

# KIC 010490282

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010490282-01	OBS	No	1.572583	131.647218	1092.2	3.500	11.2	-1.0	0.75	5504	2.46	792.19
010490282-02	OBS	No	1.572543	132.162687	289.3	7.965	10.6	7.2	0.75	5504	1.80	792.22

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010490282-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_NOFITS
010490282-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_ZUMA_TRACKER—SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—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.

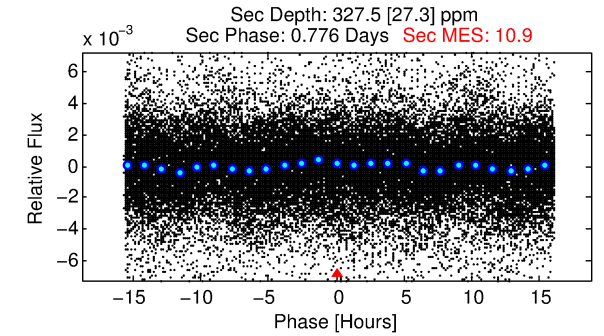
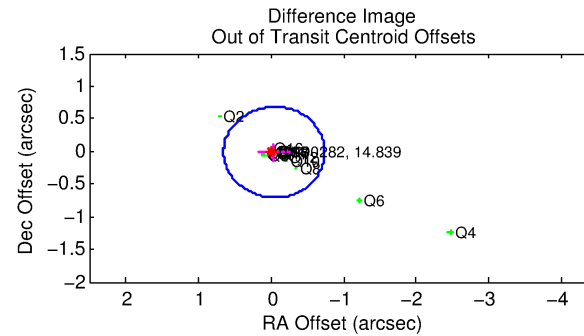
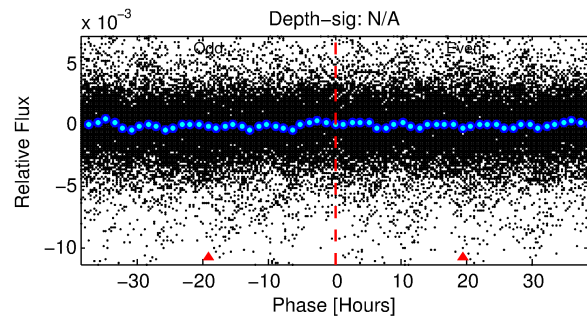
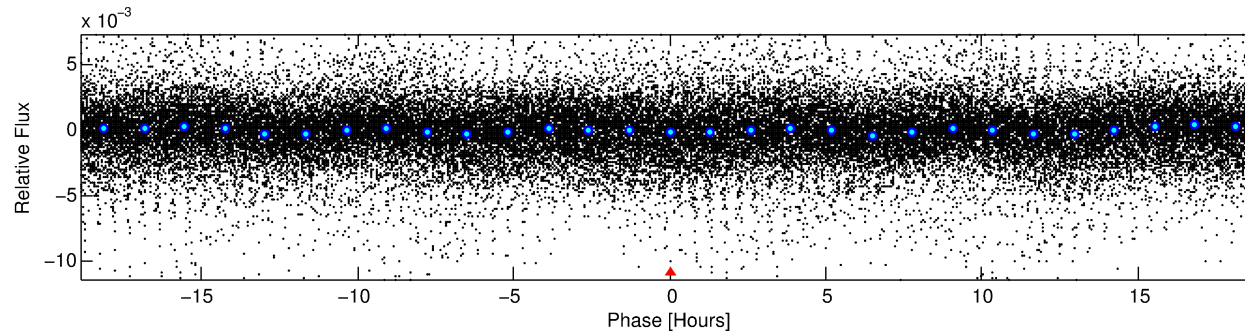
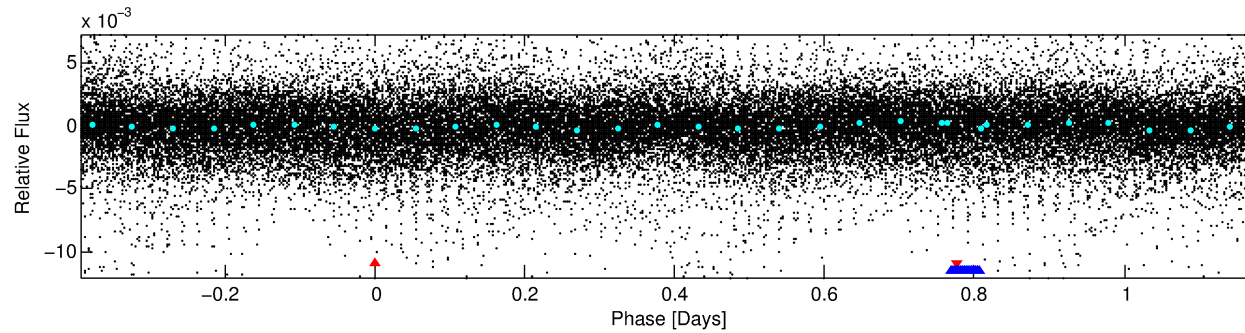
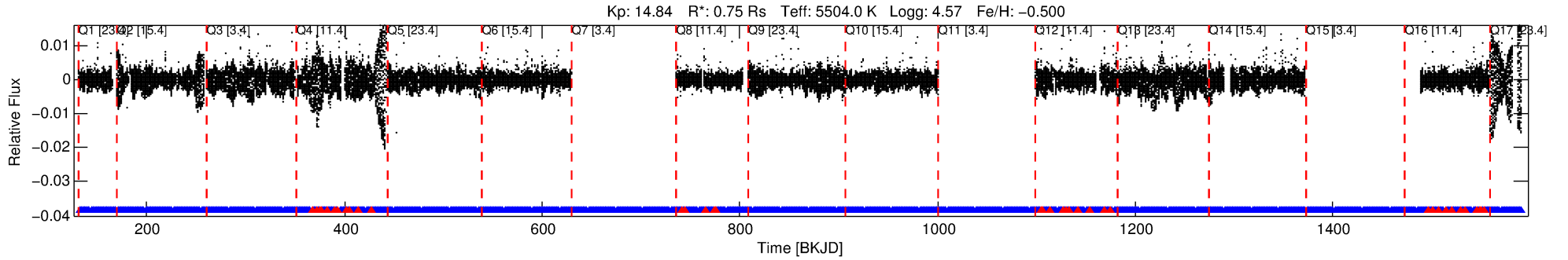
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010490282-01

No Significant Match Found

# DV One-Page Summary

KIC: 10490282 Candidate: 1 of 2 Period: 1.573 d



## TPS TCE Results:

Period = 1.57258 d  
Epoch = 131.6472 BKJD

DV fit results are unavailable

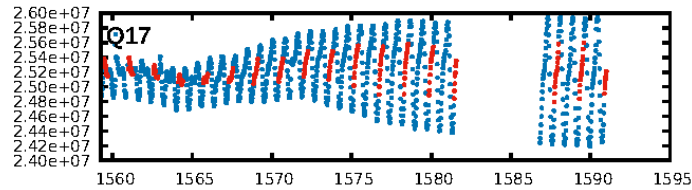
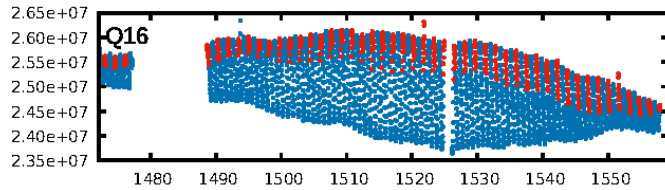
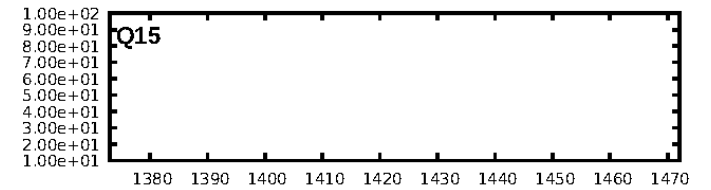
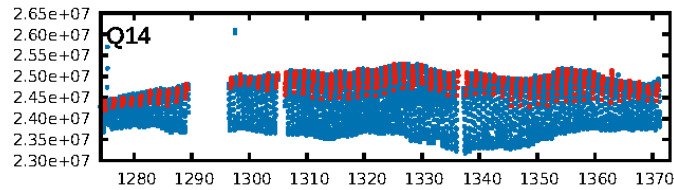
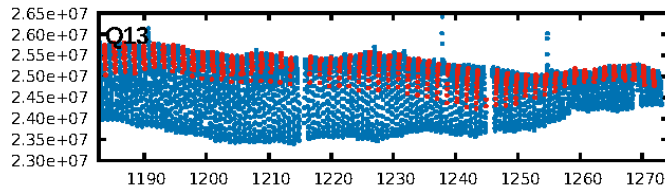
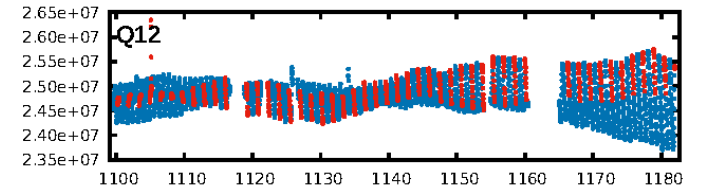
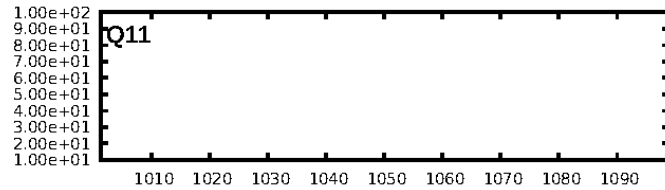
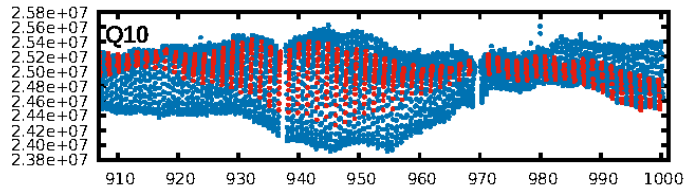
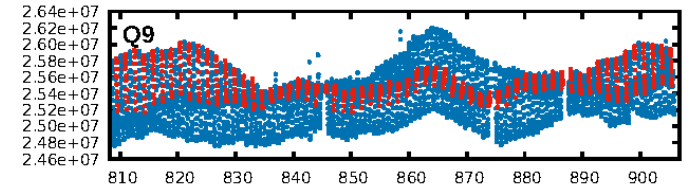
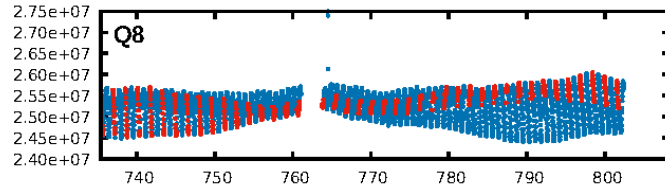
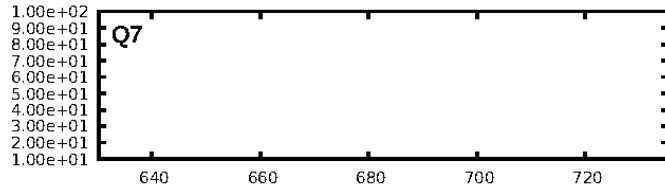
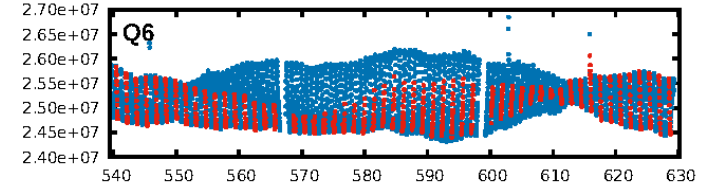
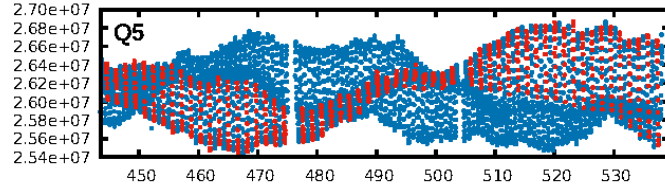
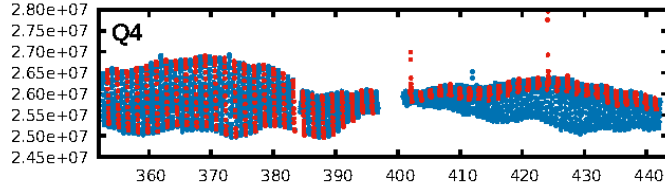
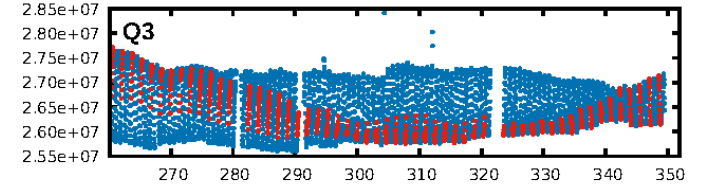
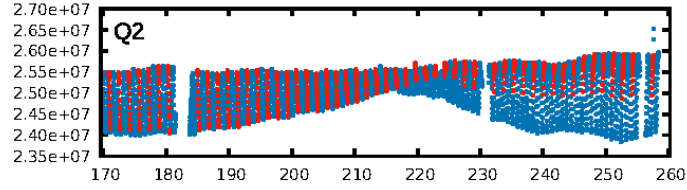
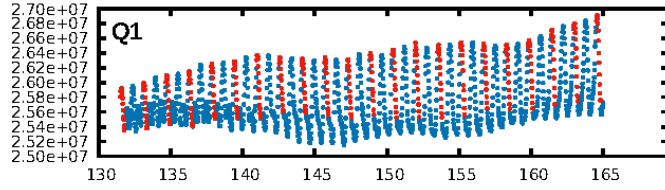
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.94 [605/642]  
GhostDiagnostic-chr: -1.197  
Centroid-sig: 0.0%  
Centroid-so: 0.266 arcsec [11.98σ]  
OotOffset-rm: 0.048 arcsec [0.21σ]  
KicOffset-rm: 0.188 arcsec [1.32σ]  
OotOffset-st: 4/1/4/5 [14]  
KicOffset-st: 4/1/4/5 [14]  
DiffImageQuality-fgm: 0.93 [13/14]  
DiffImageOverlap-fno: 1.00 [14/14]

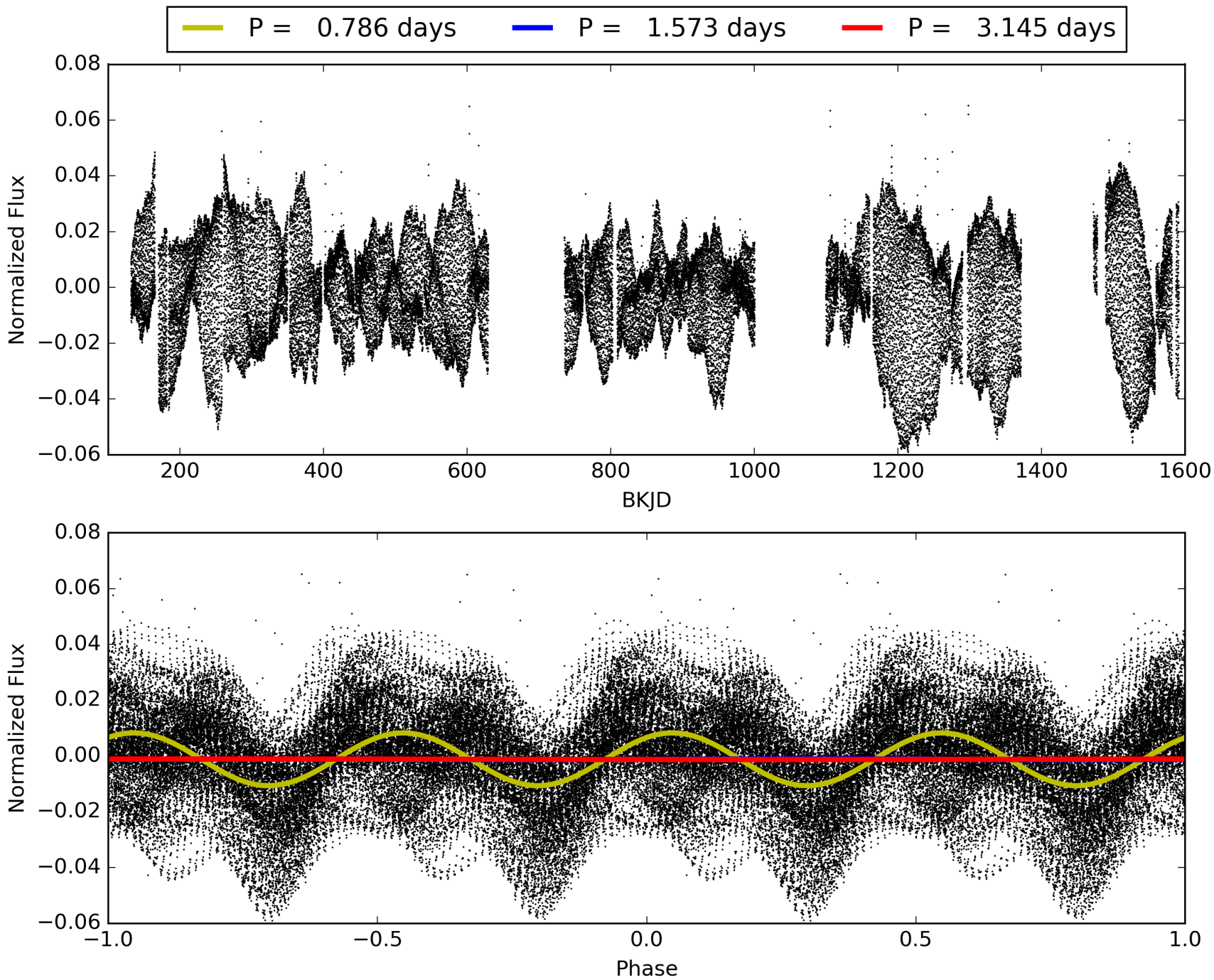
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 17:45:11 Z

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

# TCE 010490282-01, PDC Light Curves

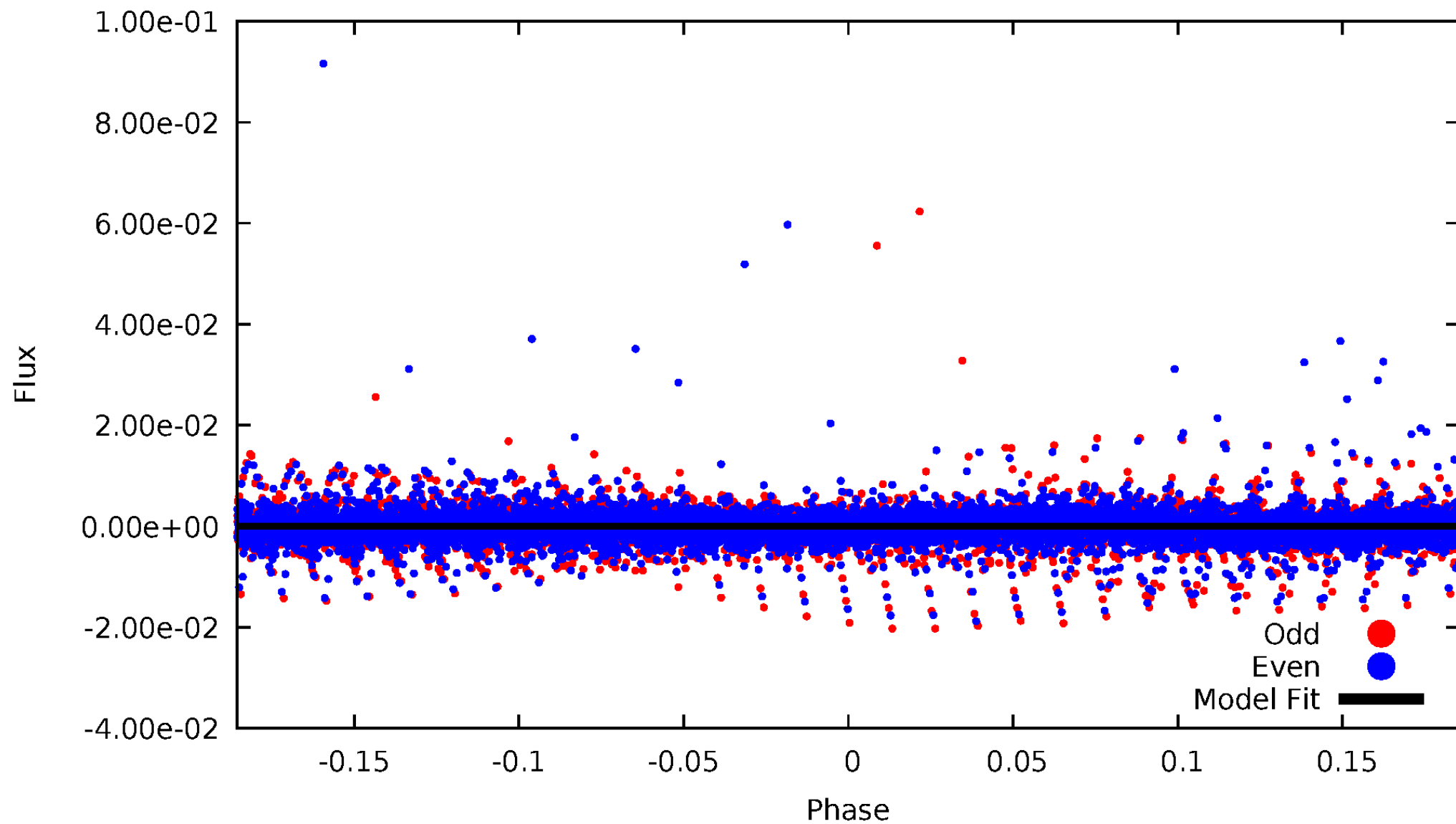


TCE 010490282-01



# DV Odd/Even

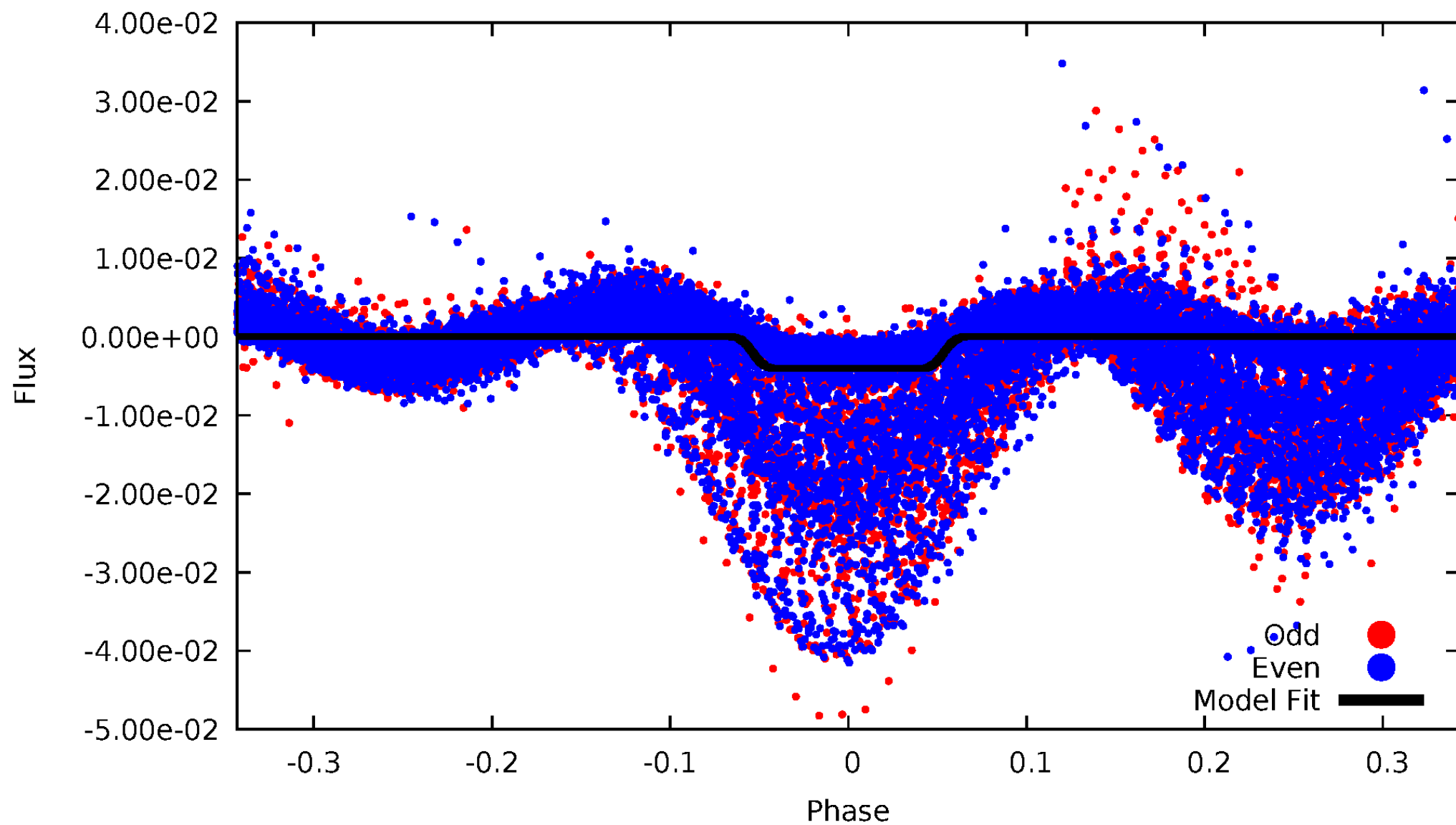
TCE 010490282-01



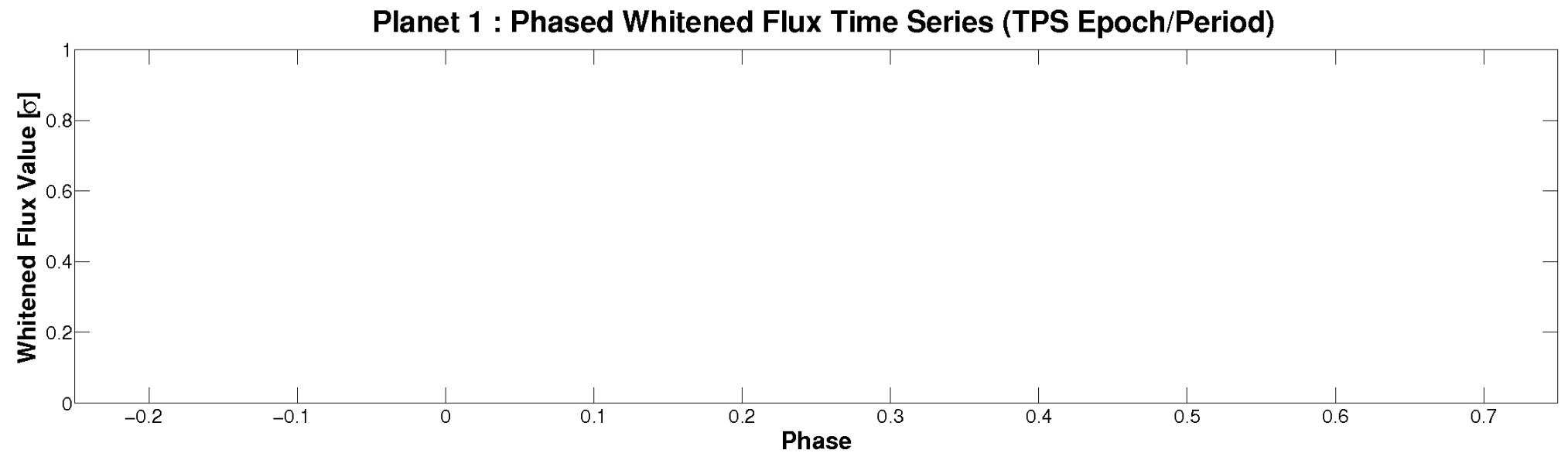
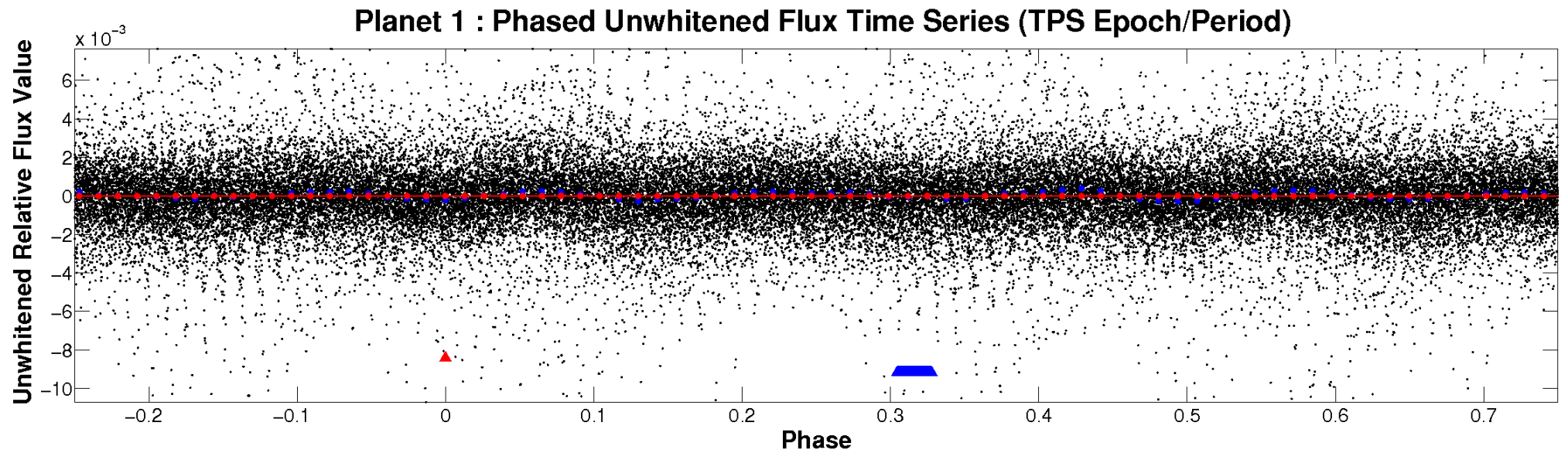


# ALT Odd/Even

TCE 010490282-01

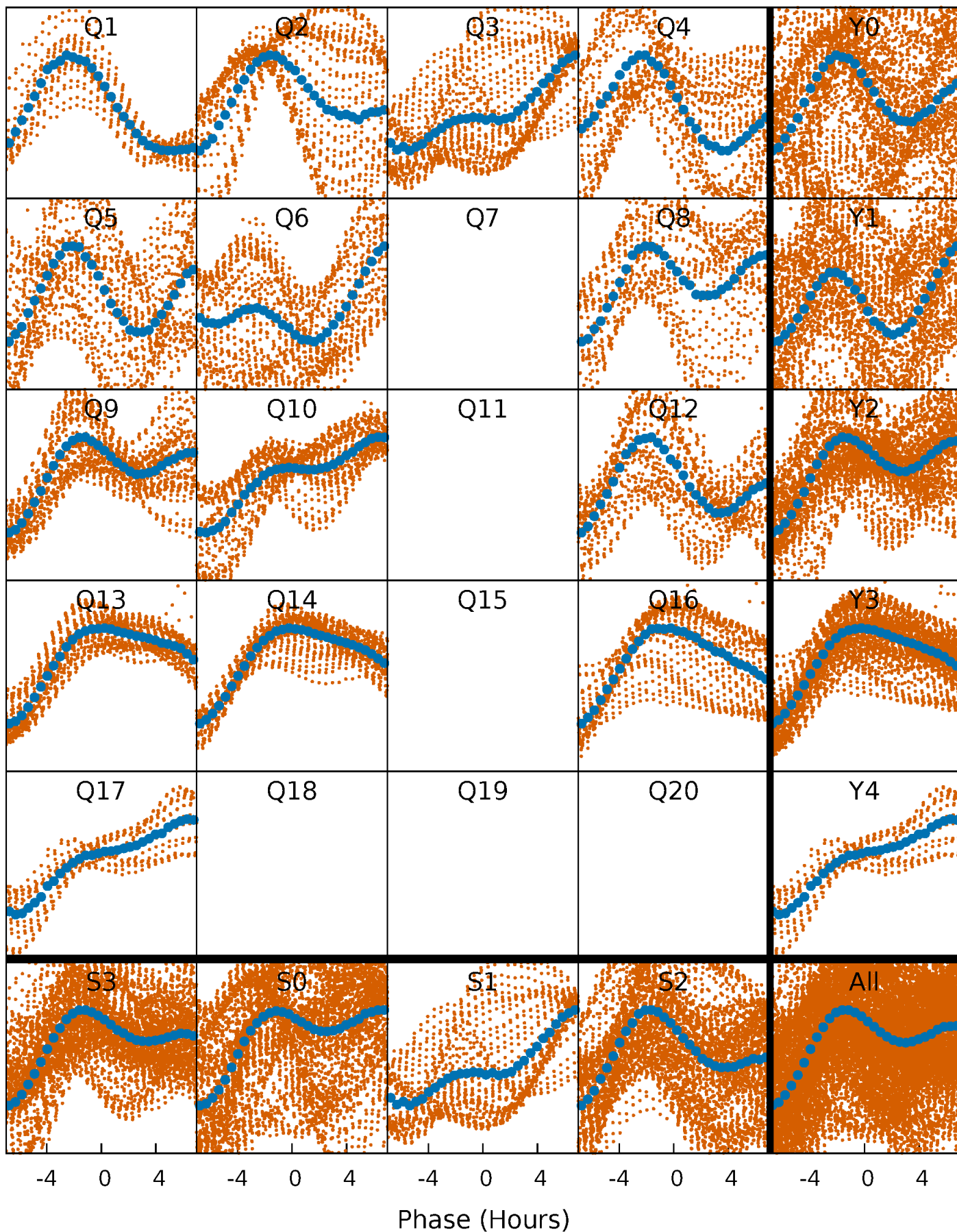


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

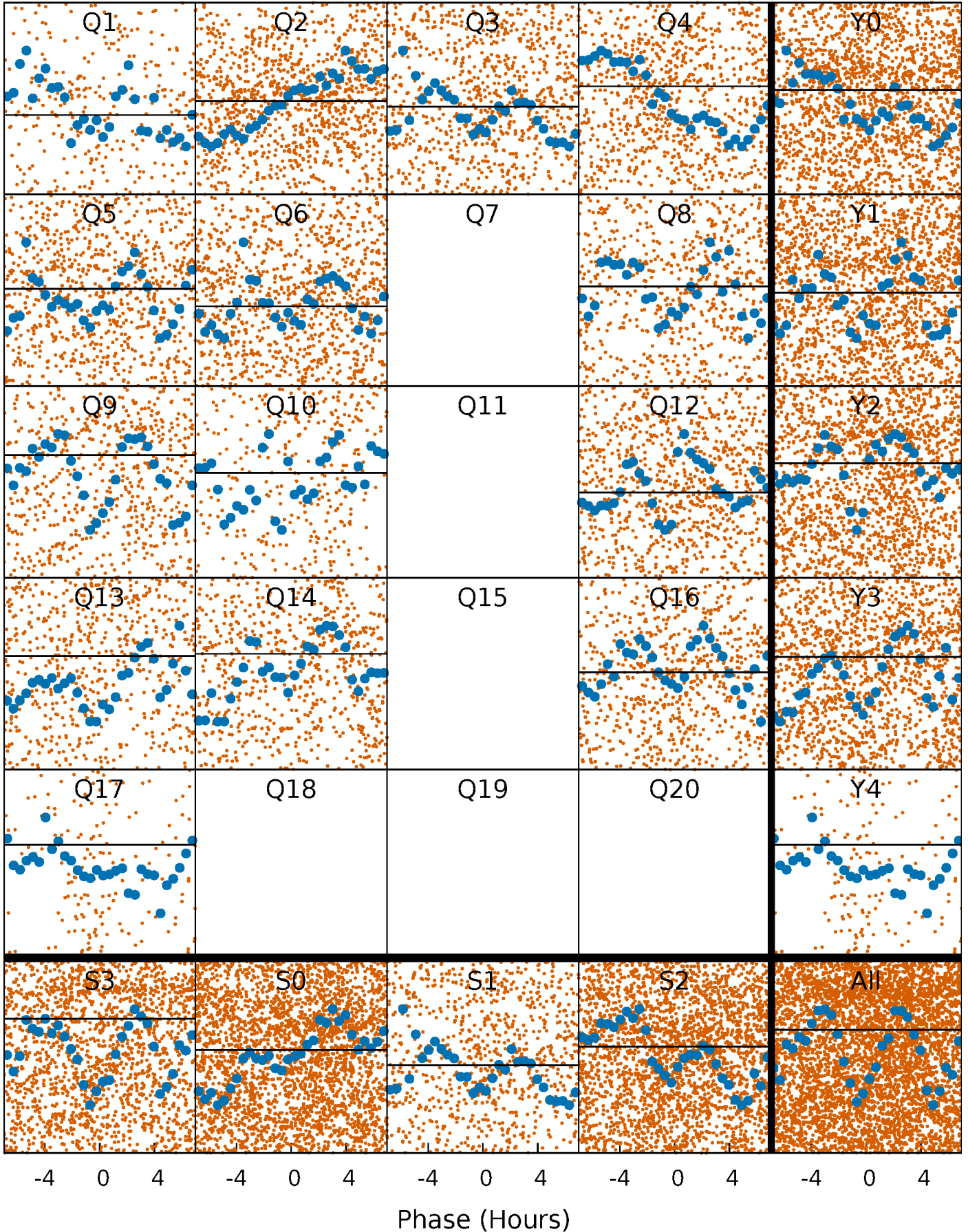
TCE 010490282-01 P= 1.572583 Days  $T_0=131.647218$  (BKJD)





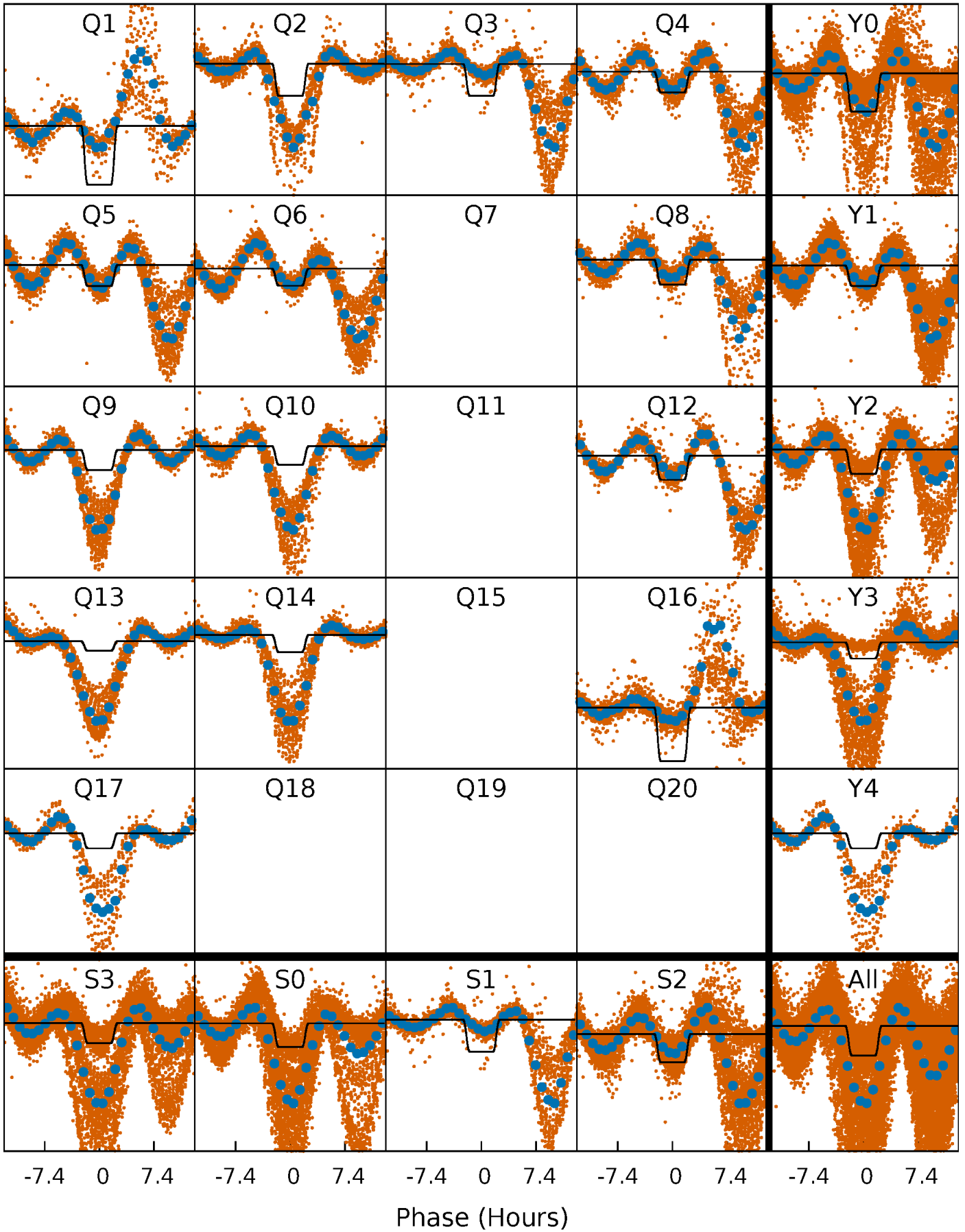
# DV Quarter-Phased Transit Curves

TCE 010490282-01 P= 1.572583 Days  $T_0=131.647218$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

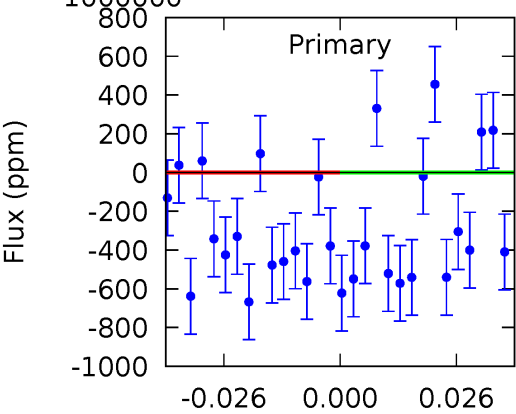
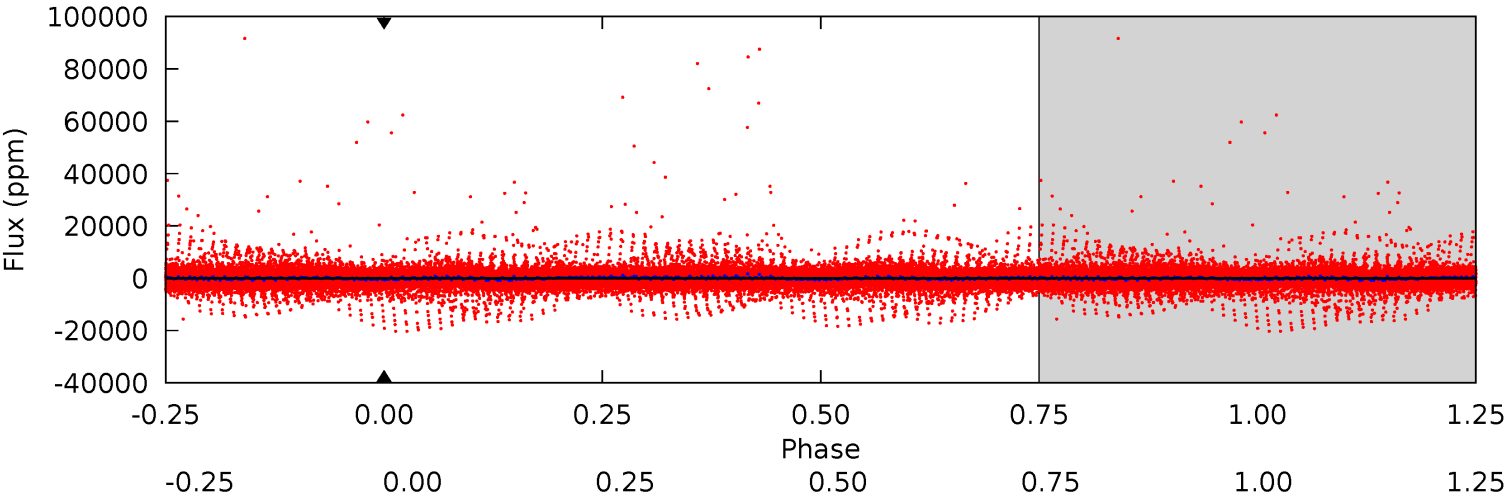
TCE 010490282-01 P= 1.572583 Days  $T_0=132.929276$  (BKJD)



DV Model-Shift Uniqueness Test

010490282-01, P = 1.572583 Days, E = 130.074635 Days

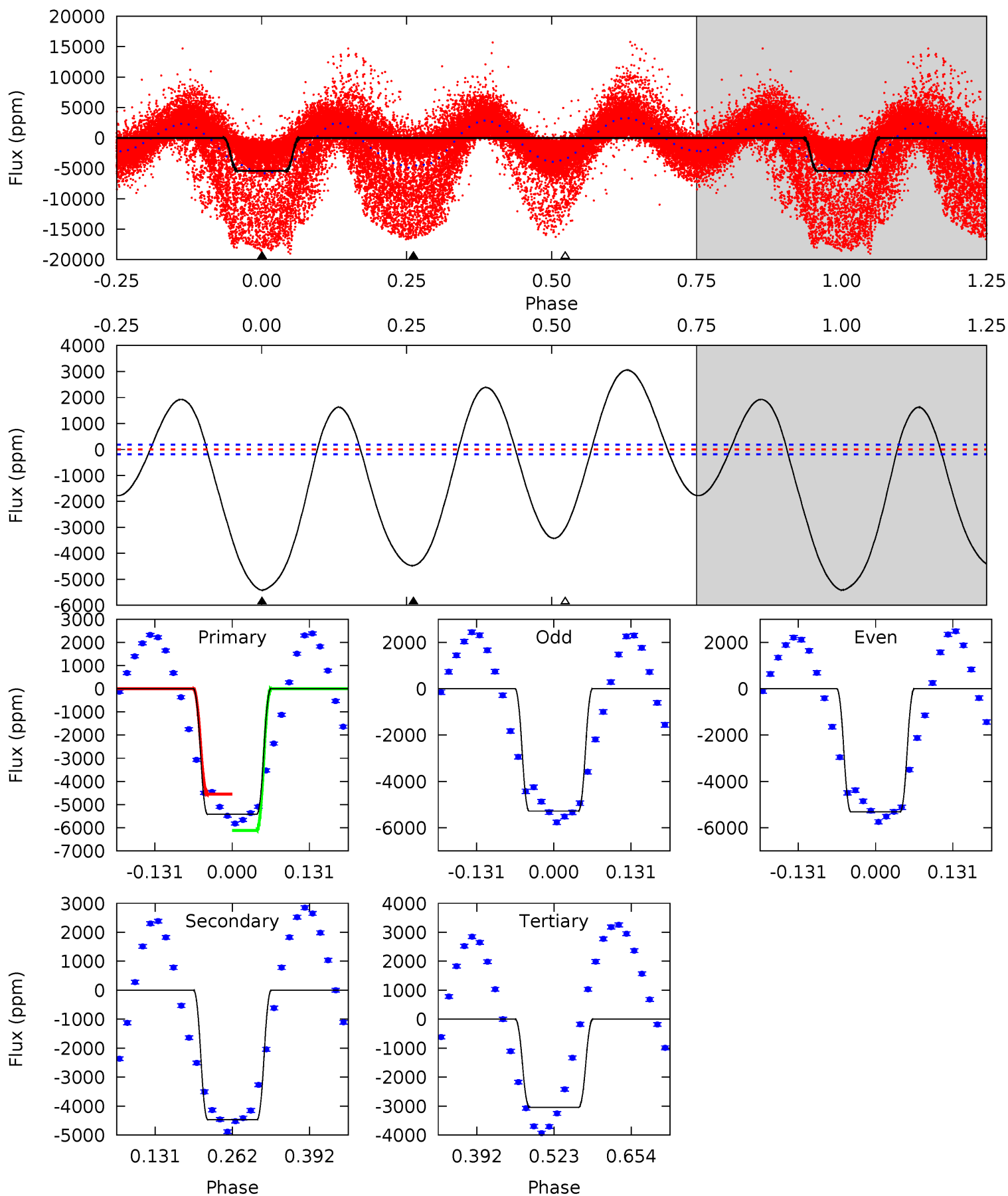
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

010490282-01, P = 1.572583 Days, E = 131.356693 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
133.6	110.3	75.0	0	4.51	1.51	47.5	58.6	133.6	35.2	110.3	0.36	2.33	0.36	0



### Stellar Parameters For KIC 010490282

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5504^{+163}_{-163}$	$4.569^{+0.056}_{-0.104}$	$-0.500^{+0.300}_{-0.300}$	$0.750^{+0.130}_{-0.070}$	$0.761^{+0.098}_{-0.060}$	$2.539^{+0.618}_{-0.791}$
	+3%/-3%	+1%/-2%	+60%/-60%	+17%/-9%	+13%/-8%	+24%/-31%
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 010490282-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$0 \pm 1000000$	$6.65^{+6.21}_{-4.53}$	$1909^{+79}_{-82}$	$-4425^{+20794}_{-12561}$	$-17.595^{+1176.953}_{-1222.855}$
Alt.	$-4469 \pm 41$	$8.45^{+7.42}_{-5.58}$	$1908^{+89}_{-83}$	$4634^{+3213}_{-963}$	$20^{+156}_{-14}$

$T_{max}$  = 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

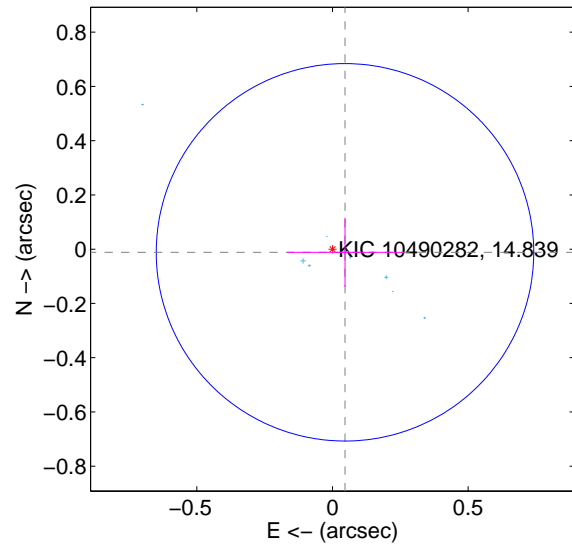
Supplemental centroid analysis for 010490282-01. Kepler magnitude: 14.84. Transit SNR -1.00

There are 13 quarters with good PRF difference image offsets

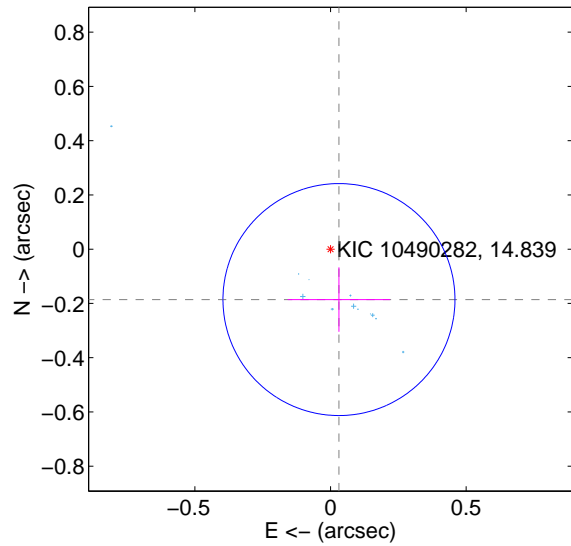
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.048 \pm 0.232$	0.21	$-0.046 \pm 0.213$	$-0.012 \pm 0.127$
PRF-fit source offset from KIC position	$0.188 \pm 0.143$	1.32	$-0.031 \pm 0.189$	$-0.186 \pm 0.119$
photometric centroid source offset	$0.27 \pm 0.02$	11.98	$0.25 \pm 0.02$	$-0.09 \pm 0.02$

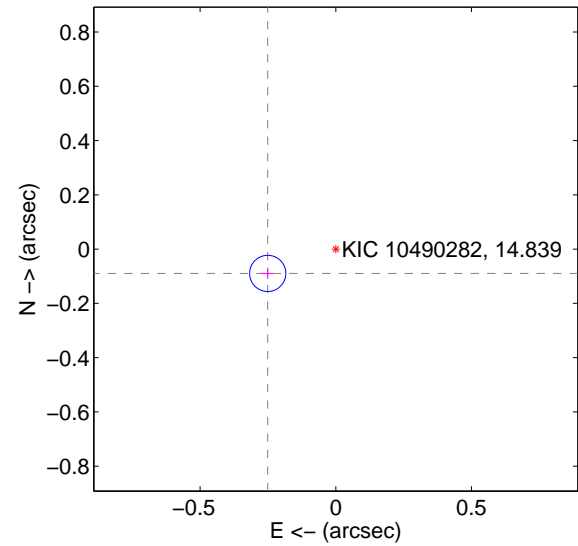
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

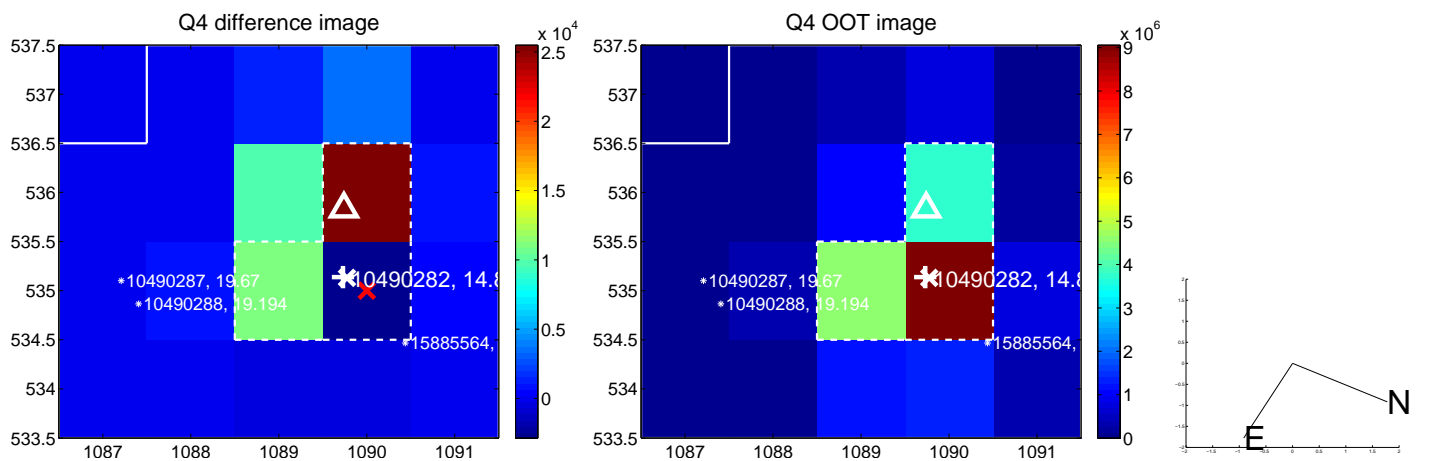
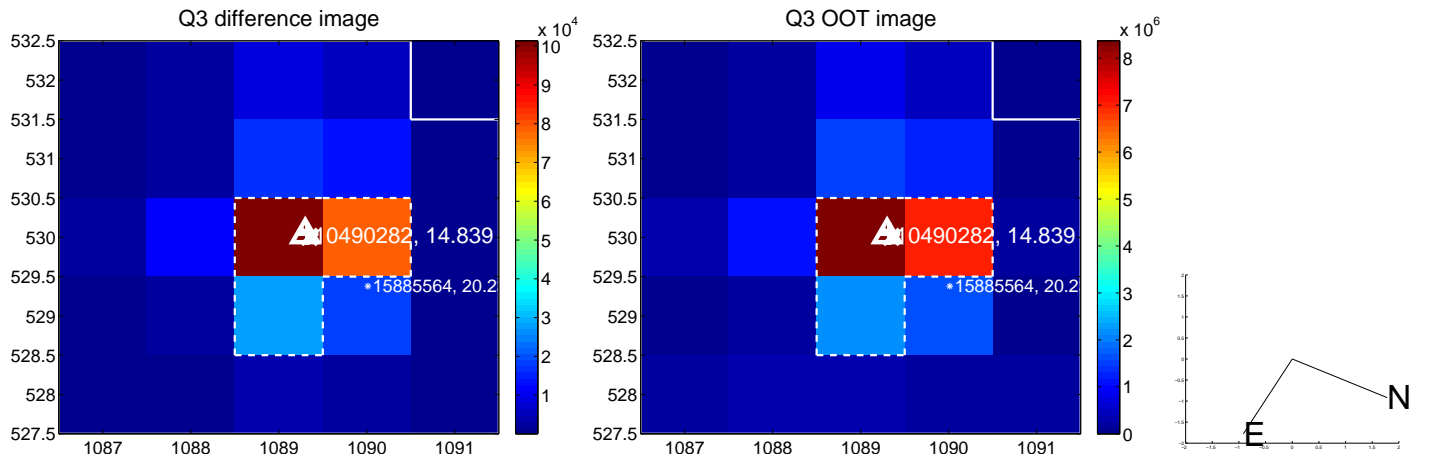
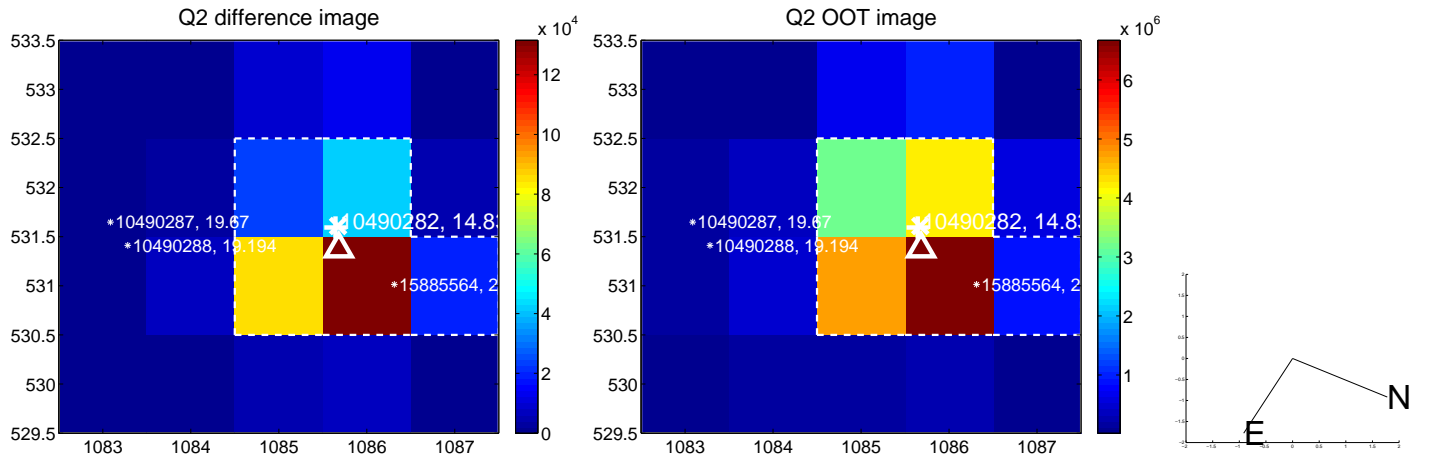
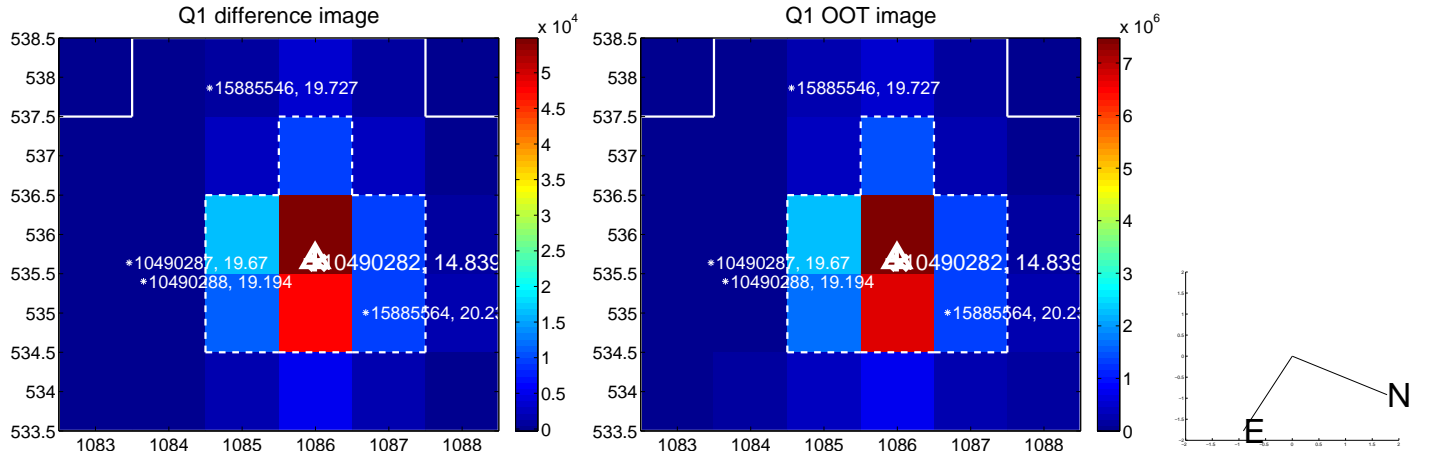


offset from photometric centroids

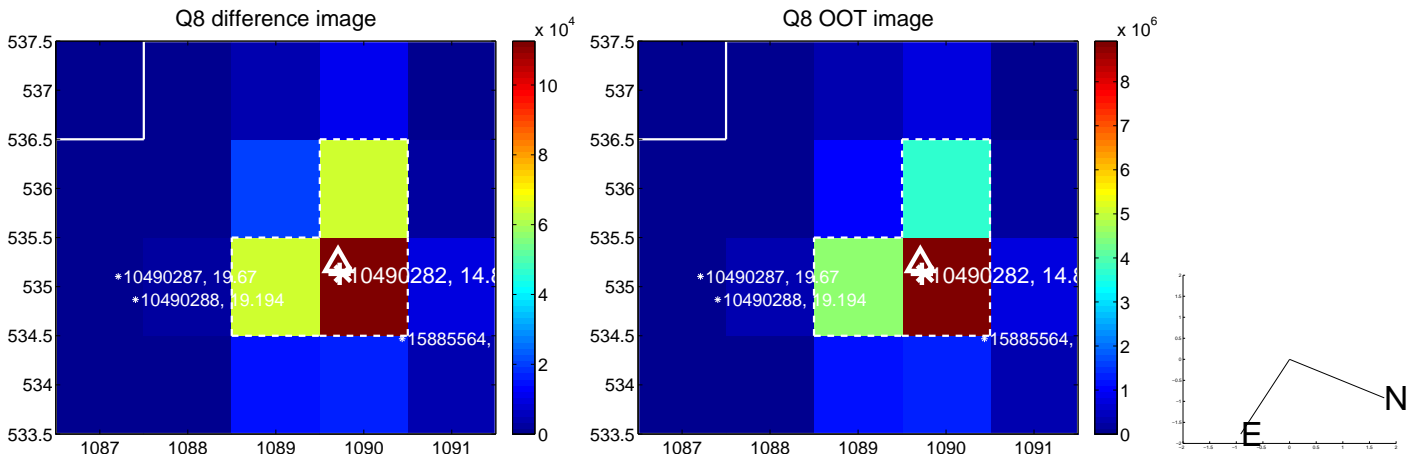
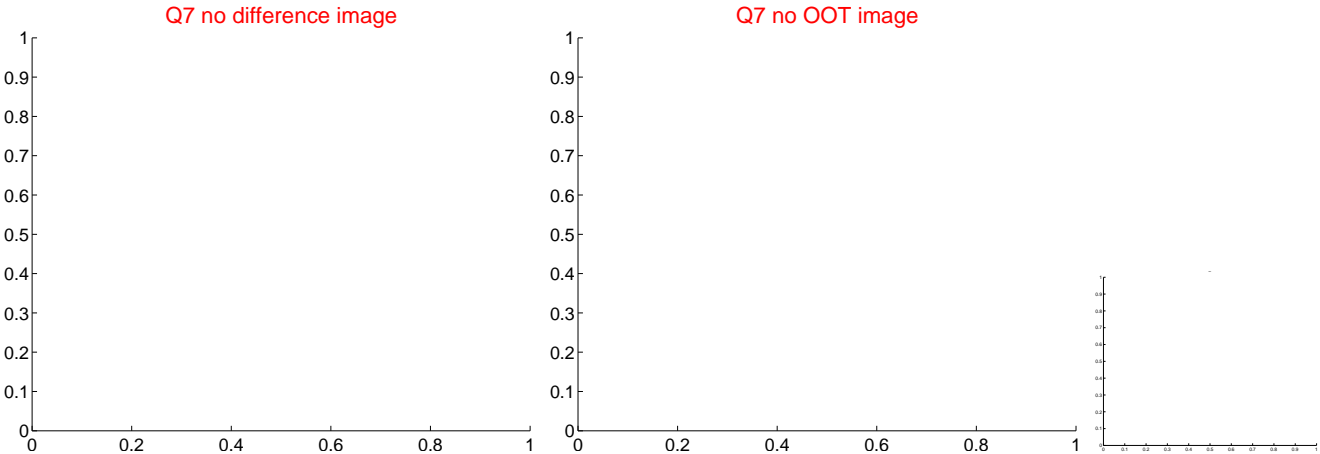
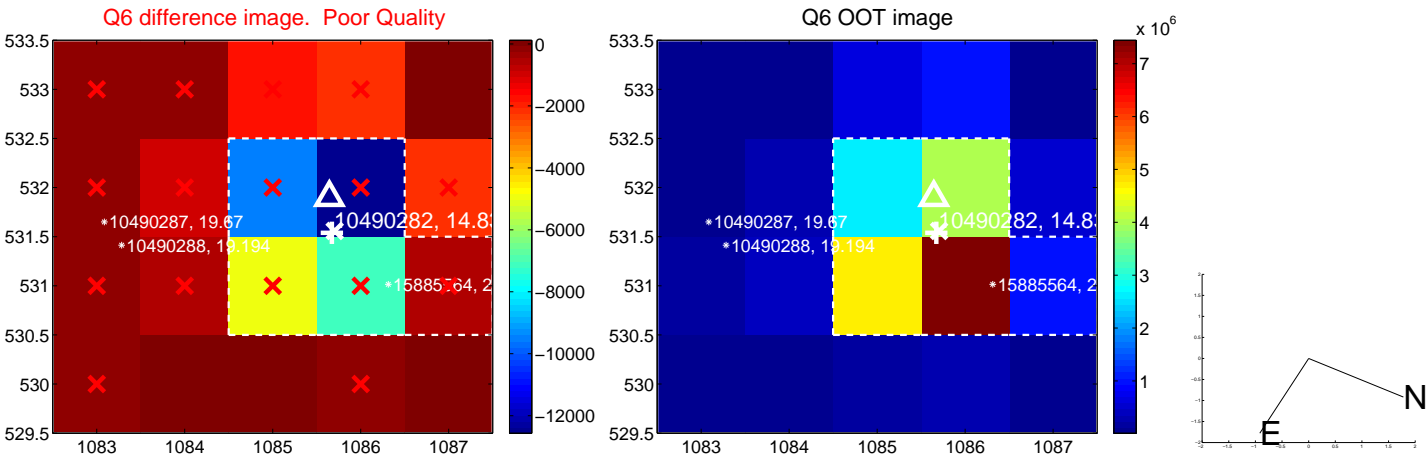
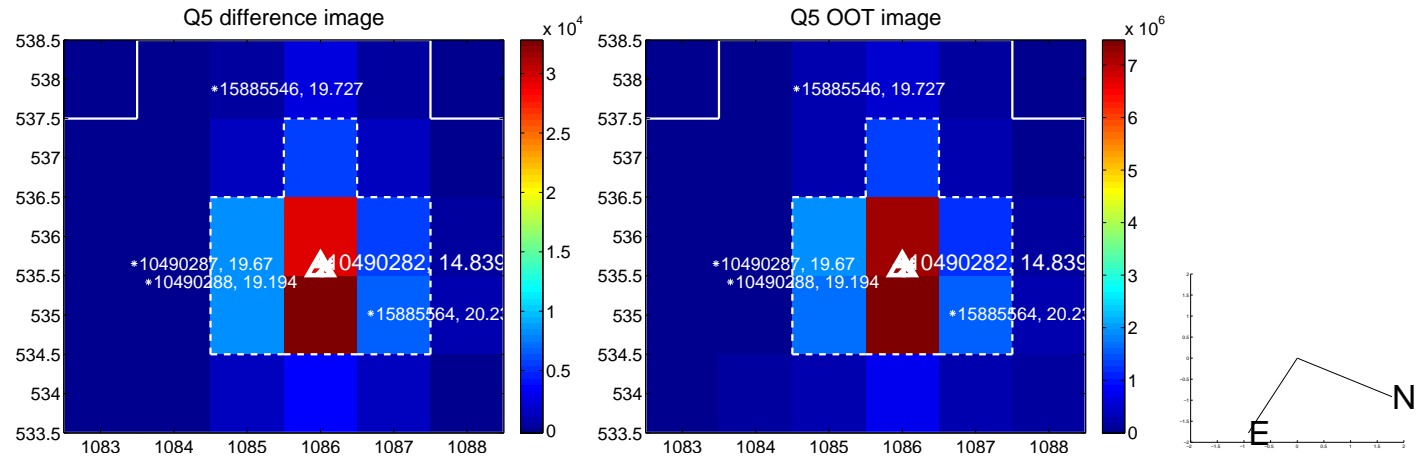


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

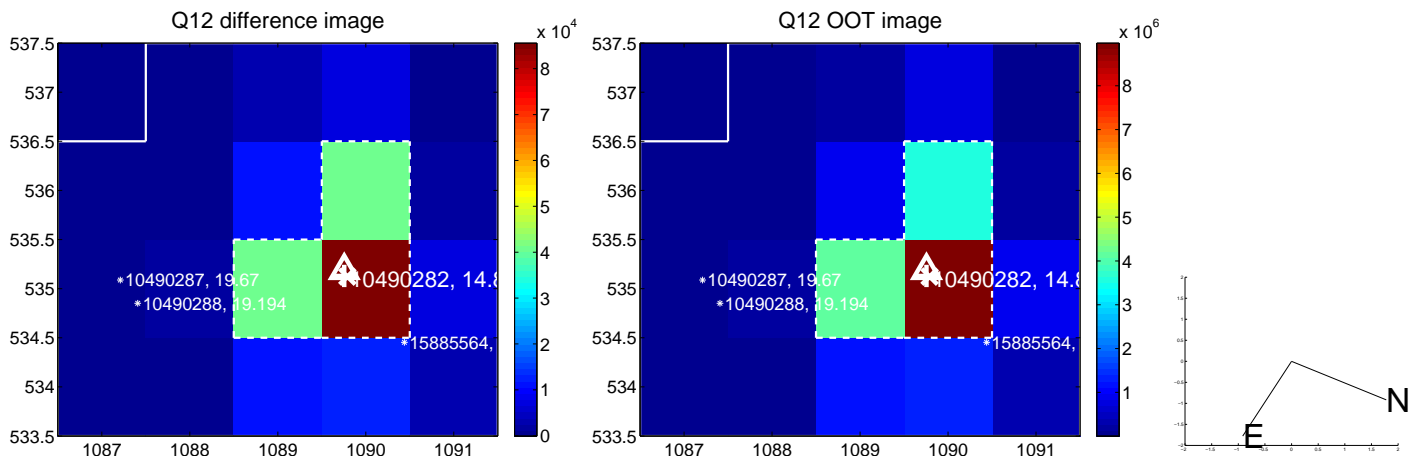
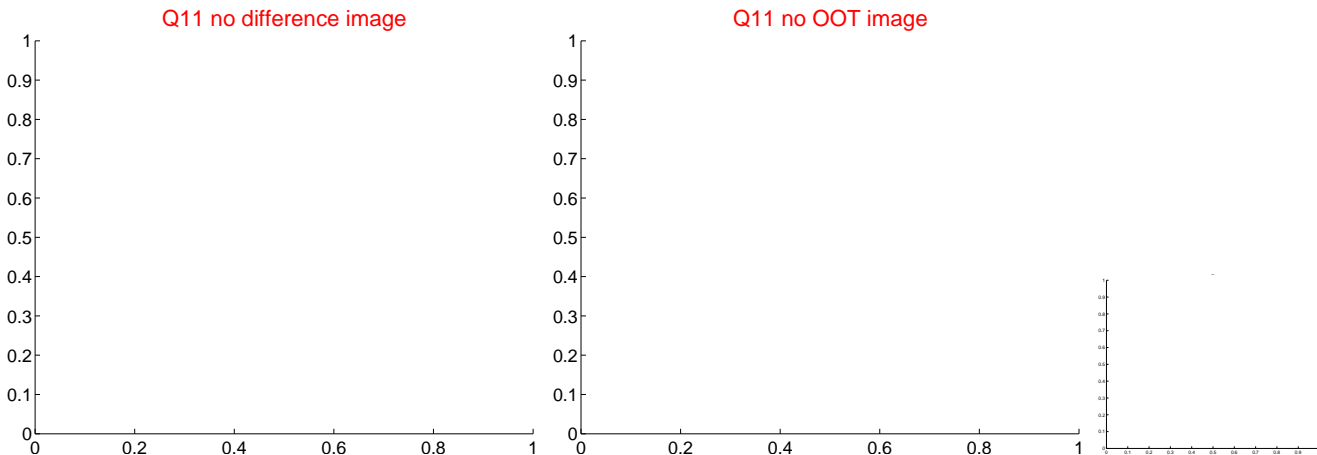
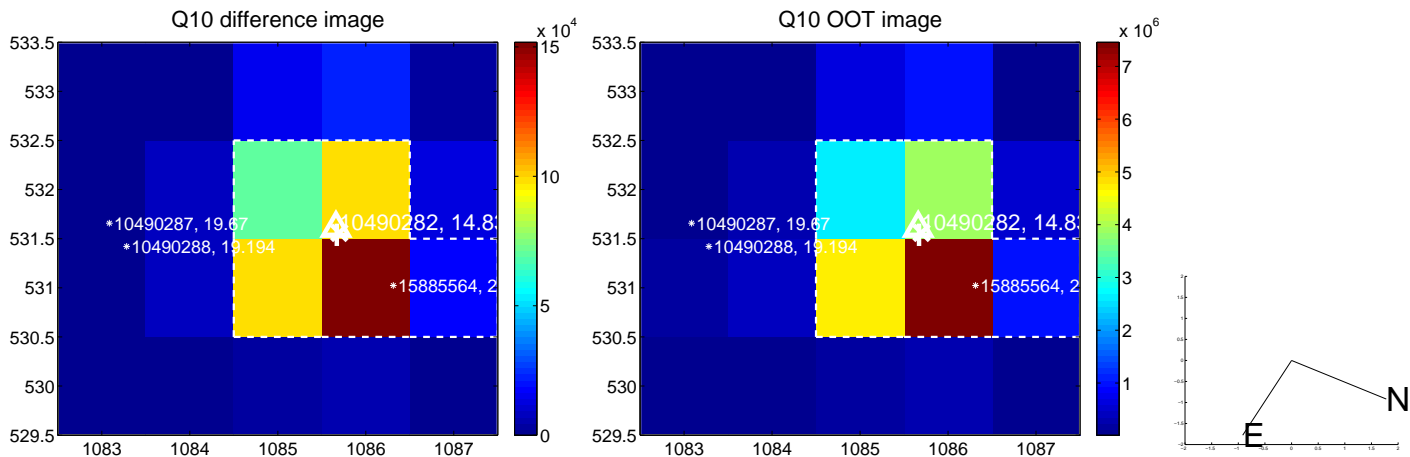
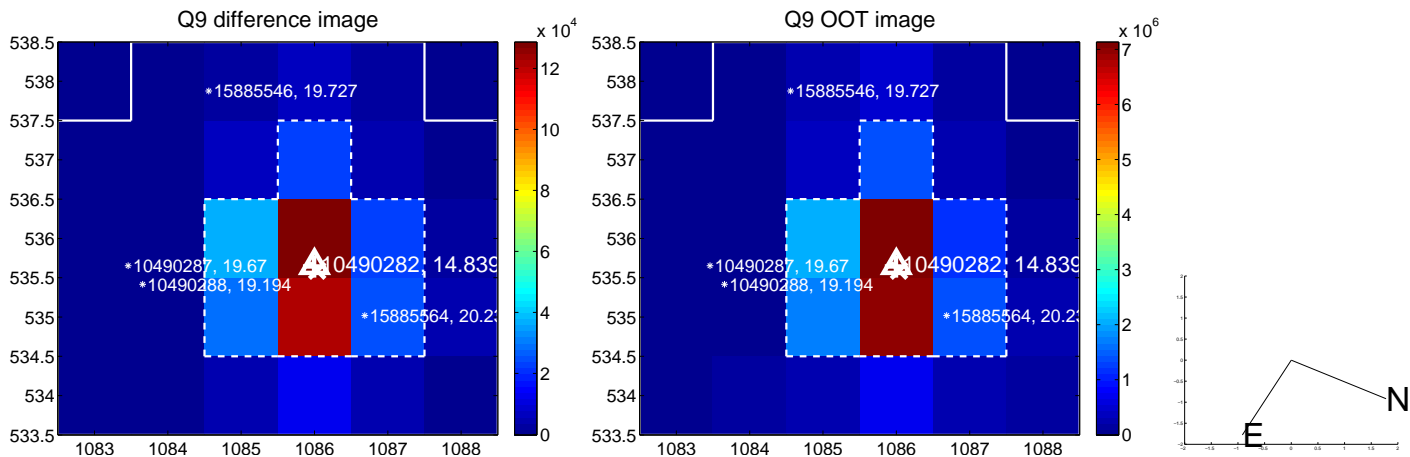
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



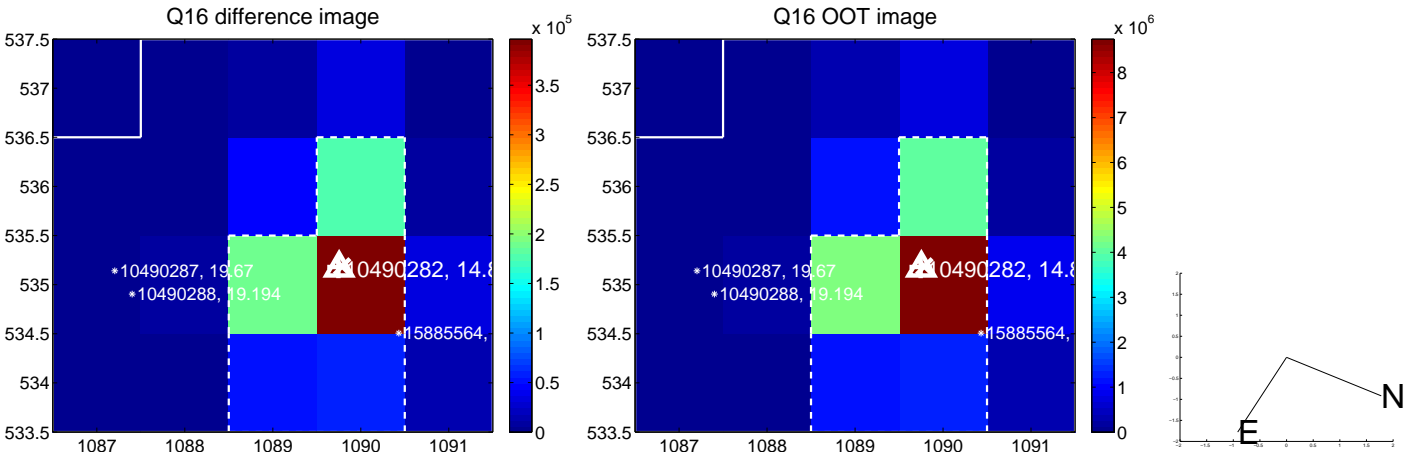
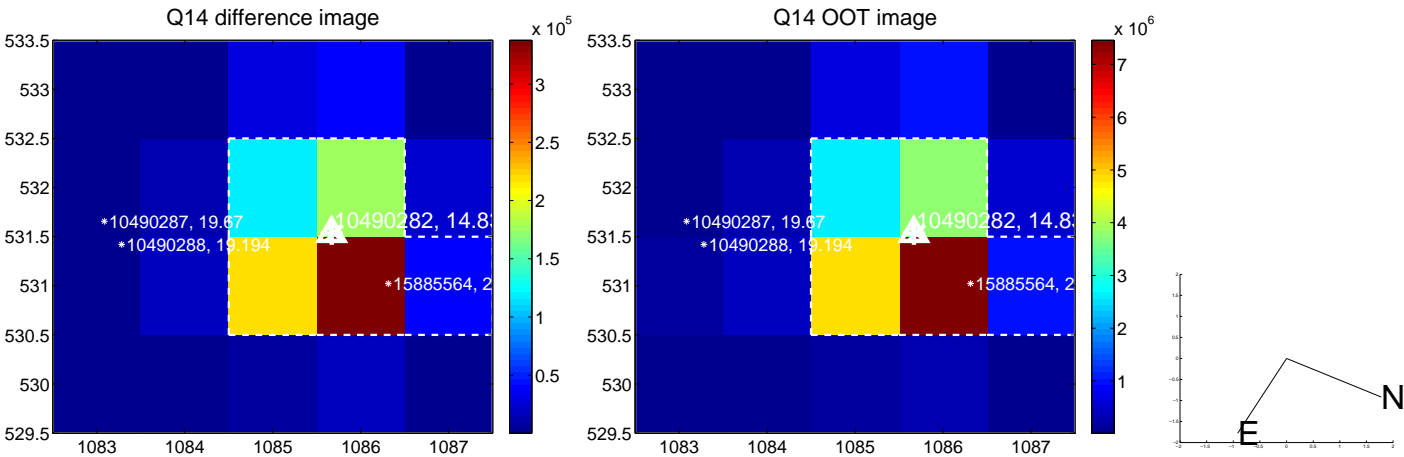
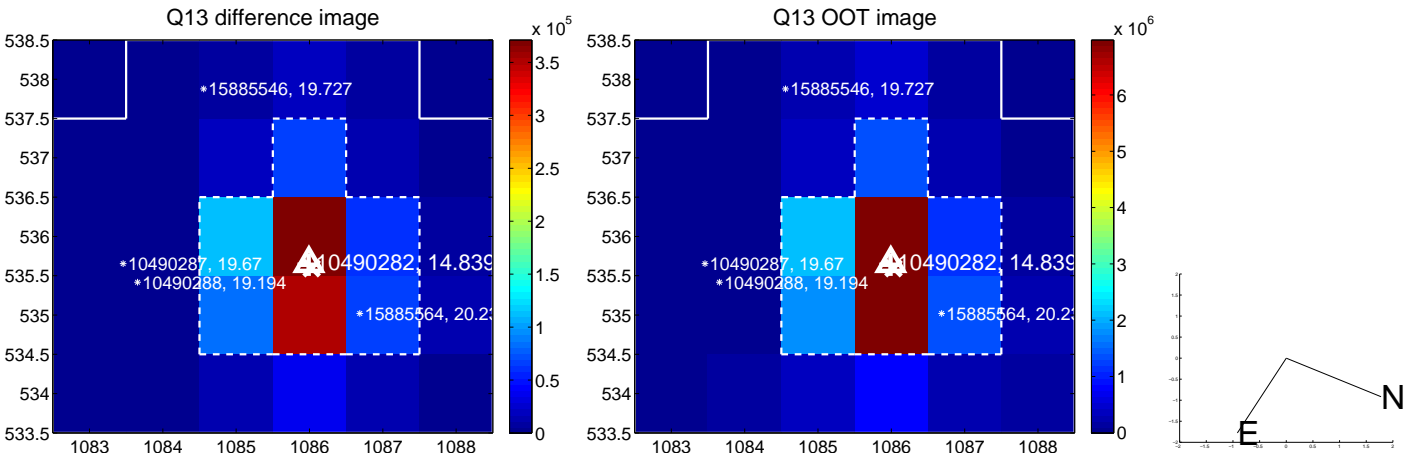
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white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

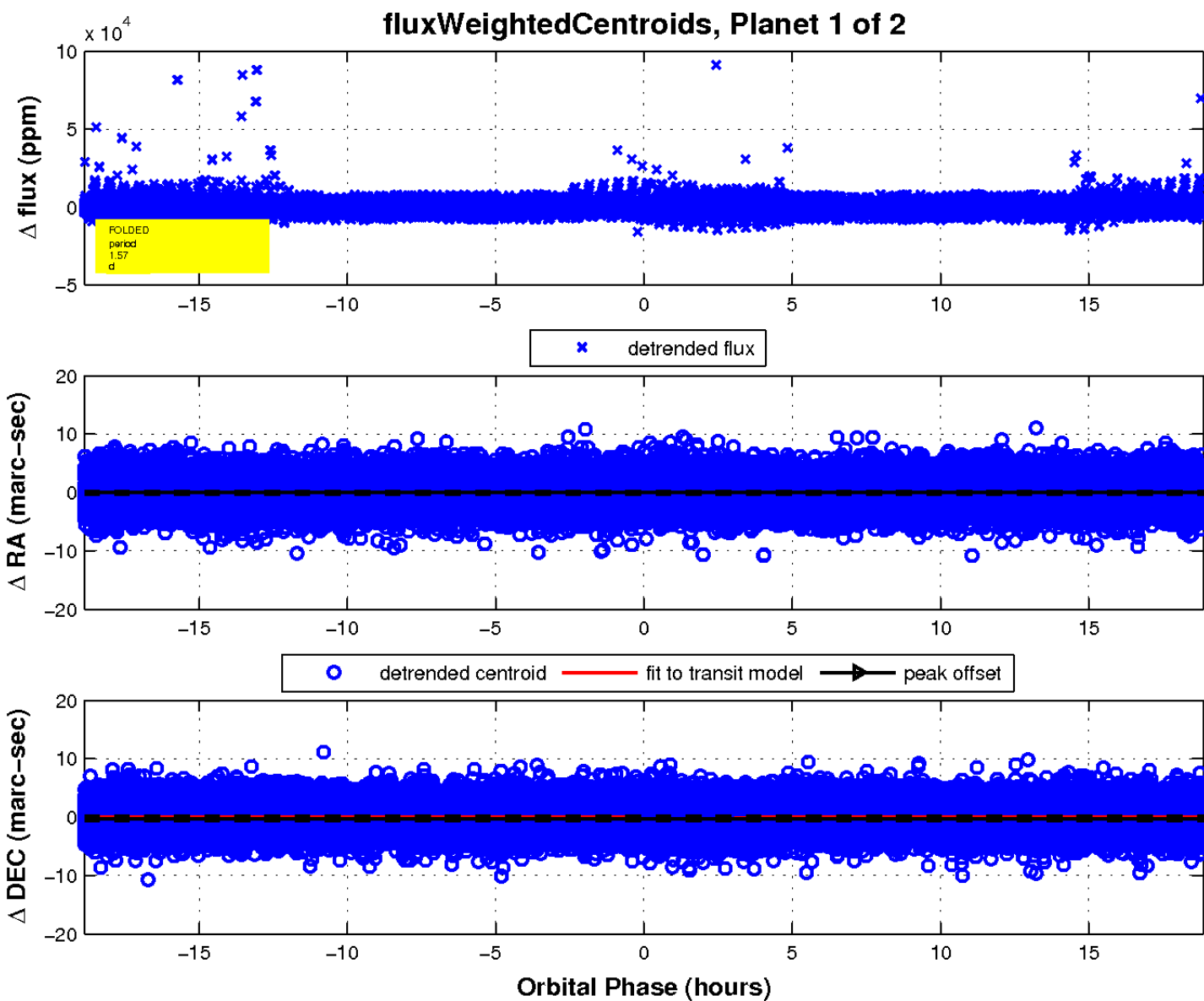
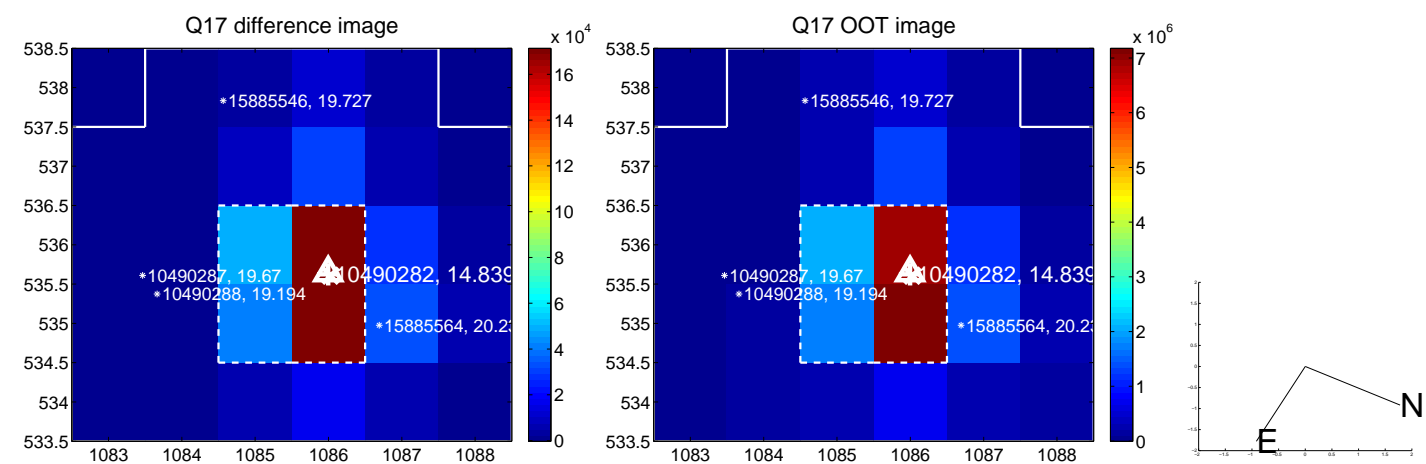


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



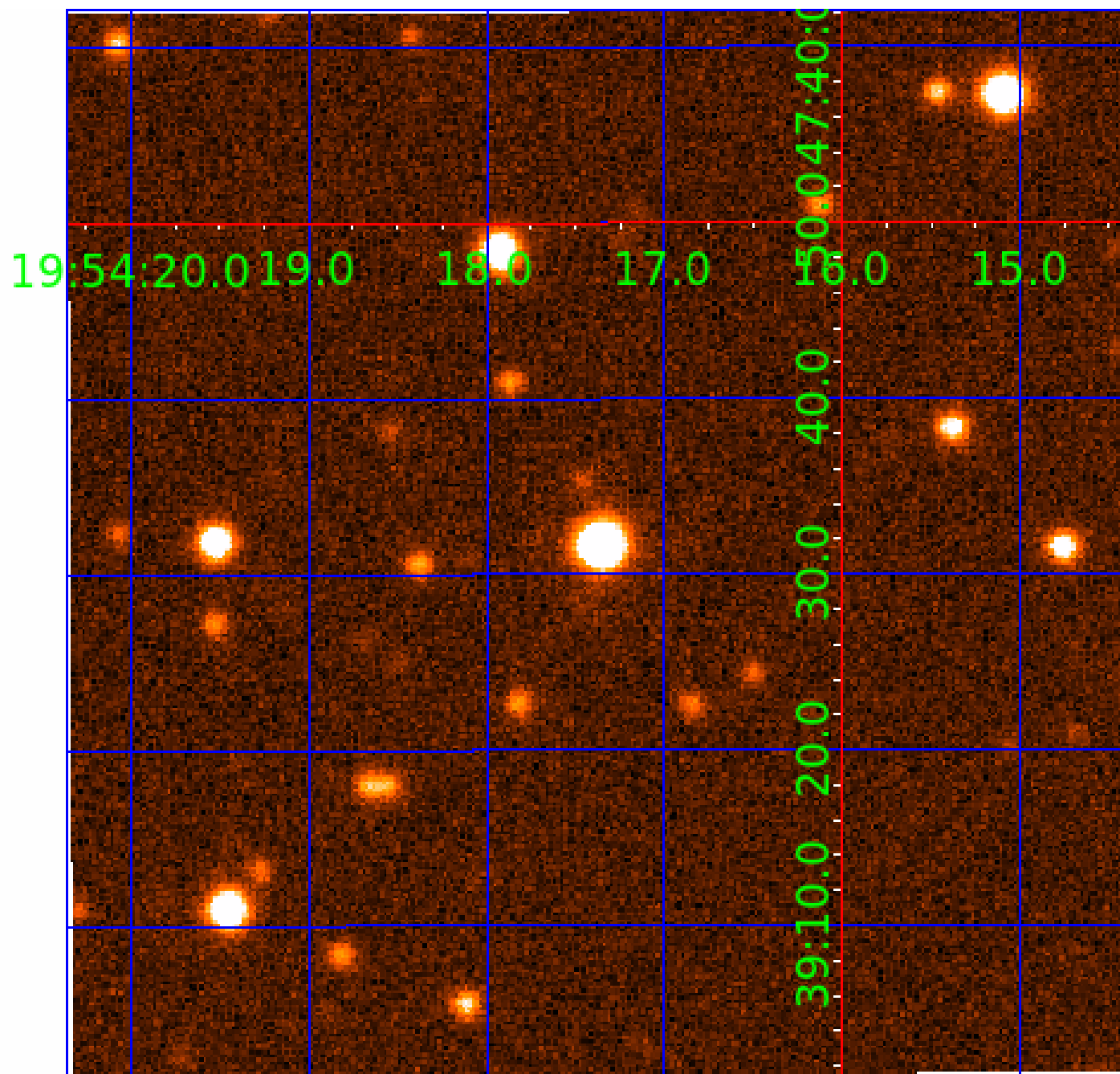


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 010490282

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010490282-01	OBS	No	1.572583	131.647218	1092.2	3.500	11.2	-1.0	0.75	5504	2.46	792.19
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## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010490282-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_NOFITS
010490282-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_ZUMA_TRACKER—SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—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.

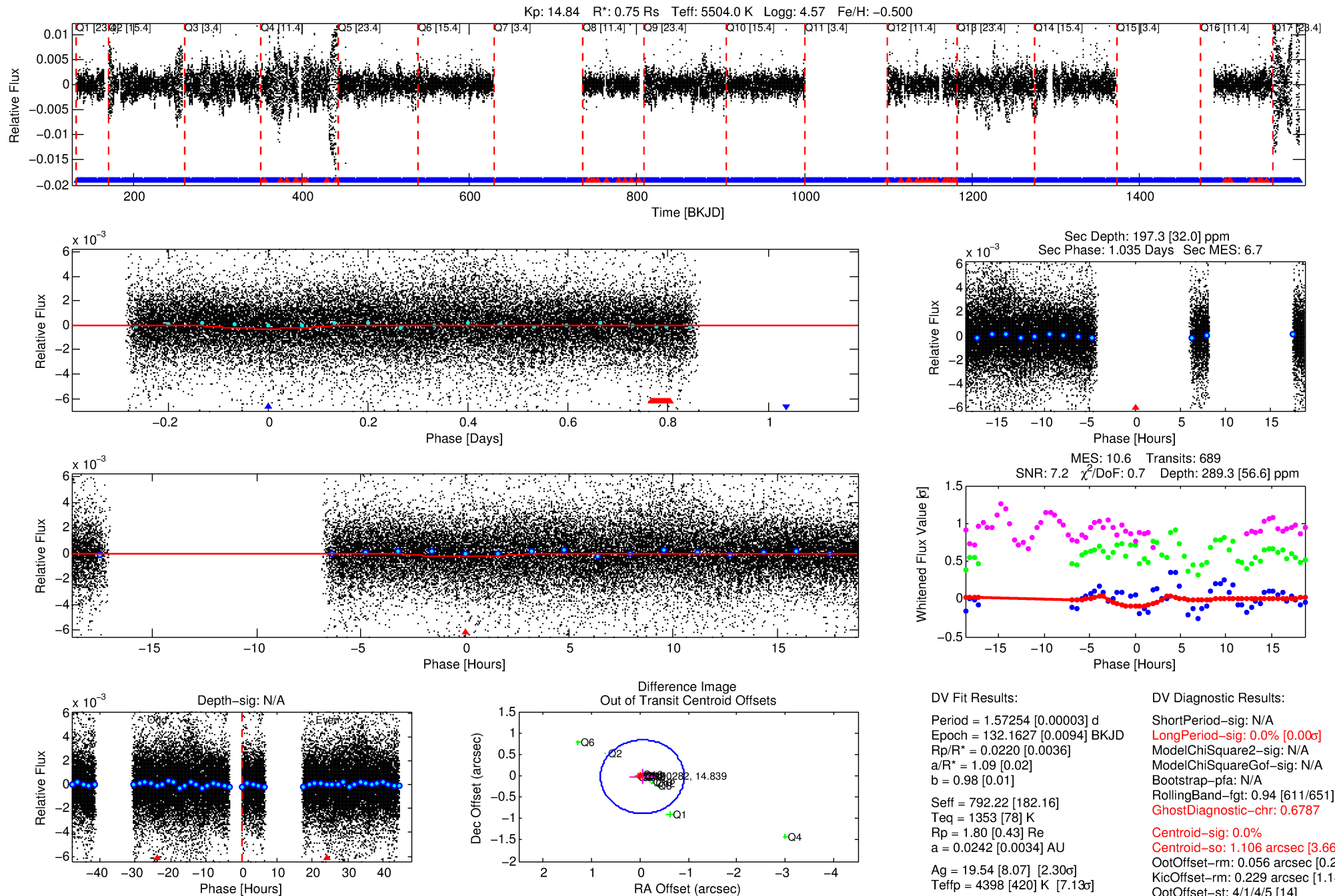
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010490282-02

No Significant Match Found

# DV One-Page Summary

KIC: 10490282 Candidate: 2 of 2 Period: 1.573 d



## DV Fit Results:

Period = 1.57254 [0.00003] d  
Epoch = 132.1627 [0.0094] BKJD  
Rp/R\* = 0.0220 [0.0036]  
a/R\* = 1.09 [0.02]  
b = 0.98 [0.01]  
Seff = 792.22 [182.16]  
Teq = 1353 [78] K  
Rp = 1.80 [0.43] Re  
a = 0.0242 [0.0034] AU  
Ag = 19.54 [8.07] [2.30σ]  
Teff = 4398 [420] K [7.13σ]

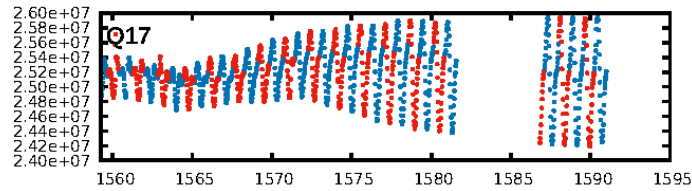
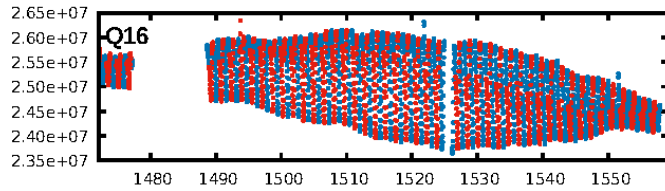
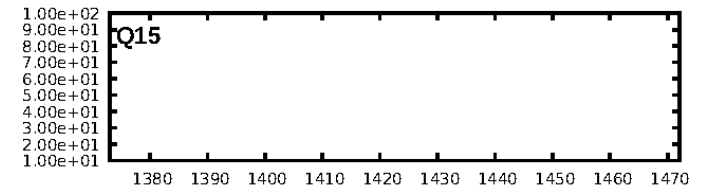
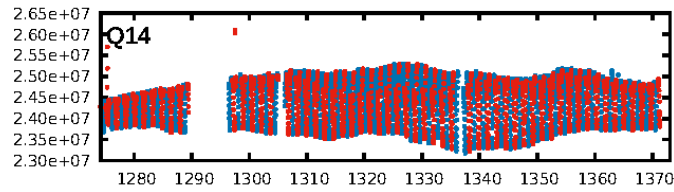
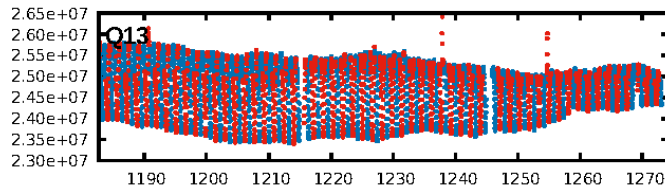
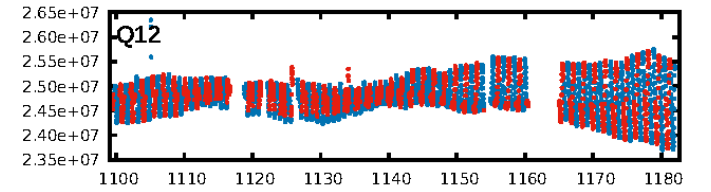
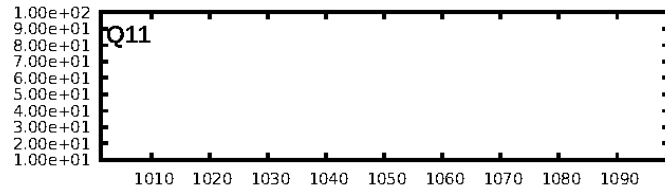
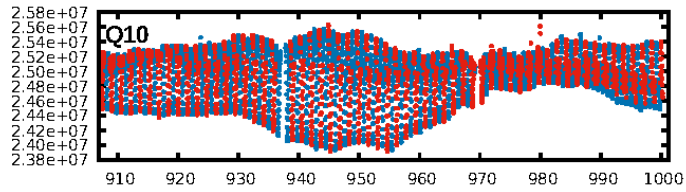
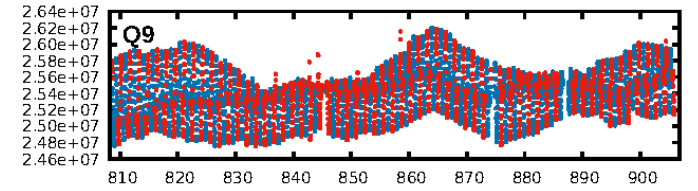
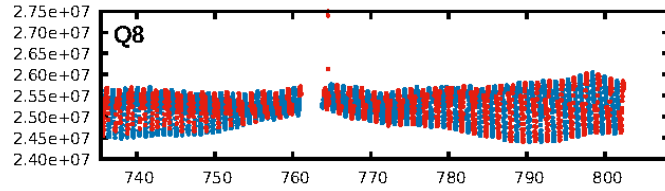
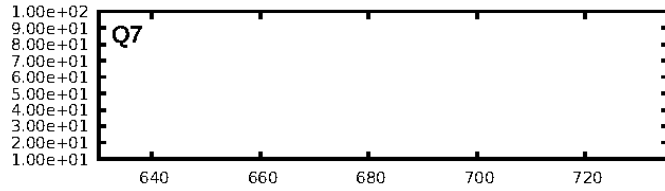
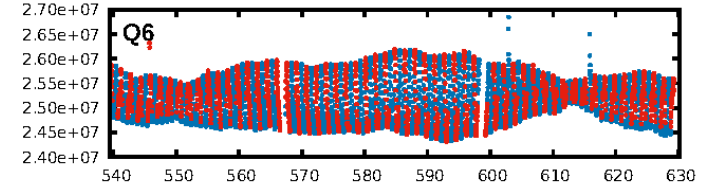
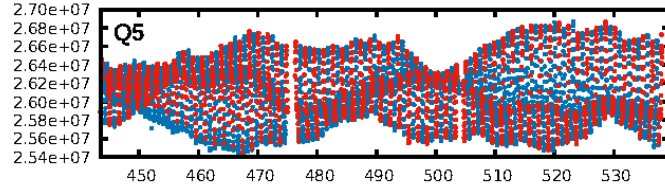
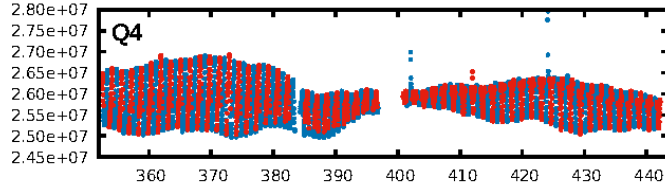
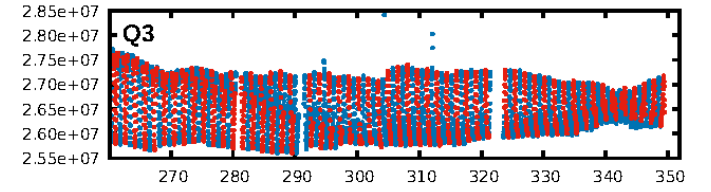
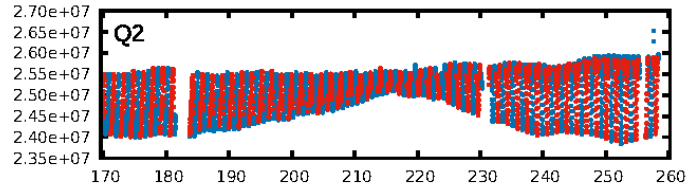
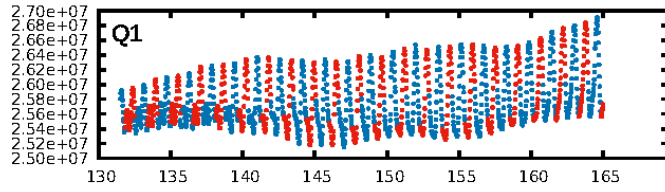
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.94 [611/651]  
GhostDiagnostic-chr: 0.6787  
Centroid-sig: 0.0%  
Centroid-so: 1.106 arcsec [3.66σ]  
OotOffset-rm: 0.056 arcsec [0.20σ]  
KicOffset-rm: 0.229 arcsec [1.18σ]  
OotOffset-st: 4/1/4/5 [14]  
KicOffset-st: 4/1/4/5 [14]  
DiffImageQuality-fgm: 1.00 [14/14]  
DiffImageOverlap-fno: 1.00 [14/14]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 17:45:23 Z

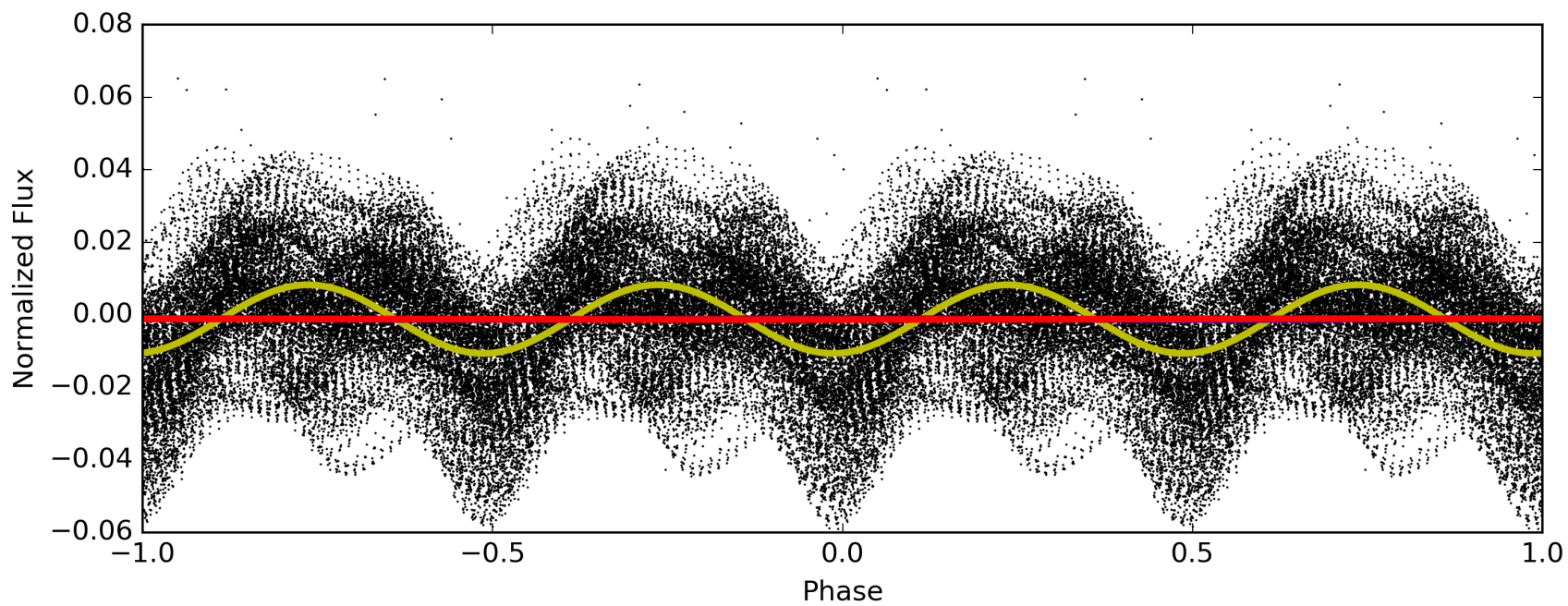
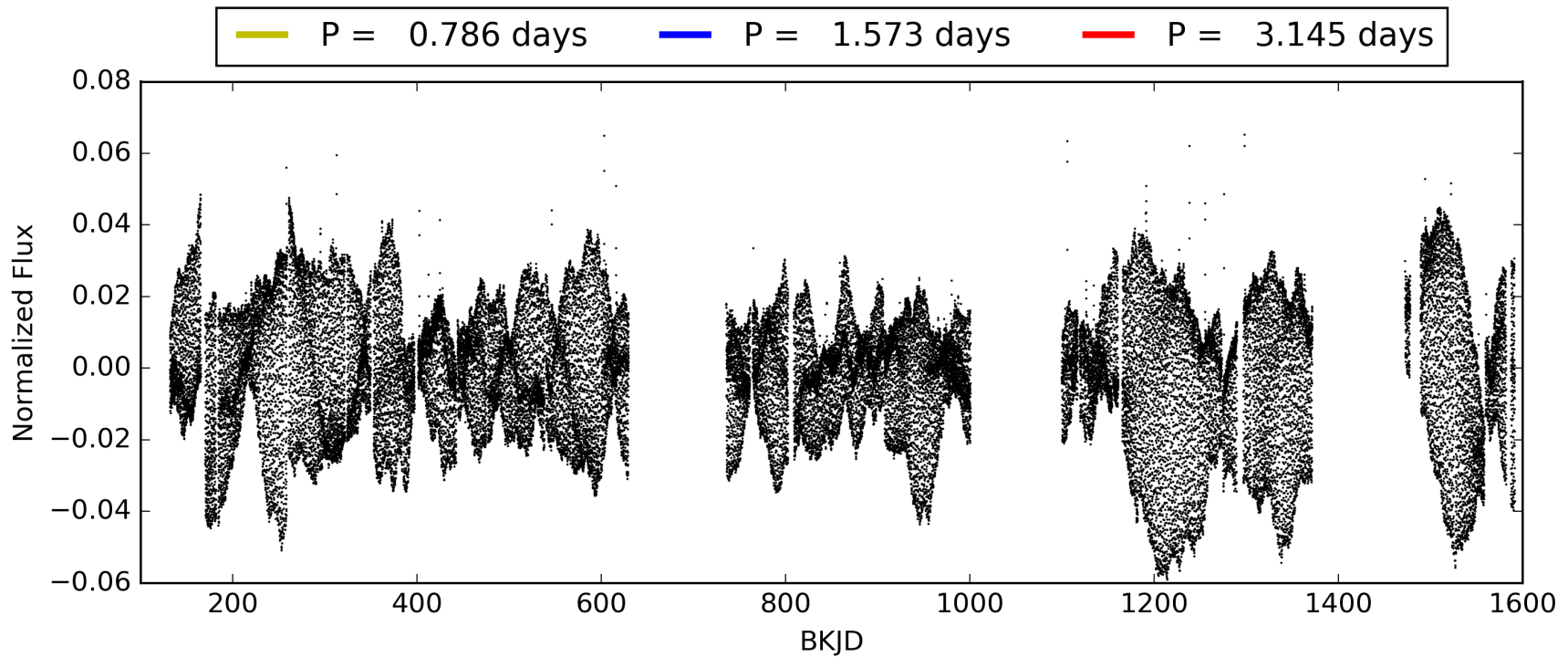
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010490282-02, PDC Light Curves



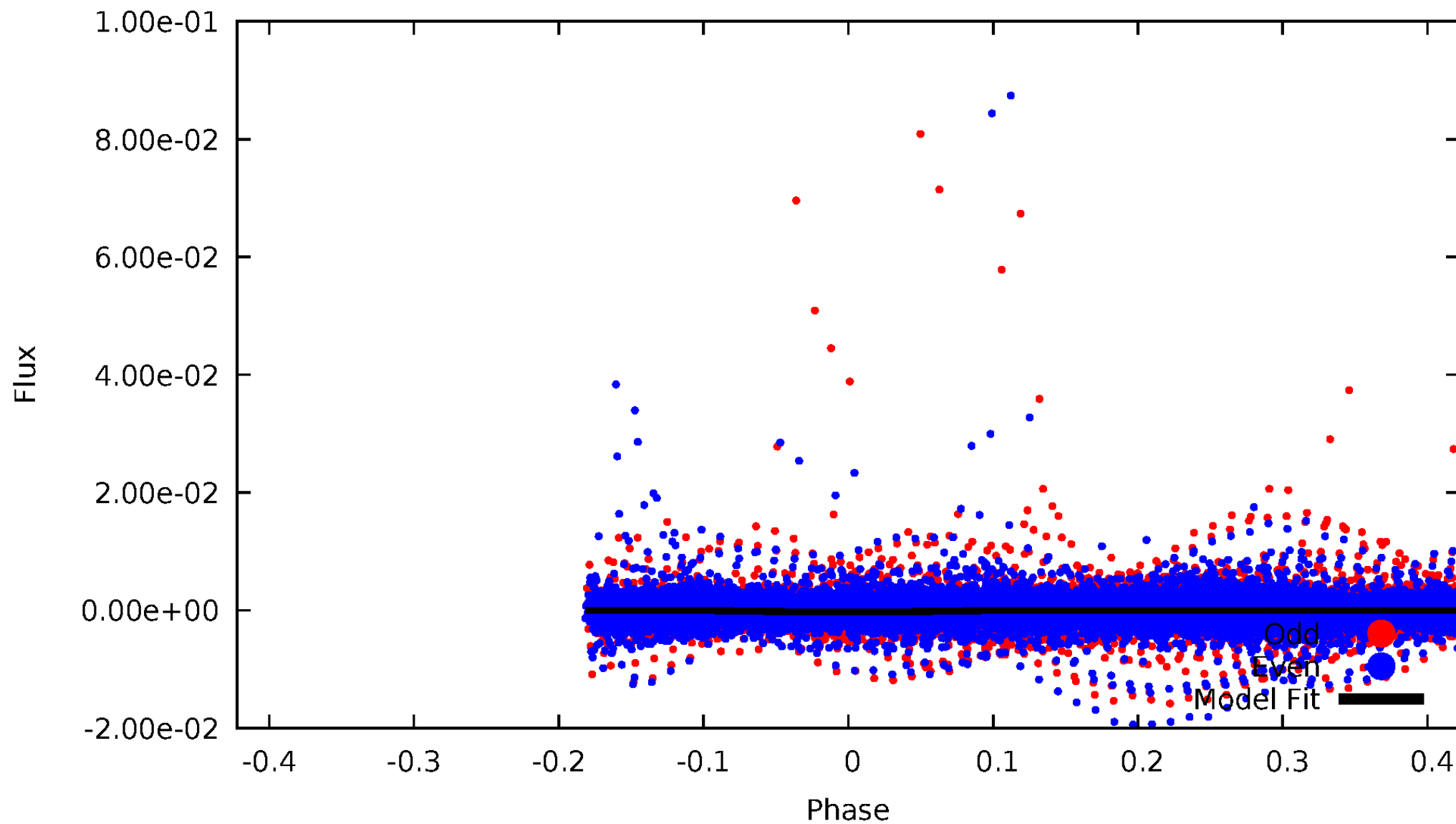


TCE 010490282-02



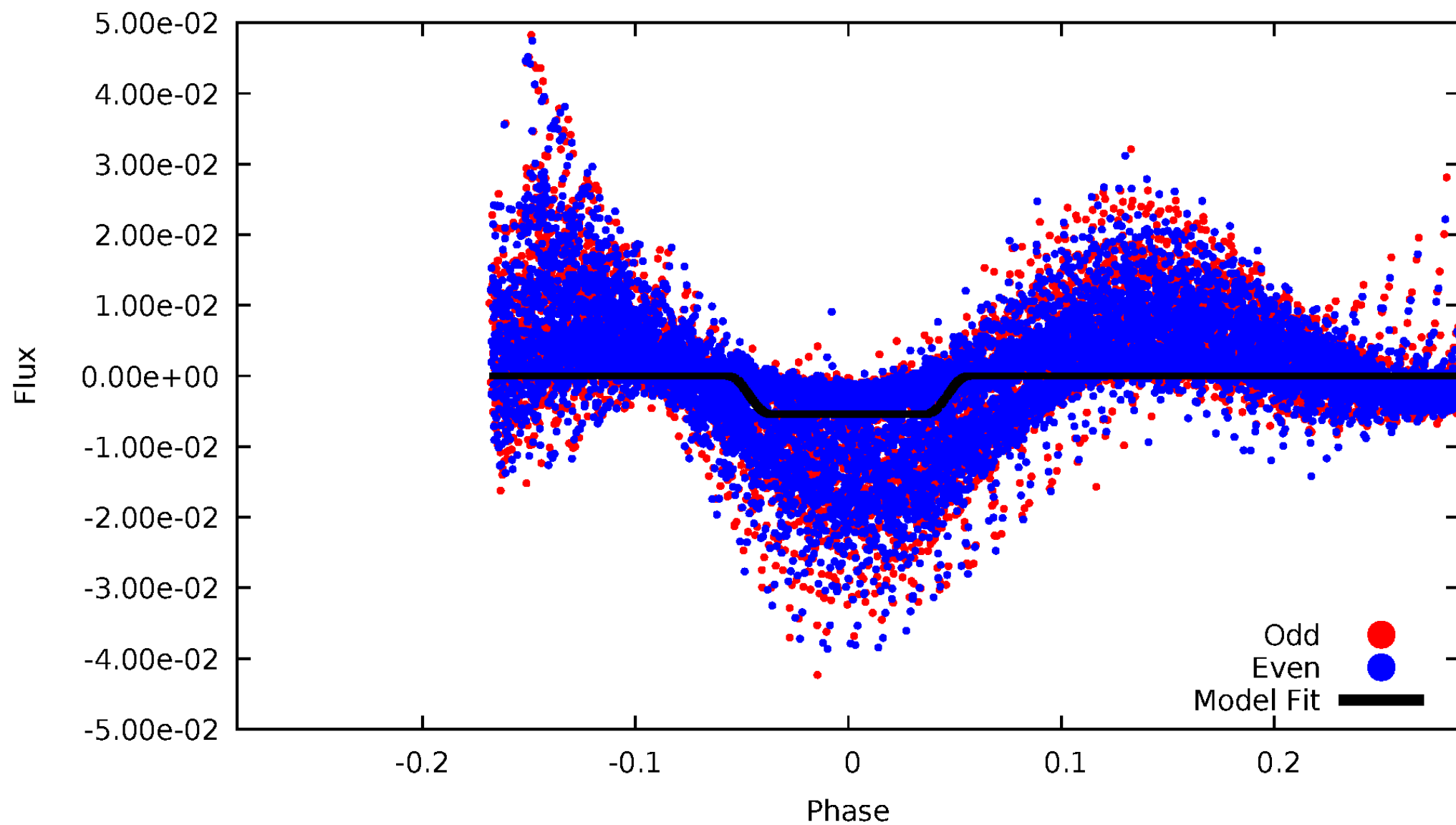
# DV Odd/Even

TCE 010490282-02



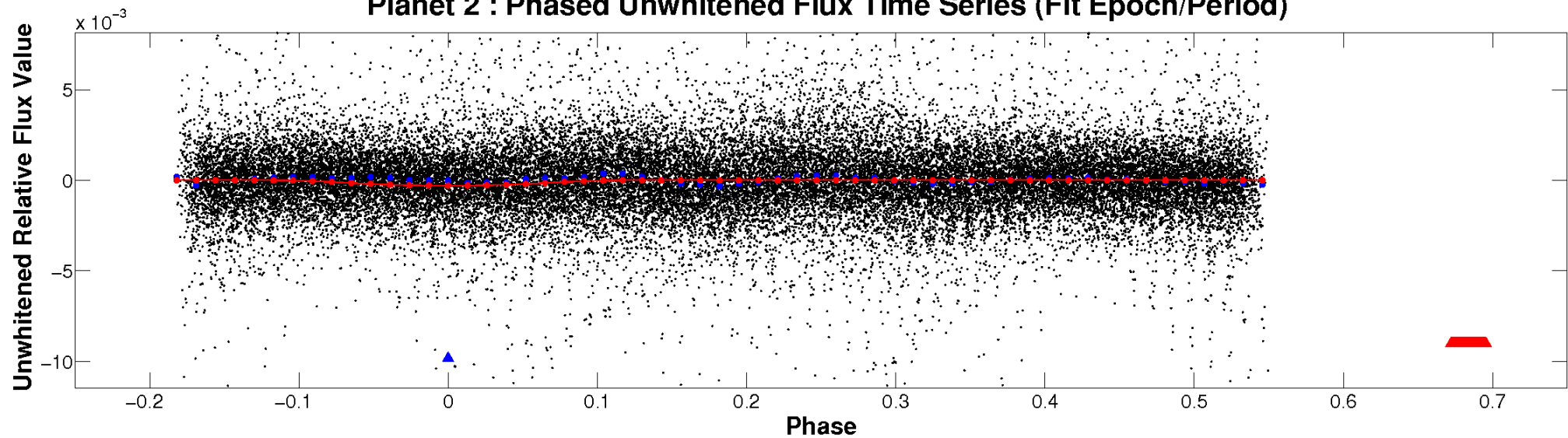
# ALT Odd/Even

TCE 010490282-02

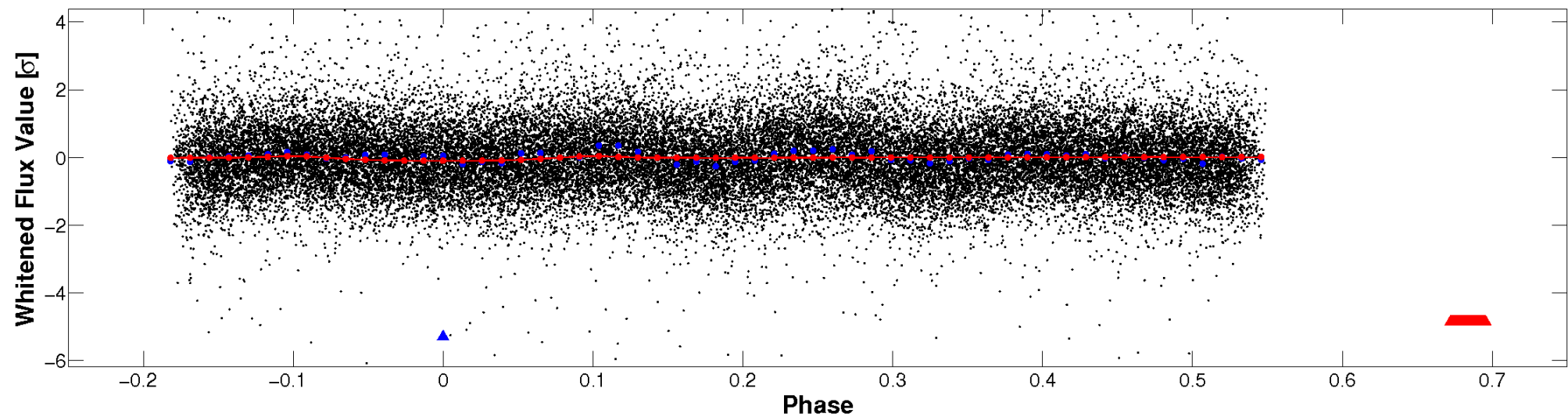


# Non-Whitened Vs. Whitened Light Curve

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

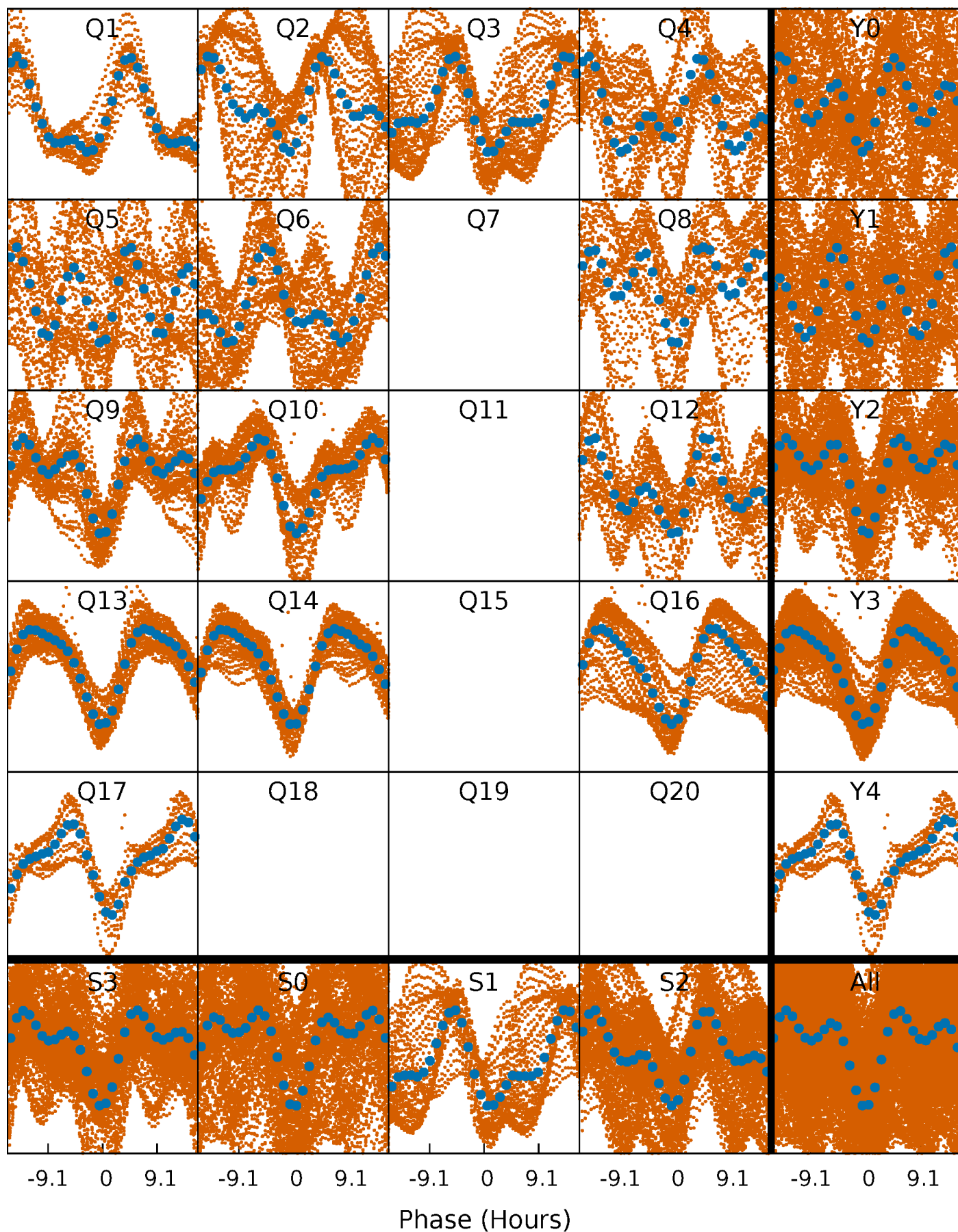


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

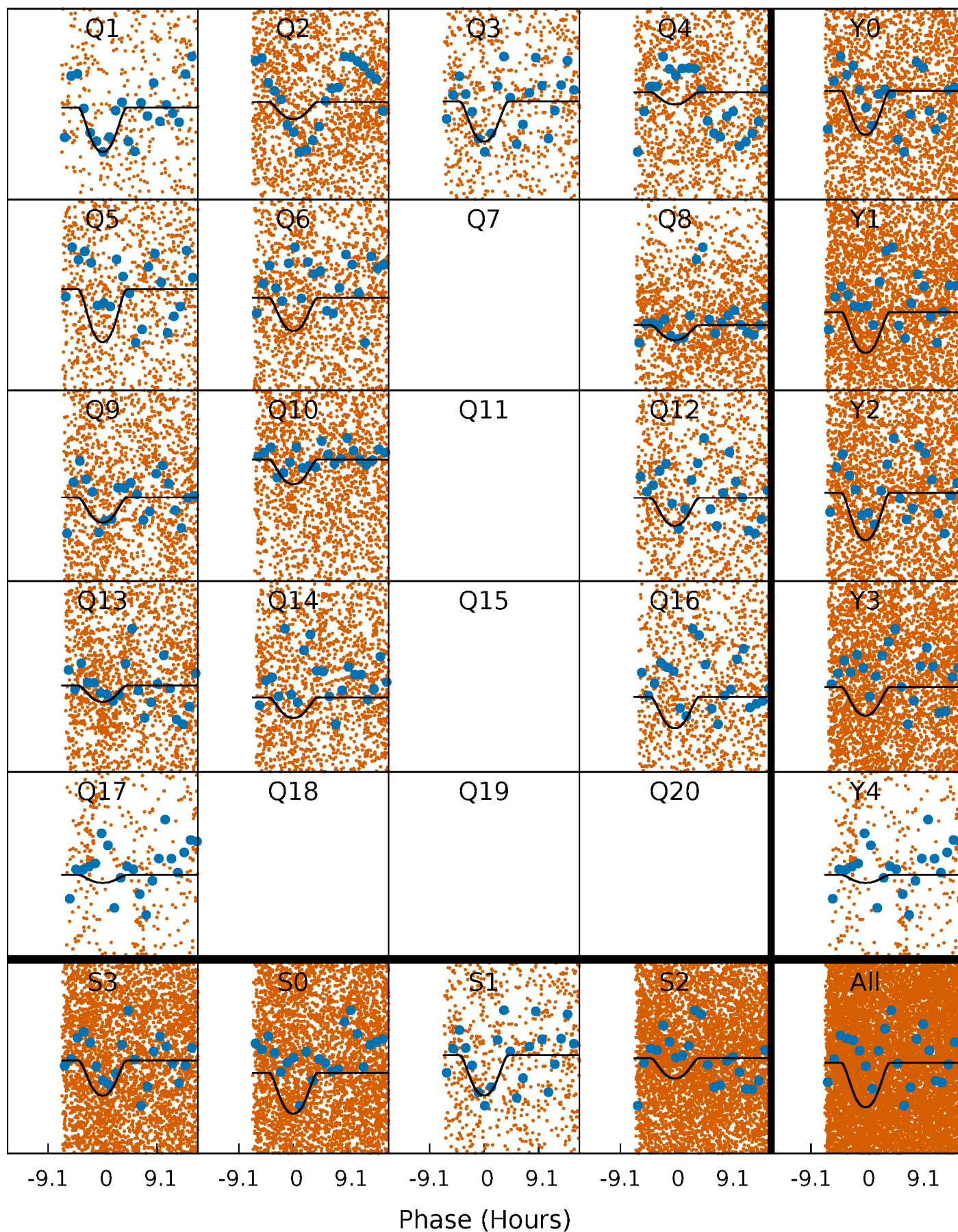
TCE 010490282-02   P= 1.572543 Days    $T_0=132.162687$  (BKJD)





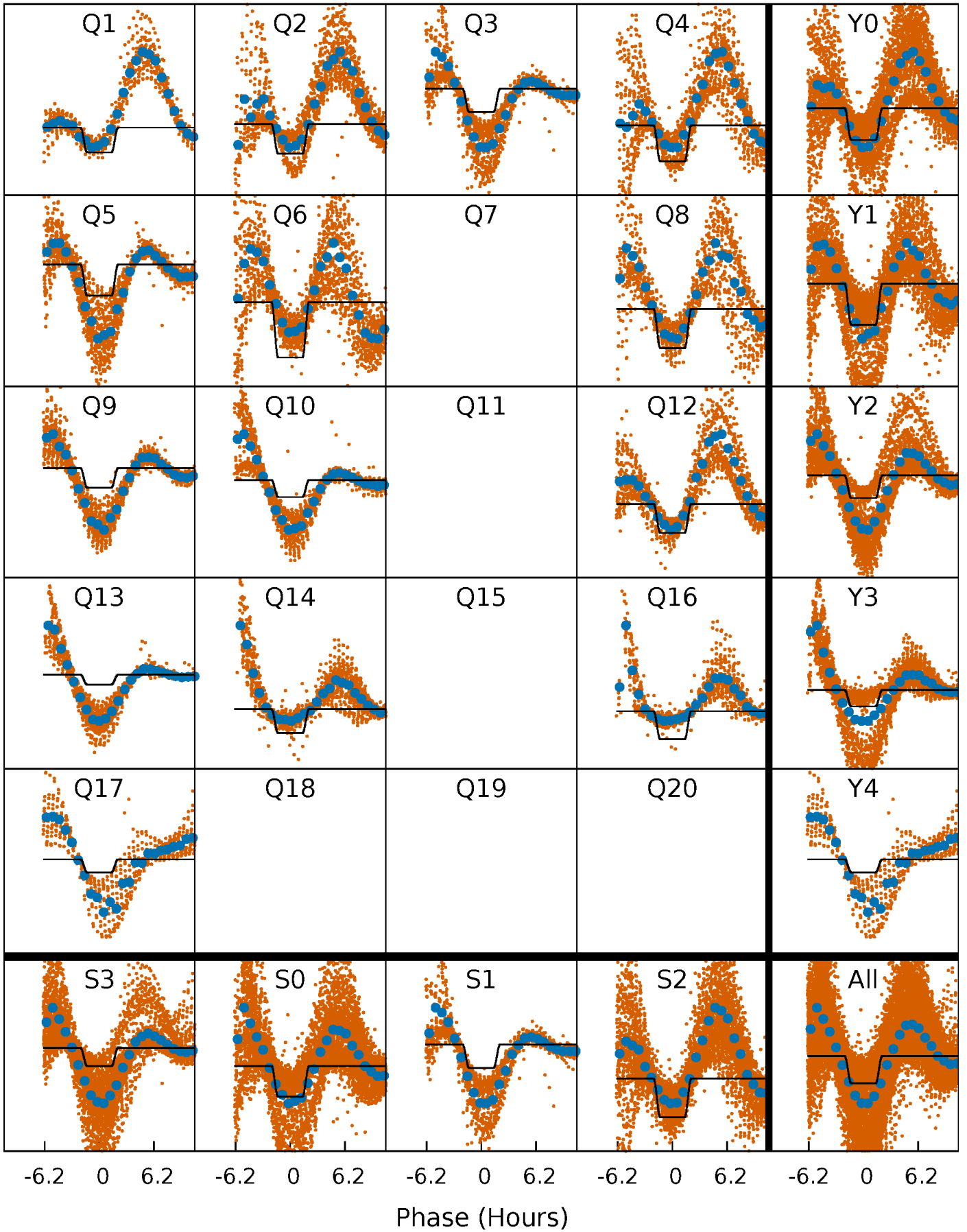
# DV Quarter-Phased Transit Curves

TCE 010490282-02     $P = 1.572543$  Days     $T_0 = 132.162687$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

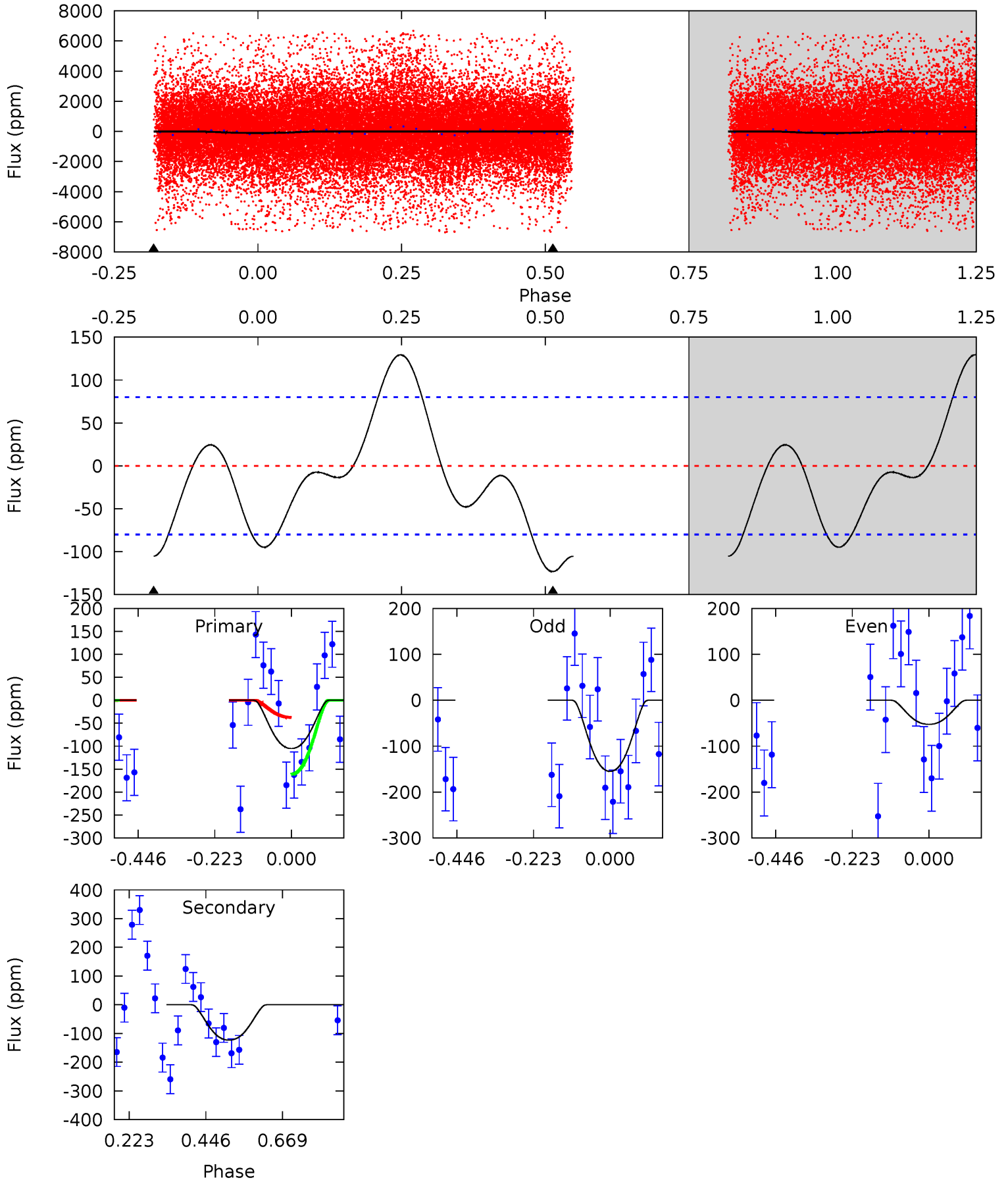
TCE 010490282-02     $P = 1.572587$  Days     $T_0 = 132.137502$  (BKJD)



# DV Model-Shift Uniqueness Test

010490282-02, P = 1.572543 Days, E = 130.590144 Days

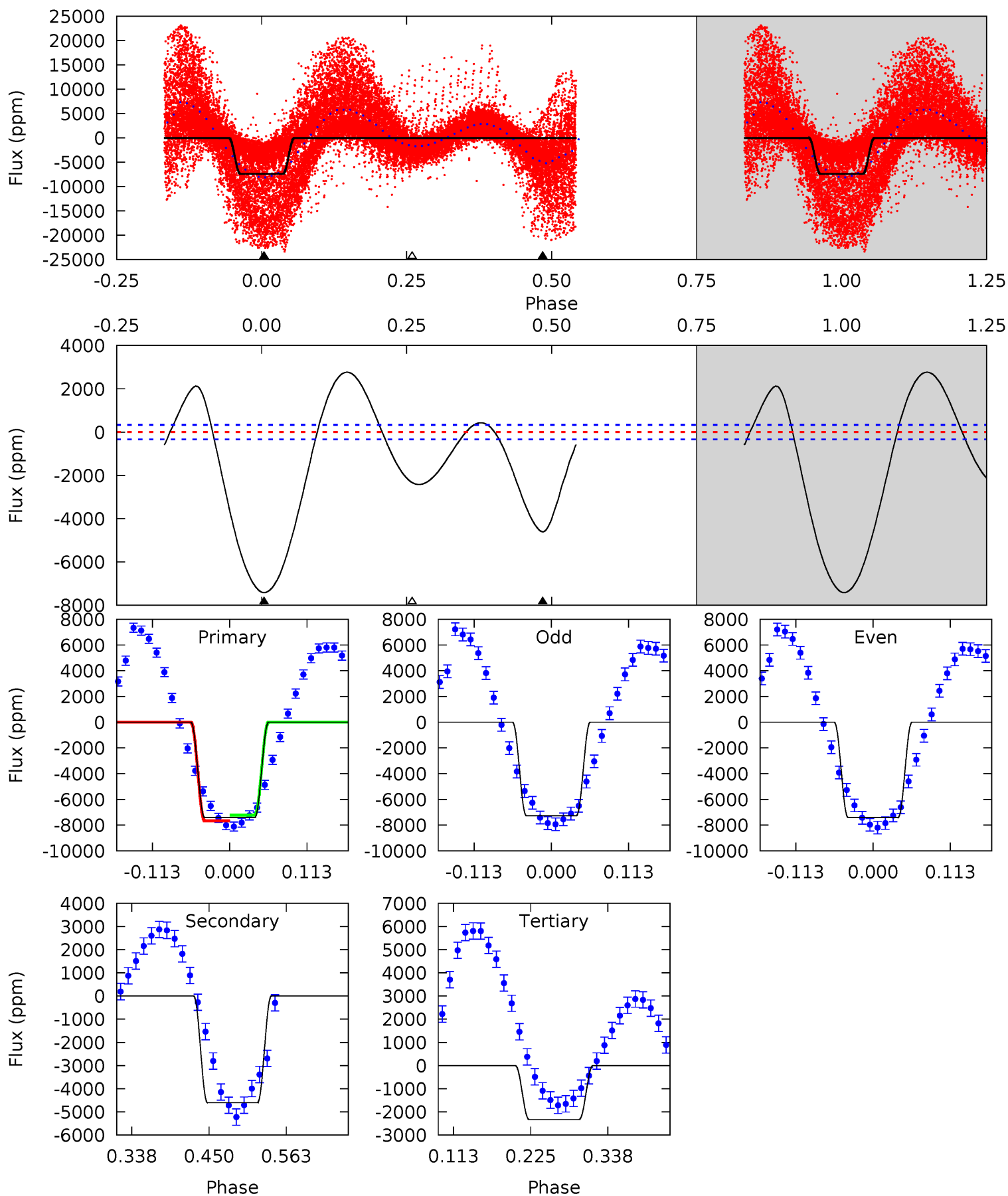
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.78	6.77	0	0	4.39	1.22	3.31	5.78	5.78	6.77	6.77	2.87	-2.78	0.51	3.81



# Alt Model-Shift Uniqueness Test

010490282-02, P = 1.572587 Days, E = 130.564915 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
100.5	62.4	31.6	0	4.54	1.59	23.6	68.9	100.5	30.8	62.4	0.95	1.74	0.27	2.04



### Stellar Parameters For KIC 010490282

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5504^{+163}_{-163}$	$4.569^{+0.056}_{-0.104}$	$-0.500^{+0.300}_{-0.300}$	$0.750^{+0.130}_{-0.070}$	$0.761^{+0.098}_{-0.060}$	$2.539^{+0.618}_{-0.791}$
	+3%/-3%	+1%/-2%	+60%/-60%	+17%/-9%	+13%/-8%	+24%/-31%
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 010490282-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-123 \pm 18$	$1.82^{+0.34}_{-0.32}$	$1910^{+90}_{-85}$	$4164^{+329}_{-268}$	$12^{+6}_{-4}$
Alt.	$-4605 \pm 74$	$6.08^{+0.61}_{-0.45}$	$1905^{+90}_{-72}$	$5309^{+198}_{-169}$	$40^{+6}_{-6}$

$T_{\text{max}}$  = 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

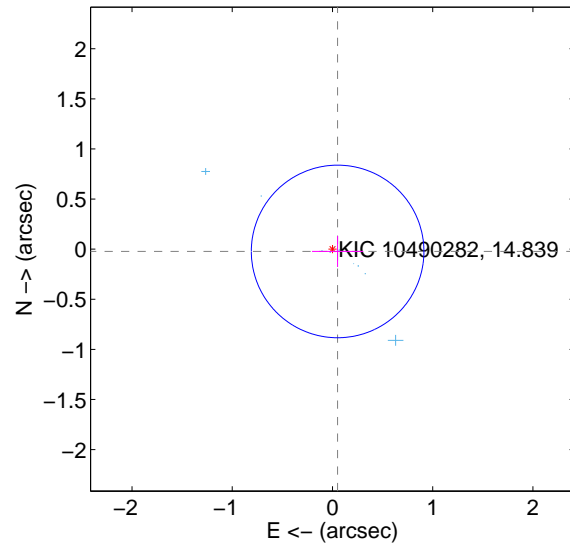
Supplemental centroid analysis for 010490282-02. Kepler magnitude: 14.84. Transit SNR 7.15

There are 14 quarters with good PRF difference image offsets

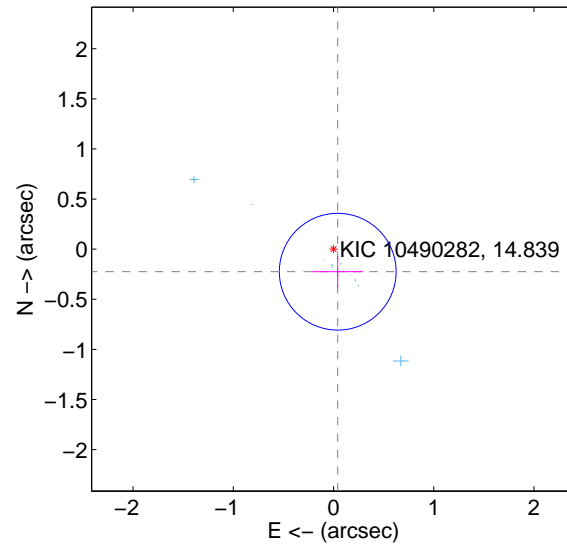
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.056 \pm 0.287$	0.20	$-0.051 \pm 0.255$	$-0.023 \pm 0.155$
PRF-fit source offset from KIC position	$0.229 \pm 0.194$	1.18	$-0.042 \pm 0.254$	$-0.225 \pm 0.157$
photometric centroid source offset	$1.11 \pm 0.30$	3.66	$-0.55 \pm 0.32$	$0.96 \pm 0.30$

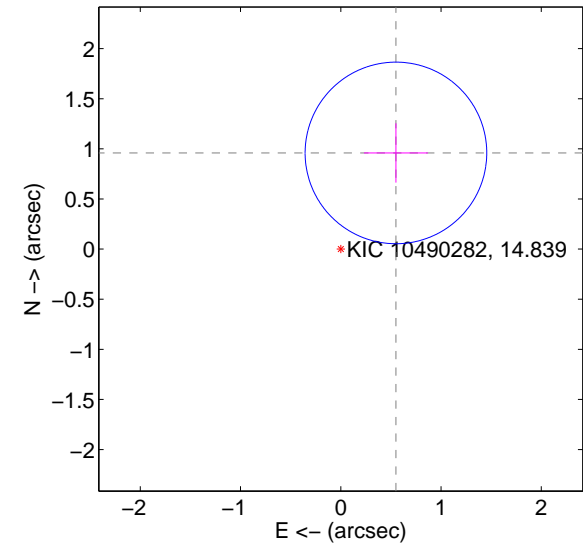
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



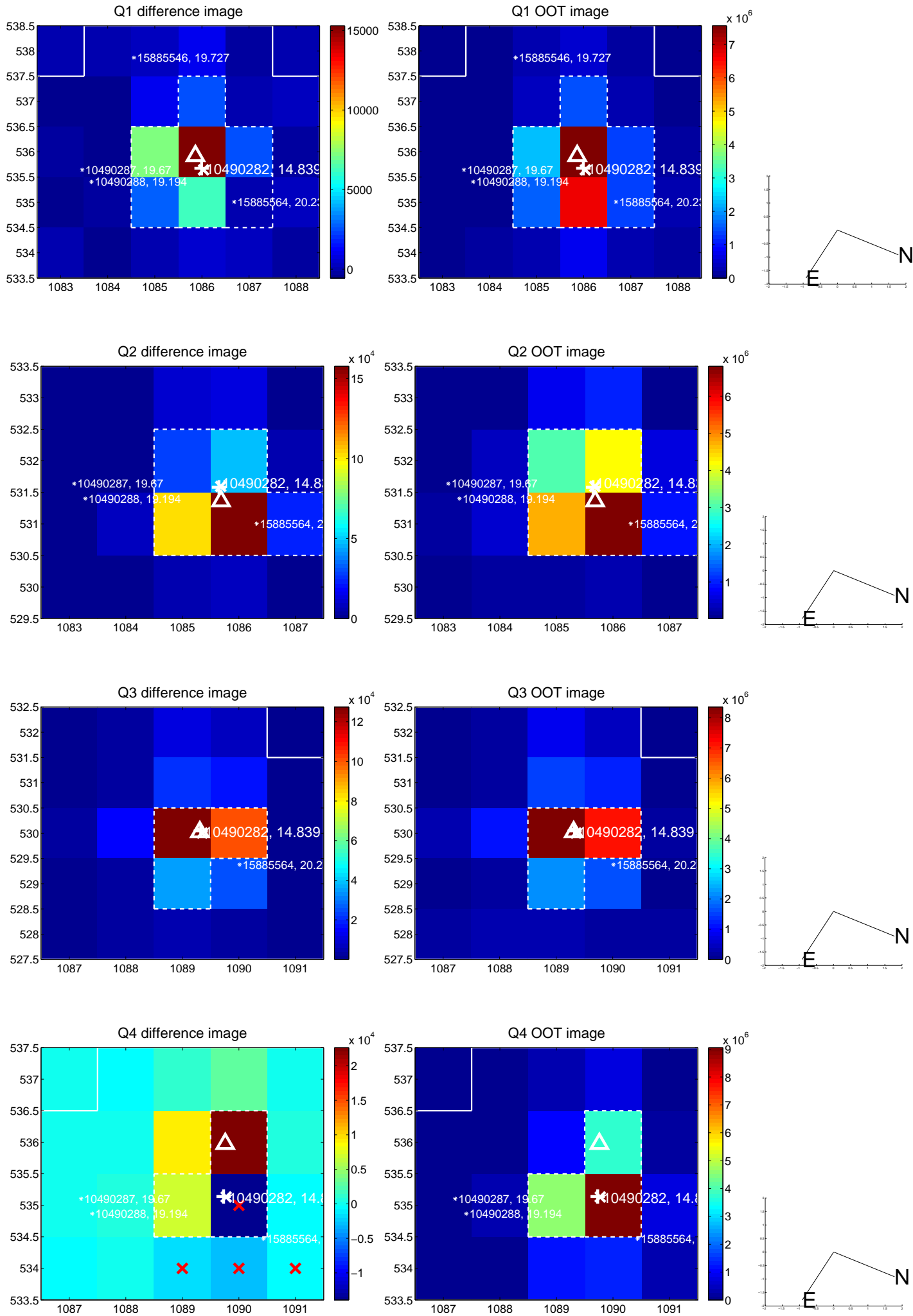
offset from photometric centroids



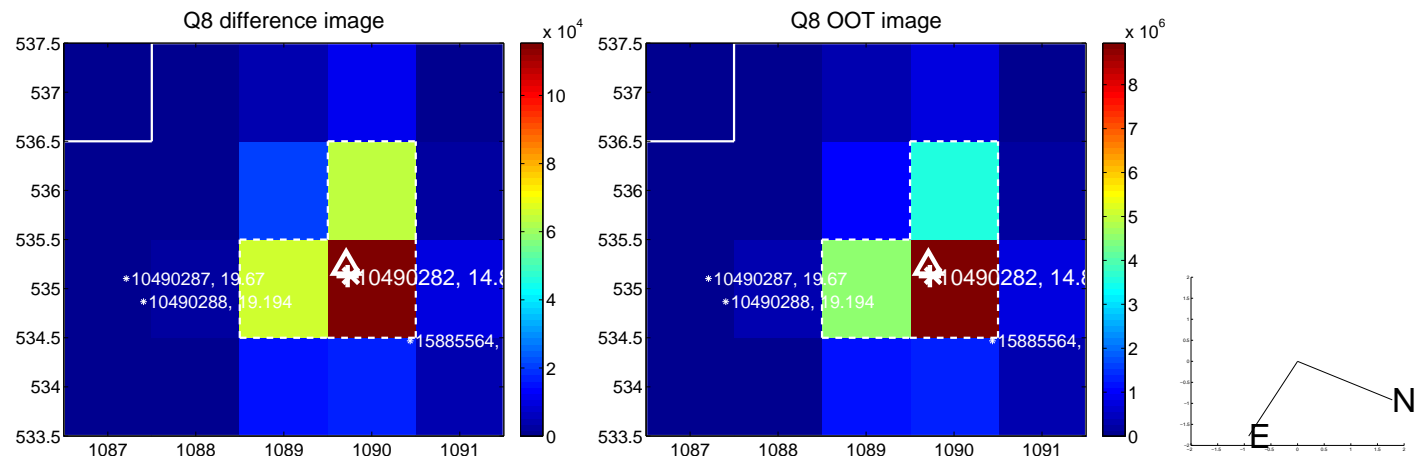
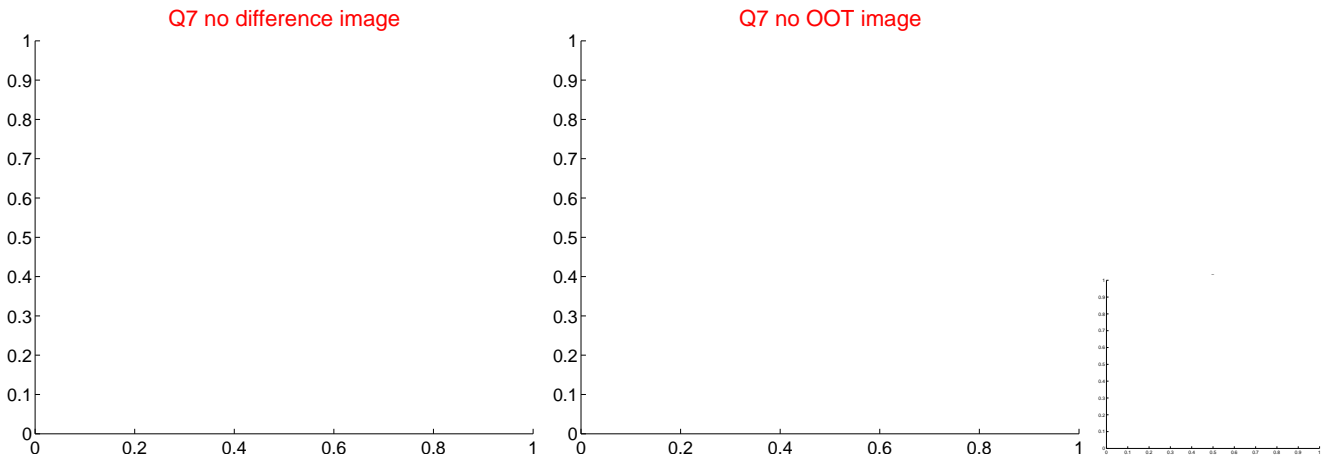
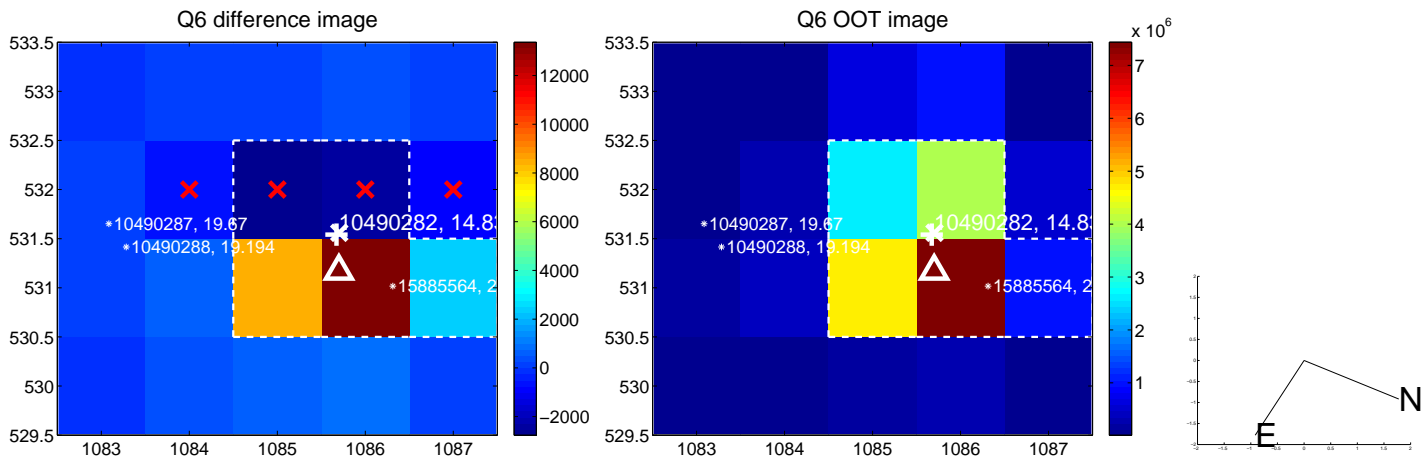
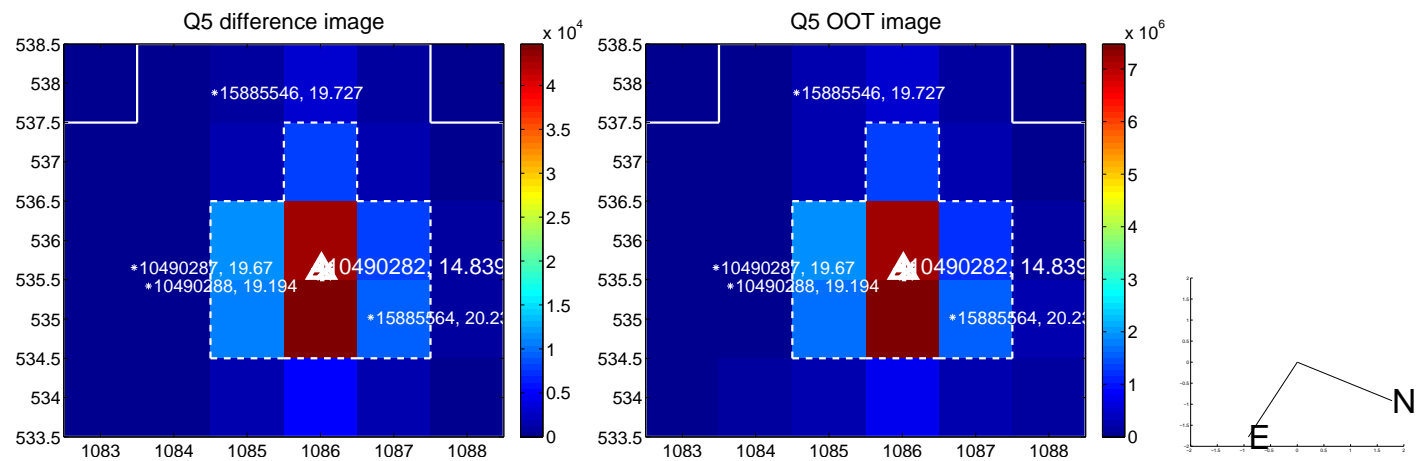
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.



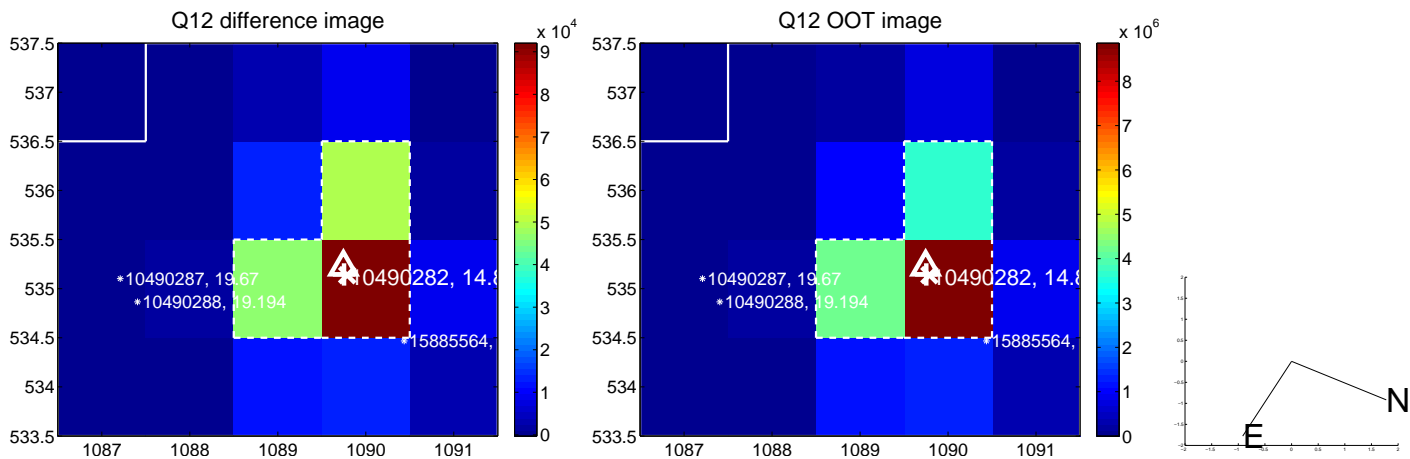
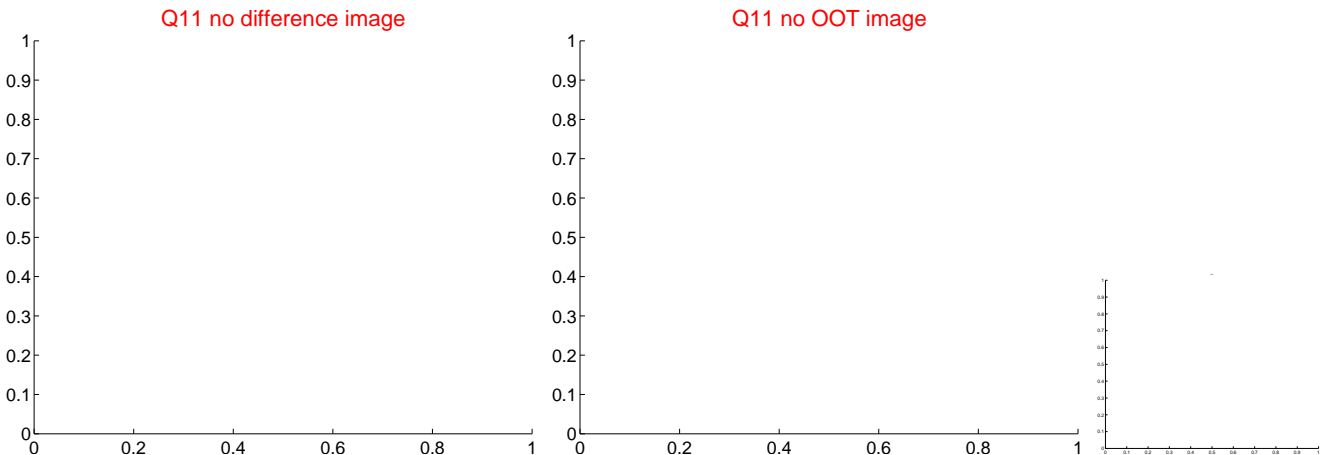
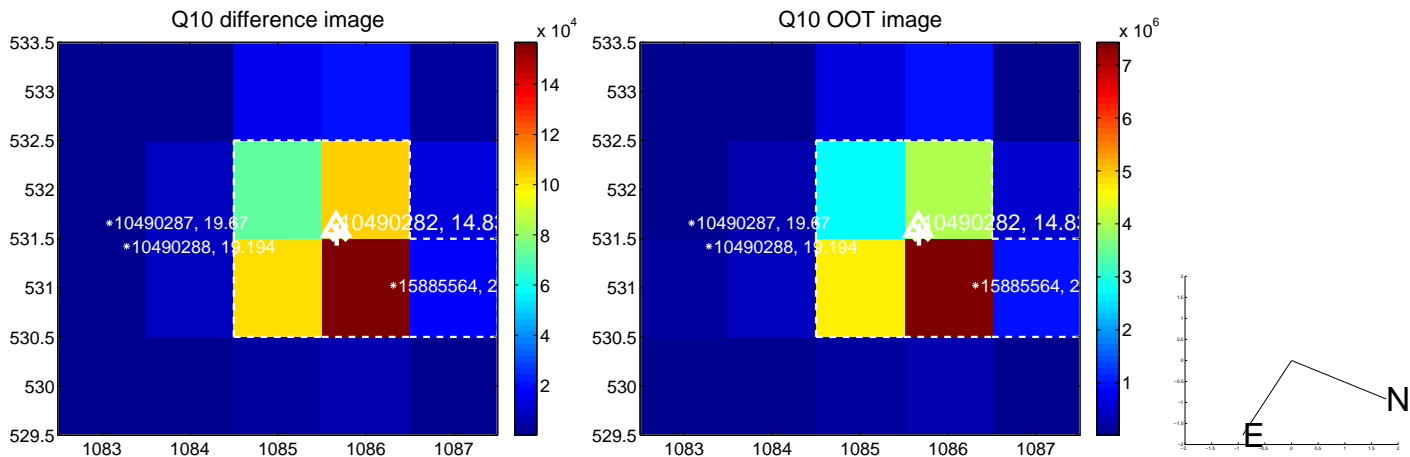
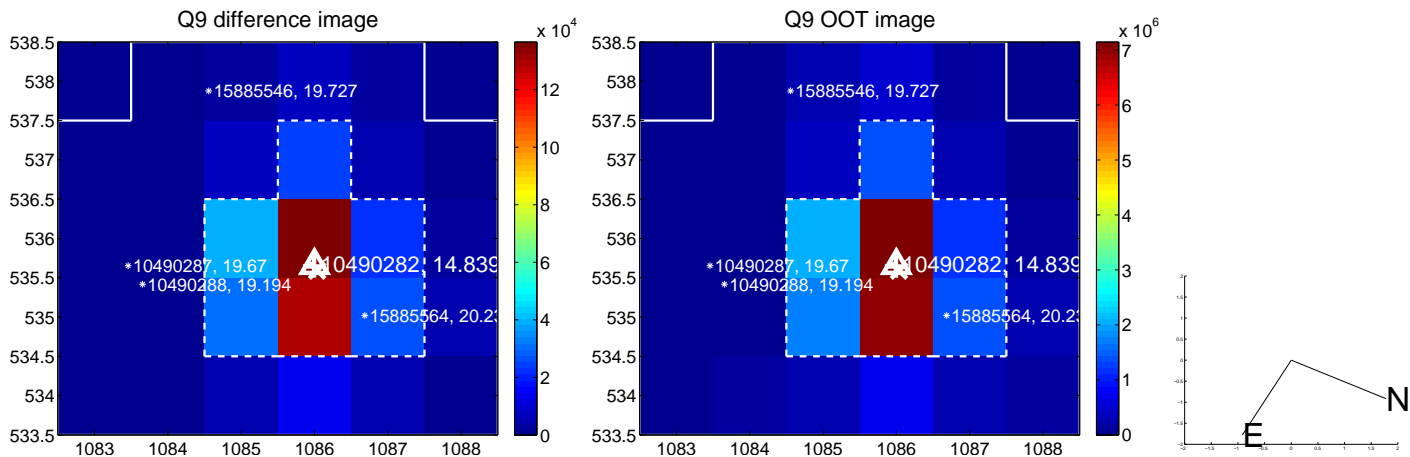
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



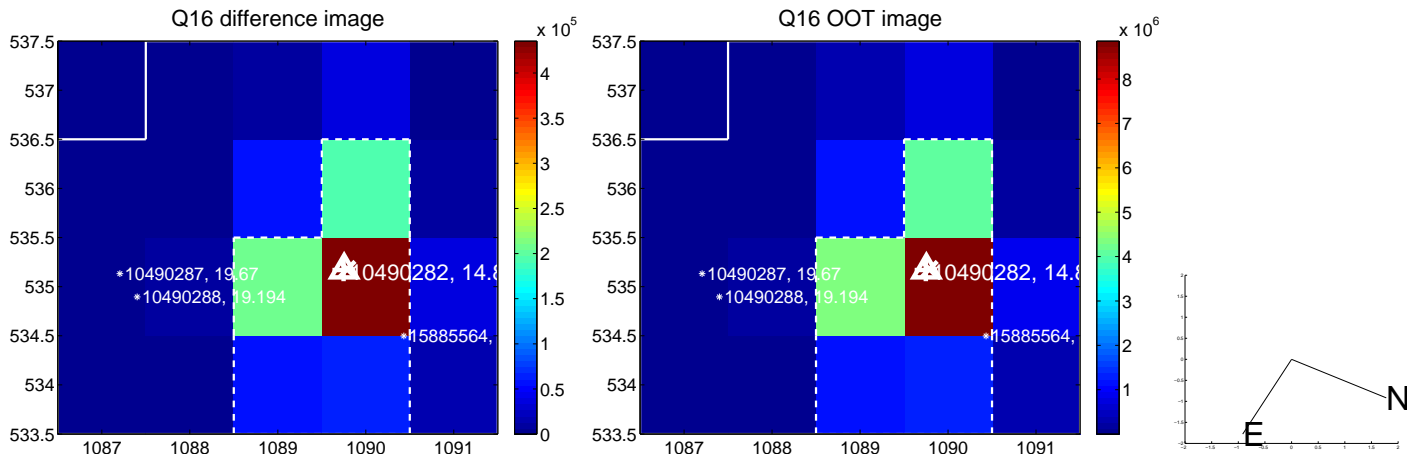
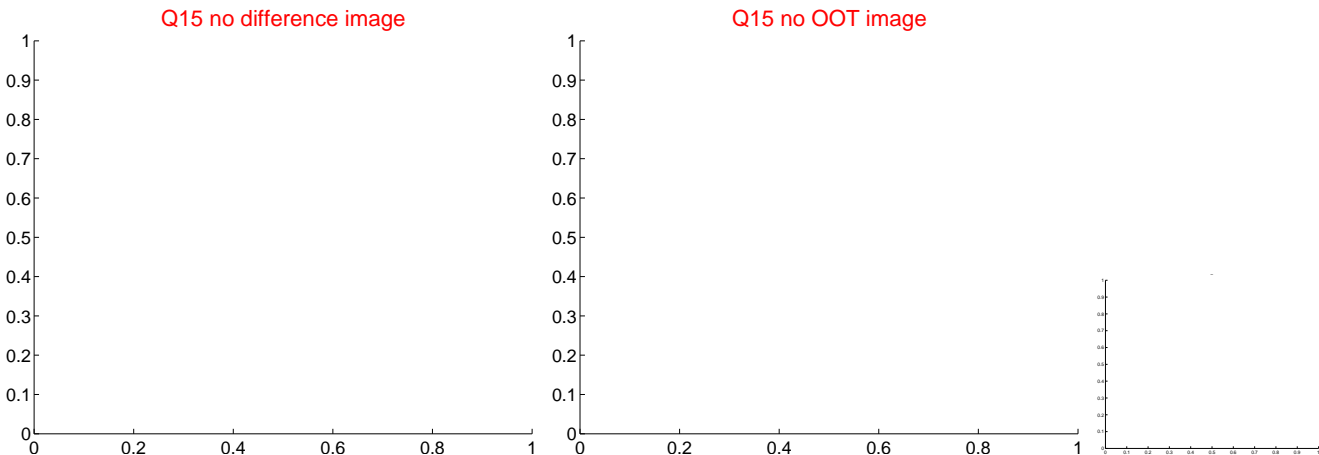
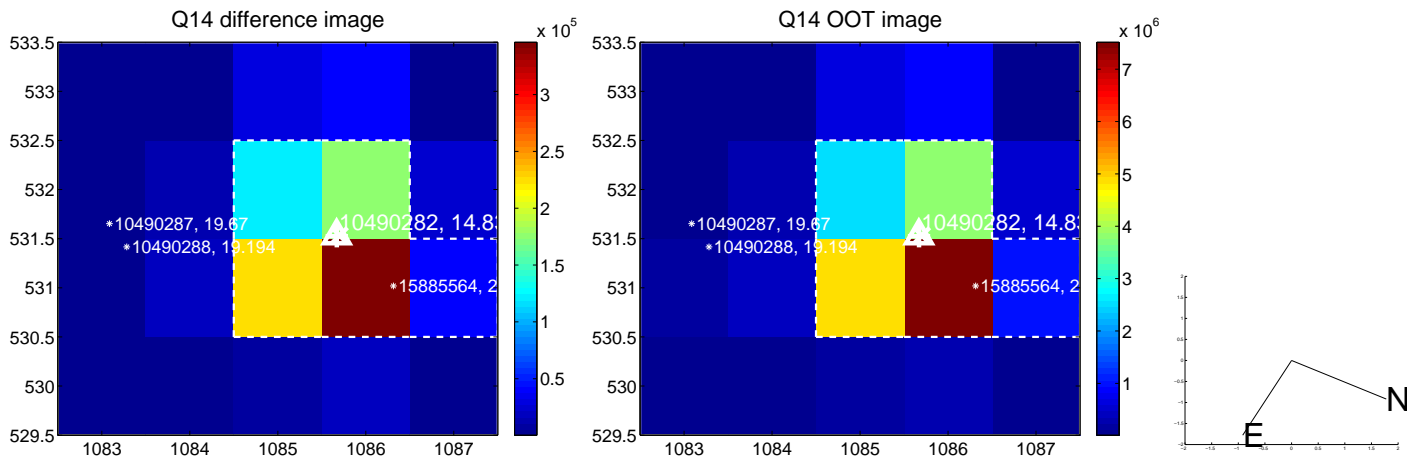
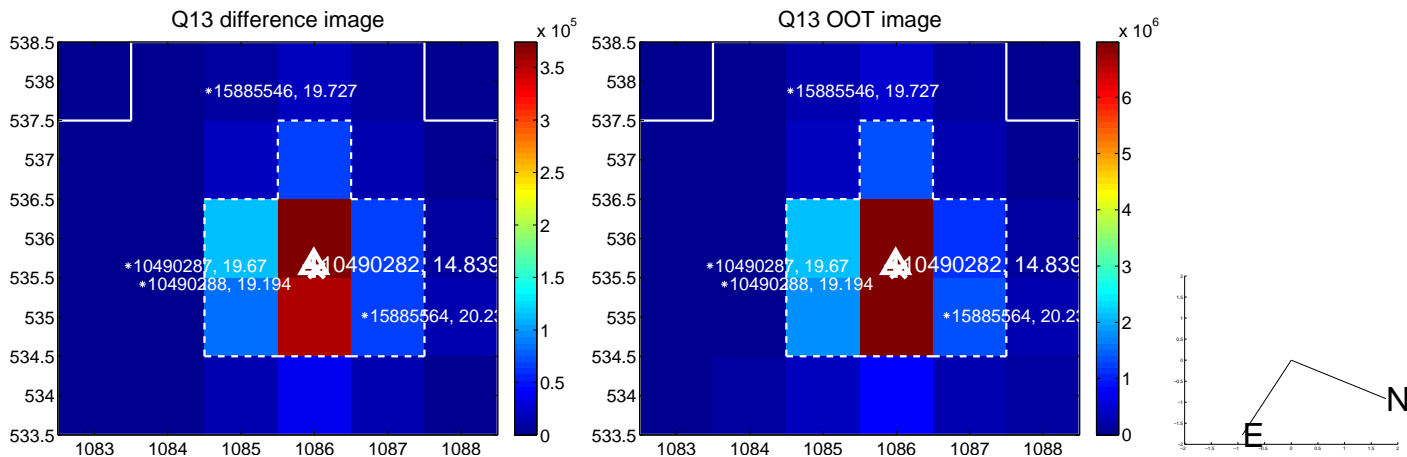
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



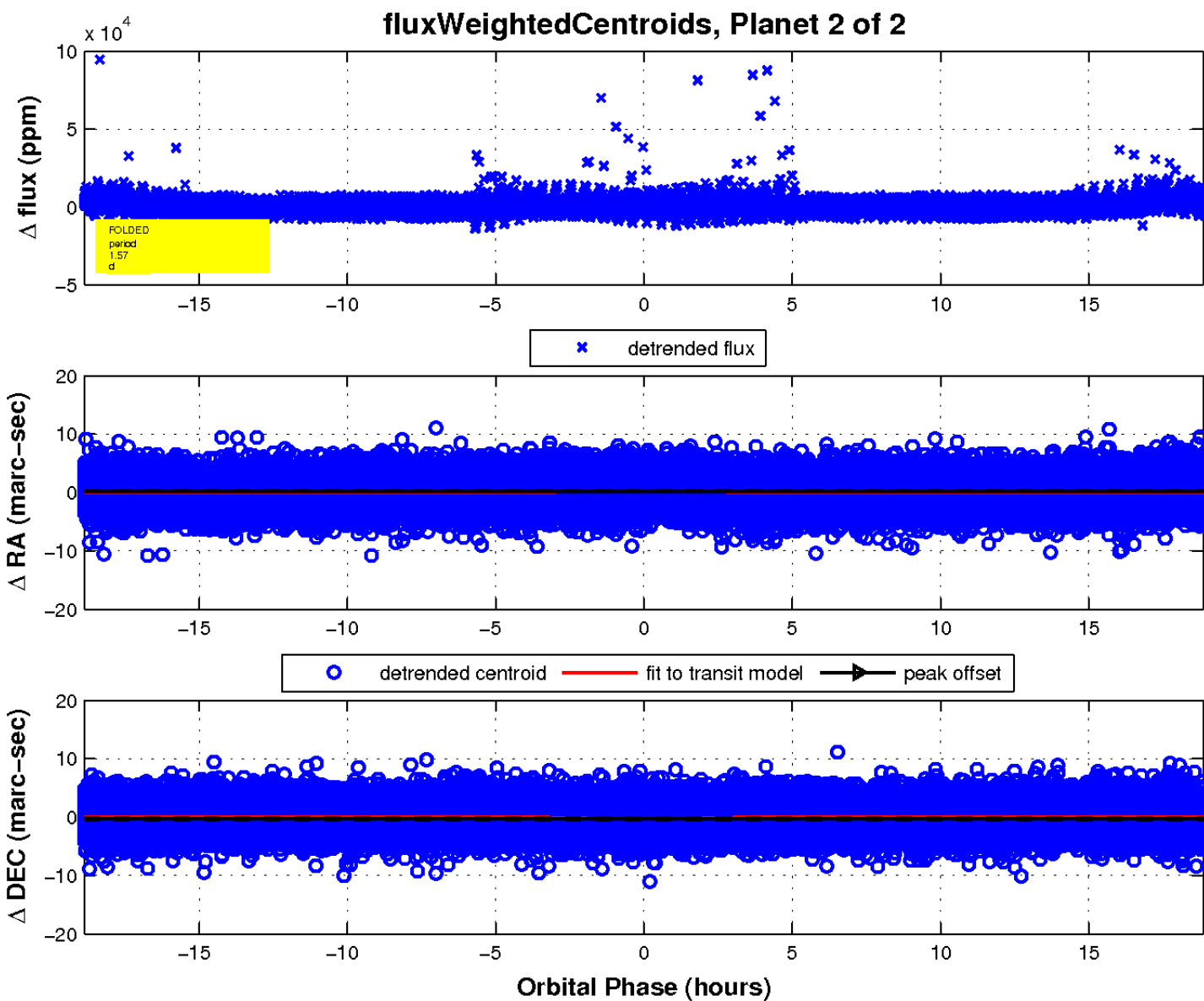
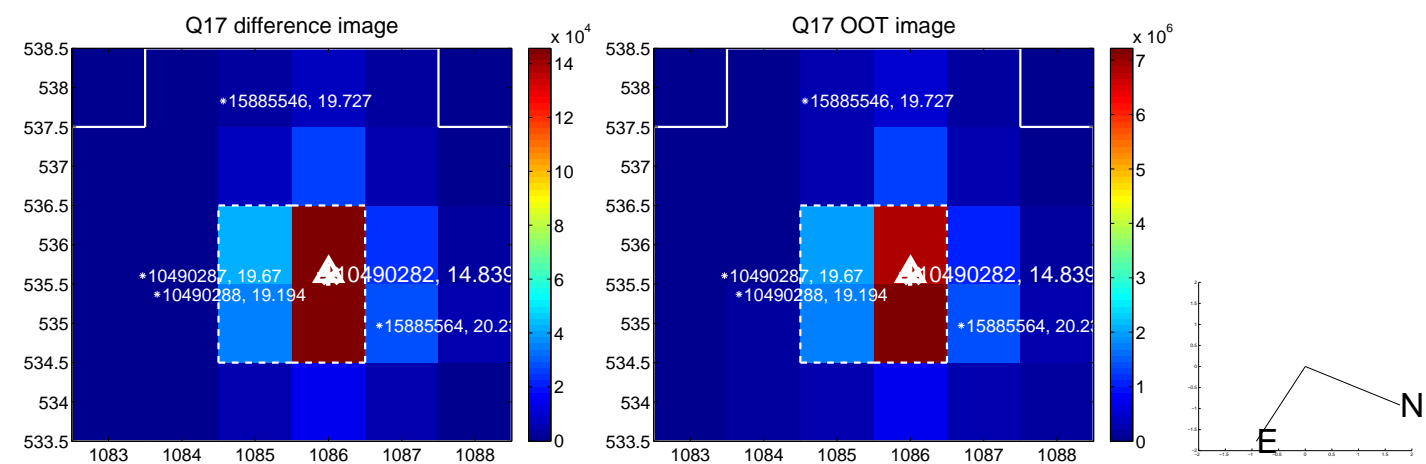
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



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



UKIRT Image

Declination

