

# KIC 010026457

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010026457-01	OBS	7275.01	9.934421	132.875088	47773.3	8.431	2159.9	1088.4	0.67	5382	25.27	50.44
010026457-02	OBS	No	9.934427	138.492981	49127.3	7.029	2093.0	1054.8	0.67	5382	25.62	50.44

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010026457-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE—CENT_KIC_POS
010026457-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_KIC_POS

**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.

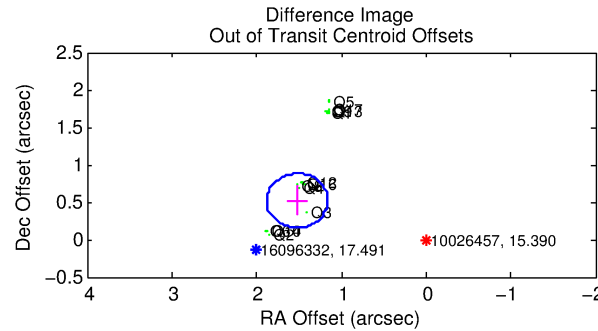
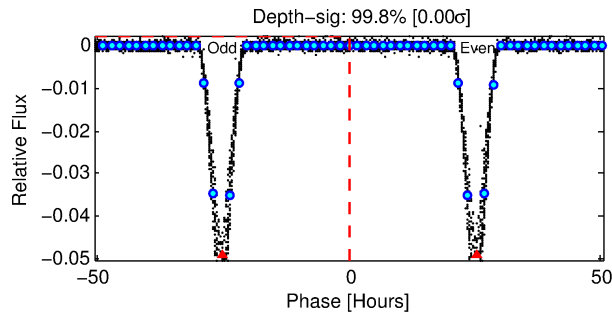
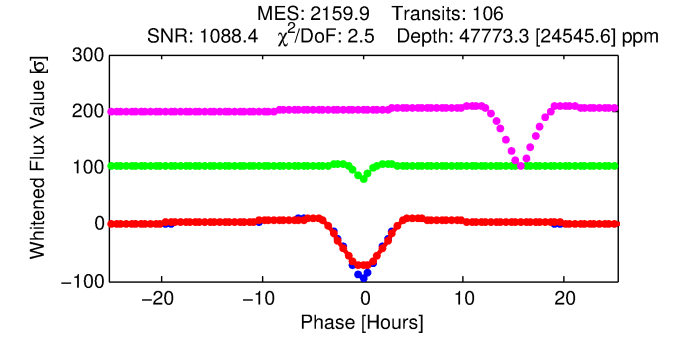
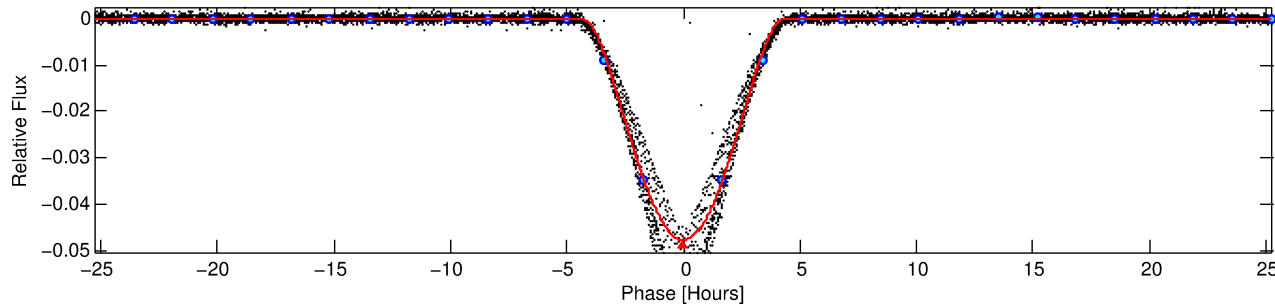
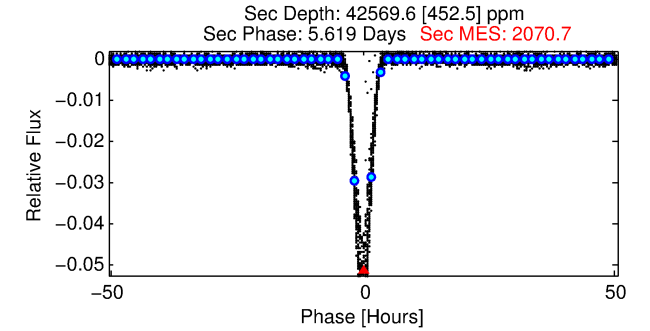
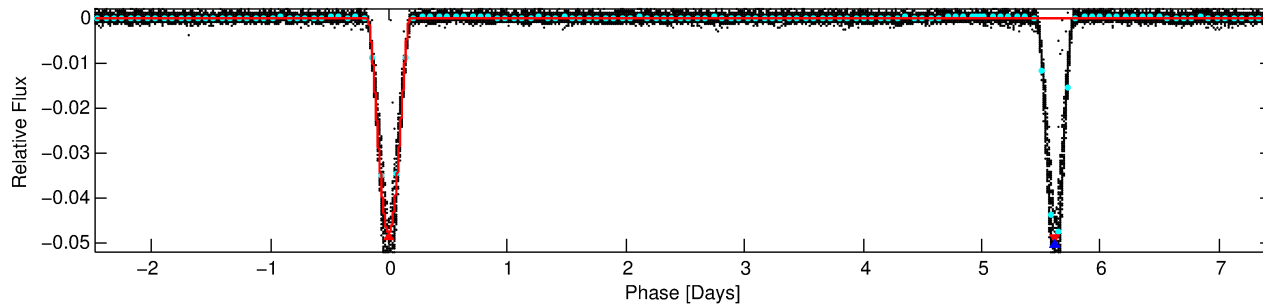
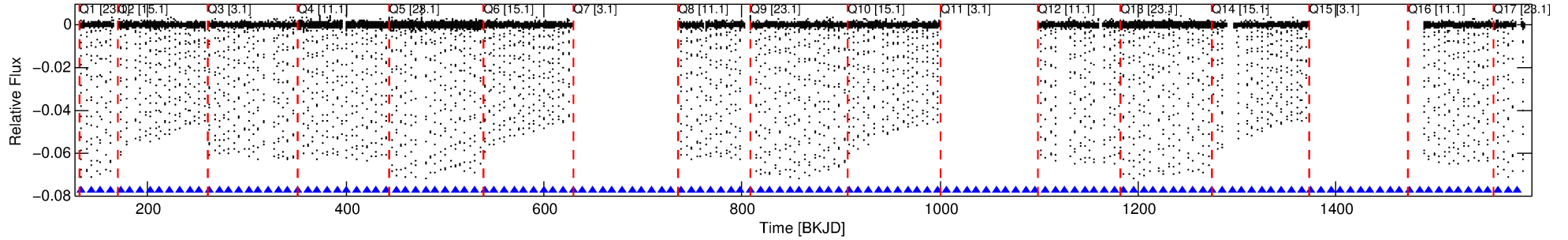
## Ephemeris Match Information For 010026457-01

No Significant Match Found

# DV One-Page Summary

KIC: 10026457 Candidate: 1 of 2 Period: 9.934 d  
KOI: K07275.01 Corr: 0.965

Kp: 15.39 R\*: 0.67 Rs Teff: 5382.0 K Logg: 4.65 Fe/H: -0.640



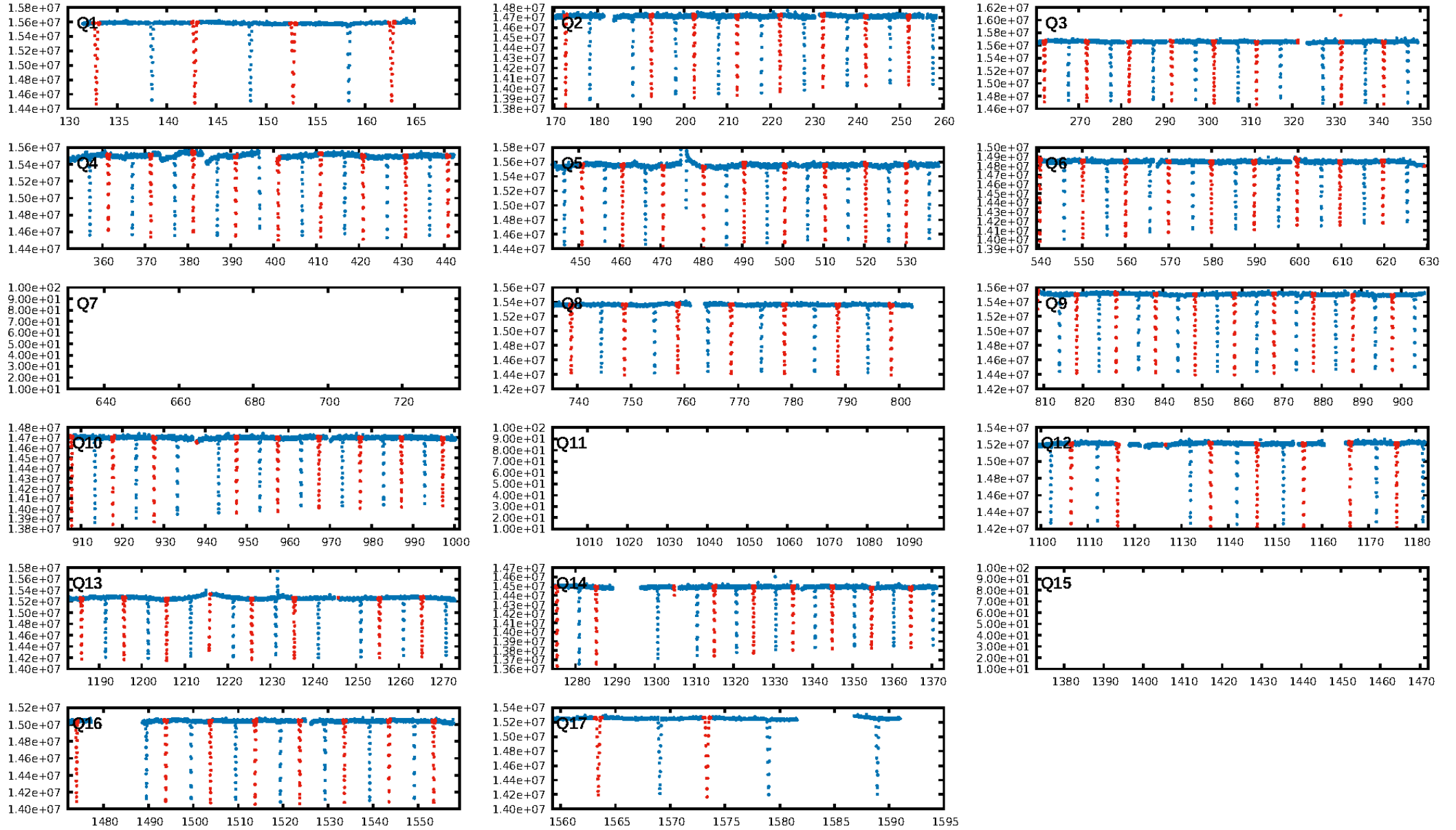
## DV Fit Results:

Period = 9.93442 [0.00000] d  
Epoch = 132.8751 [0.0001] BKJD  
Rp/R\* = 0.3461 [0.0324]  
a/R\* = 8.19 [0.01]  
b = 1.00 [0.07]  
Seff = 50.44 [10.05]  
Teff = 680 [34] K  
Rp = 25.27 [4.30] Re  
a = 0.0817 [0.0094] AU  
Ag = 244.65 [60.26] [4.04σ]  
Teffp = 4155 [230] K [14.92σ]

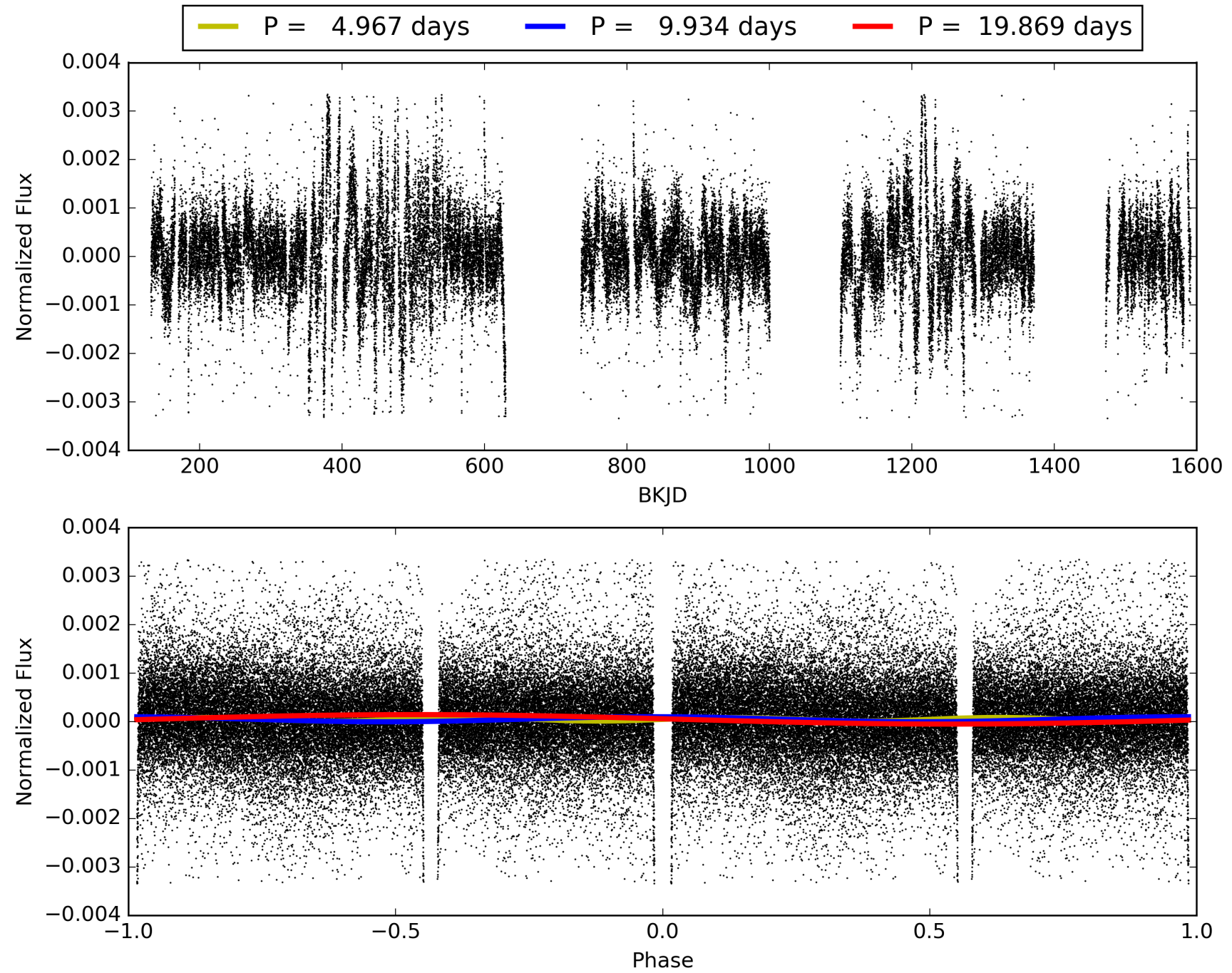
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 0.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [100/100]  
GhostDiagnostic-chr: 1.428  
Centroid-sig: 0.0%  
Centroid-so: 1.764 arcsec [445.47σ]  
OotOffset-rm: 1.607 arcsec [13.34σ]  
KicOffset-rm: 2.059 arcsec [30.40σ]  
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]

# TCE 010026457-01, PDC Light Curves

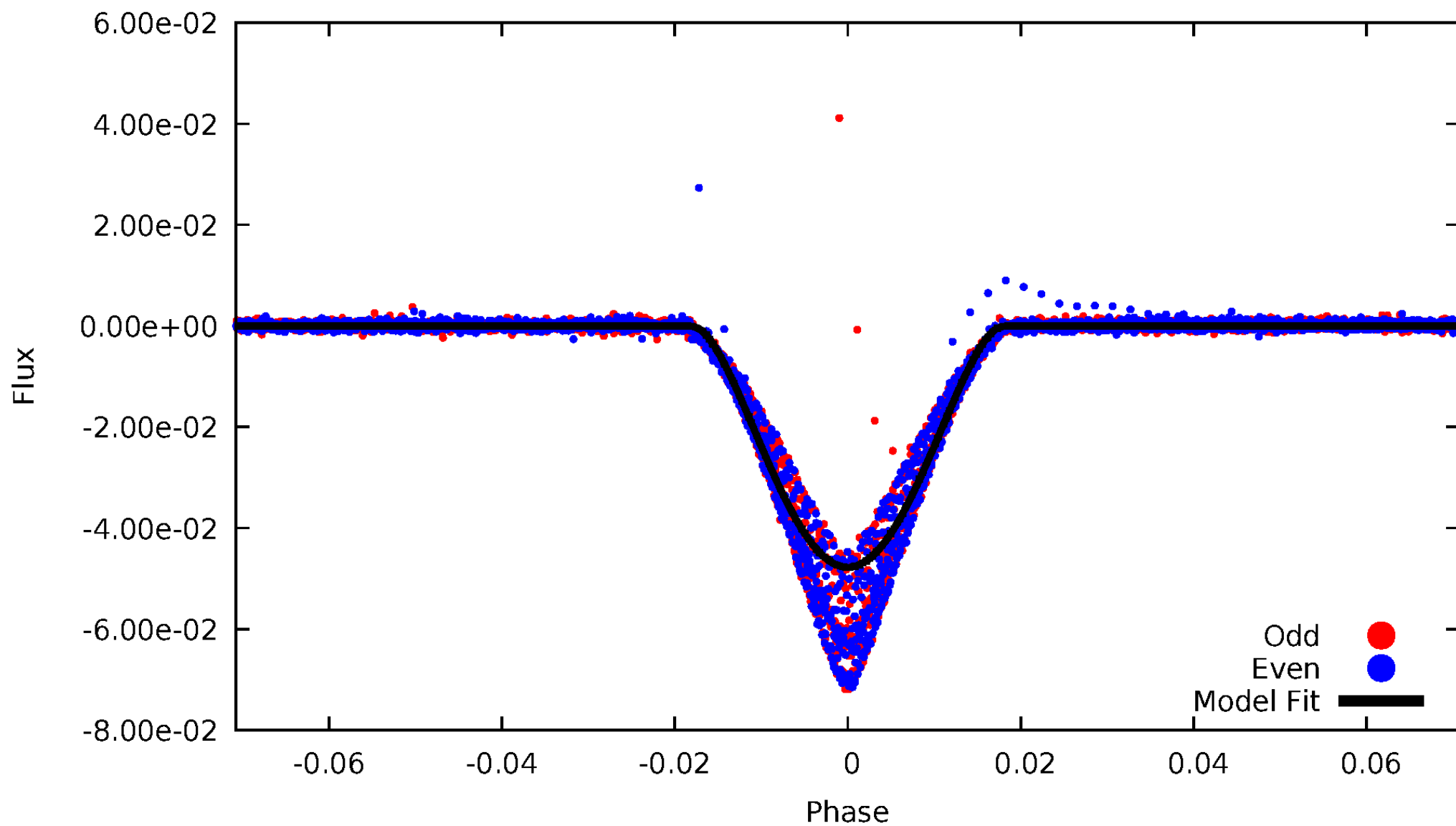


TCE 010026457-01



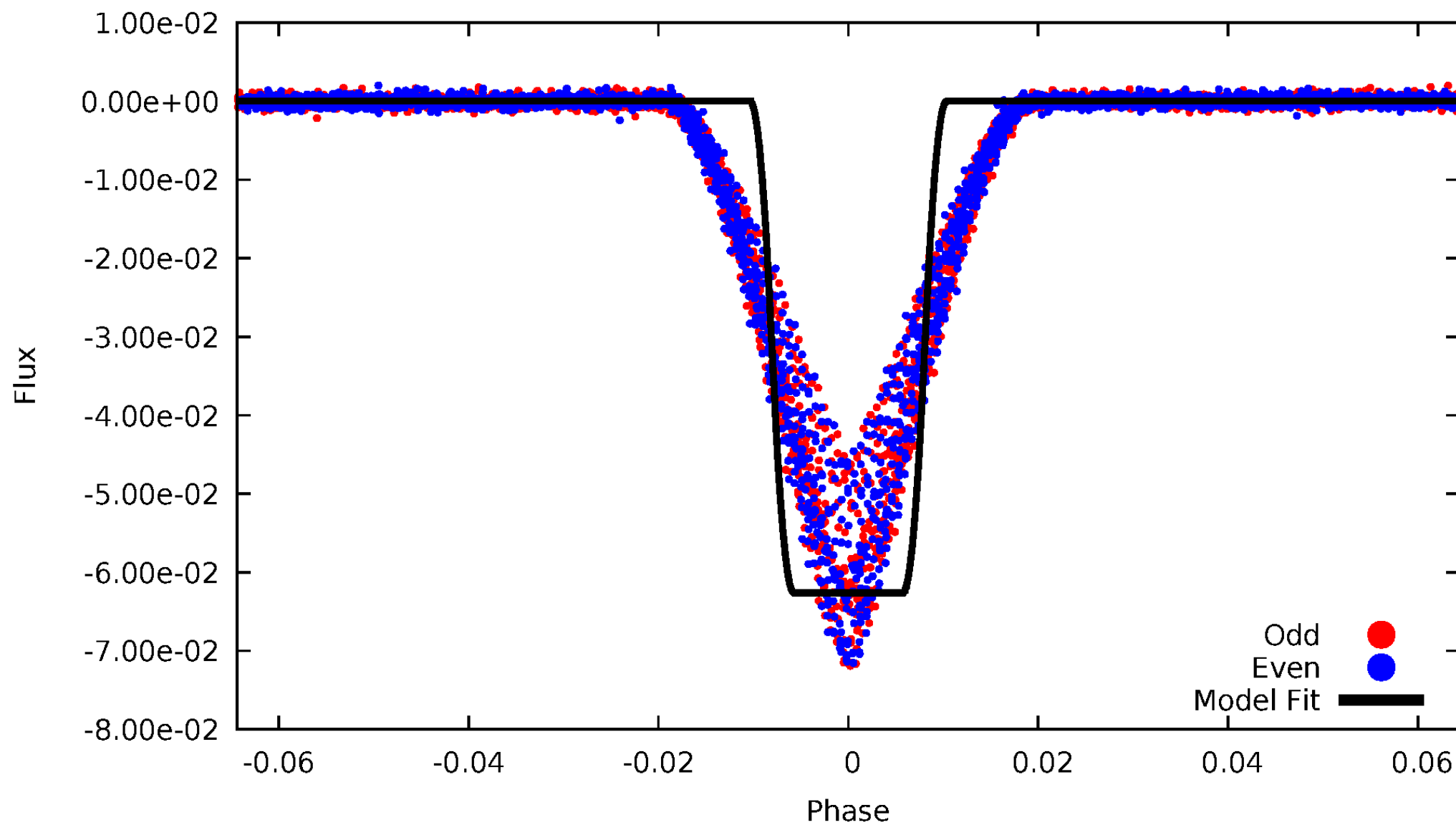
# DV Odd/Even

TCE 010026457-01



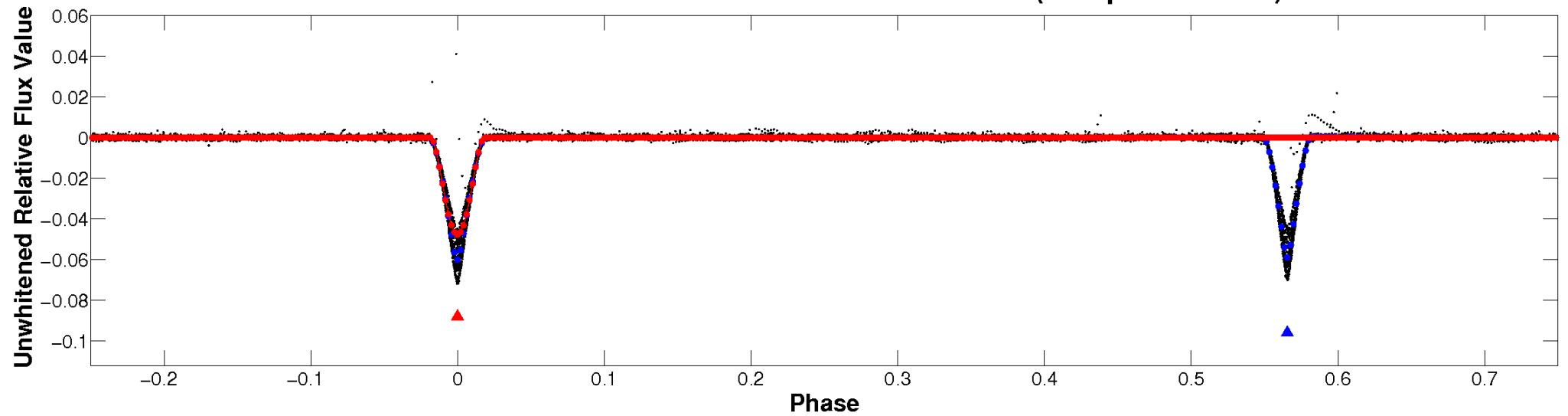
# ALT Odd/Even

TCE 010026457-01

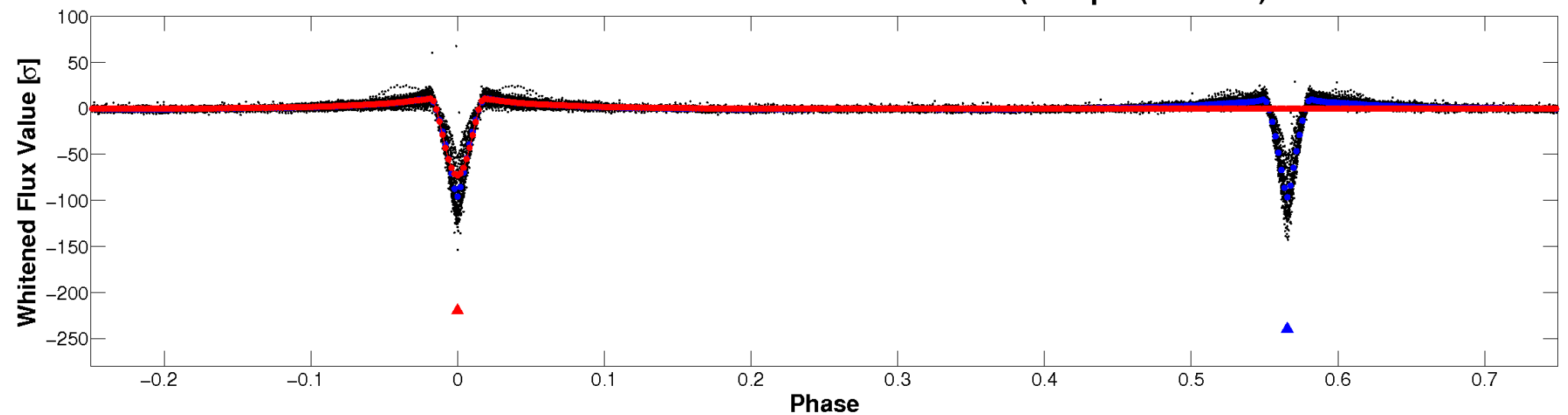


# Non-Whitened Vs. Whitened Light Curve

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

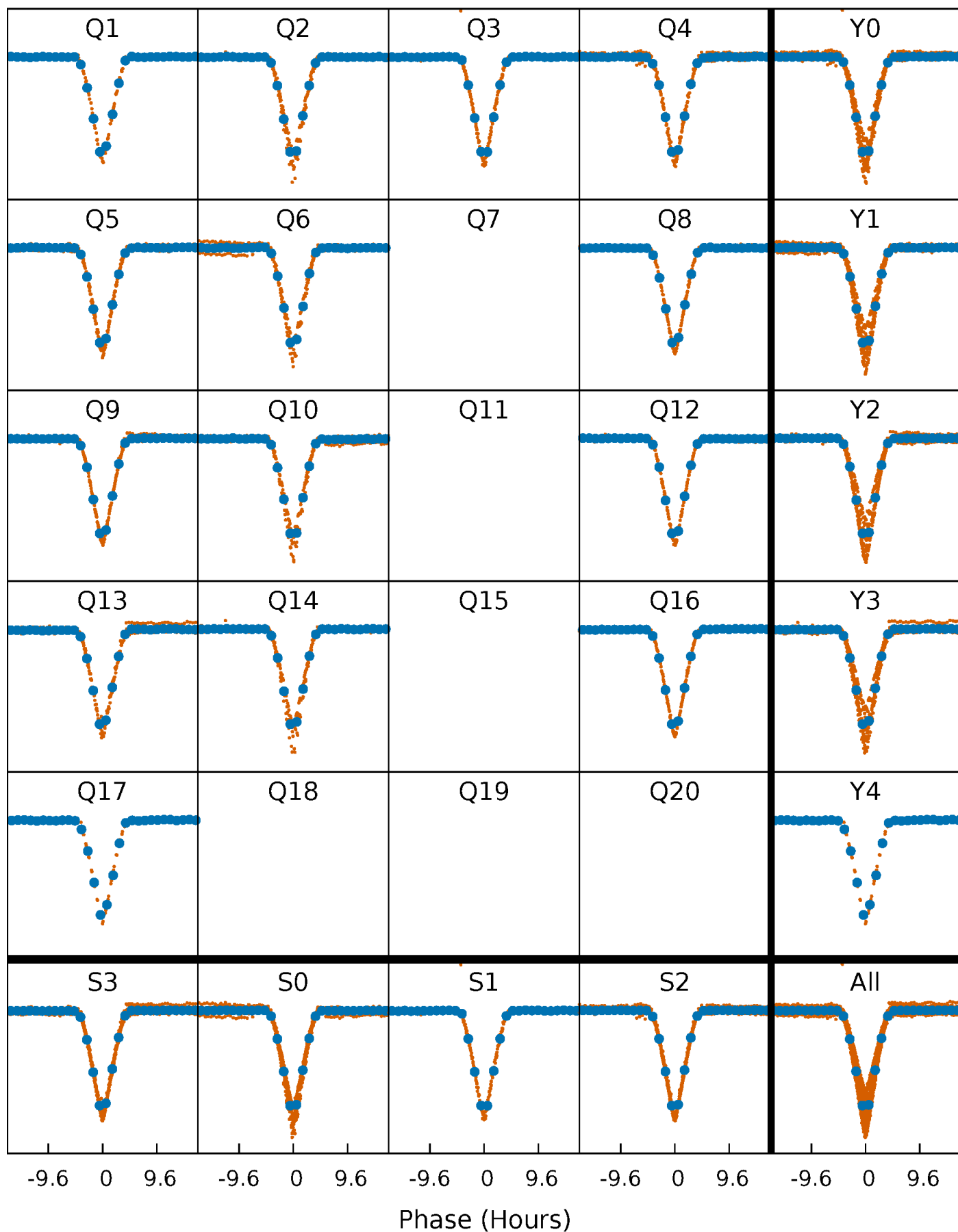


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

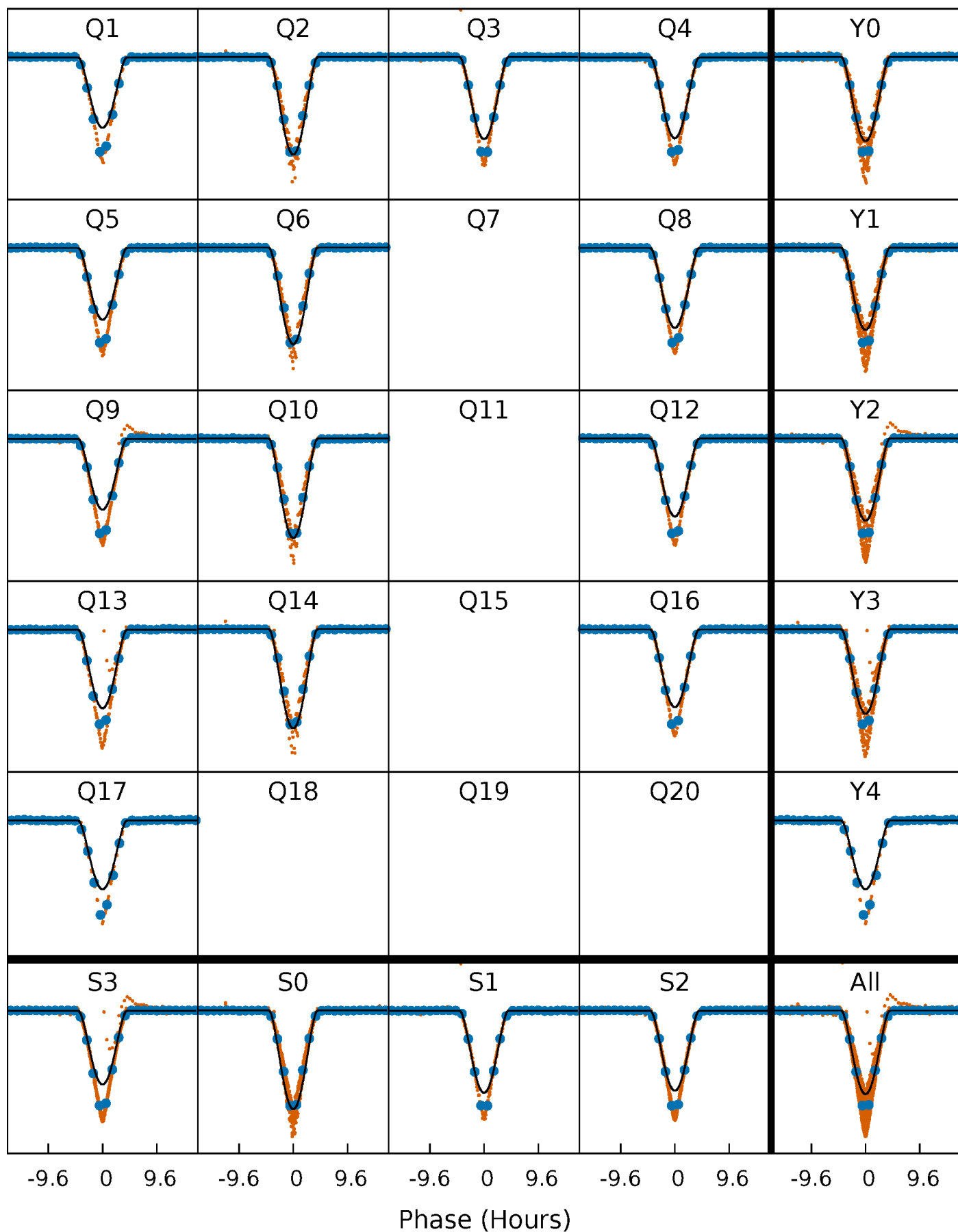
TCE 010026457-01 P= 9.934421 Days  $T_0=132.875088$  (BKJD)





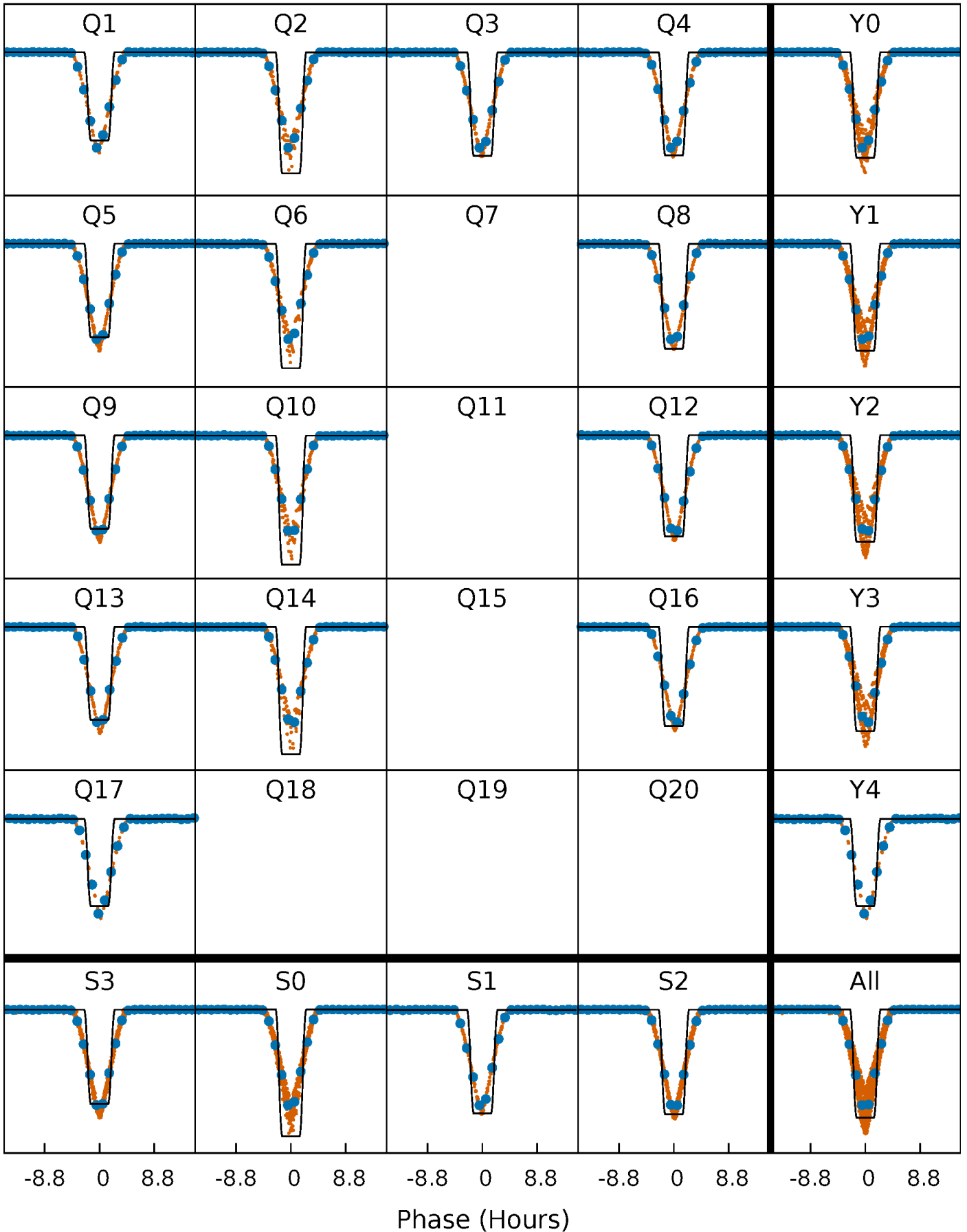
# DV Quarter-Phased Transit Curves

TCE 010026457-01 P= 9.934421 Days  $T_0=132.875088$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

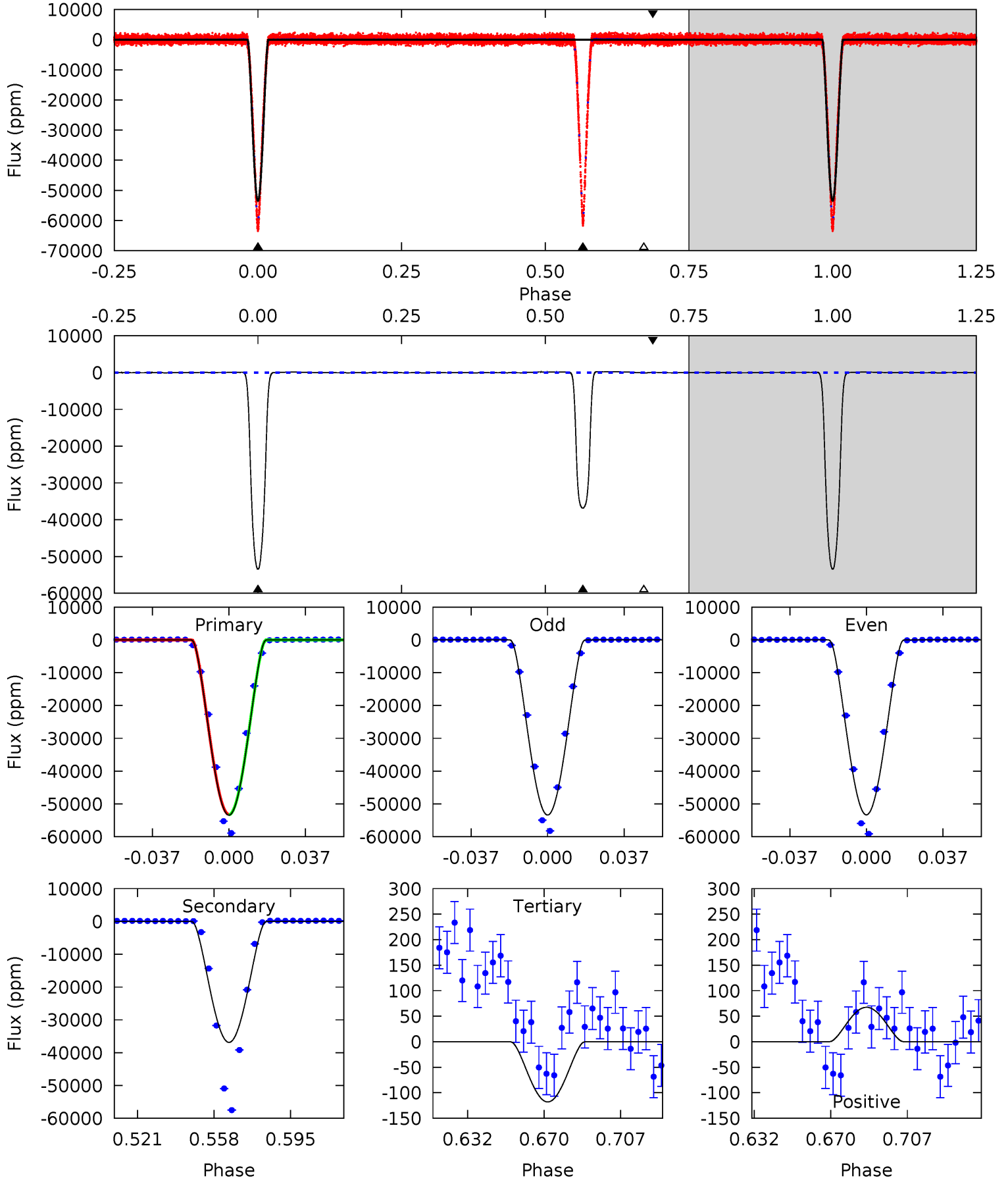
TCE 010026457-01 P= 9.934320 Days  $T_0=132.881787$  (BKJD)



# DV Model-Shift Uniqueness Test

010026457-01, P = 9.934421 Days, E = 122.940667 Days

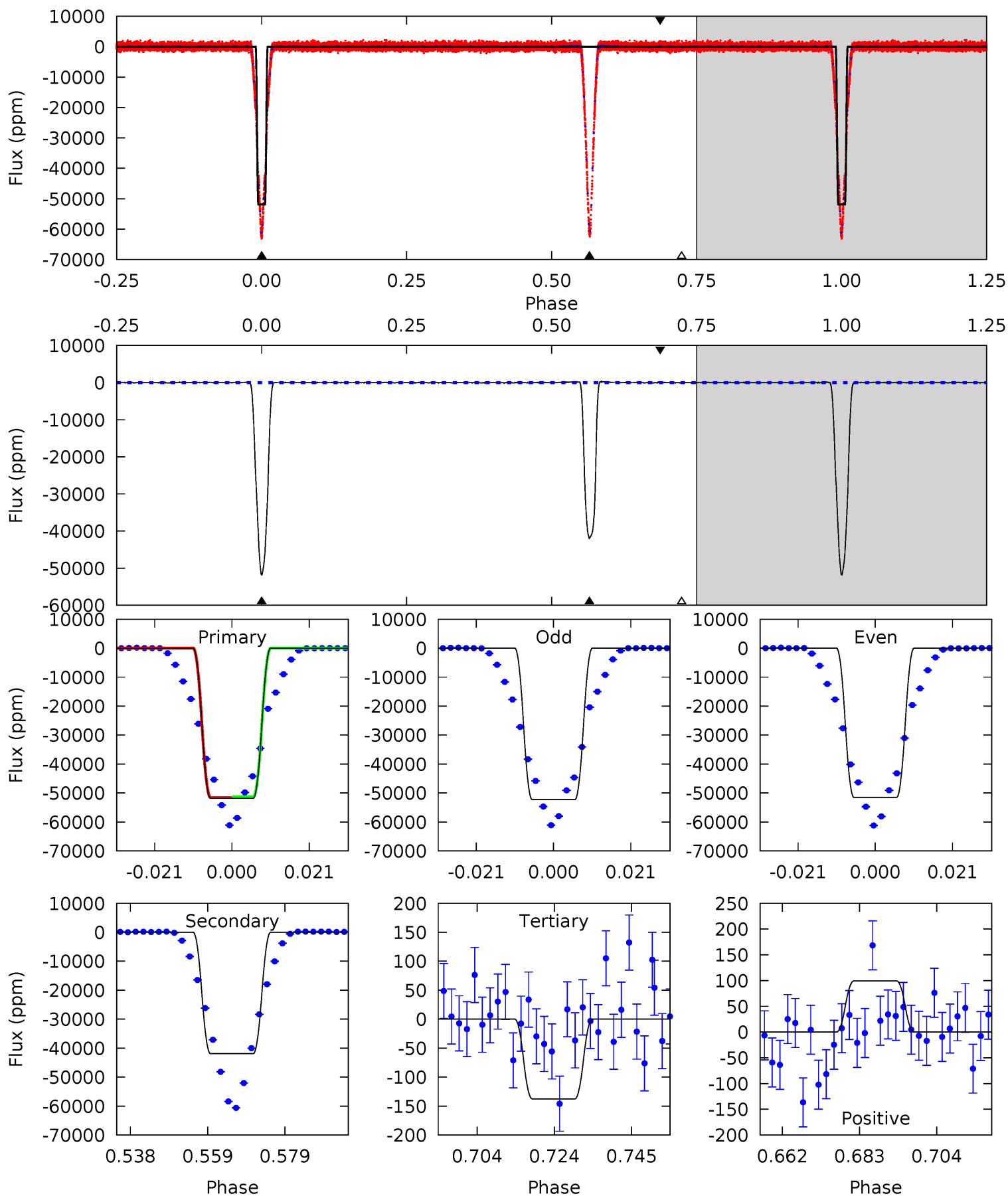
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3380	2332	7.46	4.27	4.77	2.08	4.86	3372	3376	2325	2328	1.69	0.96	0.01	0



# Alt Model-Shift Uniqueness Test

010026457-01, P = 9.934320 Days, E = 122.947467 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
1796	1452	4.76	3.44	4.88	2.31	1.70	1791	1792	1447	1449	13.3	0.98	0.00	3.70



### Stellar Parameters For KIC 010026457

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5382^{+160}_{-160}$	$4.654^{+0.030}_{-0.084}$	$-0.640^{+0.300}_{-0.300}$	$0.669^{+0.095}_{-0.041}$	$0.749^{+0.064}_{-0.072}$	$3.518^{+0.433}_{-1.036}$
	+3%/-3%	+1%/-2%	+47%/-47%	+14%/-6%	+9%/-10%	+12%/-29%
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 010026457-01 / KOI 7275.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-36874 \pm 16$	$25.98^{+2.92}_{-2.97}$	$960^{+35}_{-35}$	$4250^{+204}_{-168}$	$209^{+56}_{-37}$
Alt.	$-41916 \pm 29$	$18.78^{+2.79}_{-2.58}$	$961^{+43}_{-34}$	$4971^{+347}_{-294}$	$450^{+158}_{-103}$

$T_{max}$  = 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

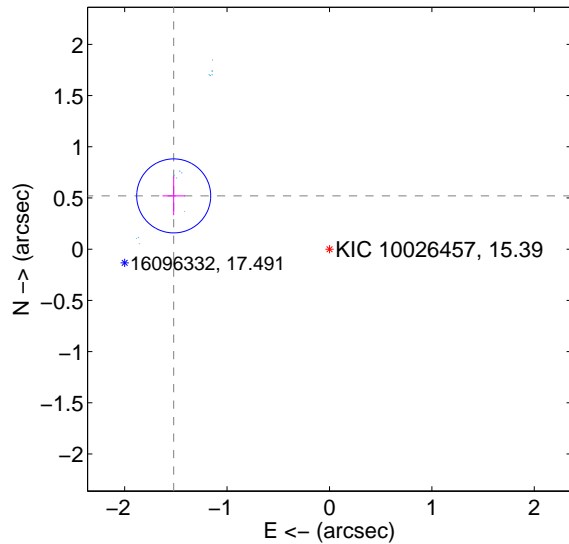
Supplemental centroid analysis for 010026457-01. Kepler magnitude: 15.39. Transit SNR 1088.37

There are 14 quarters with good PRF difference image offsets

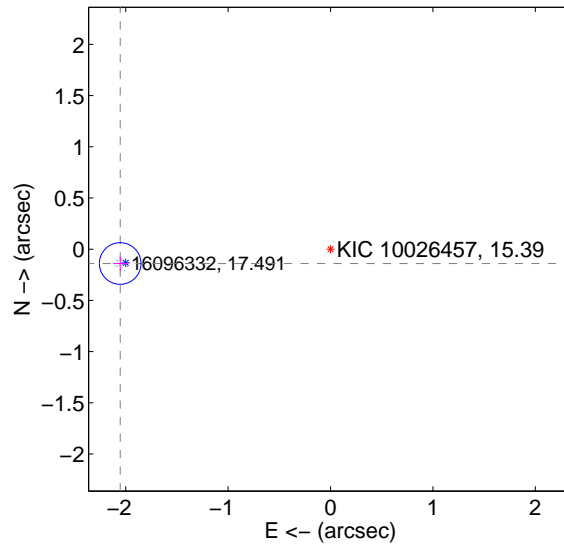
The OOT PRF centroid is offset from the target star catalog position by about 2.06 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.607 \pm 0.120$	13.34	$1.521 \pm 0.110$	$0.520 \pm 0.189$
PRF-fit source offset from KIC position	$2.059 \pm 0.068$	30.40	$2.054 \pm 0.068$	$-0.140 \pm 0.067$
photometric centroid source offset	$1.76 \pm 0.00$	445.47	$1.74 \pm 0.00$	$-0.29 \pm 0.00$

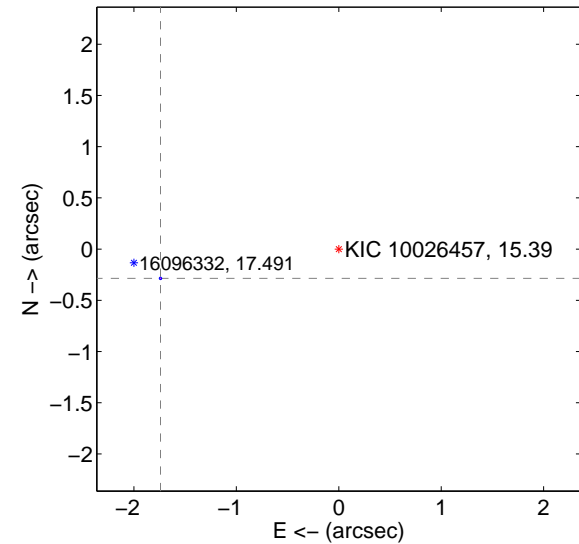
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

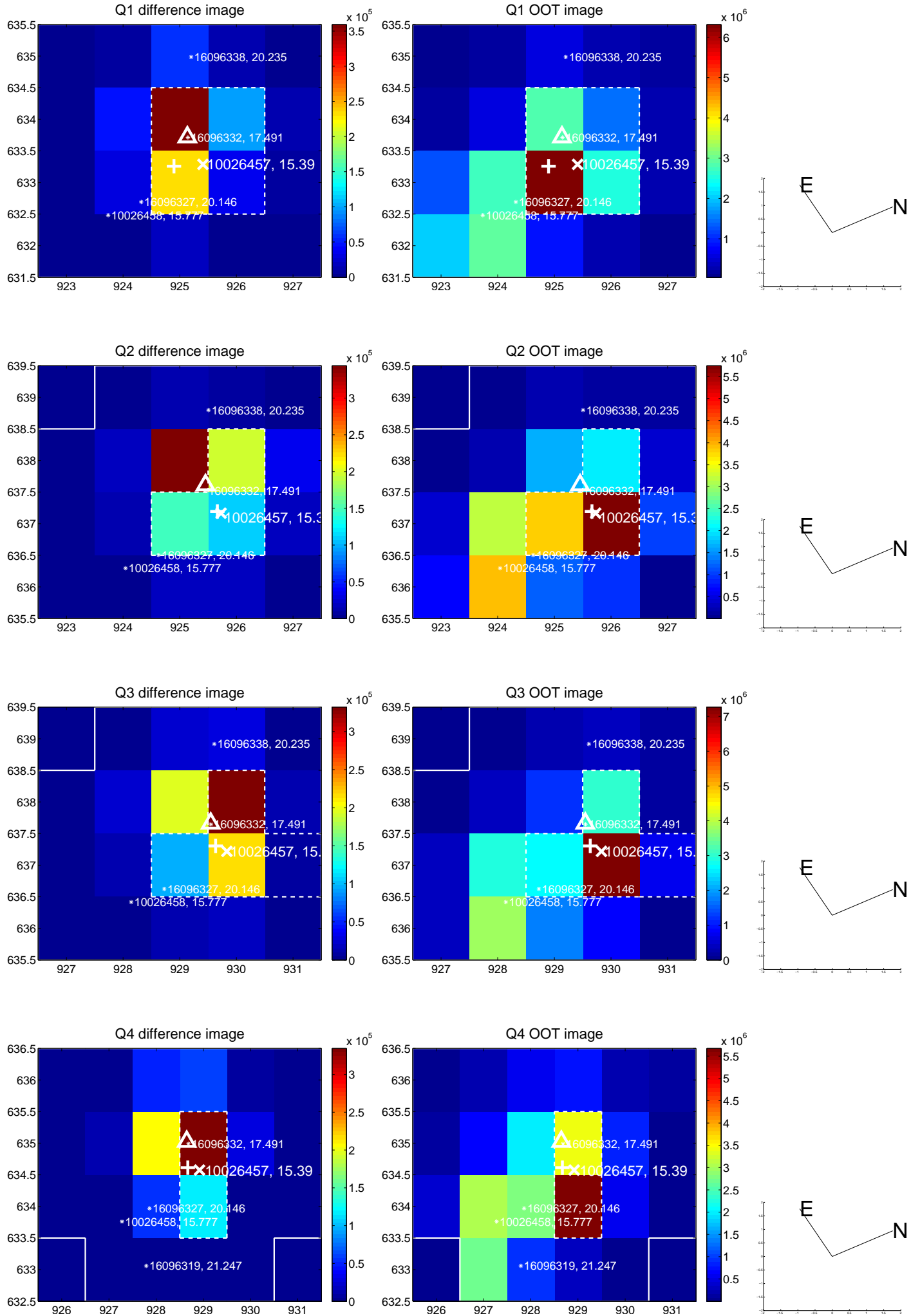


offset from photometric centroids

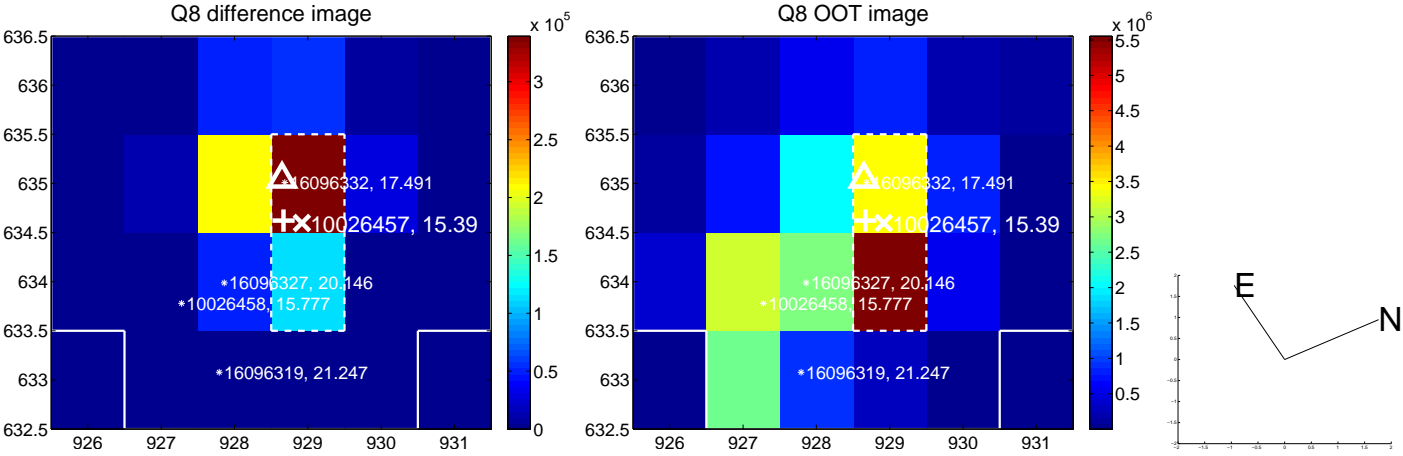
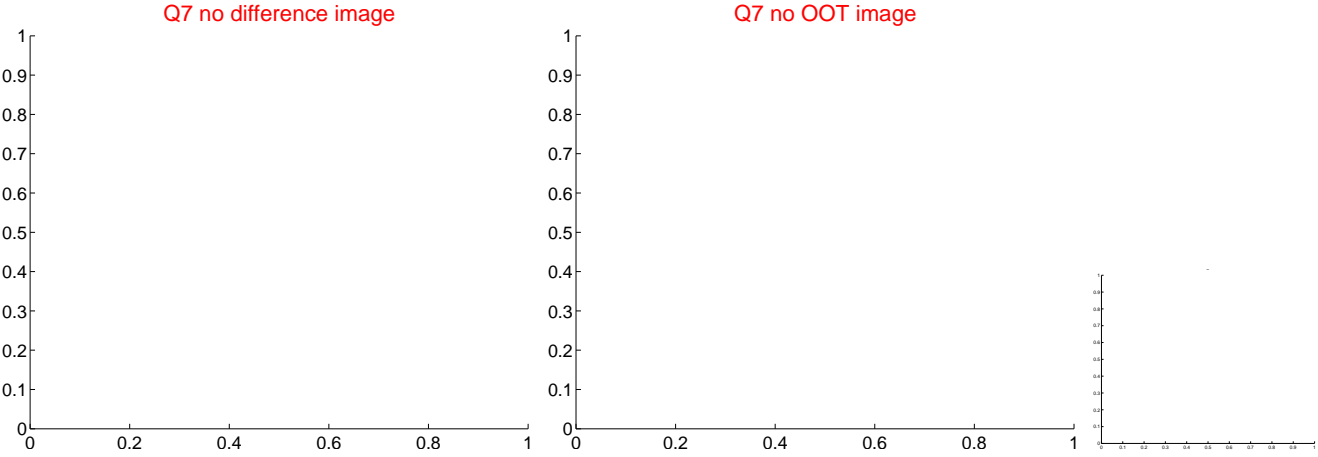
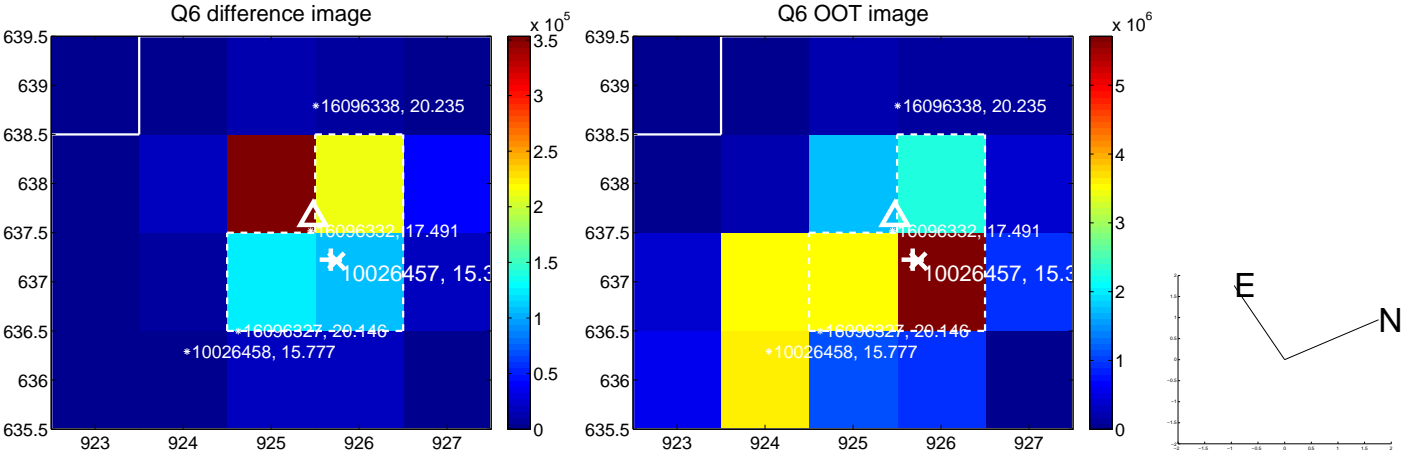
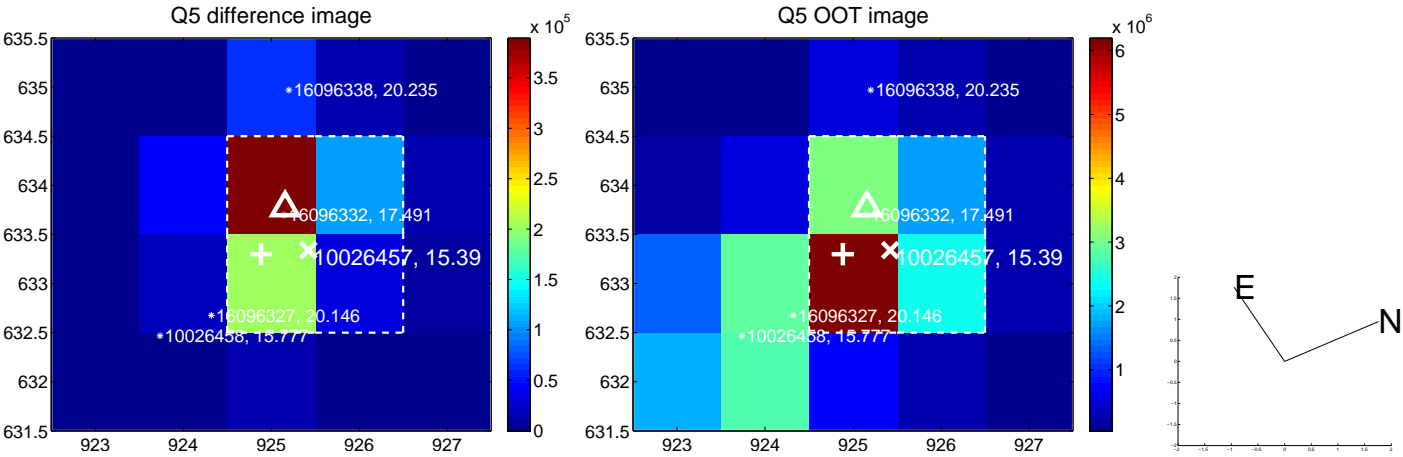


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

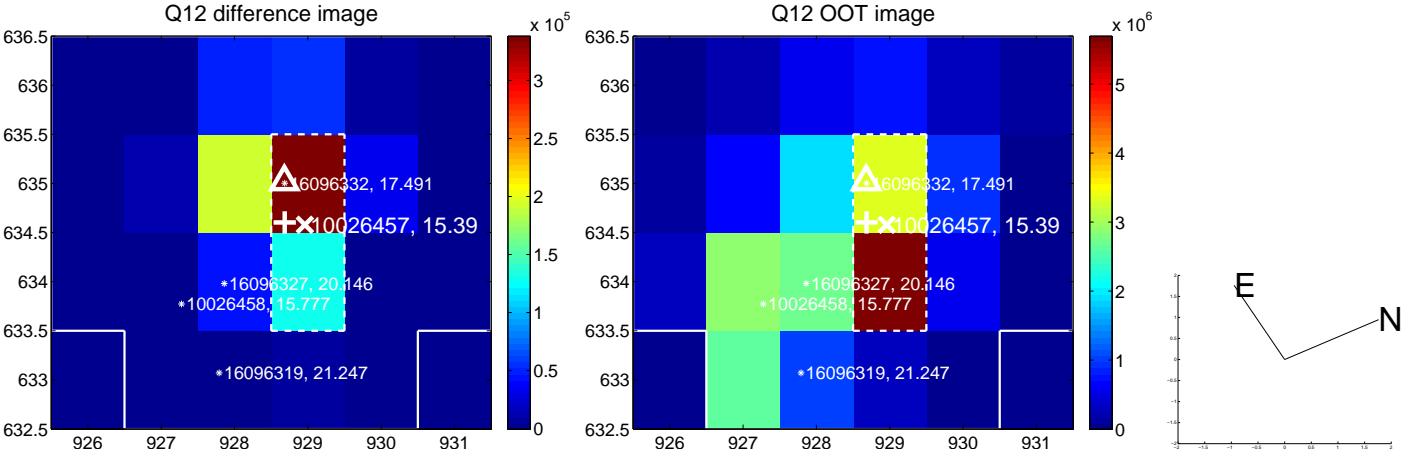
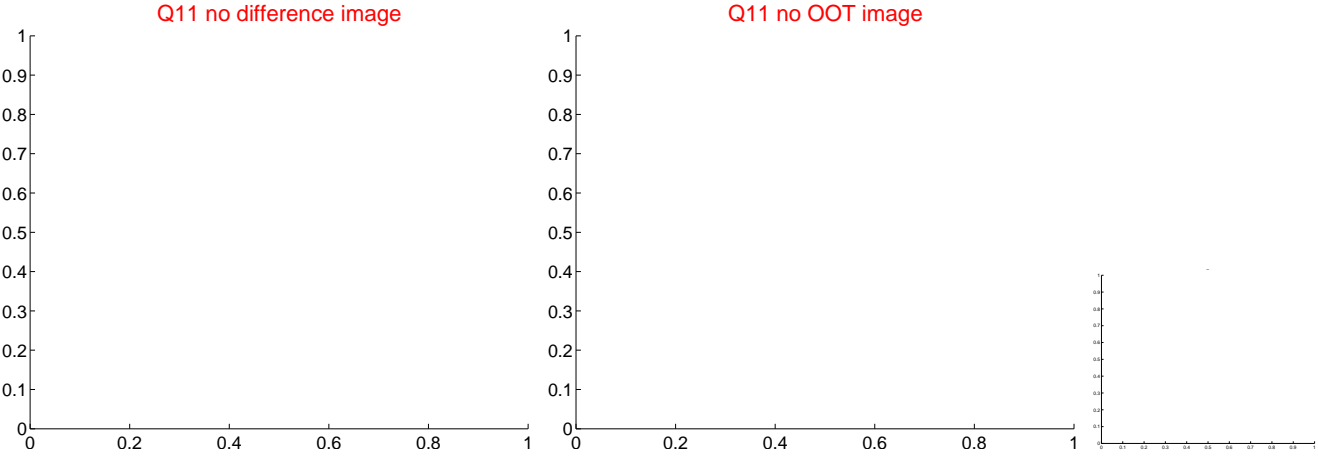
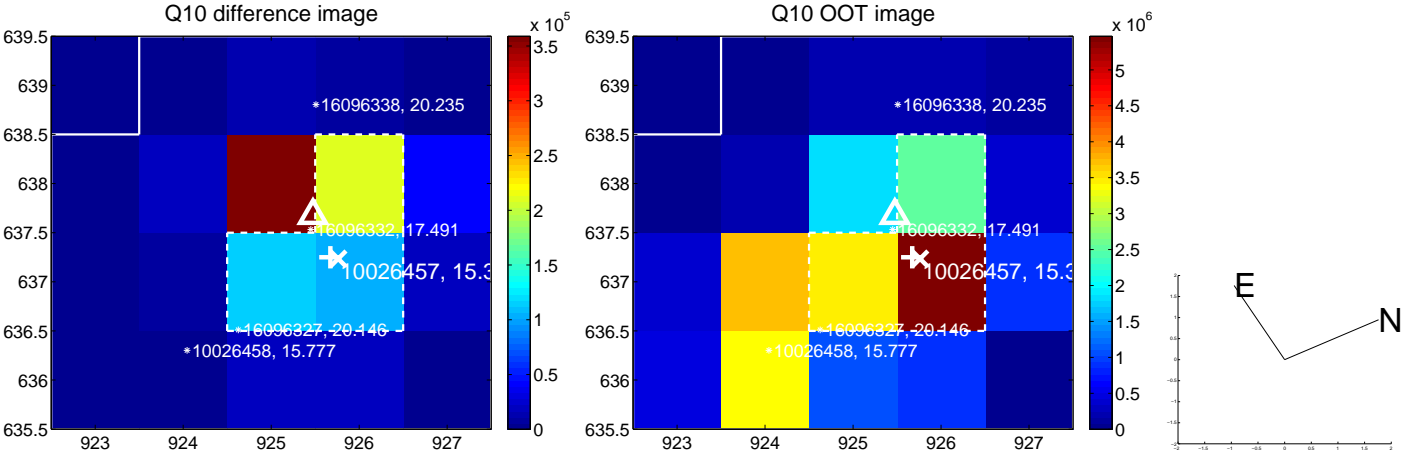
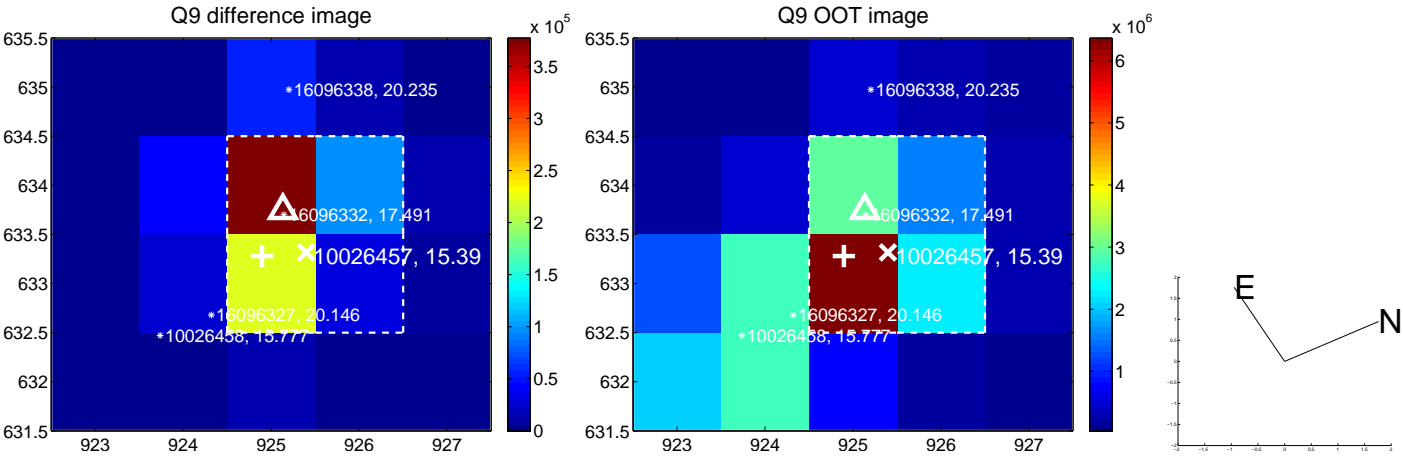


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

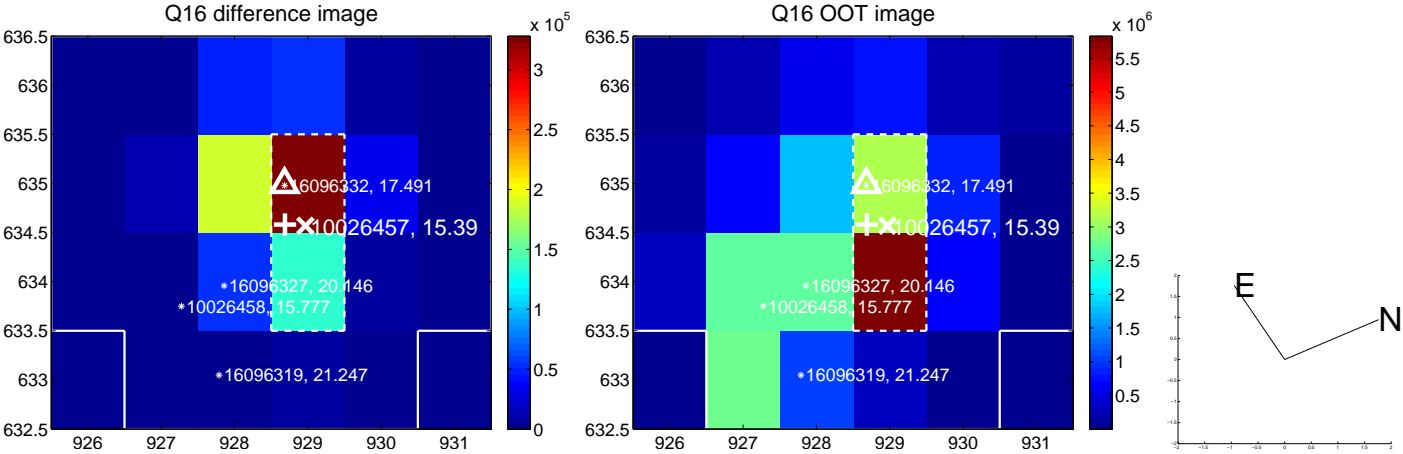
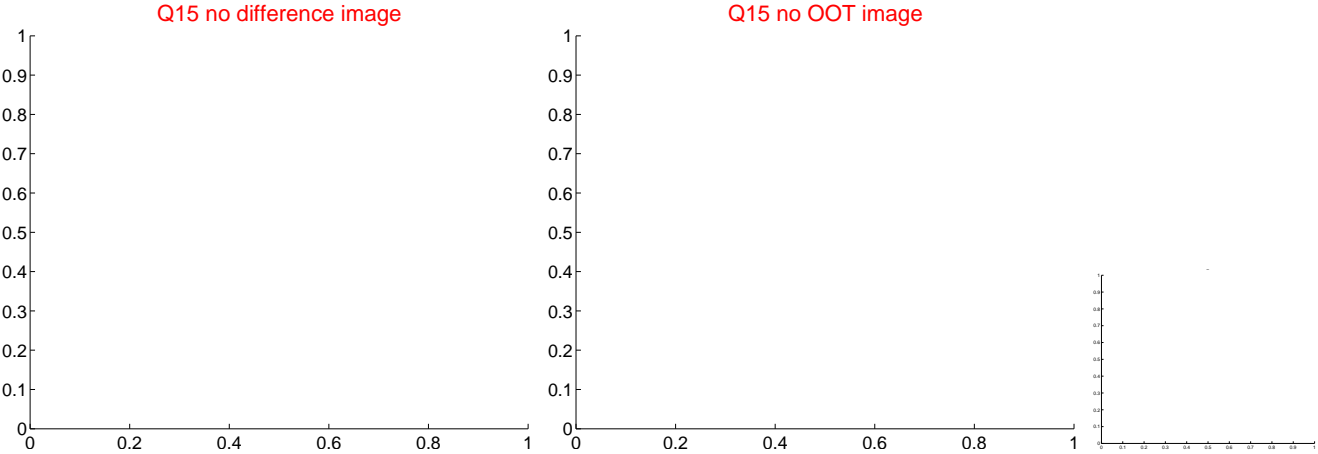
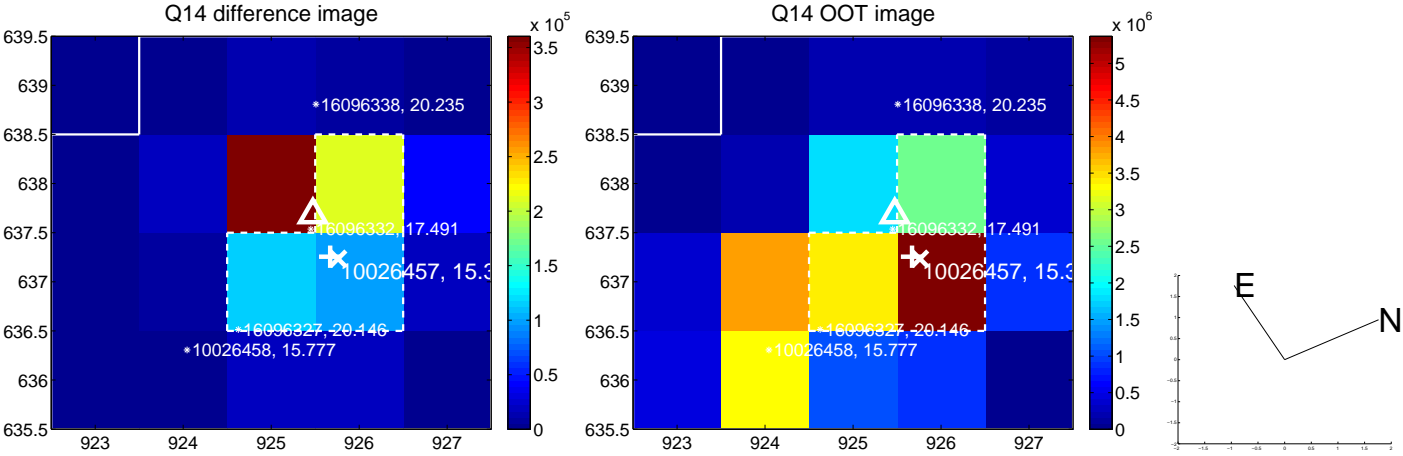
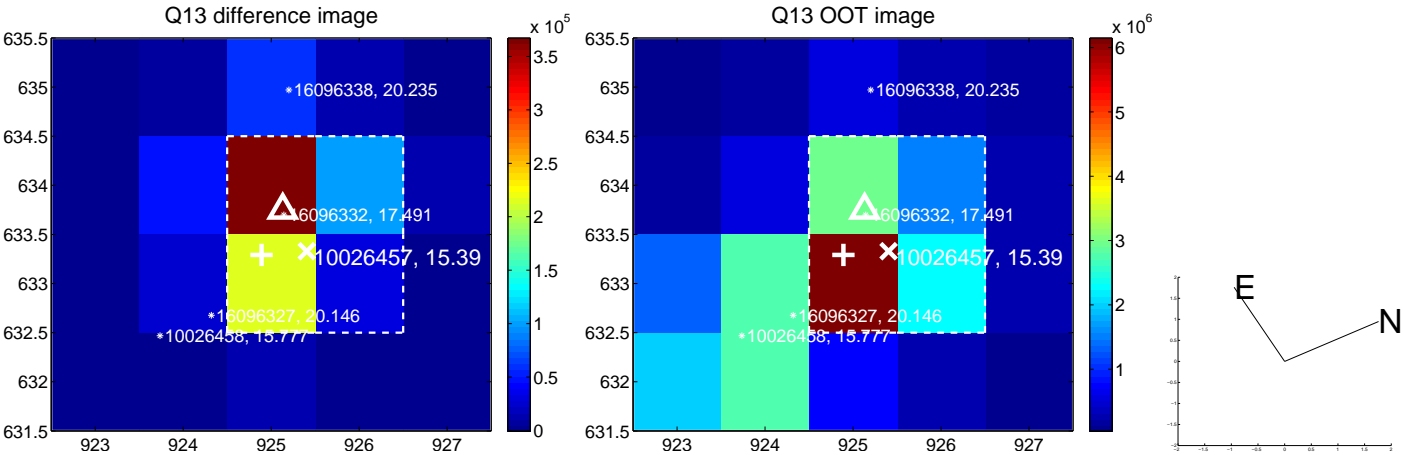




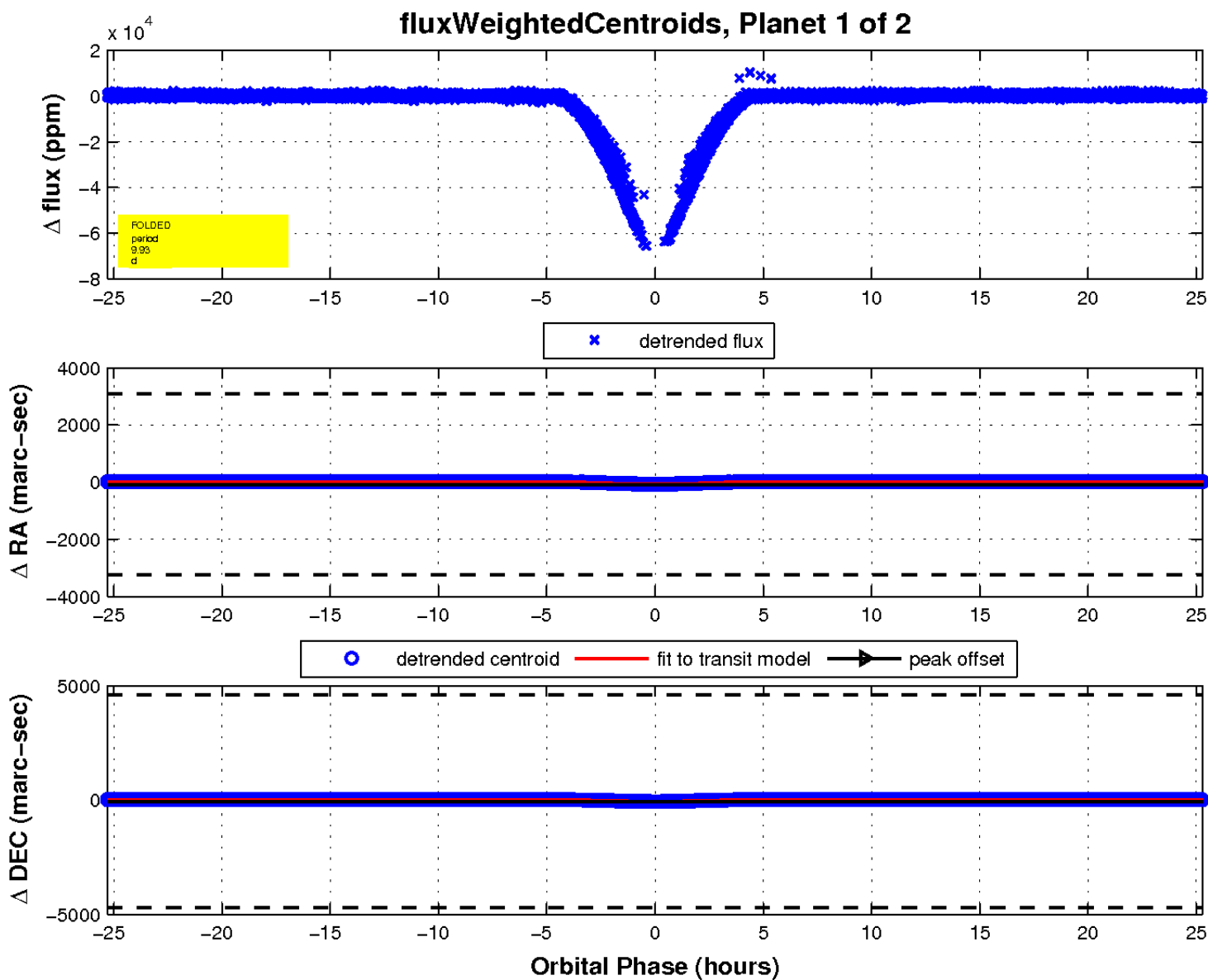
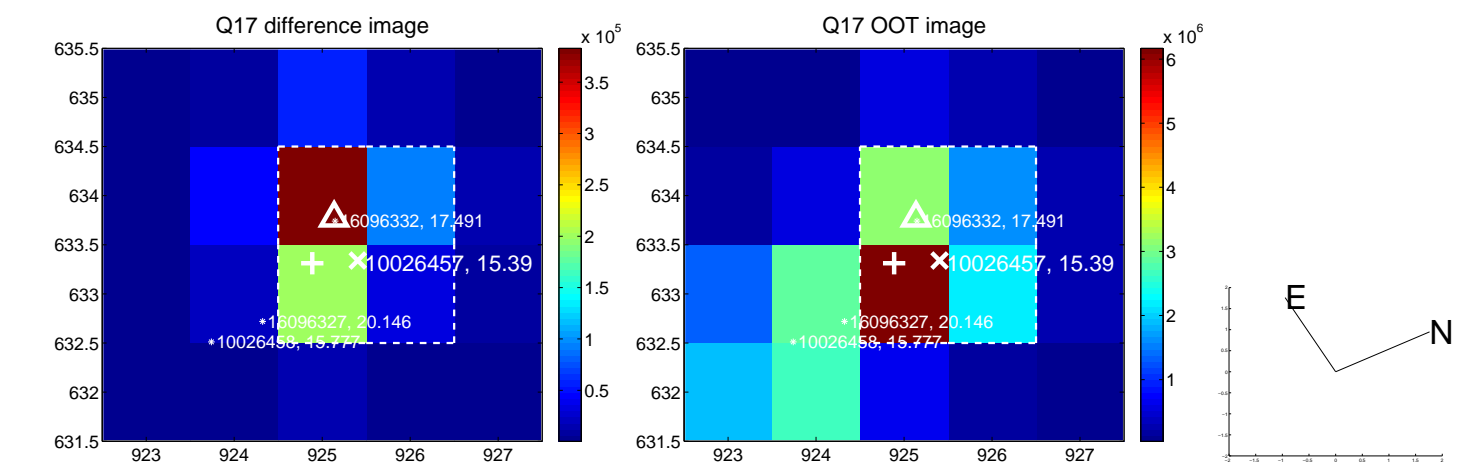
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

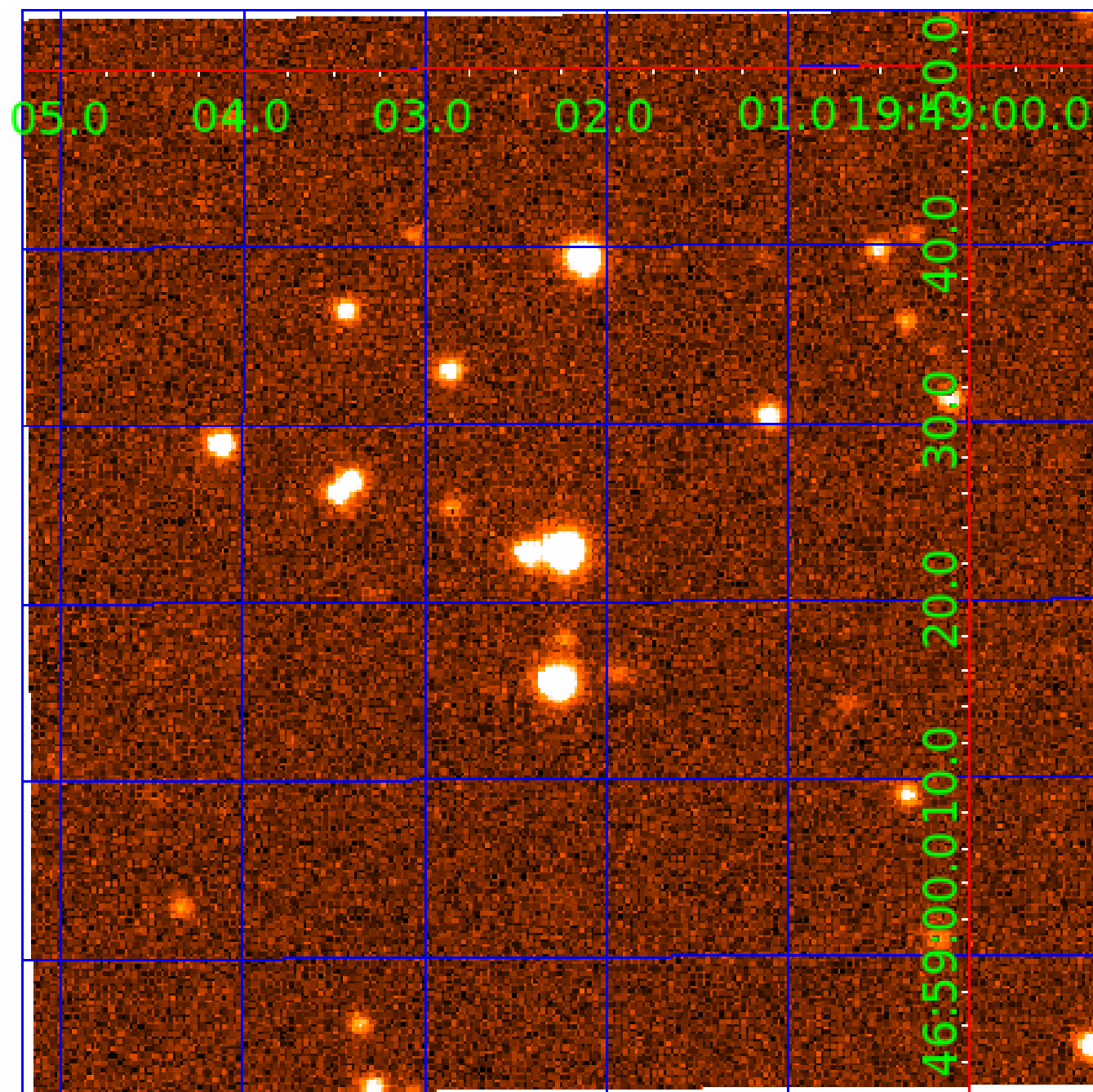


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 010026457

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010026457-01	OBS	7275.01	9.934421	132.875088	47773.3	8.431	2159.9	1088.4	0.67	5382	25.27	50.44
010026457-02	OBS	No	9.934427	138.492981	49127.3	7.029	2093.0	1054.8	0.67	5382	25.62	50.44

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010026457-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE—CENT_KIC_POS
010026457-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_KIC_POS

**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.

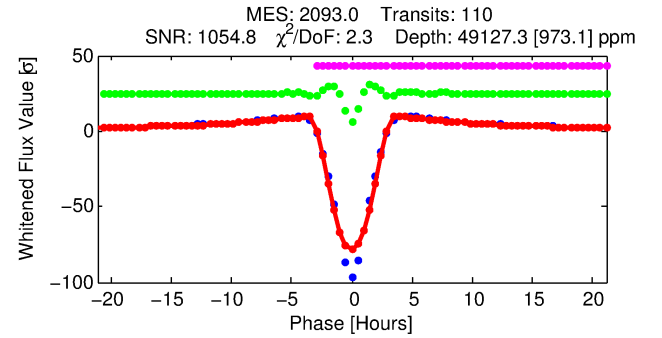
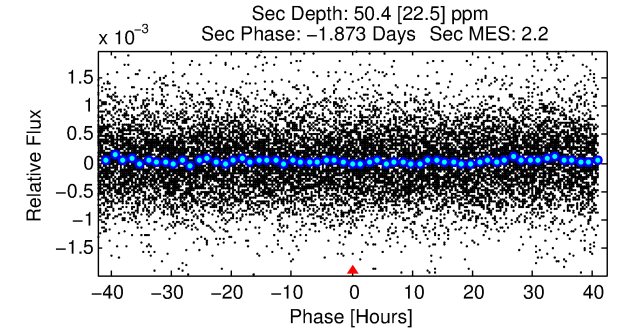
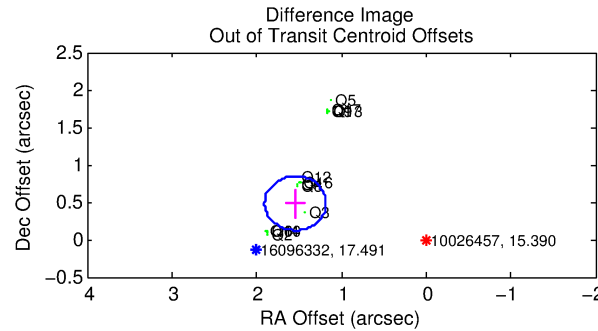
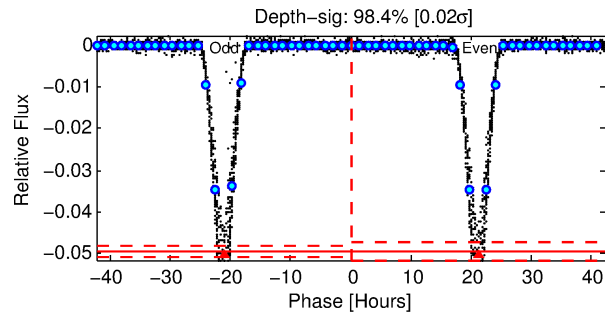
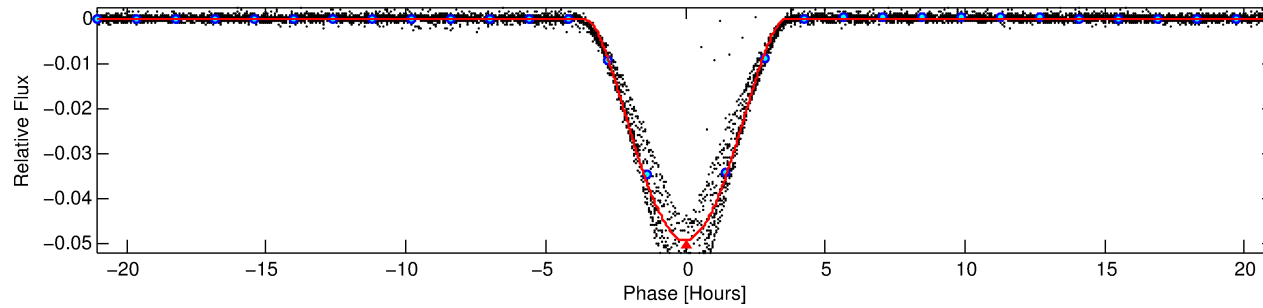
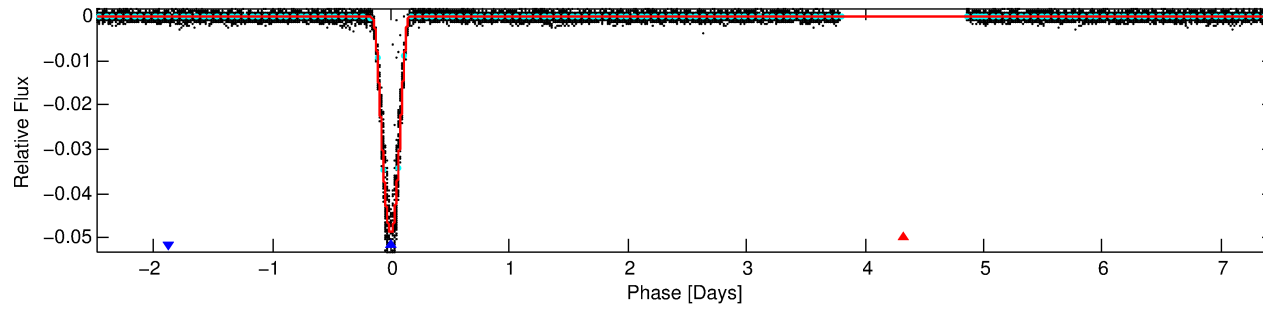
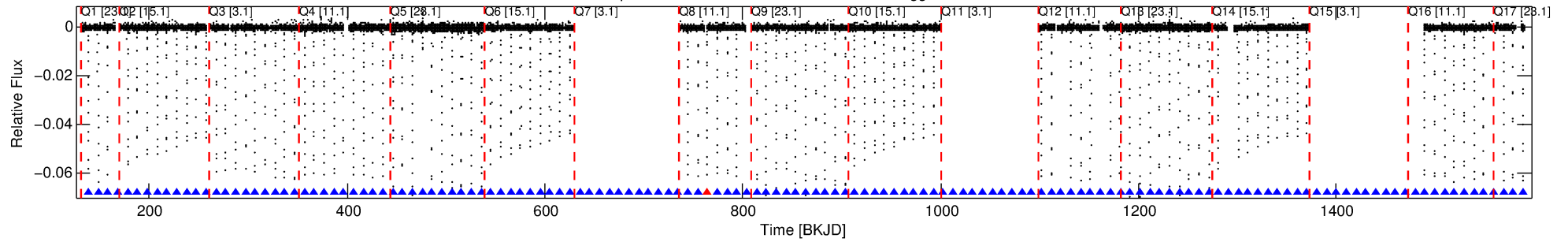
## Ephemeris Match Information For 010026457-02

No Significant Match Found

# DV One-Page Summary

KIC: 10026457 Candidate: 2 of 2 Period: 9.934 d  
KOI: K07275 Corr: No Ephemeris Match

Kp: 15.39 R\*: 0.67 Rs Teff: 5382.0 K Logg: 4.65 Fe/H: -0.640



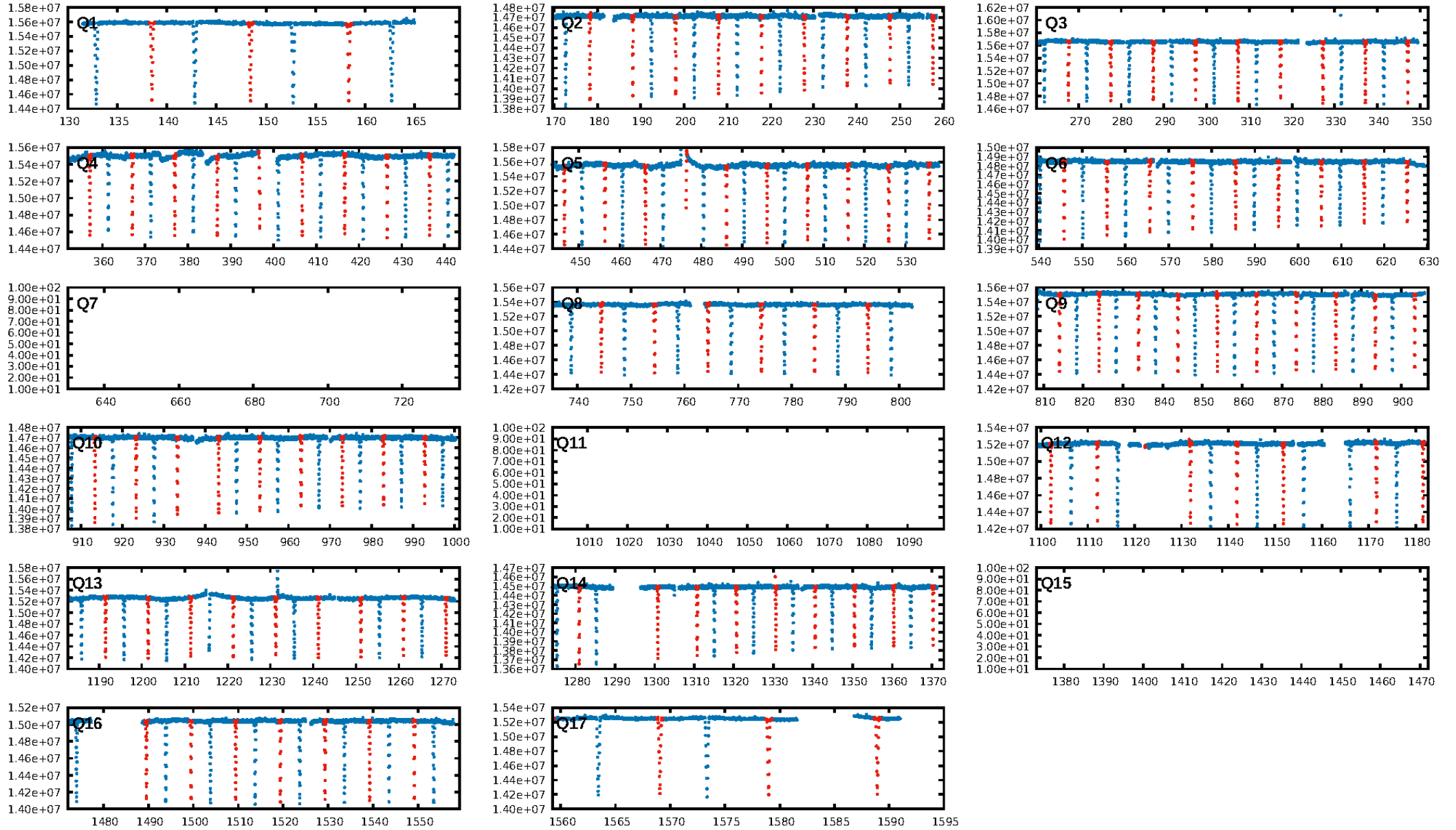
## DV Fit Results:

Period = 9.93443 [0.00000] d  
Epoch = 138.4930 [0.0001] BKJD  
Rp/R\* = 0.3509 [0.0329]  
a/R\* = 9.87 [0.01]  
b = 1.00 [0.05]  
Seff = 50.44 [10.05]  
Teq = 680 [34] K  
Rp = 25.62 [4.36] Re  
a = 0.0817 [0.0094] AU  
Ag = 0.28 [0.14] [-4.99σ]  
Teffp = 765 [96] K [0.85σ]

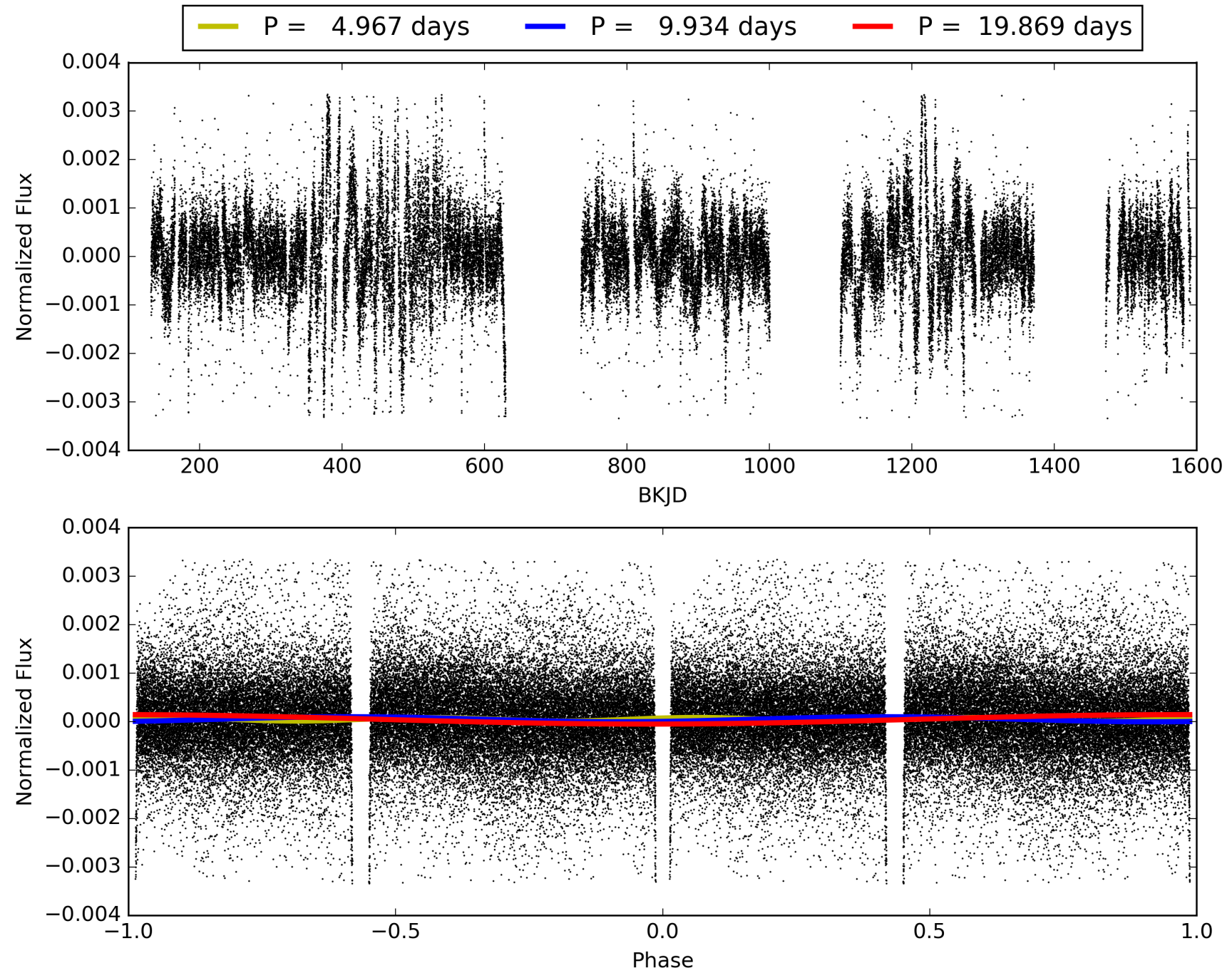
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 0.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 0.99 [102/103]  
GhostDiagnostic-chr: 1.353  
Centroid-sig: 0.0%  
Centroid-so: 1.804 arcsec [451.27σ]  
OotOffset-rm: 1.617 arcsec [13.37σ]  
KicOffset-rm: 2.073 arcsec [30.36σ]  
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]

# TCE 010026457-02, PDC Light Curves



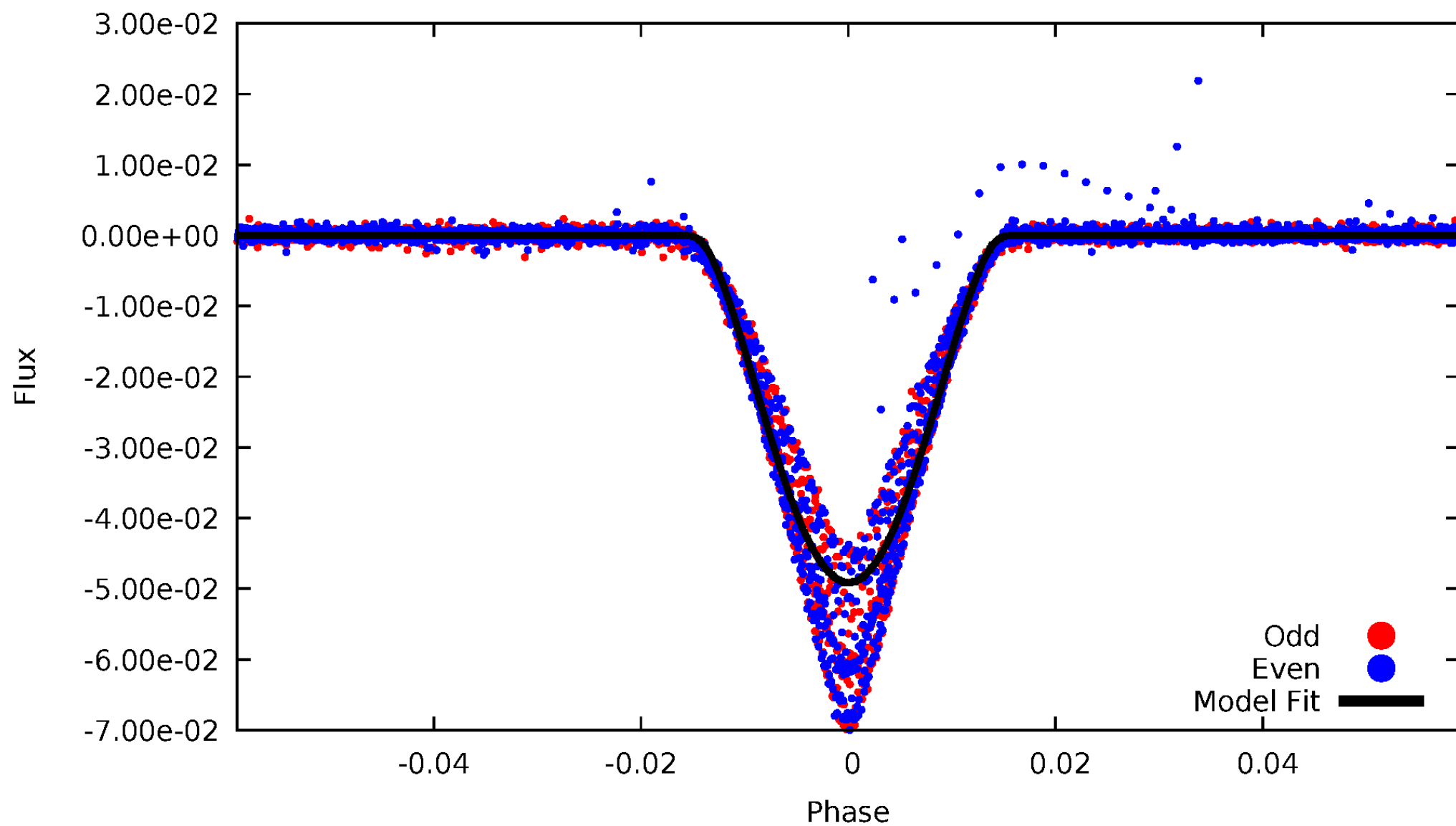
TCE 010026457-02





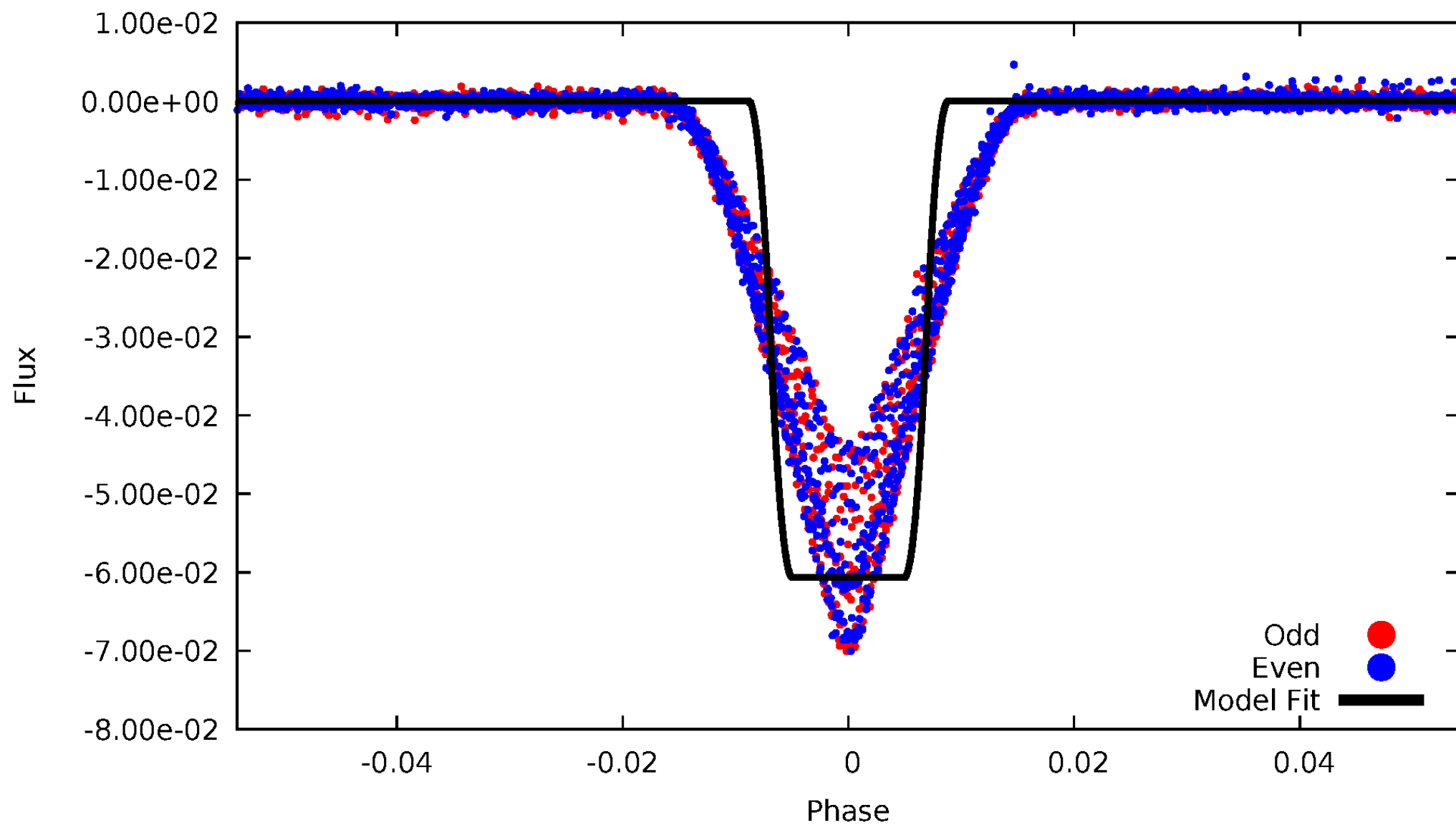
# DV Odd/Even

TCE 010026457-02



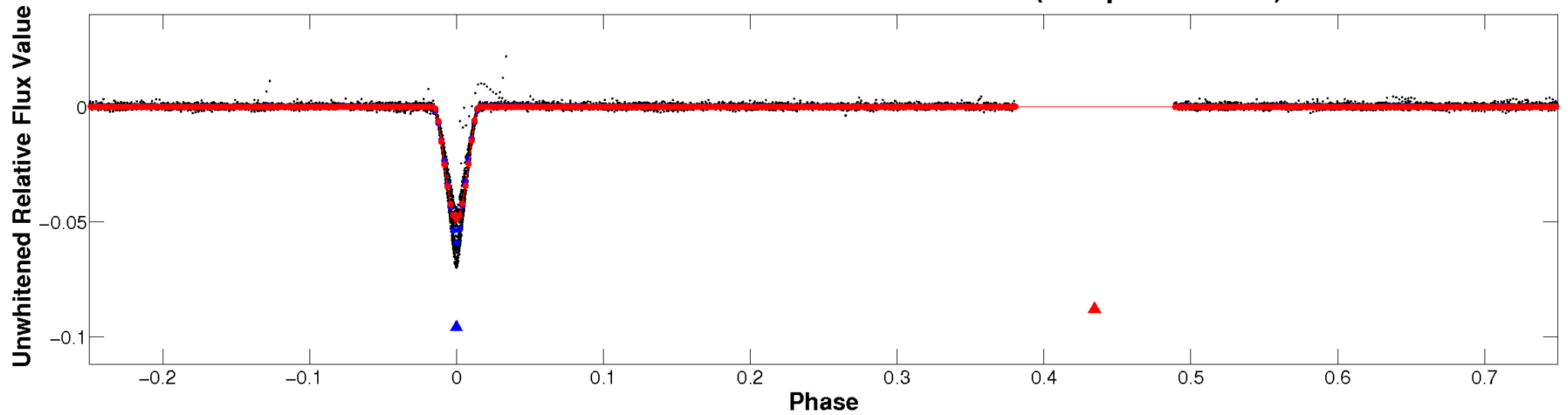
# ALT Odd/Even

TCE 010026457-02

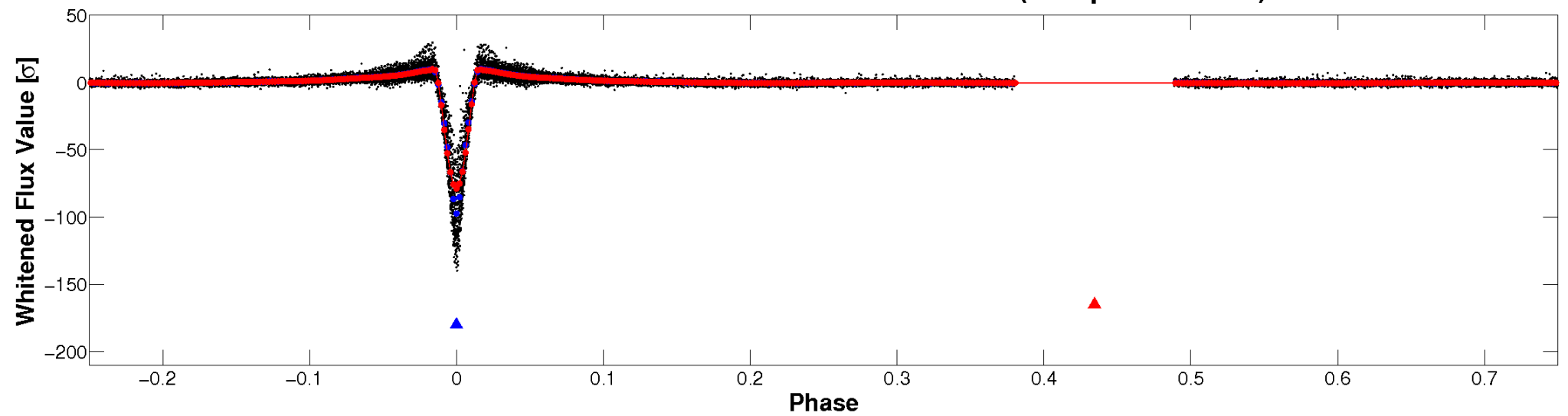


# Non-Whitened Vs. Whitened Light Curve

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

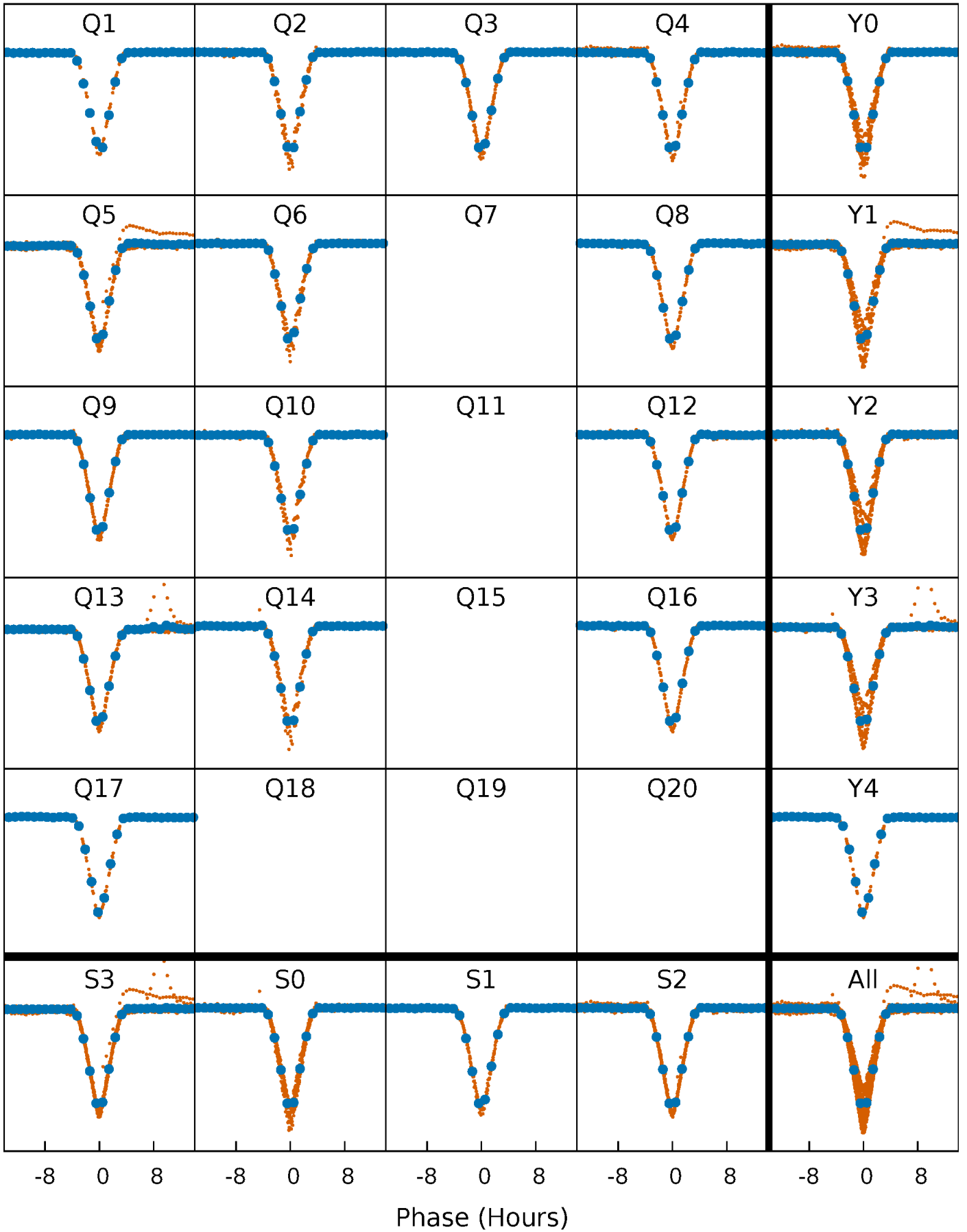


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



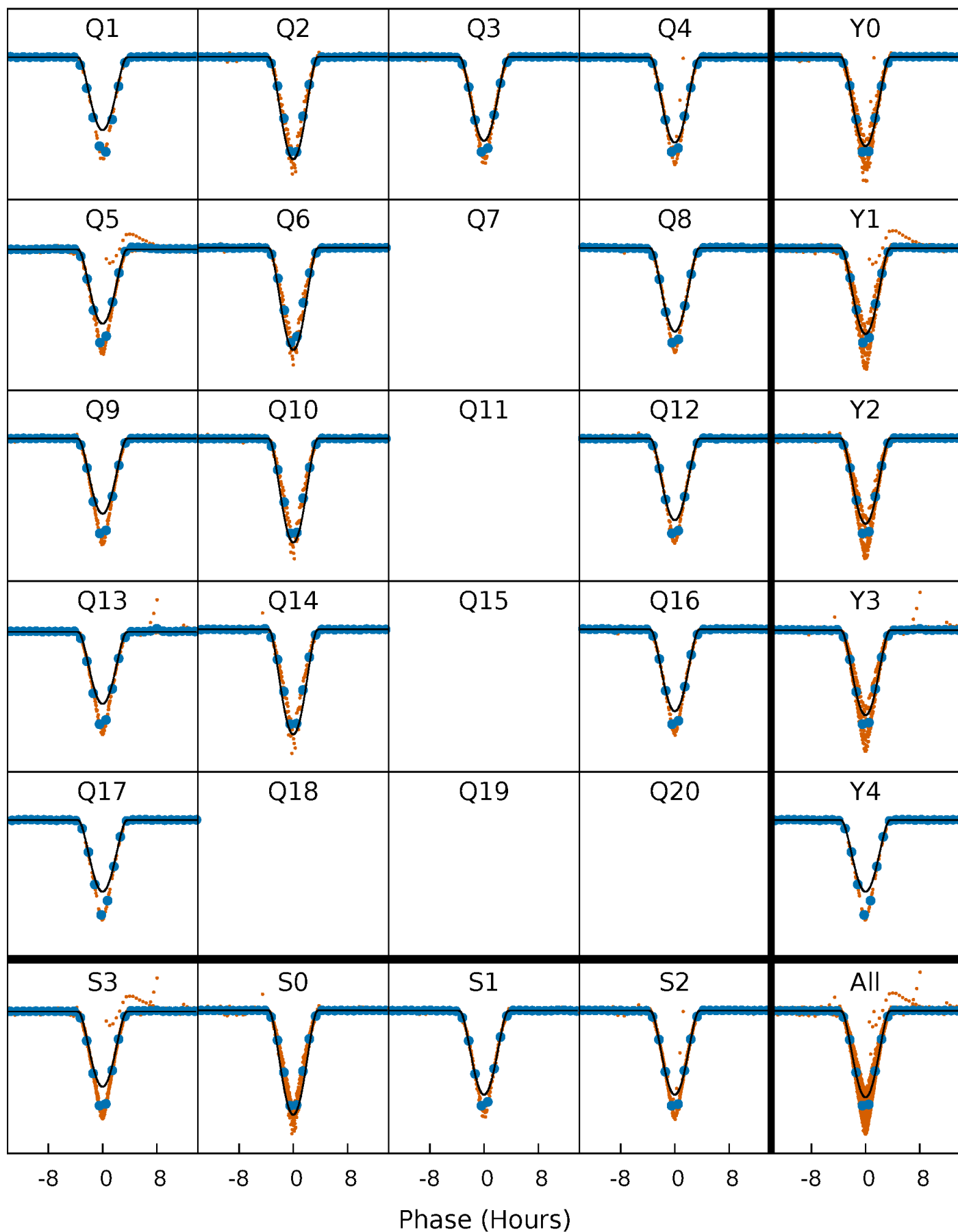
# PDC Quarter-Phased Transit Curves

TCE 010026457-02 P= 9.934427 Days  $T_0=138.492981$  (BKJD)



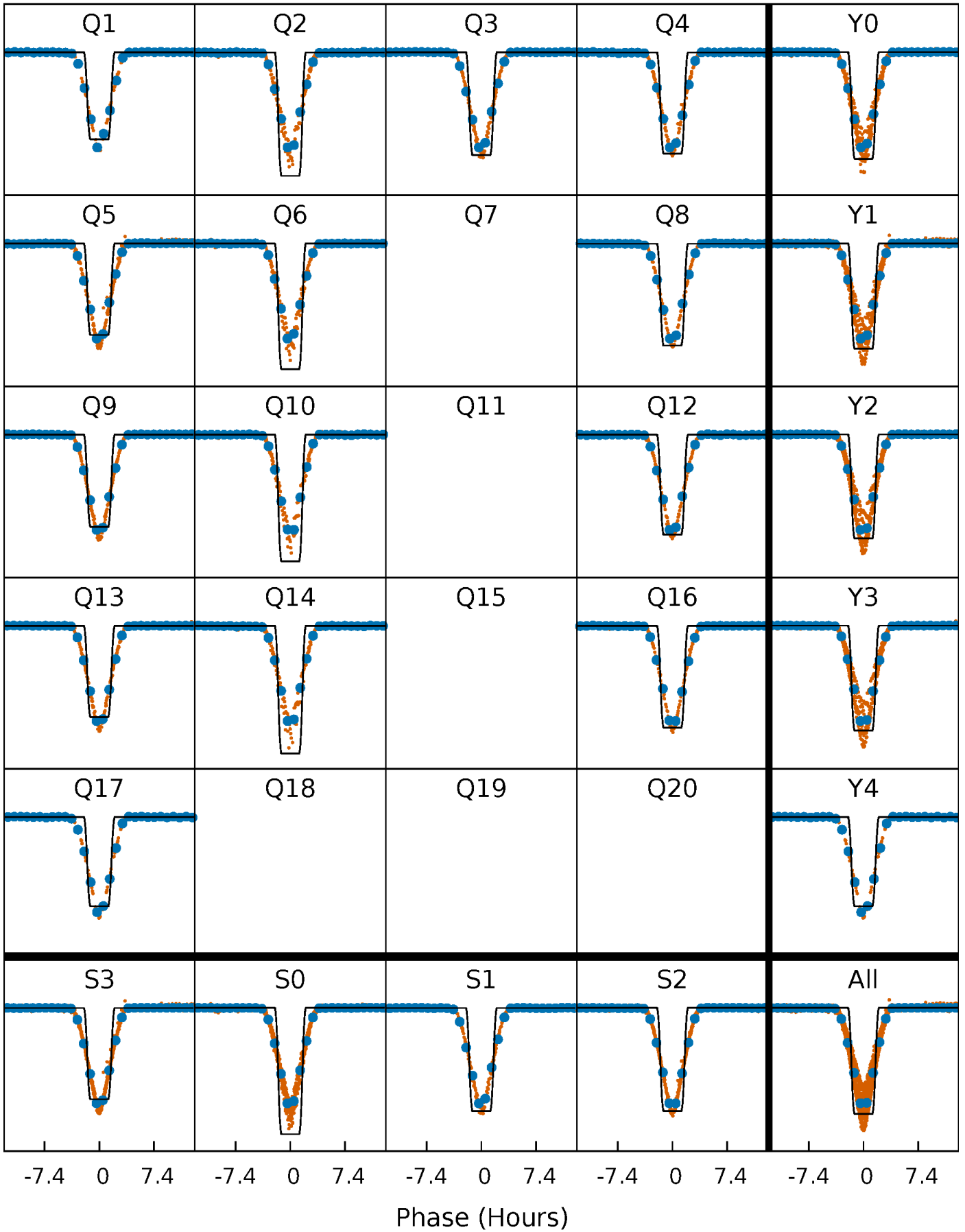
# DV Quarter-Phased Transit Curves

TCE 010026457-02   P= 9.934427 Days    $T_0=138.492981$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

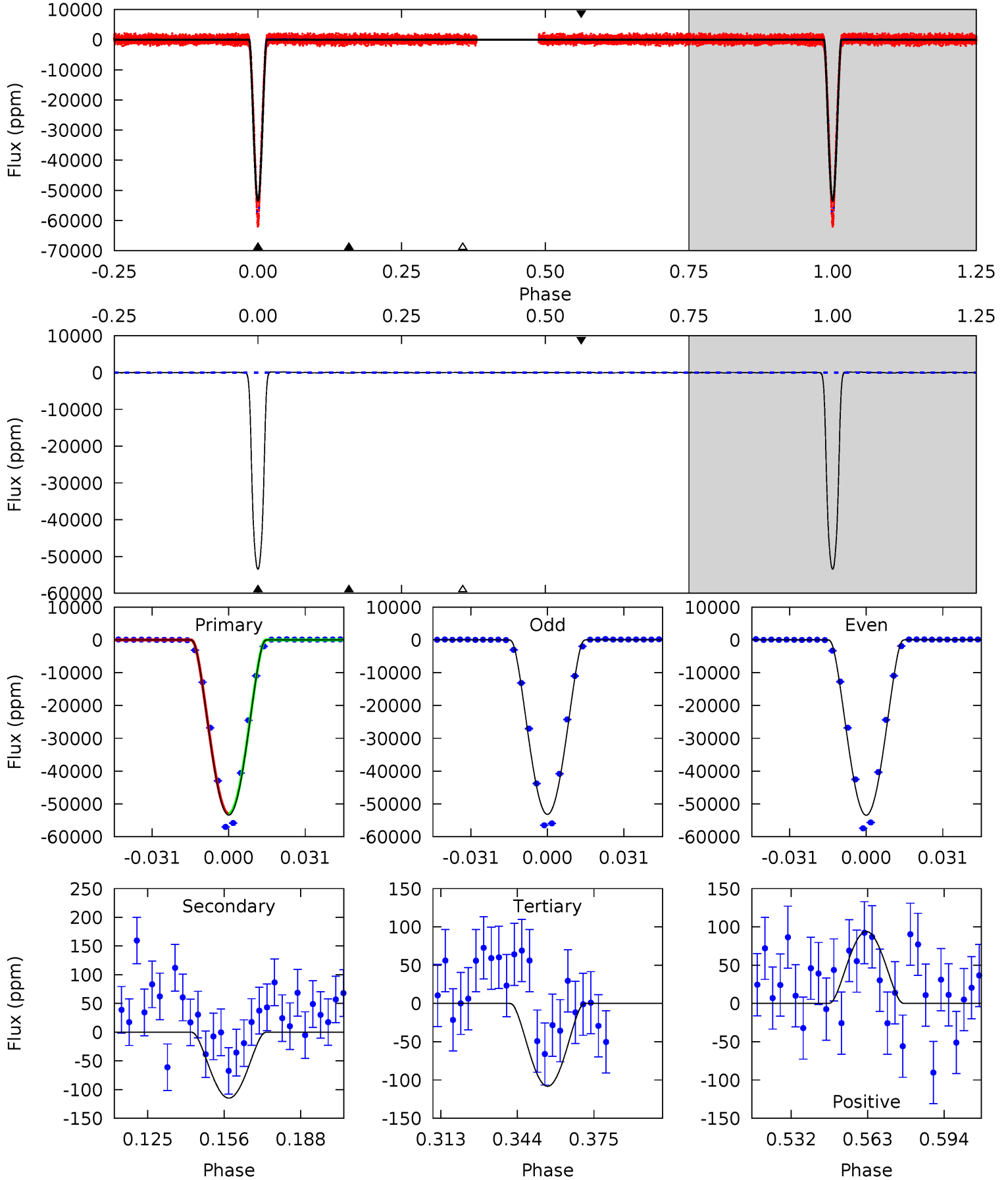
TCE 010026457-02   P= 9.934414 Days    $T_0=138.493822$  (BKJD)



# DV Model-Shift Uniqueness Test

010026457-02, P = 9.934427 Days, E = 128.558554 Days

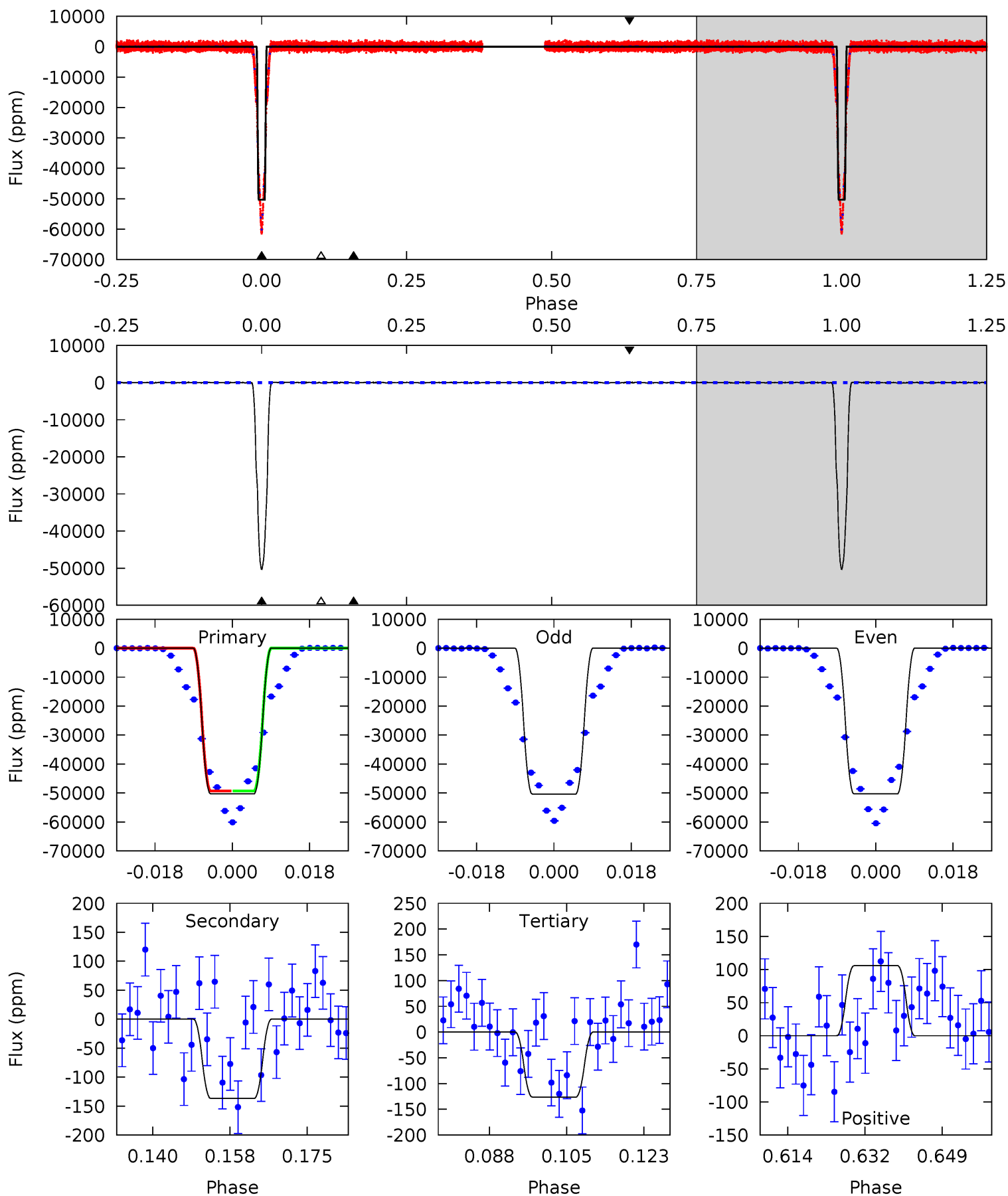
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3128	6.73	6.34	5.50	4.80	2.15	2.88	3121	3122	0.39	1.23	7.81	0.96	0.00	0.95



# Alt Model-Shift Uniqueness Test

010026457-02, P = 9.934414 Days, E = 128.559408 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
1504	4.09	3.78	3.16	4.92	2.38	1.28	1500	1501	0.32	0.93	0.74	0.97	0.00	0





### Stellar Parameters For KIC 010026457

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$5382^{+160}_{-160}$	$4.654^{+0.030}_{-0.084}$	$-0.640^{+0.300}_{-0.300}$	$0.669^{+0.095}_{-0.041}$	$0.749^{+0.064}_{-0.072}$	$3.518^{+0.433}_{-1.036}$
	+3%/-3%	+1%/-2%	+47%/-47%	+14%/-6%	+9%/-10%	+12%/-29%
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 010026457-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-115 \pm 17$	$26.16^{+2.99}_{-2.68}$	$961^{+39}_{-35}$	$1821^{+79}_{-101}$	$0.611^{+0.159}_{-0.142}$
Alt.	$-137 \pm 33$	$18.32^{+2.87}_{-2.60}$	$960^{+40}_{-34}$	$2082^{+113}_{-111}$	$1.455^{+0.716}_{-0.480}$

$T_{max}$  = 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

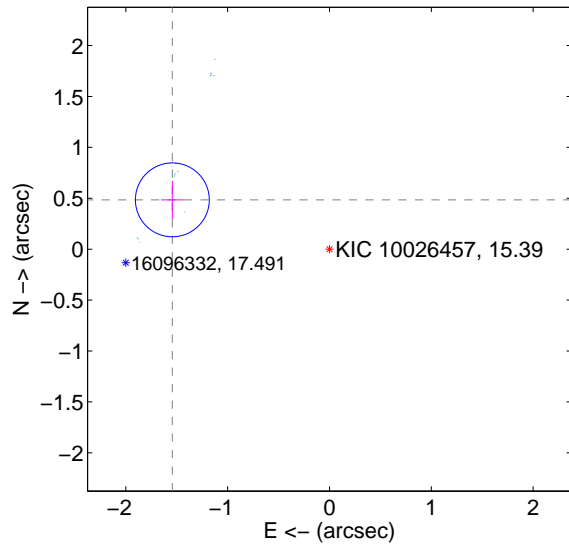
Supplemental centroid analysis for 010026457-02. Kepler magnitude: 15.39. Transit SNR 1054.77

There are 14 quarters with good PRF difference image offsets

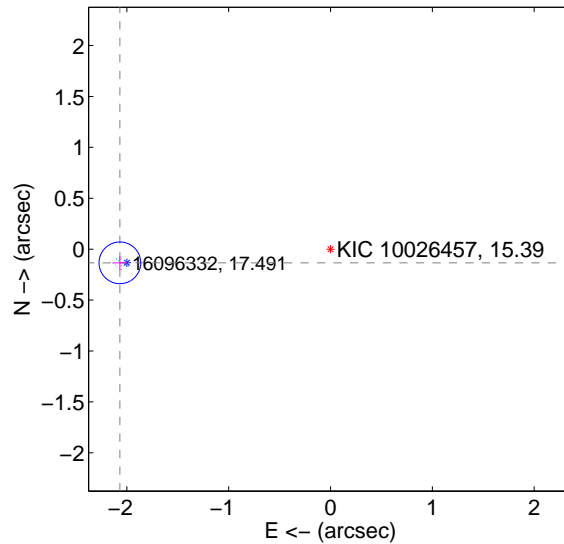
The OOT PRF centroid is offset from the target star catalog position by about 2.03 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.617 \pm 0.121$	13.37	$1.543 \pm 0.112$	$0.484 \pm 0.188$
PRF-fit source offset from KIC position	$2.073 \pm 0.068$	30.36	$2.069 \pm 0.068$	$-0.134 \pm 0.067$
photometric centroid source offset	$1.80 \pm 0.00$	451.27	$1.78 \pm 0.00$	$-0.28 \pm 0.01$

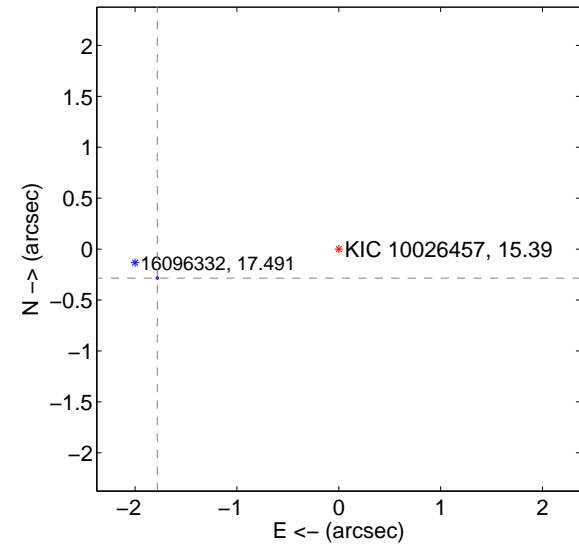
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

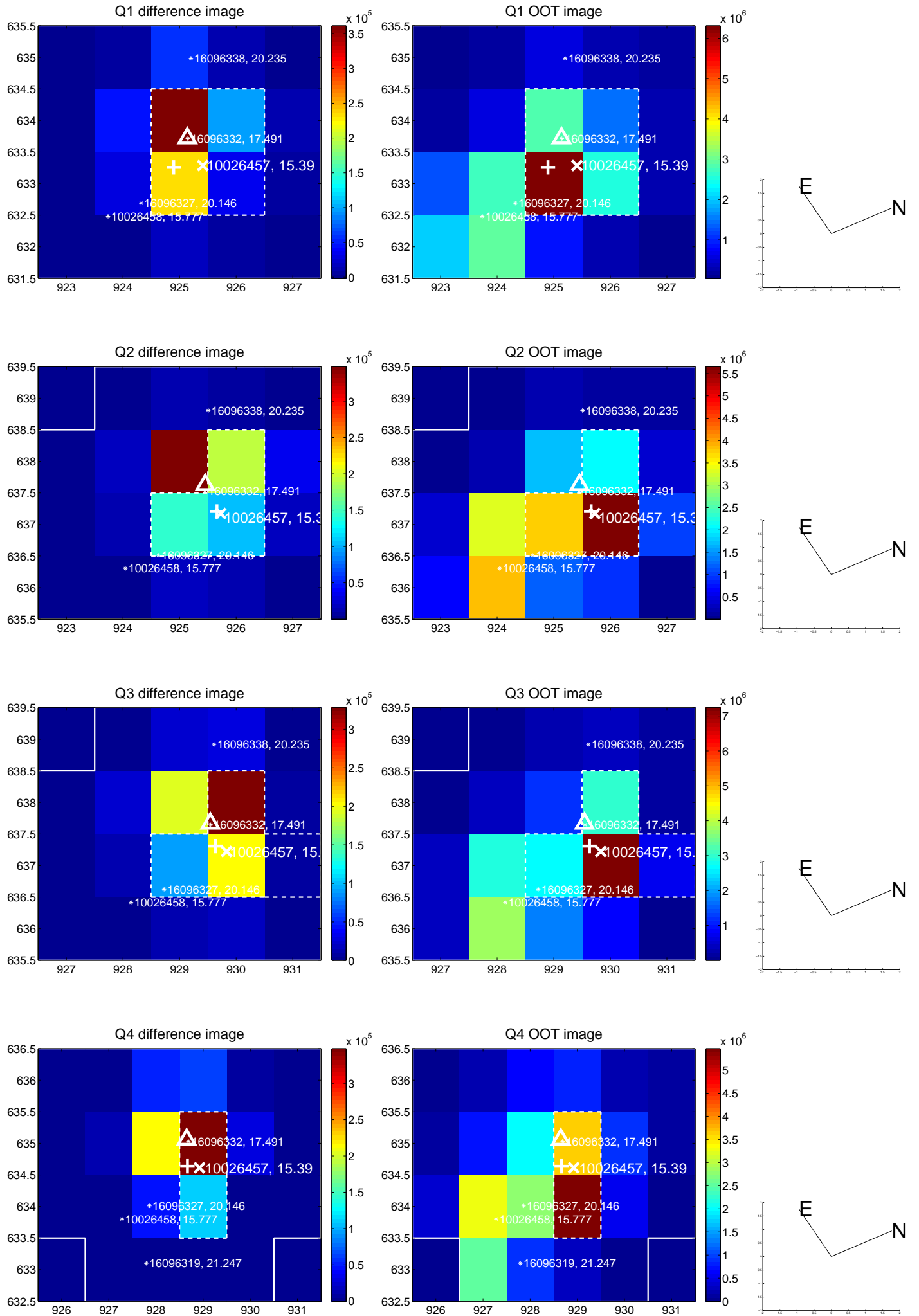


offset from photometric centroids

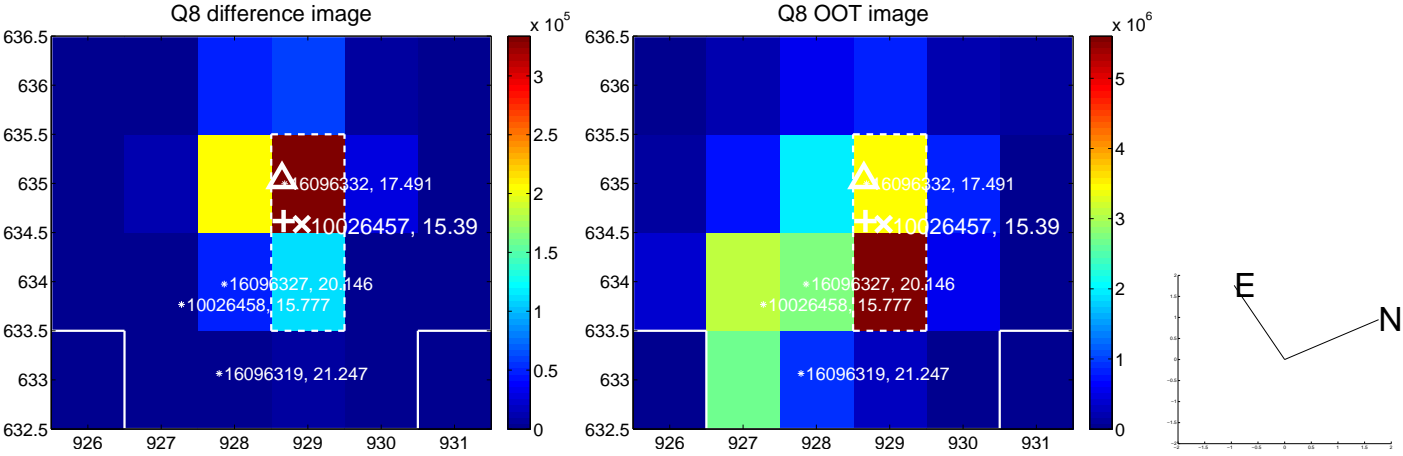
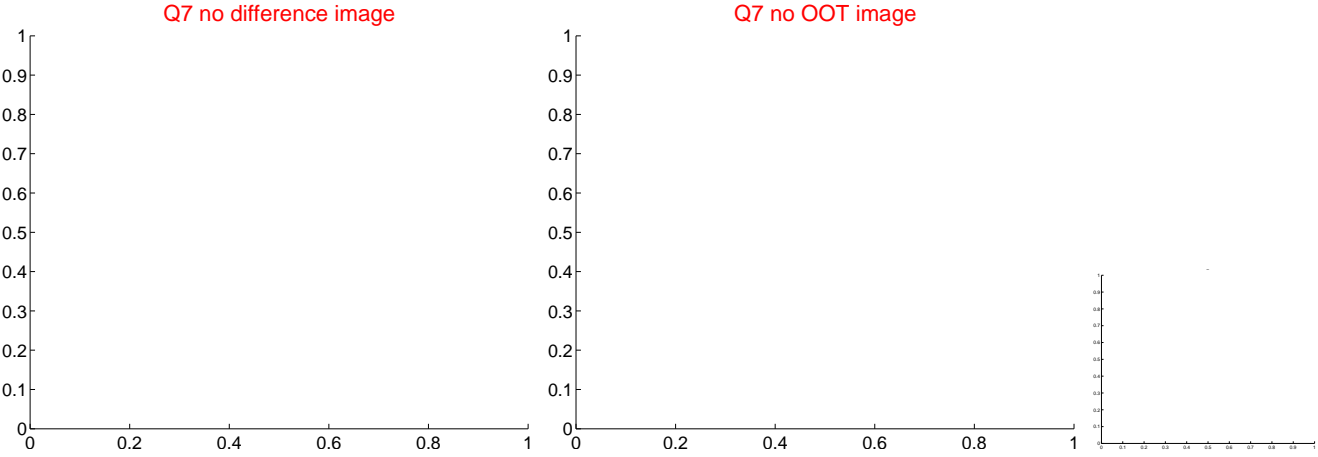
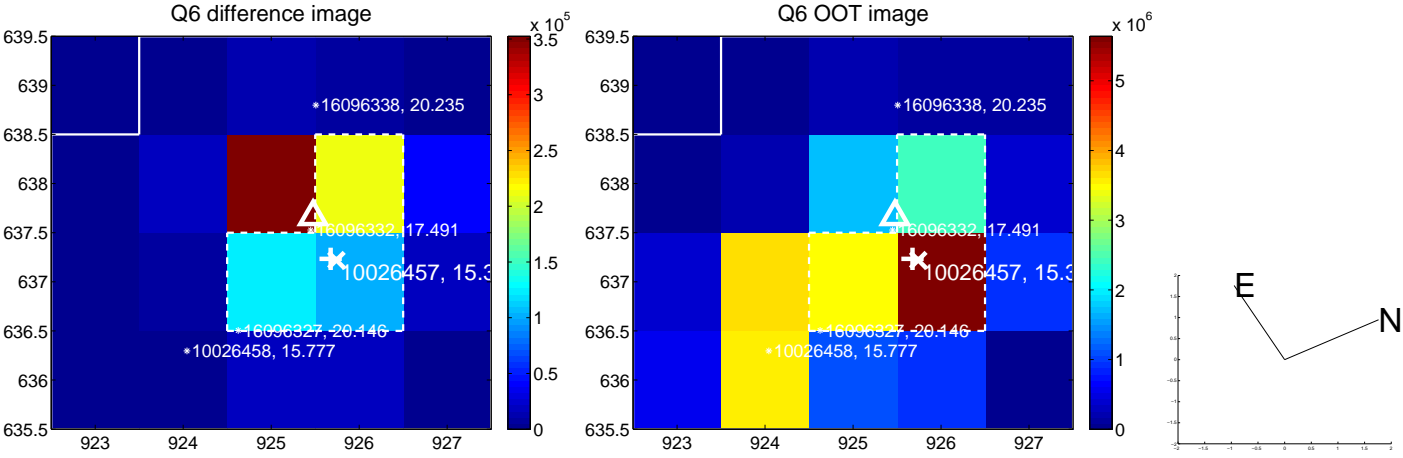
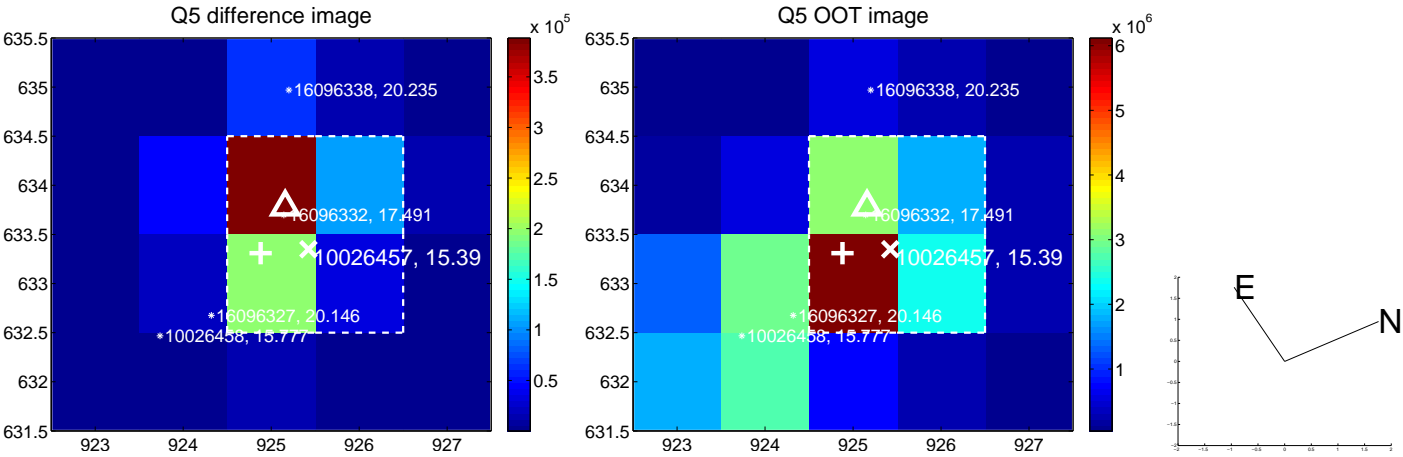


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

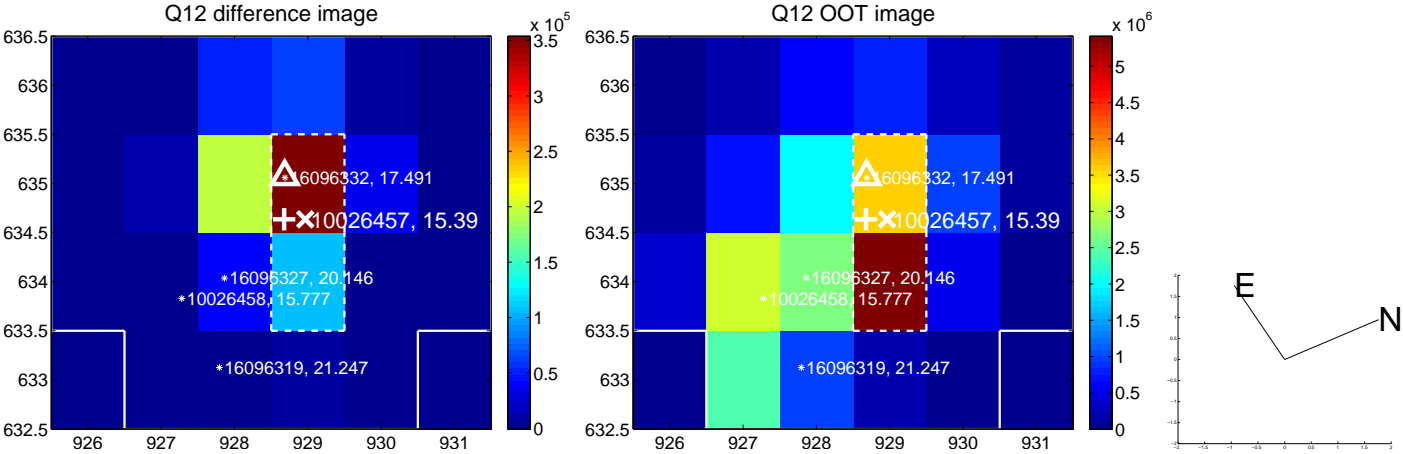
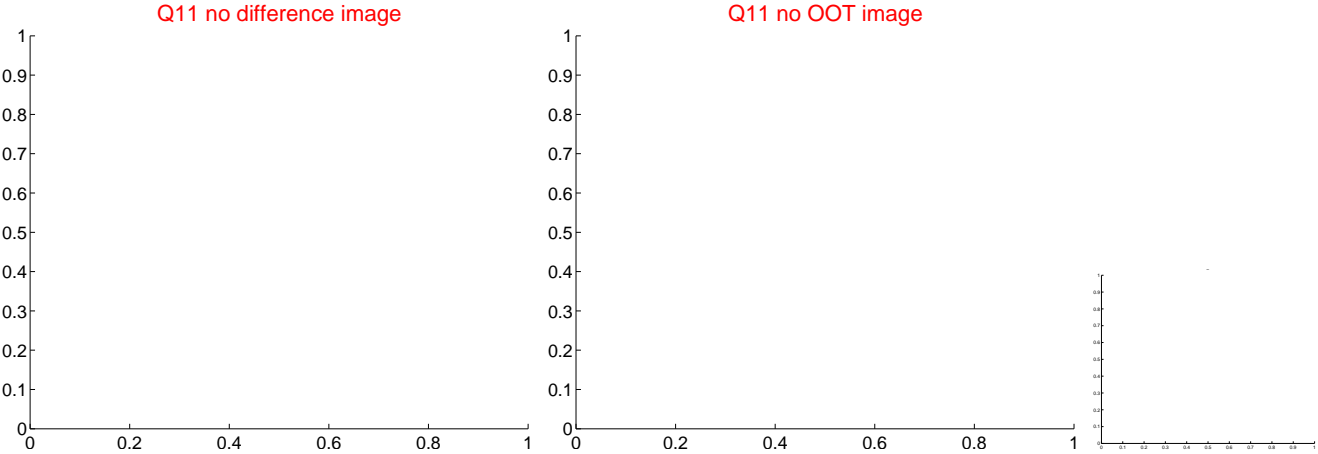
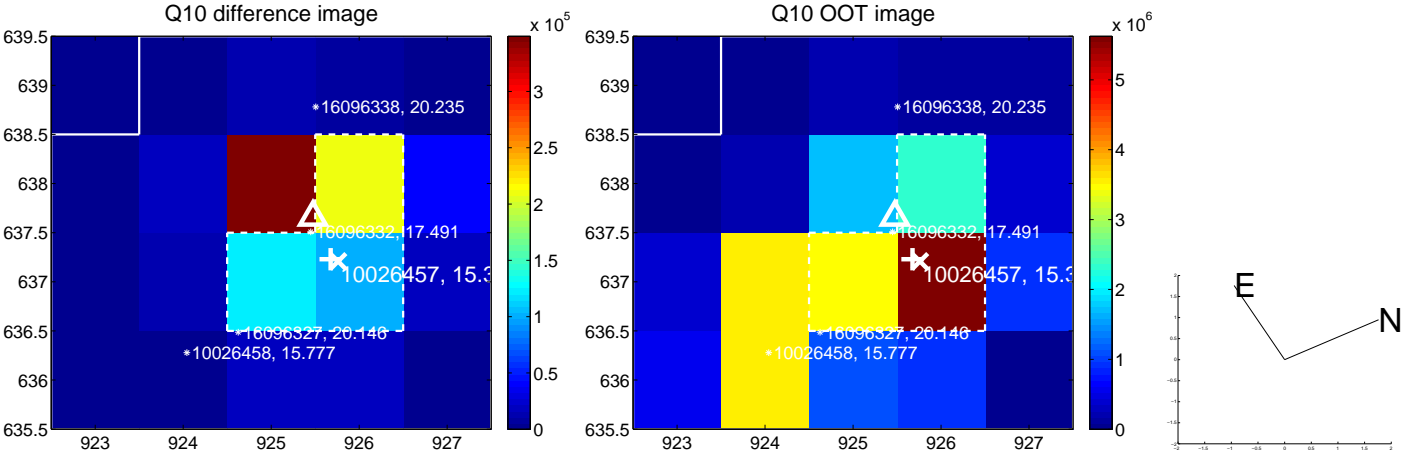
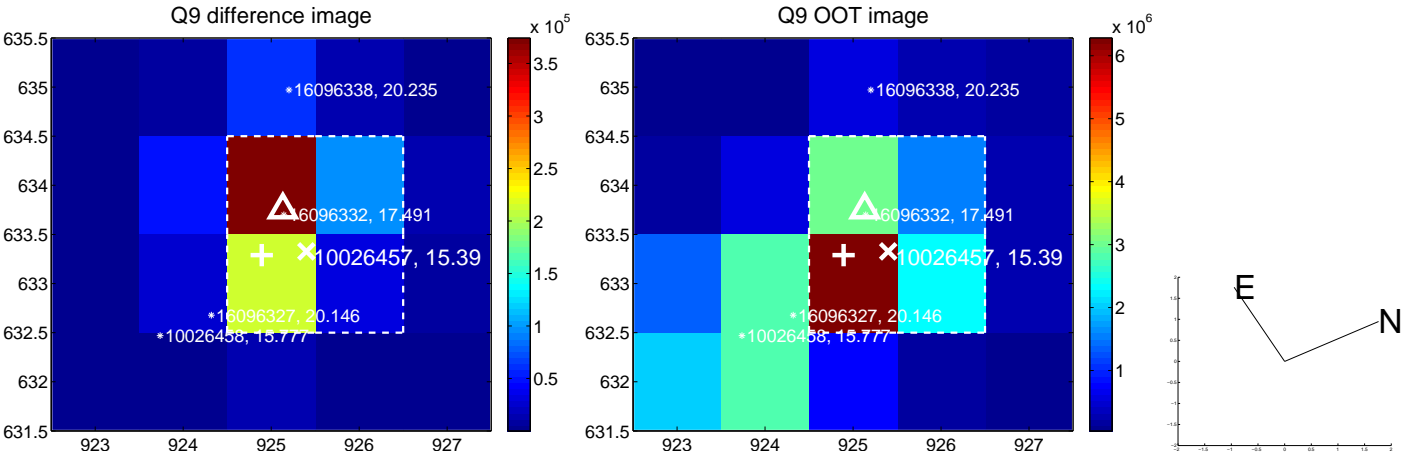
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



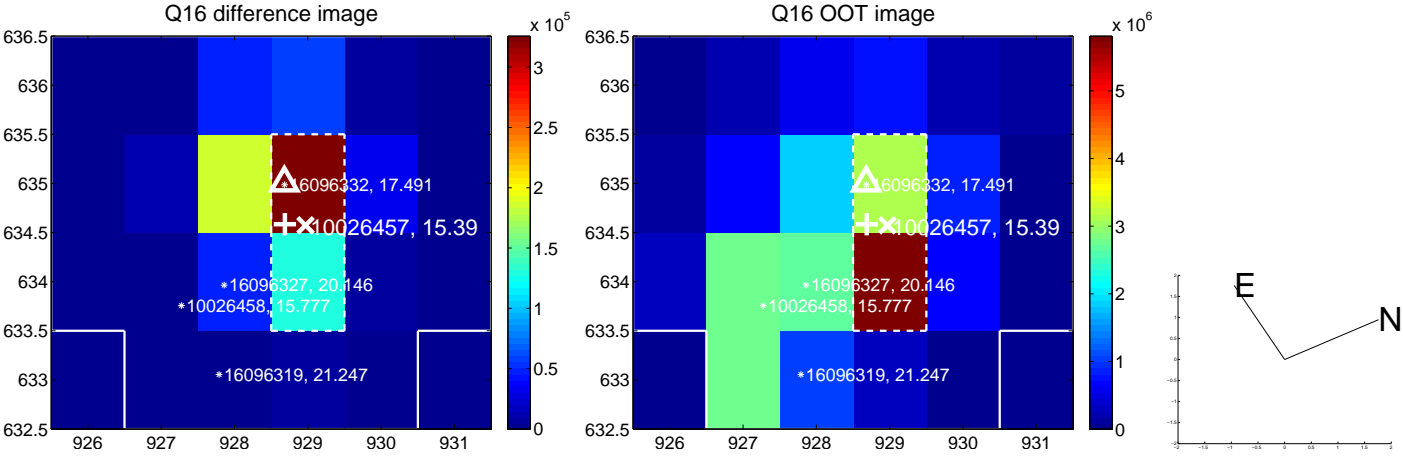
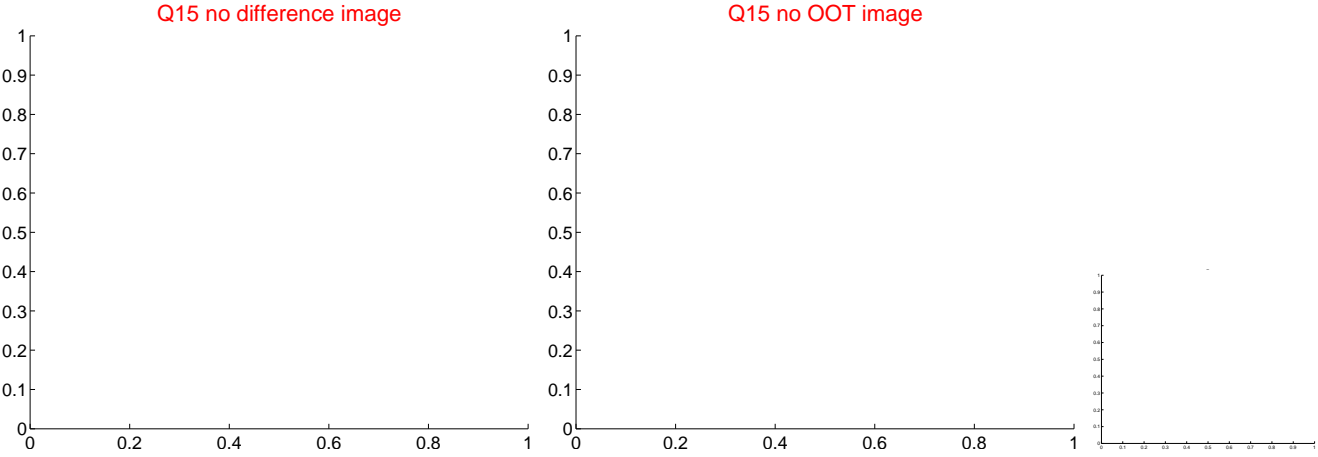
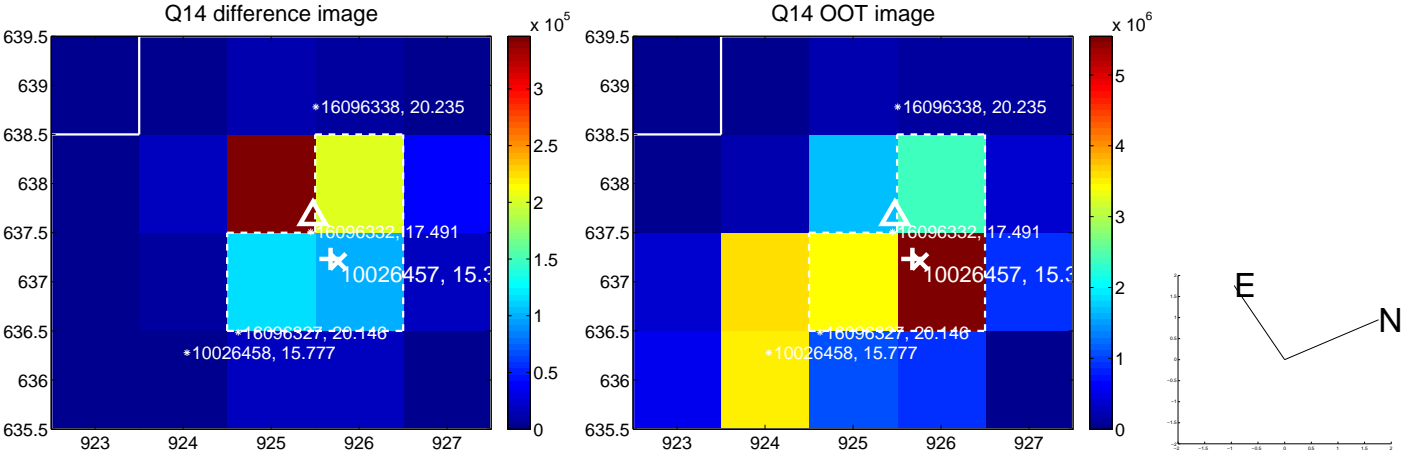
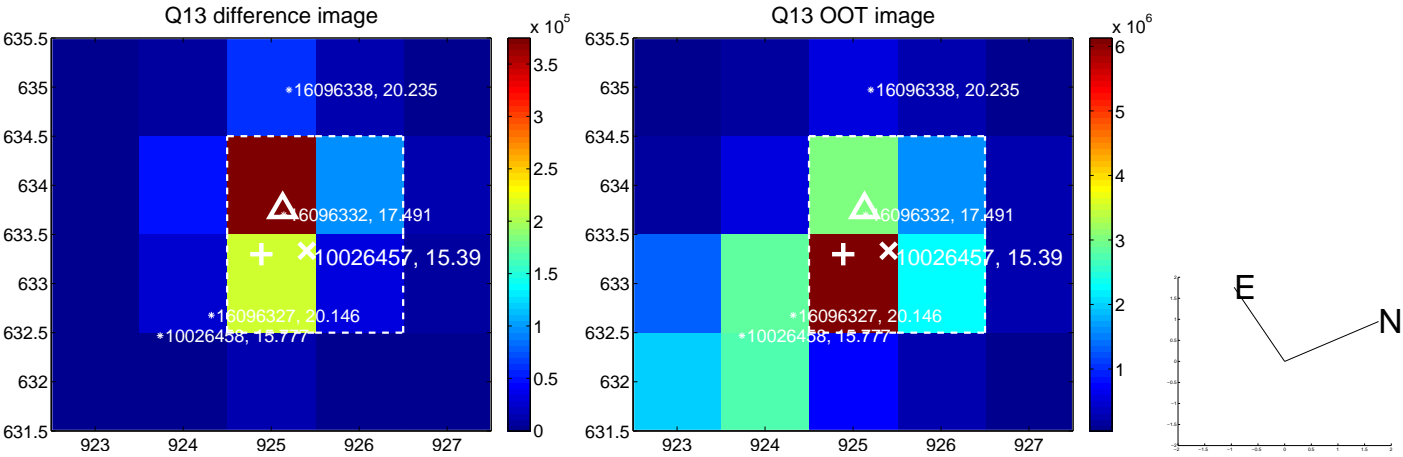
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



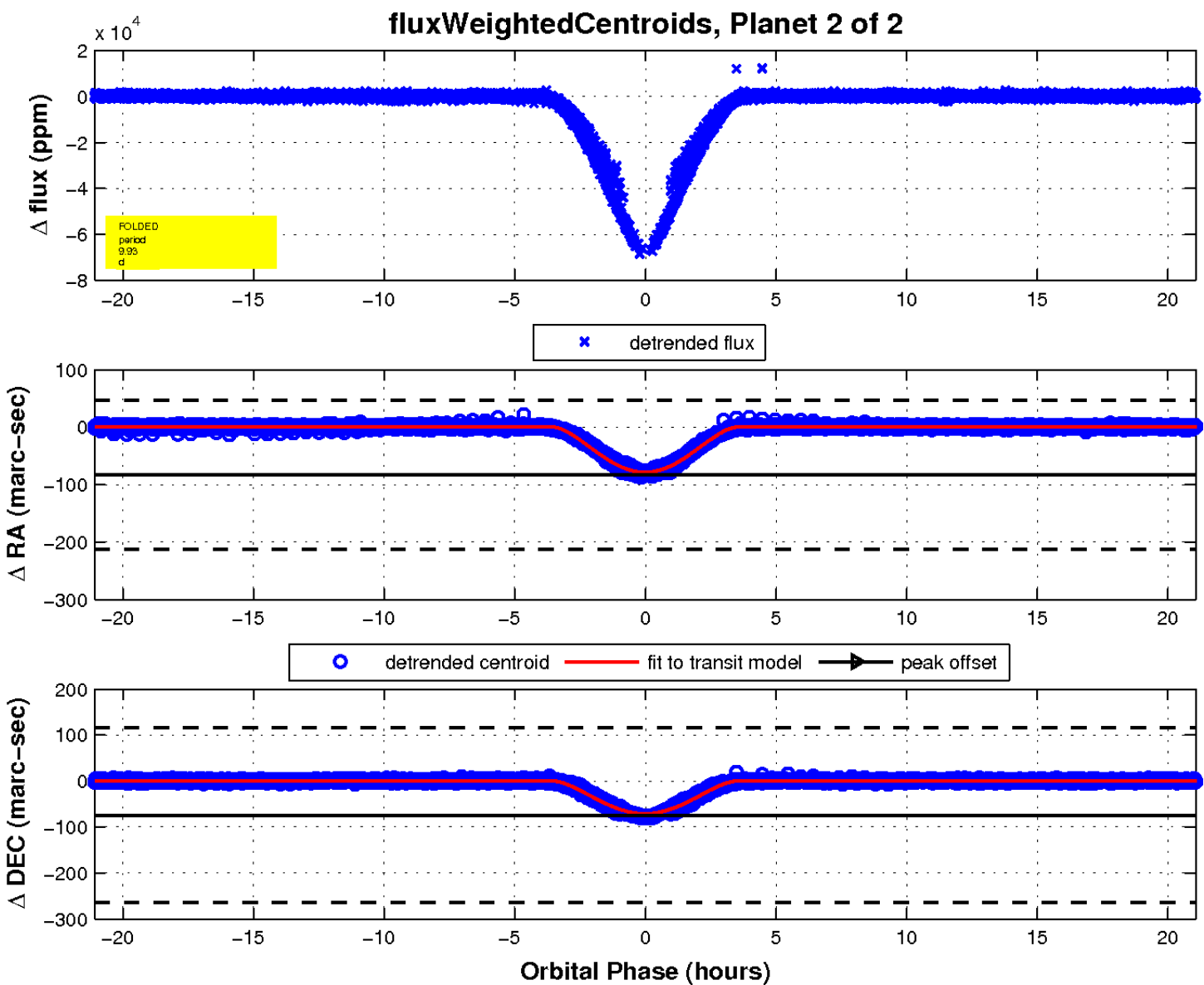
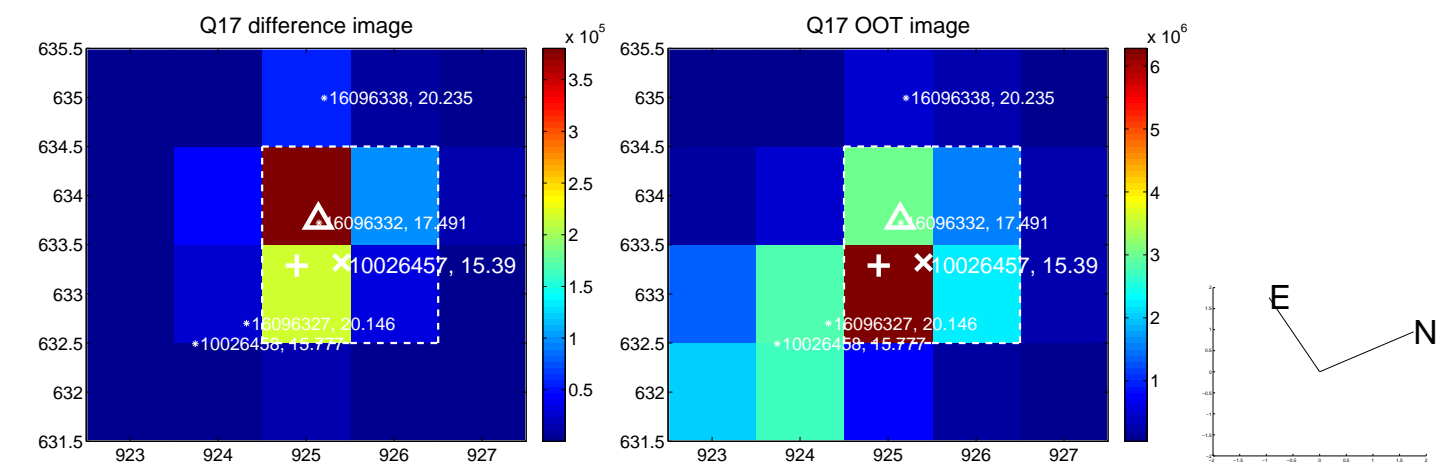
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

