

# KIC 007122259

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007122259-01	OBS	3454.01	20.882127	146.568864	230316.9	8.073	5248.3	3333.3	1.07	6335	64.08	69.77
007122259-02	OBS	No	20.882120	138.246947	105930.0	11.115	2795.8	2549.5	1.07	6335	50.62	69.77

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007122259-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—MOD_ODDEVEN_ALT—DEEP_V_SHAPED—HAS_SEC_TCE
007122259-02	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.

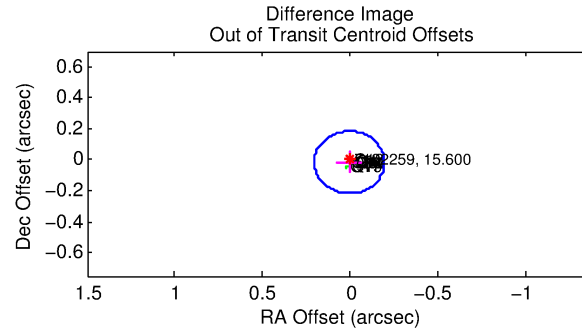
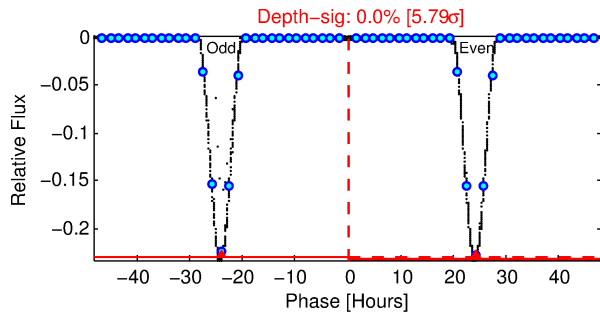
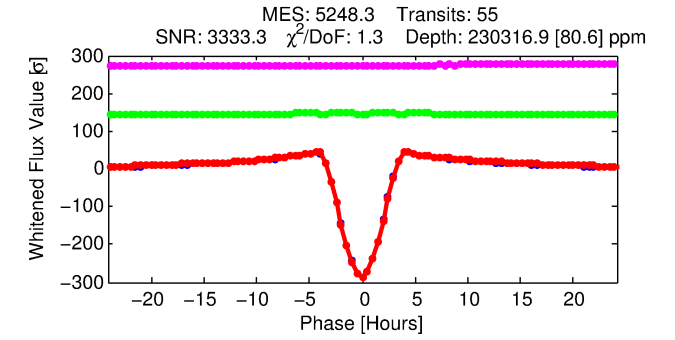
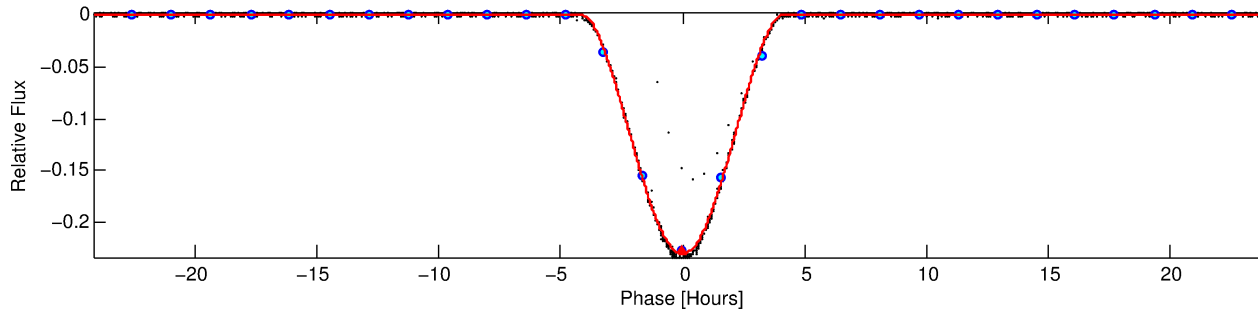
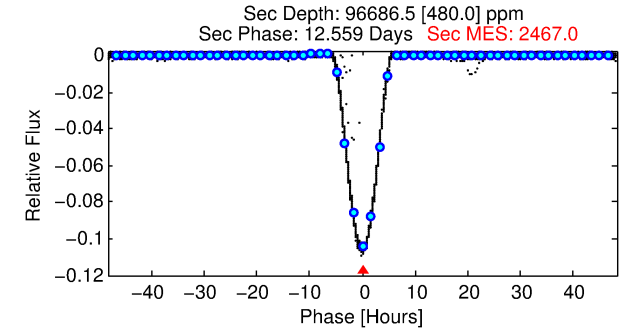
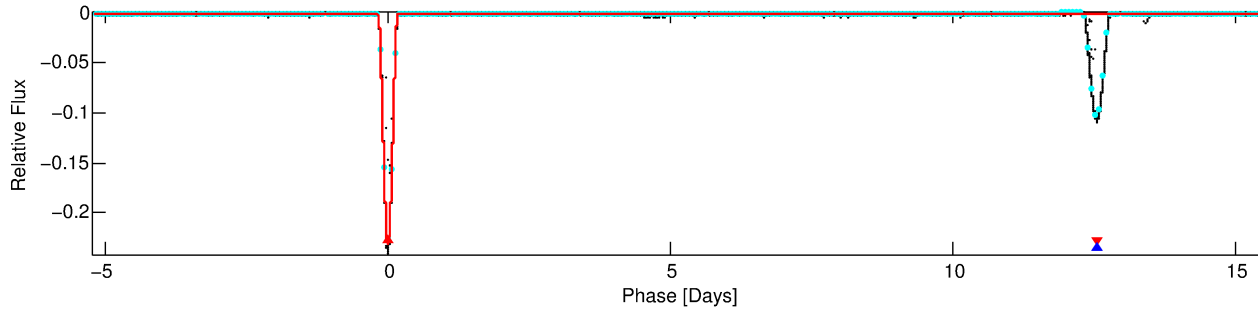
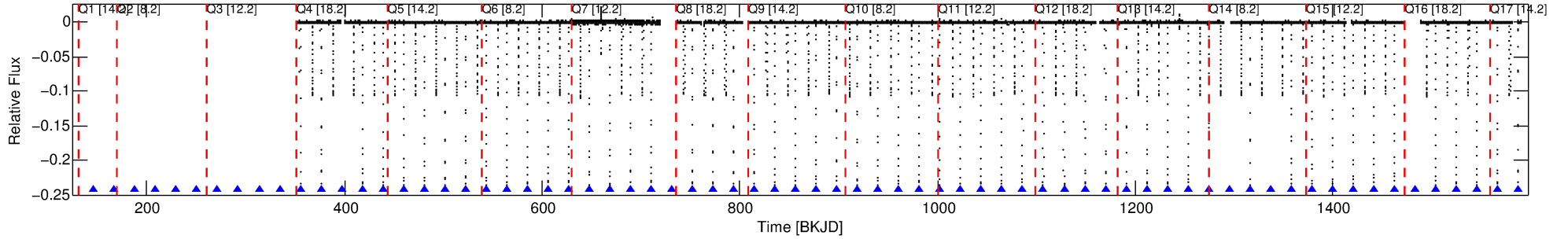
## Ephemeris Match Information For 007122259-01

No Significant Match Found

# DV One-Page Summary

KIC: 7122259 Candidate: 1 of 2 Period: 20.882 d  
KOI: K03454.01 Corr: 0.999

Kp: 15.60 R\*: 1.07 Rs Teff: 6335.0 K Logg: 4.43 Fe/H: -0.140



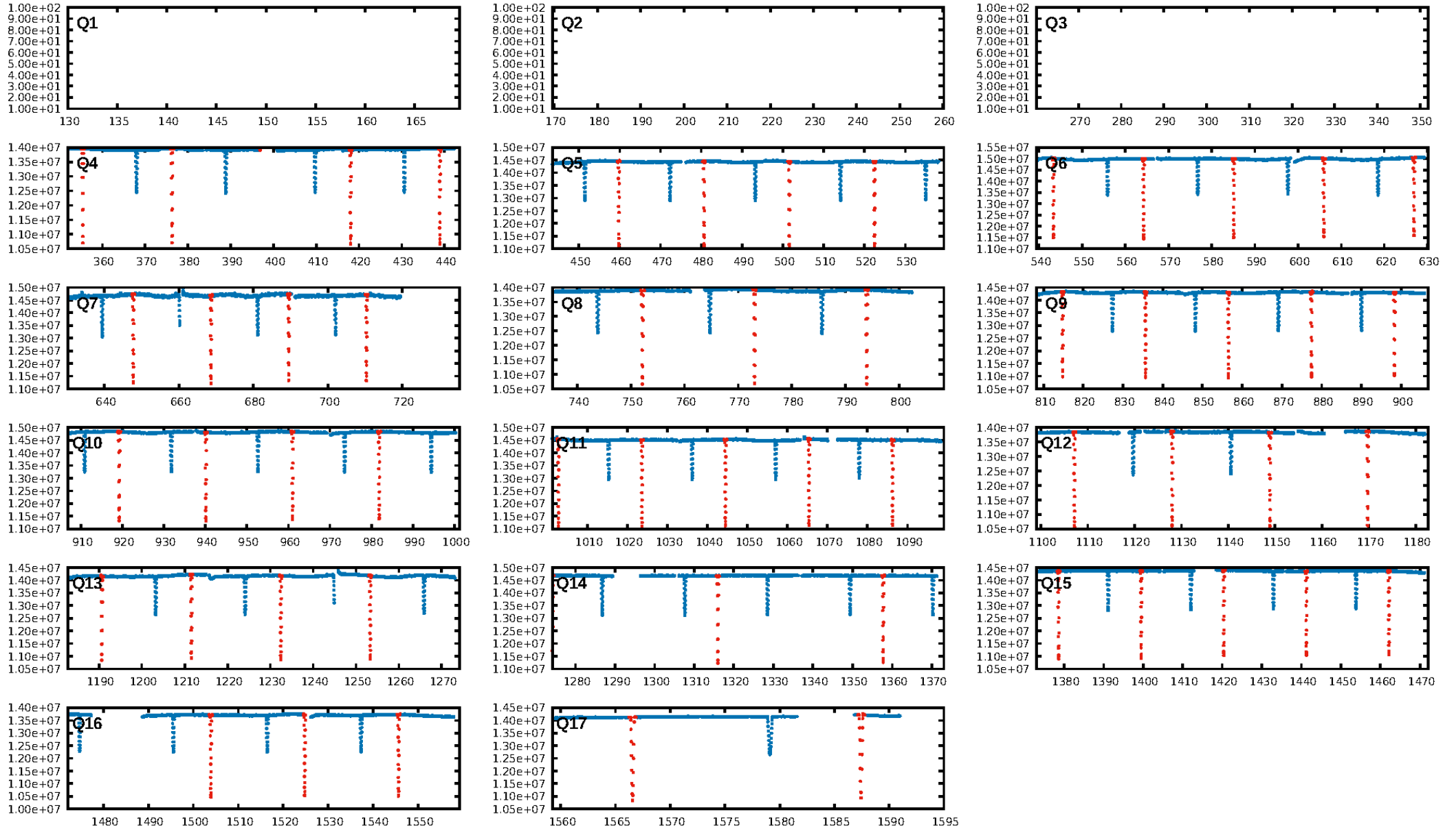
## DV Fit Results:

Period = 20.88213 [0.00000] d  
Epoch = 146.5689 [0.0001] BKJD  
Rp/R\* = 0.5478 [0.0149]  
a/R\* = 27.09 [0.08]  
b = 0.72 [0.03]  
Seff = 69.77 [28.95]  
Teq = 737 [76] K  
Rp = 64.08 [20.93] Re  
a = 0.1542 [0.0415] AU  
Ag = 307.92 [120.06] [2.56σ]  
Teffp = 4773 [193] K [19.45σ]

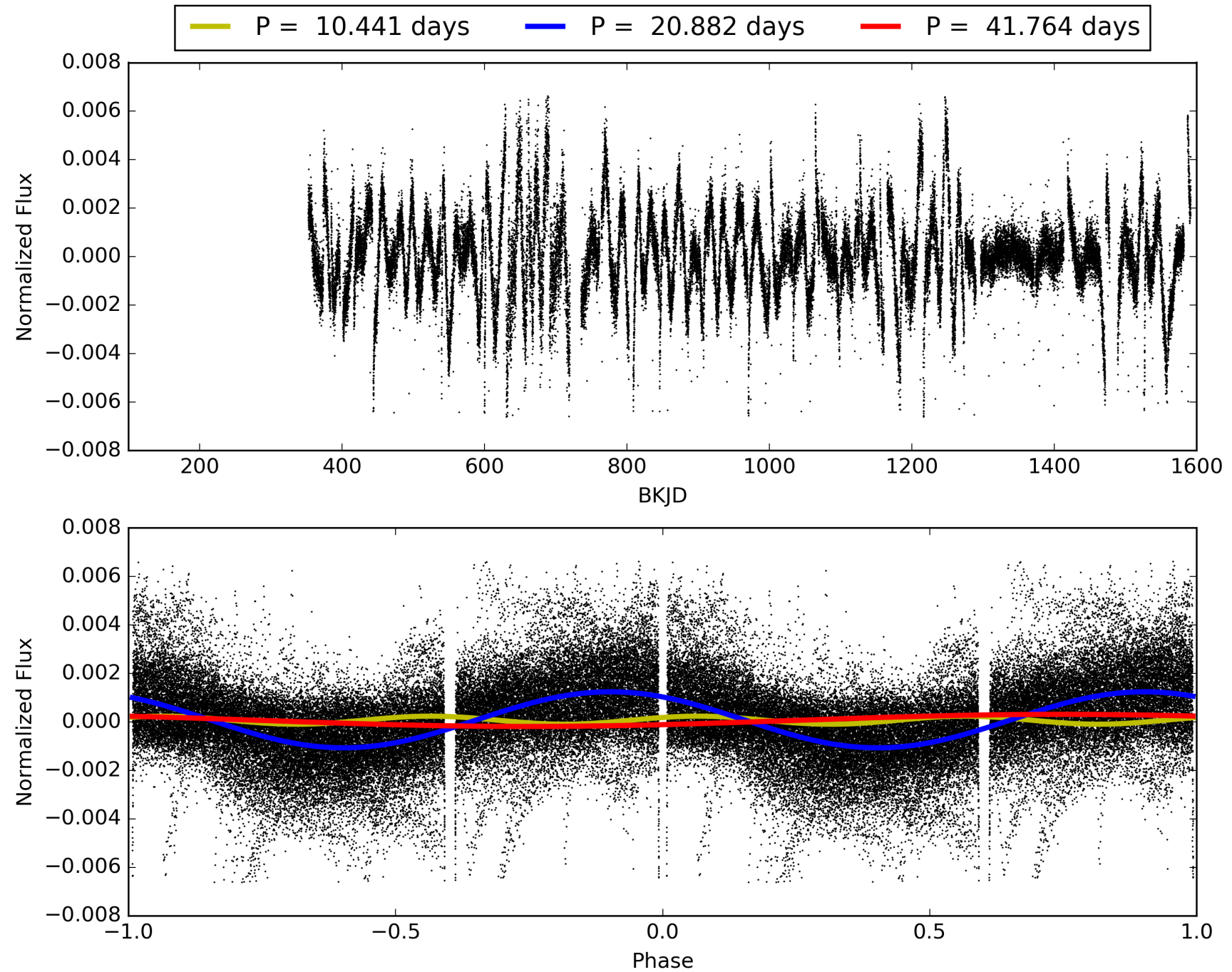
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.1%  
ModelChiSquareGof-sig: 98.1%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [53/53]  
GhostDiagnostic-chr: 4.502  
Centroid-sig: N/A  
Centroid-so: 0.048 arcsec [25.77σ]  
OotOffset-rm: 0.018 arcsec [0.27σ]  
KicOffset-rm: 0.039 arcsec [0.57σ]  
OotOffset-st: 3/3/4/4 [14]  
KicOffset-st: 3/3/4/4 [14]  
DiffImageQuality-fgm: 1.00 [14/14]  
DiffImageOverlap-fno: 1.00 [14/14]

# TCE 007122259-01, PDC Light Curves

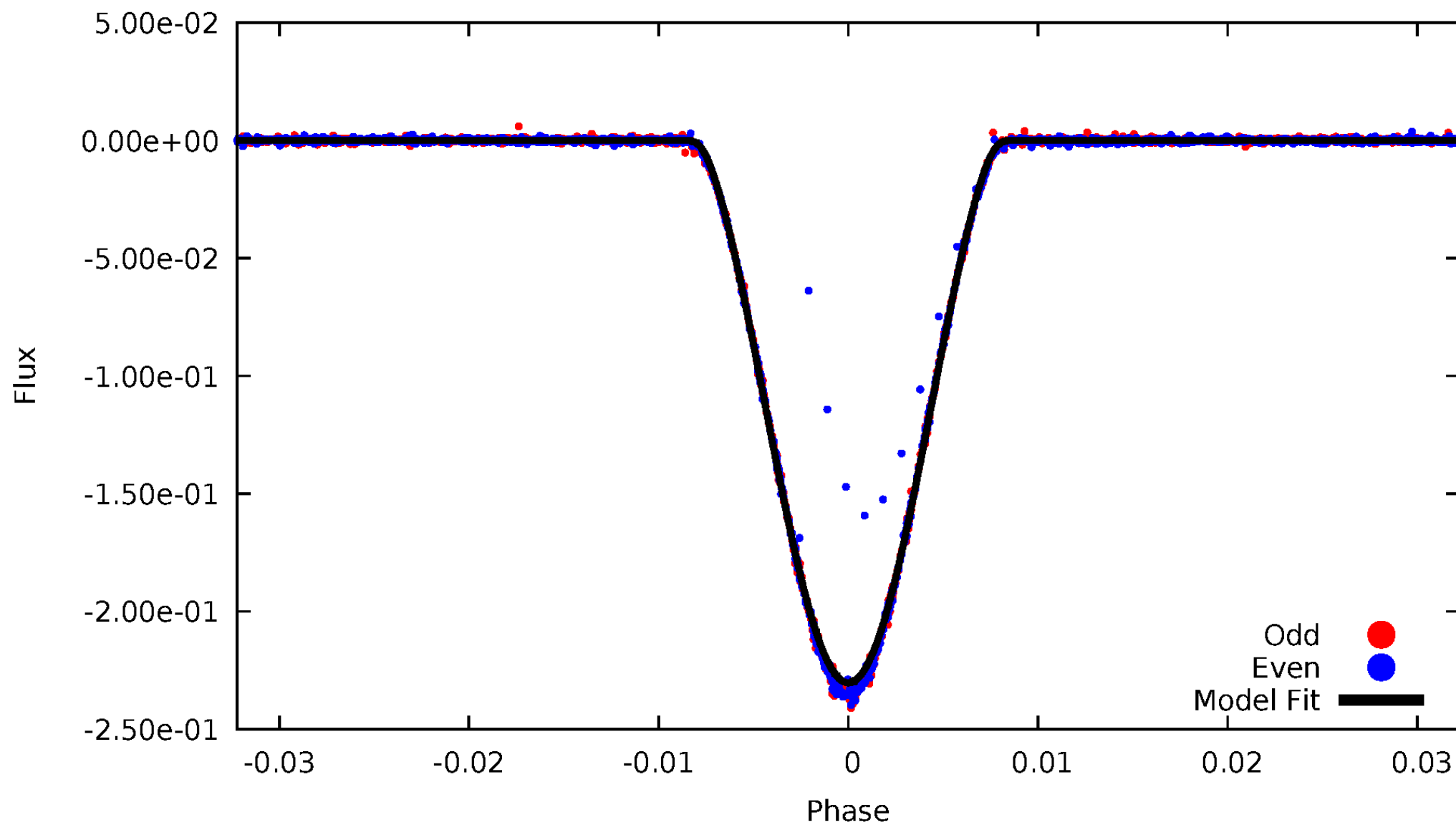


TCE 007122259-01



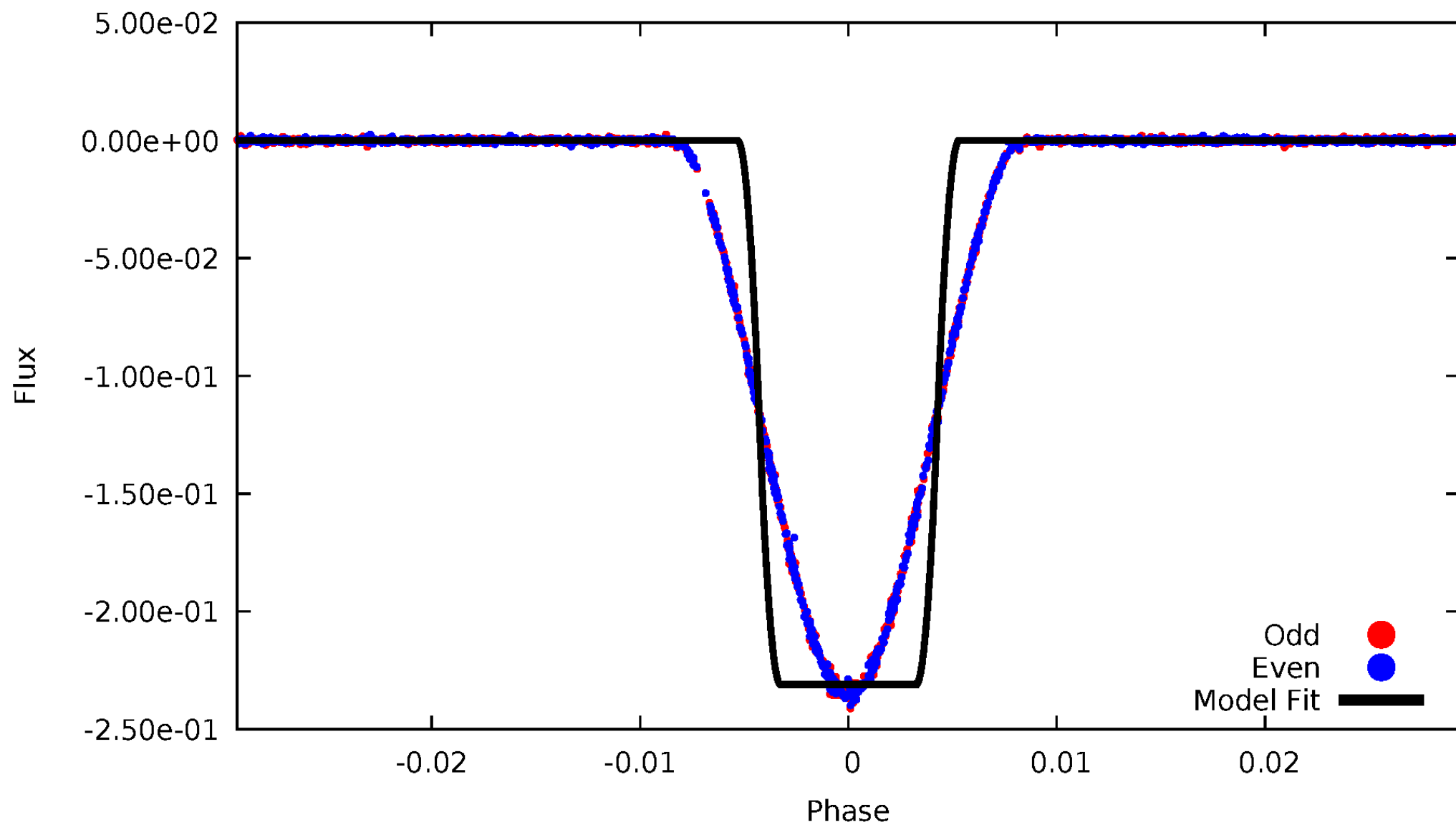
# DV Odd/Even

TCE 007122259-01



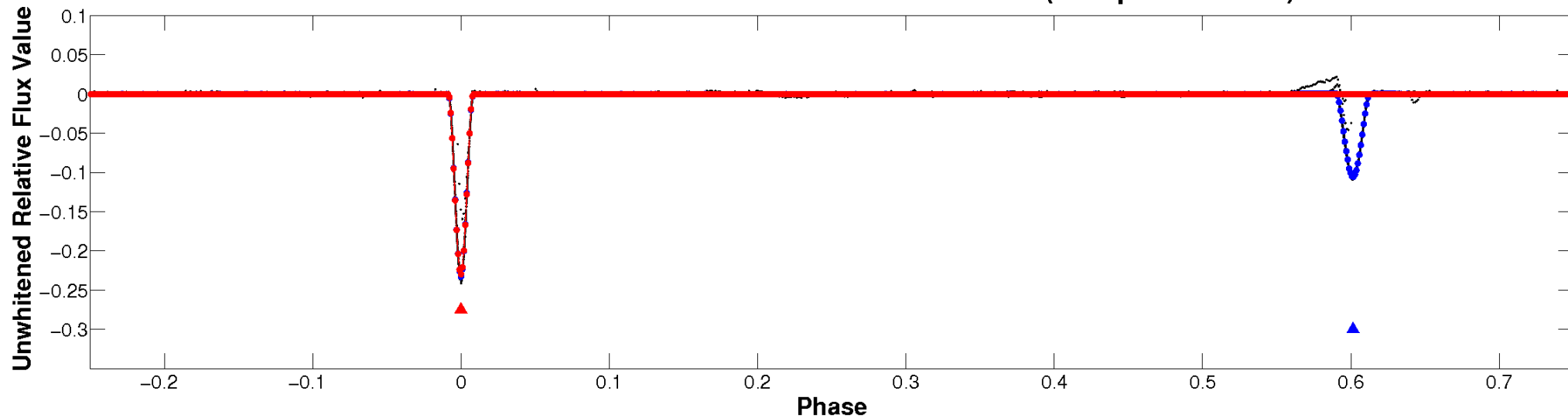
# ALT Odd/Even

TCE 007122259-01

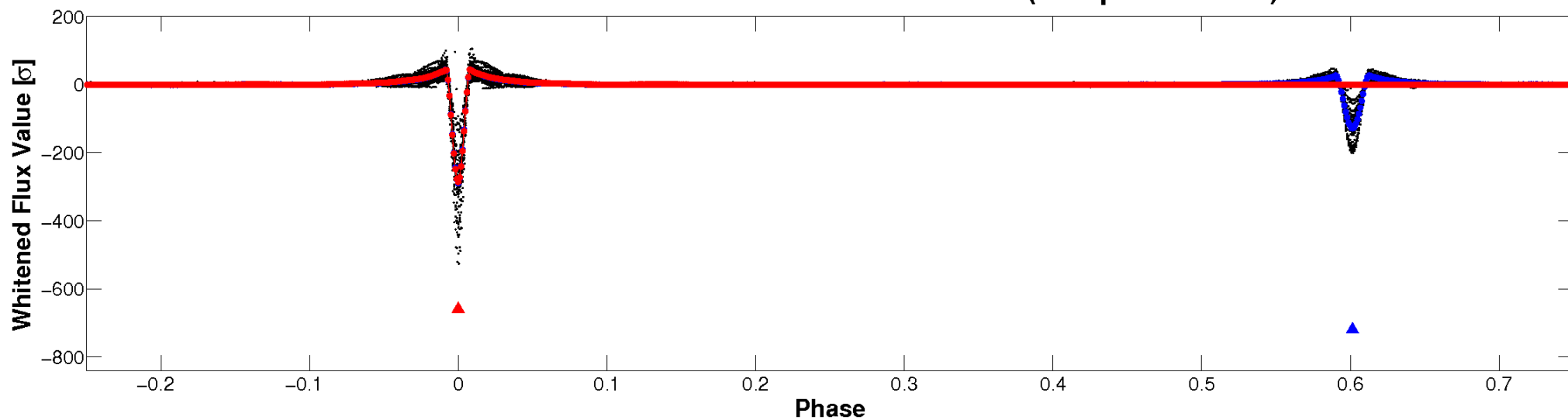


# Non-Whitened Vs. Whitened Light Curve

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

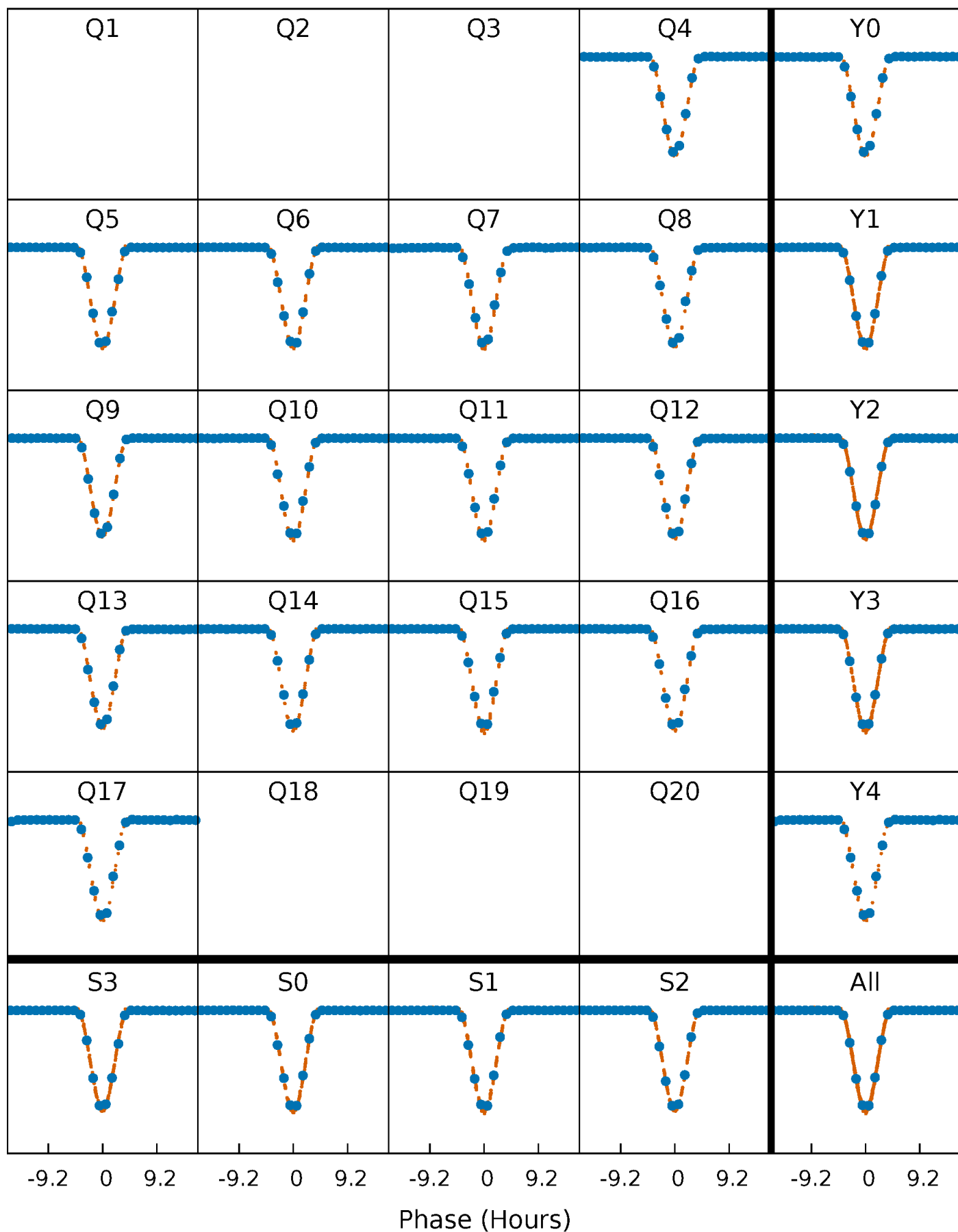


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

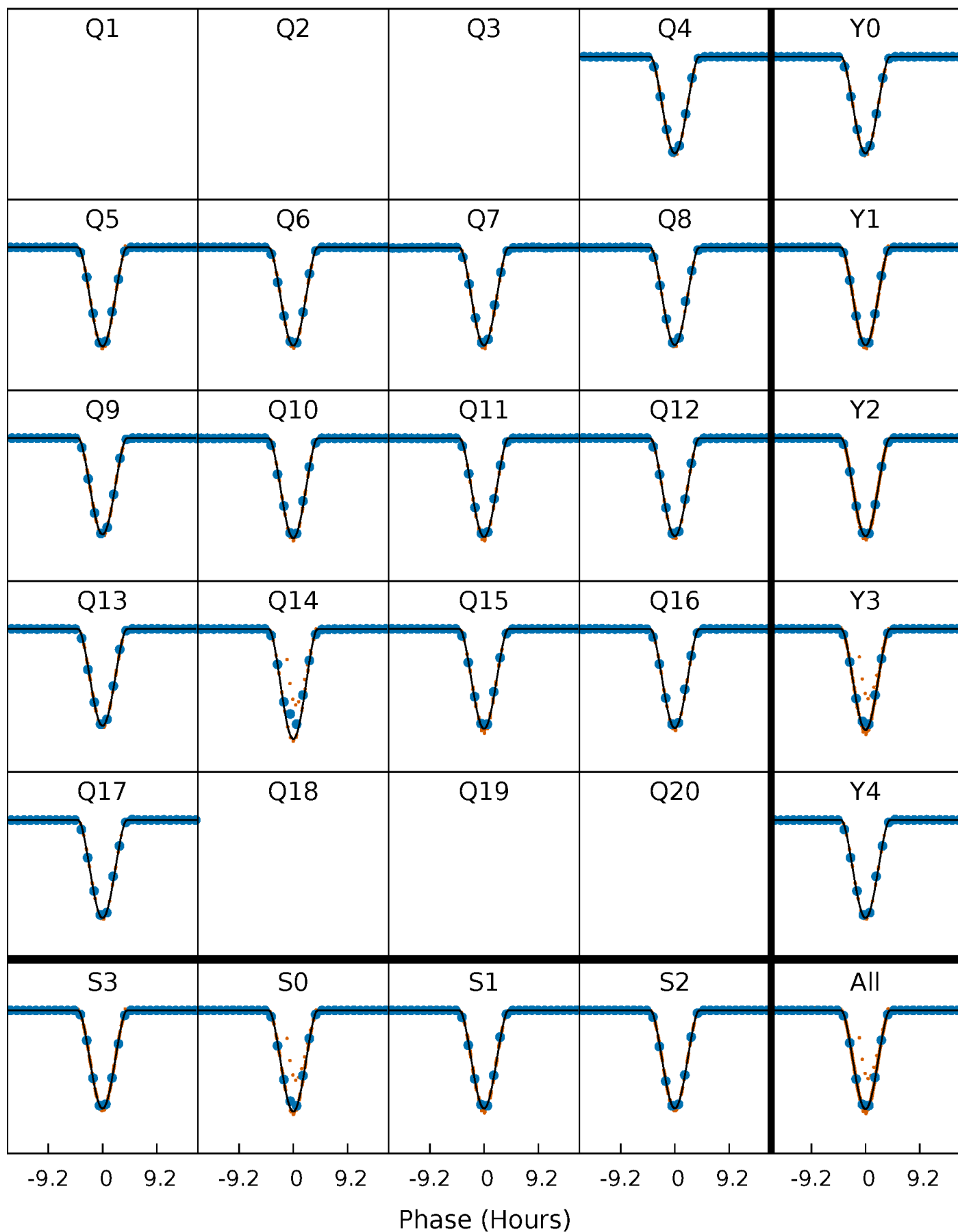
TCE 007122259-01 P= 20.882127 Days  $T_0=146.568864$  (BKJD)





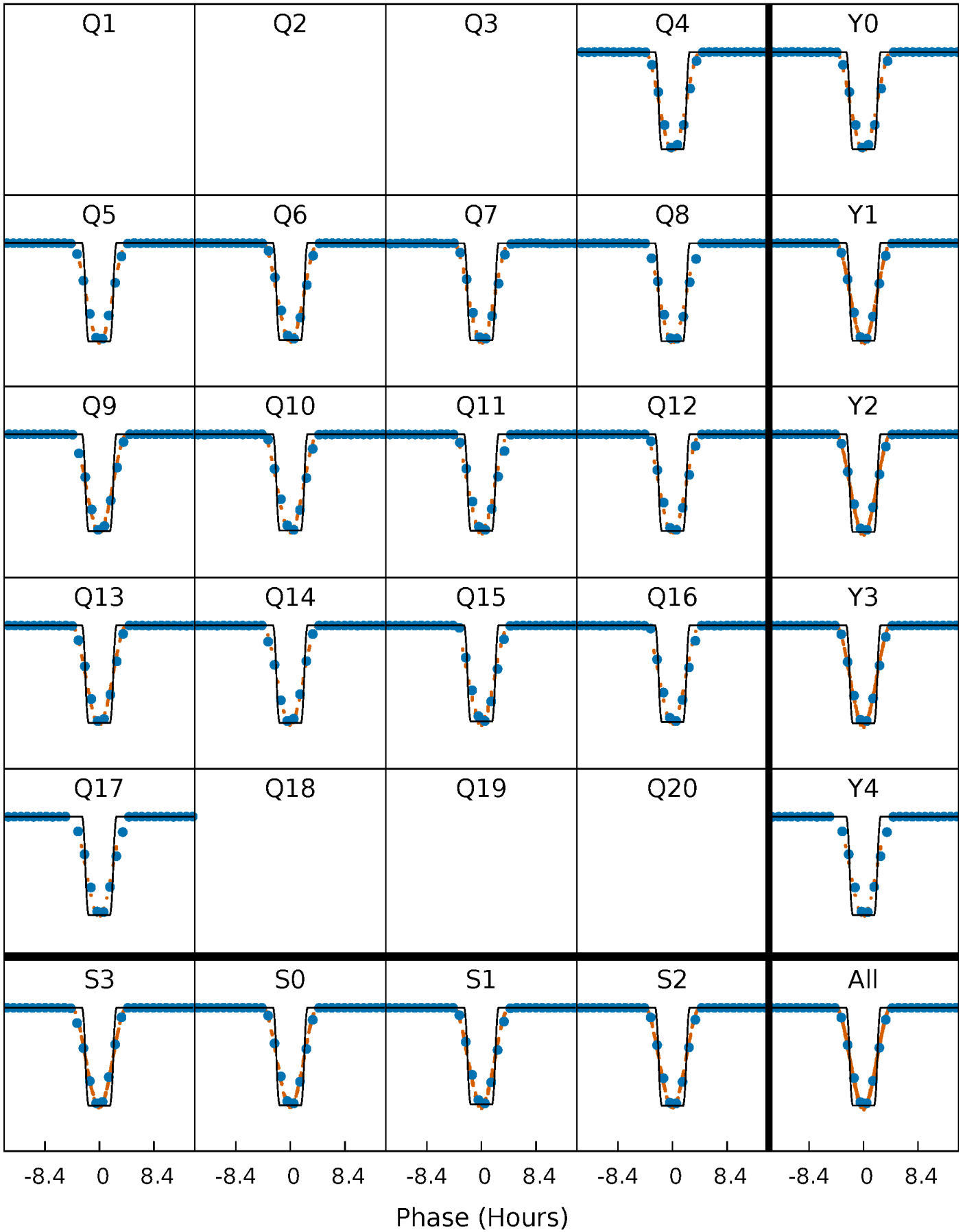
# DV Quarter-Phased Transit Curves

TCE 007122259-01 P= 20.882127 Days  $T_0=146.568864$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

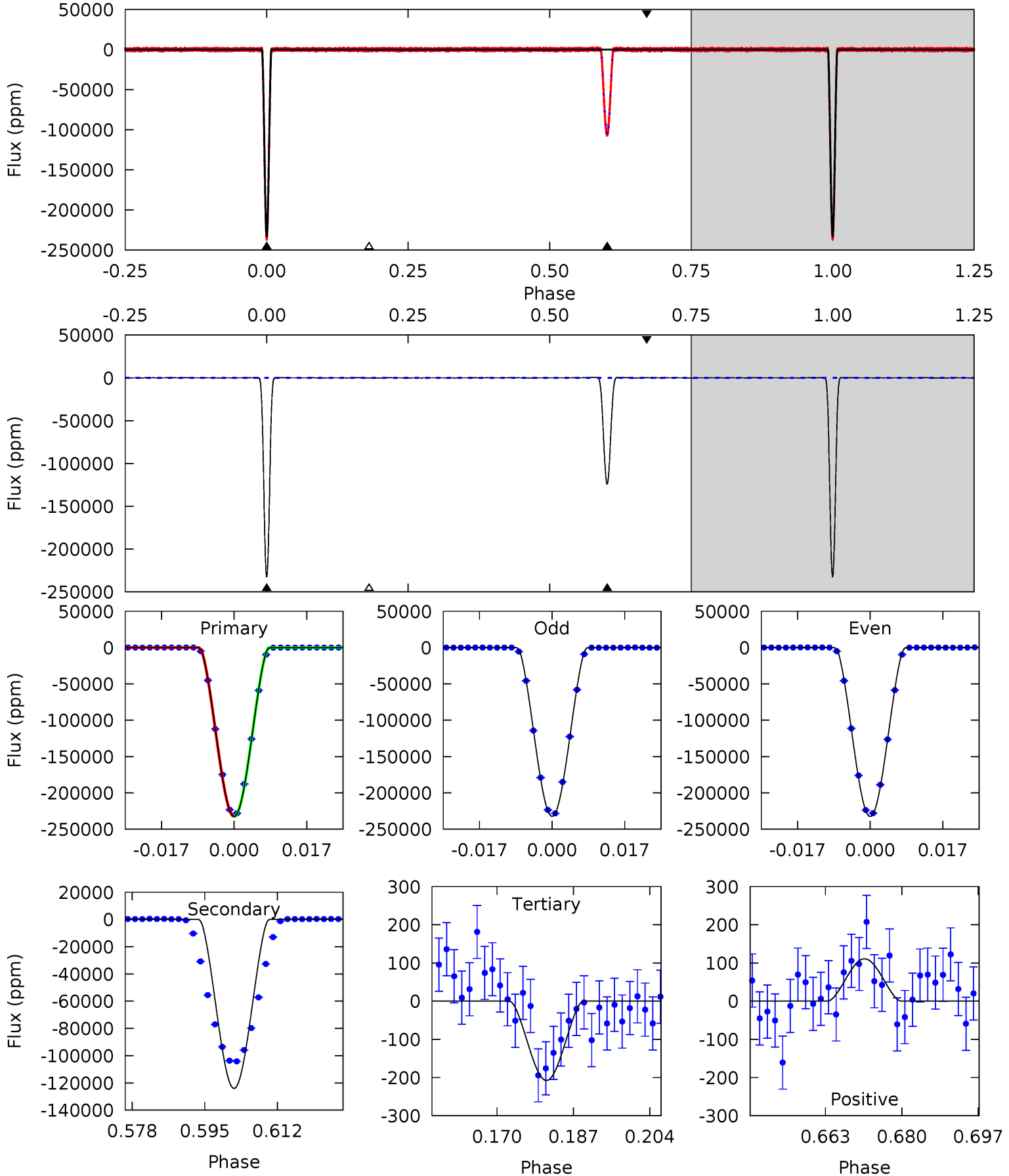
TCE 007122259-01 P= 20.882156 Days  $T_0=146.567810$  (BKJD)



# DV Model-Shift Uniqueness Test

007122259-01, P = 20.882127 Days, E = 146.568864 Days

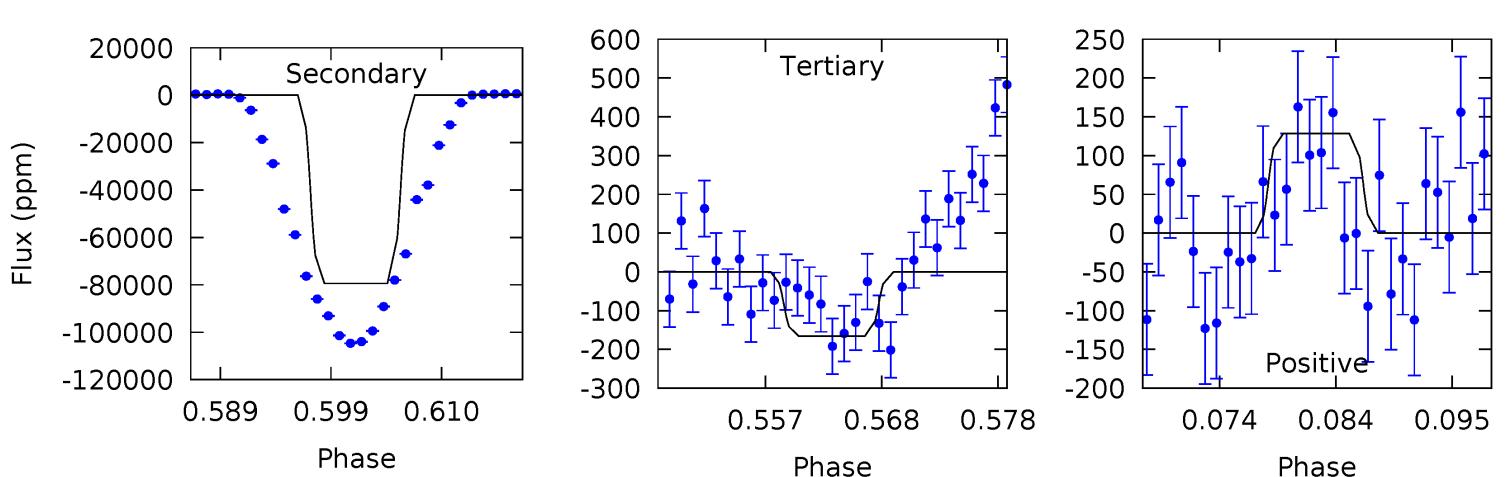
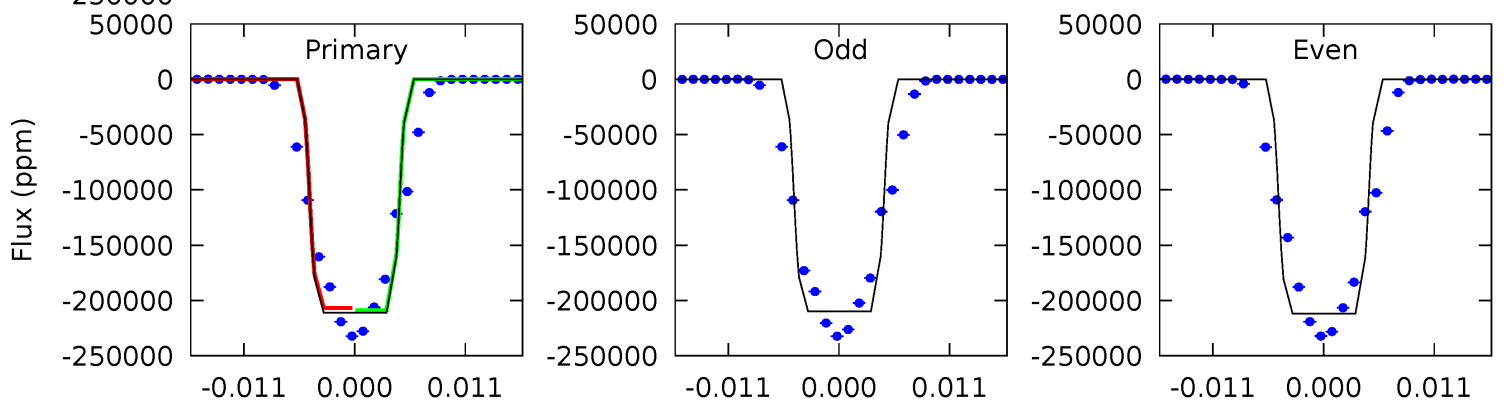
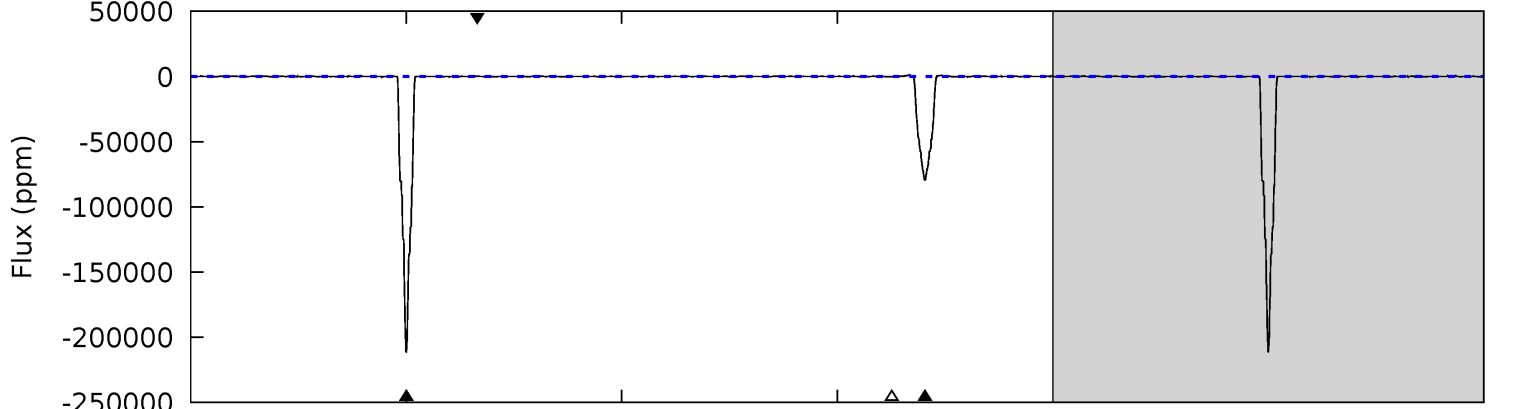
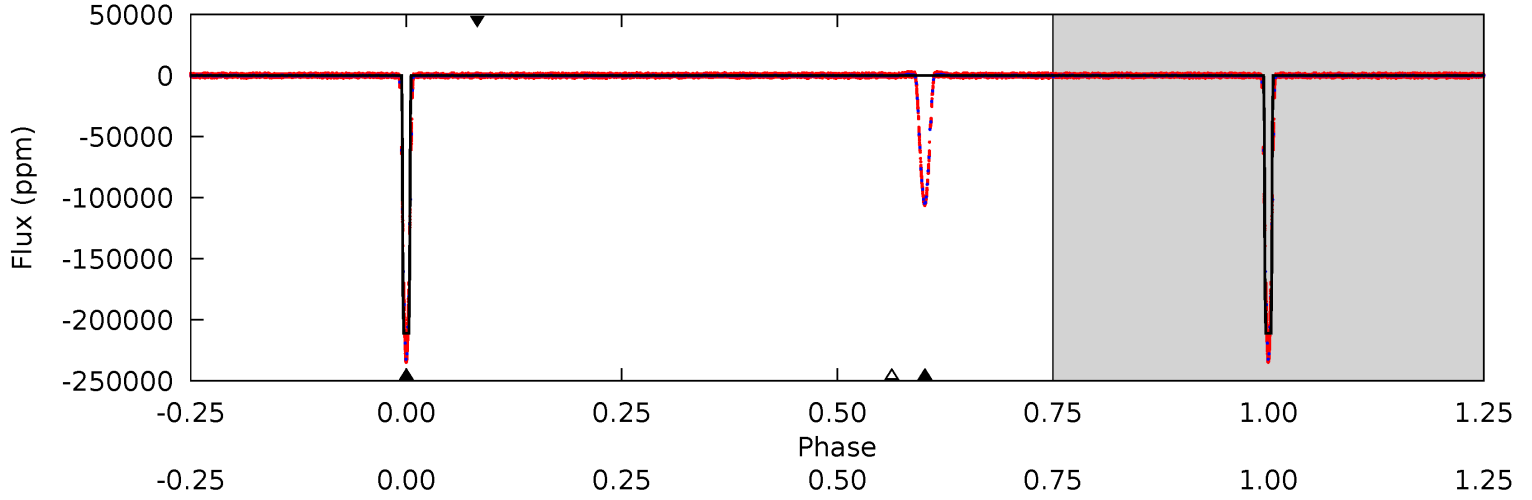
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10966	5855	9.80	5.23	4.92	2.39	4.24	10956	10961	5845	5850	8.54	0.99	0.00	0.51



# Alt Model-Shift Uniqueness Test

007122259-01, P = 20.882156 Days, E = 146.567810 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
6174	2323	4.85	3.76	5.02	2.56	20.7	6169	6170	2318	2319	29.7	1.00	0.00	0



### Stellar Parameters For KIC 007122259

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6335^{+197}_{-241}$	$4.427^{+0.065}_{-0.208}$	$-0.140^{+0.250}_{-0.300}$	$1.072^{+0.349}_{-0.116}$	$1.120^{+0.164}_{-0.148}$	$1.280^{+0.364}_{-0.641}$
	+3%/-4%	+1%/-5%	+179%/-214%	+33%/-11%	+15%/-13%	+28%/-50%
Source	KIC0	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 007122259-01 / KOI 3454.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-124059 \pm 21$	$64.99^{+12.33}_{-5.53}$	$1044^{+76}_{-55}$	$5294^{+160}_{-187}$	$427^{+73}_{-108}$
Alt.	$-79405 \pm 34$	$57.39^{+9.76}_{-4.90}$	$1049^{+77}_{-59}$	$5027^{+152}_{-178}$	$333^{+56}_{-80}$

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

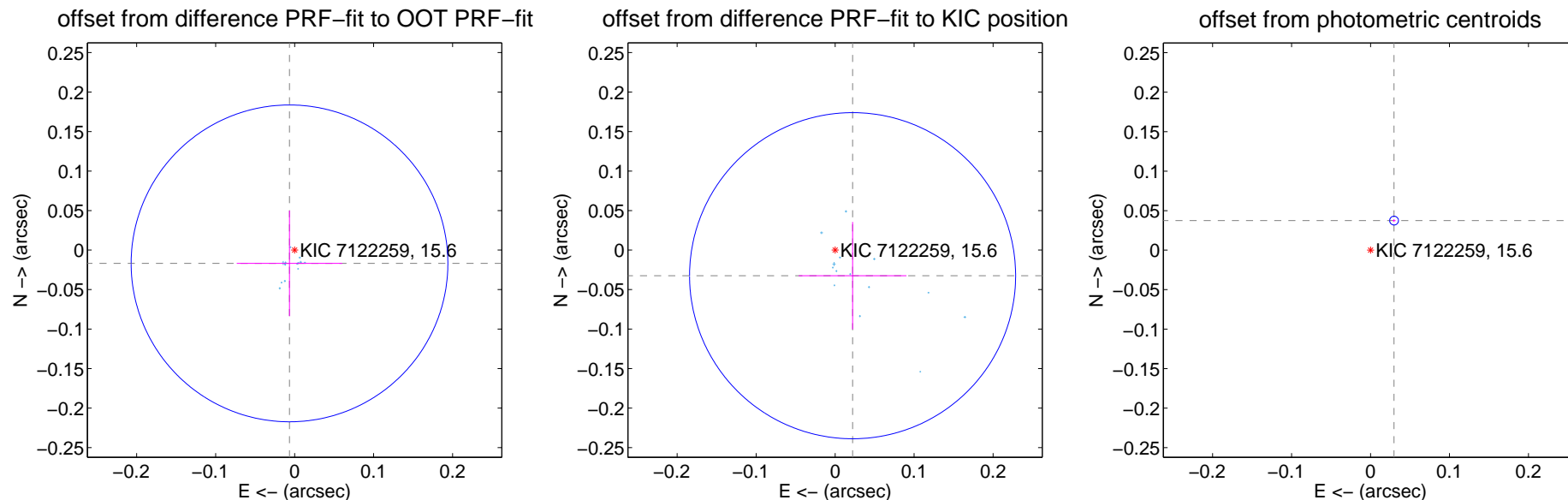
## DV Centroid Data

Supplemental centroid analysis for 007122259-01. Kepler magnitude: 15.60. Transit SNR 3333.28

There are 14 quarters with good PRF difference image offsets

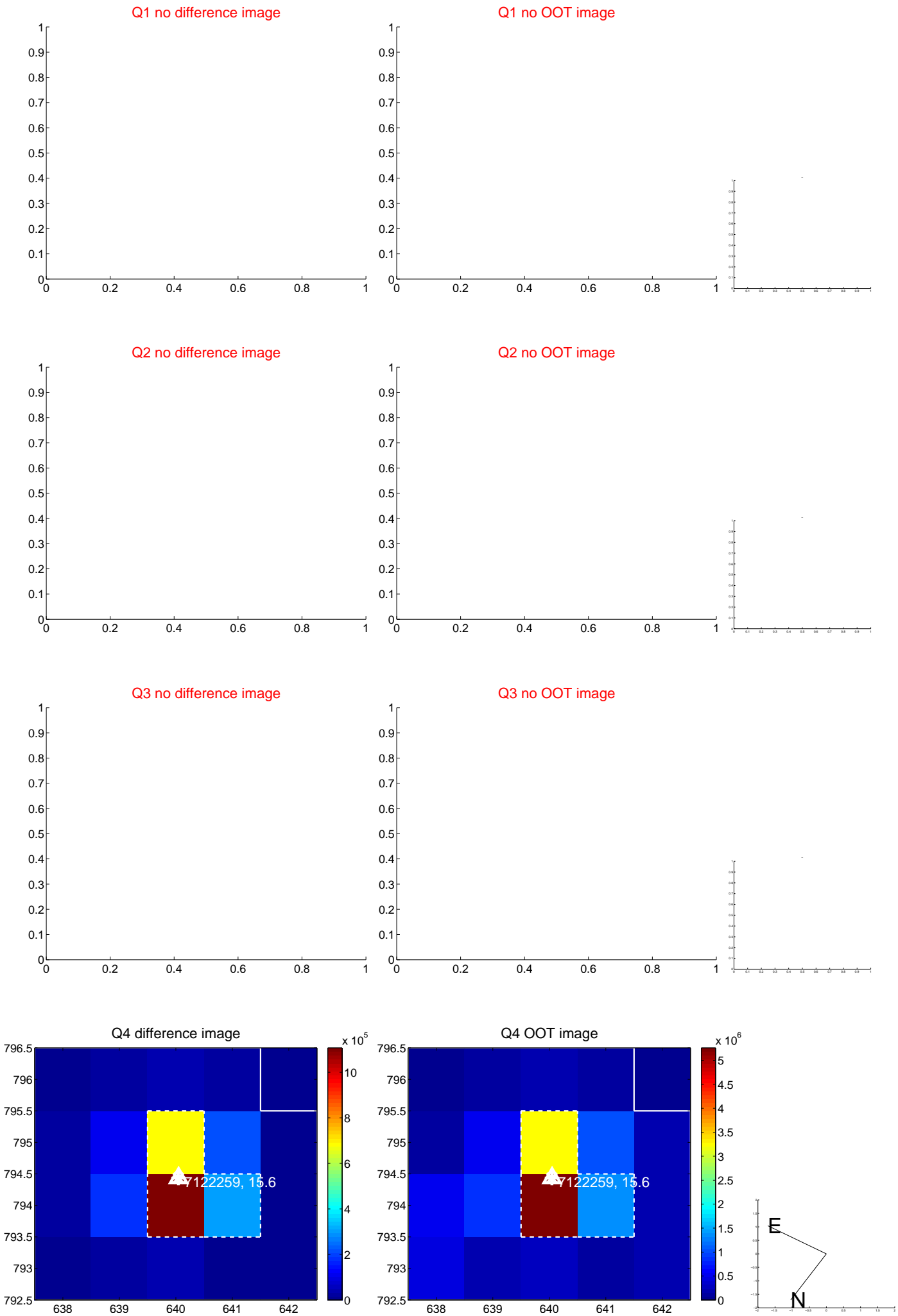
The direct PRF centroid is offset from the target star catalog position by about 0.01 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.018 \pm 0.067$	0.27	$0.006 \pm 0.067$	$-0.017 \pm 0.067$
PRF-fit source offset from KIC position	$0.039 \pm 0.069$	0.57	$-0.022 \pm 0.068$	$-0.032 \pm 0.068$
photometric centroid source offset	$0.05 \pm 0.00$	25.77	$-0.03 \pm 0.00$	$0.04 \pm 0.00$

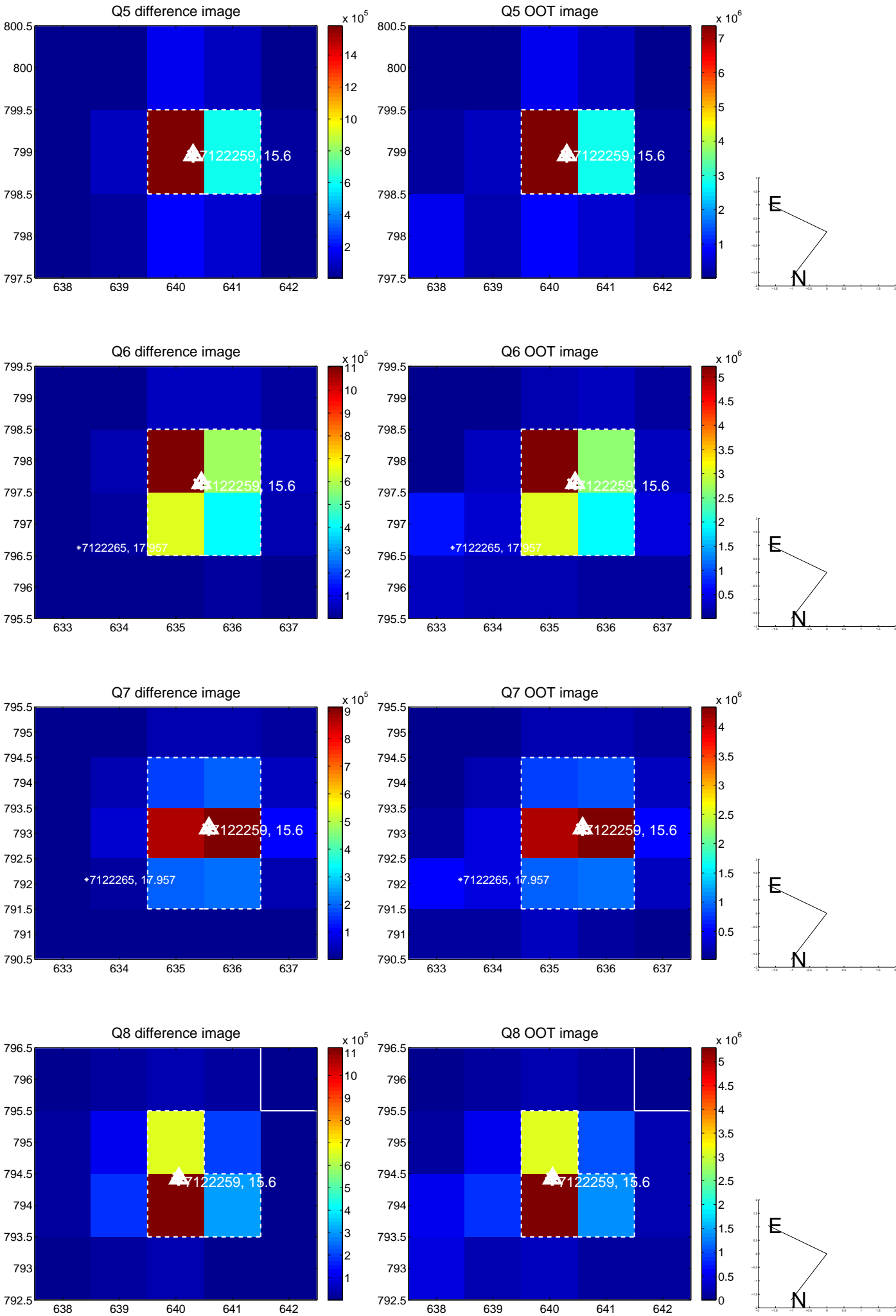


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

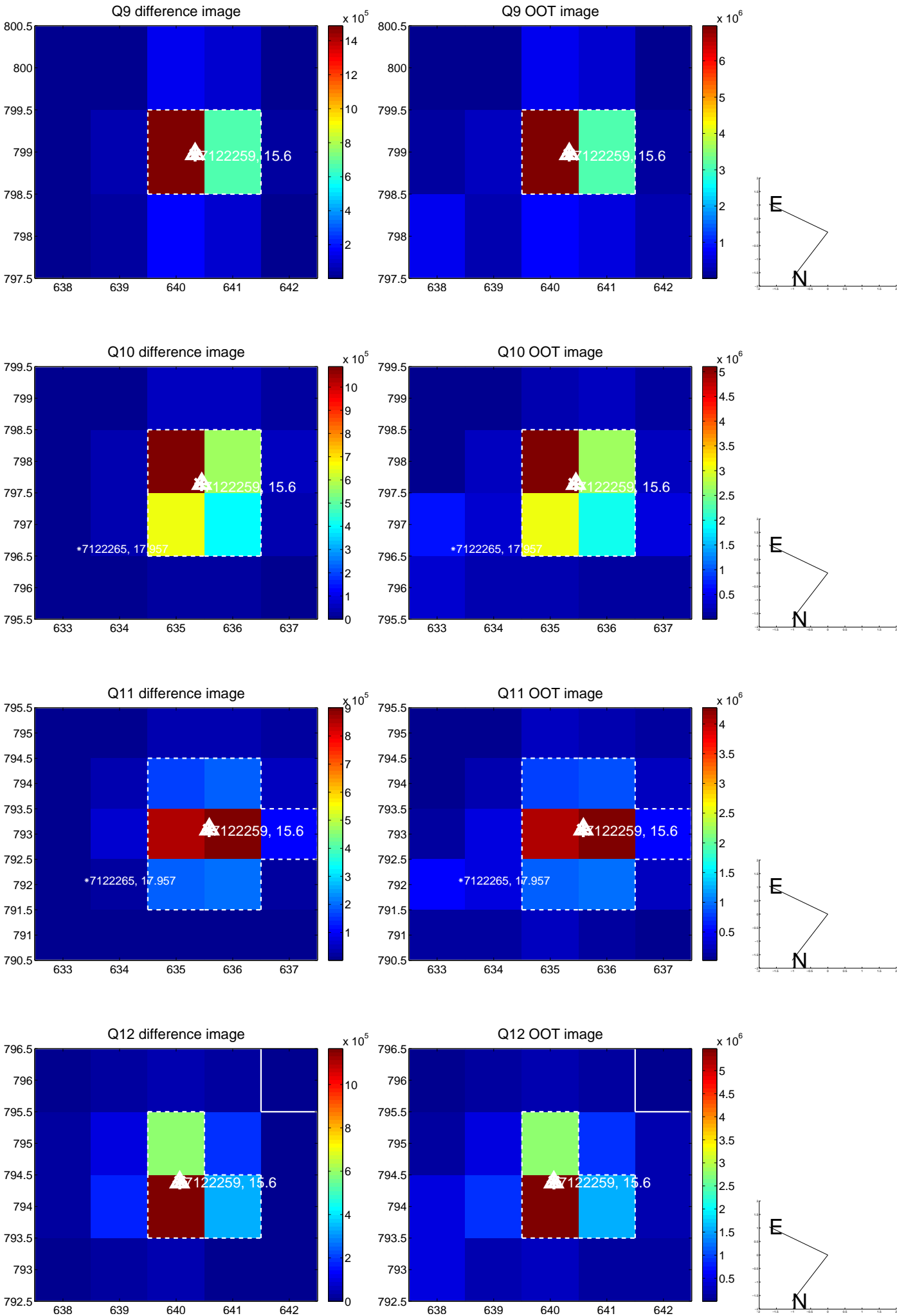


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

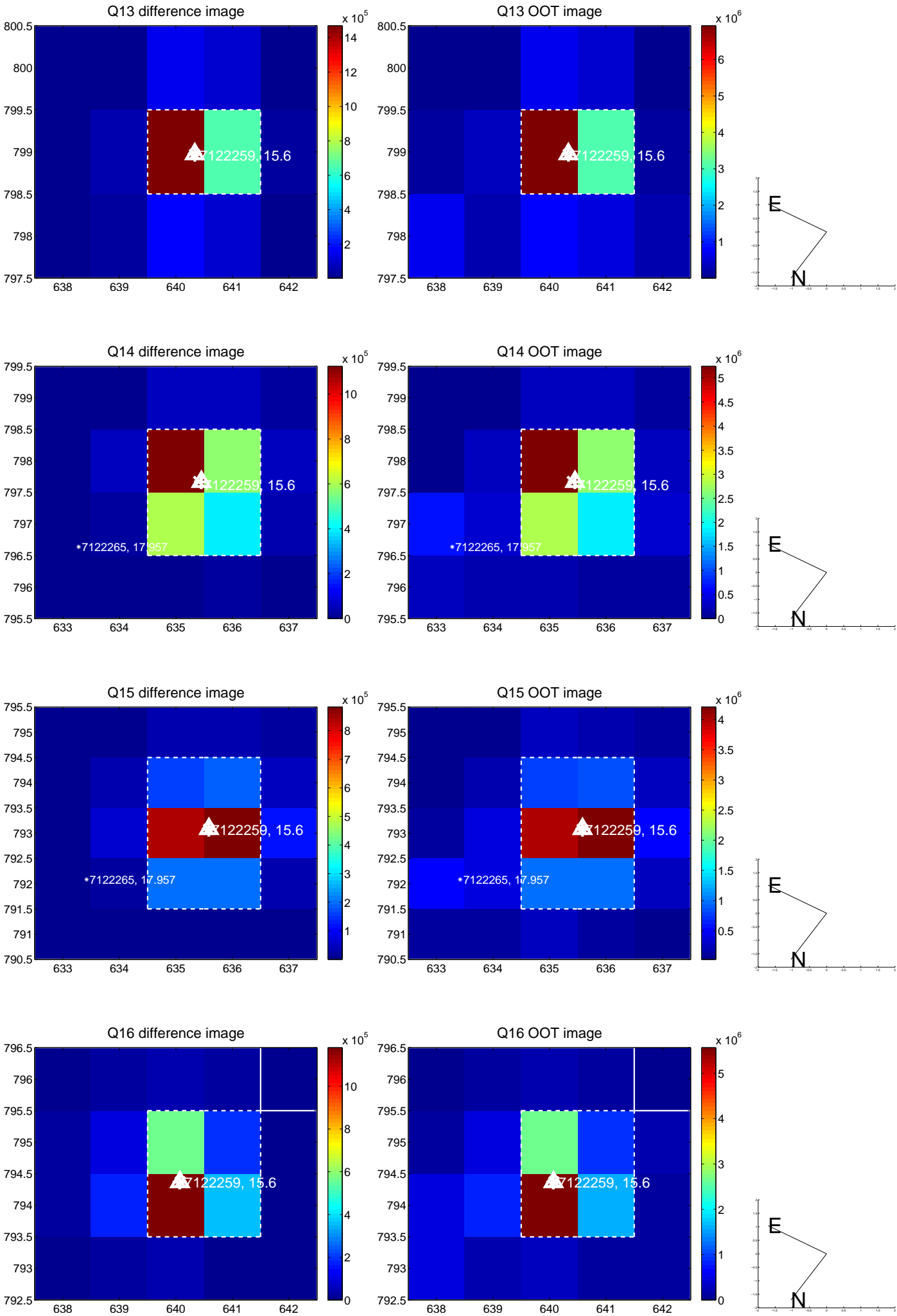




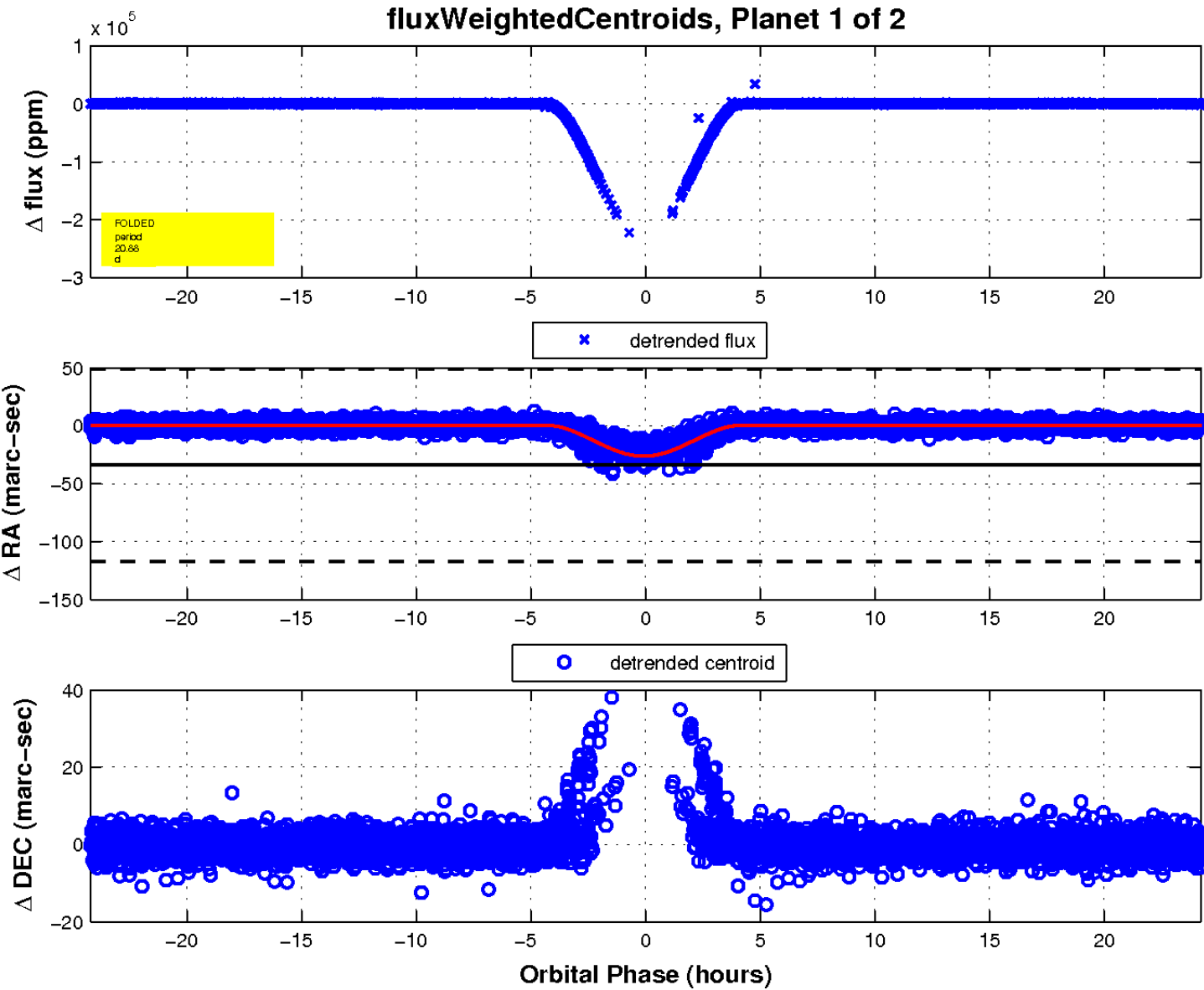
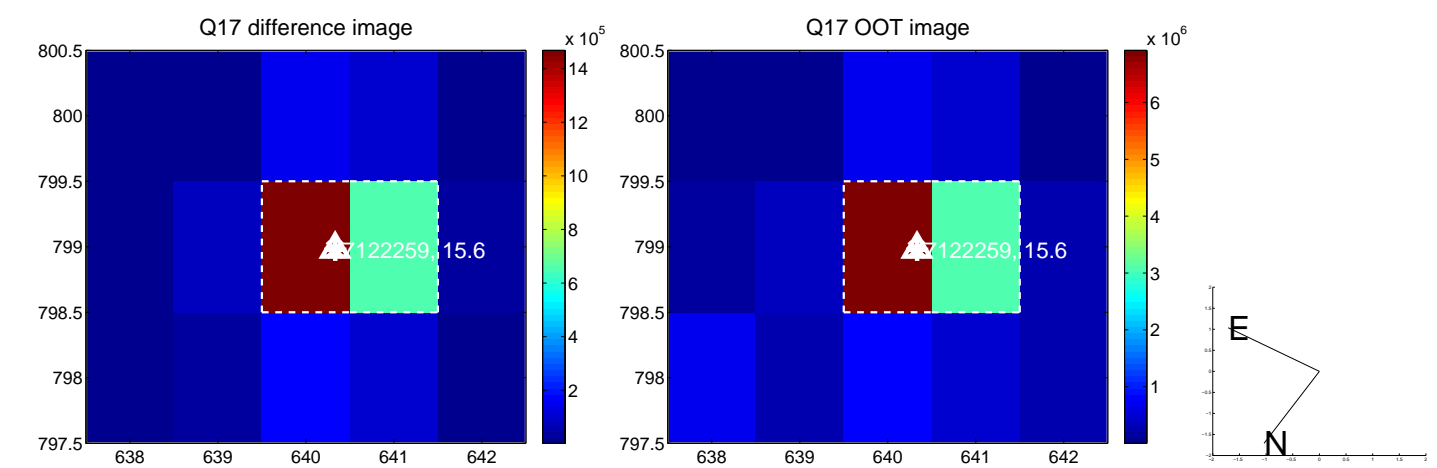
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

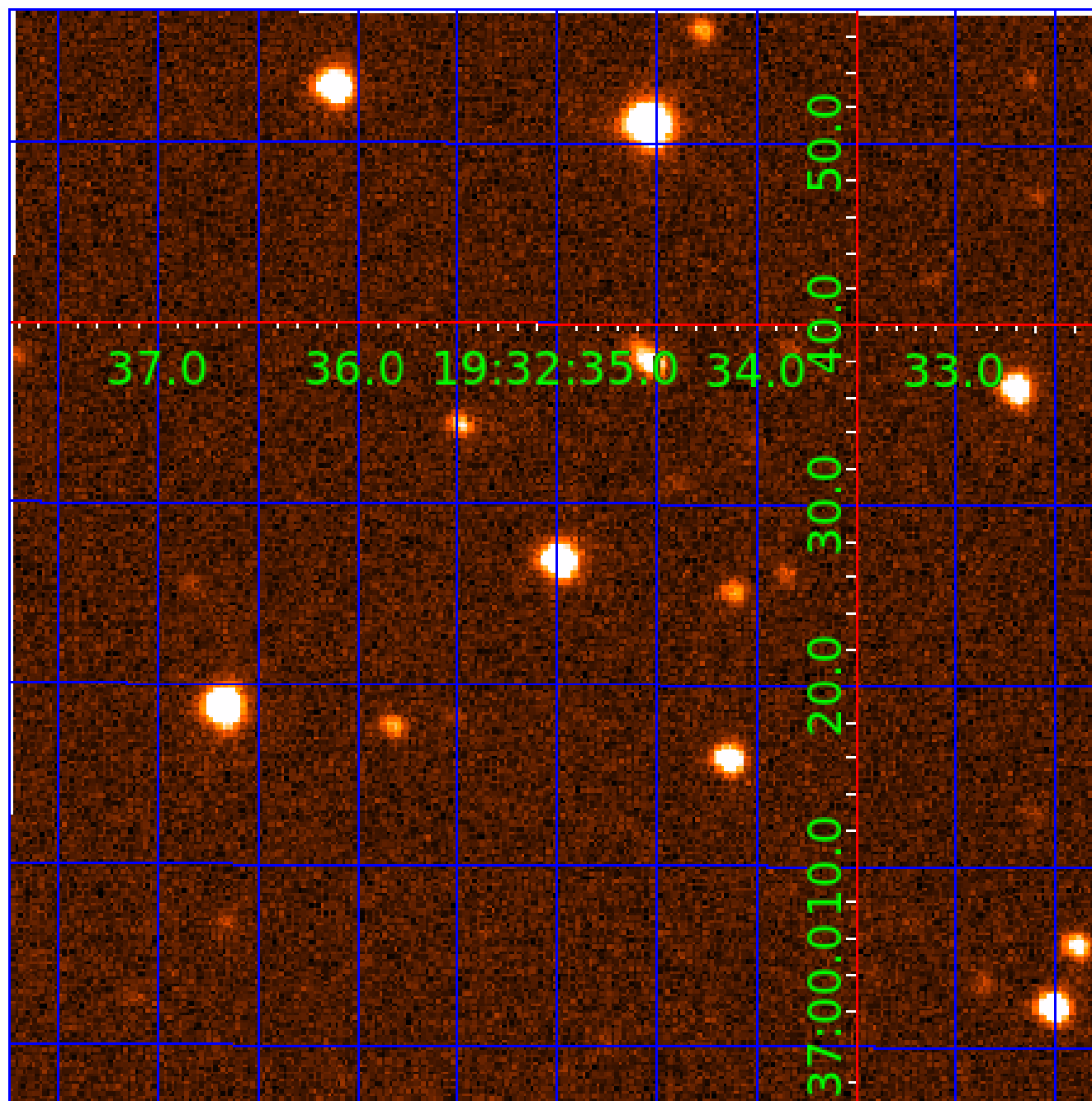


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 007122259

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007122259-01	OBS	3454.01	20.882127	146.568864	230316.9	8.073	5248.3	3333.3	1.07	6335	64.08	69.77
007122259-02	OBS	No	20.882120	138.246947	105930.0	11.115	2795.8	2549.5	1.07	6335	50.62	69.77

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007122259-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—MOD_ODDEVEN_ALT—DEEP_V_SHAPED—HAS_SEC_TCE
007122259-02	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.

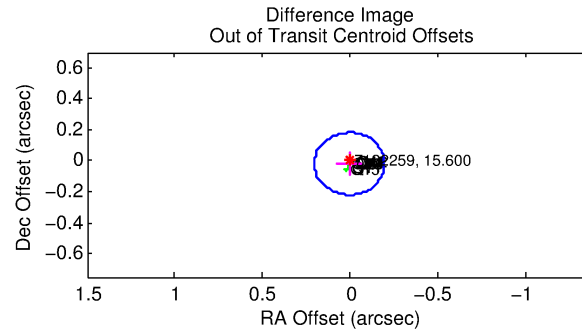
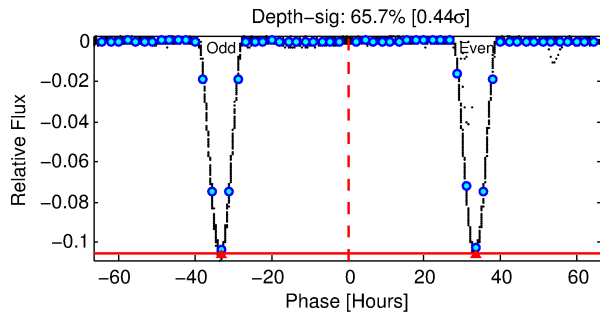
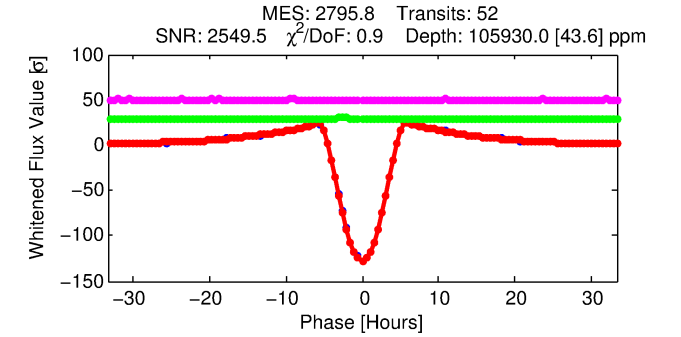
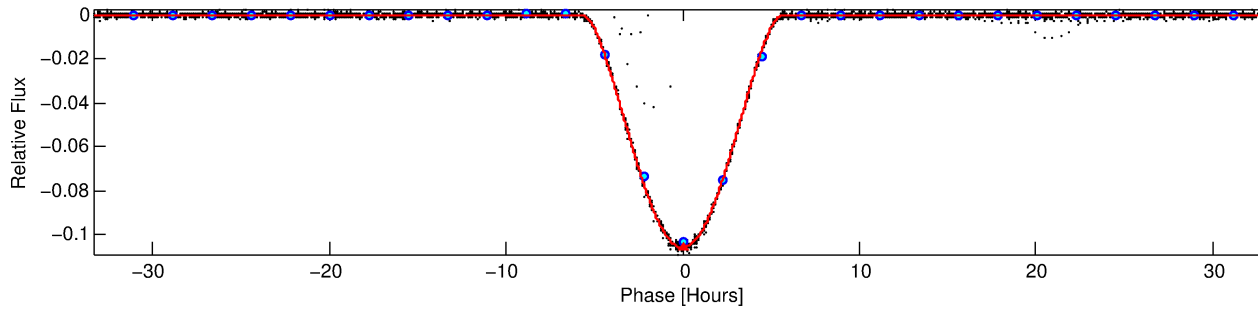
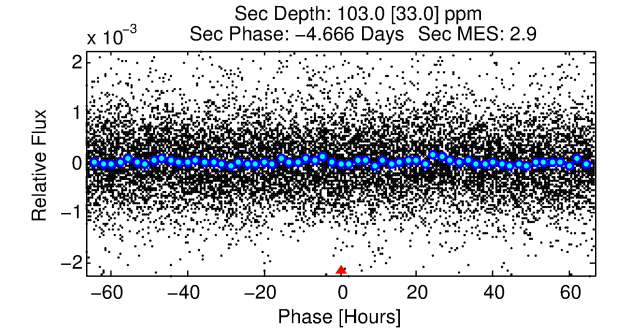
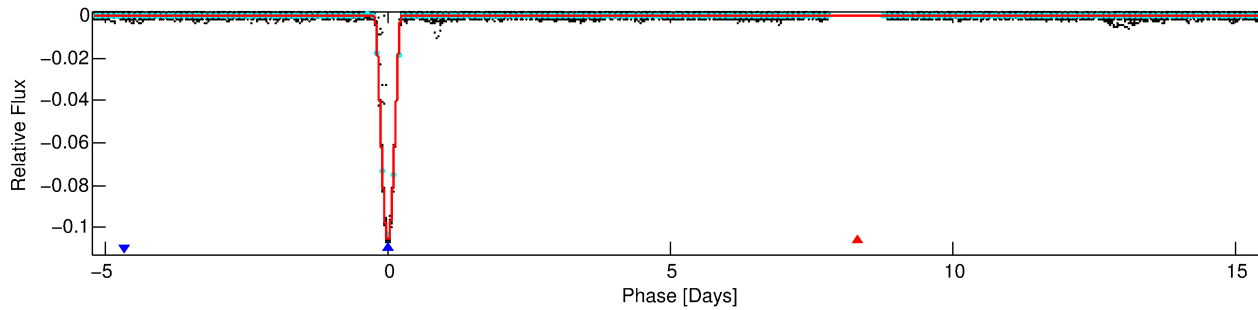
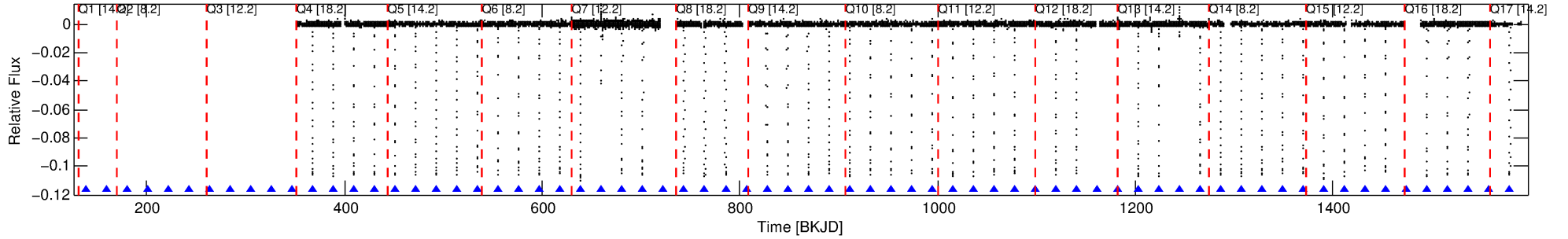
## Ephemeris Match Information For 007122259-02

No Significant Match Found

# DV One-Page Summary

KIC: 7122259 Candidate: 2 of 2 Period: 20.882 d  
KOI: K03454 Corr: No Ephemeris Match

Kp: 15.60 R\*: 1.07 Rs Teff: 6335.0 K Logg: 4.43 Fe/H: -0.140



## DV Fit Results:

Period = 20.88212 [0.00000] d  
Epoch = 138.2469 [0.0001] BKJD  
Rp/R\* = 0.4328 [0.0135]  
a/R\* = 16.03 [0.02]  
b = 0.90 [0.02]  
Seff = 69.77 [28.95]  
Teq = 737 [76] K  
Rp = 50.62 [16.56] Re  
a = 0.1542 [0.0415] AU  
Ag = 0.53 [0.27] [-1.78σ]  
Teffp = 970 [87] K [2.01σ]

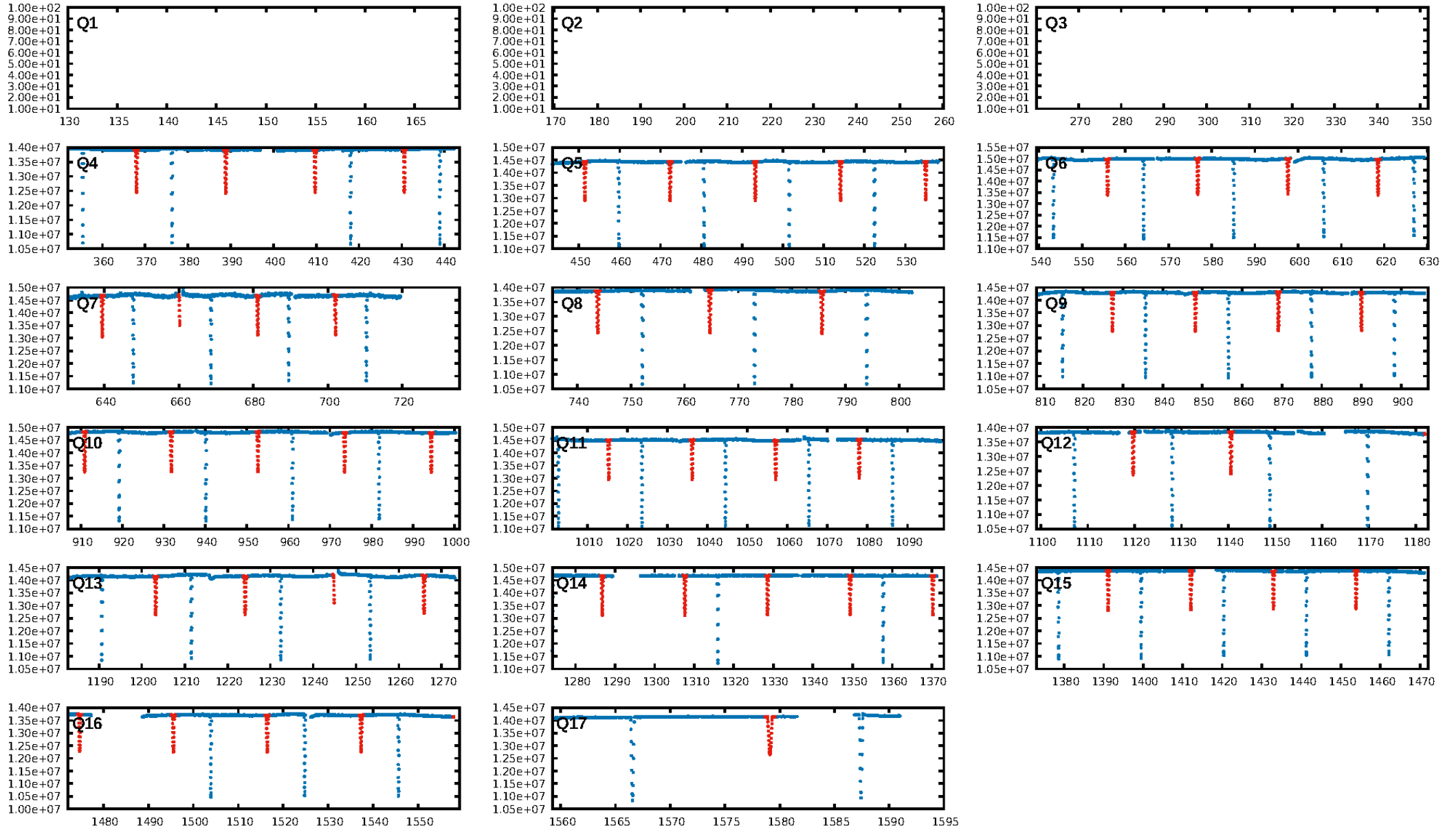
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [51/51]  
GhostDiagnostic-chr: 5.628  
Centroid-sig: N/A  
Centroid-so: 0.133 arcsec [38.90σ]  
OotOffset-rm: 0.020 arcsec [0.30σ]  
KicOffset-rm: 0.053 arcsec [0.77σ]  
OotOffset-st: 3/3/4/4 [14]  
KicOffset-st: 3/3/4/4 [14]  
DiffImageQuality-fgm: 1.00 [14/14]  
DiffImageOverlap-fno: 1.00 [14/14]

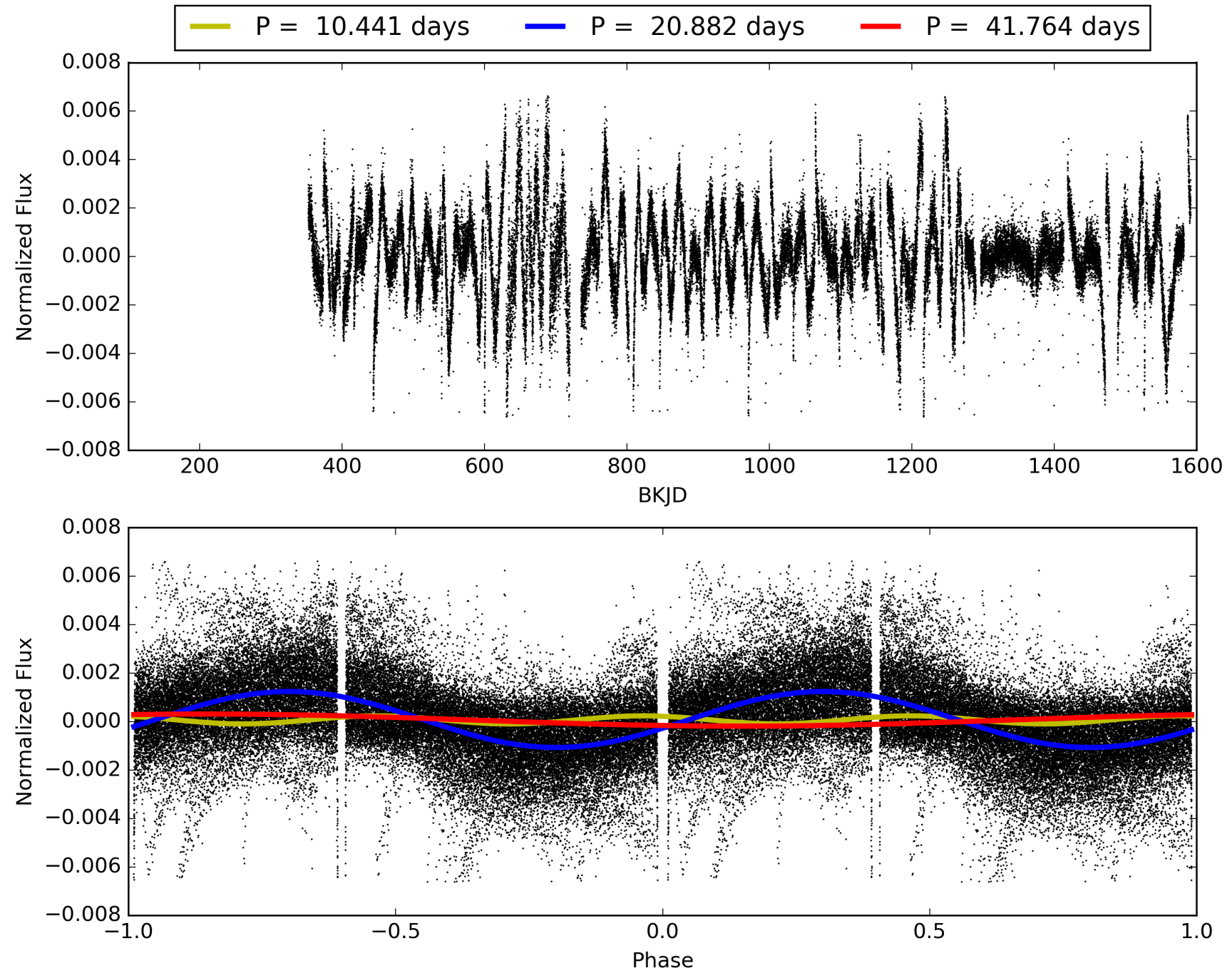
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 17:17:05 Z

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

# TCE 007122259-02, PDC Light Curves



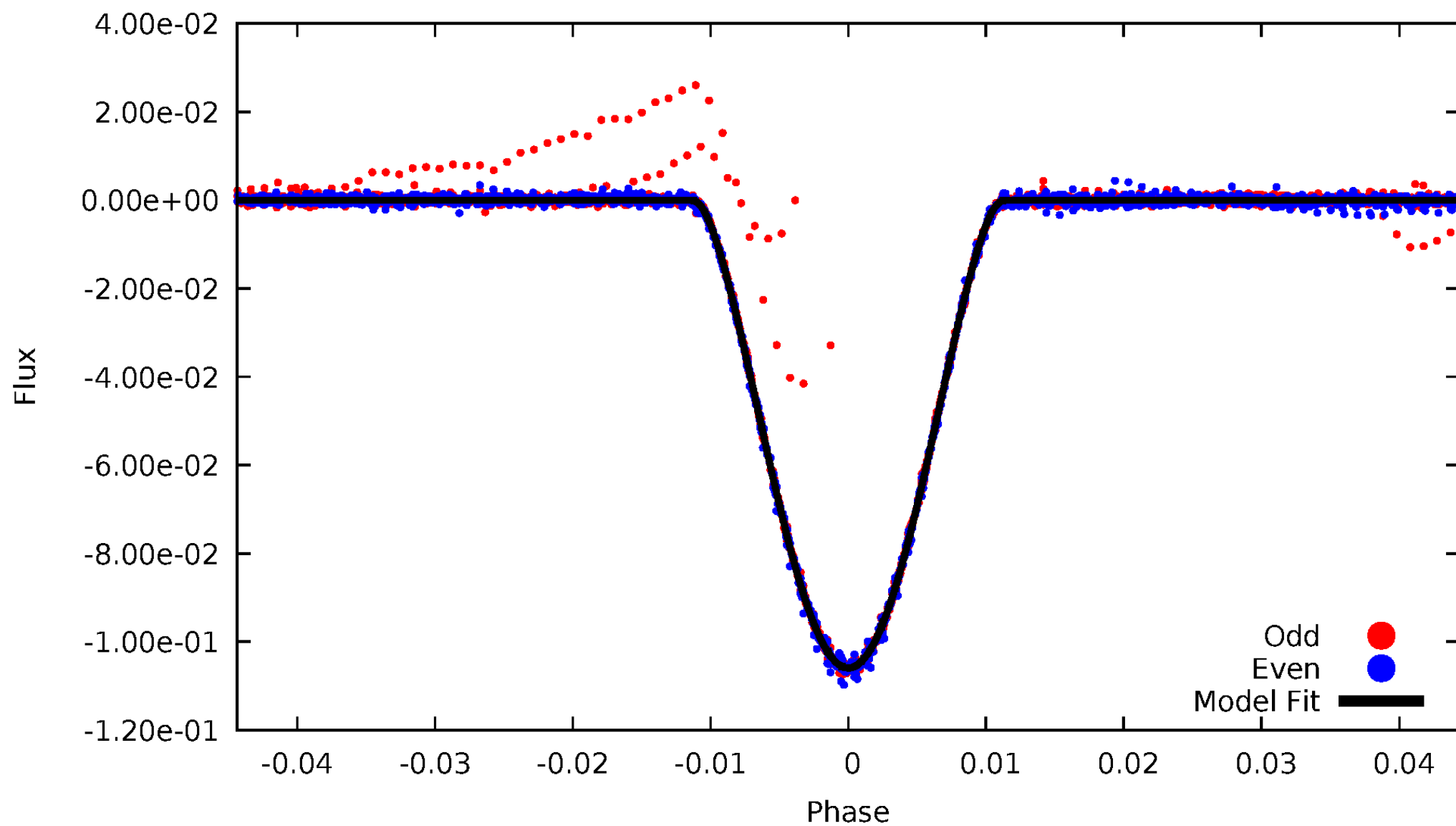
TCE 007122259-02





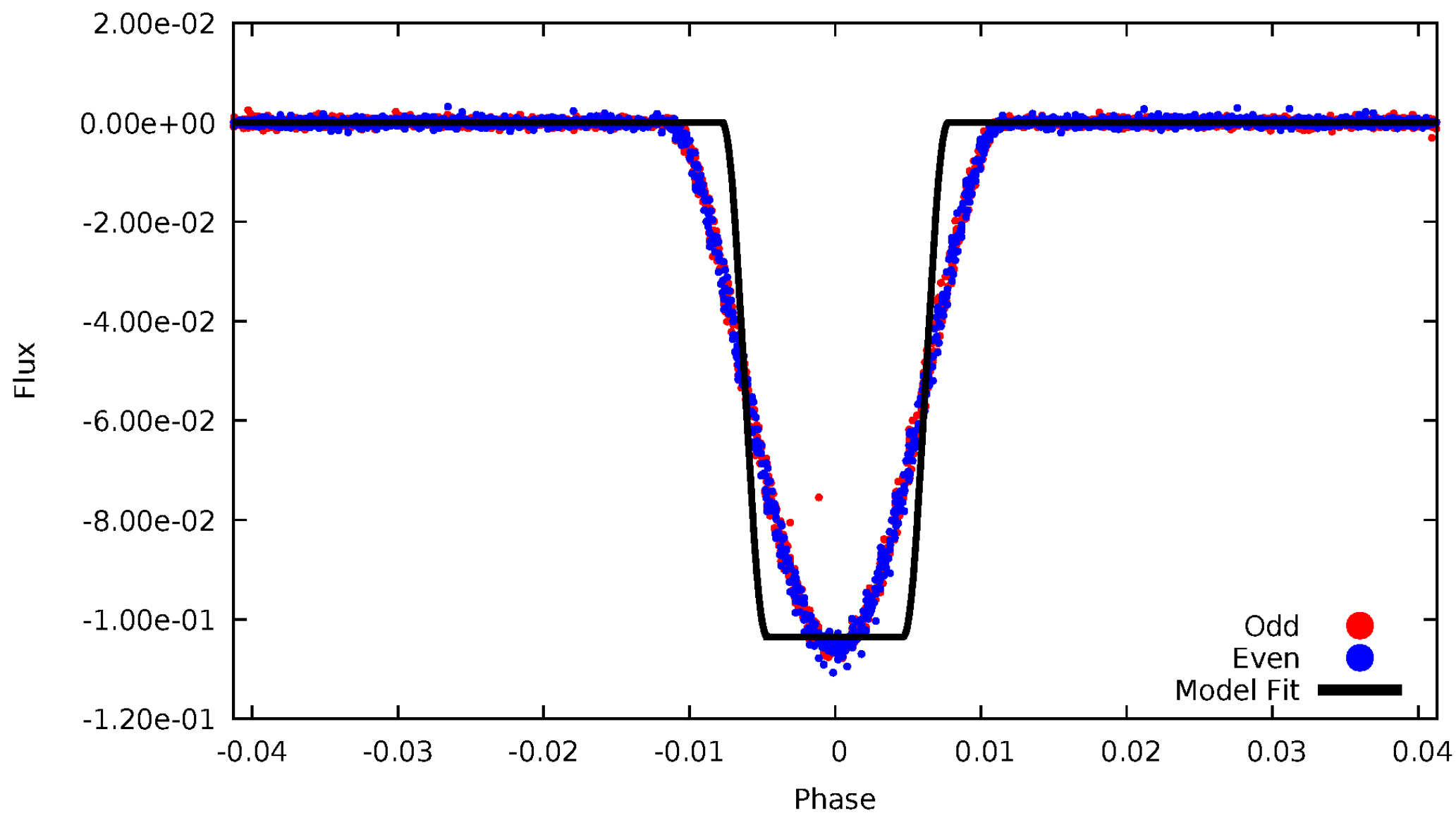
# DV Odd/Even

TCE 007122259-02



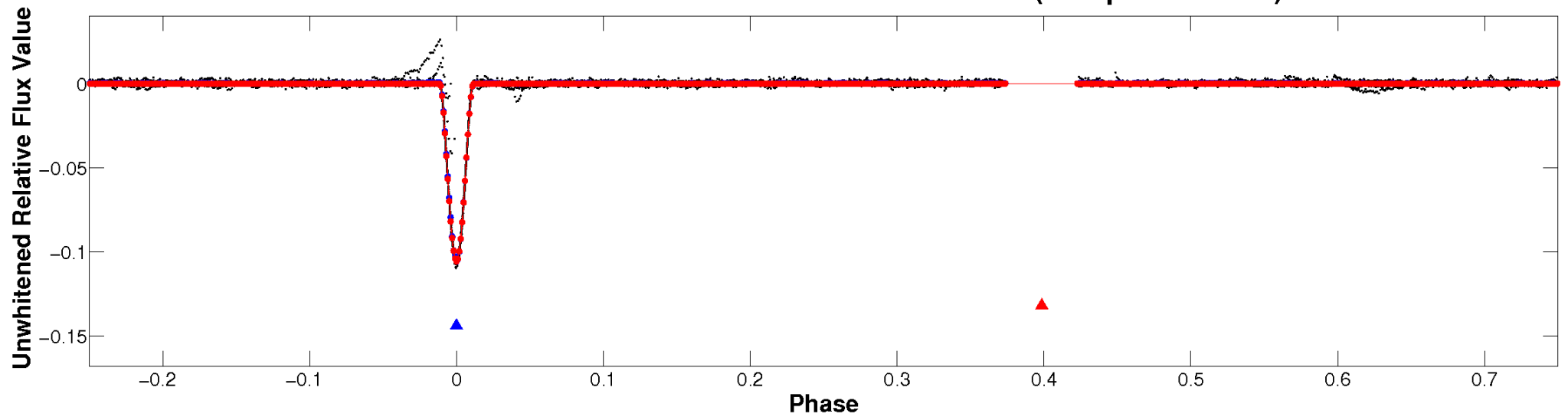
# ALT Odd/Even

TCE 007122259-02

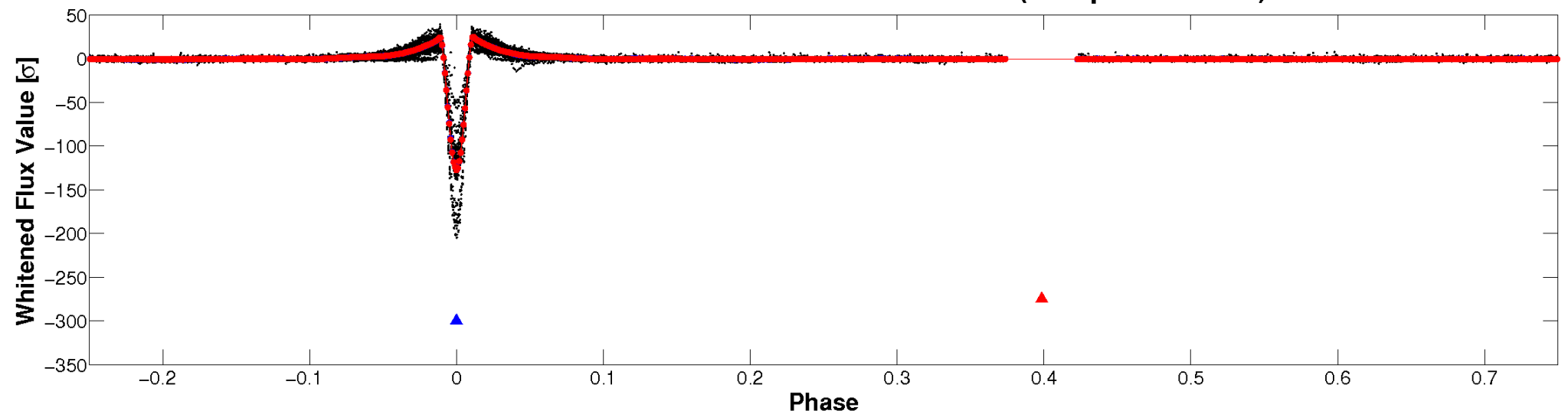


# Non-Whitened Vs. Whitened Light Curve

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

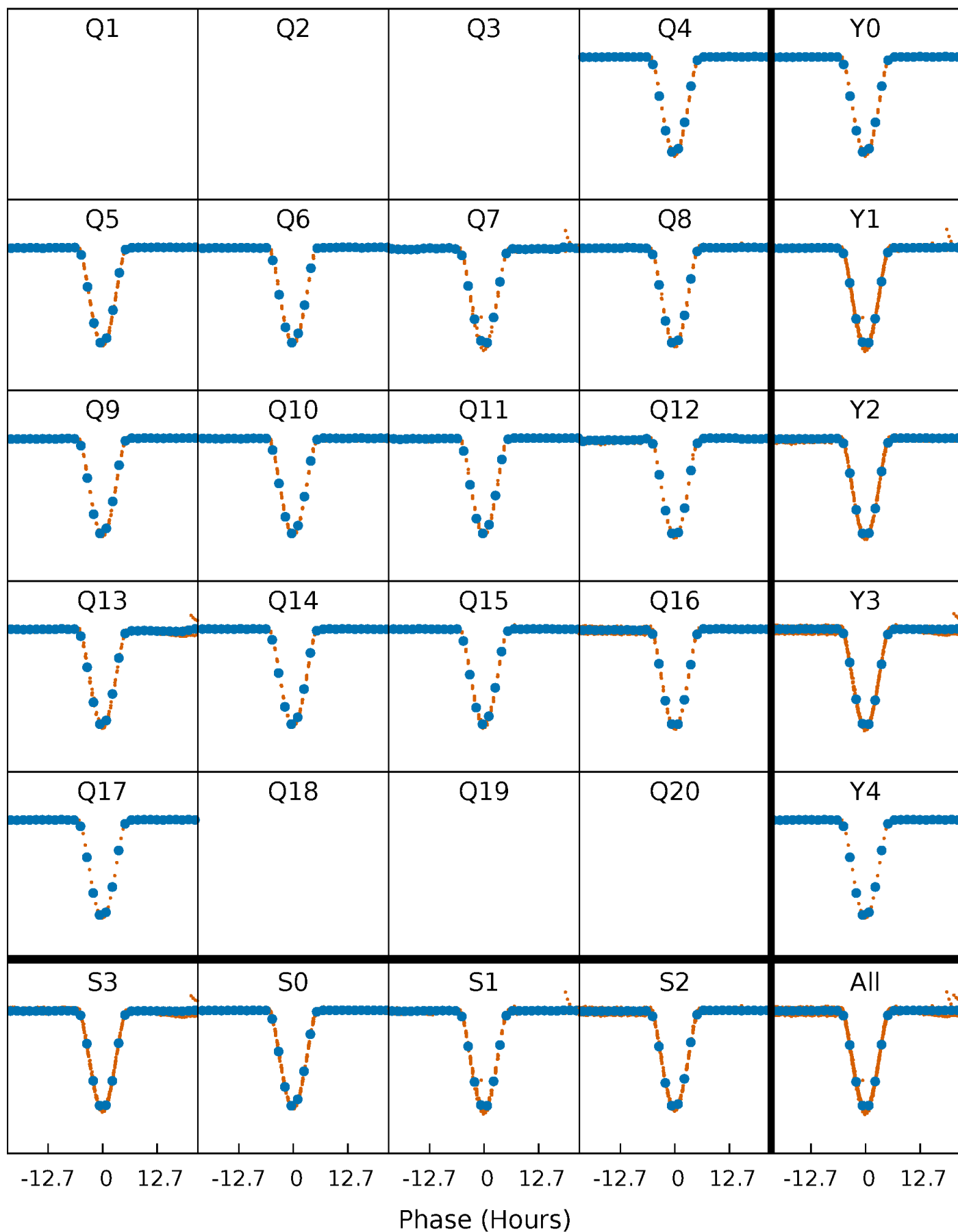


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



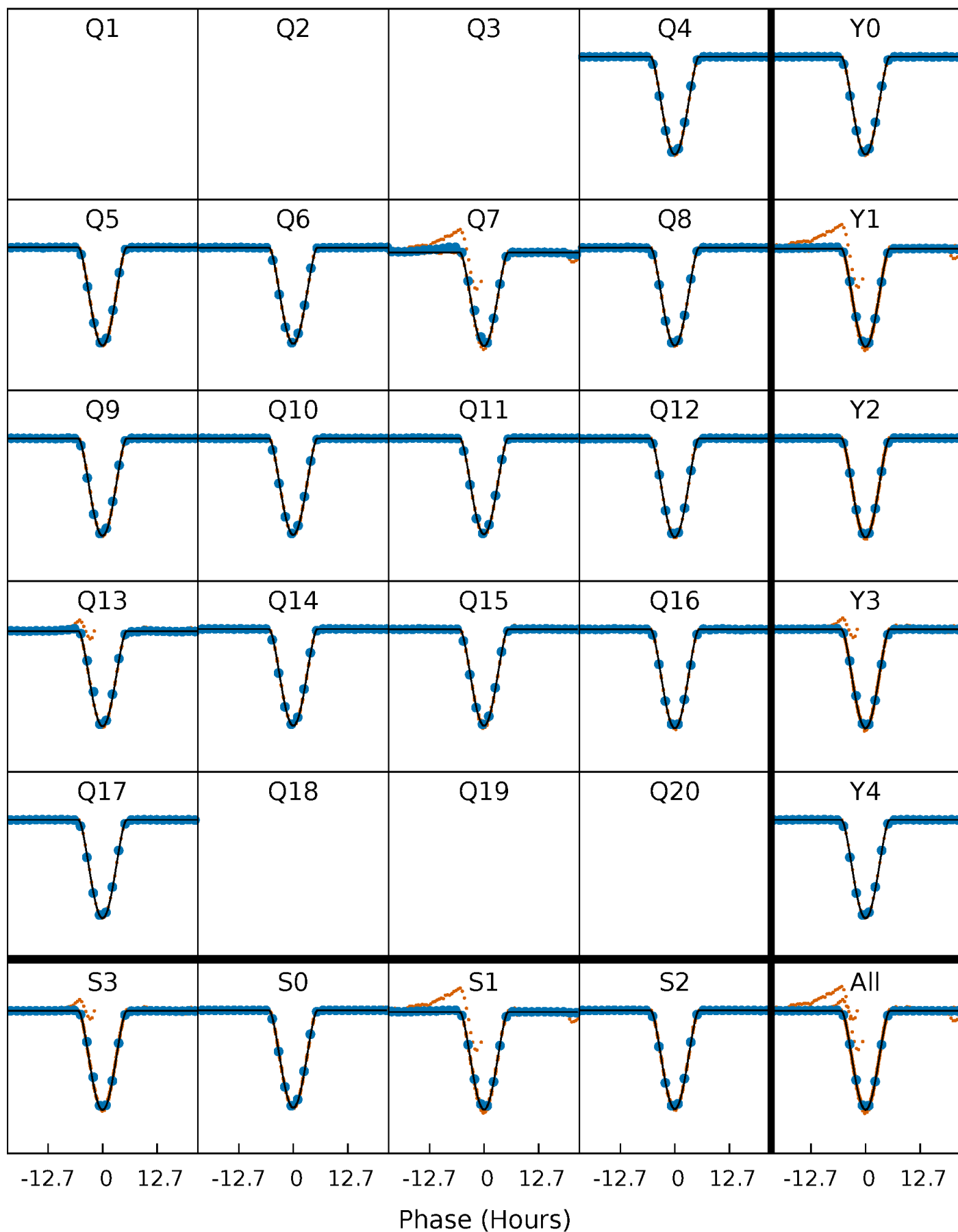
# PDC Quarter-Phased Transit Curves

TCE 007122259-02 P= 20.882120 Days  $T_0=138.246947$  (BKJD)



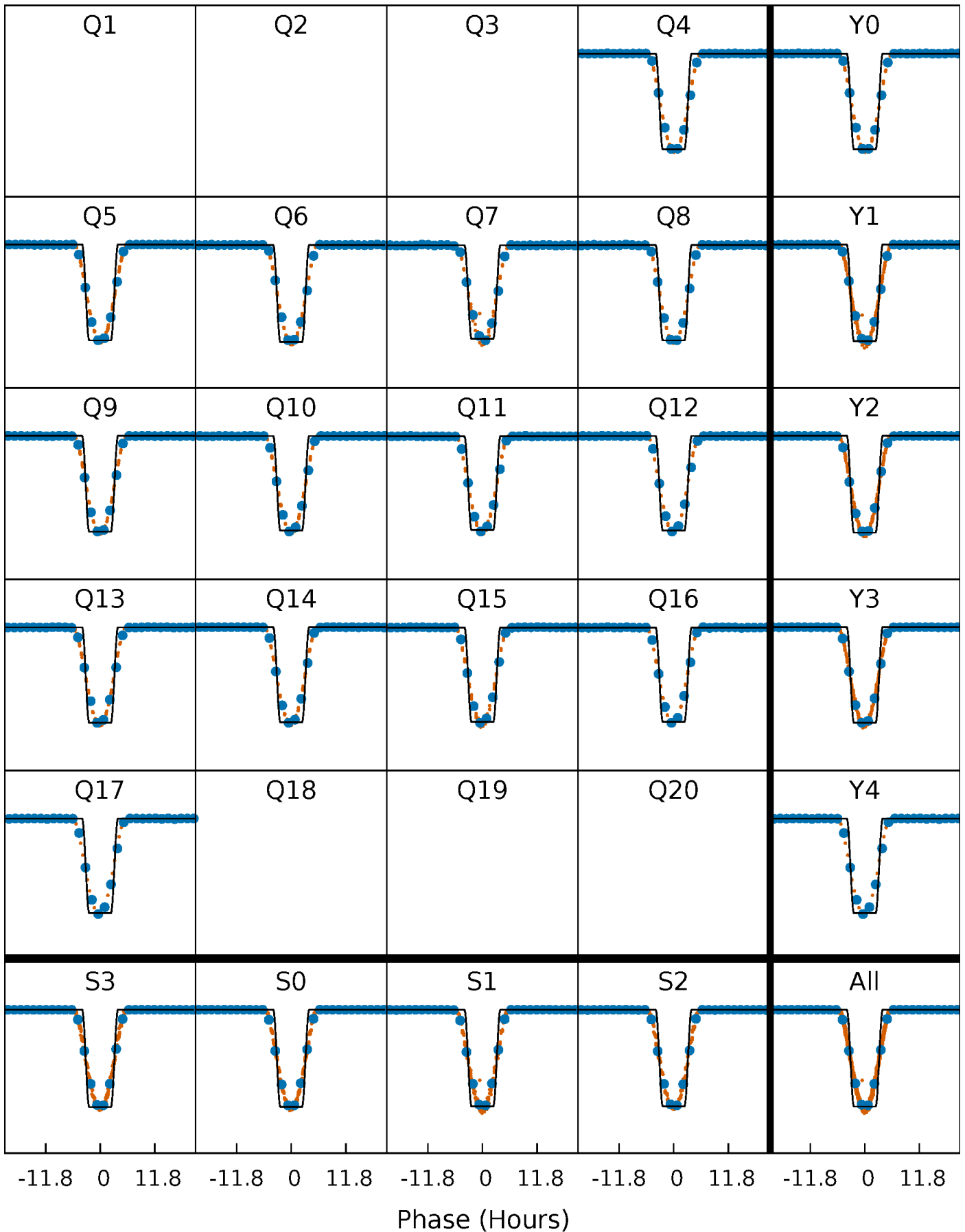
# DV Quarter-Phased Transit Curves

TCE 007122259-02 P= 20.882120 Days  $T_0=138.246947$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

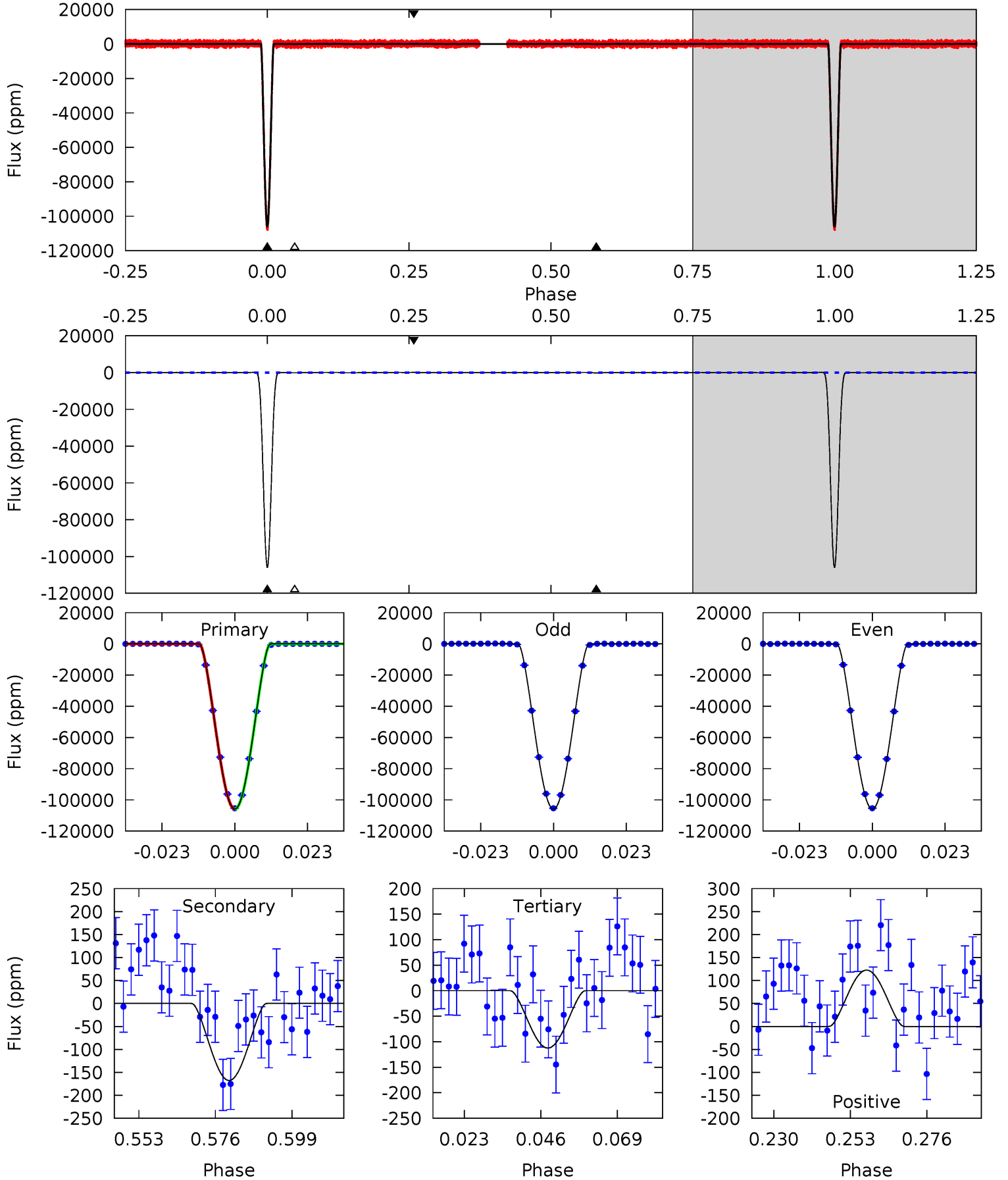
TCE 007122259-02 P= 20.882359 Days  $T_0=138.237486$  (BKJD)



# DV Model-Shift Uniqueness Test

007122259-02, P = 20.882120 Days, E = 138.246947 Days

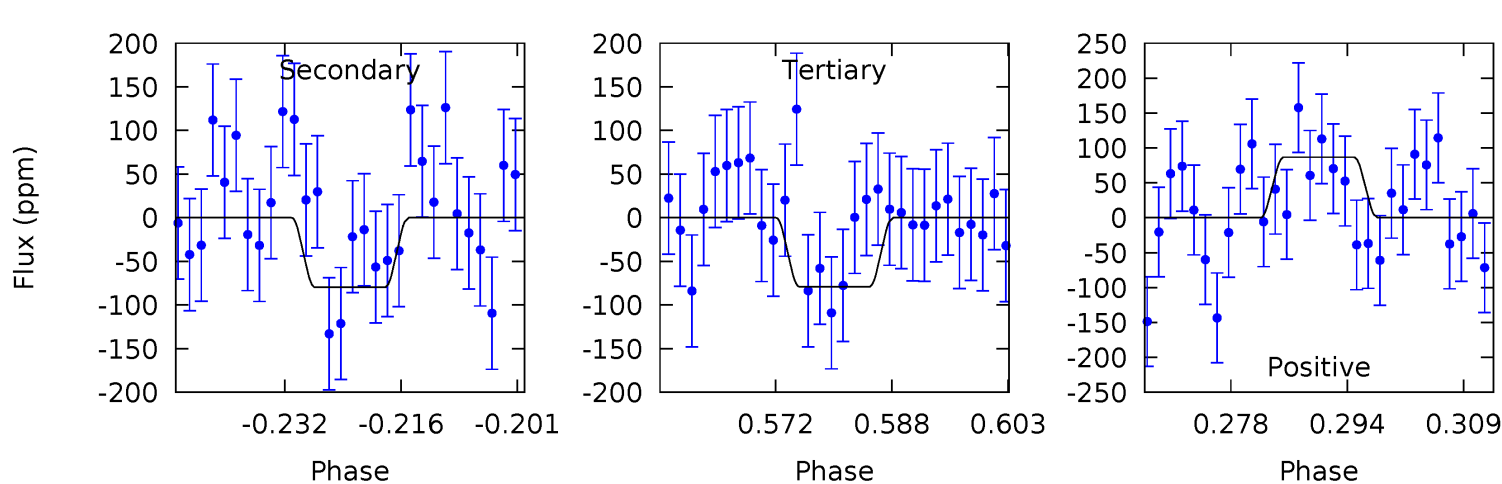
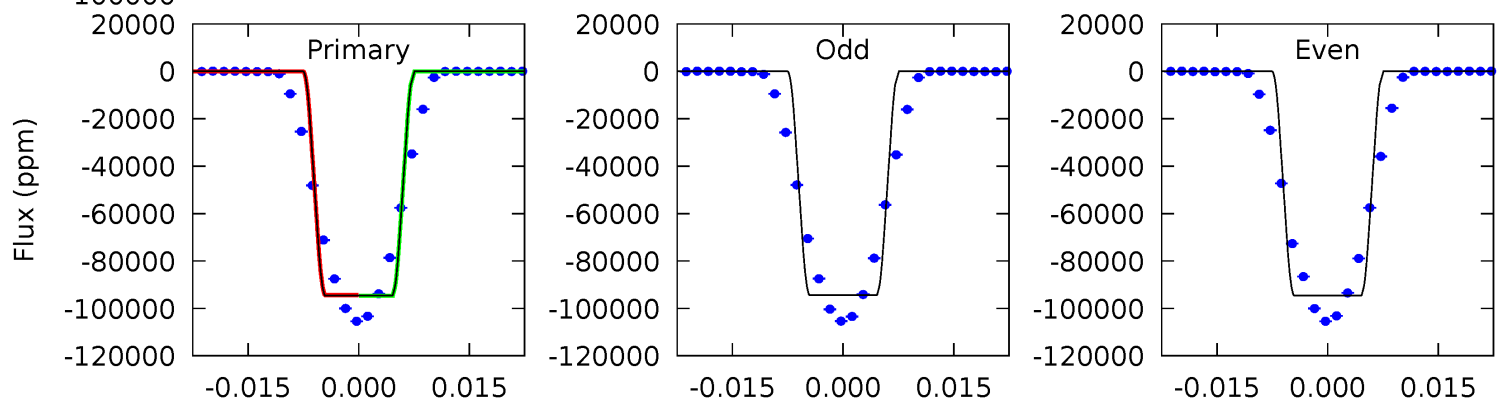
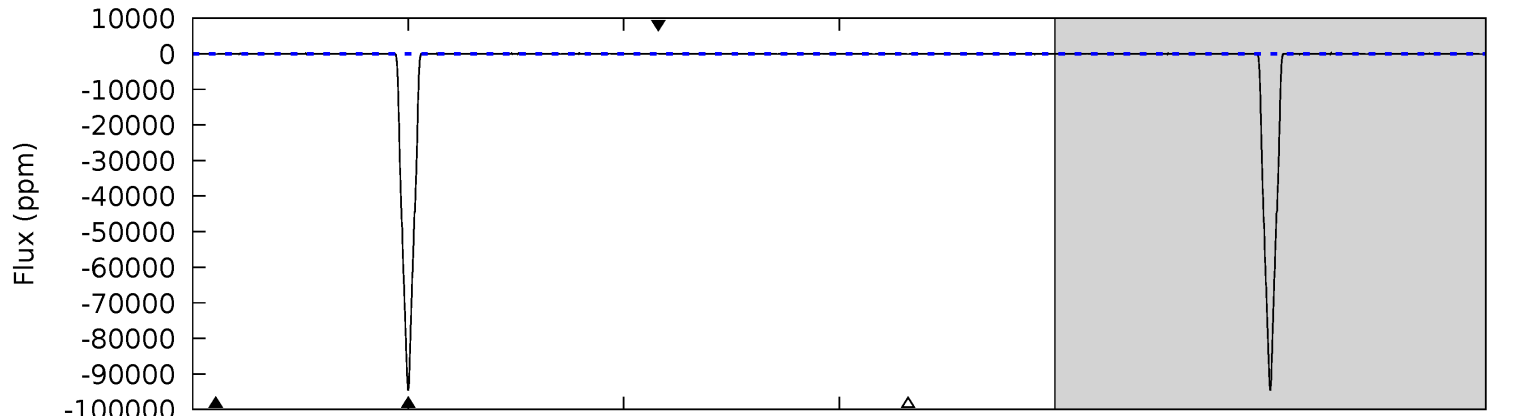
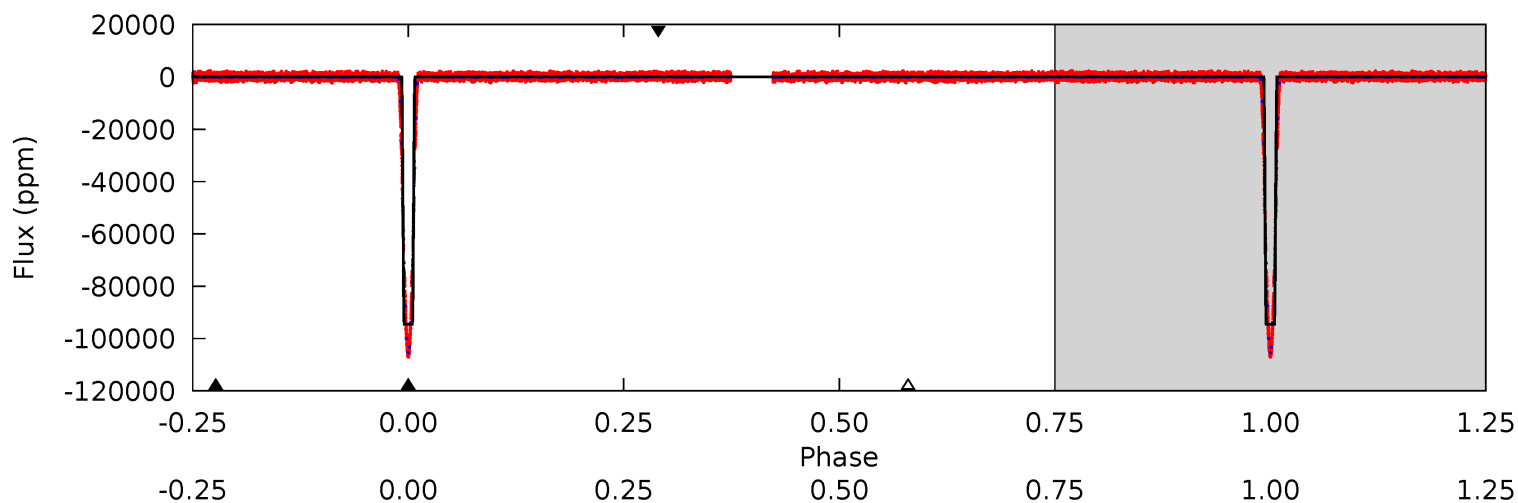
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5803	9.19	6.16	6.72	4.86	2.27	2.55	5797	5797	3.03	2.47	0.34	0.97	0.00	3.80



# Alt Model-Shift Uniqueness Test

007122259-02, P = 20.882359 Days, E = 138.237486 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
3810	3.21	3.18	3.49	4.94	2.42	1.17	3807	3806	0.03	-0.29	2.78	1.00	0.00	5.29





### Stellar Parameters For KIC 007122259

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6335^{+197}_{-241}$	$4.427^{+0.065}_{-0.208}$	$-0.140^{+0.250}_{-0.300}$	$1.072^{+0.349}_{-0.116}$	$1.120^{+0.164}_{-0.148}$	$1.280^{+0.364}_{-0.641}$
	+3%/-4%	+1%/-5%	+179%/-214%	+33%/-11%	+15%/-13%	+28%/-50%
Source	KIC0	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 007122259-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-168 \pm 18$	$51.51^{+9.06}_{-4.39}$	$1050^{+80}_{-56}$	$1975^{+52}_{-70}$	$0.787^{+0.191}_{-0.207}$
Alt.	$-80 \pm 25$	$38.48^{+6.86}_{-3.63}$	$1053^{+75}_{-60}$	$1913^{+113}_{-182}$	$0.635^{+0.315}_{-0.229}$

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

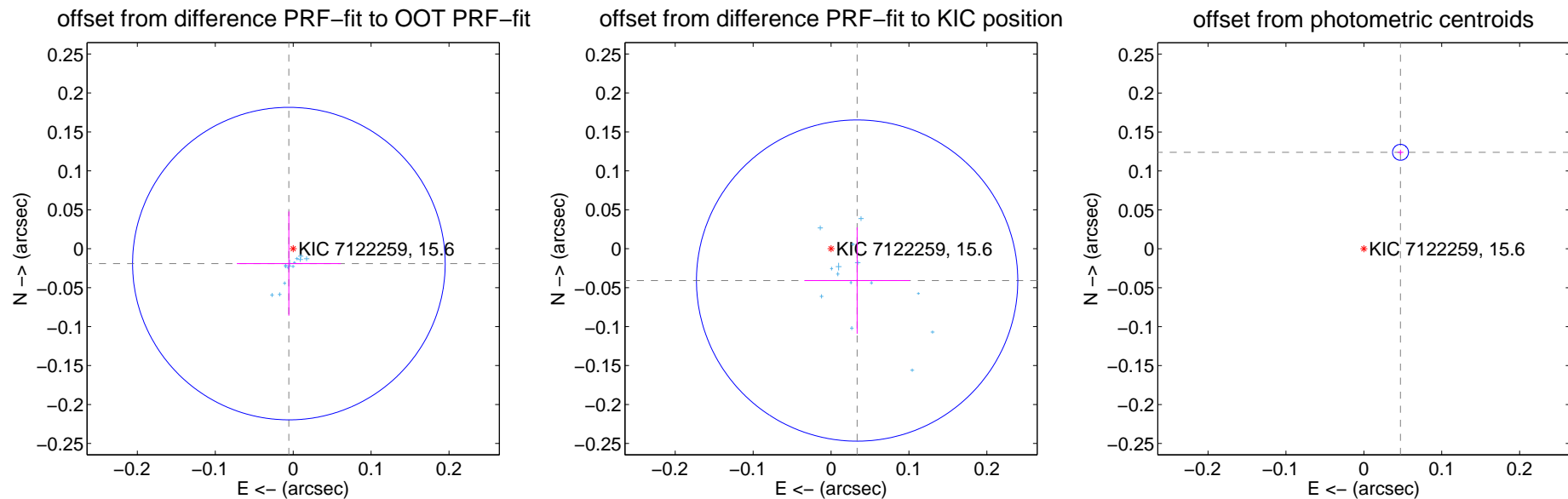
## DV Centroid Data

Supplemental centroid analysis for 007122259-02. Kepler magnitude: 15.60. Transit SNR 2549.48

There are 14 quarters with good PRF difference image offsets

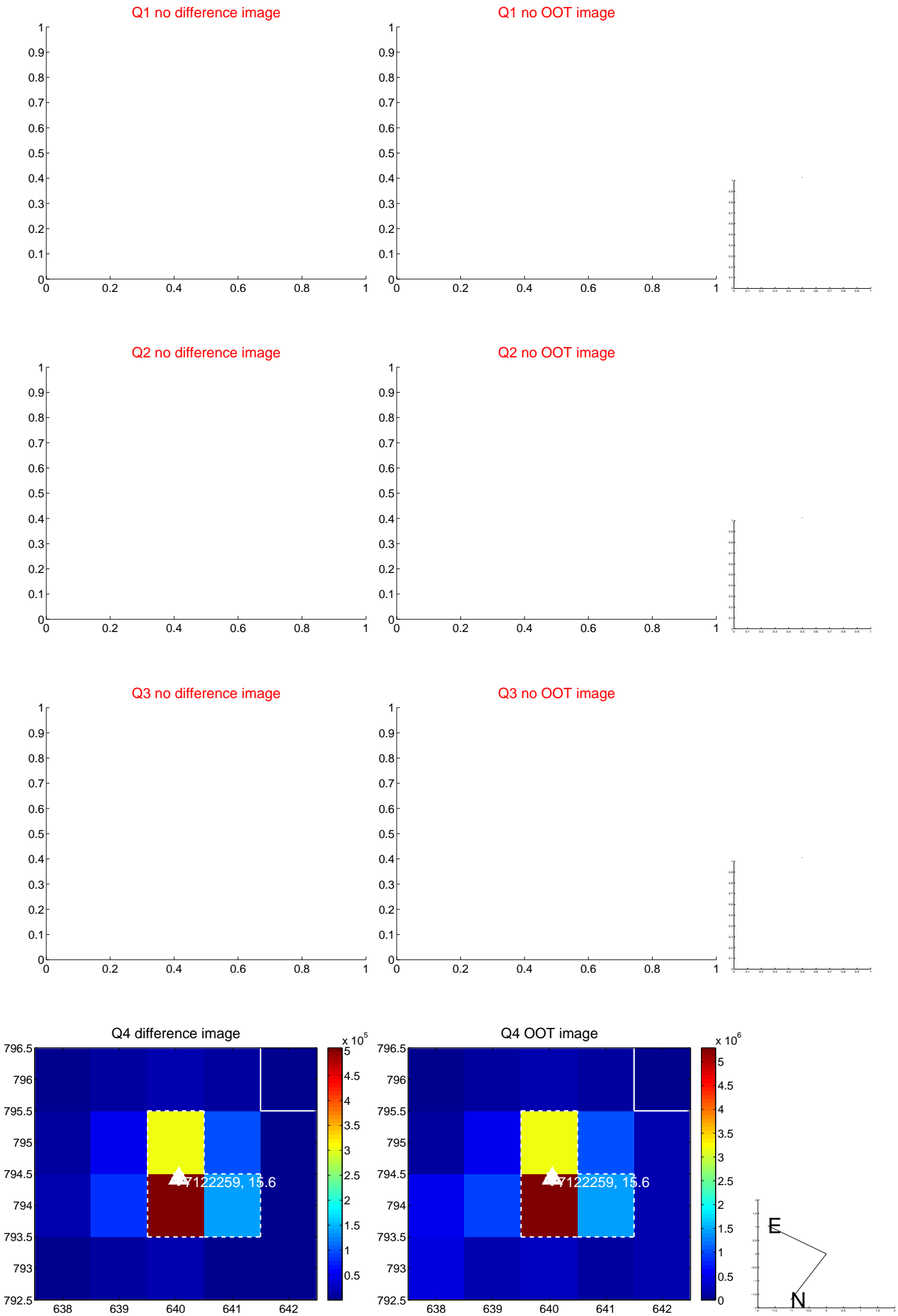
The direct PRF centroid is offset from the target star catalog position by about 0.01 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.020 \pm 0.067$	0.30	$0.006 \pm 0.067$	$-0.019 \pm 0.067$
PRF-fit source offset from KIC position	$0.053 \pm 0.069$	0.77	$-0.033 \pm 0.068$	$-0.041 \pm 0.068$
photometric centroid source offset	$0.13 \pm 0.00$	38.90	$-0.05 \pm 0.00$	$0.12 \pm 0.00$

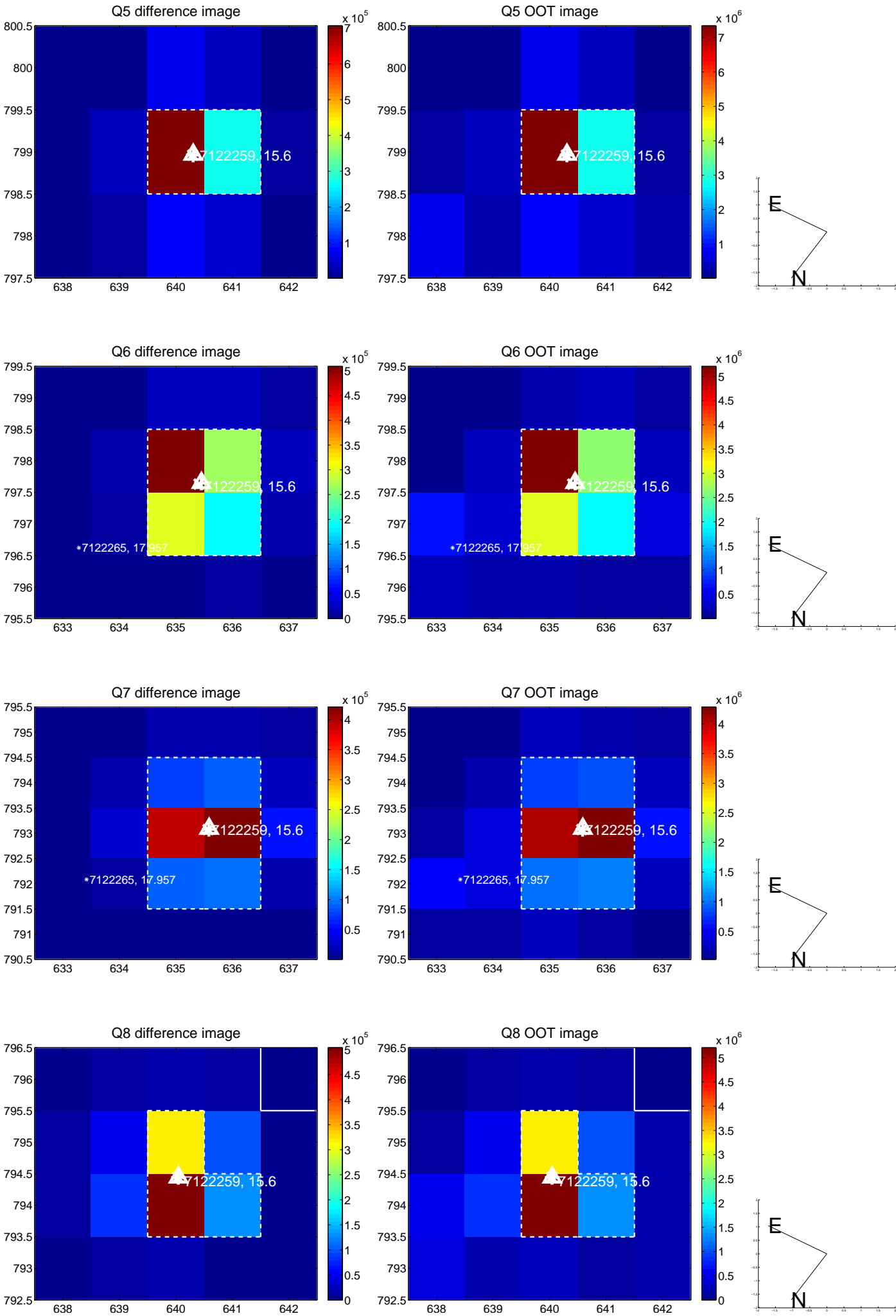


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

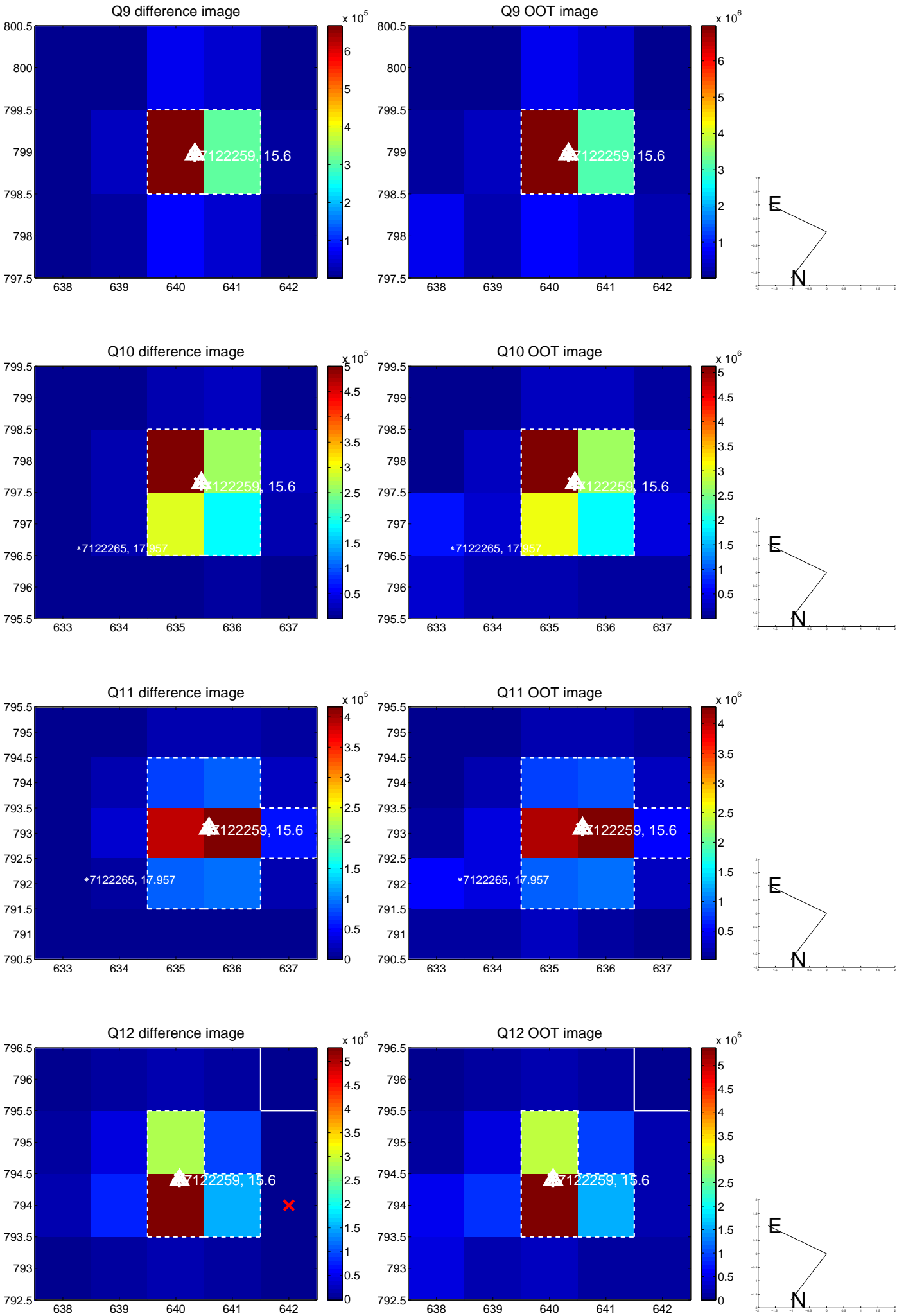
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



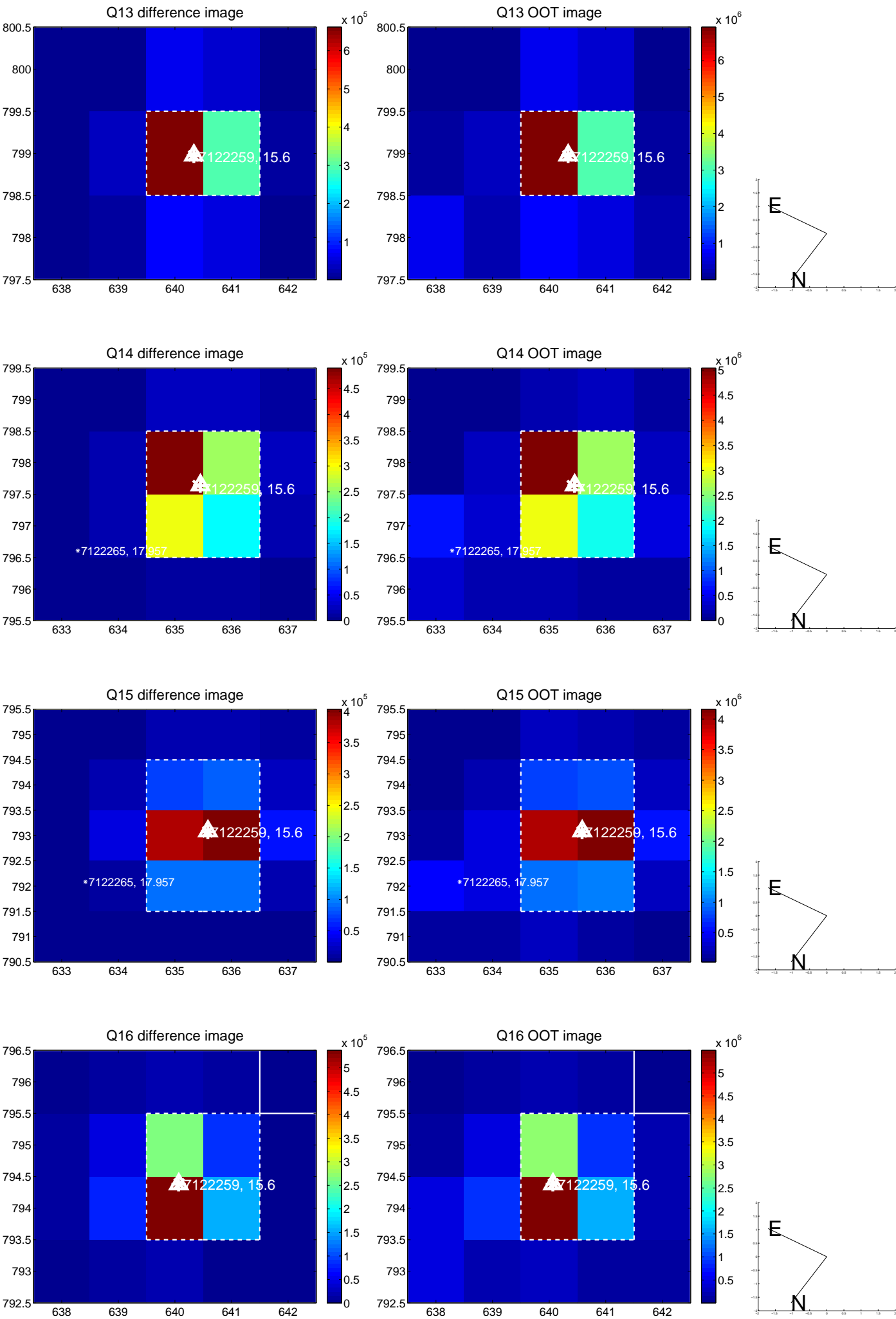
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



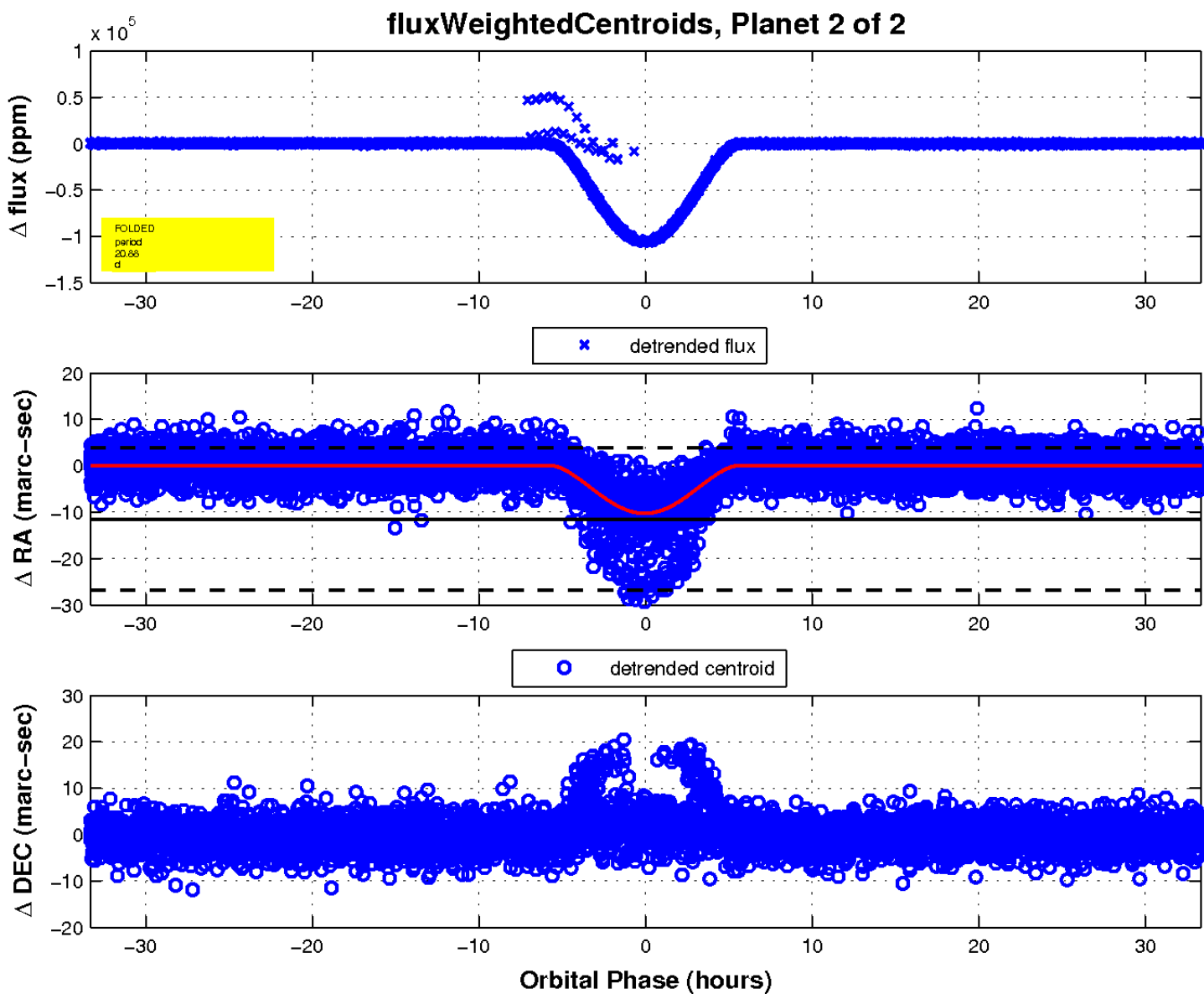
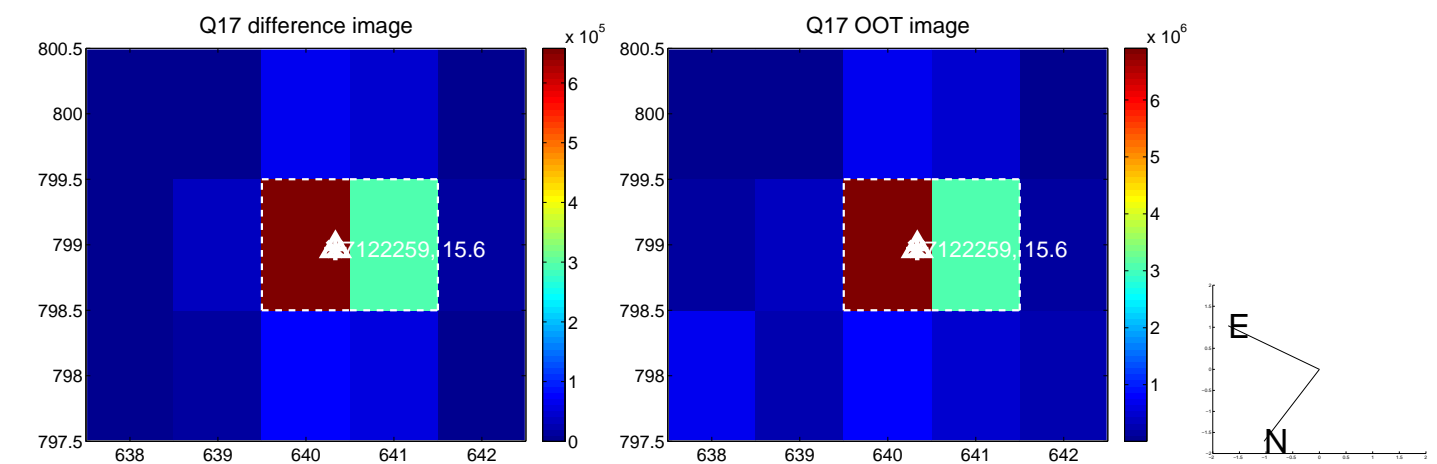
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

