

# KIC 008414907

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008414907-01	OBS	1134.01	100.303970	176.757206	5637.1	9.214	118.2	62.2	0.77	5055	10.99	2.27
008414907-02	OBS	1134.02	100.304838	155.932830	2725.6	10.213	69.3	31.9	0.77	5055	7.86	2.27
008414907-03	OBS	No	353.809235	378.358106	549.1	26.094	10.5	5.7	0.77	5055	1.79	0.42

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008414907-01	OBS	FP	0.00	1	0	1	1	INCONSISTENT_TRANS—CENT_RESOLVED_OFFSET—EPHEM_MATCH
008414907-02	OBS	FP	0.00	1	0	1	1	INCONSISTENT_TRANS—SAME_NTL_PERIOD—CENT_RESOLVED_OFFSET—EPHEM_MATCH
008414907-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST

**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.

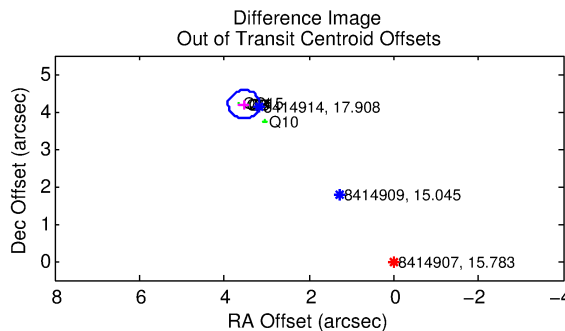
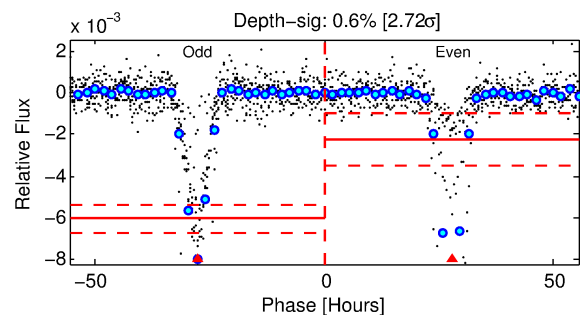
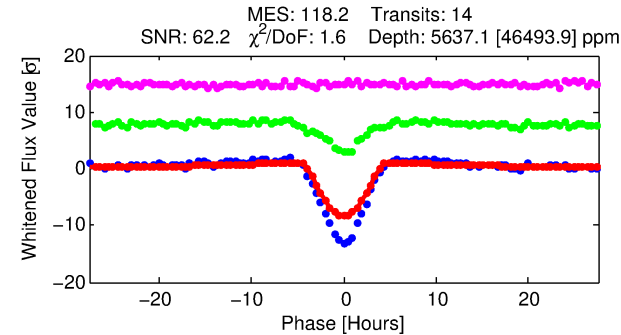
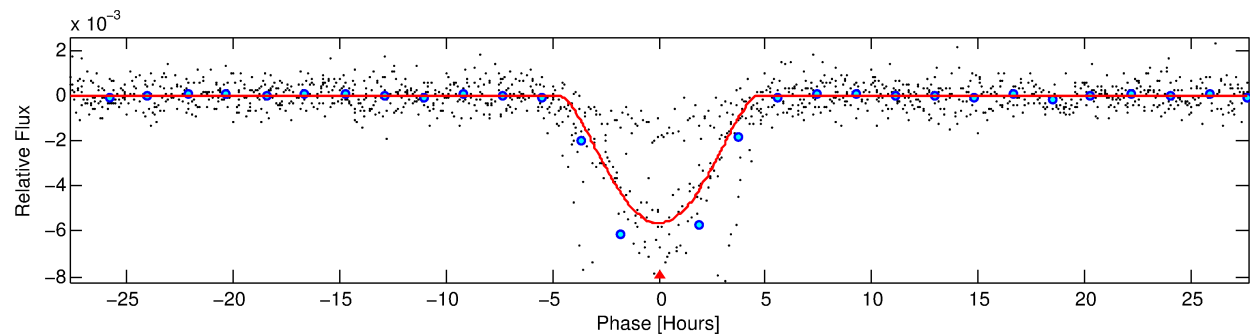
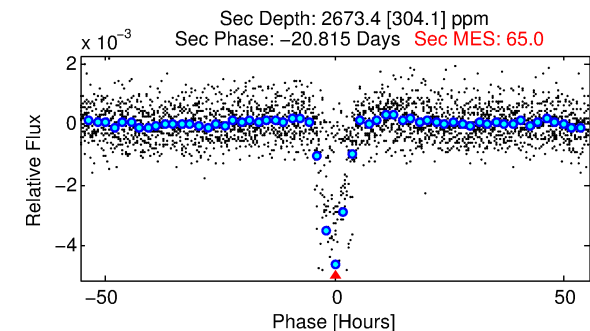
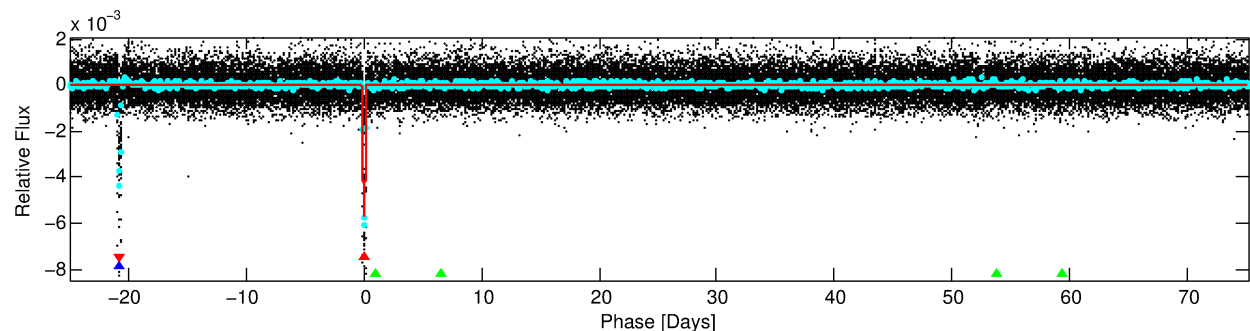
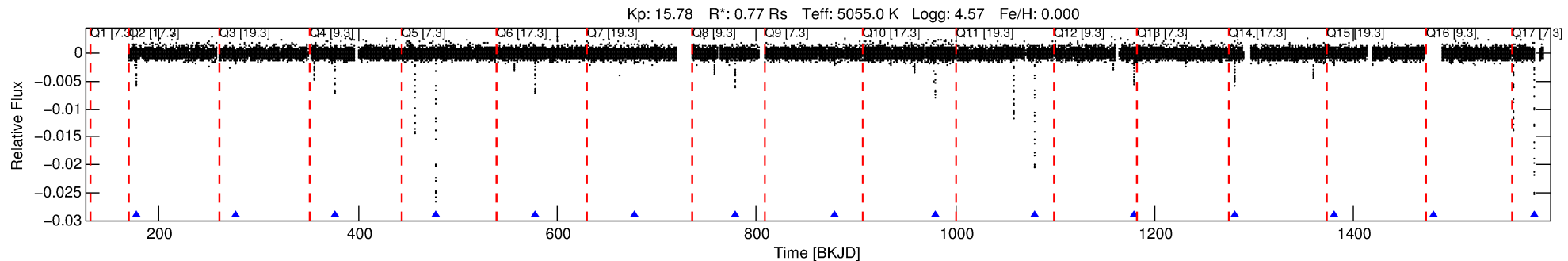
## Ephemeris Match Information For 008414907-01

TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ( $''$ )	$\Delta$ Row	$\Delta$ Col	$m_2$	$m_1$	$D_2/D_1$	Mechanism	Flag	$\sigma_P$	$\sigma_T$
008414907-01	8414907	5513.01	8414914	1:1	5.2	-1	-1	17.91	15.78	100.28	Direct-PRF	0	0.04	0.00

**Notes:**  $P_1:P_2$  is the period ratio. Dist is the distance in arcseconds.  $\Delta$ Row and  $\Delta$ Col are the number of pixels apart in row and column.  $m_2$  and  $m_1$  are the magnitudes of the parent and child.  $D_2/D_1$  is the parent's transit depth divided by the child's.  $\sigma_P$  and  $\sigma_T$  are the significance of the match in period and epoch. For a match to be considered significant  $\sigma_P < 5.0$  and  $\sigma_T < 5.0$ . Matches which have  $\sigma_P$  and  $\sigma_T$  very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

# DV One-Page Summary

KIC: 8414907 Candidate: 1 of 3 Period: 100.304 d  
KOI: K01134.01 Corr: 0.925



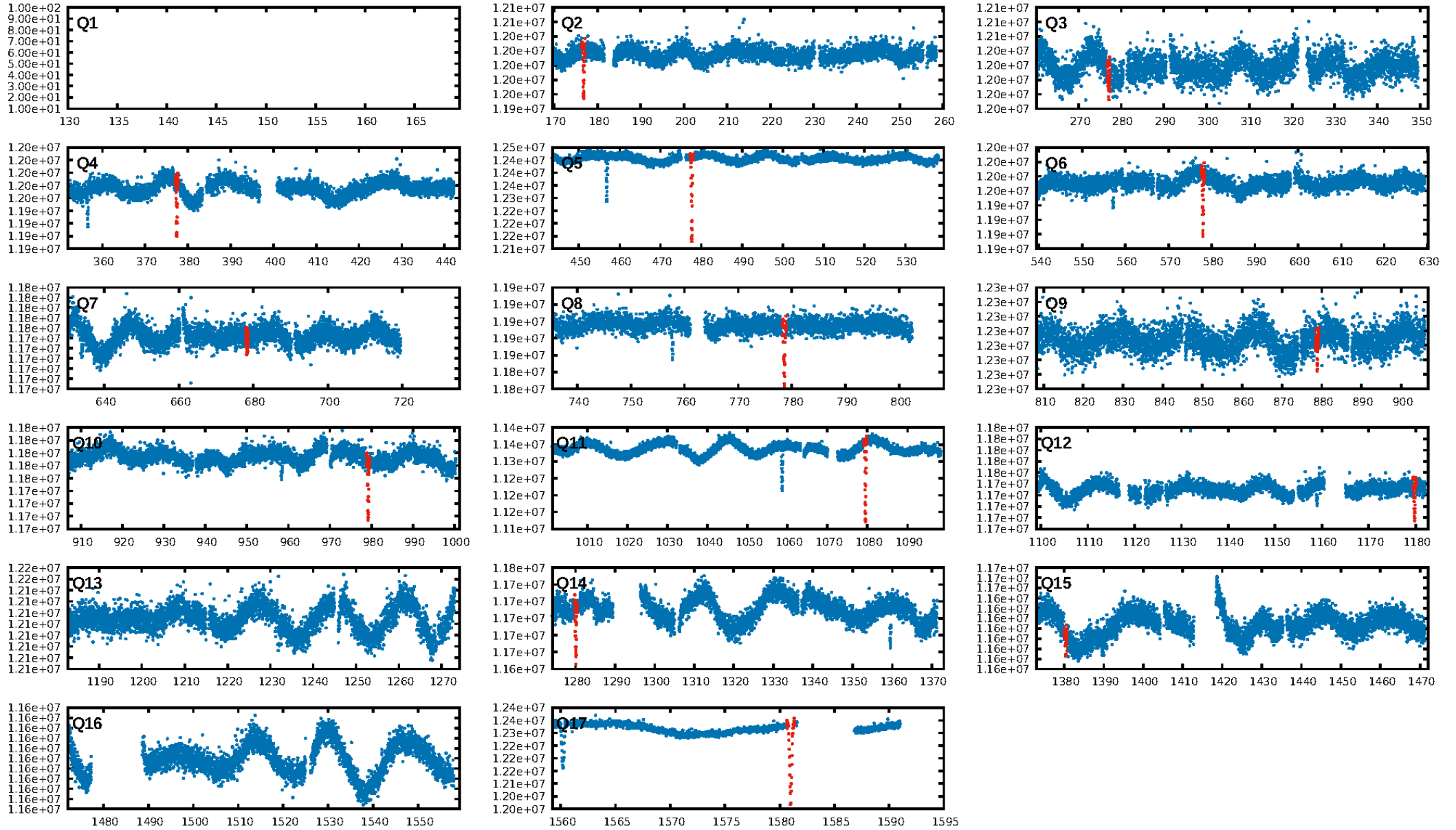
## DV Fit Results:

Period = 100.30397 [0.00041] d  
Epoch = 176.7572 [0.0031] BKJD  
Rp/R\* = 0.1305 [0.1092]  
a/R\* = 43.87 [6.07]  
b = 1.00 [0.54]  
Seff = 2.27 [0.38]  
Teq = 313 [13] K  
Rp = 11.00 [9.27] Re  
a = 0.3923 [0.0329] AU  
Ag = 1872.54 [3149.03] [0.59σ]  
Teffp = 3182 [1338] K [2.14σ]

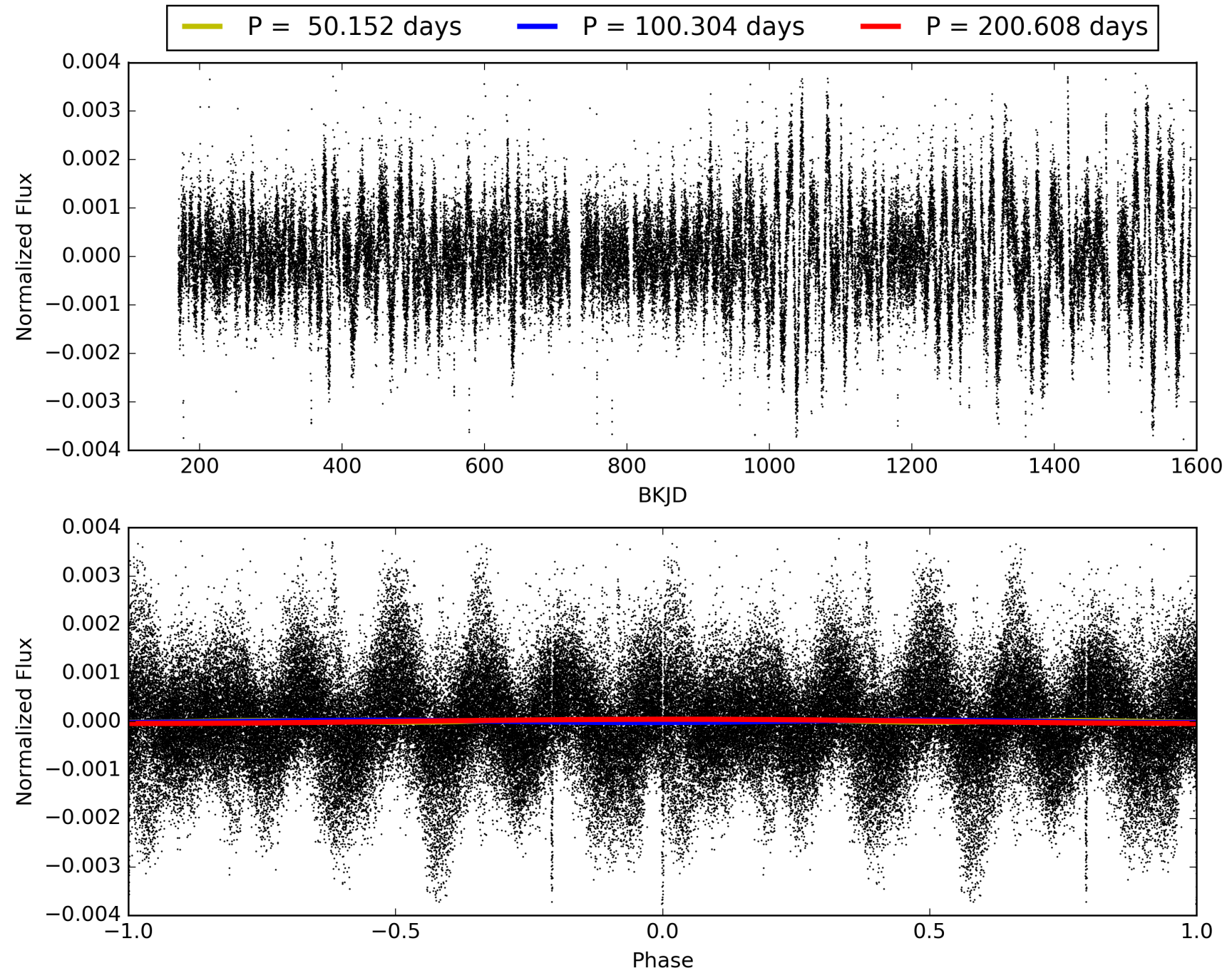
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.1% [0.00σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 72.7%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [13/13]  
GhostDiagnostic-chr: -0.7145  
Centroid-sig: 0.0%  
Centroid-so: 22.664 arcsec [200.66σ]  
OotOffset-rm: 5.484 arcsec [43.92σ]  
KicOffset-rm: 5.670 arcsec [45.09σ]  
OotOffset-st: 2/4/0/0 [6]  
KicOffset-st: 2/4/0/0 [6]  
DiffImageQuality-fgm: 1.00 [6/6]  
DiffImageOverlap-fno: 0.92 [11/12]

# TCE 008414907-01, PDC Light Curves

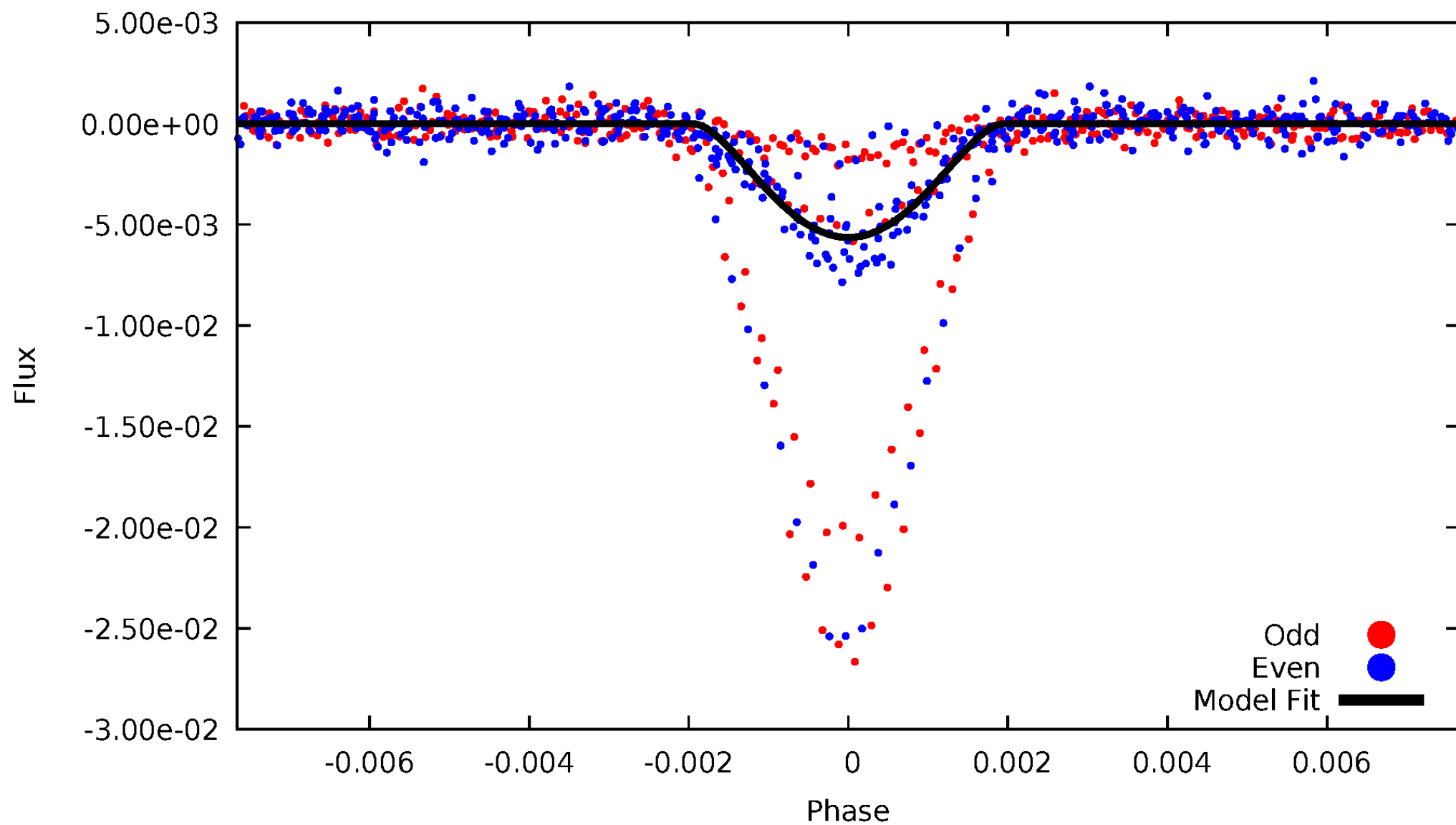


TCE 008414907-01



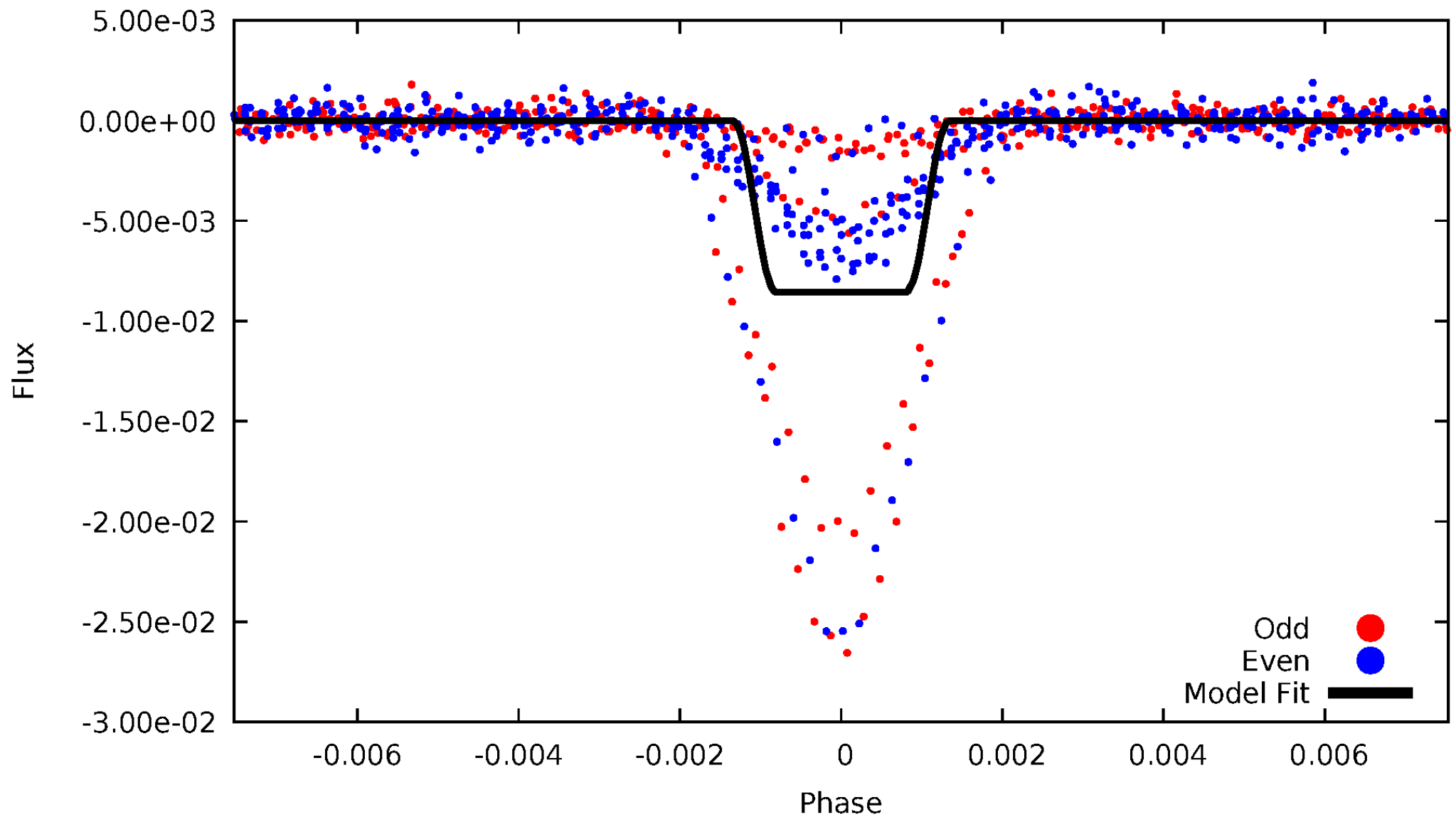
# DV Odd/Even

TCE 008414907-01



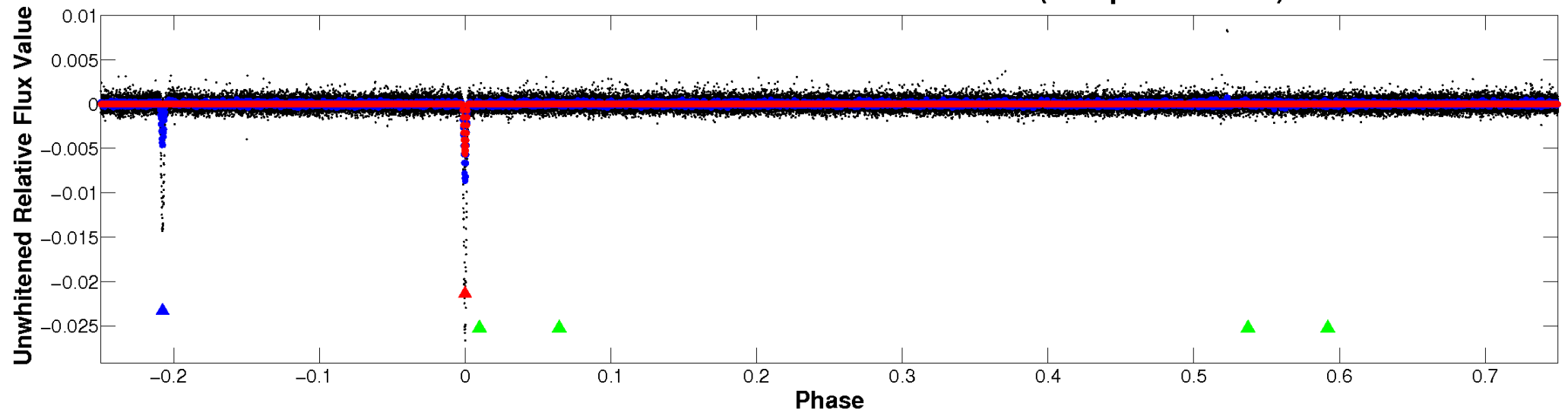
# ALT Odd/Even

TCE 008414907-01

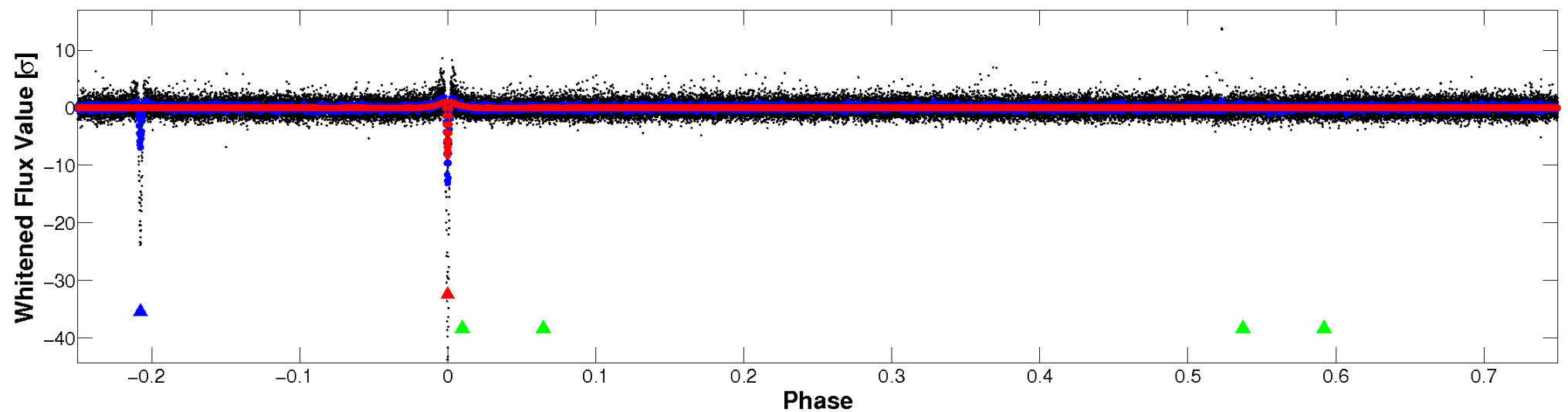


# Non-Whitened Vs. Whitened Light Curve

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



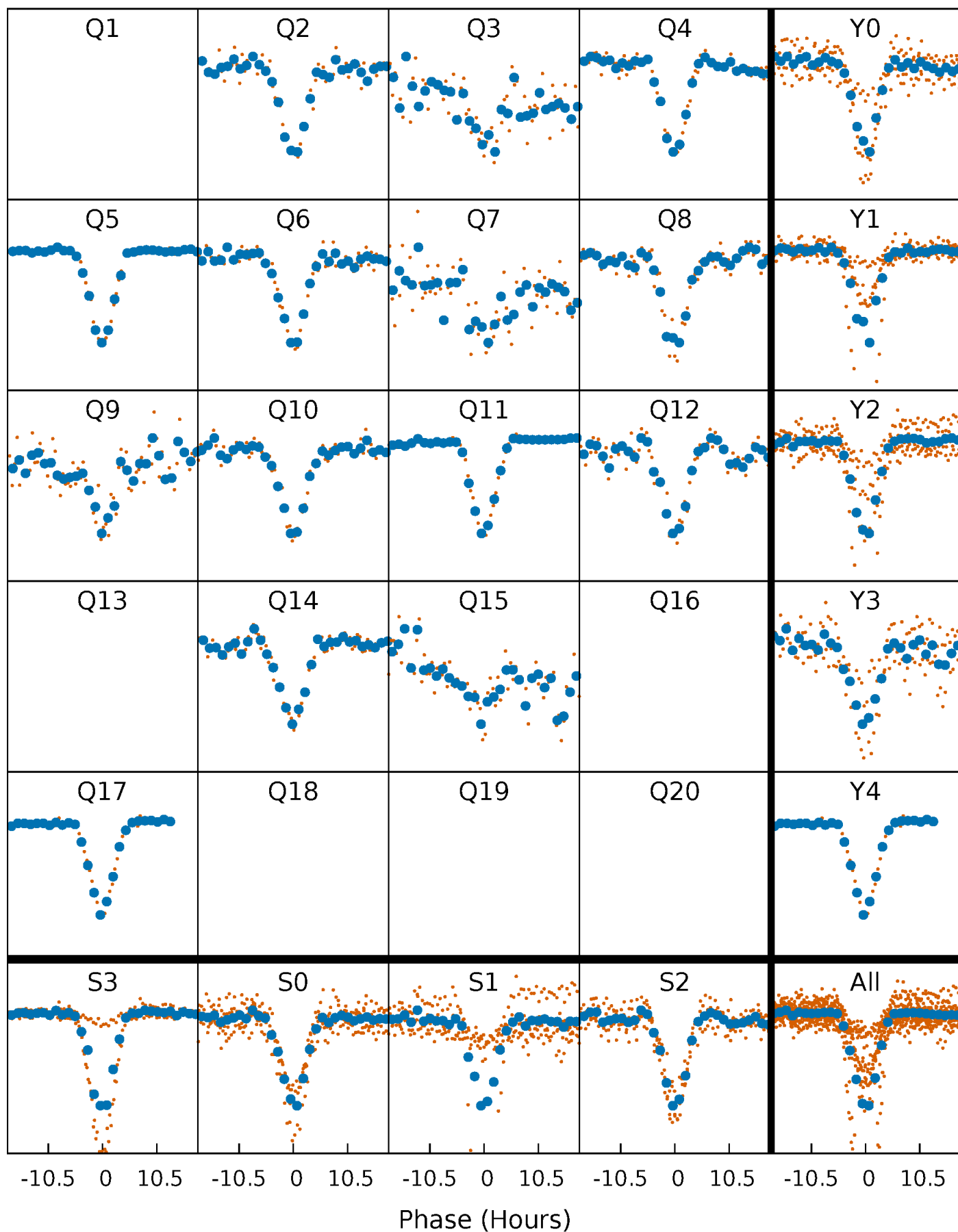
Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

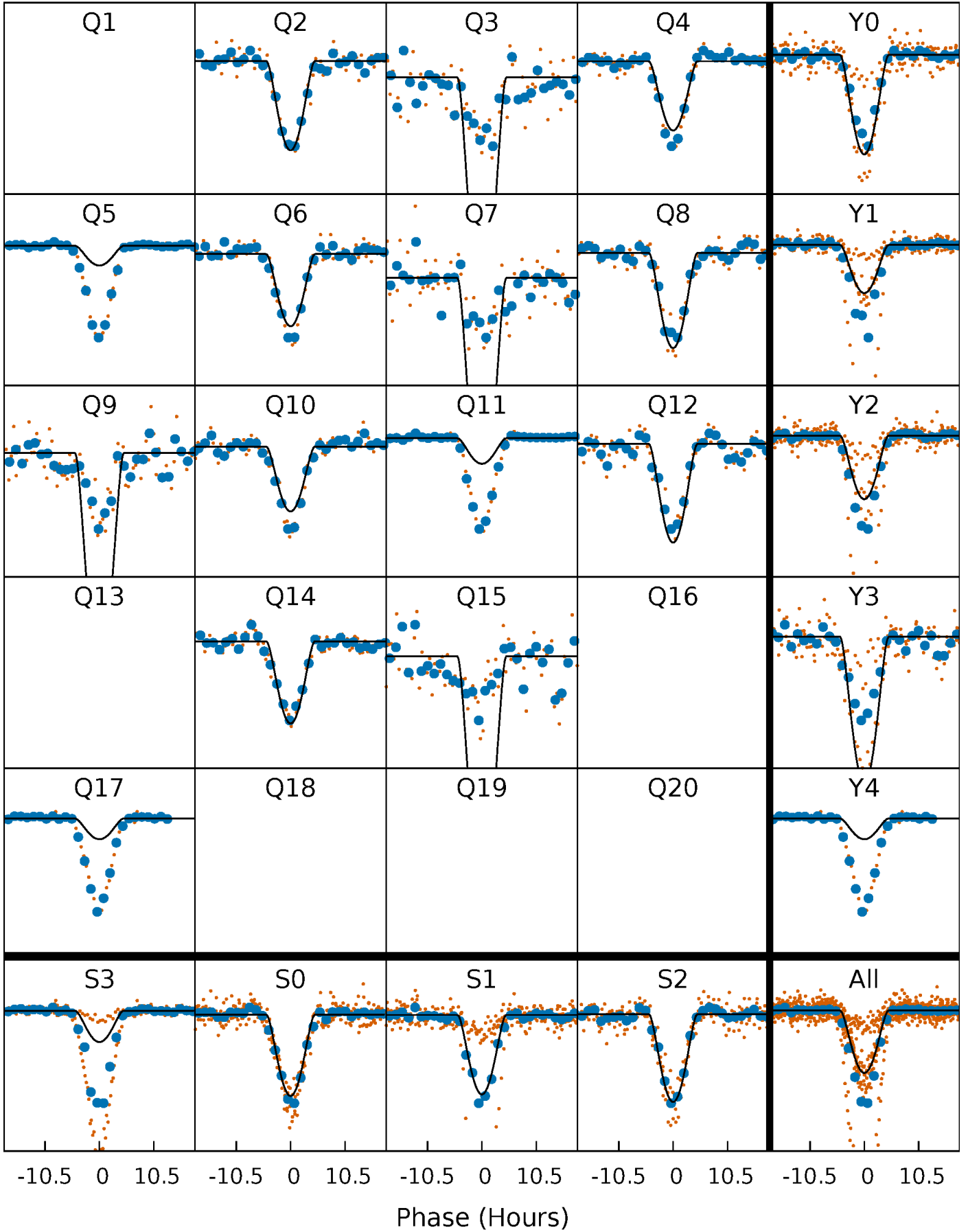
TCE 008414907-01 P=100.303970 Days  $T_0=176.757206$  (BKJD)





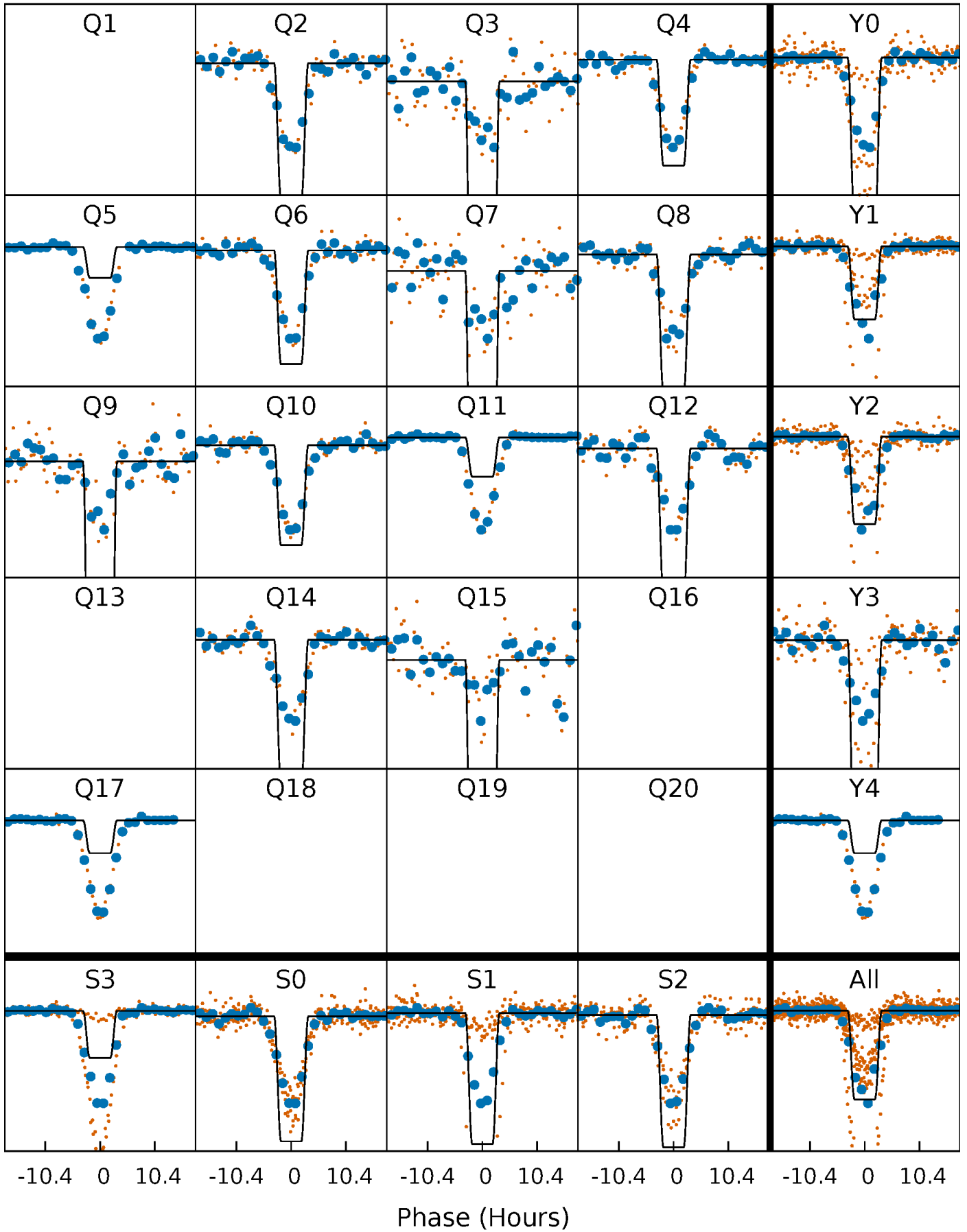
# DV Quarter-Phased Transit Curves

TCE 008414907-01     $P=100.303970$  Days     $T_0=176.757206$  (BKJD)



## Alt. Detrend Quarter-Phased Transit Curves

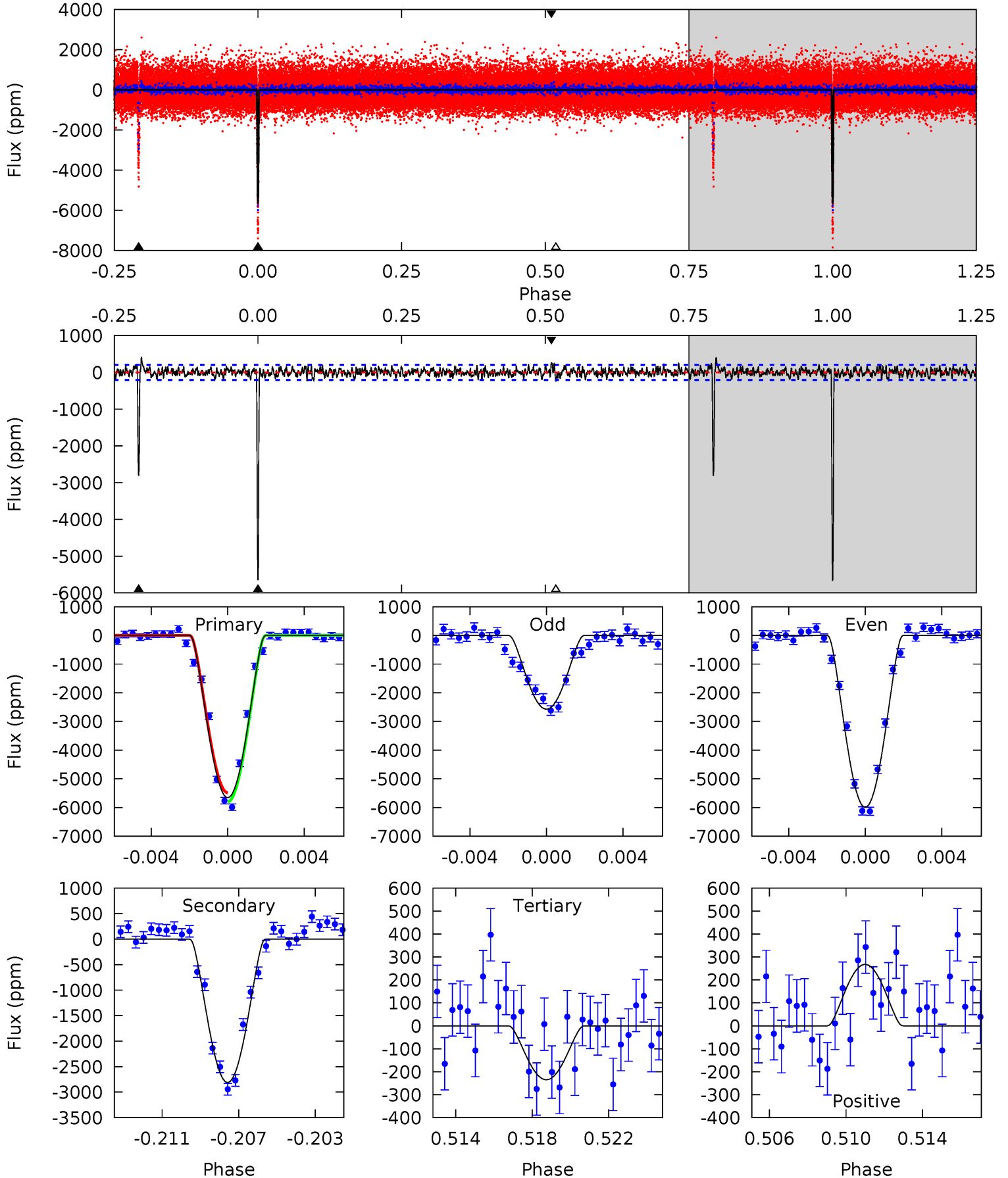
TCE 008414907-01 P=100.303411 Days  $T_0=176.759661$  (BKJD)



# DV Model-Shift Uniqueness Test

008414907-01, P = 100.303970 Days, E = 76.453236 Days

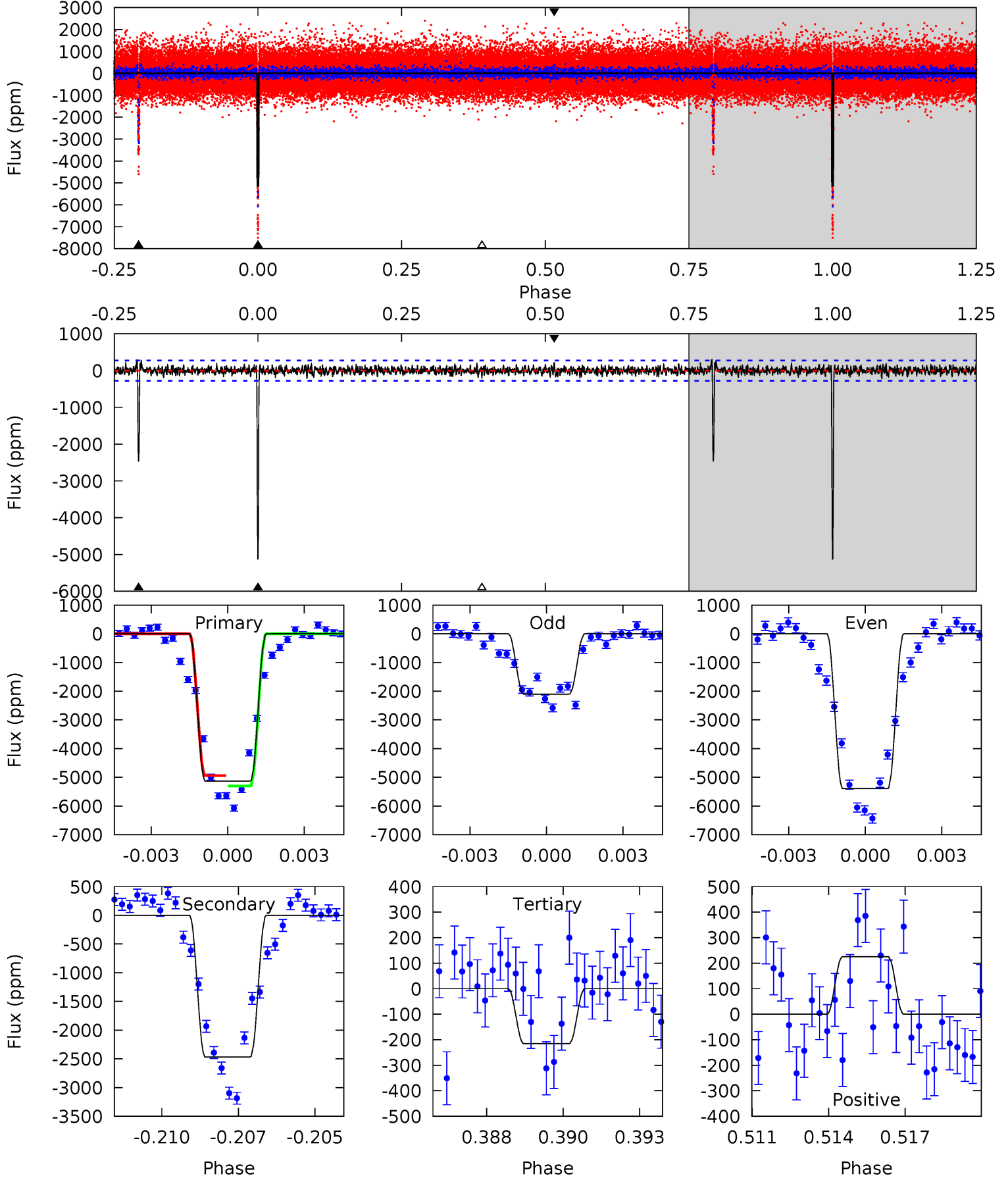
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
142.7	70.9	5.93	6.75	5.20	2.88	2.00	136.8	135.9	65.0	64.1	44.8	1.53	0.07	0



# Alt Model-Shift Uniqueness Test

008414907-01,  $P = 100.303411$  Days,  $E = 76.456250$  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
98.1	47.2	4.12	4.31	5.27	3.00	1.22	94.0	93.8	43.1	42.9	33.5	1.54	0.05	0



### Stellar Parameters For KIC 008414907

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5055^{+153}_{-138}$	$4.566^{+0.045}_{-0.060}$	$0.000^{+0.250}_{-0.300}$	$0.772^{+0.081}_{-0.066}$	$0.800^{+0.073}_{-0.066}$	$2.445^{+0.506}_{-0.544}$
	+3%/-3%	+1%/-1%	+inf%/-inf%	+10%/-9%	+9%/-8%	+21%/-22%
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 008414907-01 / KOI 1134.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-2809 \pm 40$	$12.23^{+8.62}_{-7.56}$	$439^{+17}_{-15}$	$3508^{+1457}_{-504}$	$1606^{+9544}_{-1042}$
Alt.	$-2467 \pm 52$	$10.46^{+7.63}_{-6.63}$	$440^{+17}_{-15}$	$3612^{+1704}_{-560}$	$1953^{+12537}_{-1305}$

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

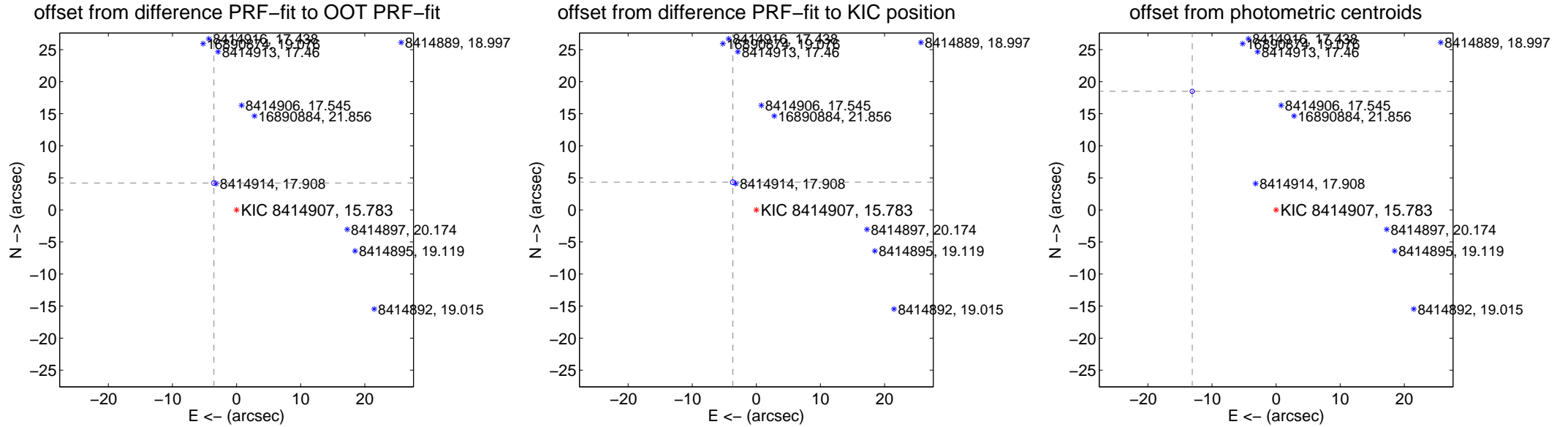
## DV Centroid Data

Supplemental centroid analysis for 008414907-01. Kepler magnitude: 15.78. Transit SNR 62.22

There are 6 quarters with good PRF difference image offsets

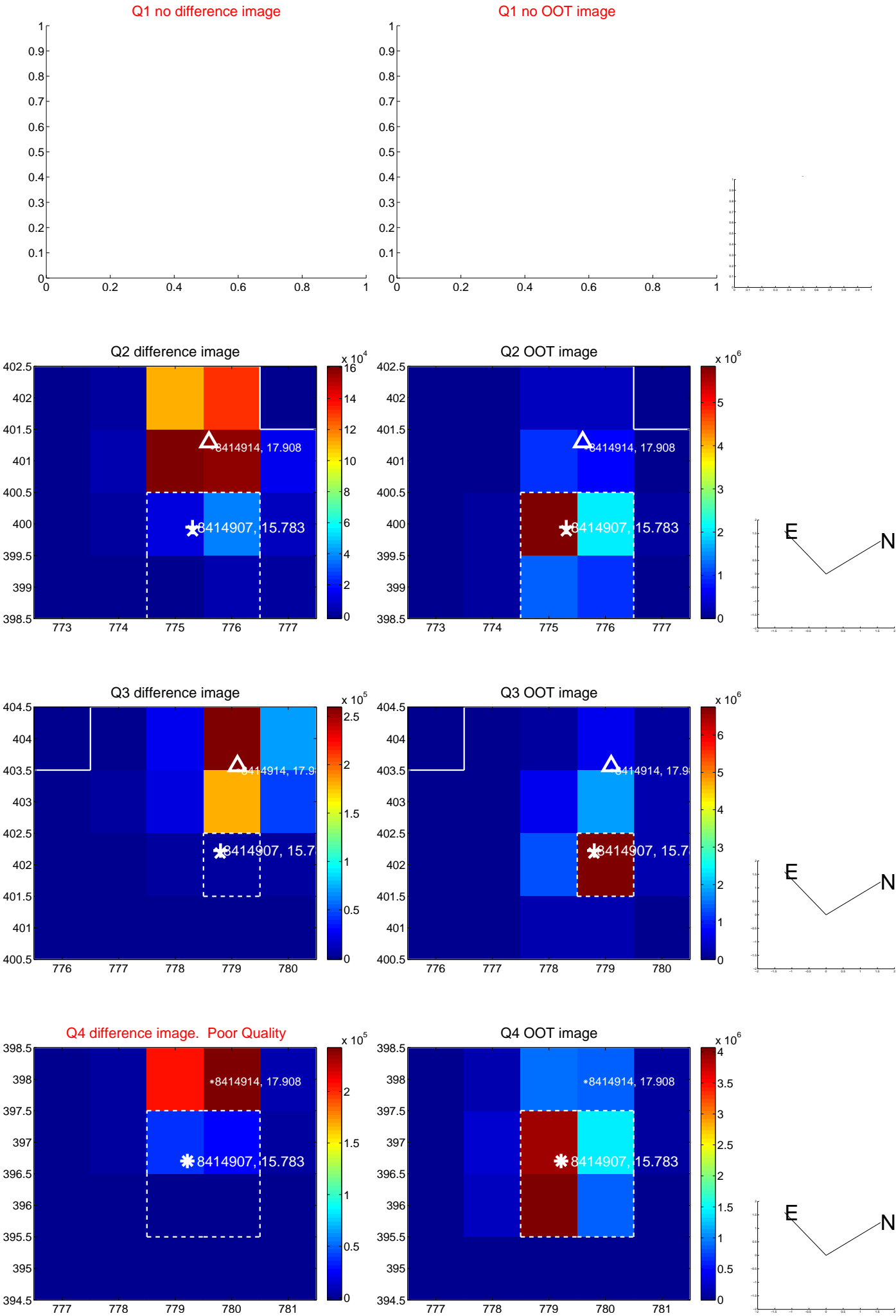
The direct PRF centroid is offset from the target star catalog position by about 0.24 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b>5.484 <math>\pm</math> 0.125</b>	<b>43.92</b>	3.534 $\pm$ 0.104	4.194 $\pm$ 0.099
PRF-fit source offset from KIC position	<b>5.670 <math>\pm</math> 0.126</b>	<b>45.09</b>	3.664 $\pm$ 0.104	4.328 $\pm$ 0.100
photometric centroid source offset	<b>22.66 <math>\pm</math> 0.11</b>	<b>200.66</b>	13.09 $\pm$ 0.10	18.50 $\pm$ 0.12



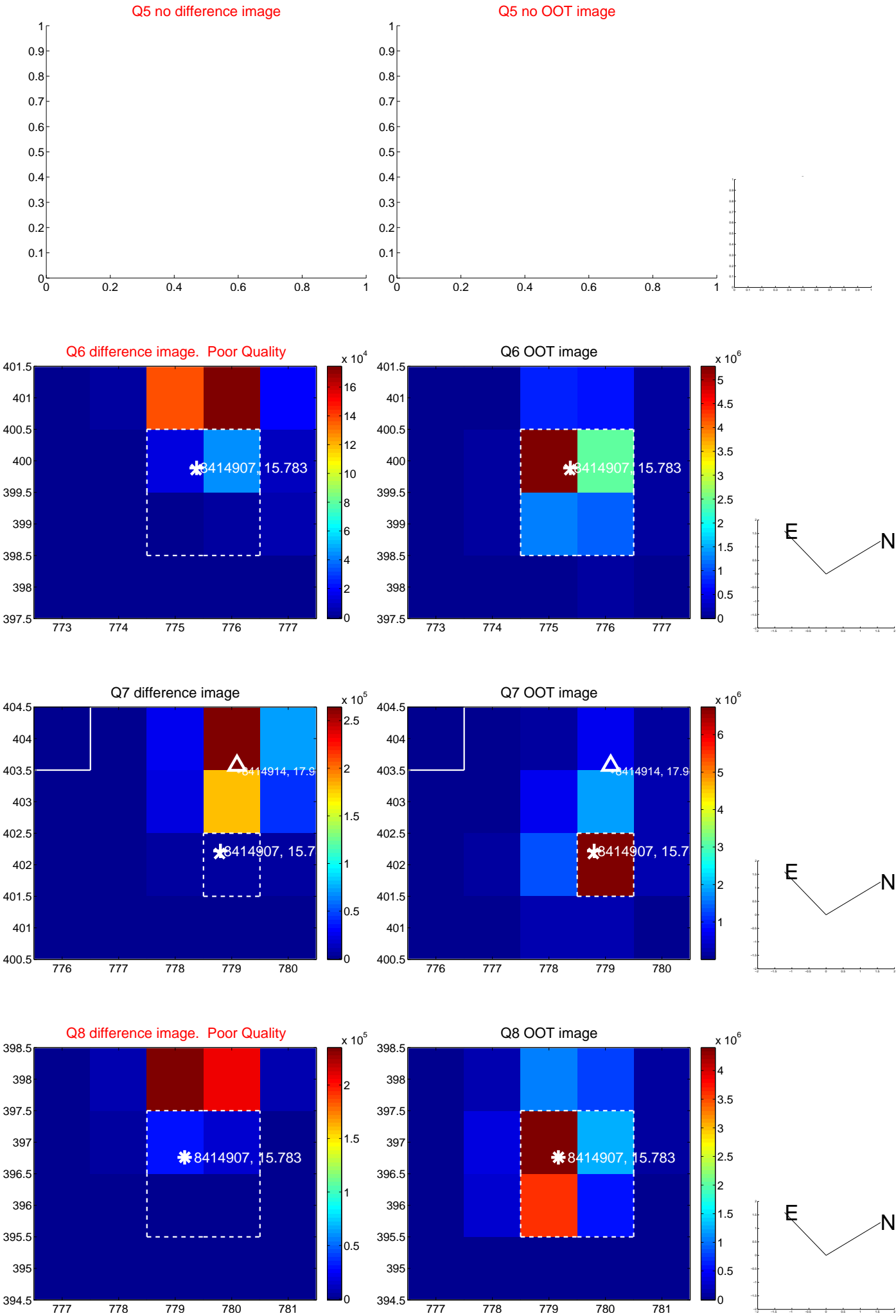
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

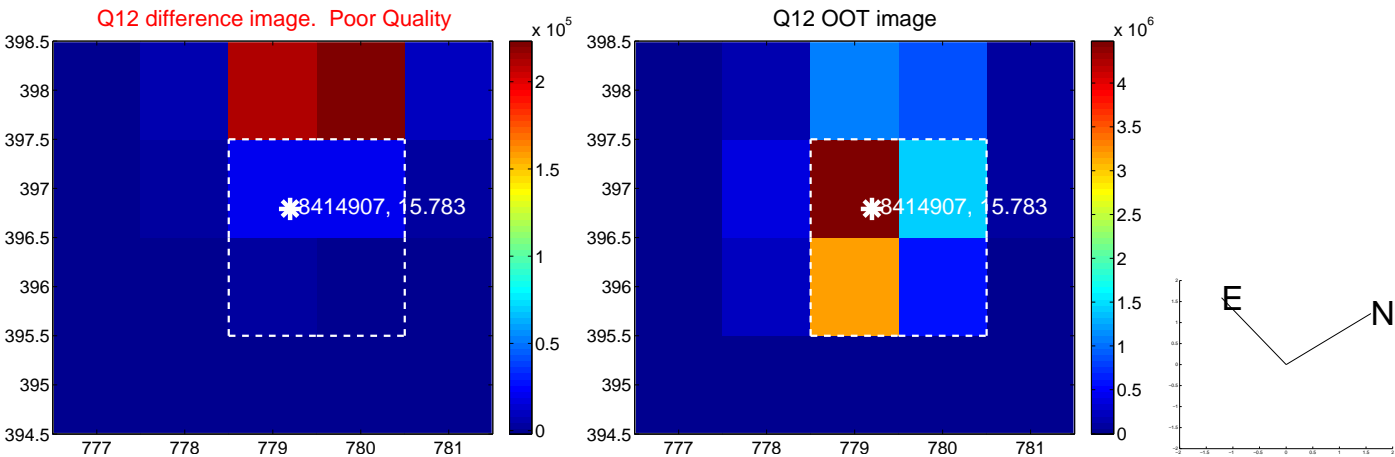
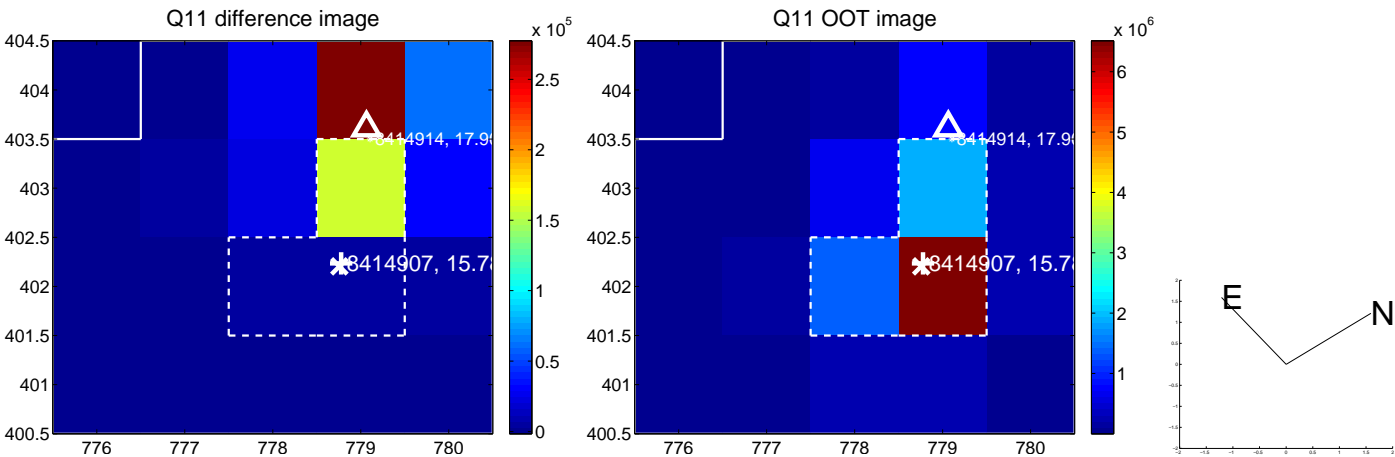
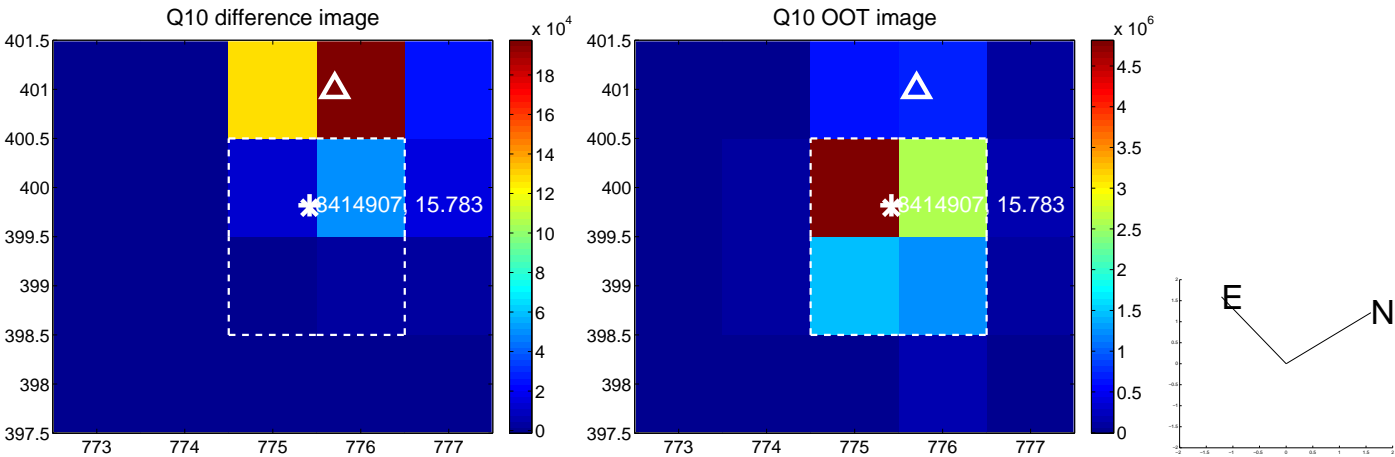
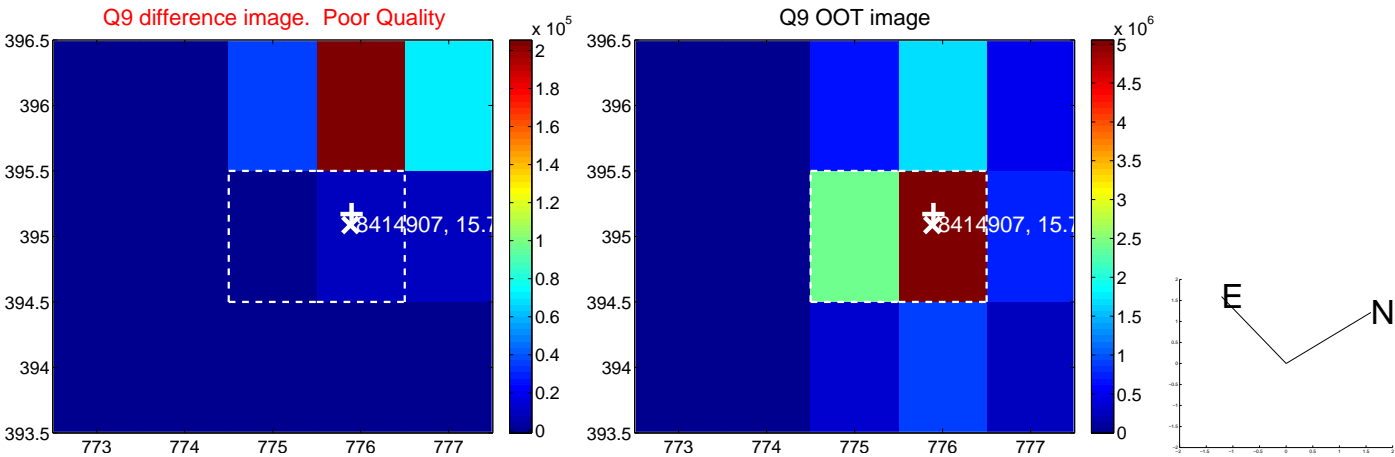




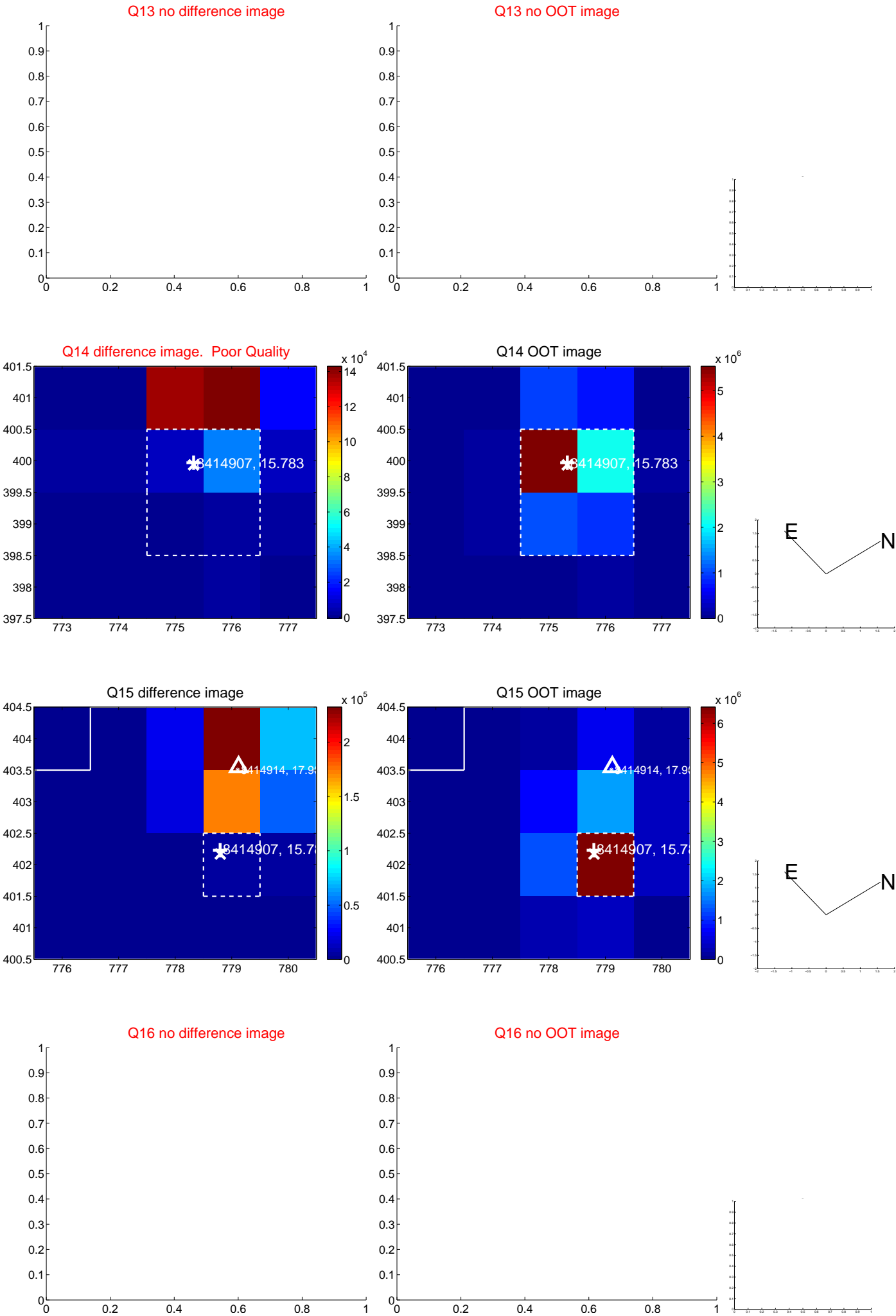
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



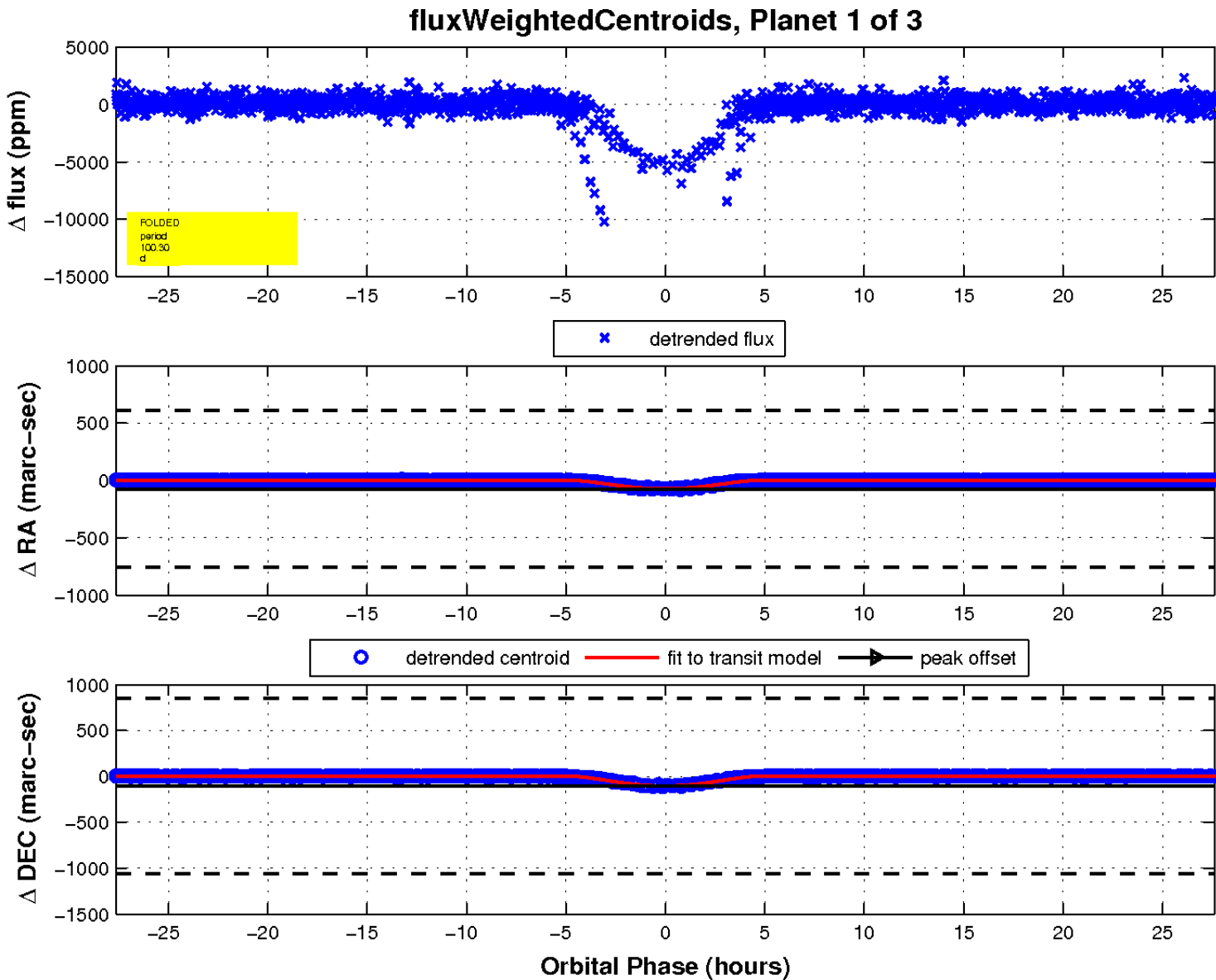
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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

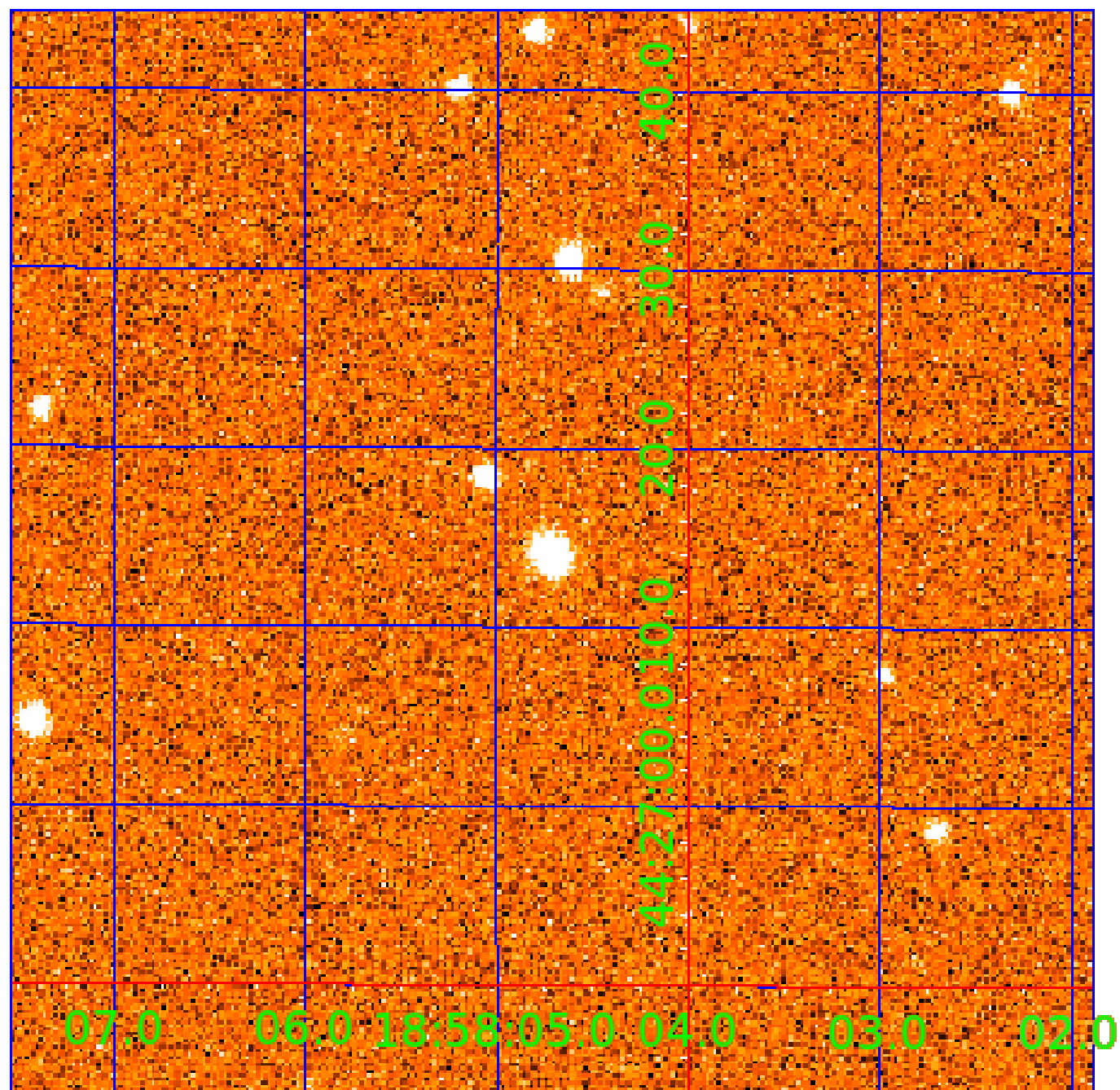
Q17 no difference image

Q17 no OOT image



UKIRT Image

Declination



# KIC 008414907

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008414907-01	OBS	1134.01	100.303970	176.757206	5637.1	9.214	118.2	62.2	0.77	5055	10.99	2.27
008414907-02	OBS	1134.02	100.304838	155.932830	2725.6	10.213	69.3	31.9	0.77	5055	7.86	2.27
008414907-03	OBS	No	353.809235	378.358106	549.1	26.094	10.5	5.7	0.77	5055	1.79	0.42

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008414907-01	OBS	FP	0.00	1	0	1	1	INCONSISTENT_TRANS—CENT_RESOLVED_OFFSET—EPHEM_MATCH
008414907-02	OBS	FP	0.00	1	0	1	1	INCONSISTENT_TRANS—SAME_NTL_PERIOD—CENT_RESOLVED_OFFSET—EPHEM_MATCH
008414907-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST

**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 008414907-02

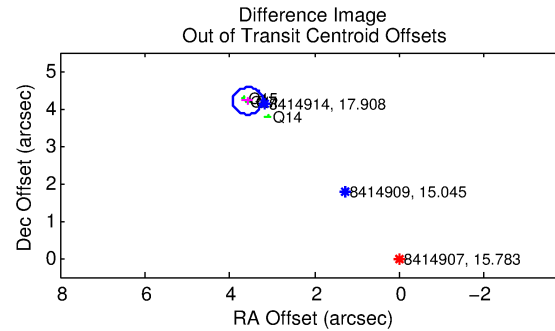
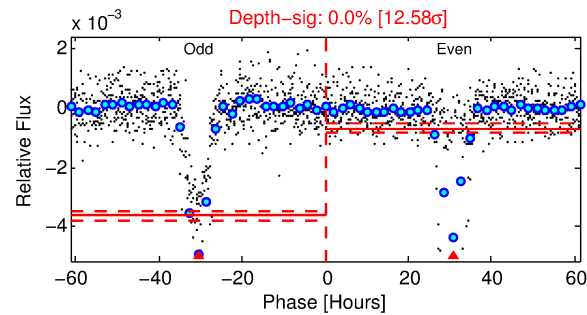
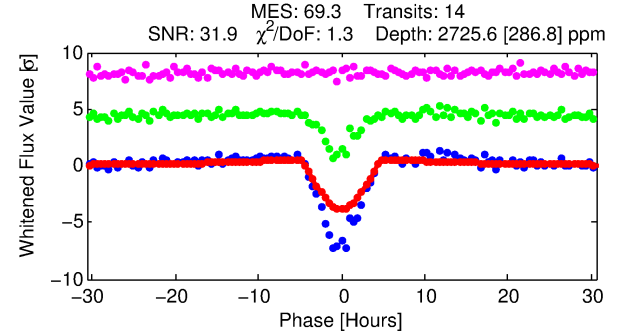
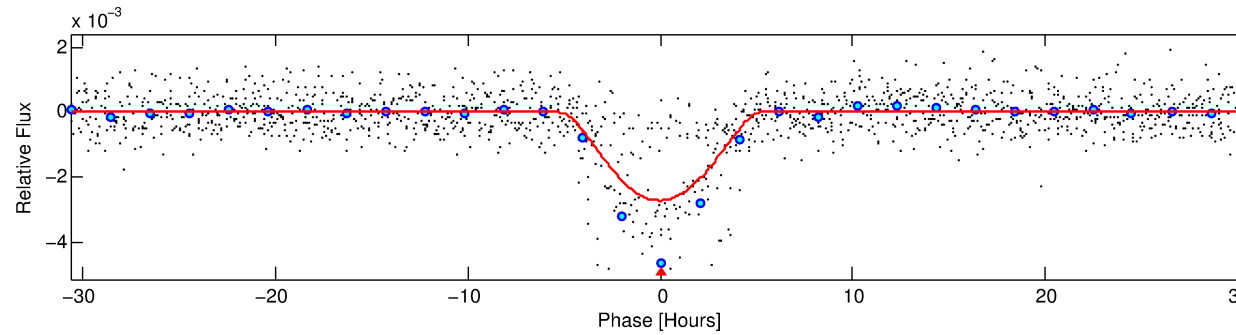
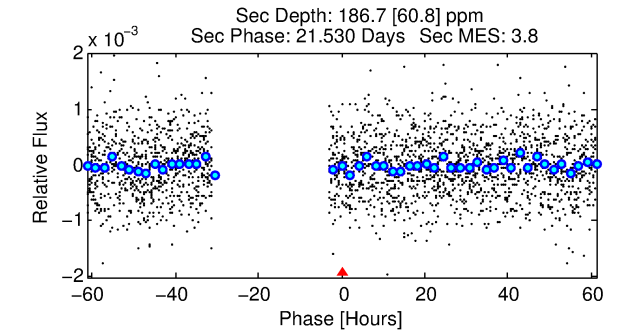
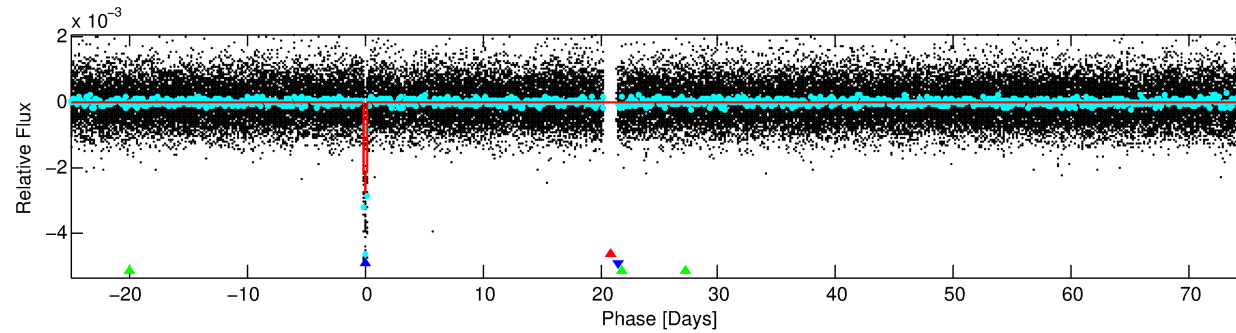
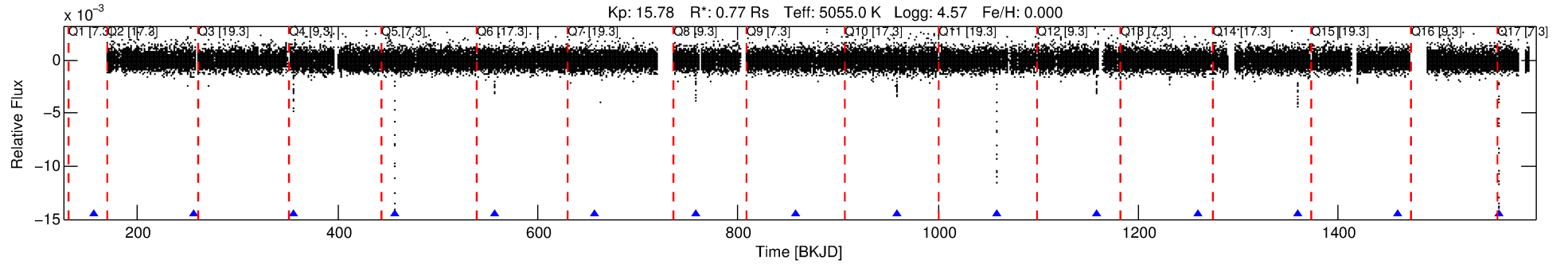
TCE (1)	KIC	Parent (2)	Parent KIC	P <sub>1</sub> :P <sub>2</sub>	Dist (″)	$\Delta$ Row	$\Delta$ Col	m <sub>2</sub>	m <sub>1</sub>	D <sub>2</sub> /D <sub>1</sub>	Mechanism	Flag	$\sigma_P$	$\sigma_T$
008414907-02	8414907	008414914-02	8414914	1:1	5.2	-1	-1	17.91	15.78	91.74	Direct-PRF	0	0.21	0.14

**Notes:** P<sub>1</sub>:P<sub>2</sub> is the period ratio. Dist is the distance in arcseconds.  $\Delta$ Row and  $\Delta$ Col are the number of pixels apart in row and column. m<sub>2</sub> and m<sub>1</sub> are the magnitudes of the parent and child. D<sub>2</sub>/D<sub>1</sub> is the parent's transit depth divided by the child's.  $\sigma_P$  and  $\sigma_T$  are the significance of the match in period and epoch. For a match to be considered significant  $\sigma_P < 5.0$  and  $\sigma_T < 5.0$ . Matches which have  $\sigma_P$  and  $\sigma_T$  very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

# DV One-Page Summary

KIC: 8414907 Candidate: 2 of 3 Period: 100.305 d

KOI: K01134 Corr: No Ephemeris Match



## DV Fit Results:

Period = 100.30484 [0.00092] d  
Epoch = 155.9328 [0.0077] BKJD  
Rp/R\* = 0.0933 [0.1246]  
a/R\* = 33.20 [8.69]  
b = 1.00 [0.17]  
Seff = 2.27 [0.38]  
Teq = 313 [13] K  
Rp = 7.86 [10.52] Re  
a = 0.3923 [0.0329] AU  
Ag = 256.01 [689.27] [0.37σ]  
Teffp = 1935 [1302] K [1.25σ]

## DV Diagnostic Results:

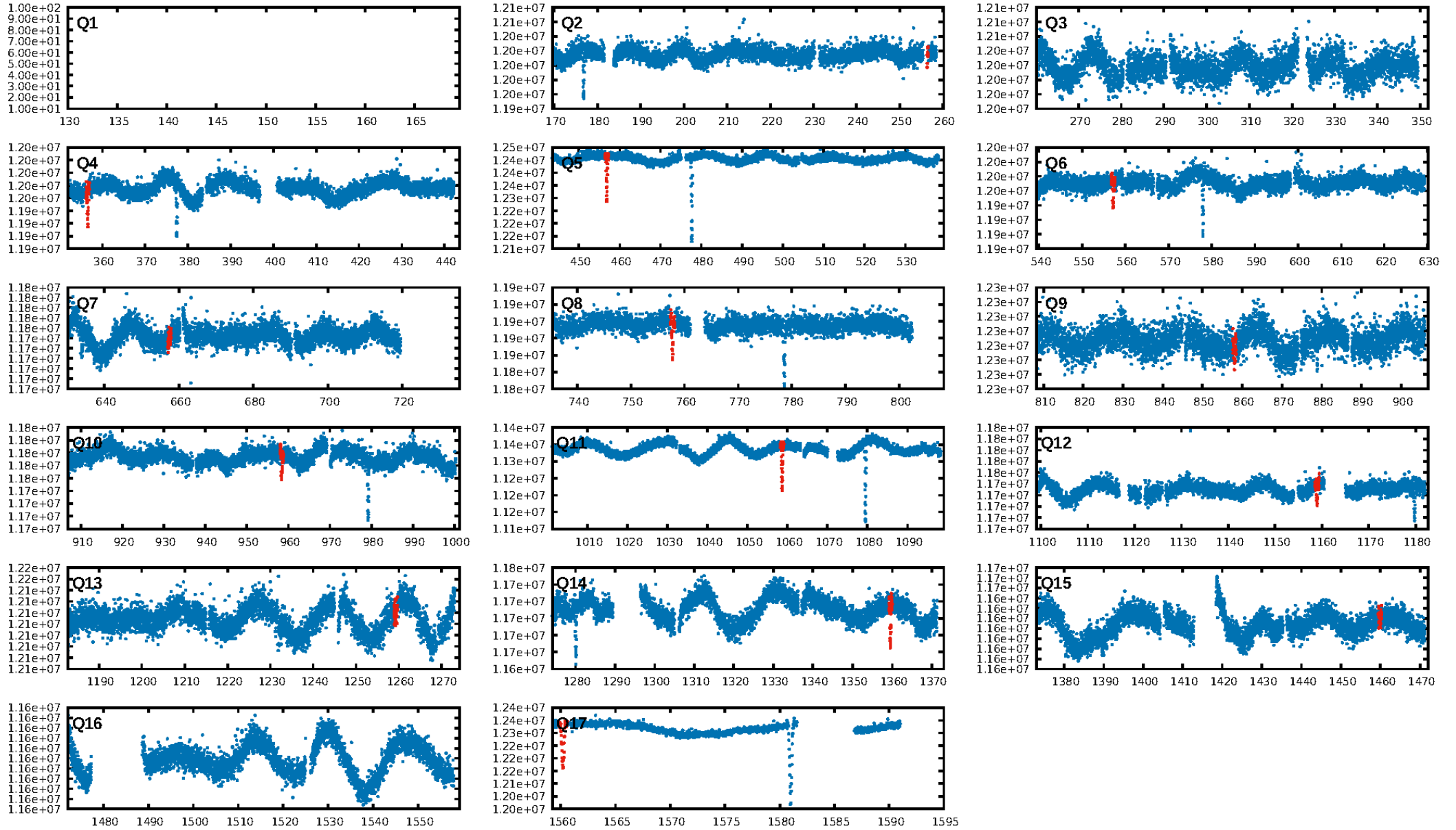
ShortPeriod-sig: 0.1% [0.00σ]  
LongPeriod-sig: 100.0% [217.12σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 84.4%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [13/13]  
GhostDiagnostic-chr: -0.481  
Centroid-sig: 0.0%  
Centroid-so: 22.006 arcsec [95.19σ]  
OotOffset-rm: 5.521 arcsec [46.02σ]  
KicOffset-rm: 5.698 arcsec [45.91σ]  
OotOffset-st: 1/3/0/0 [4]  
KicOffset-st: 1/3/0/0 [4]  
DiffImageQuality-fgm: 1.00 [4/4]  
DiffImageOverlap-fno: 1.00 [12/12]

Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 06:48:08 Z

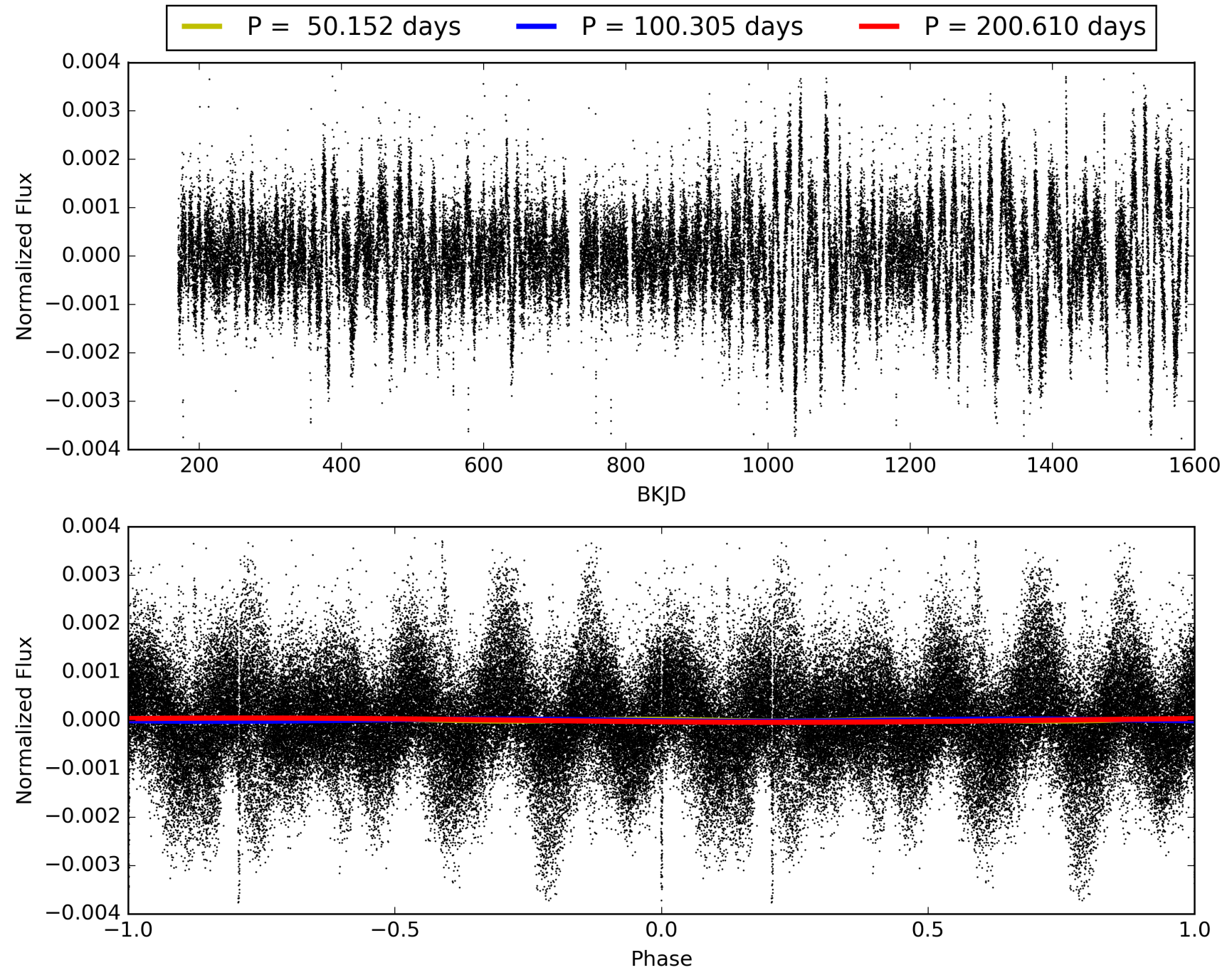
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 008414907-02, PDC Light Curves

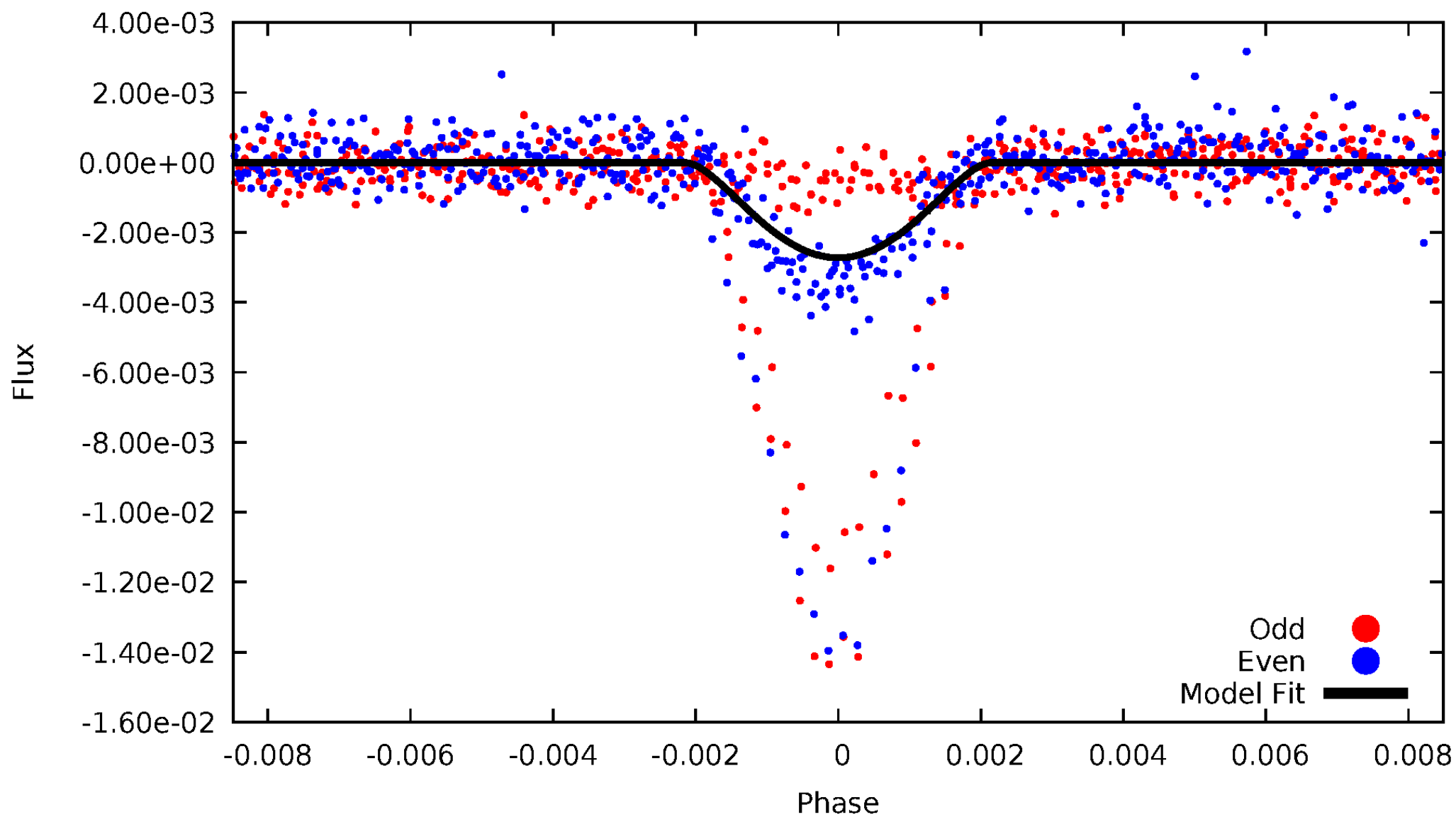


# TCE 008414907-02



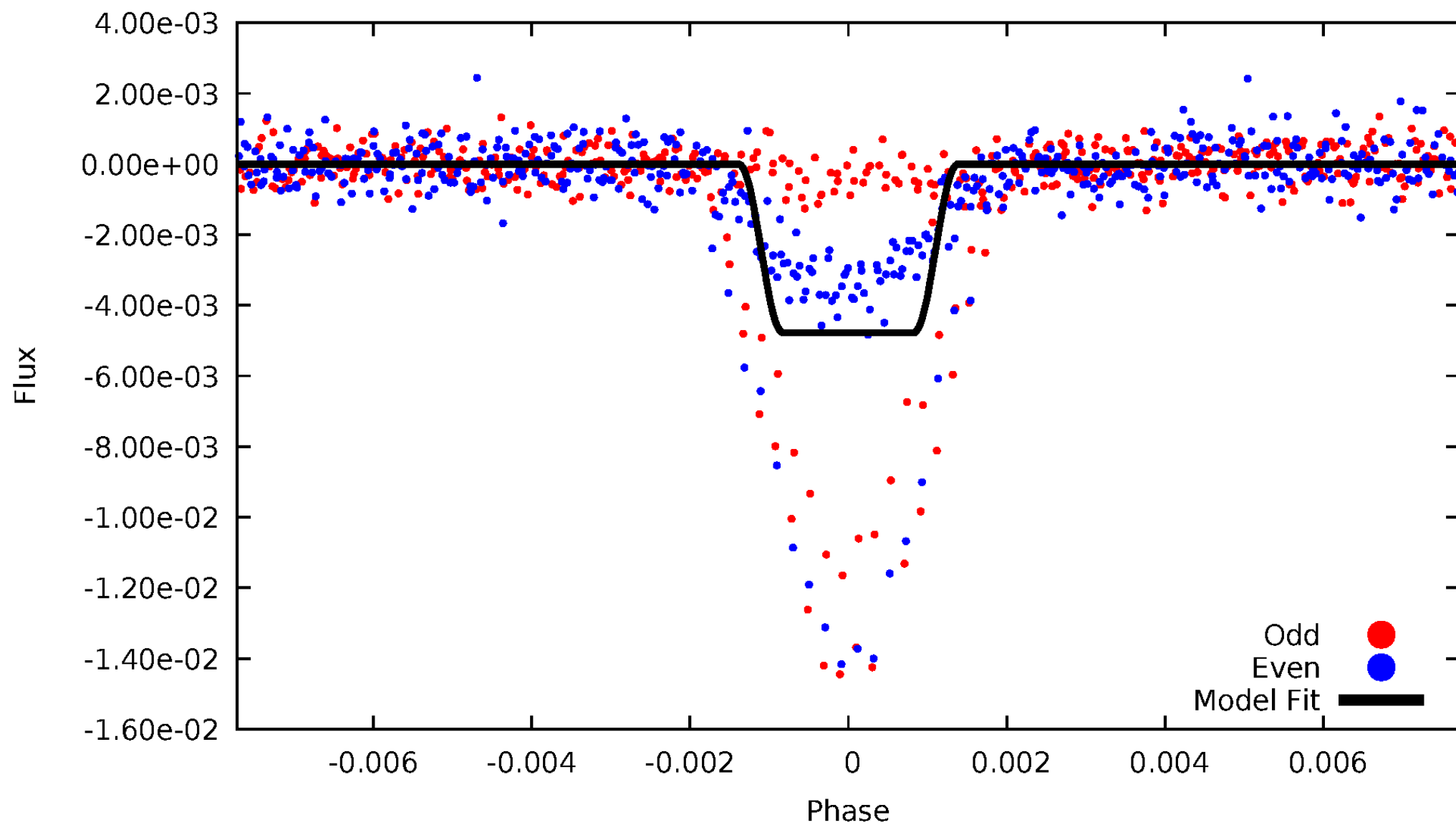
# DV Odd/Even

TCE 008414907-02



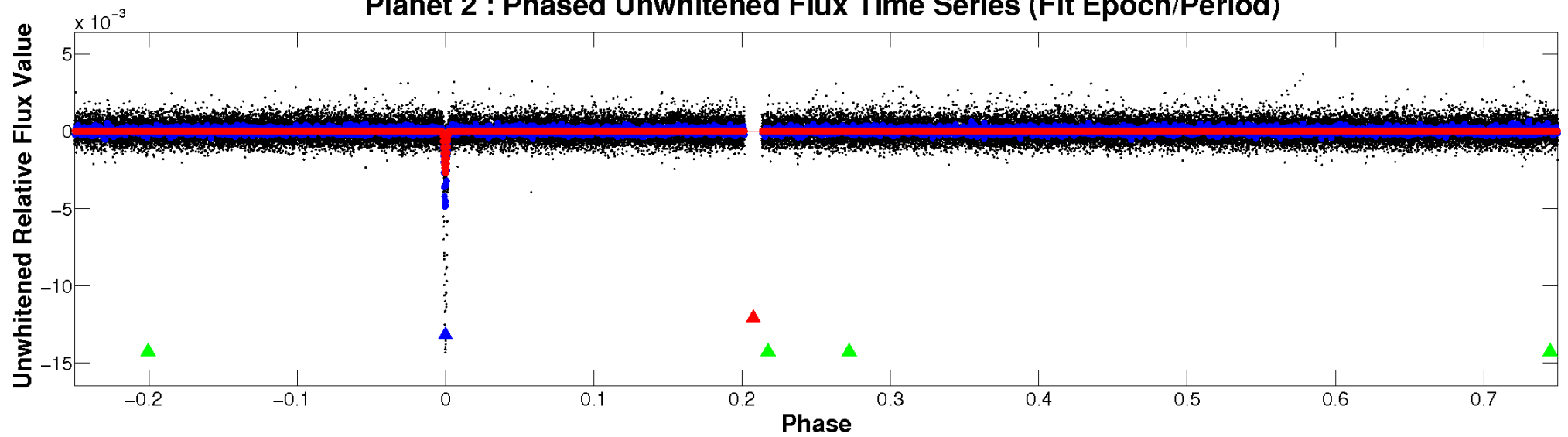
# ALT Odd/Even

TCE 008414907-02

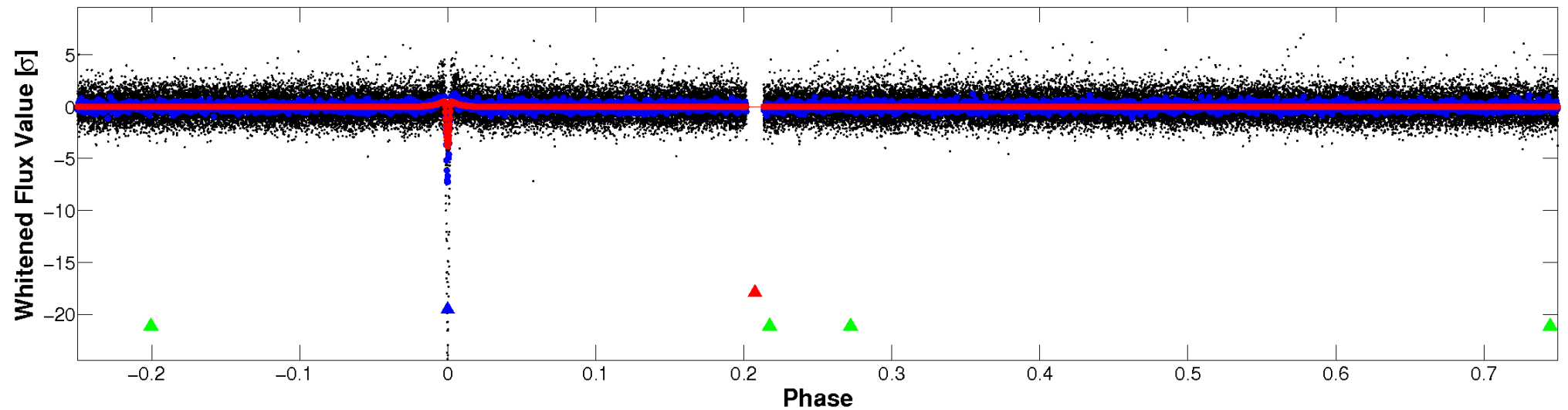


# Non-Whitened Vs. Whitened Light Curve

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

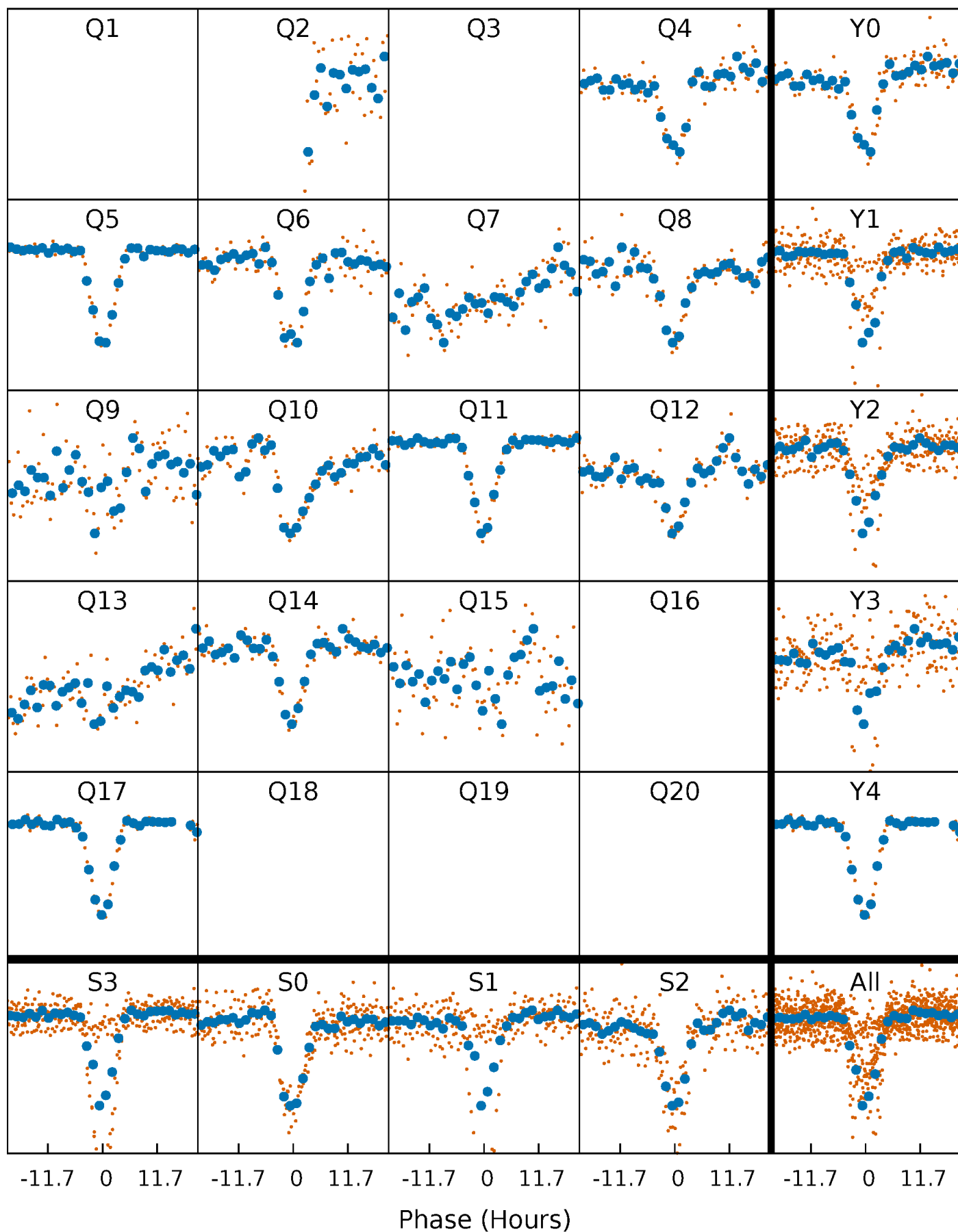


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



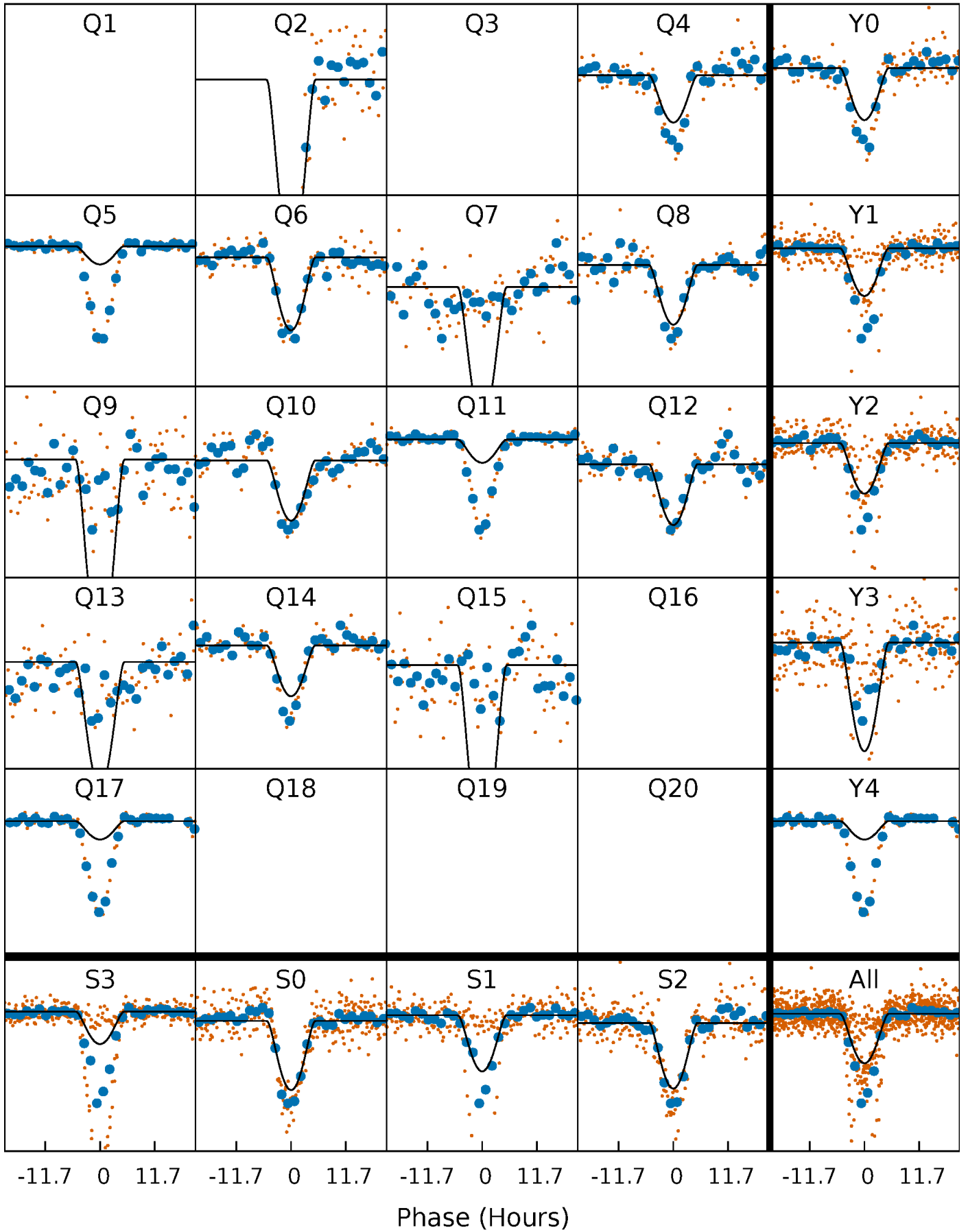
# PDC Quarter-Phased Transit Curves

TCE 008414907-02     $P=100.304838$  Days     $T_0=155.932830$  (BKJD)



# DV Quarter-Phased Transit Curves

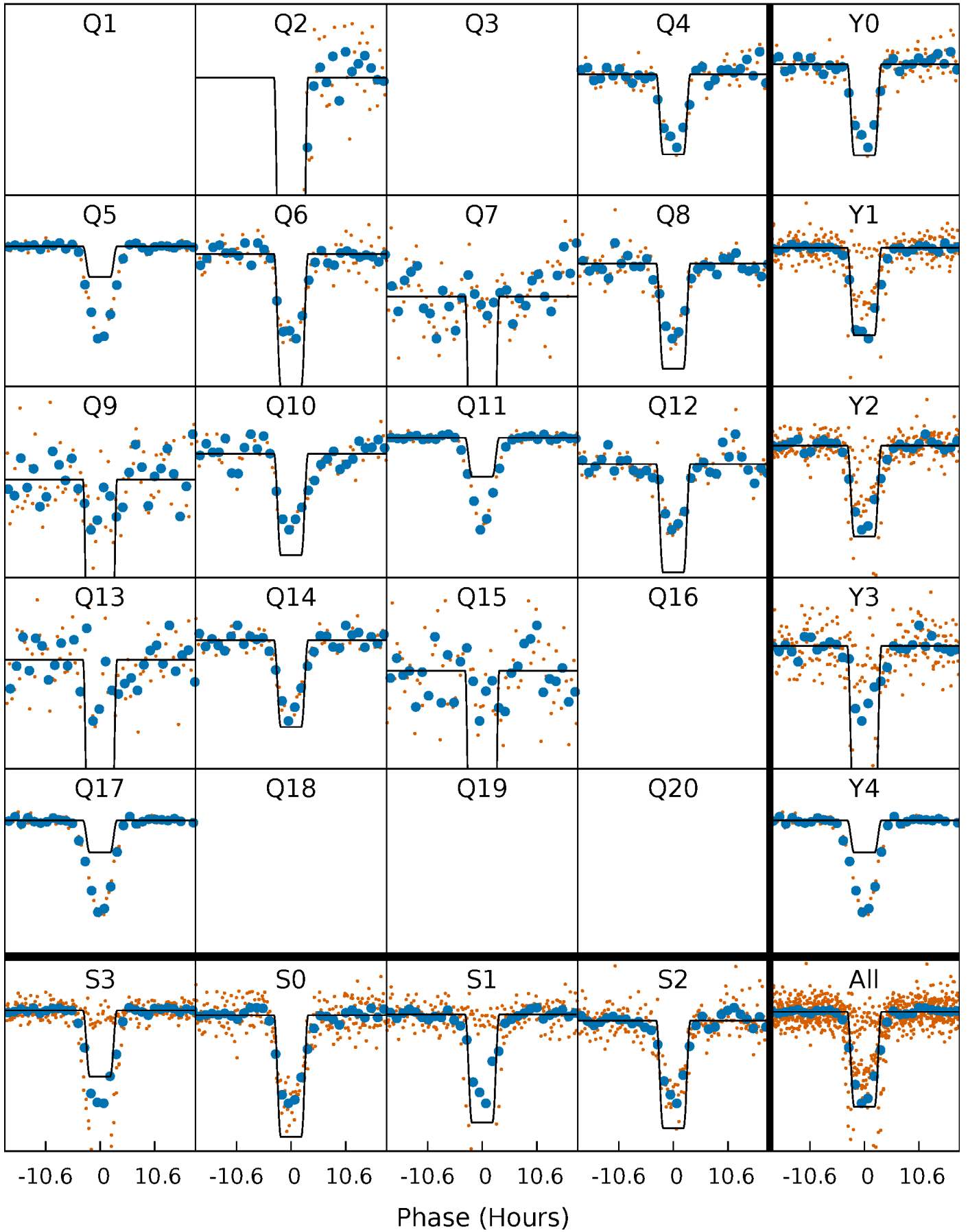
TCE 008414907-02   P=100.304838 Days    $T_0=155.932830$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

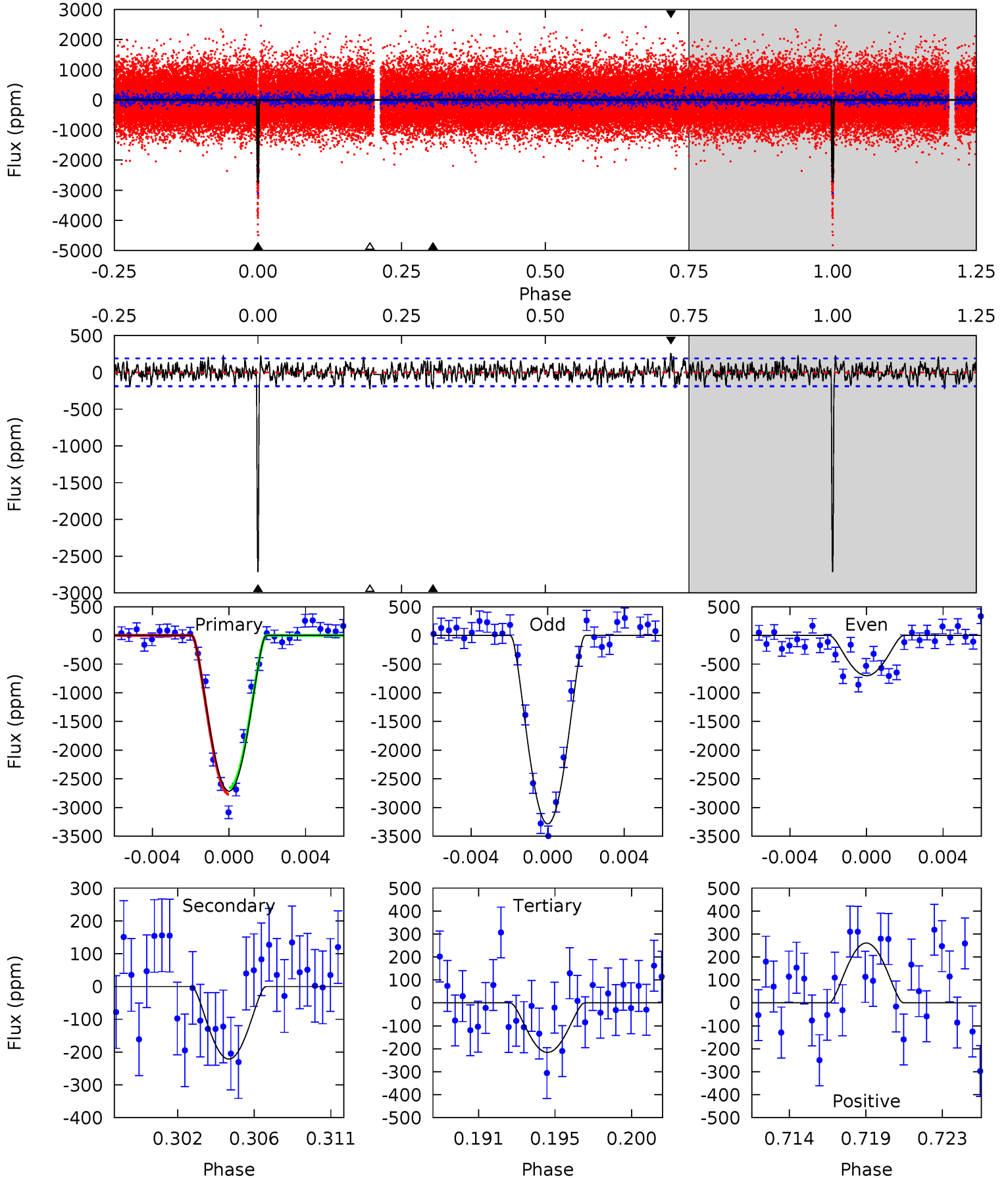
TCE 008414907-02 P=100.304619 Days  $T_0=155.931055$  (BKJD)



# DV Model-Shift Uniqueness Test

008414907-02, P = 100.304838 Days, E = 155.932830 Days

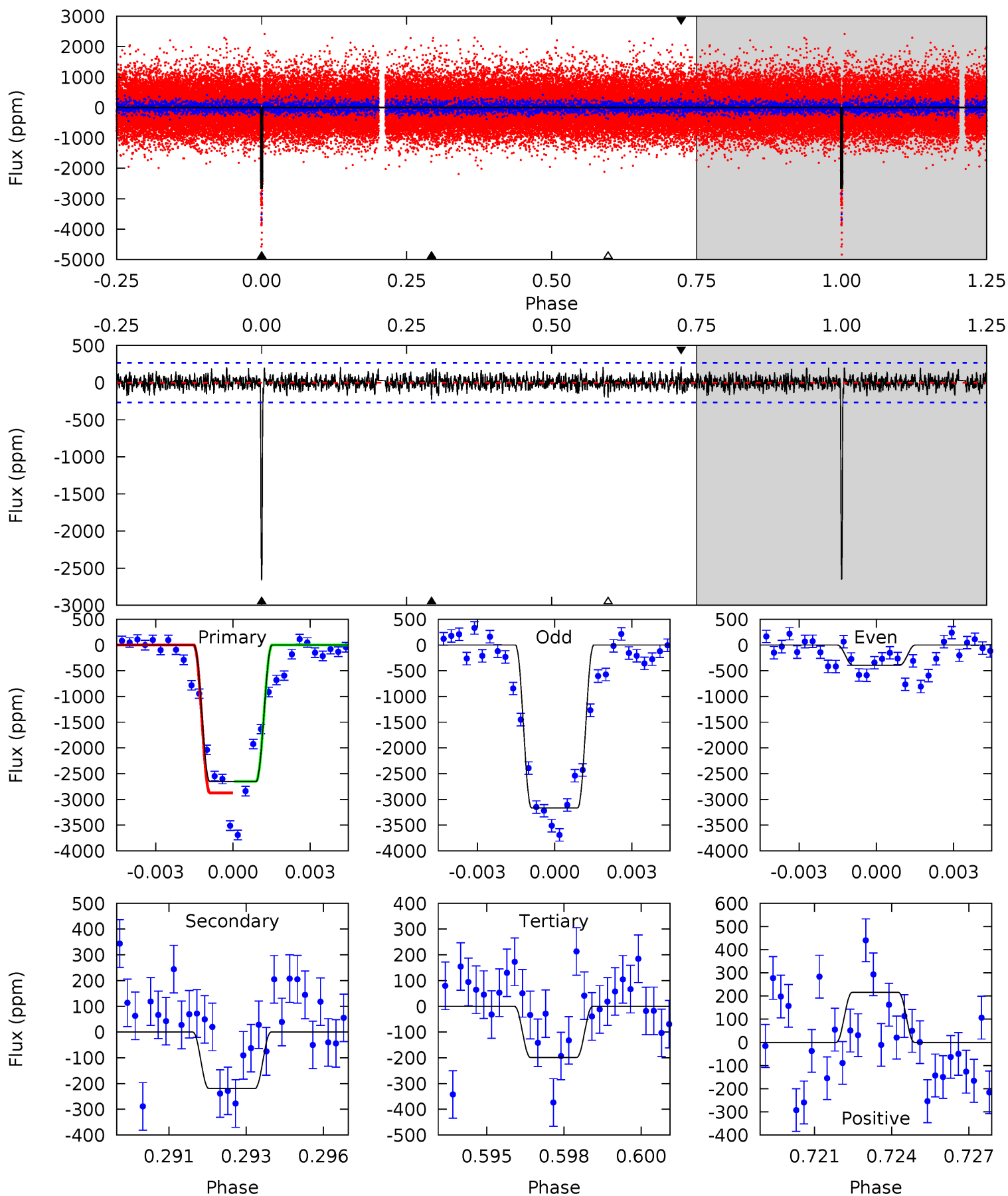
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
74.3	6.06	5.90	7.13	5.18	2.85	1.95	68.4	67.1	0.15	-1.08	36.9	1.41	0.09	1.47



# Alt Model-Shift Uniqueness Test

008414907-02, P = 100.304619 Days, E = 155.931055 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
52.5	4.33	3.93	4.26	5.27	3.00	1.18	48.5	48.2	0.40	0.07	29.8	1.40	0.08	2.21



### Stellar Parameters For KIC 008414907

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5055^{+153}_{-138}$	$4.566^{+0.045}_{-0.060}$	$0.000^{+0.250}_{-0.300}$	$0.772^{+0.081}_{-0.066}$	$0.800^{+0.073}_{-0.066}$	$2.445^{+0.506}_{-0.544}$
	+3%/-3%	+1%/-1%	+inf%/-inf%	+10%/-9%	+9%/-8%	+21%/-22%
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 008414907-02 / KOI 1134.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-221 \pm 37$	$10.37^{+9.25}_{-7.08}$	$439^{+16}_{-15}$	$2582^{+945}_{-378}$	$175^{+1369}_{-129}$
Alt.	$-219 \pm 51$	$9.64^{+8.23}_{-6.51}$	$439^{+15}_{-15}$	$2627^{+1001}_{-393}$	$206^{+1545}_{-150}$

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

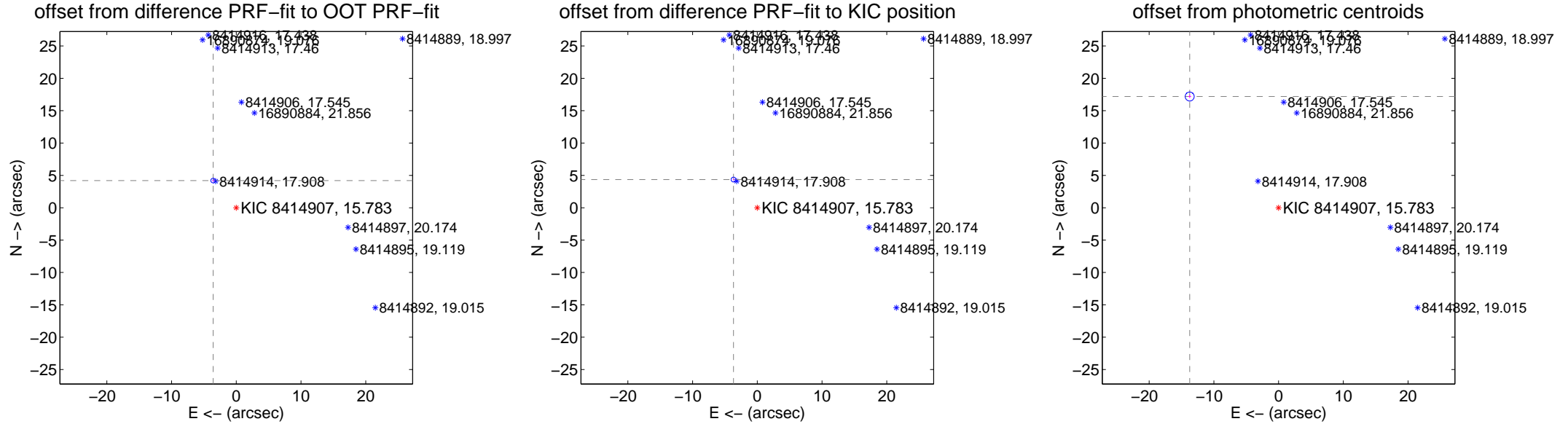
## DV Centroid Data

Supplemental centroid analysis for 008414907-02. Kepler magnitude: 15.78. Transit SNR 31.89

There are 4 quarters with good PRF difference image offsets

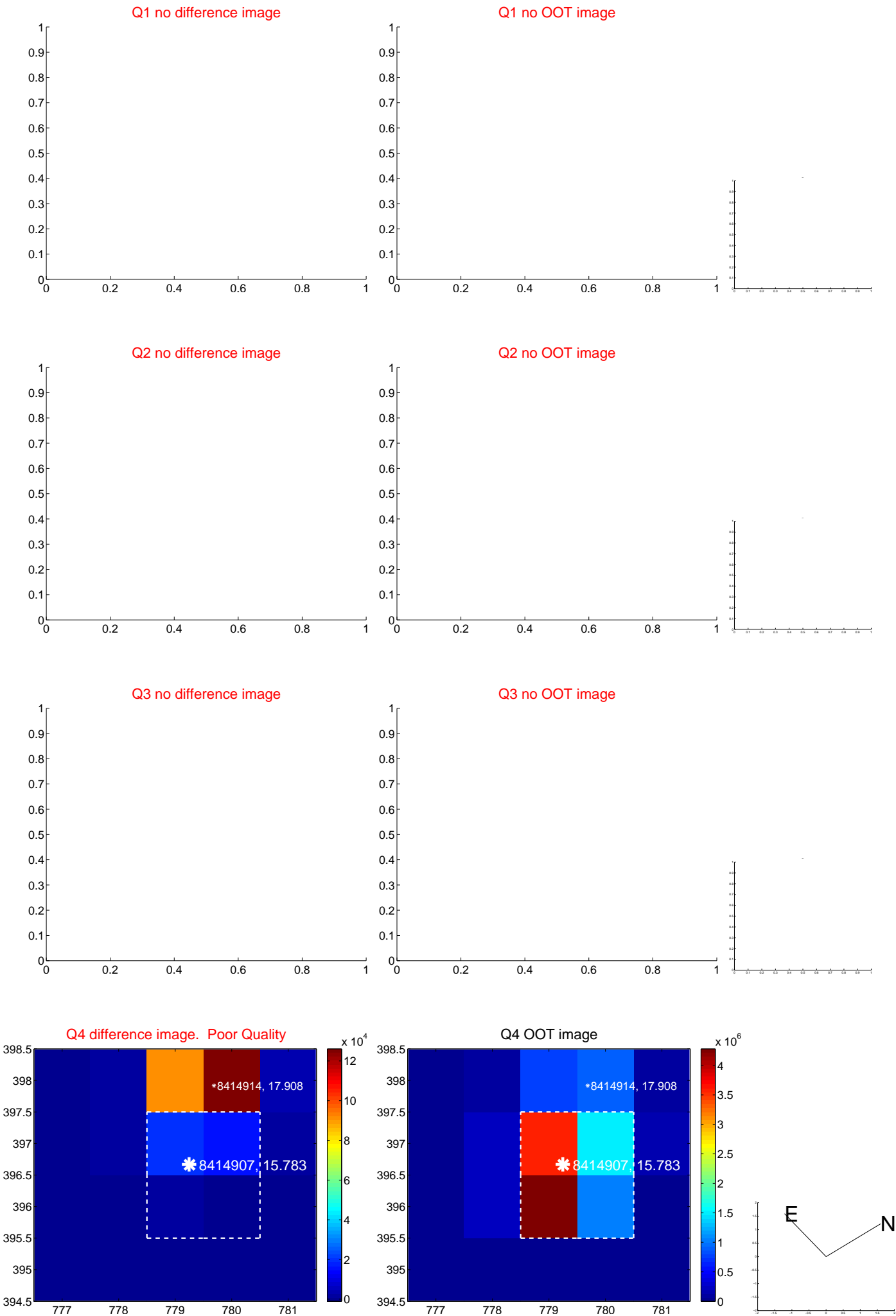
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b>5.521 <math>\pm</math> 0.120</b>	<b>46.02</b>	3.580 $\pm$ 0.102	4.202 $\pm$ 0.094
PRF-fit source offset from KIC position	<b>5.698 <math>\pm</math> 0.124</b>	<b>45.91</b>	3.676 $\pm$ 0.098	4.354 $\pm$ 0.101
photometric centroid source offset	<b>22.01 <math>\pm</math> 0.23</b>	<b>95.19</b>	13.74 $\pm$ 0.22	17.19 $\pm$ 0.24

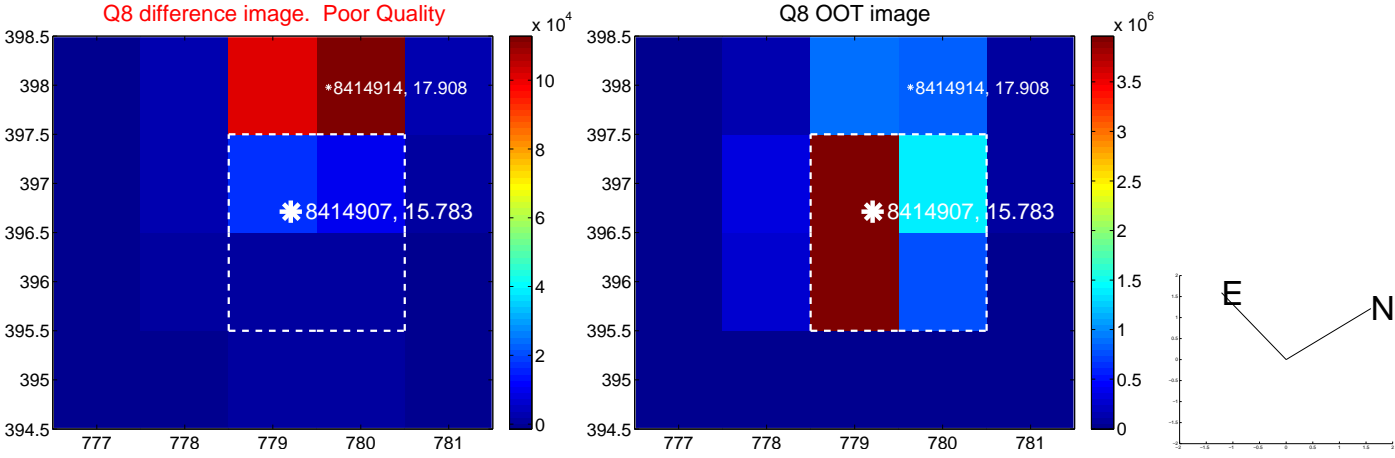
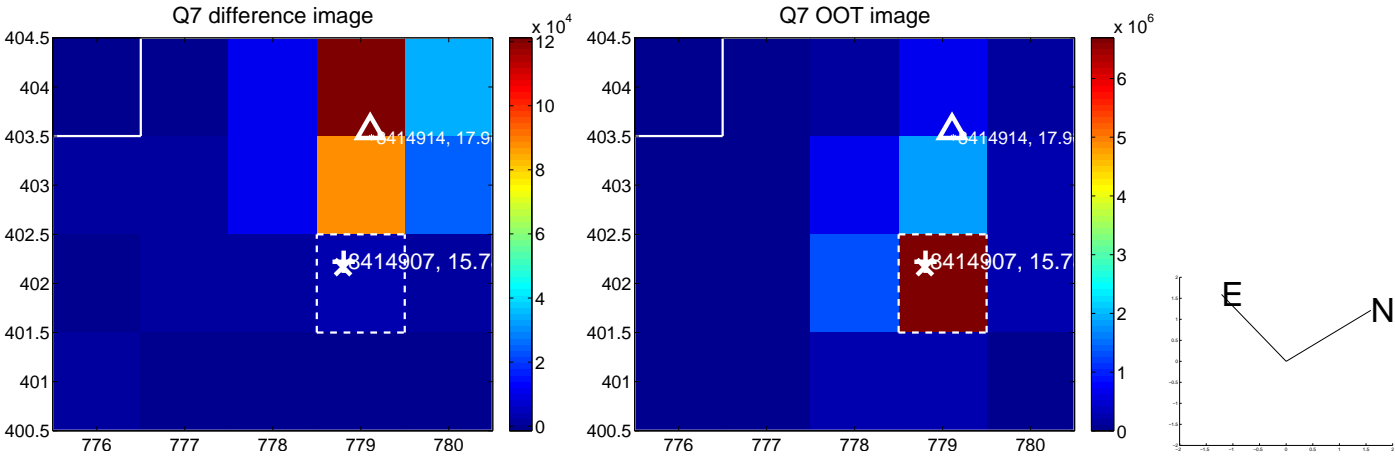
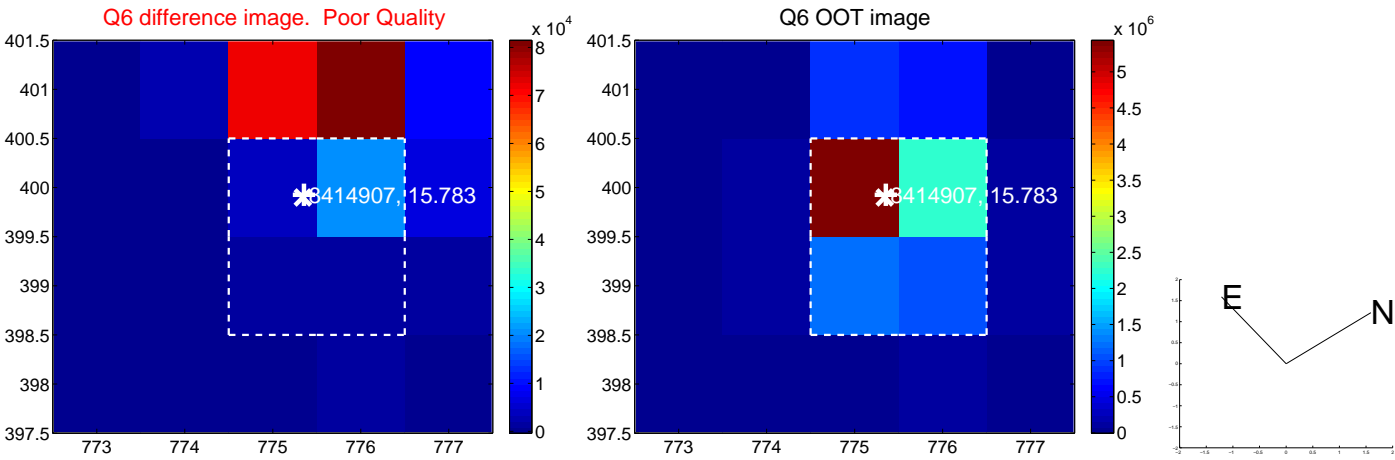
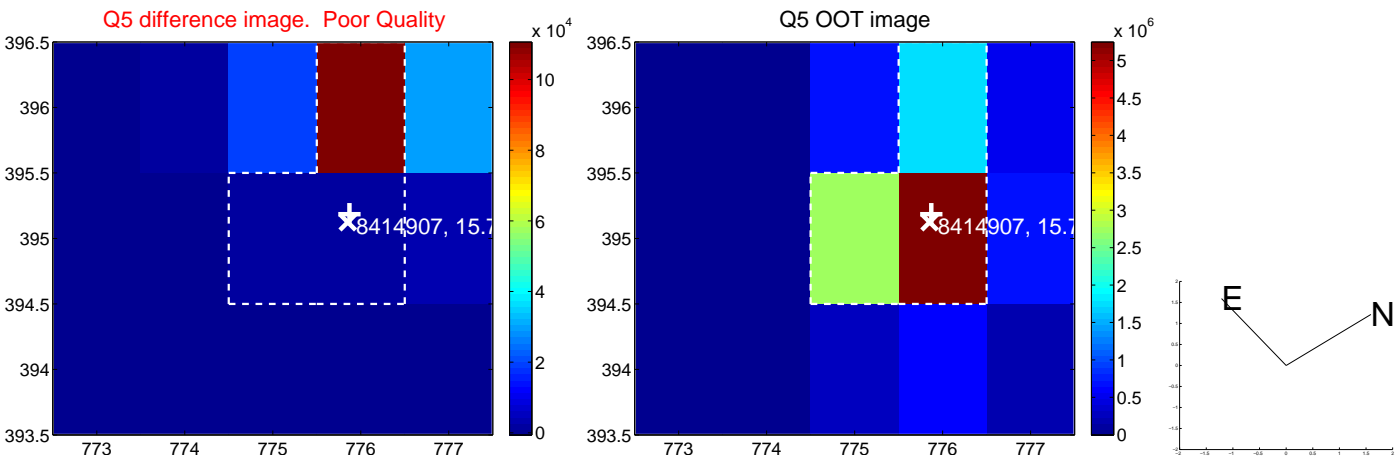


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

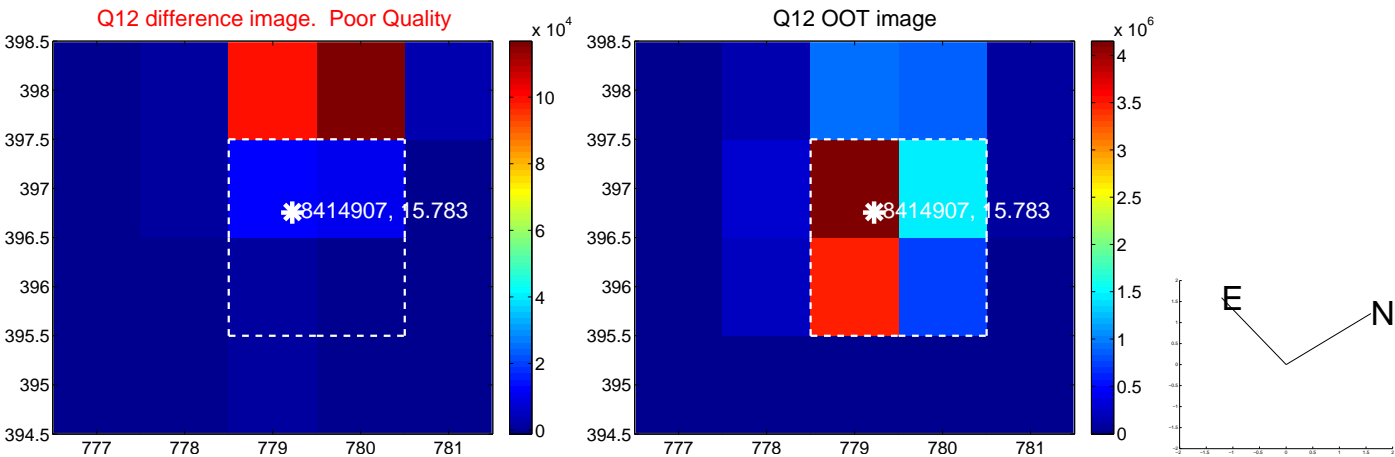
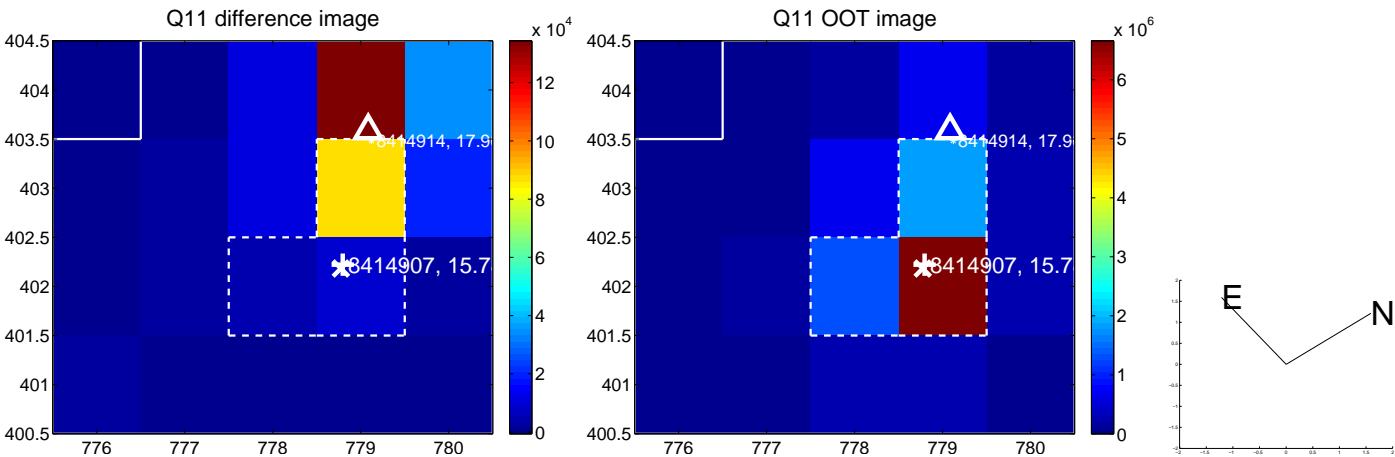
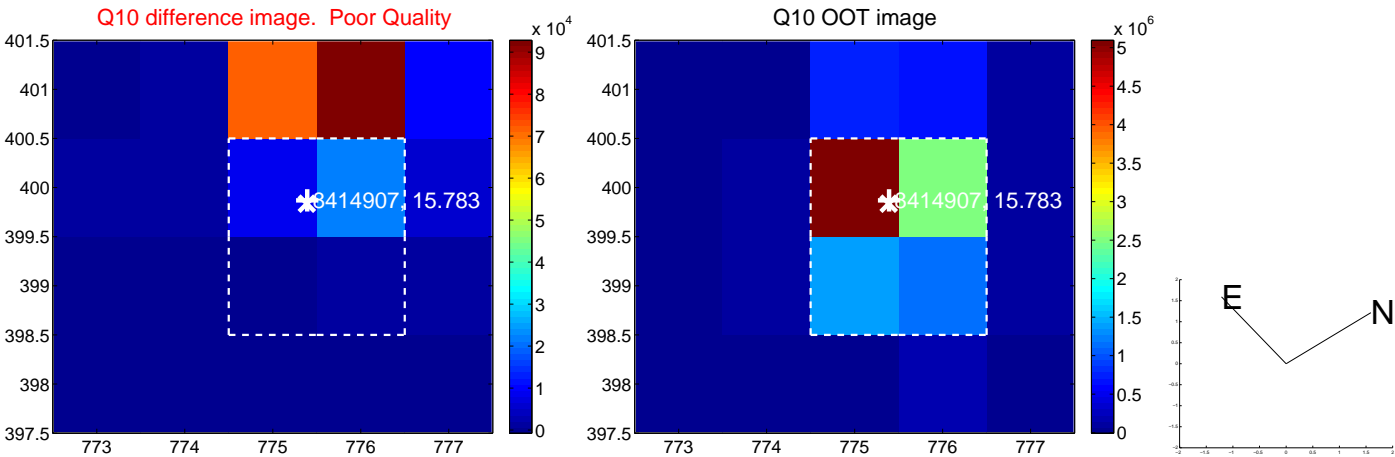
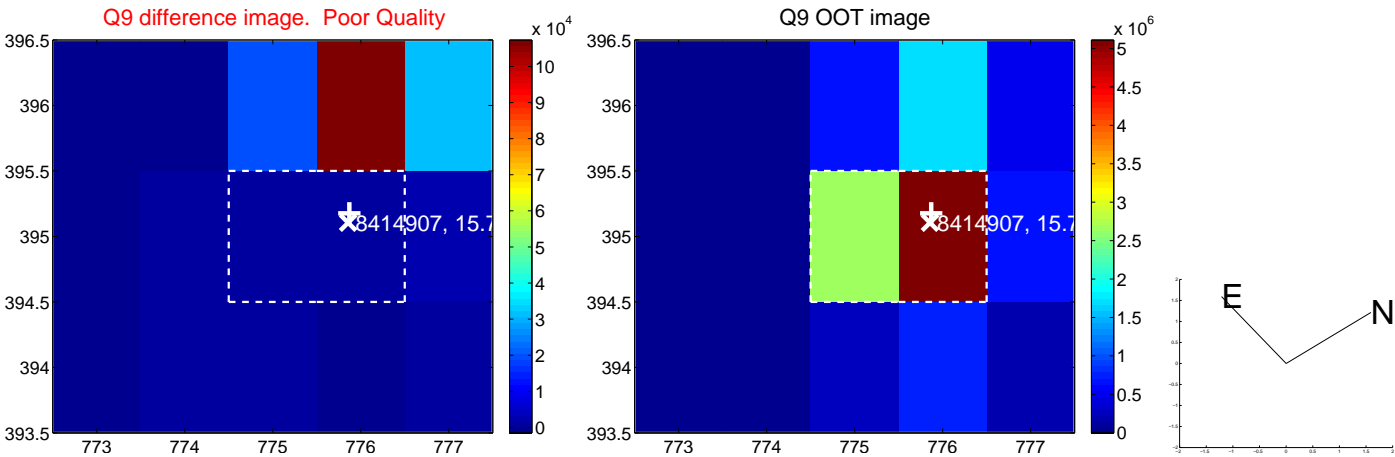


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

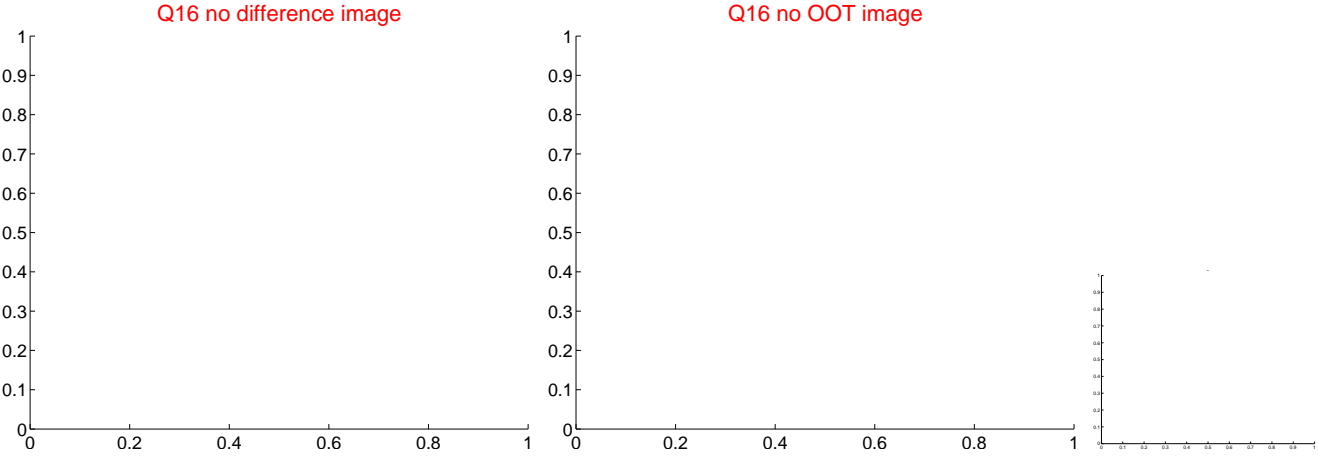
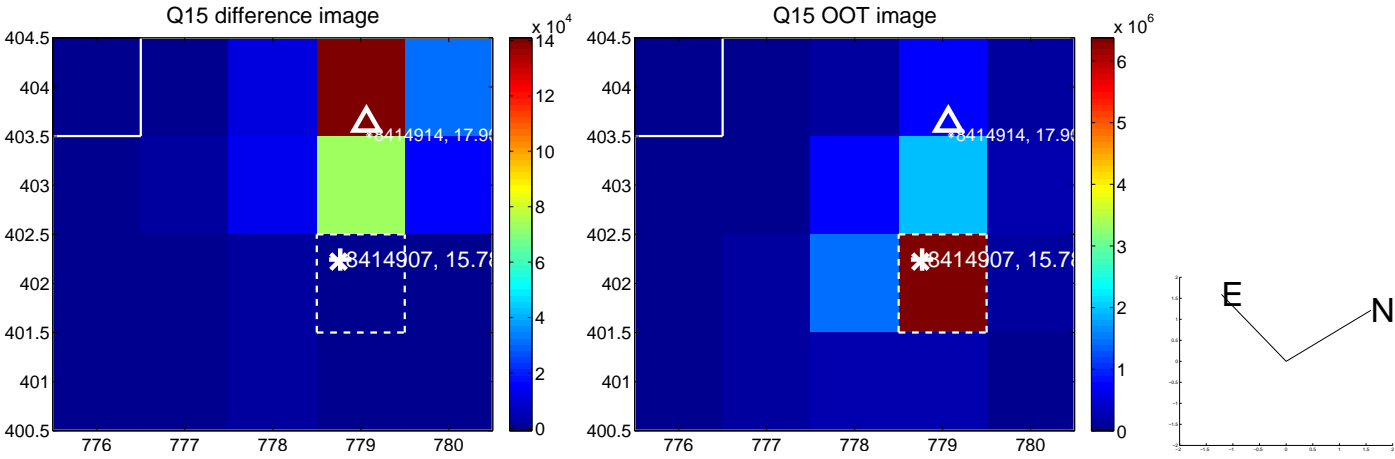
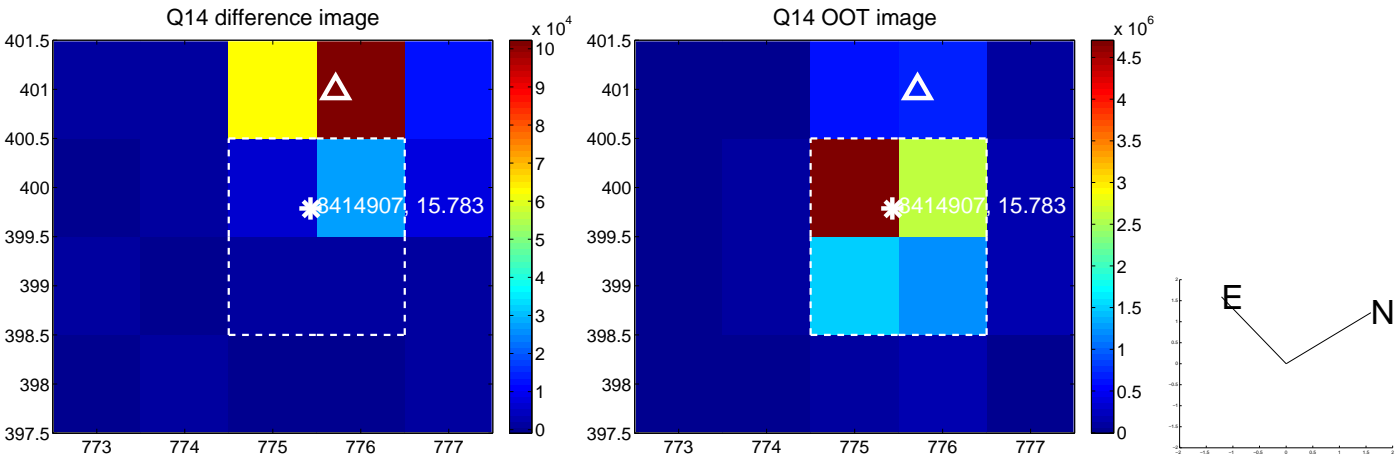
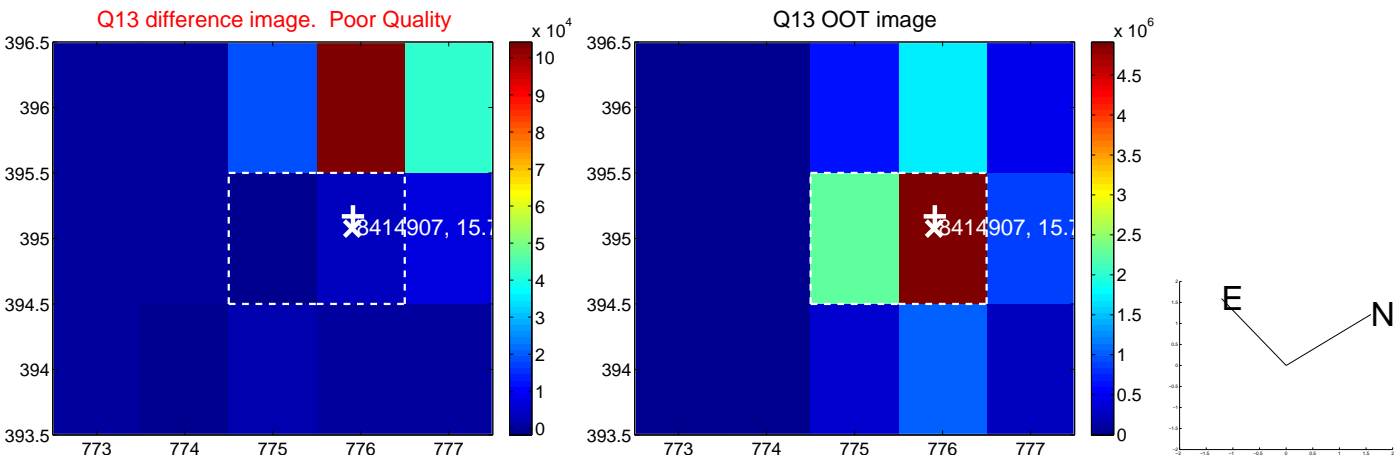




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



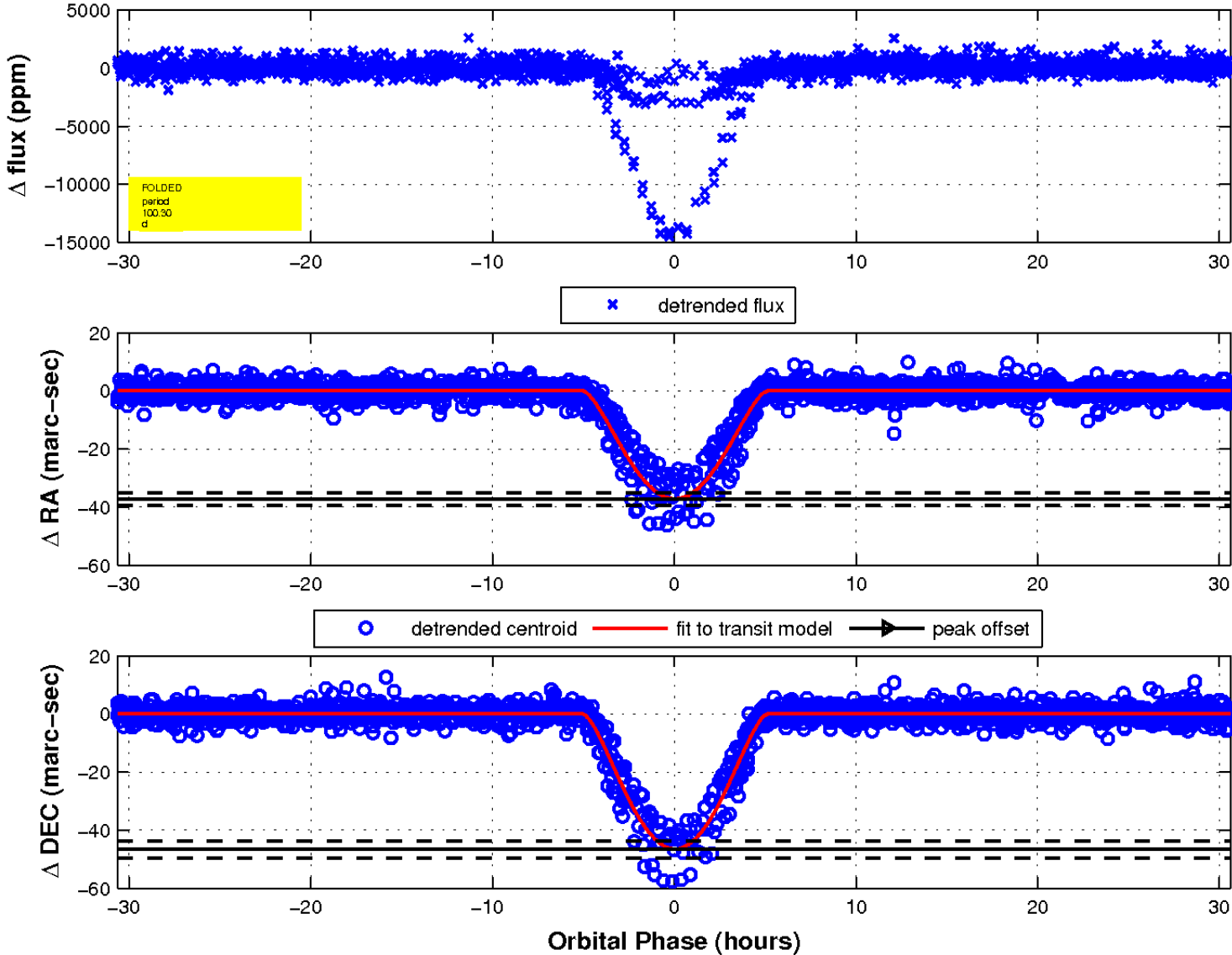
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

Q17 no difference image

Q17 no OOT image

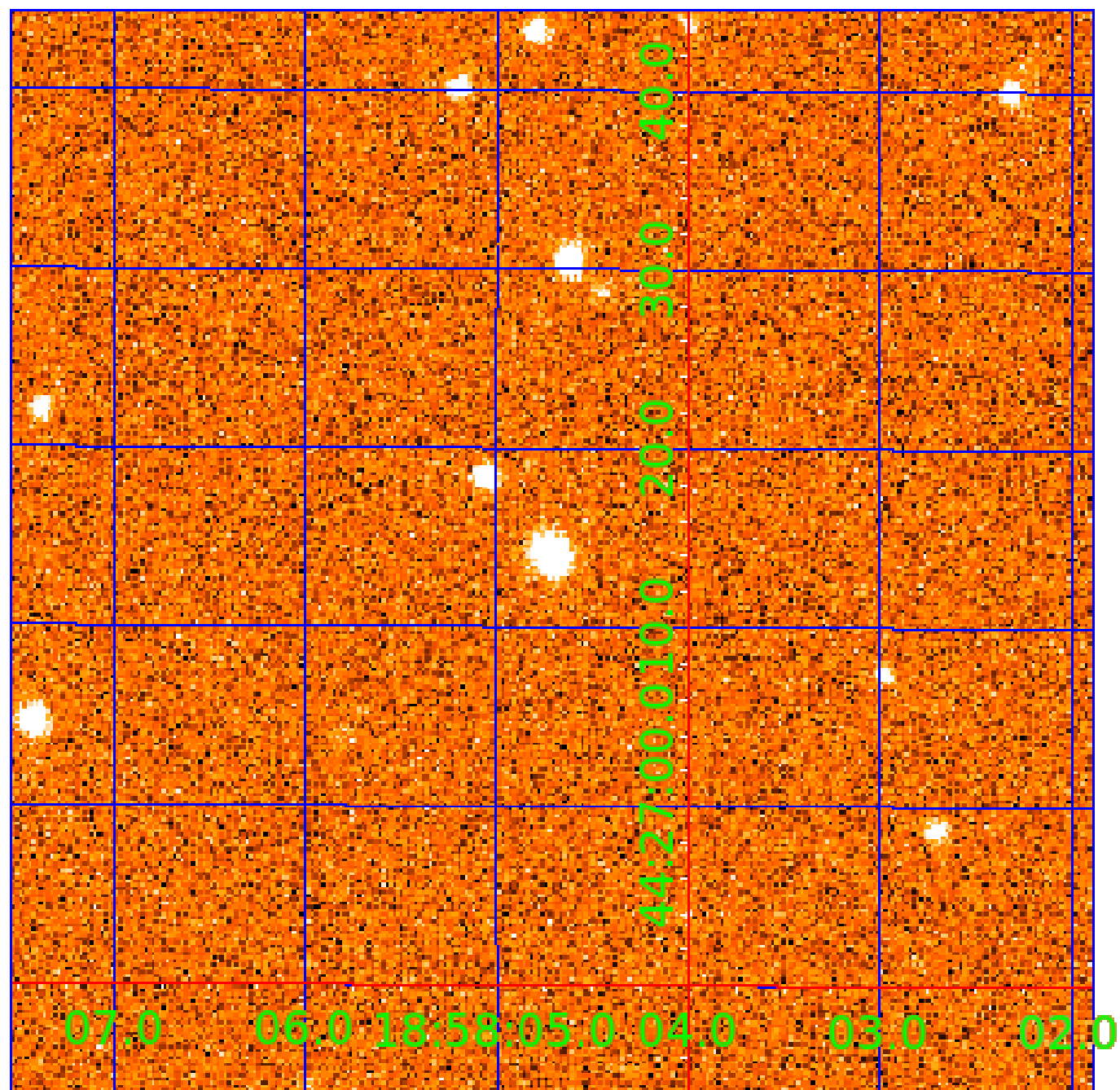


fluxWeightedCentroids, Planet 2 of 3



# UKIRT Image

Declination



# KIC 008414907

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008414907-01	OBS	1134.01	100.303970	176.757206	5637.1	9.214	118.2	62.2	0.77	5055	10.99	2.27
008414907-02	OBS	1134.02	100.304838	155.932830	2725.6	10.213	69.3	31.9	0.77	5055	7.86	2.27
008414907-03	OBS	No	353.809235	378.358106	549.1	26.094	10.5	5.7	0.77	5055	1.79	0.42

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008414907-01	OBS	FP	0.00	1	0	1	1	INCONSISTENT_TRANS—CENT_RESOLVED_OFFSET—EPHEM_MATCH
008414907-02	OBS	FP	0.00	1	0	1	1	INCONSISTENT_TRANS—SAME_NTL_PERIOD—CENT_RESOLVED_OFFSET—EPHEM_MATCH
008414907-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST

**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 008414907-03

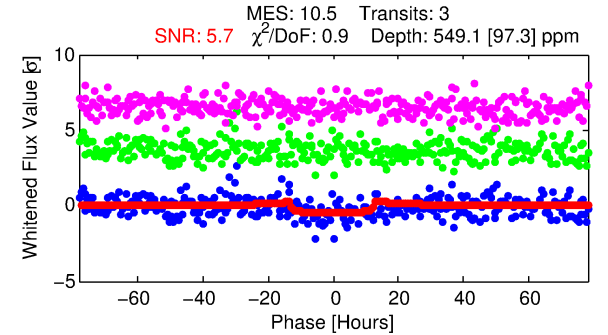
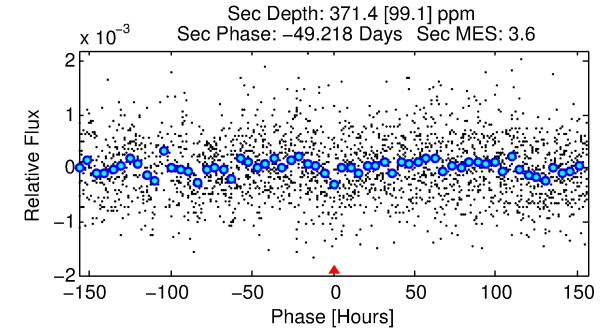
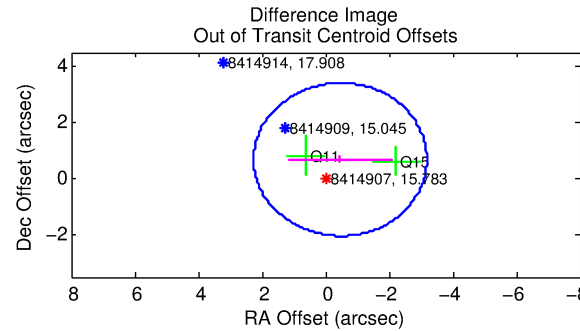
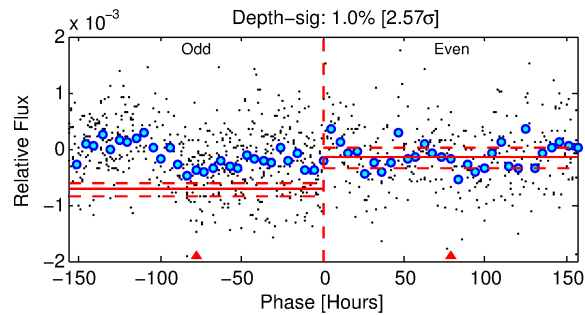
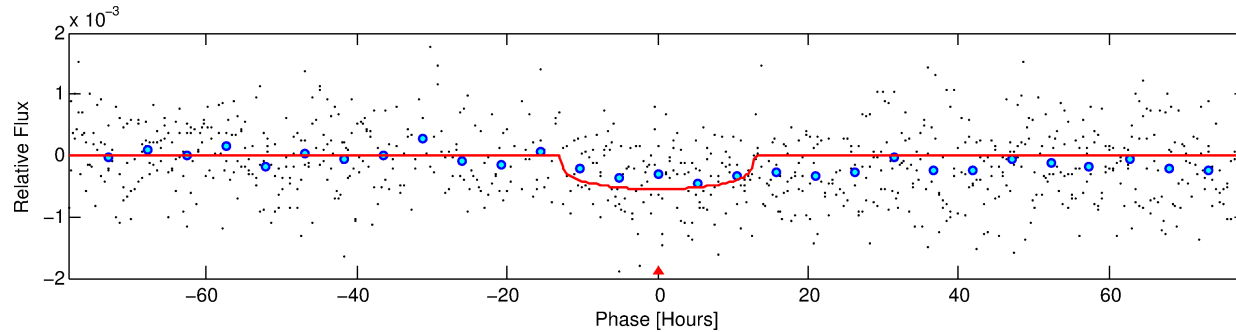
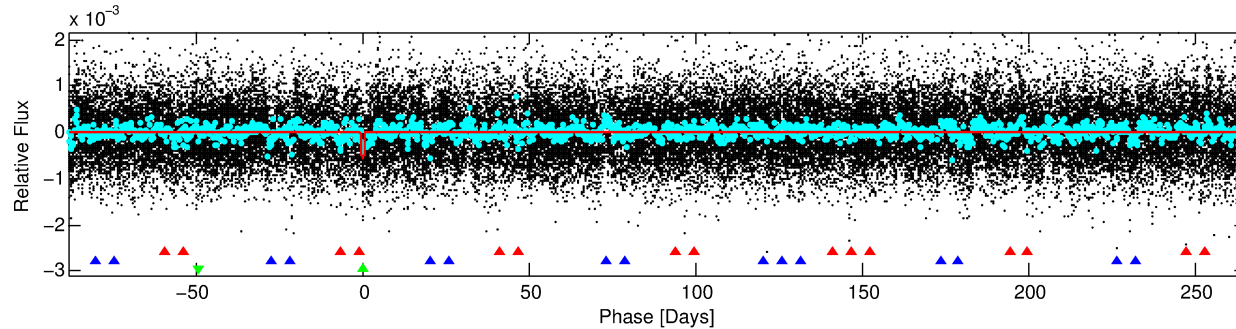
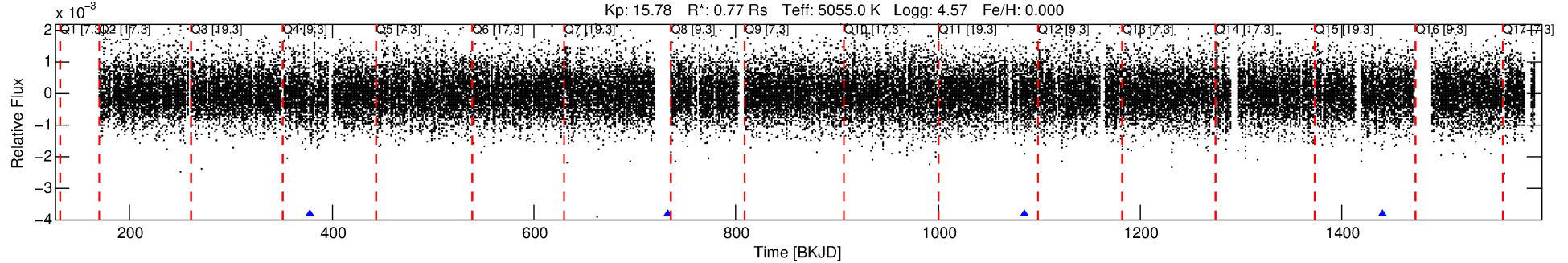
No Significant Match Found

# DV One-Page Summary

KIC: 8414907 Candidate: 3 of 3 Period: 353.809 d

KOI: K01134 Corr: No Ephemeris Match

Kp: 15.78 R\*: 0.77 Rs Teff: 5055.0 K Logg: 4.57 Fe/H: 0.000



## DV Fit Results:

Period = 353.80924 [0.02406] d  
Epoch = 378.3581 [0.0541] BKJD  
Rp/R\* = 0.0213 [0.0162]  
a/R\* = 97.85 [256.43]  
b = 0.39 [5.76]  
Seff = 0.42 [0.07]  
Teq = 206 [9] K  
Rp = 1.79 [1.38] Re  
a = 0.9091 [0.0761] AU  
Ag = 52542.07 [81447.96] [0.65σ]  
Teffp = 4810 [1865] K [2.47σ]

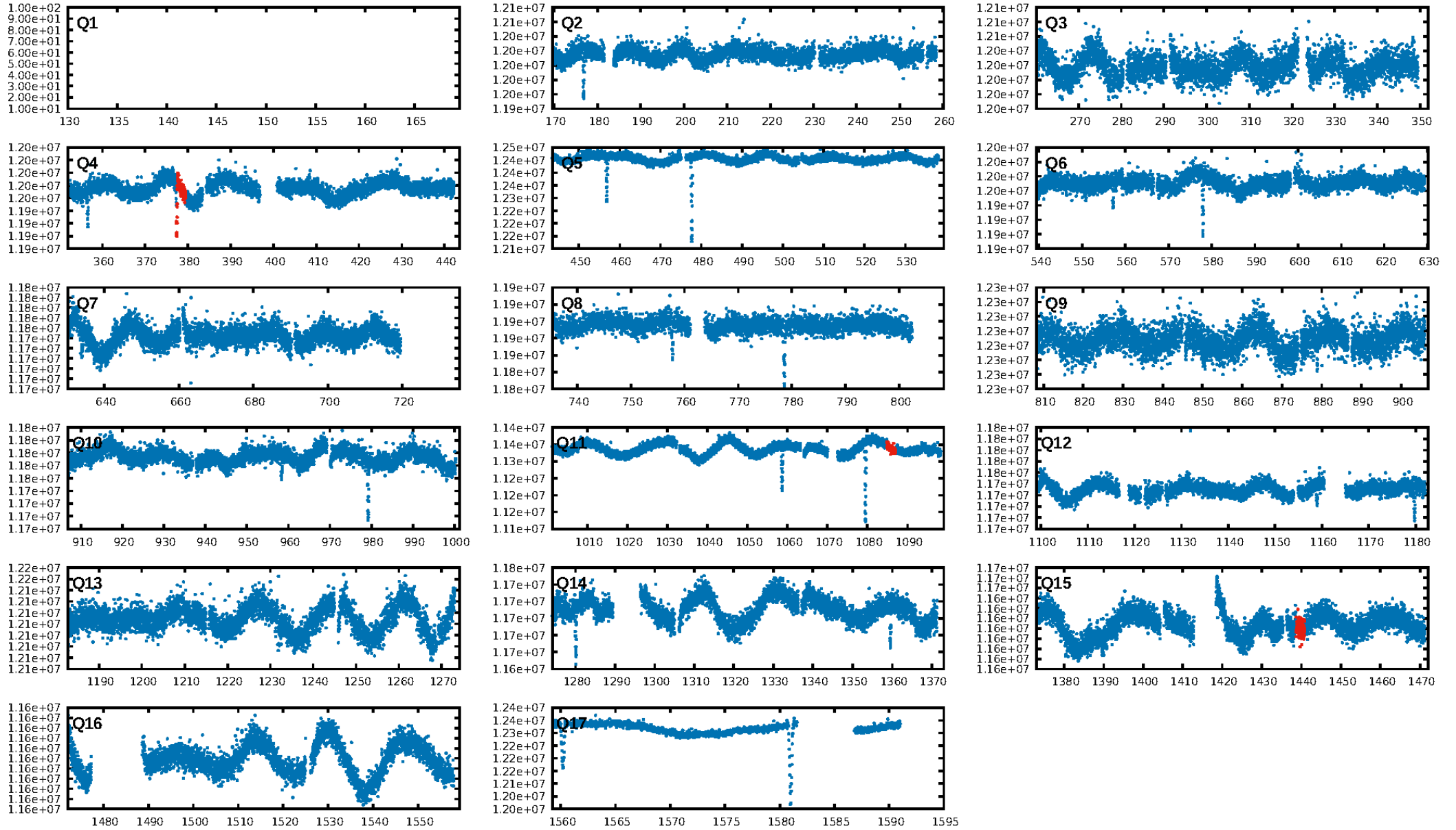
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [217.12σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.1%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 3.84e-20  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: -0.185  
Centroid-sig: 26.9%  
Centroid-so: 1.497 arcsec [1.43σ]  
OotOffset-rm: 0.826 arcsec [0.91σ]  
OotOffset-st: 0/2/0/0 [2]  
KicOffset-rm: 0.917 arcsec [1.22σ]  
KicOffset-st: 0/2/0/0 [2]  
DiffImageQuality-fgm: 0.50 [1/2]  
DiffImageOverlap-fno: 0.67 [2/3]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 06:48:15 Z

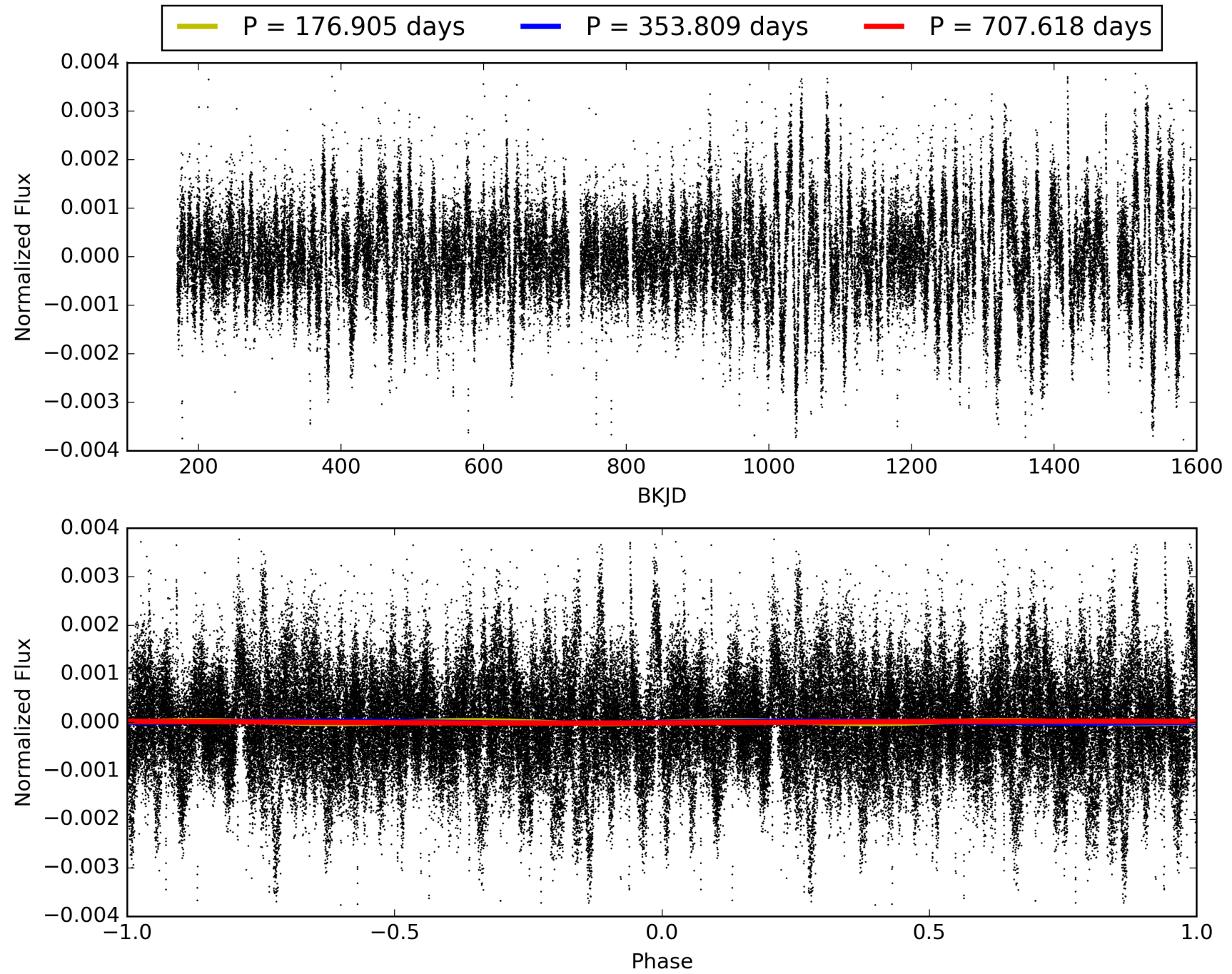
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008414907-03, PDC Light Curves





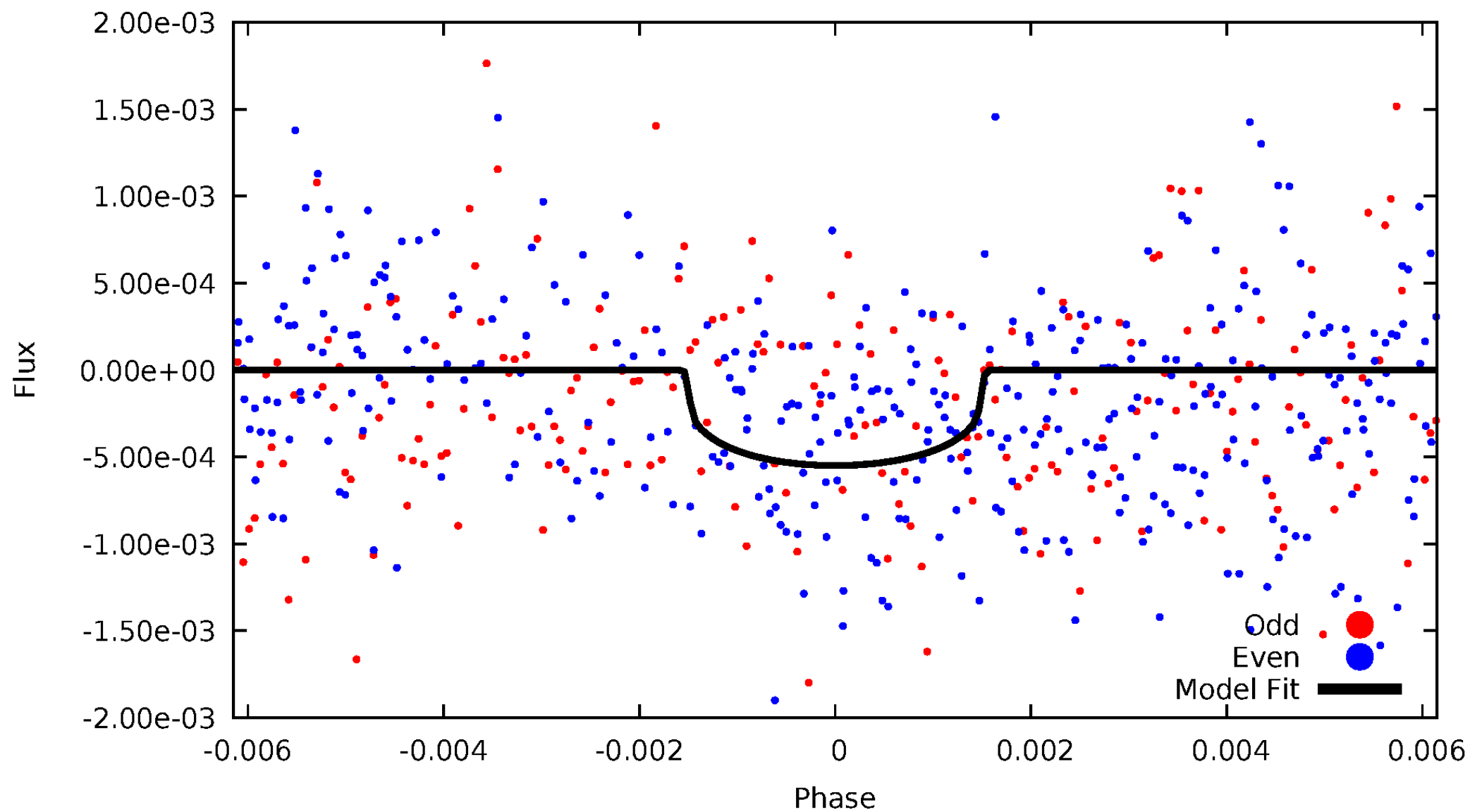
TCE 008414907-03





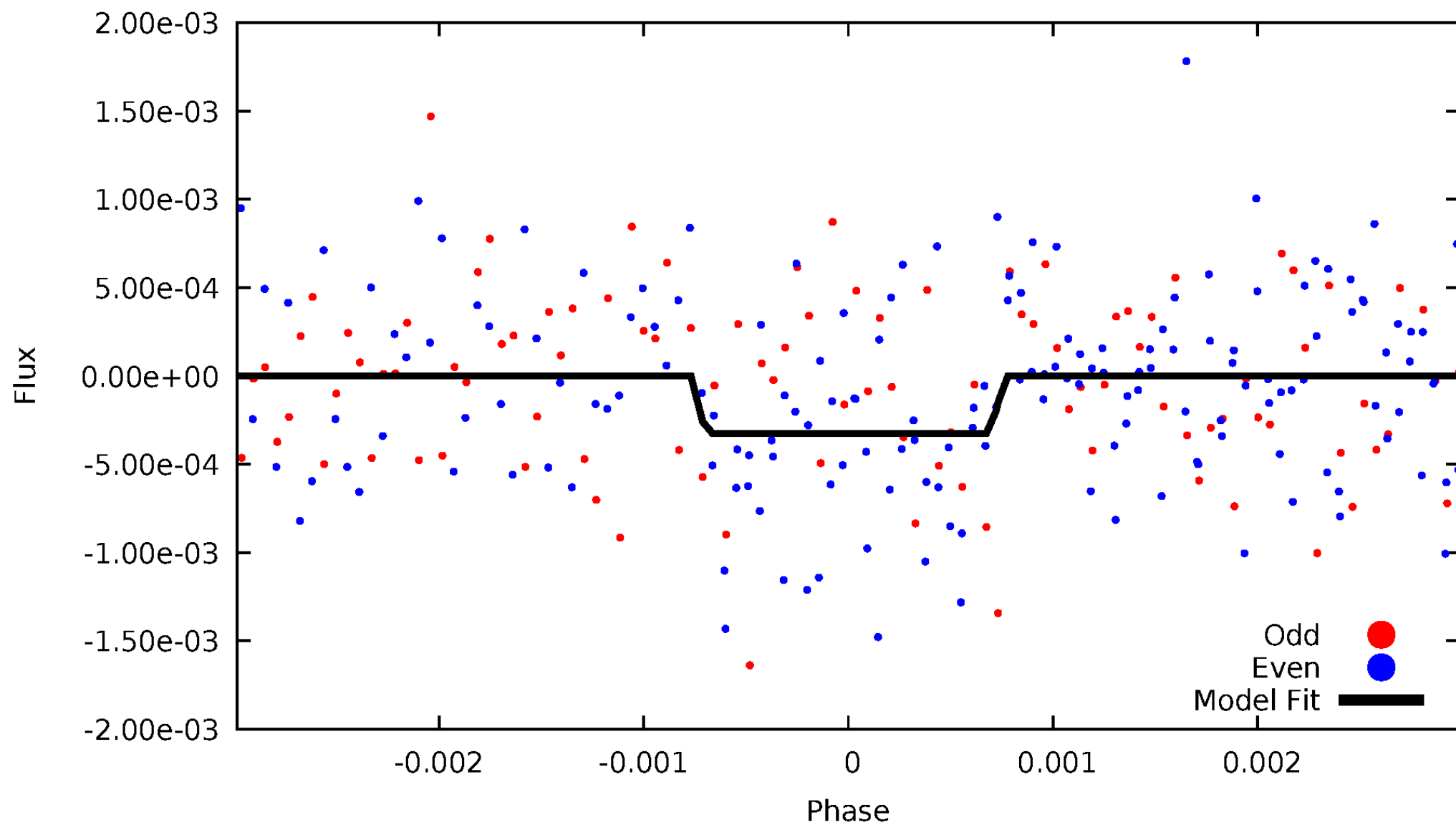
# DV Odd/Even

TCE 008414907-03



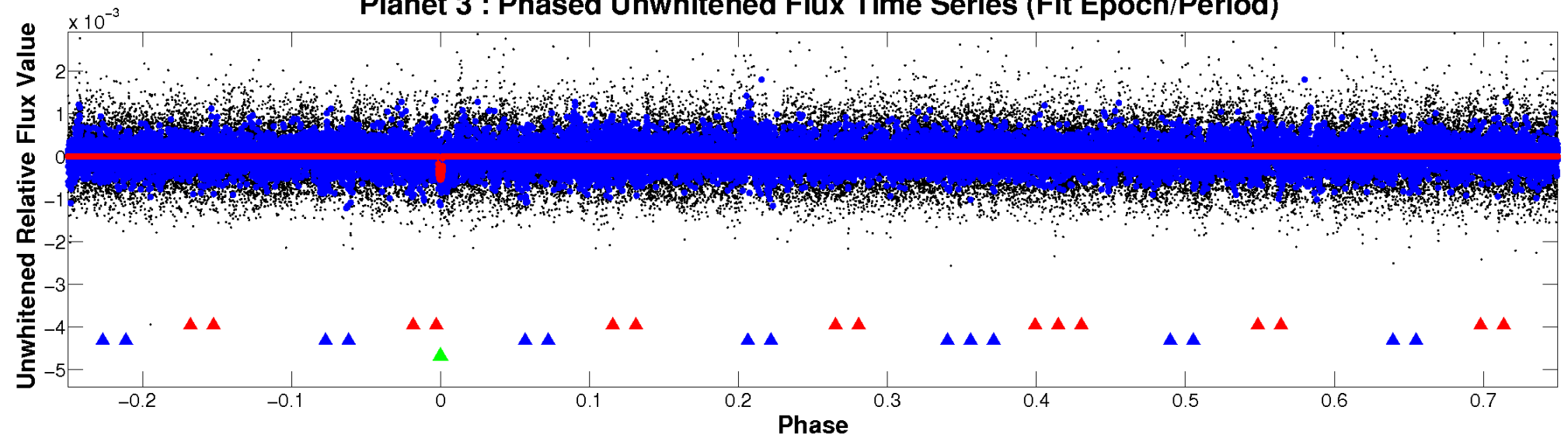
# ALT Odd/Even

TCE 008414907-03

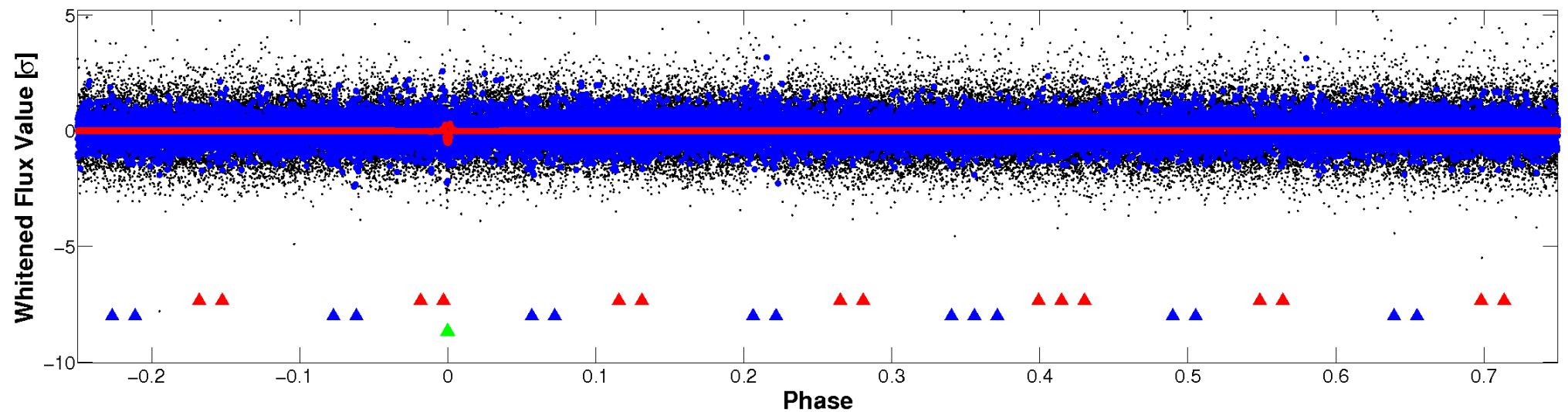


# Non-Whitened Vs. Whitened Light Curve

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 008414907-03     $P=353.809235$  Days     $T_0=378.358106$  (BKJD)



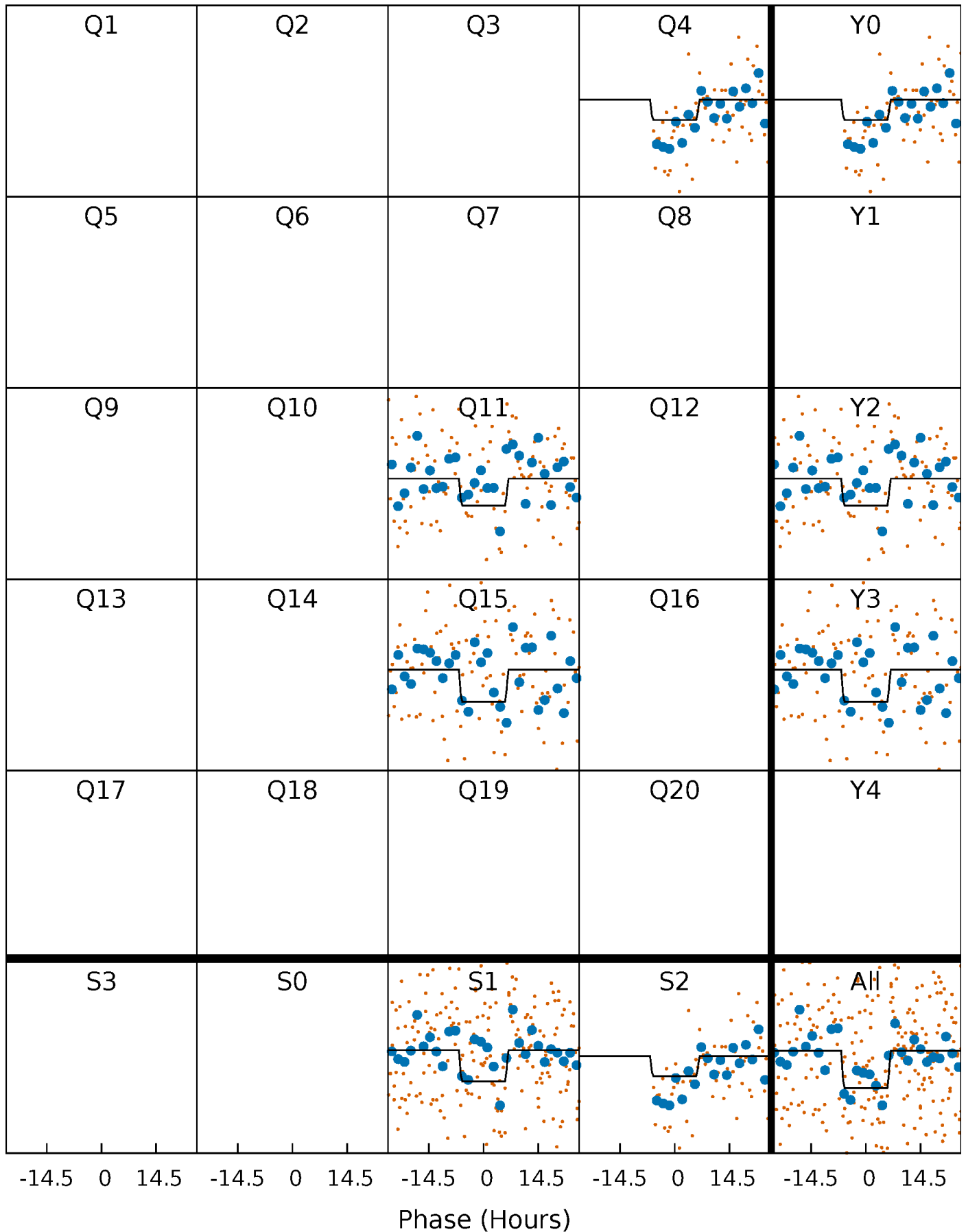
# DV Quarter-Phased Transit Curves

TCE 008414907-03     $P=353.809235$  Days     $T_0=378.358106$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

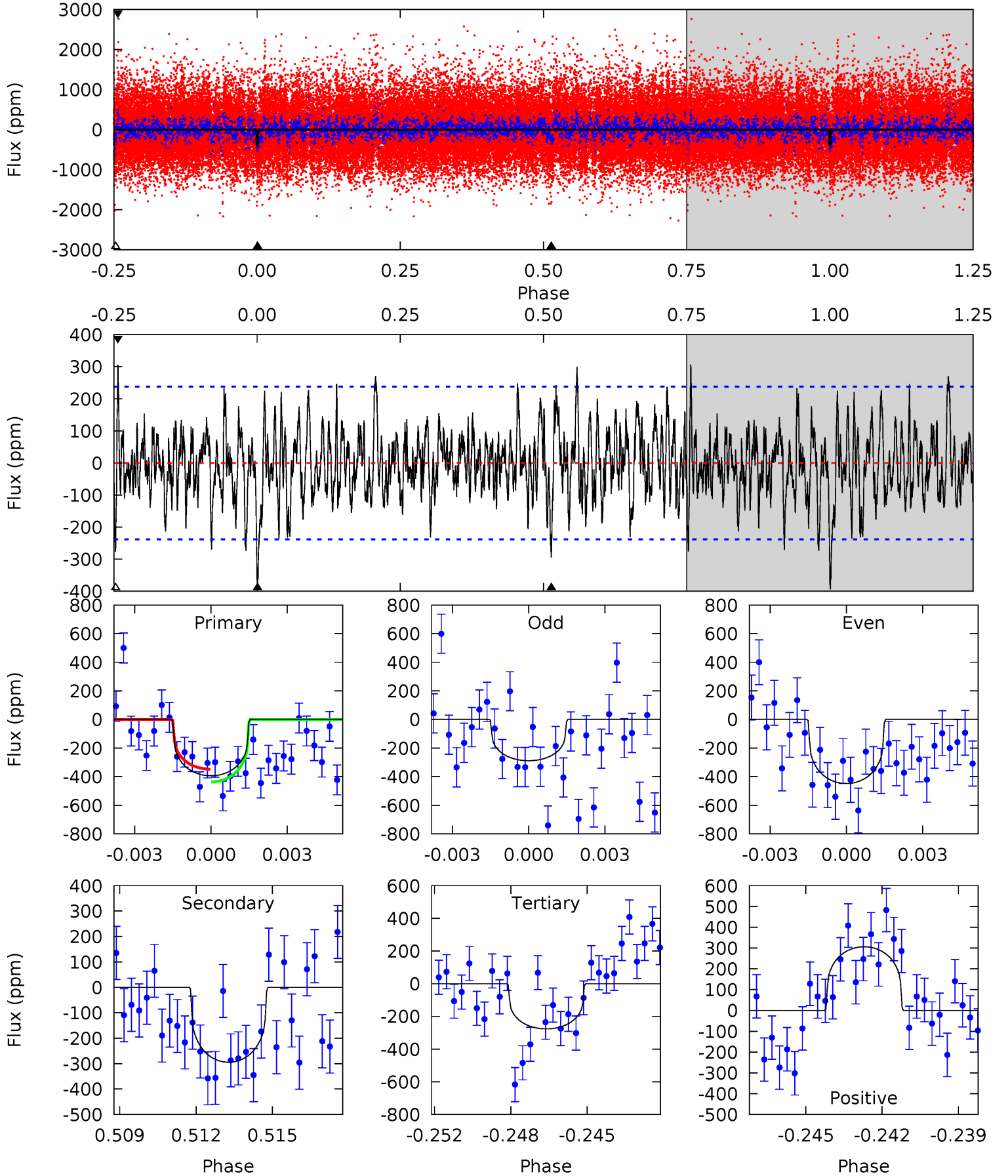
TCE 008414907-03     $P=353.888826$  Days     $T_0=378.193830$  (BKJD)



# DV Model-Shift Uniqueness Test

008414907-03, P = 353.809235 Days, E = 24.548871 Days

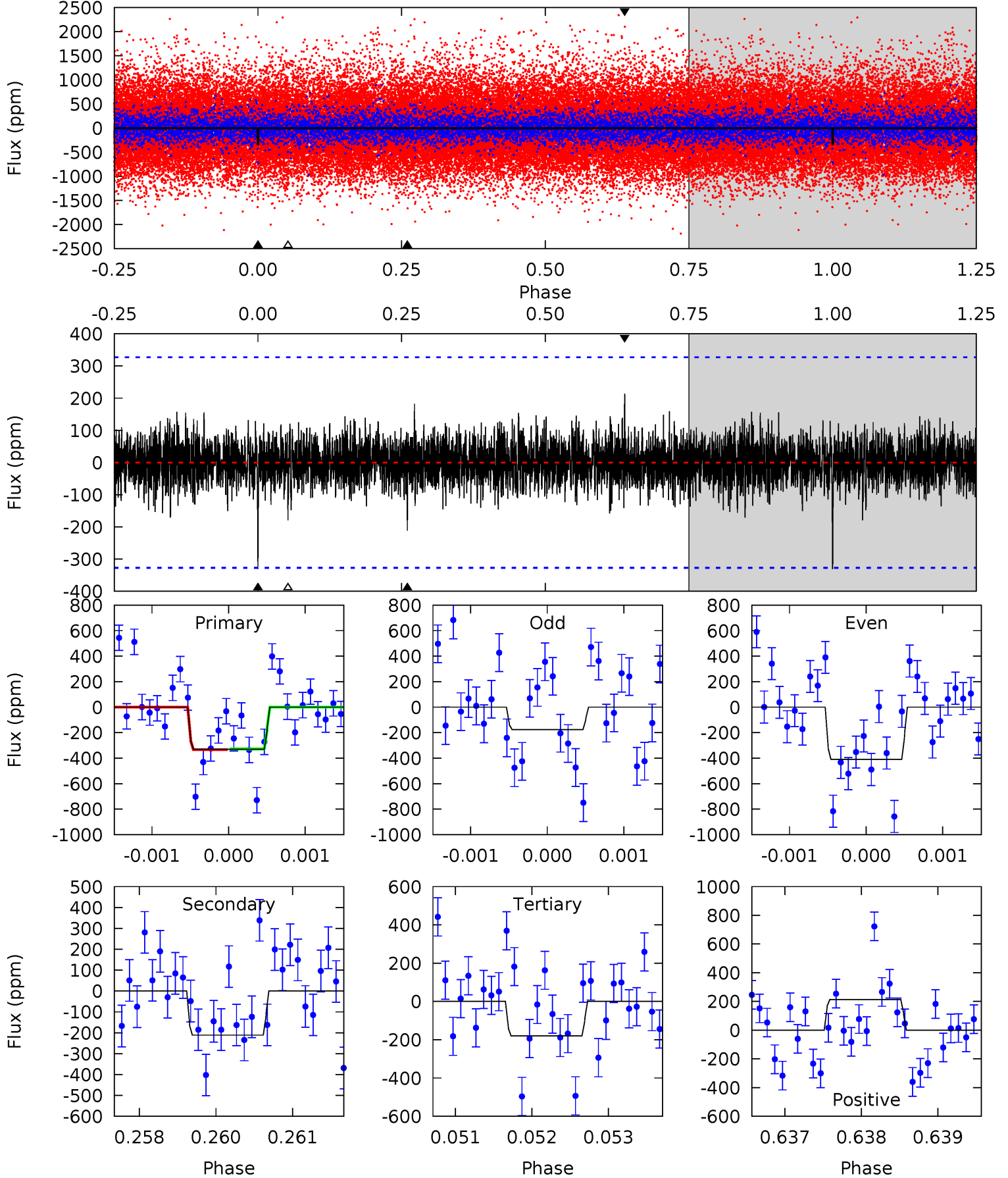
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.68	6.49	6.09	6.75	5.25	2.96	1.99	2.59	1.93	0.40	-0.26	1.68	1.08	0.44	0.98



# Alt Model-Shift Uniqueness Test

008414907-03,  $P = 353.888826$  Days,  $E = 24.305004$  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
5.44	3.48	2.95	3.52	5.39	3.19	0.78	2.49	1.92	0.52	-0.04	1.80	1.50	0.39	0.05





### Stellar Parameters For KIC 008414907

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5055^{+153}_{-138}$	$4.566^{+0.045}_{-0.060}$	$0.000^{+0.250}_{-0.300}$	$0.772^{+0.081}_{-0.066}$	$0.800^{+0.073}_{-0.066}$	$2.445^{+0.506}_{-0.544}$
	+3%/-3%	+1%/-1%	+inf%/-inf%	+10%/-9%	+9%/-8%	+21%/-22%
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 008414907-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-294 \pm 45$	$1.96^{+1.36}_{-1.17}$	$288^{+12}_{-10}$	$4487^{+2226}_{-758}$	$34737^{+175222}_{-22290}$
Alt.	$-211 \pm 61$	$1.81^{+1.24}_{-1.10}$	$289^{+11}_{-10}$	$4324^{+2252}_{-775}$	$27699^{+156831}_{-18311}$

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

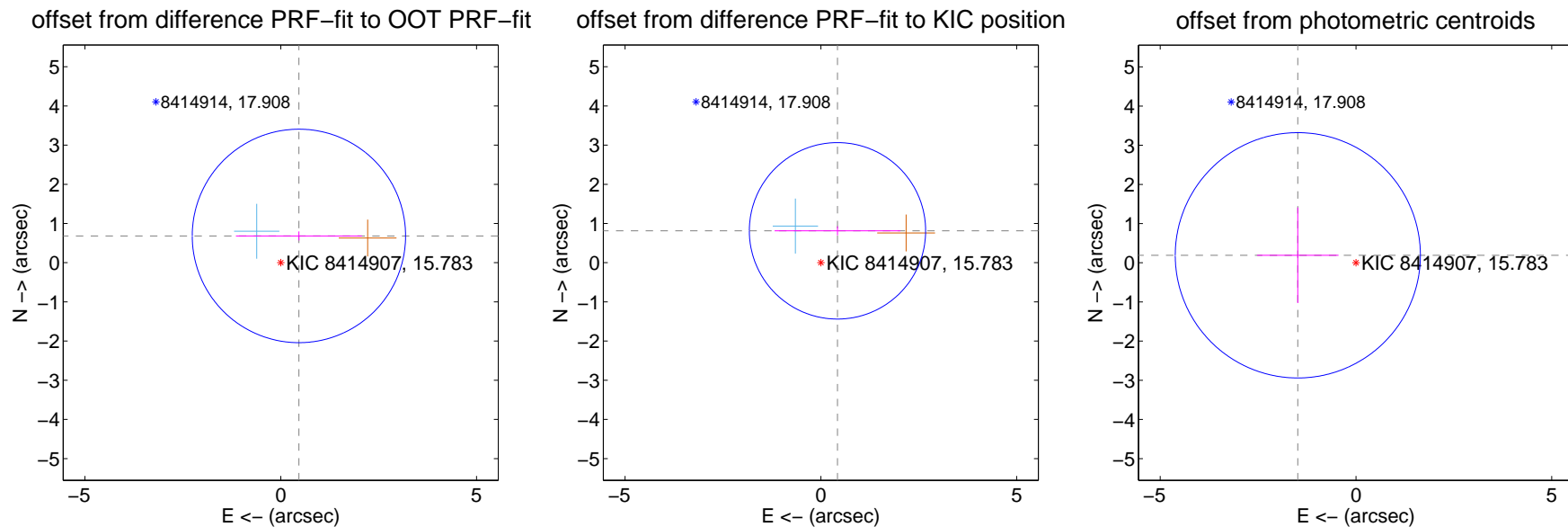
## DV Centroid Data

Supplemental centroid analysis for 008414907-03. Kepler magnitude: 15.78. Transit SNR 5.74

There are 1 quarters with good PRF difference image offsets

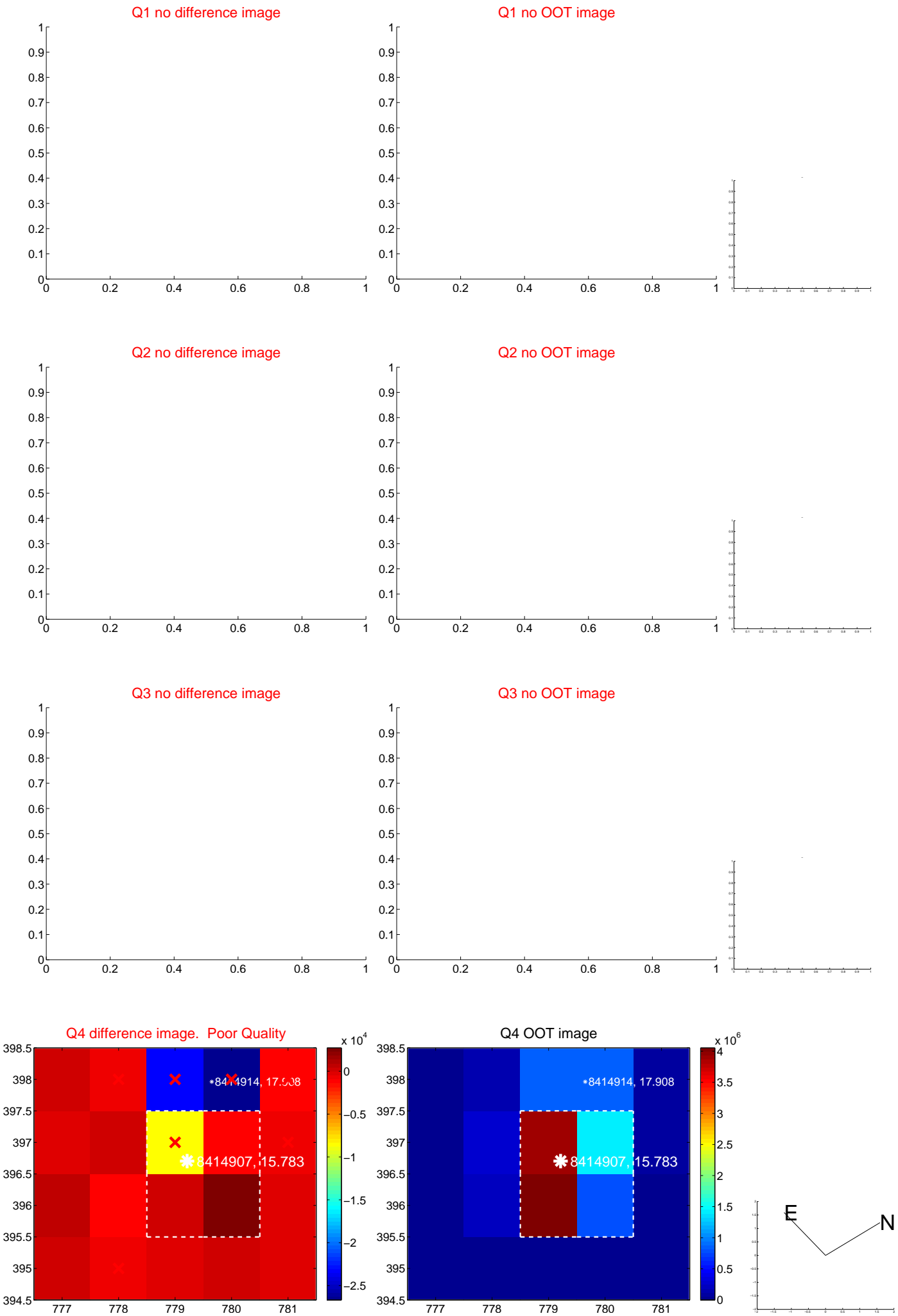
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.826 \pm 0.908$	0.91	$-0.464 \pm 1.608$	$0.683 \pm 0.115$
PRF-fit source offset from KIC position	$0.917 \pm 0.750$	1.22	$-0.424 \pm 1.606$	$0.813 \pm 0.116$
photometric centroid source offset	$1.50 \pm 1.04$	1.43	$1.49 \pm 1.04$	$0.19 \pm 1.22$



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.

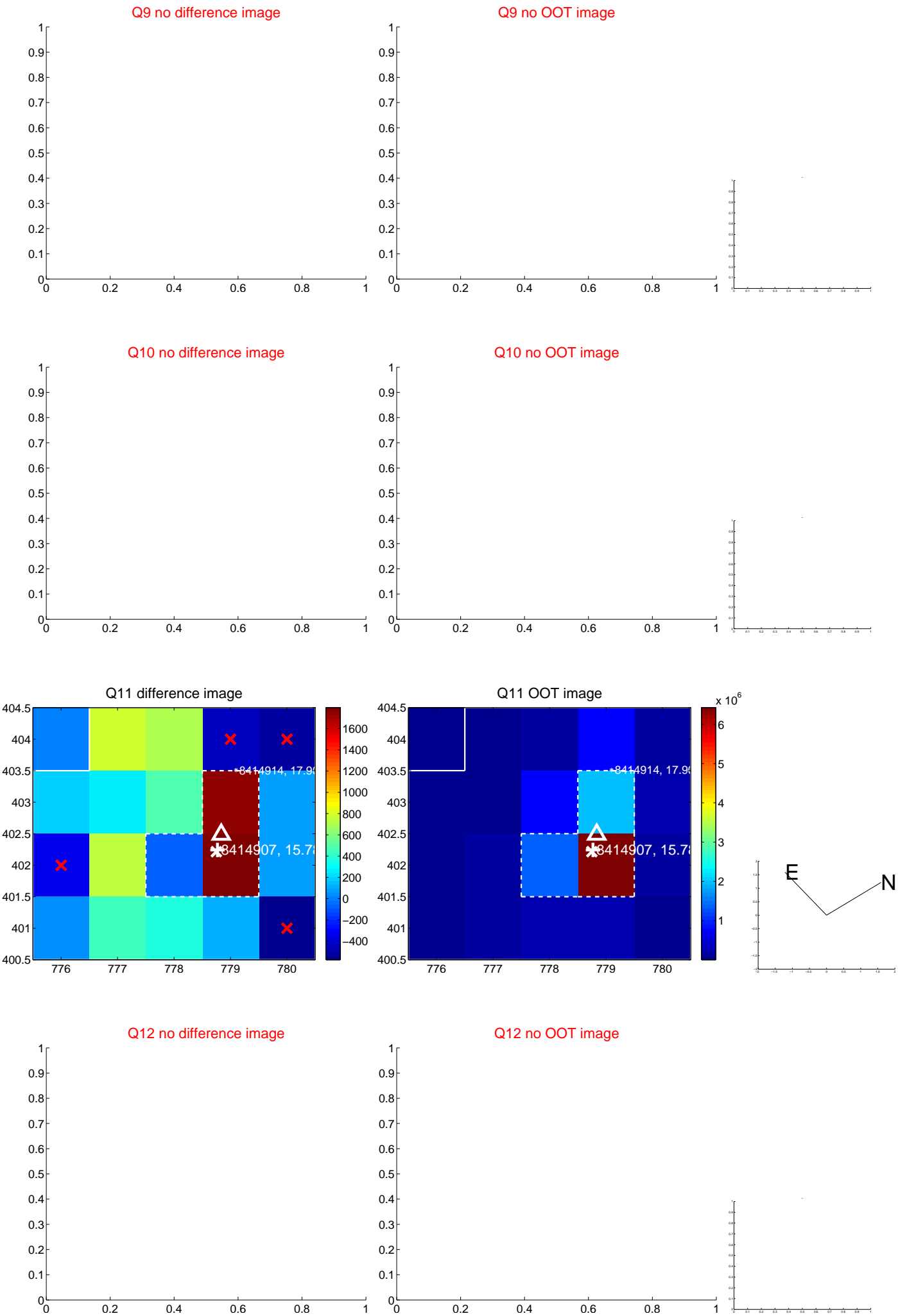
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



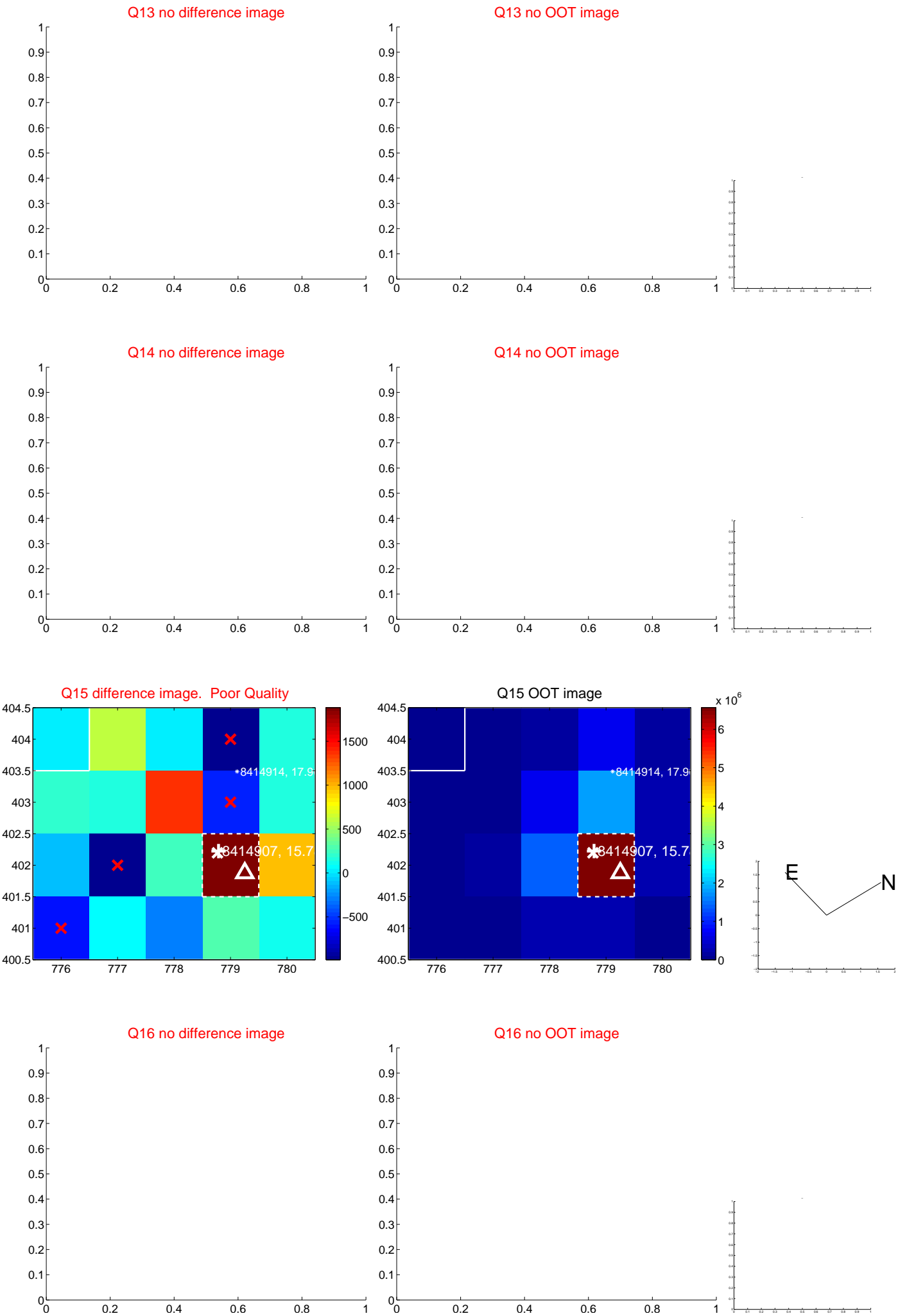
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



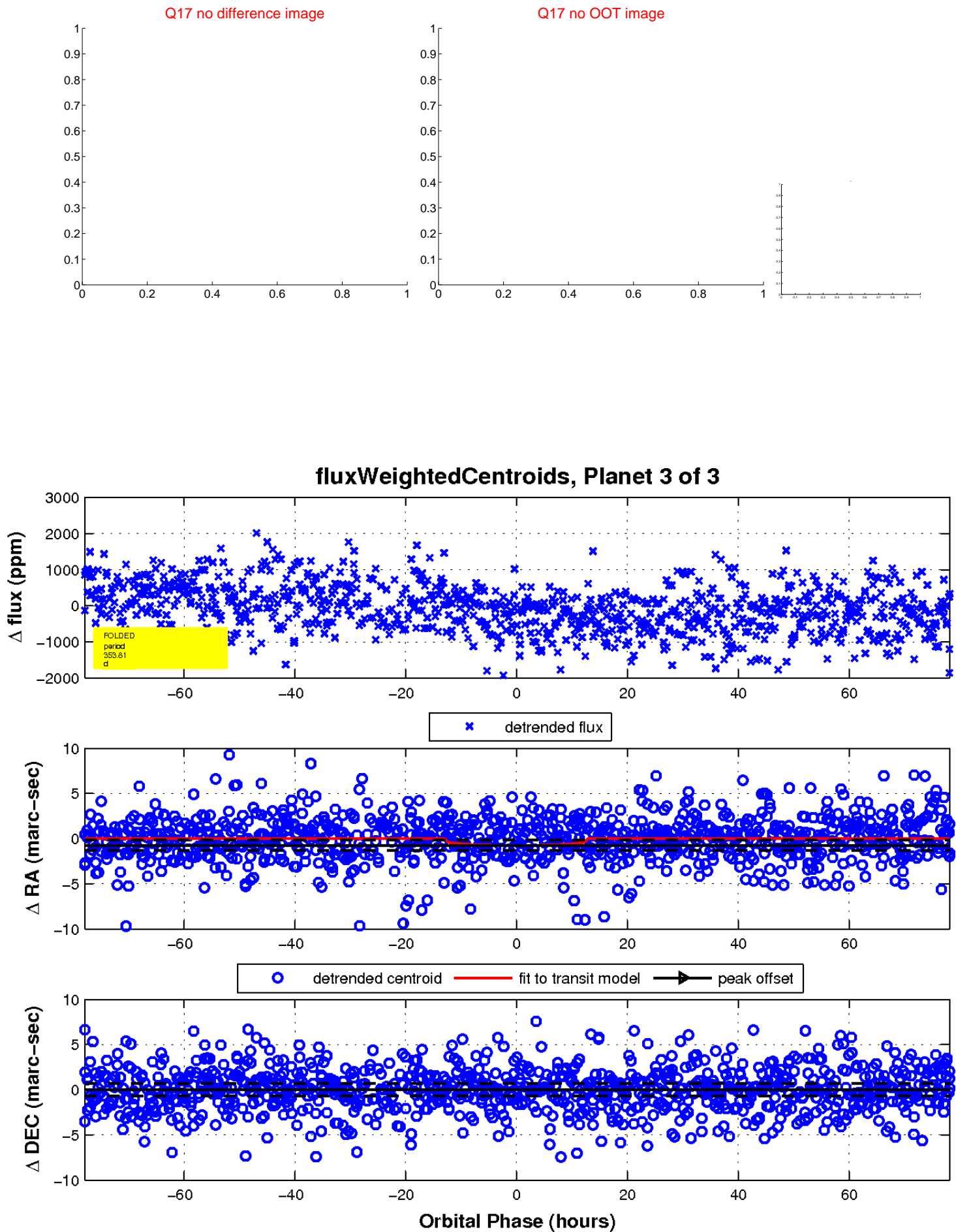
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



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# UKIRT Image

Declination

