

# KIC 004669402

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004669402-01	OBS	4128.01	143.194809	227.305252	604.8	10.535	16.9	16.8	1.06	6007	4.53	4.96
004669402-02	OBS	No	8.495723	136.155894	89.2	13.450	14.1	13.2	1.06	6007	1.15	214.52
004669402-03	OBS	No	8.495094	135.389583	93.7	19.032	7.8	8.9	1.06	6007	1.42	214.54

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004669402-01	OBS	FP	0.00	0	0	1	0	CENT_RESOLVED_OFFSET—HALO_GHOST
004669402-02	OBS	FP	0.00	1	0	0	0	LPP_DV
004669402-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—SAME_NTL_PERIOD—CENT_FEW_DIFFS

**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 004669402-01

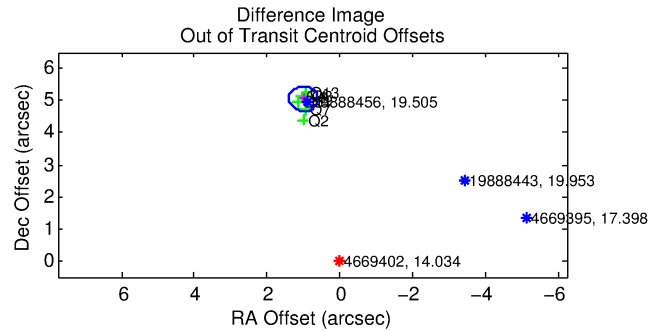
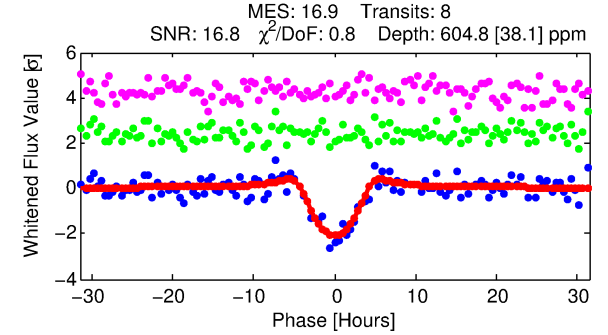
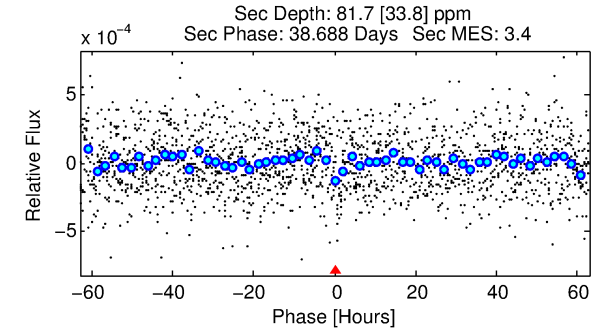
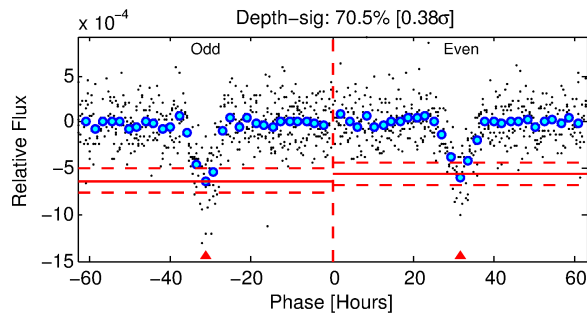
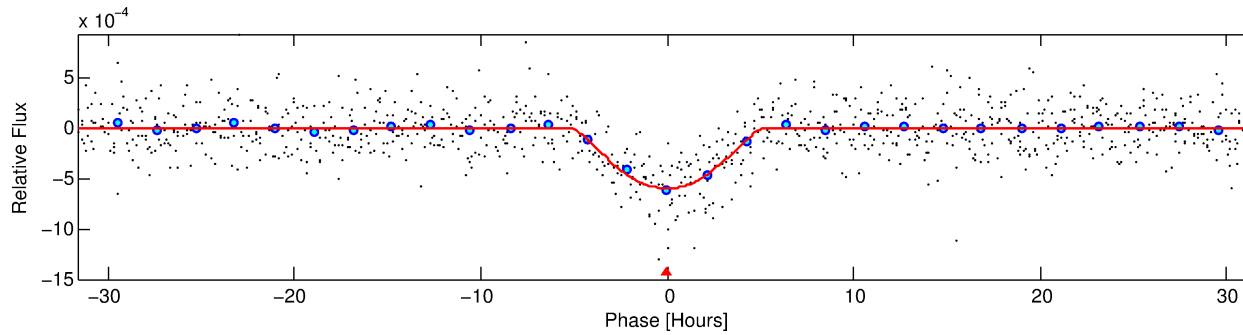
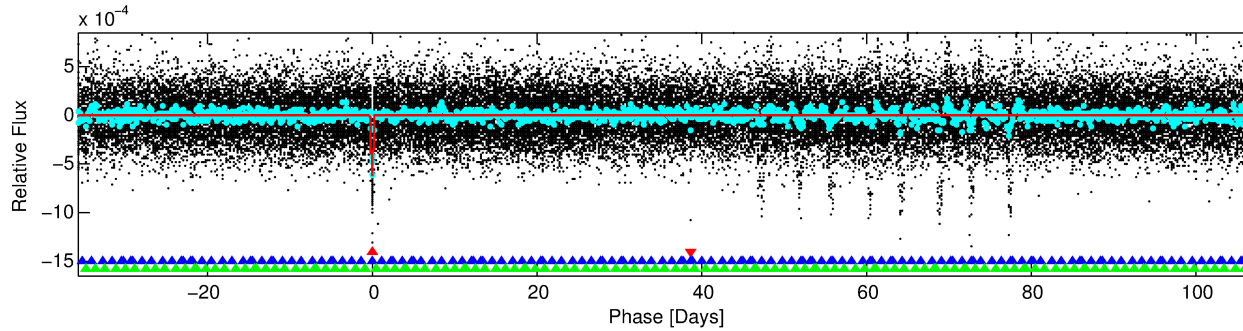
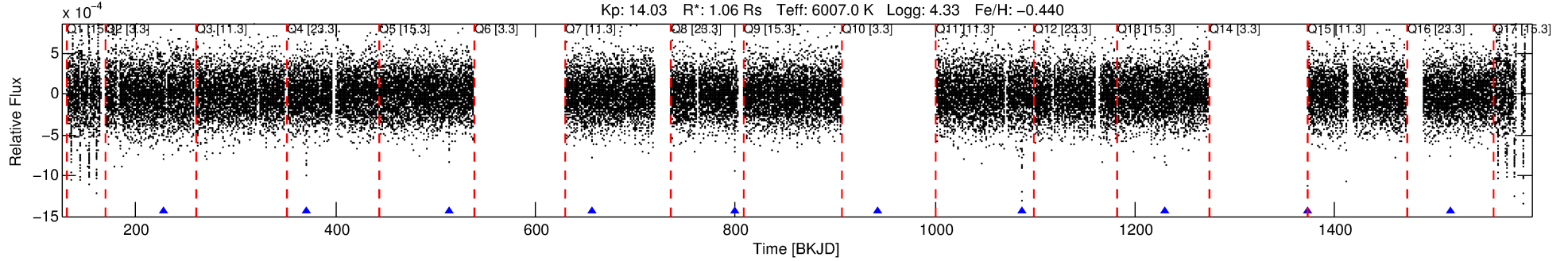
No Significant Match Found

# DV One-Page Summary

KIC: 4669402 Candidate: 1 of 3 Period: 143.195 d

KOI: K04128.01 Corr: 0.983

Kp: 14.03 R\*: 1.06 Rs Teff: 6007.0 K Logg: 4.33 Fe/H: -0.440



## DV Fit Results:

Period = 143.19481 [0.00218] d  
Epoch = 227.3053 [0.0104] BKJD  
Rp/R\* = 0.0392 [0.0422]  
a/R\* = 31.84 [10.20]  
b = 0.99 [0.07]  
Seff = 4.96 [1.73]  
Teq = 381 [33] K  
Rp = 4.53 [5.02] Re  
a = 0.5139 [0.1155] AU  
Ag = 578.02 [1281.40] [0.45σ]  
Teffp = 2885 [1584] K [1.58σ]

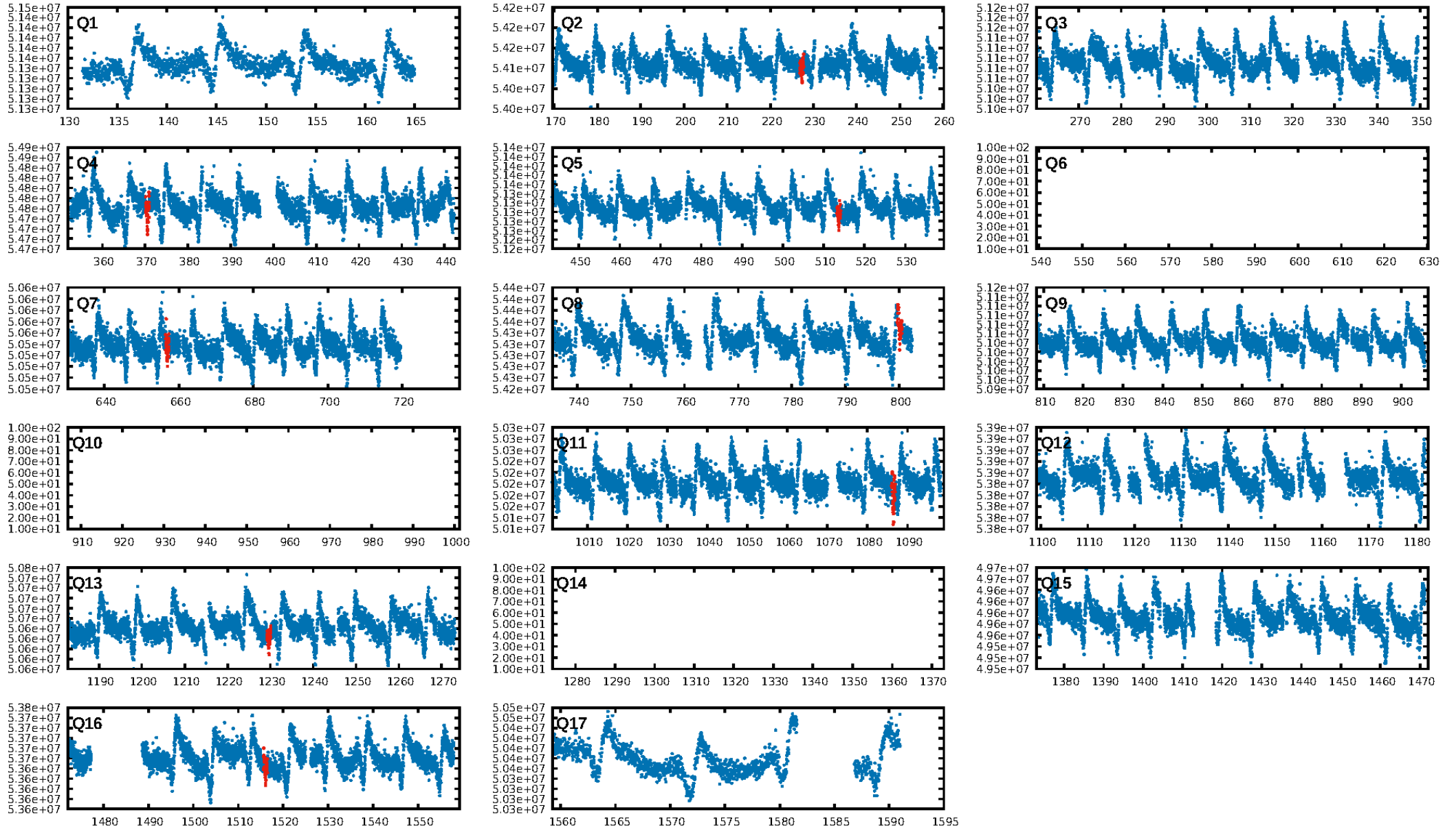
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [189.21σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.2%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 4.70e-51  
RollingBand-fgt: 1.00 [8/8]  
GhostDiagnostic-chr: 0.1817  
Centroid-sig: 0.0%  
Centroid-so: 10.197 arcsec [13.98σ]  
OotOffset-rm: 5.148 arcsec [39.43σ]  
KicOffset-rm: 4.973 arcsec [31.77σ]  
OotOffset-st: 1/2/2/2 [7]  
KicOffset-st: 1/2/2/2 [7]  
DiffImageQuality-fgm: 1.00 [7/7]  
DiffImageOverlap-fno: 0.86 [6/7]

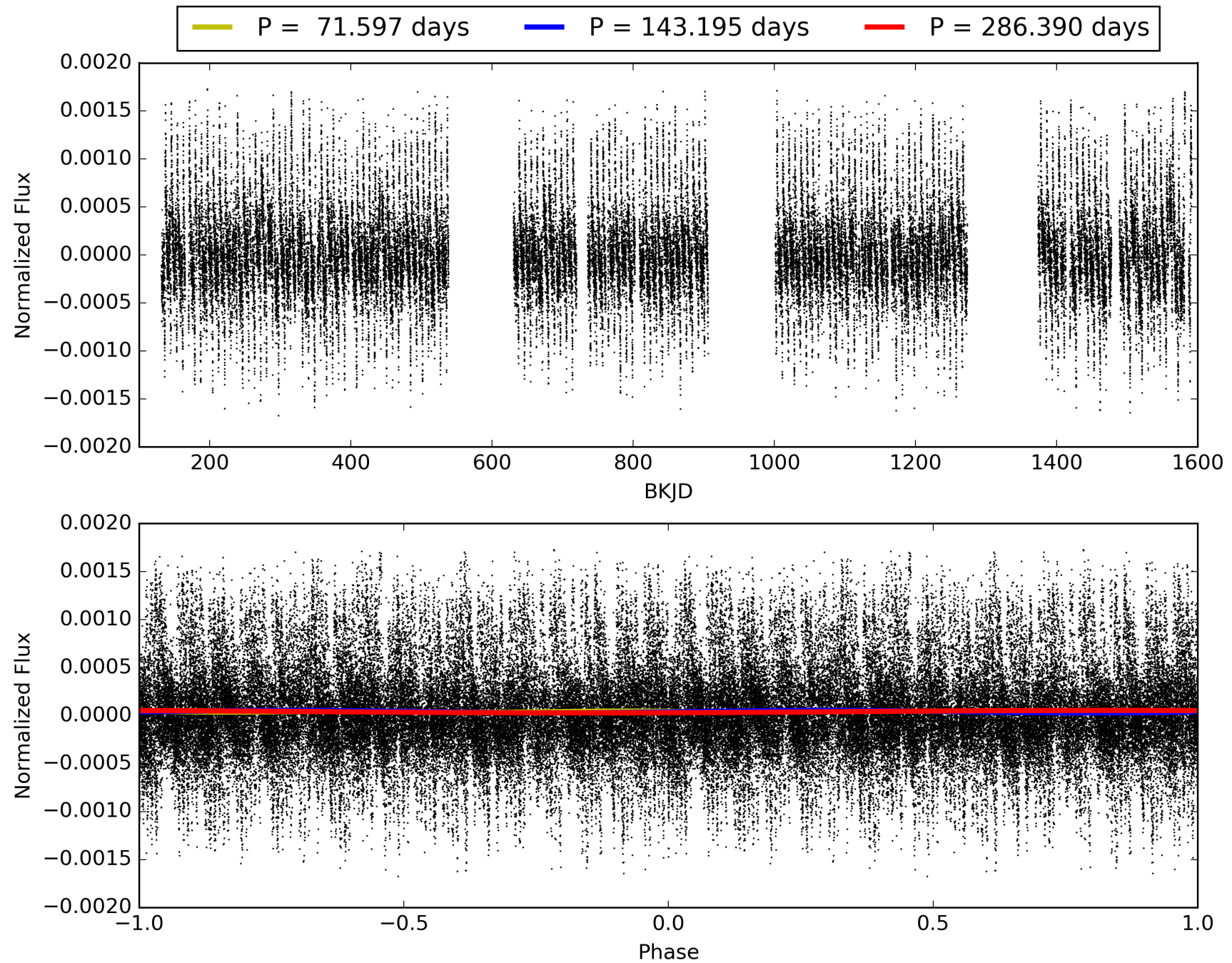
Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 12:35:10 Z

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

# TCE 004669402-01, PDC Light Curves



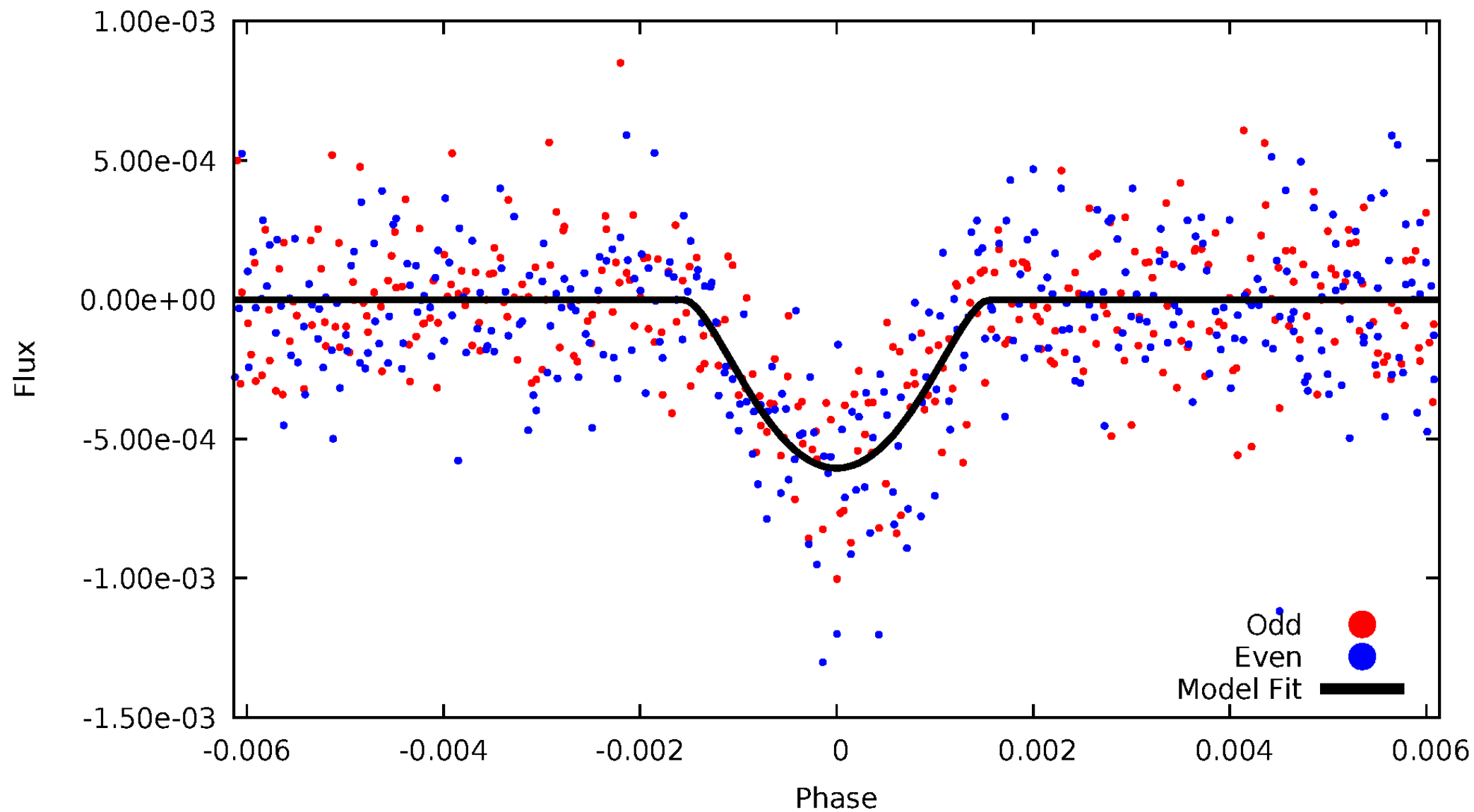
TCE 004669402-01





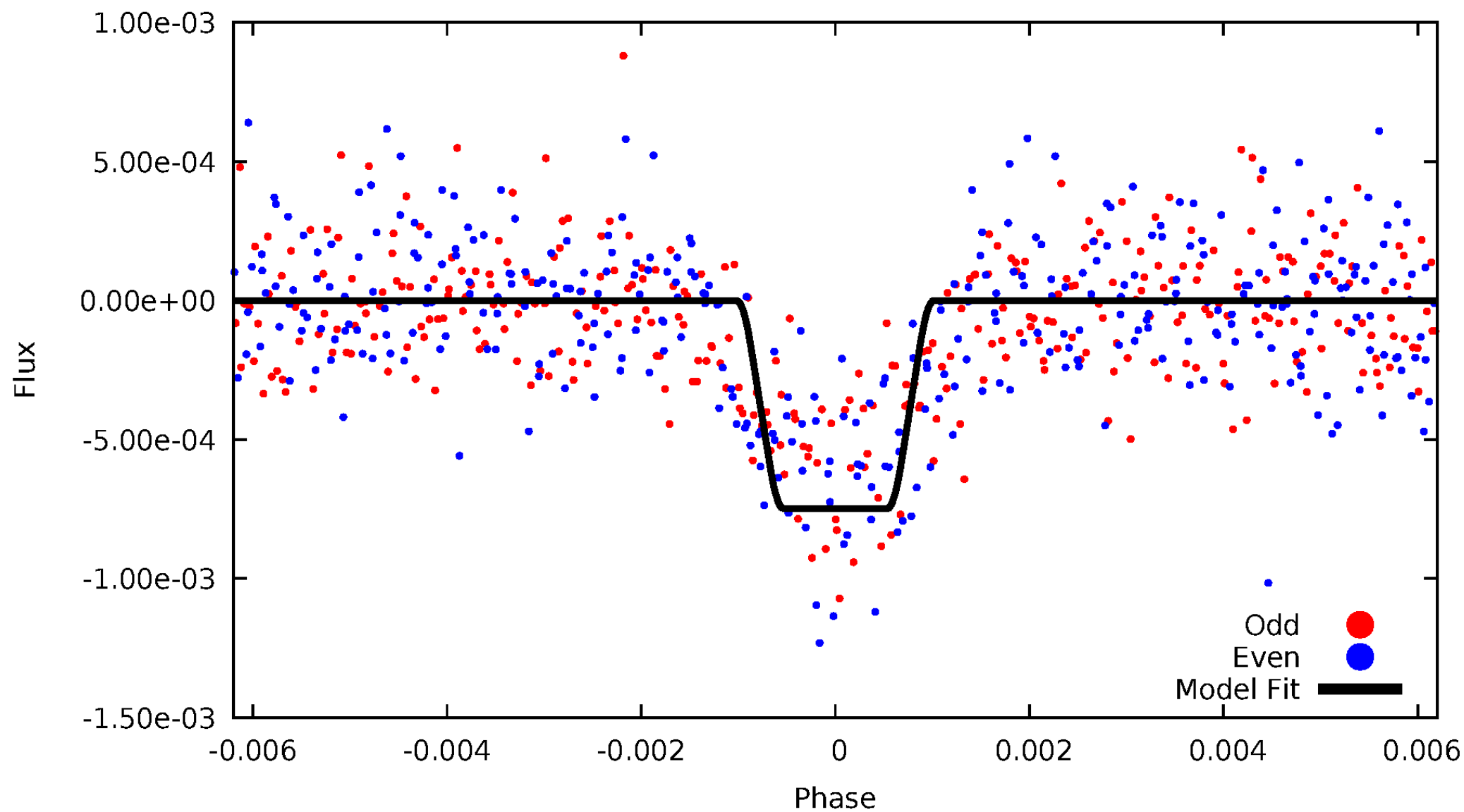
# DV Odd/Even

TCE 004669402-01



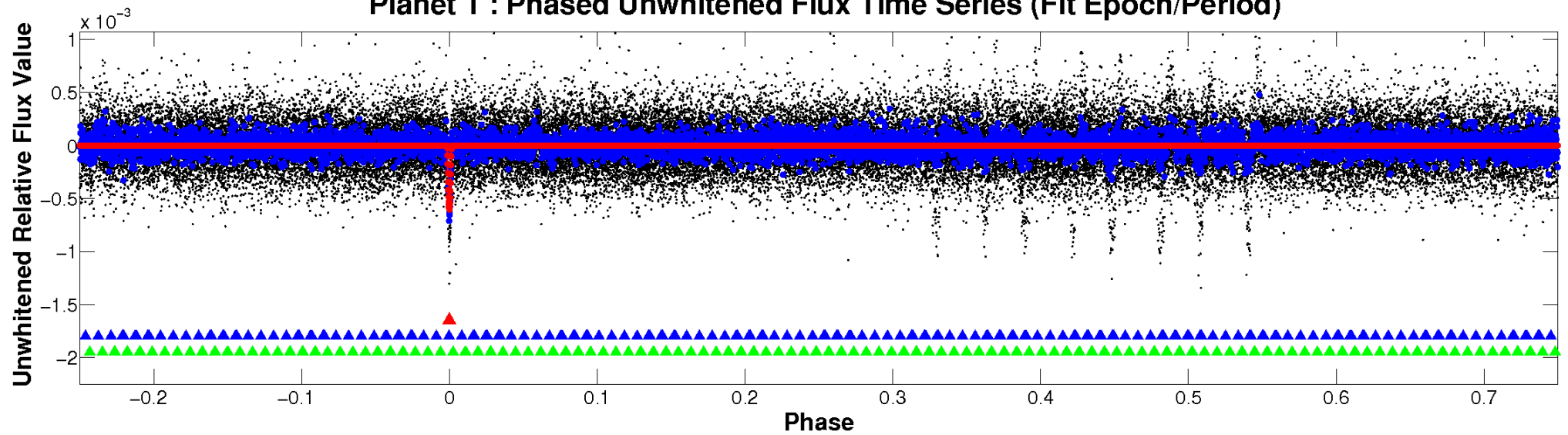
# ALT Odd/Even

TCE 004669402-01

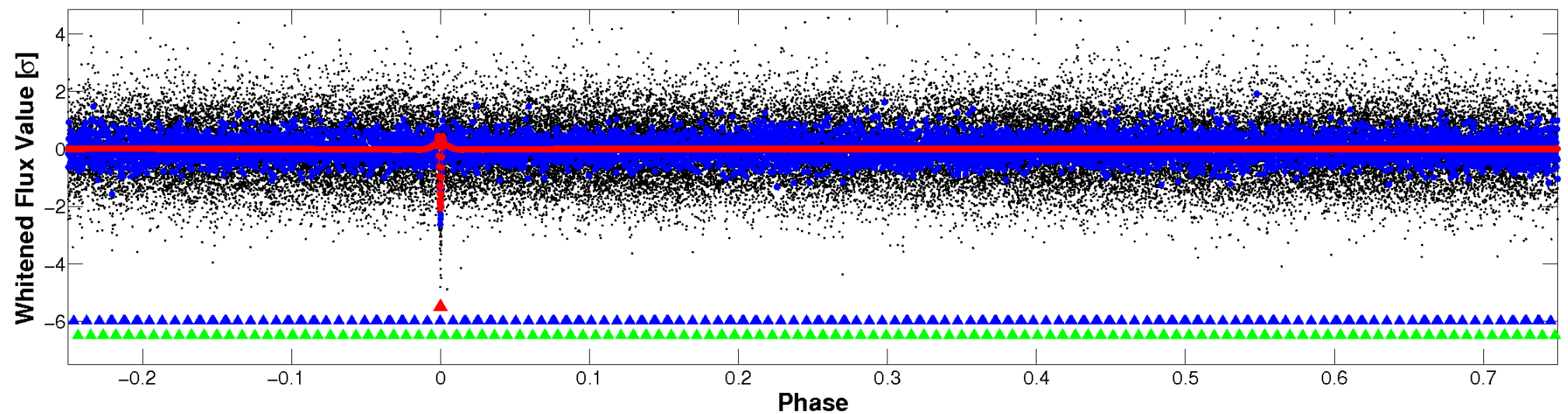


# Non-Whitened Vs. Whitened Light Curve

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

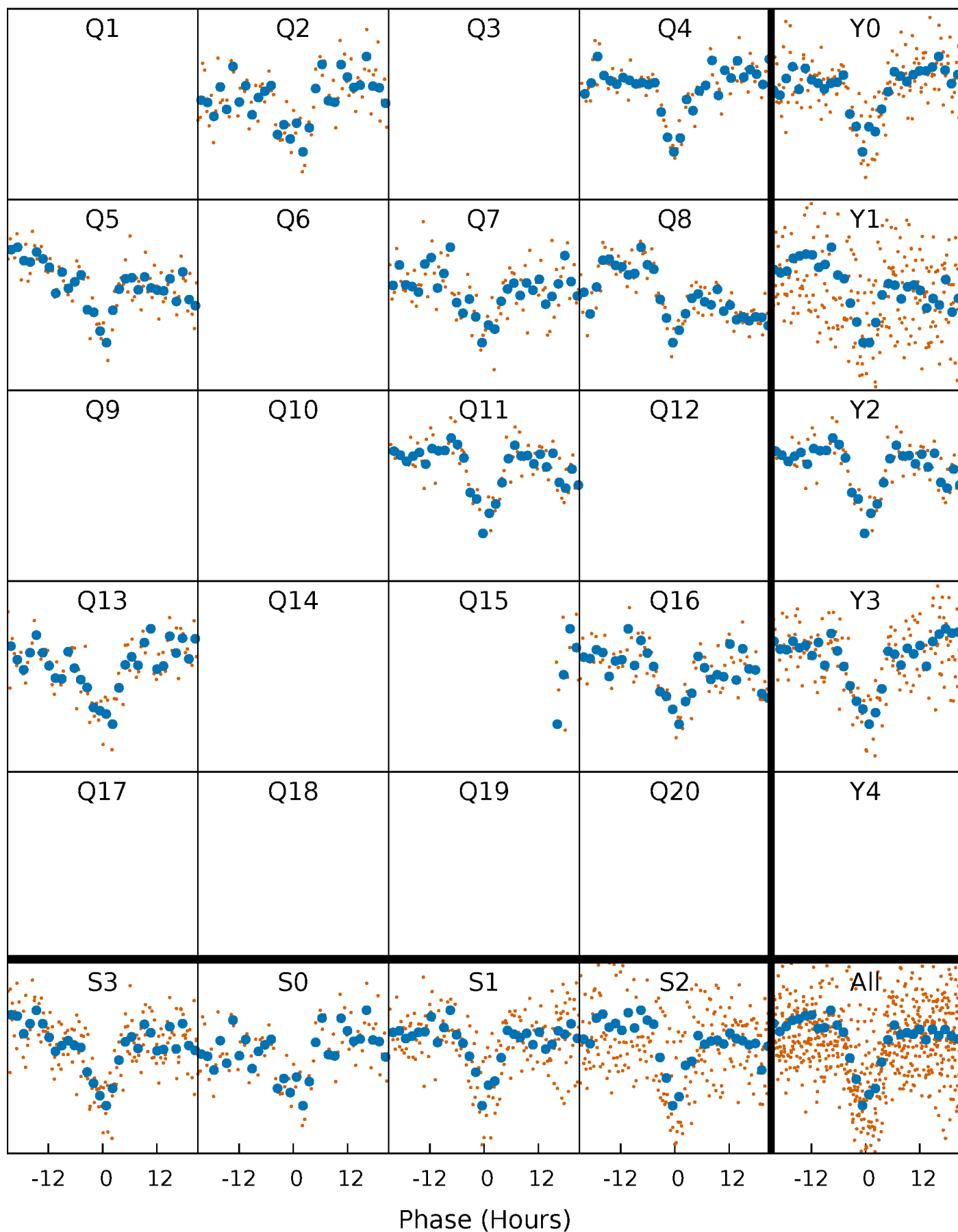


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

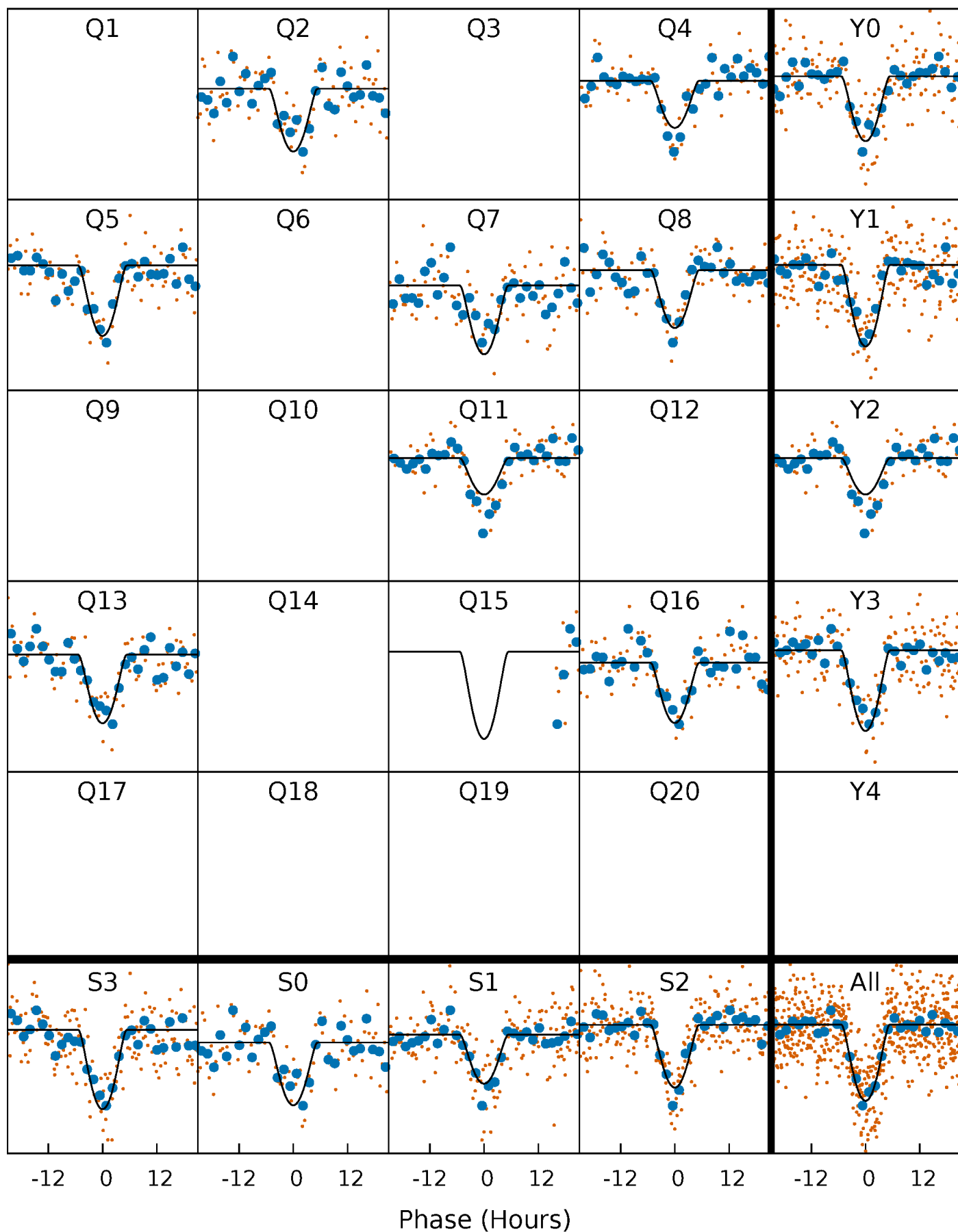
TCE 004669402-01 P=143.194808 Days  $T_0=227.305252$  (BKJD)





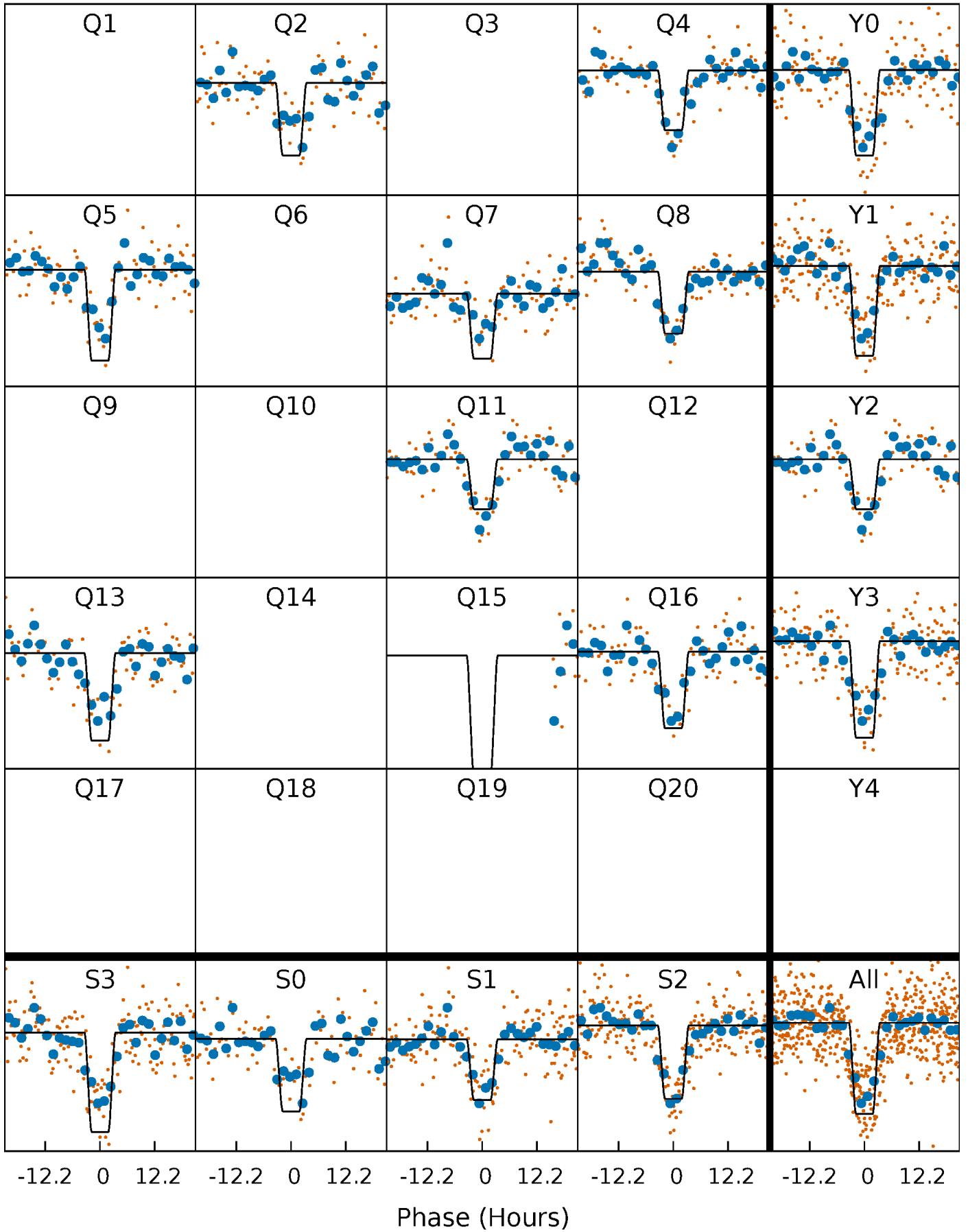
# DV Quarter-Phased Transit Curves

TCE 004669402-01 P=143.194808 Days  $T_0=227.305252$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

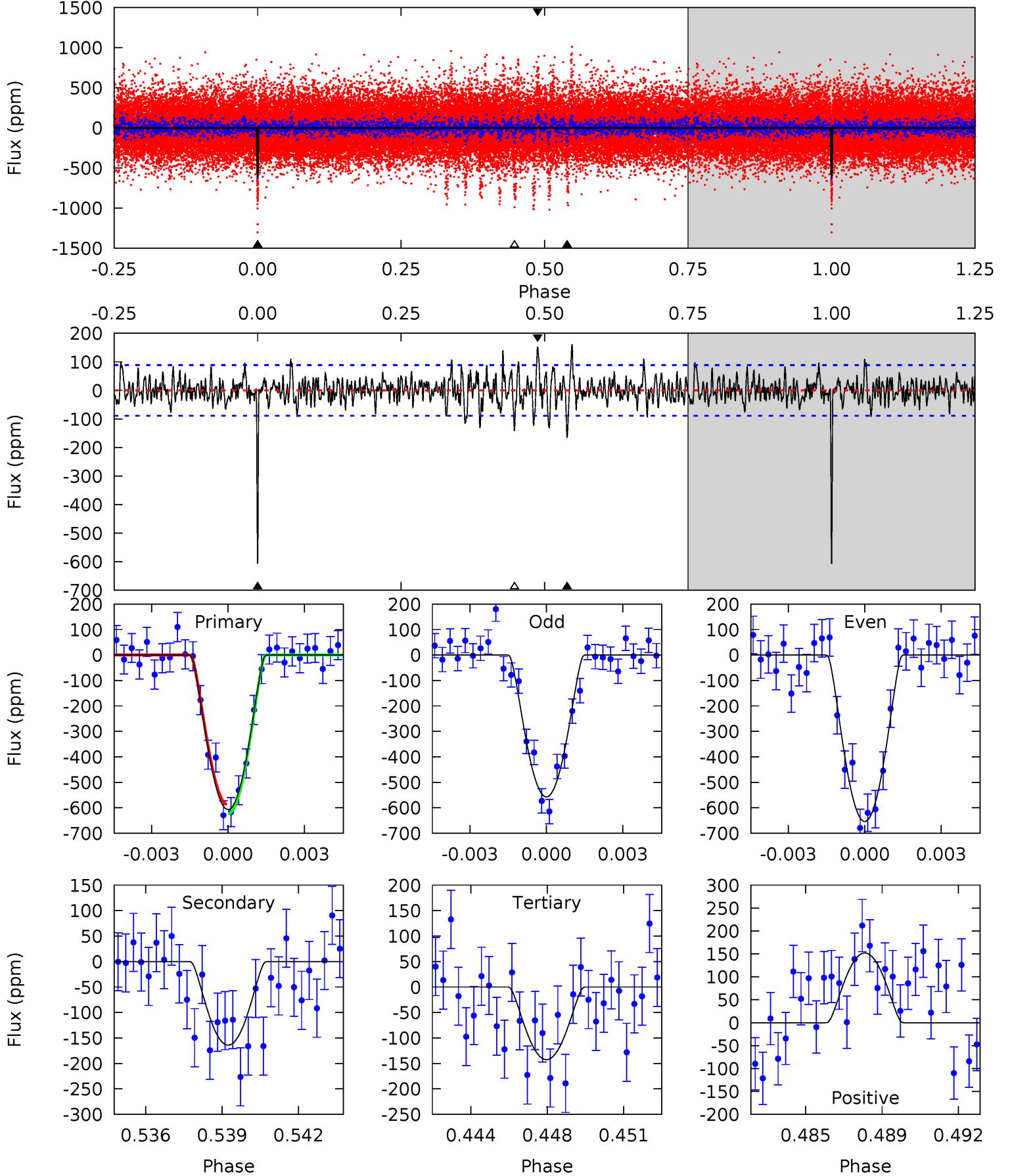
TCE 004669402-01 P=143.196597 Days  $T_0=227.297520$  (BKJD)



# DV Model-Shift Uniqueness Test

004669402-01, P = 143.194808 Days, E = 84.110444 Days

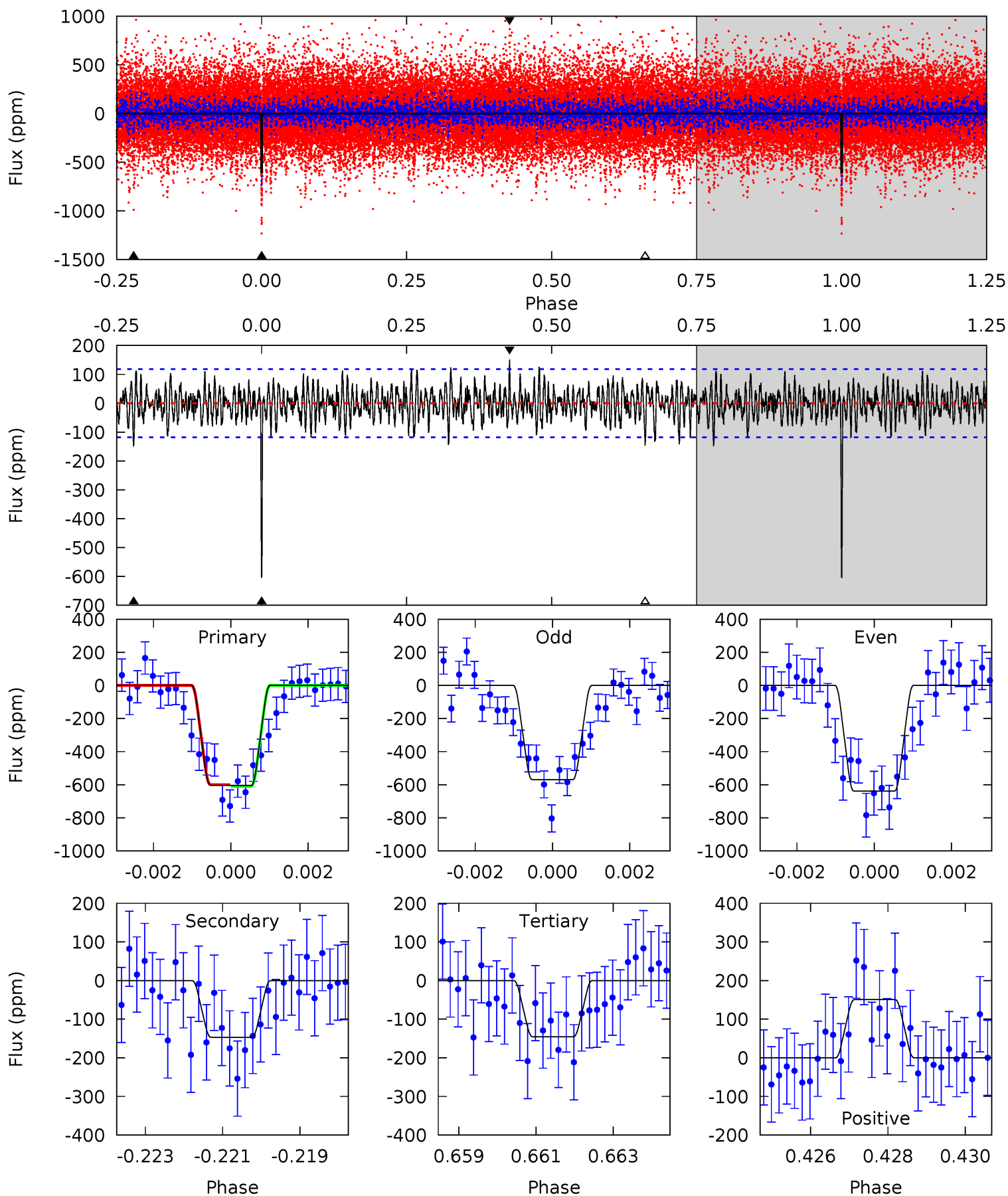
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
35.8	9.69	8.42	8.98	5.24	2.95	2.23	27.4	26.8	1.27	0.72	2.86	1.08	0.21	1.04



# Alt Model-Shift Uniqueness Test

004669402-01, P = 143.196597 Days, E = 84.100923 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
27.3	6.65	6.59	6.81	5.33	3.09	2.02	20.7	20.5	0.06	-0.17	1.56	1.09	0.20	0.24





### Stellar Parameters For KIC 004669402

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6007^{+161}_{-179}$	$4.333^{+0.180}_{-0.180}$	$-0.440^{+0.300}_{-0.300}$	$1.060^{+0.282}_{-0.205}$	$0.882^{+0.120}_{-0.076}$	$1.042^{+0.958}_{-0.503}$
	+3%/-3%	+4%/-4%	+68%/-68%	+27%/-19%	+14%/-9%	+92%/-48%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 004669402-01 / KOI 4128.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-164 \pm 17$	$5.50^{+4.50}_{-3.33}$	$532^{+39}_{-33}$	$3606^{+1396}_{-605}$	$791^{+4350}_{-551}$
Alt.	$-147 \pm 22$	$4.80^{+4.23}_{-3.18}$	$530^{+40}_{-35}$	$3644^{+1899}_{-623}$	$970^{+7363}_{-716}$

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

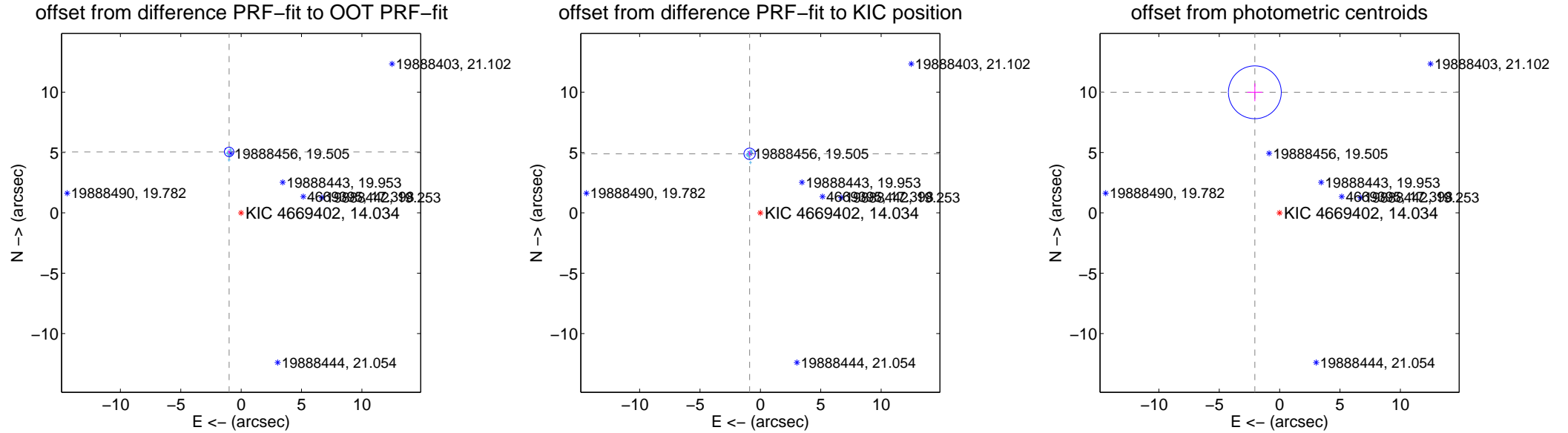
## DV Centroid Data

Supplemental centroid analysis for 004669402-01. Kepler magnitude: 14.03. Transit SNR 16.80

There are 7 quarters with good PRF difference image offsets

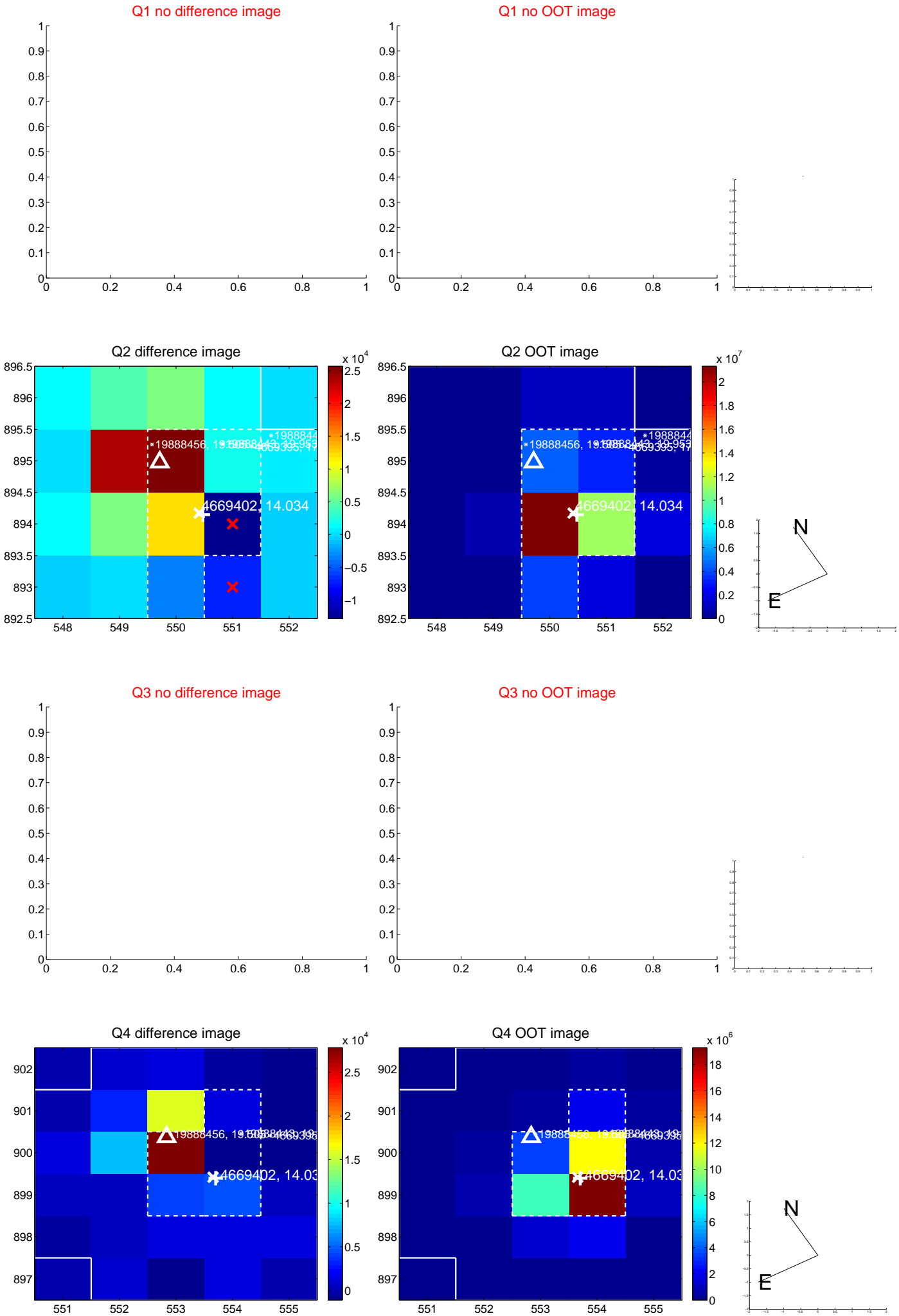
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$5.148 \pm 0.131$	39.43	$0.997 \pm 0.077$	$5.050 \pm 0.135$
PRF-fit source offset from KIC position	$4.973 \pm 0.157$	31.77	$0.889 \pm 0.079$	$4.893 \pm 0.159$
photometric centroid source offset	$10.20 \pm 0.73$	13.98	$2.05 \pm 0.62$	$9.99 \pm 0.73$

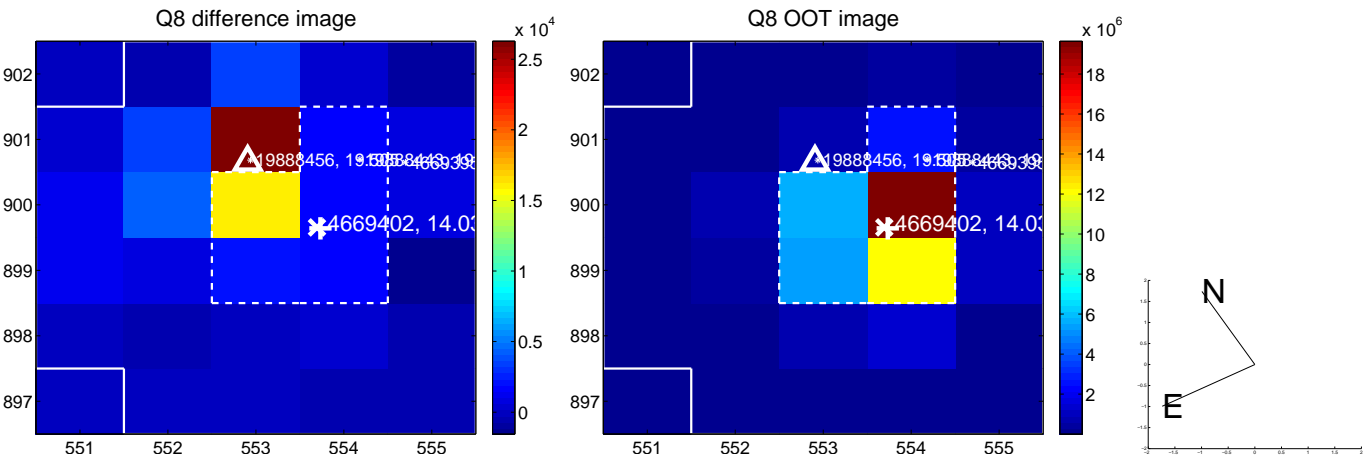
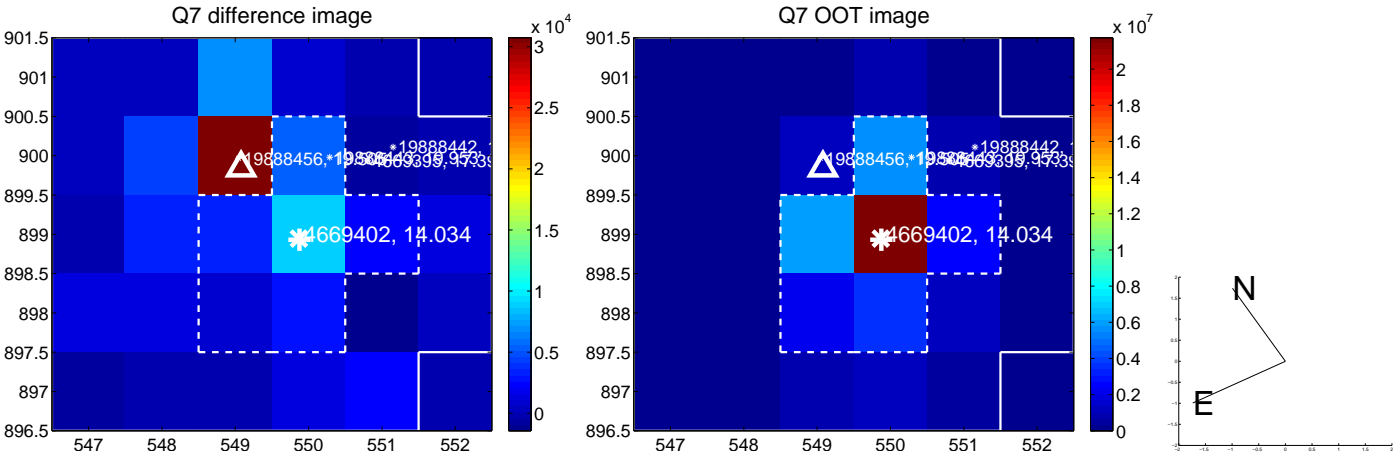
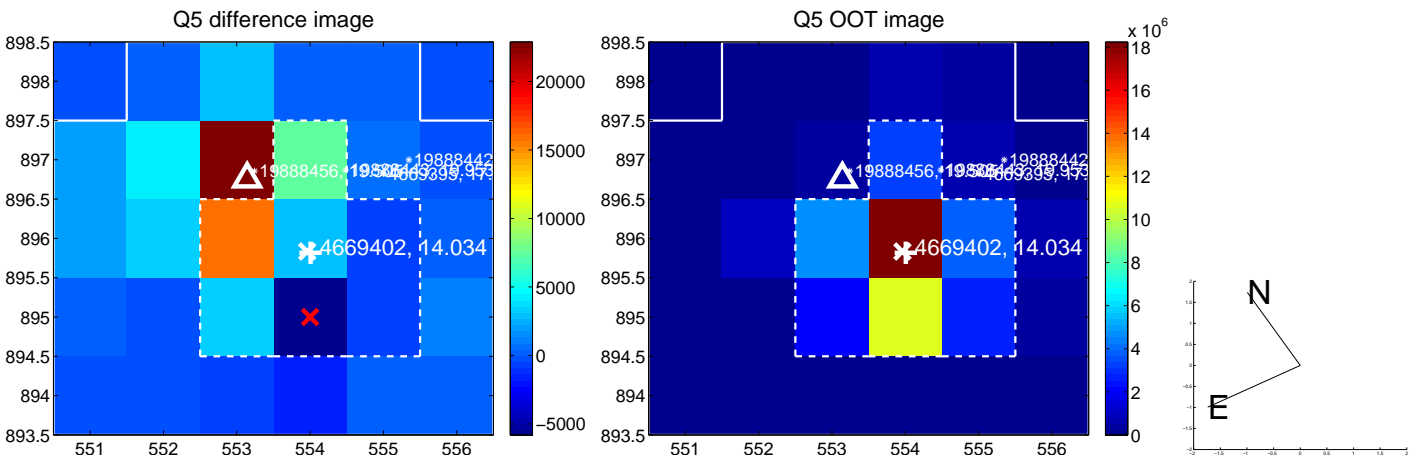


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

Q9 no difference image



Q9 no OOT image



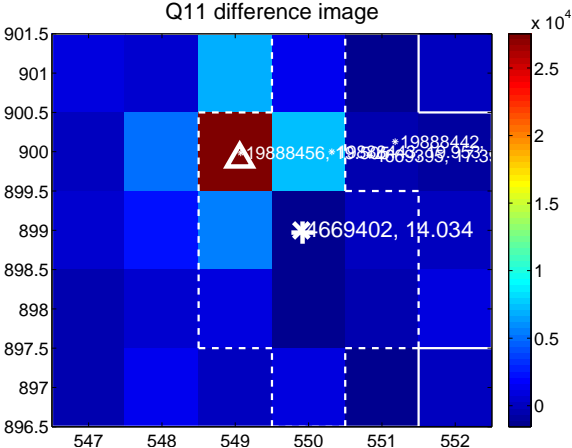
Q10 no difference image



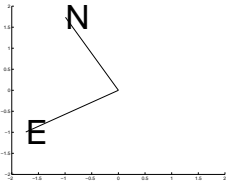
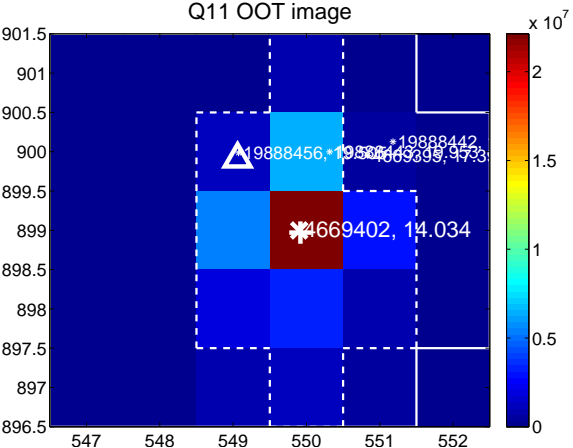
Q10 no OOT image



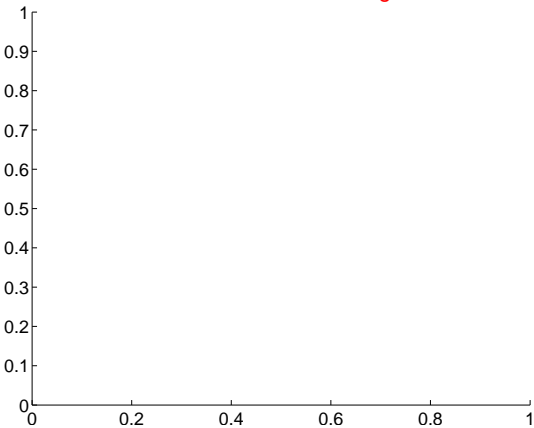
Q11 difference image



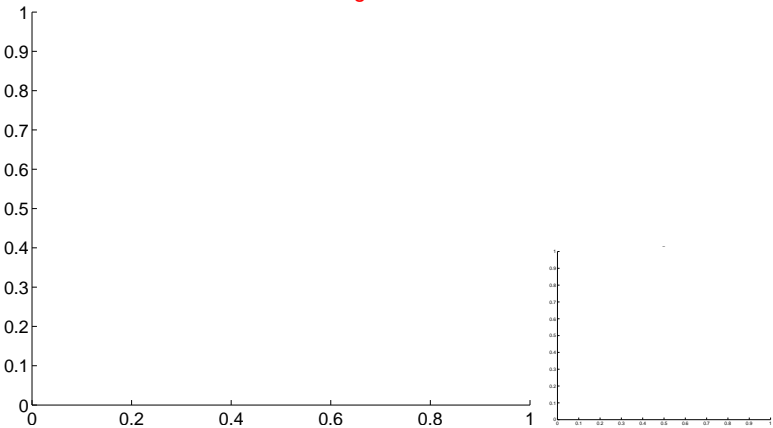
Q11 OOT image



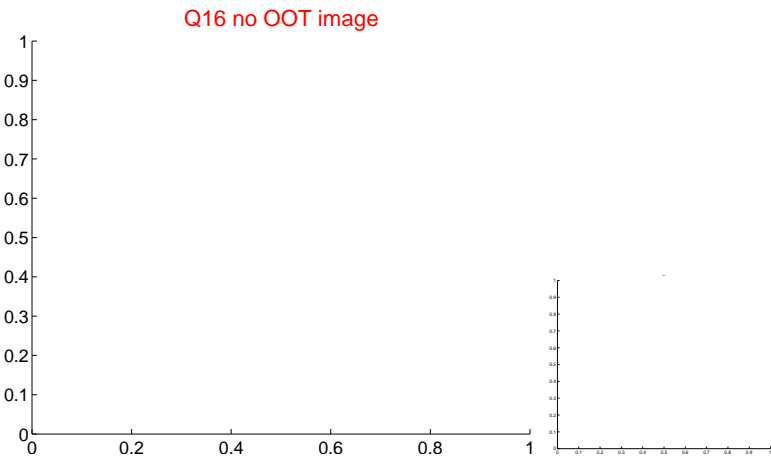
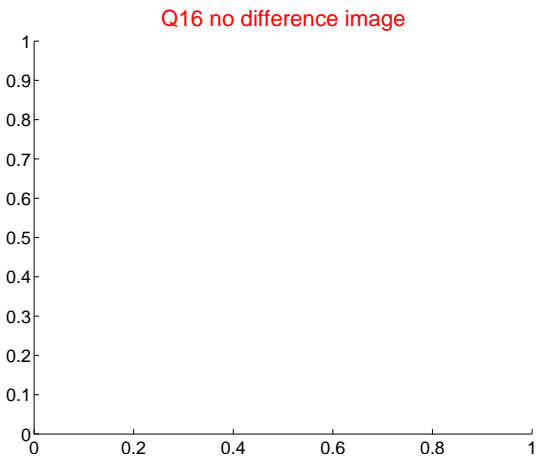
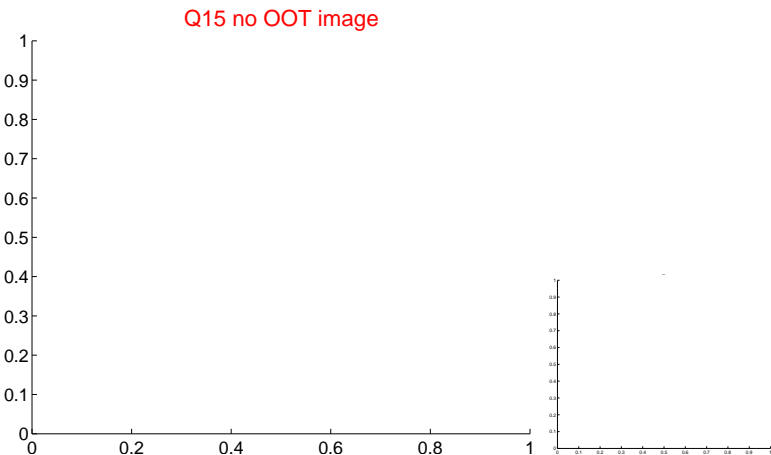
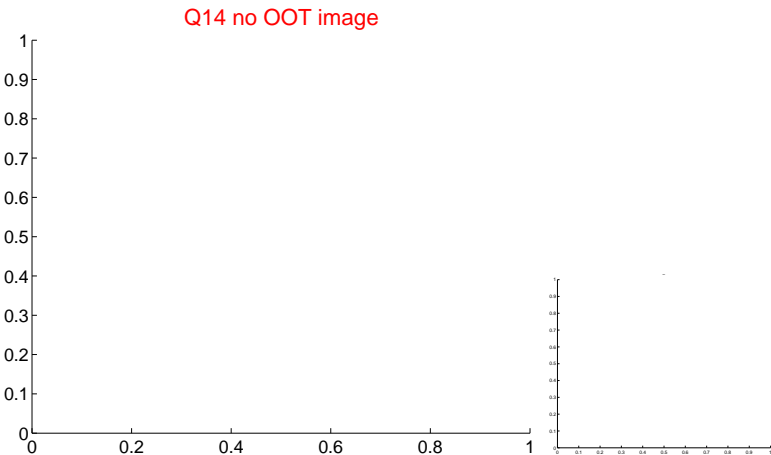
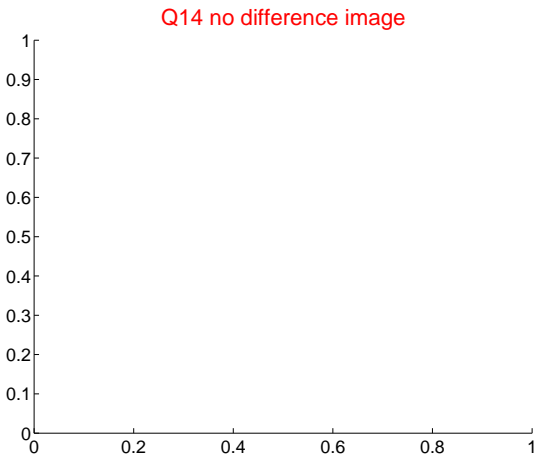
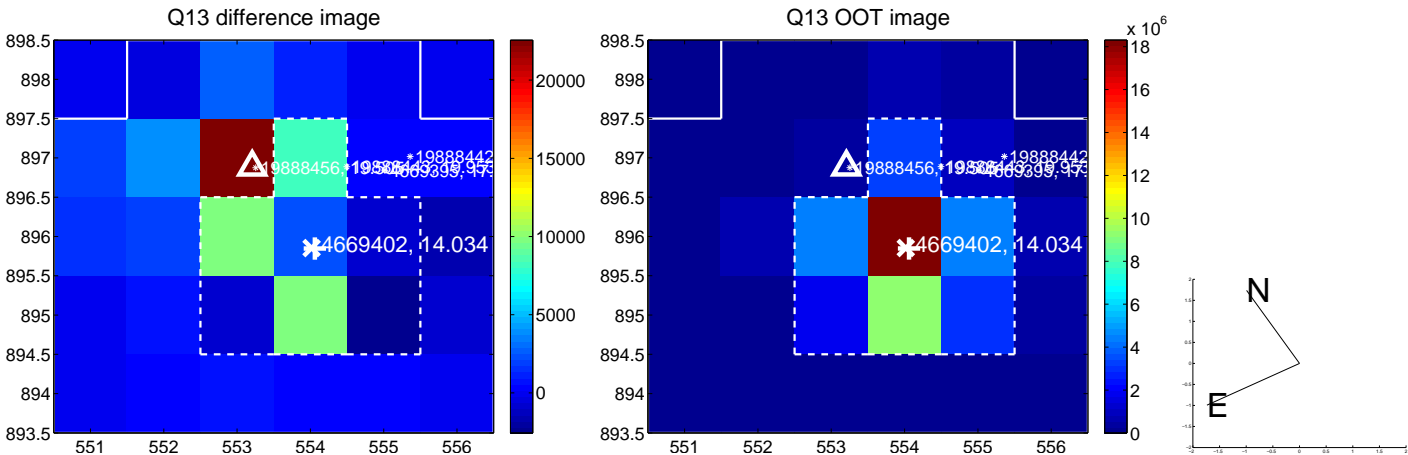
Q12 no difference image



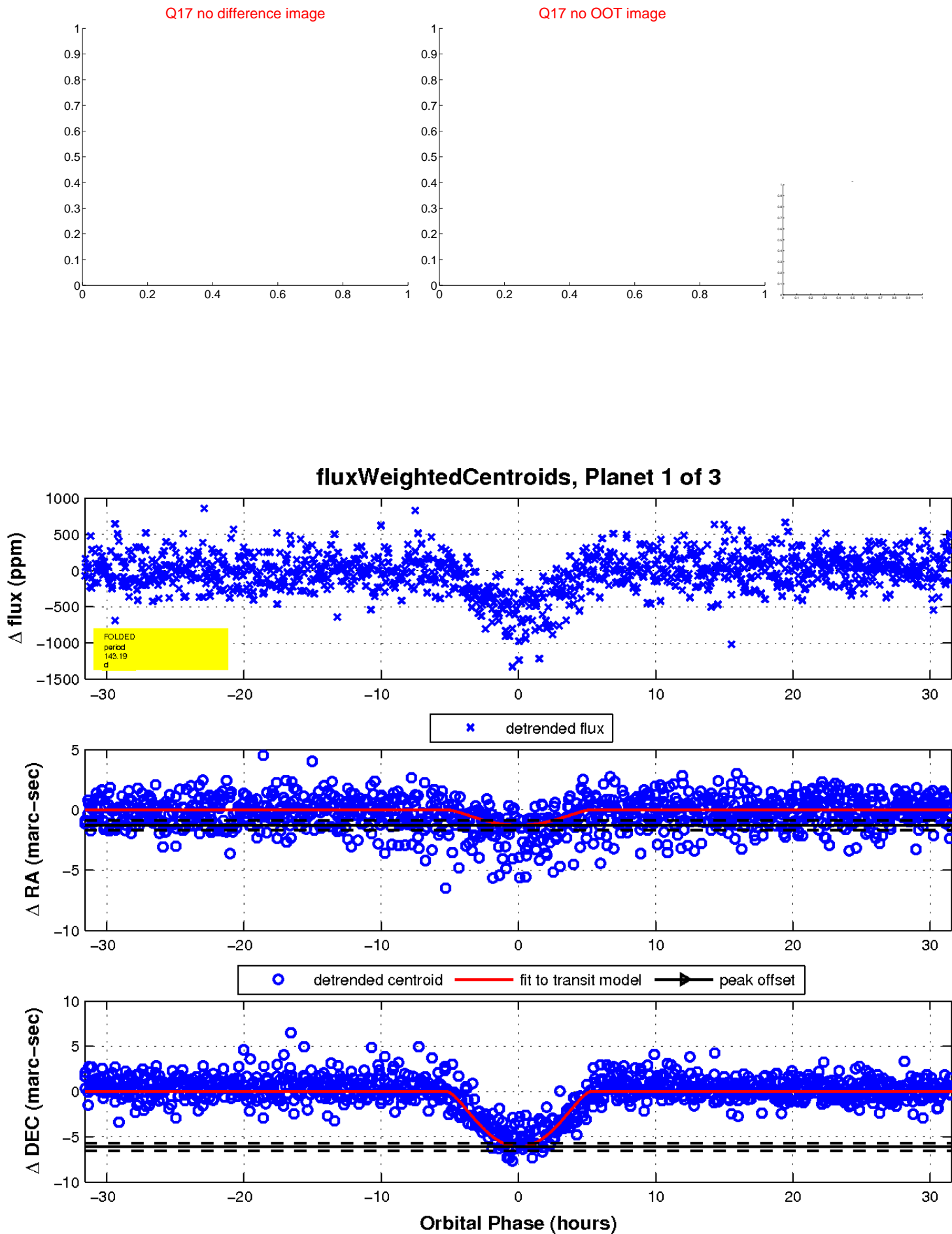
Q12 no OOT image



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

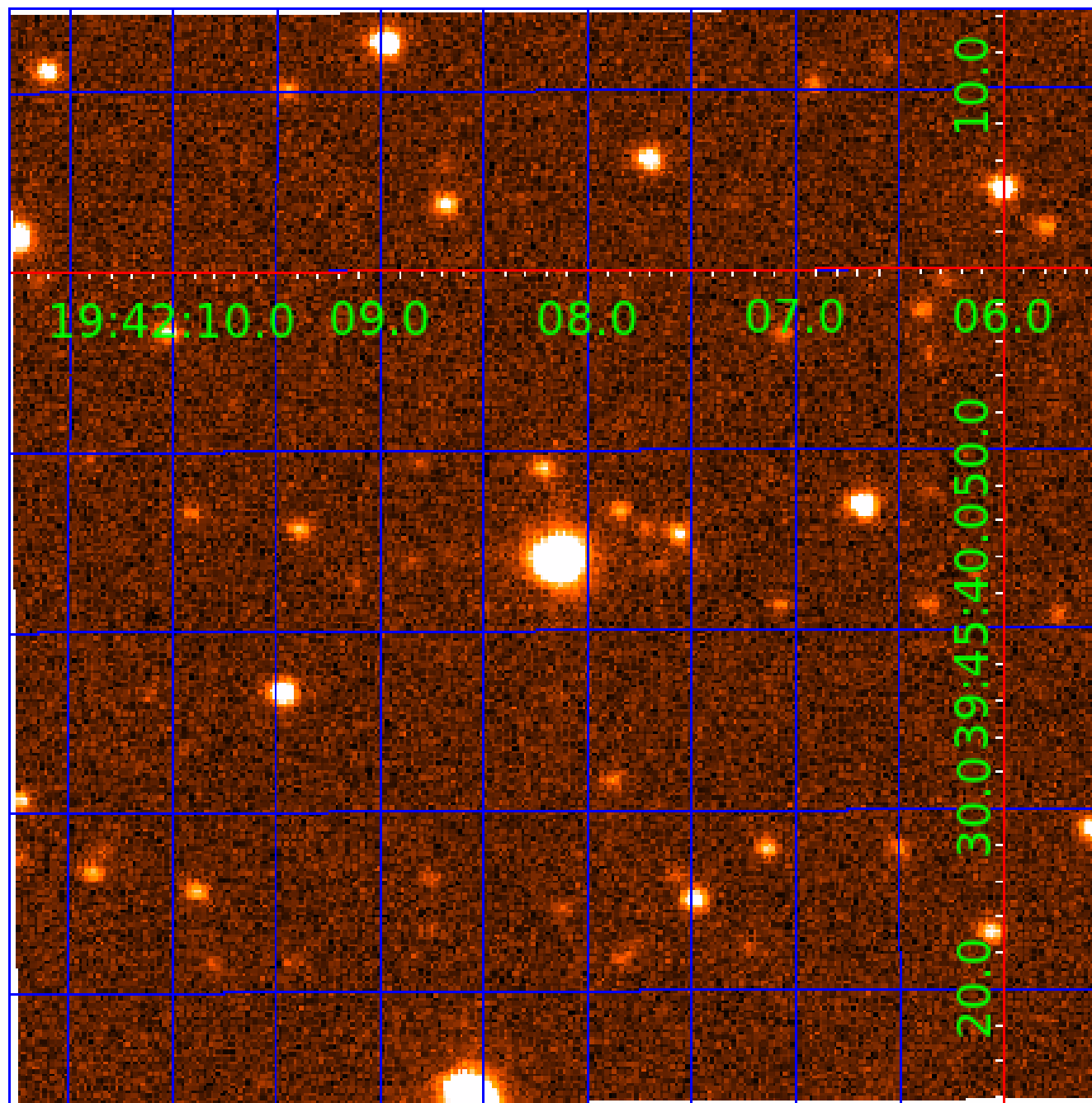


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 004669402

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004669402-01	OBS	4128.01	143.194809	227.305252	604.8	10.535	16.9	16.8	1.06	6007	4.53	4.96
004669402-02	OBS	No	8.495723	136.155894	89.2	13.450	14.1	13.2	1.06	6007	1.15	214.52
004669402-03	OBS	No	8.495094	135.389583	93.7	19.032	7.8	8.9	1.06	6007	1.42	214.54

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004669402-01	OBS	FP	0.00	0	0	1	0	CENT_RESOLVED_OFFSET—HALO_GHOST
004669402-02	OBS	FP	0.00	1	0	0	0	LPP_DV
004669402-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—SAME_NTL_PERIOD—CENT_FEW_DIFFS

**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.

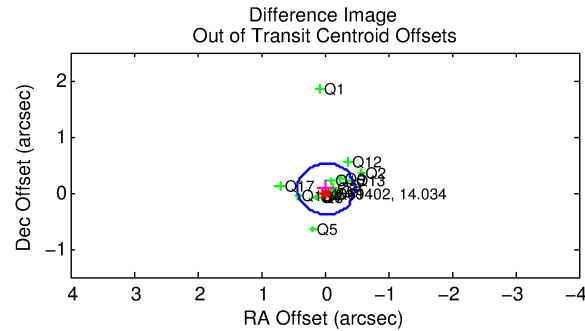
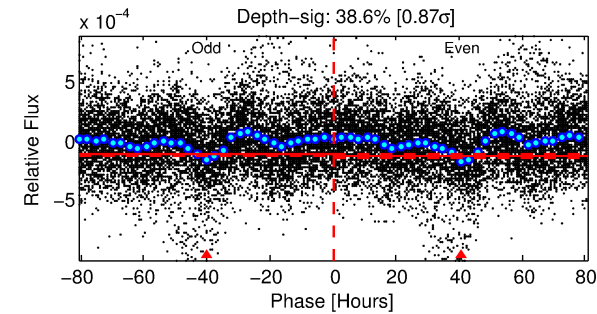
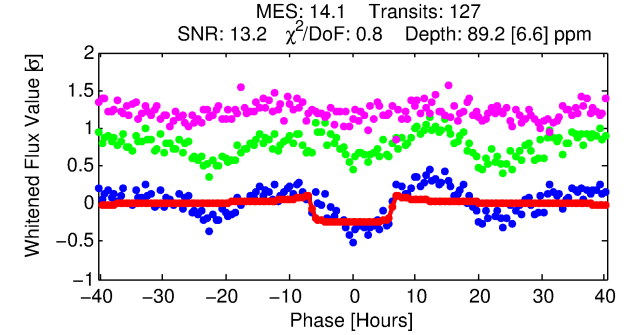
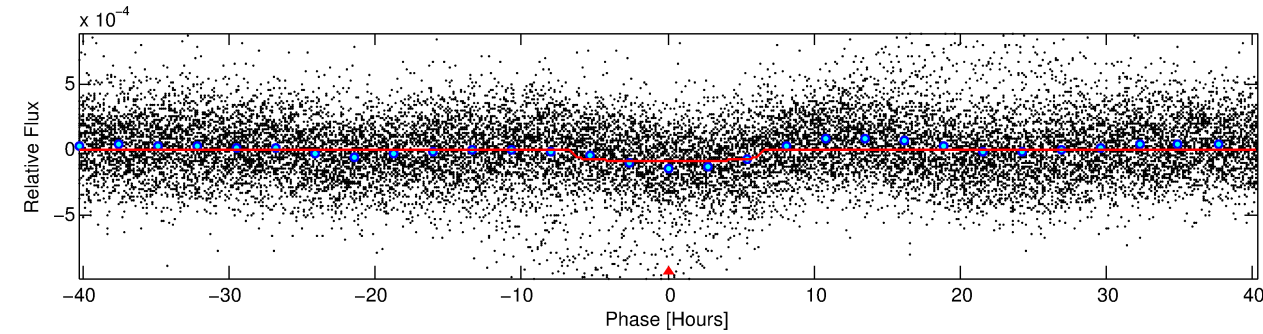
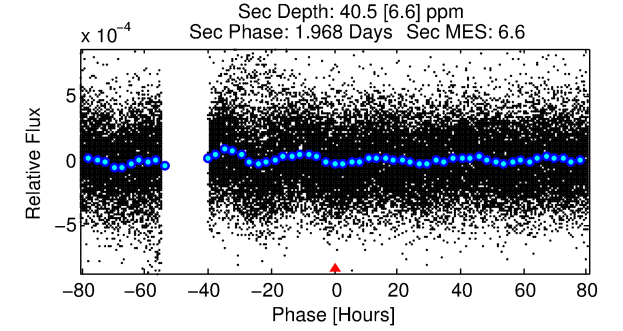
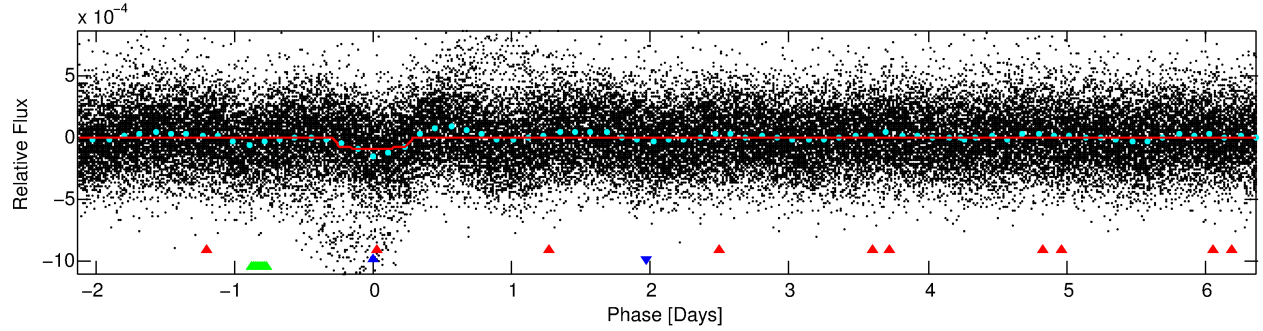
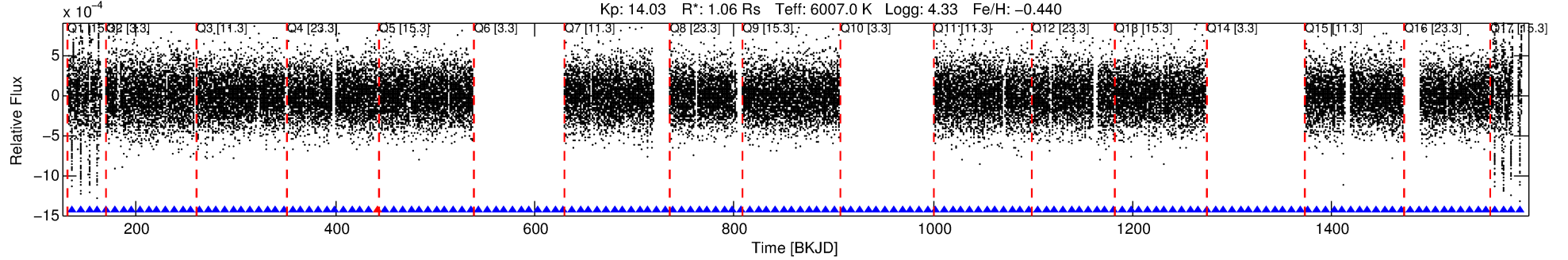
## Ephemeris Match Information For 004669402-02

No Significant Match Found

# DV One-Page Summary

KIC: 4669402 Candidate: 2 of 3 Period: 8.496 d  
KOI: K04128 Corr: No Ephemeris Match

Kp: 14.03 R\*: 1.06 Rs Teff: 6007.0 K Logg: 4.33 Fe/H: -0.440



## DV Fit Results:

Period = 8.49572 [0.00011] d  
Epoch = 136.1559 [0.0099] BKJD  
Rp/R\* = 0.0100 [0.0012]  
a/R\* = 2.59 [1.31]  
b = 0.88 [0.16]  
Seff = 214.52 [74.93]  
Teq = 976 [85] K  
Rp = 1.15 [0.34] Re  
a = 0.0782 [0.0176] AU  
Ag = 102.32 [44.75] [2.26σ]  
Teffp = 4799 [375] K [9.94σ]

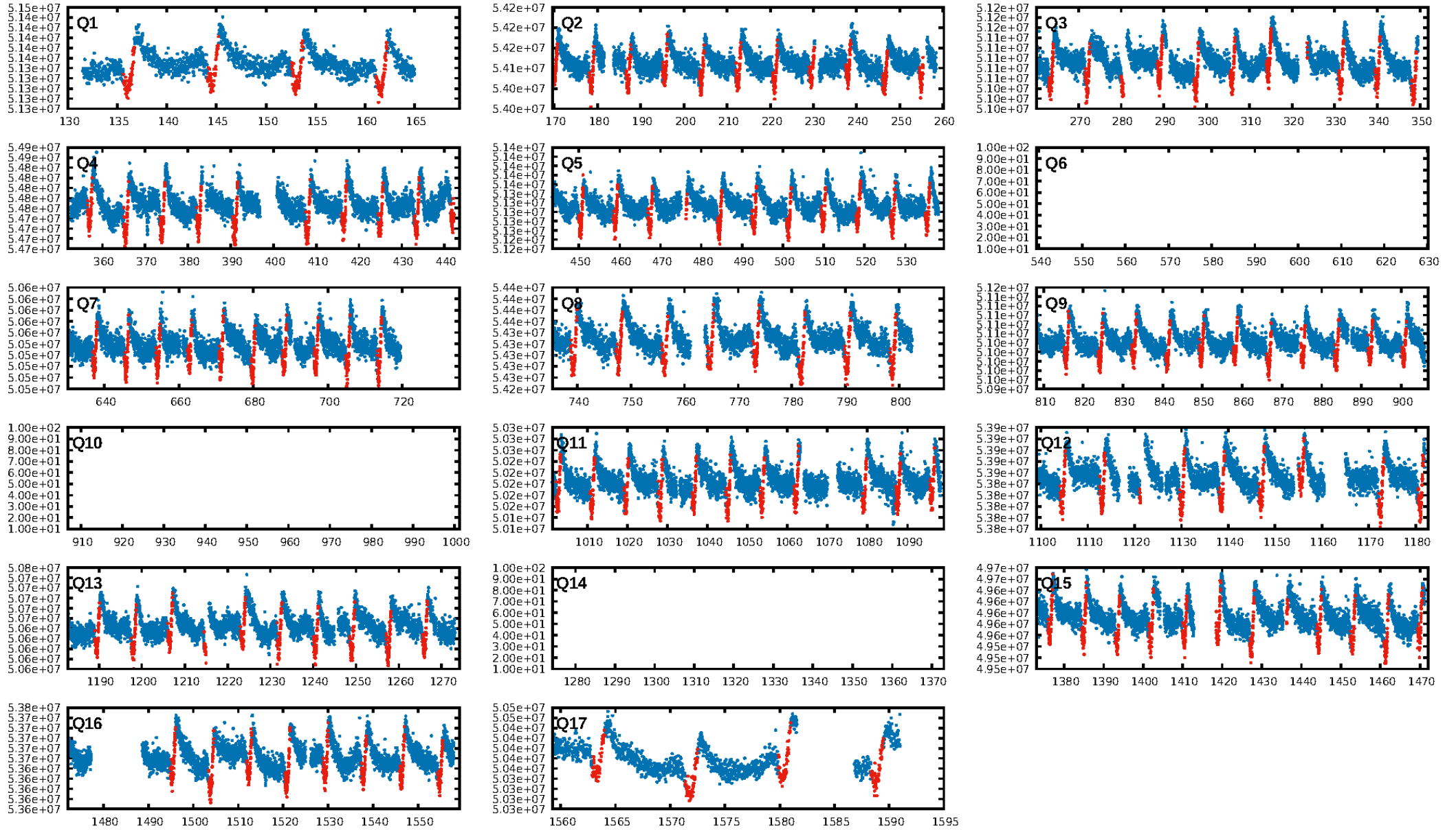
## DV Diagnostic Results:

ShortPeriod-sig: 0.1% [0.00σ]  
LongPeriod-sig: 100.0% [189.21σ]  
ModelChiSquare2-sig: 61.7%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 3.77e-40  
RollingBand-fgt: 0.99 [118/119]  
GhostDiagnostic-chr: 1.268  
Centroid-sig: 0.0%  
Centroid-so: 2.151 arcsec [2.53σ]  
OotOffset-rm: 0.070 arcsec [0.47σ]  
KicOffset-rm: 0.093 arcsec [0.81σ]  
OotOffset-st: 1/4/4/5 [14]  
KicOffset-st: 1/4/4/5 [14]  
DiffImageQuality-fgm: 1.00 [14/14]  
DiffImageOverlap-fno: 0.00 [0/14]

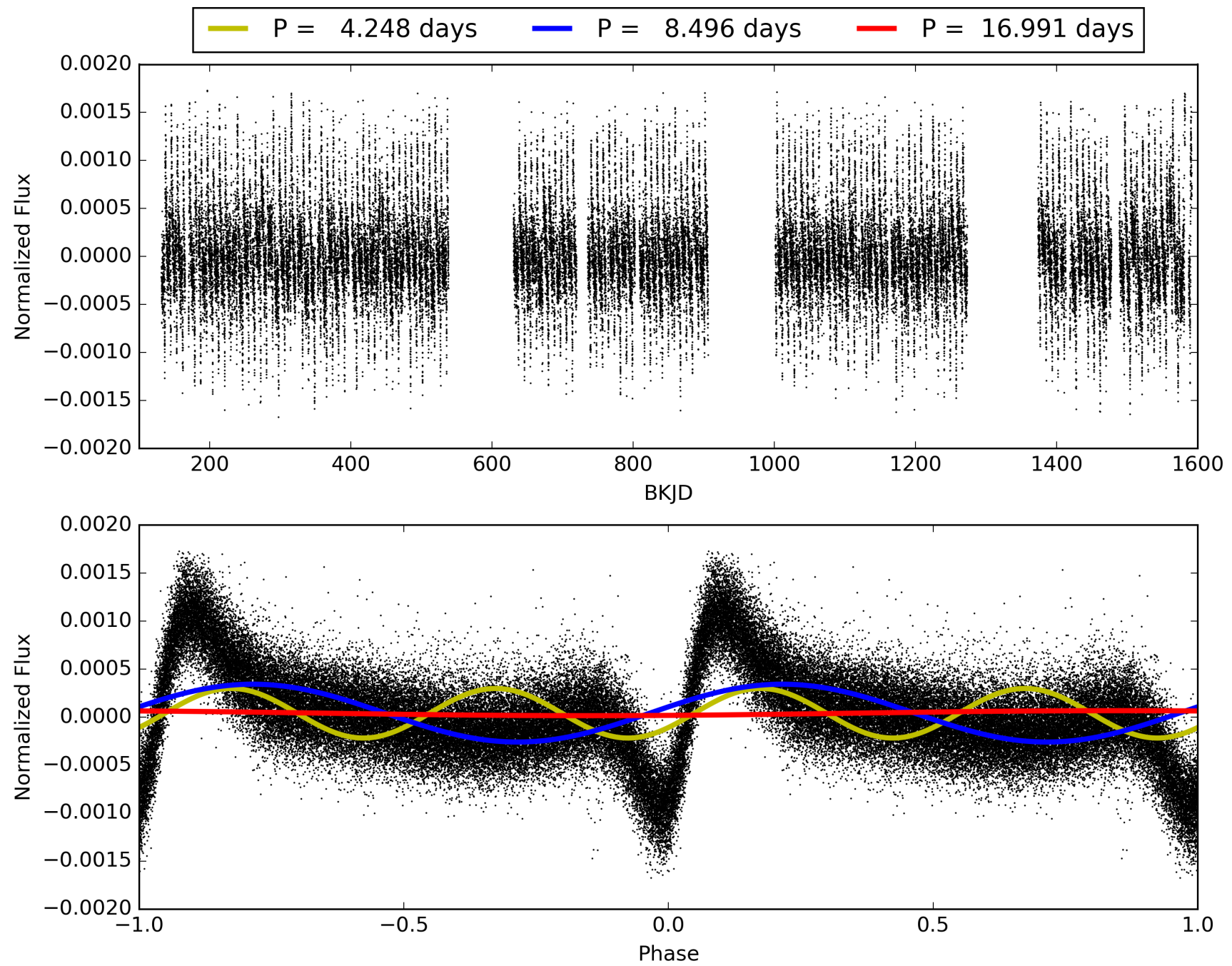
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 12:35:17 Z

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

# TCE 004669402-02, PDC Light Curves

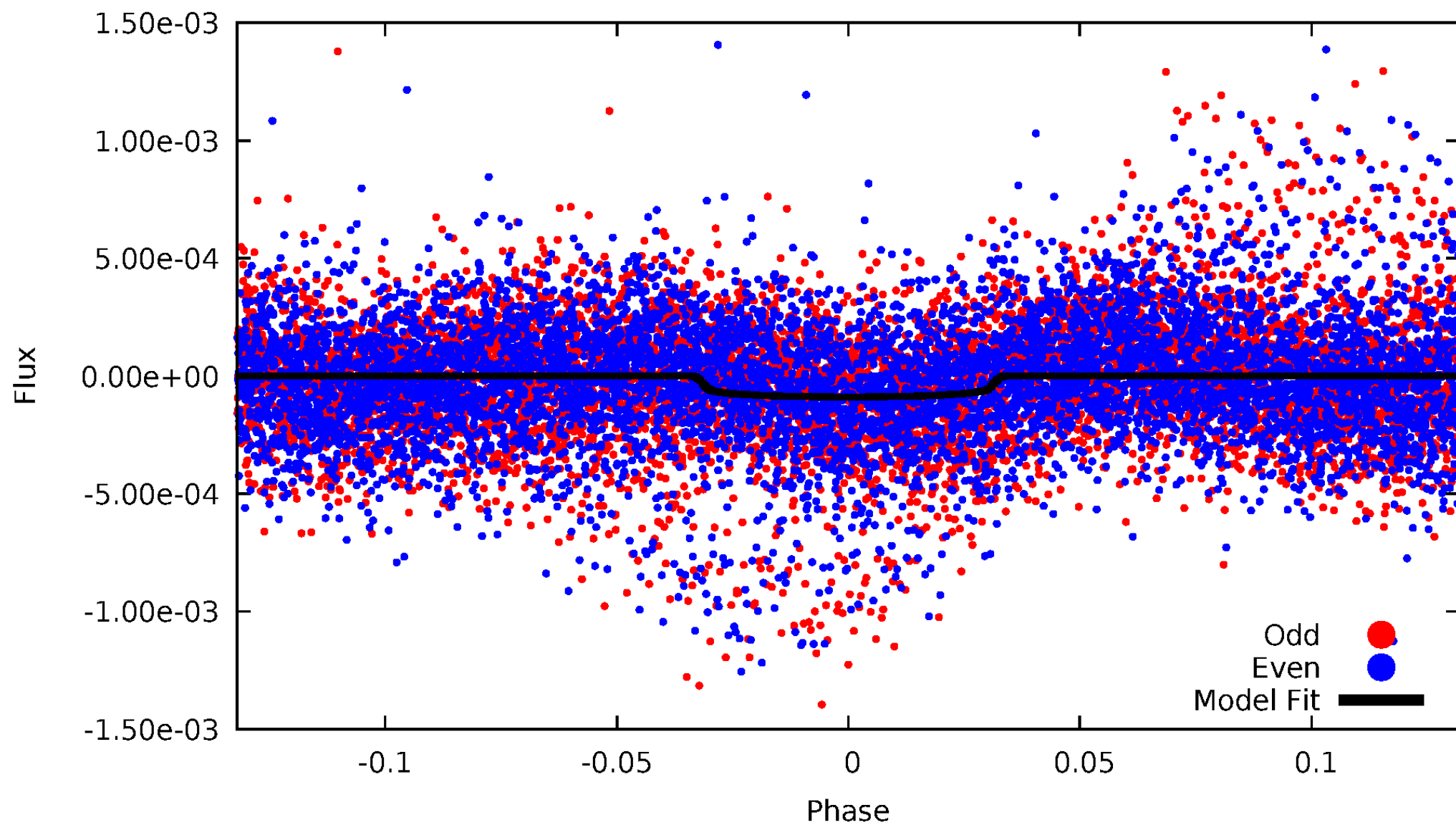


TCE 004669402-02



# DV Odd/Even

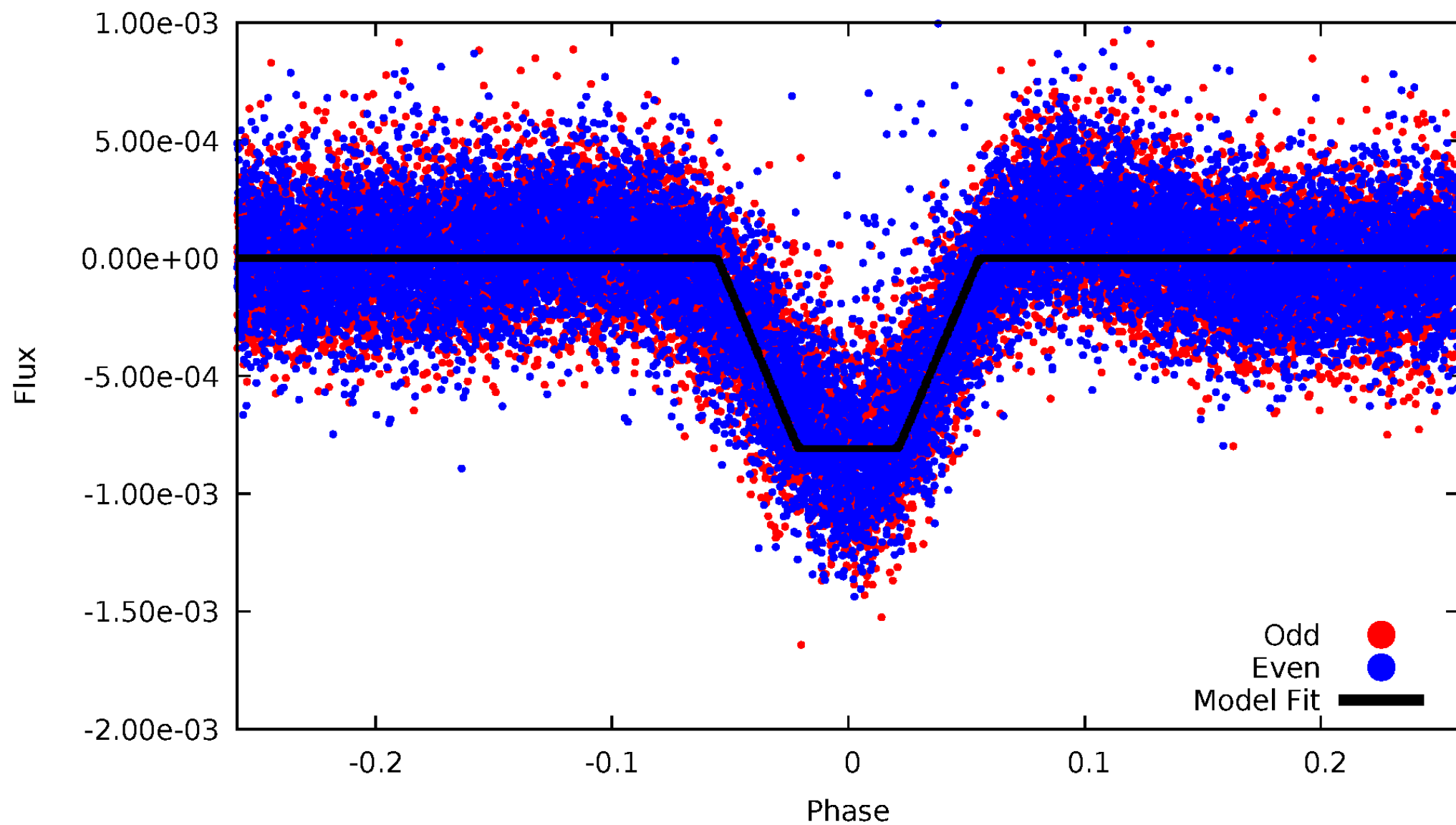
TCE 004669402-02





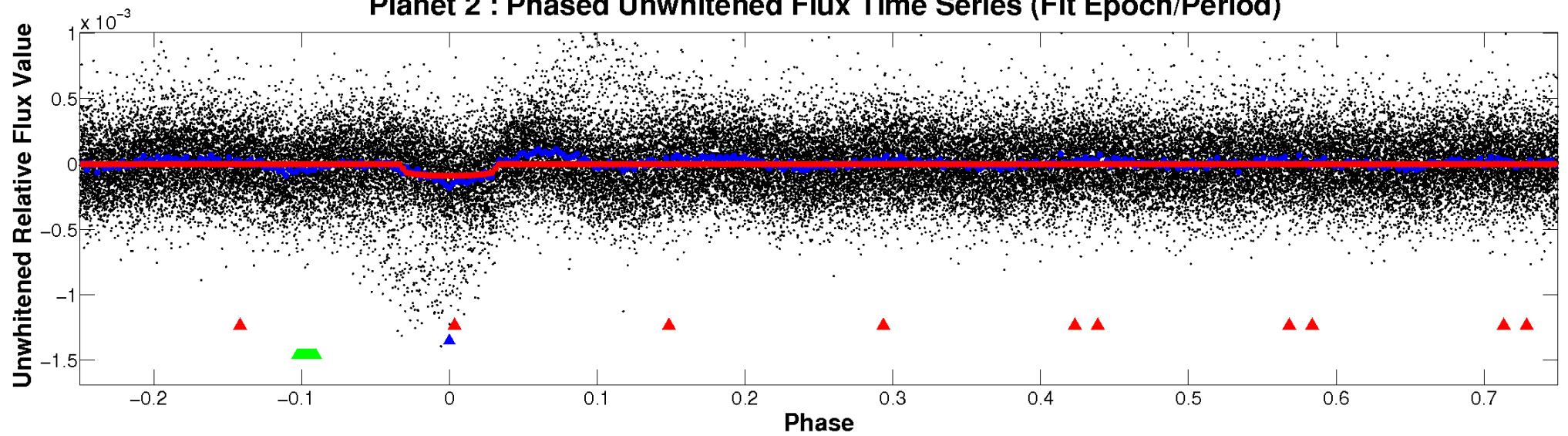
# ALT Odd/Even

TCE 004669402-02

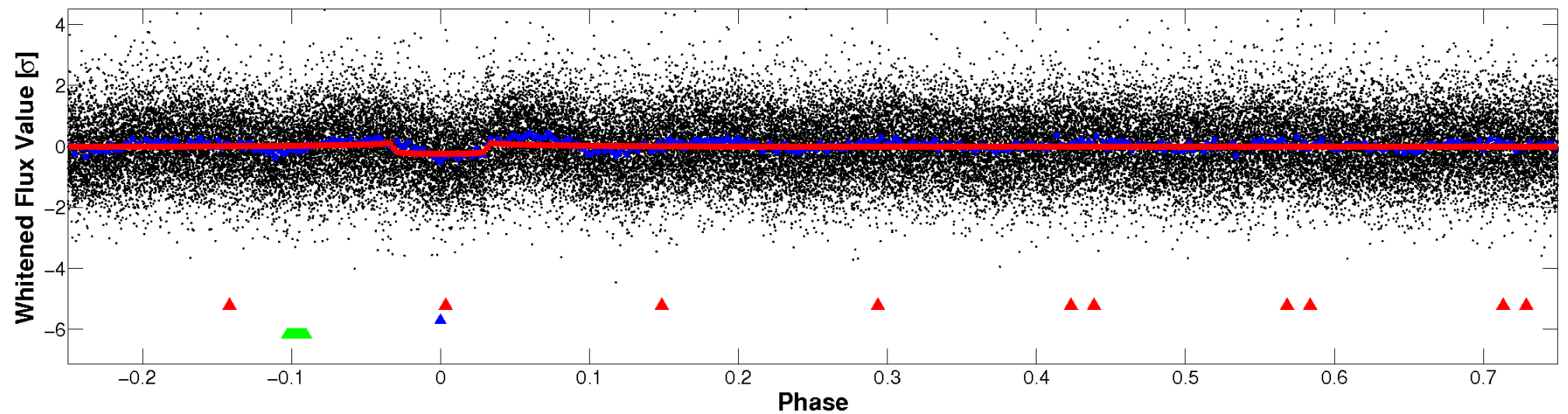


# Non-Whitened Vs. Whitened Light Curve

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



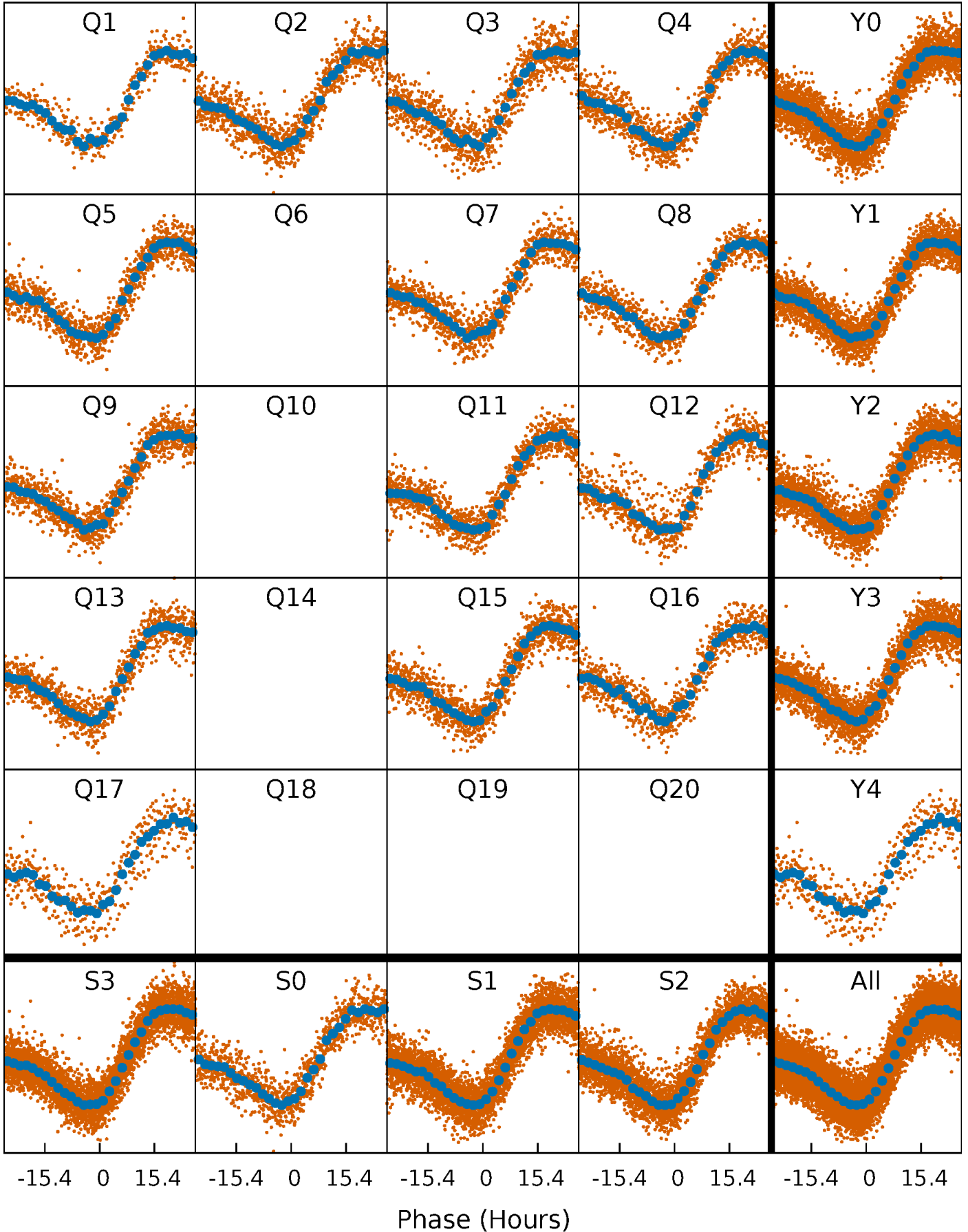
## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)





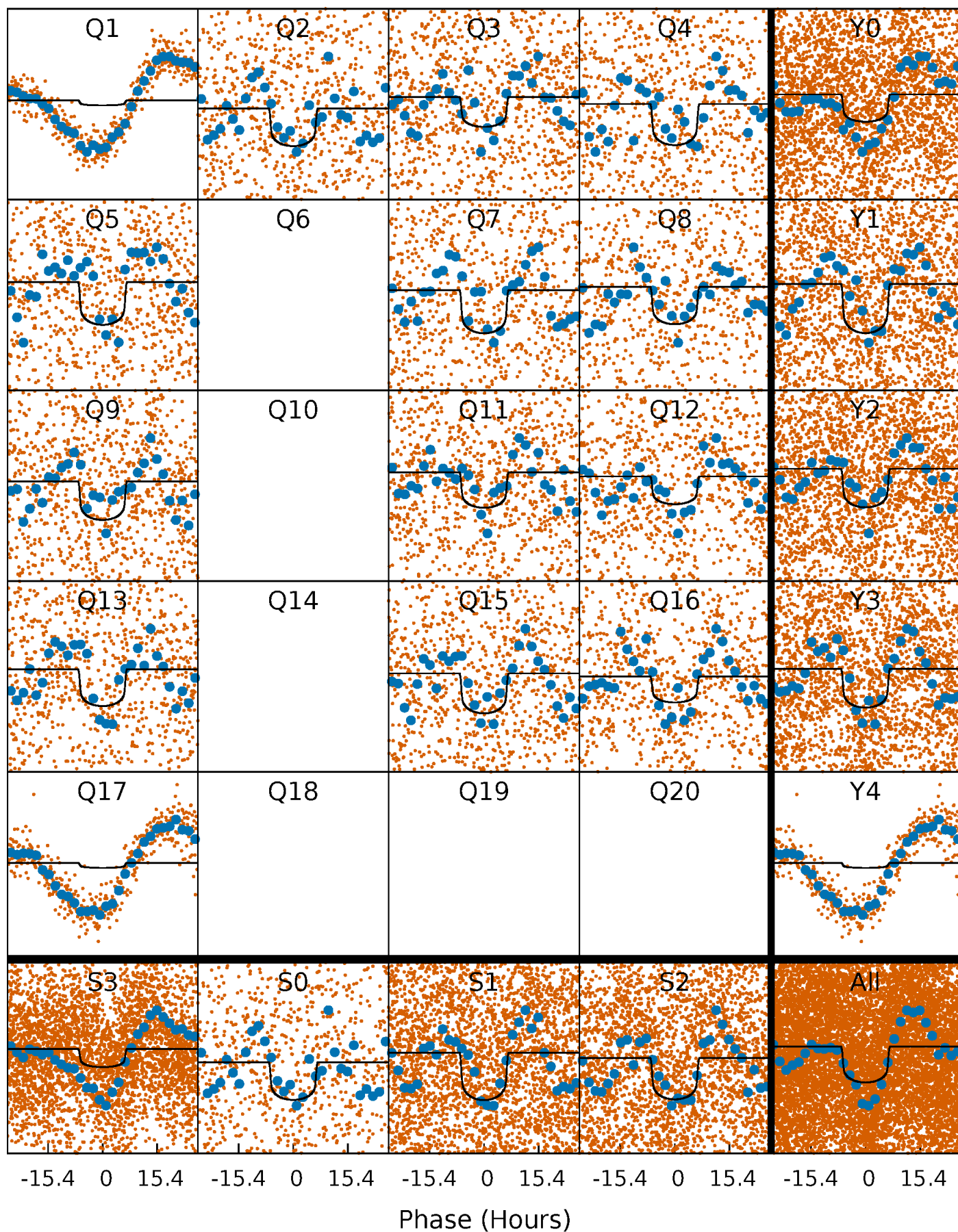
# PDC Quarter-Phased Transit Curves

TCE 004669402-02   P= 8.495723 Days    $T_0=136.155893$  (BKJD)



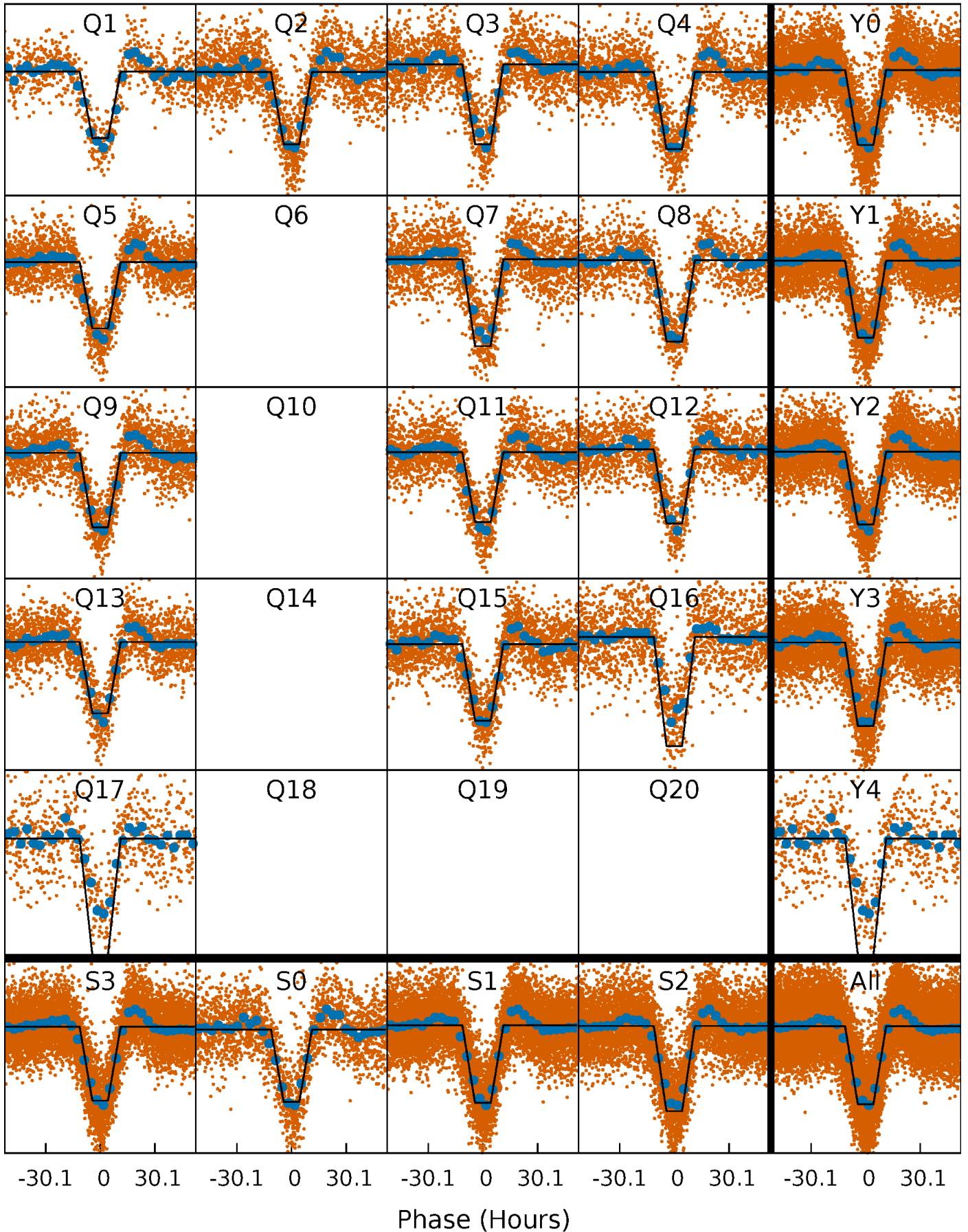
## DV Quarter-Phased Transit Curves

TCE 004669402-02   P= 8.495723 Days    $T_0=136.155893$  (BKJD)



## Alt. Detrend Quarter-Phased Transit Curves

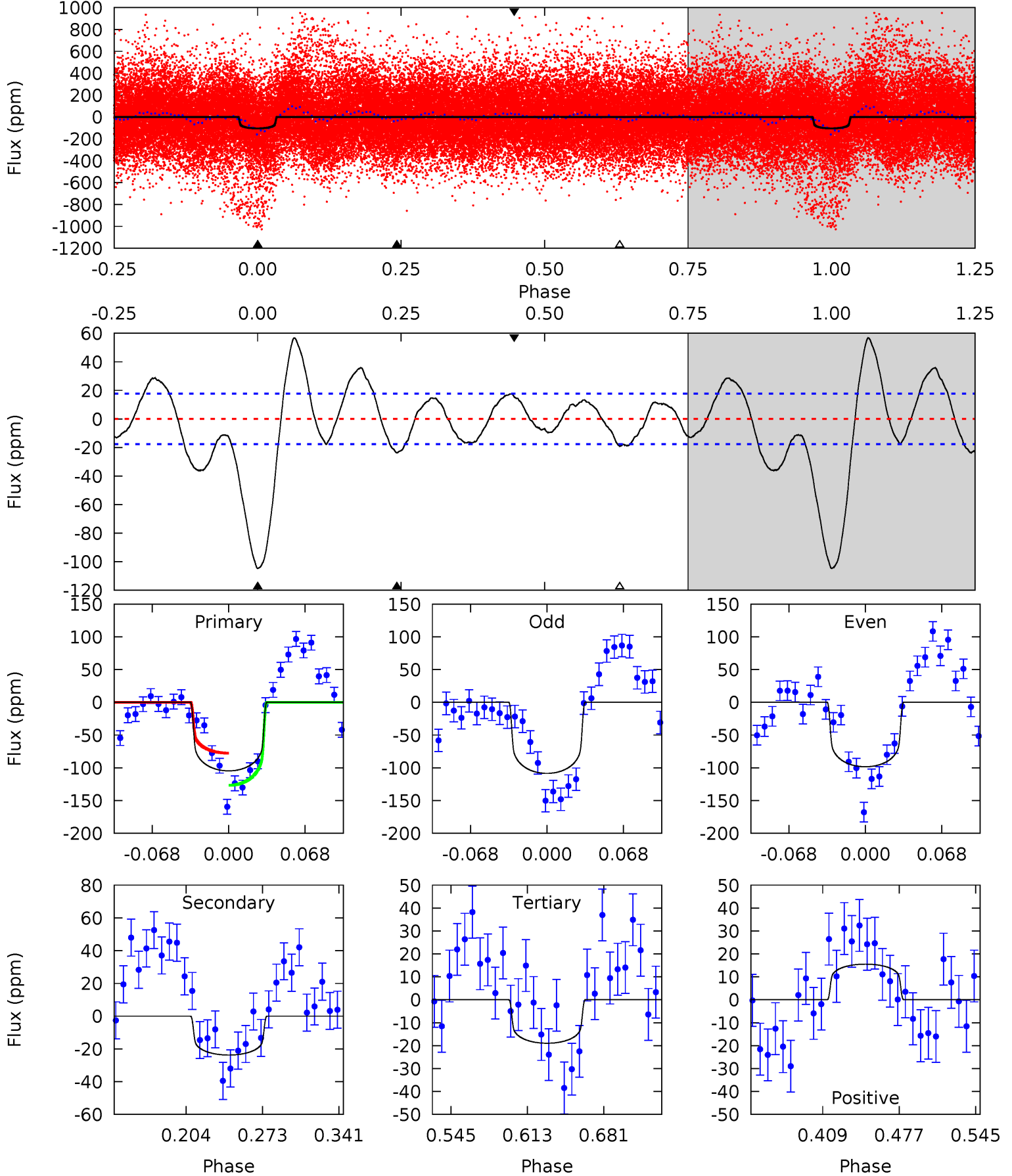
TCE 004669402-02     $P = 8.495693$  Days     $T_0 = 136.120314$  (BKJD)



# DV Model-Shift Uniqueness Test

004669402-02, P = 8.495723 Days, E = 127.660170 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
27.5	6.24	4.98	4.08	4.64	1.82	4.36	22.5	23.4	1.26	2.16	1.33	1.74	0.35	6.45

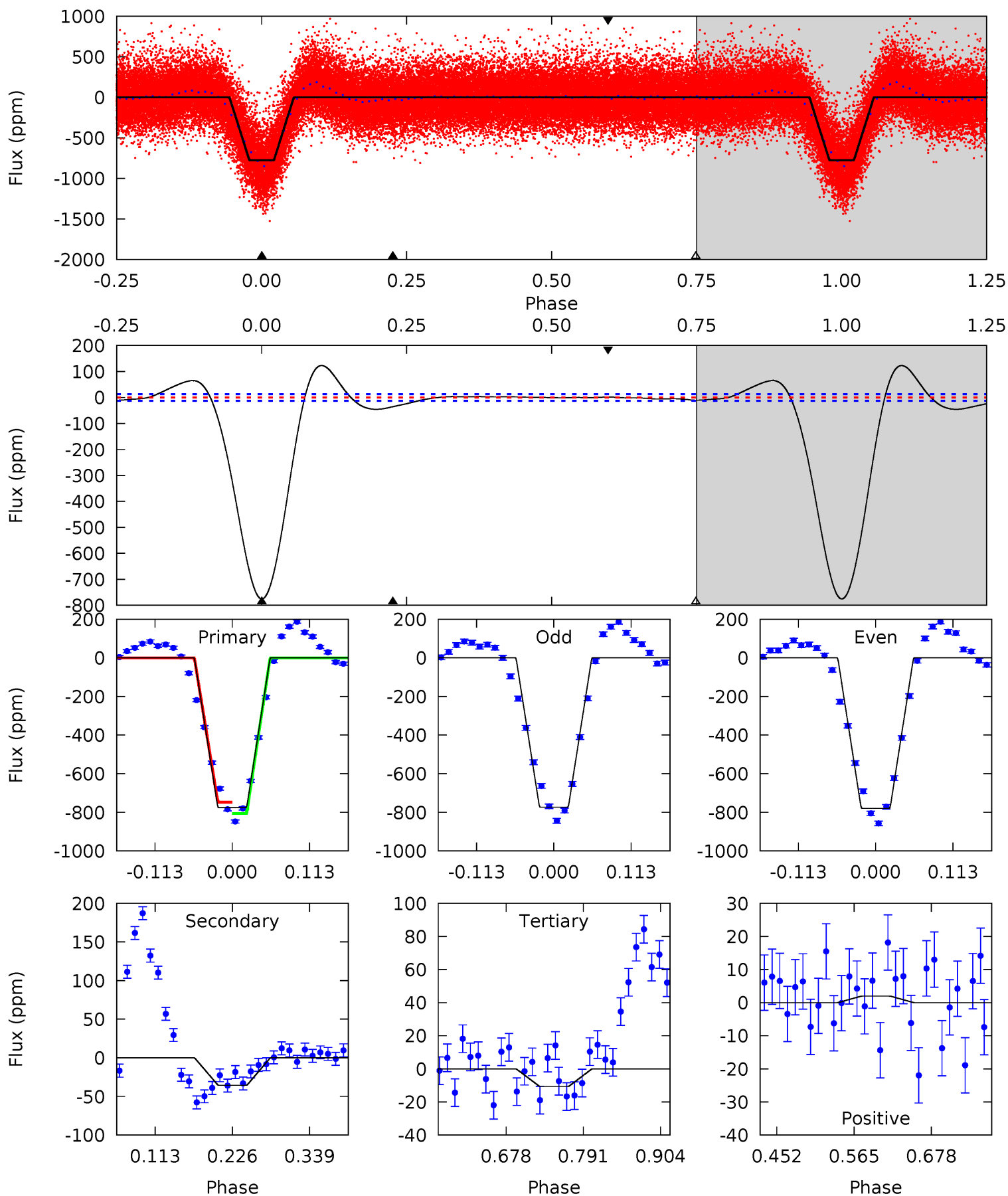




# Alt Model-Shift Uniqueness Test

004669402-02, P = 8.495693 Days, E = 127.624621 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
280.9	12.9	3.87	0.71	4.54	1.58	6.05	277.0	280.2	9.00	12.2	1.09	0.98	0.14	10.4



### Stellar Parameters For KIC 004669402

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6007^{+161}_{-179}$	$4.333^{+0.180}_{-0.180}$	$-0.440^{+0.300}_{-0.300}$	$1.060^{+0.282}_{-0.205}$	$0.882^{+0.120}_{-0.076}$	$1.042^{+0.958}_{-0.503}$
	+3%/-3%	+4%/-4%	+68%/-68%	+27%/-19%	+14%/-9%	+92%/-48%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 004669402-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-24 \pm 4$	$1.16^{+0.22}_{-0.19}$	$1362^{+96}_{-88}$	$4400^{+281}_{-256}$	$60^{+28}_{-18}$
Alt.	$-36 \pm 3$	$3.27^{+0.51}_{-0.40}$	$1361^{+93}_{-90}$	$3290^{+80}_{-80}$	$11^{+3}_{-3}$

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

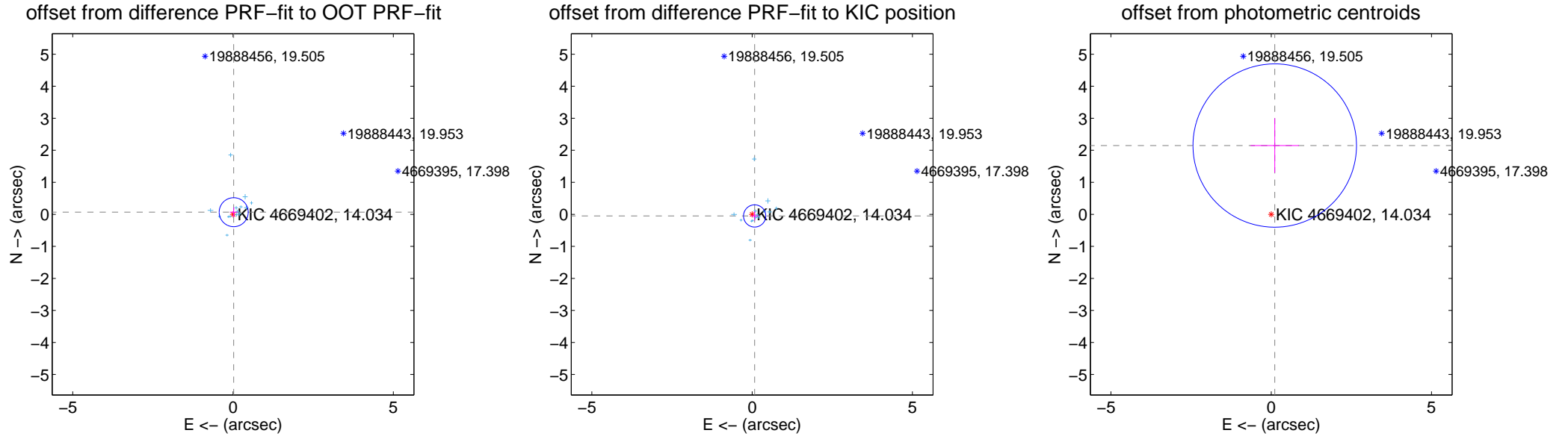
## DV Centroid Data

Supplemental centroid analysis for 004669402-02. Kepler magnitude: 14.03. Transit SNR 13.25

There are 14 quarters with good PRF difference image offsets

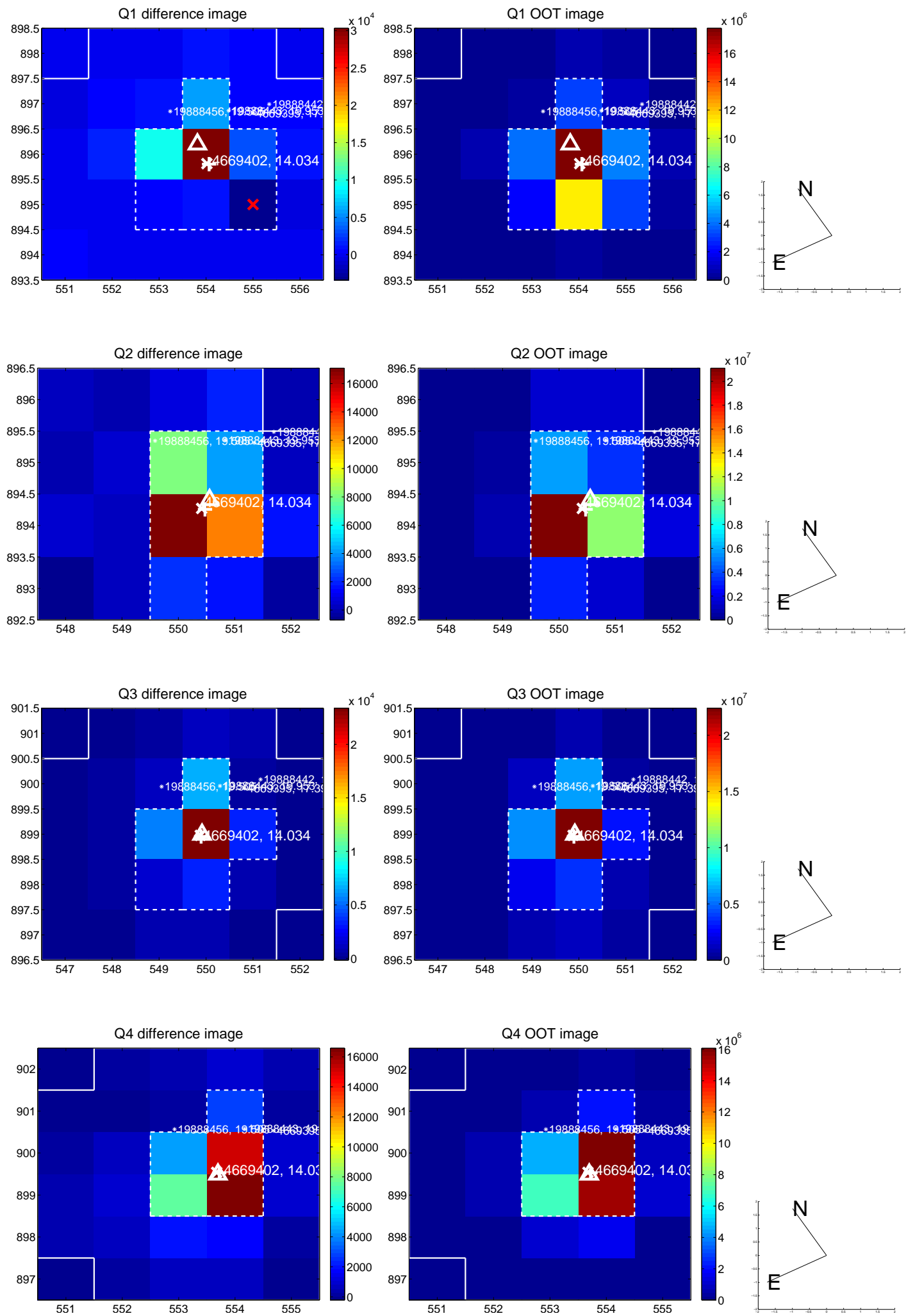
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.070 \pm 0.151$	0.47	$-0.021 \pm 0.117$	$0.067 \pm 0.152$
PRF-fit source offset from KIC position	$0.093 \pm 0.116$	0.81	$-0.079 \pm 0.111$	$-0.050 \pm 0.148$
photometric centroid source offset	$2.15 \pm 0.85$	2.53	$-0.11 \pm 0.75$	$2.15 \pm 0.85$



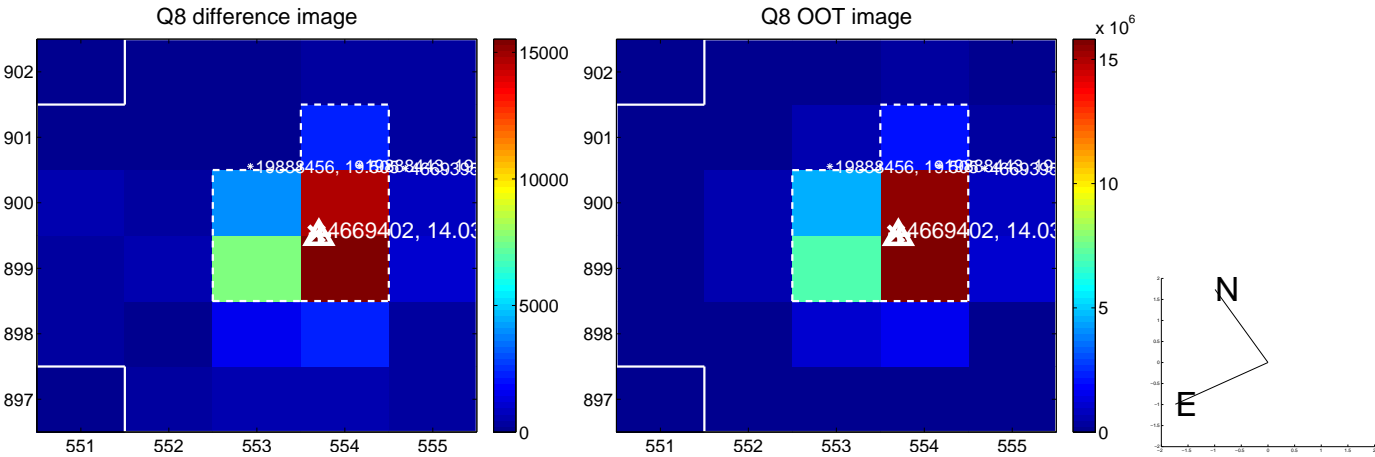
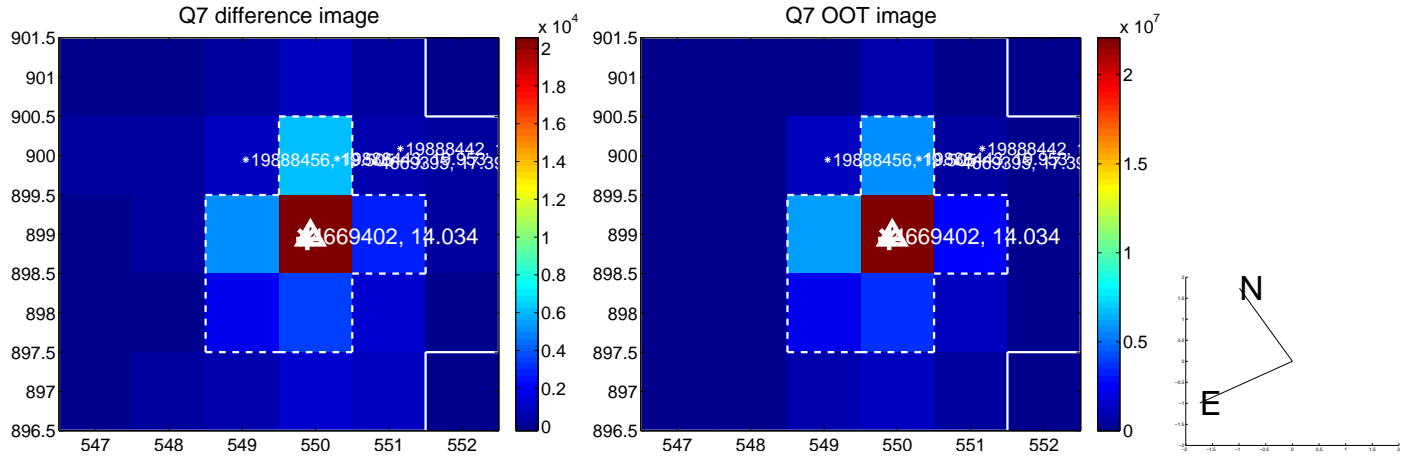
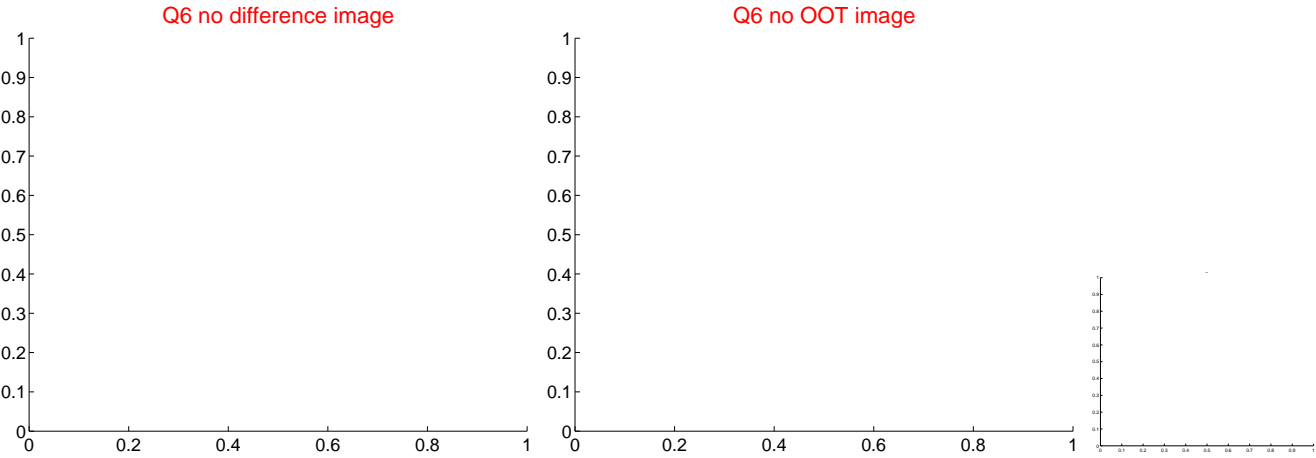
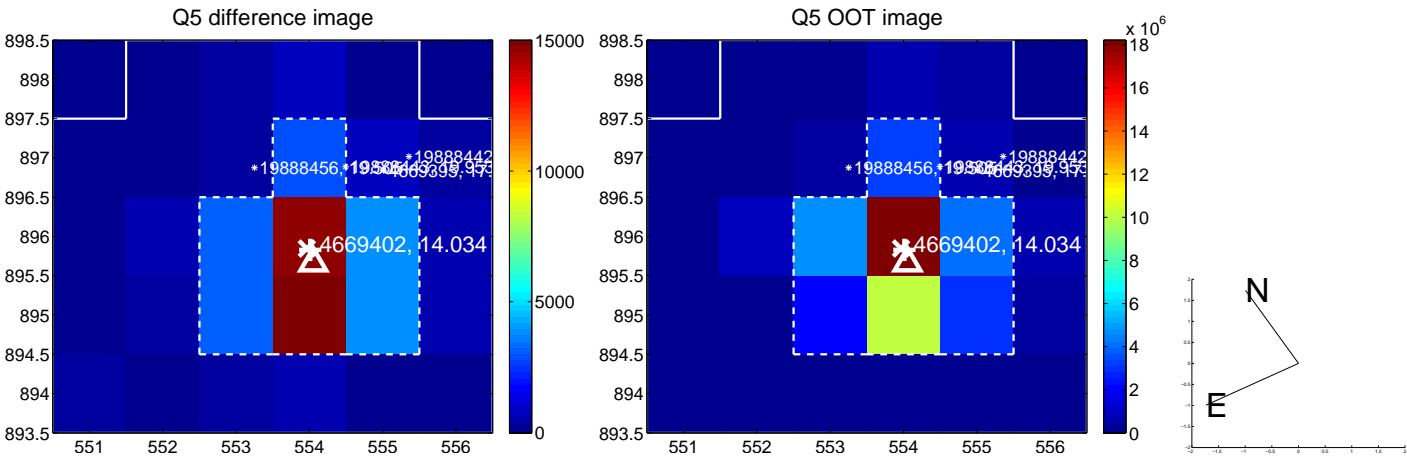
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

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

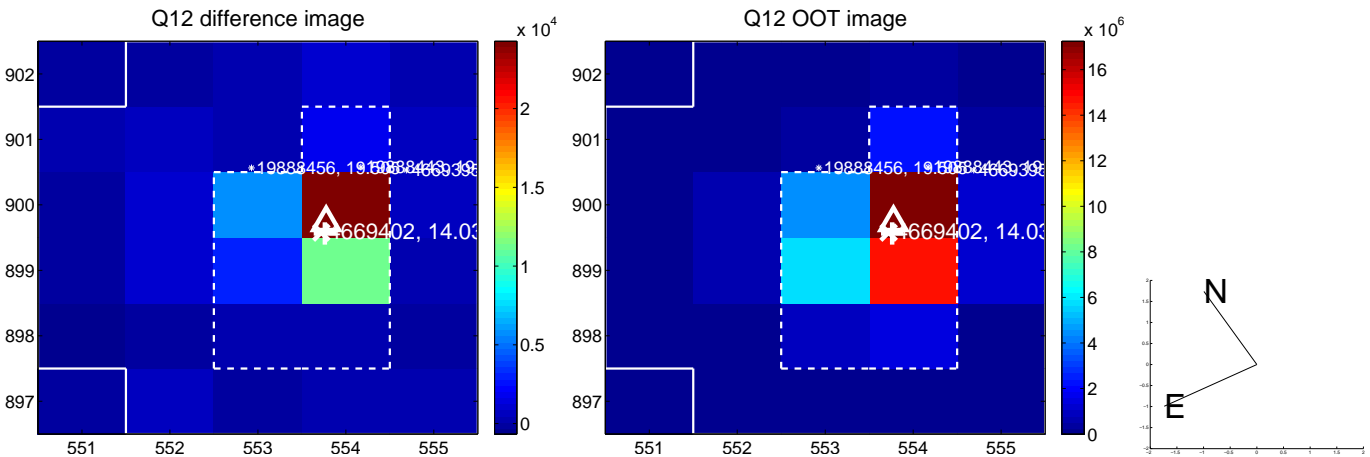
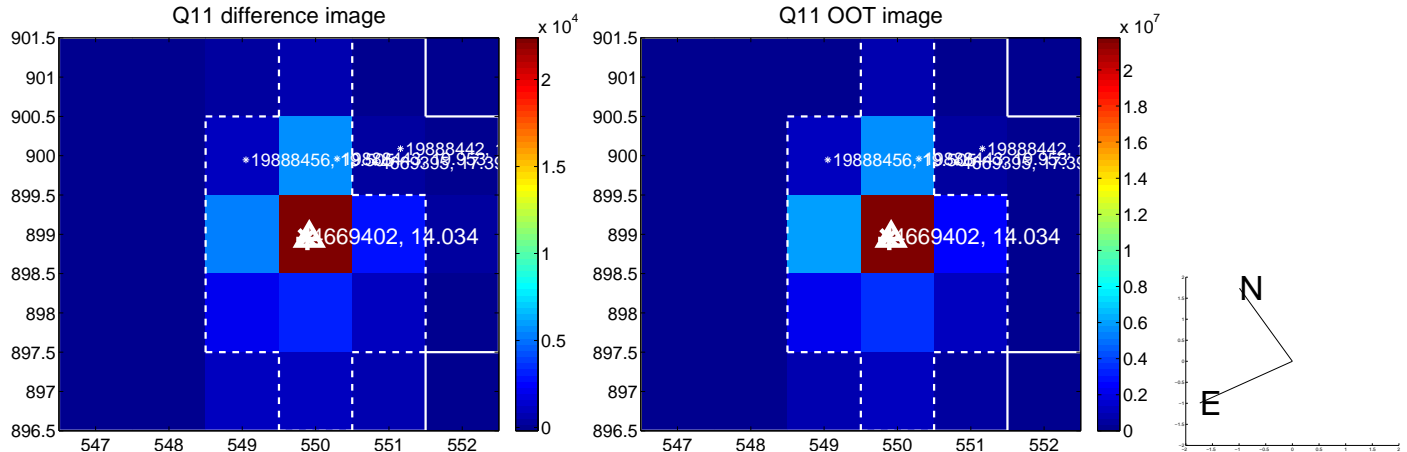
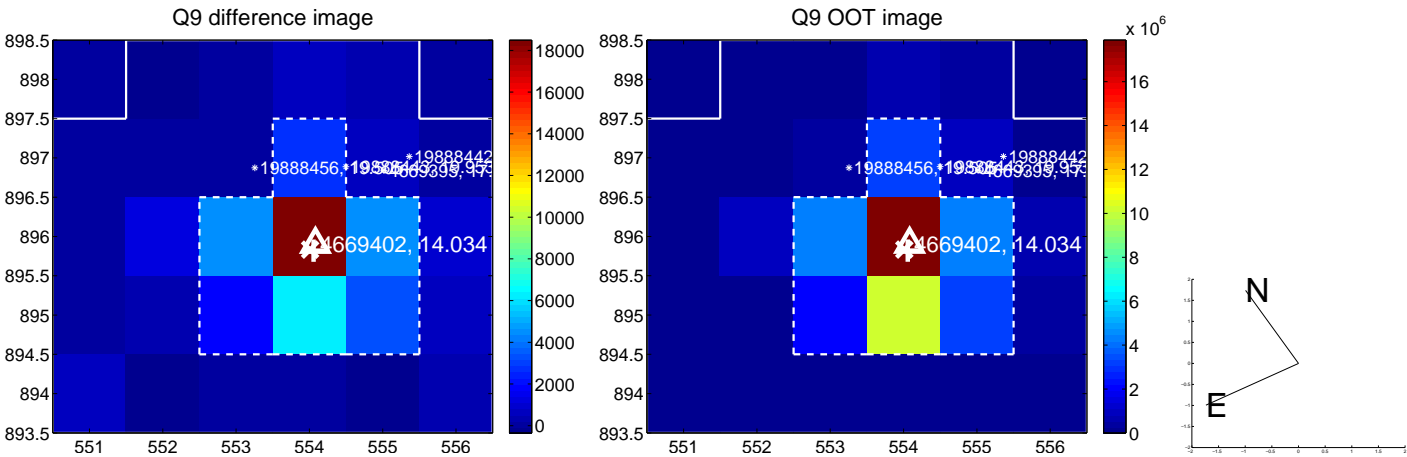




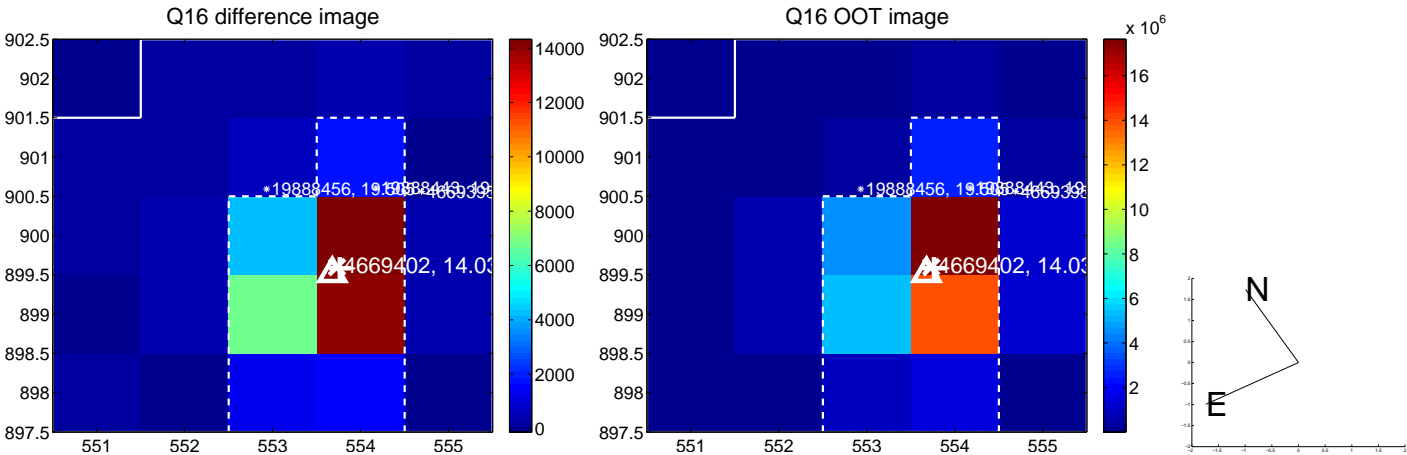
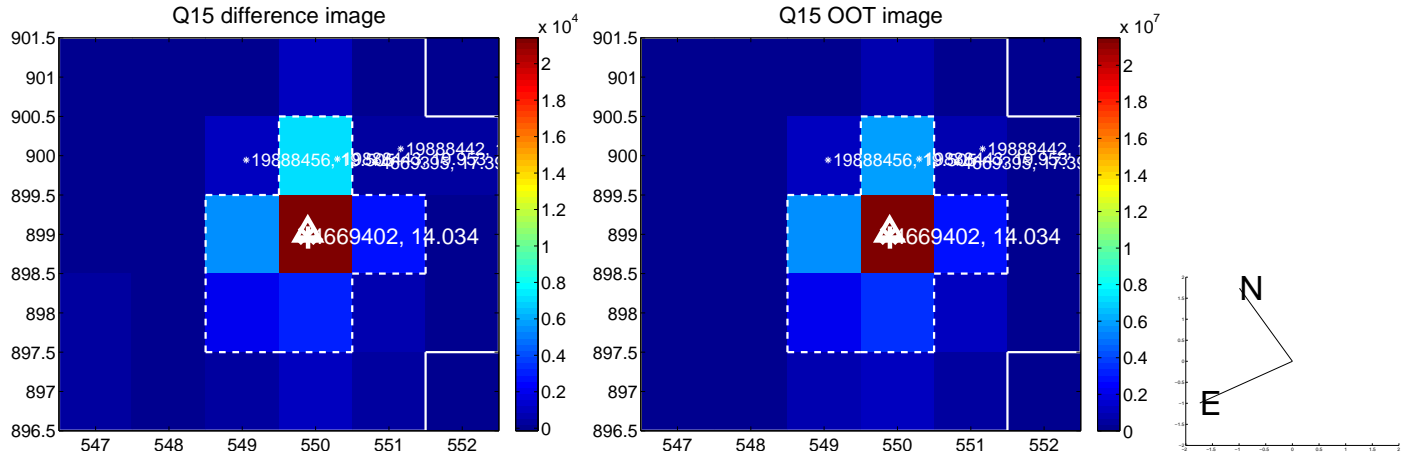
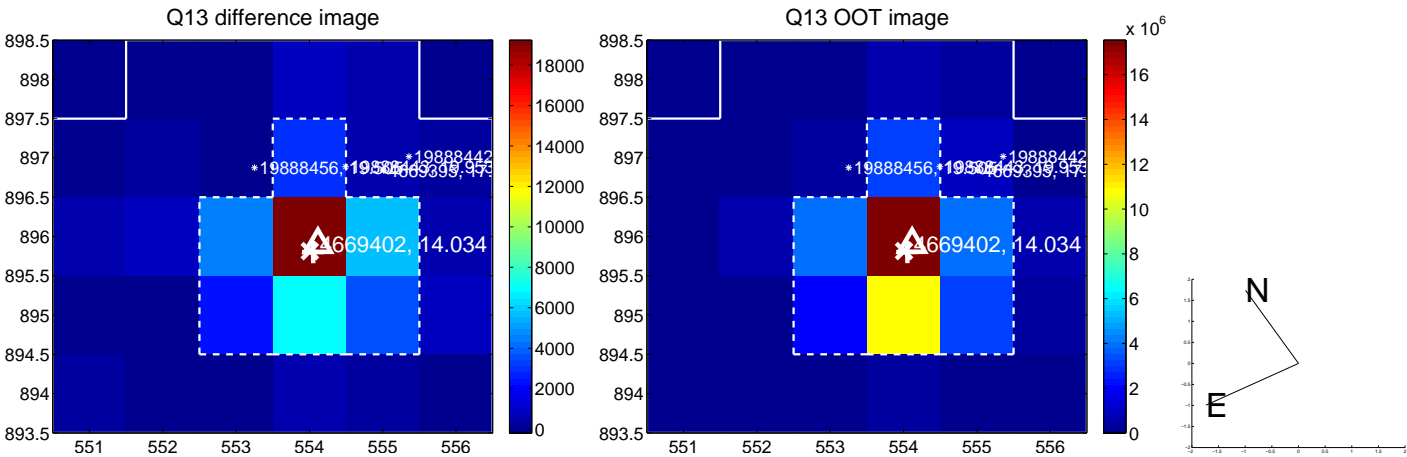
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



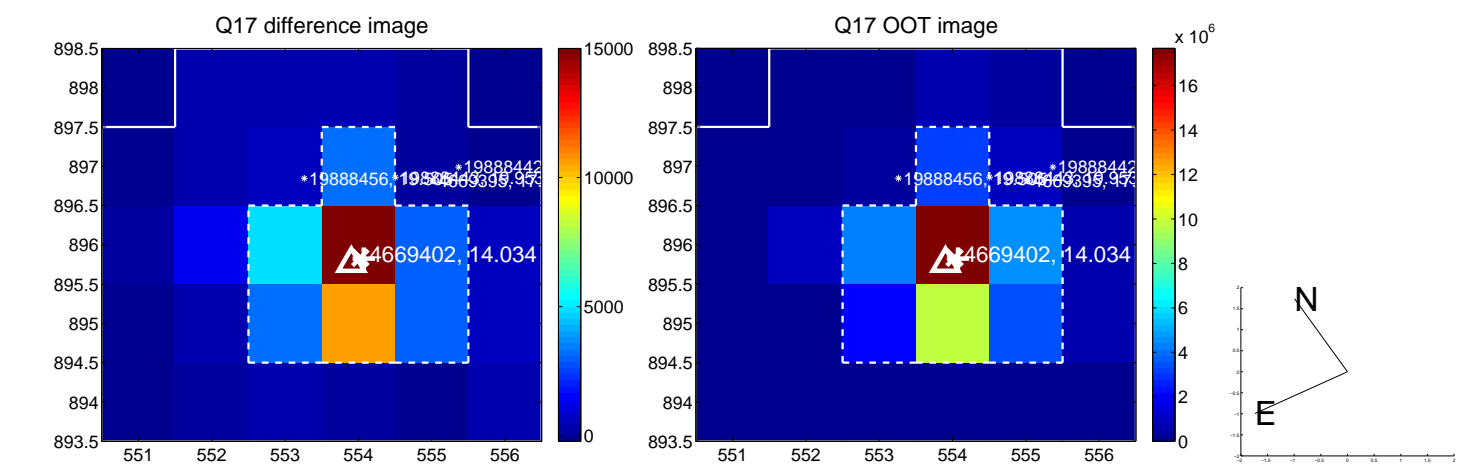
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



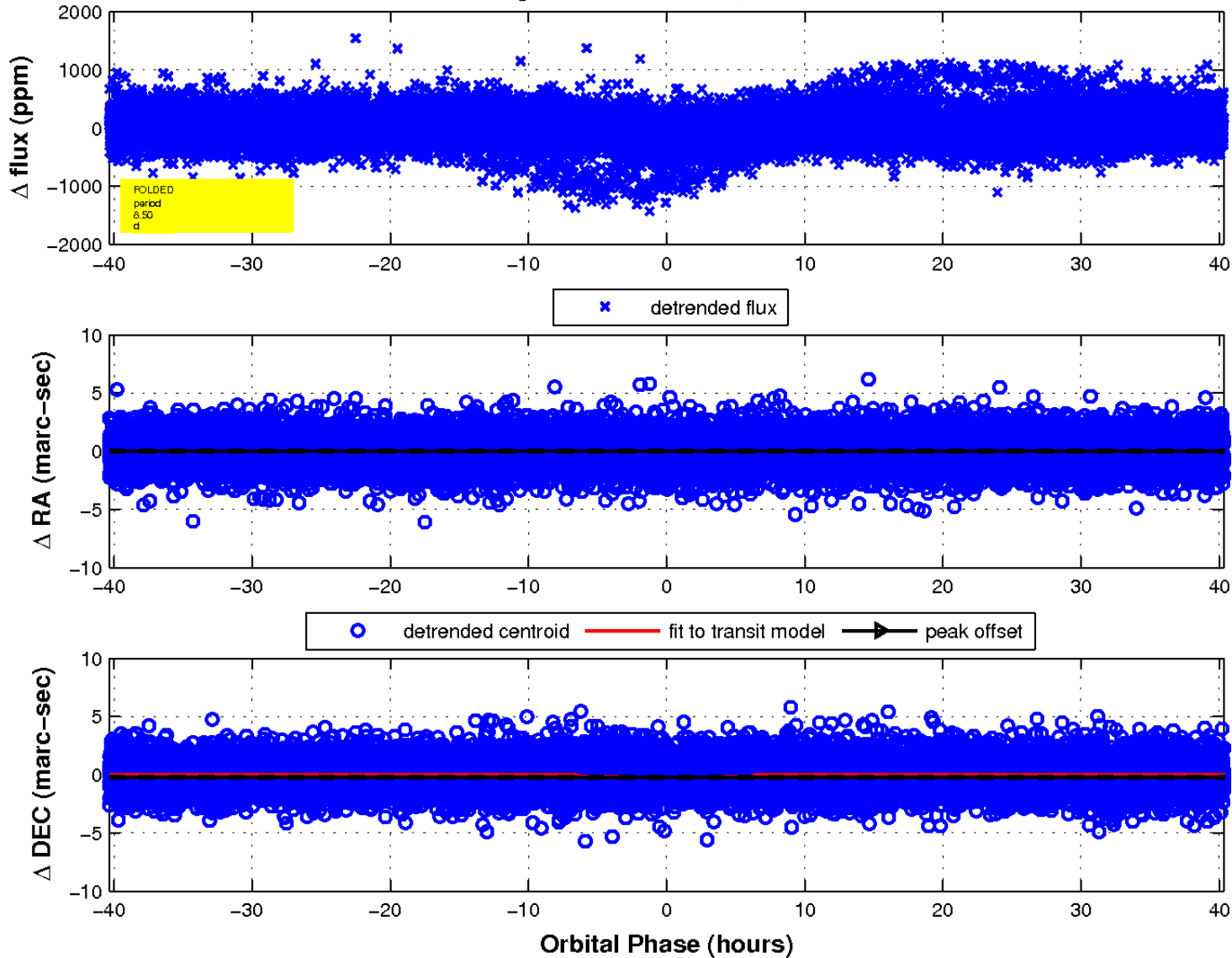
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

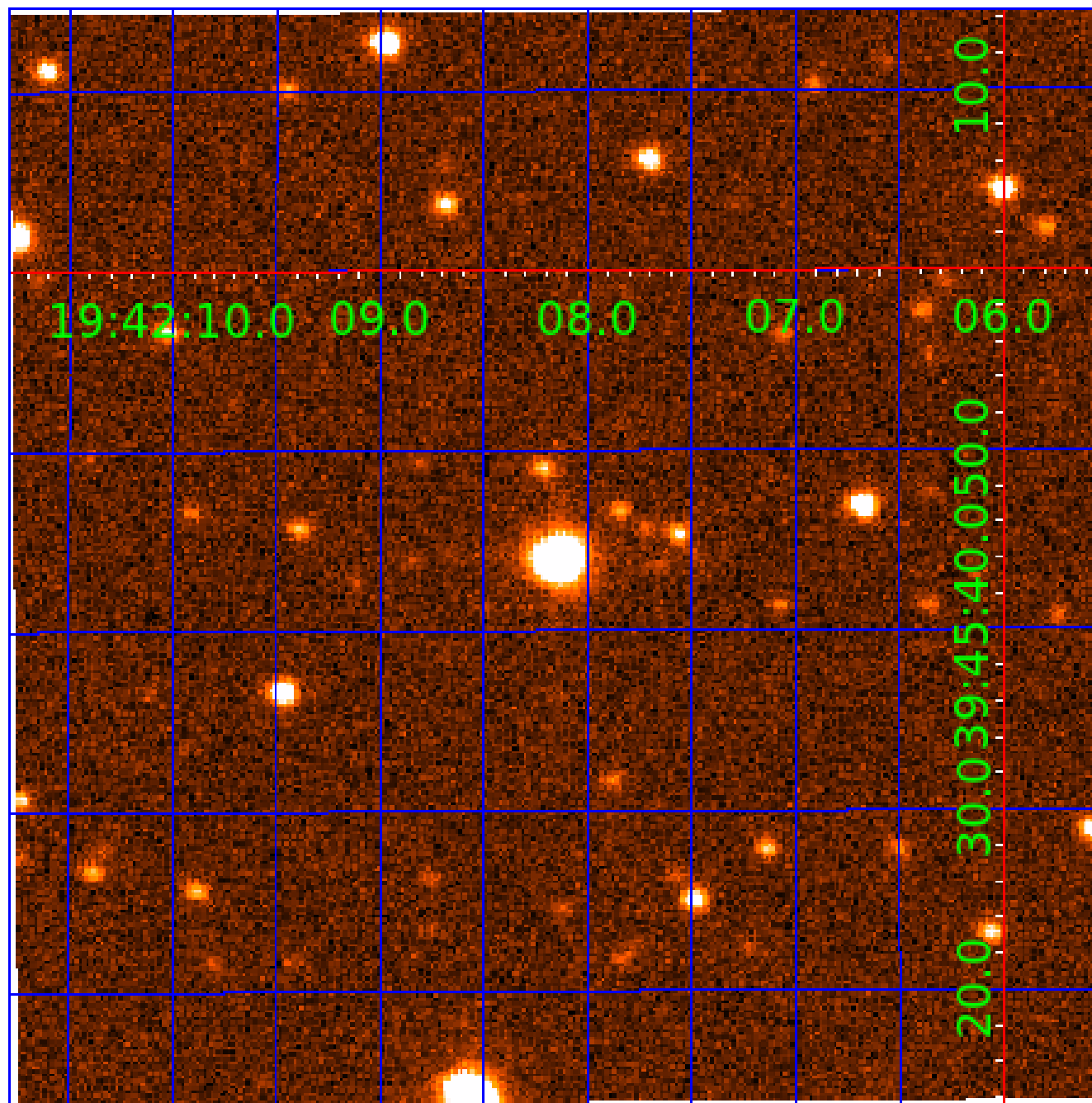


fluxWeightedCentroids, Planet 2 of 3



UKIRT Image

Declination



# KIC 004669402

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004669402-01	OBS	4128.01	143.194809	227.305252	604.8	10.535	16.9	16.8	1.06	6007	4.53	4.96
004669402-02	OBS	No	8.495723	136.155894	89.2	13.450	14.1	13.2	1.06	6007	1.15	214.52
004669402-03	OBS	No	8.495094	135.389583	93.7	19.032	7.8	8.9	1.06	6007	1.42	214.54

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004669402-01	OBS	FP	0.00	0	0	1	0	CENT_RESOLVED_OFFSET—HALO_GHOST
004669402-02	OBS	FP	0.00	1	0	0	0	LPP_DV
004669402-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—SAME_NTL_PERIOD—CENT_FEW_DIFFS

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

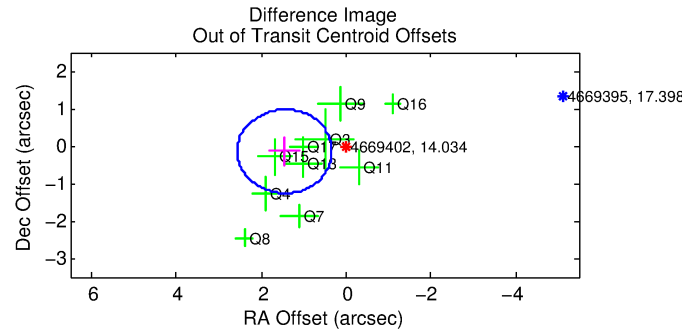
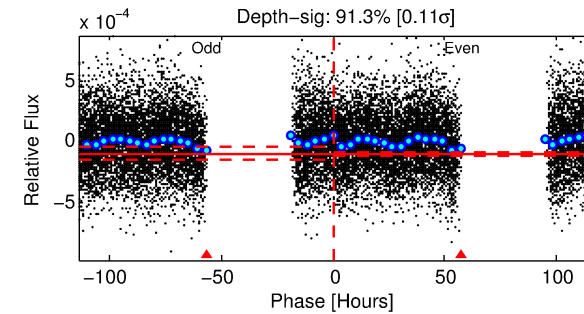
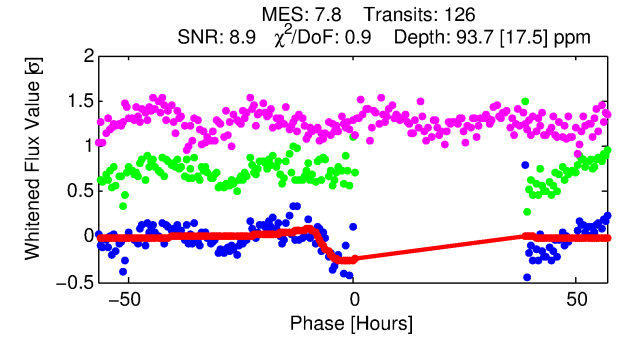
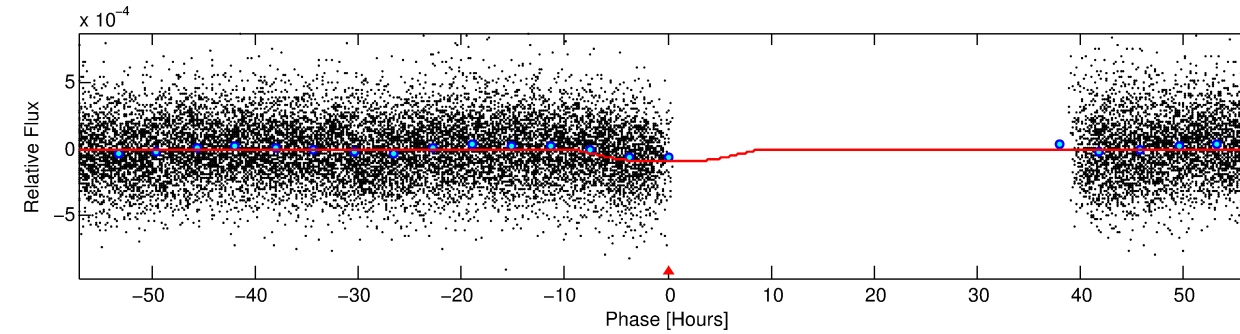
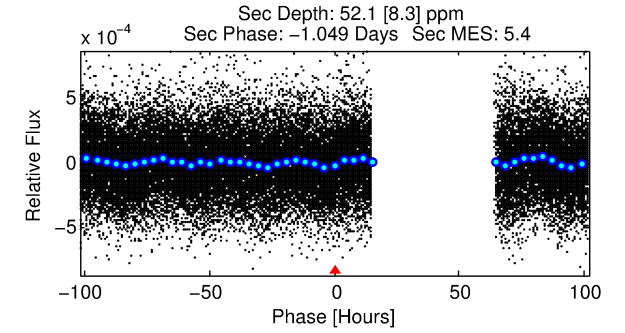
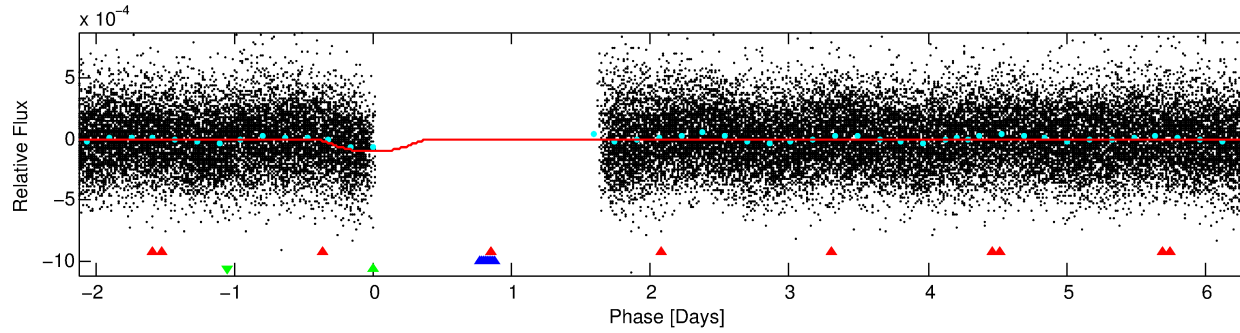
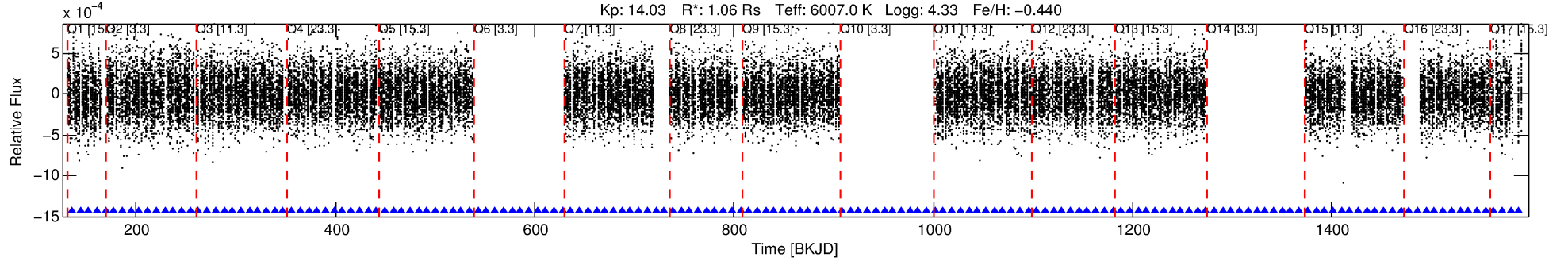
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 004669402-03

No Significant Match Found

# DV One-Page Summary

KIC: 4669402 Candidate: 3 of 3 Period: 8.495 d  
KOI: K04128 Corr: No Ephemeris Match



## DV Fit Results:

Period = 8.49509 [0.00037] d  
Epoch = 135.3896 [0.0924] BKJD  
Rp/R\* = 0.0123 [0.0013]  
a/R\* = 1.26 [0.10]  
b = 0.99 [0.01]  
Seff = 214.54 [74.94]  
Teq = 976 [85] K  
Rp = 1.42 [0.41] Re  
a = 0.0782 [0.0176] AU  
Ag = 86.63 [36.68] [2.33σ]  
Teffp = 4603 [337] K [10.44σ]

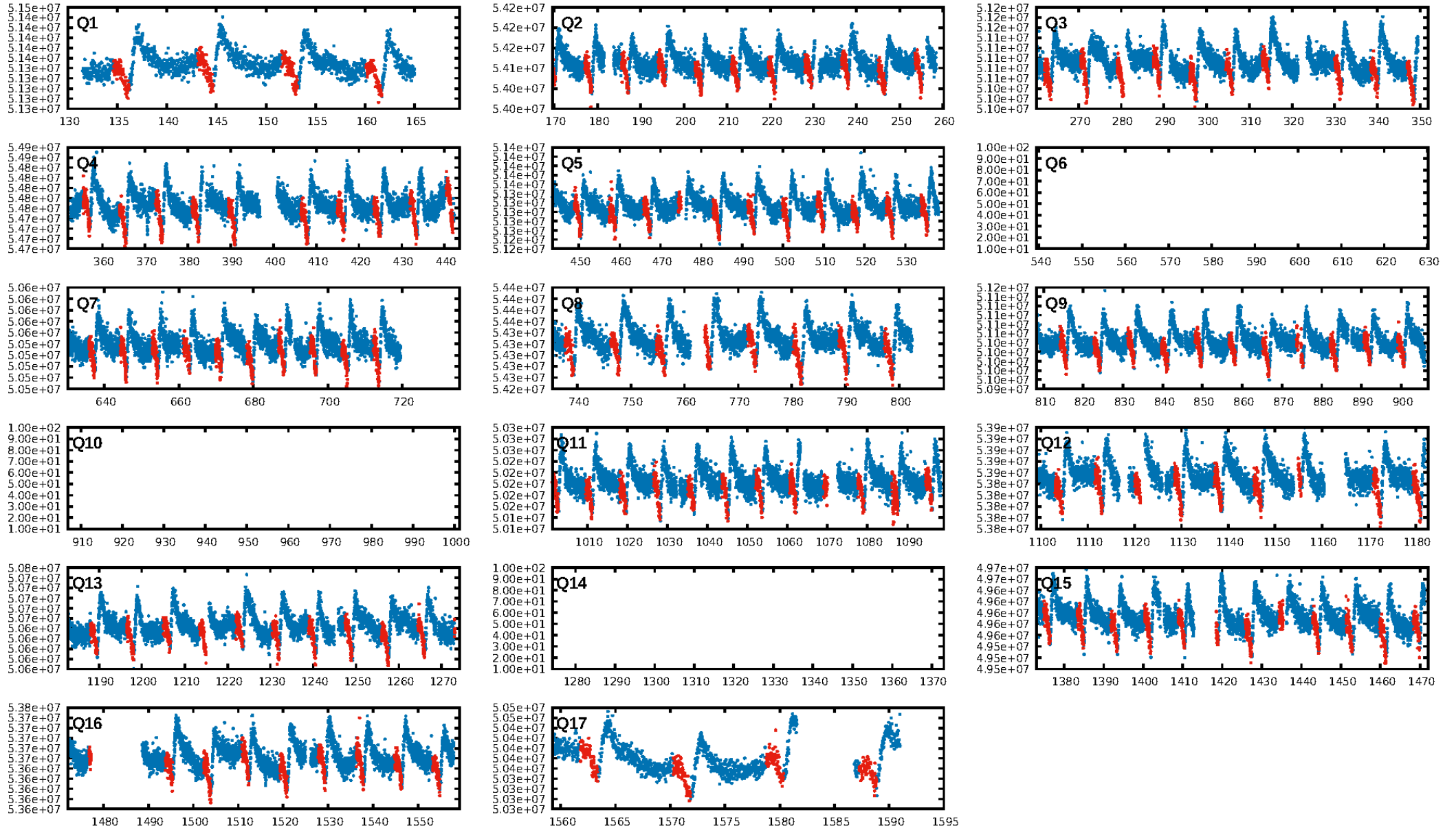
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.1% [0.00σ]  
ModelChiSquare2-sig: 100.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 7.03e-14  
RollingBand-fgt: 1.00 [118/118]  
GhostDiagnostic-chr: -0.5277  
Centroid-sig: 21.8%  
Centroid-so: 0.973 arcsec [1.21σ]  
OotOffset-rm: 1.450 arcsec [3.89σ]  
KicOffset-rm: 1.389 arcsec [4.10σ]  
OotOffset-st: 0/4/3/3 [10]  
KicOffset-st: 0/4/3/3 [10]  
DiffImageQuality-fgm: 0.00 [0/10]  
DiffImageOverlap-fno: 0.00 [0/14]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 12:35:26 Z

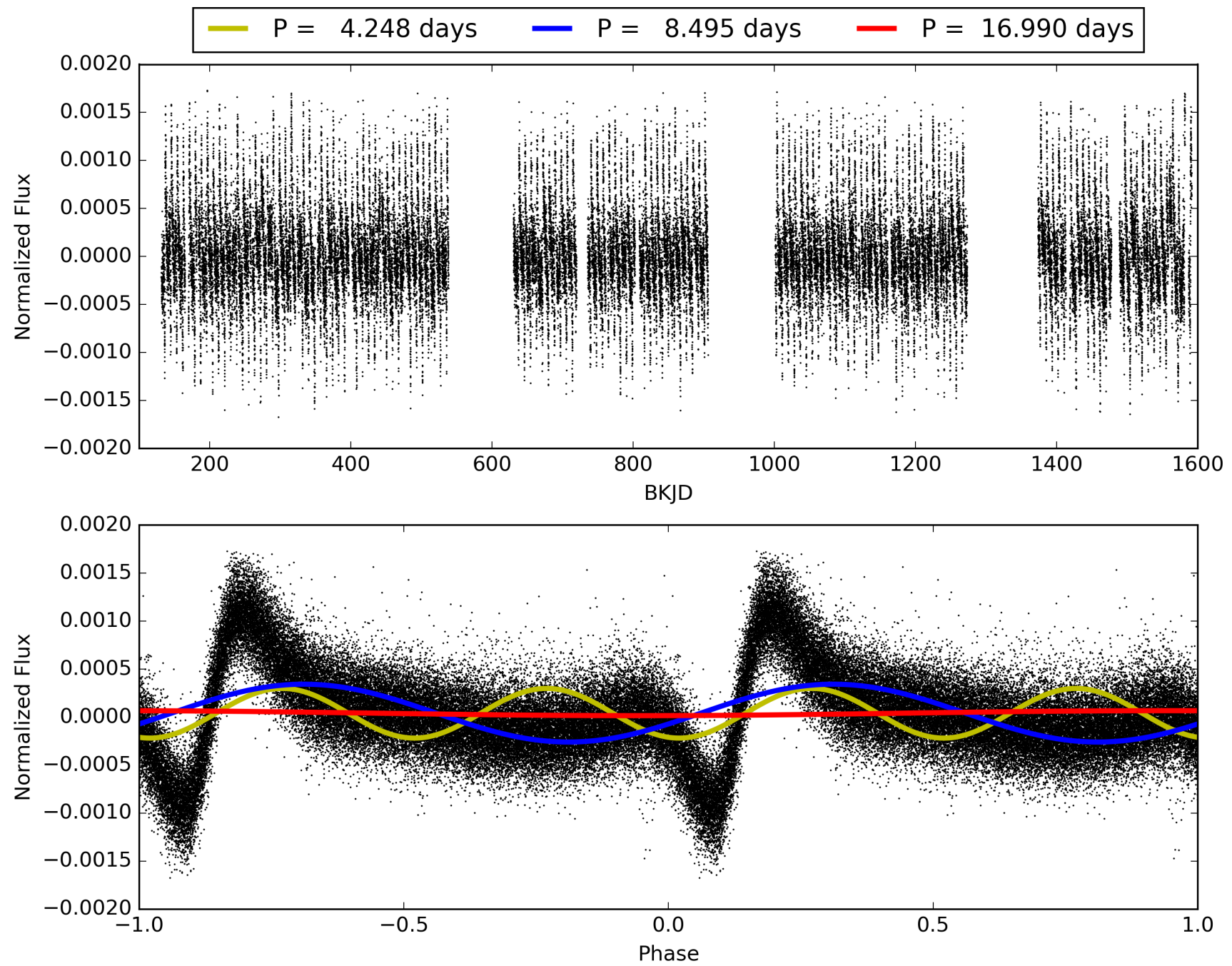
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 004669402-03, PDC Light Curves



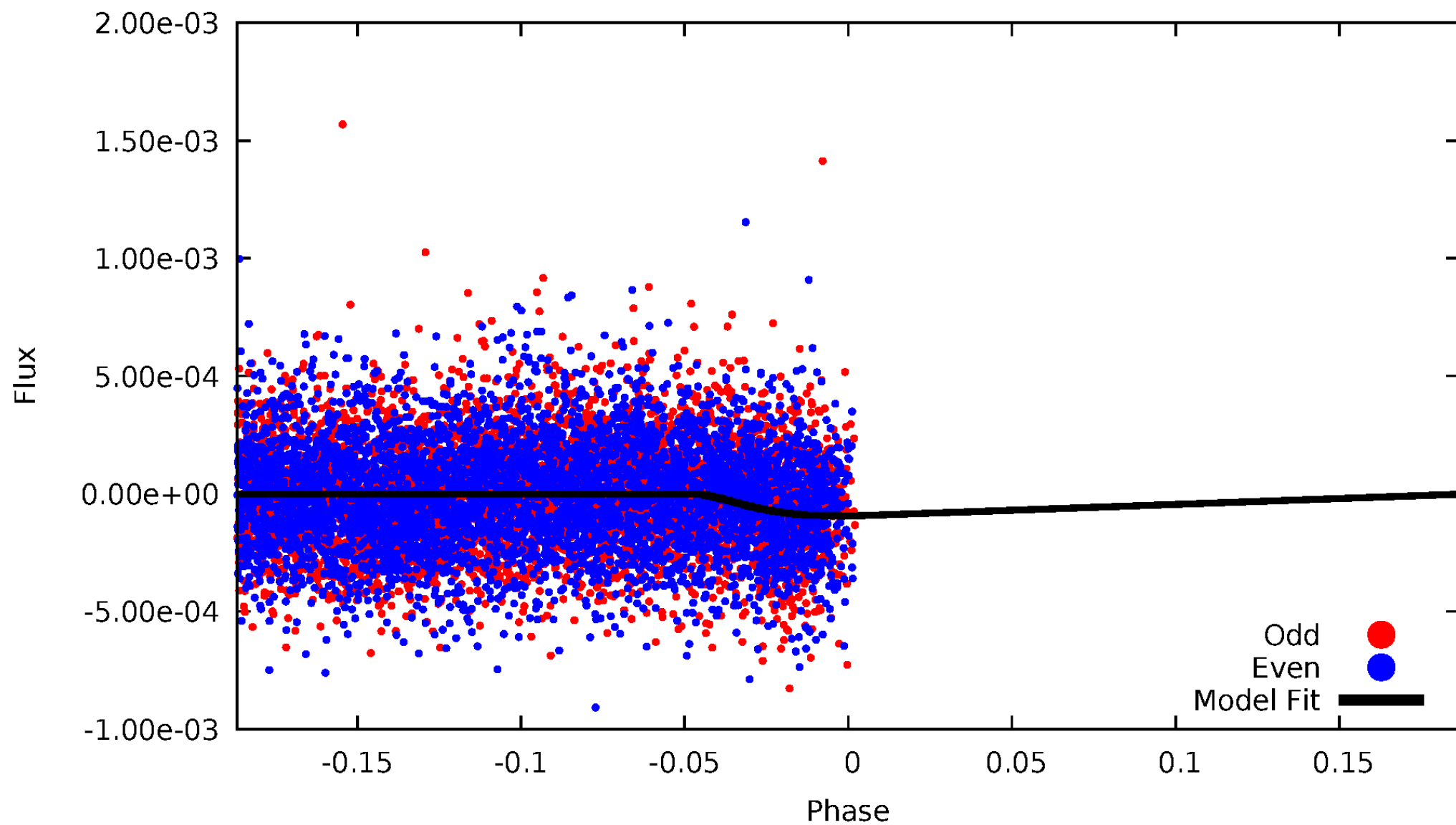


TCE 004669402-03



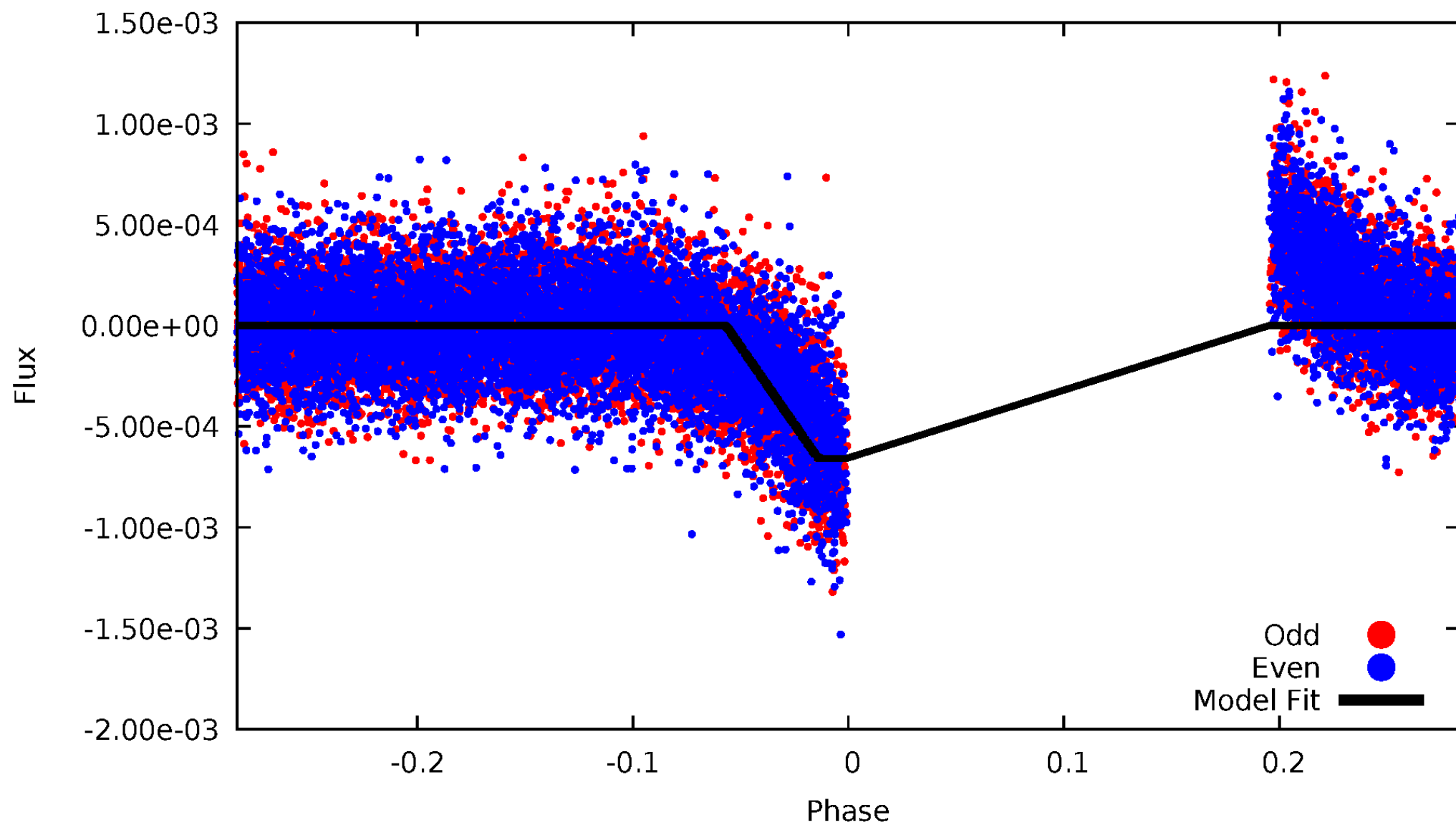
DV Odd/Even

TCE 004669402-03

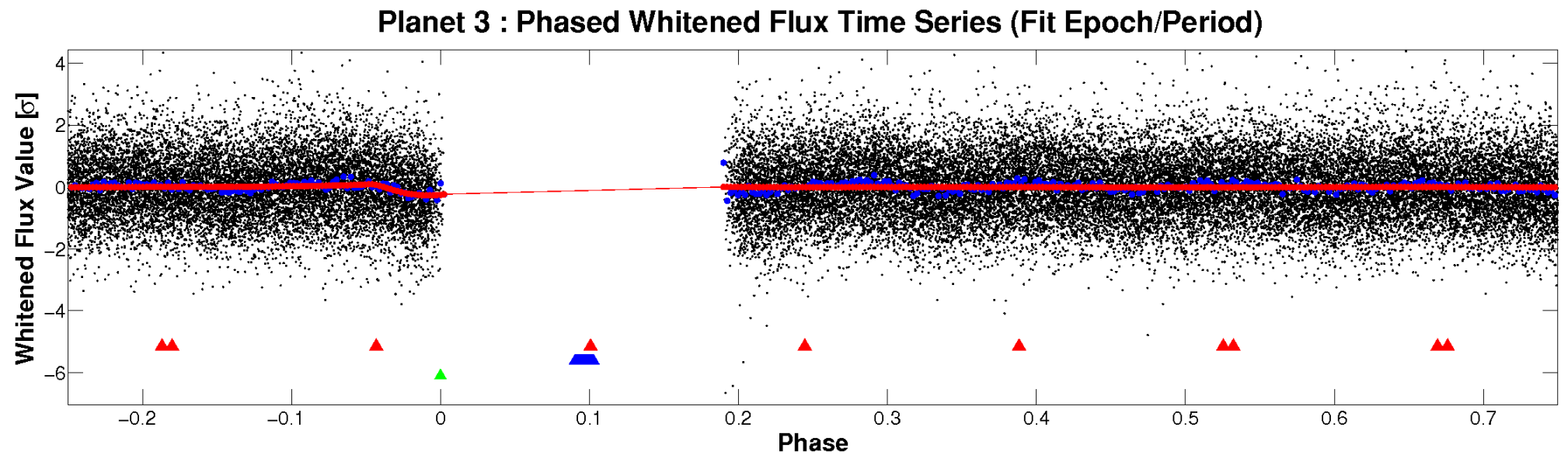
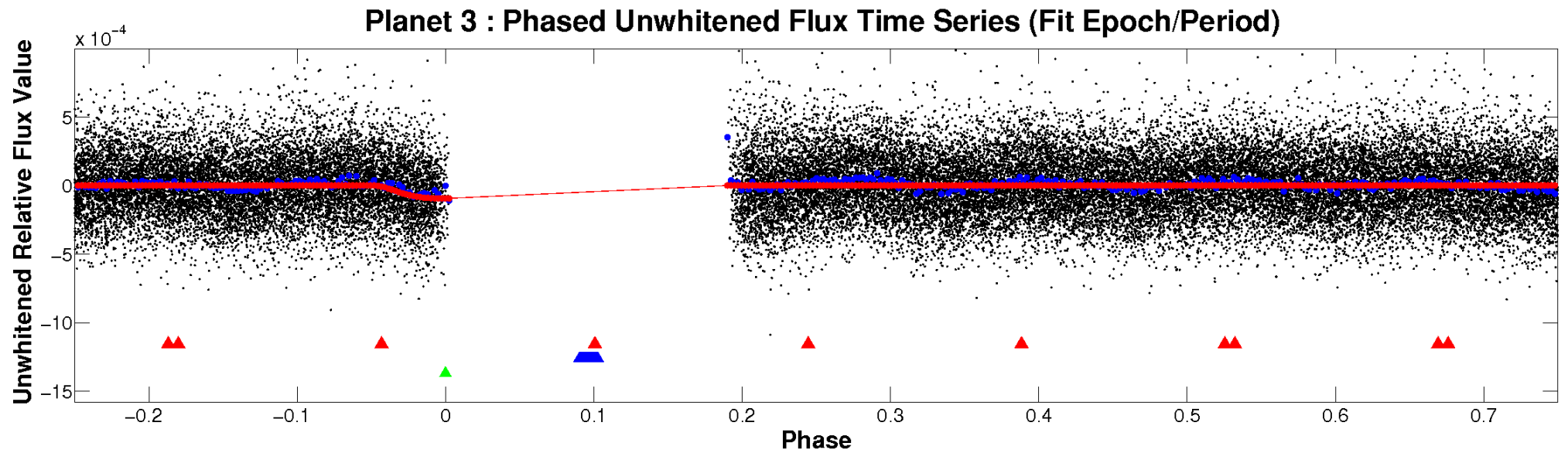


# ALT Odd/Even

TCE 004669402-03

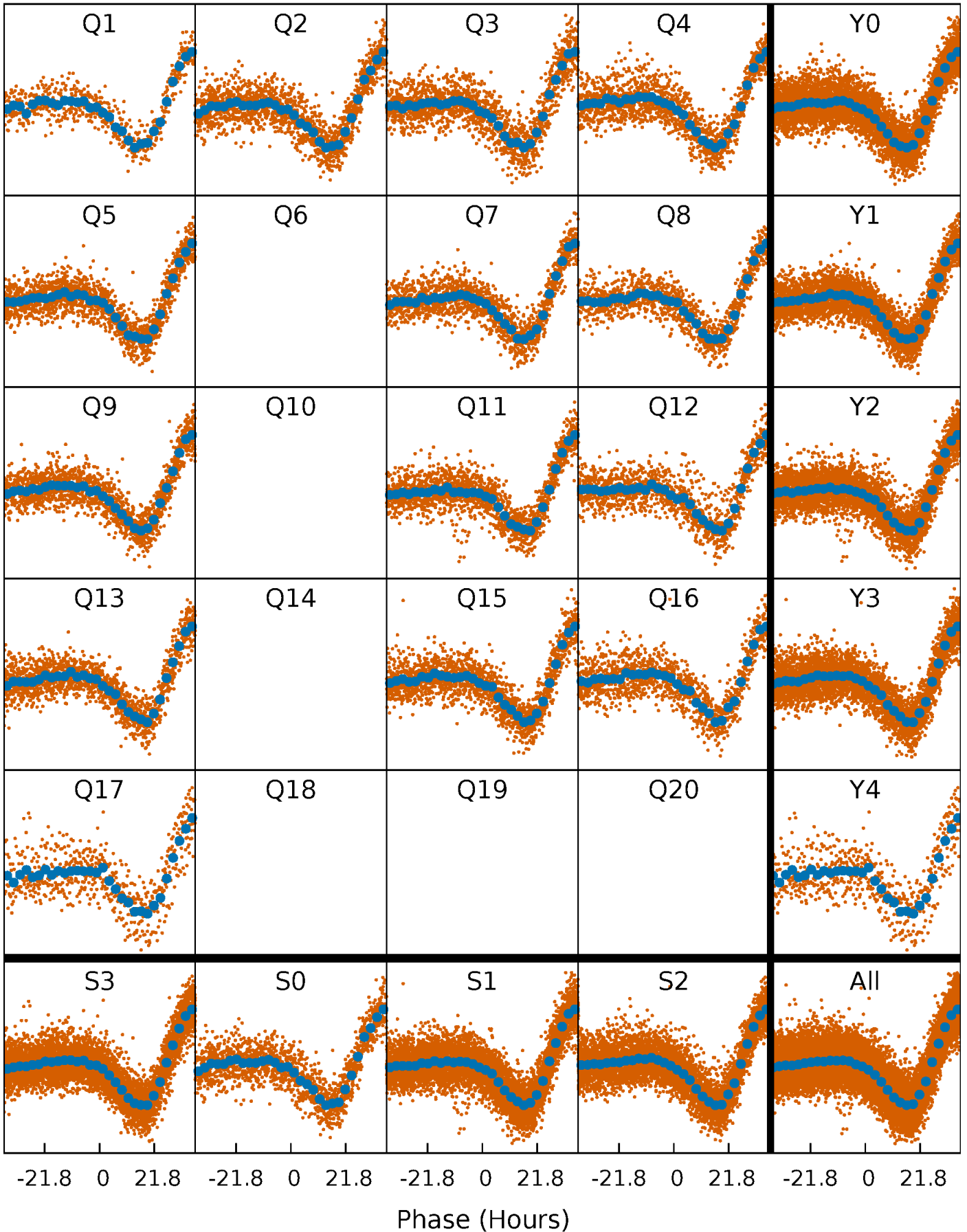


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

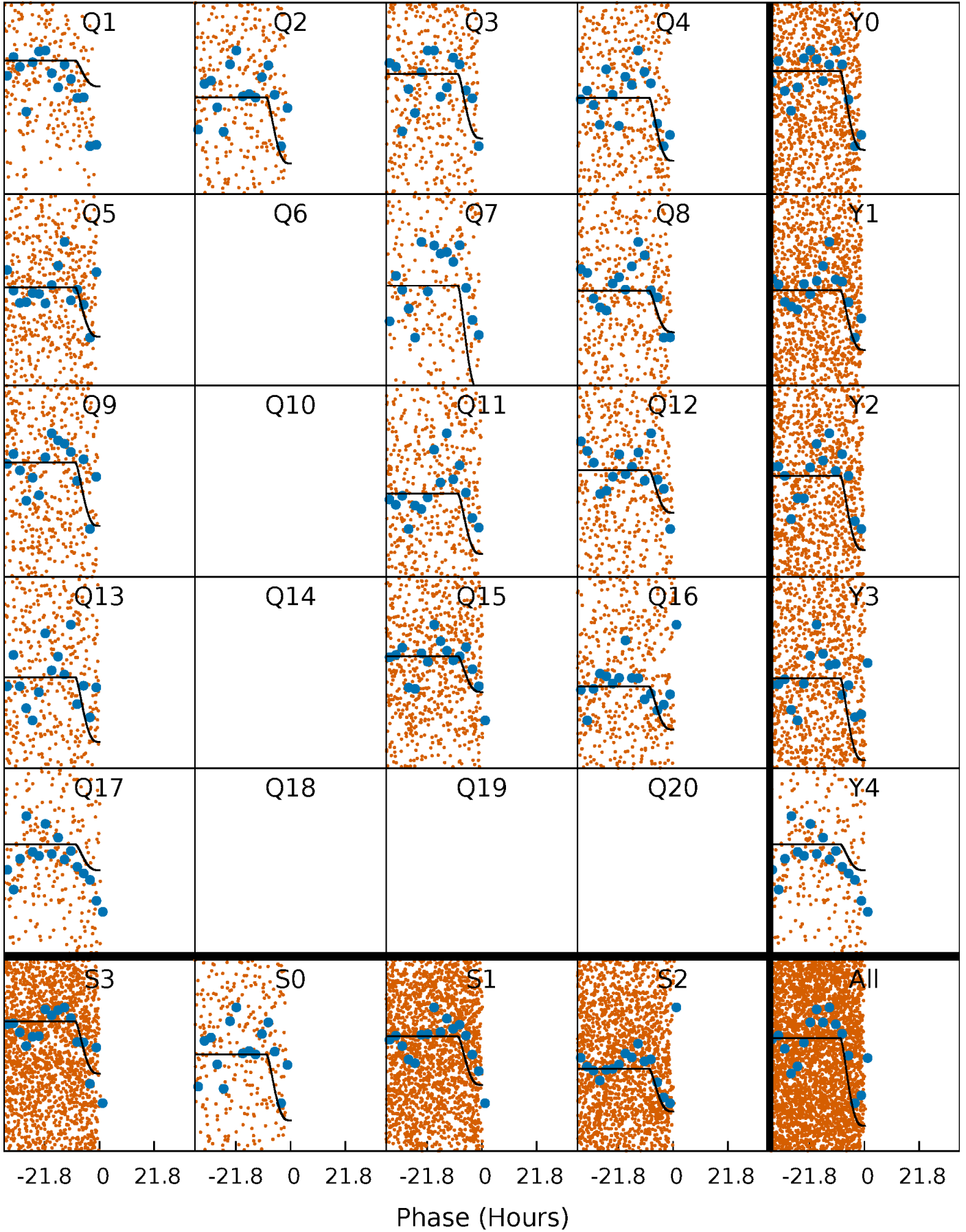
TCE 004669402-03     $P = 8.495094$  Days     $T_0 = 135.389583$  (BKJD)





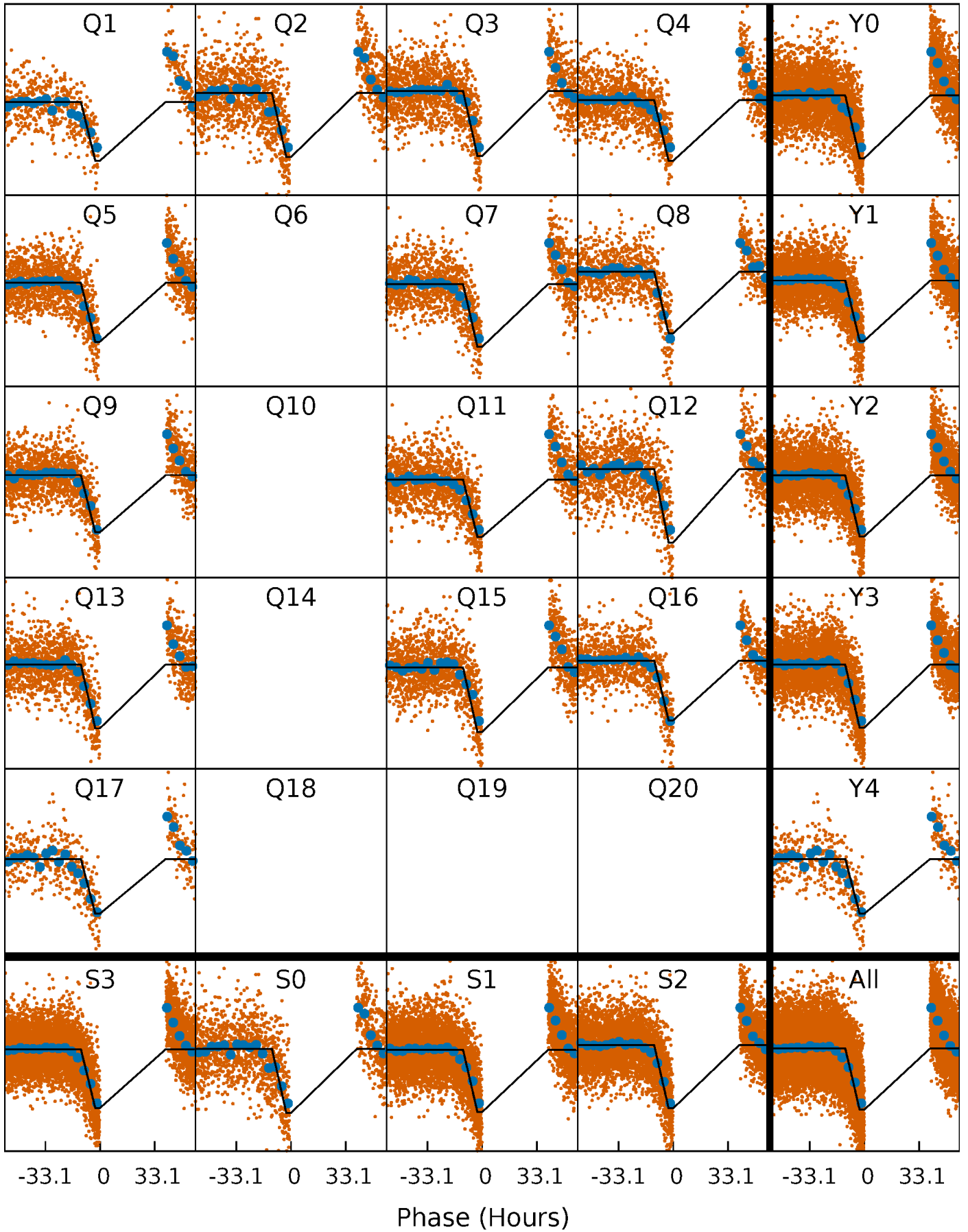
# DV Quarter-Phased Transit Curves

TCE 004669402-03   P= 8.495094 Days    $T_0=135.389583$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

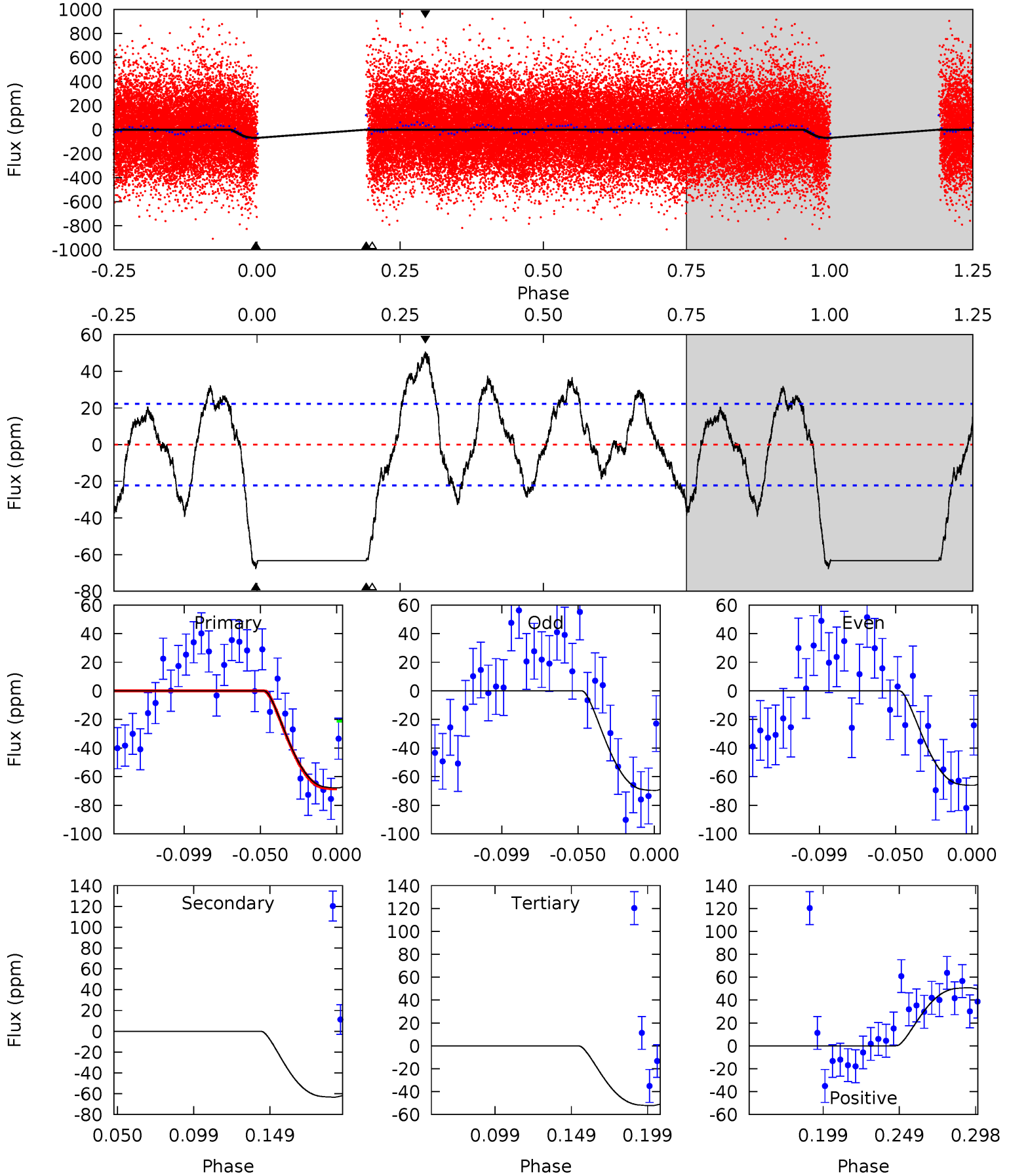
TCE 004669402-03   P= 8.495467 Days    $T_0=135.348579$  (BKJD)



# DV Model-Shift Uniqueness Test

004669402-03, P = 8.495094 Days, E = 126.894489 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
14.3	13.4	11.0	10.7	4.71	1.96	4.46	3.31	3.62	2.34	2.66	0.37	0.95	0.43	0.85

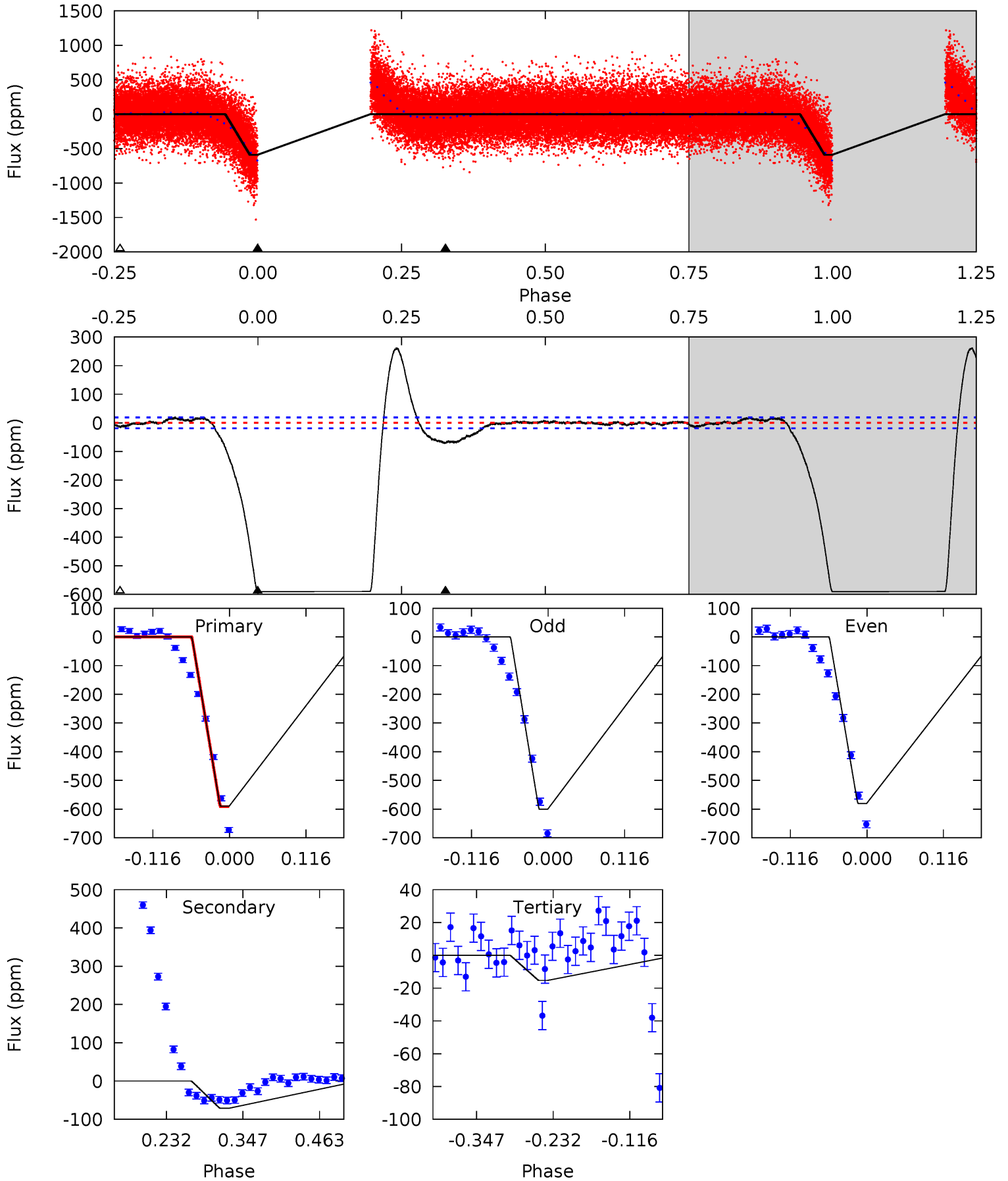




# Alt Model-Shift Uniqueness Test

004669402-03, P = 8.495467 Days, E = 126.853112 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
141.1	17.0	3.66	0	4.53	1.57	16.4	137.4	141.1	13.4	17.0	2.40	0	0.31	0



### Stellar Parameters For KIC 004669402

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6007^{+161}_{-179}$	$4.333^{+0.180}_{-0.180}$	$-0.440^{+0.300}_{-0.300}$	$1.060^{+0.282}_{-0.205}$	$0.882^{+0.120}_{-0.076}$	$1.042^{+0.958}_{-0.503}$
	+3%/-3%	+4%/-4%	+68%/-68%	+27%/-19%	+14%/-9%	+92%/-48%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 004669402-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-63 \pm 5$	$1.41^{+0.28}_{-0.21}$	$1366^{+93}_{-88}$	$4929^{+288}_{-239}$	$106^{+42}_{-31}$
Alt.	$-71 \pm 4$	$2.97^{+0.51}_{-0.36}$	$1360^{+104}_{-87}$	$3811^{+104}_{-103}$	$28^{+9}_{-7}$

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

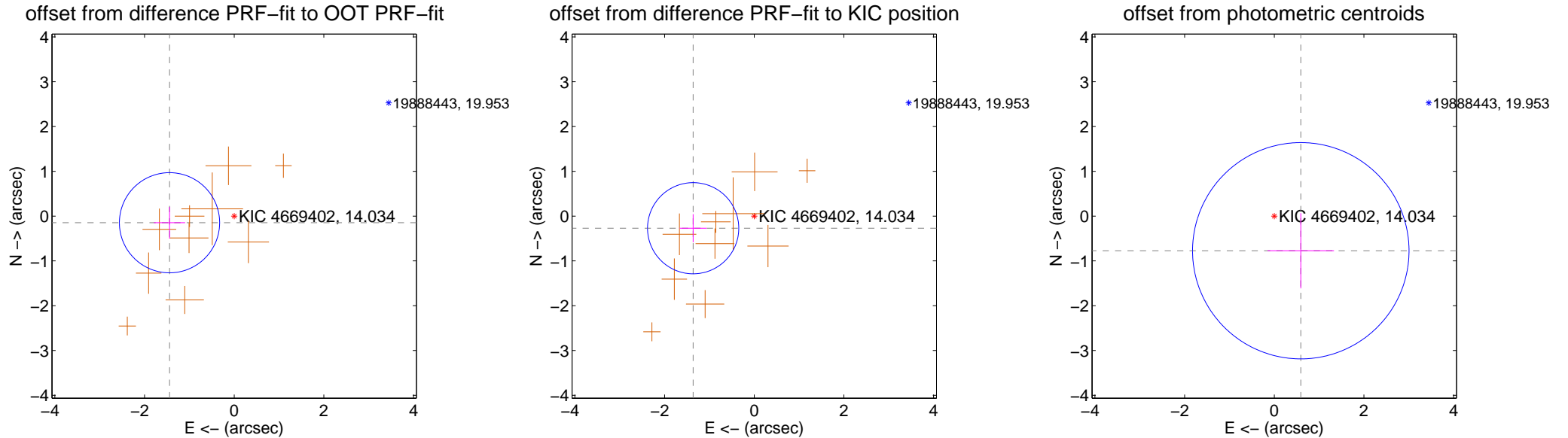
## DV Centroid Data

Supplemental centroid analysis for 004669402-03. Kepler magnitude: 14.03. Transit SNR 8.86

There are 0 quarters with good PRF difference image offsets

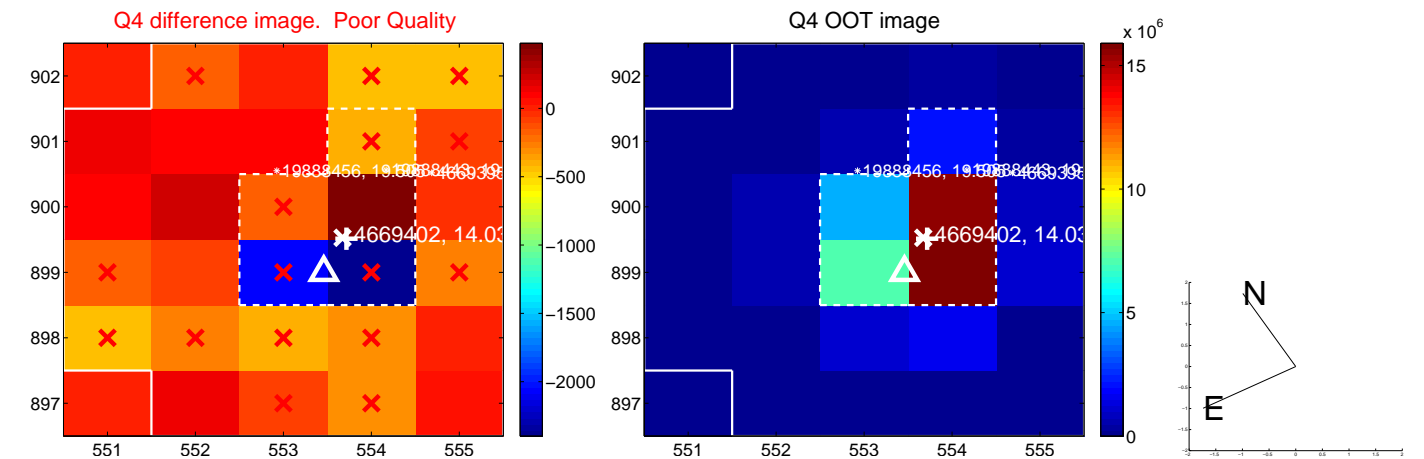
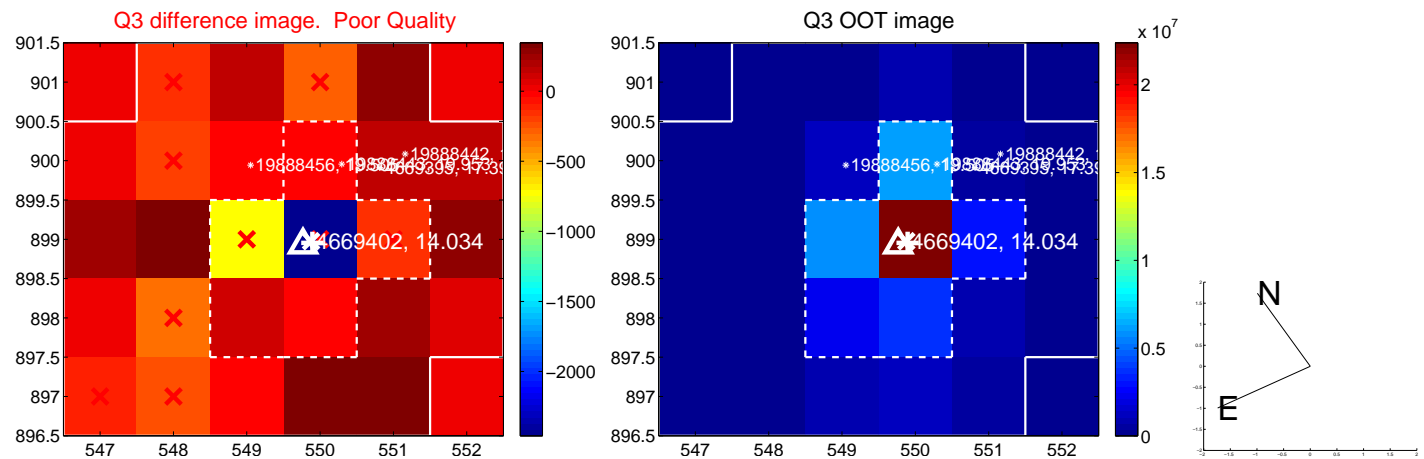
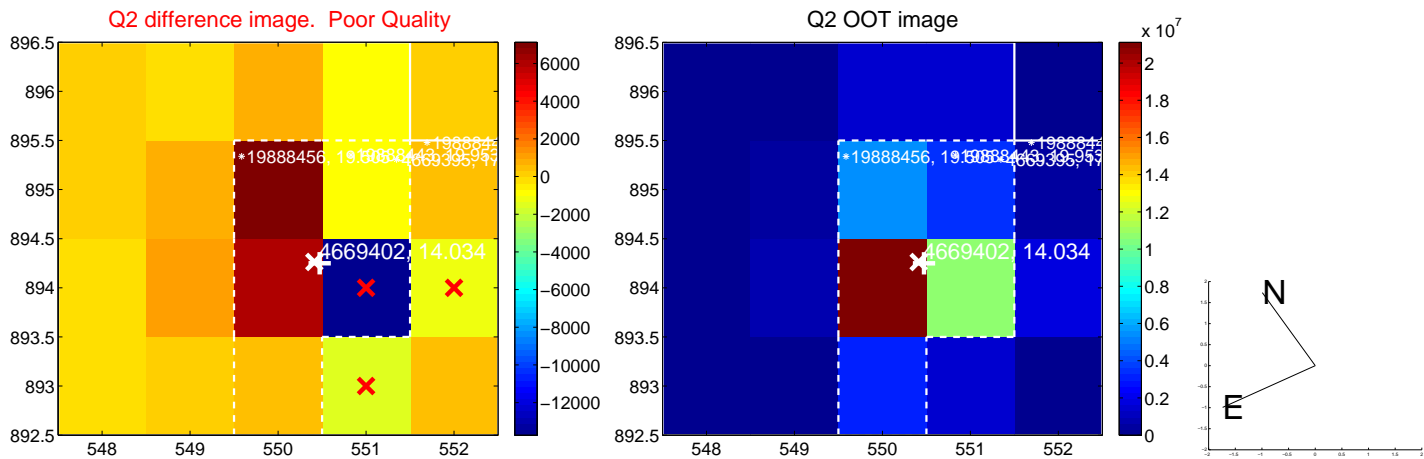
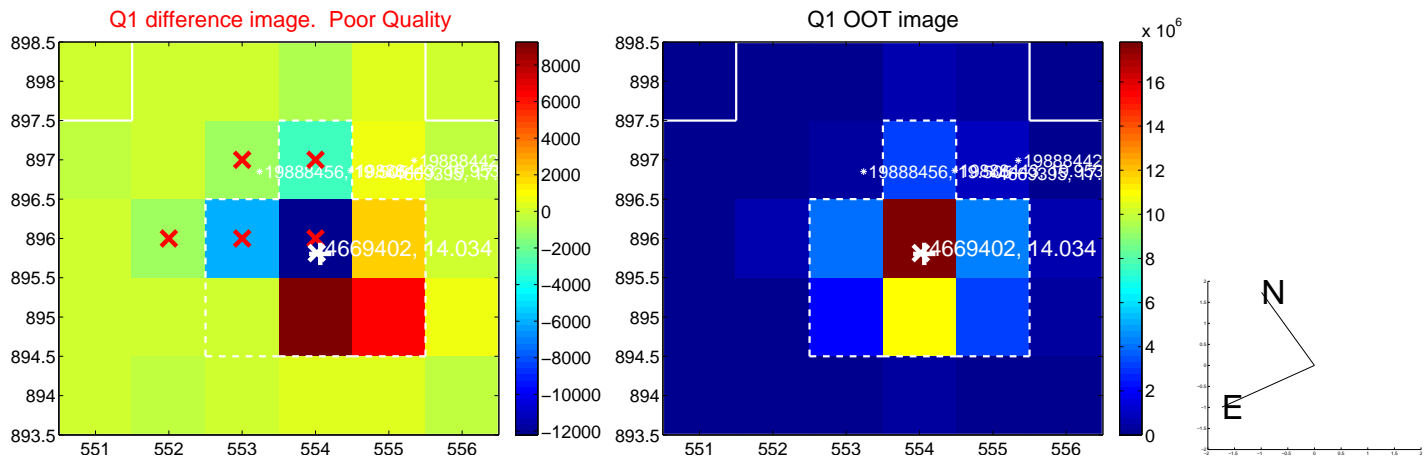
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.450 \pm 0.373$	3.89	$1.442 \pm 0.348$	$-0.148 \pm 0.353$
PRF-fit source offset from KIC position	$1.389 \pm 0.339$	4.10	$1.362 \pm 0.301$	$-0.270 \pm 0.314$
photometric centroid source offset	$0.97 \pm 0.80$	1.21	$-0.59 \pm 0.74$	$-0.77 \pm 0.84$

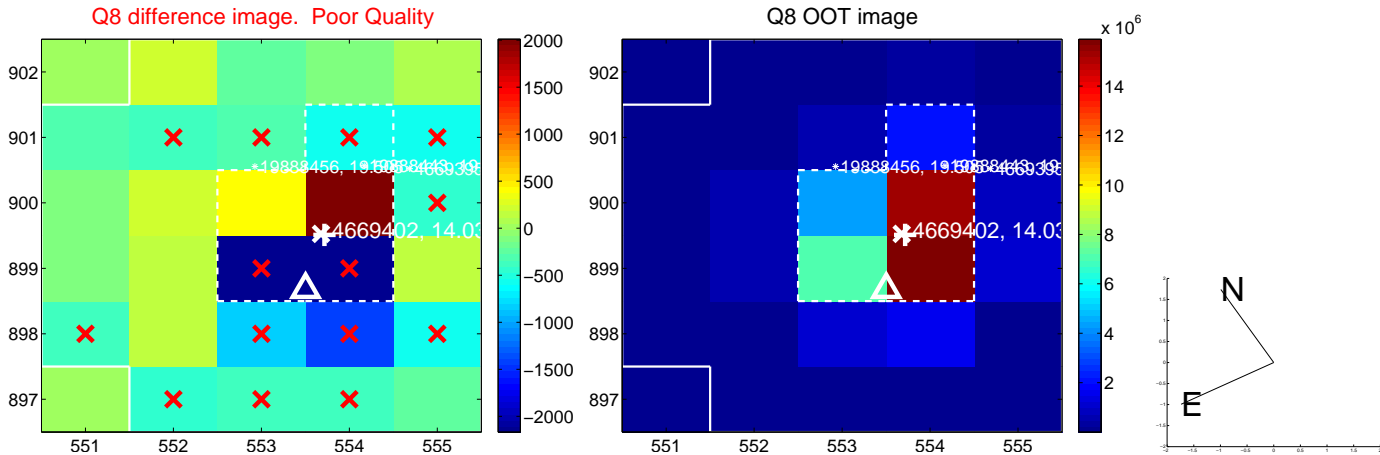
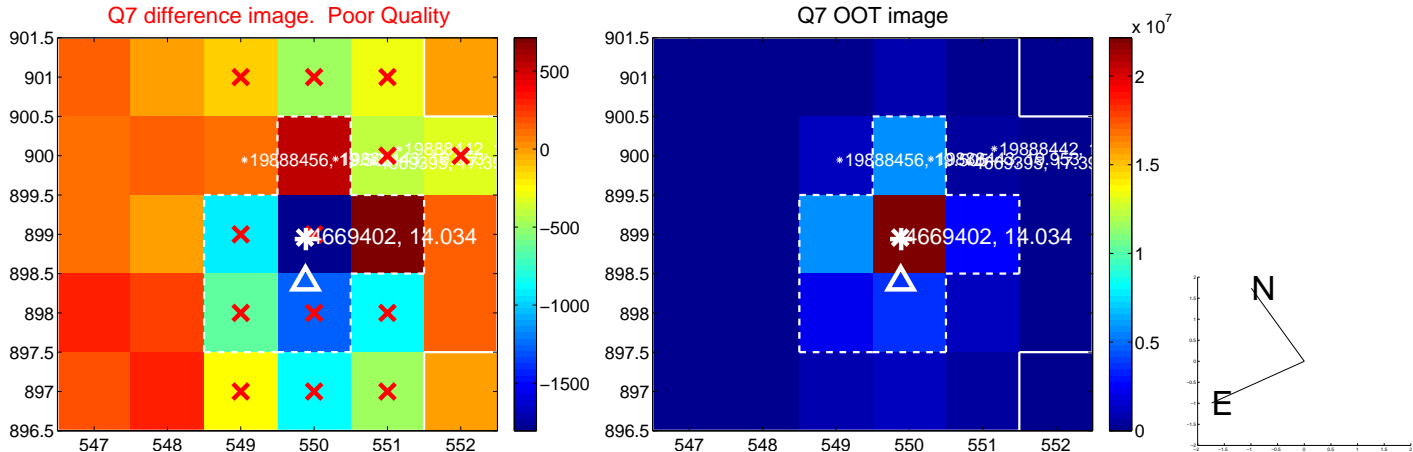
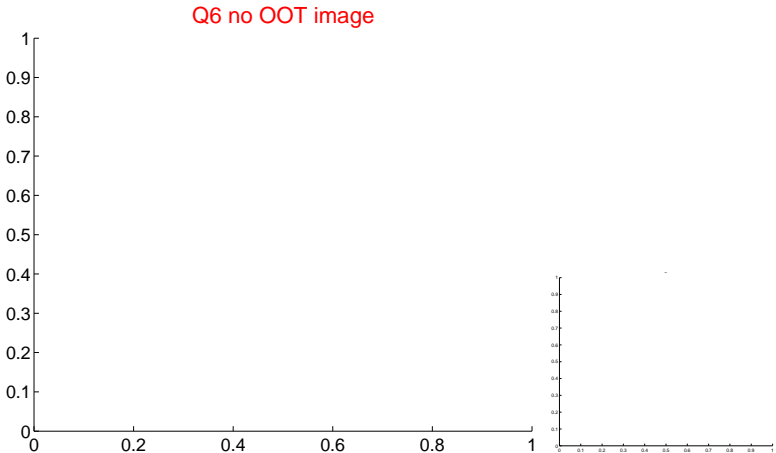
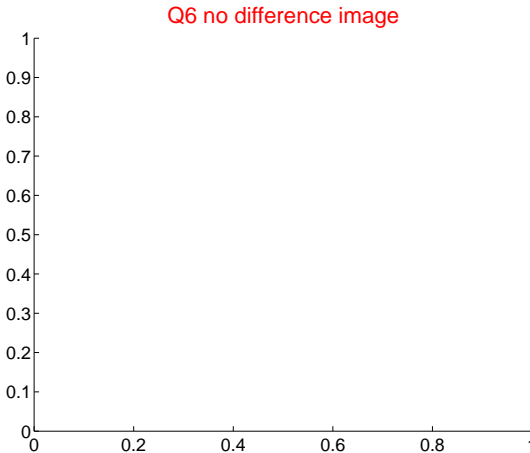
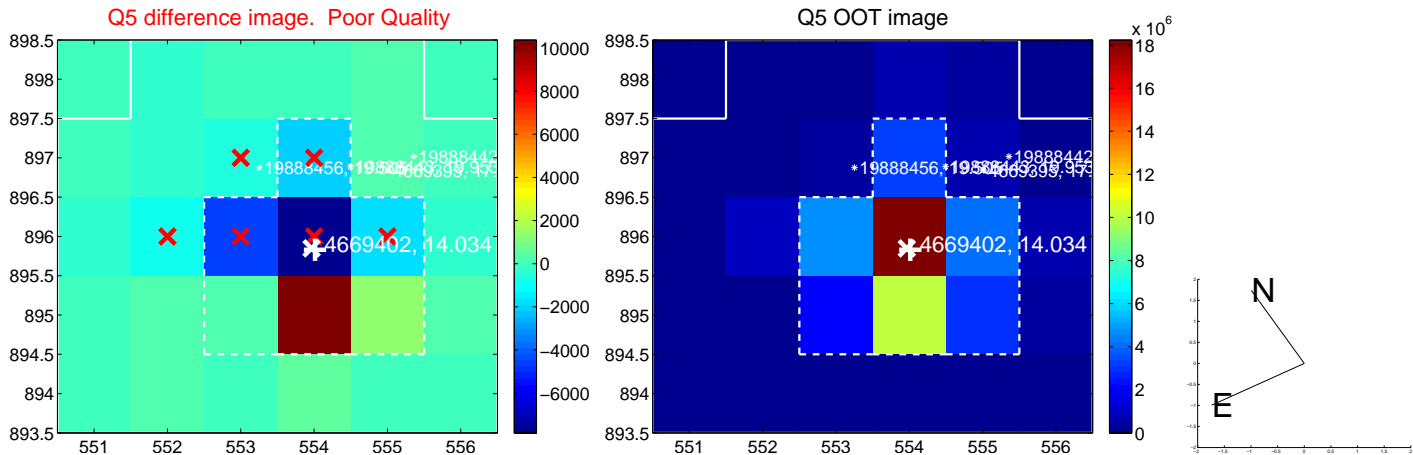


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

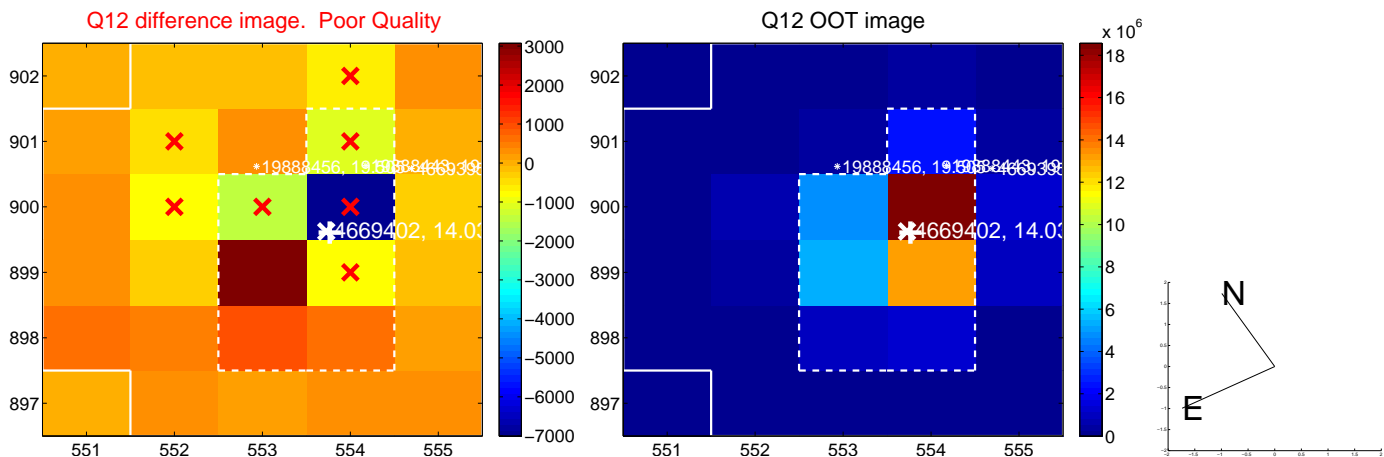
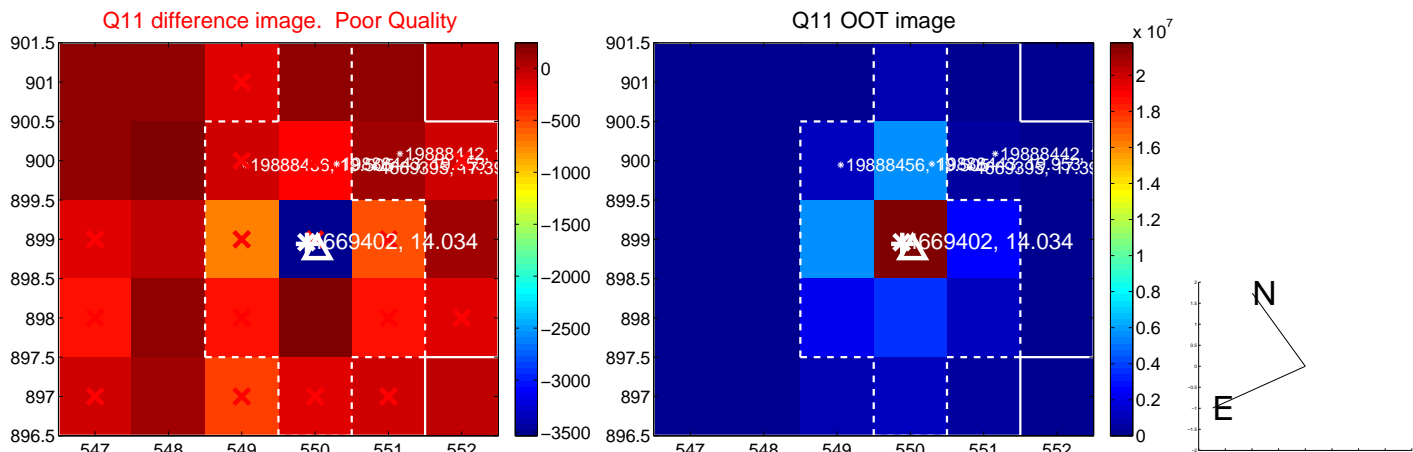
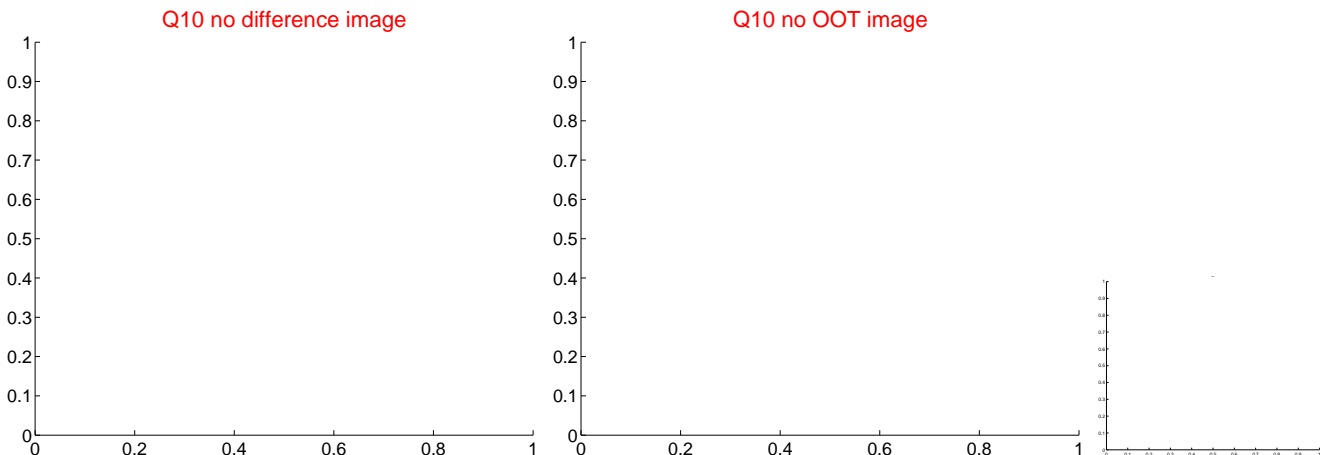
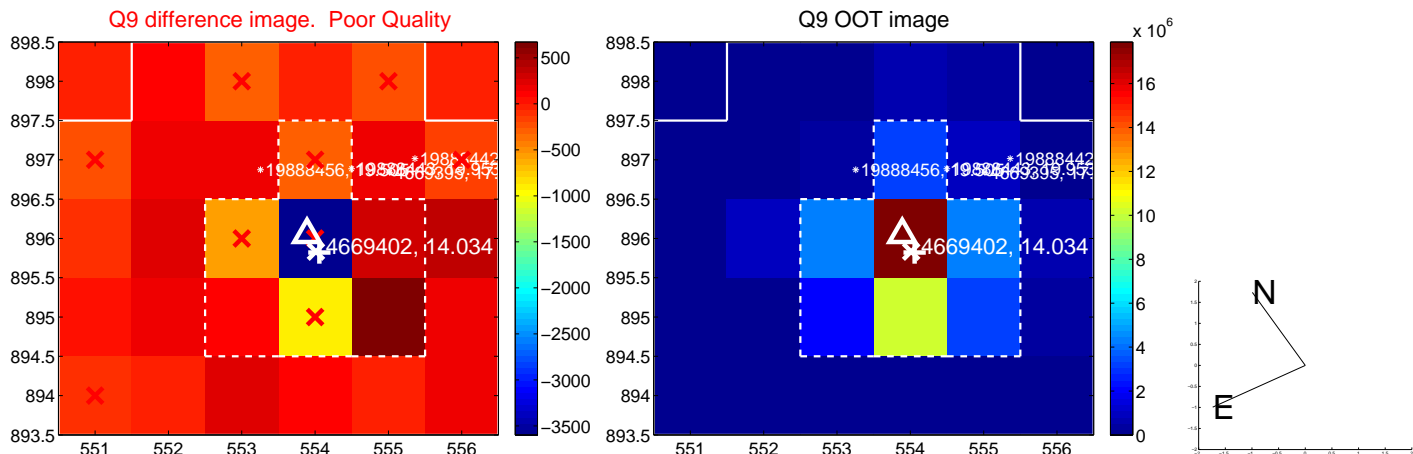
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



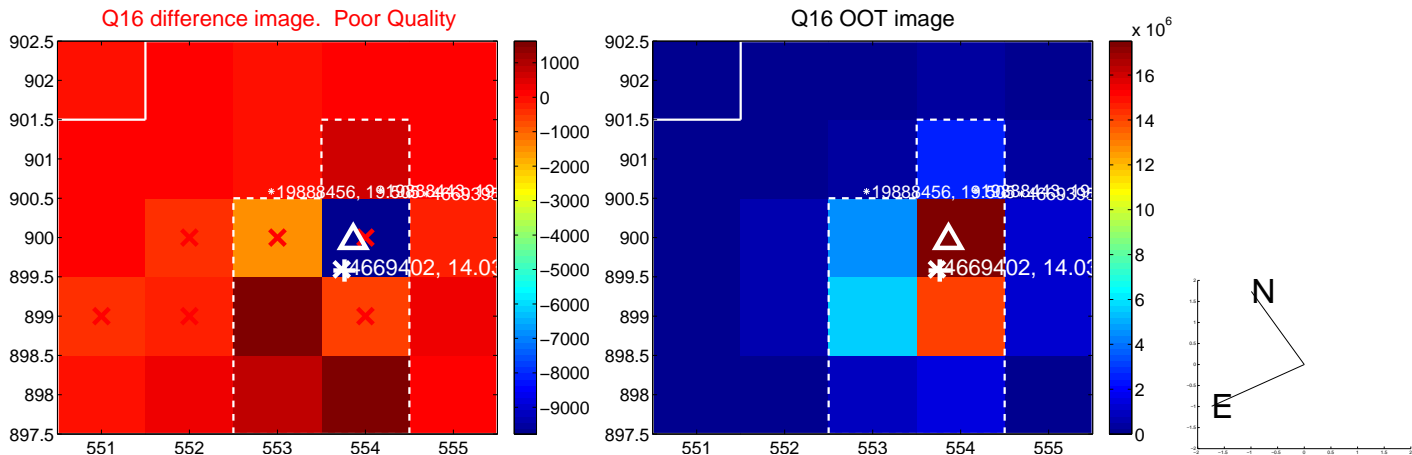
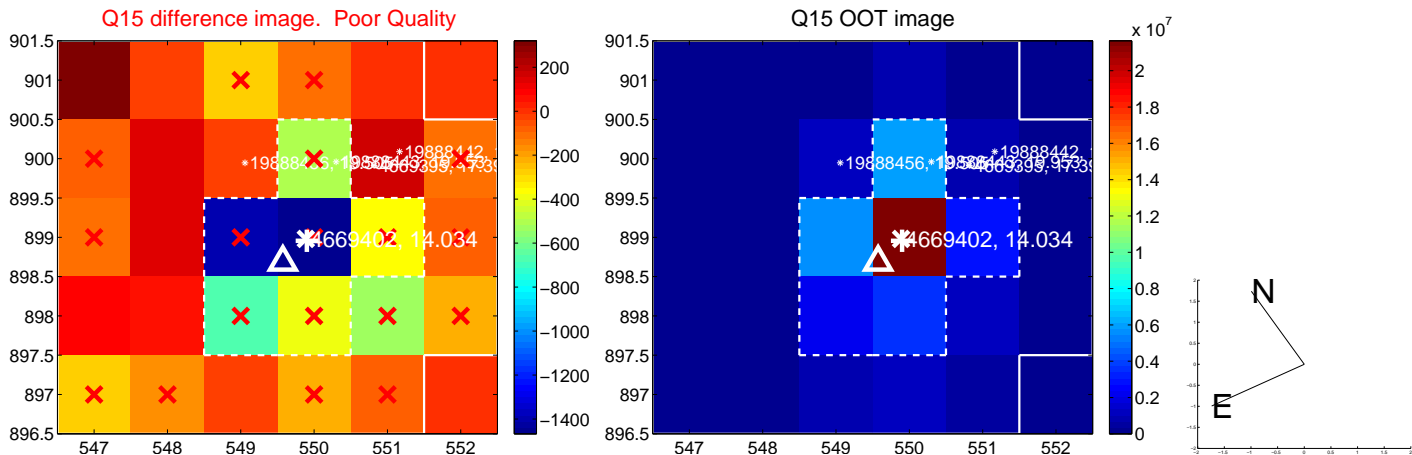
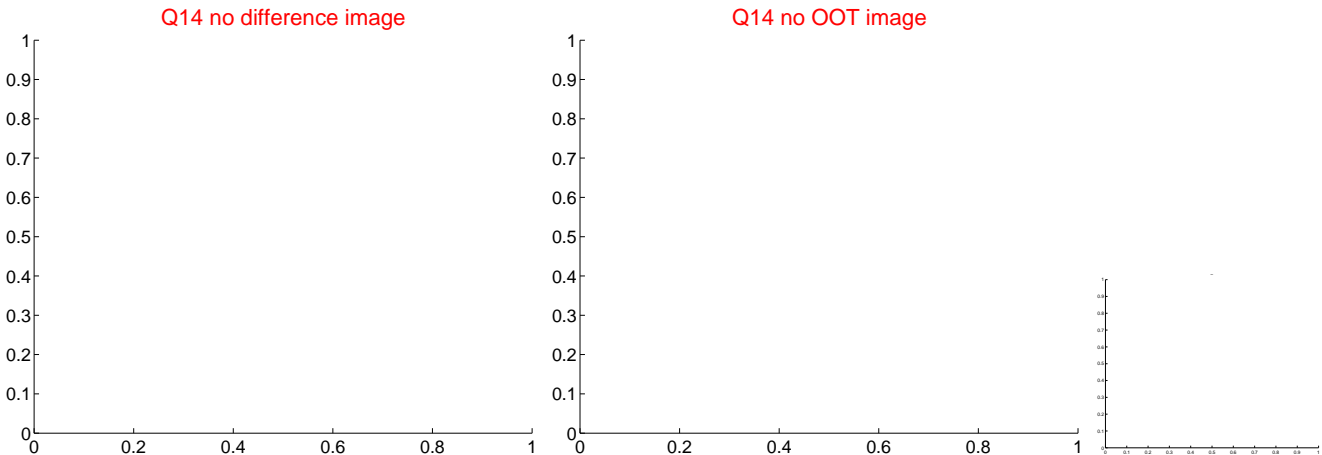
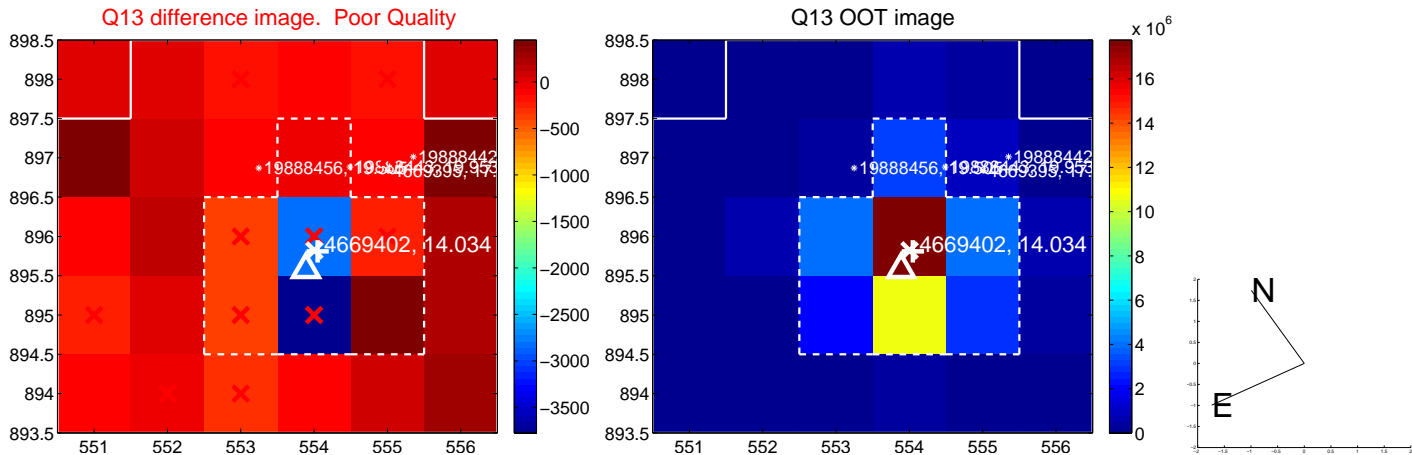
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

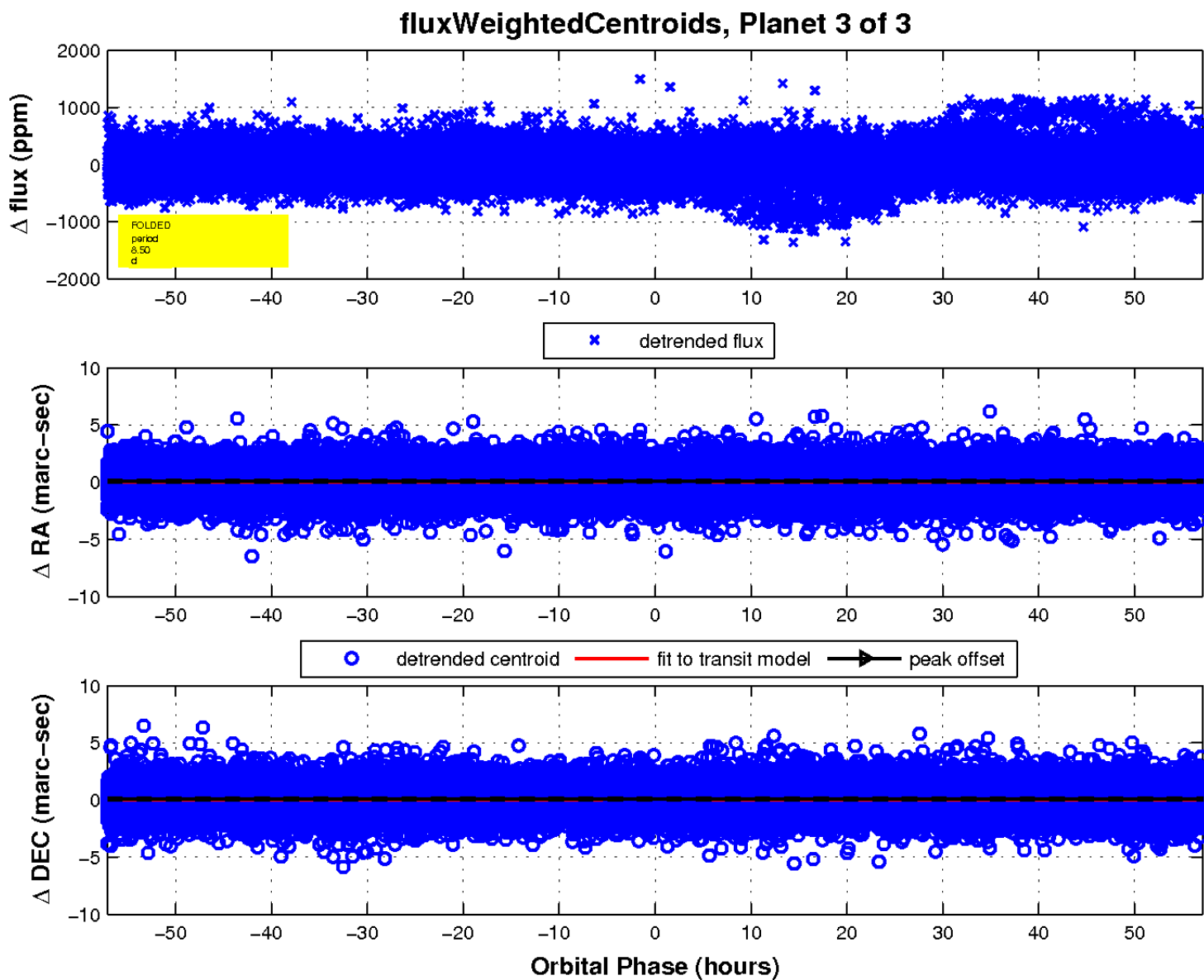
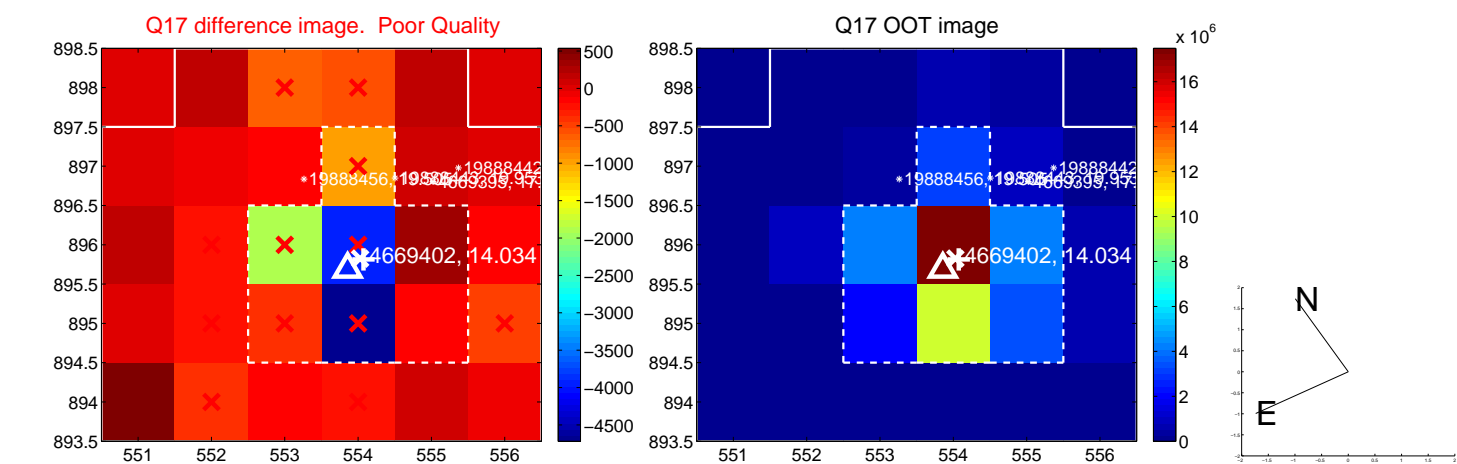


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





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



UKIRT Image

Declination

