

# KIC 012154526

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012154526-01	OBS	2004.01	56.188579	146.379770	341.0	6.543	28.2	30.4	1.18	5700	2.55	15.15
012154526-02	OBS	2004.02	3.188974	133.527823	65.4	2.969	15.7	17.0	1.18	5700	1.28	694.70
012154526-03	OBS	2004.03	1.721042	132.788849	26.8	2.318	8.2	8.4	1.18	5700	0.69	1581.04

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012154526-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
012154526-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT
012154526-03	OBS	PC	0.87	0	0	0	0	NO_COMMENT

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

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

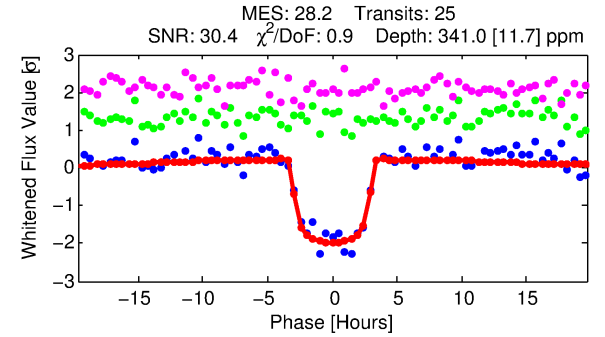
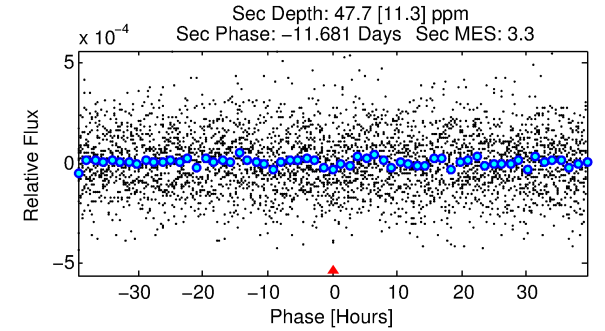
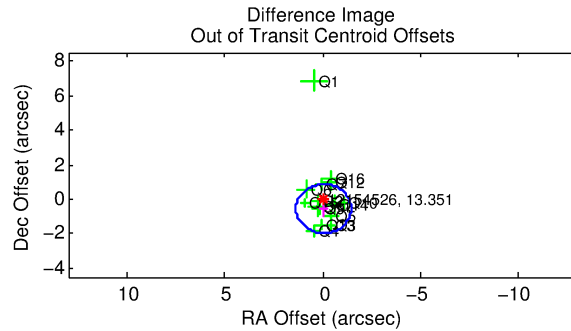
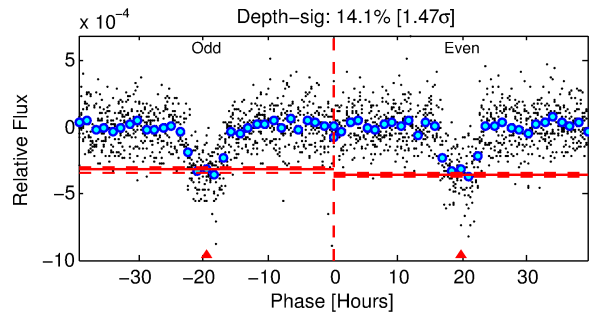
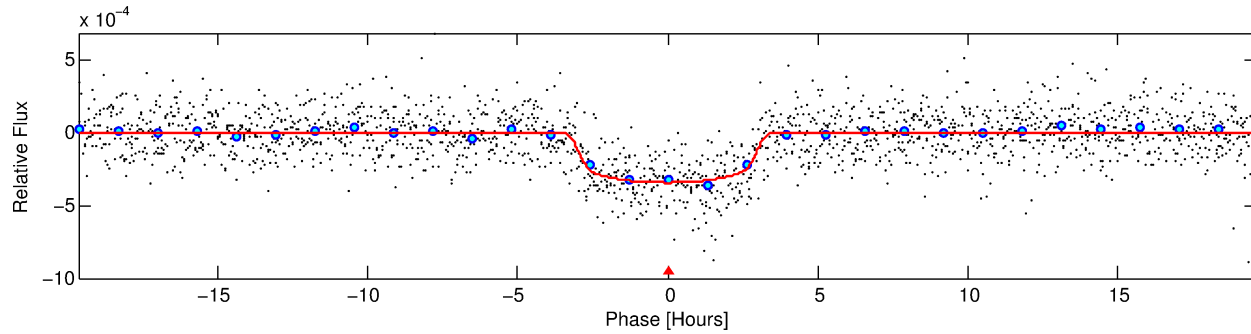
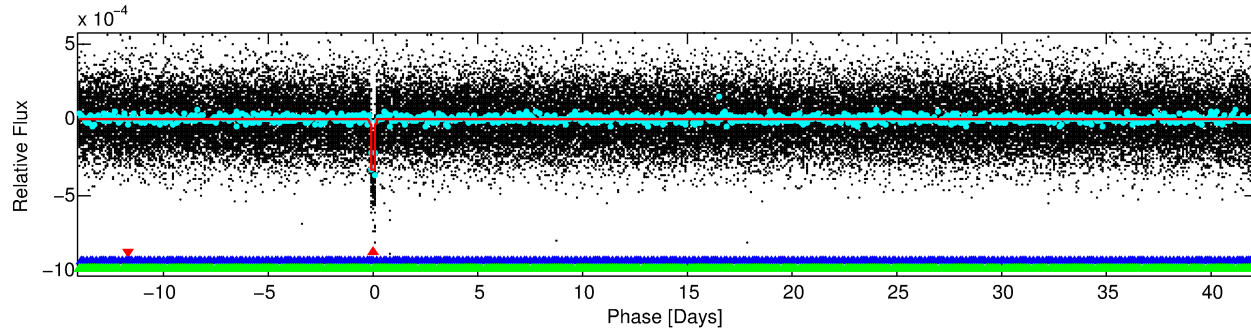
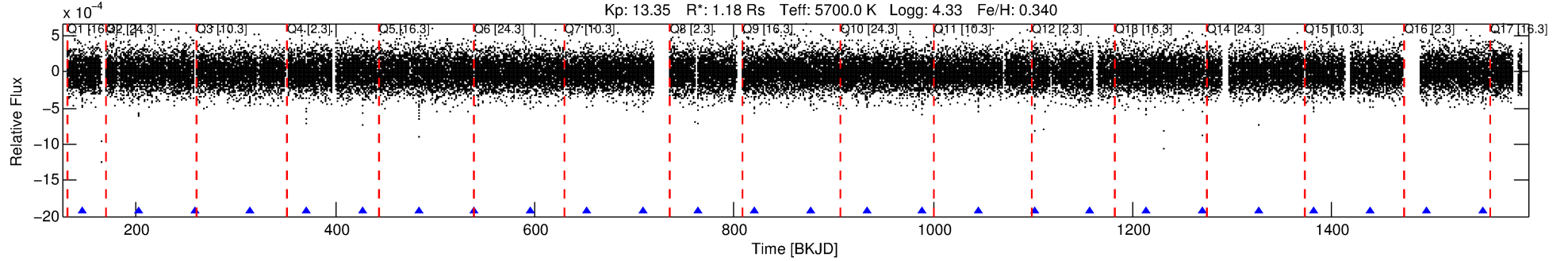
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 012154526-01

No Significant Match Found

# DV One-Page Summary

KIC: 12154526 Candidate: 1 of 3 Period: 56.189 d  
KOI: K02004.01 Corr: 0.964



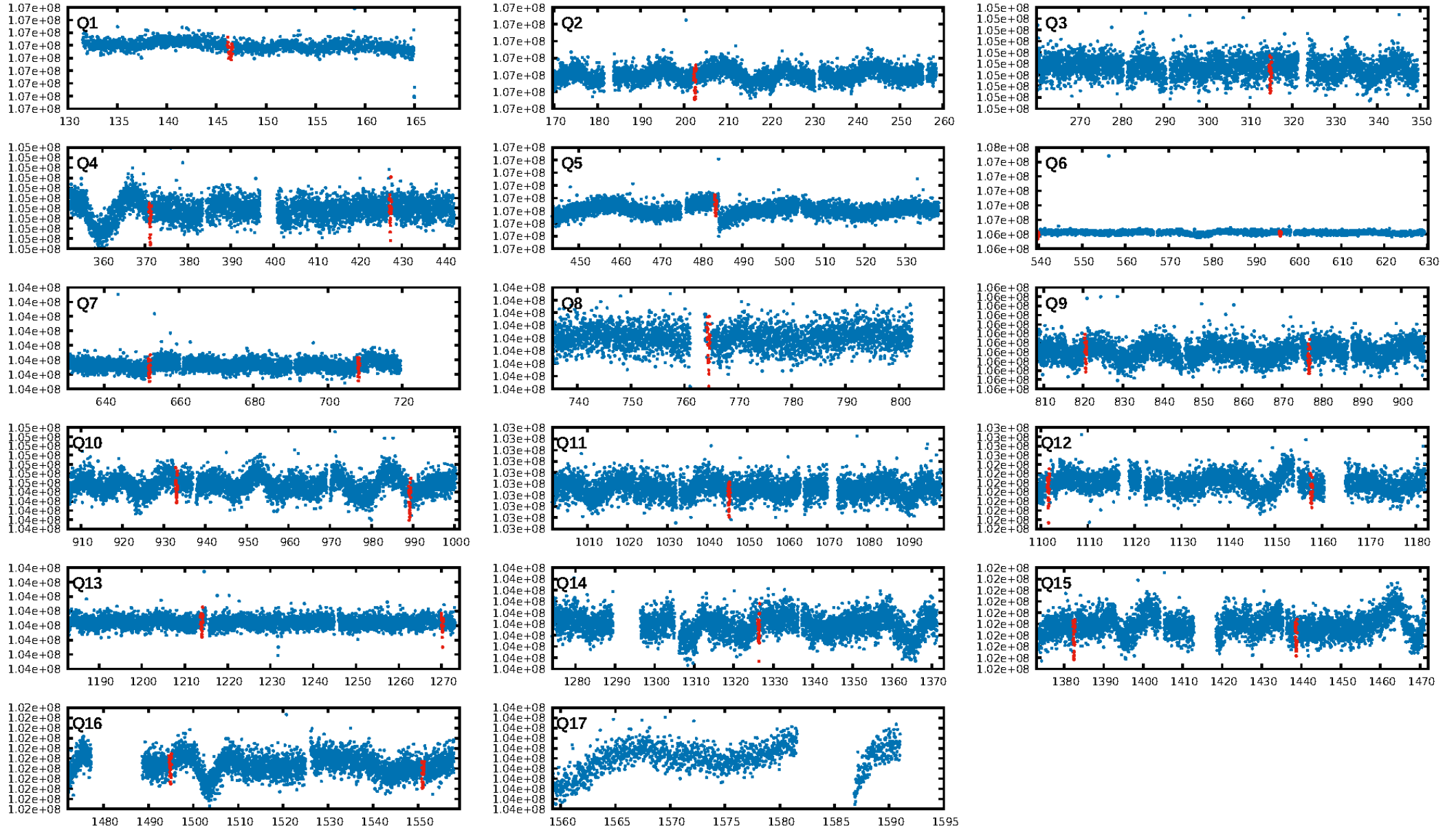
## DV Fit Results:

Period = 56.18858 [0.00028] d  
Epoch = 146.3798 [0.0042] BKJD  
Rp/R\* = 0.0199 [0.0017]  
a/R\* = 33.64 [12.18]  
b = 0.88 [0.09]  
Seff = 15.15 [3.33]  
Teq = 503 [28] K  
Rp = 2.55 [0.45] Re  
a = 0.2938 [0.0399] AU  
Ag = 347.62 [123.47] [2.81 $\sigma$ ]  
Teffp = 3359 [253] K [11.22 $\sigma$ ]

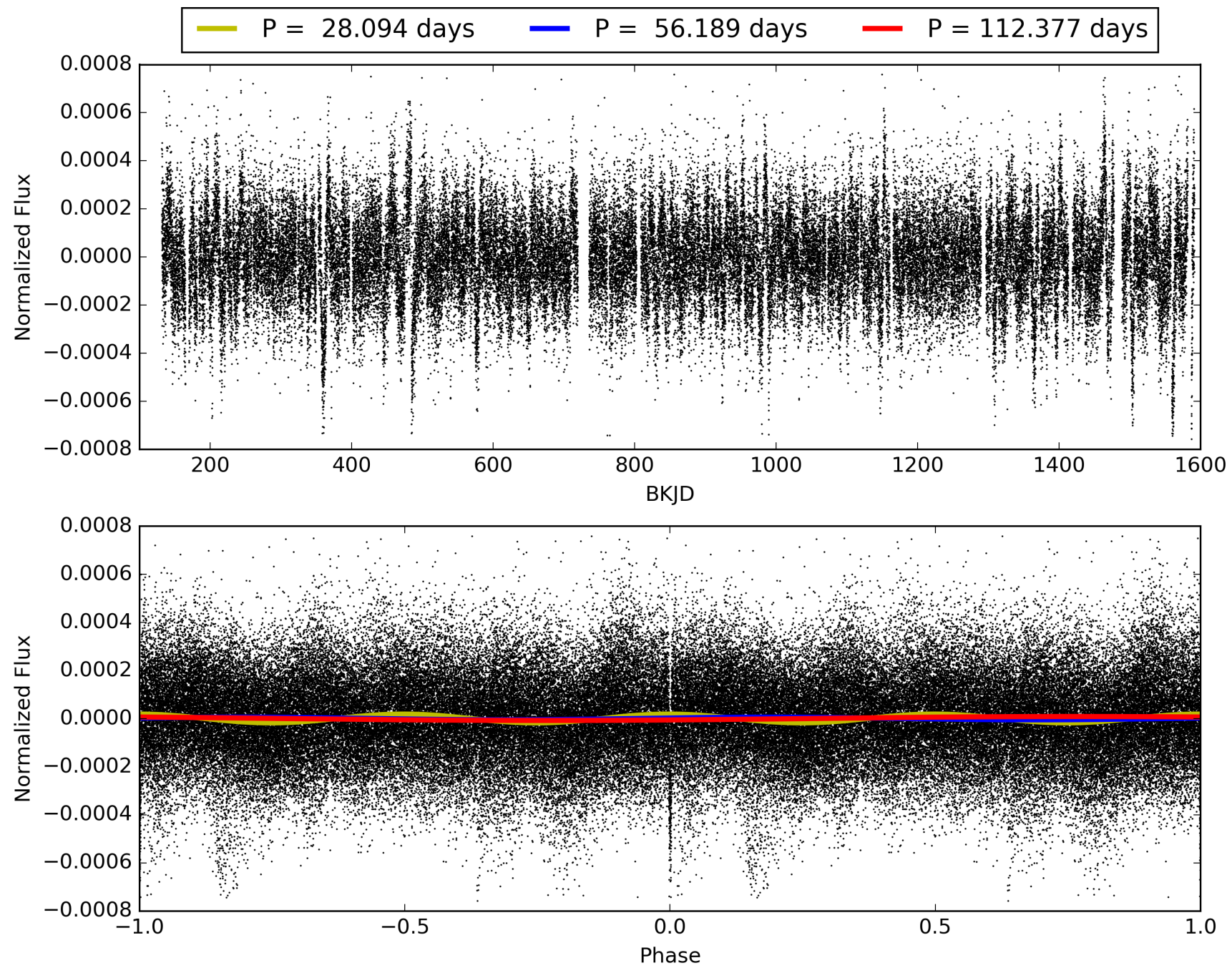
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [177.04 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 77.1%  
ModelChiSquareGoF-sig: 100.0%  
Bootstrap-pfa: 1.23e-147  
RollingBand-fgt: 1.00 [24/24]  
GhostDiagnostic-chr: 6.04  
Centroid-sig: 48.8%  
Centroid-so: 0.393 arcsec [0.81 $\sigma$ ]  
OotOffset-rm: 0.560 arcsec [1.19 $\sigma$ ]  
KicOffset-rm: 0.483 arcsec [0.91 $\sigma$ ]  
OotOffset-st: 4/4/3/4 [15]  
KicOffset-st: 4/4/3/4 [15]  
DiffImageQuality-fgm: 0.93 [14/15]  
DiffImageOverlap-fno: 0.27 [4/15]

# TCE 012154526-01, PDC Light Curves



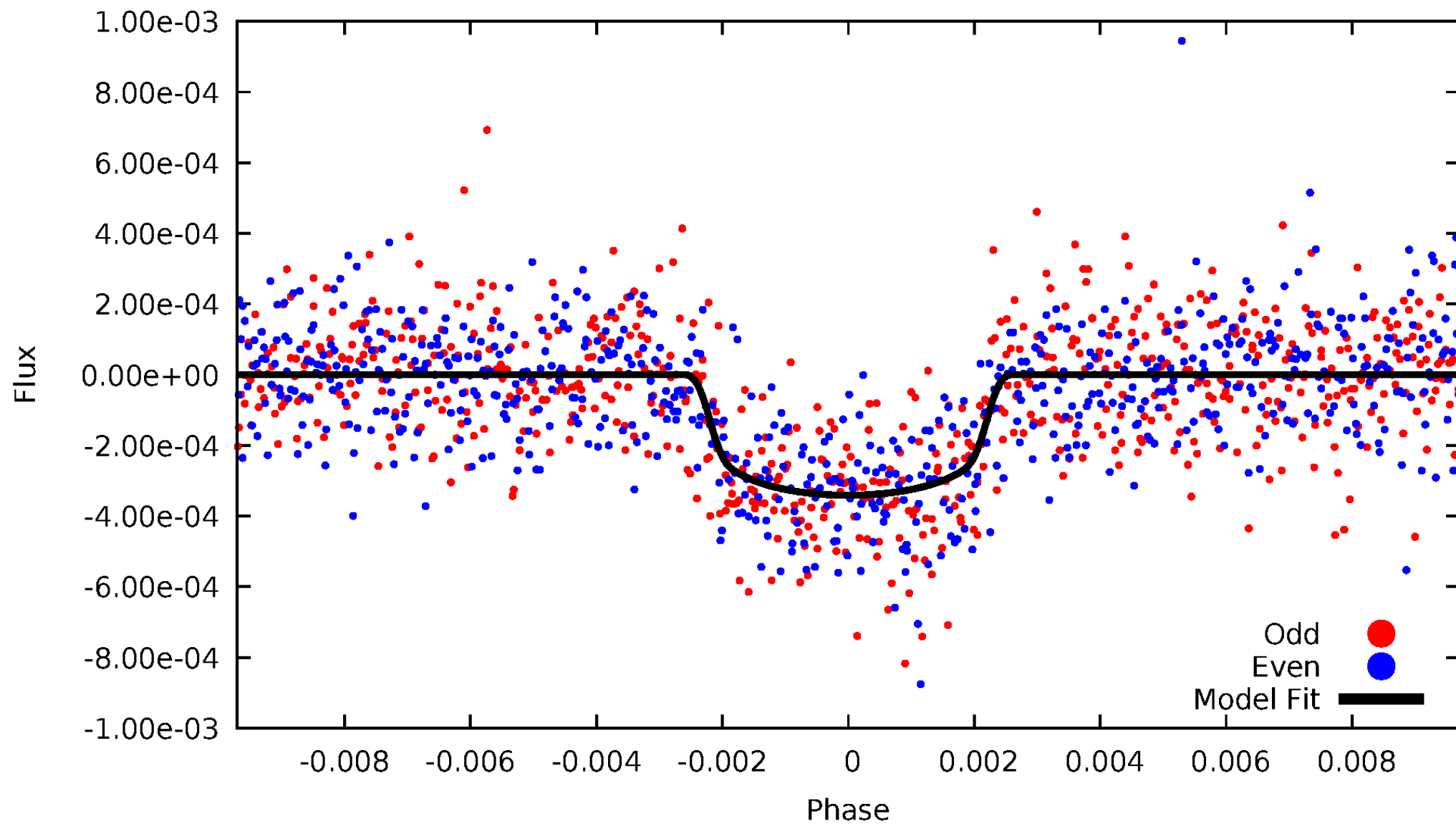
TCE 012154526-01





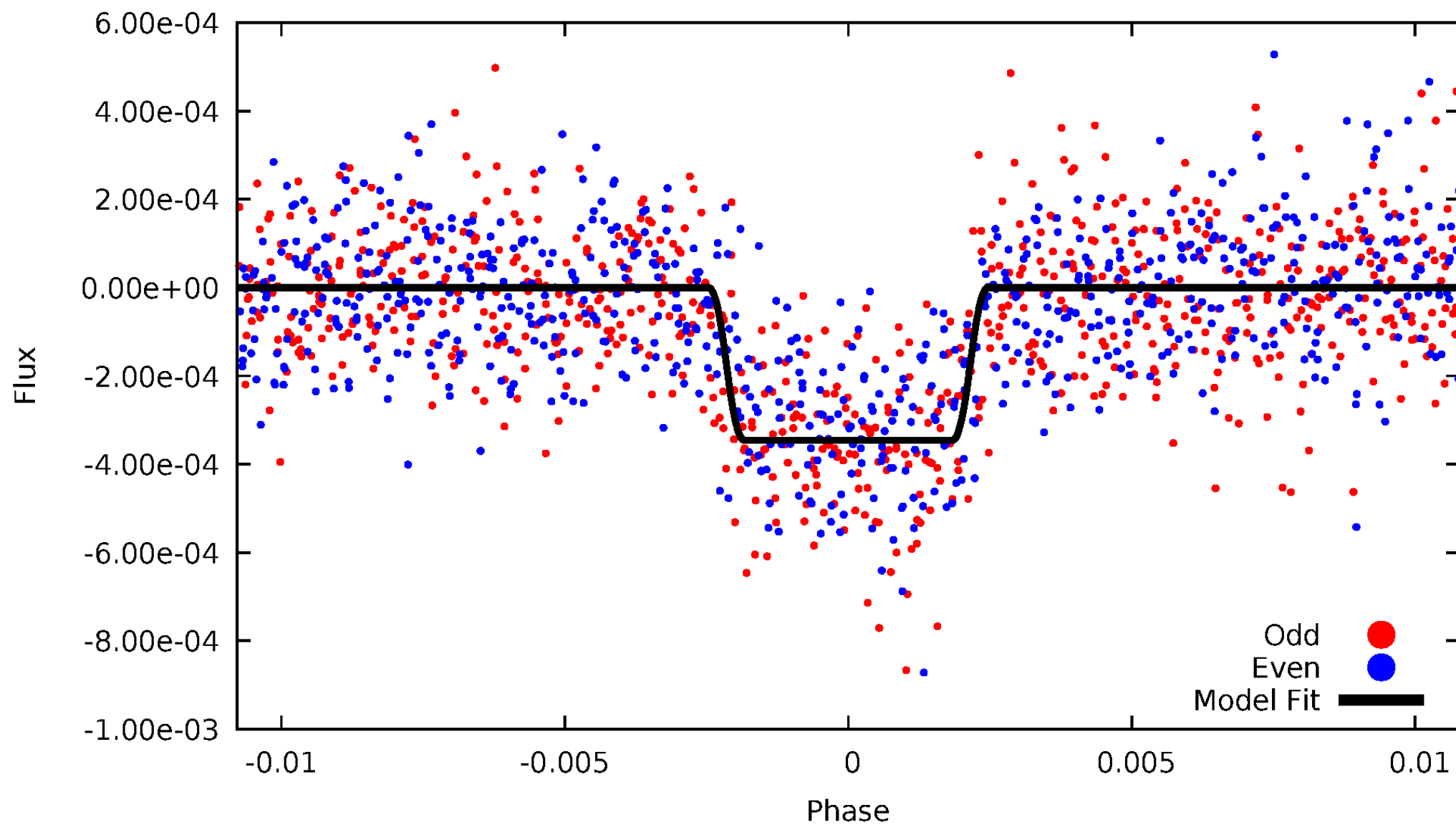
# DV Odd/Even

TCE 012154526-01



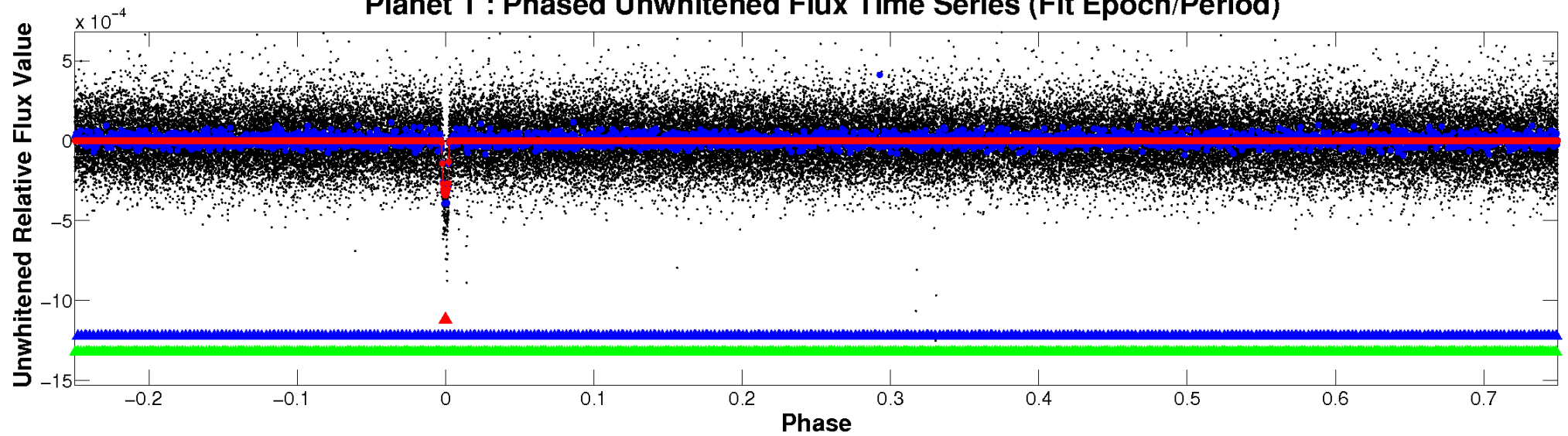
# ALT Odd/Even

TCE 012154526-01

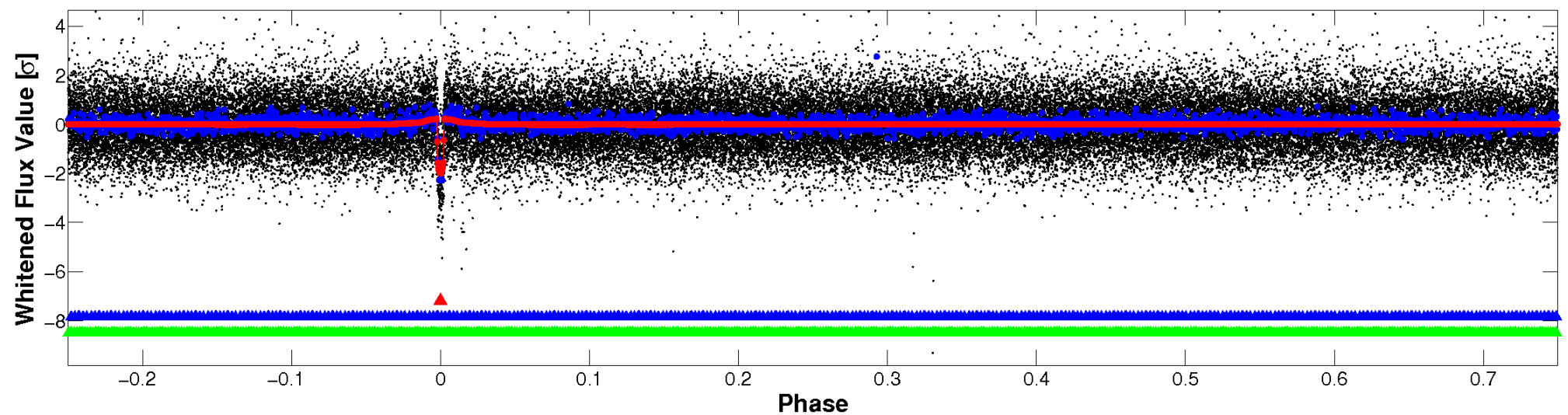


# Non-Whitened Vs. Whitened Light Curve

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

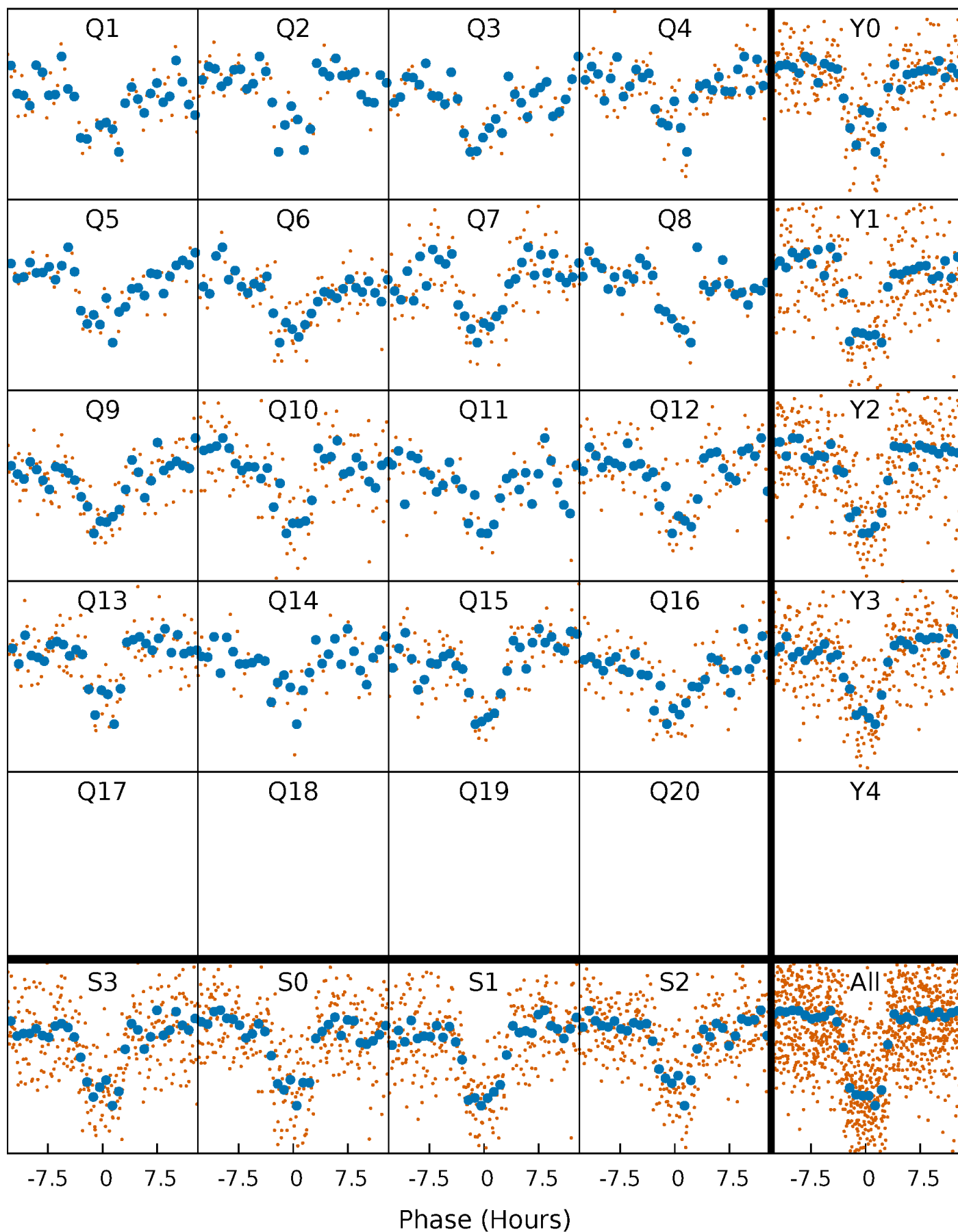


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

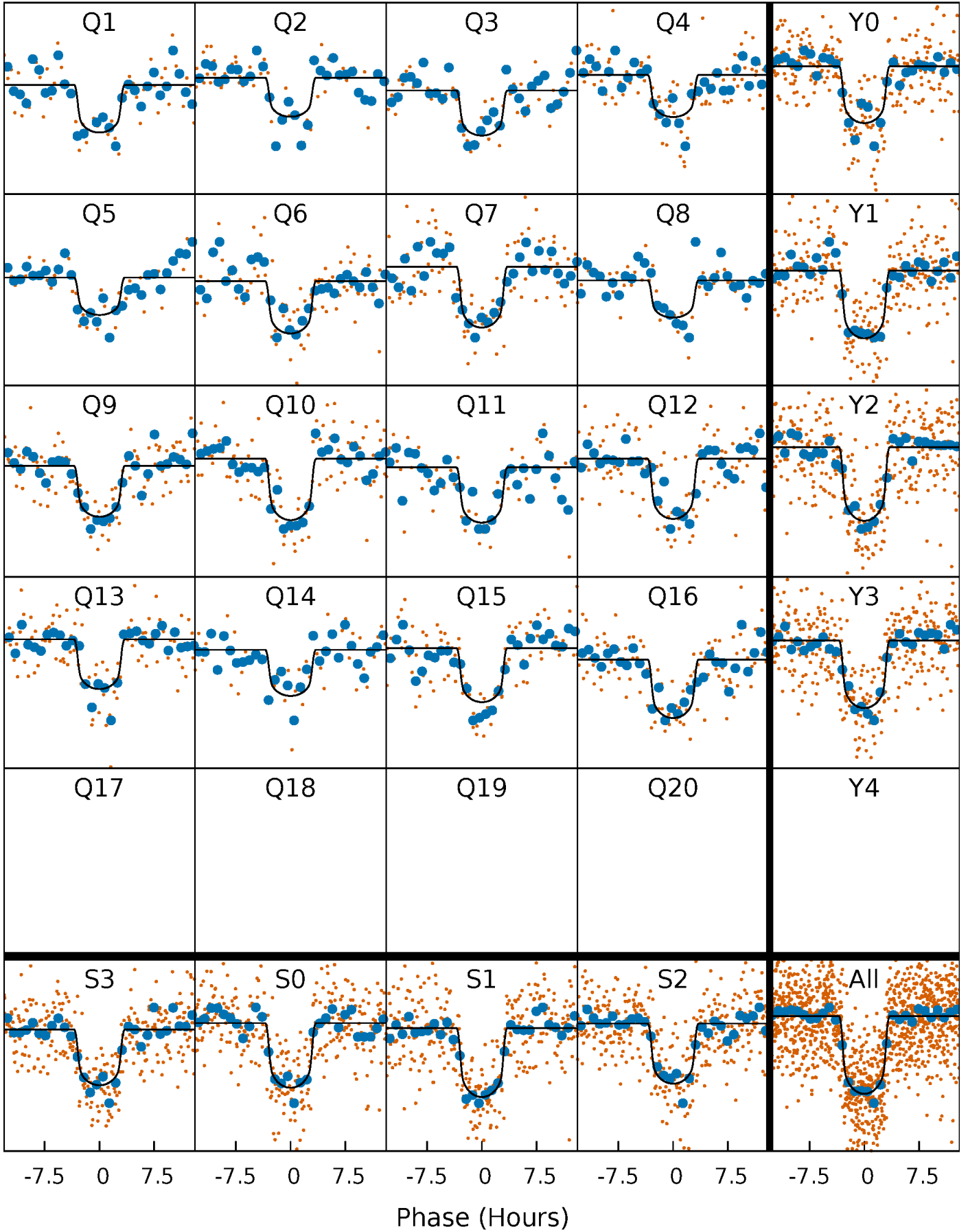
TCE 012154526-01 P= 56.188579 Days  $T_0=146.379770$  (BKJD)





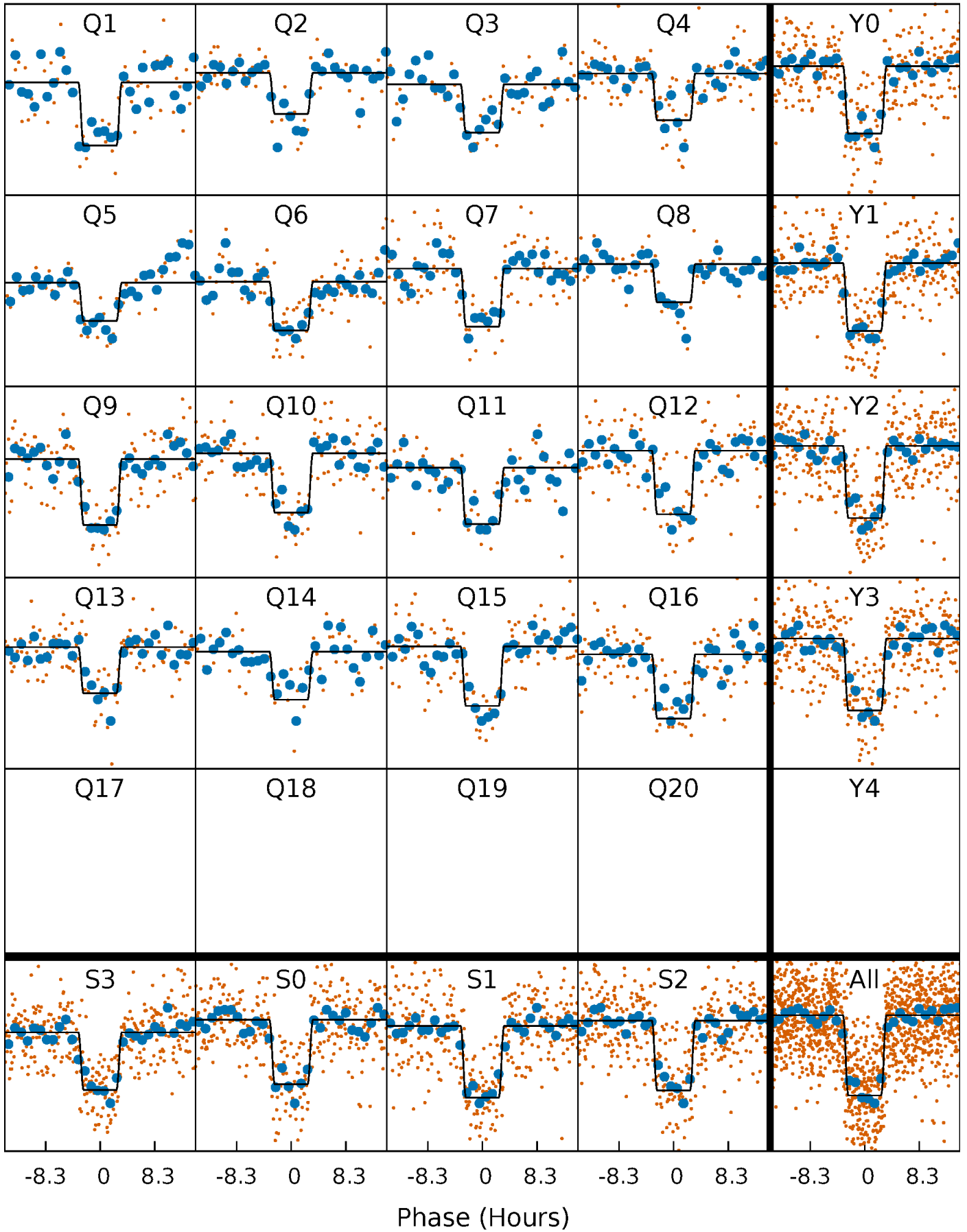
# DV Quarter-Phased Transit Curves

TCE 012154526-01 P= 56.188579 Days  $T_0=146.379770$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

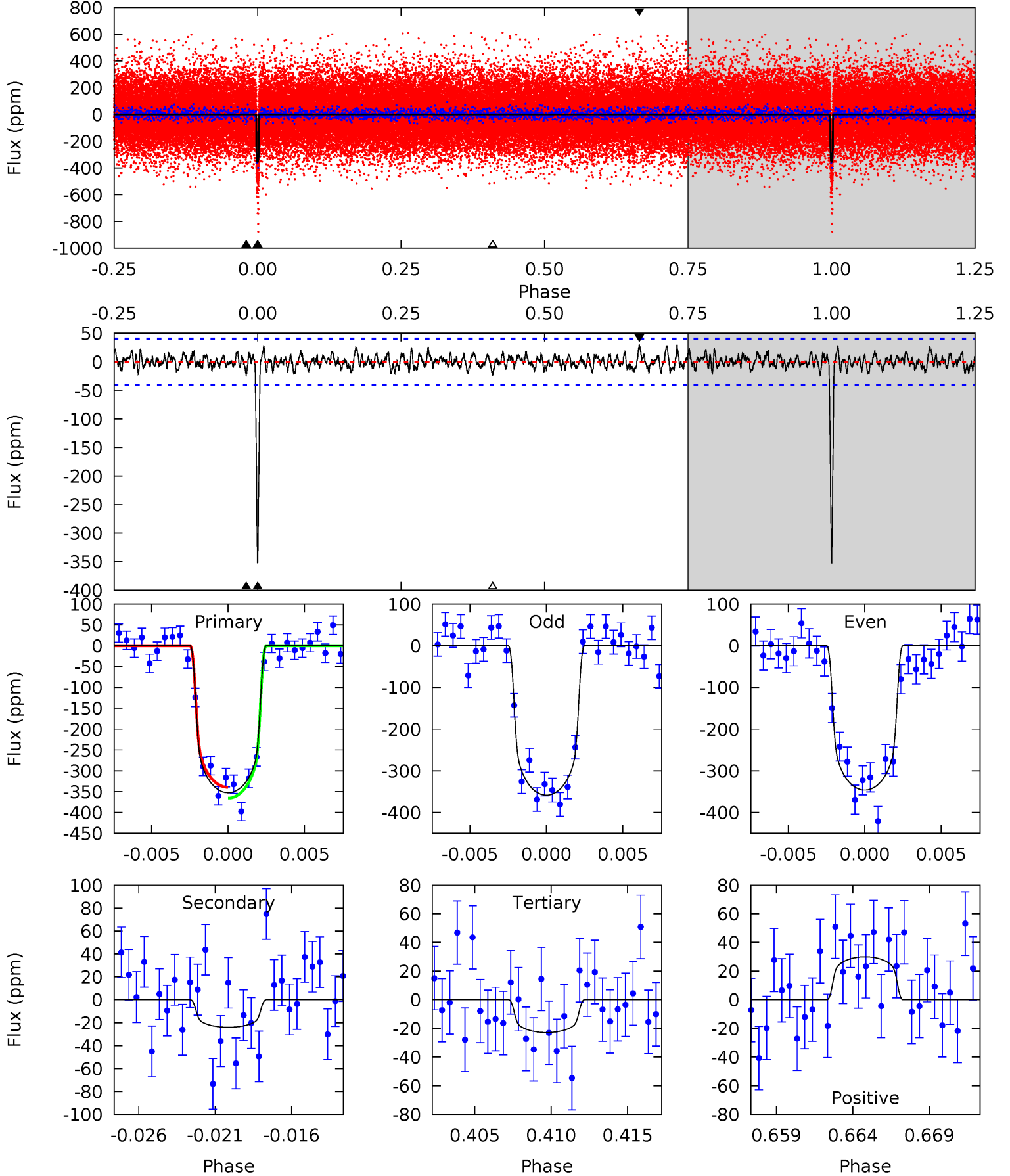
TCE 012154526-01 P= 56.187409 Days  $T_0=146.392961$  (BKJD)



# DV Model-Shift Uniqueness Test

012154526-01, P = 56.188579 Days, E = 90.191191 Days

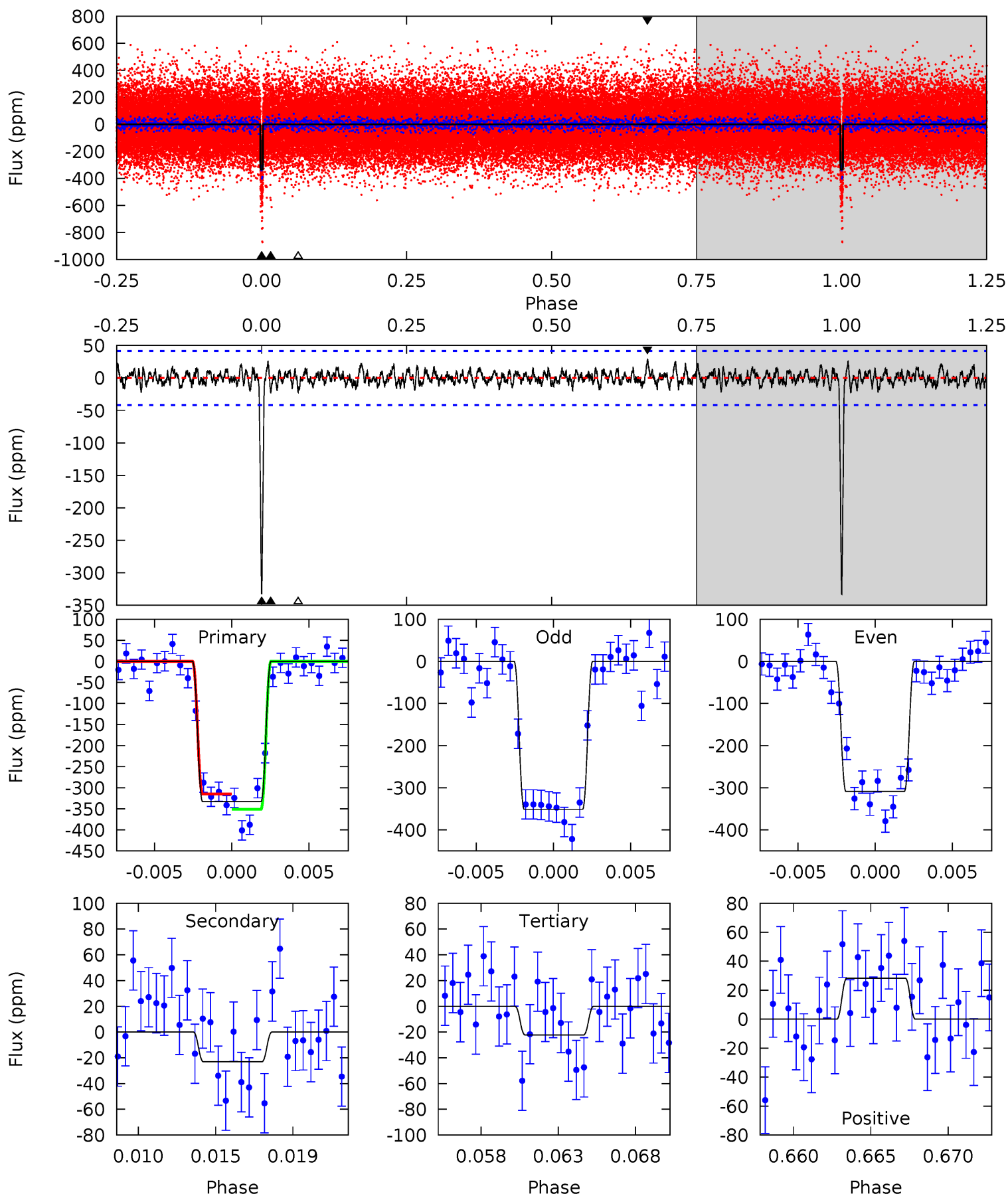
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
44.8	3.05	2.90	3.81	5.15	2.80	1.15	41.9	41.0	0.15	-0.76	0.78	0.98	0.08	1.65



# Alt Model-Shift Uniqueness Test

012154526-01, P = 56.187409 Days, E = 90.205552 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
41.3	2.87	2.77	3.52	5.16	2.82	0.99	38.5	37.8	0.10	-0.65	2.63	1.00	0.08	2.27





### Stellar Parameters For KIC 012154526

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5700^{+114}_{-114}$	$4.327^{+0.103}_{-0.115}$	$0.340^{+0.100}_{-0.150}$	$1.176^{+0.182}_{-0.149}$	$1.071^{+0.066}_{-0.066}$	$0.927^{+0.454}_{-0.303}$
	+2%/-2%	+2%/-3%	+29%/-44%	+15%/-13%	+6%/-6%	+49%/-33%
Source	SPE59	SPE59	SPE59	DSEP		

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

### Secondary Eclipse Parameters for KIC 012154526-01 / KOI 2004.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-24 \pm 8$	$2.57^{+0.32}_{-0.28}$	$705^{+30}_{-30}$	$3356^{+191}_{-221}$	$173^{+75}_{-65}$
Alt.	$-23 \pm 8$	$2.39^{+0.28}_{-0.29}$	$704^{+30}_{-31}$	$3398^{+206}_{-217}$	$187^{+92}_{-68}$

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

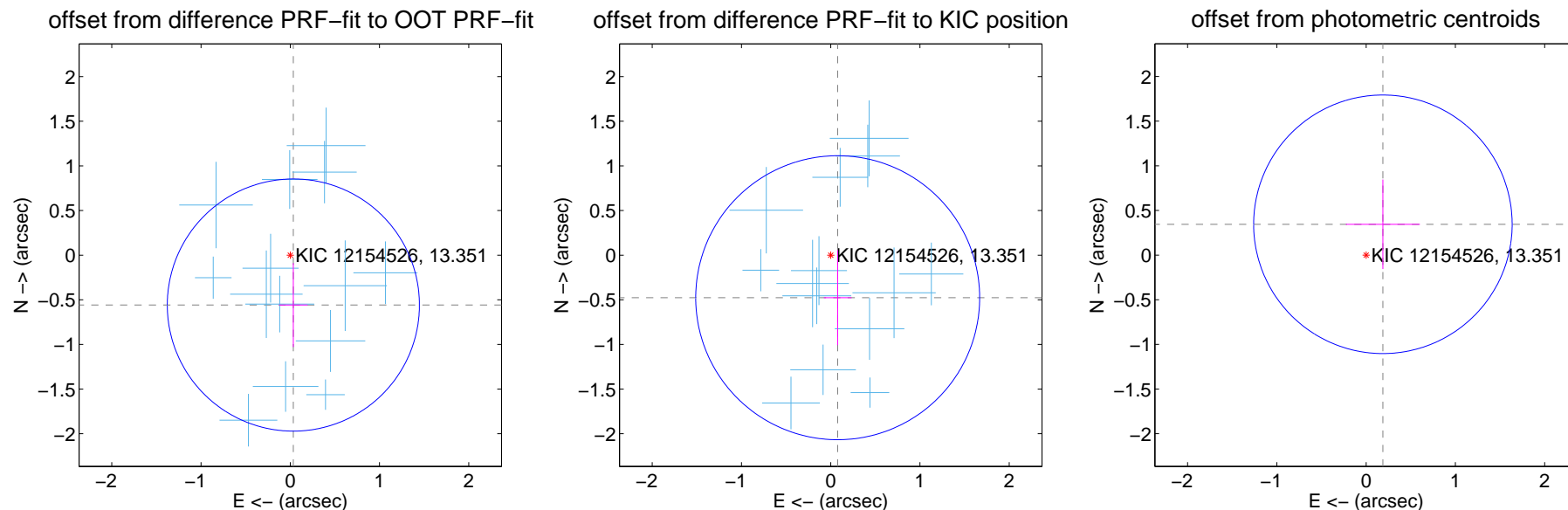
## DV Centroid Data

Supplemental centroid analysis for 012154526-01. Kepler magnitude: 13.35. Transit SNR 30.40

There are 14 quarters with good PRF difference image offsets

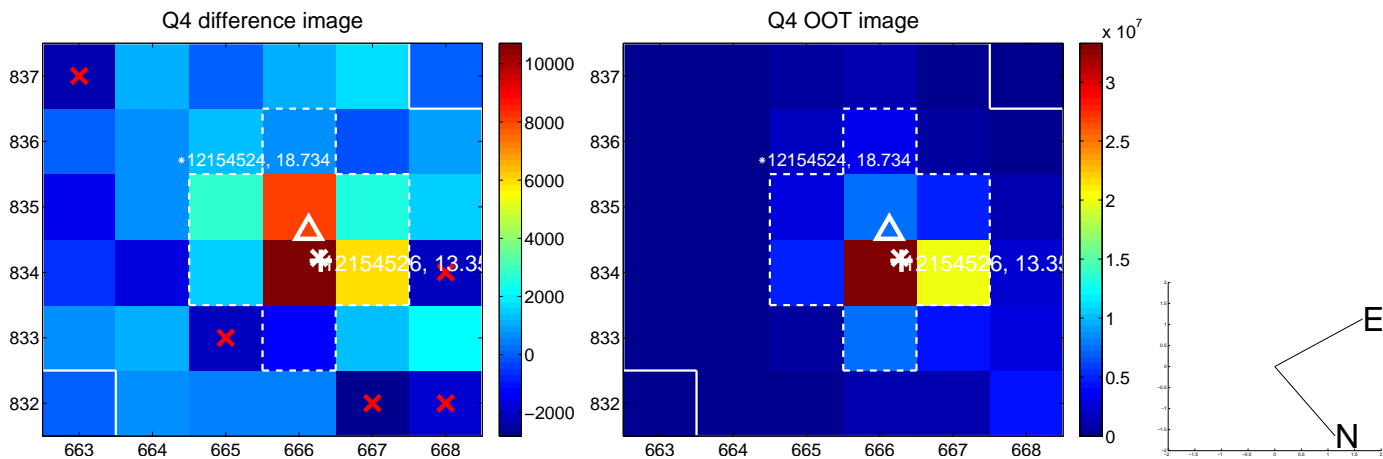
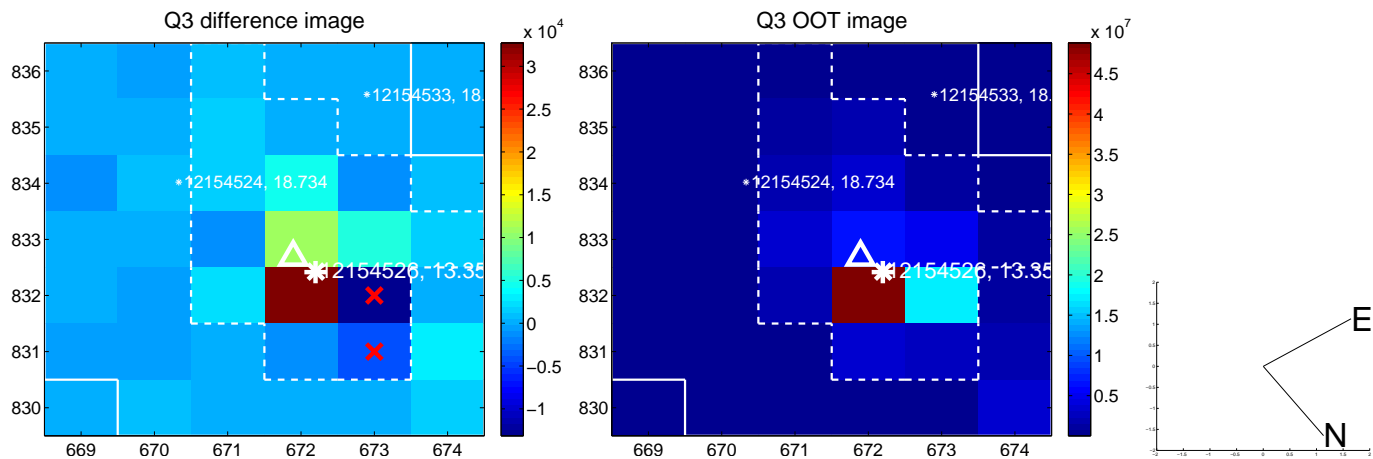
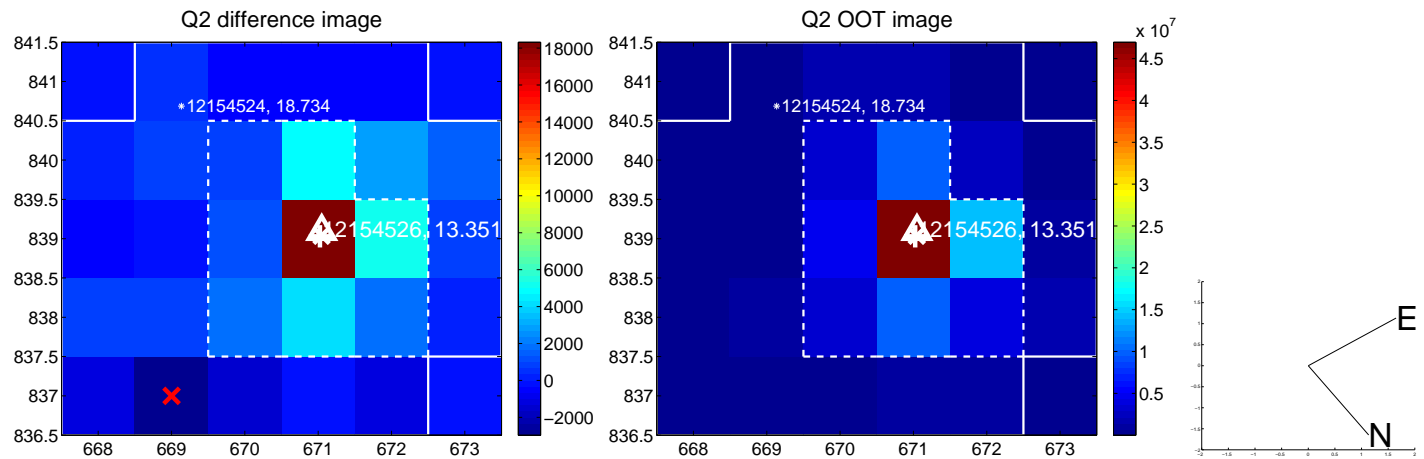
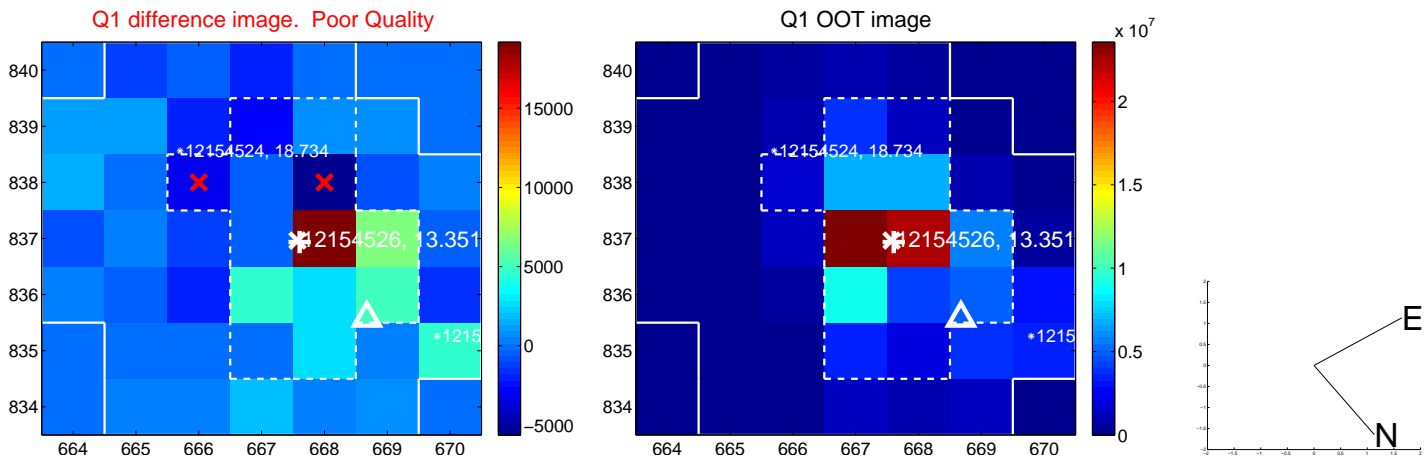
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.560 \pm 0.471$	1.19	$-0.035 \pm 0.159$	$-0.559 \pm 0.470$
PRF-fit source offset from KIC position	$0.483 \pm 0.530$	0.91	$-0.078 \pm 0.155$	$-0.477 \pm 0.532$
photometric centroid source offset	$0.39 \pm 0.48$	0.81	$-0.19 \pm 0.41$	$0.34 \pm 0.50$

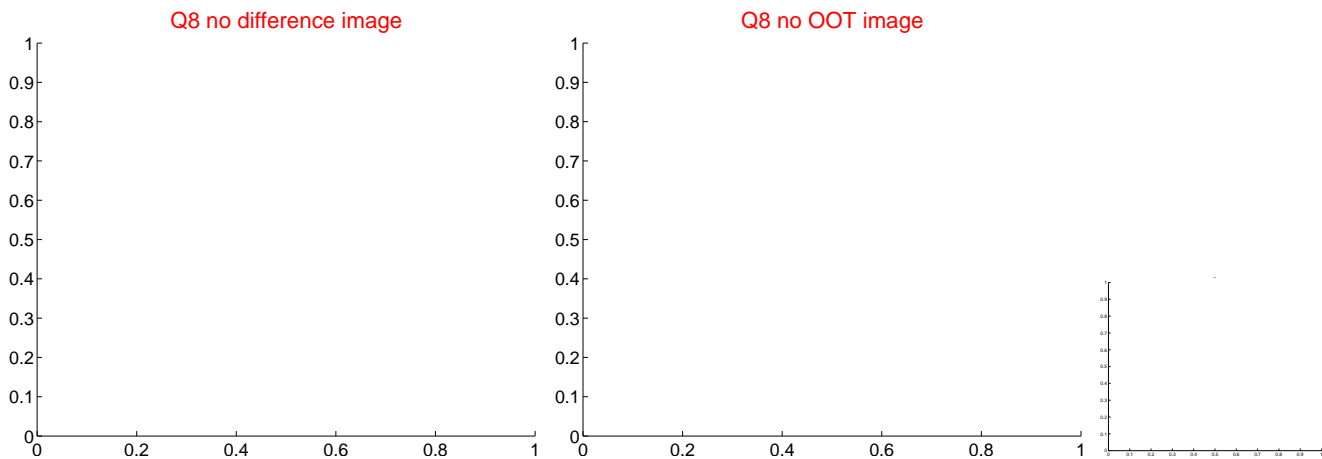
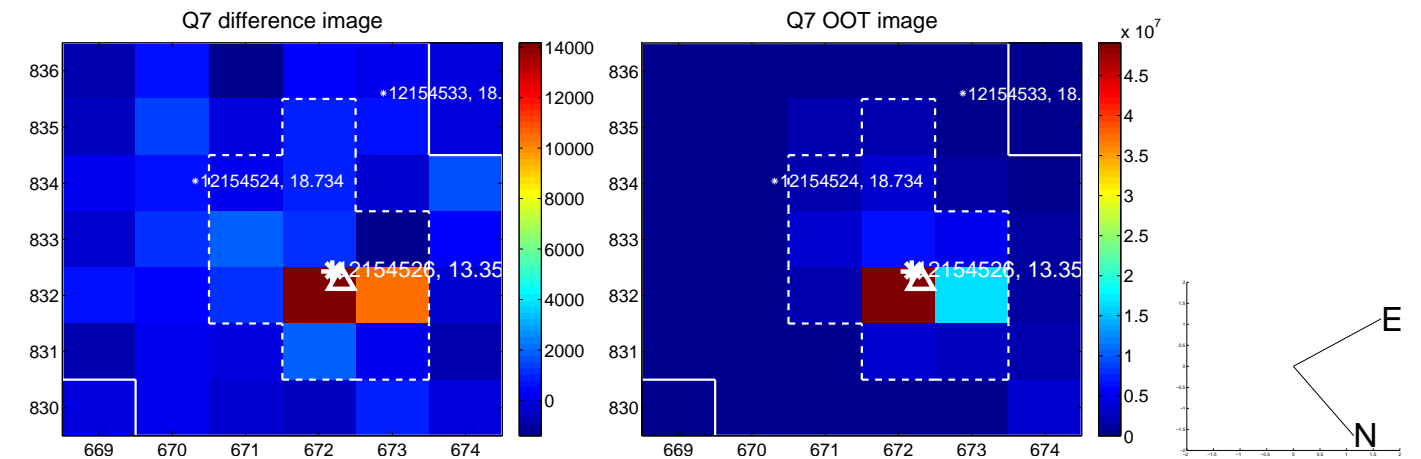
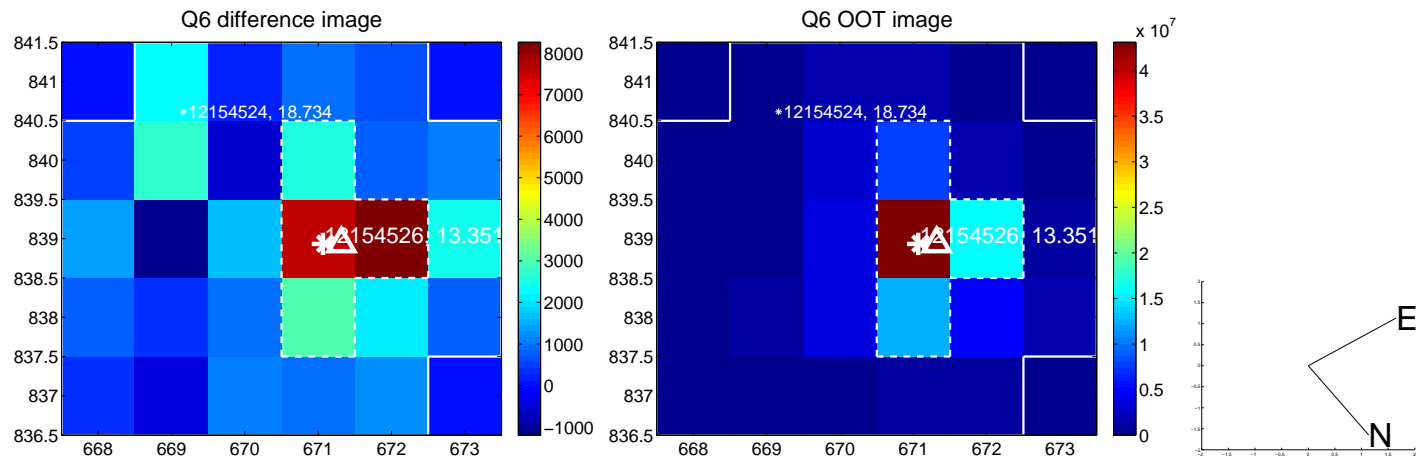
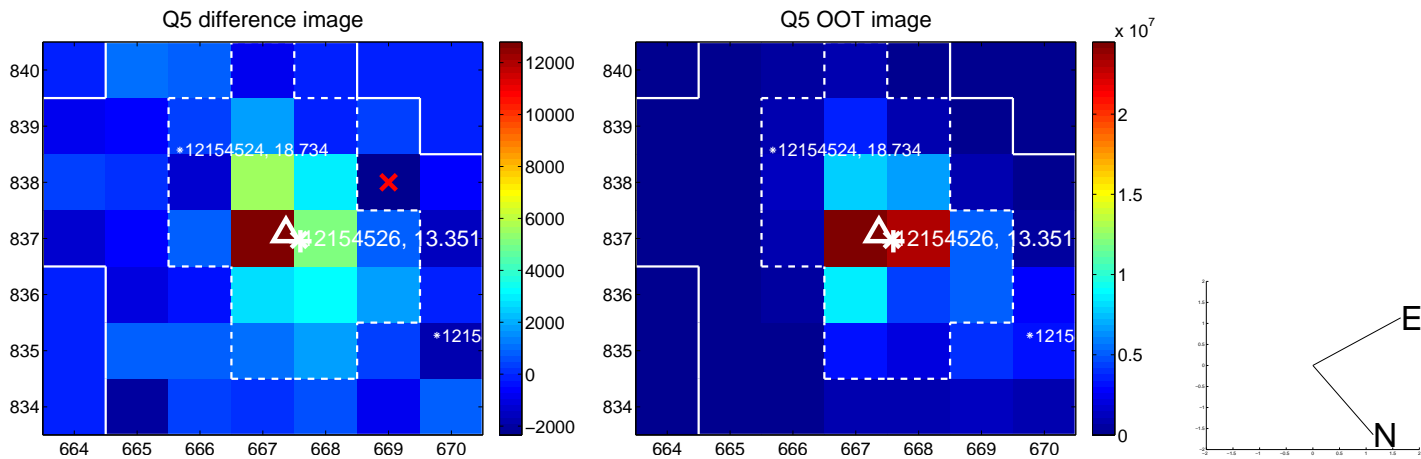


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

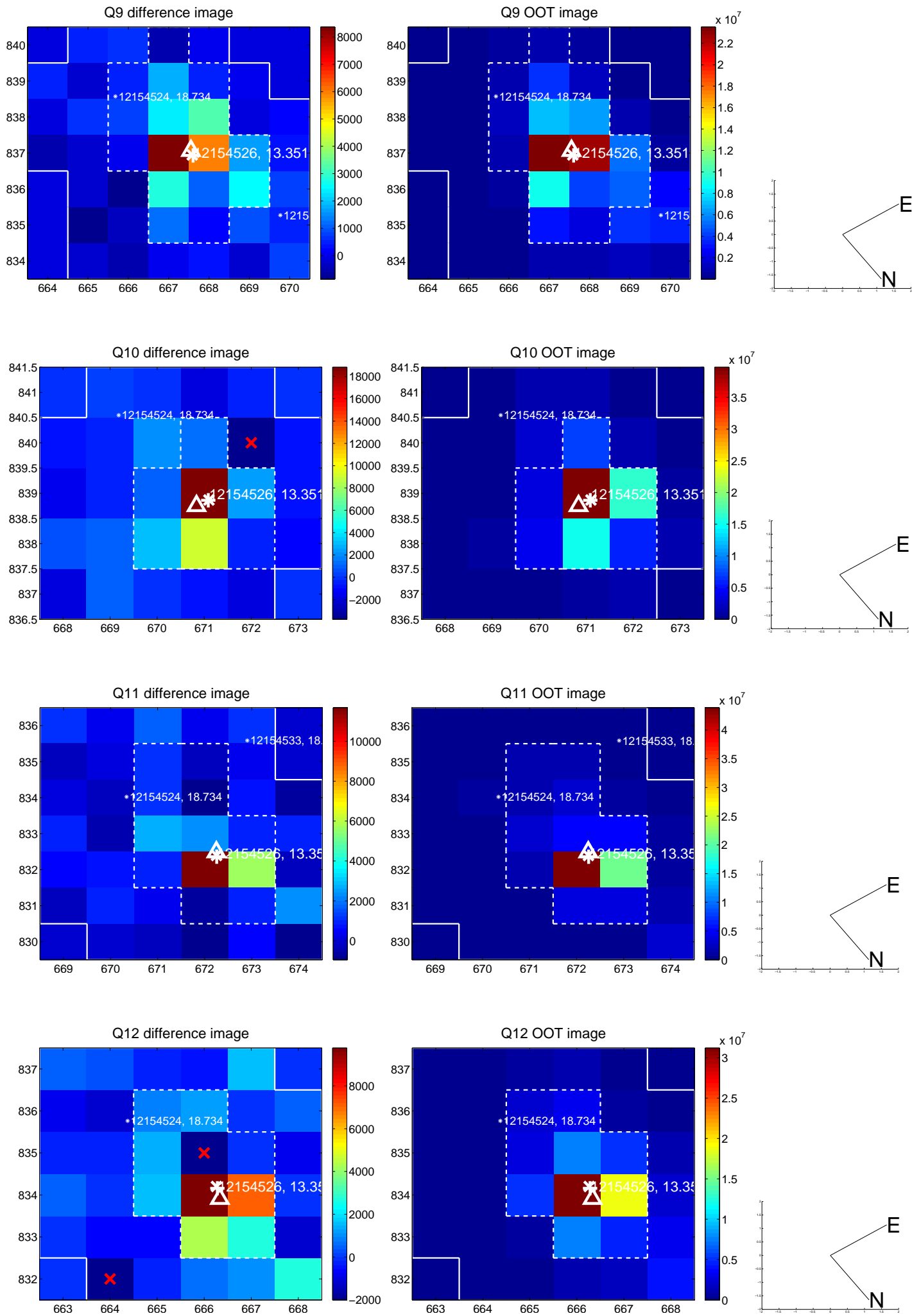


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

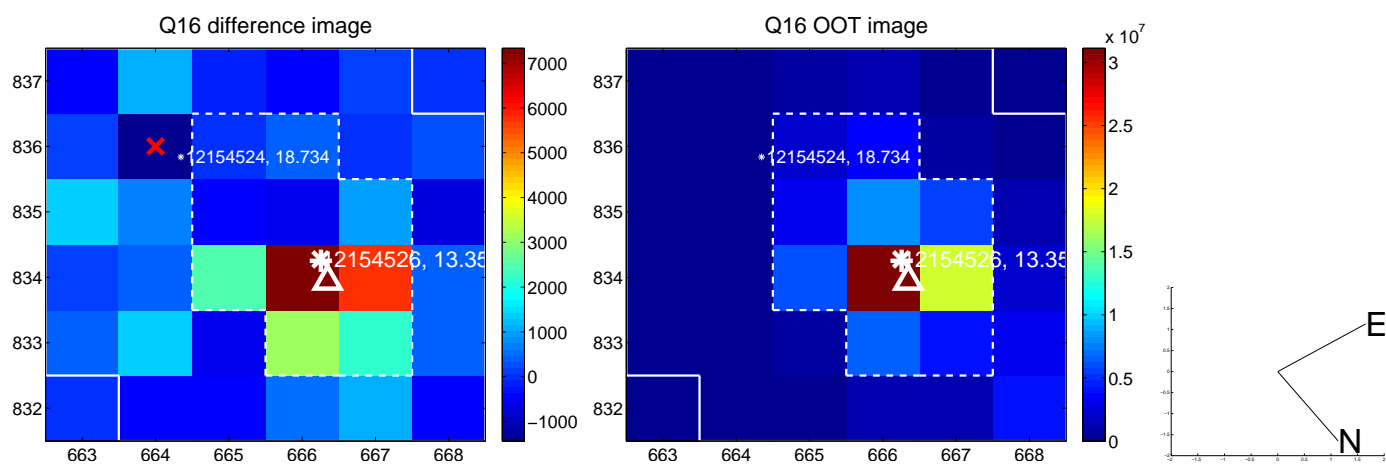
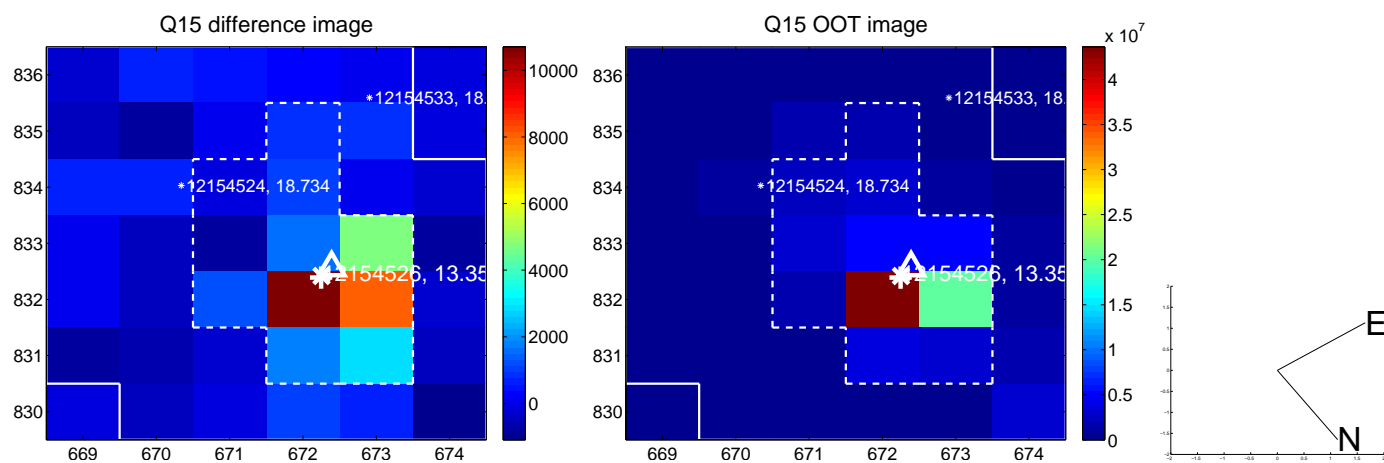
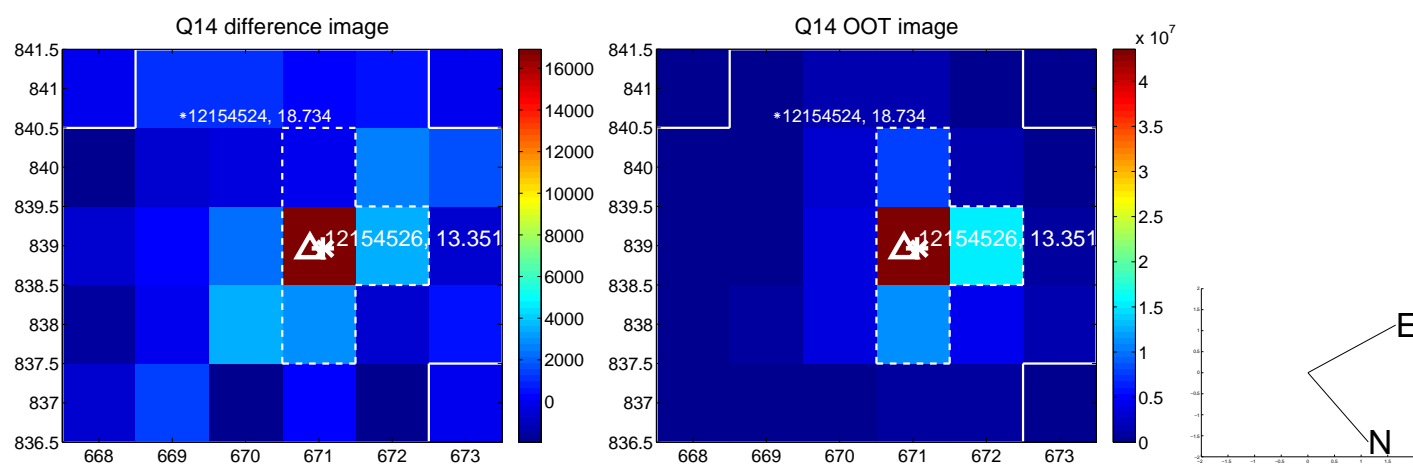
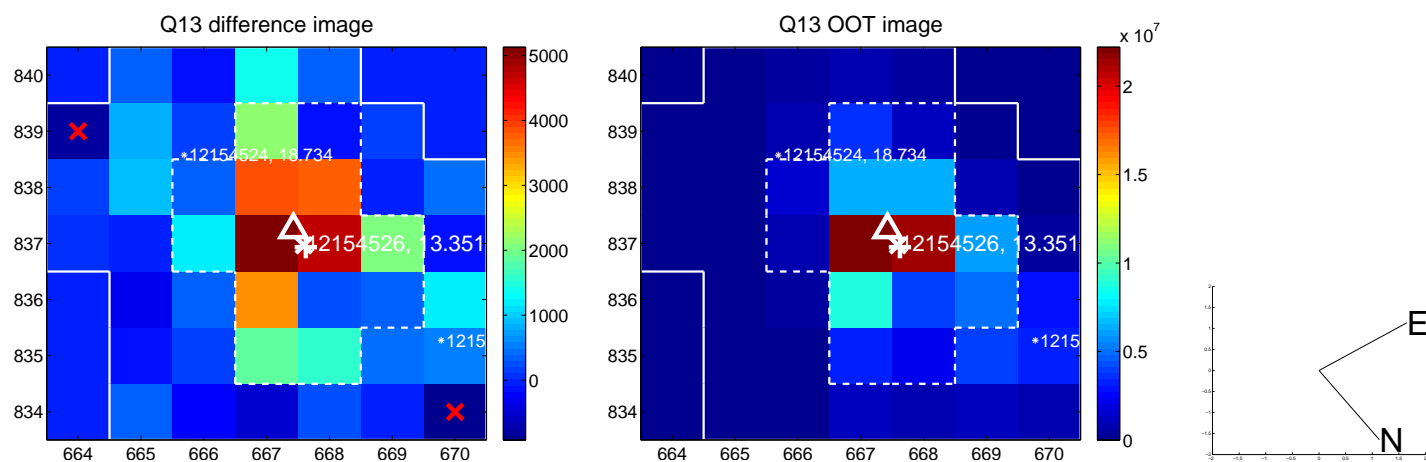




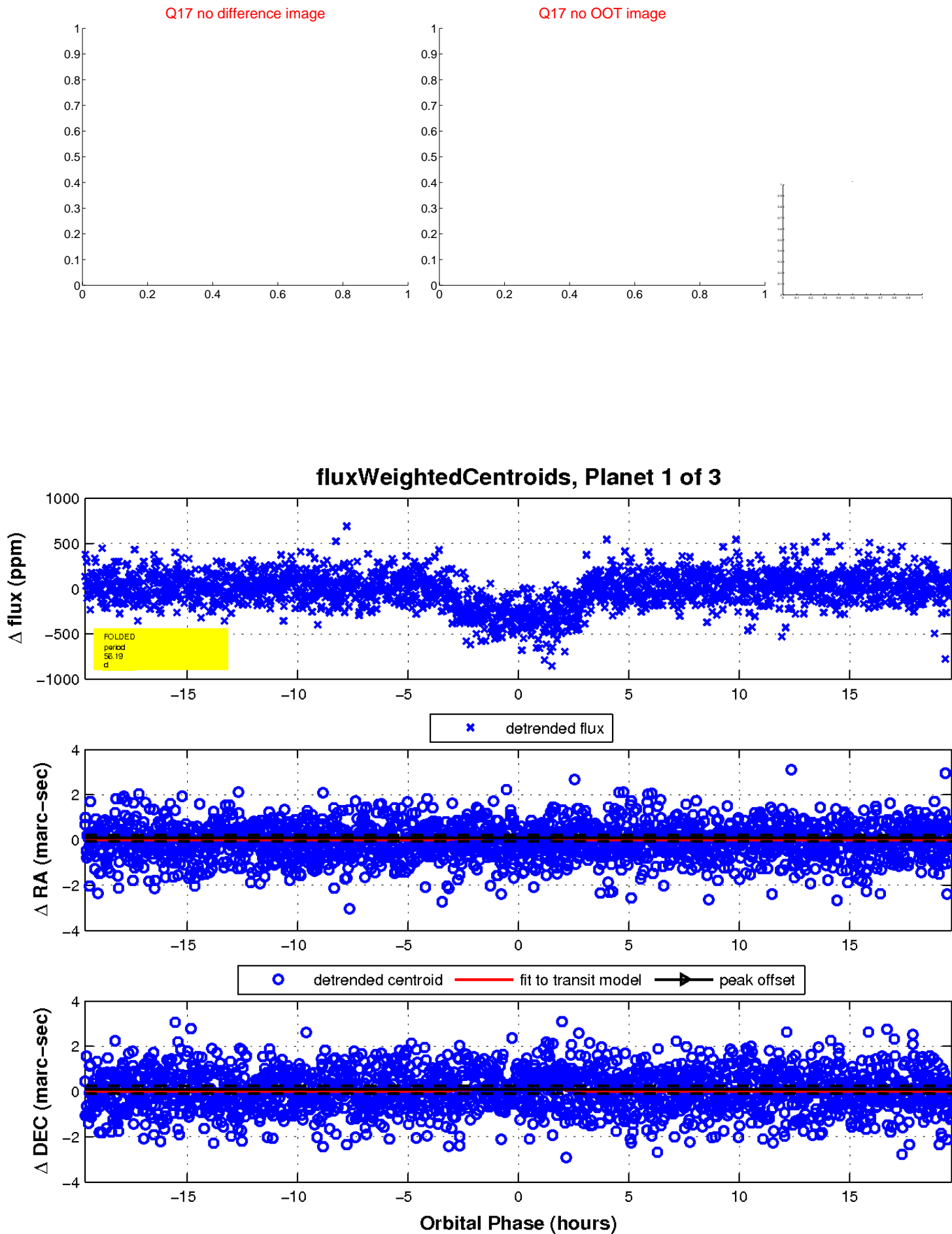
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

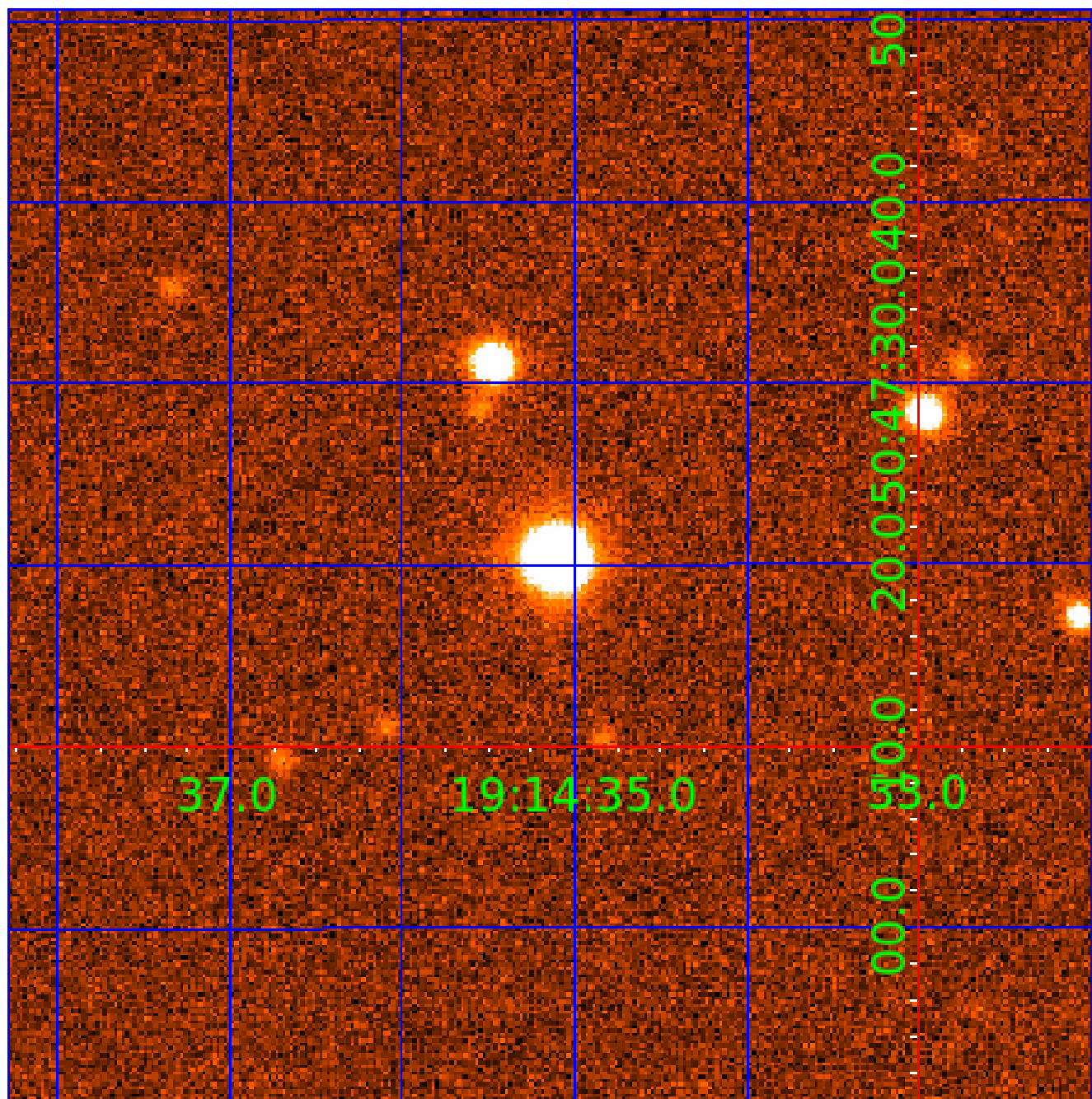


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 012154526

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012154526-01	OBS	2004.01	56.188579	146.379770	341.0	6.543	28.2	30.4	1.18	5700	2.55	15.15
012154526-02	OBS	2004.02	3.188974	133.527823	65.4	2.969	15.7	17.0	1.18	5700	1.28	694.70
012154526-03	OBS	2004.03	1.721042	132.788849	26.8	2.318	8.2	8.4	1.18	5700	0.69	1581.04

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012154526-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
012154526-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT
012154526-03	OBS	PC	0.87	0	0	0	0	NO_COMMENT

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

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

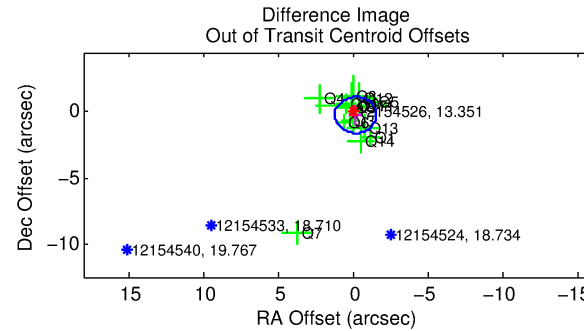
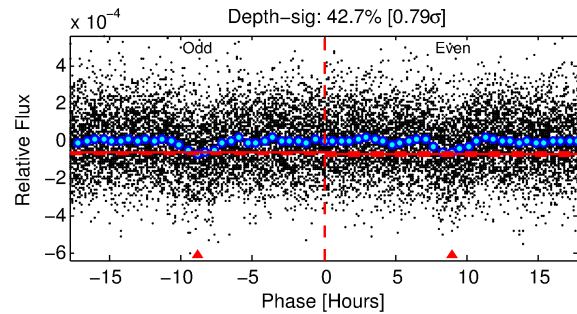
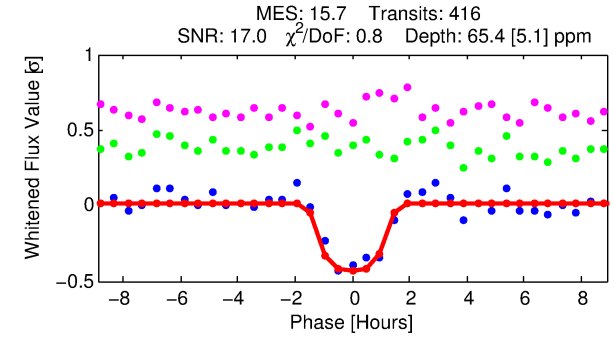
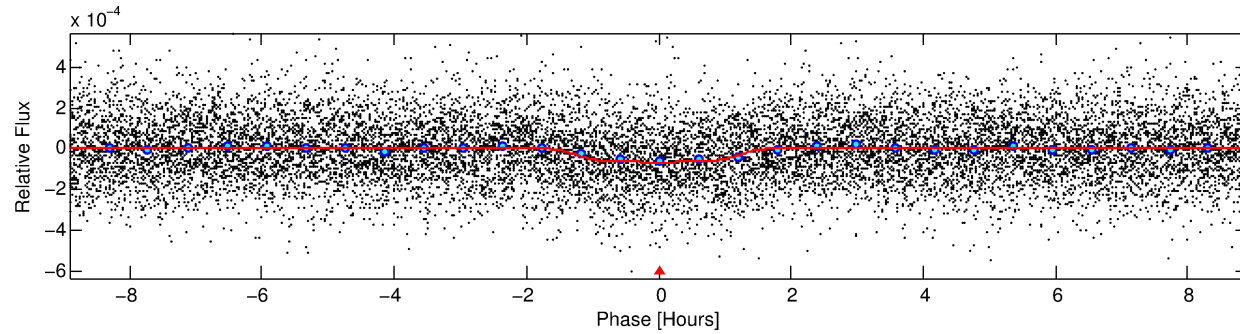
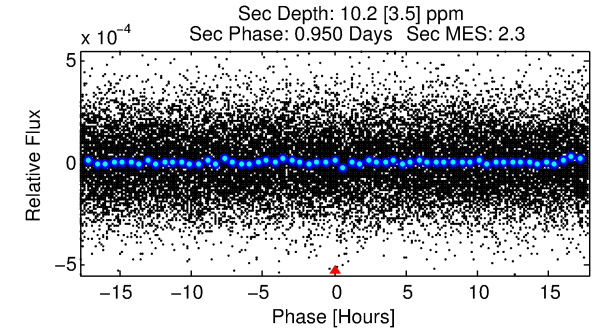
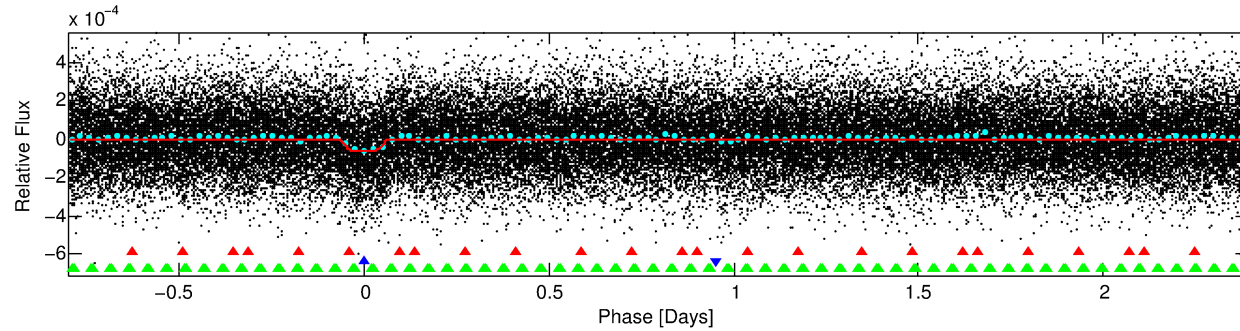
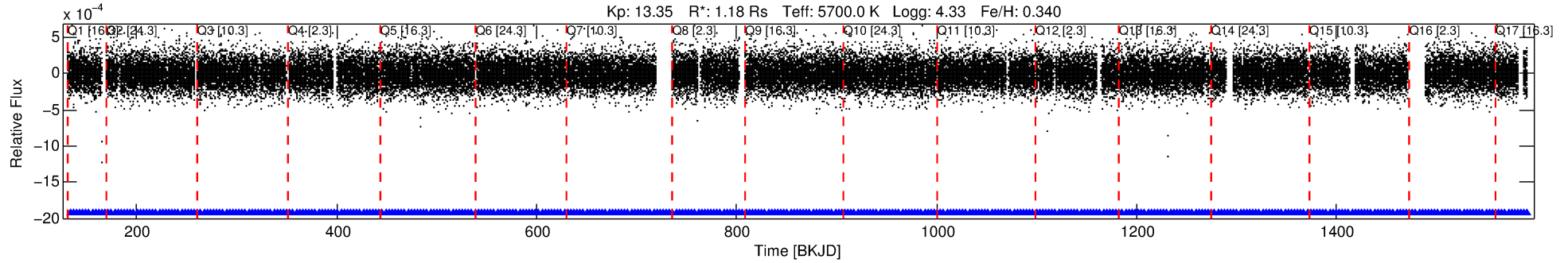
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 012154526-02

No Significant Match Found

# DV One-Page Summary

KIC: 12154526 Candidate: 2 of 3 Period: 3.189 d  
KOI: K02004.02 Corr: 0.916



## DV Fit Results:

Period = 3.18897 [0.00001] d  
Epoch = 133.5278 [0.0028] BKJD  
Rp/R\* = 0.0100 [0.0011]  
a/R\* = 2.48 [1.11]  
b = 0.97 [0.03]  
Seff = 694.70 [152.53]  
Teq = 1309 [72] K  
Rp = 1.28 [0.24] Re  
a = 0.0434 [0.0059] AU  
Ag = 6.42 [2.93] [1.85σ]  
Teffp = 3222 [335] K [5.58σ]

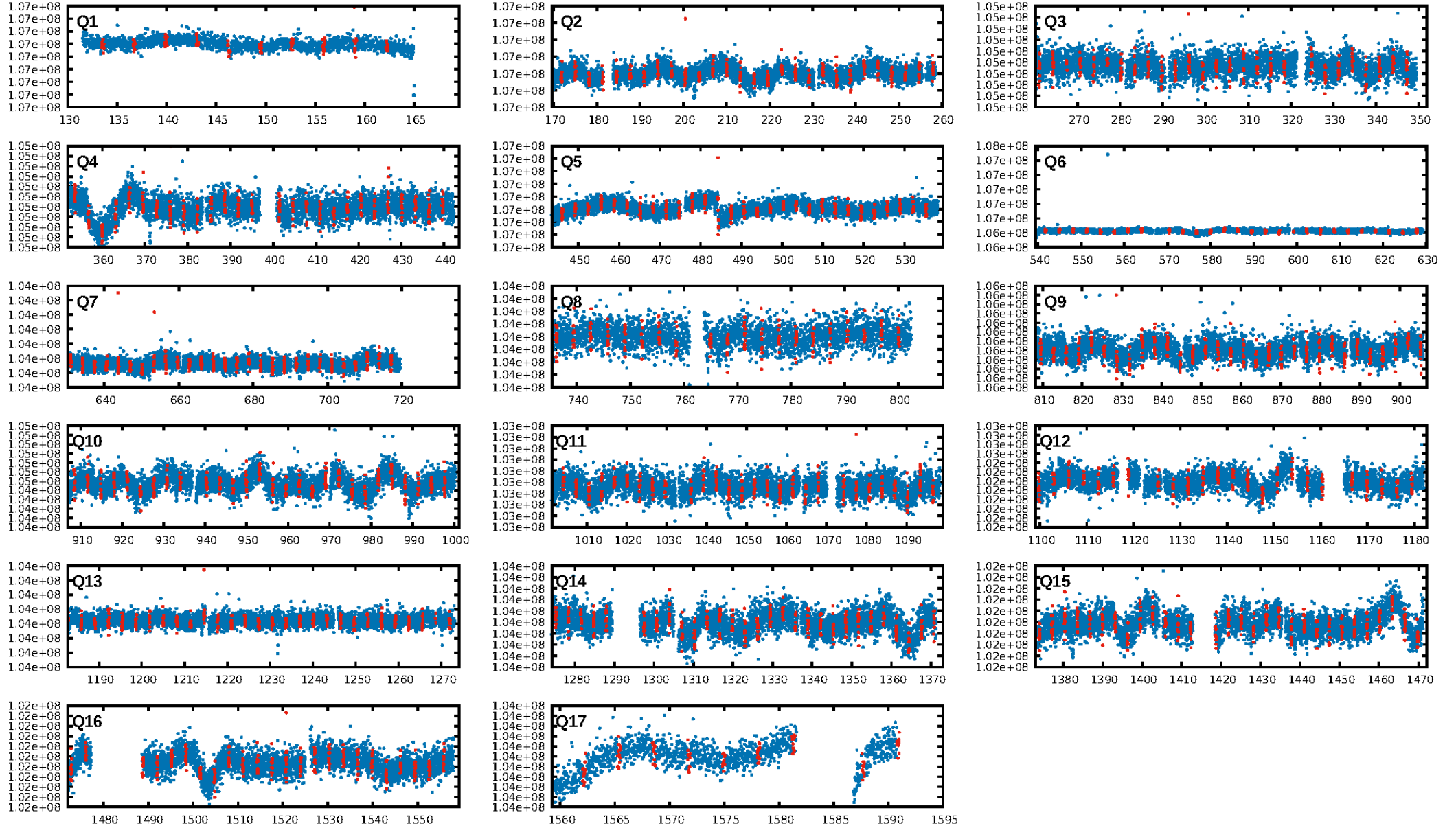
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [9.35σ]  
LongPeriod-sig: 100.0% [177.04σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 9.39e-54  
RollingBand-fgt: 1.00 [398/398]  
GhostDiagnostic-chr: 2.403  
Centroid-sig: 0.3%  
Centroid-so: 1.152 arcsec [1.25σ]  
OotOffset-rm: 0.309 arcsec [0.68σ]  
KicOffset-rm: 0.287 arcsec [0.89σ]  
OotOffset-st: 3/3/3/5 [14]  
KicOffset-st: 3/3/3/5 [14]  
DiffImageQuality-fgm: 0.64 [9/14]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 13:00:09 Z

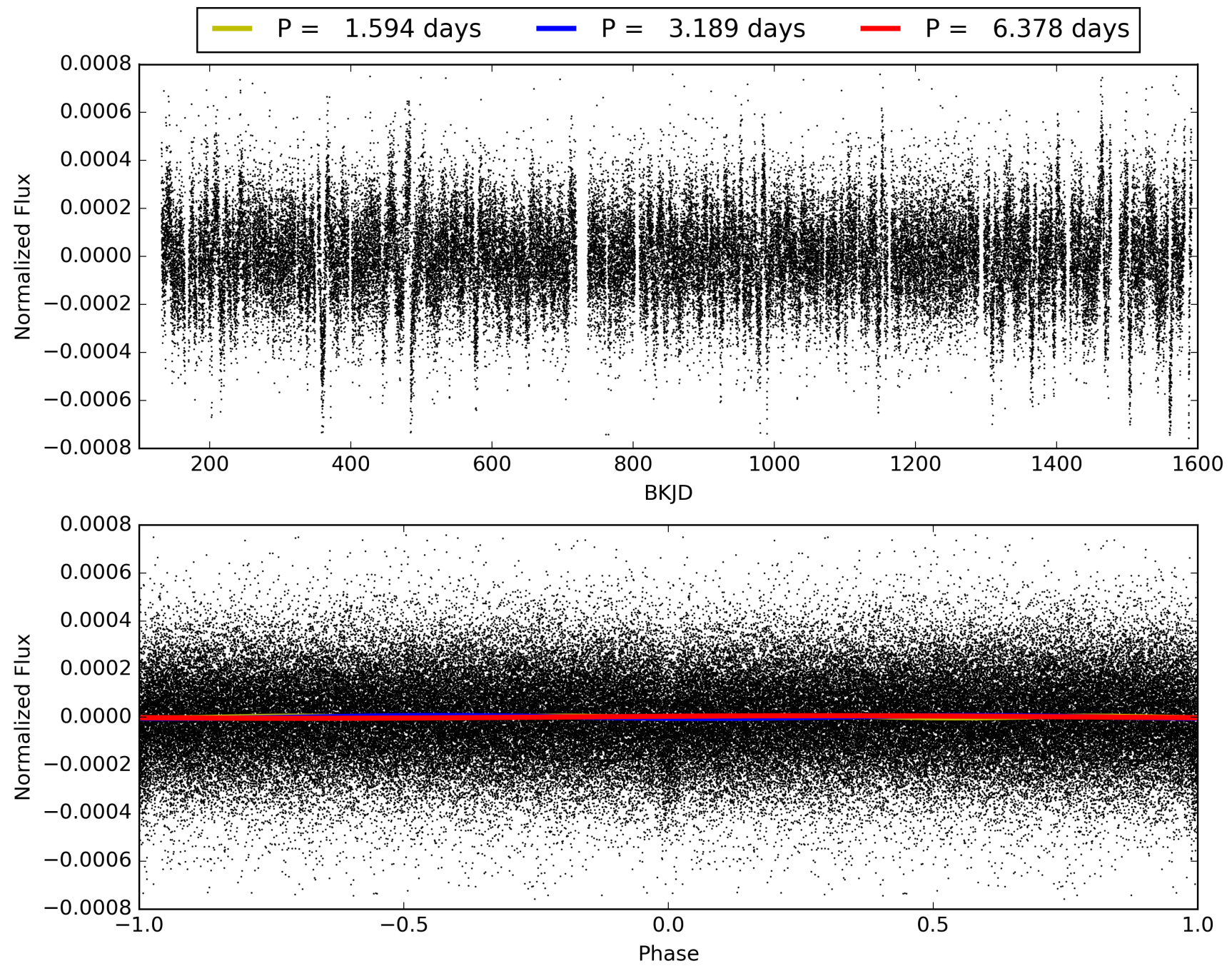
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 012154526-02, PDC Light Curves



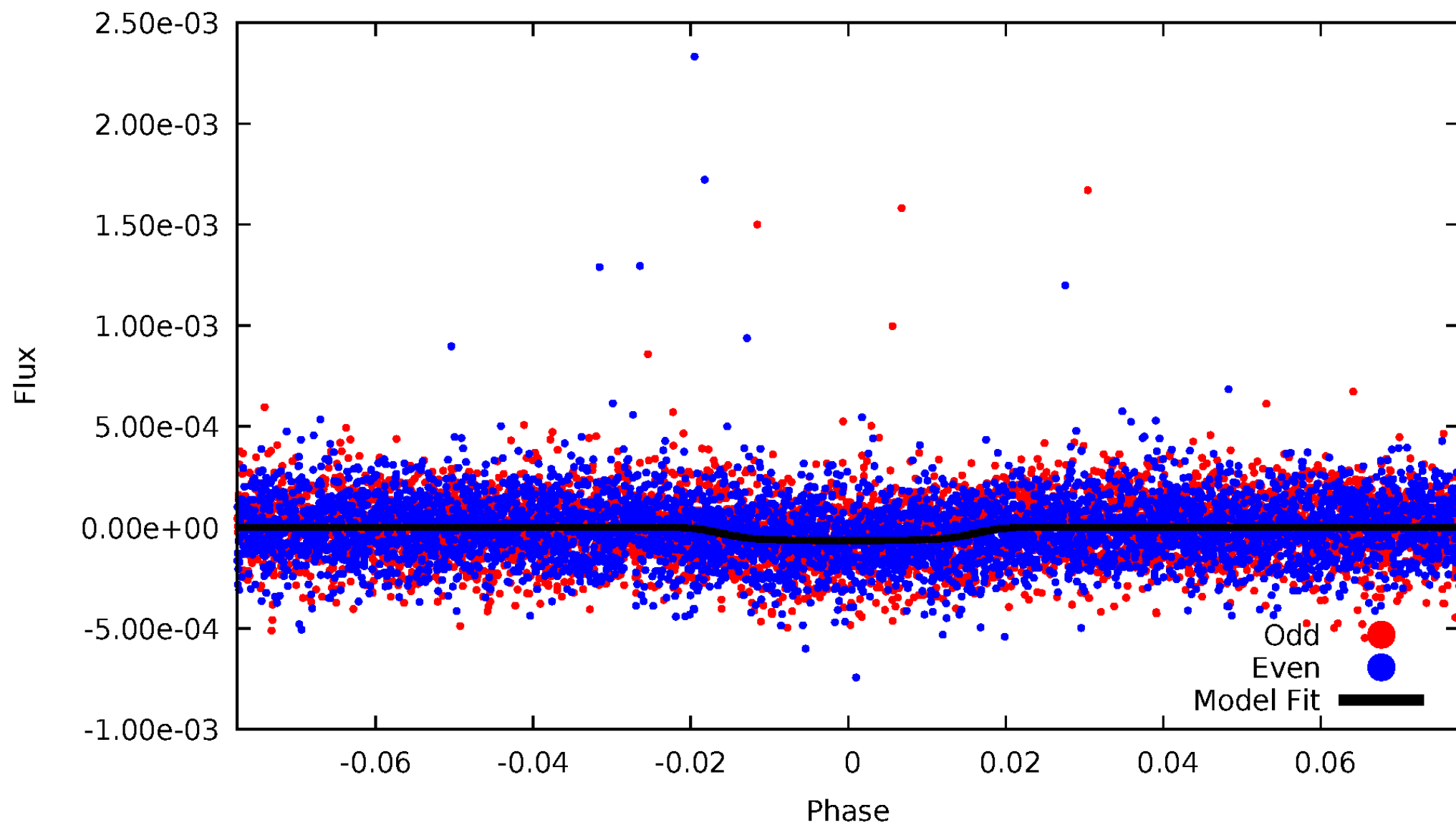


TCE 012154526-02



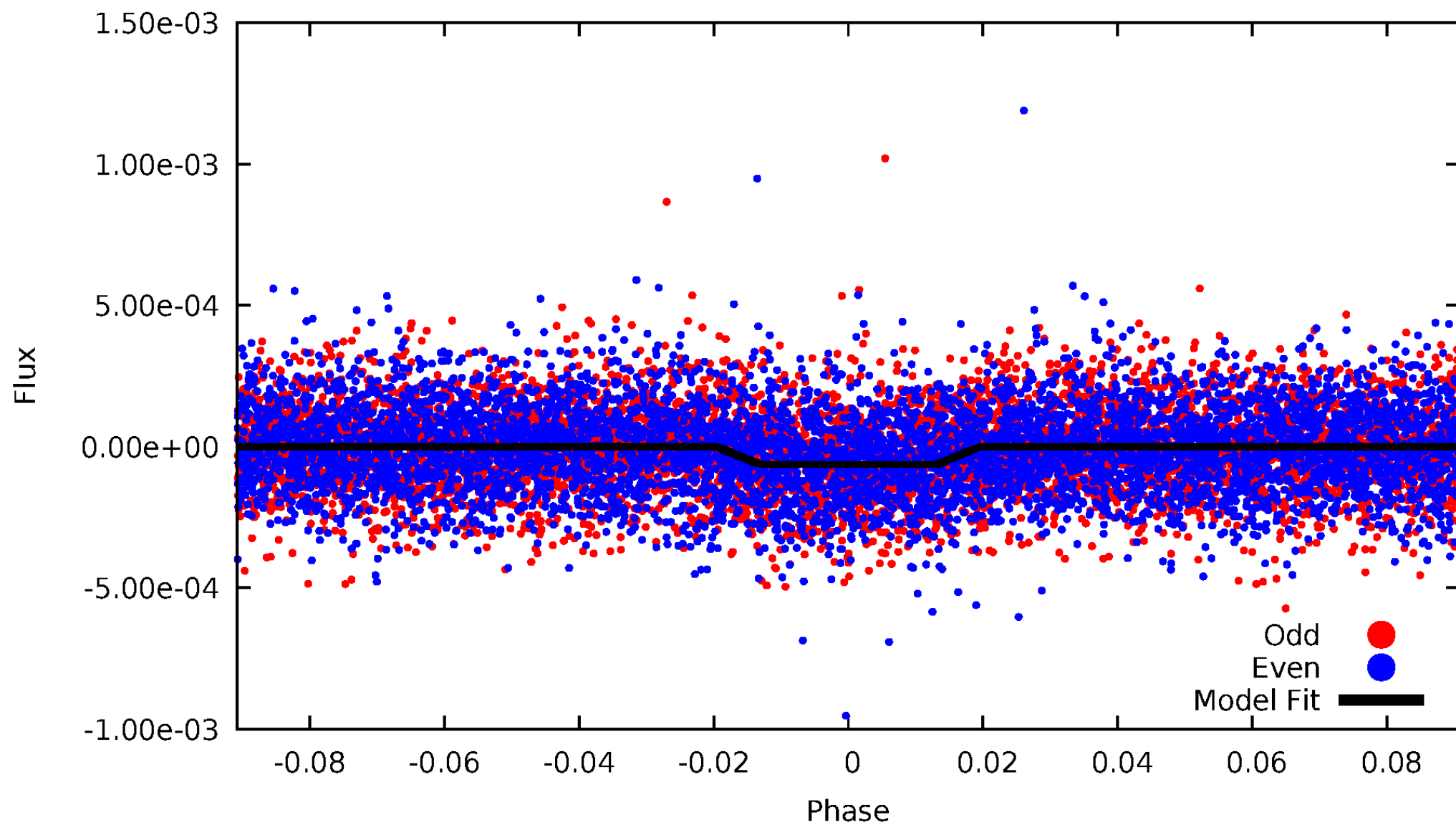
# DV Odd/Even

TCE 012154526-02



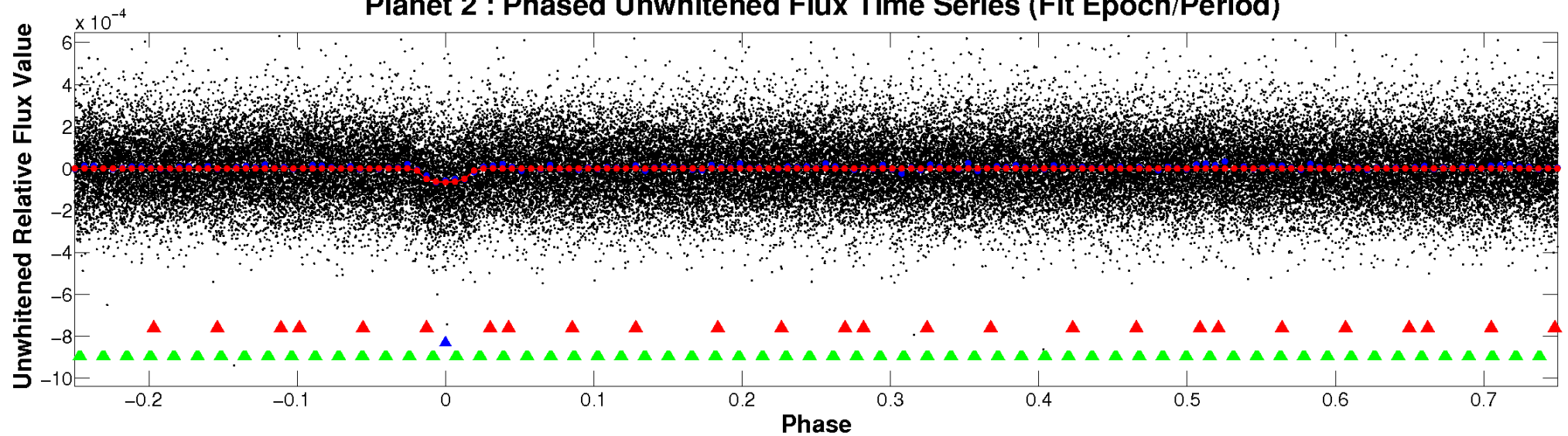
# ALT Odd/Even

TCE 012154526-02

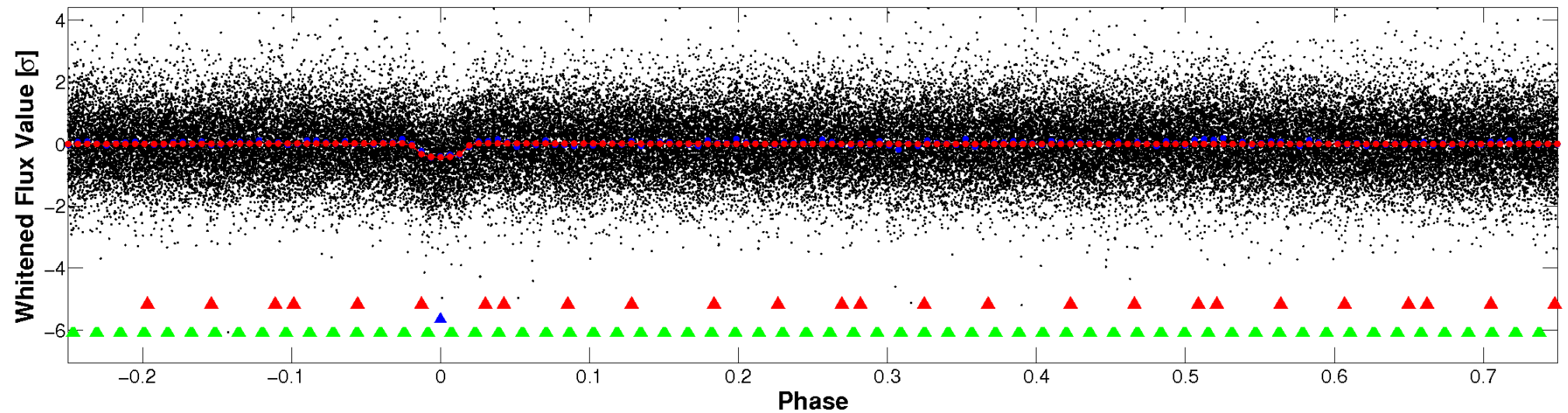


# Non-Whitened Vs. Whitened Light Curve

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



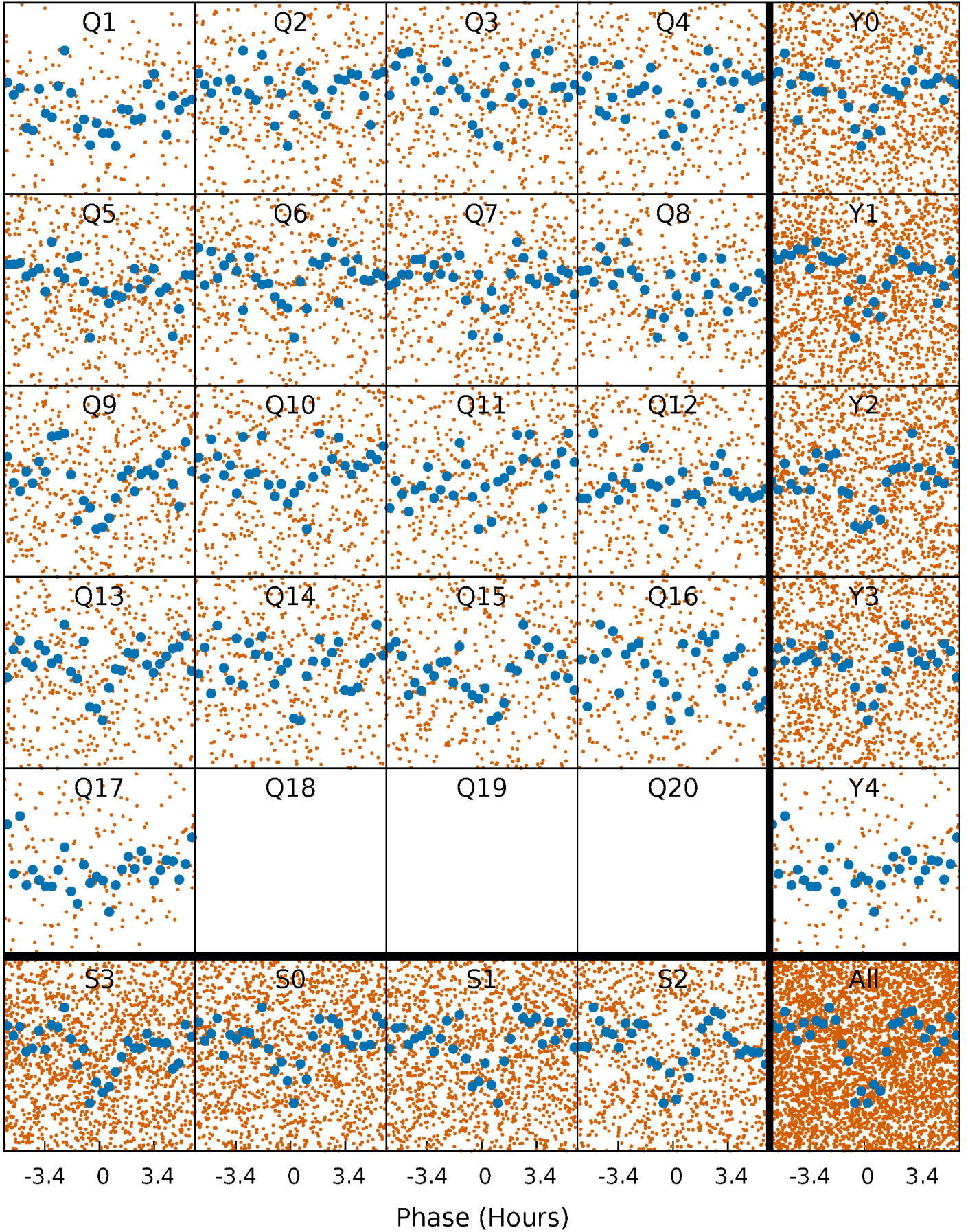
## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)





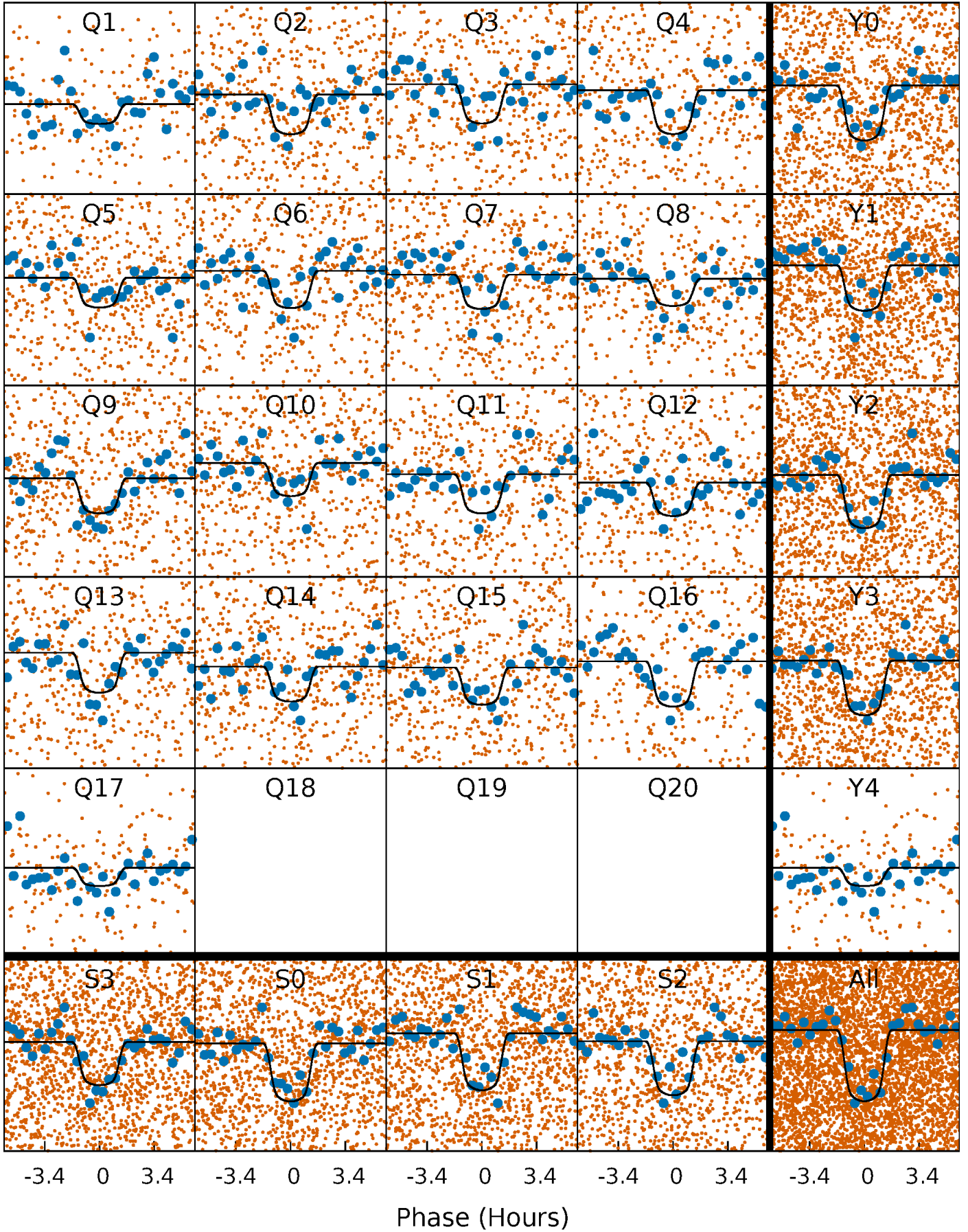
# PDC Quarter-Phased Transit Curves

TCE 012154526-02    P= 3.188974 Days     $T_0=133.527823$  (BKJD)



# DV Quarter-Phased Transit Curves

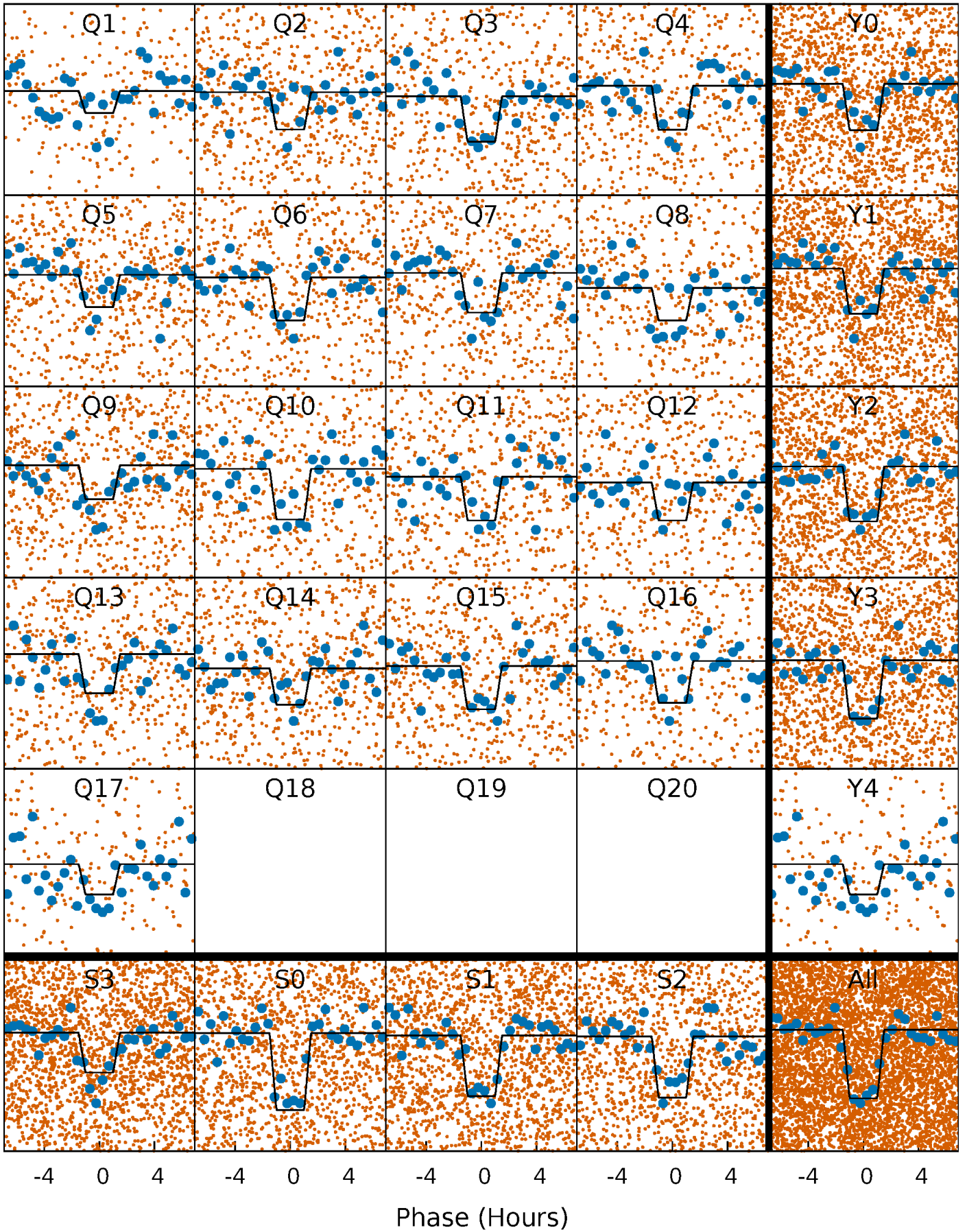
TCE 012154526-02     $P = 3.188974$  Days     $T_0 = 133.527823$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 012154526-02 P= 3.188963 Days  $T_0=133.533270$  (BKJD)

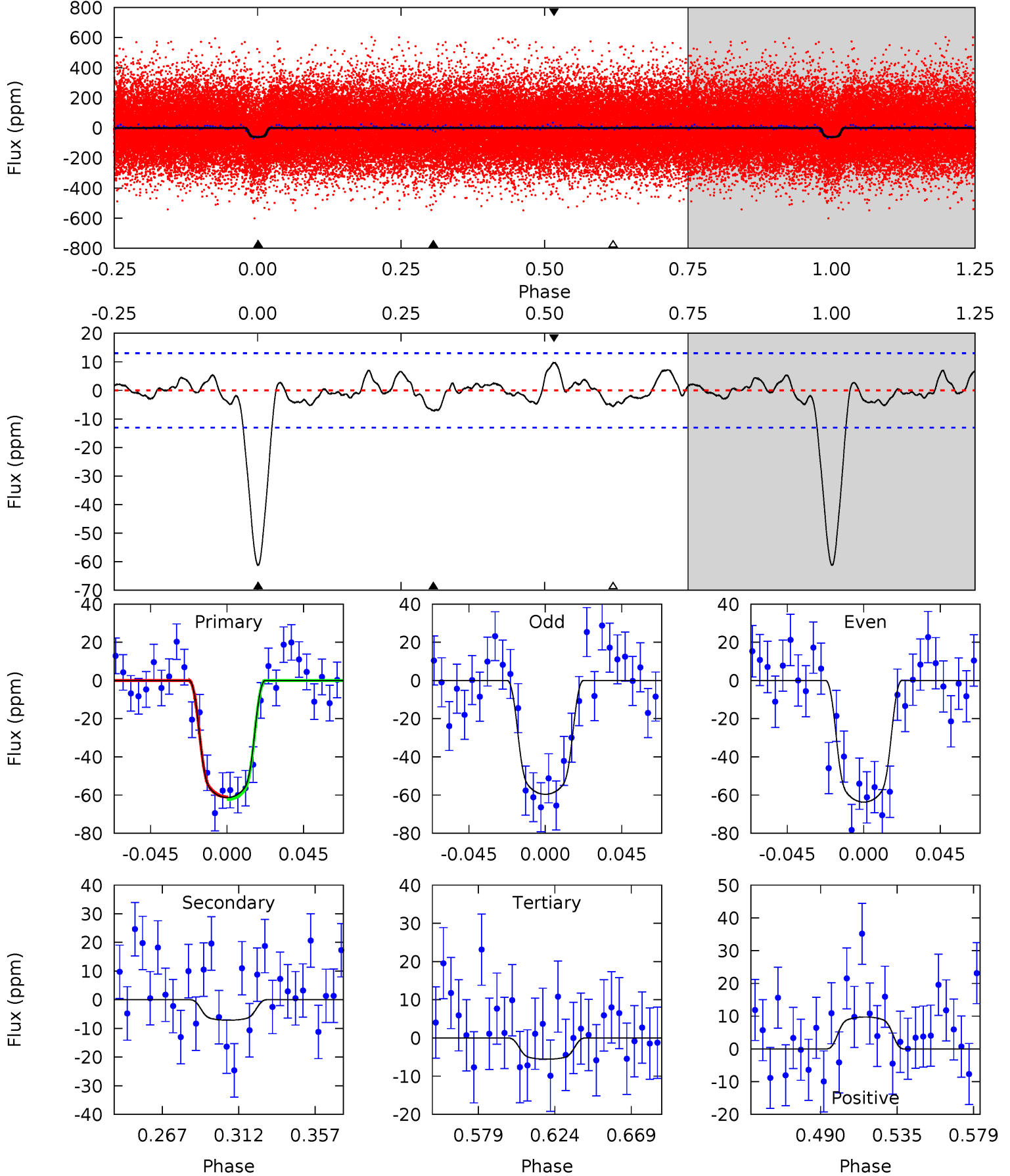




# DV Model-Shift Uniqueness Test

012154526-02, P = 3.188974 Days, E = 130.338849 Days

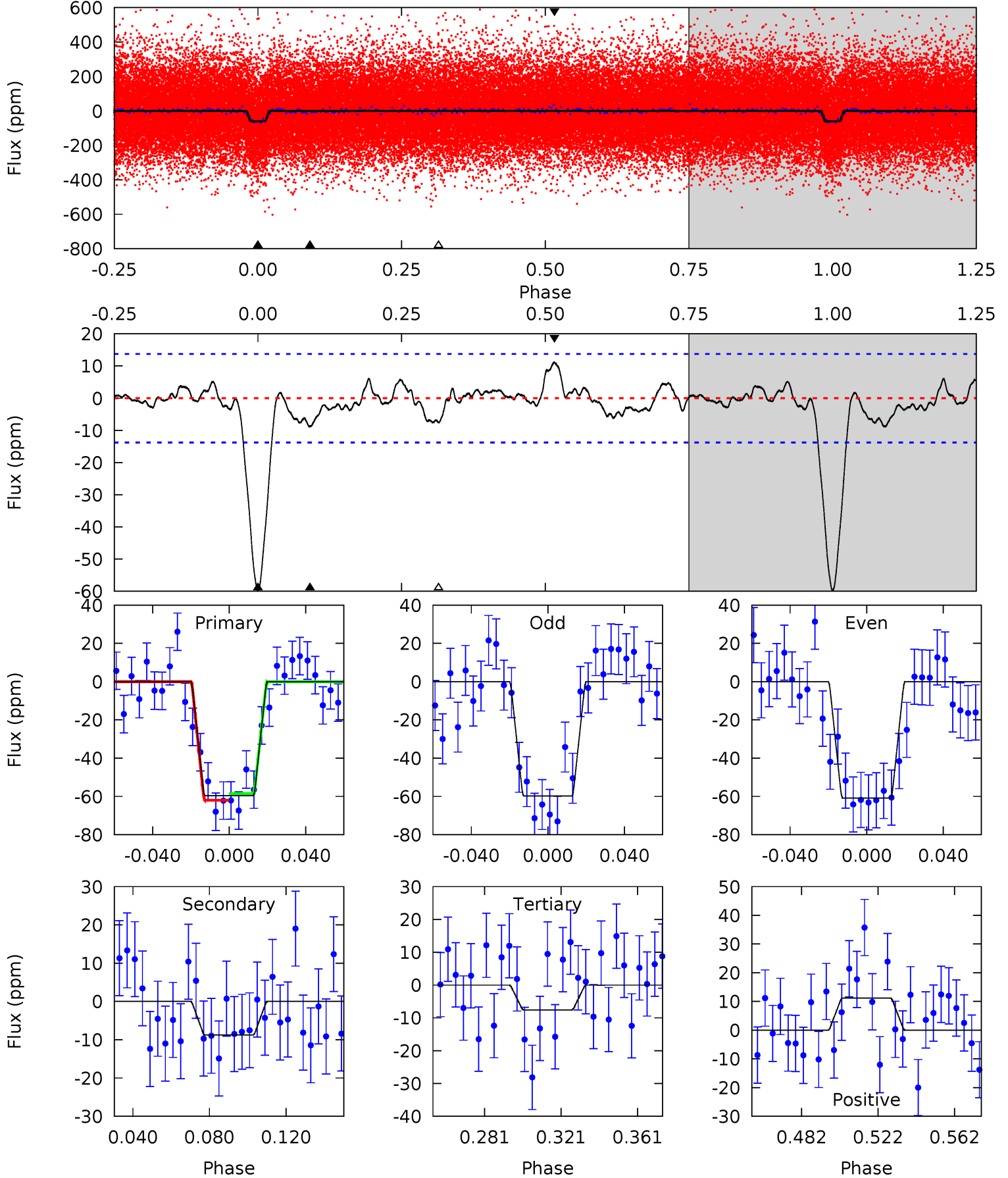
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
22.3	2.59	2.02	3.54	4.73	2.01	1.18	20.2	18.7	0.57	-0.94	0.74	0.95	0.14	0.24



# Alt Model-Shift Uniqueness Test

012154526-02, P = 3.188963 Days, E = 130.344307 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
20.6	3.03	2.61	3.85	4.75	2.05	1.13	18.0	16.8	0.42	-0.82	0.18	1.06	0.16	0.60



### Stellar Parameters For KIC 012154526

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5700^{+114}_{-114}$	$4.327^{+0.103}_{-0.115}$	$0.340^{+0.100}_{-0.150}$	$1.176^{+0.182}_{-0.149}$	$1.071^{+0.066}_{-0.066}$	$0.927^{+0.454}_{-0.303}$
	+2%/-2%	+2%/-3%	+29%/-44%	+15%/-13%	+6%/-6%	+49%/-33%
Source	SPE59	SPE59	SPE59	DSEP		

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

### Secondary Eclipse Parameters for KIC 012154526-02 / KOI 2004.02

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-7 \pm 3$	$1.29^{+0.17}_{-0.17}$	$1838^{+82}_{-79}$	$3405^{+231}_{-272}$	$4.421^{+2.070}_{-1.862}$
Alt.	$-9 \pm 3$	$1.02^{+0.18}_{-0.17}$	$1833^{+79}_{-72}$	$3815^{+312}_{-305}$	$8.476^{+5.010}_{-3.321}$

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

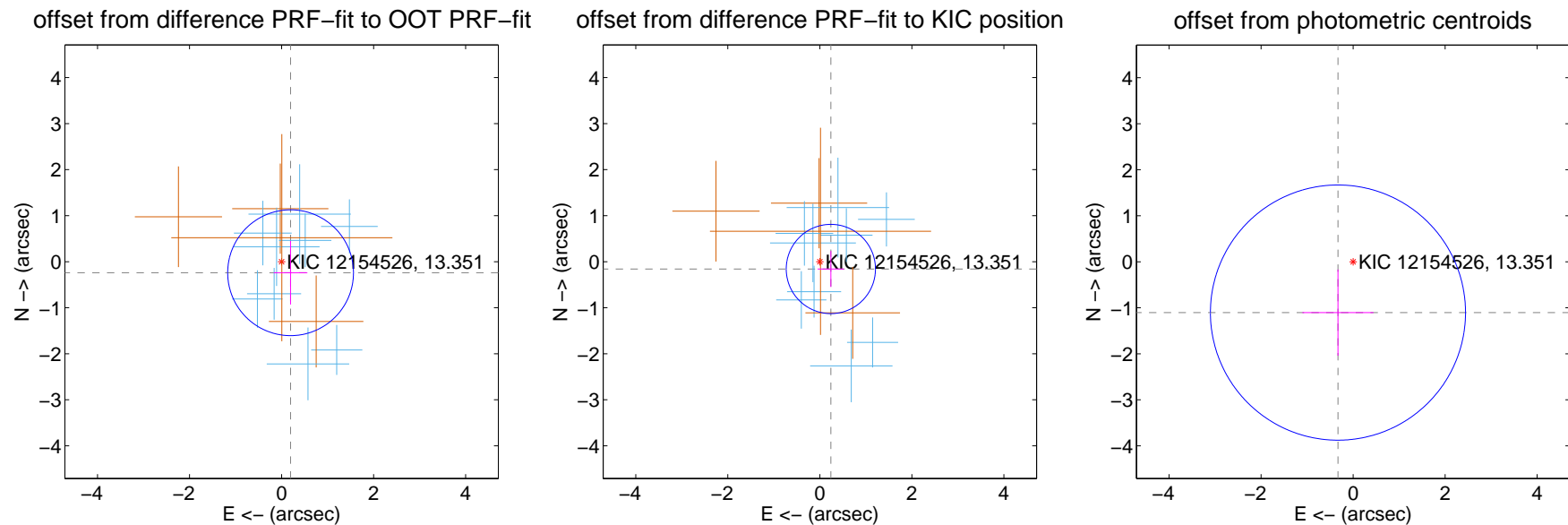
## DV Centroid Data

Supplemental centroid analysis for 012154526-02. Kepler magnitude: 13.35. Transit SNR 17.04

There are 9 quarters with good PRF difference image offsets

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

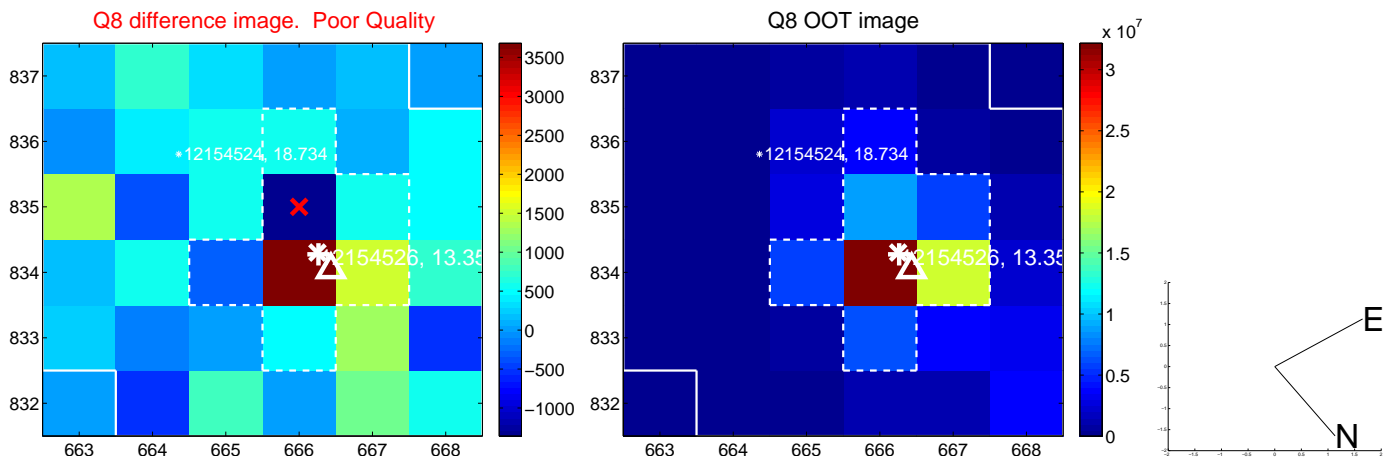
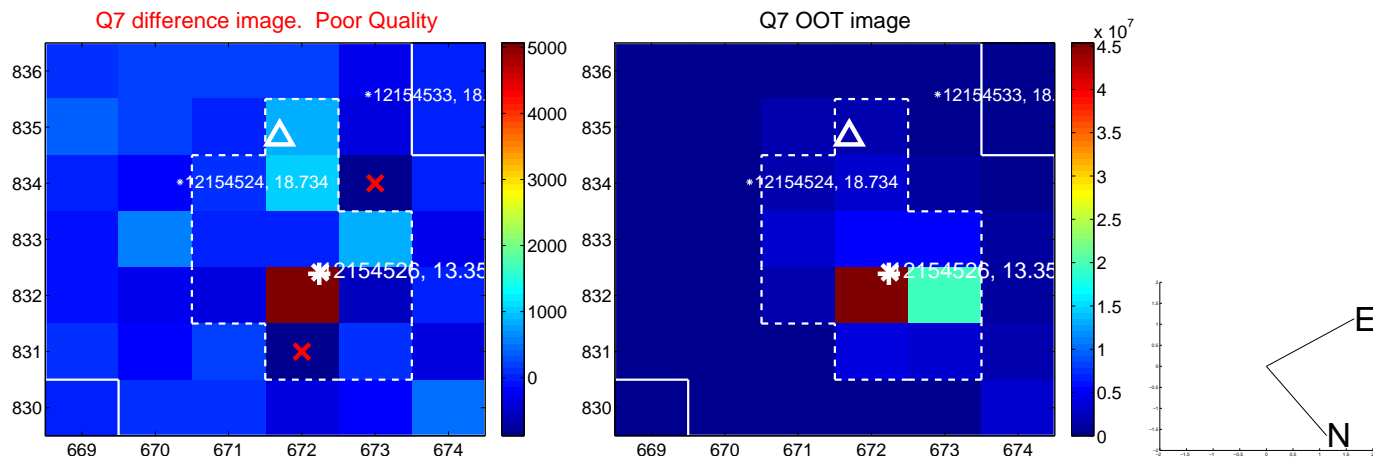
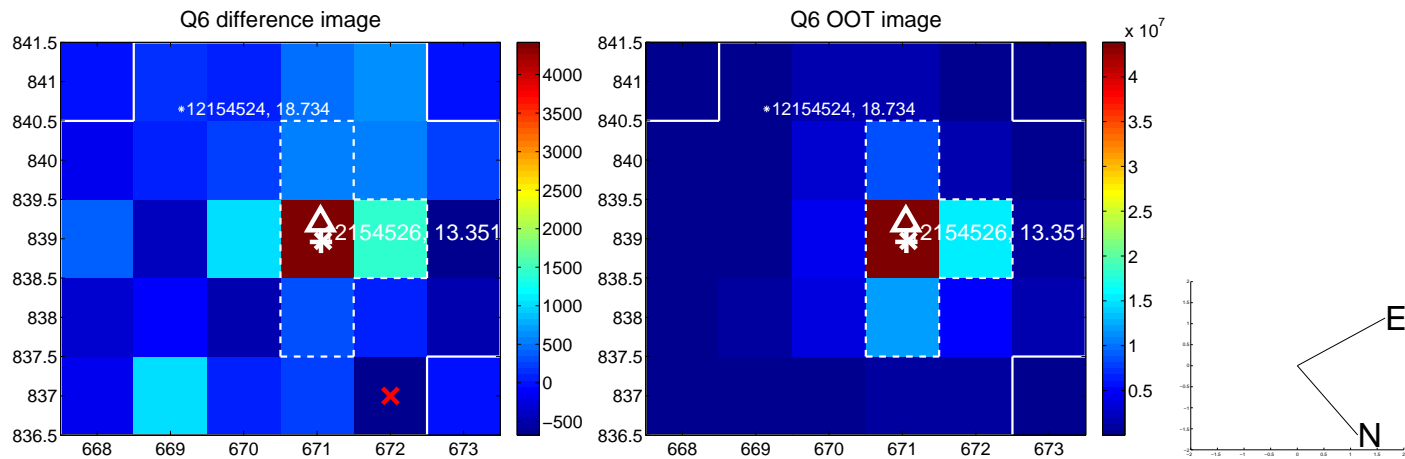
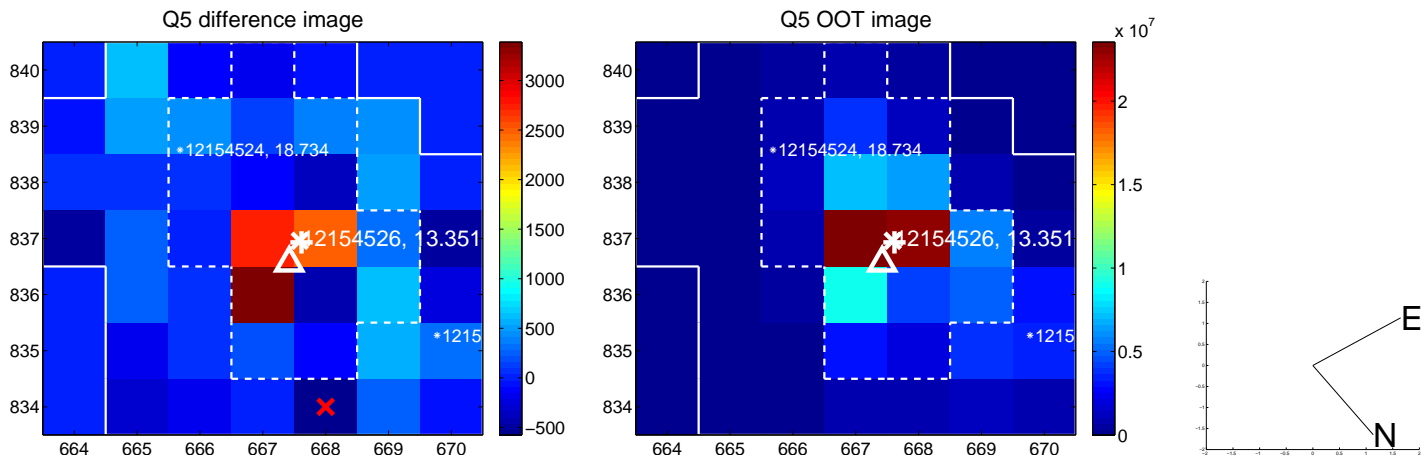
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.309 \pm 0.456$	0.68	$-0.196 \pm 0.364$	$-0.239 \pm 0.691$
PRF-fit source offset from KIC position	$0.287 \pm 0.323$	0.89	$-0.239 \pm 0.288$	$-0.159 \pm 0.391$
photometric centroid source offset	$1.15 \pm 0.92$	1.25	$0.33 \pm 0.77$	$-1.10 \pm 0.94$



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.



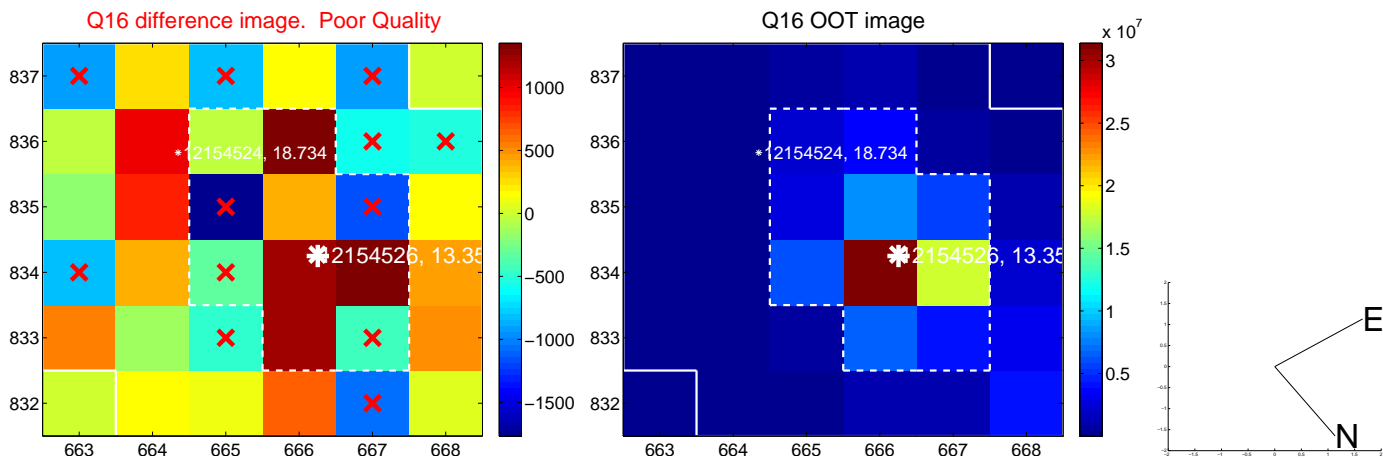
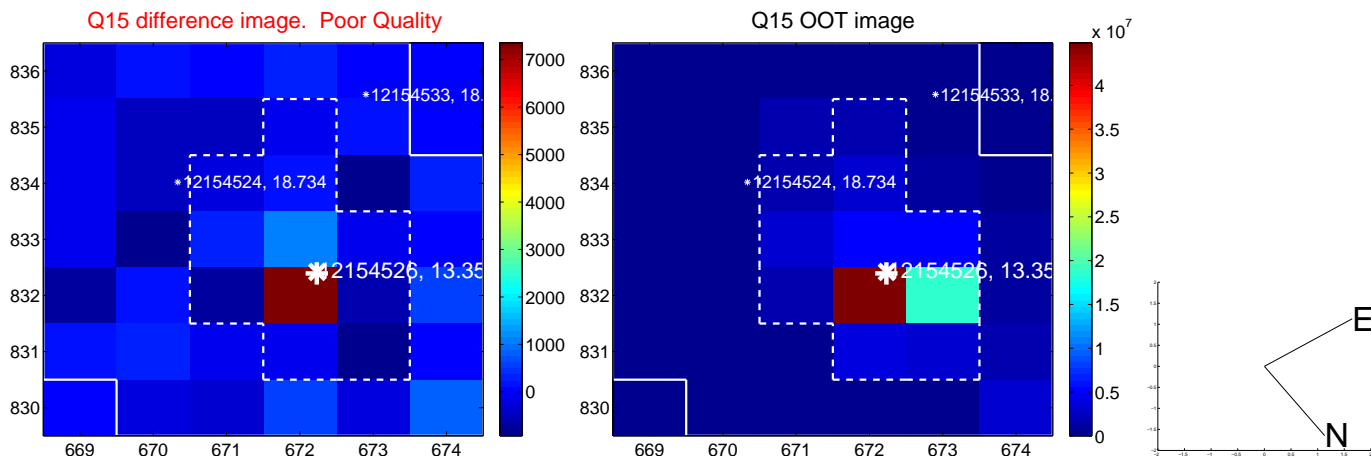
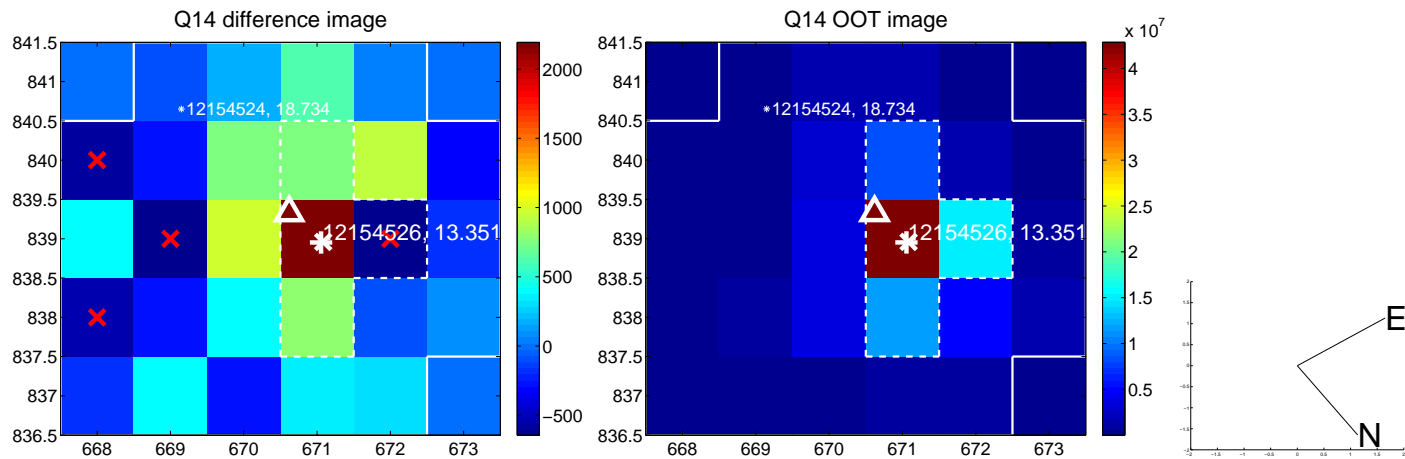
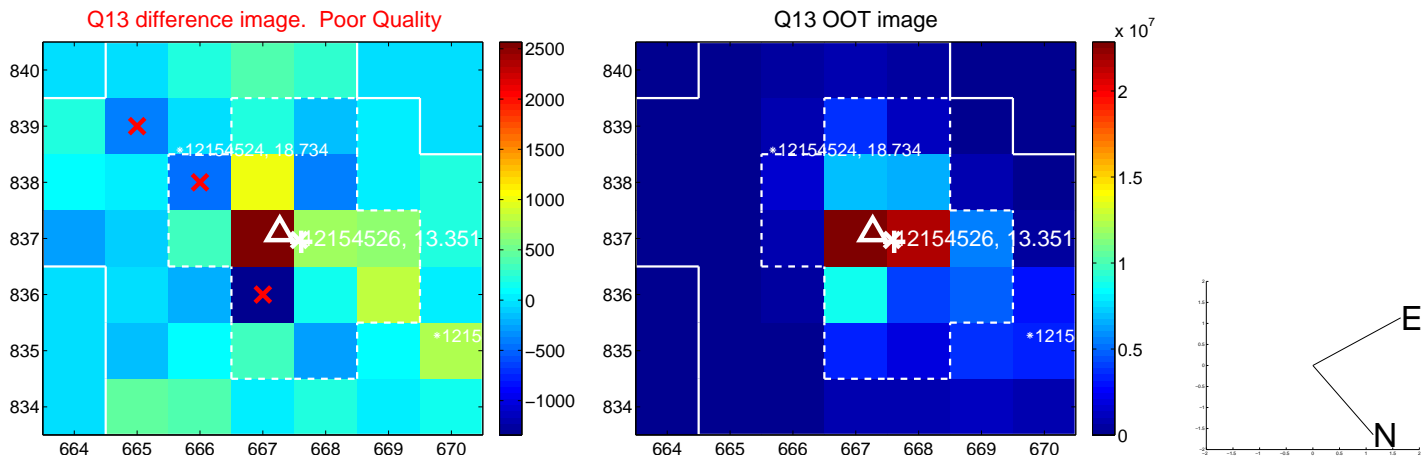
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



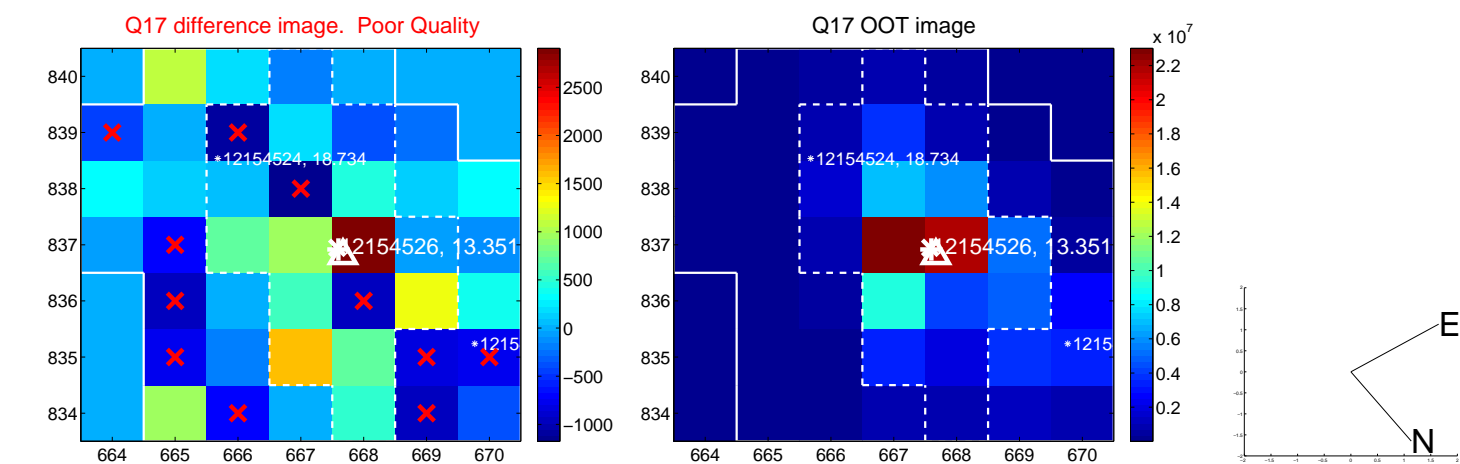




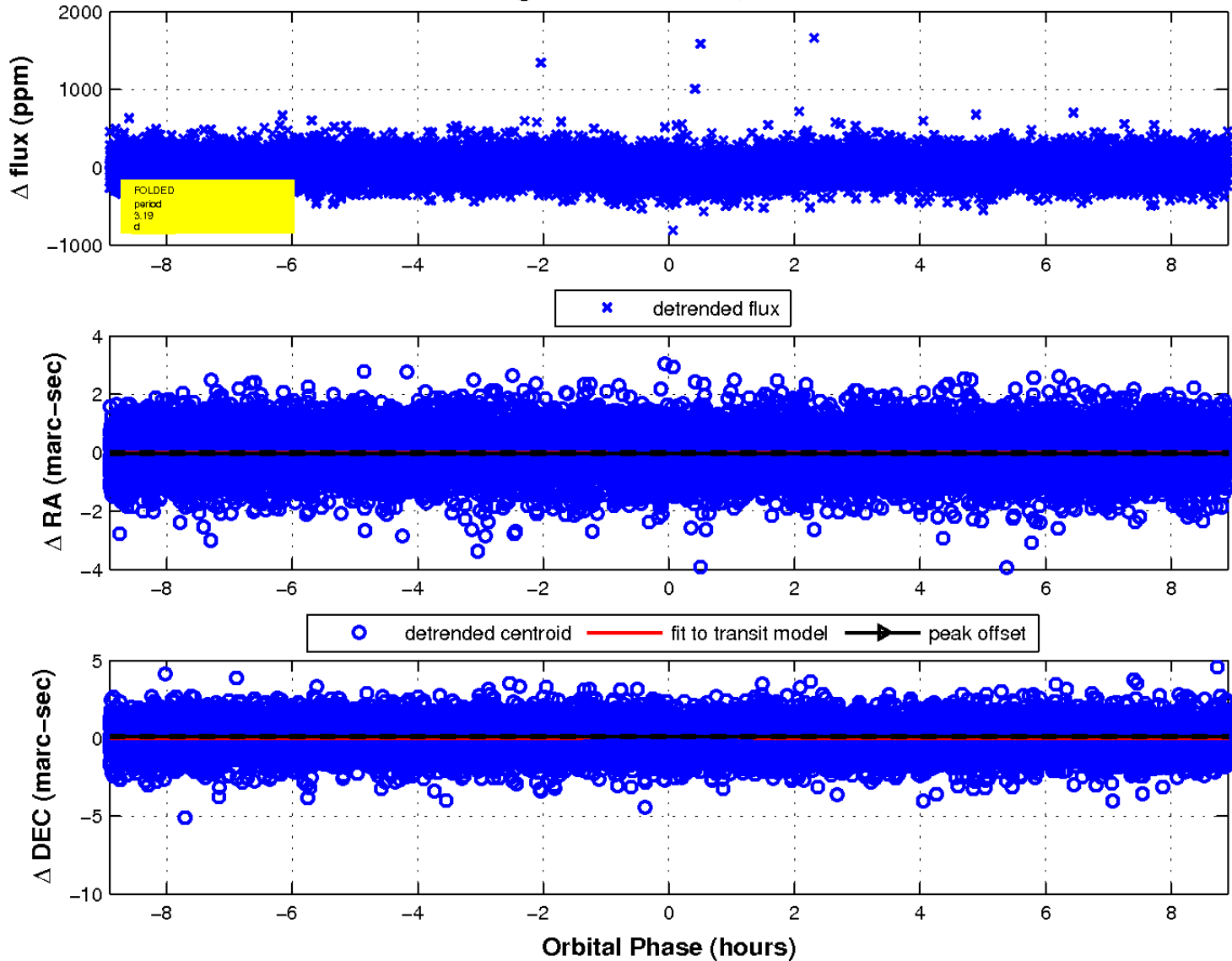
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

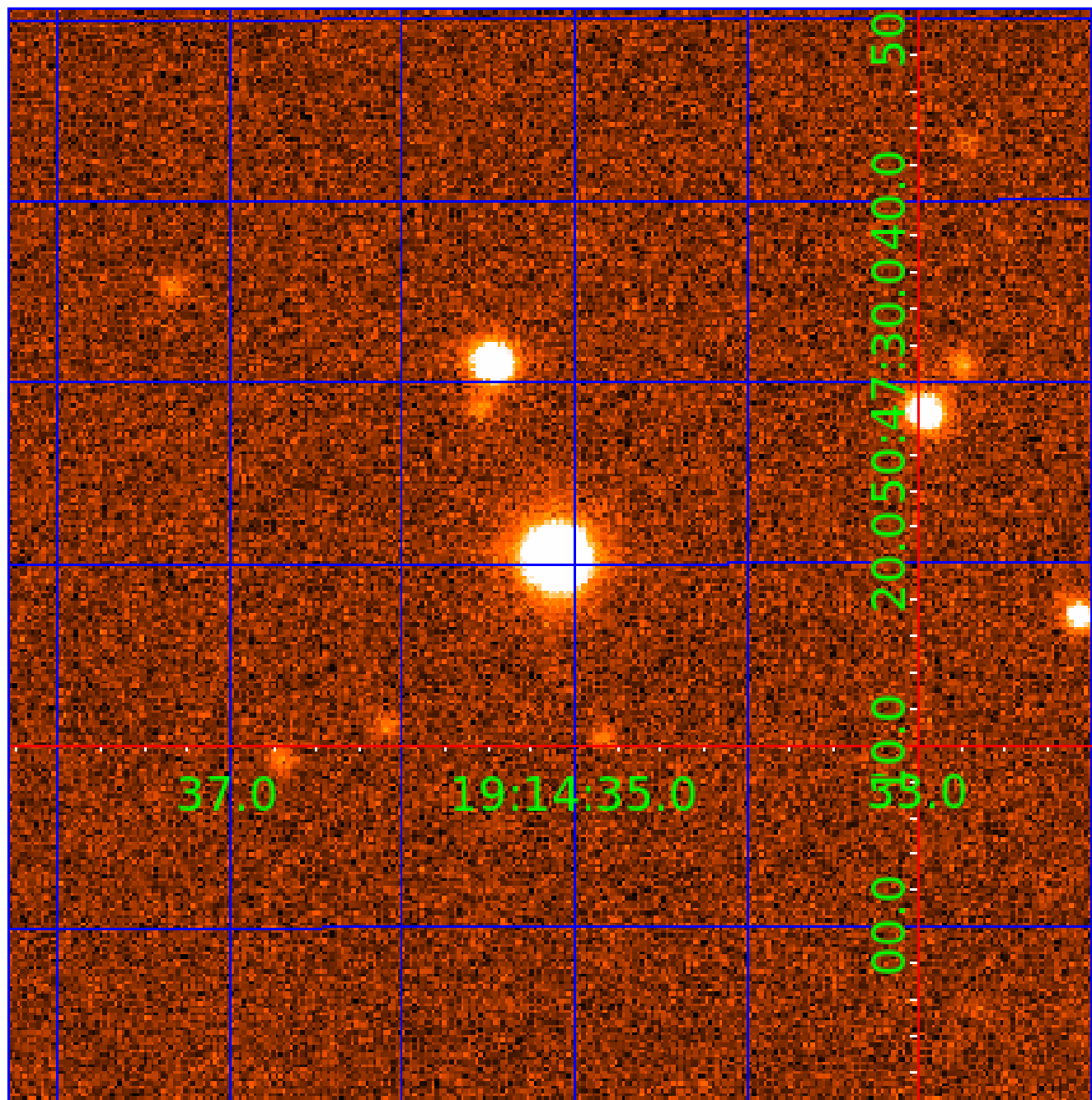


fluxWeightedCentroids, Planet 2 of 3



UKIRT Image

Declination



# KIC 012154526

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012154526-01	OBS	2004.01	56.188579	146.379770	341.0	6.543	28.2	30.4	1.18	5700	2.55	15.15
012154526-02	OBS	2004.02	3.188974	133.527823	65.4	2.969	15.7	17.0	1.18	5700	1.28	694.70
012154526-03	OBS	2004.03	1.721042	132.788849	26.8	2.318	8.2	8.4	1.18	5700	0.69	1581.04

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012154526-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
012154526-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT
012154526-03	OBS	PC	0.87	0	0	0	0	NO_COMMENT

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

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

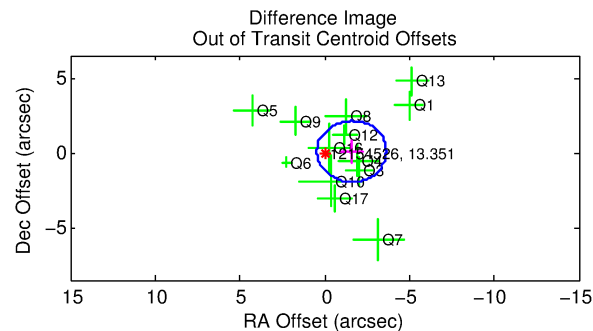
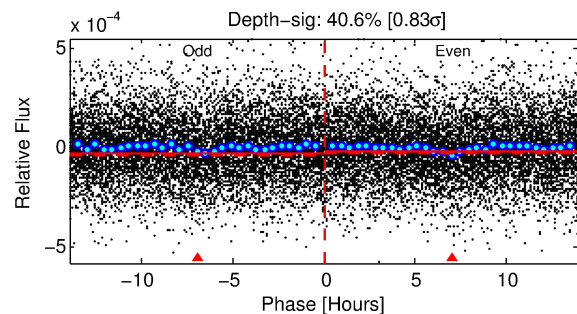
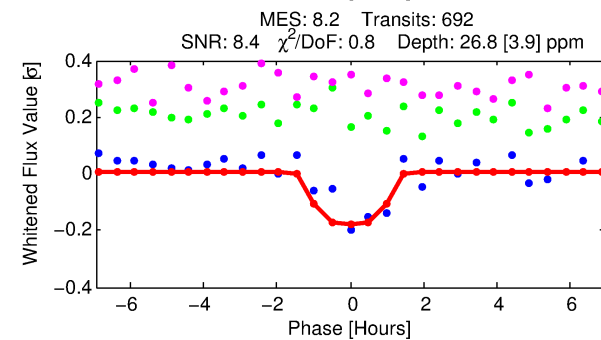
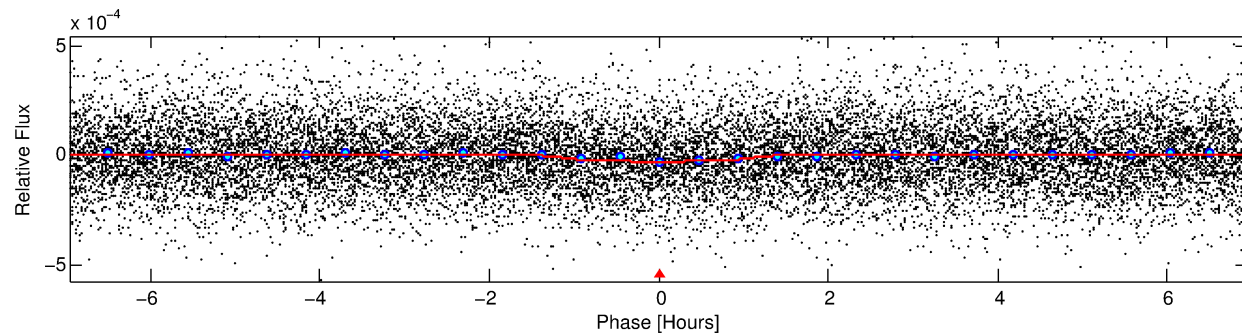
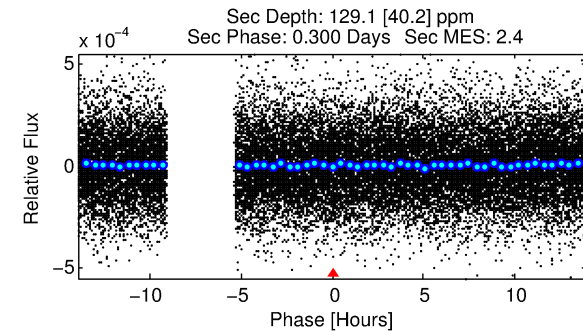
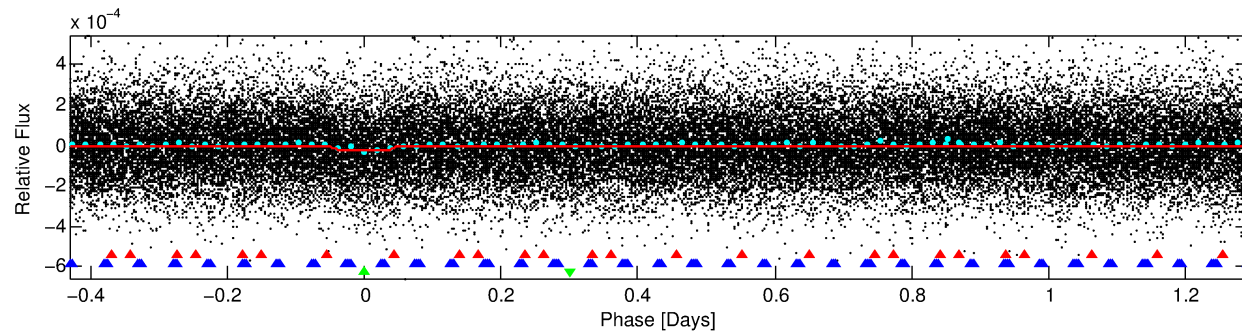
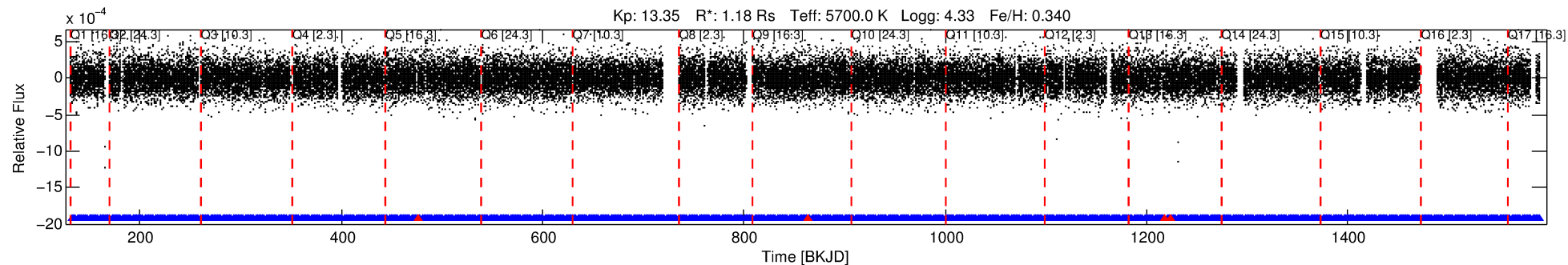
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 012154526-03

No Significant Match Found

# DV One-Page Summary

KIC: 12154526 Candidate: 3 of 3 Period: 1.721 d  
KOI: K02004.03 Corr: 0.806



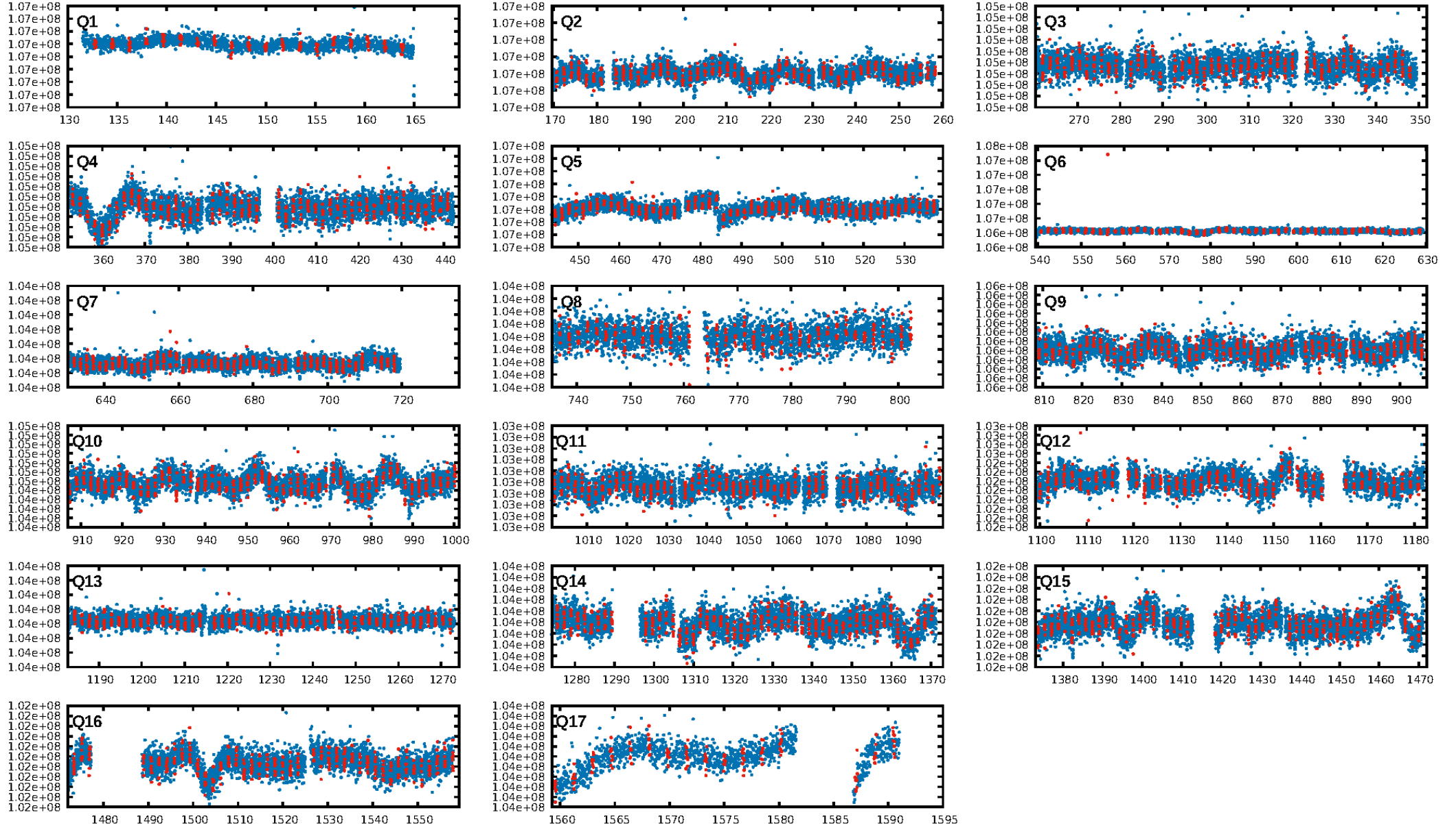
## DV Fit Results:

Period = 1.72104 [0.00002] d  
Epoch = 132.7888 [0.0043] BKJD  
Rp/R\* = 0.0054 [0.0020]  
a/R\* = 3.35 [4.70]  
b = 0.83 [0.59]  
Seff = 1581.04 [347.14]  
Teq = 1608 [88] K  
Rp = 0.69 [0.27] Re  
a = 0.0288 [0.0039] AU  
Ag = 123.39 [100.94] [1.21σ]  
Teffp = 8286 [1649] K [4.04σ]

## DV Diagnostic Results:

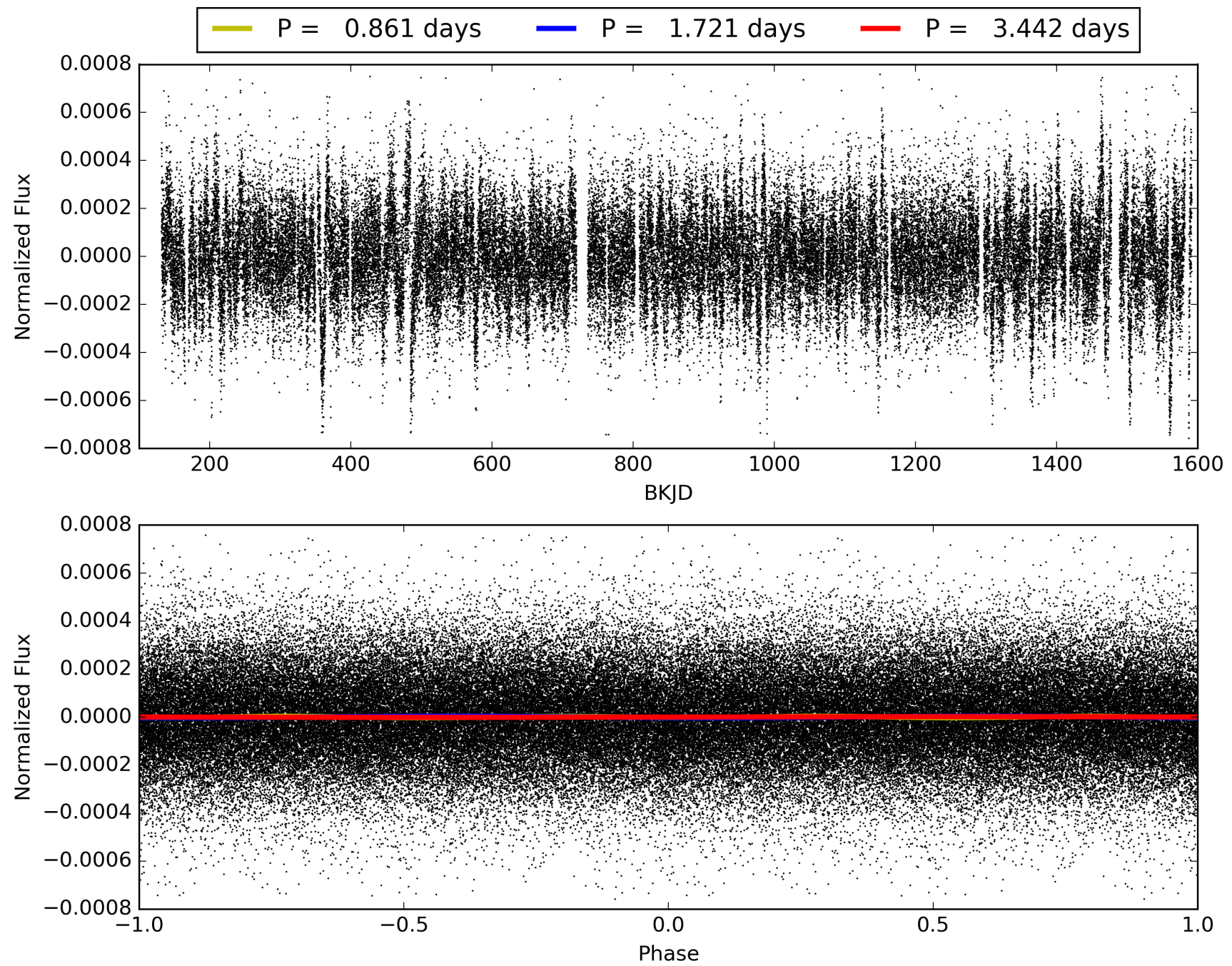
ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [9.35σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.22e-16  
RollingBand-fgt: 0.99 [656/660]  
GhostDiagnostic-chr: 2.076  
Centroid-sig: 77.3%  
Centroid-so: 0.596 arcsec [0.40σ]  
OotOffset-rm: 1.597 arcsec [2.34σ]  
KicOffset-rm: 1.640 arcsec [2.14σ]  
OotOffset-st: 2/2/4/5 [13]  
KicOffset-st: 2/2/4/5 [13]  
DiffImageQuality-fgm: 0.23 [3/13]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 012154526-03, PDC Light Curves





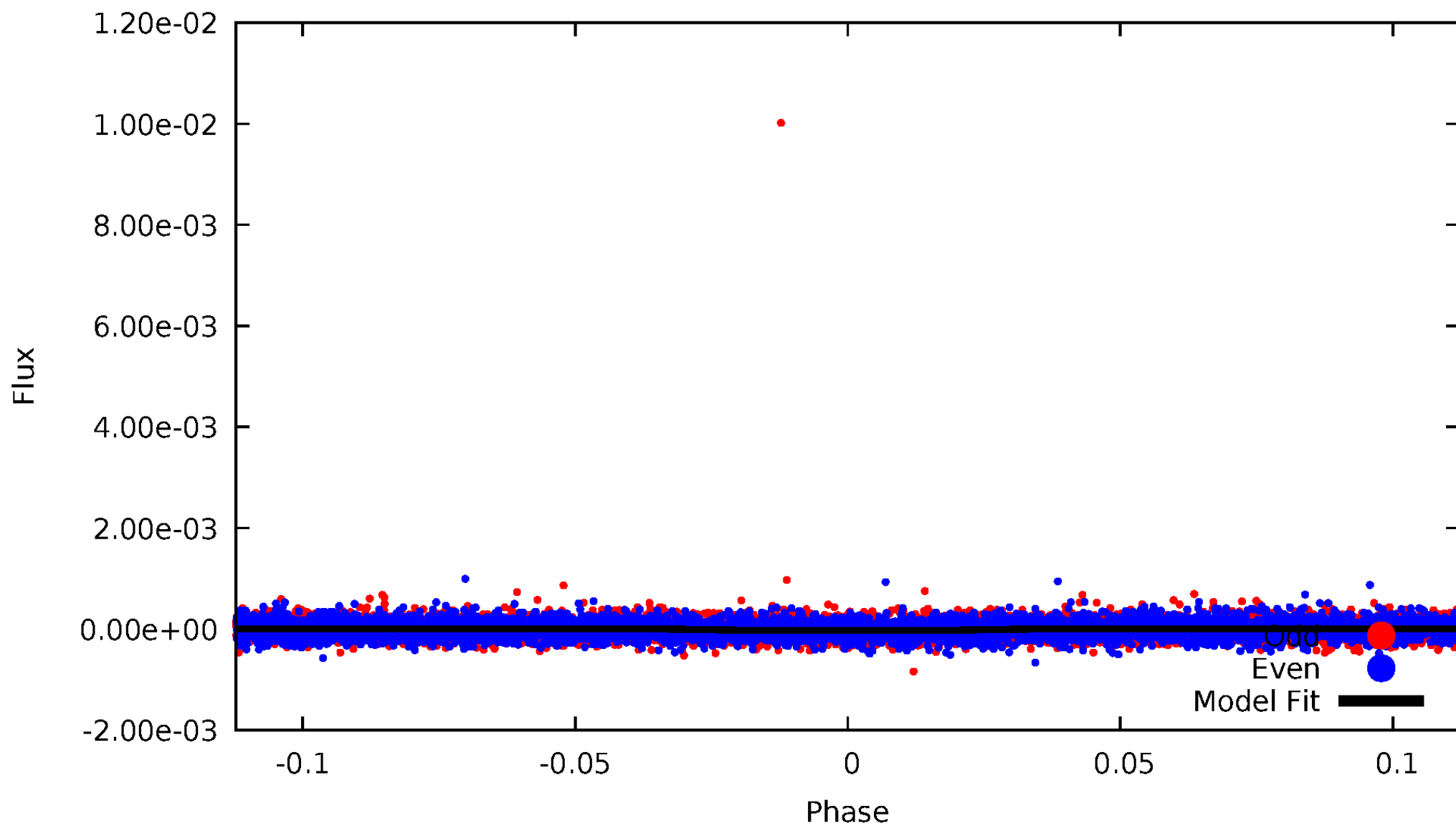
TCE 012154526-03





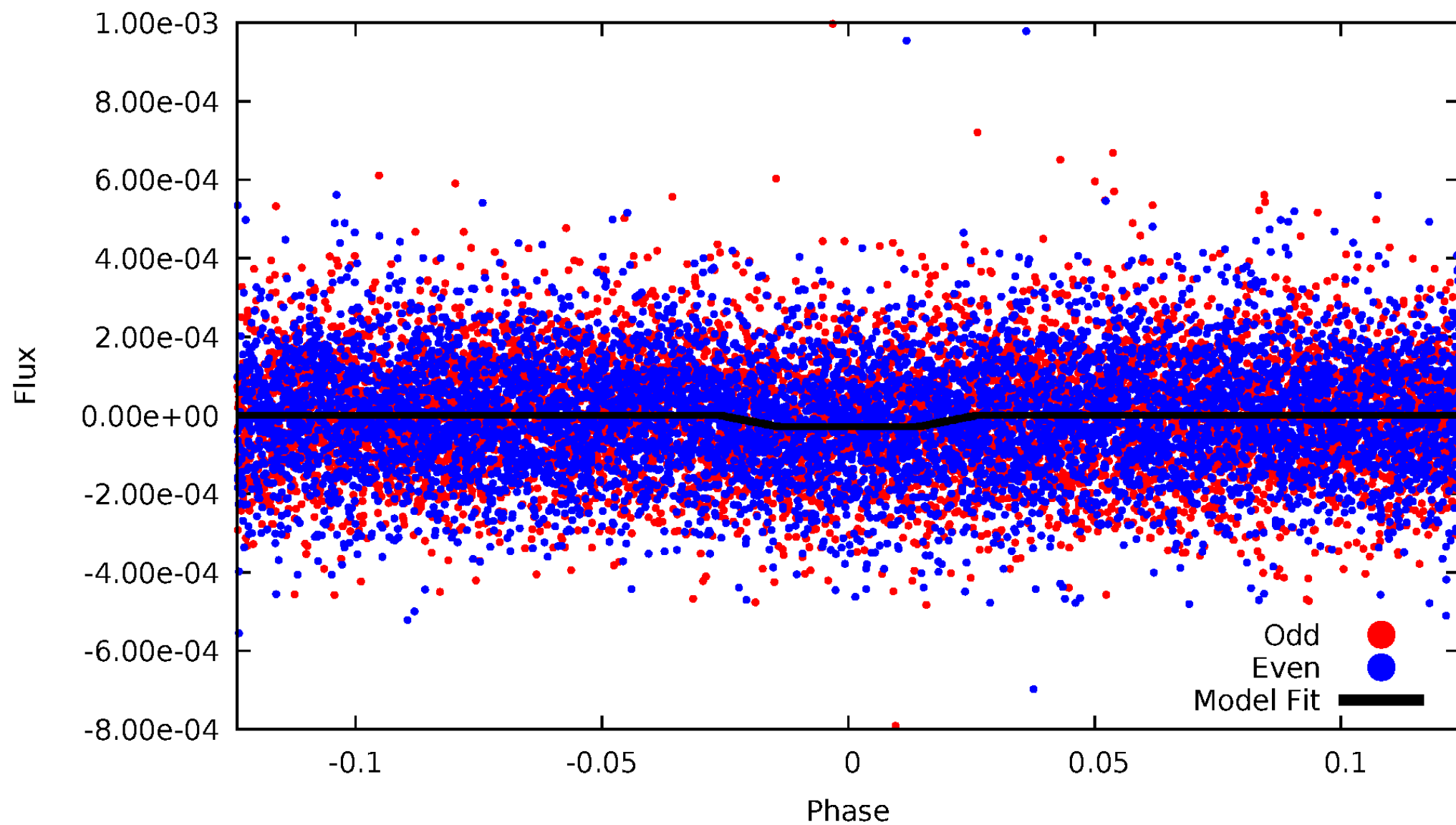
# DV Odd/Even

TCE 012154526-03



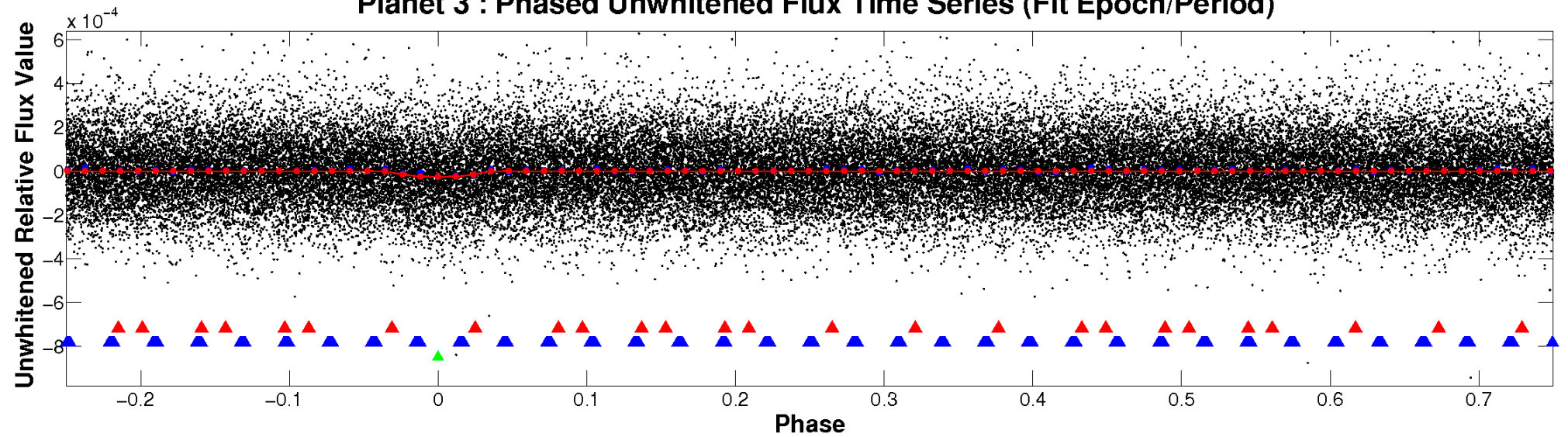
# ALT Odd/Even

TCE 012154526-03

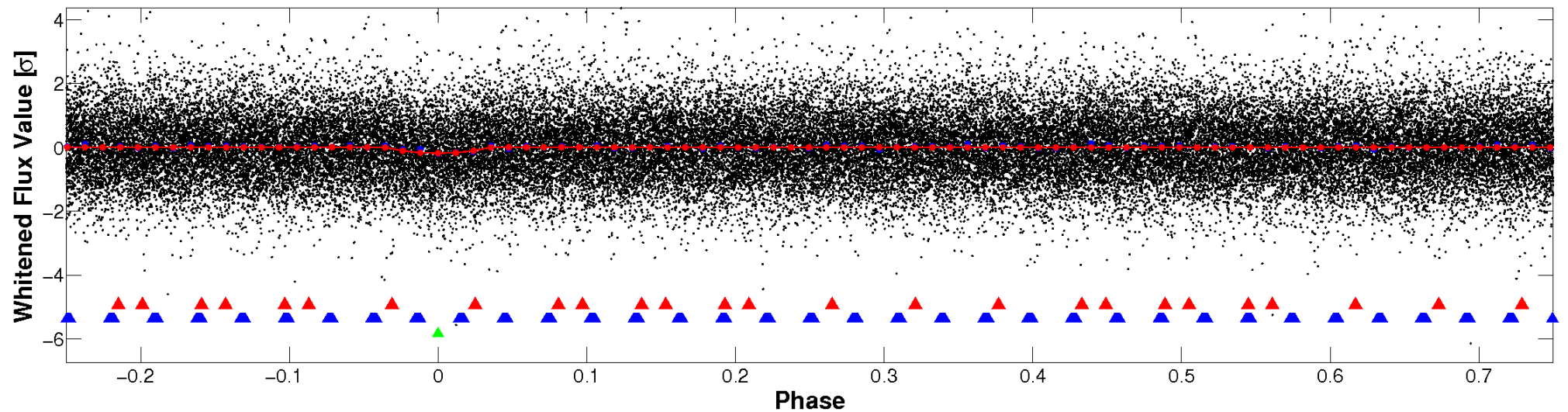


# Non-Whitened Vs. Whitened Light Curve

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

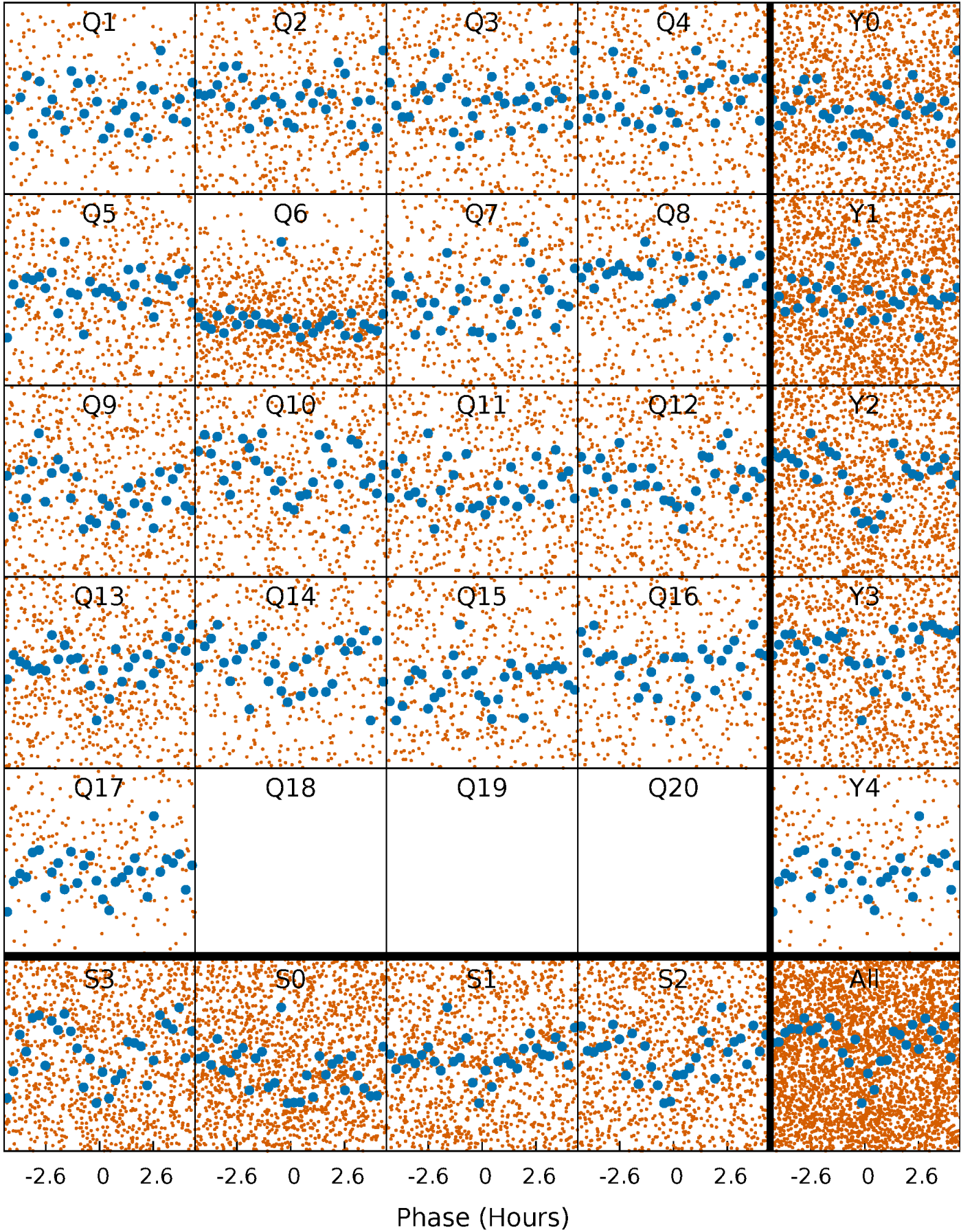


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

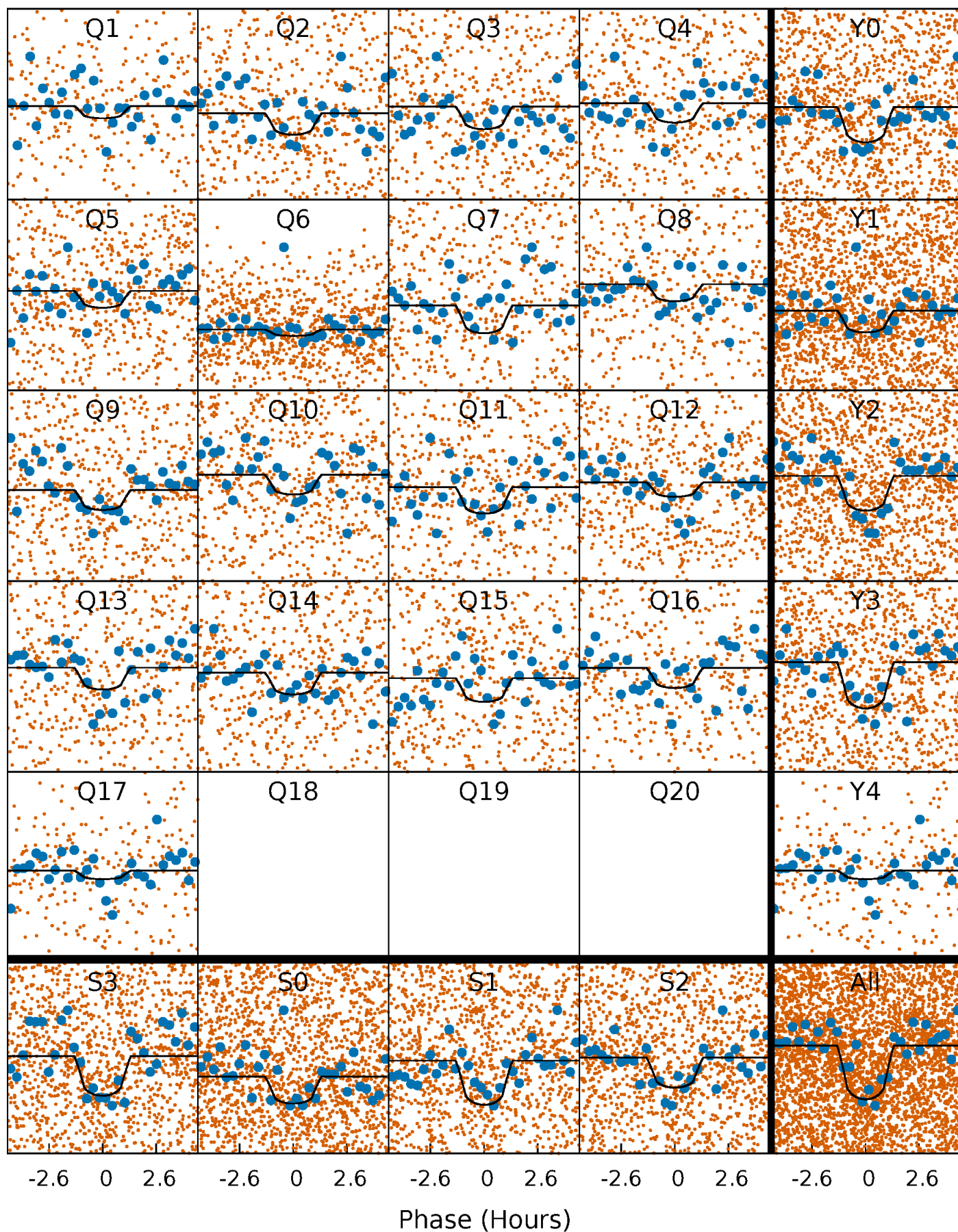
TCE 012154526-03 P= 1.721042 Days  $T_0=132.788849$  (BKJD)





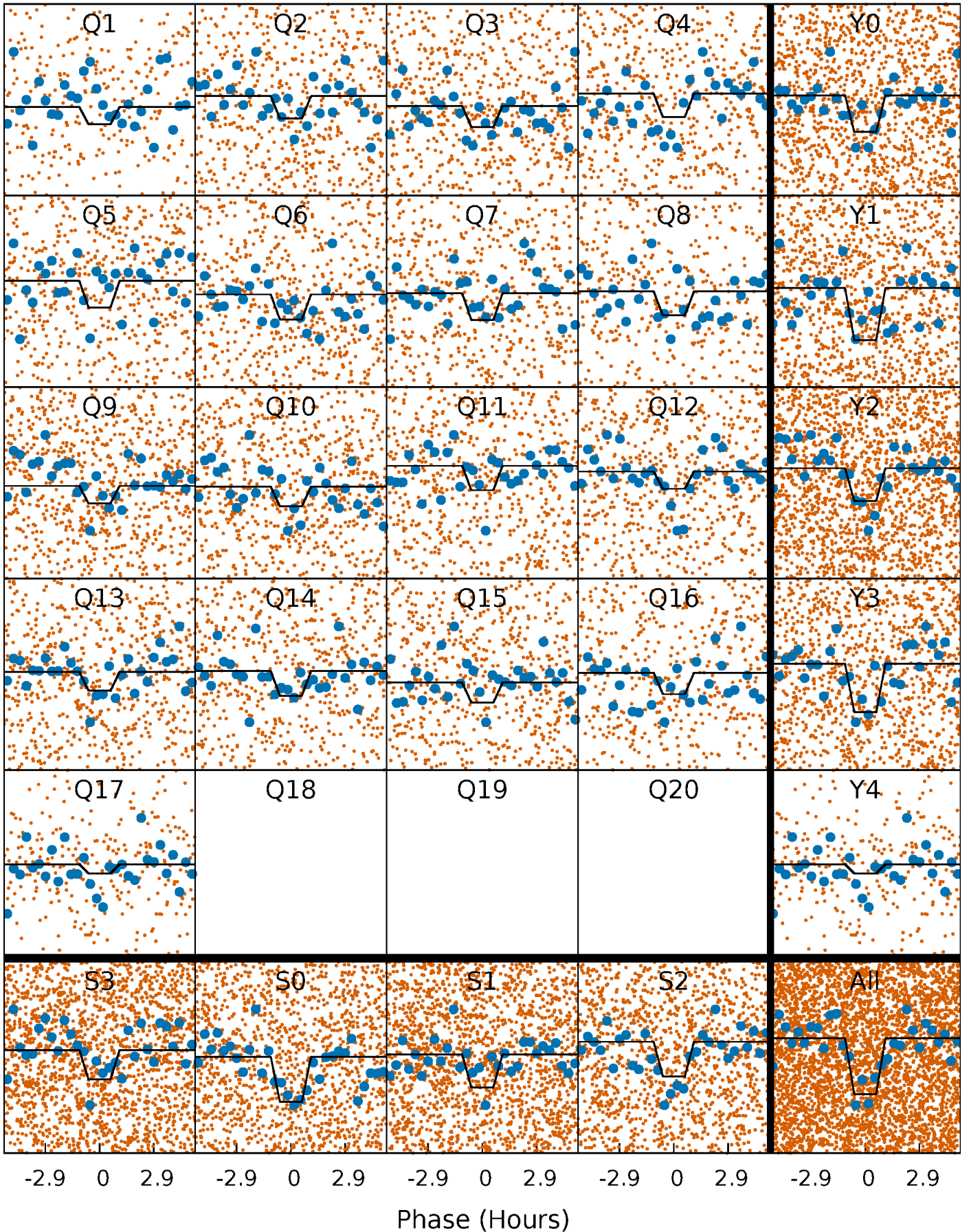
# DV Quarter-Phased Transit Curves

TCE 012154526-03 P= 1.721042 Days  $T_0=132.788849$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 012154526-03 P= 1.721090 Days  $T_0=132.765803$  (BKJD)

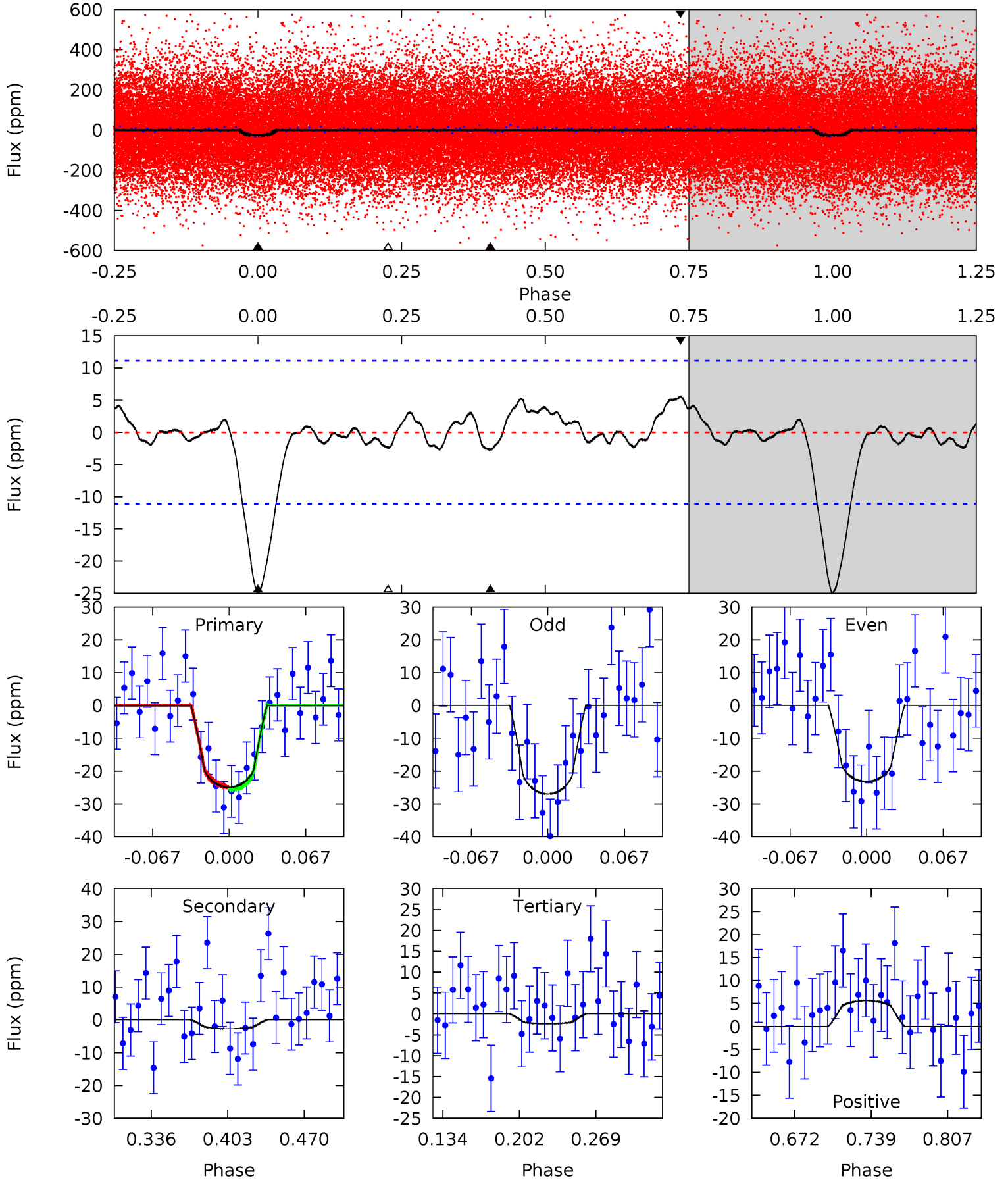




# DV Model-Shift Uniqueness Test

012154526-03, P = 1.721042 Days, E = 131.067807 Days

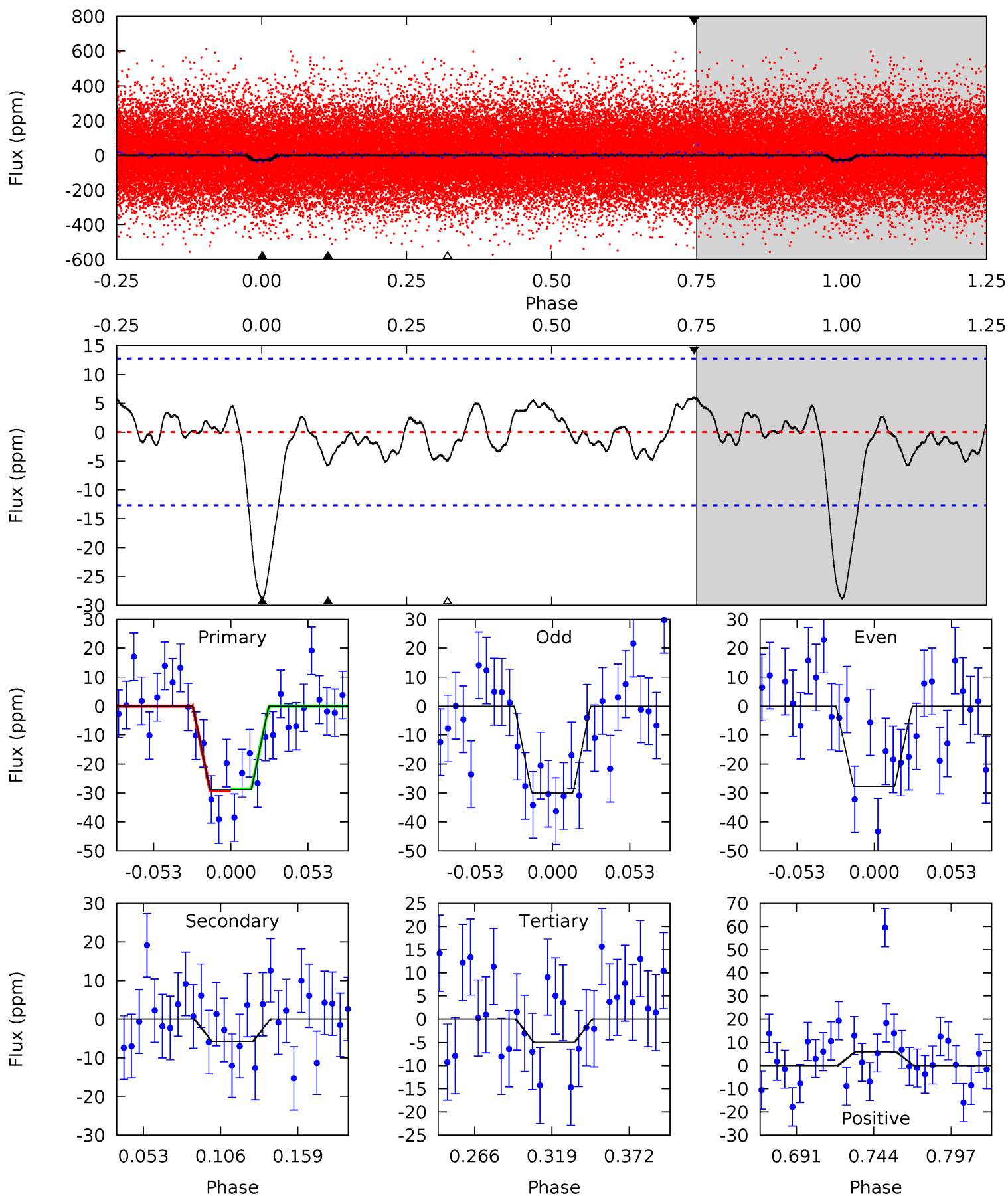
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.4	1.14	1.01	2.34	4.65	1.83	0.82	9.40	8.07	0.13	-1.20	0.79	0.85	0.18	0.18



# Alt Model-Shift Uniqueness Test

012154526-03, P = 1.721090 Days, E = 131.044713 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
10.7	2.12	1.82	2.20	4.70	1.93	1.08	8.86	8.49	0.30	-0.08	0.42	0.94	0.17	0.12



### Stellar Parameters For KIC 012154526

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5700^{+114}_{-114}$	$4.327^{+0.103}_{-0.115}$	$0.340^{+0.100}_{-0.150}$	$1.176^{+0.182}_{-0.149}$	$1.071^{+0.066}_{-0.066}$	$0.927^{+0.454}_{-0.303}$
	+2%/-2%	+2%/-3%	+29%/-44%	+15%/-13%	+6%/-6%	+49%/-33%
Source	SPE59	SPE59	SPE59	DSEP		

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

### Secondary Eclipse Parameters for KIC 012154526-03 / KOI 2004.03

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-3\pm 2$	$0.71^{+0.25}_{-0.26}$	$2254^{+101}_{-89}$	$3468^{+830}_{-5925}$	$2.232^{+5.369}_{-2.085}$
Alt.	$-6\pm 3$	$0.71^{+0.25}_{-0.25}$	$2257^{+97}_{-96}$	$3989^{+807}_{-547}$	$5.128^{+8.563}_{-2.938}$

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

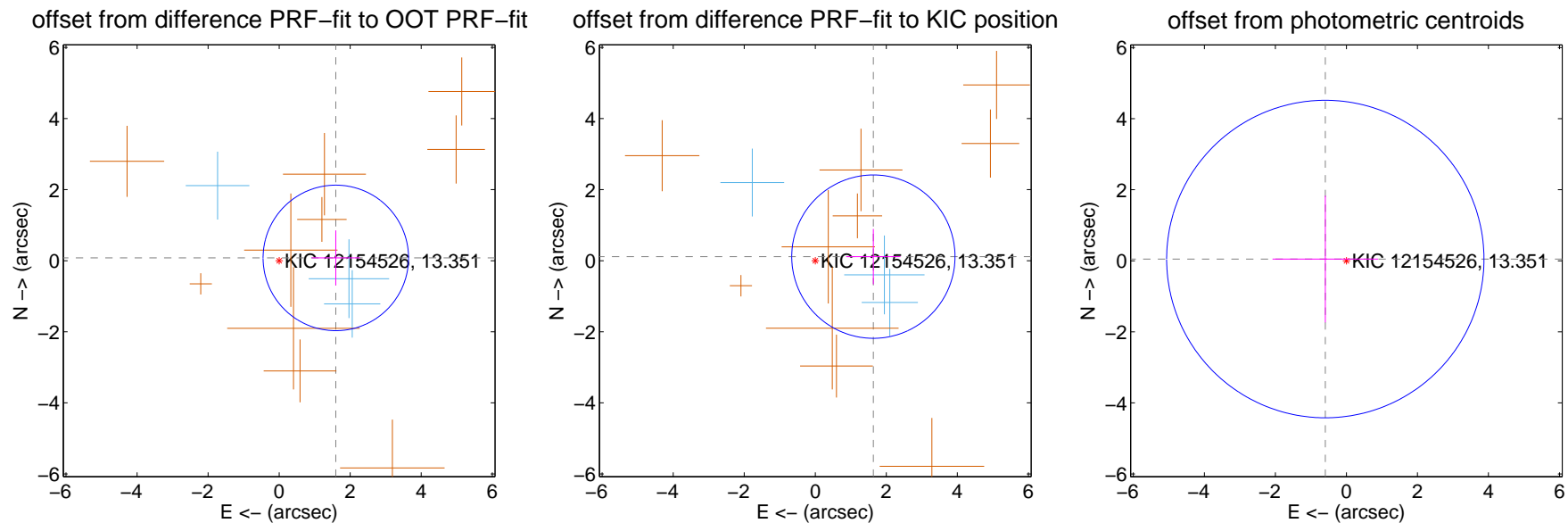
## DV Centroid Data

Supplemental centroid analysis for 012154526-03. Kepler magnitude: 13.35. Transit SNR 8.43

There are 3 quarters with good PRF difference image offsets

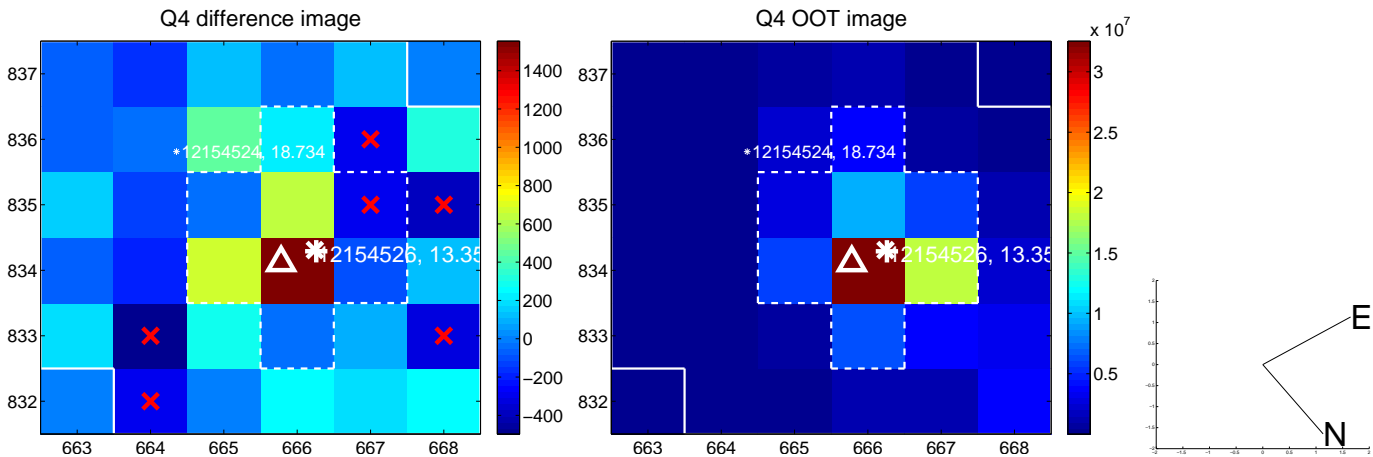
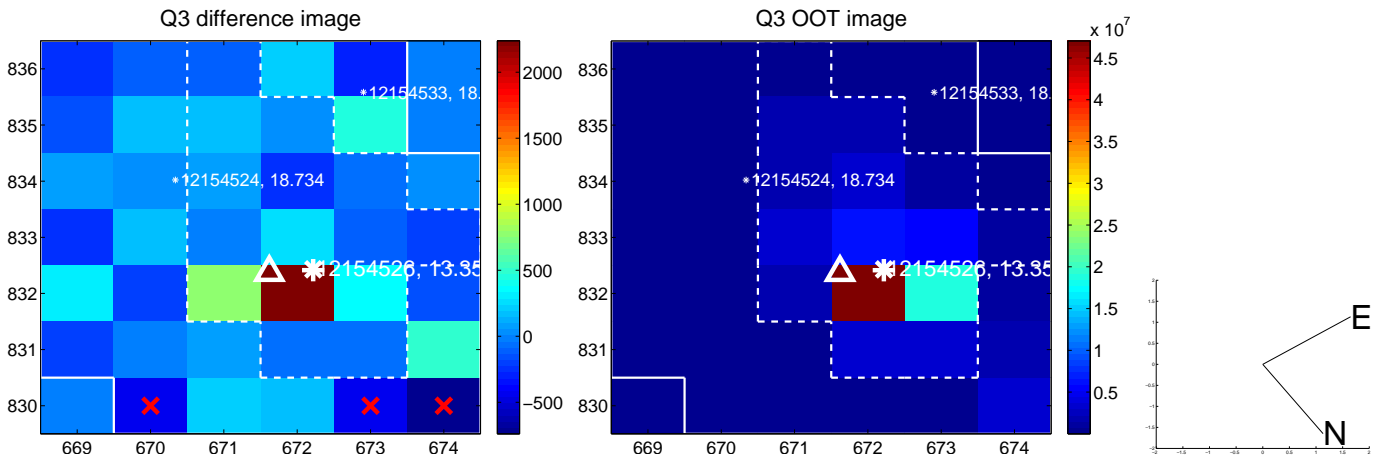
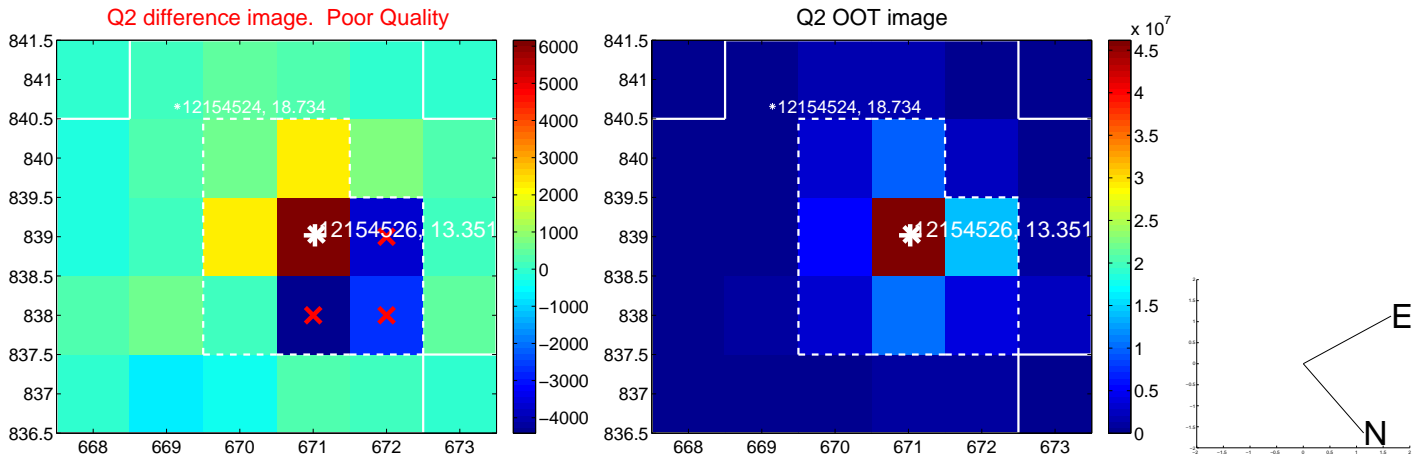
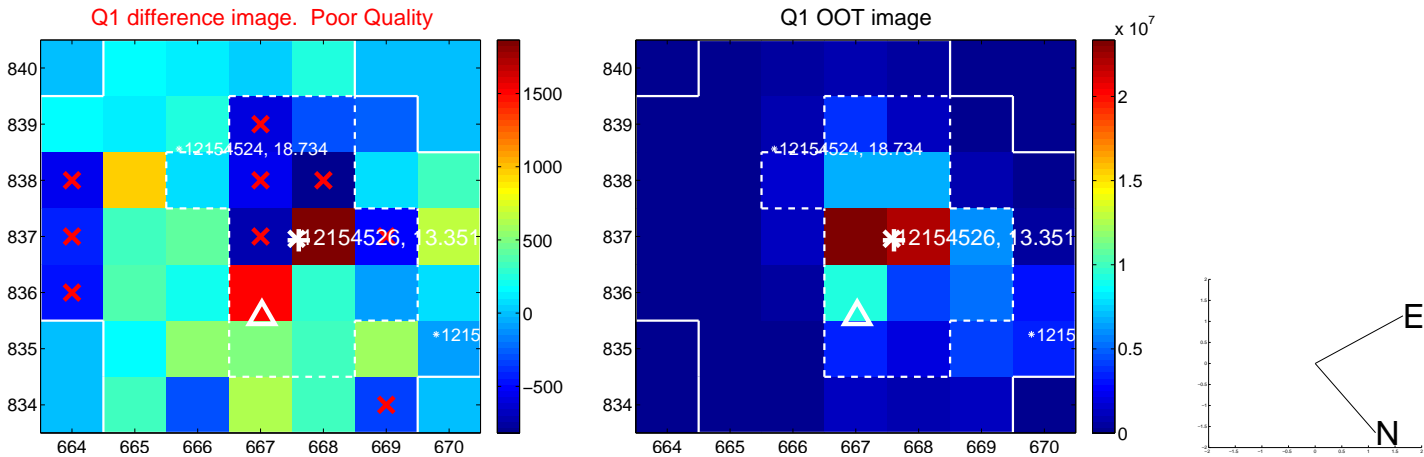
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.597 \pm 0.682$	2.34	$-1.595 \pm 0.679$	$0.078 \pm 0.774$
PRF-fit source offset from KIC position	$1.640 \pm 0.766$	2.14	$-1.636 \pm 0.765$	$0.114 \pm 0.778$
photometric centroid source offset	$0.60 \pm 1.49$	0.40	$0.59 \pm 1.49$	$0.05 \pm 1.79$

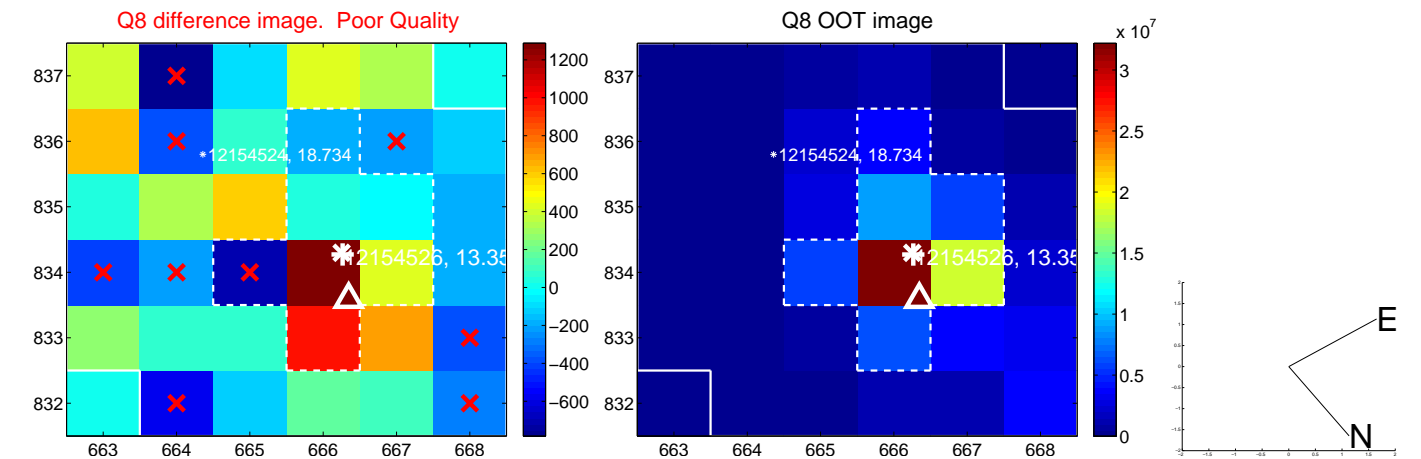
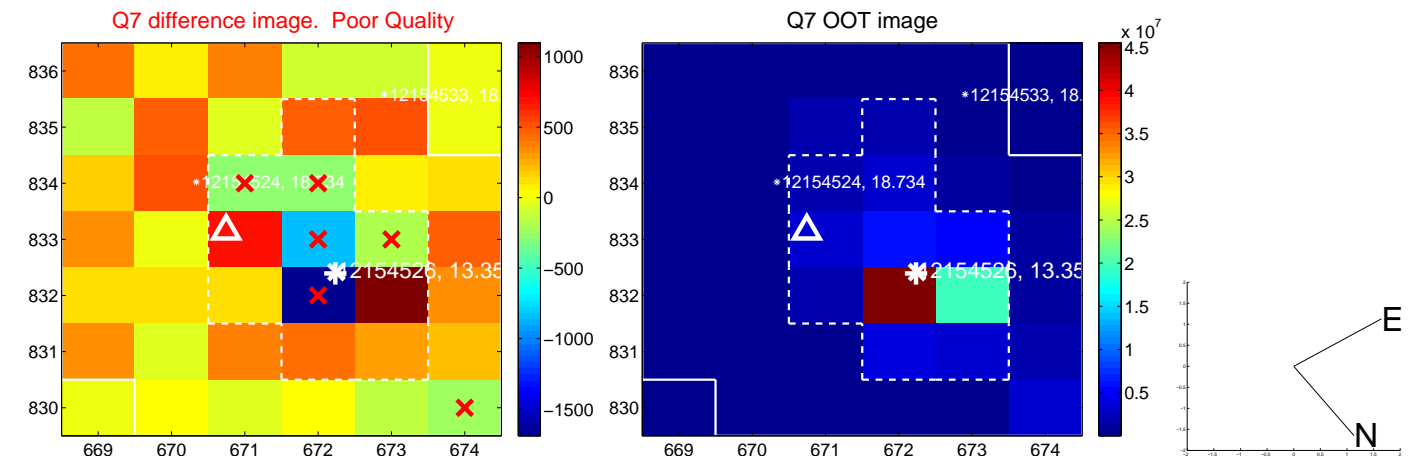
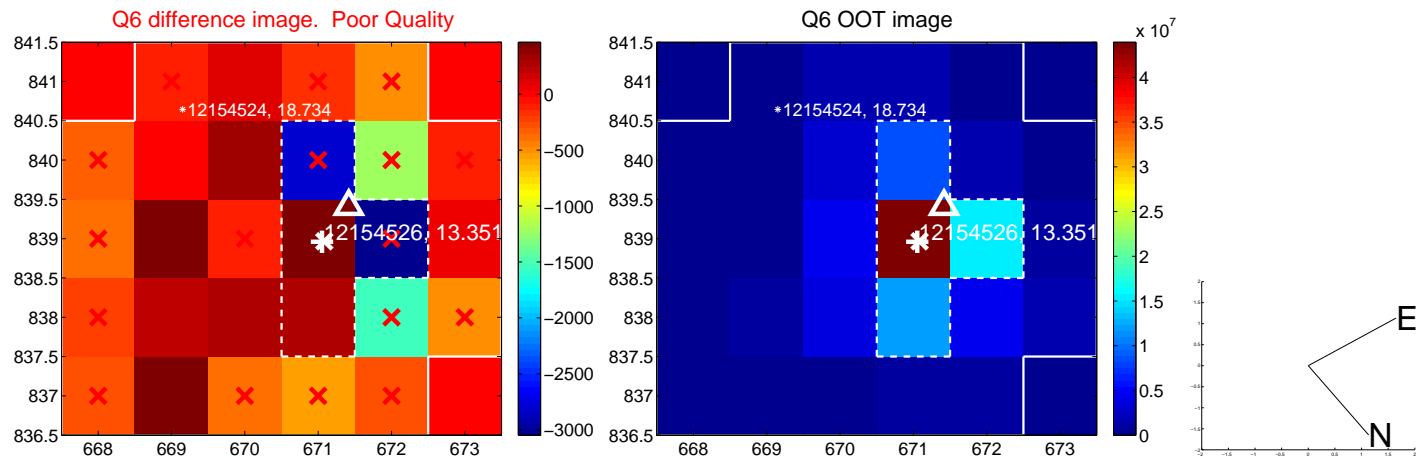
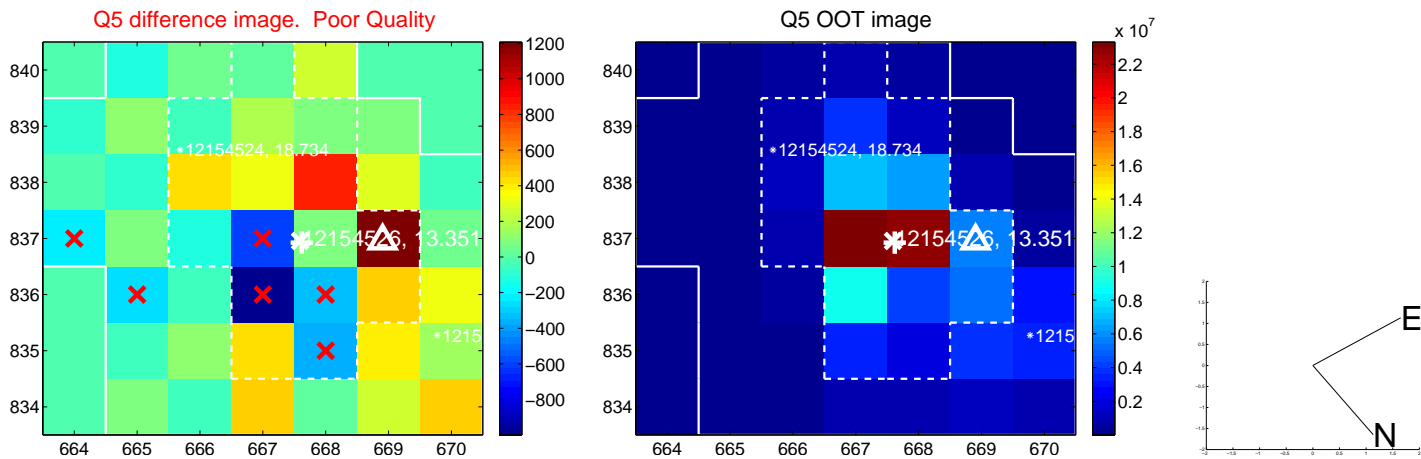


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

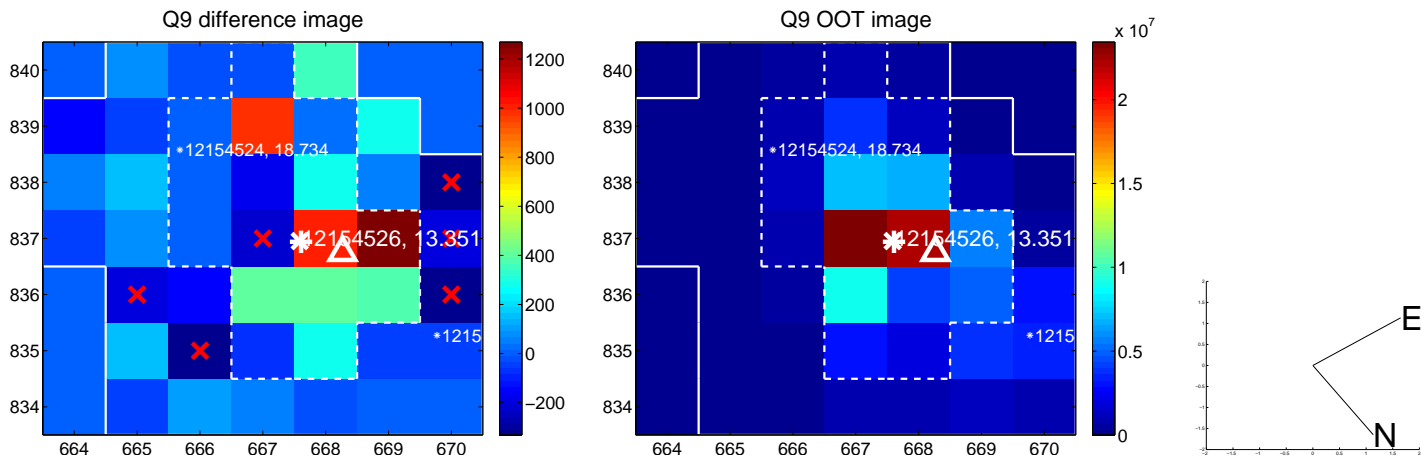


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

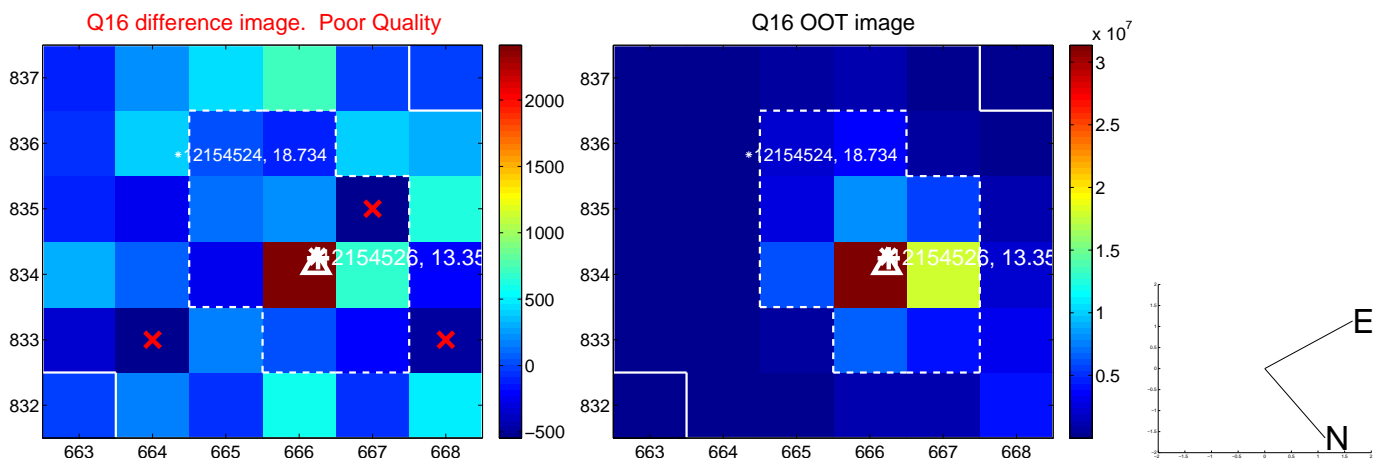
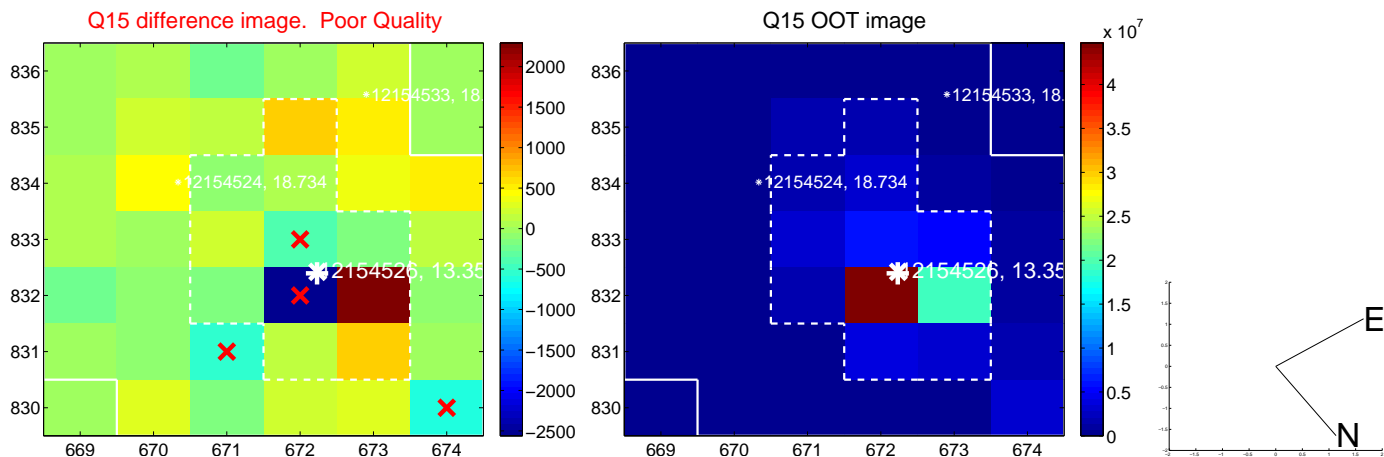
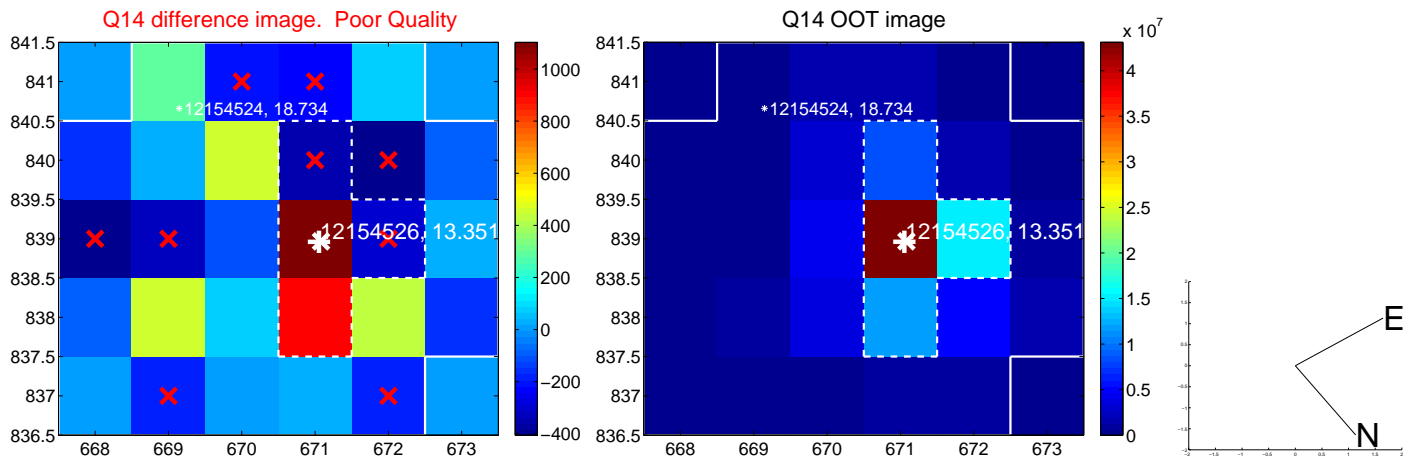
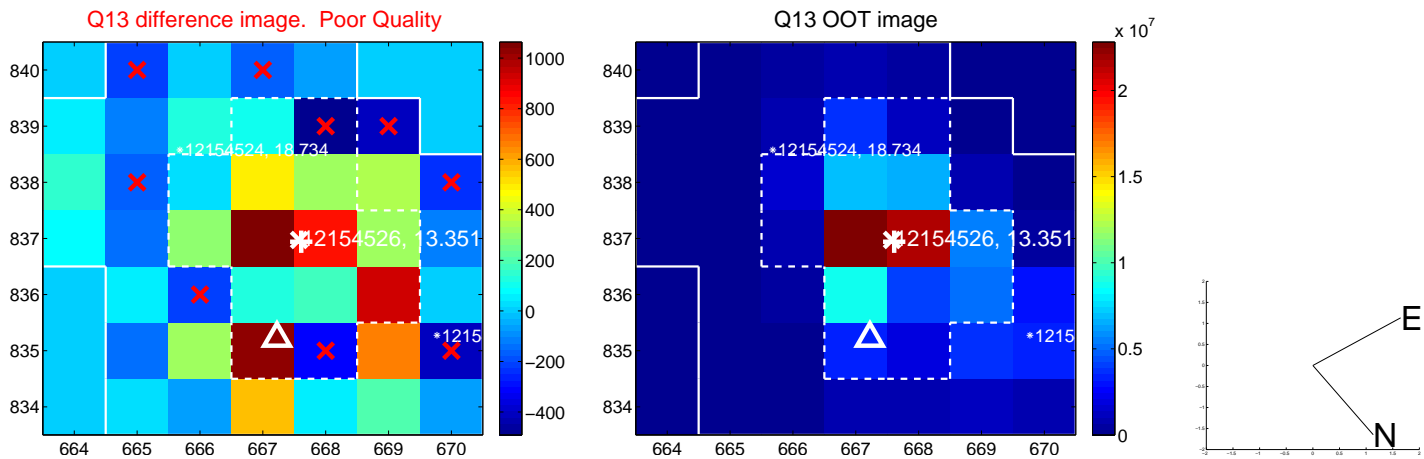




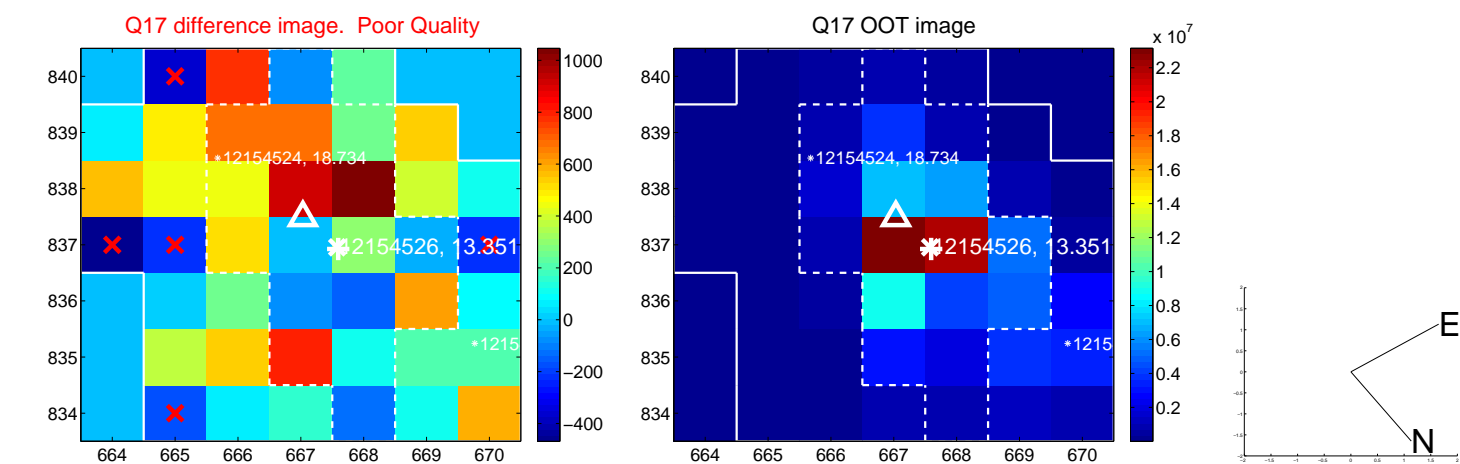
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



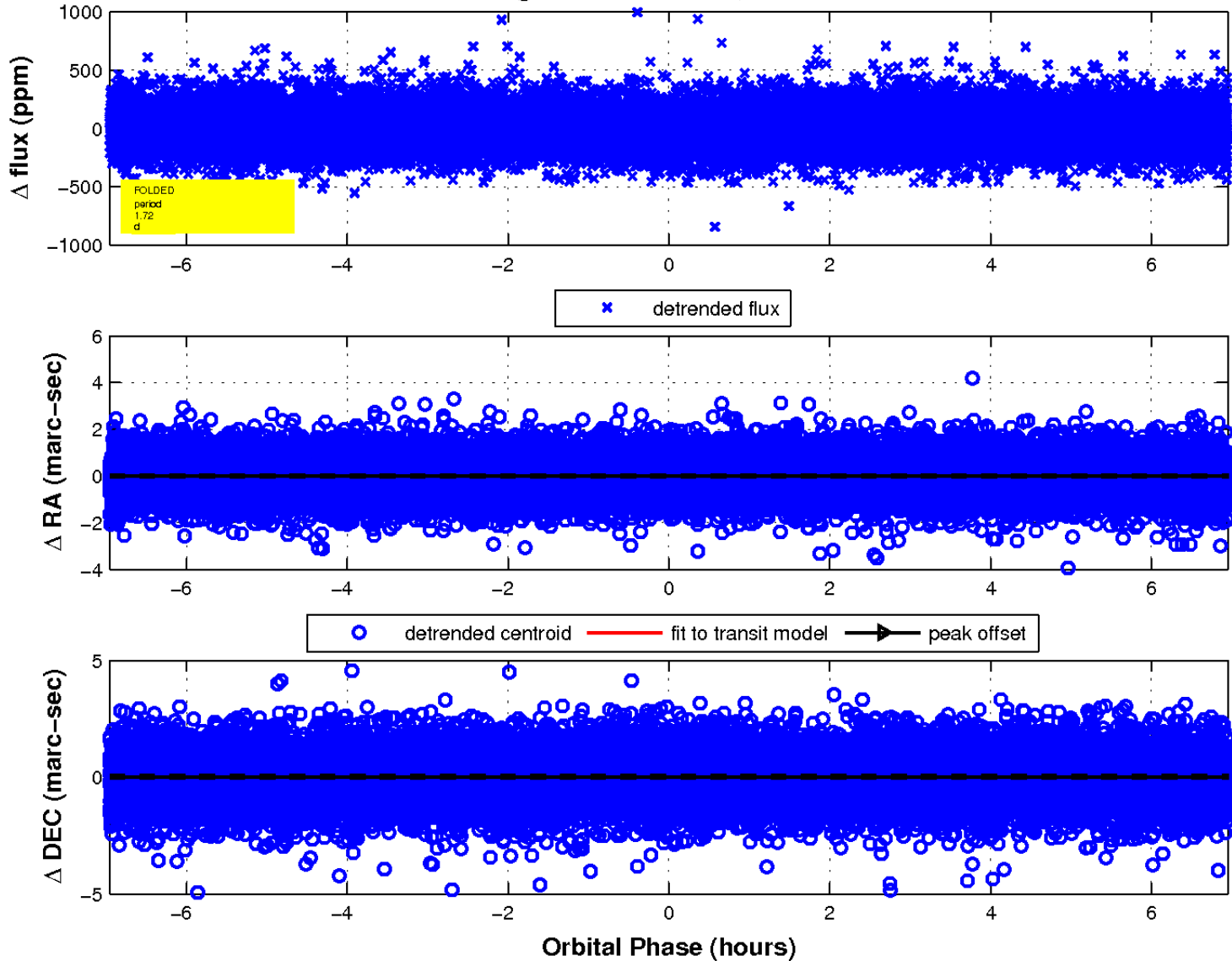
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 3 of 3



UKIRT Image

Declination

