

# KIC 005376836

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005376836-01	OBS	0182.01	3.479424	133.318140	19485.2	3.485	1656.2	1482.2	0.88	5907	12.98	437.20
005376836-02	OBS	No	3.479434	131.577875	473.3	3.260	40.1	43.3	0.88	5907	2.26	437.20

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005376836-01	OBS	PC	0.88	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—PLANET_OCCULT_ALT—HAS_SEC_TCE
005376836-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

**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.

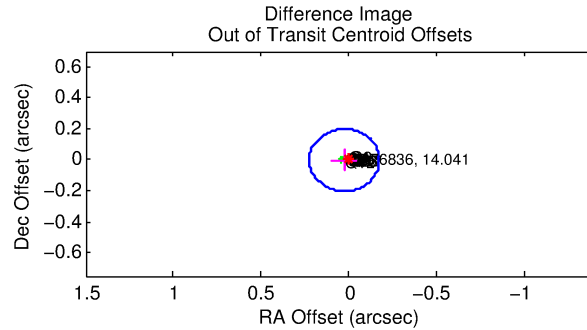
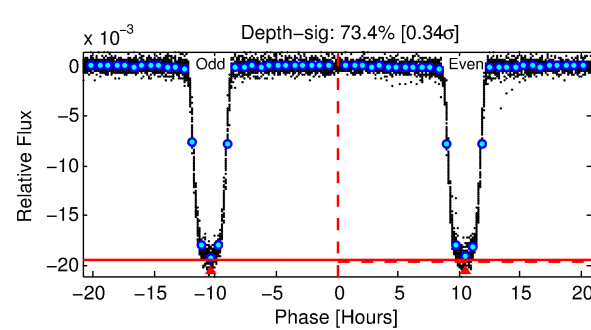
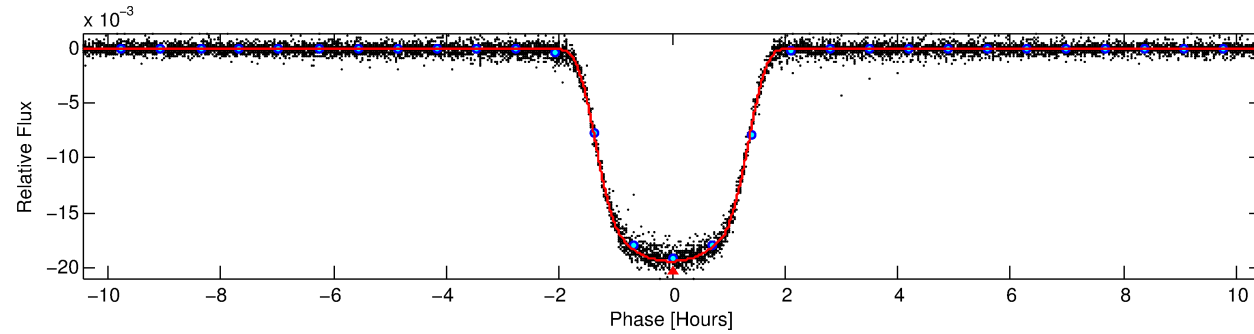
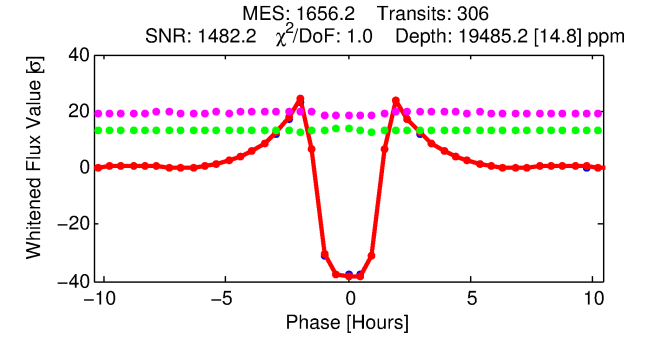
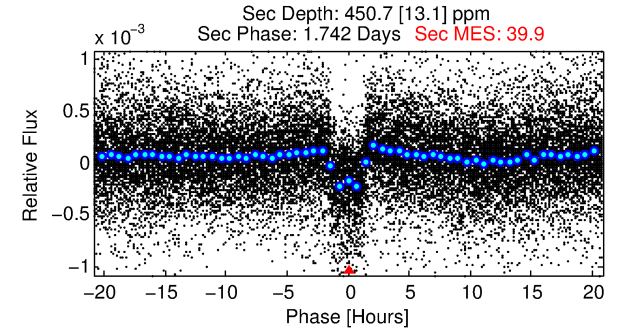
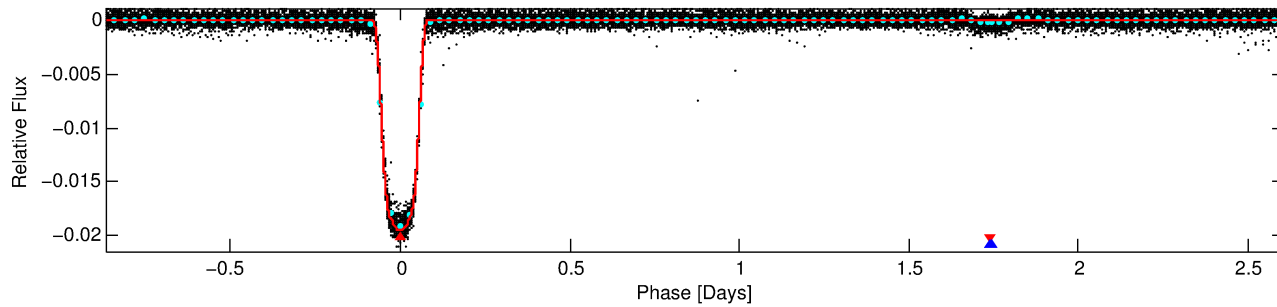
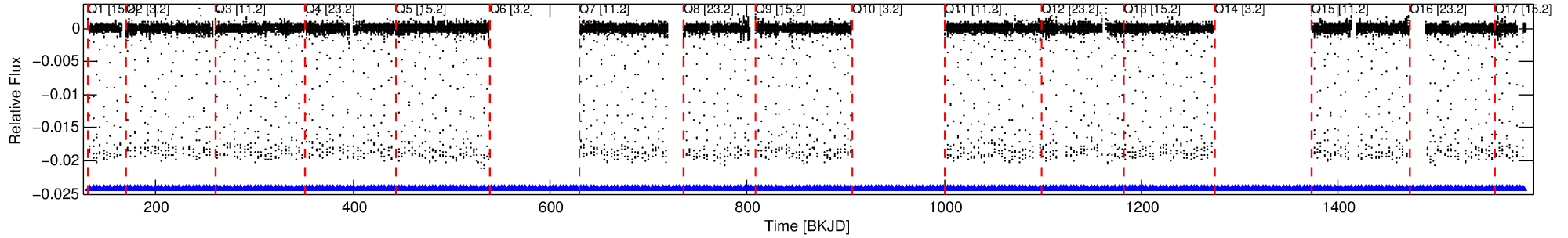
## Ephemeris Match Information For 005376836-01

No Significant Match Found

# DV One-Page Summary

KIC: 5376836 Candidate: 1 of 2 Period: 3.479 d  
KOI: K00182.01 Corr: 0.993

Kp: 14.04 R\*: 0.88 Rs Teff: 5907.0 K Logg: 4.52 Fe/H: -0.300



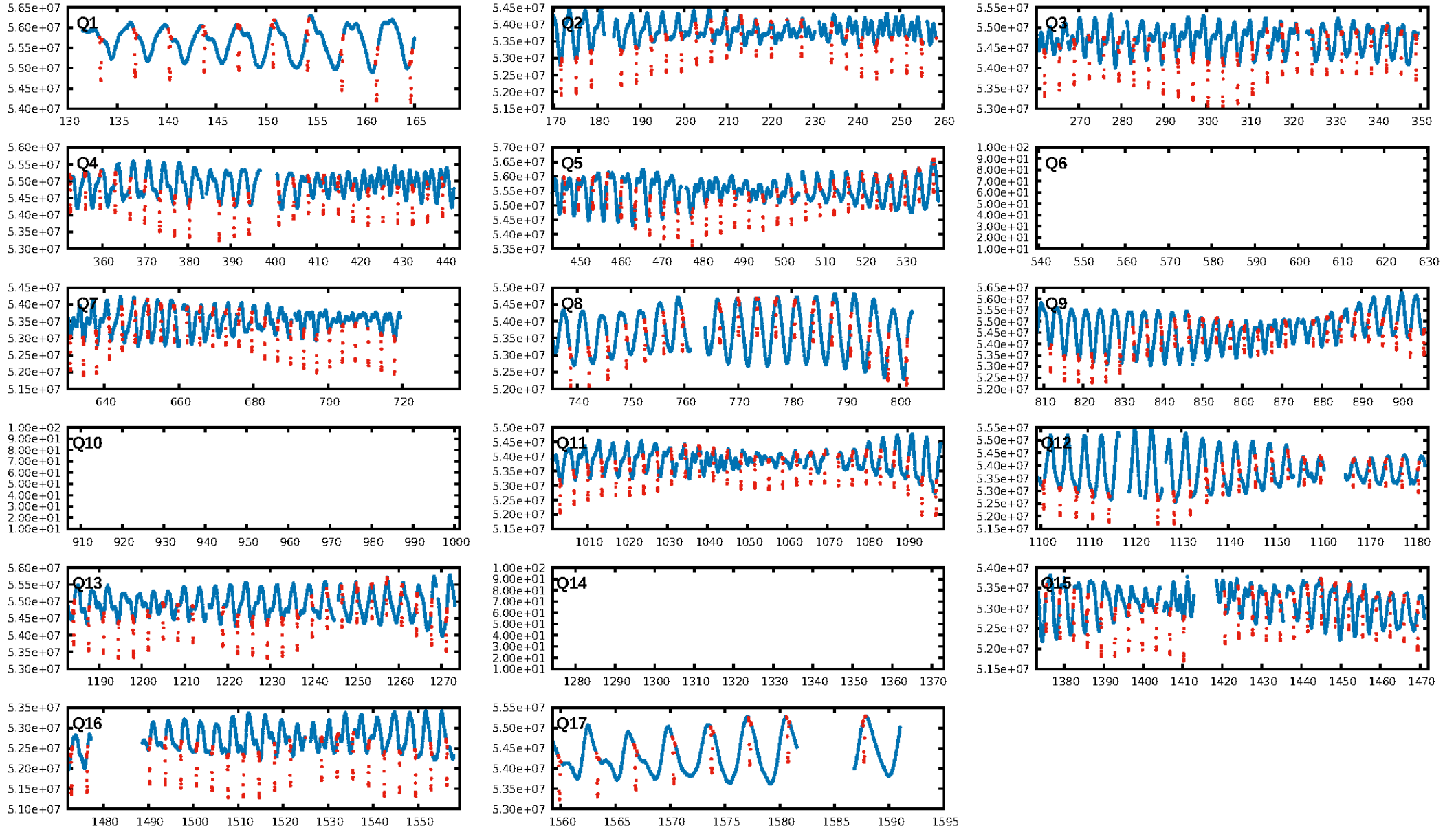
## DV Fit Results:

Period = 3.47942 [0.00000] d  
Epoch = 133.3181 [0.0000] BKJD  
Rp/R\* = 0.1355 [0.0001]  
a/R\* = 7.13 [0.02]  
b = 0.65 [0.00]  
Seff = 437.20 [159.32]  
Teq = 1166 [106] K  
Rp = 12.98 [3.67] Re  
a = 0.0439 [0.0104] AU  
Ag = 2.83 [0.98] [1.87σ]  
Teffp = 2338 [71] K [9.16σ]

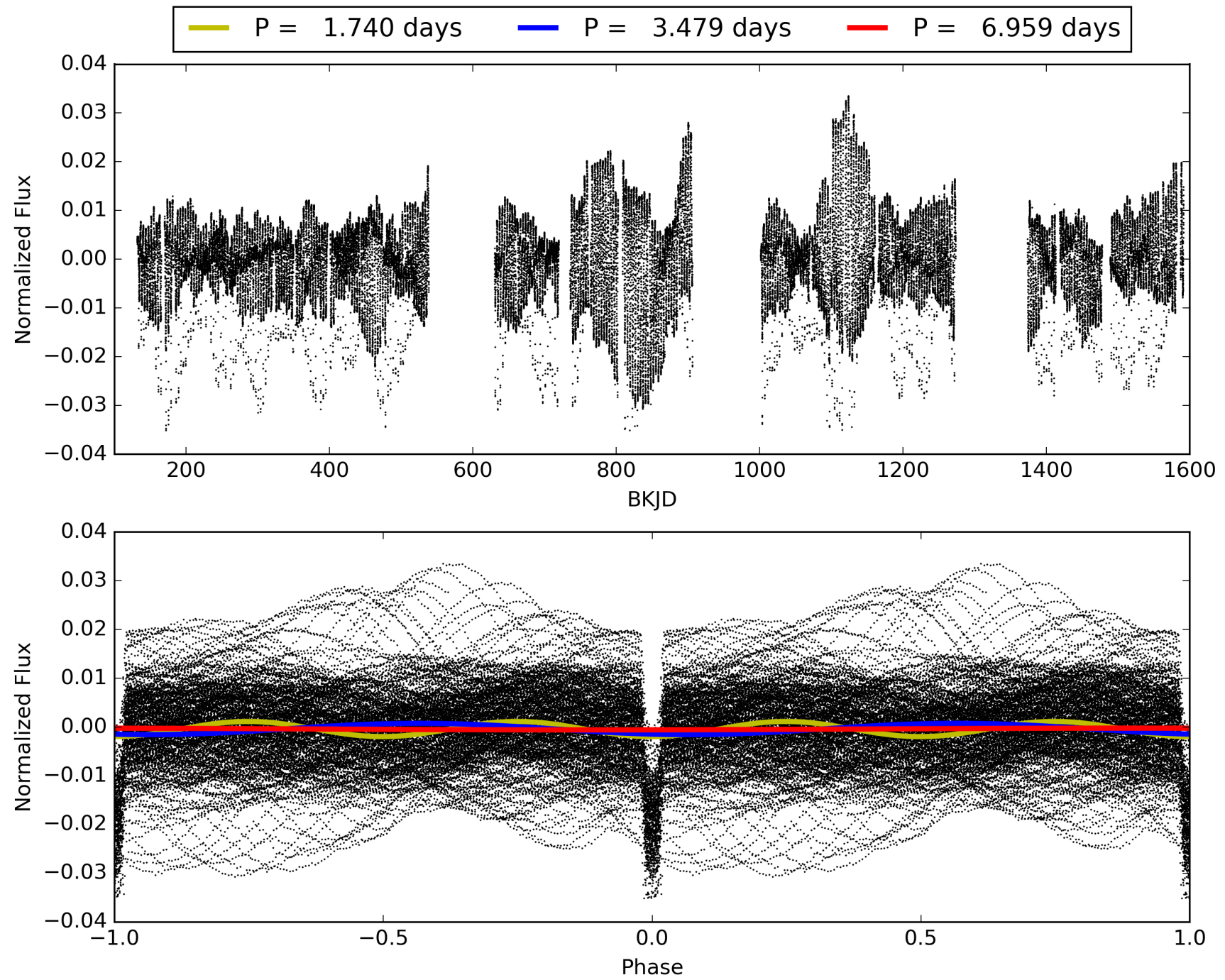
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [288/288]  
GhostDiagnostic-chr: 1.905  
Centroid-sig: 0.0%  
Centroid-so: 0.273 arcsec [65.94σ]  
OotOffset-rm: 0.028 arcsec [0.41σ]  
KicOffset-rm: 0.287 arcsec [4.15σ]  
OotOffset-st: 1/4/4/5 [14]  
KicOffset-st: 1/4/4/5 [14]  
DiffImageQuality-fgm: 1.00 [14/14]  
DiffImageOverlap-fno: 1.00 [14/14]

# TCE 005376836-01, PDC Light Curves

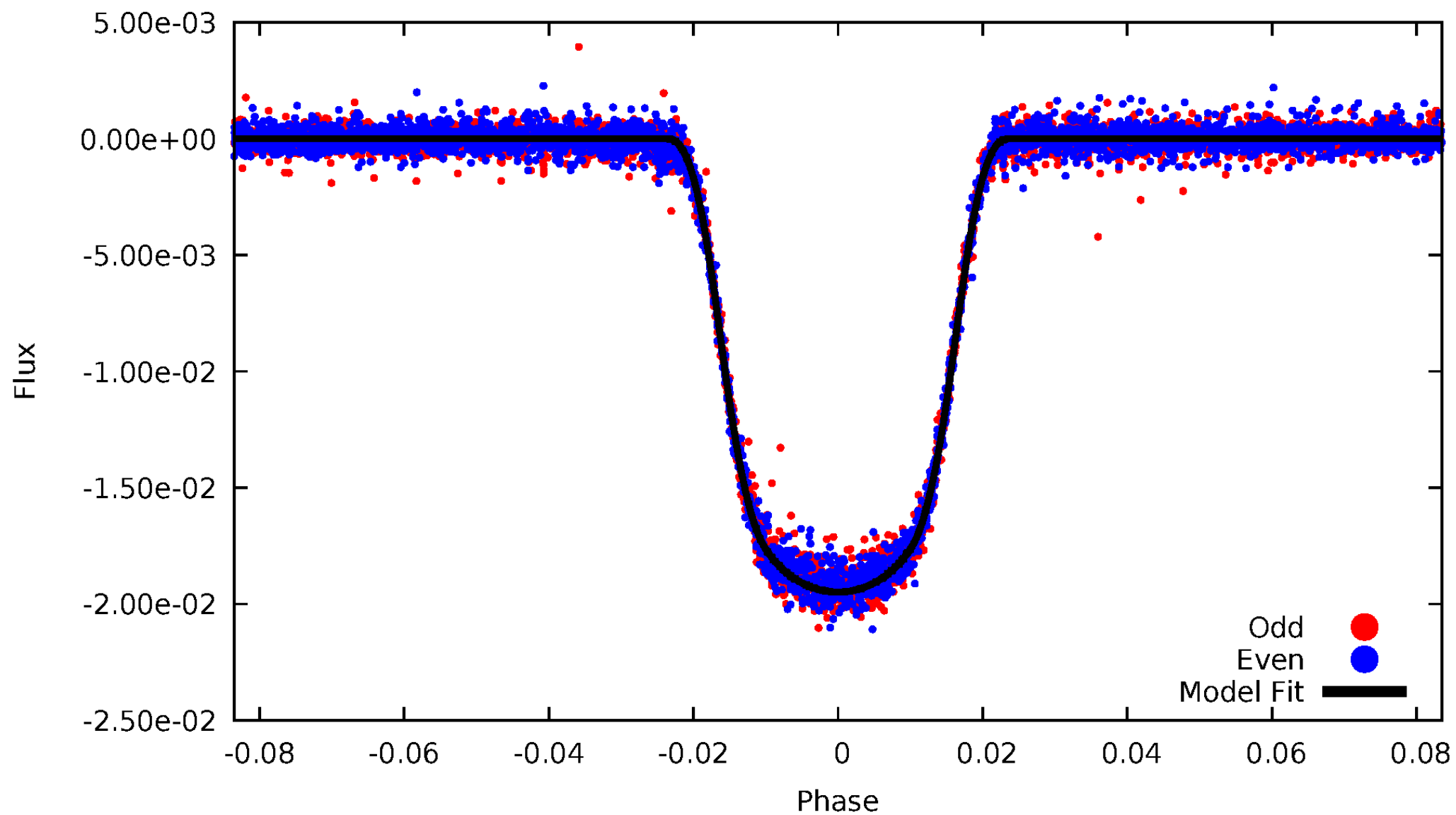


TCE 005376836-01



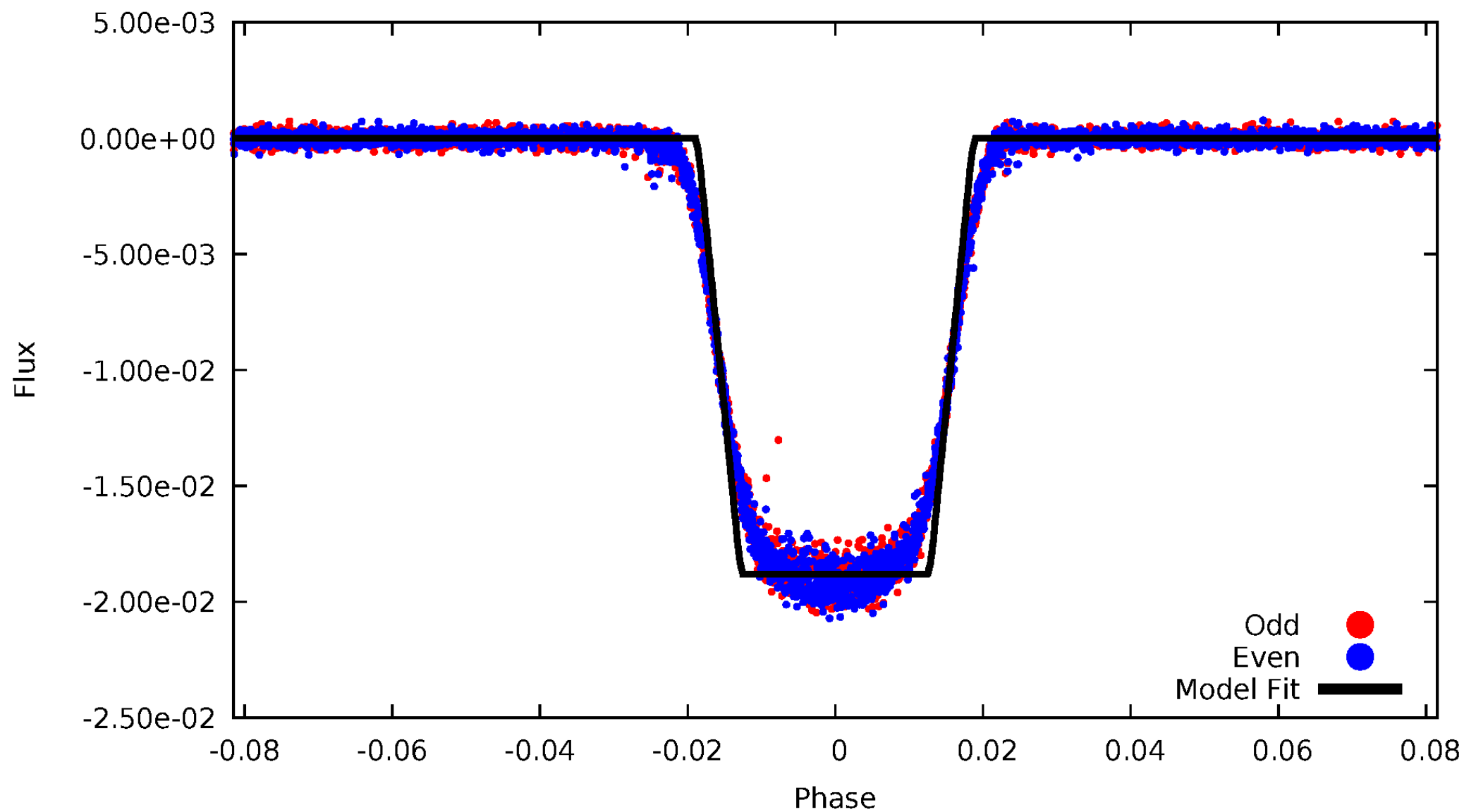
# DV Odd/Even

TCE 005376836-01



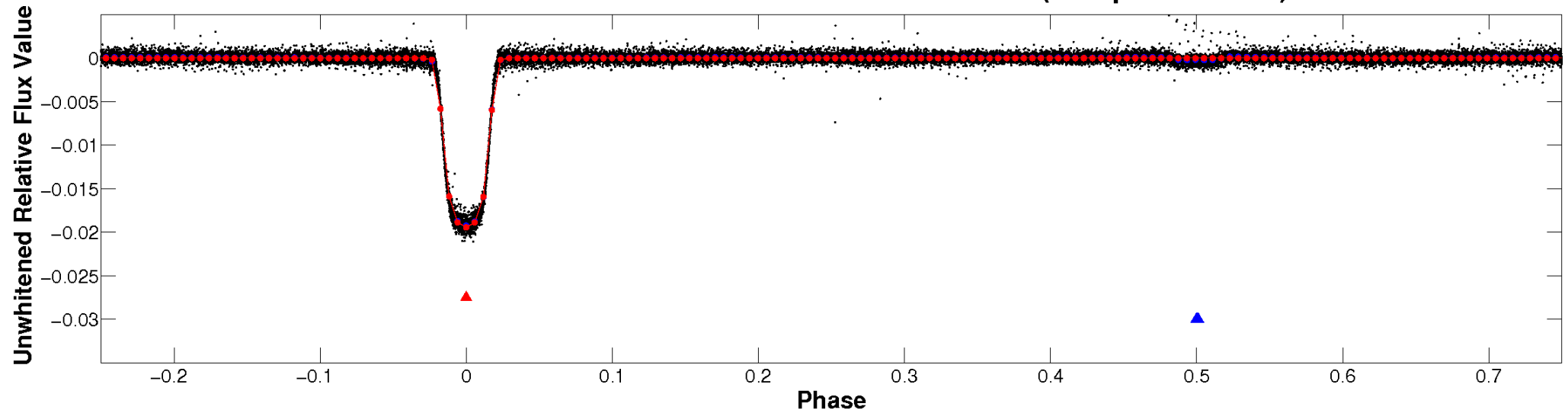
# ALT Odd/Even

TCE 005376836-01

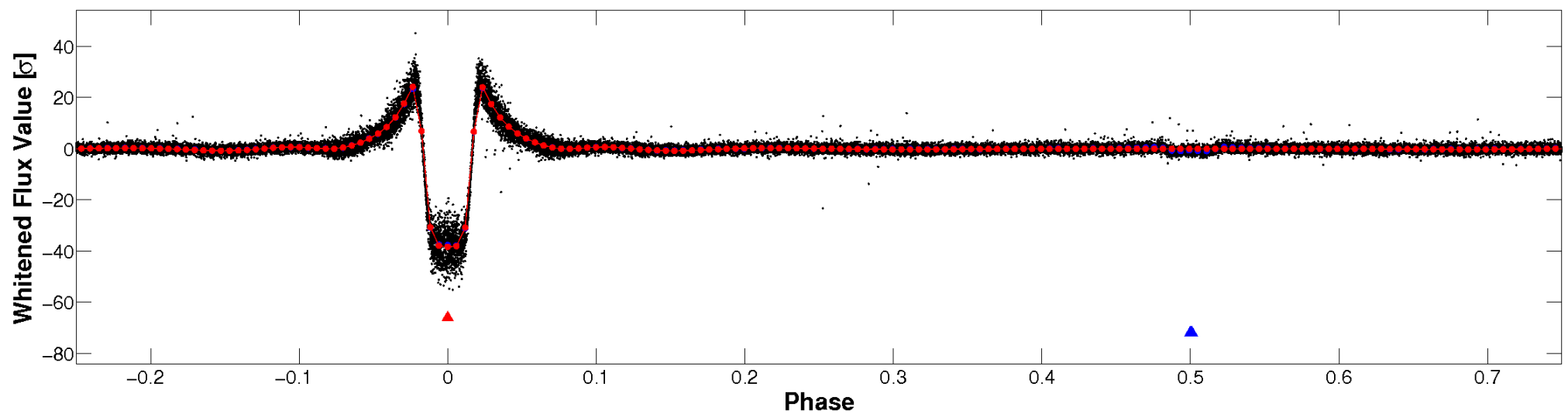


# Non-Whitened Vs. Whitened Light Curve

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



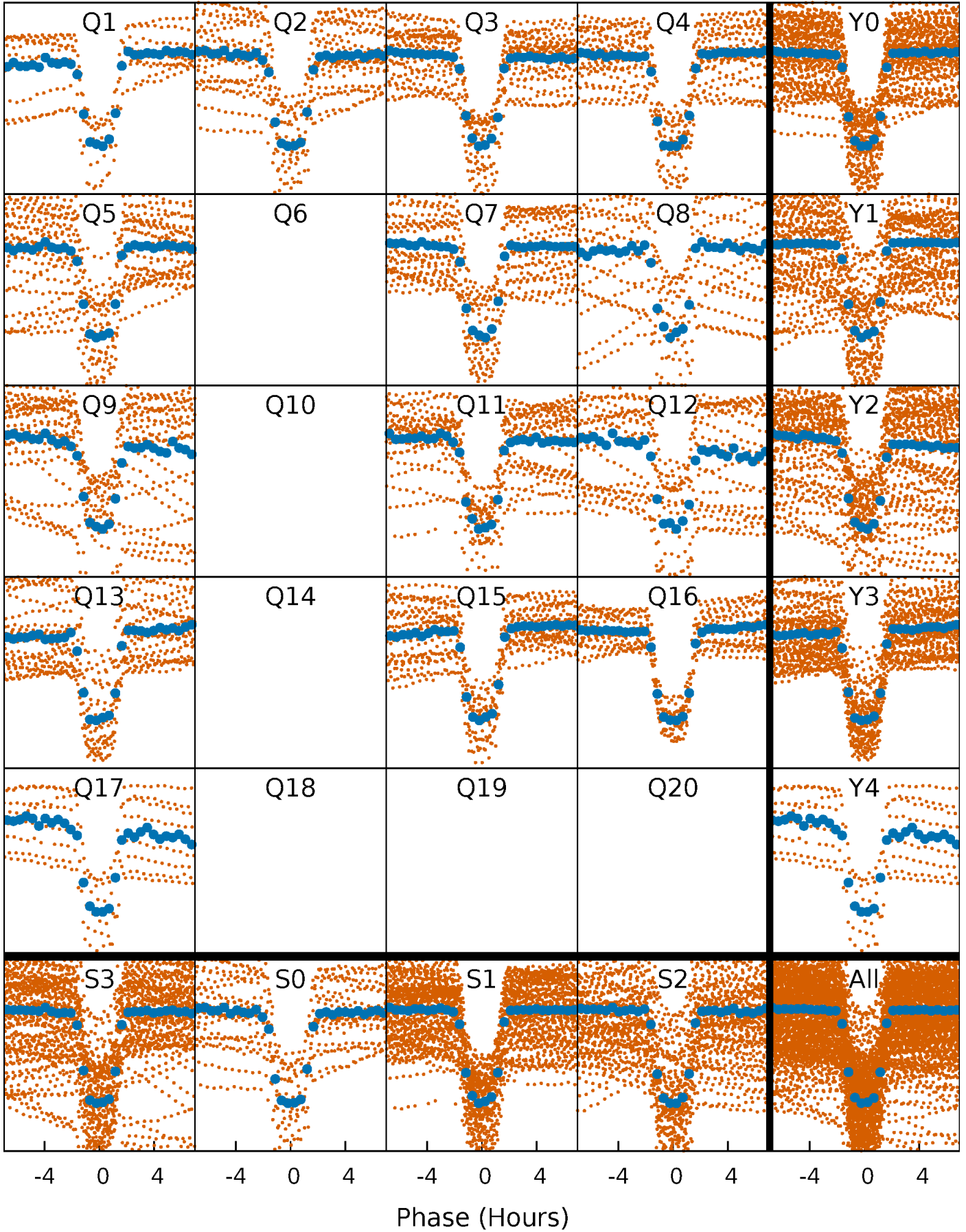
Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

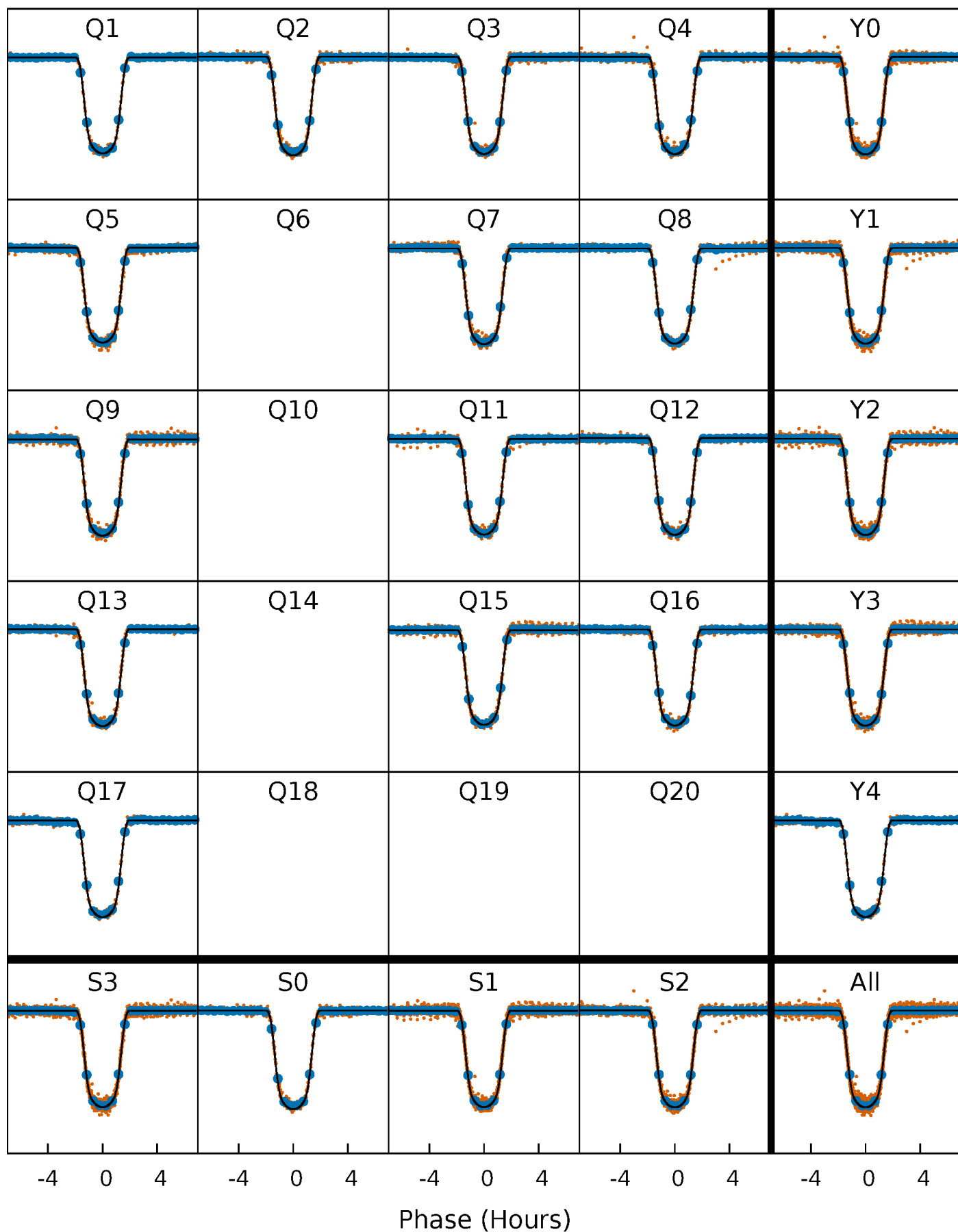
TCE 005376836-01   P= 3.479424 Days    $T_0=133.318140$  (BKJD)





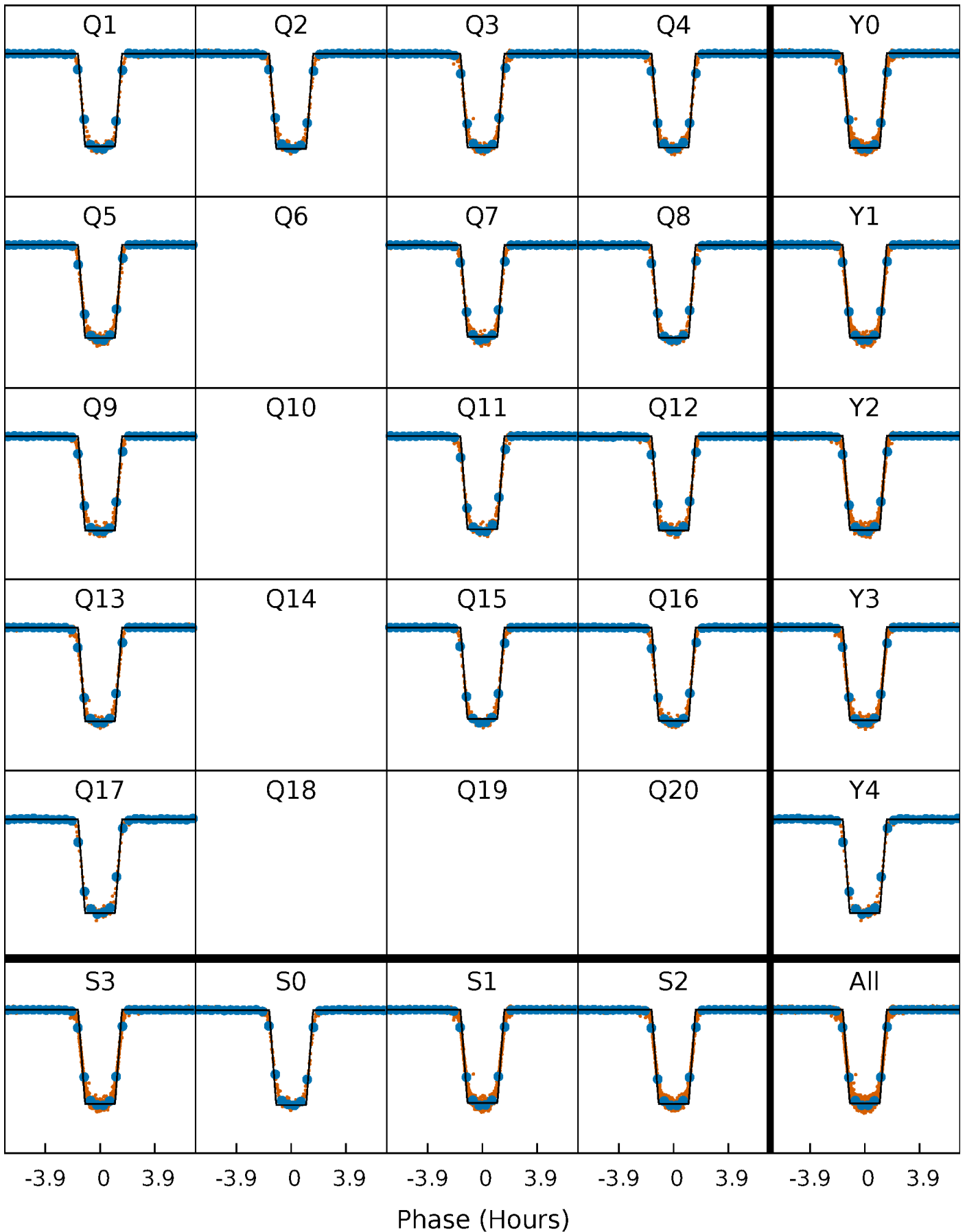
# DV Quarter-Phased Transit Curves

TCE 005376836-01 P= 3.479424 Days  $T_0=133.318140$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

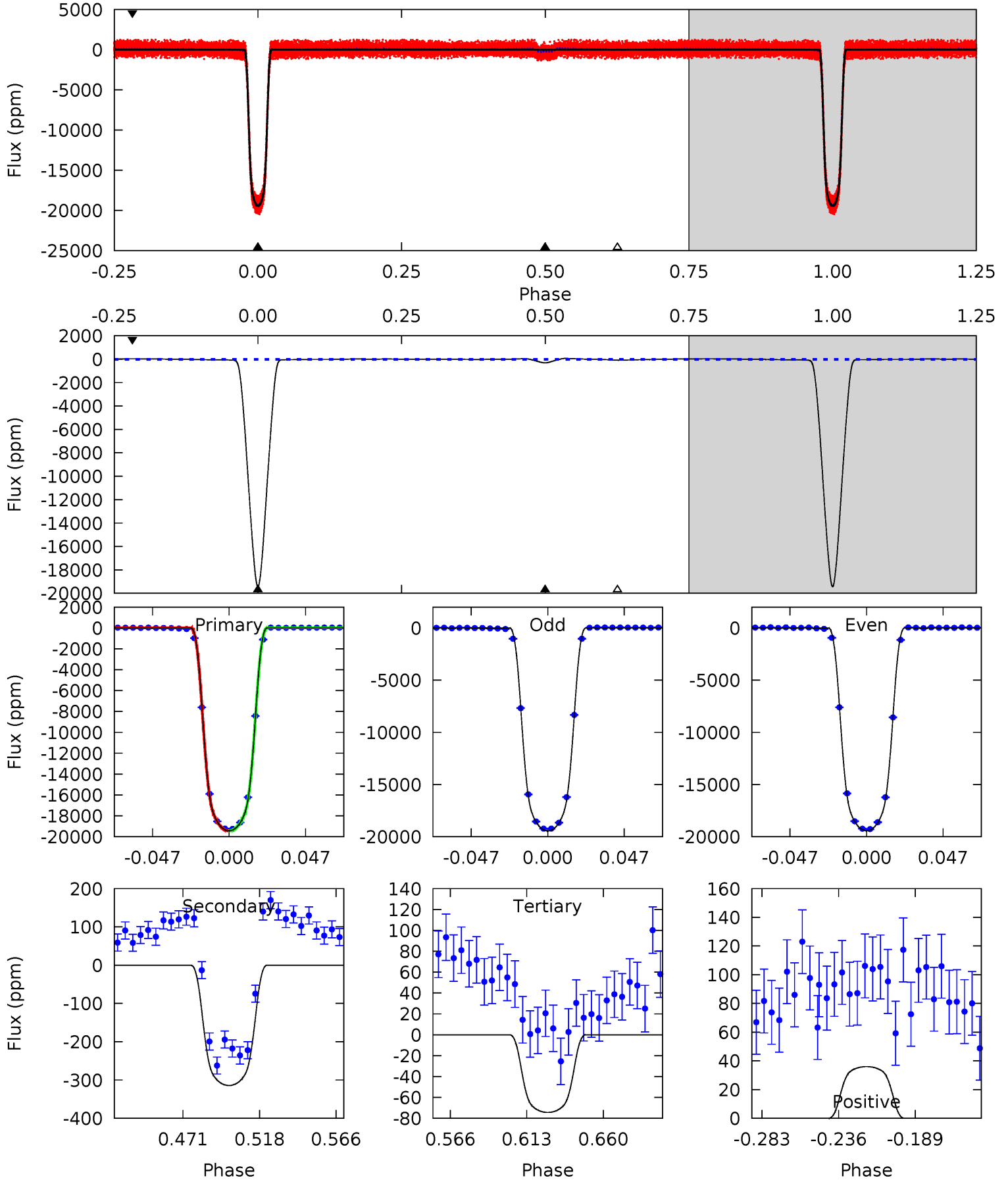
TCE 005376836-01 P= 3.479429 Days  $T_0=133.317069$  (BKJD)



# DV Model-Shift Uniqueness Test

005376836-01, P = 3.479424 Days, E = 129.838716 Days

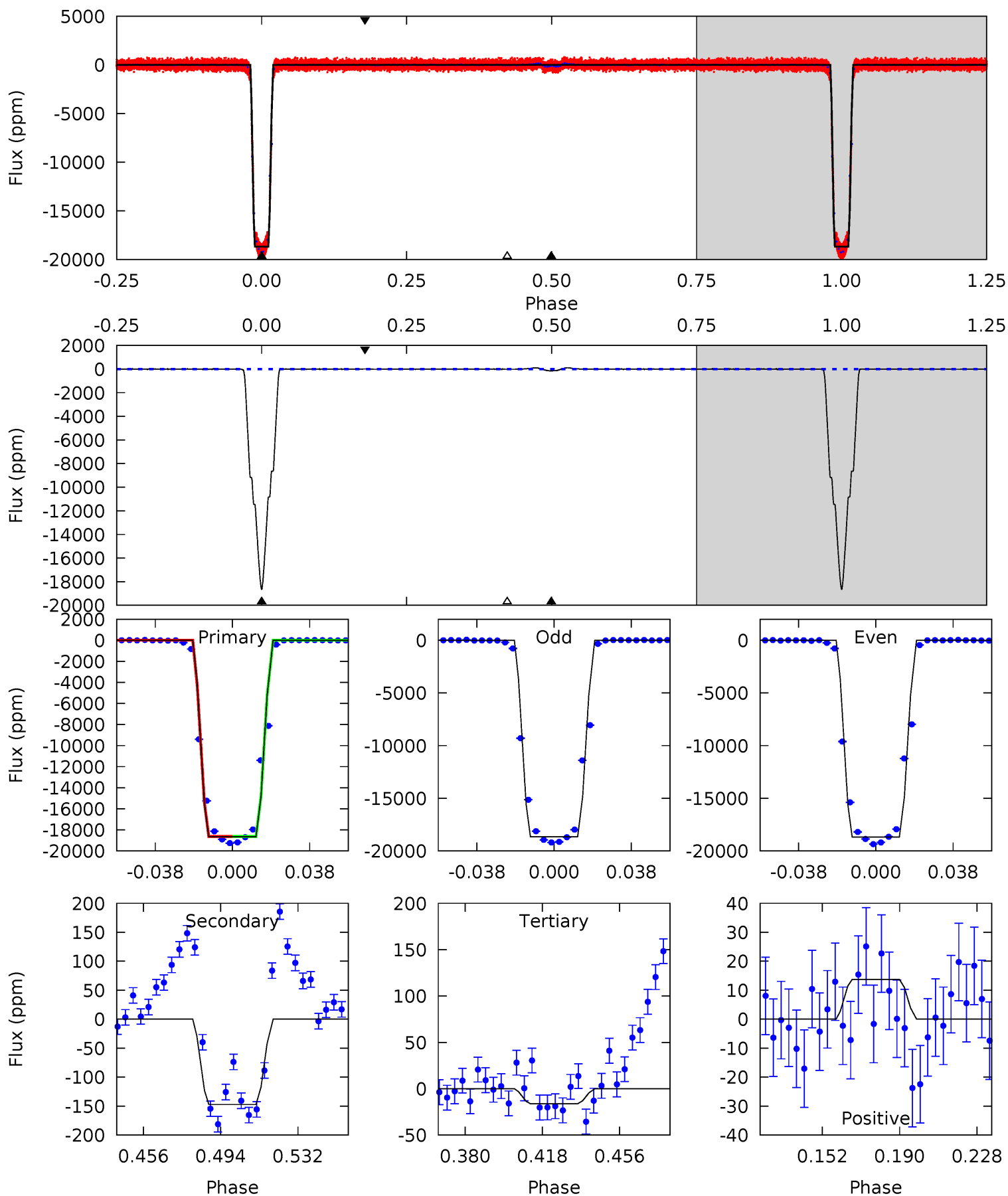
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2869	46.4	11.0	5.32	4.72	1.99	4.04	2858	2864	35.4	41.1	1.18	1.00	0.00	0.22



# Alt Model-Shift Uniqueness Test

005376836-01, P = 3.479429 Days, E = 129.837640 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
3351	26.4	2.92	2.47	4.76	2.08	1.34	3348	3348	23.5	24.0	2.27	1.00	0.01	0.62



### Stellar Parameters For KIC 005376836

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5907^{+158}_{-175}$	$4.519^{+0.062}_{-0.188}$	$-0.300^{+0.300}_{-0.300}$	$0.878^{+0.248}_{-0.083}$	$0.929^{+0.108}_{-0.108}$	$1.935^{+0.511}_{-0.985}$
	+3%/-3%	+1%/-4%	+100%/-100%	+28%/-9%	+12%/-12%	+26%/-51%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 005376836-01 / KOI 0182.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-314 \pm 7$	$13.25^{+1.97}_{-0.92}$	$1657^{+104}_{-77}$	$2789^{+46}_{-49}$	$1.874^{+0.258}_{-0.424}$
Alt.	$-147 \pm 6$	$13.22^{+1.99}_{-0.78}$	$1649^{+108}_{-74}$	$2444^{+46}_{-53}$	$0.866^{+0.117}_{-0.185}$

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

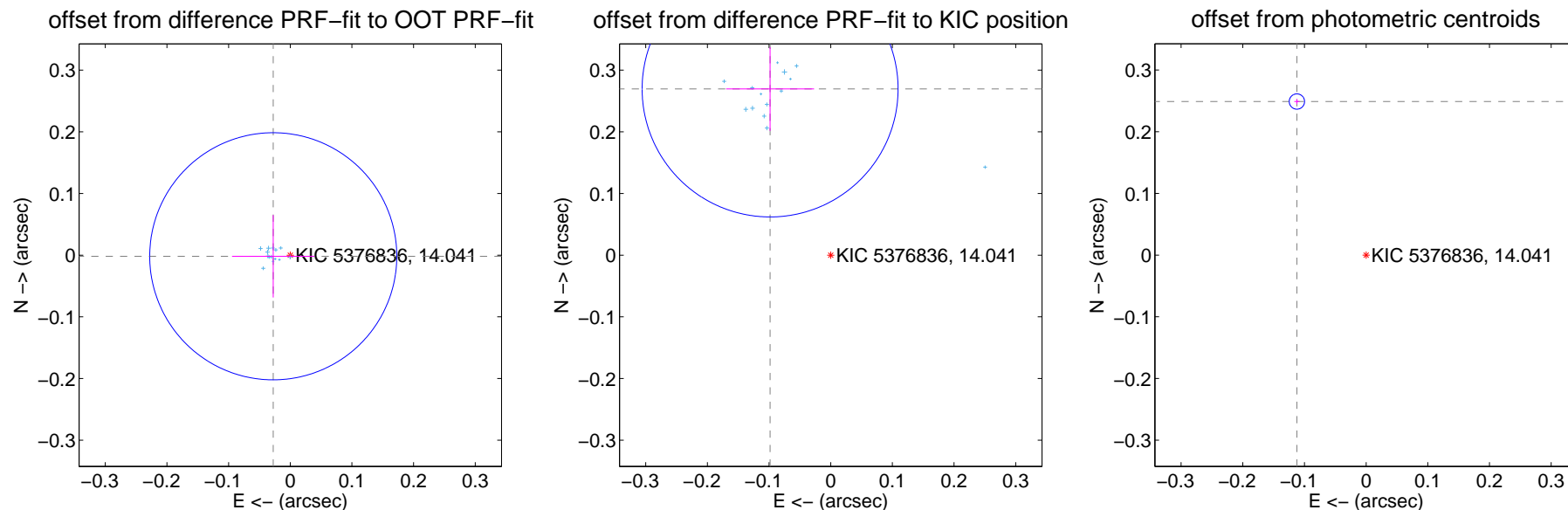
## DV Centroid Data

Supplemental centroid analysis for 005376836-01. Kepler magnitude: 14.04. Transit SNR 1482.23

There are 14 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.31 arcsec

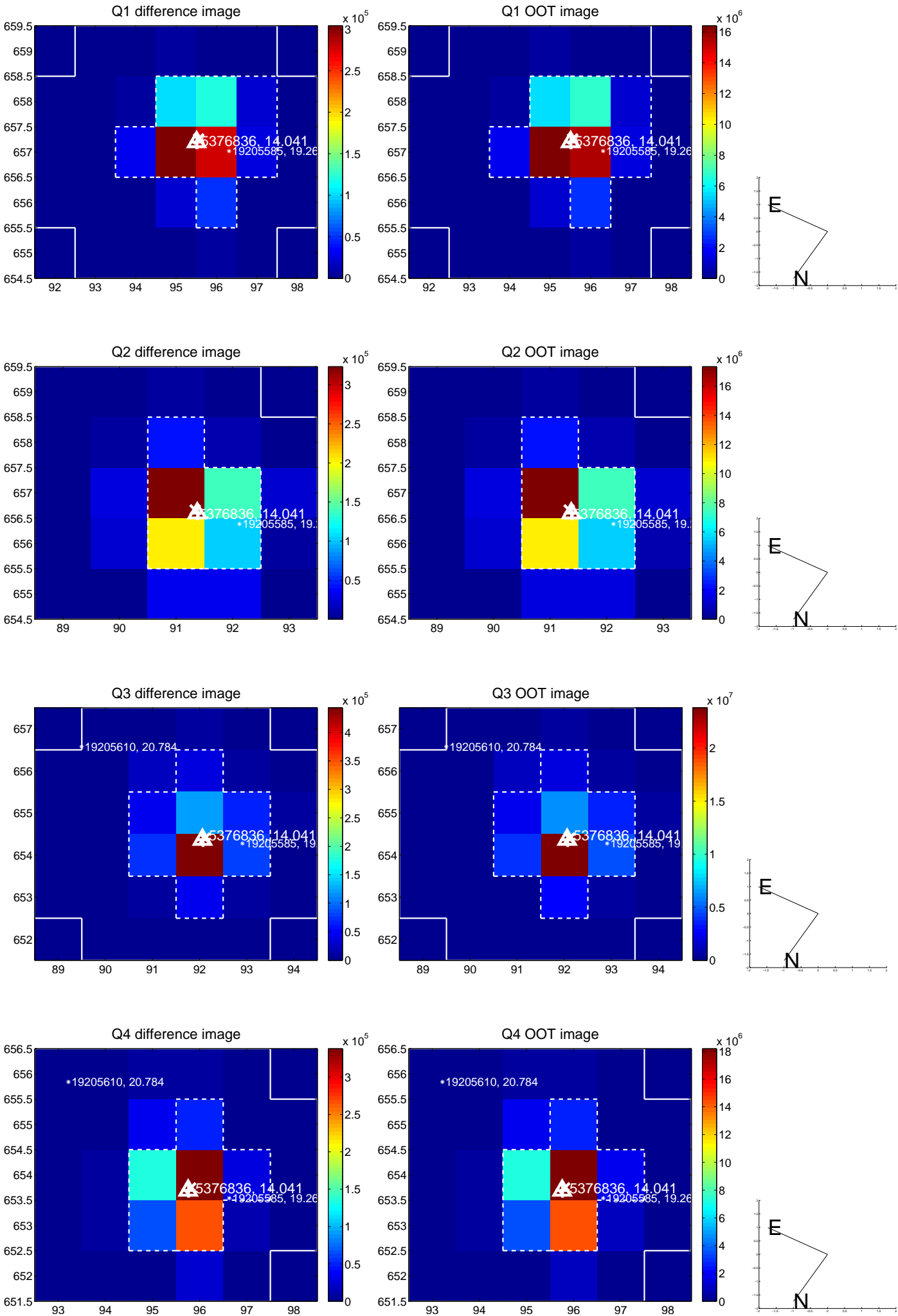
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.028 \pm 0.067$	0.41	$0.028 \pm 0.067$	$-0.002 \pm 0.067$
PRF-fit source offset from KIC position	$0.287 \pm 0.069$	4.15	$0.098 \pm 0.071$	$0.269 \pm 0.068$
photometric centroid source offset	$0.27 \pm 0.00$	65.94	$0.11 \pm 0.00$	$0.25 \pm 0.00$



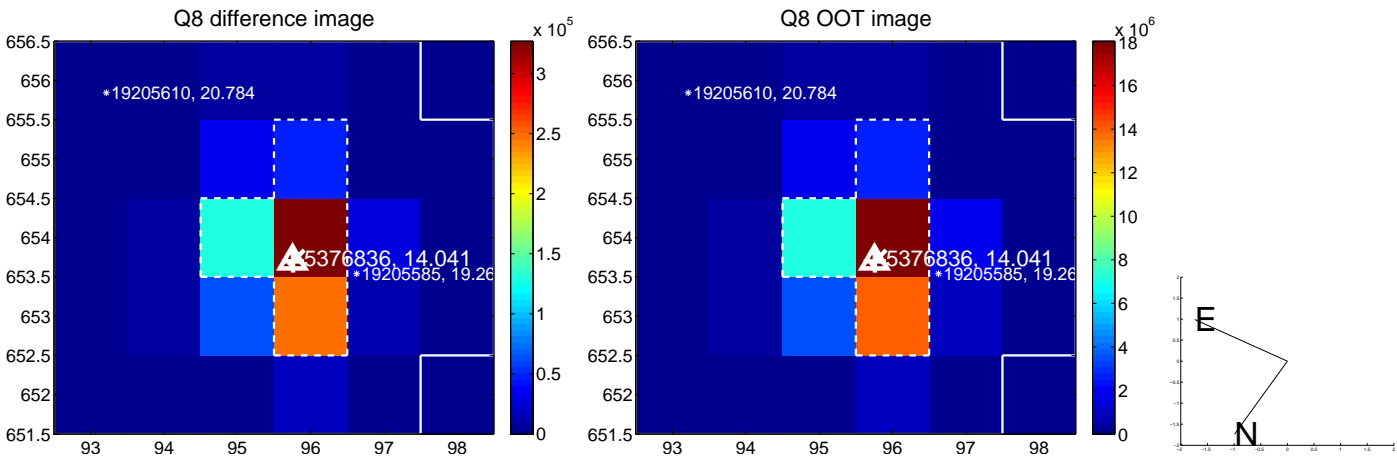
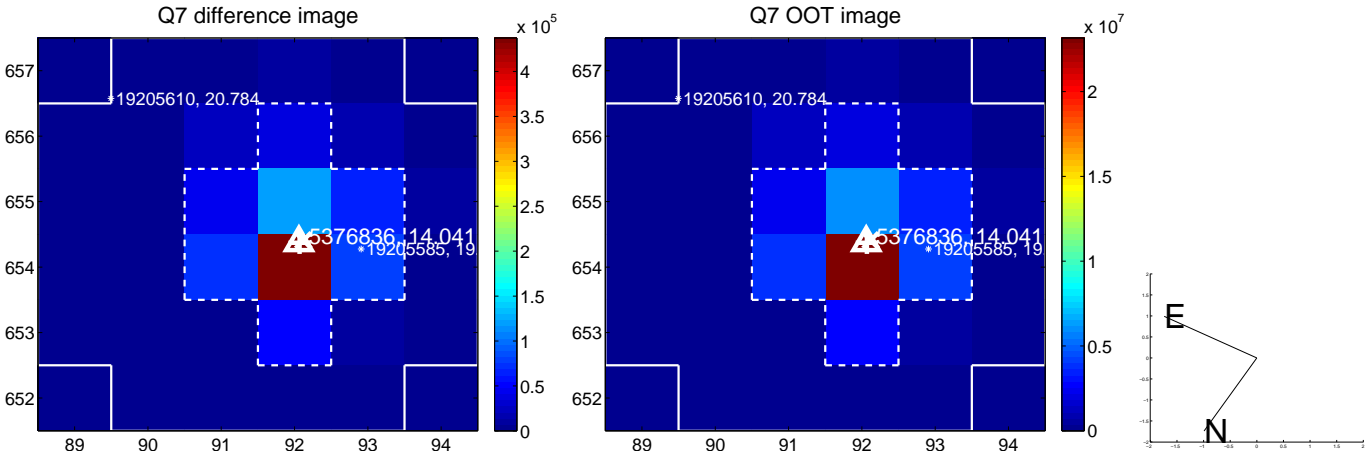
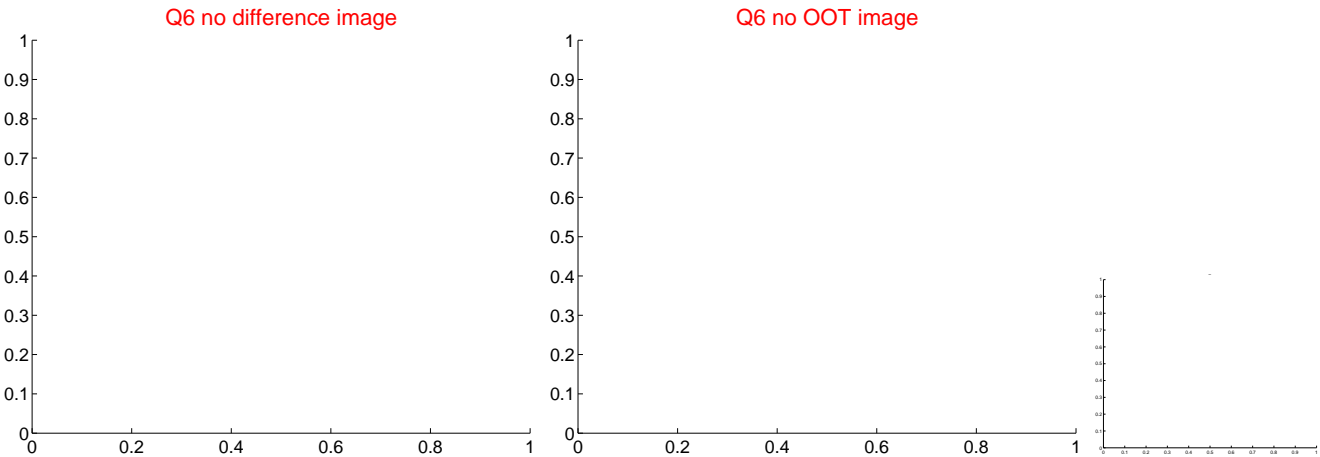
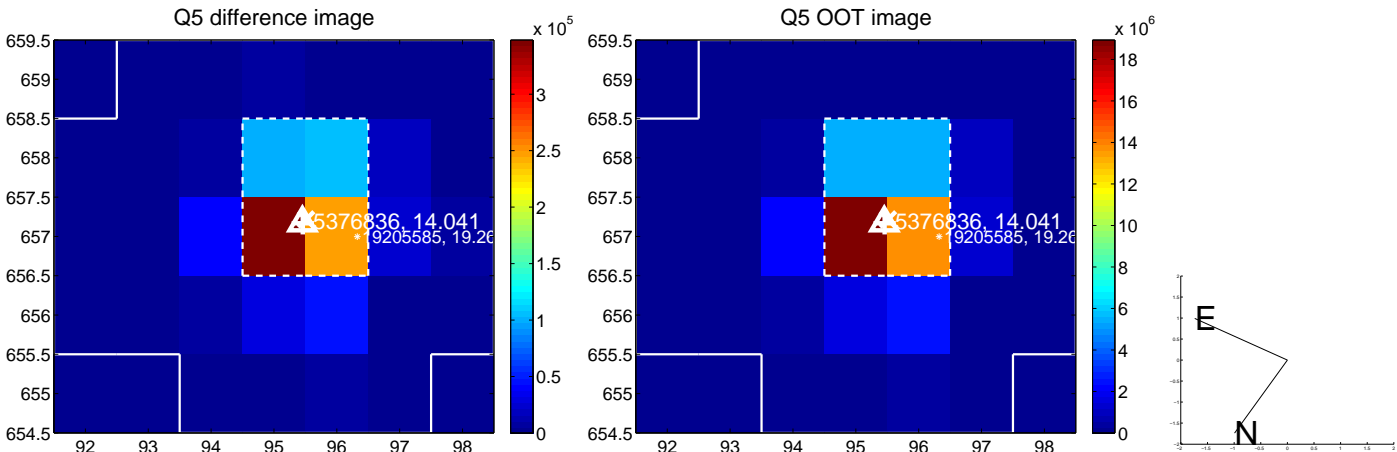
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



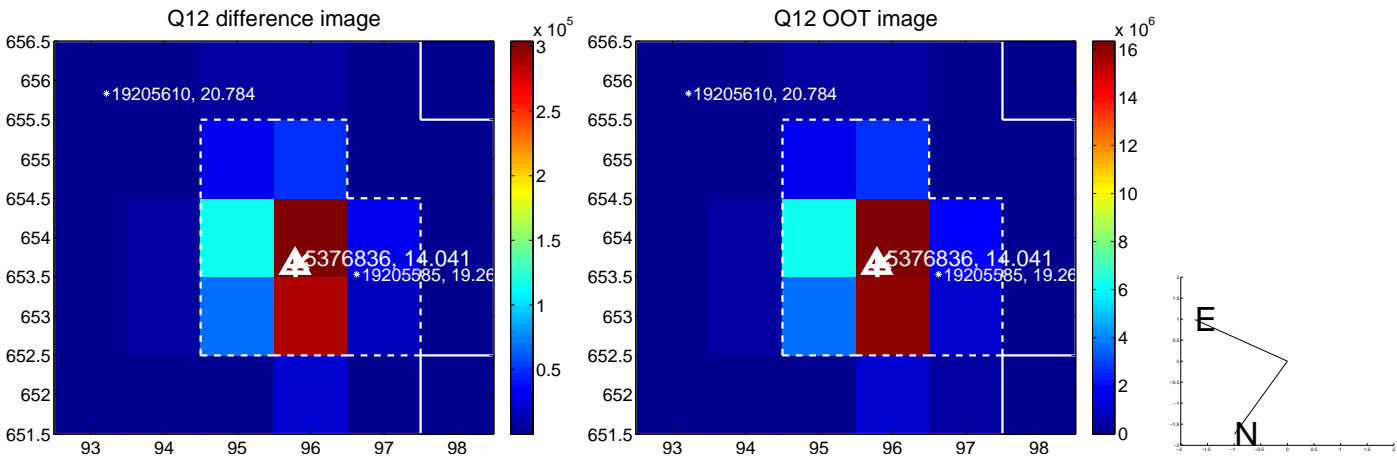
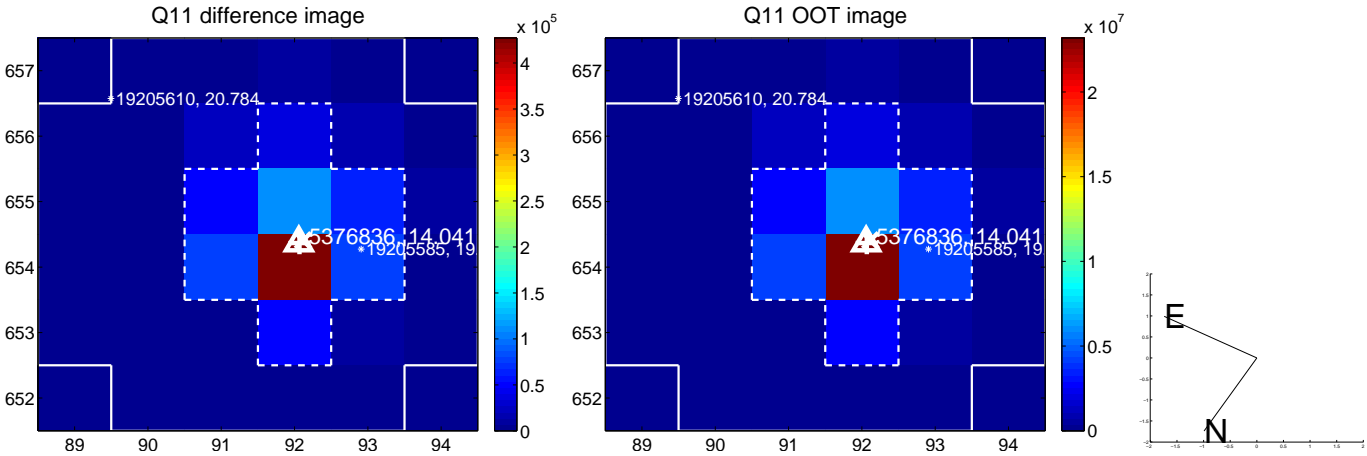
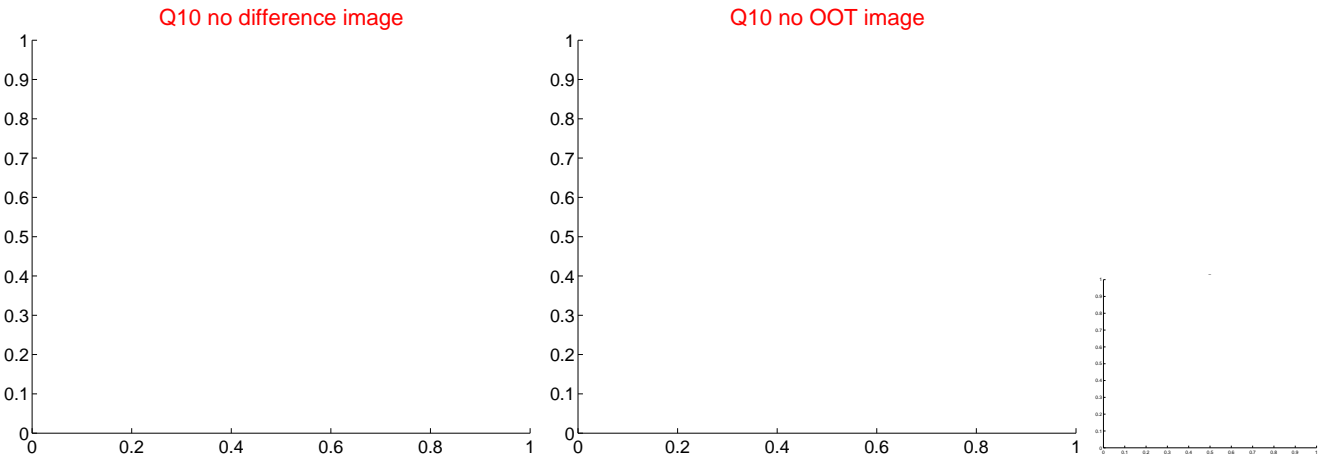
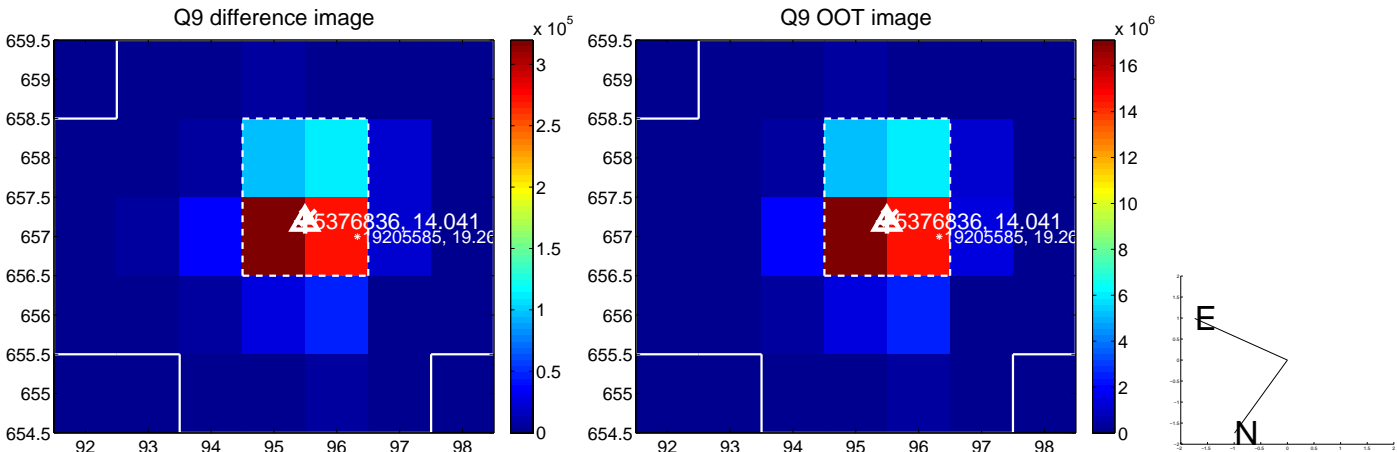
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



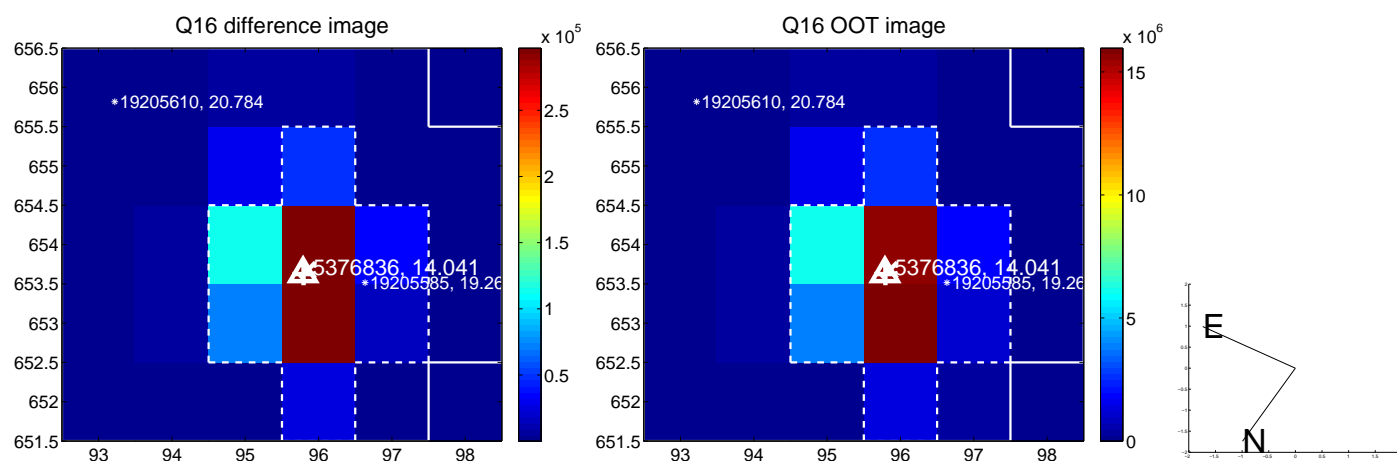
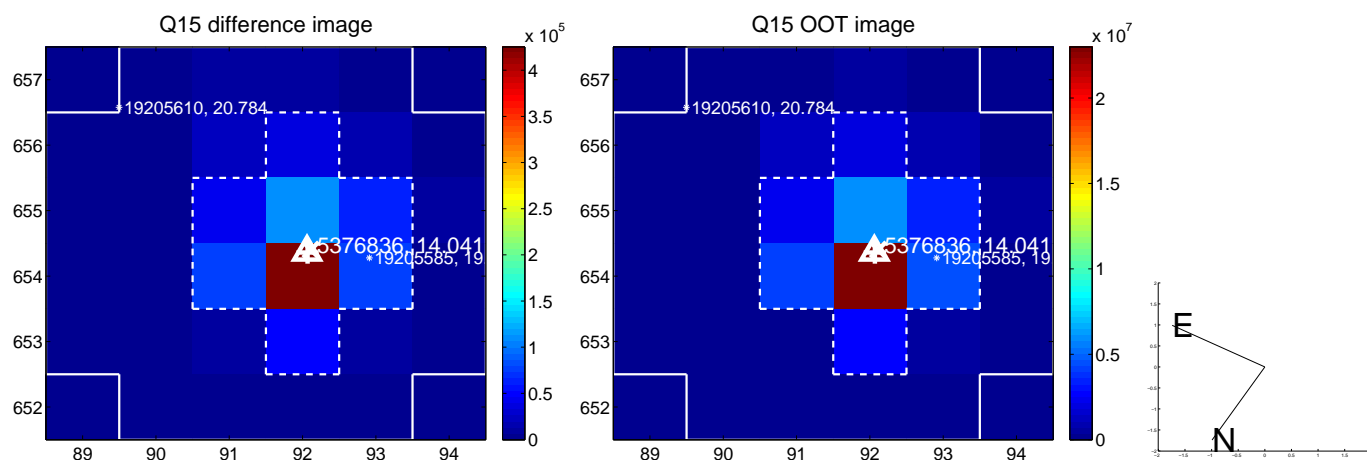
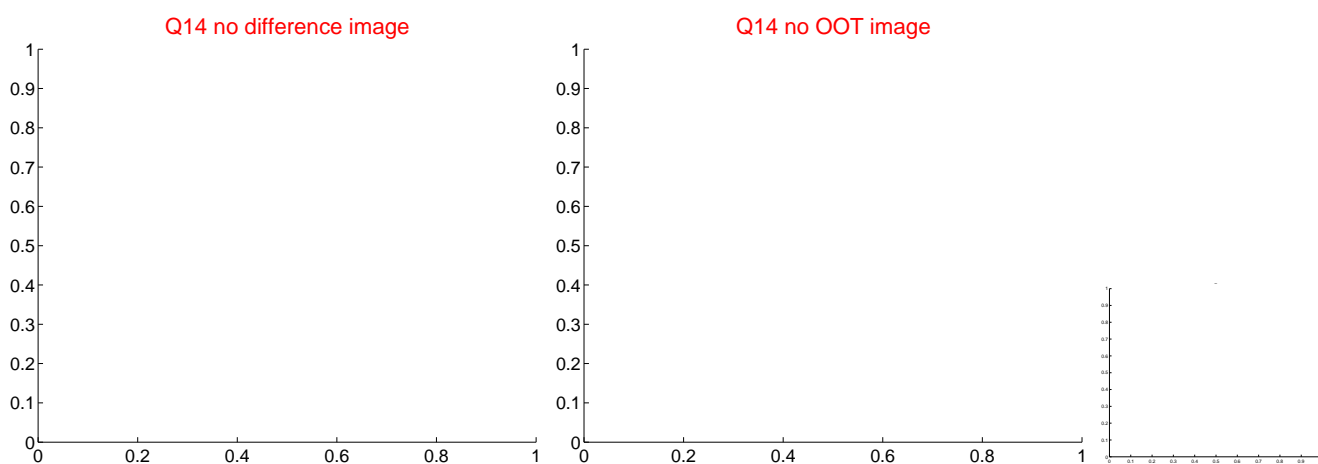
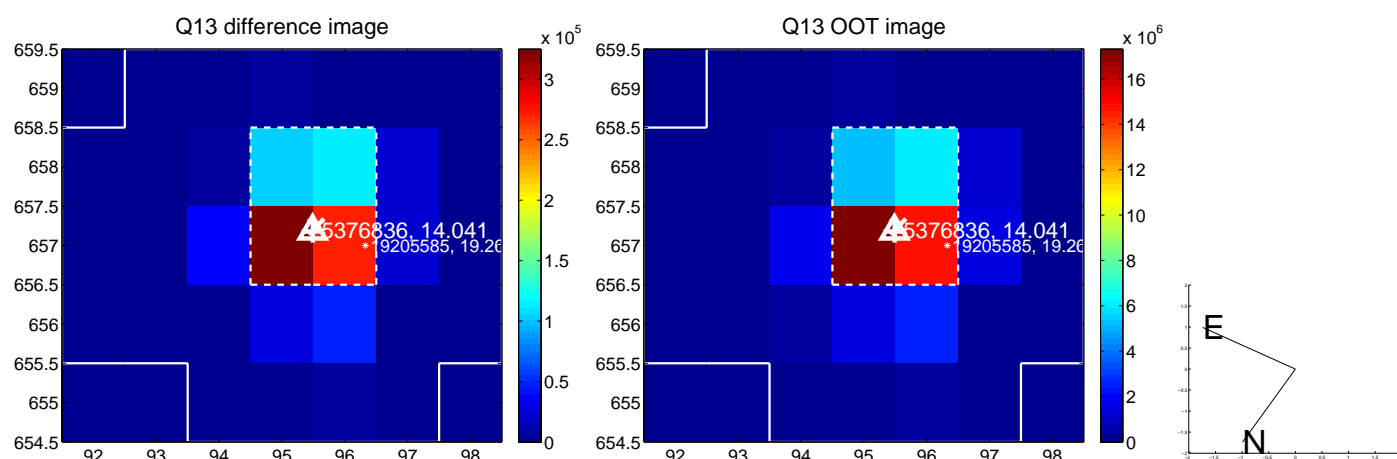
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



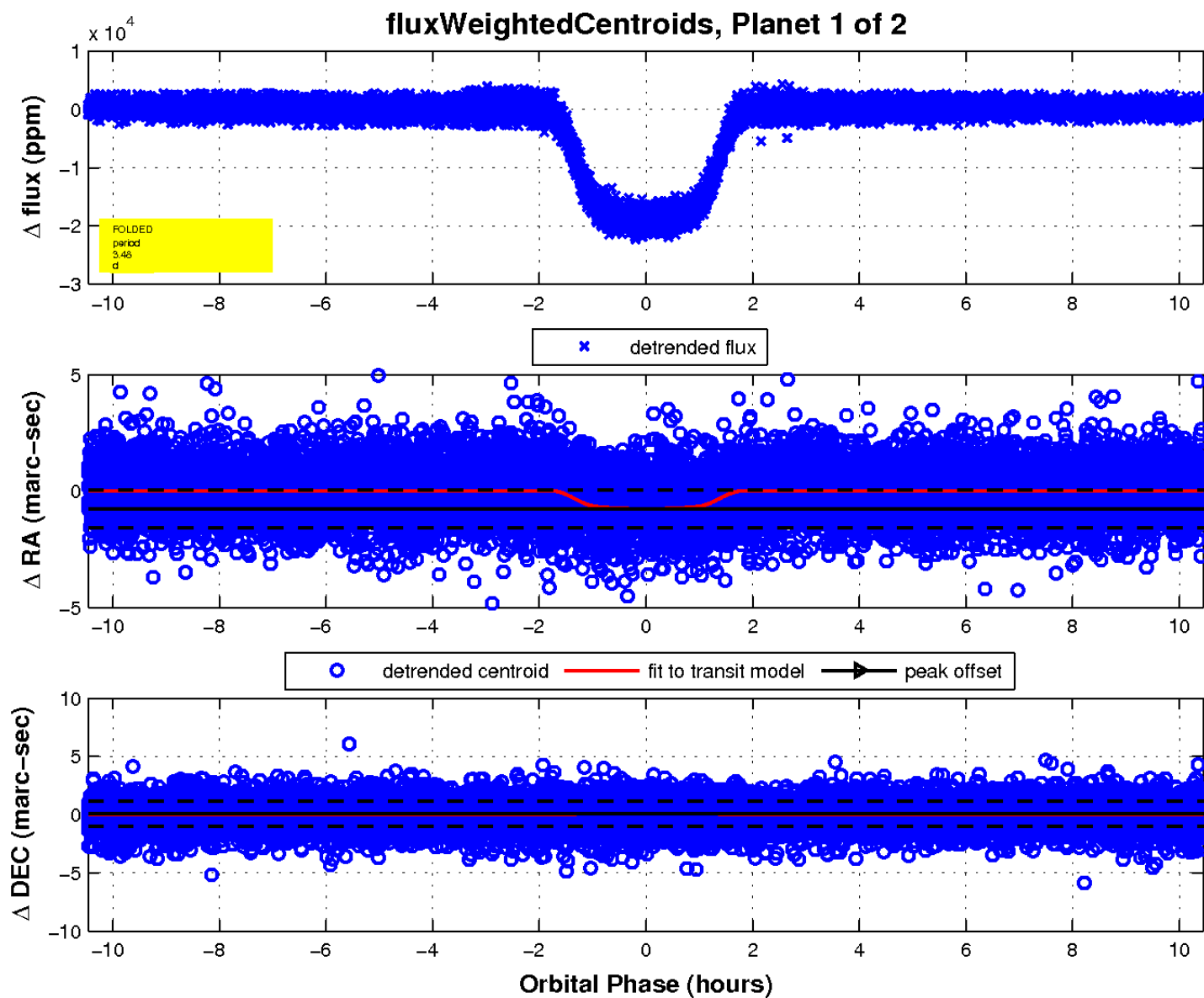
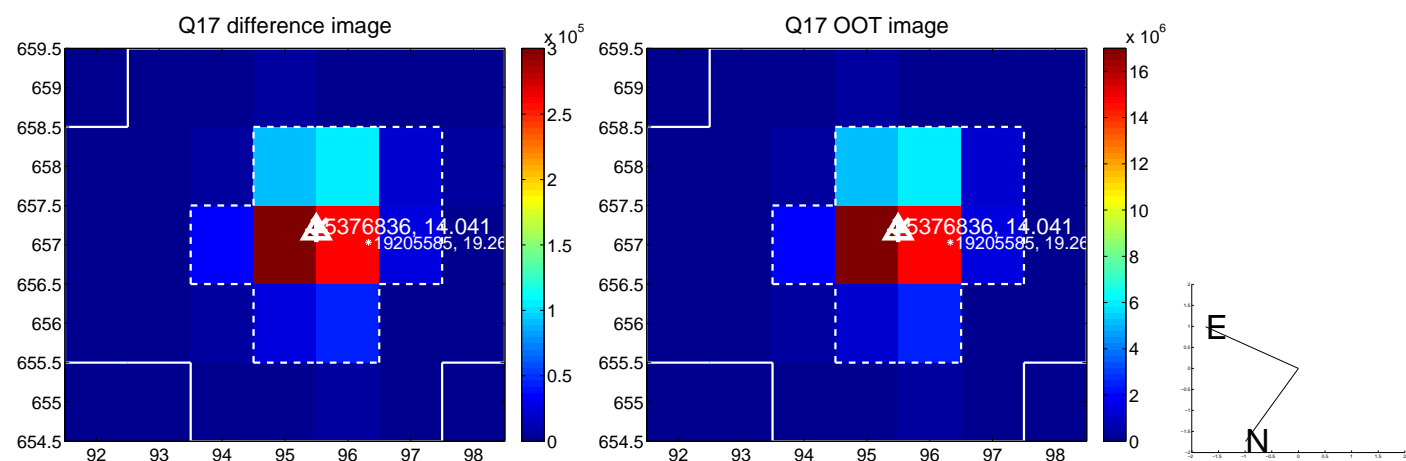
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

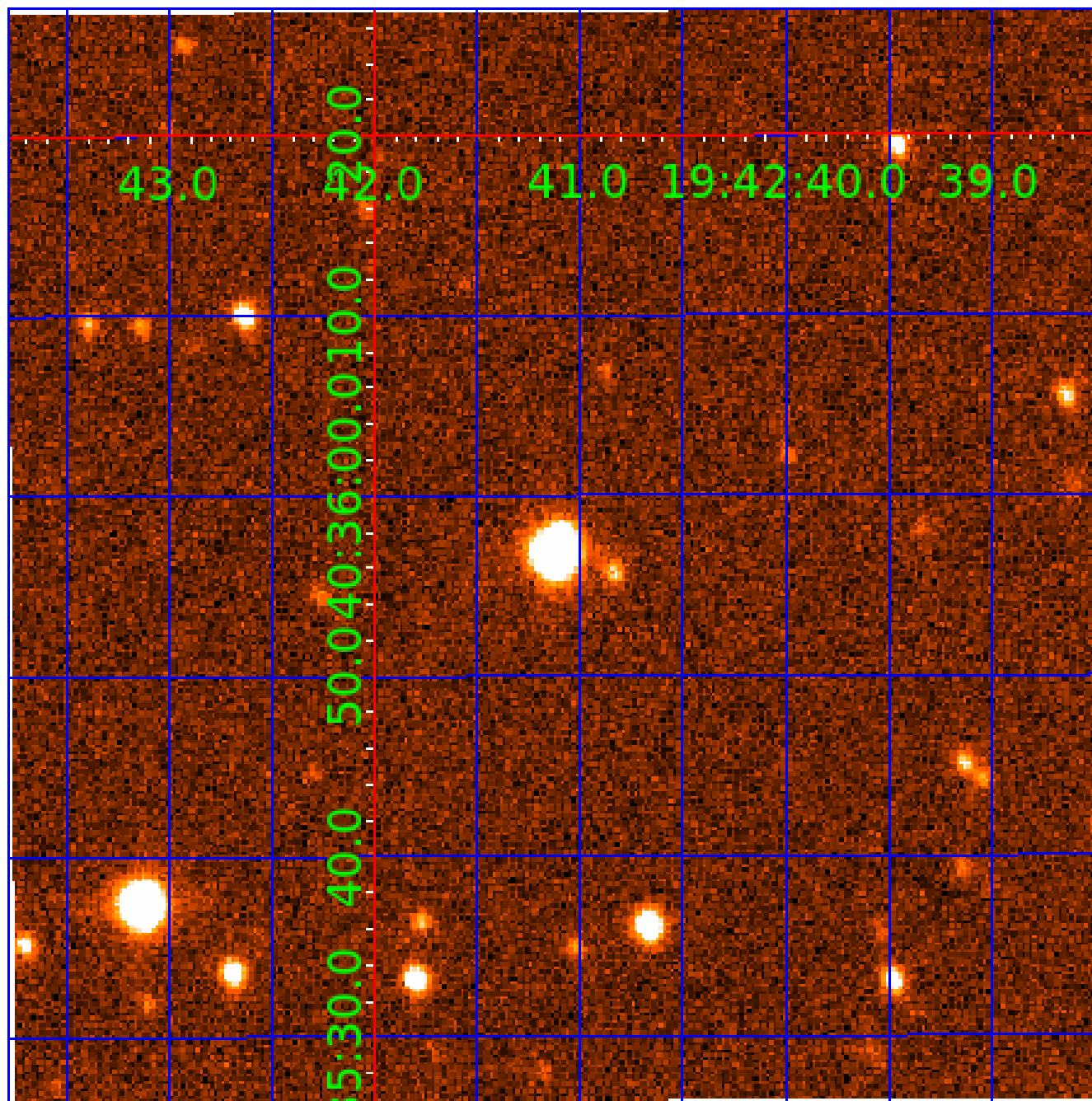


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 005376836

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005376836-01	OBS	0182.01	3.479424	133.318140	19485.2	3.485	1656.2	1482.2	0.88	5907	12.98	437.20
005376836-02	OBS	No	3.479434	131.577875	473.3	3.260	40.1	43.3	0.88	5907	2.26	437.20

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005376836-01	OBS	PC	0.88	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—PLANET_OCCULT_ALT—HAS_SEC_TCE
005376836-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

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

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

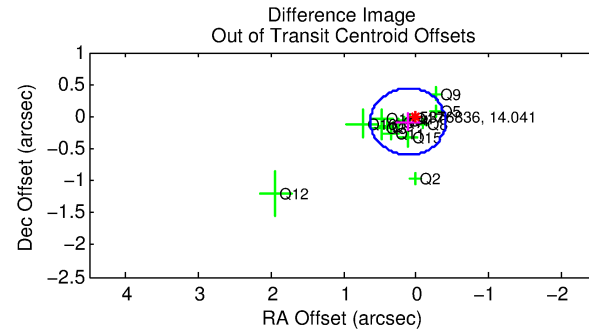
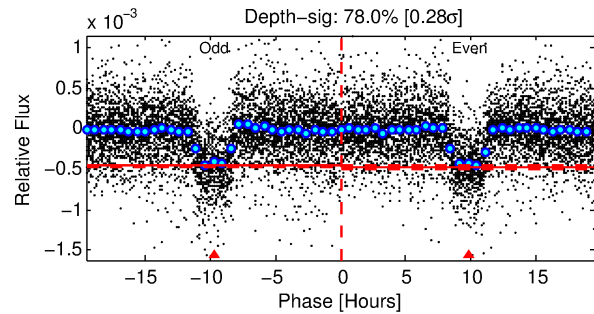
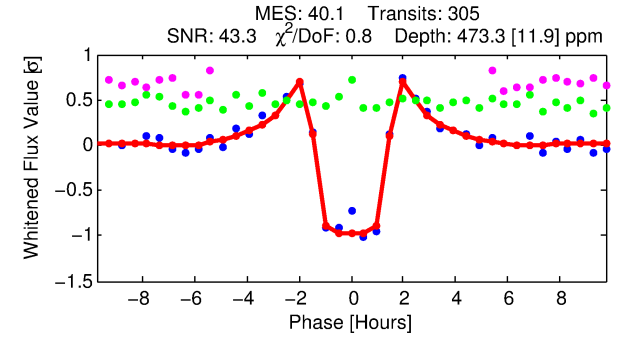
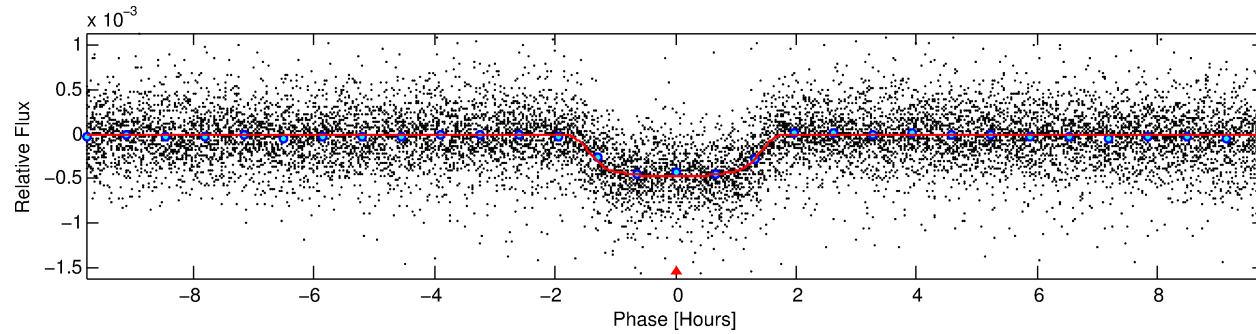
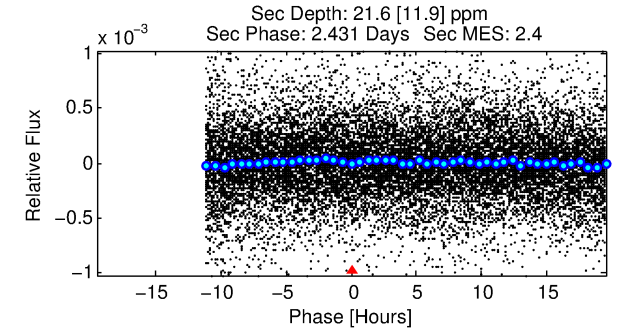
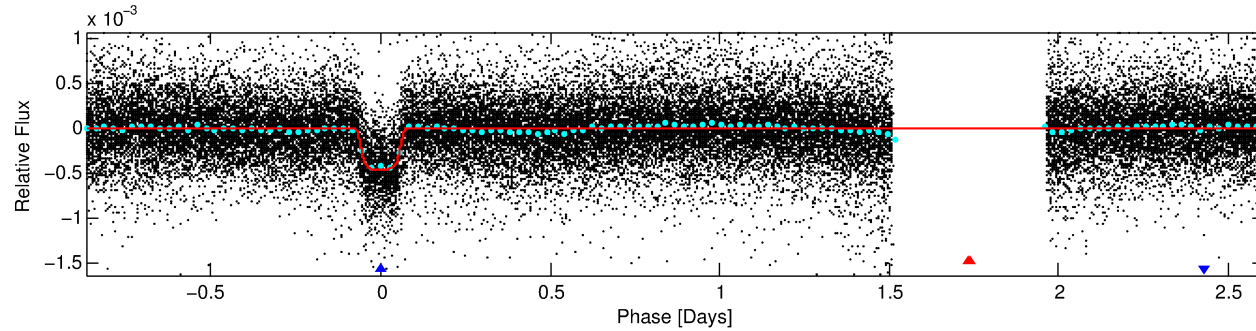
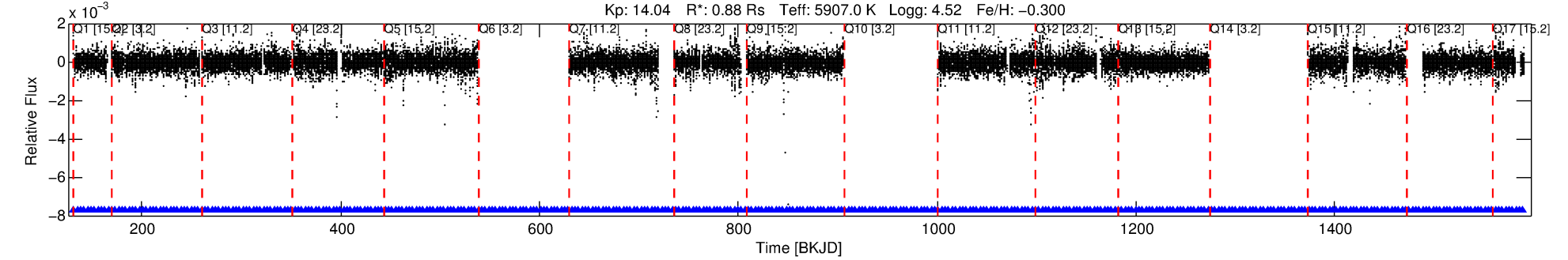
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005376836-02

No Significant Match Found

# DV One-Page Summary

KIC: 5376836 Candidate: 2 of 2 Period: 3.479 d  
KOI: K00182 Corr: No Ephemeris Match



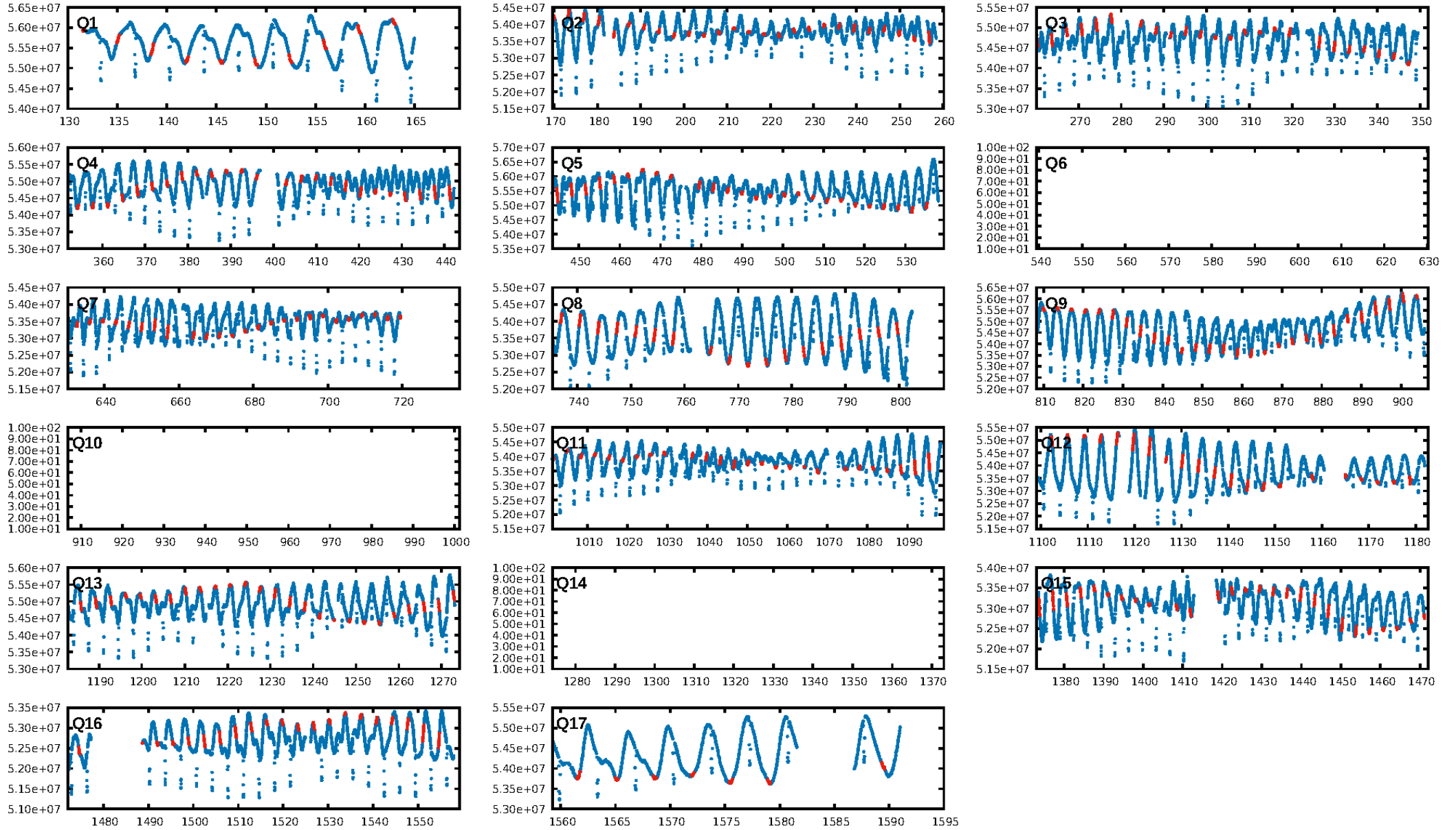
## DV Fit Results:

Period = 3.47943 [0.00000] d  
Epoch = 131.5779 [0.0007] BKJD  
Rp/R\* = 0.0236 [0.0009]  
a/R\* = 4.05 [0.68]  
b = 0.90 [0.04]  
Seff = 437.20 [159.32]  
Teq = 1166 [106] K  
Rp = 2.26 [0.64] Re  
a = 0.0439 [0.0104] AU  
Ag = 4.48 [2.93] [1.19σ]  
Teffp = 2623 [372] K [3.77σ]

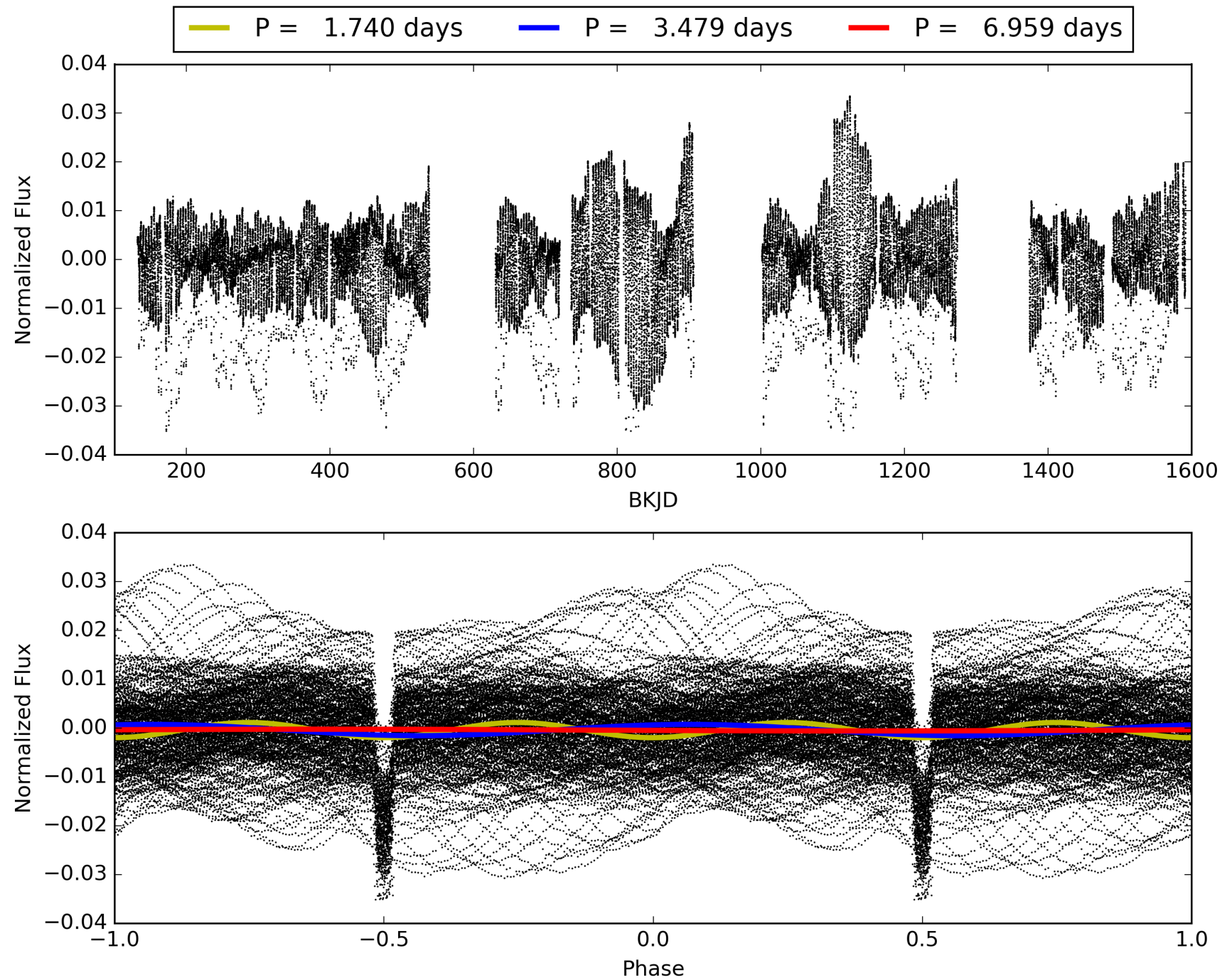
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [288/288]  
GhostDiagnostic-chr: 1.245  
Centroid-sig: 21.3%  
Centroid-so: 0.428 arcsec [2.58σ]  
OotOffset-rm: 0.139 arcsec [0.80σ]  
KicOffset-rm: 0.248 arcsec [2.11σ]  
OotOffset-st: 1/4/4/5 [14]  
KicOffset-st: 1/4/4/5 [14]  
DiffImageQuality-fgm: 0.93 [13/14]  
DiffImageOverlap-fno: 1.00 [14/14]

# TCE 005376836-02, PDC Light Curves

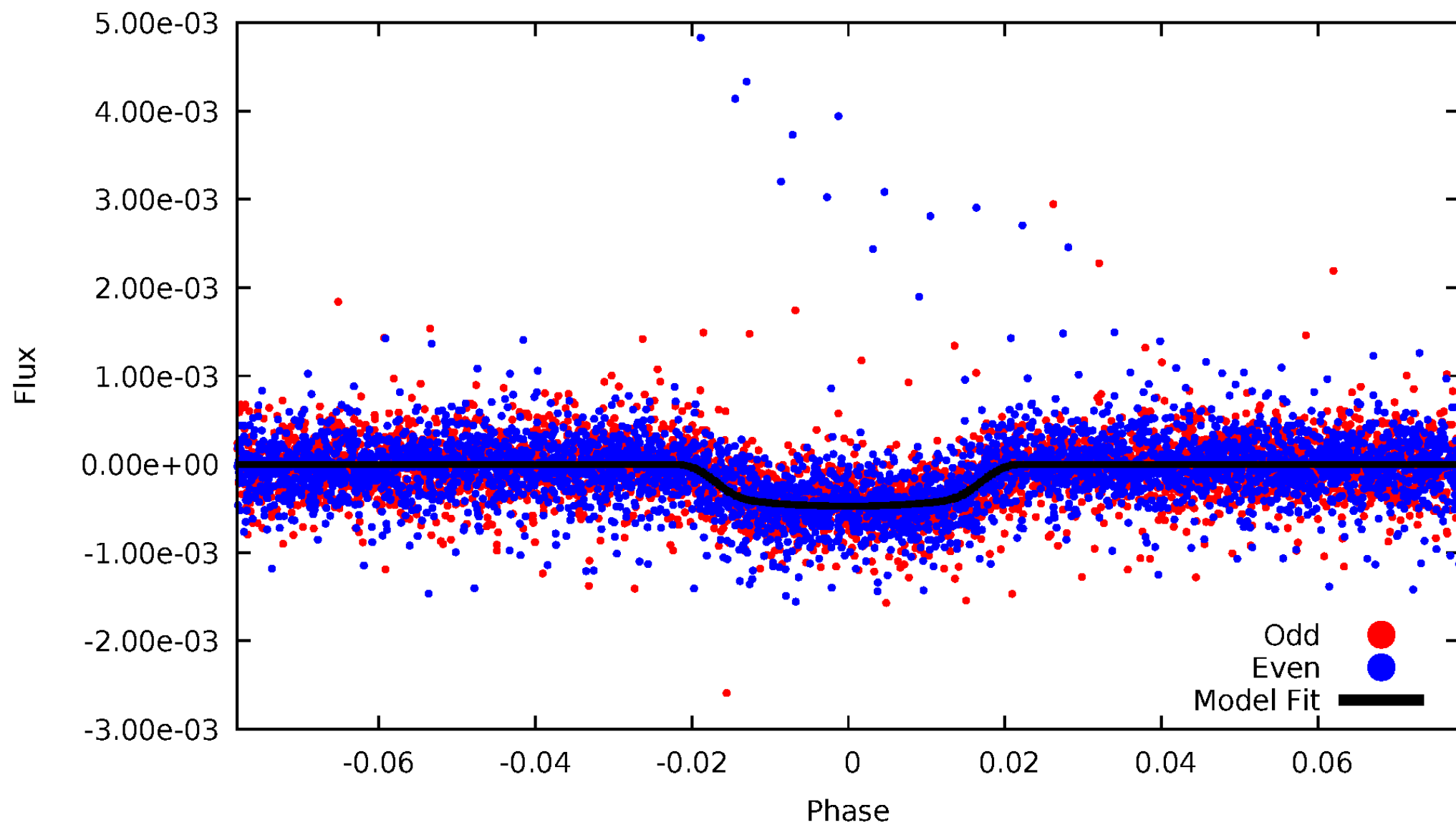


TCE 005376836-02



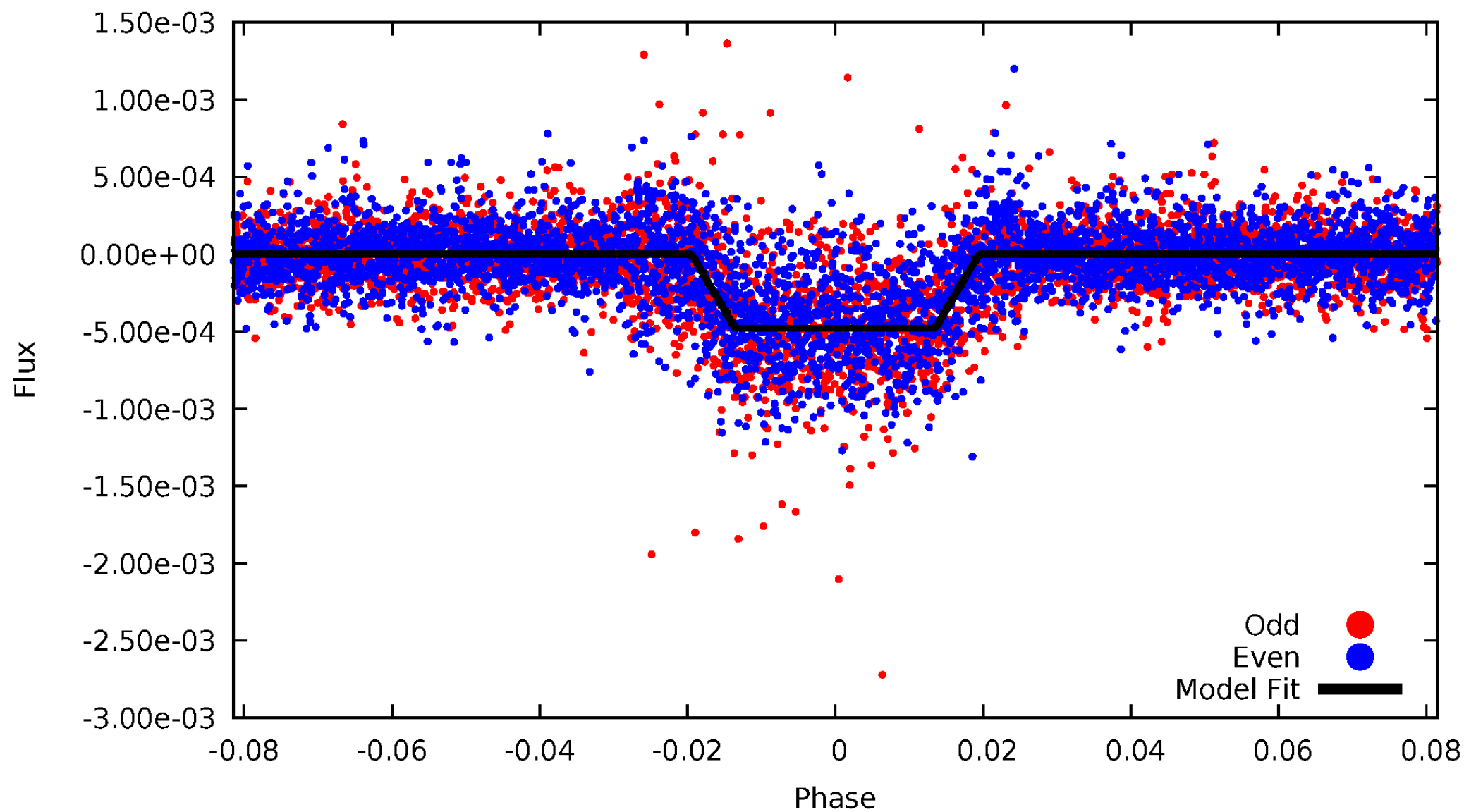
# DV Odd/Even

TCE 005376836-02



# ALT Odd/Even

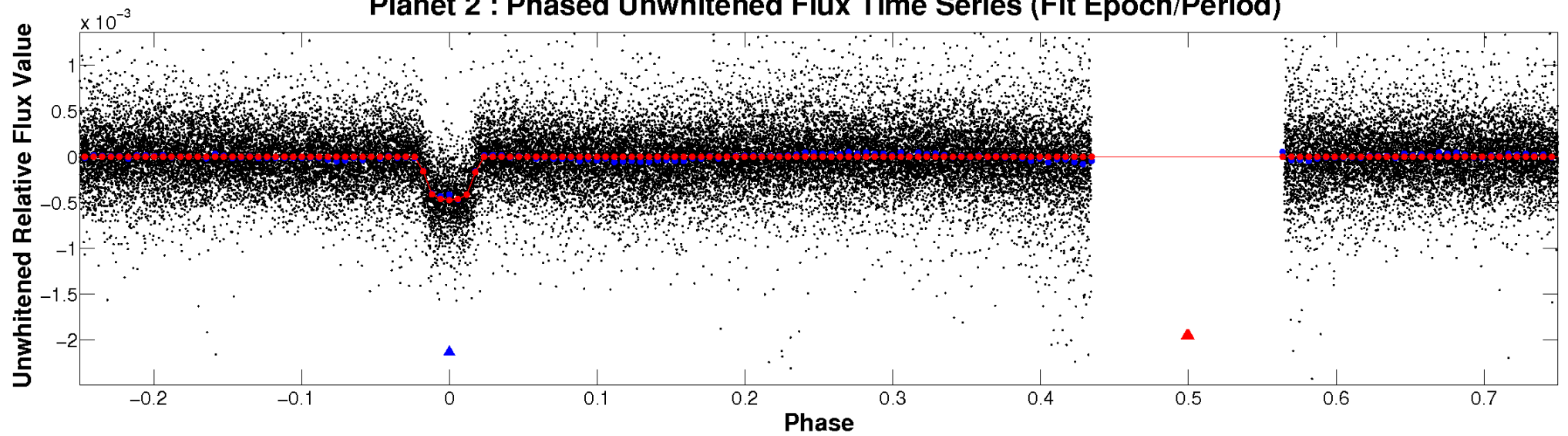
TCE 005376836-02



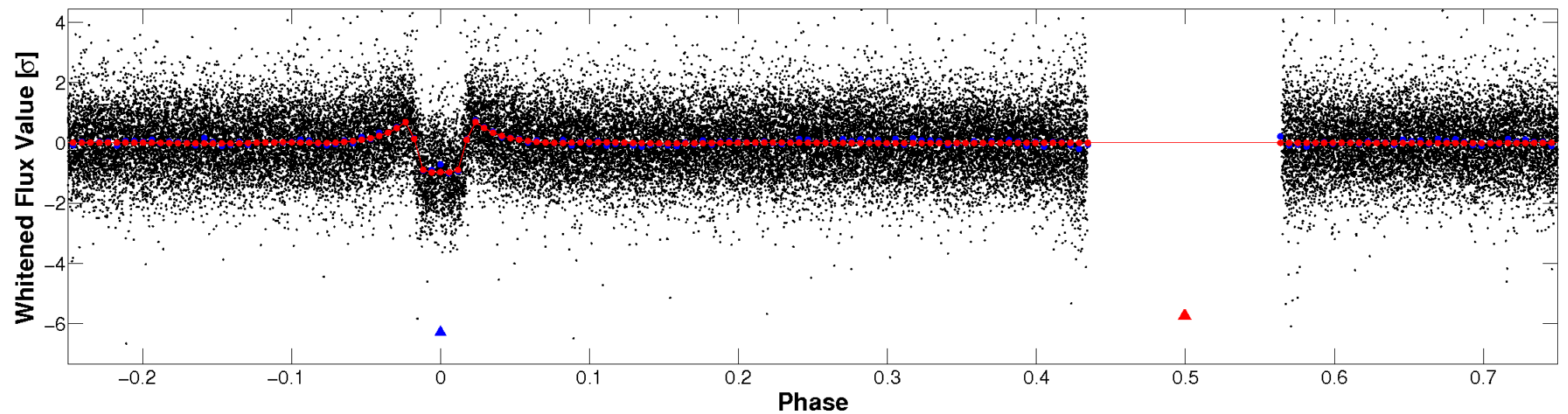


# Non-Whitened Vs. Whitened Light Curve

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

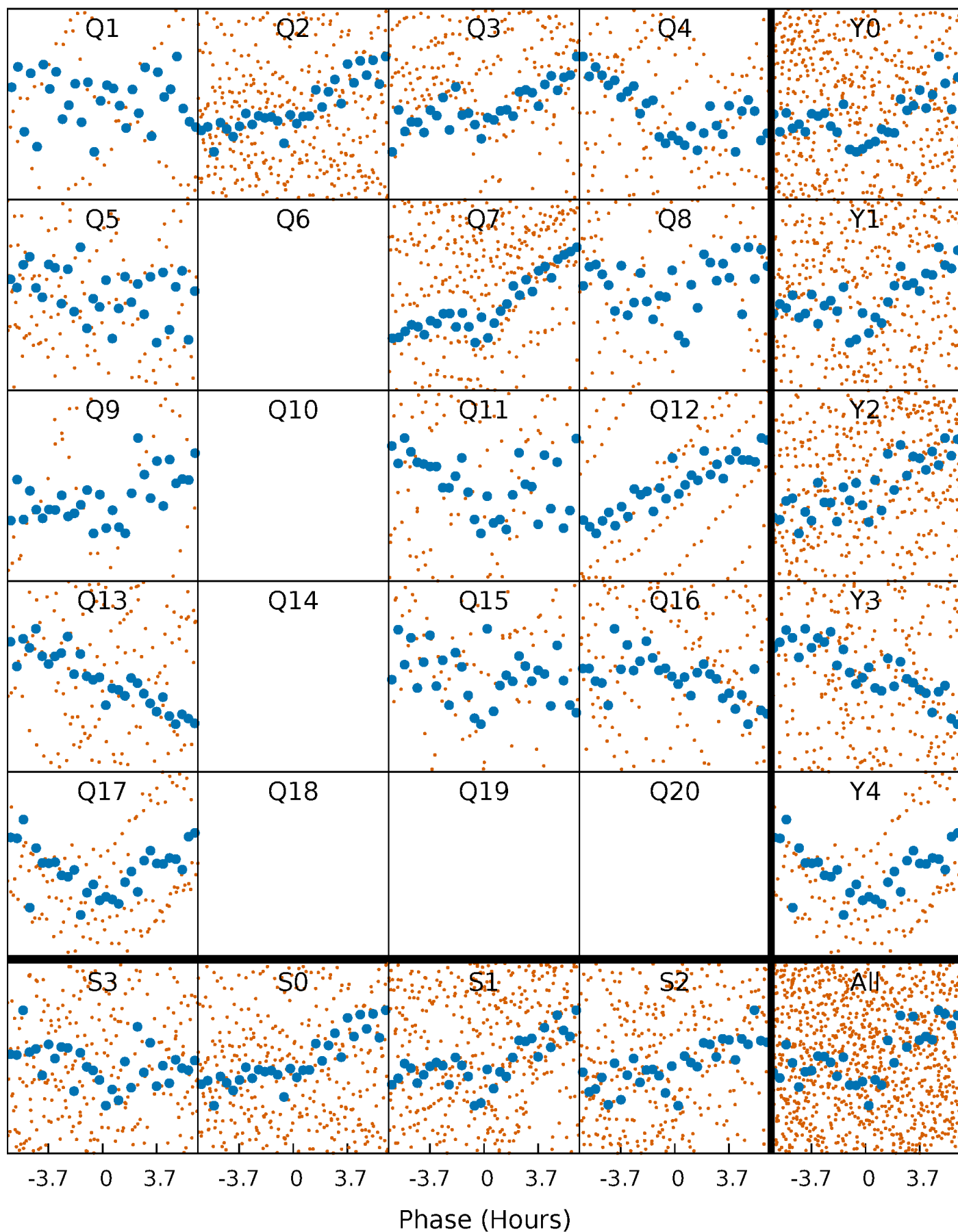


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



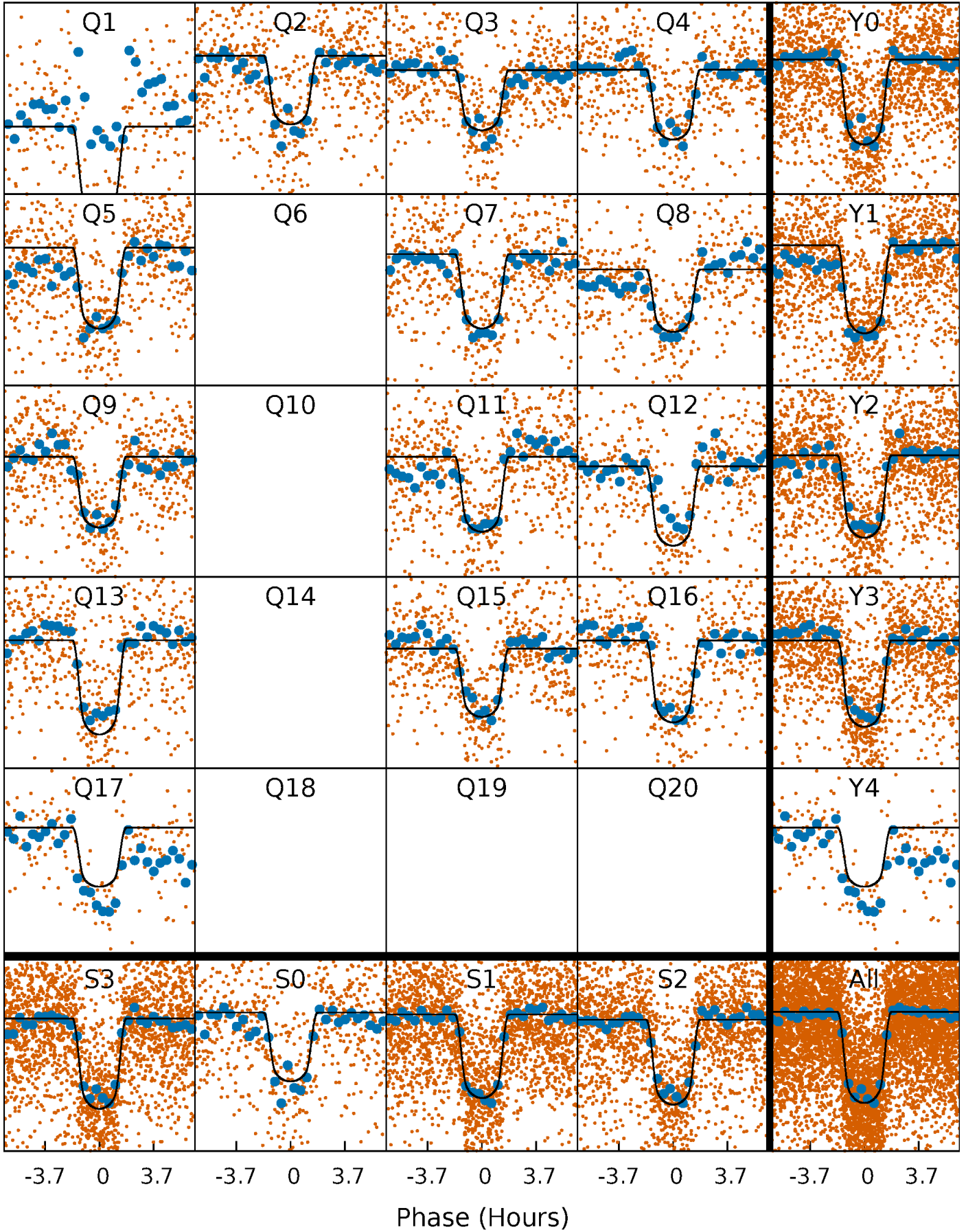
# PDC Quarter-Phased Transit Curves

TCE 005376836-02   P= 3.479434 Days    $T_0=131.577875$  (BKJD)



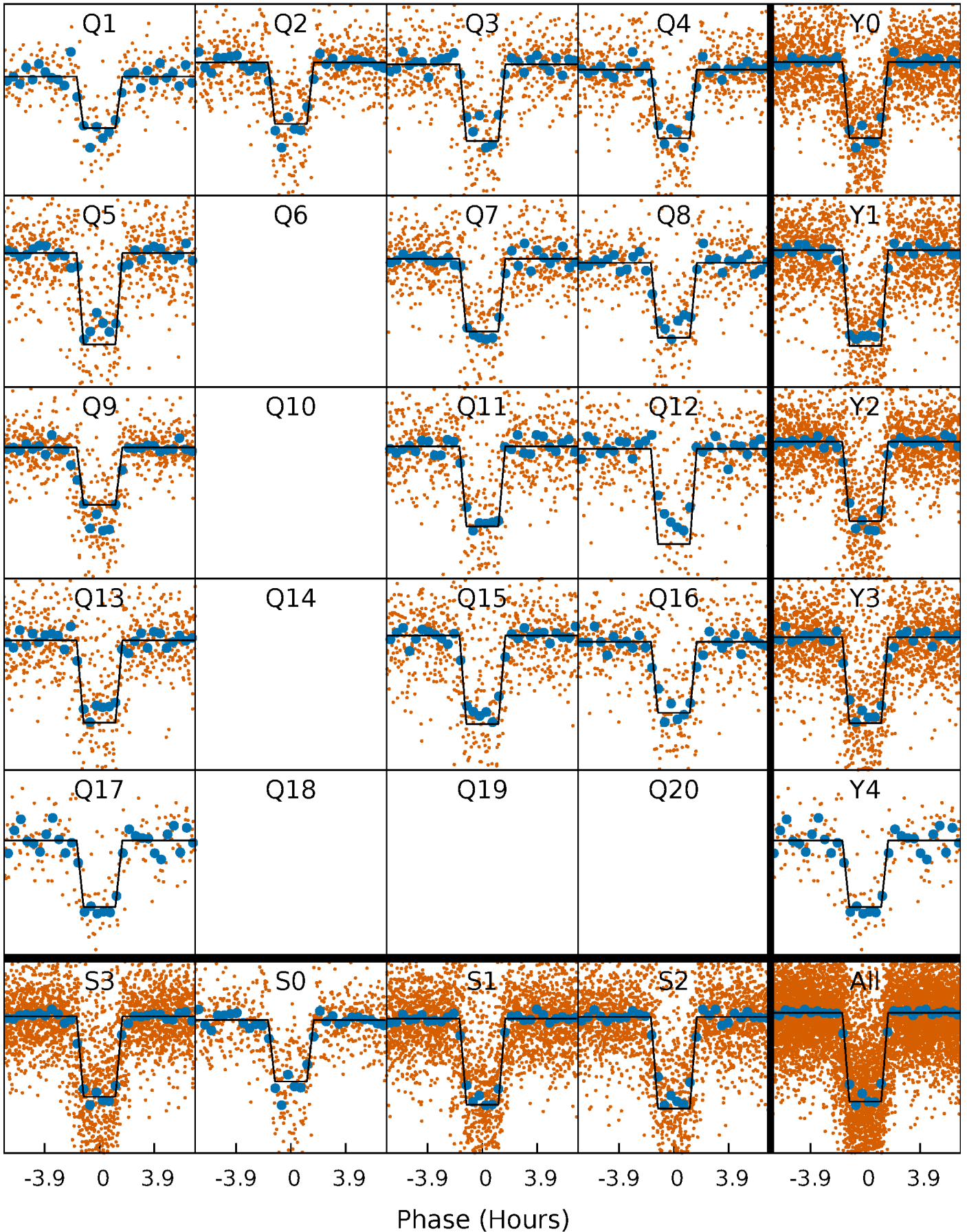
# DV Quarter-Phased Transit Curves

TCE 005376836-02   P= 3.479434 Days    $T_0=131.577875$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 005376836-02     $P = 3.479429$  Days     $T_0 = 131.578239$  (BKJD)

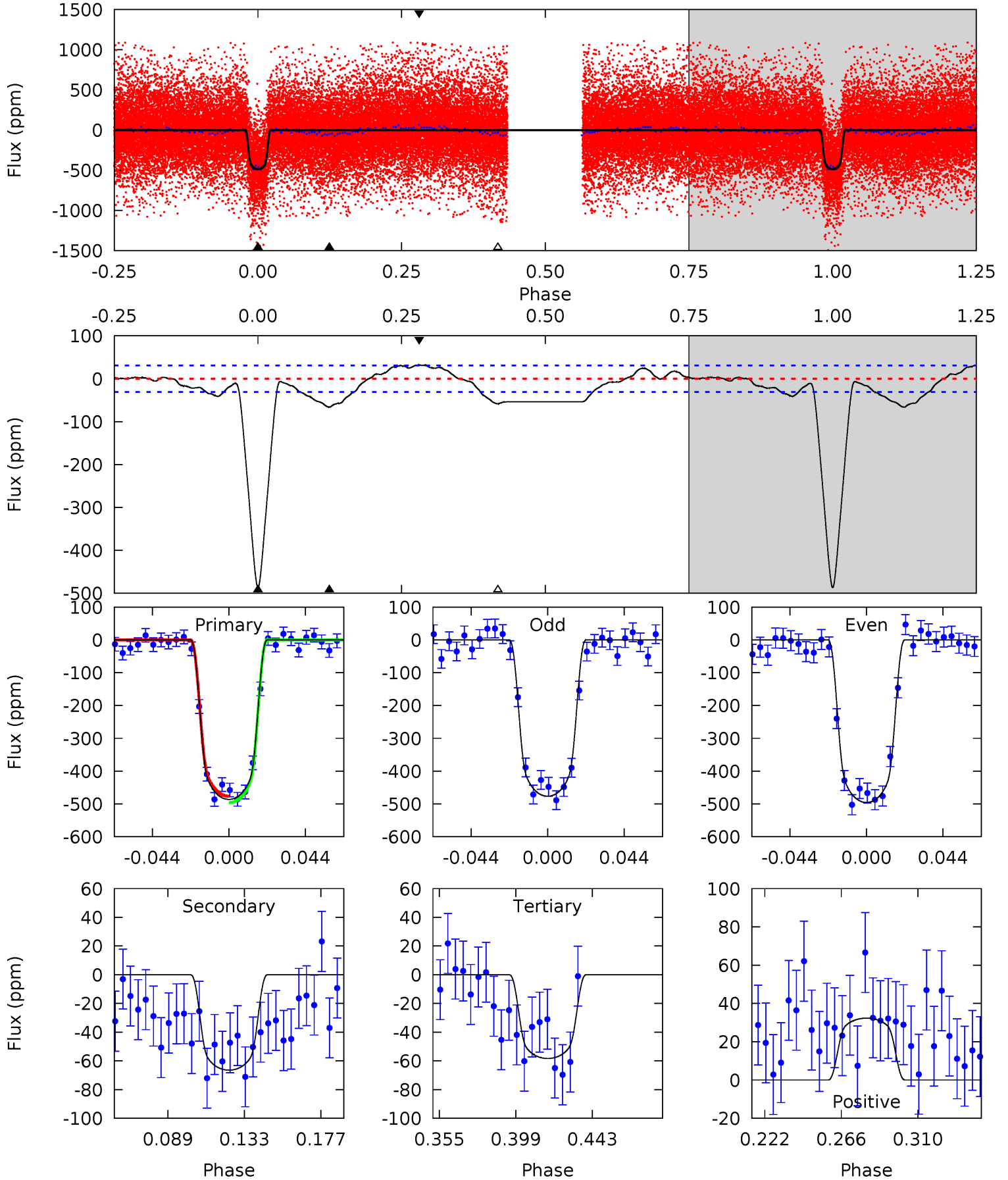




# DV Model-Shift Uniqueness Test

005376836-02, P = 3.479434 Days, E = 128.098441 Days

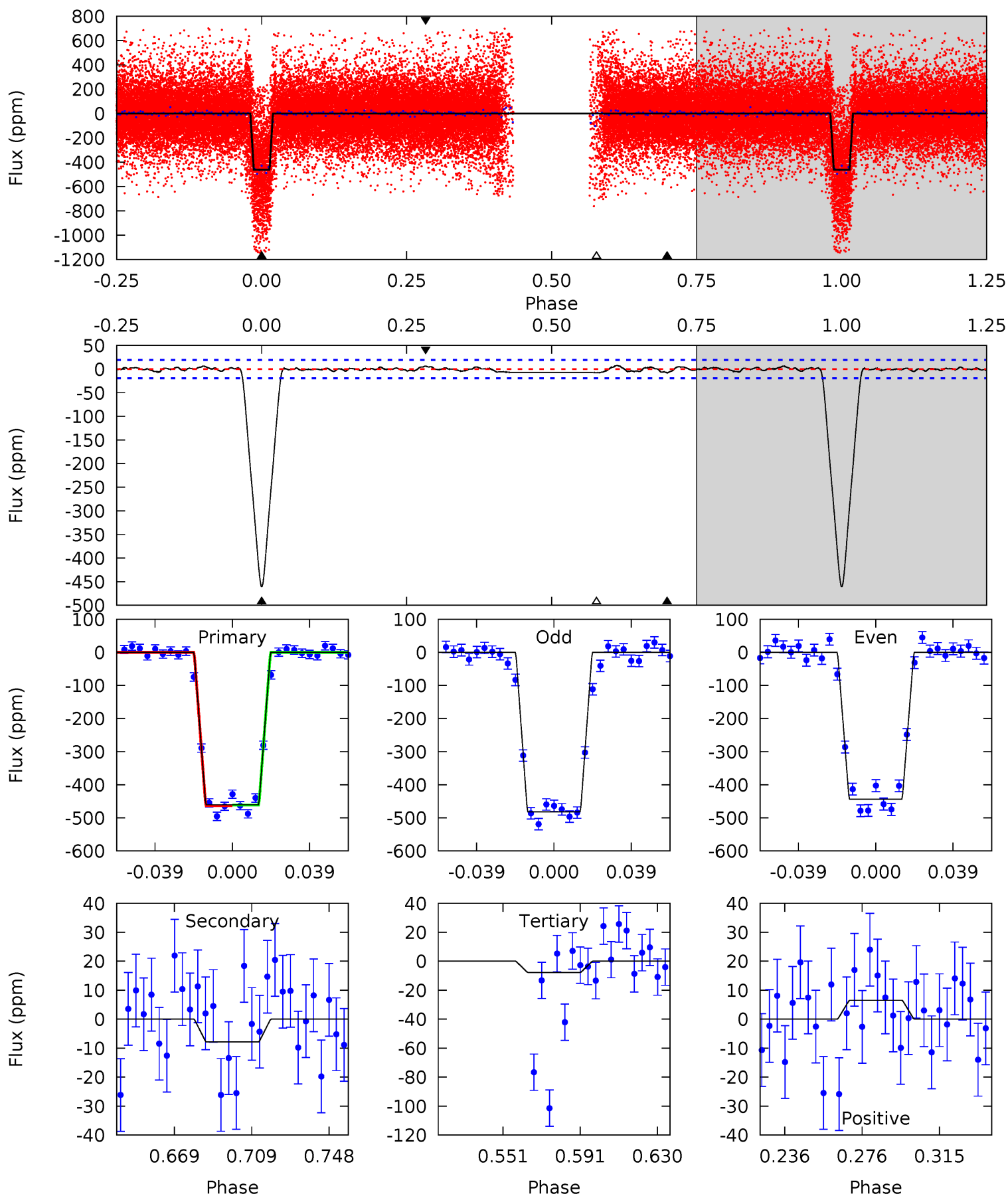
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
74.6	10.2	8.95	4.96	4.73	2.01	3.48	65.6	69.6	1.24	5.23	1.47	0.95	0.06	1.54



# Alt Model-Shift Uniqueness Test

005376836-02, P = 3.479429 Days, E = 128.098810 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
112.3	1.92	1.88	1.59	4.76	2.06	0.70	110.4	110.7	0.03	0.33	4.69	0.99	0.02	0.22





### Stellar Parameters For KIC 005376836

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5907^{+158}_{-175}$	$4.519^{+0.062}_{-0.188}$	$-0.300^{+0.300}_{-0.300}$	$0.878^{+0.248}_{-0.083}$	$0.929^{+0.108}_{-0.108}$	$1.935^{+0.511}_{-0.985}$
	+3%/-3%	+1%/-4%	+100%/-100%	+28%/-9%	+12%/-12%	+26%/-51%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 005376836-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-66 \pm 7$	$2.29^{+0.36}_{-0.17}$	$1650^{+117}_{-73}$	$3814^{+120}_{-102}$	$13^{+3}_{-3}$
Alt.	$-8 \pm 4$	$2.13^{+0.34}_{-0.17}$	$1651^{+110}_{-76}$	$2770^{+202}_{-335}$	$1.710^{+1.087}_{-0.902}$

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

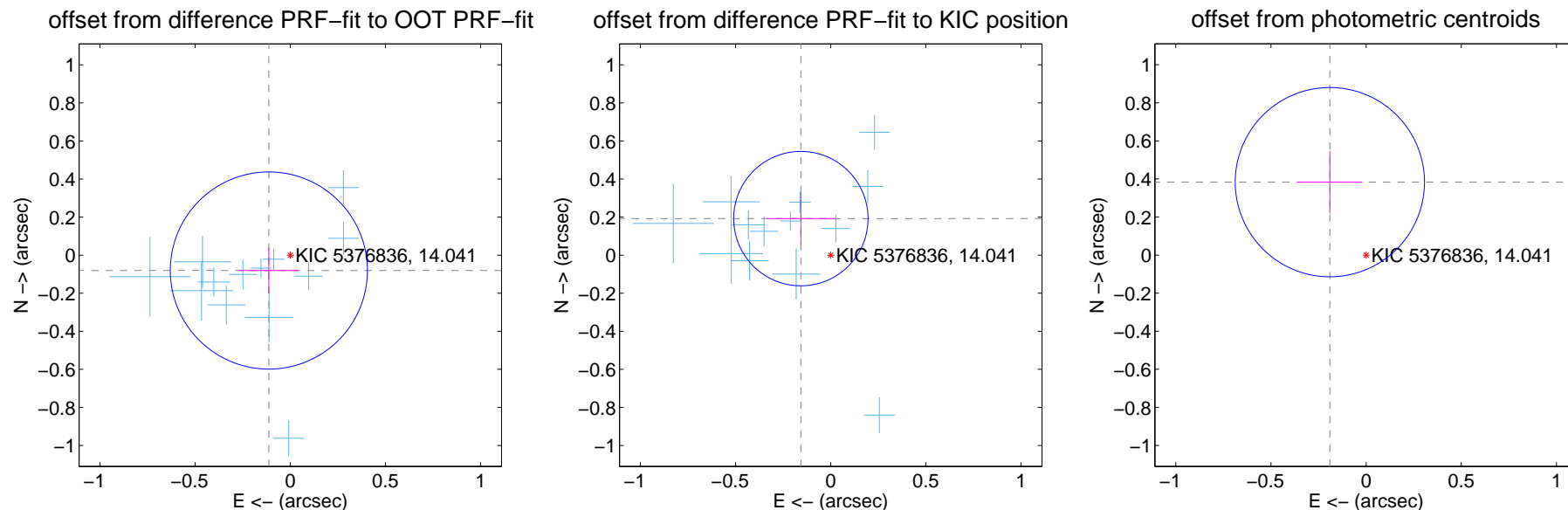
## DV Centroid Data

Supplemental centroid analysis for 005376836-02. Kepler magnitude: 14.04. Transit SNR 43.32

There are 13 quarters with good PRF difference image offsets

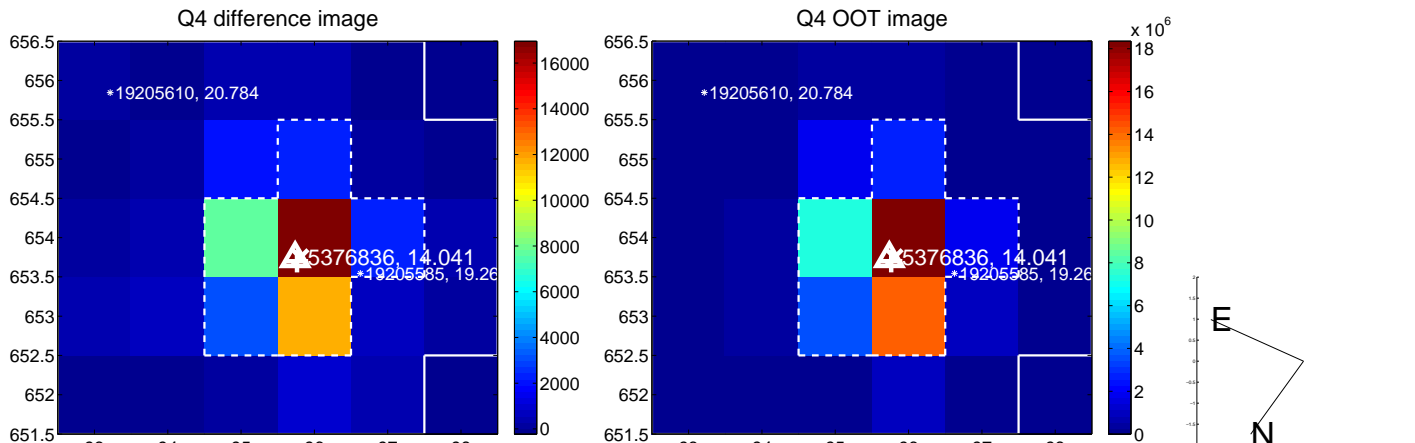
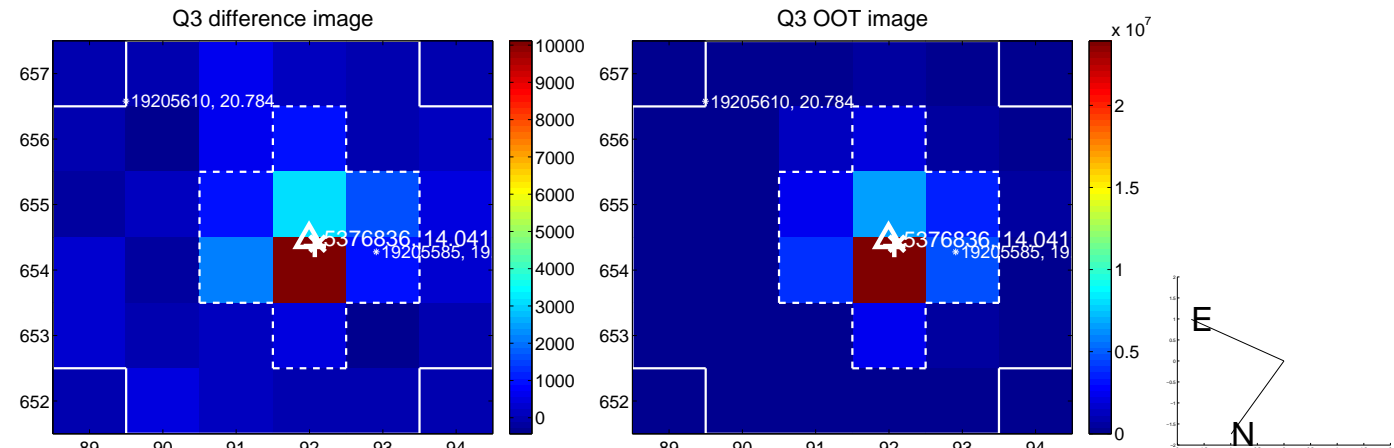
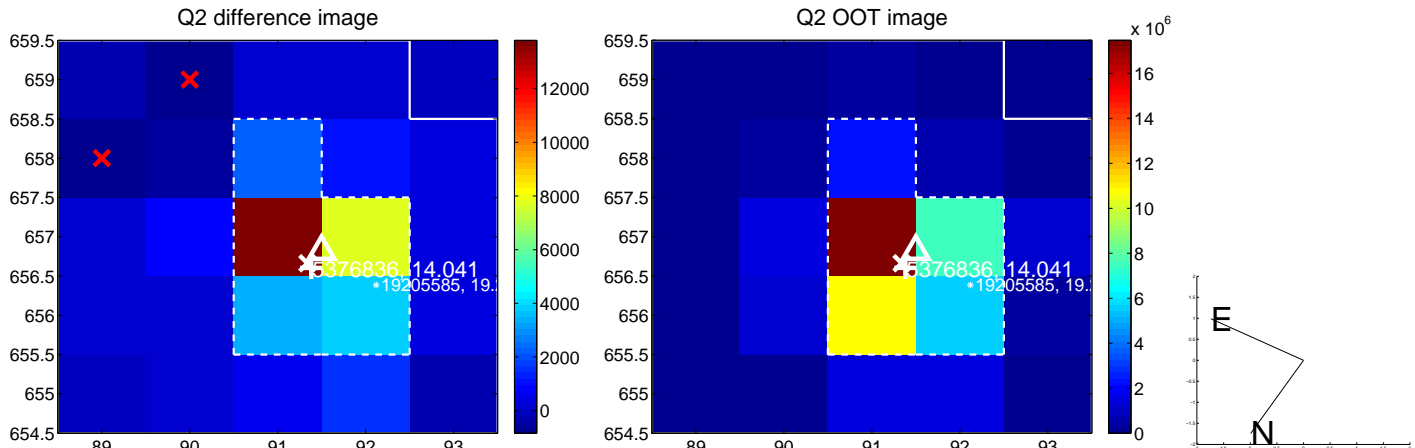
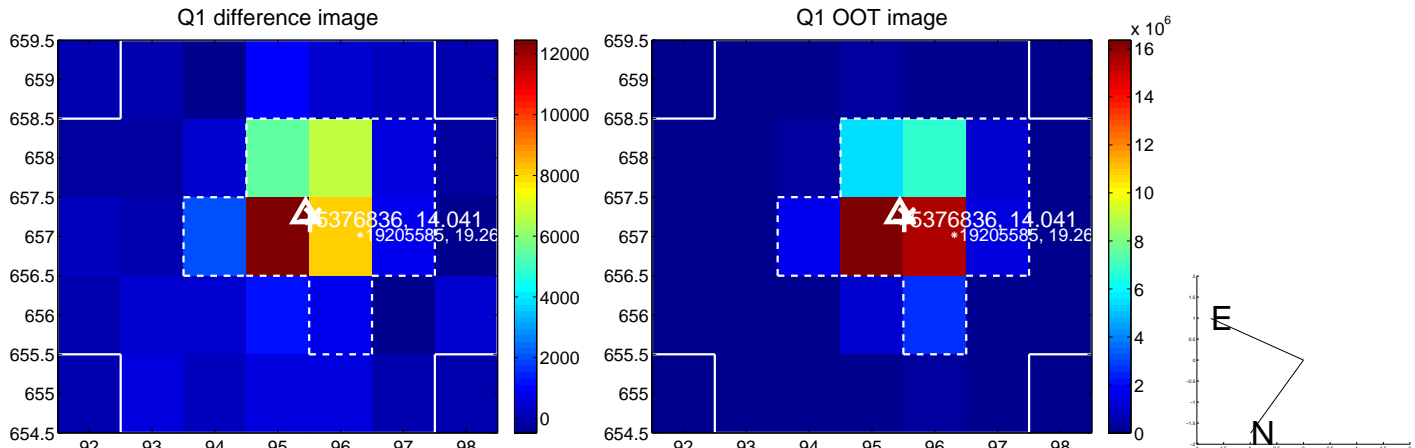
The direct PRF centroid is offset from the target star catalog position by about 0.31 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.139 \pm 0.173$	0.80	$0.113 \pm 0.157$	$-0.081 \pm 0.120$
PRF-fit source offset from KIC position	$0.248 \pm 0.118$	2.11	$0.157 \pm 0.180$	$0.192 \pm 0.136$
photometric centroid source offset	$0.43 \pm 0.17$	2.58	$0.19 \pm 0.17$	$0.38 \pm 0.16$

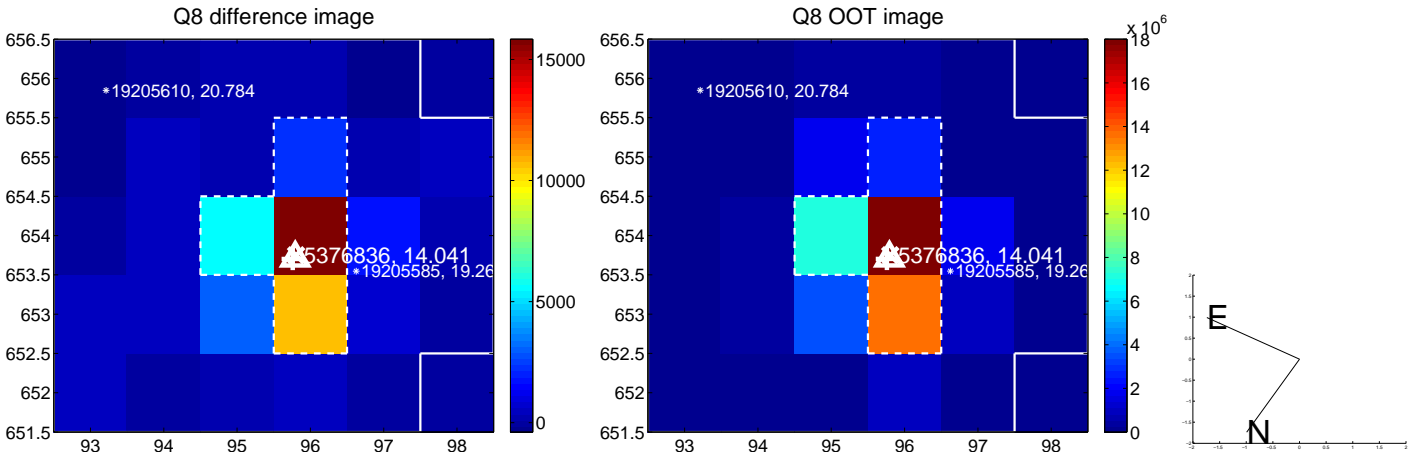
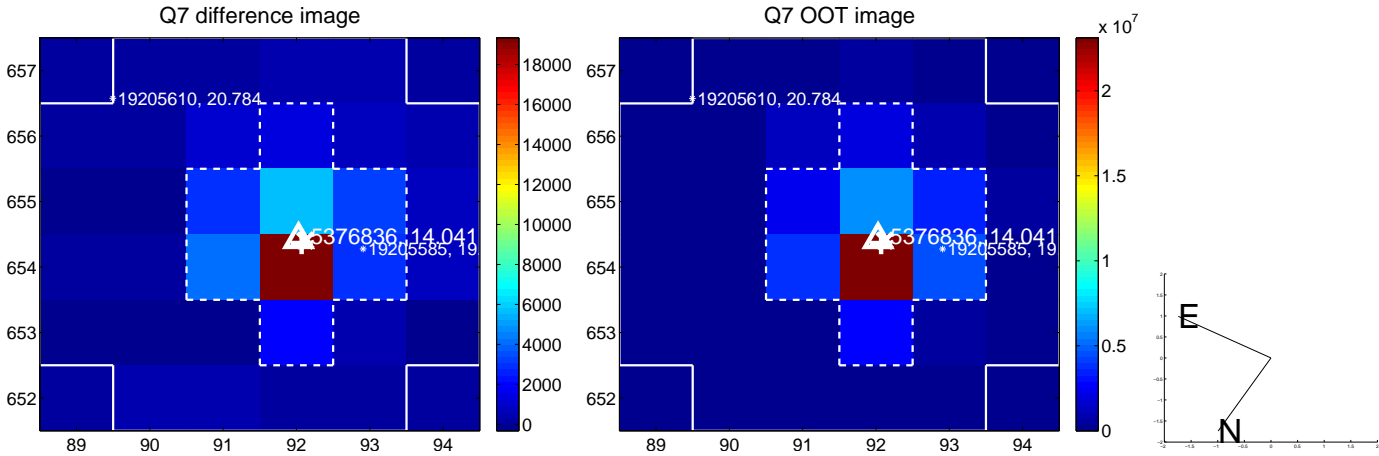
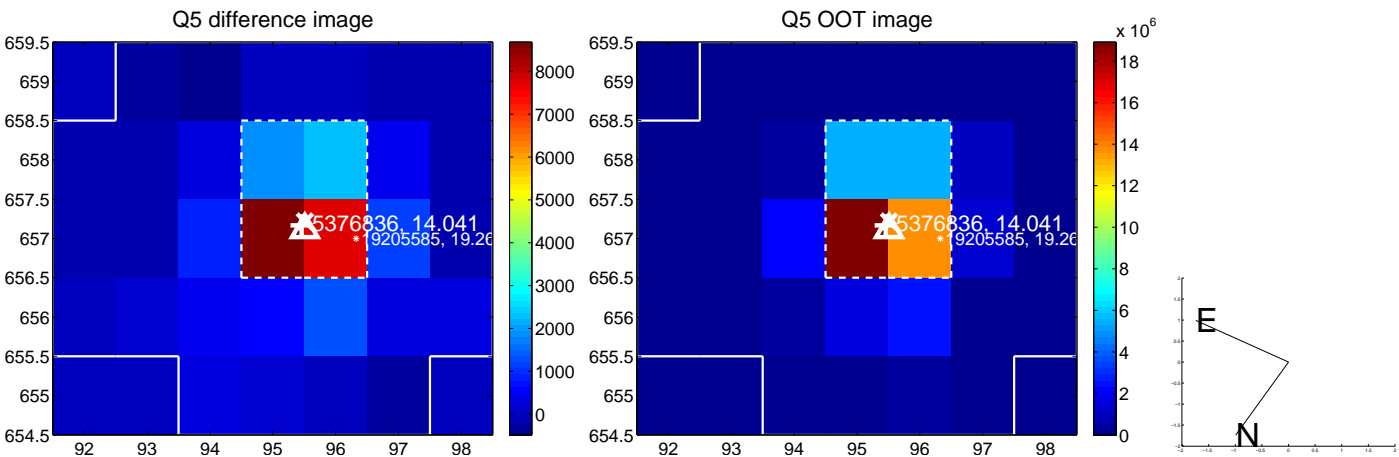


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

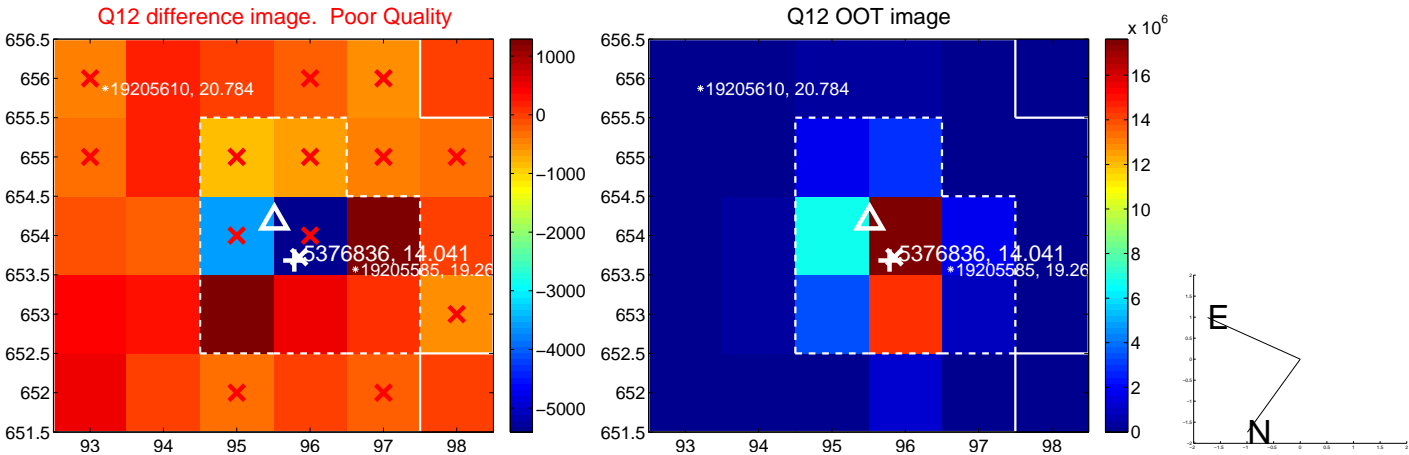
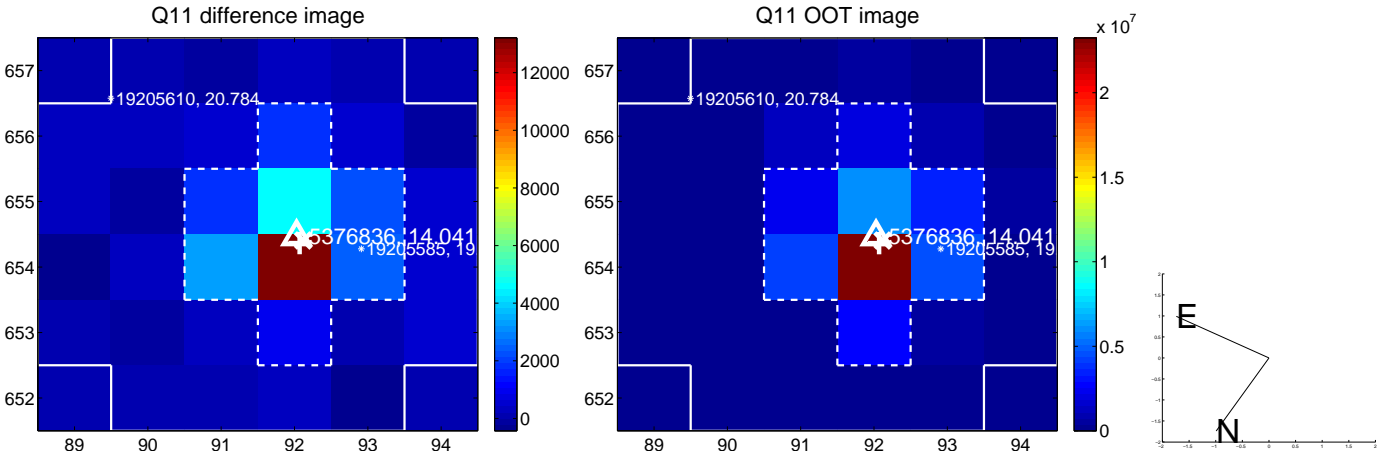
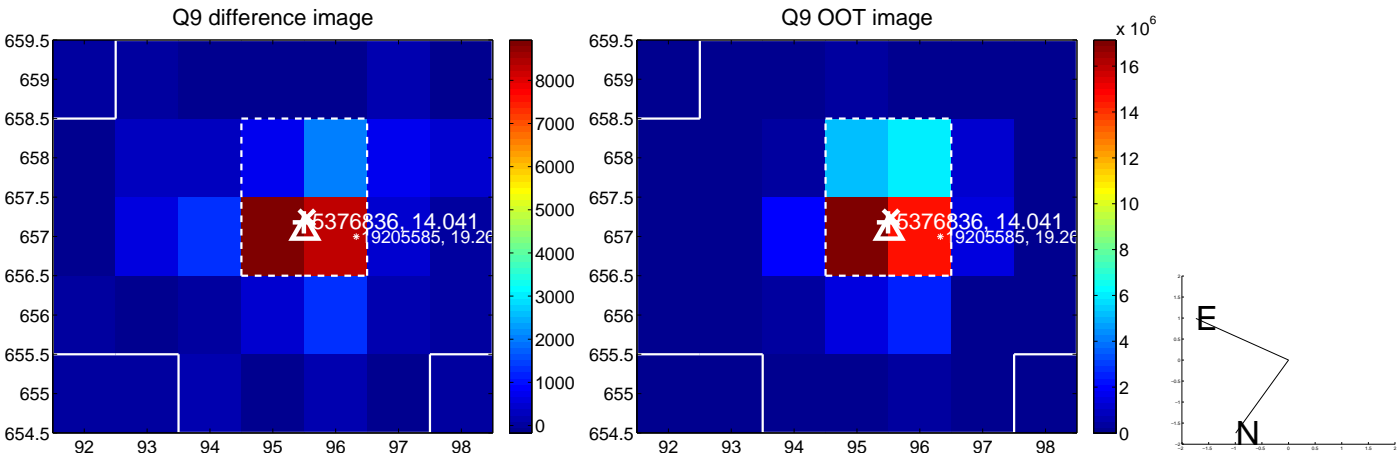
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



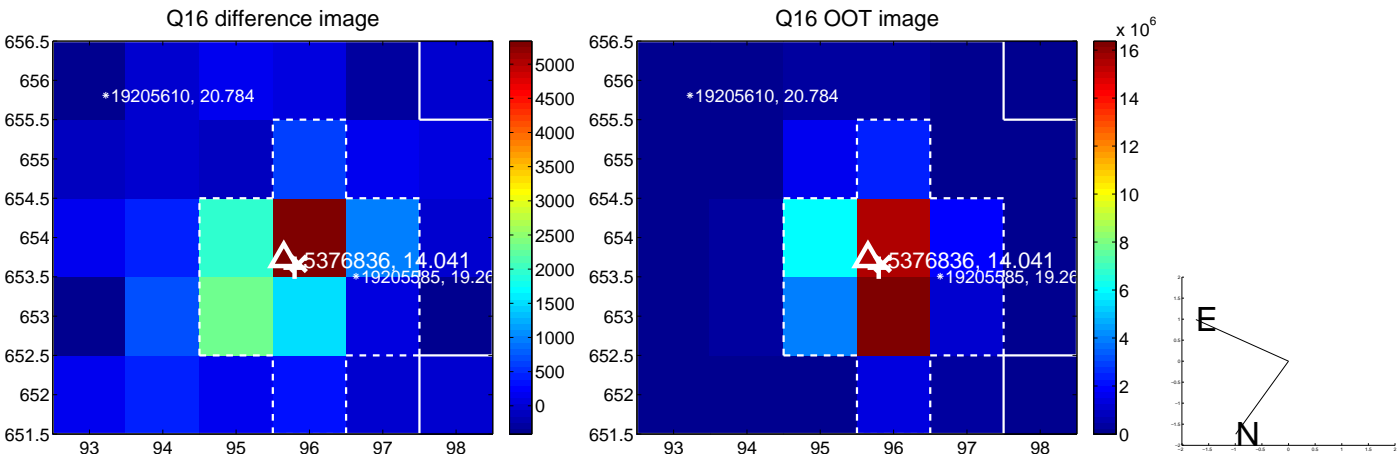
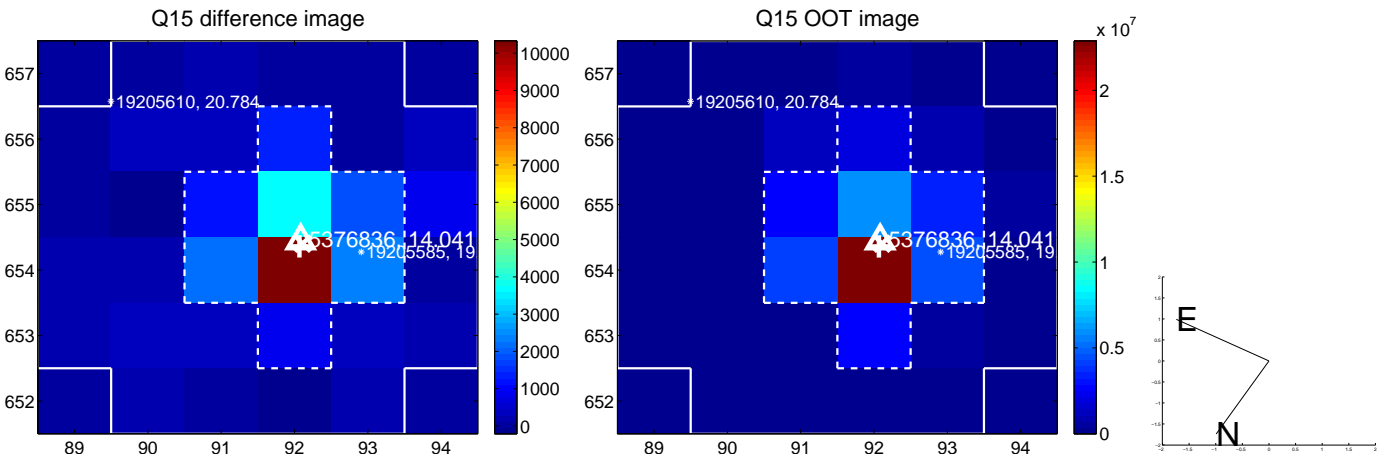
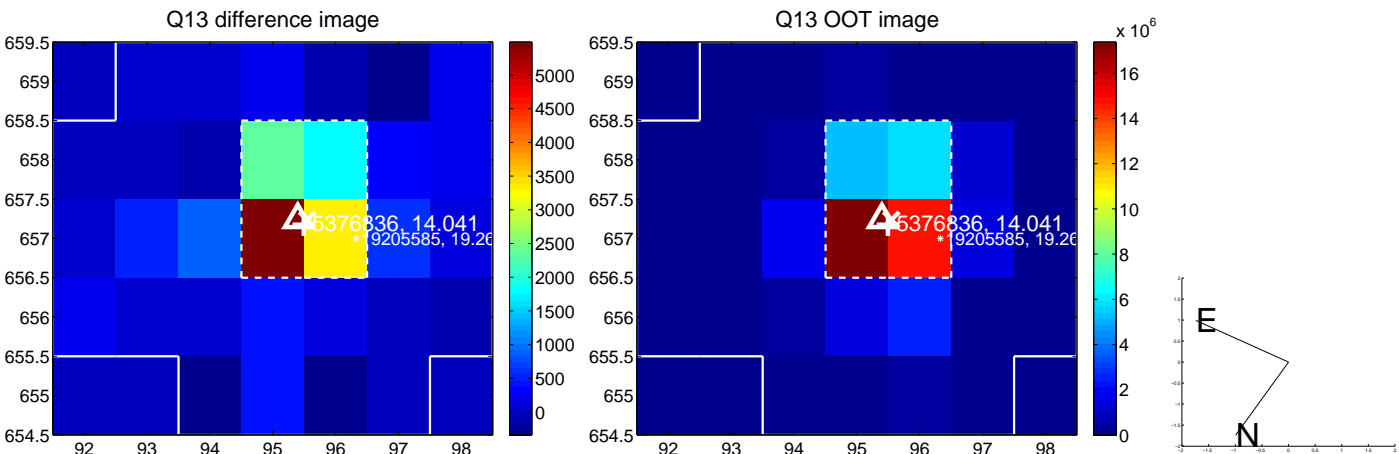
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



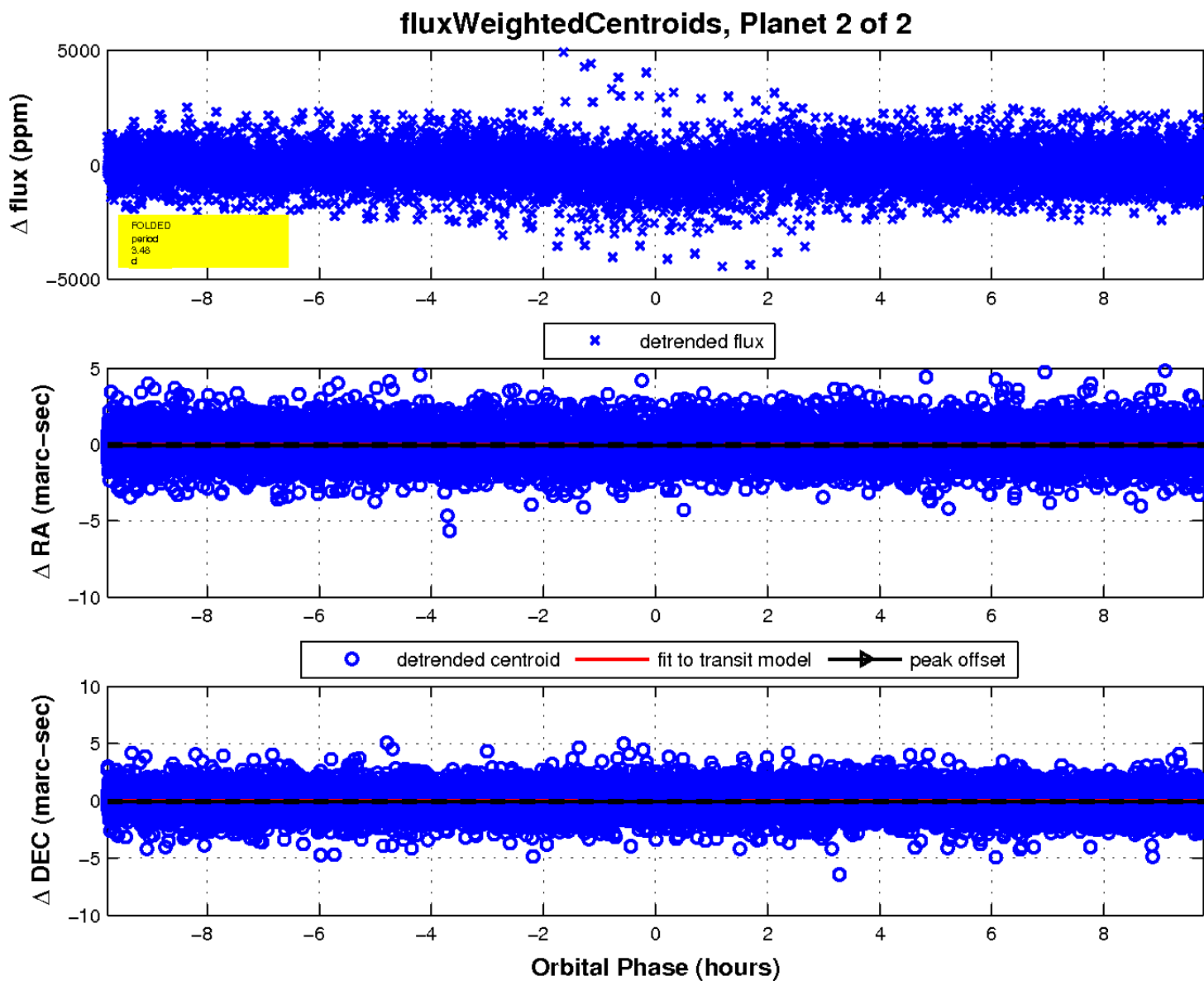
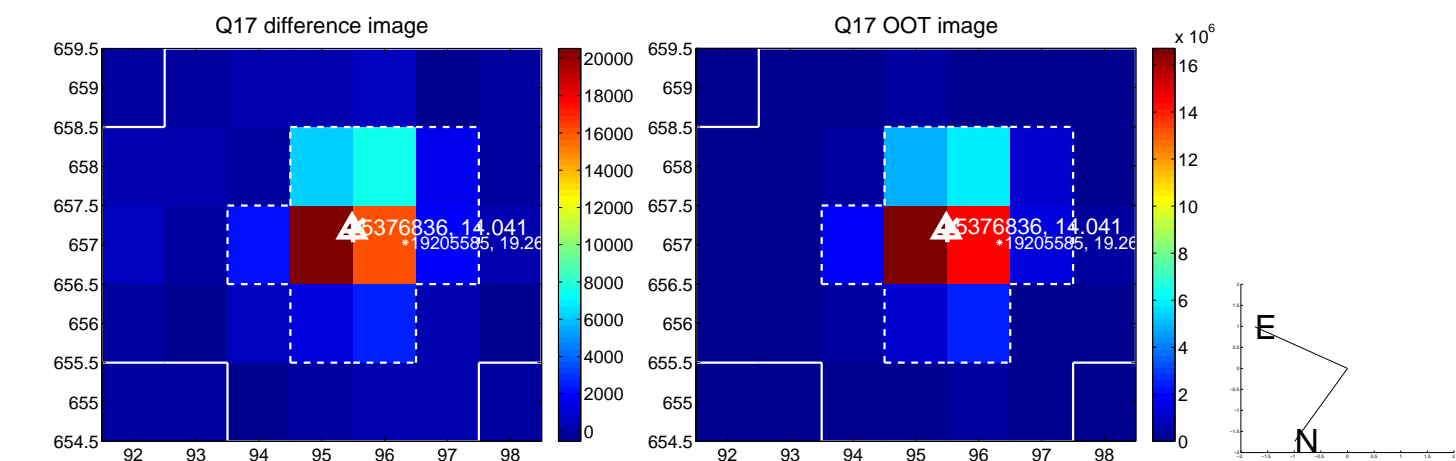
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



# UKIRT Image

Declination

