

# KIC 005097278

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005097278-01	OBS	No	0.613503	131.565445	30.3	1.287	11.7	12.1	1.77	7392	1.13	31224.49
005097278-02	OBS	No	0.613512	131.867913	30.4	1.207	9.4	11.2	1.77	7392	1.12	31223.93
005097278-03	OBS	No	144.723708	269.841811	1057.7	4.318	8.8	7.5	1.77	7392	10.68	21.42
005097278-04	OBS	No	3.471417	131.524616	121.0	3.500	8.9	-1.0	1.77	7392	1.98	3096.77
005097278-05	OBS	No	103.141368	170.345502	640.1	3.308	8.0	6.5	1.77	7392	5.15	33.65
005097278-06	OBS	No	163.663790	142.434048	818.2	2.135	7.4	6.9	1.77	7392	5.55	18.18

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005097278-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
005097278-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—SAME_NTL_PERIOD—CENT_SATURATED
005097278-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED—HALO_GHOST
005097278-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED
005097278-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED—HALO_GHOST
005097278-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—CENT_SATURATED

**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 005097278-01

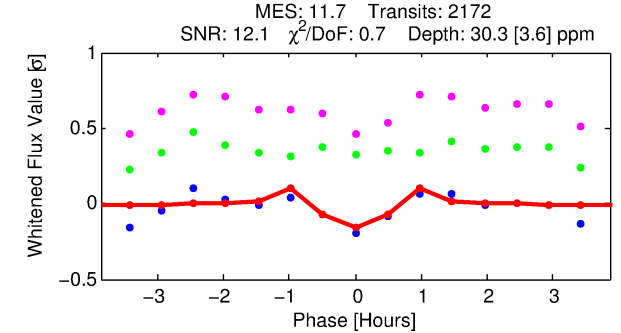
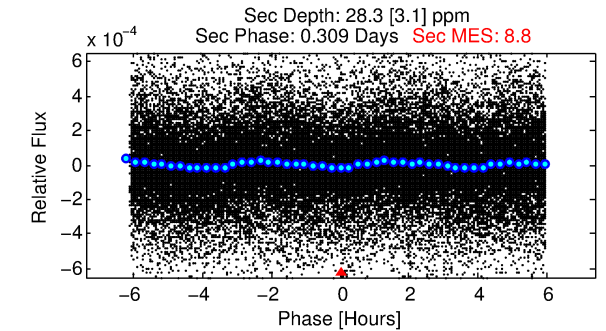
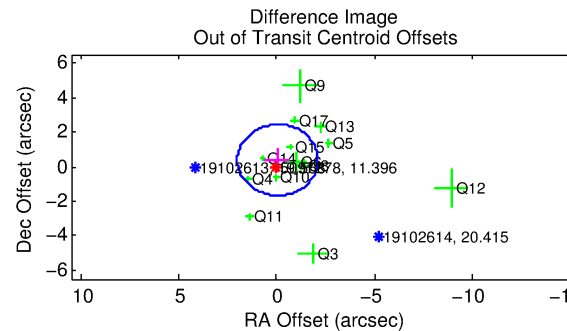
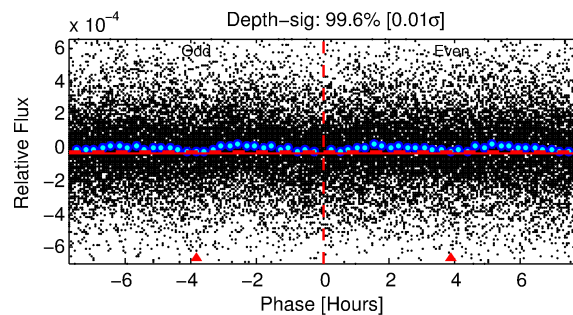
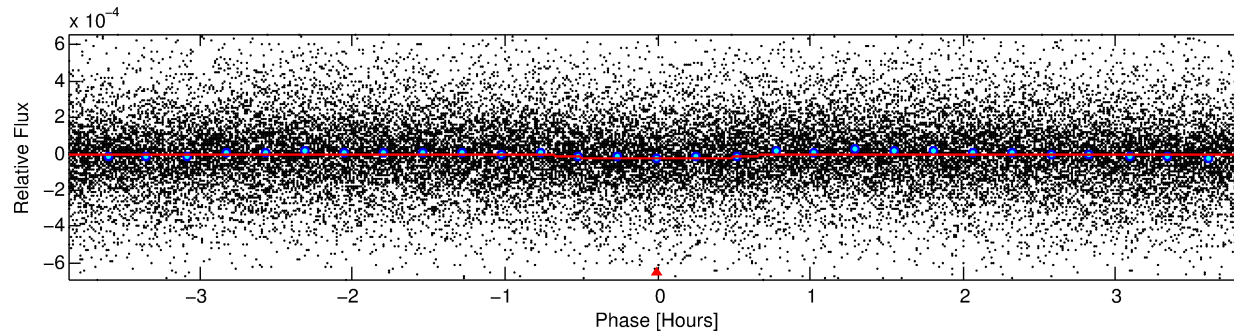
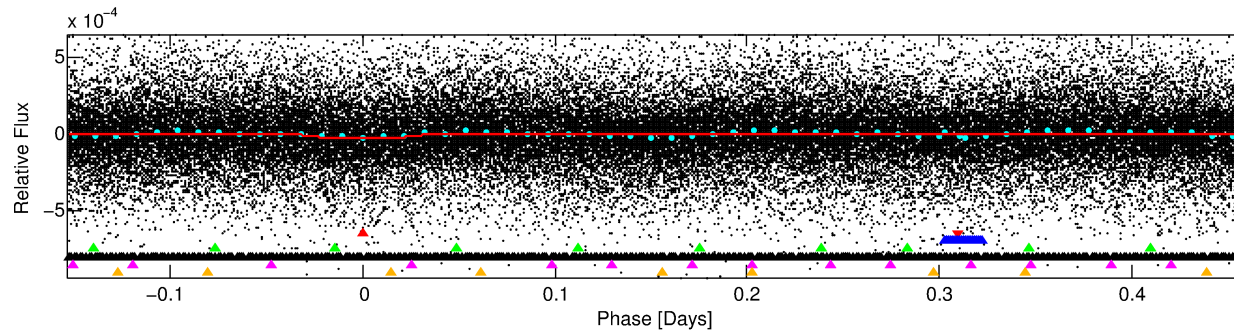
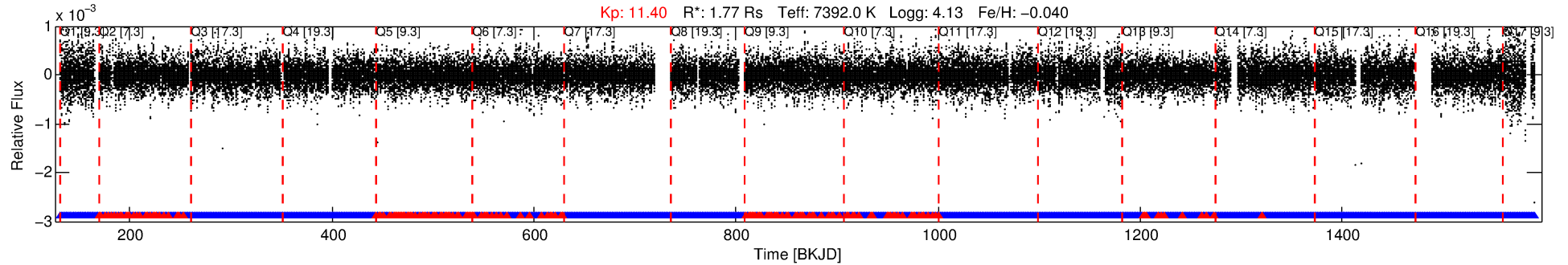
No Significant Match Found

# DV One-Page Summary

KIC: 5097278 Candidate: 1 of 6 Period: 0.614 d

KOI: K06519 Corr: No Ephemeris Match

Kp: 11.40 R\*: 1.77 Rs Teff: 7392.0 K Logg: 4.13 Fe/H: -0.040



## DV Fit Results:

Period = 0.61350 [0.00001] d  
Epoch = 131.5654 [0.0009] BKJD  
Rp/R\* = 0.0059 [0.0006]  
a/R\* = 1.89 [0.81]  
b = 0.90 [0.13]  
Seff = 31224.49 [12591.92]  
Teq = 3390 [342] K  
Rp = 1.13 [0.37] Re  
a = 0.0164 [0.0042] AU  
Ag = 3.27 [1.42] [1.60σ]  
Teffp = 7045 [535] K [5.76σ]

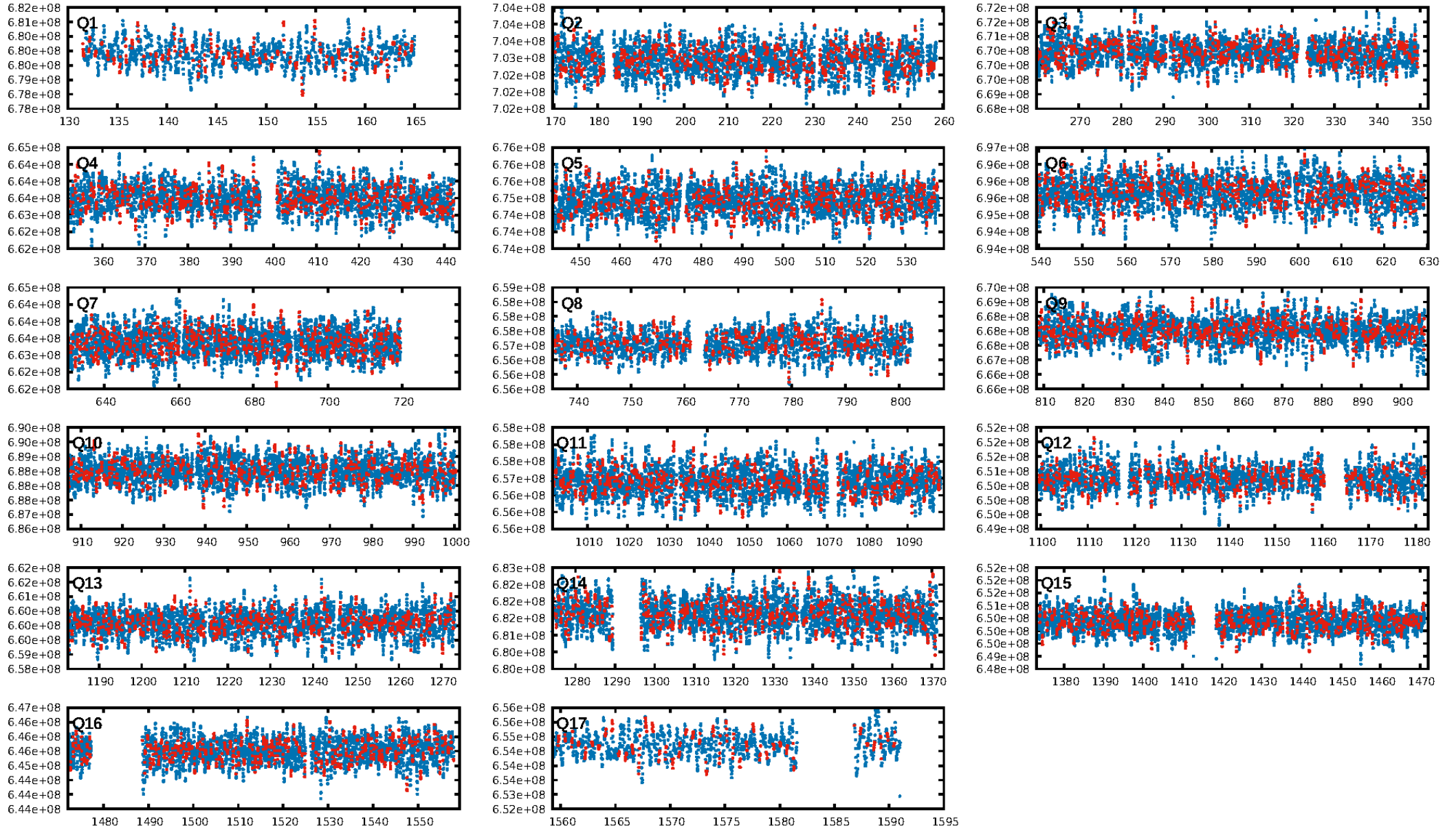
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.36e-25  
RollingBand-fgt: 0.91 [1891/2074]  
GhostDiagnostic-chr: 1.163  
Centroid-sig: 1.7%  
Centroid-so: 0.751 arcsec [1.69σ]  
OotOffset-rm: 0.388 arcsec [0.57σ]  
KicOffset-rm: 0.382 arcsec [0.61σ]  
OotOffset-st: 3/3/3/4 [13]  
KicOffset-st: 3/3/3/4 [13]  
DiffImageQuality-fgm: 0.38 [5/13]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 13:28:59 Z

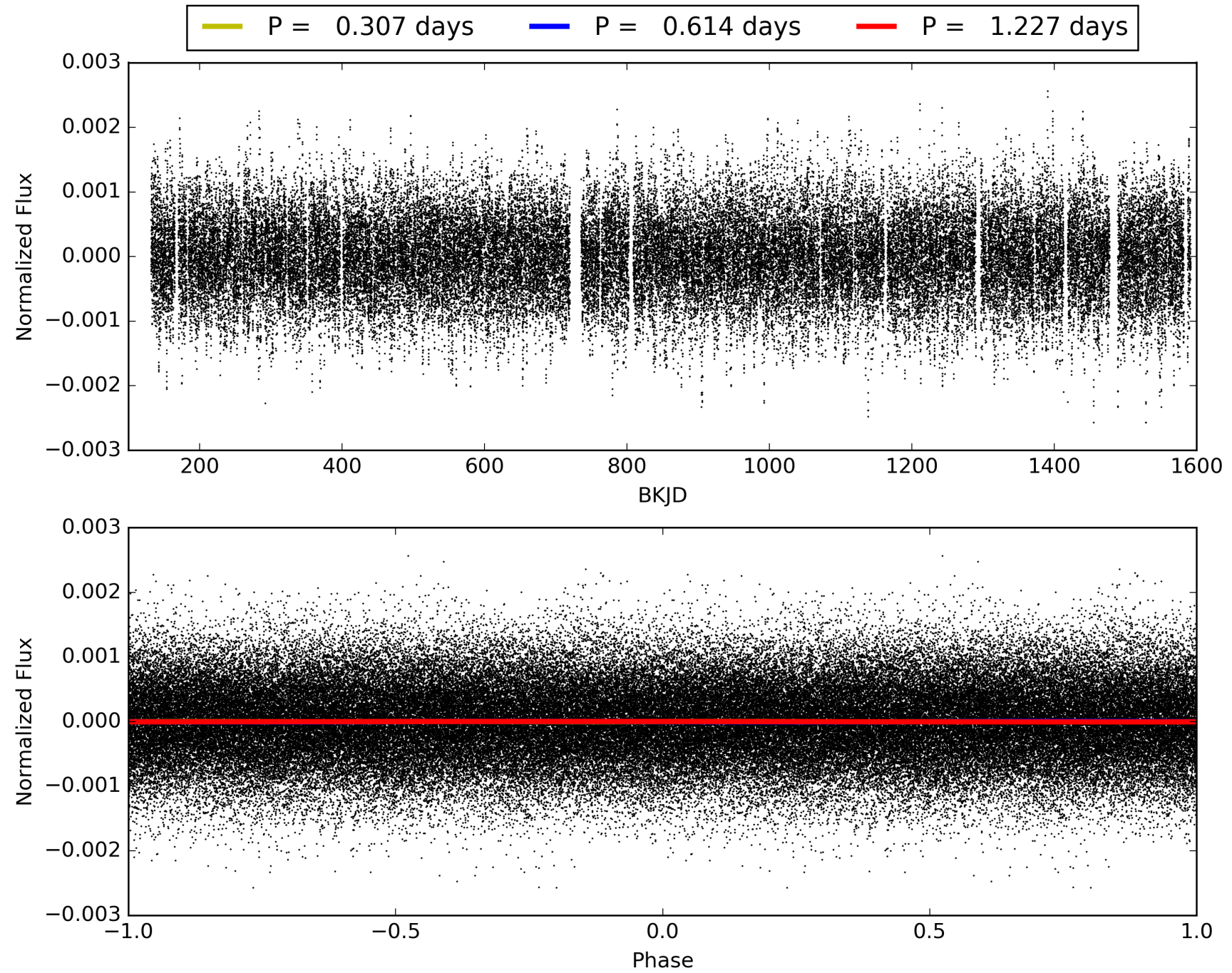
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005097278-01, PDC Light Curves





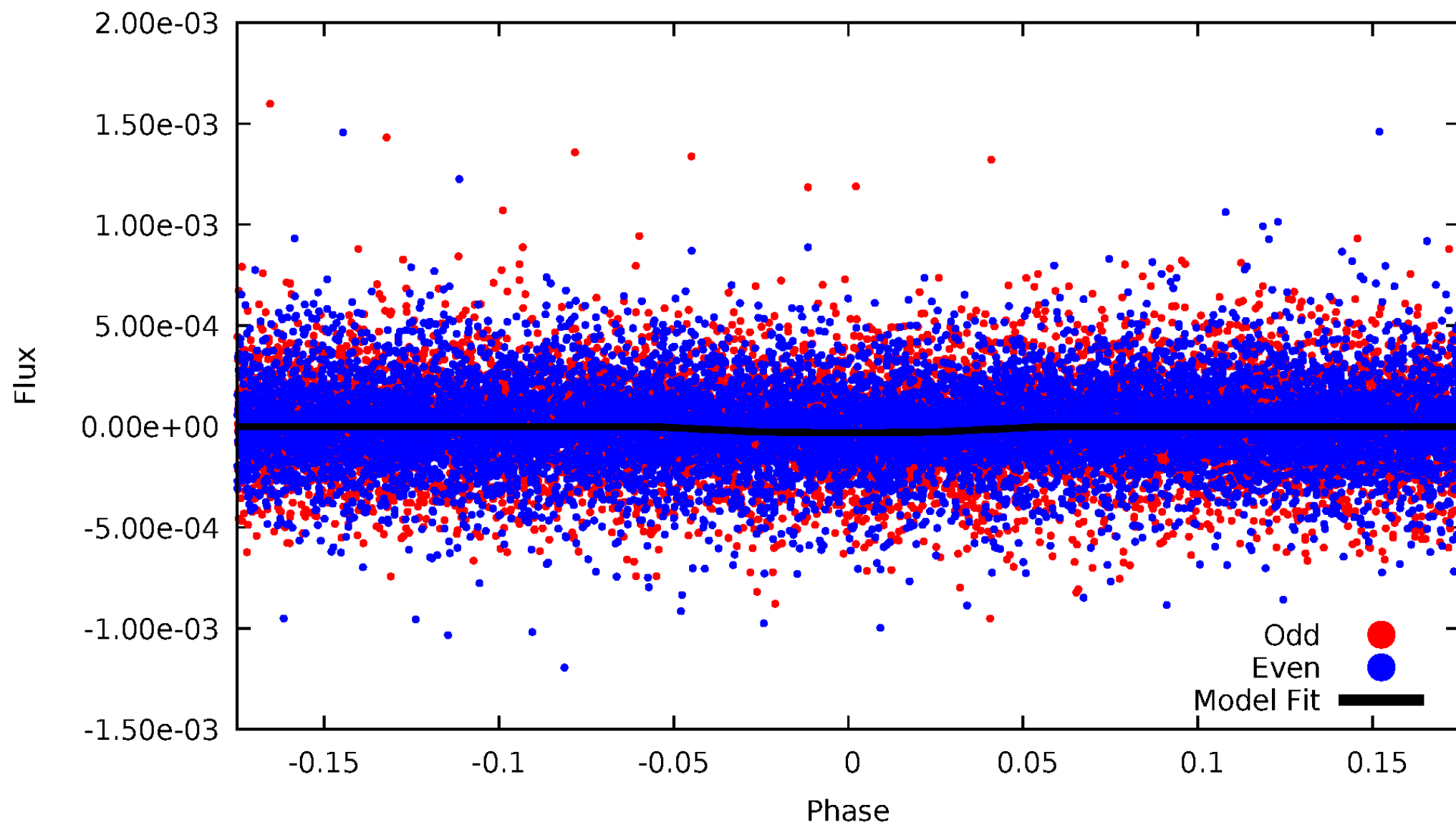
TCE 005097278-01





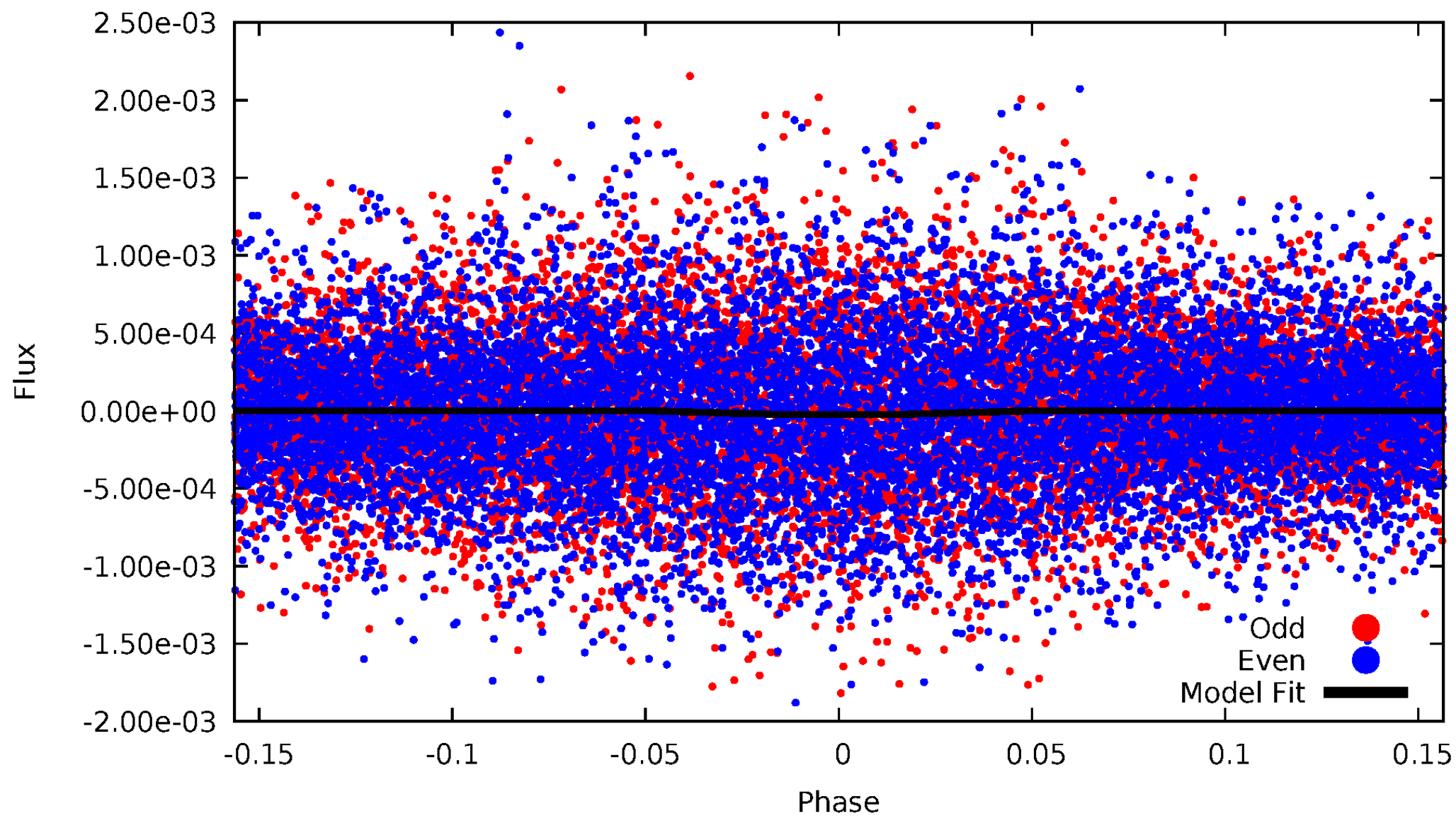
# DV Odd/Even

TCE 005097278-01



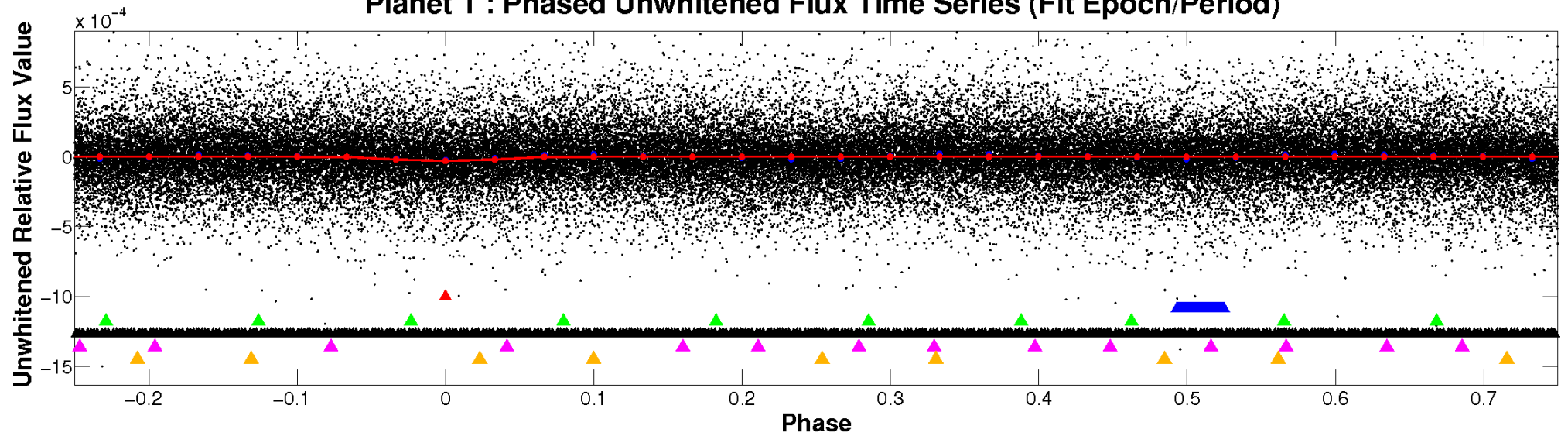
# ALT Odd/Even

TCE 005097278-01

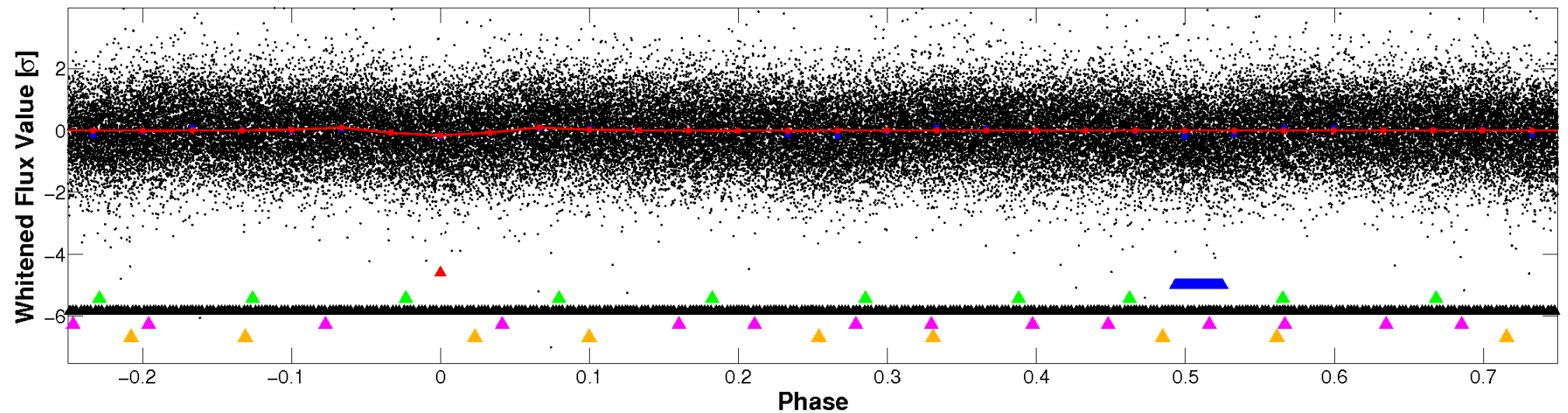


# Non-Whitened Vs. Whitened Light Curve

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



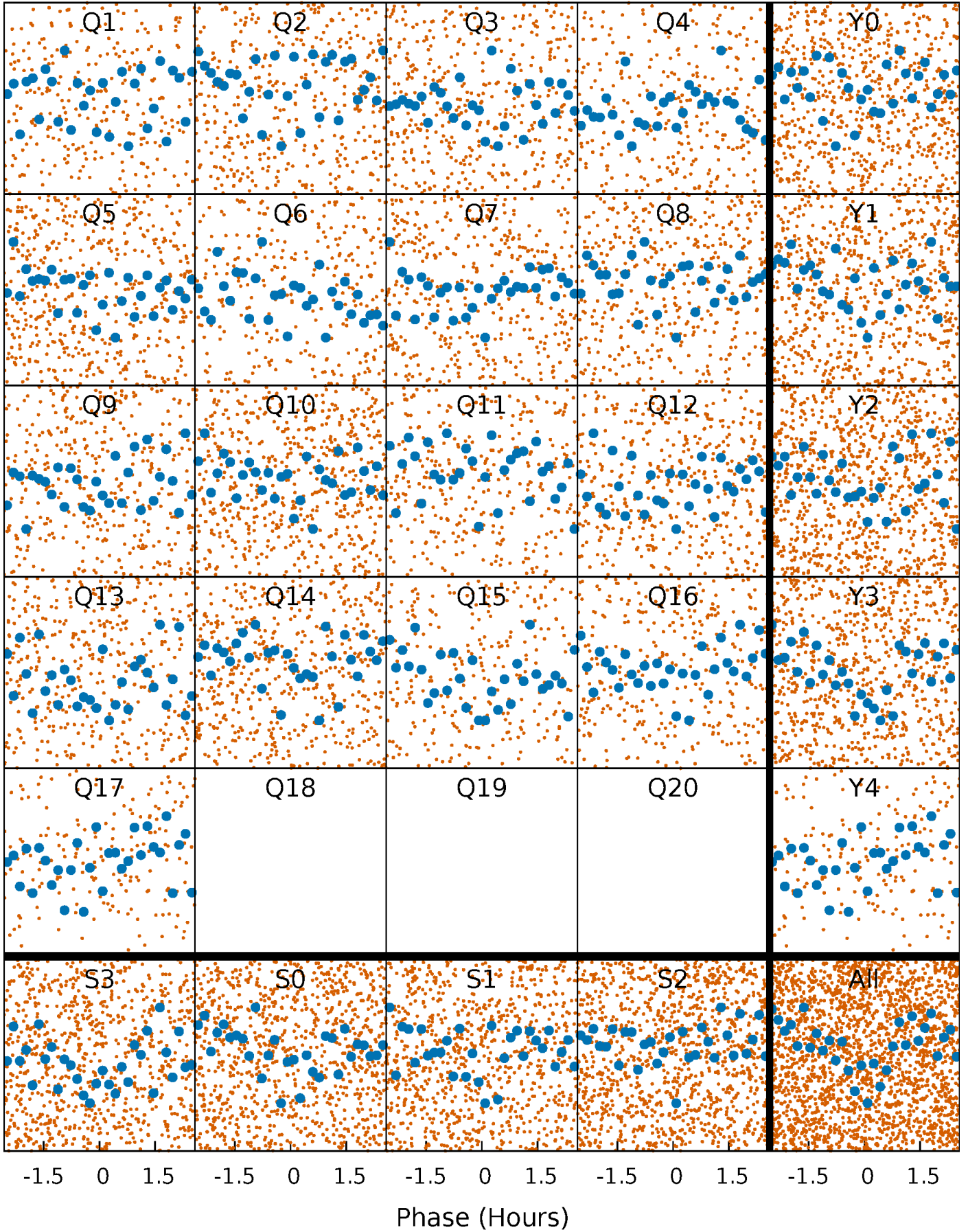
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





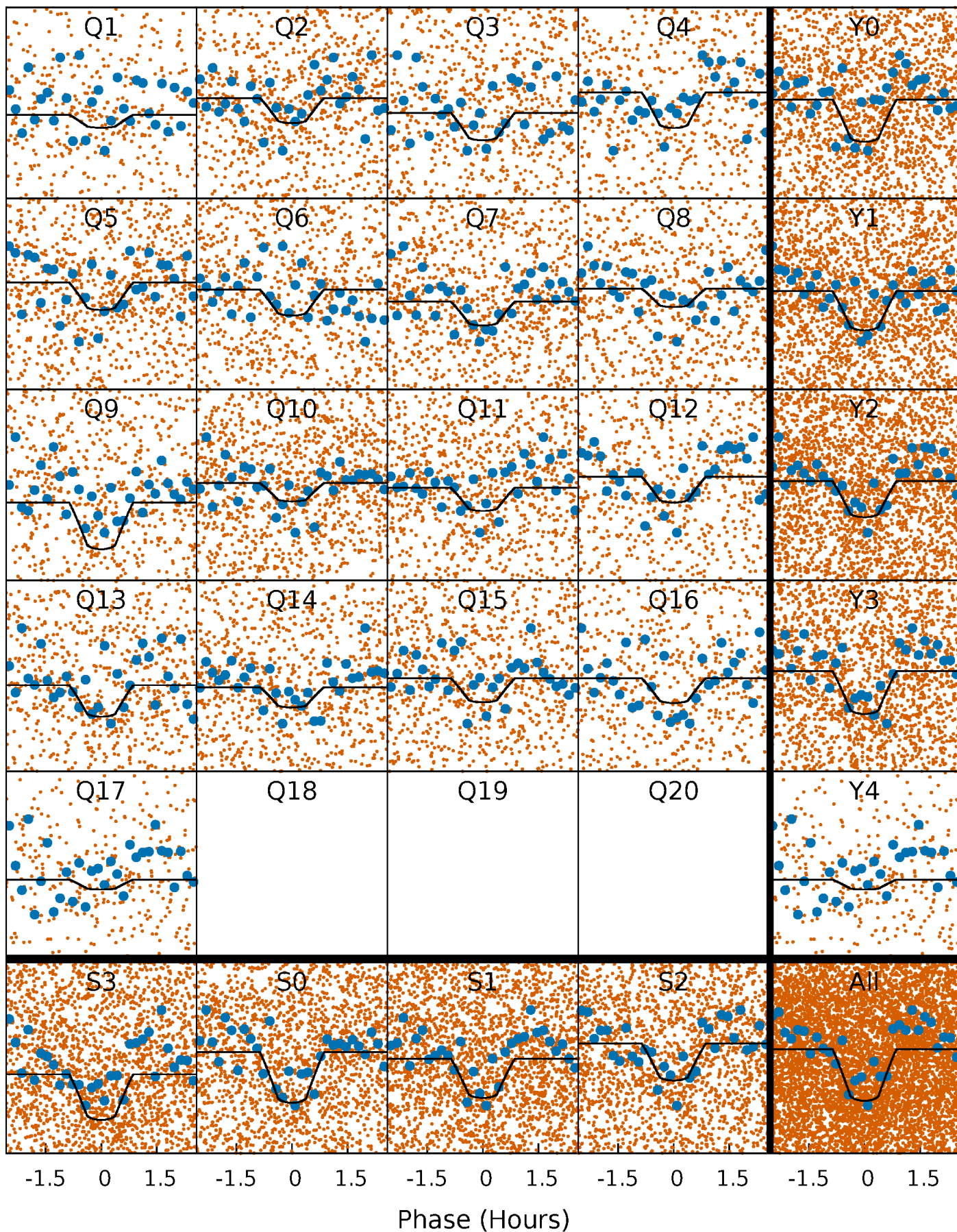
# PDC Quarter-Phased Transit Curves

TCE 005097278-01   P= 0.613503 Days    $T_0=131.565445$  (BKJD)



# DV Quarter-Phased Transit Curves

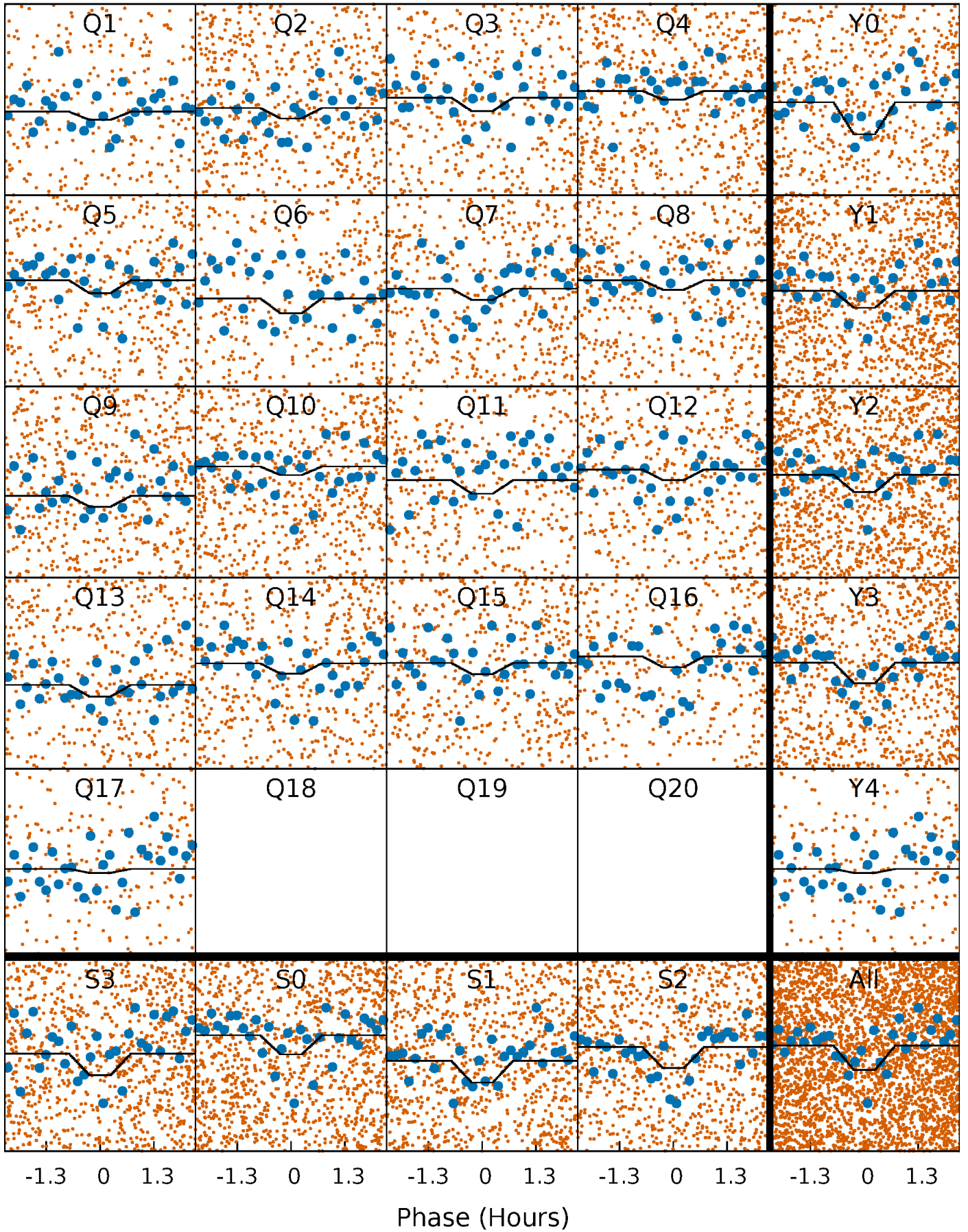
TCE 005097278-01 P= 0.613503 Days  $T_0=131.565445$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 005097278-01 P= 0.613507 Days  $T_0=131.561437$  (BKJD)

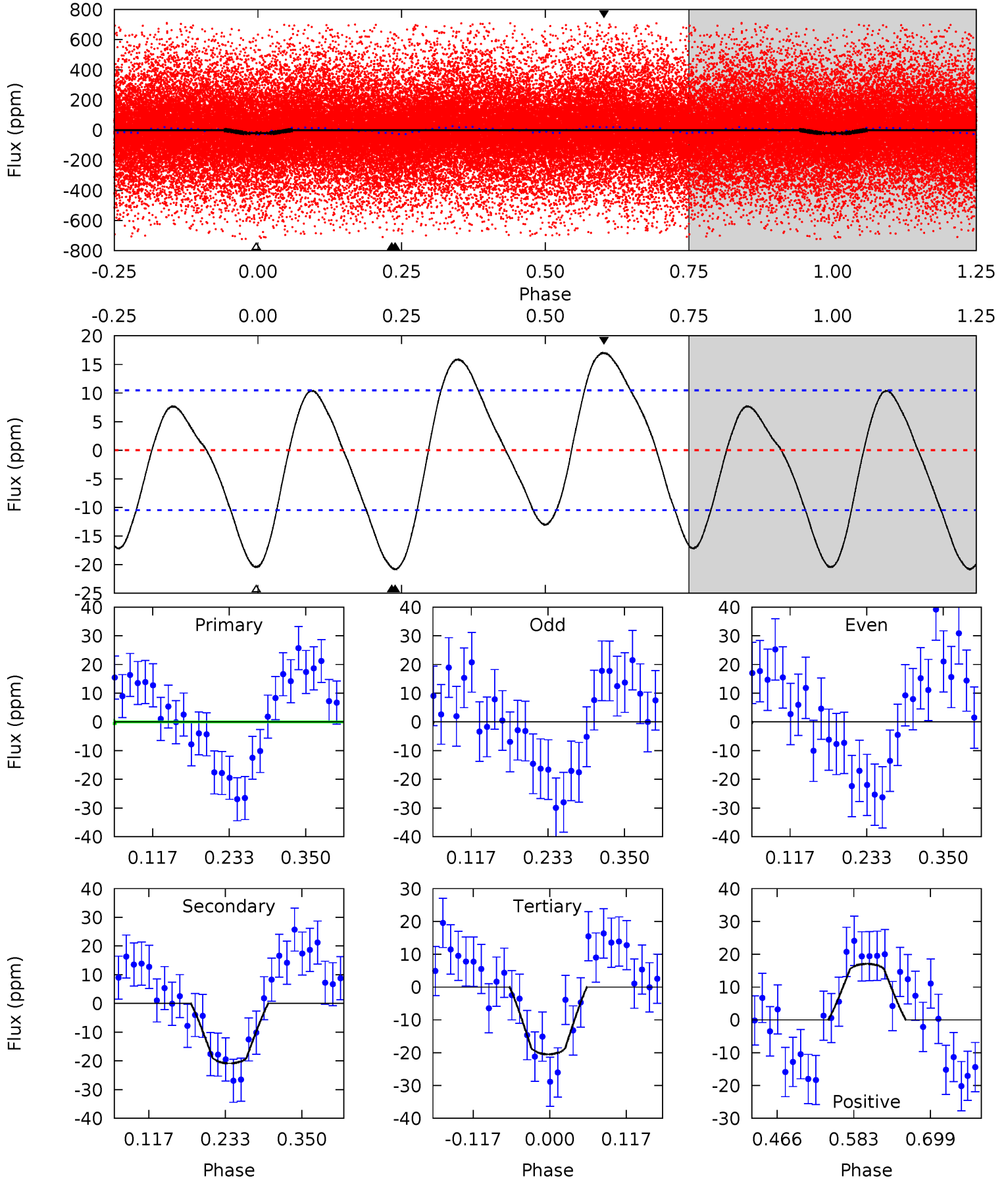




# DV Model-Shift Uniqueness Test

005097278-01, P = 0.613503 Days, E = 130.951942 Days

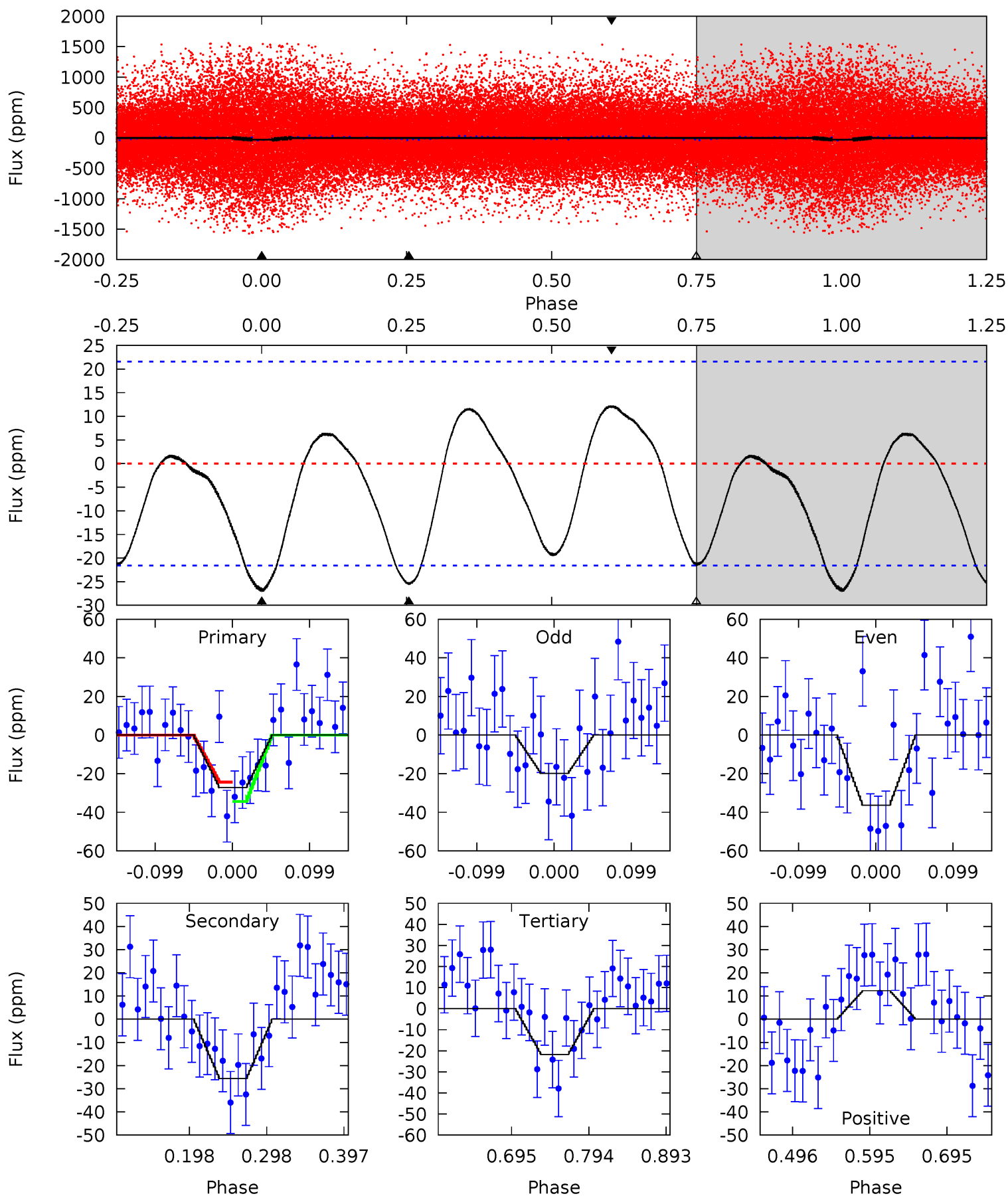
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.93	9.04	8.88	7.40	4.53	1.57	4.53	0.04	1.53	0.16	1.65	0.66	1.16	0.45	0.11



# Alt Model-Shift Uniqueness Test

005097278-01, P = 0.613507 Days, E = 130.947930 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.75	5.43	4.60	2.60	4.57	1.65	2.13	1.15	3.14	0.83	2.83	1.79	1.02	0.31	1.09



### Stellar Parameters For KIC 005097278

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7392^{+207}_{-337}$	$4.135^{+0.128}_{-0.192}$	$-0.040^{+0.200}_{-0.350}$	$1.772^{+0.548}_{-0.365}$	$1.563^{+0.213}_{-0.237}$	$0.396^{+0.253}_{-0.209}$
	+3%/-5%	+3%/-5%	+500%/-875%	+31%/-21%	+14%/-15%	+64%/-53%
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 005097278-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-21 \pm 2$	$1.16^{+0.23}_{-0.19}$	$4790^{+366}_{-334}$	$6186^{+501}_{-487}$	$2.228^{+0.994}_{-0.665}$
Alt.	$-26 \pm 5$	$0.93^{+0.19}_{-0.15}$	$4737^{+356}_{-293}$	$7402^{+921}_{-727}$	$4.229^{+2.040}_{-1.430}$

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



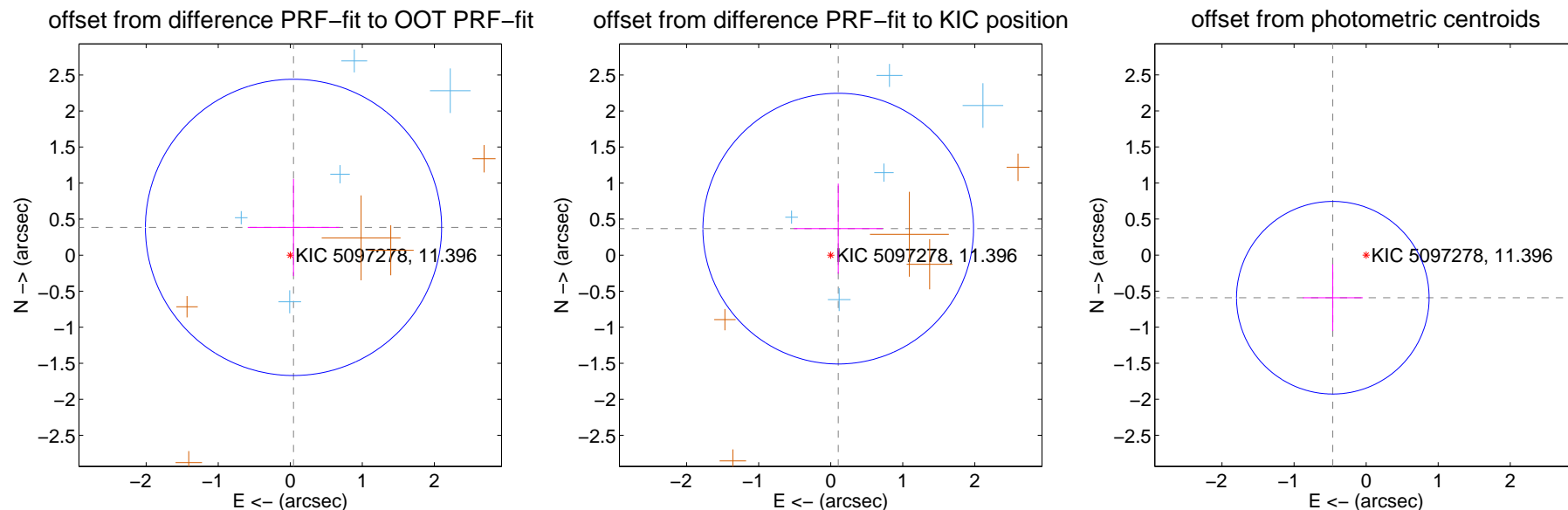
## DV Centroid Data

Supplemental centroid analysis for 005097278-01. **Kepler magnitude: 11.40.** Transit SNR 12.15

There are 5 quarters with good PRF difference image offsets

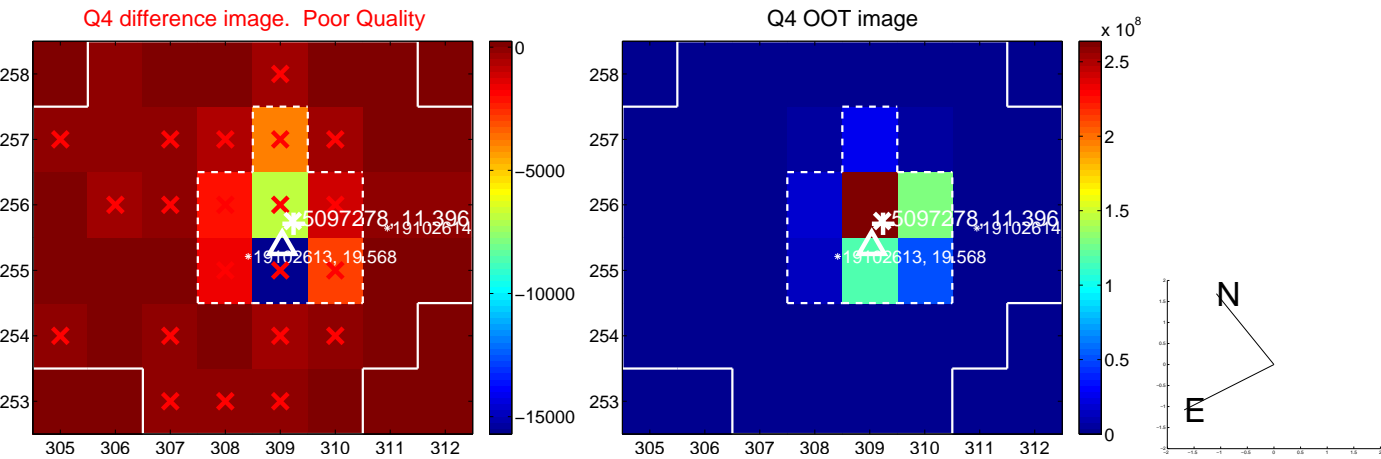
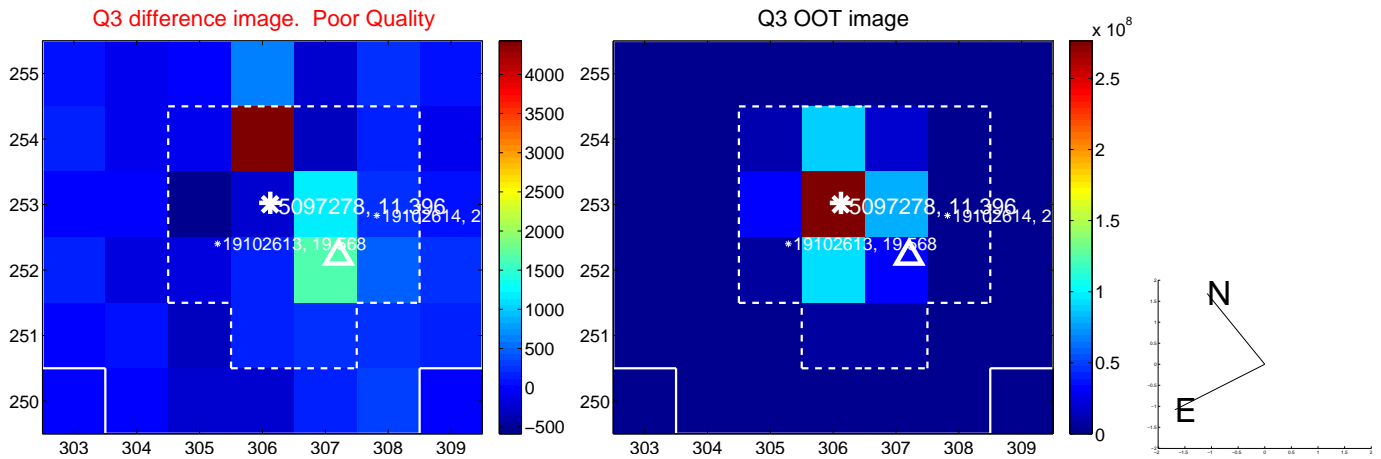
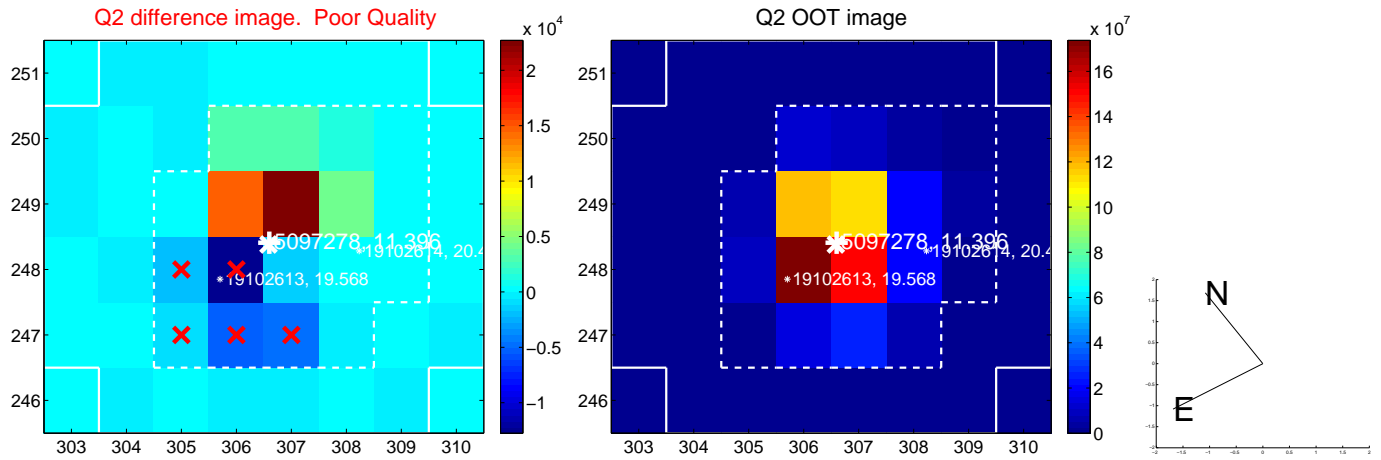
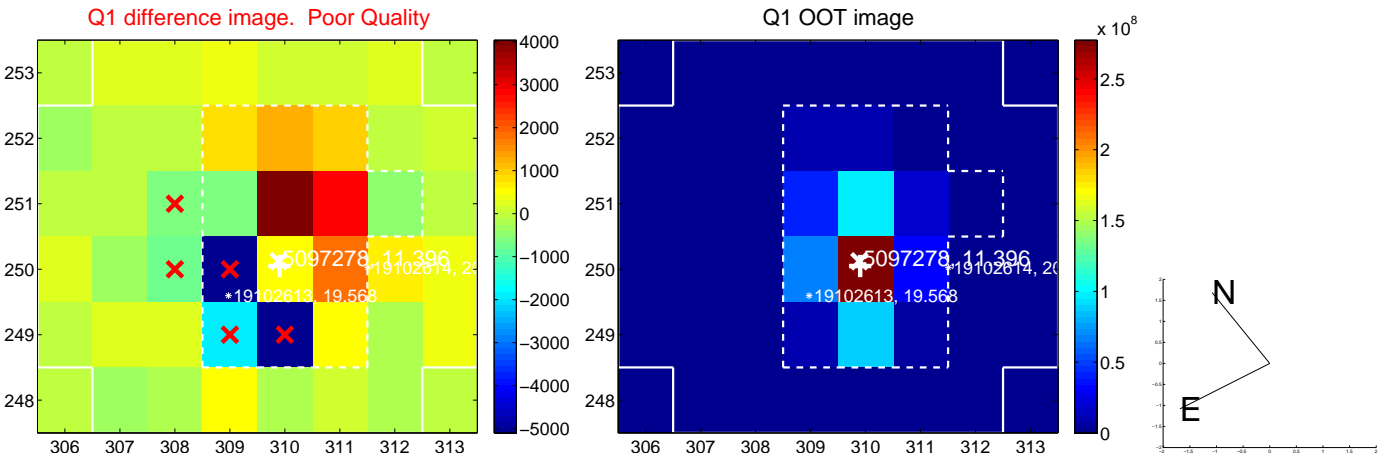
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.388 \pm 0.685$	0.57	$-0.045 \pm 0.635$	$0.385 \pm 0.675$
PRF-fit source offset from KIC position	$0.382 \pm 0.626$	0.61	$-0.104 \pm 0.617$	$0.368 \pm 0.625$
photometric centroid source offset	$0.75 \pm 0.45$	1.69	$0.46 \pm 0.42$	$-0.59 \pm 0.46$

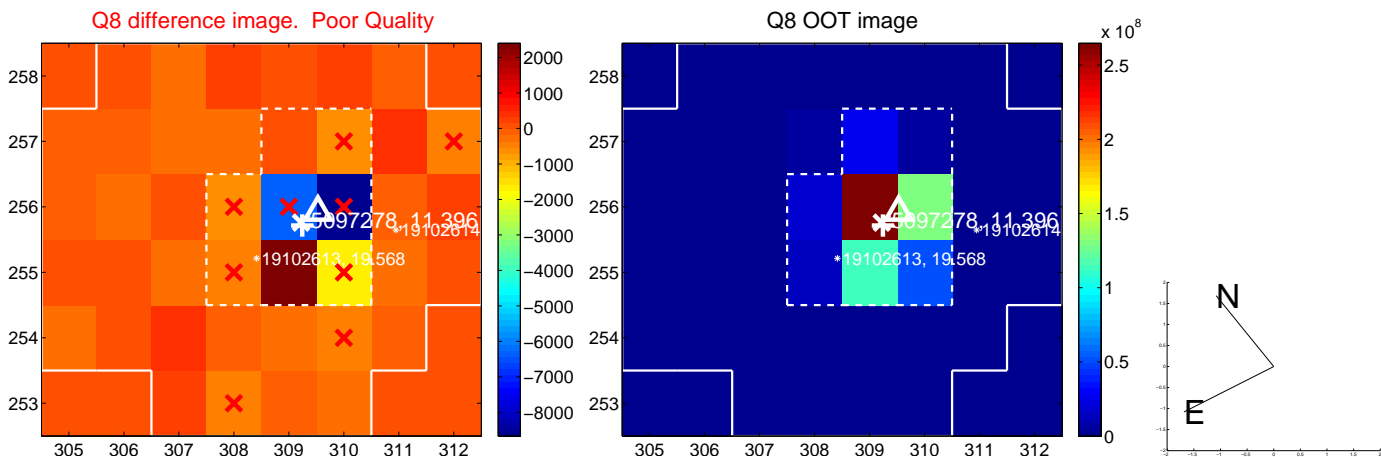
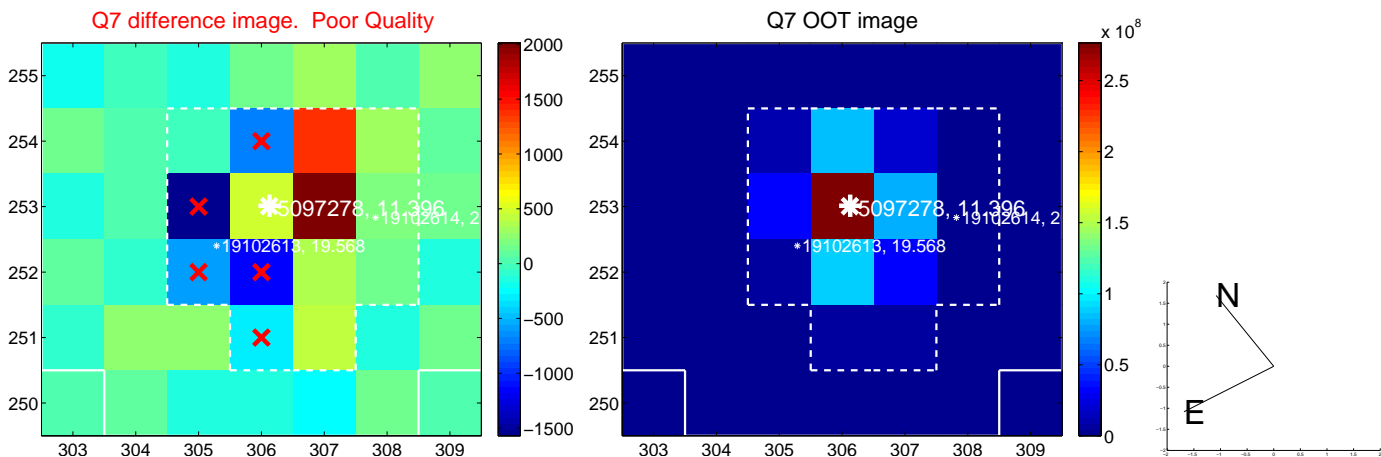
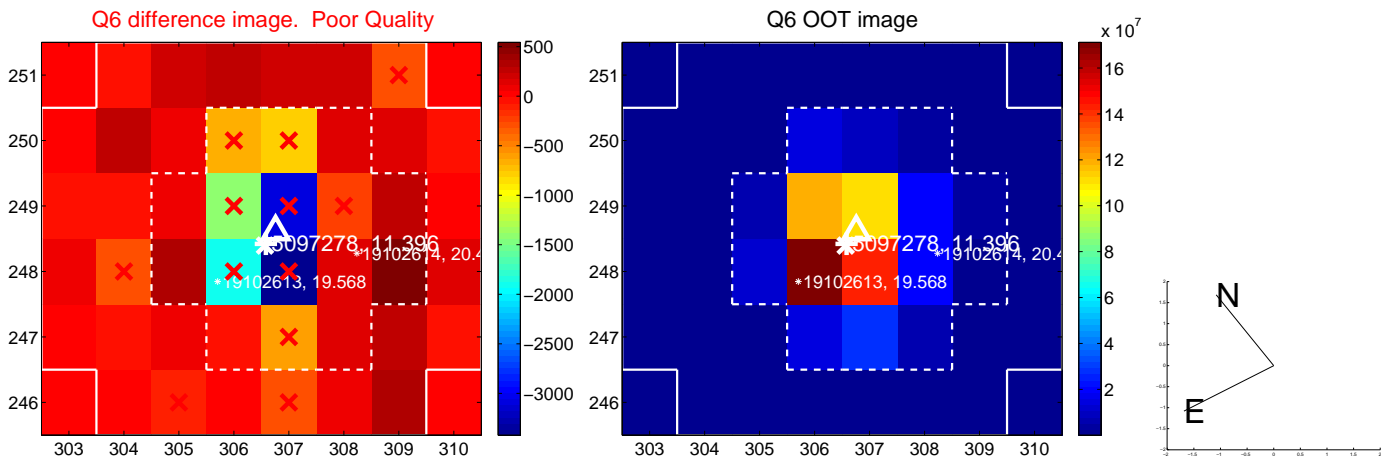
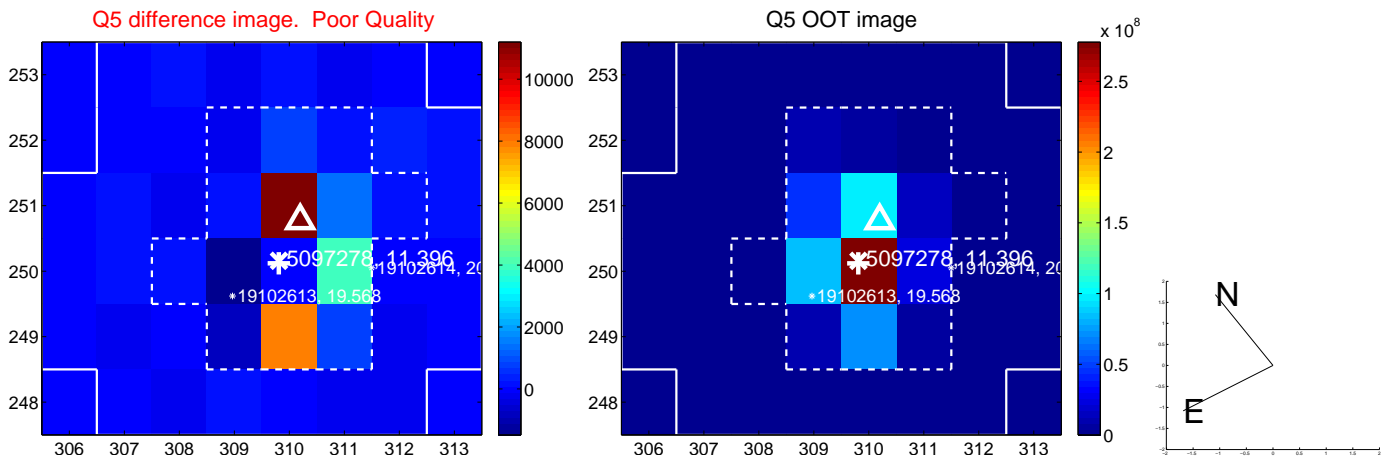


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: 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 ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

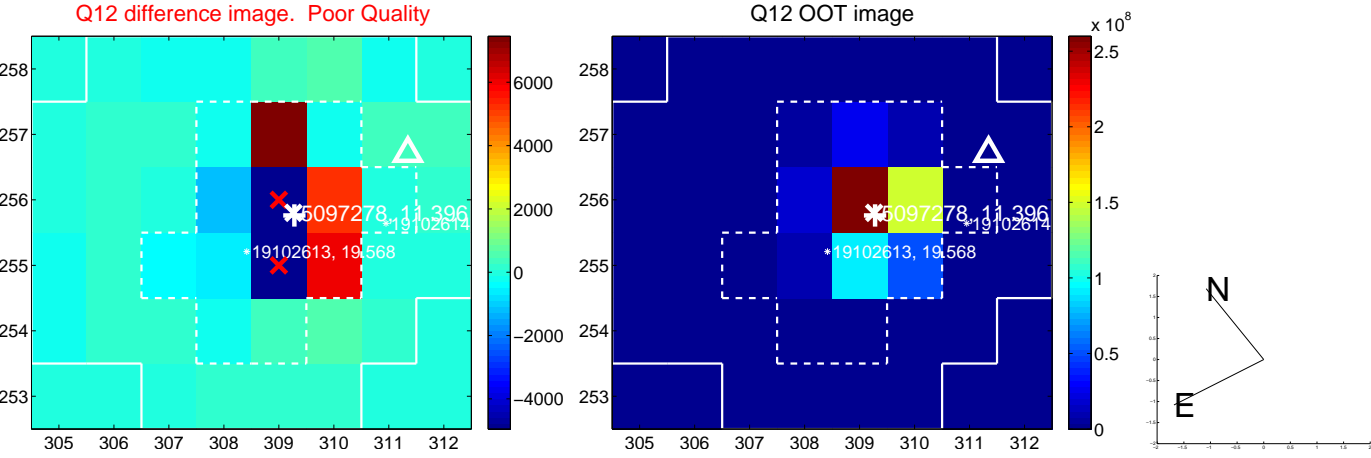
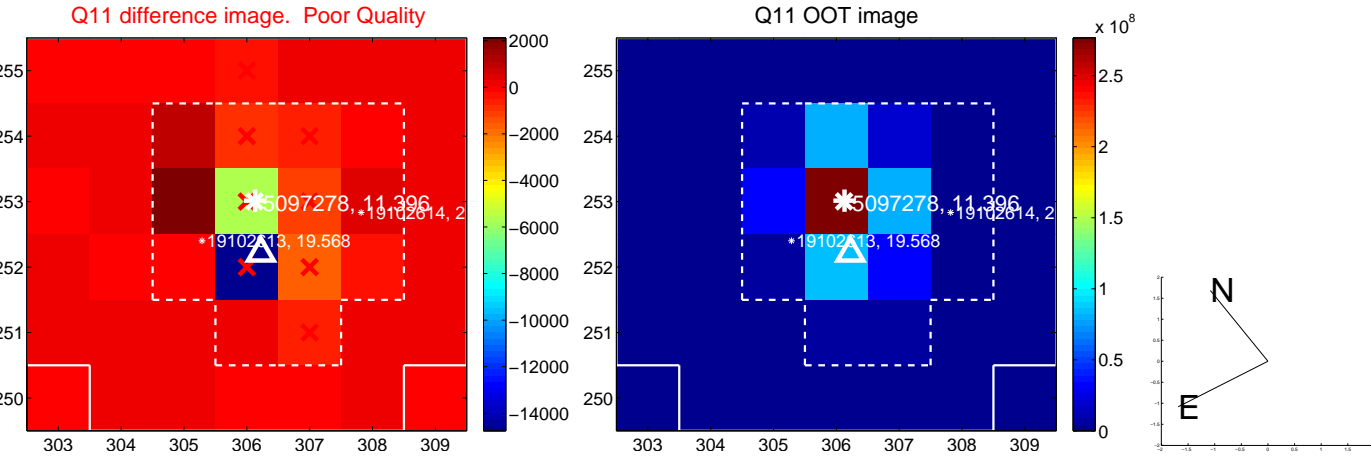
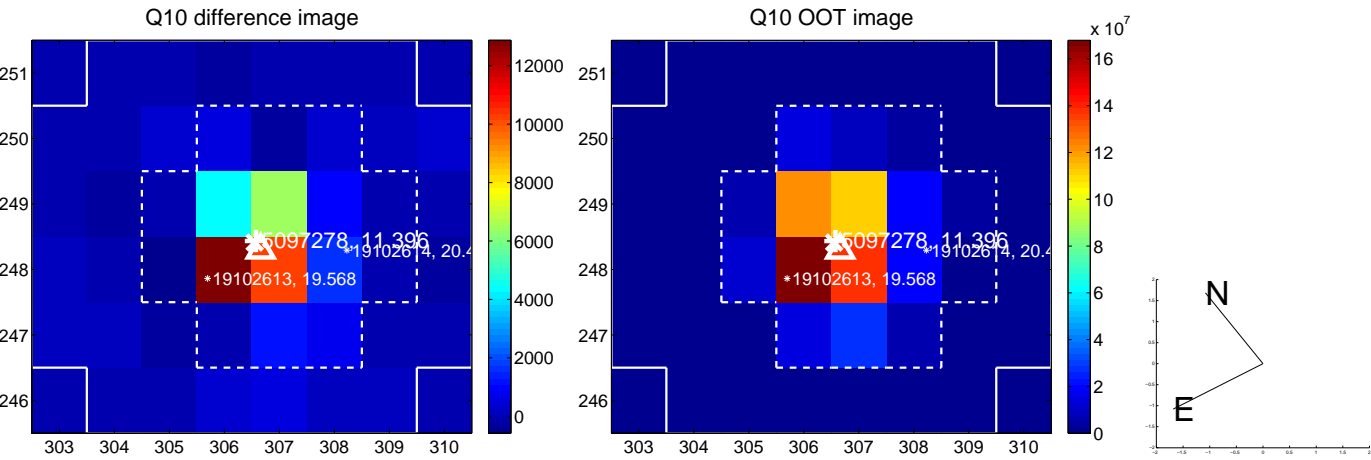
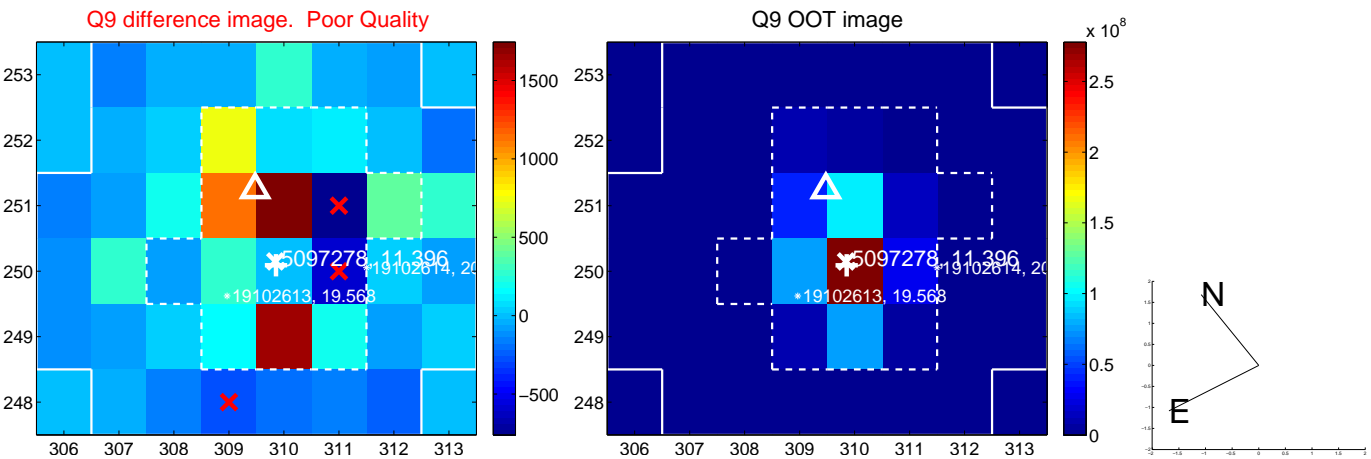


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

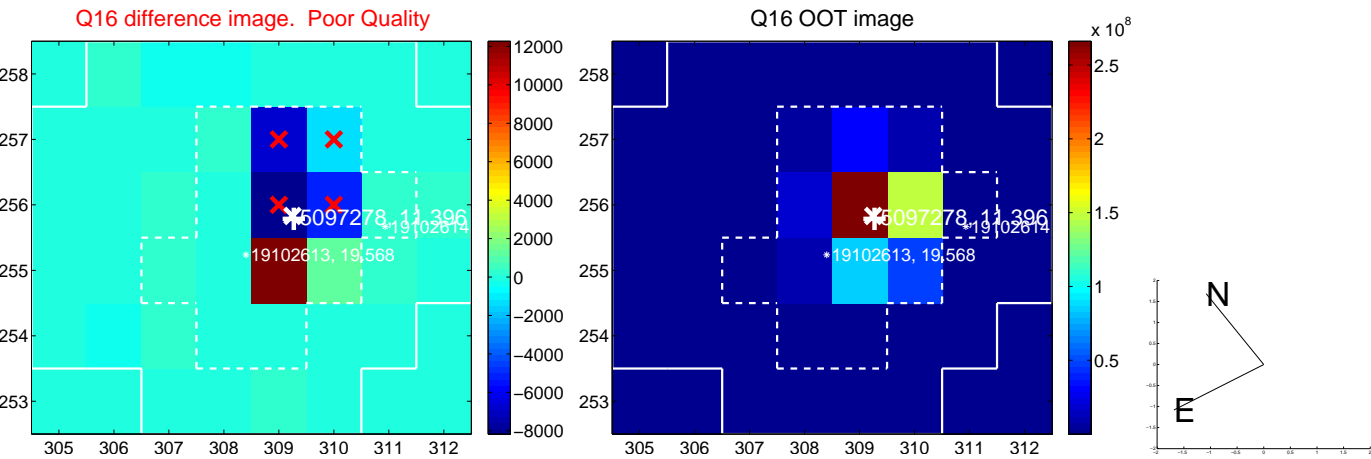
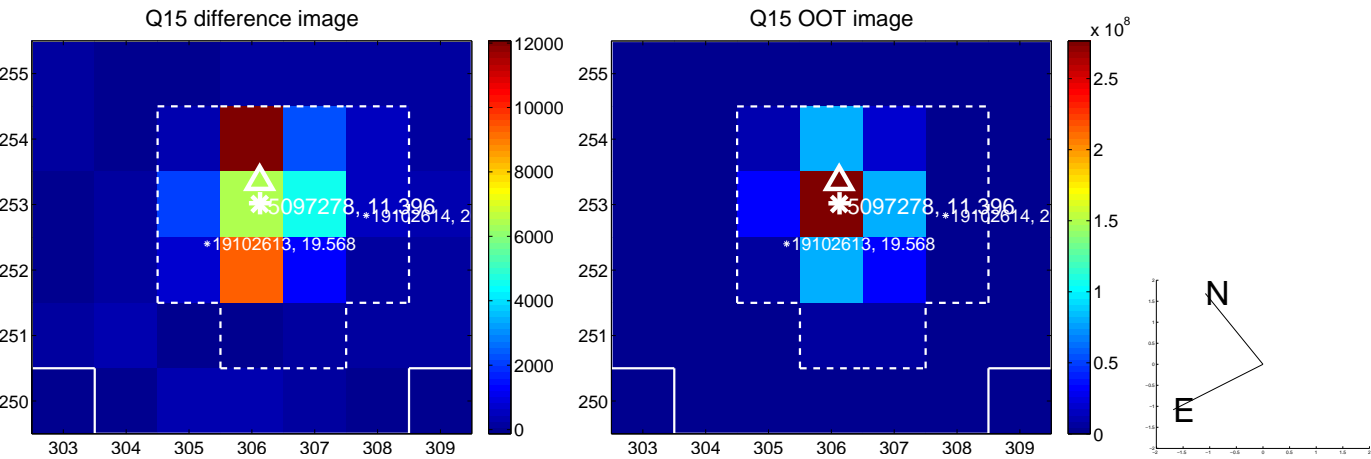
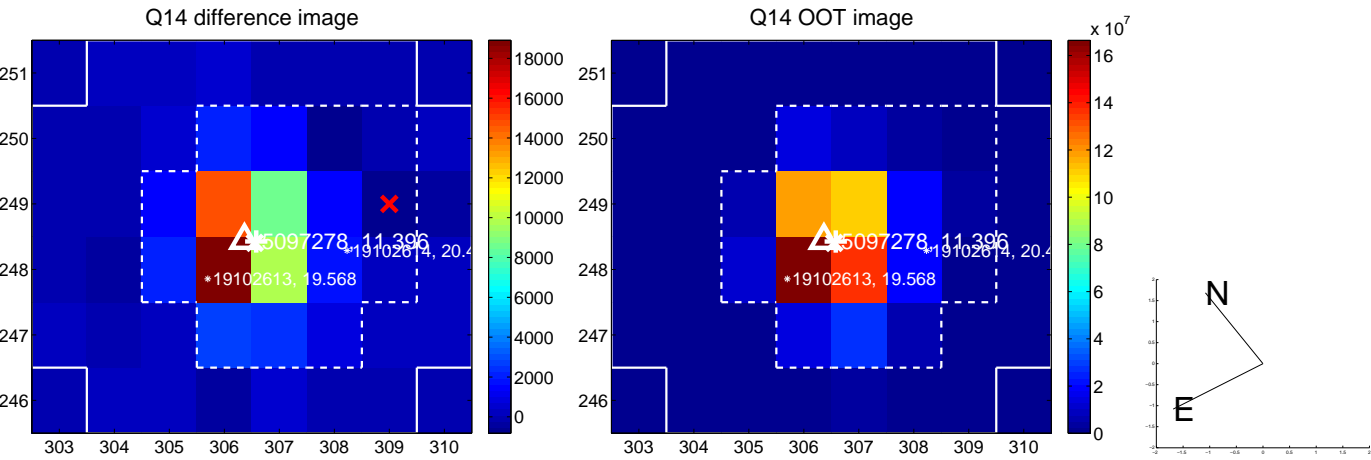
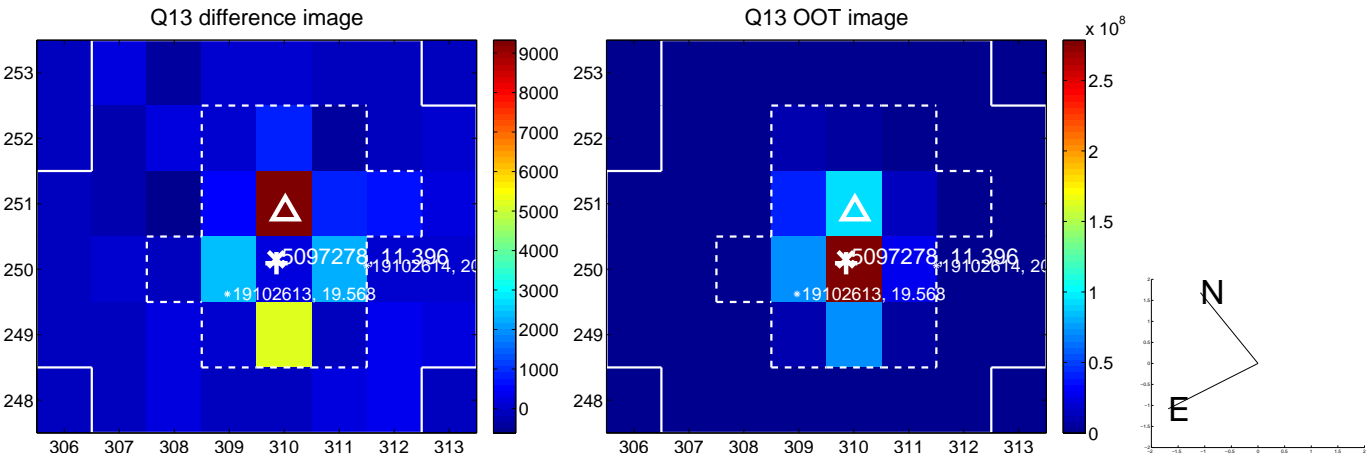




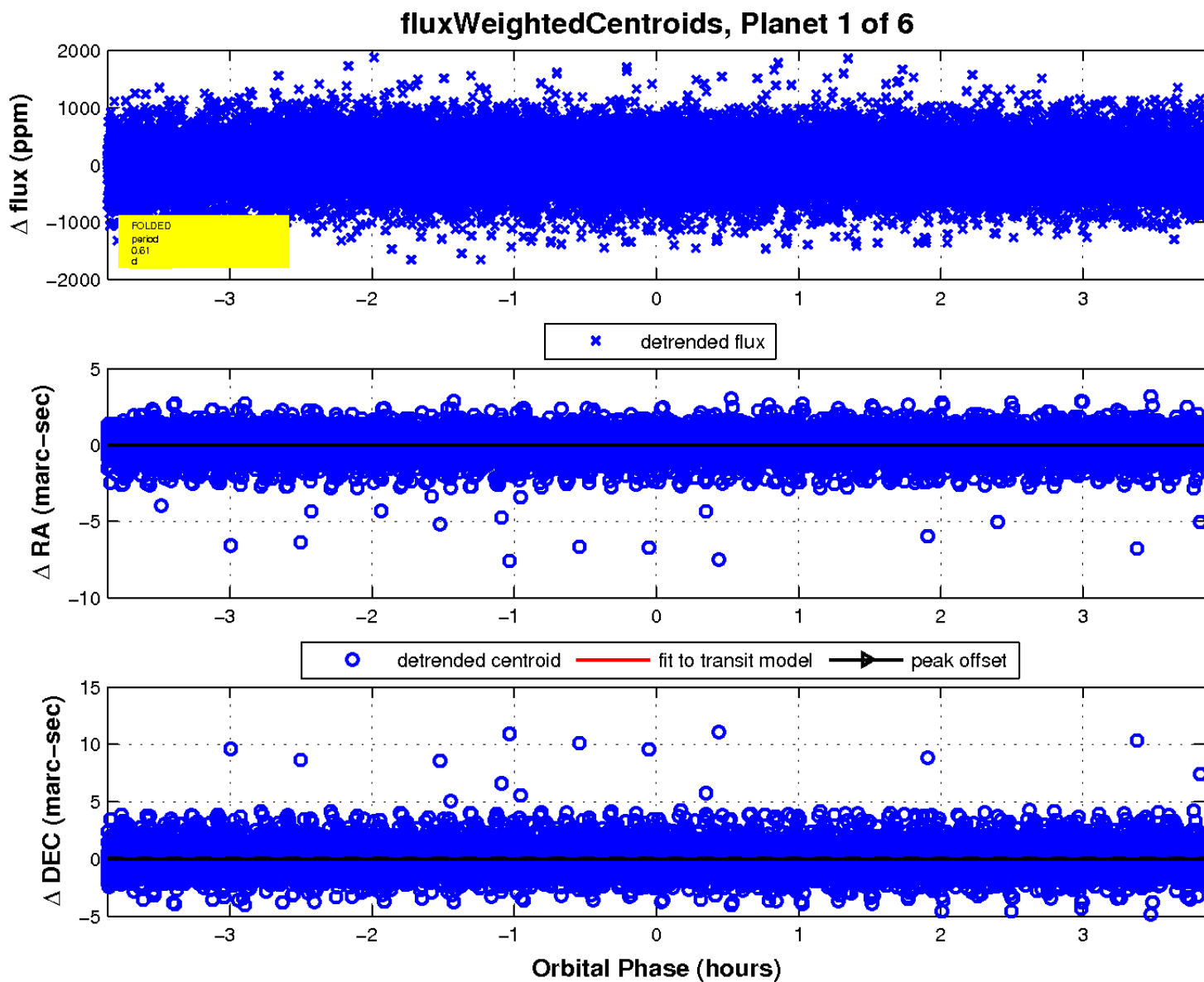
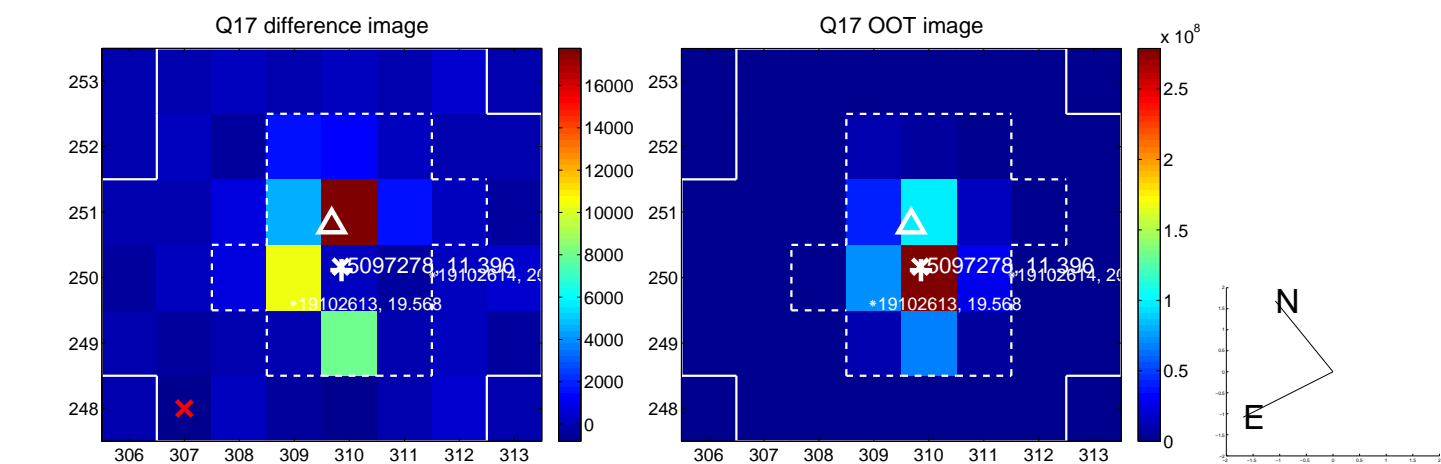
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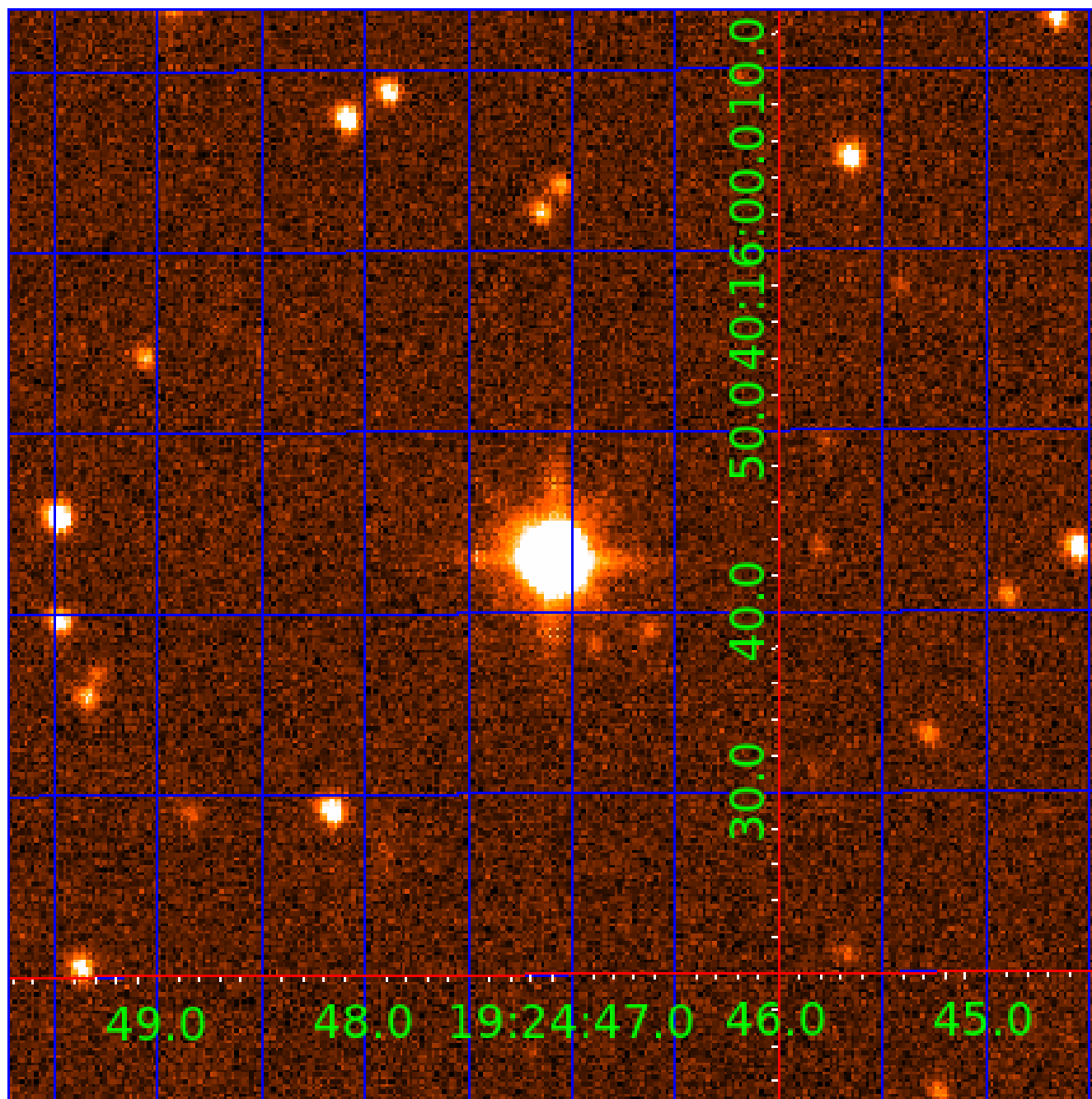


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UKIRT Image

Declination



# KIC 005097278

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005097278-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED
005097278-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED—HALO_GHOST
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**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 005097278-02

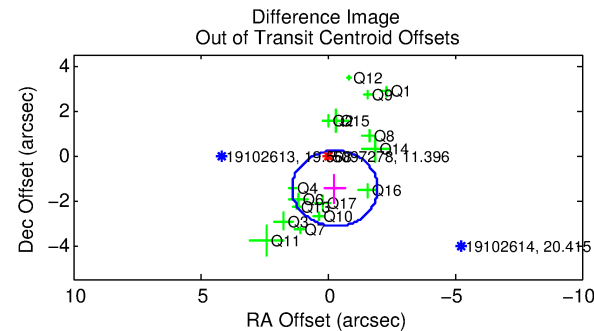
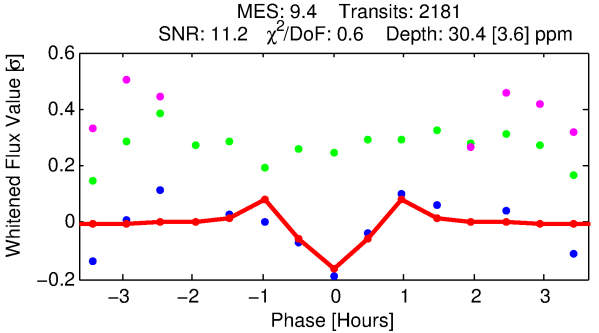
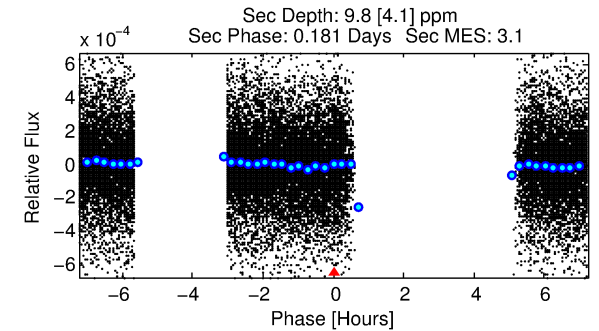
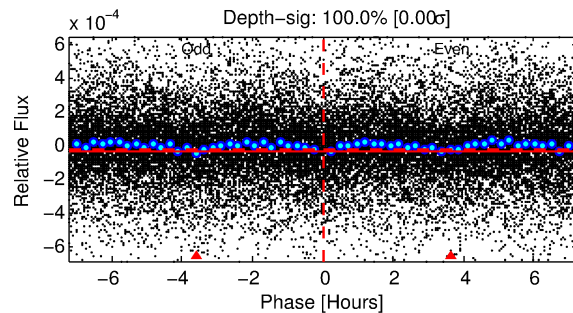
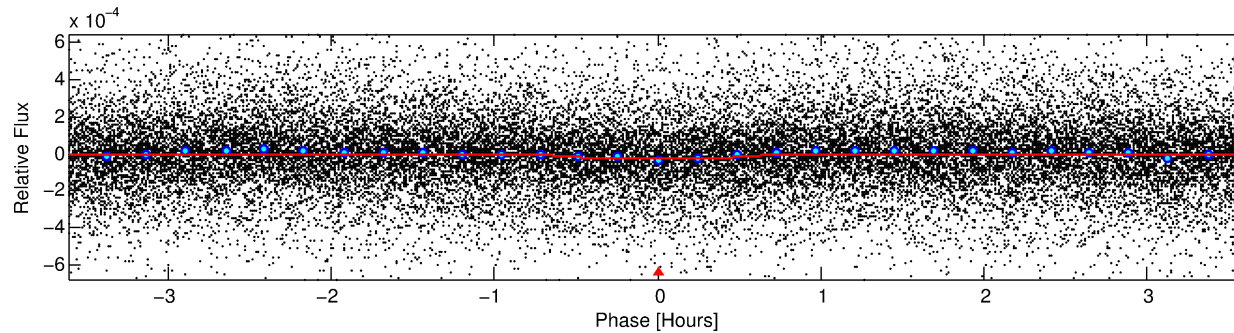
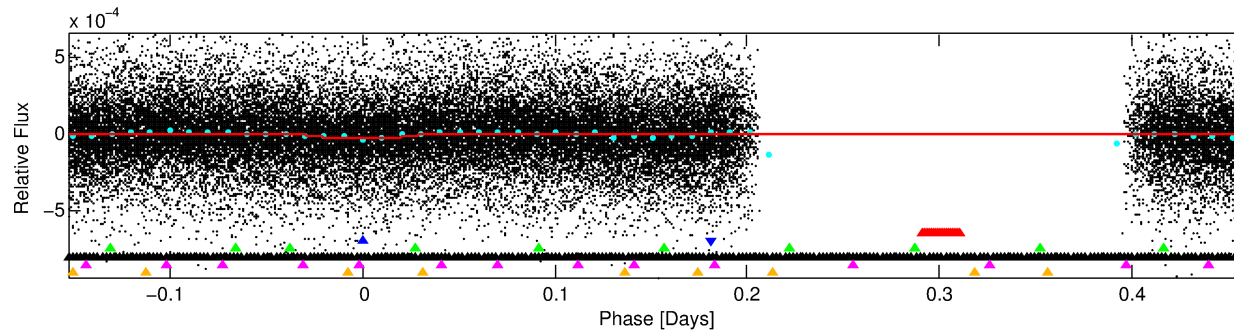
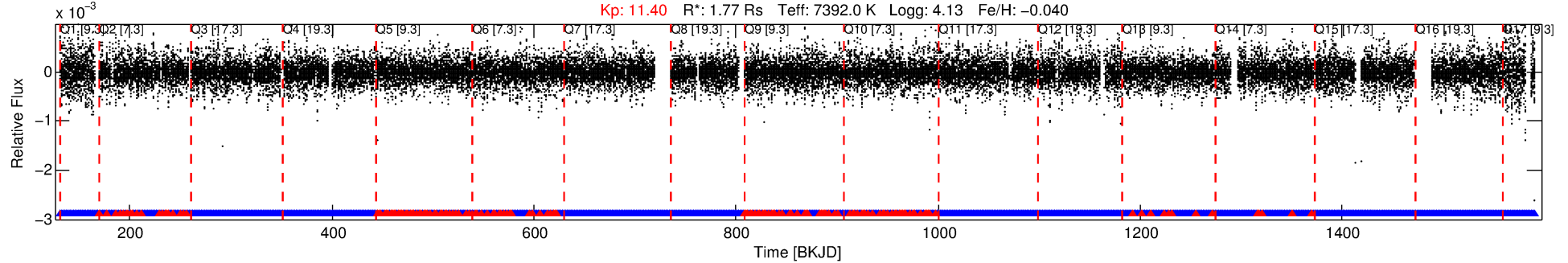
No Significant Match Found



# DV One-Page Summary

KIC: 5097278 Candidate: 2 of 6 Period: 0.614 d  
KOI: K06519 Corr: No Ephemeris Match

Kp: 11.40 R\*: 1.77 Rs Teff: 7392.0 K Logg: 4.13 Fe/H: -0.040



## DV Fit Results:

Period = 0.61351 [0.00001] d  
Epoch = 131.8679 [0.0009] BKJD  
Rp/R\* = 0.0058 [0.0006]  
a/R\* = 2.10 [0.94]  
b = 0.88 [0.15]  
Seff = 31223.93 [12591.70]  
Teq = 3390 [342] K  
Rp = 1.12 [0.37] Re  
a = 0.0164 [0.0042] AU  
Ag = 1.15 [0.68] [0.22σ]  
Teffp = 5429 [680] K [2.68σ]

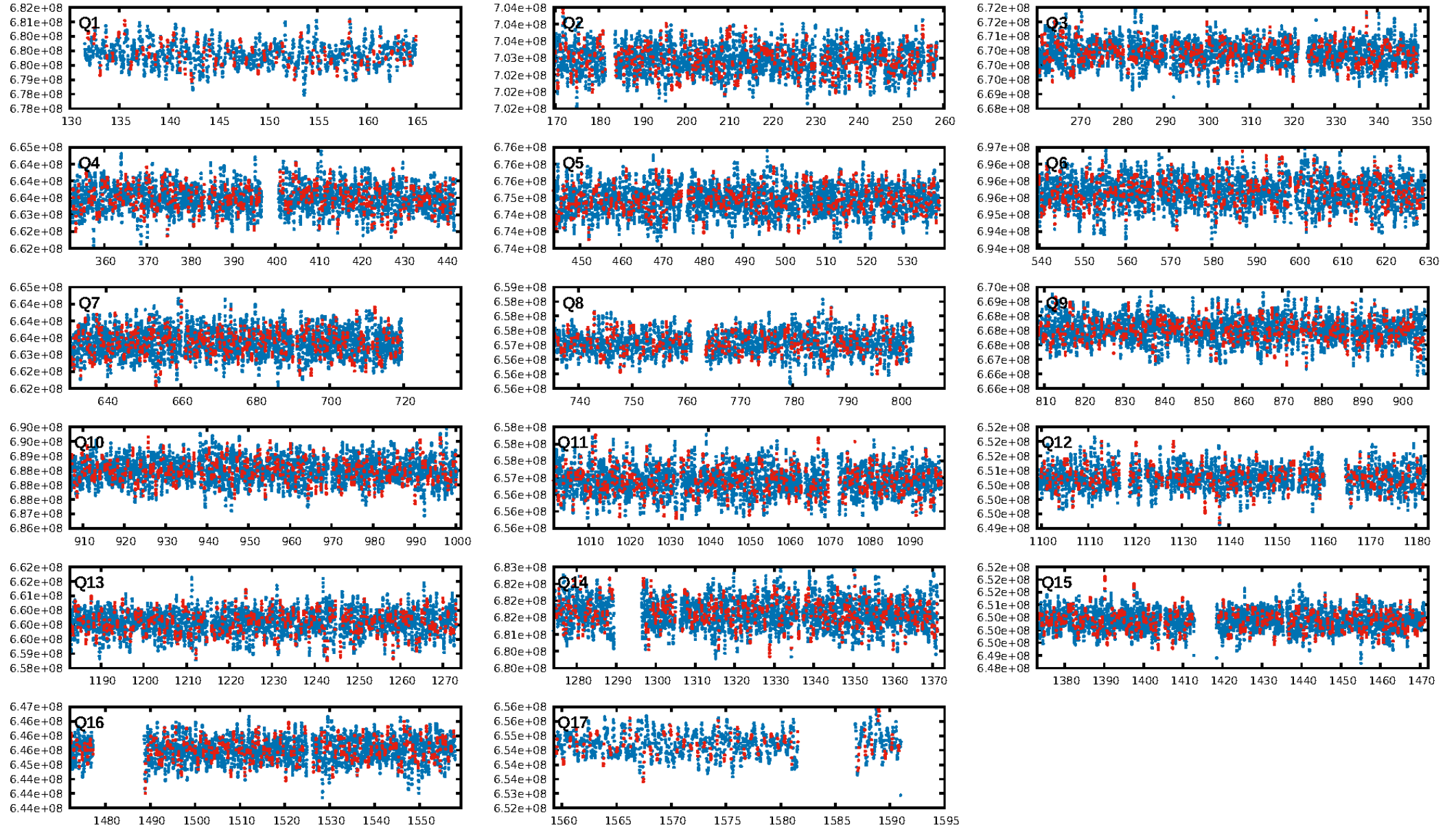
## DV Diagnostic Results:

**ShortPeriod-sig: 0.0% [0.00σ]**  
LongPeriod-sig: 100.0% [18.53σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.38e-16  
RollingBand-fgt: 0.91 [1901/2082]  
GhostDiagnostic-chr: 3.16  
Centroid-sig: 70.2%  
Centroid-so: 0.125 arcsec [0.29σ]  
OotOffset-rm: 1.499 arcsec [2.68σ]  
KicOffset-rm: 1.537 arcsec [2.98σ]  
OotOffset-st: 4/4/4/4 [16]  
KicOffset-st: 4/4/4/4 [16]  
DiffImageQuality-fgm: 0.38 [6/16]  
DiffImageOverlap-fno: 1.00 [17/17]

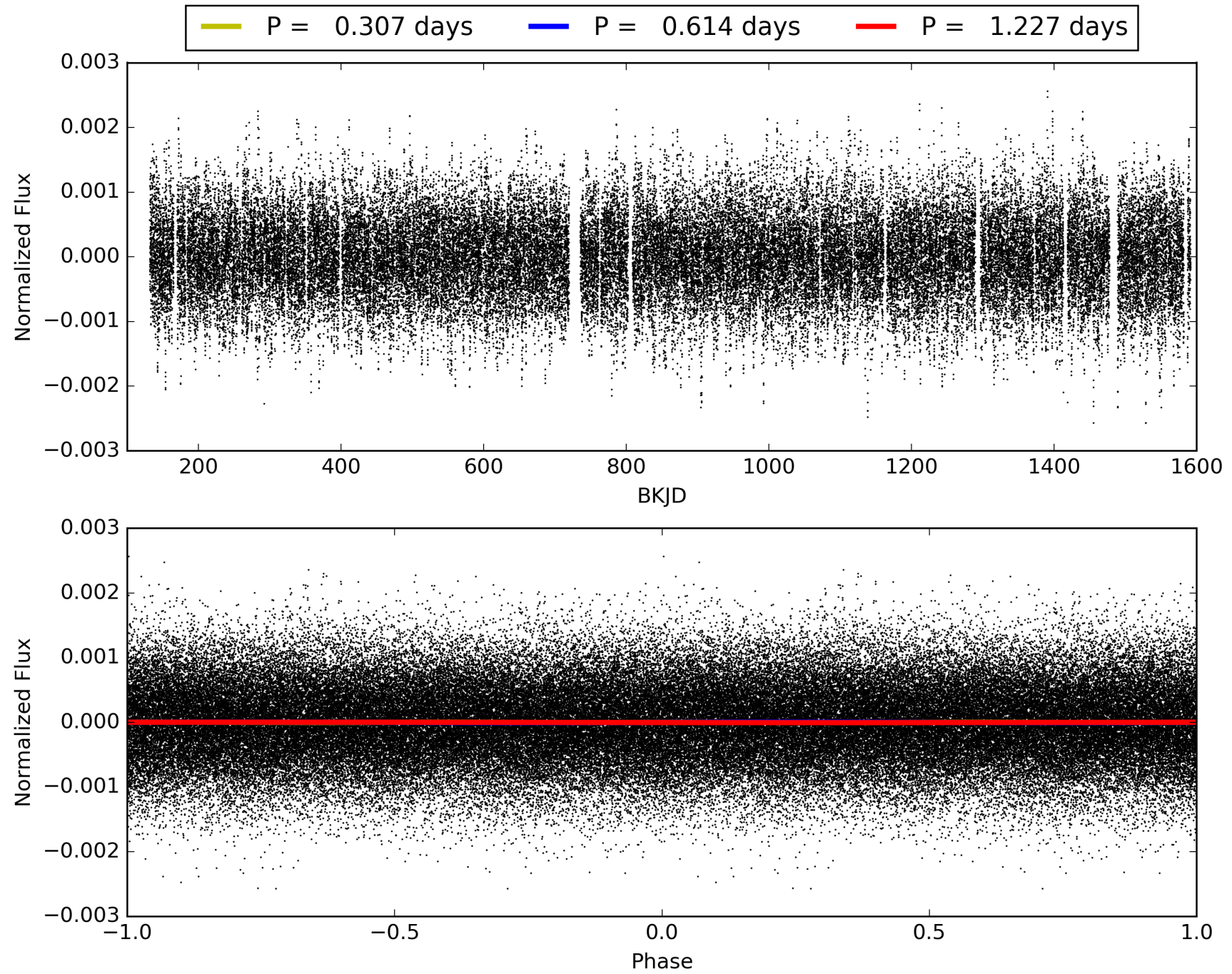
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 13:29:09 Z

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

# TCE 005097278-02, PDC Light Curves



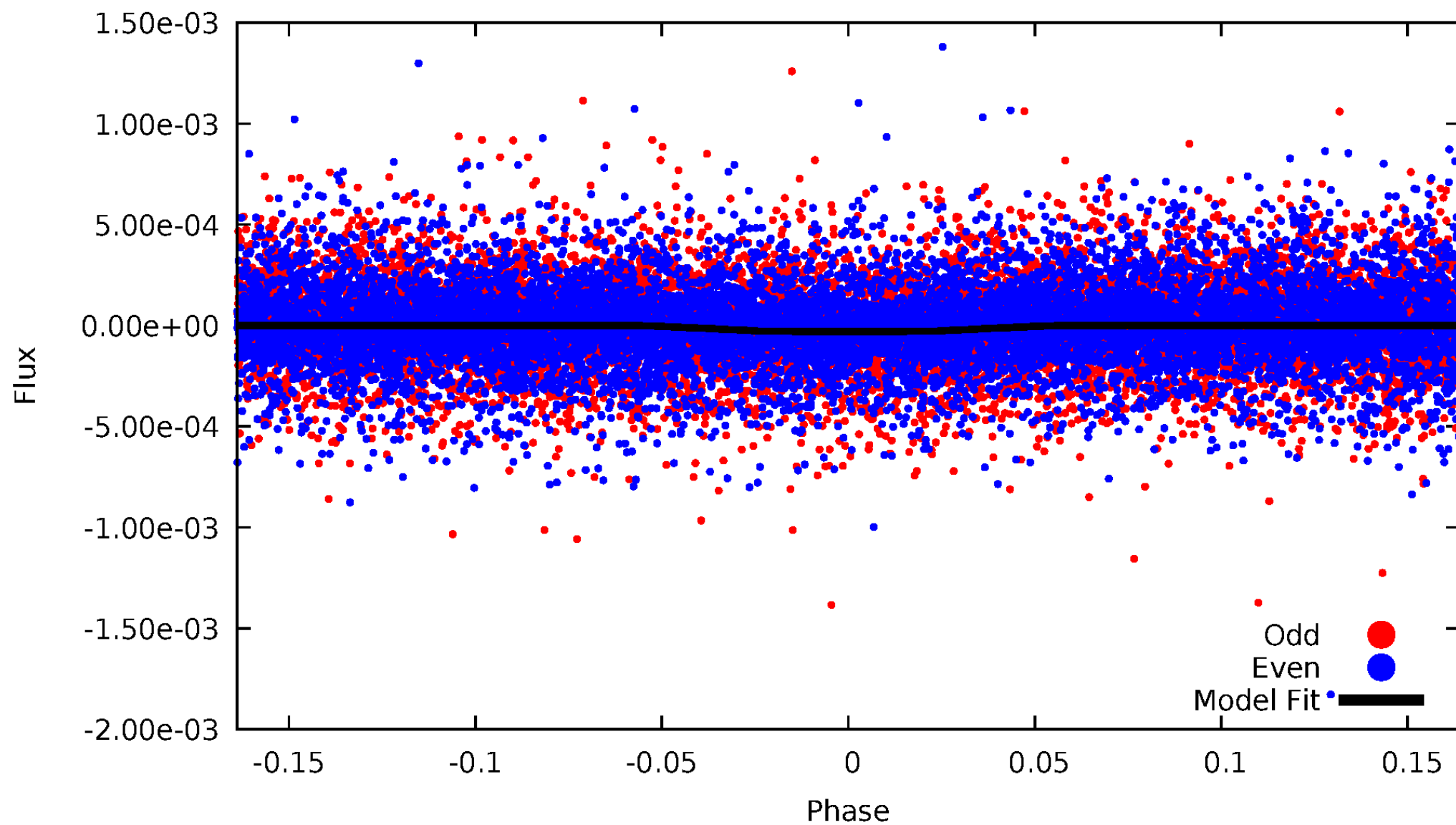
TCE 005097278-02





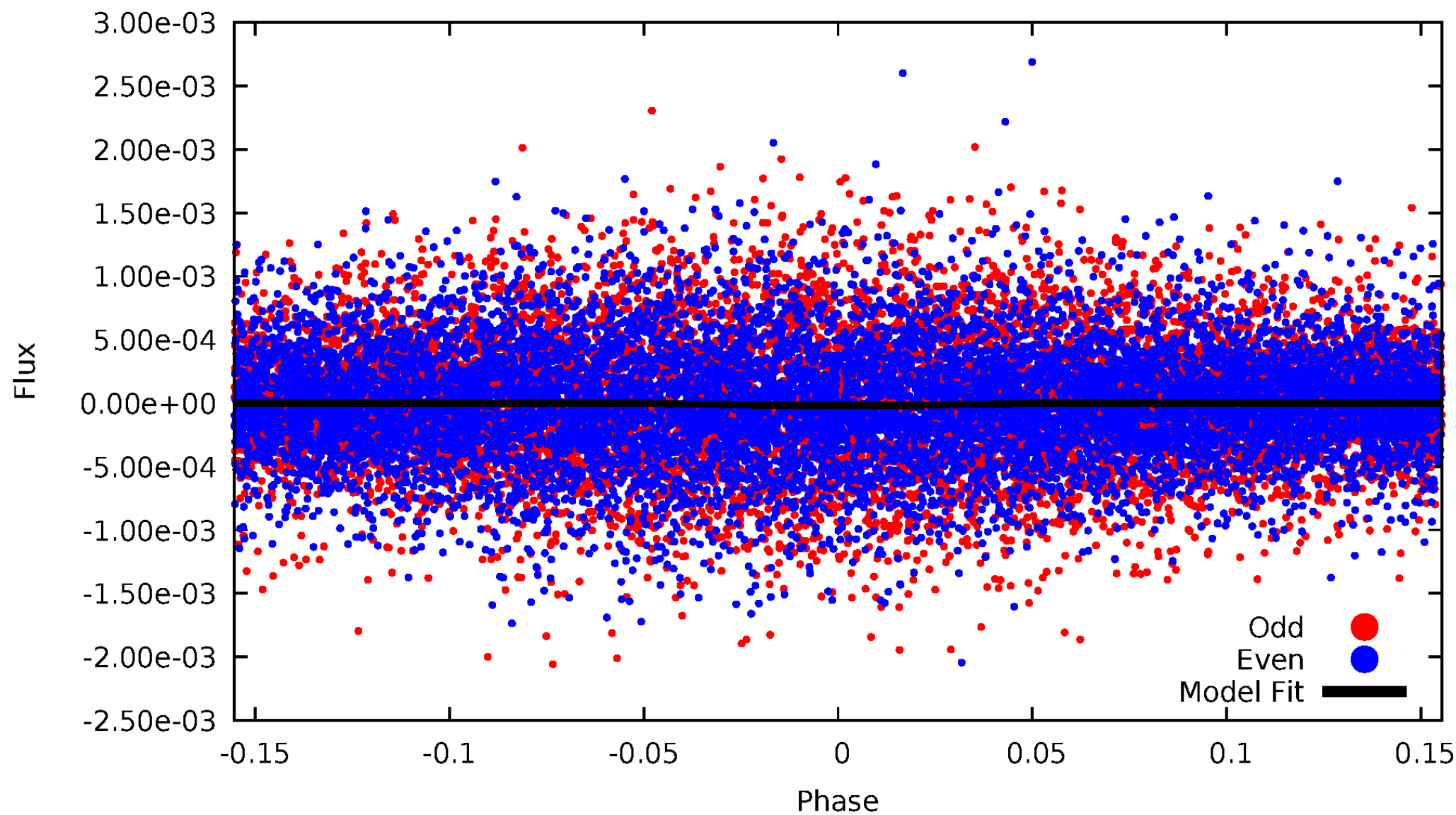
DV Odd/Even

TCE 005097278-02



# ALT Odd/Even

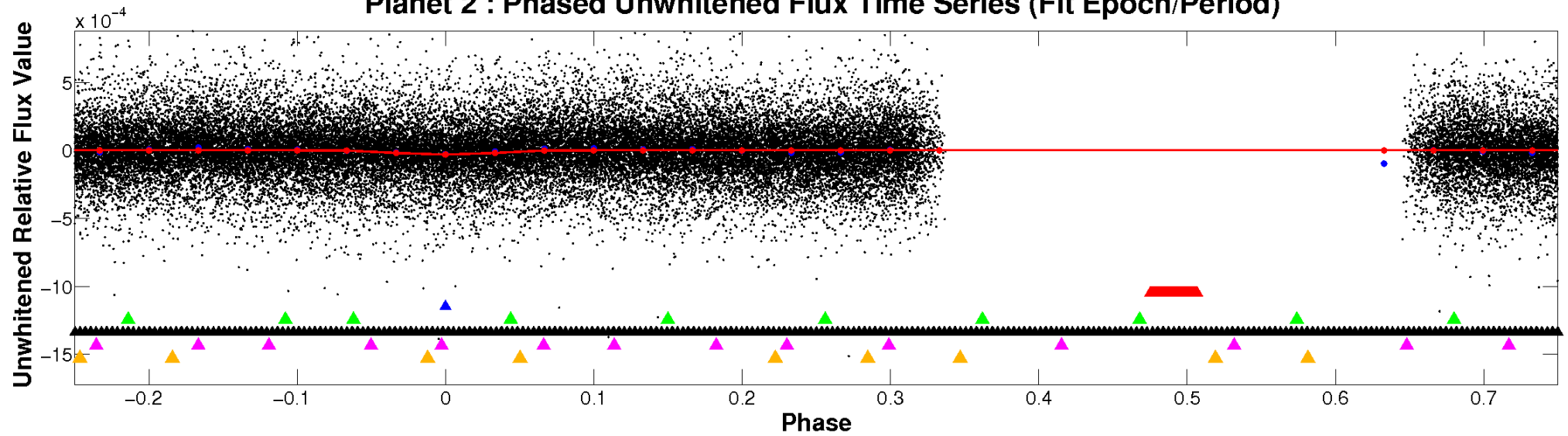
TCE 005097278-02



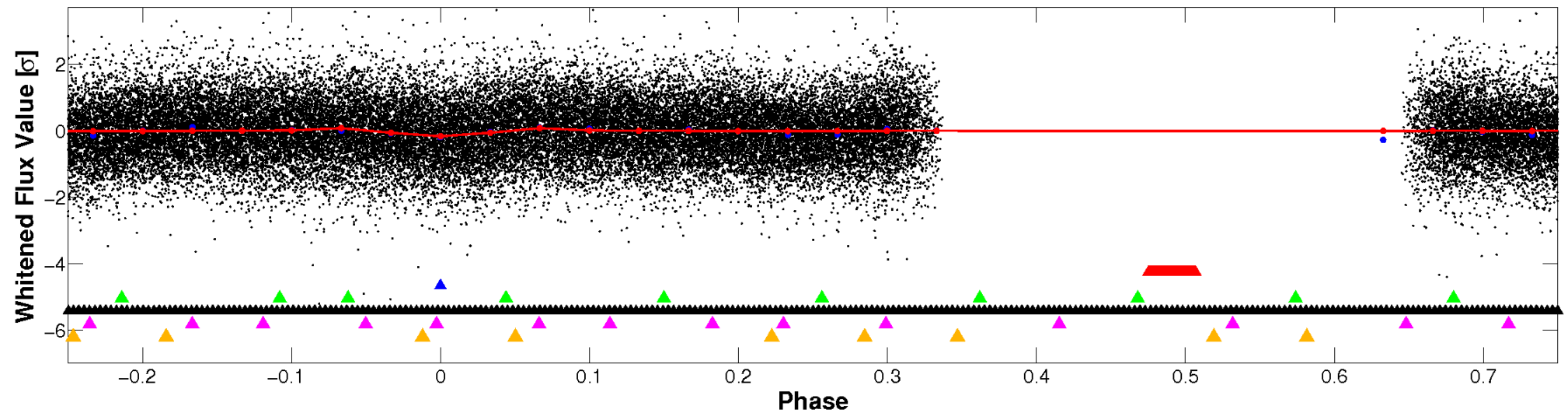


# Non-Whitened Vs. Whitened Light Curve

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

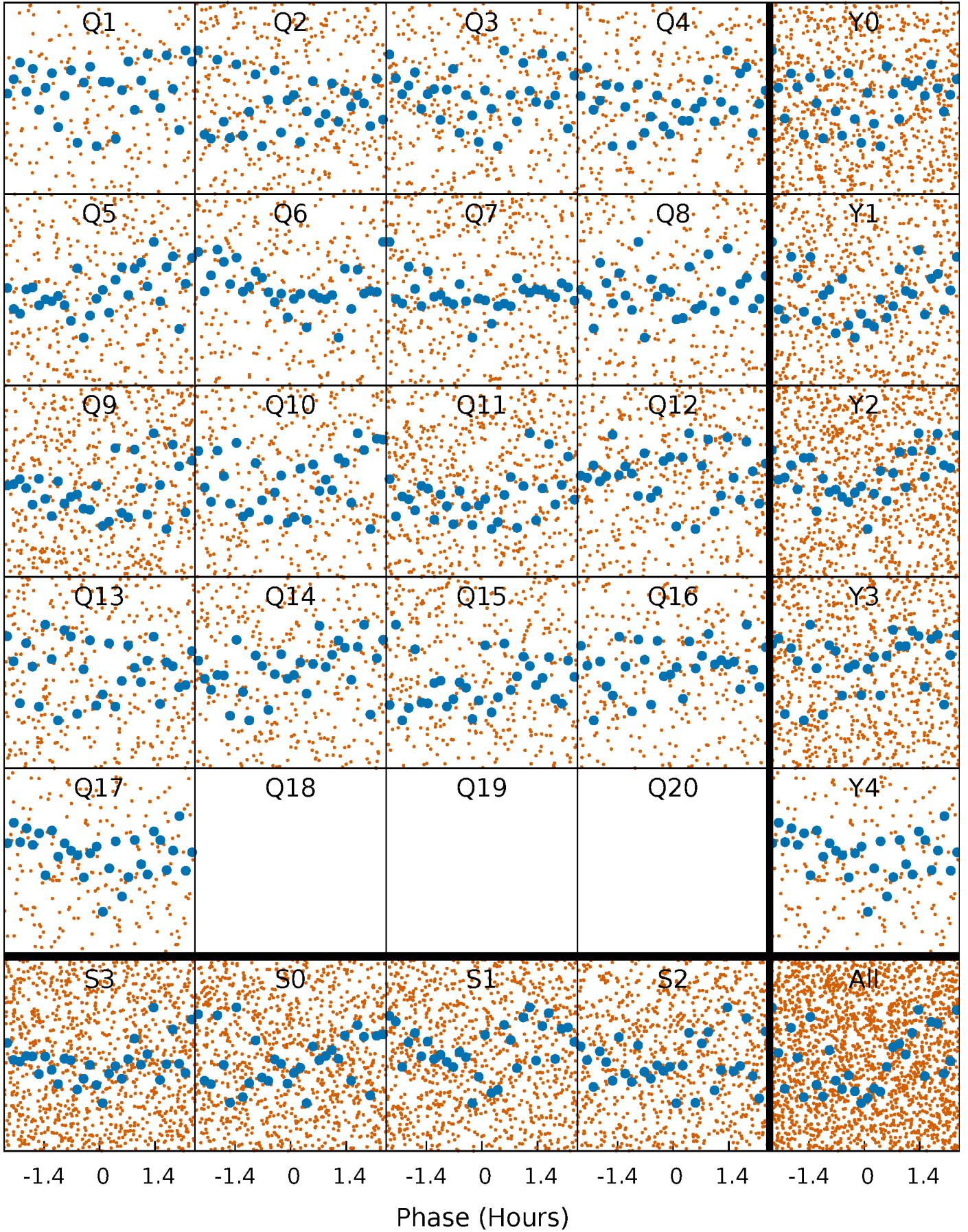


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



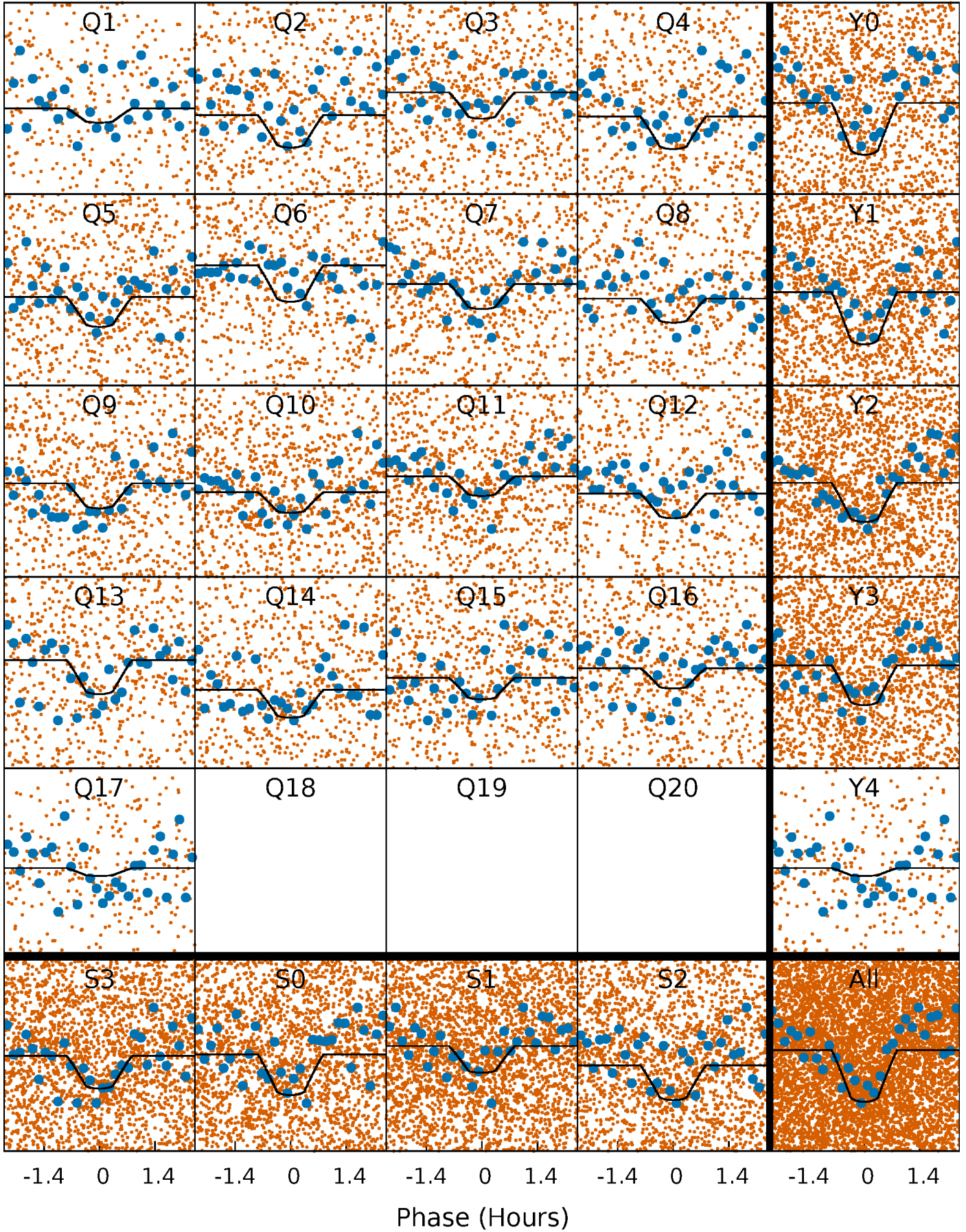
# PDC Quarter-Phased Transit Curves

TCE 005097278-02   P= 0.613512 Days    $T_0=131.867913$  (BKJD)



# DV Quarter-Phased Transit Curves

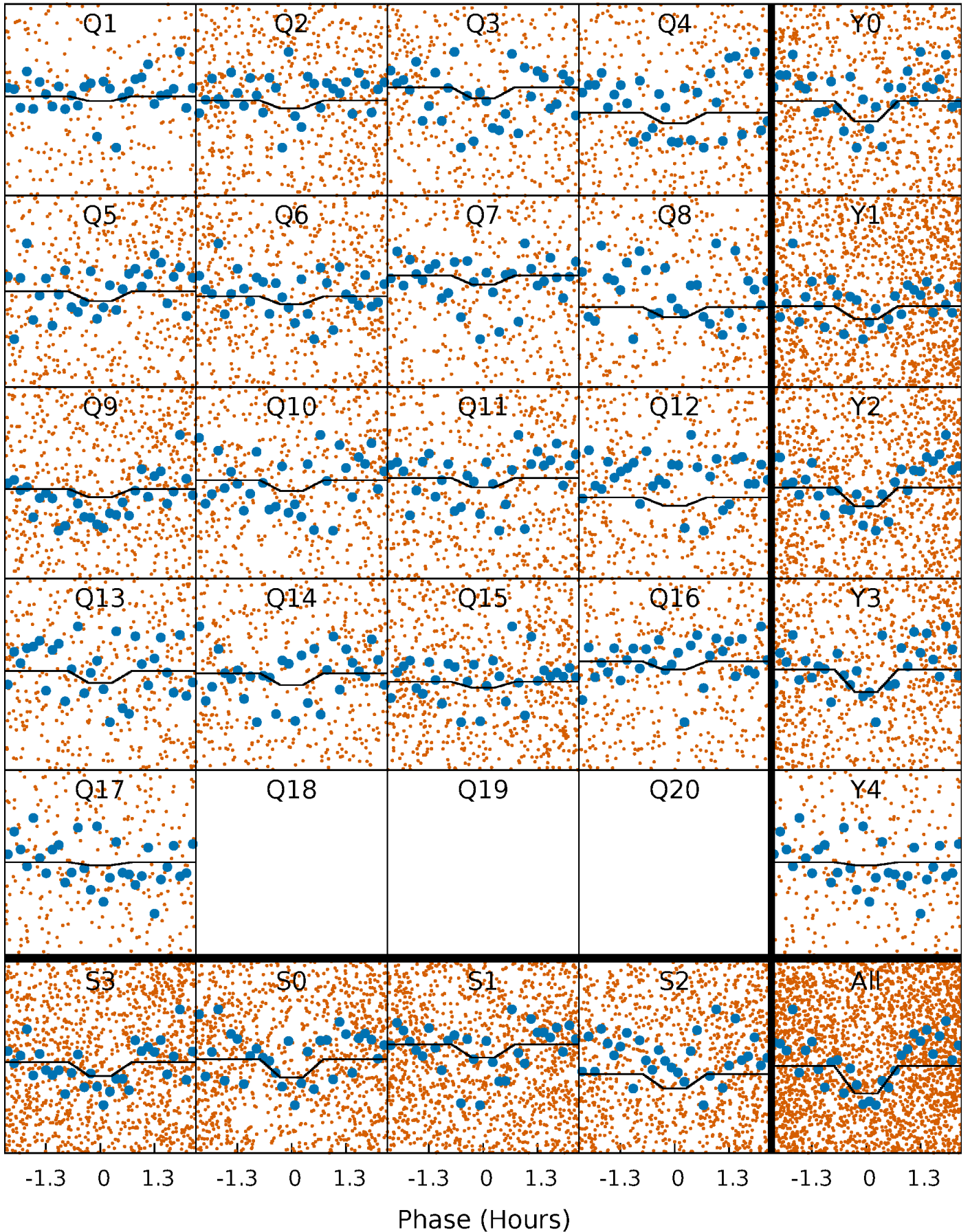
TCE 005097278-02   P= 0.613512 Days    $T_0=131.867913$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

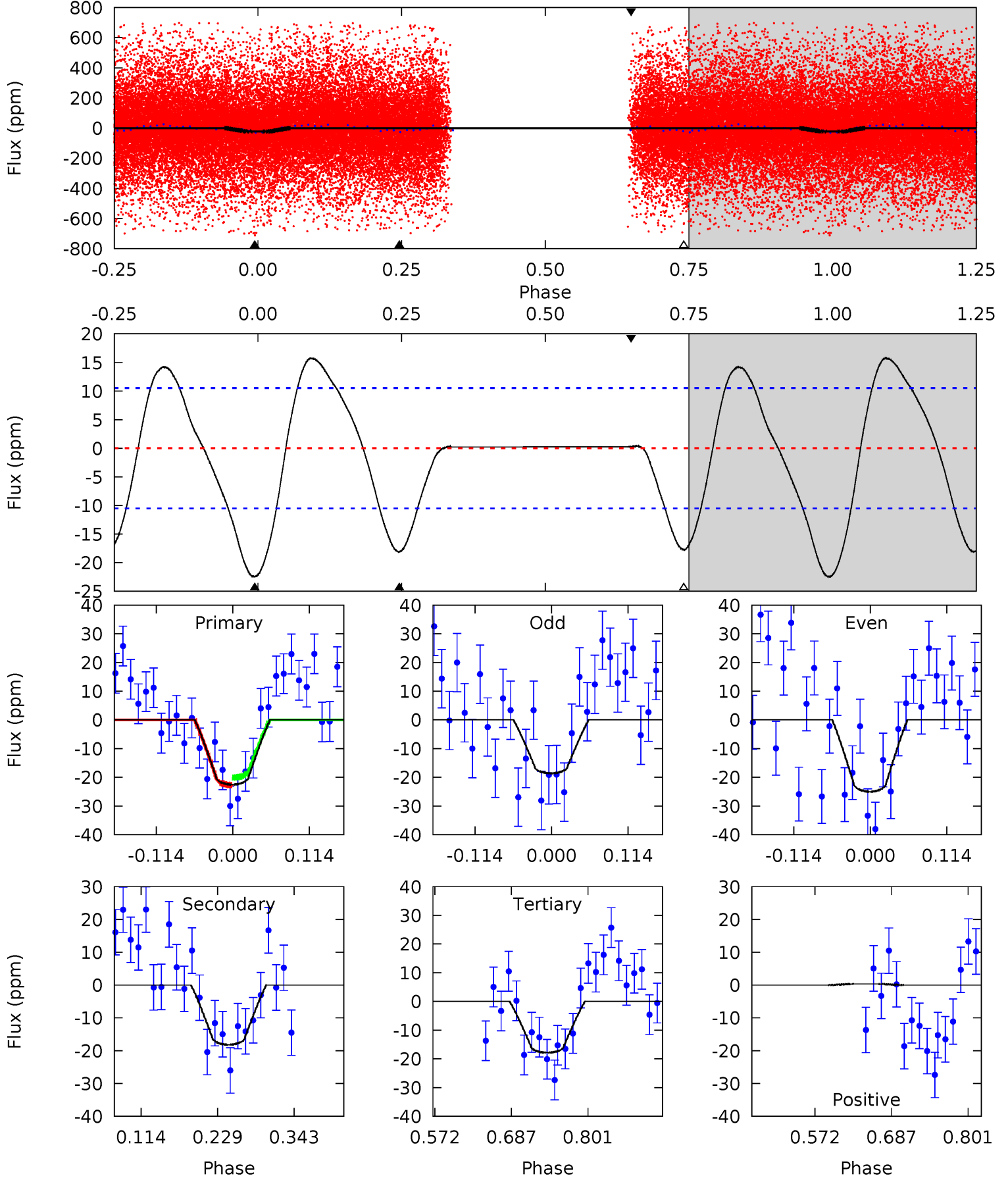
TCE 005097278-02   P= 0.613507 Days    $T_0=131.868248$  (BKJD)



# DV Model-Shift Uniqueness Test

005097278-02, P = 0.613512 Days, E = 131.254401 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
9.72	7.84	7.69	0.15	4.54	1.58	4.87	2.03	9.57	0.15	7.69	1.38	1.26	0.41	0.59

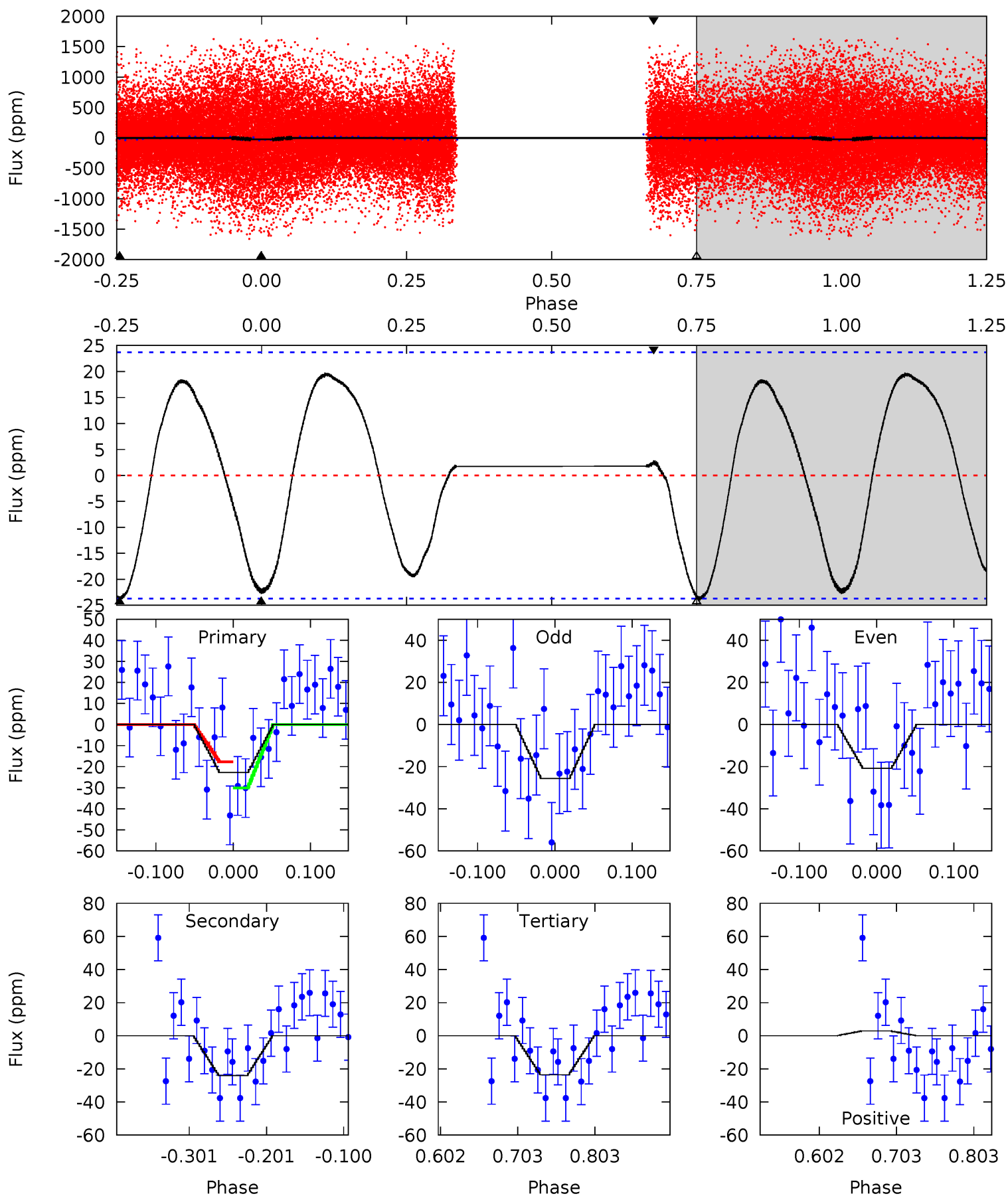




# Alt Model-Shift Uniqueness Test

005097278-02, P = 0.613507 Days, E = 131.254741 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
4.39	4.64	4.54	0.56	4.56	1.64	2.67	-0.15	3.83	0.10	4.08	0.47	0.54	0.45	1.12



### Stellar Parameters For KIC 005097278

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7392^{+207}_{-337}$	$4.135^{+0.128}_{-0.192}$	$-0.040^{+0.200}_{-0.350}$	$1.772^{+0.548}_{-0.365}$	$1.563^{+0.213}_{-0.237}$	$0.396^{+0.253}_{-0.209}$
	+3%/-5%	+3%/-5%	+500%/-875%	+31%/-21%	+14%/-15%	+64%/-53%
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 005097278-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-18 \pm 2$	$1.13^{+0.23}_{-0.17}$	$4750^{+368}_{-289}$	$5972^{+514}_{-505}$	$2.047^{+0.883}_{-0.631}$
Alt.	$-24 \pm 5$	$0.84^{+0.18}_{-0.16}$	$4770^{+351}_{-323}$	$7797^{+1053}_{-873}$	$4.943^{+2.896}_{-1.833}$

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

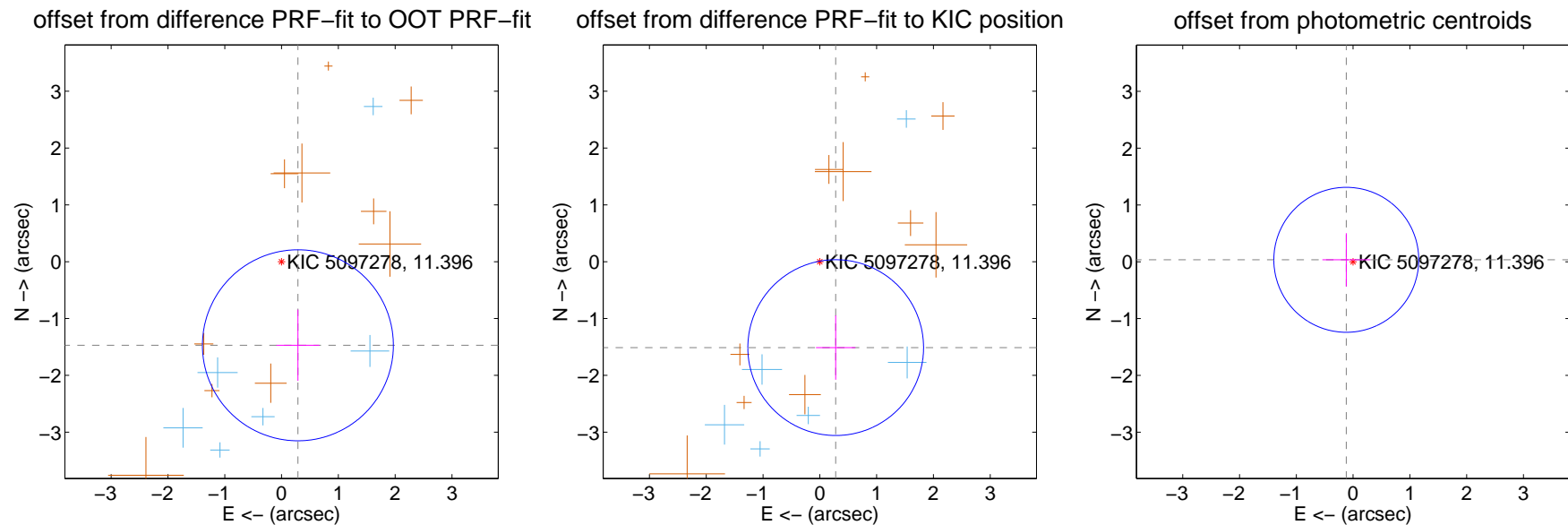
## DV Centroid Data

Supplemental centroid analysis for 005097278-02. **Kepler magnitude: 11.40.** Transit SNR 11.21

There are 6 quarters with good PRF difference image offsets

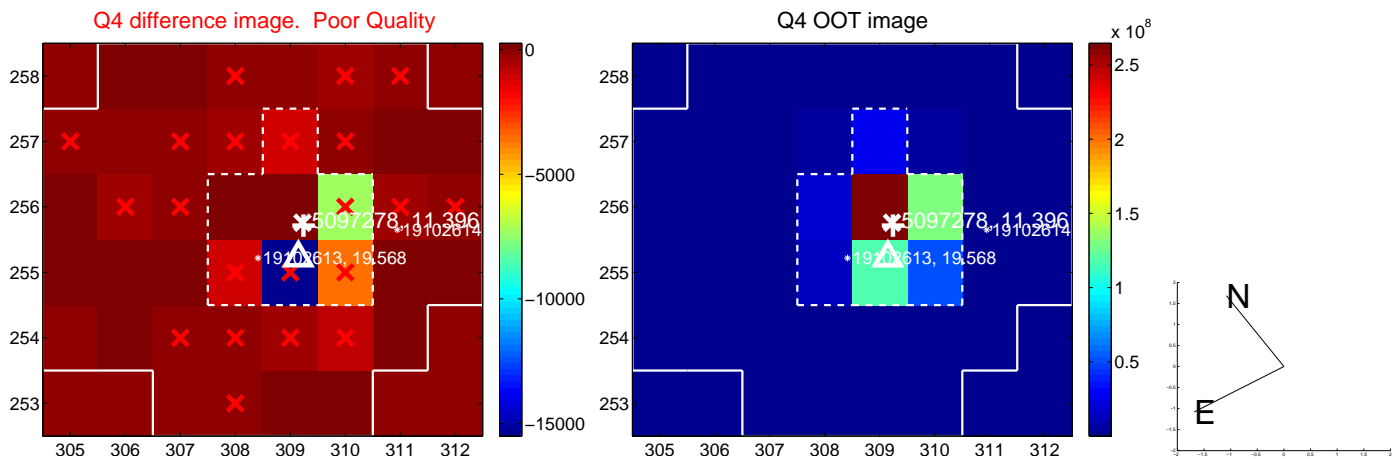
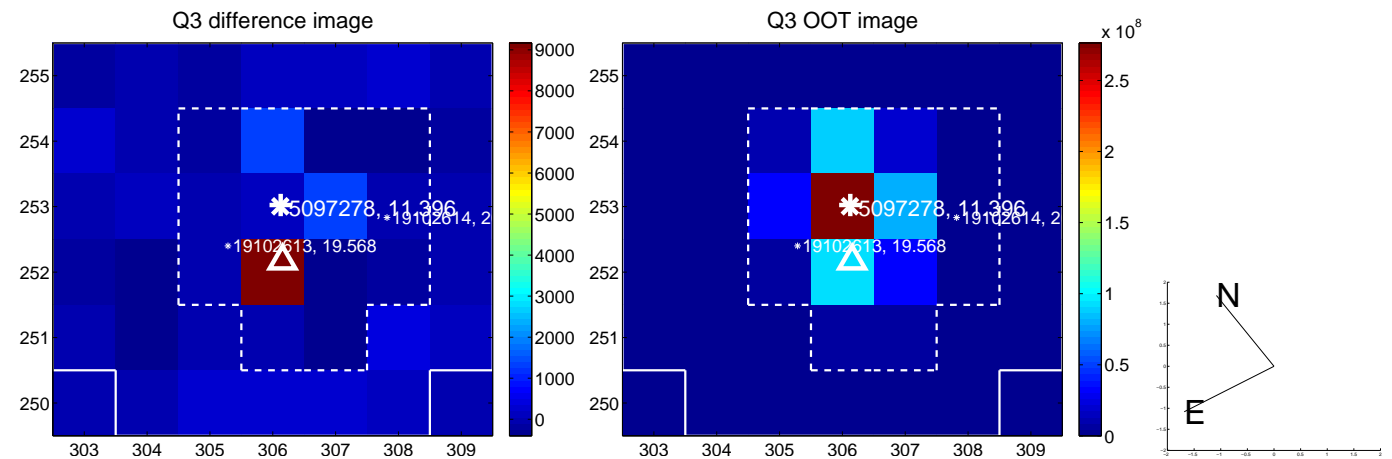
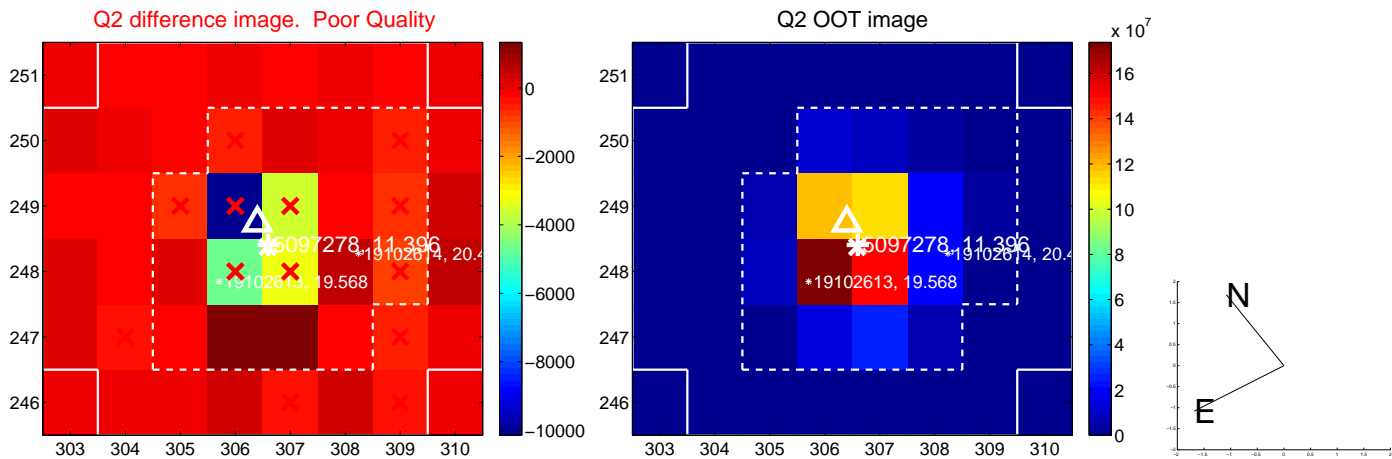
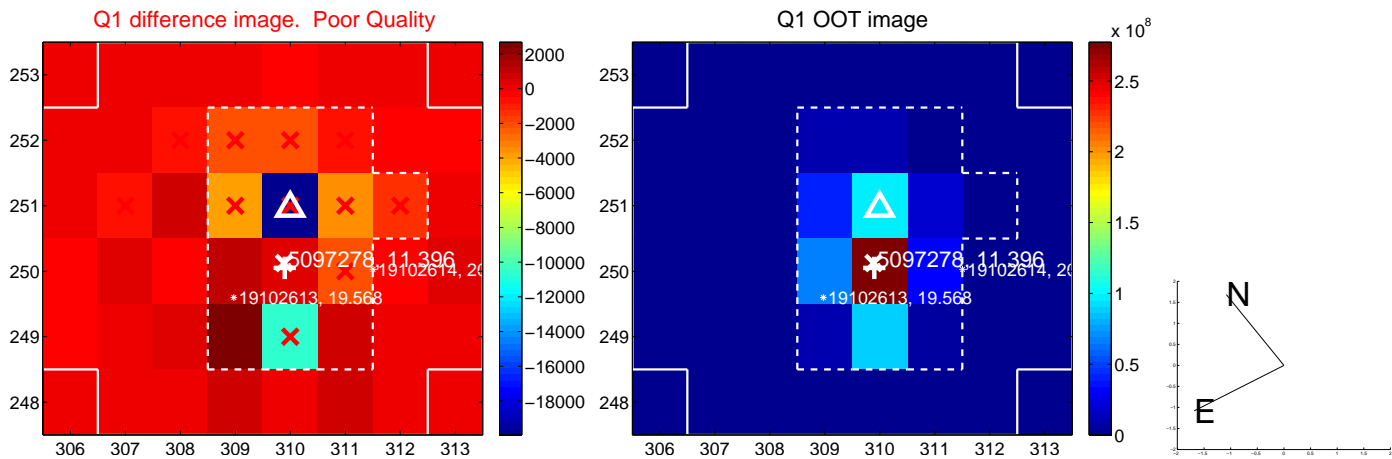
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.499 \pm 0.560$	2.68	$-0.287 \pm 0.378$	$-1.471 \pm 0.626$
PRF-fit source offset from KIC position	$1.537 \pm 0.516$	2.98	$-0.279 \pm 0.346$	$-1.512 \pm 0.566$
photometric centroid source offset	$0.12 \pm 0.43$	0.29	$0.12 \pm 0.42$	$0.03 \pm 0.47$

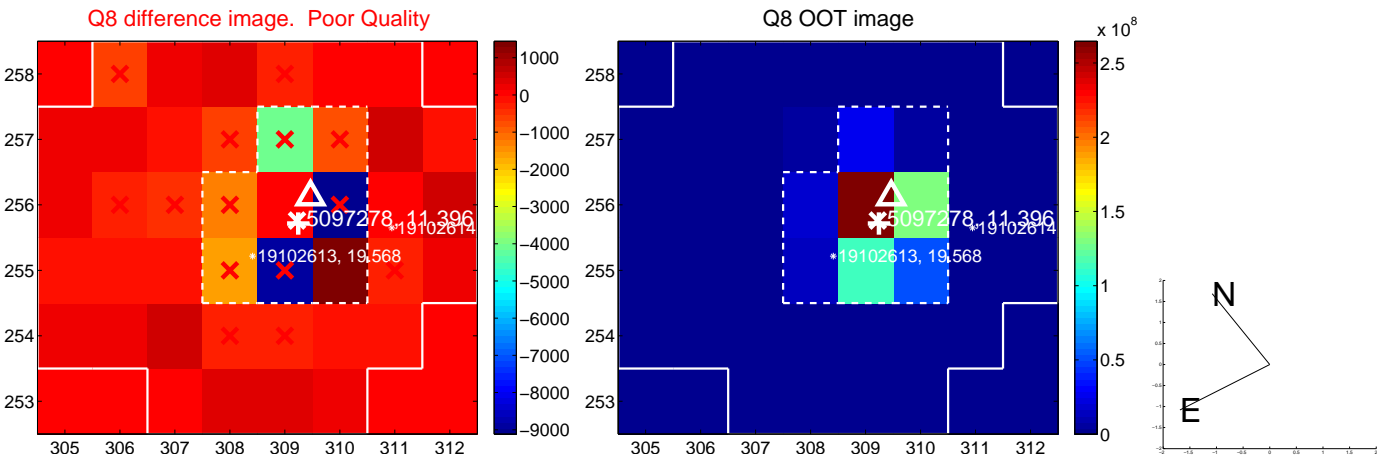
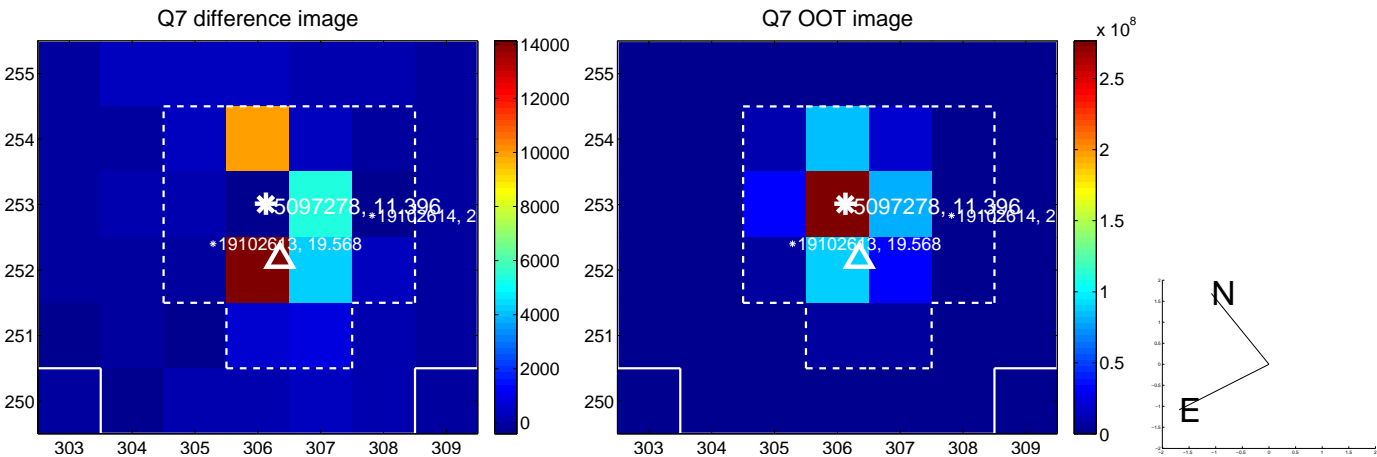
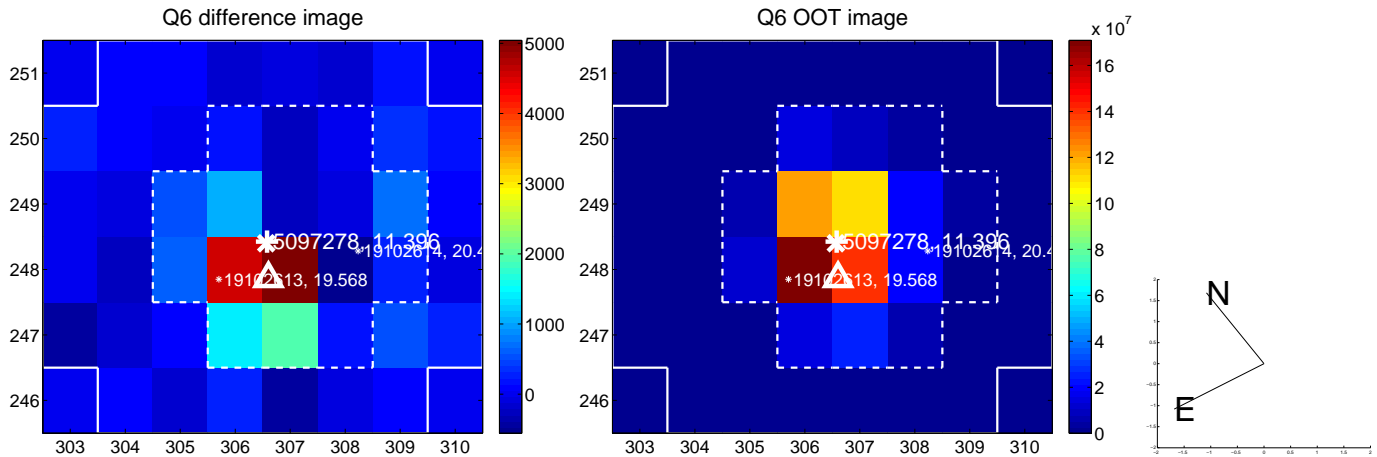
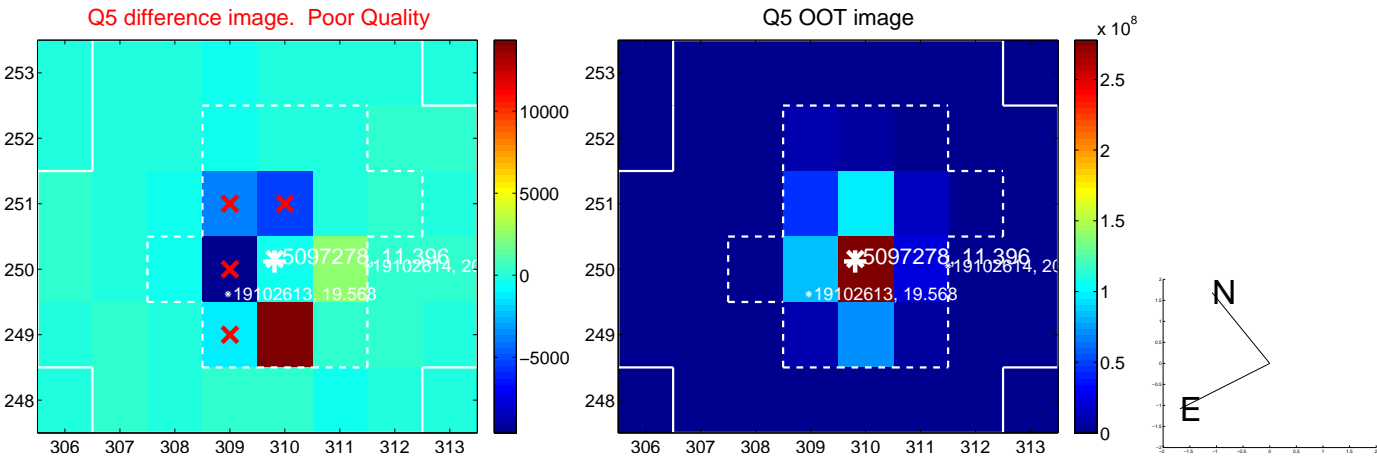


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

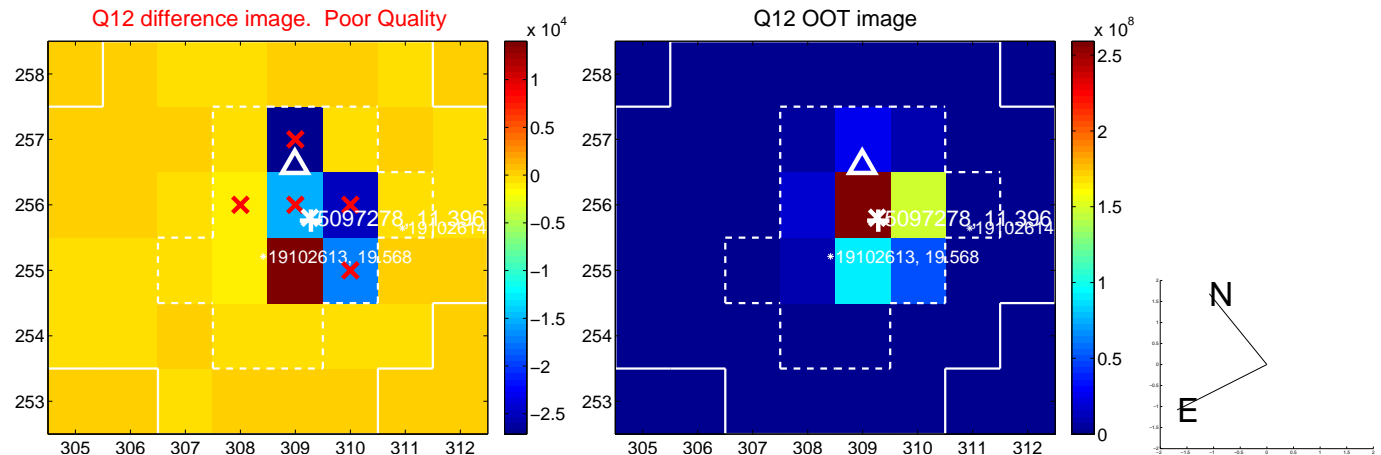
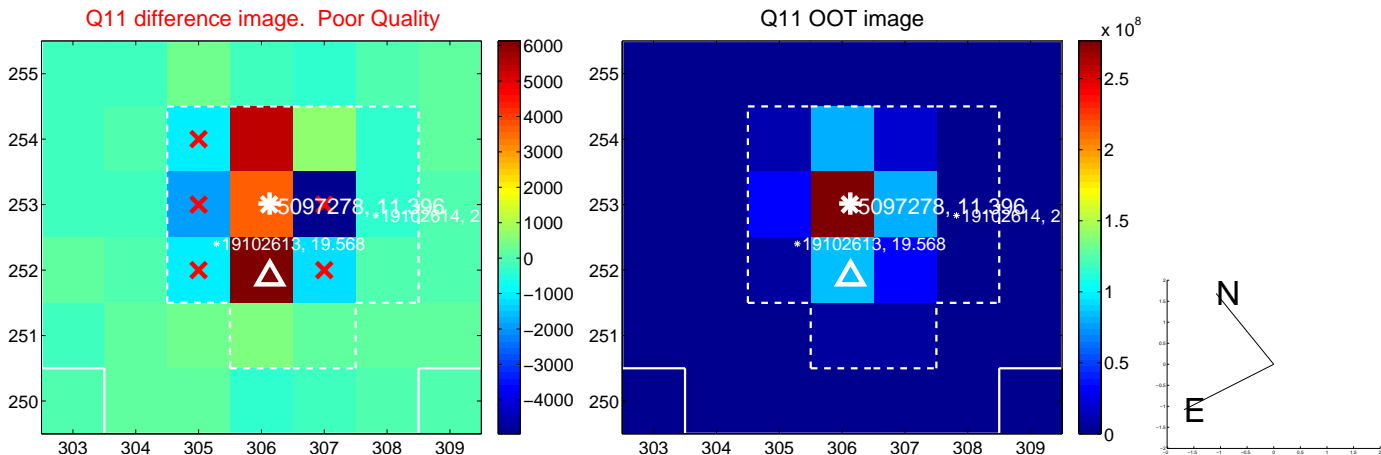
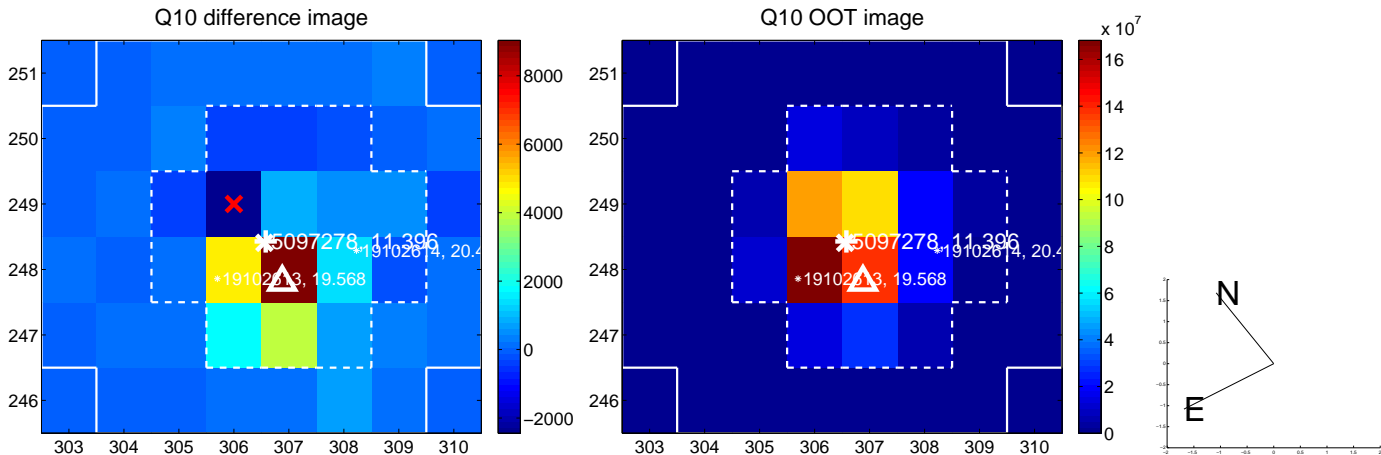
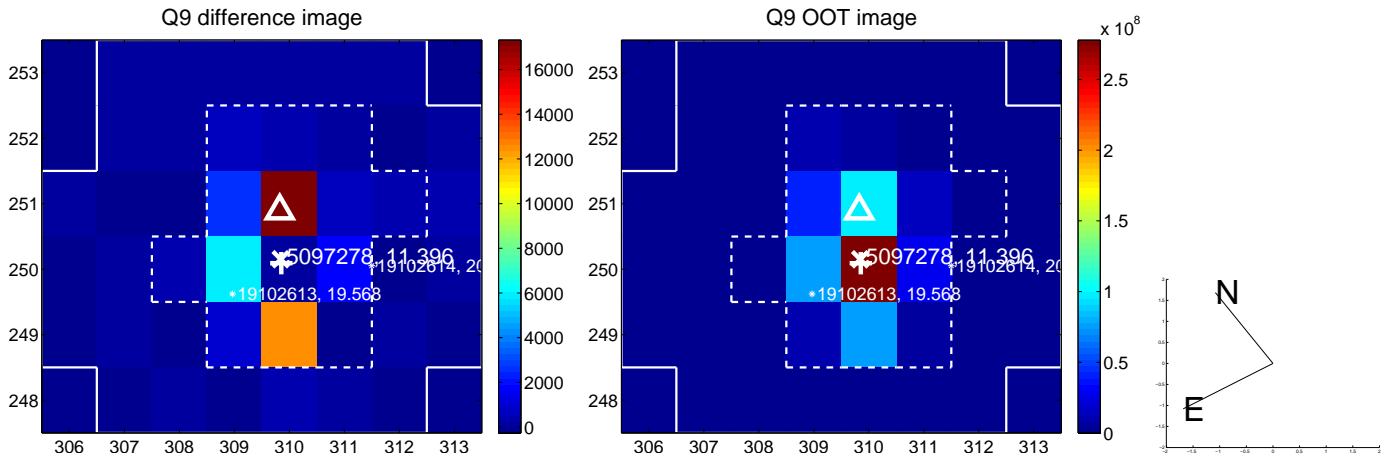


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

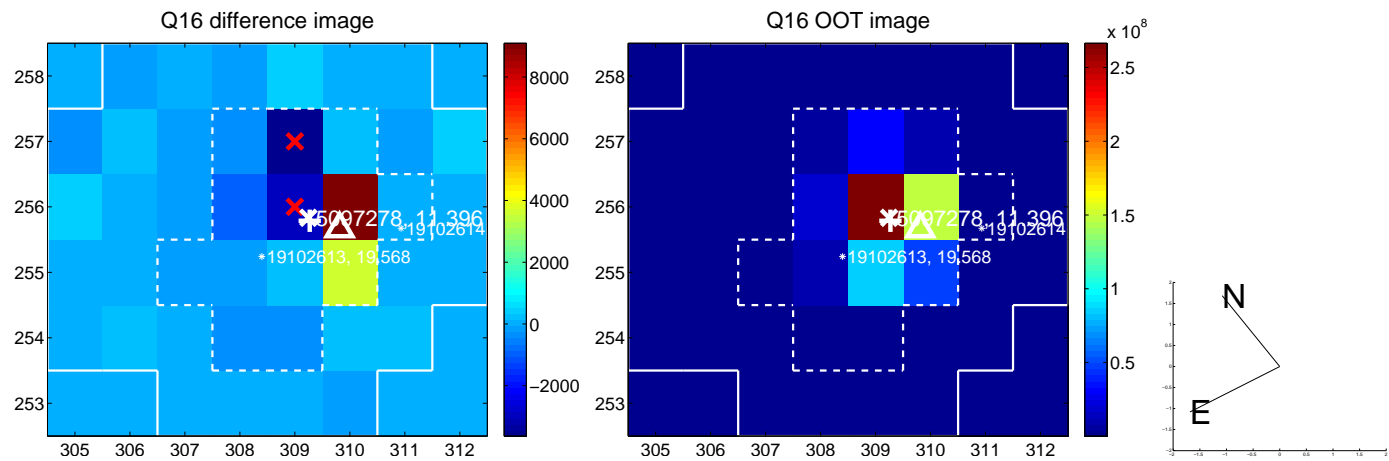
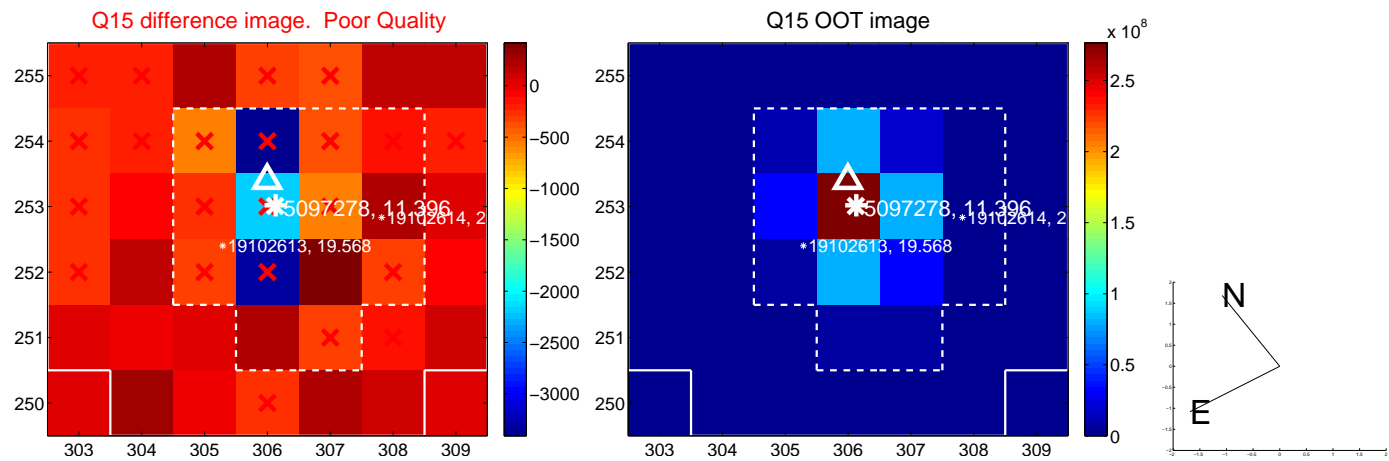
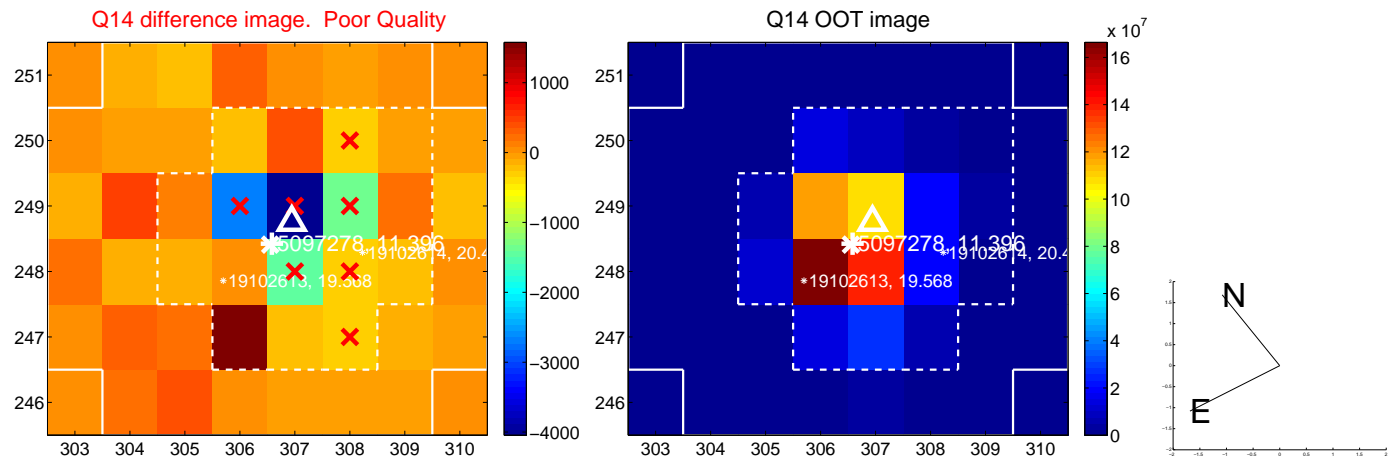
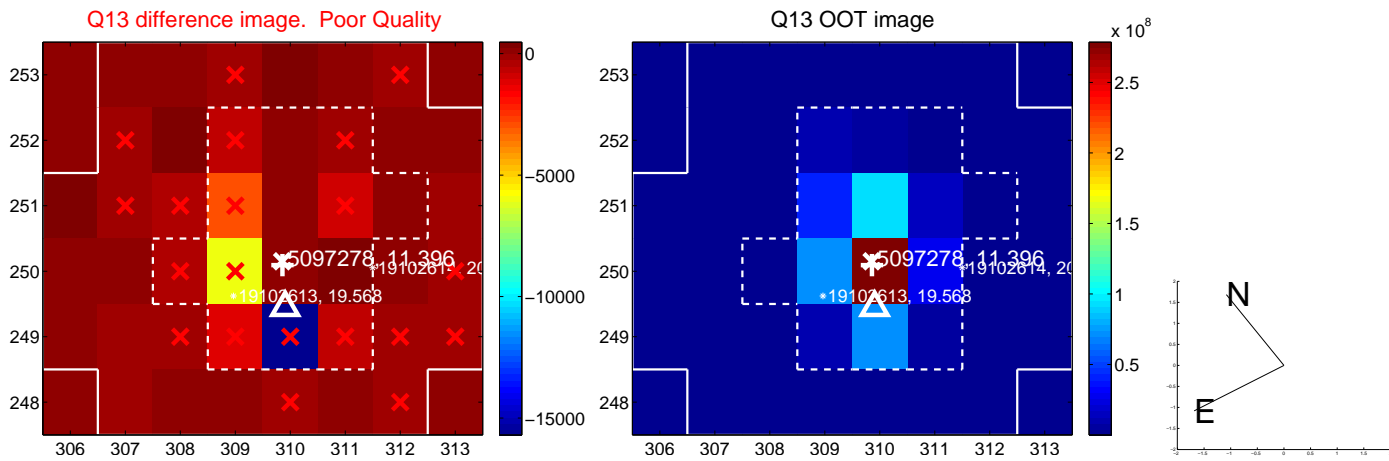




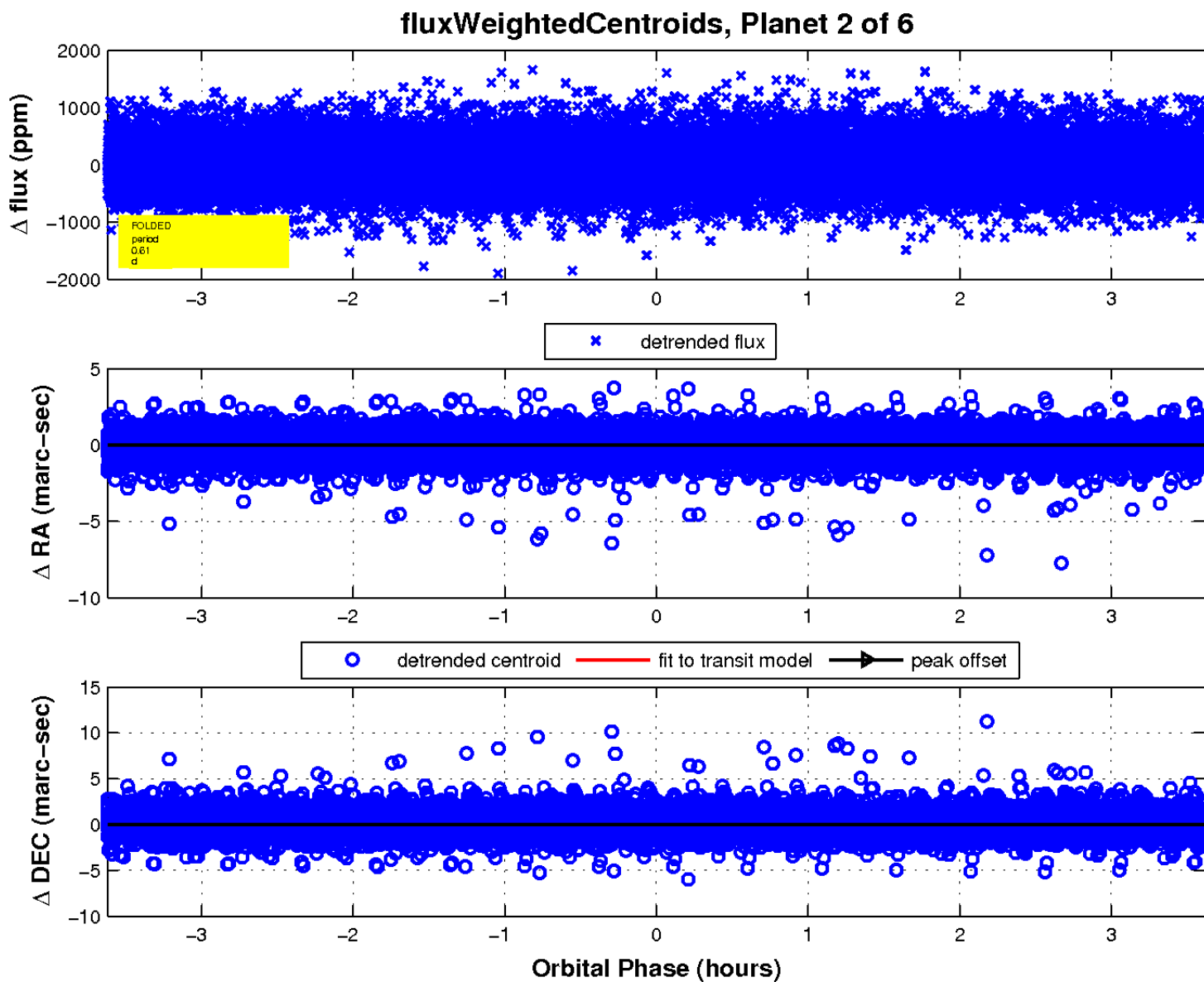
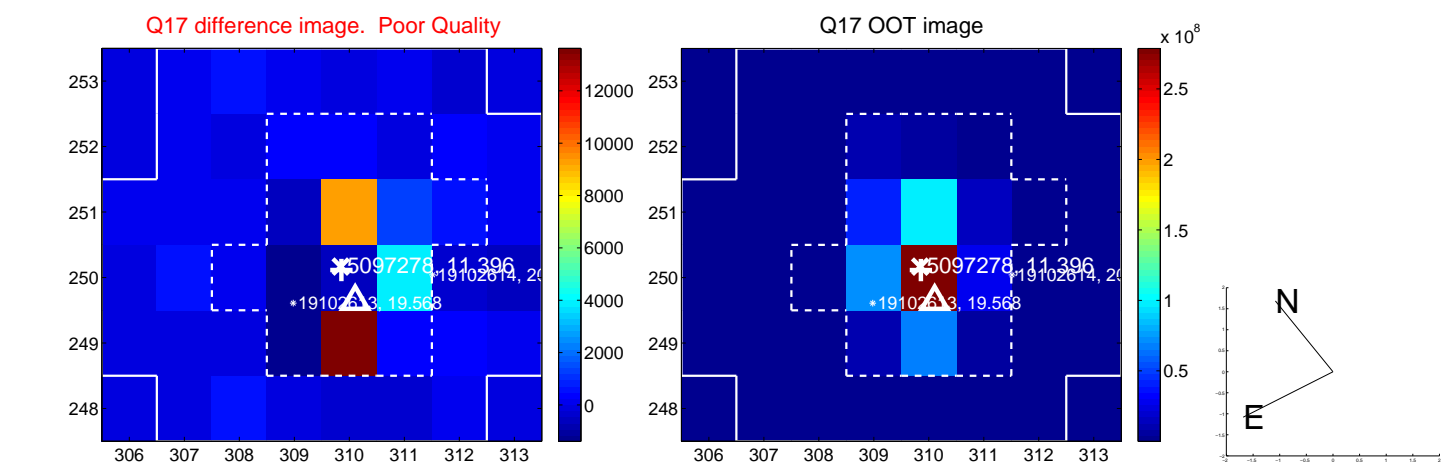
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

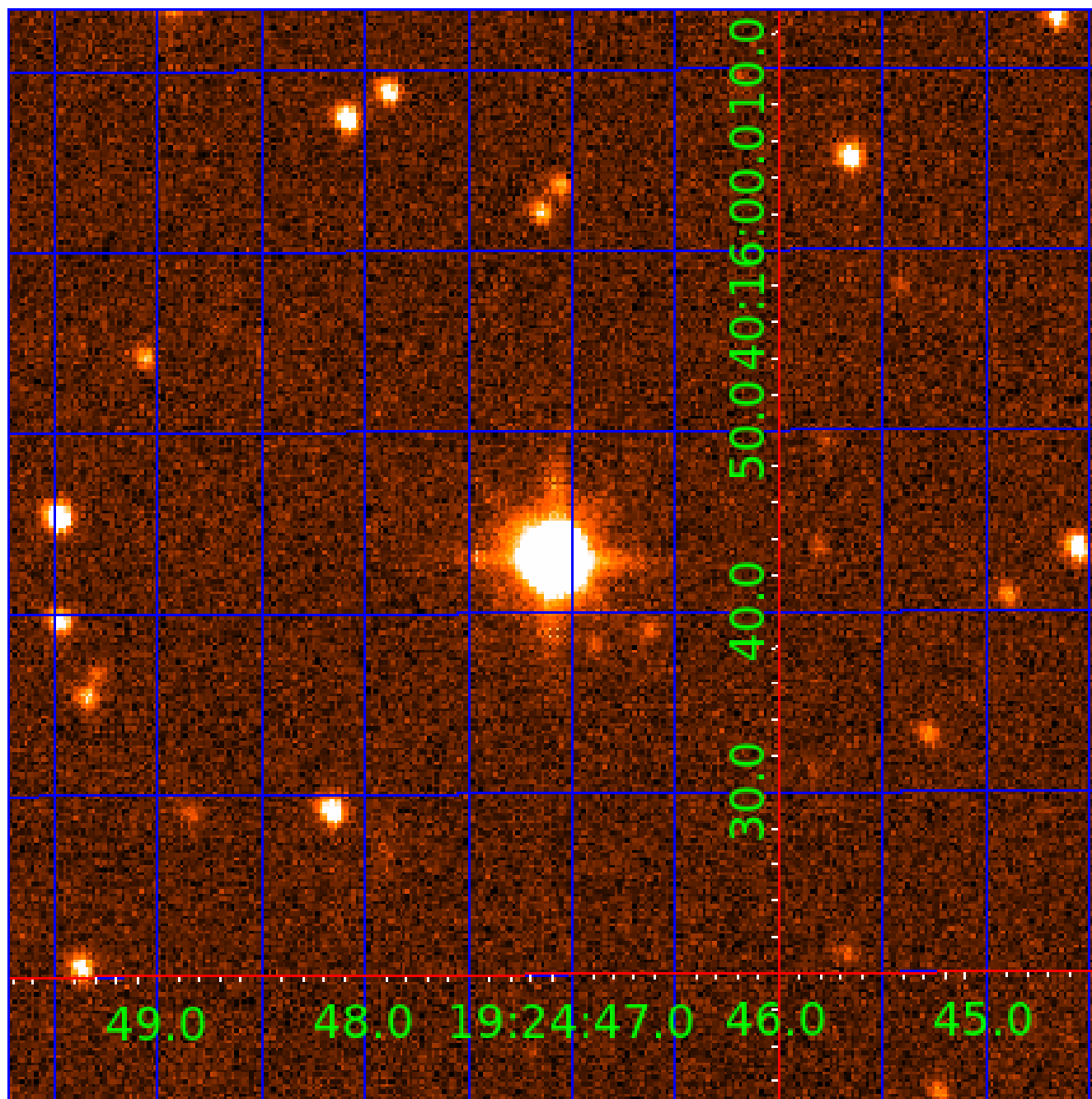


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 005097278

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005097278-01	OBS	No	0.613503	131.565445	30.3	1.287	11.7	12.1	1.77	7392	1.13	31224.49
005097278-02	OBS	No	0.613512	131.867913	30.4	1.207	9.4	11.2	1.77	7392	1.12	31223.93
005097278-03	OBS	No	144.723708	269.841811	1057.7	4.318	8.8	7.5	1.77	7392	10.68	21.42
005097278-04	OBS	No	3.471417	131.524616	121.0	3.500	8.9	-1.0	1.77	7392	1.98	3096.77
005097278-05	OBS	No	103.141368	170.345502	640.1	3.308	8.0	6.5	1.77	7392	5.15	33.65
005097278-06	OBS	No	163.663790	142.434048	818.2	2.135	7.4	6.9	1.77	7392	5.55	18.18

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005097278-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
005097278-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—SAME_NTL_PERIOD—CENT_SATURATED
005097278-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED—HALO_GHOST
005097278-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED
005097278-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED—HALO_GHOST
005097278-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—CENT_SATURATED

**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 005097278-03

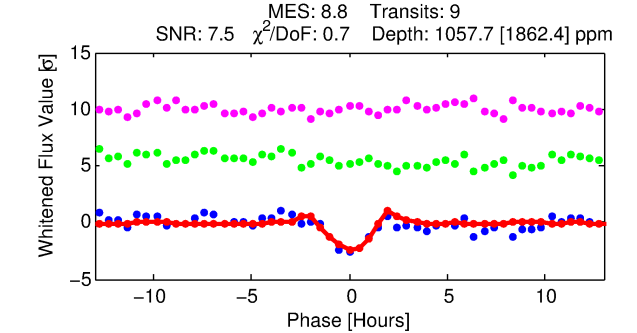
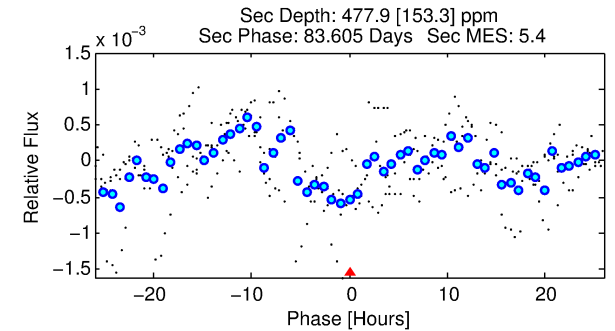
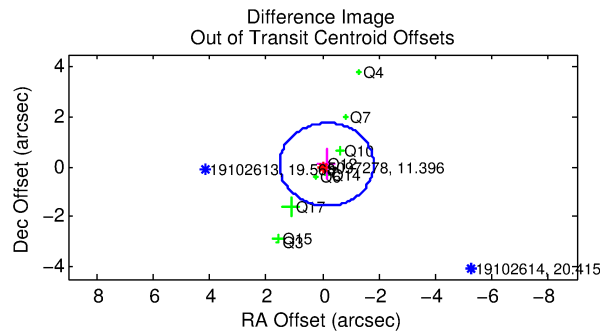
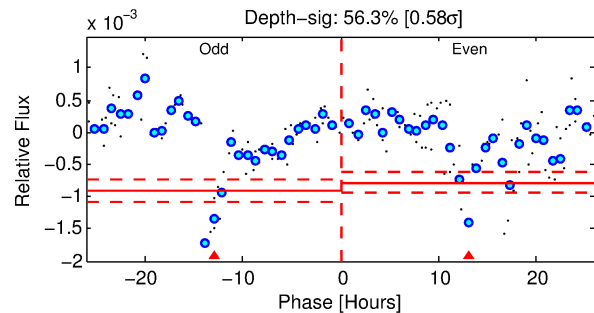
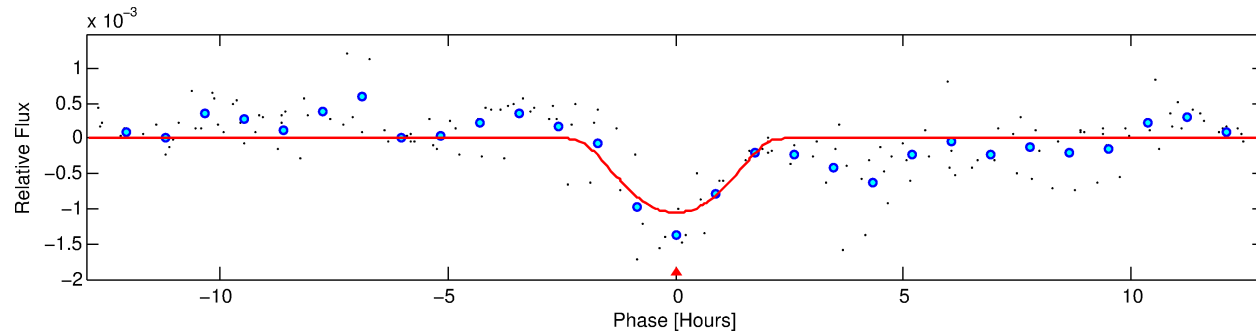
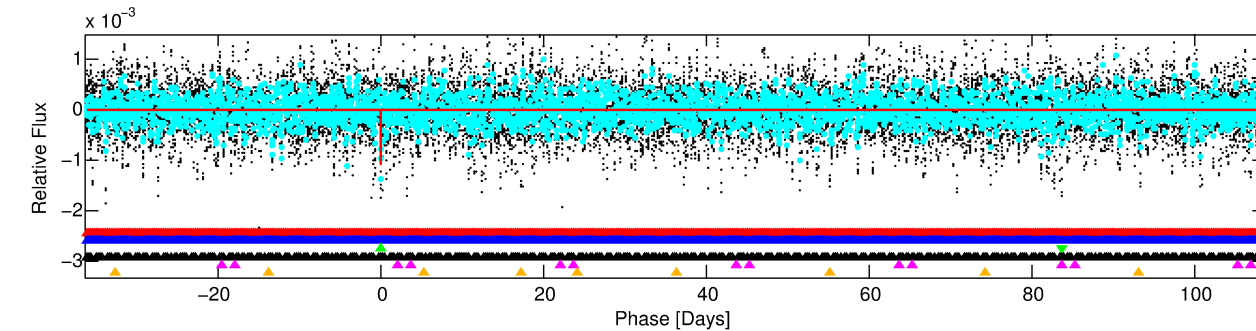
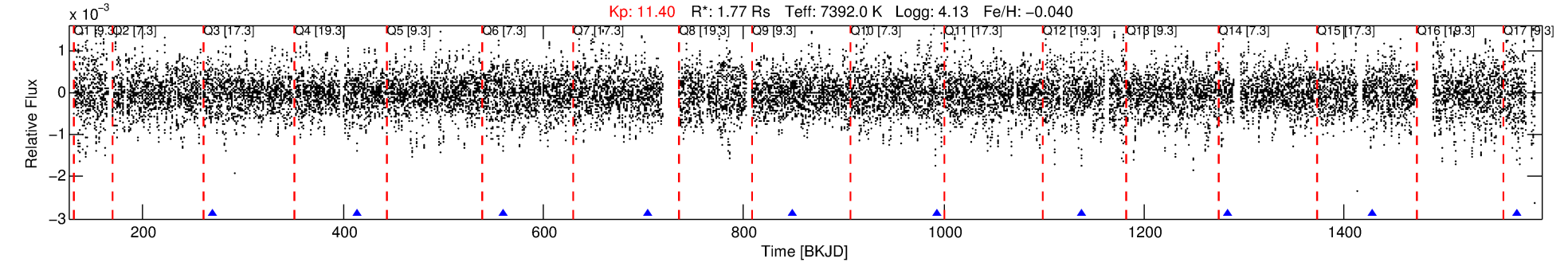
No Significant Match Found



# DV One-Page Summary

KIC: 5097278 Candidate: 3 of 6 Period: 144.724 d  
KOI: K06519 Corr: No Ephemeris Match

Kp: 11.40 R\*: 1.77 Rs Teff: 7392.0 K Logg: 4.13 Fe/H: -0.040



## DV Fit Results:

Period = 144.72371 [0.00169] d  
Epoch = 269.8418 [0.0067] BKJD  
Rp/R\* = 0.0552 [0.1055]  
a/R\* = 86.28 [39.81]  
b = 1.00 [0.09]  
Seff = 21.42 [8.64]  
Teq = 549 [55] K  
Rp = 10.68 [20.67] Re  
a = 0.6262 [0.1587] AU  
Ag = 903.71 [3480.20] [0.26σ]  
Teffp = 4650 [4463] K [0.92σ]

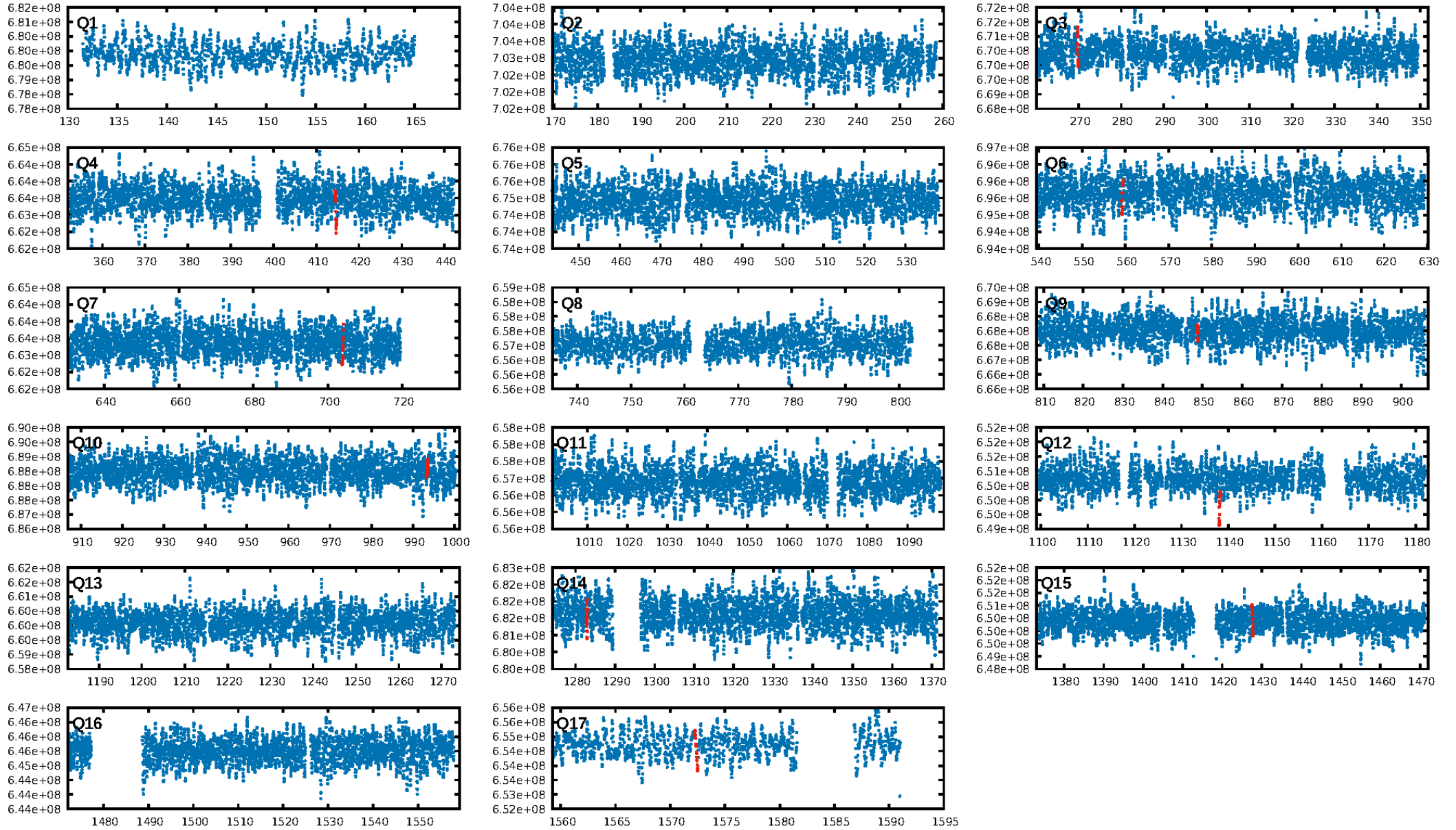
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [183.48σ]  
LongPeriod-sig: 100.0% [94.37σ]  
ModelChiSquare2-sig: 9.2%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 2.84e-12**  
RollingBand-fgt: 1.00 [8/8]  
**GhostDiagnostic-chr: 0.1668**  
Centroid-sig: 79.5%  
Centroid-so: 0.105 arcsec [0.63σ]  
OotOffset-rm: 0.172 arcsec [0.31σ]  
KicOffset-rm: 0.180 arcsec [0.70σ]  
OotOffset-st: 3/3/2/1 [9]  
KicOffset-st: 3/3/2/1 [9]  
DiffImageQuality-fgm: 0.44 [4/9]  
DiffImageOverlap-fno: 0.00 [0/10]

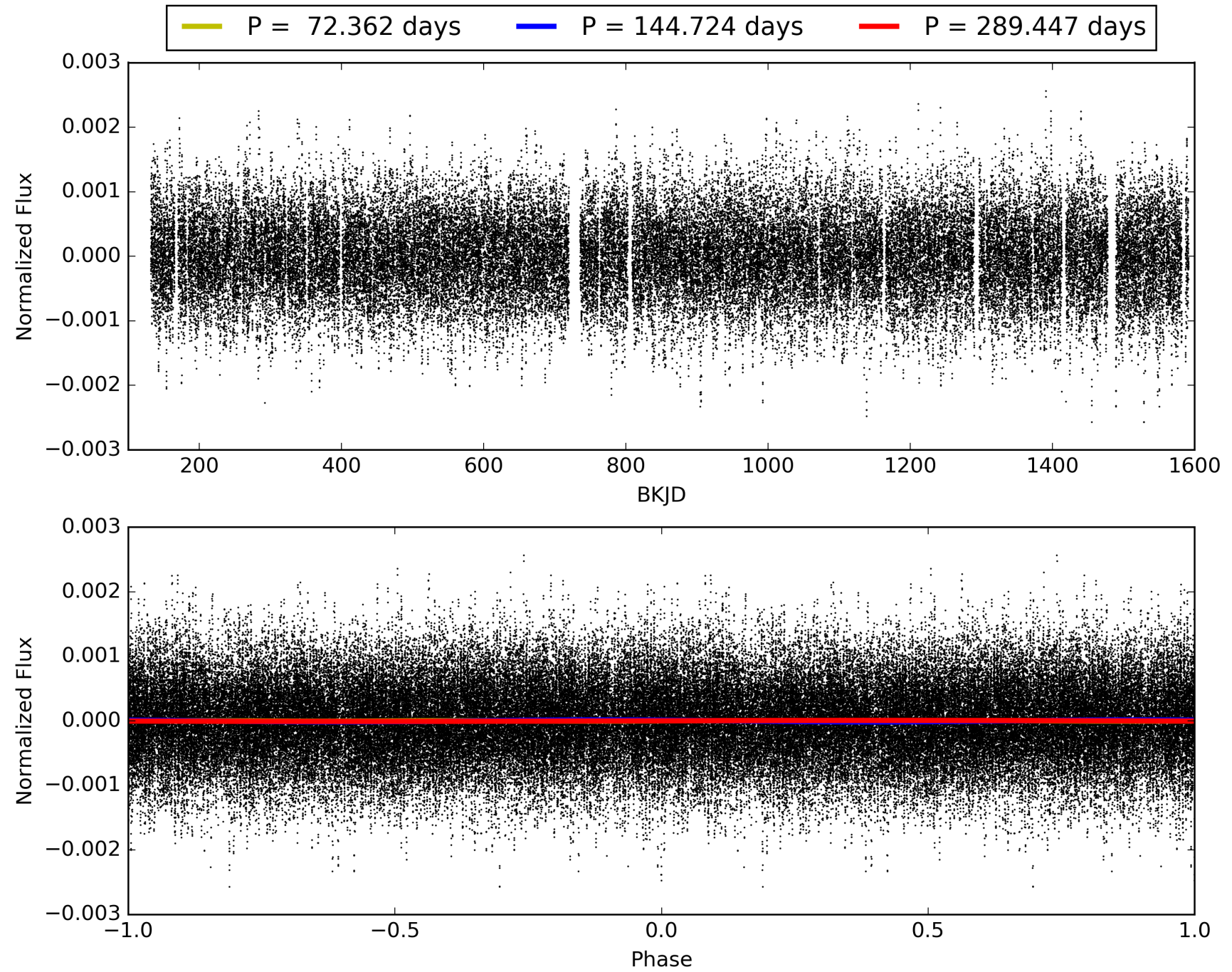
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 13:29:17 Z

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

# TCE 005097278-03, PDC Light Curves

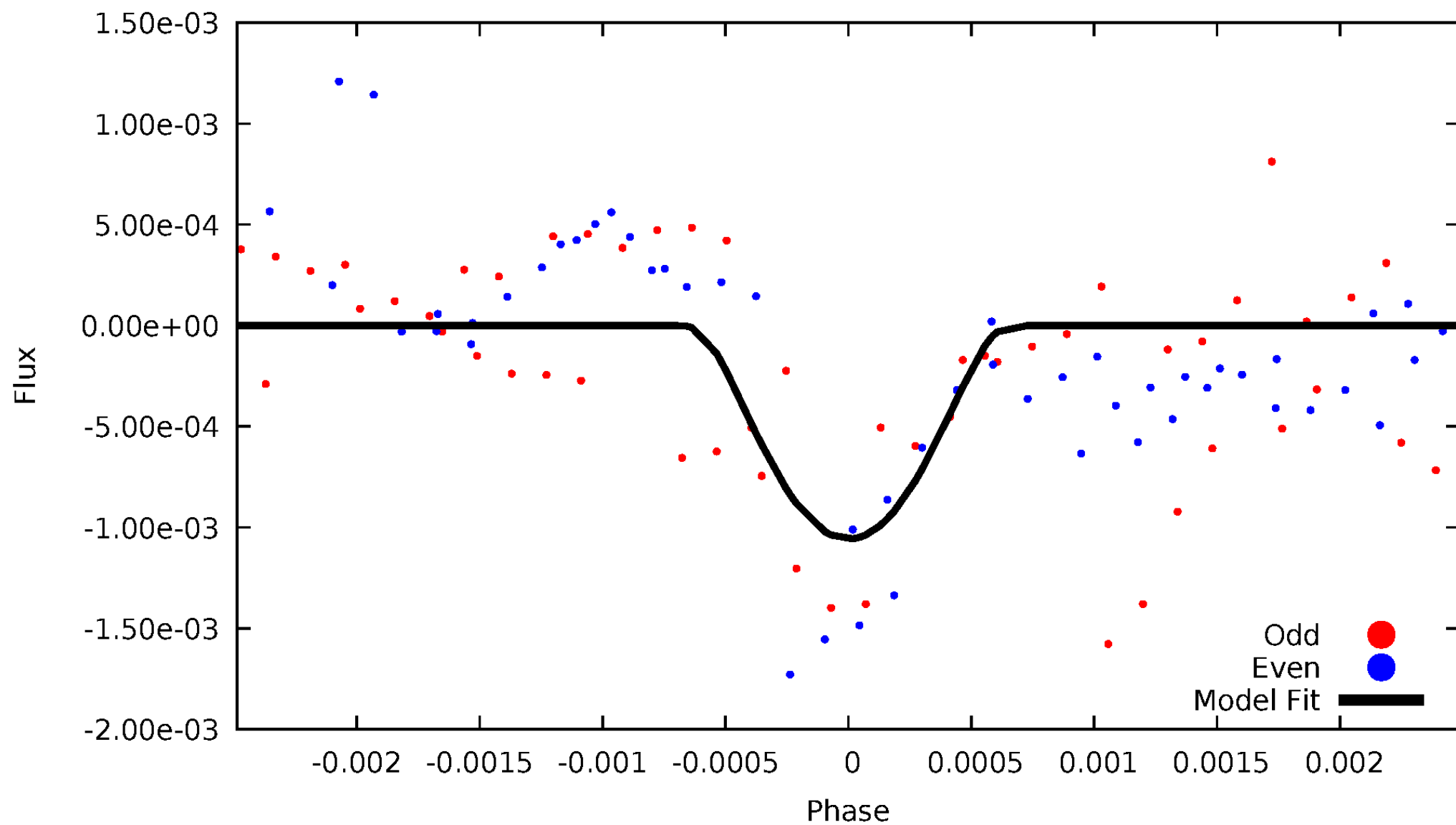


# TCE 005097278-03



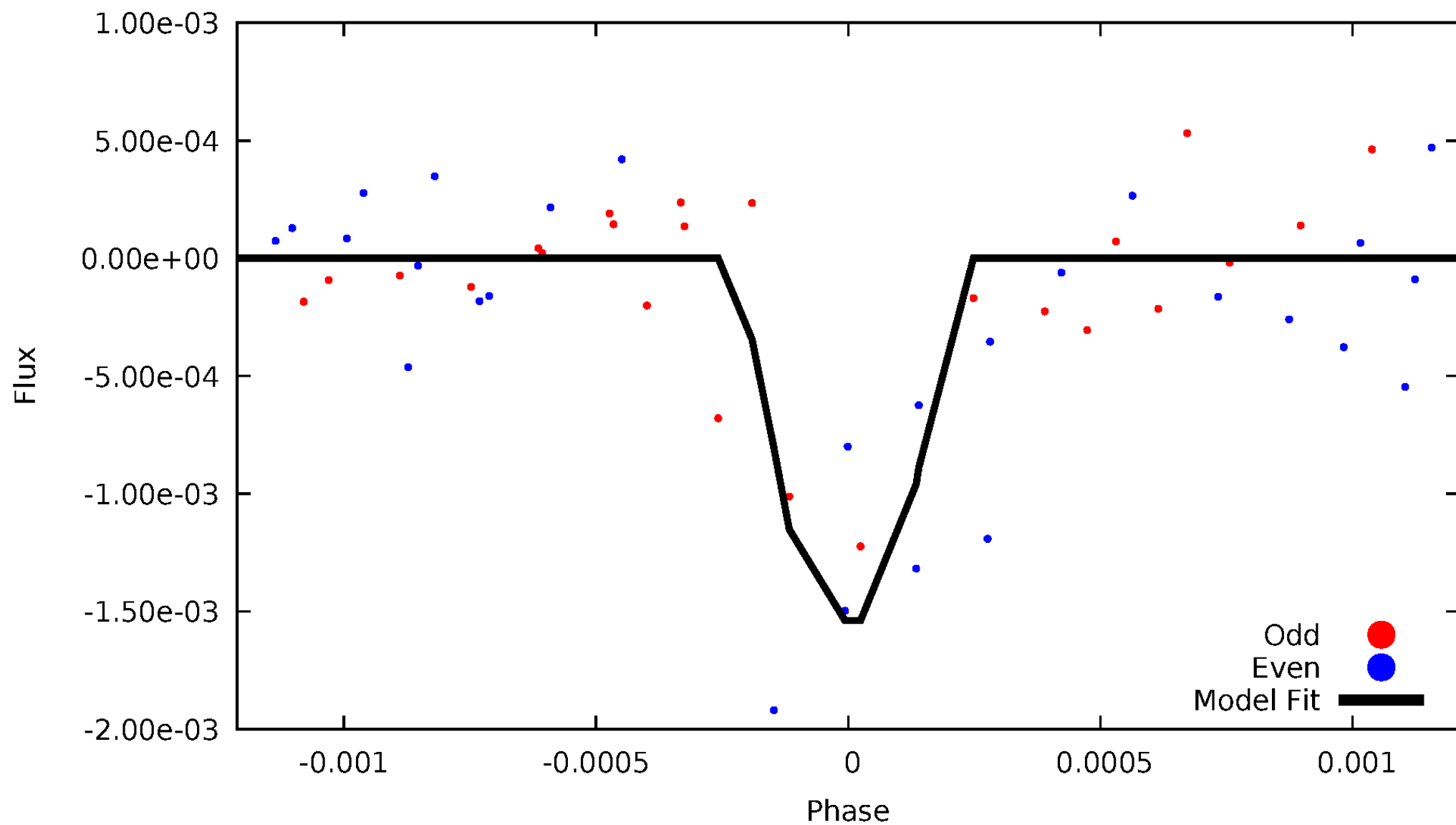
# DV Odd/Even

TCE 005097278-03



# ALT Odd/Even

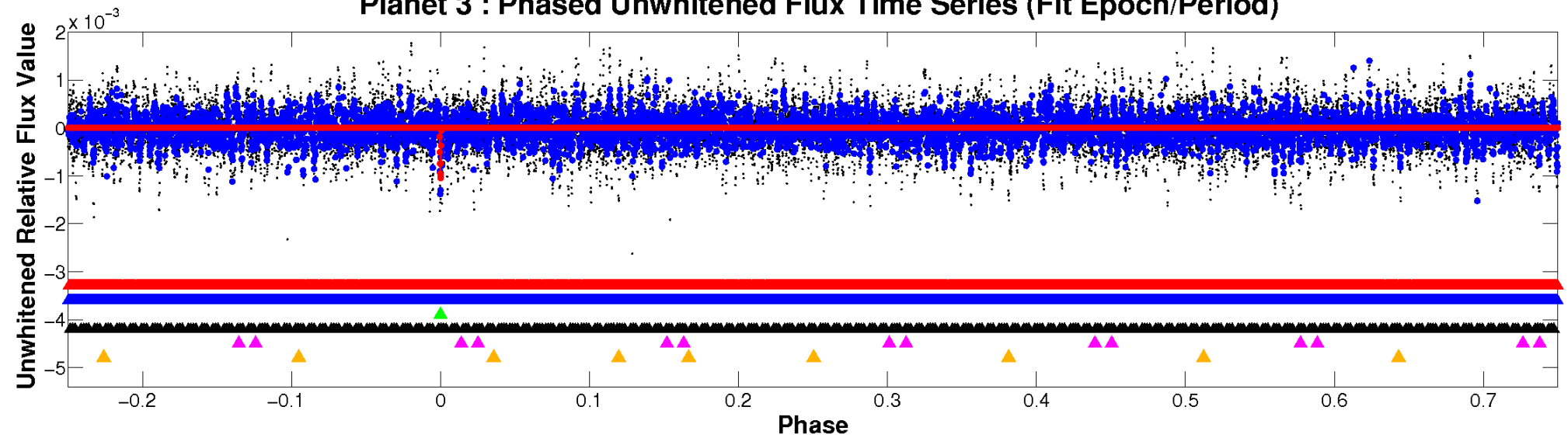
TCE 005097278-03



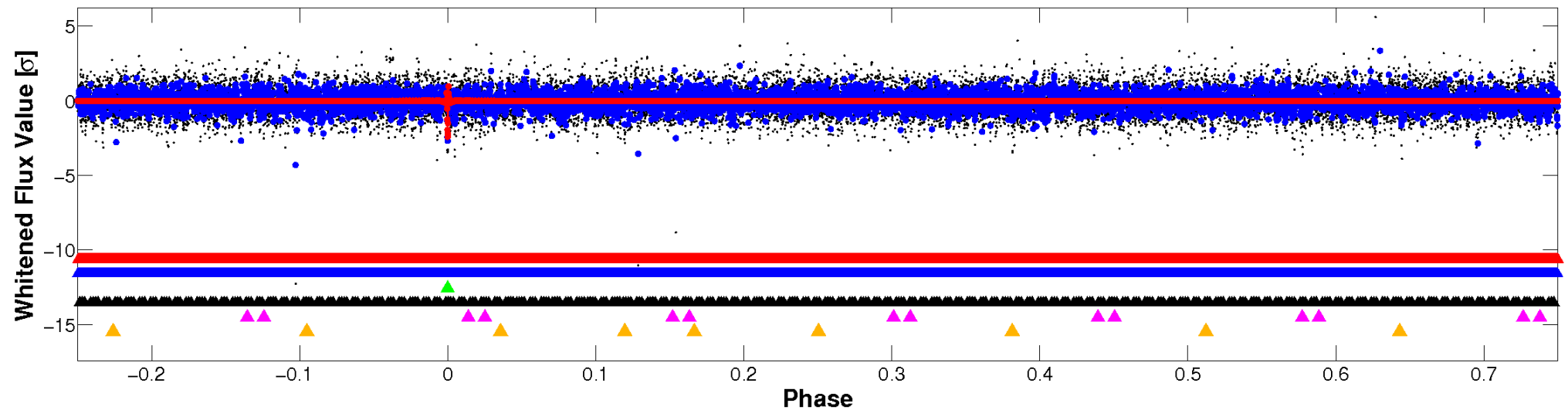


# Non-Whitened Vs. Whitened Light Curve

## Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

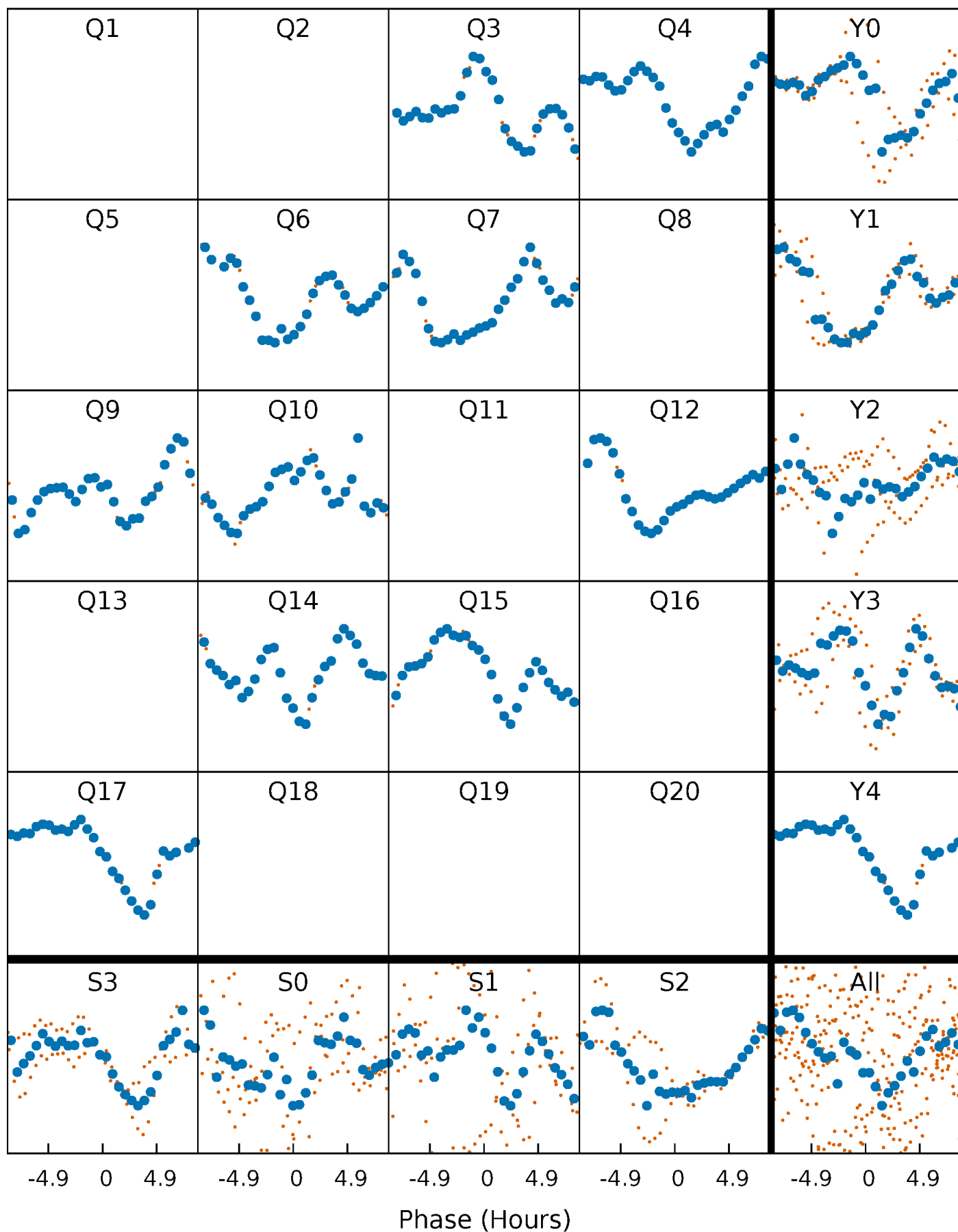


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



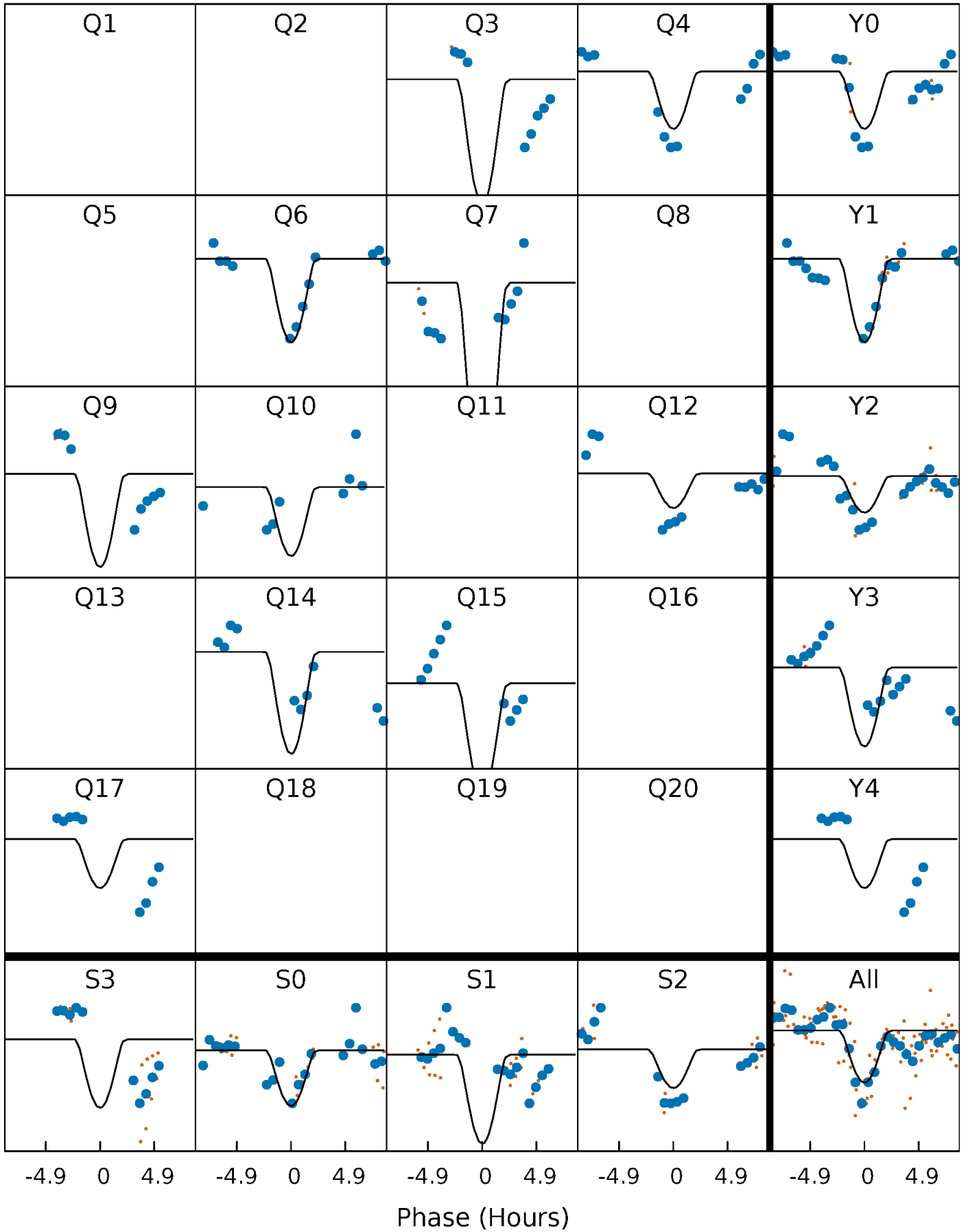
# PDC Quarter-Phased Transit Curves

TCE 005097278-03 P=144.723708 Days  $T_0=269.841811$  (BKJD)



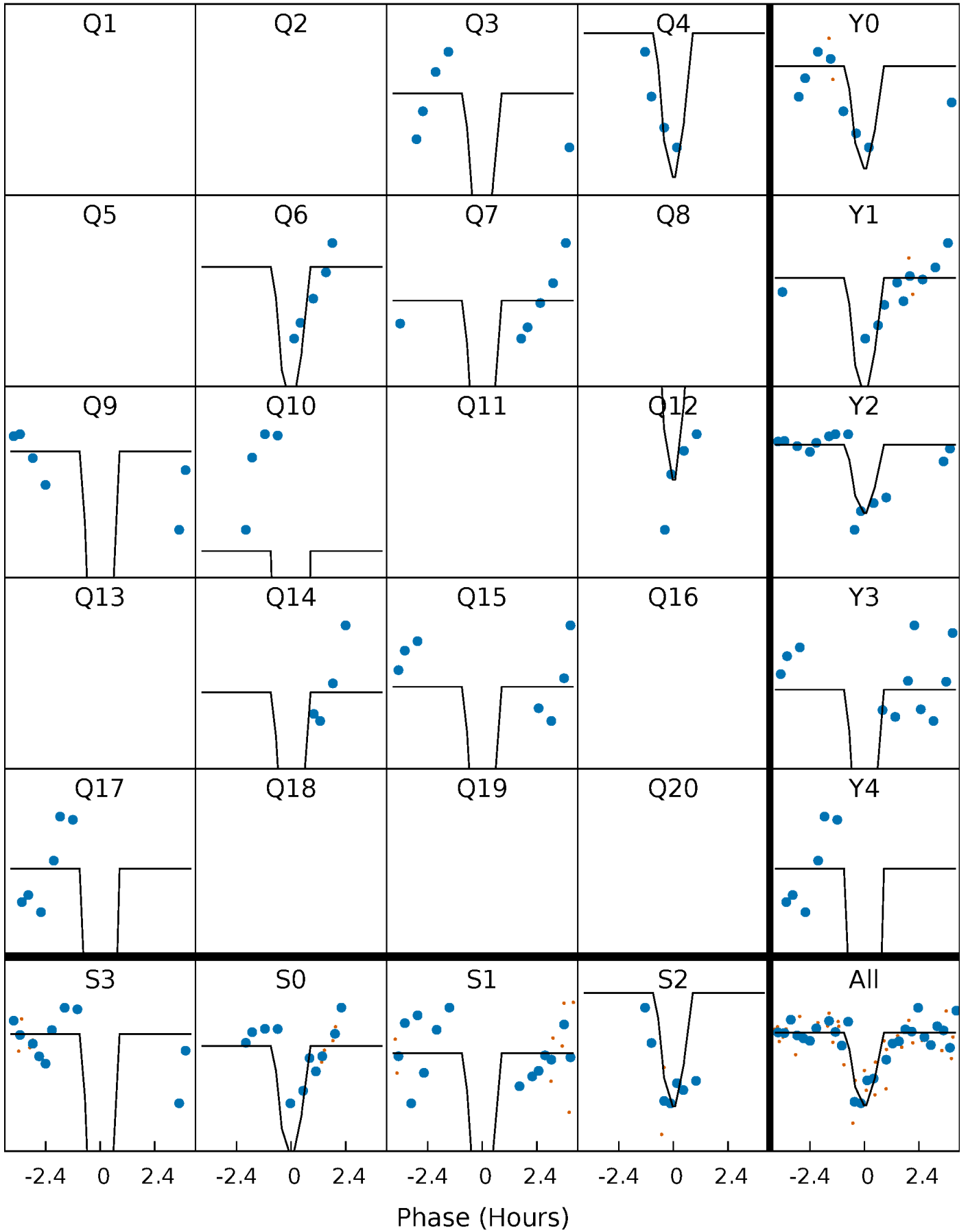
# DV Quarter-Phased Transit Curves

TCE 005097278-03   P=144.723708 Days    $T_0=269.841811$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

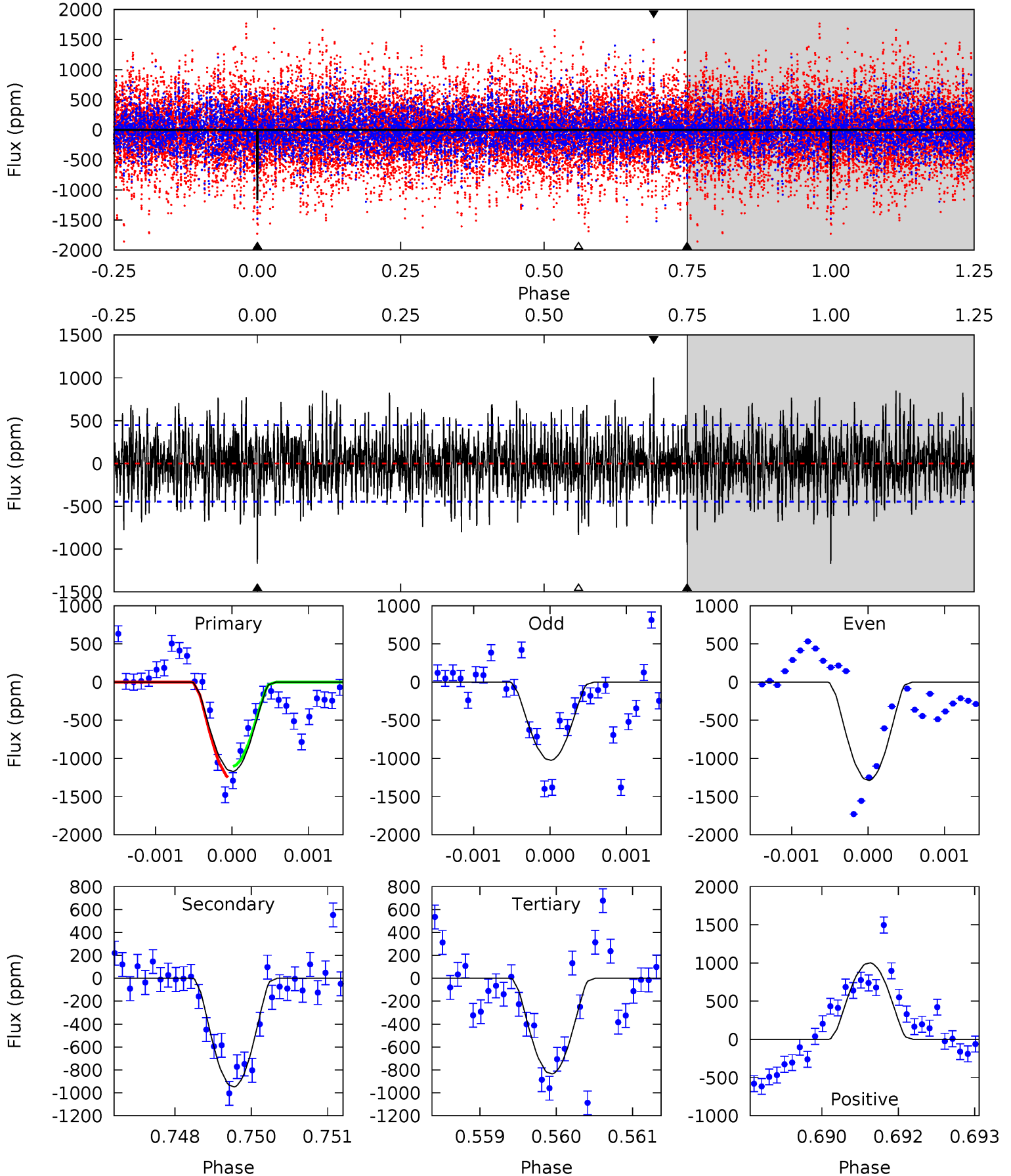
TCE 005097278-03 P=144.719772 Days  $T_0=269.852493$  (BKJD)



# DV Model-Shift Uniqueness Test

005097278-03, P = 144.723708 Days, E = 125.118103 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
14.2	11.5	10.1	12.2	5.41	3.22	3.10	4.09	2.06	1.38	-0.65	1.59	0.66	0.46	0.88

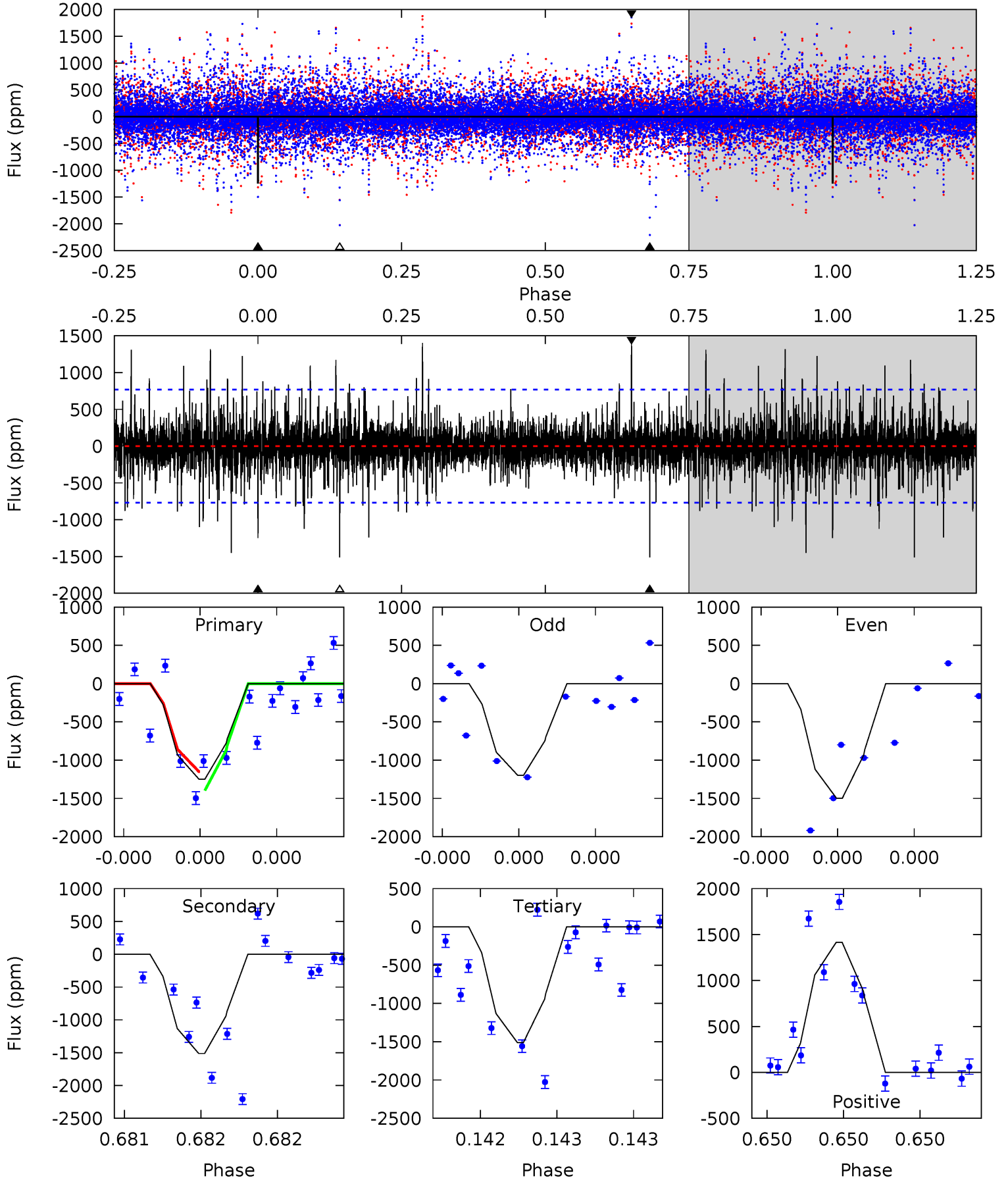




# Alt Model-Shift Uniqueness Test

005097278-03, P = 144.719772 Days, E = 125.132721 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
9.10	11.0	11.0	10.3	5.61	3.54	1.59	-1.92	-1.22	0.00	0.70	0.98	1.09	0.48	0.91



### Stellar Parameters For KIC 005097278

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7392^{+207}_{-337}$	$4.135^{+0.128}_{-0.192}$	$-0.040^{+0.200}_{-0.350}$	$1.772^{+0.548}_{-0.365}$	$1.563^{+0.213}_{-0.237}$	$0.396^{+0.253}_{-0.209}$
	+3%/-5%	+3%/-5%	+500%/-875%	+31%/-21%	+14%/-15%	+64%/-53%
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 005097278-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-949 \pm 82$	$19.57^{+17.62}_{-13.53}$	$768^{+71}_{-53}$	$4319^{+2873}_{-863}$	$536^{+4813}_{-390}$
Alt.	$-1512 \pm 137$	$17.13^{+17.24}_{-11.70}$	$769^{+58}_{-52}$	$4920^{+4092}_{-1143}$	$1068^{+9357}_{-800}$

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

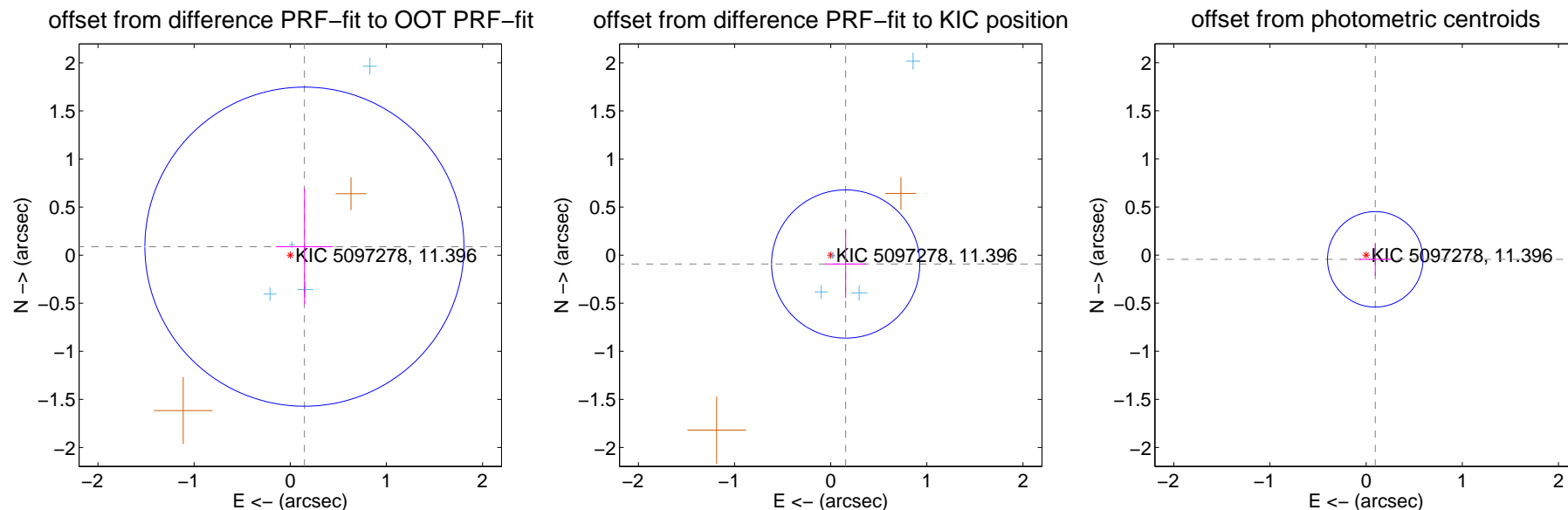
## DV Centroid Data

Supplemental centroid analysis for 005097278-03. **Kepler magnitude: 11.40.** Transit SNR 7.54

There are 4 quarters with good PRF difference image offsets

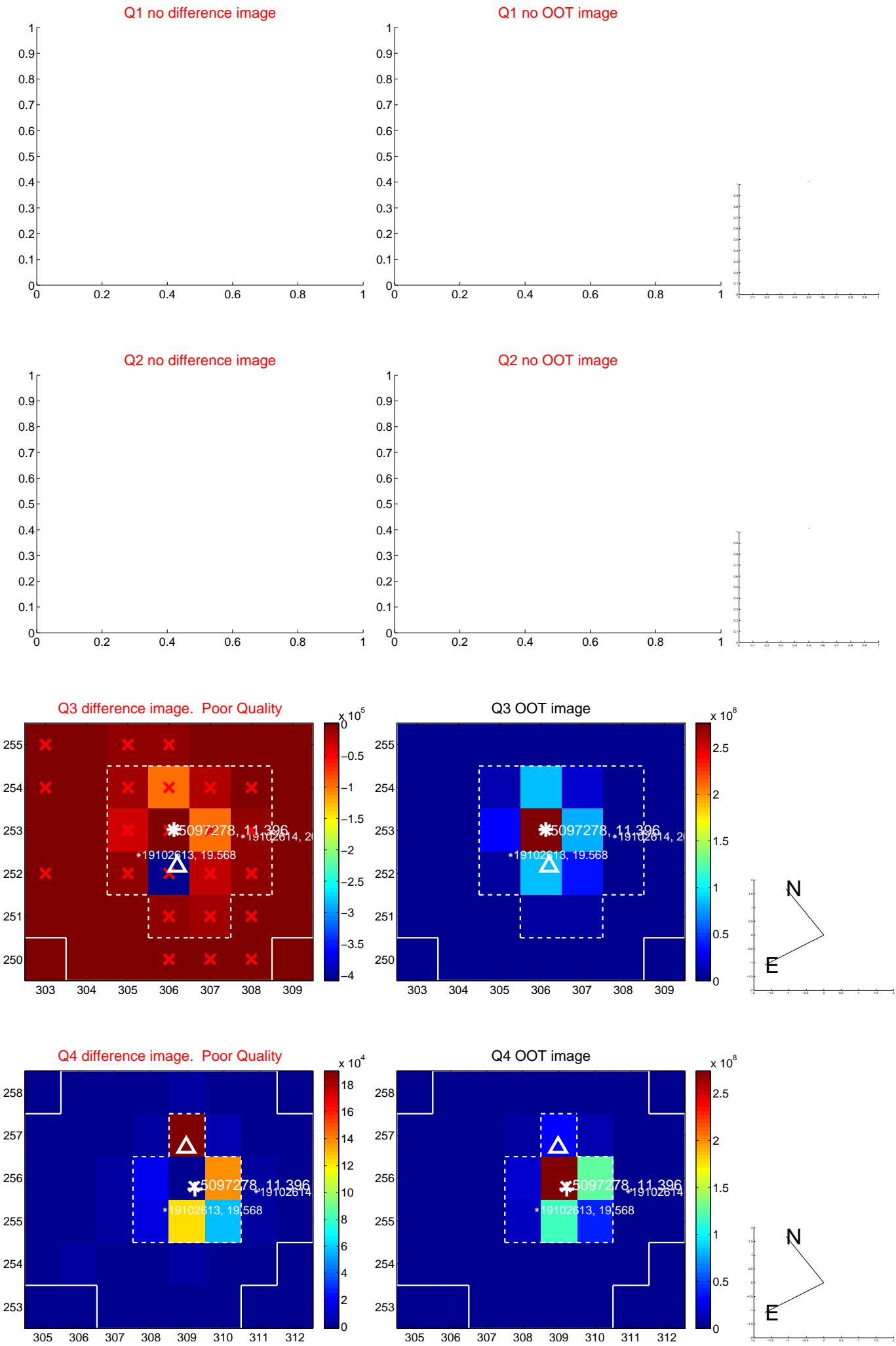
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.172 \pm 0.553$	0.31	$-0.147 \pm 0.297$	$0.088 \pm 0.601$
PRF-fit source offset from KIC position	$0.180 \pm 0.257$	0.70	$-0.155 \pm 0.212$	$-0.092 \pm 0.355$
photometric centroid source offset	$0.10 \pm 0.17$	0.63	$-0.09 \pm 0.16$	$-0.04 \pm 0.17$



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.

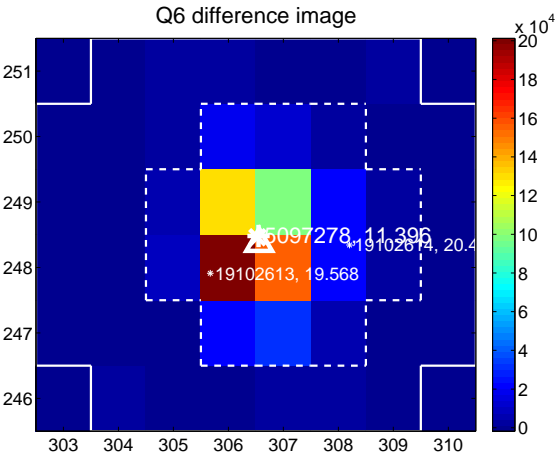
Q5 no difference image



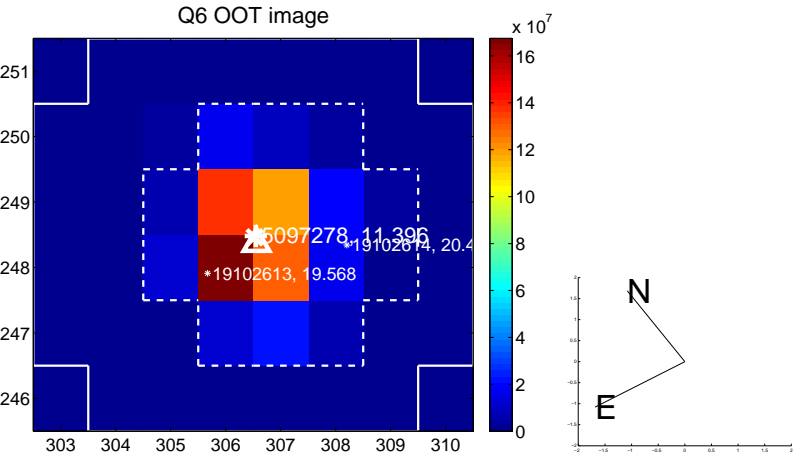
Q5 no OOT image



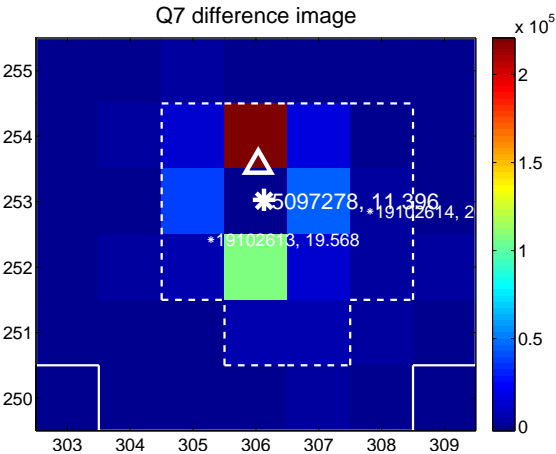
Q6 difference image



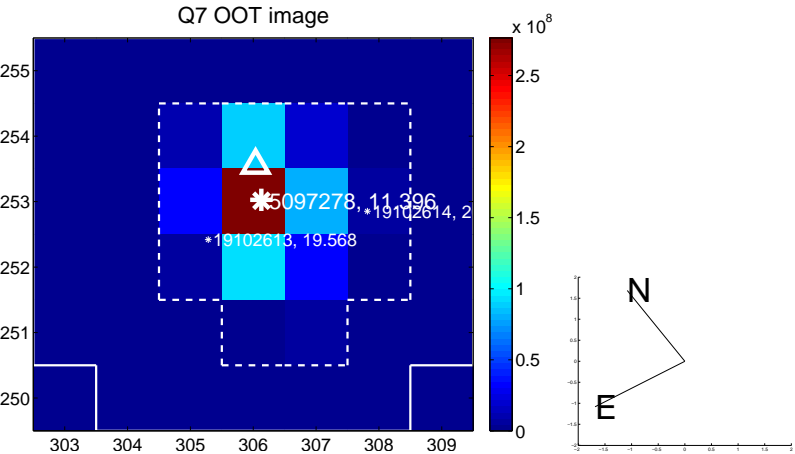
Q6 OOT image



Q7 difference image



Q7 OOT image



Q8 no difference image

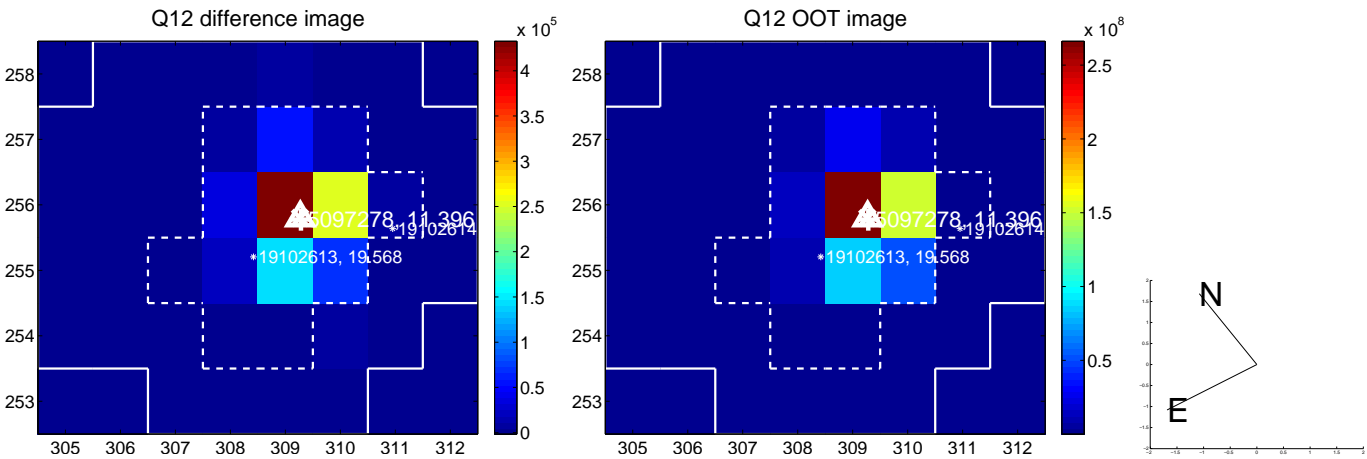
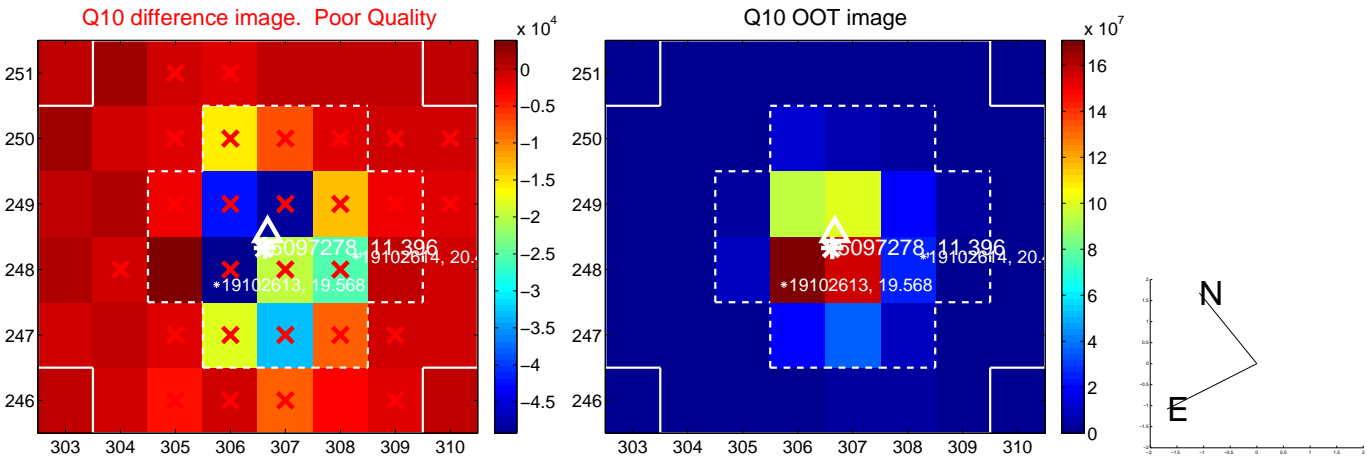
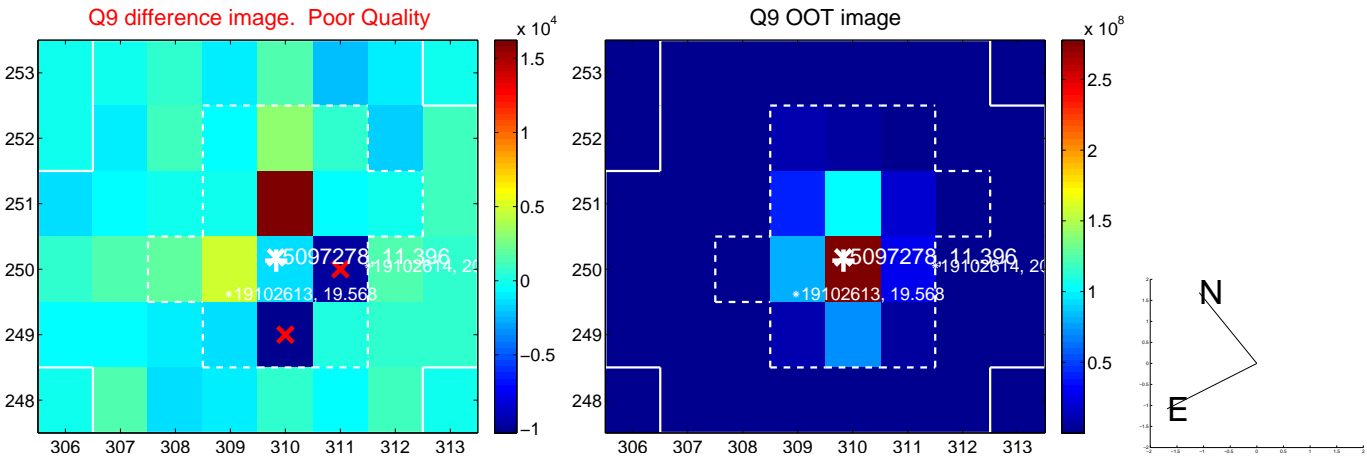


Q8 no OOT image

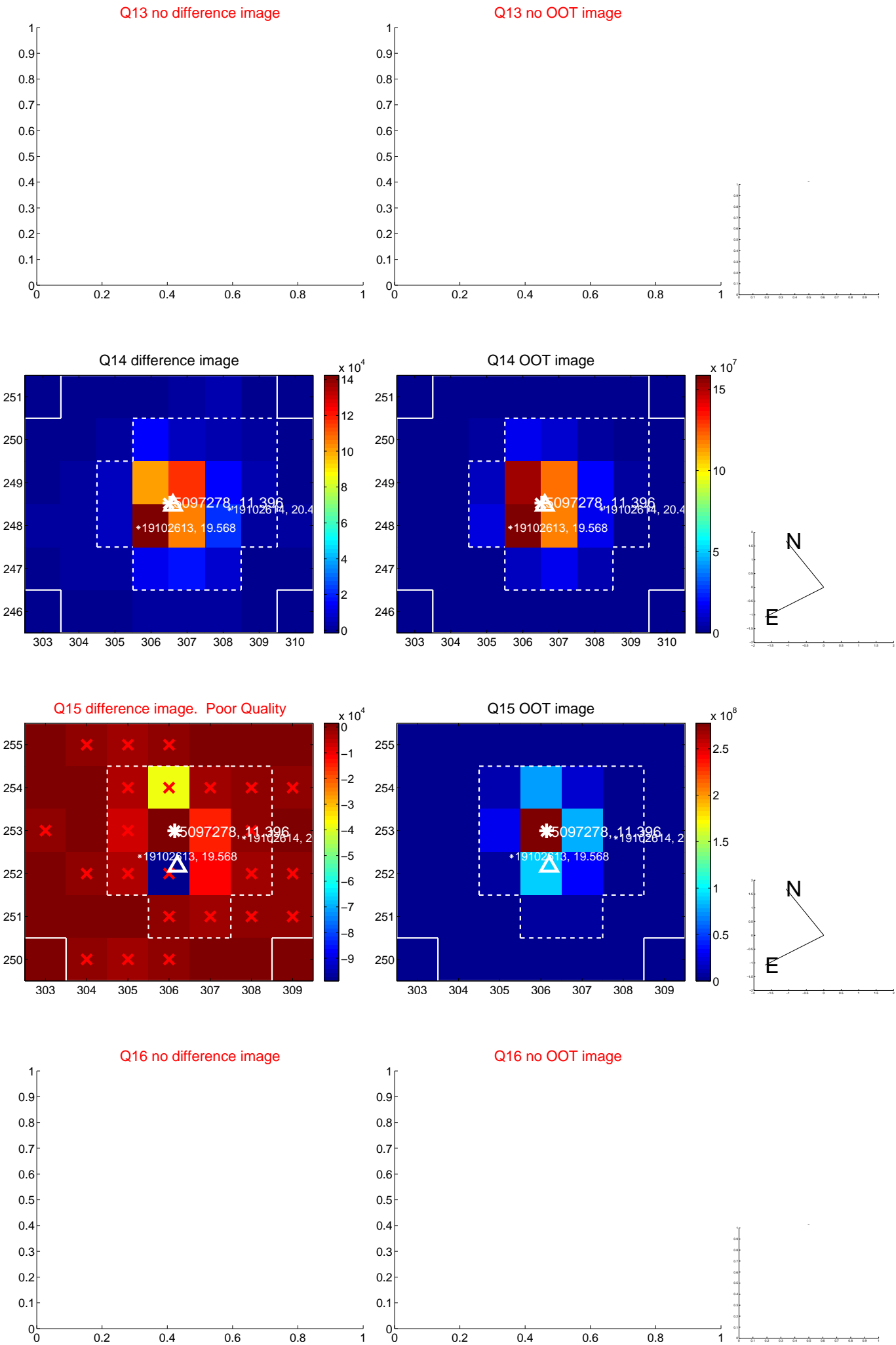




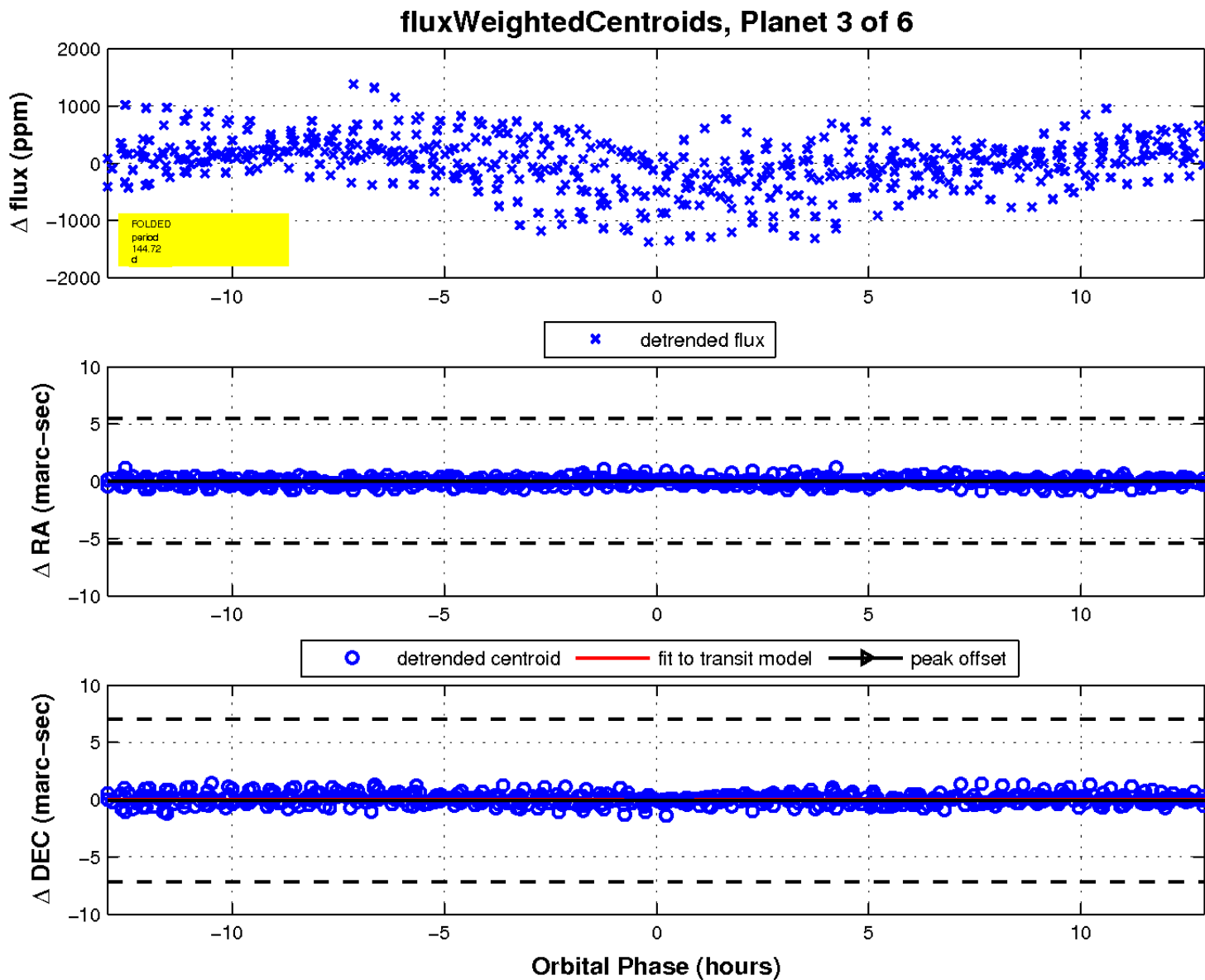
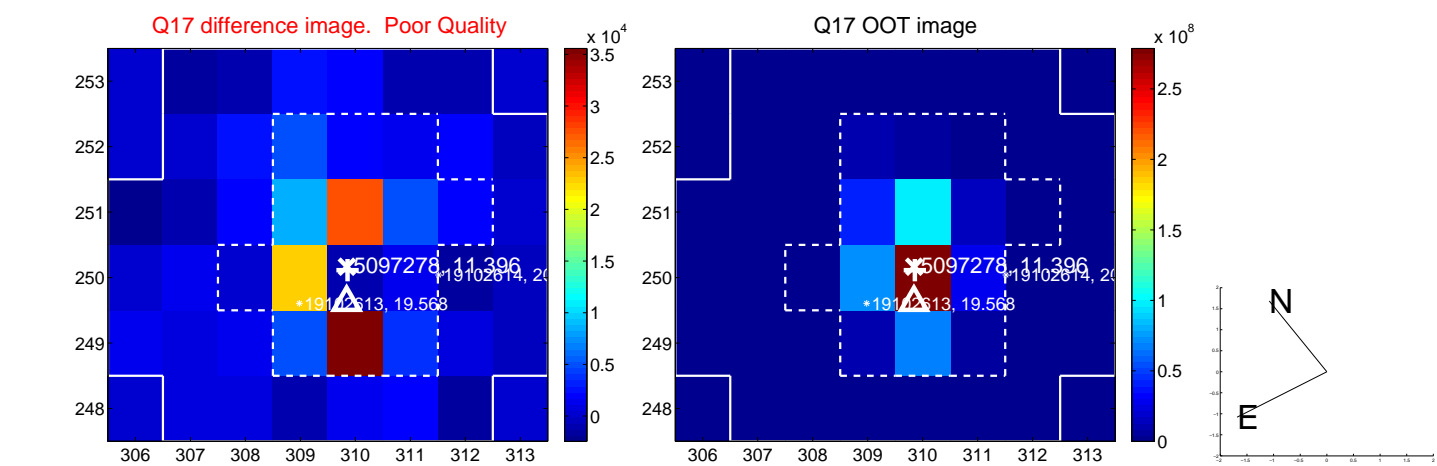
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

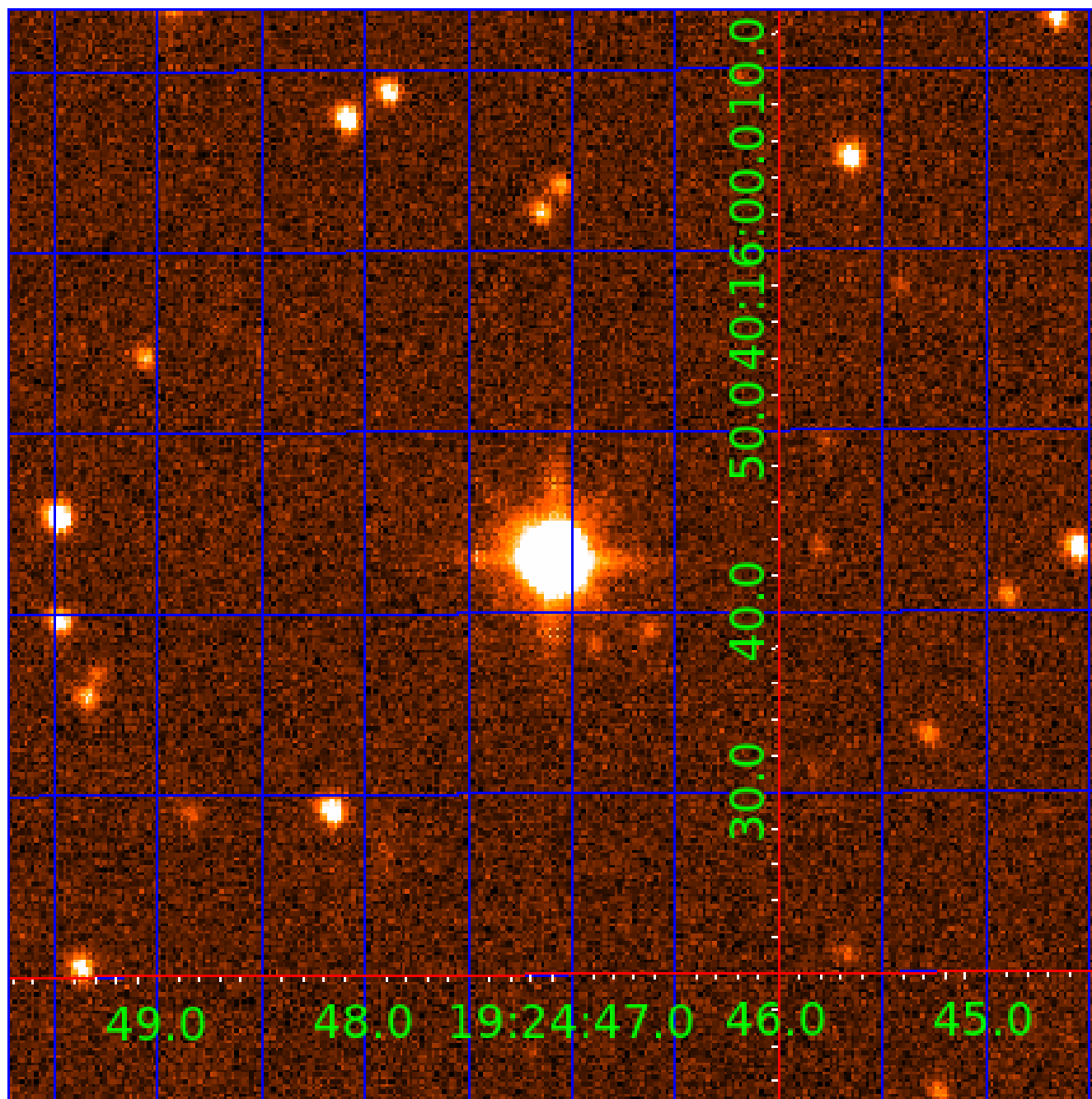


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 005097278

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005097278-01	OBS	No	0.613503	131.565445	30.3	1.287	11.7	12.1	1.77	7392	1.13	31224.49
005097278-02	OBS	No	0.613512	131.867913	30.4	1.207	9.4	11.2	1.77	7392	1.12	31223.93
005097278-03	OBS	No	144.723708	269.841811	1057.7	4.318	8.8	7.5	1.77	7392	10.68	21.42
005097278-04	OBS	No	3.471417	131.524616	121.0	3.500	8.9	-1.0	1.77	7392	1.98	3096.77
005097278-05	OBS	No	103.141368	170.345502	640.1	3.308	8.0	6.5	1.77	7392	5.15	33.65
005097278-06	OBS	No	163.663790	142.434048	818.2	2.135	7.4	6.9	1.77	7392	5.55	18.18

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005097278-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
005097278-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—SAME_NTL_PERIOD—CENT_SATURATED
005097278-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED—HALO_GHOST
005097278-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED
005097278-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED—HALO_GHOST
005097278-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—CENT_SATURATED

**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 005097278-04

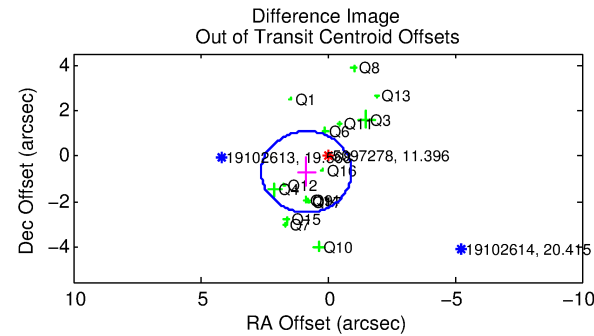
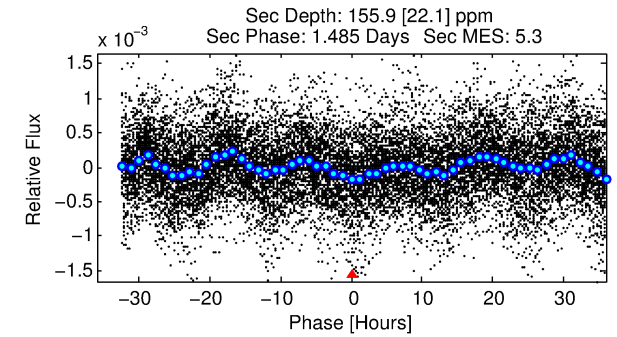
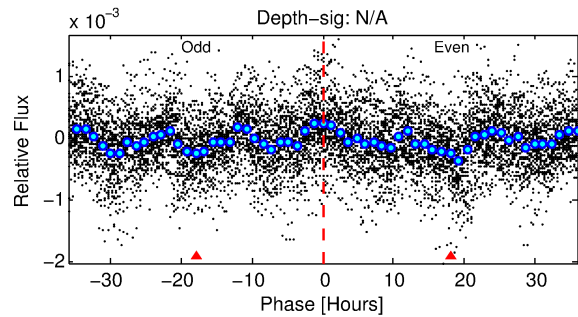
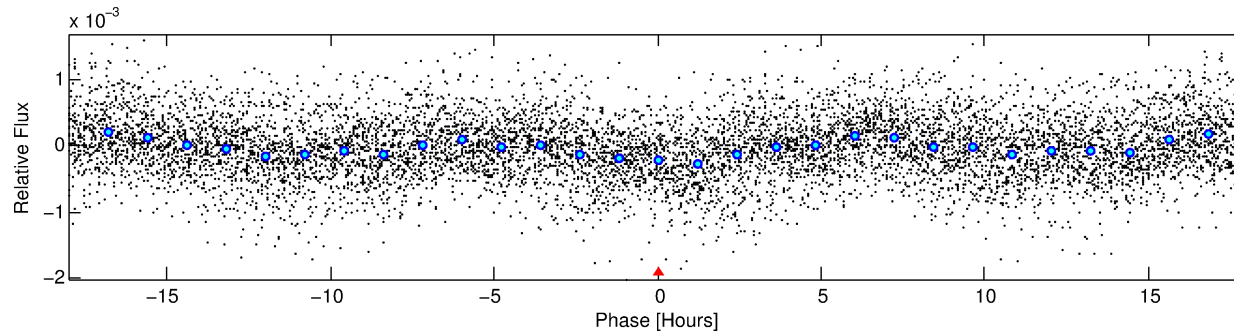
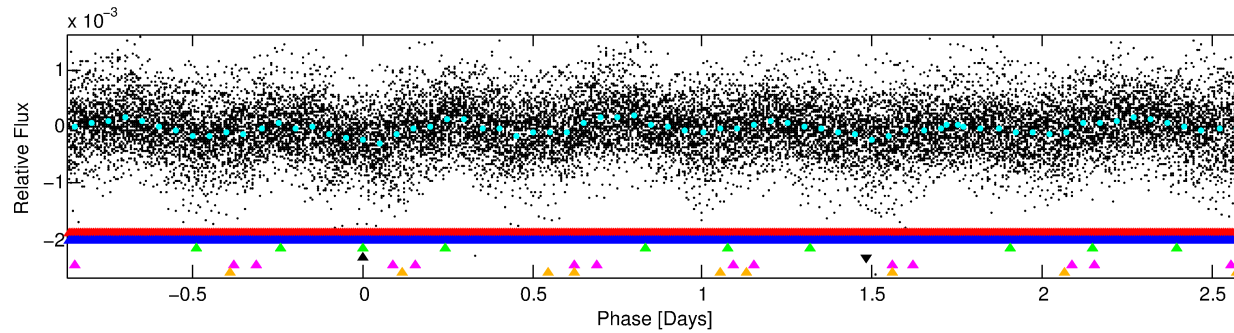
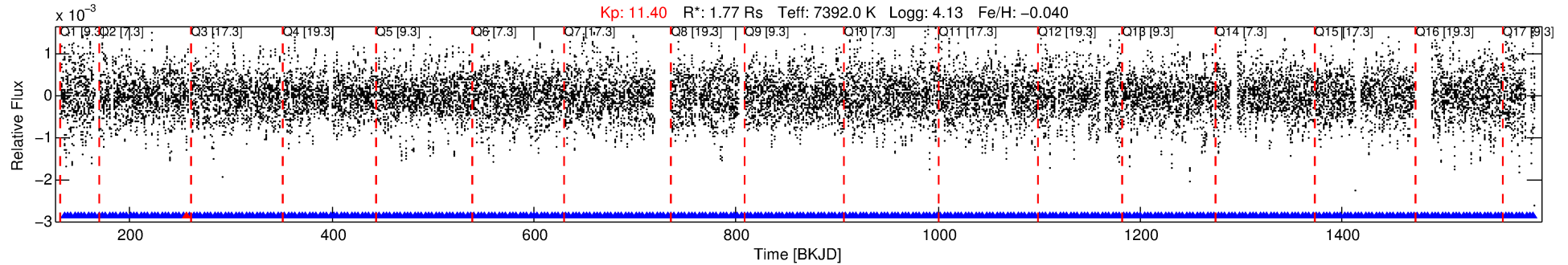
No Significant Match Found



# DV One-Page Summary

KIC: 5097278 Candidate: 4 of 6 Period: 3.471 d  
KOI: K06519 Corr: No Ephemeris Match

Kp: 11.40 R\*: 1.77 Rs Teff: 7392.0 K Logg: 4.13 Fe/H: -0.040



## TPS TCE Results:

Period = 3.47142 d  
Epoch = 131.5246 BKJD

DV fit results are unavailable

## DV Diagnostic Results:

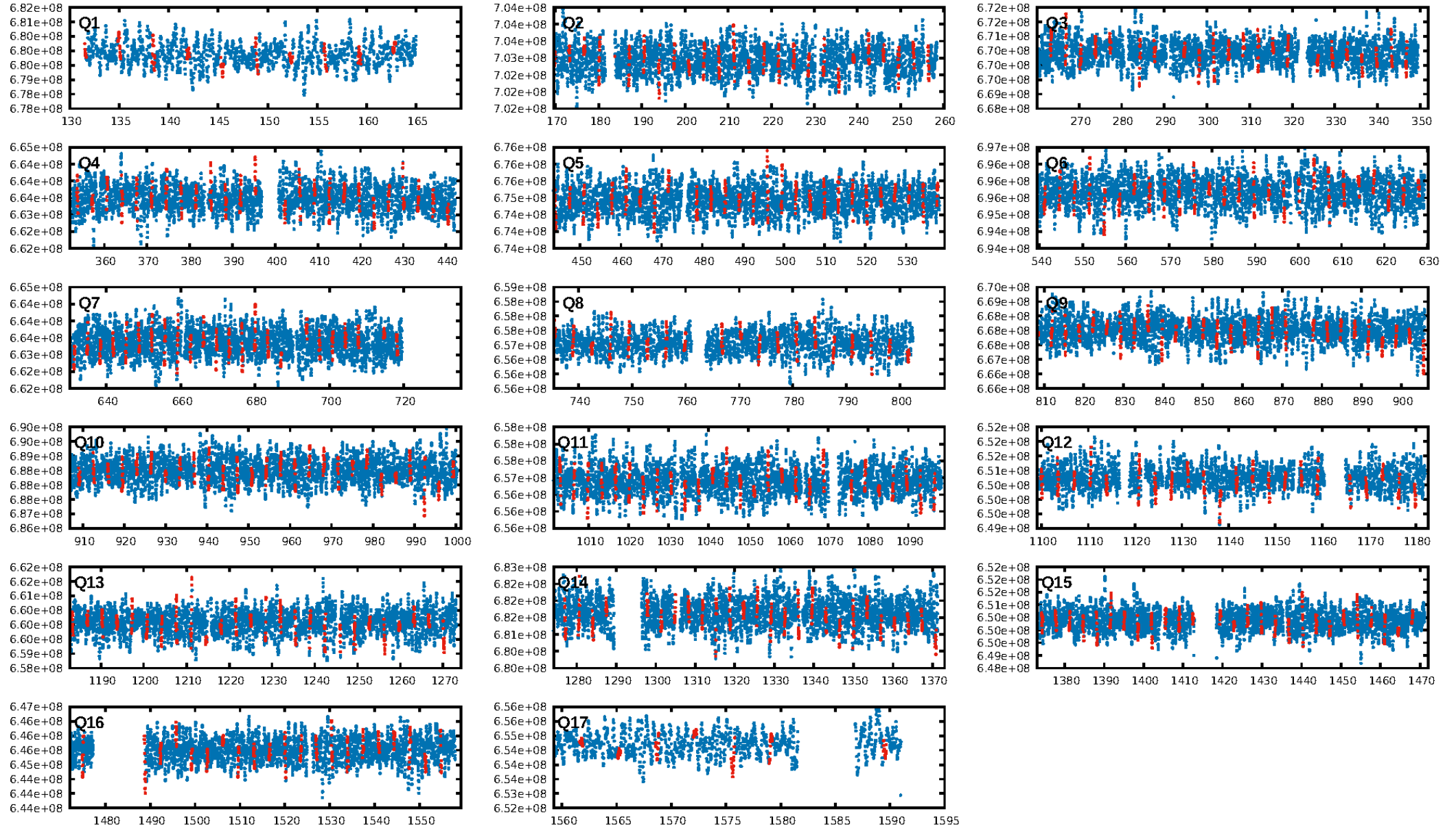
ShortPeriod-sig: 100.0% [18.53σ]  
LongPeriod-sig: 100.0% [496.74σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.82e-11  
RollingBand-fgt: 1.00 [367/368]  
GhostDiagnostic-chr: 2.294

Centroid-sig: 0.0%  
Centroid-so: 0.214 arcsec [3.13σ]  
OotOffset-rm: 1.073 arcsec [1.81σ]  
KicOffset-rm: 1.140 arcsec [1.86σ]  
OotOffset-st: 3/4/4/4 [15]  
KicOffset-st: 3/4/4/4 [15]  
DiffImageQuality-fgm: 0.60 [9/15]  
DiffImageOverlap-fno: 0.00 [0/17]

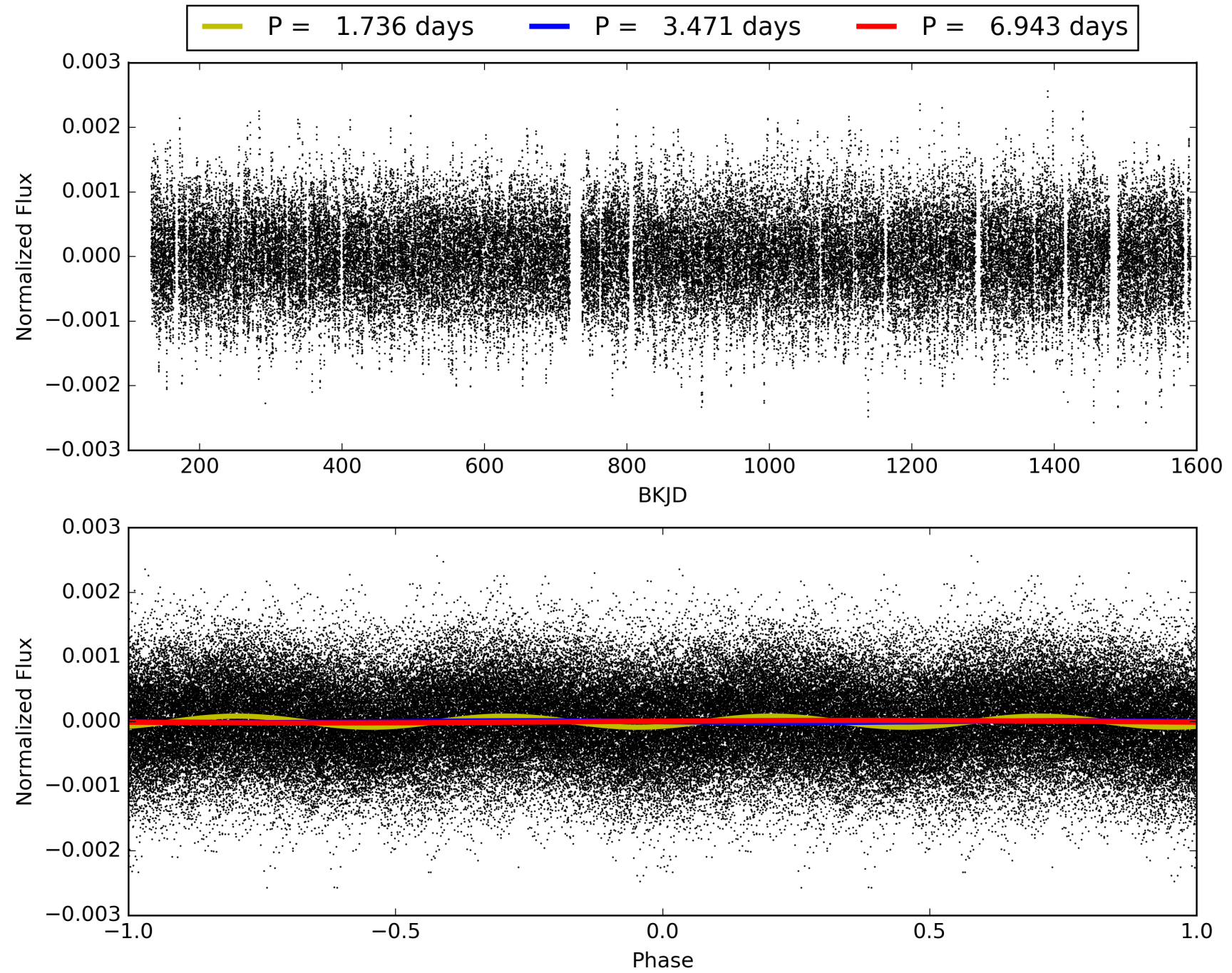
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 13:29:22 Z

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

# TCE 005097278-04, PDC Light Curves



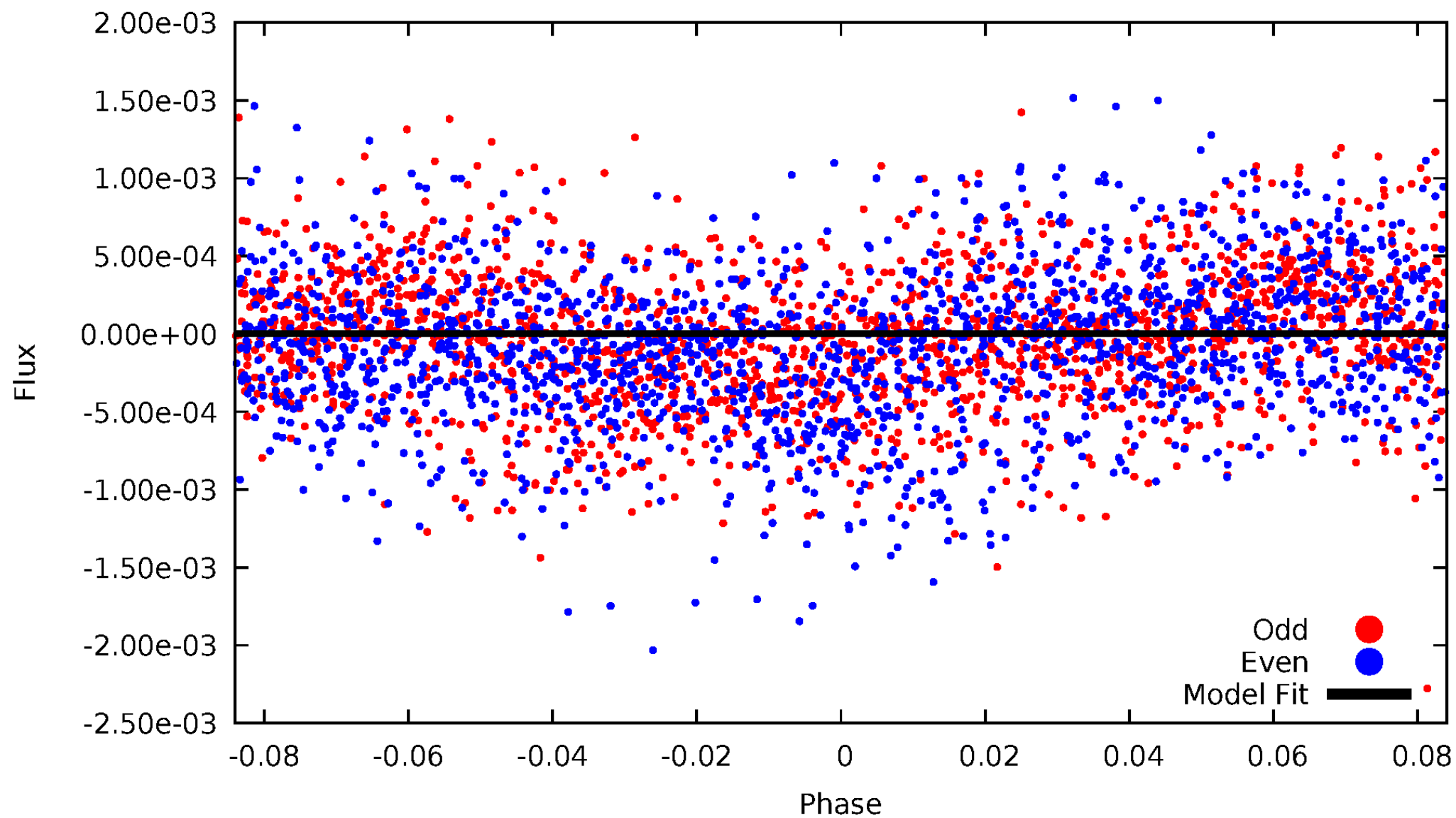
TCE 005097278-04





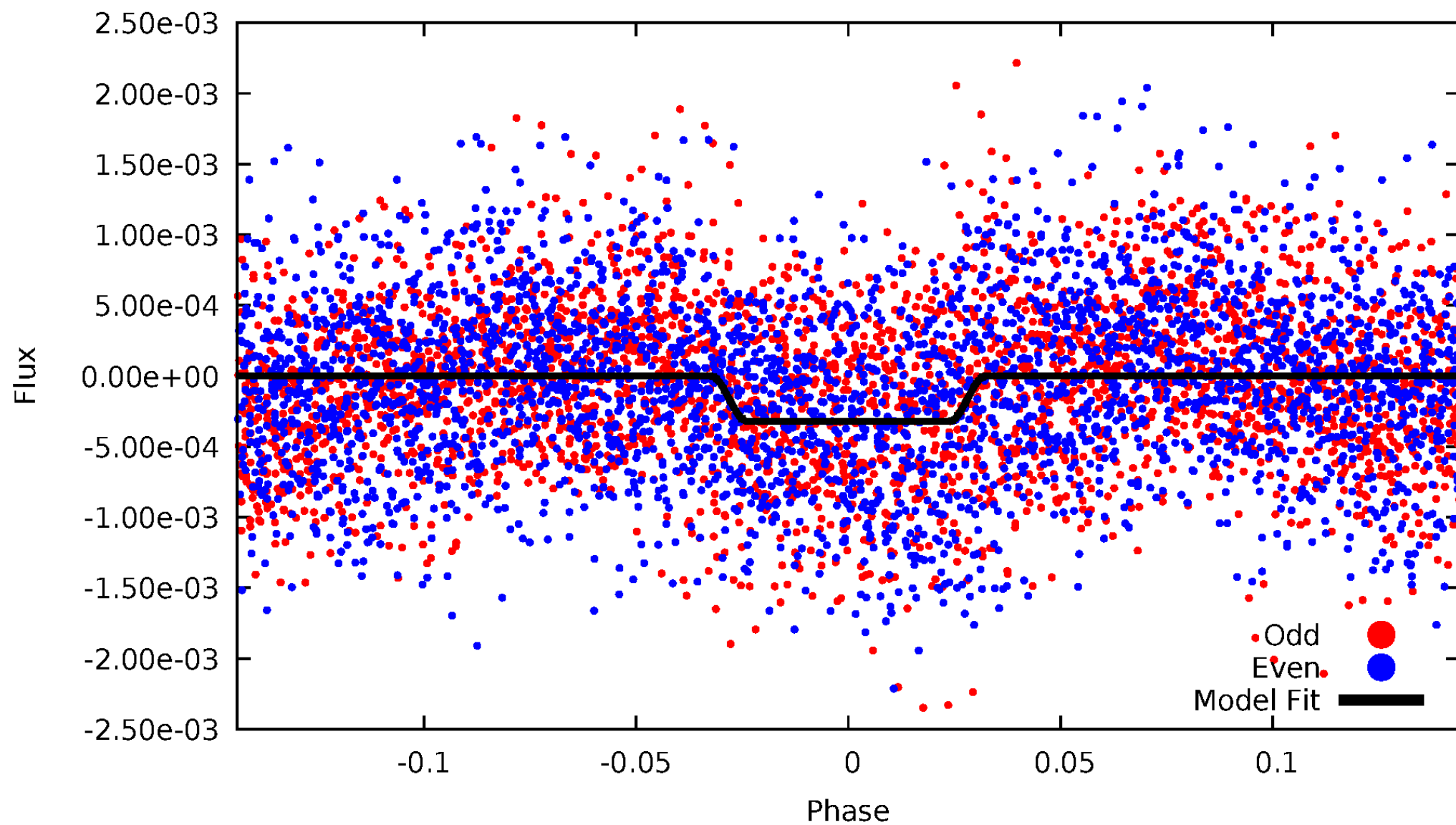
DV Odd/Even

TCE 005097278-04



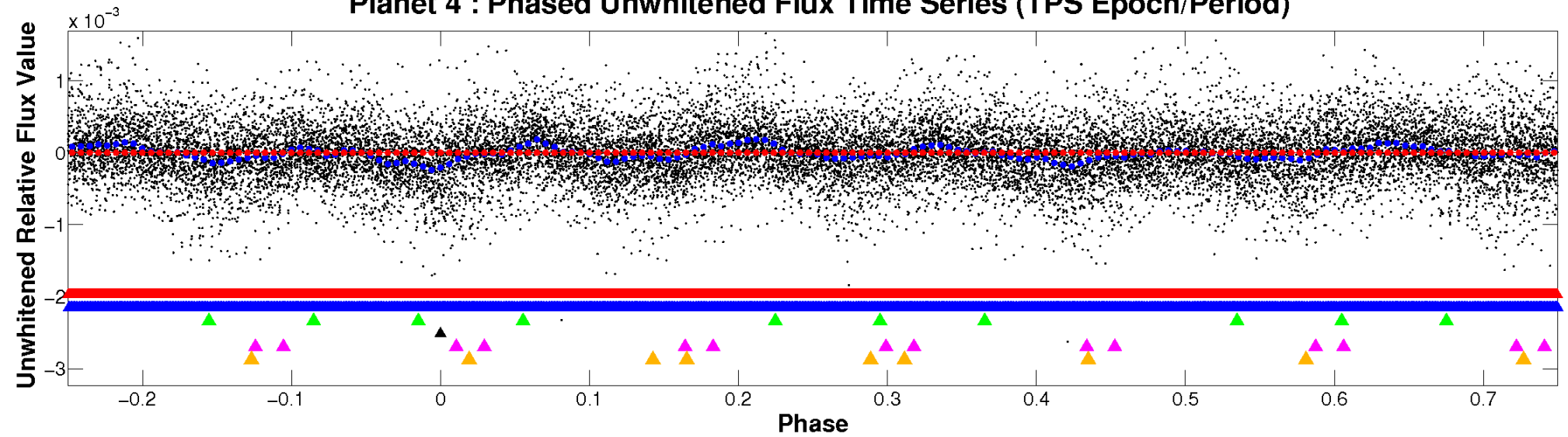
# ALT Odd/Even

TCE 005097278-04



# Non-Whitened Vs. Whitened Light Curve

**Planet 4 : Phased Unwhitened Flux Time Series (TPS Epoch/Period)**



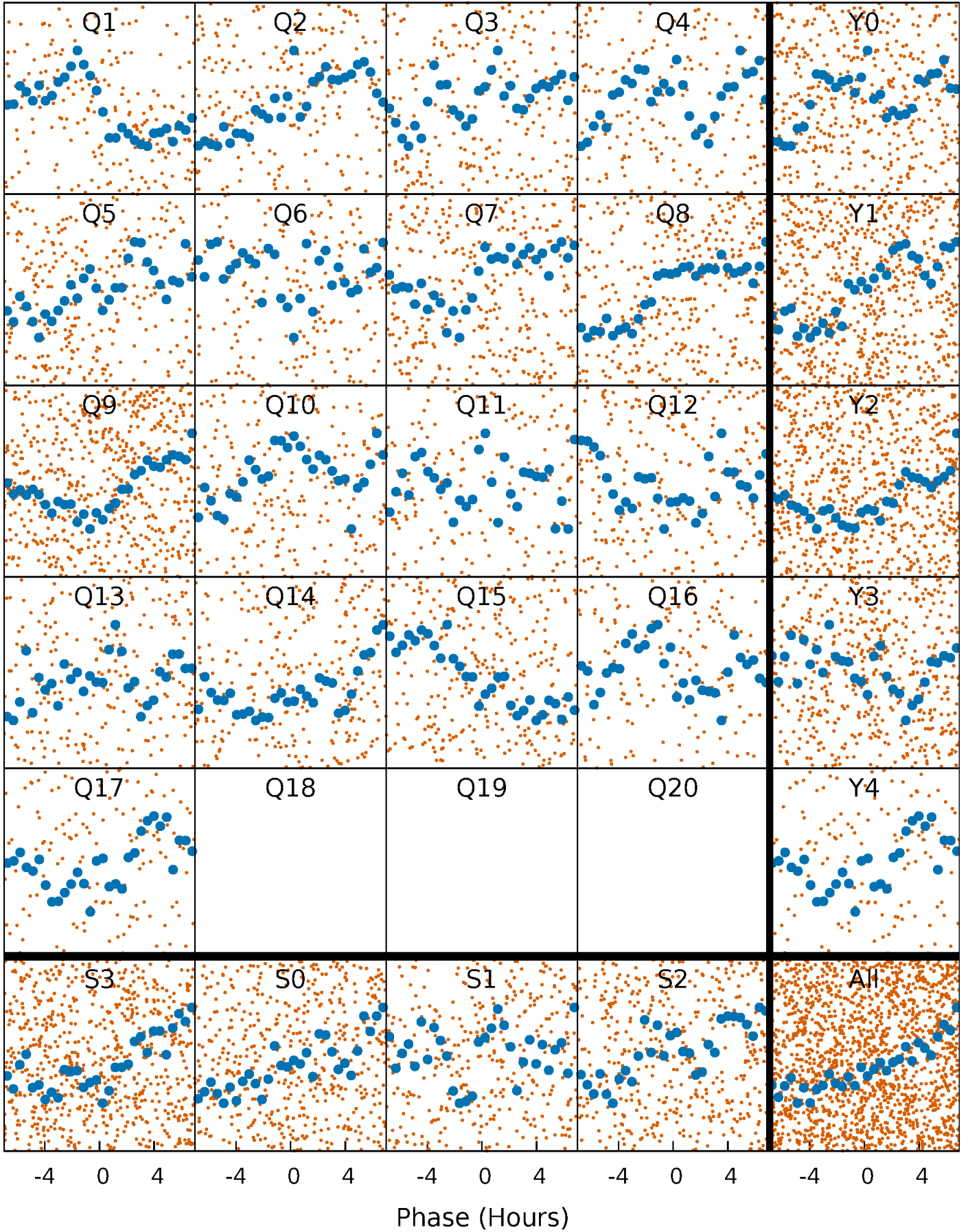
**Planet 4 : Phased Whitened Flux Time Series (TPS Epoch/Period)**





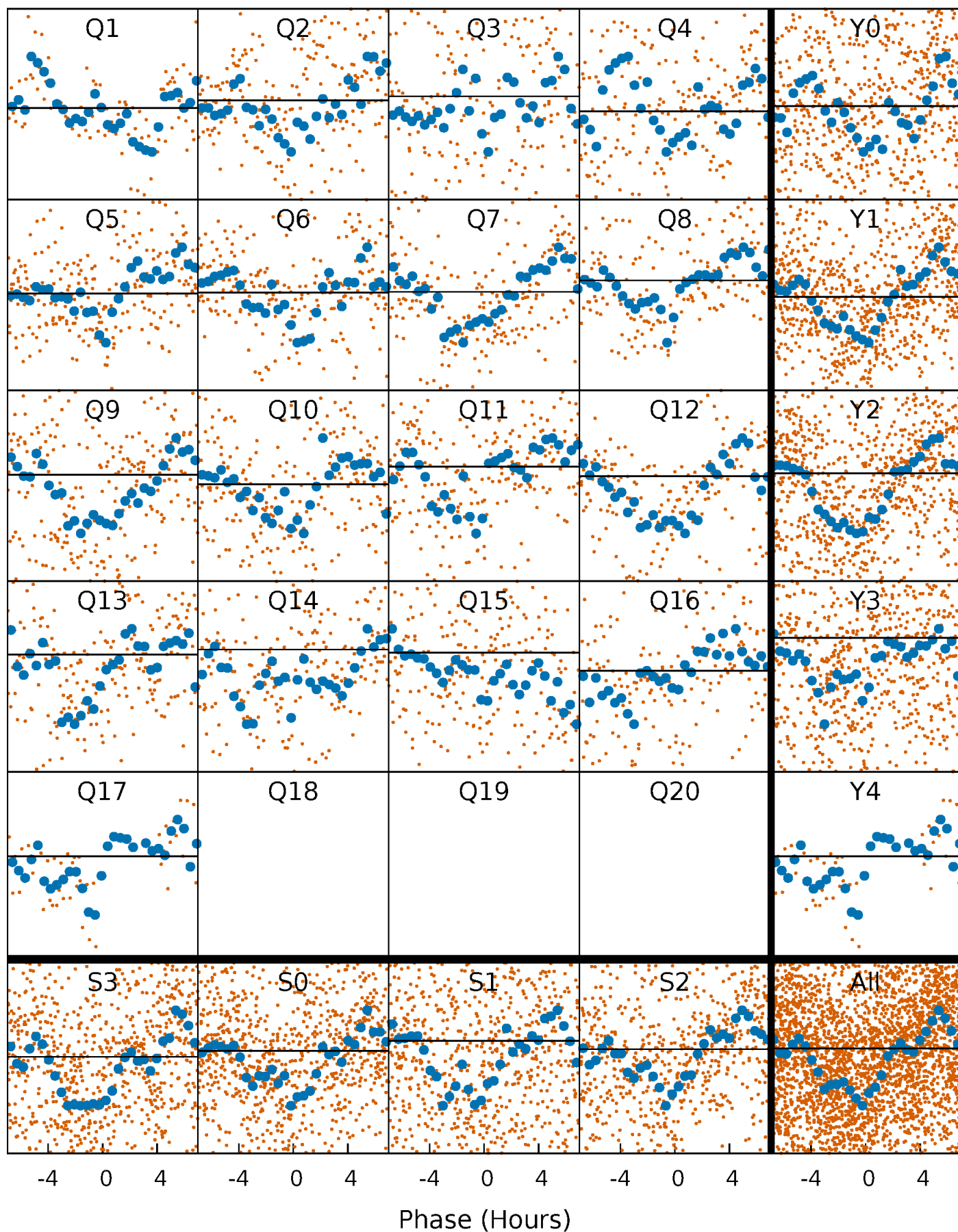
# PDC Quarter-Phased Transit Curves

TCE 005097278-04   P= 3.471417 Days    $T_0=131.524616$  (BKJD)



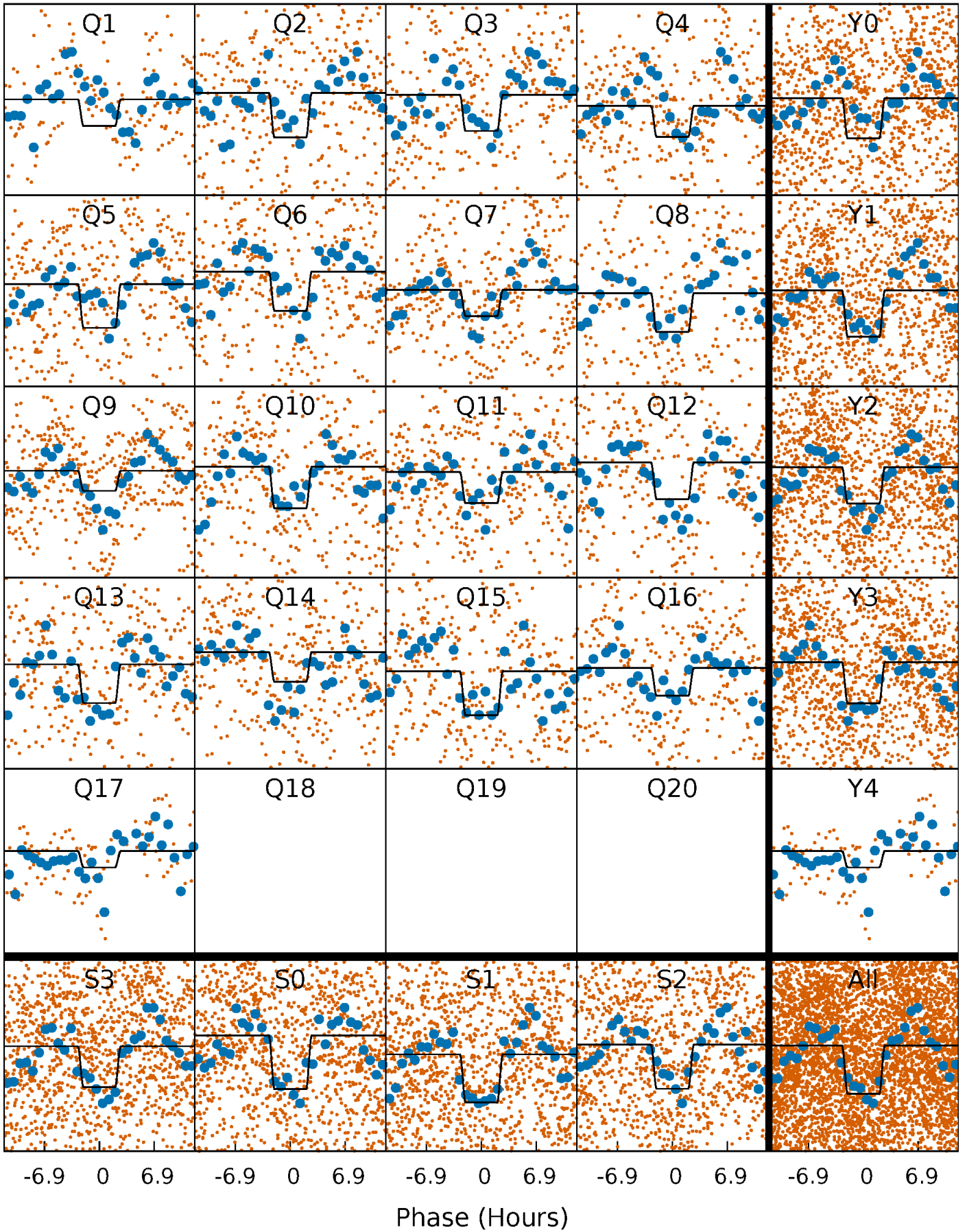
# DV Quarter-Phased Transit Curves

TCE 005097278-04 P= 3.471417 Days  $T_0=131.524616$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

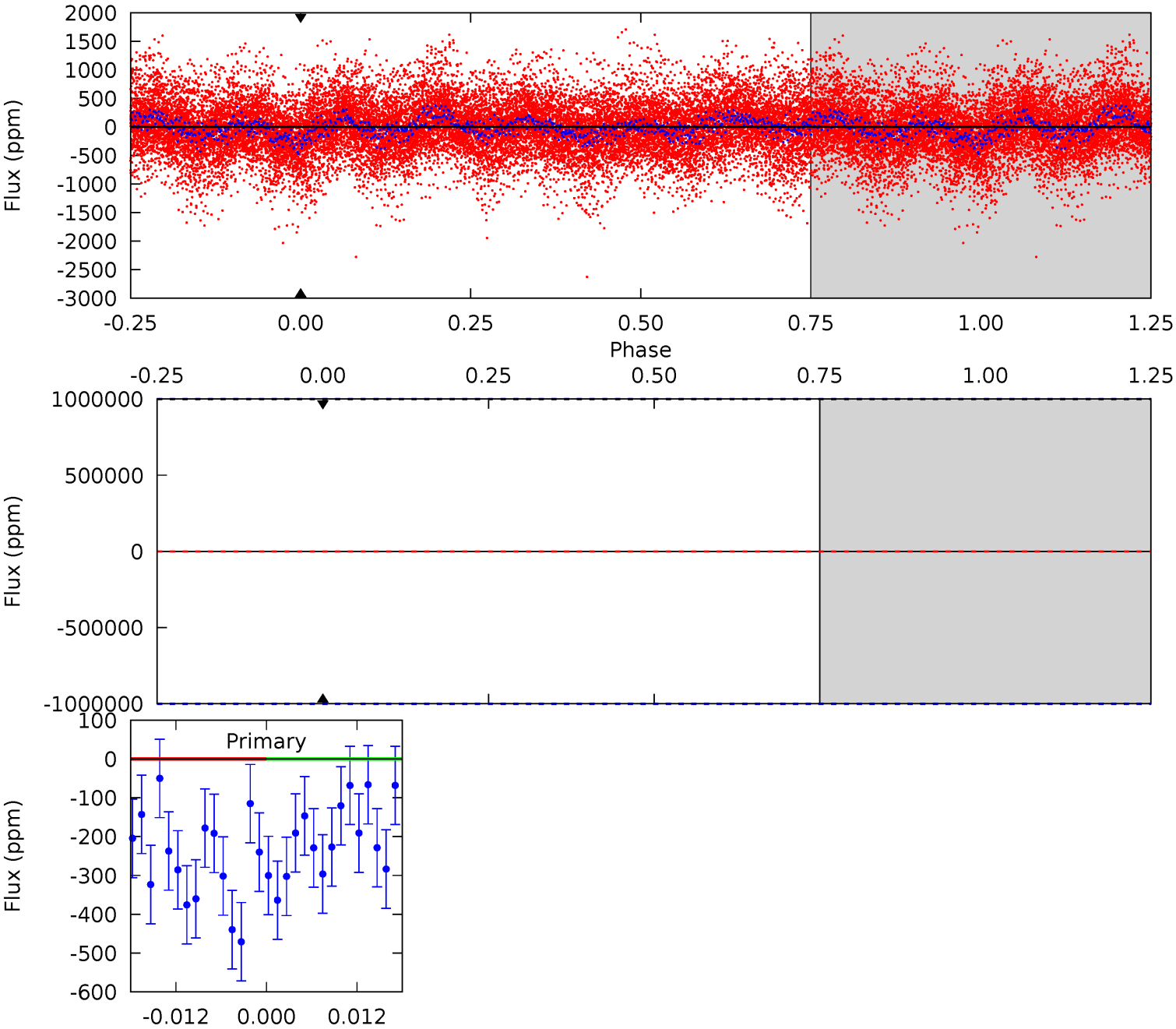
TCE 005097278-04   P= 3.471417 Days    $T_0=134.945256$  (BKJD)



# DV Model-Shift Uniqueness Test

005097278-04, P = 3.471417 Days, E = 131.524616 Days

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

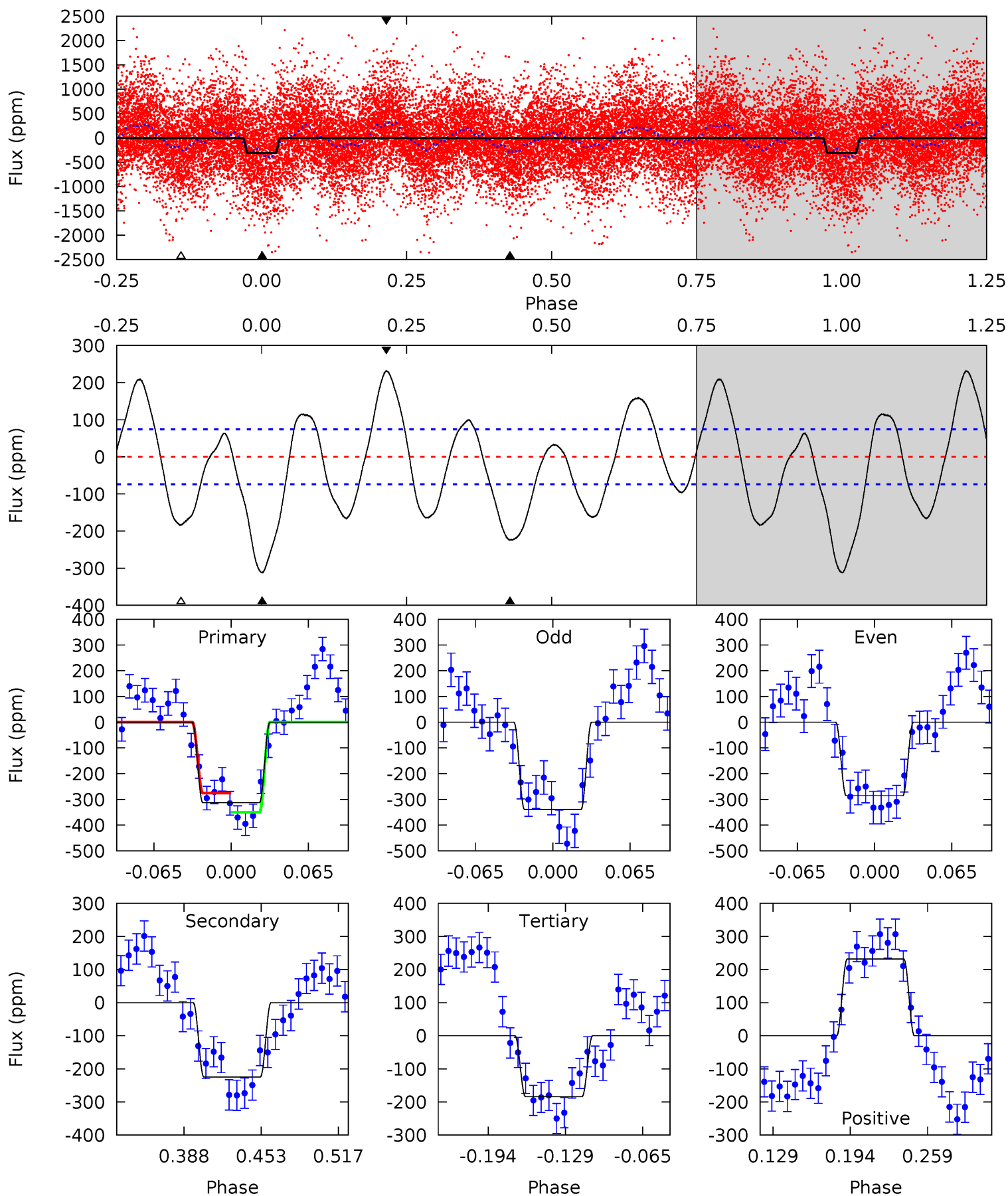




# Alt Model-Shift Uniqueness Test

005097278-04, P = 3.471417 Days, E = 131.473839 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
19.7	14.1	11.6	14.6	4.66	1.85	7.23	8.09	5.11	2.55	-0.43	1.66	1.16	0.43	2.35



### Stellar Parameters For KIC 005097278

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7392^{+207}_{-337}$	$4.135^{+0.128}_{-0.192}$	$-0.040^{+0.200}_{-0.350}$	$1.772^{+0.548}_{-0.365}$	$1.563^{+0.213}_{-0.237}$	$0.396^{+0.253}_{-0.209}$
	+3%/-5%	+3%/-5%	+500%/-875%	+31%/-21%	+14%/-15%	+64%/-53%
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 005097278-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$0 \pm 1000000$	$14.10^{+15.61}_{-9.72}$	$2675^{+213}_{-174}$	$6771^{+36157}_{-45407}$	$25^{+1439}_{-1230}$
Alt.	$-225 \pm 16$	$15.06^{+15.32}_{-10.77}$	$2680^{+208}_{-180}$	$3508^{+2461}_{-1101}$	$1.482^{+16.603}_{-1.110}$

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



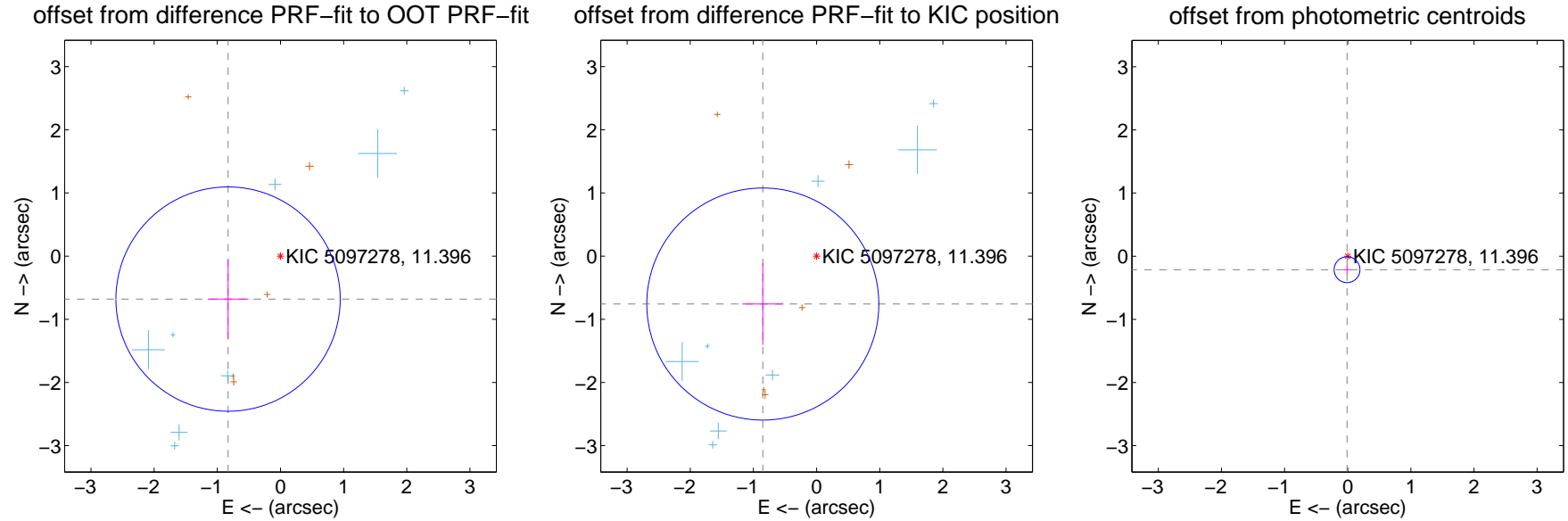
## DV Centroid Data

Supplemental centroid analysis for 005097278-04. **Kepler magnitude: 11.40.** Transit SNR -1.00

There are 9 quarters with good PRF difference image offsets

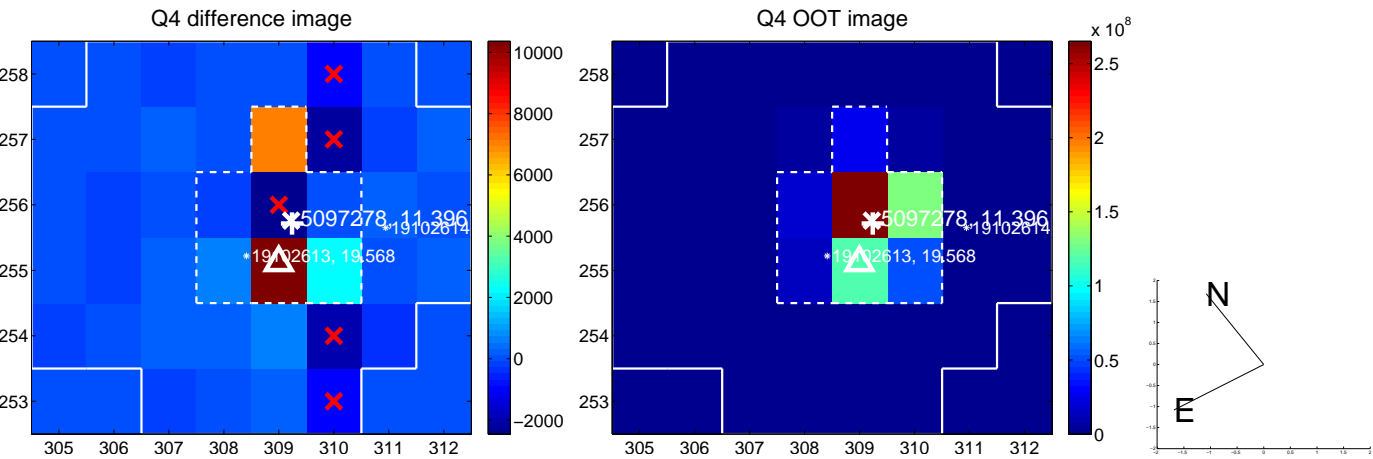
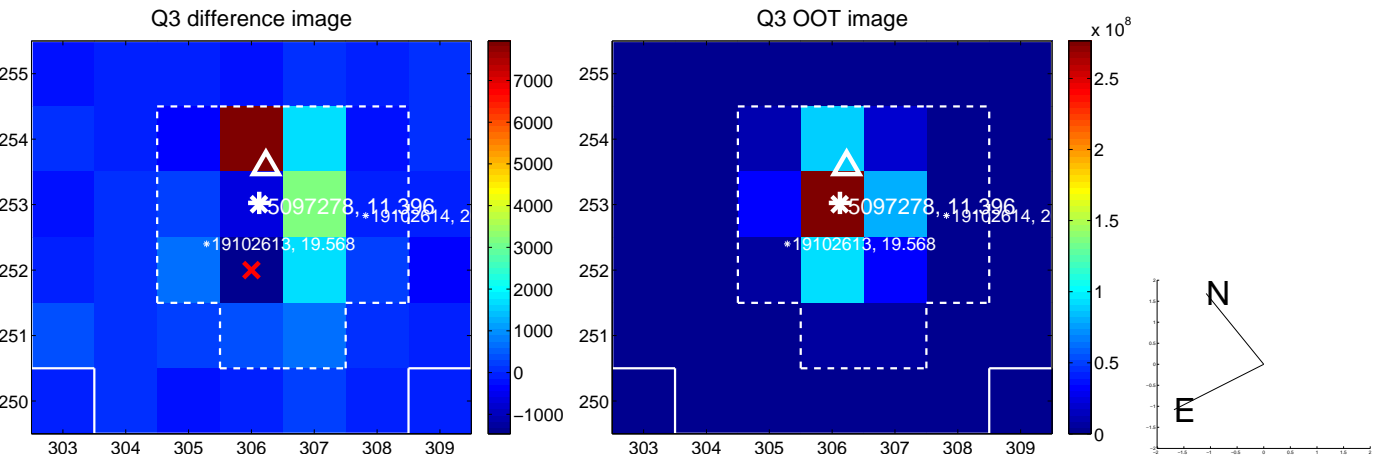
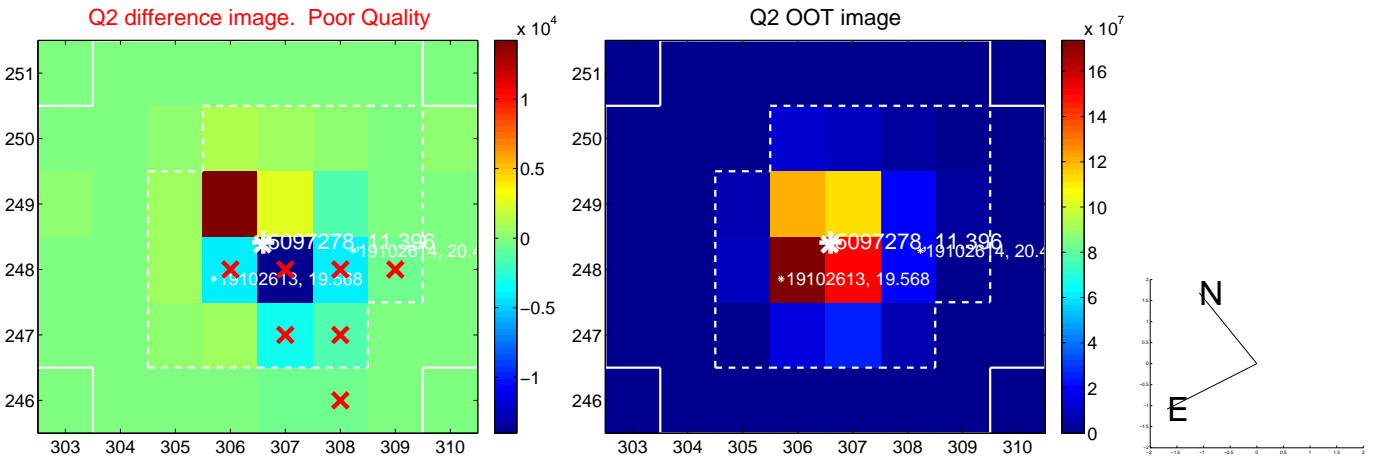
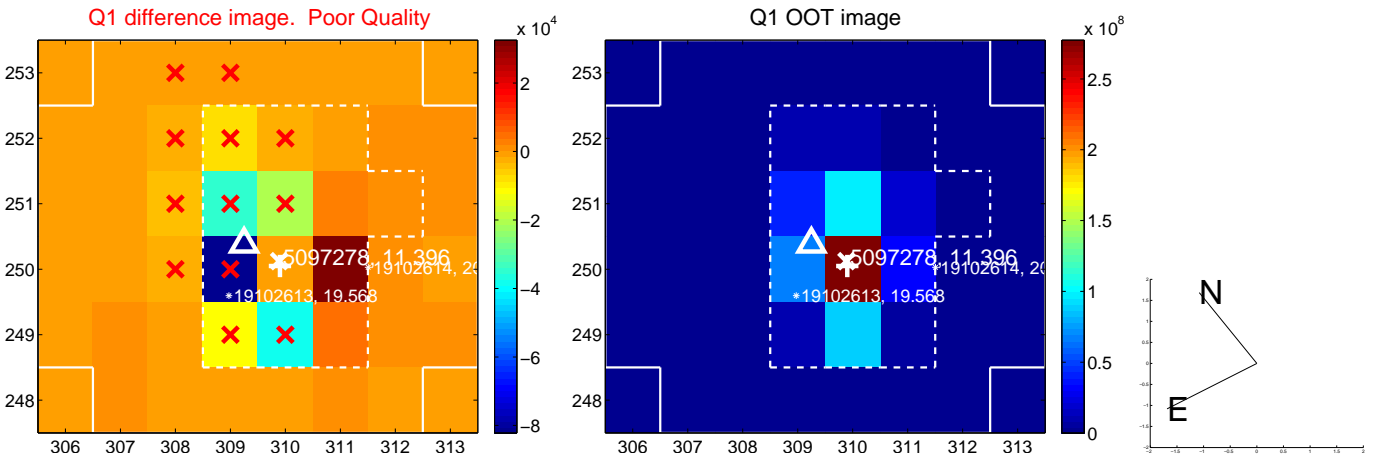
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.073 \pm 0.592$	1.81	$0.829 \pm 0.323$	$-0.680 \pm 0.627$
PRF-fit source offset from KIC position	$1.140 \pm 0.612$	1.86	$0.851 \pm 0.326$	$-0.759 \pm 0.646$
photometric centroid source offset	<b><math>0.21 \pm 0.07</math></b>	<b>3.13</b>	$0.01 \pm 0.06$	$-0.21 \pm 0.07$

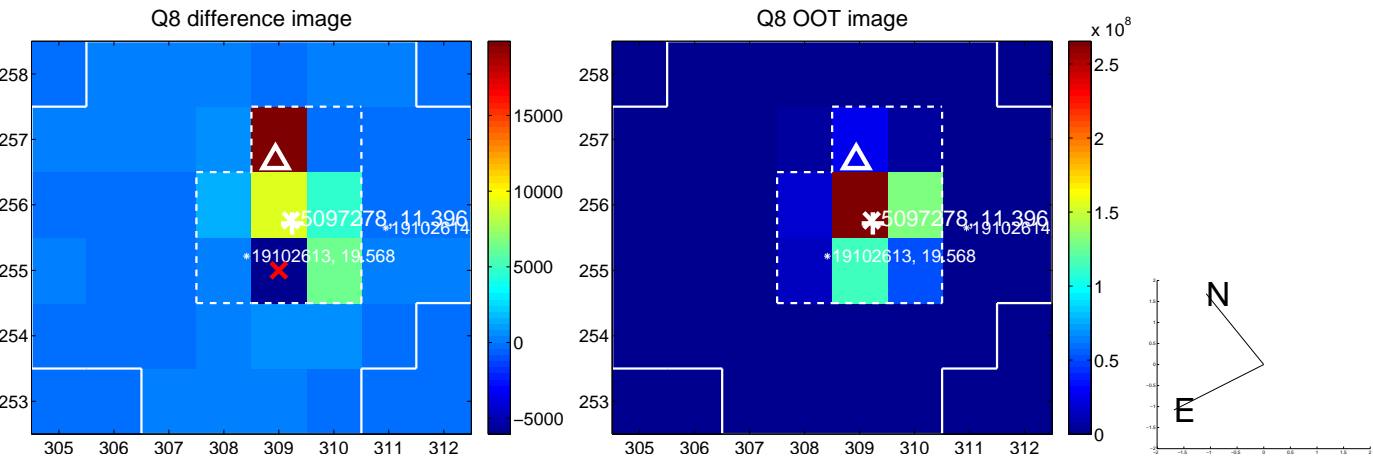
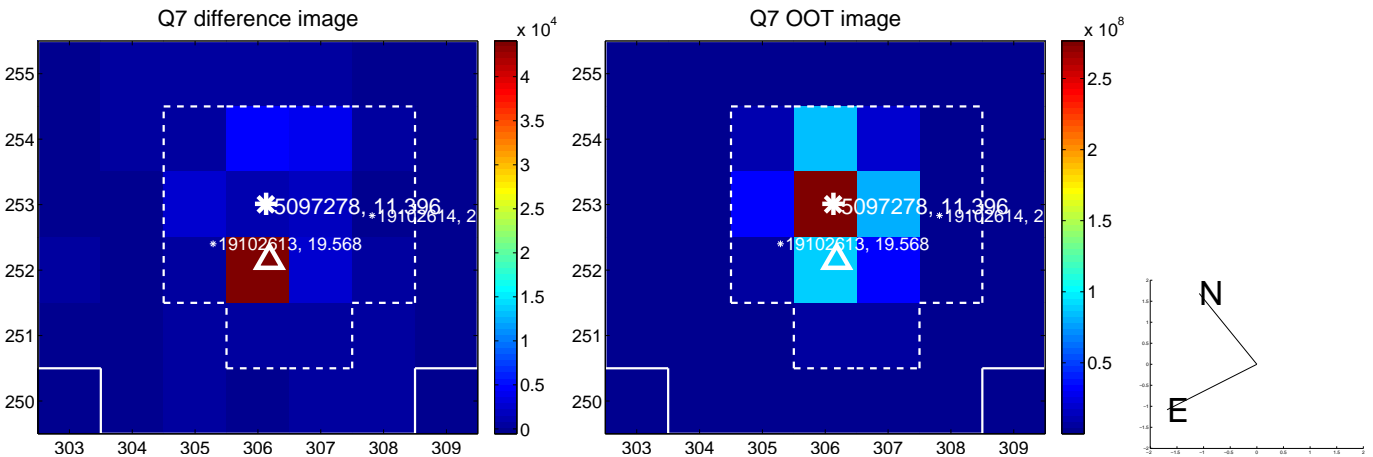
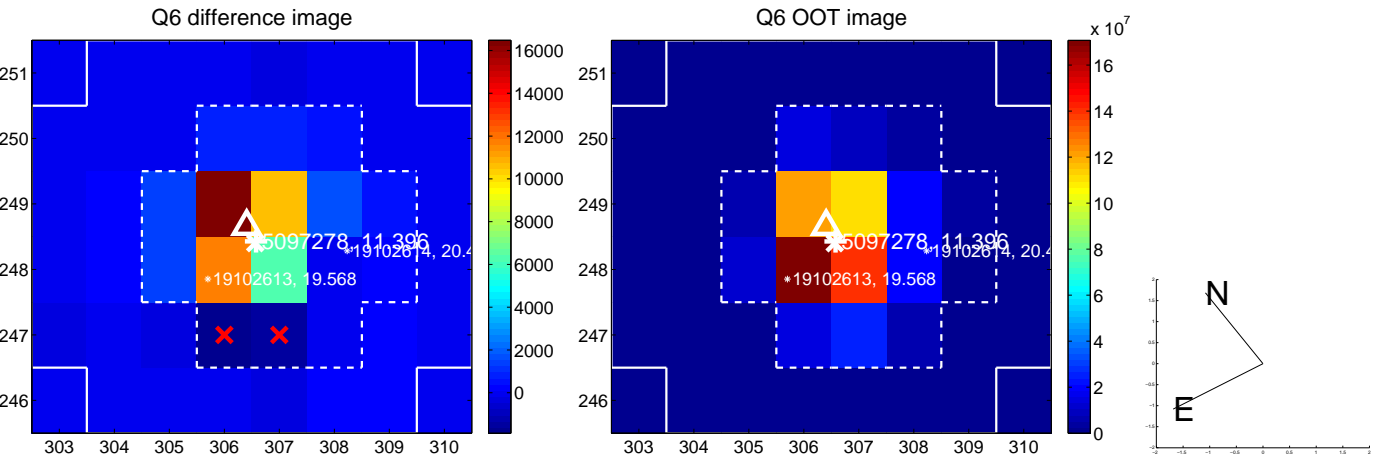
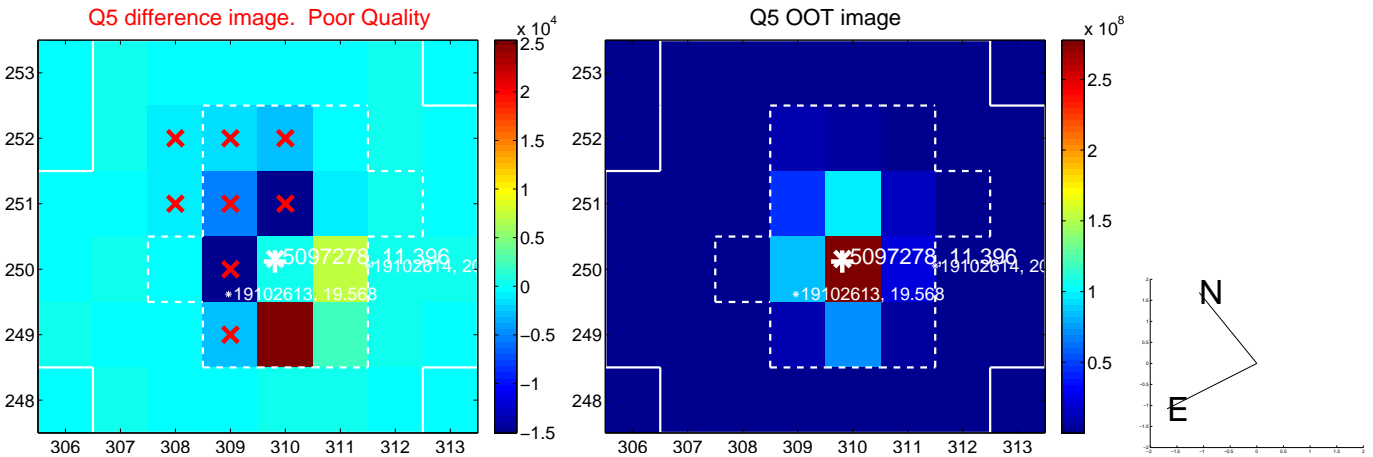


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

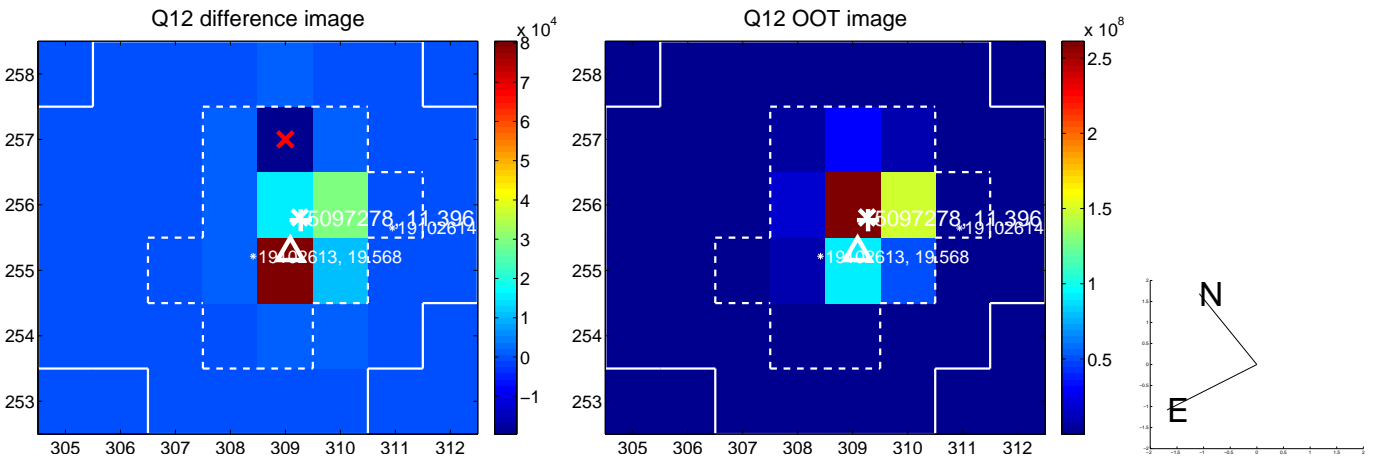
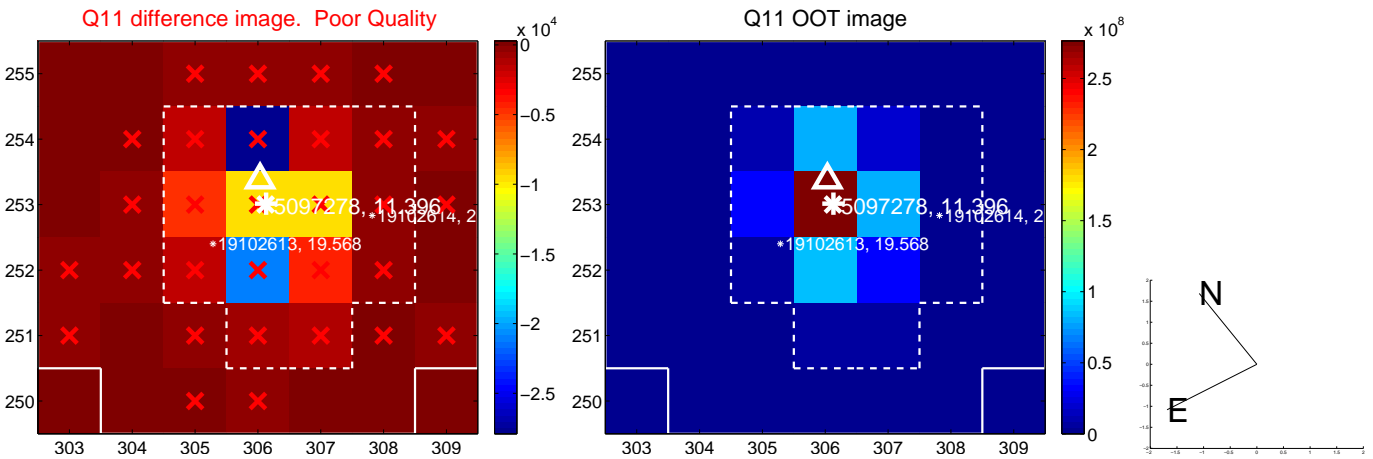
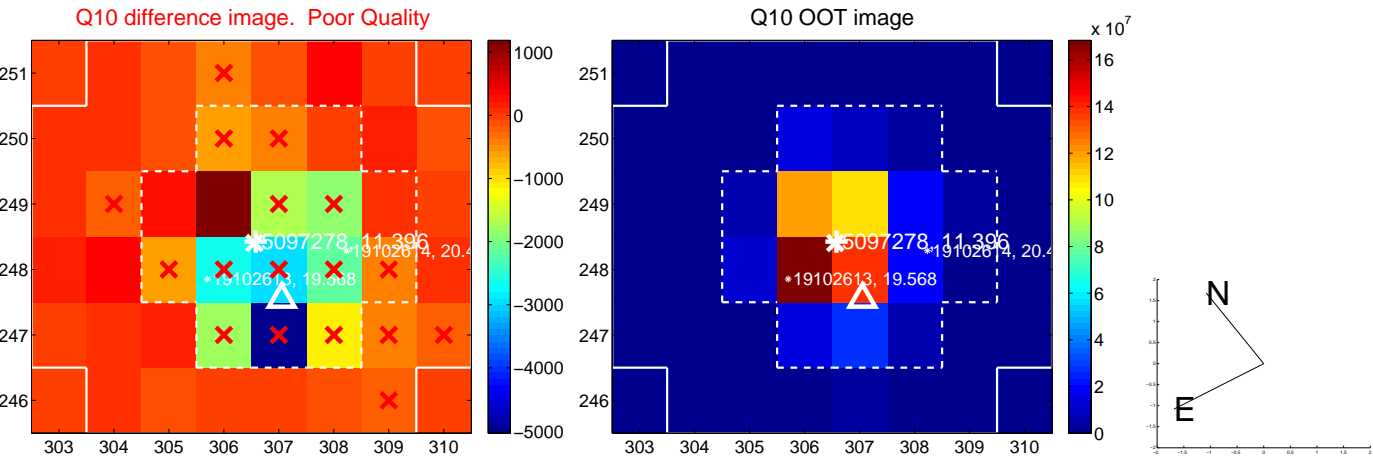
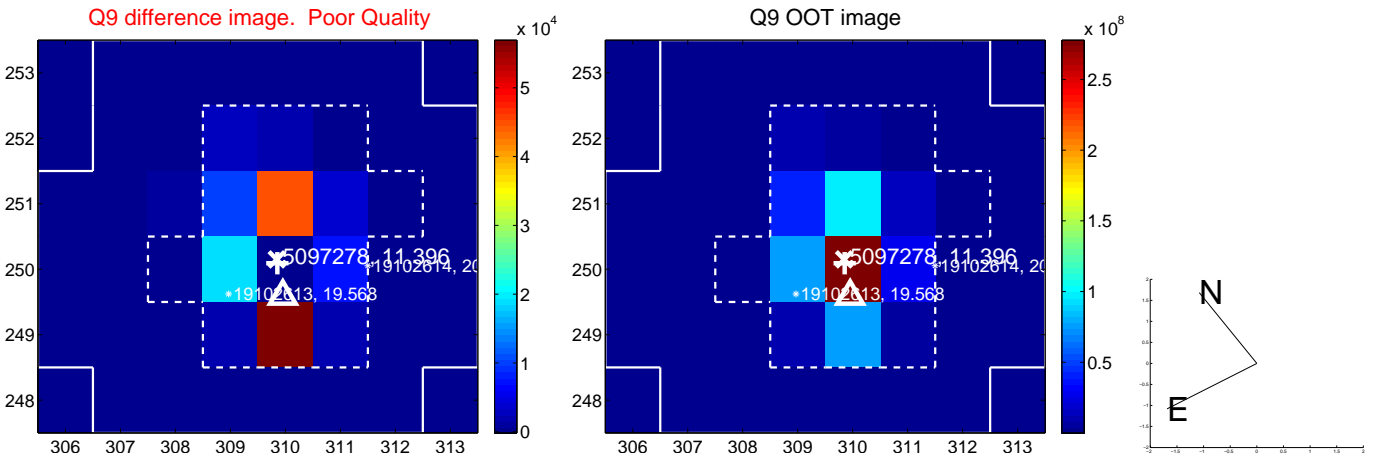
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



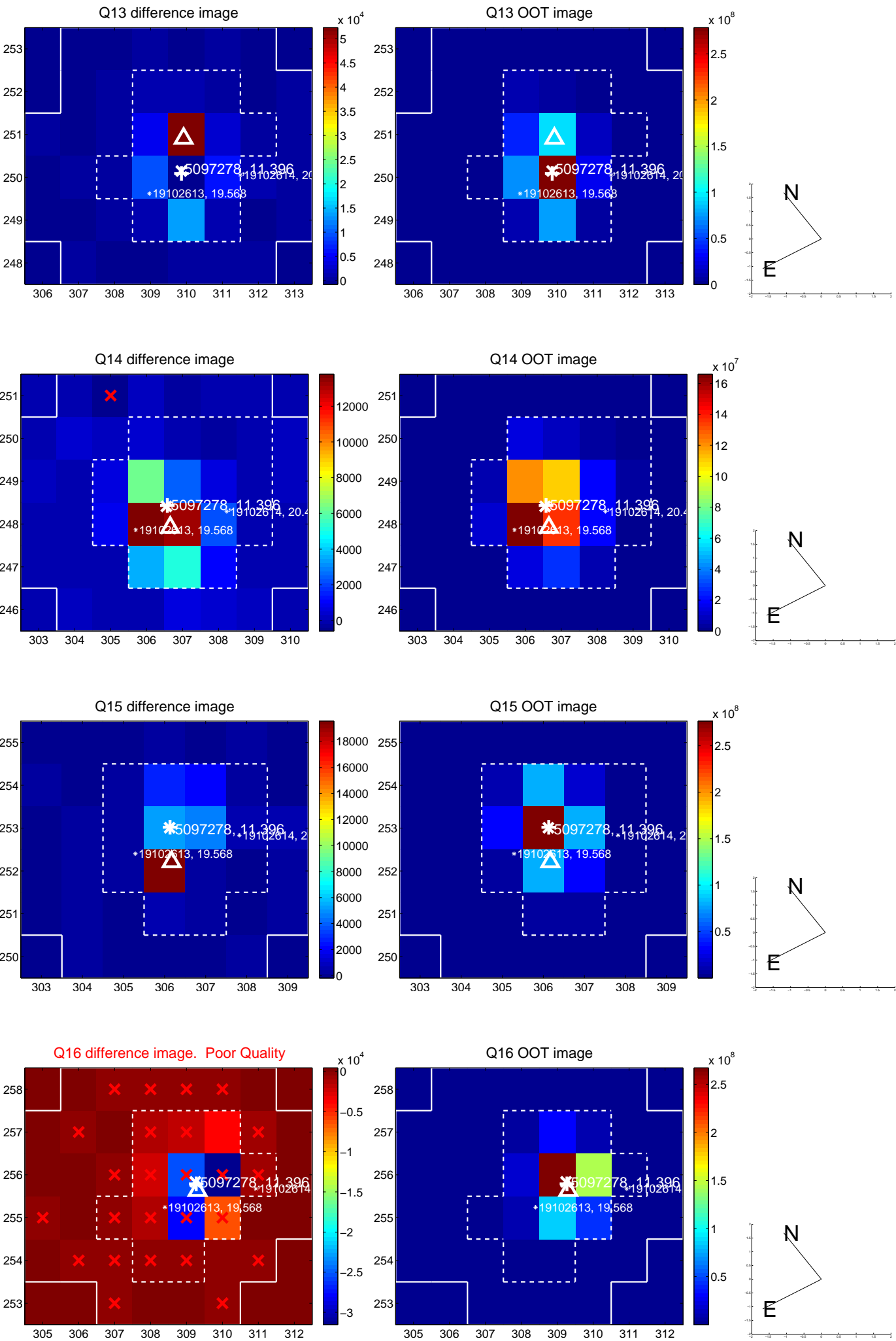
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



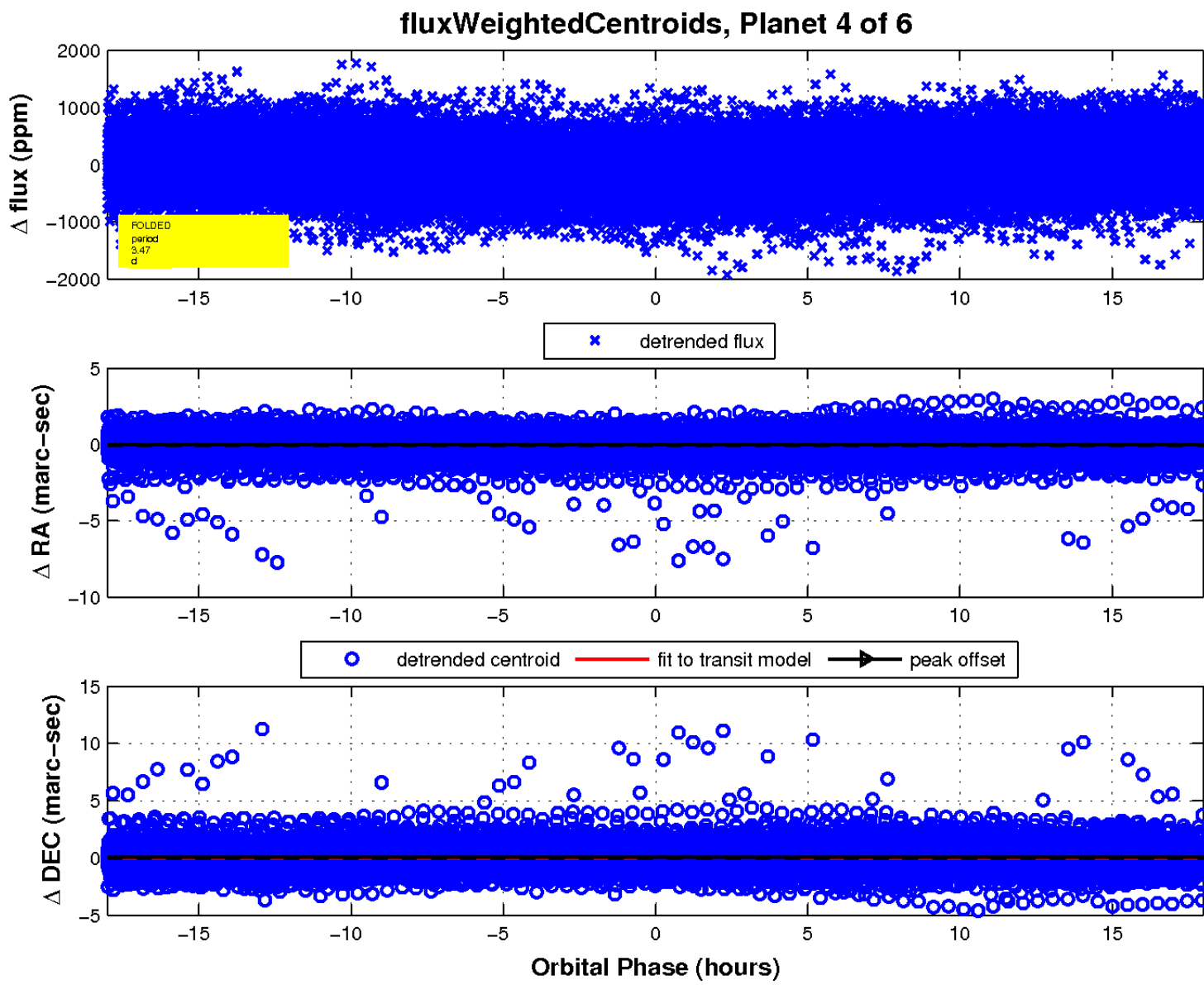
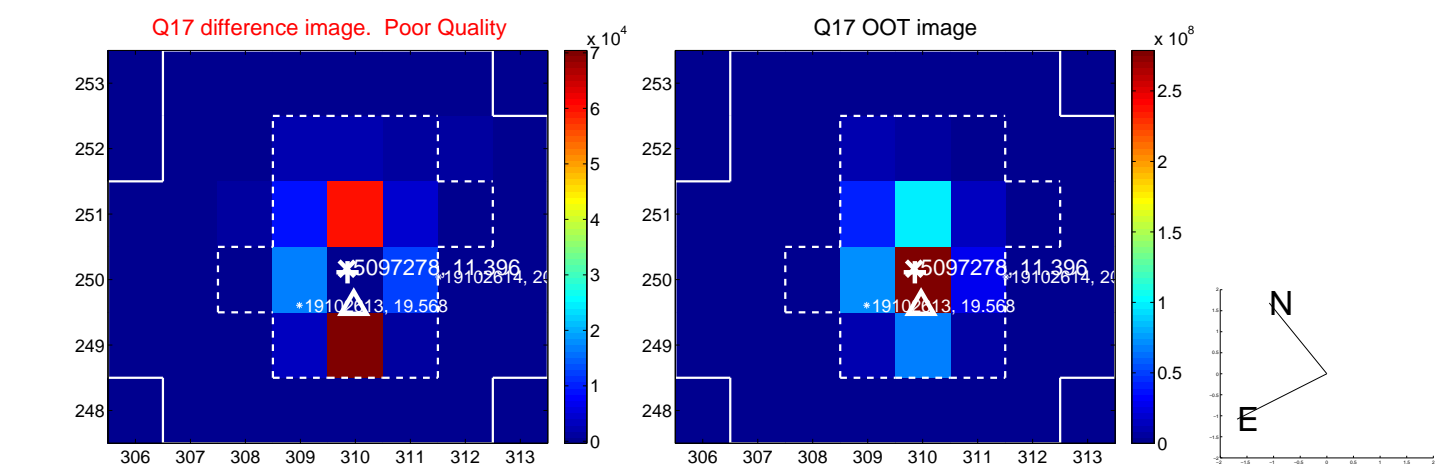
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



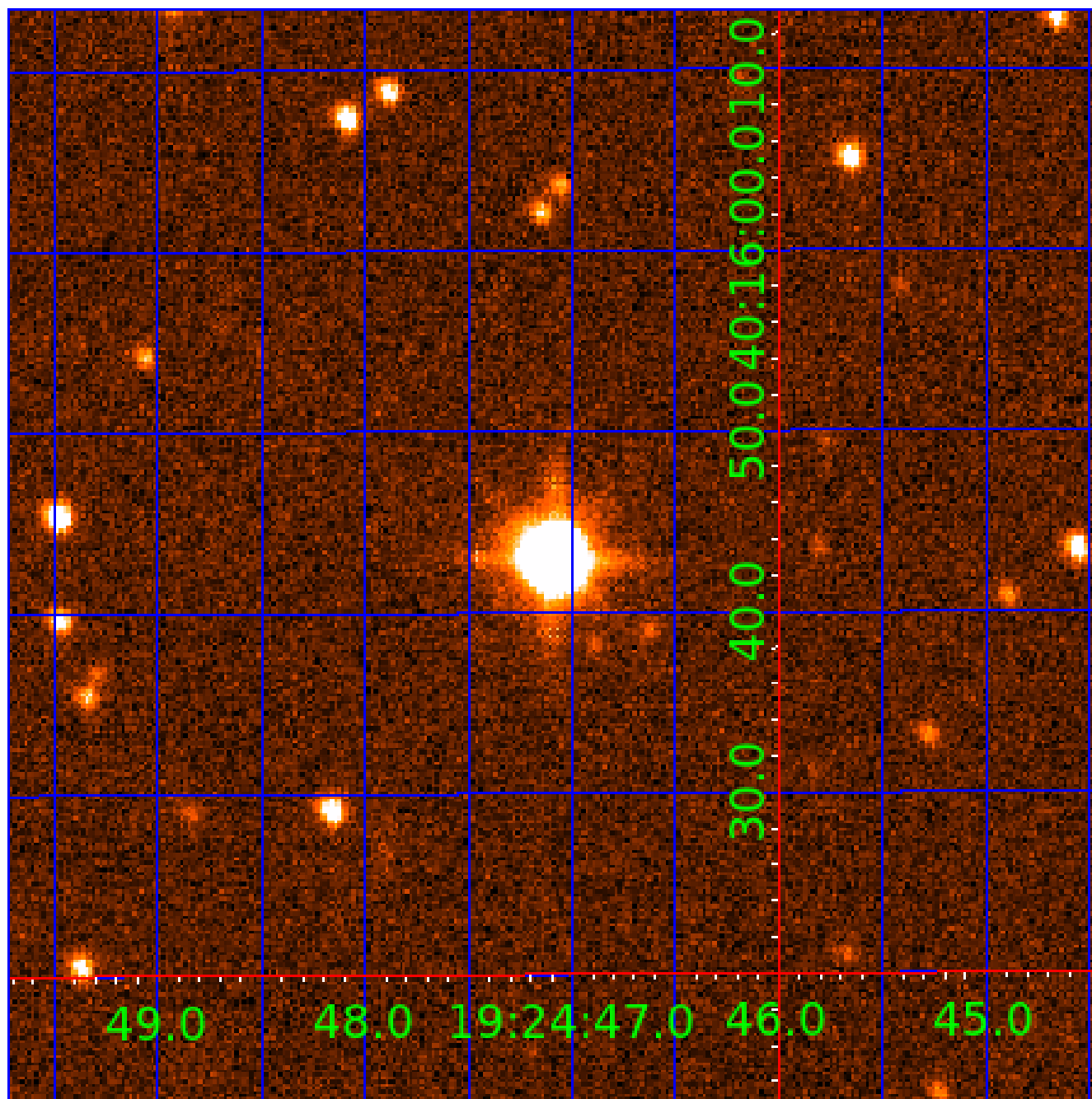
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image

Declination



# KIC 005097278

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005097278-01	OBS	No	0.613503	131.565445	30.3	1.287	11.7	12.1	1.77	7392	1.13	31224.49
005097278-02	OBS	No	0.613512	131.867913	30.4	1.207	9.4	11.2	1.77	7392	1.12	31223.93
005097278-03	OBS	No	144.723708	269.841811	1057.7	4.318	8.8	7.5	1.77	7392	10.68	21.42
005097278-04	OBS	No	3.471417	131.524616	121.0	3.500	8.9	-1.0	1.77	7392	1.98	3096.77
005097278-05	OBS	No	103.141368	170.345502	640.1	3.308	8.0	6.5	1.77	7392	5.15	33.65
005097278-06	OBS	No	163.663790	142.434048	818.2	2.135	7.4	6.9	1.77	7392	5.55	18.18

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005097278-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
005097278-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—SAME_NTL_PERIOD—CENT_SATURATED
005097278-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED—HALO_GHOST
005097278-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED
005097278-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED—HALO_GHOST
005097278-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—CENT_SATURATED

**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.

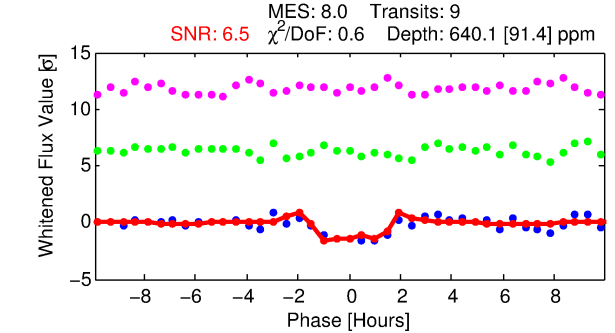
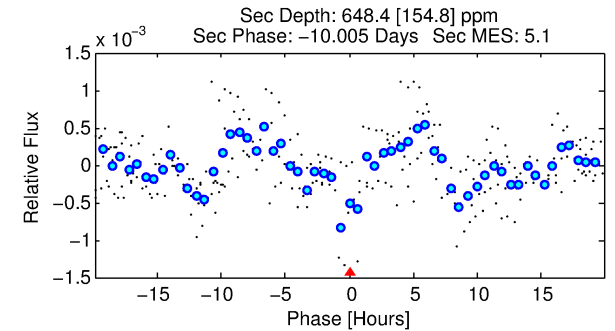
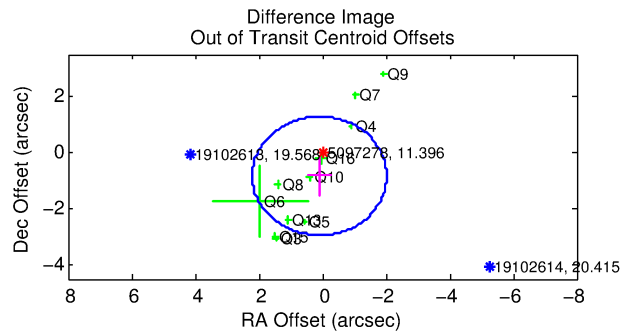
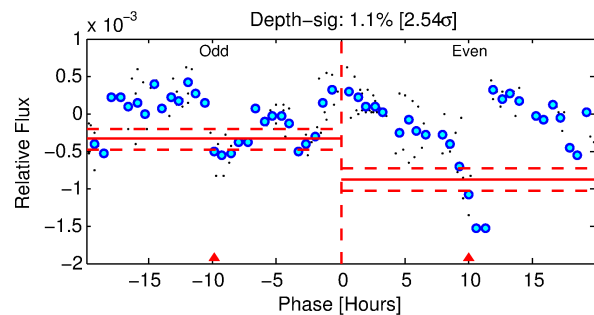
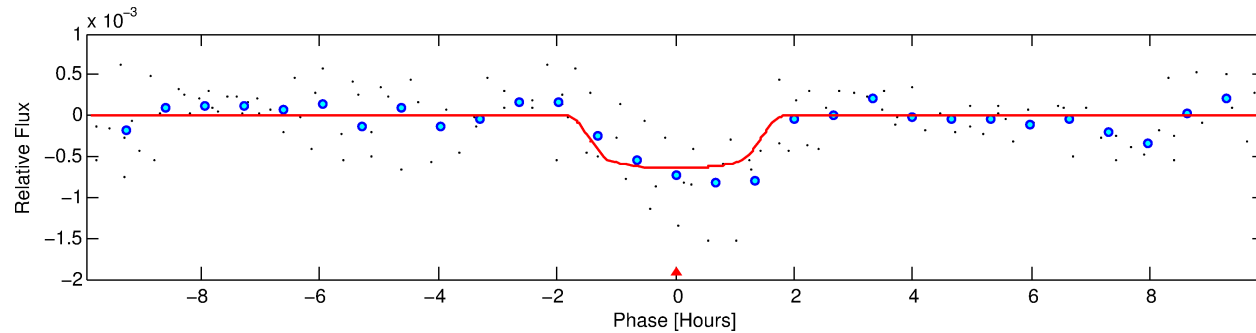
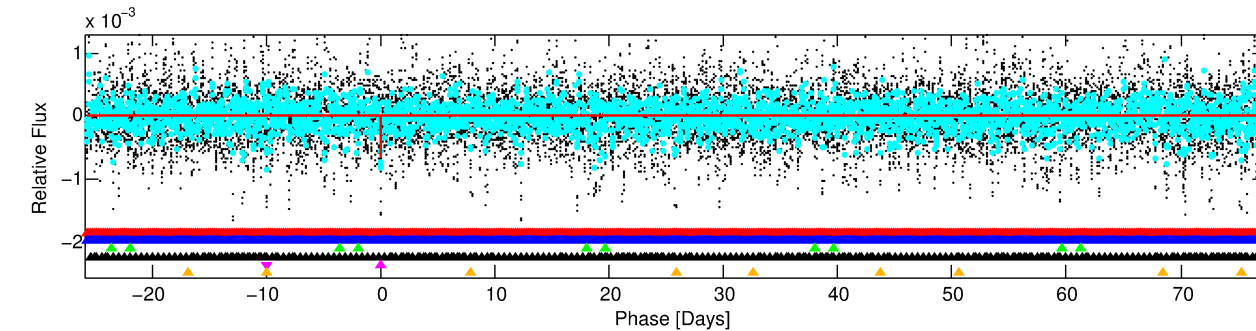
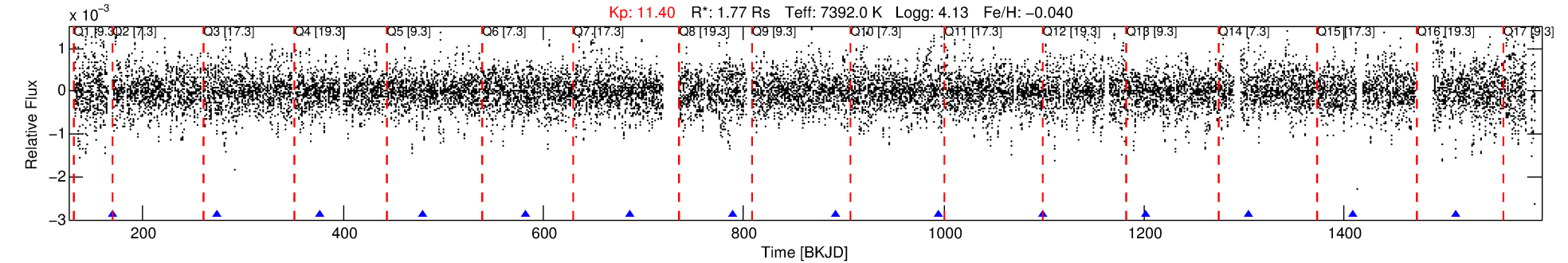
Ephemeris Match Information For 005097278-05

No Significant Match Found

# DV One-Page Summary

KIC: 5097278 Candidate: 5 of 6 Period: 103.141 d  
KOI: K06519 Corr: No Ephemeris Match

Kp: 11.40 R\*: 1.77 Rs Teff: 7392.0 K Logg: 4.13 Fe/H: -0.040



## DV Fit Results:

Period = 103.14137 [0.00062] d  
Epoch = 170.3455 [0.0051] BKJD  
Rp/R\* = 0.0266 [0.0041]  
a/R\* = 122.92 [91.59]  
b = 0.89 [0.18]  
Seff = 33.65 [13.57]  
Teff = 614 [62] K  
Rp = 5.15 [1.78] Re  
a = 0.4996 [0.1266] AU  
Ag = 3357.72 [1776.75] [1.89σ]  
Teffp = 7228 [775] K [8.51σ]

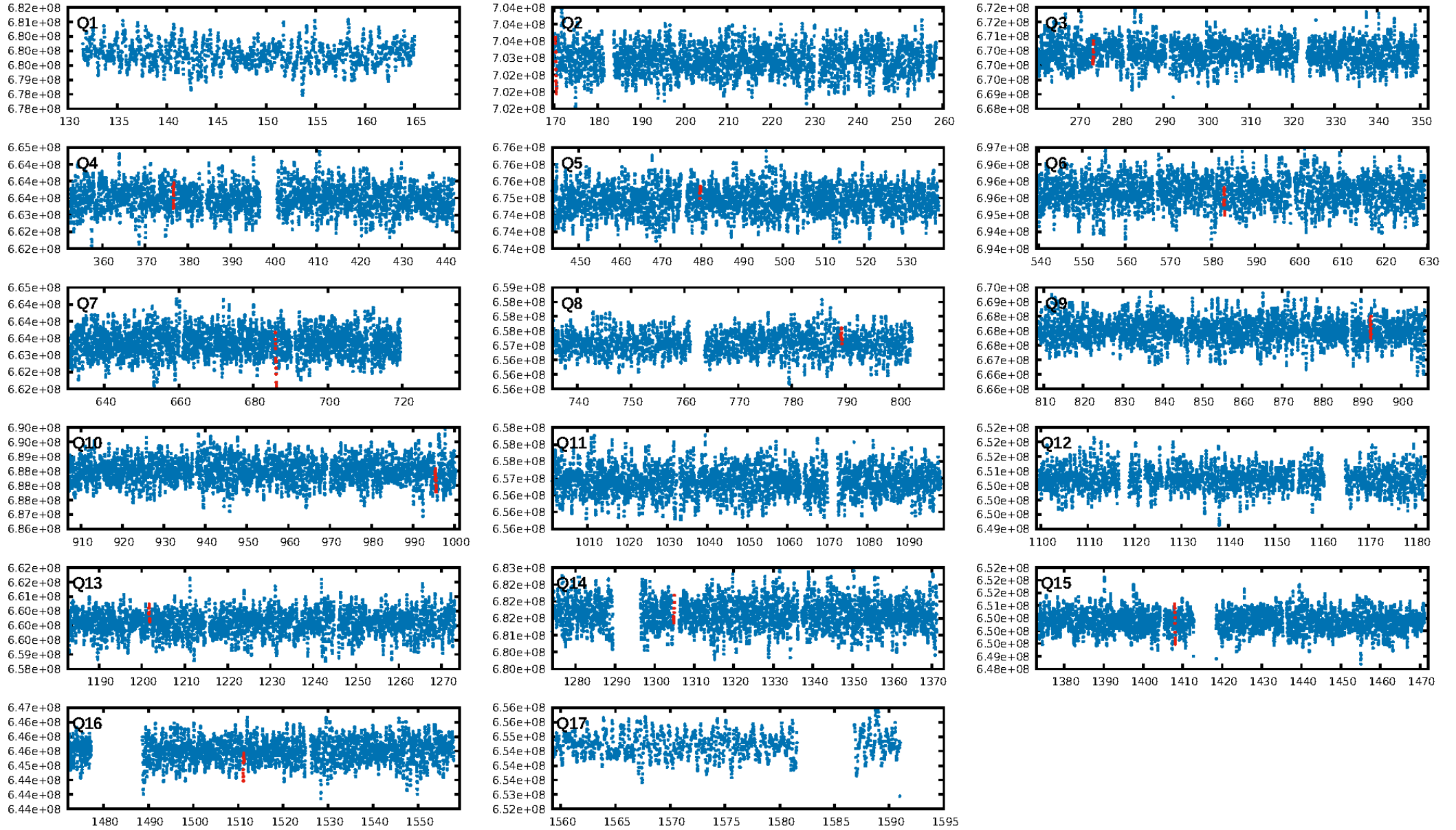
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [496.74σ]  
LongPeriod-sig: 100.0% [183.48σ]  
ModelChiSquare2-sig: 21.4%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 5.37e-11**  
RollingBand-fgt: 1.00 [9/9]  
GhostDiagnostic-chr: 0.2409  
Centroid-sig: 92.4%  
Centroid-so: 0.150 arcsec [0.70σ]  
OotOffset-rm: 0.838 arcsec [1.19σ]  
KicOffset-rm: 0.923 arcsec [1.31σ]  
OotOffset-st: 2/3/3/3 [11]  
KicOffset-st: 2/3/3/3 [11]  
DiffImageQuality-fgm: 0.45 [5/11]  
DiffImageOverlap-fno: 0.00 [0/11]

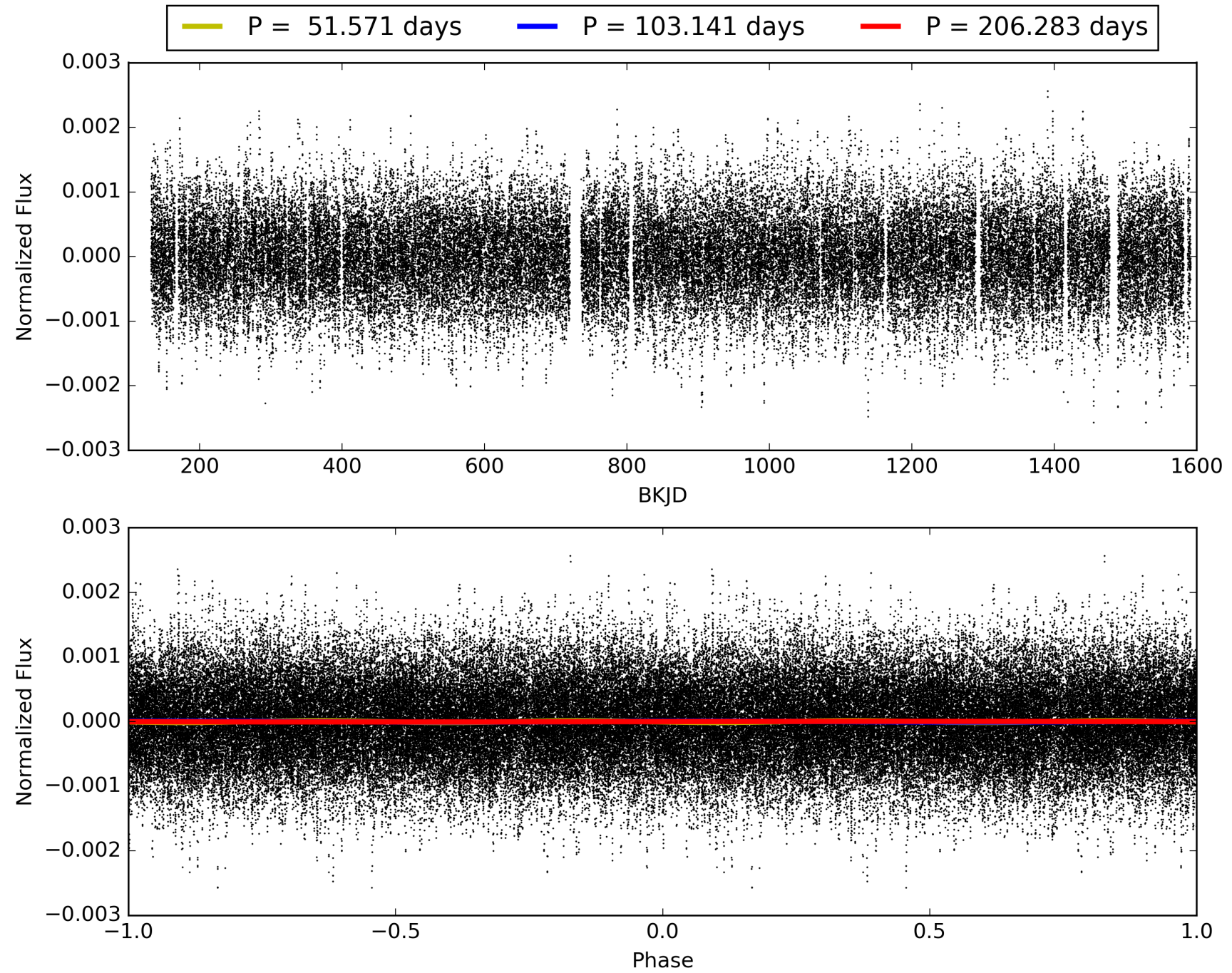
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 13:29:28 Z

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

# TCE 005097278-05, PDC Light Curves

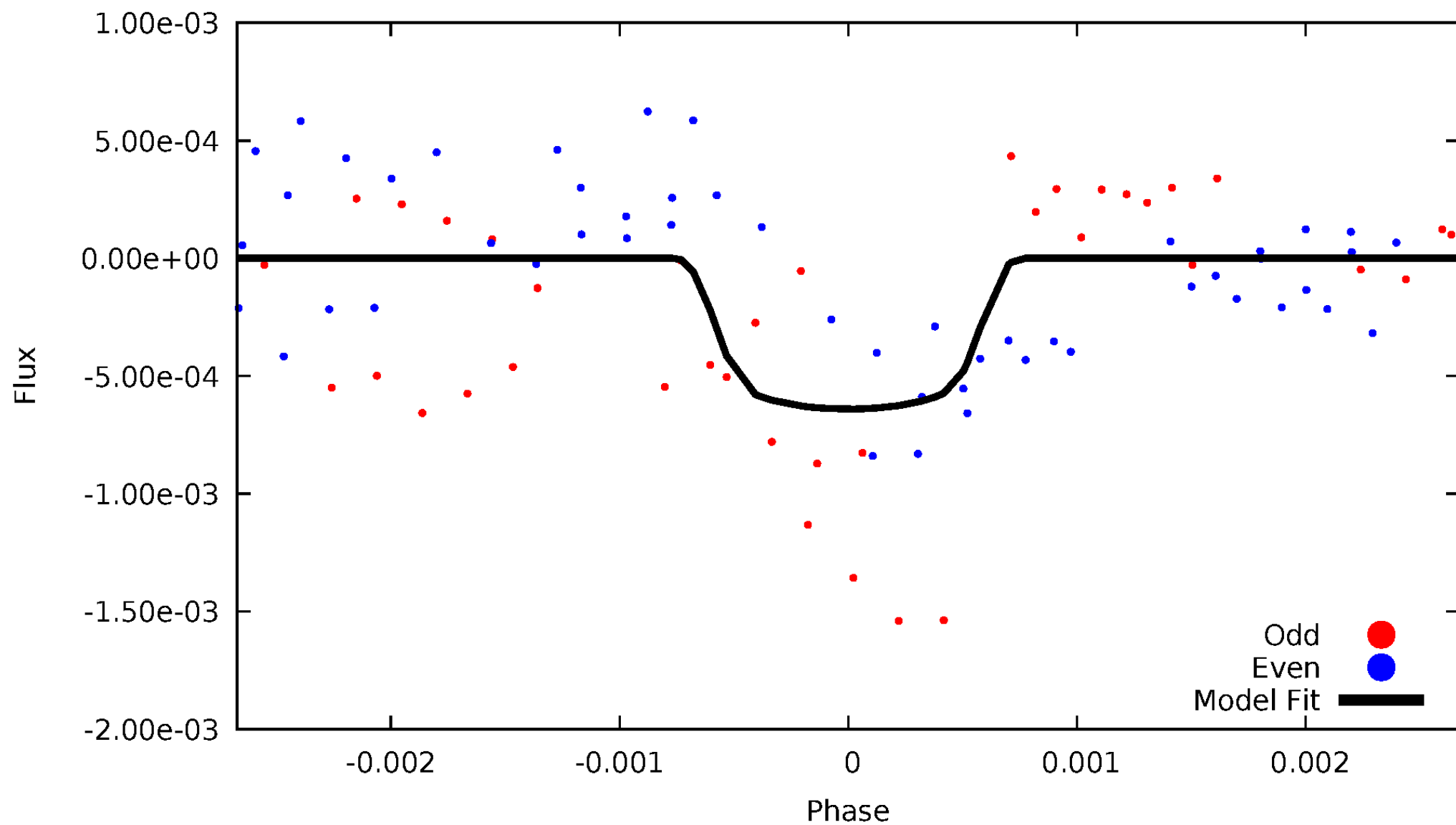


TCE 005097278-05



# DV Odd/Even

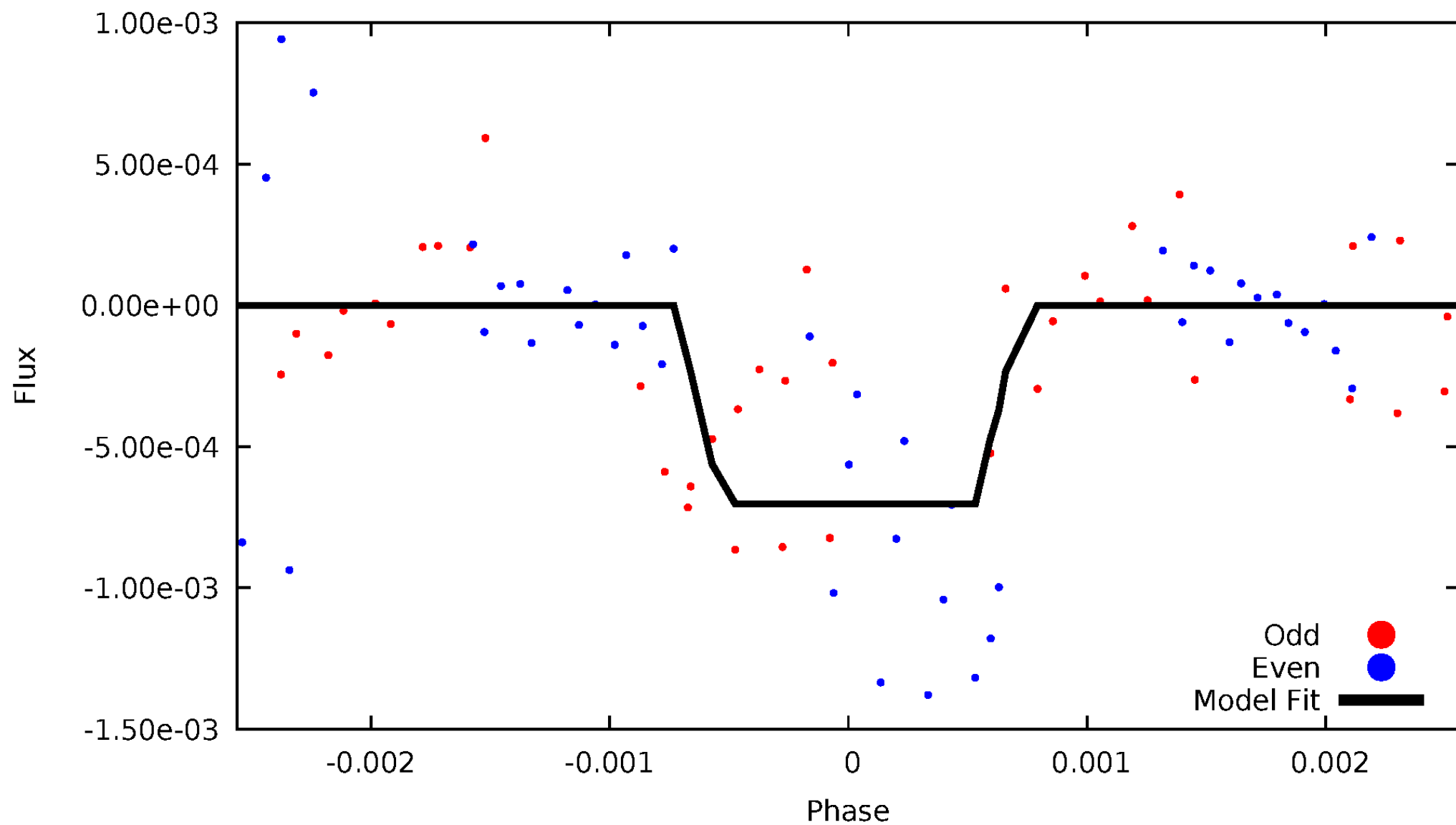
TCE 005097278-05





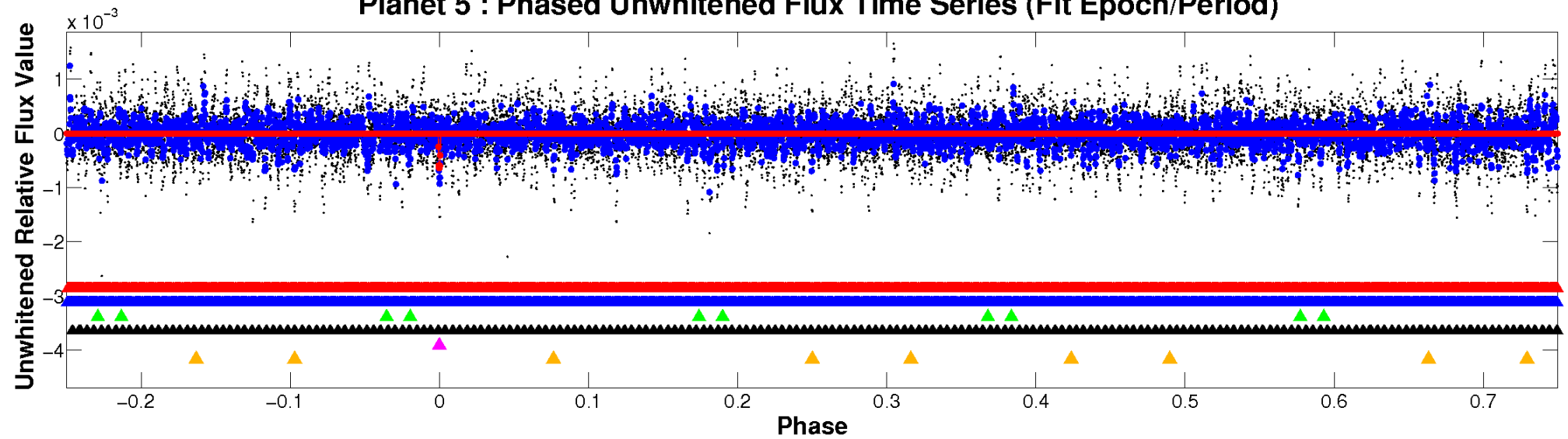
# ALT Odd/Even

TCE 005097278-05

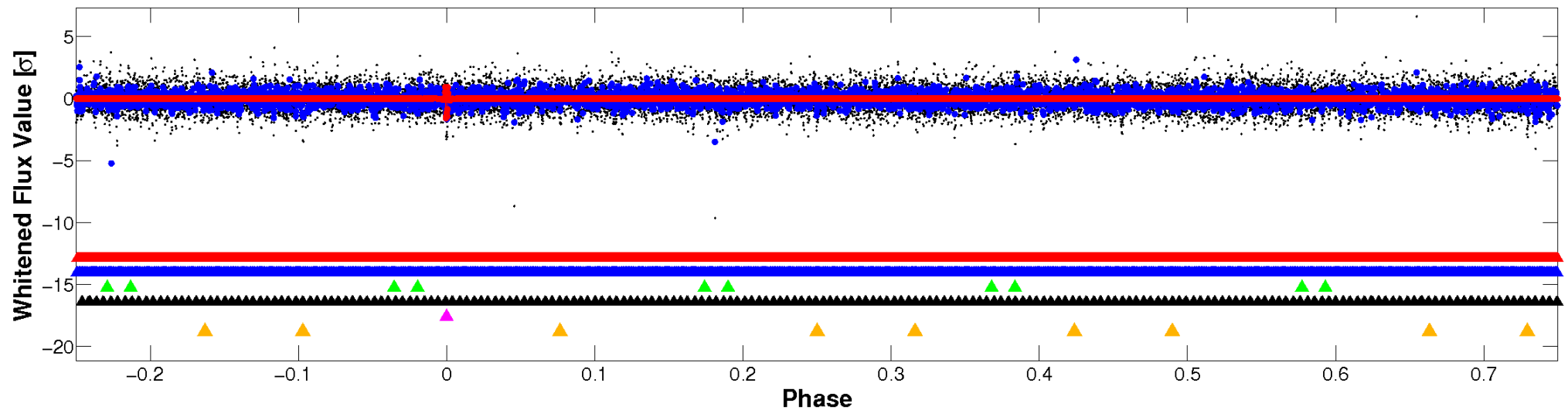


# Non-Whitened Vs. Whitened Light Curve

## Planet 5 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

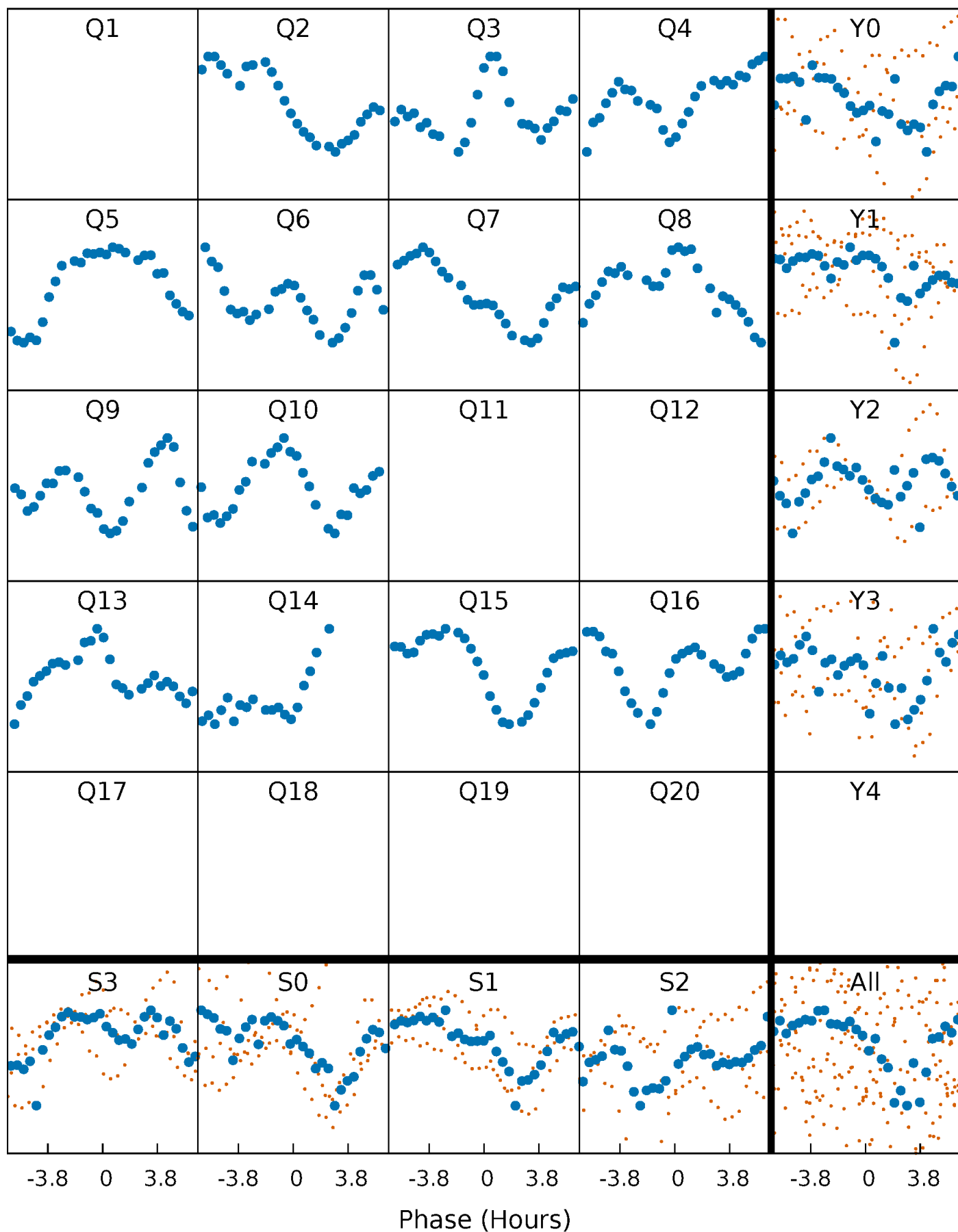


## Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



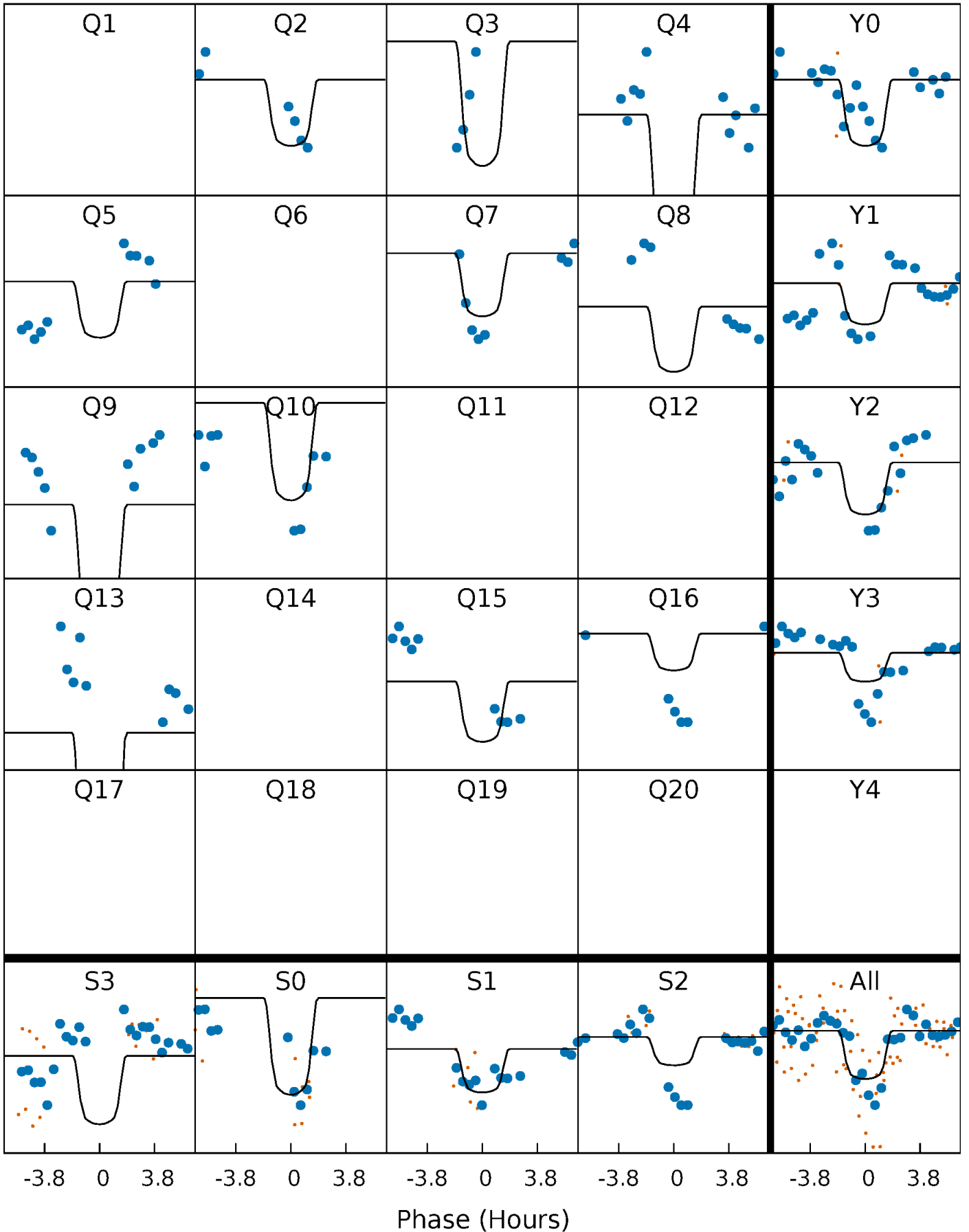
# PDC Quarter-Phased Transit Curves

TCE 005097278-05     $P=103.141368$  Days     $T_0=170.345502$  (BKJD)



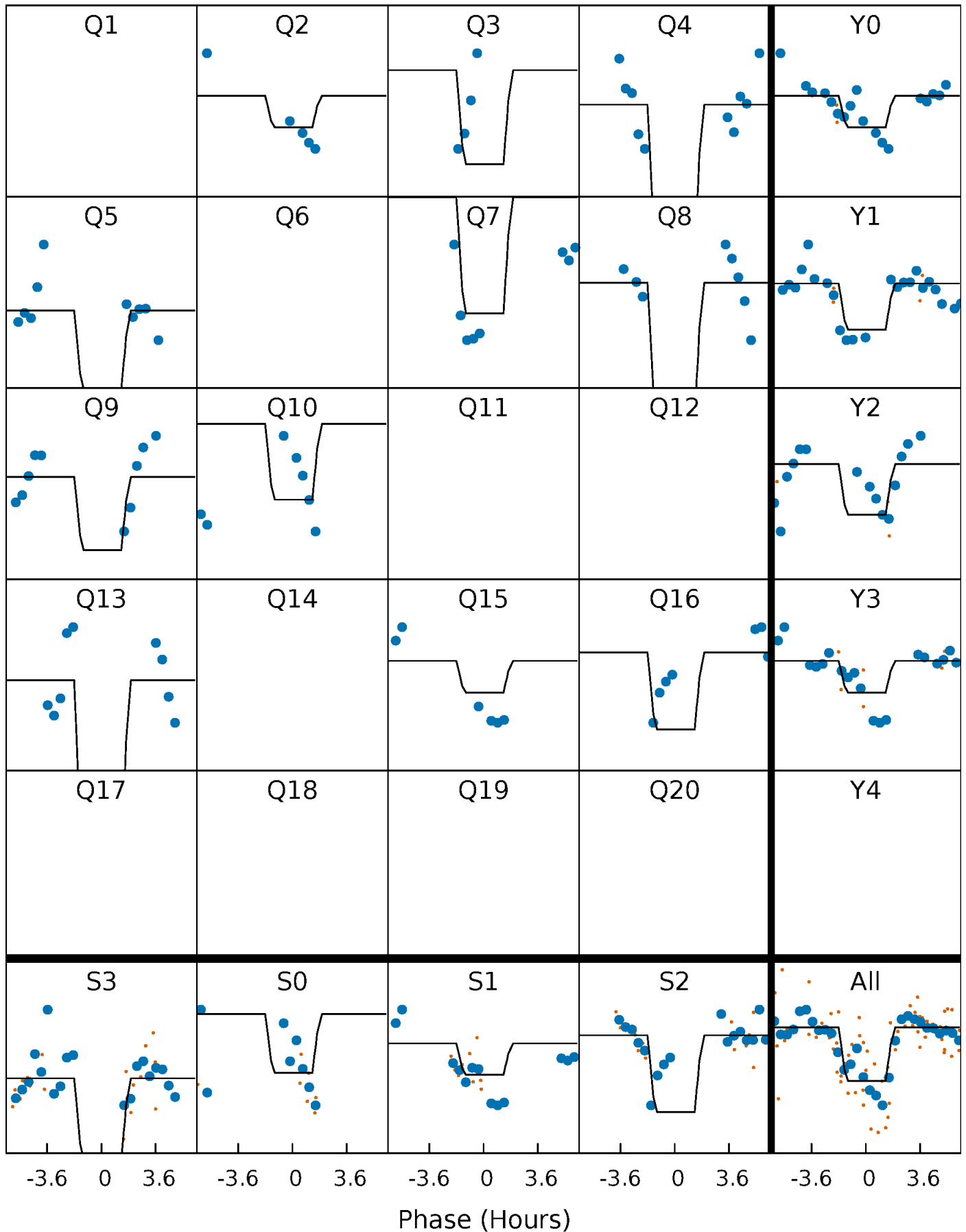
# DV Quarter-Phased Transit Curves

TCE 005097278-05     $P=103.141368$  Days     $T_0=170.345502$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

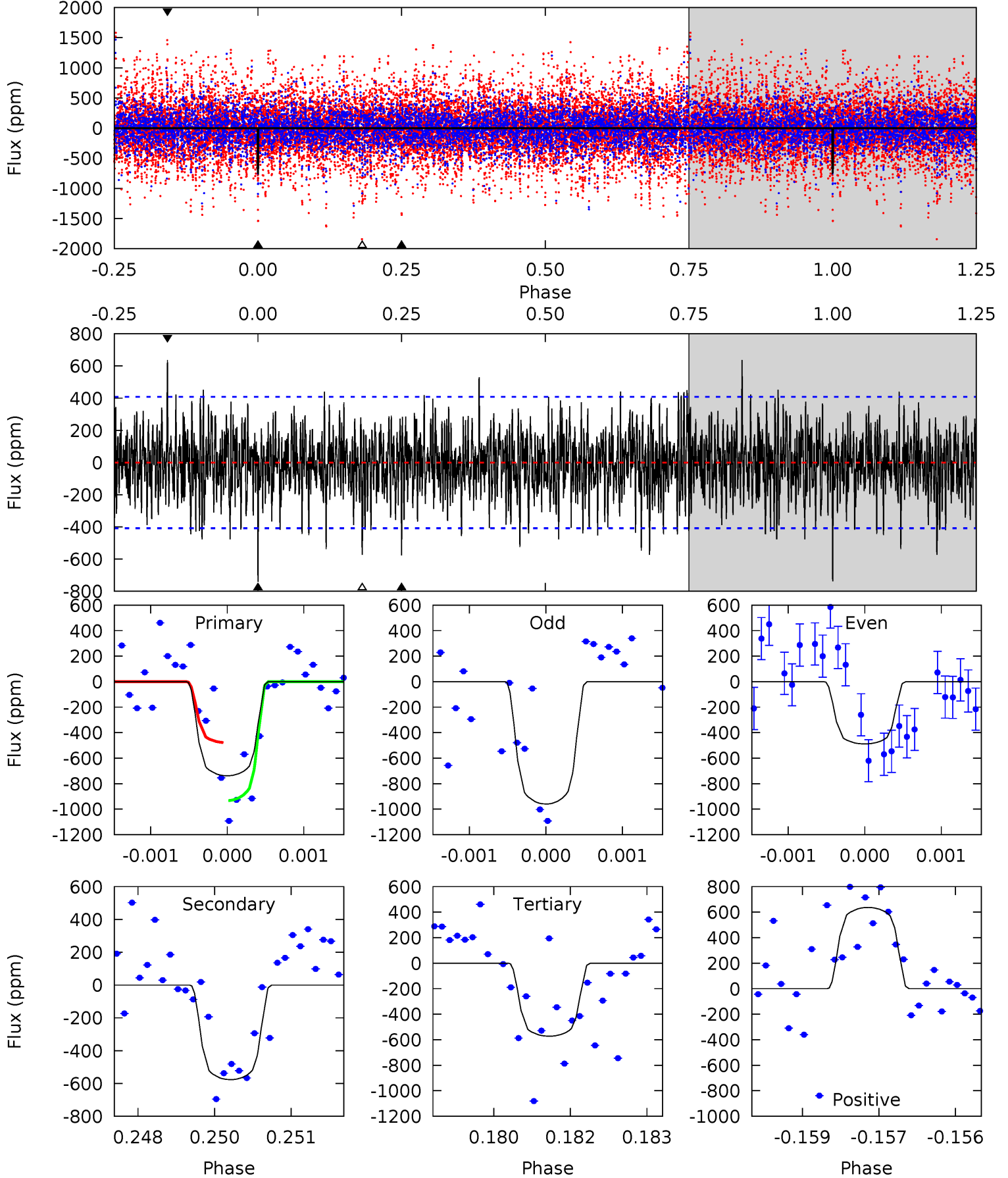
TCE 005097278-05 P=103.145815 Days  $T_0=170.337616$  (BKJD)



# DV Model-Shift Uniqueness Test

005097278-05, P = 103.141368 Days, E = 67.204134 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
9.73	7.60	7.54	8.39	5.39	3.19	2.17	2.18	1.33	0.06	-0.79	3.08	1.16	0.46	2.98

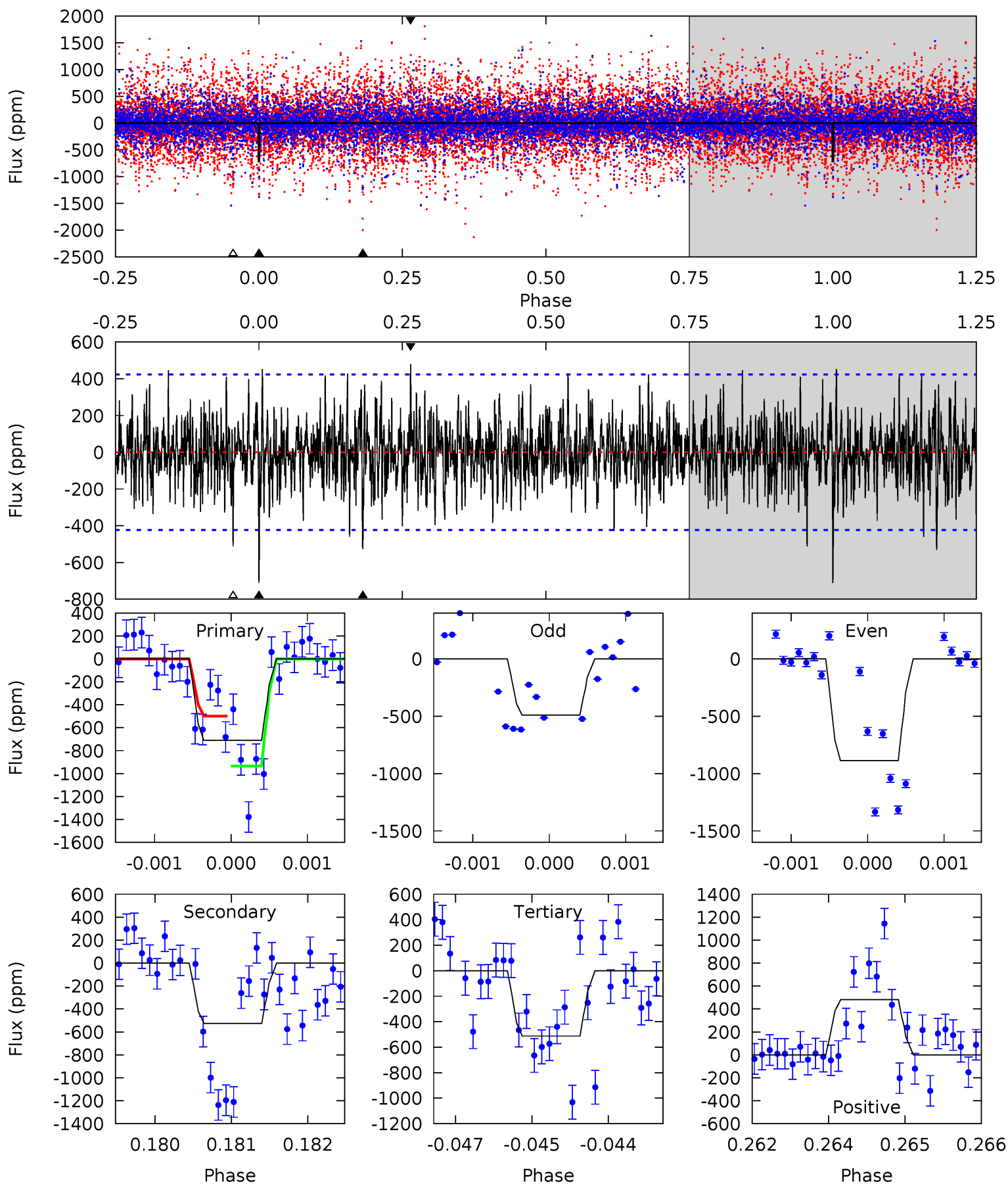




# Alt Model-Shift Uniqueness Test

005097278-05, P = 103.145815 Days, E = 67.191801 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
9.07	6.71	6.54	6.13	5.40	3.21	1.72	2.53	2.94	0.17	0.58	2.47	0.98	0.40	2.81



### Stellar Parameters For KIC 005097278

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7392^{+207}_{-337}$	$4.135^{+0.128}_{-0.192}$	$-0.040^{+0.200}_{-0.350}$	$1.772^{+0.548}_{-0.365}$	$1.563^{+0.213}_{-0.237}$	$0.396^{+0.253}_{-0.209}$
	+3%/-5%	+3%/-5%	+500%/-875%	+31%/-21%	+14%/-15%	+64%/-53%
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 005097278-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-577 \pm 76$	$5.26^{+1.26}_{-0.97}$	$863^{+70}_{-56}$	$6854^{+789}_{-575}$	$2810^{+1394}_{-967}$
Alt.	$-526 \pm 78$	$5.18^{+1.21}_{-1.01}$	$860^{+66}_{-58}$	$6764^{+773}_{-596}$	$2642^{+1457}_{-916}$

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

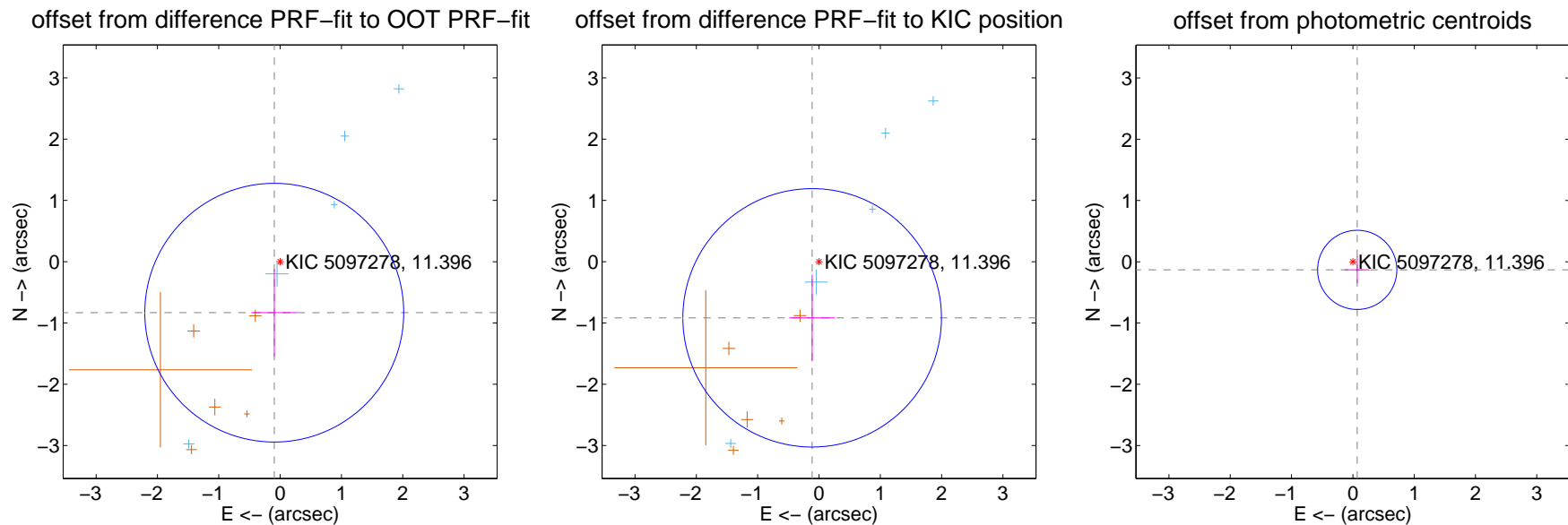
## DV Centroid Data

Supplemental centroid analysis for 005097278-05. **Kepler magnitude: 11.40.** Transit SNR 6.51

There are 5 quarters with good PRF difference image offsets

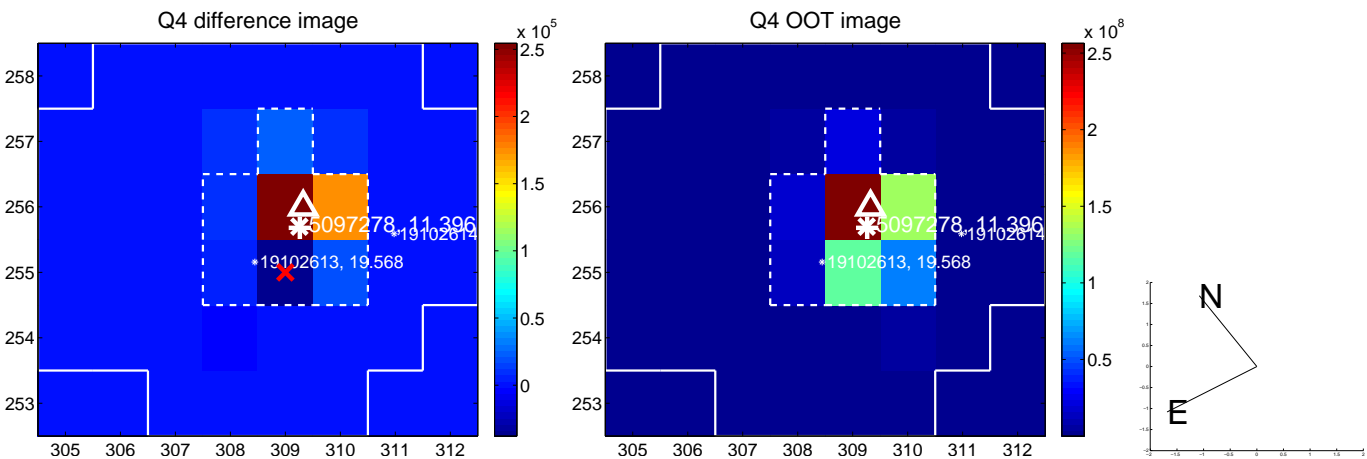
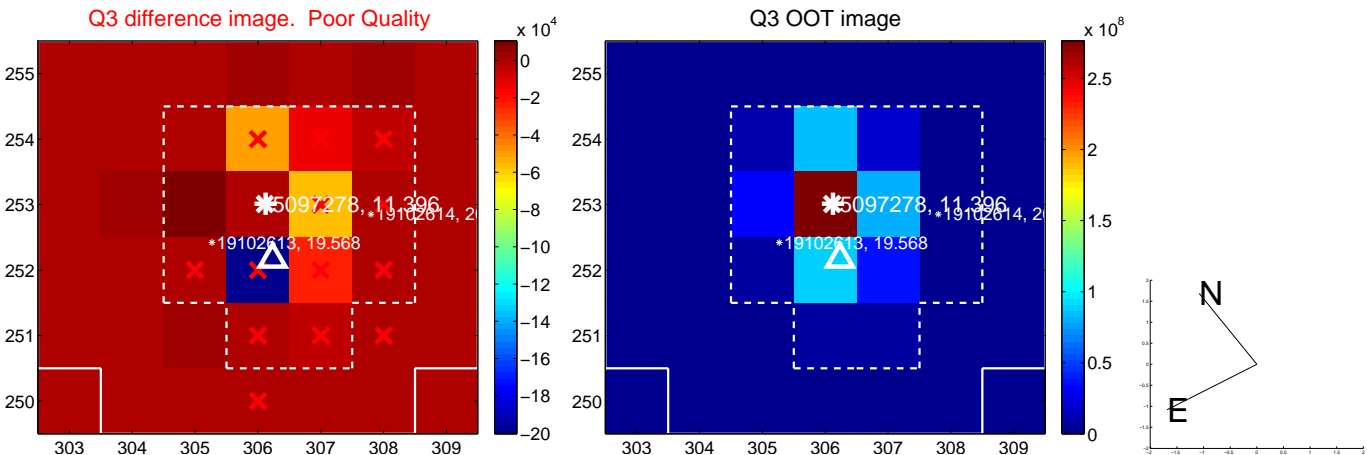
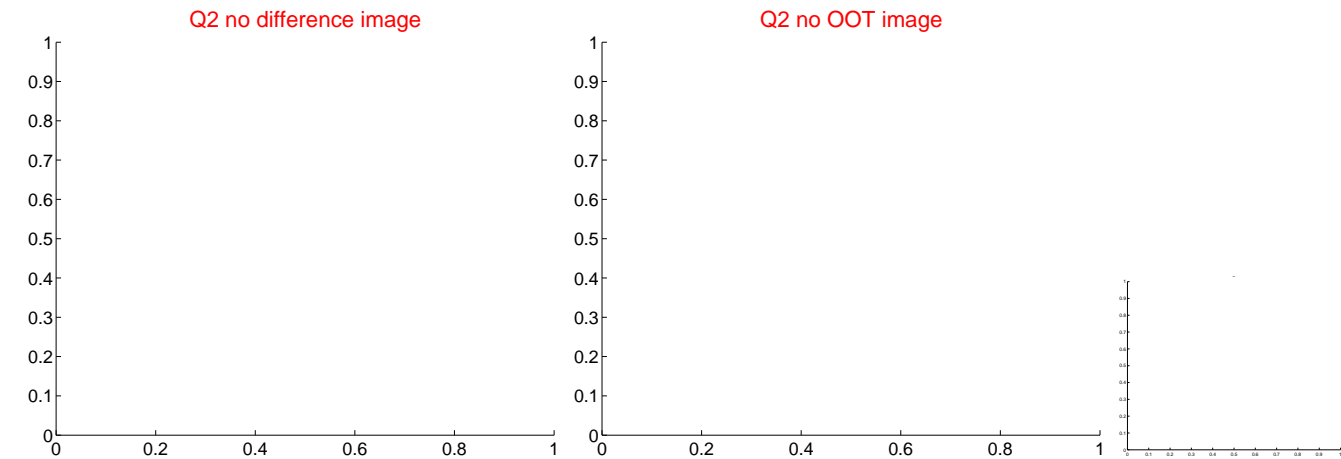
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.838 \pm 0.704$	1.19	$0.095 \pm 0.375$	$-0.832 \pm 0.707$
PRF-fit source offset from KIC position	$0.923 \pm 0.703$	1.31	$0.111 \pm 0.374$	$-0.916 \pm 0.707$
photometric centroid source offset	$0.15 \pm 0.22$	0.70	$-0.07 \pm 0.20$	$-0.13 \pm 0.22$

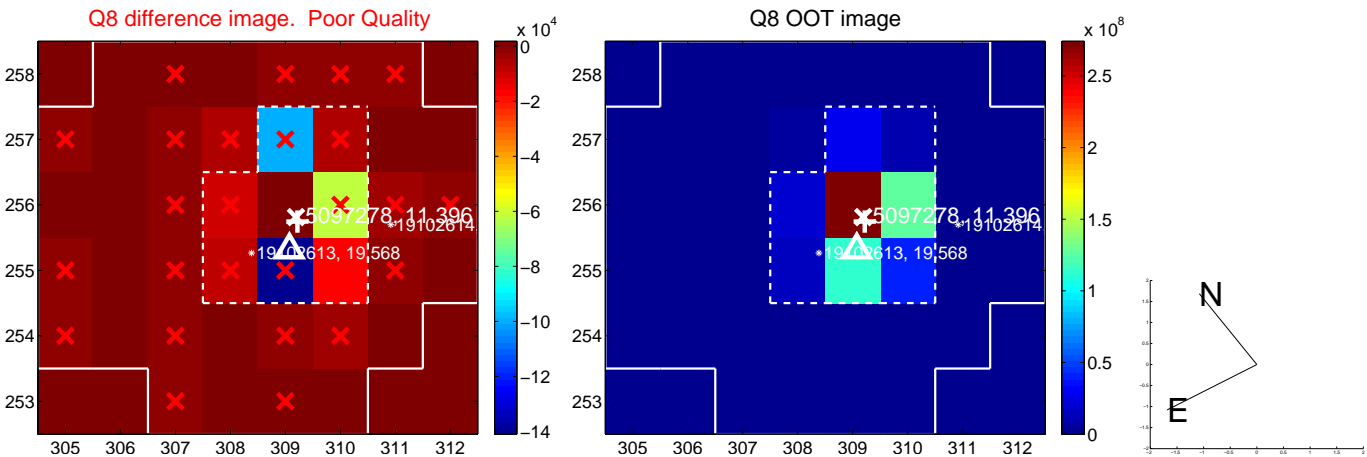
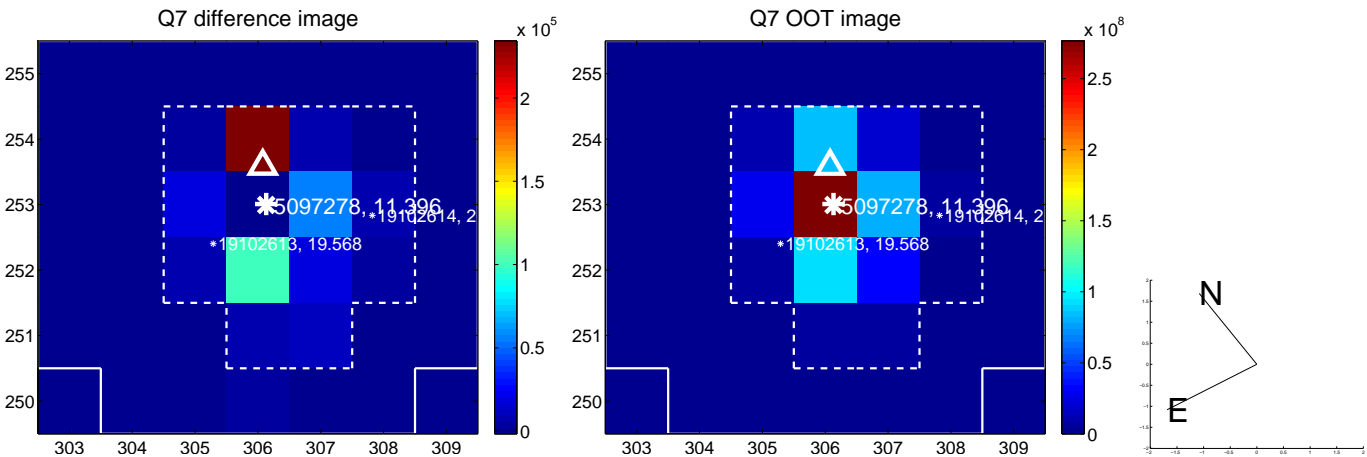
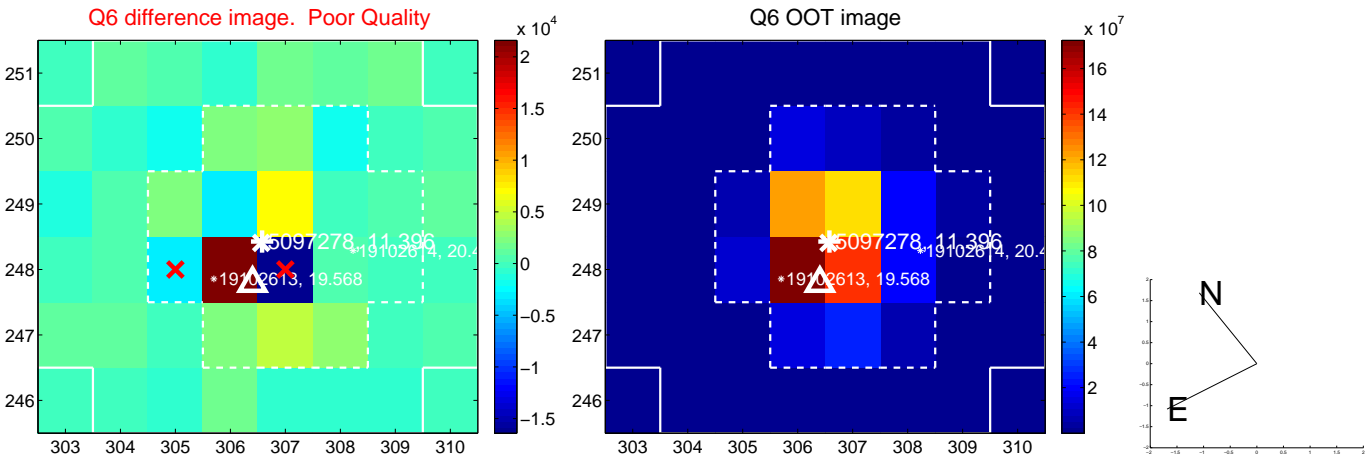
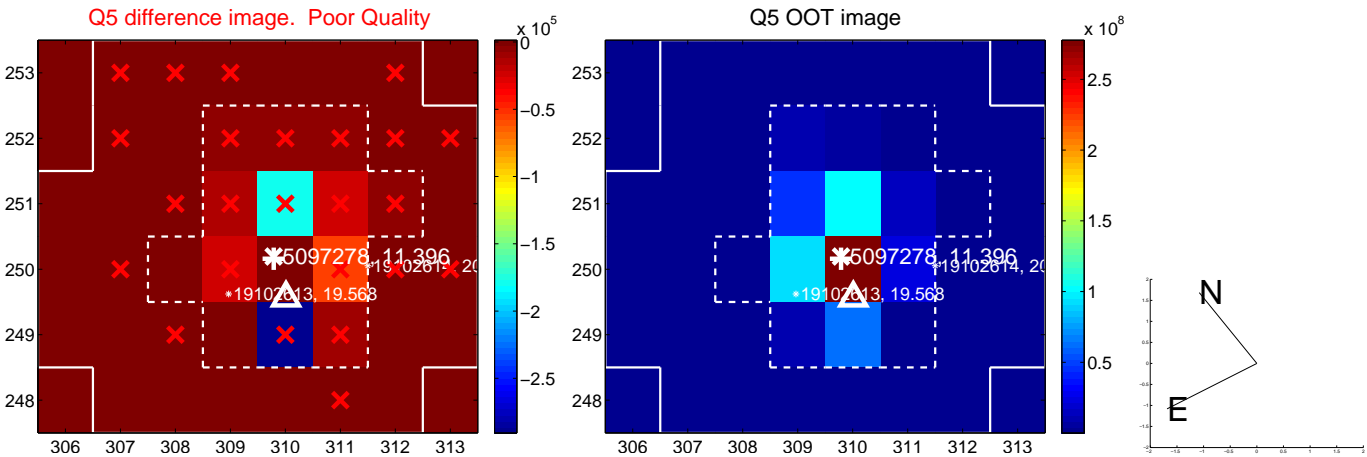


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

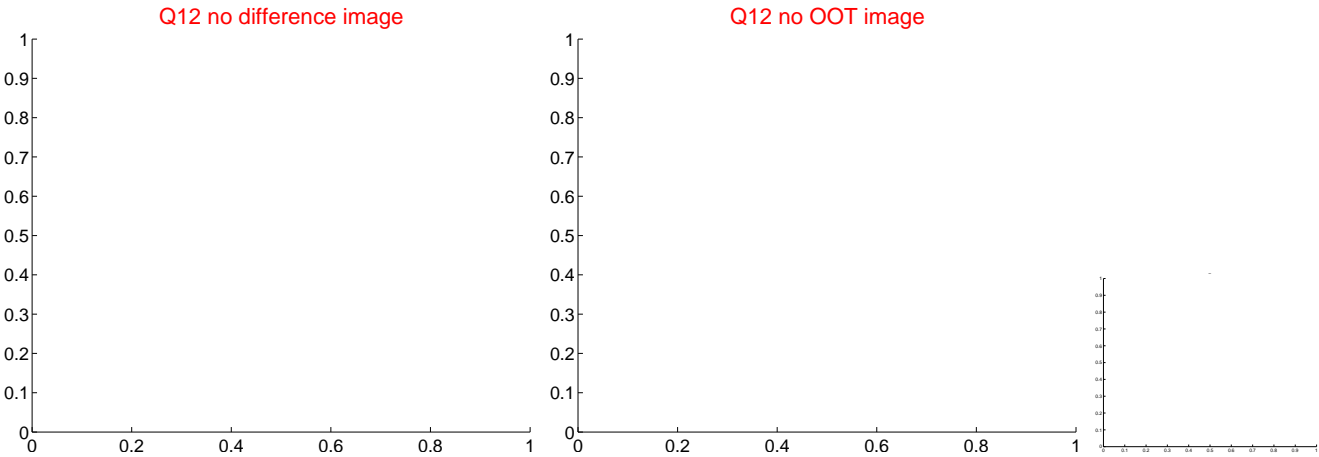
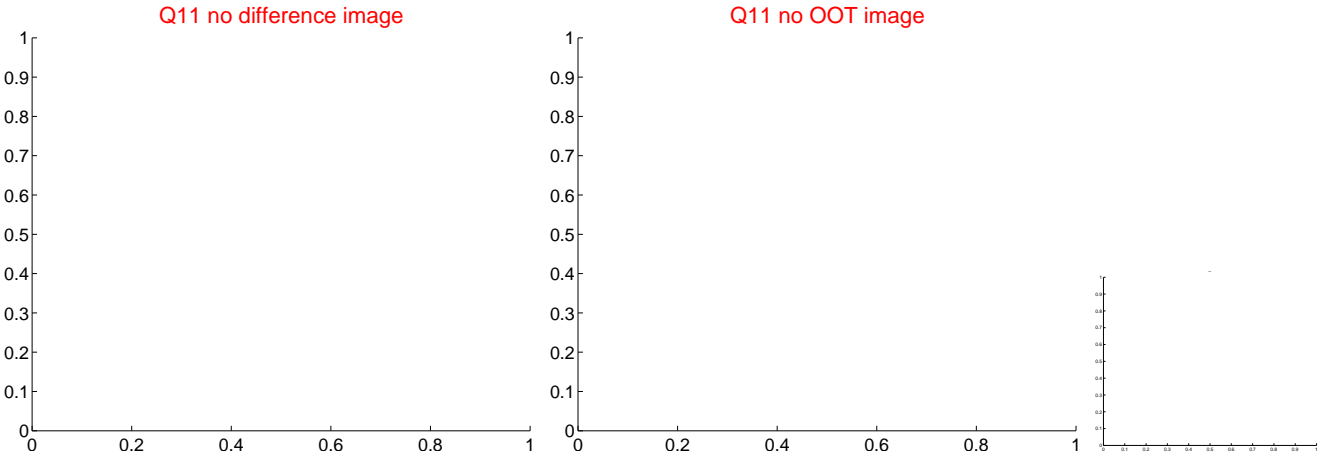
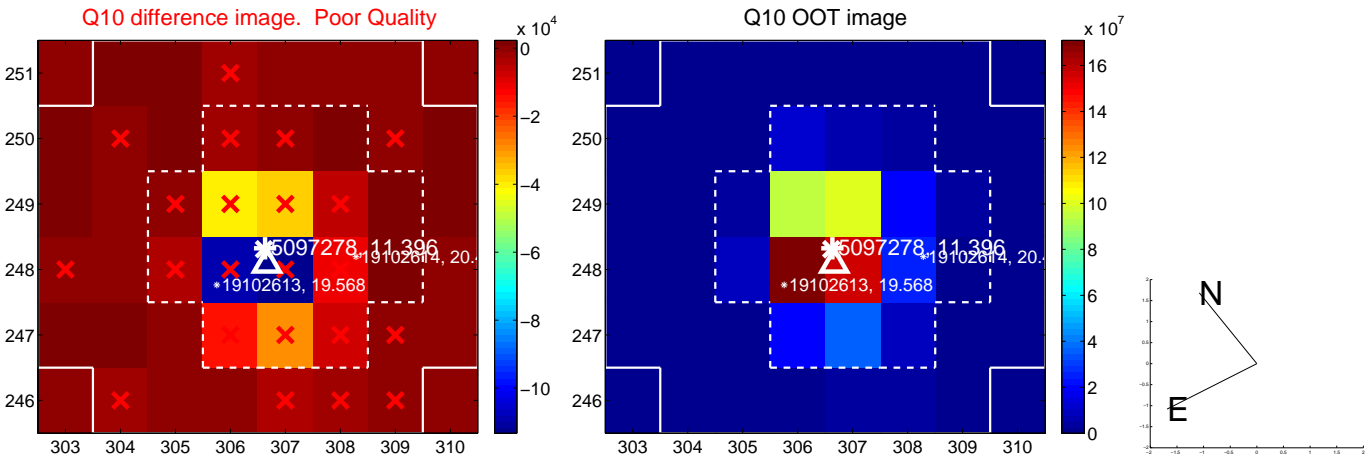
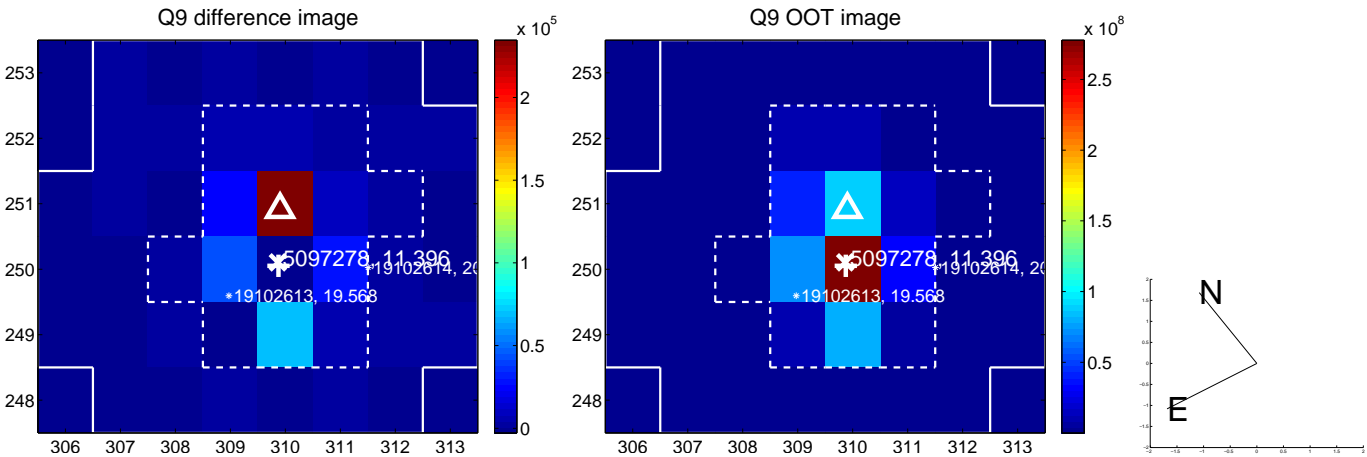
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

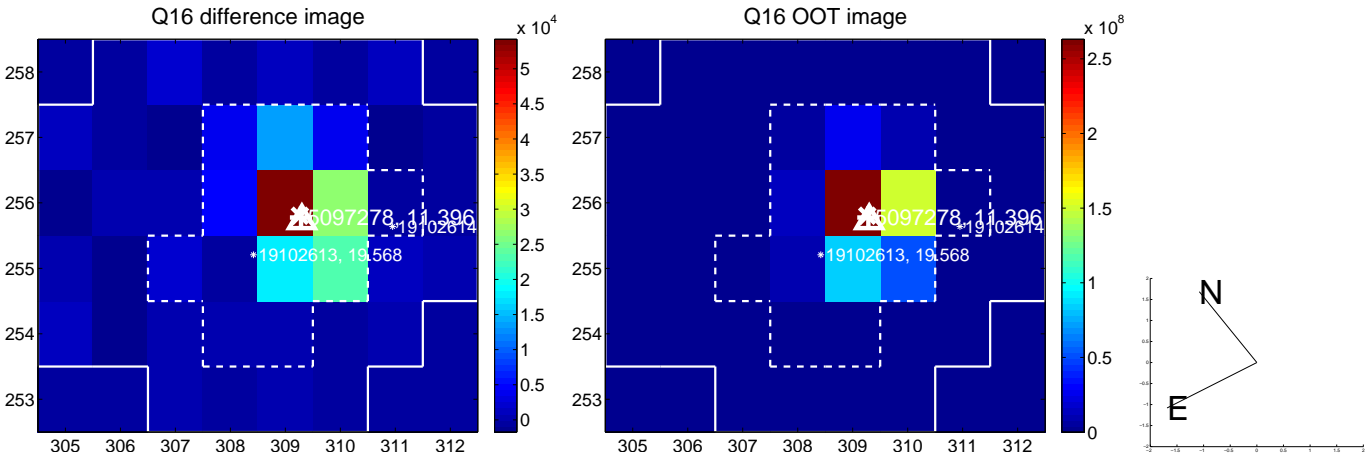
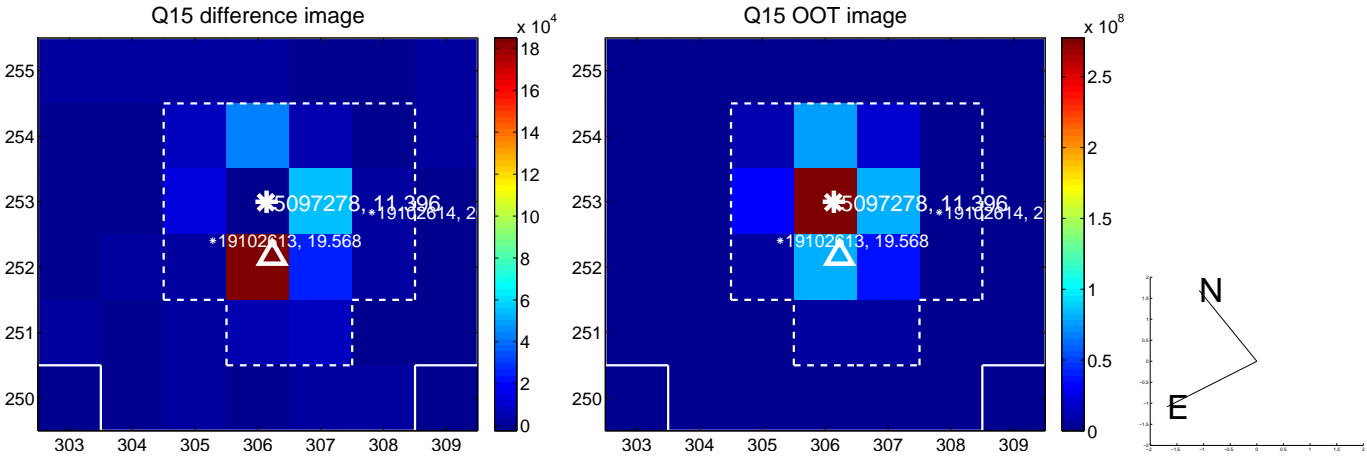
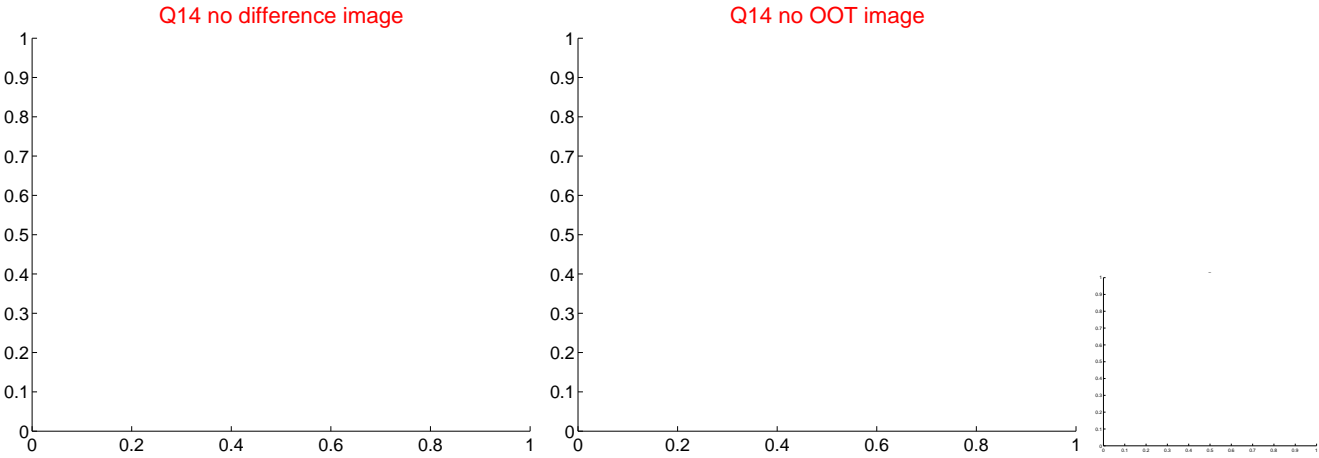
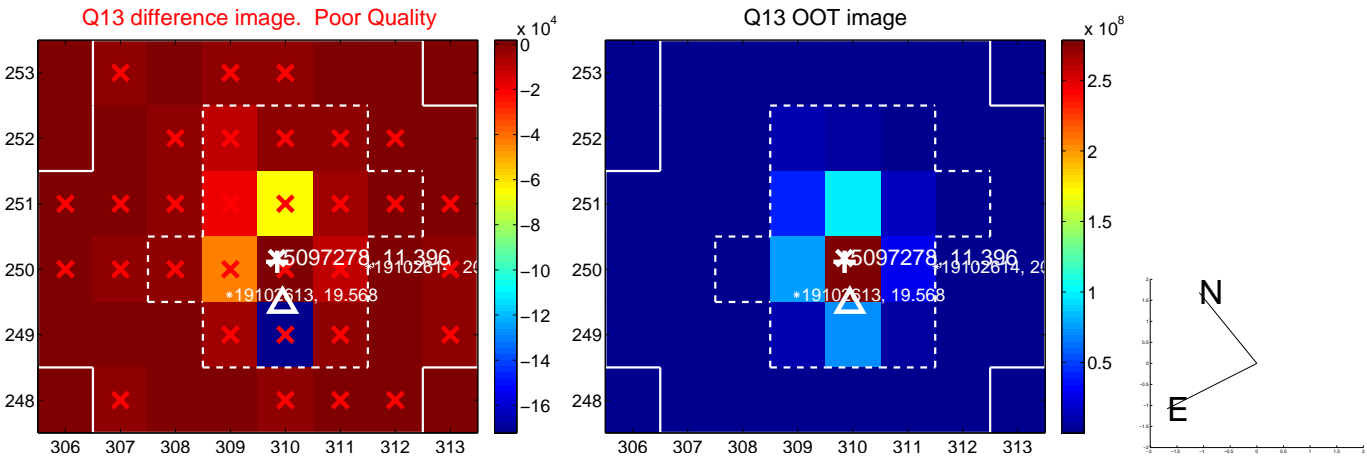


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

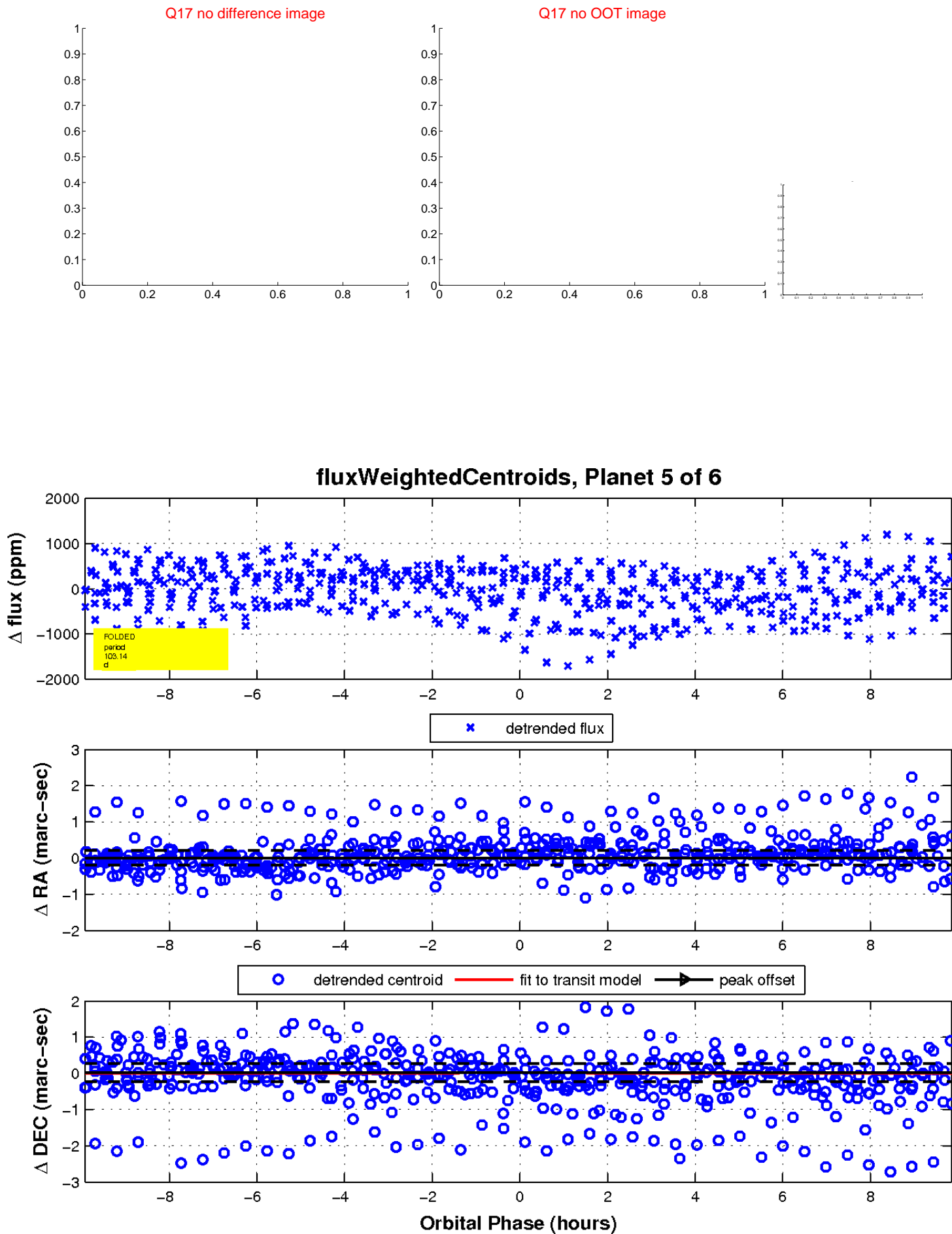




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

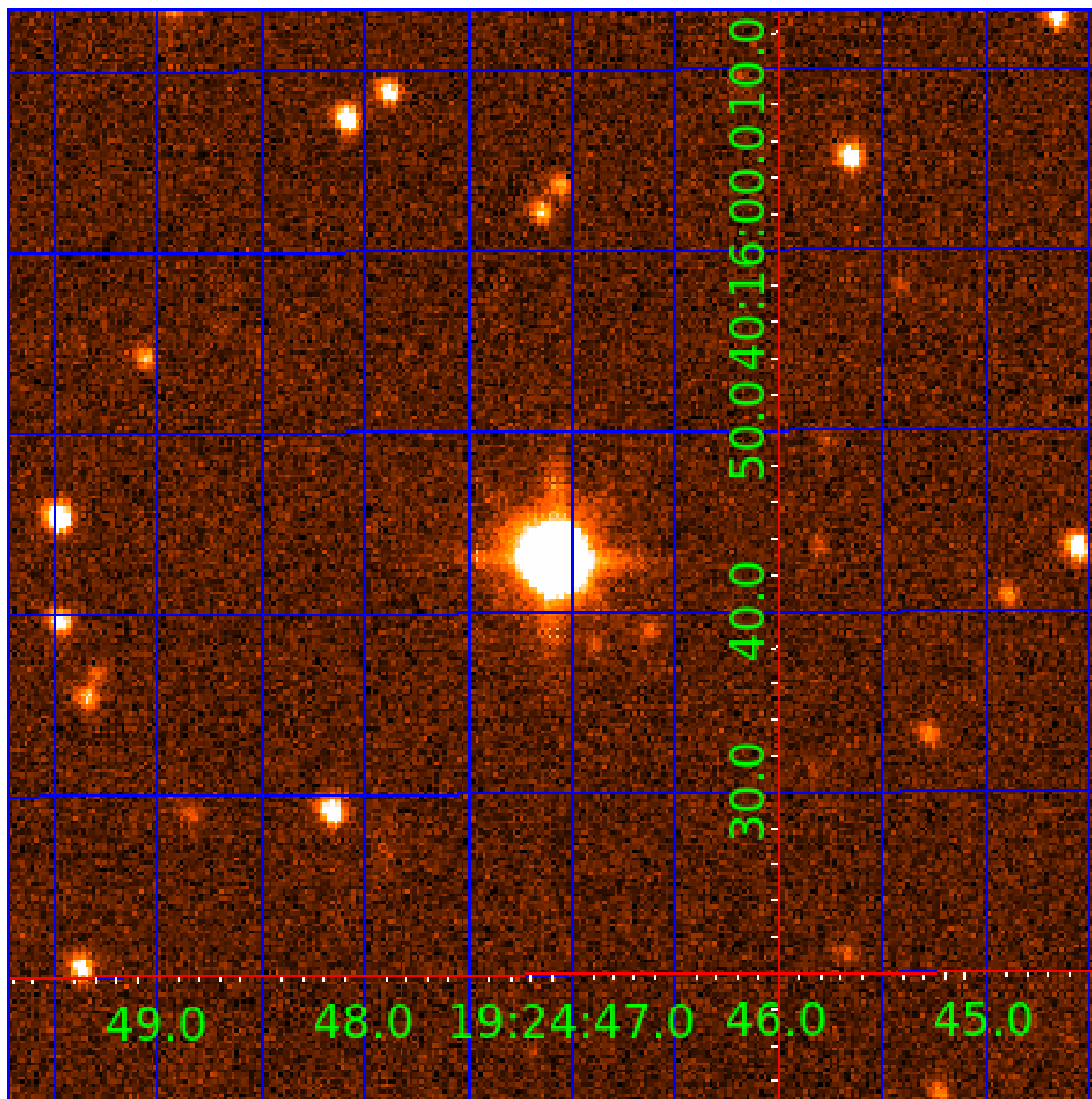


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 005097278

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005097278-01	OBS	No	0.613503	131.565445	30.3	1.287	11.7	12.1	1.77	7392	1.13	31224.49
005097278-02	OBS	No	0.613512	131.867913	30.4	1.207	9.4	11.2	1.77	7392	1.12	31223.93
005097278-03	OBS	No	144.723708	269.841811	1057.7	4.318	8.8	7.5	1.77	7392	10.68	21.42
005097278-04	OBS	No	3.471417	131.524616	121.0	3.500	8.9	-1.0	1.77	7392	1.98	3096.77
005097278-05	OBS	No	103.141368	170.345502	640.1	3.308	8.0	6.5	1.77	7392	5.15	33.65
005097278-06	OBS	No	163.663790	142.434048	818.2	2.135	7.4	6.9	1.77	7392	5.55	18.18

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005097278-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
005097278-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—SAME_NTL_PERIOD—CENT_SATURATED
005097278-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED—HALO_GHOST
005097278-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED
005097278-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED—HALO_GHOST
005097278-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—CENT_SATURATED

**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.

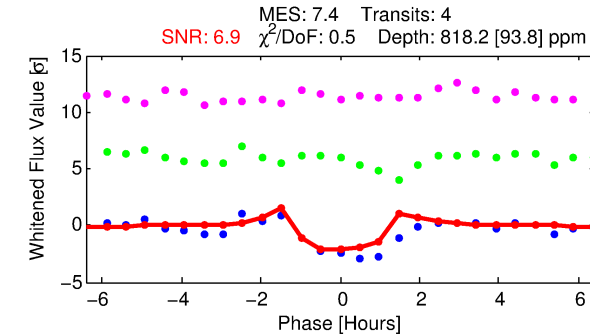
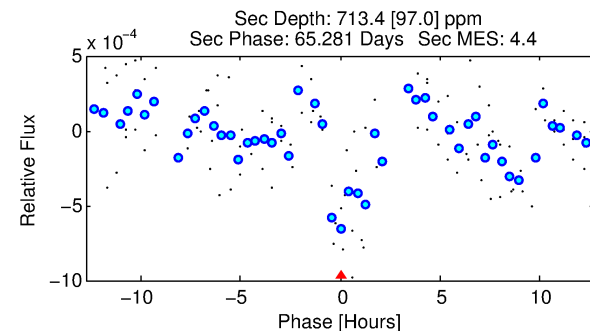
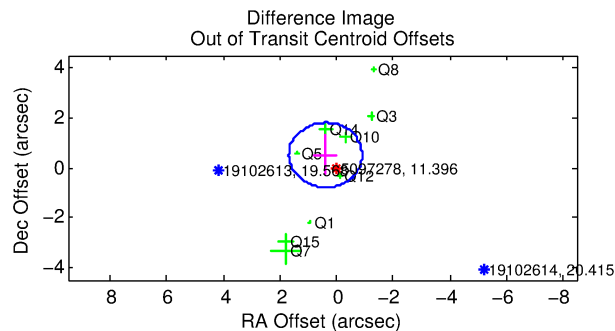
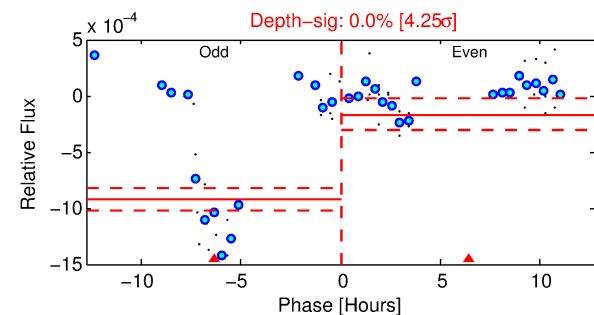
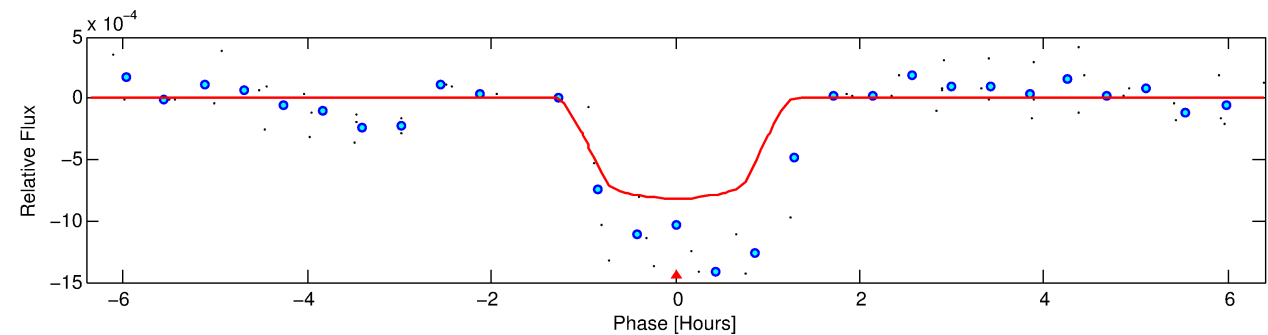
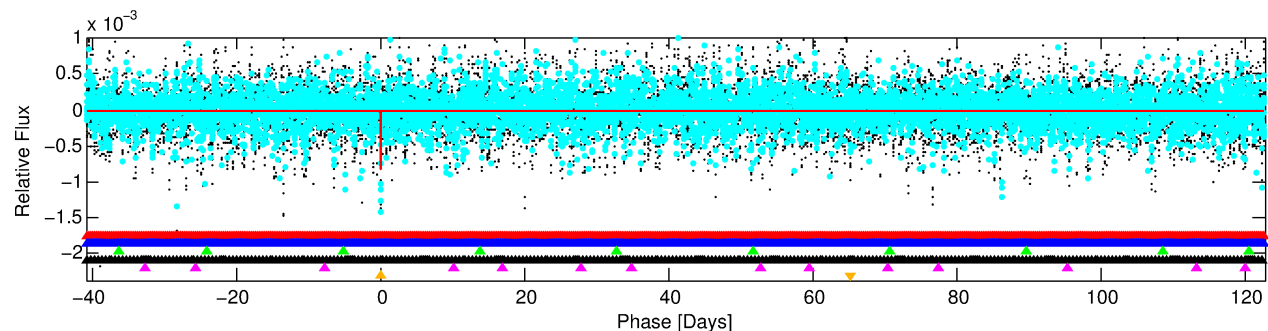
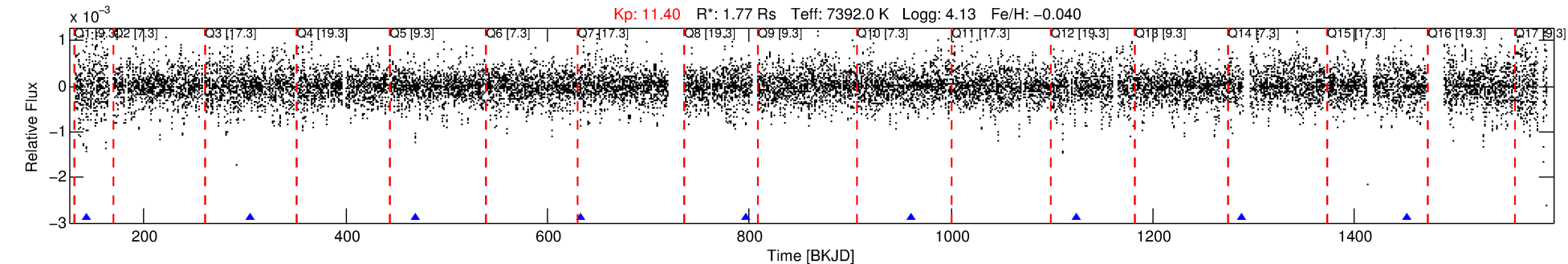
Ephemeris Match Information For 005097278-06

No Significant Match Found

# DV One-Page Summary

KIC: 5097278 Candidate: 6 of 6 Period: 163.664 d  
KOI: K06519 Corr: No Ephemeris Match

Kp: 11.40 R\*: 1.77 Rs Teff: 7392.0 K Logg: 4.13 Fe/H: -0.040



## DV Fit Results:

Period = 163.66379 [0.00076] d  
Epoch = 142.4340 [0.0042] BKJD  
Rp/R\* = 0.0287 [0.0107]  
a/R\* = 394.97 [906.63]  
b = 0.78 [1.17]  
Seff = 18.18 [7.33]  
Teff = 527 [53] K  
Rp = 5.55 [2.69] Re  
a = 0.6797 [0.1722] AU  
Ag = 5885.40 [4949.82] [1.19σ]  
Teffp = 7131 [1394] K [4.74σ]

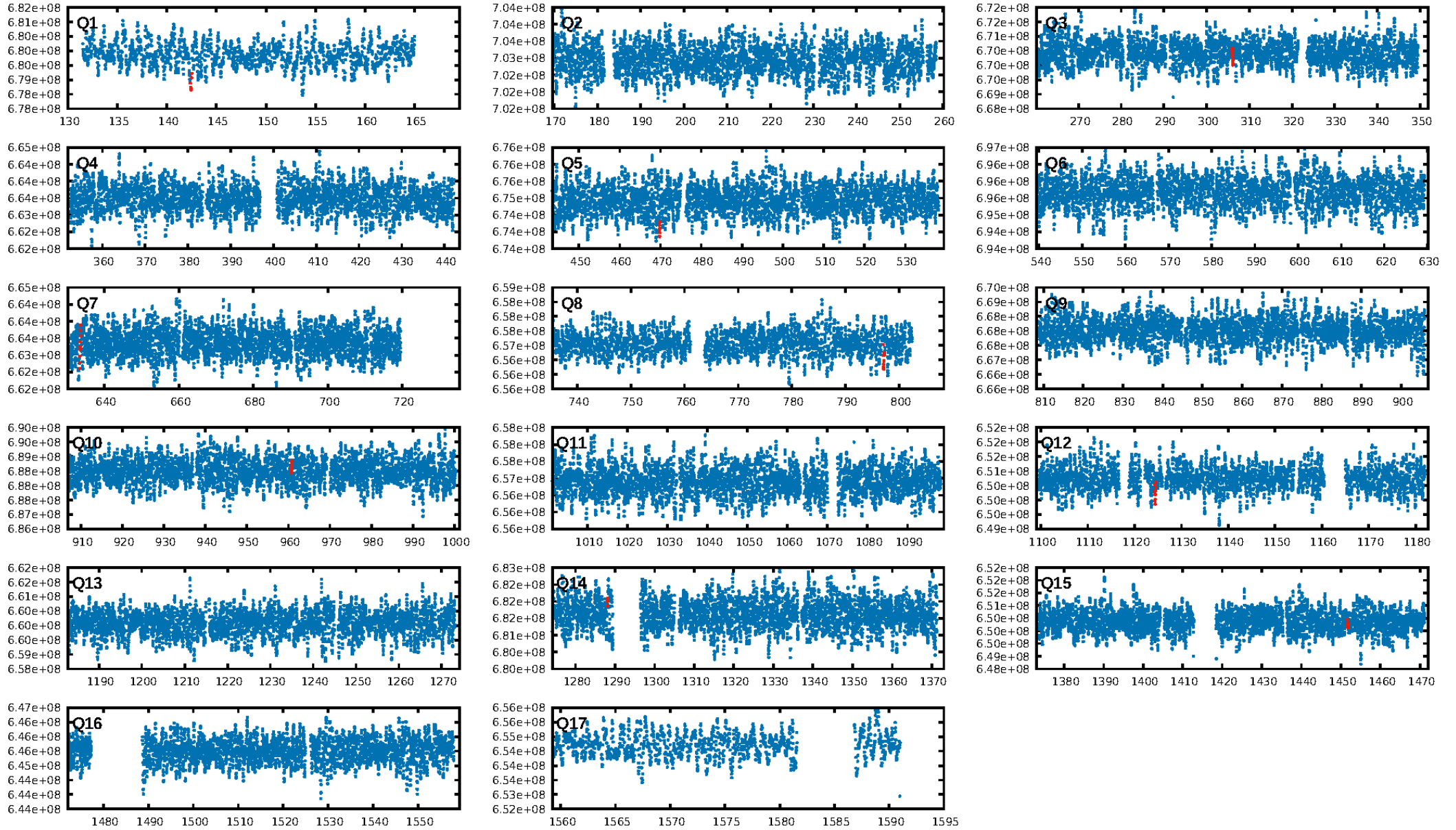
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [94.37σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 31.3%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 2.31e-09**  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 115.3  
Centroid-sig: 13.4%  
Centroid-so: 0.234 arcsec [0.89σ]  
OotOffset-rm: 0.640 arcsec [1.48σ]  
KicOffset-rm: 0.668 arcsec [1.55σ]  
OotOffset-st: 2/3/2/2 [9]  
KicOffset-st: 2/3/2/2 [9]  
DiffImageQuality-fgm: 0.56 [5/9]  
DiffImageOverlap-fno: 0.00 [0/9]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 13:29:34 Z

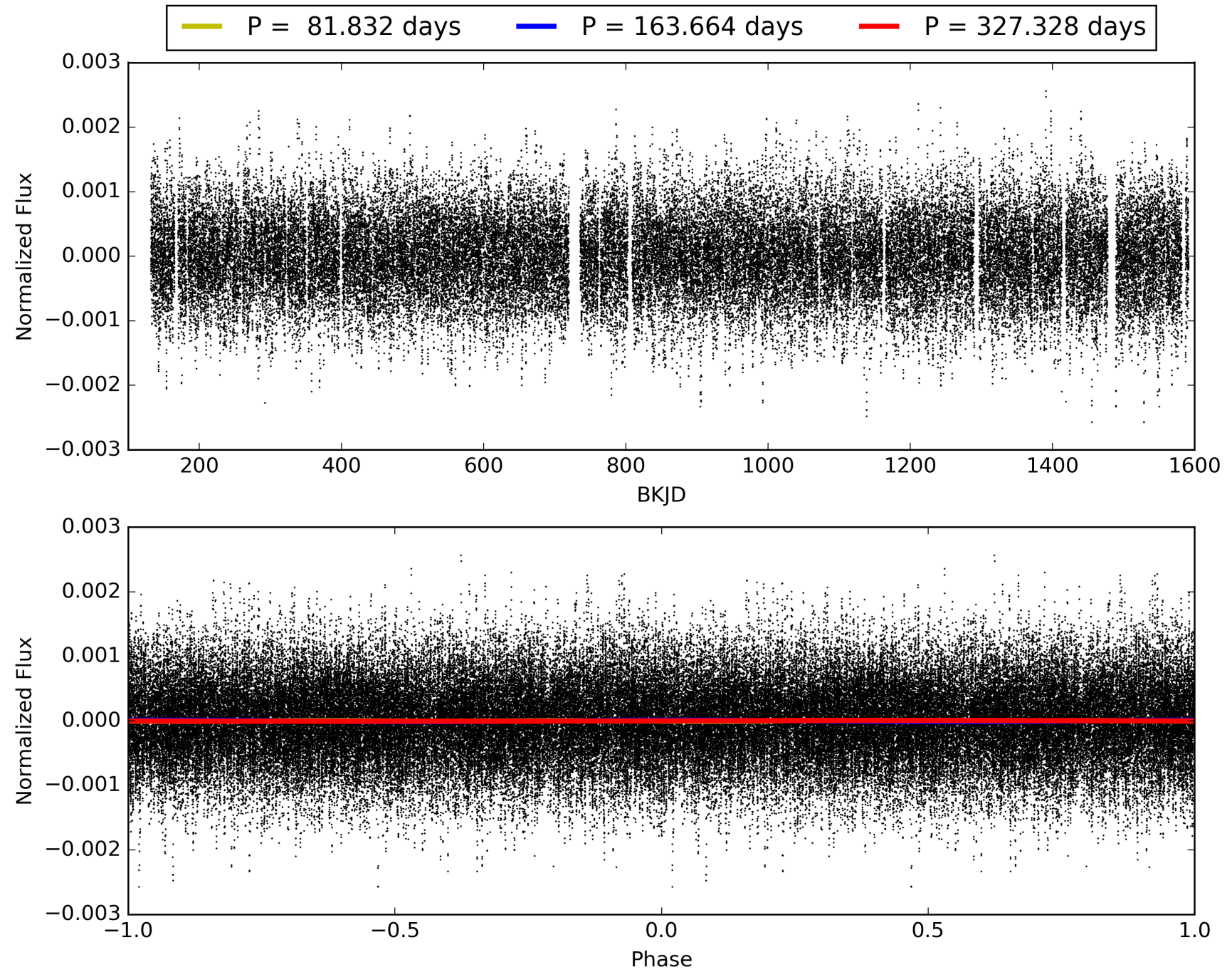
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005097278-06, PDC Light Curves



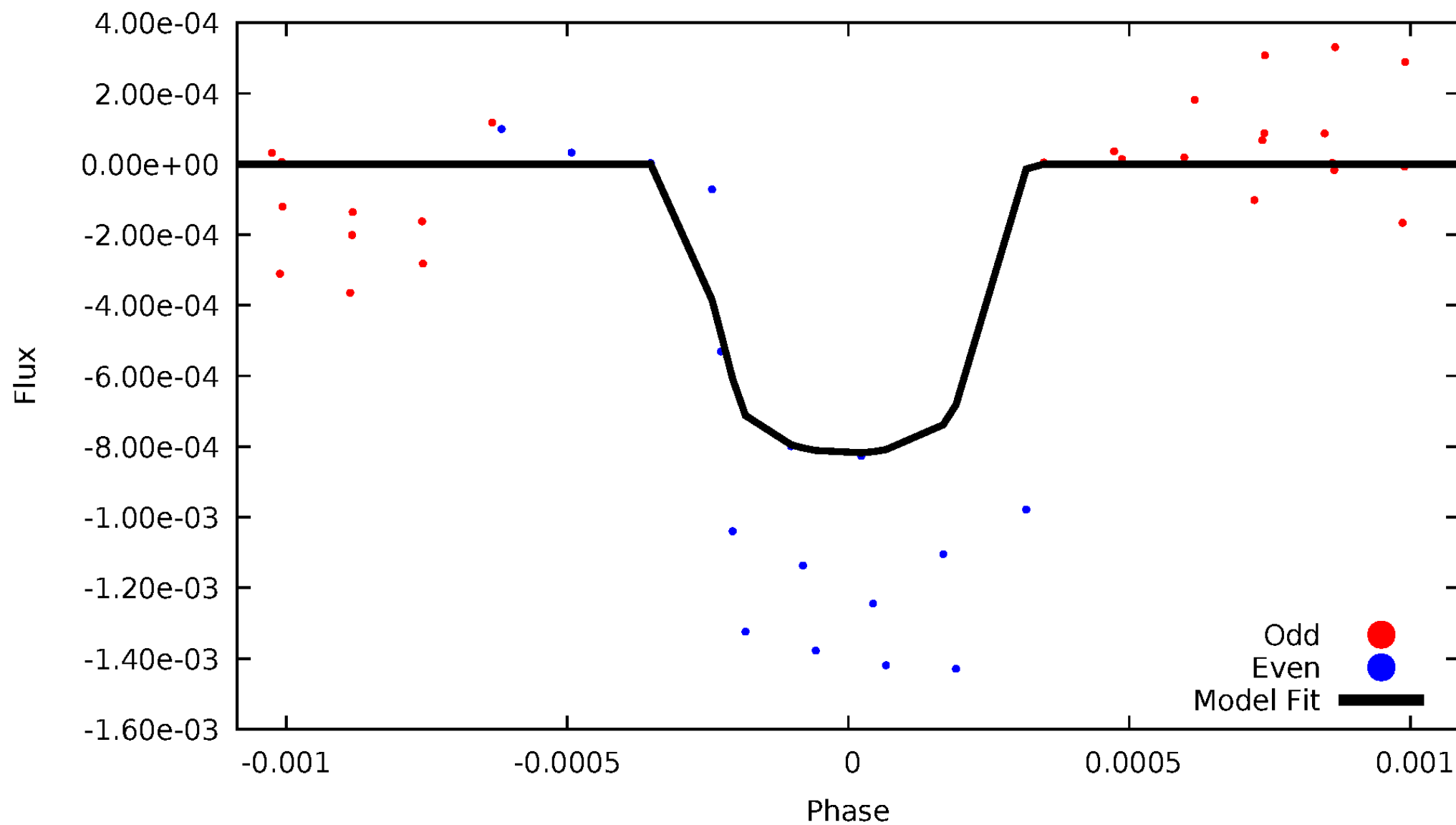


# TCE 005097278-06



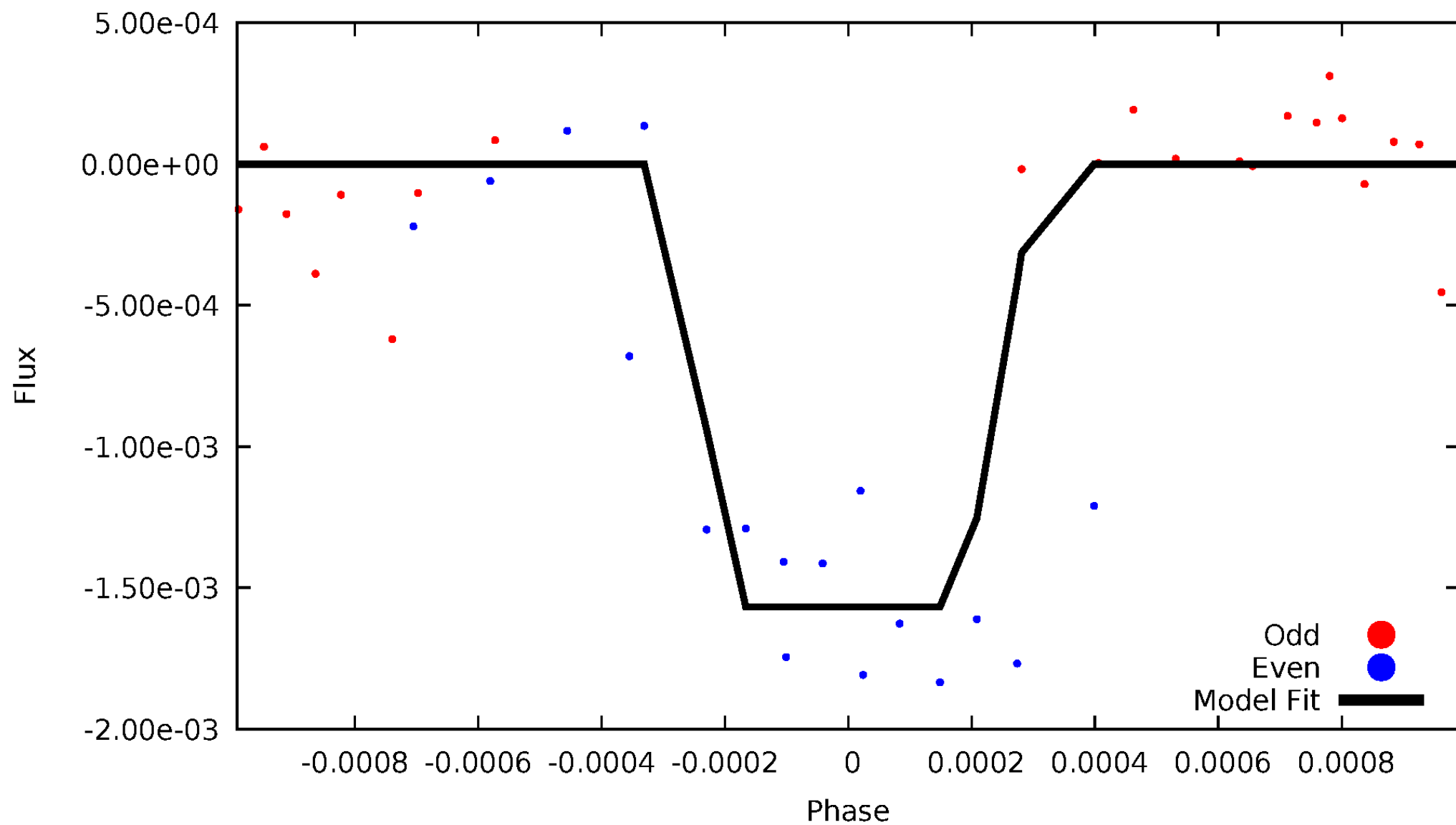
# DV Odd/Even

TCE 005097278-06



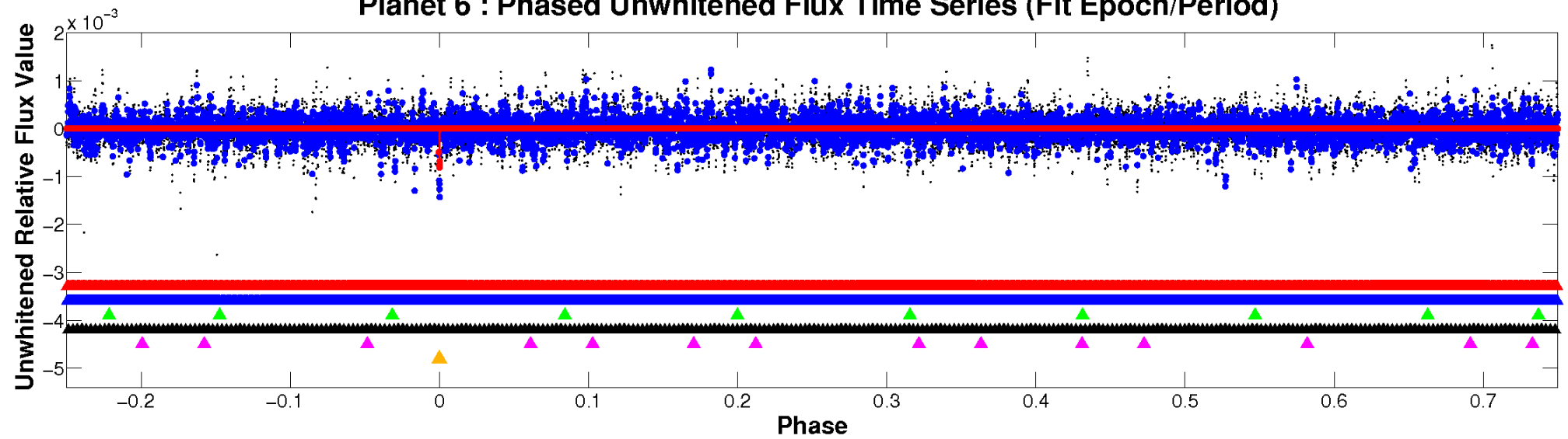
# ALT Odd/Even

TCE 005097278-06

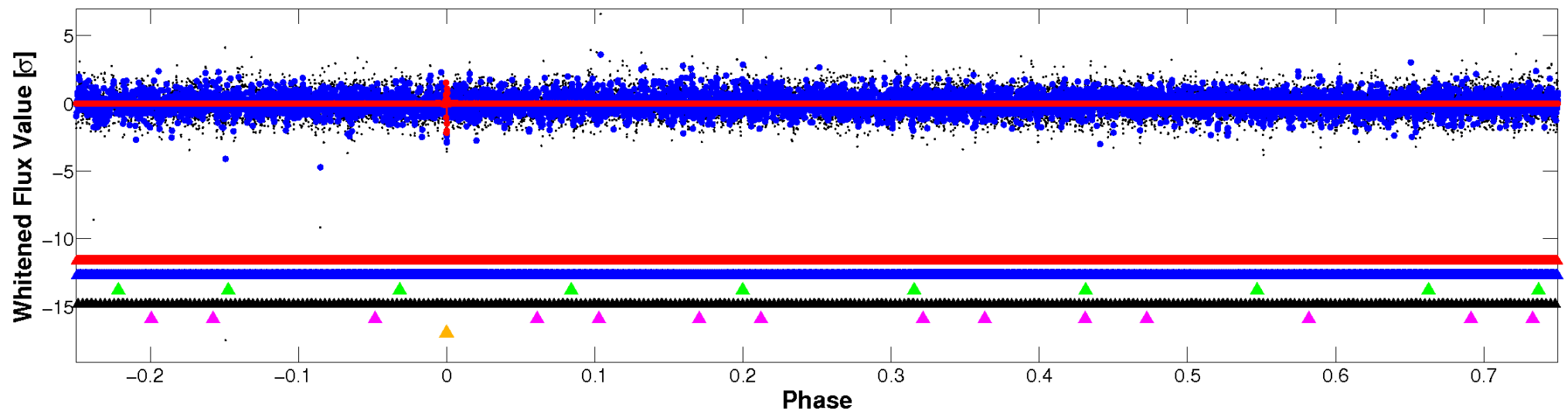


# Non-Whitened Vs. Whitened Light Curve

## Planet 6 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

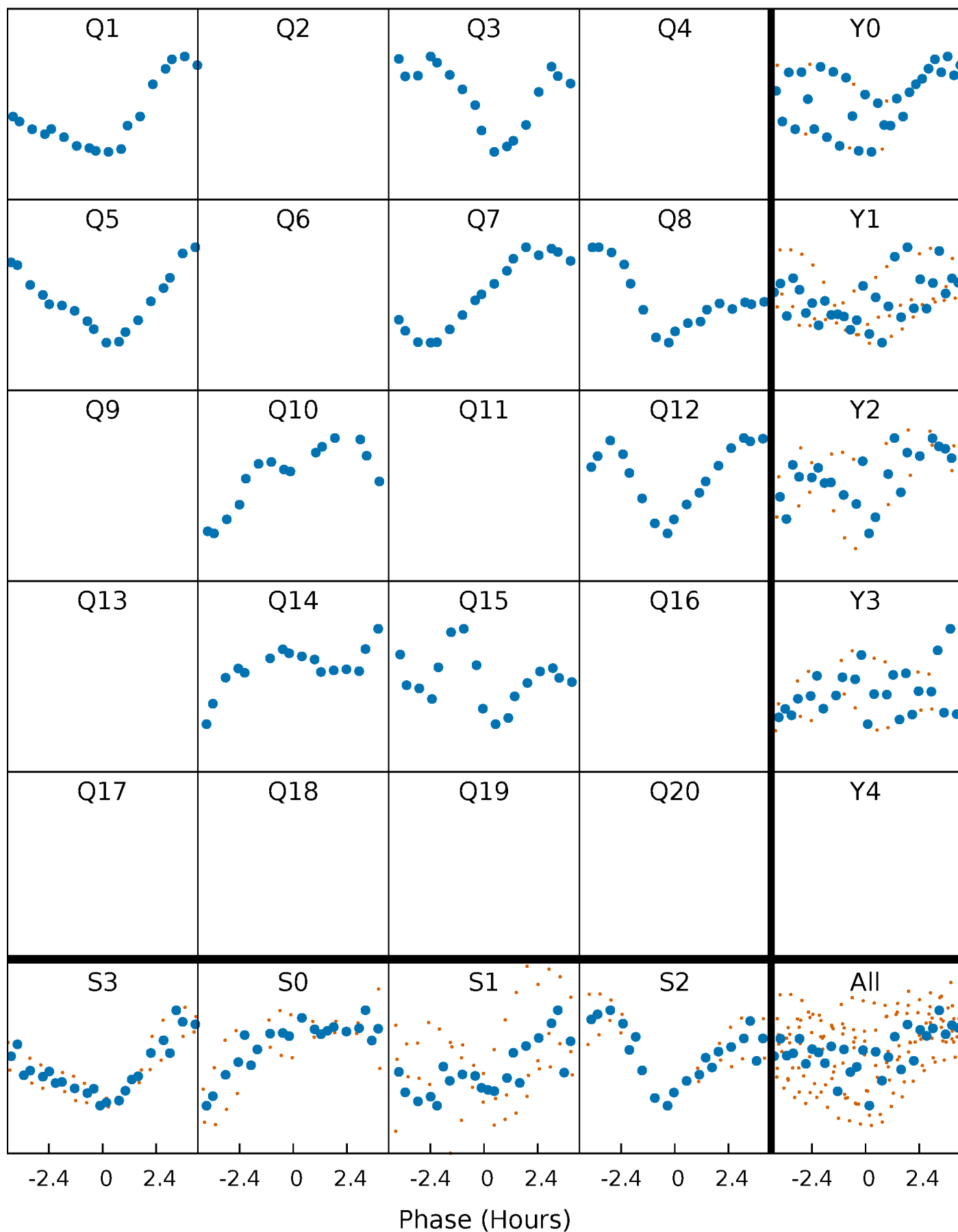


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



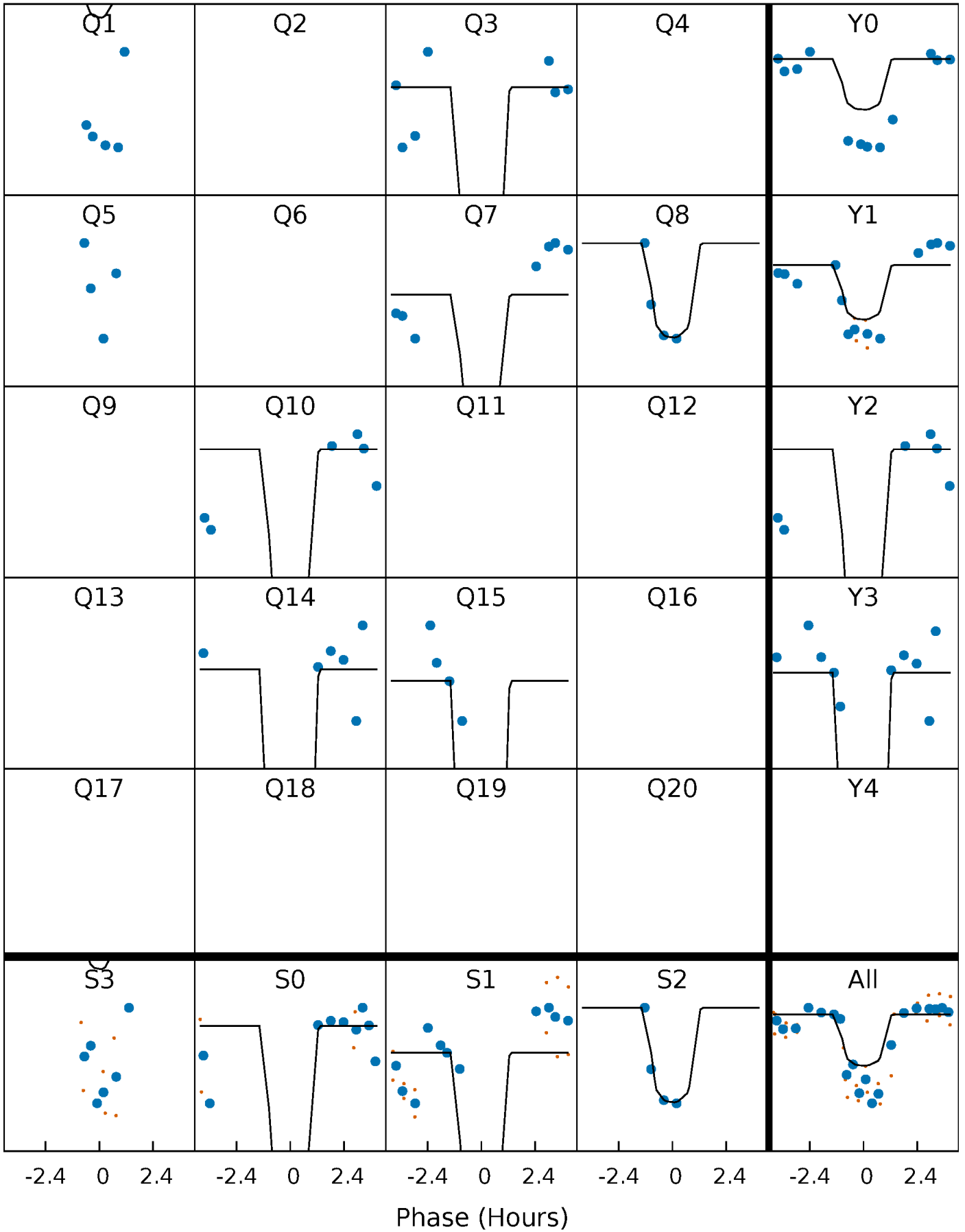
# PDC Quarter-Phased Transit Curves

TCE 005097278-06 P=163.663790 Days  $T_0=142.434048$  (BKJD)



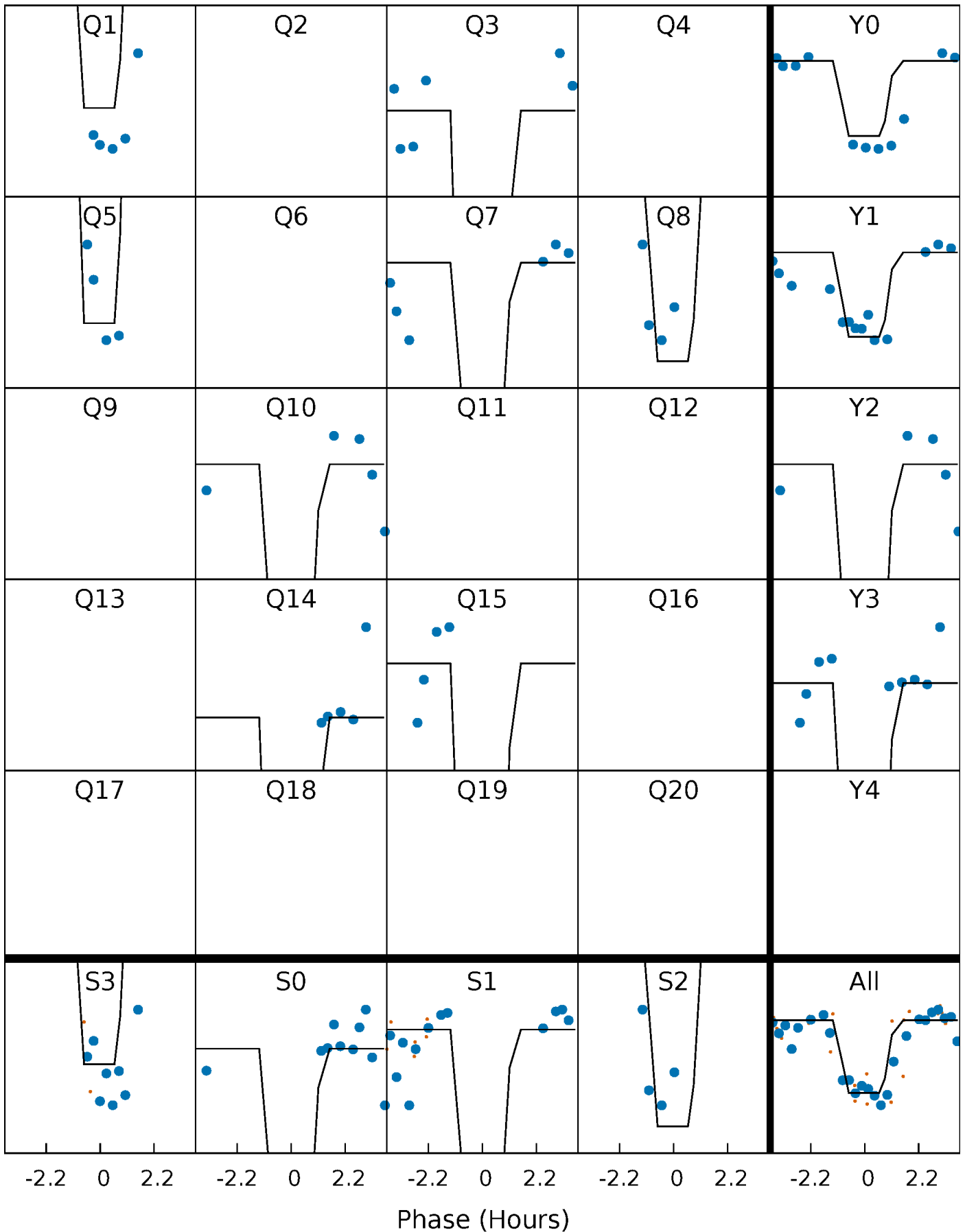
# DV Quarter-Phased Transit Curves

TCE 005097278-06 P=163.663790 Days  $T_0=142.434048$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 005097278-06 P=163.667272 Days  $T_0=142.420646$  (BKJD)

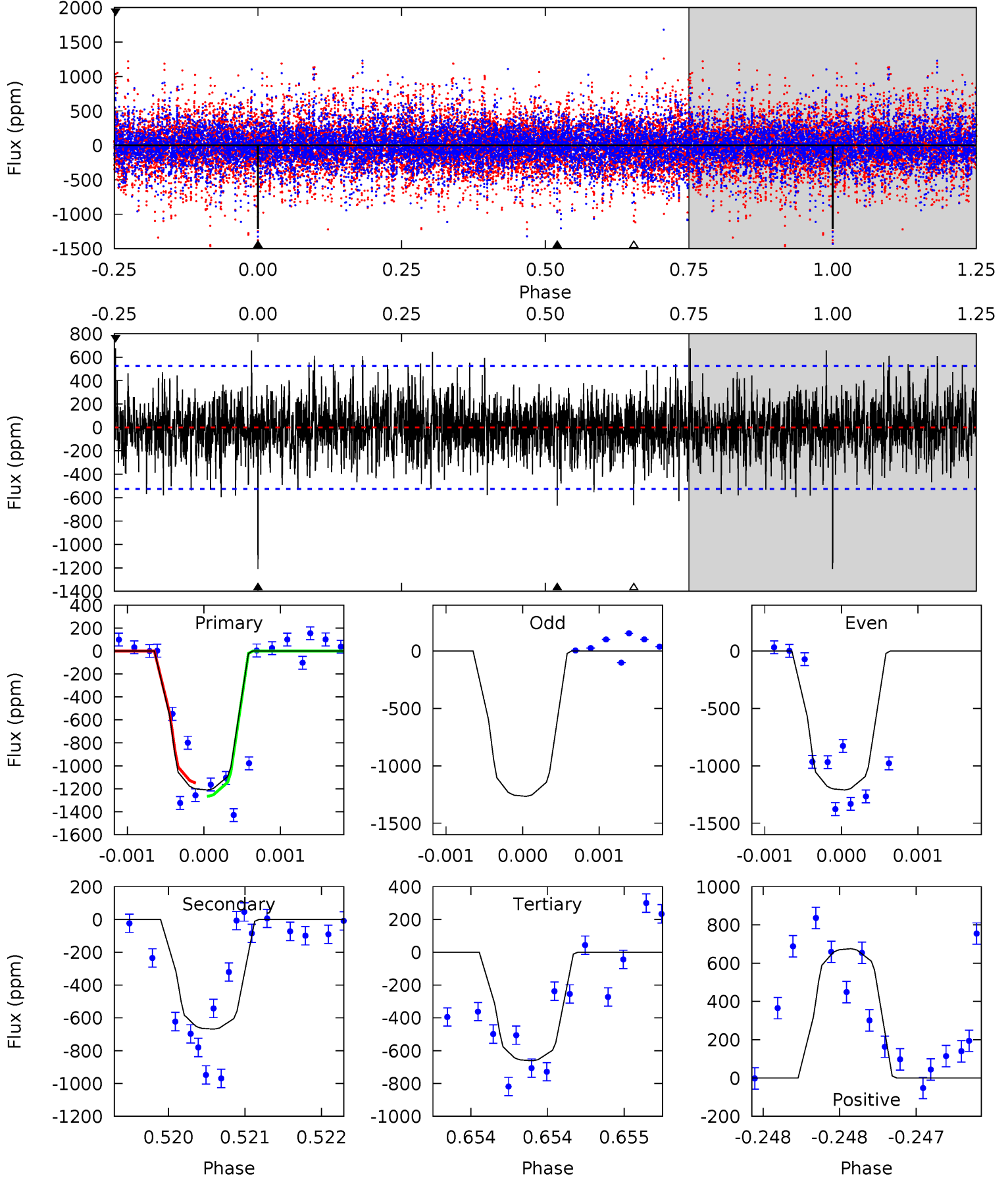




# DV Model-Shift Uniqueness Test

005097278-06, P = 163.663790 Days, E = 142.434048 Days

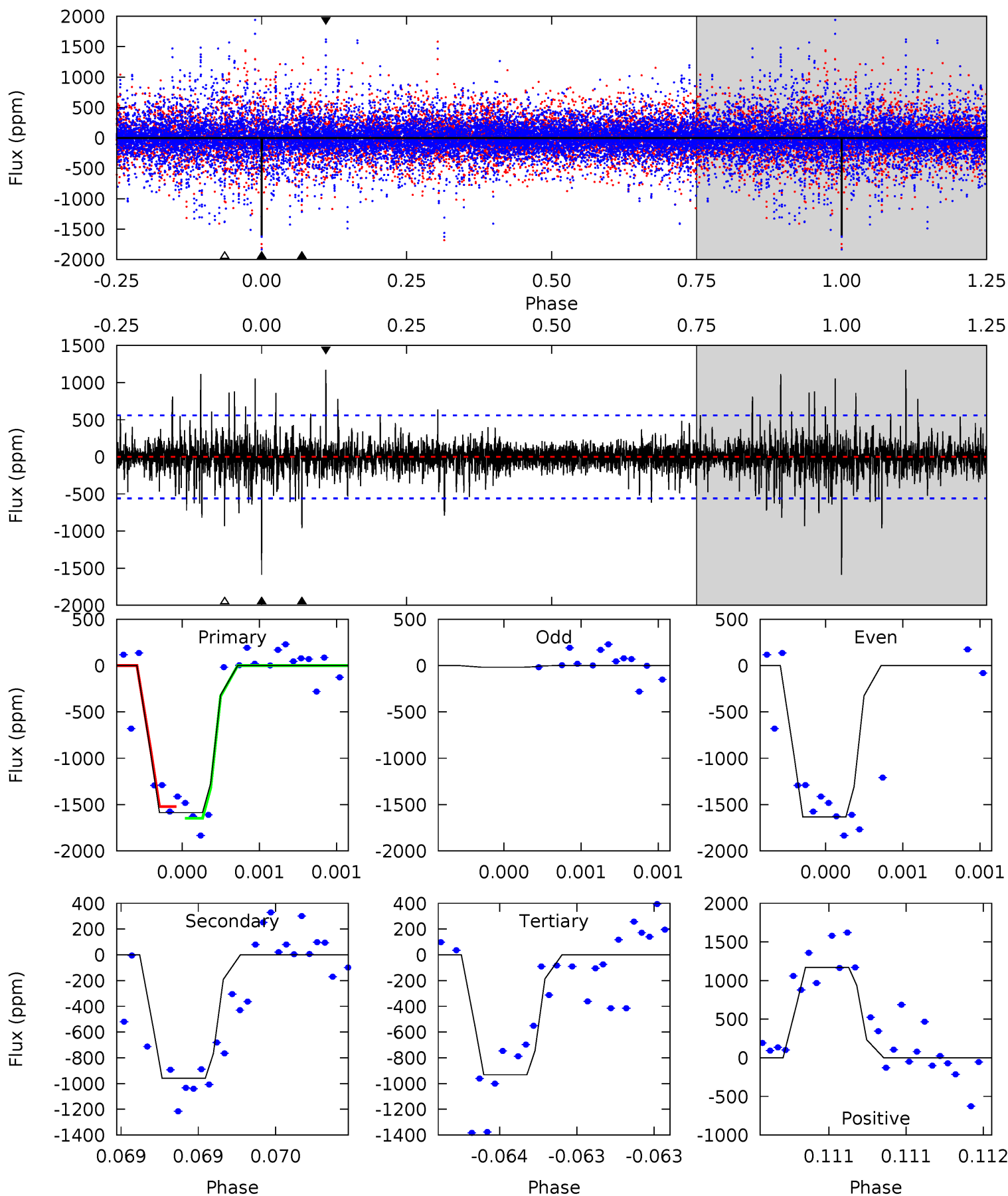
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.8	7.08	7.00	7.15	5.56	3.46	1.79	5.81	5.66	0.08	-0.07	0.34	0.96	0.36	0.62



# Alt Model-Shift Uniqueness Test

005097278-06, P = 163.667272 Days, E = 142.420646 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
15.7	9.52	9.24	11.6	5.55	3.45	1.50	6.50	4.12	0.28	-2.10	6.04	1.05	0.42	0.59



### Stellar Parameters For KIC 005097278

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7392^{+207}_{-337}$	$4.135^{+0.128}_{-0.192}$	$-0.040^{+0.200}_{-0.350}$	$1.772^{+0.548}_{-0.365}$	$1.563^{+0.213}_{-0.237}$	$0.396^{+0.253}_{-0.209}$
	+3%/-5%	+3%/-5%	+500%/-875%	+31%/-21%	+14%/-15%	+64%/-53%
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 005097278-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-669 \pm 95$	$5.55^{+2.29}_{-2.13}$	$737^{+55}_{-52}$	$6938^{+2396}_{-1139}$	$5506^{+9053}_{-2812}$
Alt.	$-959 \pm 101$	$7.73^{+2.54}_{-2.17}$	$738^{+58}_{-48}$	$6437^{+1316}_{-728}$	$4037^{+3670}_{-1718}$

$T_{\text{max}}$  = 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

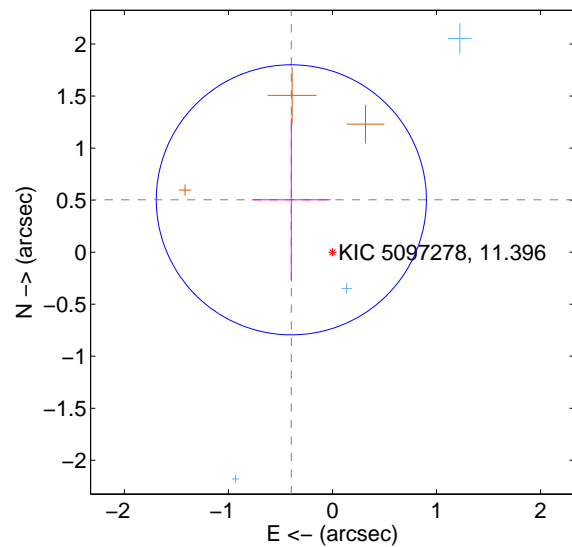
Supplemental centroid analysis for 005097278-06. **Kepler magnitude: 11.40.** Transit SNR 6.91

There are 5 quarters with good PRF difference image offsets

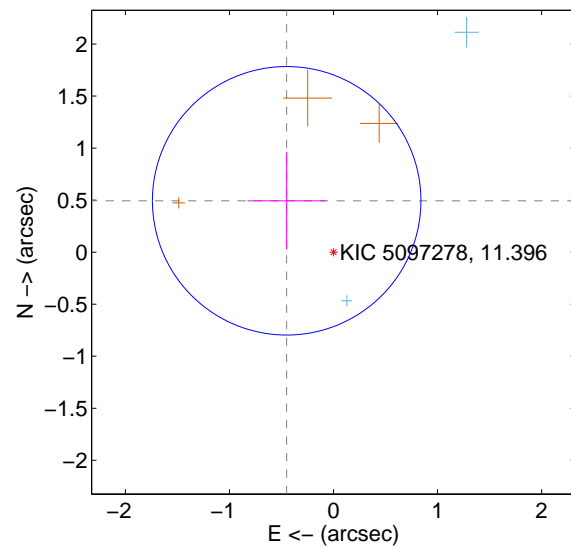
The direct PRF centroid is offset from the target star catalog position by about 0.04 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.640 \pm 0.432$	1.48	$0.395 \pm 0.378$	$0.503 \pm 0.781$
PRF-fit source offset from KIC position	$0.668 \pm 0.430$	1.55	$0.450 \pm 0.377$	$0.494 \pm 0.469$
photometric centroid source offset	$0.23 \pm 0.26$	0.89	$0.22 \pm 0.26$	$0.08 \pm 0.29$

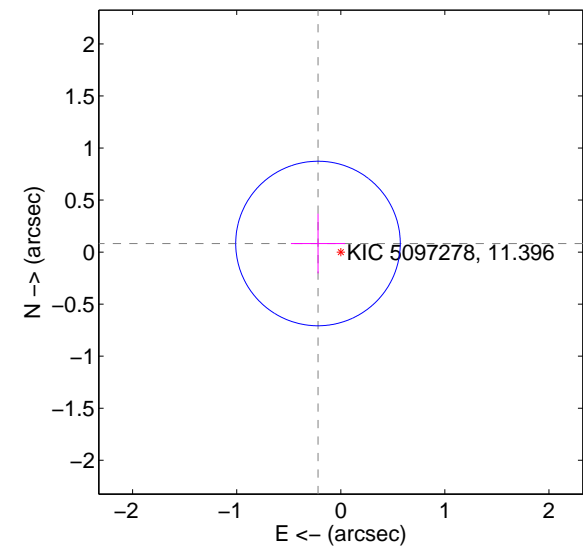
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

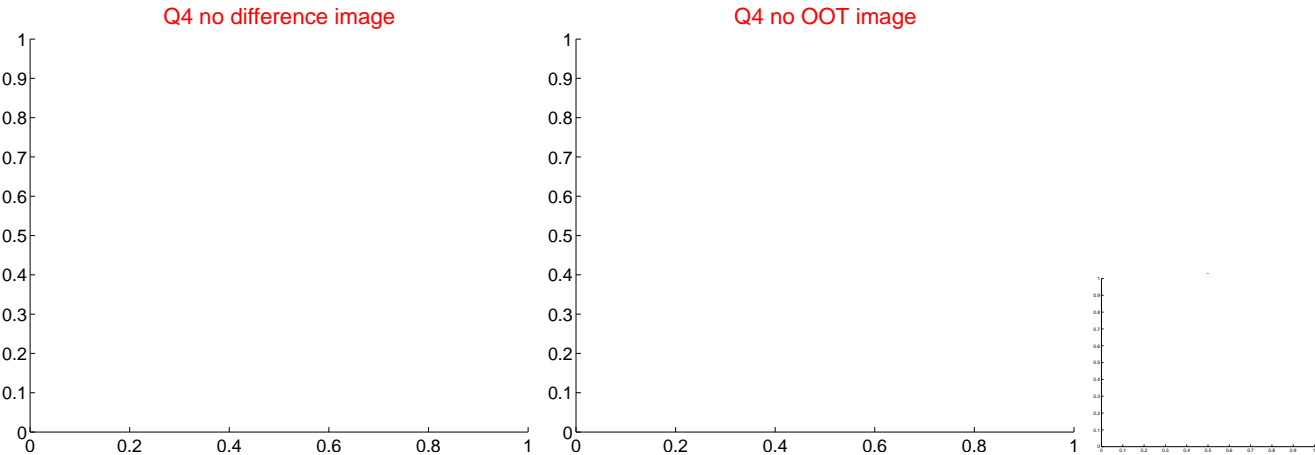
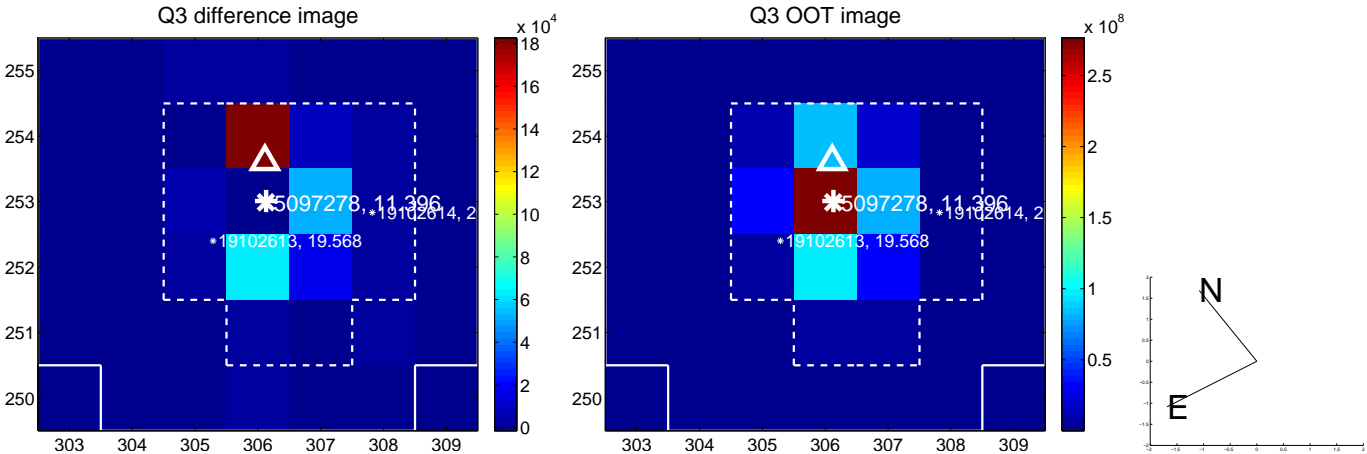
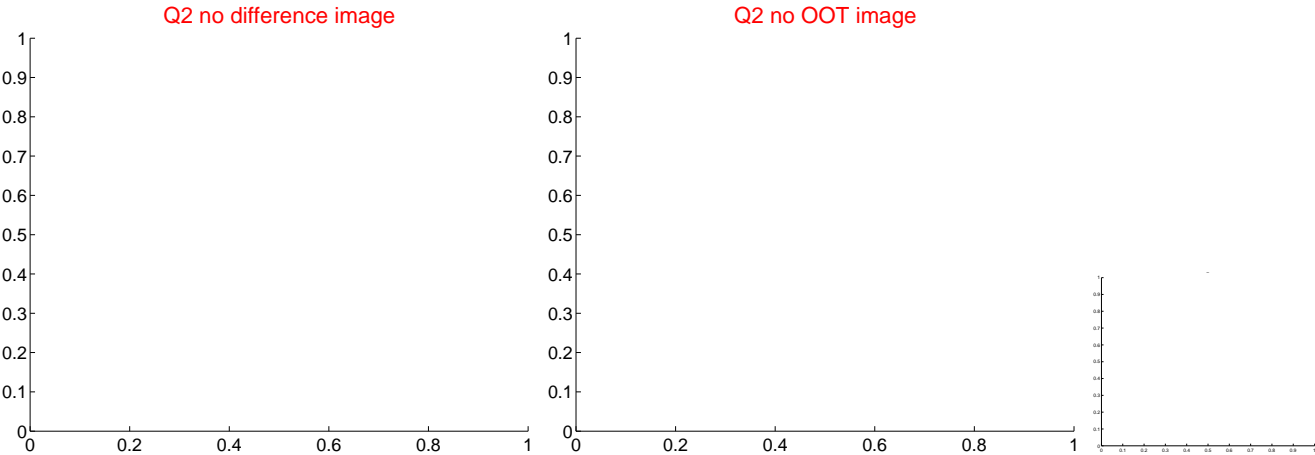
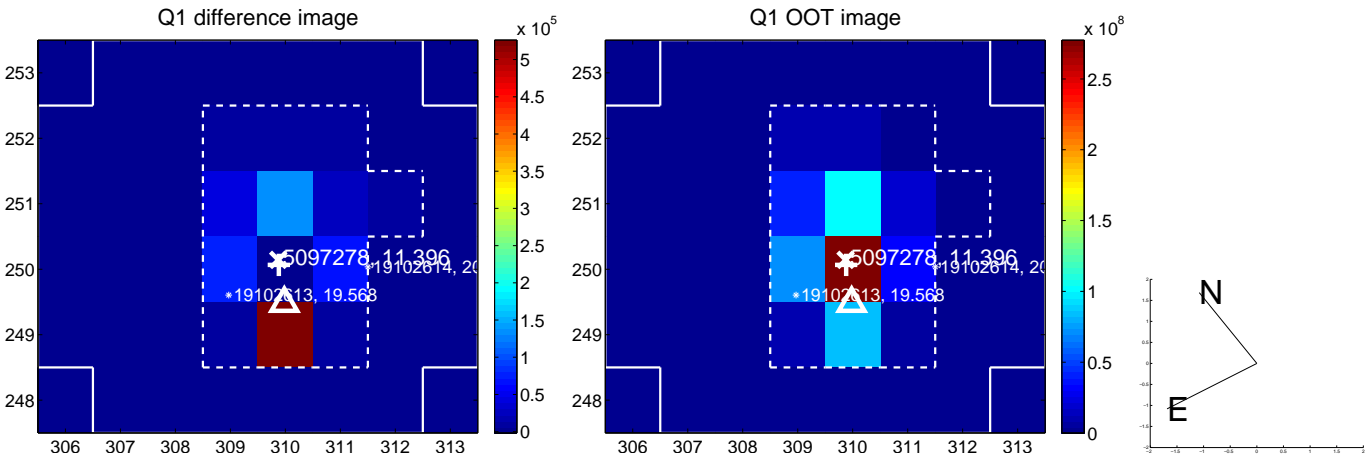


offset from photometric centroids

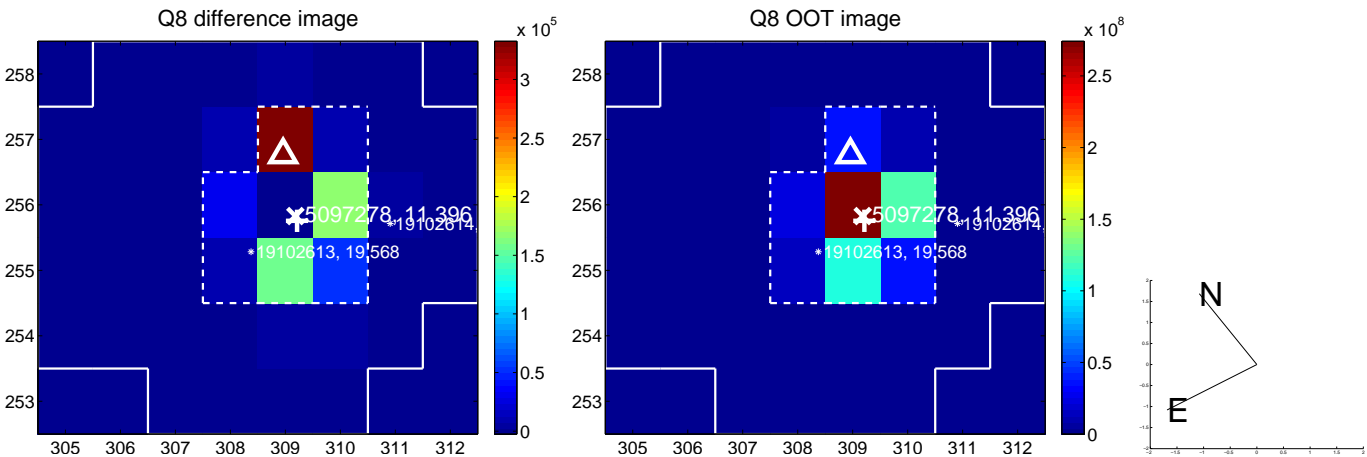
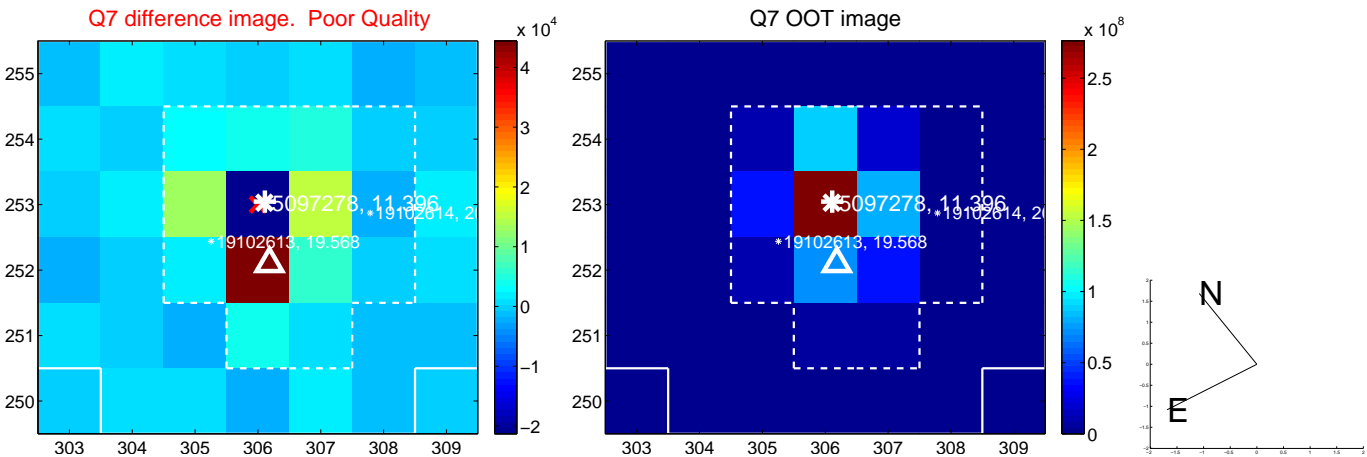
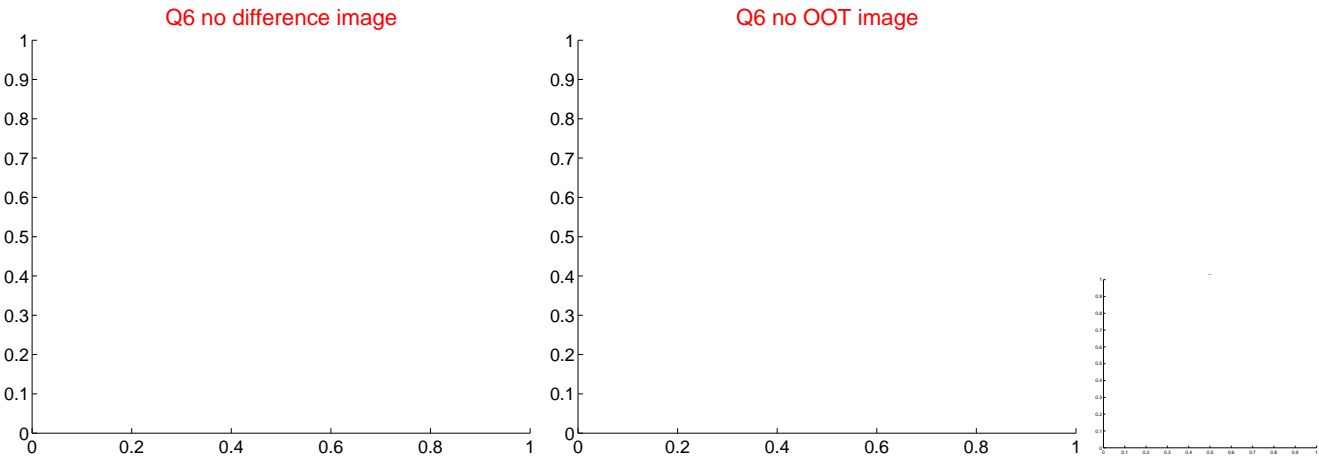
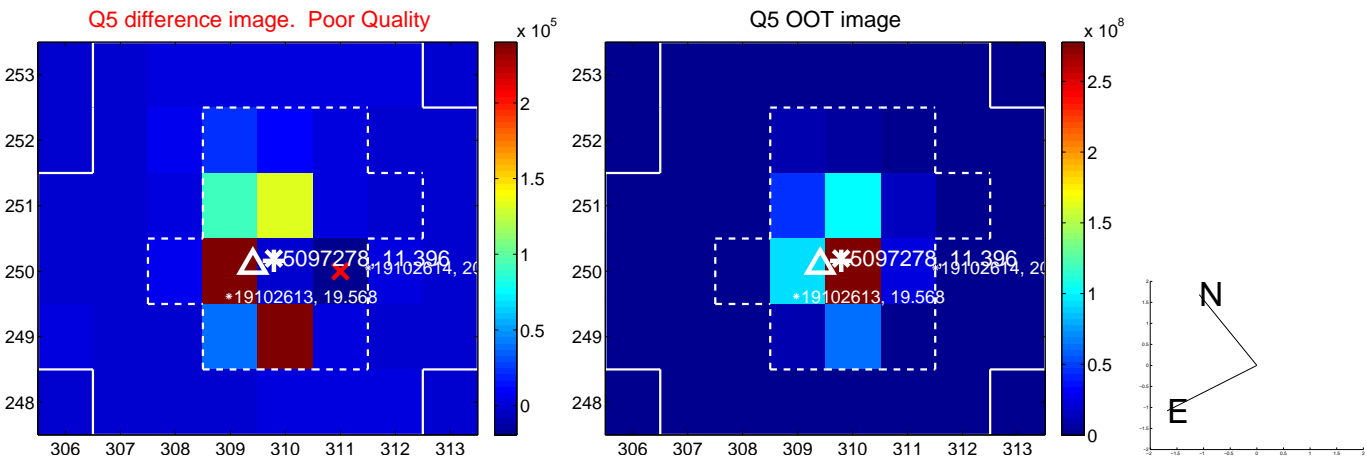


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

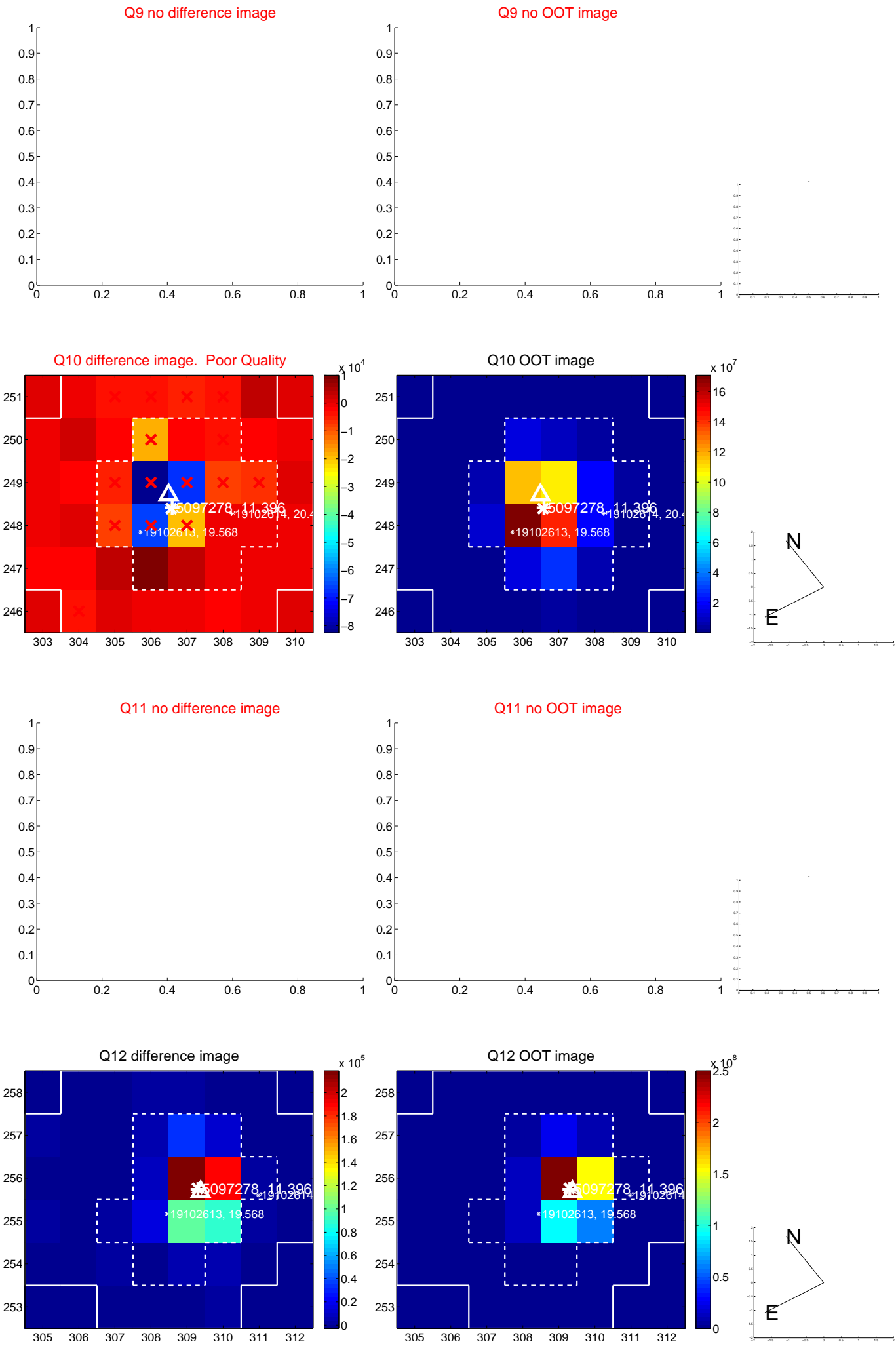
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

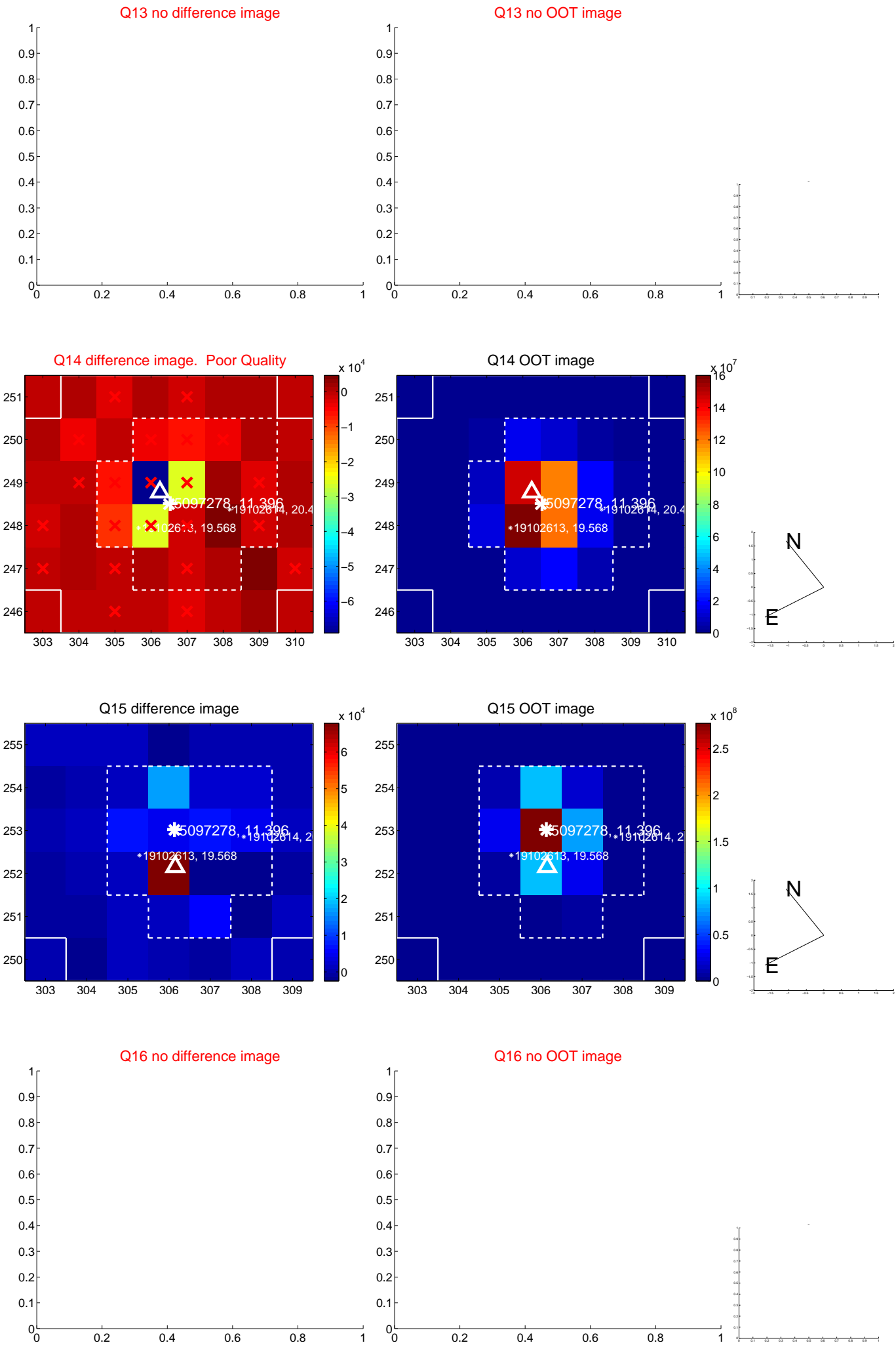


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

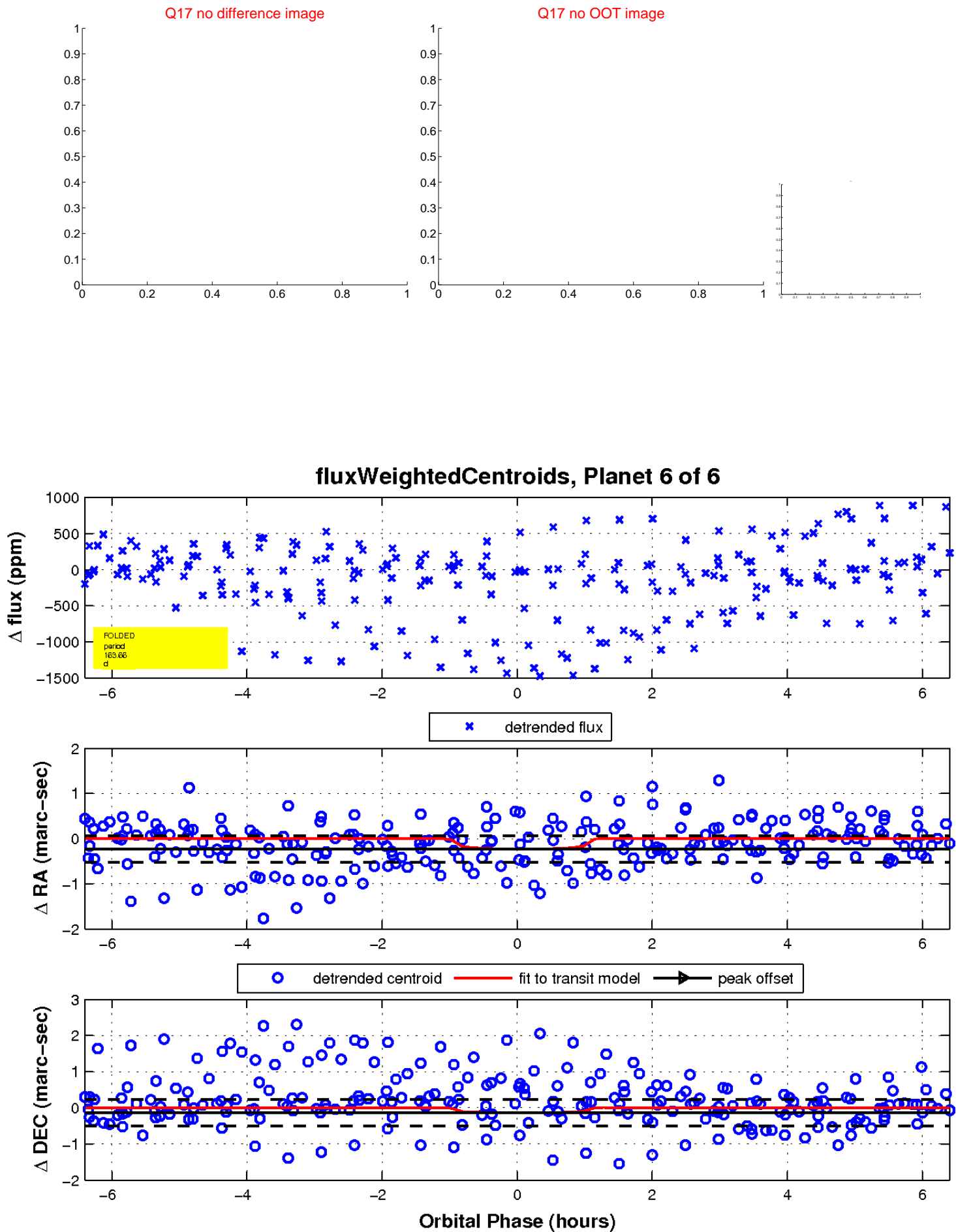




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image

Declination

