

# KIC 009758615

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009758615-01	OBS	No	0.526153	132.039922	564.4	0.880	13.4	41.2	1.90	6969	4.88	33987.50
009758615-02	OBS	No	0.526151	131.811476	547.6	0.775	15.4	37.1	1.90	6969	5.25	33987.67
009758615-03	OBS	No	0.526149	131.654095	165.0	1.131	16.3	14.9	1.90	6969	2.62	33987.82

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009758615-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009758615-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—SAME_NTL_PERIOD
009758615-03	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD

**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 009758615-01

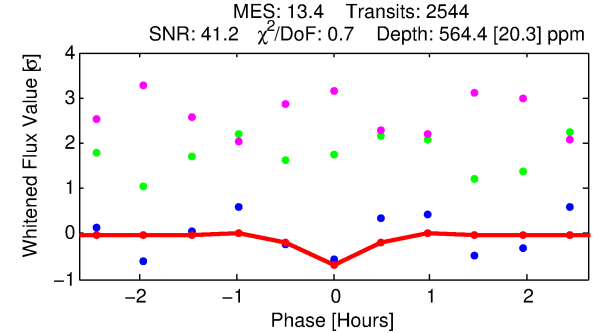
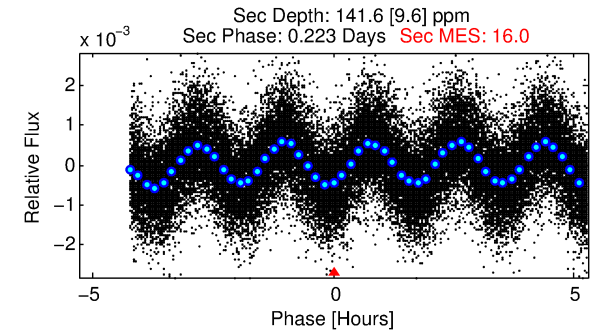
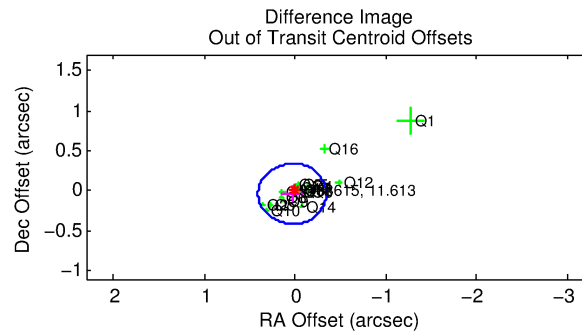
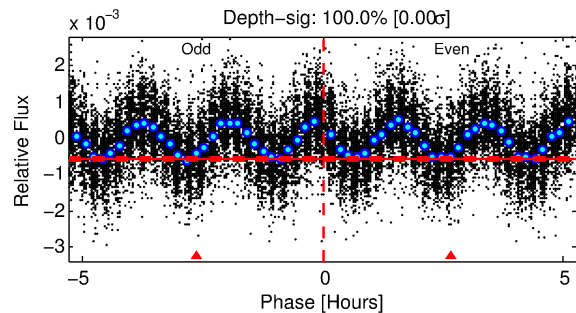
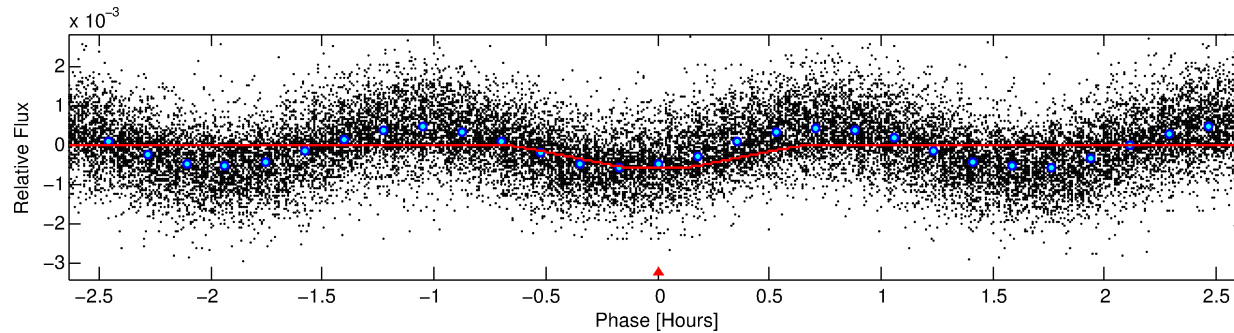
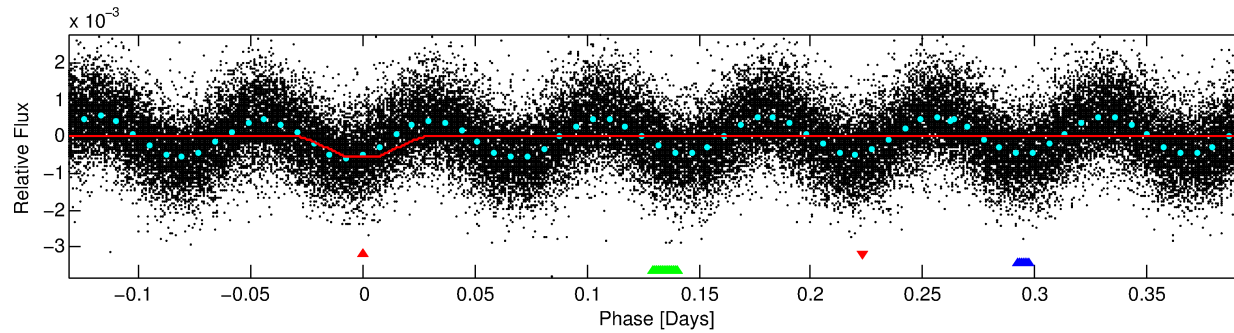
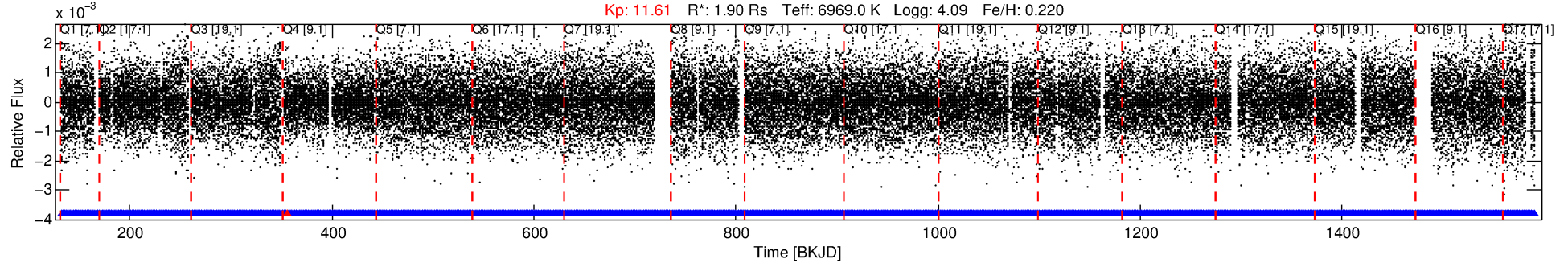
No Significant Match Found

# DV One-Page Summary

KIC: 9758615 Candidate: 1 of 3 Period: 0.526 d

KOI: K05709 Corr: No Ephemeris Match

Kp: 11.61 R\*: 1.90 Rs Teff: 6969.0 K Logg: 4.09 Fe/H: 0.220



## DV Fit Results:

Period = 0.52615 [0.00000] d  
Epoch = 132.0399 [0.0003] BKJD  
Rp/R\* = 0.0236 [0.0023]  
a/R\* = 3.51 [1.76]  
b = 0.70 [0.40]  
Seff = 33987.50 [13602.37]  
Teq = 3462 [346] K  
Rp = 4.87 [1.63] Re  
a = 0.0150 [0.0038] AU  
Ag = 0.73 [0.30] [-0.89σ]  
Teff = 4952 [335] K [3.09σ]

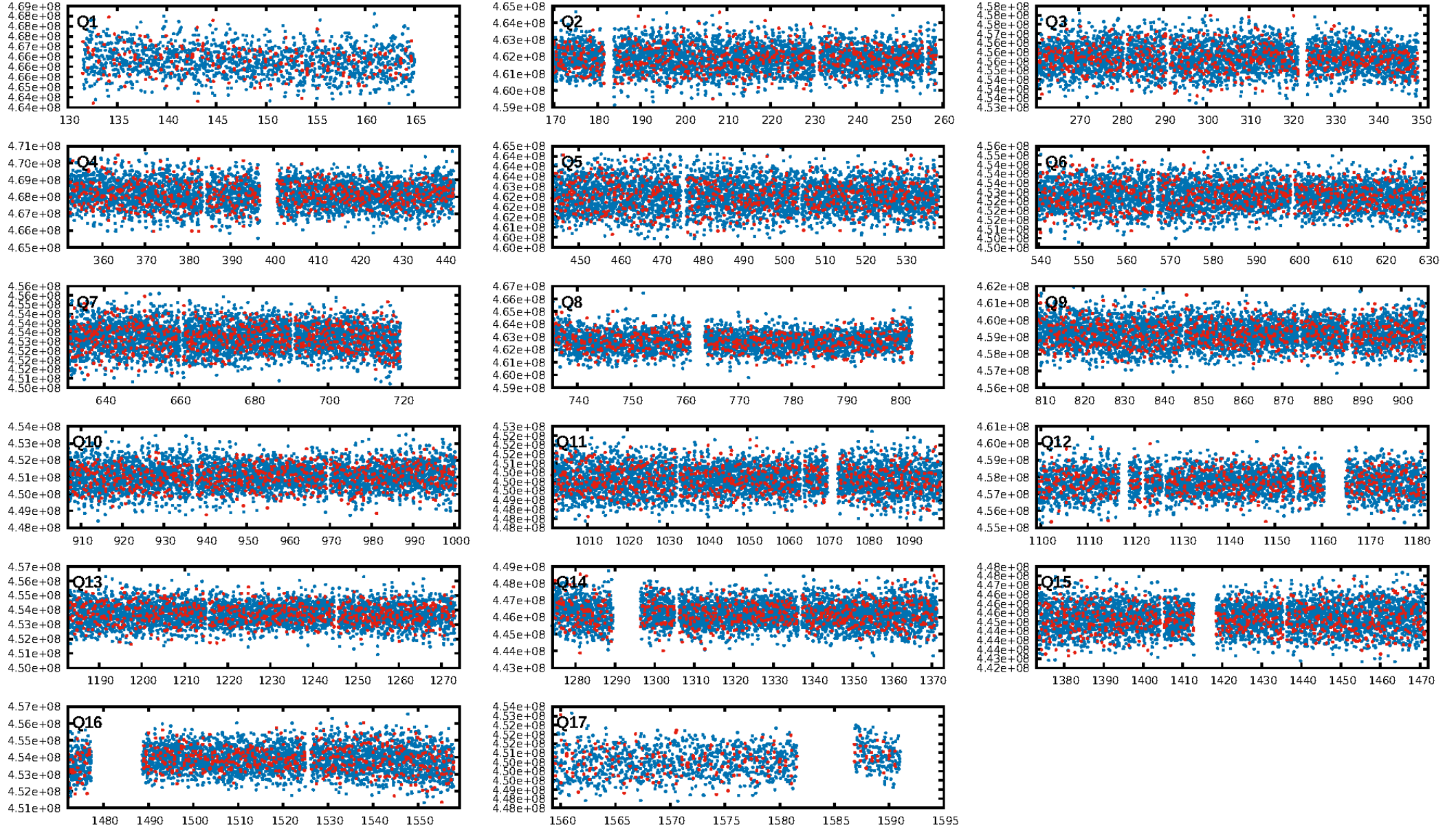
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 6.55e-175  
RollingBand-fgt: 1.00 [2428/2429]  
GhostDiagnostic-chr: 4.388  
Centroid-sig: 1.0%  
Centroid-so: 0.060 arcsec [3.16σ]  
OotOffset-rm: 0.050 arcsec [0.40σ]  
KicOffset-rm: 0.095 arcsec [0.77σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:30:00 Z

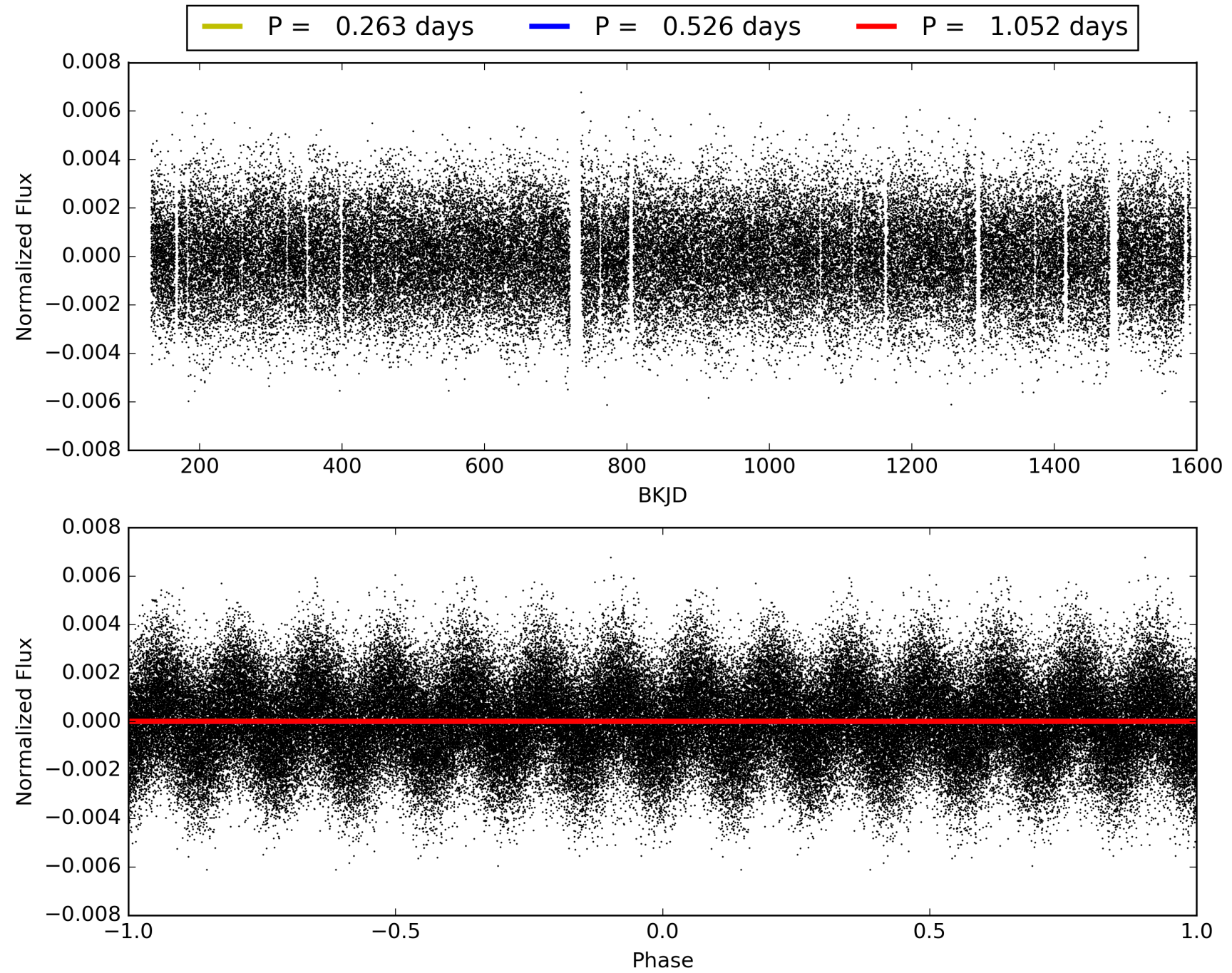
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 009758615-01, PDC Light Curves





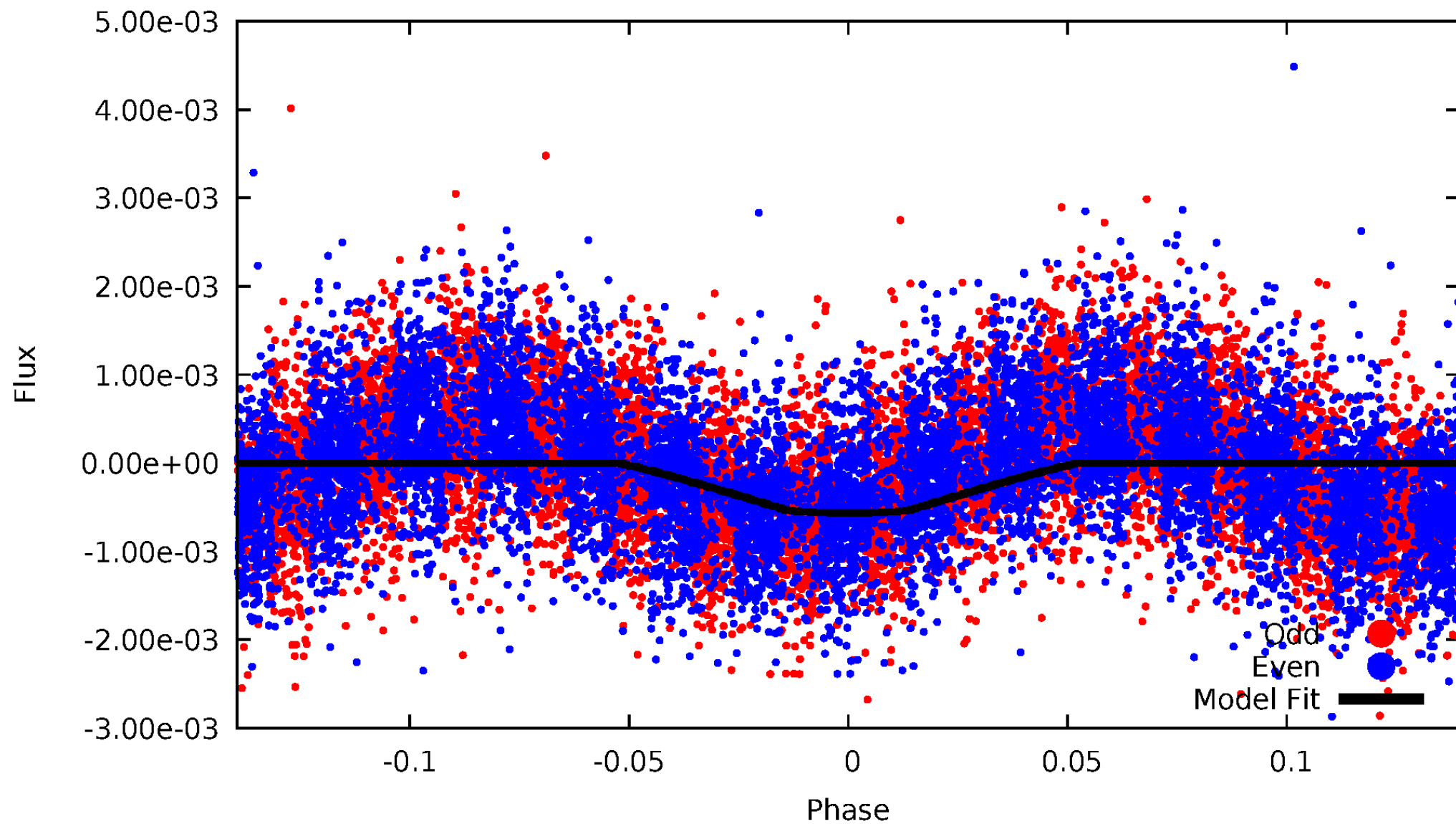
TCE 009758615-01





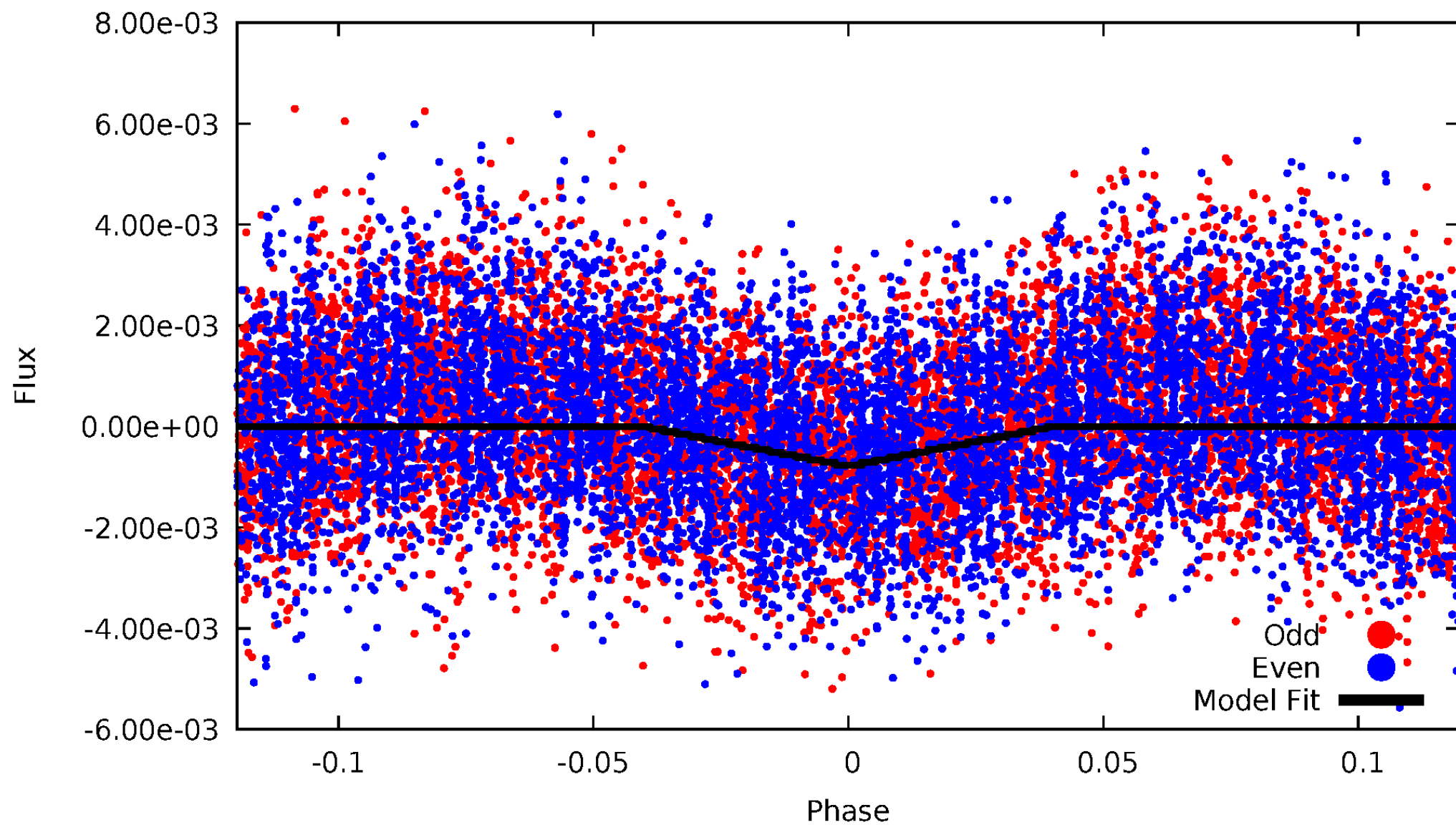
# DV Odd/Even

TCE 009758615-01

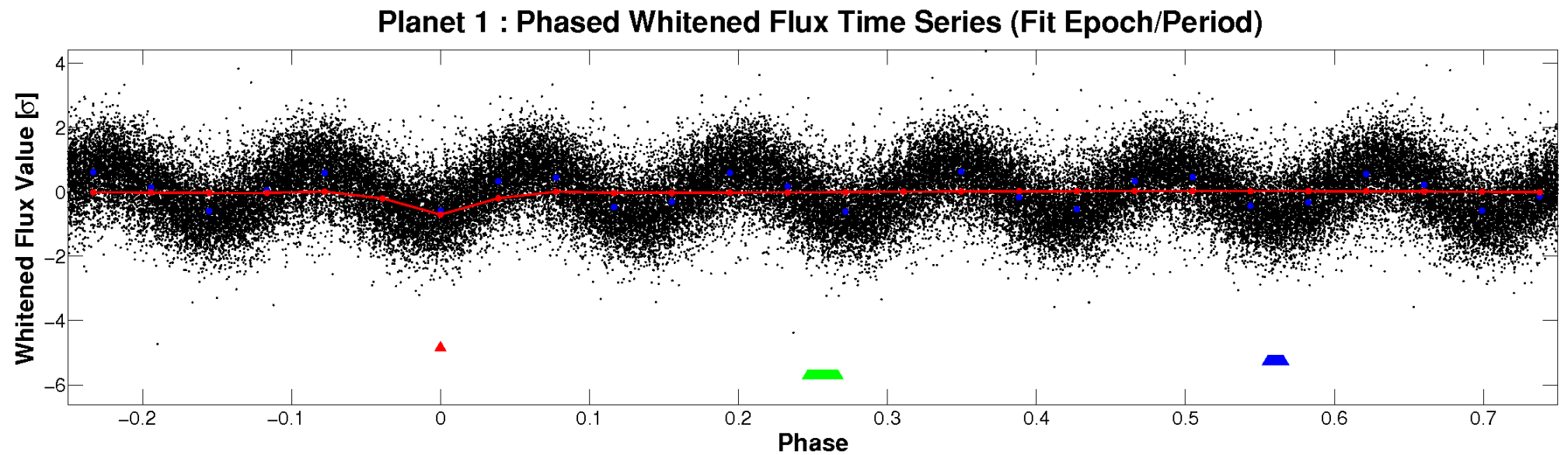
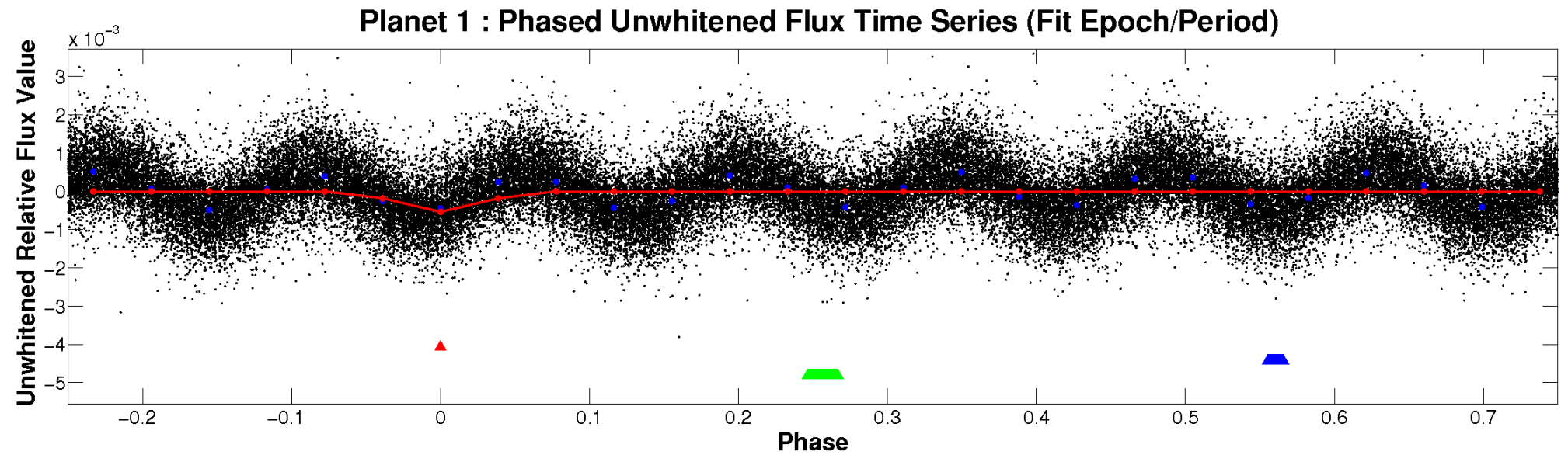


# ALT Odd/Even

TCE 009758615-01



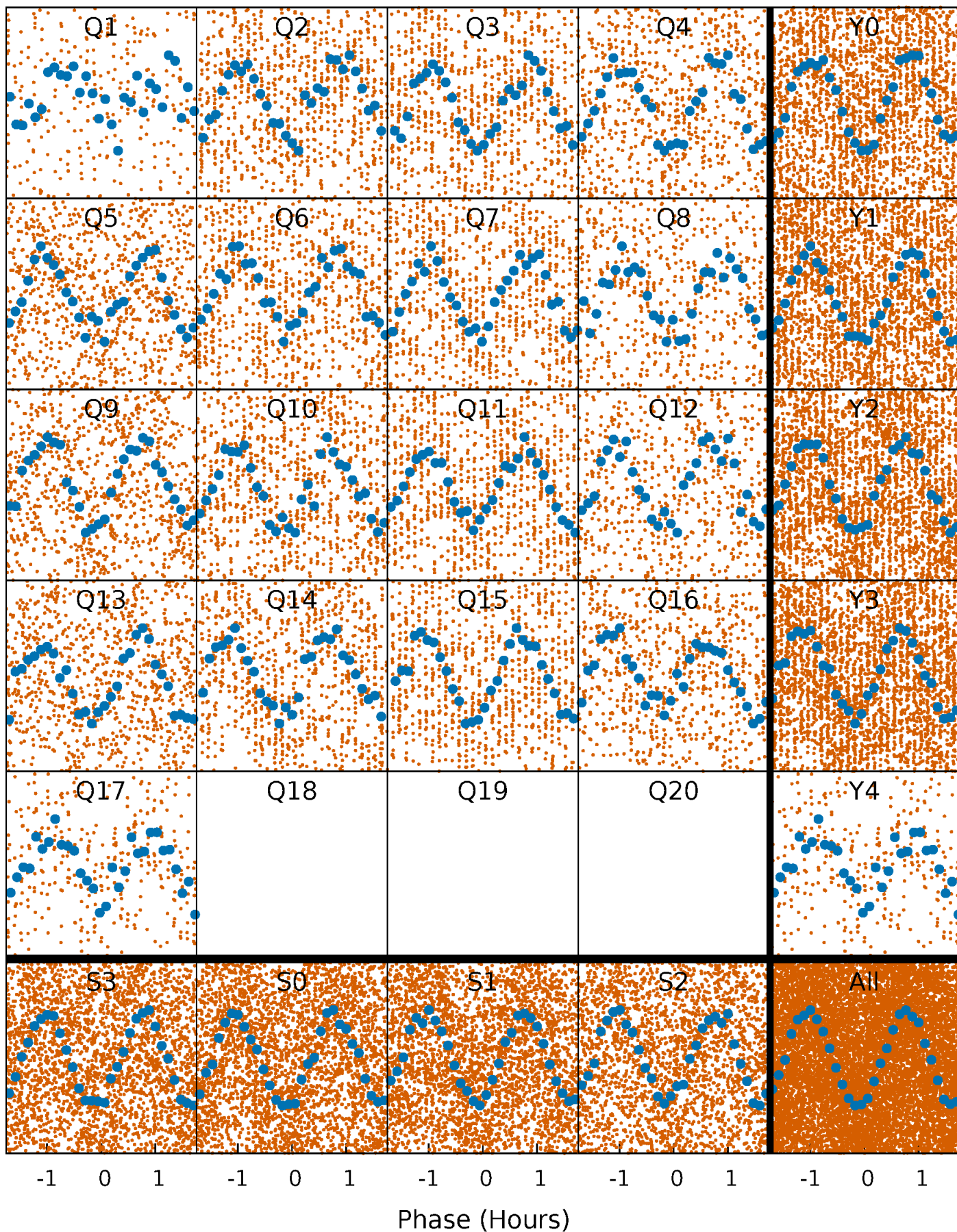
# Non-Whitened Vs. Whitened Light Curve





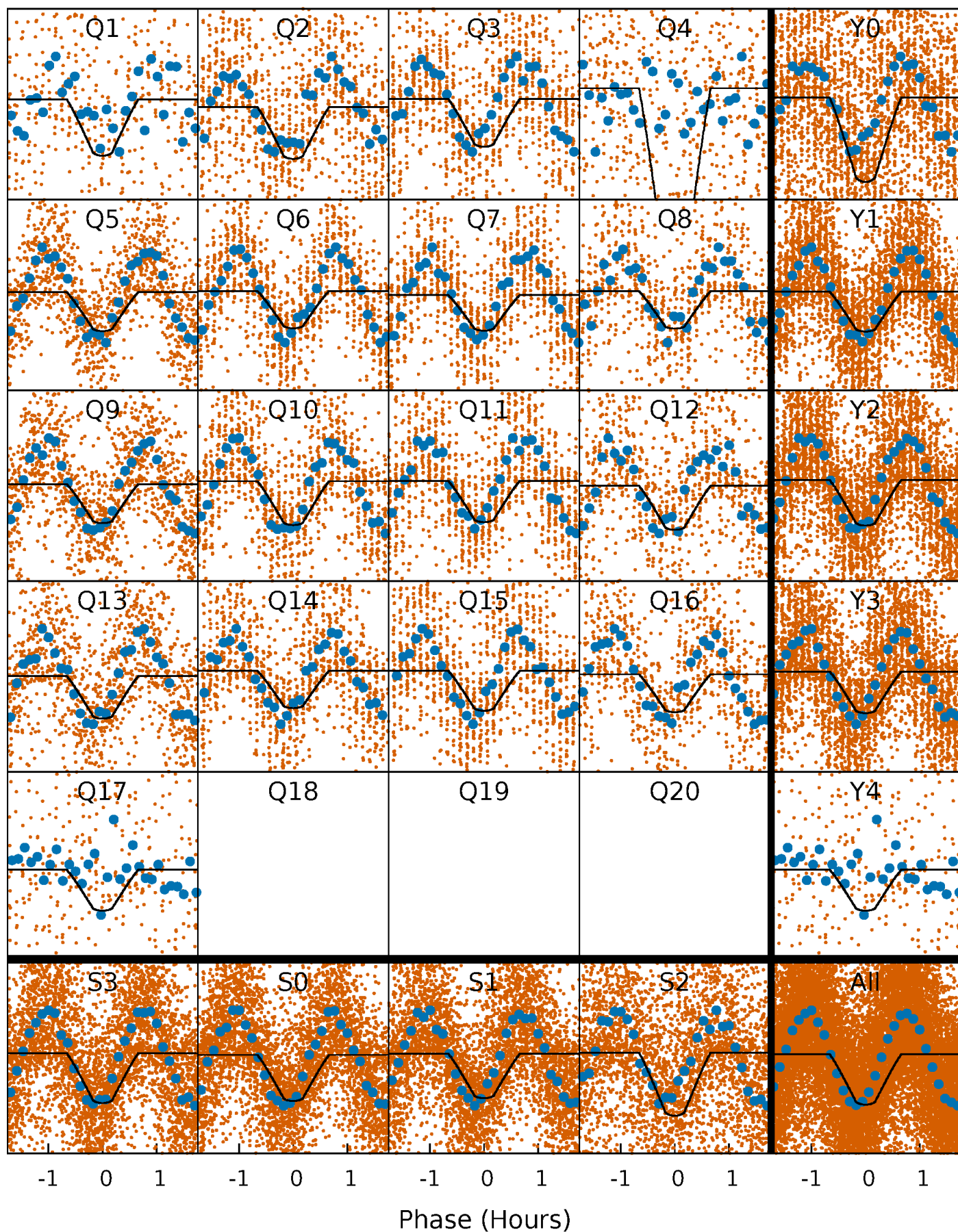
# PDC Quarter-Phased Transit Curves

TCE 009758615-01 P= 0.526153 Days  $T_0=132.039922$  (BKJD)



# DV Quarter-Phased Transit Curves

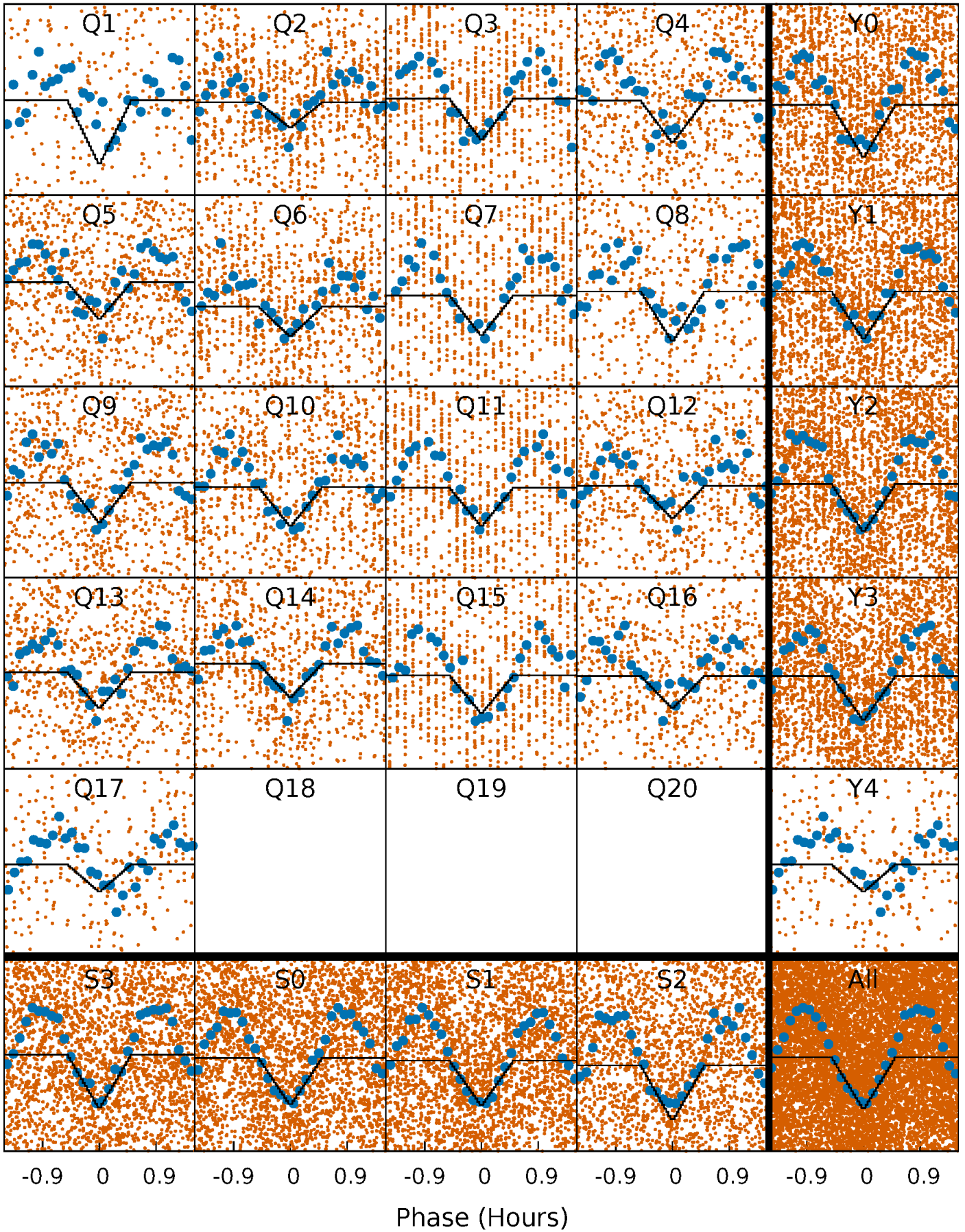
TCE 009758615-01 P= 0.526153 Days  $T_0=132.039922$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 009758615-01 P= 0.526149 Days  $T_0=132.041843$  (BKJD)

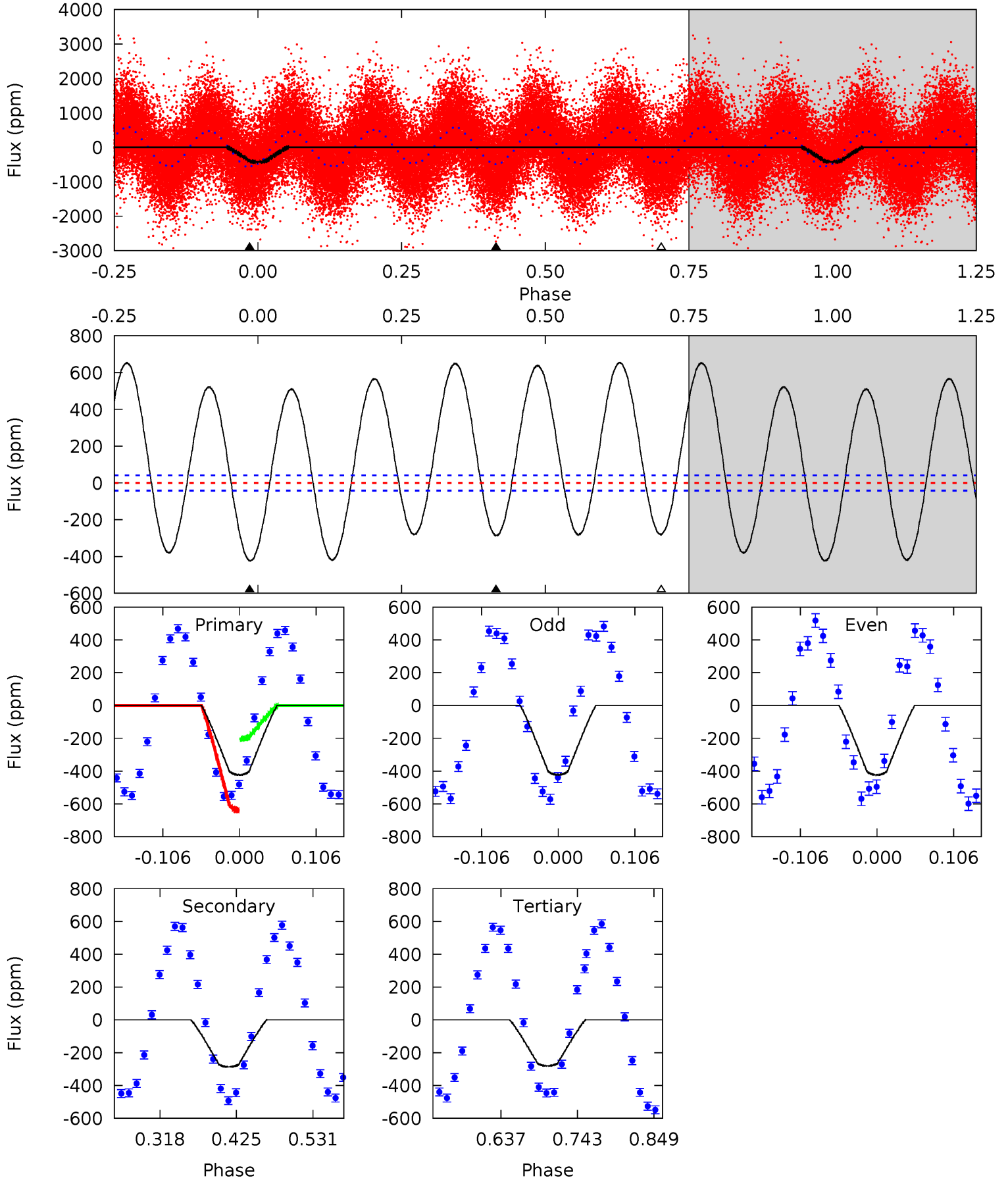




# DV Model-Shift Uniqueness Test

009758615-01, P = 0.526153 Days, E = 130.987616 Days

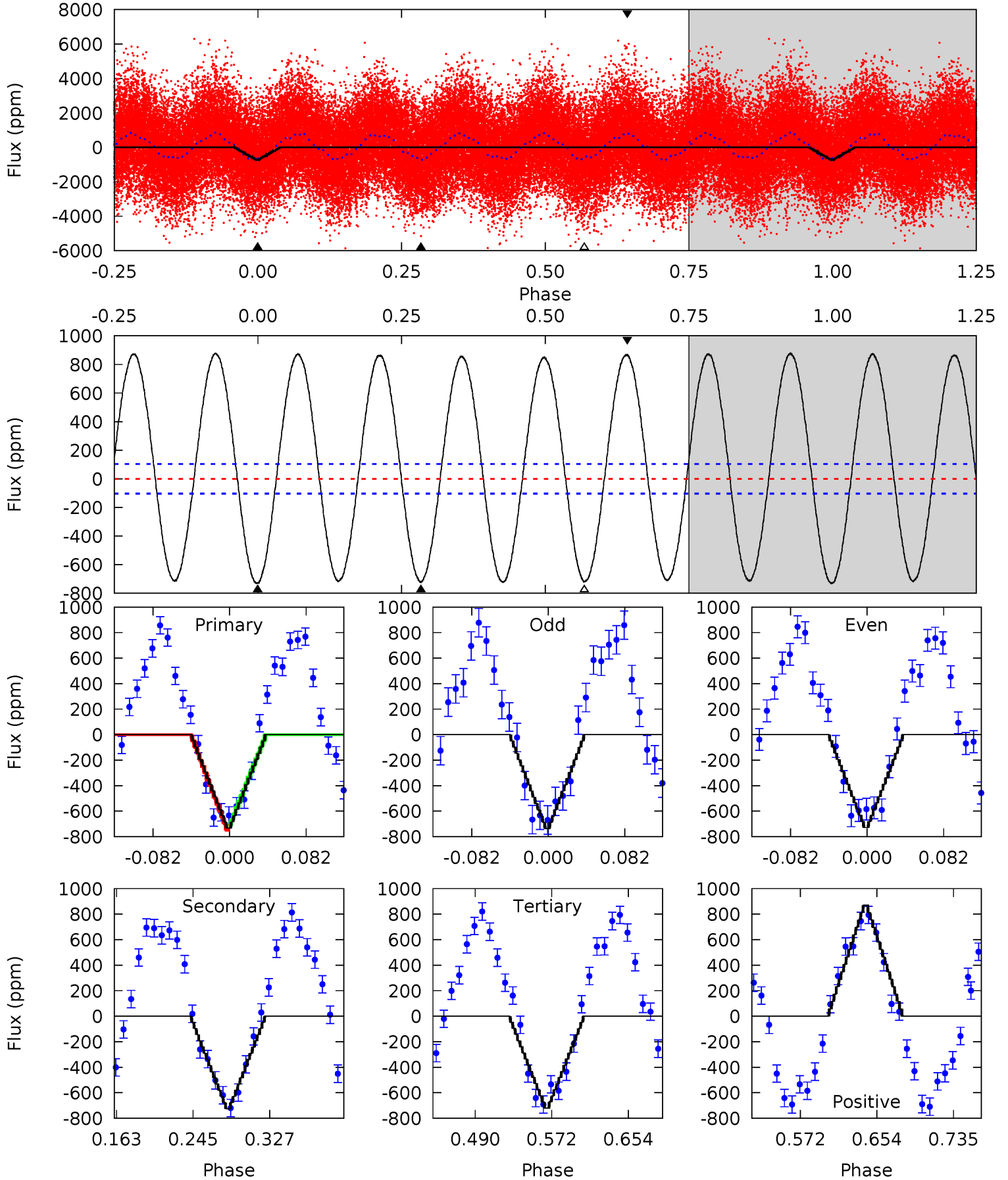
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
46.3	31.4	30.7	0	4.55	1.62	36.3	15.6	46.3	0.66	31.4	0.06	0.96	0.61	24.3



# Alt Model-Shift Uniqueness Test

009758615-01, P = 0.526149 Days, E = 130.989545 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
32.7	32.3	32.1	38.8	4.61	1.74	24.1	0.57	-6.15	0.23	-6.49	0.18	0.97	0.55	0.84



### Stellar Parameters For KIC 009758615

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6969^{+192}_{-312}$	$4.089^{+0.136}_{-0.187}$	$0.220^{+0.150}_{-0.350}$	$1.896^{+0.608}_{-0.406}$	$1.608^{+0.208}_{-0.277}$	$0.332^{+0.260}_{-0.168}$
	+3%/-4%	+3%/-5%	+68%/-159%	+32%/-21%	+13%/-17%	+78%/-50%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 009758615-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-286 \pm 9$	$4.93^{+0.79}_{-0.75}$	$4846^{+359}_{-317}$	$5520^{+380}_{-343}$	$1.435^{+0.512}_{-0.363}$
Alt.	$-725 \pm 22$	$5.69^{+1.09}_{-0.79}$	$4824^{+374}_{-323}$	$6599^{+443}_{-360}$	$2.711^{+0.873}_{-0.762}$

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



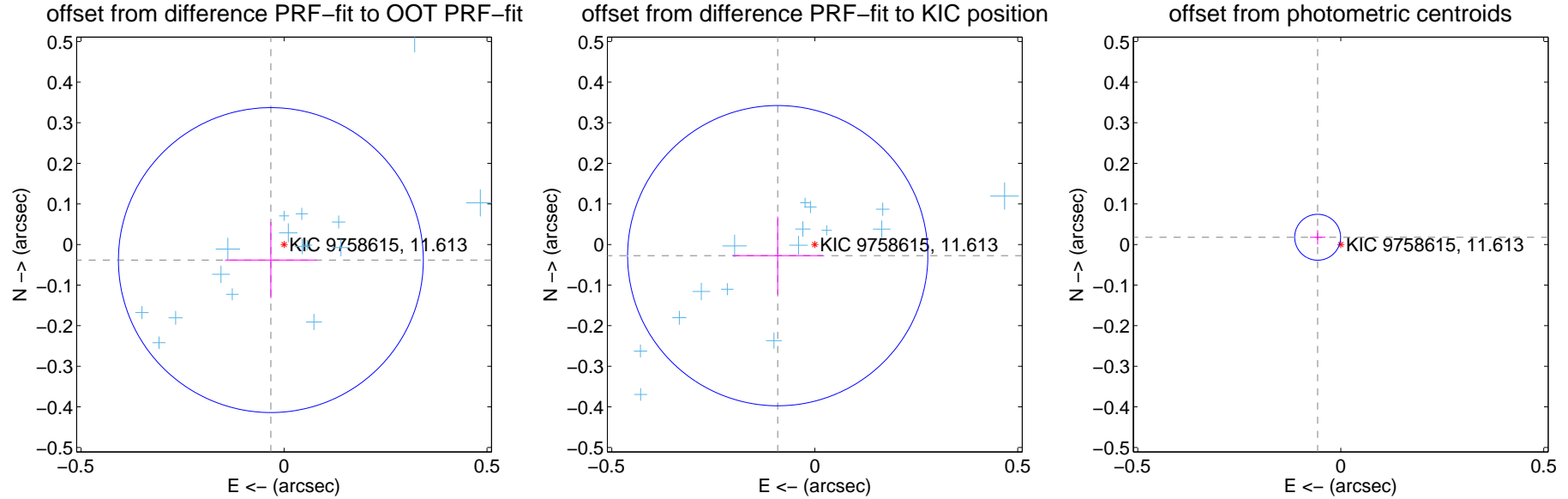
## DV Centroid Data

Supplemental centroid analysis for 009758615-01. **Kepler magnitude: 11.61.** Transit SNR 41.16

There are 17 quarters with good PRF difference image offsets

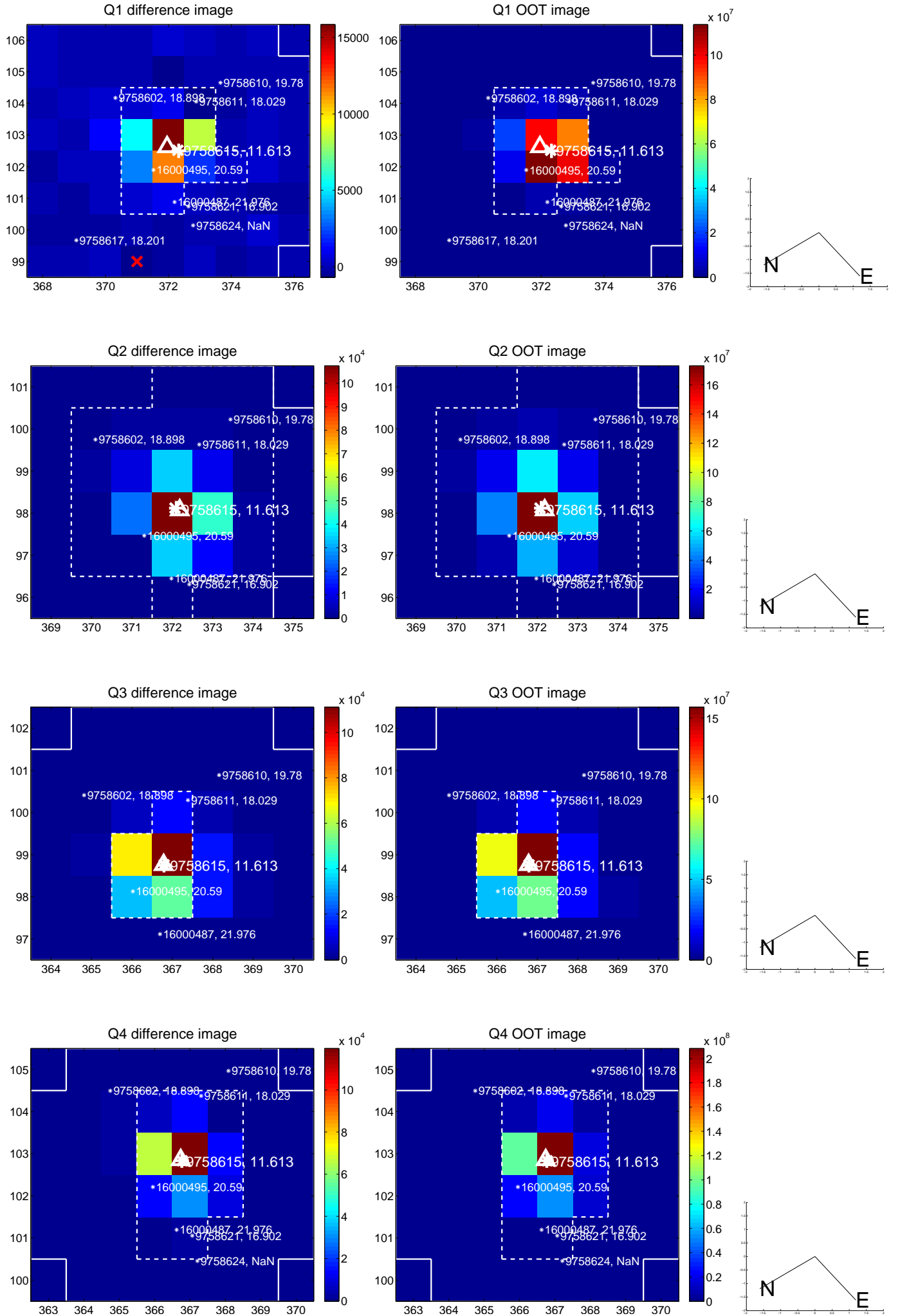
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.050 \pm 0.125$	0.40	$0.032 \pm 0.113$	$-0.038 \pm 0.094$
PRF-fit source offset from KIC position	$0.095 \pm 0.123$	0.77	$0.091 \pm 0.111$	$-0.027 \pm 0.096$
photometric centroid source offset	<b><math>0.06 \pm 0.02</math></b>	<b>3.16</b>	$0.06 \pm 0.02$	$0.02 \pm 0.02$

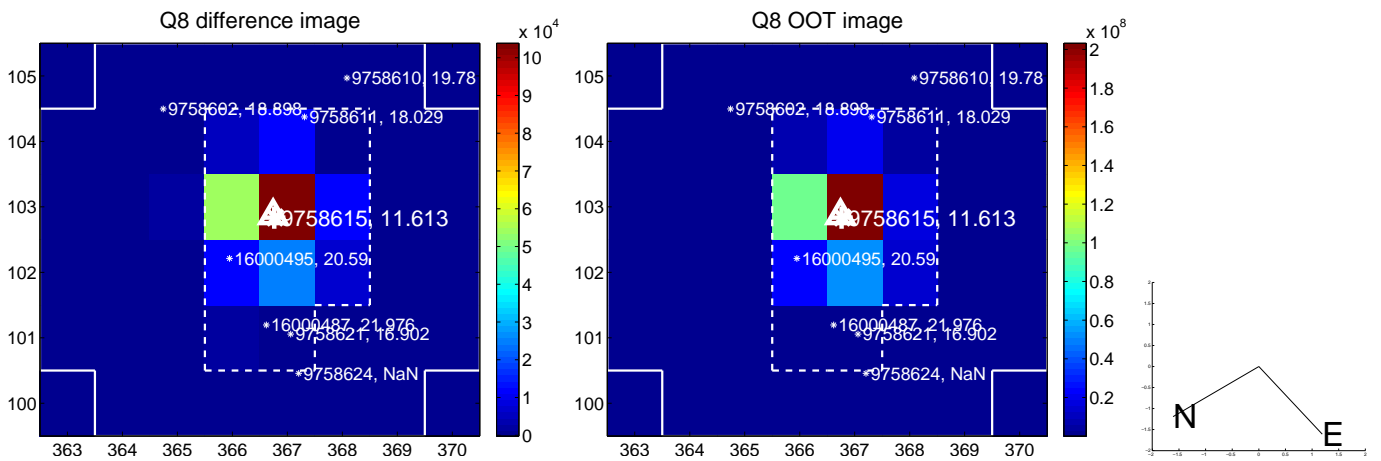
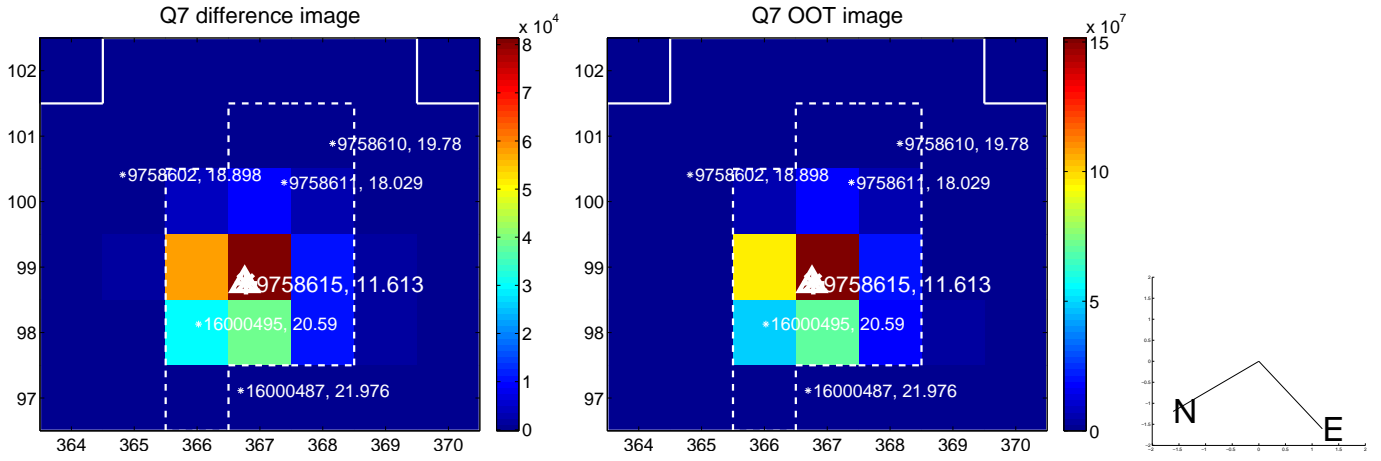
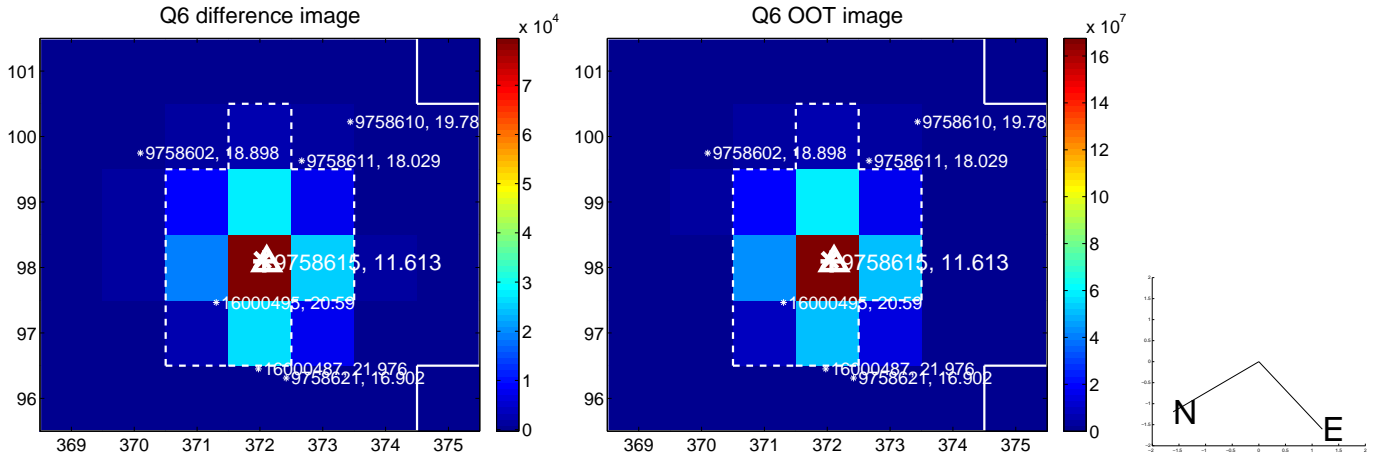
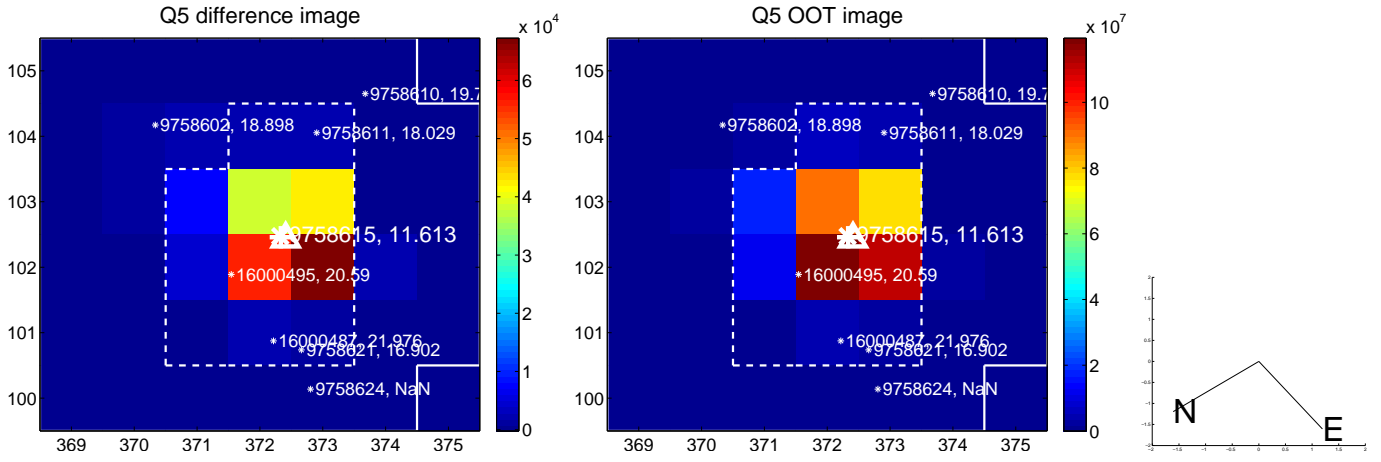


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

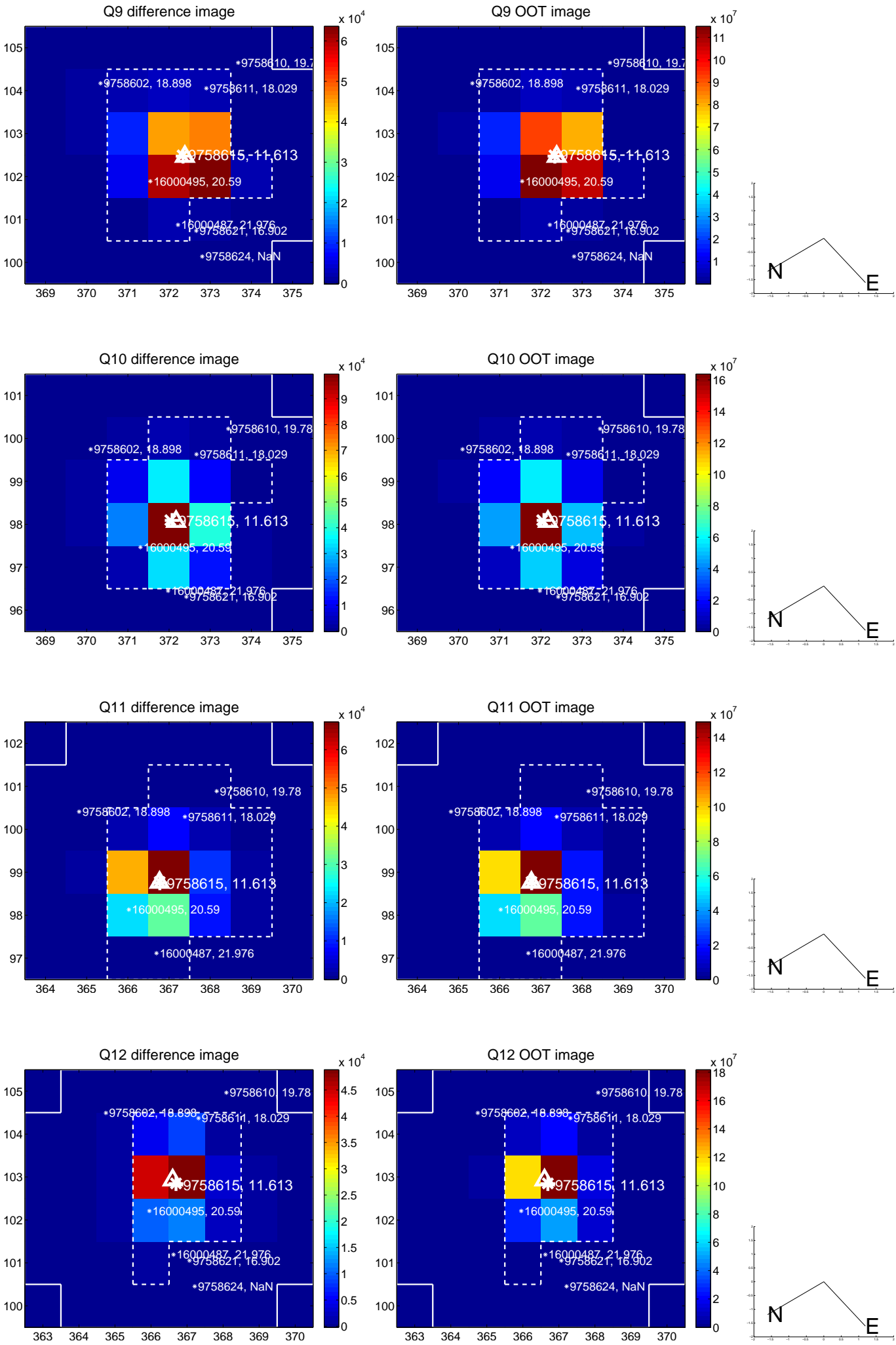


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

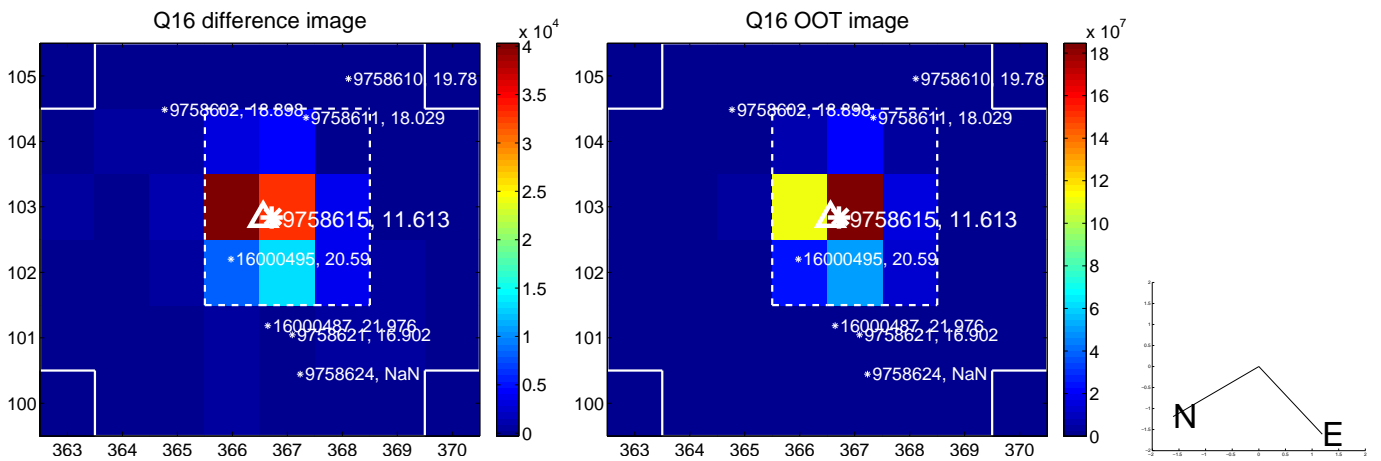
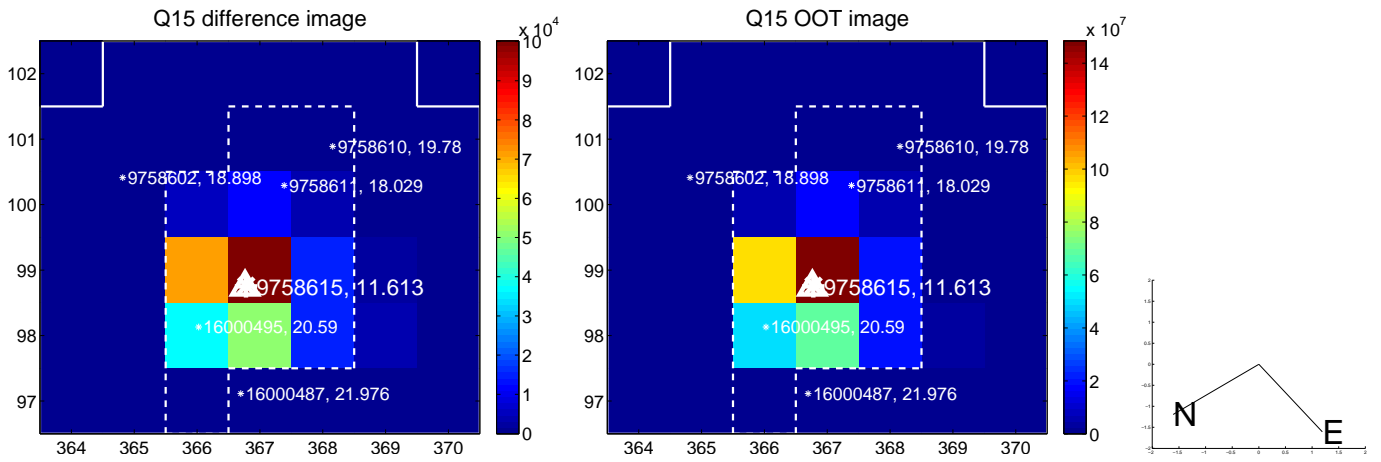
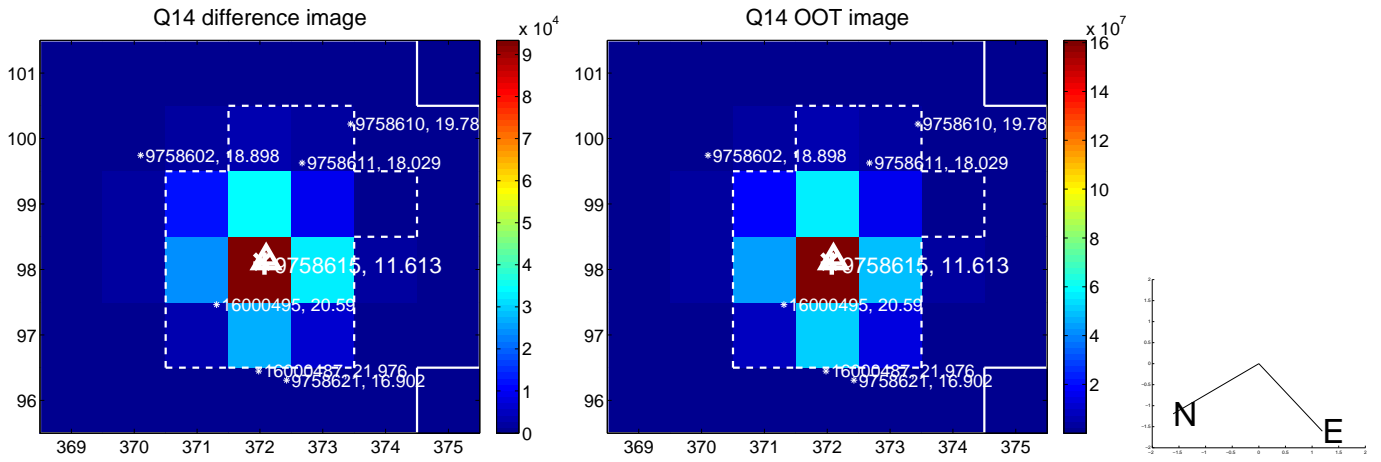
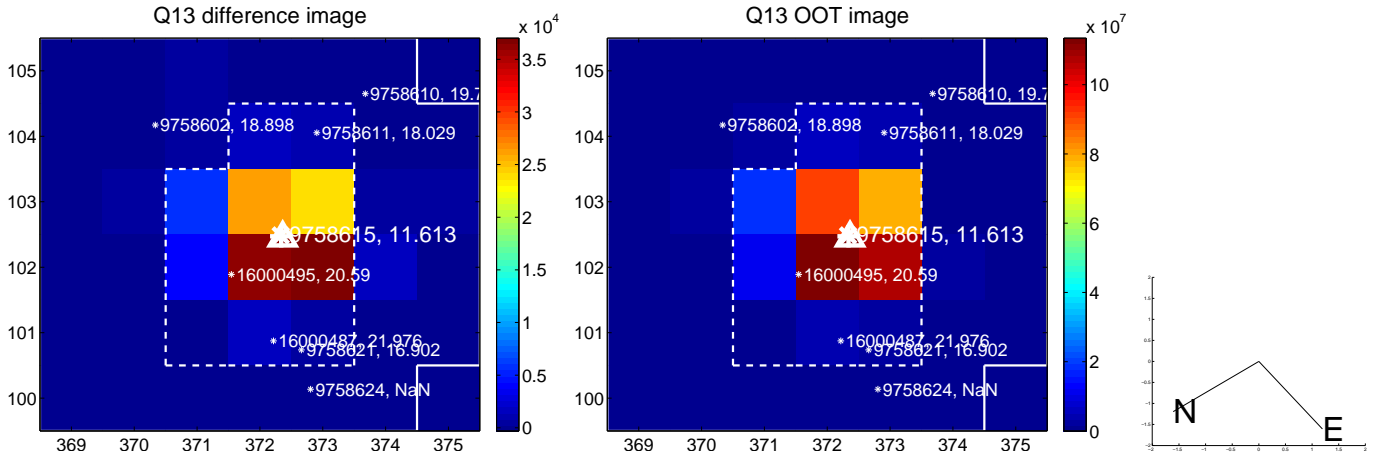




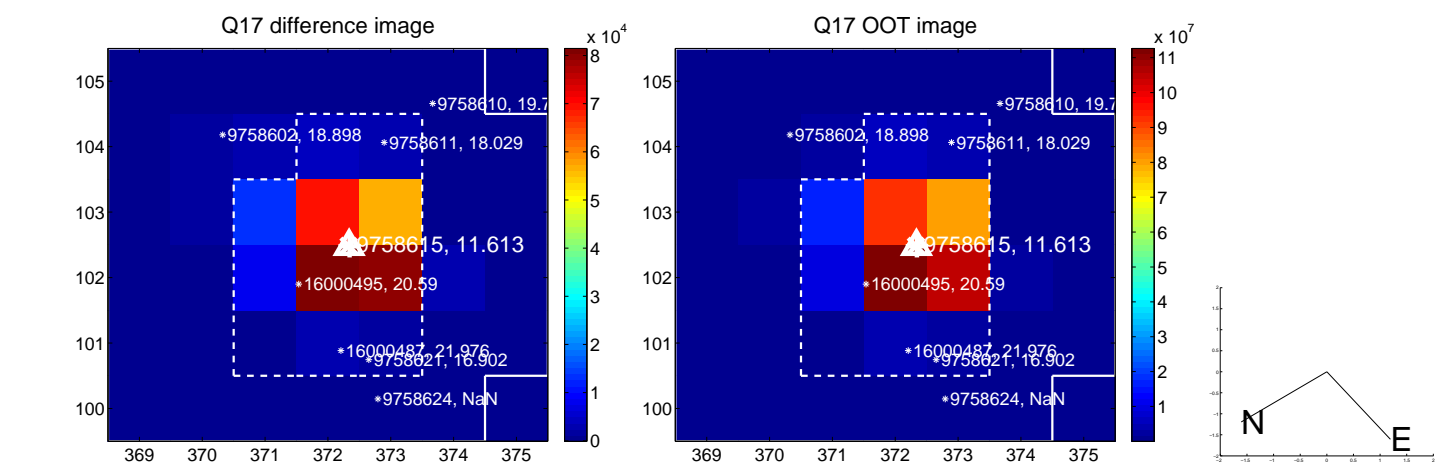
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



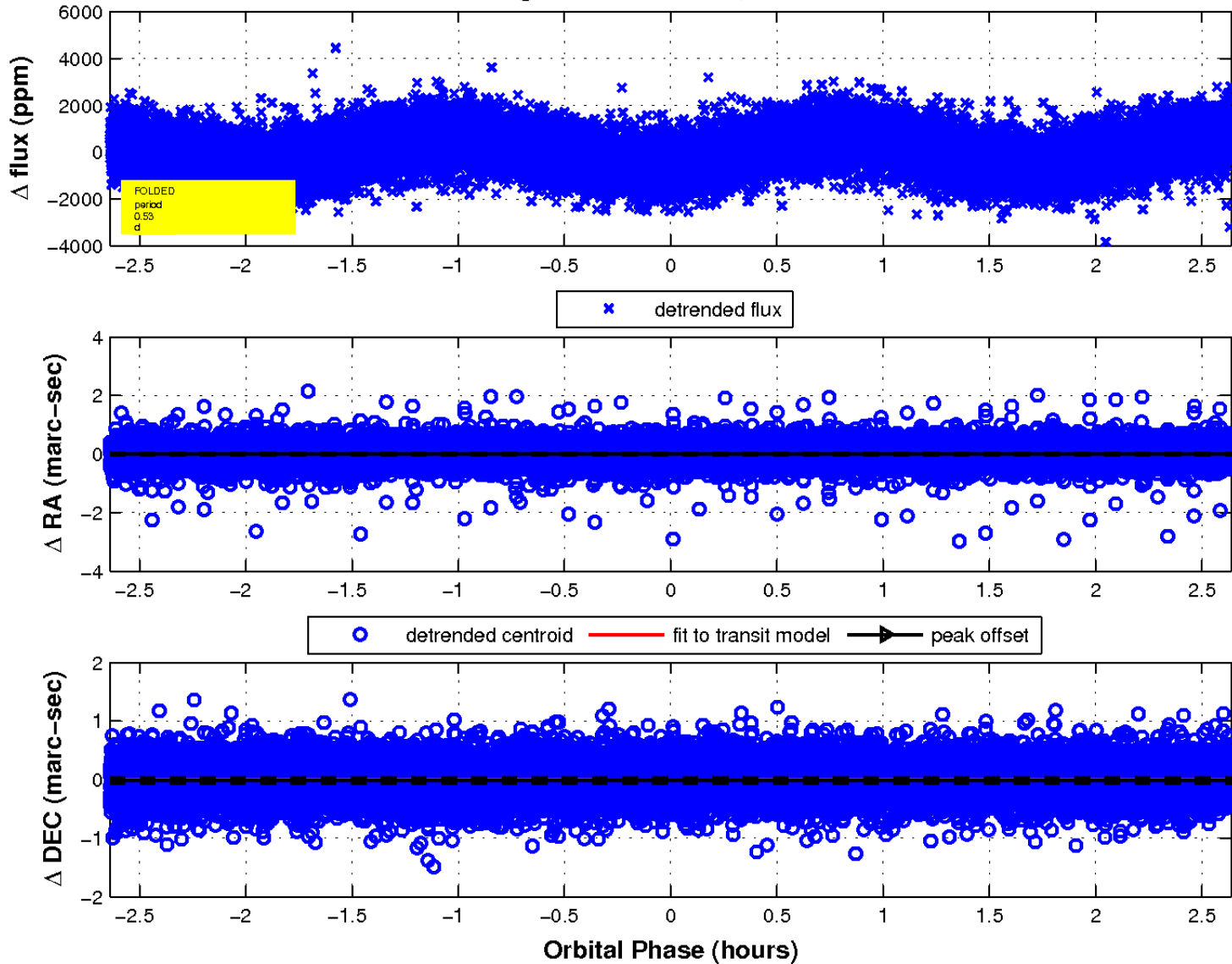
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

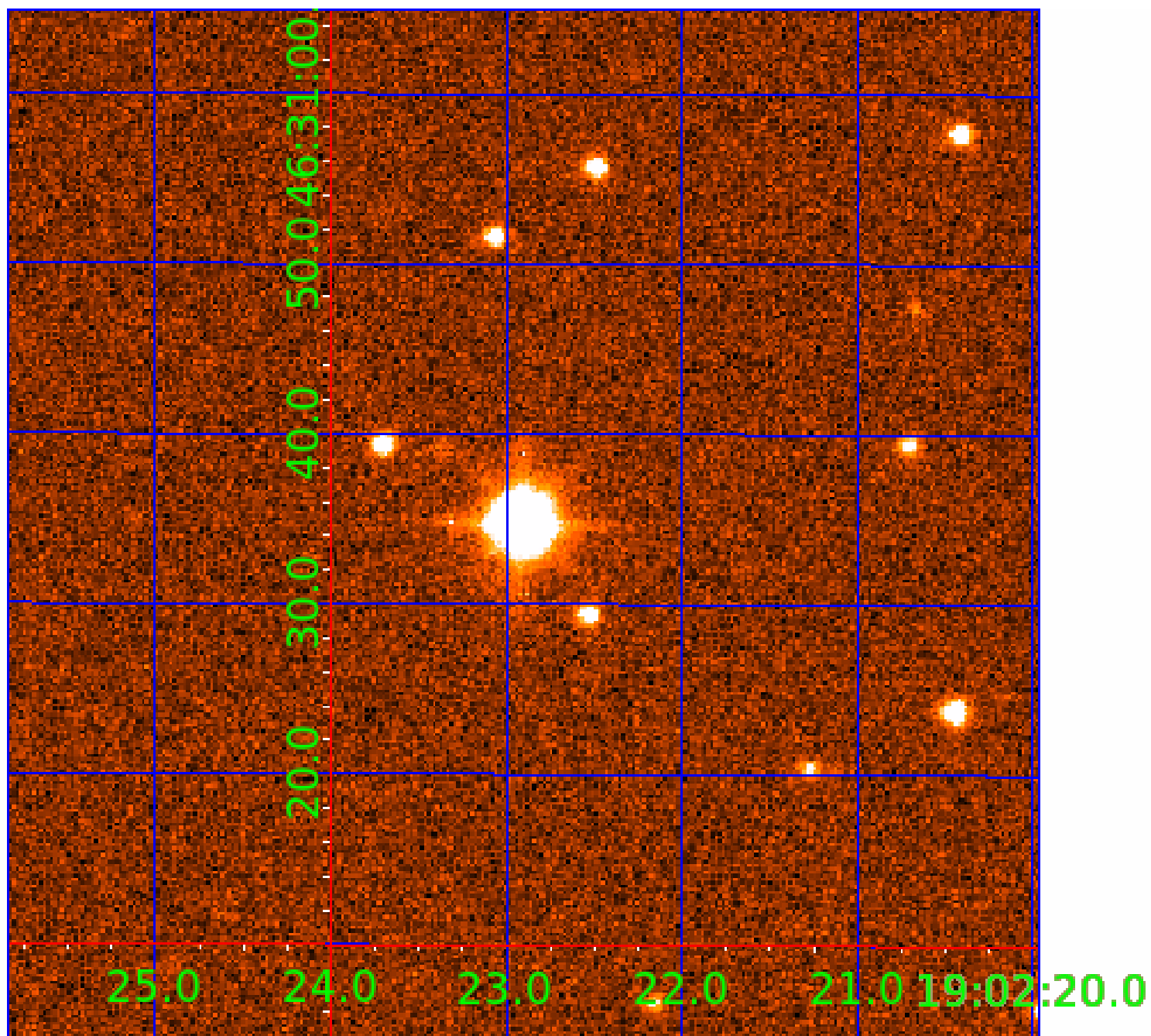


fluxWeightedCentroids, Planet 1 of 3



UKIRT Image

Declination





# KIC 009758615

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009758615-01	OBS	No	0.526153	132.039922	564.4	0.880	13.4	41.2	1.90	6969	4.88	33987.50
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009758615-03	OBS	No	0.526149	131.654095	165.0	1.131	16.3	14.9	1.90	6969	2.62	33987.82

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009758615-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009758615-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—SAME_NTL_PERIOD
009758615-03	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD

**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.

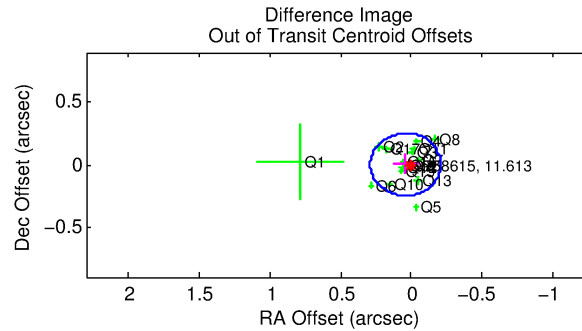
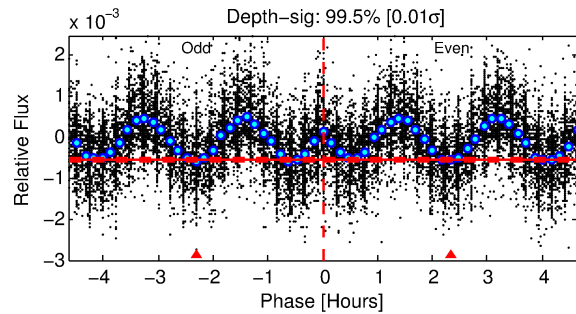
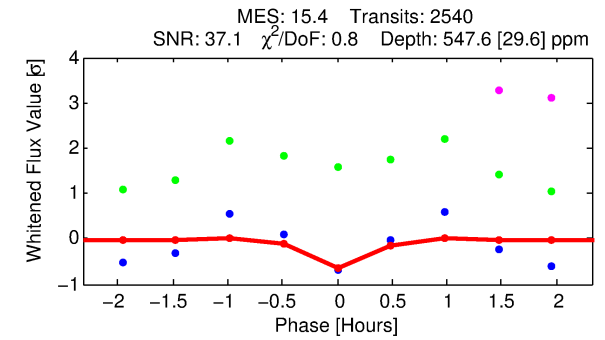
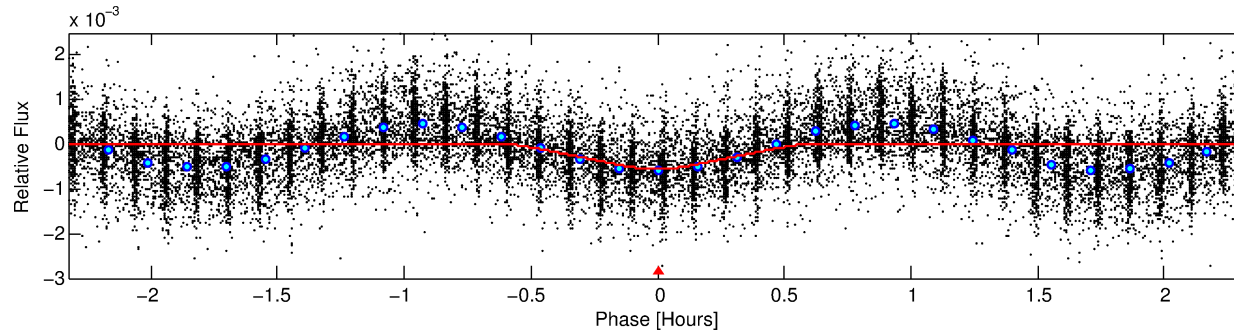
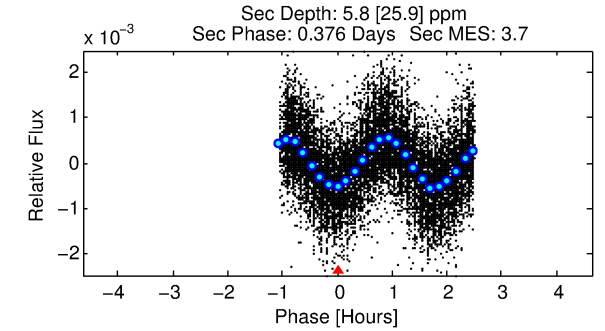
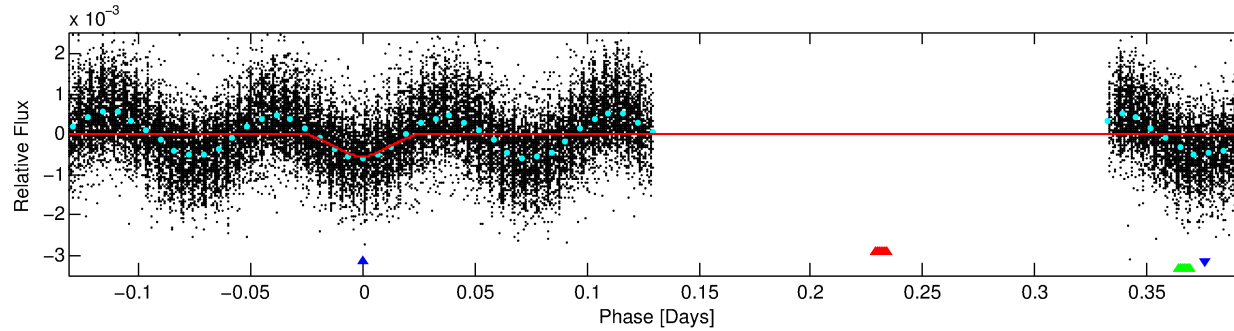
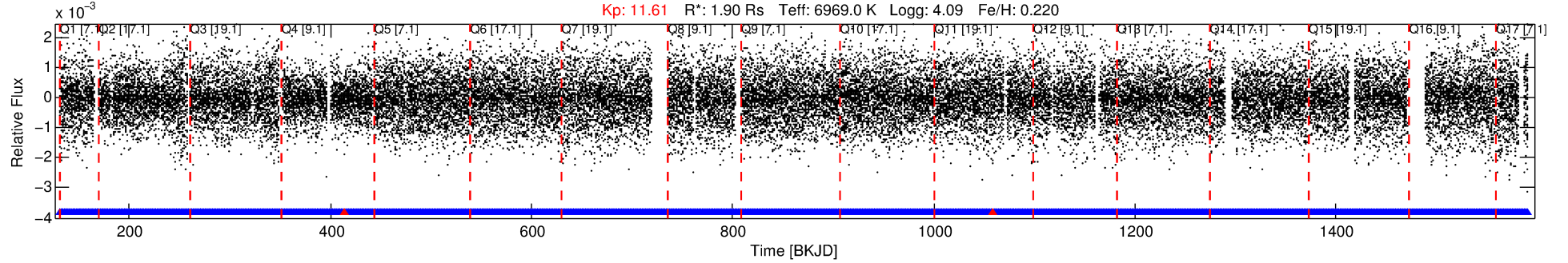
## Ephemeris Match Information For 009758615-02

No Significant Match Found

# DV One-Page Summary

KIC: 9758615 Candidate: 2 of 3 Period: 0.526 d  
KOI: K05709 Corr: No Ephemeris Match

Kp: 11.61 R\*: 1.90 Rs Teff: 6969.0 K Logg: 4.09 Fe/H: 0.220



## DV Fit Results:

Period = 0.52615 [0.00000] d  
Epoch = 131.8115 [0.0004] BKJD  
Rp/R\* = 0.0254 [0.0032]  
a/R\* = 2.71 [1.63]  
b = 0.90 [0.15]  
Seff = 33987.67 [13602.44]  
Teq = 3462 [346] K  
Rp = 5.25 [1.81] Re  
a = 0.0150 [0.0038] AU  
Ag = 0.03 [0.12] [-8.38σ]  
Teffp = 2152 [2389] K [-0.54σ]

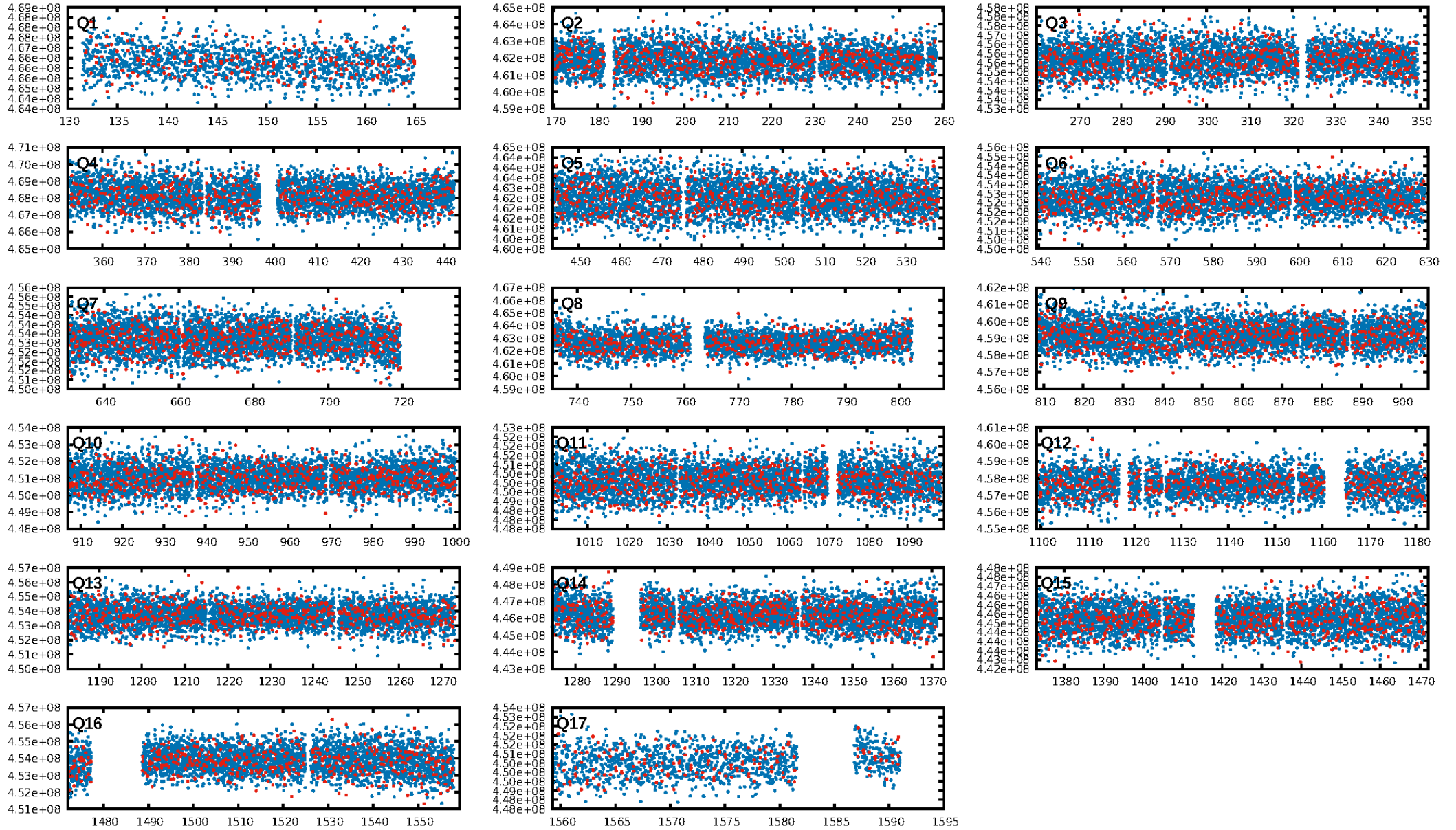
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.27e-203  
RollingBand-fgt: 1.00 [2423/2425]  
GhostDiagnostic-chr: 5.259  
Centroid-sig: 67.7%  
Centroid-so: 0.035 arcsec [1.64σ]  
OotOffset-rm: 0.040 arcsec [0.48σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-rm: 0.091 arcsec [1.10σ]  
KicOffset-st: 4/4/4/5 [17]  
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DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:30:10 Z

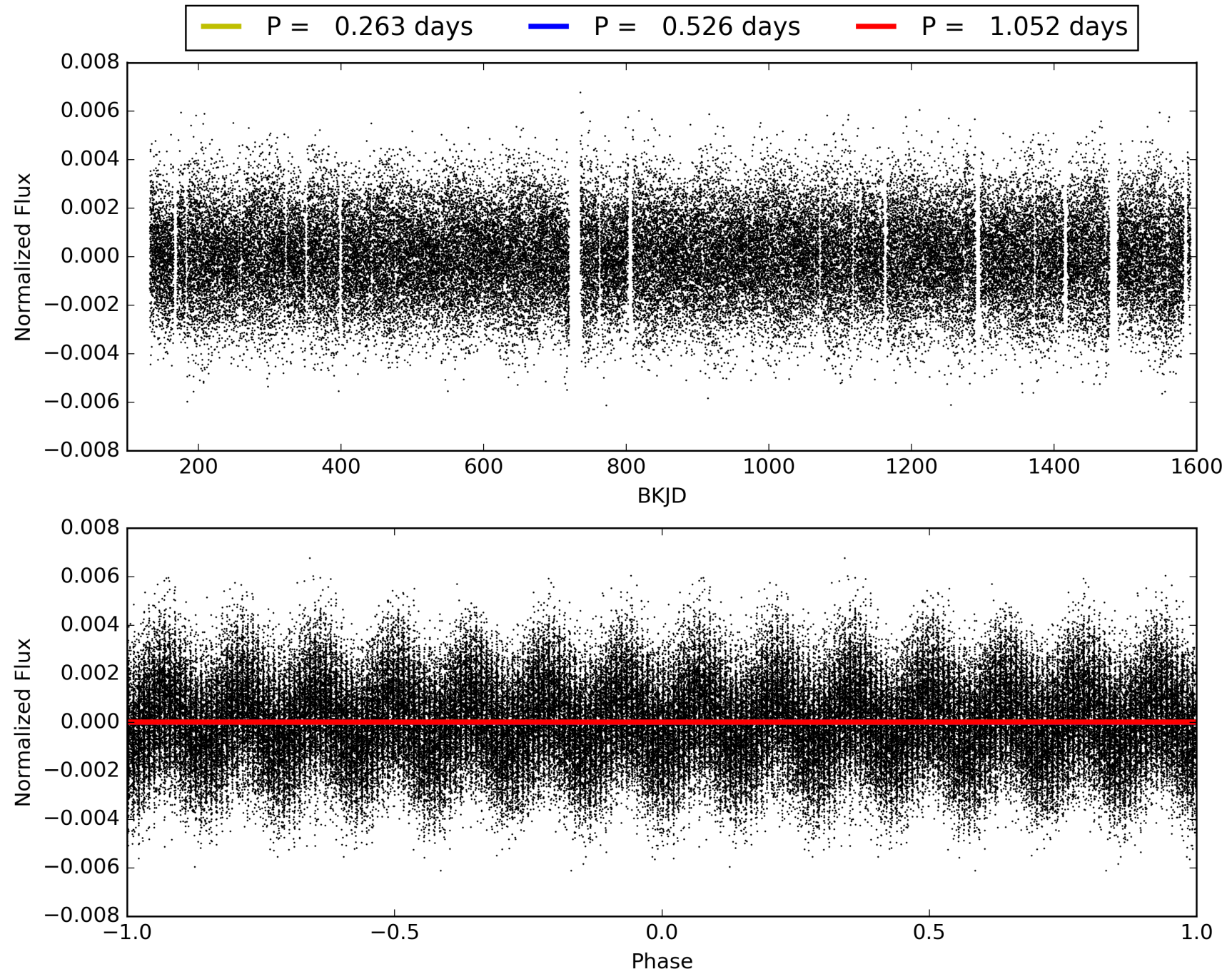
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 009758615-02, PDC Light Curves





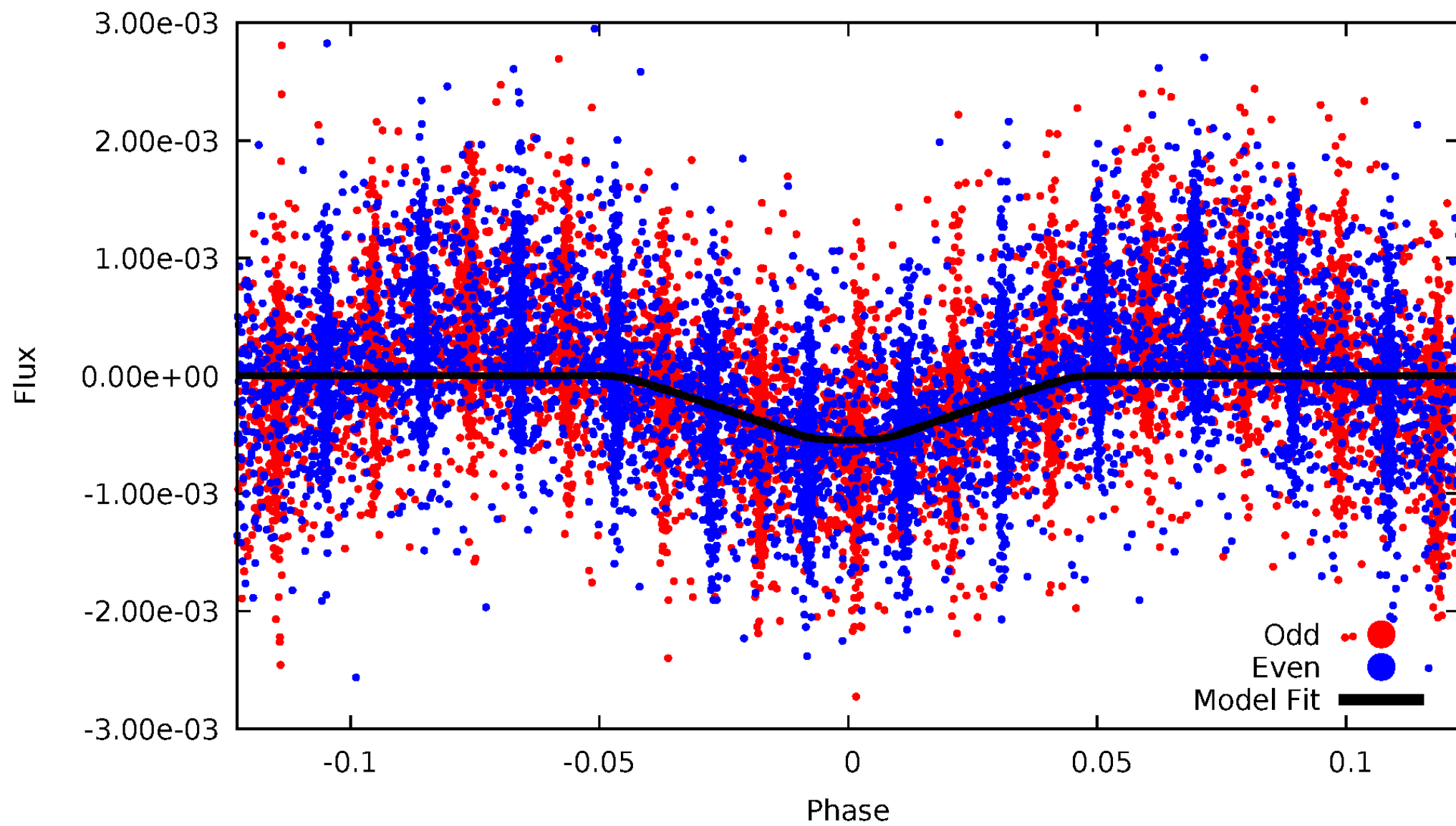
TCE 009758615-02





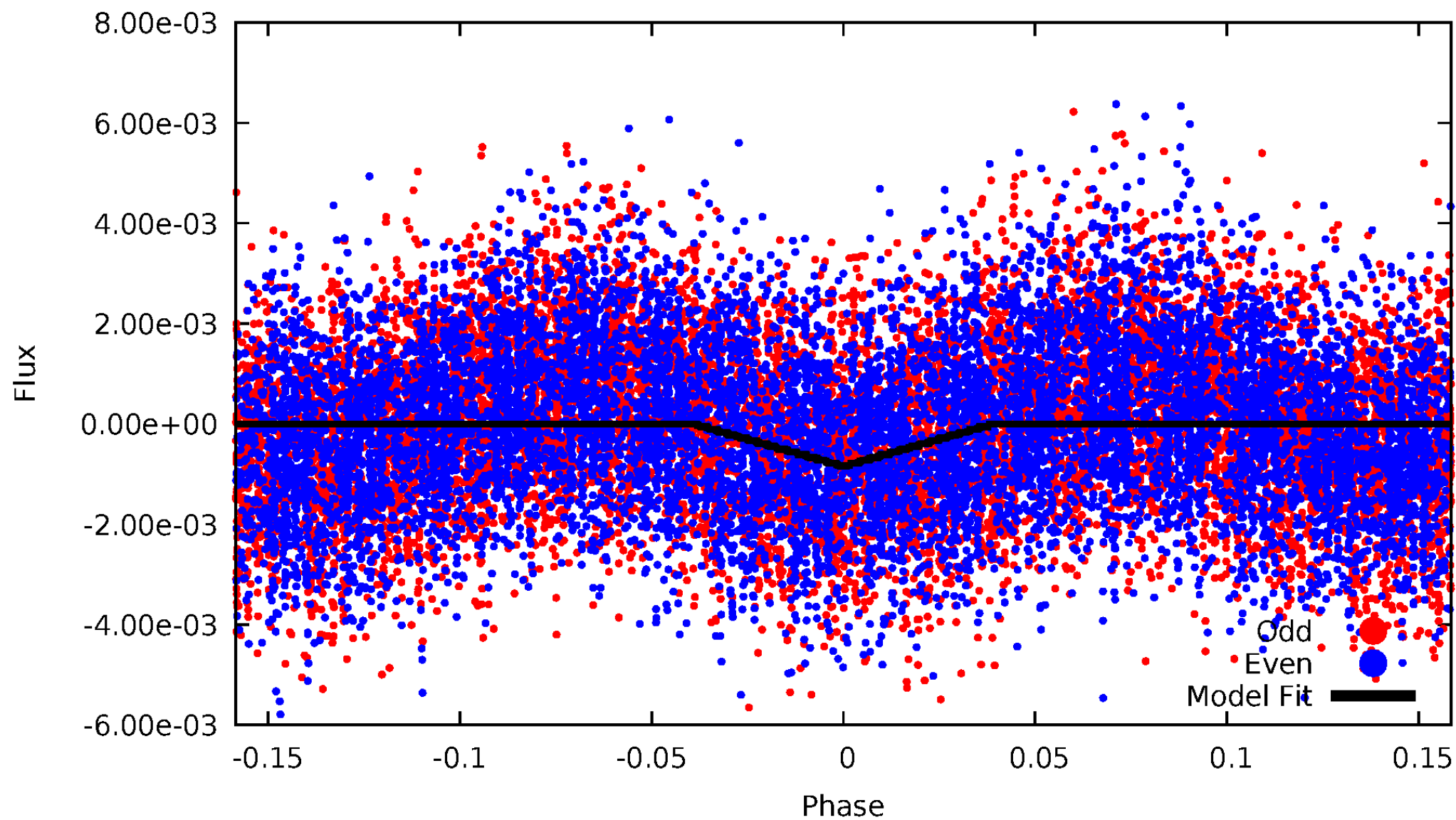
DV Odd/Even

TCE 009758615-02



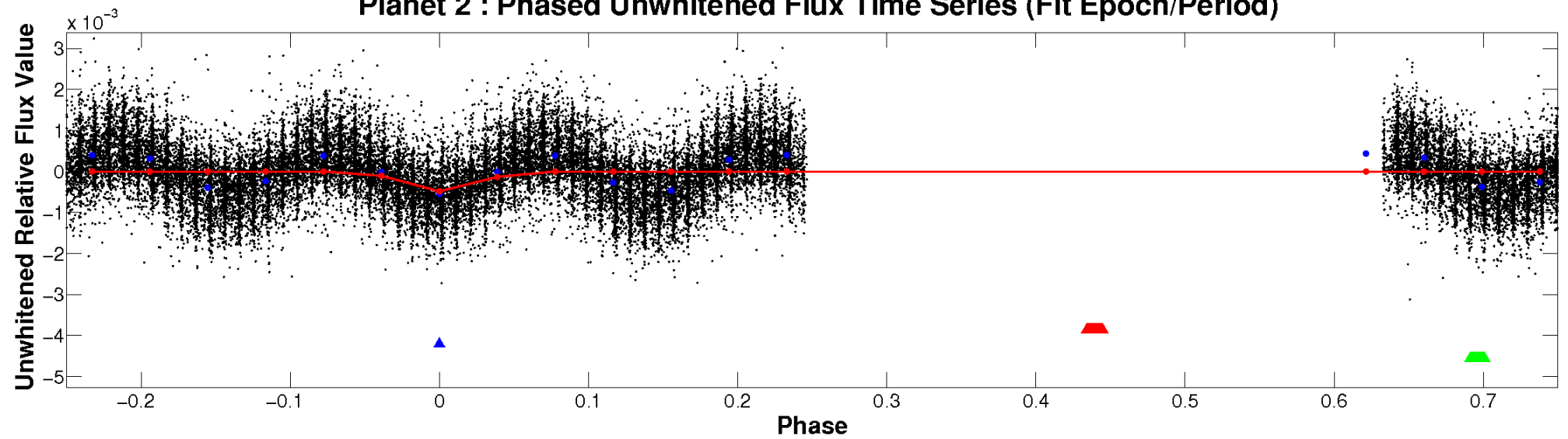
# ALT Odd/Even

TCE 009758615-02

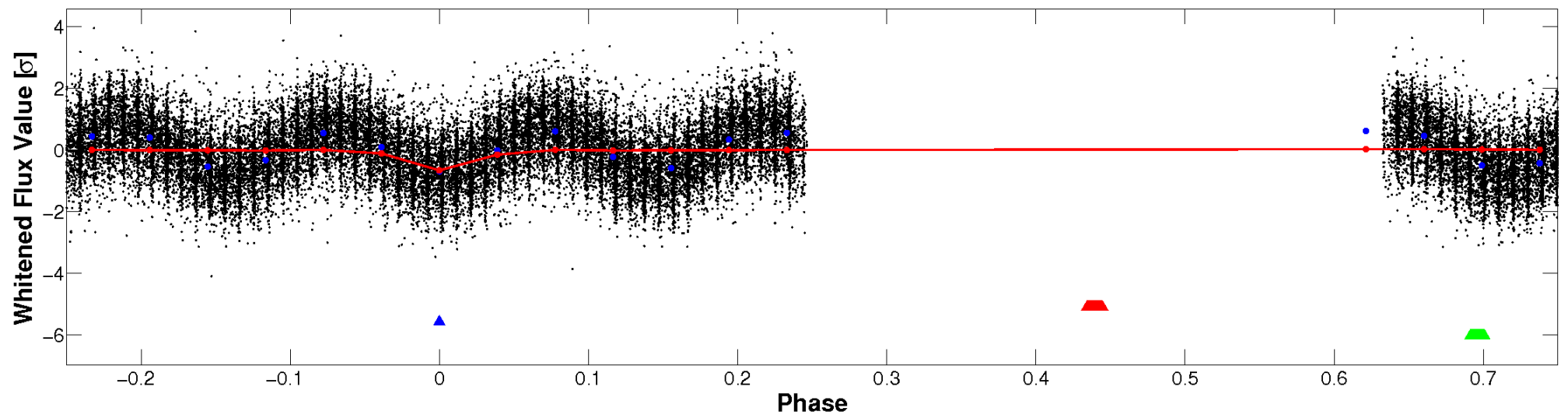


# Non-Whitened Vs. Whitened Light Curve

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

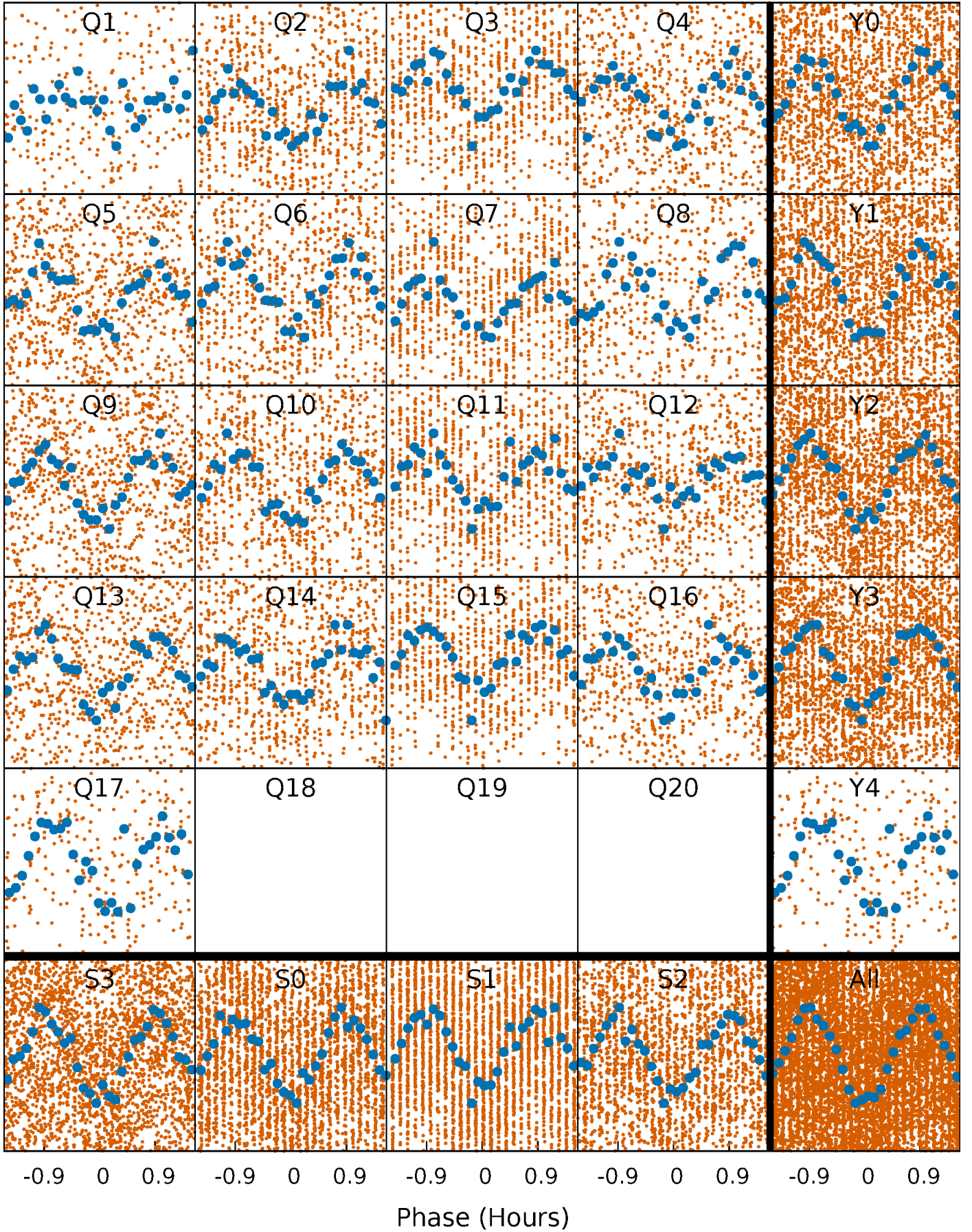


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

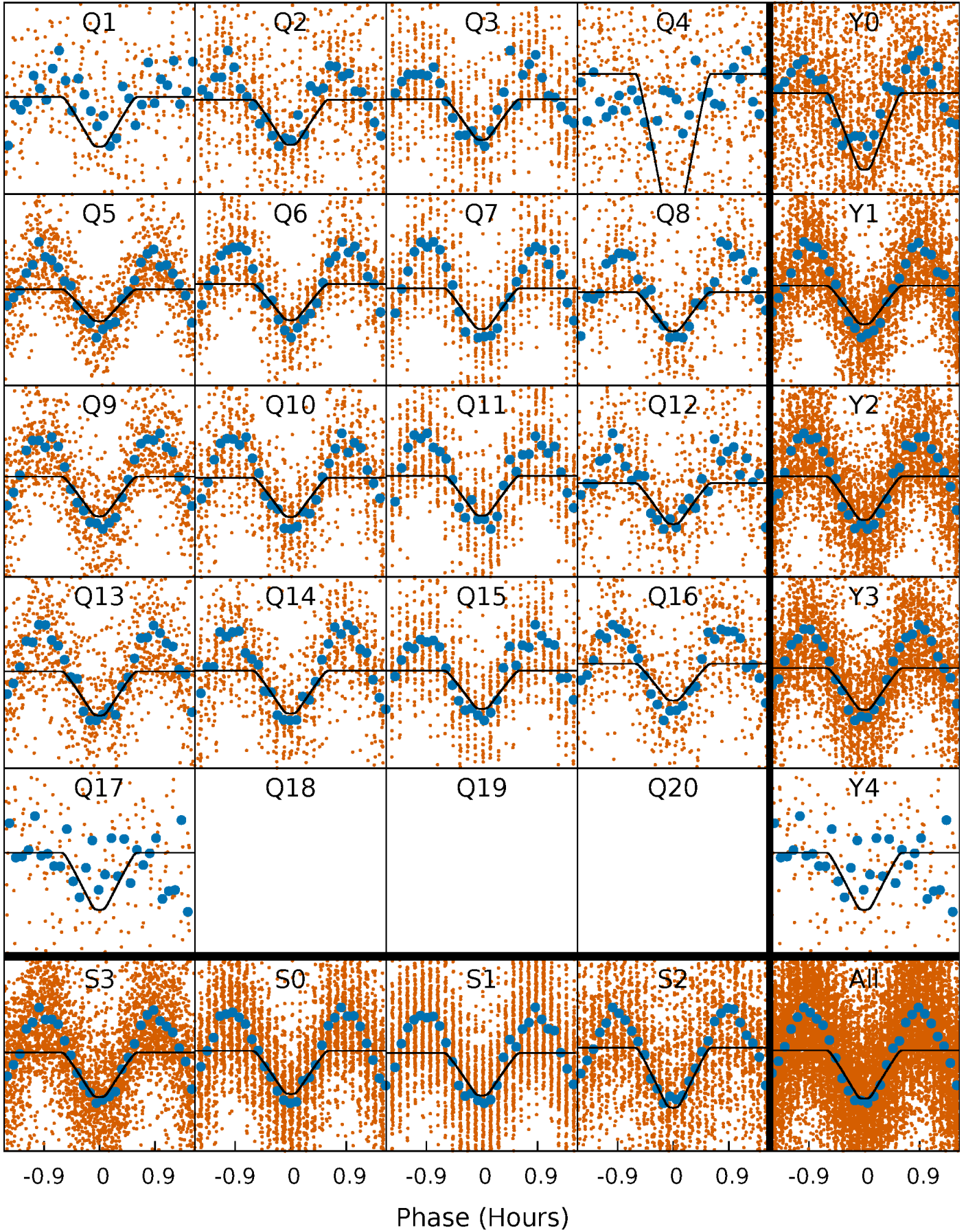
TCE 009758615-02    P= 0.526151 Days     $T_0=131.811476$  (BKJD)





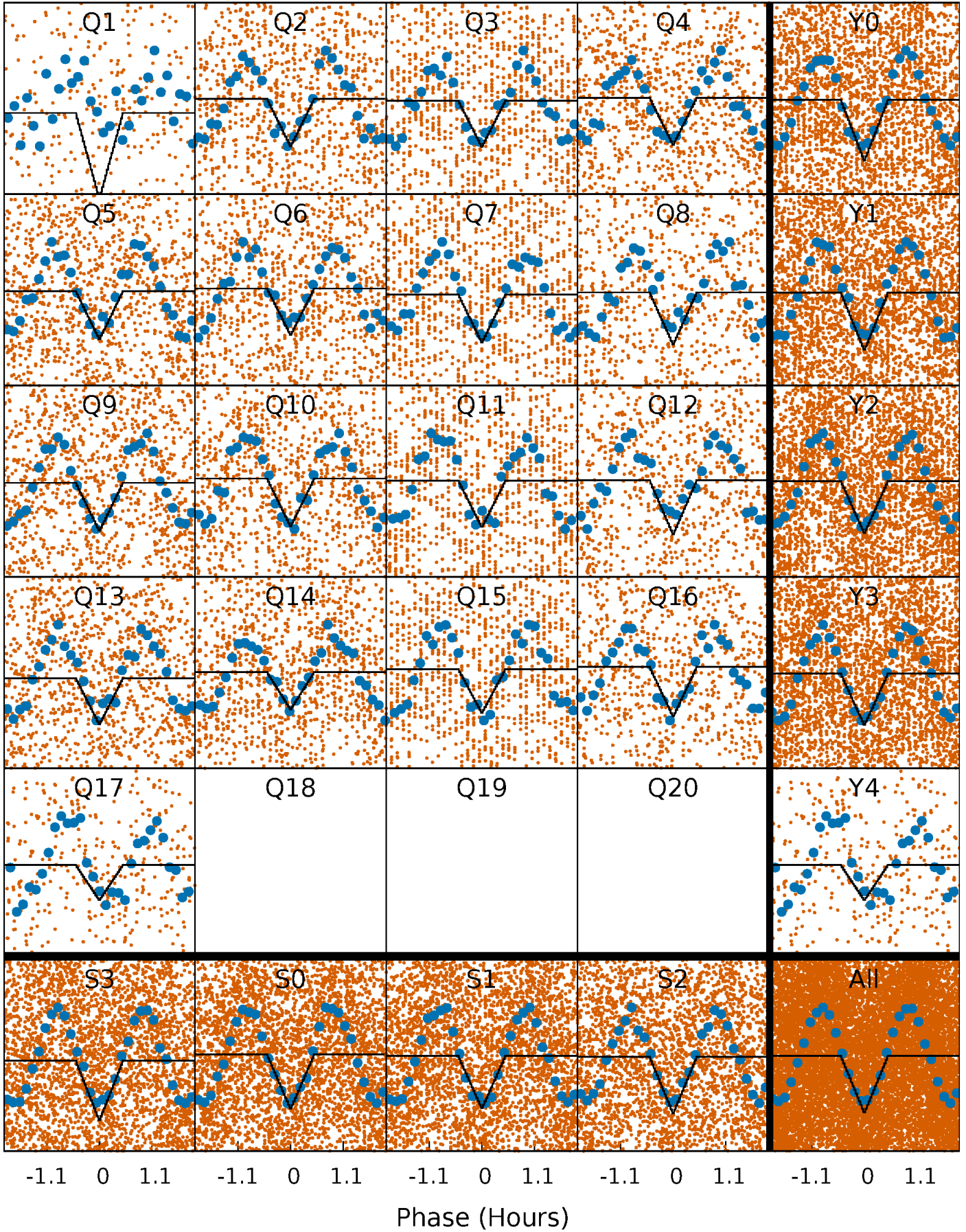
# DV Quarter-Phased Transit Curves

TCE 009758615-02 P= 0.526151 Days  $T_0=131.811476$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

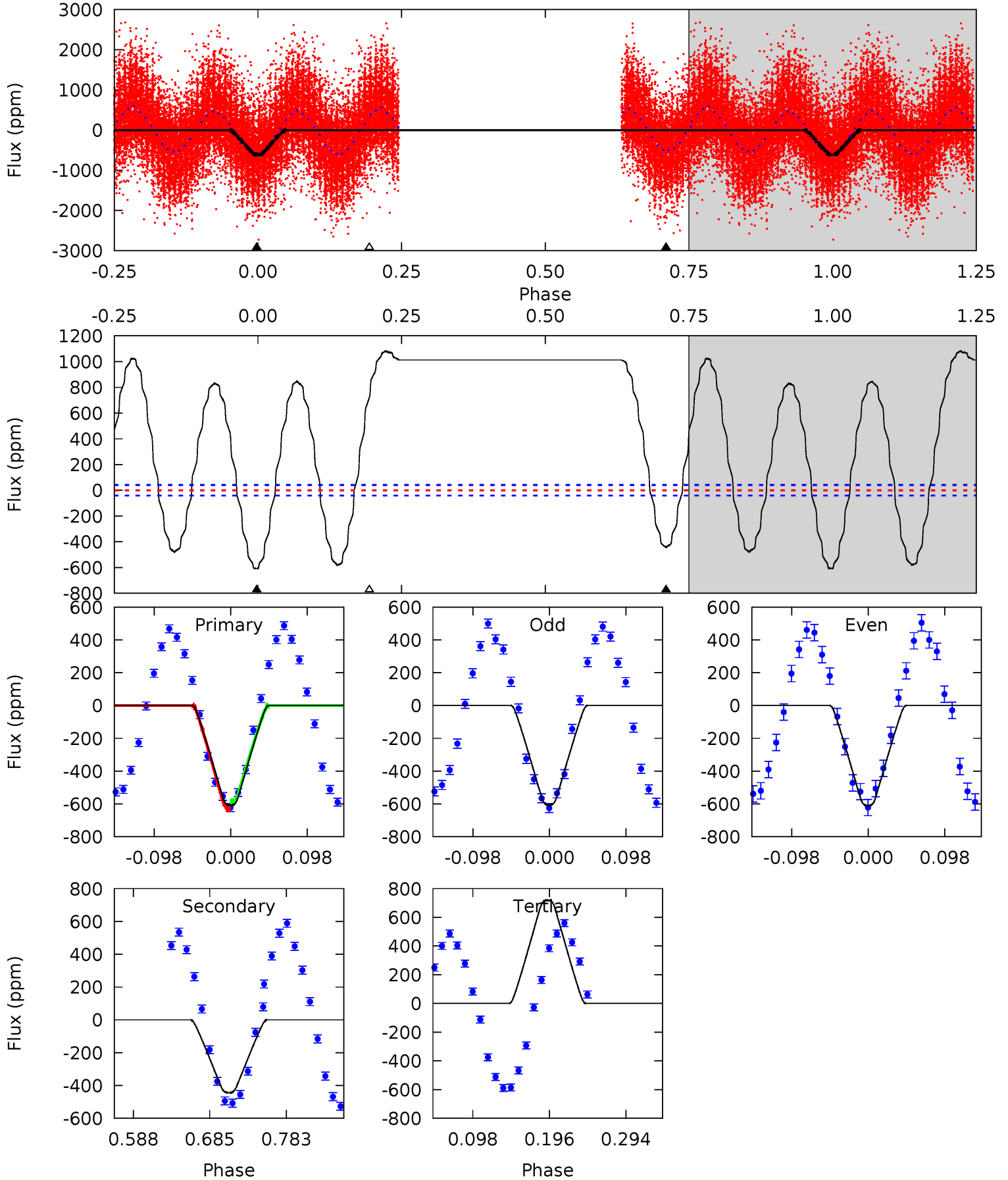
TCE 009758615-02 P= 0.526149 Days  $T_0=131.814862$  (BKJD)



# DV Model-Shift Uniqueness Test

009758615-02, P = 0.526151 Days, E = 131.285325 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
68.7	50.2	-81.1	0	4.57	1.66	61.9	149.7	68.7	131.2	50.2	0.25	1.04	0.64	3.19

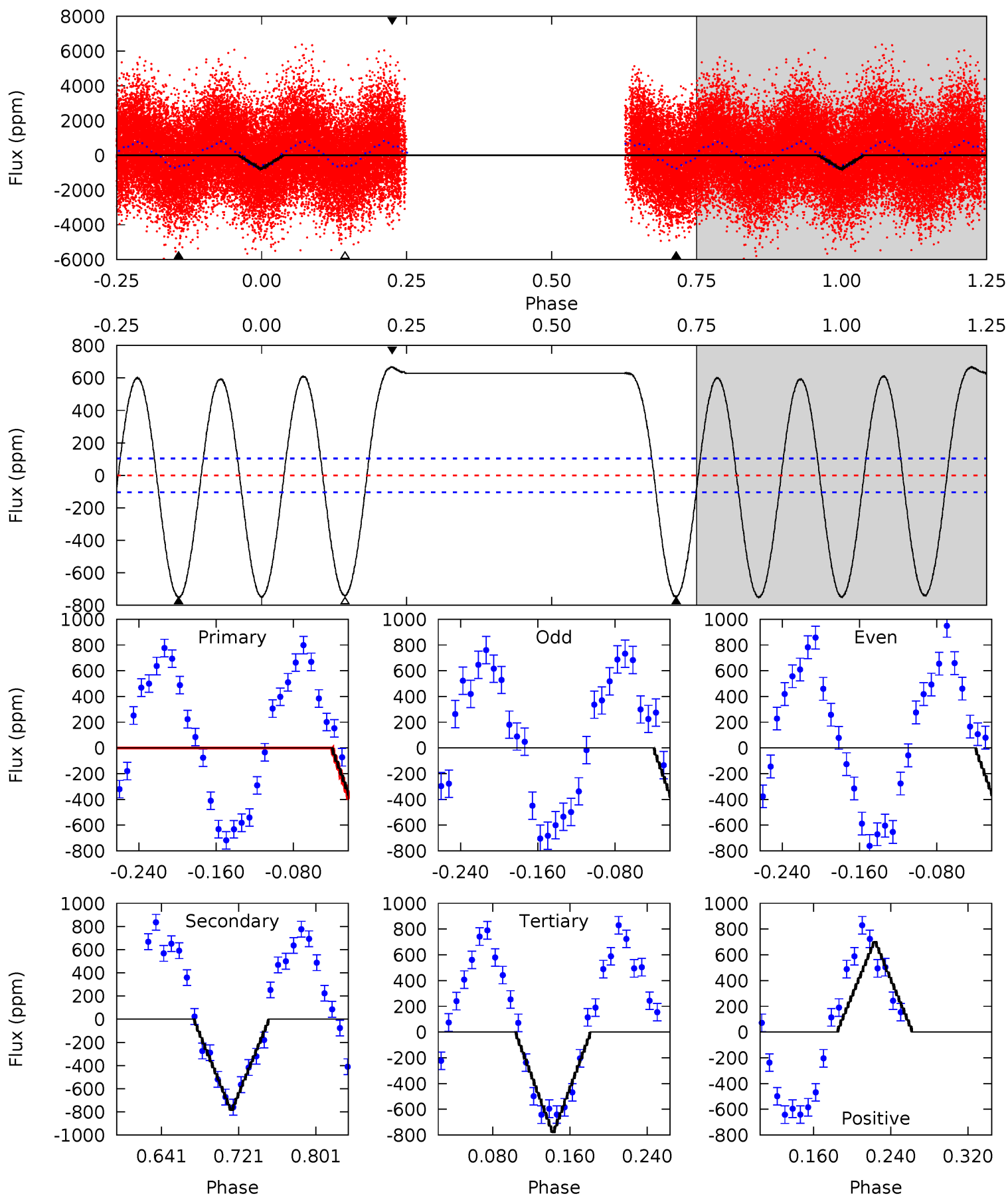




# Alt Model-Shift Uniqueness Test

009758615-02, P = 0.526149 Days, E = 131.288713 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
33.4	33.3	33.0	29.8	4.61	1.75	22.1	0.42	3.66	0.30	3.55	0.60	1.05	0.47	2.92





### Stellar Parameters For KIC 009758615

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6969^{+192}_{-312}$	$4.089^{+0.136}_{-0.187}$	$0.220^{+0.150}_{-0.350}$	$1.896^{+0.608}_{-0.406}$	$1.608^{+0.208}_{-0.277}$	$0.332^{+0.260}_{-0.168}$
	+3%/-4%	+3%/-5%	+68%/-159%	+32%/-21%	+13%/-17%	+78%/-50%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 009758615-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-445 \pm 9$	$5.32^{+1.18}_{-1.00}$	$4846^{+388}_{-332}$	$6010^{+557}_{-505}$	$1.917^{+0.849}_{-0.619}$
Alt.	$-749 \pm 22$	$6.03^{+1.27}_{-1.01}$	$4828^{+377}_{-315}$	$6472^{+497}_{-483}$	$2.487^{+0.906}_{-0.735}$

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

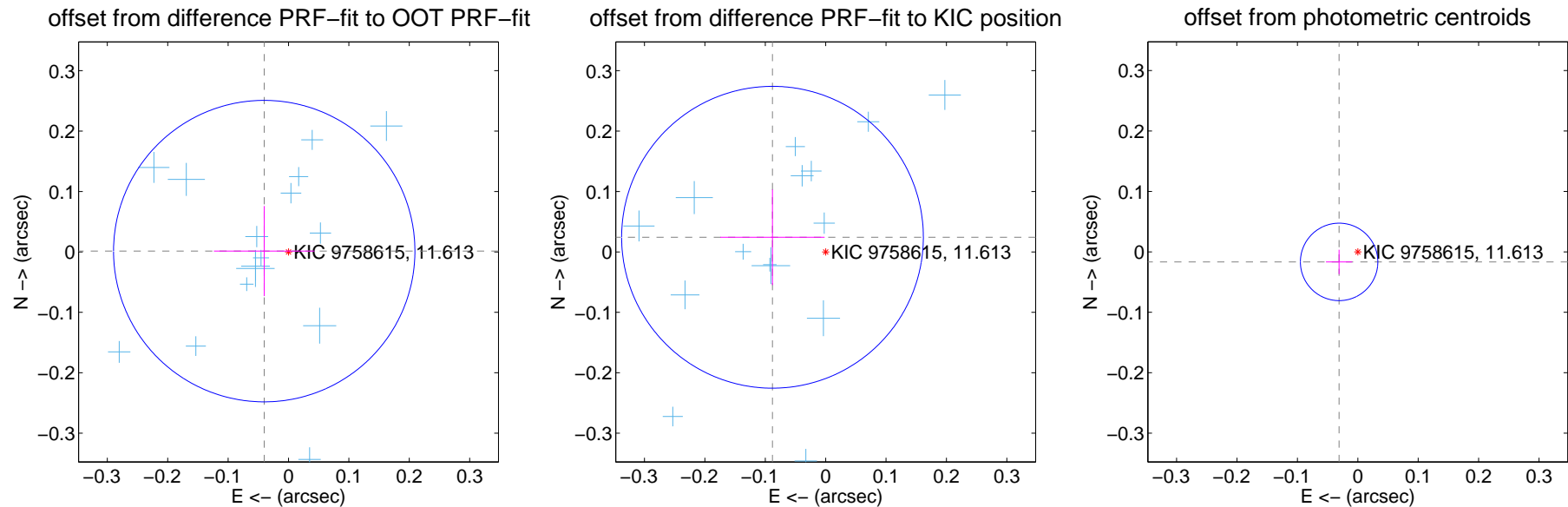
## DV Centroid Data

Supplemental centroid analysis for 009758615-02. **Kepler magnitude: 11.61.** Transit SNR 37.12

There are 16 quarters with good PRF difference image offsets

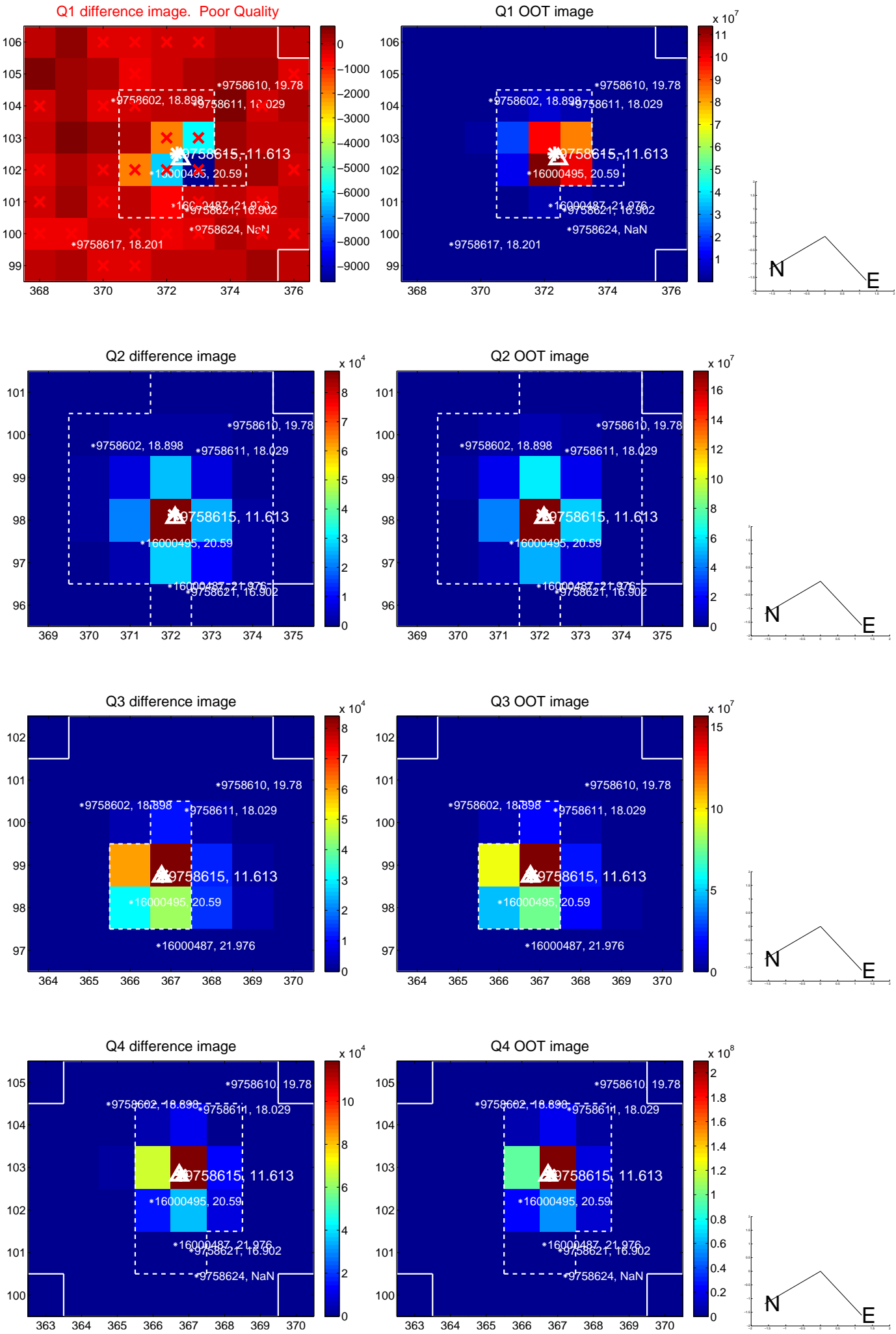
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.040 \pm 0.083$	0.48	$0.040 \pm 0.083$	$0.001 \pm 0.075$
PRF-fit source offset from KIC position	$0.091 \pm 0.083$	1.10	$0.088 \pm 0.086$	$0.024 \pm 0.079$
photometric centroid source offset	$0.04 \pm 0.02$	1.64	$0.03 \pm 0.02$	$-0.02 \pm 0.02$

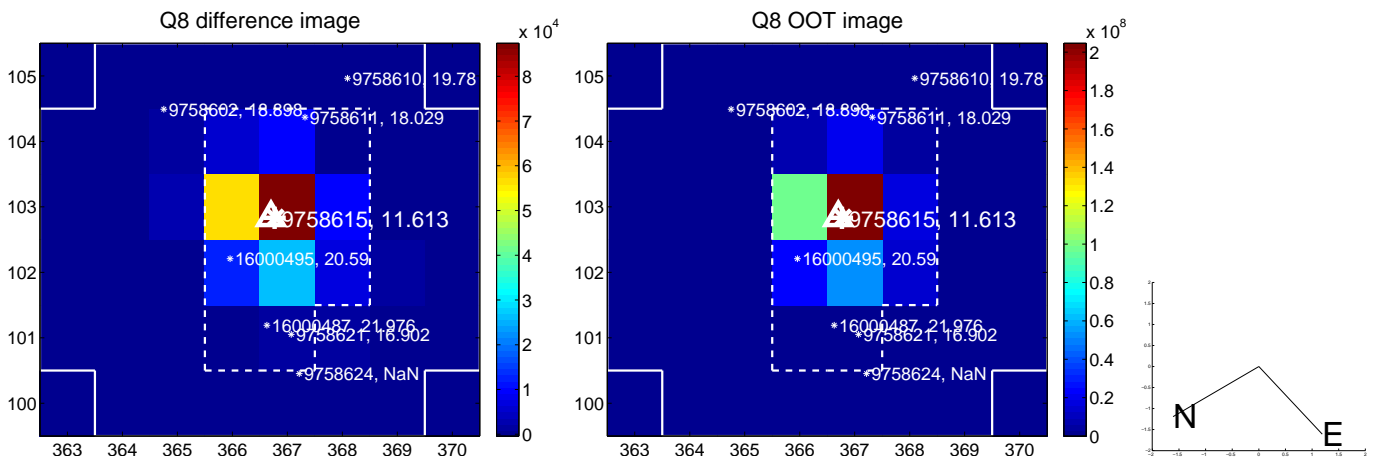
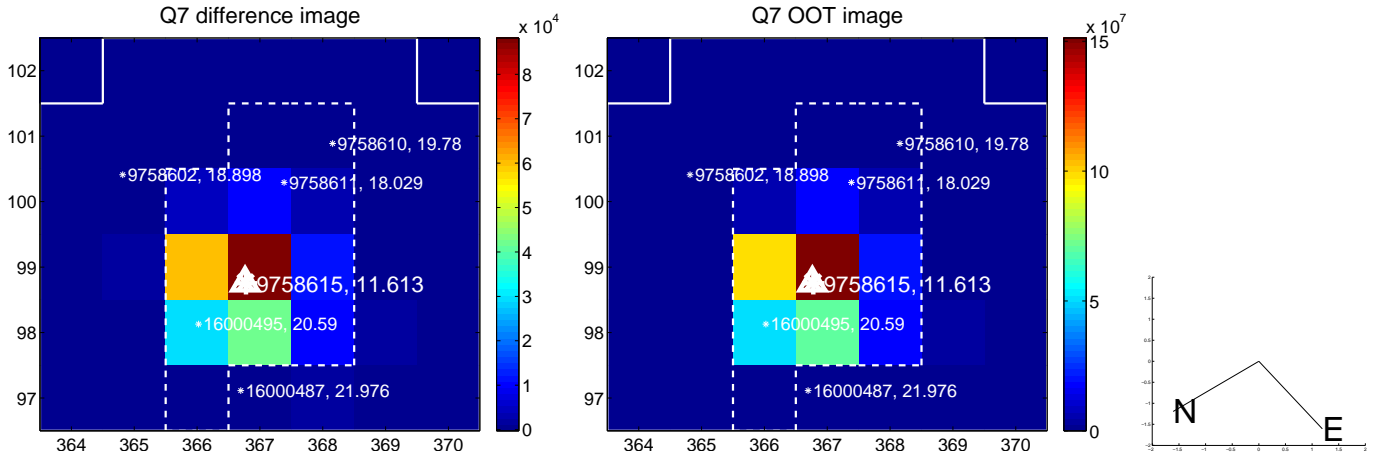
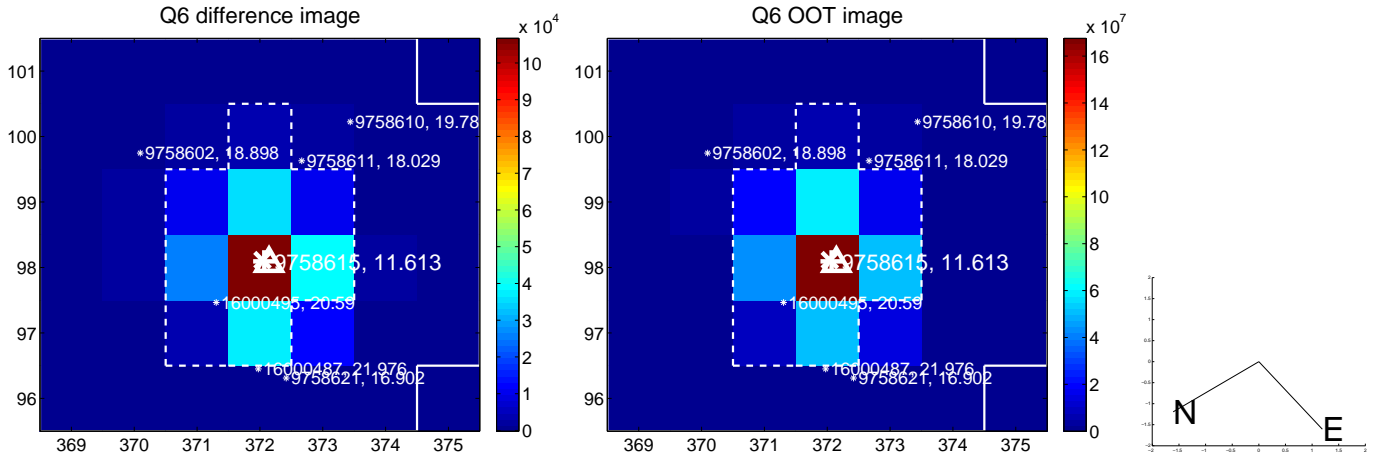
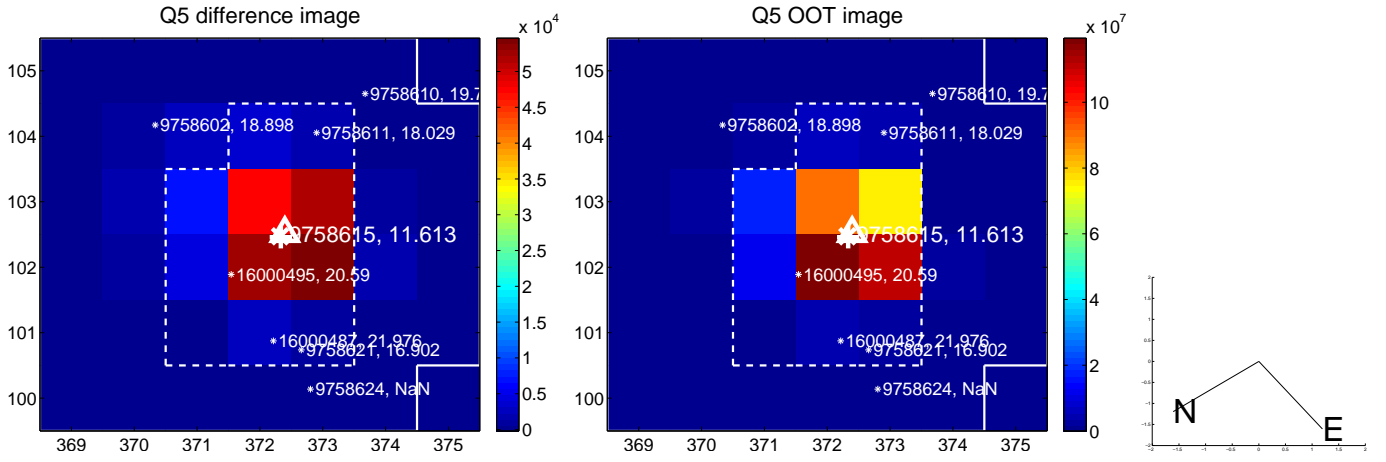


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

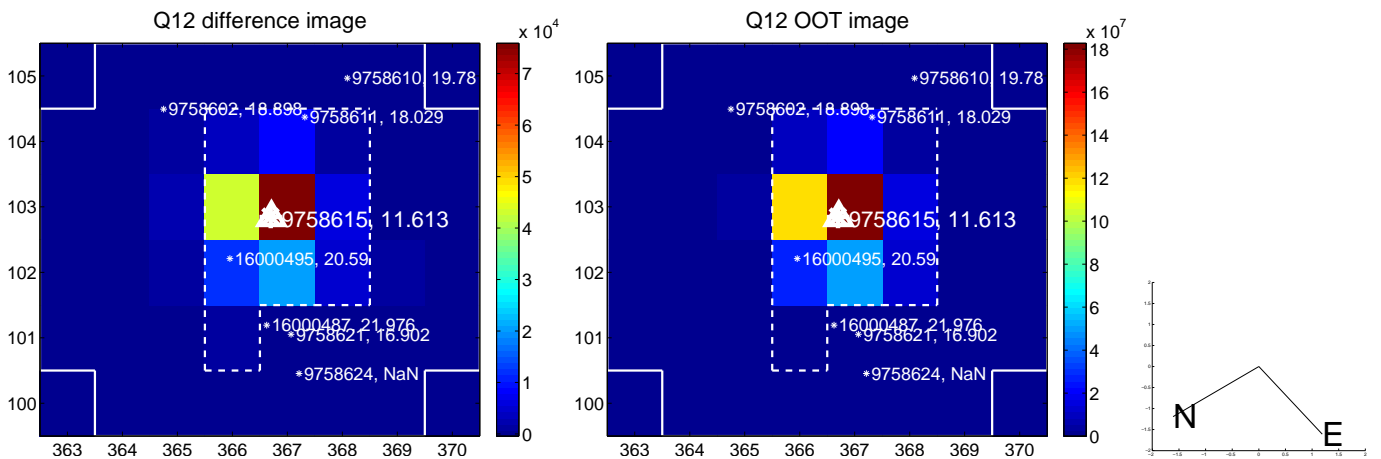
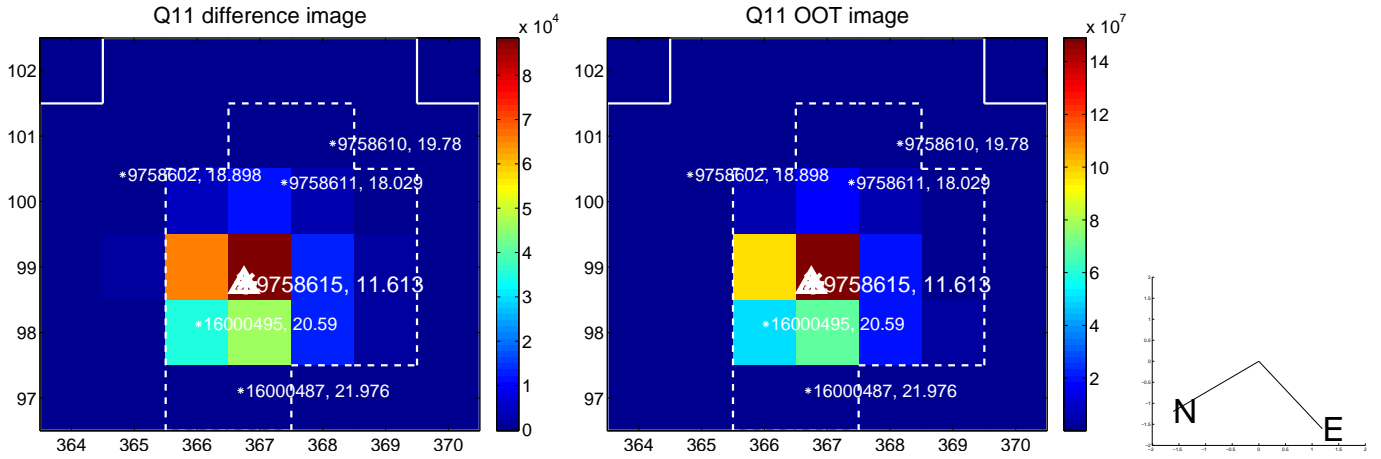
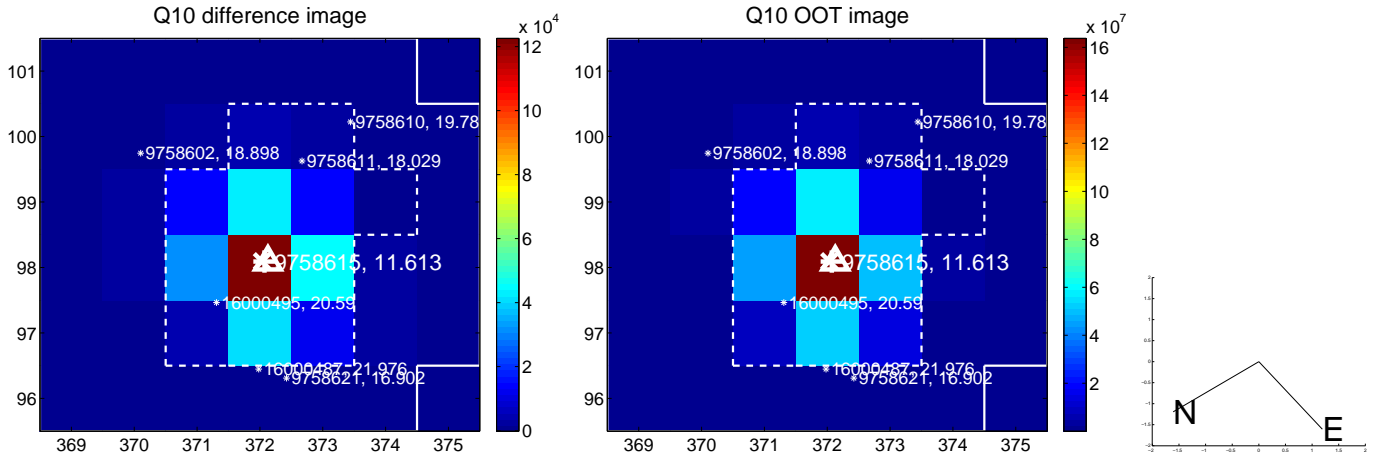
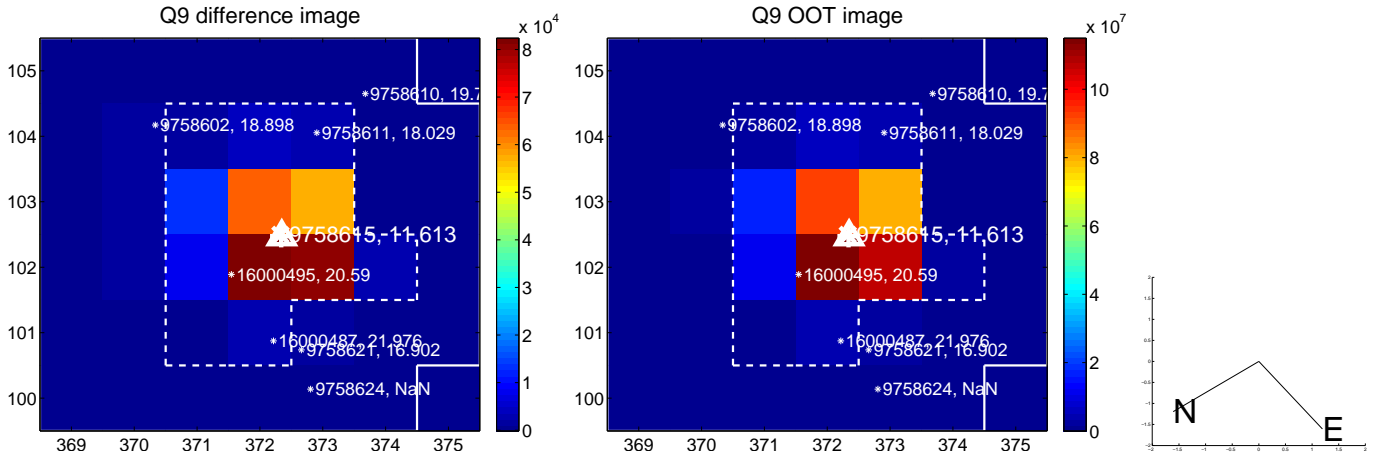
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

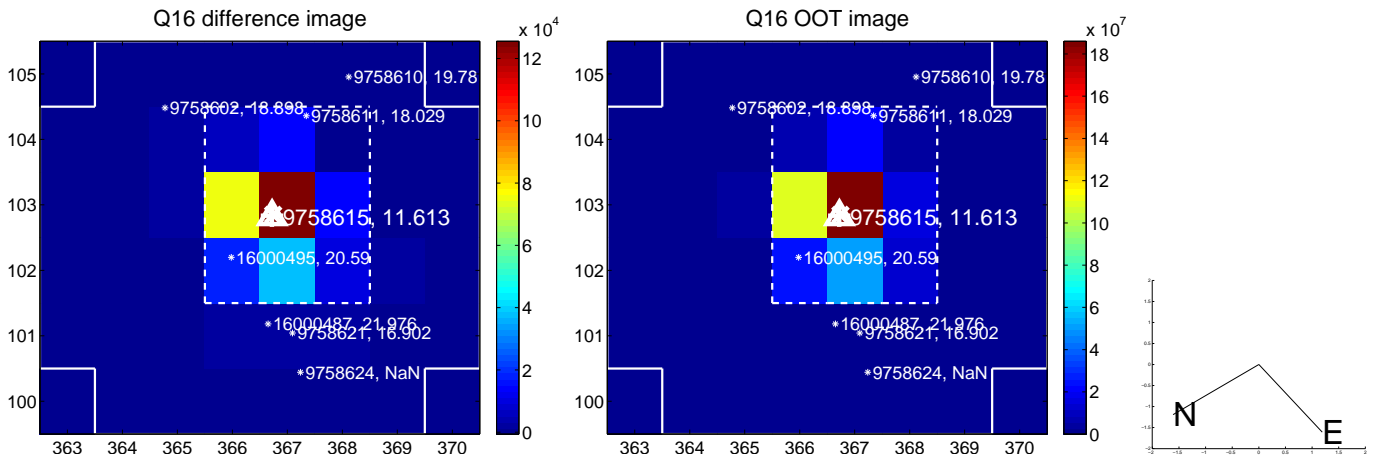
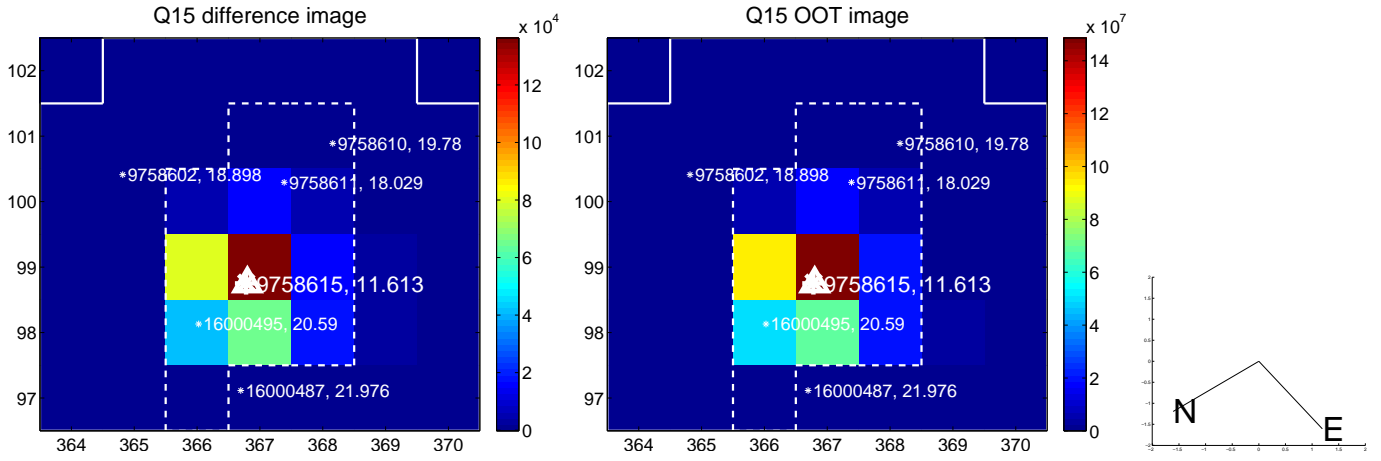
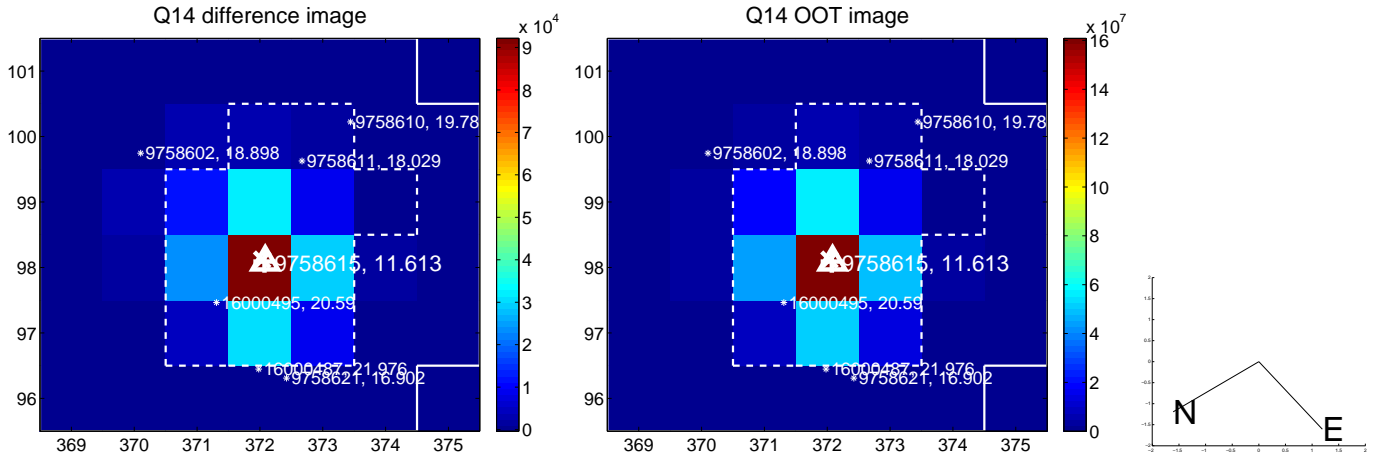
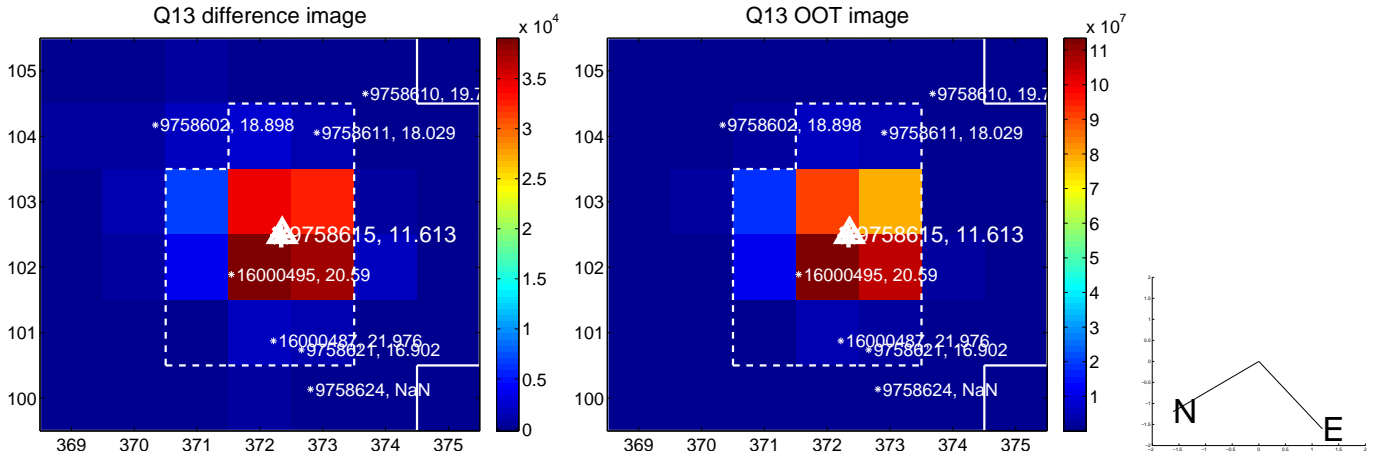


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

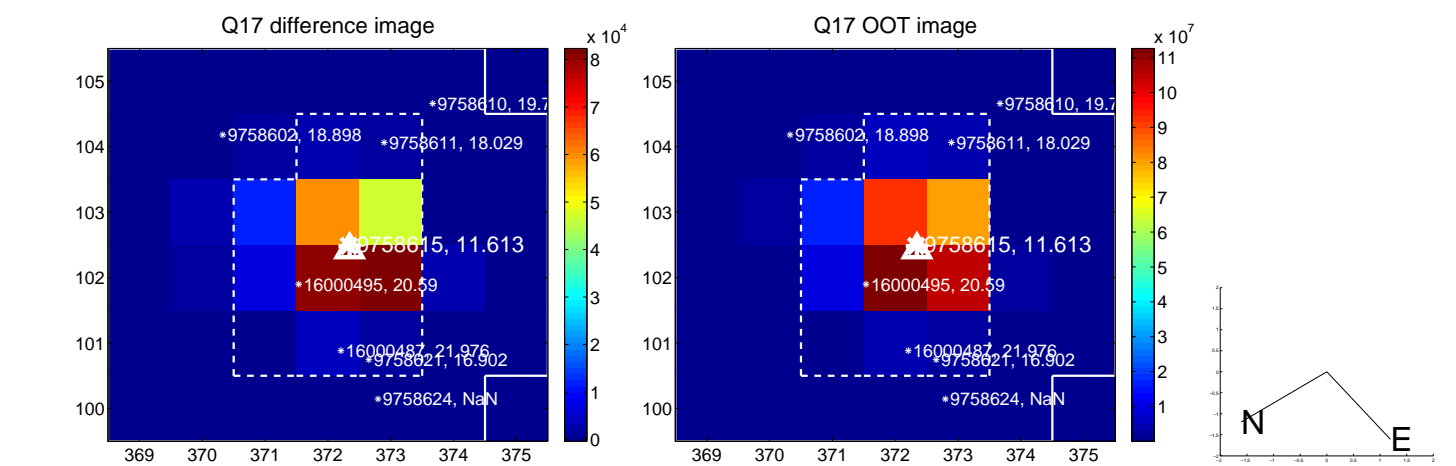




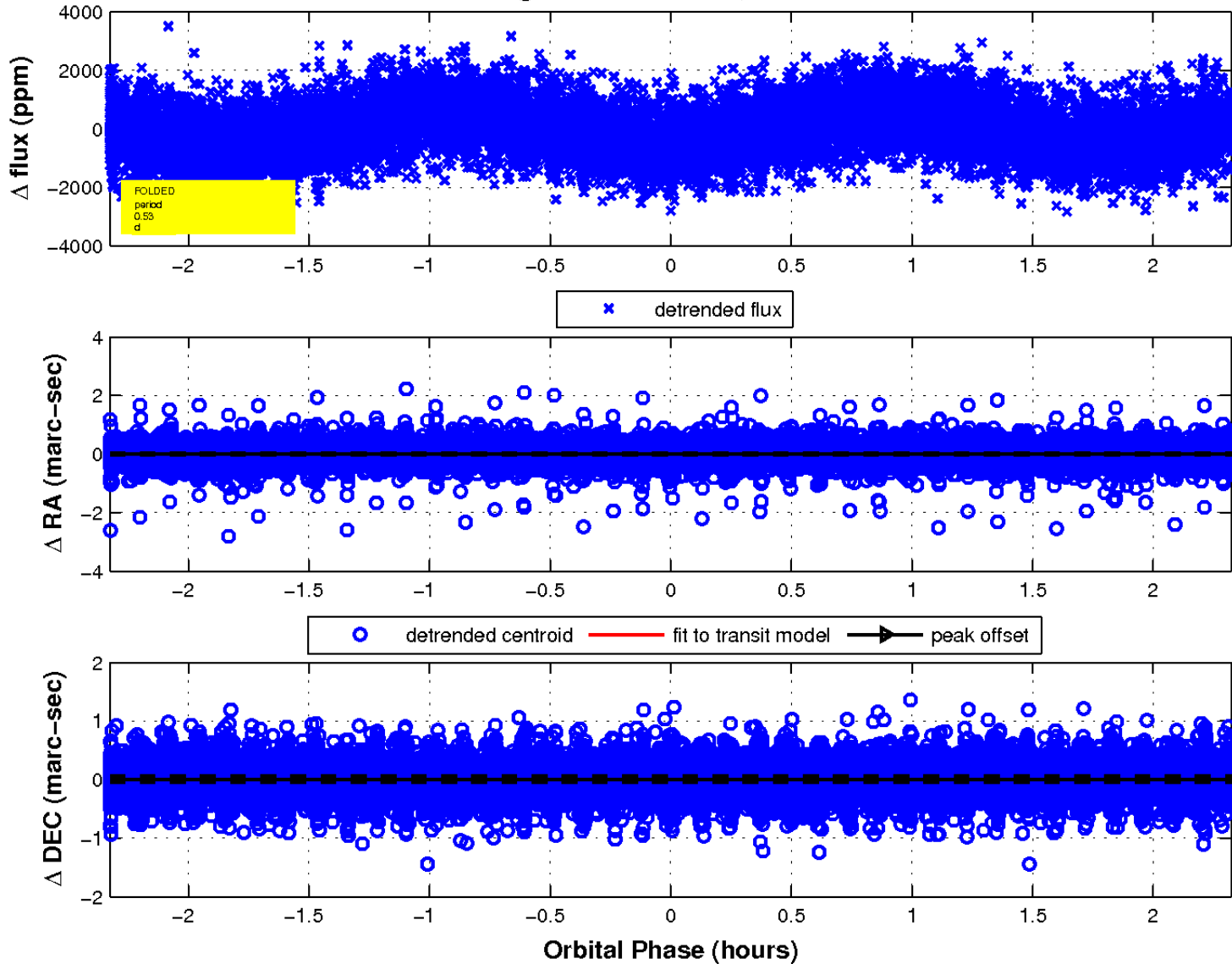
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

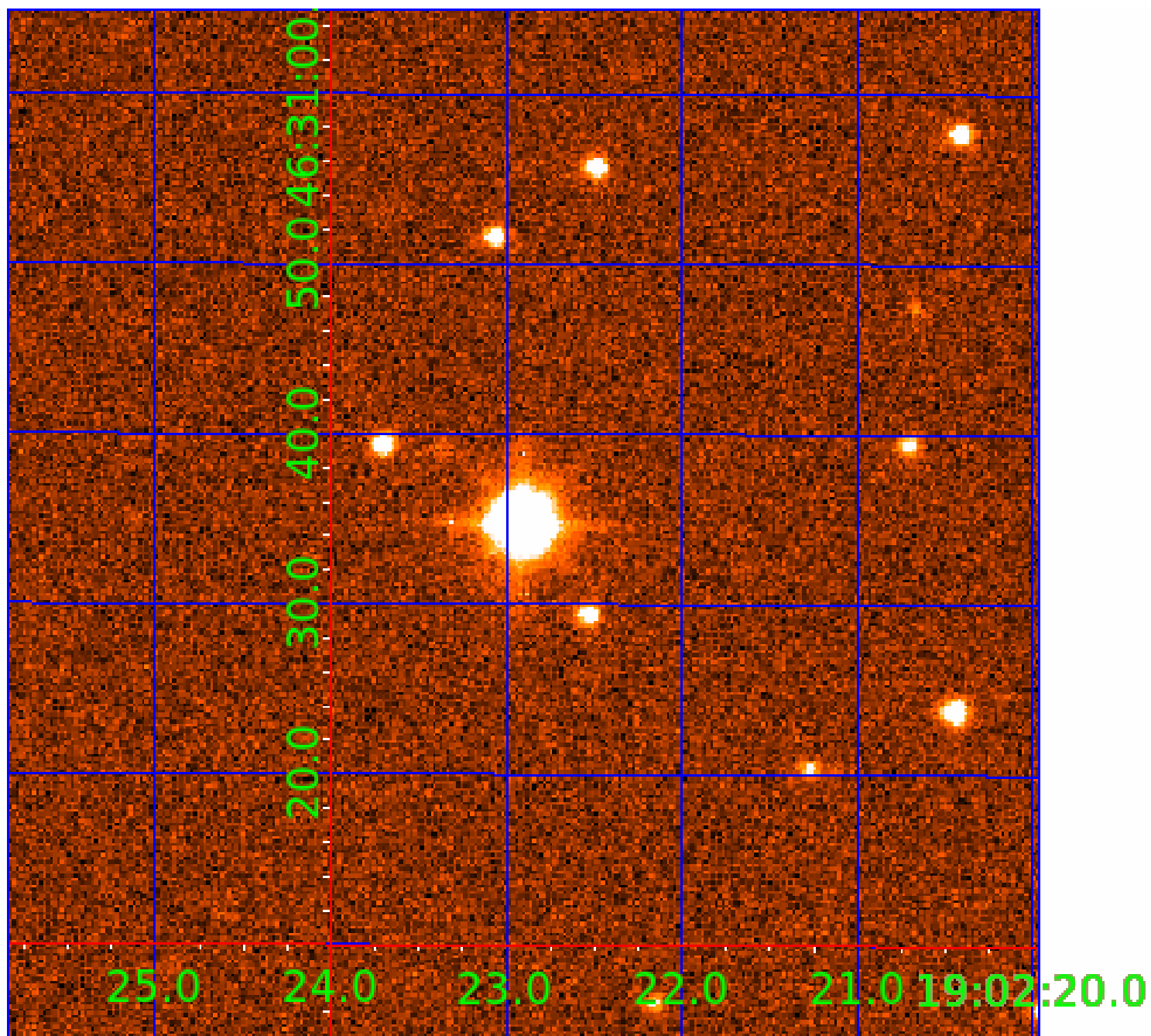


fluxWeightedCentroids, Planet 2 of 3



UKIRT Image

Declination



# KIC 009758615

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009758615-01	OBS	No	0.526153	132.039922	564.4	0.880	13.4	41.2	1.90	6969	4.88	33987.50
009758615-02	OBS	No	0.526151	131.811476	547.6	0.775	15.4	37.1	1.90	6969	5.25	33987.67
009758615-03	OBS	No	0.526149	131.654095	165.0	1.131	16.3	14.9	1.90	6969	2.62	33987.82

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009758615-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009758615-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—SAME_NTL_PERIOD
009758615-03	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD

**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 009758615-03

No Significant Match Found

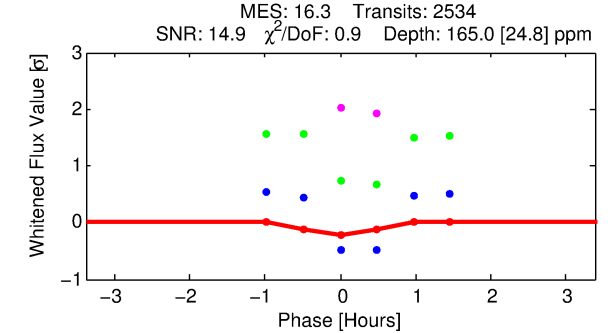
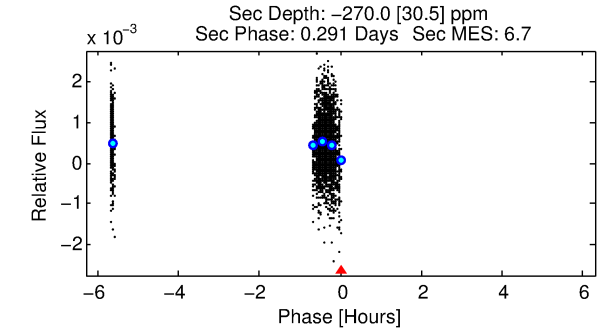
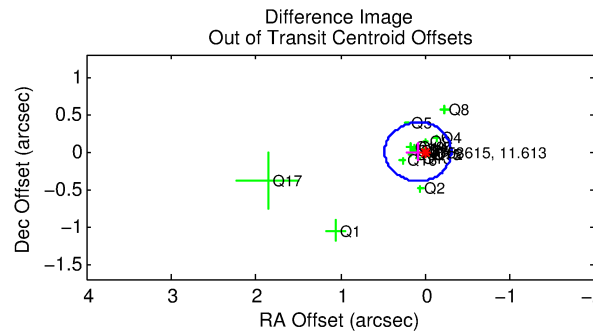
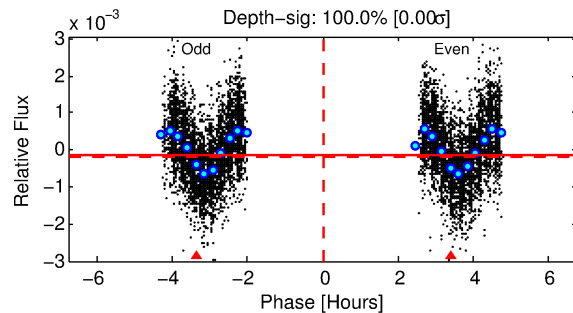
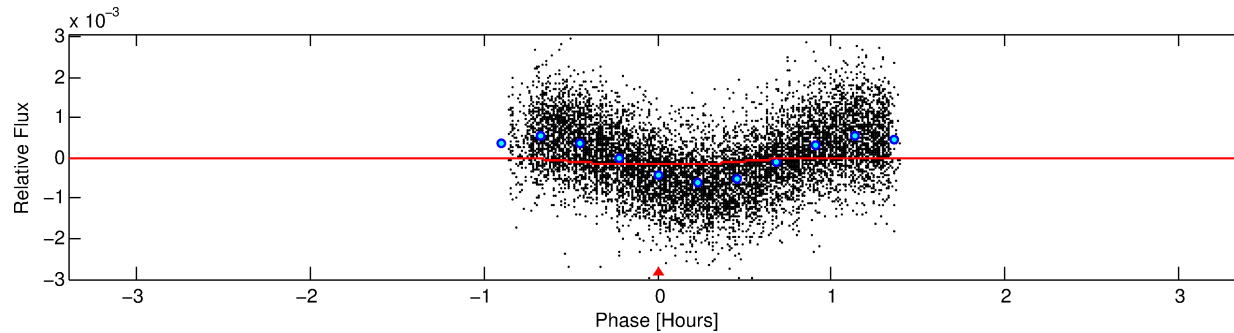
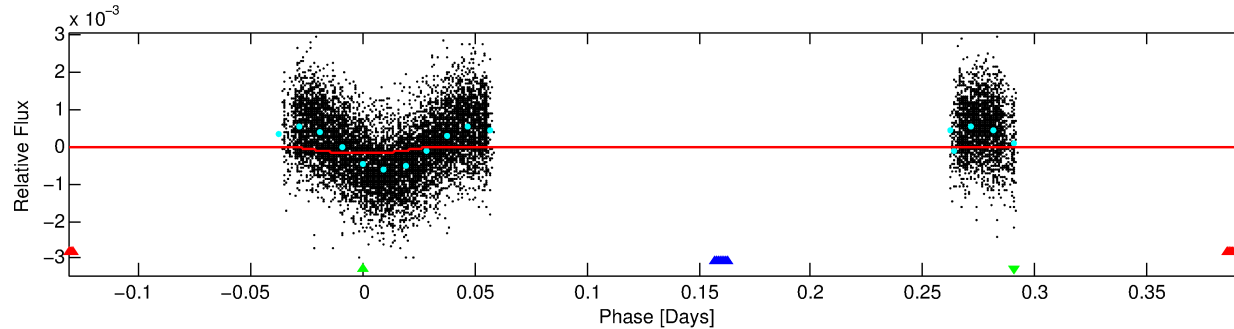
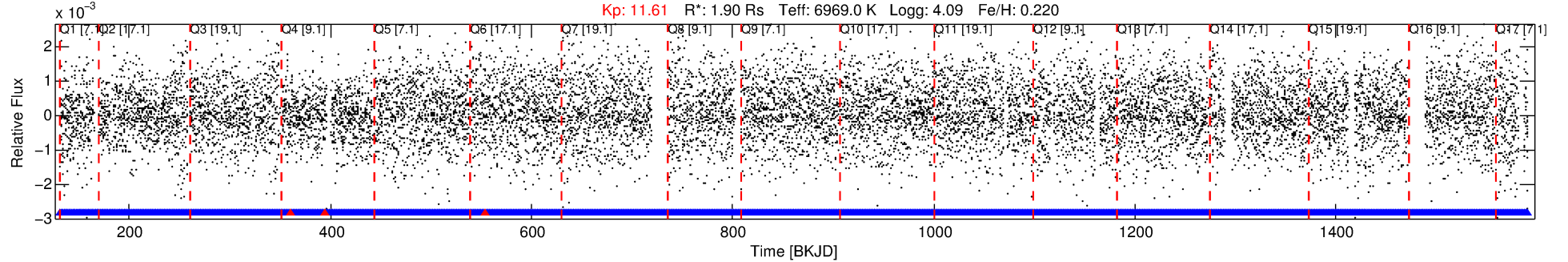


# DV One-Page Summary

KIC: 9758615 Candidate: 3 of 3 Period: 0.526 d

KOI: K05709 Corr: No Ephemeris Match

Kp: 11.61 R\*: 1.90 Rs Teff: 6969.0 K Logg: 4.09 Fe/H: 0.220



## DV Fit Results:

Period = 0.52615 [0.00001] d  
Epoch = 131.6541 [0.0014] BKJD  
Rp/R\* = 0.0127 [0.0040]  
a/R\* = 2.73 [4.22]  
b = 0.70 [1.31]  
Seff = 33987.83 [13602.50]  
Teff = 3462 [346] K  
Rp = 2.62 [1.18] Re  
a = 0.0150 [0.0038] AU  
Ag = N/A  
Teffp = N/A

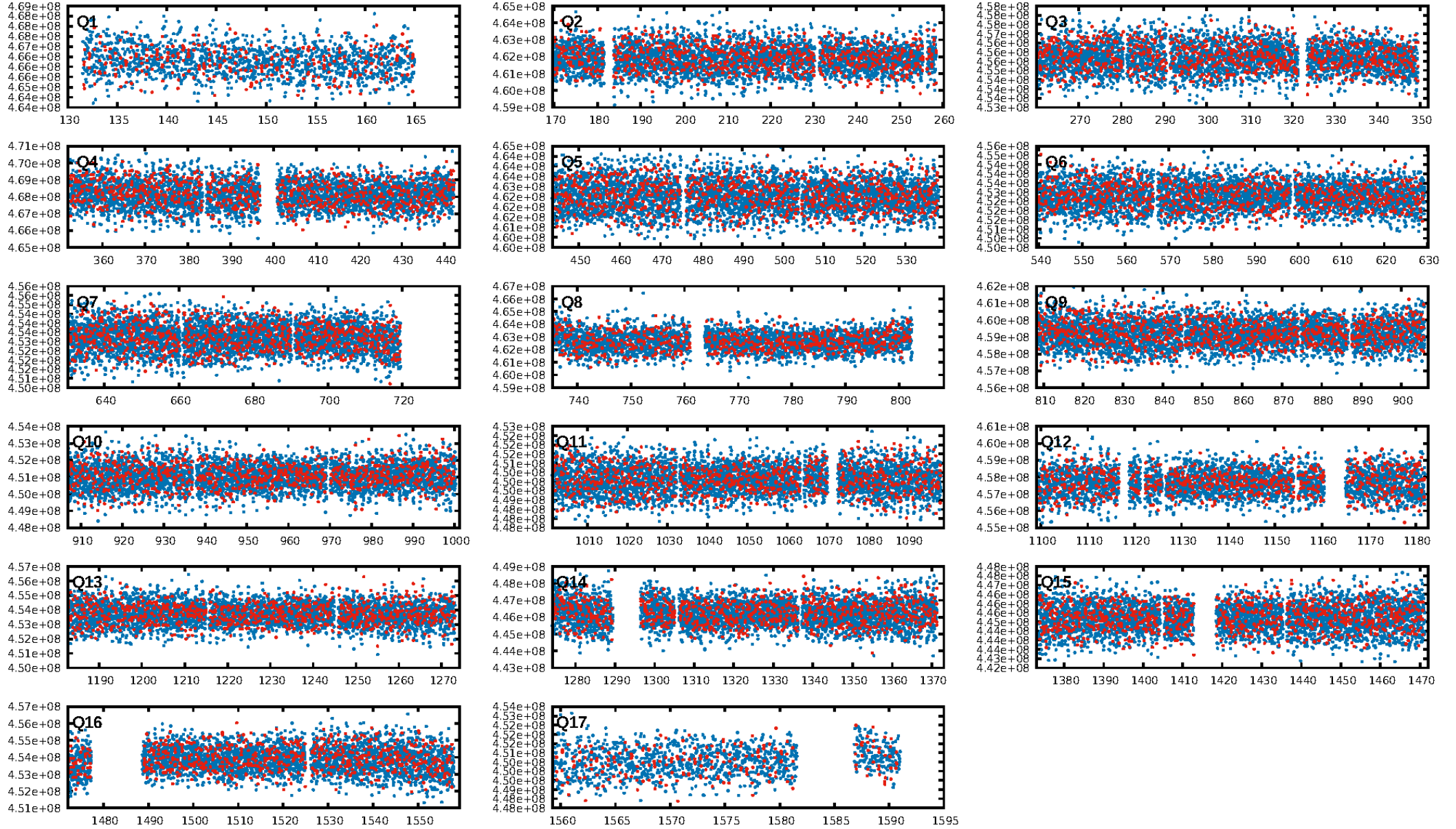
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 5.19e-217  
RollingBand-fgt: 1.00 [2417/2420]  
GhostDiagnostic-chr: 4.726  
Centroid-sig: 2.0%  
Centroid-so: 0.150 arcsec [2.67σ]  
OotOffset-rm: 0.088 arcsec [0.67σ]  
KicOffset-rm: 0.149 arcsec [1.16σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 0.00 [0/17]

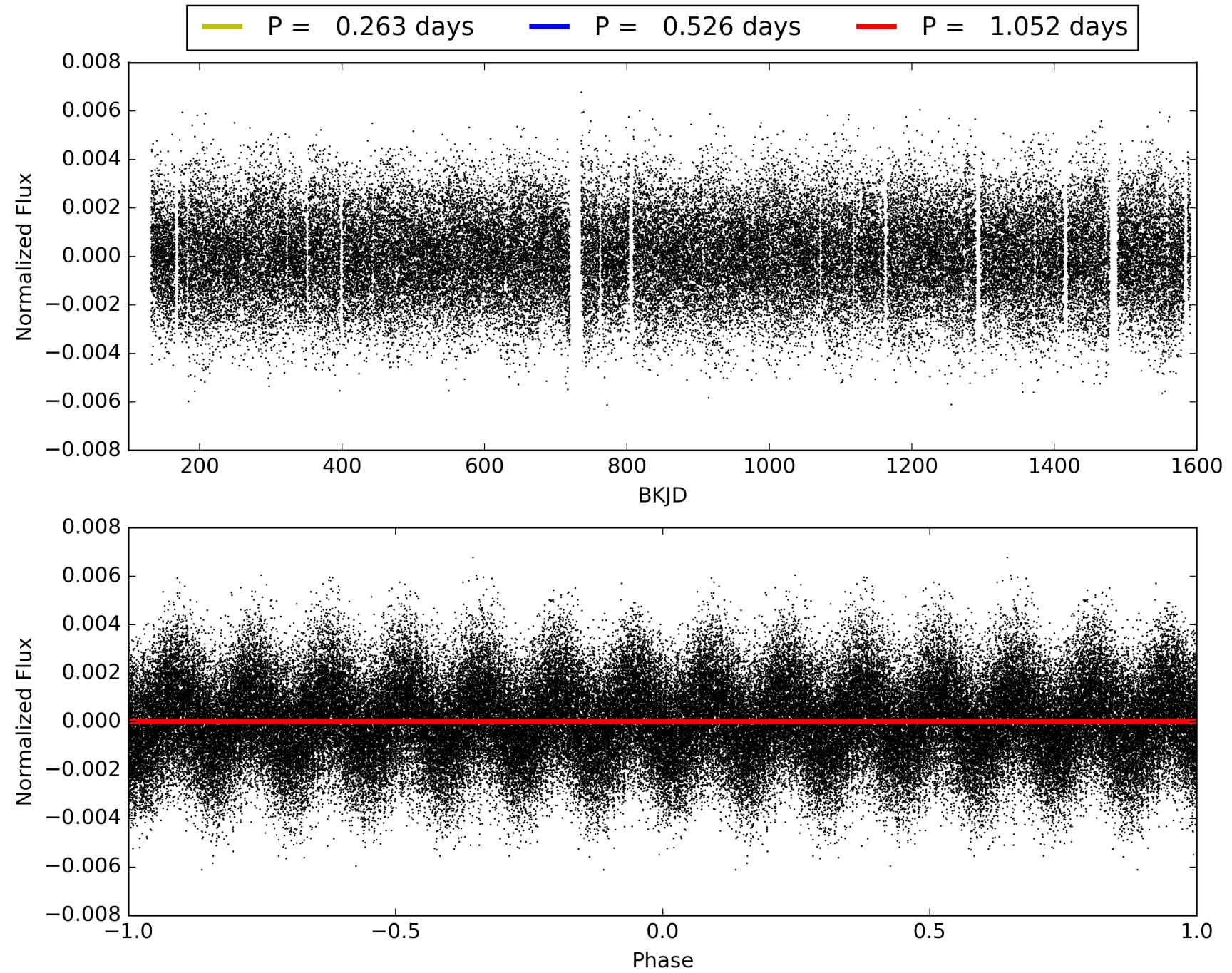
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:30:18 Z

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

# TCE 009758615-03, PDC Light Curves



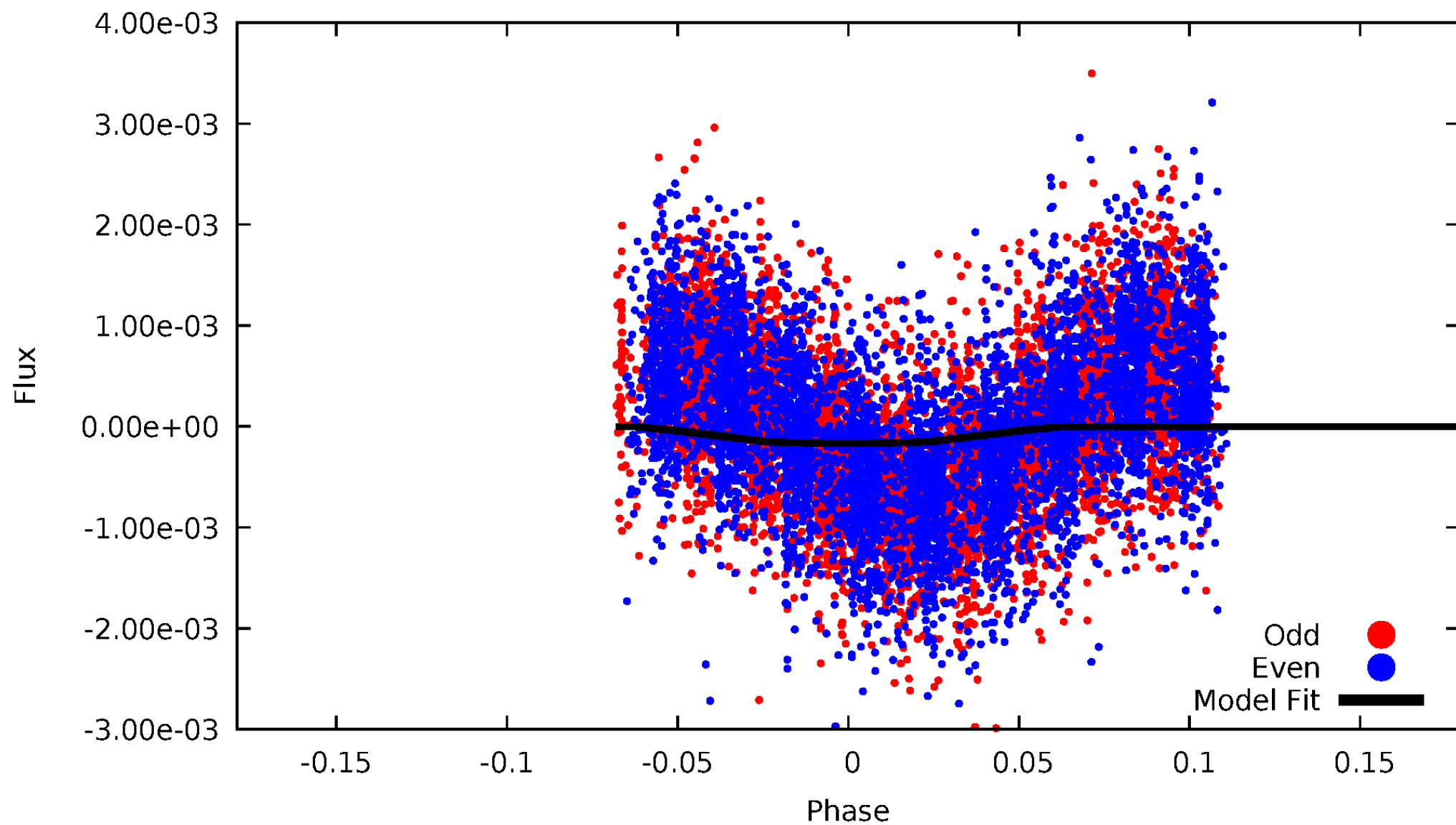
TCE 009758615-03





DV Odd/Even

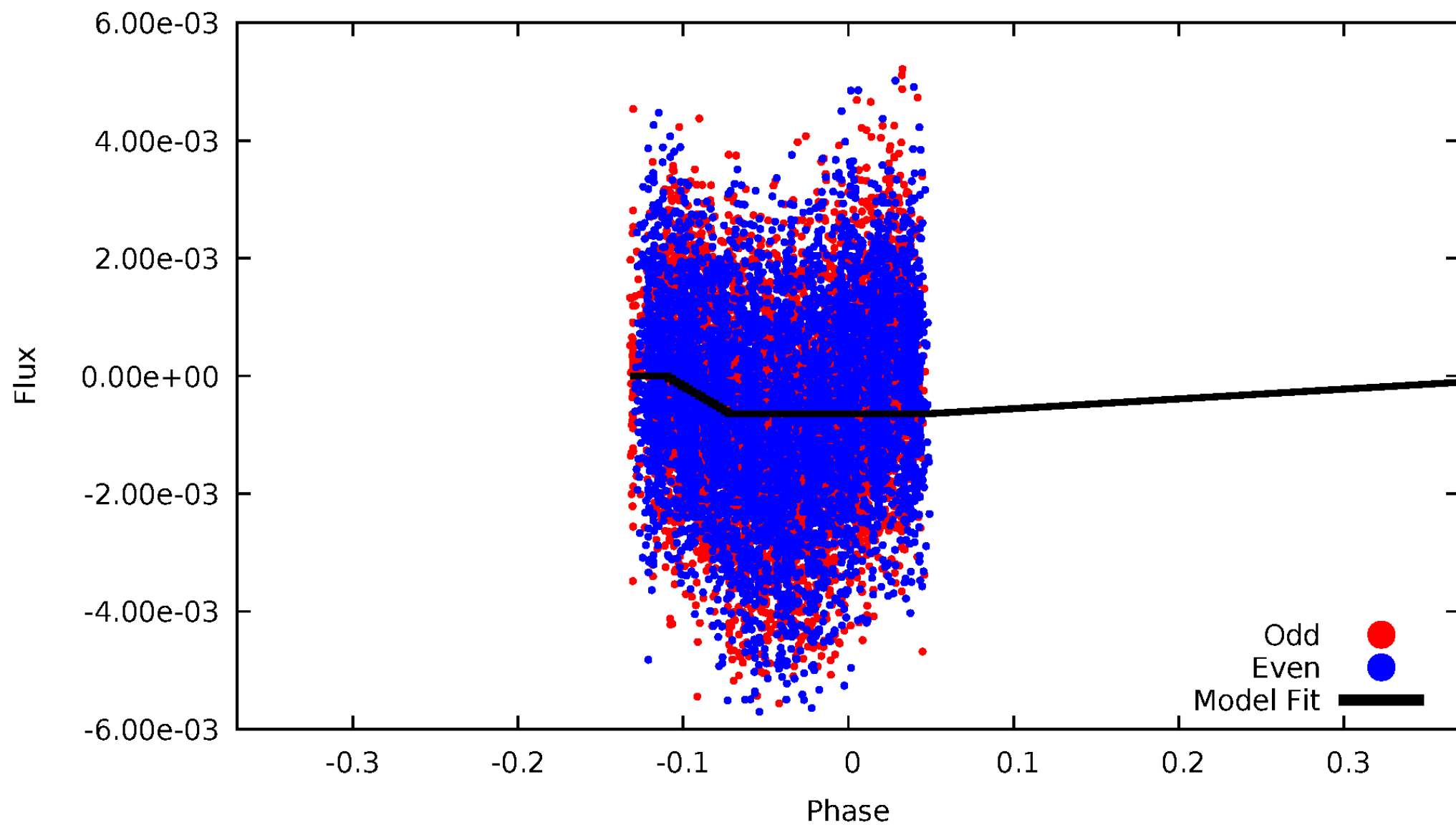
TCE 009758615-03





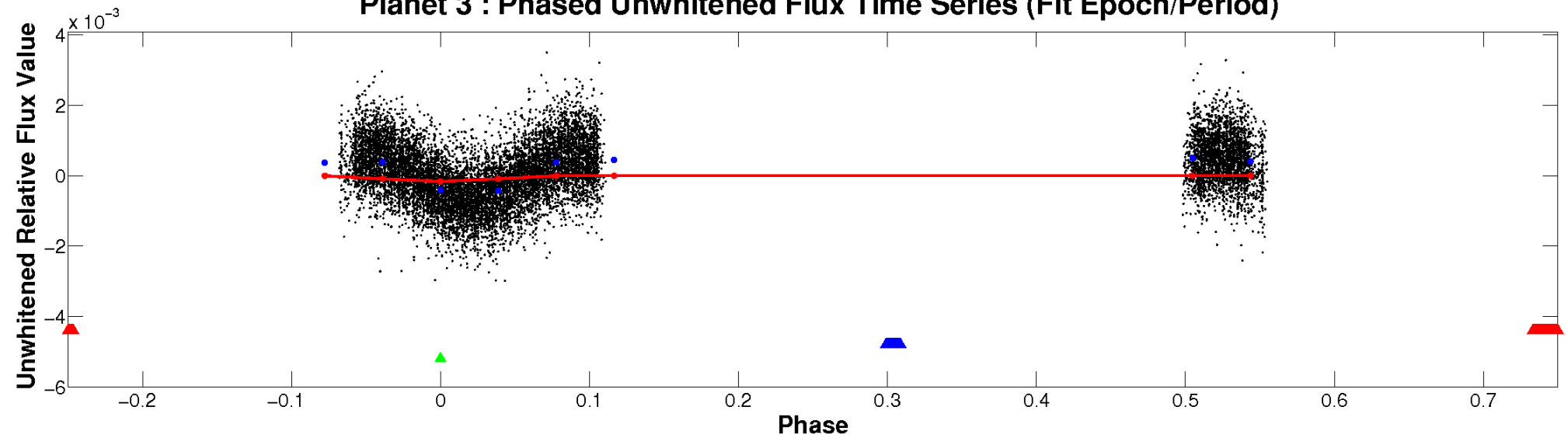
# ALT Odd/Even

TCE 009758615-03

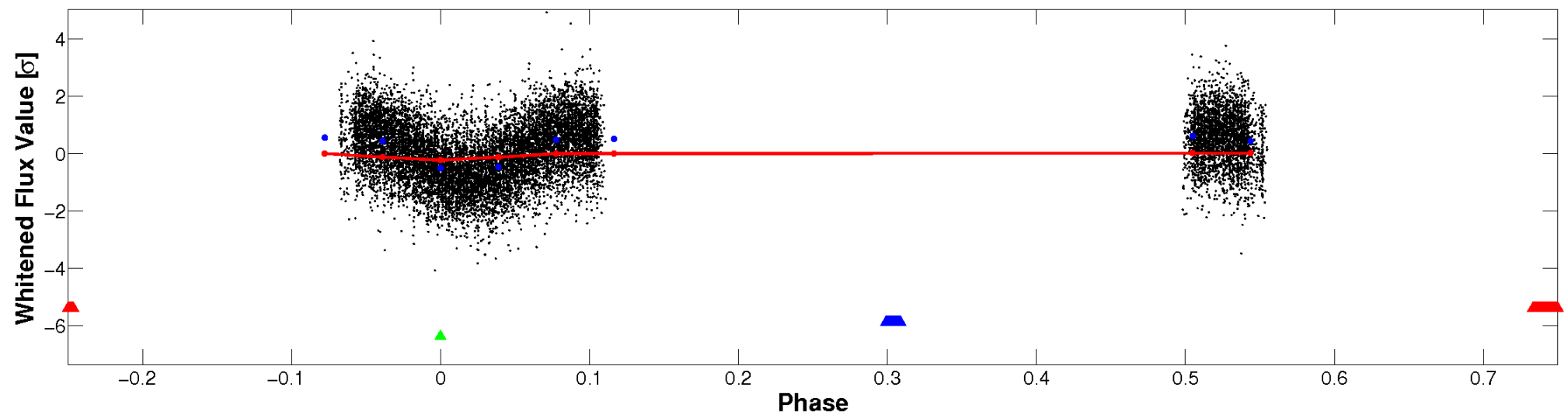


# Non-Whitened Vs. Whitened Light Curve

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

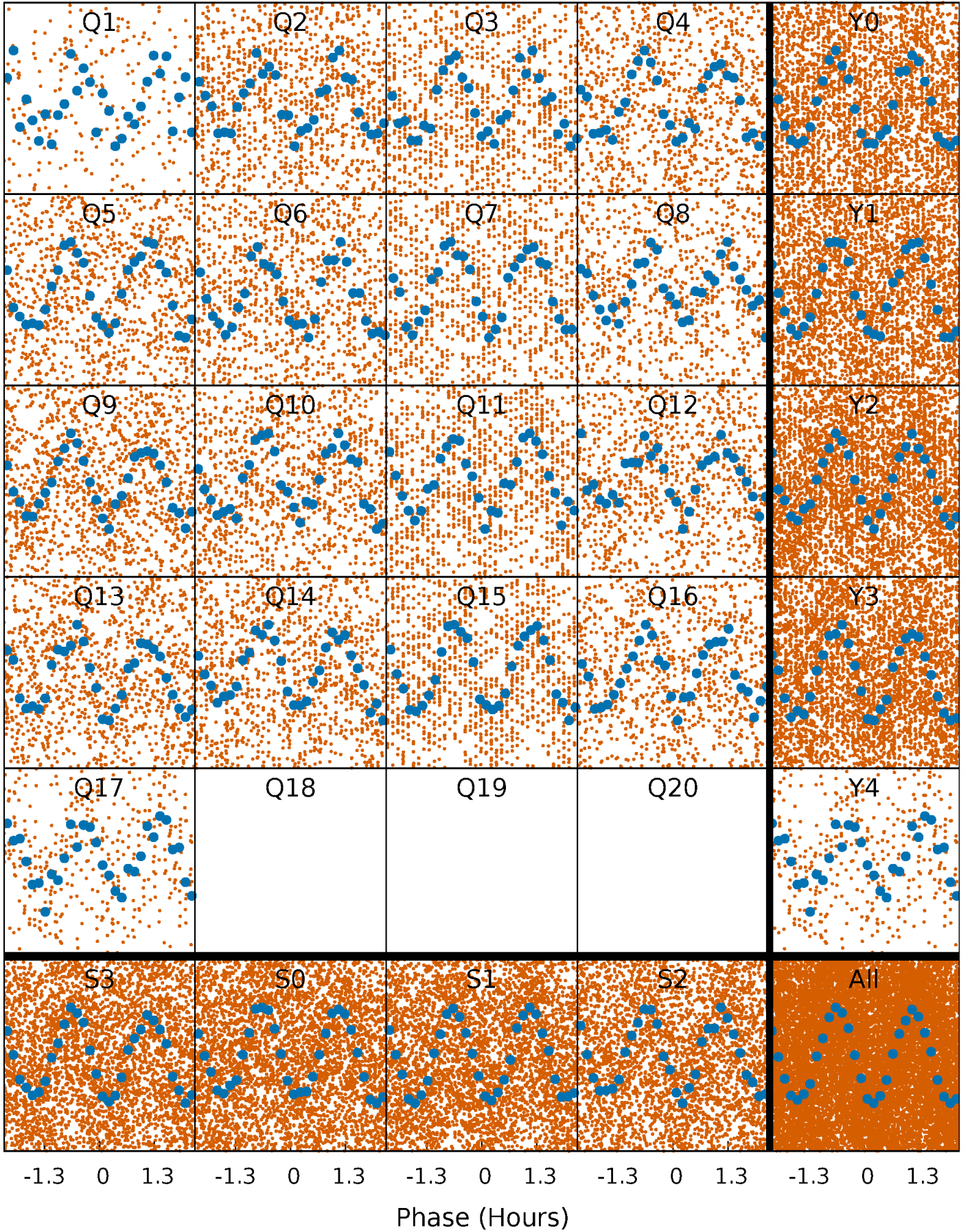


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



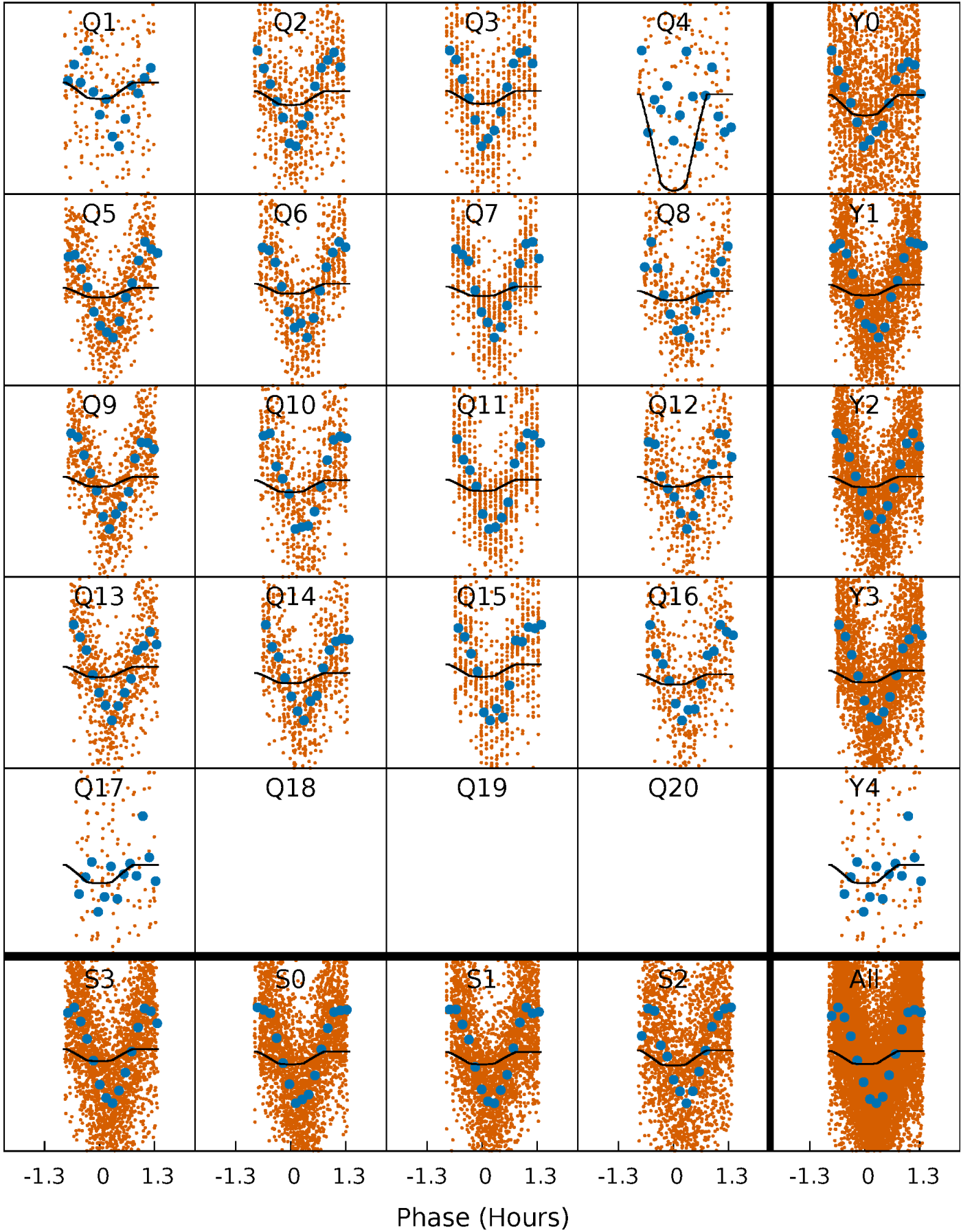
# PDC Quarter-Phased Transit Curves

TCE 009758615-03   P= 0.526149 Days    $T_0=131.654095$  (BKJD)



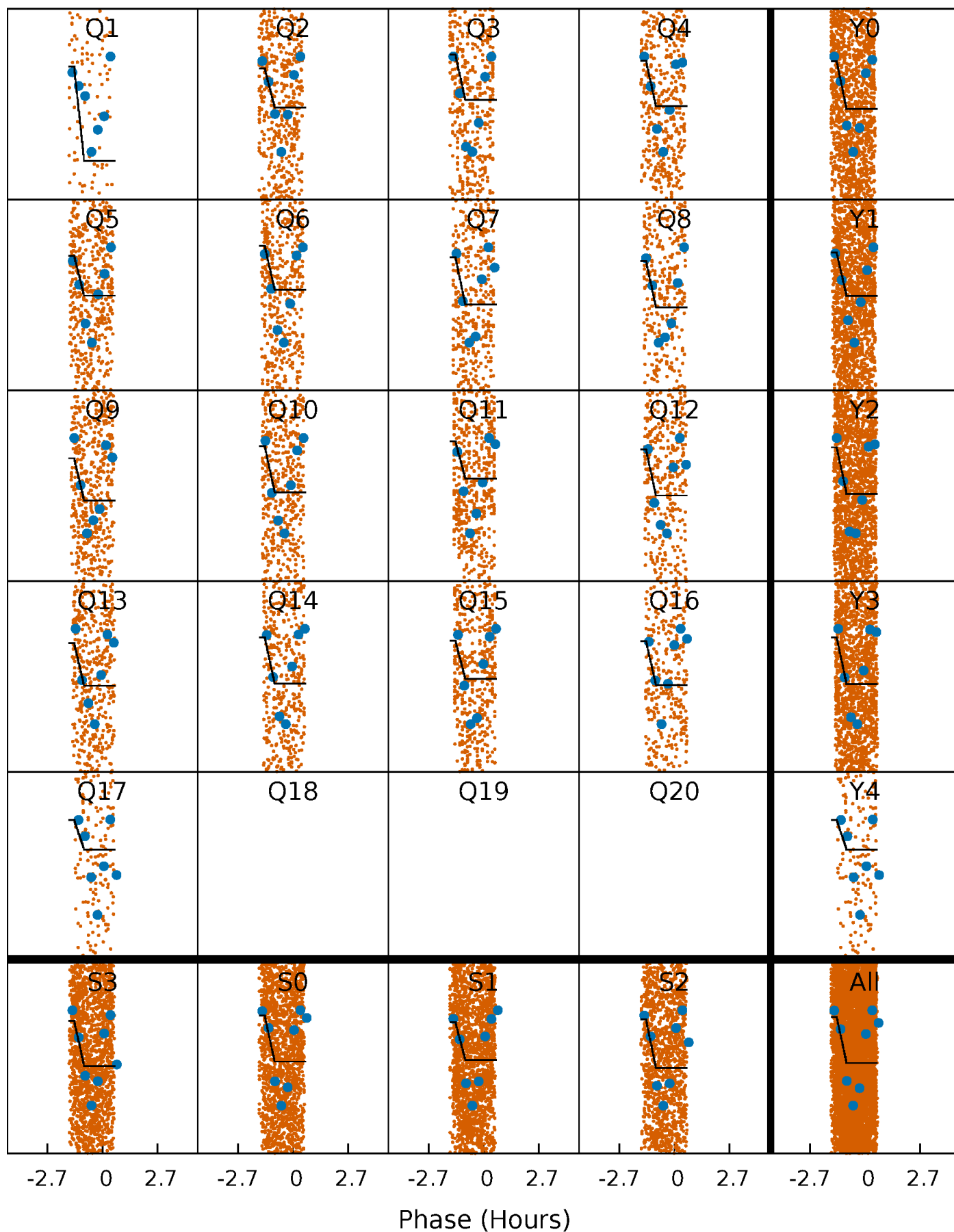
# DV Quarter-Phased Transit Curves

TCE 009758615-03   P= 0.526149 Days    $T_0=131.654095$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 009758615-03     $P = 0.526149$  Days     $T_0 = 131.687882$  (BKJD)

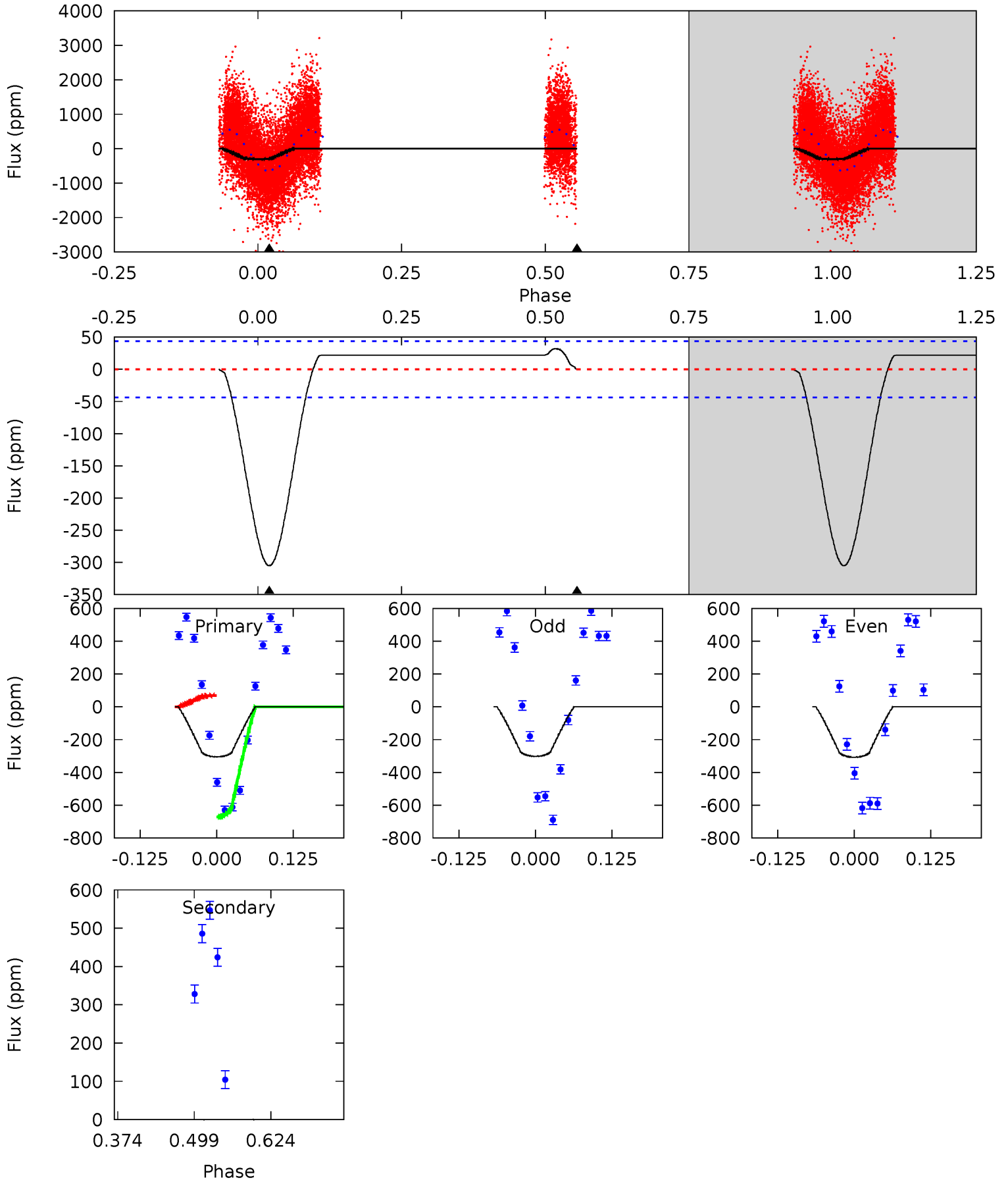




# DV Model-Shift Uniqueness Test

009758615-03, P = 0.526149 Days, E = 131.127946 Days

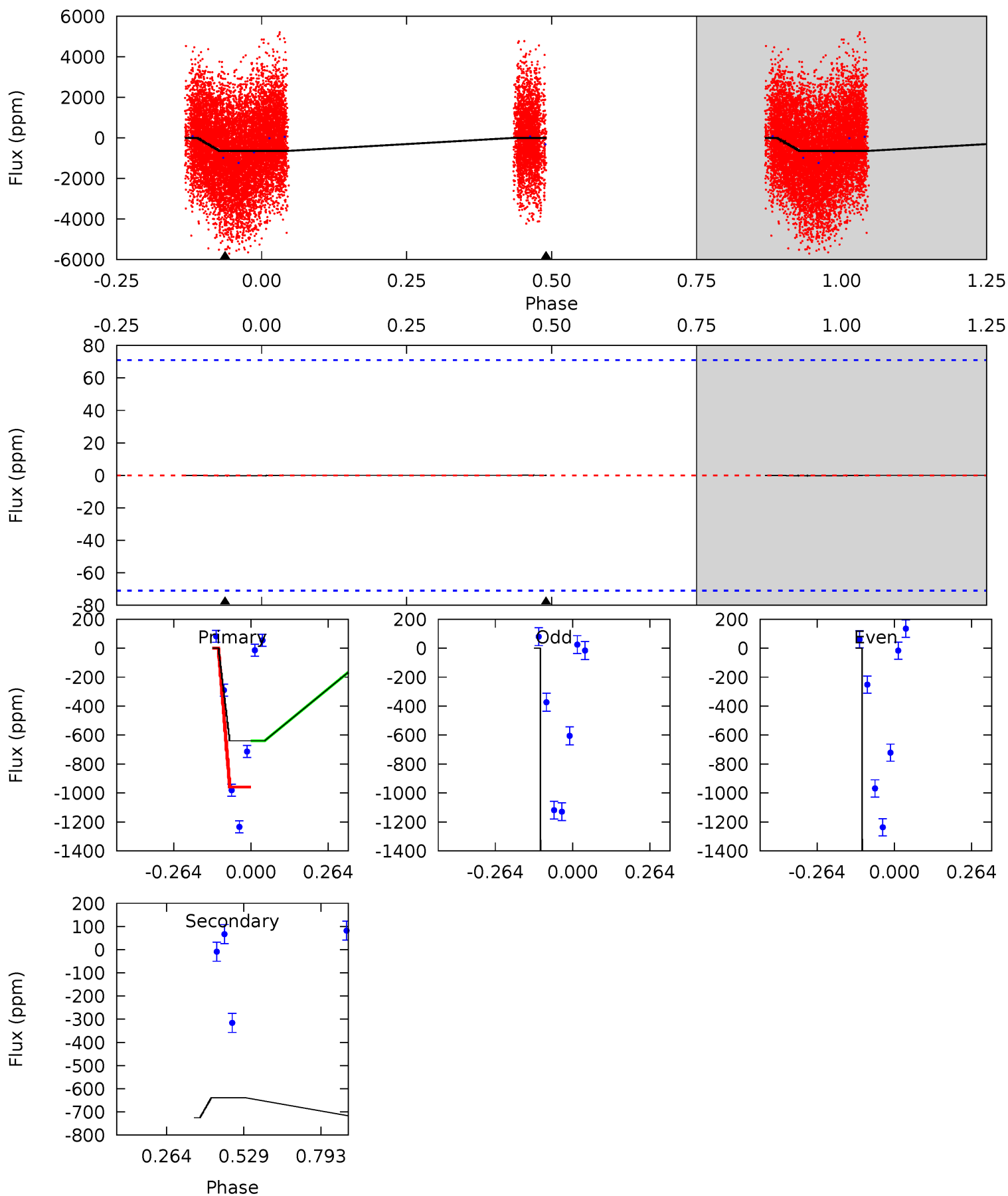
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
31.5	-0.02	0	0	4.52	1.54	1.20	31.5	31.5	-0.02	-0.02	0.28	1.05	0.10	32.2



# Alt Model-Shift Uniqueness Test

009758615-03, P = 0.526149 Days, E = 131.161733 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
0.01	0	0	0	4.36	1.12	0.00	0.01	0.01	0	0	0.00	0	0.35	0



### Stellar Parameters For KIC 009758615

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6969^{+192}_{-312}$	$4.089^{+0.136}_{-0.187}$	$0.220^{+0.150}_{-0.350}$	$1.896^{+0.608}_{-0.406}$	$1.608^{+0.208}_{-0.277}$	$0.332^{+0.260}_{-0.168}$
	+3%/-4%	+3%/-5%	+68%/-159%	+32%/-21%	+13%/-17%	+78%/-50%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 009758615-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$0\pm 10$	$2.64^{+0.93}_{-0.87}$	$4873^{+371}_{-348}$	$-4240^{+800}_{-475}$	$-0.000^{+0.195}_{-0.182}$
Alt.	$0\pm 16$	$5.29^{+1.30}_{-1.05}$	$4855^{+397}_{-340}$	$-4226^{+284}_{-299}$	$-0.000^{+0.068}_{-0.076}$

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

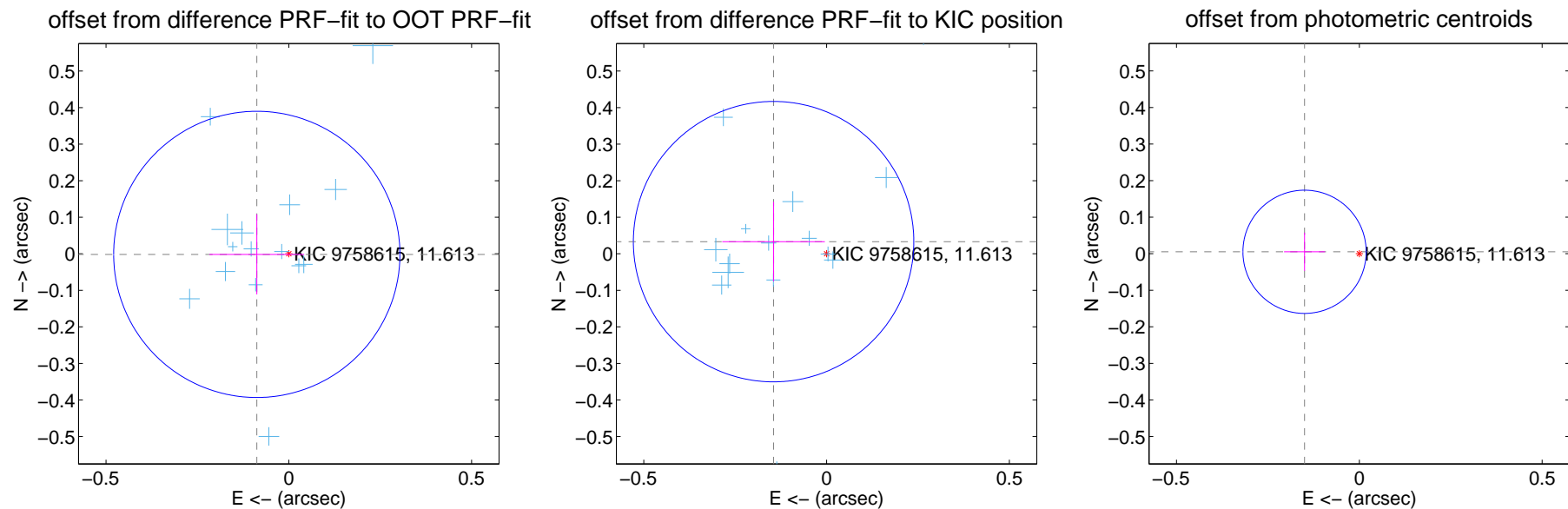
## DV Centroid Data

Supplemental centroid analysis for 009758615-03. **Kepler magnitude: 11.61.** Transit SNR 14.85

There are 17 quarters with good PRF difference image offsets

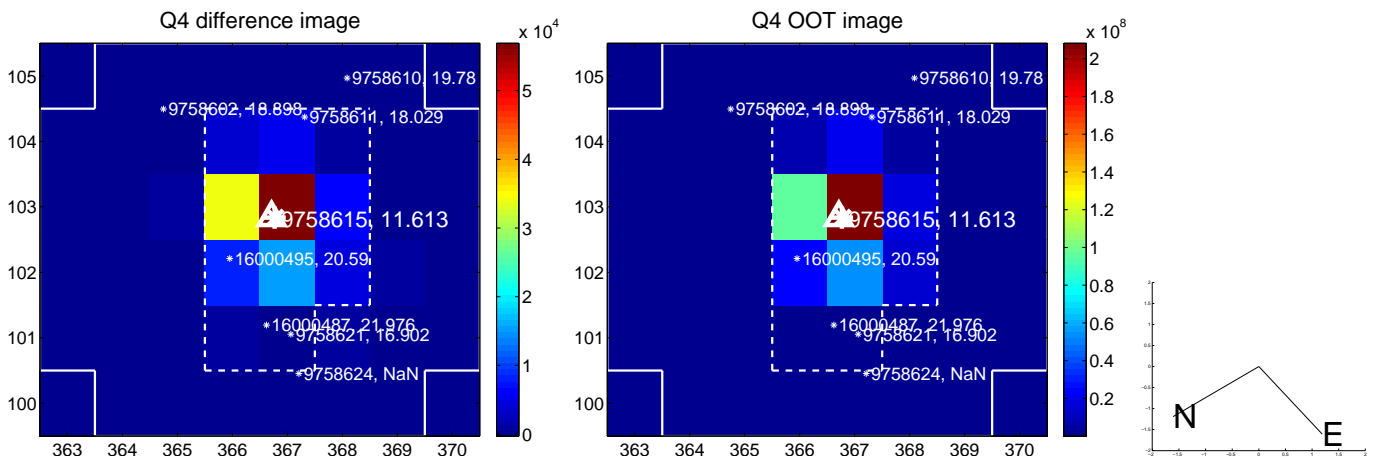
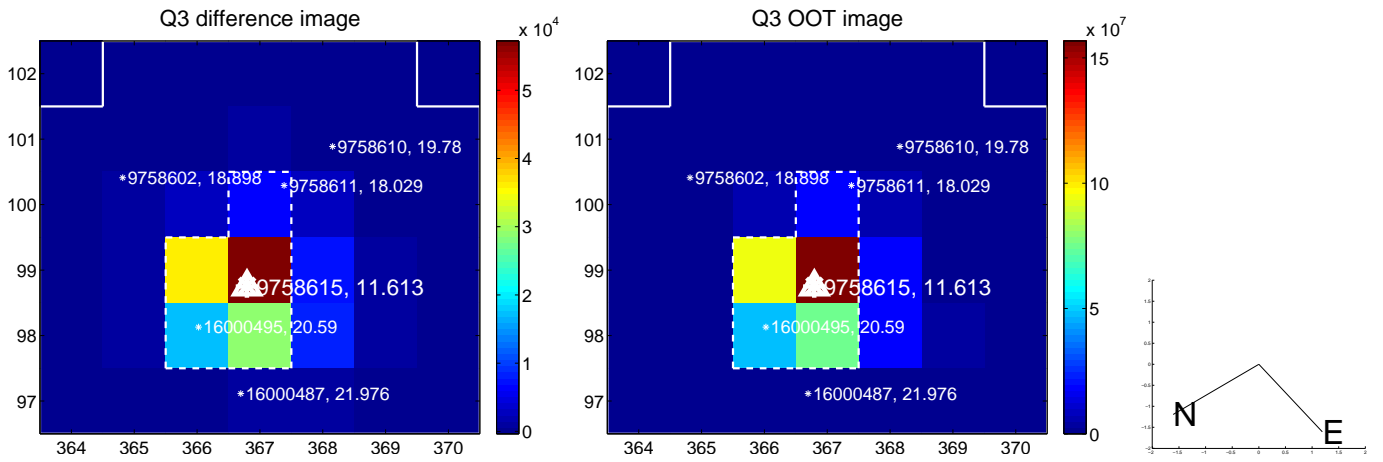
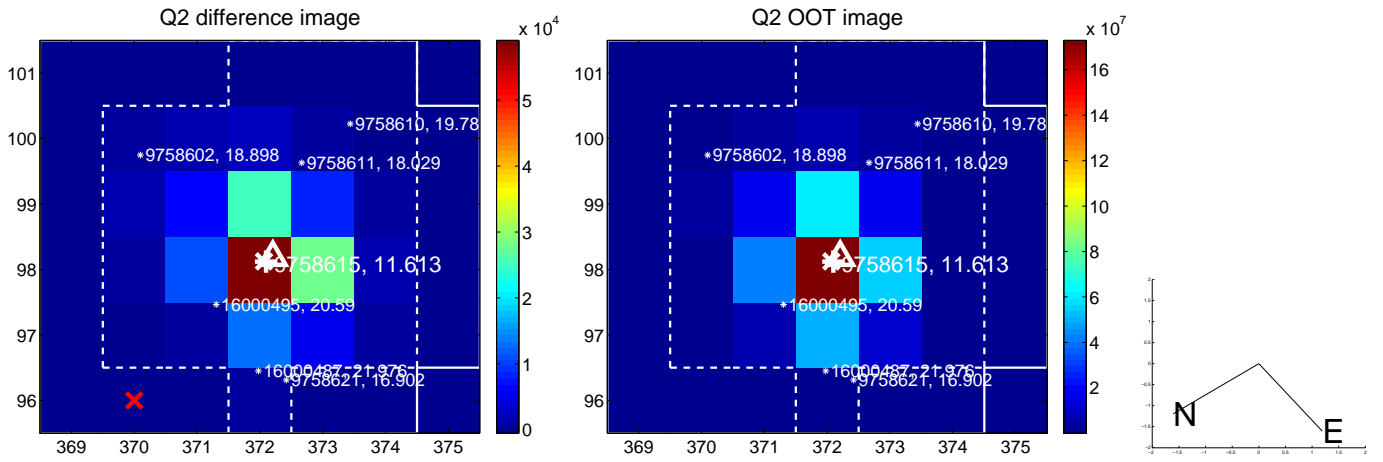
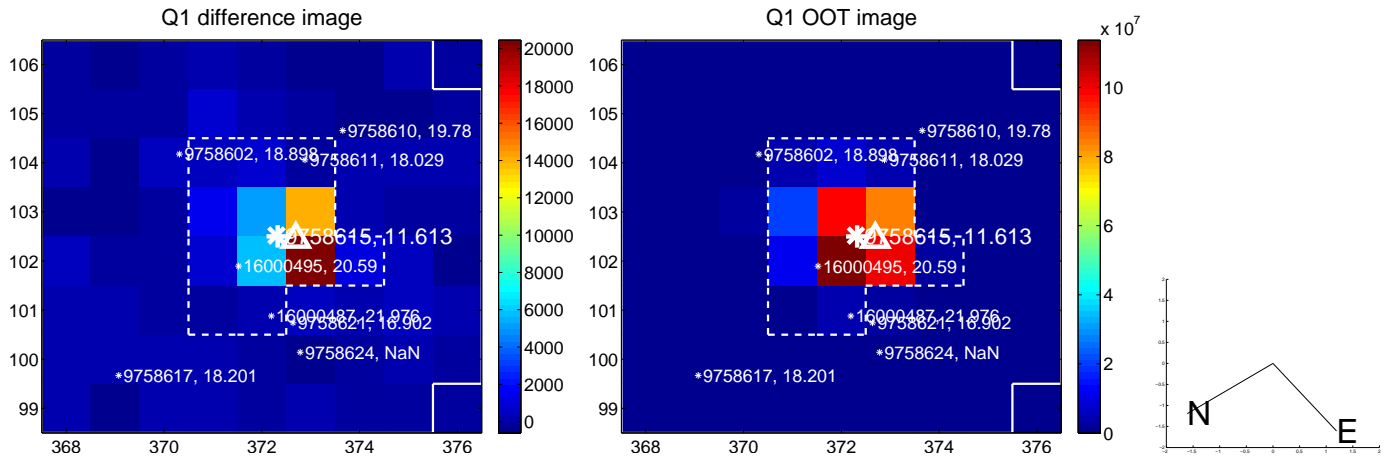
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.088 \pm 0.131$	0.67	$0.088 \pm 0.130$	$-0.002 \pm 0.109$
PRF-fit source offset from KIC position	$0.149 \pm 0.128$	1.16	$0.145 \pm 0.140$	$0.033 \pm 0.109$
photometric centroid source offset	$0.15 \pm 0.06$	2.67	$0.15 \pm 0.06$	$0.01 \pm 0.05$



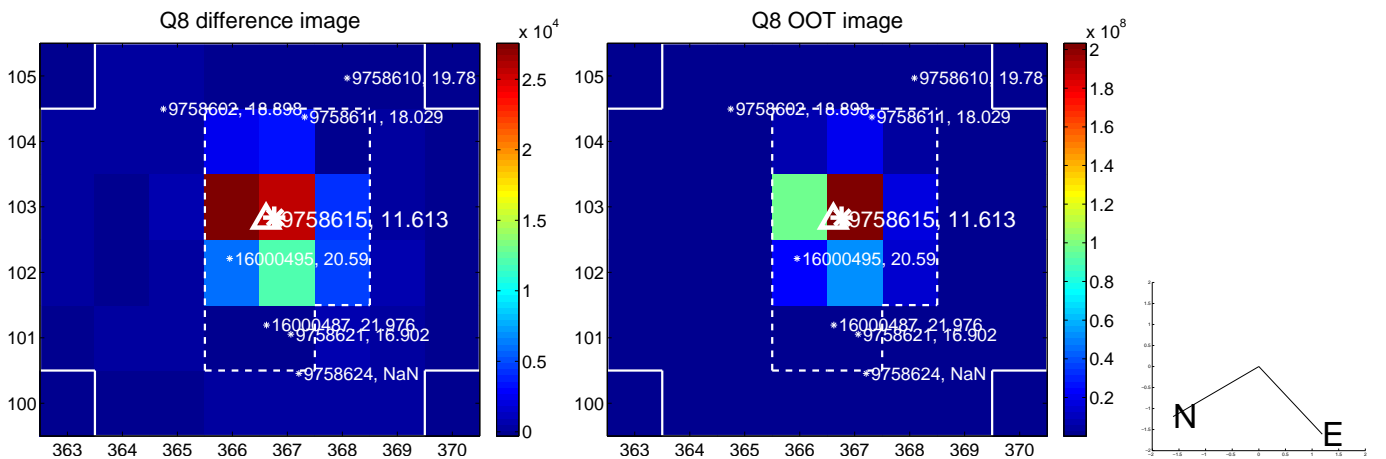
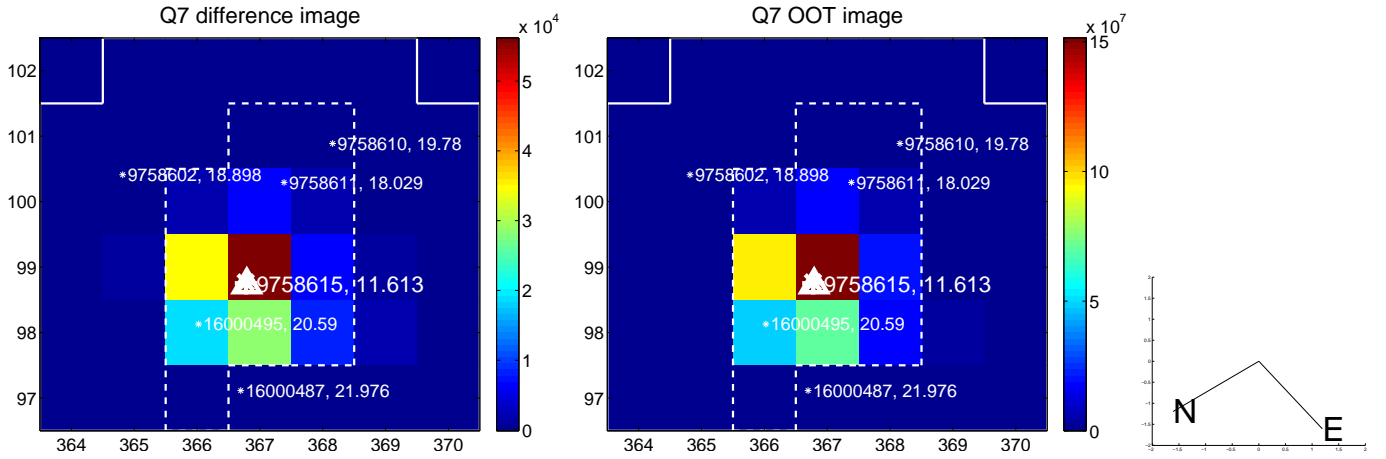
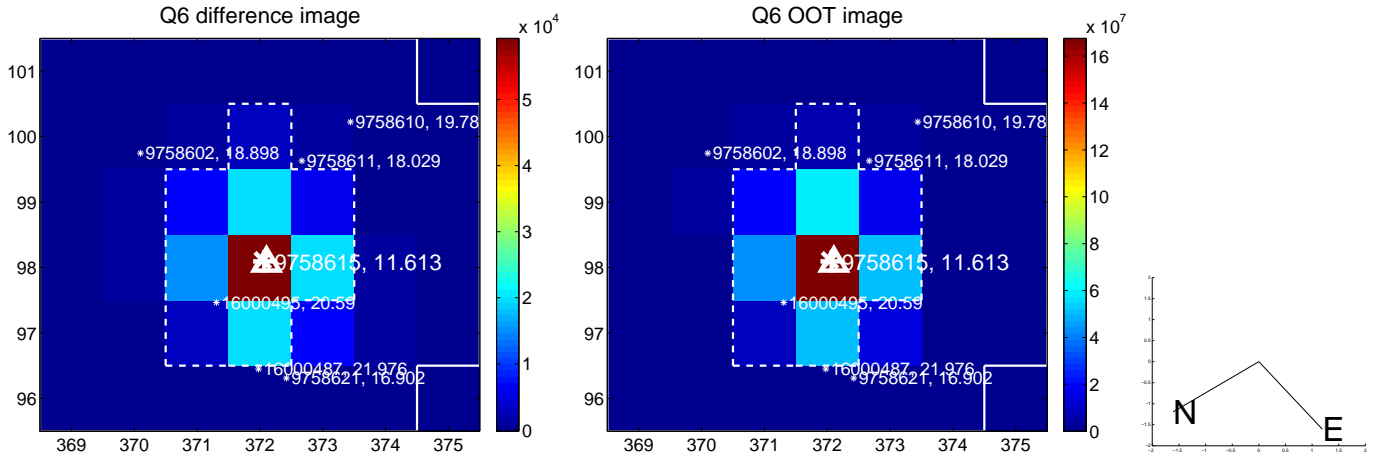
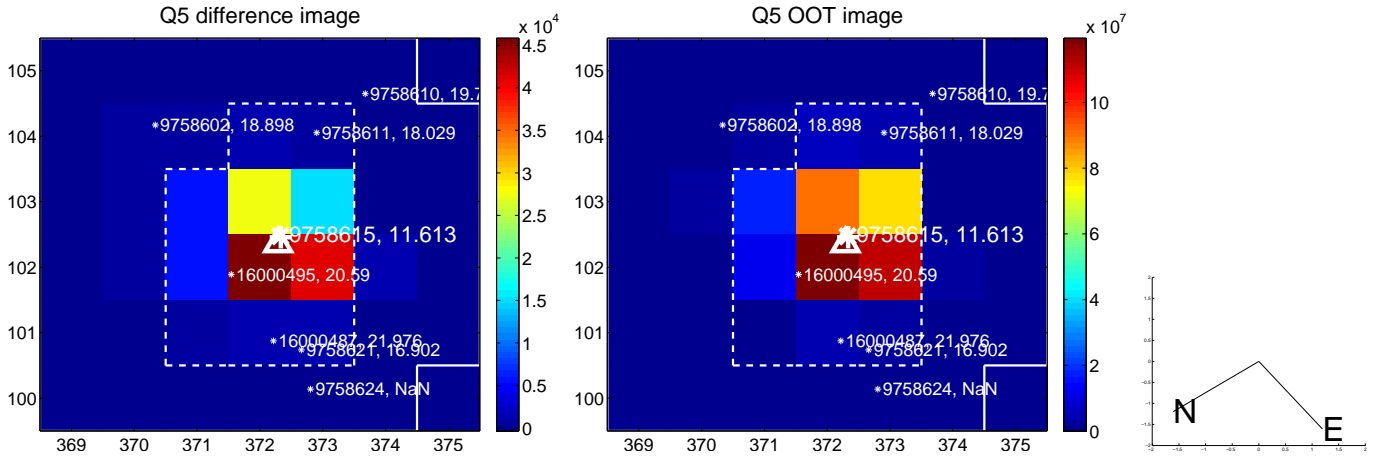
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

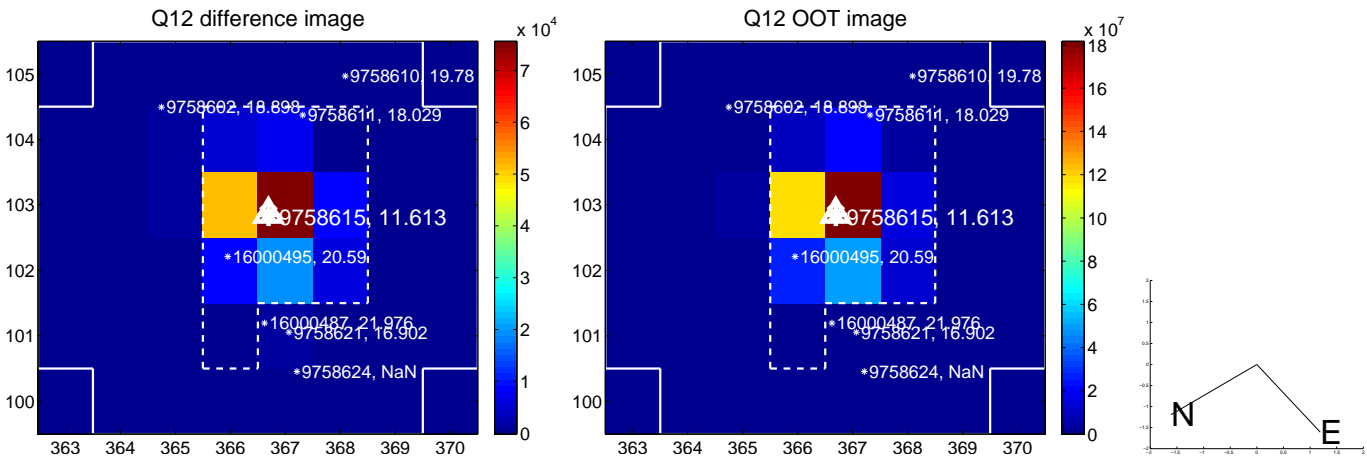
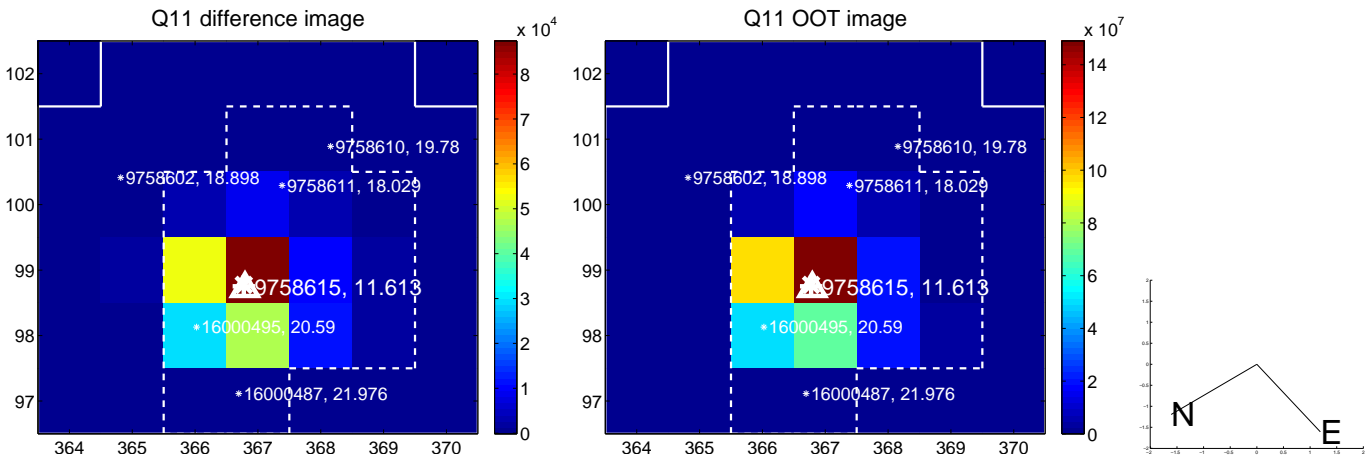
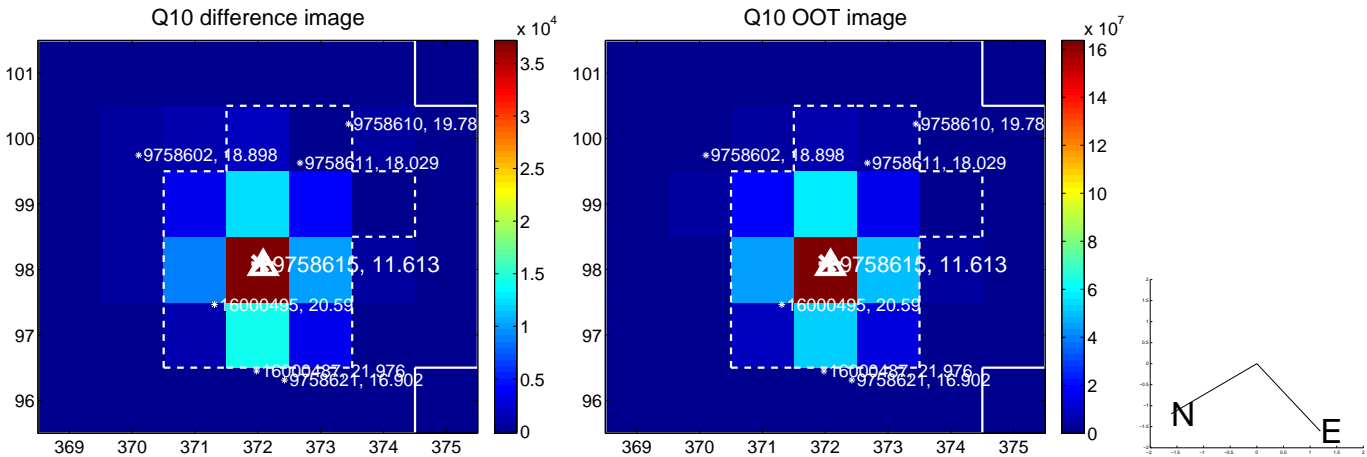
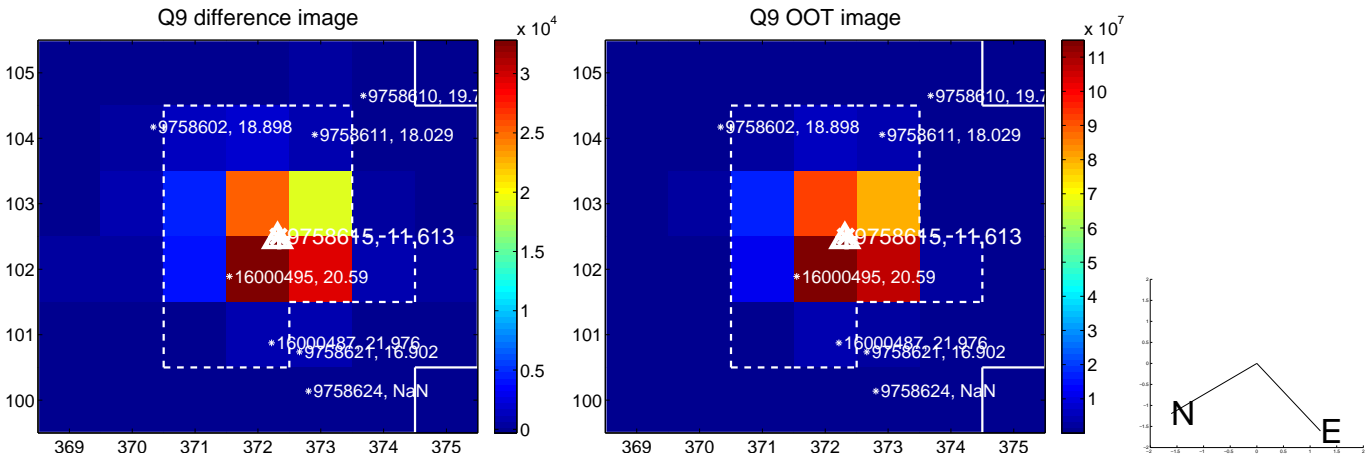




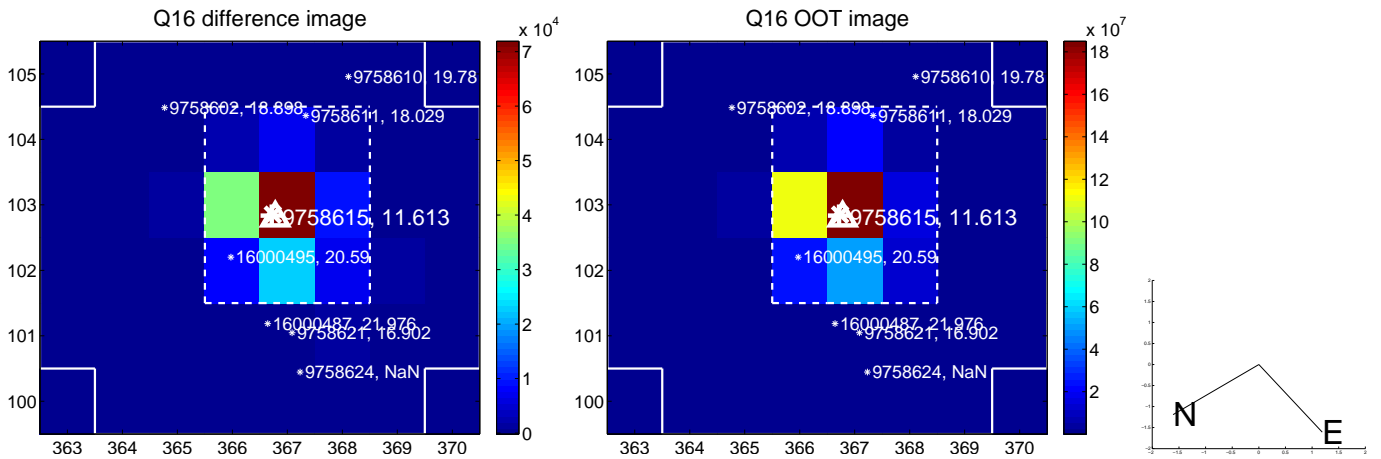
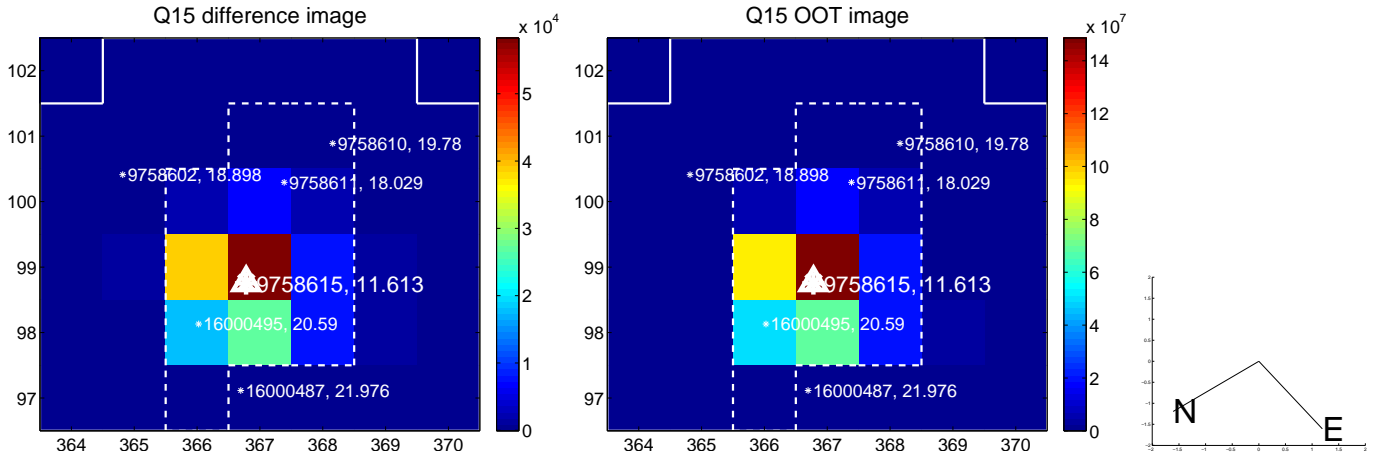
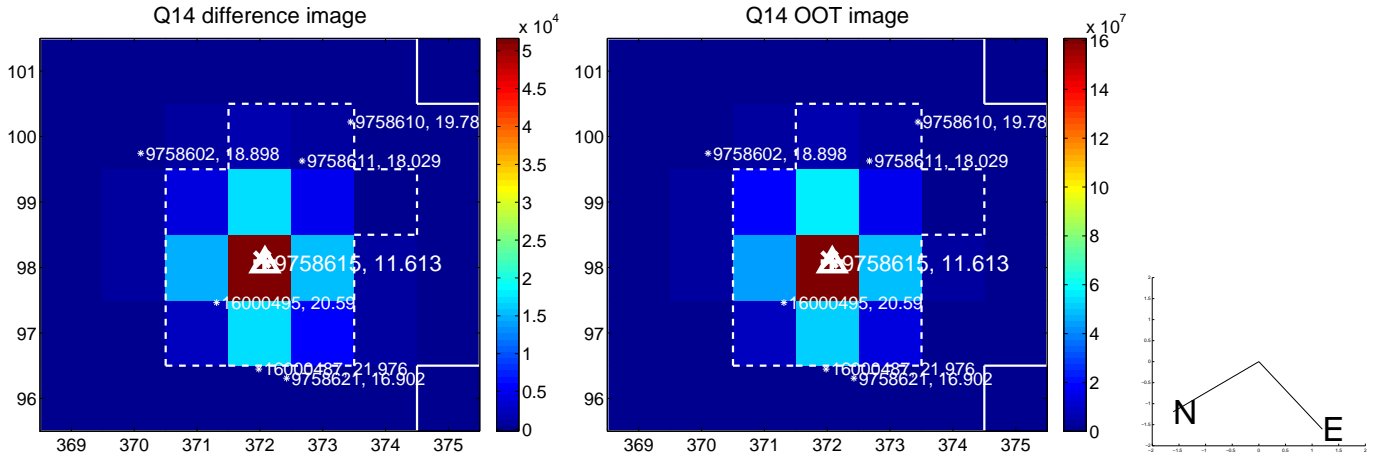
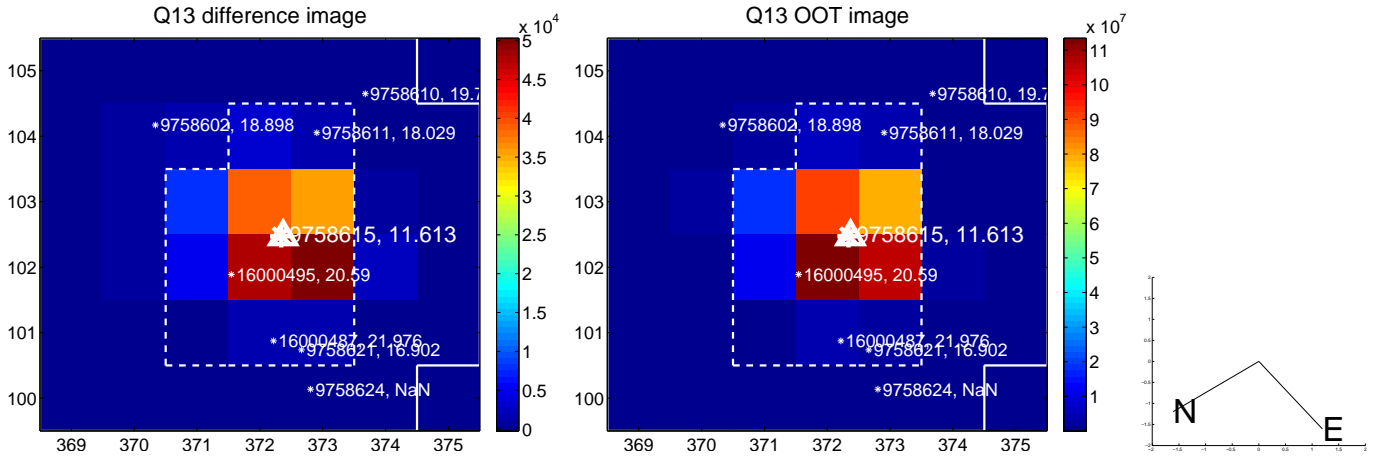
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



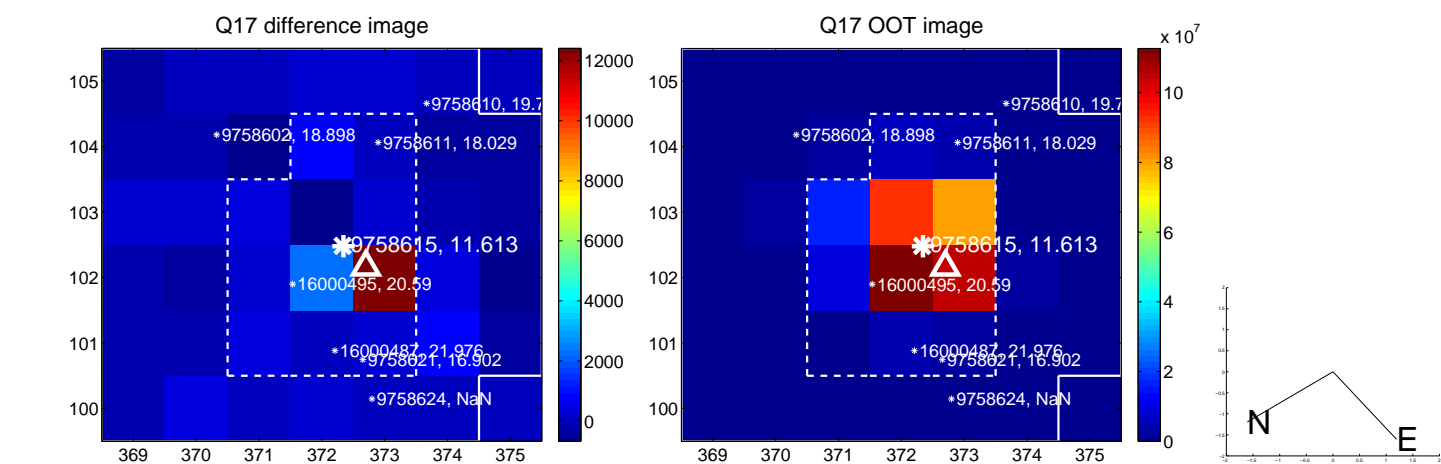
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



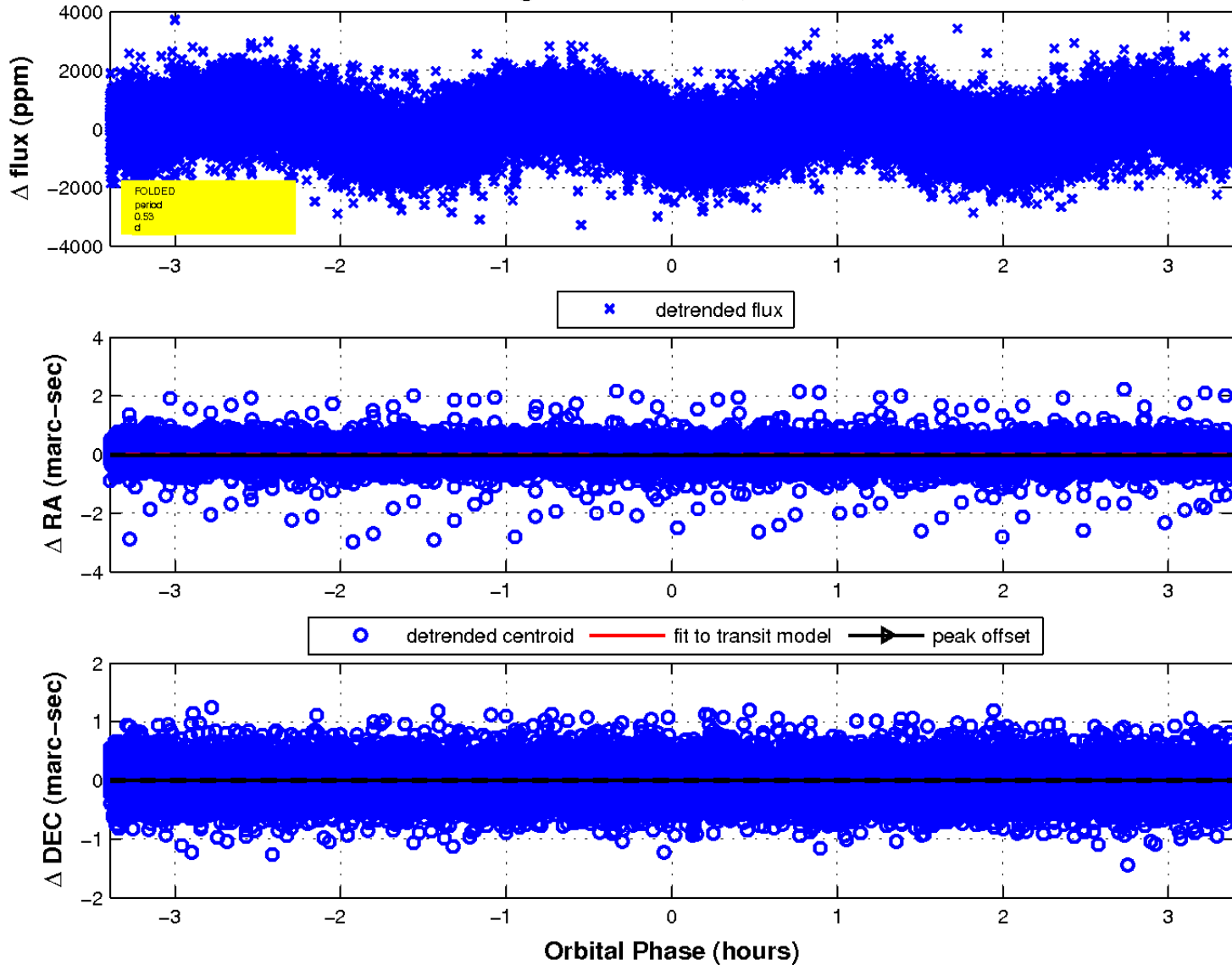
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 3 of 3



UKIRT Image

Declination

