004937435-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD

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

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

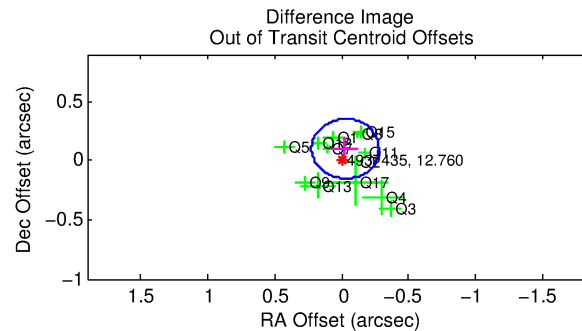
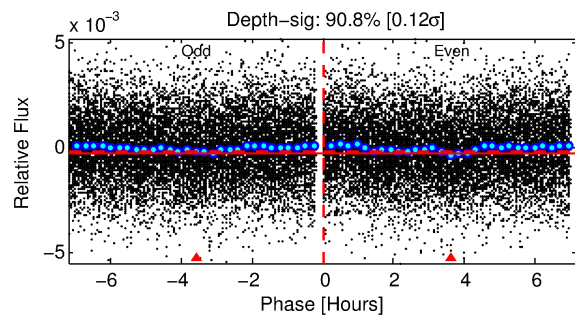
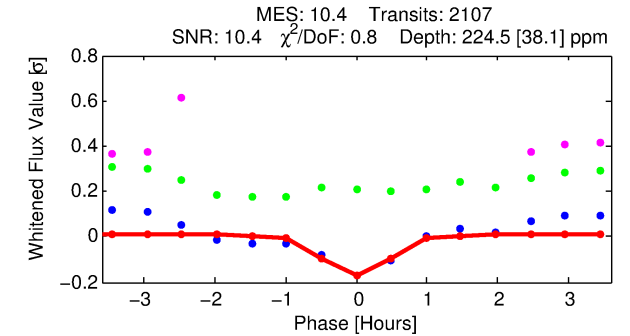
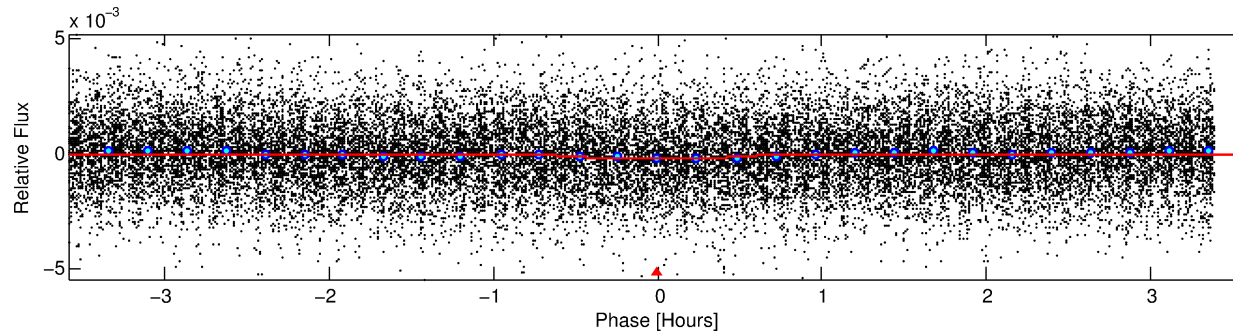
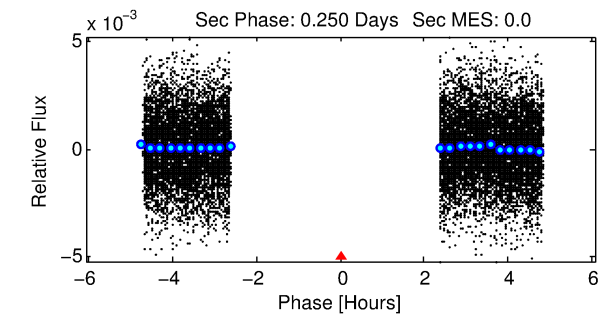
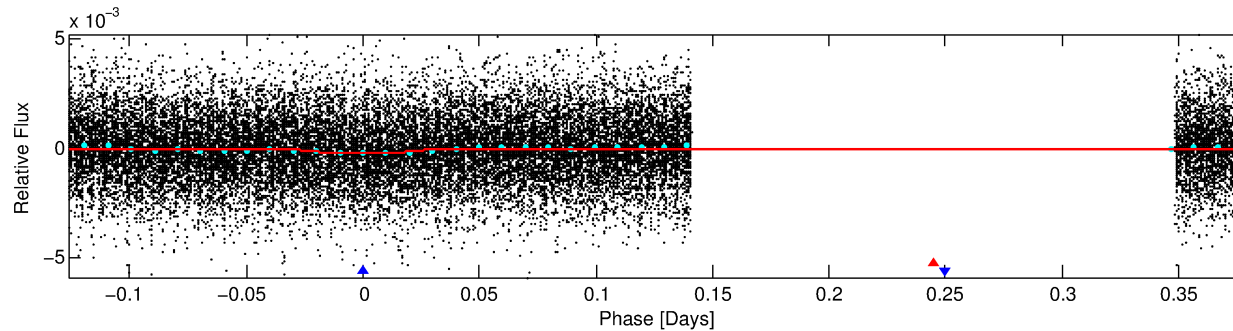
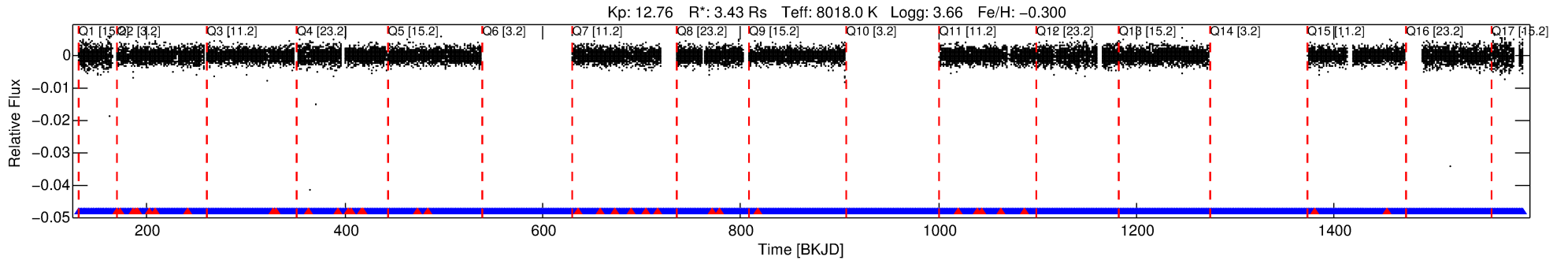
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 004937435-02

No Significant Match Found

# DV One-Page Summary

KIC: 4937435 Candidate: 2 of 2 Period: 0.506 d



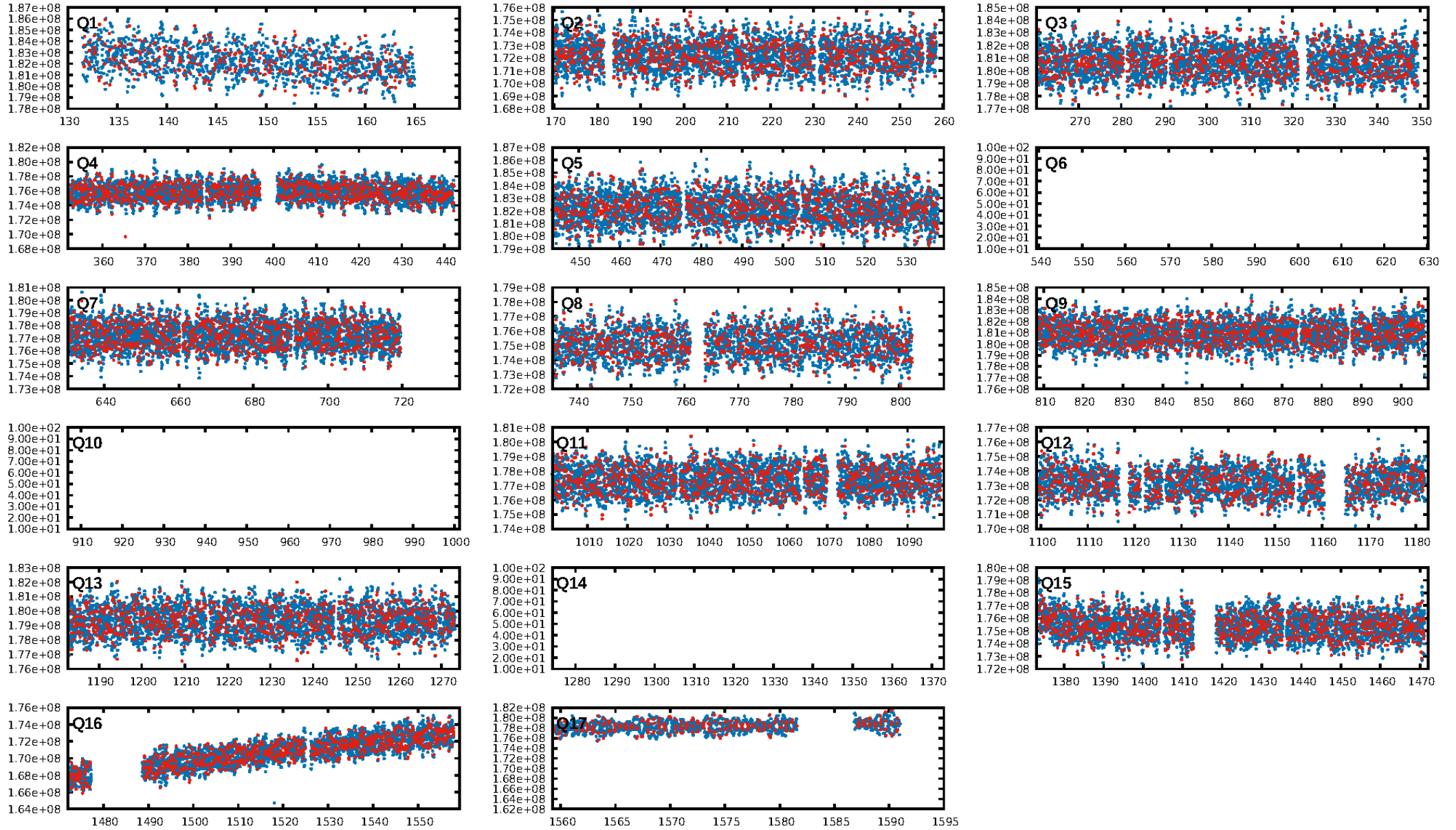
## DV Fit Results:

Period = 0.50574 [0.00001] d  
Epoch = 131.6854 [0.0020] BKJD  
Rp/R\* = 0.0161 [0.0095]  
a/R\* = 1.80 [4.30]  
b = 0.90 [0.75]  
Seff = N/A  
Teq = N/A  
Rp = 6.03 [4.57] Re  
a = N/A  
Ag = N/A  
Teffp = N/A

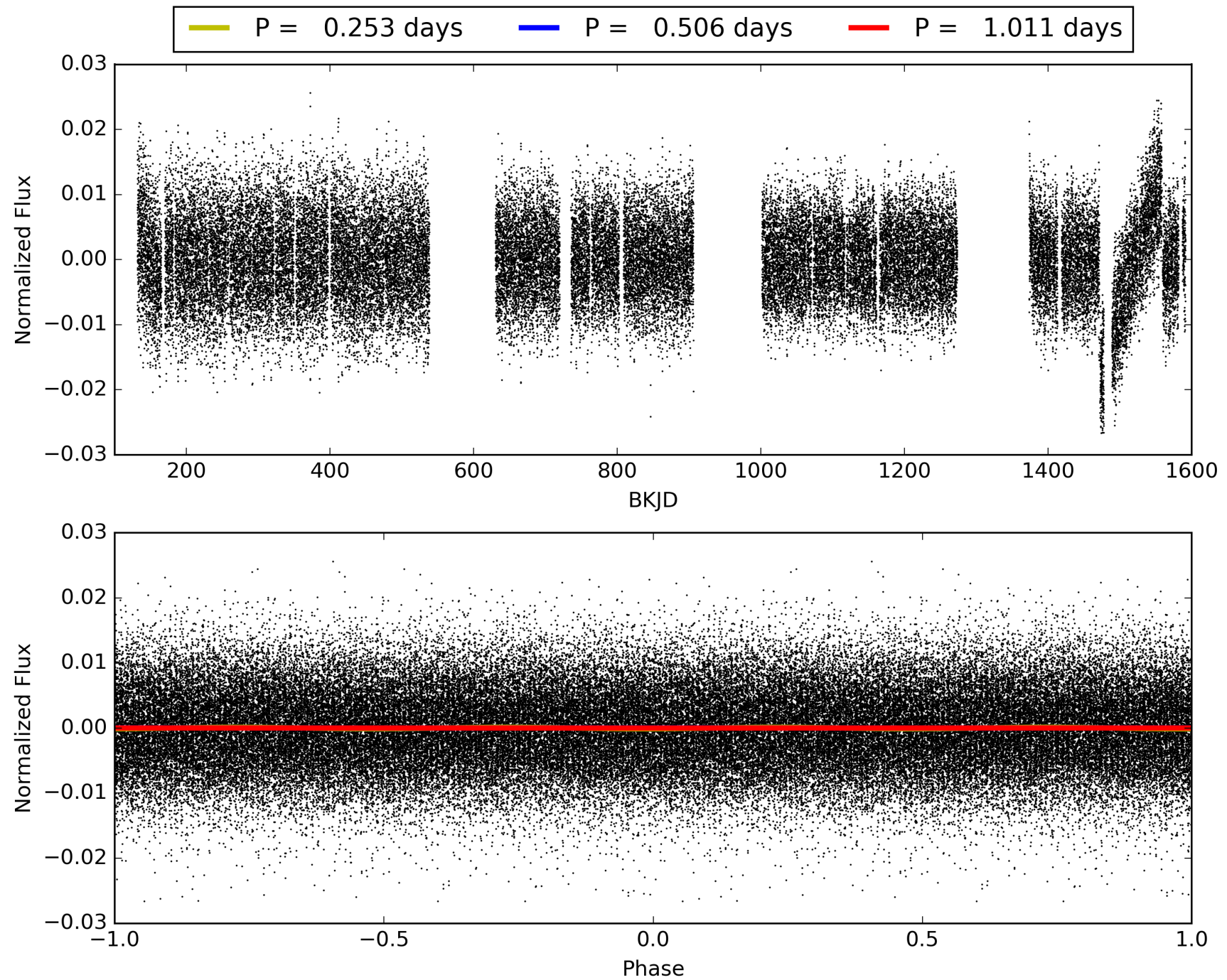
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.72e-43  
RollingBand-fgt: 0.98 [1955/1990]  
GhostDiagnostic-chr: 2.012  
Centroid-sig: 0.1%  
Centroid-so: 0.172 arcsec [1.08σ]  
OotOffset-rm: 0.106 arcsec [1.26σ]  
KicOffset-rm: 0.044 arcsec [0.47σ]  
OotOffset-st: 1/4/3/5 [13]  
KicOffset-st: 1/4/3/5 [13]  
DiffImageQuality-fgm: 0.85 [11/13]  
DiffImageOverlap-fno: 0.00 [0/14]

# TCE 004937435-02, PDC Light Curves

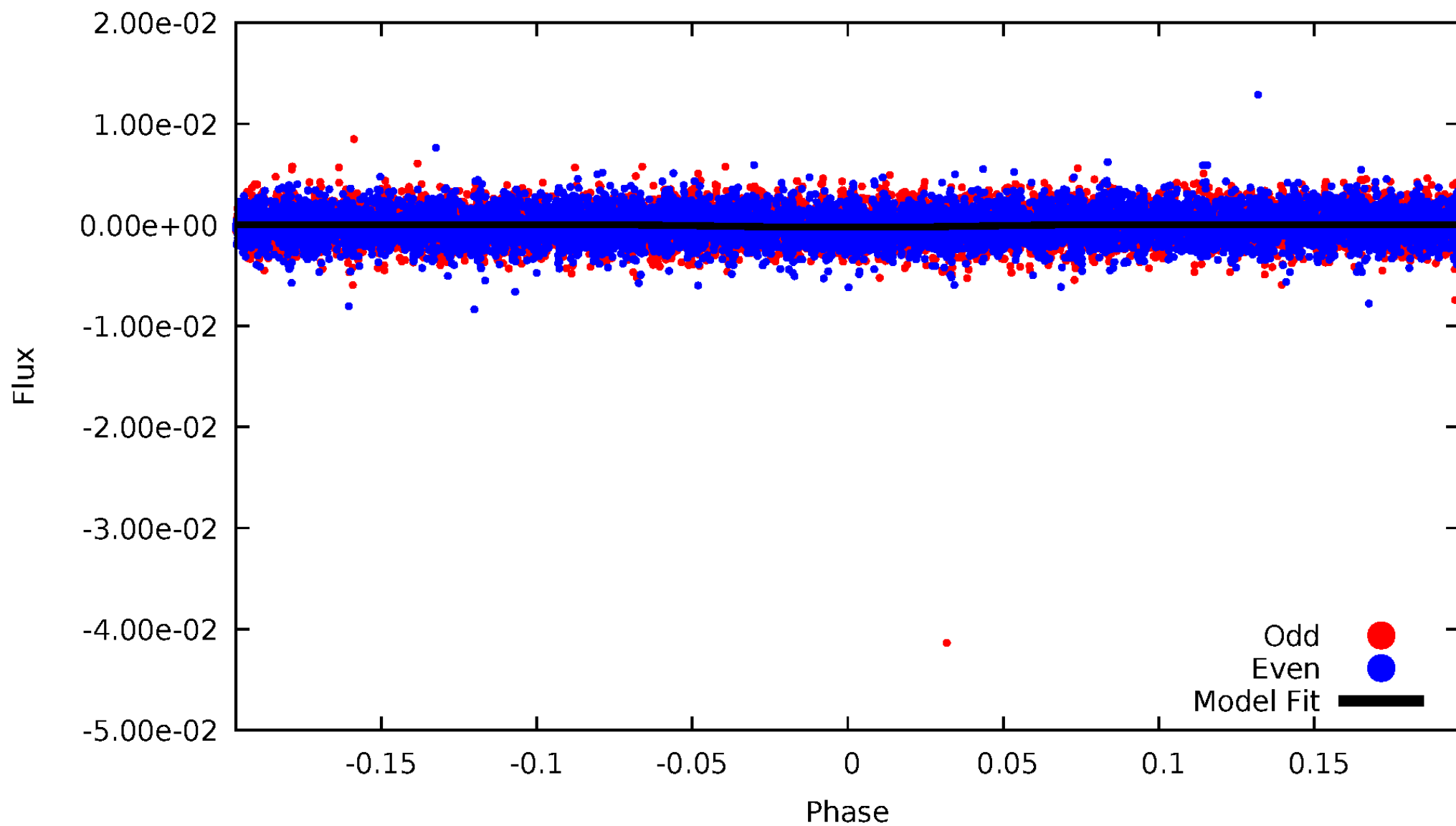


TCE 004937435-02



# DV Odd/Even

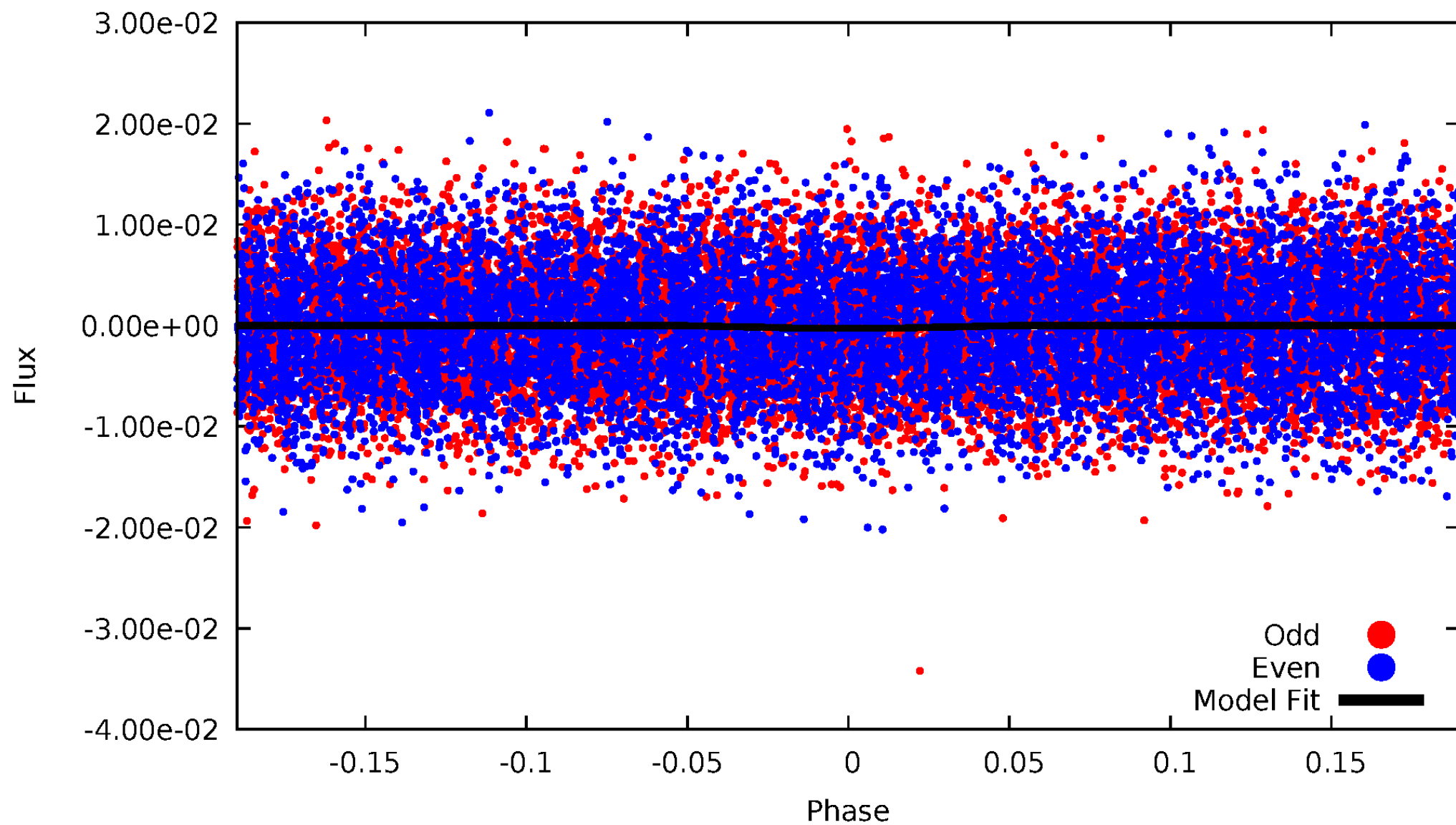
TCE 004937435-02





# ALT Odd/Even

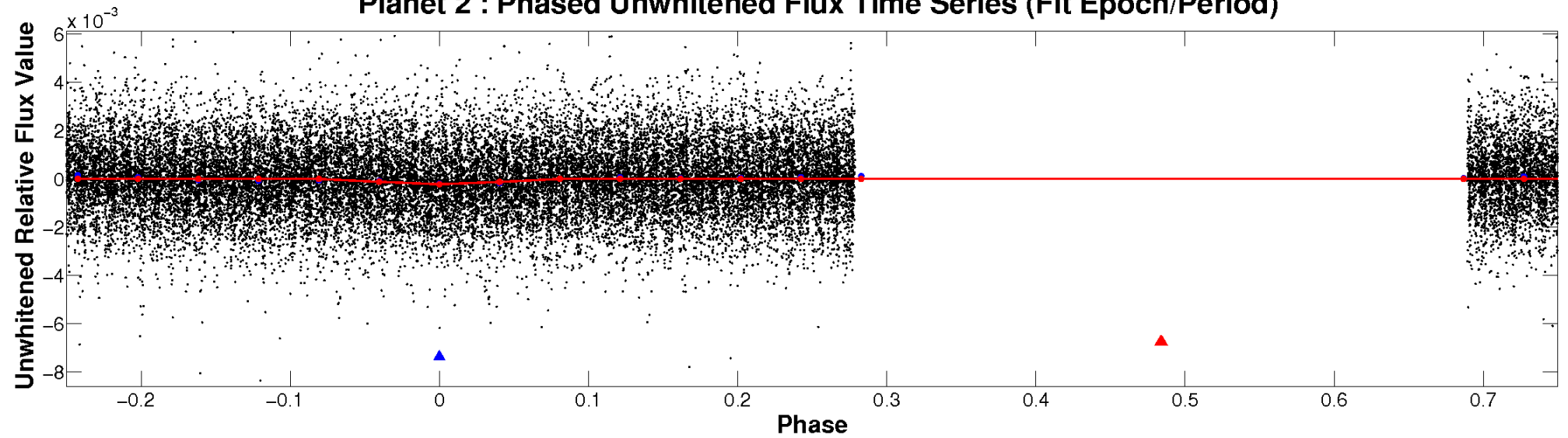
TCE 004937435-02



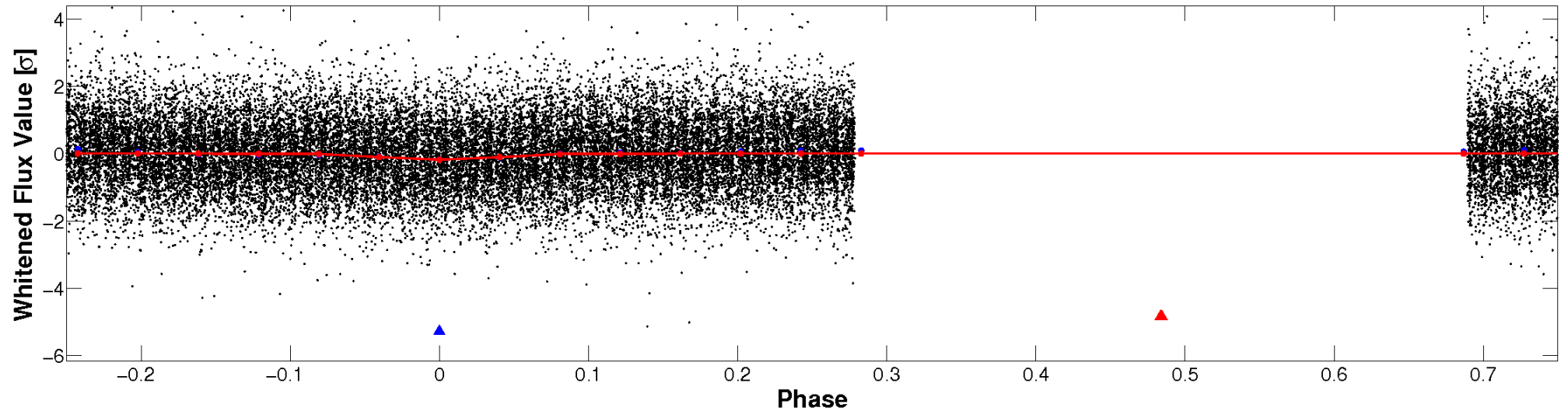


# Non-Whitened Vs. Whitened Light Curve

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

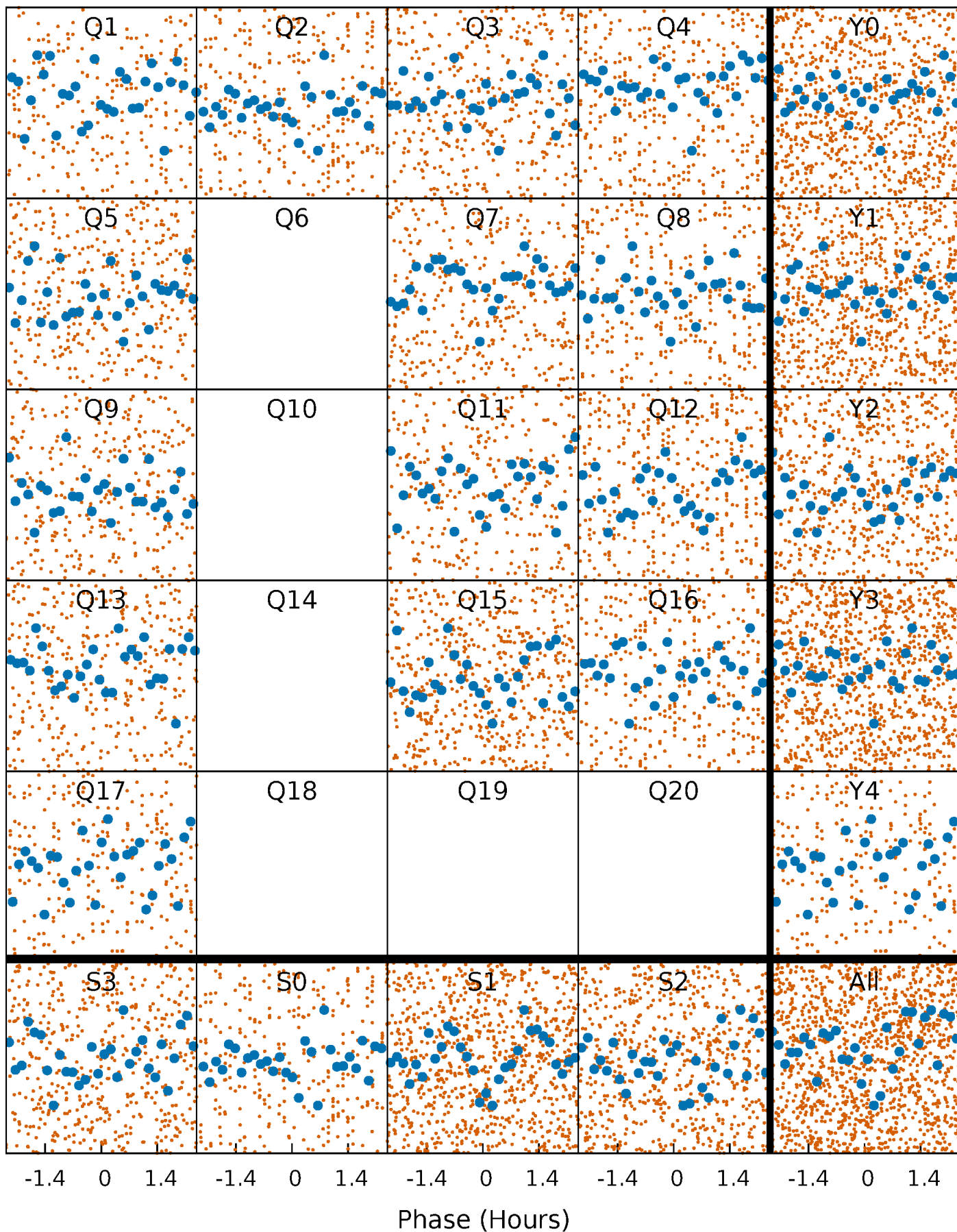


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



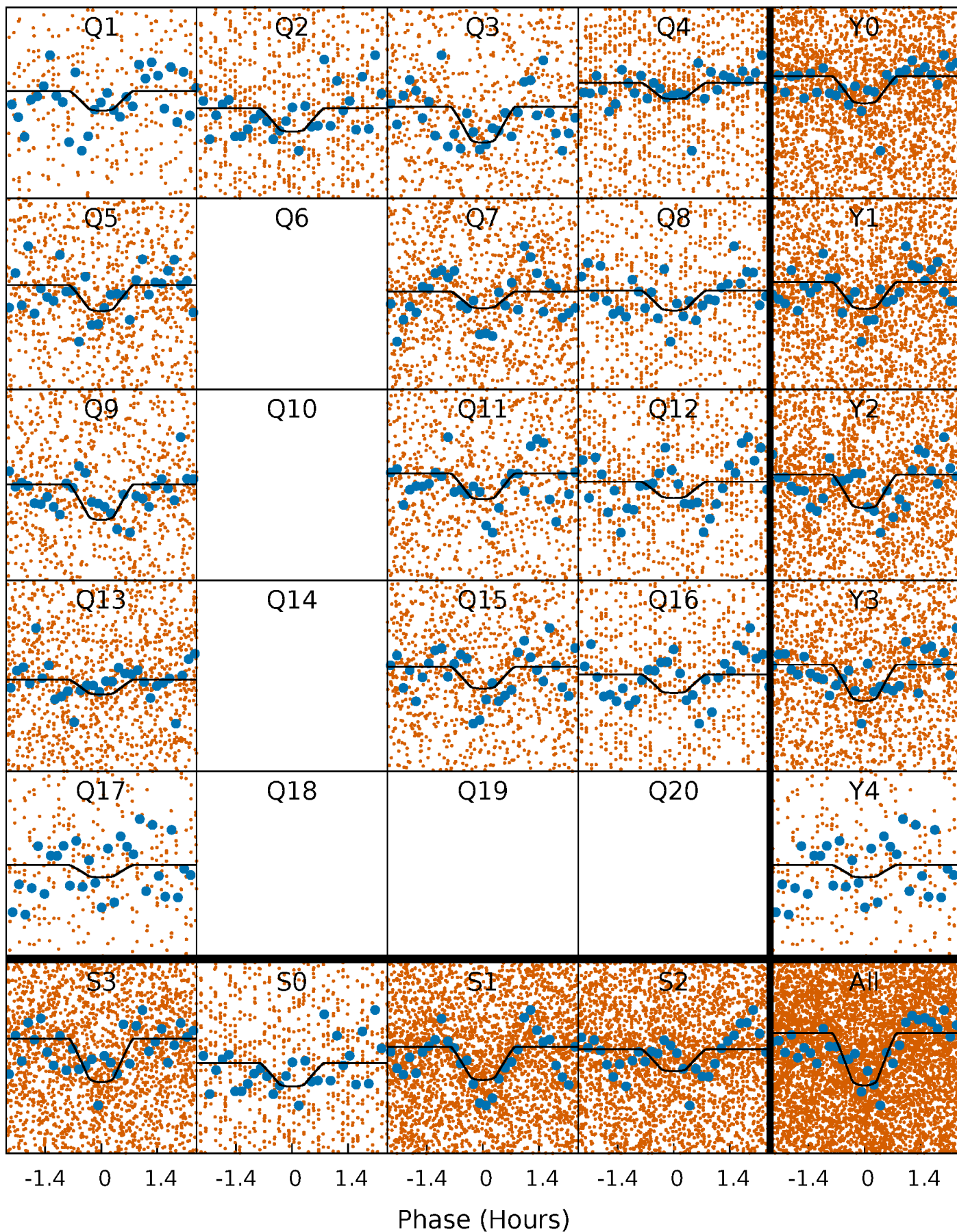
# PDC Quarter-Phased Transit Curves

TCE 004937435-02   P= 0.505736 Days    $T_0=131.685440$  (BKJD)



# DV Quarter-Phased Transit Curves

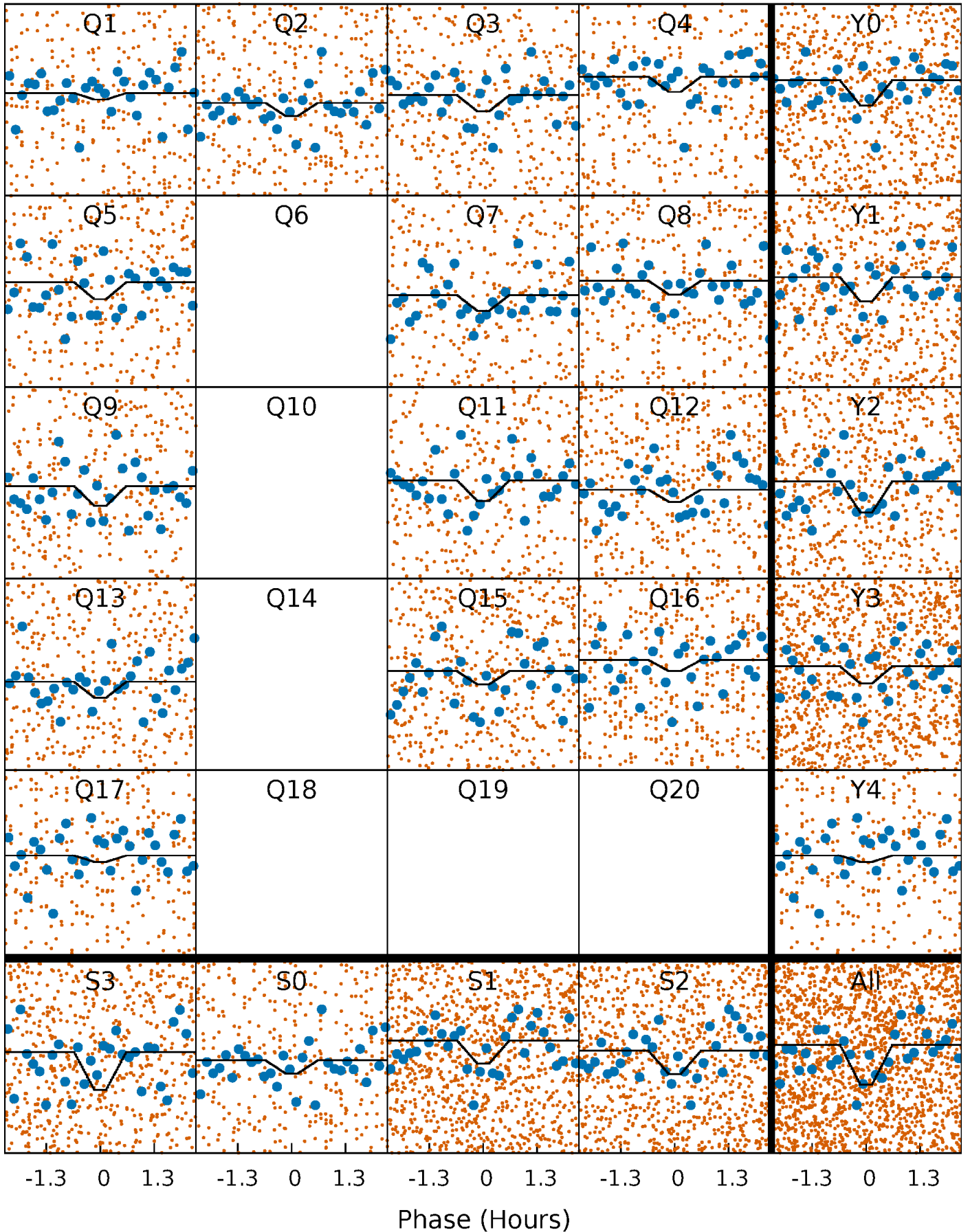
TCE 004937435-02     $P = 0.505736$  Days     $T_0 = 131.685440$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

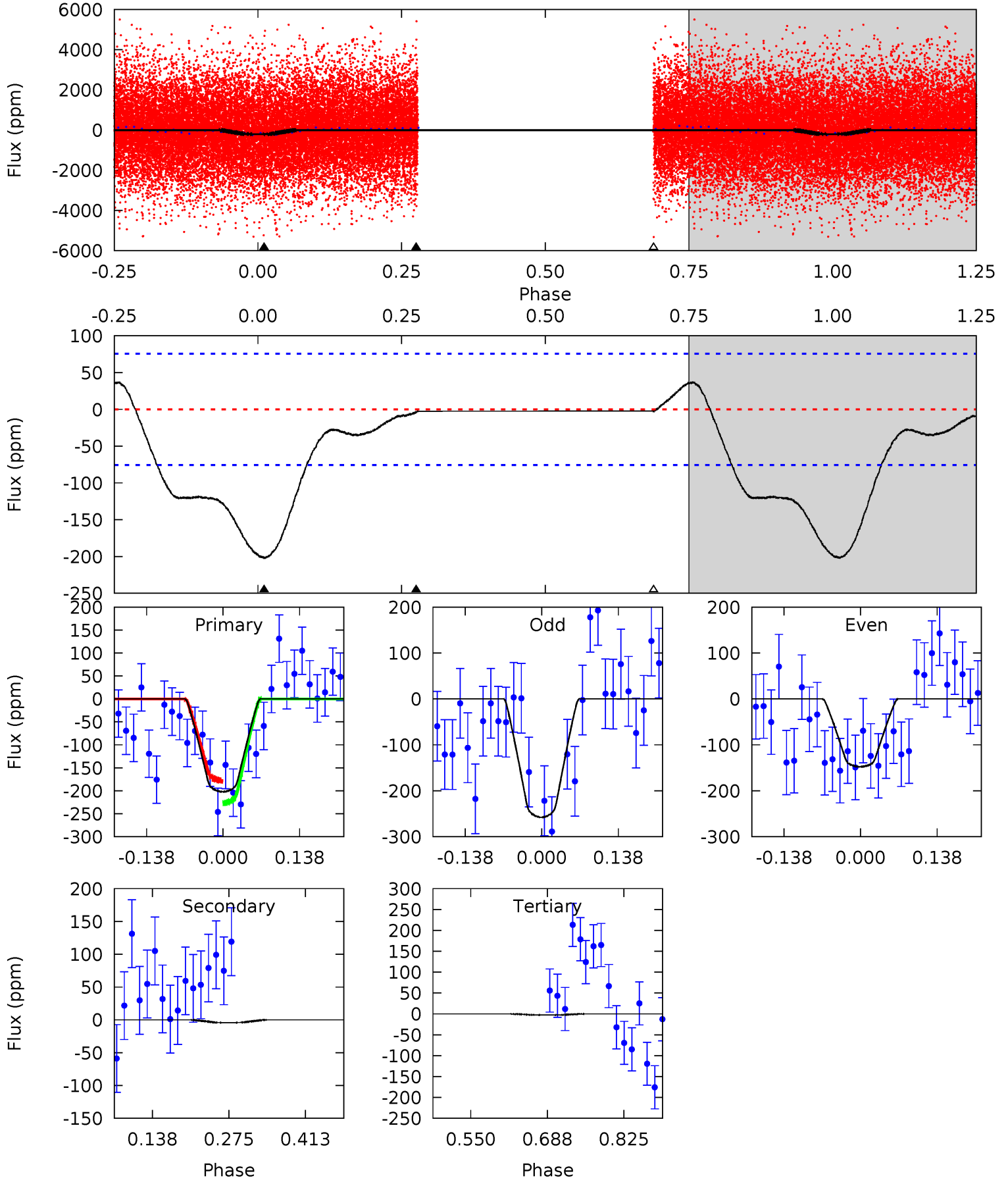
TCE 004937435-02   P= 0.505740 Days    $T_0=131.688378$  (BKJD)



# DV Model-Shift Uniqueness Test

004937435-02, P = 0.505736 Days, E = 131.179704 Days

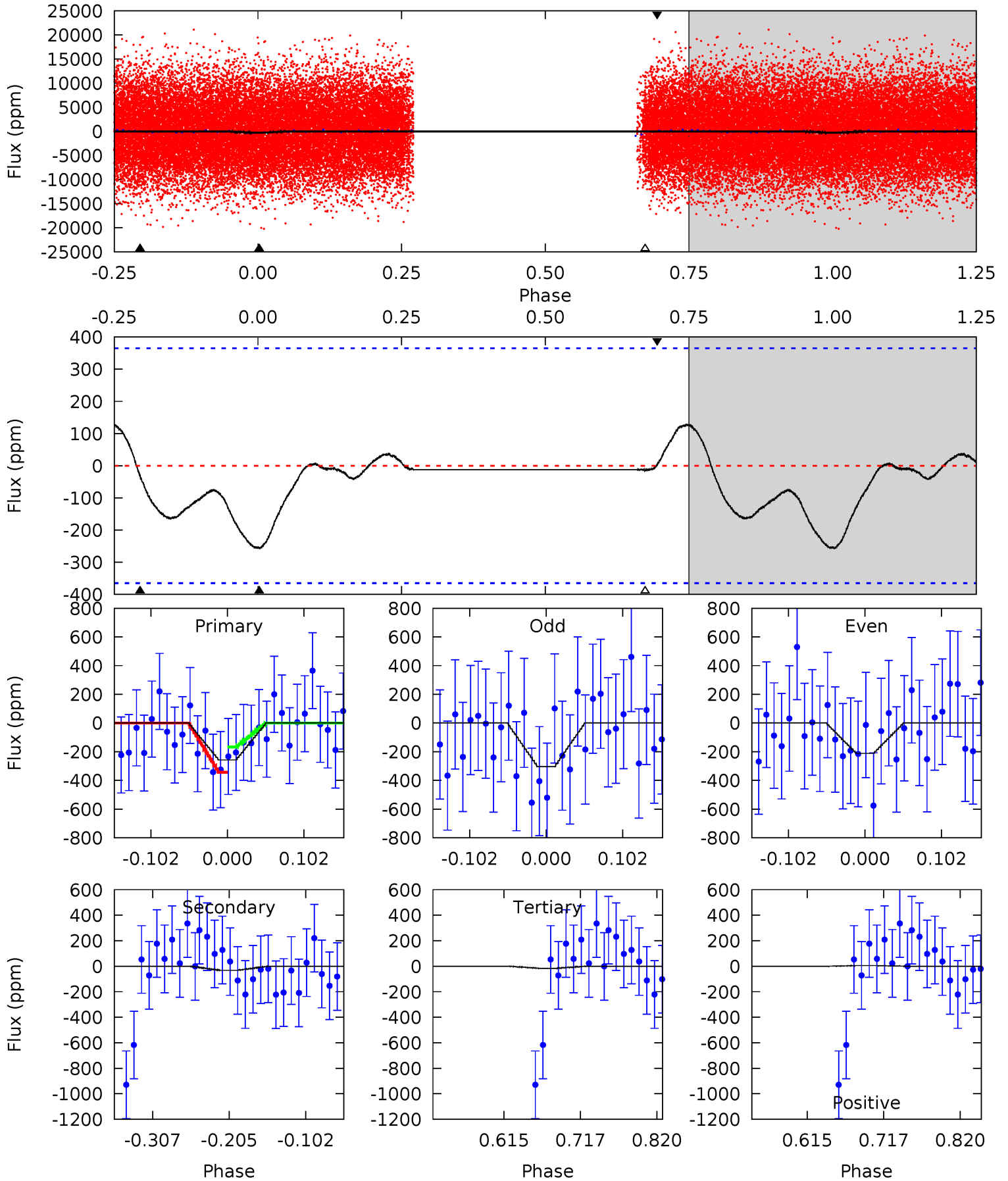
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.0	0.25	0.16	0	4.50	1.49	3.35	11.9	12.0	0.09	0.25	3.29	0.98	0.15	1.45



# Alt Model-Shift Uniqueness Test

004937435-02, P = 0.505740 Days, E = 131.182638 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
3.21	0.40	0.20	0.07	4.56	1.63	0.58	3.01	3.15	0.20	0.33	0.57	0.88	0.33	1.07





### Stellar Parameters For KIC 004937435

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$8018^{+223}_{-334}$	$3.662^{+0.456}_{-0.085}$	$-0.300^{+0.200}_{-0.300}$	$3.430^{+0.703}_{-1.641}$	$1.972^{+0.251}_{-0.459}$	$0.069^{+0.325}_{-0.025}$
	+3%/-4%	+12%/-2%	+67%/-100%	+20%/-48%	+13%/-23%	+473%/-36%
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 004937435-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-4 \pm 17$	$5.36^{+3.50}_{-2.97}$	$7026^{+542}_{-857}$	$-5510^{+1085}_{-620}$	$0.016^{+0.137}_{-0.087}$
Alt.	$-32 \pm 80$	$5.60^{+3.60}_{-2.93}$	$7019^{+526}_{-865}$	$-5060^{+11025}_{-1341}$	$0.103^{+0.674}_{-0.346}$

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

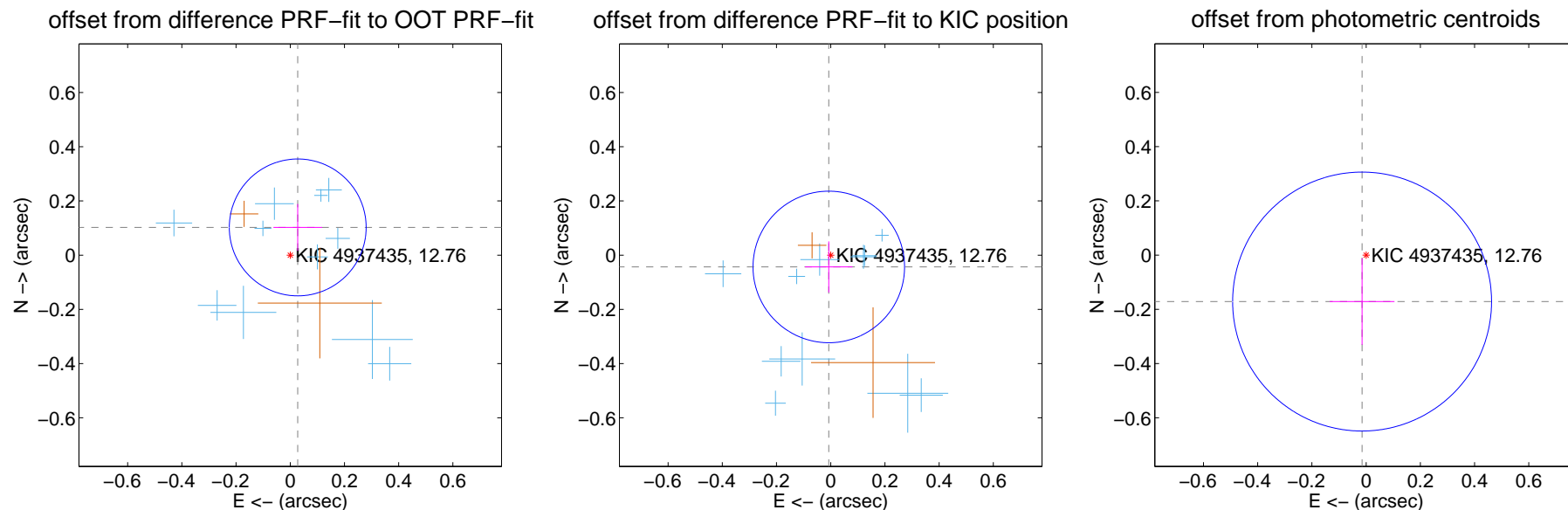
## DV Centroid Data

Supplemental centroid analysis for 004937435-02. Kepler magnitude: 12.76. Transit SNR 10.36

There are 11 quarters with good PRF difference image offsets

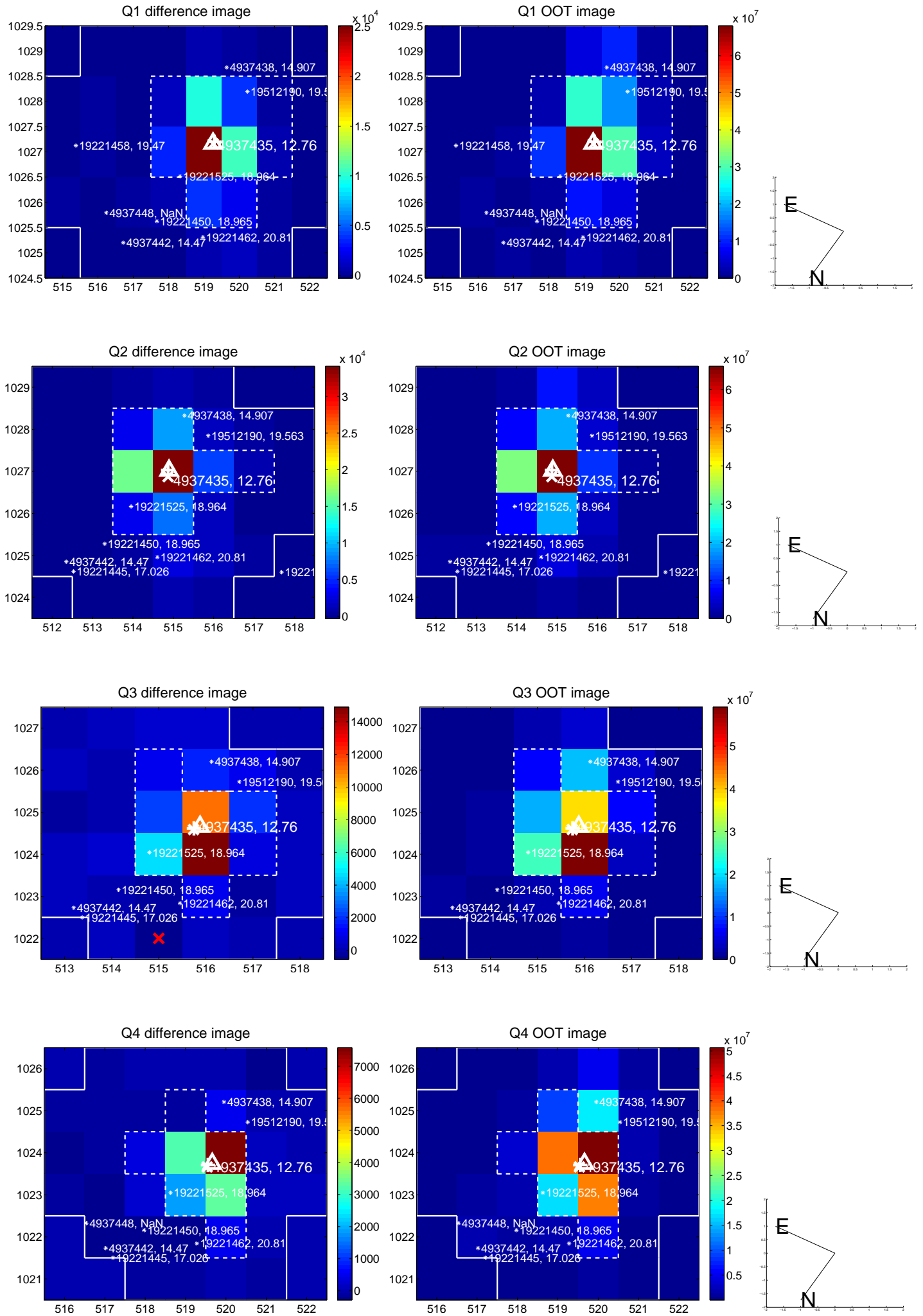
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.106 \pm 0.084$	1.26	$-0.028 \pm 0.090$	$0.102 \pm 0.086$
PRF-fit source offset from KIC position	$0.044 \pm 0.093$	0.47	$0.007 \pm 0.087$	$-0.044 \pm 0.094$
photometric centroid source offset	$0.17 \pm 0.16$	1.08	$0.01 \pm 0.12$	$-0.17 \pm 0.16$

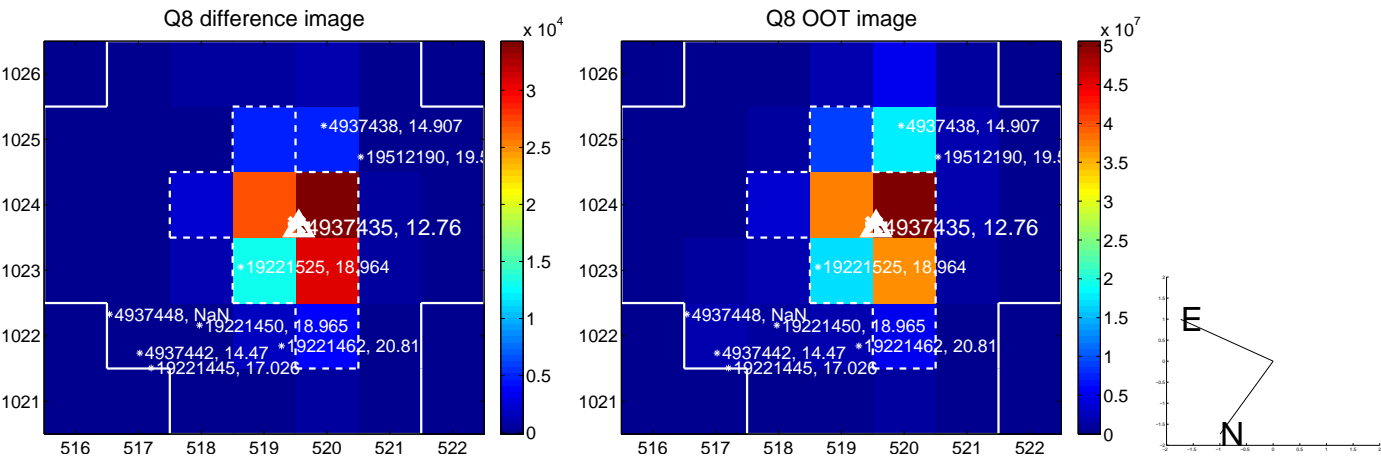
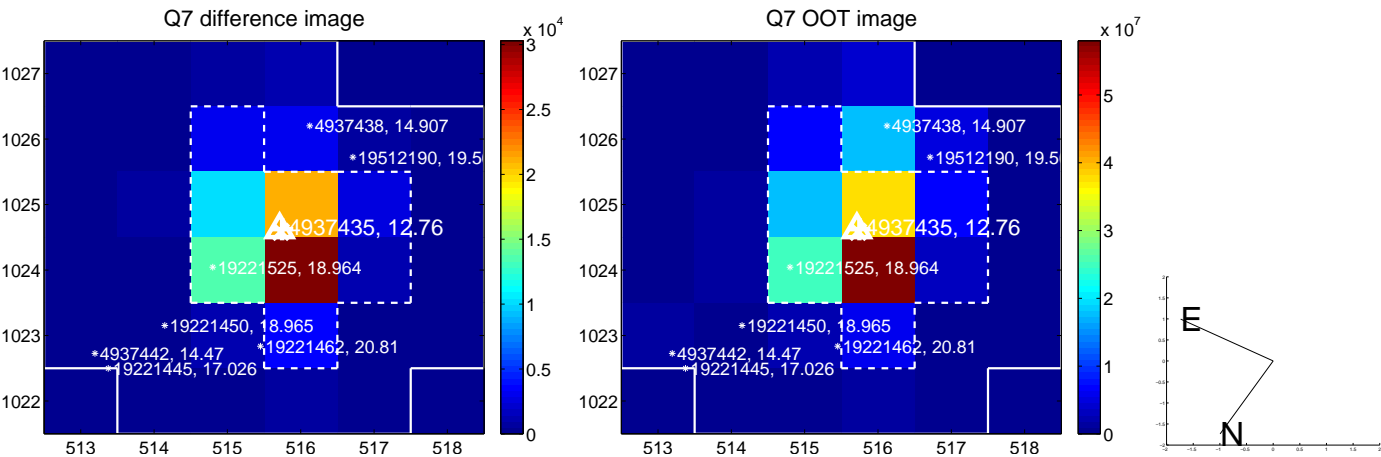
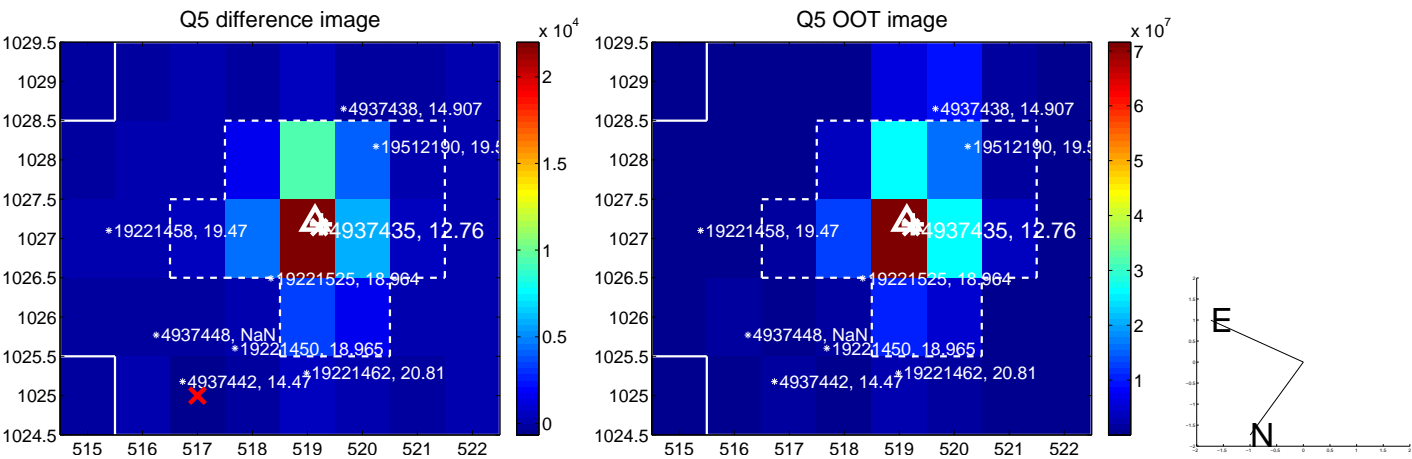


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

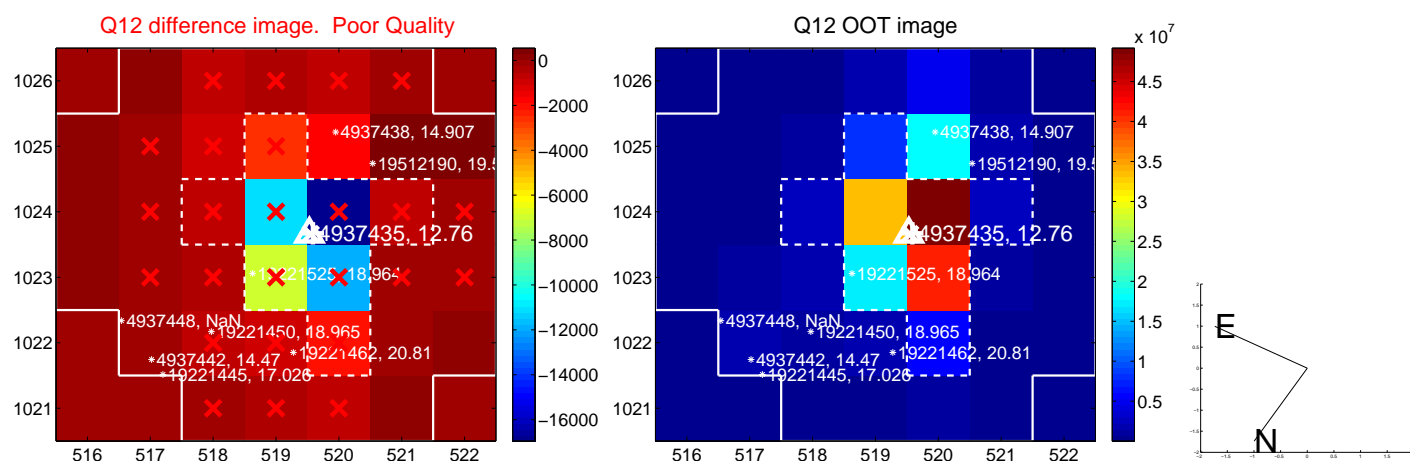
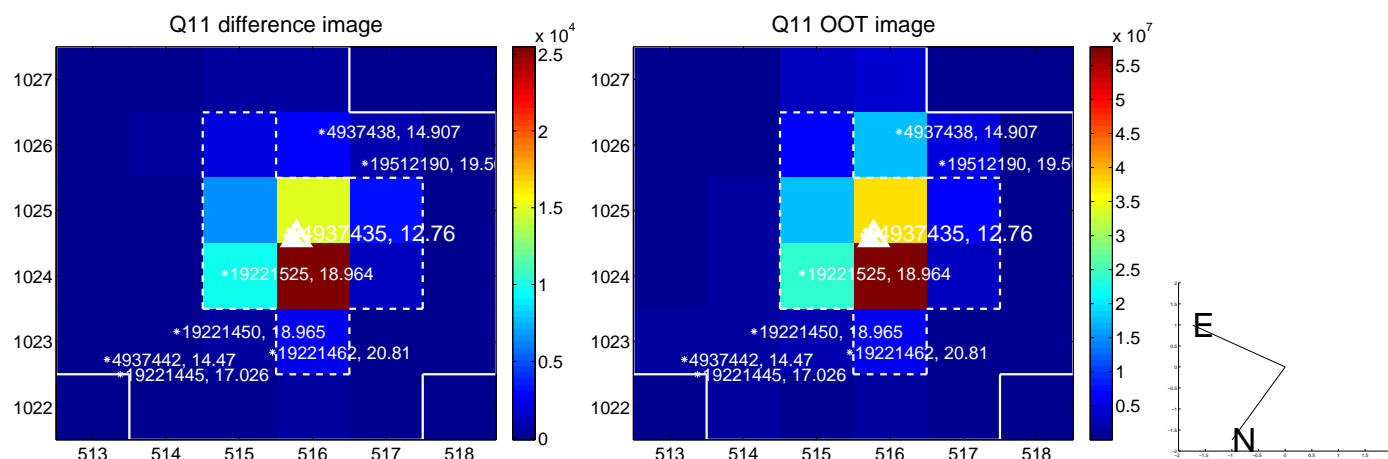
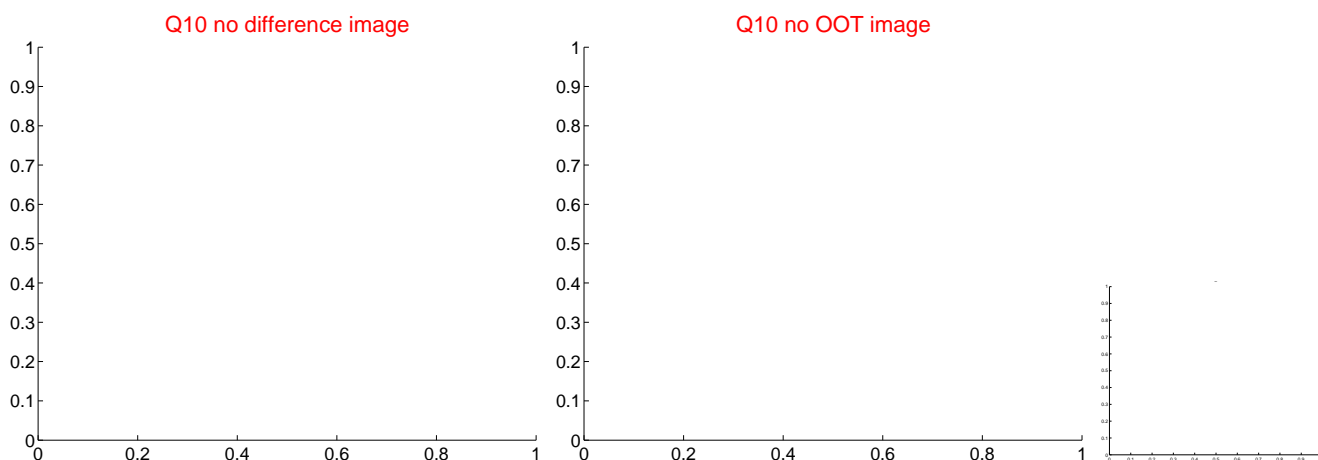
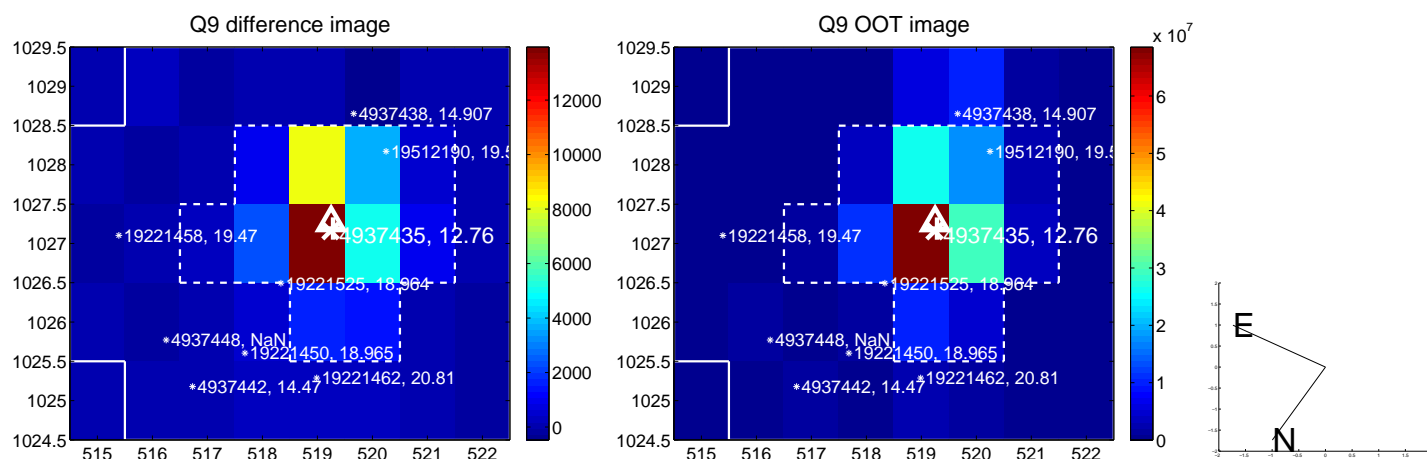
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



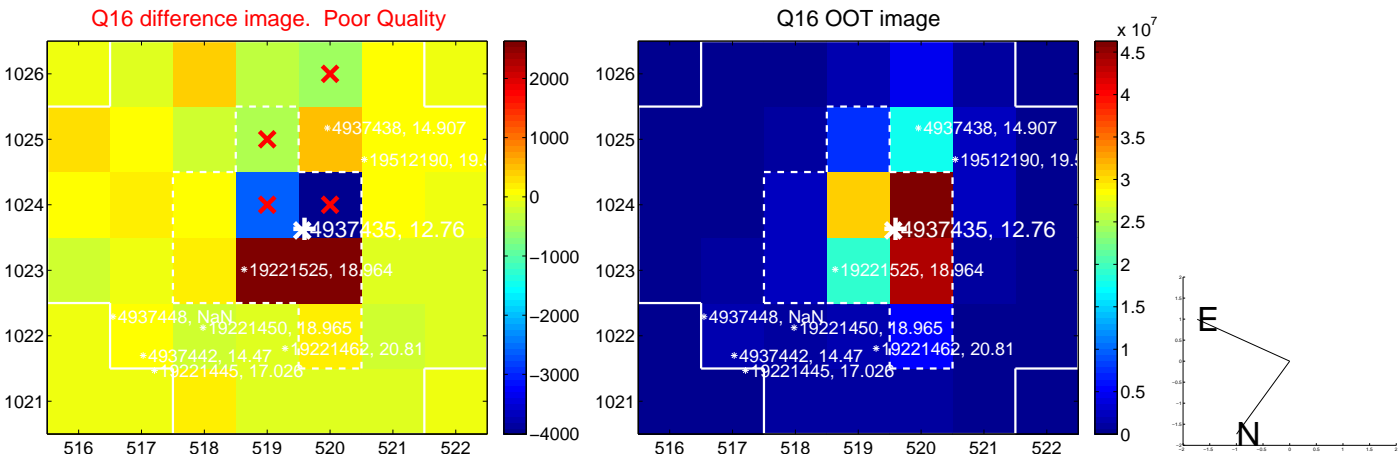
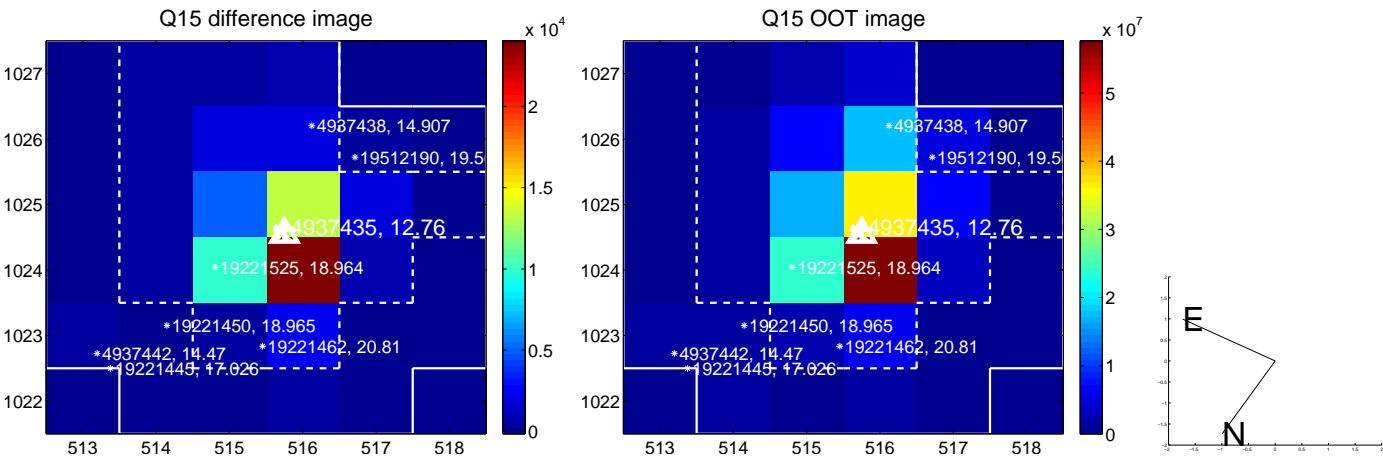
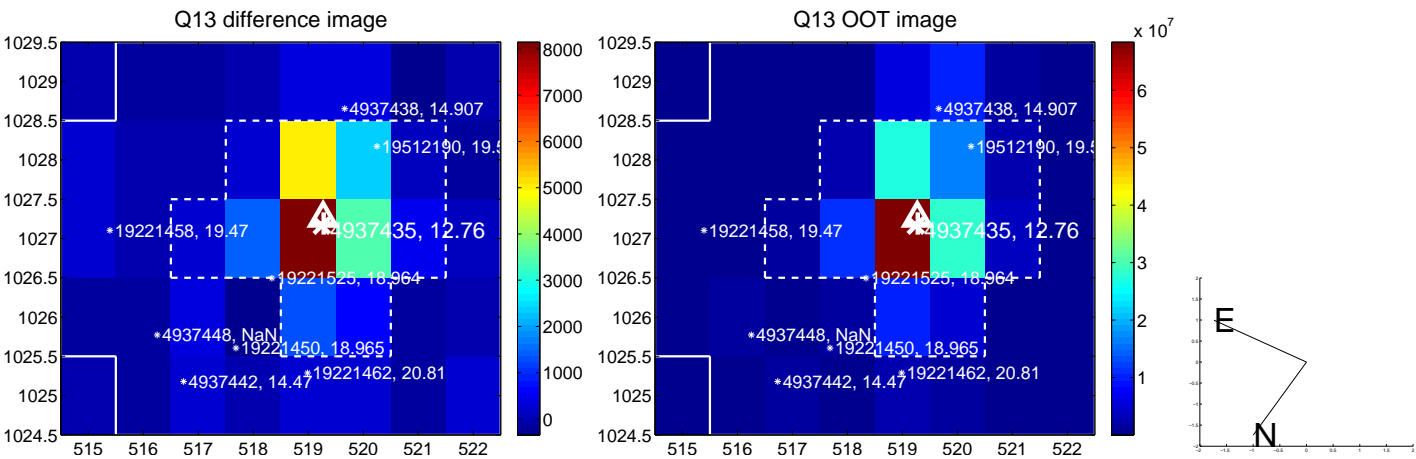
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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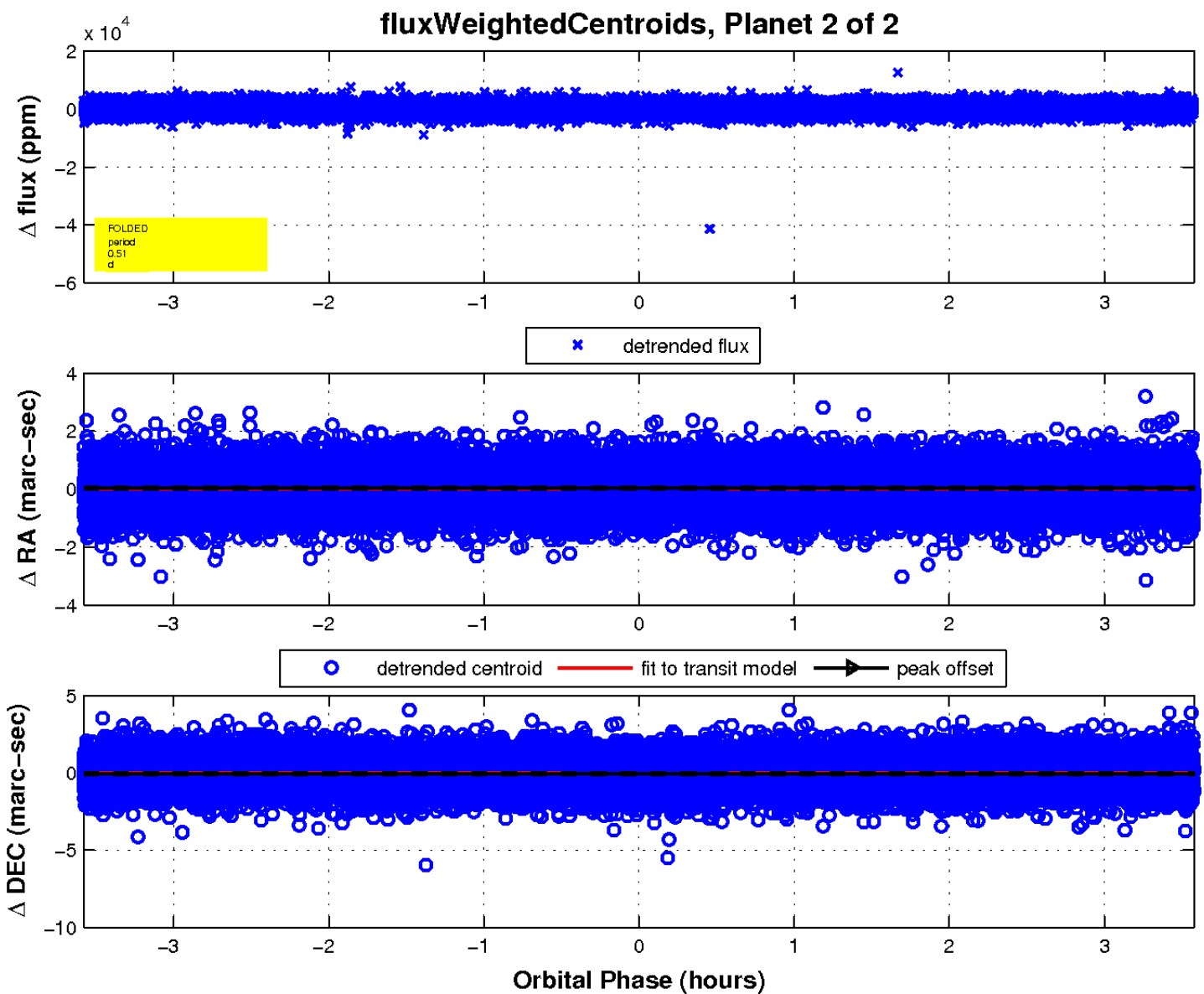
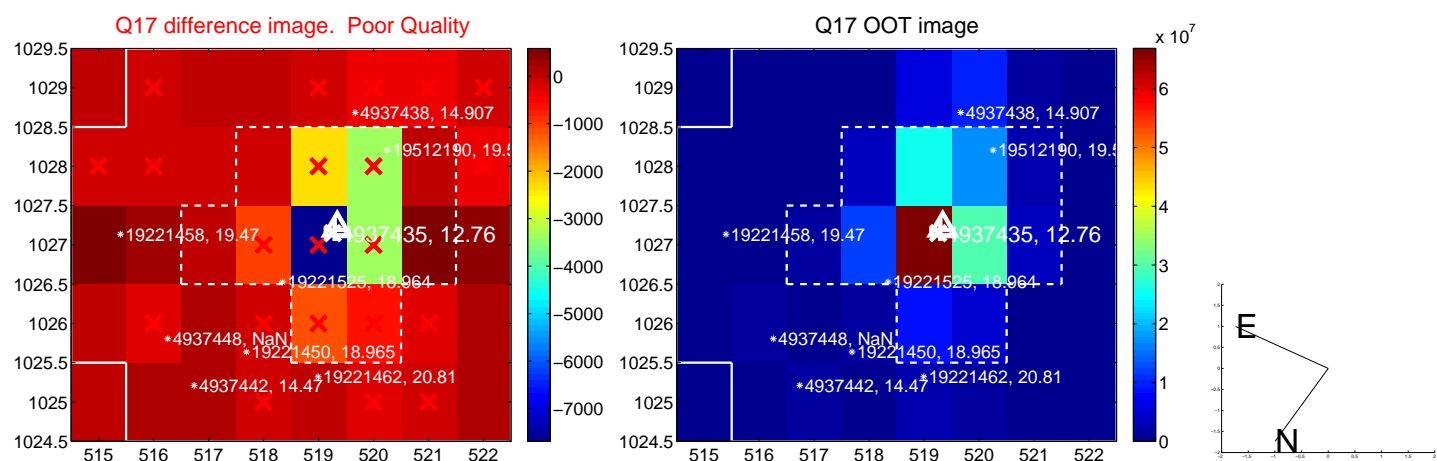


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





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



UKIRT Image

