

# KIC 011854431

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011854431-01	OBS	No	0.638276	131.568481	128.3	1.669	33.6	6.9	0.55	4709	0.70	944.86
011854431-02	OBS	No	0.639835	131.779944	8137.1	2.000	47.6	-1.0	0.55	4709	4.87	941.79

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011854431-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
011854431-02	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_NOFITS

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

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

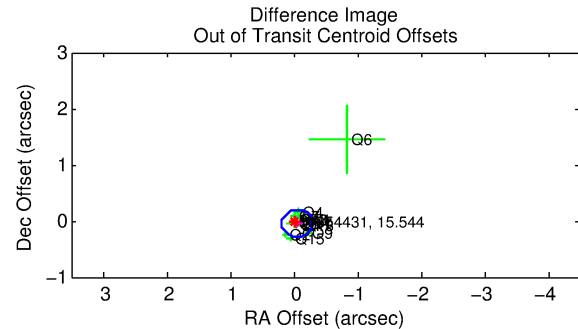
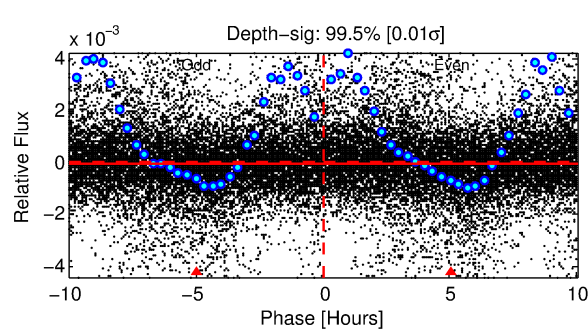
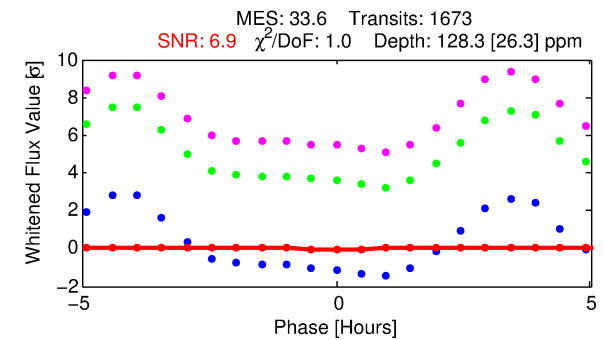
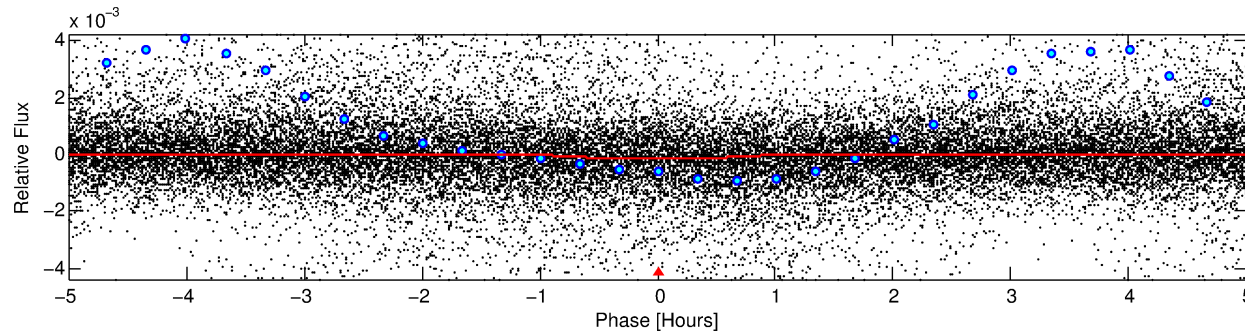
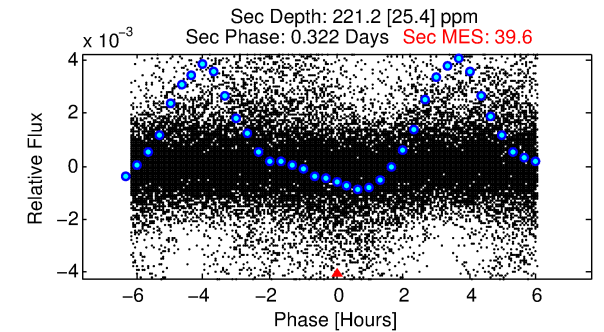
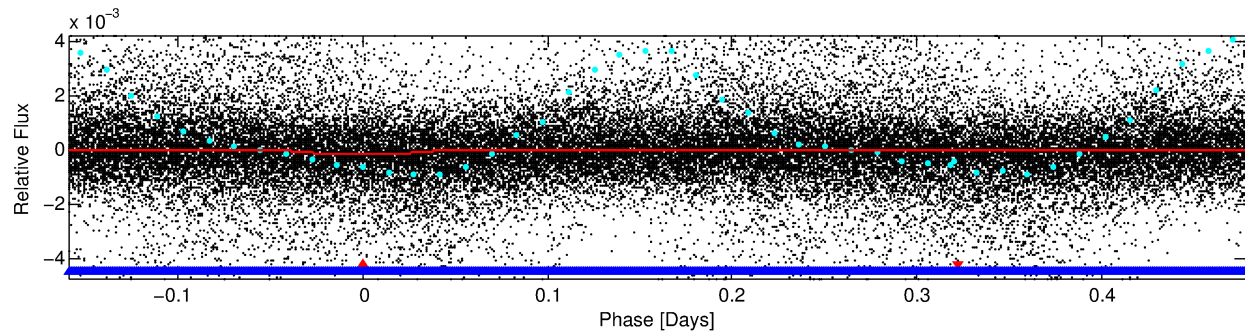
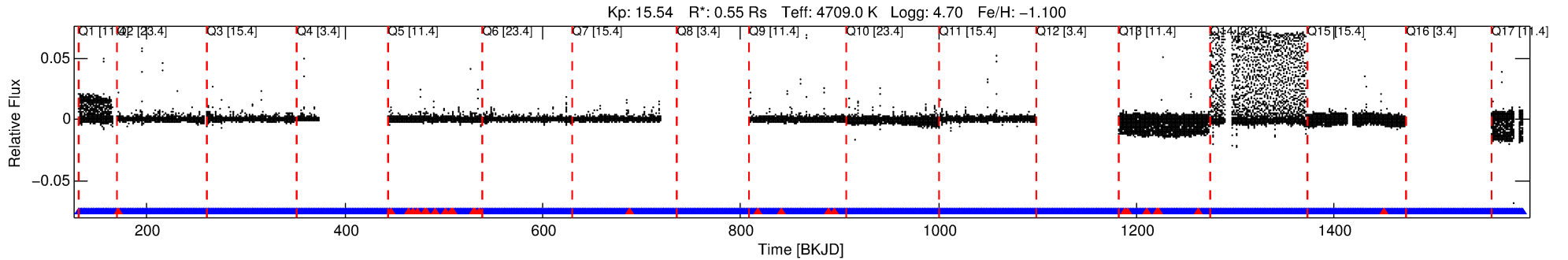
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 011854431-01

No Significant Match Found

# DV One-Page Summary

KIC: 11854431 Candidate: 1 of 2 Period: 0.638 d



## DV Fit Results:

Period = 0.63828 [0.00002] d  
Epoch = 131.5685 [0.0033] BKJD  
Rp/R\* = 0.0116 [0.0153]  
a/R\* = 2.00 [7.59]  
b = 0.80 [2.30]  
Seff = 944.86 [142.71]  
Teq = 1414 [53] K  
Rp = 0.70 [0.92] Re  
a = 0.0119 [0.0007] AU  
Ag = 35.23 [92.64] [0.37σ]  
Teffp = 5325 [3503] K [1.12σ]

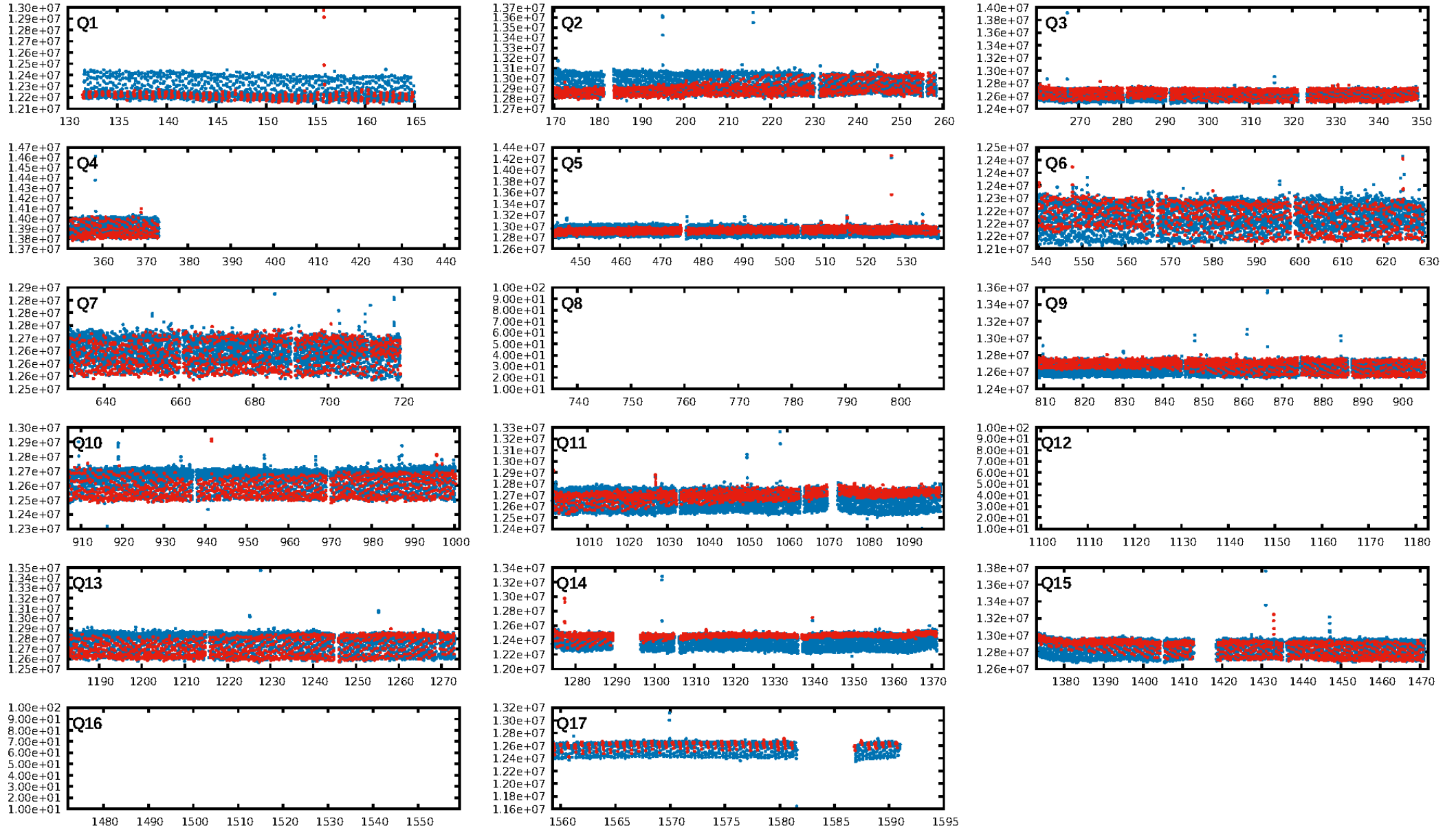
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 1.1% [0.01σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.98 [1518/1545]  
GhostDiagnostic-chr: 22.28  
Centroid-sig: 18.5%  
Centroid-so: 1.137 arcsec [0.81σ]  
OotOffset-rm: 0.065 arcsec [0.81σ]  
KicOffset-rm: 0.132 arcsec [1.65σ]  
OotOffset-st: 4/4/1/5 [14]  
KicOffset-st: 4/4/1/5 [14]  
DiffImageQuality-fgm: 0.57 [8/14]  
DiffImageOverlap-fno: 0.00 [0/14]

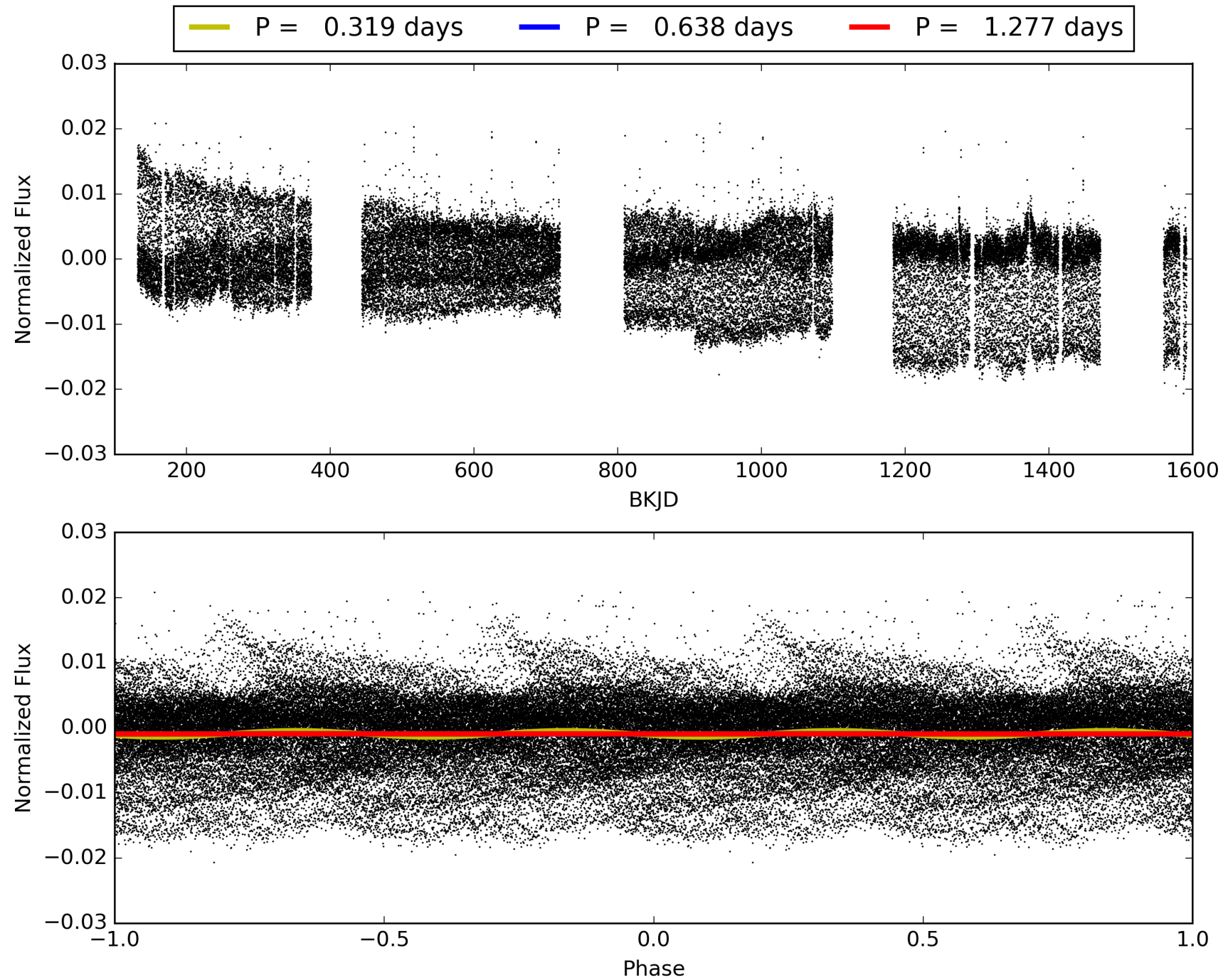
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 10:45:26 Z

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

# TCE 011854431-01, PDC Light Curves

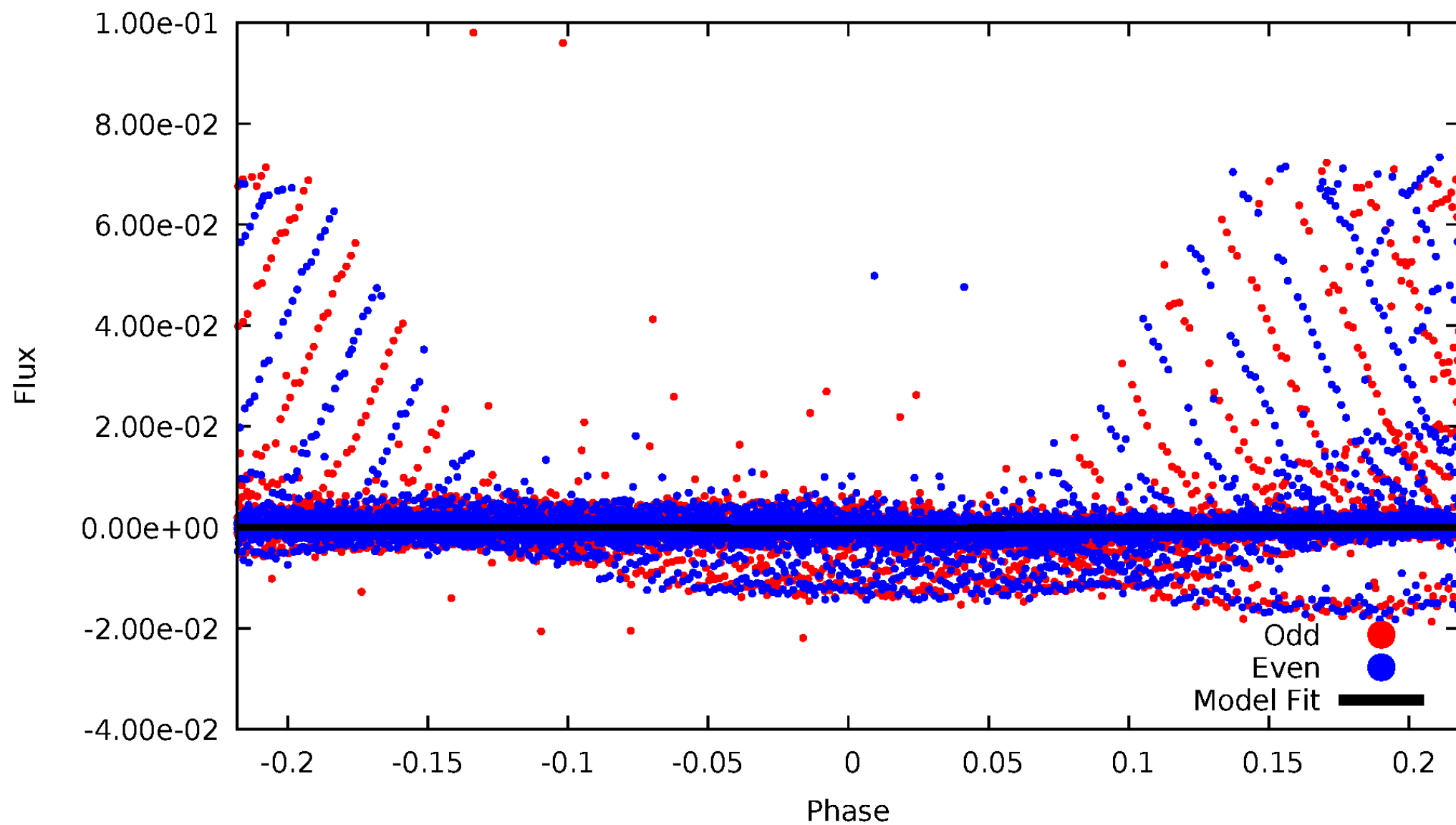


TCE 011854431-01



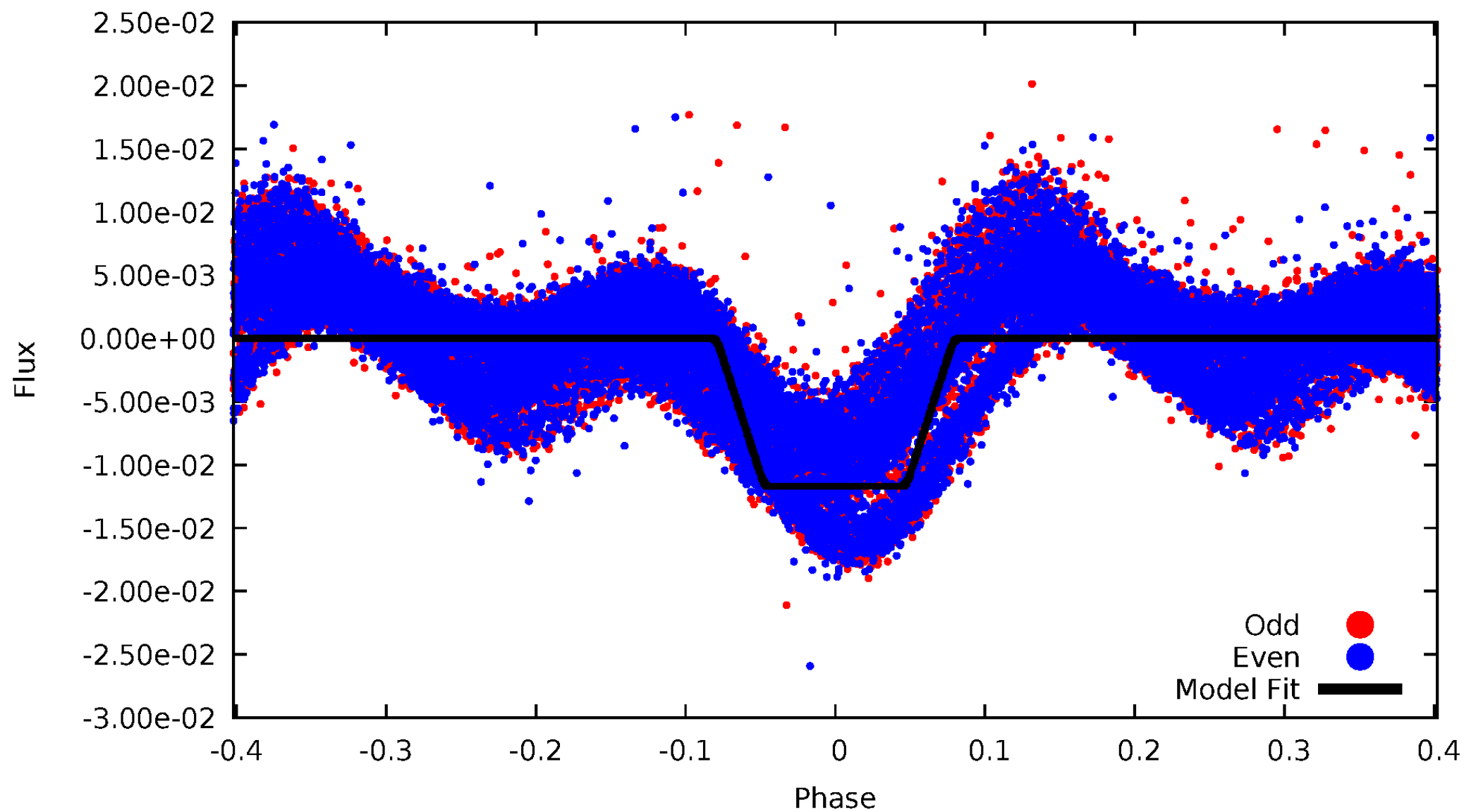
# DV Odd/Even

TCE 011854431-01



# ALT Odd/Even

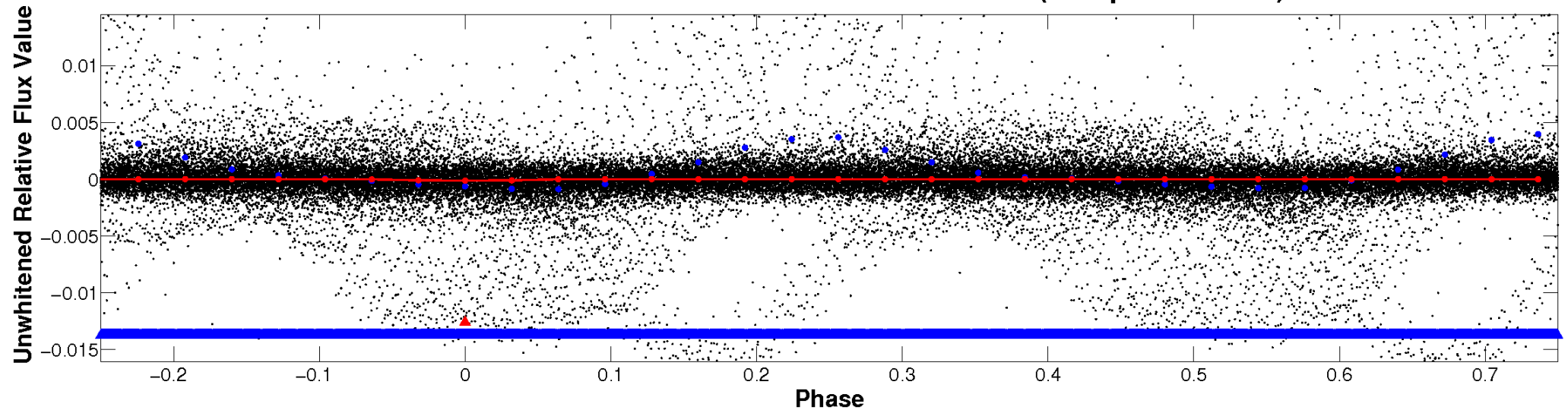
TCE 011854431-01



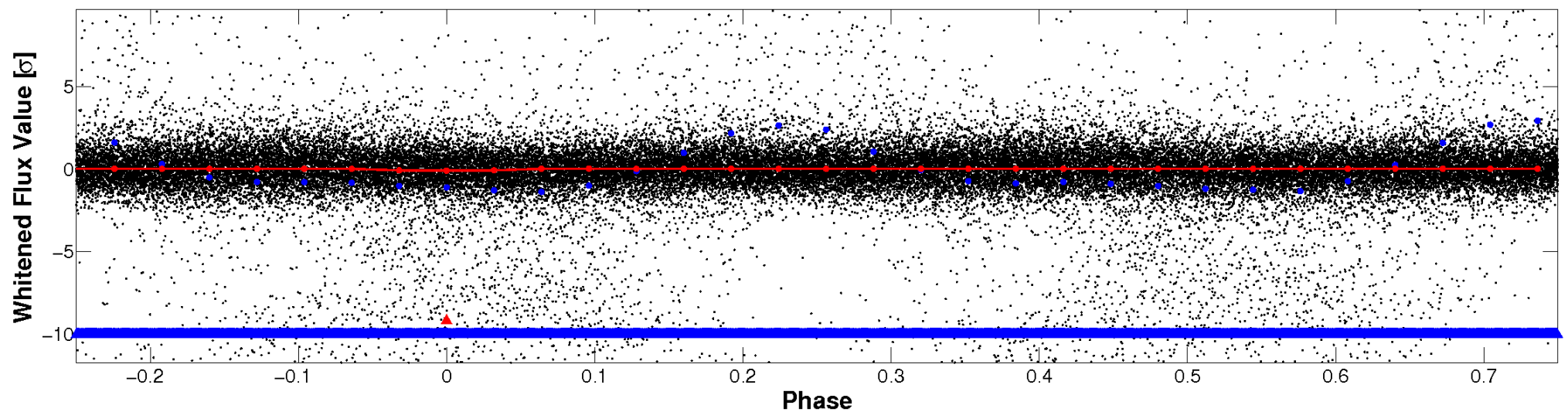


# Non-Whitened Vs. Whitened Light Curve

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

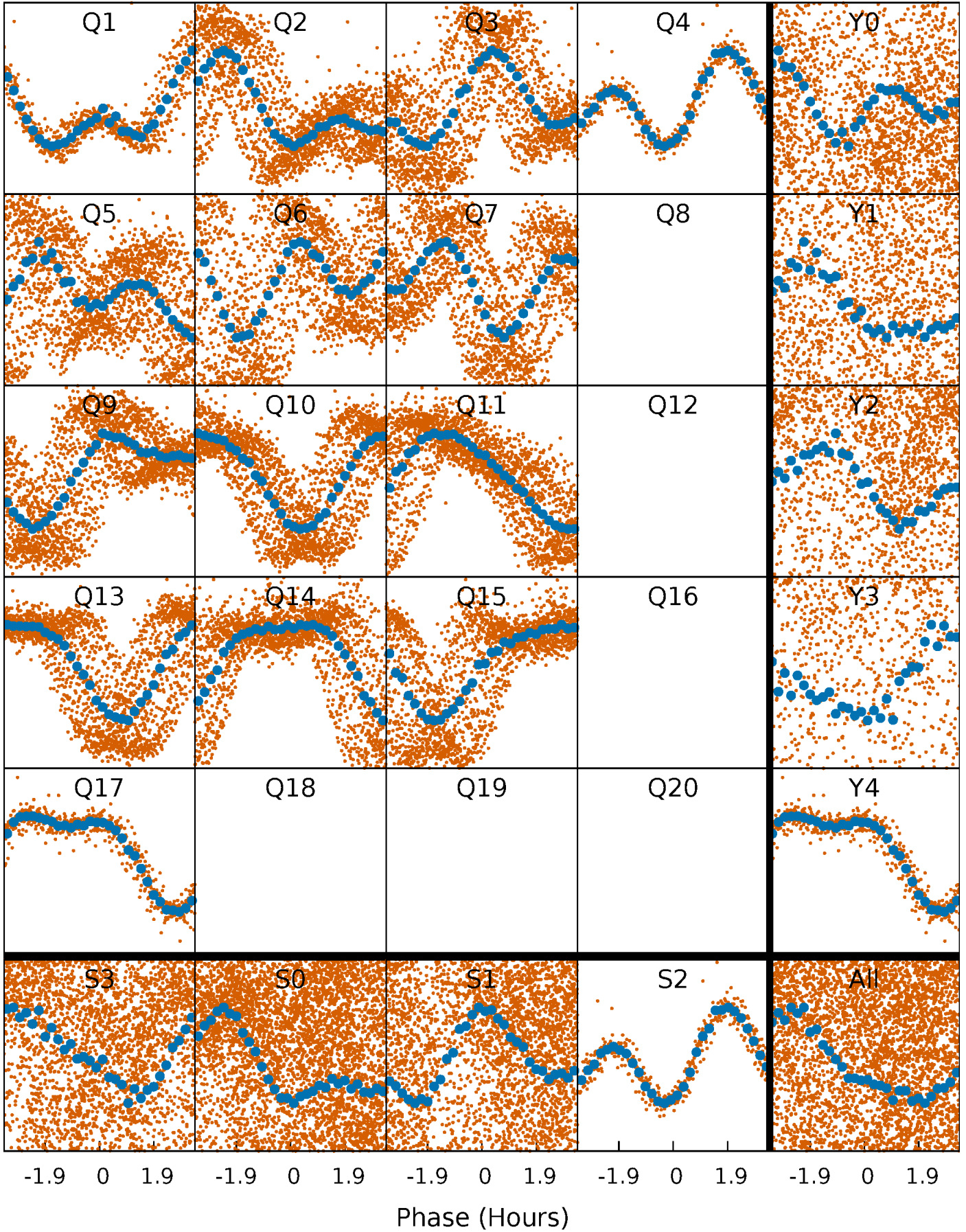


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

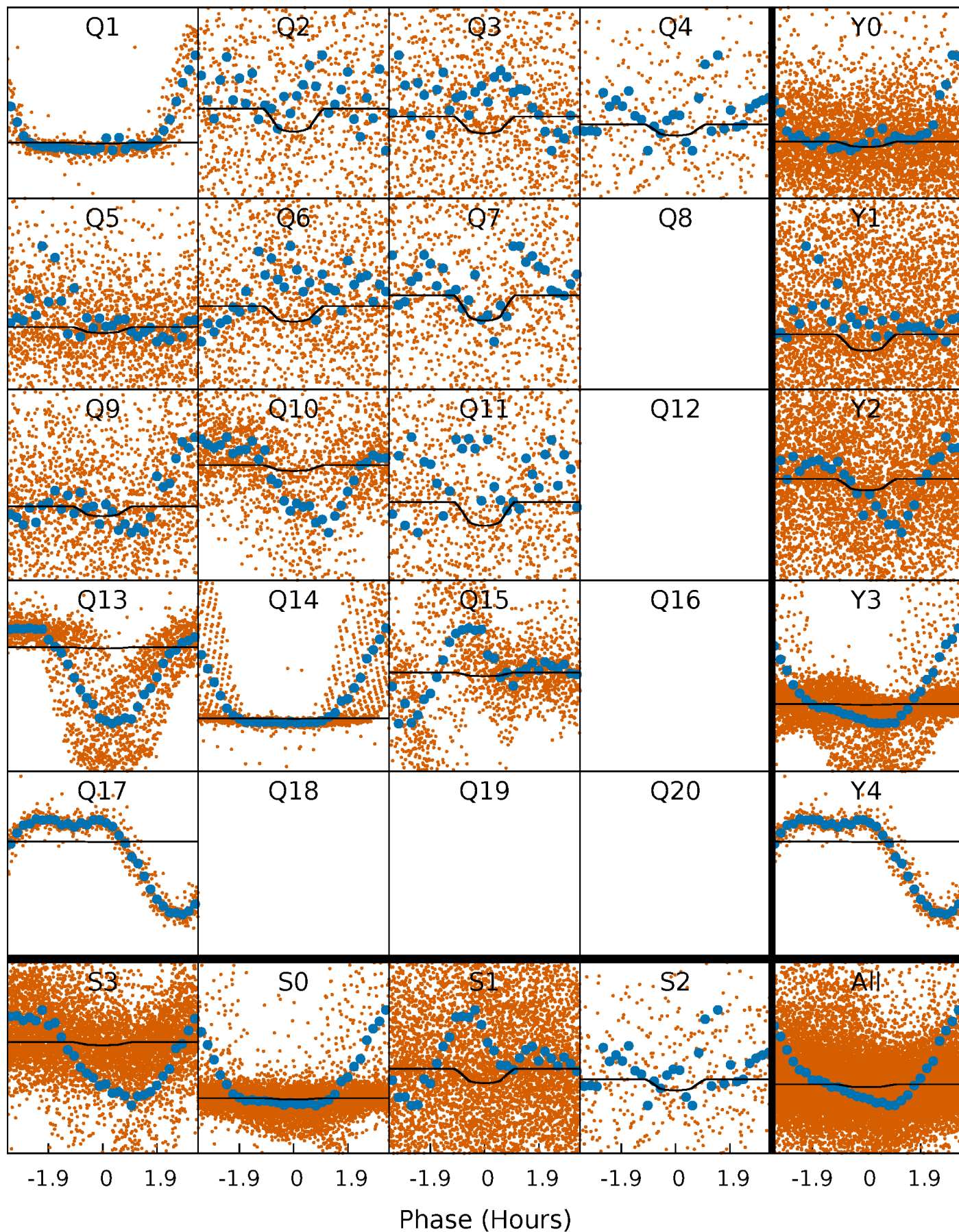
TCE 011854431-01   P= 0.638276 Days    $T_0=131.568481$  (BKJD)





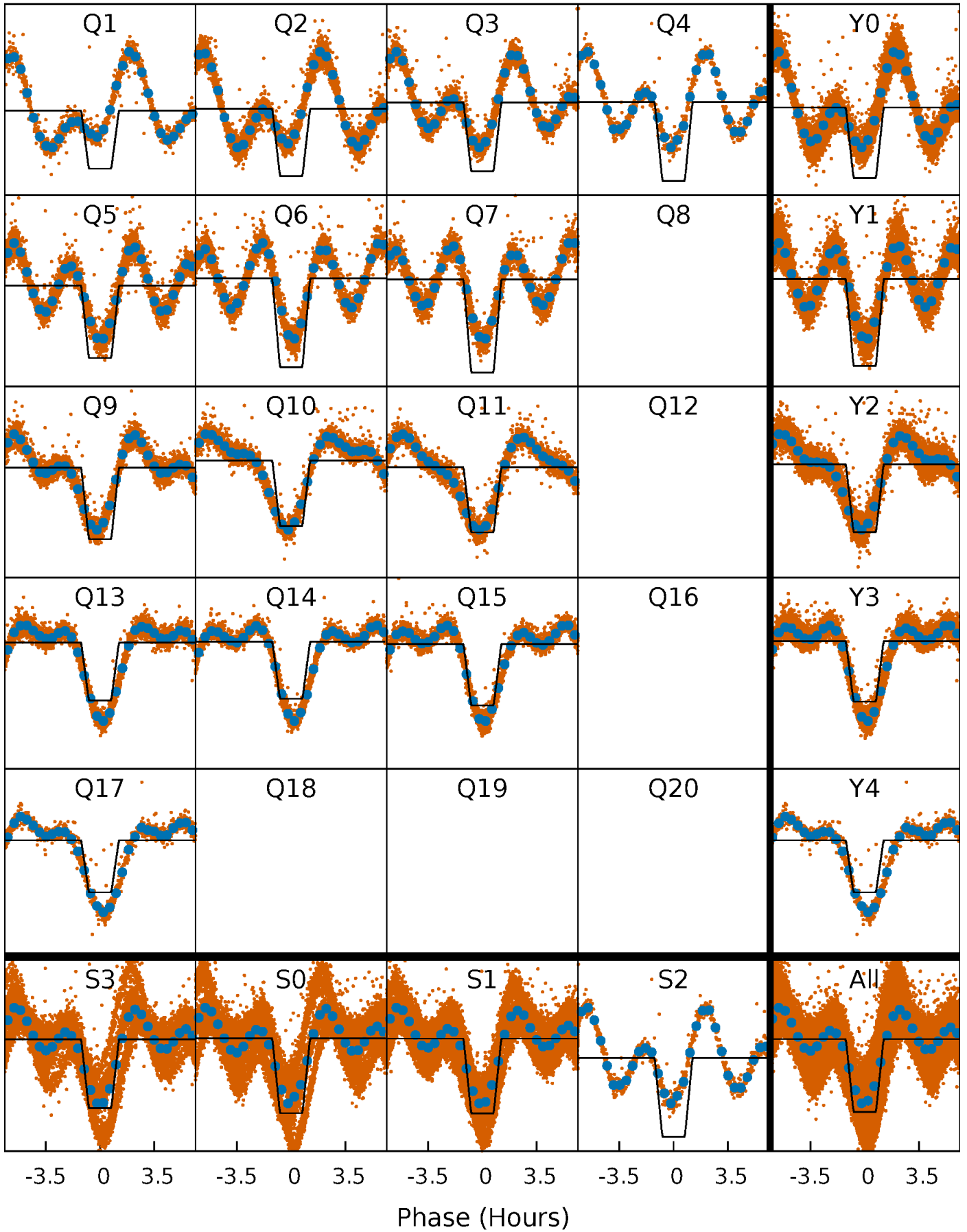
# DV Quarter-Phased Transit Curves

TCE 011854431-01 P= 0.638276 Days  $T_0=131.568481$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

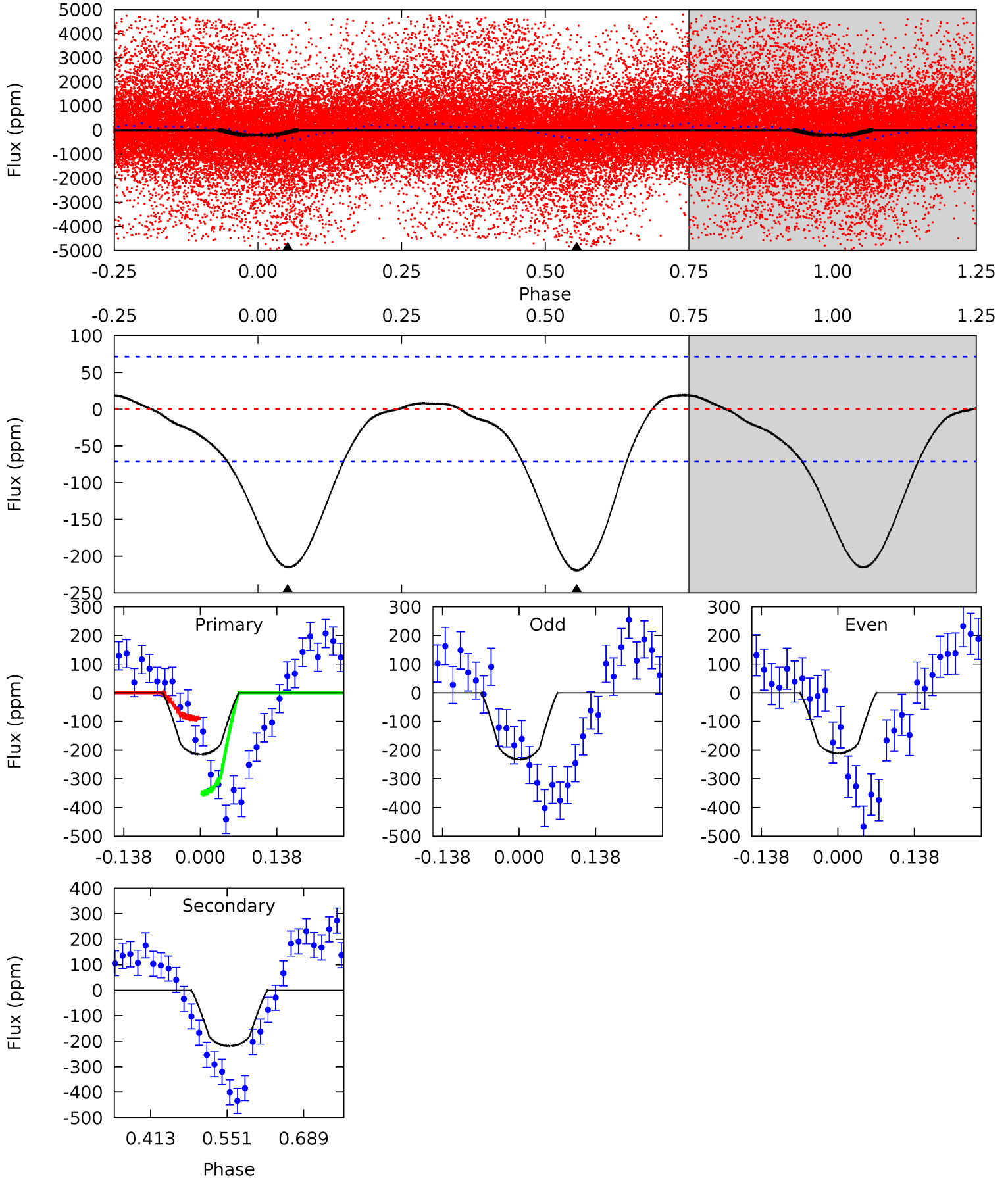
TCE 011854431-01 P= 0.639007 Days  $T_0=131.616128$  (BKJD)



# DV Model-Shift Uniqueness Test

011854431-01, P = 0.638276 Days, E = 130.930205 Days

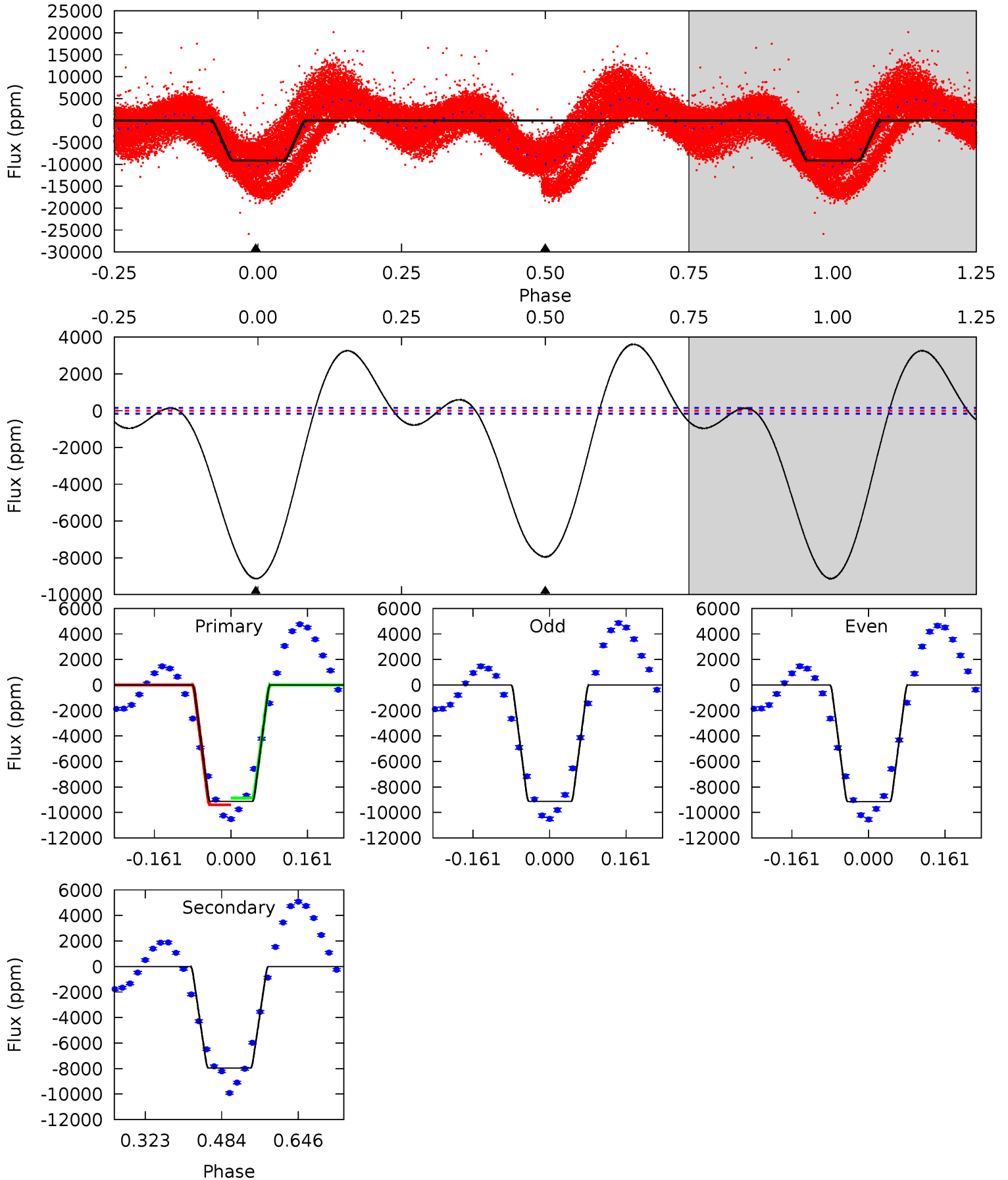
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.5	13.8	0	0	4.50	1.48	0.96	13.5	13.5	13.8	13.8	0.67	4.31	0.08	8.58



# Alt Model-Shift Uniqueness Test

011854431-01, P = 0.639007 Days, E = 130.977121 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
258.3	225.1	0	0	4.46	1.40	39.4	258.3	258.3	225.1	225.1	0.23	1.06	0.28	7.80



### Stellar Parameters For KIC 011854431

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$4709^{+146}_{-146}$	$4.697^{+0.048}_{-0.028}$	$-1.100^{+0.300}_{-0.300}$	$0.551^{+0.037}_{-0.037}$	$0.551^{+0.044}_{-0.024}$	$4.646^{+0.916}_{-0.587}$
	+3%/-3%	+1%/-1%	+27%/-27%	+7%/-7%	+8%/-4%	+20%/-13%
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 011854431-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-219 \pm 16$	$0.91^{+0.77}_{-0.61}$	$1970^{+66}_{-71}$	$4699^{+3478}_{-1009}$	$21^{+181}_{-15}$
Alt.	$-7960 \pm 35$	$6.46^{+0.93}_{-0.95}$	$1966^{+68}_{-73}$	$4357^{+313}_{-253}$	$15^{+6}_{-4}$

$T_{\text{max}}$  = 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

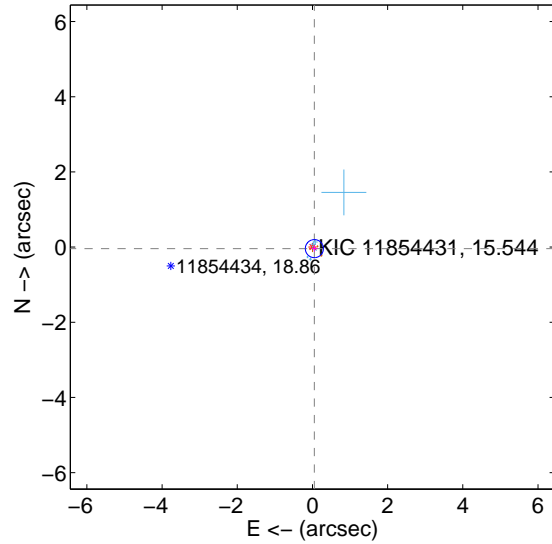
Supplemental centroid analysis for 011854431-01. Kepler magnitude: 15.54. Transit SNR 6.93

There are 8 quarters with good PRF difference image offsets

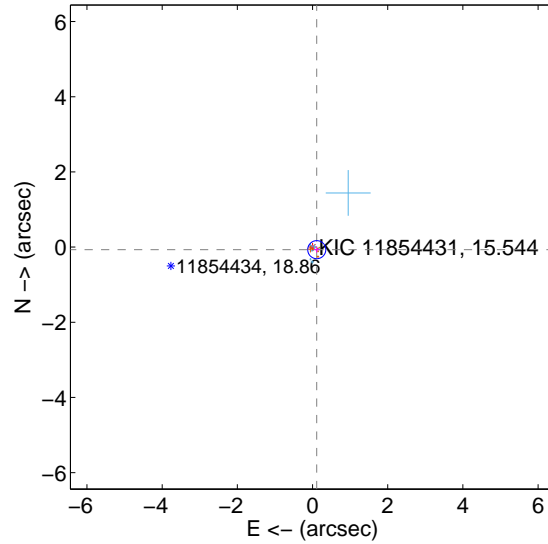
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.065 \pm 0.080$	0.81	$-0.051 \pm 0.080$	$-0.040 \pm 0.080$
PRF-fit source offset from KIC position	$0.132 \pm 0.080$	1.65	$-0.113 \pm 0.080$	$-0.068 \pm 0.080$
photometric centroid source offset	$1.14 \pm 1.41$	0.81	$0.04 \pm 1.39$	$-1.14 \pm 1.41$

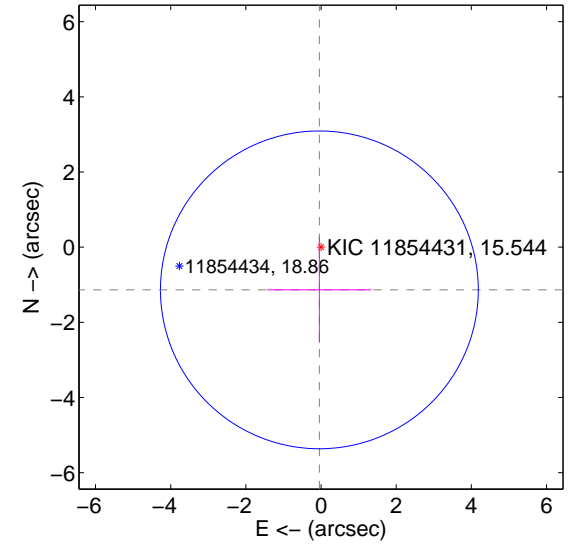
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

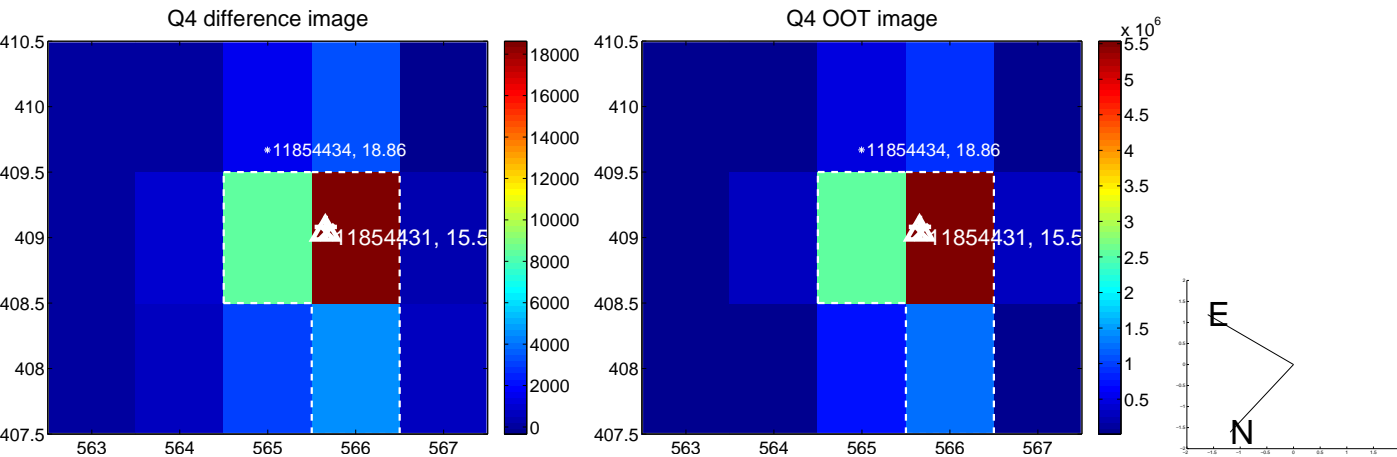
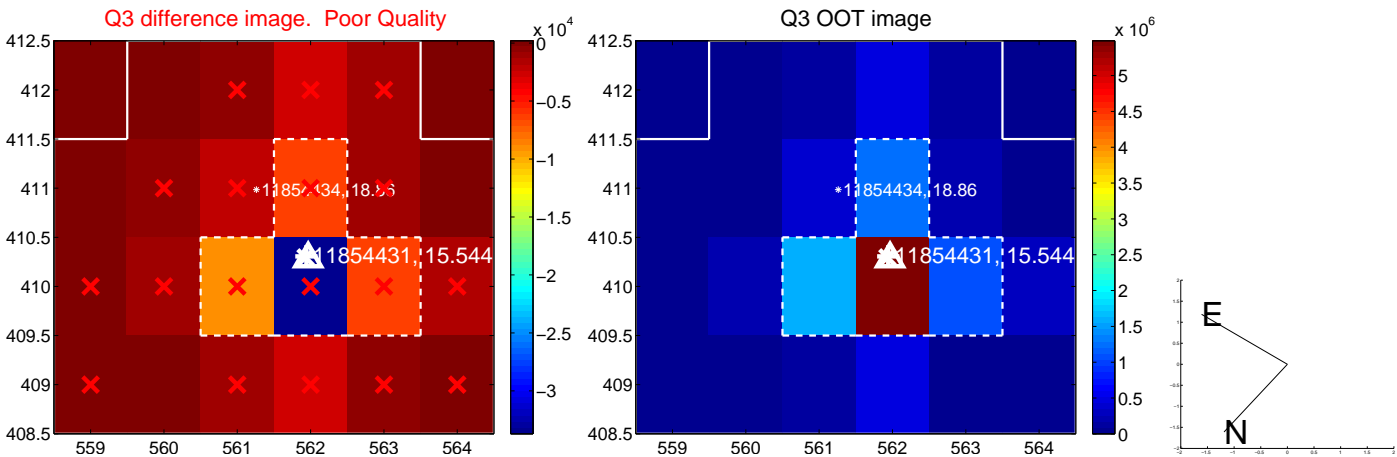
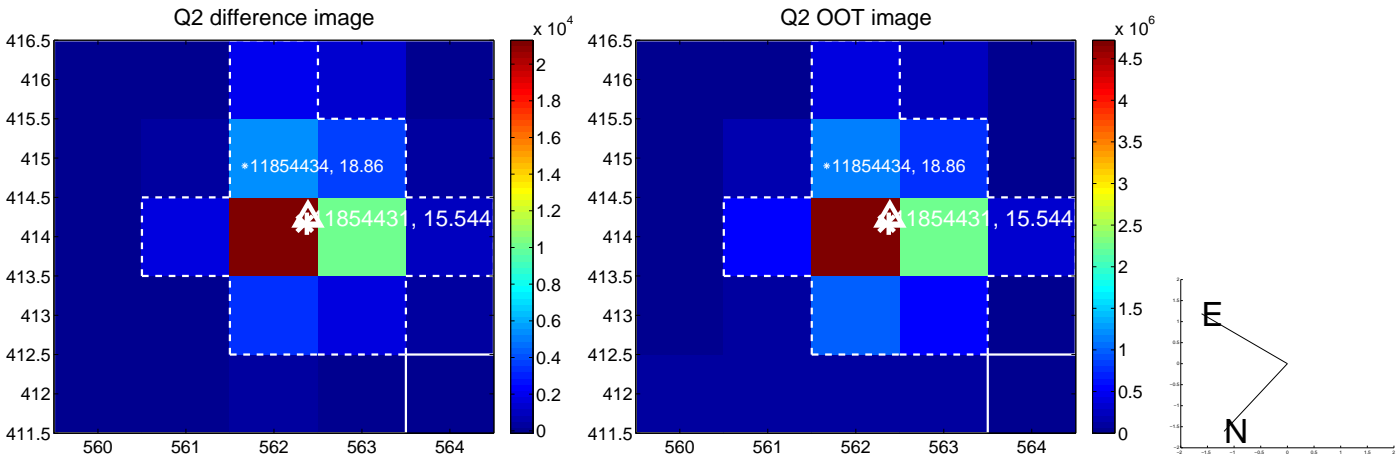
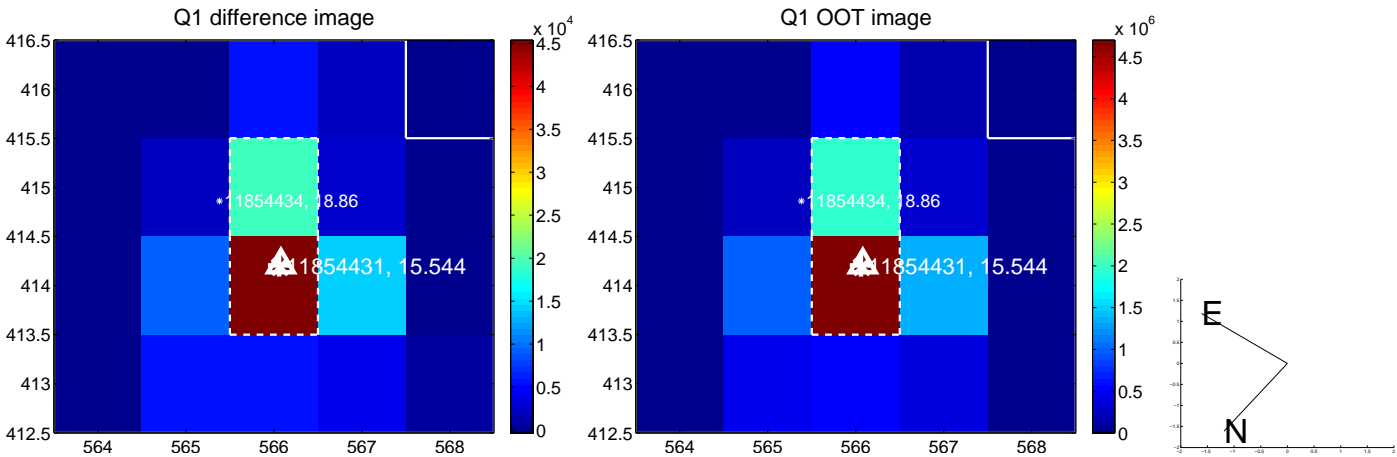


offset from photometric centroids

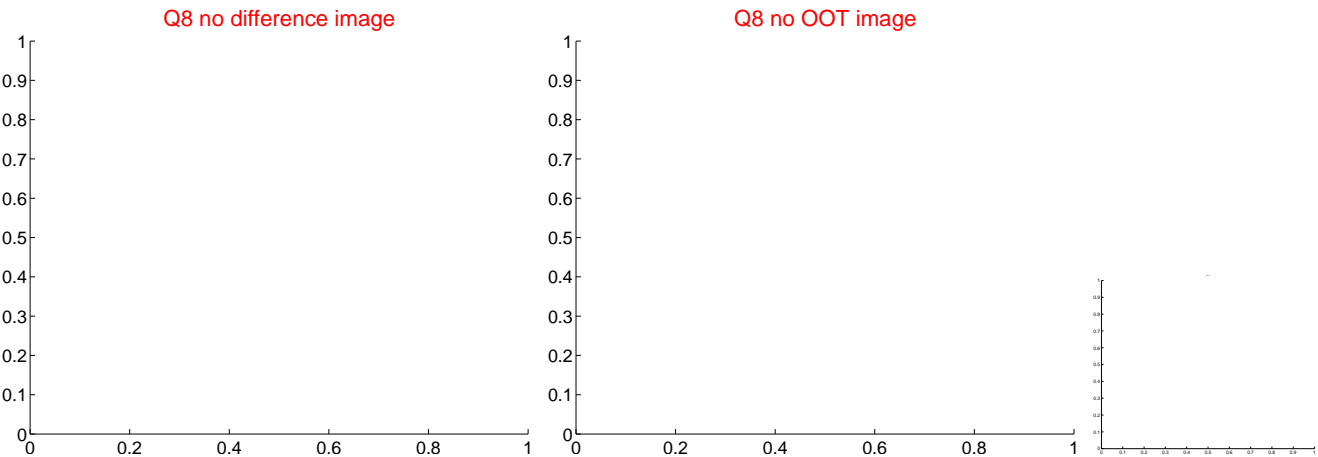
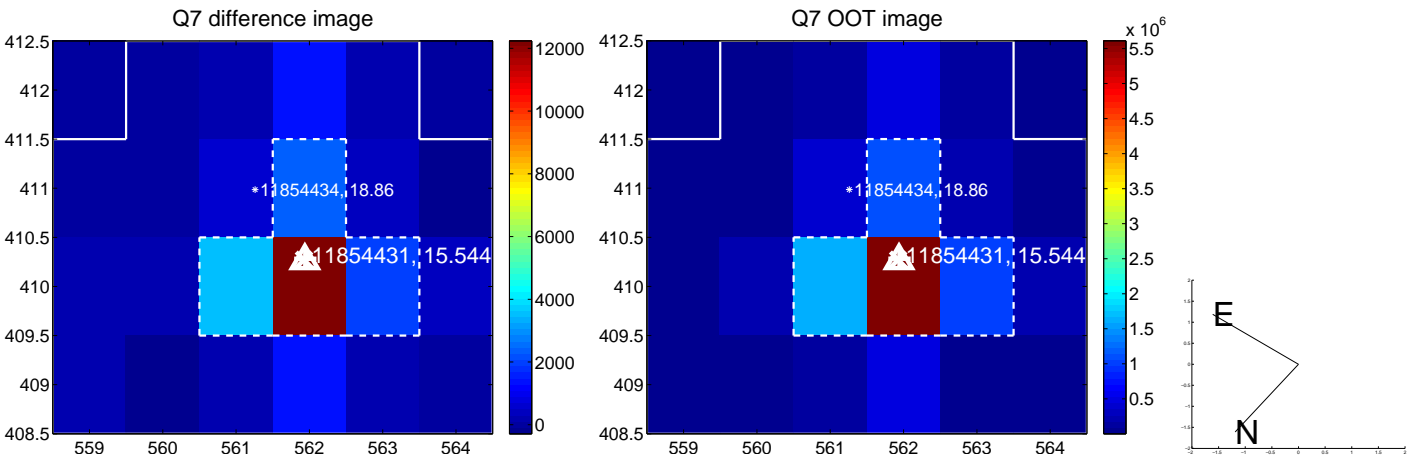
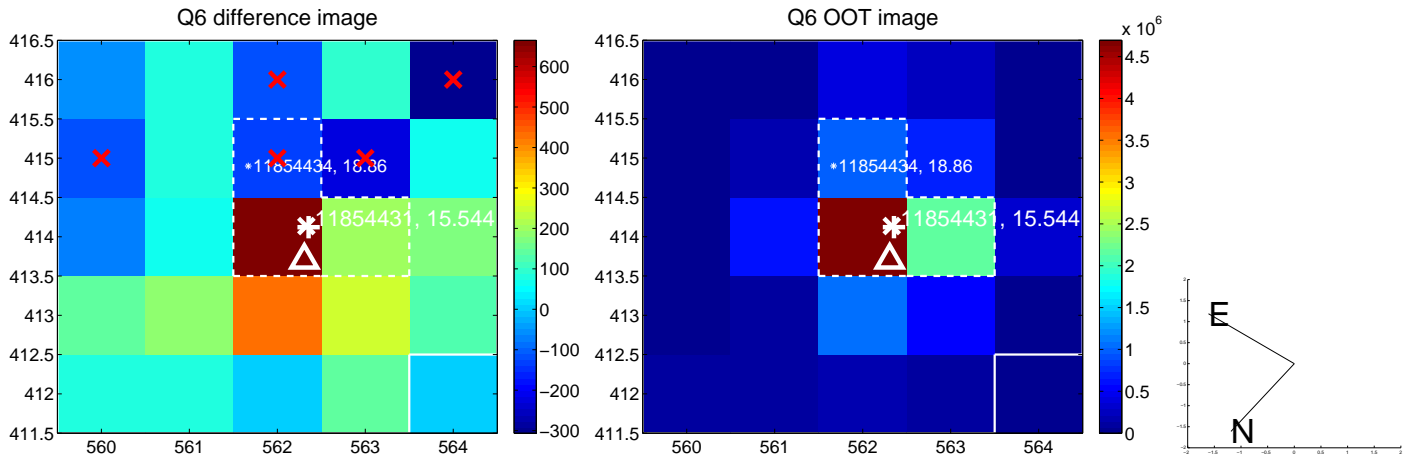
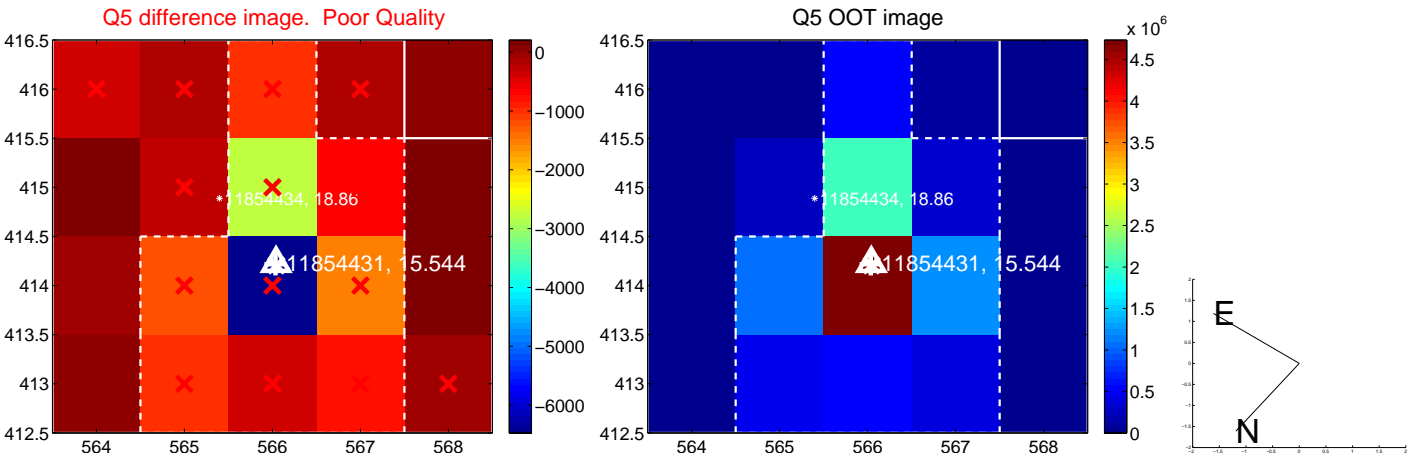


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

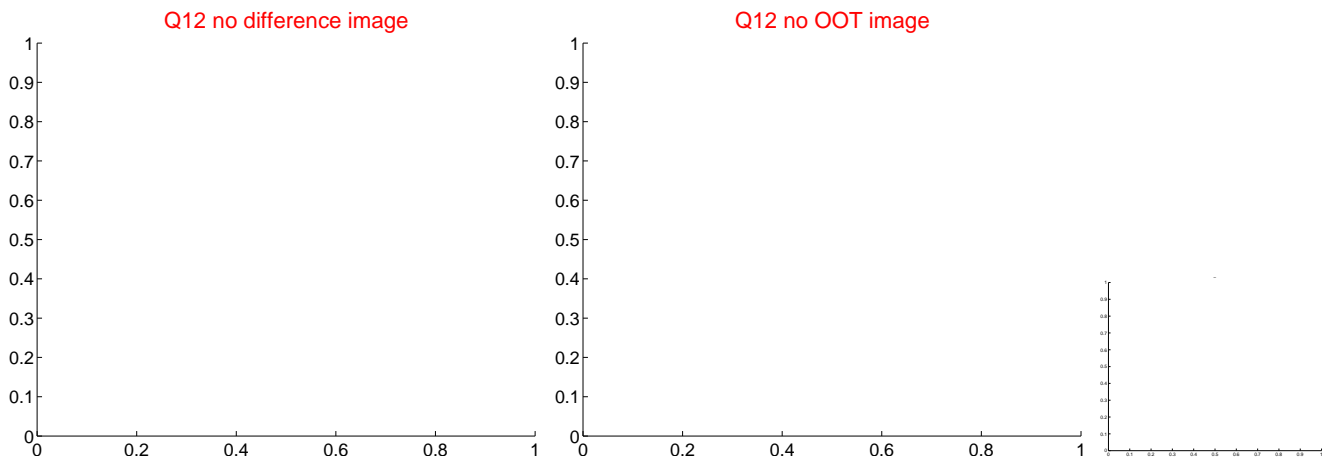
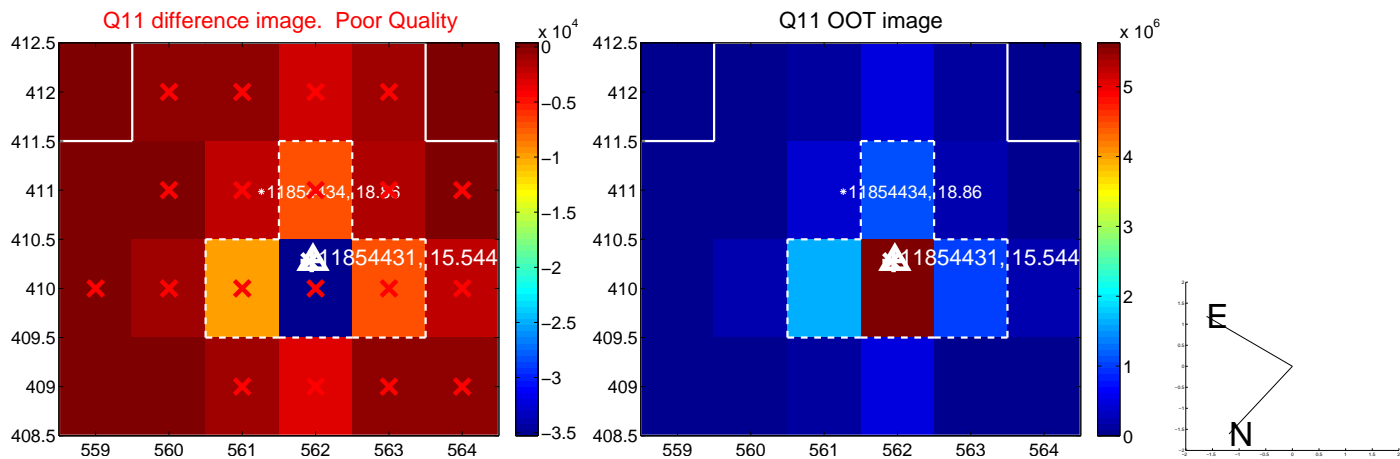
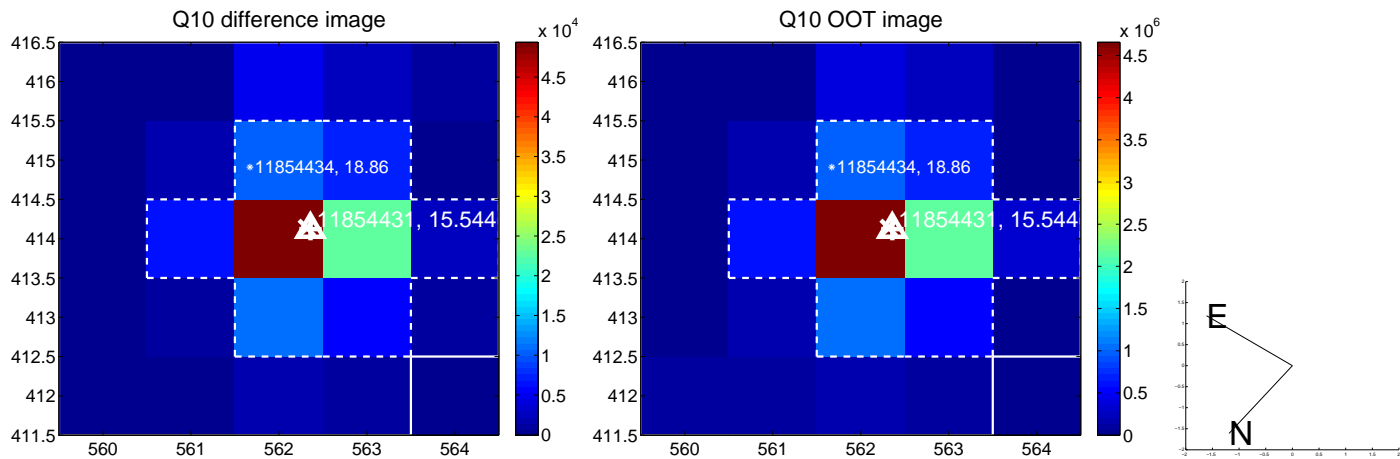
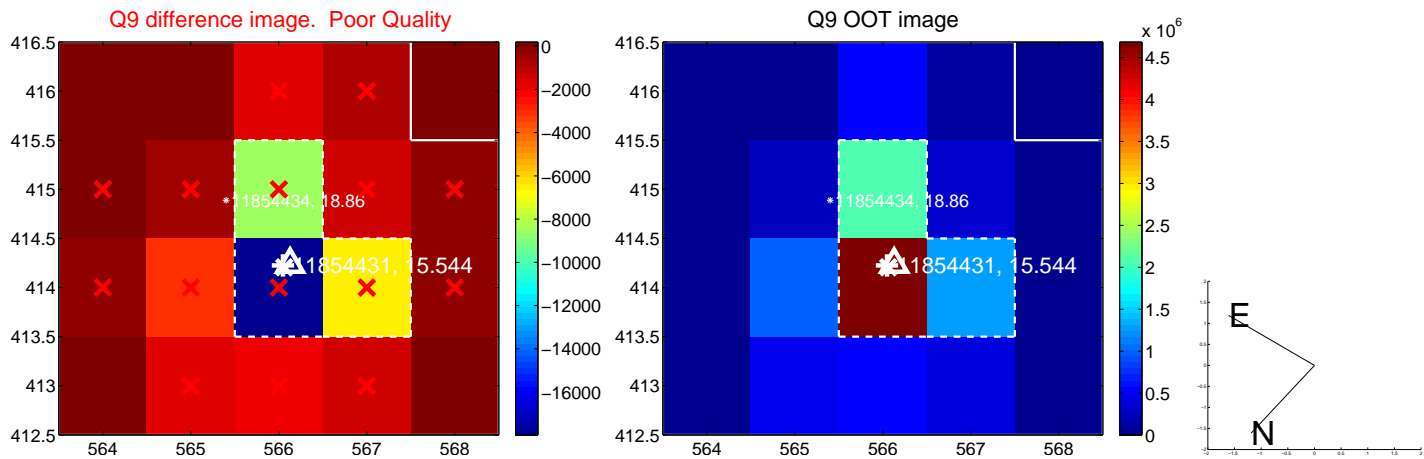
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



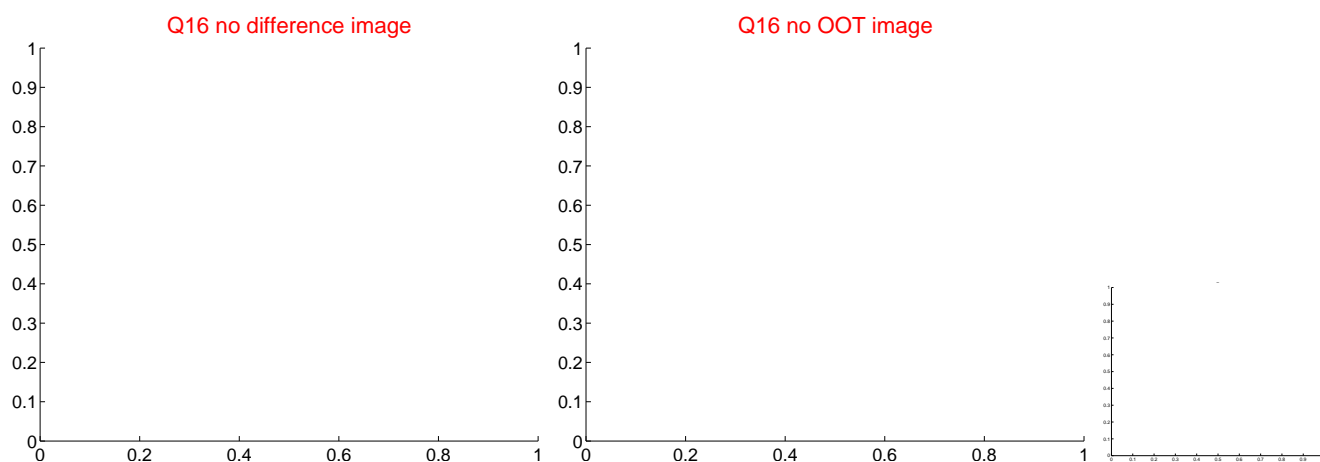
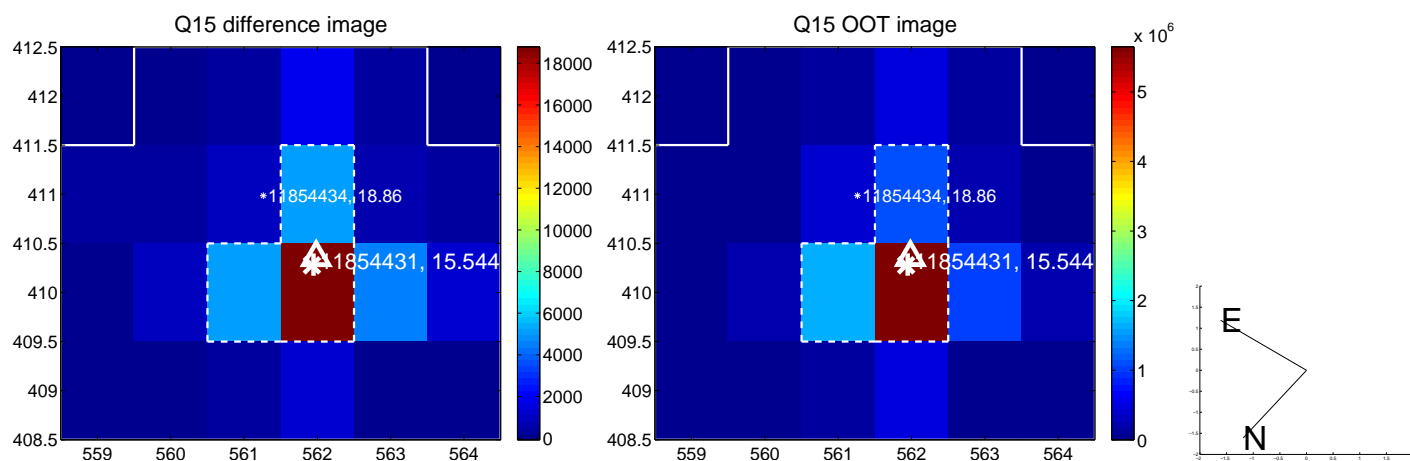
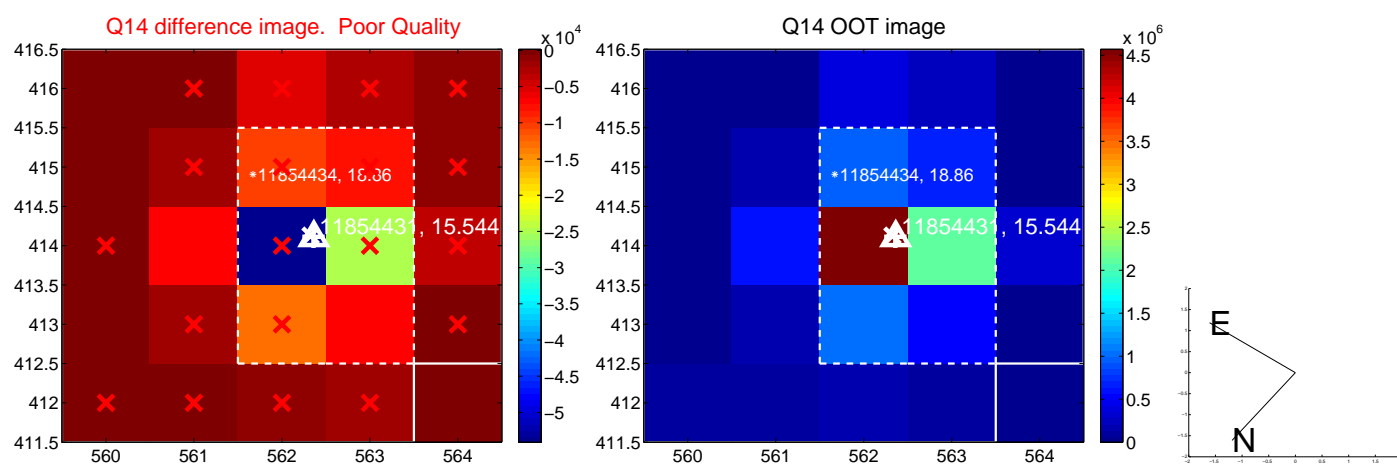
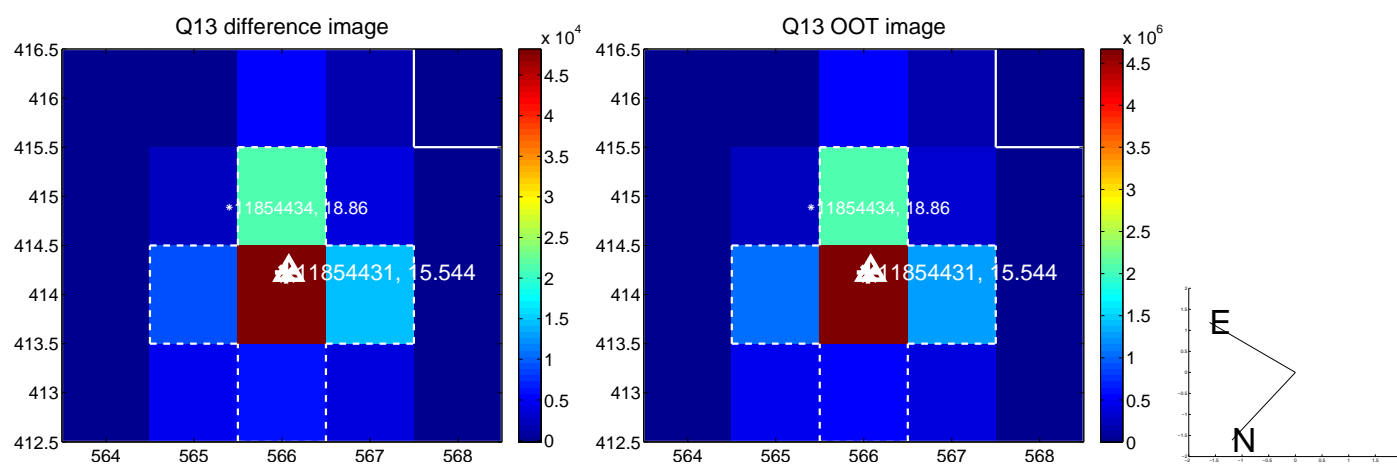
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

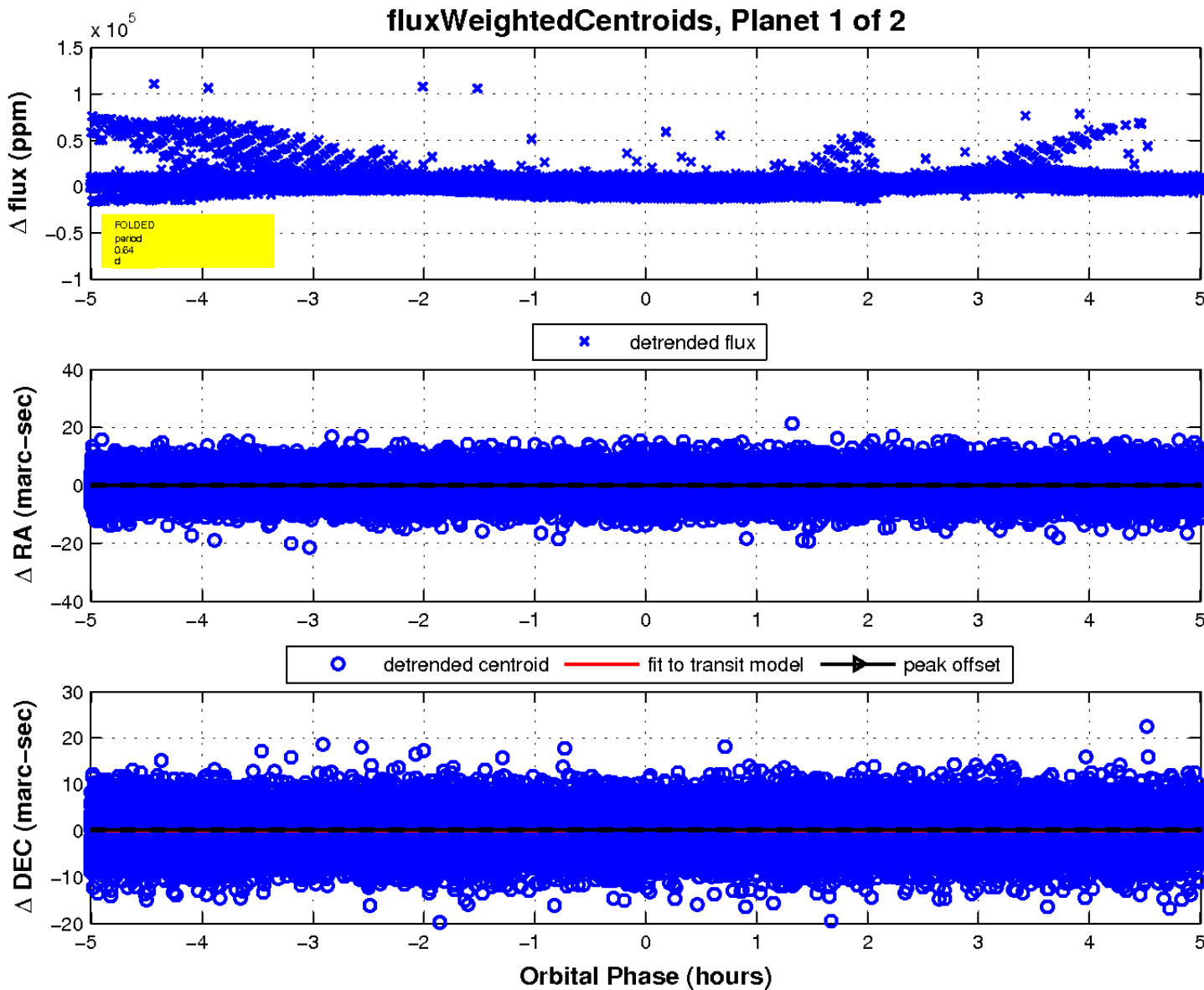
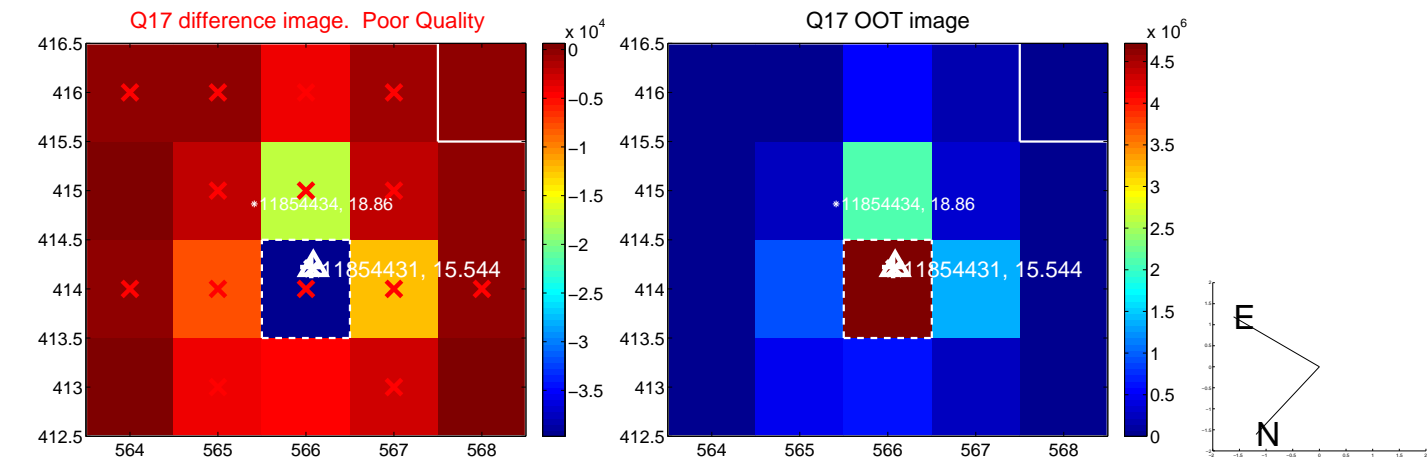


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



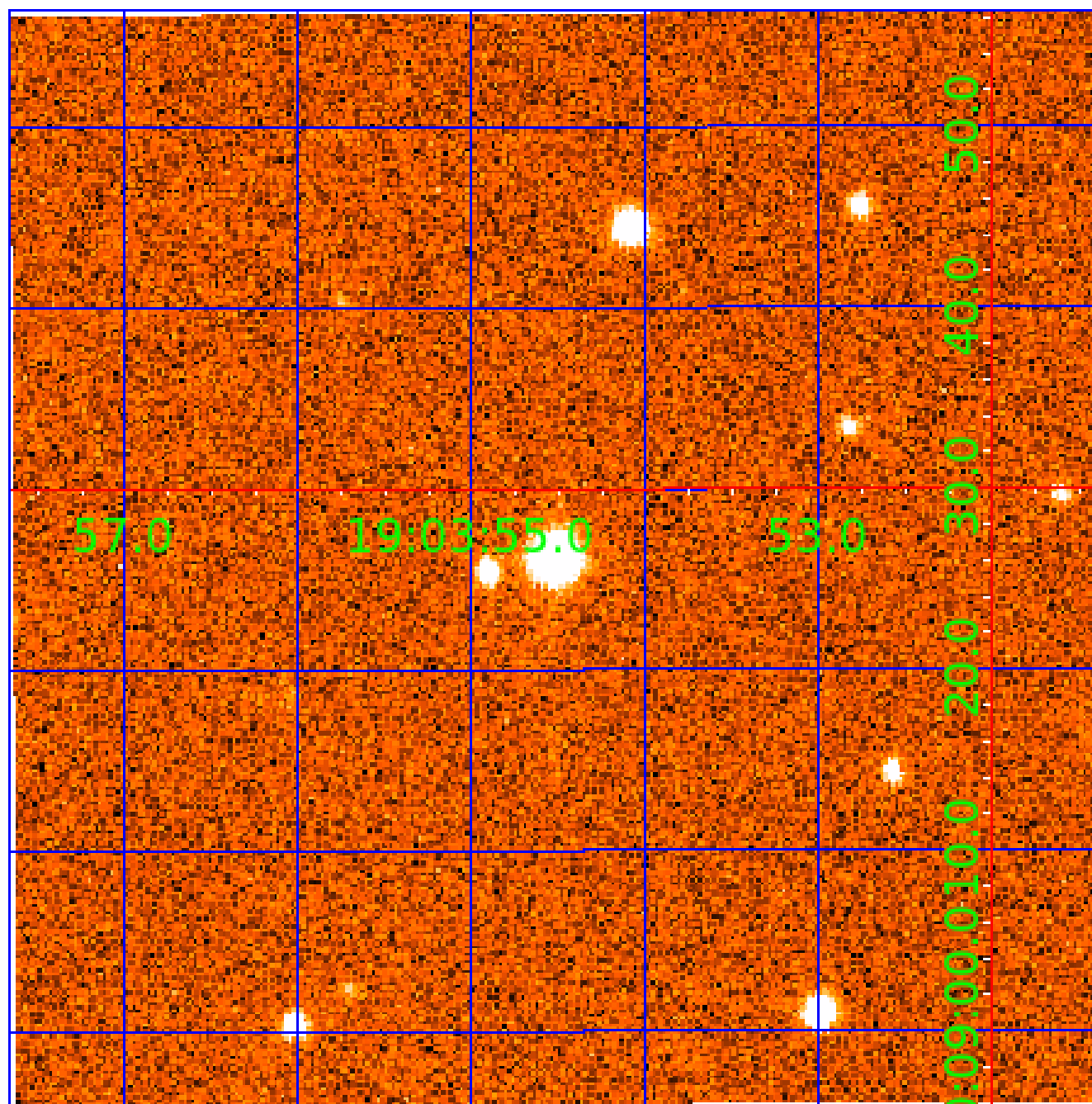


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination



# KIC 011854431

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011854431-01	OBS	No	0.638276	131.568481	128.3	1.669	33.6	6.9	0.55	4709	0.70	944.86
011854431-02	OBS	No	0.639835	131.779944	8137.1	2.000	47.6	-1.0	0.55	4709	4.87	941.79

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011854431-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
011854431-02	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_NOFITS

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

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

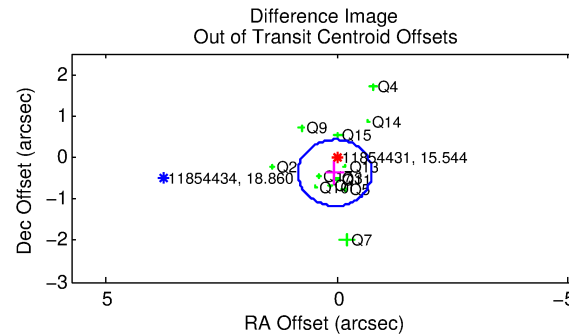
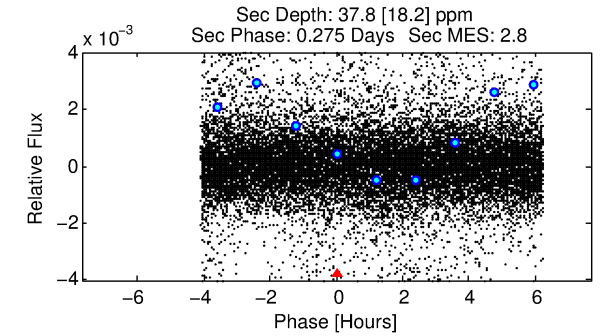
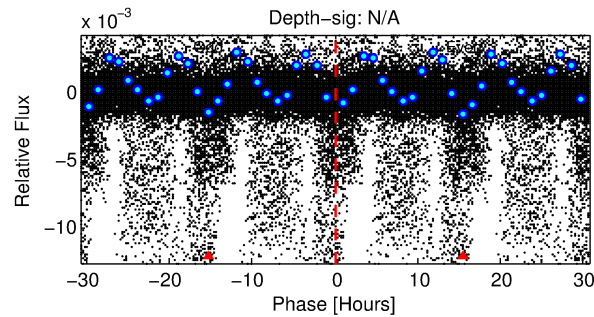
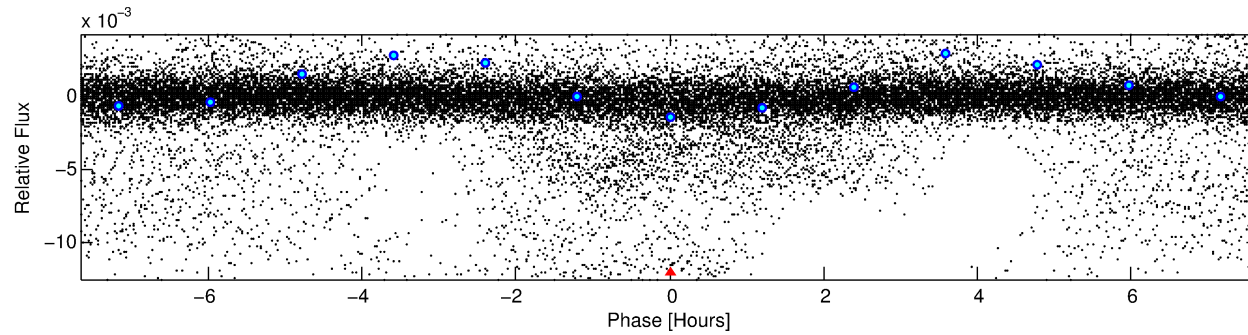
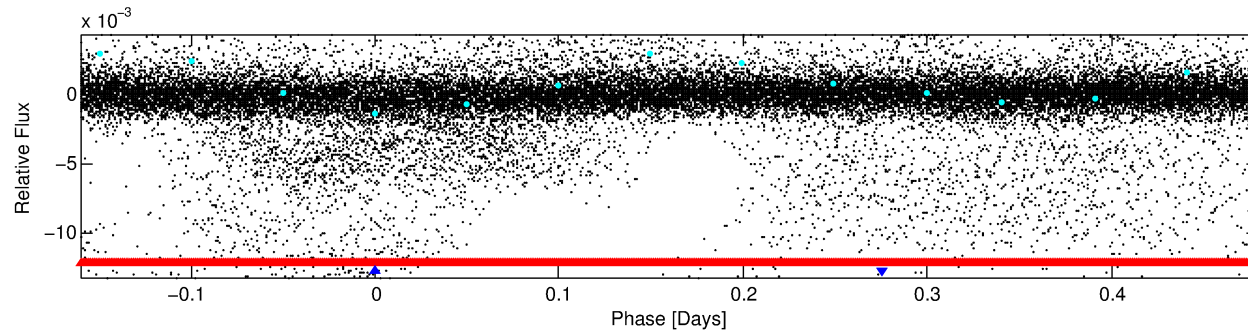
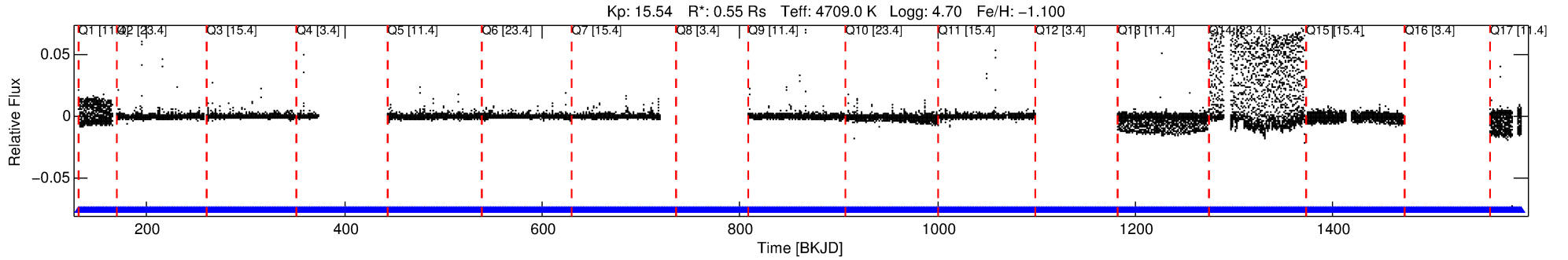
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 011854431-02

No Significant Match Found

# DV One-Page Summary

KIC: 11854431 Candidate: 2 of 2 Period: 0.640 d



## TPS TCE Results:

Period = 0.63984 d  
Epoch = 131.7799 BKJD

DV fit results are unavailable

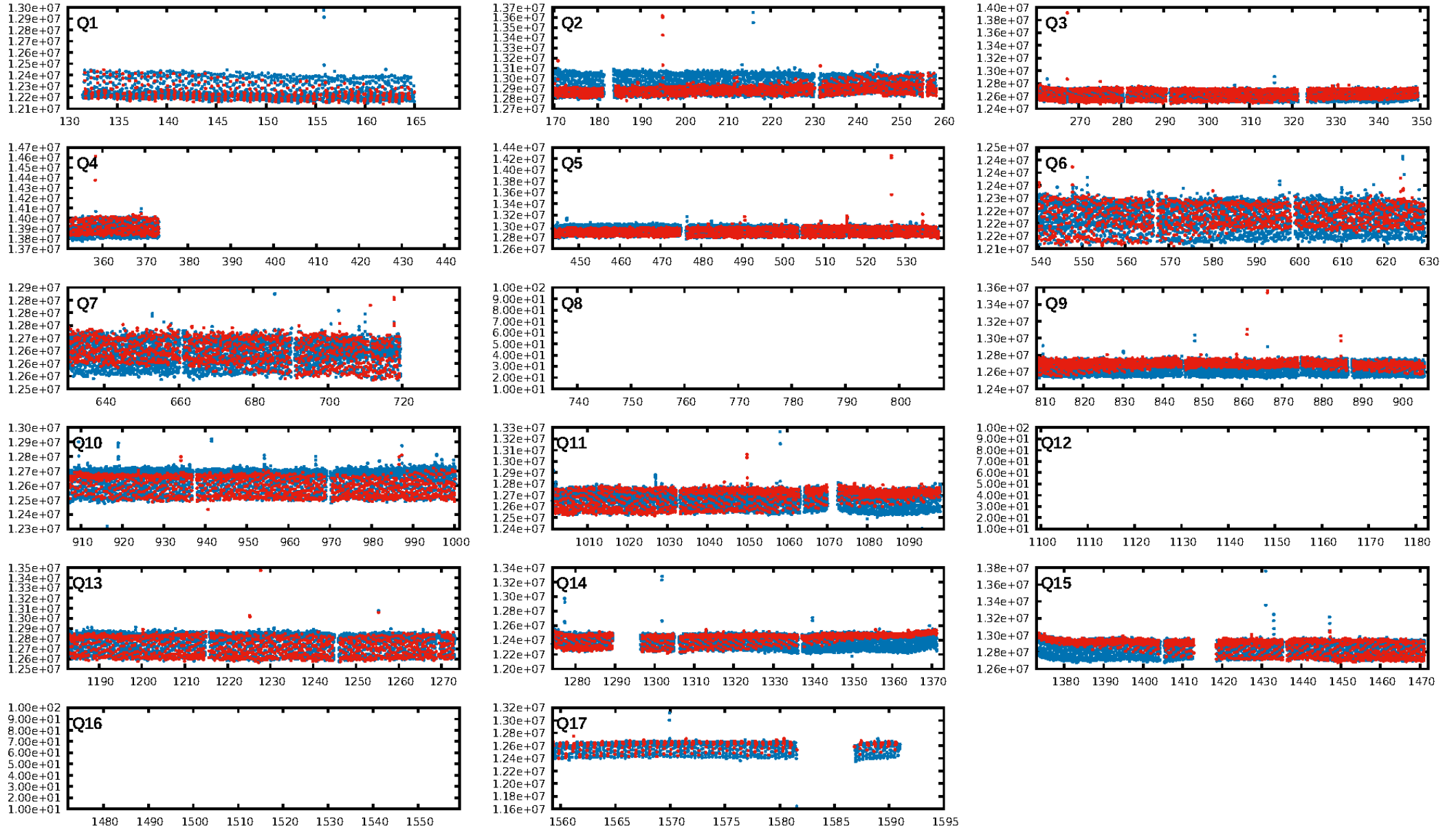
## DV Diagnostic Results:

ShortPeriod-sig: 1.1% [0.01σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [1551/1551]  
GhostDiagnostic-chr: 19.44  
Centroid-sig: 88.5%  
Centroid-so: 0.199 arcsec [14.09σ]  
OotOffset-rm: 0.375 arcsec [1.41σ]  
KicOffset-rm: 0.406 arcsec [1.61σ]  
OotOffset-st: 3/4/1/5 [13]  
KicOffset-st: 3/4/1/5 [13]  
DiffImageQuality-fgm: 0.54 [7/13]  
DiffImageOverlap-fno: 0.00 [0/14]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 10:45:38 Z

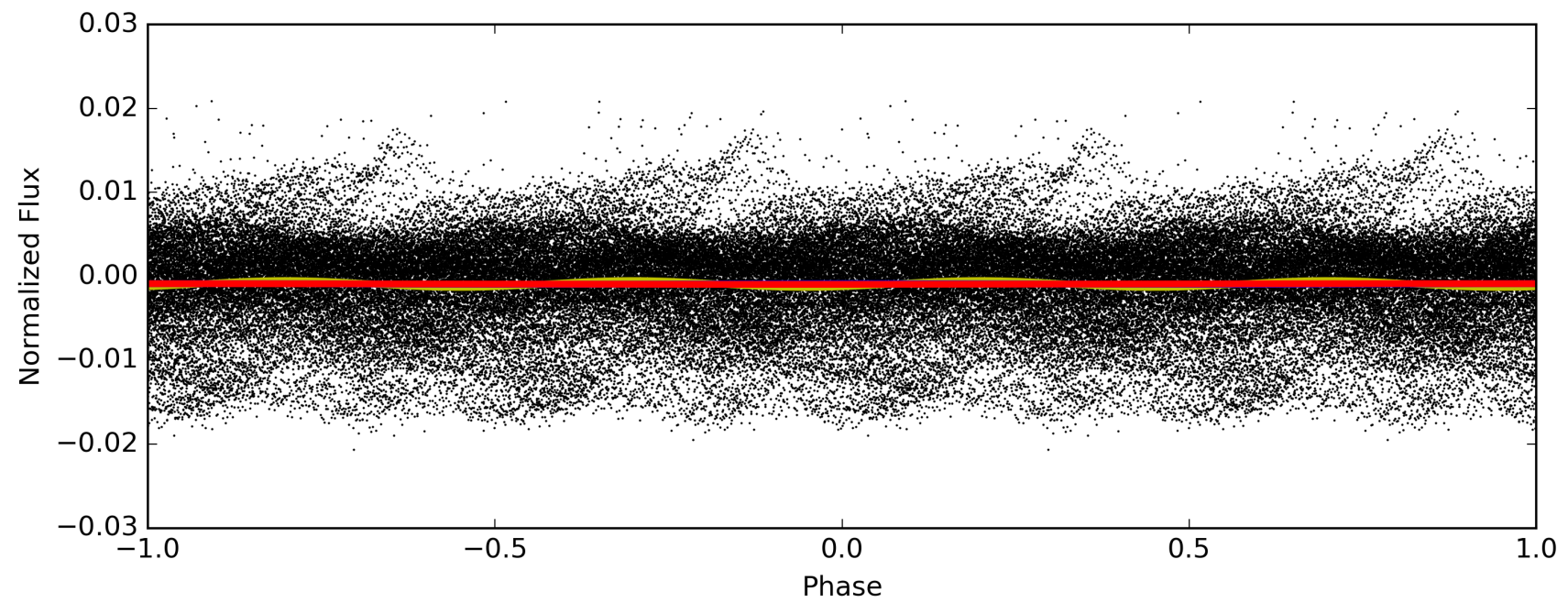
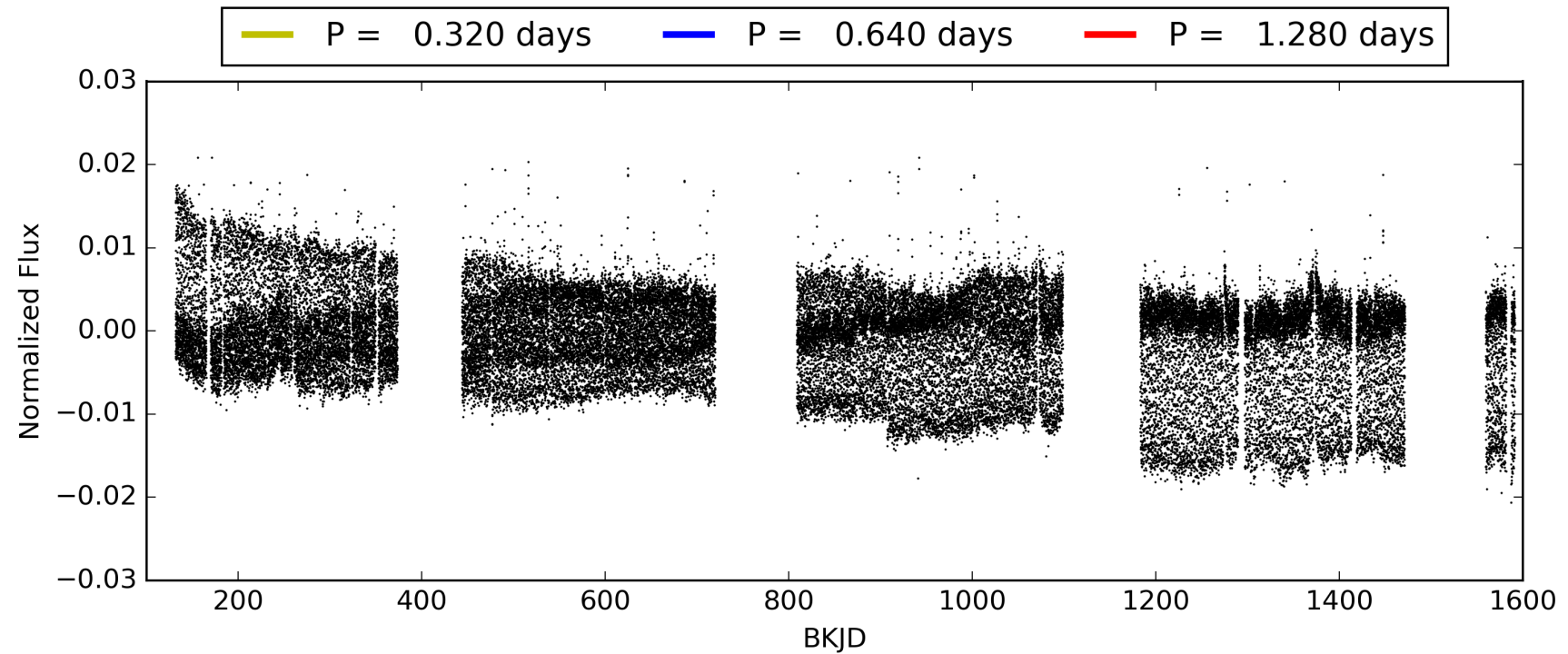
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 011854431-02, PDC Light Curves



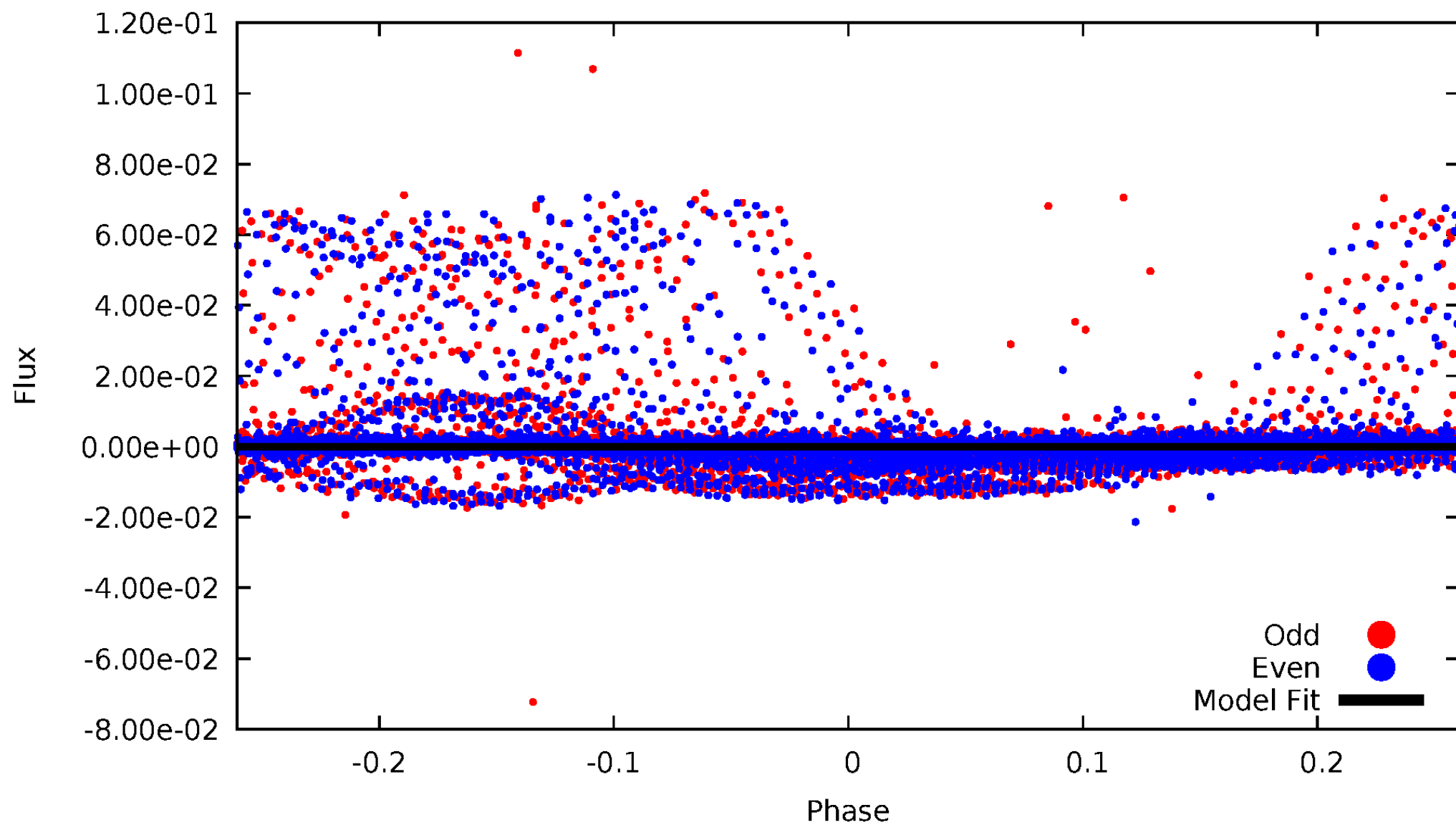


TCE 011854431-02



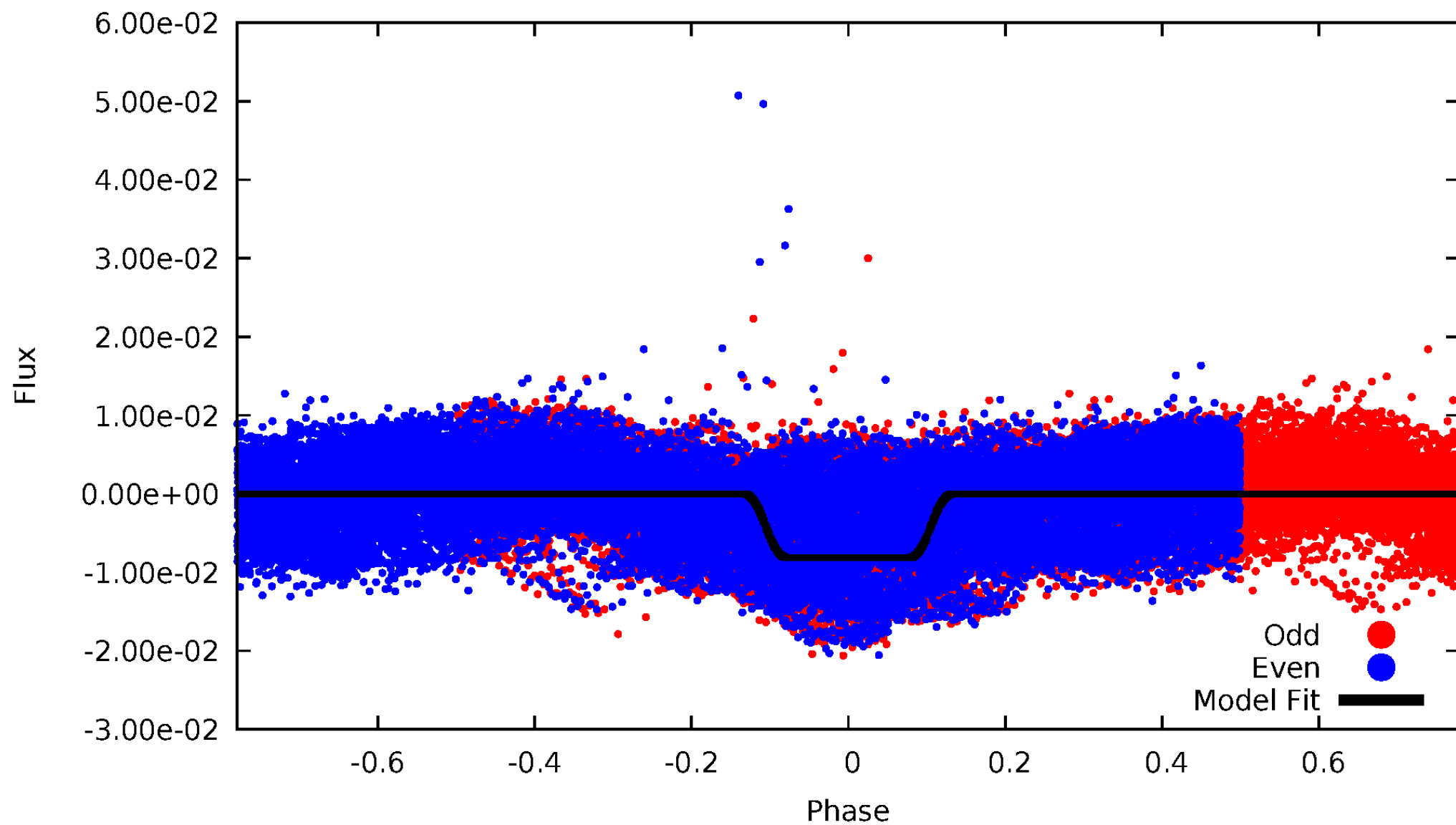
# DV Odd/Even

TCE 011854431-02



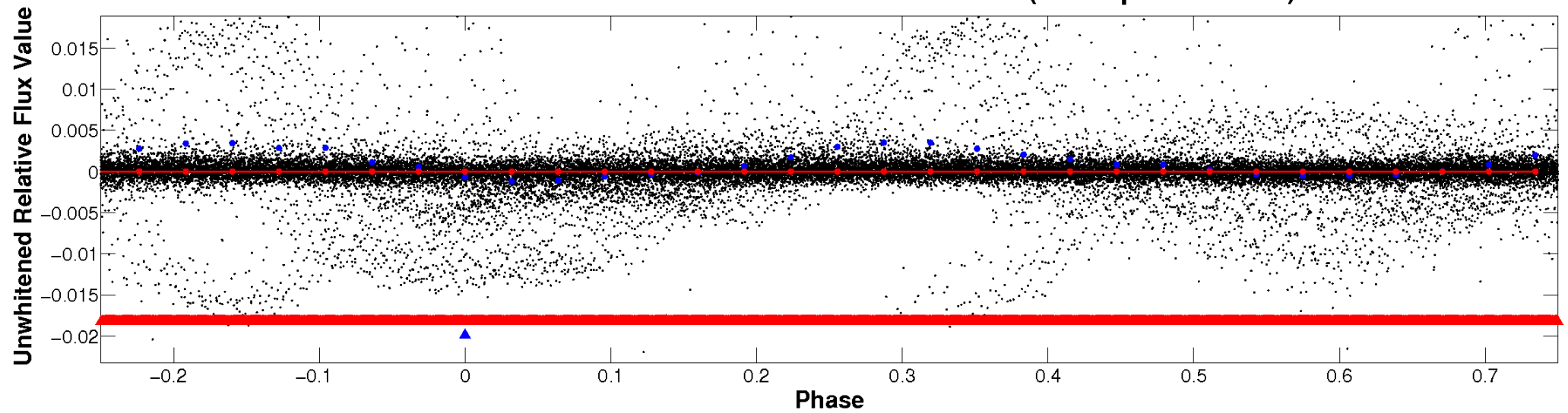
# ALT Odd/Even

TCE 011854431-02

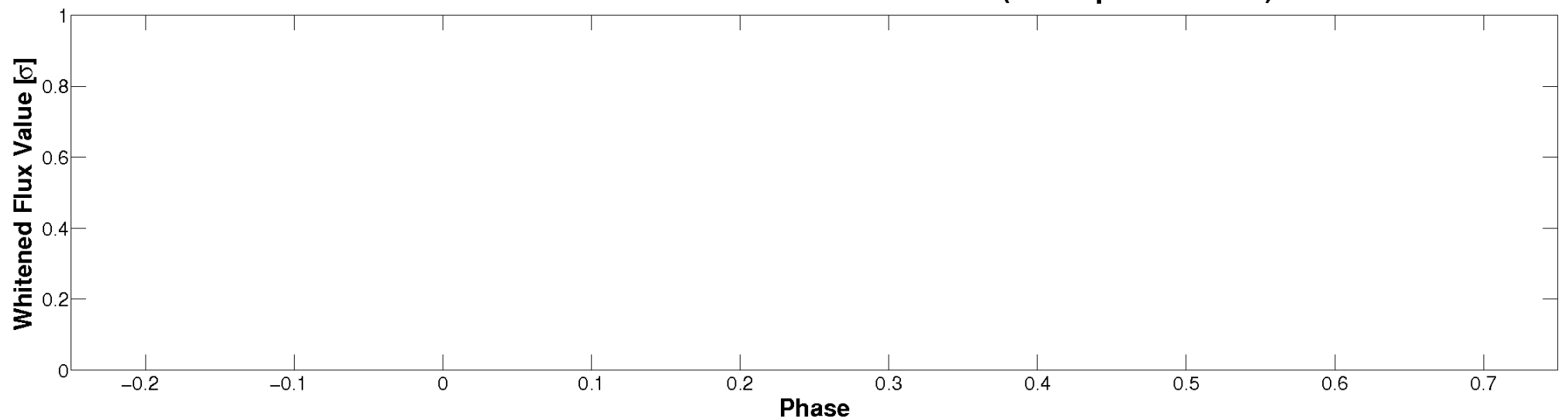


# Non-Whitened Vs. Whitened Light Curve

**Planet 2 : Phased Unwhitened Flux Time Series (TPS Epoch/Period)**

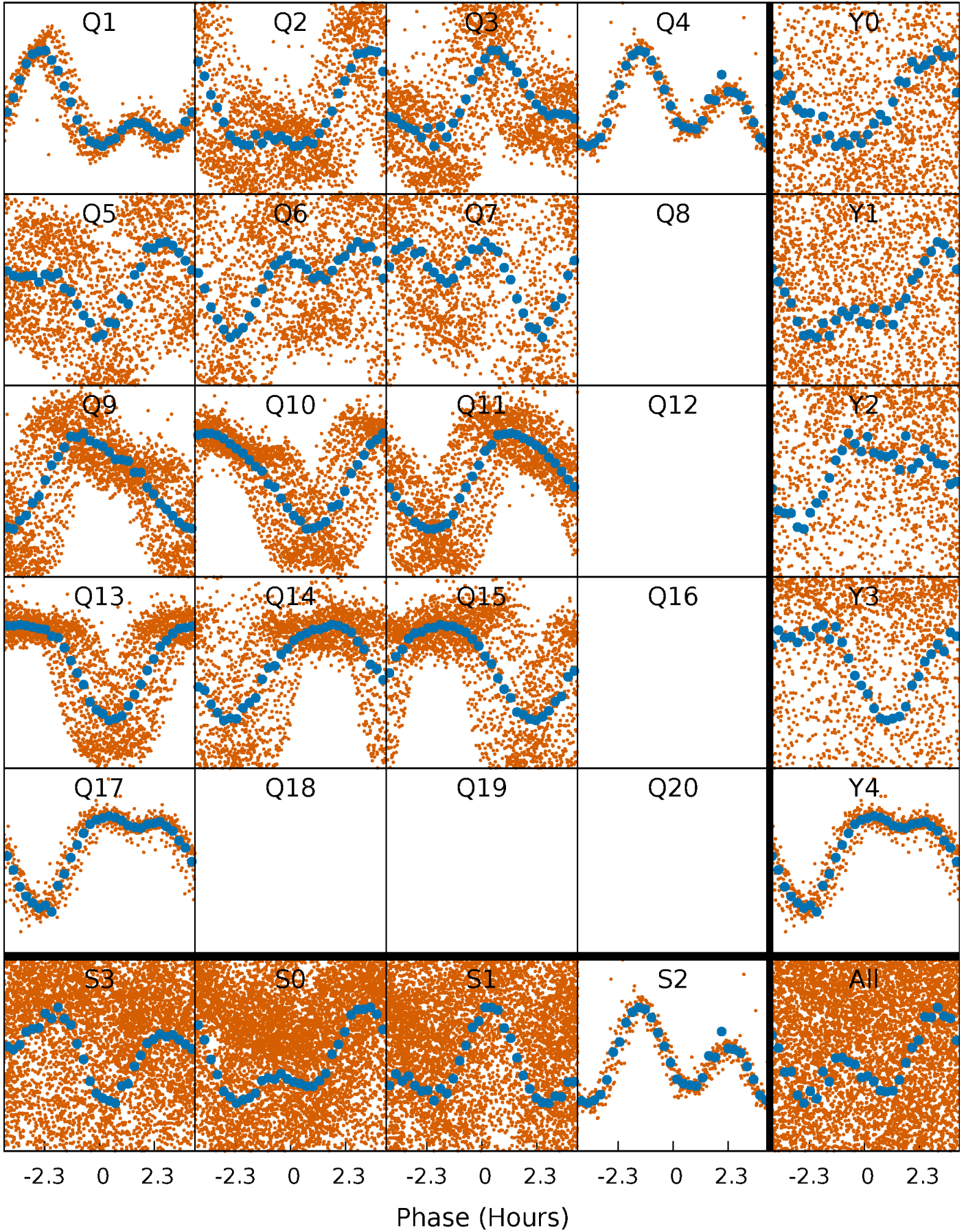


**Planet 2 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



# PDC Quarter-Phased Transit Curves

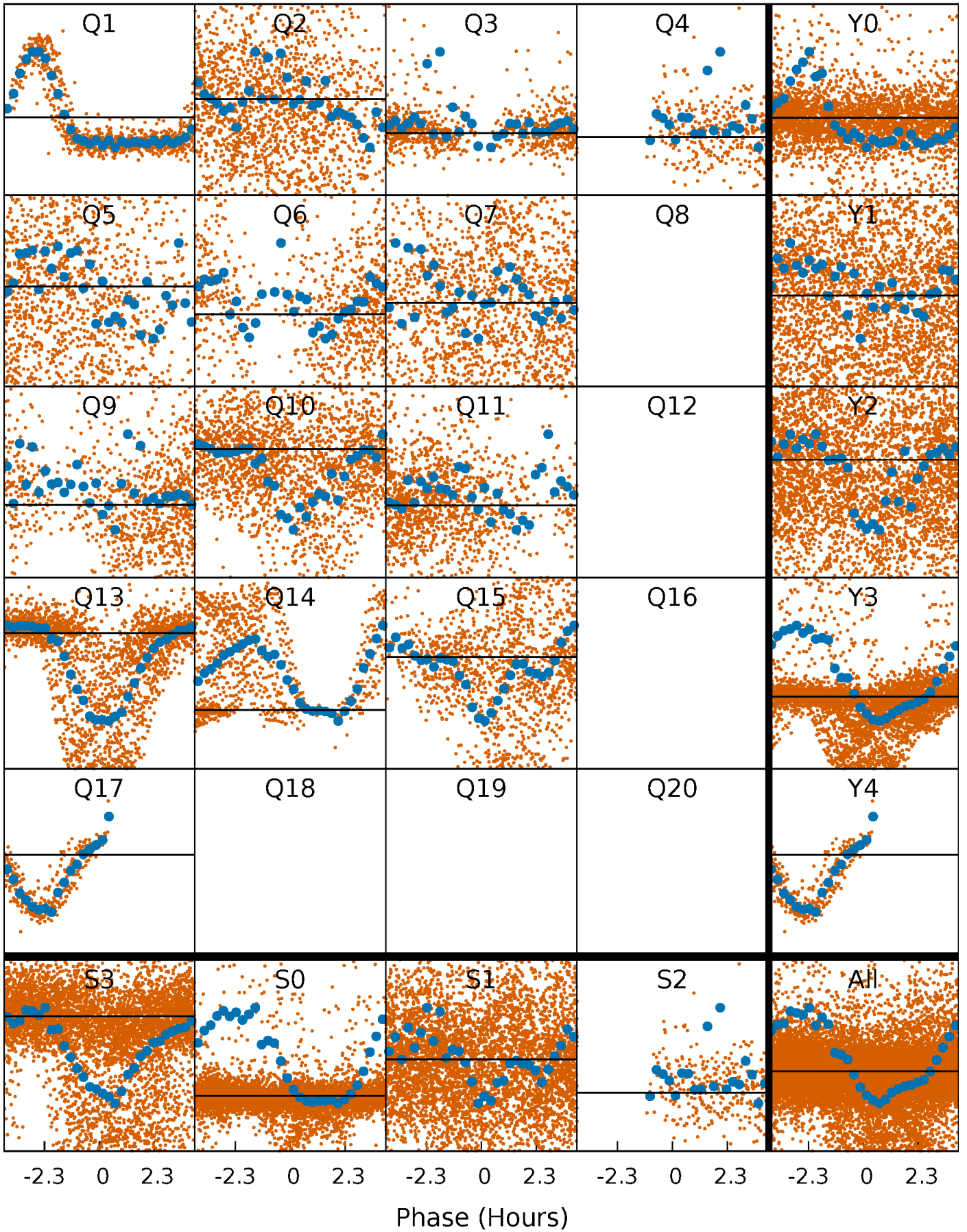
TCE 011854431-02   P= 0.639835 Days    $T_0=131.779944$  (BKJD)





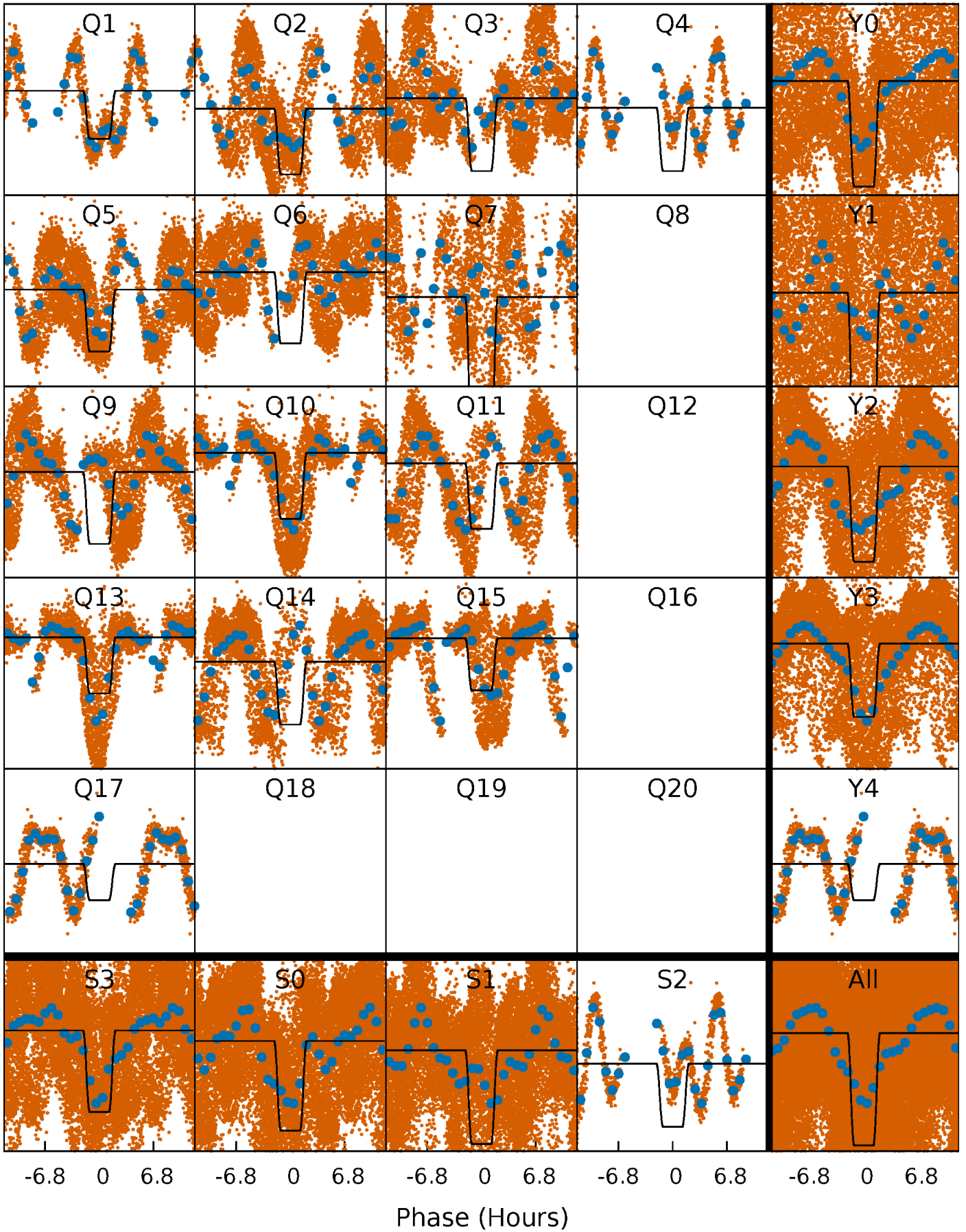
# DV Quarter-Phased Transit Curves

TCE 011854431-02   P= 0.639835 Days    $T_0=131.779944$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

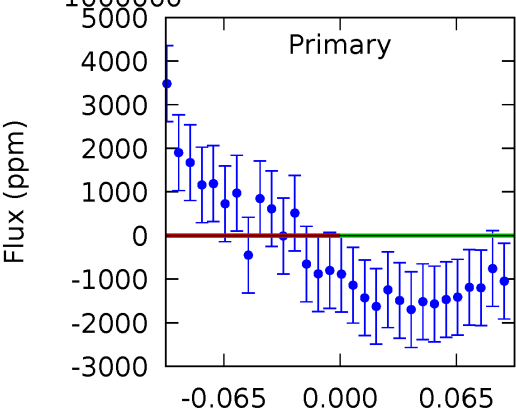
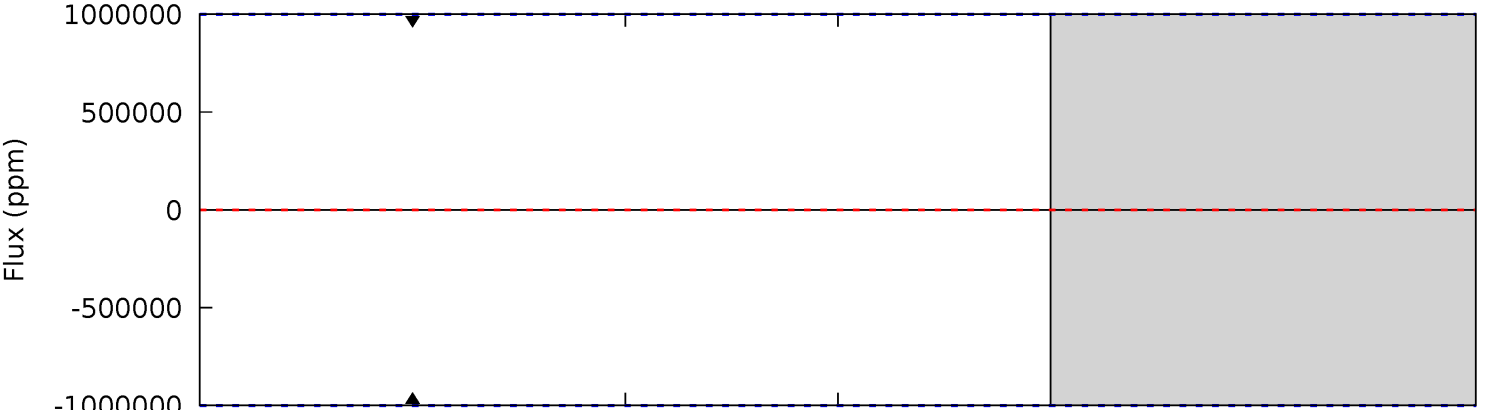
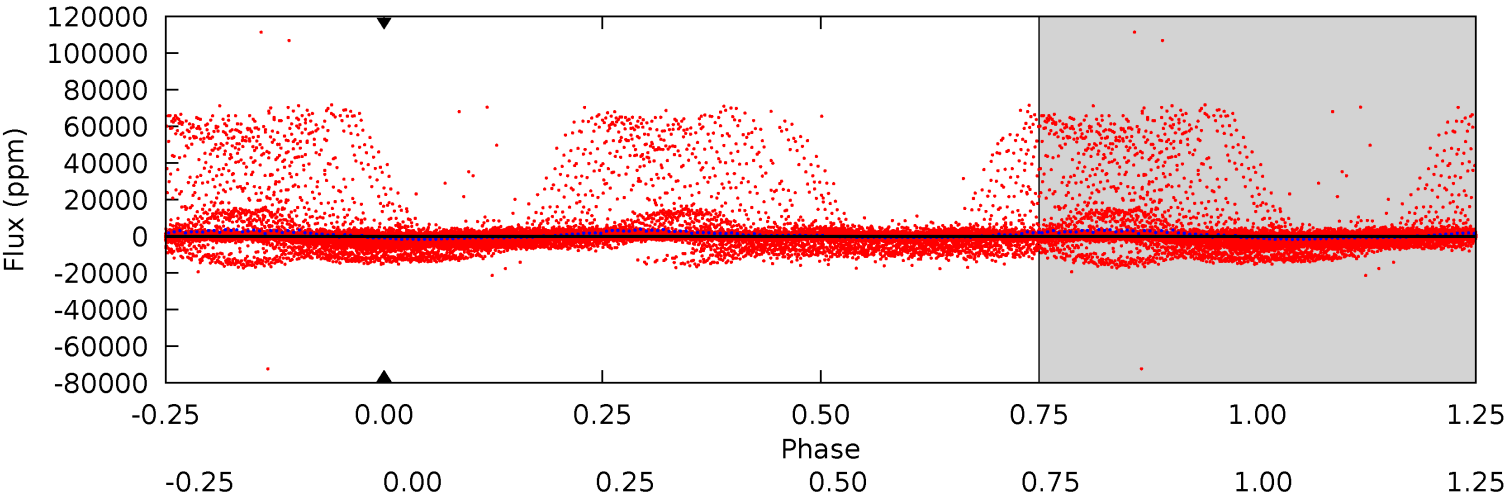
TCE 011854431-02   P= 0.639835 Days    $T_0=131.808030$  (BKJD)



DV Model-Shift Uniqueness Test

011854431-02, P = 0.639835 Days, E = 131.140109 Days

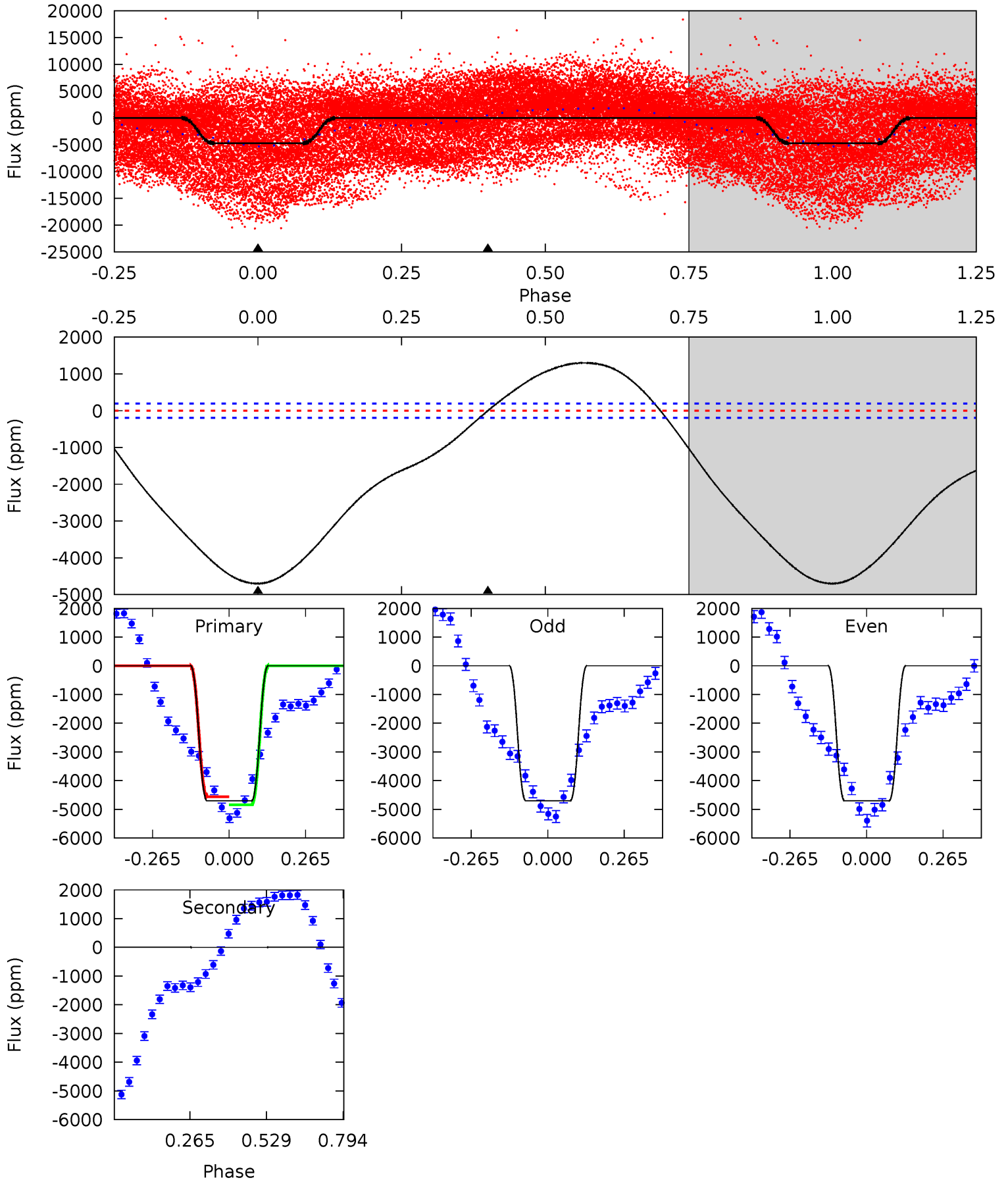
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

011854431-02, P = 0.639835 Days, E = 131.168195 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
105.6	0.02	0	0	4.36	1.12	11.9	105.6	105.6	0.02	0.02	0.07	1.03	0.22	2.91



### Stellar Parameters For KIC 011854431

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4709^{+146}_{-146}$	$4.697^{+0.048}_{-0.028}$	$-1.100^{+0.300}_{-0.300}$	$0.551^{+0.037}_{-0.037}$	$0.551^{+0.044}_{-0.024}$	$4.646^{+0.916}_{-0.587}$
	+3%/-3%	+1%/-1%	+27%/-27%	+7%/-7%	+8%/-4%	+20%/-13%
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 011854431-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$0 \pm 1000000$	$6.59^{+5.23}_{-4.28}$	$1965^{+62}_{-68}$	$-3557^{+12093}_{-5730}$	$-4.161^{+234.820}_{-303.874}$
Alt.	$-1 \pm 45$	$6.92^{+5.39}_{-4.27}$	$1963^{+71}_{-72}$	$-2438^{+158}_{-119}$	$-0.000^{+0.124}_{-0.133}$

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

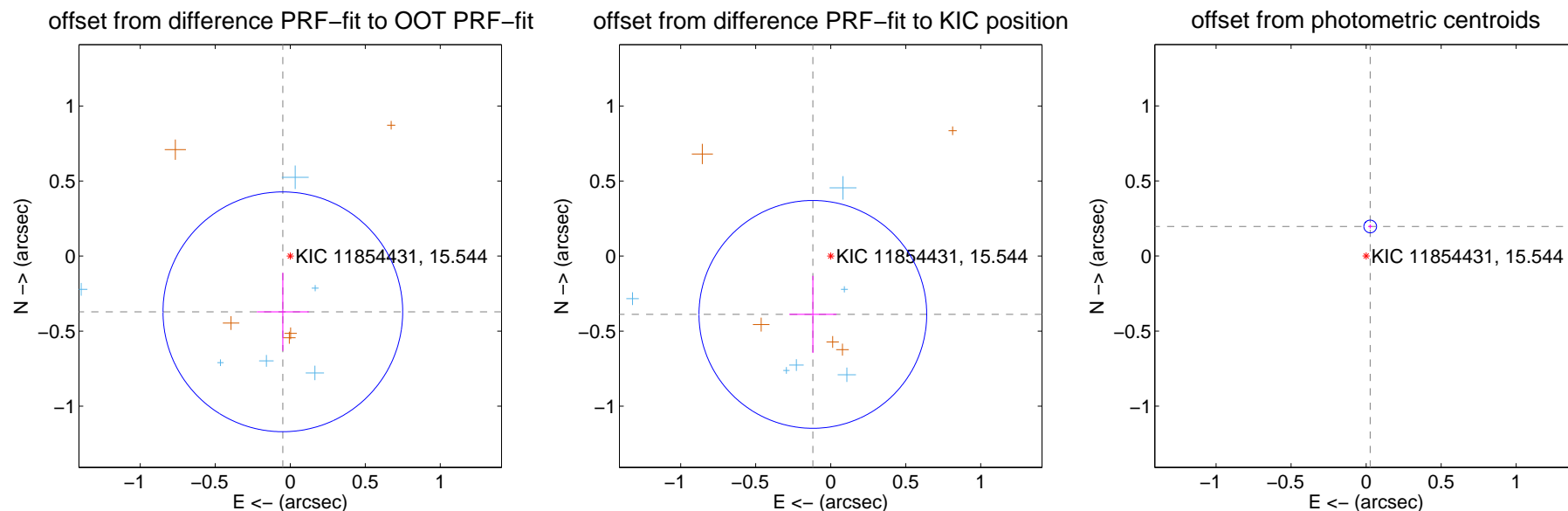
## DV Centroid Data

Supplemental centroid analysis for 011854431-02. Kepler magnitude: 15.54. Transit SNR -1.00

There are 7 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

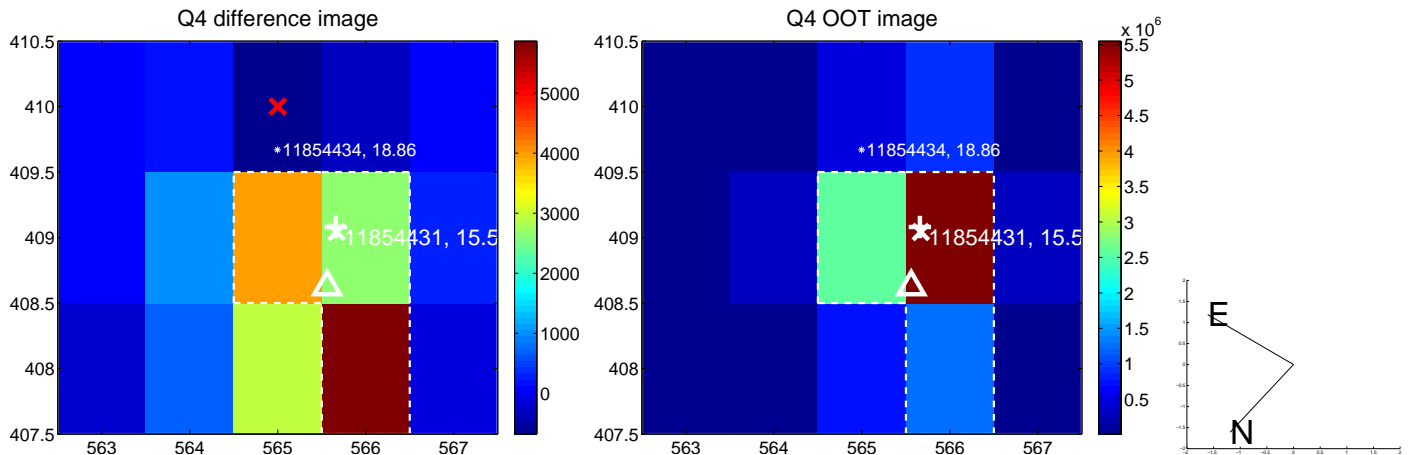
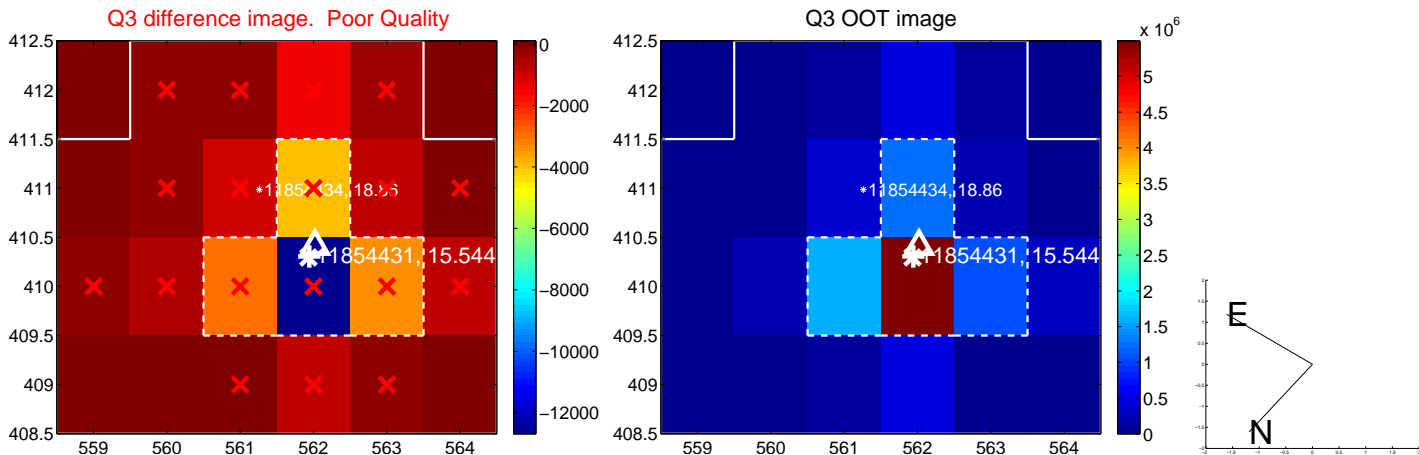
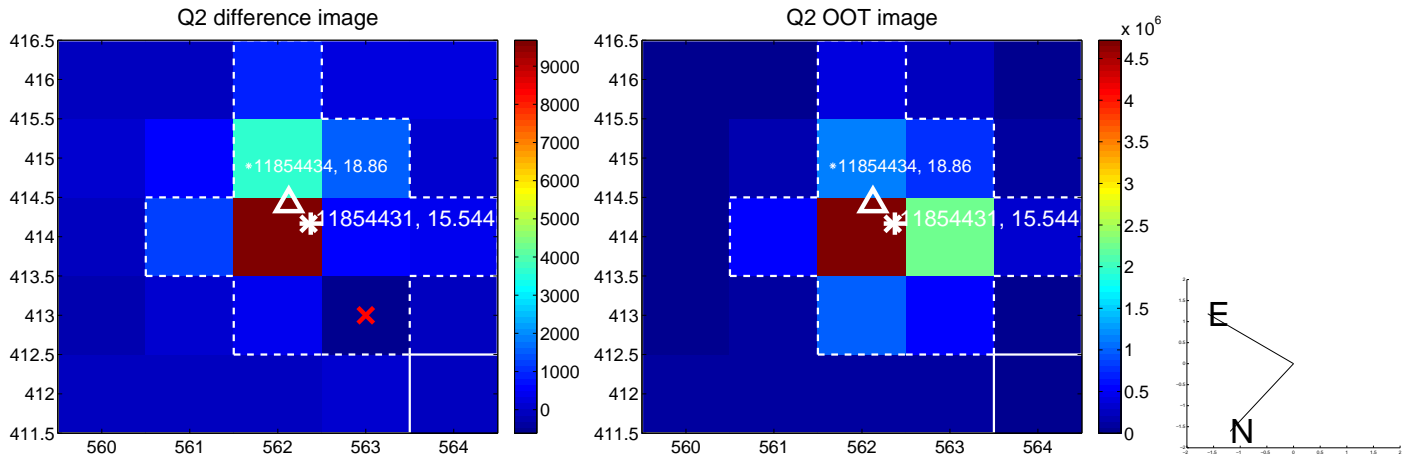
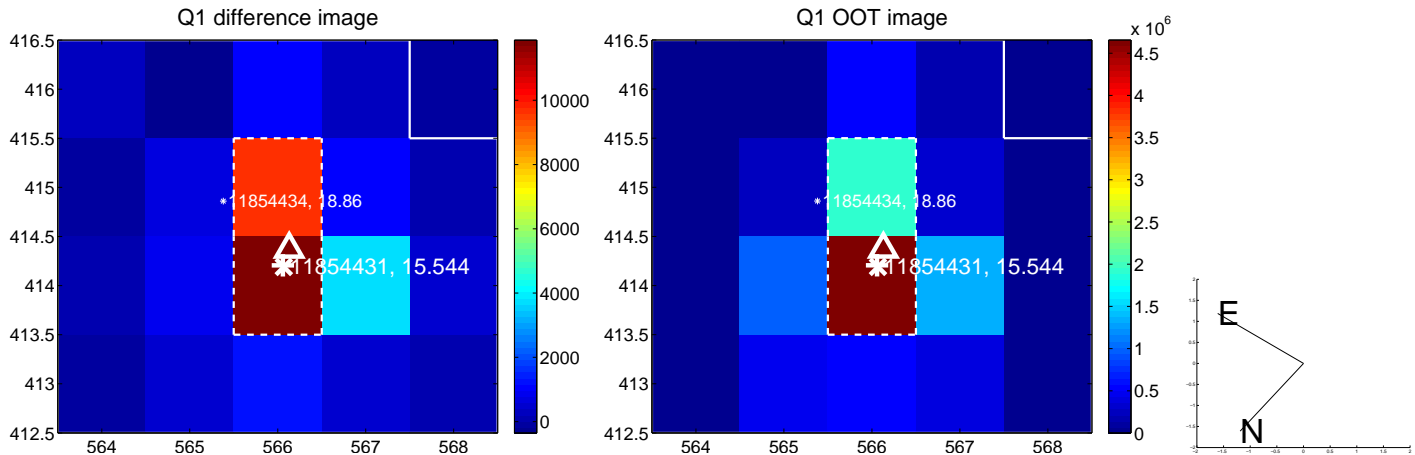
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.375 \pm 0.266$	1.41	$0.049 \pm 0.173$	$-0.371 \pm 0.261$
PRF-fit source offset from KIC position	$0.406 \pm 0.253$	1.61	$0.119 \pm 0.158$	$-0.388 \pm 0.257$
photometric centroid source offset	$0.20 \pm 0.01$	14.09	$-0.03 \pm 0.01$	$0.20 \pm 0.01$



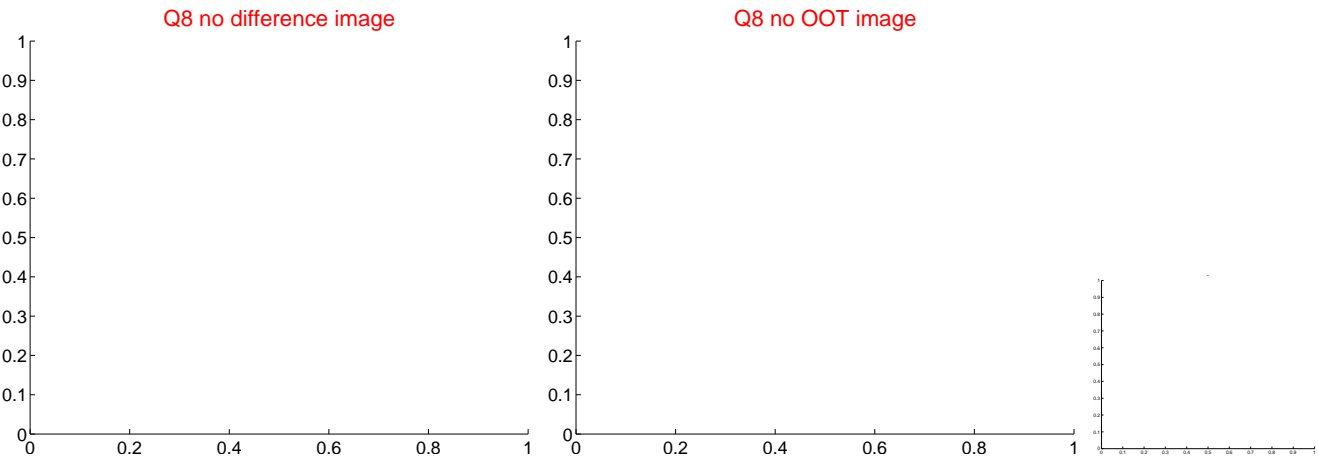
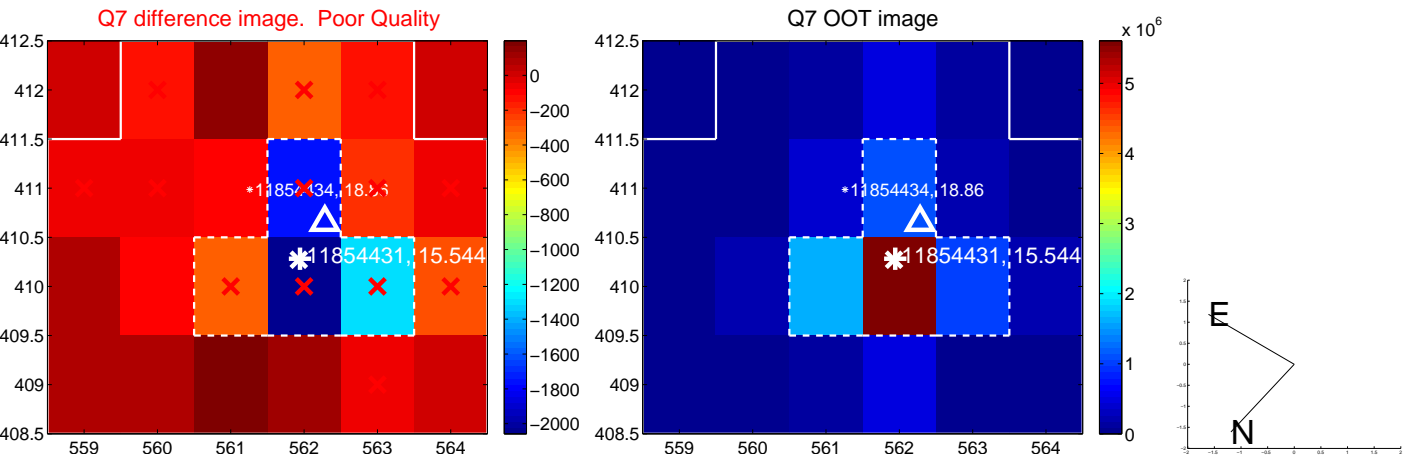
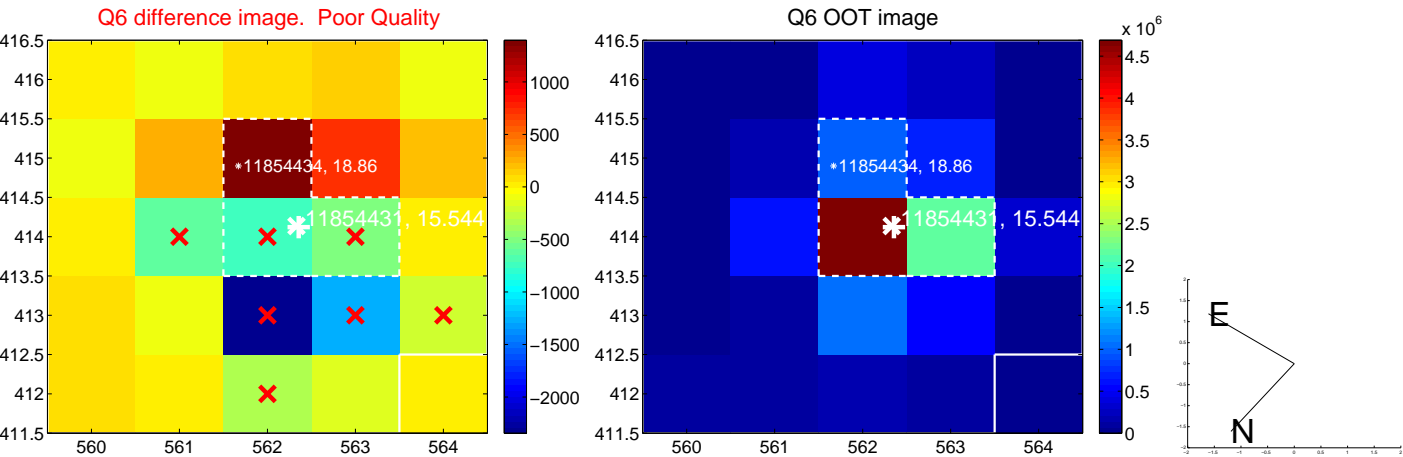
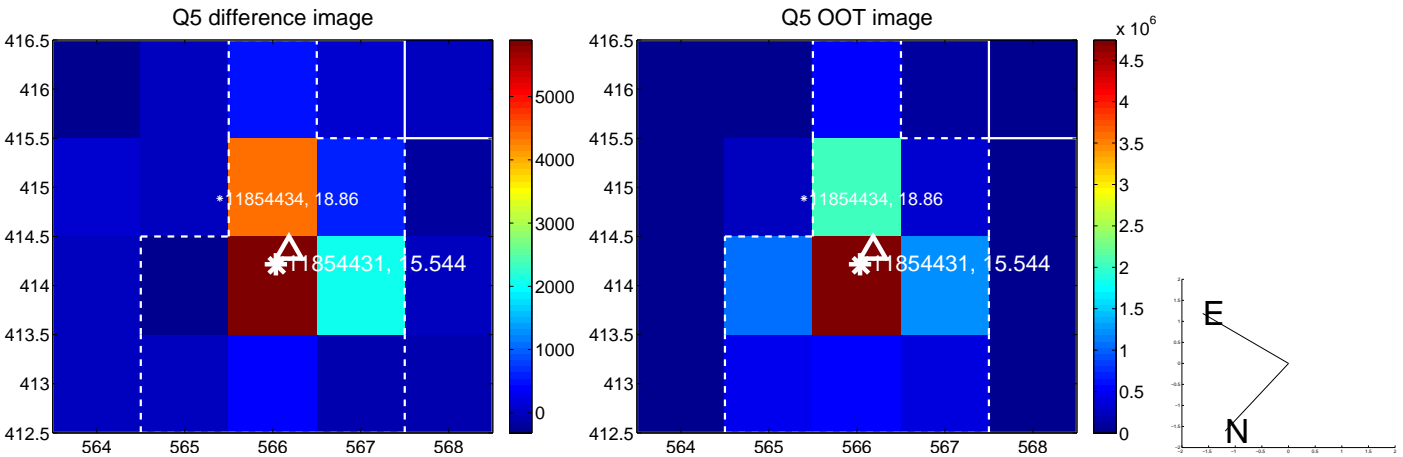
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



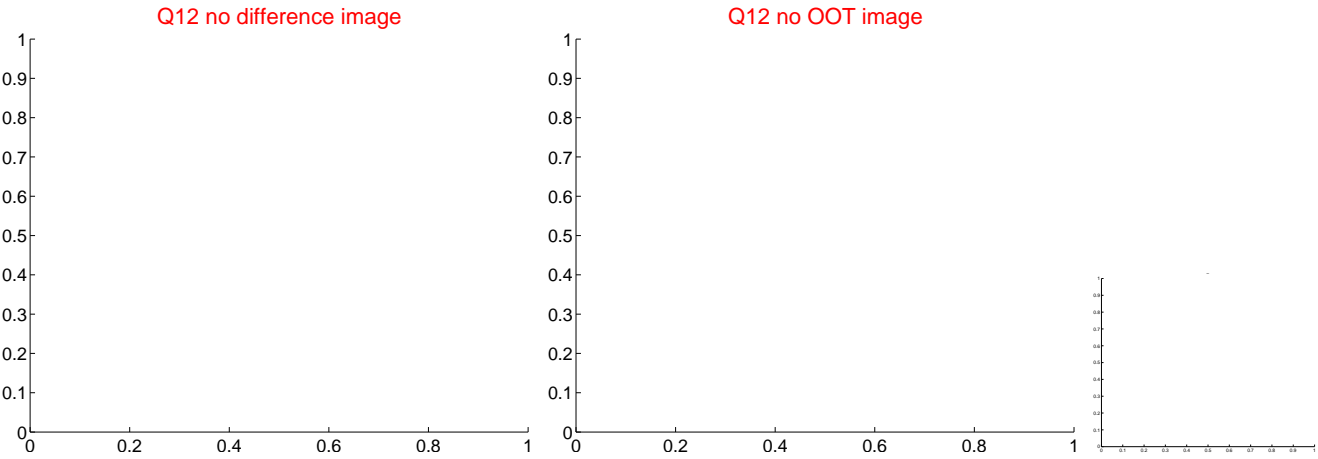
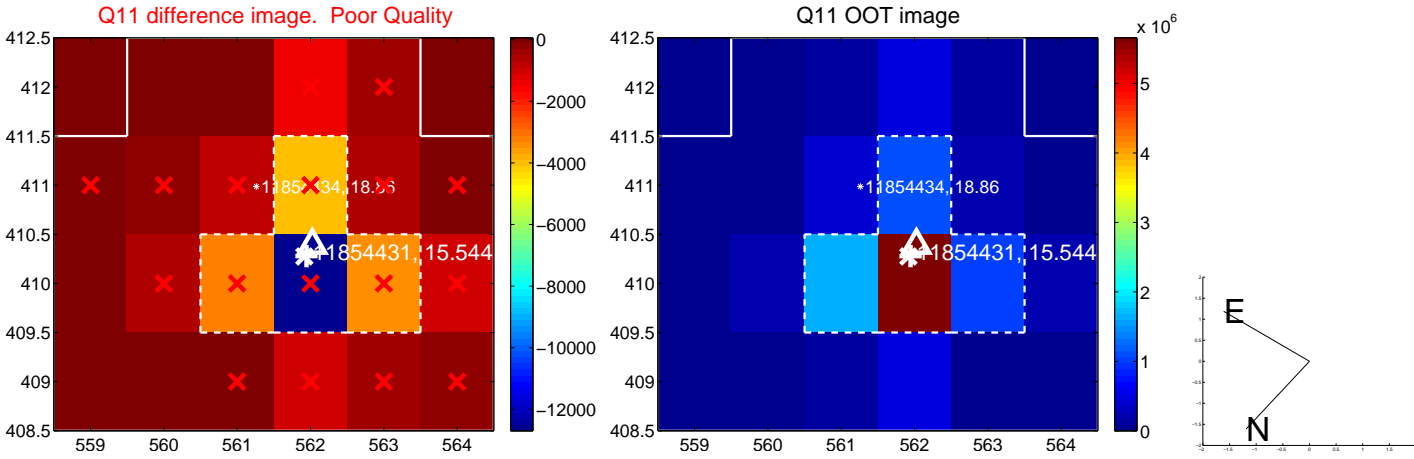
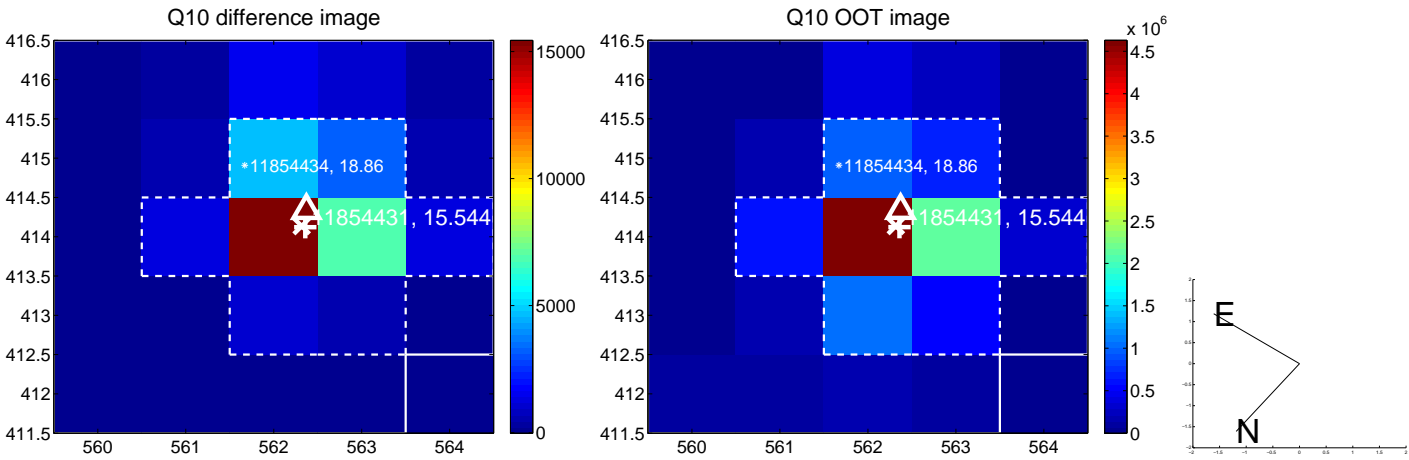
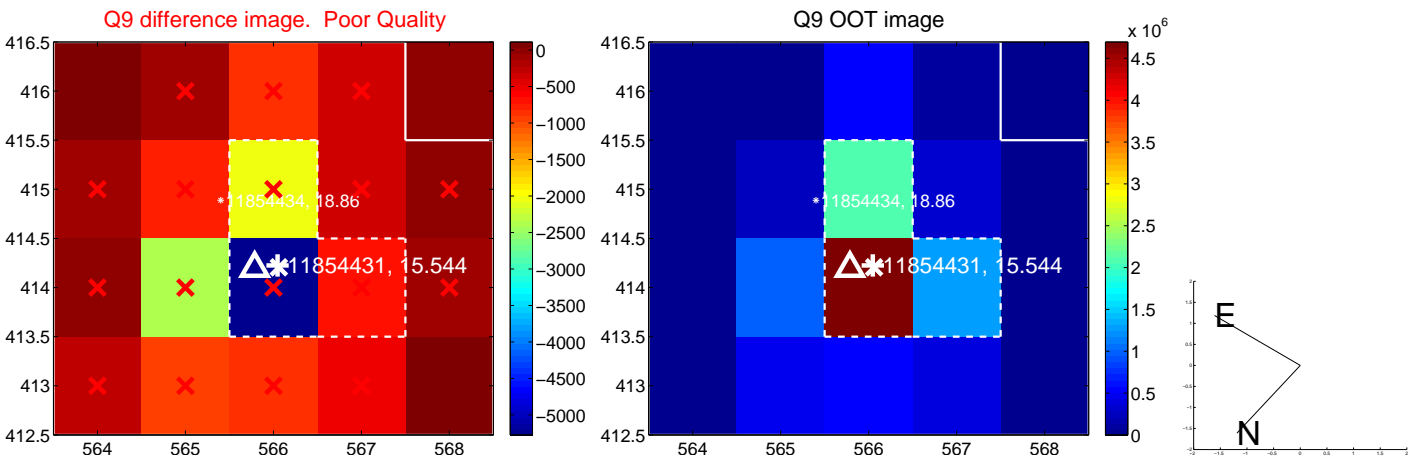
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



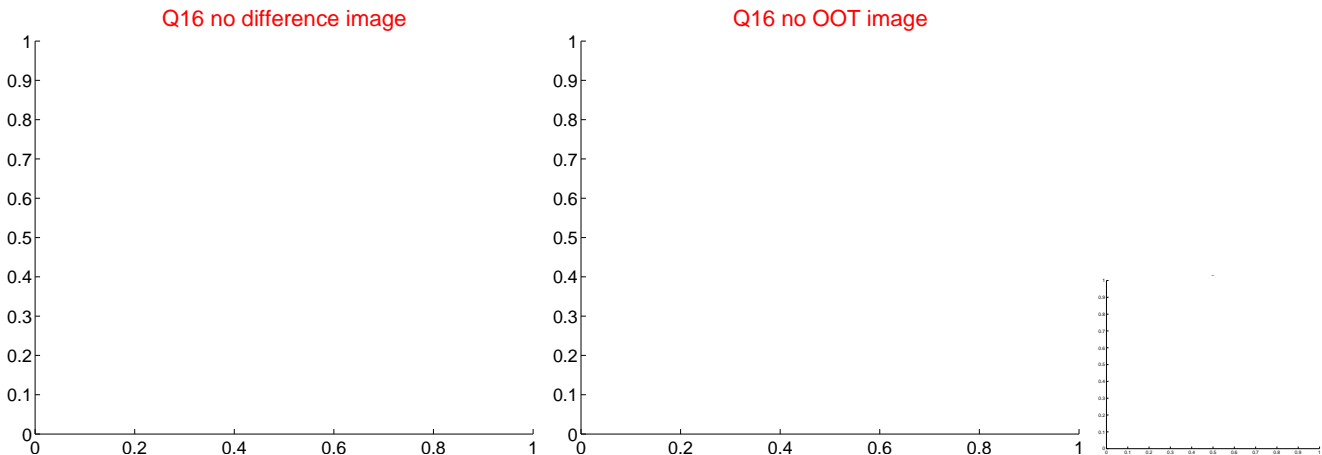
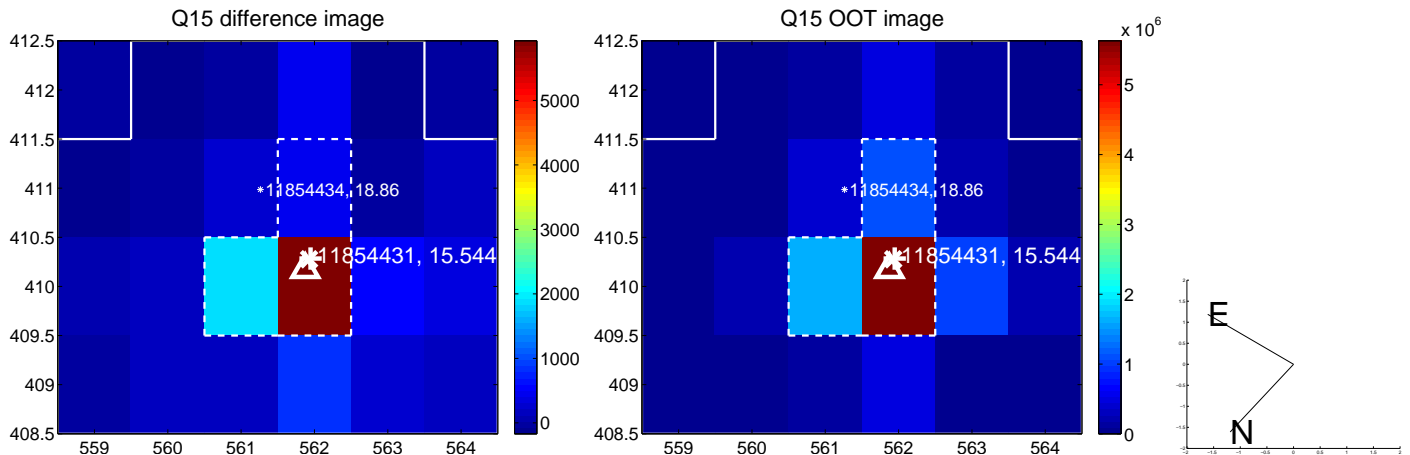
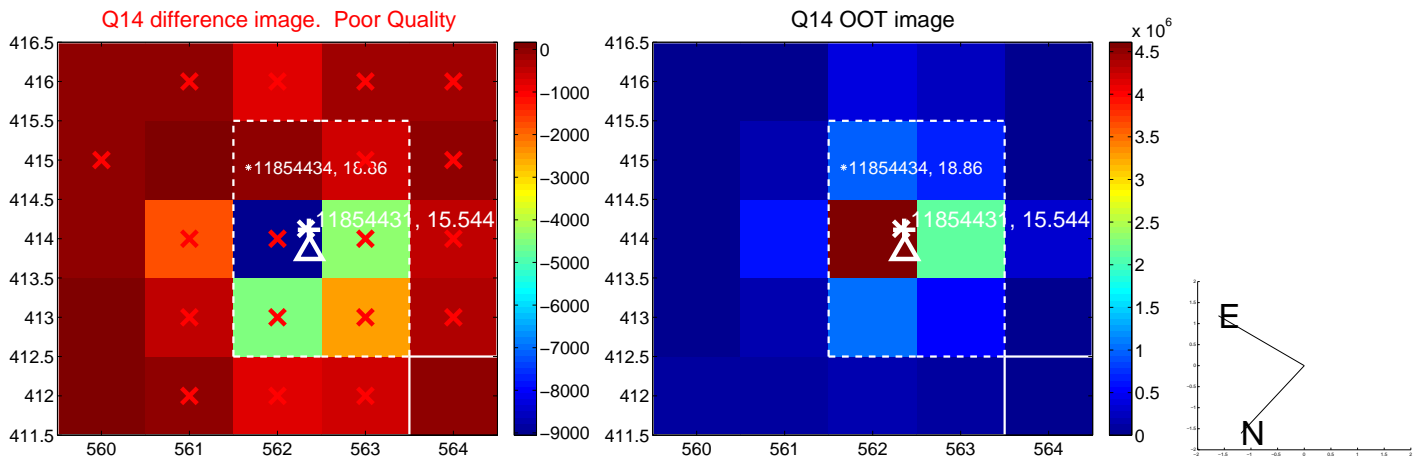
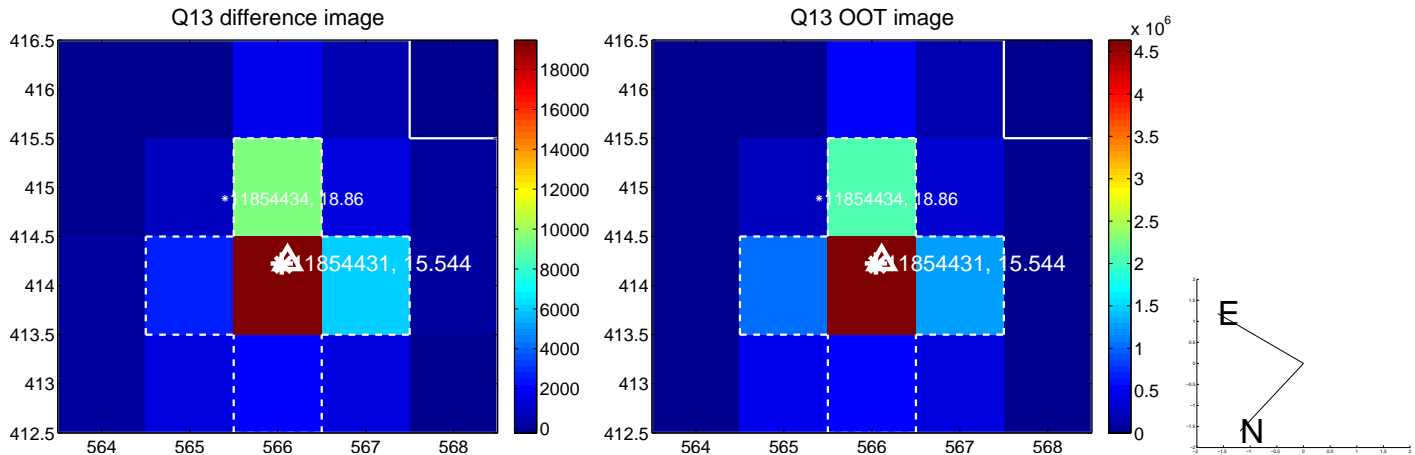
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



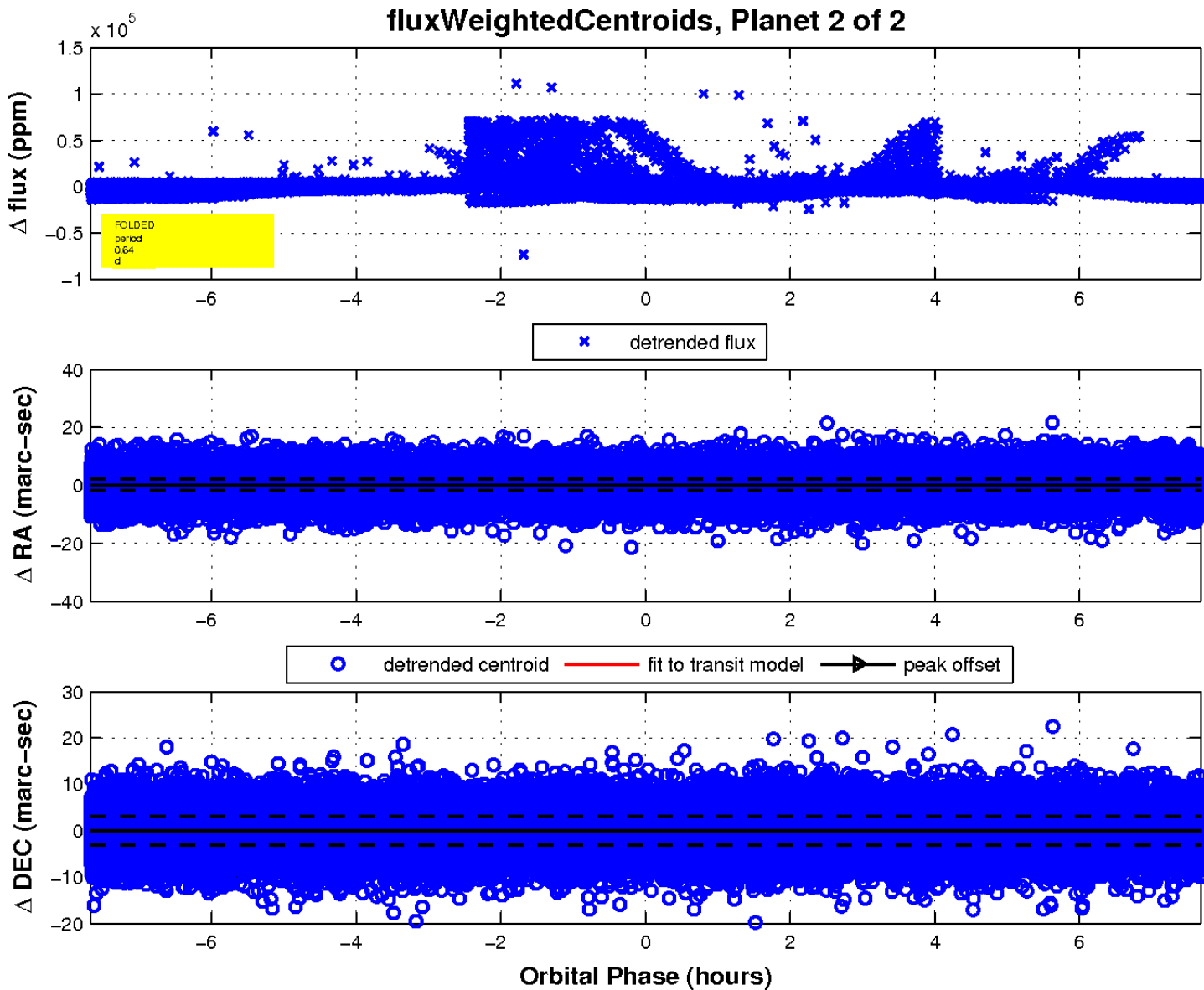
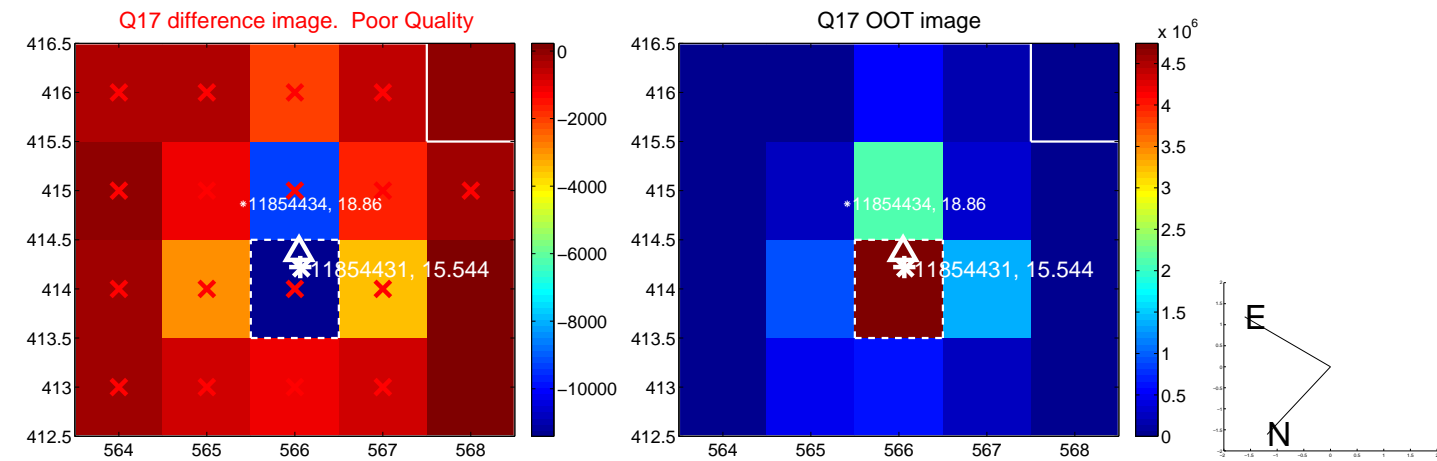
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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.



# UKIRT Image

Declination

