

# KIC 007047922

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007047922-01	OBS	1899.01	19.761716	135.176818	392.4	4.024	31.5	34.0	1.18	6327	2.84	92.60
007047922-02	OBS	1899.02	10.522842	140.048228	77.8	3.548	8.7	9.2	1.18	6327	1.19	214.55

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007047922-01	OBS	PC	0.97	0	0	0	0	NO_COMMENT
007047922-02	OBS	PC	0.99	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.

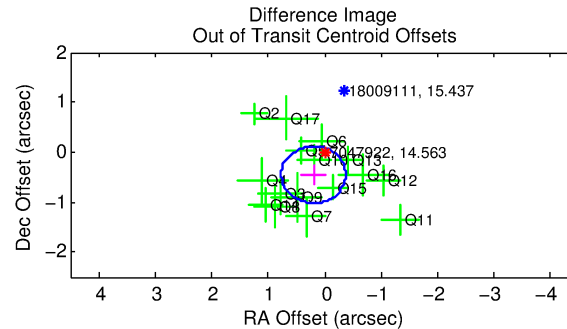
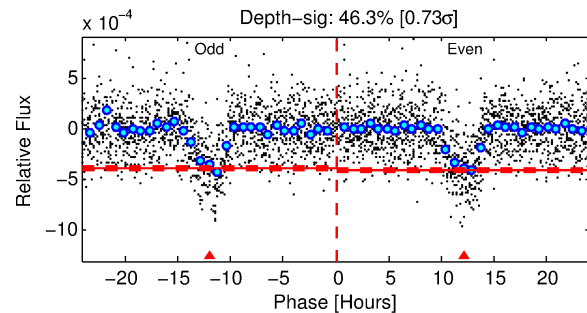
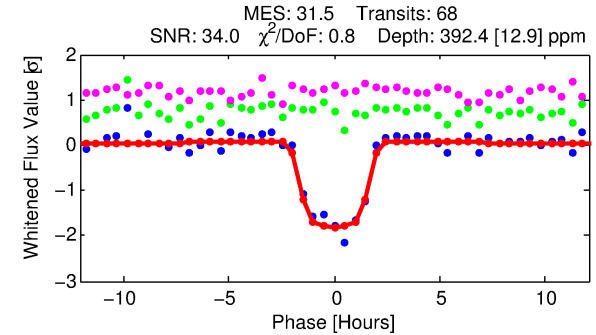
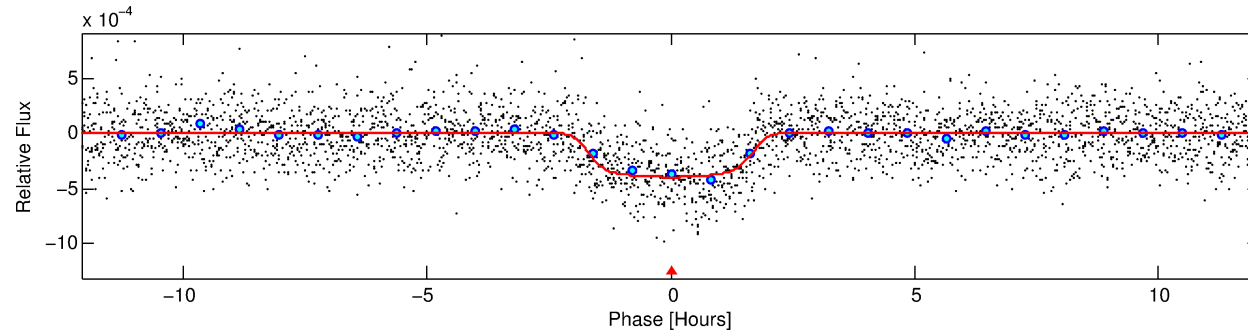
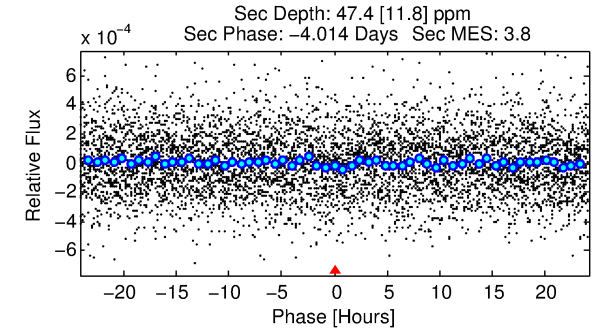
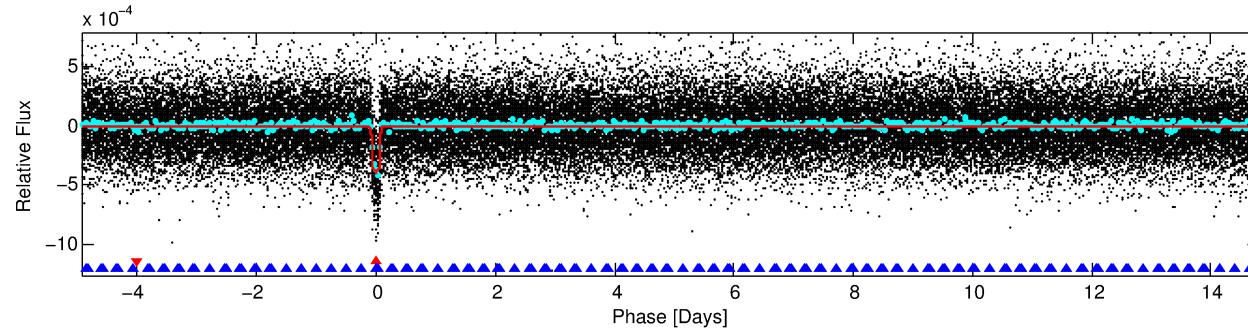
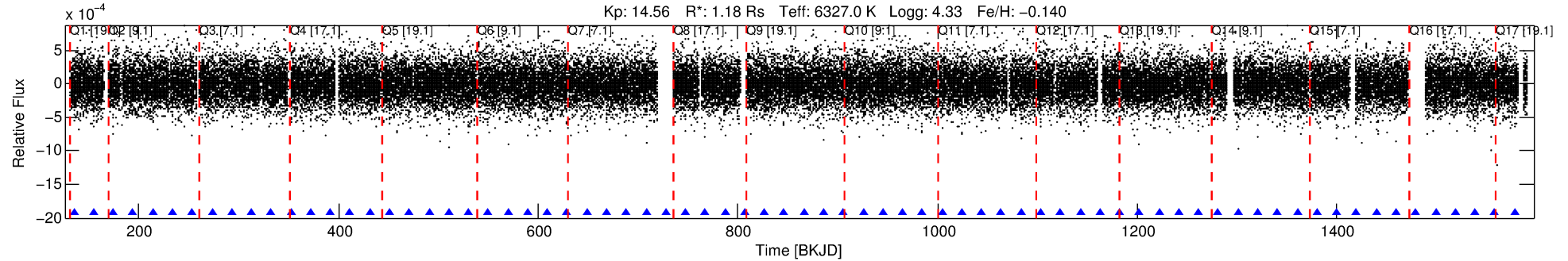
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007047922-01

No Significant Match Found

# DV One-Page Summary

KIC: 7047922 Candidate: 1 of 2 Period: 19.762 d  
KOI: K01899.01 Corr: 0.943



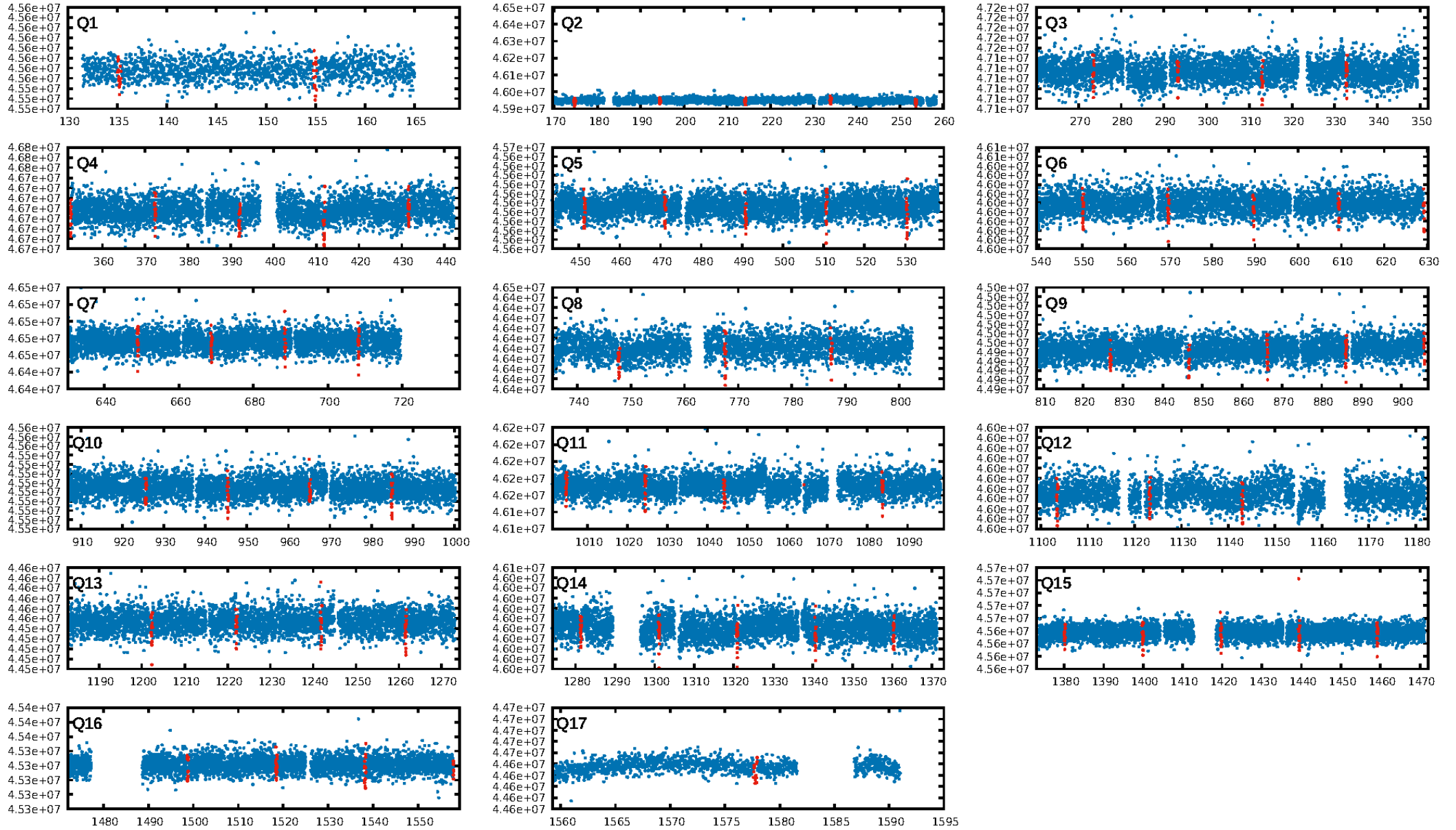
## DV Fit Results:

Period = 19.76172 [0.00006] d  
Epoch = 135.1768 [0.0026] BKJD  
Rp/R\* = 0.0222 [0.0009]  
a/R\* = 15.29 [3.08]  
b = 0.94 [0.03]  
Seff = 92.60 [46.66]  
Teff = 791 [100] K  
Rp = 2.84 [0.95] Re  
a = 0.1463 [0.0389] AU  
Ag = 69.13 [31.34] [2.17σ]  
Teffp = 3526 [381] K [6.95σ]

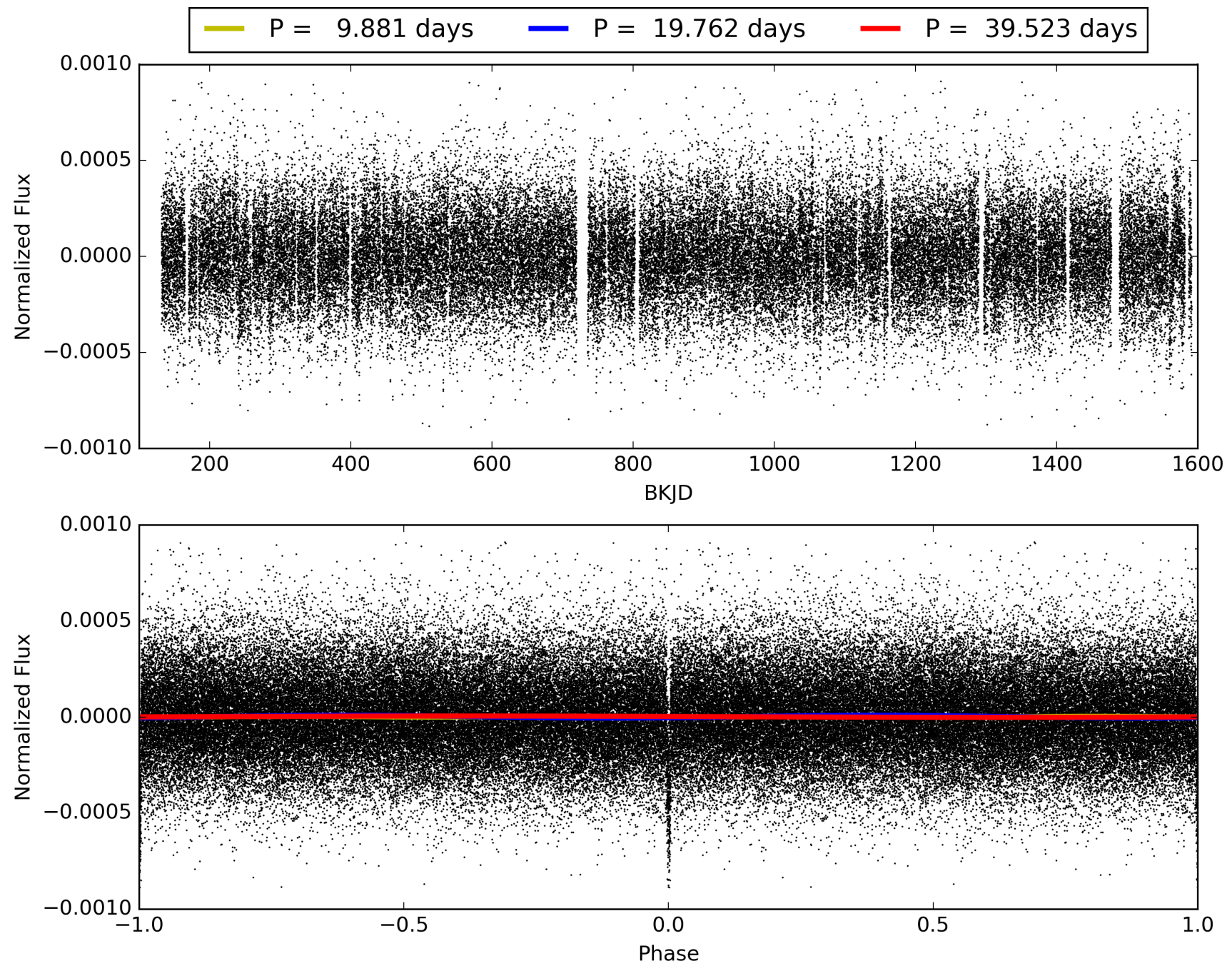
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [41.33σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 98.7%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 2.50e-211  
RollingBand-fgt: 1.00 [65/65]  
GhostDiagnostic-chr: 4.824  
Centroid-sig: 0.0%  
Centroid-so: 1.310 arcsec [3.42σ]  
OotOffset-rm: 0.494 arcsec [2.60σ]  
KicOffset-rm: 0.512 arcsec [2.58σ]  
OotOffset-st: 4/4/4/4 [16]  
KicOffset-st: 4/4/4/4 [16]  
DiffImageQuality-fgm: 1.00 [16/16]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 007047922-01, PDC Light Curves

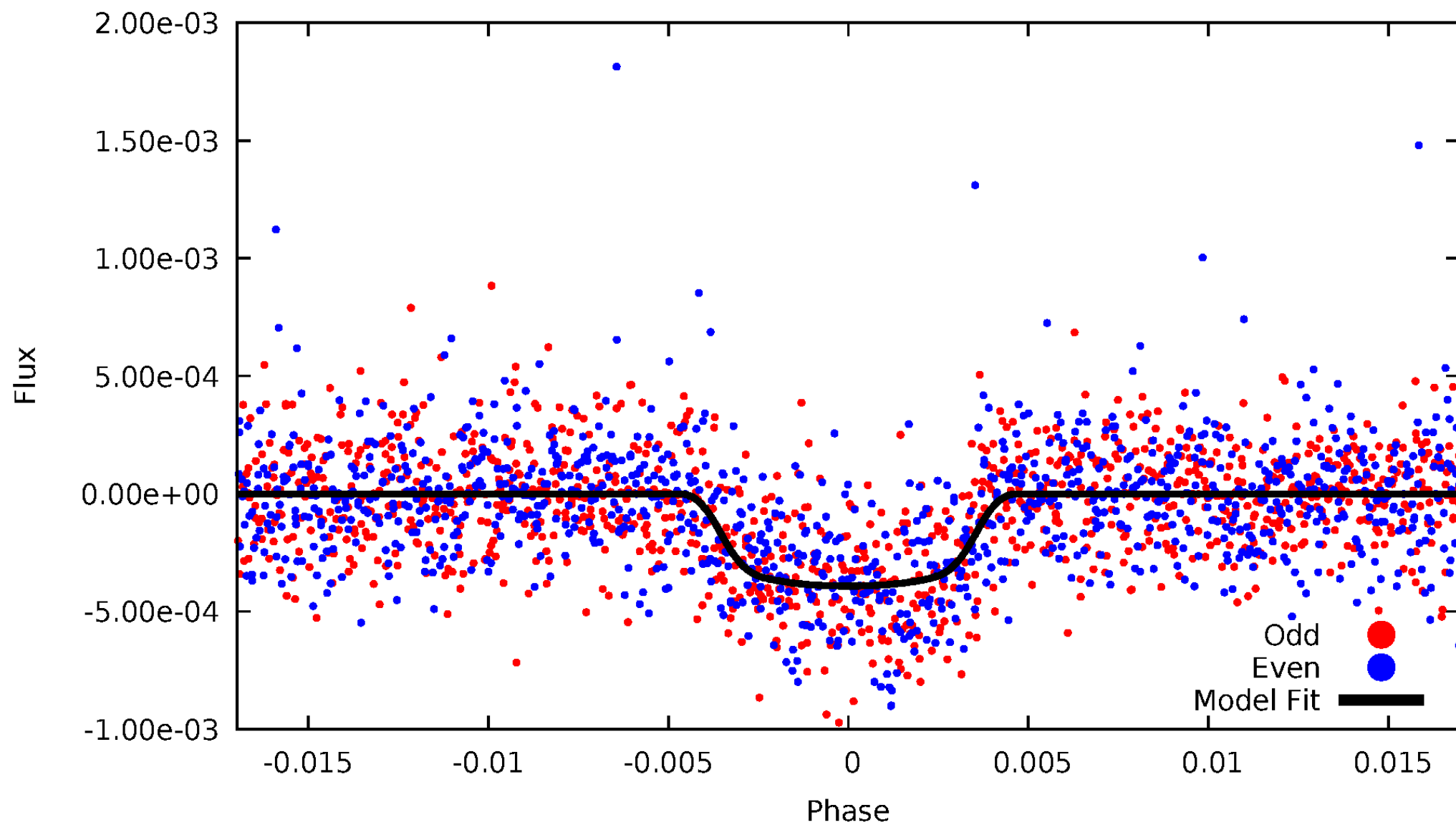


TCE 007047922-01



# DV Odd/Even

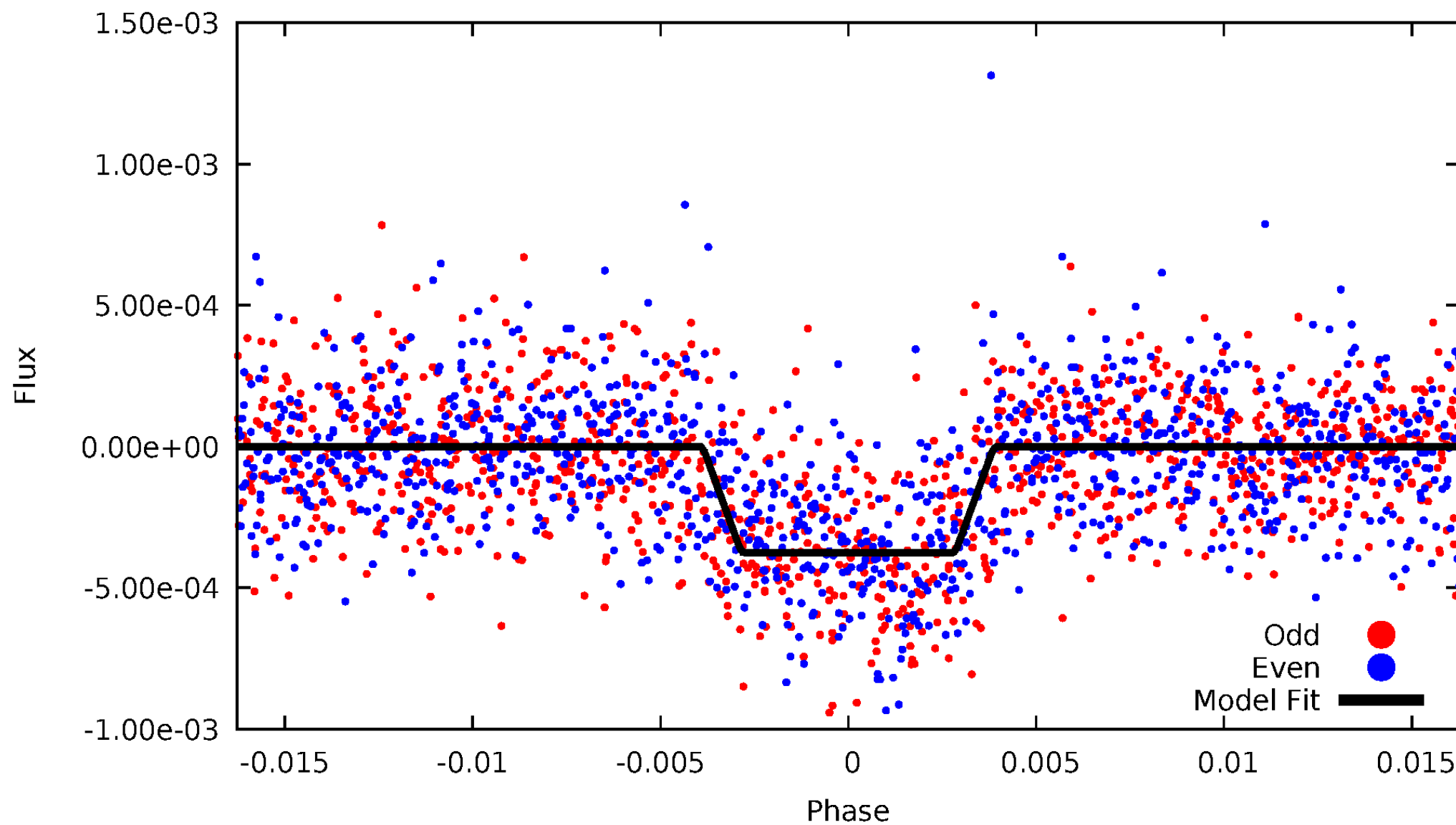
TCE 007047922-01





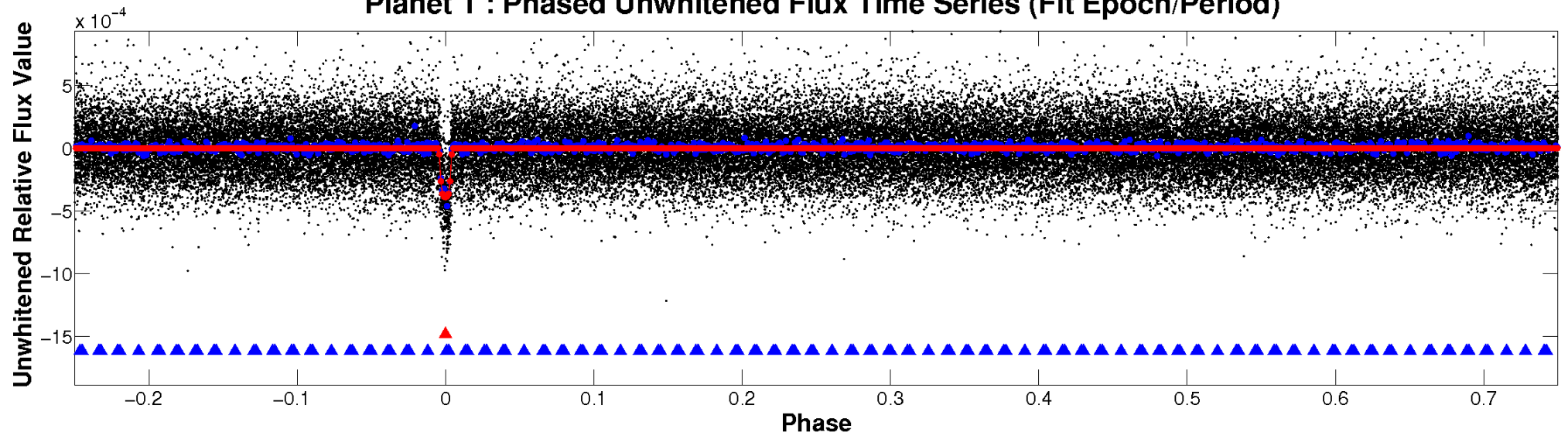
# ALT Odd/Even

TCE 007047922-01

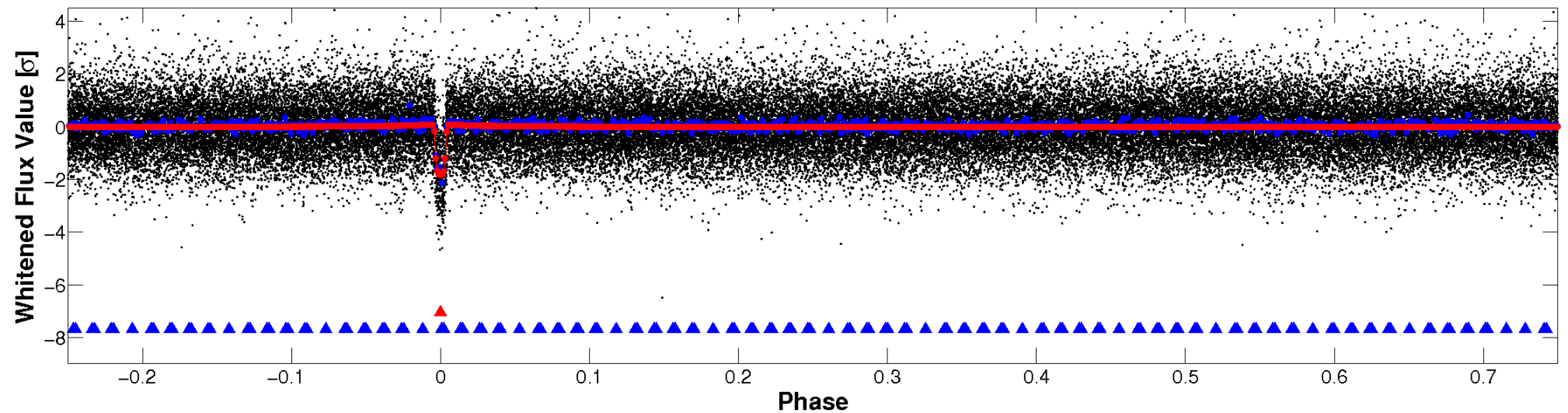


# Non-Whitened Vs. Whitened Light Curve

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

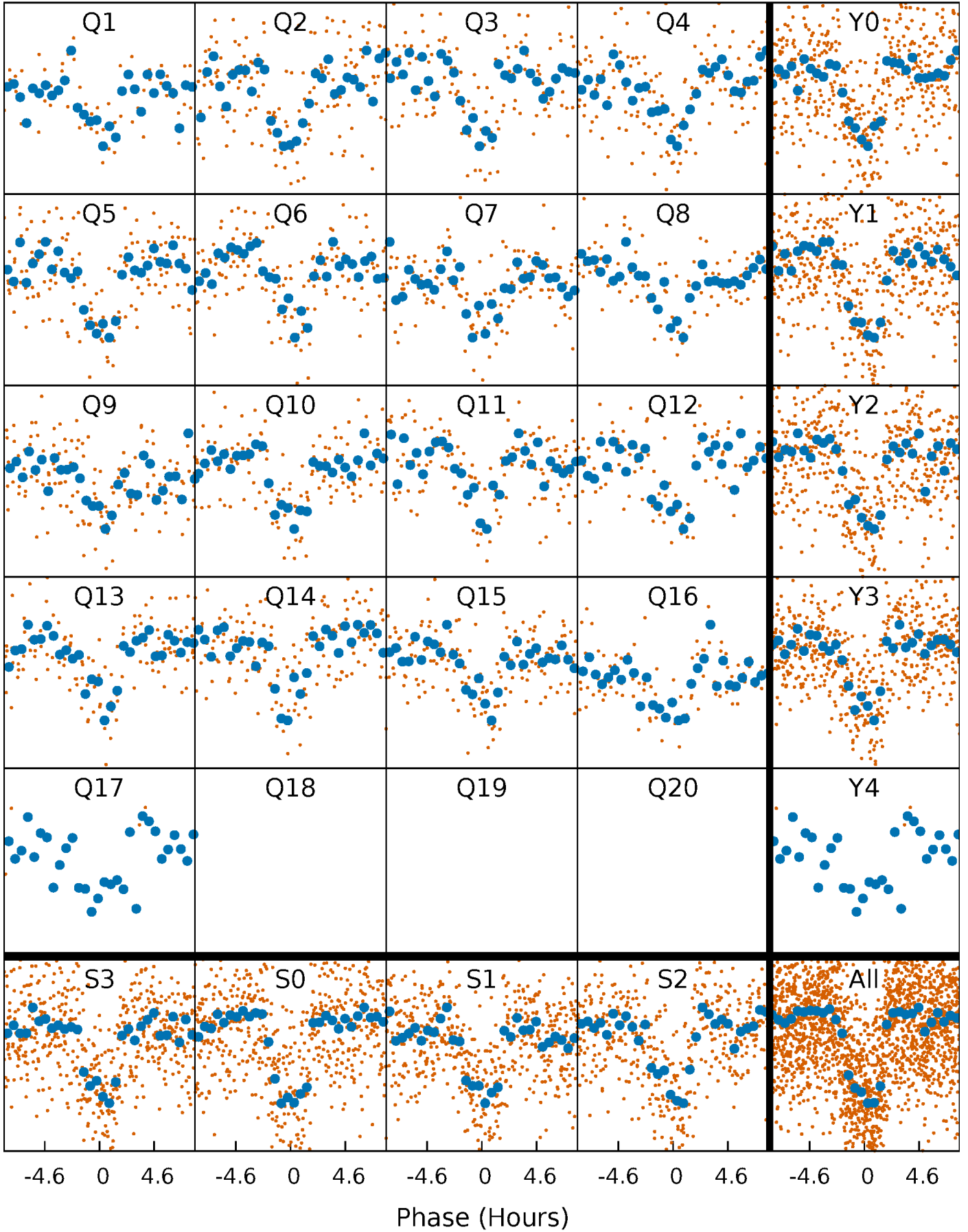


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

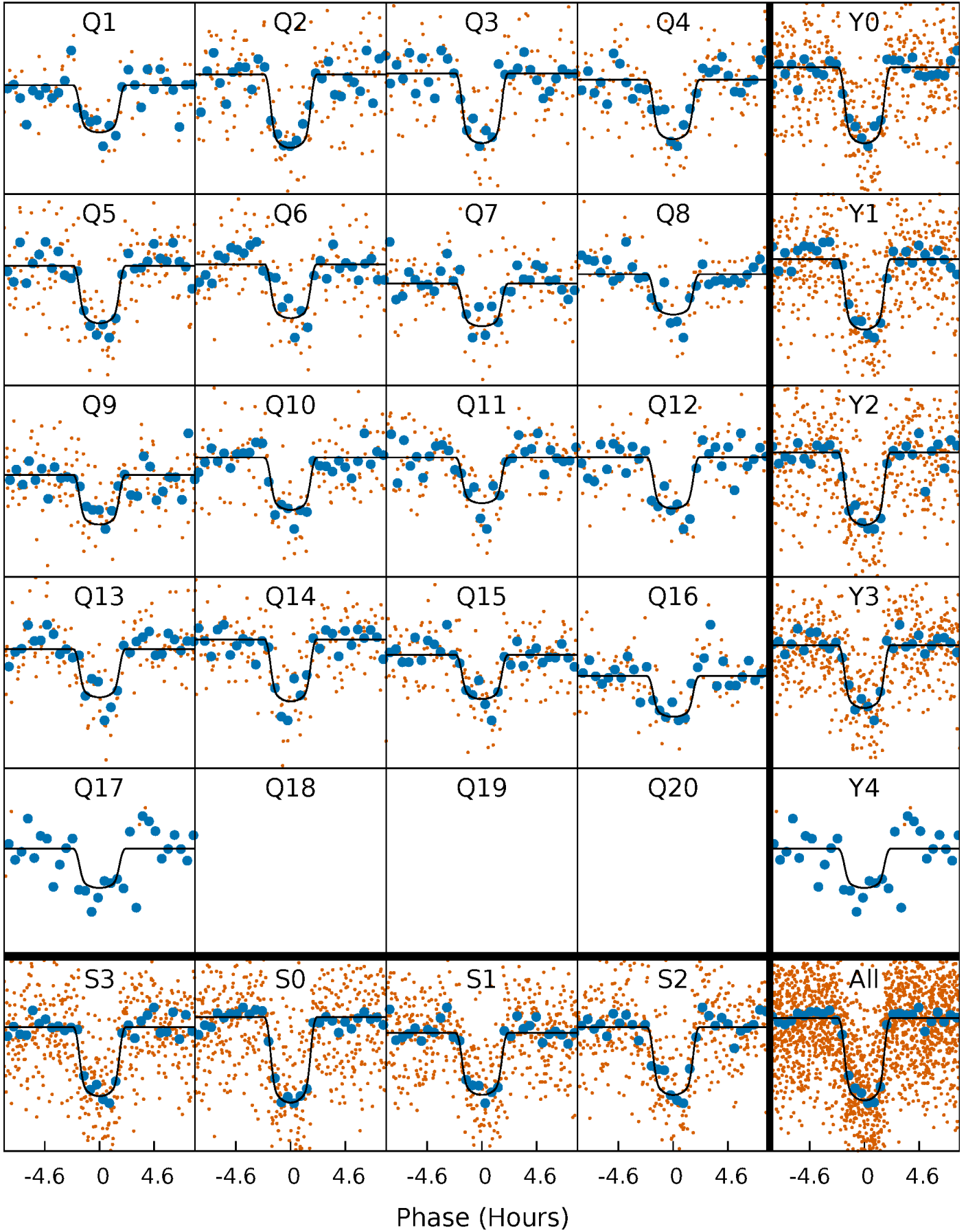
TCE 007047922-01 P= 19.761716 Days  $T_0=135.176818$  (BKJD)





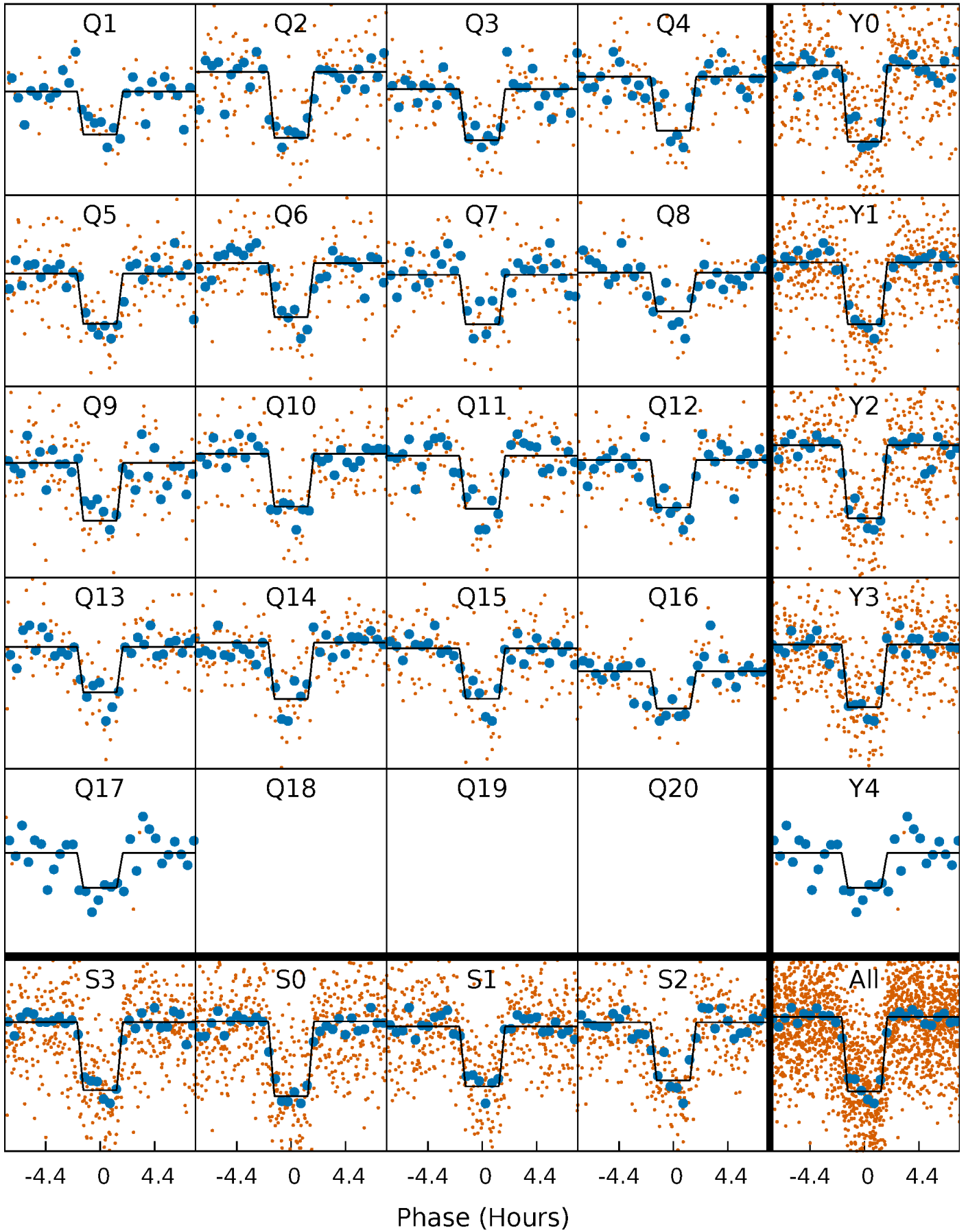
# DV Quarter-Phased Transit Curves

TCE 007047922-01 P= 19.761716 Days  $T_0=135.176818$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

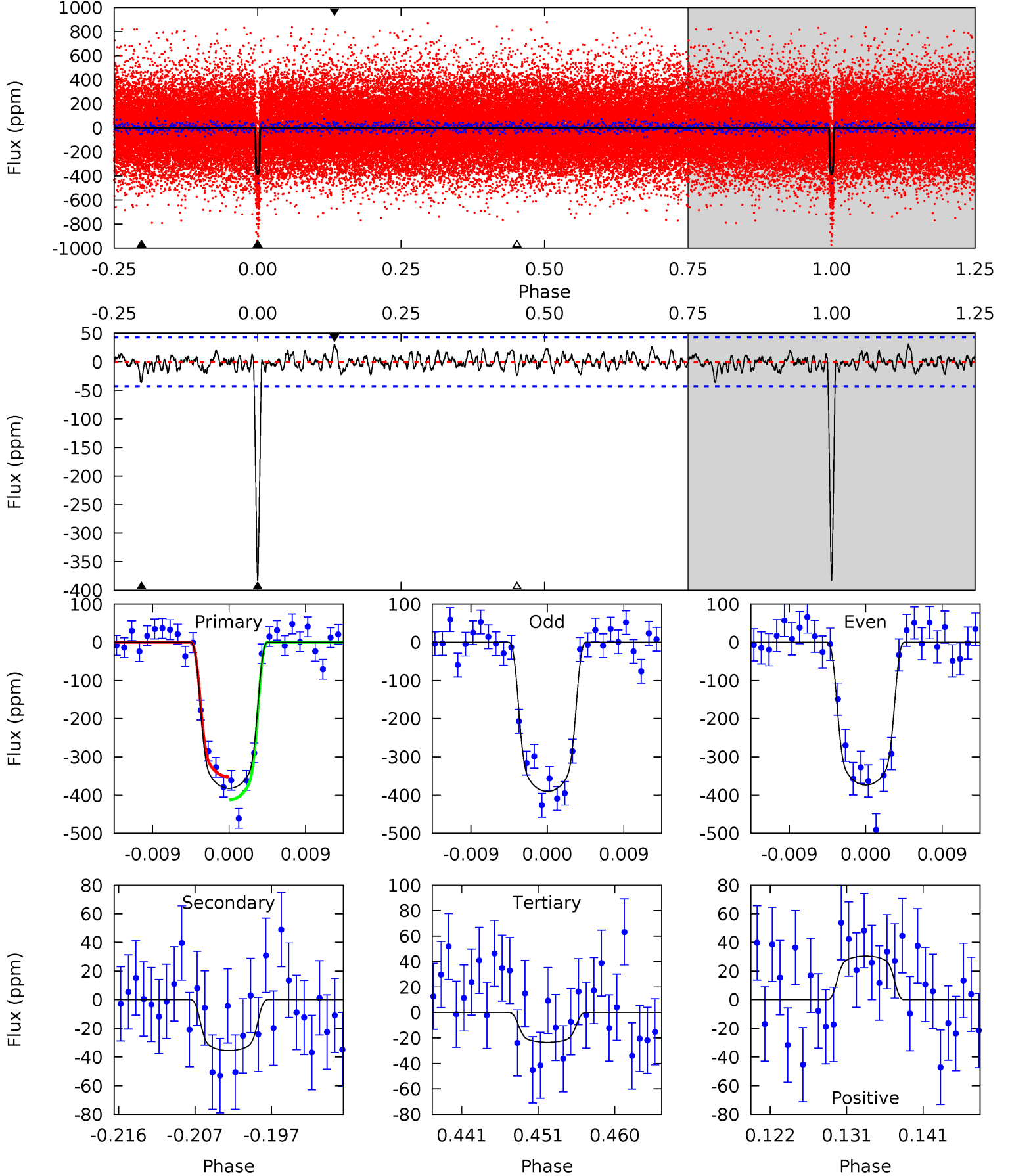
TCE 007047922-01 P= 19.761927 Days  $T_0=135.169098$  (BKJD)



# DV Model-Shift Uniqueness Test

007047922-01,  $P = 19.761716$  Days,  $E = 115.415102$  Days

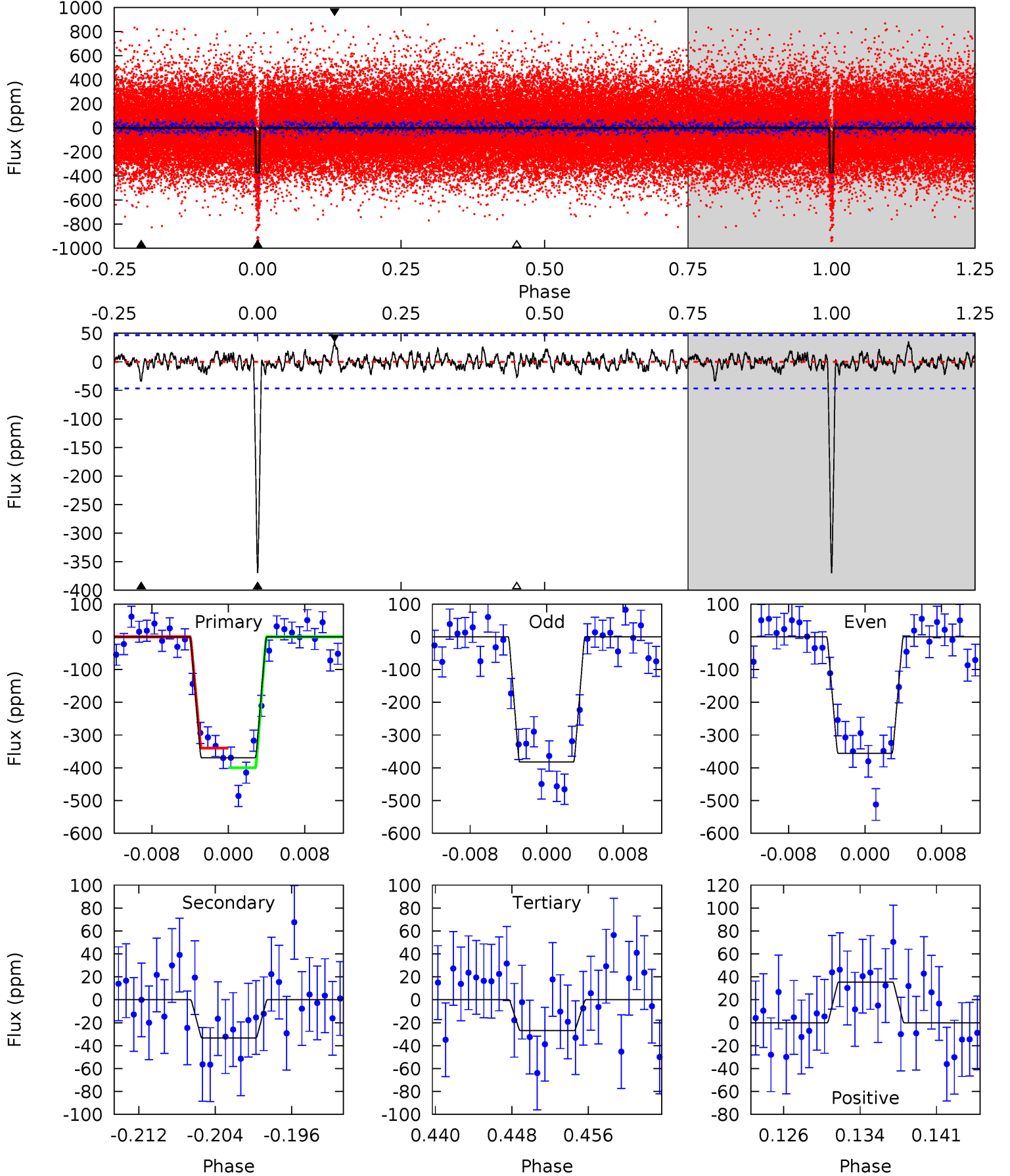
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
45.2	4.19	2.77	3.61	5.04	2.60	1.13	42.4	41.6	1.42	0.58	0.99	0.96	0.07	3.54



# Alt Model-Shift Uniqueness Test

007047922-01,  $P = 19.761927$  Days,  $E = 115.407171$  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
40.2	3.62	2.93	3.86	5.07	2.66	1.02	37.2	36.3	0.69	-0.24	1.43	0.99	0.09	3.24



### Stellar Parameters For KIC 007047922

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6327^{+291}_{-542}$	$4.327^{+0.158}_{-0.193}$	$-0.140^{+0.300}_{-0.300}$	$1.175^{+0.389}_{-0.259}$	$1.064^{+0.212}_{-0.173}$	$0.925^{+0.779}_{-0.492}$
	+5%/-9%	+4%/-4%	+214%/-214%	+33%/-22%	+20%/-16%	+84%/-53%
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 007047922-01 / KOI 1899.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-35 \pm 8$	$2.85^{+0.50}_{-0.37}$	$1101^{+99}_{-112}$	$3656^{+212}_{-252}$	$50^{+21}_{-17}$
Alt.	$-33 \pm 9$	$2.52^{+0.45}_{-0.34}$	$1096^{+106}_{-94}$	$3765^{+250}_{-271}$	$60^{+26}_{-22}$

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



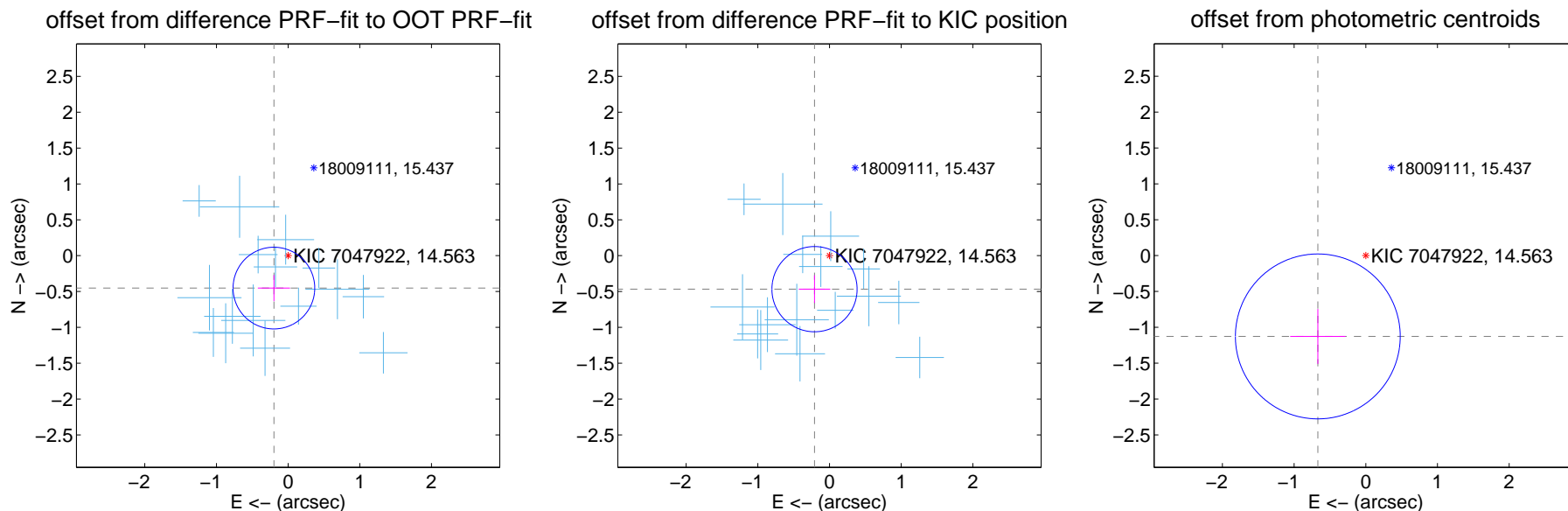
## DV Centroid Data

Supplemental centroid analysis for 007047922-01. Kepler magnitude: 14.56. Transit SNR 34.00

There are 16 quarters with good PRF difference image offsets

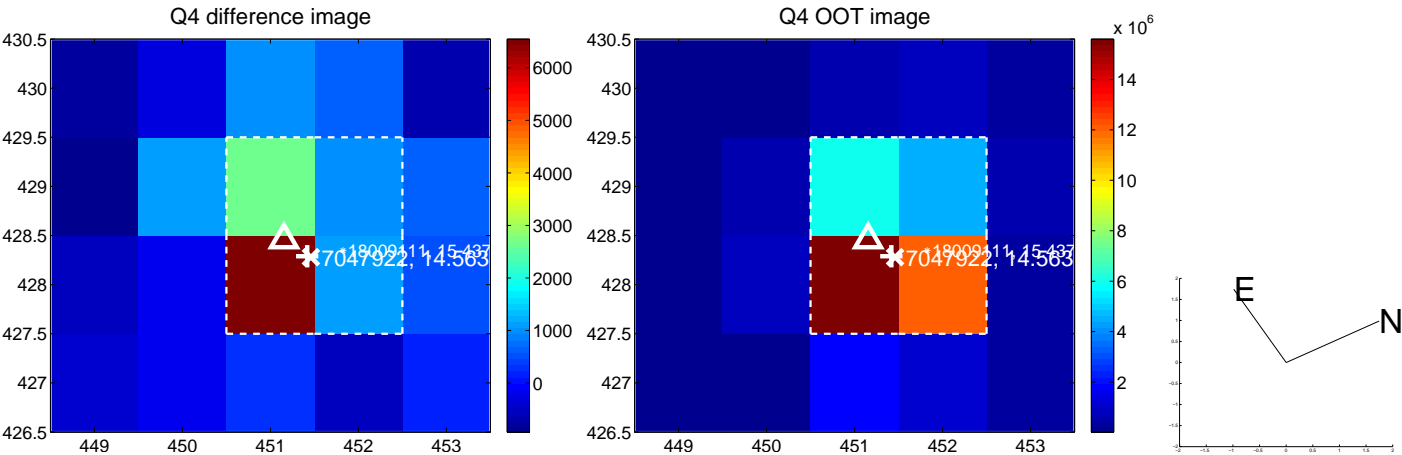
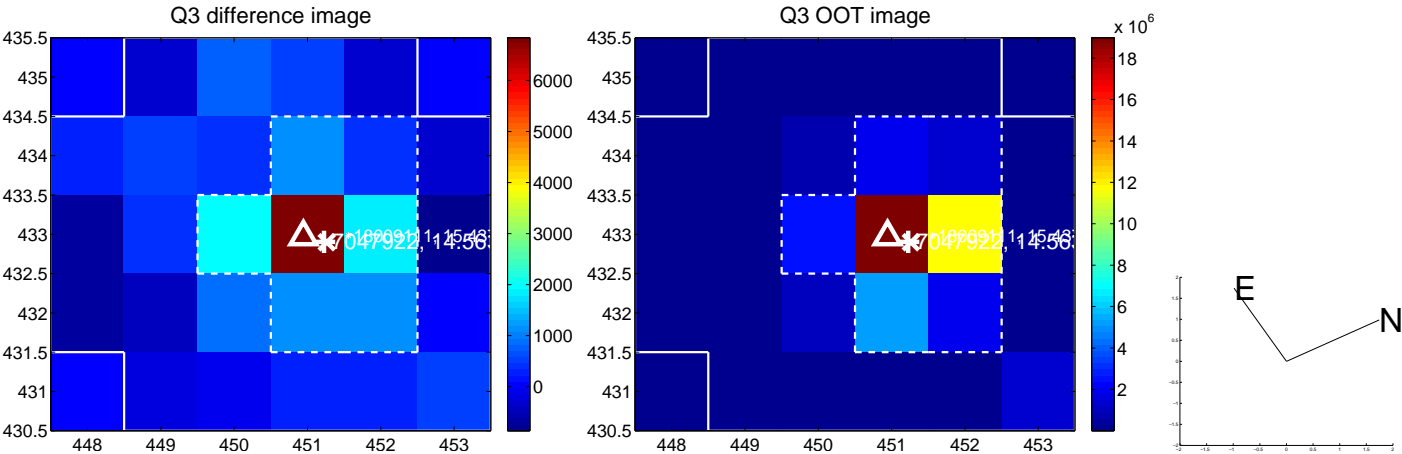
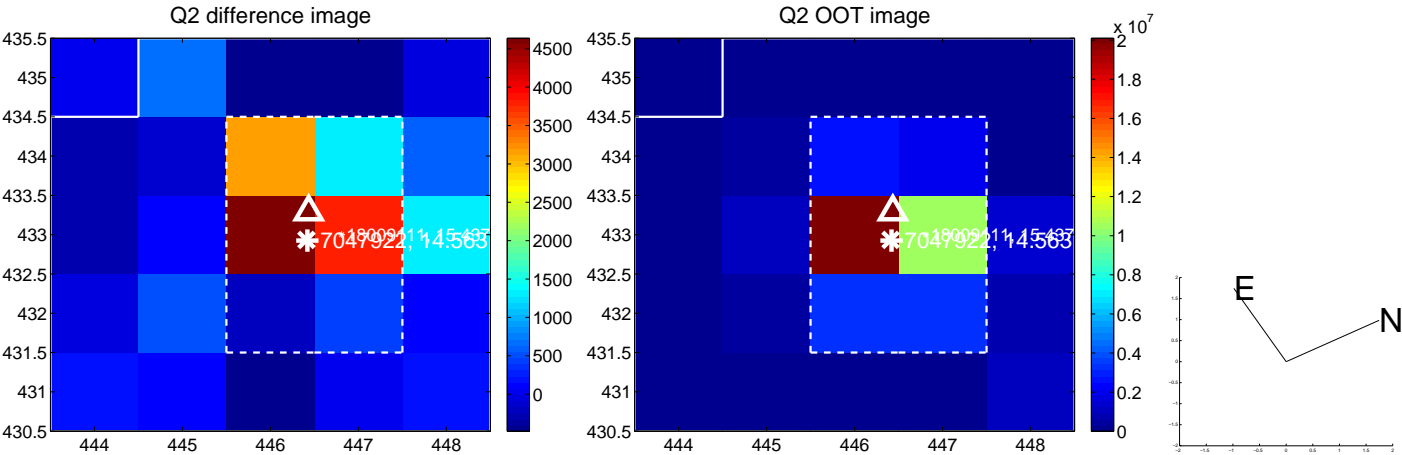
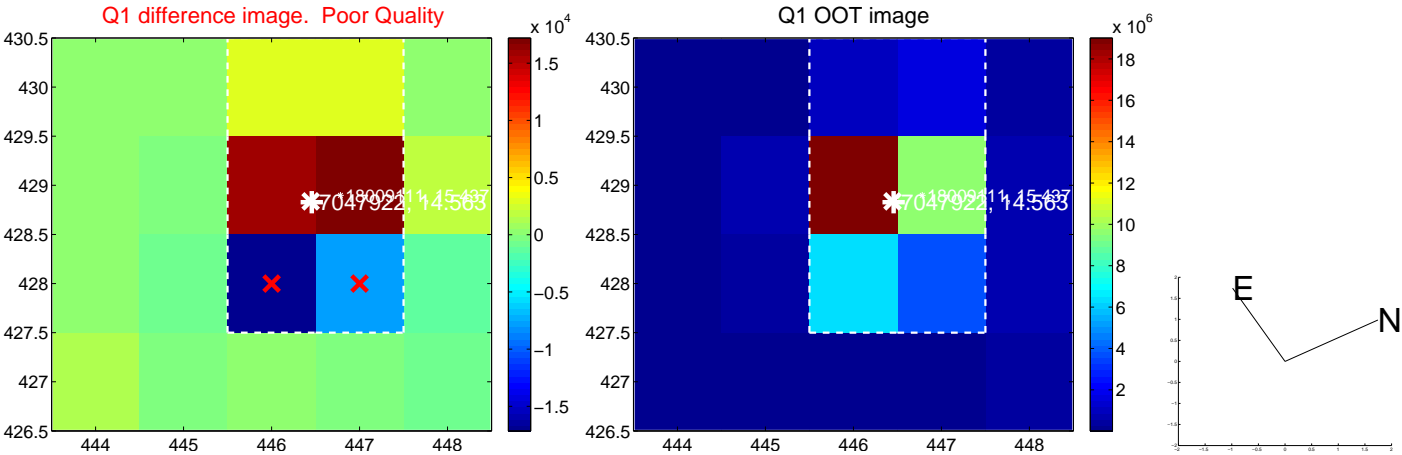
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.494 \pm 0.190$	2.60	$0.198 \pm 0.224$	$-0.452 \pm 0.183$
PRF-fit source offset from KIC position	$0.512 \pm 0.198$	2.58	$0.209 \pm 0.220$	$-0.467 \pm 0.193$
photometric centroid source offset	$1.31 \pm 0.38$	<b>3.42</b>	$0.67 \pm 0.38$	$-1.13 \pm 0.38$

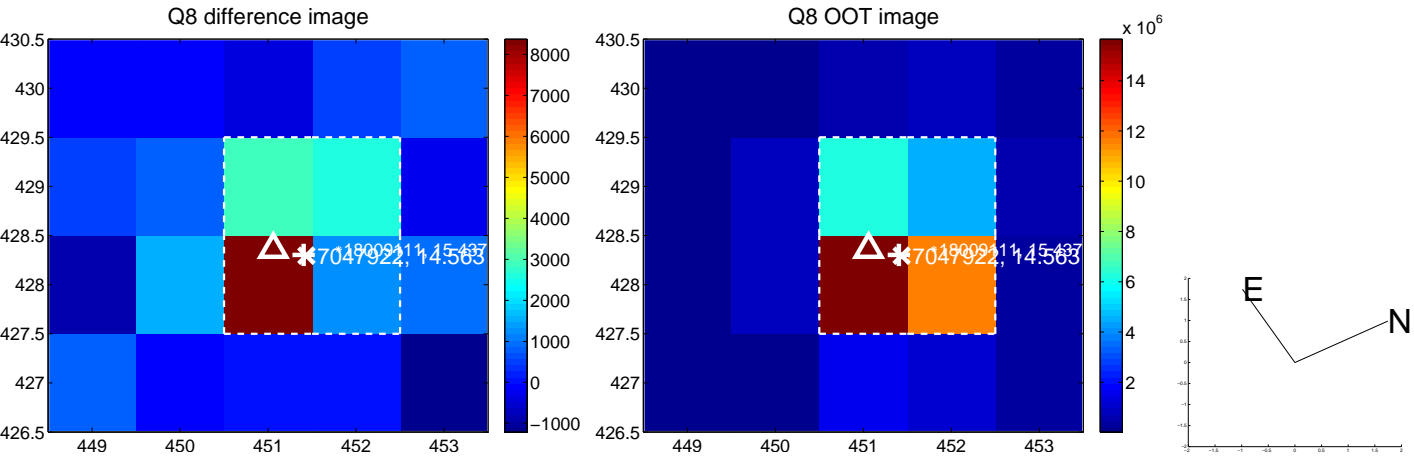
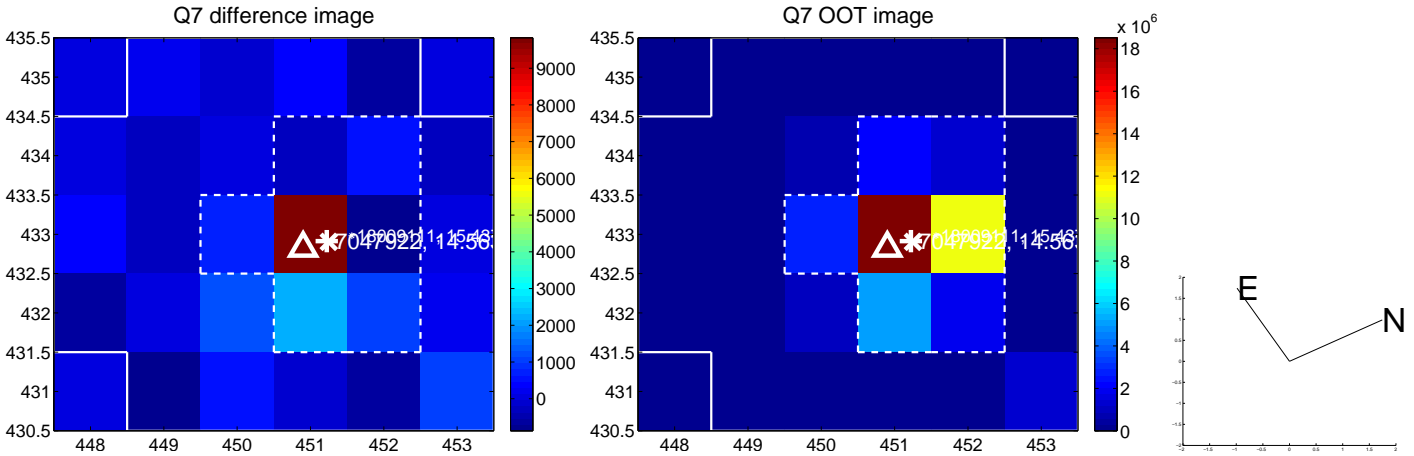
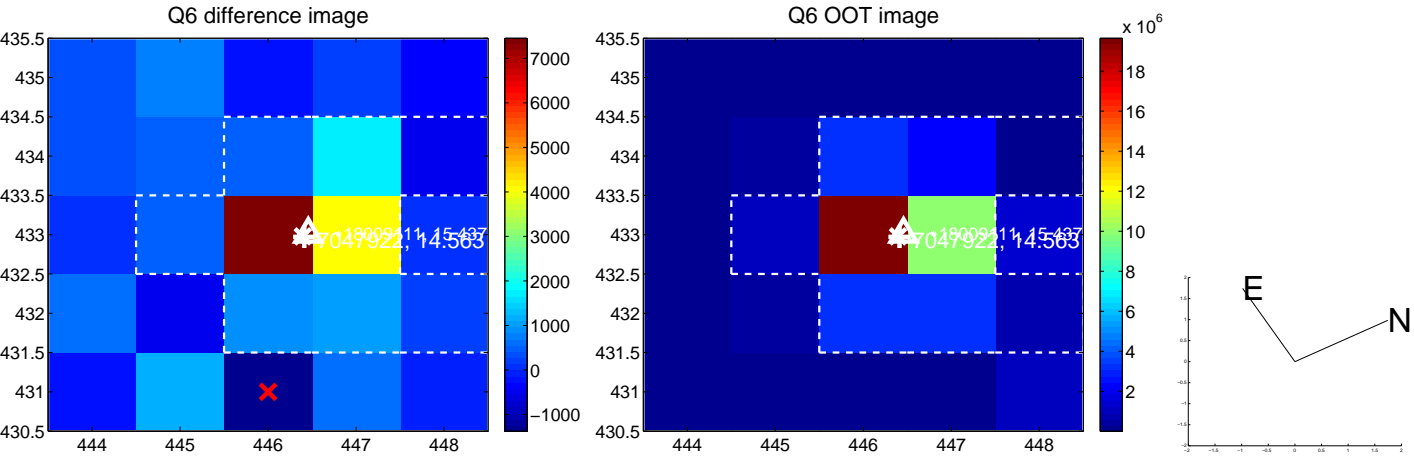
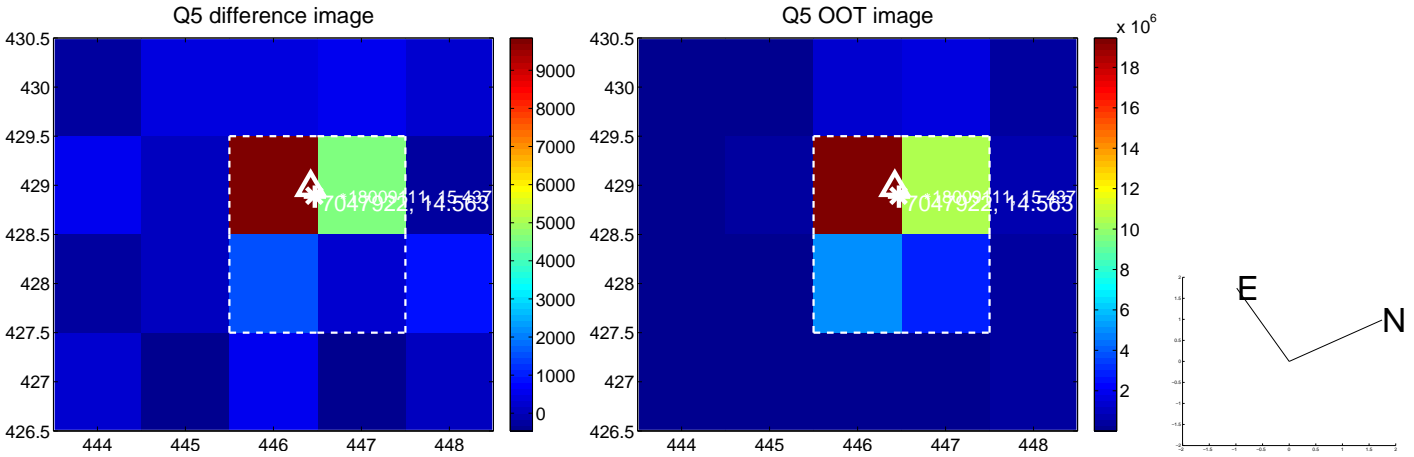


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

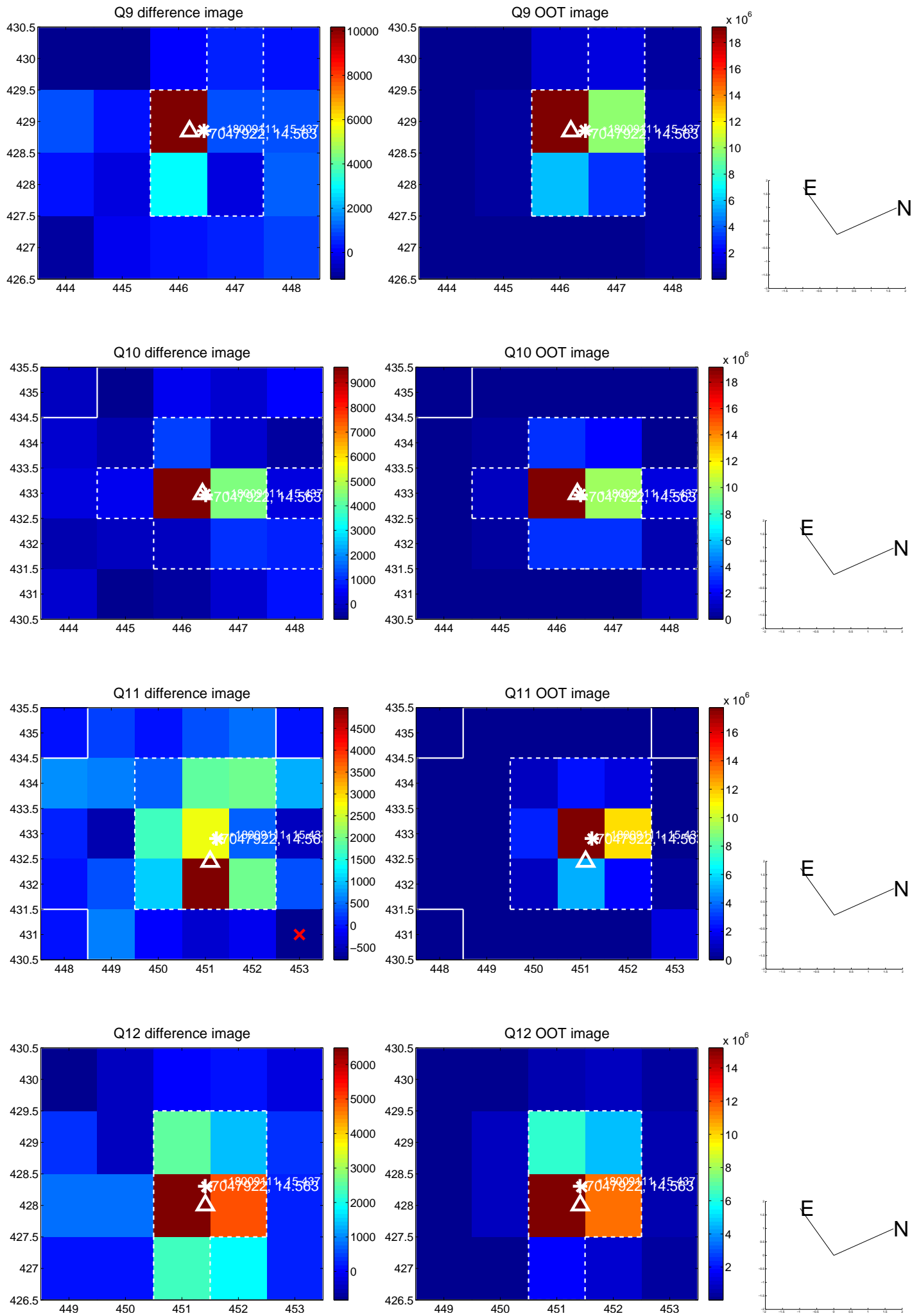
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



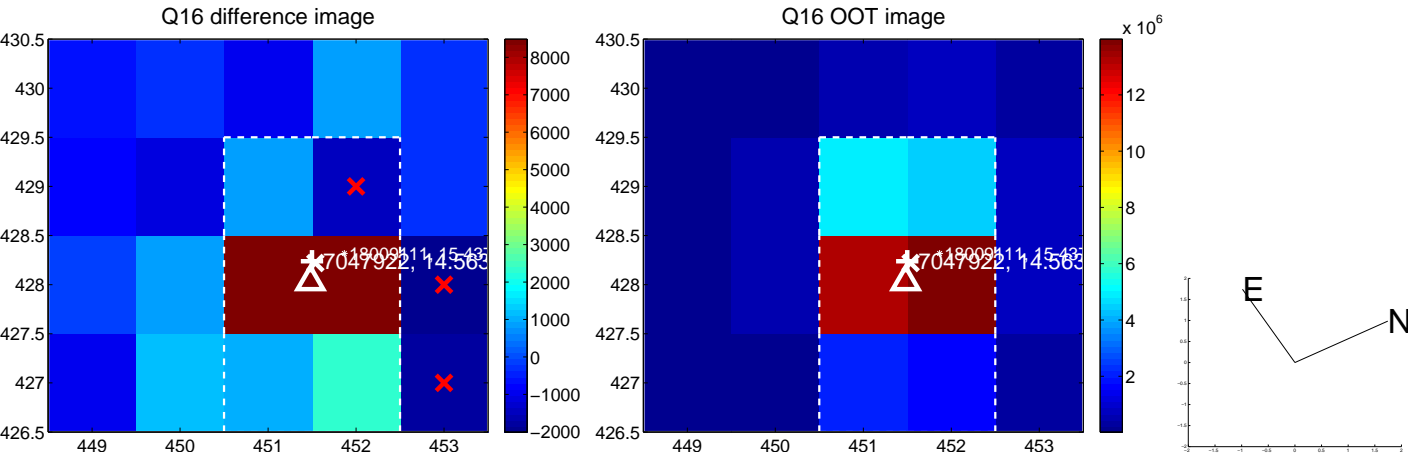
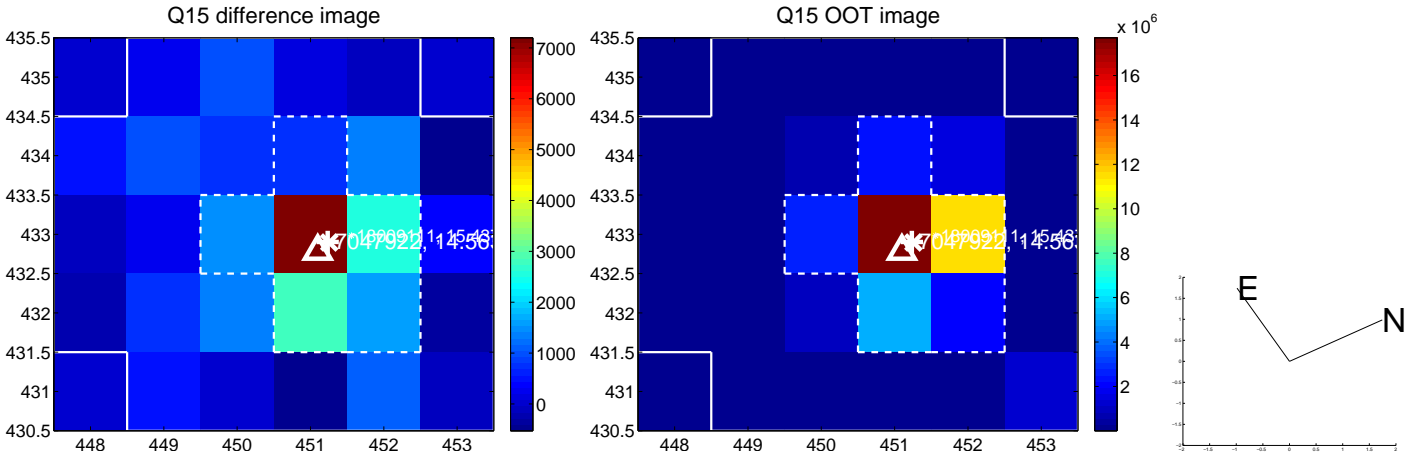
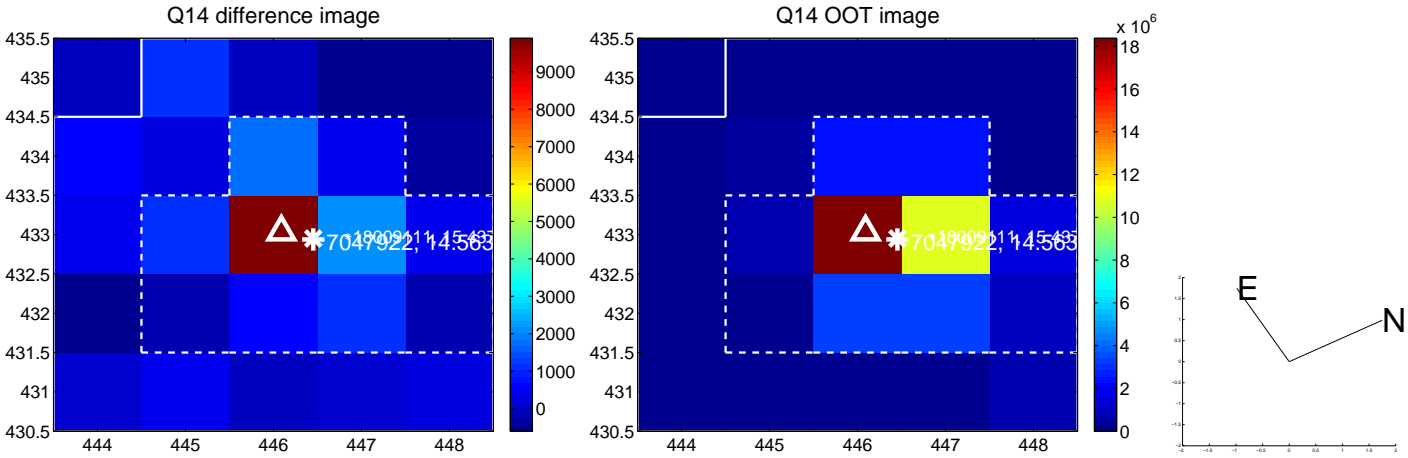
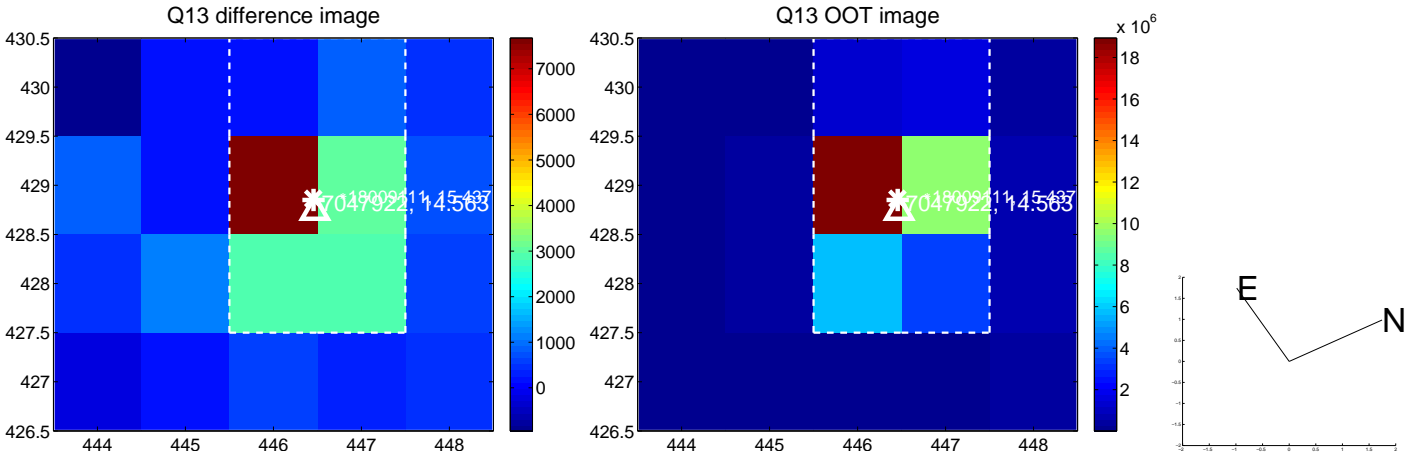
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

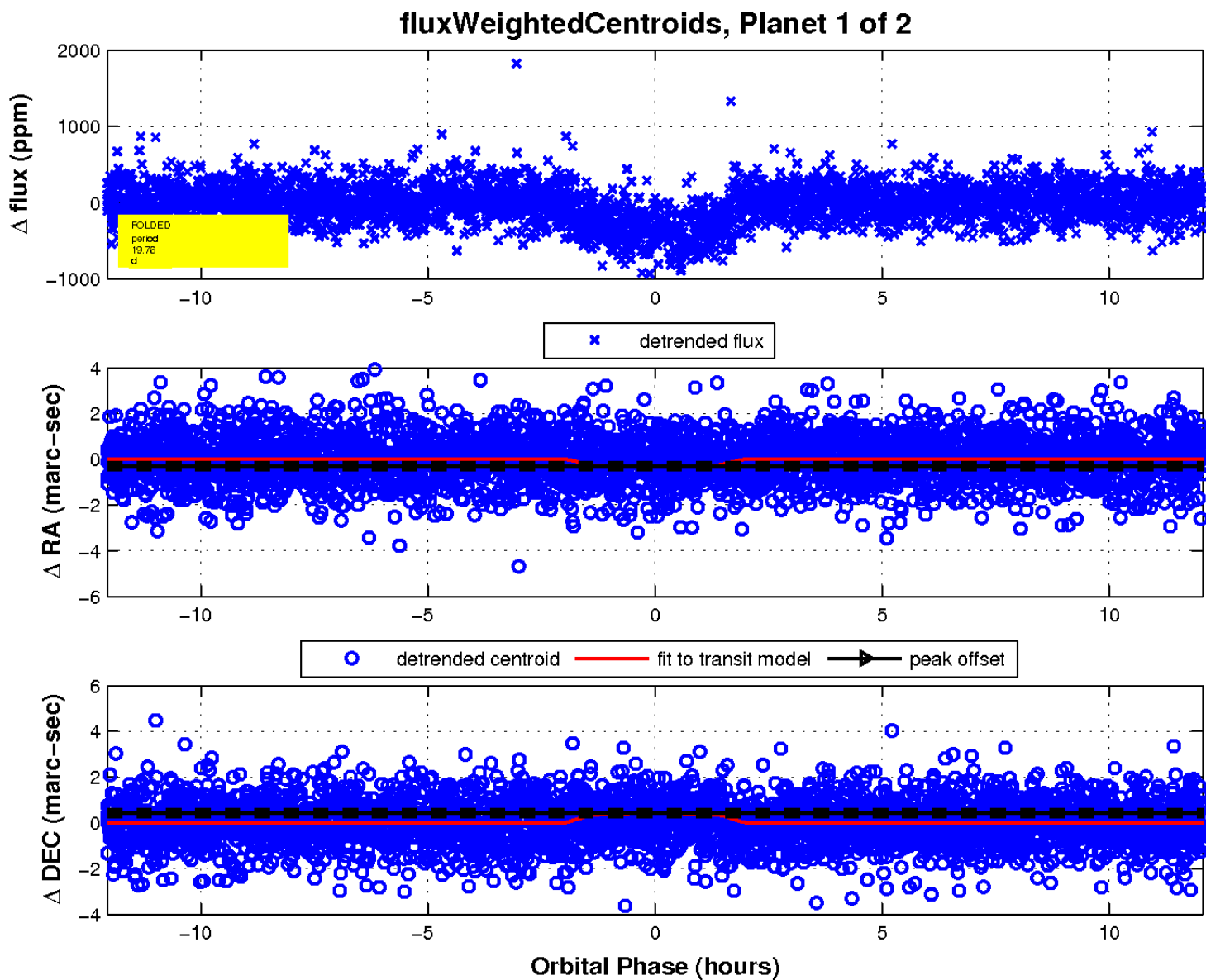
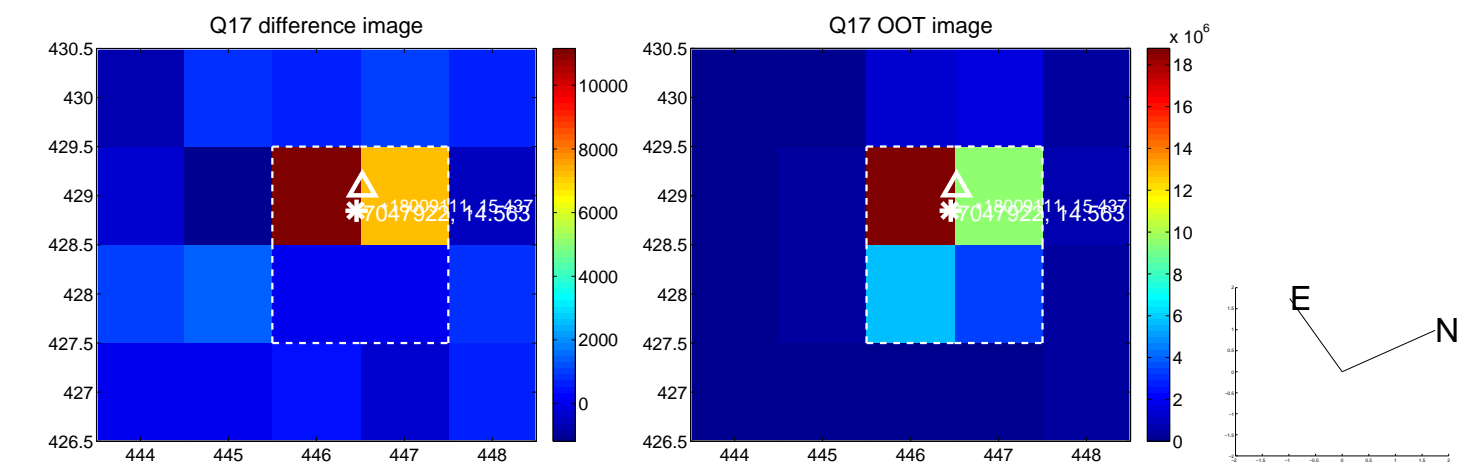


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



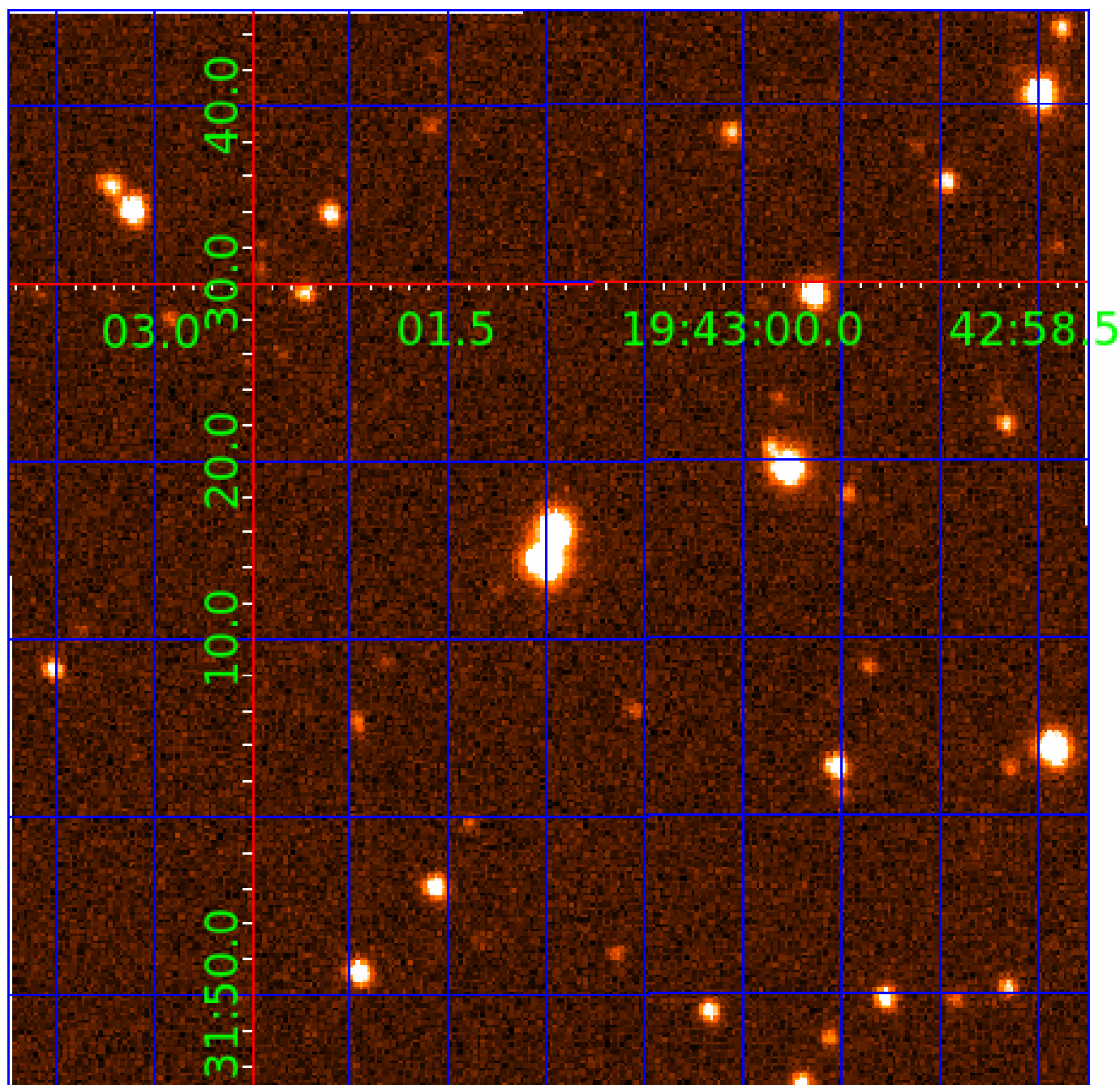


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 007047922

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007047922-01	OBS	1899.01	19.761716	135.176818	392.4	4.024	31.5	34.0	1.18	6327	2.84	92.60
007047922-02	OBS	1899.02	10.522842	140.048228	77.8	3.548	8.7	9.2	1.18	6327	1.19	214.55

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007047922-01	OBS	PC	0.97	0	0	0	0	NO_COMMENT
007047922-02	OBS	PC	0.99	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.

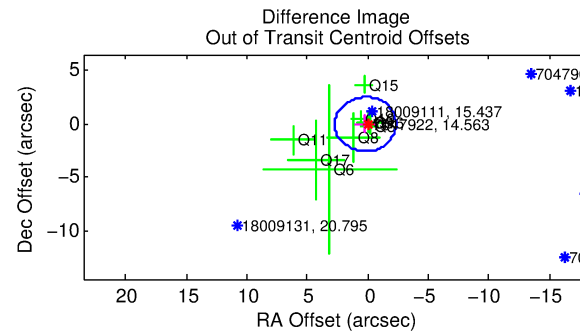
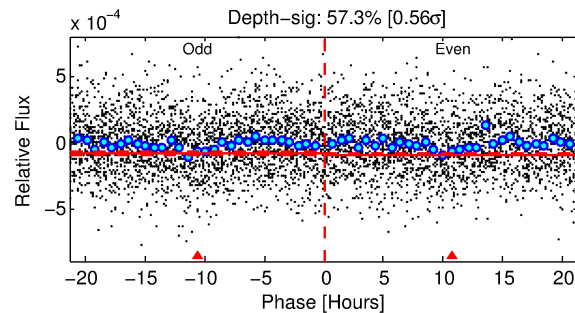
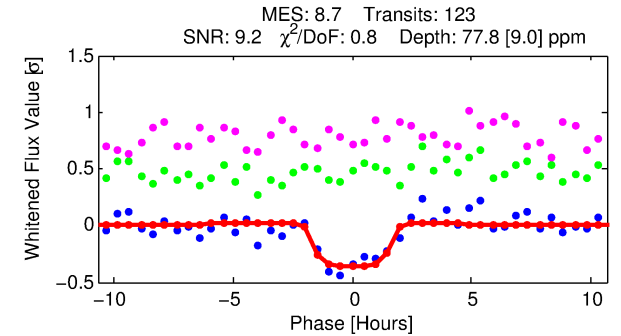
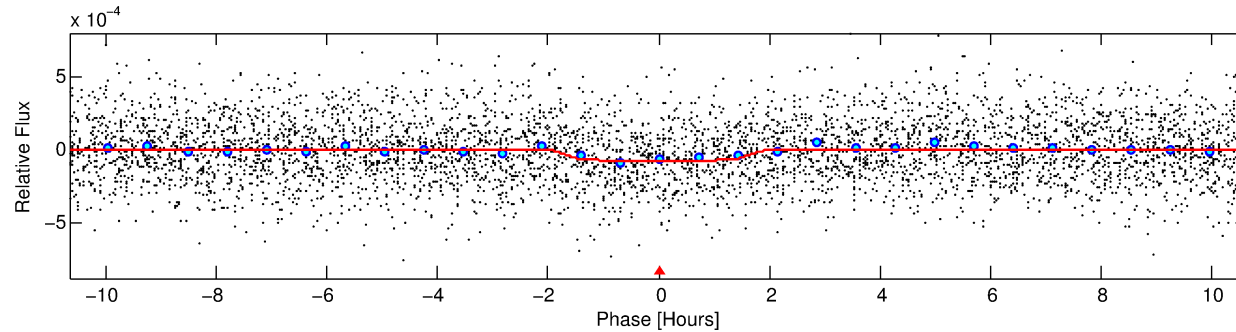
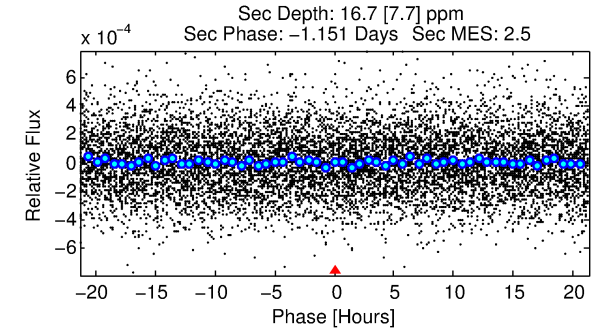
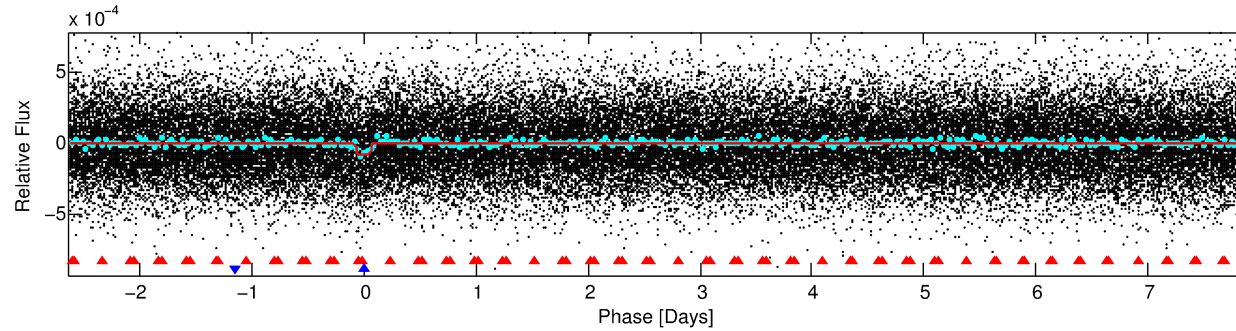
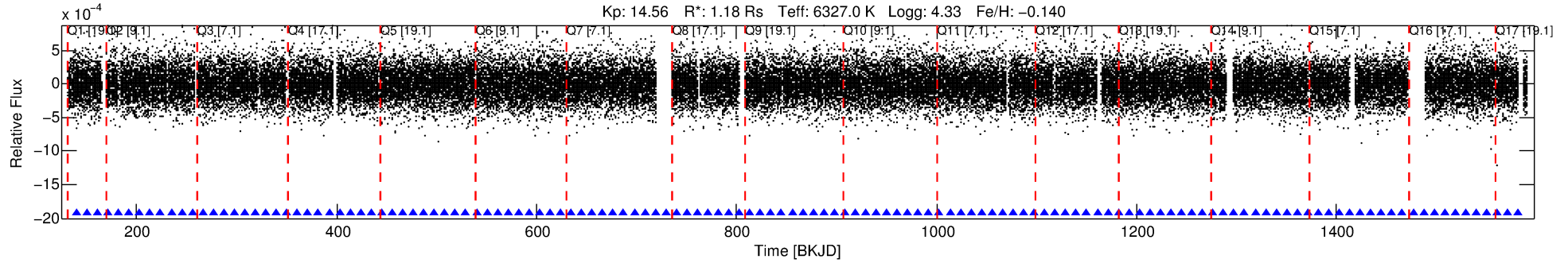
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007047922-02

No Significant Match Found

# DV One-Page Summary

KIC: 7047922 Candidate: 2 of 2 Period: 10.523 d  
KOI: K01899.02 Corr: 0.922



## DV Fit Results:

Period = 10.52284 [0.00011] d  
Epoch = 140.0482 [0.0079] BKJD  
Rp/R\* = 0.0093 [0.0060]  
a/R\* = 11.37 [39.72]  
b = 0.88 [0.94]  
Teff = 214.55 [108.11]  
Teq = 976 [123] K  
Rp = 1.19 [0.86] Re  
a = 0.0961 [0.0255] AU  
Ag = 59.49 [83.88] [0.70σ]  
Teffp = 4190 [1470] K [2.18σ]

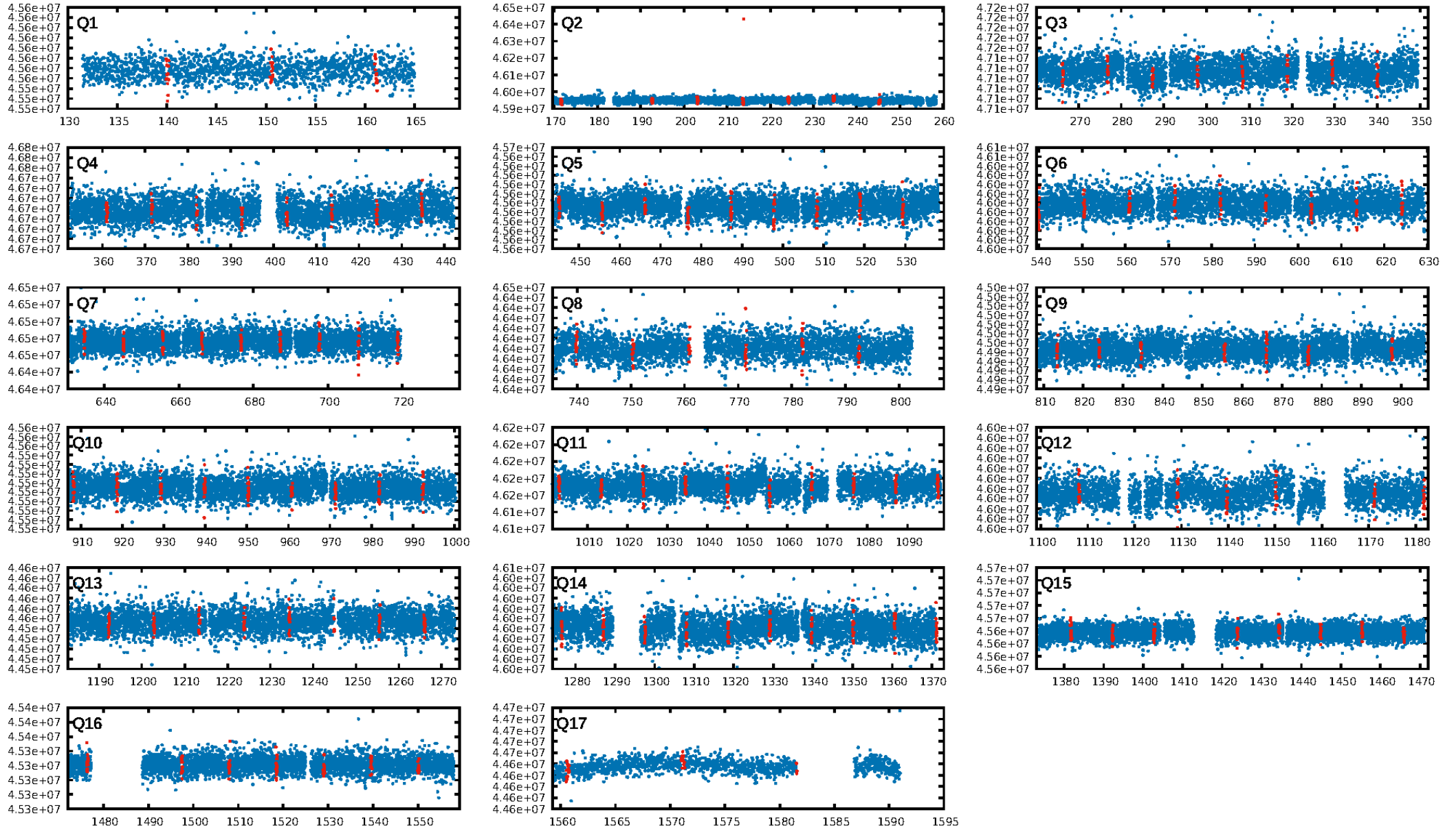
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [41.33σ]  
ModelChiSquare2-sig: 98.6%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 5.58e-18  
RollingBand-fgt: 1.00 [118/118]  
GhostDiagnostic-chr: -4.018  
Centroid-sig: 43.1%  
Centroid-so: 1.469 arcsec [1.03σ]  
OotOffset-rm: 0.225 arcsec [0.27σ]  
KicOffset-rm: 0.232 arcsec [0.27σ]  
OotOffset-st: 2/2/2/3 [9]  
KicOffset-st: 2/2/2/3 [9]  
DiffImageQuality-fgm: 0.56 [5/9]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 18:25:31 Z

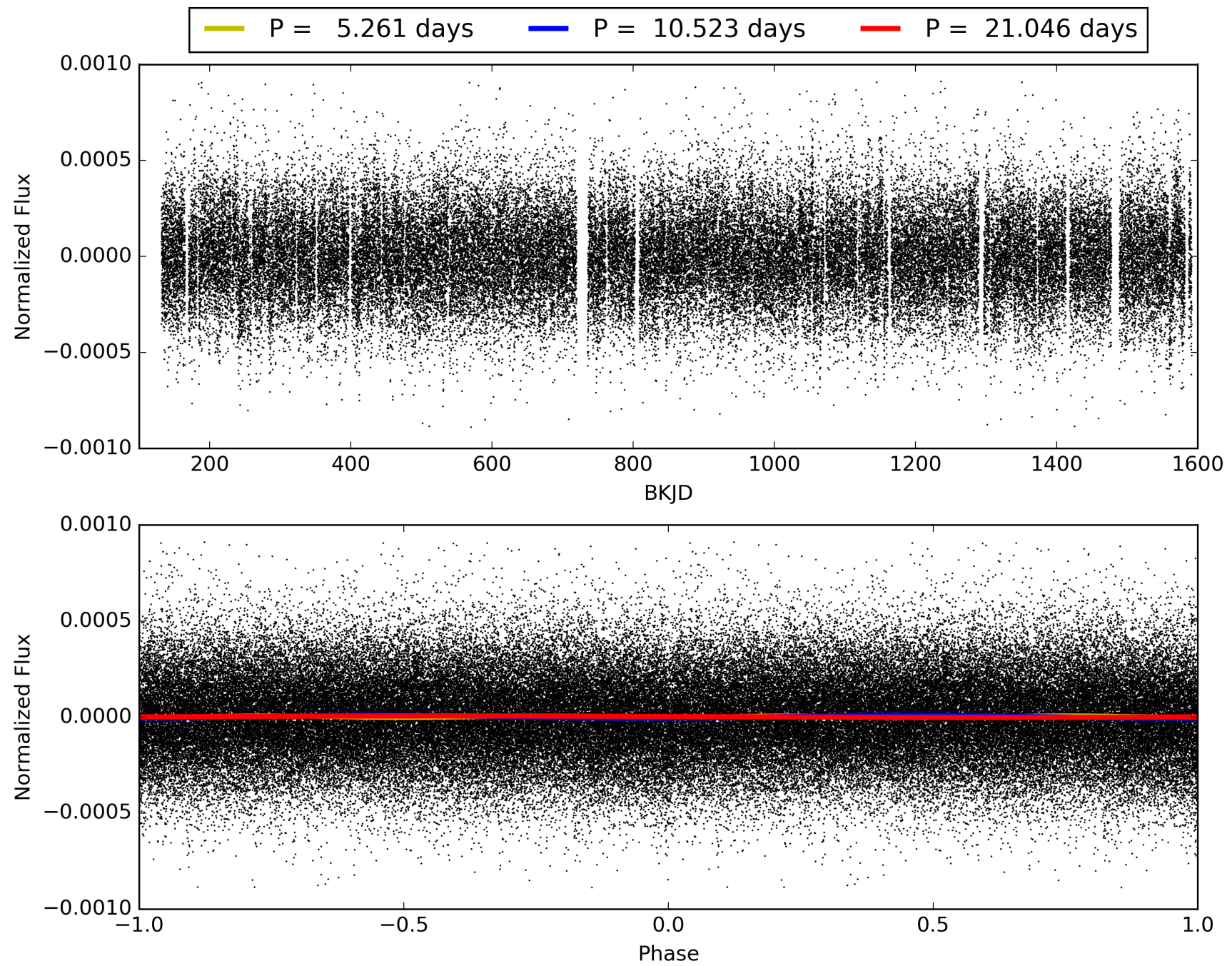
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 007047922-02, PDC Light Curves



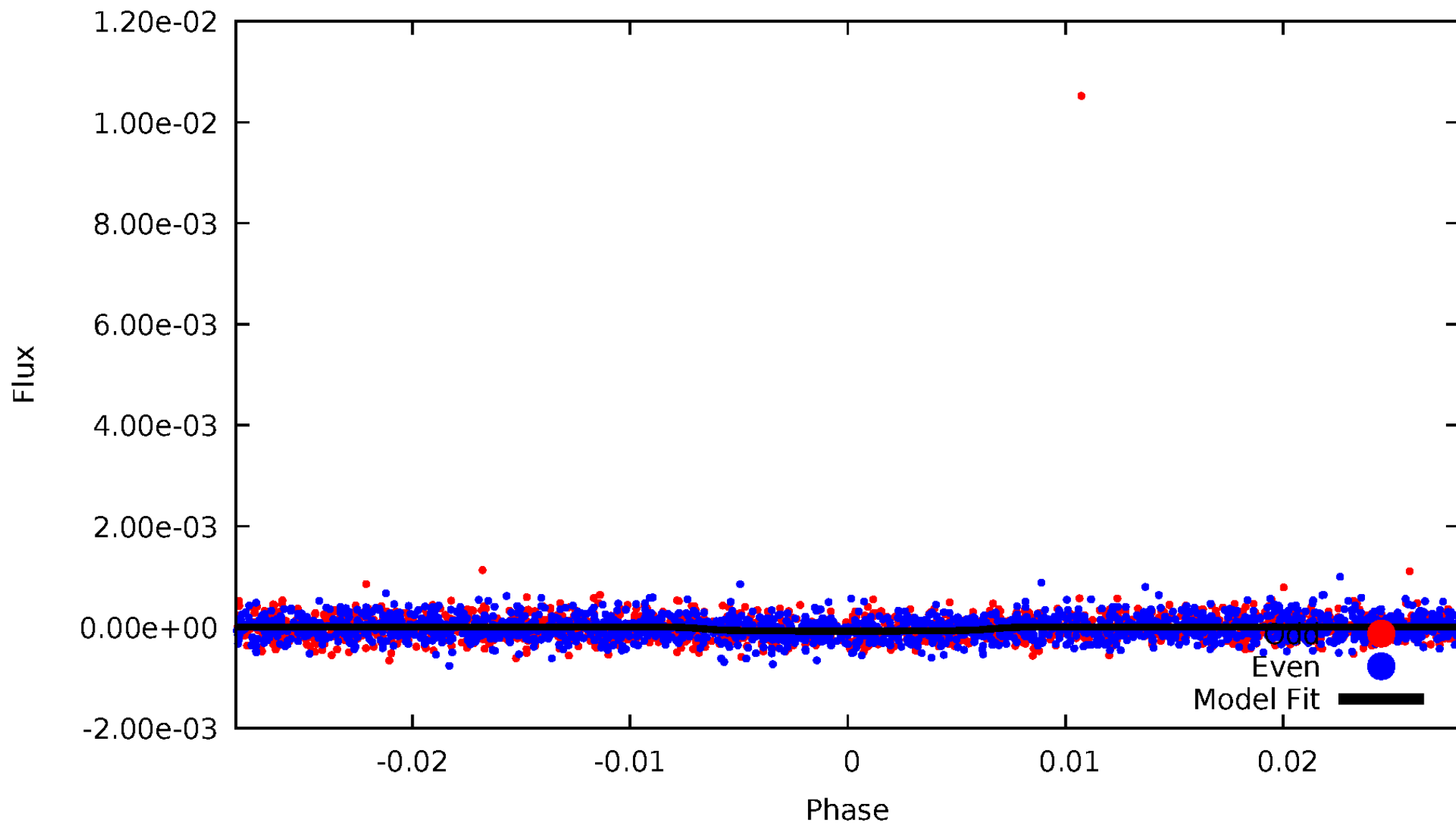


TCE 007047922-02



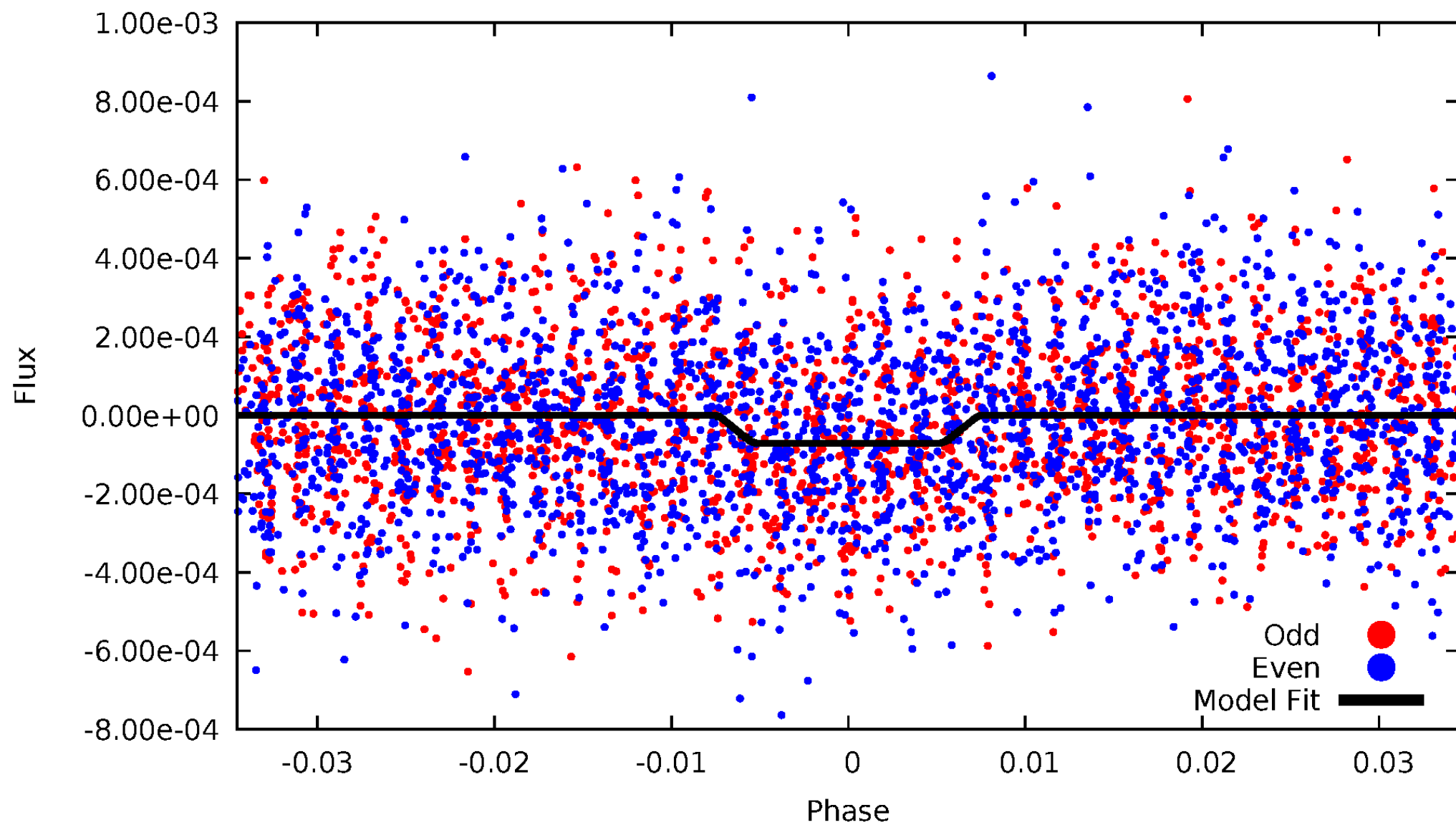
# DV Odd/Even

TCE 007047922-02



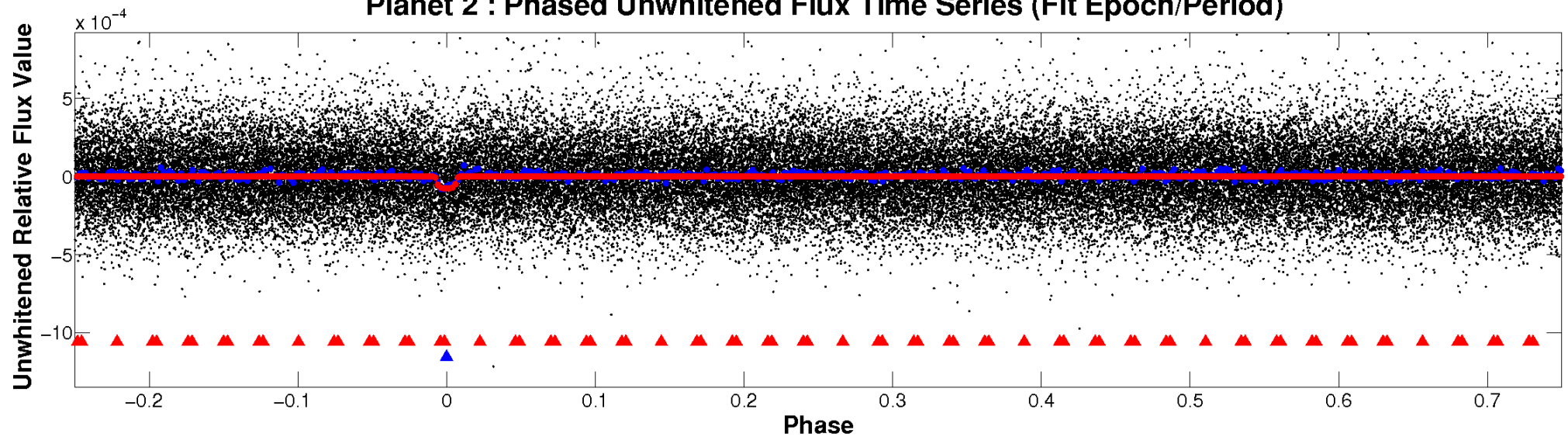
# ALT Odd/Even

TCE 007047922-02

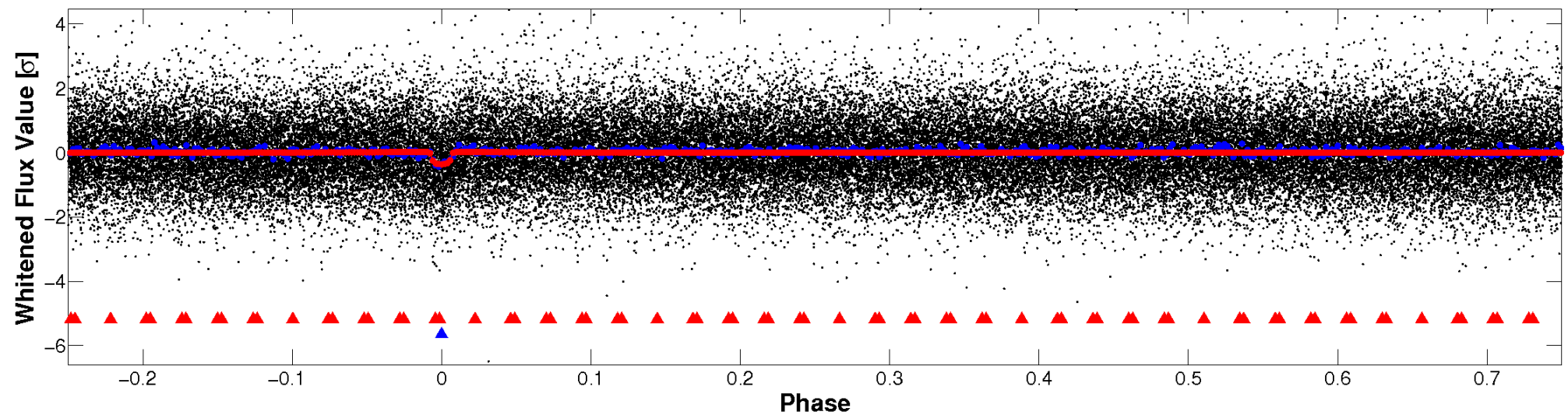


# Non-Whitened Vs. Whitened Light Curve

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



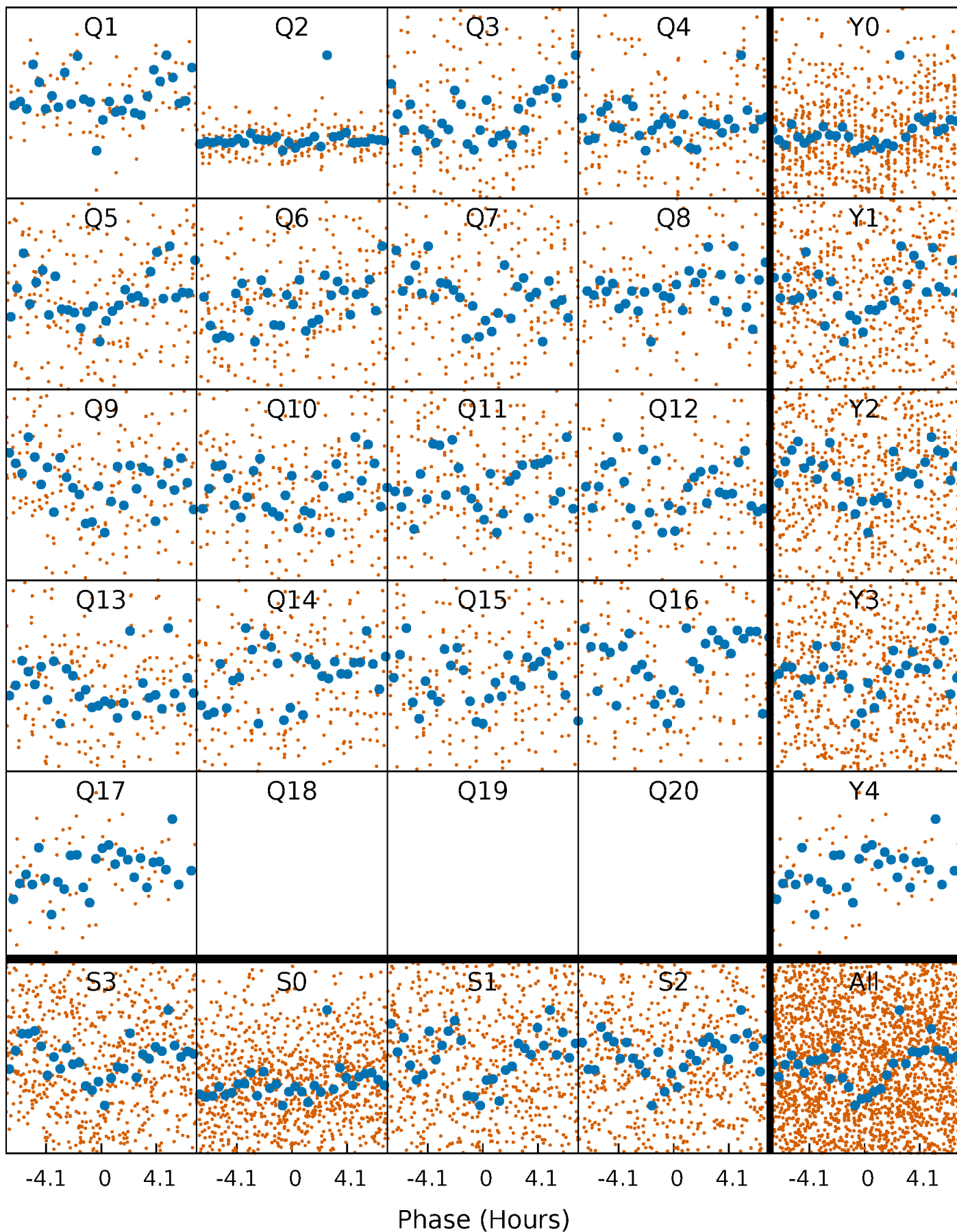
## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

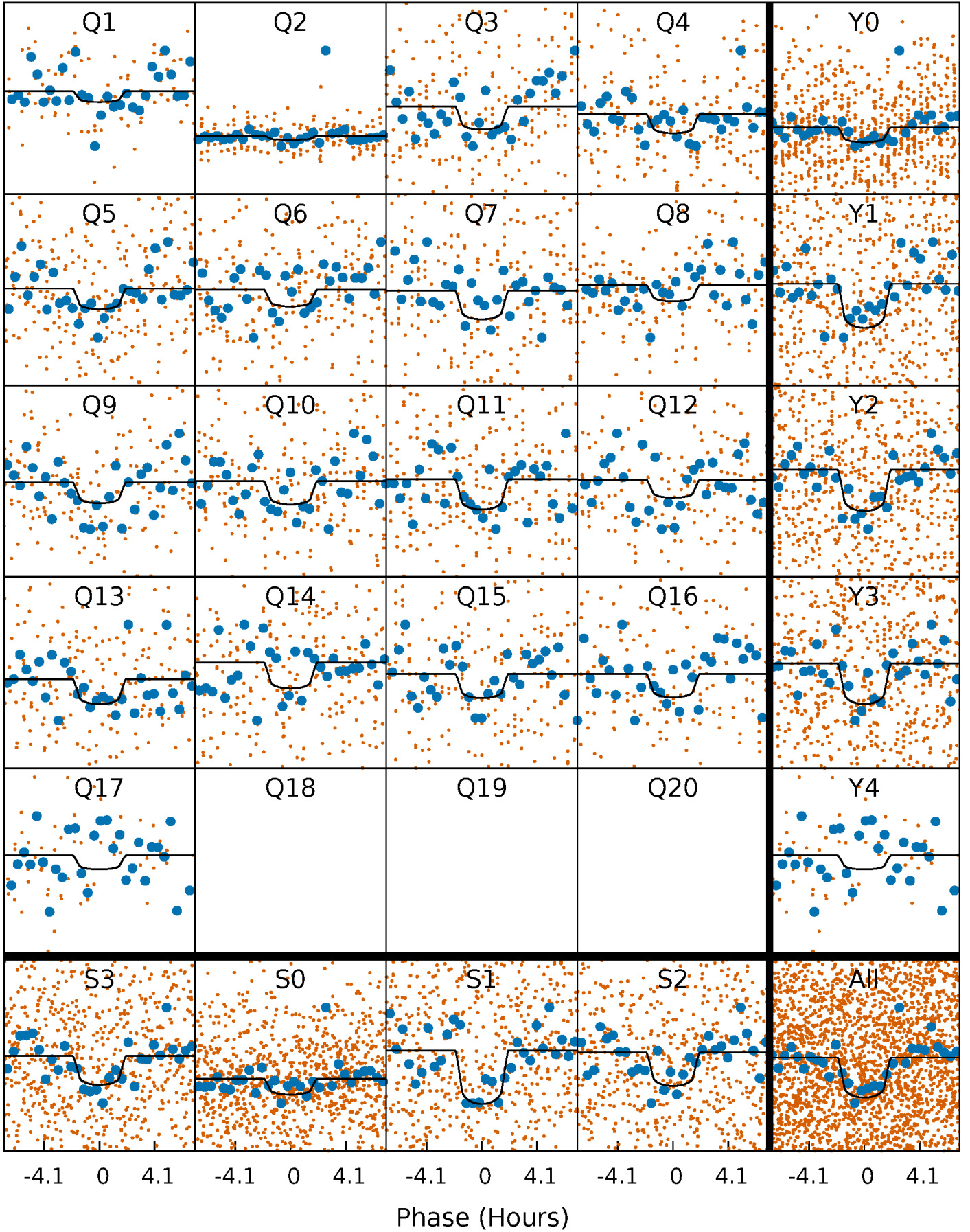
TCE 007047922-02 P= 10.522842 Days  $T_0=140.048228$  (BKJD)





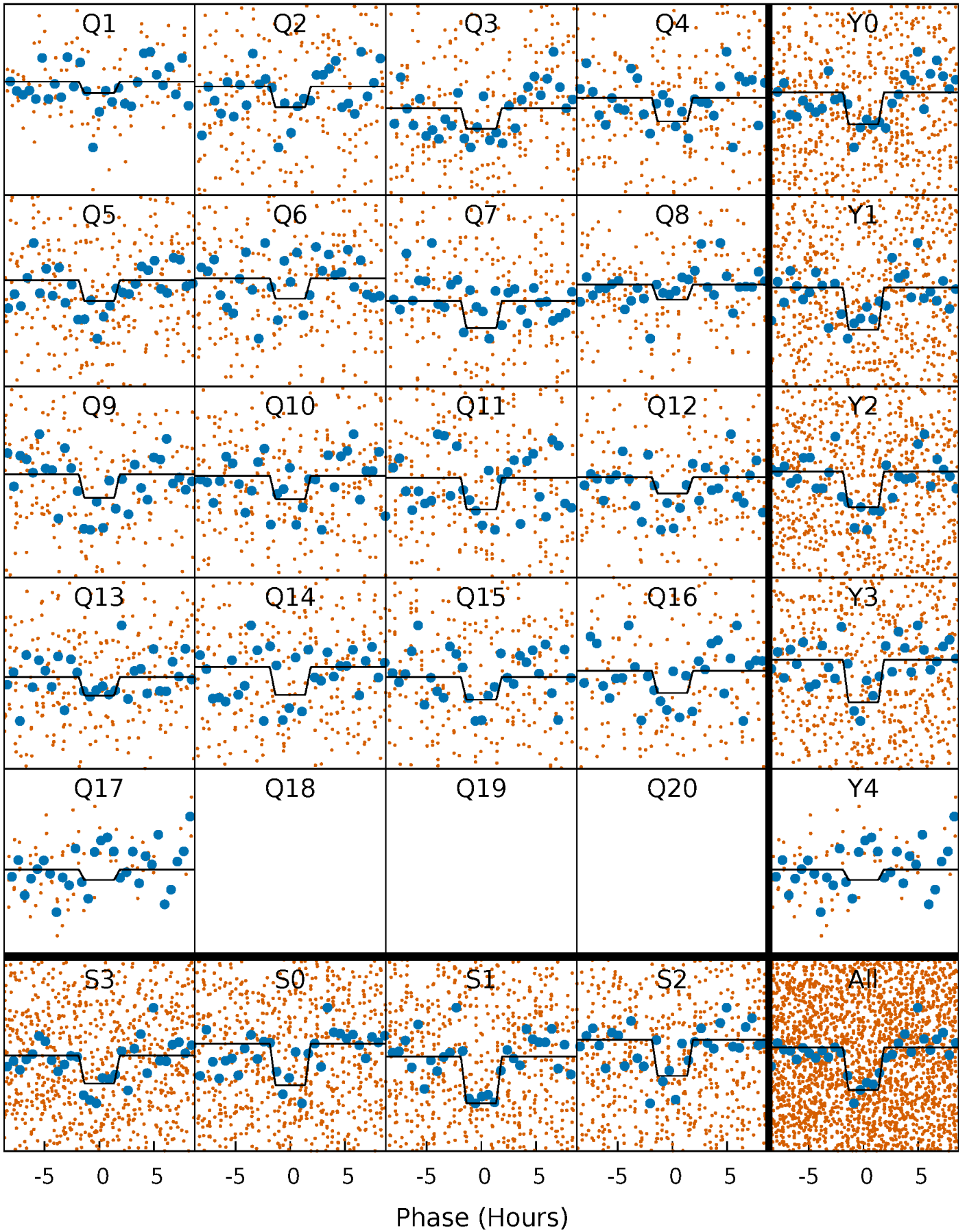
# DV Quarter-Phased Transit Curves

TCE 007047922-02     $P = 10.522842$  Days     $T_0 = 140.048228$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

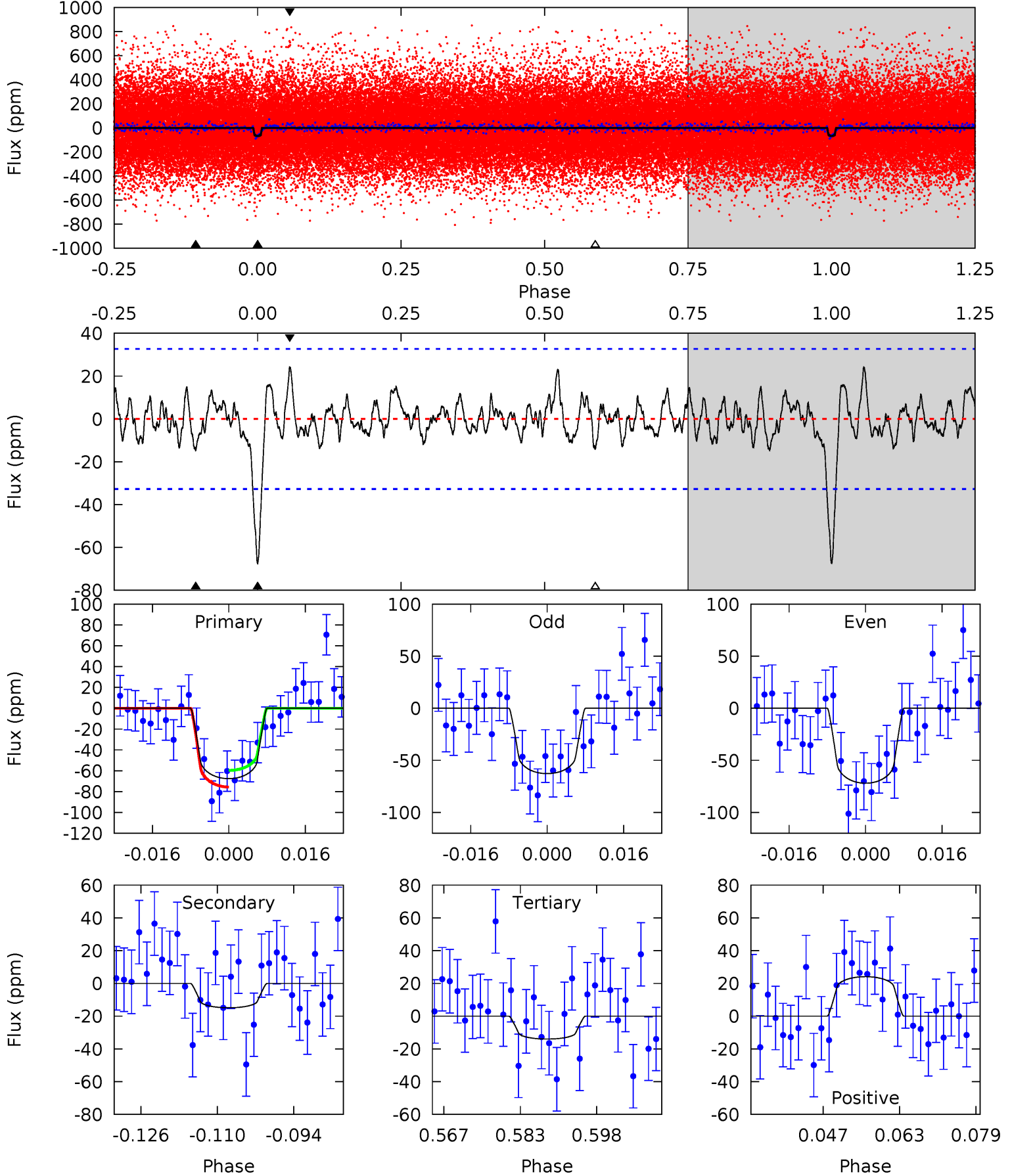
TCE 007047922-02 P= 10.522784 Days  $T_0=140.057305$  (BKJD)



# DV Model-Shift Uniqueness Test

007047922-02, P = 10.522842 Days, E = 129.525386 Days

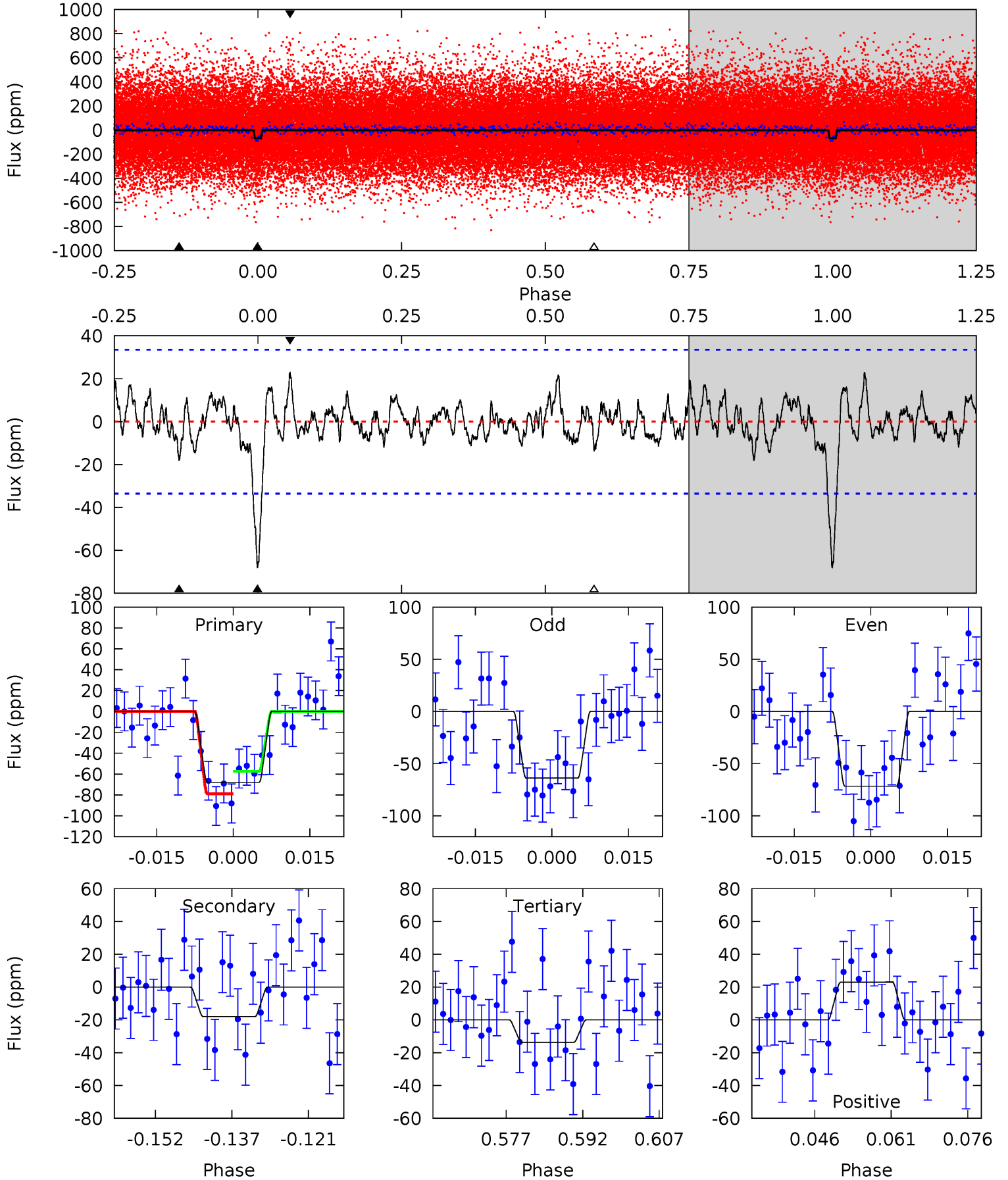
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.2	2.25	2.11	3.64	4.94	2.41	1.02	8.09	6.57	0.14	-1.39	0.69	0.91	0.26	1.21



# Alt Model-Shift Uniqueness Test

007047922-02, P = 10.522784 Days, E = 129.534521 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
10.0	2.66	2.02	3.38	4.95	2.43	1.00	8.00	6.64	0.64	-0.72	0.58	0.87	0.25	1.59



### Stellar Parameters For KIC 007047922

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6327^{+291}_{-542}$	$4.327^{+0.158}_{-0.193}$	$-0.140^{+0.300}_{-0.300}$	$1.175^{+0.389}_{-0.259}$	$1.064^{+0.212}_{-0.173}$	$0.925^{+0.779}_{-0.492}$
	+5%/-9%	+4%/-4%	+214%/-214%	+33%/-22%	+20%/-16%	+84%/-53%
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 007047922-02 / KOI 1899.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-15 \pm 7$	$1.23^{+0.81}_{-0.68}$	$1349^{+136}_{-133}$	$4192^{+1698}_{-769}$	$45^{+198}_{-30}$
Alt.	$-18 \pm 7$	$1.17^{+0.82}_{-0.65}$	$1355^{+119}_{-127}$	$4398^{+2090}_{-837}$	$63^{+270}_{-42}$

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

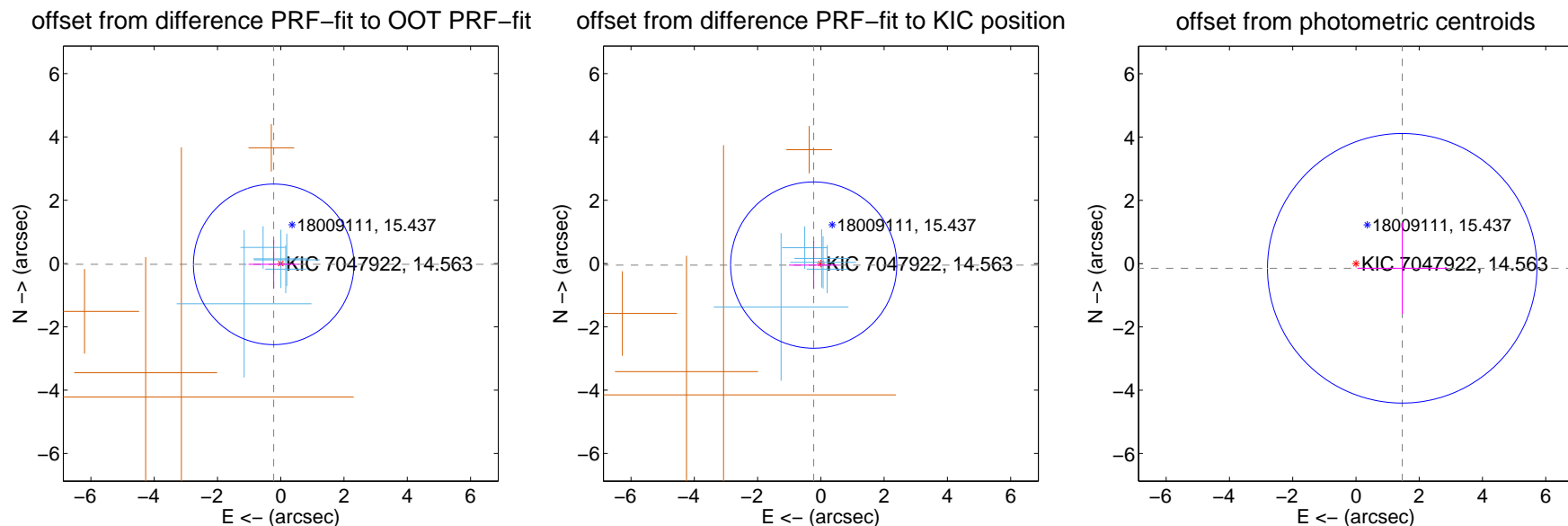
## DV Centroid Data

Supplemental centroid analysis for 007047922-02. Kepler magnitude: 14.56. Transit SNR 9.16

There are 5 quarters with good PRF difference image offsets

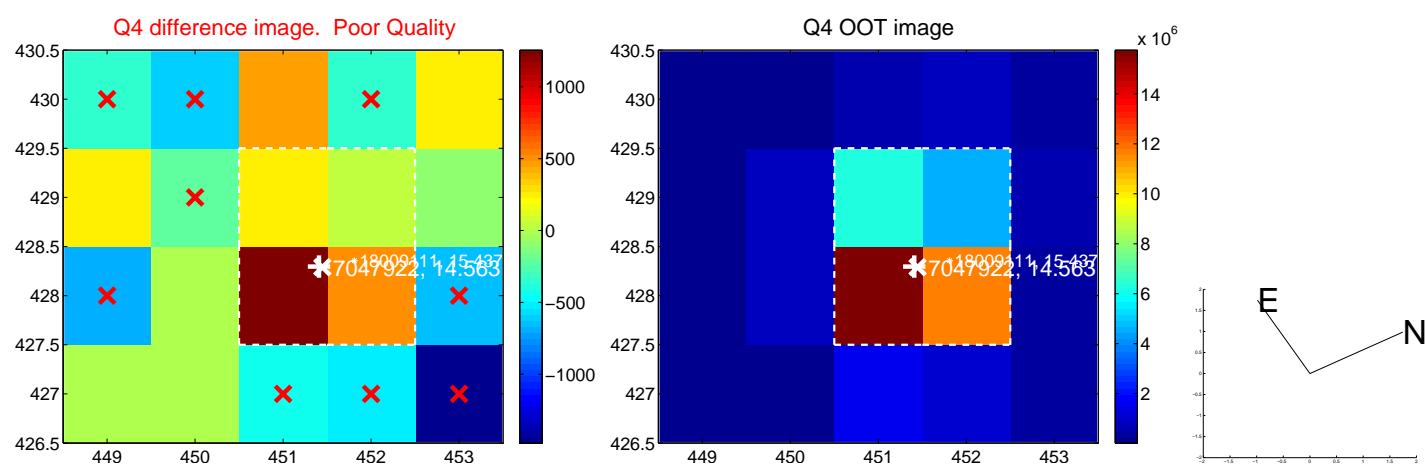
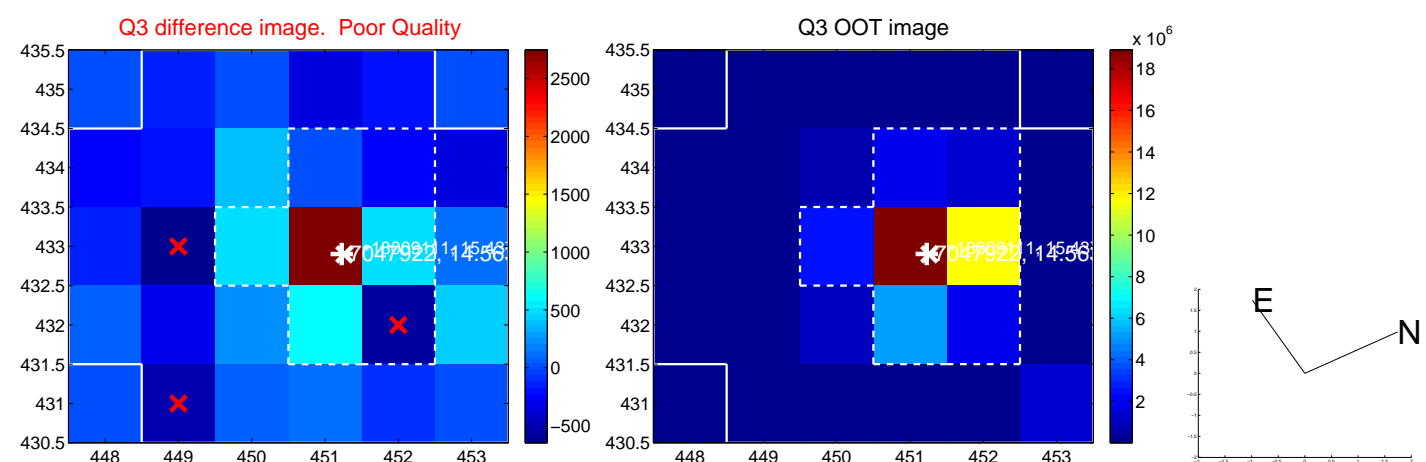
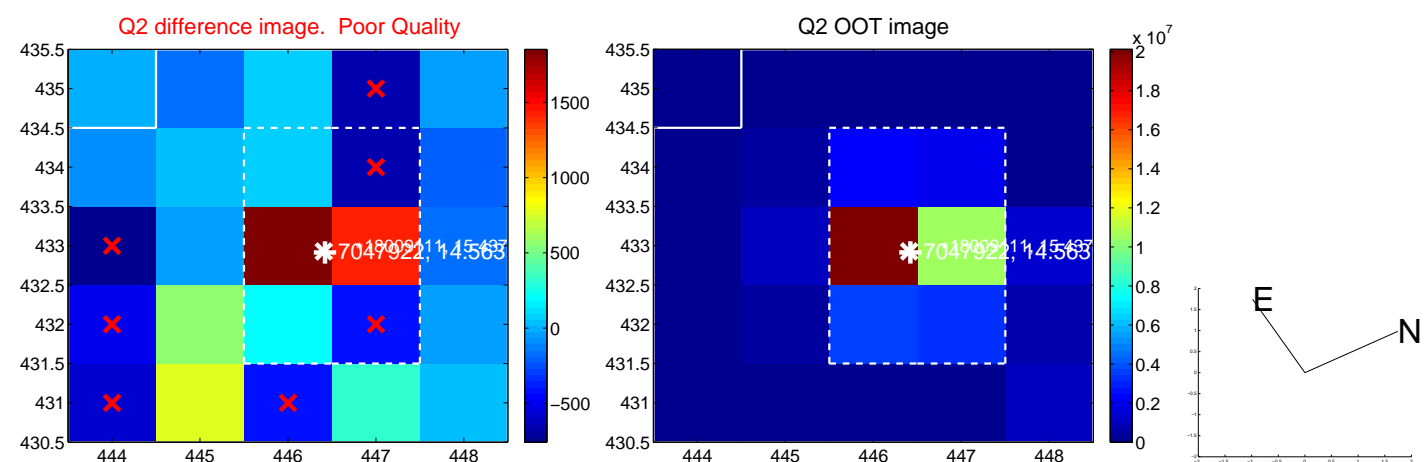
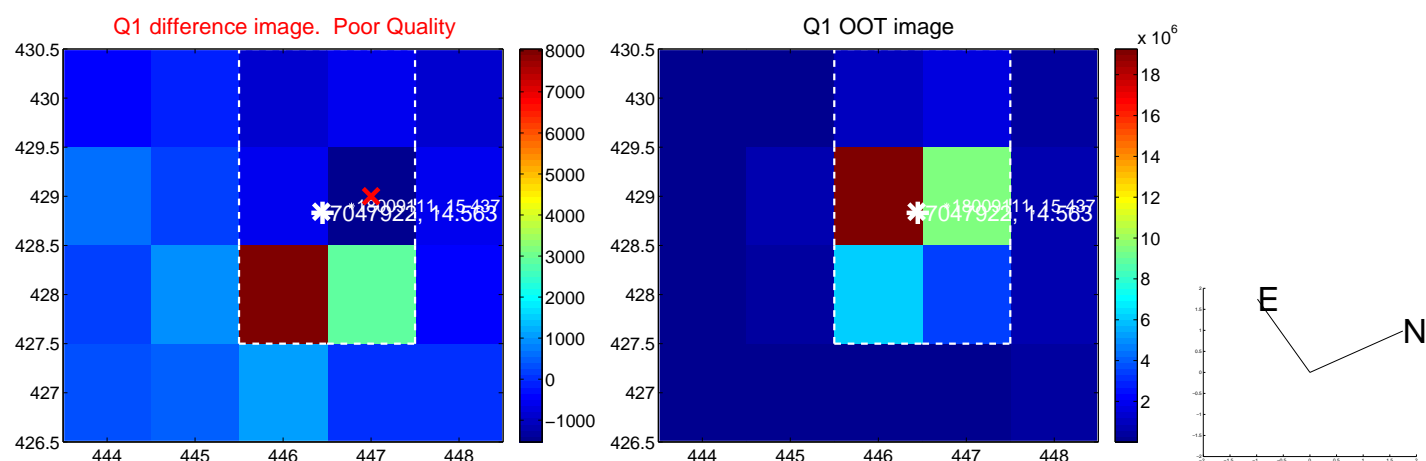
The direct PRF centroid is offset from the target star catalog position by about 0.04 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.225 \pm 0.845$	0.27	$0.224 \pm 0.791$	$-0.026 \pm 0.768$
PRF-fit source offset from KIC position	$0.232 \pm 0.875$	0.27	$0.227 \pm 0.780$	$-0.049 \pm 0.756$
photometric centroid source offset	$1.47 \pm 1.42$	1.03	$-1.46 \pm 1.42$	$-0.15 \pm 1.44$



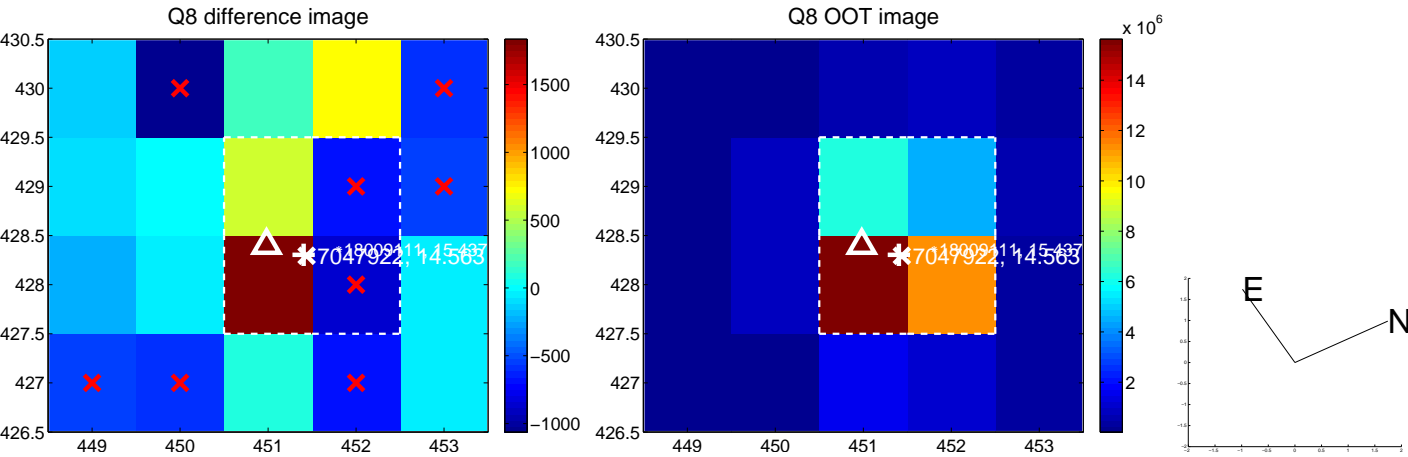
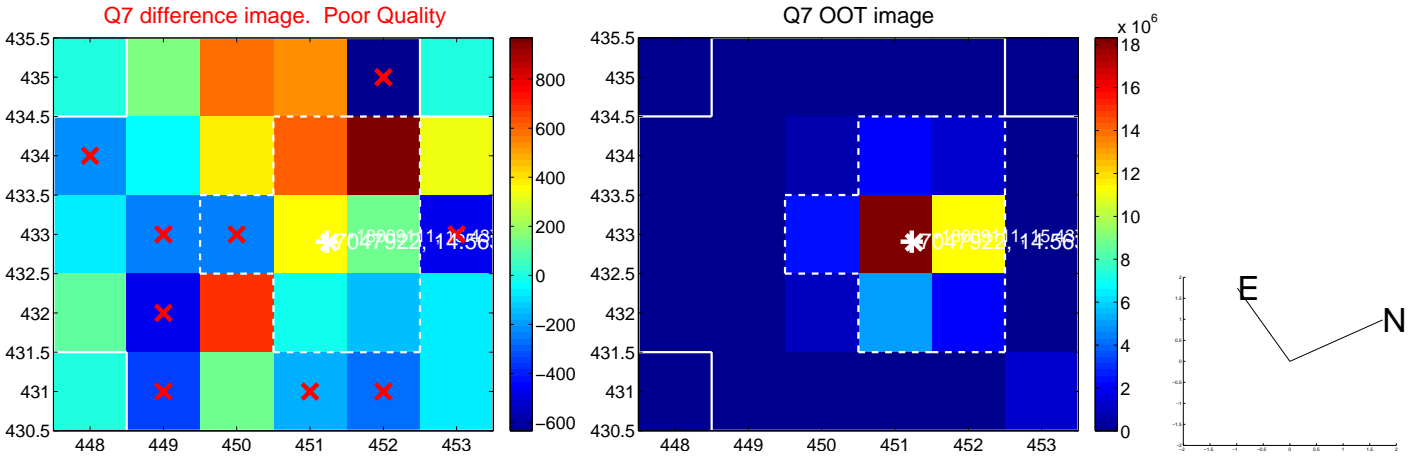
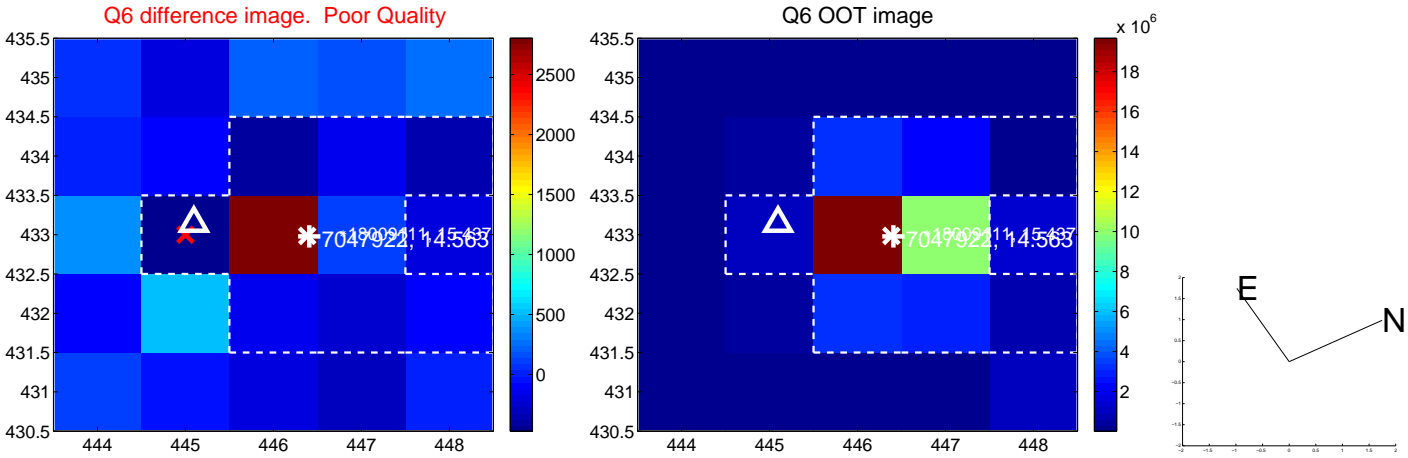
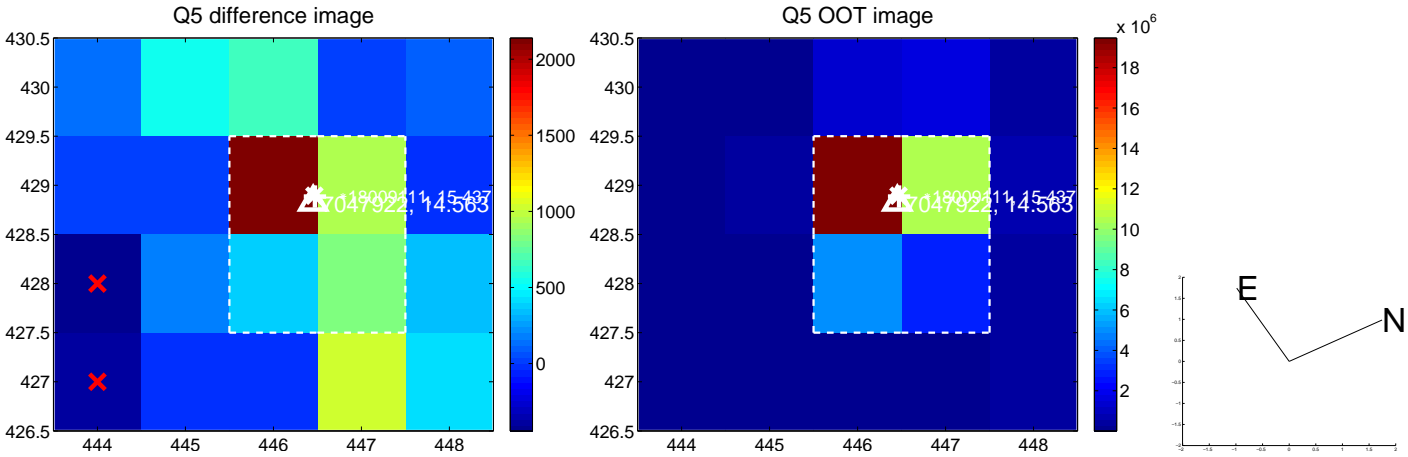
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

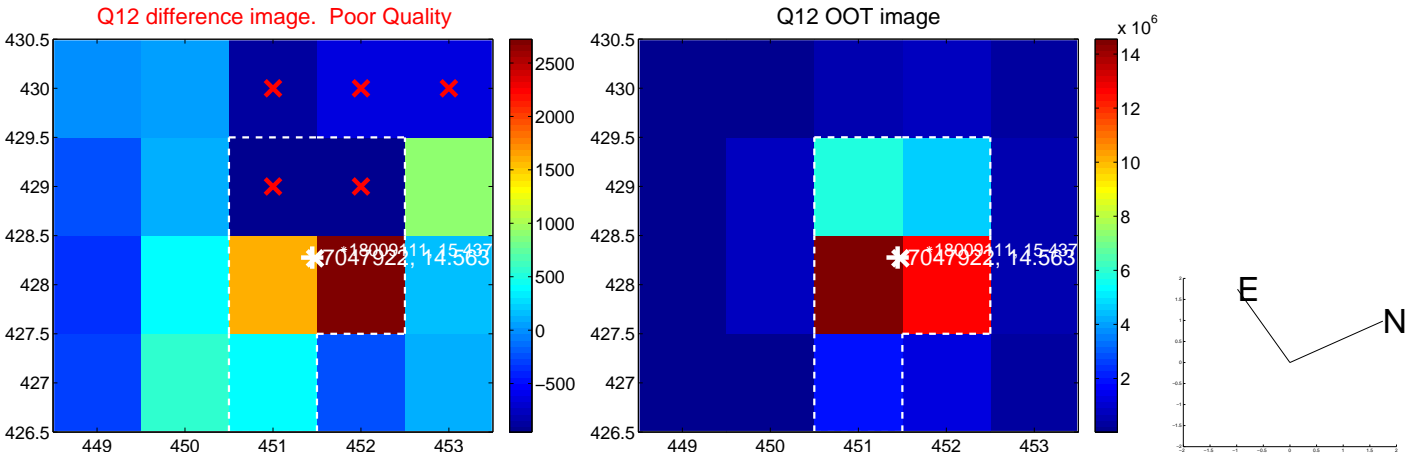
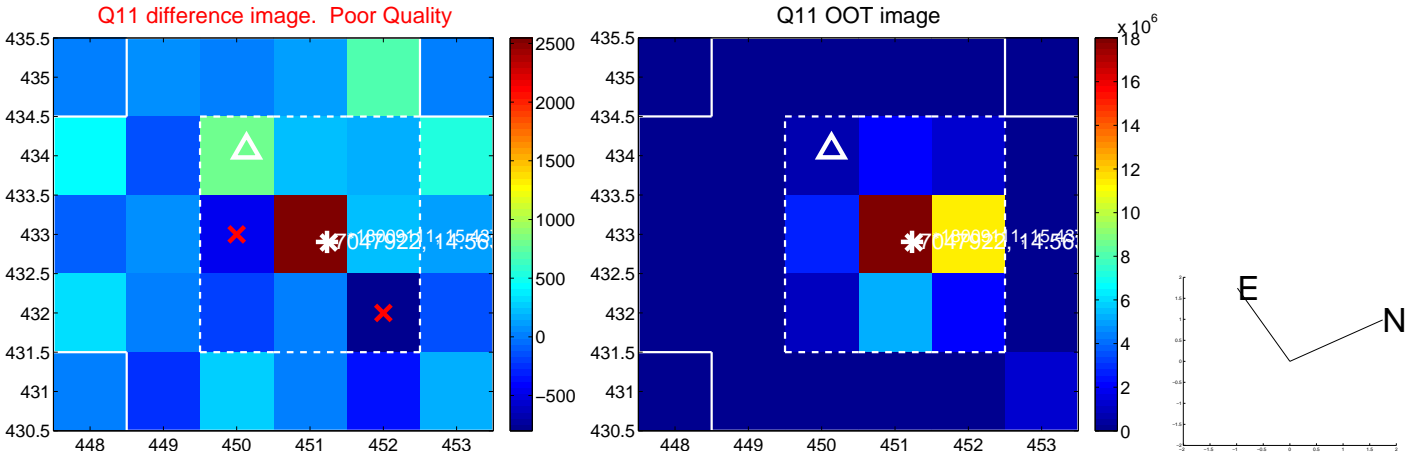
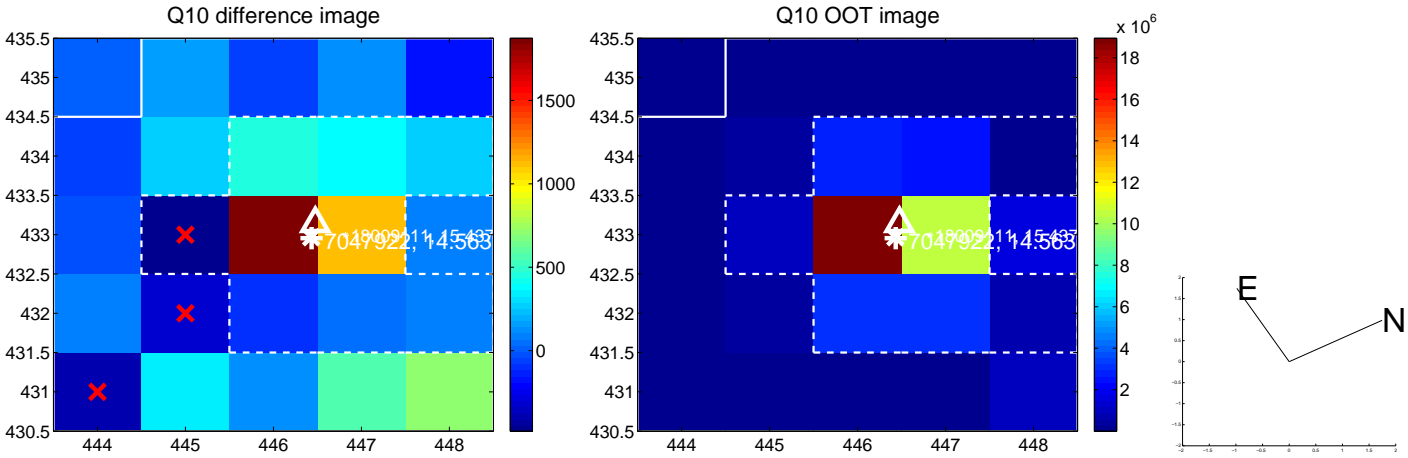
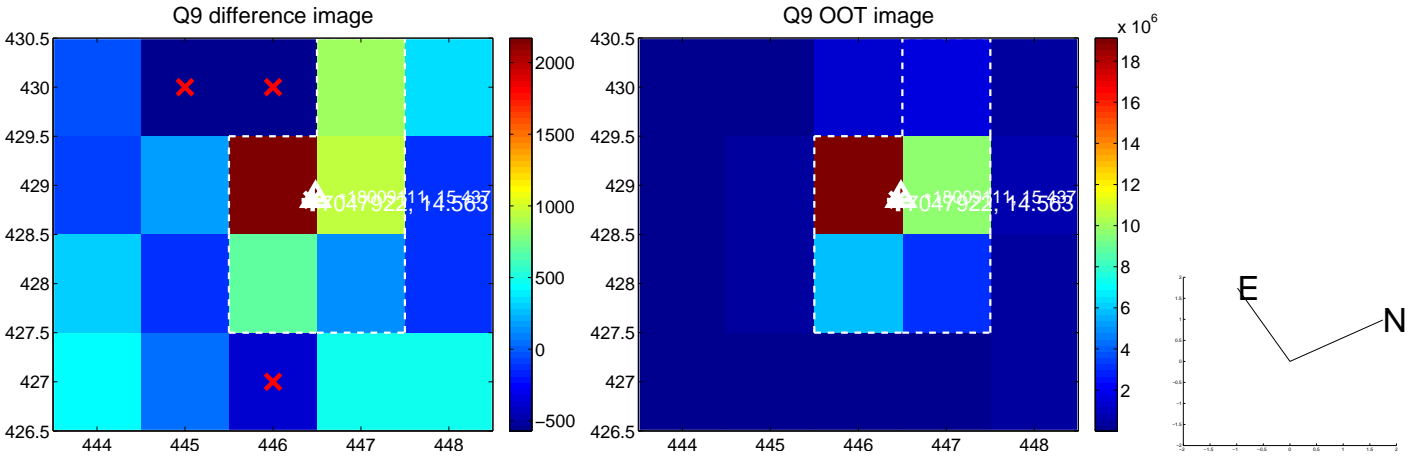




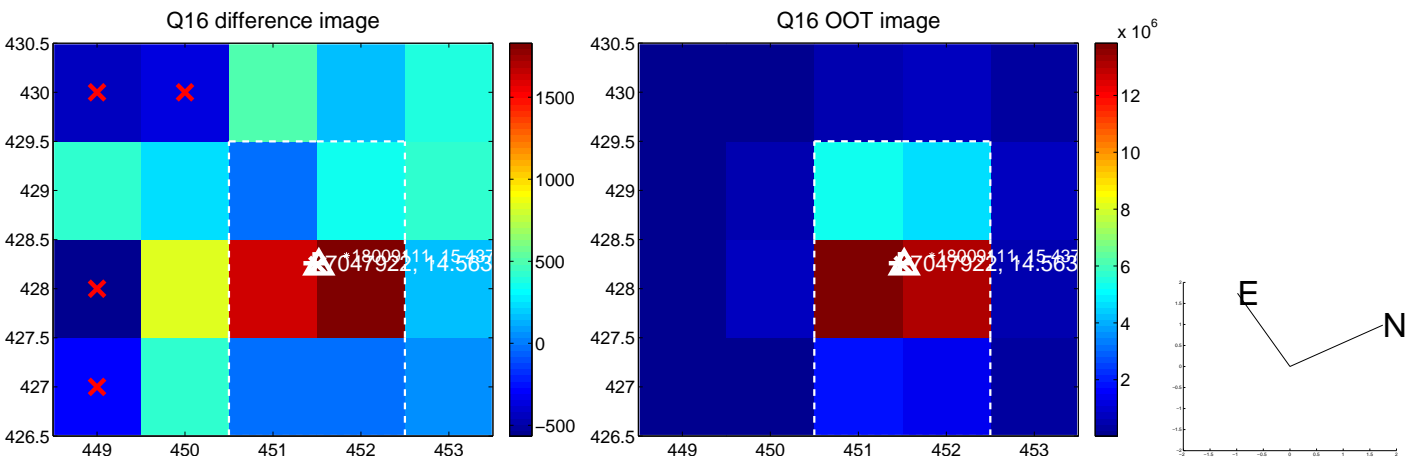
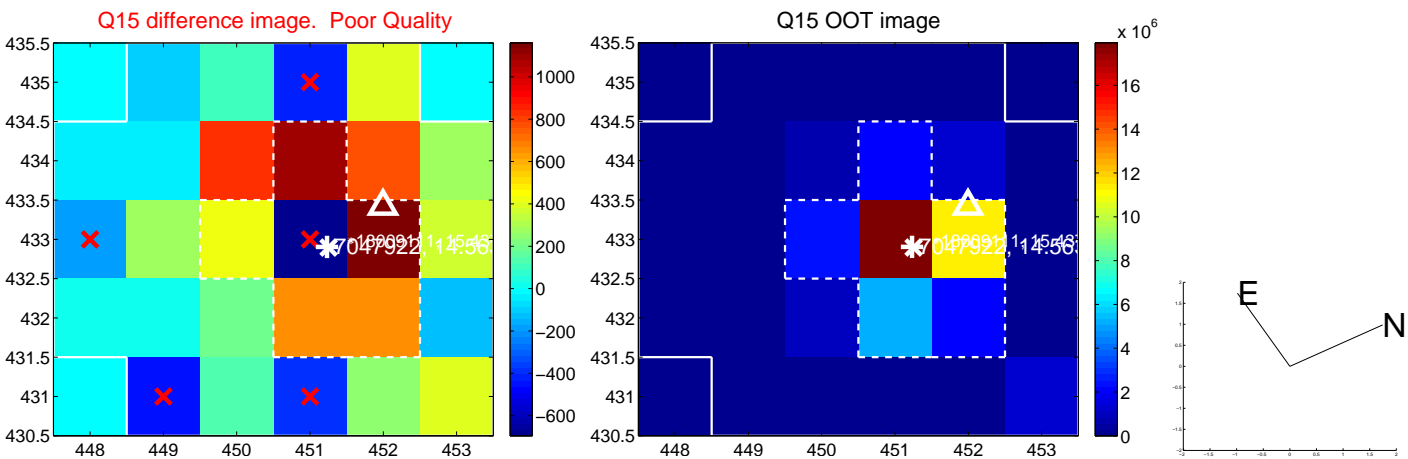
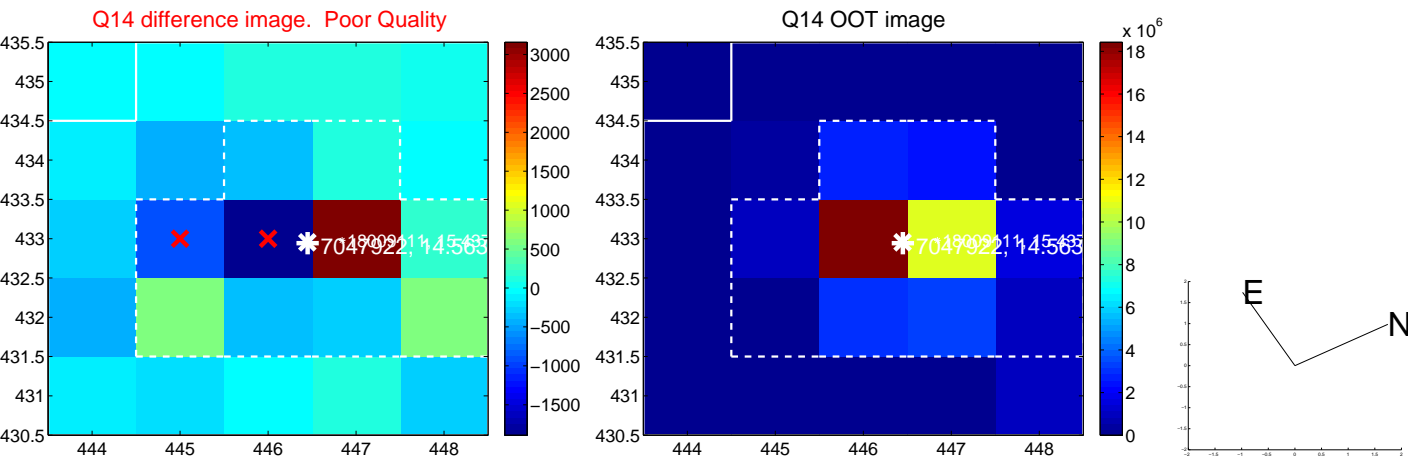
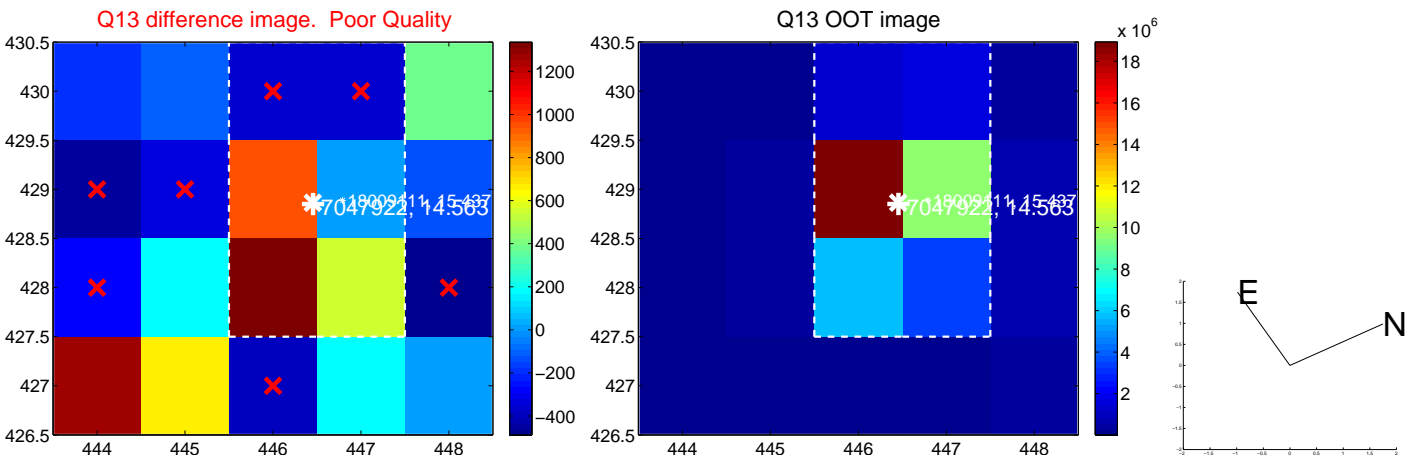
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



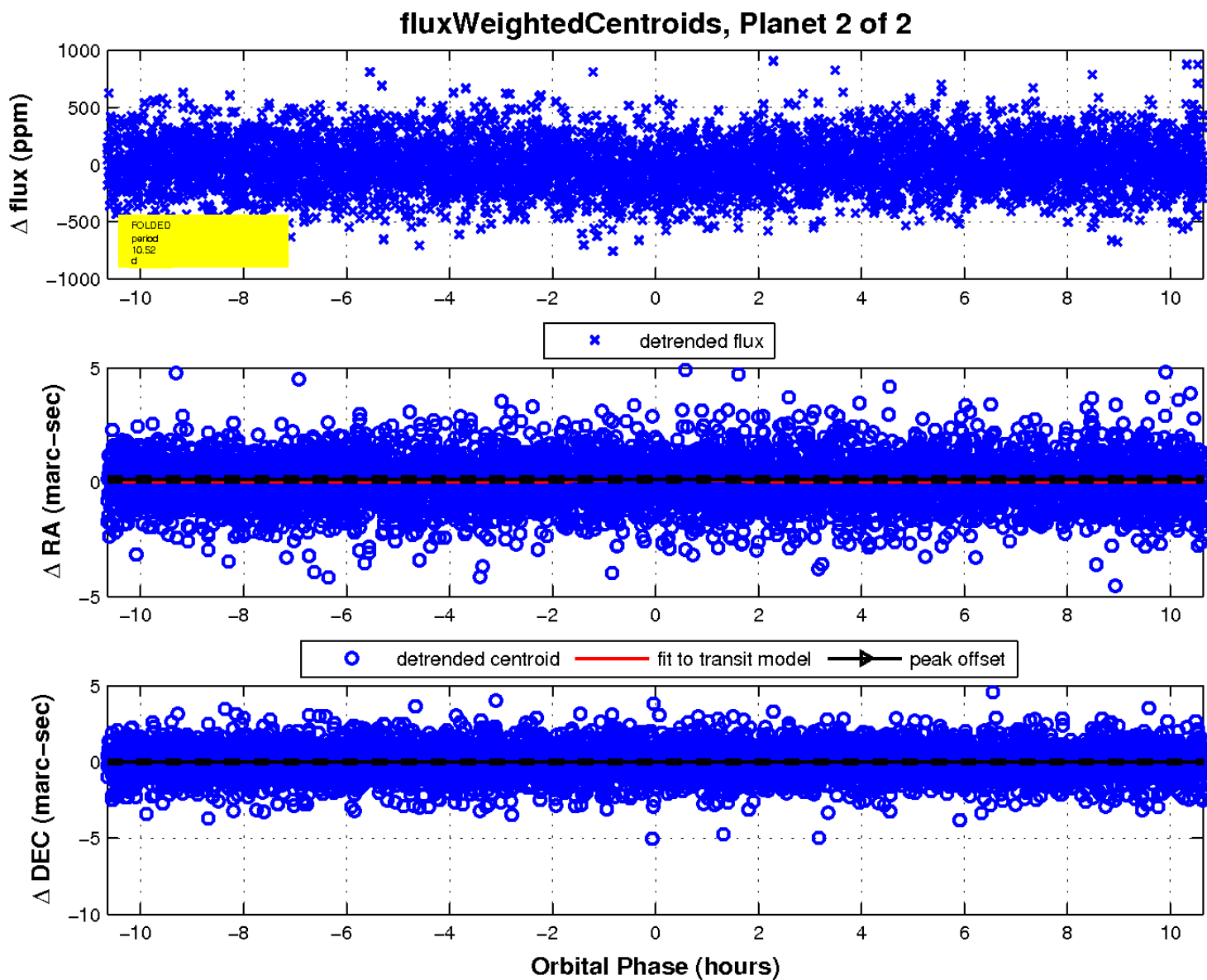
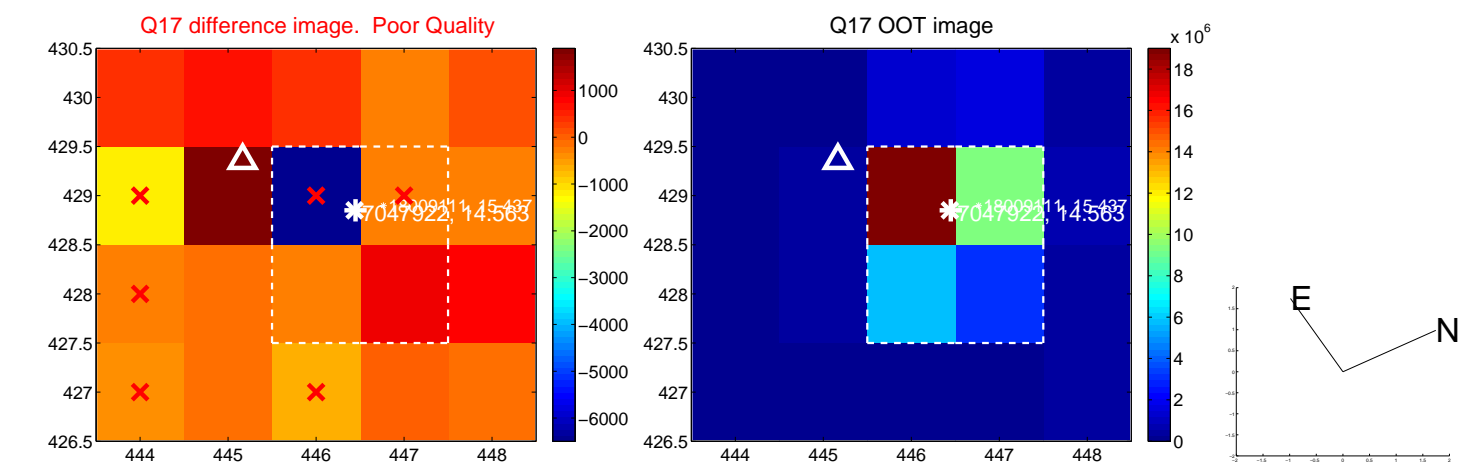
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

