

# KIC 002997455

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
002997455-01	OBS	6098.01	1.129842	131.792994	4052.7	1.848	485.1	434.4	7.10	4846	55.99	0.00
002997455-02	OBS	No	1.129838	132.361480	295.6	1.421	32.0	37.2	7.10	4846	15.06	0.00

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002997455-01	OBS	FP	0.00	0	1	1	0	PLANET_IN_STAR—MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_UNRESOLVED_OFFSET
002997455-02	OBS	FP	0.00	1	1	1	0	IS_SEC_TCE—CENT_UNRESOLVED_OFFSET

**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.

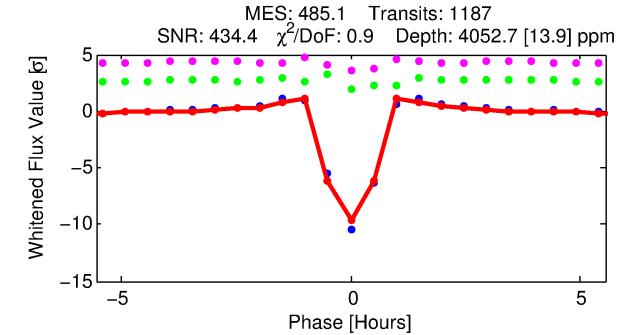
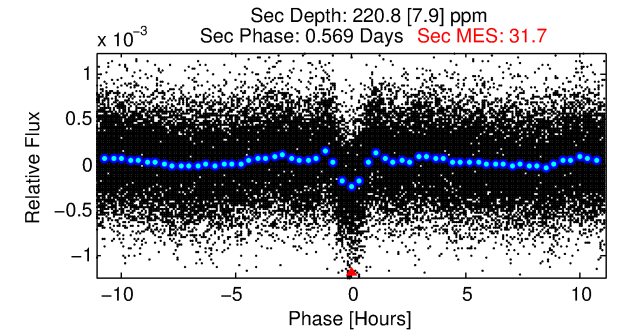
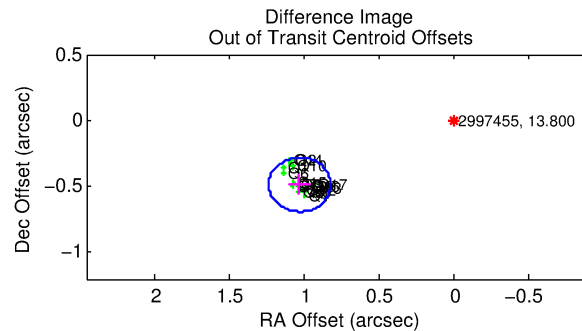
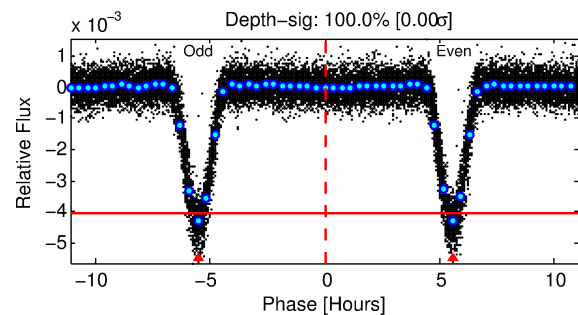
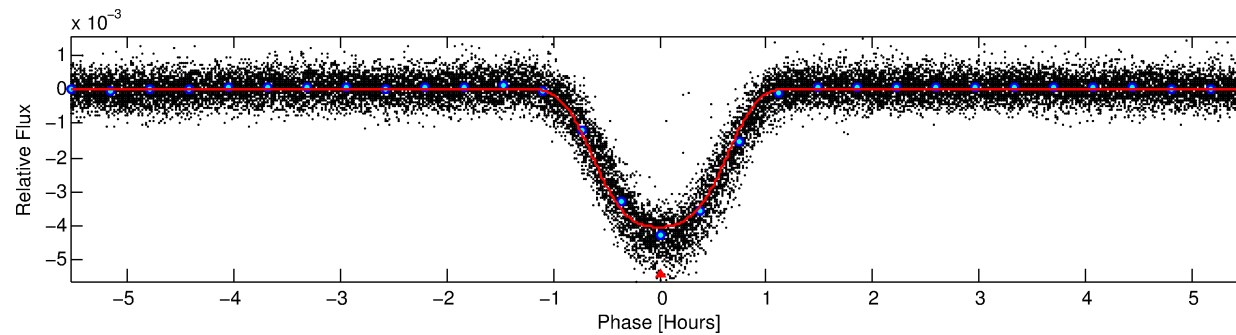
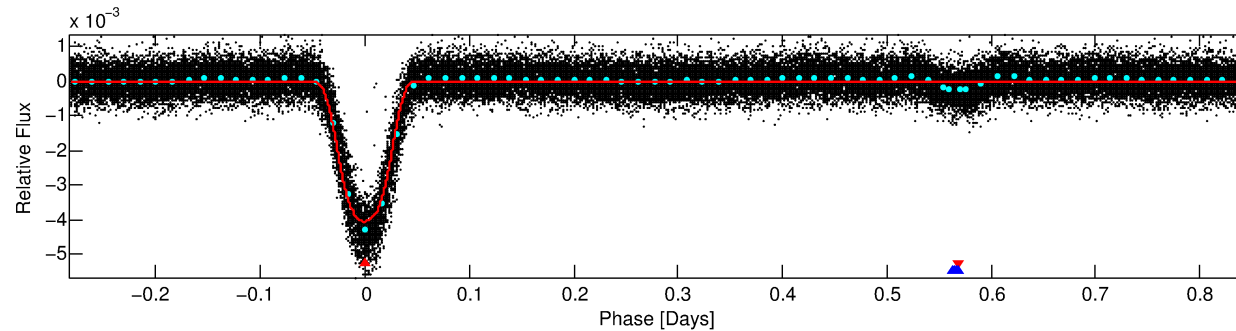
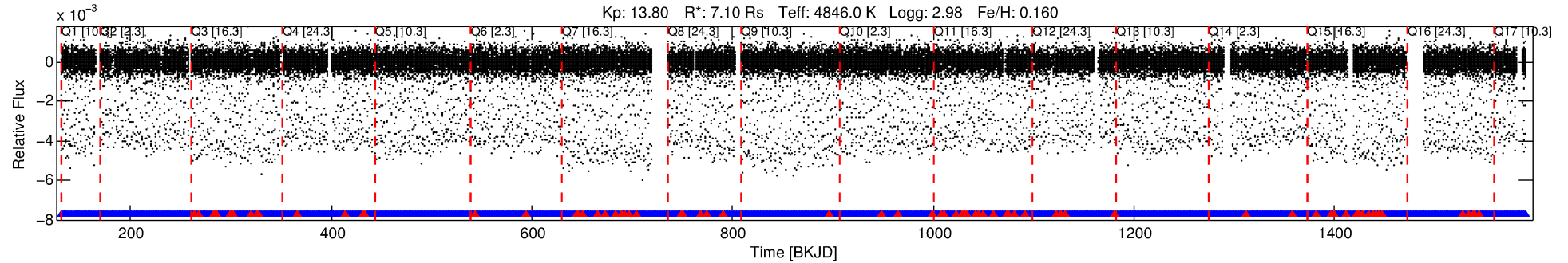
## Ephemeris Match Information For 002997455-01

No Significant Match Found

# DV One-Page Summary

KIC: 2997455 Candidate: 1 of 2 Period: 1.130 d  
KOI: K06098.01 Corr: 0.946

Kp: 13.80 R\*: 7.10 Rs Teff: 4846.0 K Logg: 2.98 Fe/H: 0.160



## DV Fit Results:

Period = 1.12984 [0.00000] d  
Epoch = 131.7930 [0.0000] BKJD  
Rp/R\* = 0.0723 [0.0003]  
a/R\* = 2.89 [0.02]  
b = 0.90 [0.00]  
Seff = N/A  
Teq = N/A  
Rp = 56.00 [17.54] Re  
a = N/A  
Ag = N/A  
Teffp = N/A

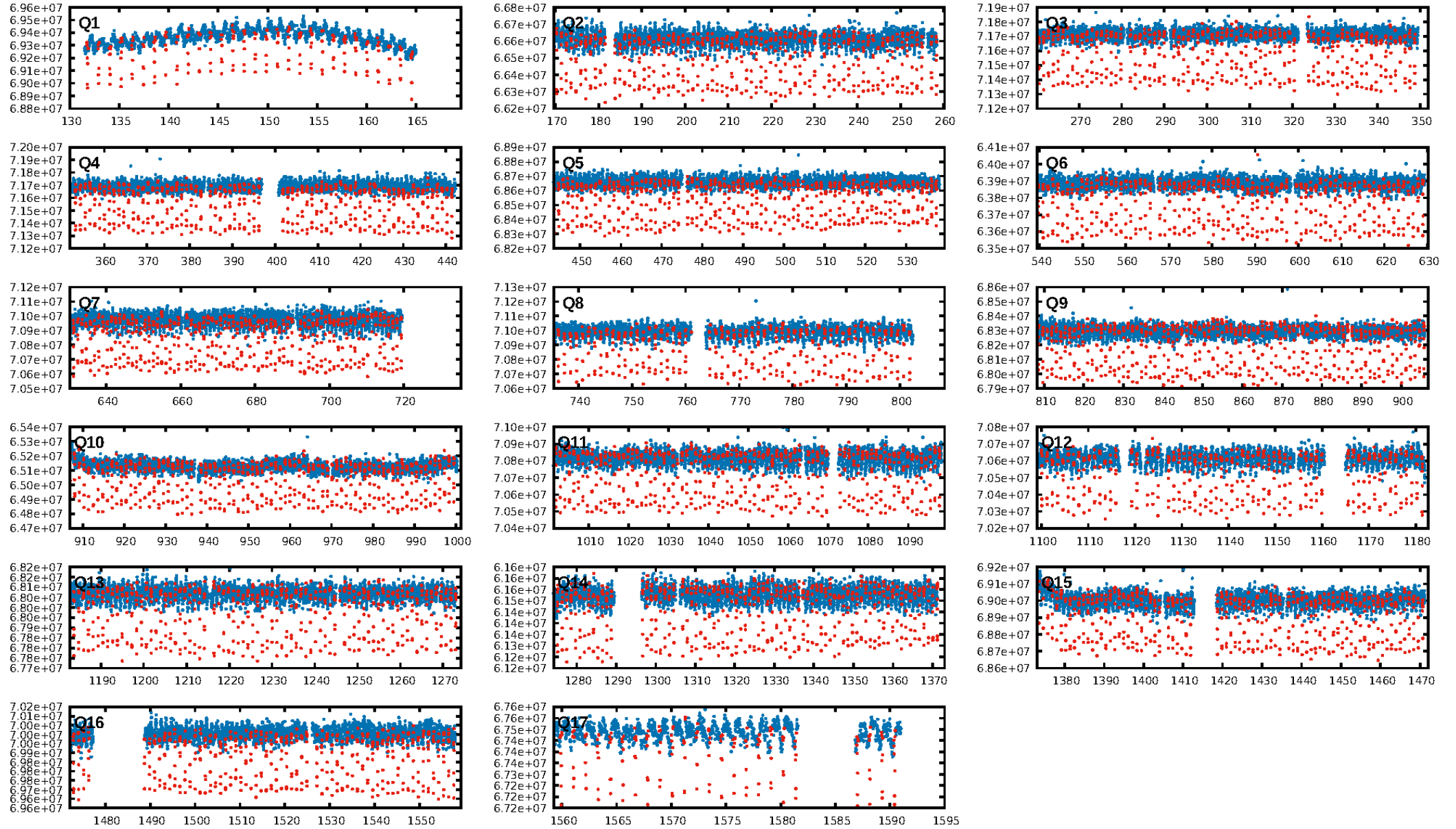
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 0.93 [1057/1133]  
GhostDiagnostic-chr: 7.256  
Centroid-sig: 0.0%  
Centroid-so: 0.818 arcsec [54.77σ]  
OotOffset-rm: 1.135 arcsec [16.58σ]  
KicOffset-rm: 1.152 arcsec [16.15σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 1.00 [17/17]

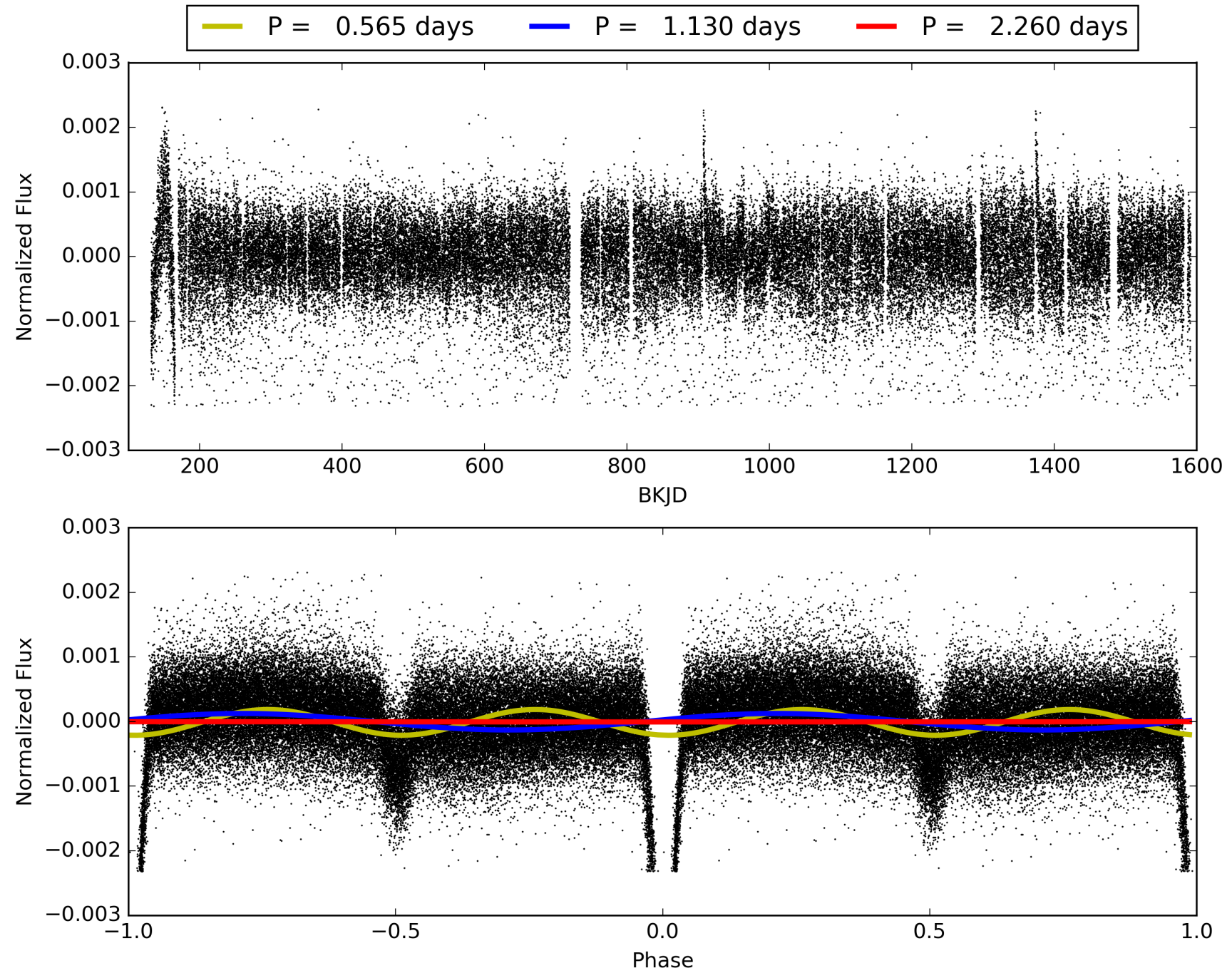
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 12:46:01 Z

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

# TCE 002997455-01, PDC Light Curves

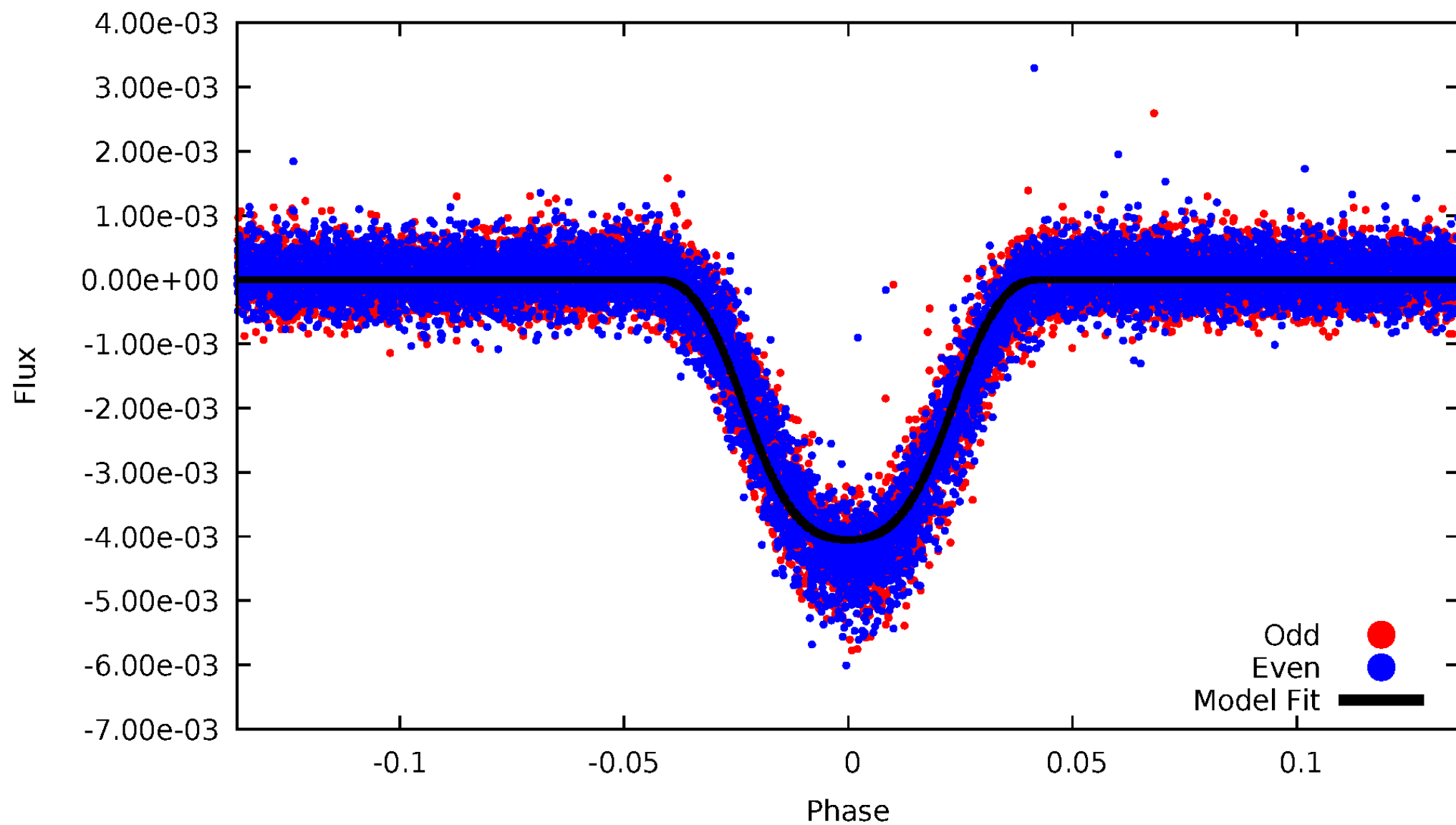


TCE 002997455-01



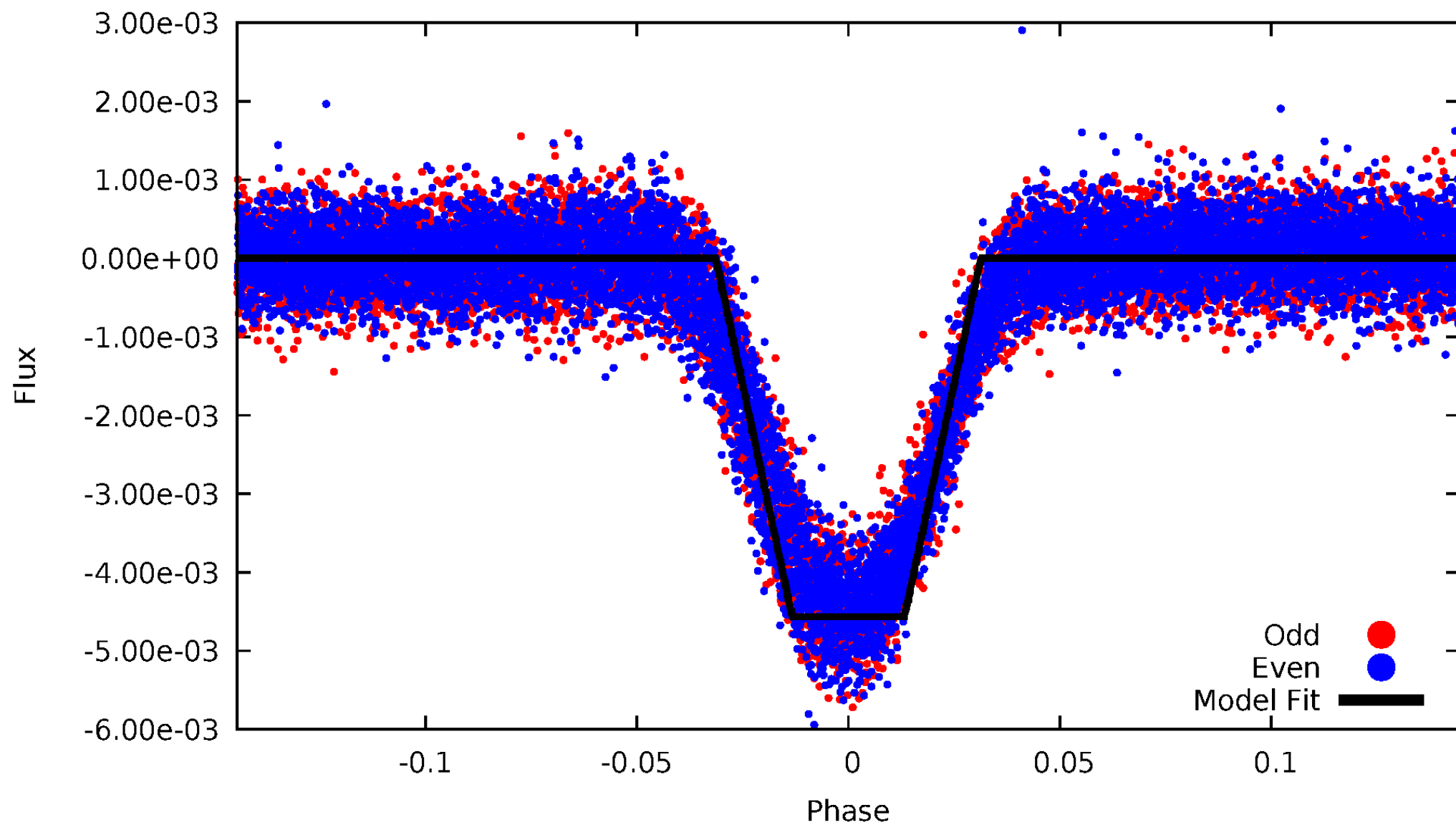
# DV Odd/Even

TCE 002997455-01



# ALT Odd/Even

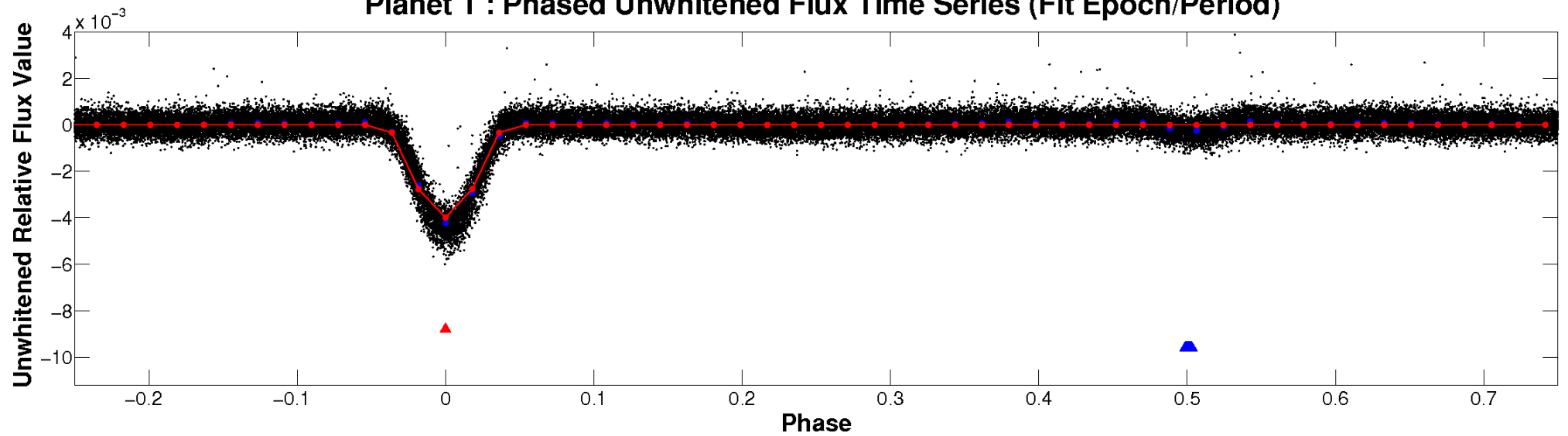
TCE 002997455-01



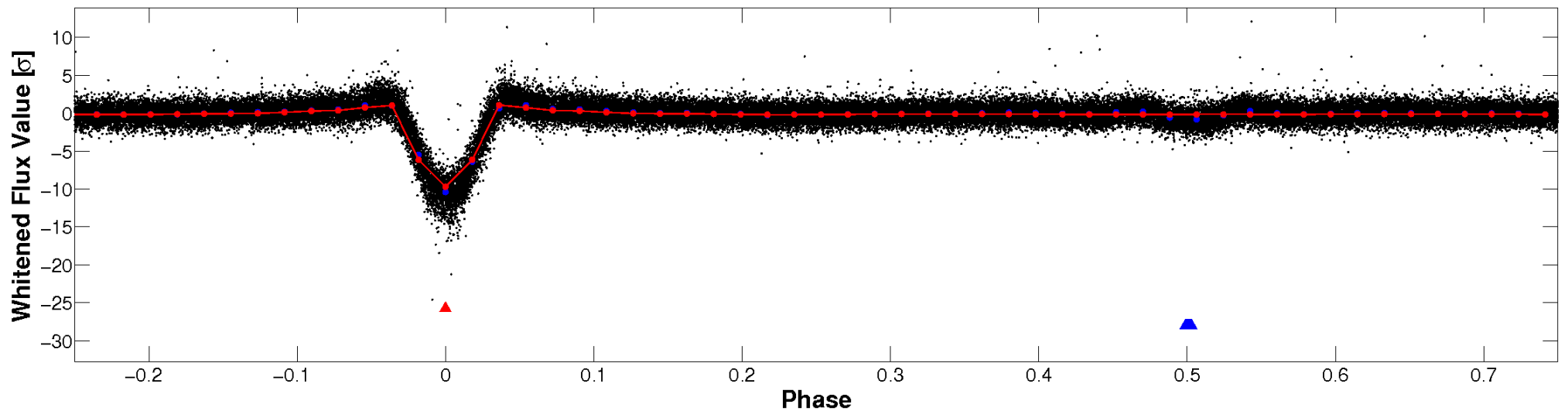


# Non-Whitened Vs. Whitened Light Curve

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

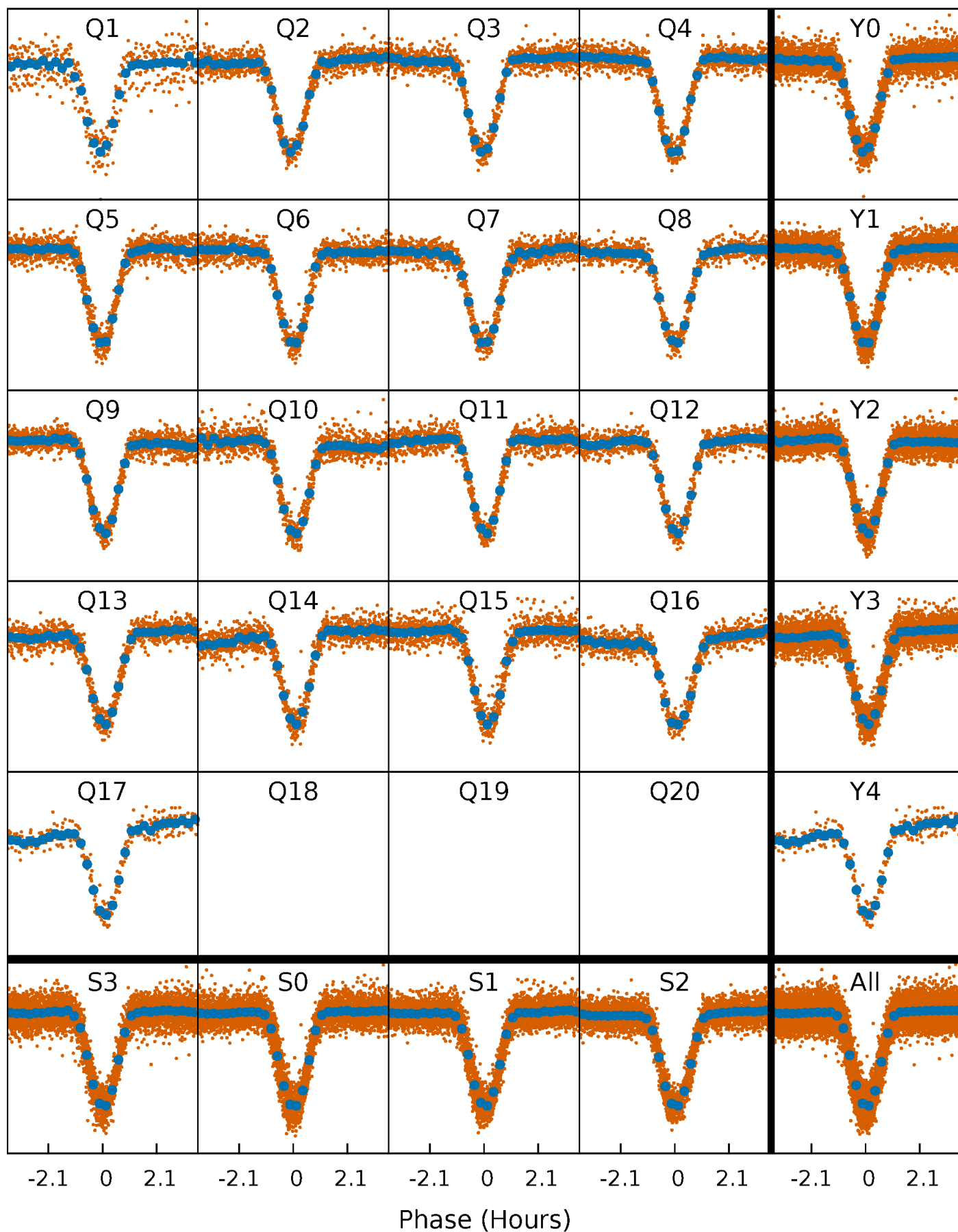


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

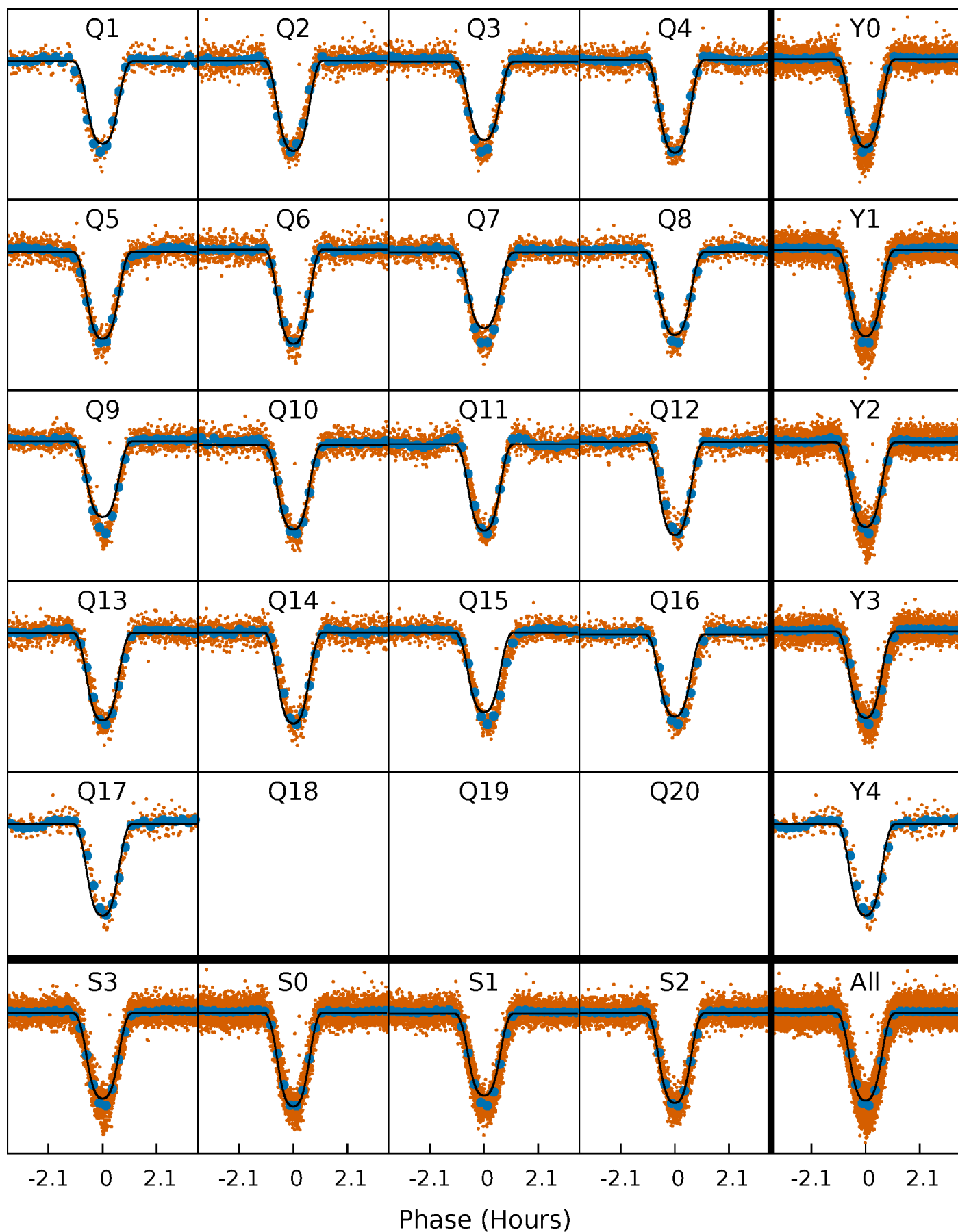
TCE 002997455-01 P= 1.129842 Days  $T_0=131.792994$  (BKJD)





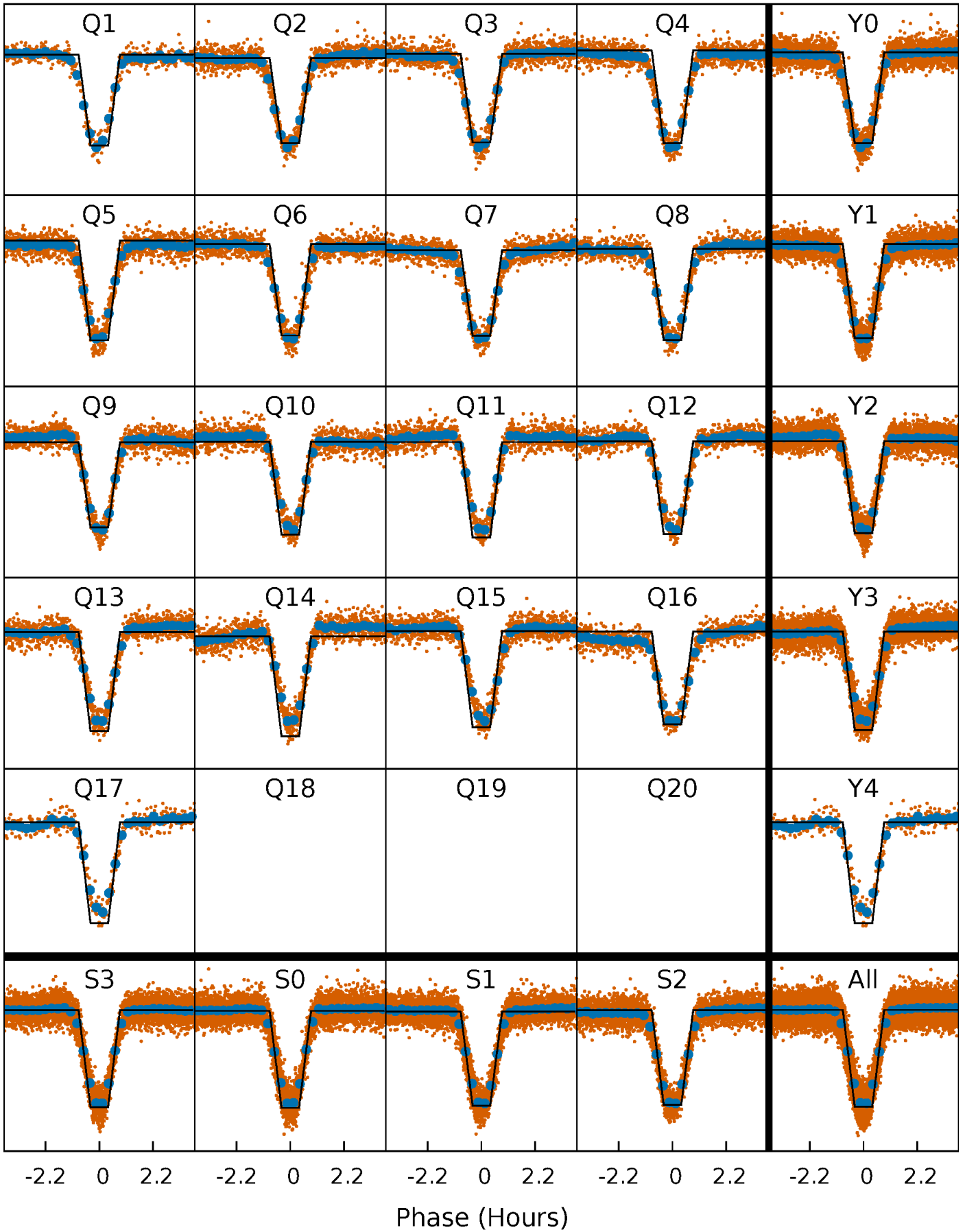
# DV Quarter-Phased Transit Curves

TCE 002997455-01 P= 1.129842 Days  $T_0=131.792994$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

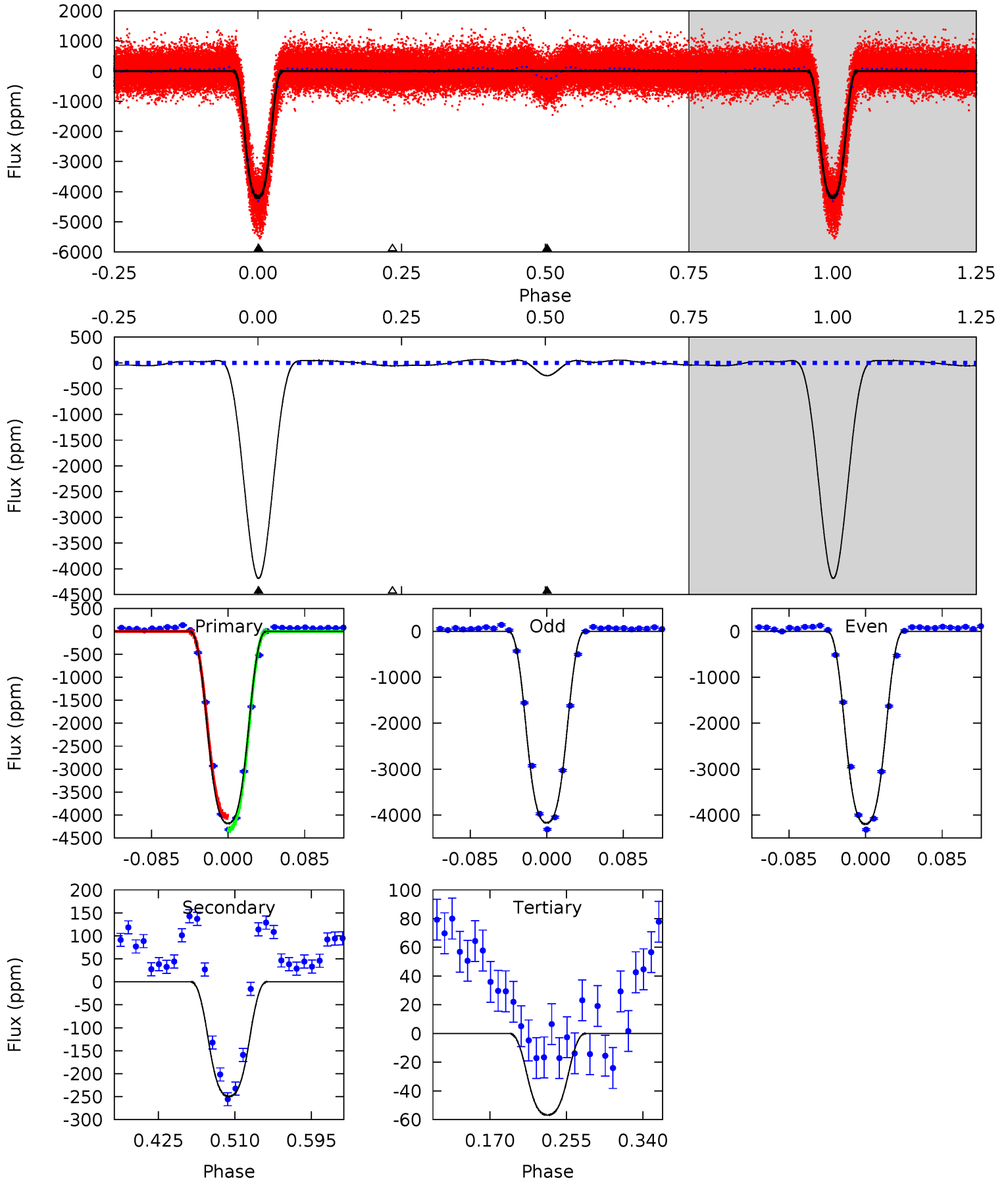
TCE 002997455-01 P= 1.129844 Days  $T_0=131.792443$  (BKJD)



# DV Model-Shift Uniqueness Test

002997455-01, P = 1.129842 Days, E = 130.663152 Days

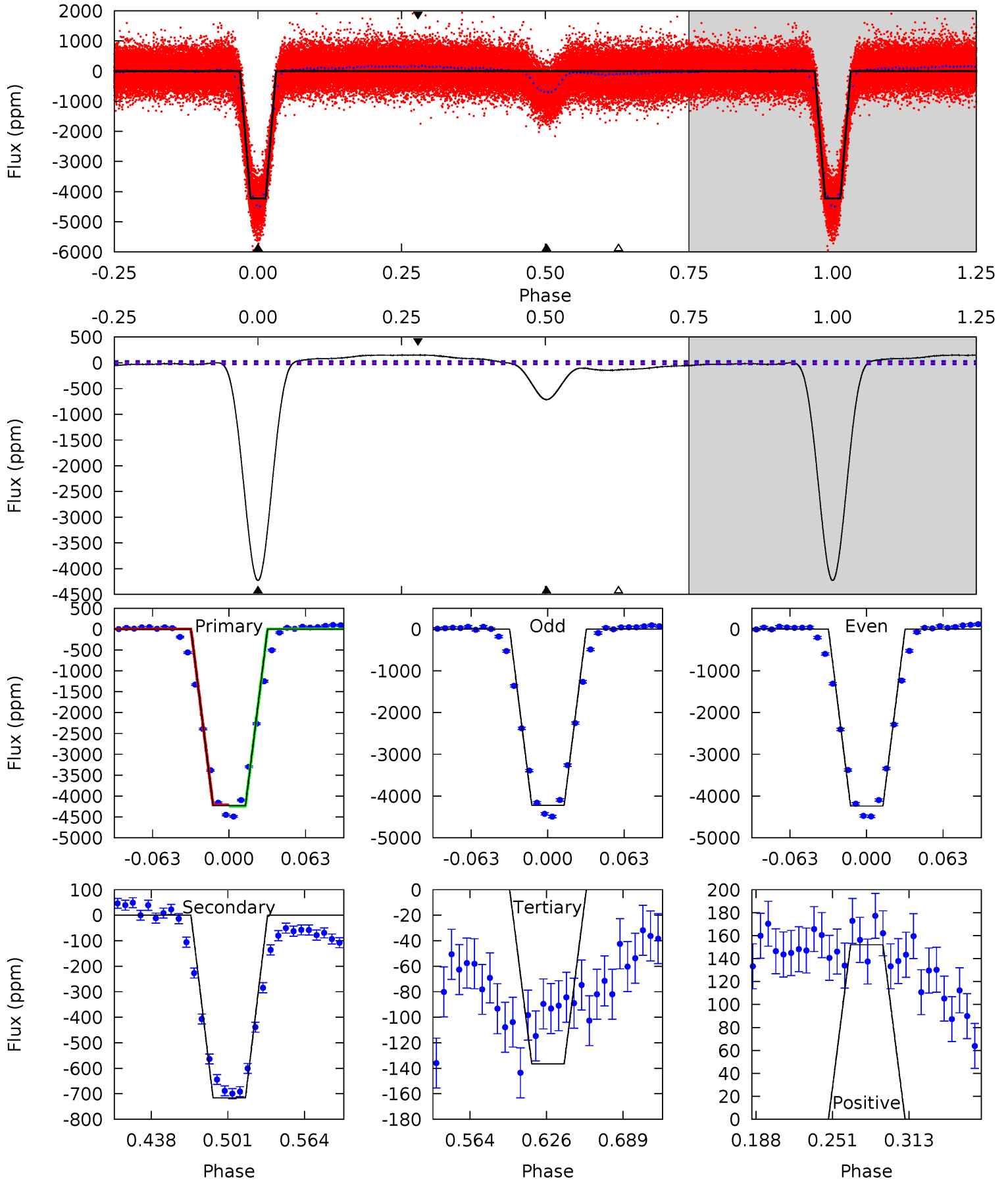
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
954.2	56.9	13.0	0	4.60	1.72	8.68	941.2	954.2	43.9	56.9	3.21	1.01	0.02	32.9



# Alt Model-Shift Uniqueness Test

002997455-01, P = 1.129844 Days, E = 130.662599 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
645.6	109.2	20.9	23.2	4.66	1.86	14.5	624.7	622.3	88.4	86.0	1.34	1.00	0.03	2.33



### Stellar Parameters For KIC 002997455

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$4846^{+50}_{-93}$	$2.984^{+0.174}_{-0.116}$	$0.160^{+0.100}_{-0.150}$	$7.102^{+1.198}_{-2.224}$	$1.775^{+0.252}_{-0.589}$	$0.007^{+0.008}_{-0.002}$
	+1%/-2%	+6%/-4%	+62%/-94%	+17%/-31%	+14%/-33%	+121%/-32%
Source	SPE74	SPE74	SPE74	DSEP		

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

### Secondary Eclipse Parameters for KIC 002997455-01 / KOI 6098.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-249 \pm 4$	$56.67^{+5.63}_{-8.18}$	$4960^{+243}_{-284}$	$-4142^{+193}_{-167}$	$0.029^{+0.007}_{-0.005}$
Alt.	$-716 \pm 7$	$52.83^{+5.36}_{-8.14}$	$4943^{+252}_{-287}$	$-3930^{+239}_{-209}$	$0.095^{+0.025}_{-0.016}$

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

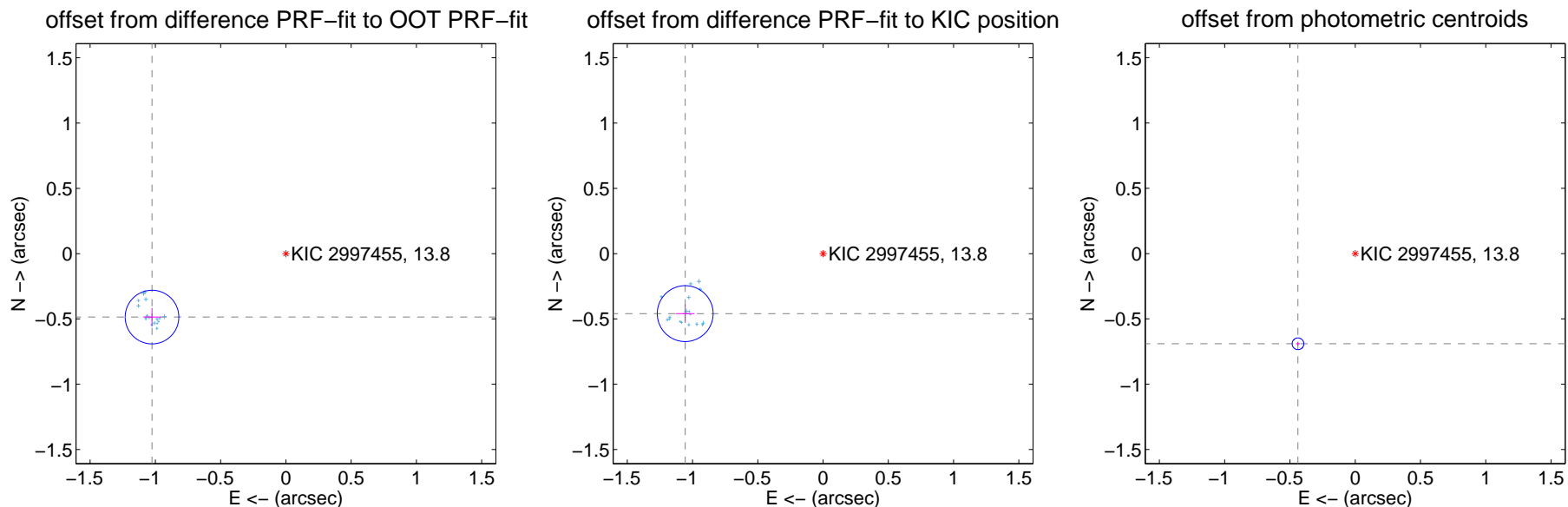
## DV Centroid Data

Supplemental centroid analysis for 002997455-01. Kepler magnitude: 13.80. Transit SNR 434.45

There are 17 quarters with good PRF difference image offsets

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

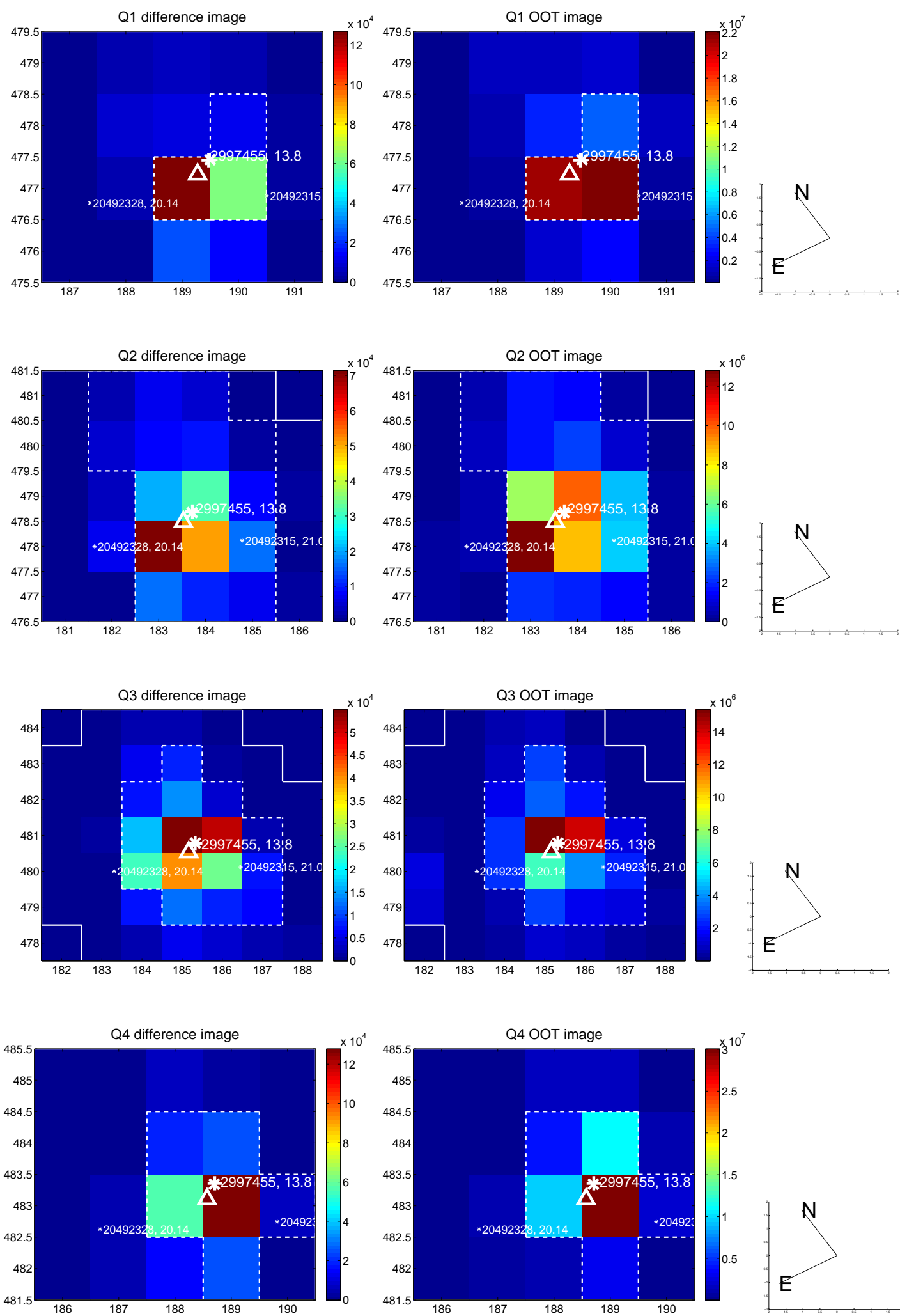
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.135 \pm 0.068$	16.58	$1.026 \pm 0.068$	$-0.486 \pm 0.070$
PRF-fit source offset from KIC position	$1.152 \pm 0.071$	16.15	$1.056 \pm 0.071$	$-0.459 \pm 0.071$
photometric centroid source offset	$0.82 \pm 0.01$	54.77	$0.44 \pm 0.02$	$-0.69 \pm 0.01$



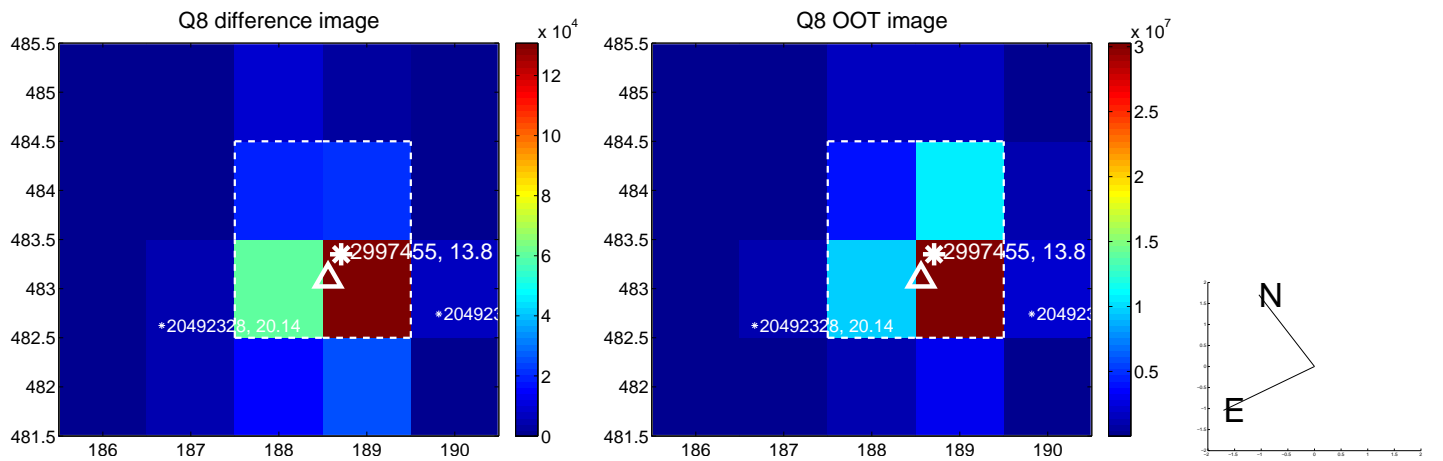
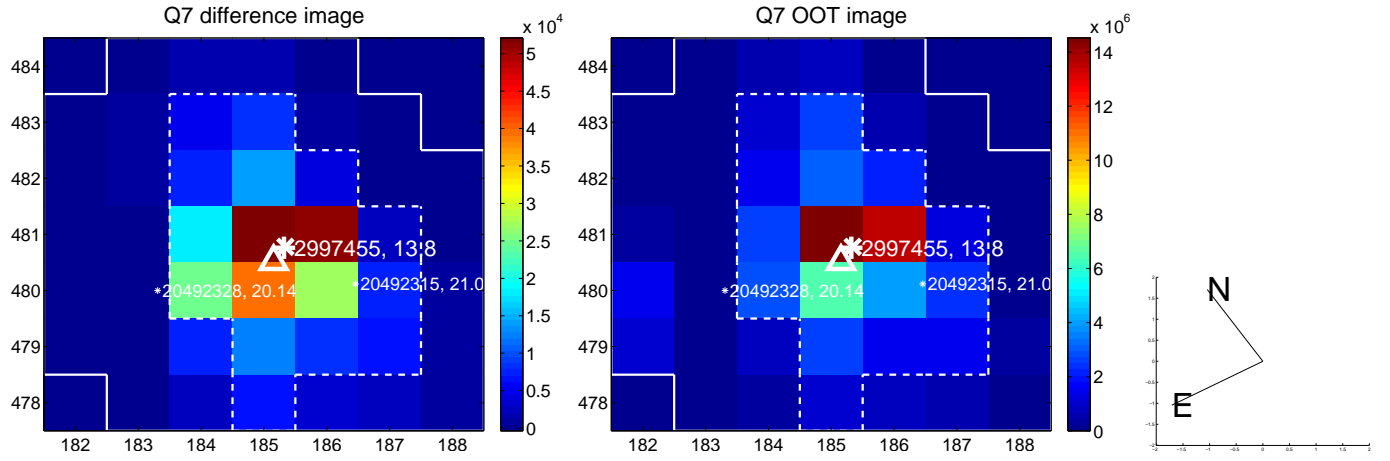
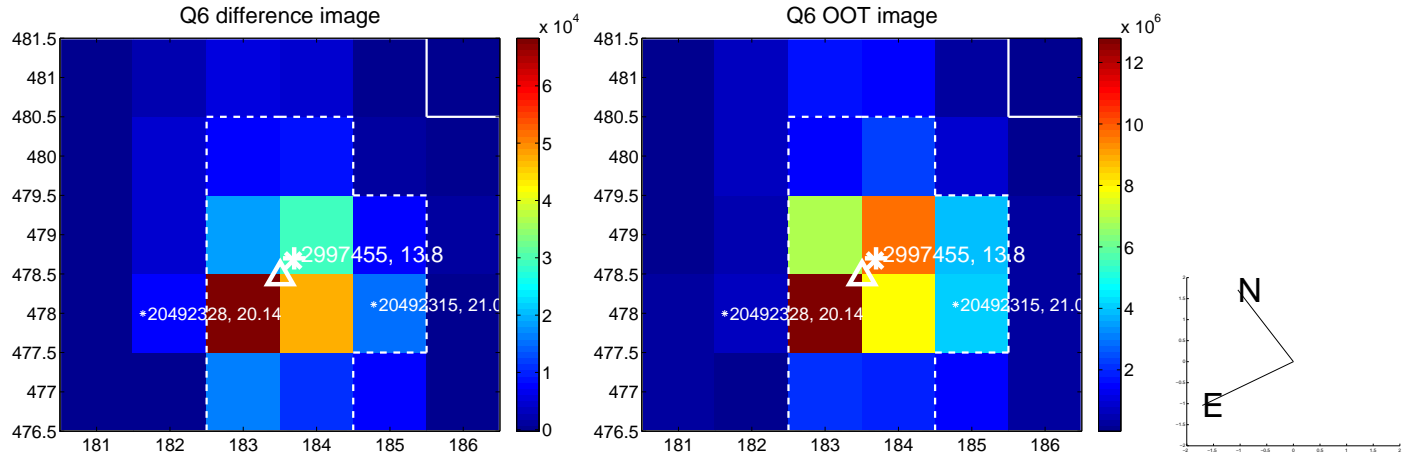
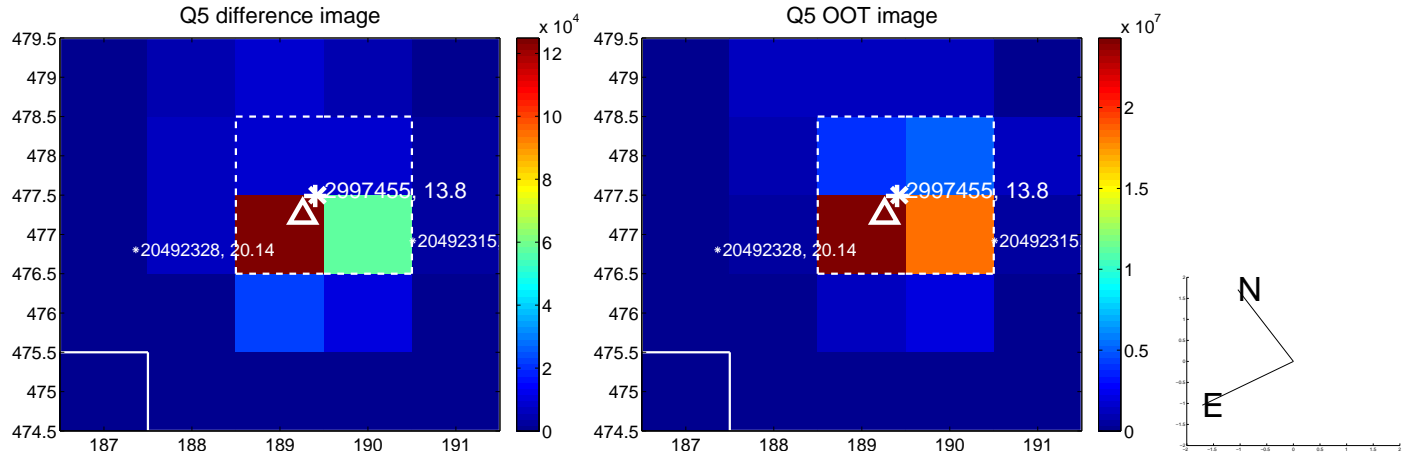
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



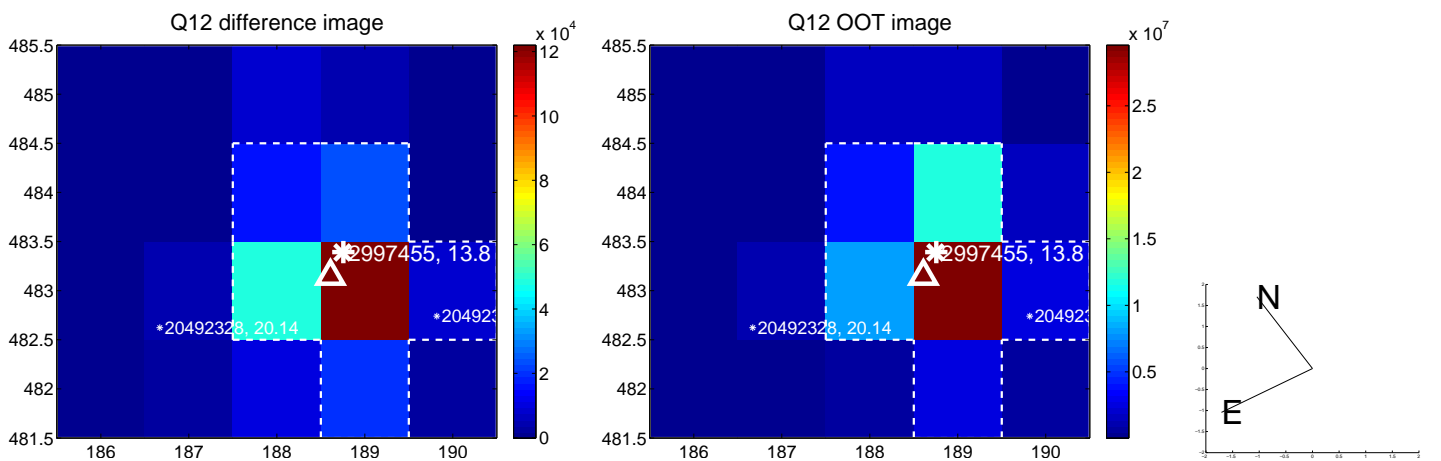
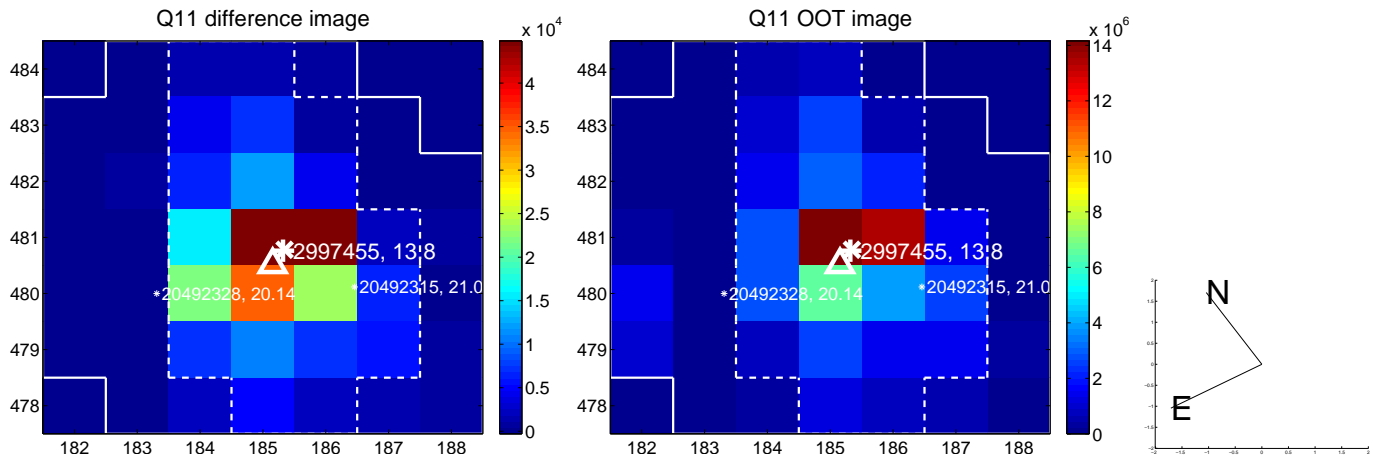
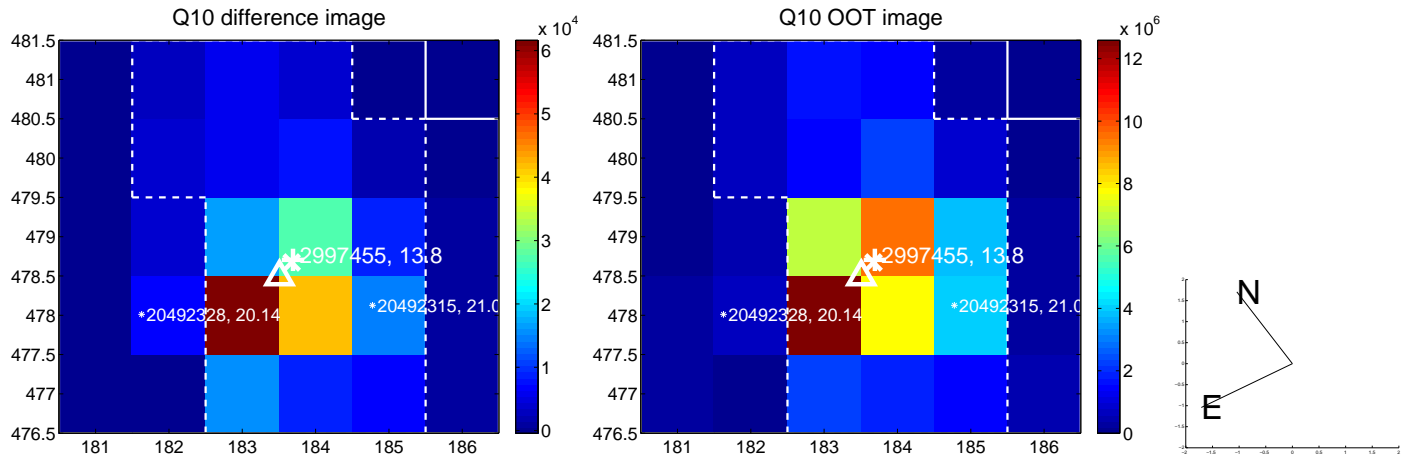
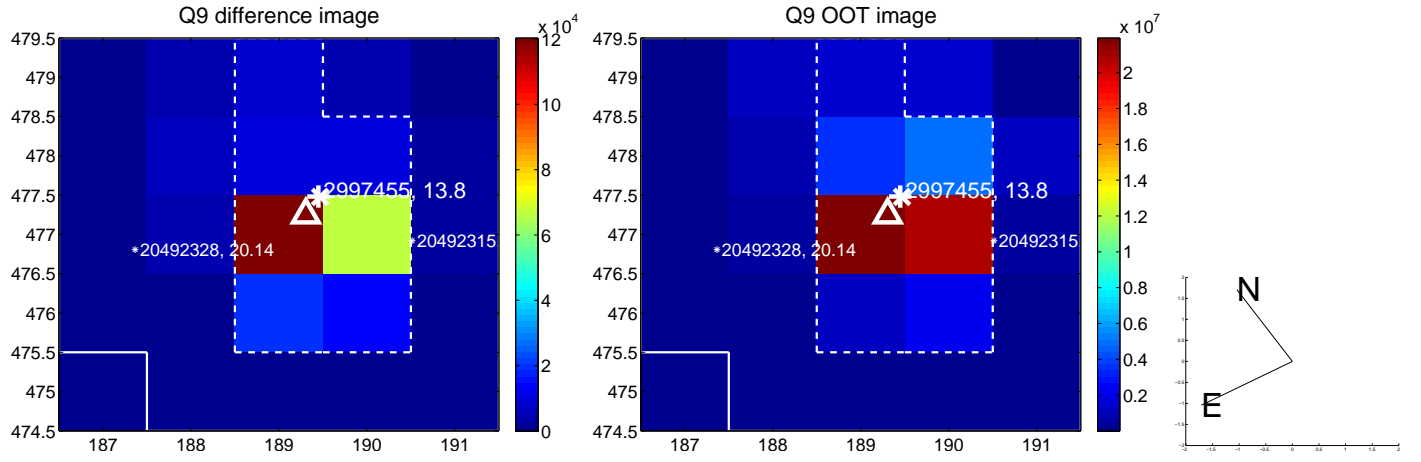
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



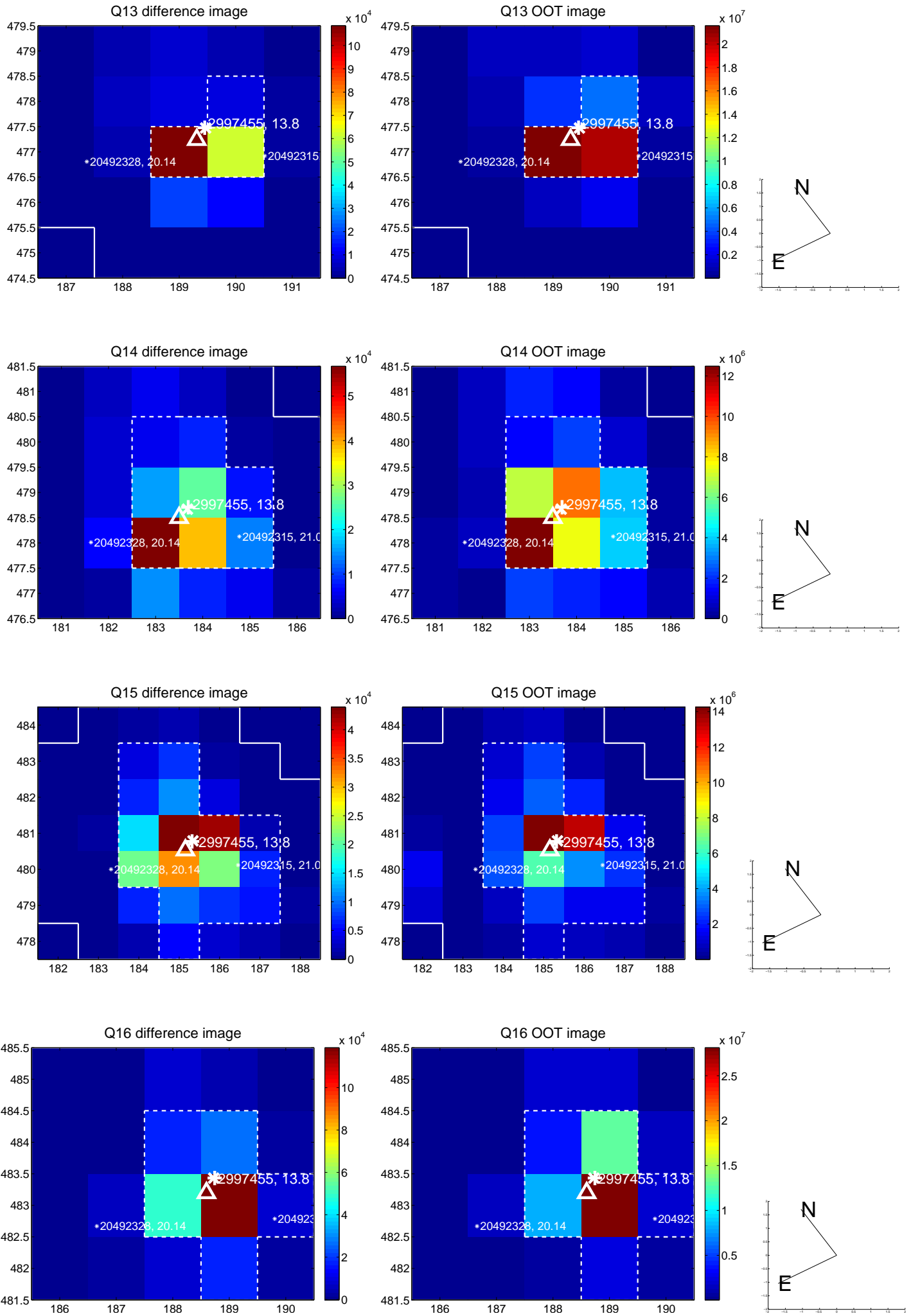
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



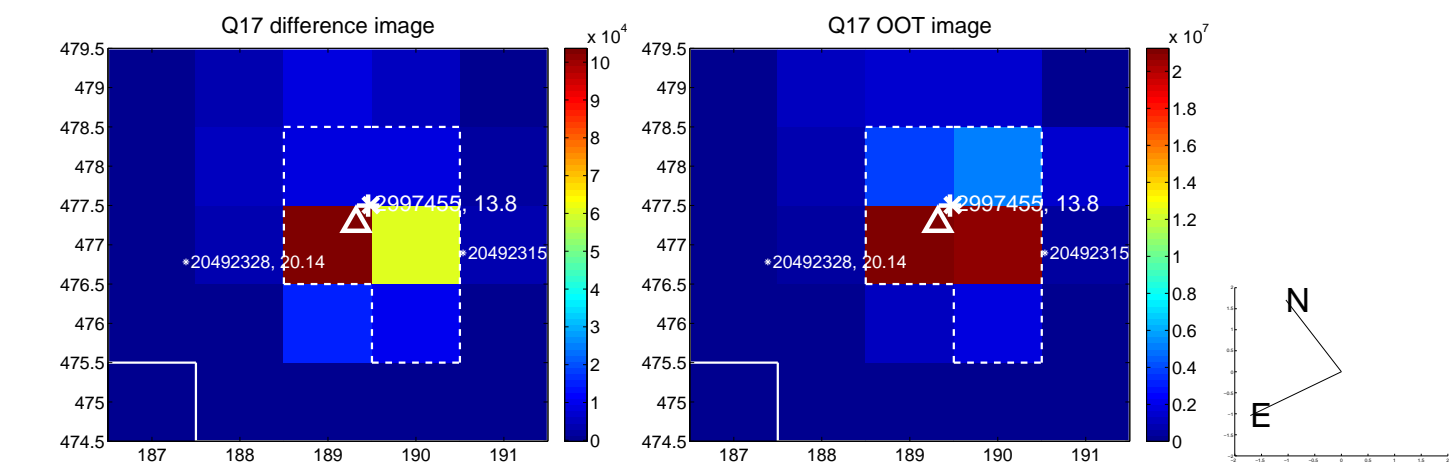
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



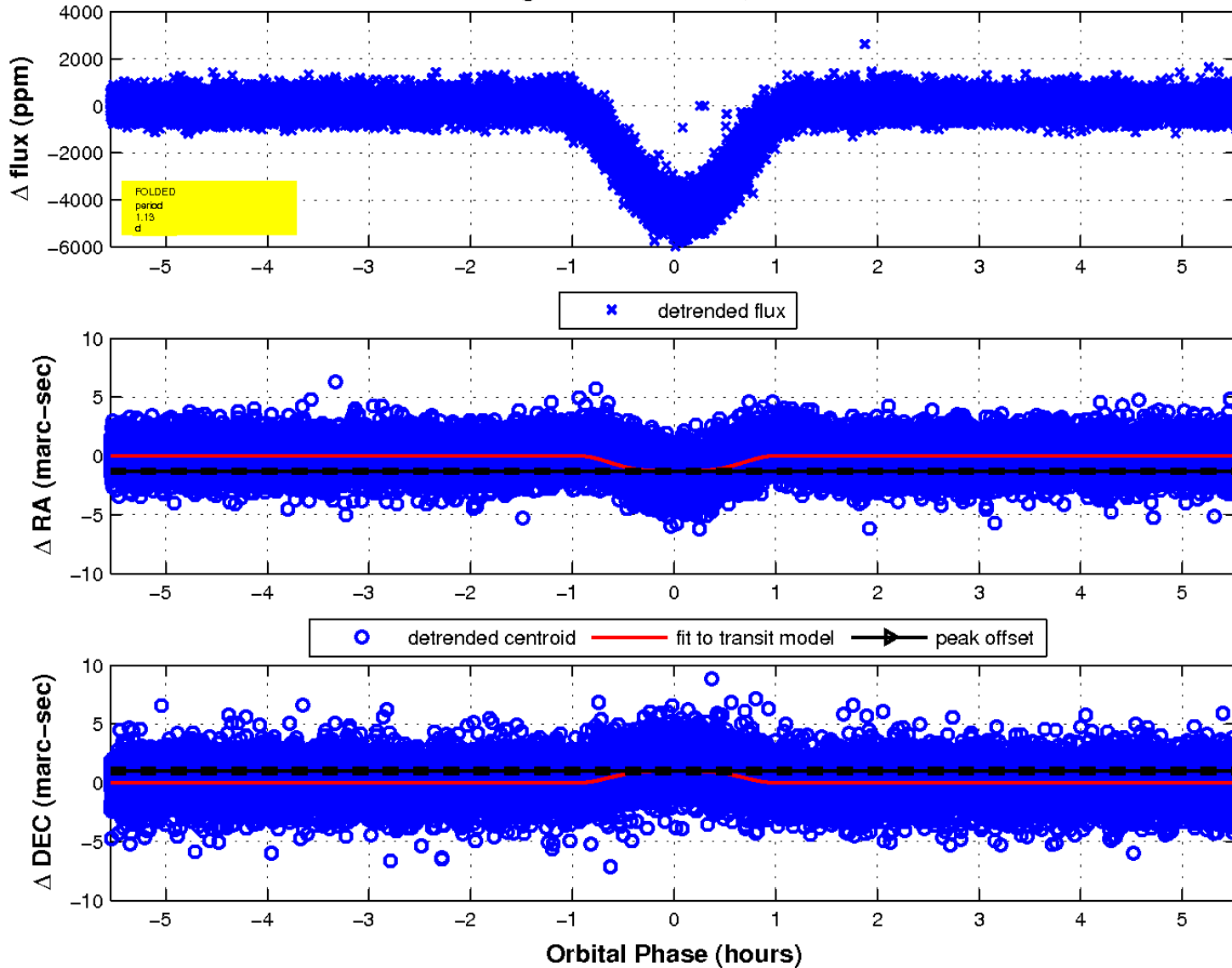
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

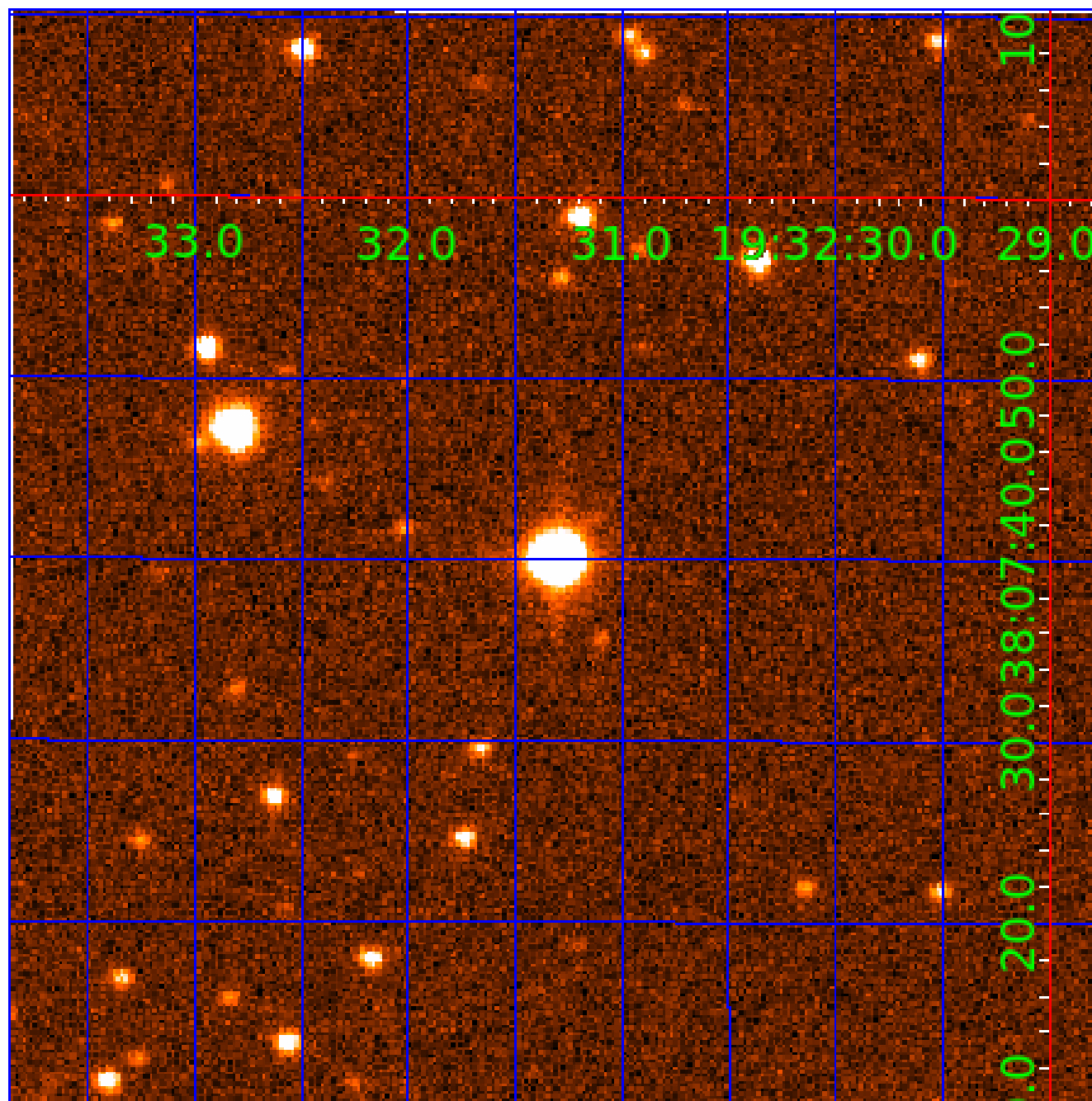


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination





# KIC 002997455

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
002997455-01	OBS	6098.01	1.129842	131.792994	4052.7	1.848	485.1	434.4	7.10	4846	55.99	0.00
002997455-02	OBS	No	1.129838	132.361480	295.6	1.421	32.0	37.2	7.10	4846	15.06	0.00

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002997455-01	OBS	FP	0.00	0	1	1	0	PLANET_IN_STAR—MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_UNRESOLVED_OFFSET
002997455-02	OBS	FP	0.00	1	1	1	0	IS_SEC_TCE—CENT_UNRESOLVED_OFFSET

**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 002997455-02

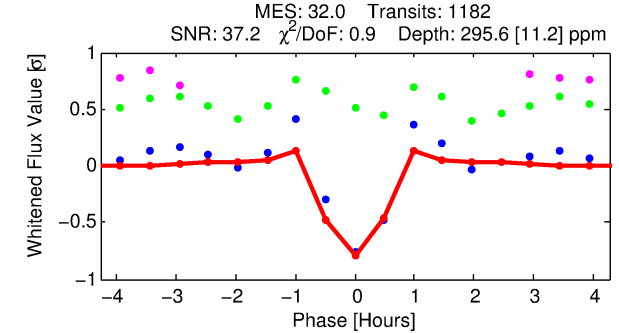
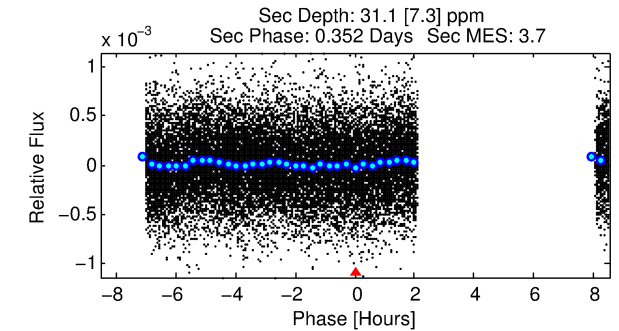
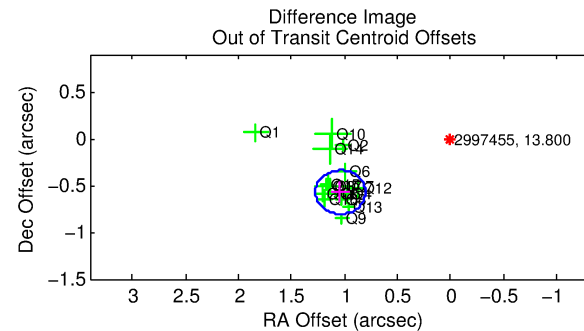
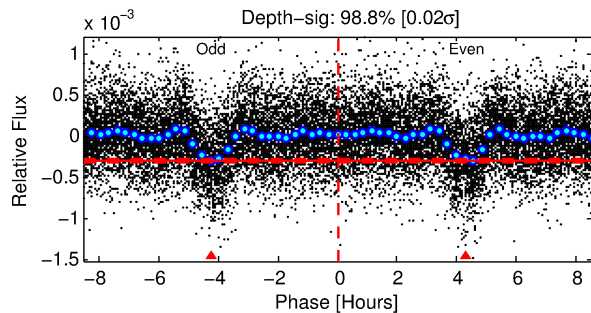
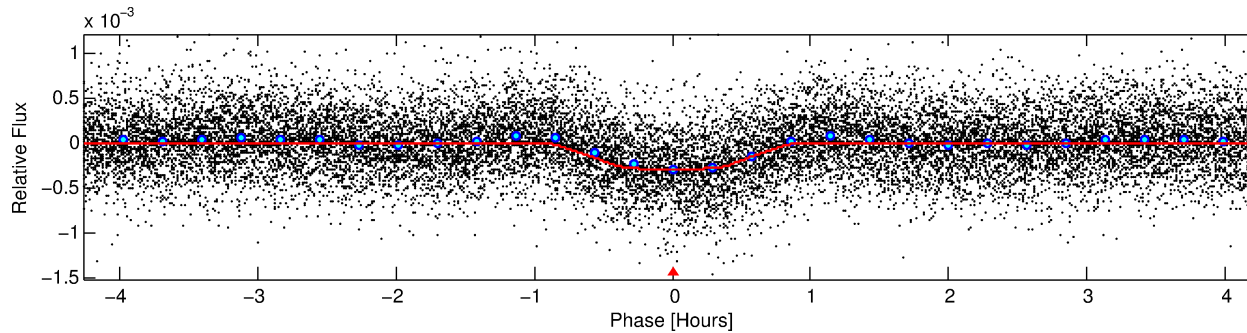
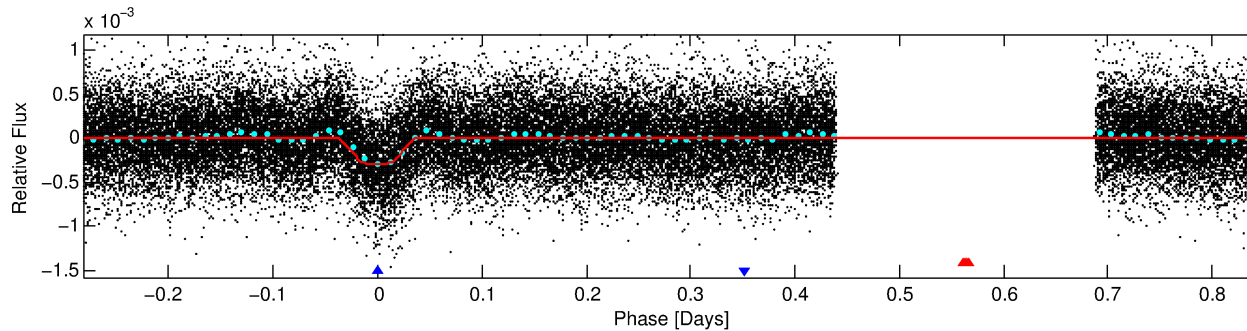
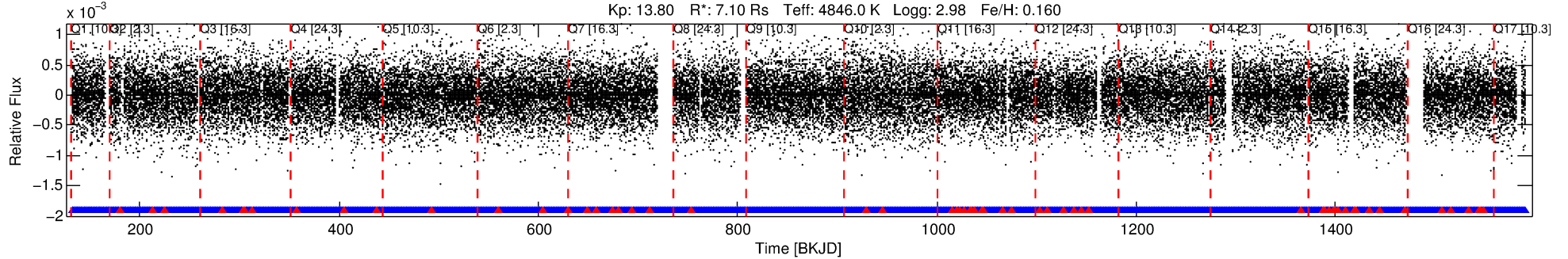
No Significant Match Found

# DV One-Page Summary

KIC: 2997455 Candidate: 2 of 2 Period: 1.130 d

KOI: K06098 Corr: No Ephemeris Match

Kp: 13.80 R\*: 7.10 Rs Teff: 4846.0 K Logg: 2.98 Fe/H: 0.160



## DV Fit Results:

Period = 1.12984 [0.00000] d  
Epoch = 132.3615 [0.0005] BKJD  
Rp/R\* = 0.0194 [0.0039]  
a/R\* = 3.04 [2.04]  
b = 0.90 [0.16]  
Seff = N/A  
Teq = N/A  
Rp = 15.06 [5.59] Re  
a = N/A  
Ag = N/A  
Teffp = N/A

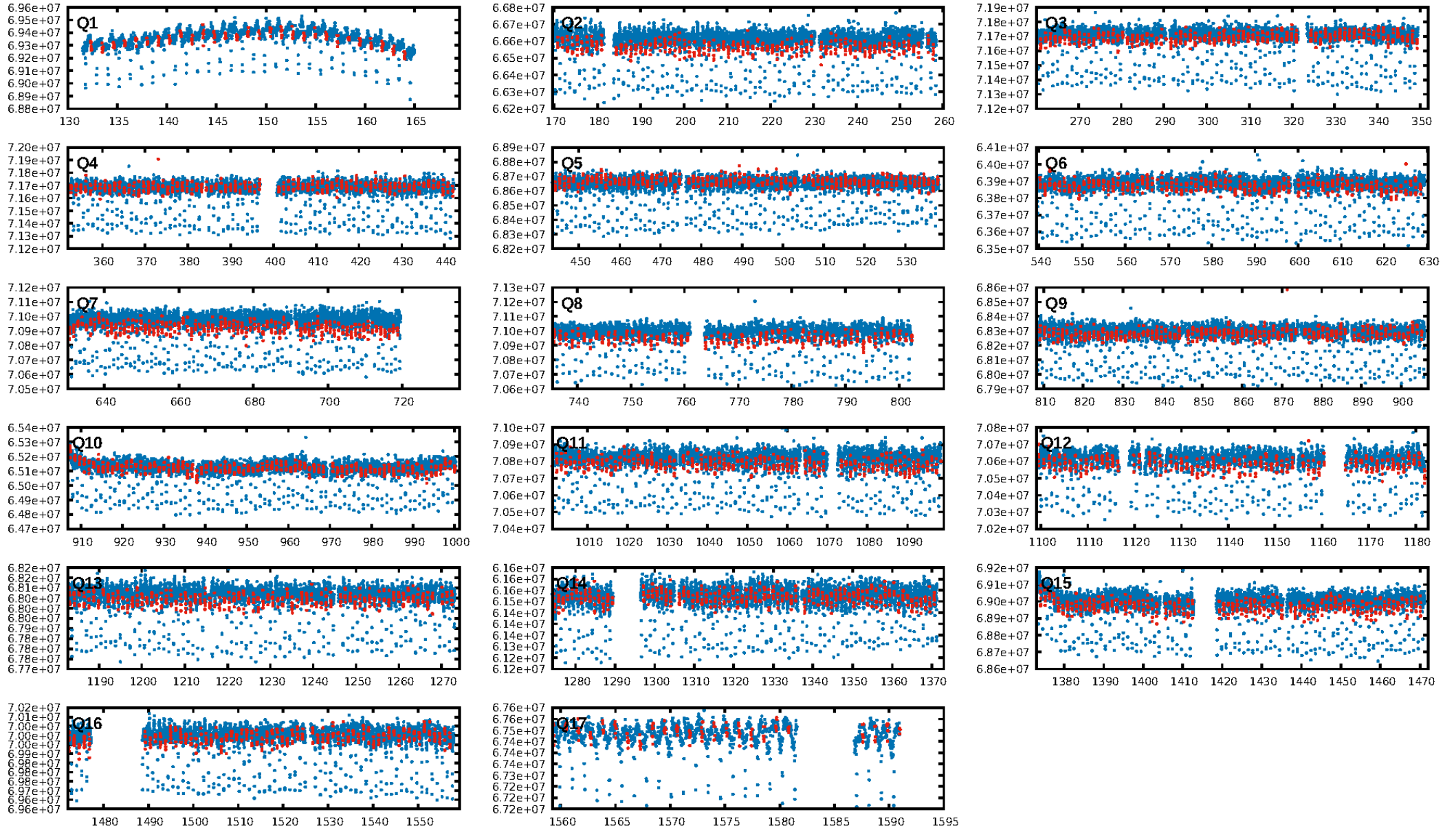
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.93e-187  
RollingBand-fgt: 0.95 [1068/1129]  
GhostDiagnostic-chr: 3.828  
Centroid-sig: 0.0%  
Centroid-so: 1.182 arcsec [5.74σ]  
OotOffset-rm: 1.184 arcsec [15.17σ]  
KicOffset-rm: 1.225 arcsec [14.05σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 1.00 [17/17]

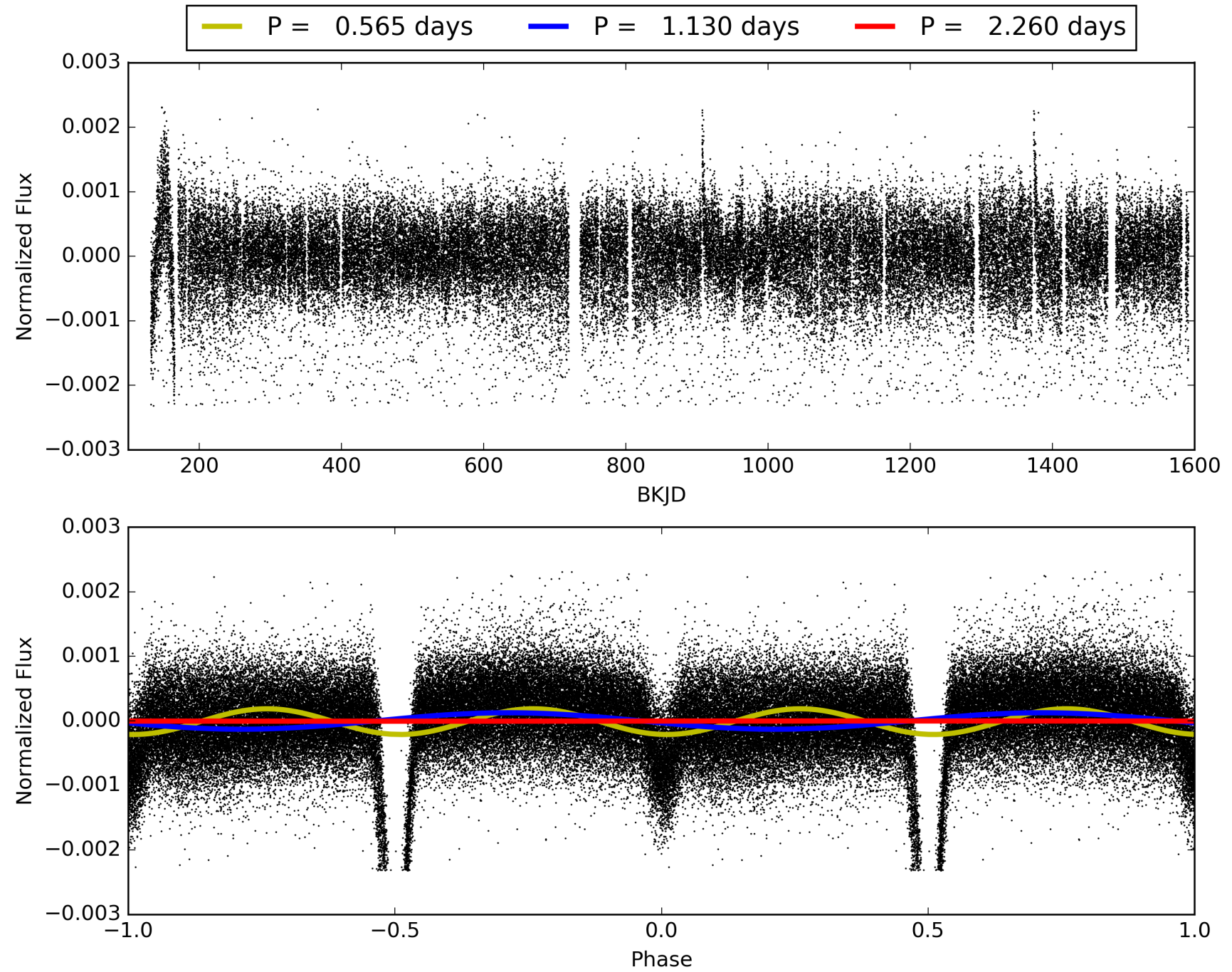
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 12:46:10 Z

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

# TCE 002997455-02, PDC Light Curves



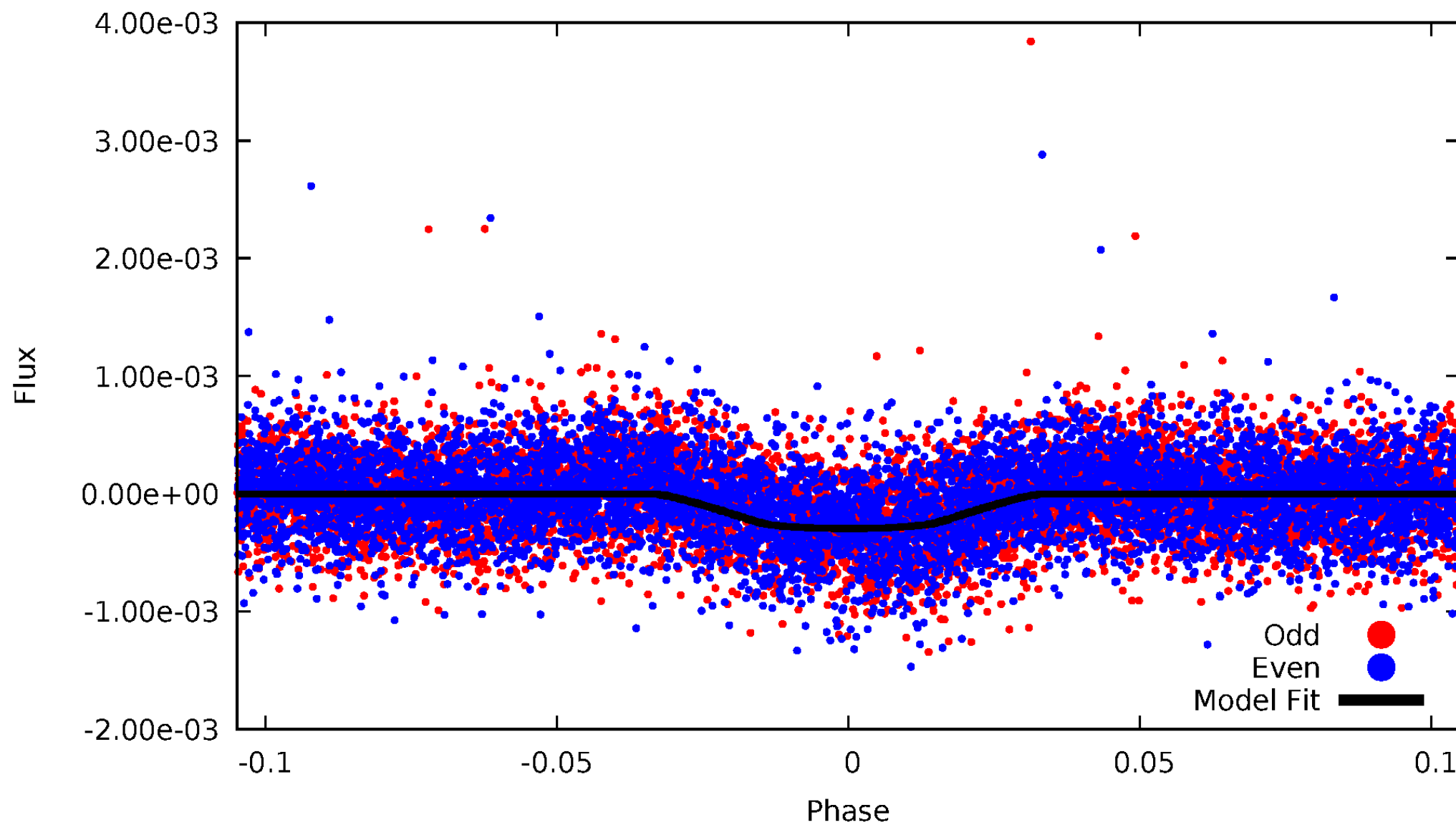
# TCE 002997455-02





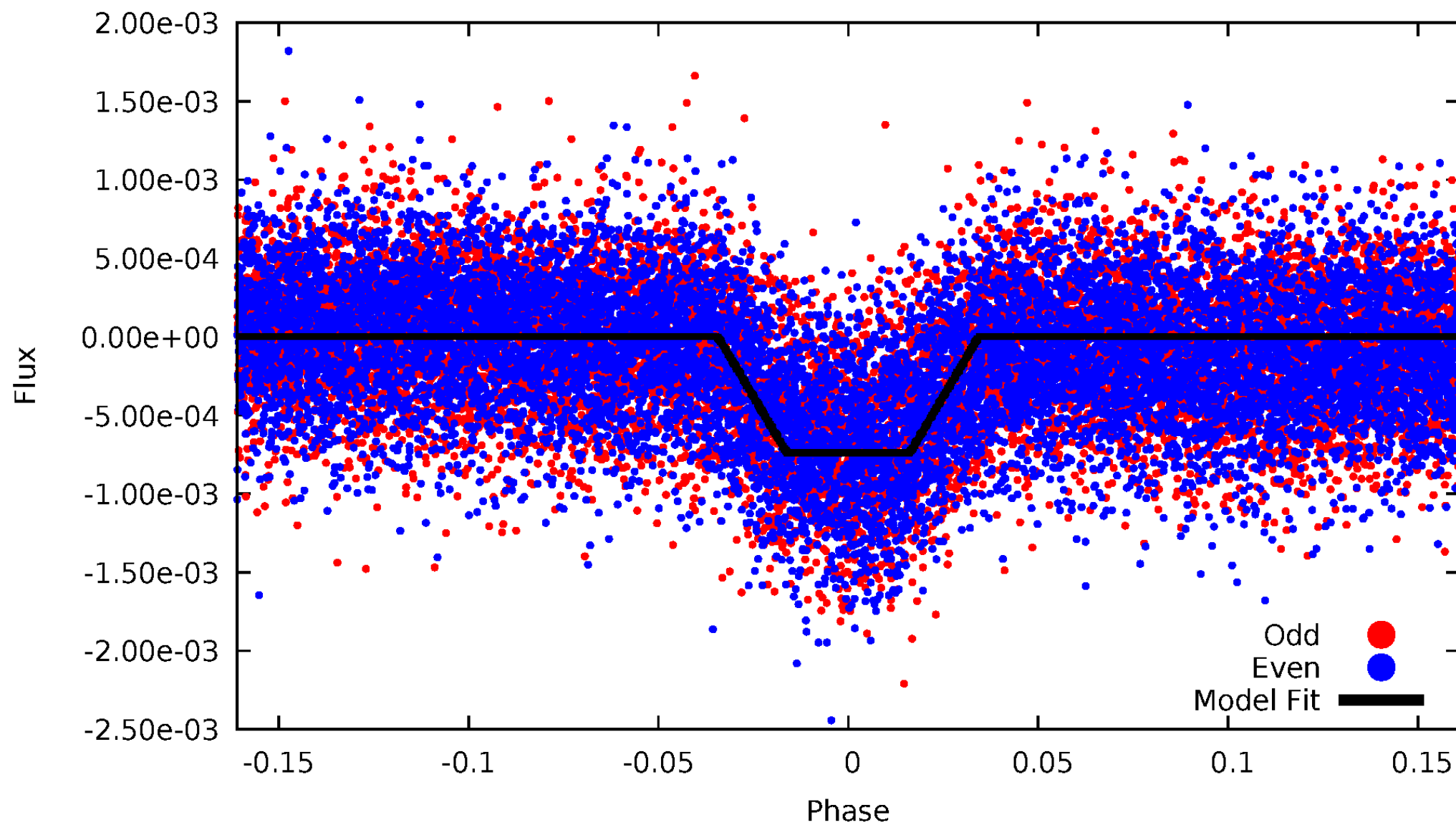
# DV Odd/Even

TCE 002997455-02



# ALT Odd/Even

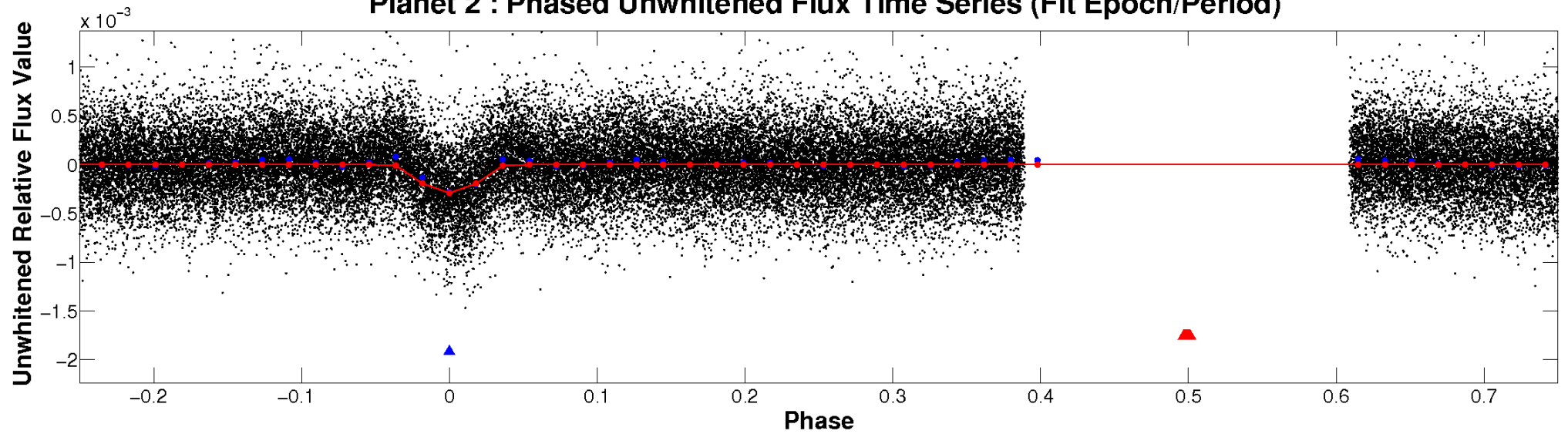
TCE 002997455-02



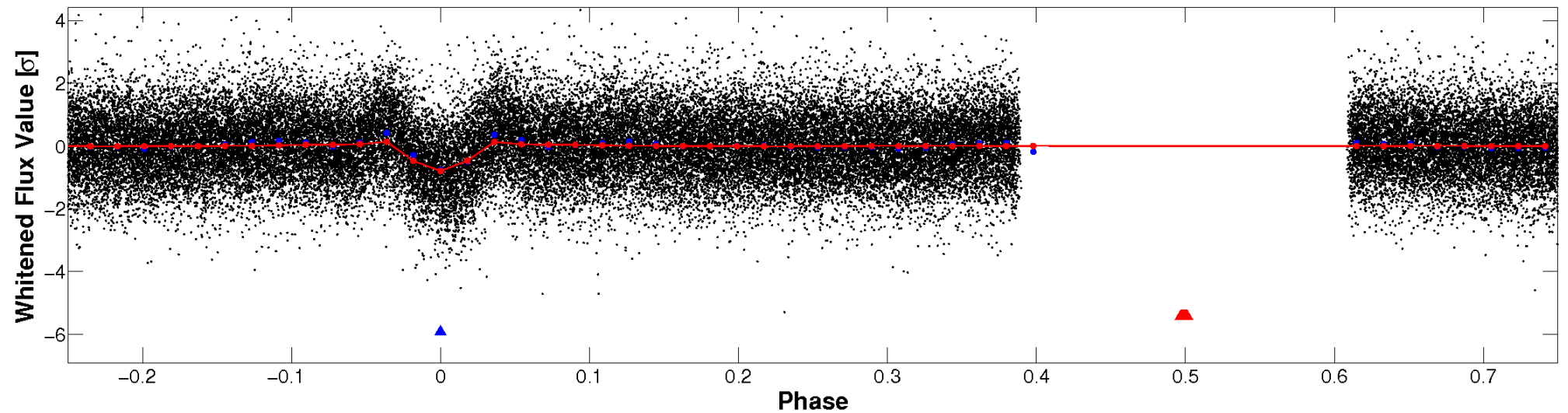


# Non-Whitened Vs. Whitened Light Curve

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

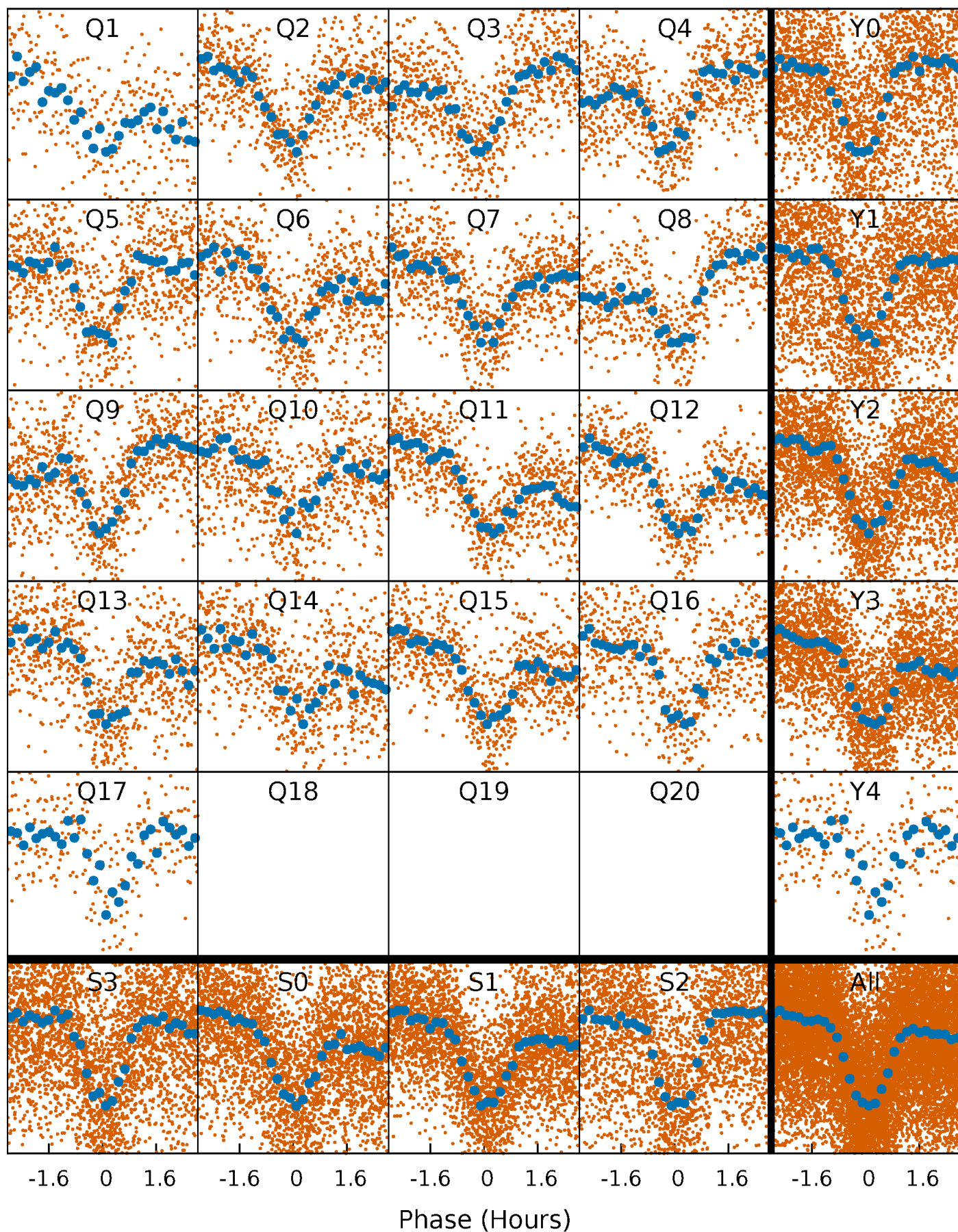


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



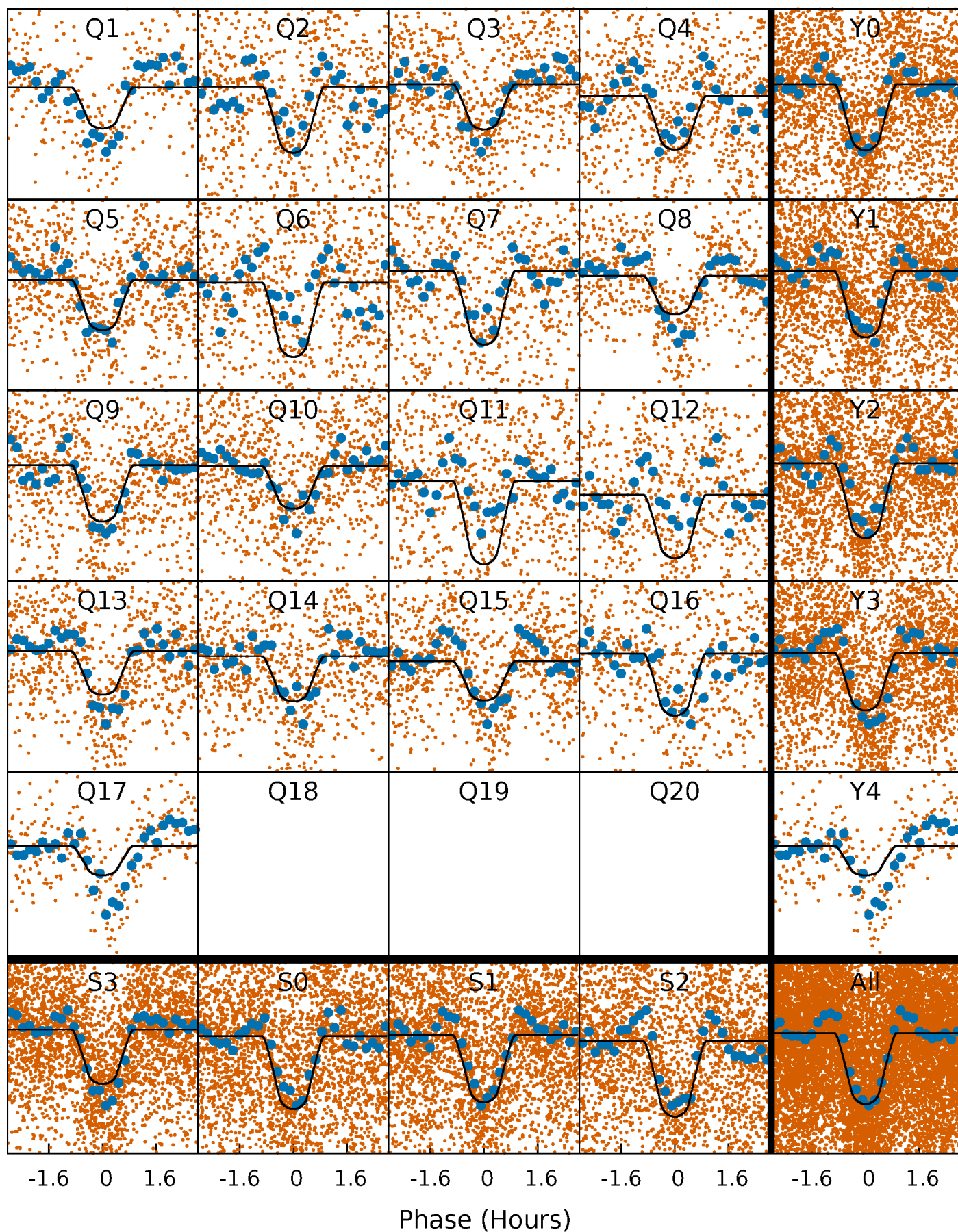
# PDC Quarter-Phased Transit Curves

TCE 002997455-02 P= 1.129838 Days  $T_0=132.361480$  (BKJD)



# DV Quarter-Phased Transit Curves

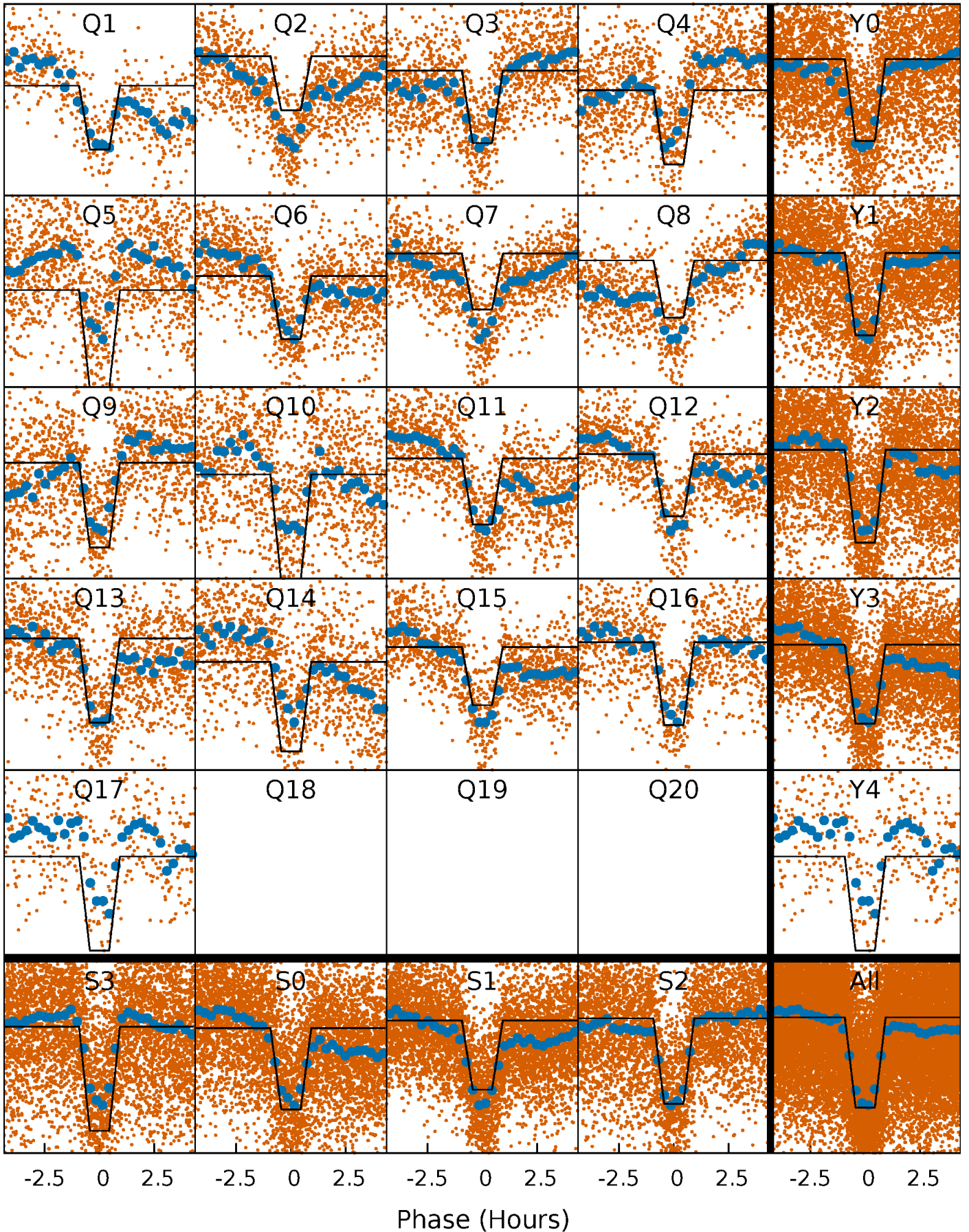
TCE 002997455-02   P= 1.129838 Days    $T_0=132.361480$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

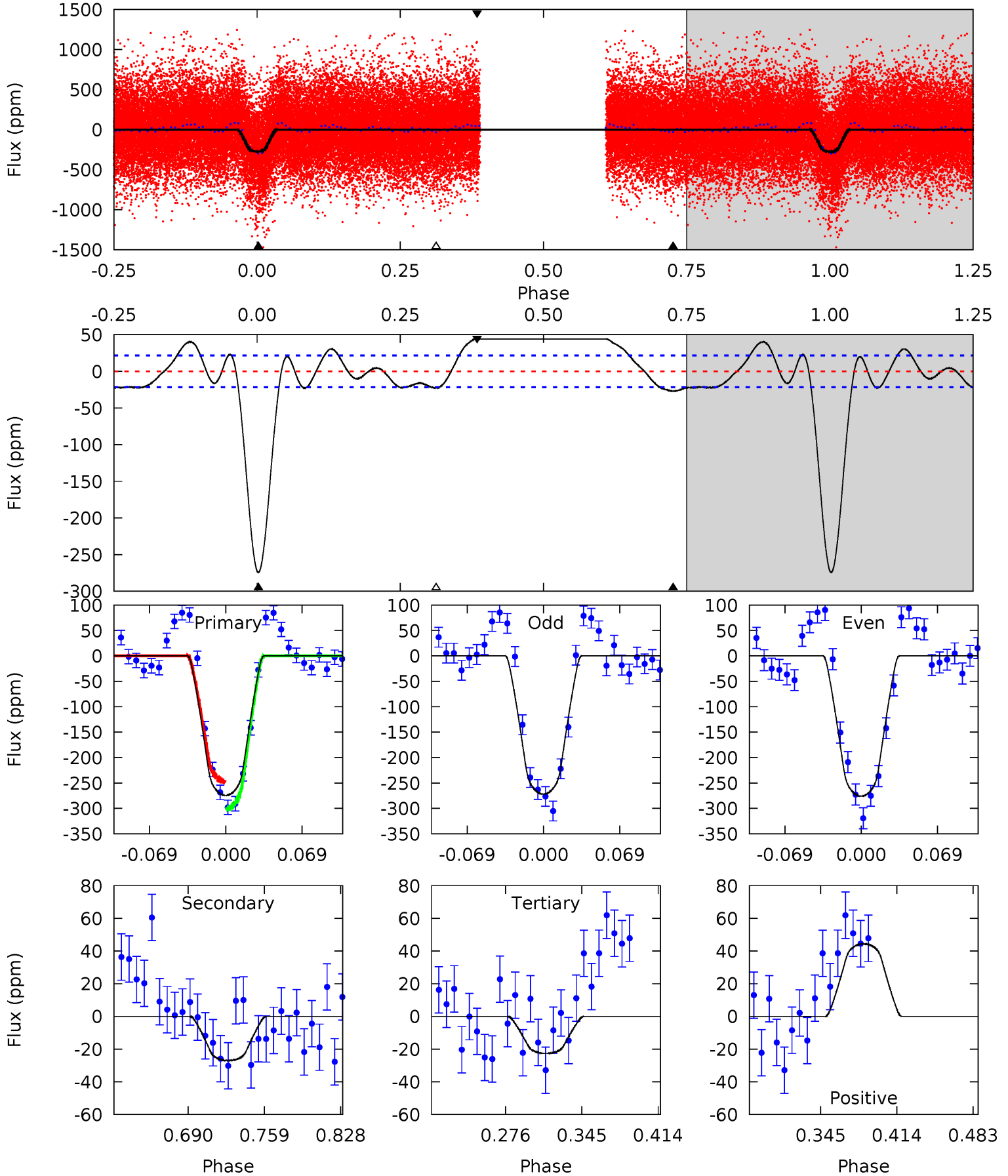
TCE 002997455-02   P= 1.129844 Days    $T_0=132.359933$  (BKJD)



# DV Model-Shift Uniqueness Test

002997455-02, P = 1.129838 Days, E = 131.231642 Days

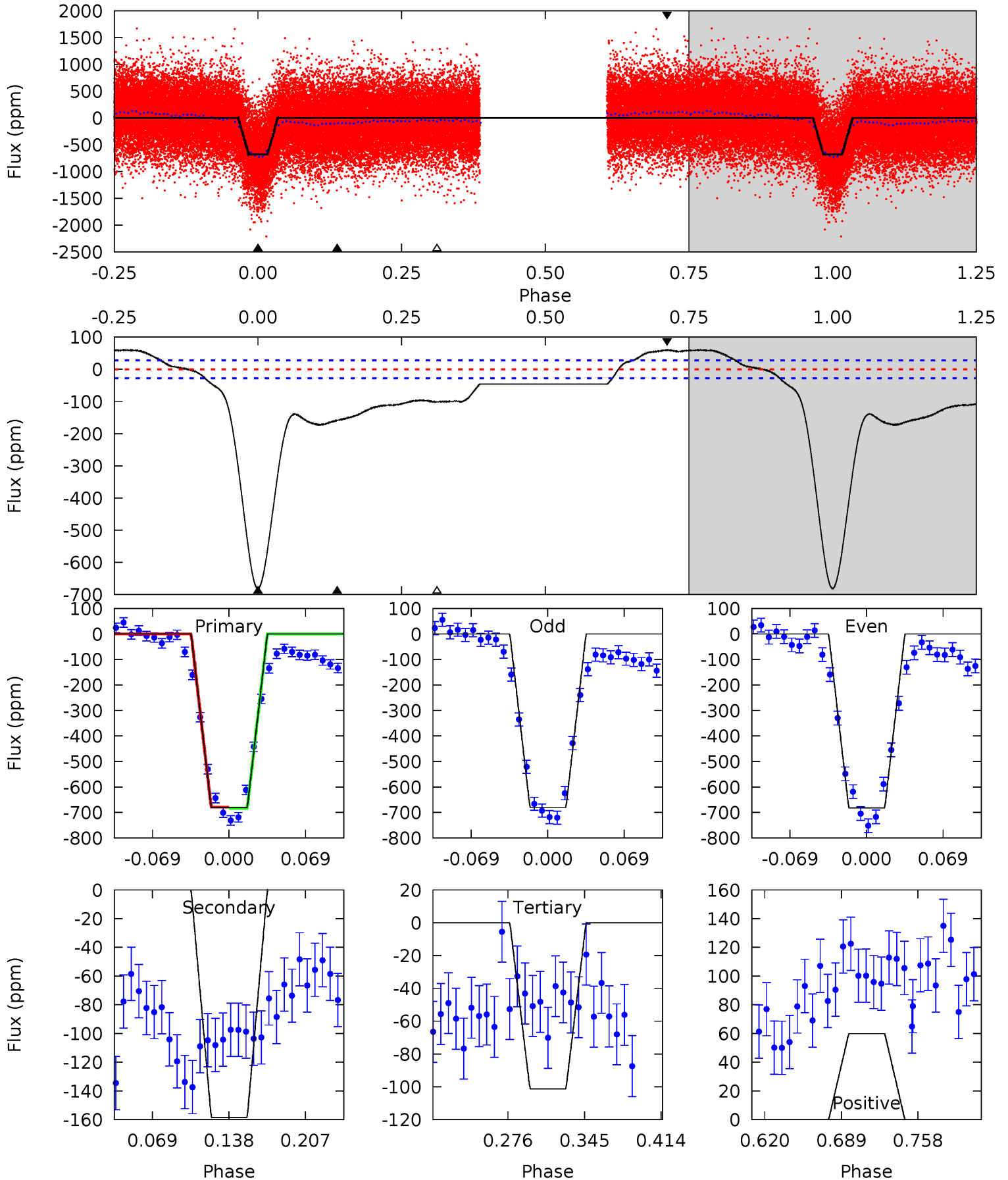
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
58.9	5.81	4.87	9.54	4.64	1.82	4.62	54.1	49.4	0.94	-3.73	0.44	1.00	0.14	5.77



# Alt Model-Shift Uniqueness Test

002997455-02, P = 1.129844 Days, E = 131.230089 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
114.3	26.6	17.0	10.0	4.64	1.82	11.1	97.3	104.2	9.59	16.5	0.15	0.98	0.08	0.34





### Stellar Parameters For KIC 002997455

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$4846^{+50}_{-93}$	$2.984^{+0.174}_{-0.116}$	$0.160^{+0.100}_{-0.150}$	$7.102^{+1.198}_{-2.224}$	$1.775^{+0.252}_{-0.589}$	$0.007^{+0.008}_{-0.002}$
	+1%/-2%	+6%/-4%	+62%/-94%	+17%/-31%	+14%/-33%	+121%/-32%
Source	SPE74	SPE74	SPE74	DSEP		

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

### Secondary Eclipse Parameters for KIC 002997455-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-27 \pm 5$	$14.69^{+3.90}_{-3.30}$	$4929^{+265}_{-312}$	$-4065^{+232}_{-204}$	$0.044^{+0.029}_{-0.016}$
Alt.	$-158 \pm 6$	$20.81^{+3.98}_{-3.78}$	$4965^{+221}_{-311}$	$-3806^{+361}_{-222}$	$0.130^{+0.063}_{-0.033}$

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

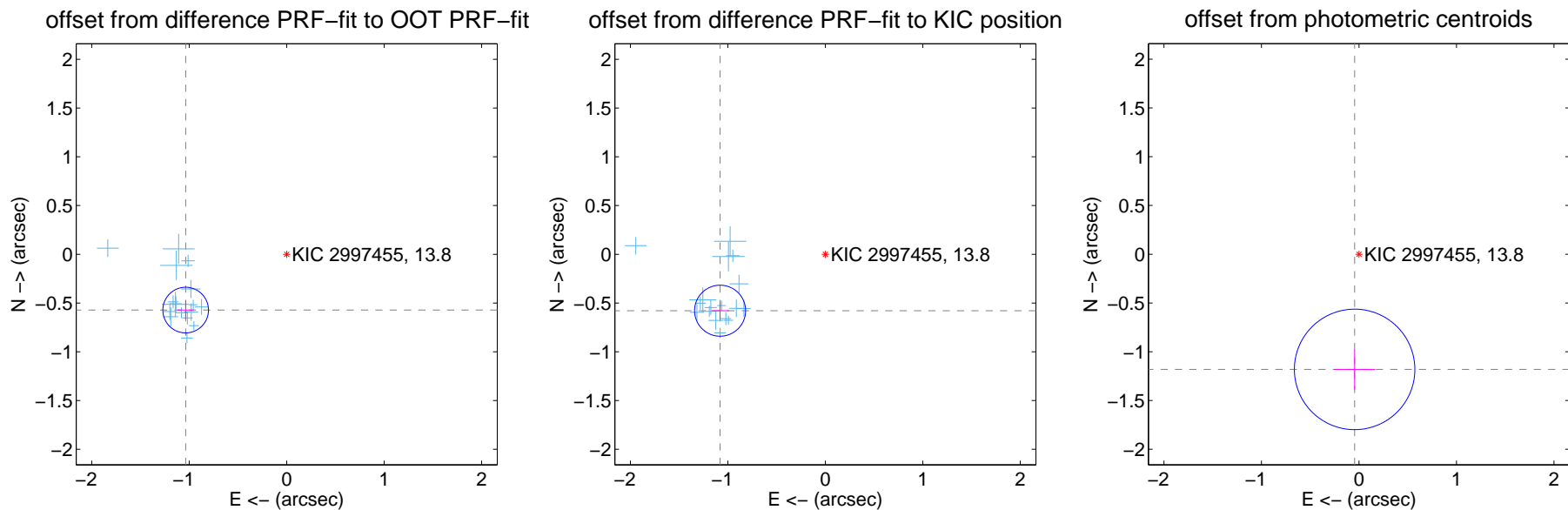
## DV Centroid Data

Supplemental centroid analysis for 002997455-02. Kepler magnitude: 13.80. Transit SNR 37.23

There are 17 quarters with good PRF difference image offsets

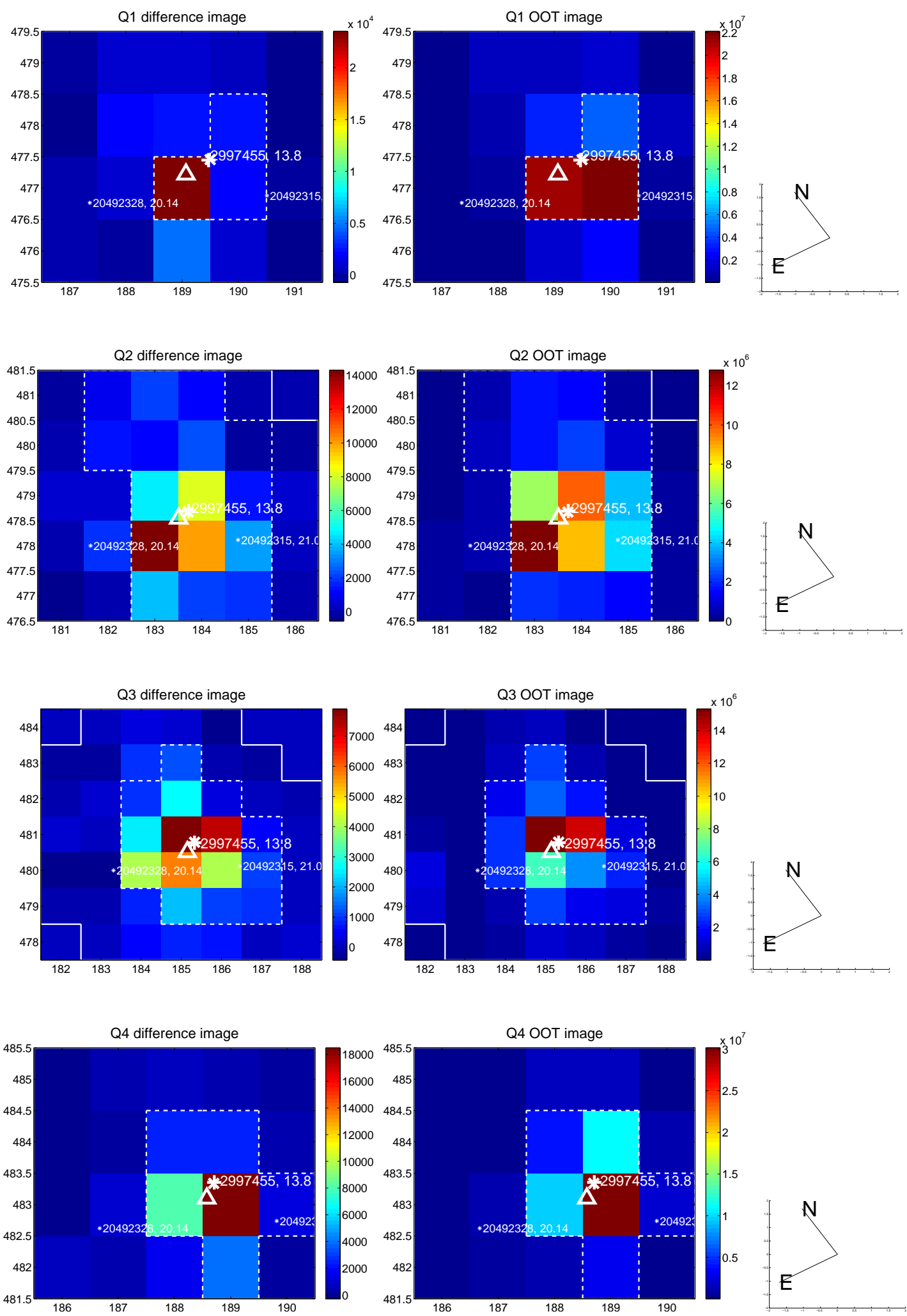
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.184 \pm 0.078$	15.17	$1.036 \pm 0.083$	$-0.572 \pm 0.094$
PRF-fit source offset from KIC position	$1.225 \pm 0.087$	14.05	$1.080 \pm 0.091$	$-0.579 \pm 0.092$
photometric centroid source offset	$1.18 \pm 0.21$	5.74	$0.04 \pm 0.21$	$-1.18 \pm 0.21$

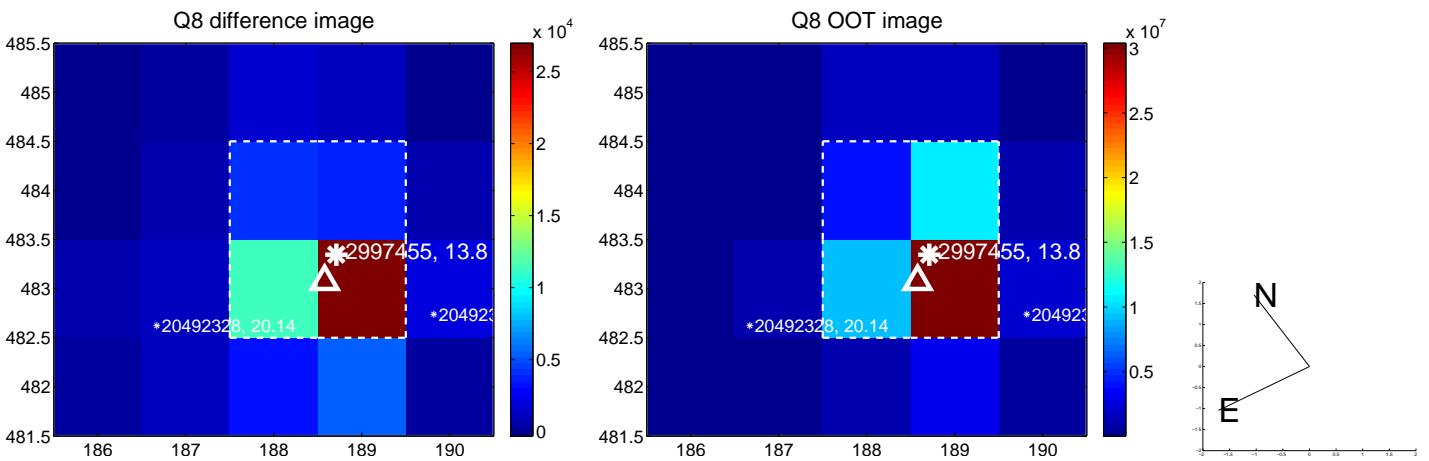
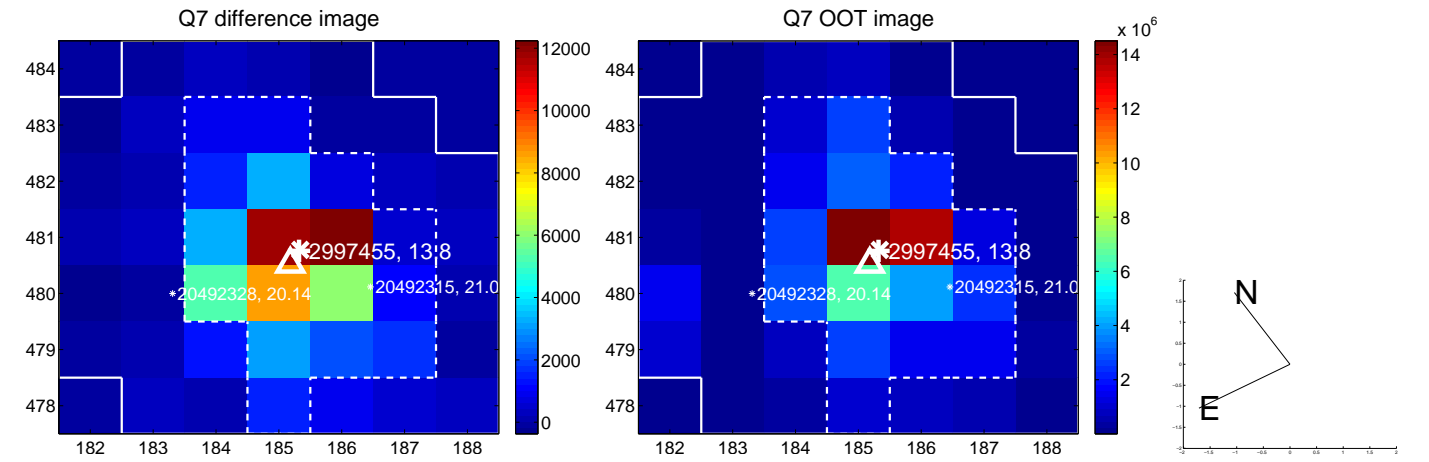
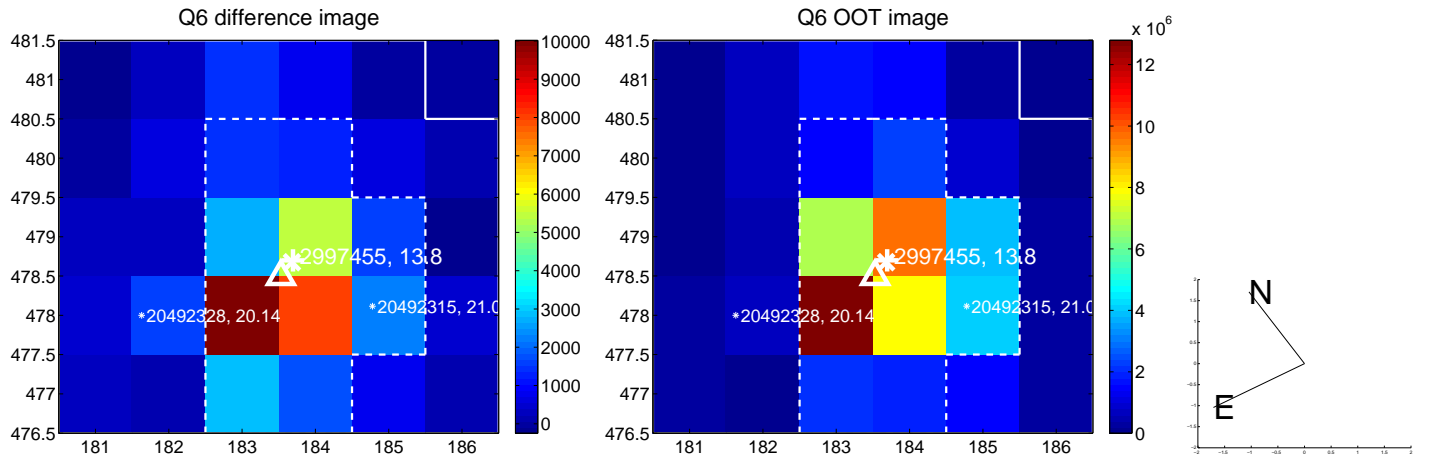
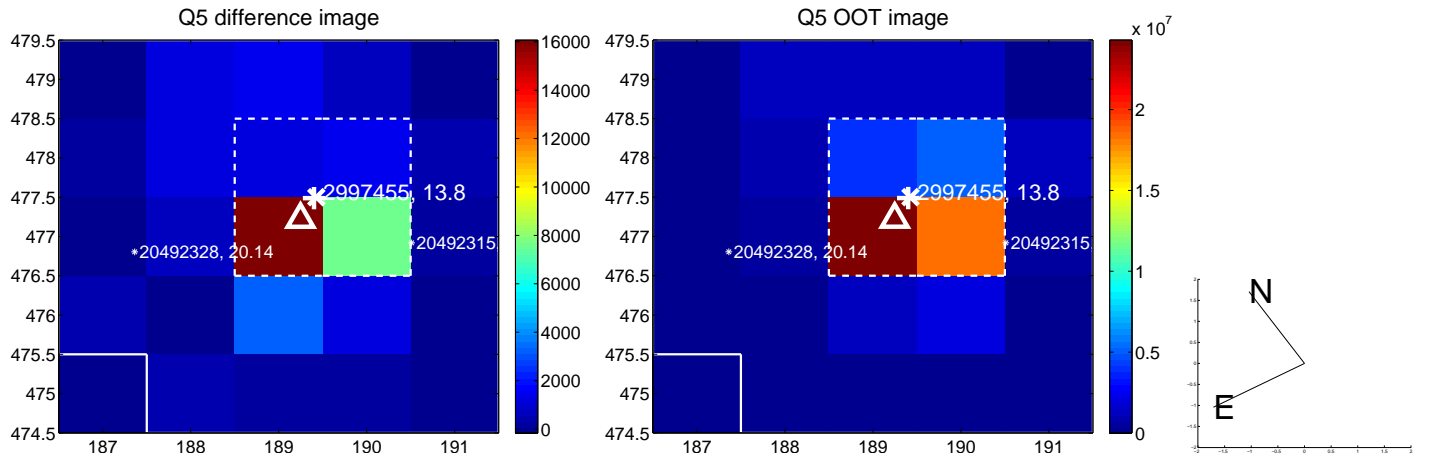


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

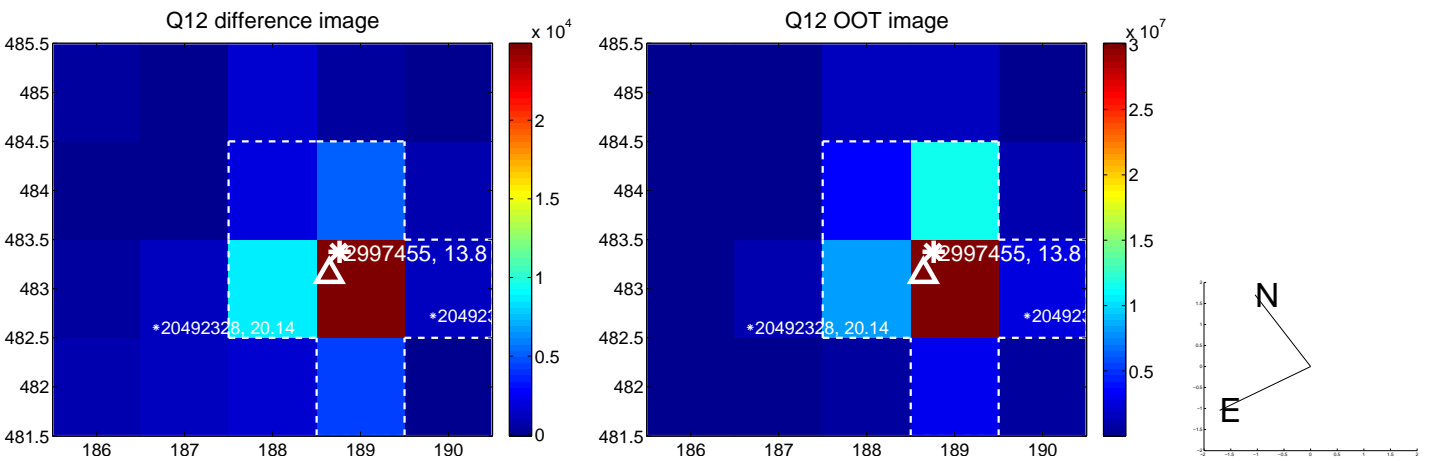
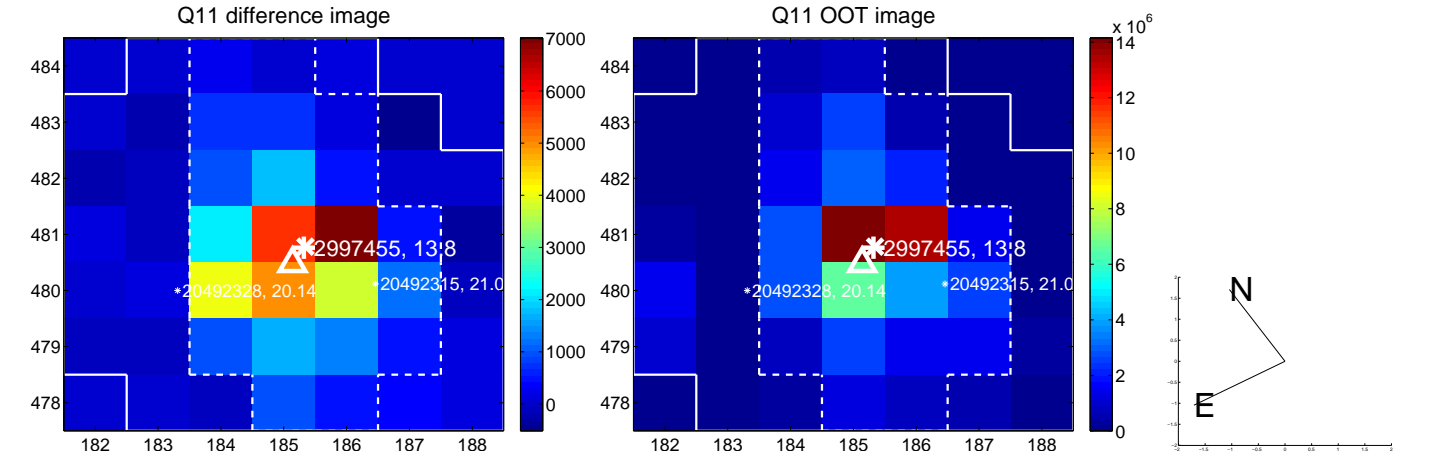
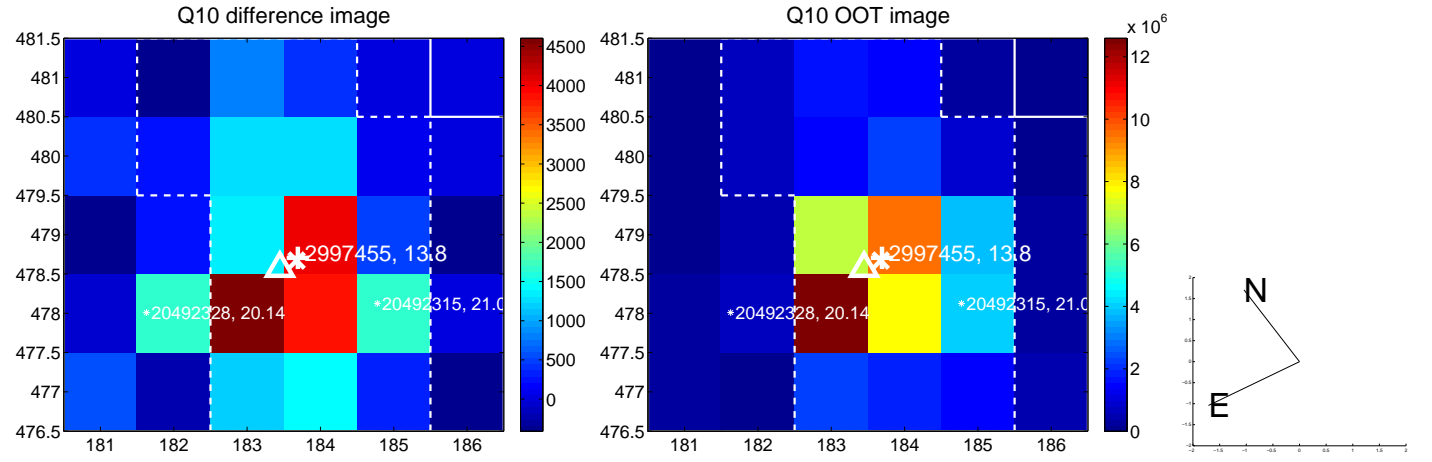
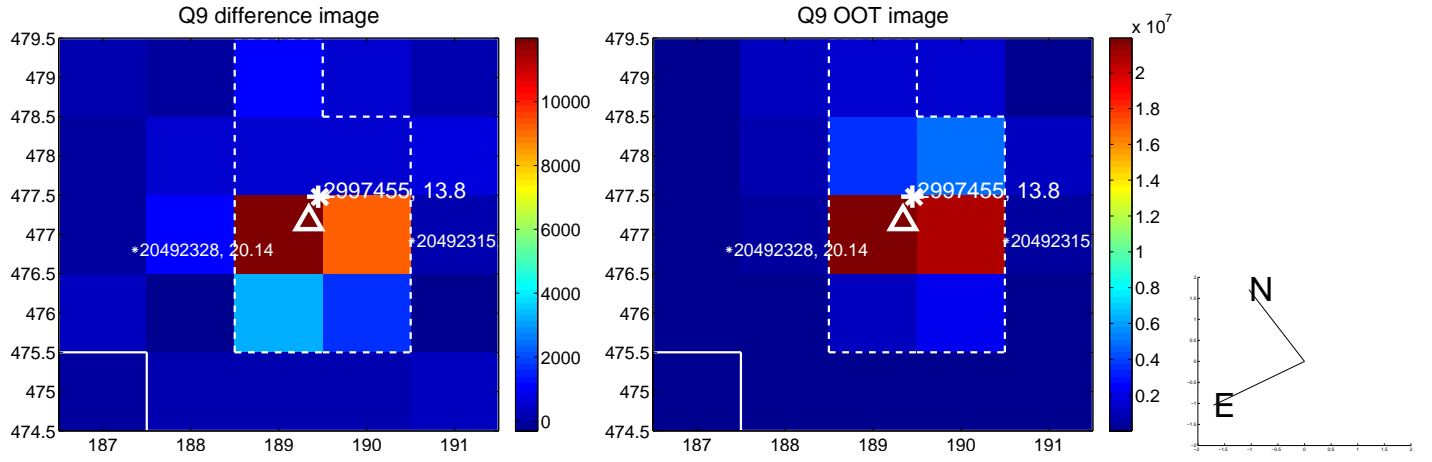
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



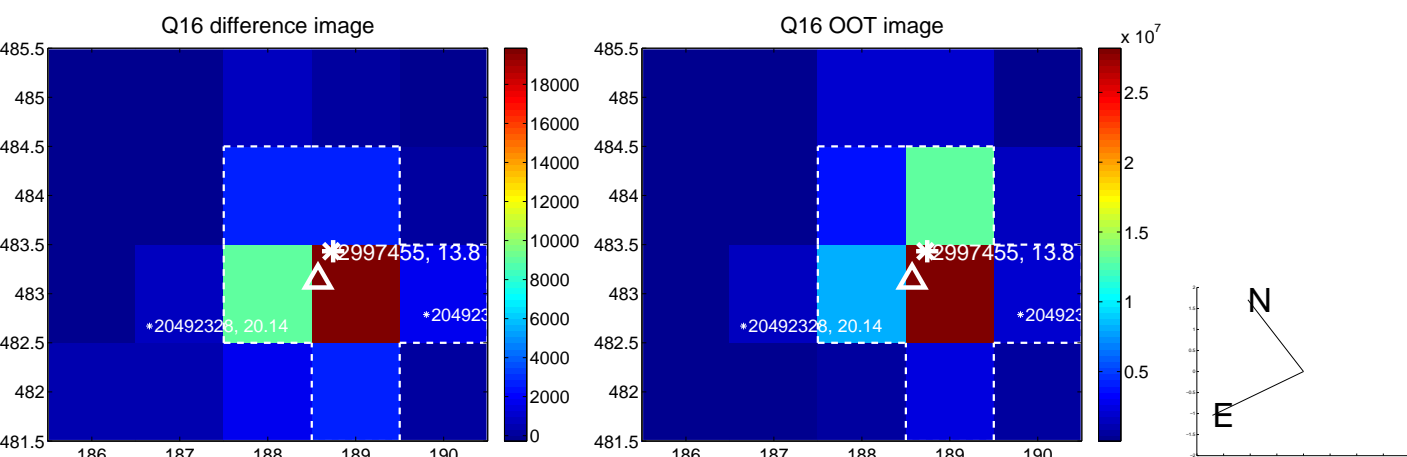
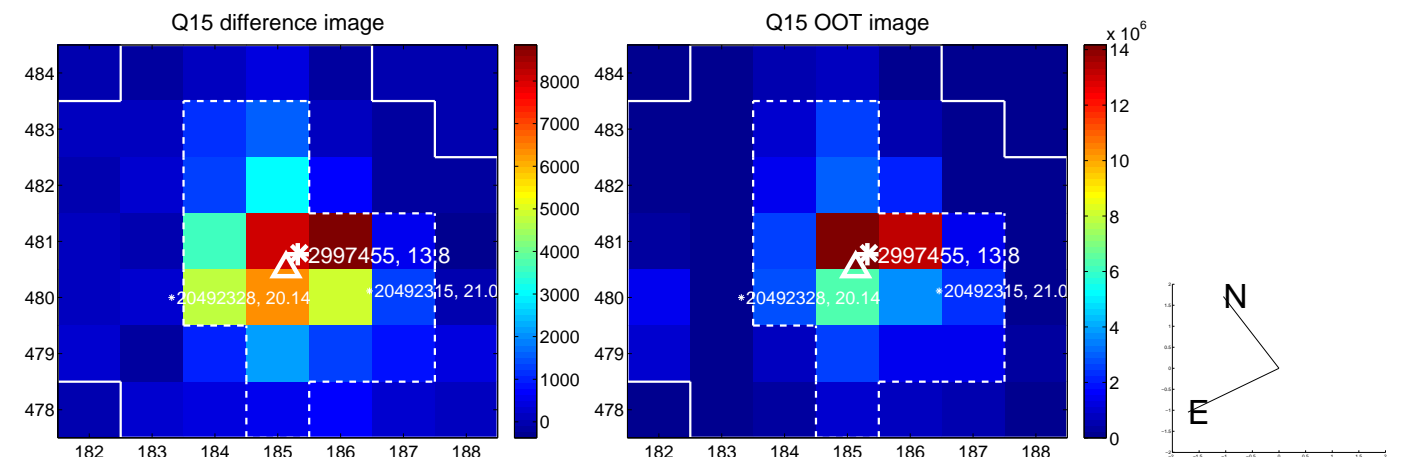
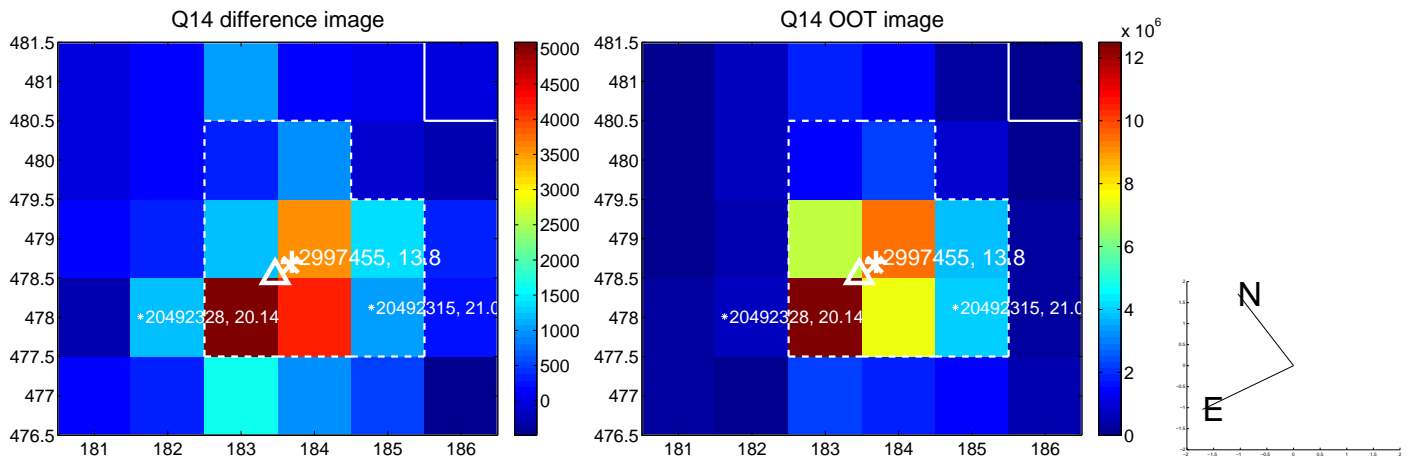
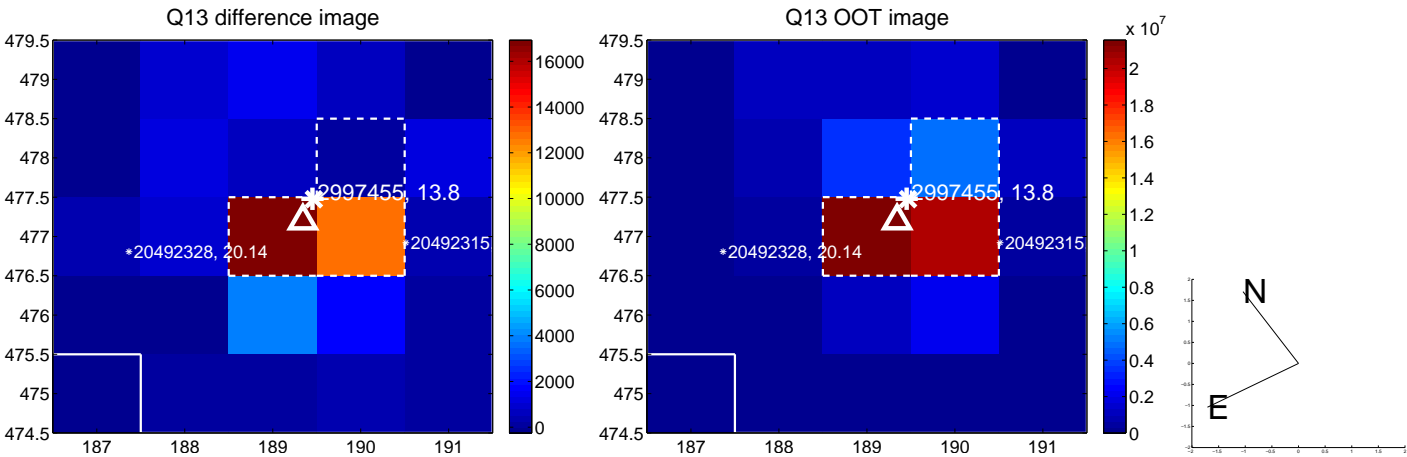
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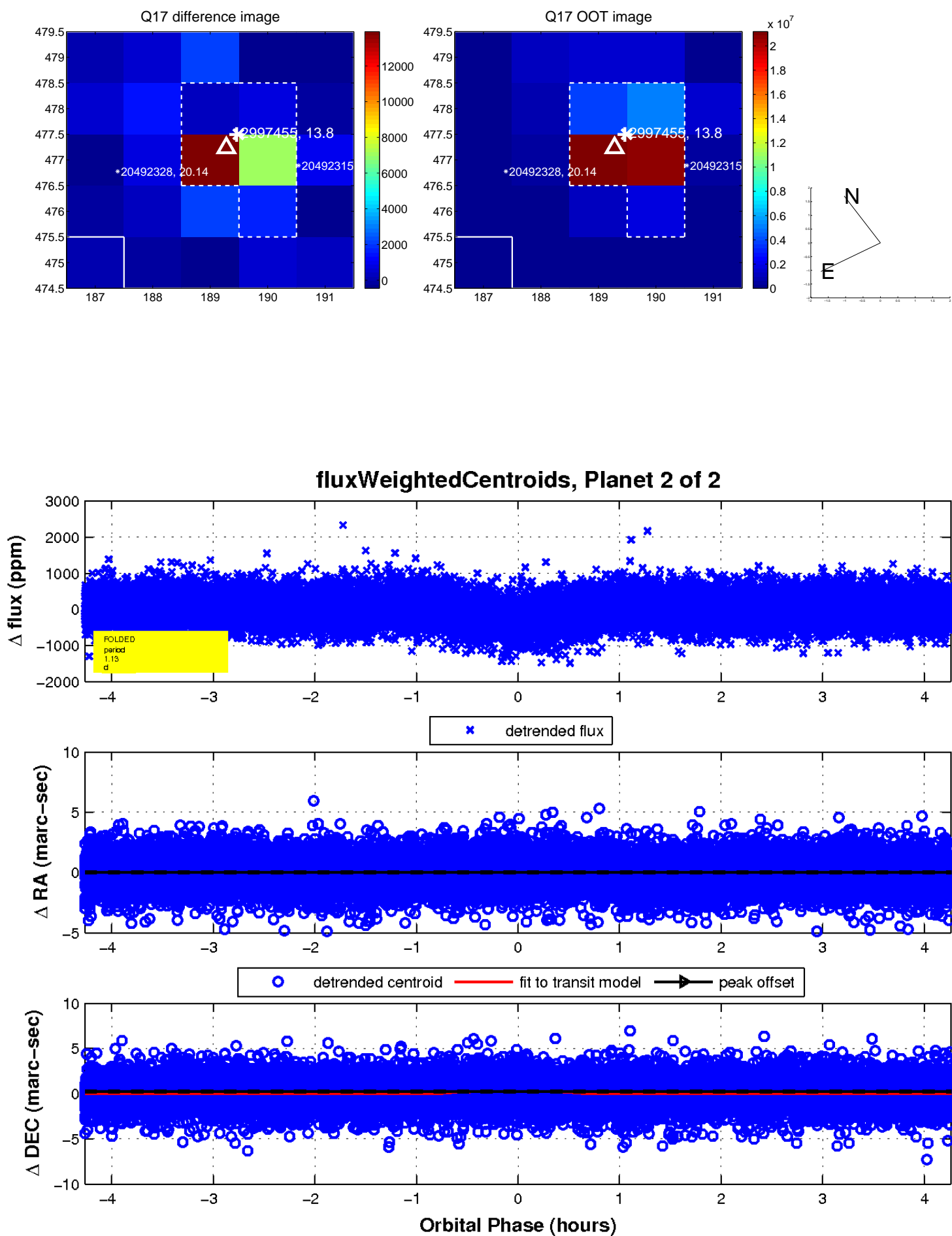
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UKIRT Image

Declination

