

# KIC 011551652

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011551652-01	OBS	No	1.191440	132.013011	13.5	5.088	12.7	13.9	2.07	7302	0.88	17663.33
011551652-02	OBS	No	171.620450	206.002625	121.2	10.072	12.0	7.4	2.07	7302	2.63	23.39
011551652-03	OBS	No	111.882750	210.834362	107.5	15.123	9.6	7.1	2.07	7302	2.32	41.38

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011551652-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
011551652-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_SATURATED
011551652-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED—HALO_GHOST

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

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

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

## Ephemeris Match Information For 011551652-01

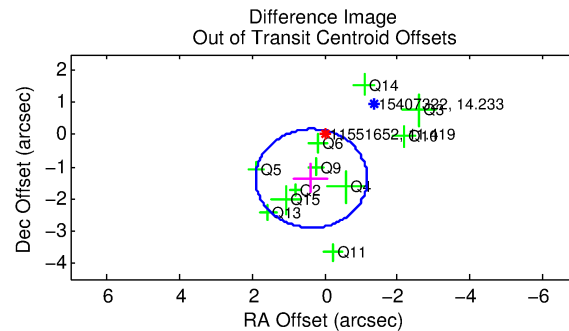
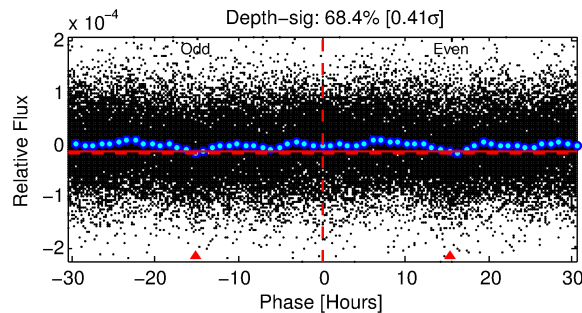
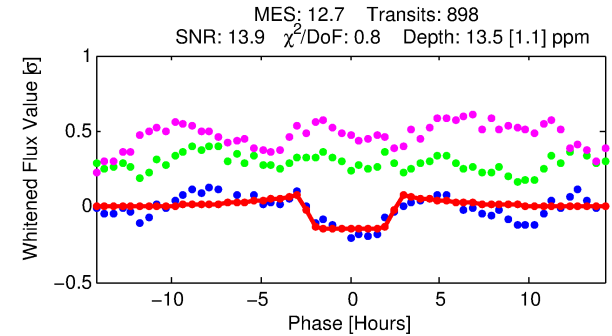
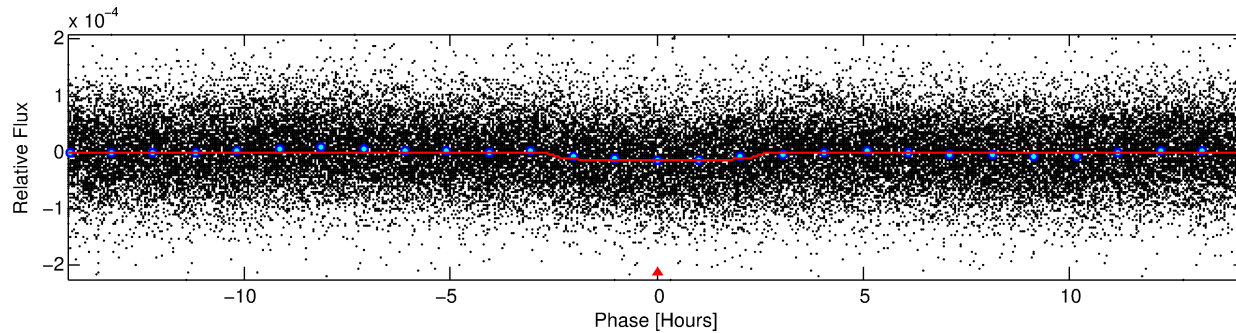
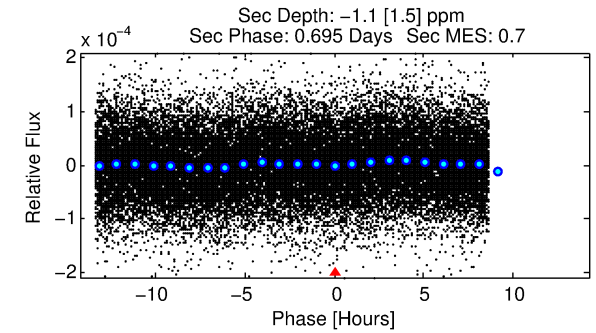
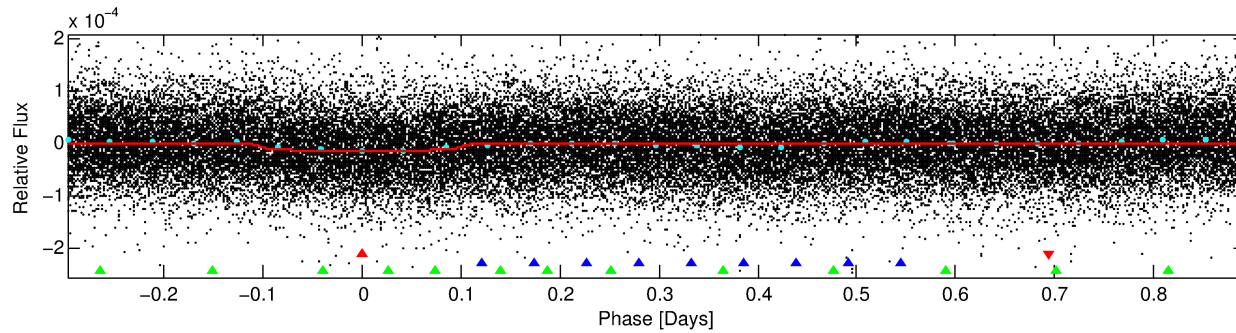
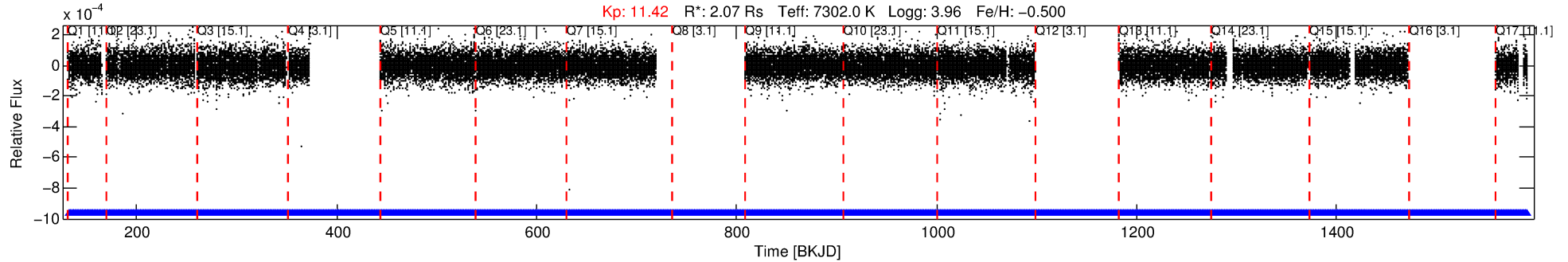
No Significant Match Found

# DV One-Page Summary

KIC: 11551652 Candidate: 1 of 3 Period: 1.191 d

KOI: K07455 Corr: No Ephemeris Match

Kp: 11.42 R\*: 2.07 Rs Teff: 7302.0 K Logg: 3.96 Fe/H: -0.500



## DV Fit Results:

Period = 1.19144 [0.00001] d  
Epoch = 132.0130 [0.0027] BKJD  
Rp/R\* = 0.0039 [0.0006]  
a/R\* = 1.22 [0.41]  
b = 0.91 [0.20]  
Seff = 17663.33 [9997.91]  
Teq = 2940 [416] K  
Rp = 0.88 [0.36] Re  
a = 0.0248 [0.0086] AU  
Ag = N/A  
Teffp = N/A

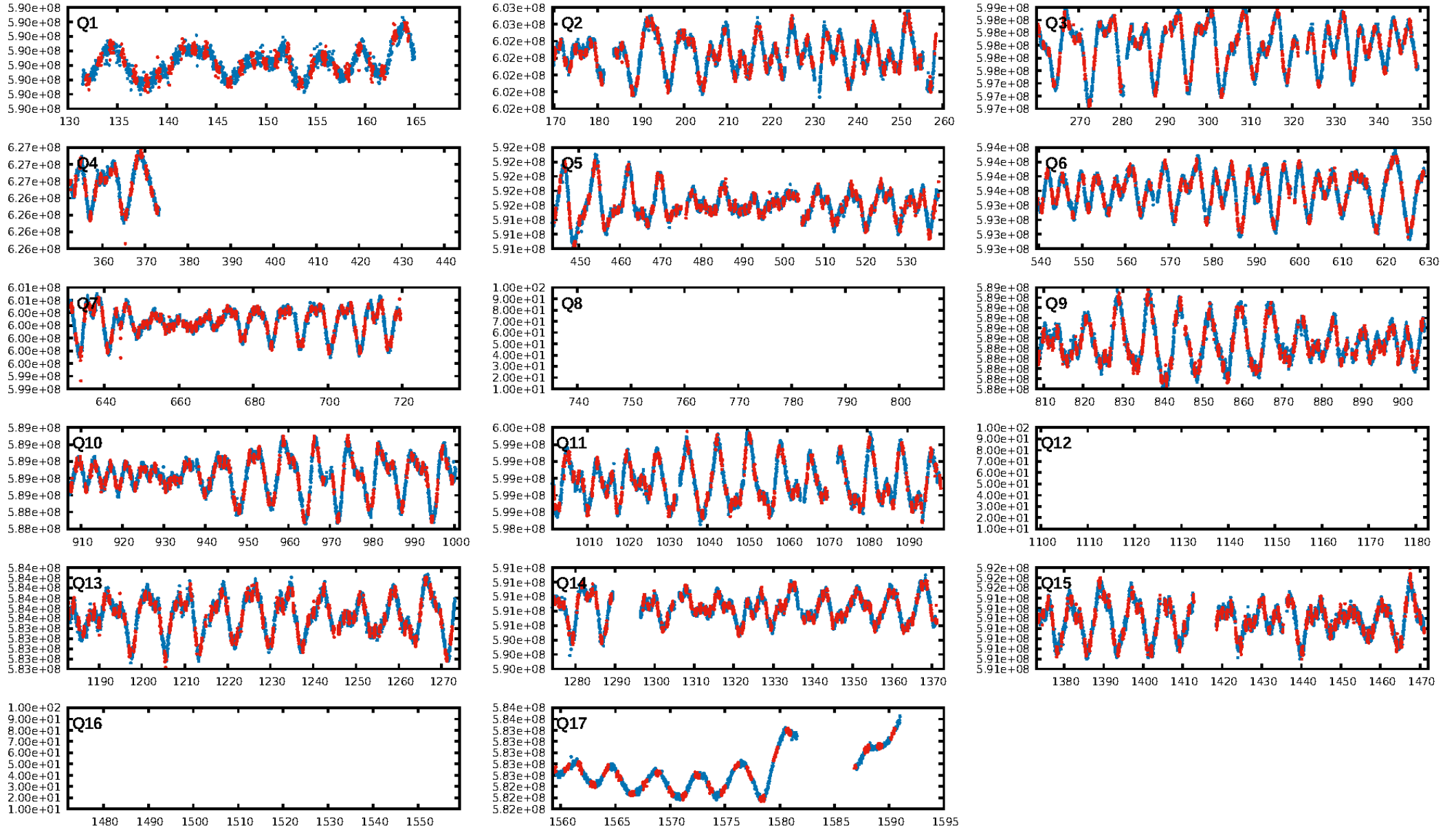
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [166.49 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGoF-sig: N/A  
Bootstrap-pfa: 1.43e-30  
RollingBand-fgt: 1.00 [829/829]  
GhostDiagnostic-chr: 4.826  
Centroid-sig: 1.1%  
Centroid-so: 1.503 arcsec [2.19 $\sigma$ ]  
OotOffset-rm: 1.415 arcsec [2.76 $\sigma$ ]  
KicOffset-rm: 1.386 arcsec [2.70 $\sigma$ ]  
OotOffset-st: 4/3/1/3 [11]  
KicOffset-st: 4/3/1/3 [11]  
DiffImageQuality-fgm: 0.91 [10/11]  
DiffImageOverlap-fno: 1.00 [14/14]

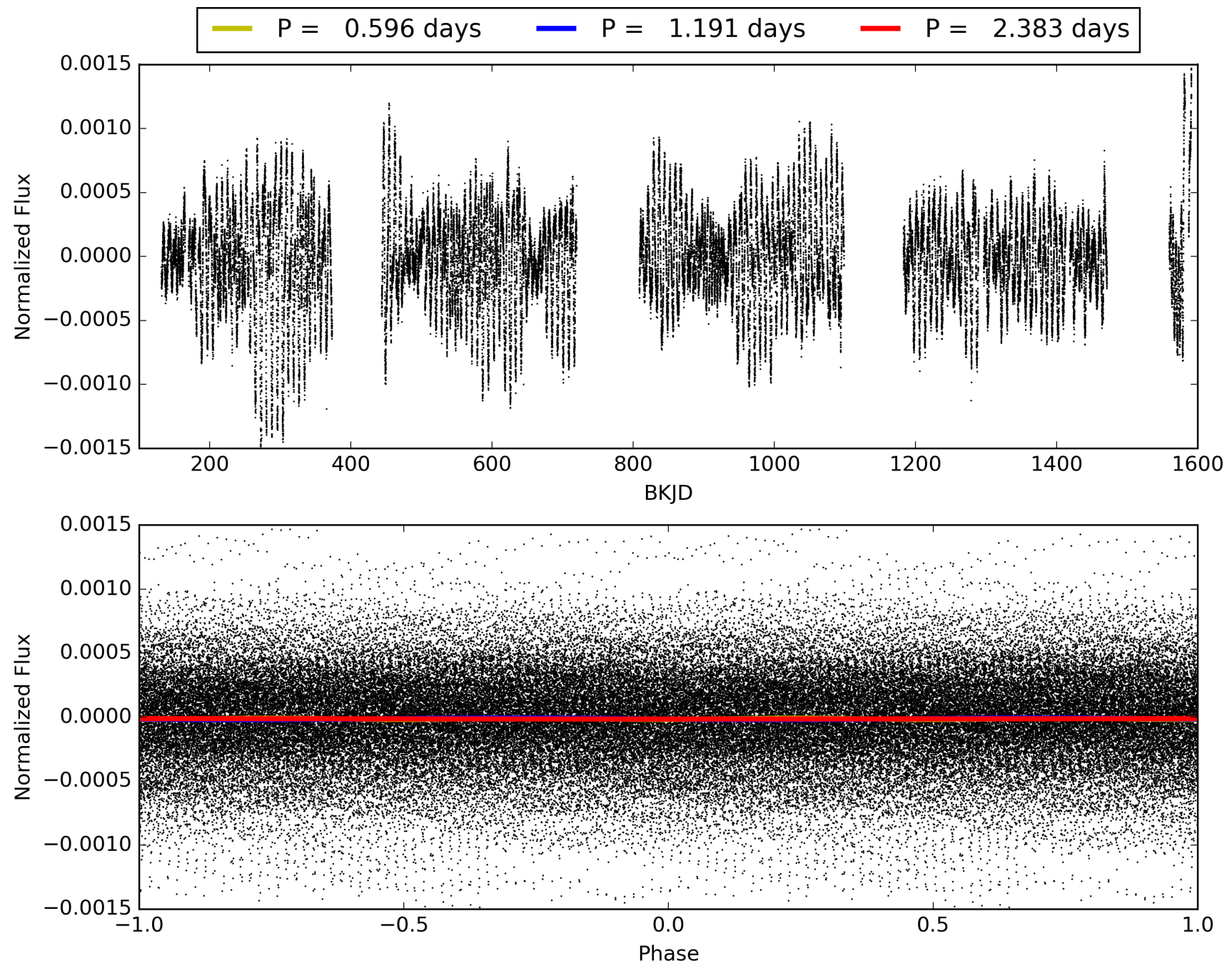
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 03:54:17 Z

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

# TCE 011551652-01, PDC Light Curves

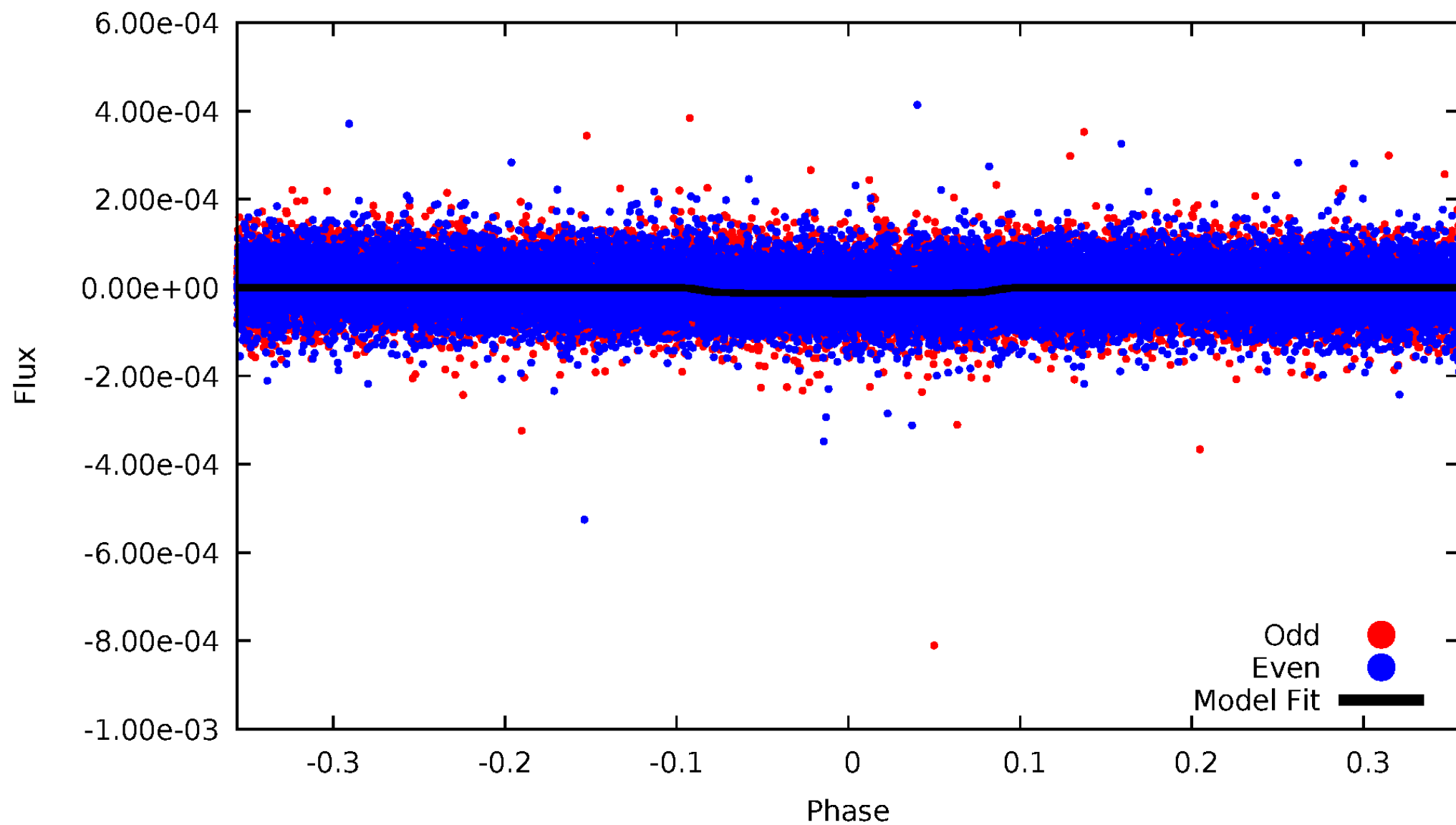


TCE 011551652-01



# DV Odd/Even

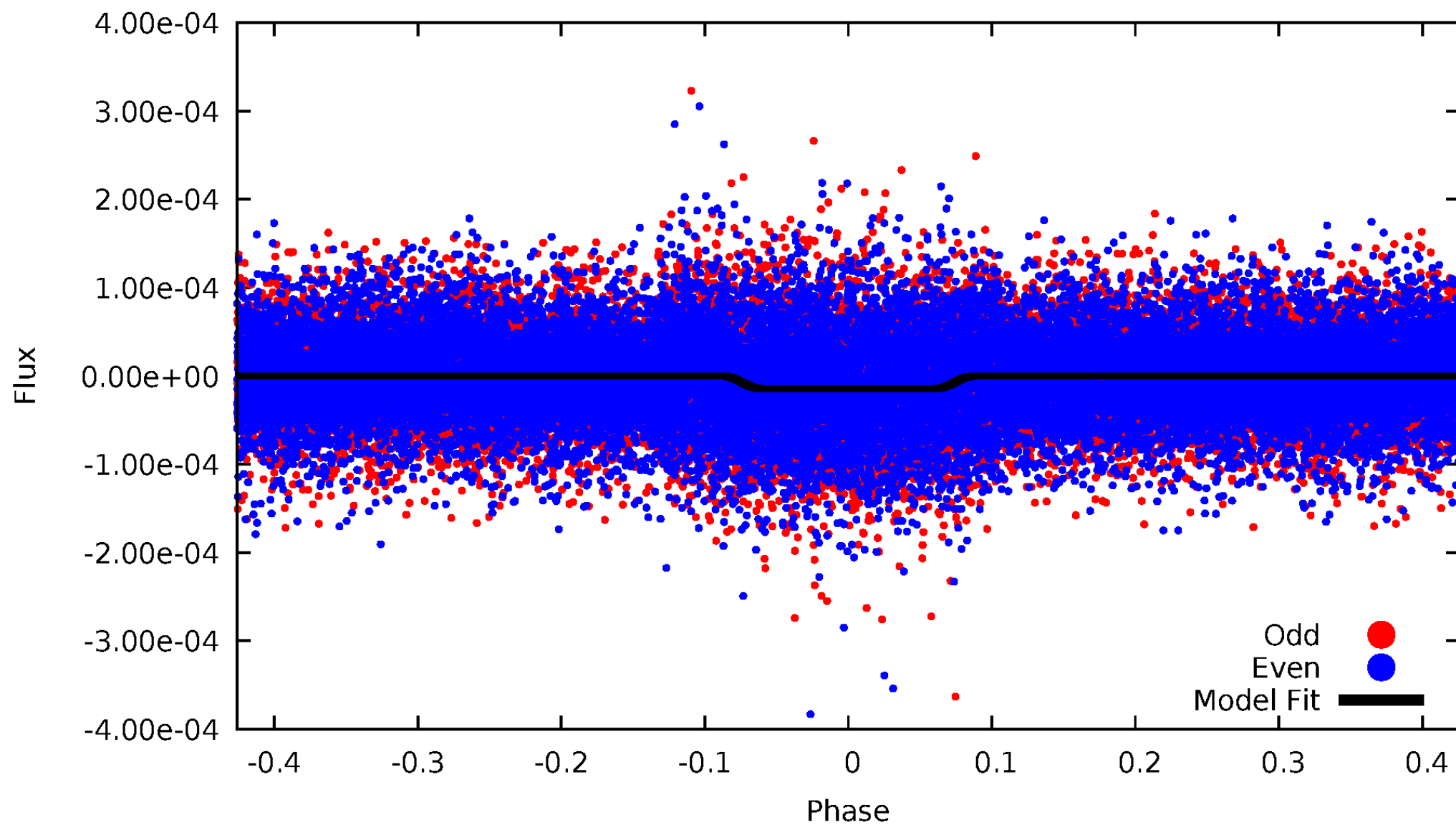
TCE 011551652-01





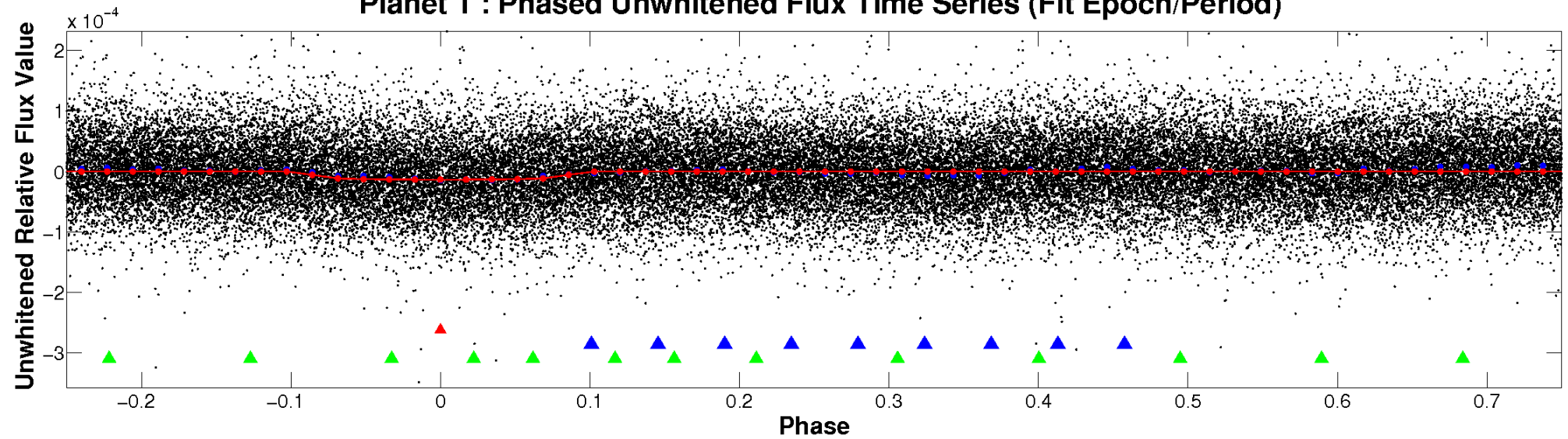
# ALT Odd/Even

TCE 011551652-01

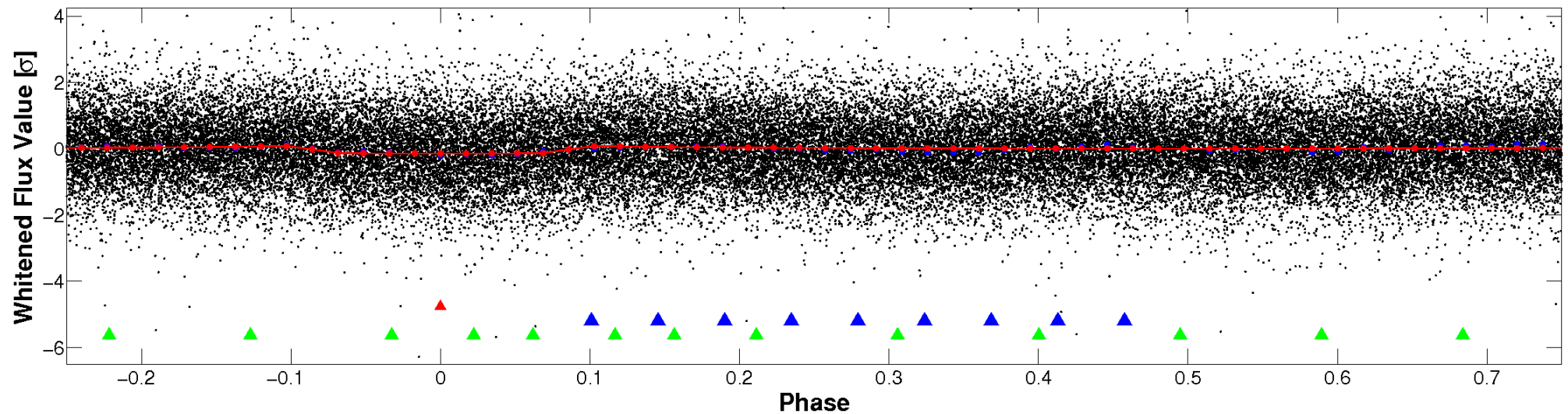


# Non-Whitened Vs. Whitened Light Curve

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

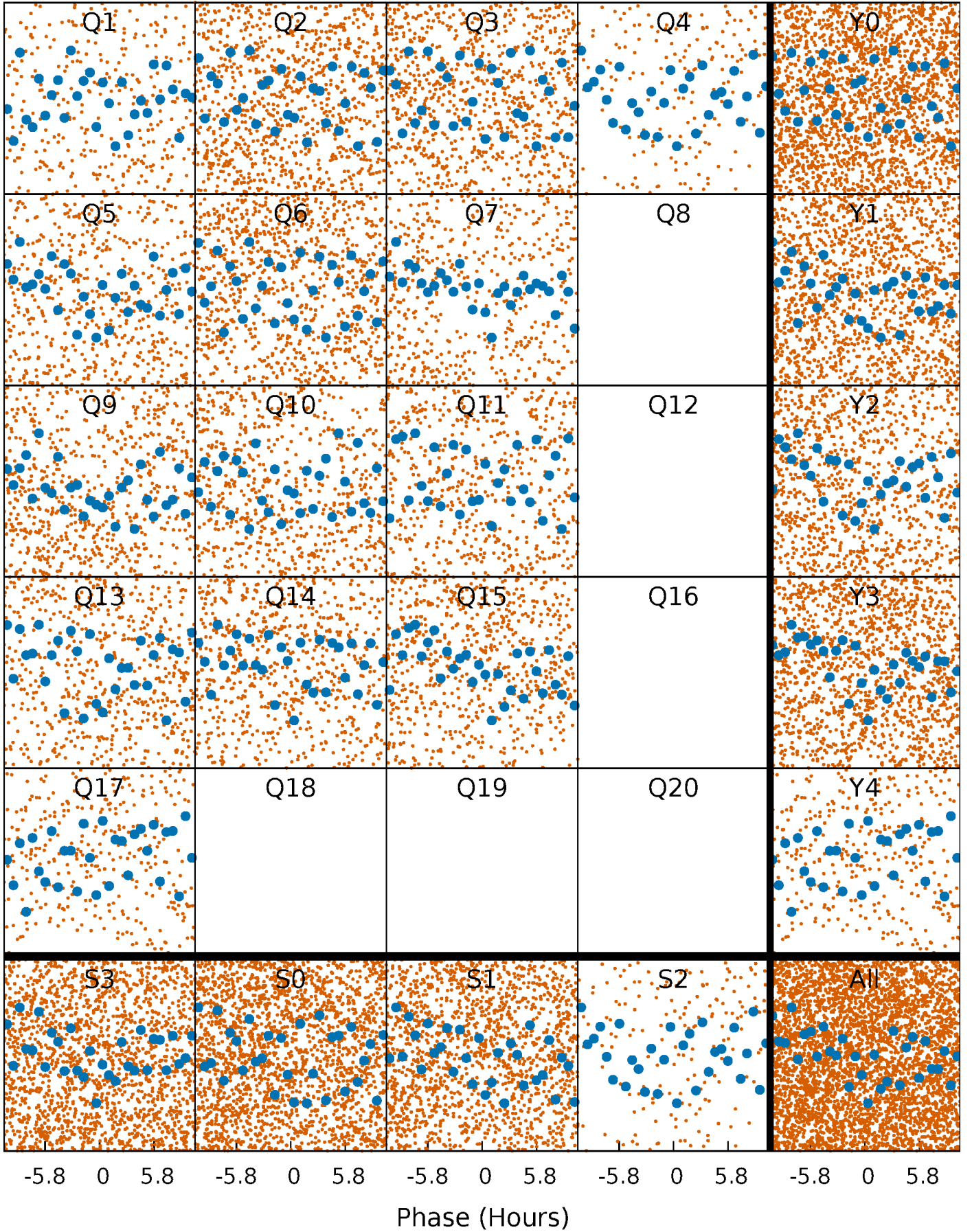


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

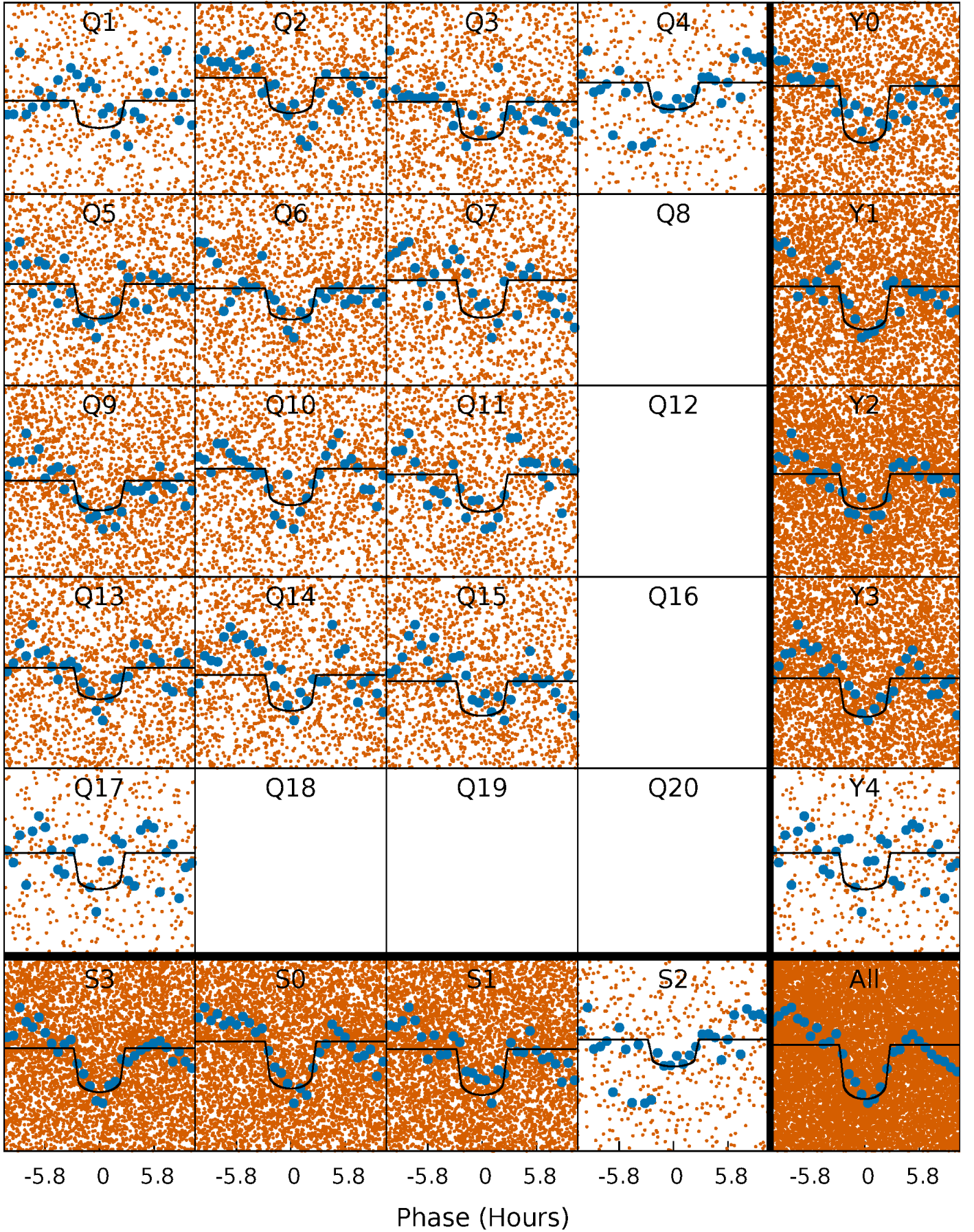
TCE 011551652-01 P= 1.191440 Days  $T_0=132.013011$  (BKJD)





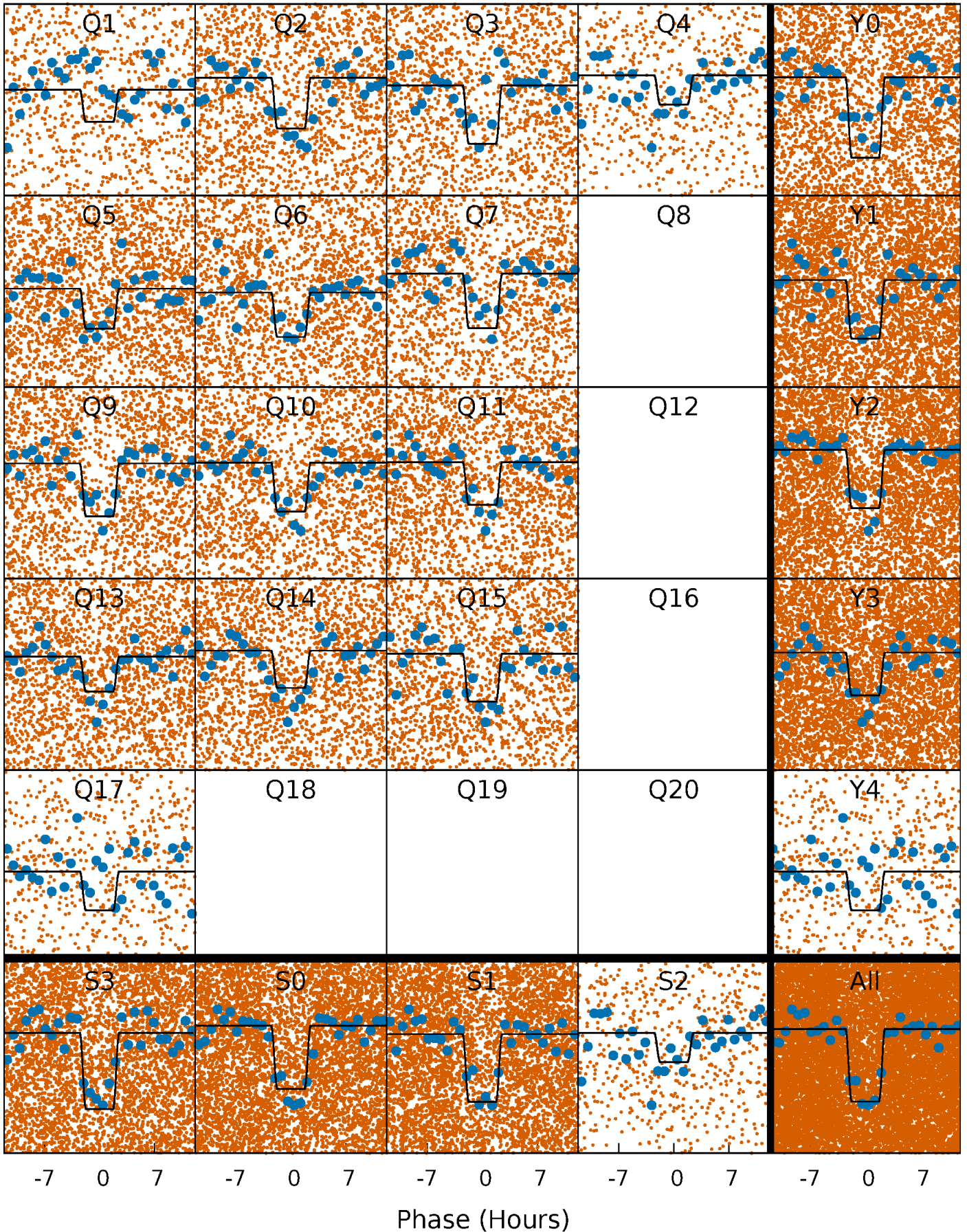
# DV Quarter-Phased Transit Curves

TCE 011551652-01 P= 1.191440 Days  $T_0=132.013011$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 011551652-01 P= 1.191480 Days  $T_0=131.998011$  (BKJD)

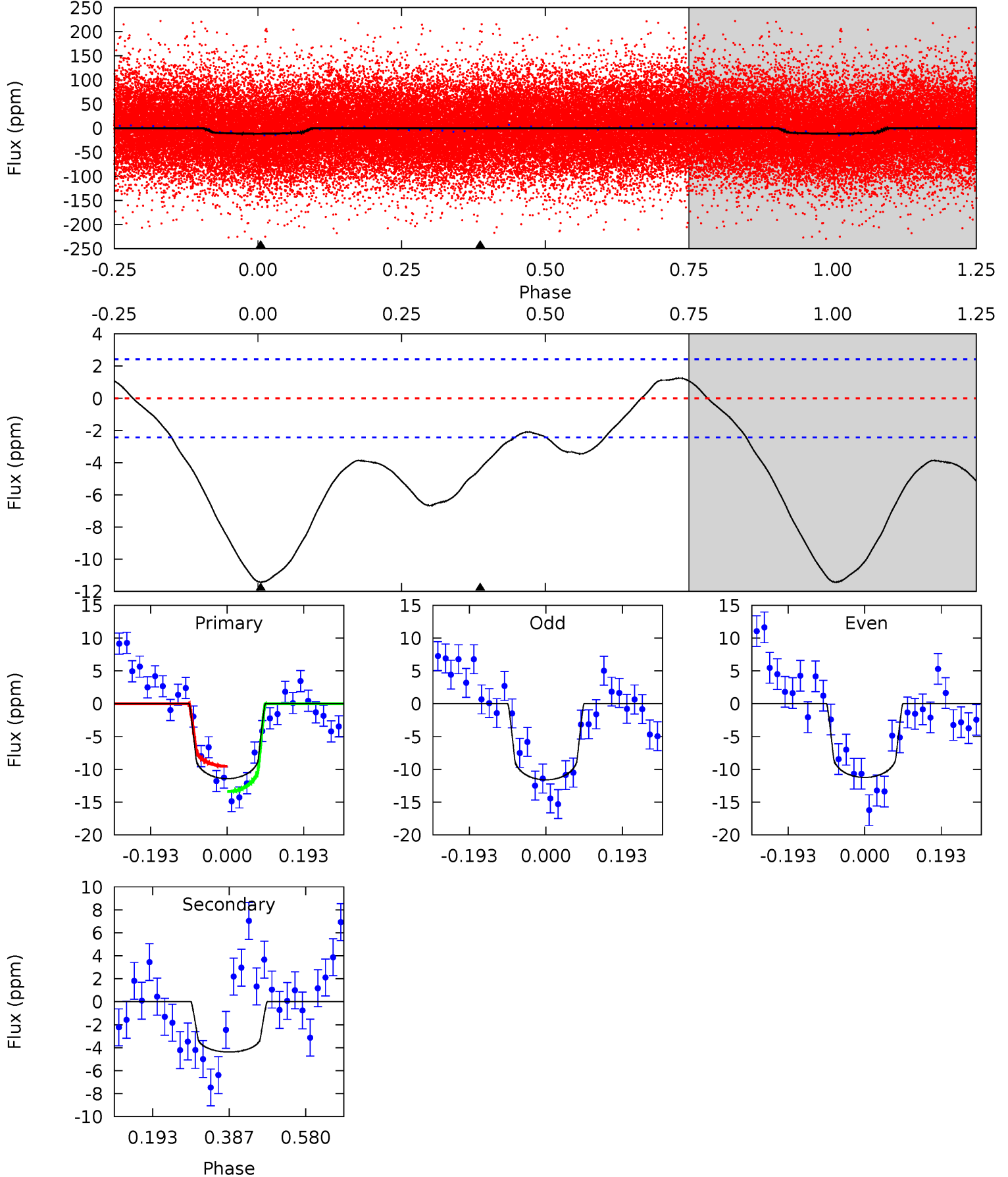




# DV Model-Shift Uniqueness Test

011551652-01, P = 1.191440 Days, E = 130.821571 Days

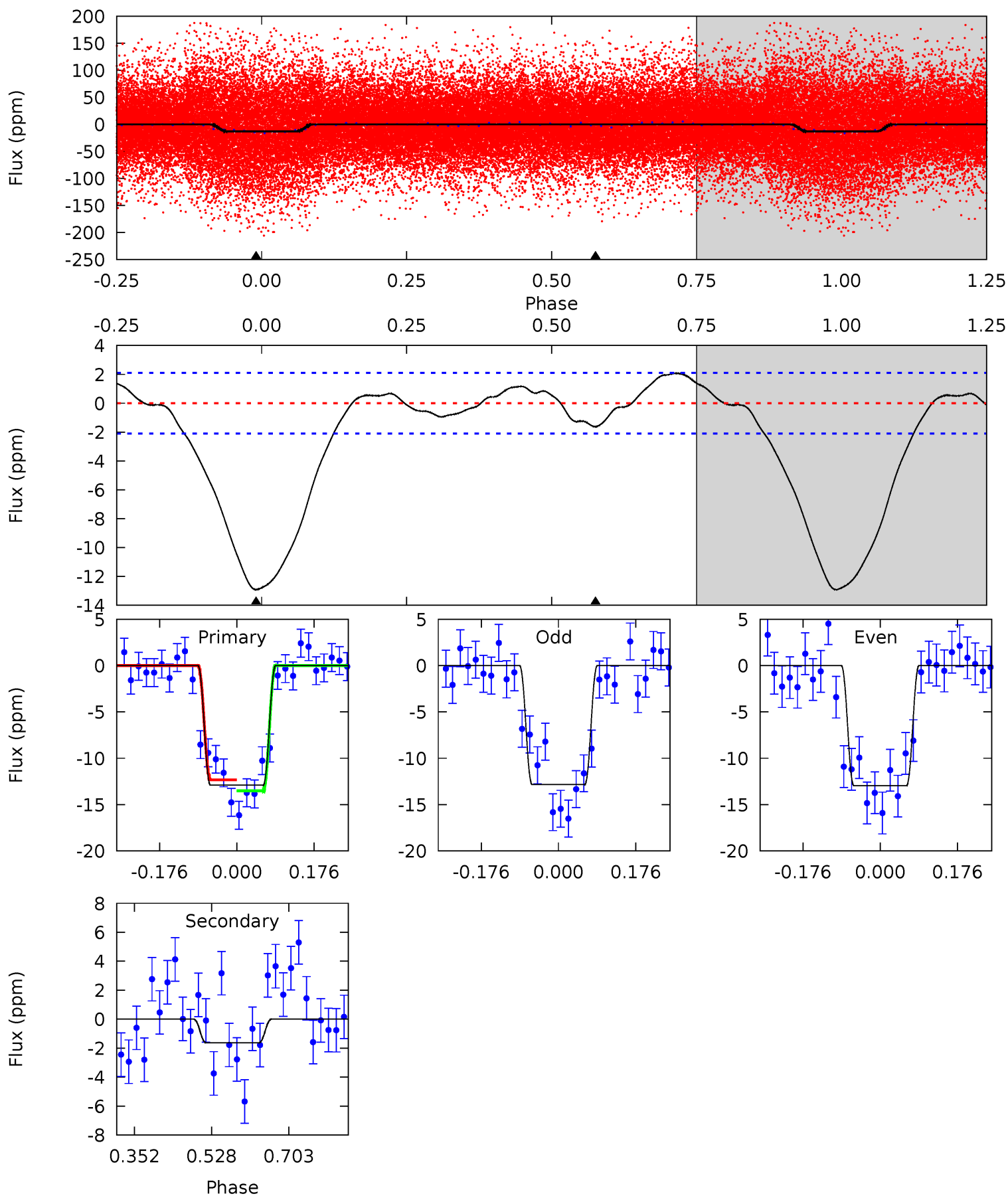
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.8	7.98	0	0	4.42	1.30	2.43	20.8	20.8	7.98	7.98	0.34	0.94	0.10	3.53



# Alt Model-Shift Uniqueness Test

011551652-01, P = 1.191480 Days, E = 130.806531 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
27.3	3.44	0	0	4.44	1.35	1.26	27.3	27.3	3.44	3.44	0.13	1.06	0.14	1.24





### Stellar Parameters For KIC 011551652

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7302^{+233}_{-285}$	$3.965^{+0.315}_{-0.135}$	$-0.500^{+0.250}_{-0.300}$	$2.069^{+0.516}_{-0.774}$	$1.440^{+0.198}_{-0.296}$	$0.229^{+0.544}_{-0.092}$
	+3%/-4%	+8%/-3%	+50%/-60%	+25%/-37%	+14%/-21%	+238%/-40%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 011551652-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-4 \pm 1$	$0.85^{+0.20}_{-0.20}$	$4023^{+331}_{-397}$	$5113^{+516}_{-438}$	$2.051^{+1.337}_{-0.698}$
Alt.	$-2 \pm 0$	$0.80^{+0.22}_{-0.18}$	$4014^{+321}_{-365}$	$4043^{+506}_{-649}$	$0.841^{+0.605}_{-0.361}$

$T_{max}$  = 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

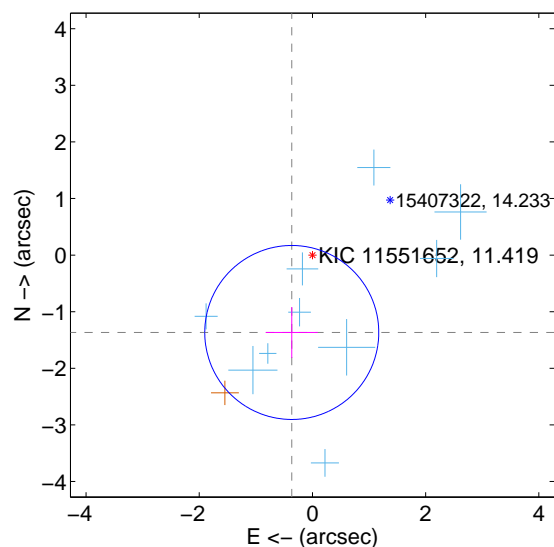
Supplemental centroid analysis for 011551652-01. **Kepler magnitude: 11.42.** Transit SNR 13.93

There are 10 quarters with good PRF difference image offsets

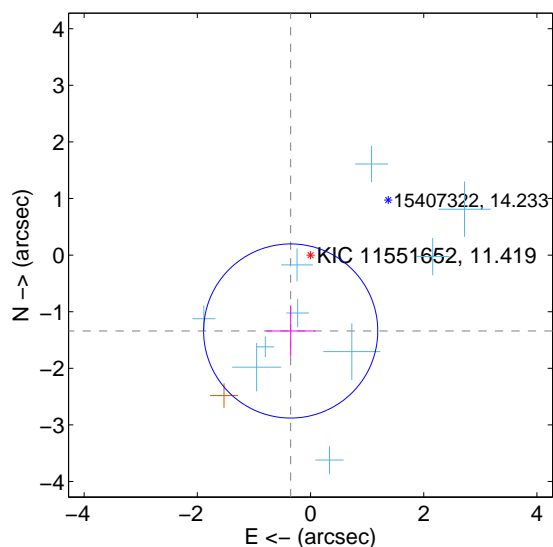
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.415 \pm 0.512$	2.76	$0.365 \pm 0.460$	$-1.367 \pm 0.449$
PRF-fit source offset from KIC position	$1.386 \pm 0.513$	2.70	$0.351 \pm 0.439$	$-1.341 \pm 0.452$
photometric centroid source offset	$1.50 \pm 0.69$	2.19	$1.27 \pm 0.69$	$0.81 \pm 0.68$

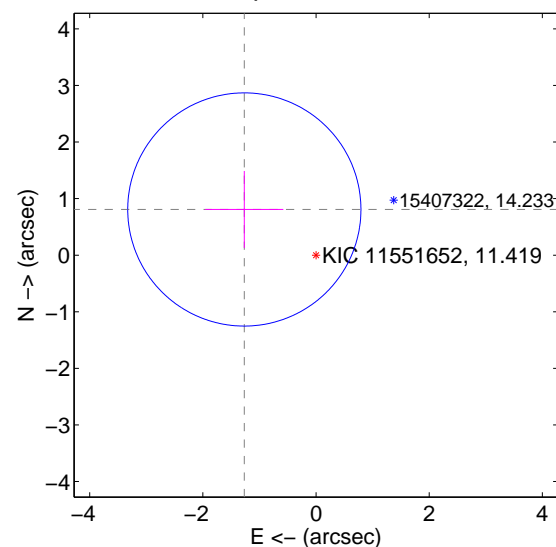
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

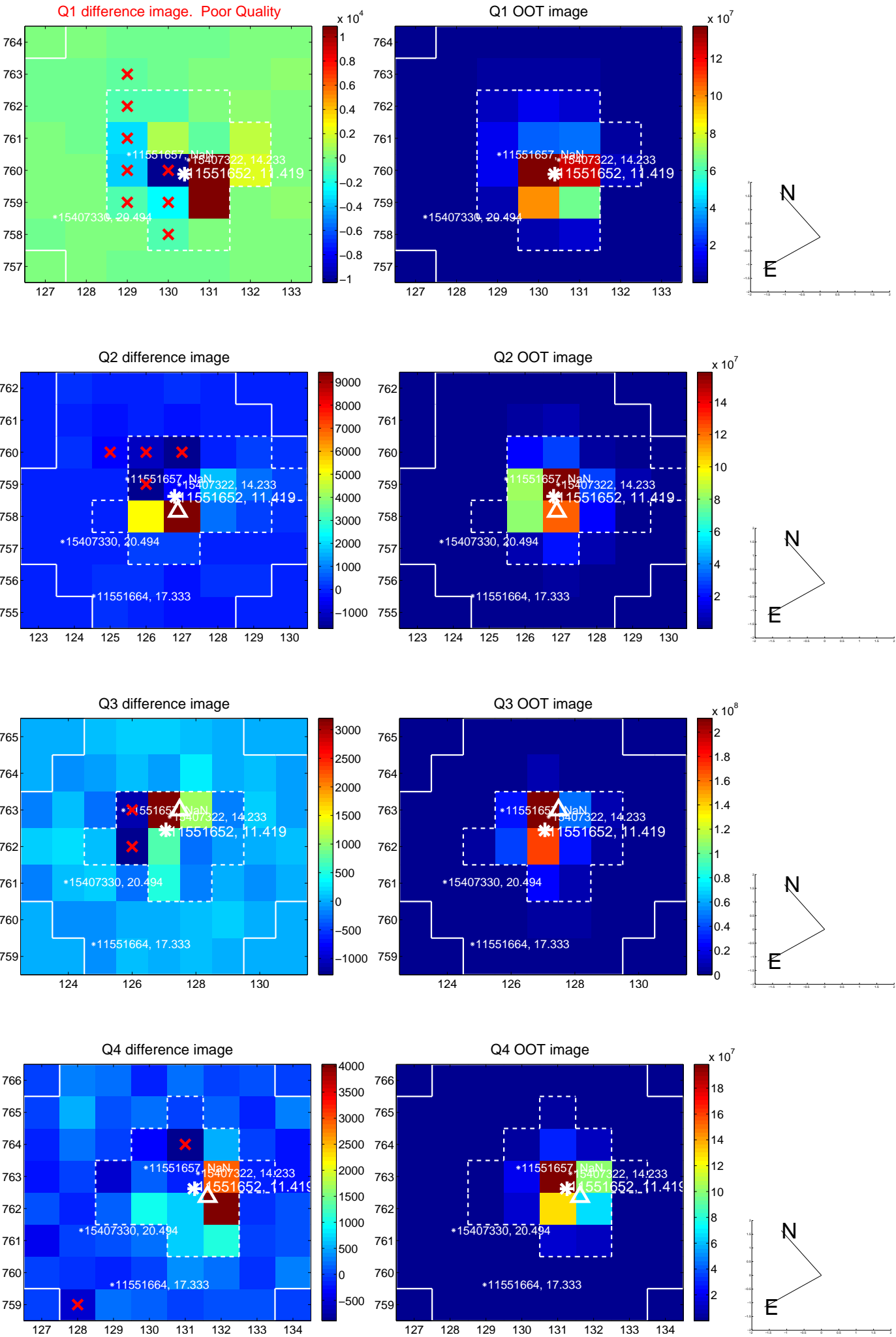


offset from photometric centroids

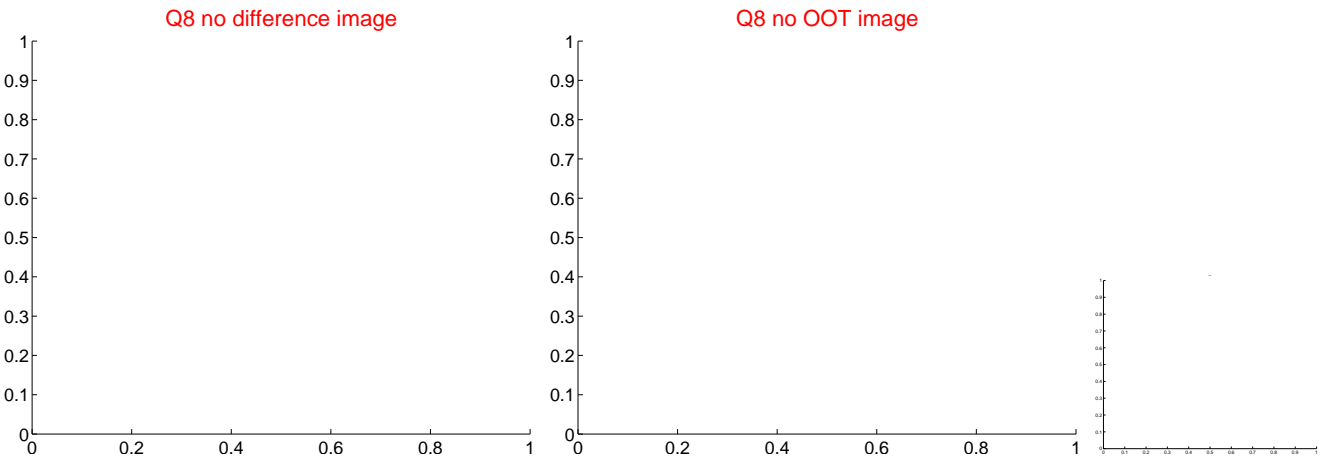
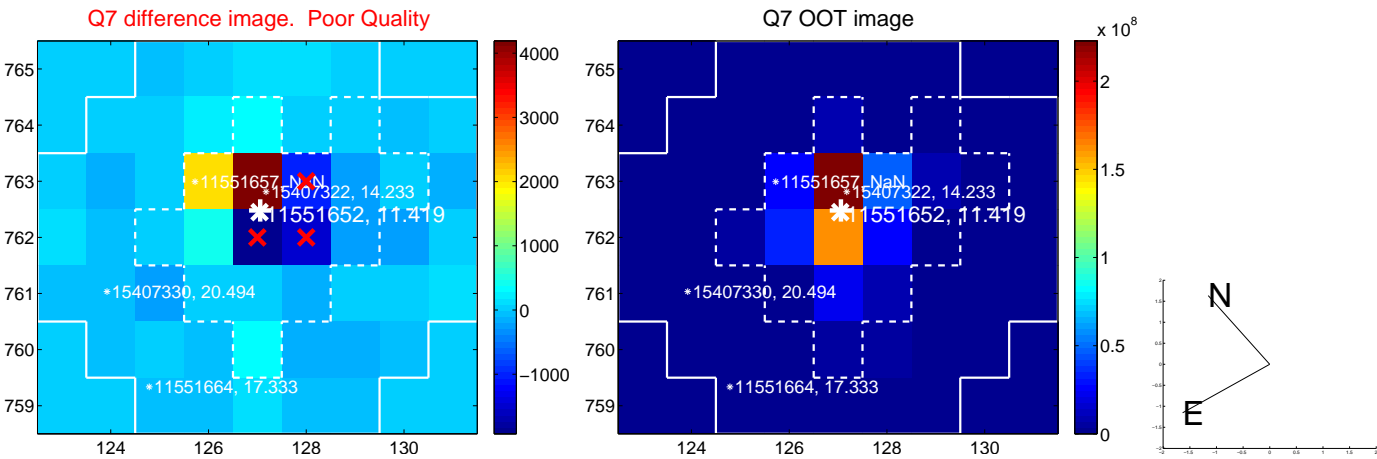
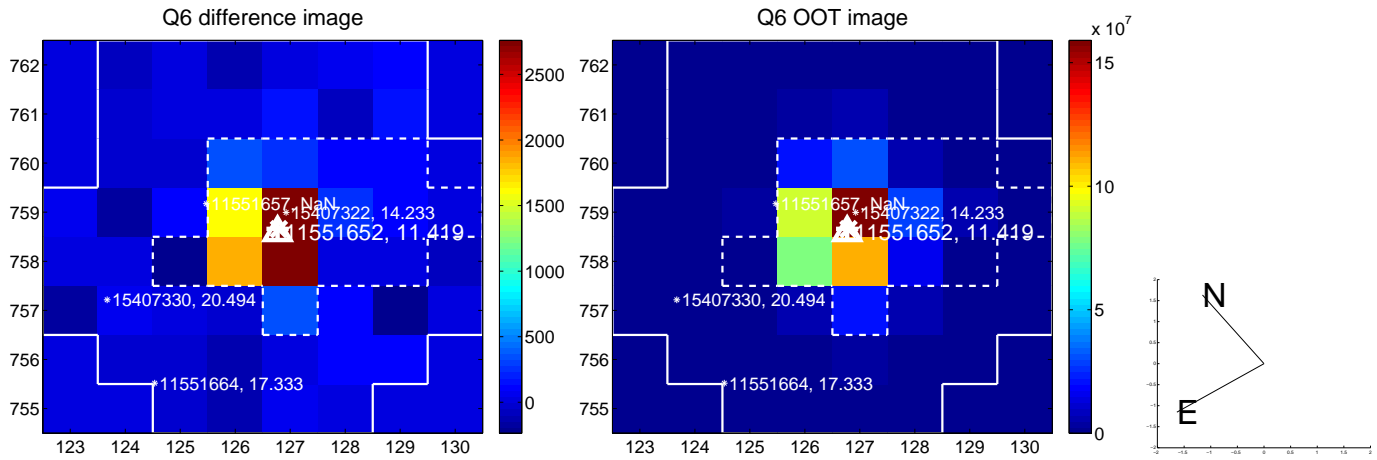
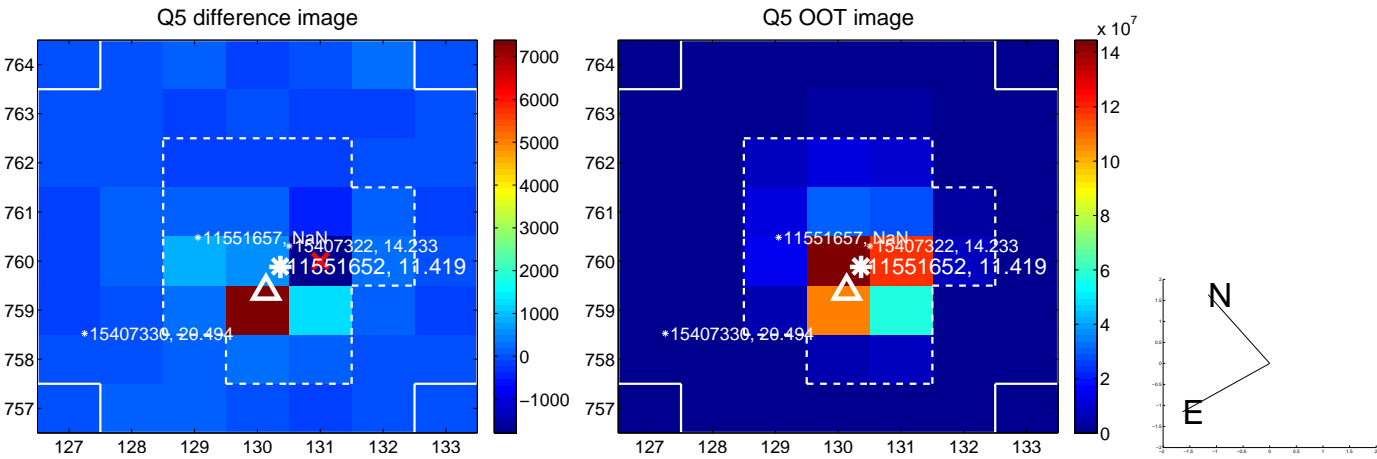


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

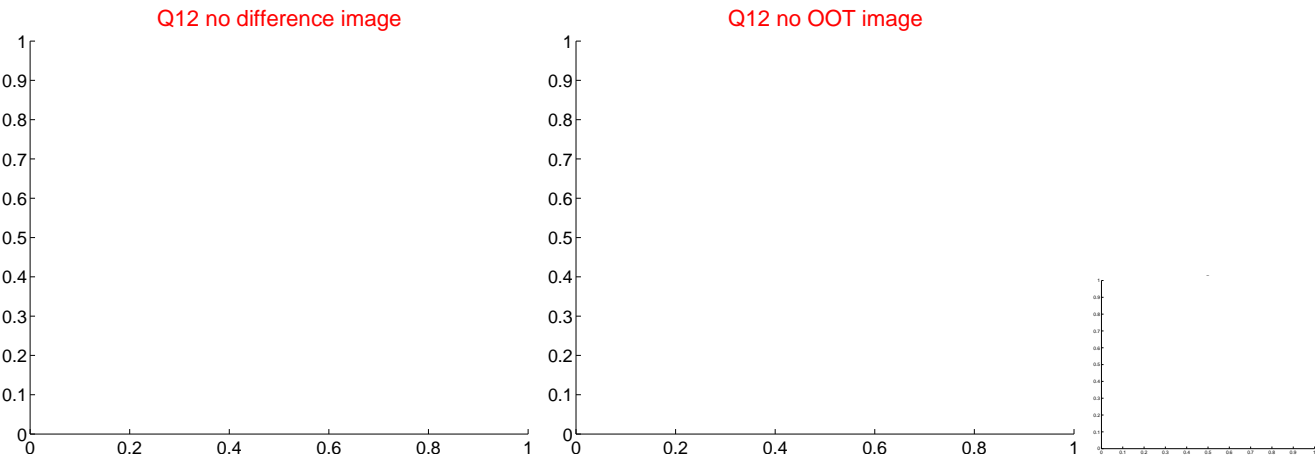
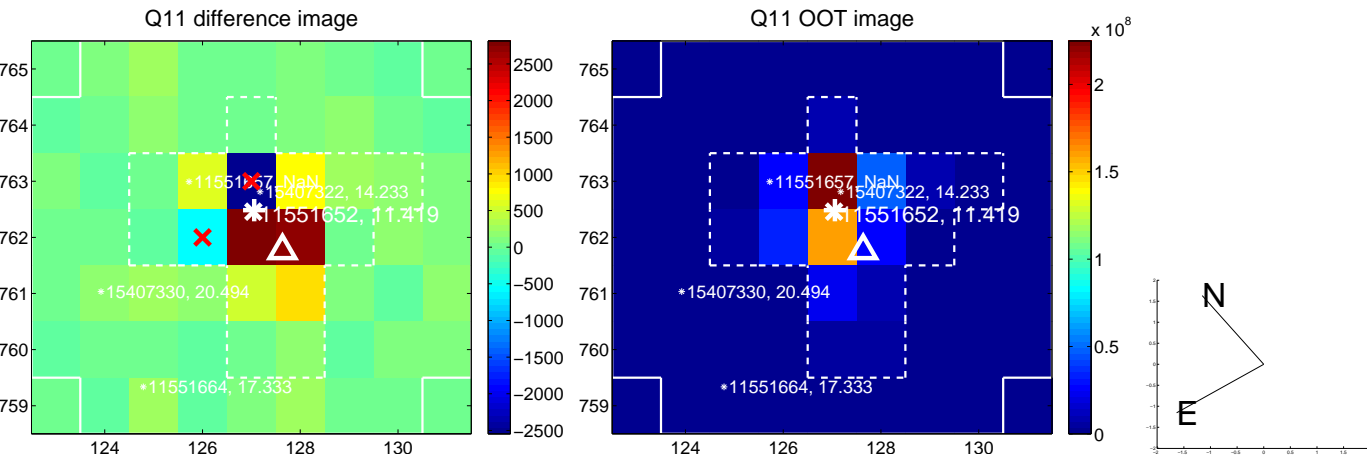
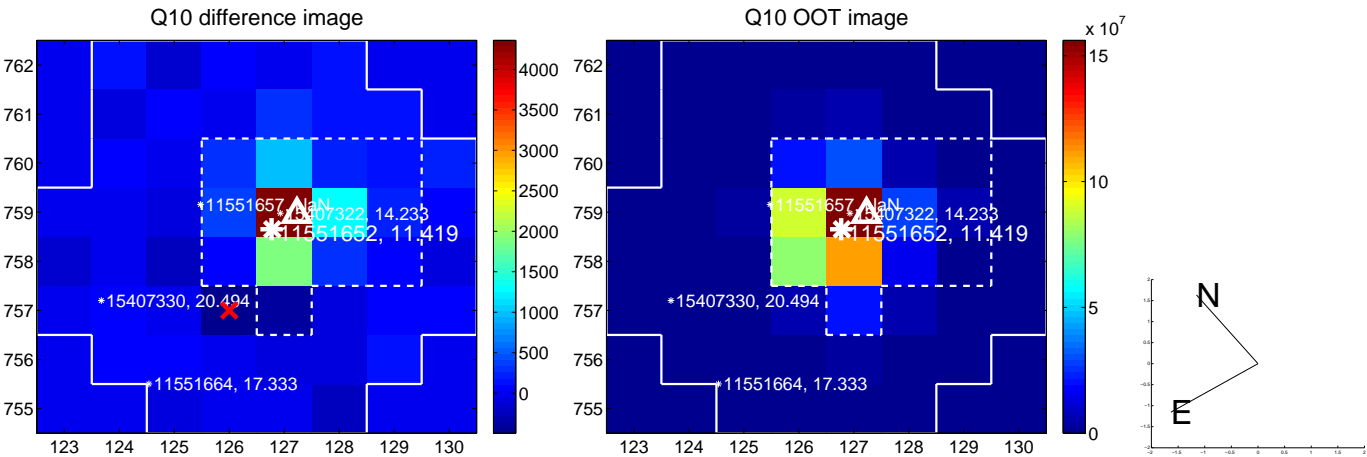
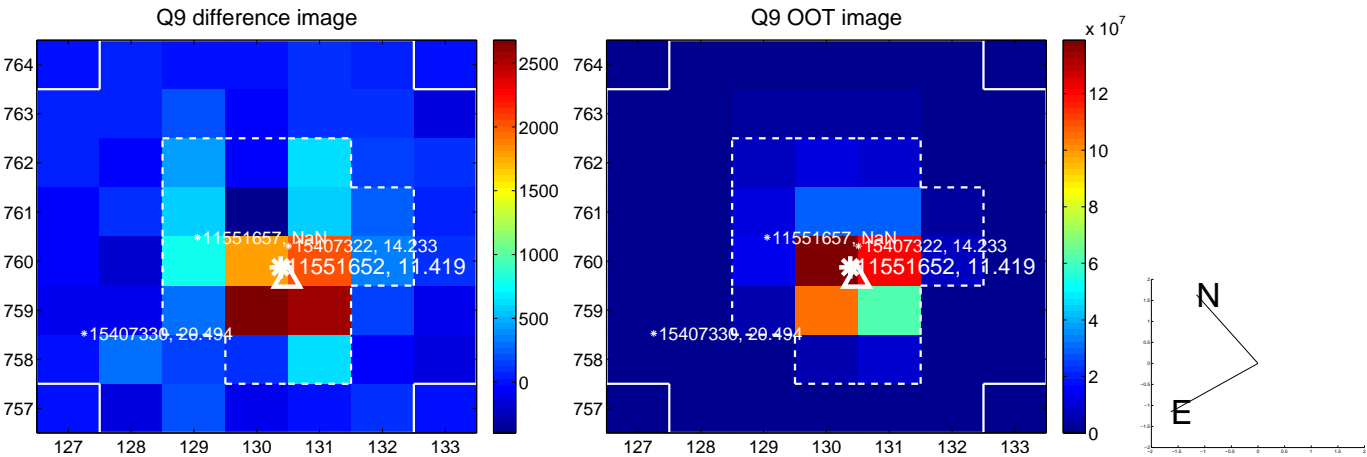


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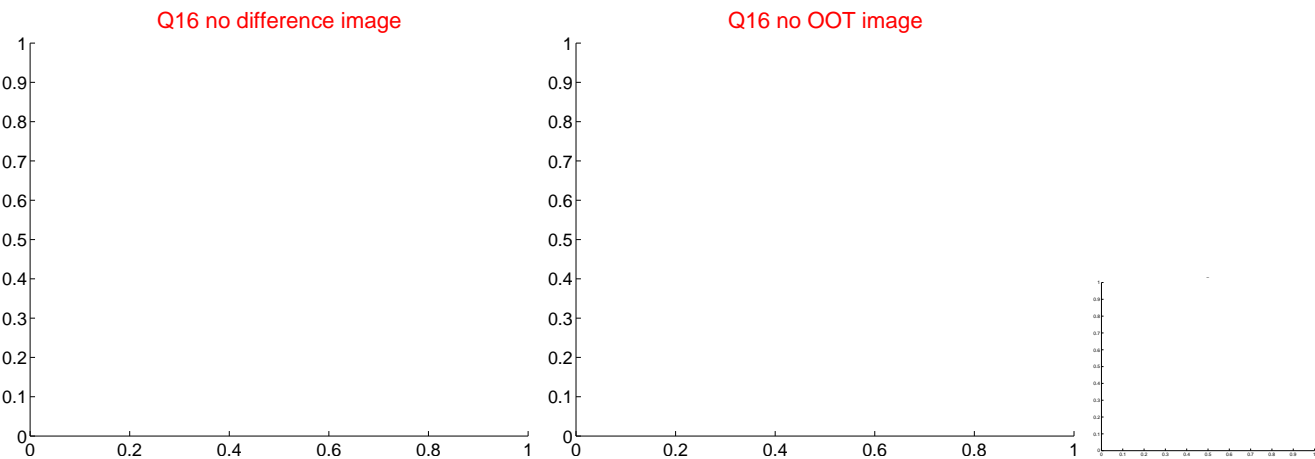
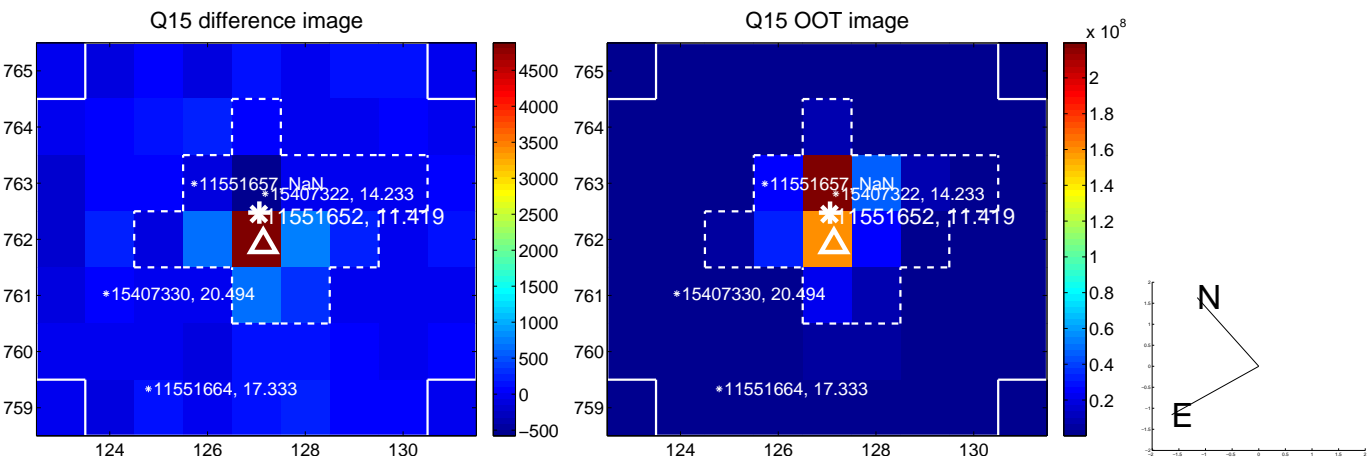
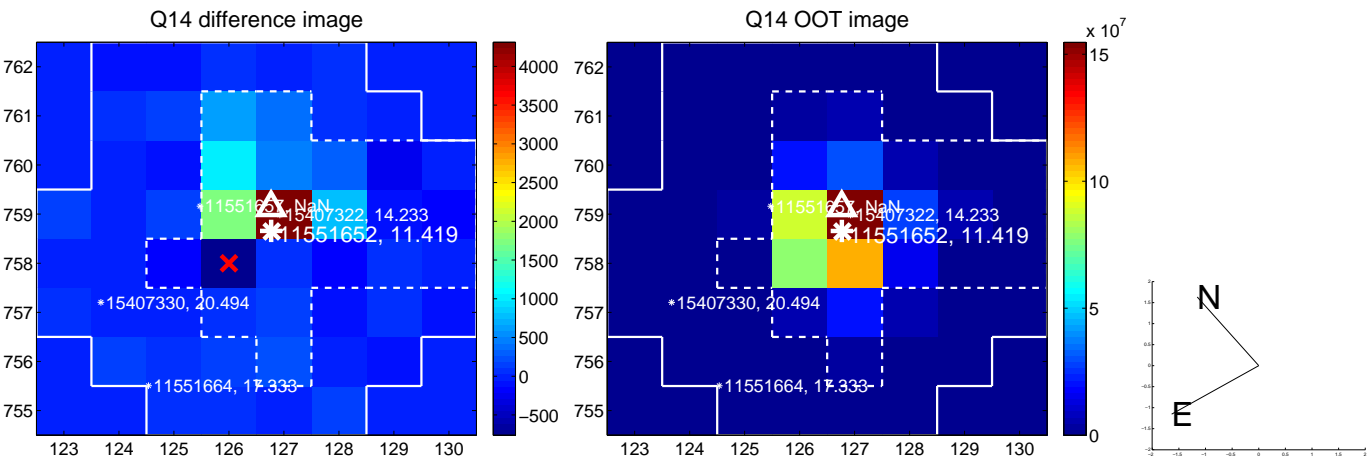
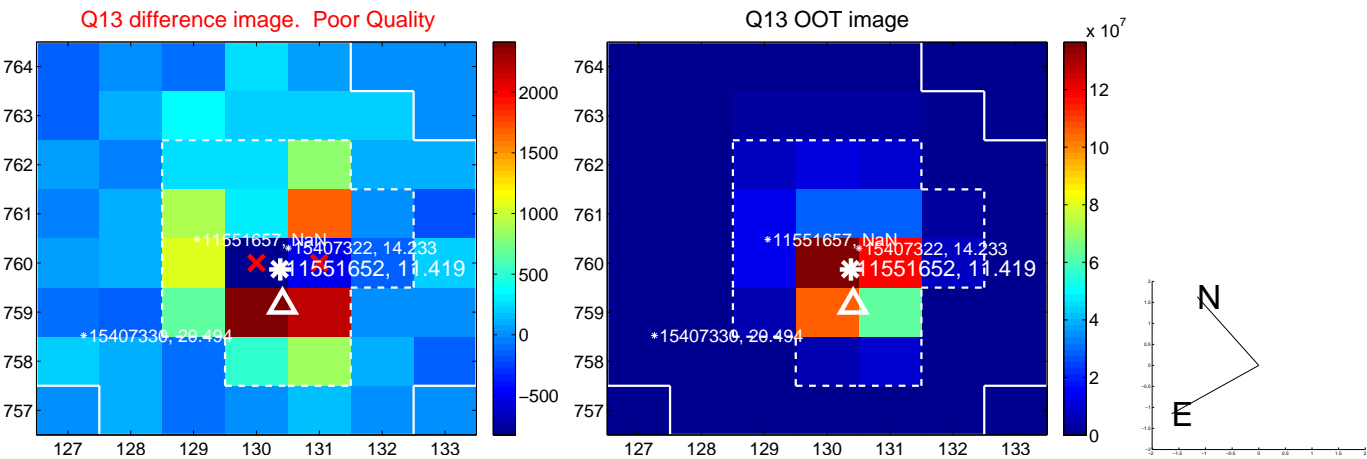




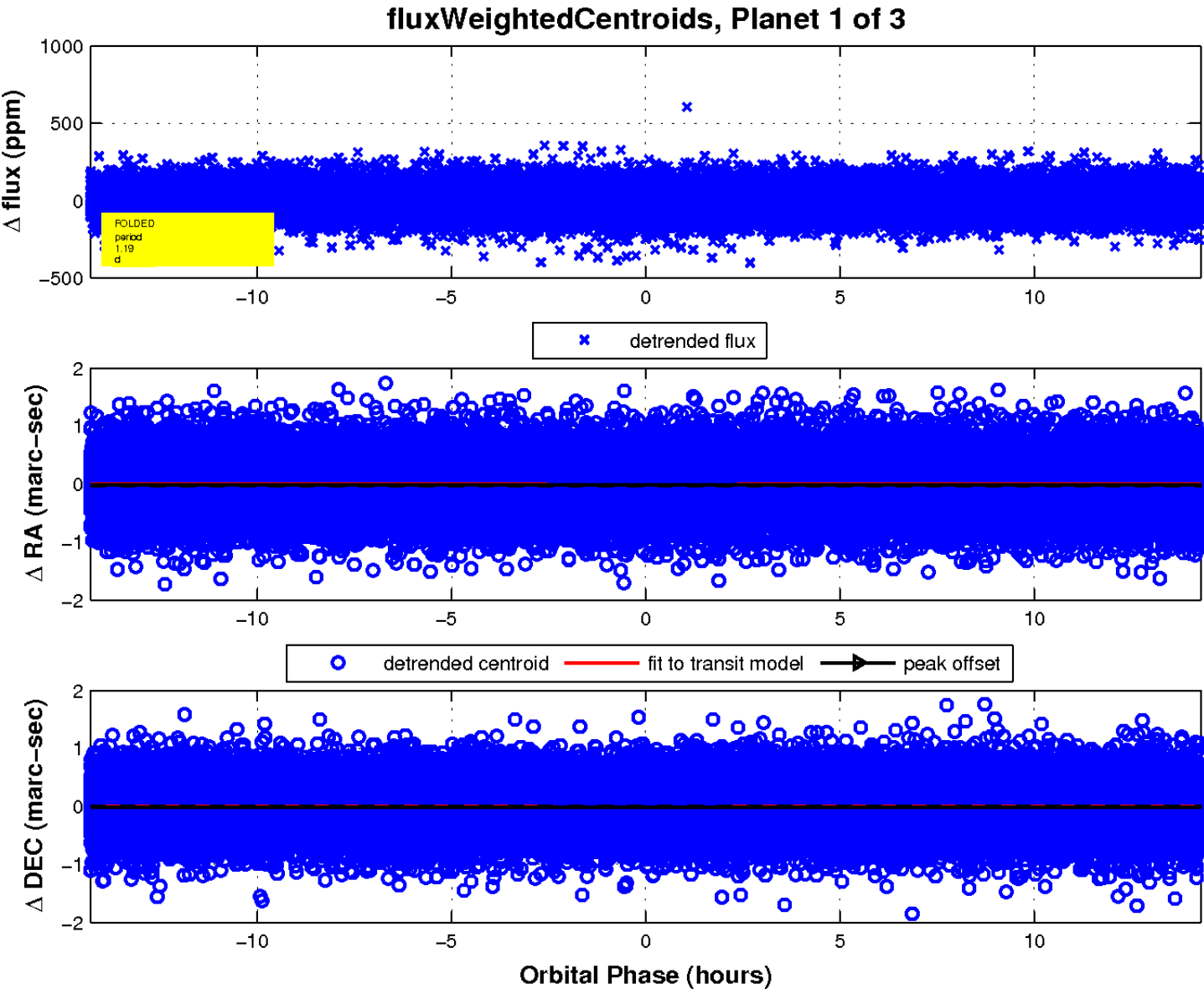
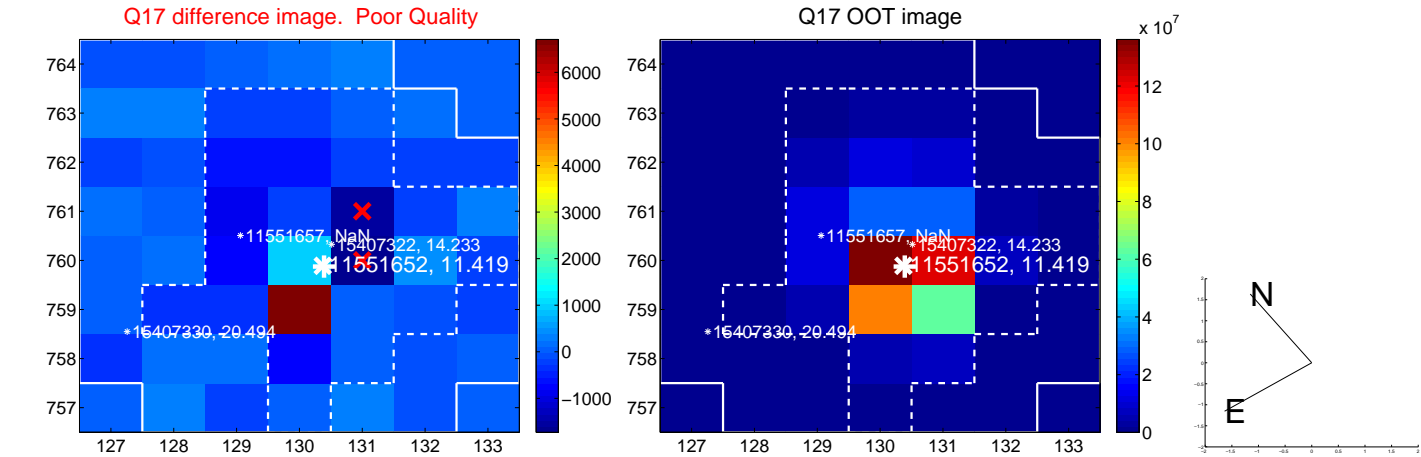
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

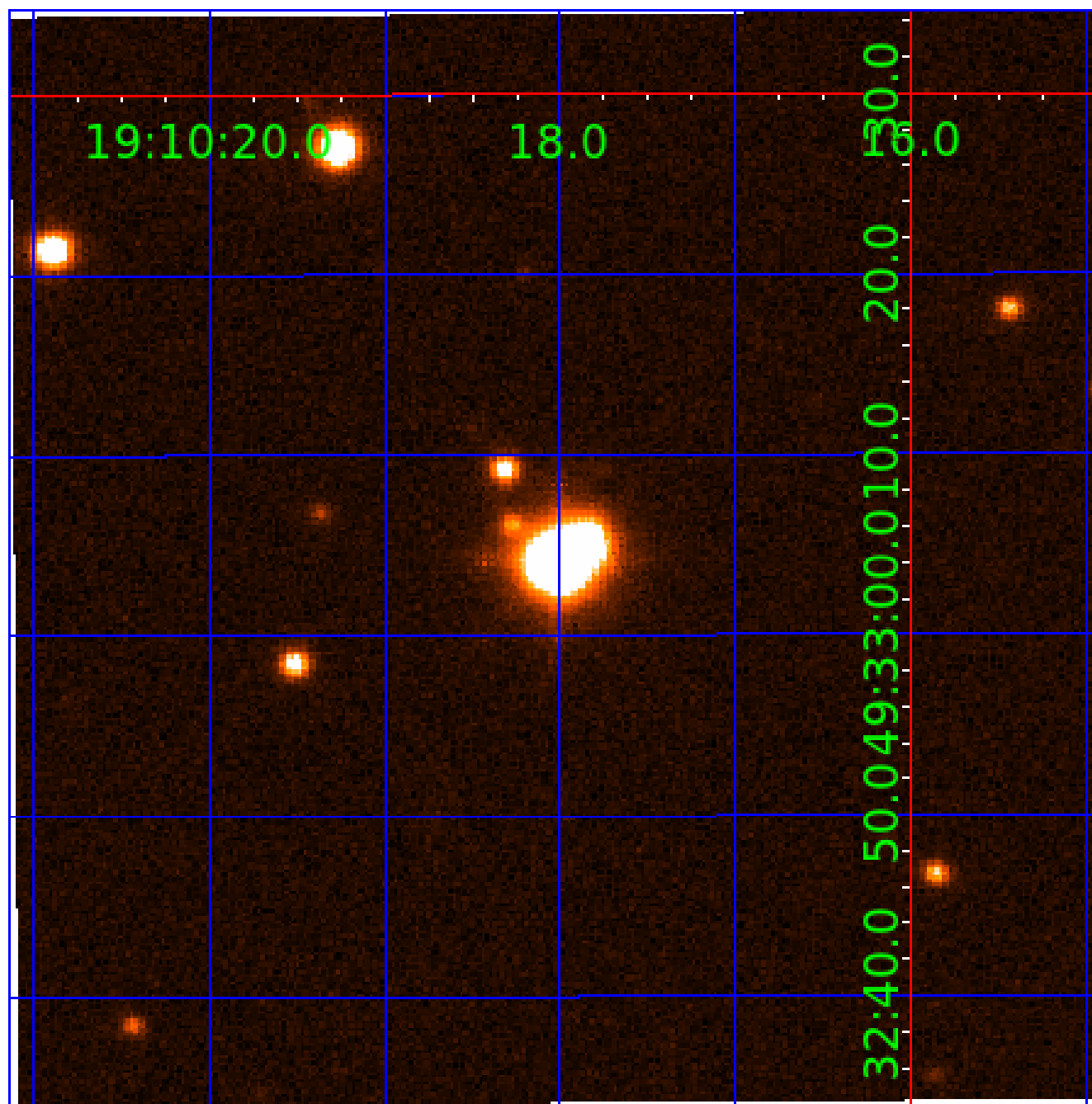


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 011551652

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011551652-01	OBS	No	1.191440	132.013011	13.5	5.088	12.7	13.9	2.07	7302	0.88	17663.33
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011551652-03	OBS	No	111.882750	210.834362	107.5	15.123	9.6	7.1	2.07	7302	2.32	41.38

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
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011551652-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_SATURATED
011551652-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED—HALO_GHOST

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

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

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

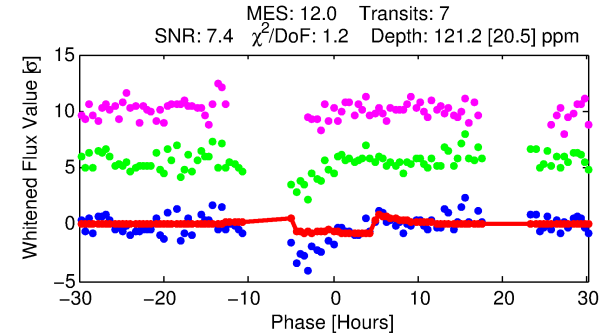
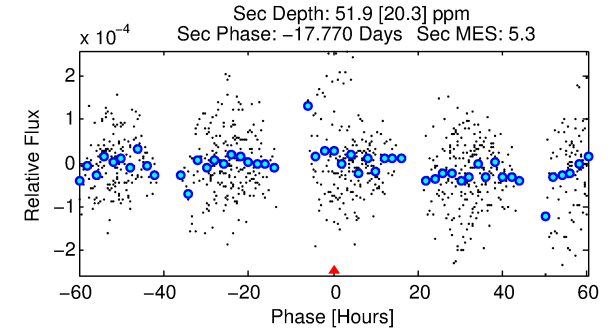
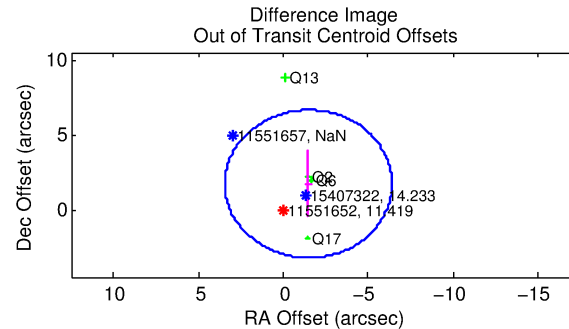
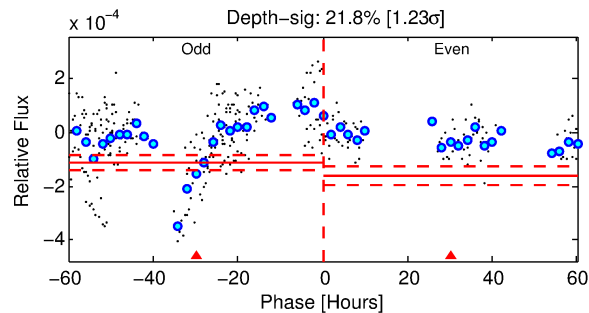
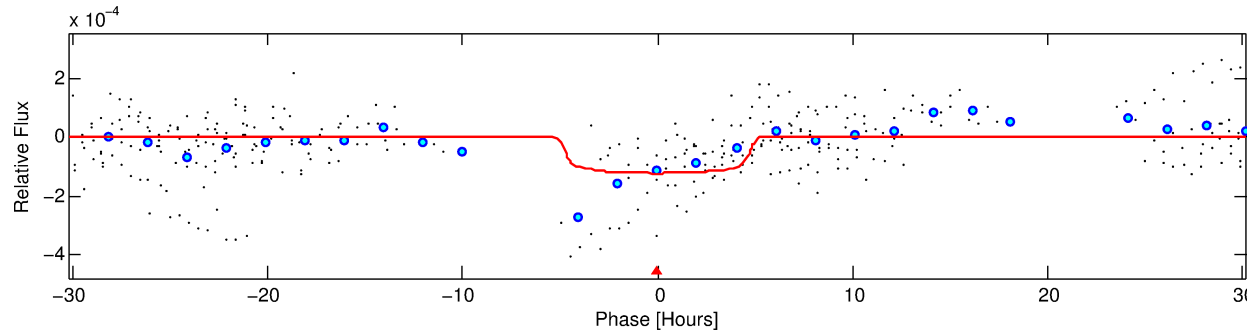
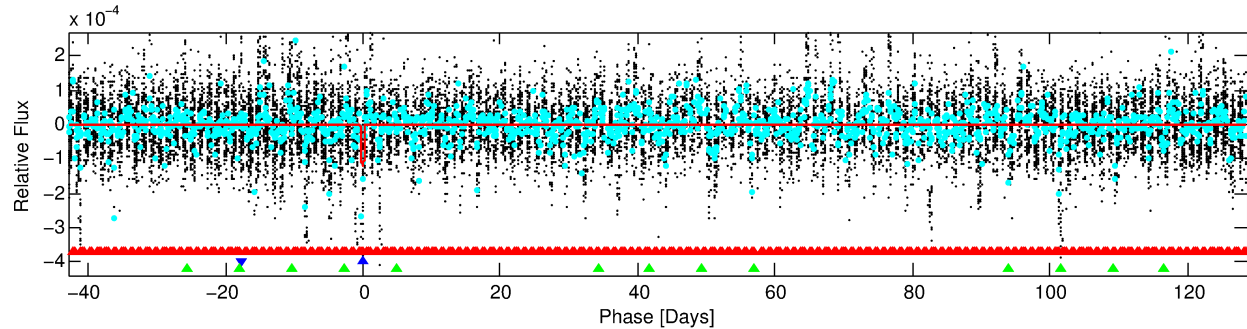
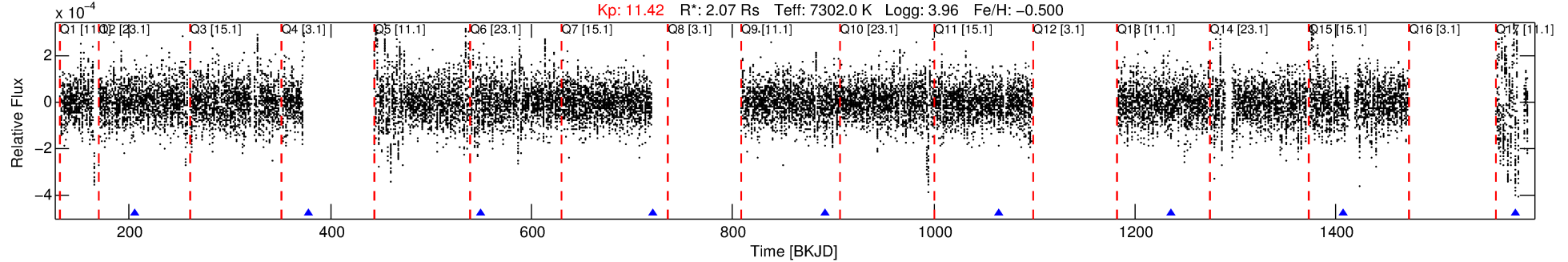
## Ephemeris Match Information For 011551652-02

No Significant Match Found

# DV One-Page Summary

KIC: 11551652 Candidate: 2 of 3 Period: 171.620 d  
KOI: K07455 Corr: No Ephemeris Match

Kp: 11.42 R\*: 2.07 Rs Teff: 7302.0 K Logg: 3.96 Fe/H: -0.500



## DV Fit Results:

Period = 171.62045 [0.00379] d  
Epoch = 206.0026 [0.0279] BKJD  
Rp/R\* = 0.0116 [0.0022]  
a/R\* = 61.33 [58.32]  
b = 0.90 [0.21]  
Seff = 23.39 [13.24]  
Teq = 561 [79] K  
Rp = 2.63 [1.10] Re  
a = 0.6827 [0.2371] AU  
Ag = 1926.78 [1477.34] [1.30σ]  
Teffp = 5744 [808] K [6.39σ]

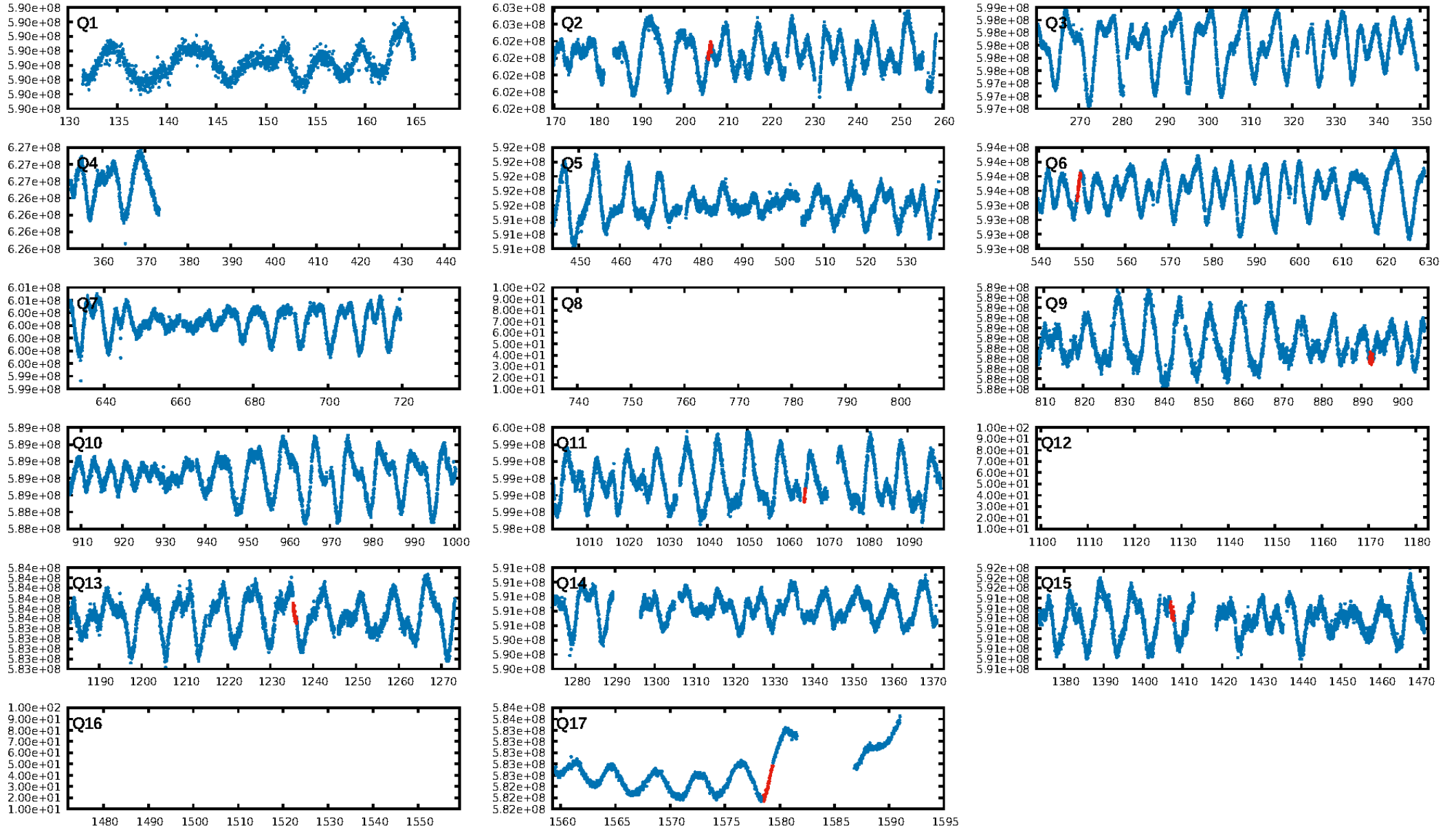
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [78.91σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 7.59e-18  
RollingBand-fgt: 1.00 [6/6]  
GhostDiagnostic-chr: -7.791  
Centroid-sig: 54.5%  
Centroid-so: 0.914 arcsec [1.03σ]  
OotOffset-rm: 2.266 arcsec [1.38σ]  
KicOffset-rm: 2.305 arcsec [1.39σ]  
OotOffset-st: 2/0/0/2 [4]  
KicOffset-st: 2/0/0/2 [4]  
DiffImageQuality-fgm: 0.00 [0/4]  
DiffImageOverlap-fno: 0.00 [0/6]

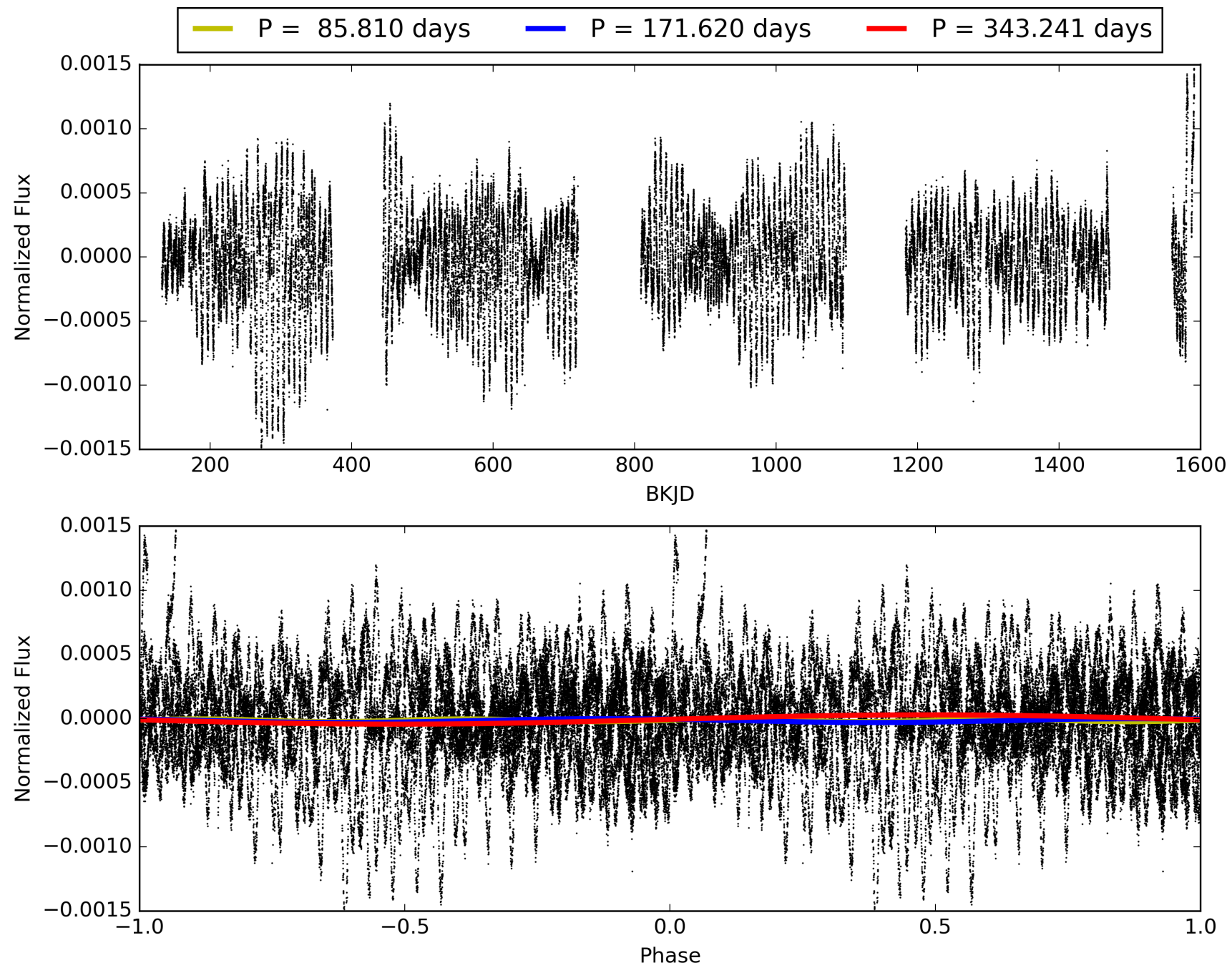
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 03:54:26 Z

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

# TCE 011551652-02, PDC Light Curves

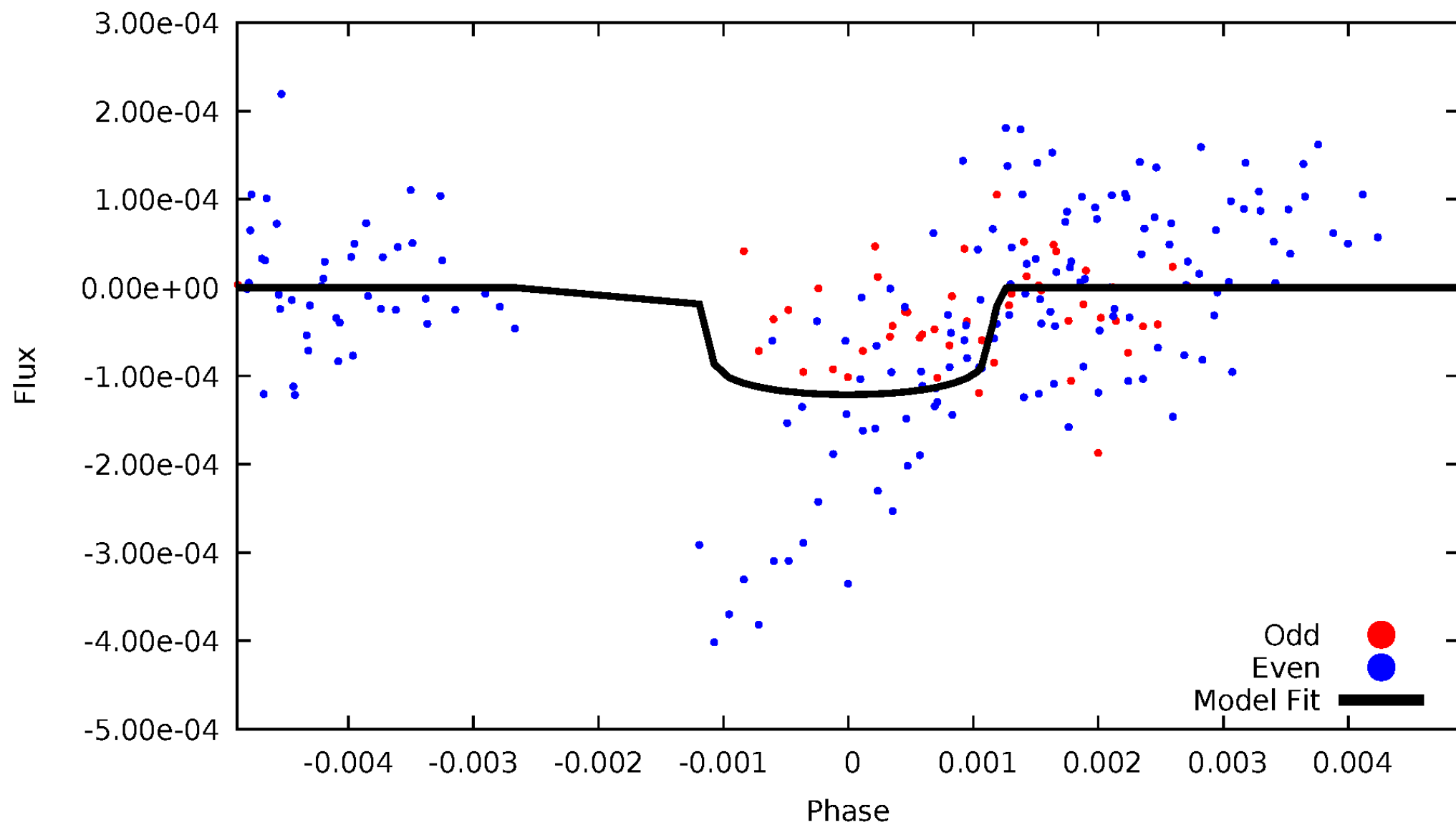


# TCE 011551652-02



# DV Odd/Even

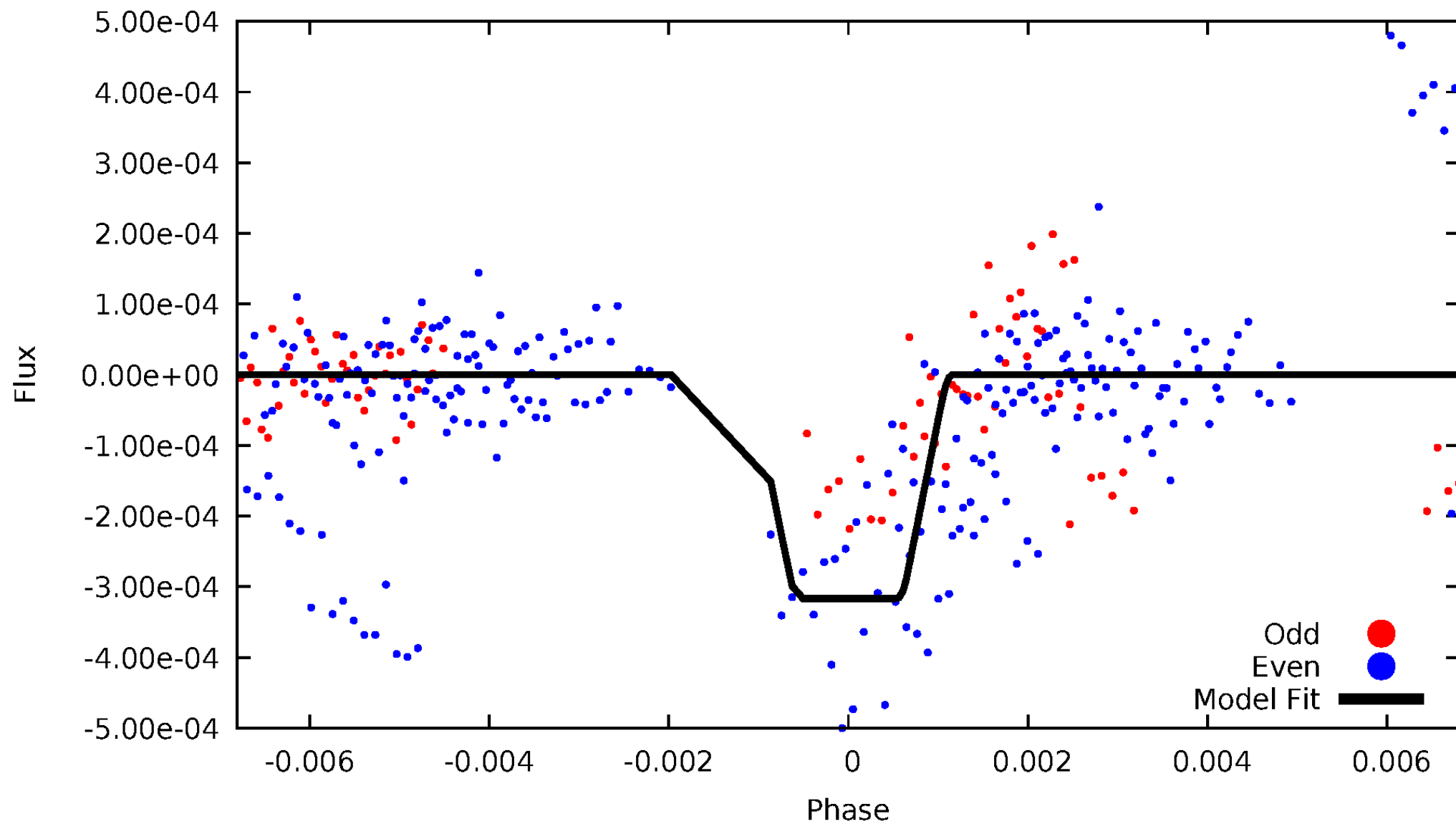
TCE 011551652-02





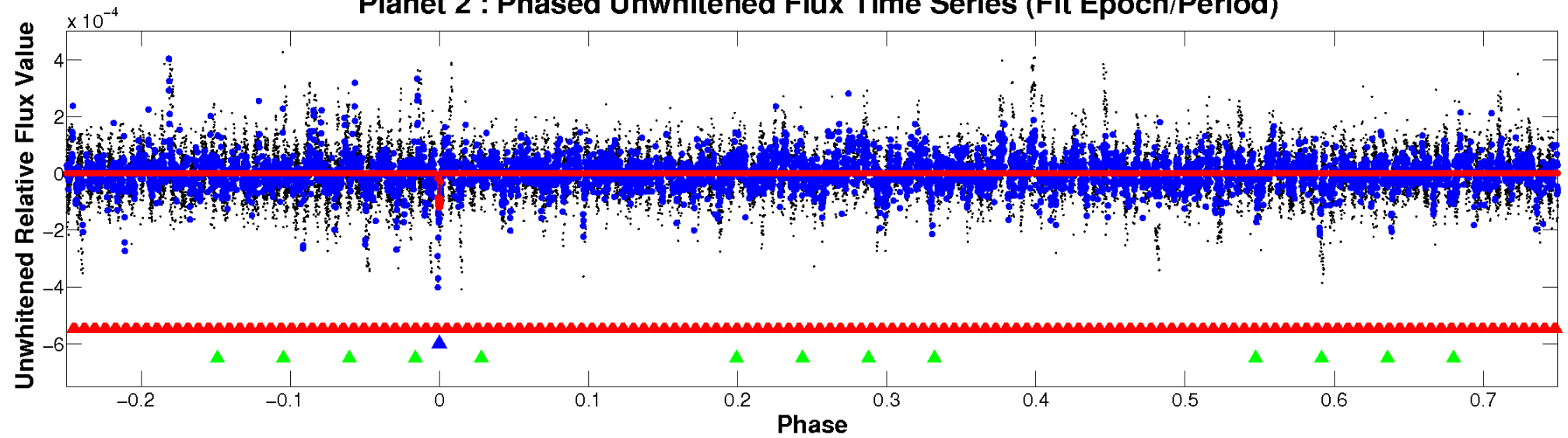
# ALT Odd/Even

TCE 011551652-02

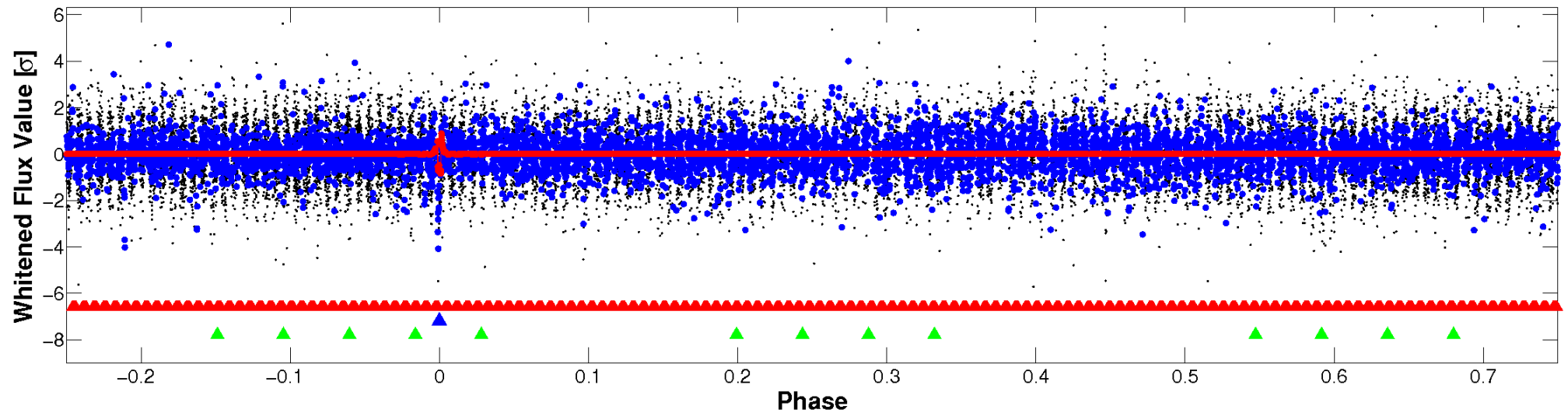


# Non-Whitened Vs. Whitened Light Curve

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

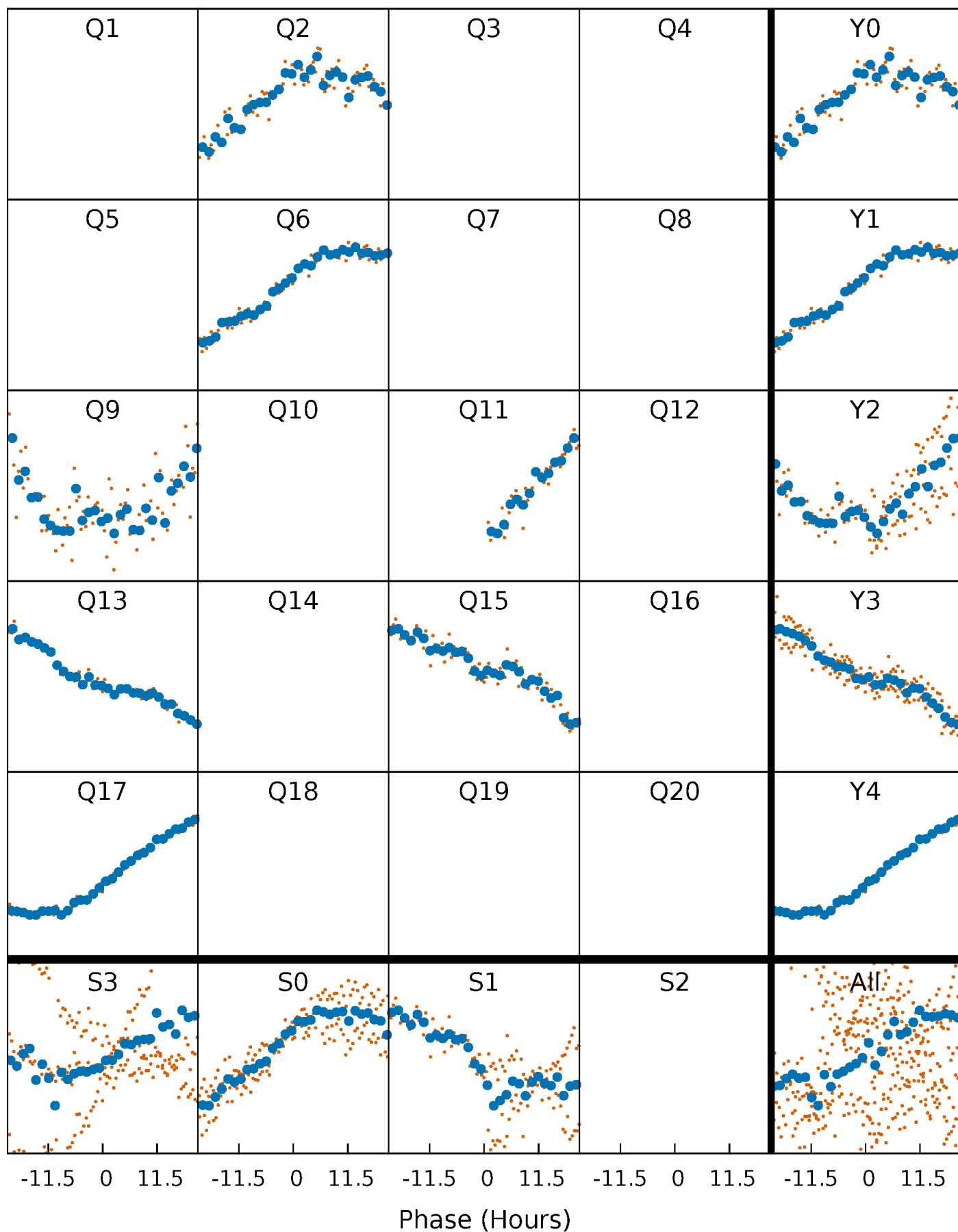


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



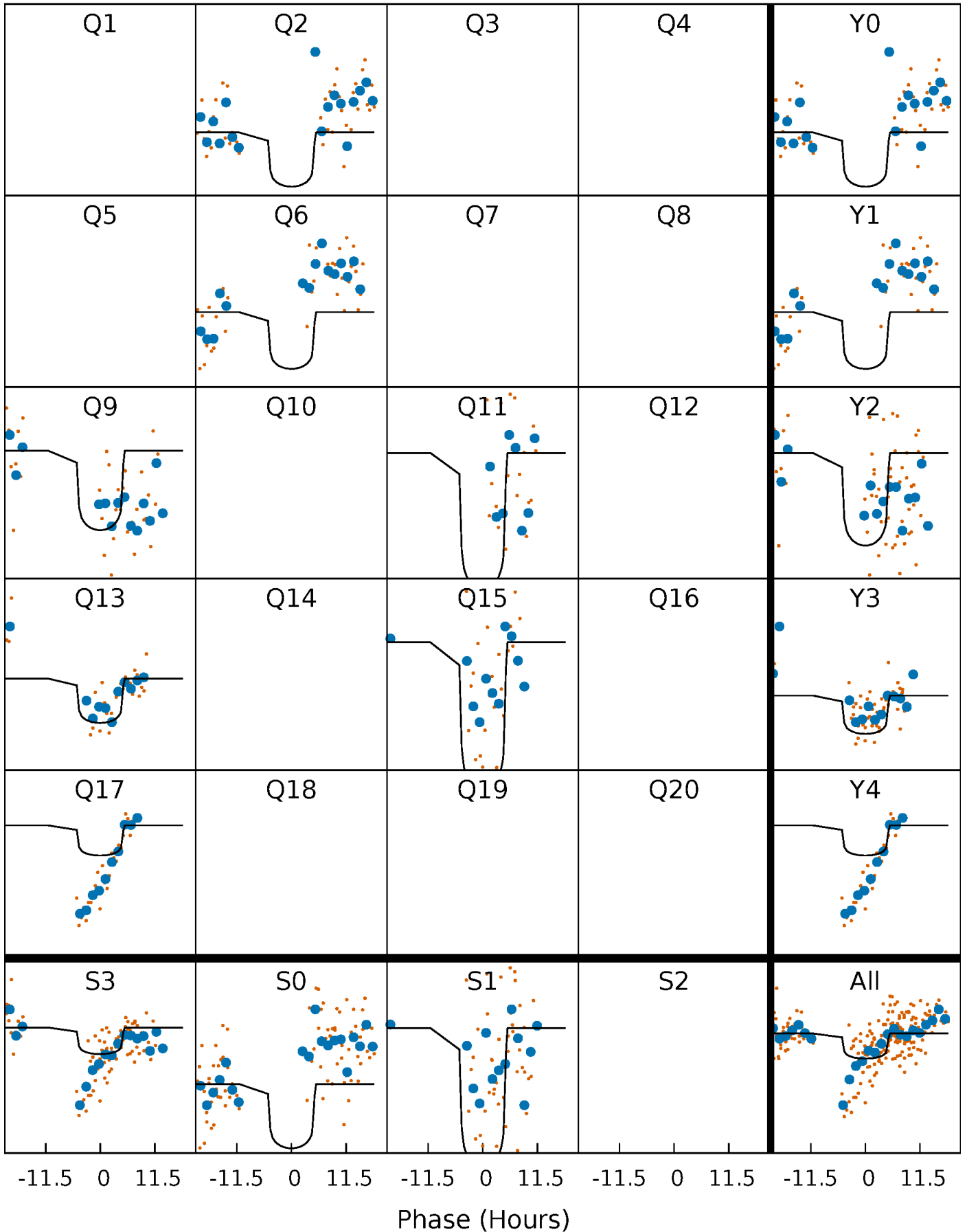
# PDC Quarter-Phased Transit Curves

TCE 011551652-02     $P=171.620450$  Days     $T_0=206.002625$  (BKJD)



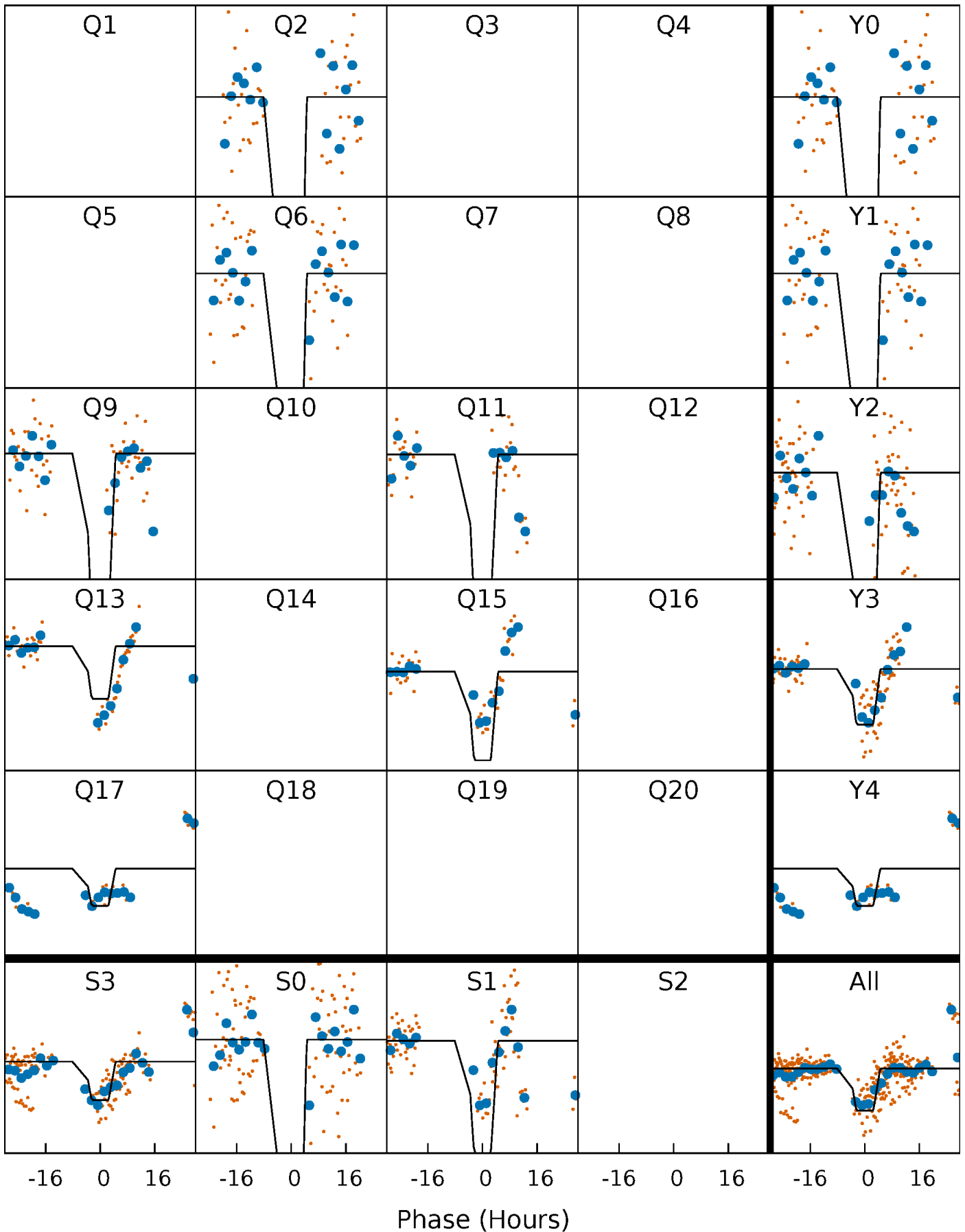
# DV Quarter-Phased Transit Curves

TCE 011551652-02 P=171.620450 Days  $T_0=206.002625$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 011551652-02 P=171.628282 Days  $T_0=205.883437$  (BKJD)

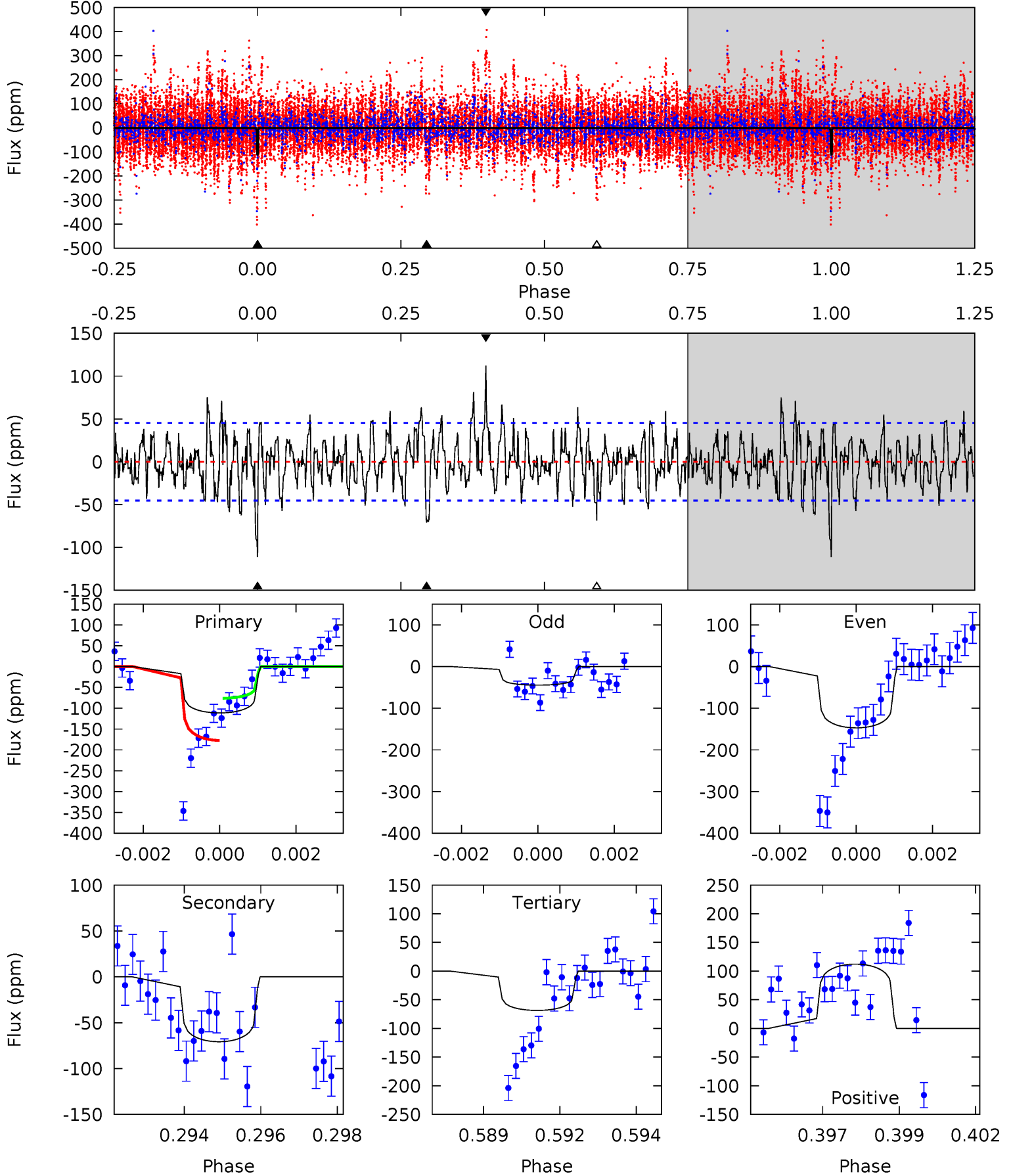




# DV Model-Shift Uniqueness Test

011551652-02,  $P = 171.620450$  Days,  $E = 34.382175$  Days

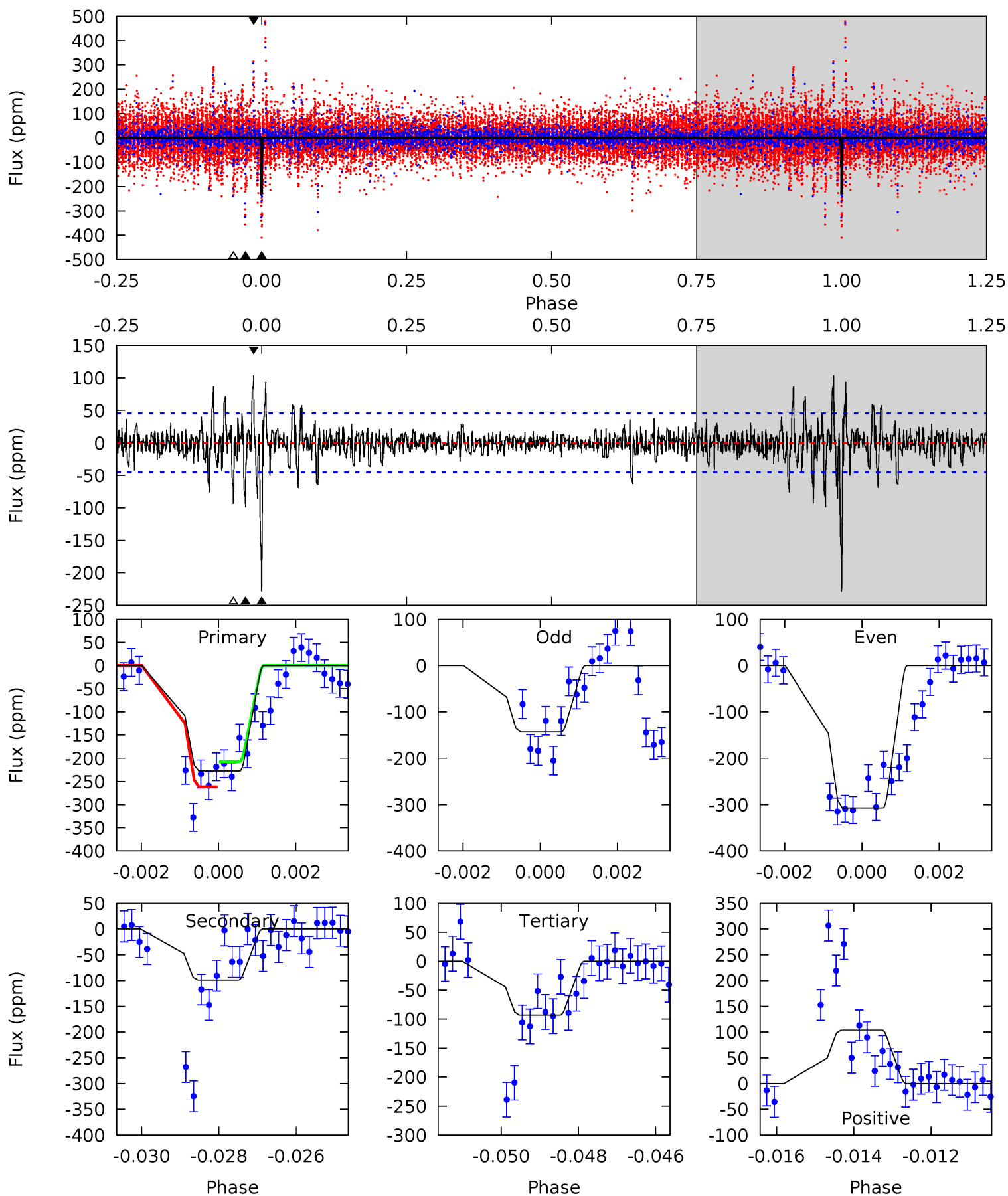
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.0	8.26	8.00	13.1	5.30	3.04	2.76	4.98	-0.11	0.26	-4.83	5.68	1.14	0.50	5.40



# Alt Model-Shift Uniqueness Test

011551652-02,  $P = 171.628282$  Days,  $E = 34.255155$  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
26.8	11.6	10.9	12.2	5.33	3.09	1.76	15.9	14.6	0.68	-0.60	9.52	1.20	0.31	2.82



### Stellar Parameters For KIC 011551652

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7302^{+233}_{-285}$	$3.965^{+0.315}_{-0.135}$	$-0.500^{+0.250}_{-0.300}$	$2.069^{+0.516}_{-0.774}$	$1.440^{+0.198}_{-0.296}$	$0.229^{+0.544}_{-0.092}$
	+3%/-4%	+8%/-3%	+50%/-60%	+25%/-37%	+14%/-21%	+238%/-40%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 011551652-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-71 \pm 9$	$2.48^{+0.61}_{-0.57}$	$772^{+59}_{-78}$	$6132^{+736}_{-542}$	$2886^{+1944}_{-1019}$
Alt.	$-99 \pm 9$	$3.86^{+0.80}_{-0.87}$	$769^{+62}_{-74}$	$5422^{+383}_{-316}$	$1705^{+986}_{-540}$

$T_{max}$  = 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

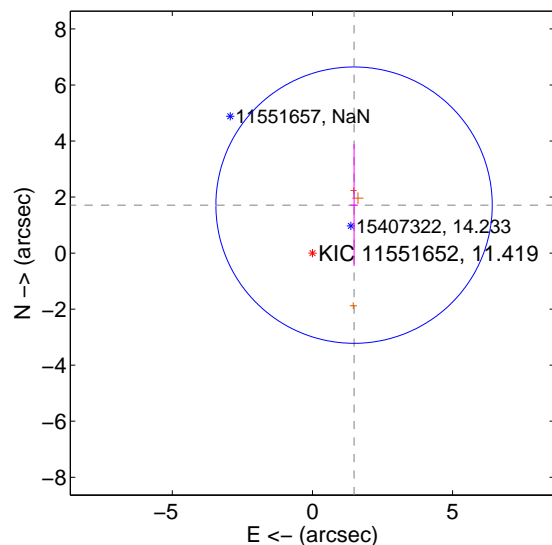
Supplemental centroid analysis for 011551652-02. **Kepler magnitude: 11.42.** Transit SNR 7.45

**There are 0 quarters with good PRF difference image offsets**

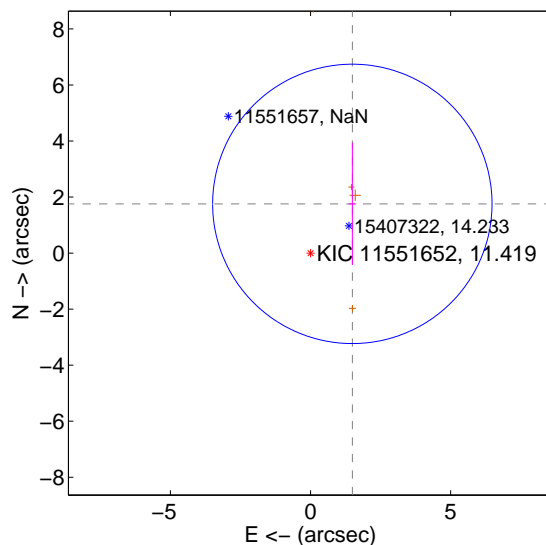
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.266 \pm 1.644$	1.38	$-1.486 \pm 0.138$	$1.711 \pm 2.173$
PRF-fit source offset from KIC position	$2.305 \pm 1.662$	1.39	$-1.492 \pm 0.135$	$1.756 \pm 2.178$
photometric centroid source offset	$0.91 \pm 0.89$	1.03	$-0.91 \pm 0.89$	$0.05 \pm 0.90$

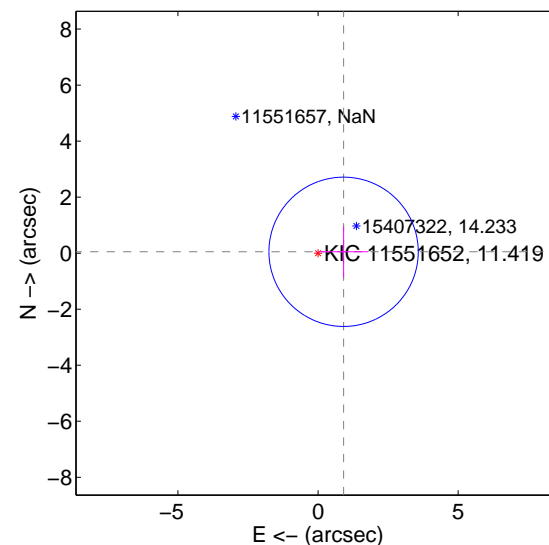
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

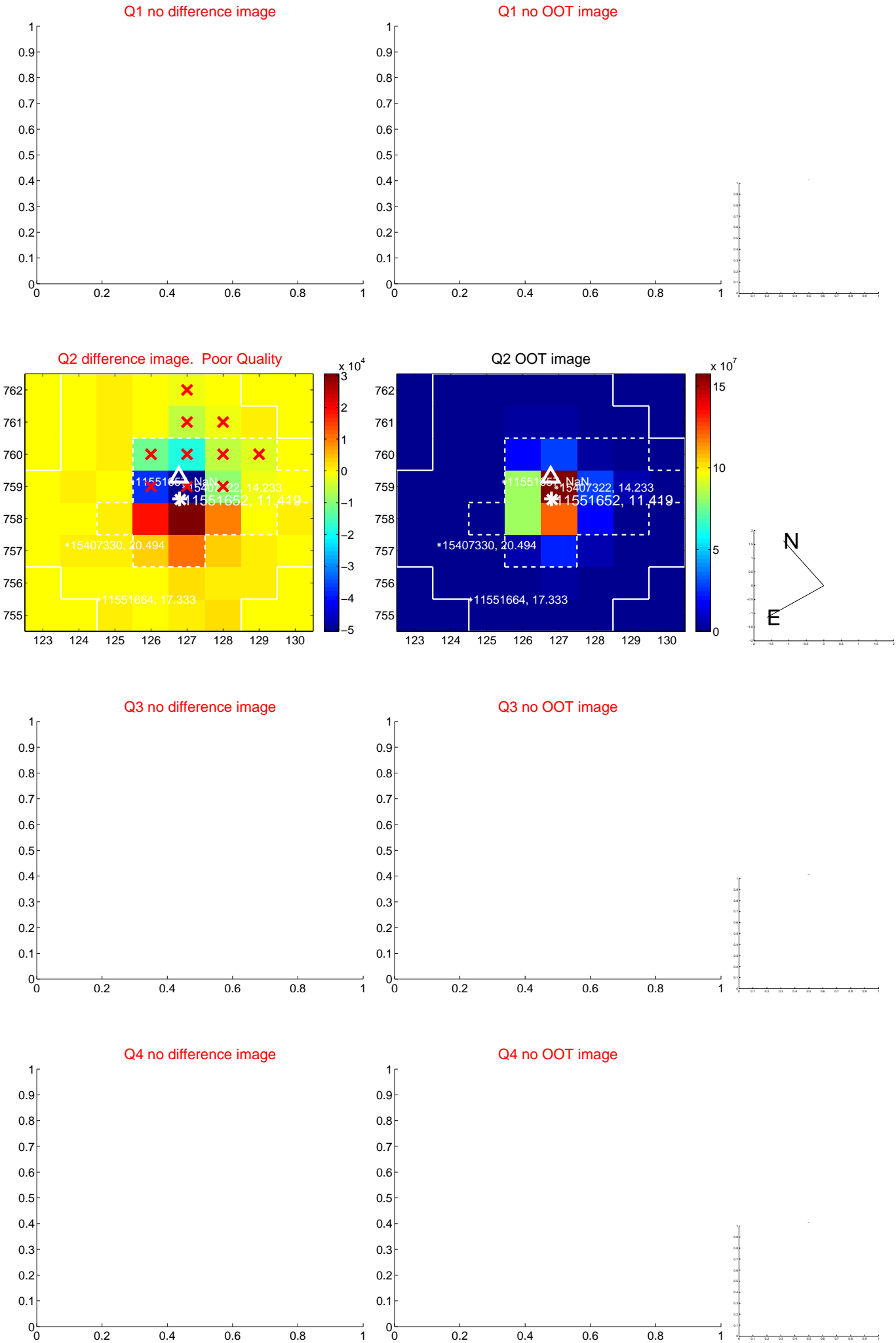


offset from photometric centroids



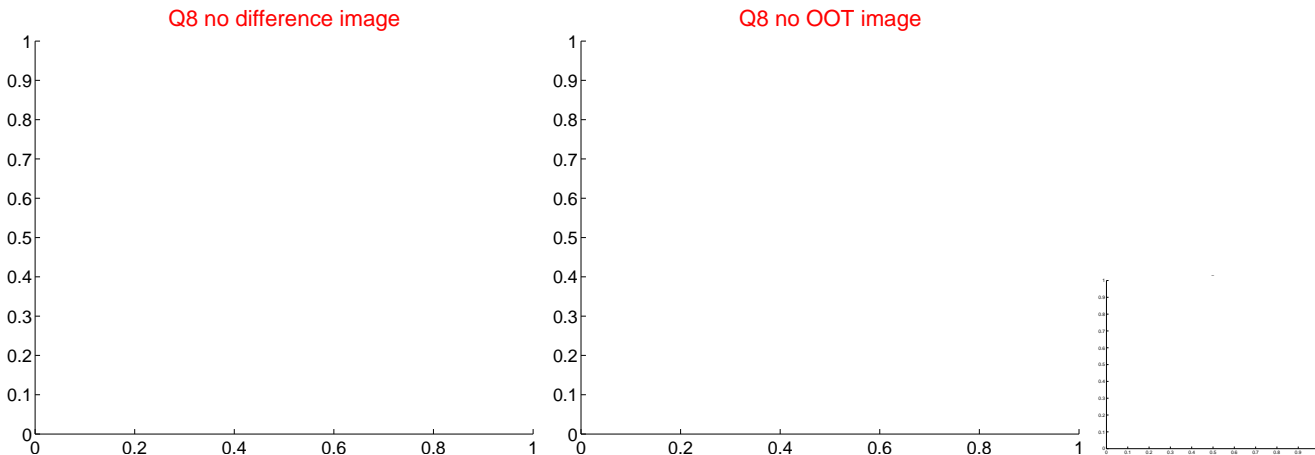
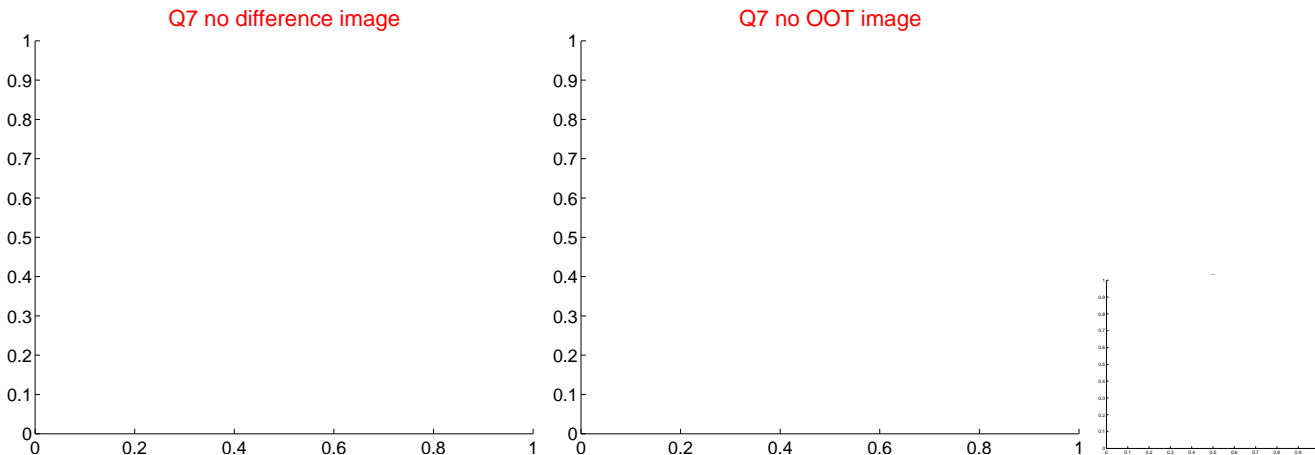
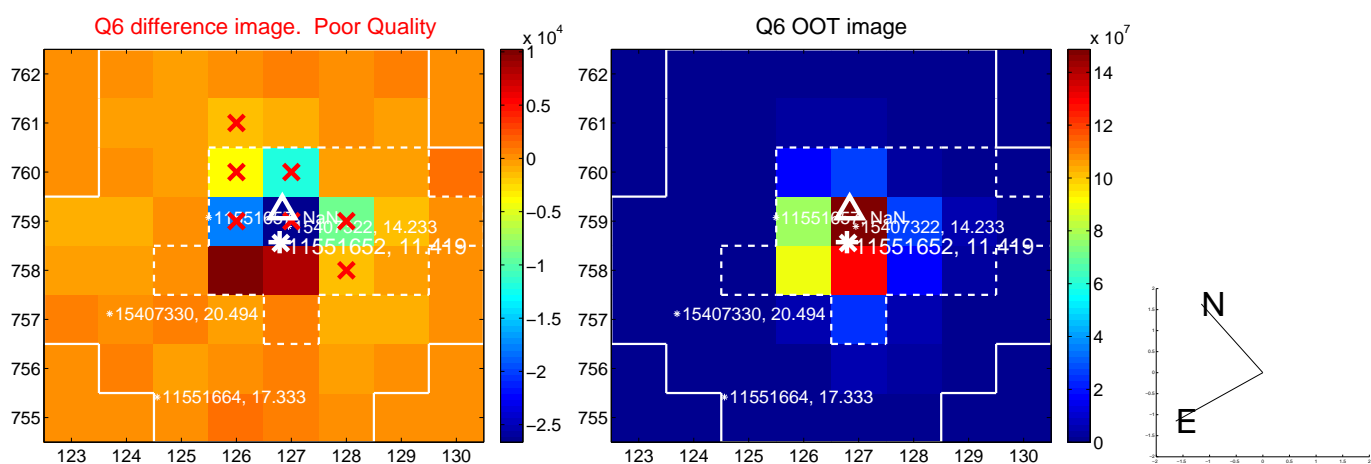
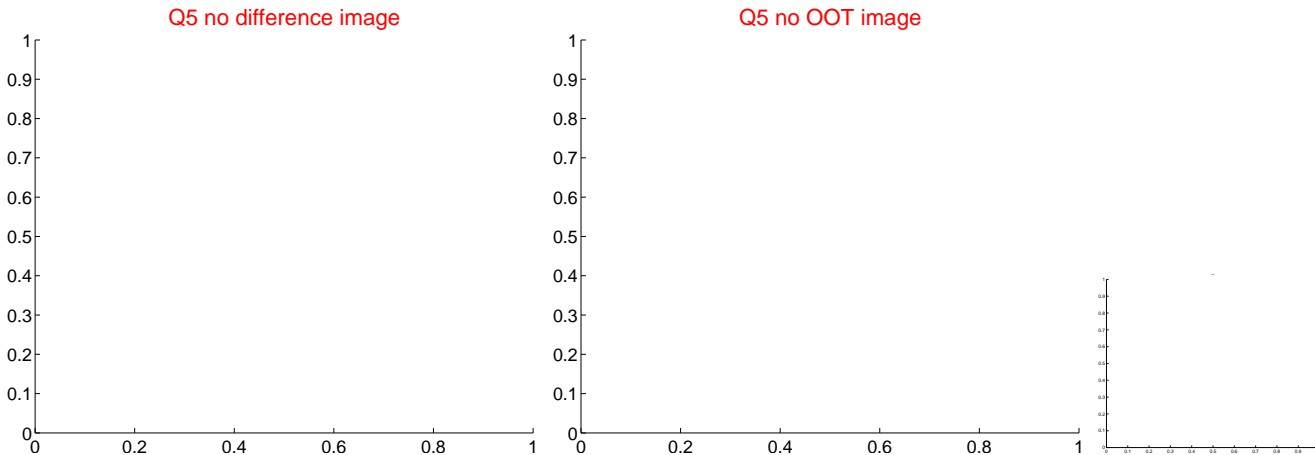
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

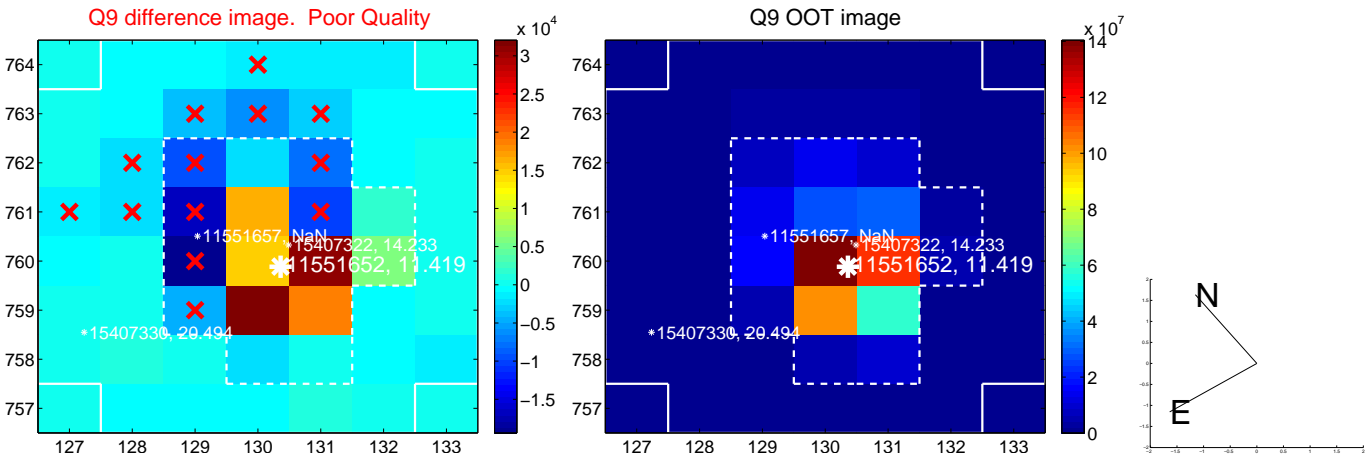




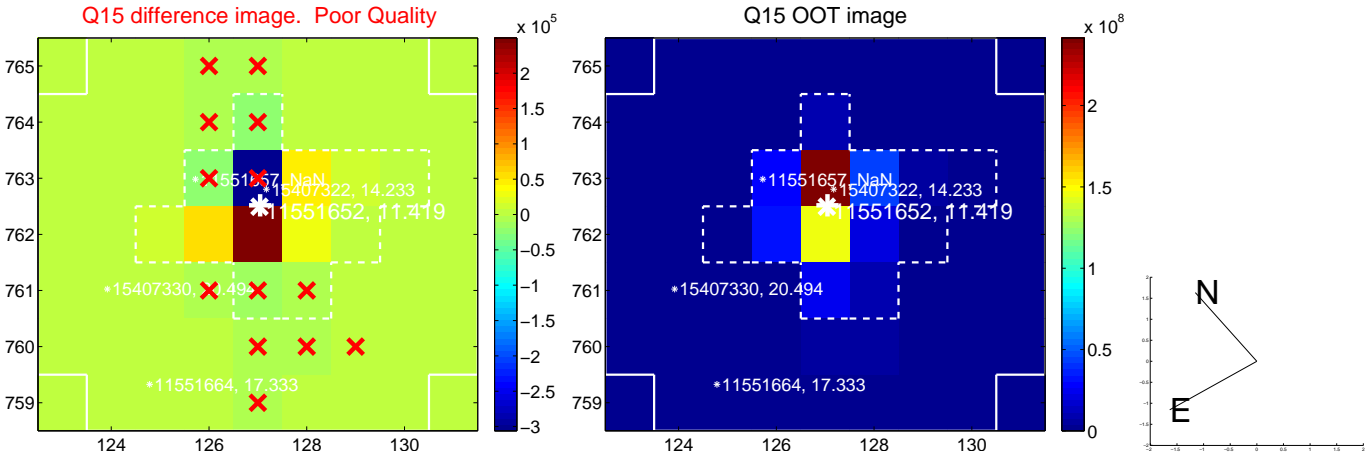
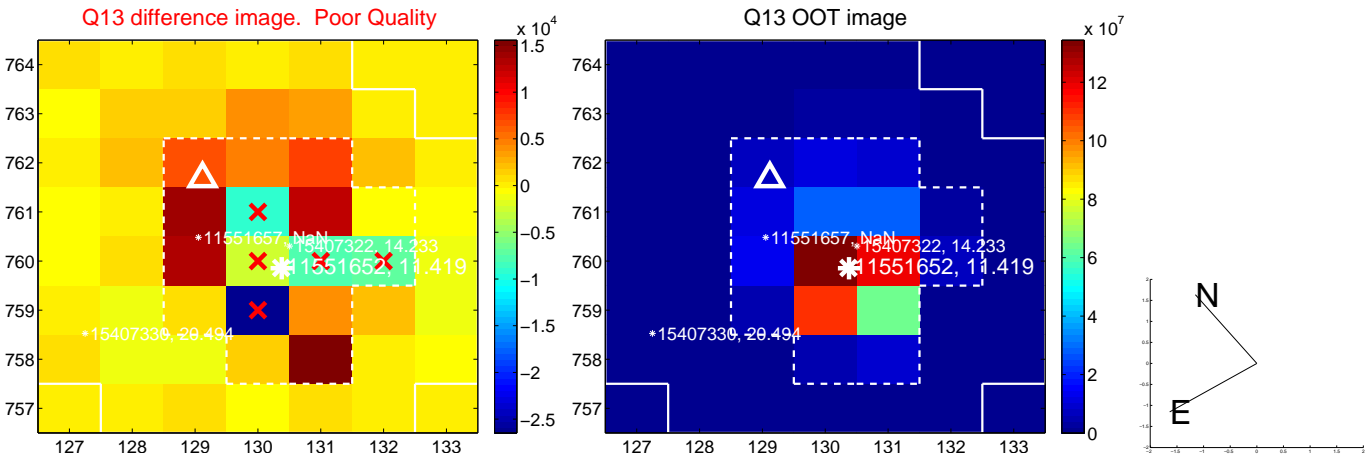
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



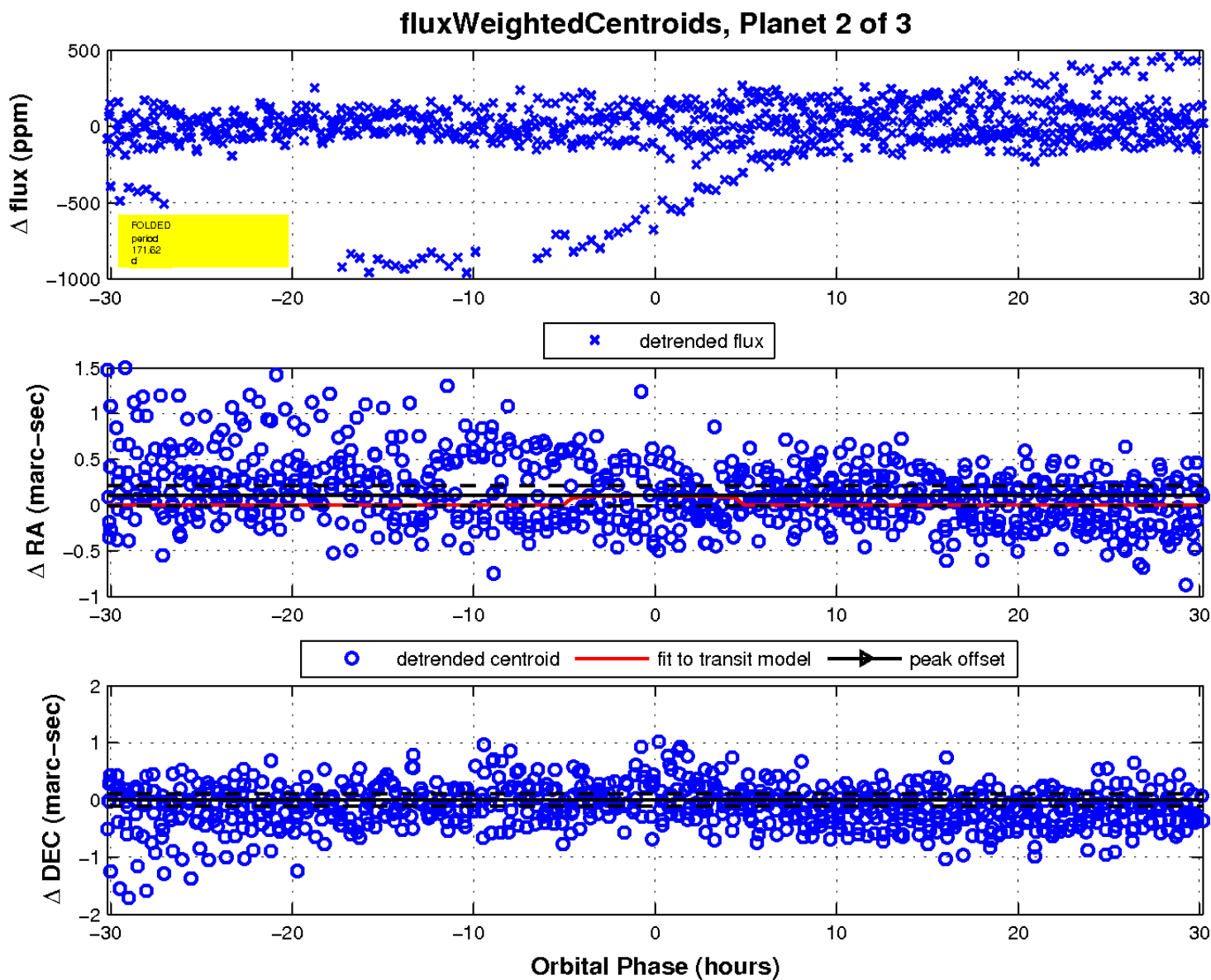
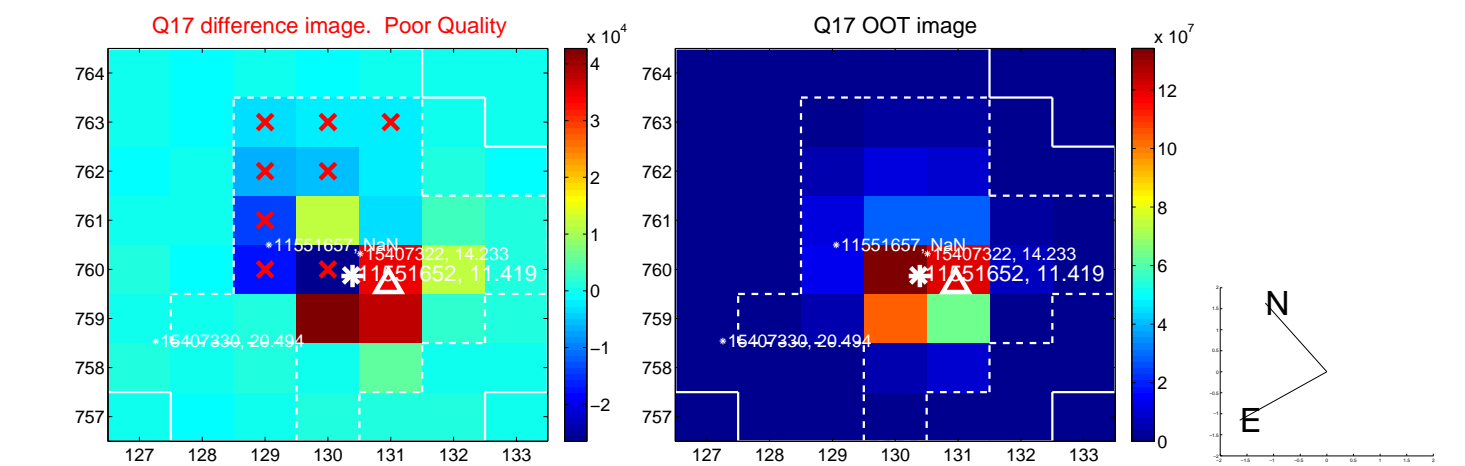
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

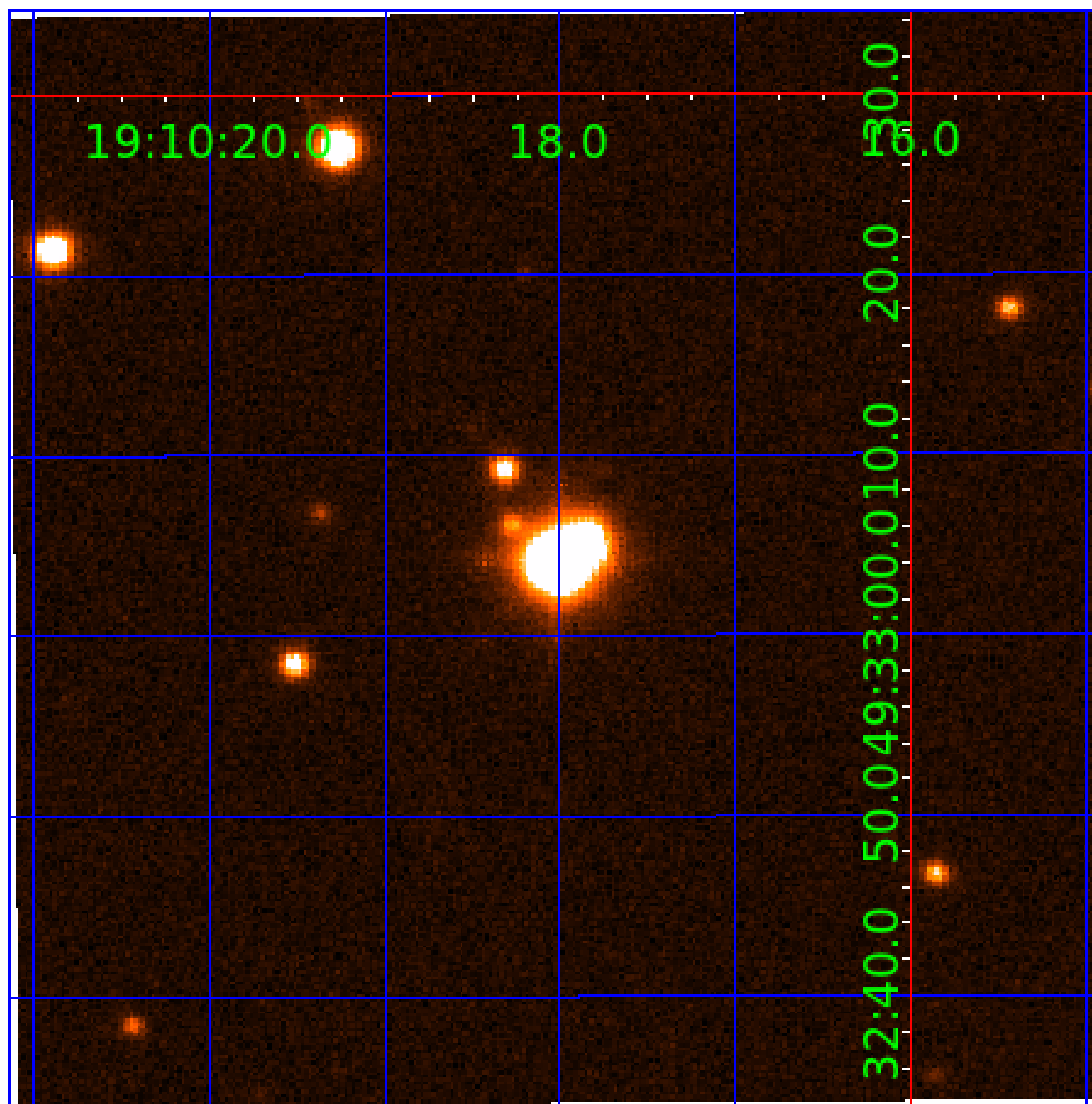


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\Delta$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 011551652

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011551652-01	OBS	No	1.191440	132.013011	13.5	5.088	12.7	13.9	2.07	7302	0.88	17663.33
011551652-02	OBS	No	171.620450	206.002625	121.2	10.072	12.0	7.4	2.07	7302	2.63	23.39
011551652-03	OBS	No	111.882750	210.834362	107.5	15.123	9.6	7.1	2.07	7302	2.32	41.38

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011551652-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
011551652-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_SATURATED
011551652-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED—HALO_GHOST

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

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

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

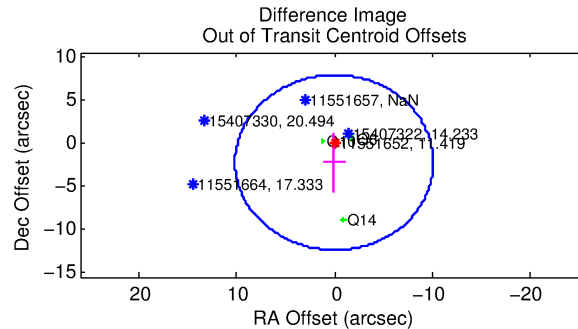
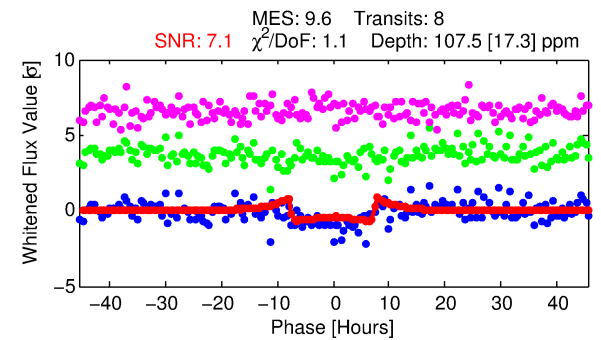
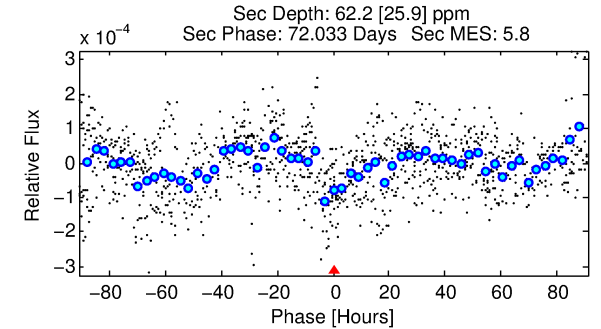
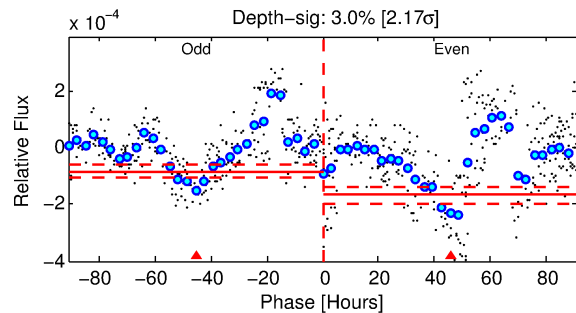
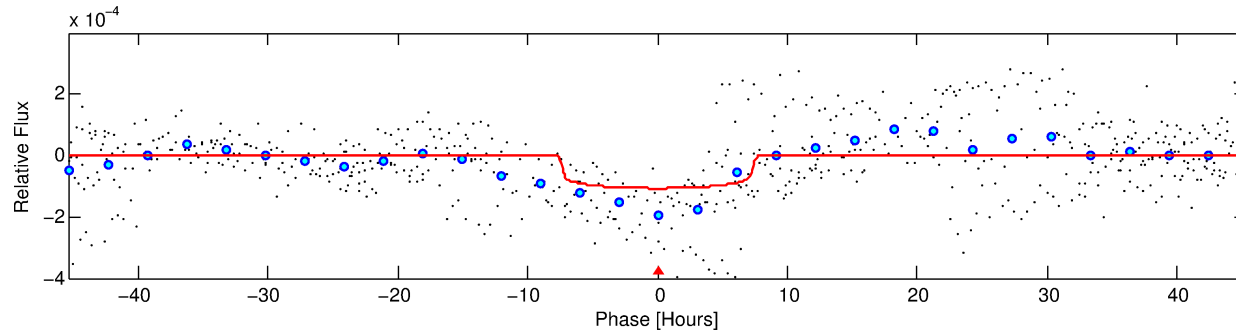
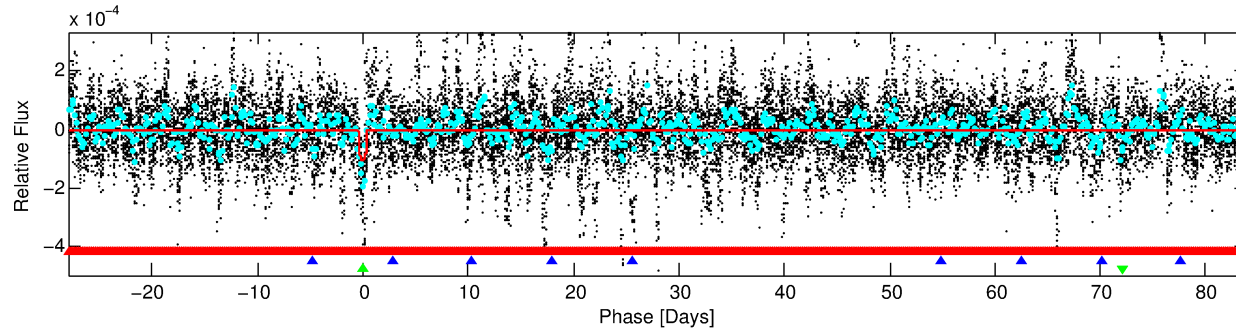
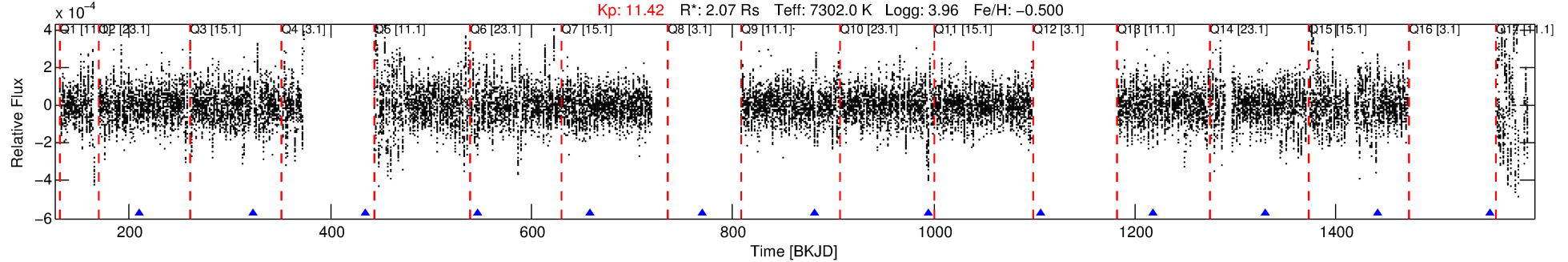
## Ephemeris Match Information For 011551652-03

No Significant Match Found

# DV One-Page Summary

KIC: 11551652 Candidate: 3 of 3 Period: 111.883 d  
KOI: K07455 Corr: No Ephemeris Match

Kp: 11.42 R\*: 2.07 Rs Teff: 7302.0 K Logg: 3.96 Fe/H: -0.500



## DV Fit Results:

Period = 111.88275 [0.00185] d  
Epoch = 210.8344 [0.0138] BKJD  
Rp/R\* = 0.0103 [0.0026]  
a/R\* = 39.24 [56.73]  
b = 0.73 [0.91]  
Seff = 41.38 [23.42]  
Teq = 647 [92] K  
Rp = 2.32 [1.05] Re  
a = 0.5133 [0.1783] AU  
Ag = 1681.34 [1434.06] [1.17σ]  
Teffp = 6403 [1081] K [5.31σ]

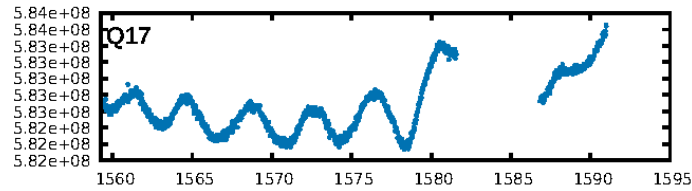
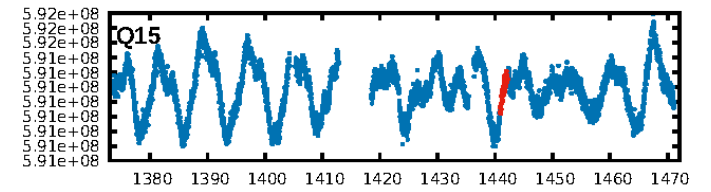
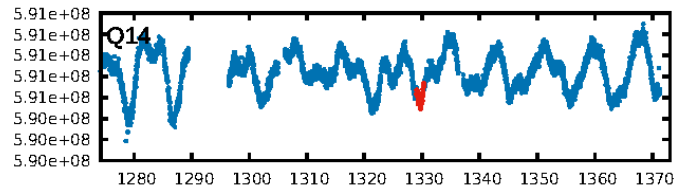
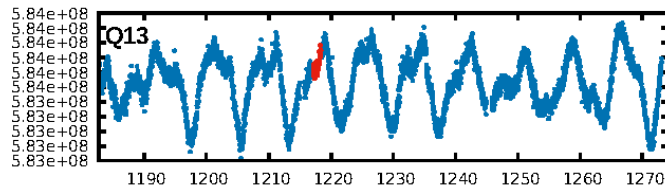
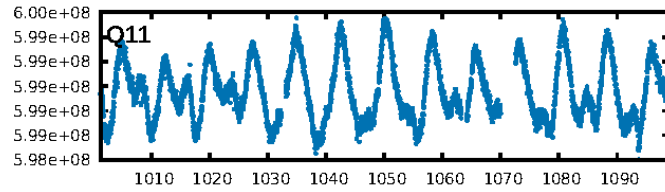
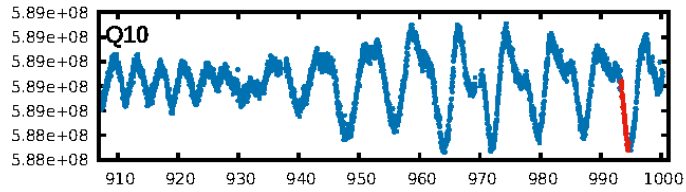
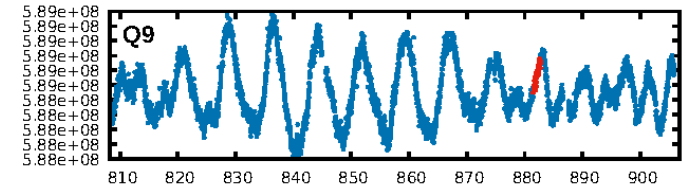
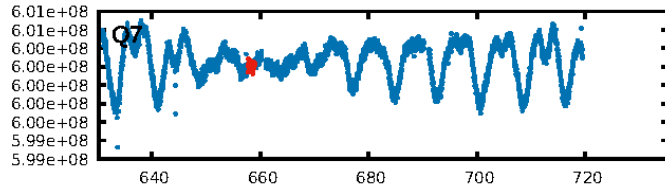
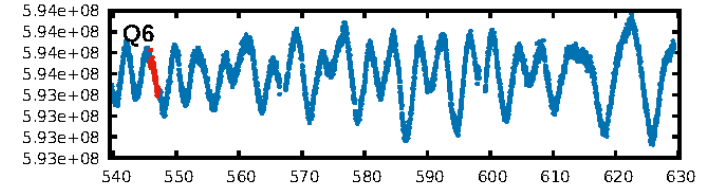
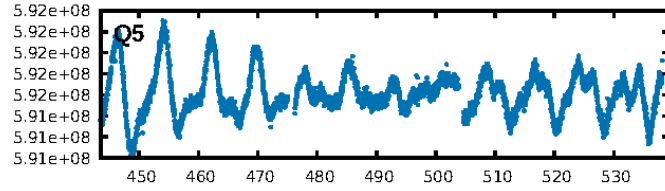
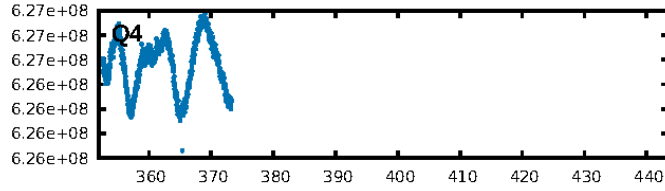
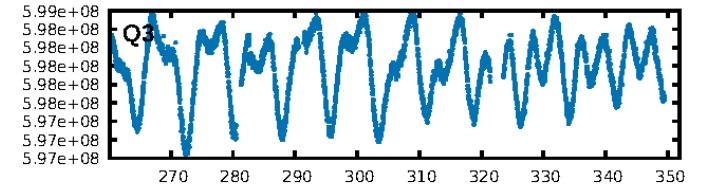
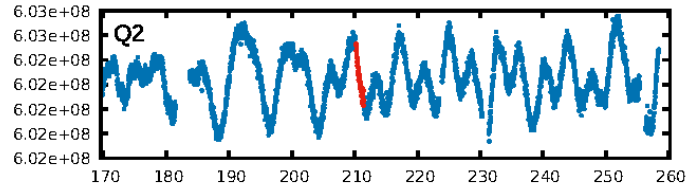
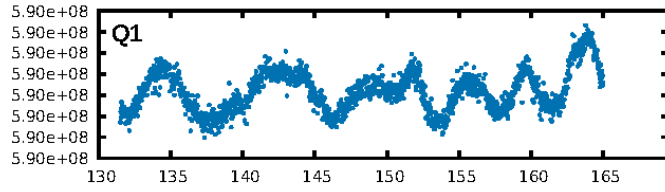
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [166.49σ]  
LongPeriod-sig: 100.0% [78.91σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.20e-16  
RollingBand-fgt: 1.00 [8/8]  
GhostDiagnostic-chr: 0.123  
Centroid-sig: 21.7%  
Centroid-so: 0.824 arcsec [0.93σ]  
OotOffset-rm: 2.254 arcsec [0.67σ]  
KicOffset-rm: 2.217 arcsec [0.66σ]  
OotOffset-st: 3/0/0/0 [3]  
KicOffset-st: 3/0/0/0 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 0.00 [0/7]

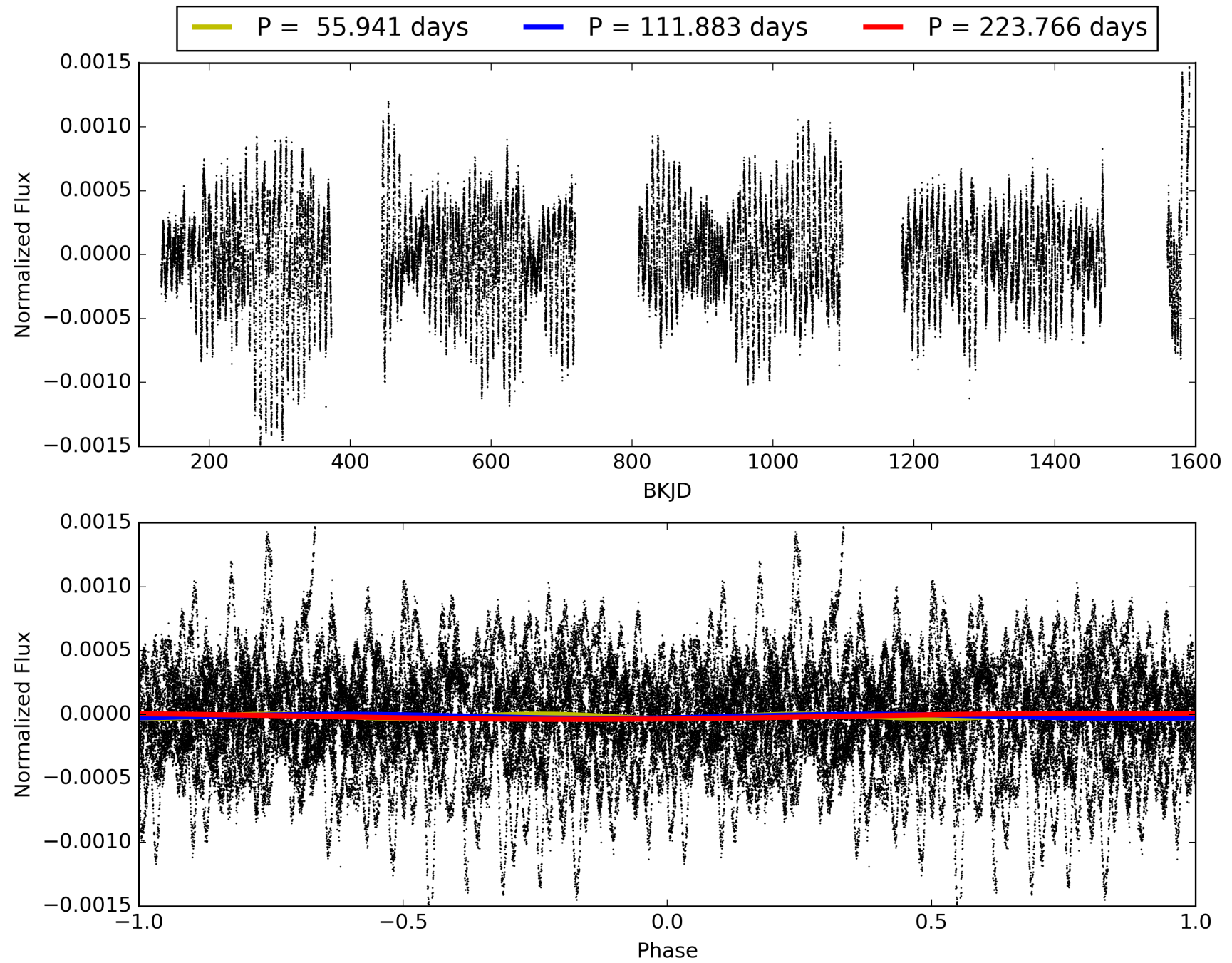
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 03:54:31 Z

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

# TCE 011551652-03, PDC Light Curves

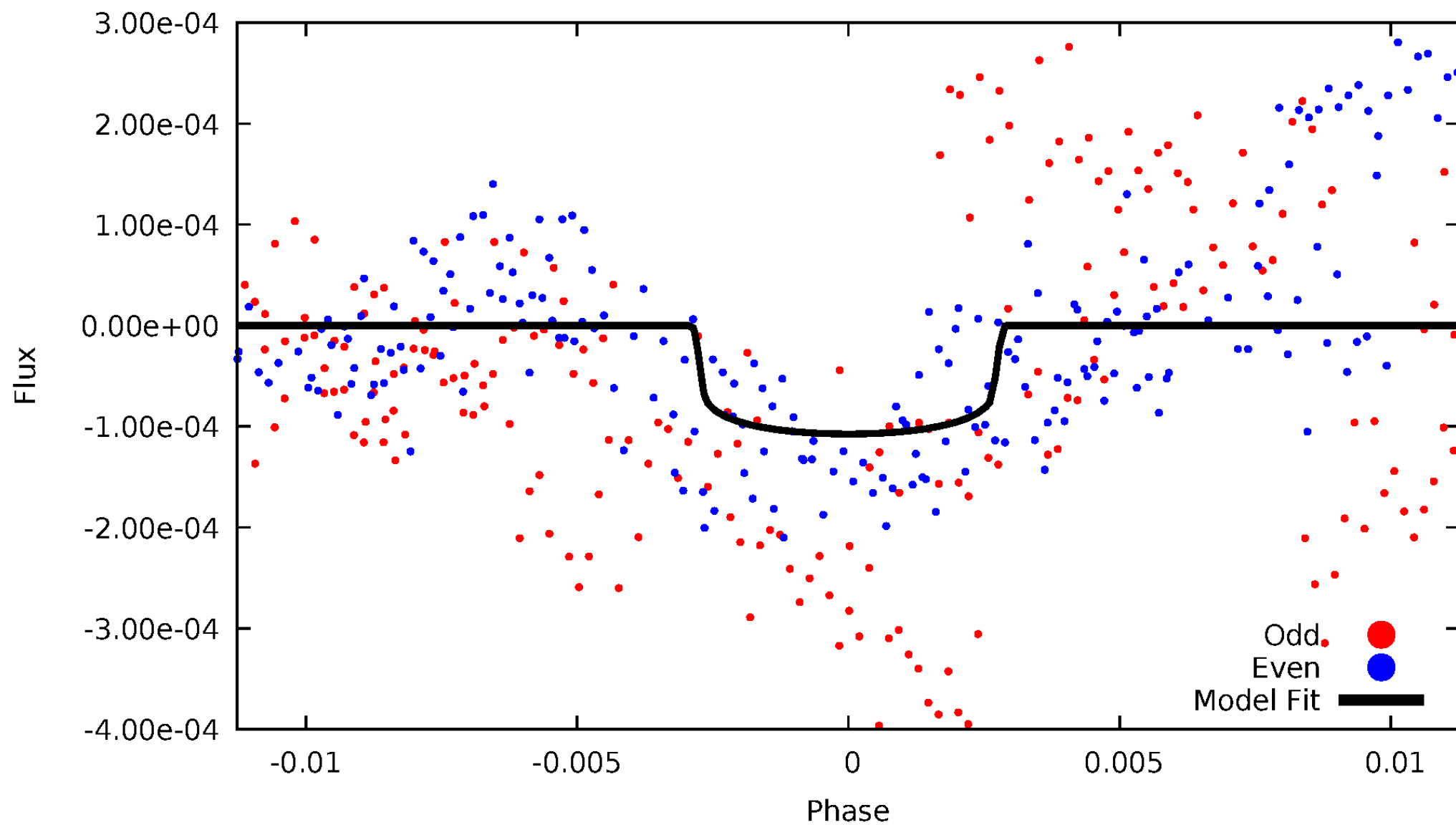


# TCE 011551652-03



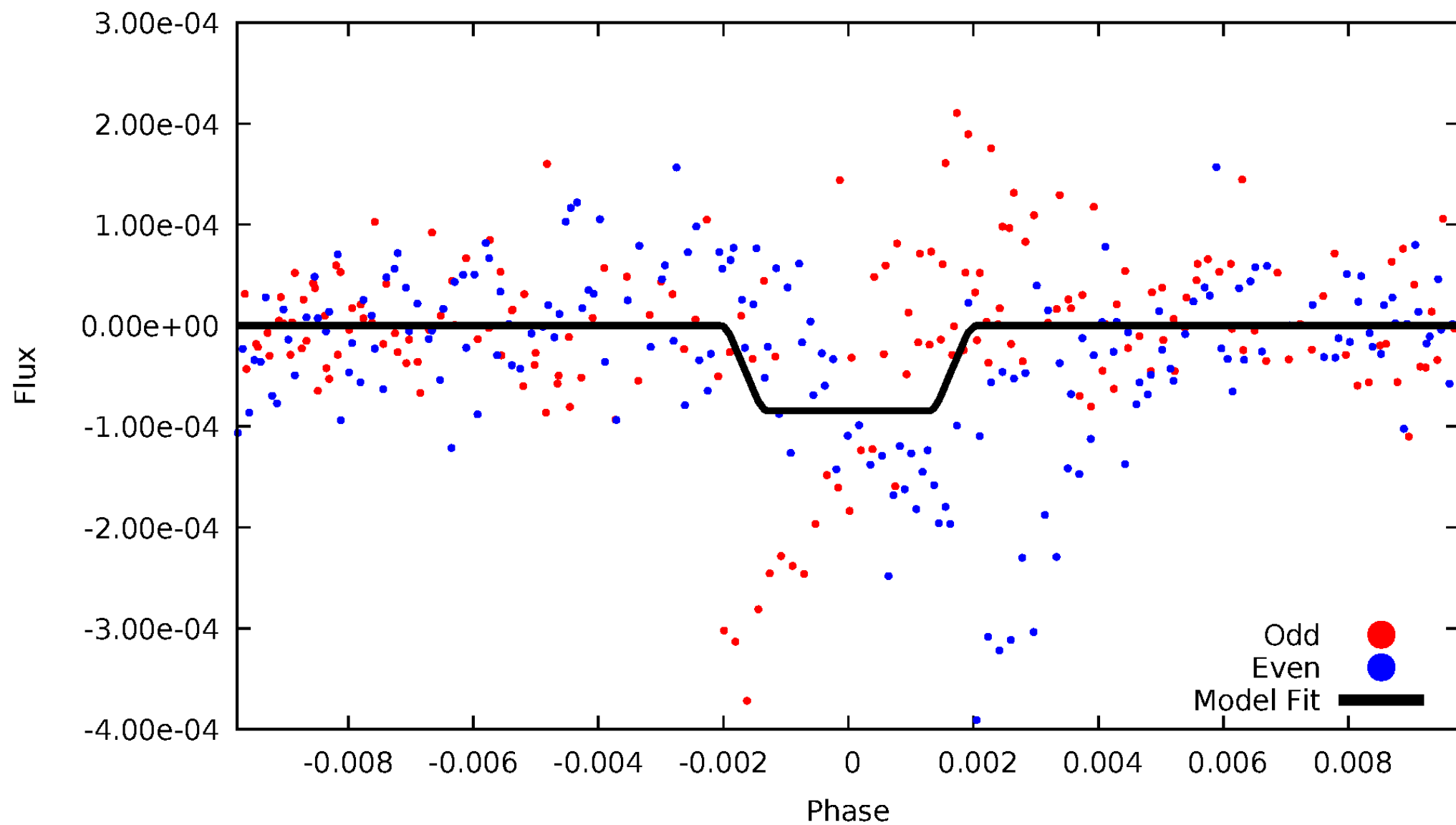
# DV Odd/Even

TCE 011551652-03



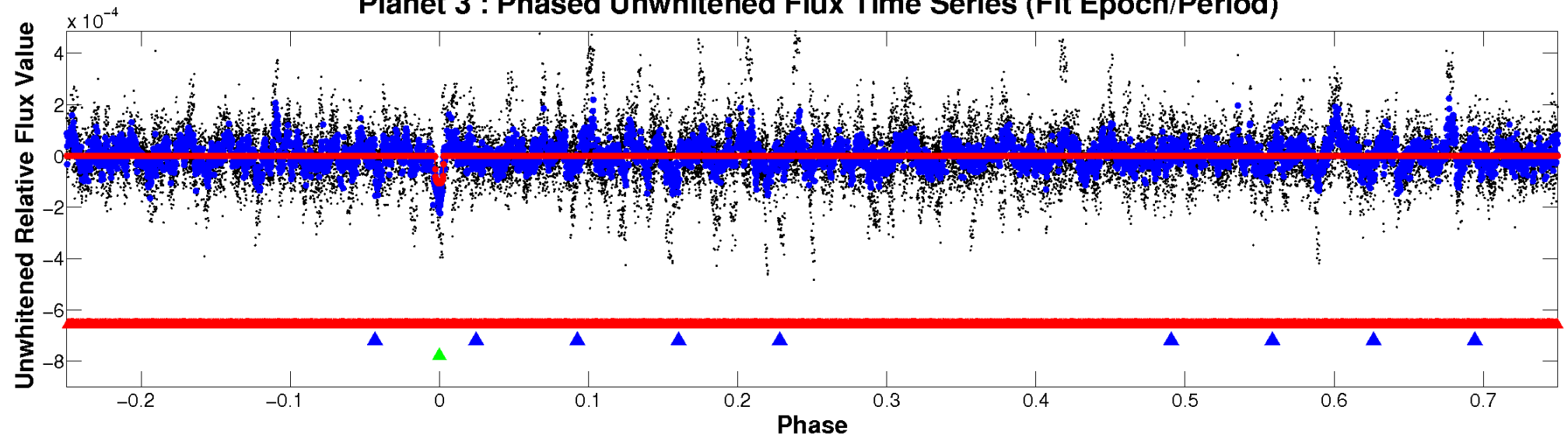
# ALT Odd/Even

TCE 011551652-03

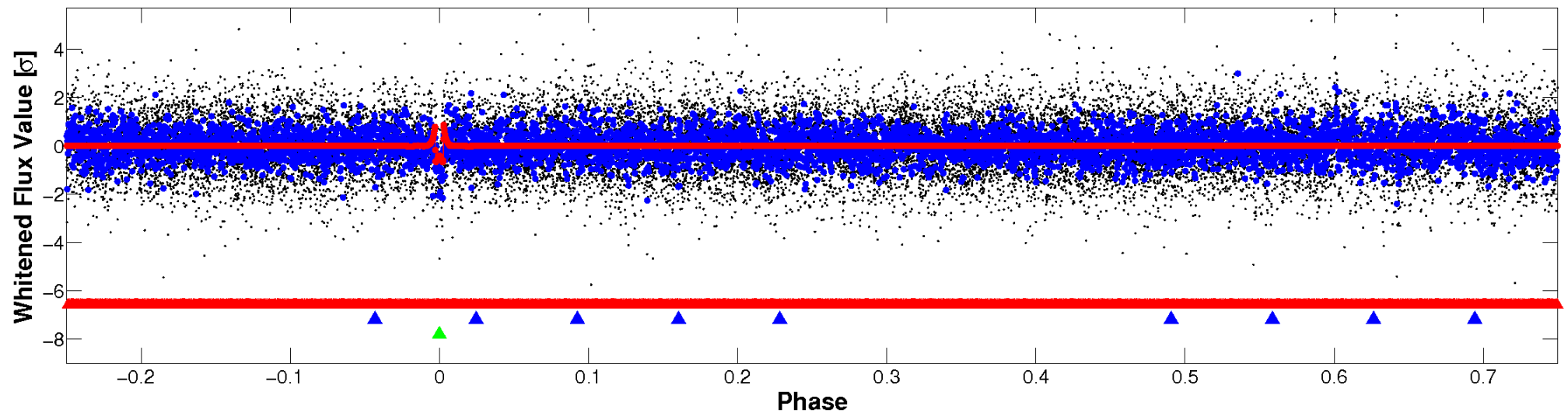


# Non-Whitened Vs. Whitened Light Curve

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



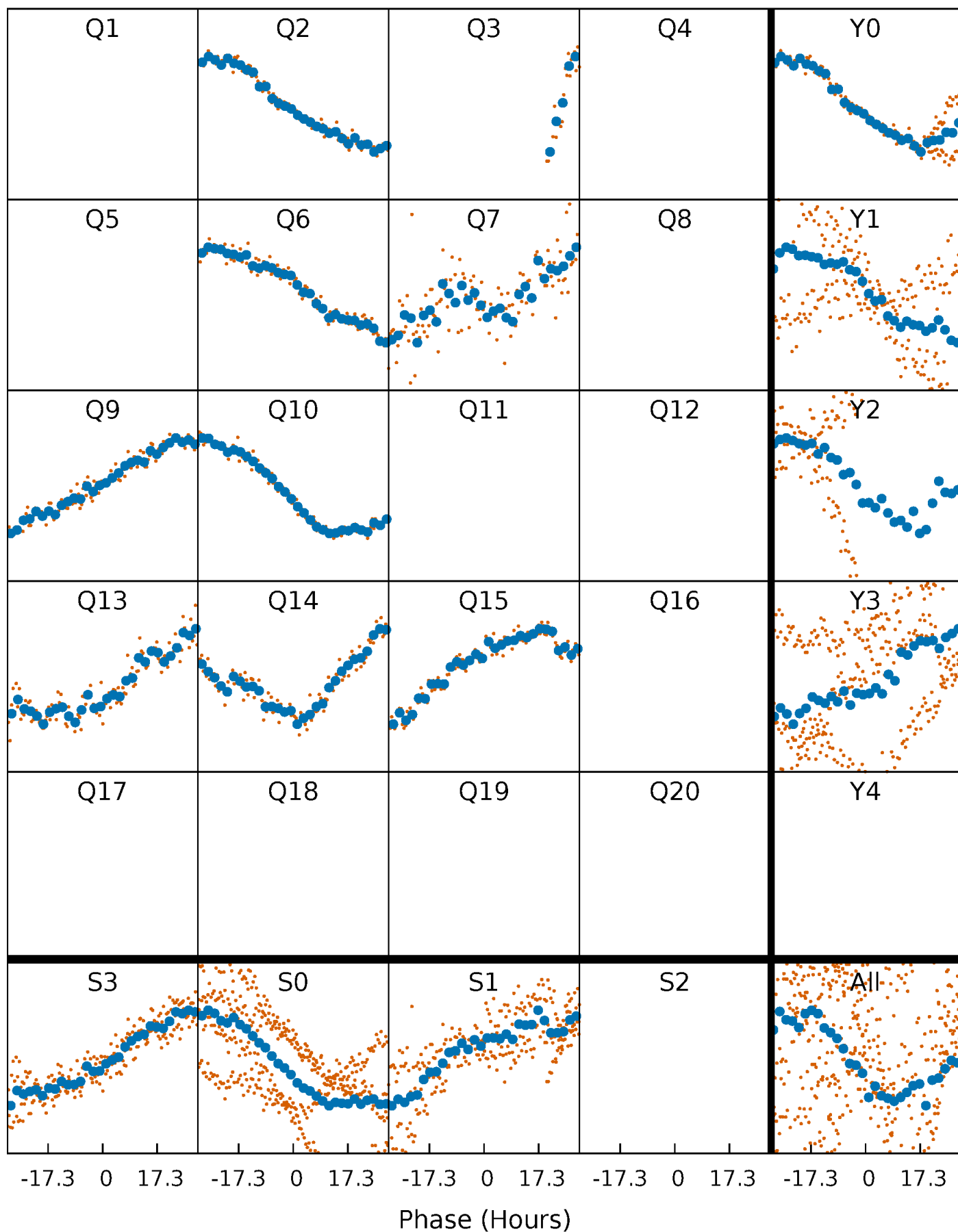
Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)





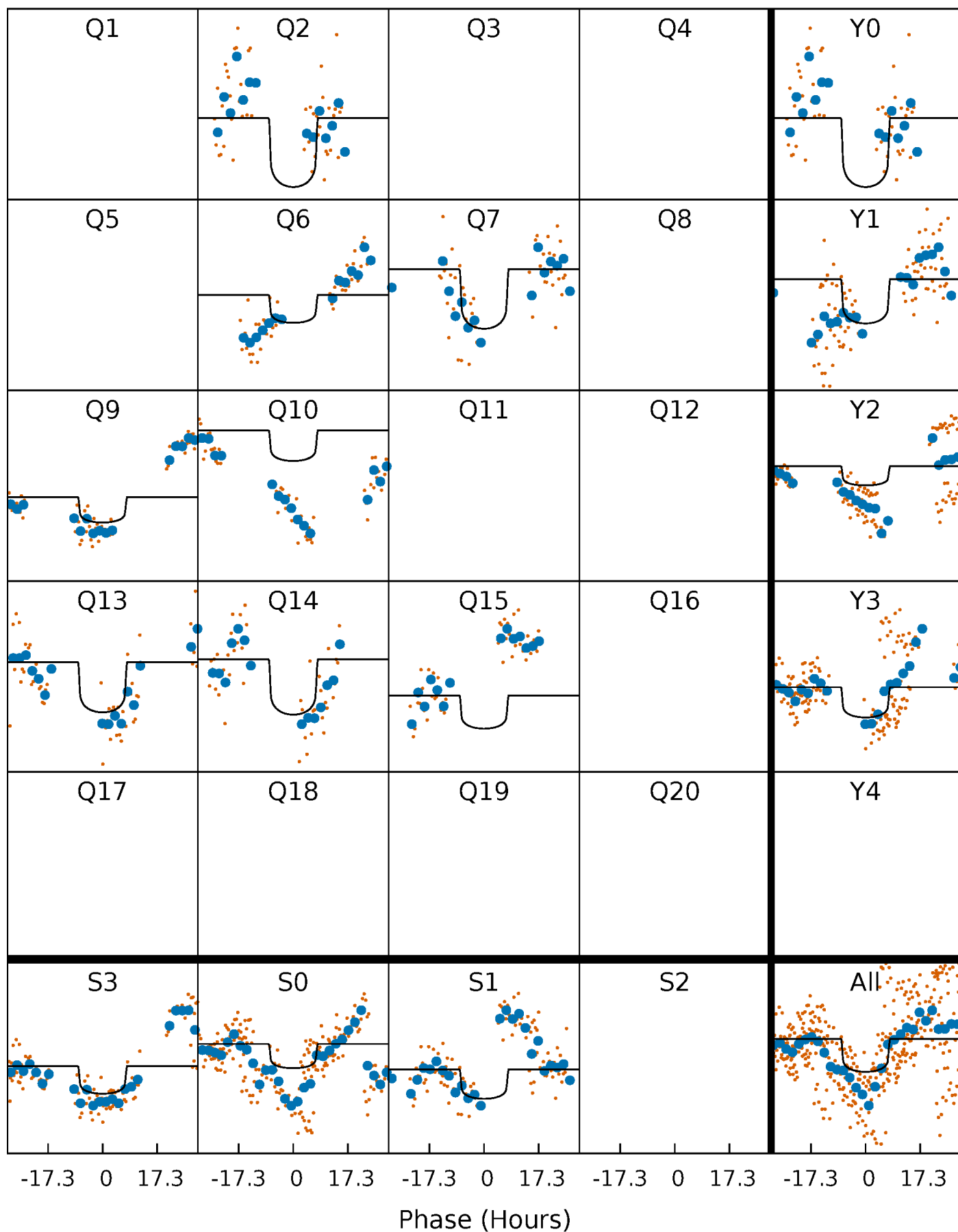
# PDC Quarter-Phased Transit Curves

TCE 011551652-03     $P=111.882750$  Days     $T_0=210.834362$  (BKJD)



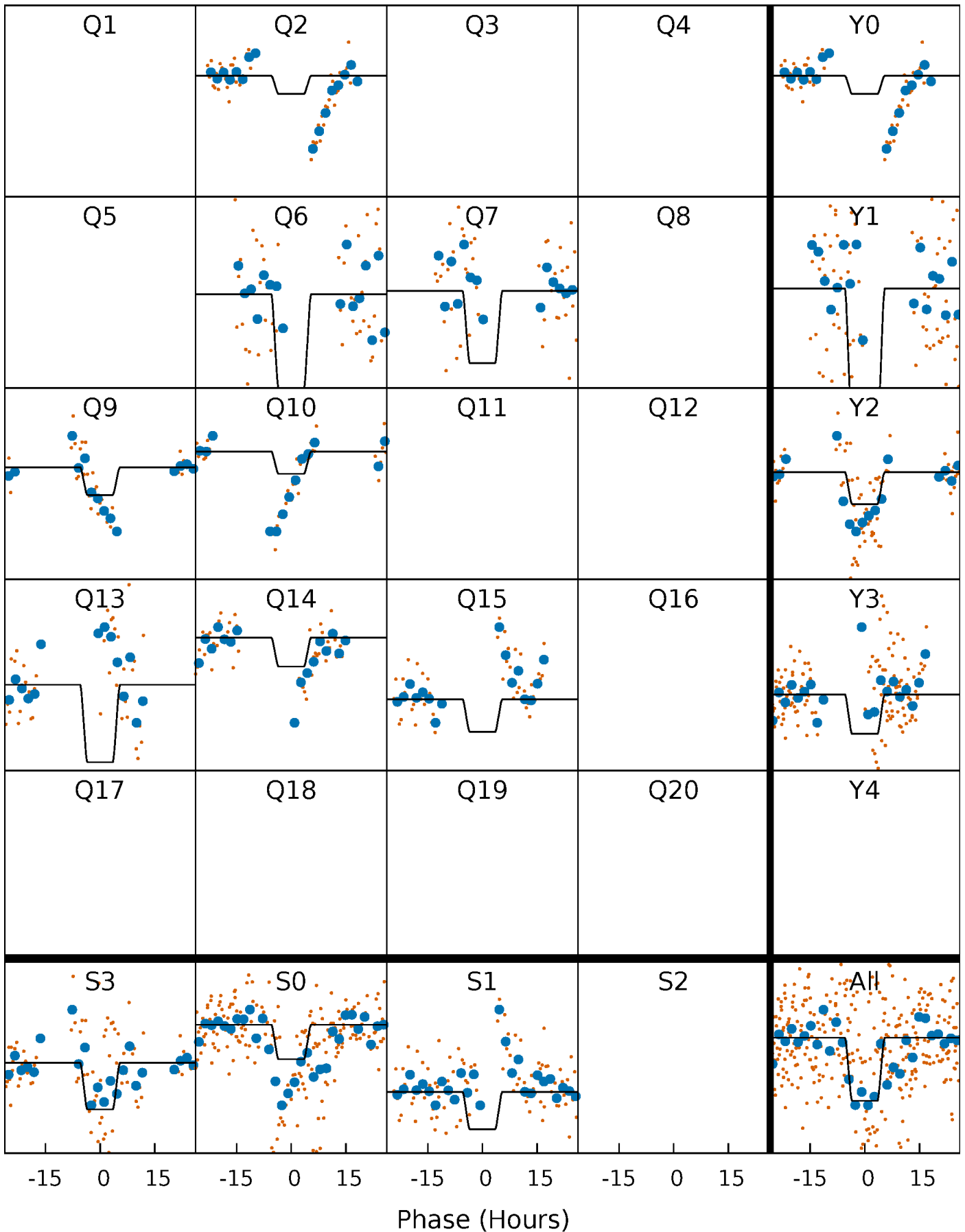
# DV Quarter-Phased Transit Curves

TCE 011551652-03 P=111.882750 Days  $T_0=210.834362$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

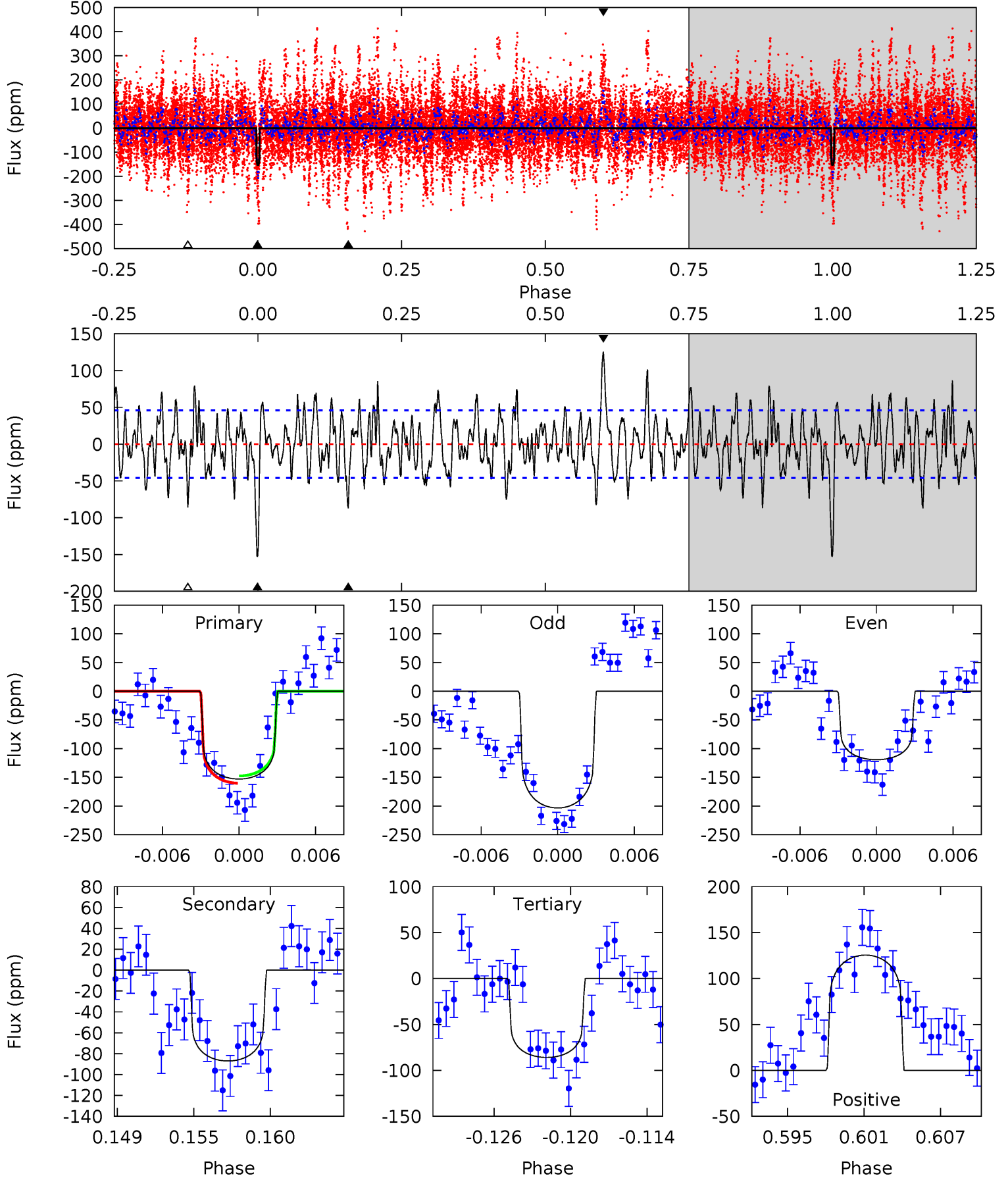
TCE 011551652-03 P=111.891782 Days  $T_0=210.750380$  (BKJD)



# DV Model-Shift Uniqueness Test

011551652-03, P = 111.882750 Days, E = 98.951612 Days

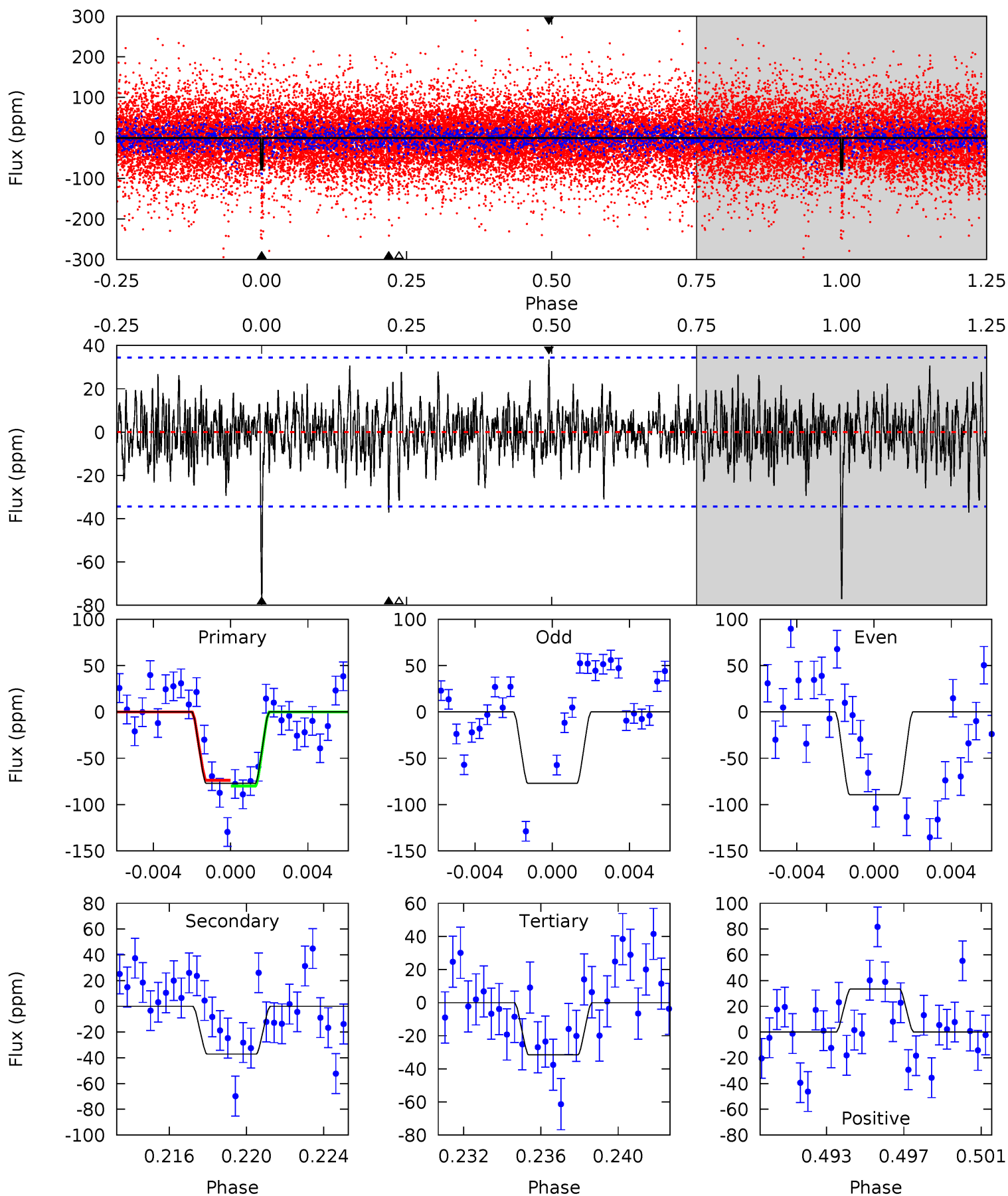
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.1	9.72	9.59	14.0	5.13	2.76	3.58	7.49	3.08	0.12	-4.29	4.60	0.74	0.45	0.71



# Alt Model-Shift Uniqueness Test

011551652-03, P = 111.891782 Days, E = 98.858598 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
11.7	5.60	4.77	5.05	5.20	2.87	1.40	6.88	6.60	0.84	0.55	0.93	1.86	0.30	0.46



### Stellar Parameters For KIC 011551652

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7302^{+233}_{-285}$	$3.965^{+0.315}_{-0.135}$	$-0.500^{+0.250}_{-0.300}$	$2.069^{+0.516}_{-0.774}$	$1.440^{+0.198}_{-0.296}$	$0.229^{+0.544}_{-0.092}$
	+3%/-4%	+8%/-3%	+50%/-60%	+25%/-37%	+14%/-21%	+238%/-40%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 011551652-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-87 \pm 9$	$2.20^{+0.67}_{-0.69}$	$887^{+65}_{-86}$	$6904^{+1336}_{-798}$	$2583^{+2949}_{-1062}$
Alt.	$-37 \pm 7$	$1.94^{+0.74}_{-0.59}$	$882^{+75}_{-87}$	$5875^{+1150}_{-716}$	$1417^{+1682}_{-677}$

$T_{max}$  = 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

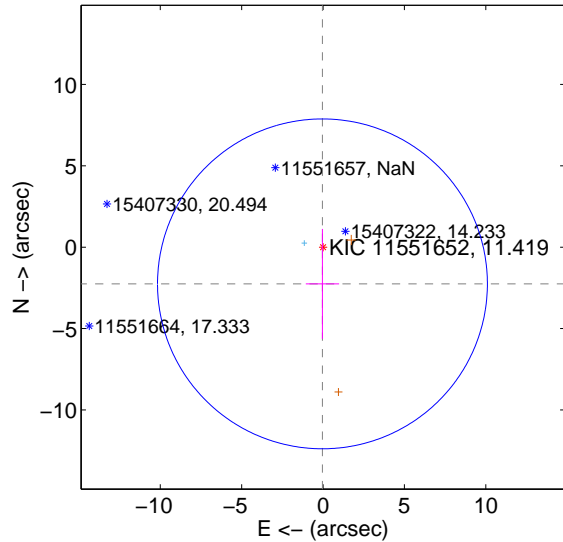
Supplemental centroid analysis for 011551652-03. **Kepler magnitude: 11.42.** Transit SNR 7.10

**There are 1 quarters with good PRF difference image offsets**

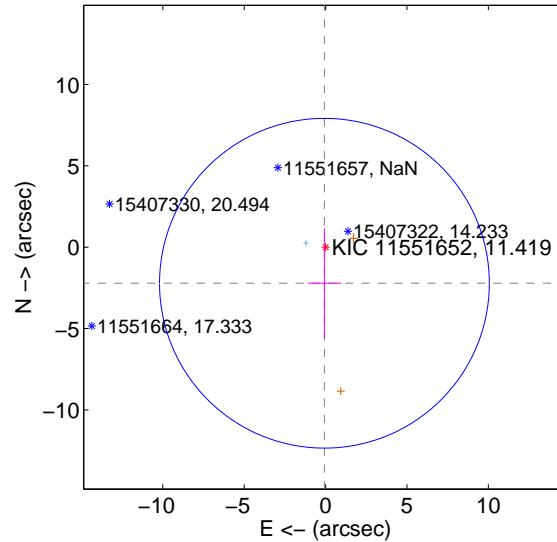
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.254 \pm 3.377$	0.67	$0.035 \pm 1.021$	$-2.254 \pm 3.377$
PRF-fit source offset from KIC position	$2.217 \pm 3.376$	0.66	$0.071 \pm 1.037$	$-2.215 \pm 3.377$
photometric centroid source offset	$0.82 \pm 0.88$	0.93	$0.13 \pm 0.92$	$-0.81 \pm 0.88$

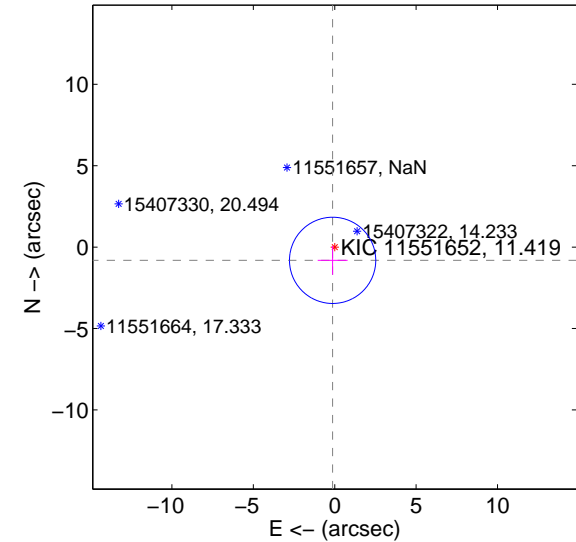
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



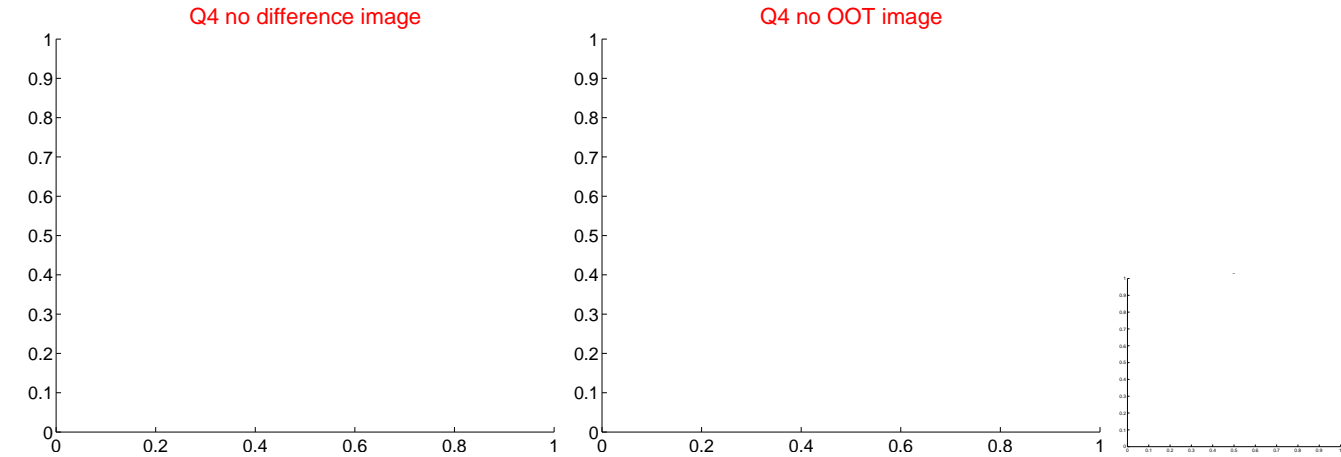
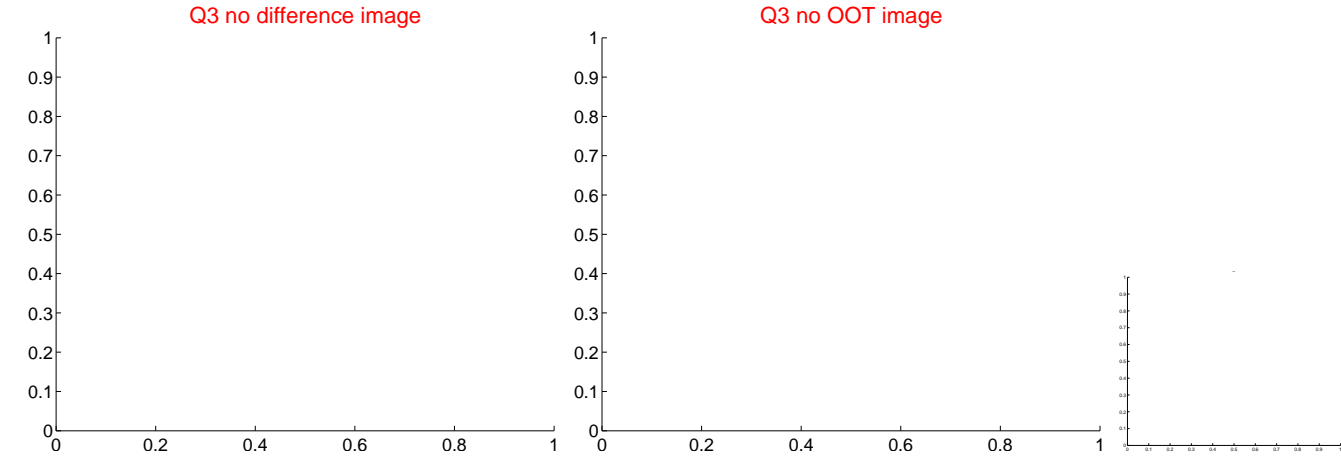
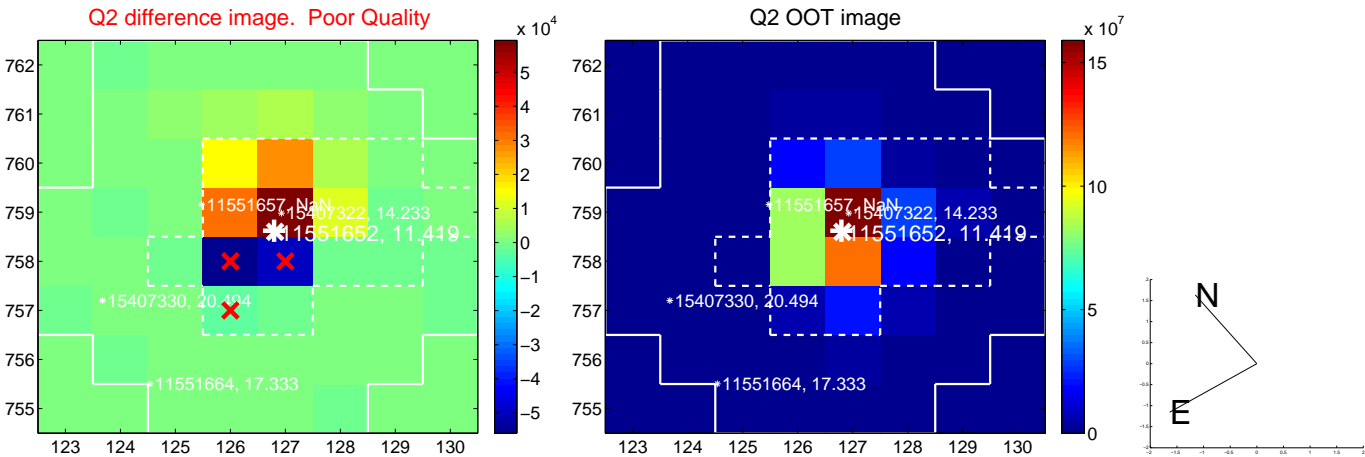
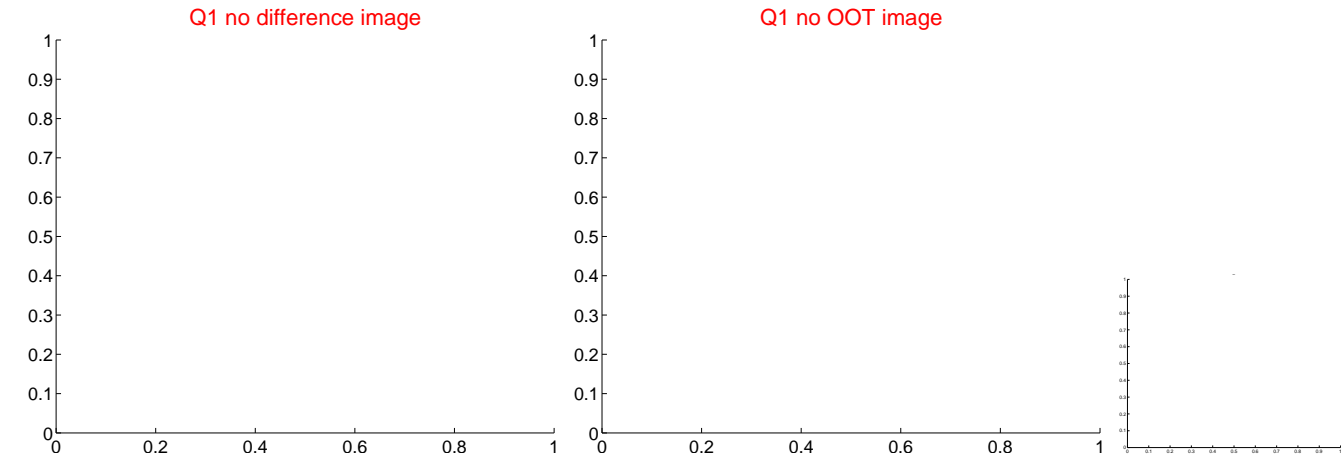
offset from photometric centroids



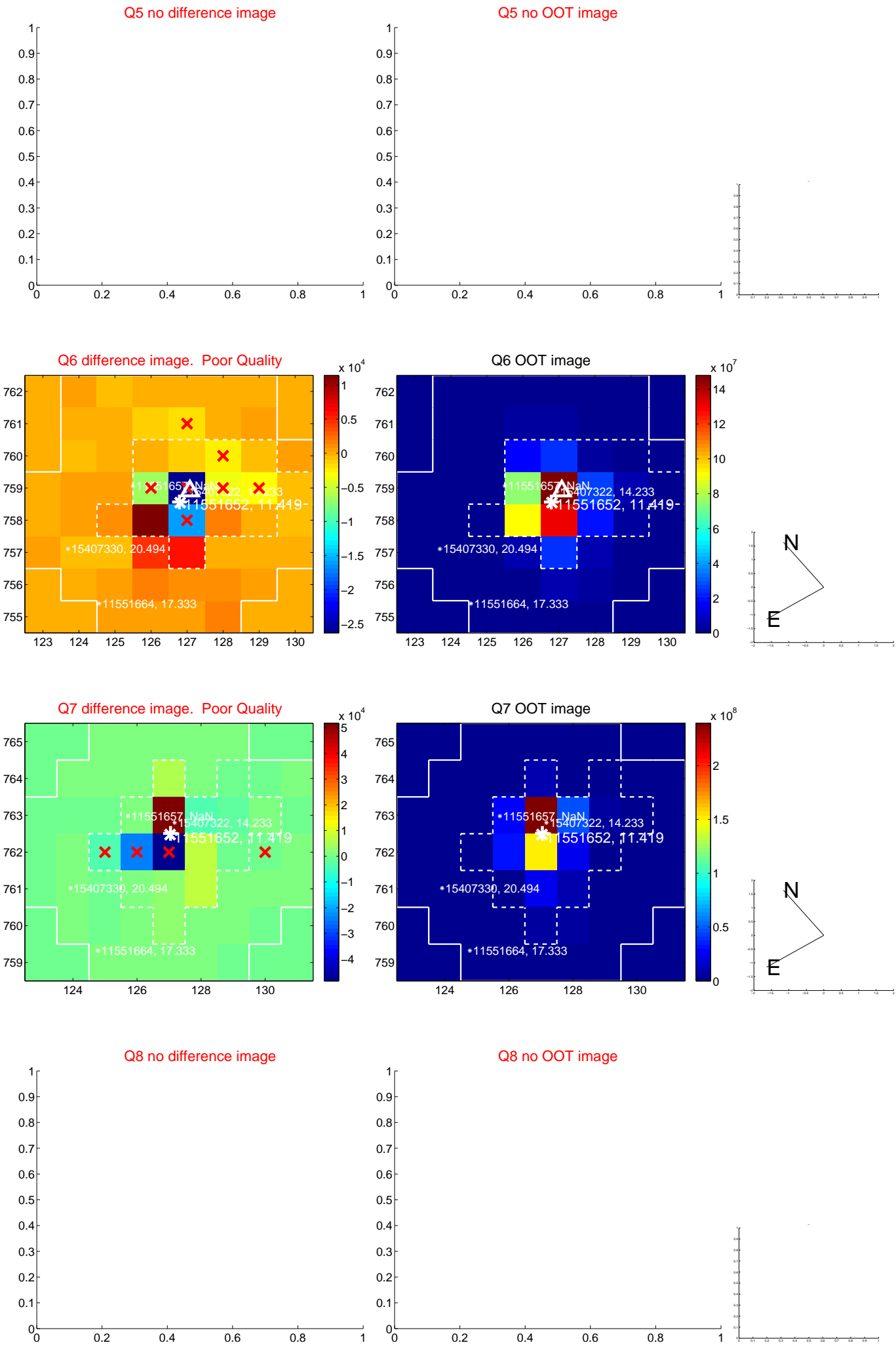
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



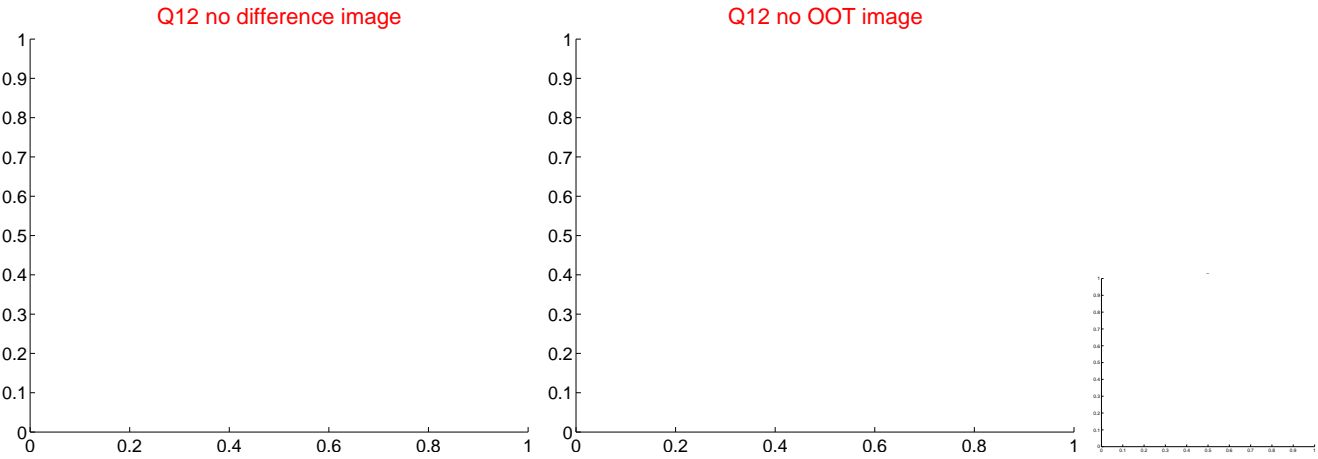
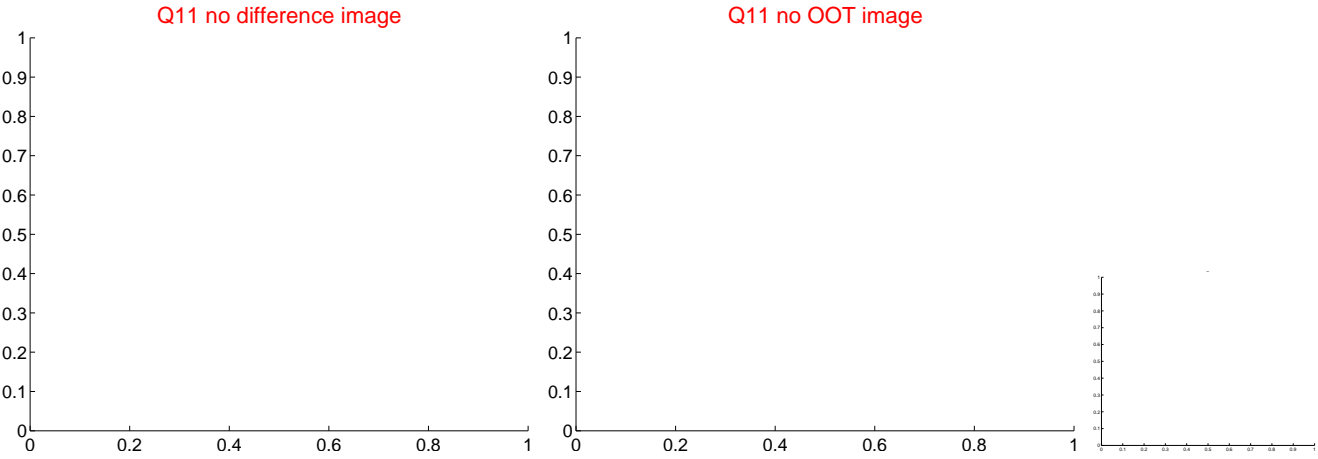
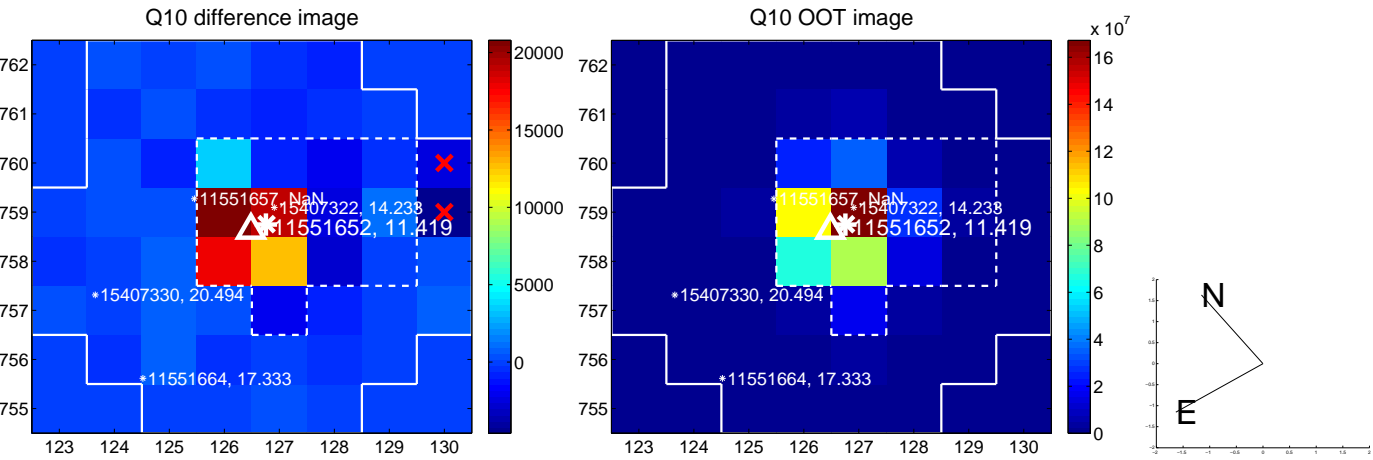
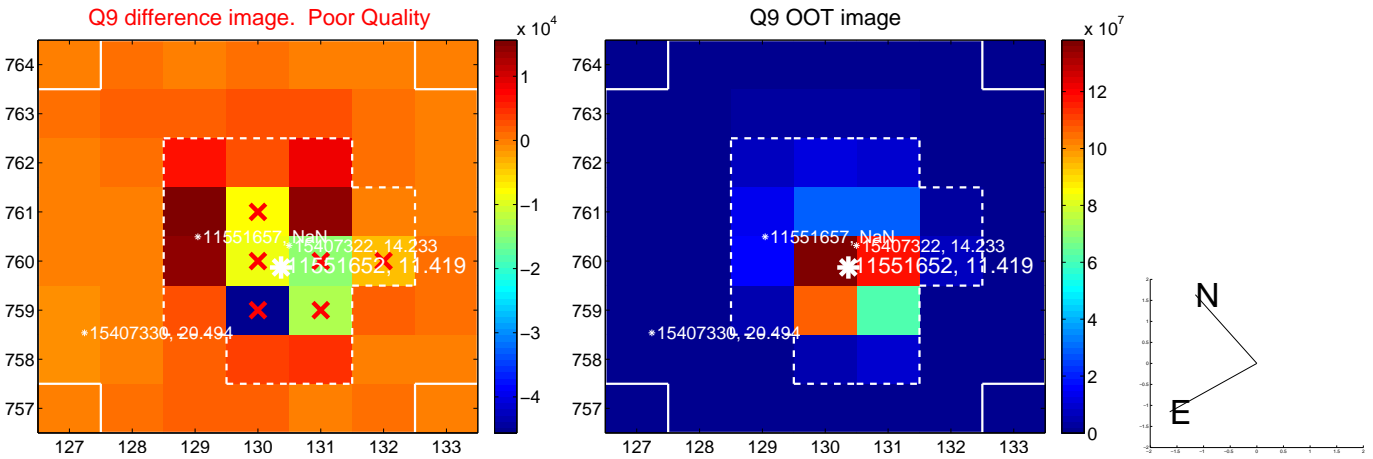
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



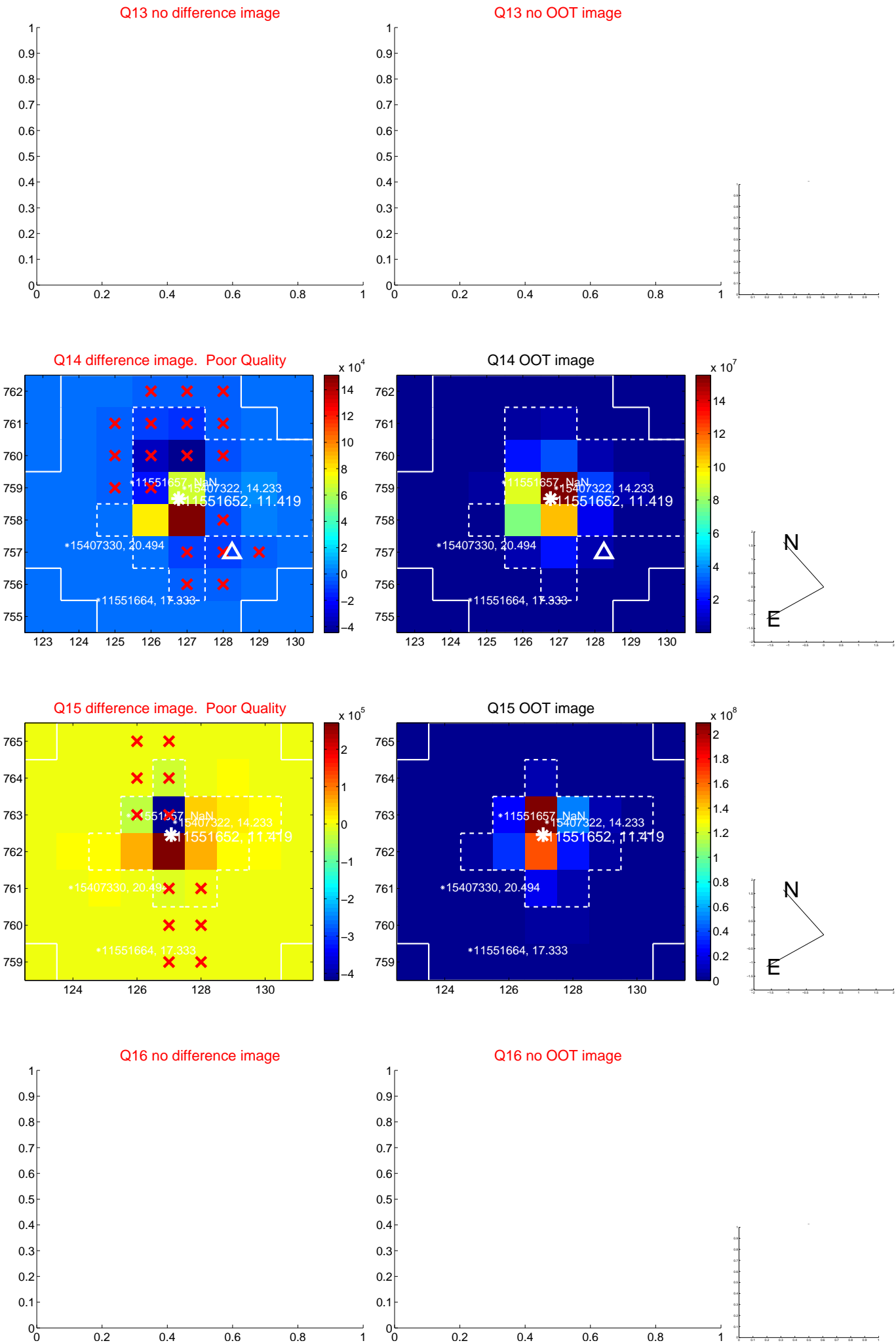
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



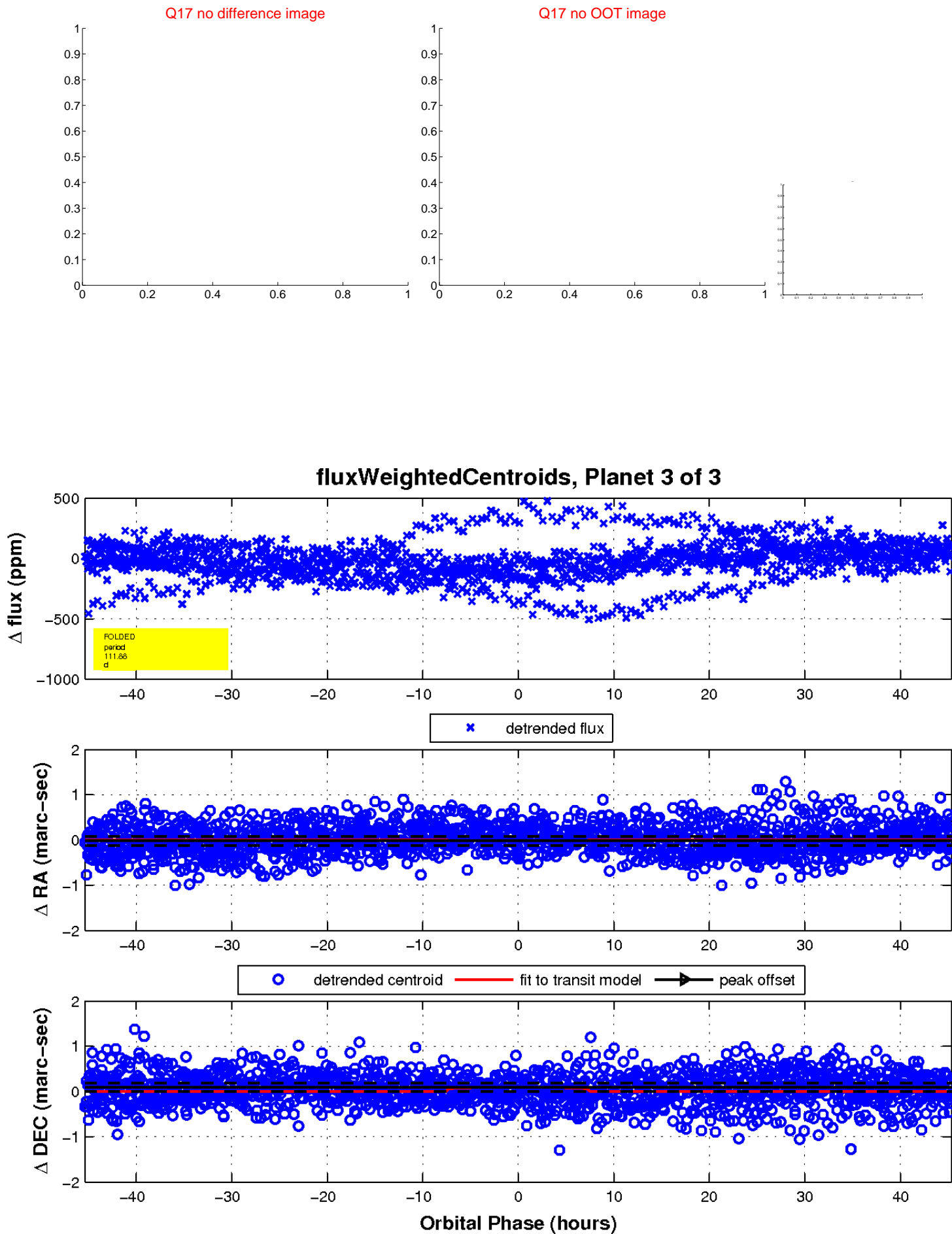
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

