

# KIC 009655129

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009655129-01	OBS	1714.01	2.743997	133.759415	31028.5	4.567	1006.3	821.5	0.81	5334	15.68	394.08
009655129-02	OBS	No	2.744002	132.384130	1214.3	4.034	53.0	56.2	0.81	5334	3.39	394.08

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009655129-01	OBS	PC	0.55	0	1	0	0	SWEET_EB—MOD_SEC_ALT—PLANET_OCCULT_ALT—HAS_SEC_TCE
009655129-02	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.

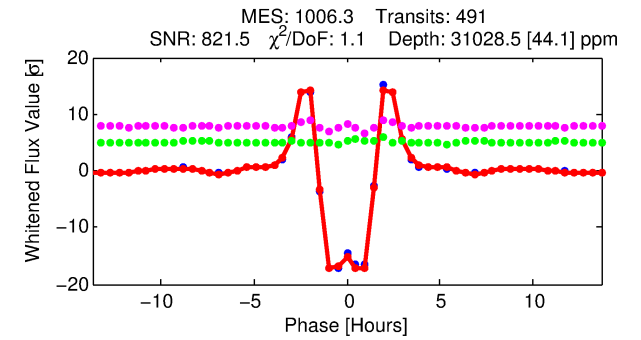
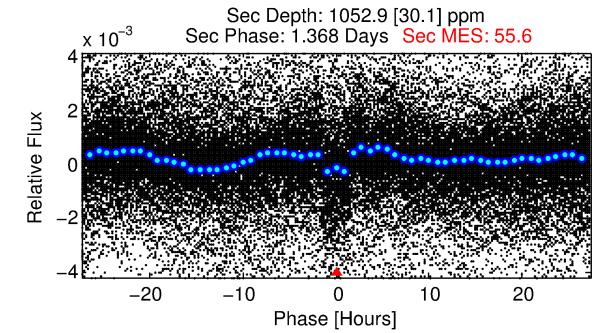
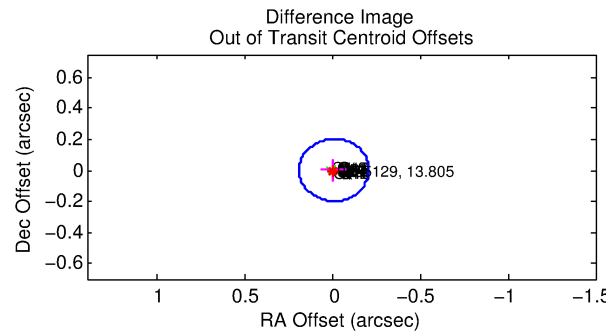
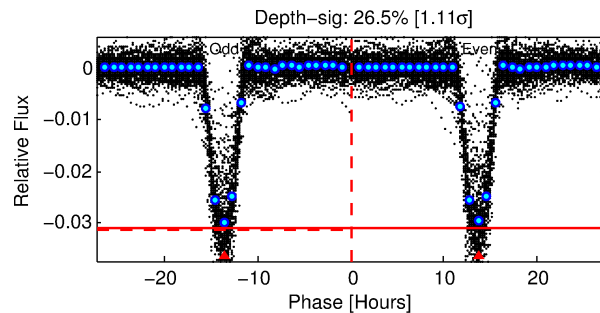
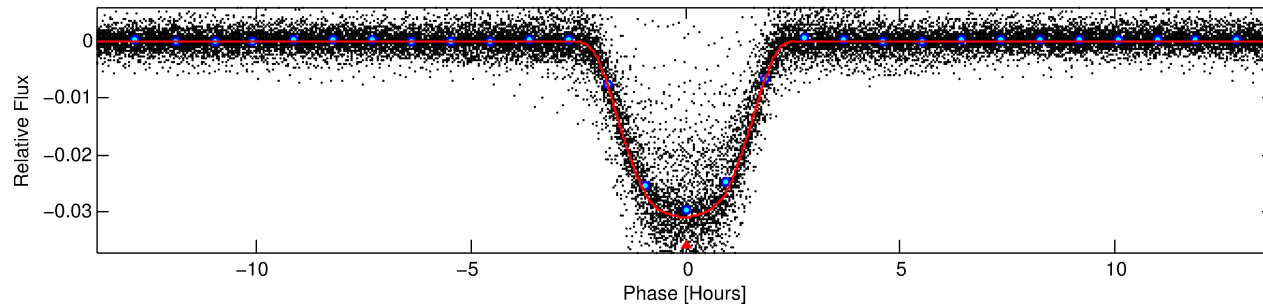
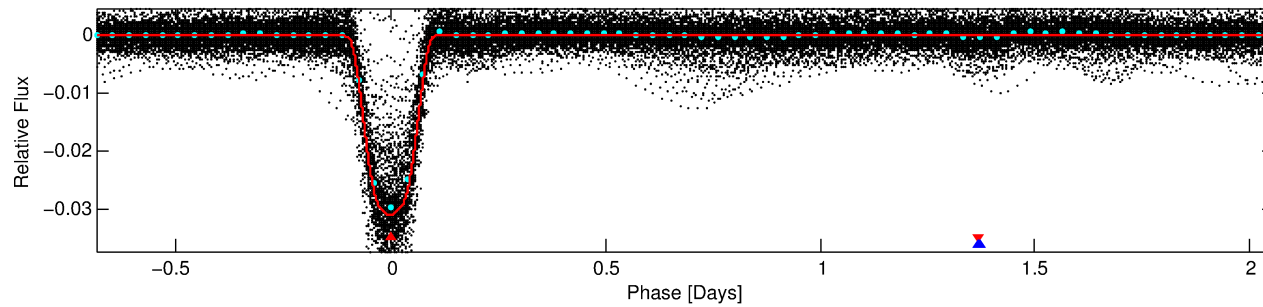
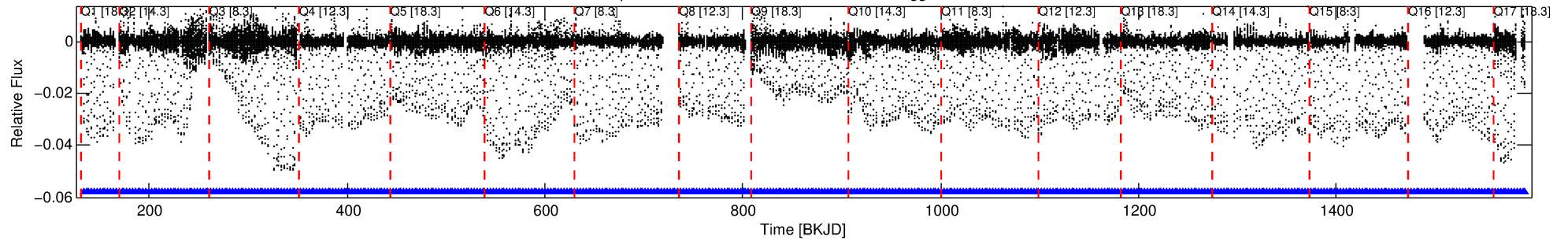
## Ephemeris Match Information For 009655129-01

No Significant Match Found

# DV One-Page Summary

KIC: 9655129 Candidate: 1 of 2 Period: 2.744 d  
KOI: K01714.01 Corr: 0.906

Kp: 13.81 R\*: 0.81 Rs Teff: 5334.0 K Logg: 4.49 Fe/H: -0.320



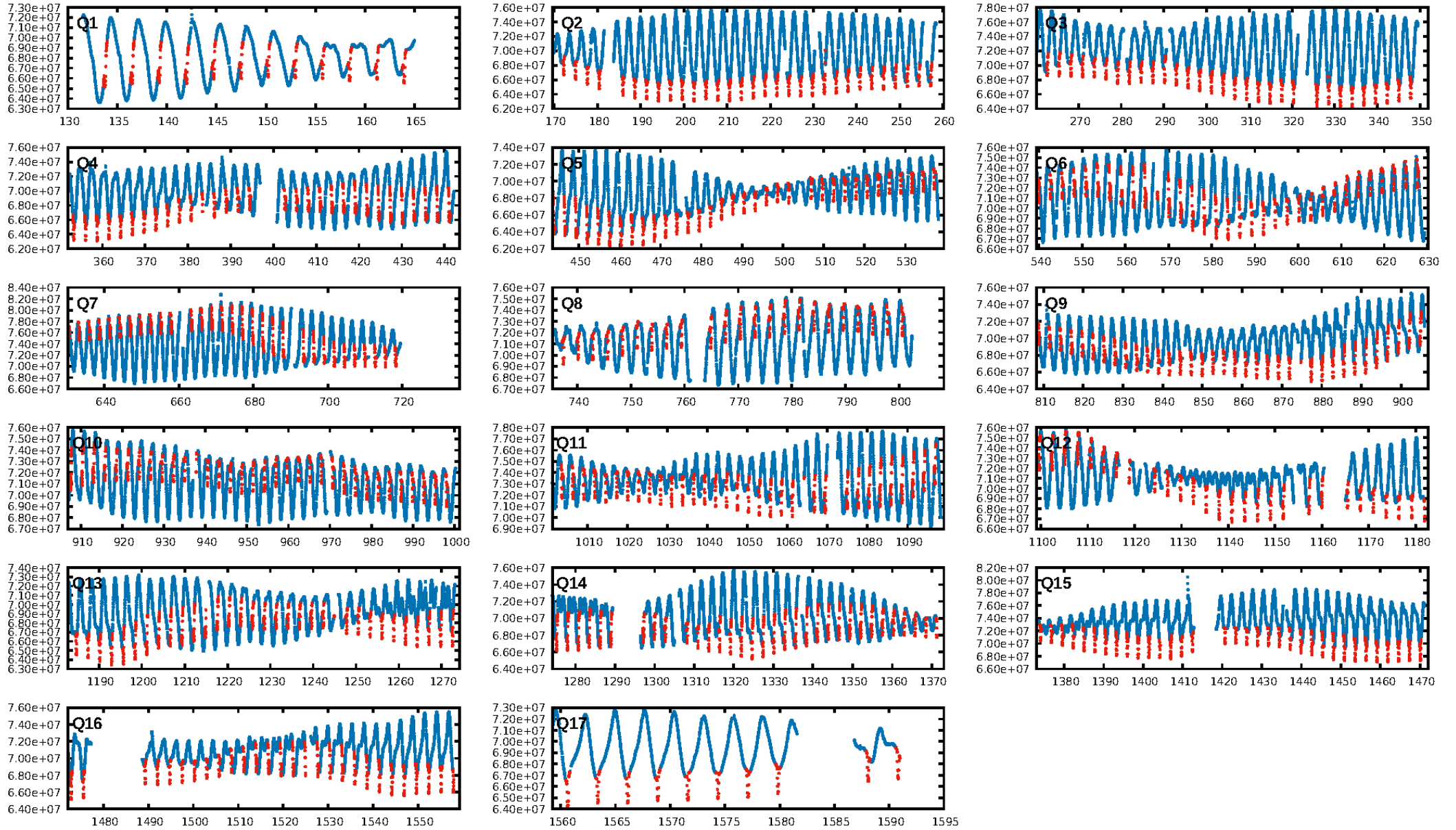
## DV Fit Results:

Period = 2.74400 [0.00000] d  
Epoch = 133.7594 [0.0000] BKJD  
Rp/R\* = 0.1774 [0.0001]  
a/R\* = 4.25 [0.00]  
b = 0.75 [0.00]  
Seff = 394.08 [90.42]  
Teff = 1136 [65] K  
Rp = 15.68 [2.34] Re  
a = 0.0347 [0.0045] AU  
Ag = 2.84 [0.56] [3.27σ]  
Teffp = 2281 [70] K [11.98σ]

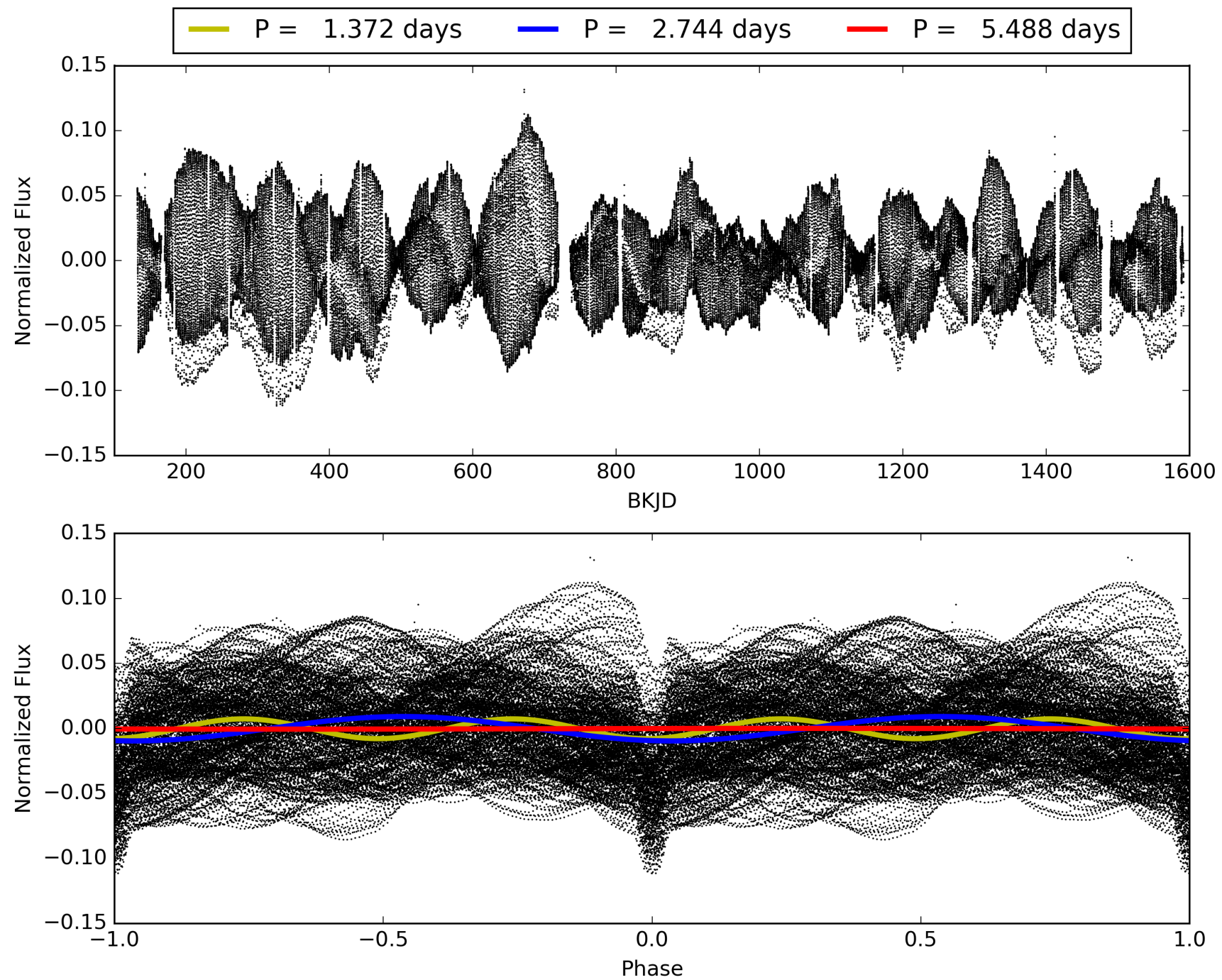
## DV Diagnostic Results:

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 [469/469]  
GhostDiagnostic-chr: 1.117  
Centroid-sig: N/A  
Centroid-so: 0.211 arcsec [118.67σ]  
OotOffset-rm: 0.007 arcsec [0.11σ]  
KicOffset-rm: 0.144 arcsec [2.13σ]  
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]

# TCE 009655129-01, PDC Light Curves

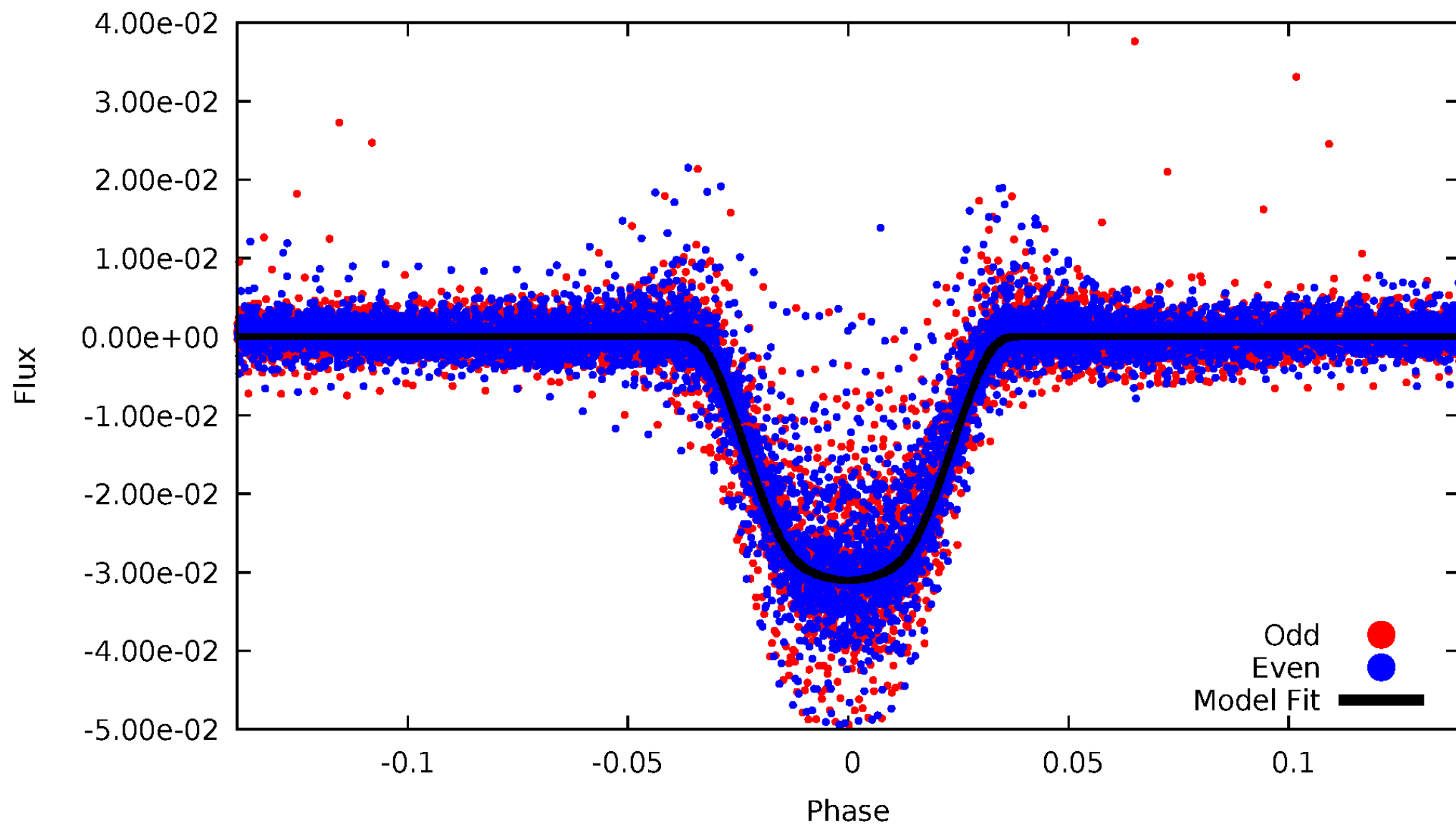


TCE 009655129-01



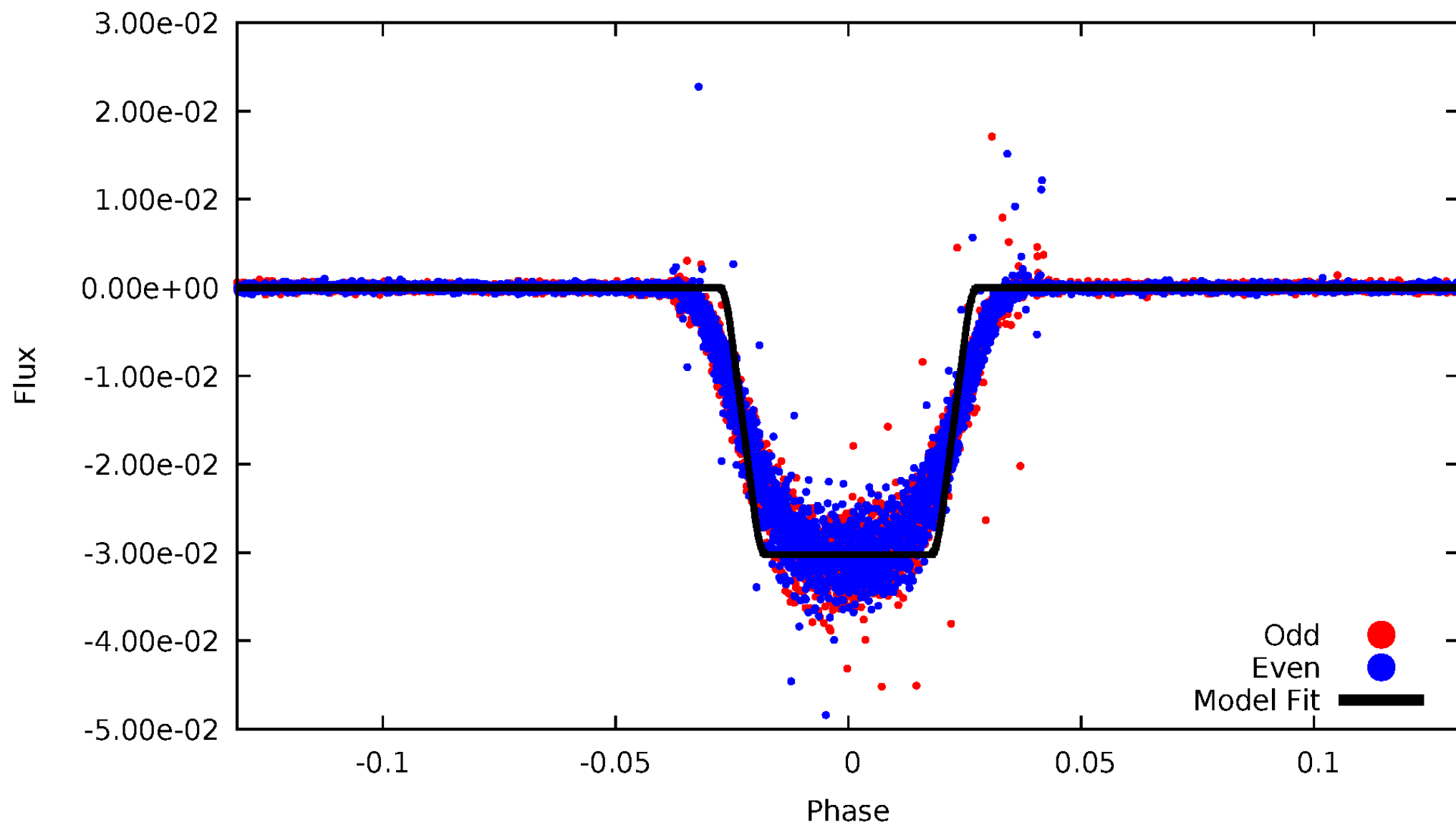
# DV Odd/Even

TCE 009655129-01



# ALT Odd/Even

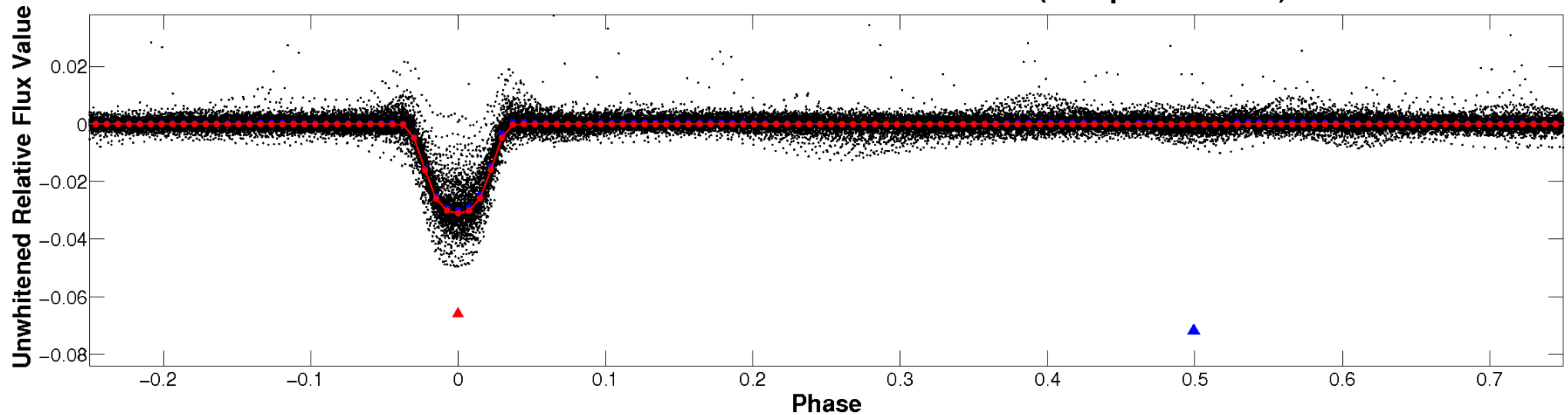
TCE 009655129-01



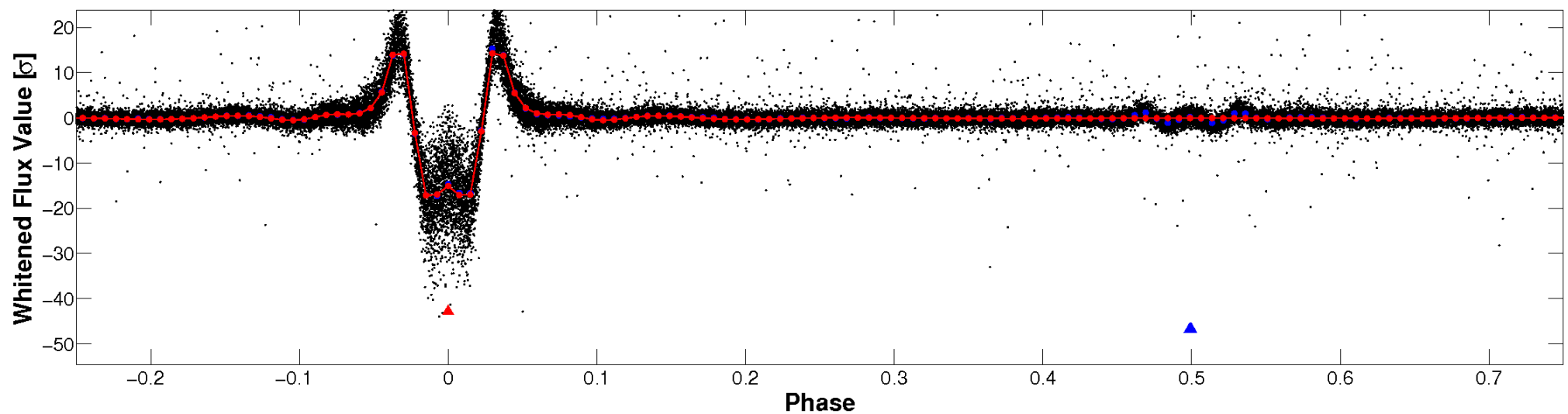


# Non-Whitened Vs. Whitened Light Curve

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

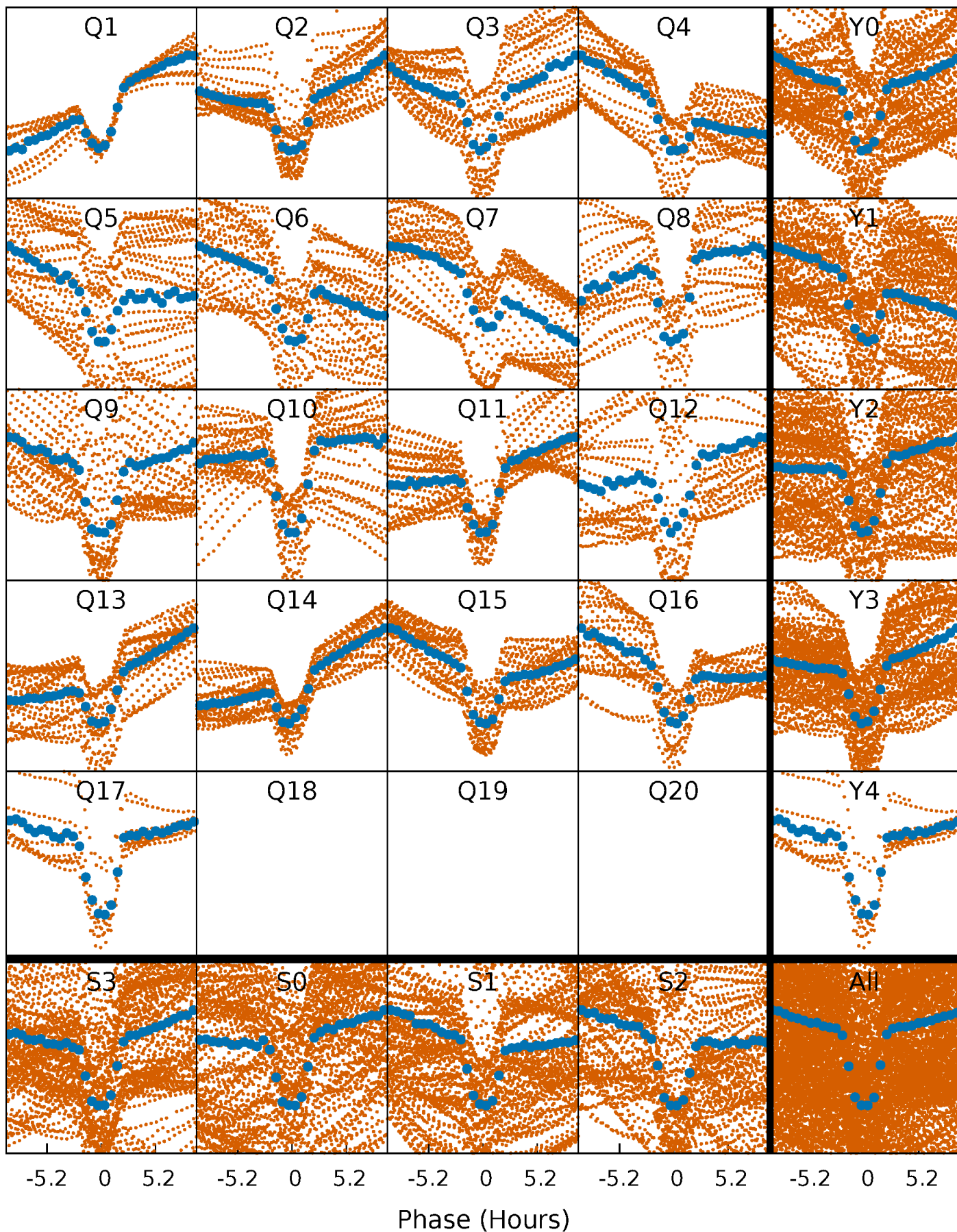


## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

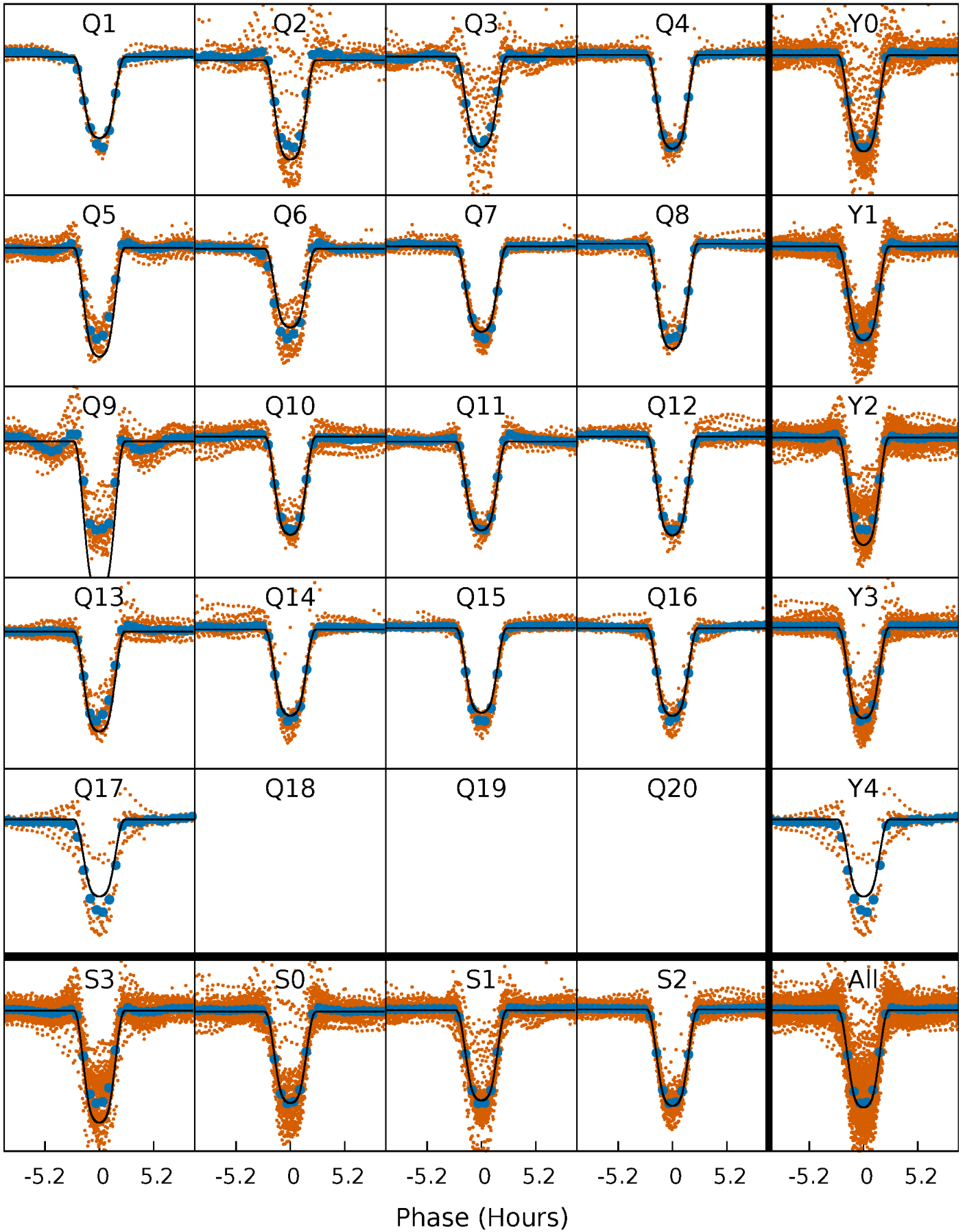
TCE 009655129-01 P= 2.743997 Days  $T_0=133.759414$  (BKJD)





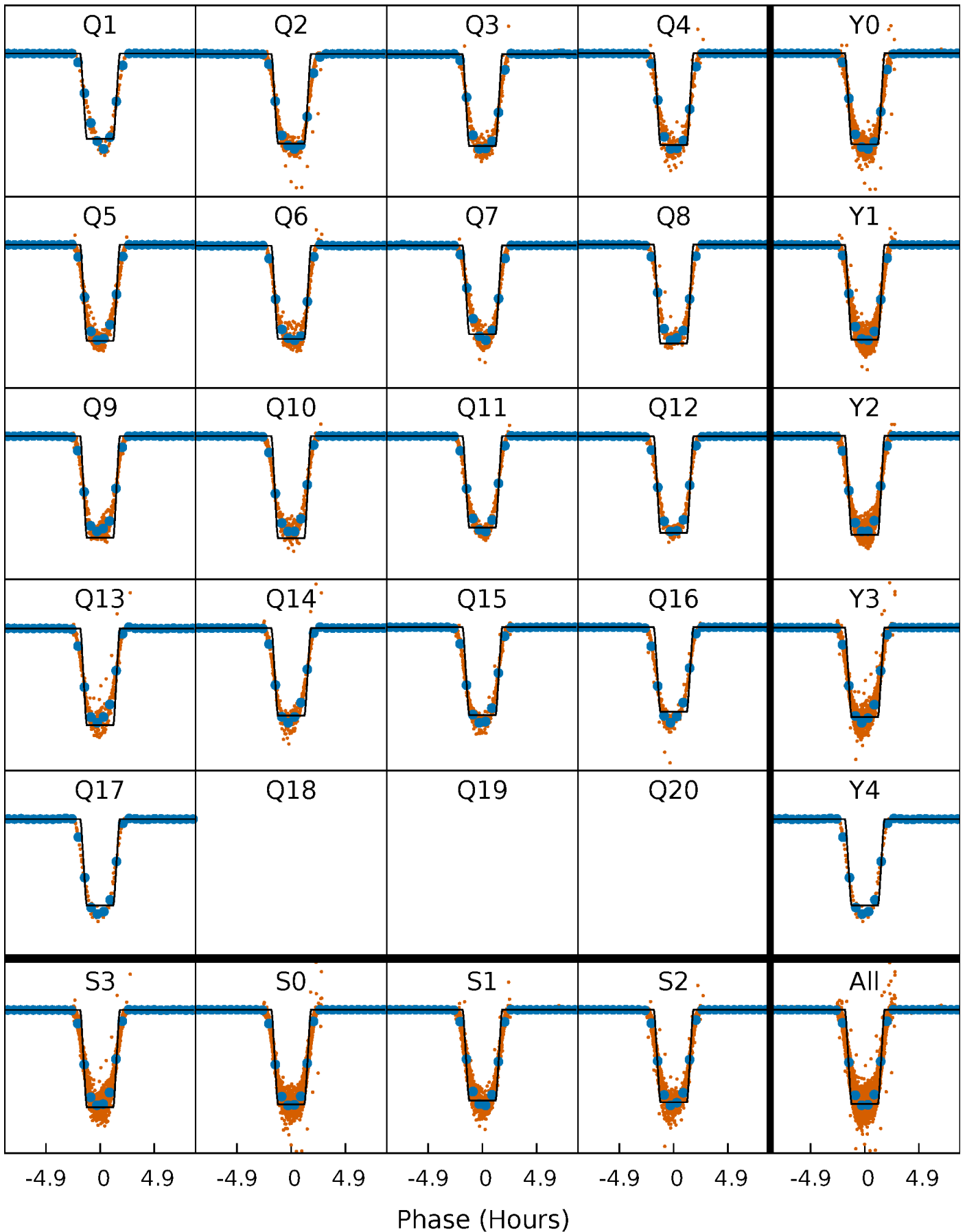
# DV Quarter-Phased Transit Curves

TCE 009655129-01 P= 2.743997 Days  $T_0=133.759414$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

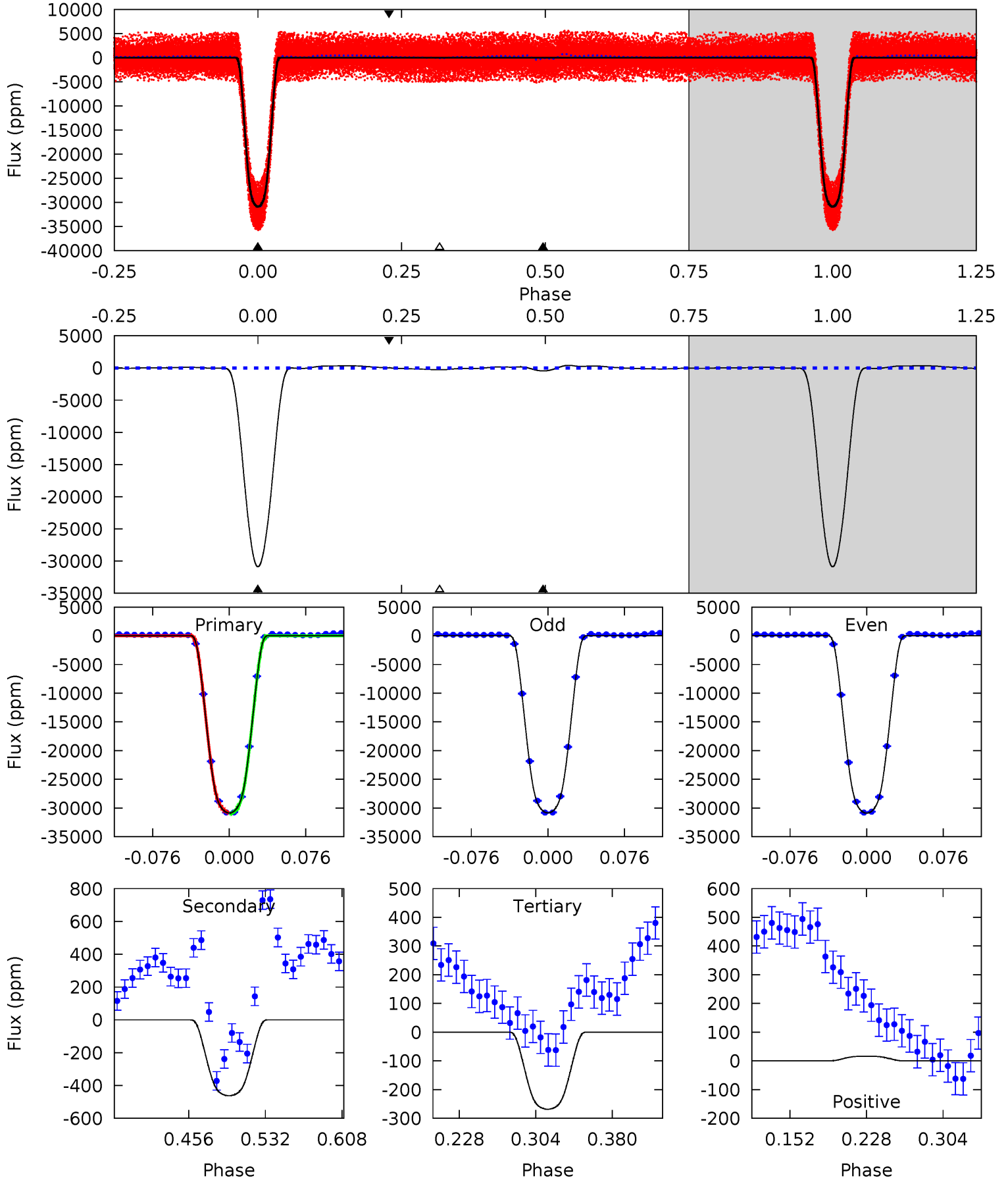
TCE 009655129-01 P= 2.744019 Days  $T_0=133.753879$  (BKJD)



# DV Model-Shift Uniqueness Test

009655129-01, P = 2.743997 Days, E = 131.015417 Days

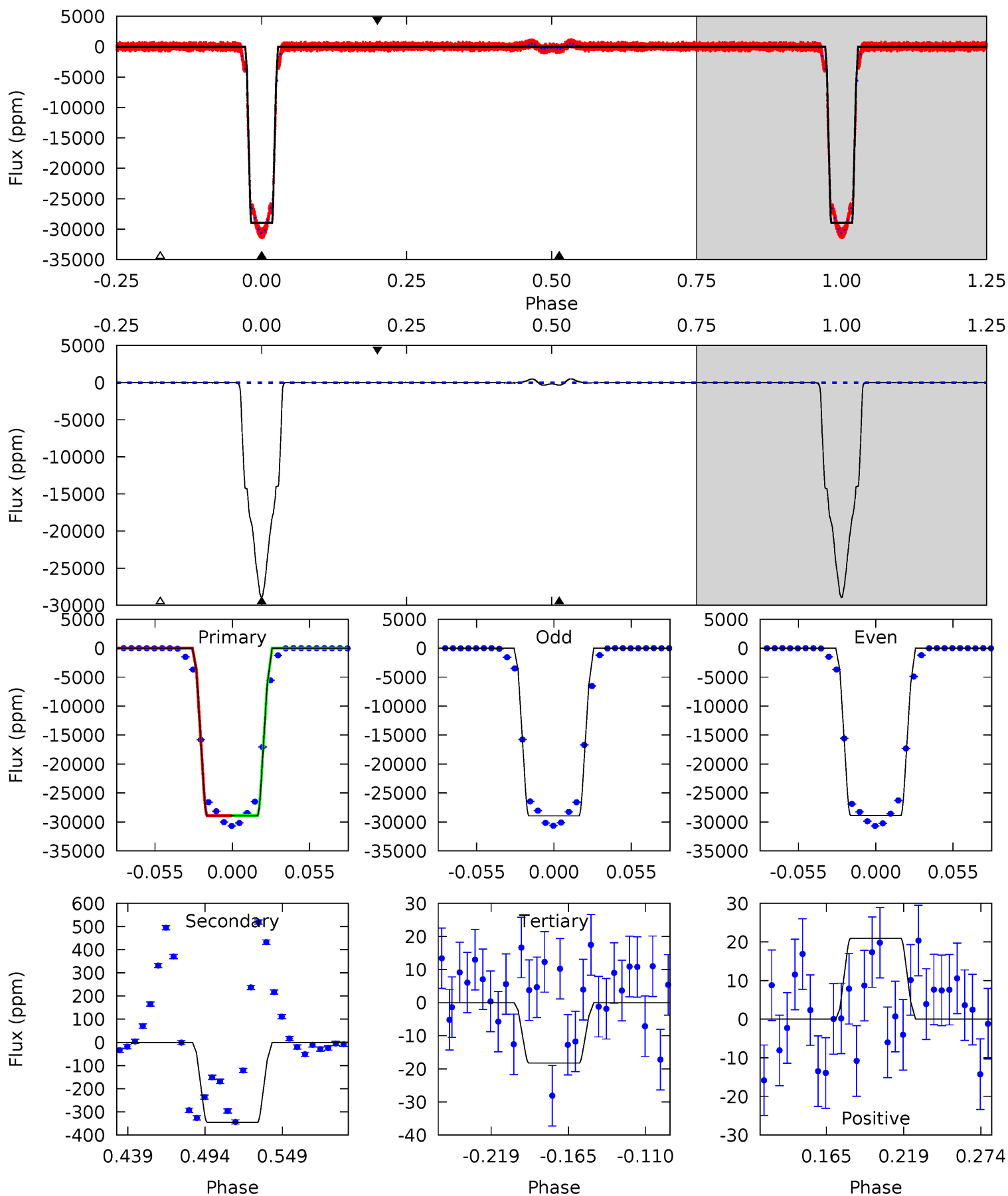
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1273	19.1	11.1	0.67	4.62	1.77	6.58	1262	1272	8.00	18.4	0.91	0.97	0.01	0



# Alt Model-Shift Uniqueness Test

009655129-01, P = 2.744019 Days, E = 131.009860 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
3944	47.1	2.49	2.85	4.69	1.92	2.91	3942	3942	44.6	44.3	3.44	1.00	0.02	0



### Stellar Parameters For KIC 009655129

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5334^{+159}_{-143}$	$4.492^{+0.110}_{-0.099}$	$-0.320^{+0.350}_{-0.300}$	$0.810^{+0.121}_{-0.110}$	$0.743^{+0.110}_{-0.055}$	$1.972^{+0.902}_{-0.617}$
	+3%/-3%	+2%/-2%	+109%/-94%	+15%/-14%	+15%/-7%	+46%/-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 009655129-01 / KOI 1714.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-462 \pm 24$	$15.72^{+1.42}_{-1.20}$	$1585^{+76}_{-74}$	$2554^{+48}_{-50}$	$1.257^{+0.212}_{-0.192}$
Alt.	$-346 \pm 7$	$15.47^{+1.36}_{-1.32}$	$1582^{+74}_{-77}$	$2450^{+46}_{-46}$	$0.976^{+0.176}_{-0.139}$

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



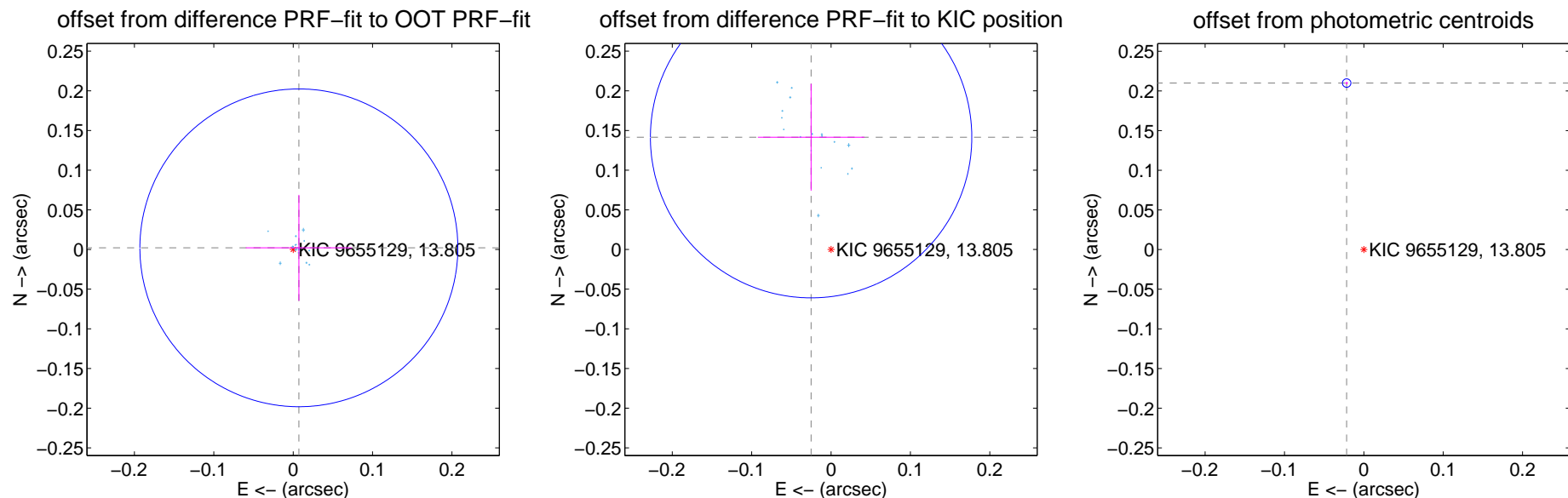
## DV Centroid Data

Supplemental centroid analysis for 009655129-01. Kepler magnitude: 13.80. Transit SNR 821.51

There are 17 quarters with good PRF difference image offsets

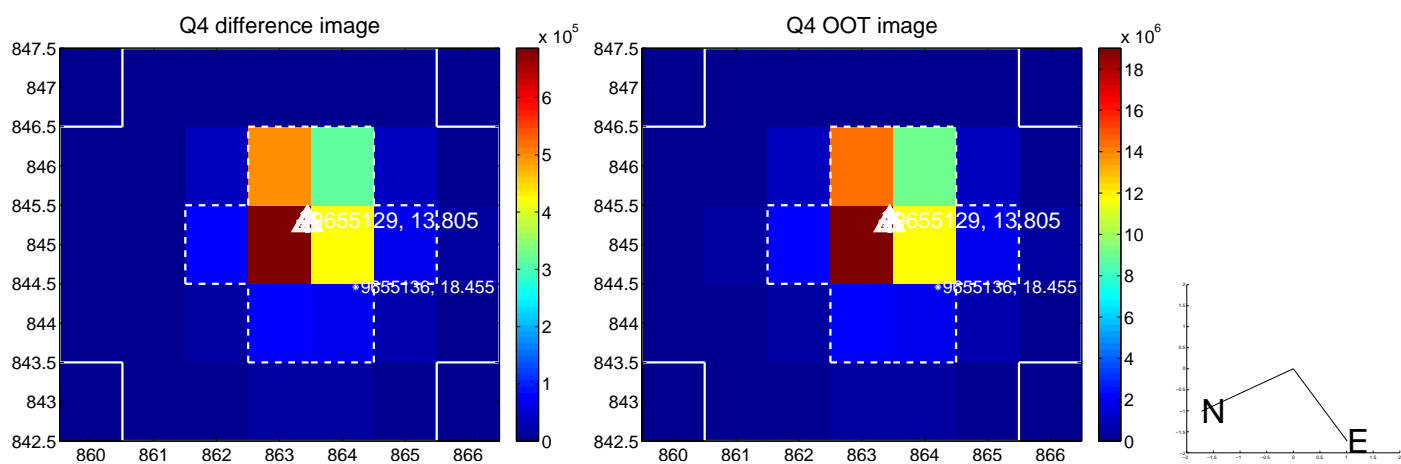
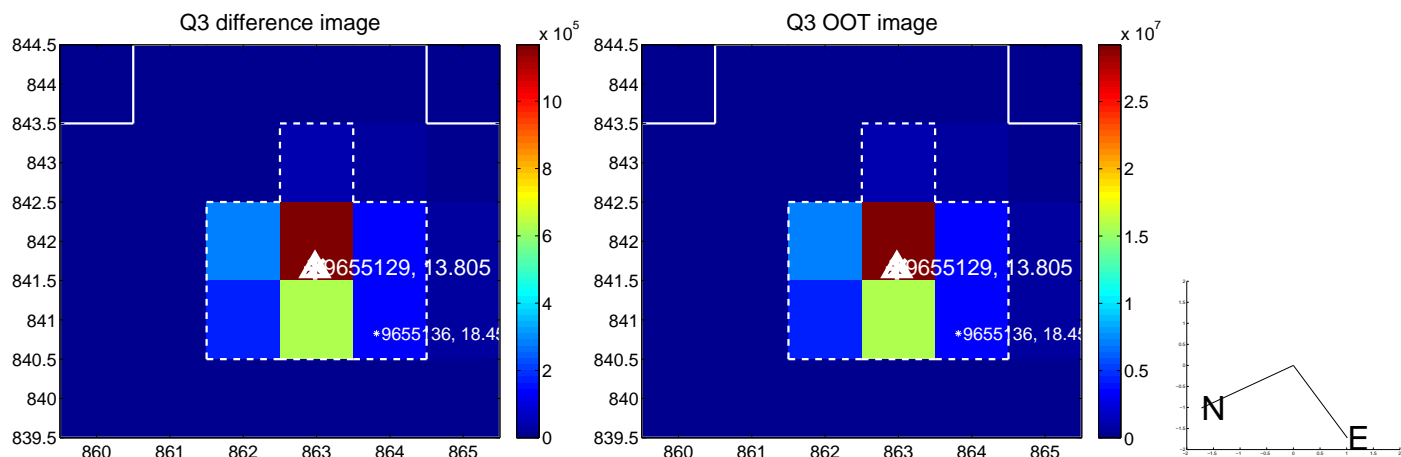
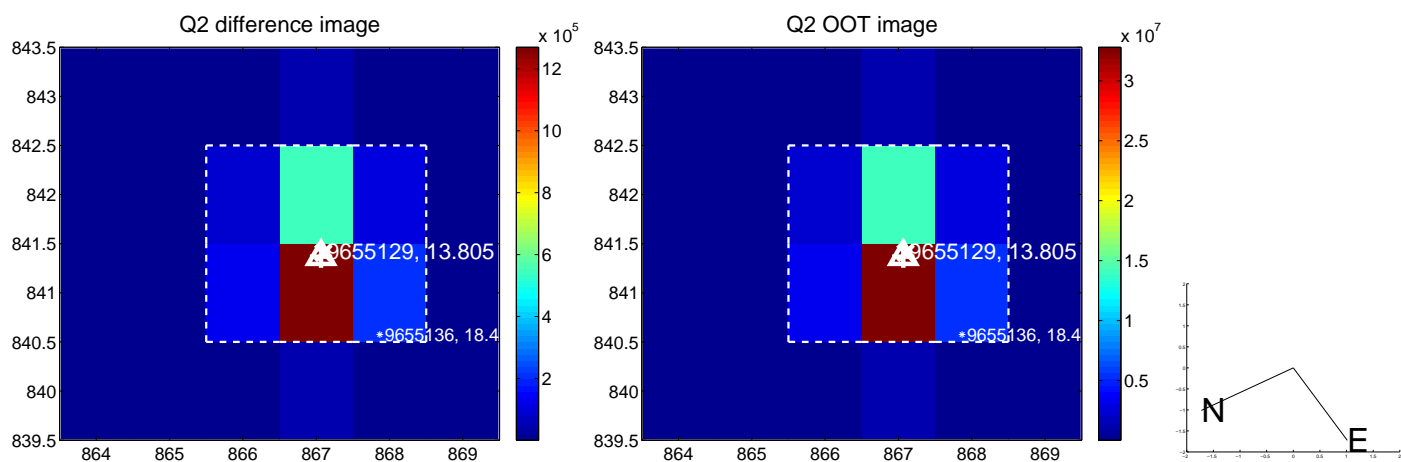
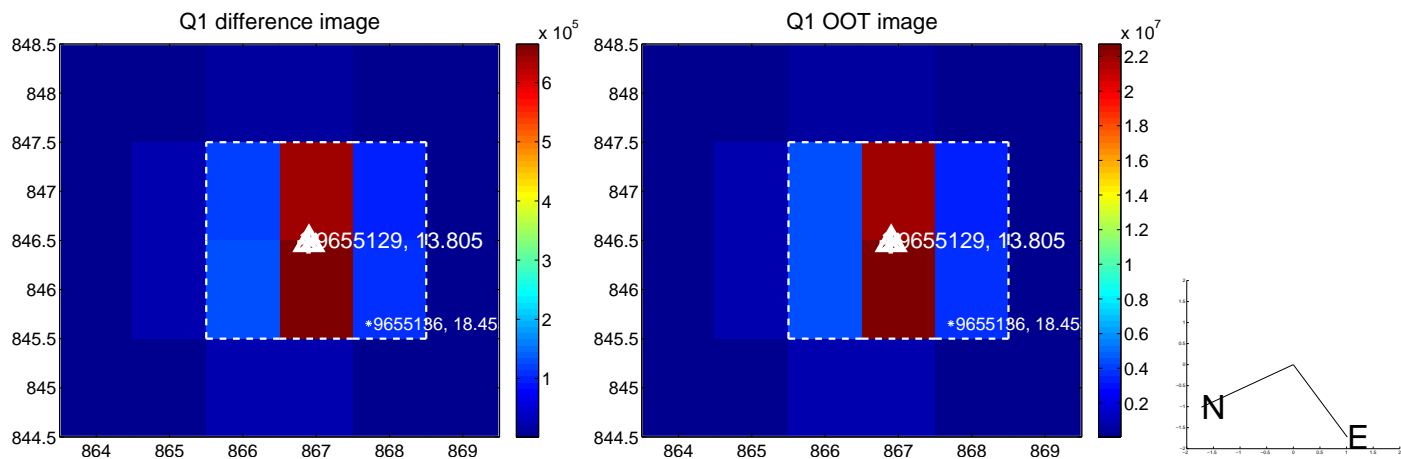
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.007 \pm 0.067$	0.11	$-0.007 \pm 0.067$	$0.002 \pm 0.067$
PRF-fit source offset from KIC position	$0.144 \pm 0.067$	2.13	$0.025 \pm 0.067$	$0.142 \pm 0.067$
photometric centroid source offset	$0.21 \pm 0.00$	118.67	$0.02 \pm 0.00$	$0.21 \pm 0.00$

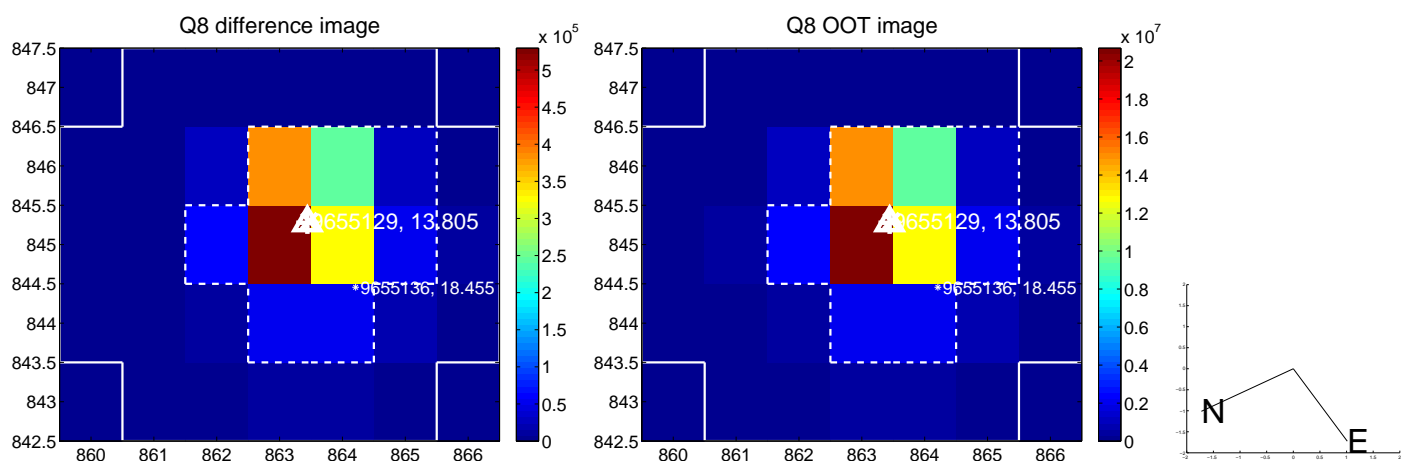
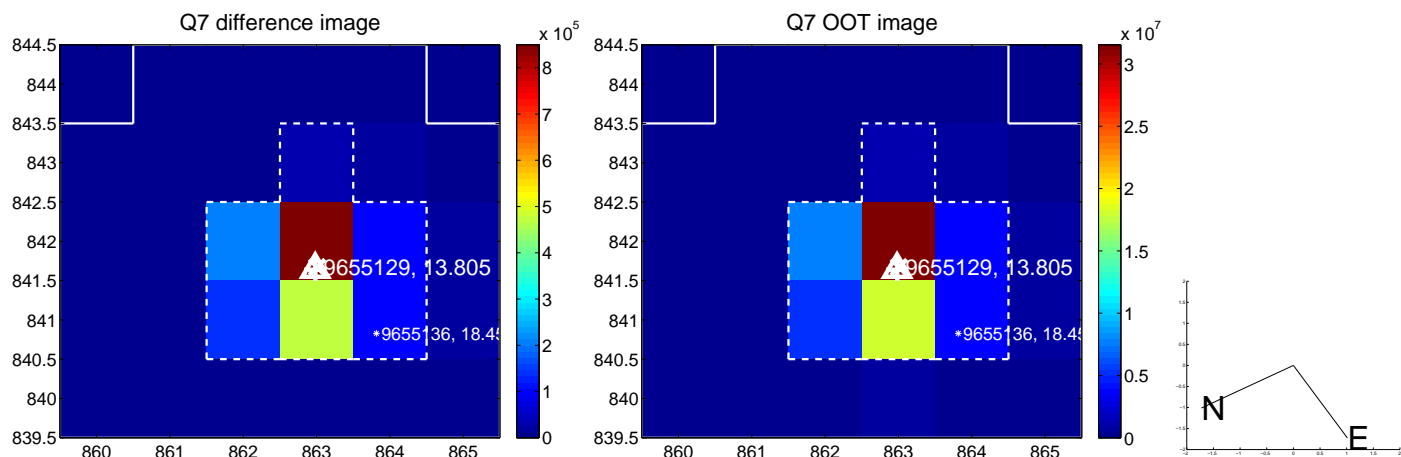
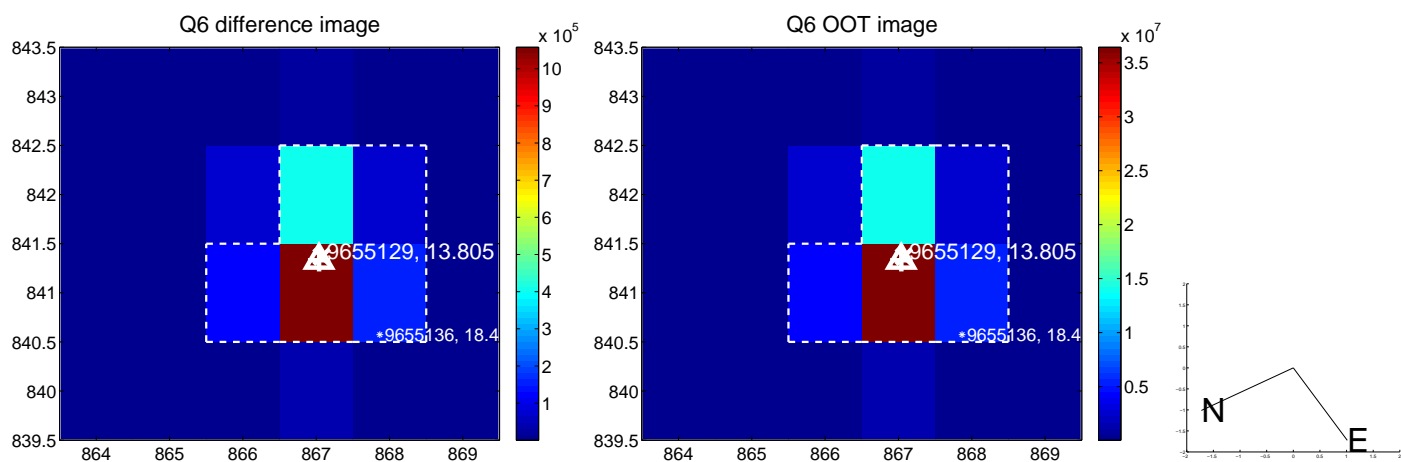
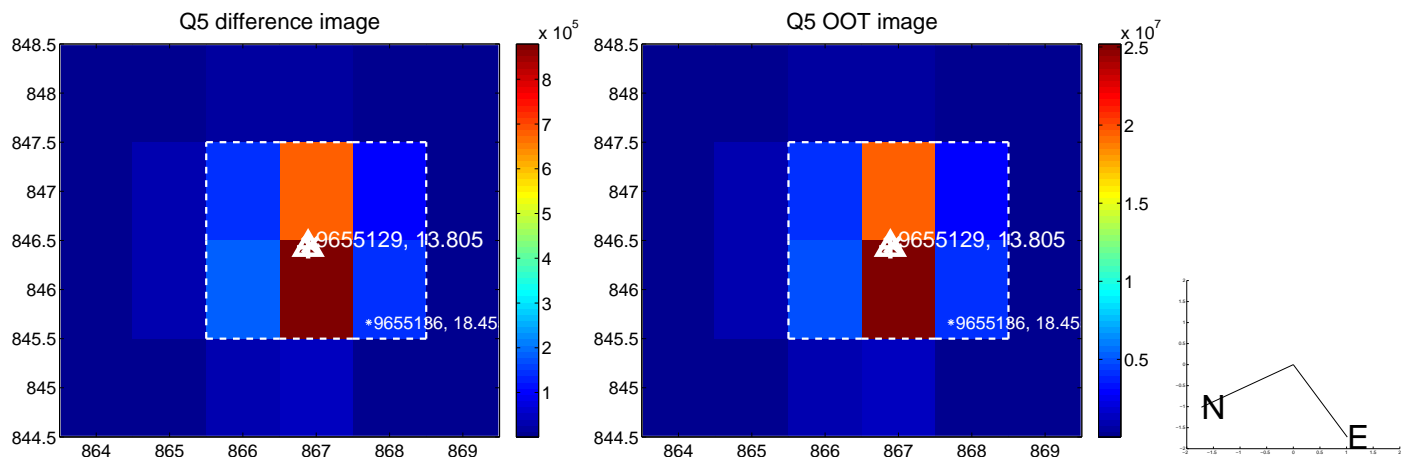


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

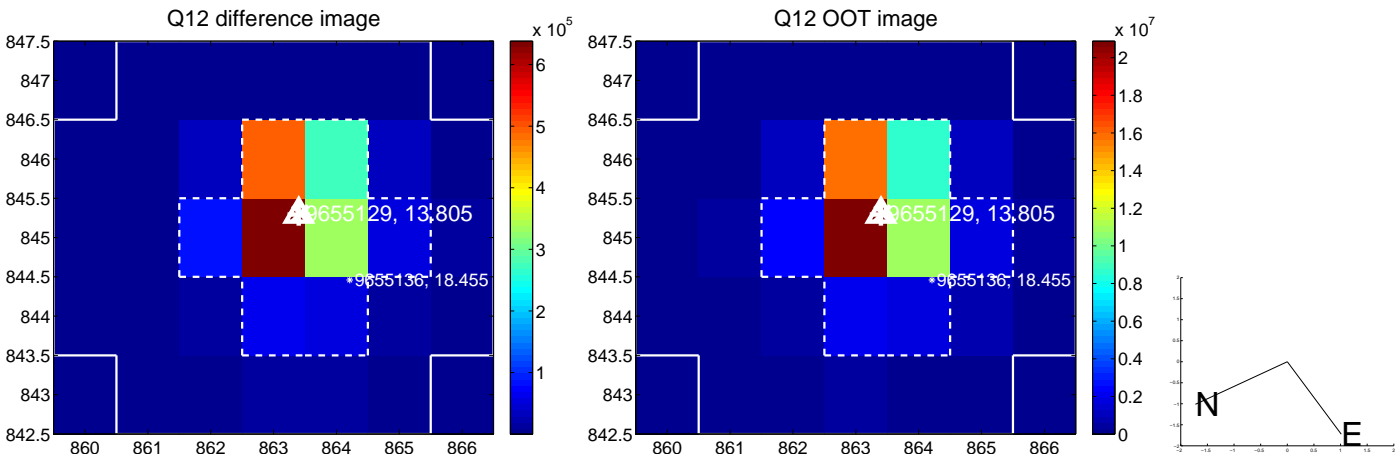
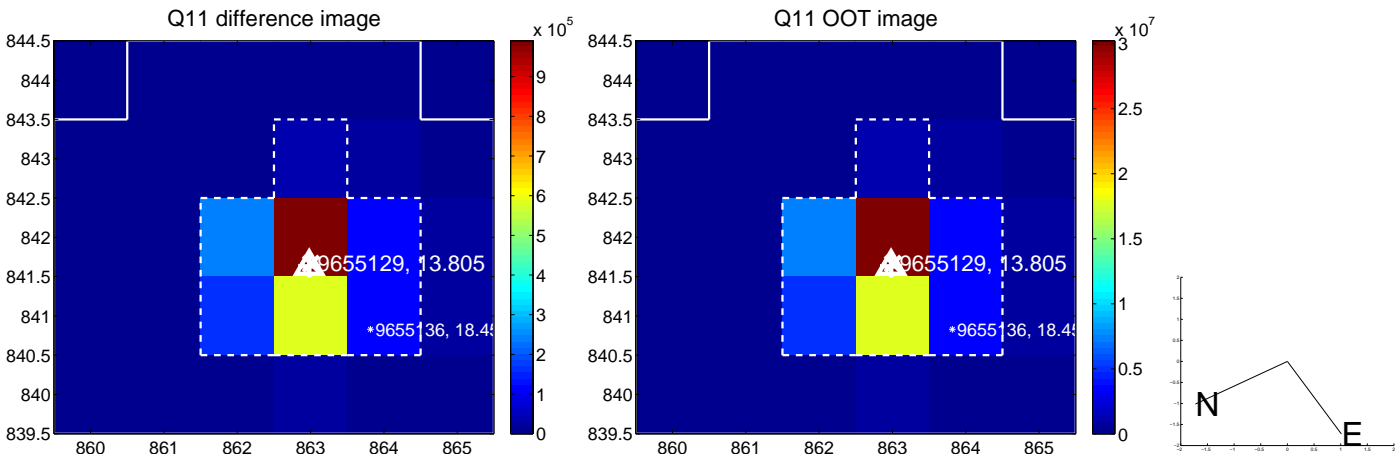
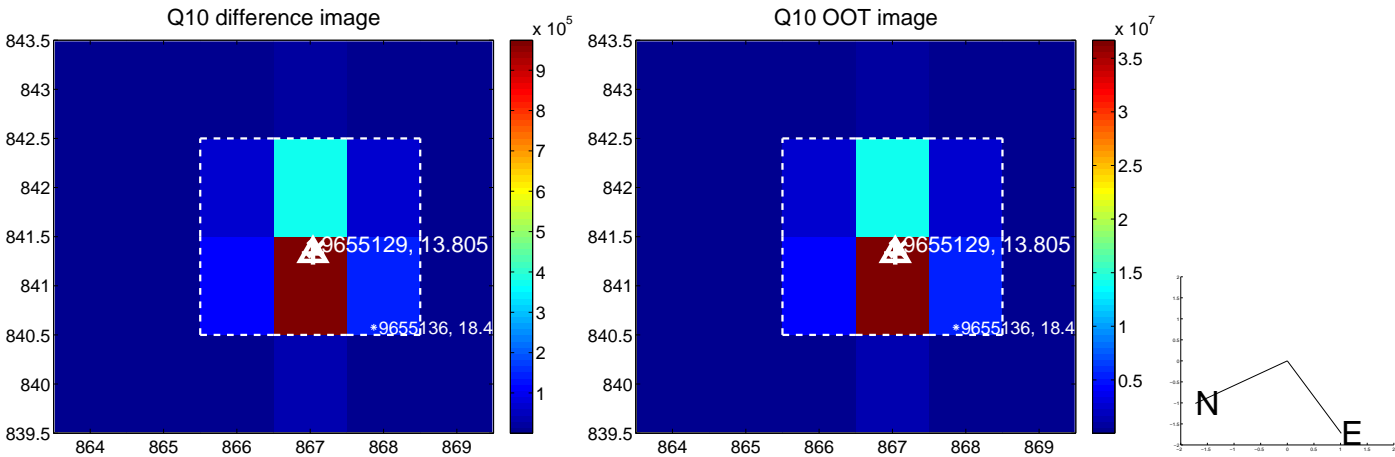
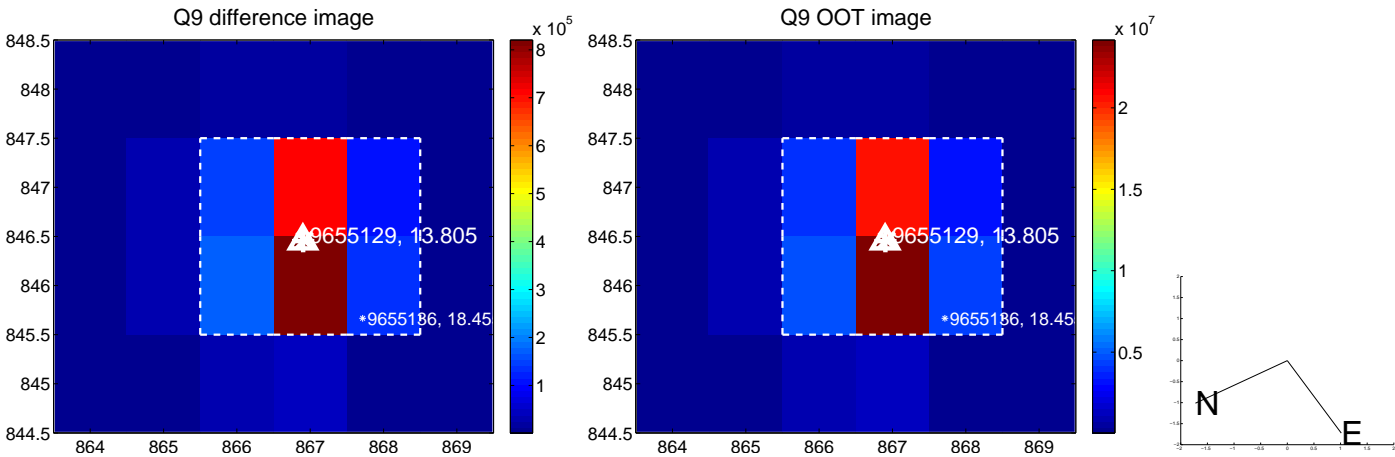
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



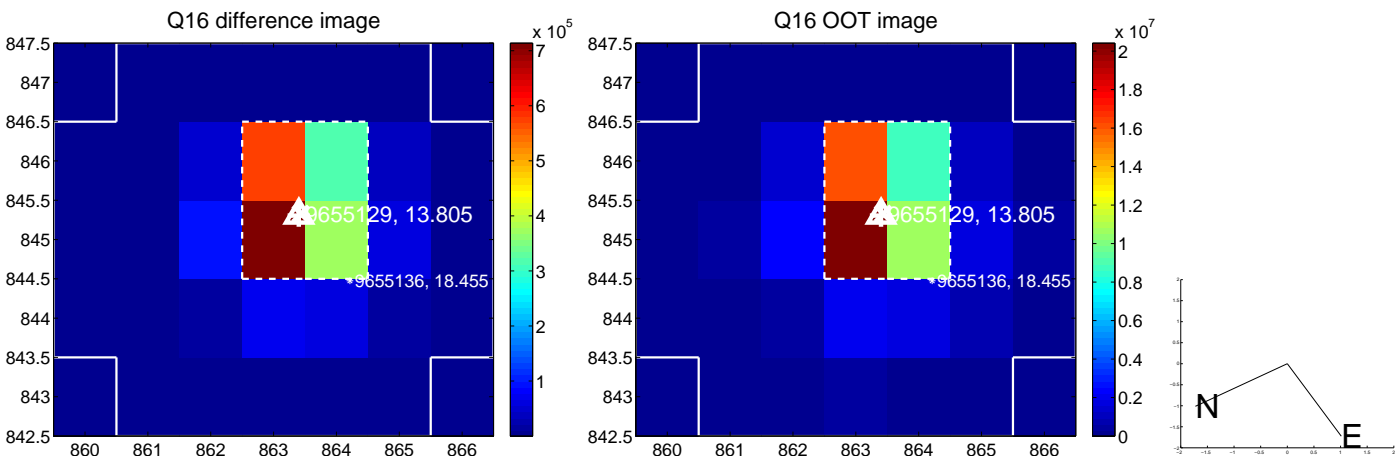
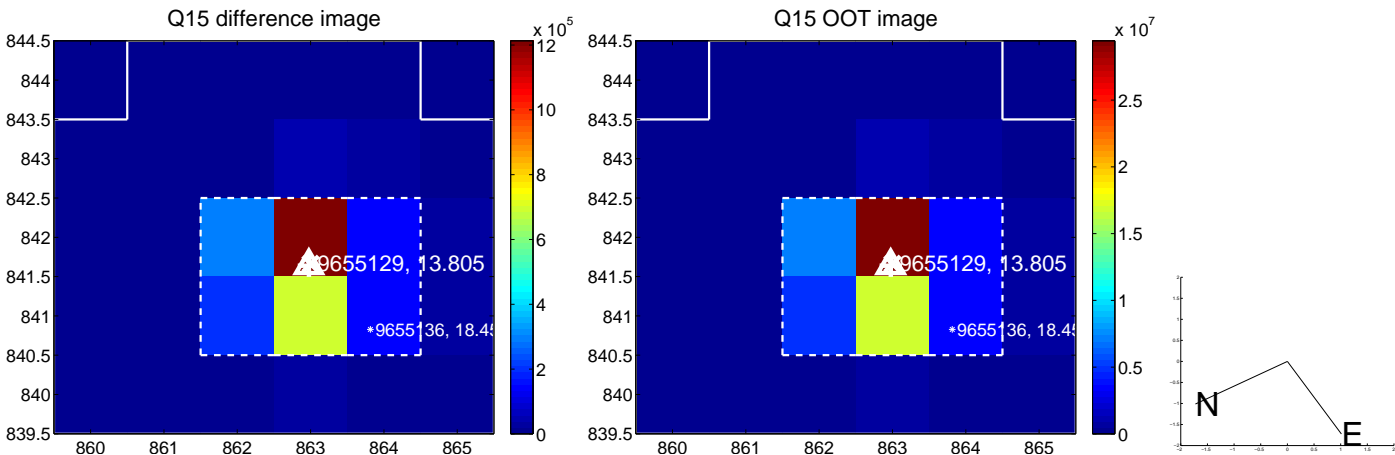
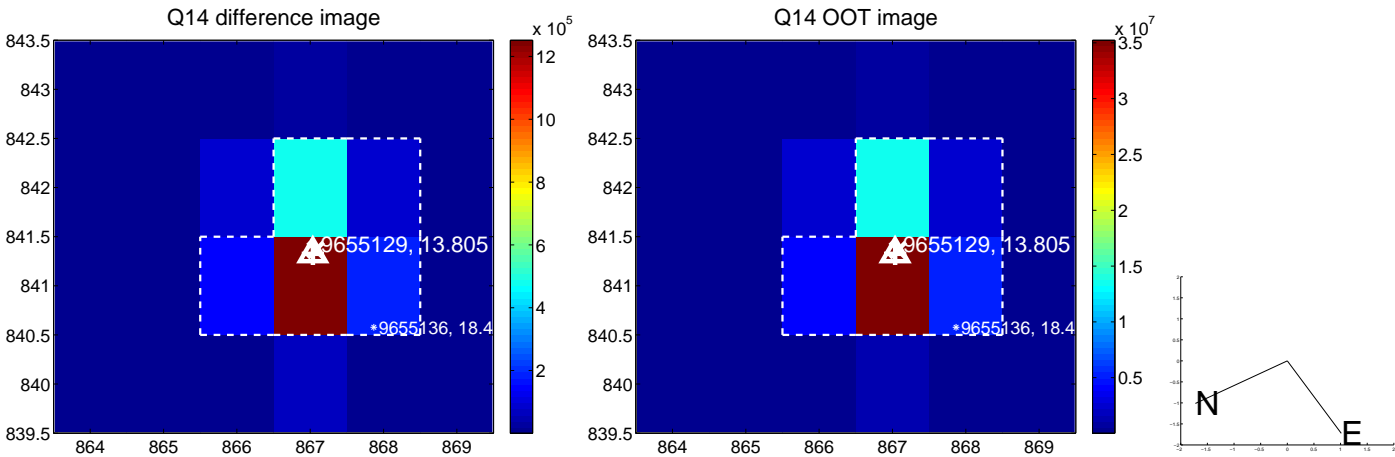
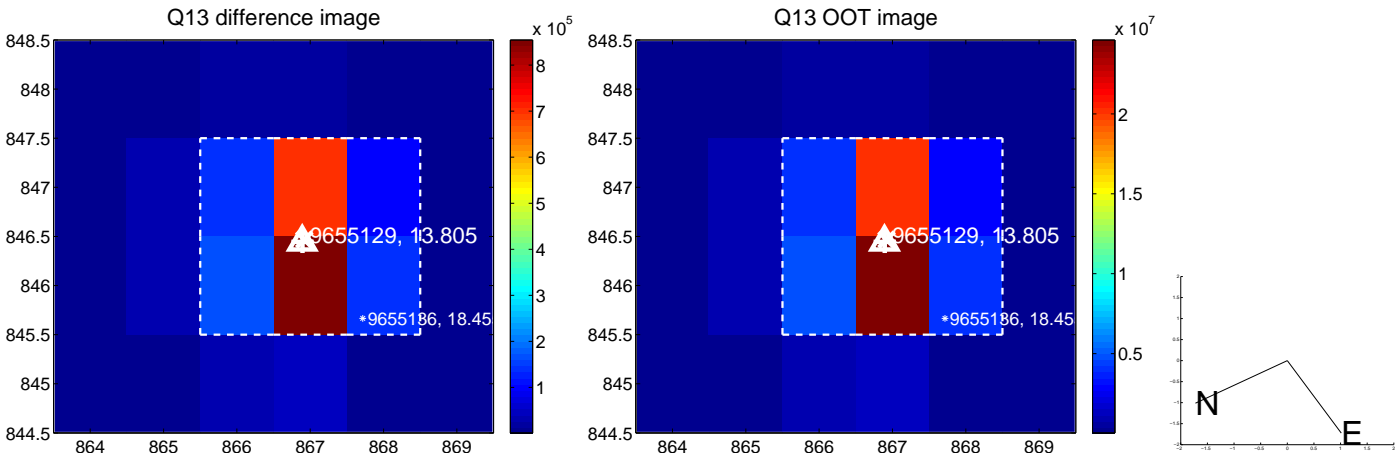
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

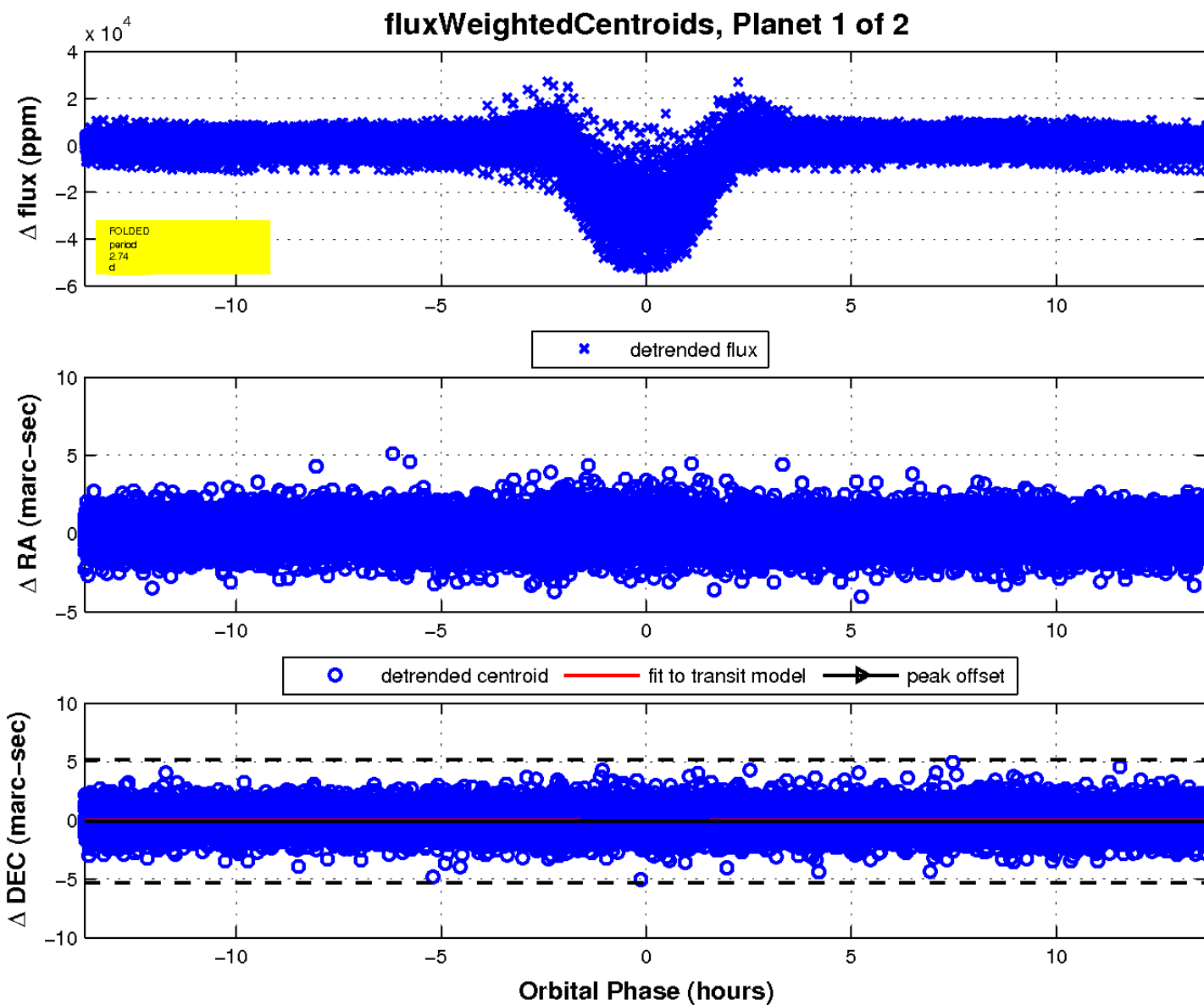
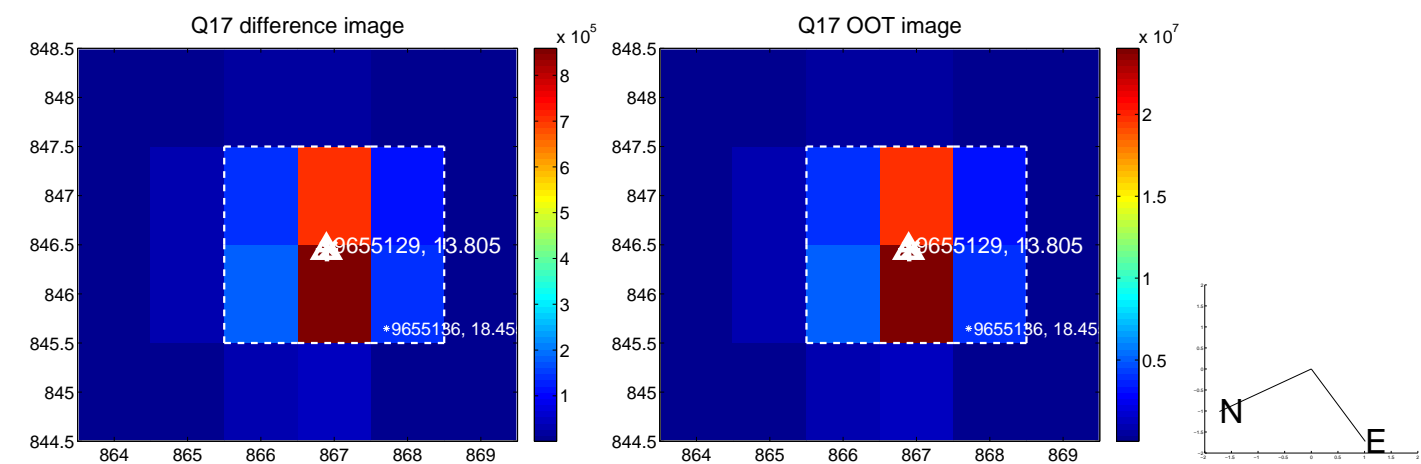


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



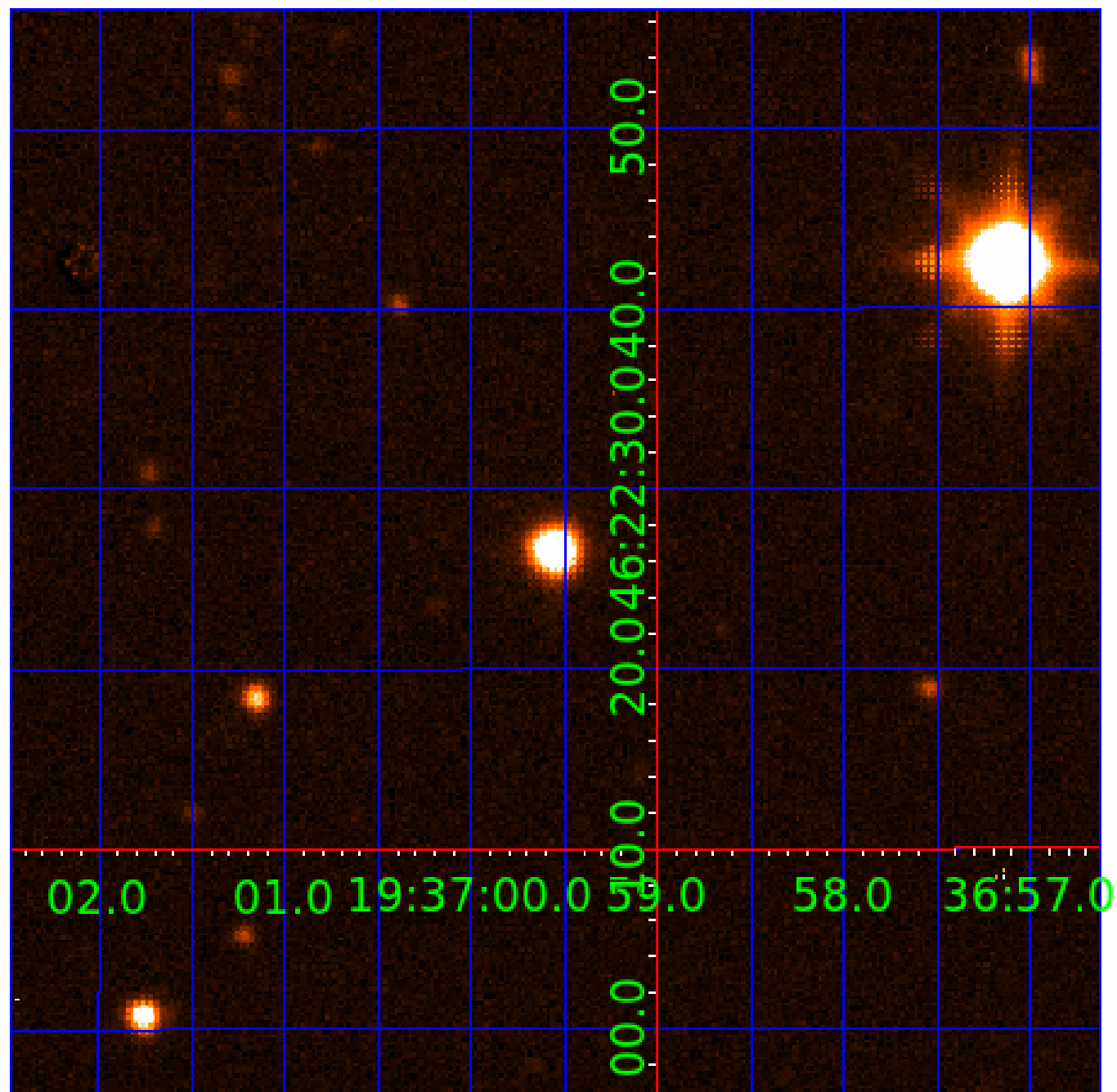


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 009655129

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009655129-01	OBS	1714.01	2.743997	133.759415	31028.5	4.567	1006.3	821.5	0.81	5334	15.68	394.08
009655129-02	OBS	No	2.744002	132.384130	1214.3	4.034	53.0	56.2	0.81	5334	3.39	394.08

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009655129-01	OBS	PC	0.55	0	1	0	0	SWEET_EB—MOD_SEC_ALT—PLANET_OCCULT_ALT—HAS_SEC_TCE
009655129-02	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 009655129-02

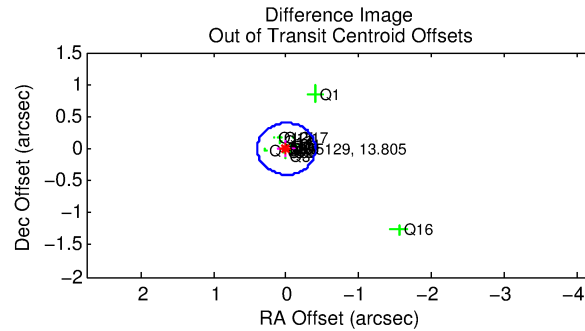
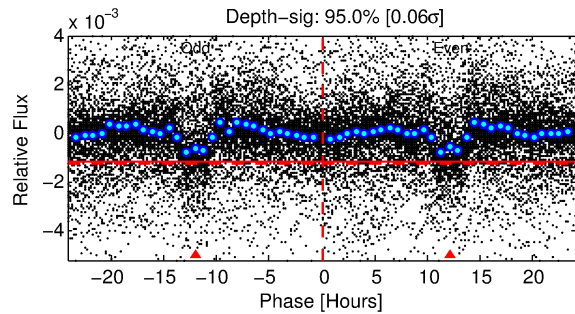
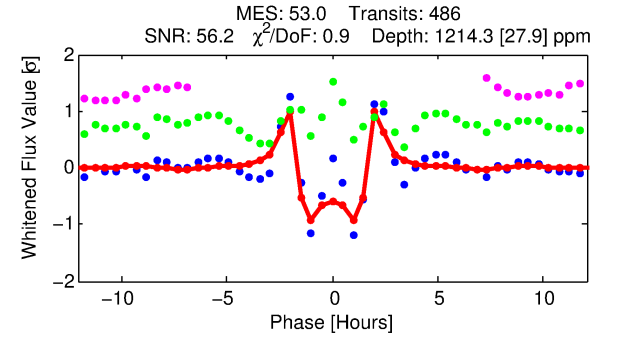
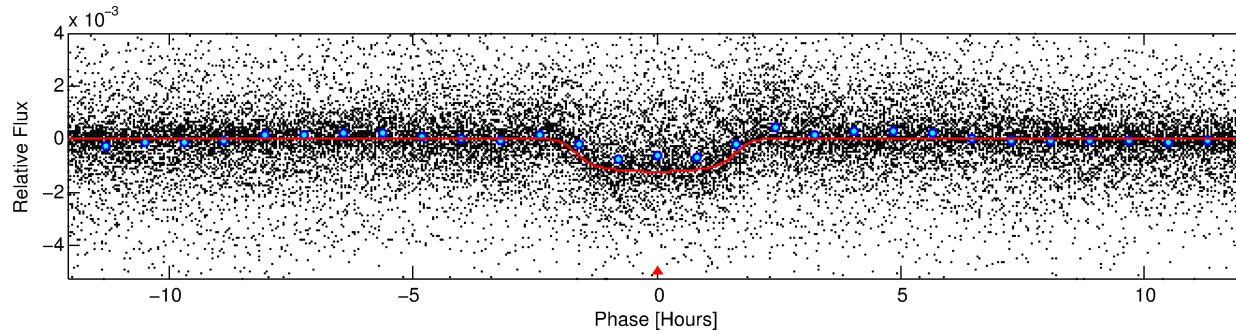
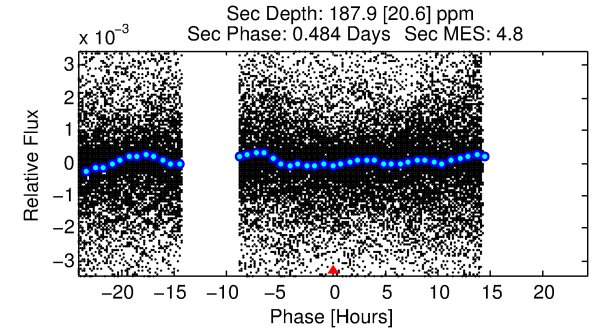
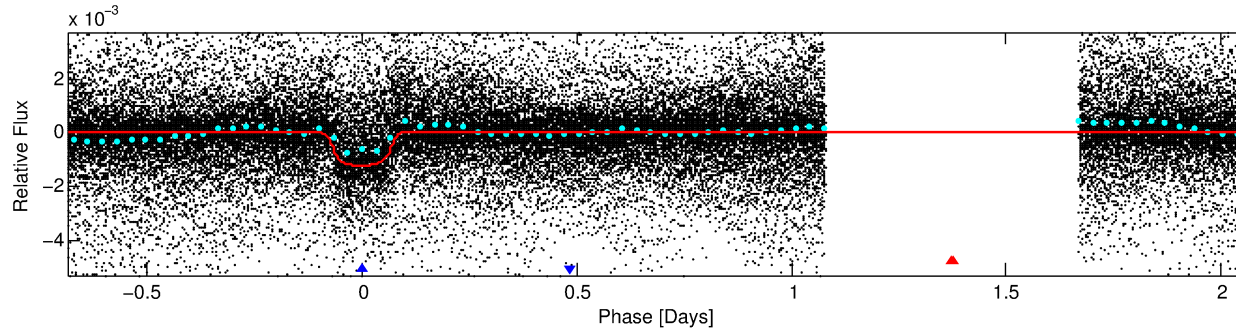
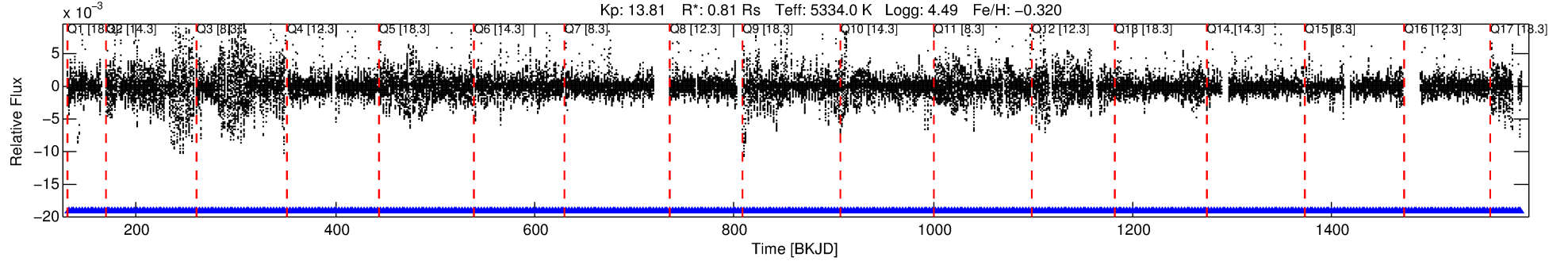
No Significant Match Found

# DV One-Page Summary

KIC: 9655129 Candidate: 2 of 2 Period: 2.744 d

KOI: K01714 Corr: No Ephemeris Match

Kp: 13.81 R\*: 0.81 Rs Teff: 5334.0 K Logg: 4.49 Fe/H: -0.320



## DV Fit Results:

Period = 2.74400 [0.00000] d  
Epoch = 132.3841 [0.0004] BKJD  
Rp/R\* = 0.0384 [0.0005]  
a/R\* = 2.85 [0.07]  
b = 0.90 [0.01]  
Seff = 394.08 [90.42]  
Teq = 1136 [65] K  
Rp = 3.39 [0.51] Re  
a = 0.0347 [0.0045] AU  
Ag = 10.86 [2.46] [4.01σ]  
Teffp = 3189 [131] K [14.01σ]

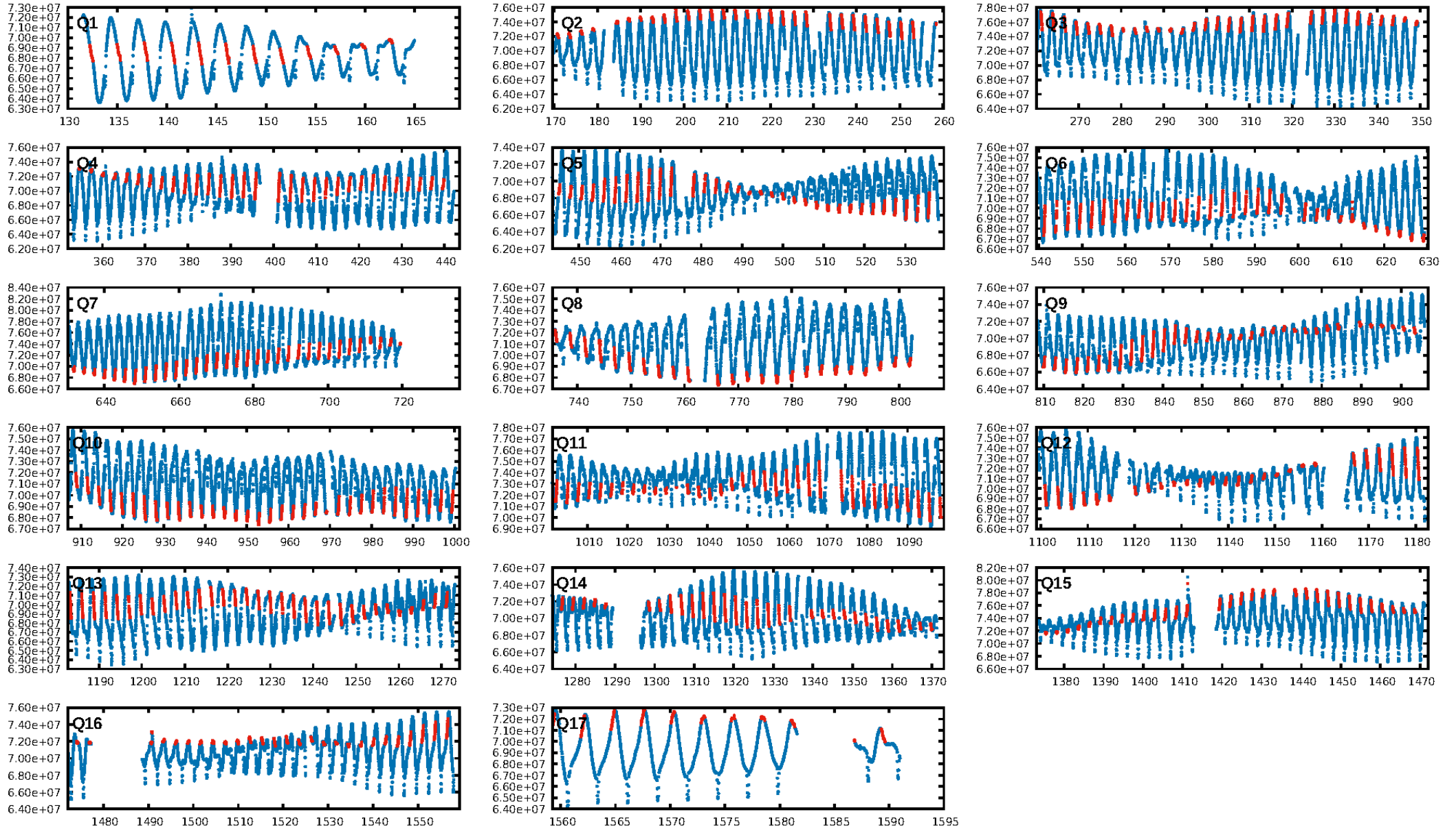
## DV Diagnostic Results:

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 [464/464]  
GhostDiagnostic-chr: 0.8613  
Centroid-sig: N/A  
Centroid-so: 0.270 arcsec [6.25σ]  
OotOffset-rm: 0.003 arcsec [0.02σ]  
KicOffset-rm: 0.162 arcsec [1.37σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.76 [13/17]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 01:21:50 Z

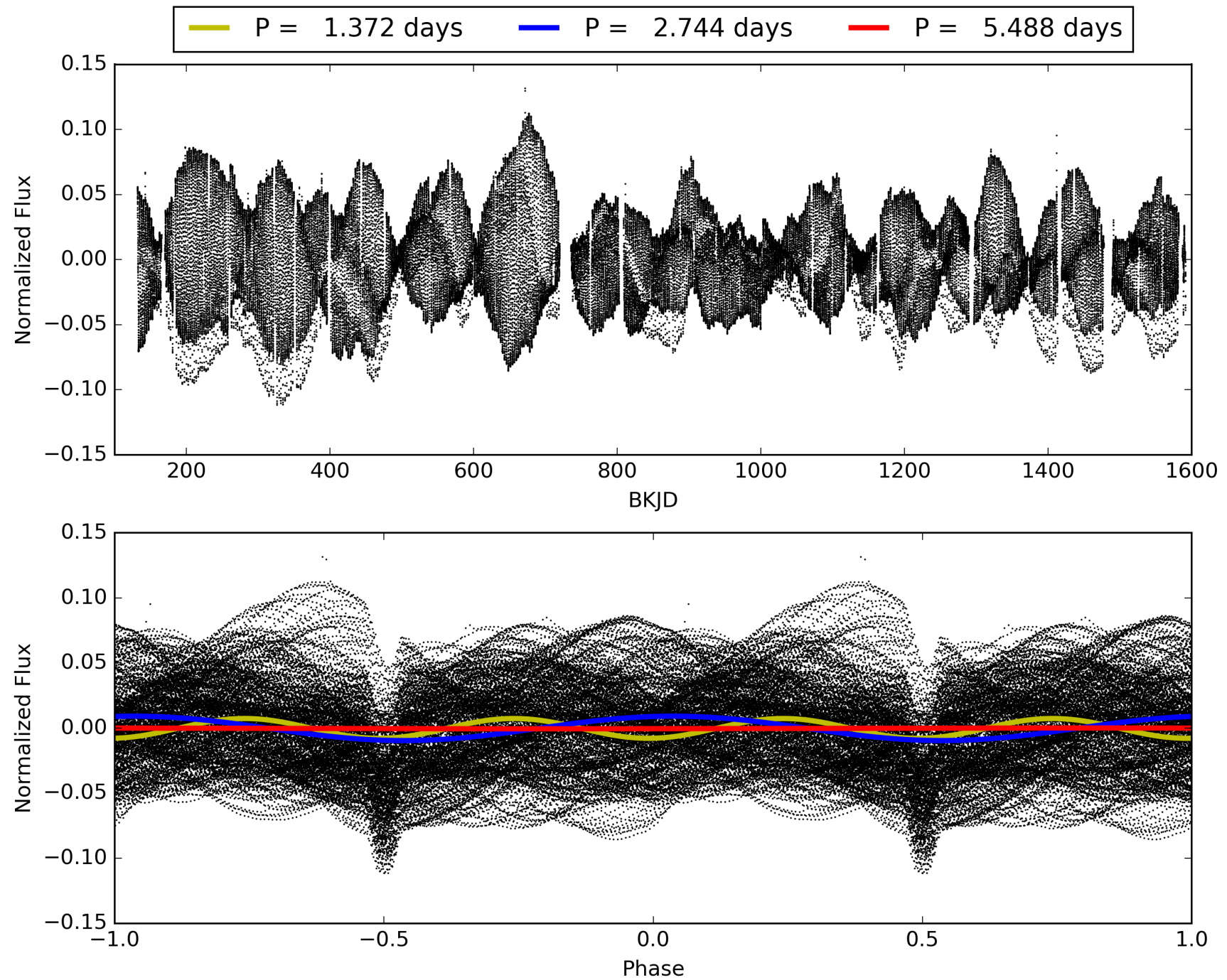
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 009655129-02, PDC Light Curves



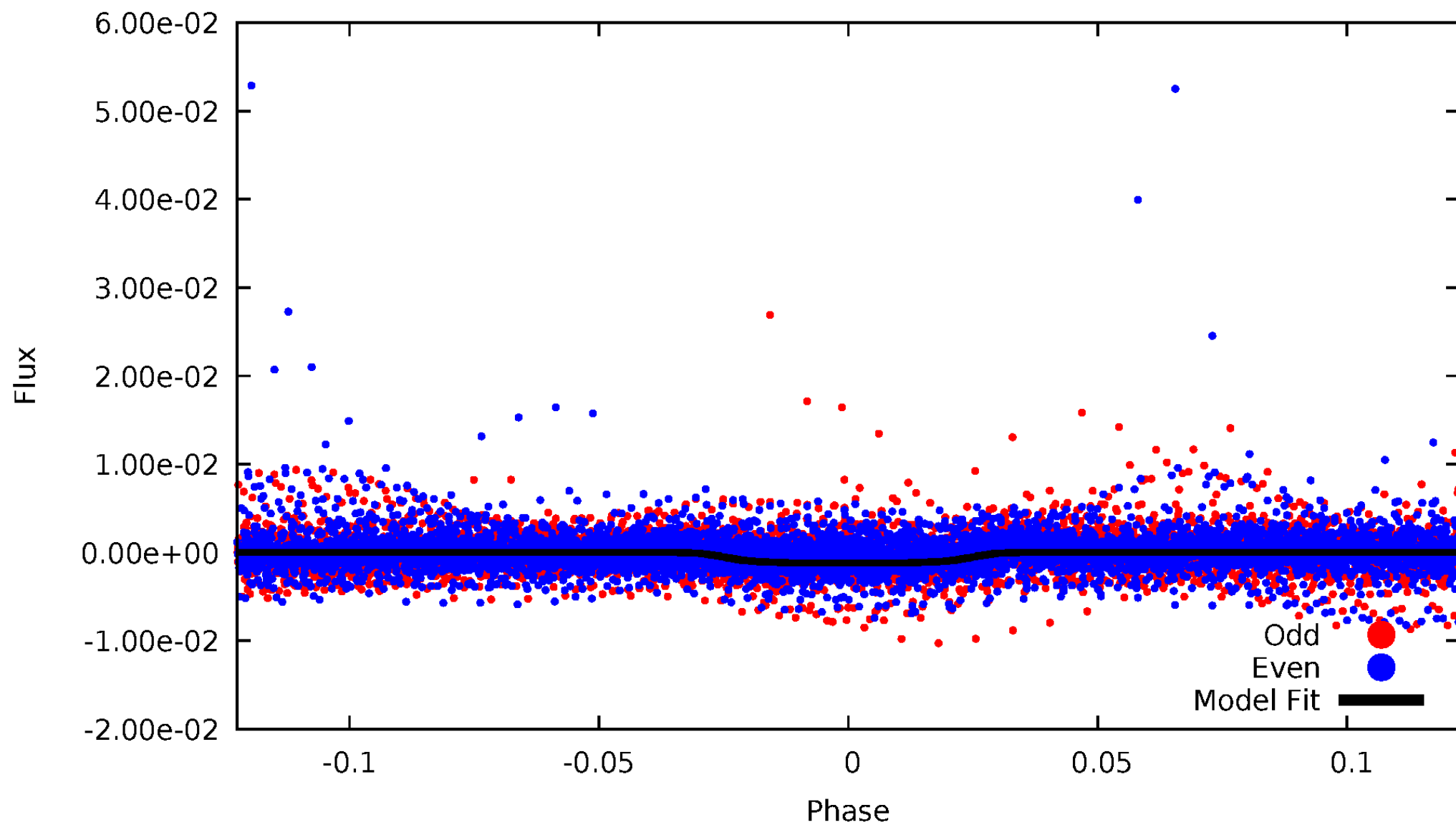


TCE 009655129-02



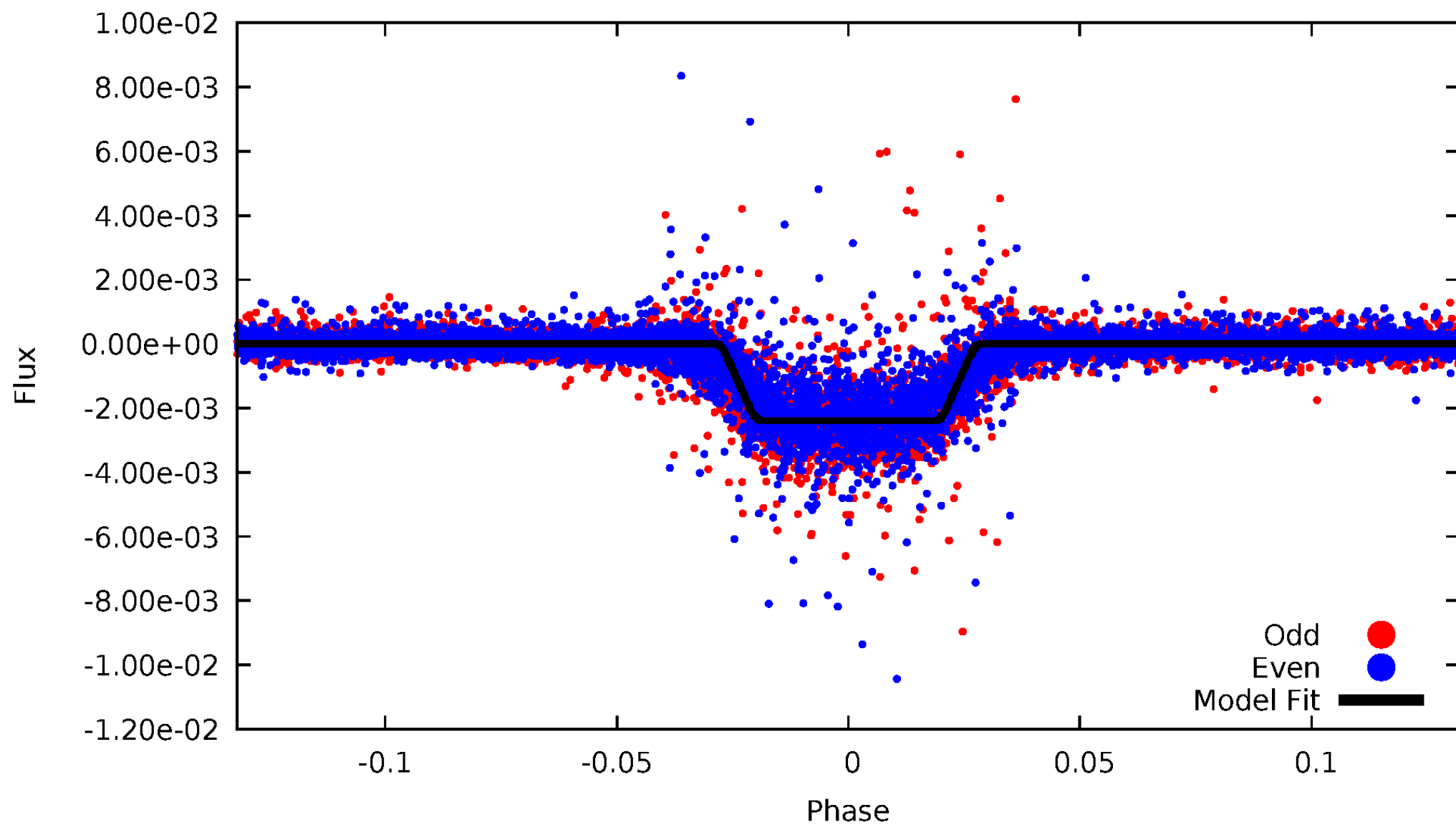
# DV Odd/Even

TCE 009655129-02



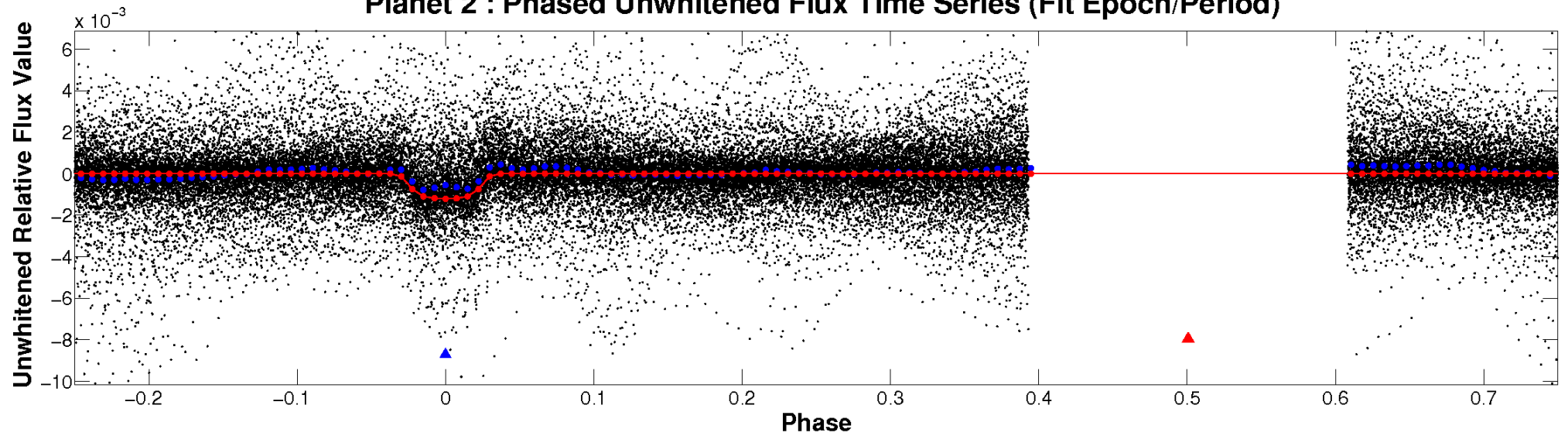
# ALT Odd/Even

TCE 009655129-02

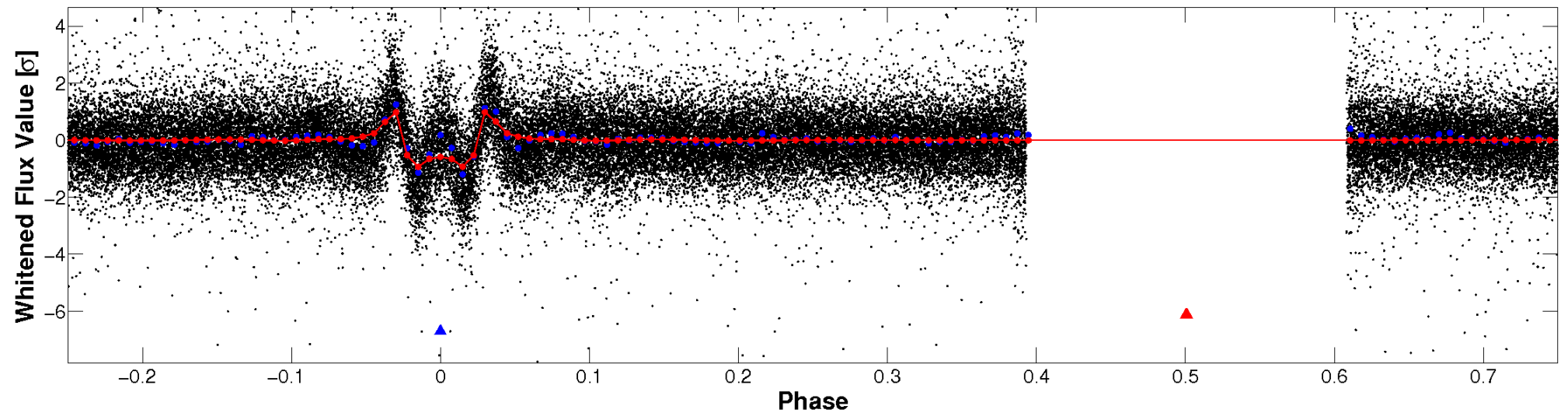


# Non-Whitened Vs. Whitened Light Curve

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



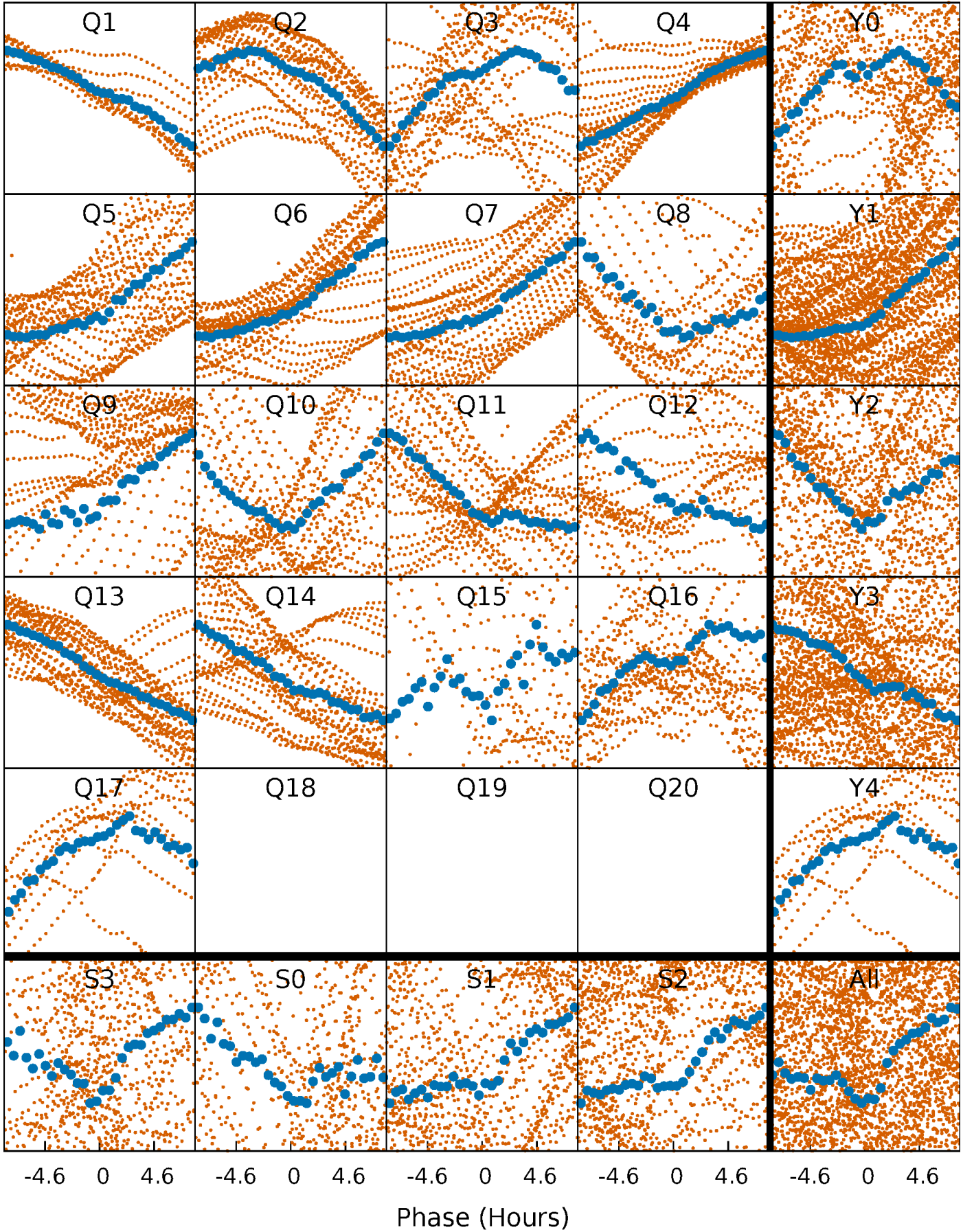
## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

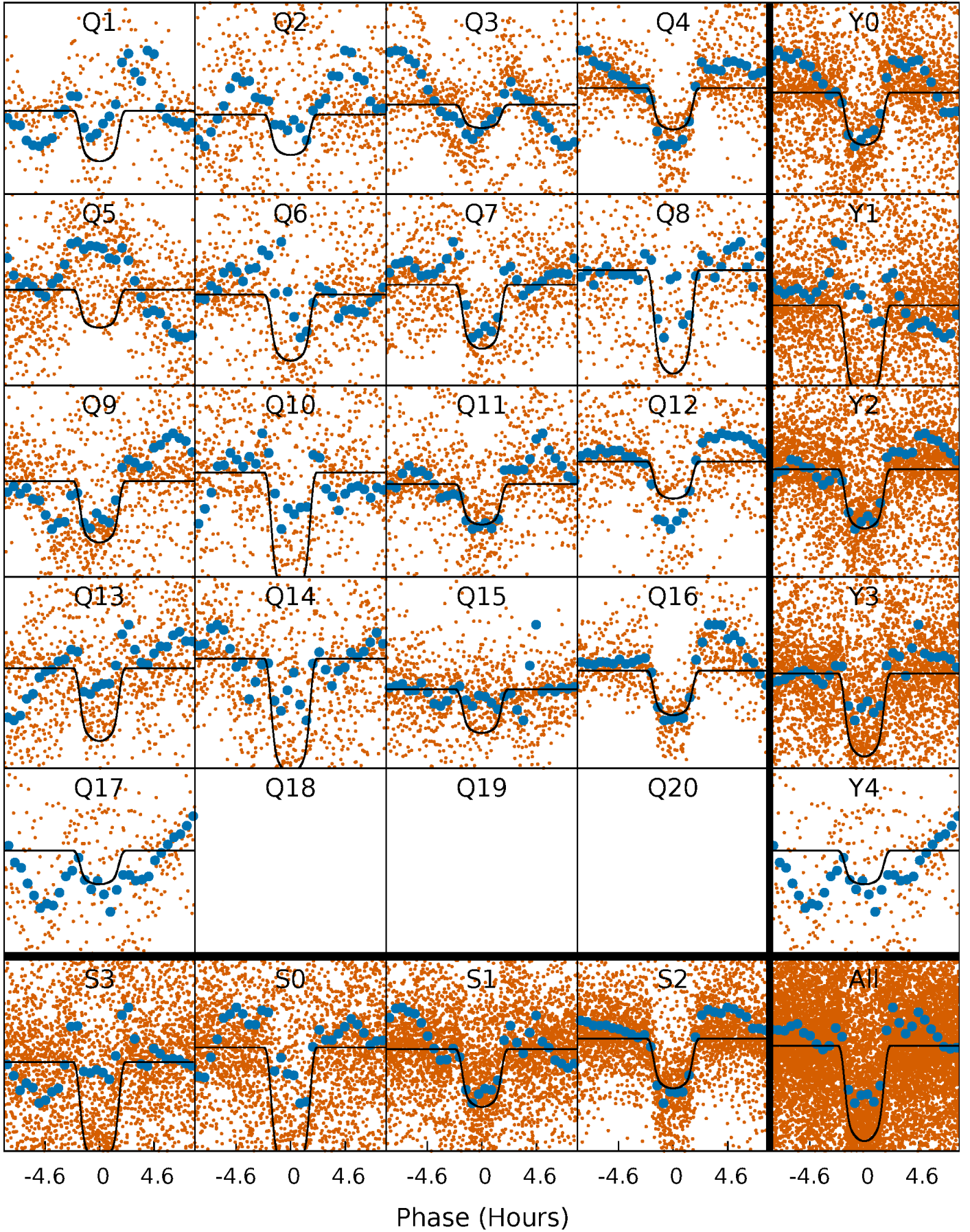
TCE 009655129-02 P= 2.744002 Days  $T_0=132.384130$  (BKJD)





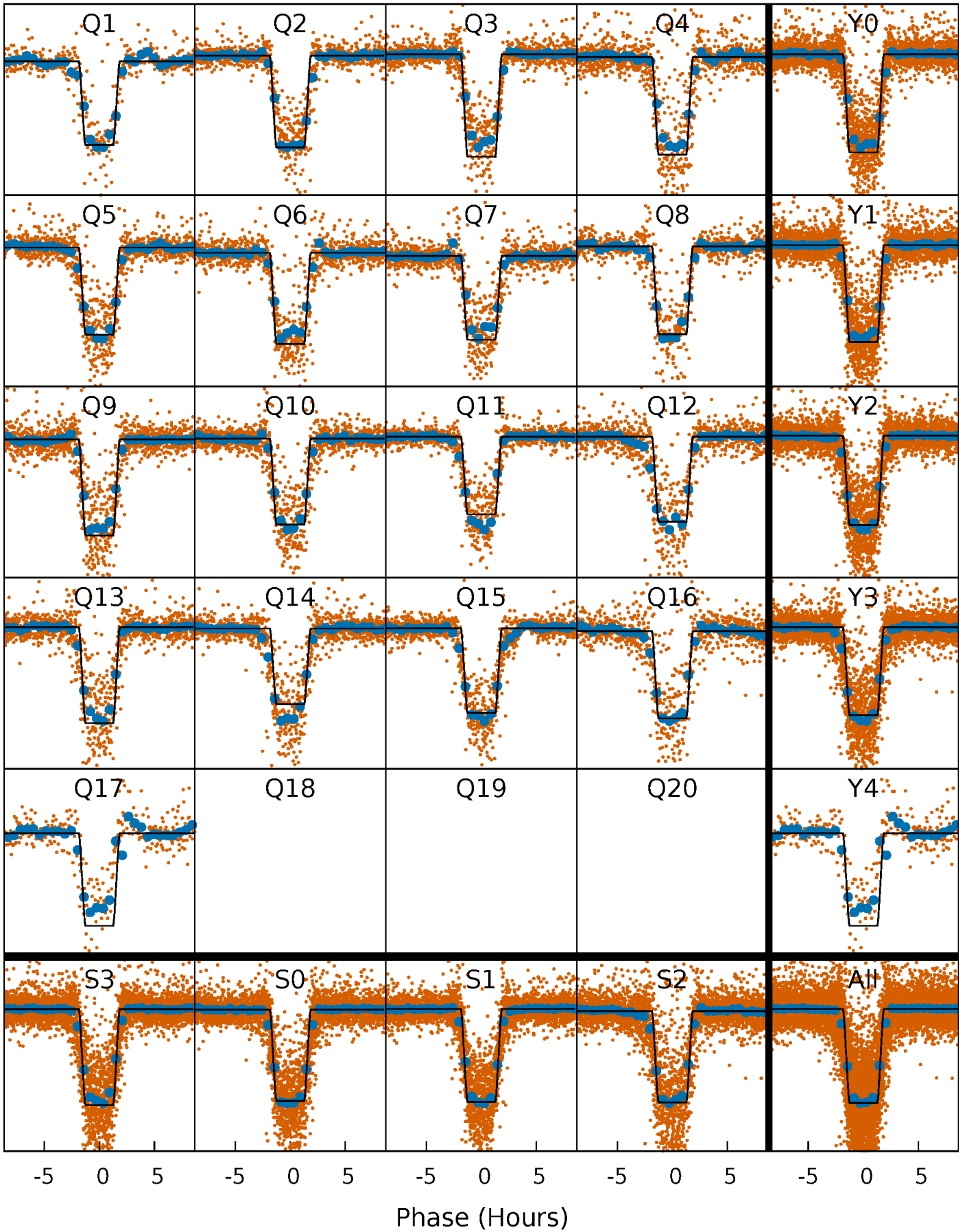
# DV Quarter-Phased Transit Curves

TCE 009655129-02   P= 2.744002 Days    $T_0=132.384130$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

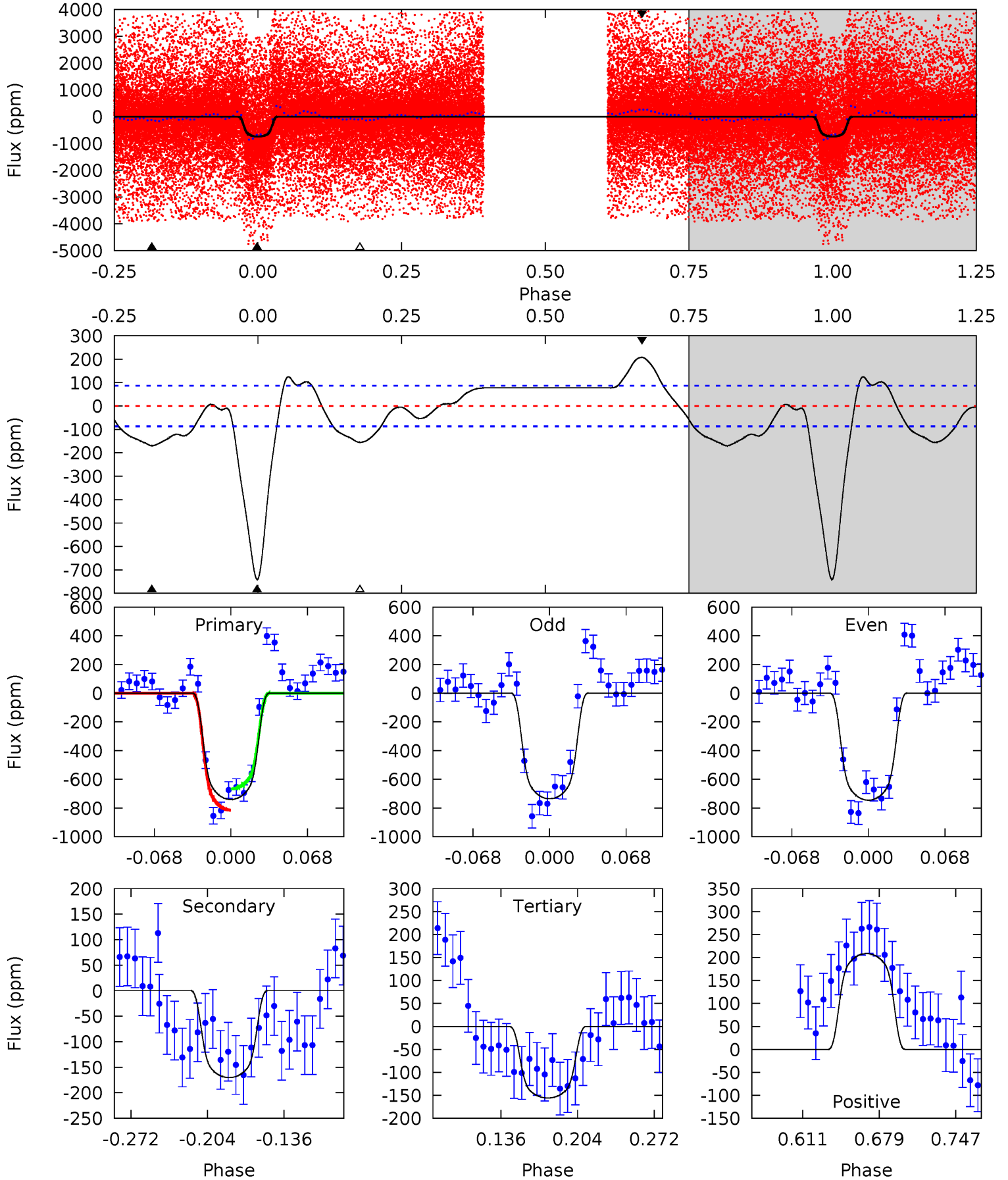
TCE 009655129-02   P= 2.744027 Days    $T_0=132.379298$  (BKJD)



# DV Model-Shift Uniqueness Test

009655129-02, P = 2.744002 Days, E = 129.640128 Days

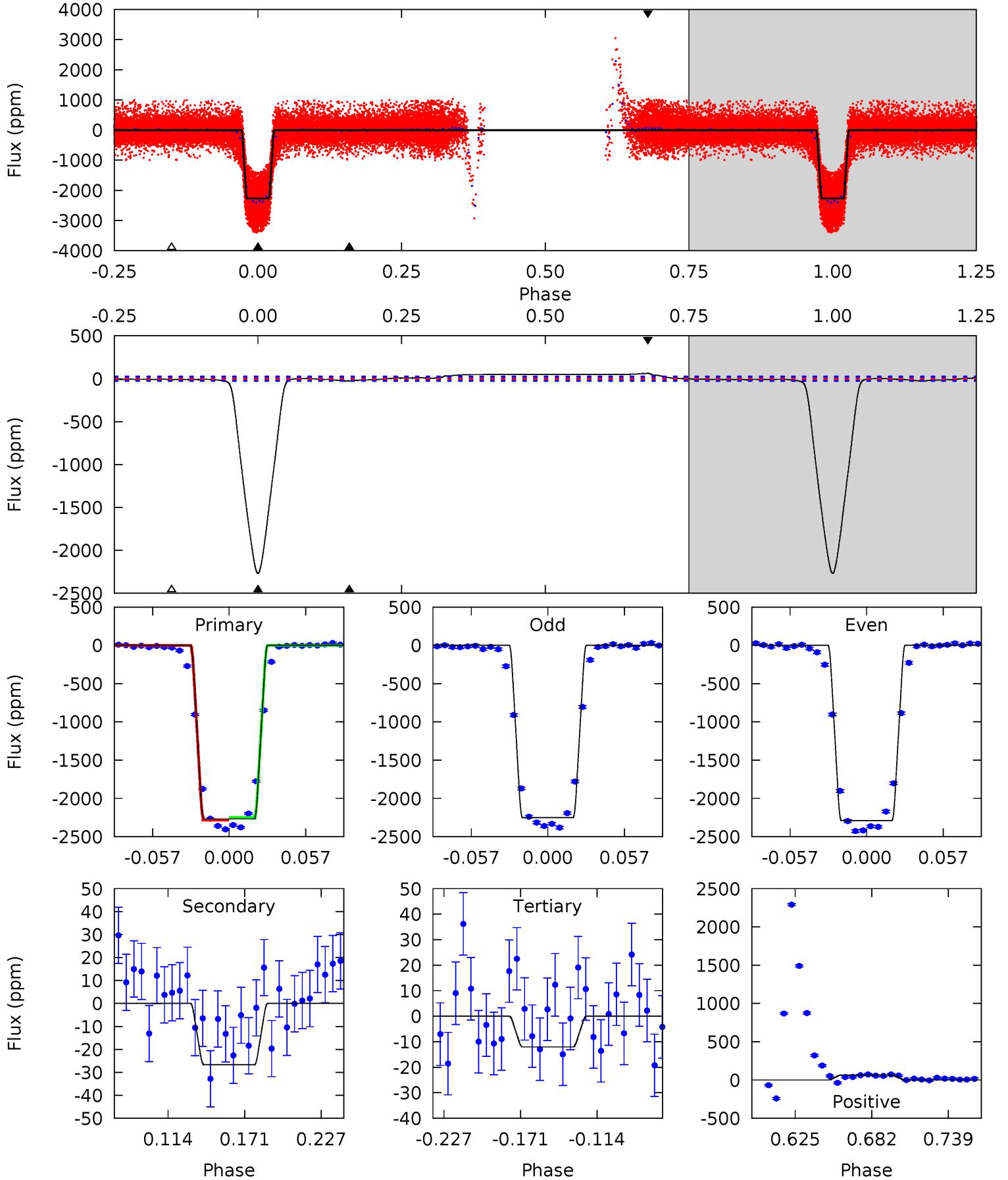
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
39.7	9.12	8.34	11.2	4.65	1.83	5.00	31.3	28.5	0.78	-2.04	0.27	0.76	0.22	4.13



# Alt Model-Shift Uniqueness Test

009655129-02, P = 2.744027 Days, E = 129.635271 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
439.5	5.17	2.34	12.4	4.68	1.90	3.46	437.2	427.1	2.84	-7.27	3.82	1.01	0.03	3.64



### Stellar Parameters For KIC 009655129

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5334^{+159}_{-143}$	$4.492^{+0.110}_{-0.099}$	$-0.320^{+0.350}_{-0.300}$	$0.810^{+0.121}_{-0.110}$	$0.743^{+0.110}_{-0.055}$	$1.972^{+0.902}_{-0.617}$
	+3%/-3%	+2%/-2%	+109%/-94%	+15%/-14%	+15%/-7%	+46%/-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 009655129-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-170 \pm 19$	$3.40^{+0.31}_{-0.27}$	$1588^{+78}_{-75}$	$3534^{+96}_{-95}$	$9.796^{+2.123}_{-1.745}$
Alt.	$-27 \pm 5$	$4.36^{+0.39}_{-0.36}$	$1590^{+71}_{-72}$	$2443^{+89}_{-104}$	$0.952^{+0.259}_{-0.225}$

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



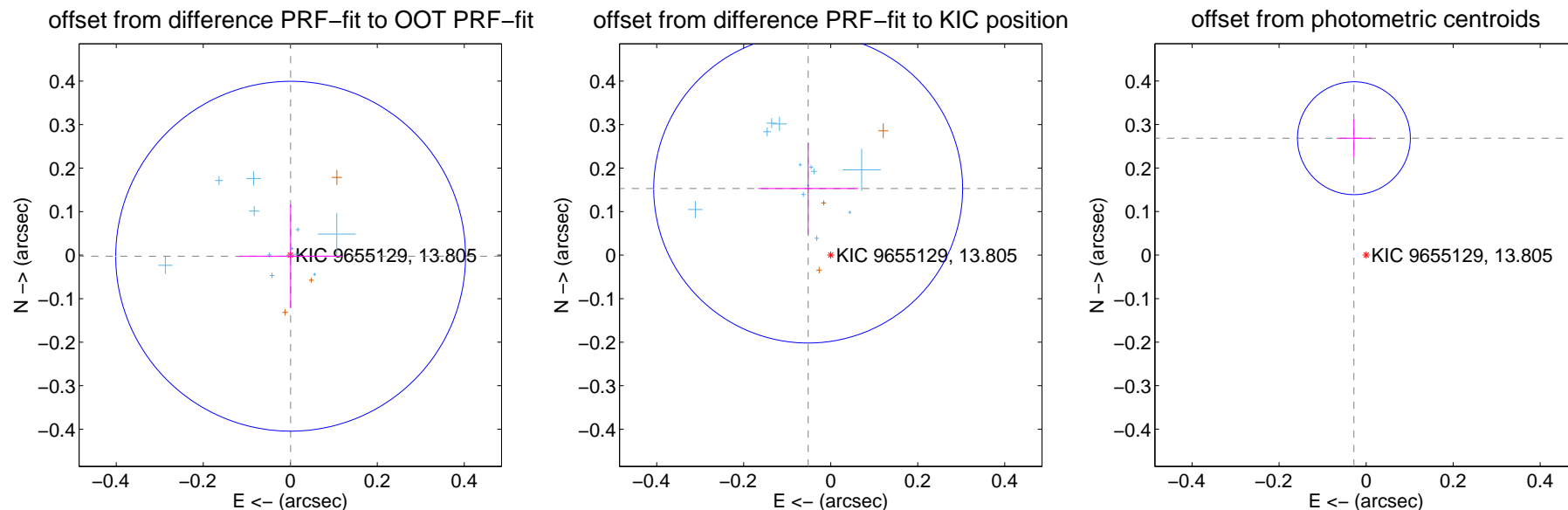
## DV Centroid Data

Supplemental centroid analysis for 009655129-02. Kepler magnitude: 13.80. Transit SNR 56.20

There are 13 quarters with good PRF difference image offsets

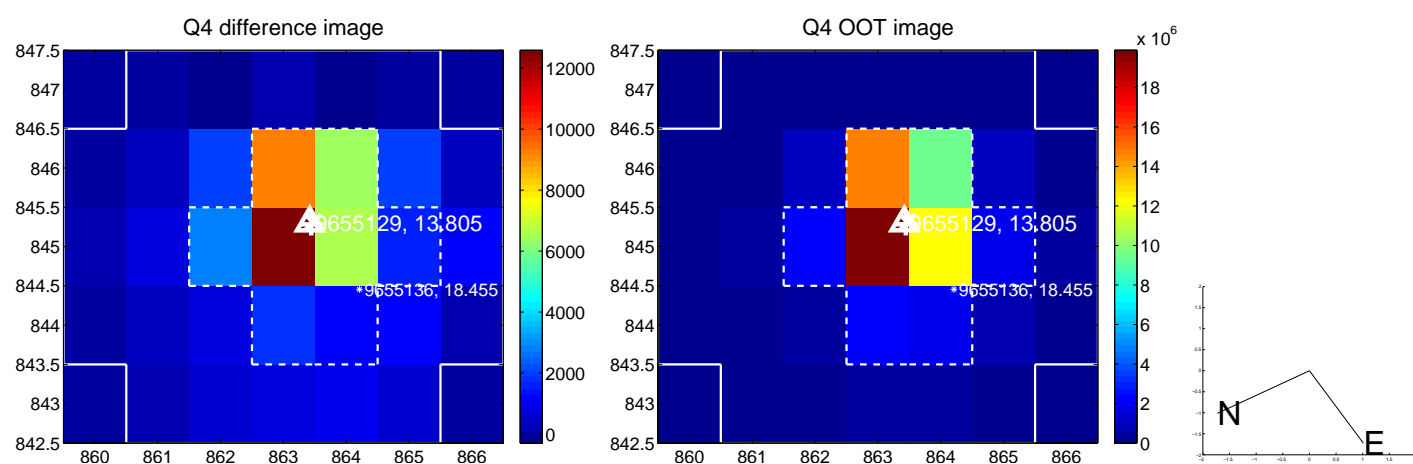
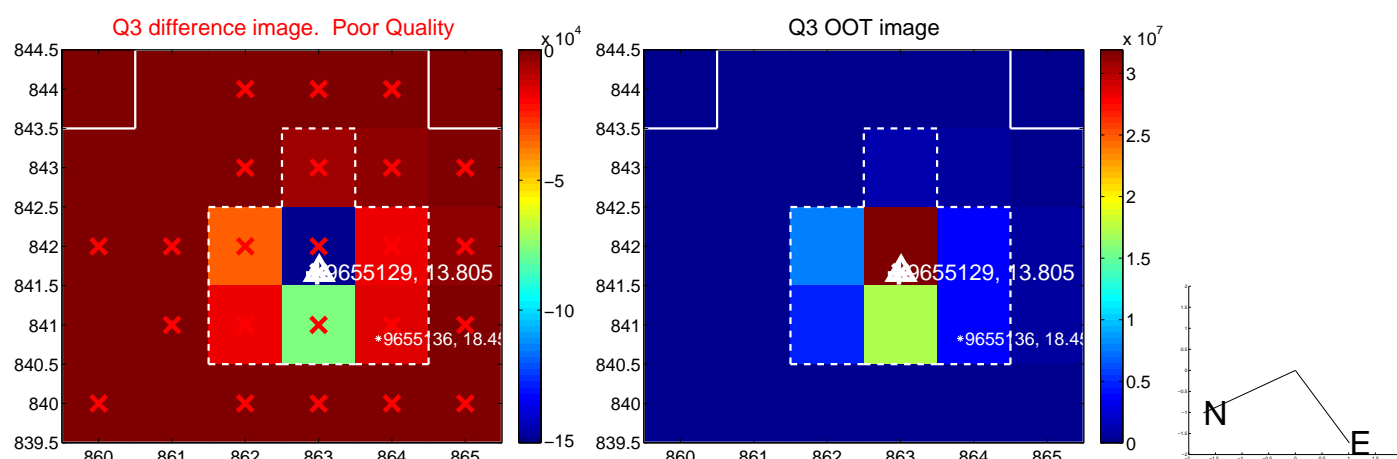
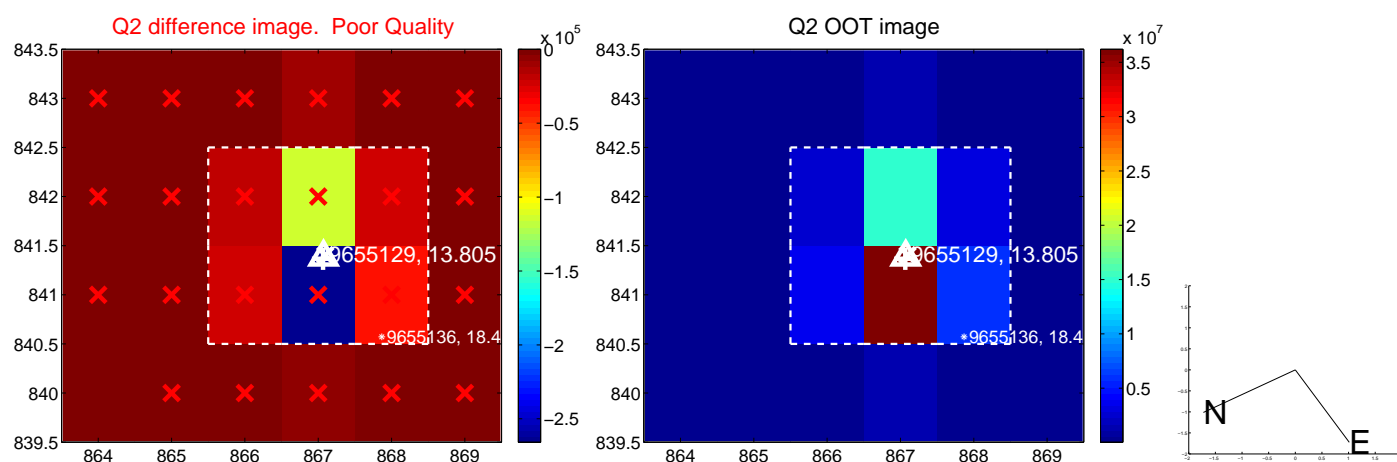
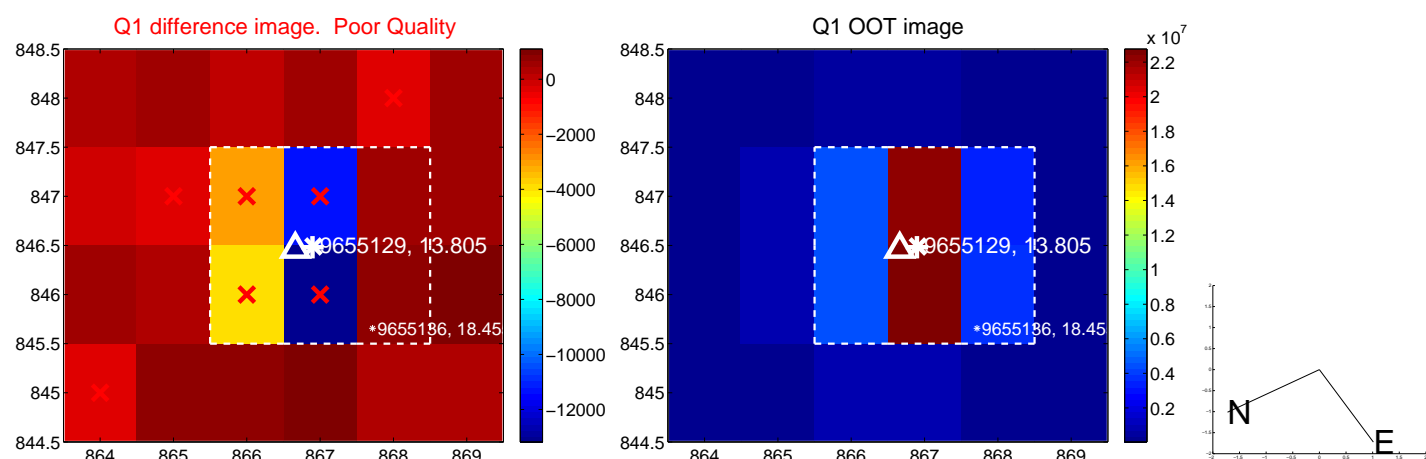
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.003 \pm 0.134$	0.02	$-0.001 \pm 0.118$	$-0.002 \pm 0.119$
PRF-fit source offset from KIC position	$0.162 \pm 0.118$	1.37	$0.052 \pm 0.115$	$0.153 \pm 0.105$
photometric centroid source offset	$0.27 \pm 0.04$	6.25	$0.03 \pm 0.04$	$0.27 \pm 0.04$



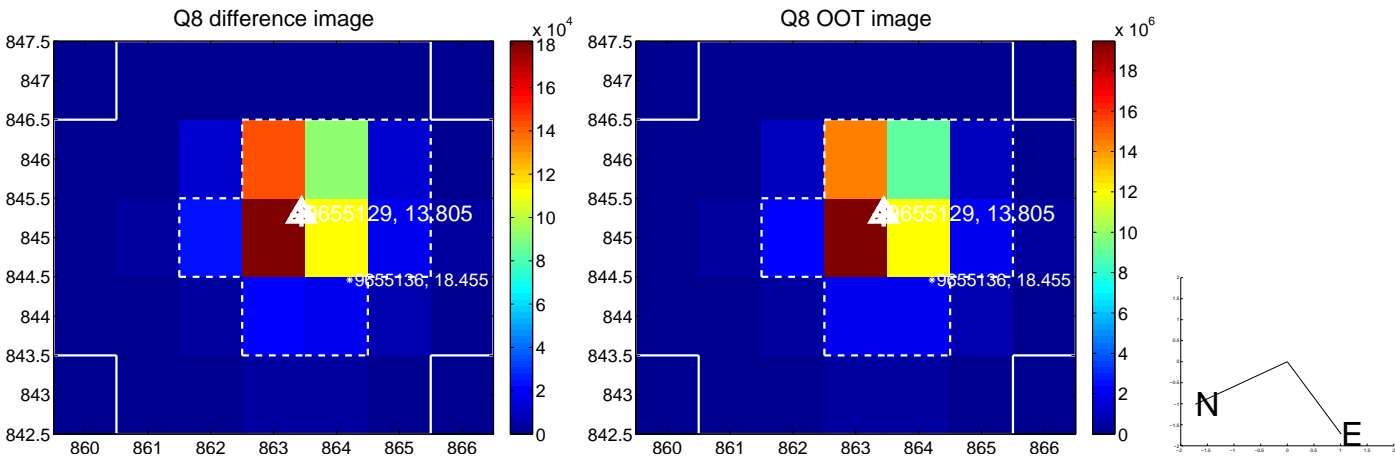
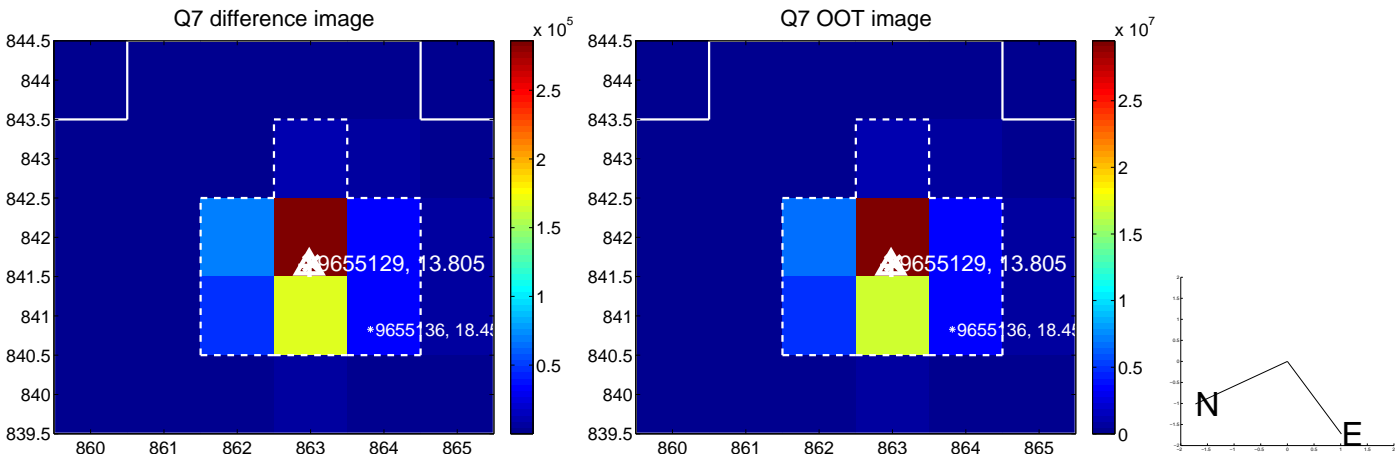
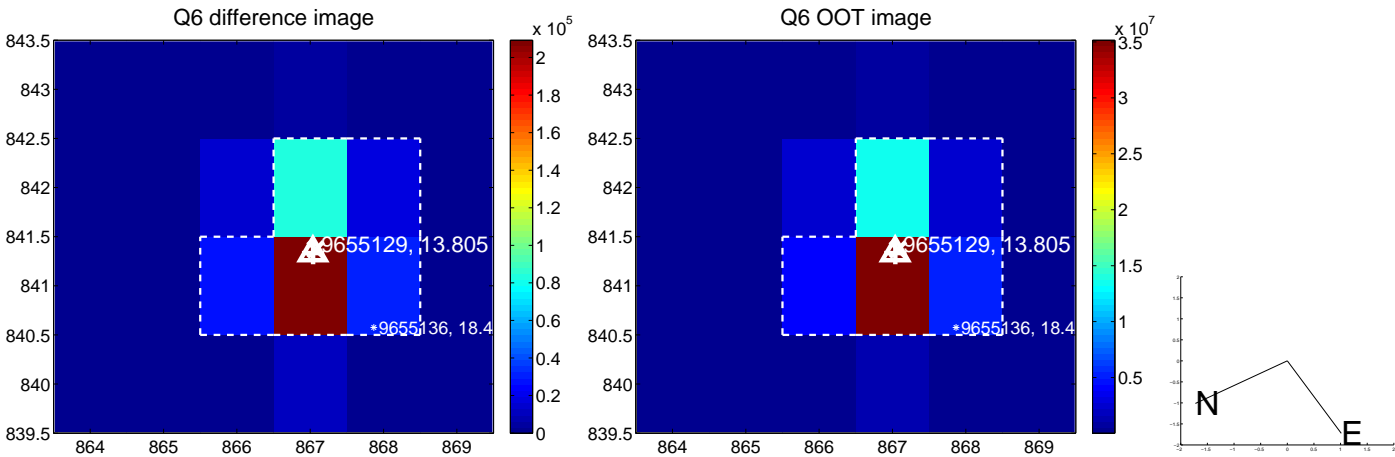
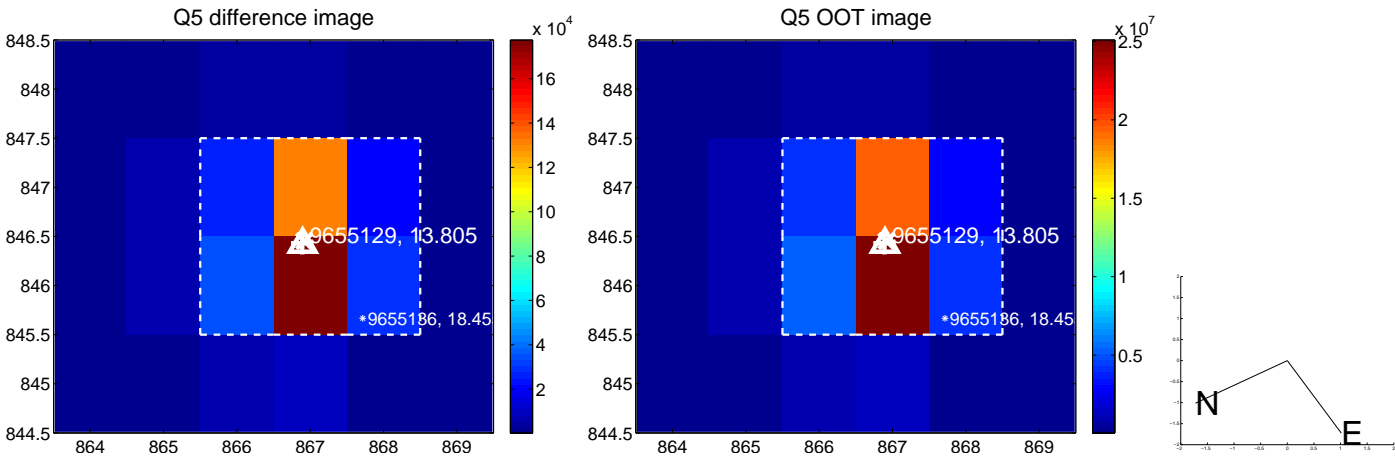
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

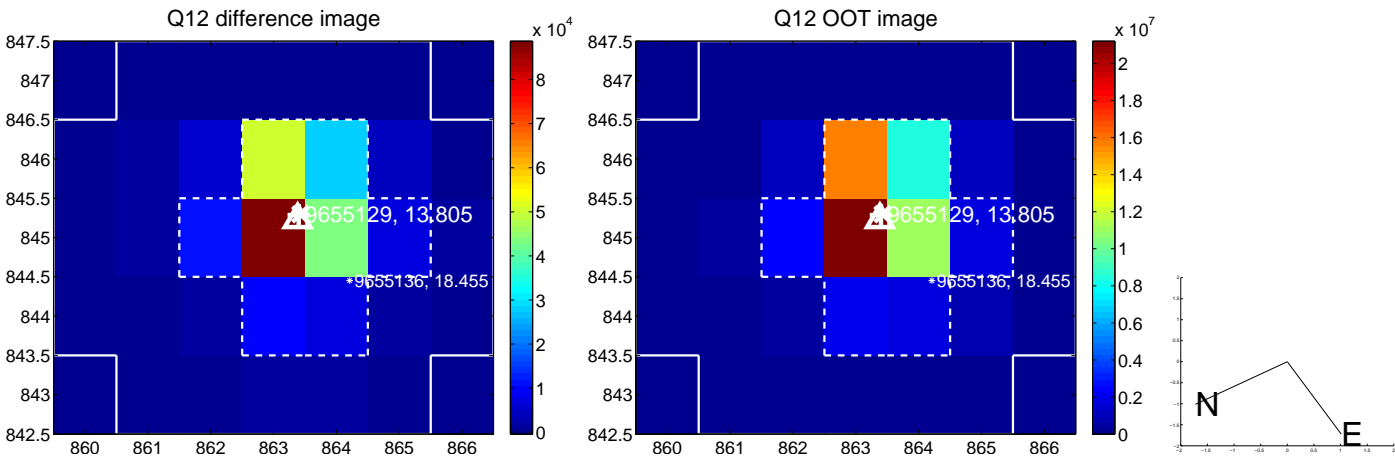
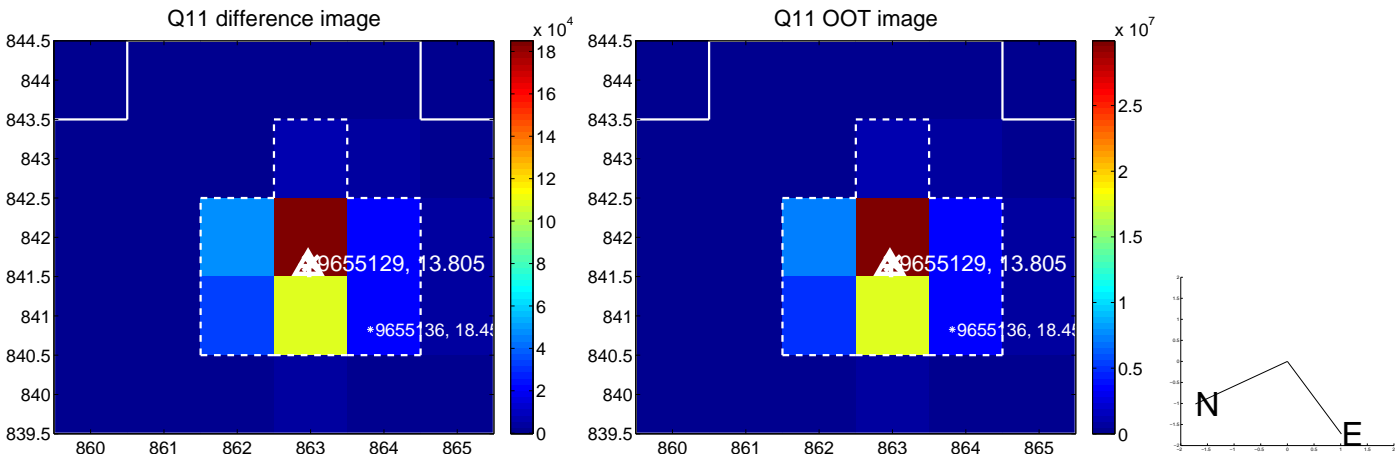
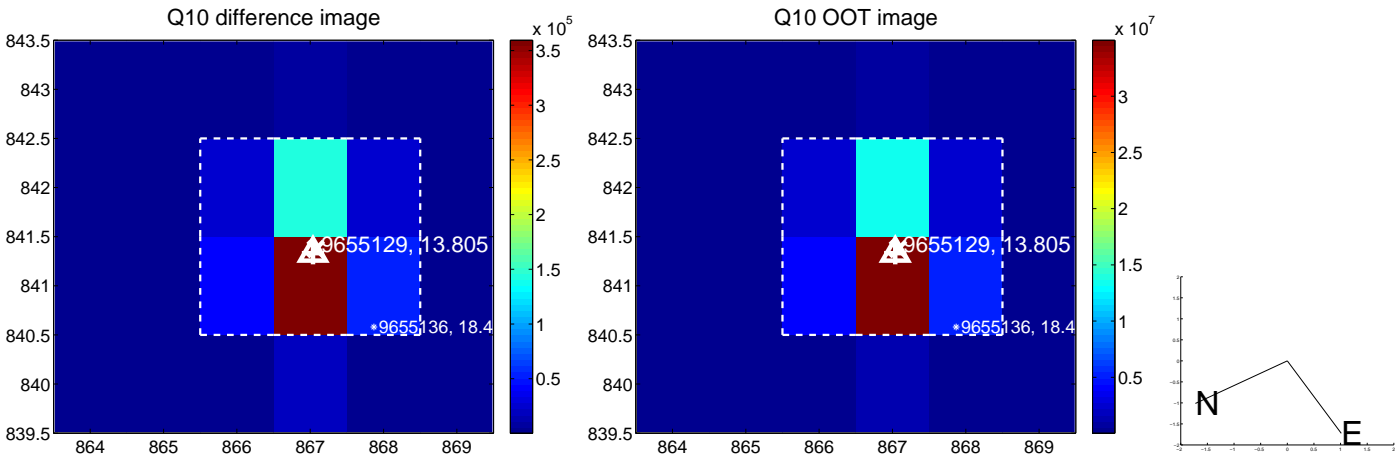
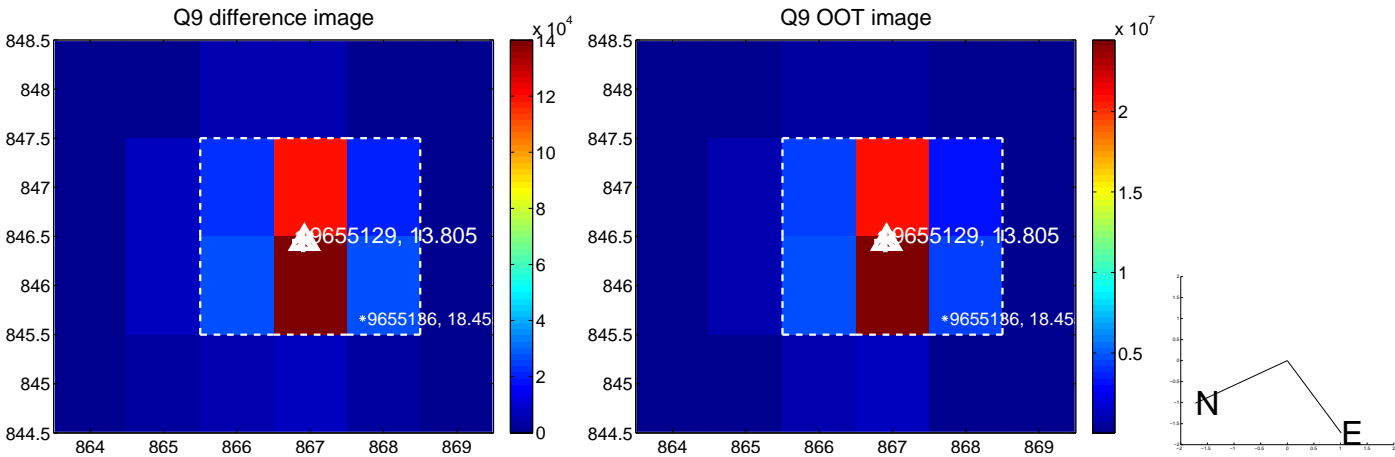




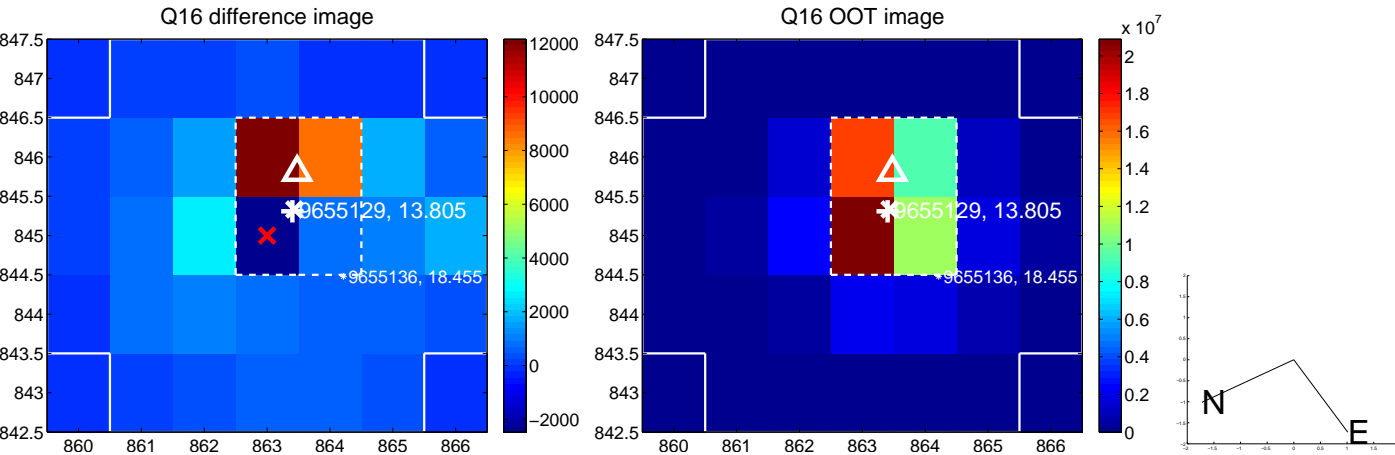
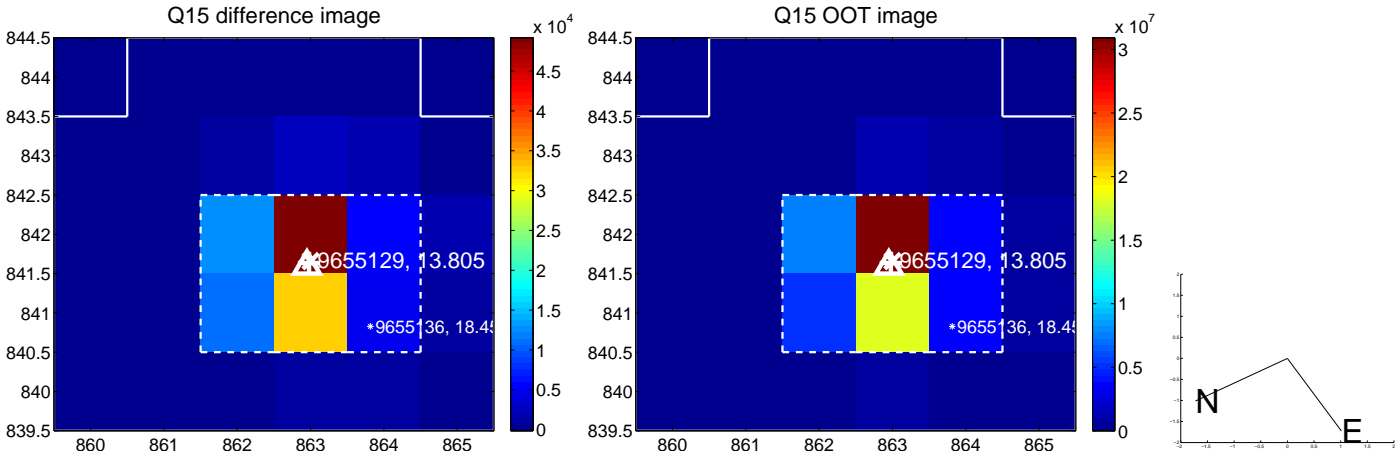
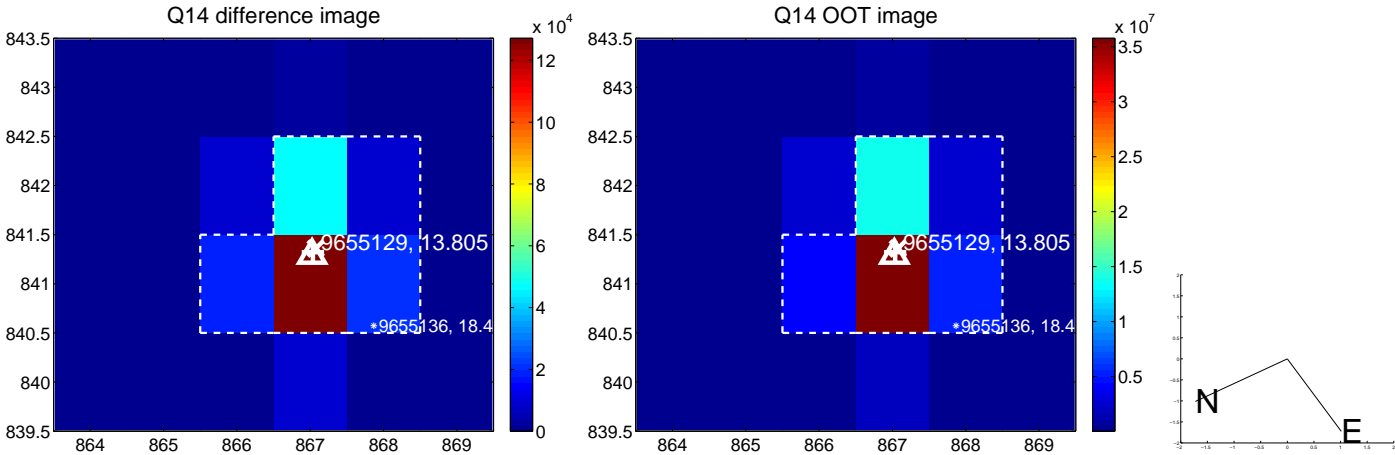
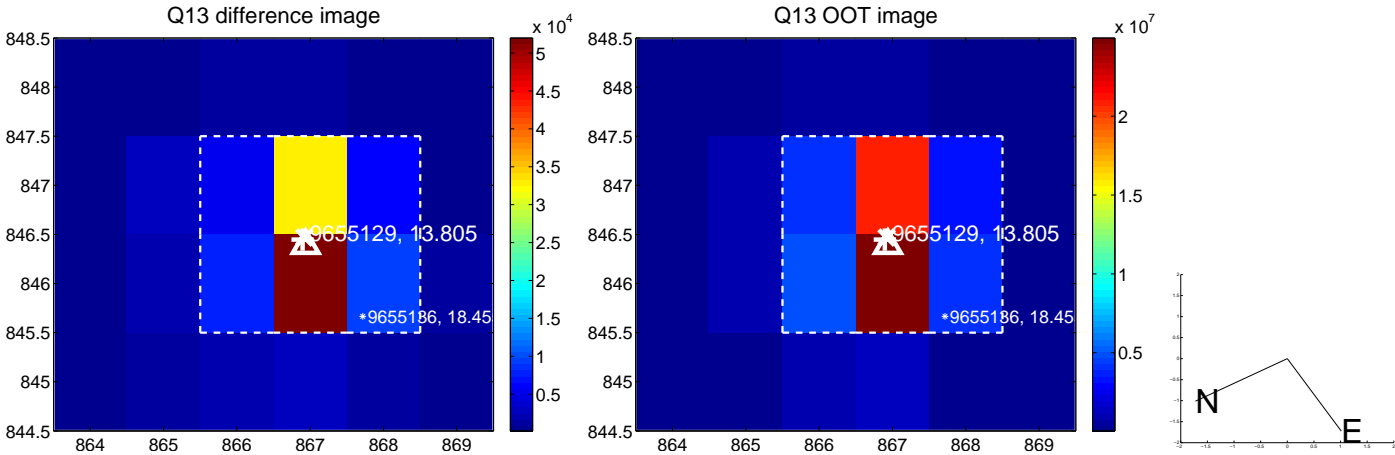
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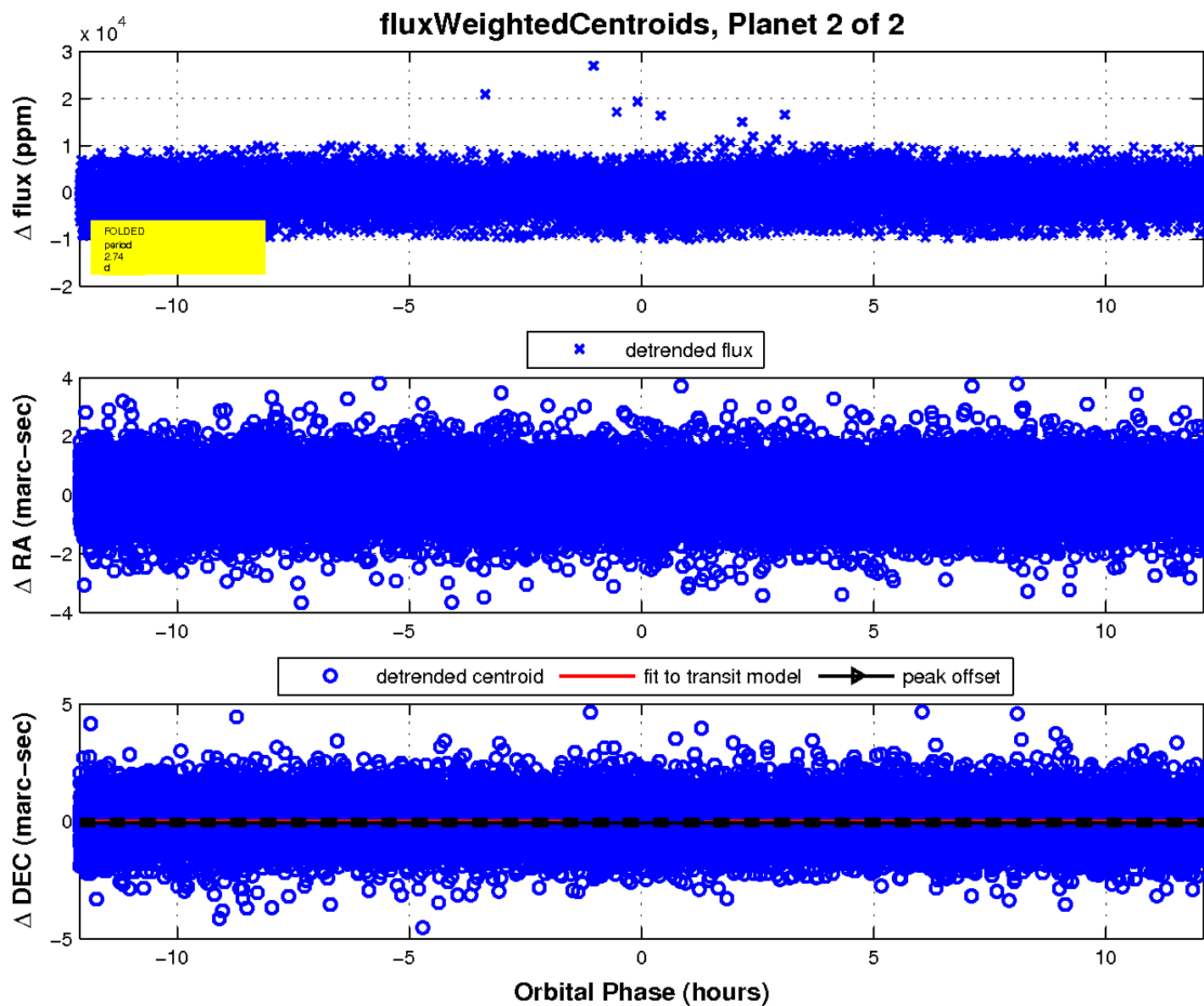
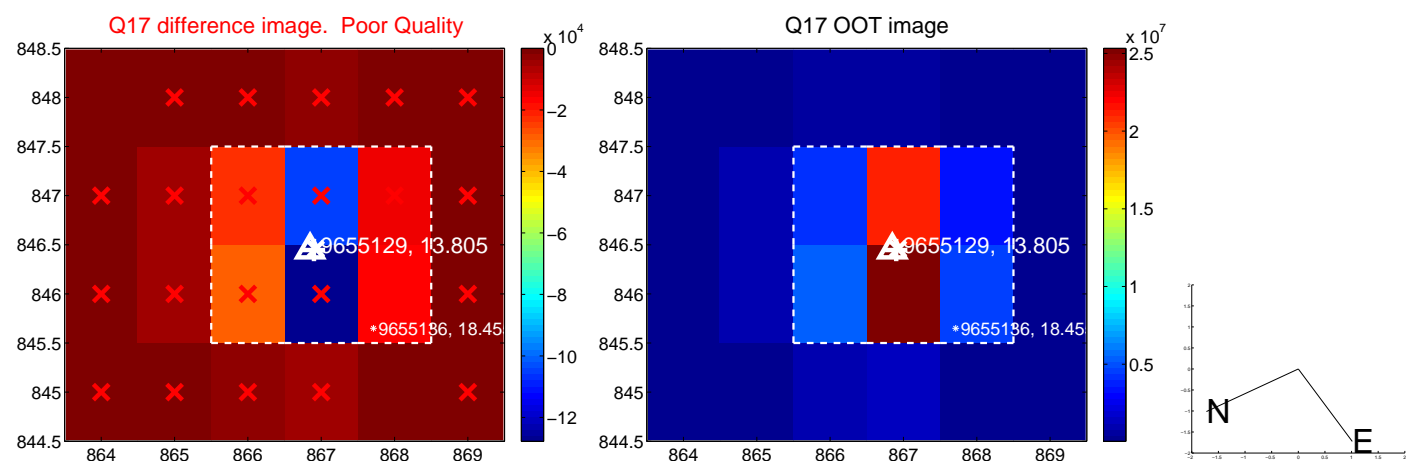
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UKIRT Image

Declination

