

# KIC 008111622

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008111622-01	OBS	6968.01	15.446109	145.532030	324454.7	3.000	9167.1	-1.0	0.90	5838	48.00	57.11
008111622-02	OBS	No	15.446063	132.921345	29042.2	5.005	846.3	812.3	0.90	5838	17.19	57.11
008111622-03	OBS	No	5.148862	135.568763	3.3	3.190	629.2	0.1	0.90	5838	0.19	247.09
008111622-04	OBS	No	5.148855	134.984699	17281.8	15.000	626.6	-1.0	0.90	5838	11.71	247.09
008111622-05	OBS	No	339.756480	146.339456	1522.1	6.611	11.1	7.4	0.90	5838	4.73	0.93
008111622-06	OBS	No	192.159982	310.742053	987.2	10.488	12.9	6.6	0.90	5838	2.94	1.98

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008111622-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_ALT—HAS_SEC_TCE—CENT_NOFITS
008111622-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
008111622-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD—CENT_FEW_MEAS
008111622-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—RESIDUAL_TCE—CENT_NOFITS
008111622-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
008111622-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—INCONSISTENT_TRANS

**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 008111622-01

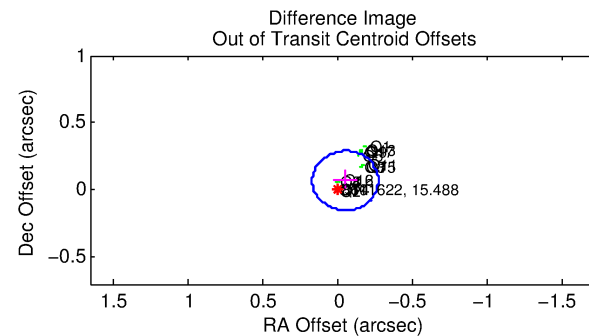
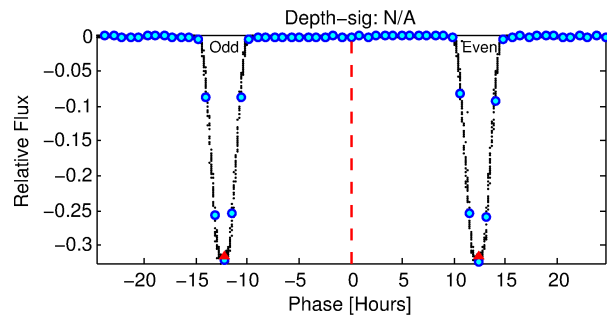
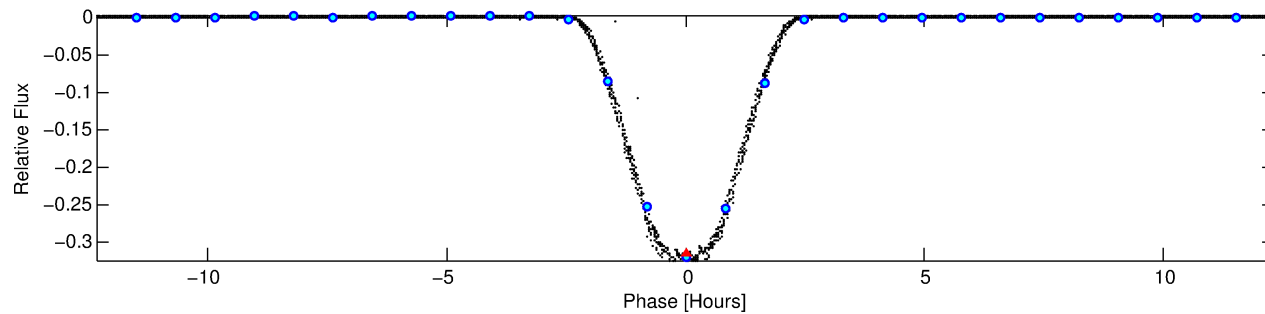
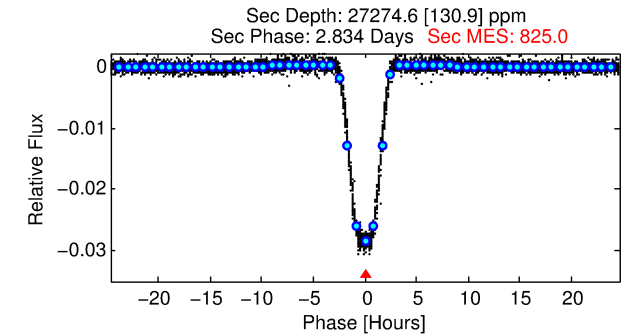
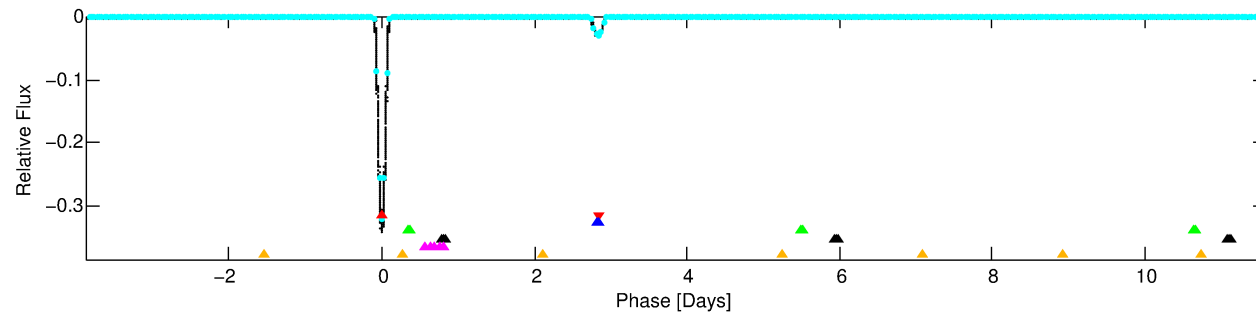
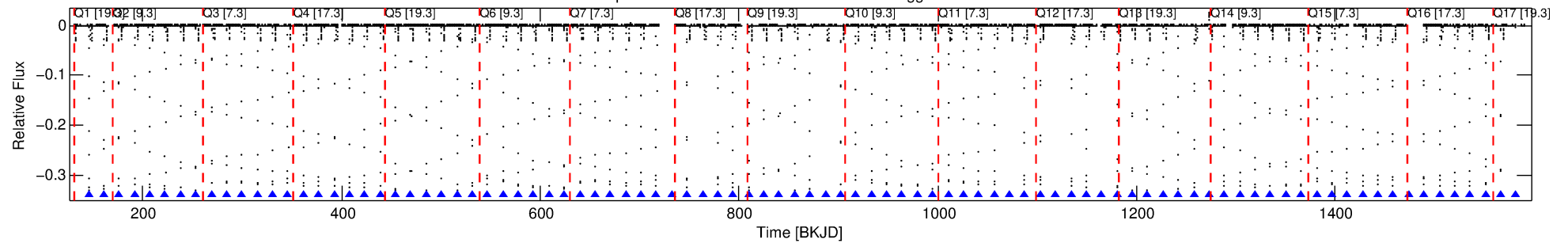
No Significant Match Found

# DV One-Page Summary

KIC: 8111622 Candidate: 1 of 6 Period: 15.446 d

KOI: K06968.01 Corr: 0.807

Kp: 15.49 R\*: 0.90 Rs Teff: 5838.0 K Logg: 4.53 Fe/H: -0.080



## TPS TCE Results:

Period = 15.44611 d  
Epoch = 145.5320 BKJD

DV fit results are unavailable

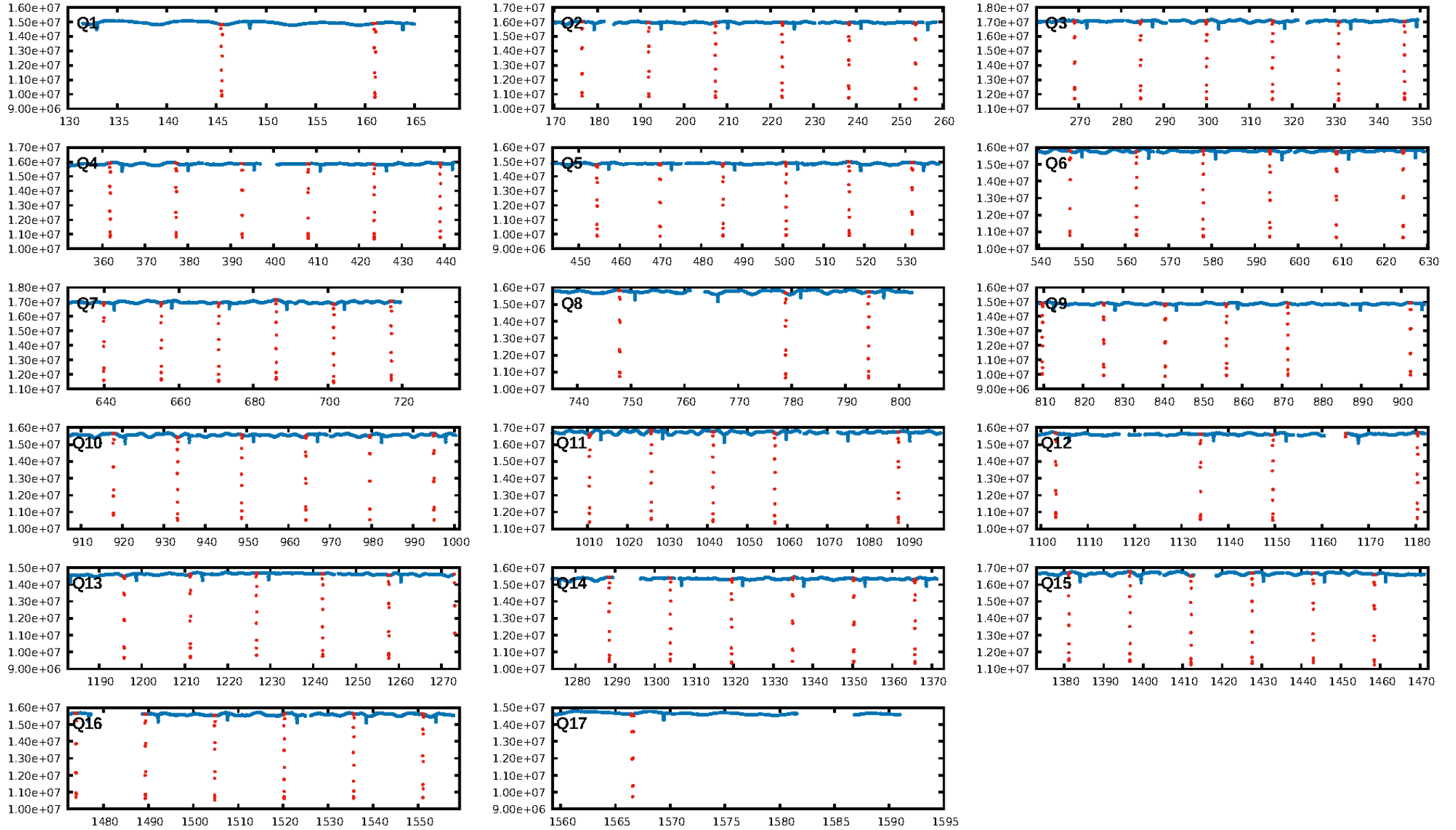
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00 $\sigma$ ]  
LongPeriod-sig: 100.0% [388.80 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [84/84]  
GhostDiagnostic-chr: 1.032  
Centroid-sig: N/A  
Centroid-so: 0.126 arcsec [123.29 $\sigma$ ]  
OotOffset-rm: 0.089 arcsec [1.21 $\sigma$ ]  
KicOffset-rm: 0.097 arcsec [1.41 $\sigma$ ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 0.00 [0/17]

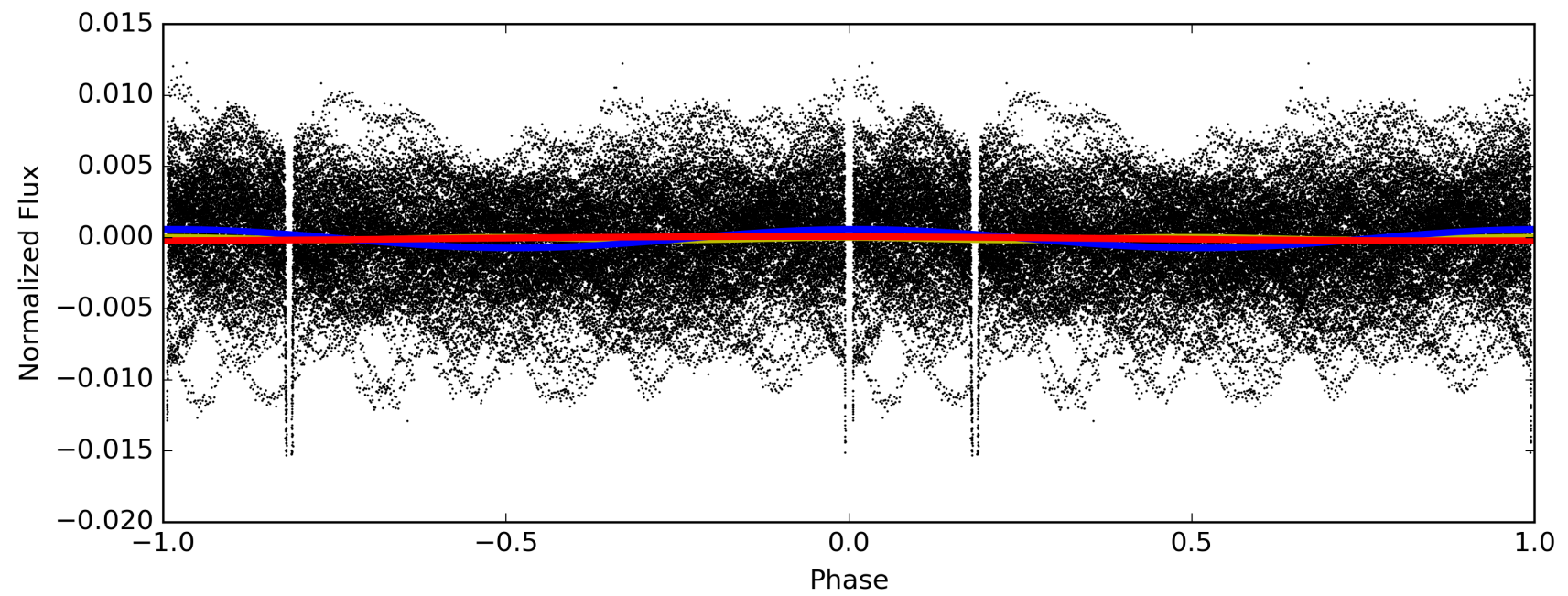
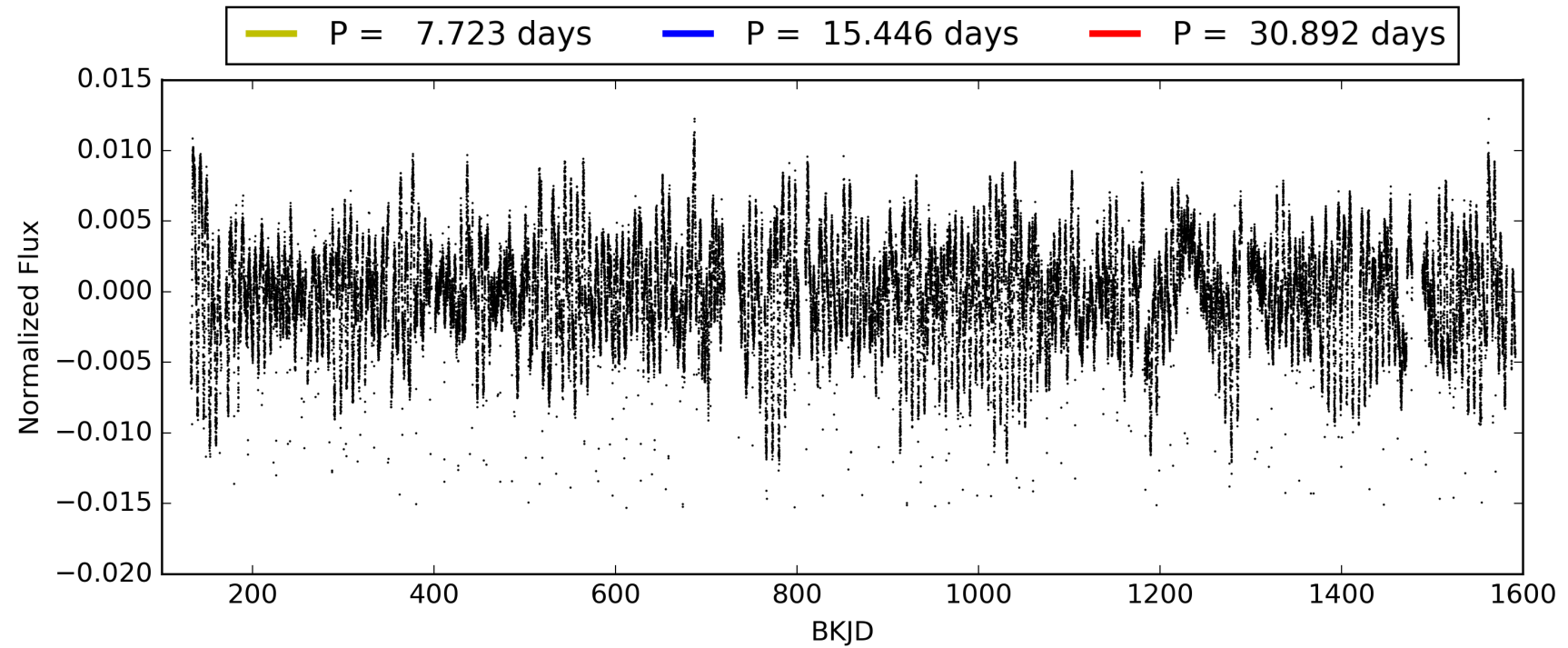
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 14:41:08 Z

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

# TCE 008111622-01, PDC Light Curves



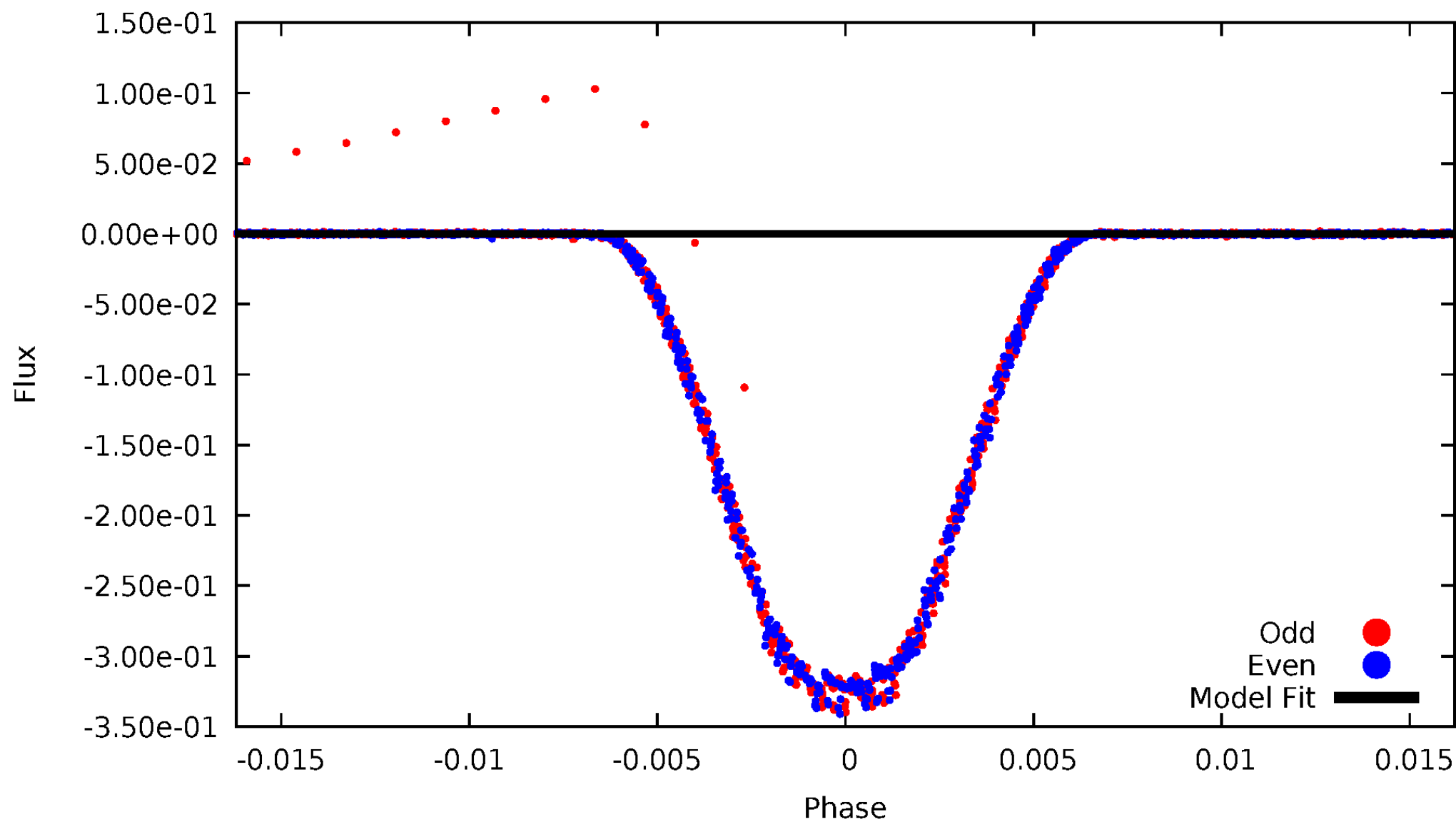
TCE 008111622-01





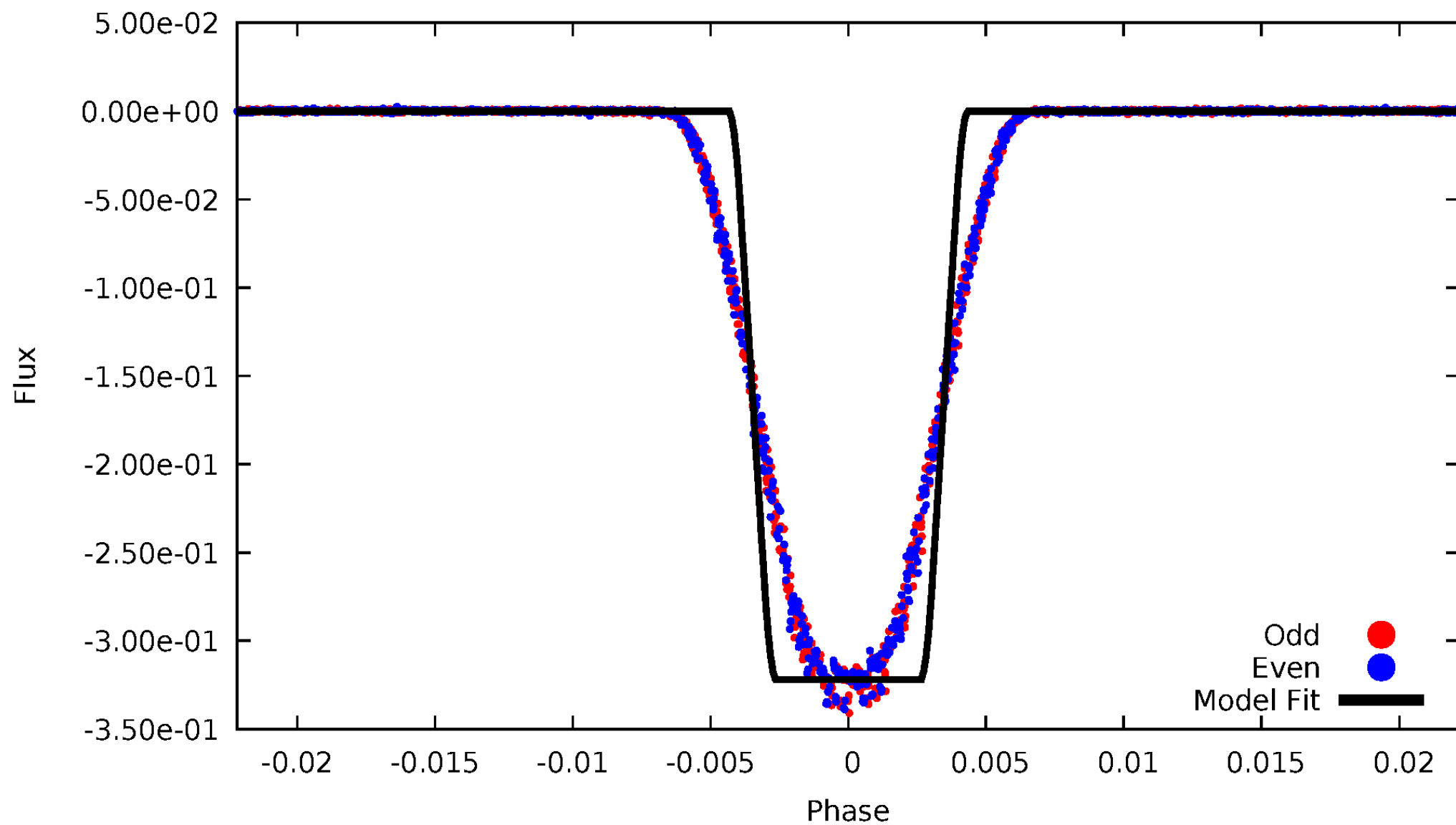
# DV Odd/Even

TCE 008111622-01



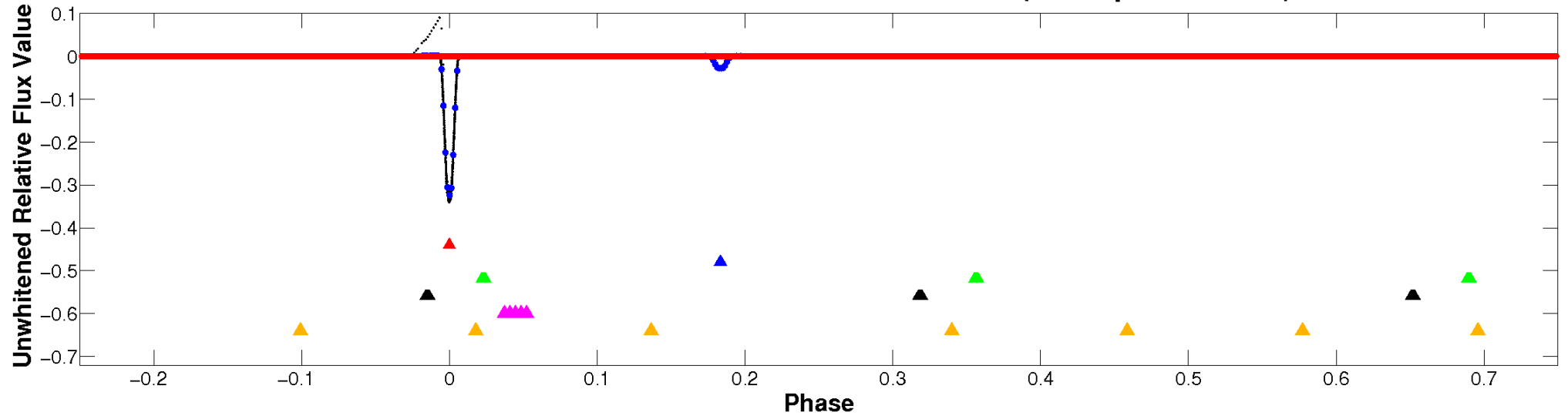
# ALT Odd/Even

TCE 008111622-01

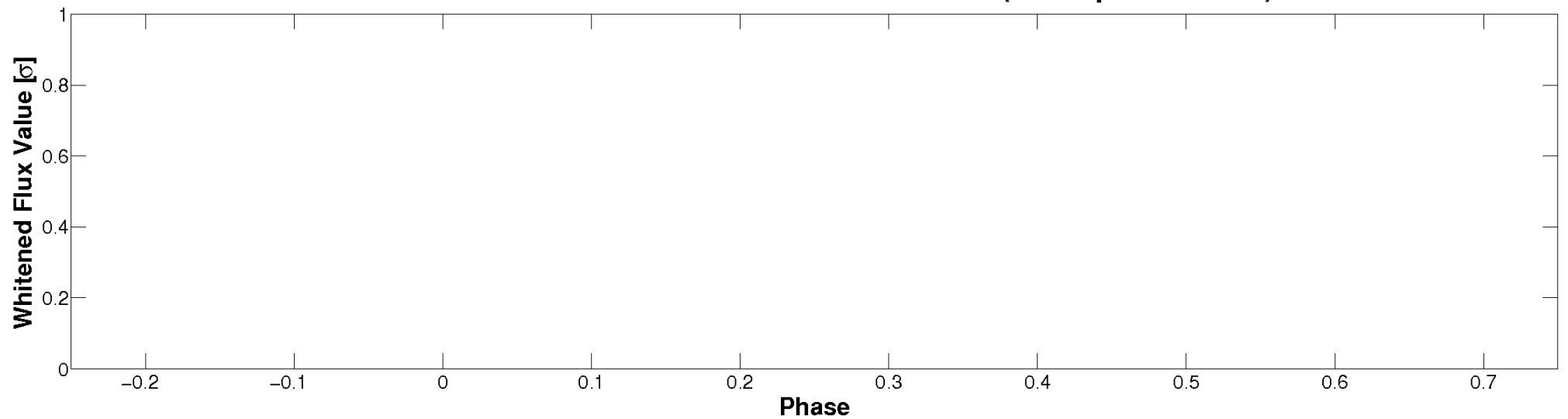


# Non-Whitened Vs. Whitened Light Curve

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

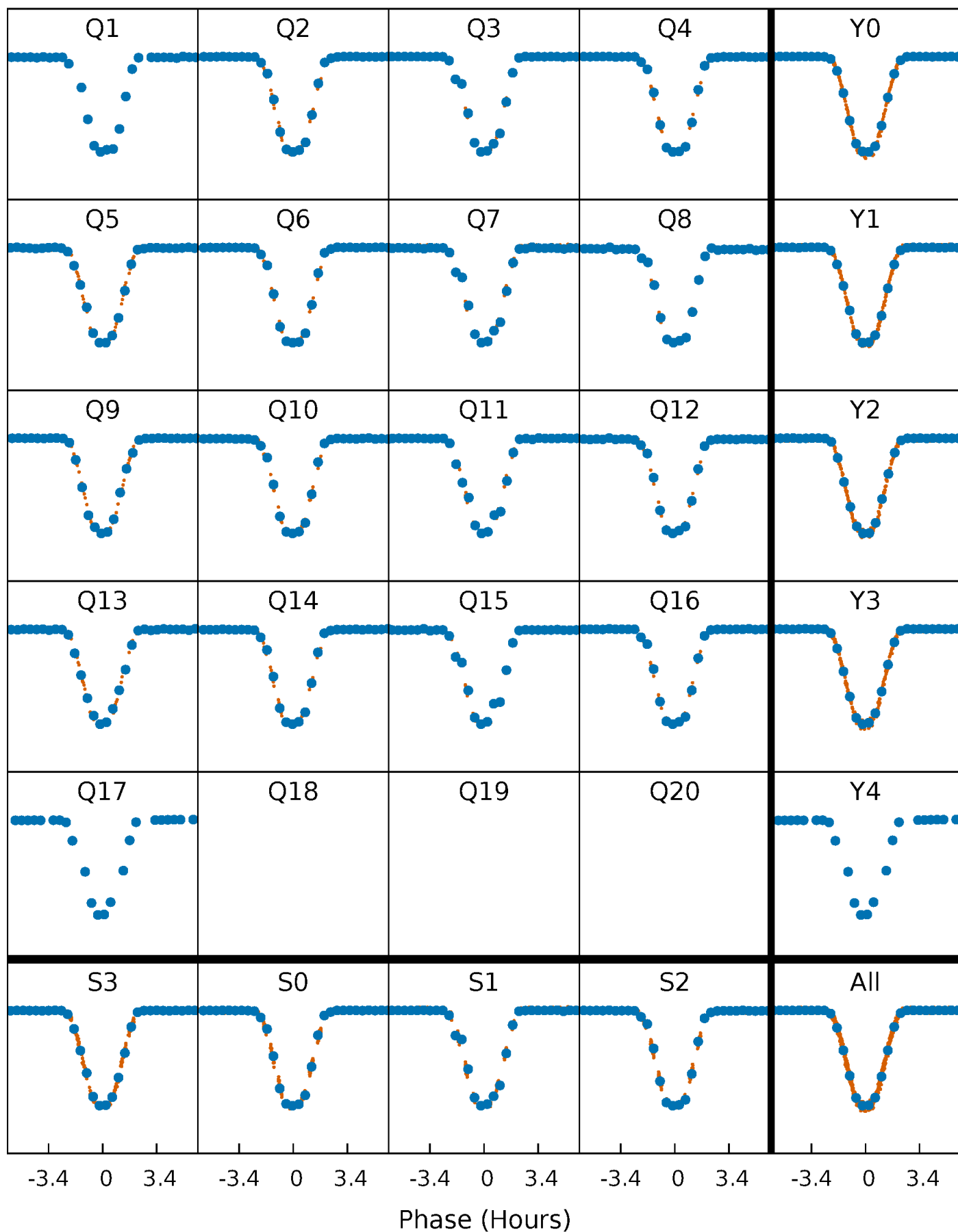


Planet 1 : Phased Whitened Flux Time Series (TPS Epoch/Period)



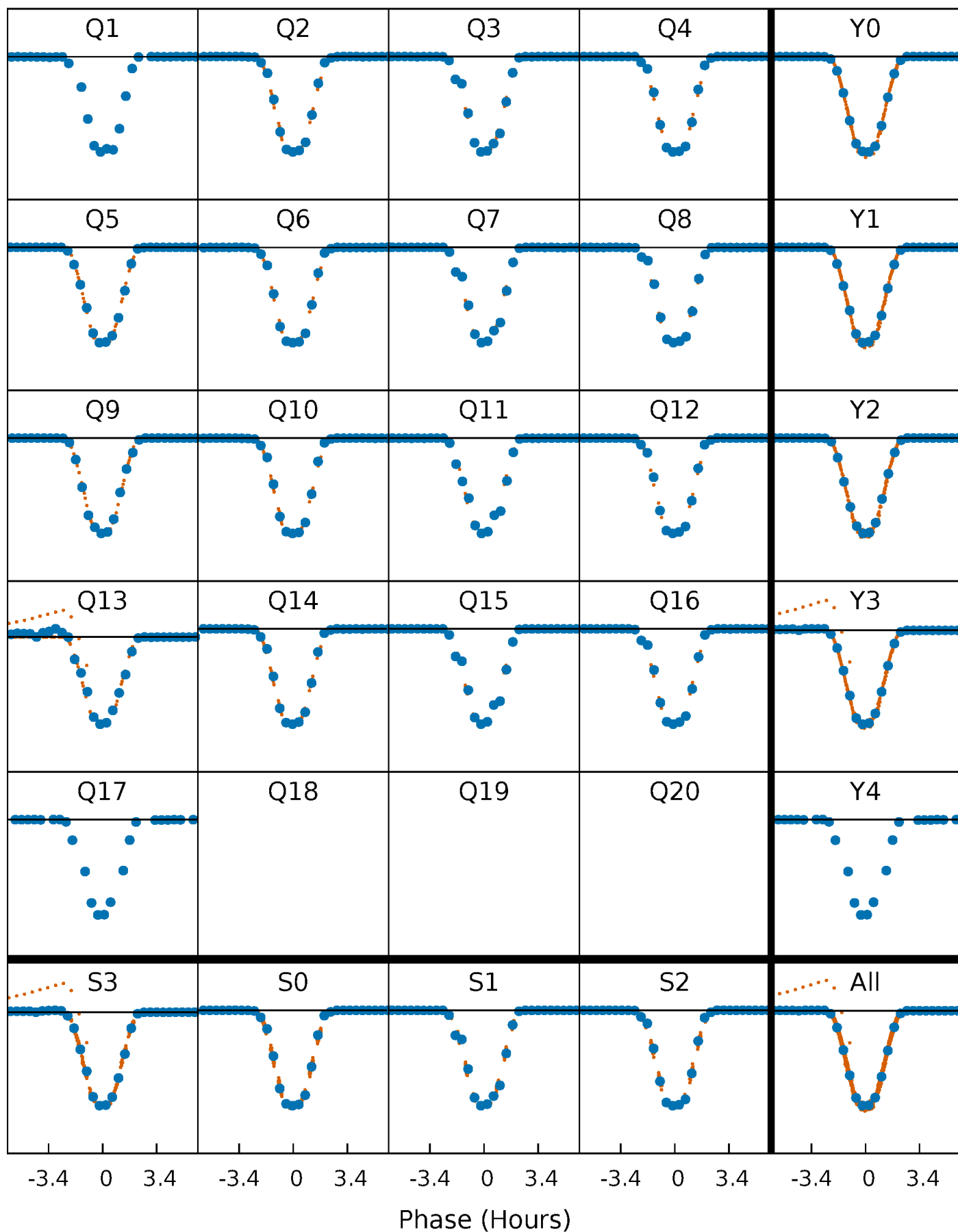
# PDC Quarter-Phased Transit Curves

TCE 008111622-01 P= 15.446109 Days  $T_0=145.532030$  (BKJD)



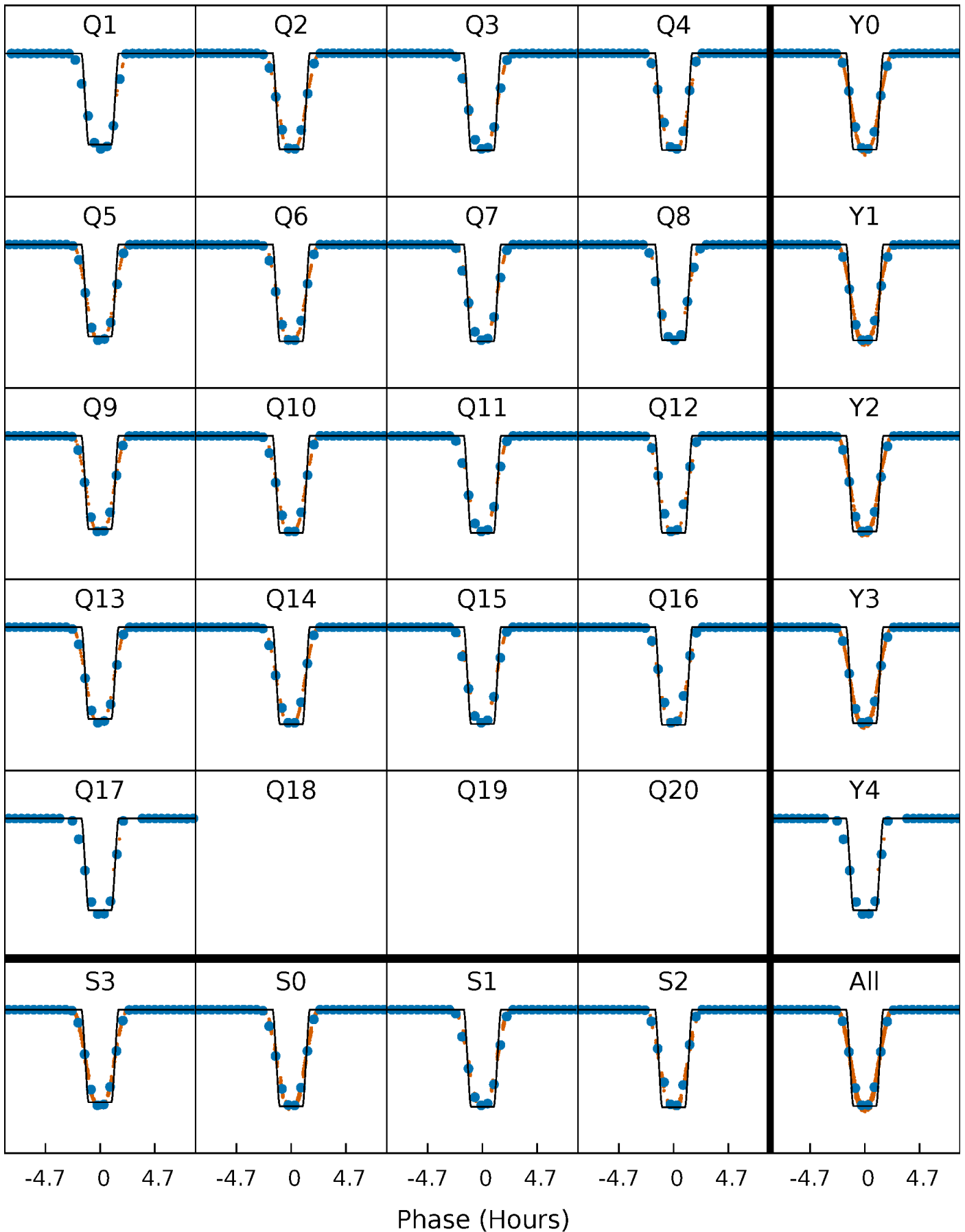
# DV Quarter-Phased Transit Curves

TCE 008111622-01 P= 15.446109 Days  $T_0=145.532030$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 008111622-01 P= 15.446109 Days  $T_0=145.531837$  (BKJD)

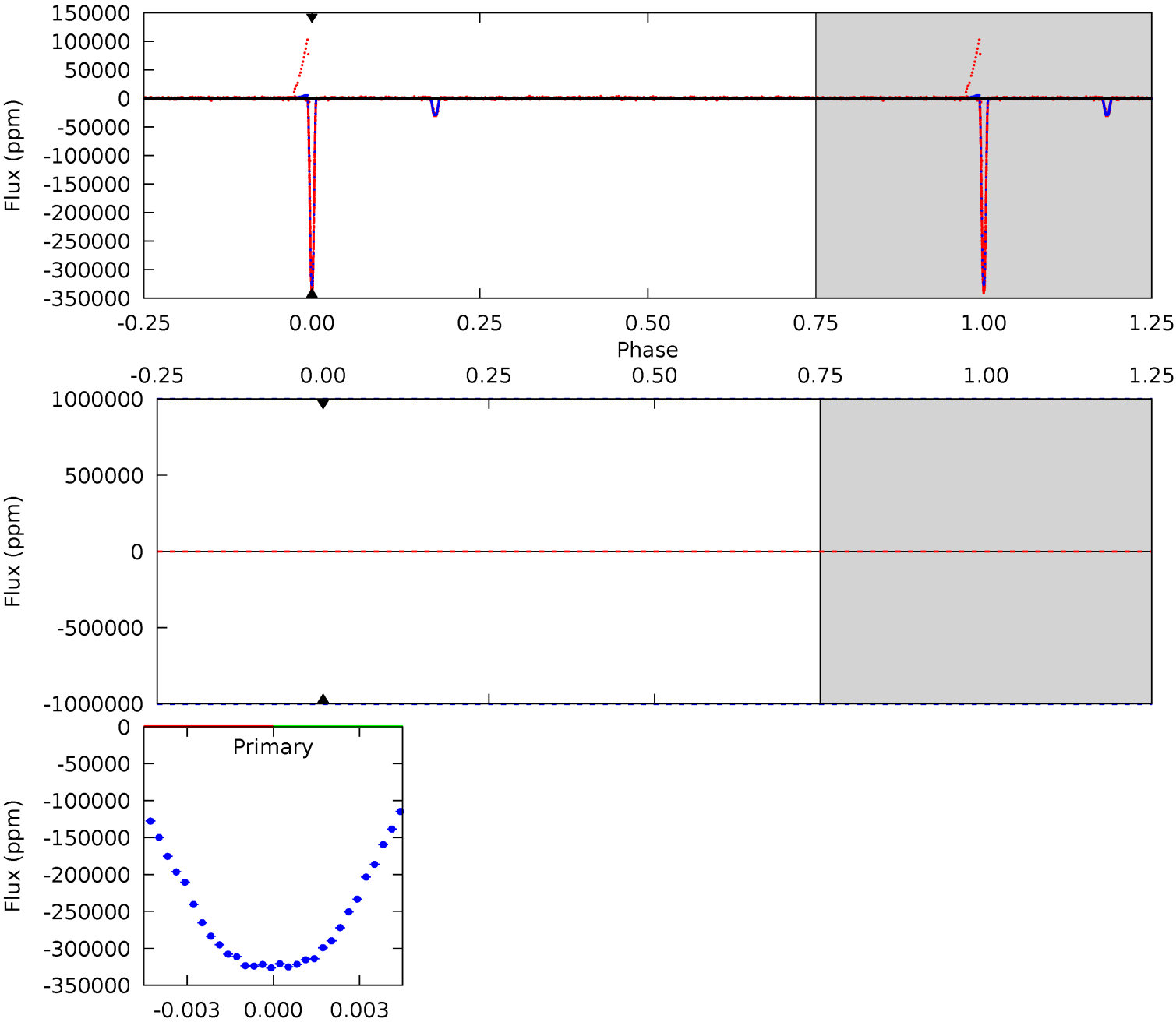




# DV Model-Shift Uniqueness Test

008111622-01, P = 15.446109 Days, E = 130.085921 Days

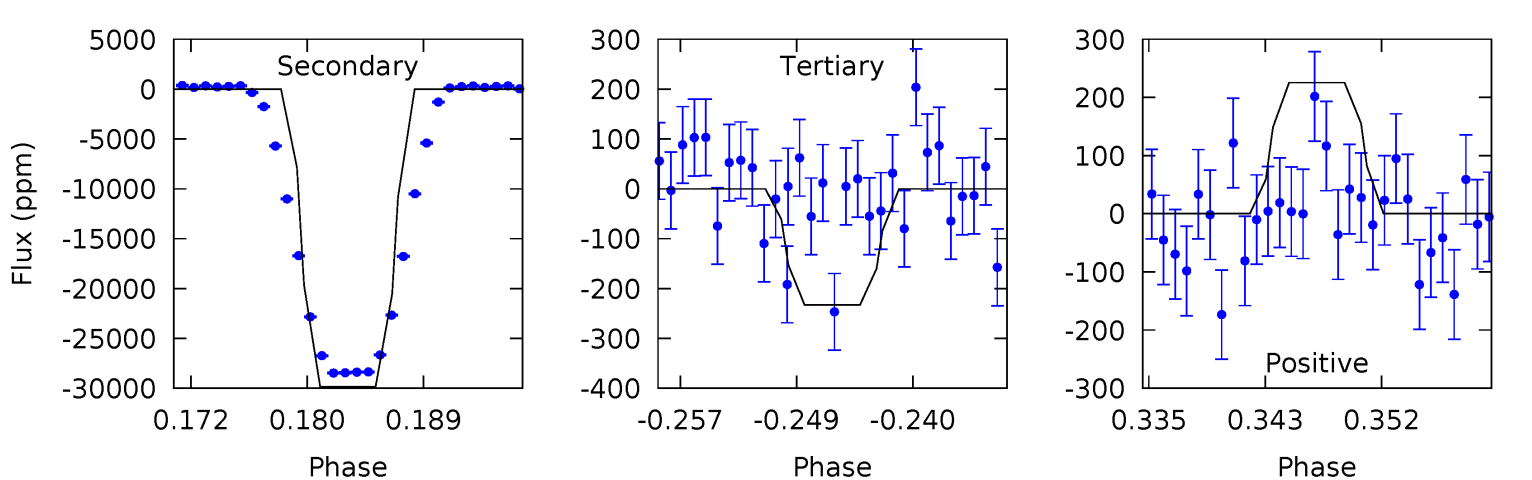
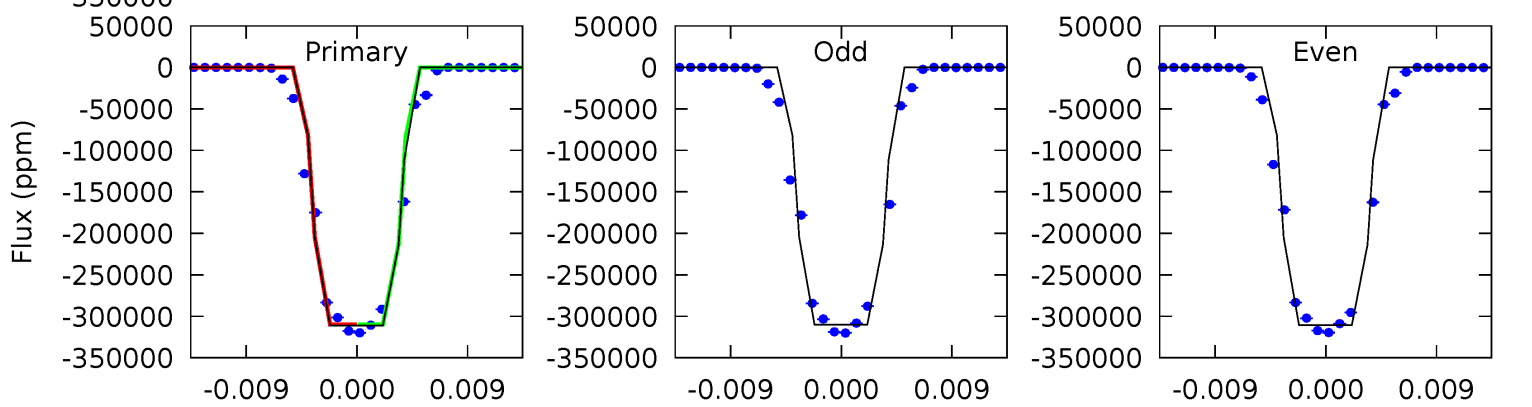
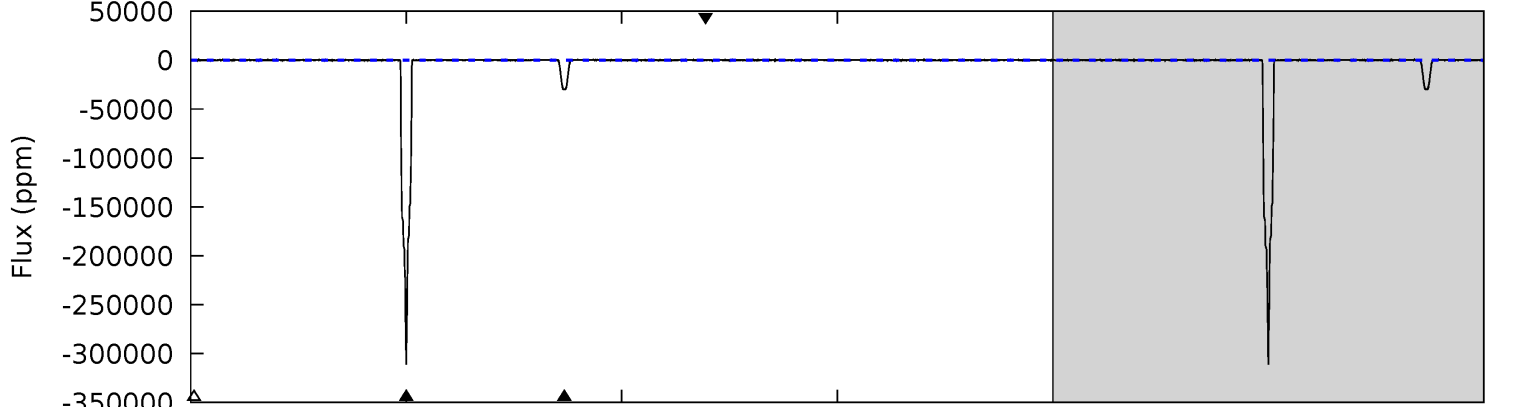
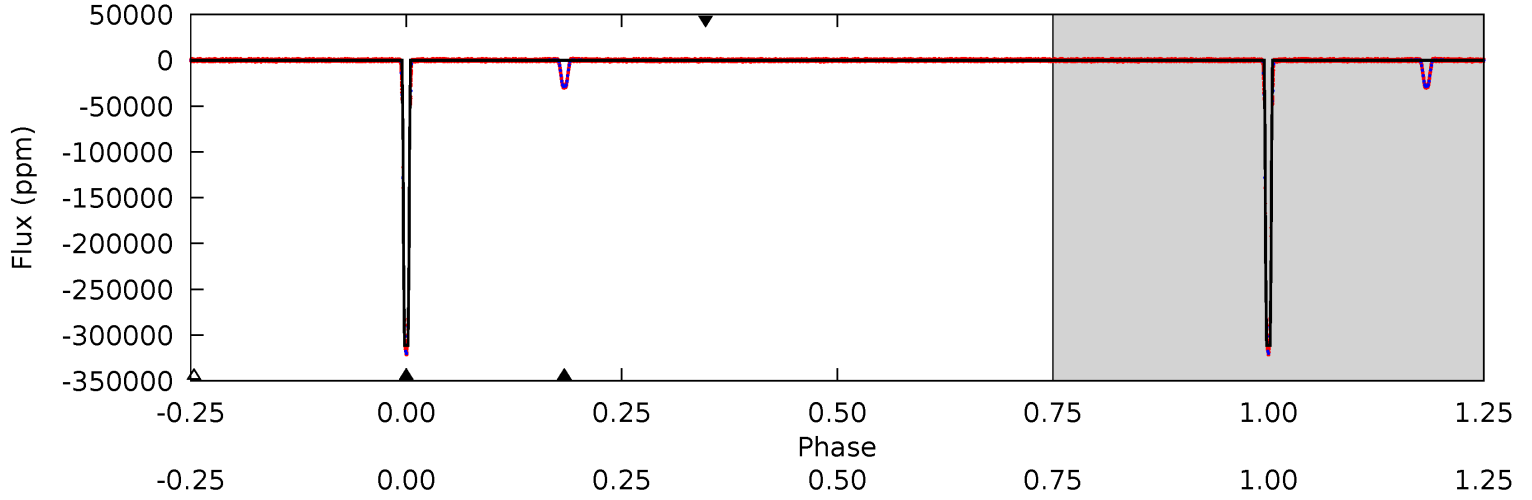
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

008111622-01, P = 15.446109 Days, E = 130.085728 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
5897	565.7	4.41	4.27	5.06	2.63	1.33	5892	5892	561.2	561.4	6.17	1.01	0.00	0.12



### Stellar Parameters For KIC 008111622

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5838^{+157}_{-192}$	$4.529^{+0.038}_{-0.212}$	$-0.080^{+0.300}_{-0.300}$	$0.897^{+0.275}_{-0.092}$	$0.992^{+0.116}_{-0.127}$	$1.938^{+0.404}_{-1.031}$
	+3%/-3%	+1%/-5%	+375%/-375%	+31%/-10%	+12%/-13%	+21%/-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 008111622-01 / KOI 6968.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$0 \pm 1000000$	$50.86^{+12.91}_{-11.97}$	$1006^{+69}_{-48}$	$-2359^{+7357}_{-2382}$	$-1.909^{+370.781}_{-284.441}$
Alt.	$-29848 \pm 53$	$58.75^{+13.96}_{-11.80}$	$1005^{+76}_{-46}$	$3670^{+249}_{-204}$	$71^{+38}_{-23}$

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

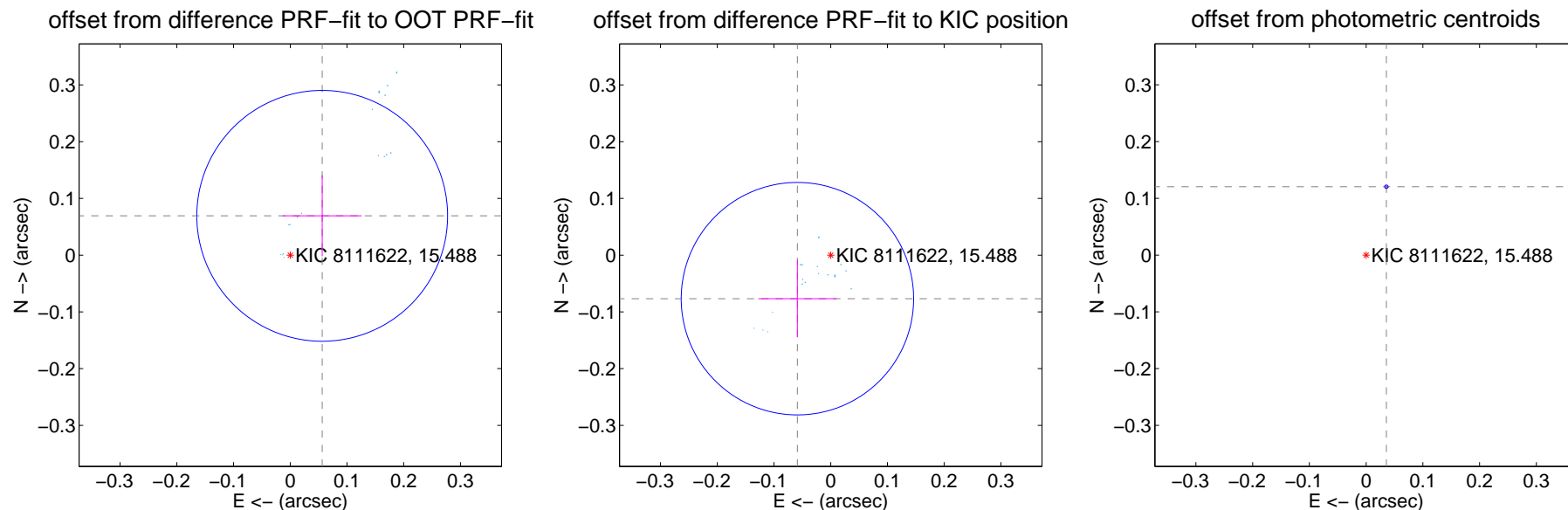
## DV Centroid Data

Supplemental centroid analysis for 008111622-01. Kepler magnitude: 15.49. Transit SNR -1.00

There are 17 quarters with good PRF difference image offsets

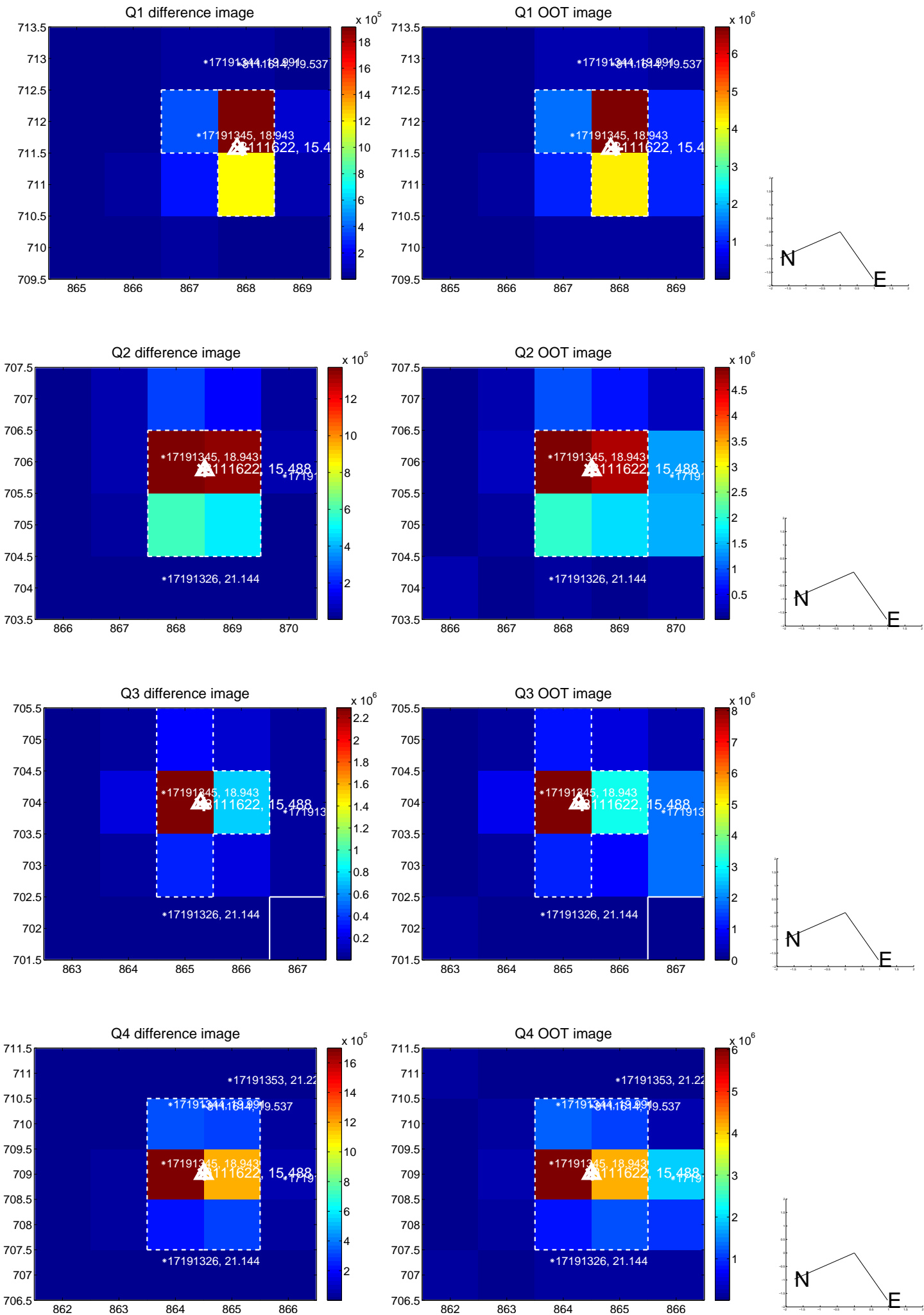
The direct PRF centroid is offset from the target star catalog position by about 0.36 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.089 \pm 0.074$	1.21	$-0.056 \pm 0.070$	$0.069 \pm 0.071$
PRF-fit source offset from KIC position	$0.097 \pm 0.068$	1.41	$0.059 \pm 0.069$	$-0.077 \pm 0.068$
photometric centroid source offset	$0.13 \pm 0.00$	123.29	$-0.04 \pm 0.00$	$0.12 \pm 0.00$

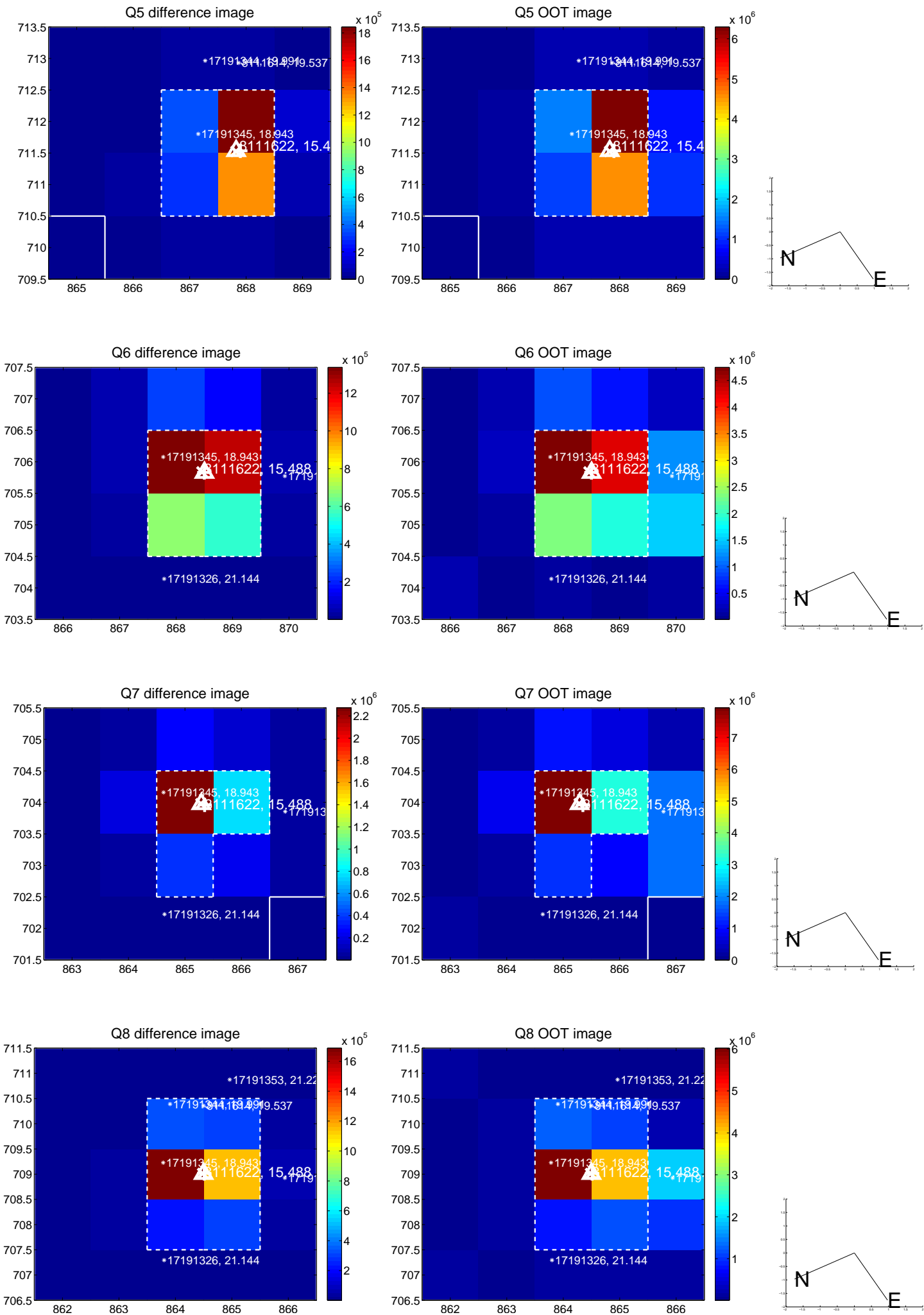


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

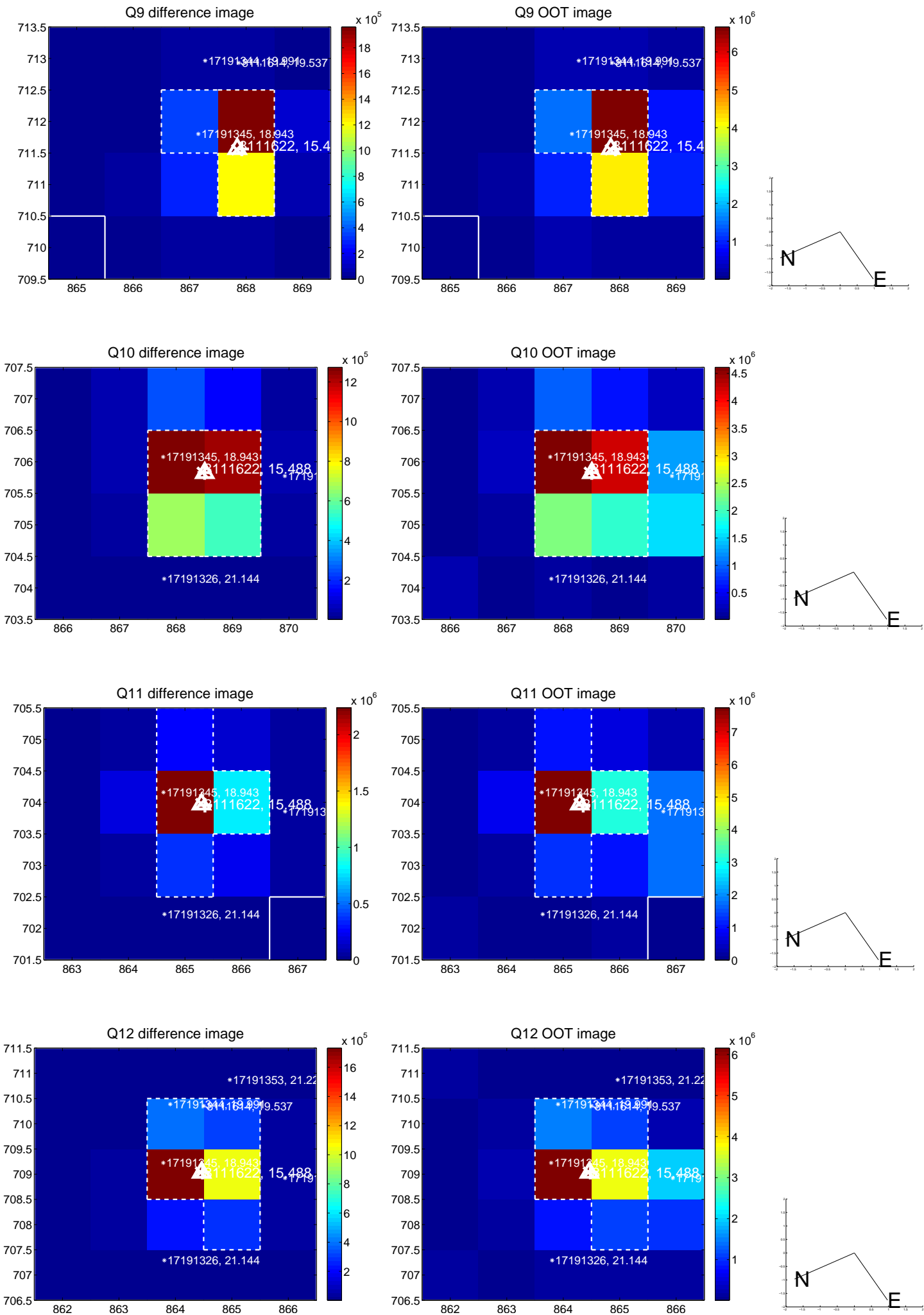


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

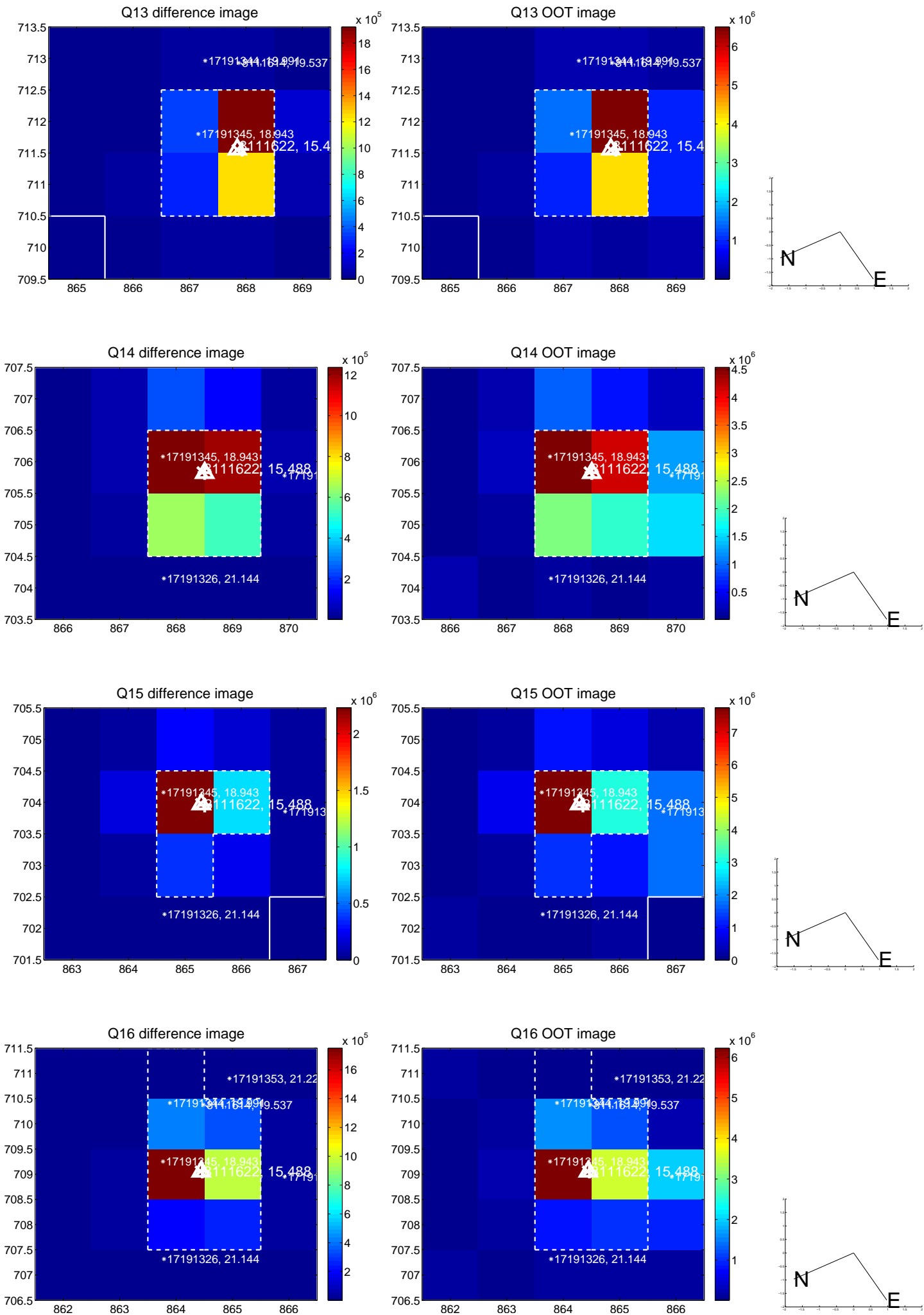




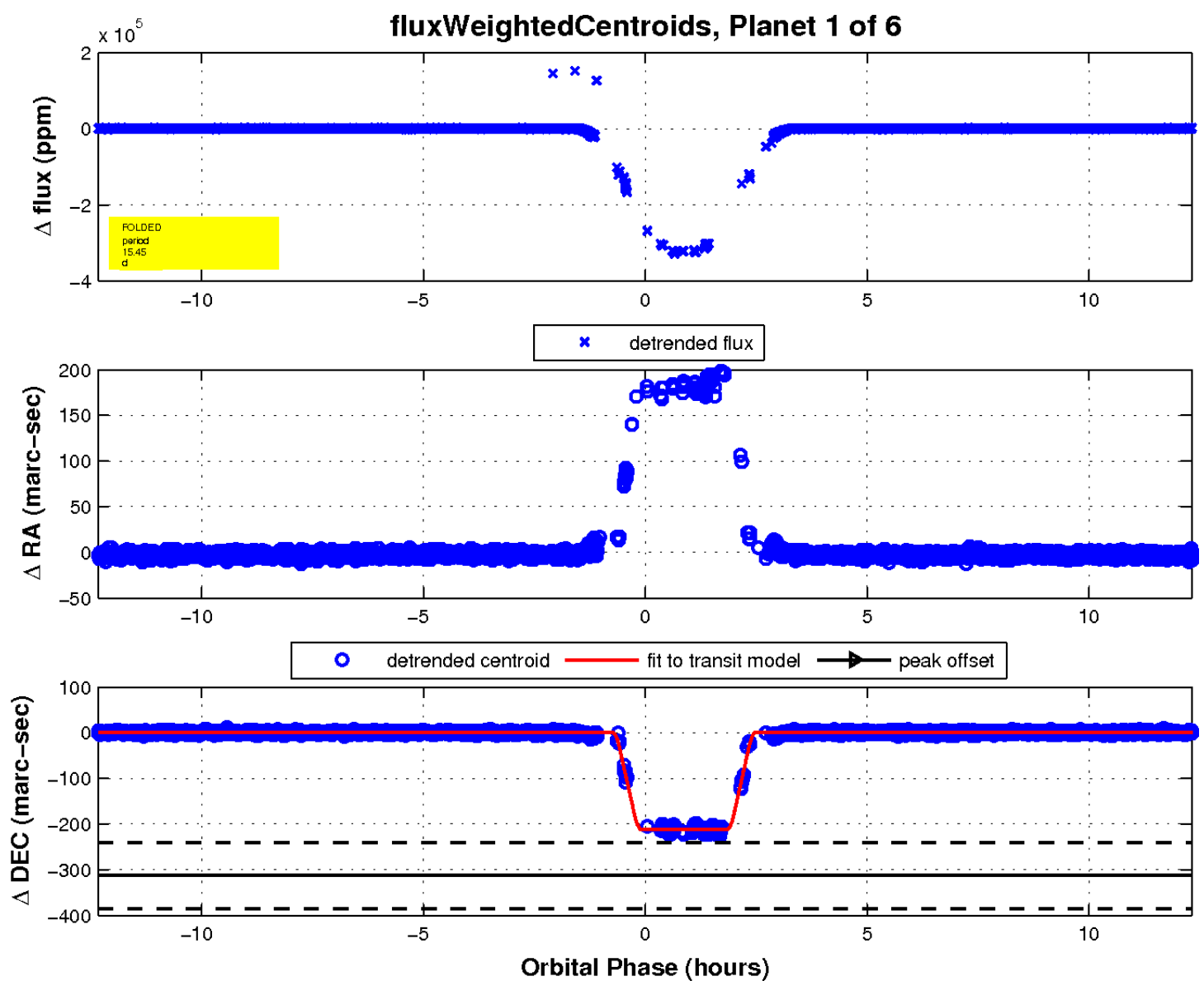
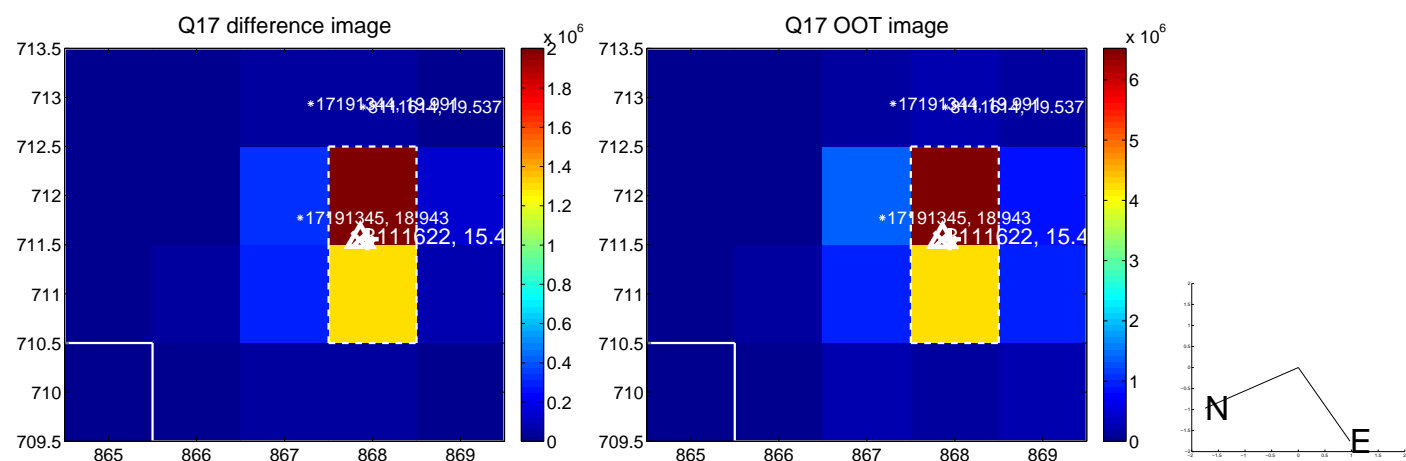
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



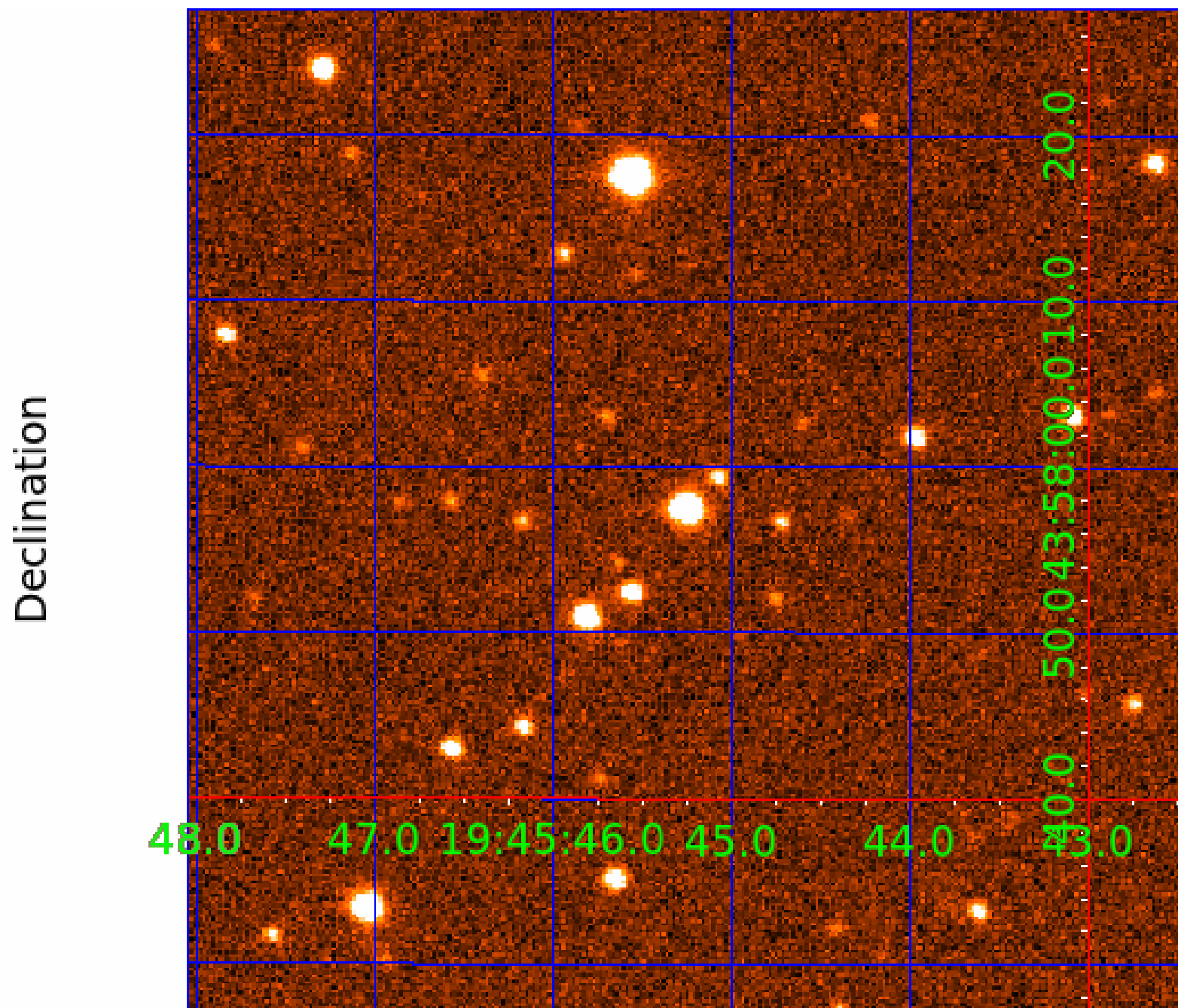
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



# KIC 008111622

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008111622-01	OBS	6968.01	15.446109	145.532030	324454.7	3.000	9167.1	-1.0	0.90	5838	48.00	57.11
008111622-02	OBS	No	15.446063	132.921345	29042.2	5.005	846.3	812.3	0.90	5838	17.19	57.11
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008111622-04	OBS	No	5.148855	134.984699	17281.8	15.000	626.6	-1.0	0.90	5838	11.71	247.09
008111622-05	OBS	No	339.756480	146.339456	1522.1	6.611	11.1	7.4	0.90	5838	4.73	0.93
008111622-06	OBS	No	192.159982	310.742053	987.2	10.488	12.9	6.6	0.90	5838	2.94	1.98

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008111622-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_ALT—HAS_SEC_TCE—CENT_NOFITS
008111622-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
008111622-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD—CENT_FEW_MEAS
008111622-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—RESIDUAL_TCE—CENT_NOFITS
008111622-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
008111622-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—INCONSISTENT_TRANS

**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.

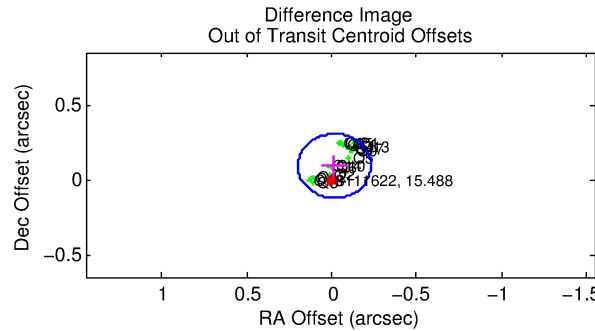
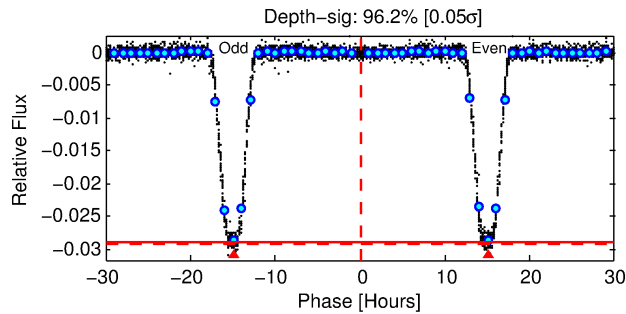
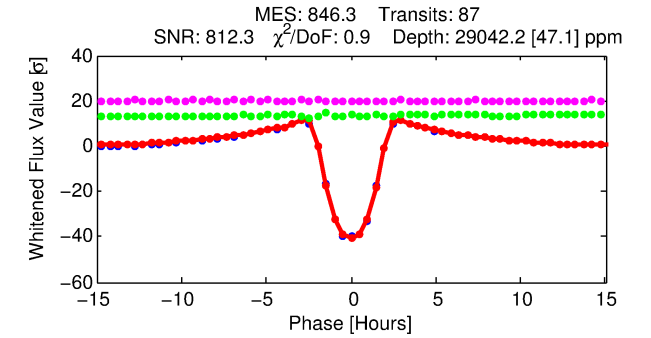
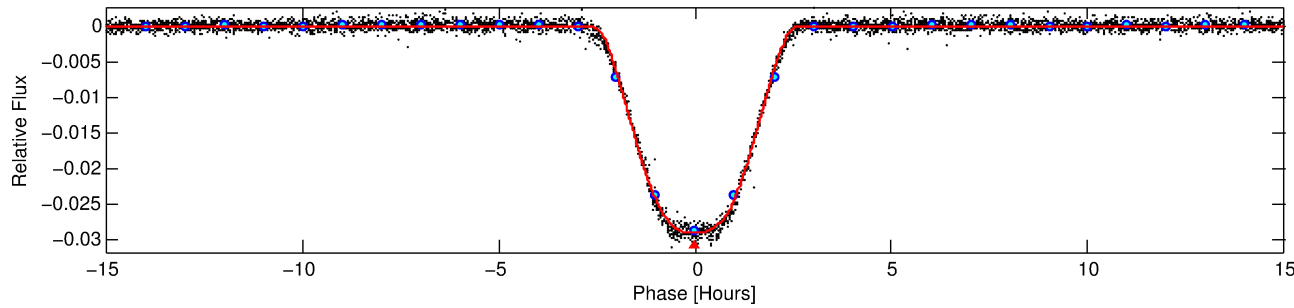
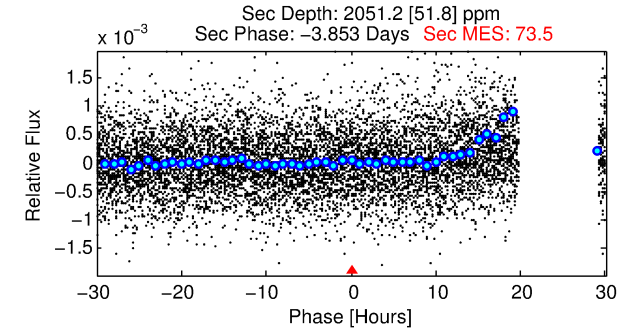
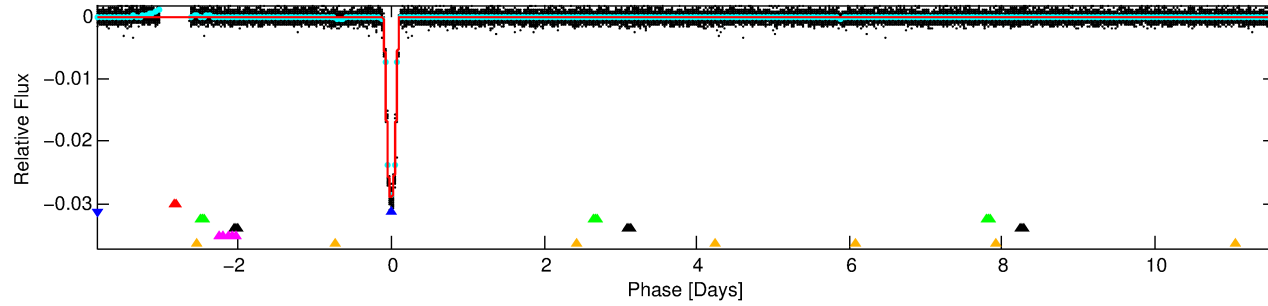
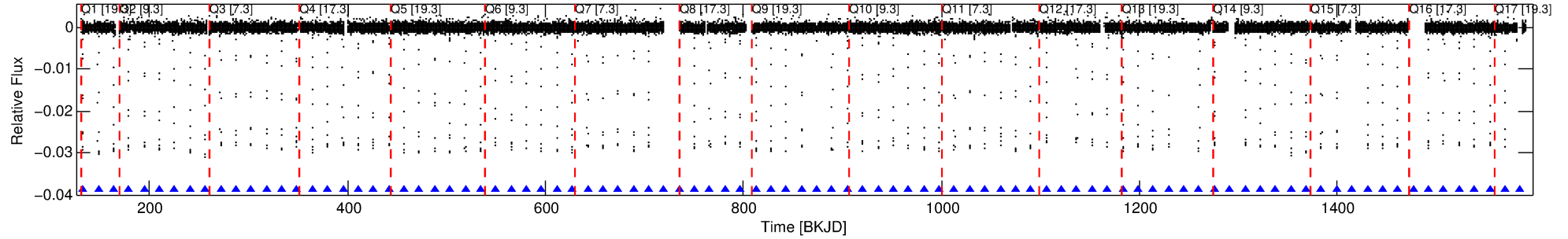
Ephemeris Match Information For 008111622-02

No Significant Match Found

# DV One-Page Summary

KIC: 8111622 Candidate: 2 of 6 Period: 15.446 d  
KOI: K06968 Corr: No Ephemeris Match

Kp: 15.49 R\*: 0.90 Rs Teff: 5838.0 K Logg: 4.53 Fe/H: -0.080



## DV Fit Results:

Period = 15.44606 [0.00000] d  
Epoch = 132.9213 [0.0001] BKJD  
Rp/R\* = 0.1756 [0.0002]  
a/R\* = 20.30 [0.04]  
b = 0.80 [0.00]  
Seff = 57.11 [23.20]  
Teq = 701 [71] K  
Rp = 17.19 [5.27] Re  
a = 0.1211 [0.0316] AU  
Ag = 56.02 [21.57] [2.55σ]  
Teffp = 2965 [99] K [18.53σ]

## DV Diagnostic Results:

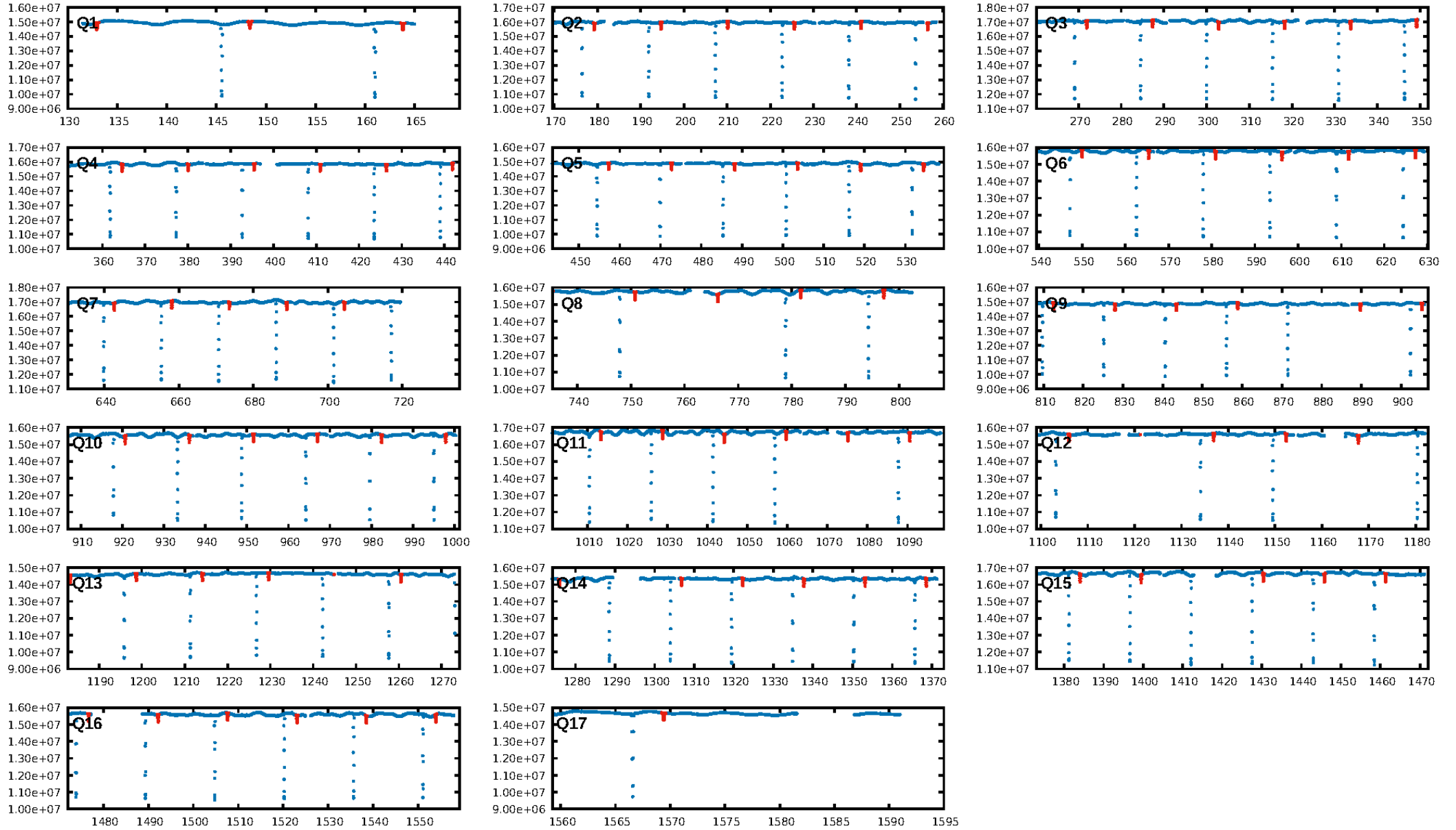
ShortPeriod-sig: 100.0% [41.64σ]  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [83/83]  
GhostDiagnostic-chr: 4.203  
Centroid-sig: N/A  
Centroid-so: 0.067 arcsec [6.20σ]  
OotOffset-rm: 0.093 arcsec [1.29σ]  
KicOffset-rm: 0.104 arcsec [1.52σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 14:41:11 Z

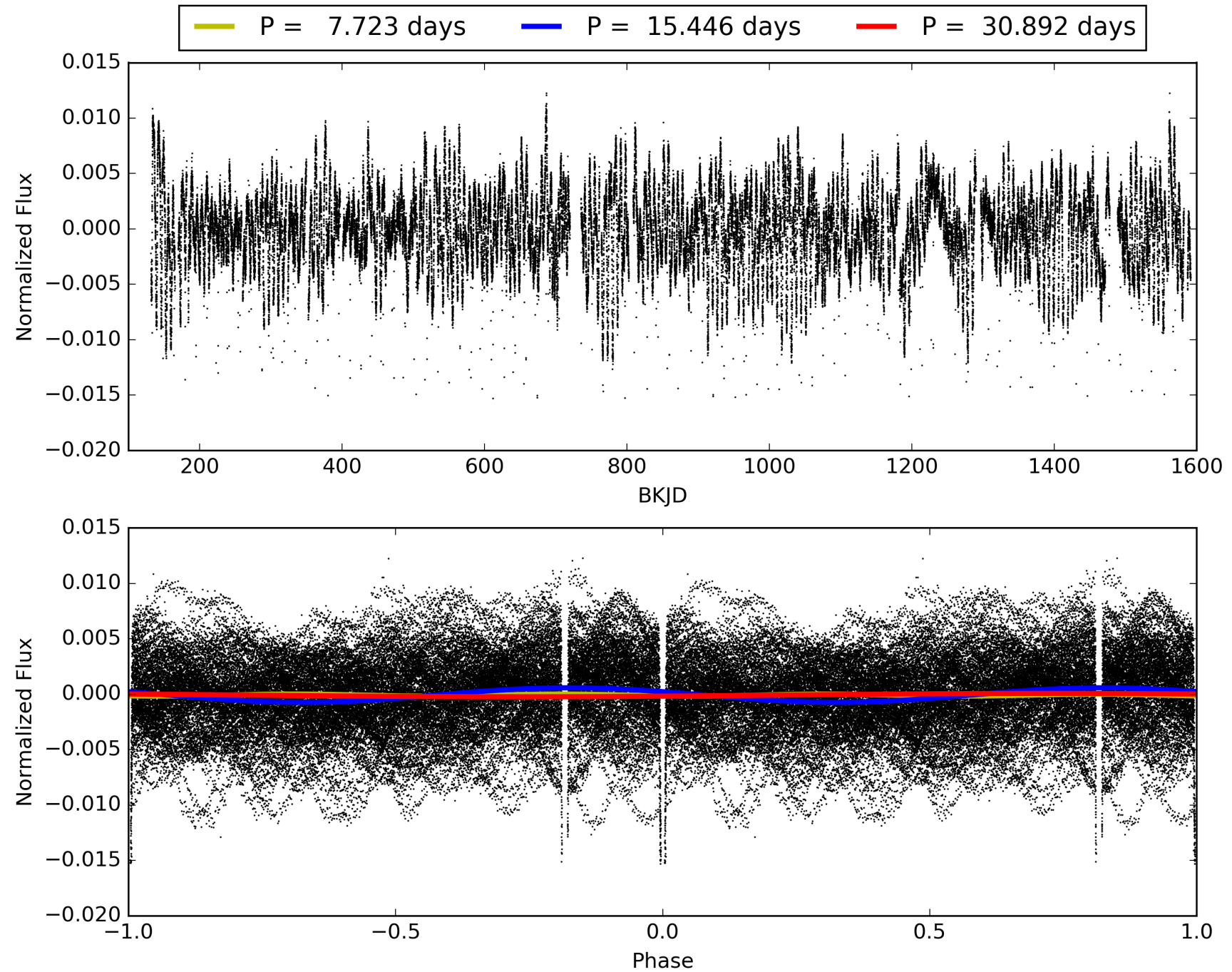
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 008111622-02, PDC Light Curves

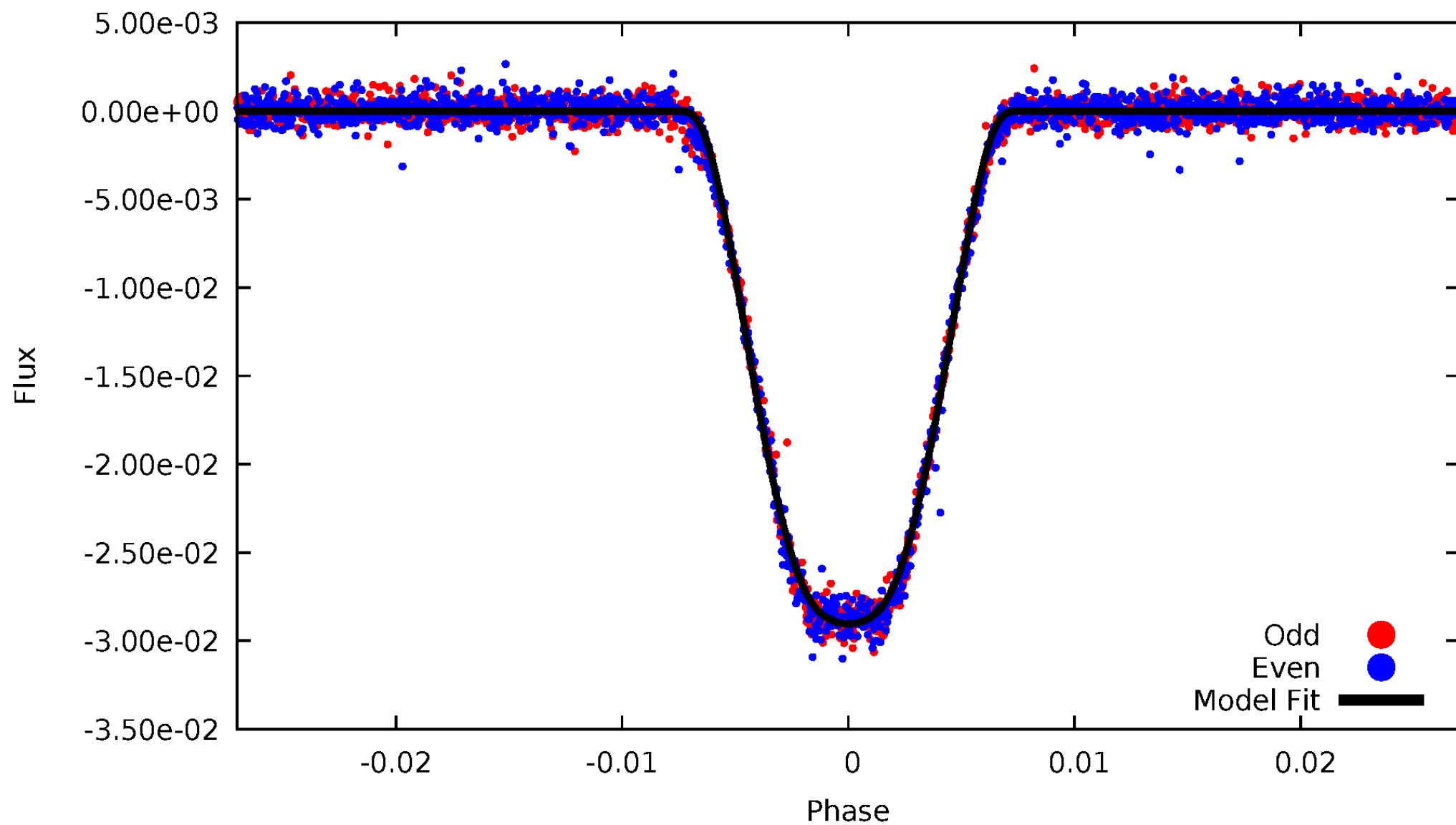


TCE 008111622-02



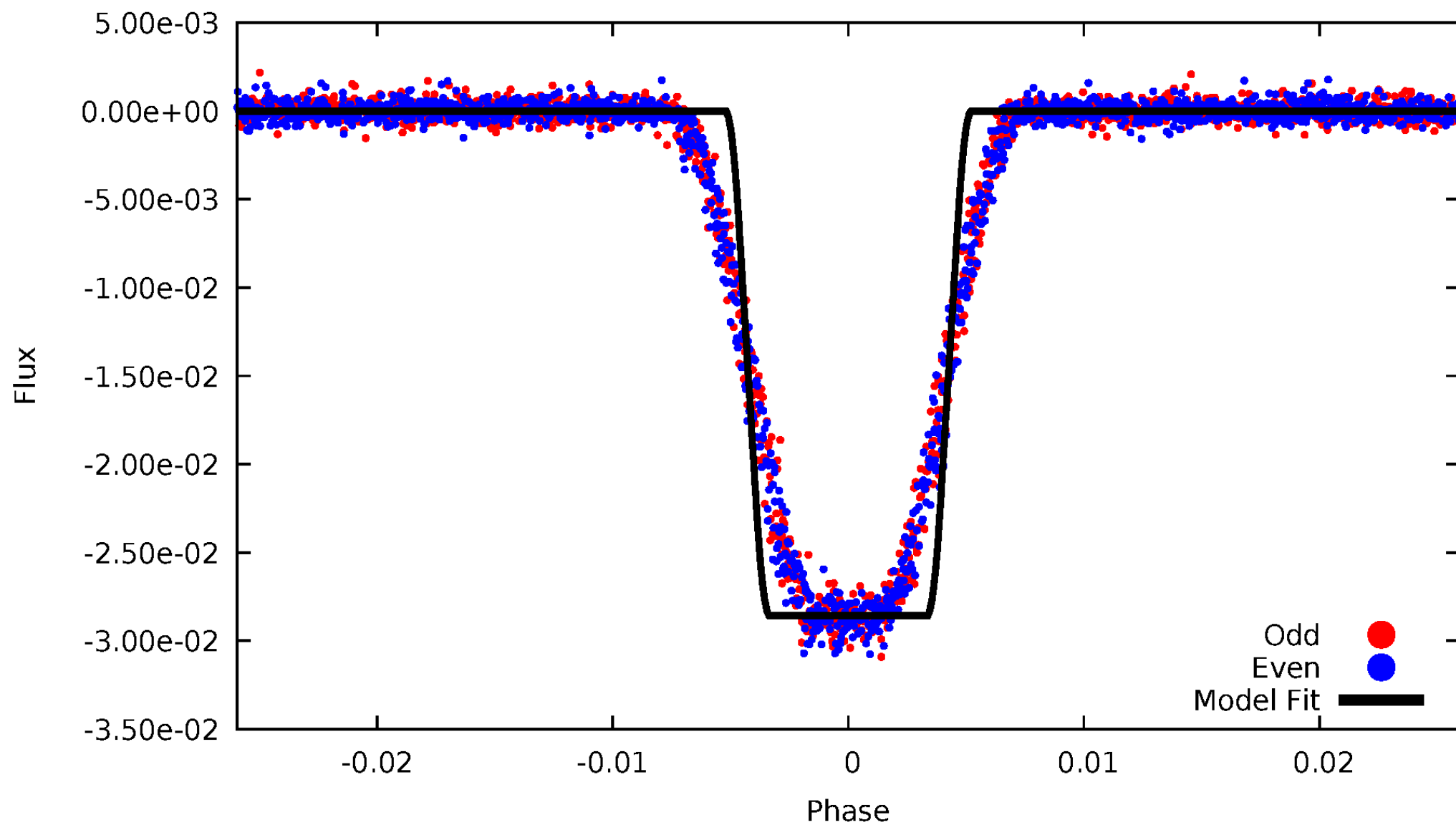
DV Odd/Even

TCE 008111622-02



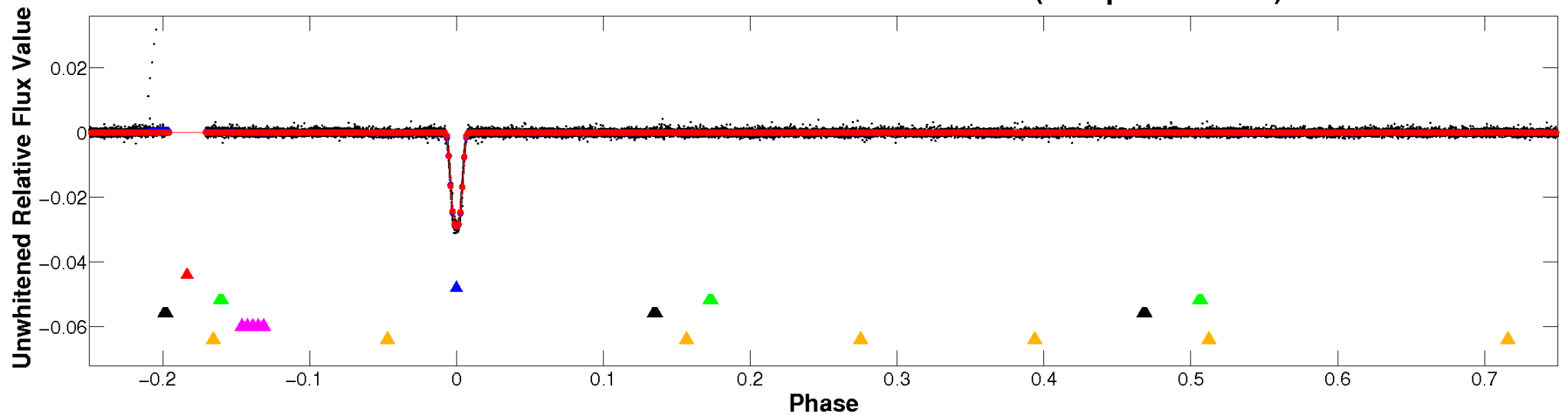
# ALT Odd/Even

TCE 008111622-02

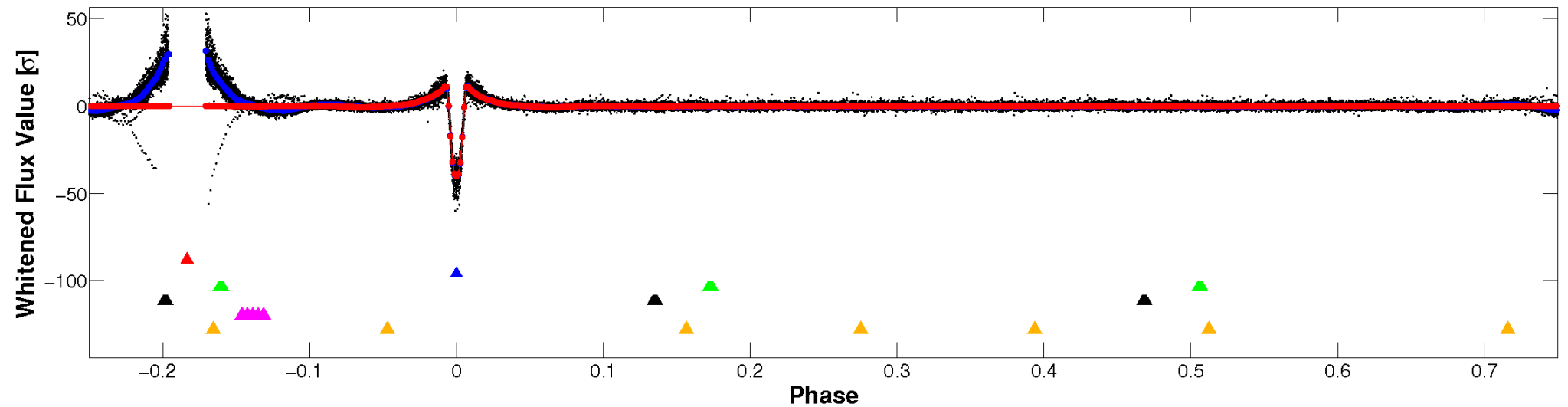


# Non-Whitened Vs. Whitened Light Curve

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

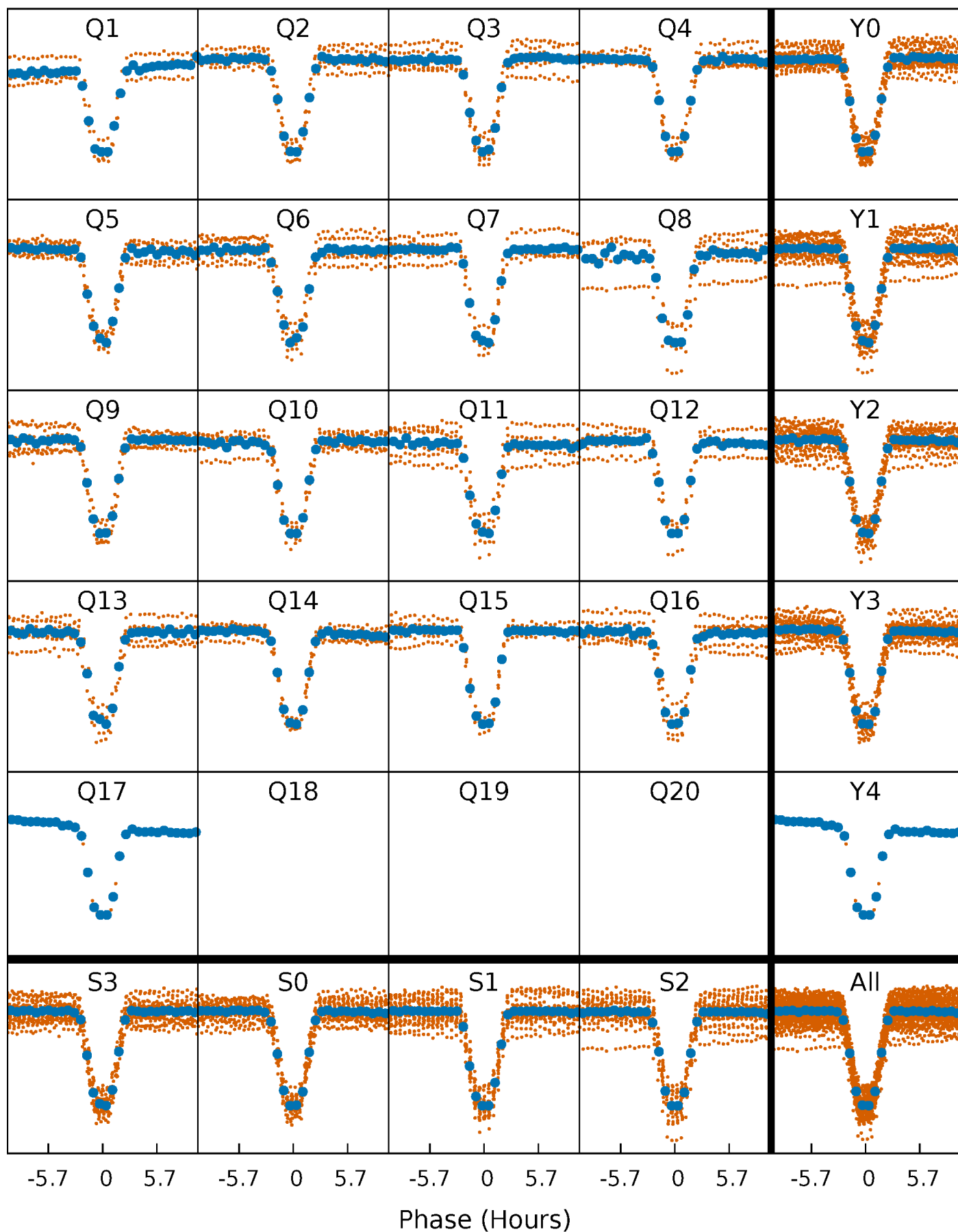


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

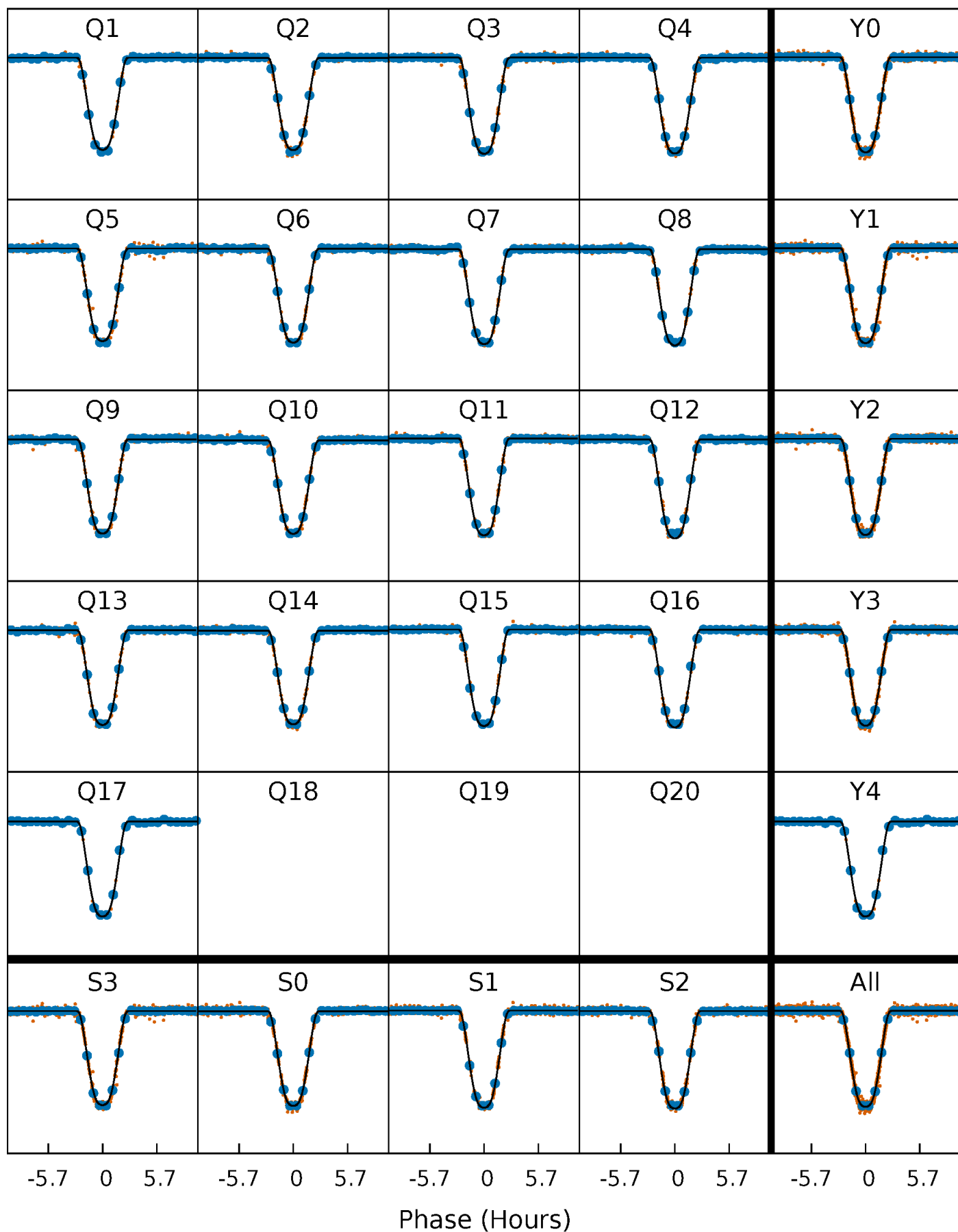
TCE 008111622-02 P= 15.446063 Days  $T_0=132.921345$  (BKJD)





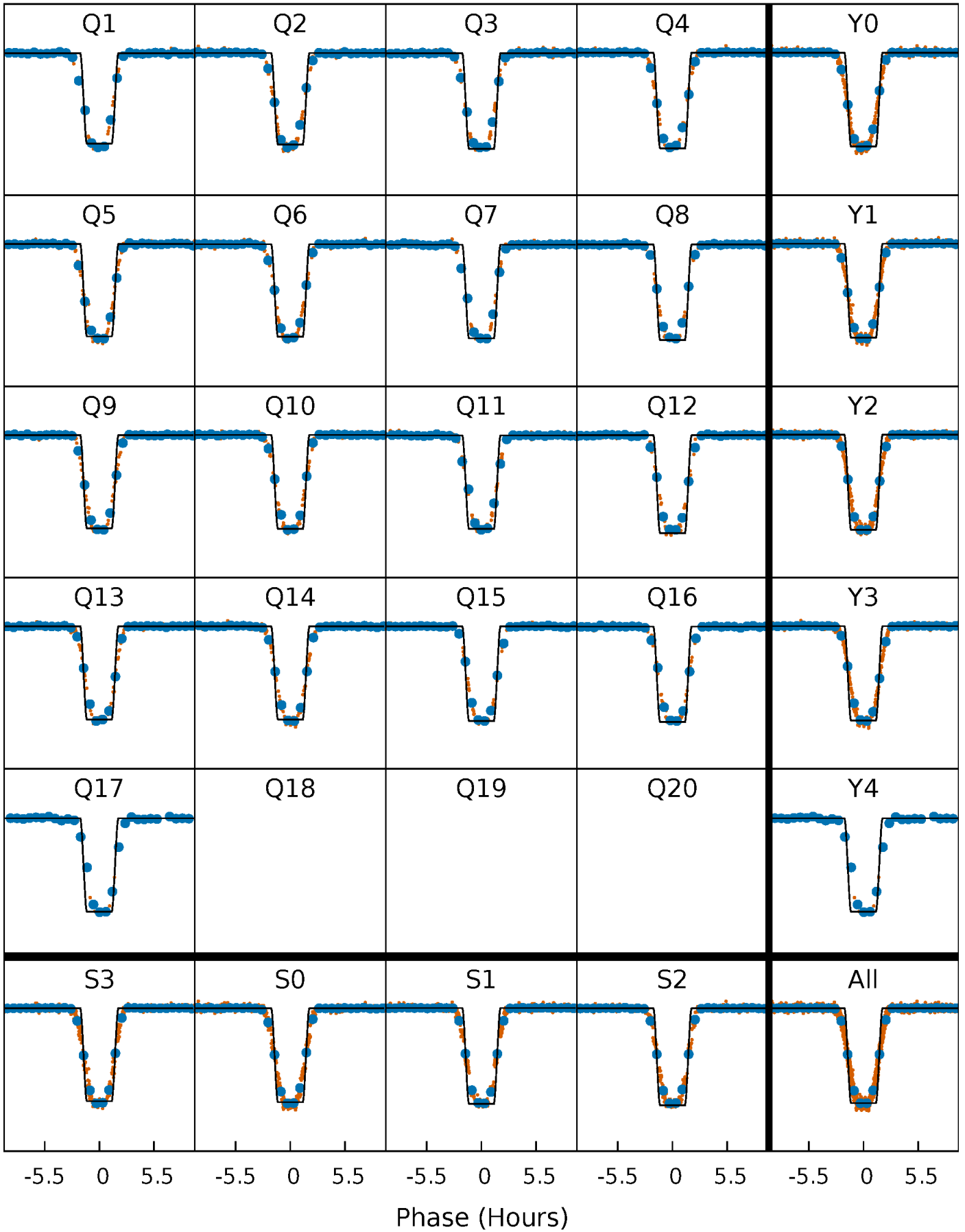
# DV Quarter-Phased Transit Curves

TCE 008111622-02 P= 15.446063 Days  $T_0=132.921345$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

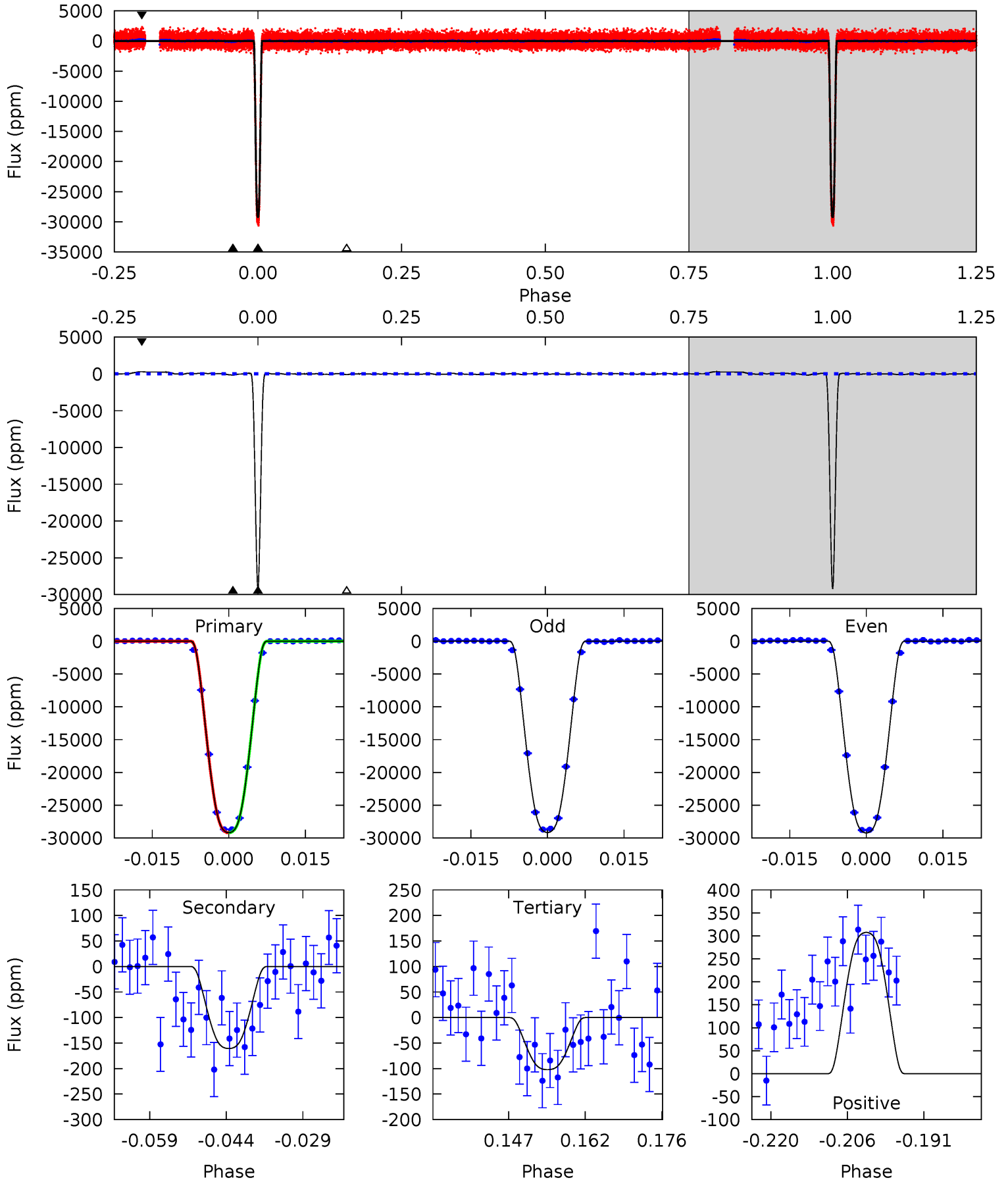
TCE 008111622-02 P= 15.445939 Days  $T_0=132.927043$  (BKJD)



# DV Model-Shift Uniqueness Test

008111622-02, P = 15.446063 Days, E = 117.475282 Days

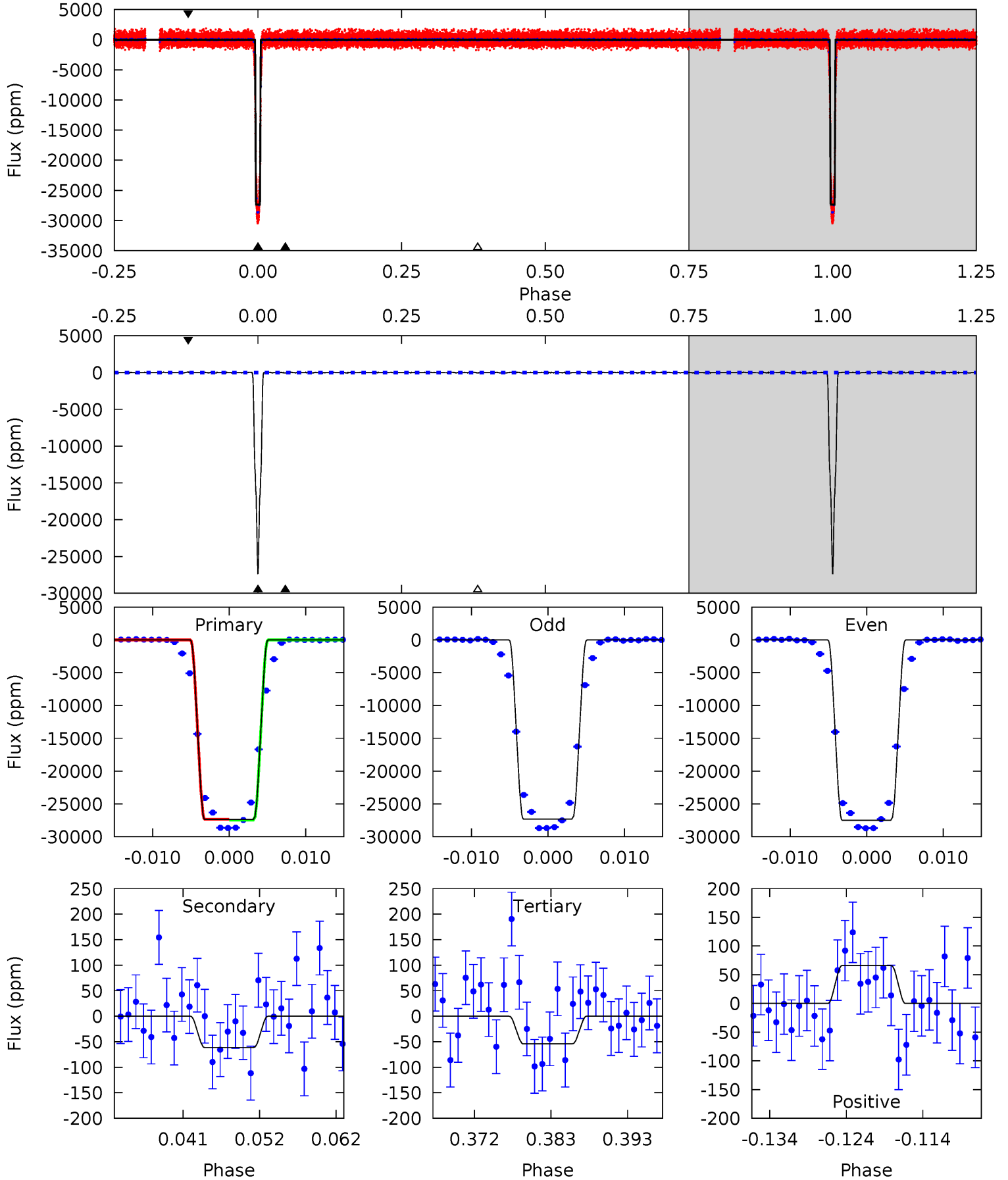
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1718	9.46	6.01	18.1	4.95	2.44	3.71	1712	1700	3.45	-8.63	1.87	1.00	0.01	0.21



# Alt Model-Shift Uniqueness Test

008111622-02, P = 15.445939 Days, E = 117.481104 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
1322	2.96	2.62	3.19	5.02	2.56	0.93	1319	1319	0.34	-0.23	4.71	1.00	0.00	3.36



### Stellar Parameters For KIC 008111622

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5838^{+157}_{-192}$	$4.529^{+0.038}_{-0.212}$	$-0.080^{+0.300}_{-0.300}$	$0.897^{+0.275}_{-0.092}$	$0.992^{+0.116}_{-0.127}$	$1.938^{+0.404}_{-1.031}$
	+3%/-3%	+1%/-5%	+375%/-375%	+31%/-10%	+12%/-13%	+21%/-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 008111622-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-161 \pm 17$	$17.80^{+2.88}_{-1.33}$	$1005^{+68}_{-50}$	$2415^{+48}_{-48}$	$3.937^{+0.790}_{-0.983}$
Alt.	$-61 \pm 21$	$17.17^{+2.92}_{-1.39}$	$1004^{+76}_{-49}$	$2153^{+88}_{-123}$	$1.549^{+0.688}_{-0.559}$

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

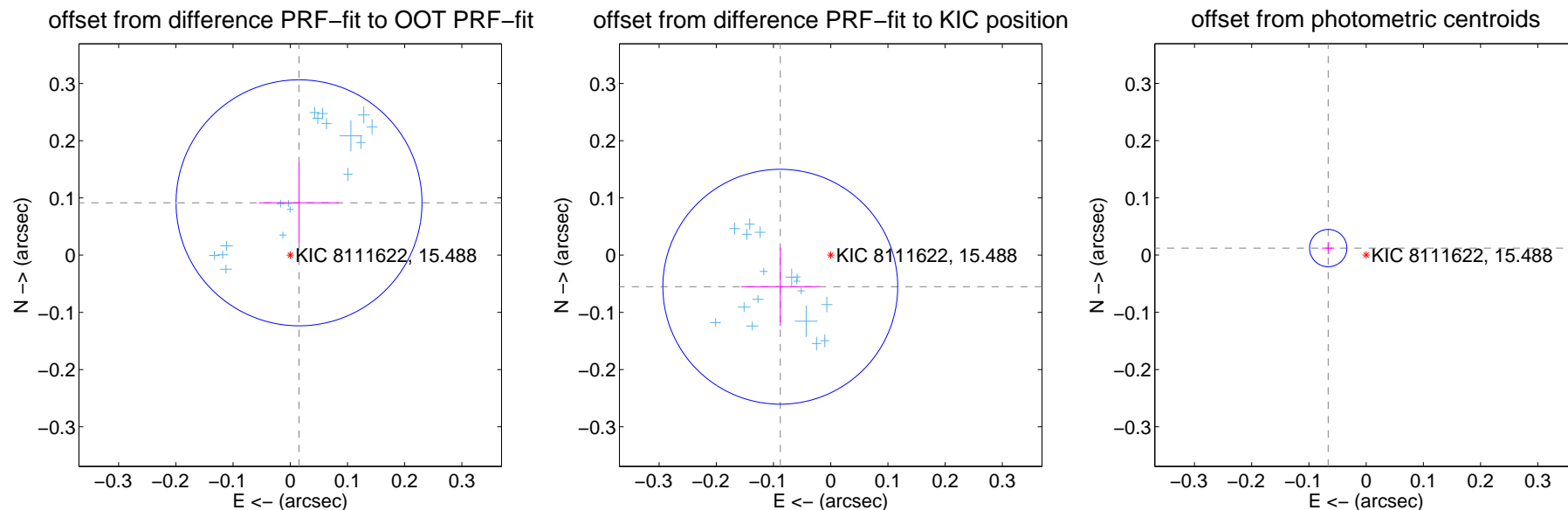
## DV Centroid Data

Supplemental centroid analysis for 008111622-02. Kepler magnitude: 15.49. Transit SNR 812.28

There are 17 quarters with good PRF difference image offsets

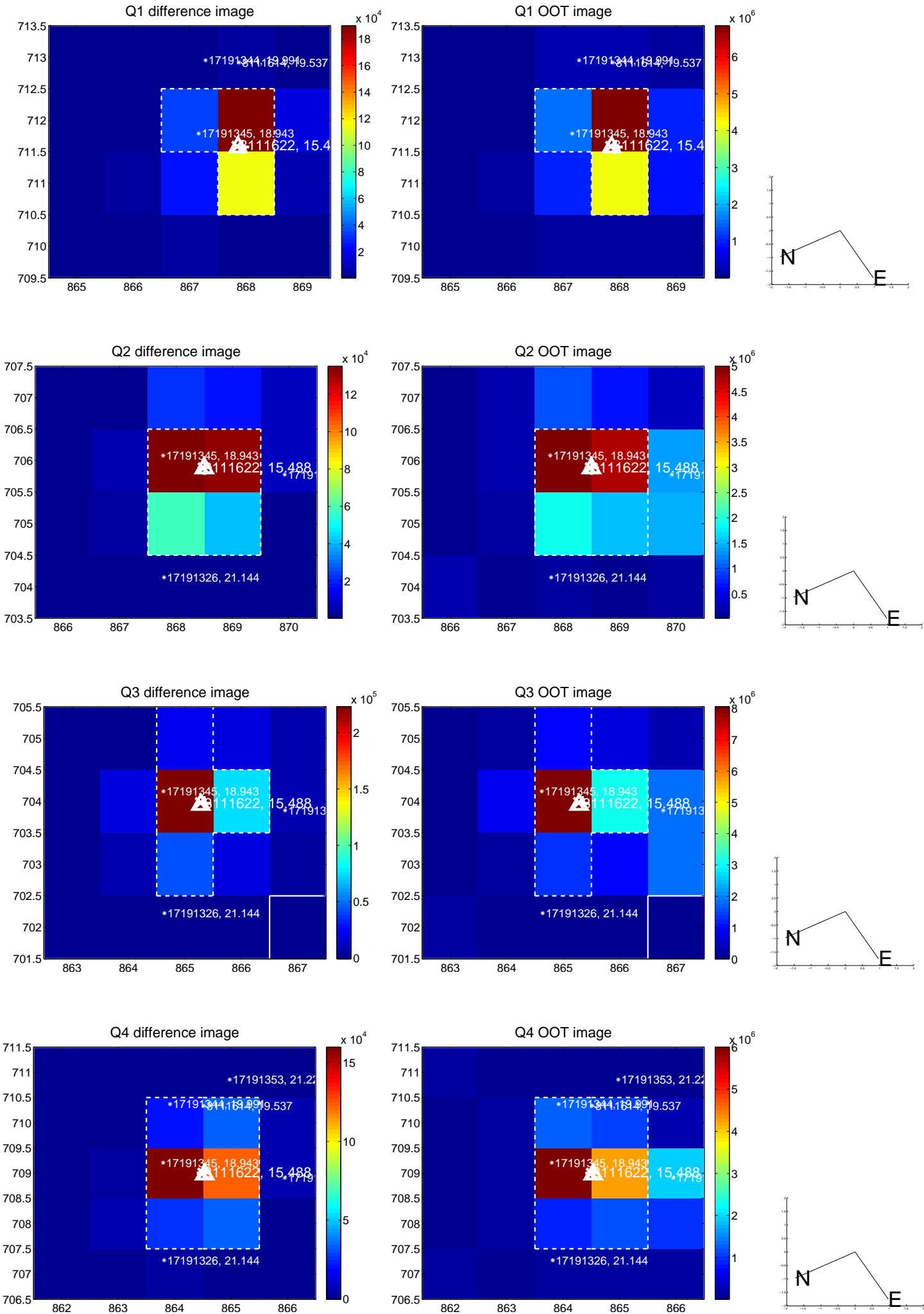
The direct PRF centroid is offset from the target star catalog position by about 0.36 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.093 \pm 0.072$	1.29	$-0.015 \pm 0.070$	$0.091 \pm 0.071$
PRF-fit source offset from KIC position	$0.104 \pm 0.068$	1.52	$0.088 \pm 0.068$	$-0.055 \pm 0.069$
photometric centroid source offset	$0.07 \pm 0.01$	6.20	$0.07 \pm 0.01$	$0.01 \pm 0.01$

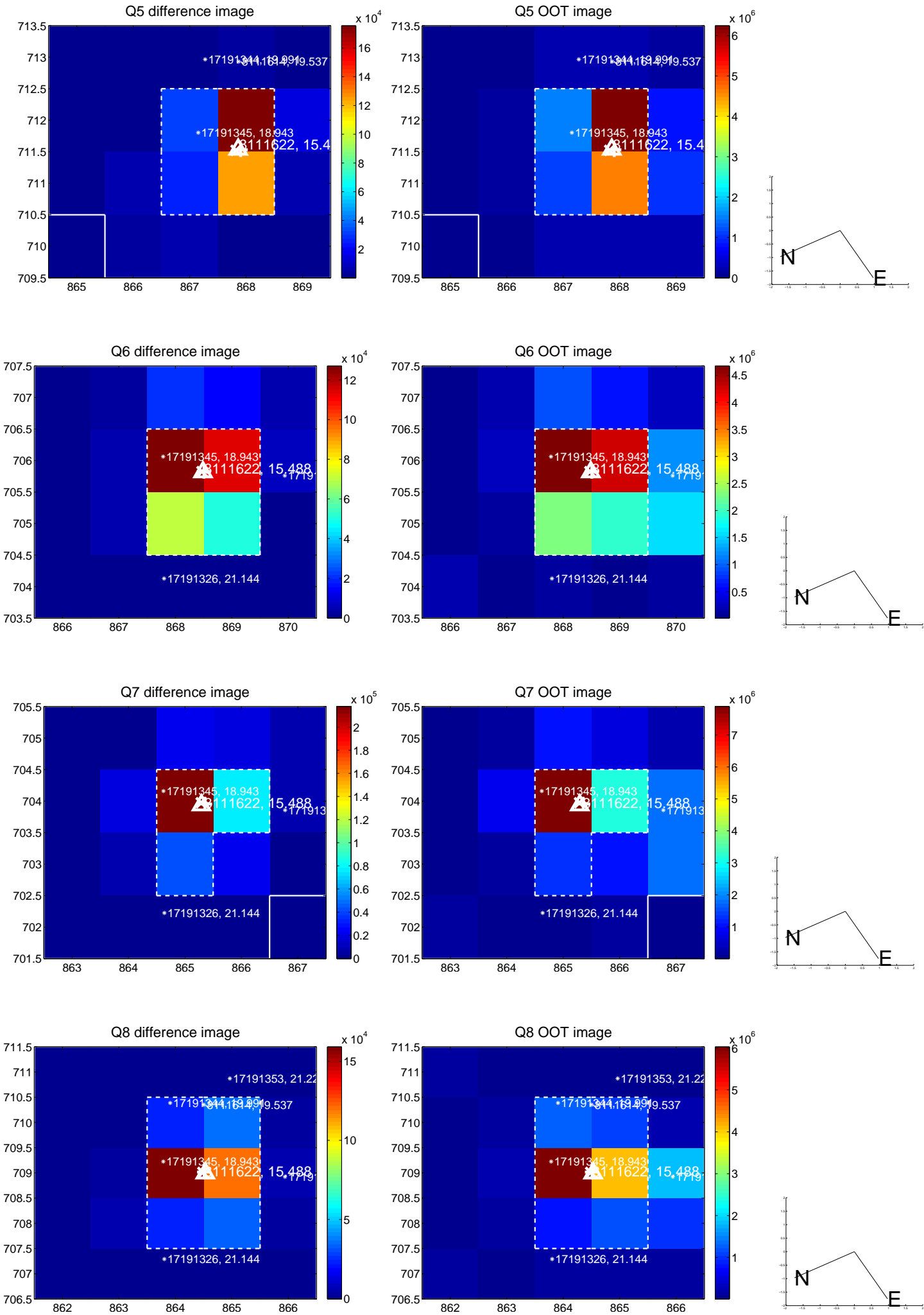


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

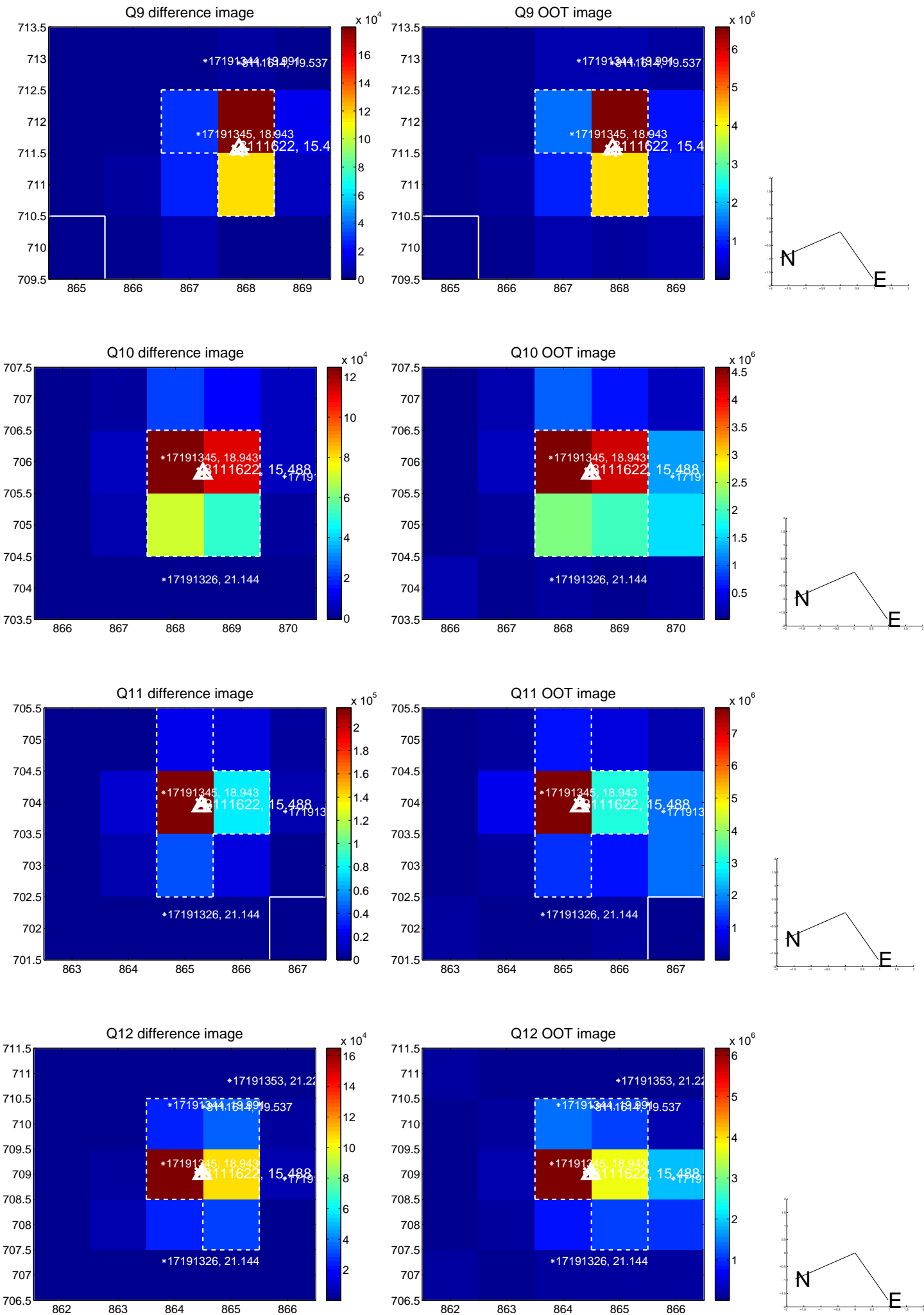


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

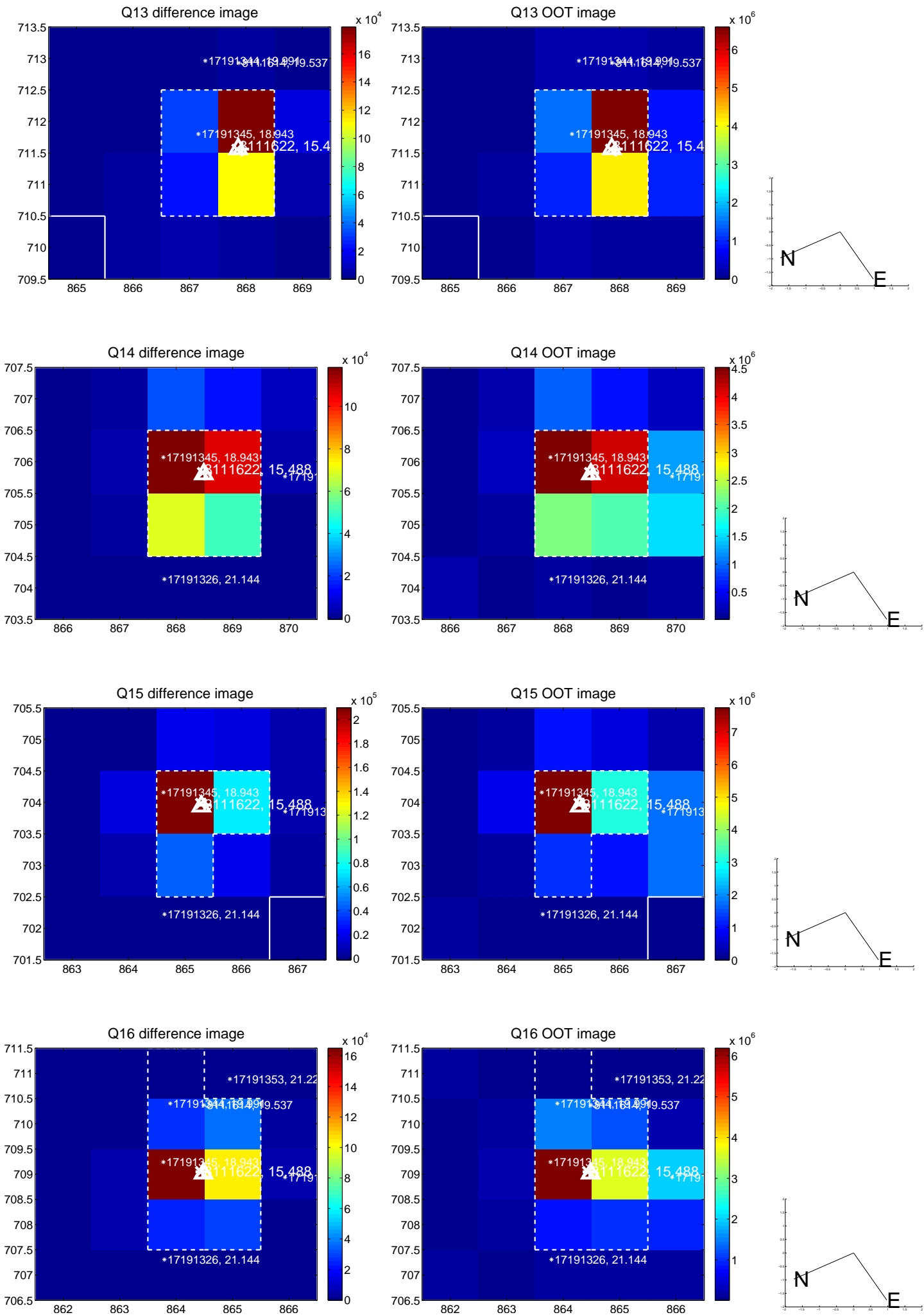




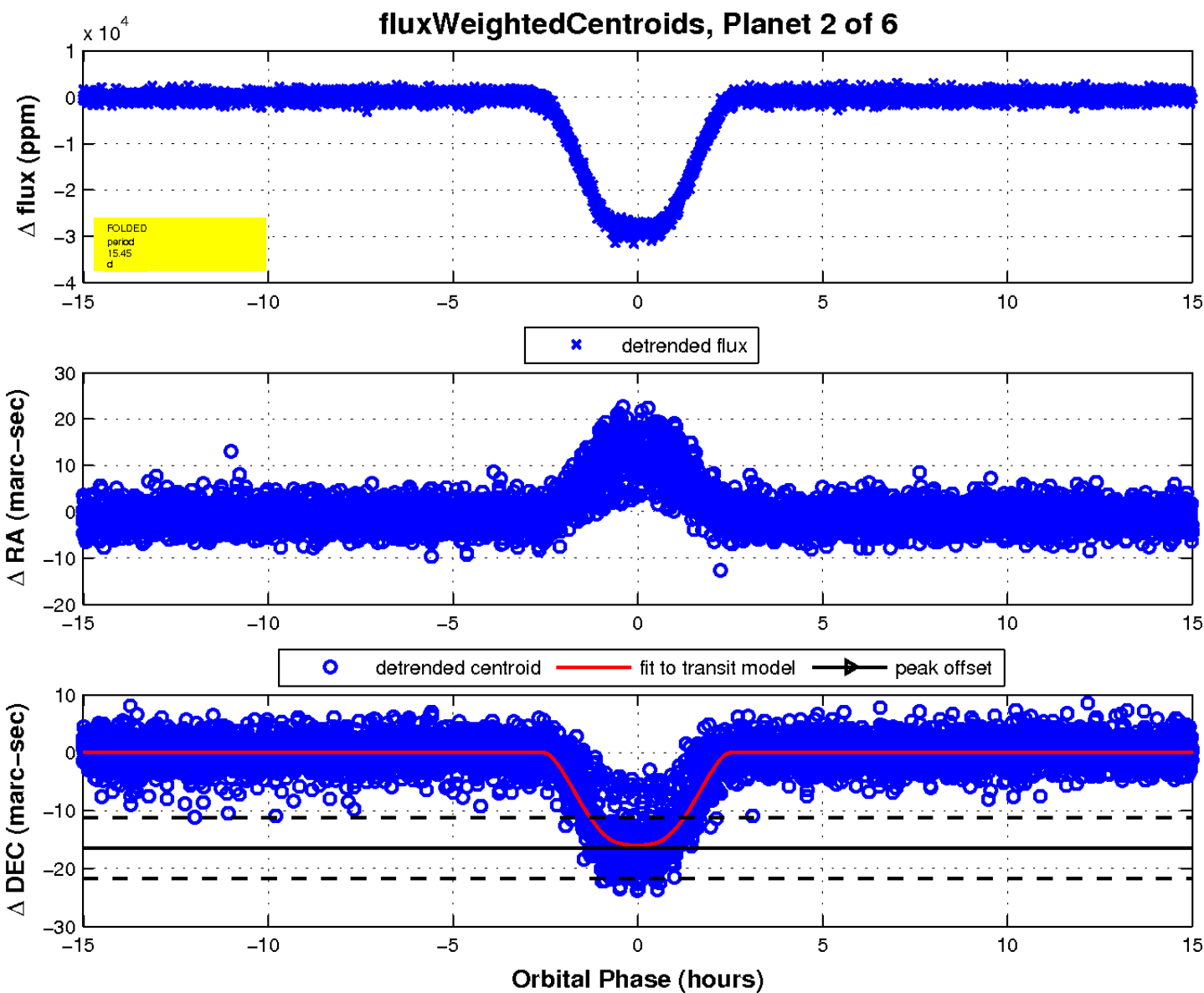
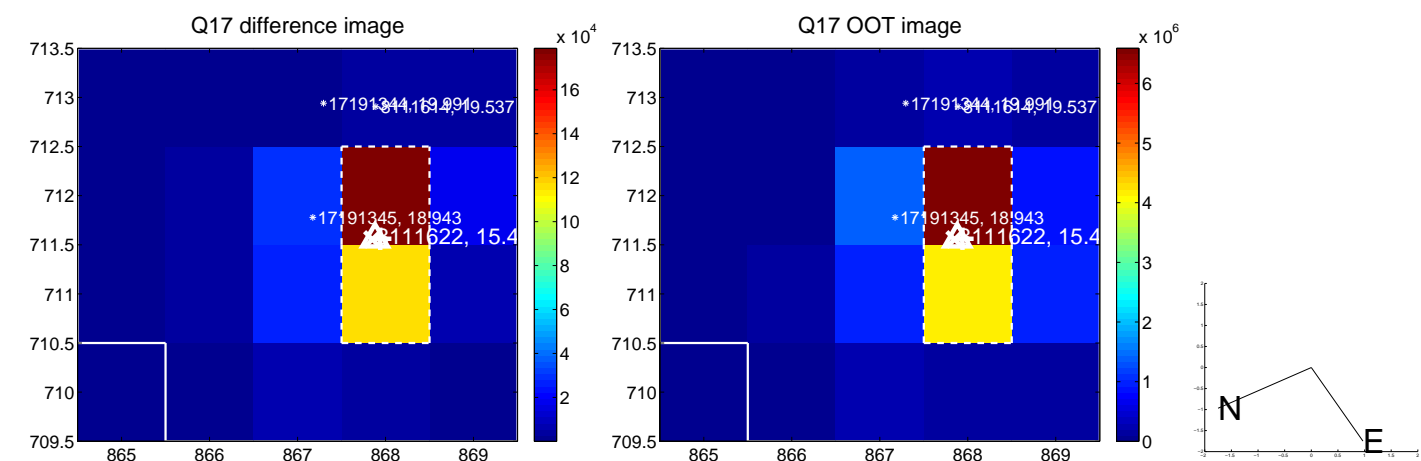
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

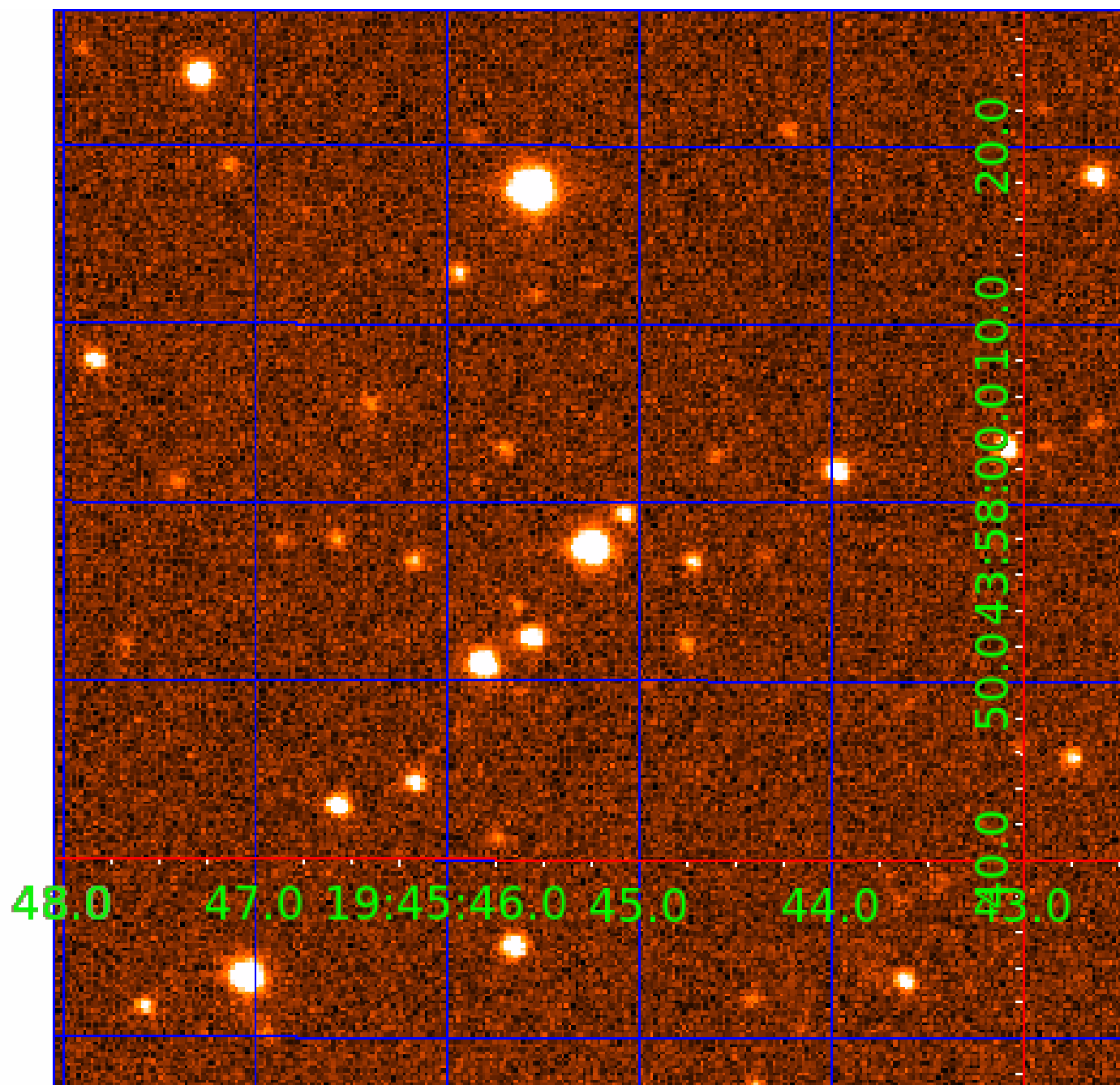


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 008111622

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008111622-01	OBS	6968.01	15.446109	145.532030	324454.7	3.000	9167.1	-1.0	0.90	5838	48.00	57.11
008111622-02	OBS	No	15.446063	132.921345	29042.2	5.005	846.3	812.3	0.90	5838	17.19	57.11
008111622-03	OBS	No	5.148862	135.568763	3.3	3.190	629.2	0.1	0.90	5838	0.19	247.09
008111622-04	OBS	No	5.148855	134.984699	17281.8	15.000	626.6	-1.0	0.90	5838	11.71	247.09
008111622-05	OBS	No	339.756480	146.339456	1522.1	6.611	11.1	7.4	0.90	5838	4.73	0.93
008111622-06	OBS	No	192.159982	310.742053	987.2	10.488	12.9	6.6	0.90	5838	2.94	1.98

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008111622-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_ALT—HAS_SEC_TCE—CENT_NOFITS
008111622-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
008111622-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD—CENT_FEW_MEAS
008111622-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—RESIDUAL_TCE—CENT_NOFITS
008111622-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
008111622-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—INCONSISTENT_TRANS

**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 008111622-03

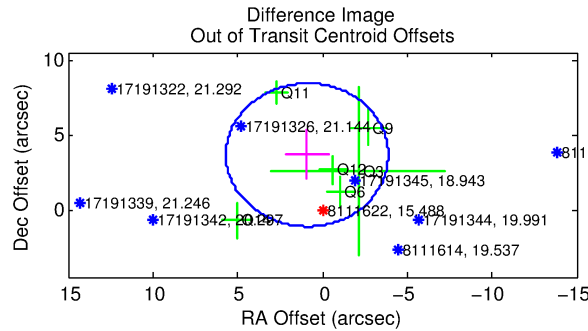
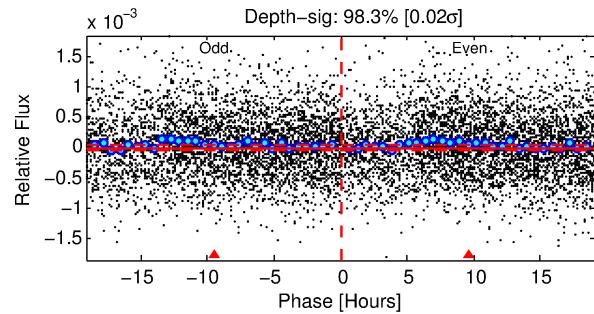
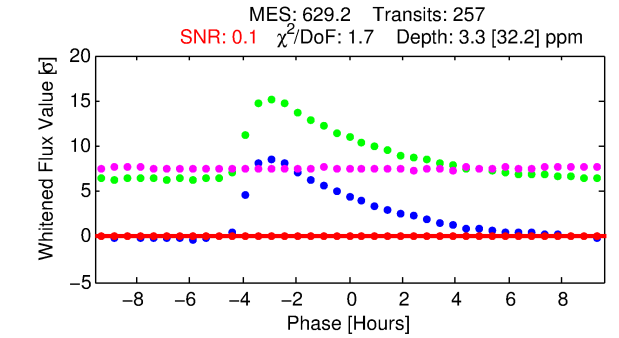
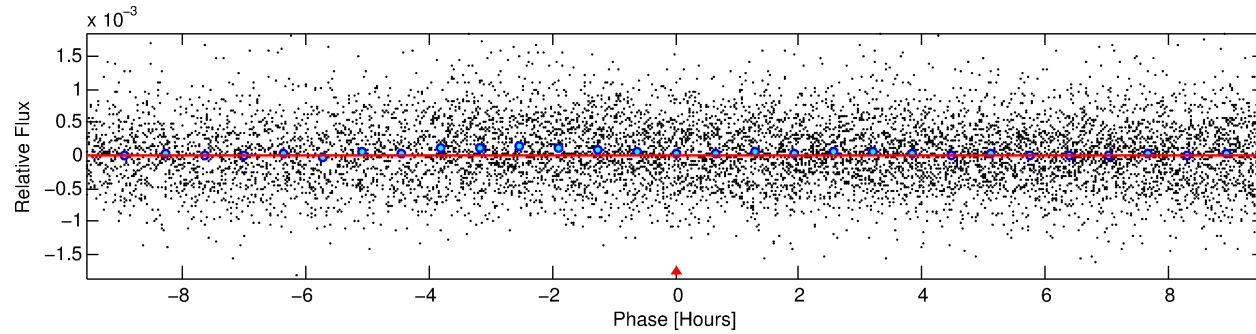
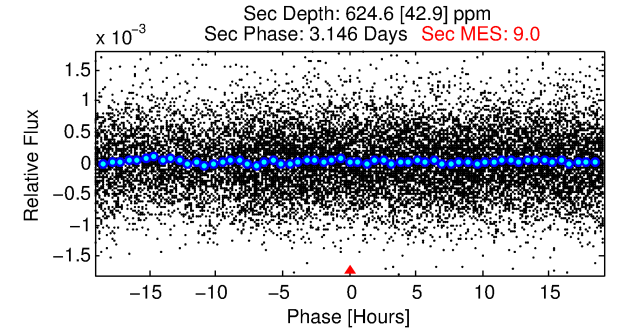
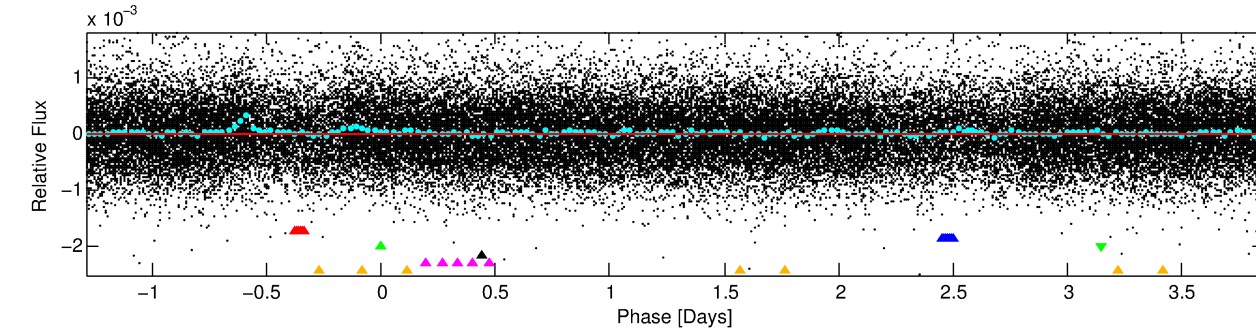
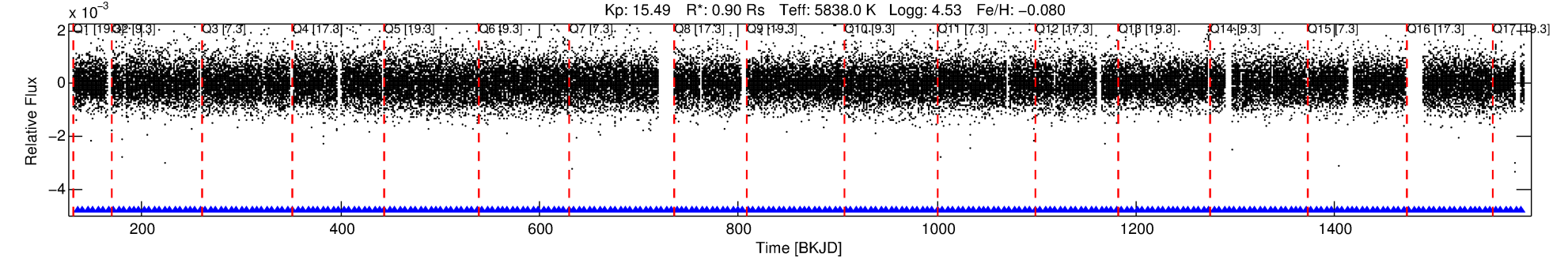
No Significant Match Found

# DV One-Page Summary

KIC: 8111622 Candidate: 3 of 6 Period: 5.149 d

KOI: K06968 Corr: No Ephemeris Match

Kp: 15.49 R\*: 0.90 Rs Teff: 5838.0 K Logg: 4.53 Fe/H: -0.080



## DV Fit Results:

Period = 5.14886 [0.00306] d  
Epoch = 135.5688 [0.4225] BKJD  
Rp/R\* = 0.0019 [0.0150]  
a/R\* = 6.06 [173.43]  
b = 0.88 [7.85]  
Seff = 247.09 [100.37]  
Teff = 1011 [103] K  
Rp = 0.19 [1.47] Re  
a = 0.0582 [0.0152] AU  
Ag = 32862.84 [512356.19] [0.06σ]  
Teffp = 21045 [82008] K [0.24σ]

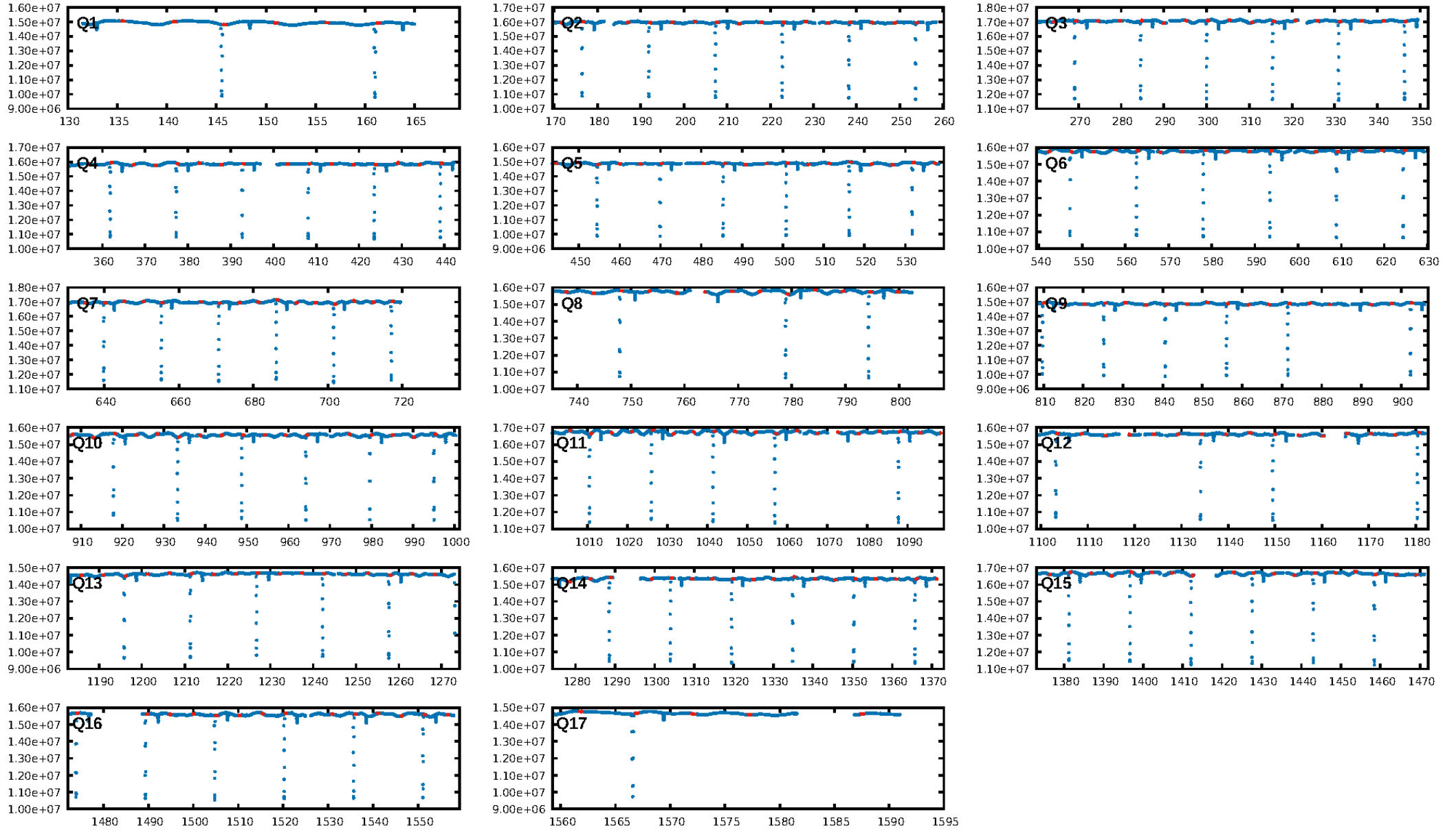
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: 100.0% [41.64σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [246/246]  
GhostDiagnostic-chr: N/A  
Centroid-sig: N/A  
Centroid-so: N/A  
OotOffset-rm: 3.758 arcsec [2.36σ]  
KicOffset-rm: 3.554 arcsec [2.28σ]  
OotOffset-st: 2/2/1/1 [6]  
KicOffset-st: 2/2/1/1 [6]  
DiffImageQuality-fgm: 0.17 [1/6]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 14:41:17 Z

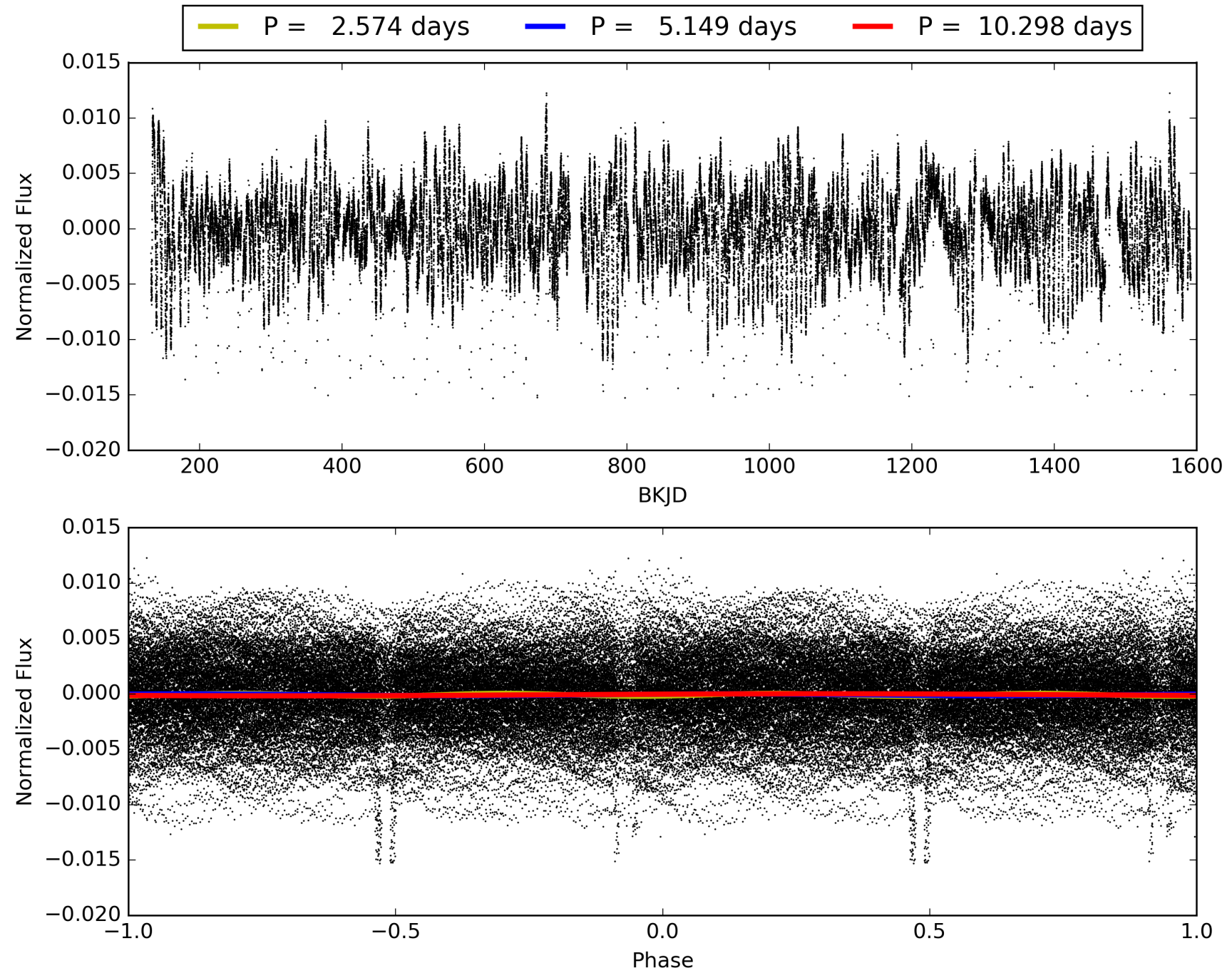
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008111622-03, PDC Light Curves





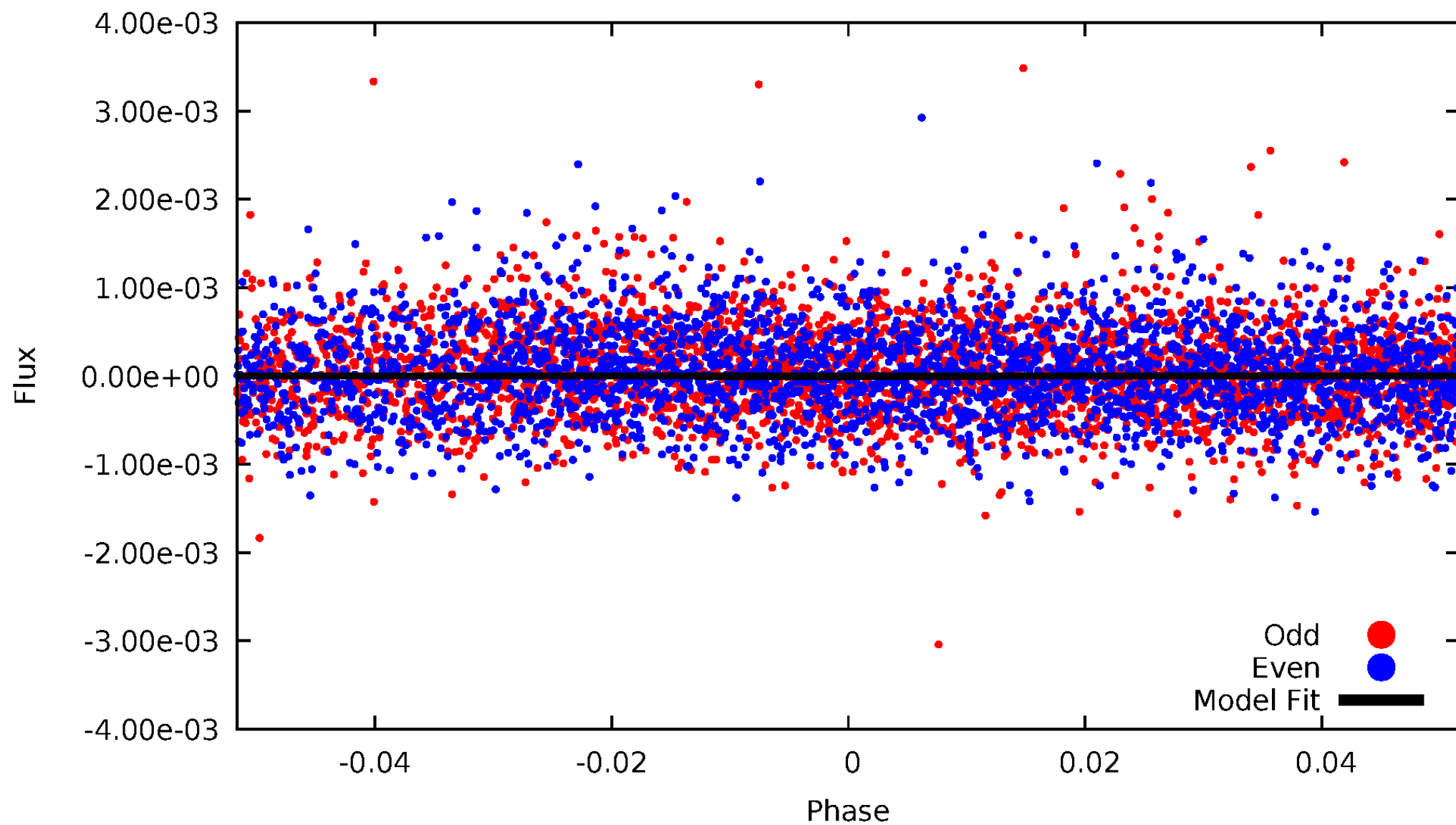
# TCE 008111622-03





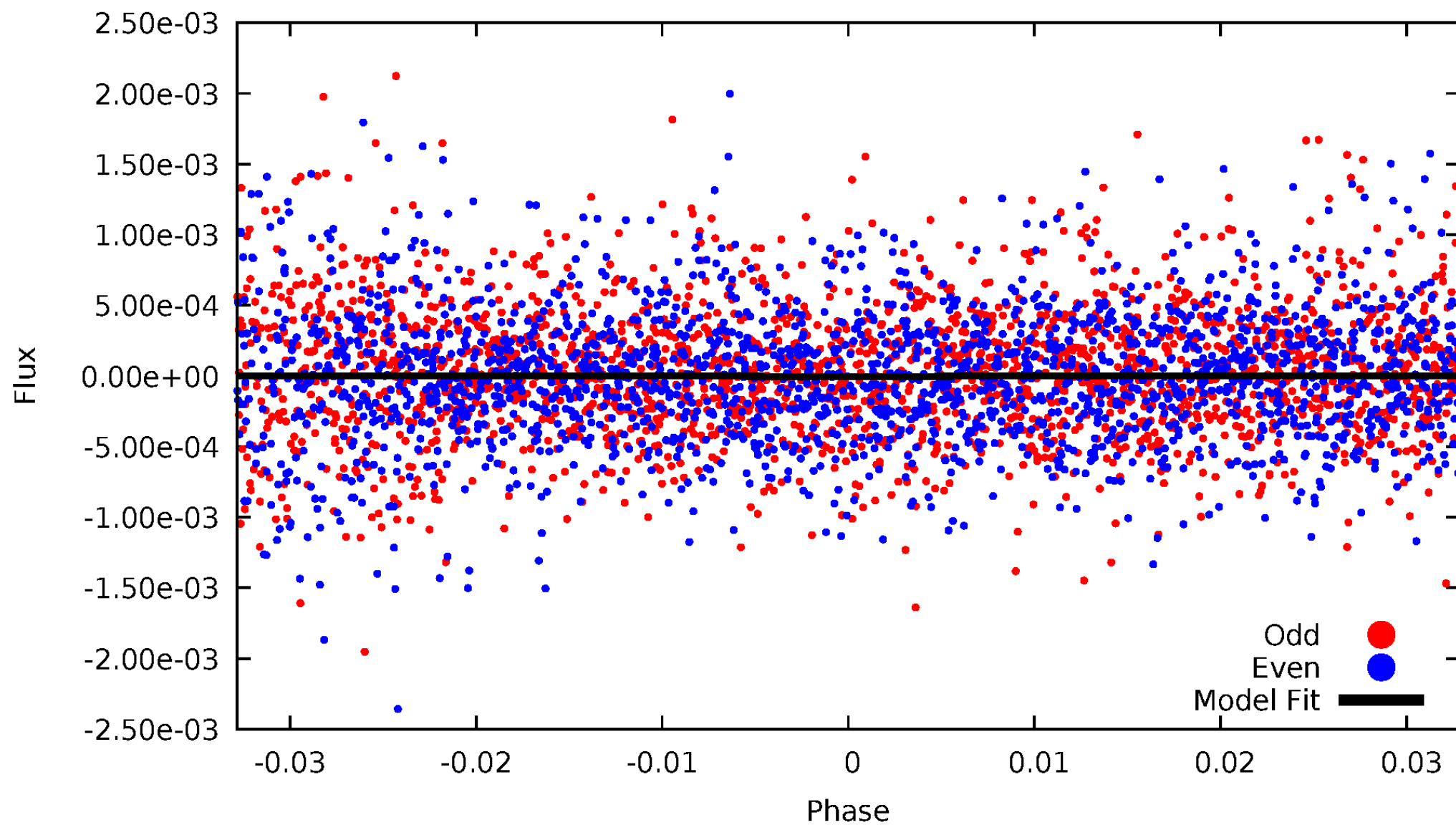
# DV Odd/Even

TCE 008111622-03



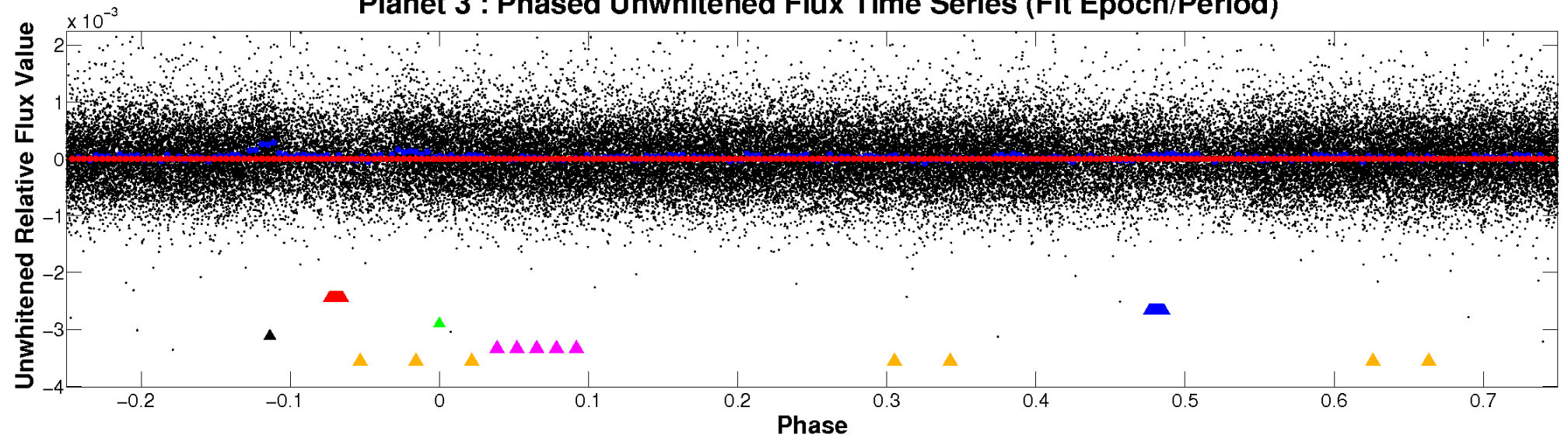
# ALT Odd/Even

TCE 008111622-03

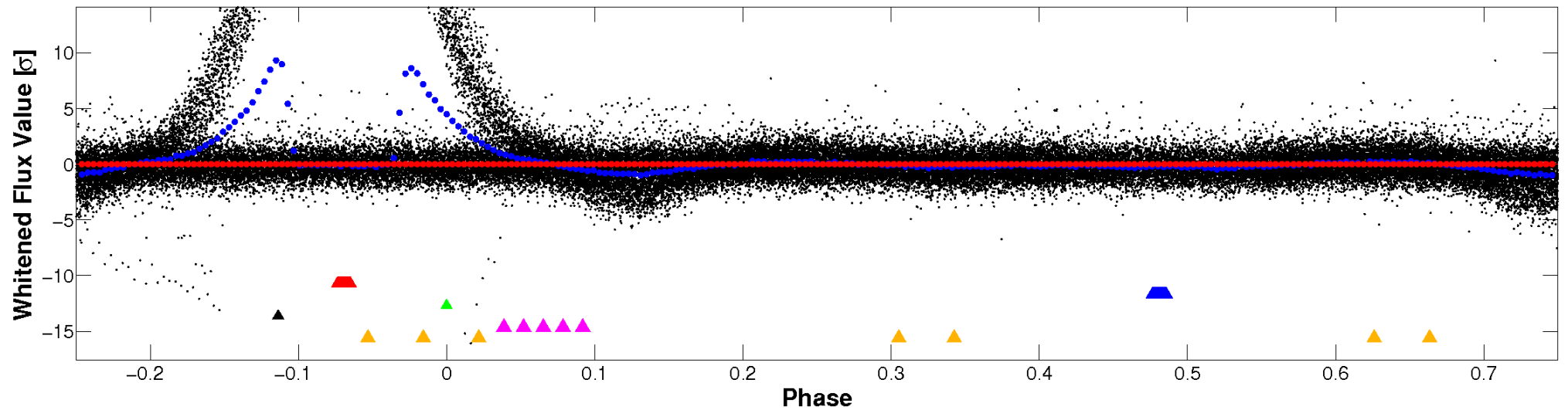


# Non-Whitened Vs. Whitened Light Curve

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

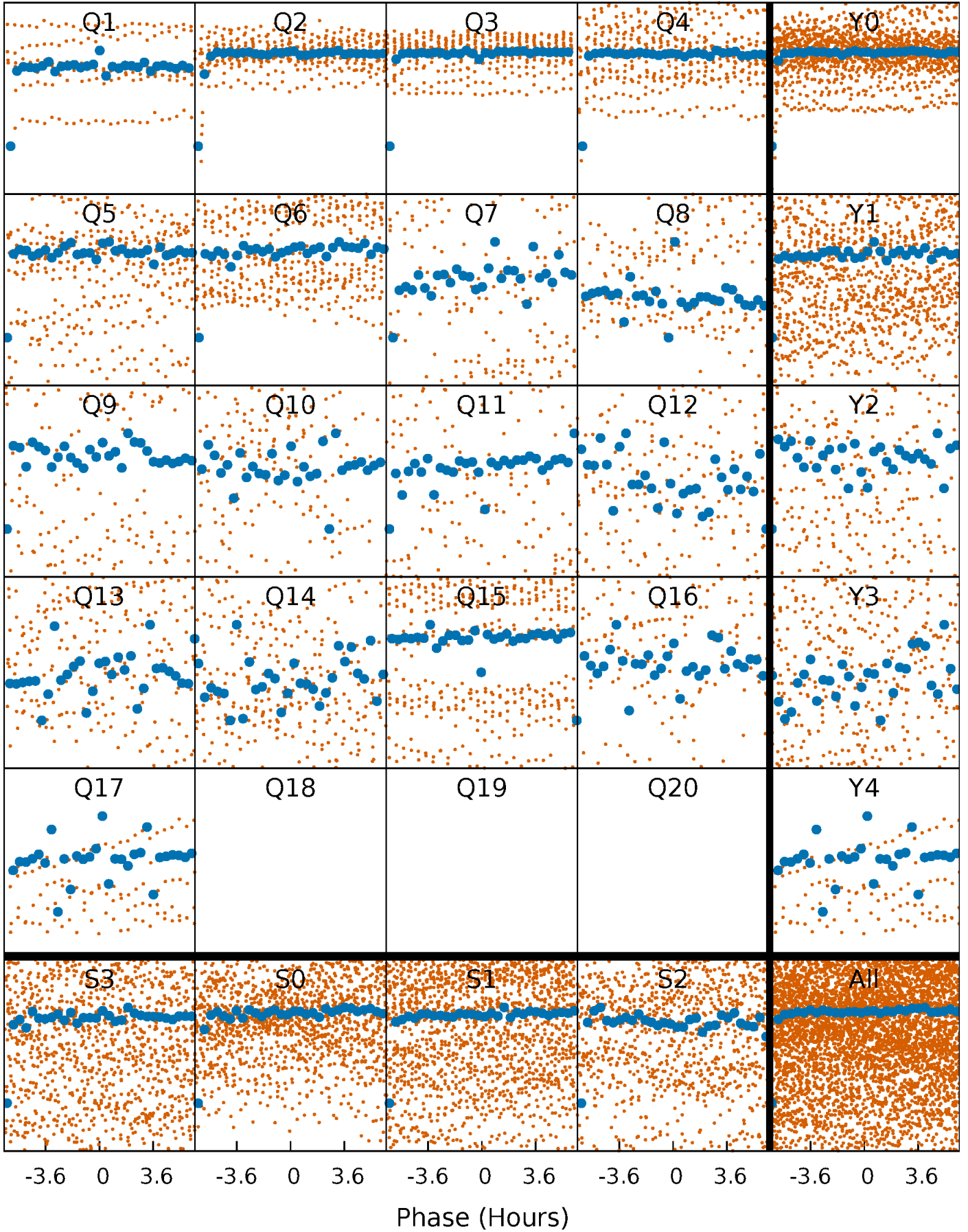


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



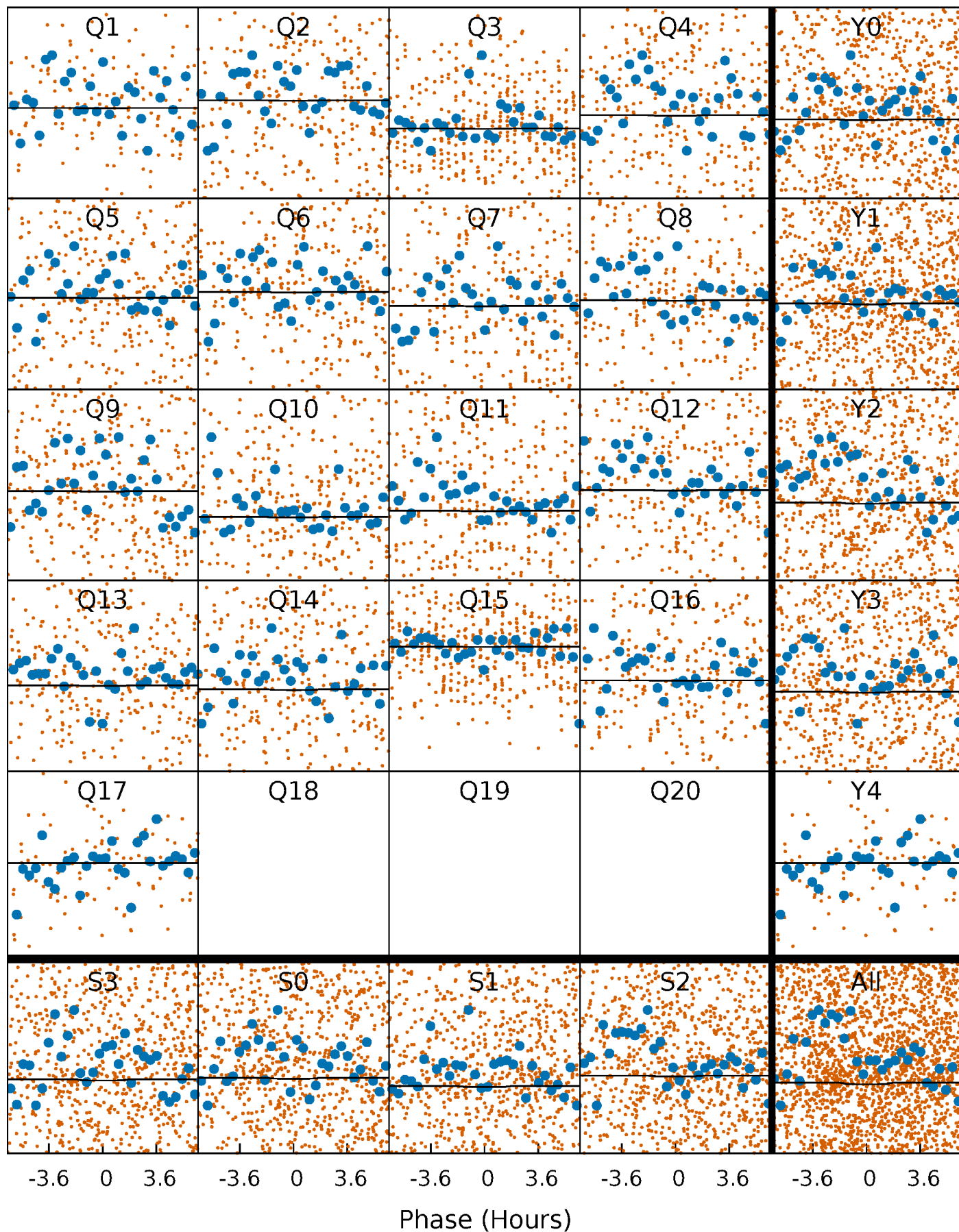
# PDC Quarter-Phased Transit Curves

TCE 008111622-03 P= 5.148862 Days  $T_0=135.568763$  (BKJD)



# DV Quarter-Phased Transit Curves

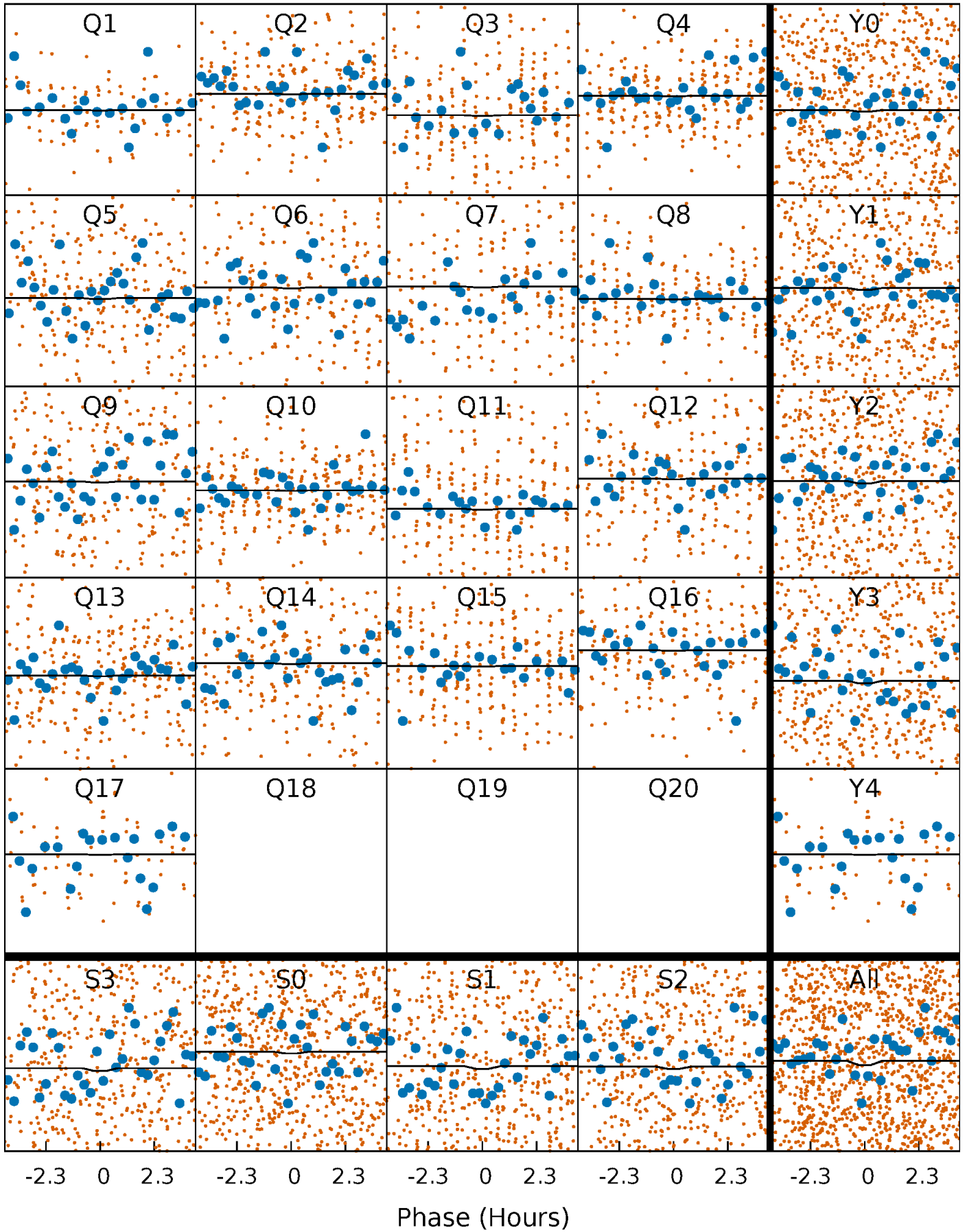
TCE 008111622-03 P= 5.148862 Days  $T_0=135.568763$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

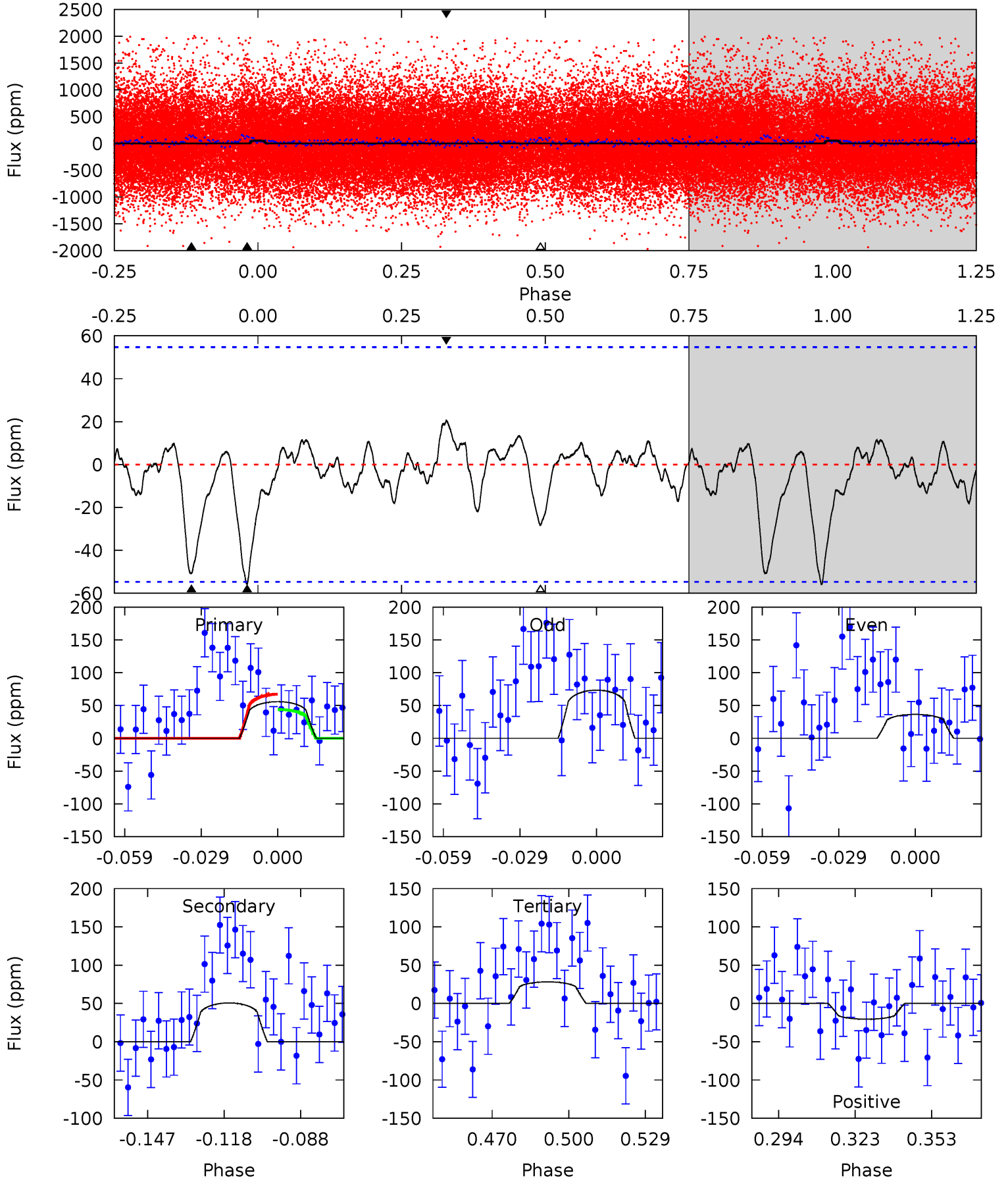
TCE 008111622-03 P= 5.148855 Days  $T_0=135.563330$  (BKJD)



# DV Model-Shift Uniqueness Test

008111622-03, P = 5.148862 Days, E = 130.419901 Days

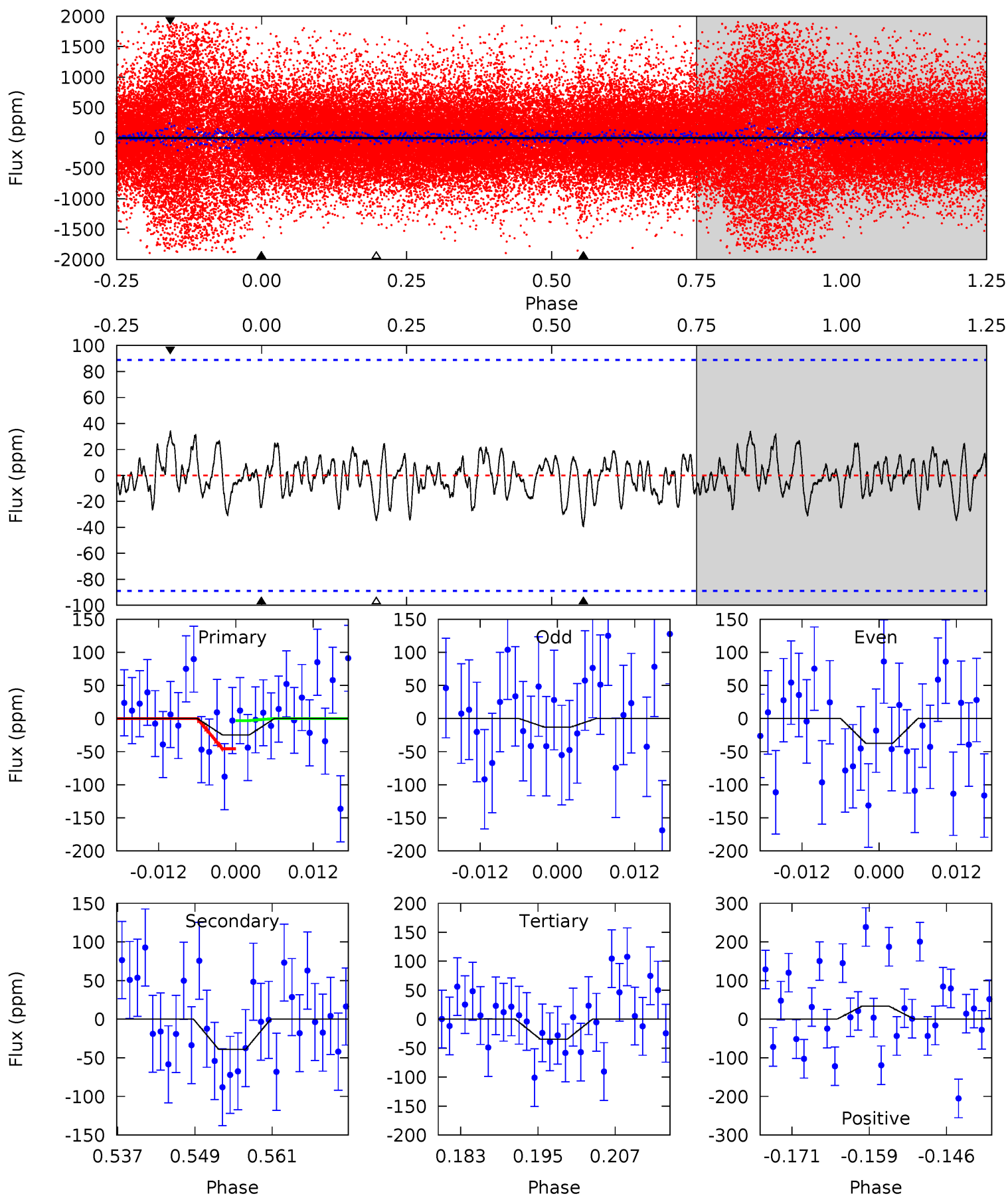
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.91	4.46	2.48	1.81	4.82	2.18	0.75	2.43	3.10	1.98	2.65	1.63	0.89	0.27	1.03



# Alt Model-Shift Uniqueness Test

008111622-03, P = 5.148855 Days, E = 130.414475 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
1.39	2.20	1.95	1.90	4.99	2.51	0.71	-0.56	-0.51	0.25	0.29	0.70	13.0	0.46	1.19





### Stellar Parameters For KIC 008111622

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5838^{+157}_{-192}$	$4.529^{+0.038}_{-0.212}$	$-0.080^{+0.300}_{-0.300}$	$0.897^{+0.275}_{-0.092}$	$0.992^{+0.116}_{-0.127}$	$1.938^{+0.404}_{-1.031}$
	+3%/-3%	+1%/-5%	+375%/-375%	+31%/-10%	+12%/-13%	+21%/-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 008111622-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-51 \pm 11$	$1.08^{+1.19}_{-0.76}$	$1456^{+103}_{-75}$	$4919^{+4509}_{-1226}$	$78^{+816}_{-62}$
Alt.	$-39 \pm 18$	$1.19^{+1.17}_{-0.82}$	$1452^{+89}_{-69}$	$4386^{+3332}_{-1019}$	$44^{+433}_{-34}$

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

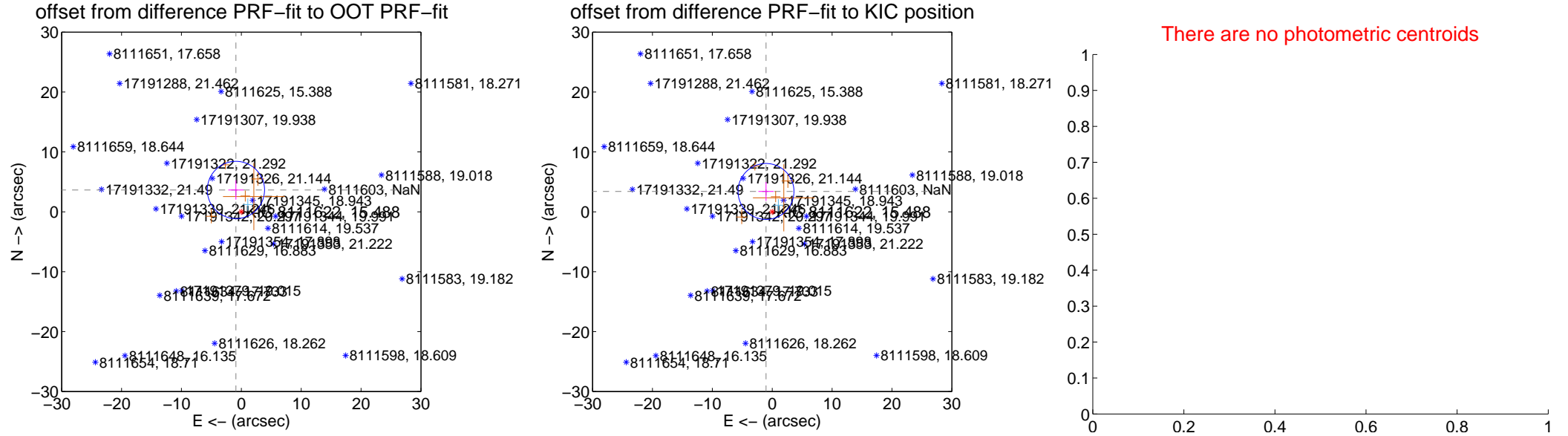
# DV Centroid Data

Supplemental centroid analysis for 008111622-03. Kepler magnitude: 15.49. Transit SNR 0.14

There are 1 quarters with good PRF difference image offsets

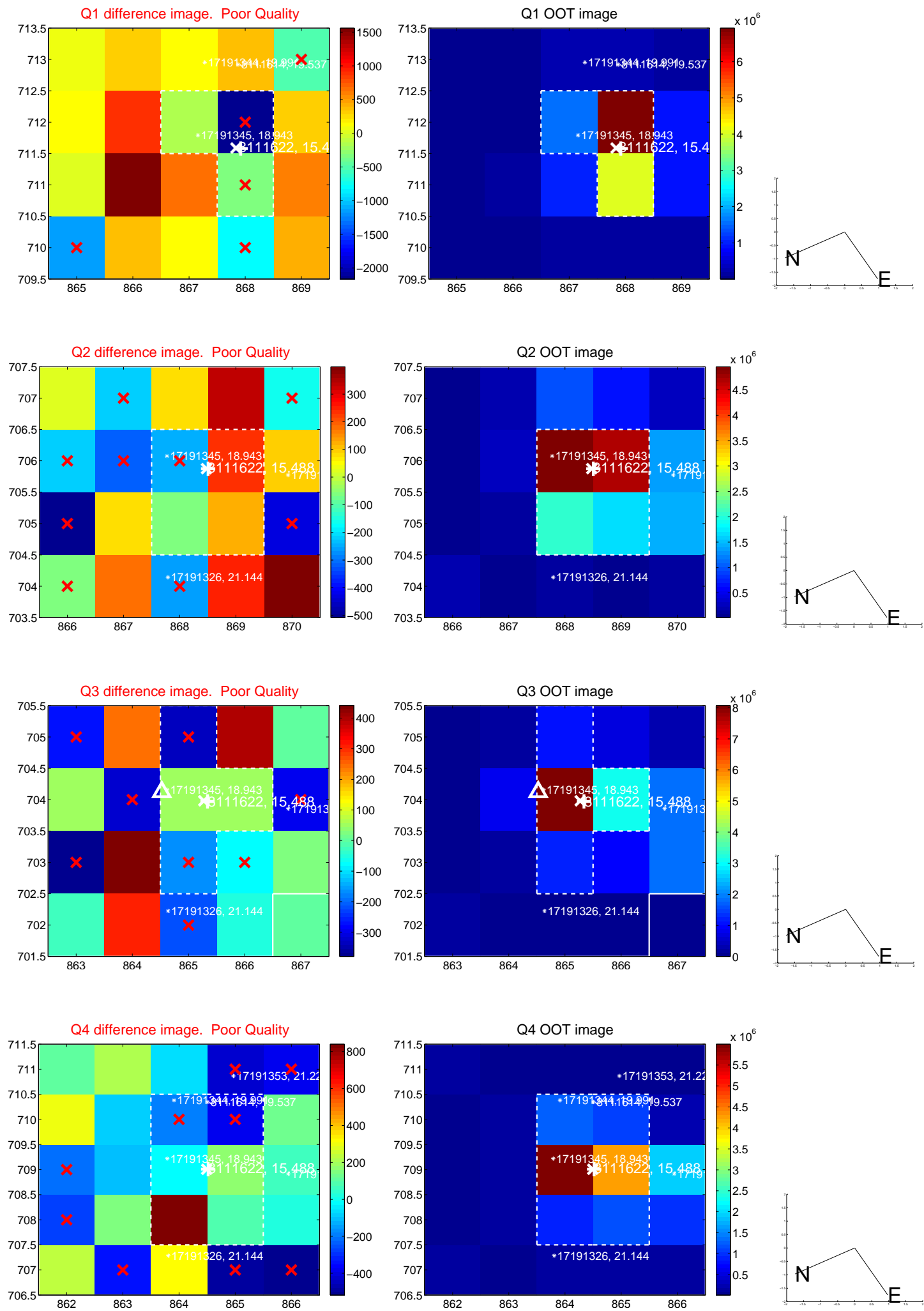
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.758 \pm 1.593$	2.36	$0.902 \pm 1.271$	$3.648 \pm 1.611$
PRF-fit source offset from KIC position	$3.554 \pm 1.556$	2.28	$1.036 \pm 1.278$	$3.399 \pm 1.580$
photometric centroid source offset	—	—	—	—

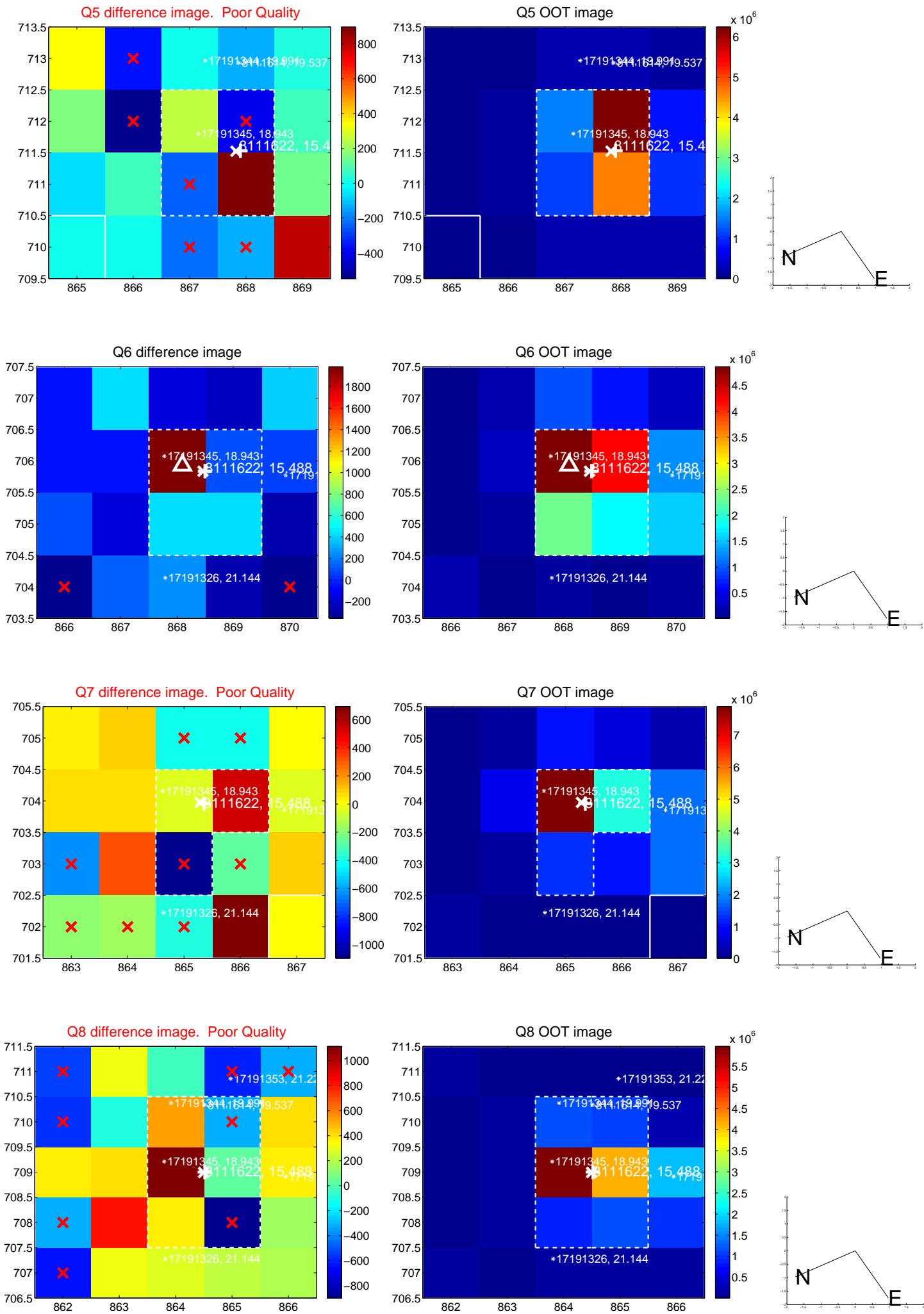


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

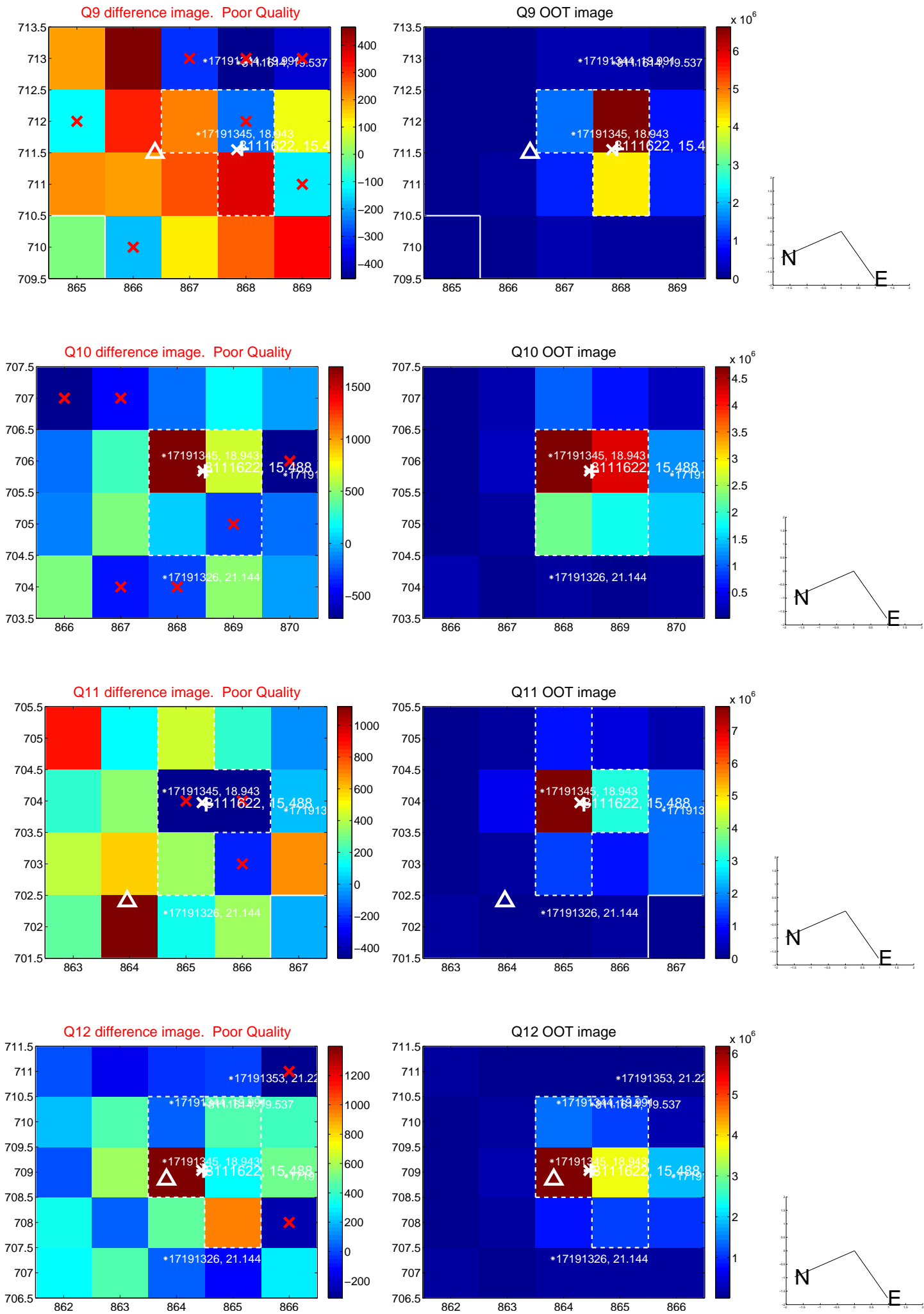
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



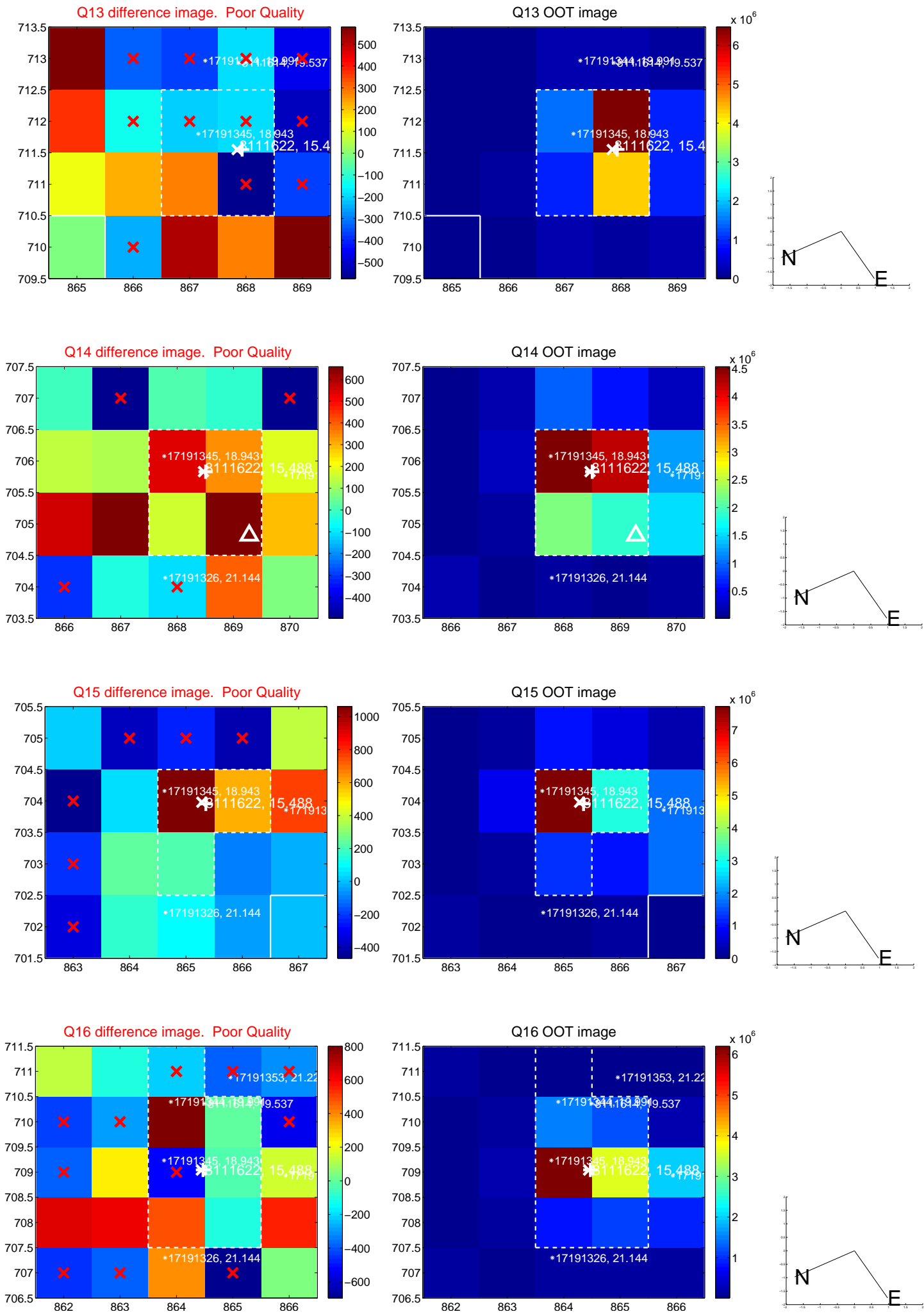
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



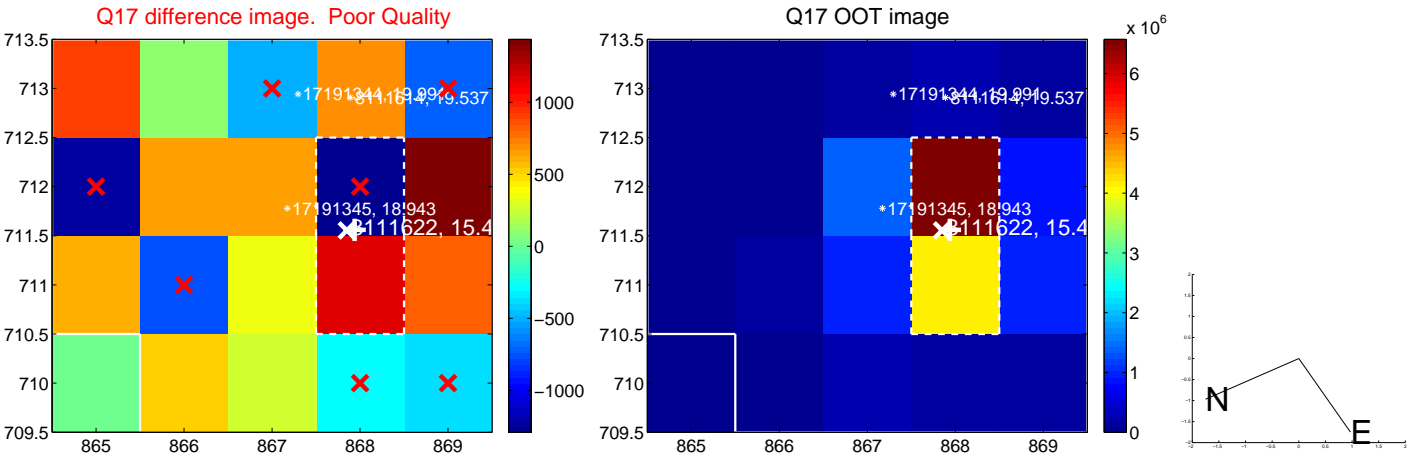
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

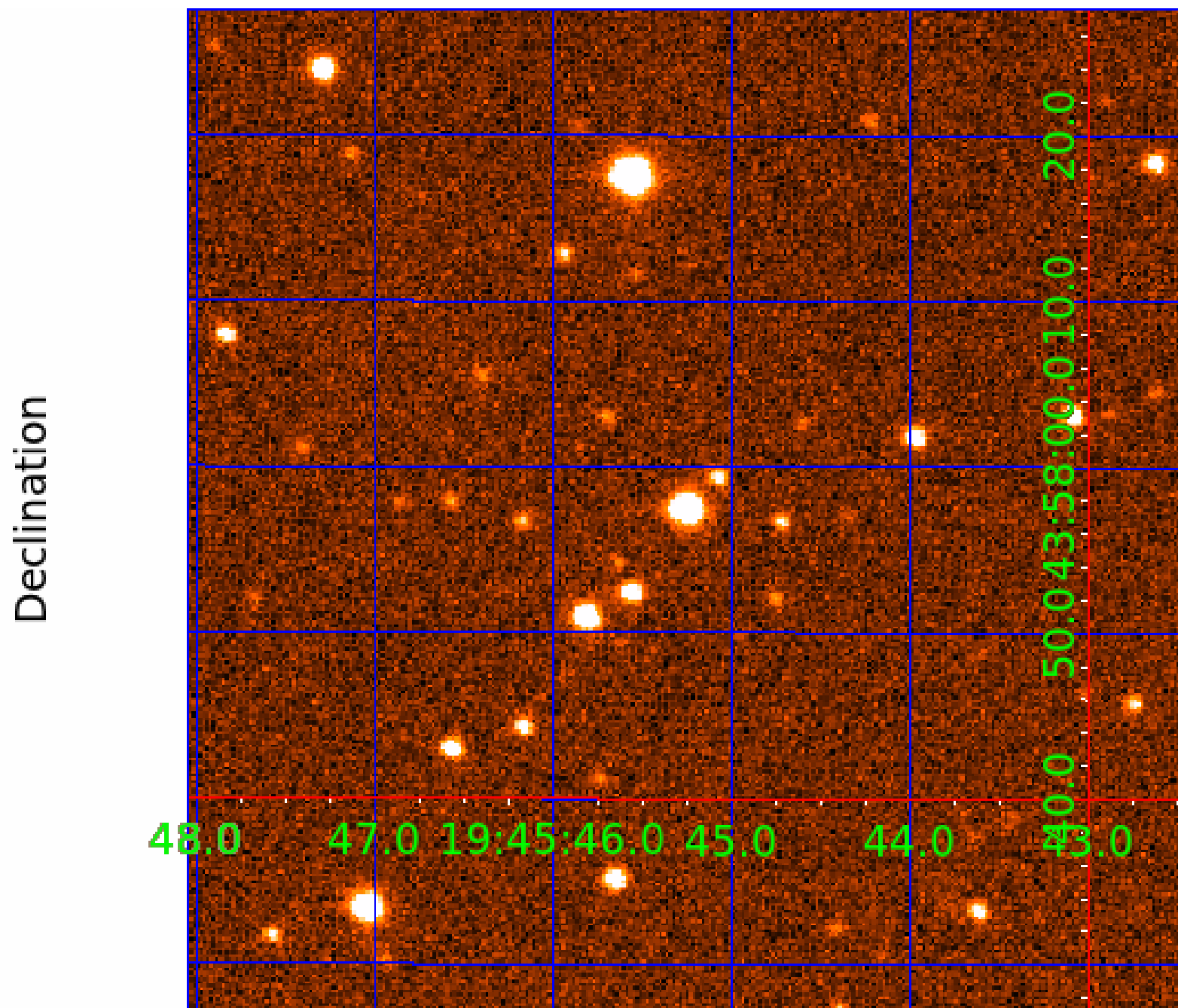


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



folded centroid time series figure for this object.

UKIRT Image





# KIC 008111622

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008111622-01	OBS	6968.01	15.446109	145.532030	324454.7	3.000	9167.1	-1.0	0.90	5838	48.00	57.11
008111622-02	OBS	No	15.446063	132.921345	29042.2	5.005	846.3	812.3	0.90	5838	17.19	57.11
008111622-03	OBS	No	5.148862	135.568763	3.3	3.190	629.2	0.1	0.90	5838	0.19	247.09
008111622-04	OBS	No	5.148855	134.984699	17281.8	15.000	626.6	-1.0	0.90	5838	11.71	247.09
008111622-05	OBS	No	339.756480	146.339456	1522.1	6.611	11.1	7.4	0.90	5838	4.73	0.93
008111622-06	OBS	No	192.159982	310.742053	987.2	10.488	12.9	6.6	0.90	5838	2.94	1.98

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008111622-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_ALT—HAS_SEC_TCE—CENT_NOFITS
008111622-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
008111622-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD—CENT_FEW_MEAS
008111622-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—RESIDUAL_TCE—CENT_NOFITS
008111622-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
008111622-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—INCONSISTENT_TRANS

**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 008111622-04

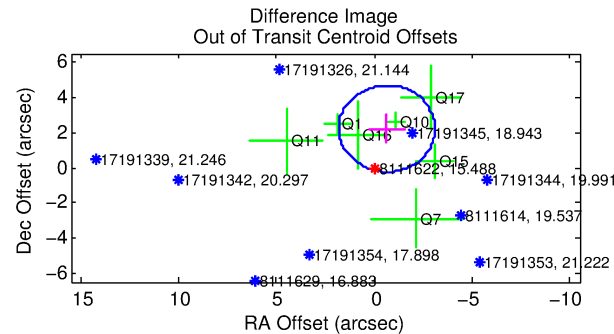
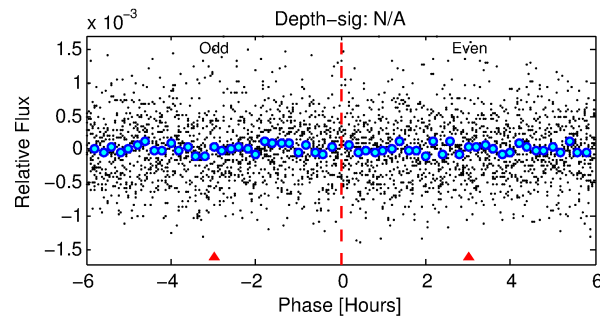
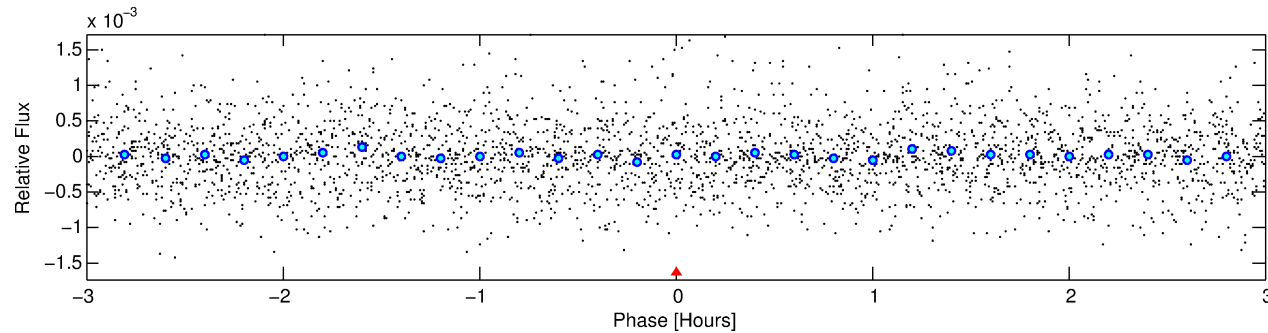
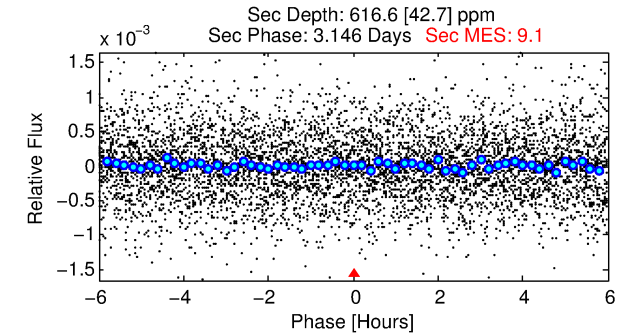
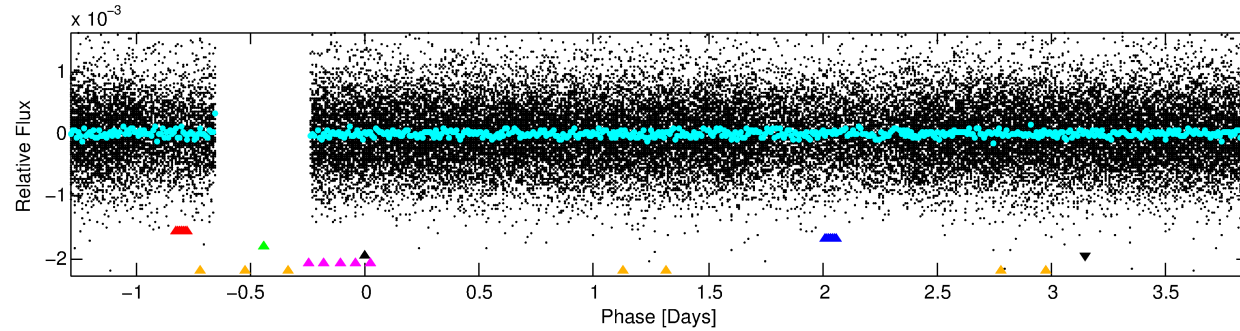
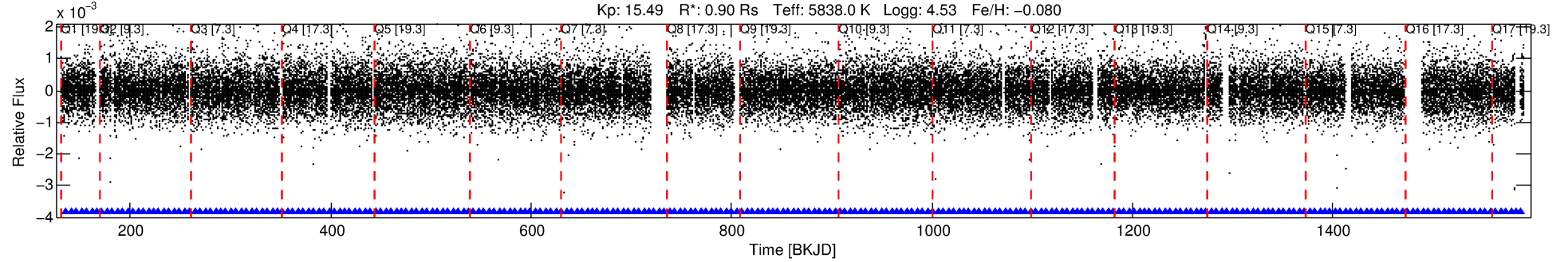
No Significant Match Found

# DV One-Page Summary

KIC: 8111622 Candidate: 4 of 6 Period: 5.149 d

KOI: K06968 Corr: No Ephemeris Match

Kp: 15.49 R\*: 0.90 Rs Teff: 5838.0 K Logg: 4.53 Fe/H: -0.080



## TPS TCE Results:

Period = 5.14886 d  
Epoch = 134.9847 BKJD

DV fit results are unavailable

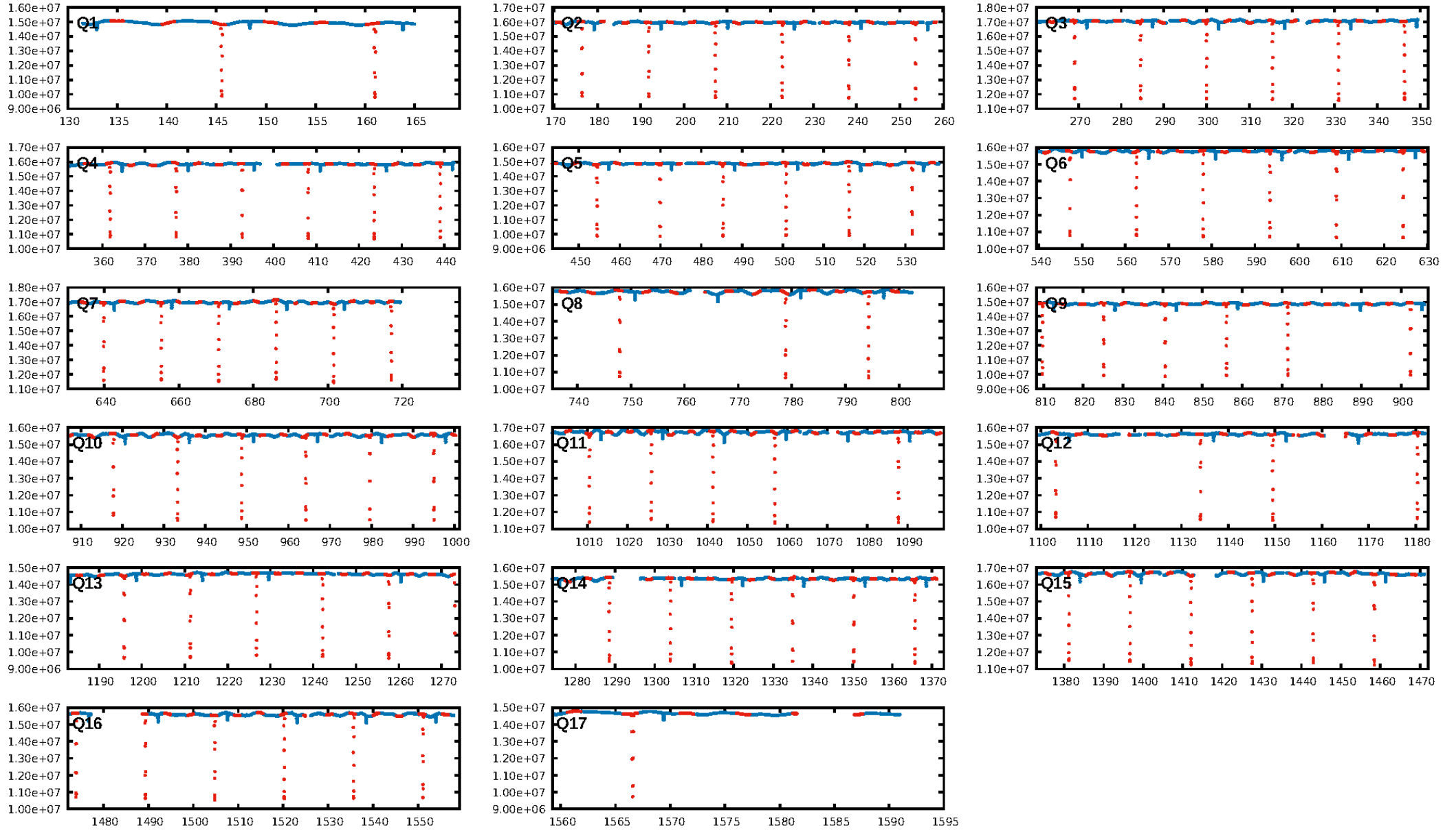
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [249/249]  
GhostDiagnostic-chr: 0.8334  
Centroid-sig: N/A  
Centroid-so: 84.703 arcsec [1.31σ]  
OotOffset-rm: 2.315 arcsec [2.82σ]  
KicOffset-rm: 2.092 arcsec [3.03σ]  
OotOffset-st: 1/3/1/2 [7]  
KicOffset-st: 1/3/1/2 [7]  
DiffImageQuality-fgm: 0.14 [1/7]  
DiffImageOverlap-fno: 1.00 [13/13]

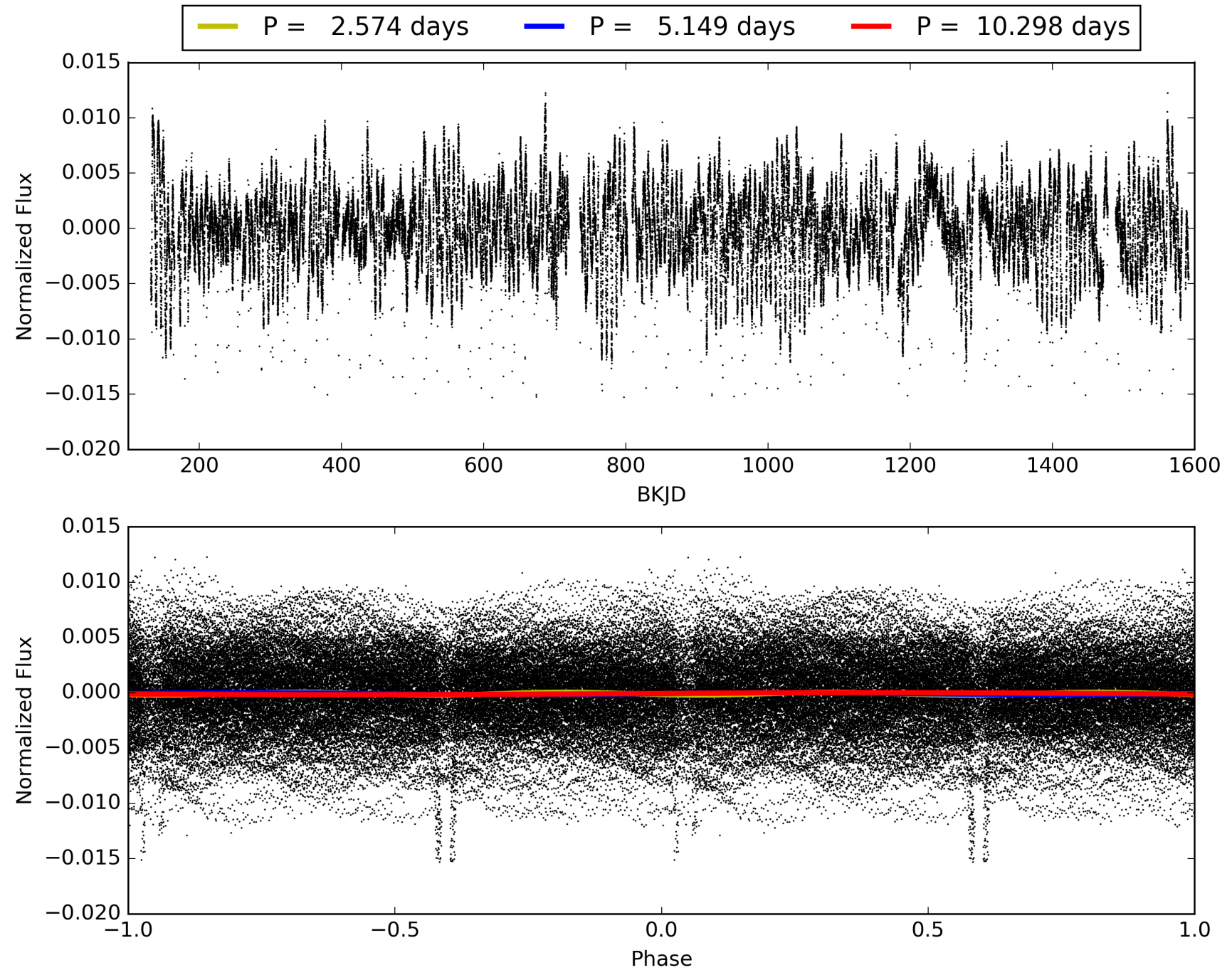
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 14:41:24 Z

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

# TCE 008111622-04, PDC Light Curves

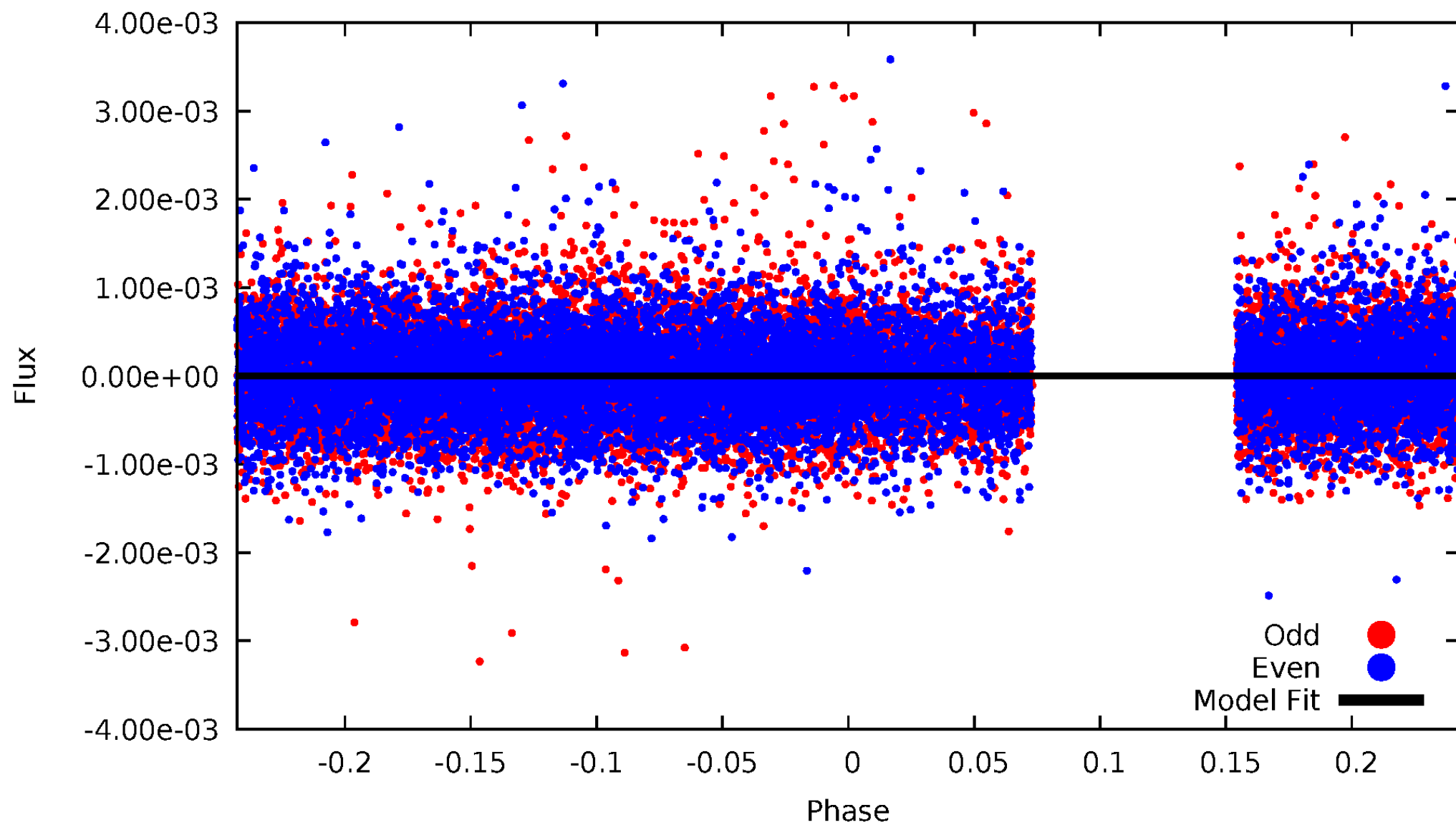


# TCE 008111622-04



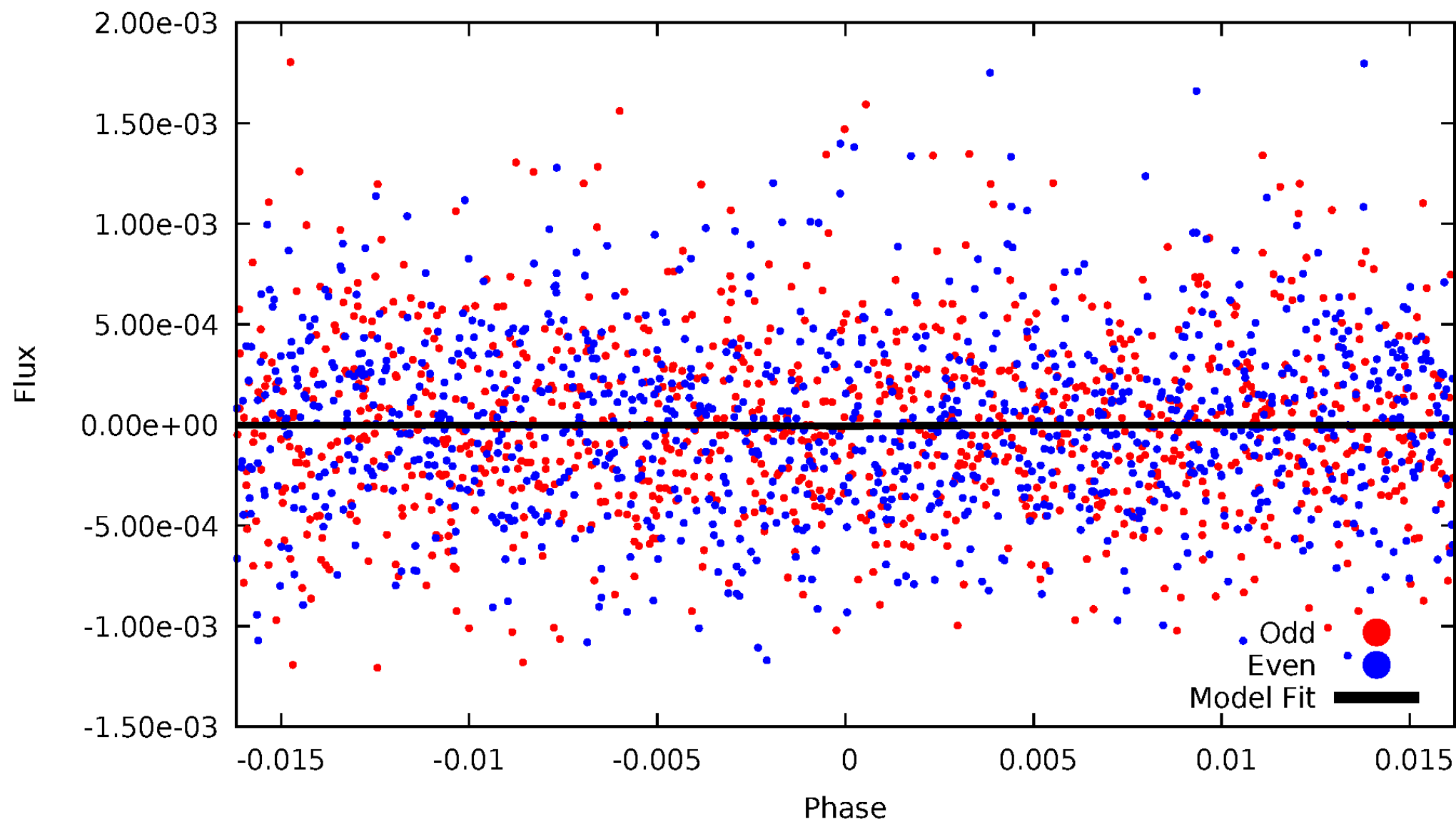
# DV Odd/Even

TCE 008111622-04



# ALT Odd/Even

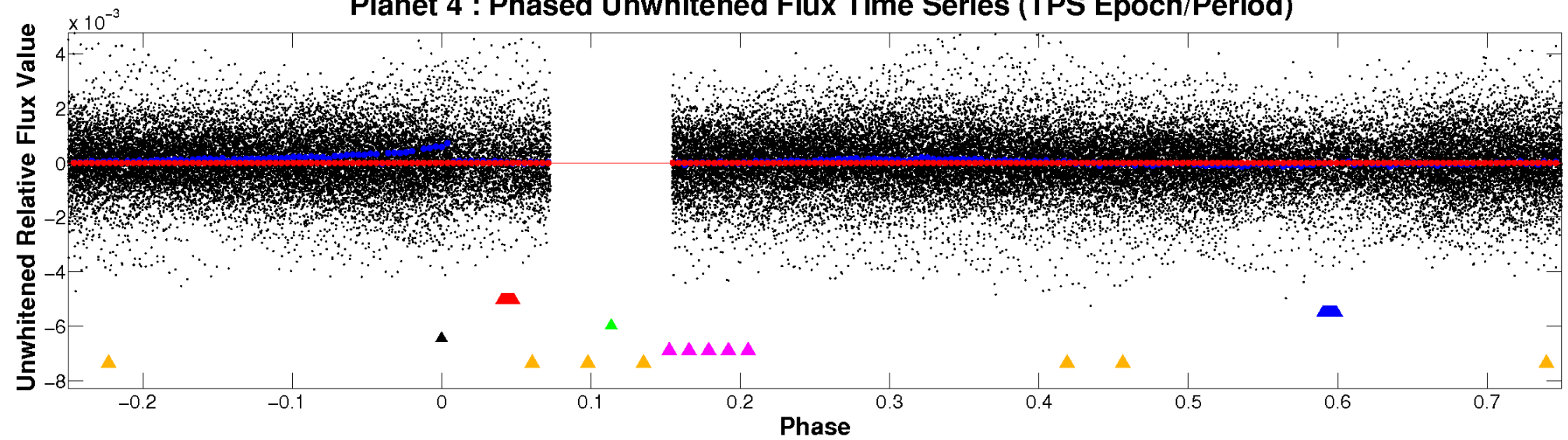
TCE 008111622-04



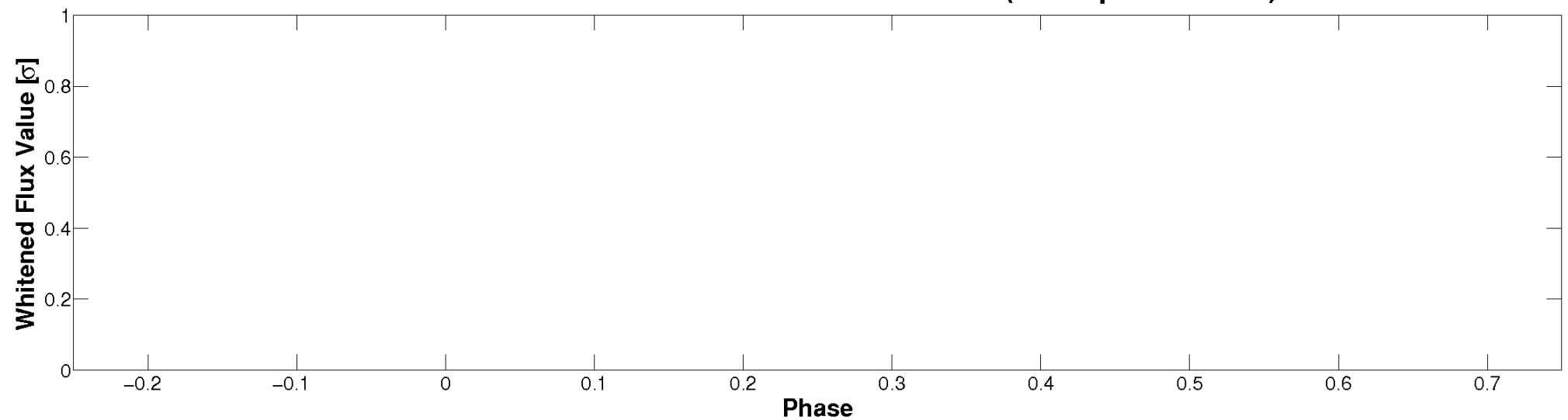


# Non-Whitened Vs. Whitened Light Curve

**Planet 4 : Phased Unwhitened Flux Time Series (TPS Epoch/Period)**

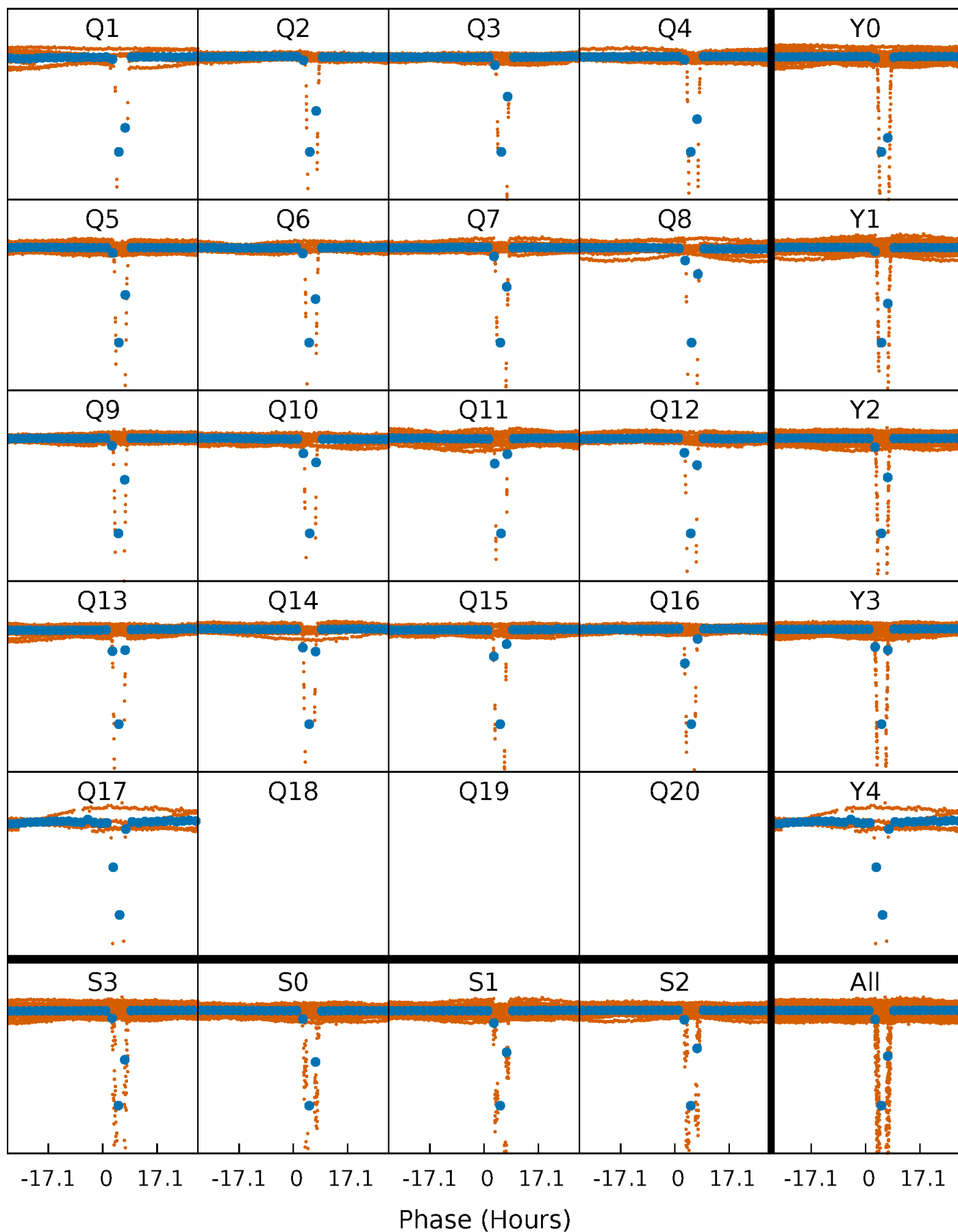


**Planet 4 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



# PDC Quarter-Phased Transit Curves

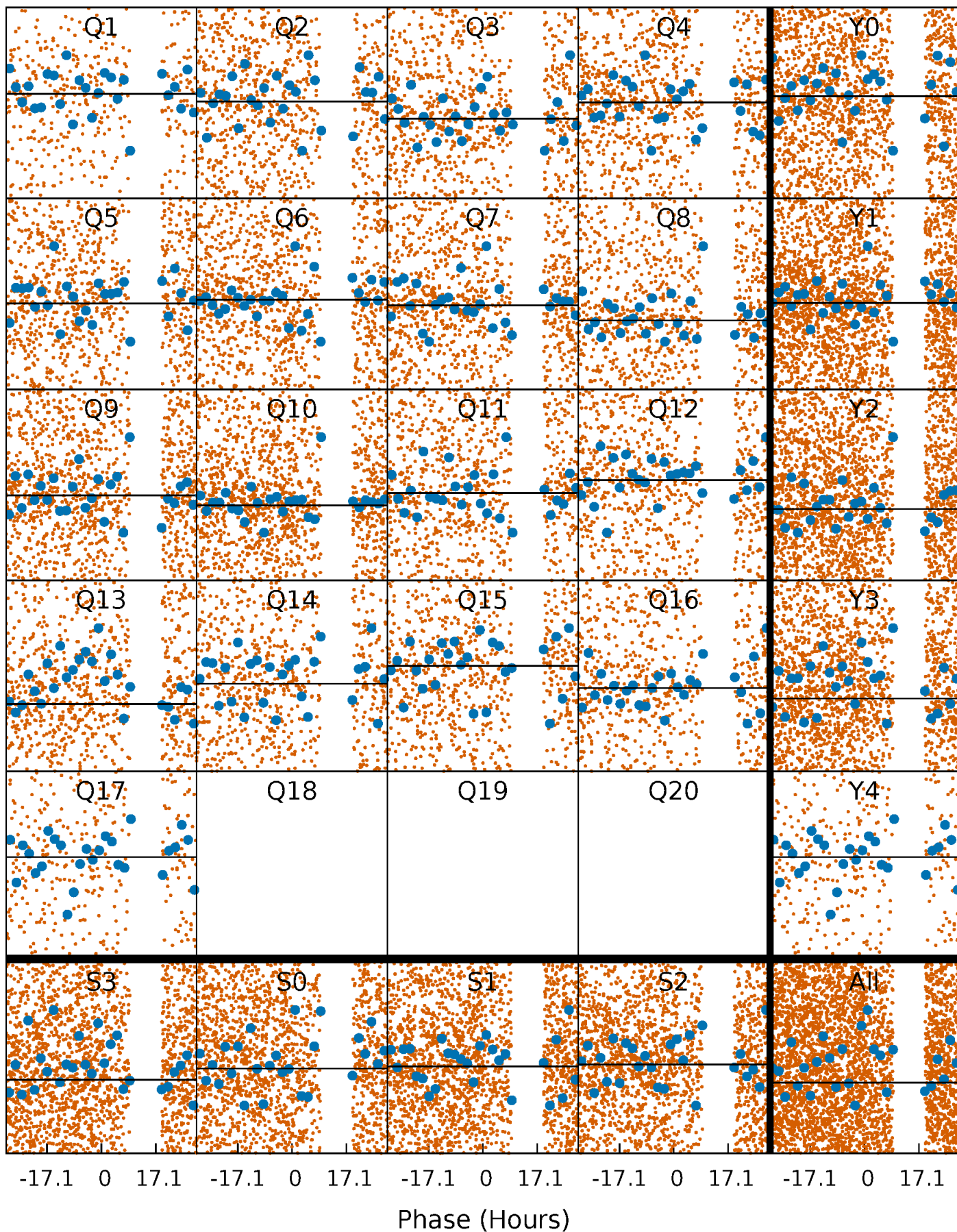
TCE 008111622-04 P= 5.148855 Days  $T_0=134.984699$  (BKJD)





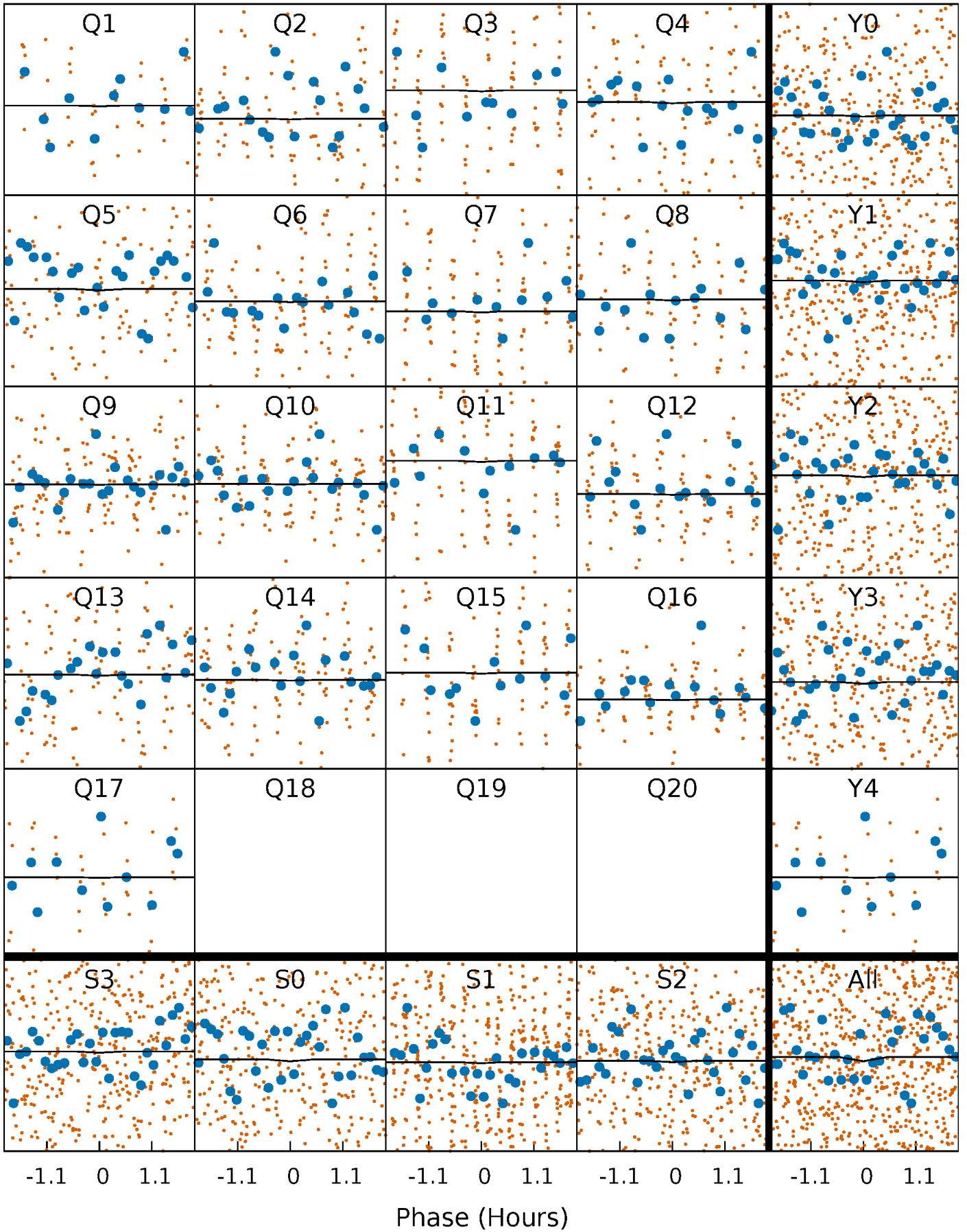
# DV Quarter-Phased Transit Curves

TCE 008111622-04 P= 5.148855 Days  $T_0=134.984699$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

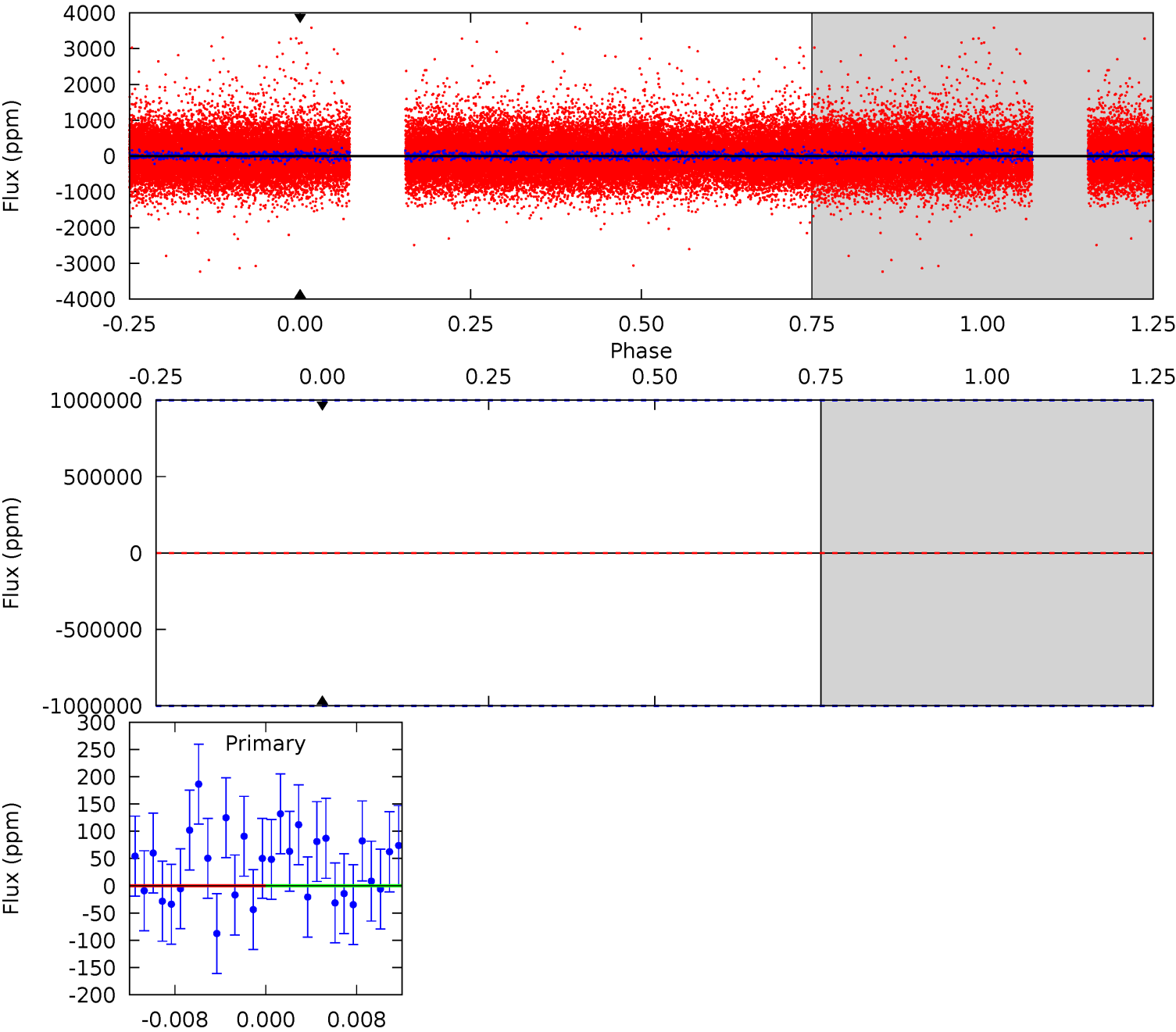
TCE 008111622-04 P= 5.148855 Days  $T_0=136.014153$  (BKJD)



DV Model-Shift Uniqueness Test

008111622-04, P = 5.148855 Days, E = 129.835844 Days

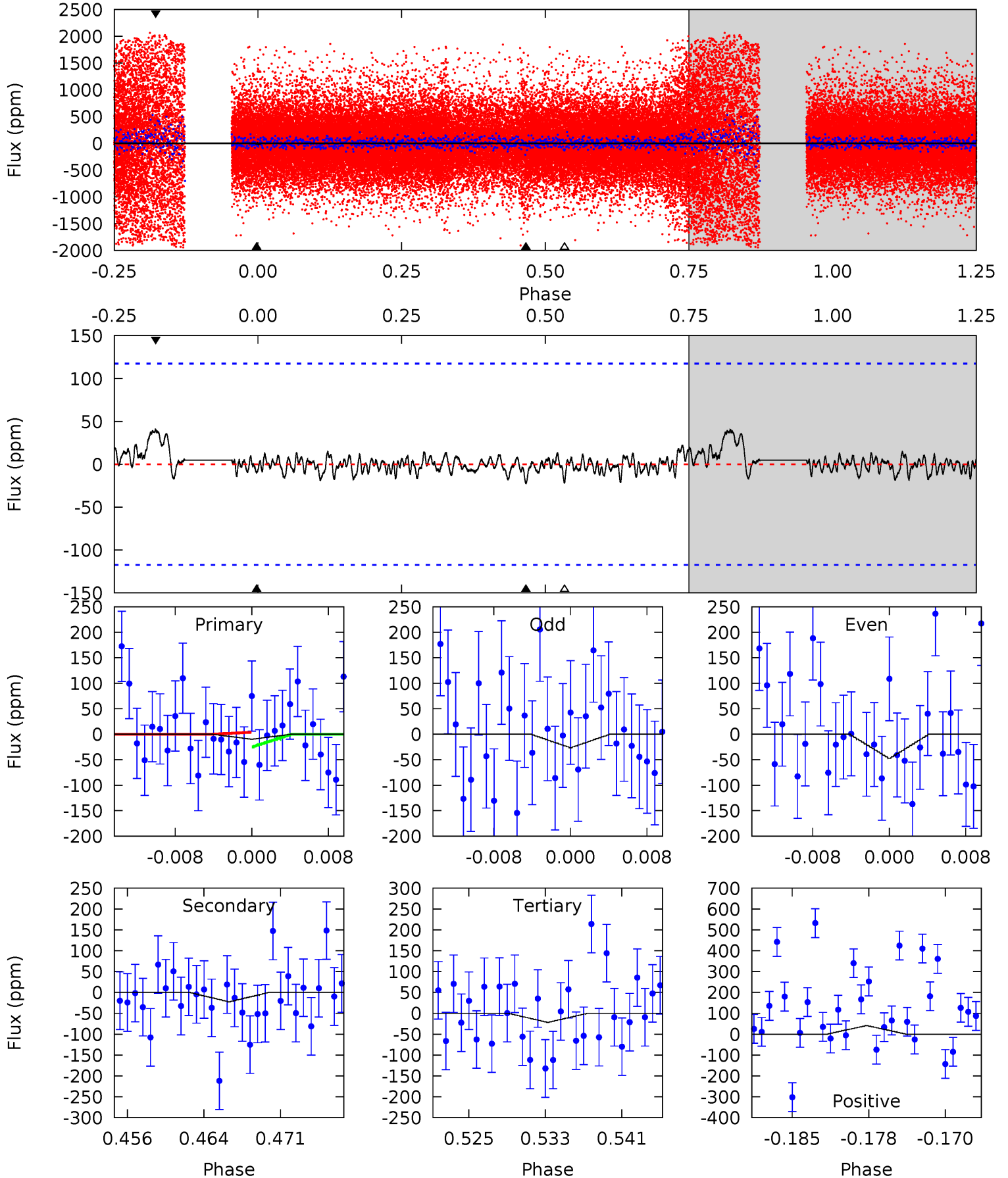
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

008111622-04, P = 5.148855 Days, E = 130.865298 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
0.43	0.97	0.93	1.78	5.08	2.66	0.40	-0.51	-1.35	0.04	-0.81	0.46	0.35	0.65	0.44



### Stellar Parameters For KIC 008111622

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5838^{+157}_{-192}$	$4.529^{+0.038}_{-0.212}$	$-0.080^{+0.300}_{-0.300}$	$0.897^{+0.275}_{-0.092}$	$0.992^{+0.116}_{-0.127}$	$1.938^{+0.404}_{-1.031}$
	+3%/-3%	+1%/-5%	+375%/-375%	+31%/-10%	+12%/-13%	+21%/-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 008111622-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$0 \pm 1000000$	$14.55^{+9.58}_{-8.71}$	$1448^{+101}_{-65}$	$-4788^{+15908}_{-5945}$	$-66.609^{+1453.514}_{-1211.867}$
Alt.	$-22 \pm 23$	$7.02^{+7.74}_{-4.86}$	$1448^{+102}_{-72}$	$2218^{+1060}_{-4396}$	$0.706^{+7.001}_{-0.704}$

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

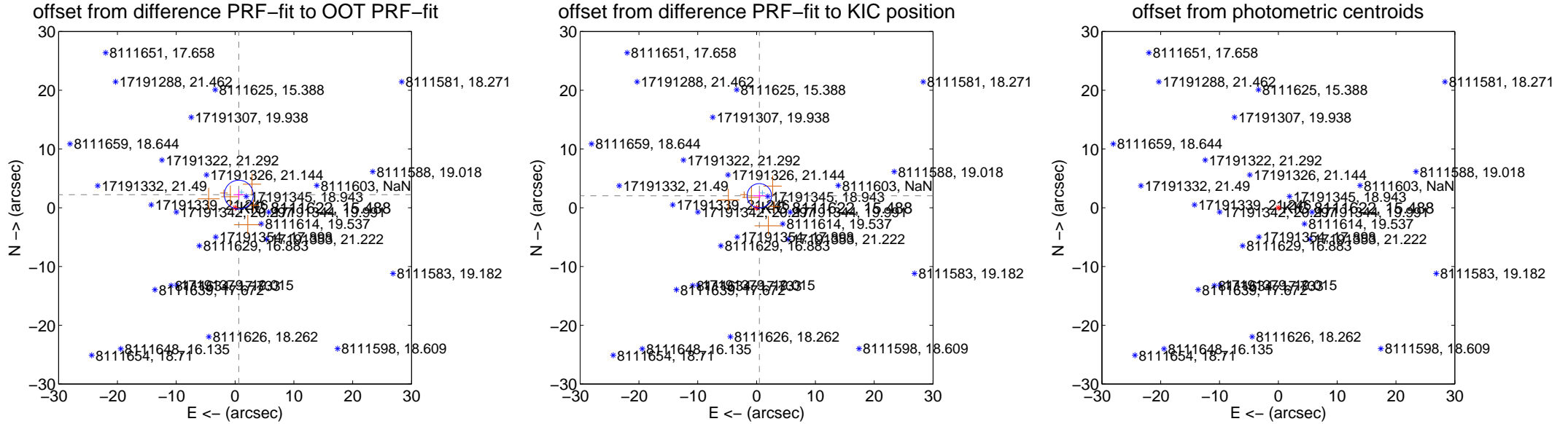
## DV Centroid Data

Supplemental centroid analysis for 008111622-04. Kepler magnitude: 15.49. Transit SNR -1.00

There are 1 quarters with good PRF difference image offsets

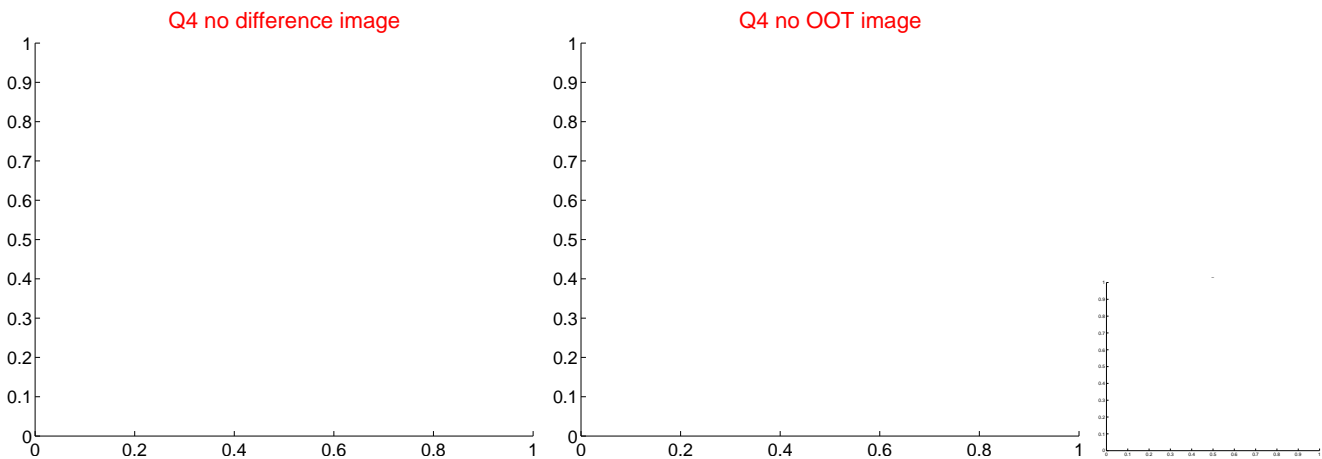
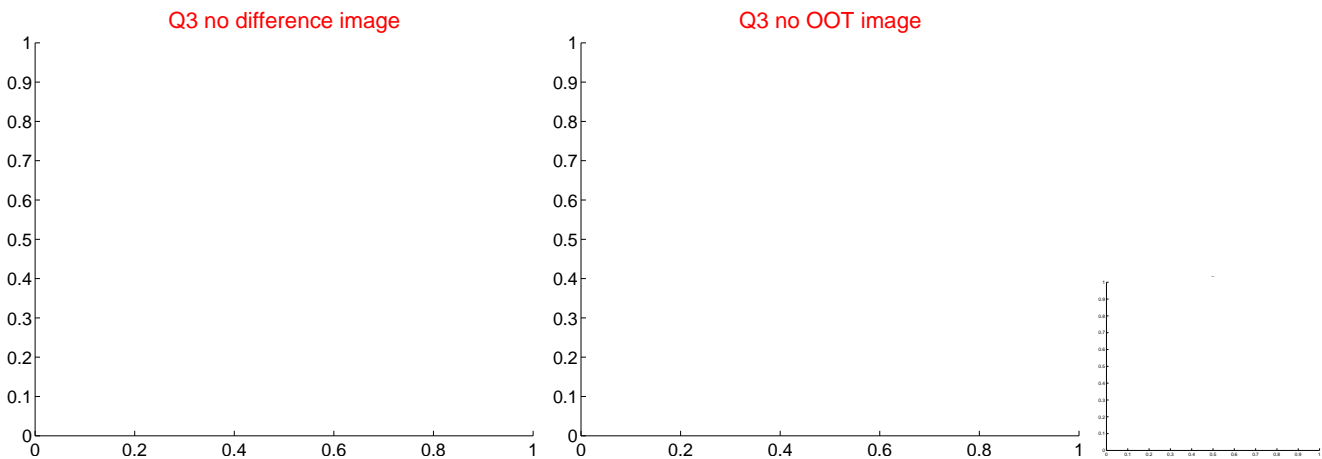
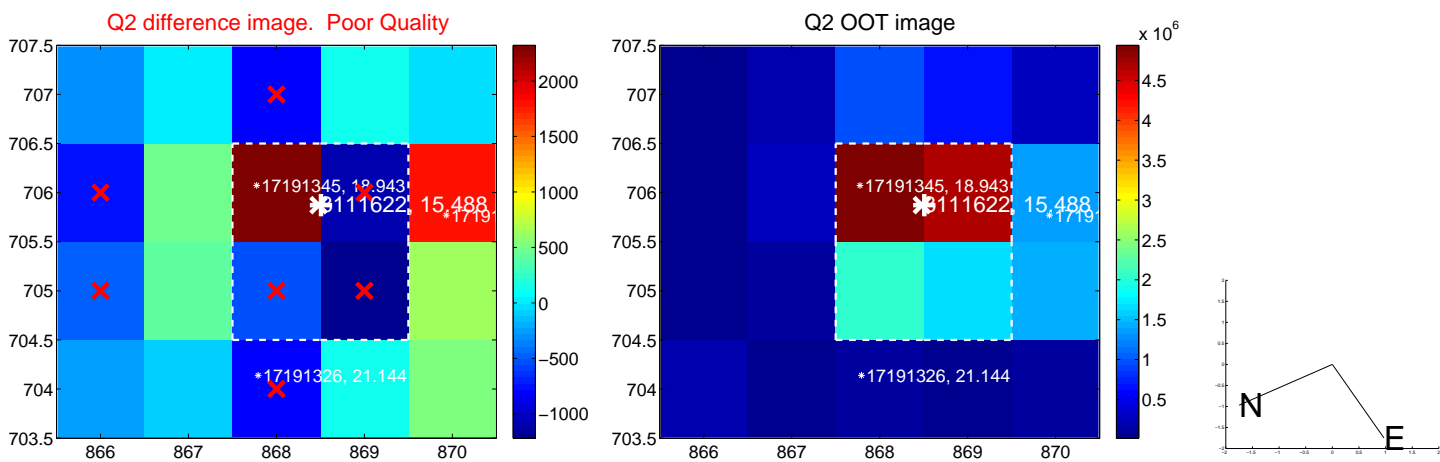
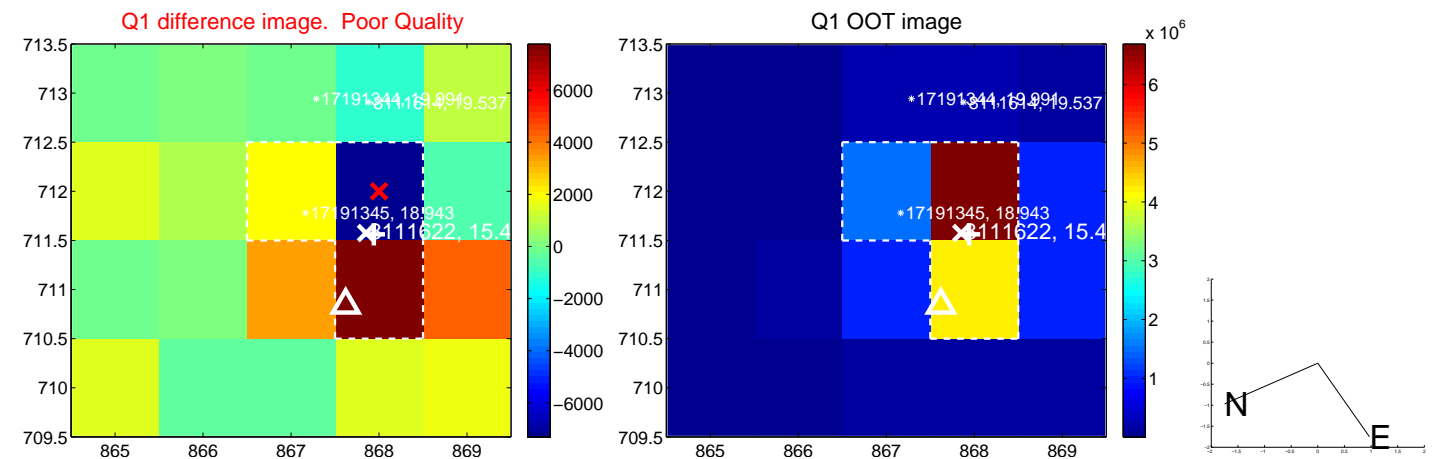
The direct PRF centroid is offset from the target star catalog position by about 0.36 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.315 \pm 0.820$	2.82	$-0.635 \pm 0.904$	$2.226 \pm 0.834$
PRF-fit source offset from KIC position	<b><math>2.092 \pm 0.691</math></b>	<b>3.03</b>	$-0.469 \pm 1.075$	$2.039 \pm 0.737$
photometric centroid source offset	$84.71 \pm 64.63$	1.31	$-78.39 \pm 64.75$	$-32.13 \pm 63.91$



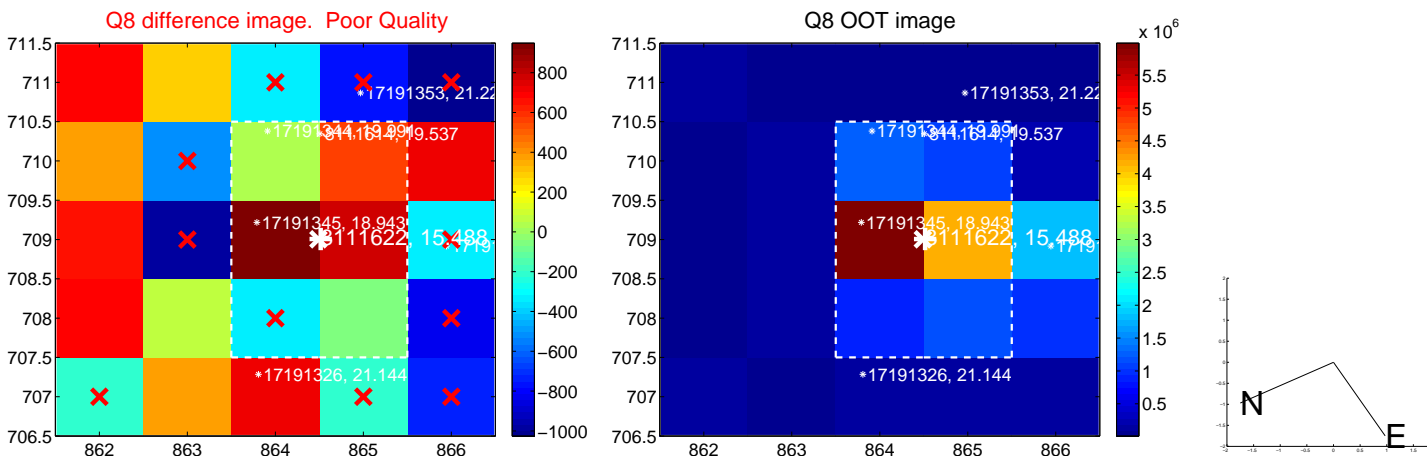
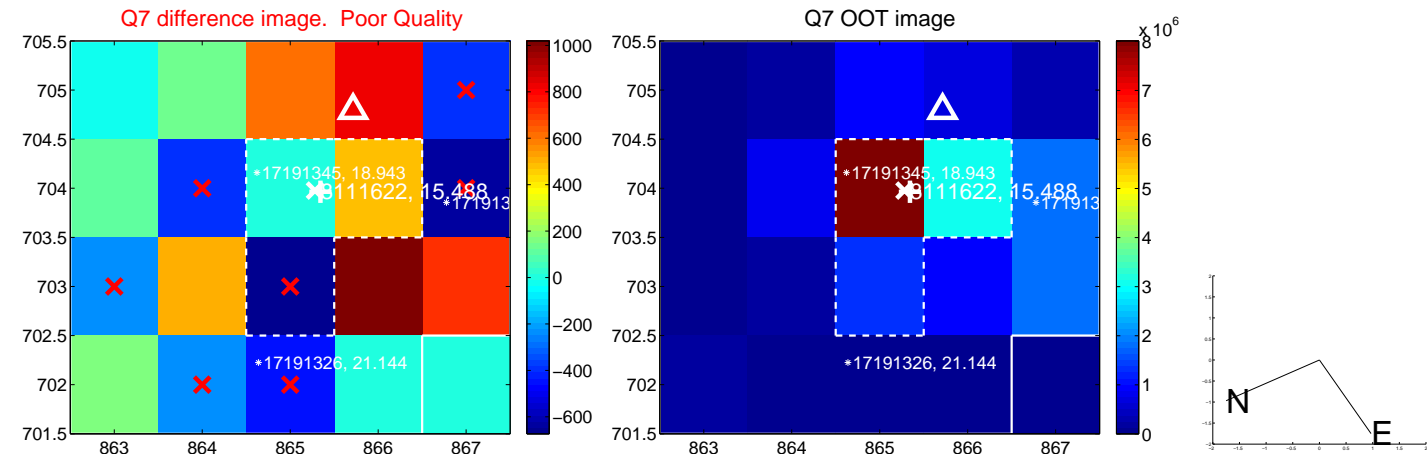
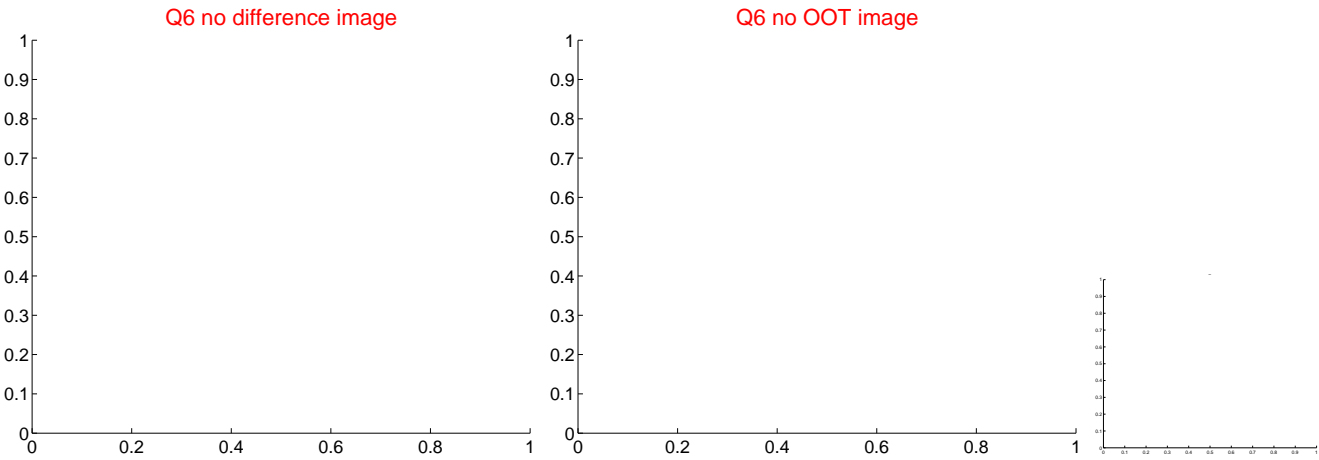
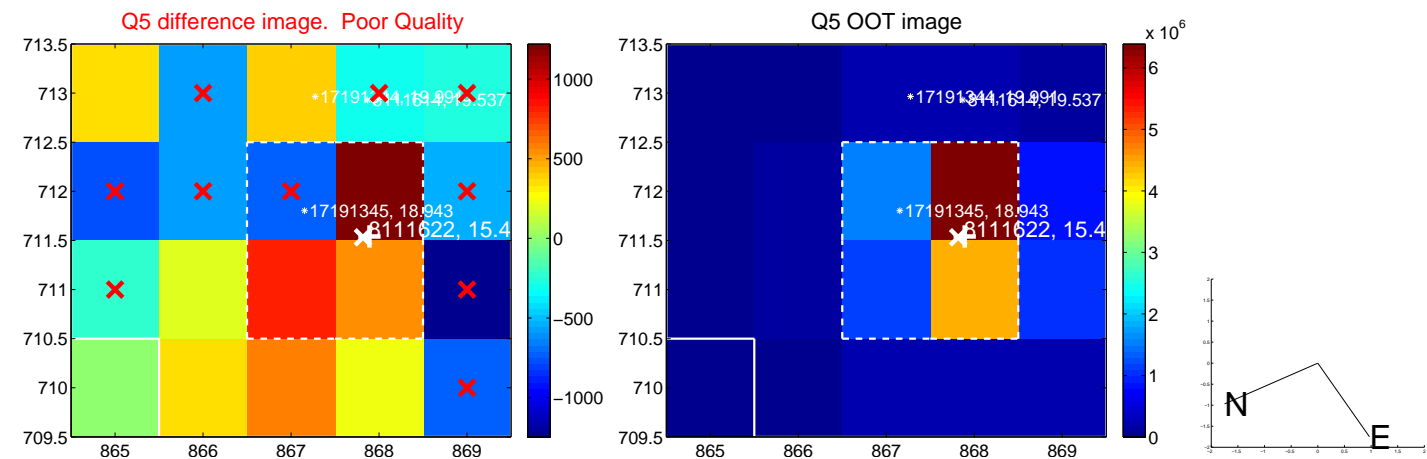
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

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



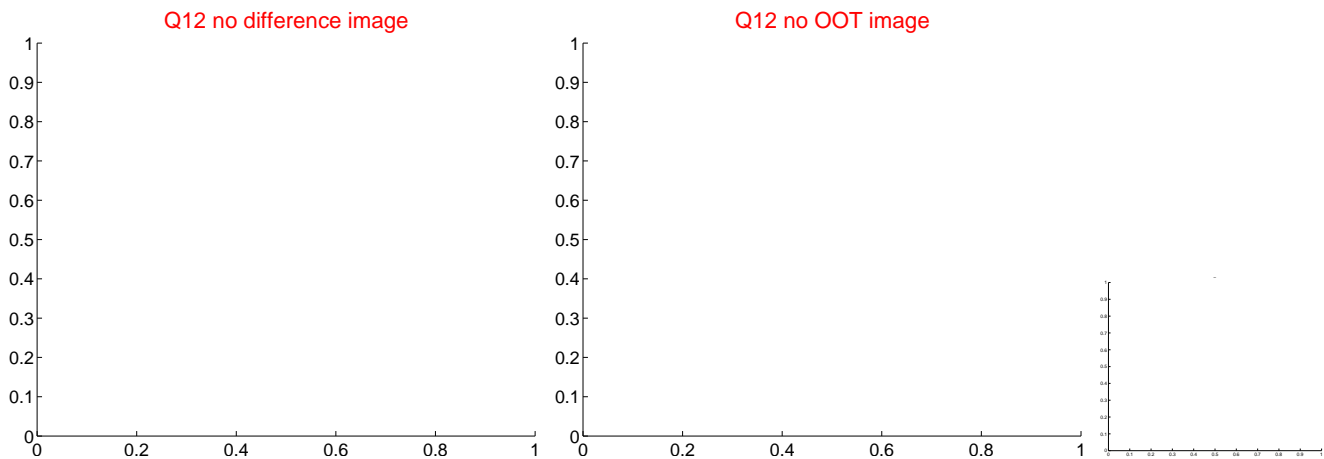
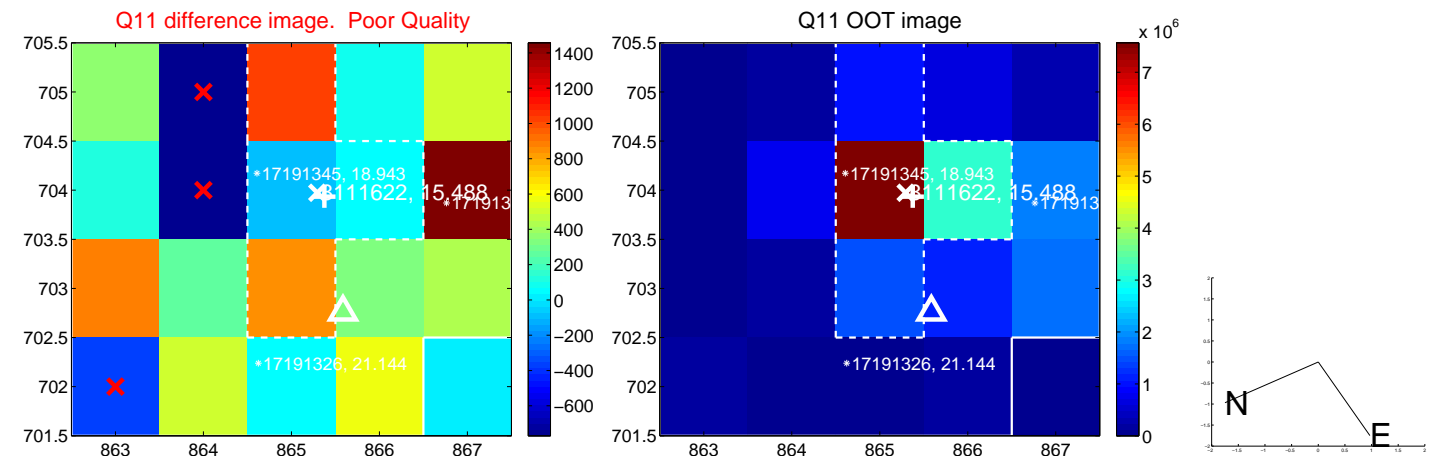
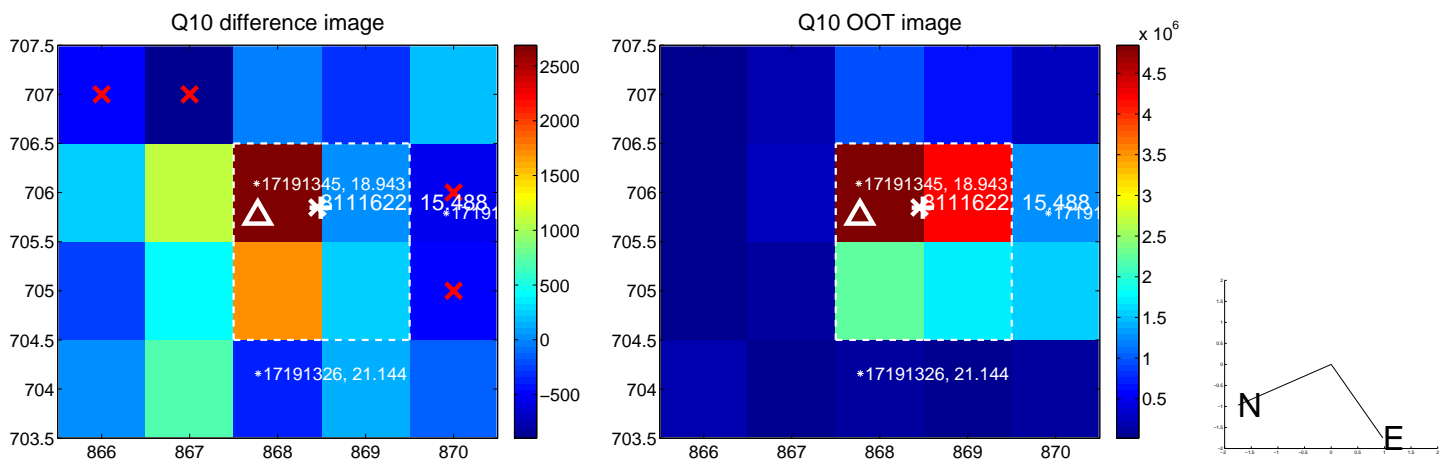
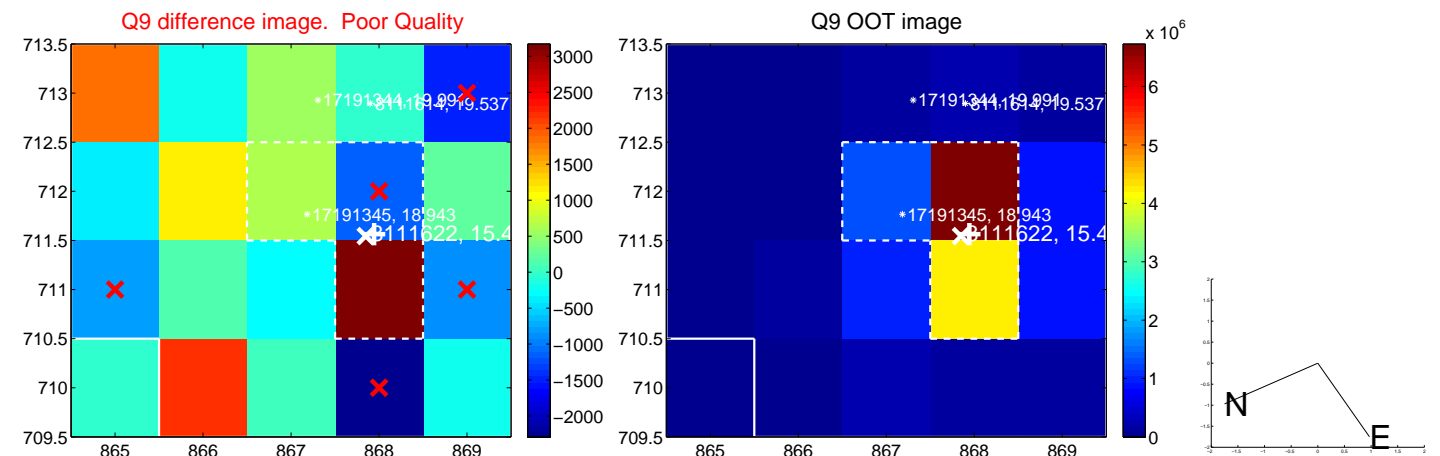


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

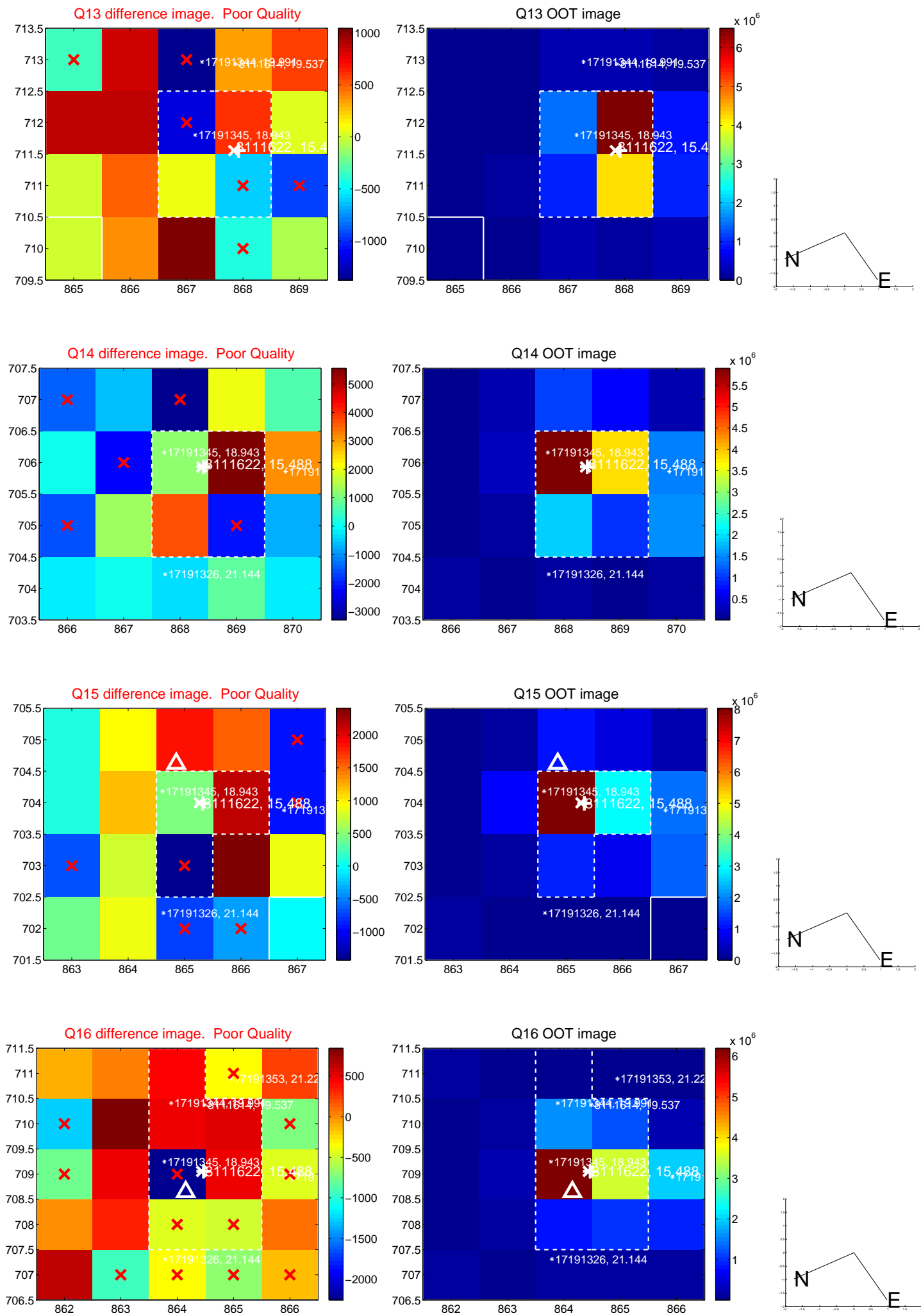




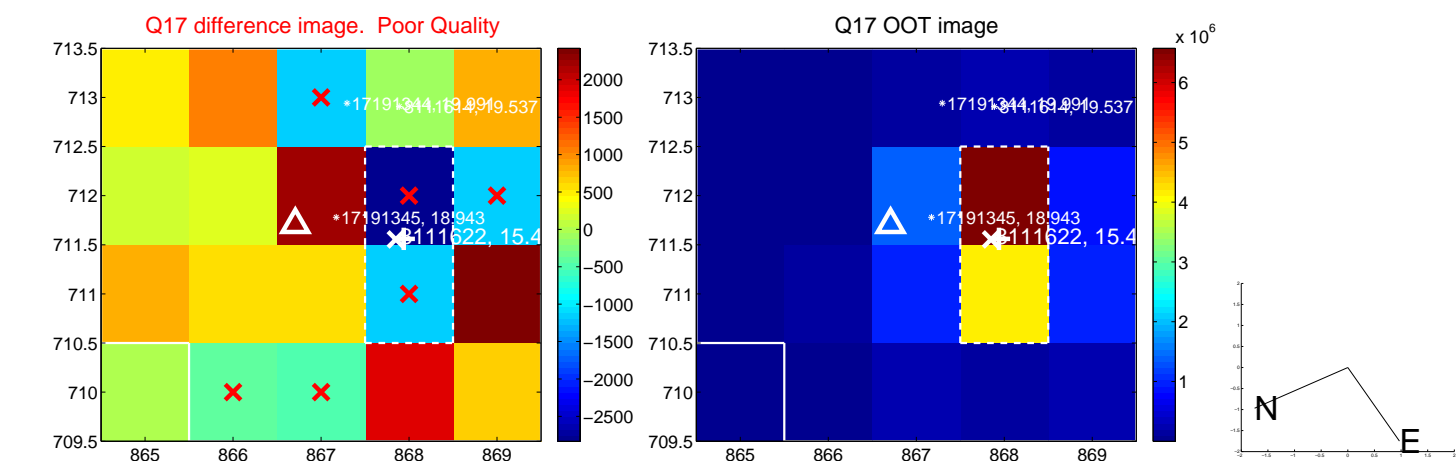
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



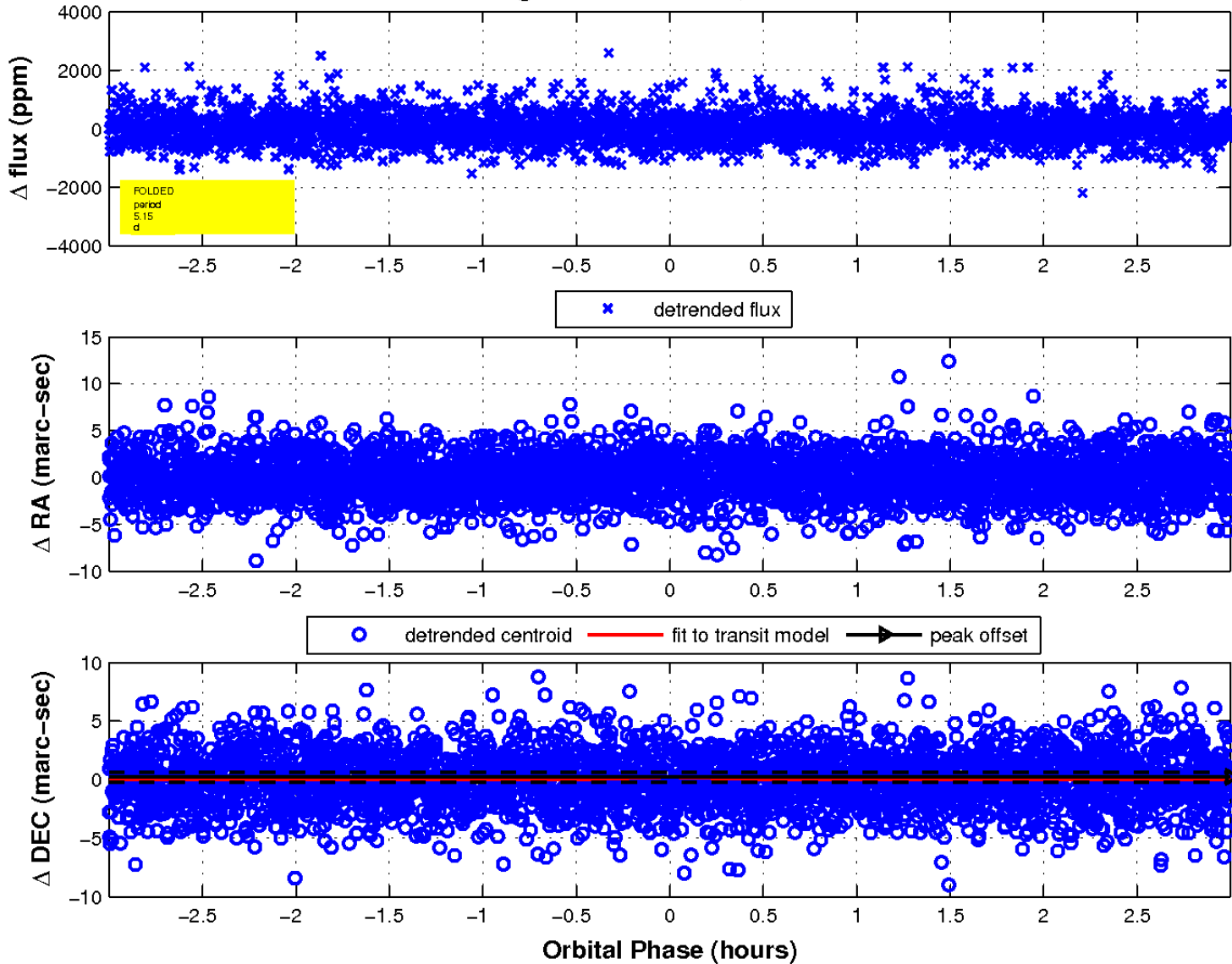
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



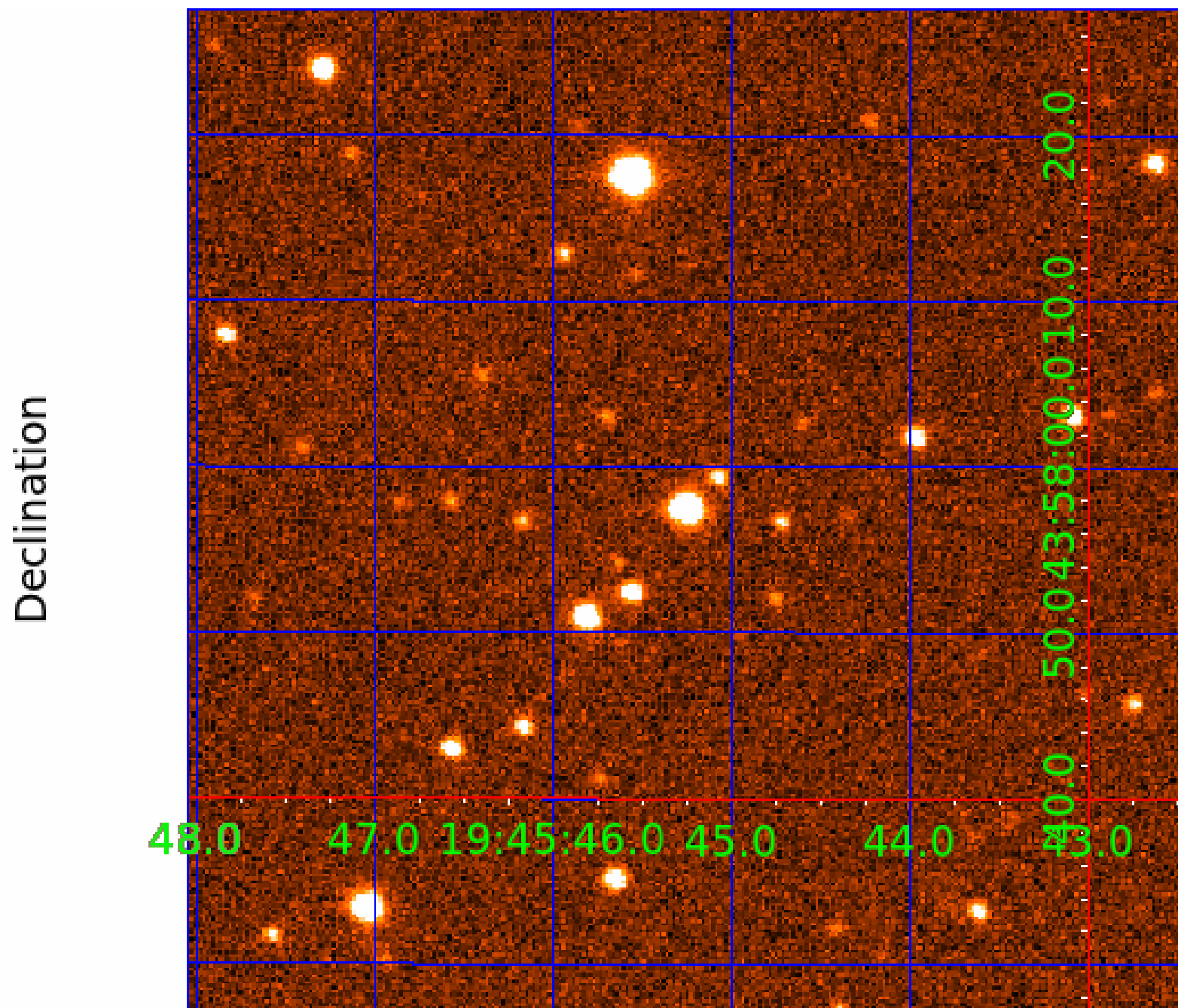
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 4 of 6



UKIRT Image



# KIC 008111622

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008111622-01	OBS	6968.01	15.446109	145.532030	324454.7	3.000	9167.1	-1.0	0.90	5838	48.00	57.11
008111622-02	OBS	No	15.446063	132.921345	29042.2	5.005	846.3	812.3	0.90	5838	17.19	57.11
008111622-03	OBS	No	5.148862	135.568763	3.3	3.190	629.2	0.1	0.90	5838	0.19	247.09
008111622-04	OBS	No	5.148855	134.984699	17281.8	15.000	626.6	-1.0	0.90	5838	11.71	247.09
008111622-05	OBS	No	339.756480	146.339456	1522.1	6.611	11.1	7.4	0.90	5838	4.73	0.93
008111622-06	OBS	No	192.159982	310.742053	987.2	10.488	12.9	6.6	0.90	5838	2.94	1.98

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008111622-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_ALT—HAS_SEC_TCE—CENT_NOFITS
008111622-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
008111622-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD—CENT_FEW_MEAS
008111622-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—RESIDUAL_TCE—CENT_NOFITS
008111622-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
008111622-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—INCONSISTENT_TRANS

**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 008111622-05

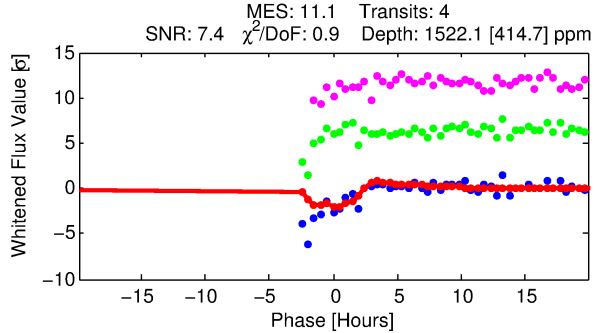
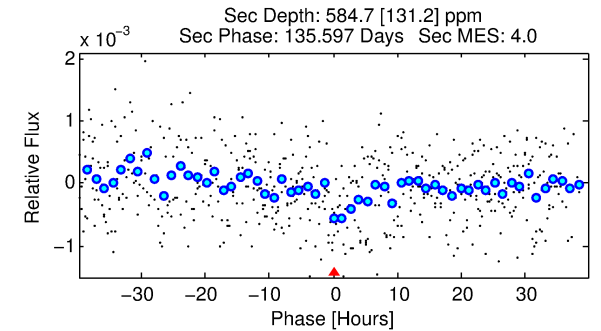
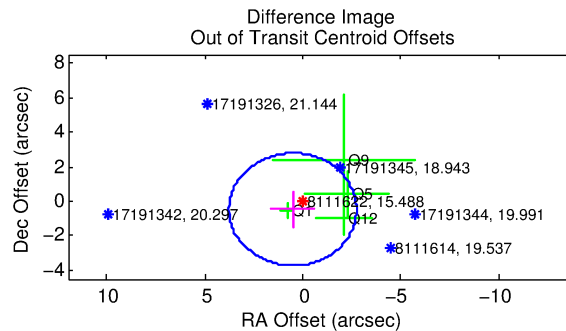
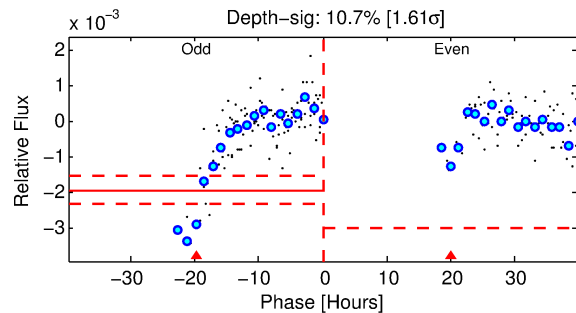
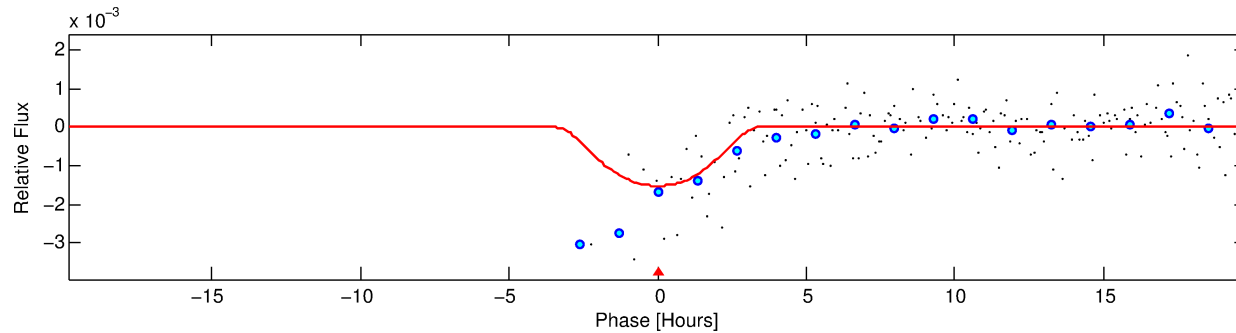
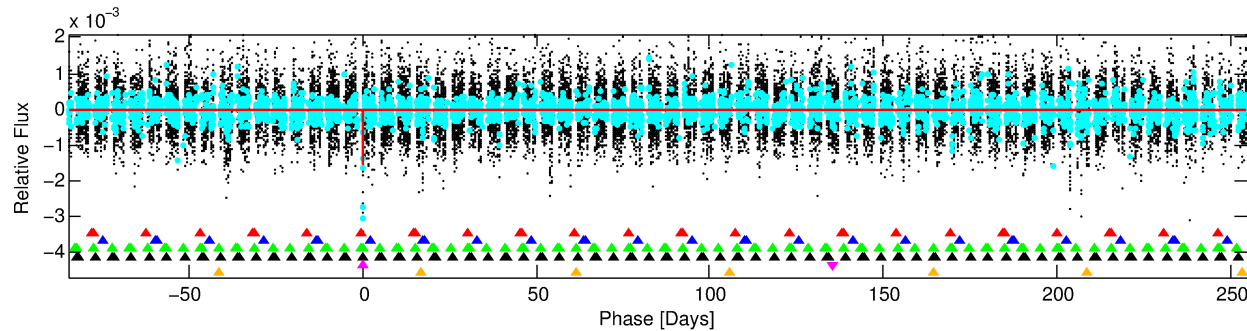
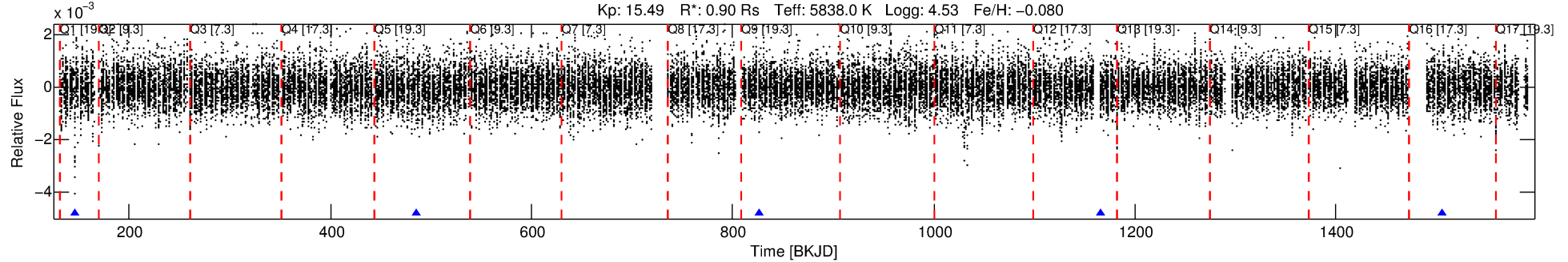
No Significant Match Found

# DV One-Page Summary

KIC: 8111622 Candidate: 5 of 6 Period: 339.756 d

KOI: K06968 Corr: No Ephemeris Match

Kp: 15.49 R\*: 0.90 Rs Teff: 5838.0 K Logg: 4.53 Fe/H: -0.080



## DV Fit Results:

Period = 339.75648 [0.00943] d  
Epoch = 146.3395 [0.0105] BKJD  
Rp/R\* = 0.0483 [0.0281]  
a/R\* = 162.89 [62.81]  
b = 0.96 [0.07]  
Seff = 0.93 [0.38]  
Teq = 250 [25] K  
Rp = 4.73 [3.11] Re  
a = 0.9506 [0.2483] AU  
Ag = 13016.50 [16215.97] [0.80σ]  
Teffp = 4132 [1232] K [3.15σ]

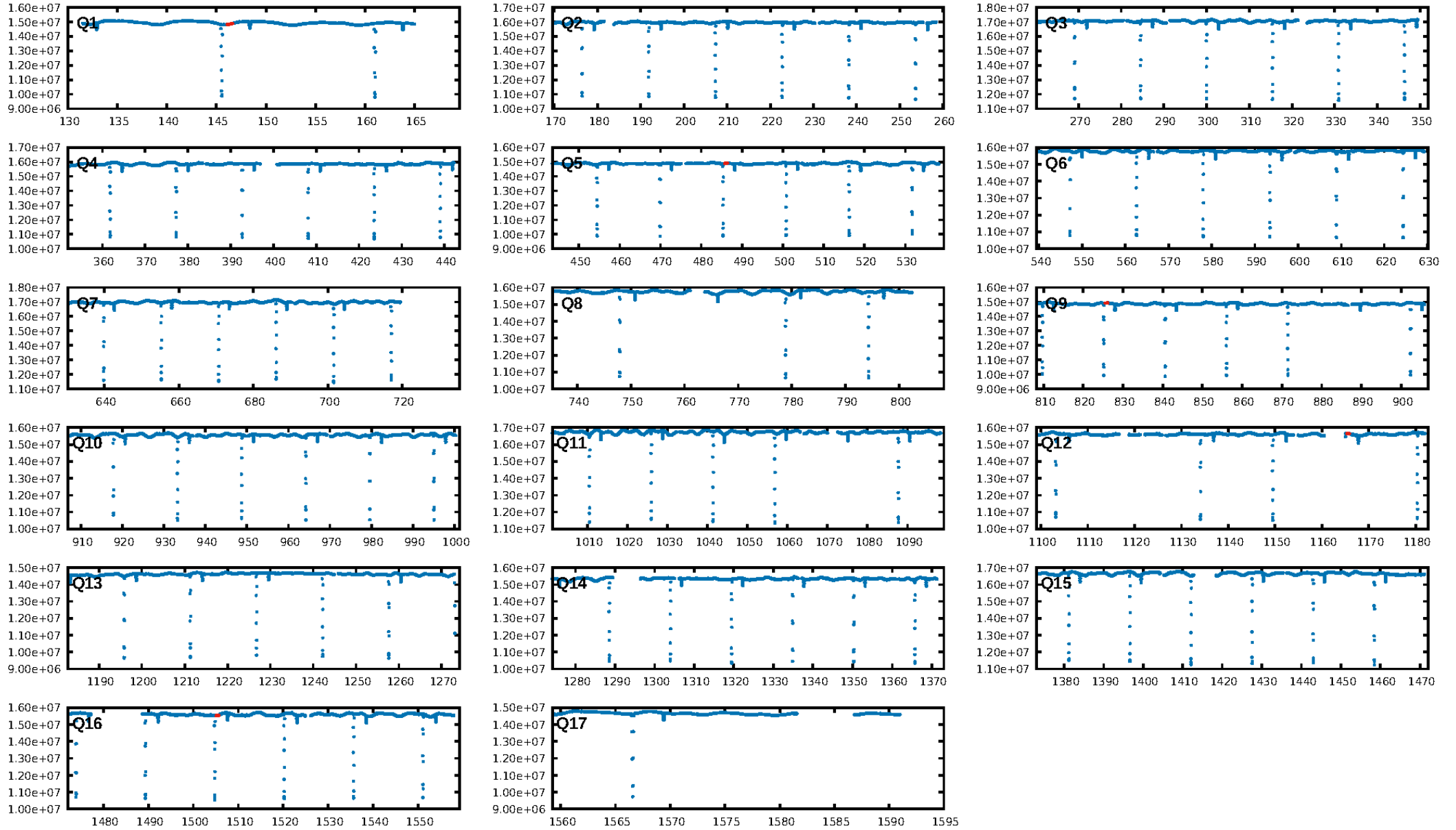
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [285.73σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 67.5%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 5.21e-18  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: 0.1844**  
Centroid-sig: N/A  
Centroid-so: 1.048 arcsec [1.29σ]  
OotOffset-rm: 0.706 arcsec [0.65σ]  
KicOffset-rm: 1.011 arcsec [0.94σ]  
OotOffset-st: 0/0/1/3 [4]  
KicOffset-st: 0/0/1/3 [4]  
DiffImageQuality-fgm: 0.25 [1/4]  
DiffImageOverlap-fno: 0.00 [0/4]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 14:41:33 Z

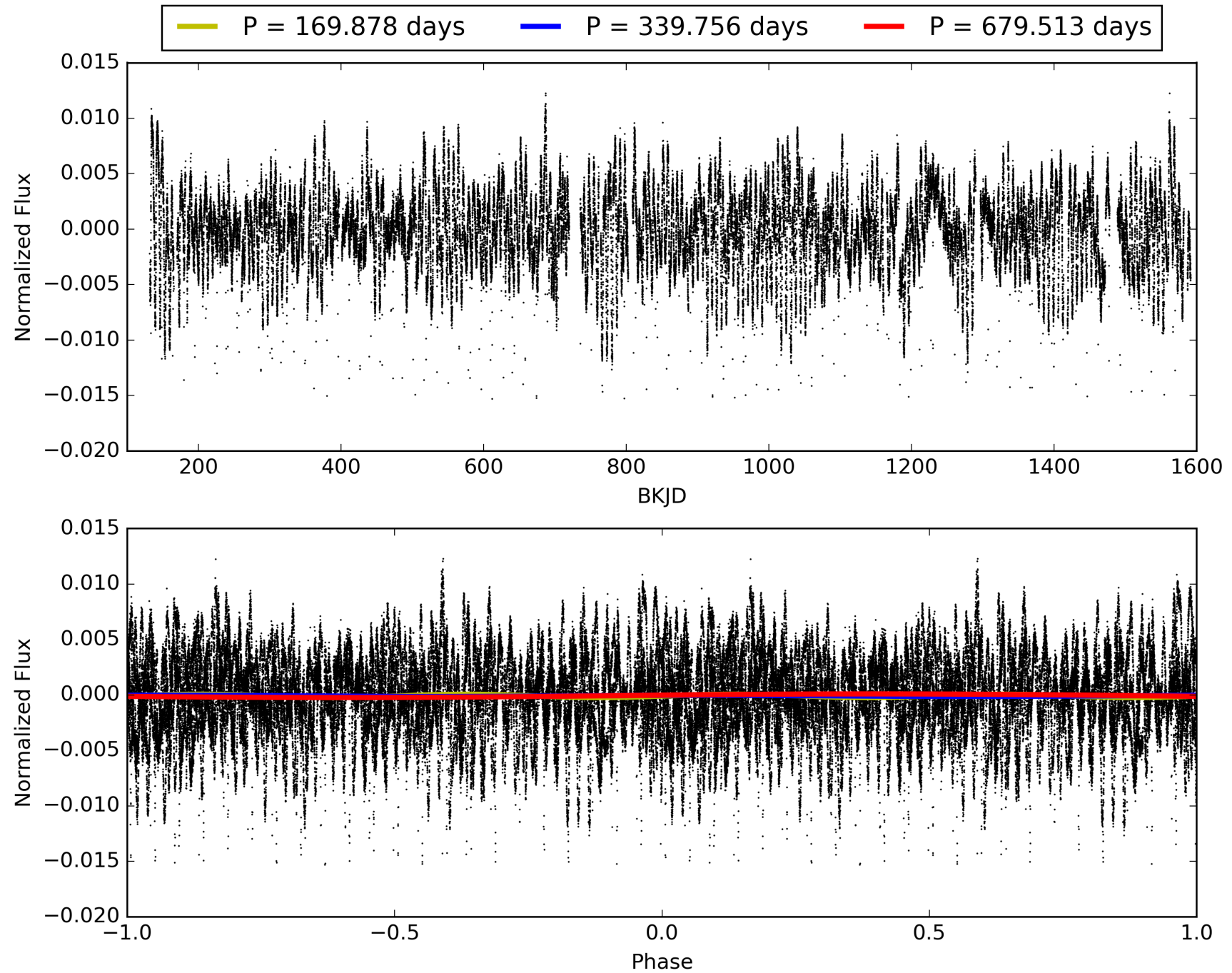
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008111622-05, PDC Light Curves





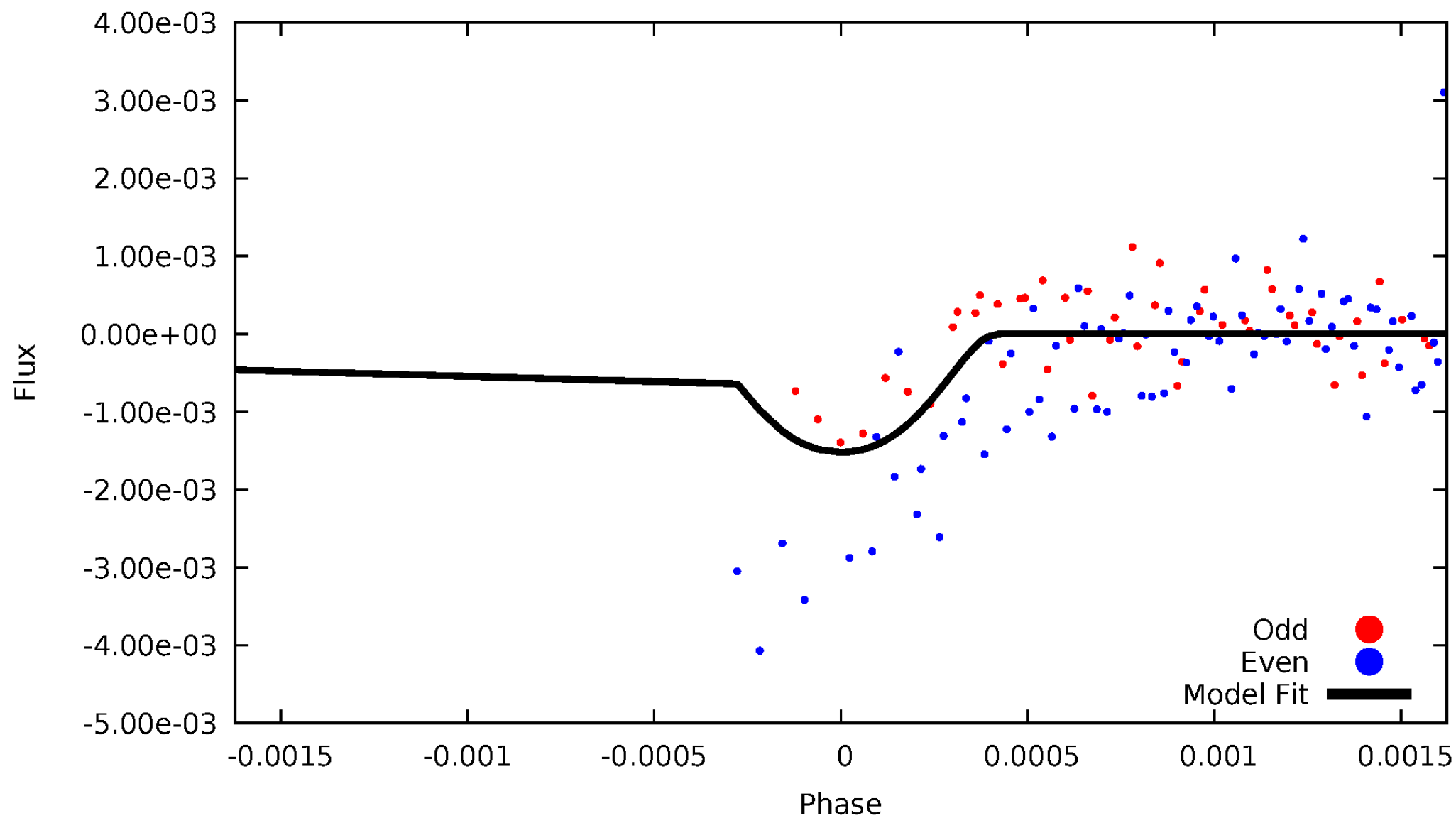
TCE 008111622-05





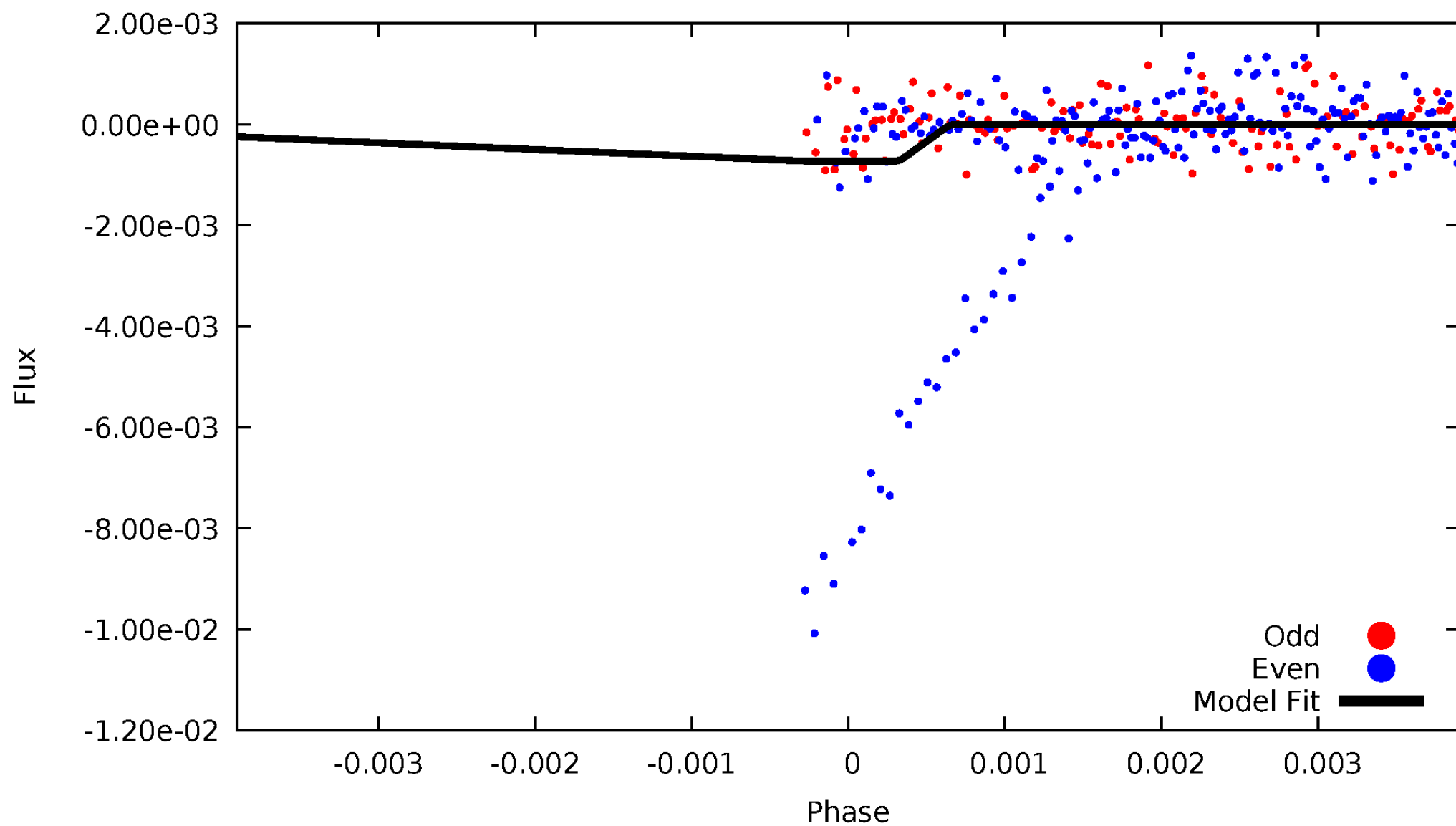
# DV Odd/Even

TCE 008111622-05



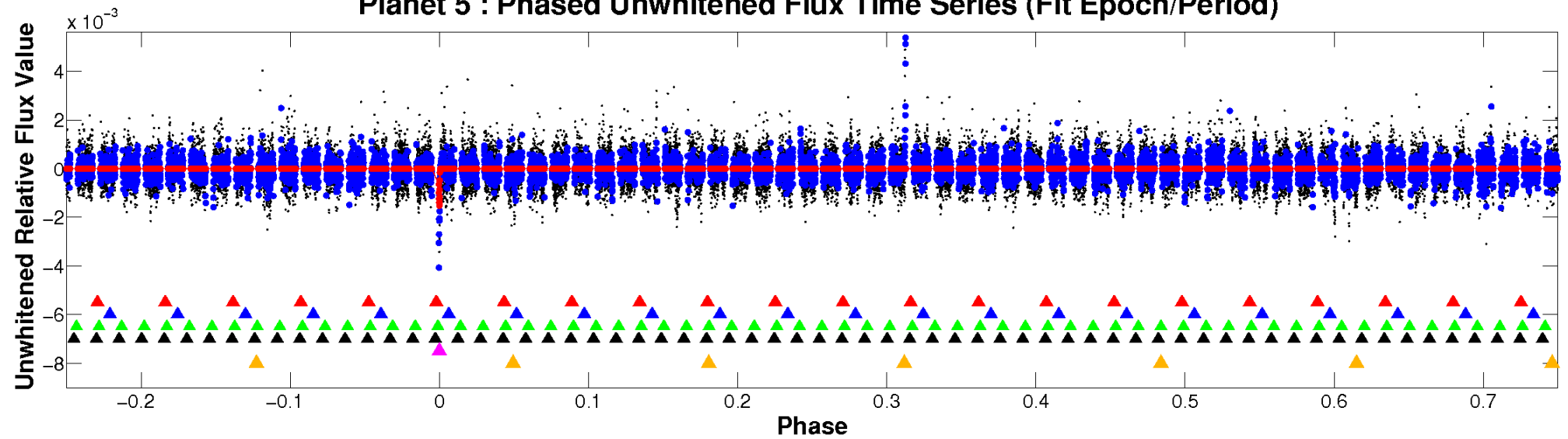
# ALT Odd/Even

TCE 008111622-05

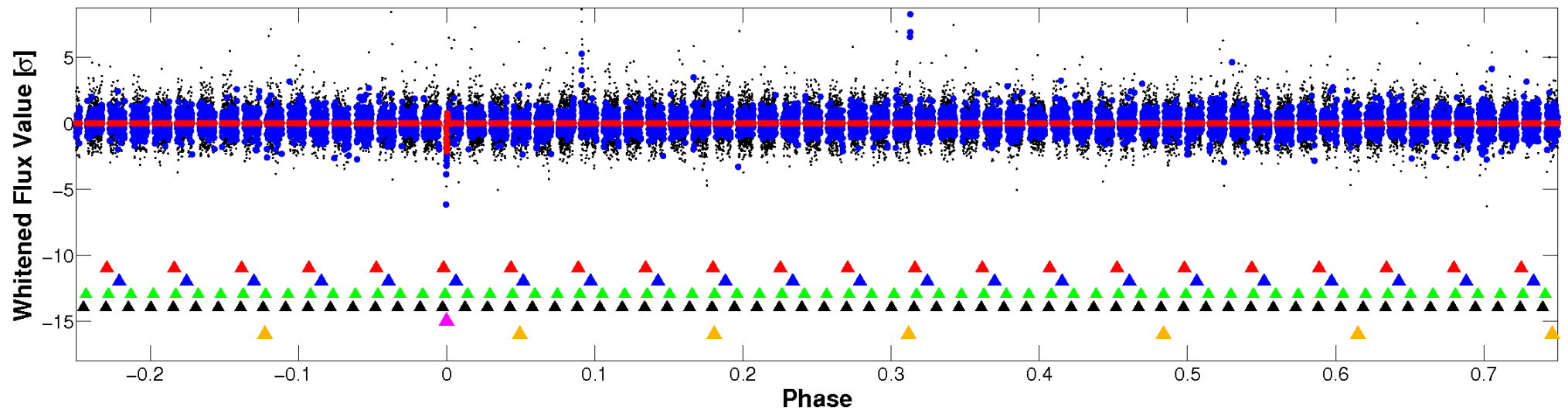


# Non-Whitened Vs. Whitened Light Curve

## Planet 5 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

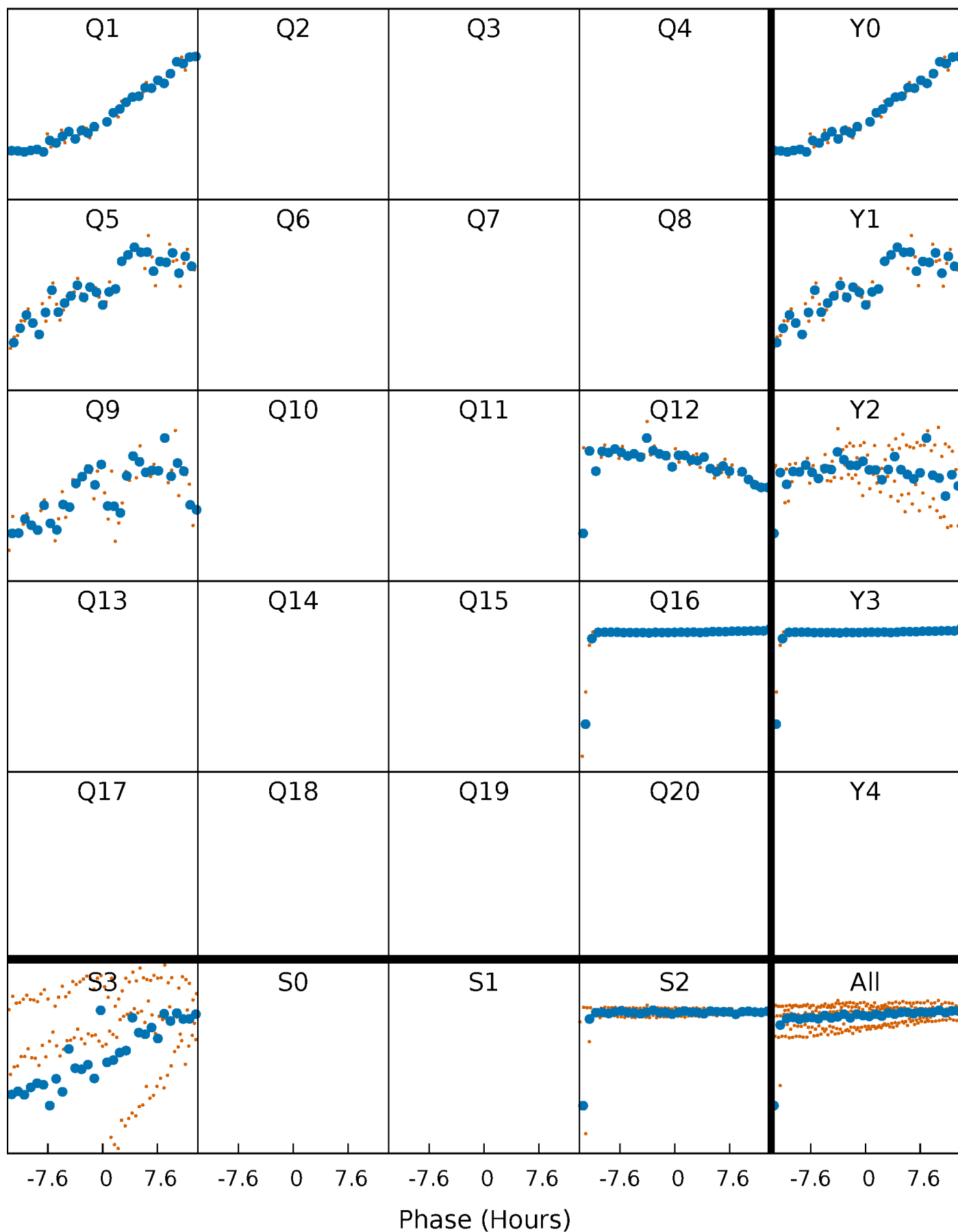


## Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



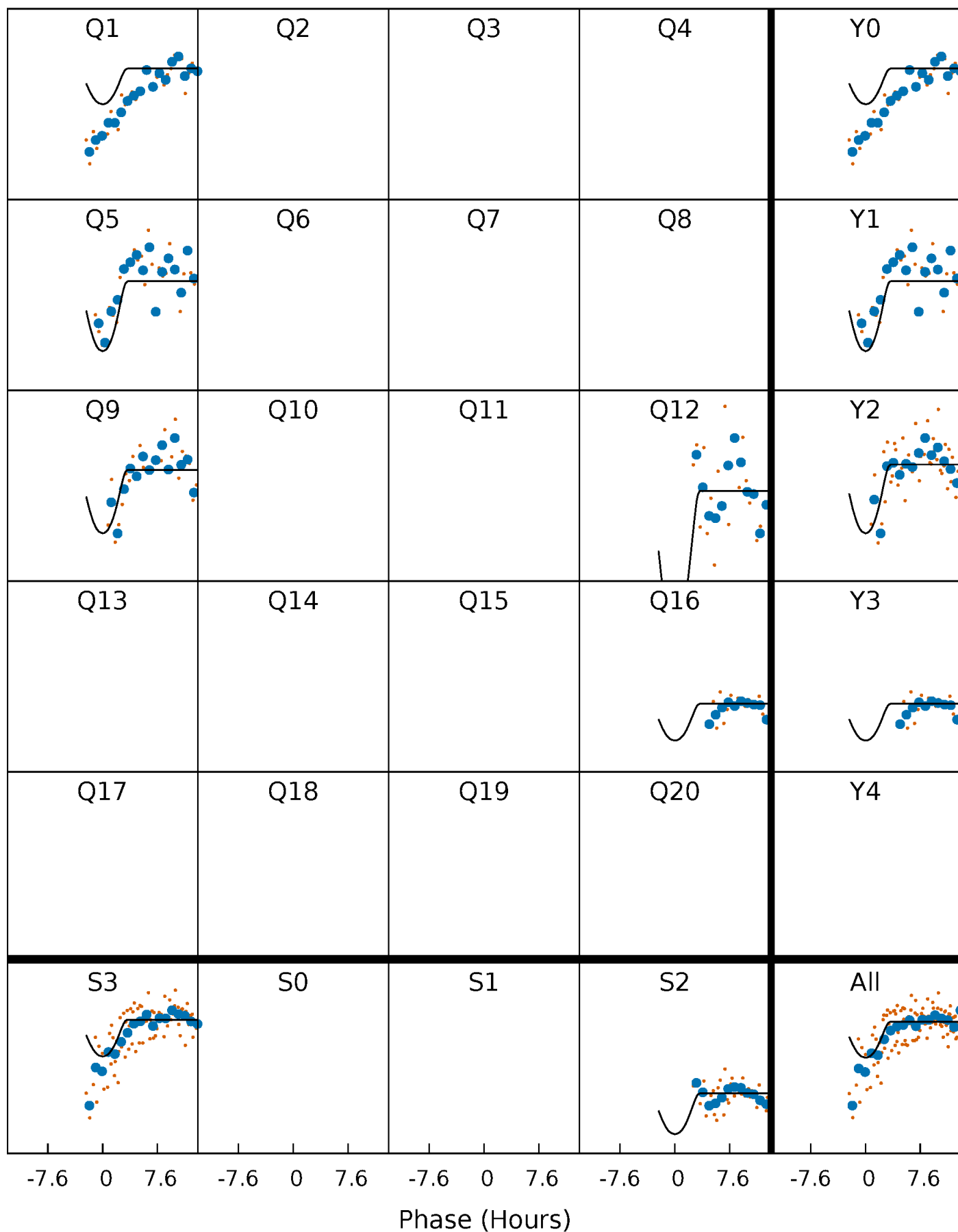
# PDC Quarter-Phased Transit Curves

TCE 008111622-05     $P=339.756480$  Days     $T_0=146.339456$  (BKJD)



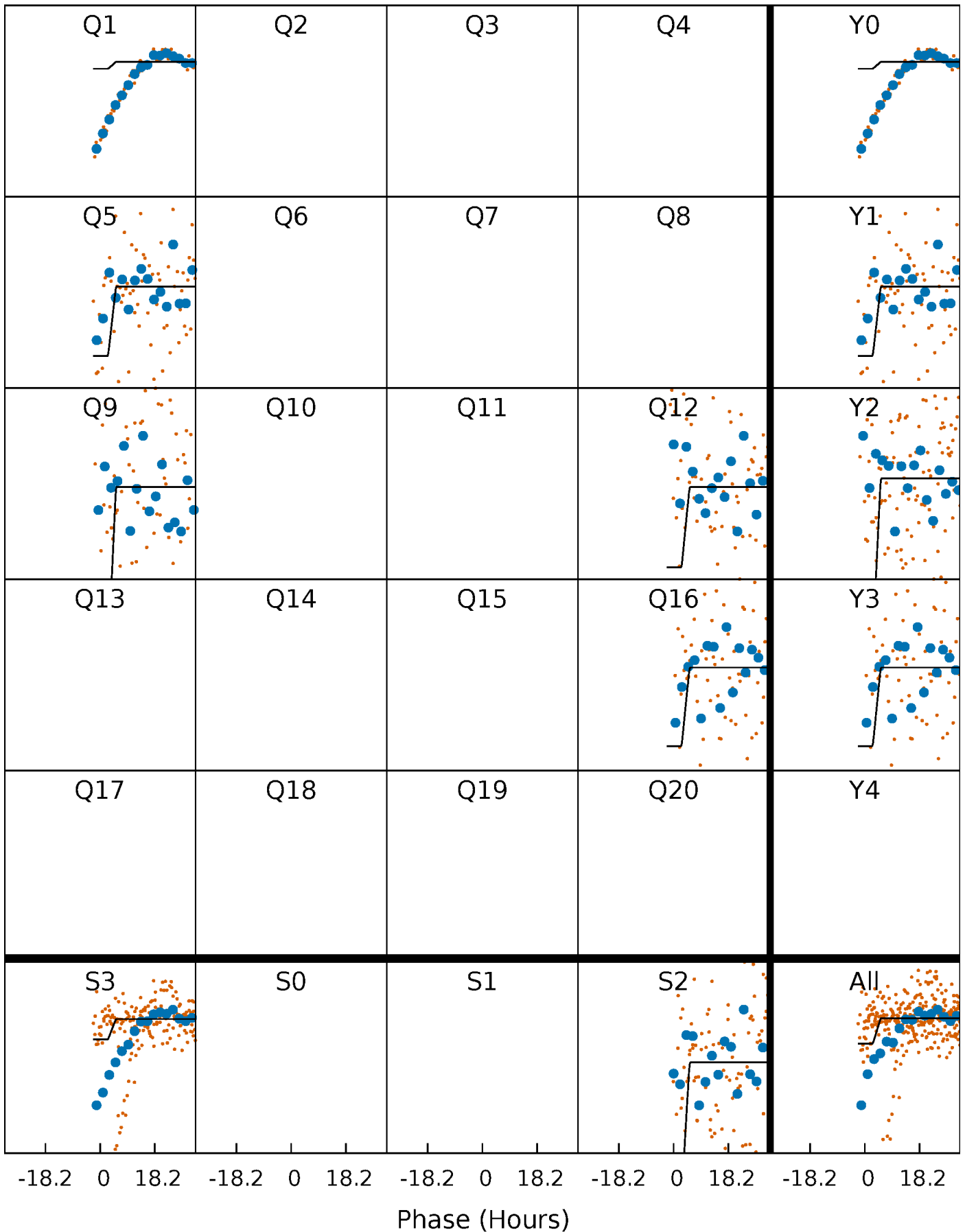
# DV Quarter-Phased Transit Curves

TCE 008111622-05     $P=339.756480$  Days     $T_0=146.339456$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

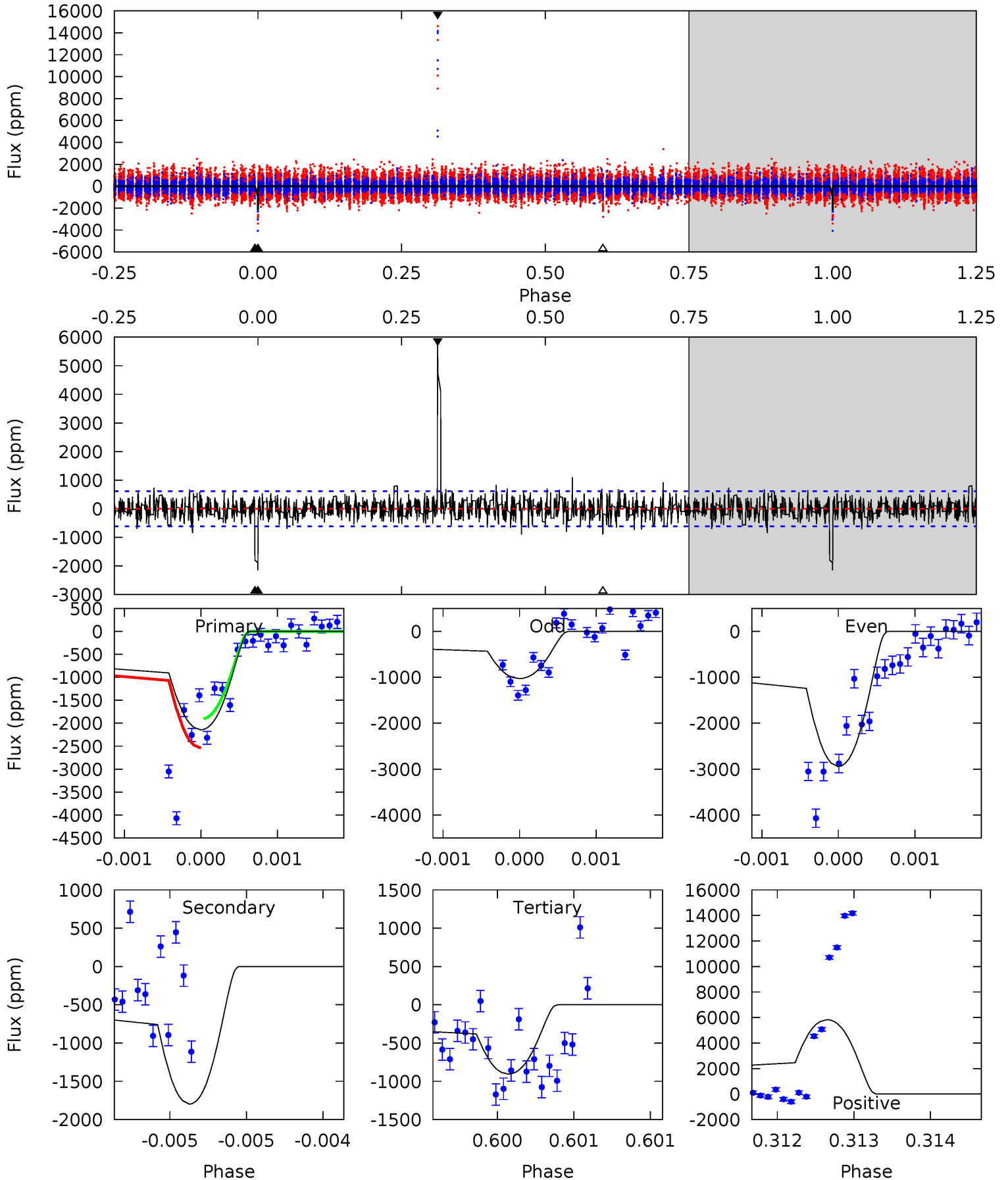
TCE 008111622-05     $P=339.806574$  Days     $T_0=146.339036$  (BKJD)



# DV Model-Shift Uniqueness Test

008111622-05, P = 339.756480 Days, E = 146.339456 Days

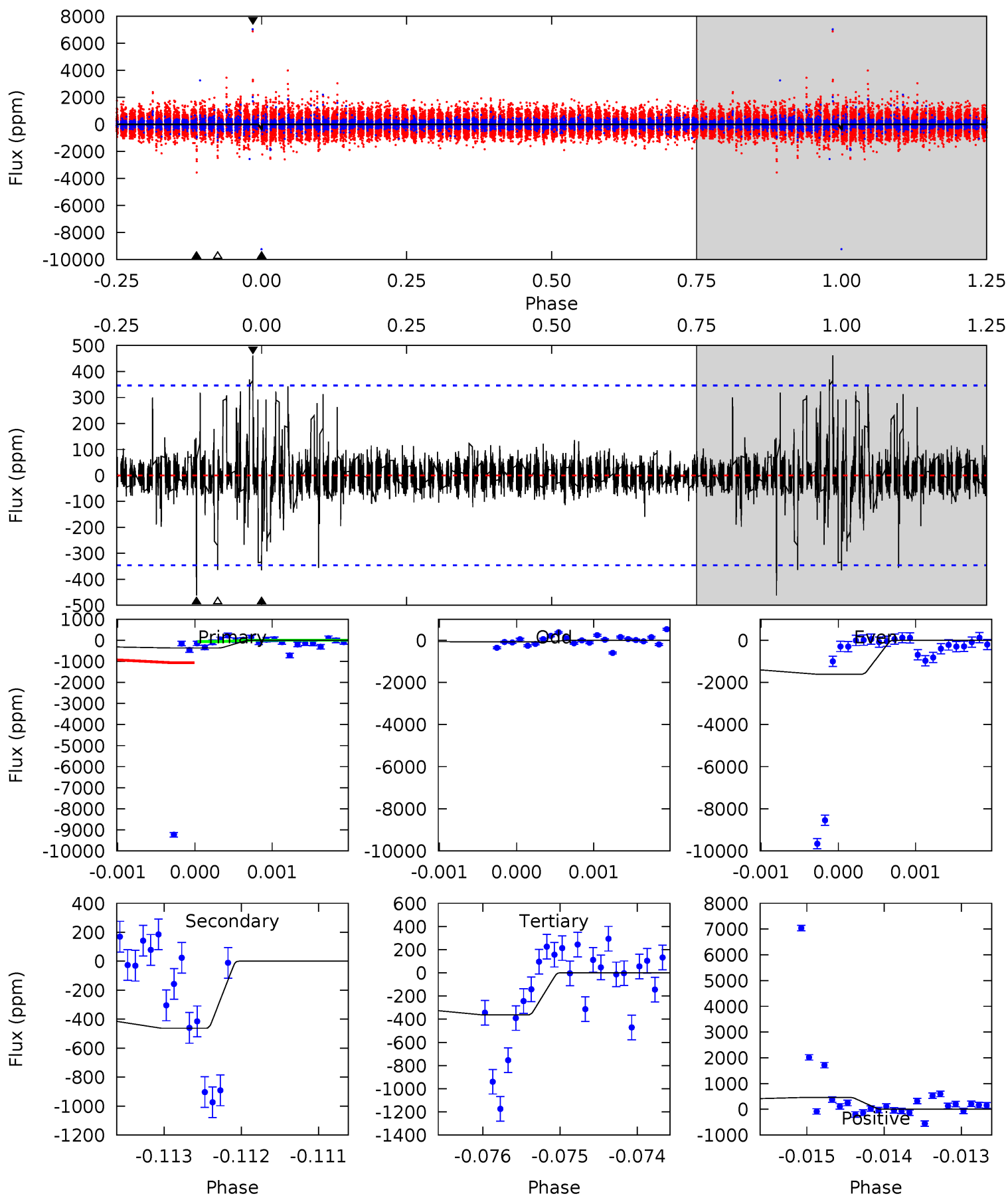
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.4	16.3	8.18	52.7	5.52	3.41	2.25	11.2	-33.4	8.07	-36.5	8.48	0.93	0.73	2.24



# Alt Model-Shift Uniqueness Test

008111622-05, P = 339.806574 Days, E = 146.339036 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
5.75	7.29	5.74	7.29	5.46	3.30	0.84	0.02	-1.53	1.56	0.00	12.0	5.75	0.50	6.42





### Stellar Parameters For KIC 008111622

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5838^{+157}_{-192}$	$4.529^{+0.038}_{-0.212}$	$-0.080^{+0.300}_{-0.300}$	$0.897^{+0.275}_{-0.092}$	$0.992^{+0.116}_{-0.127}$	$1.938^{+0.404}_{-1.031}$
	+3%/-3%	+1%/-5%	+375%/-375%	+31%/-10%	+12%/-13%	+21%/-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 008111622-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	-1799±111	$5.17^{+2.73}_{-2.80}$	$360^{+25}_{-18}$	$5421^{+2858}_{-915}$	$32541^{+124820}_{-18584}$
Alt.	-462±63	$3.63^{+2.80}_{-2.34}$	$359^{+26}_{-18}$	$4691^{+3111}_{-883}$	$16850^{+113924}_{-11473}$

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

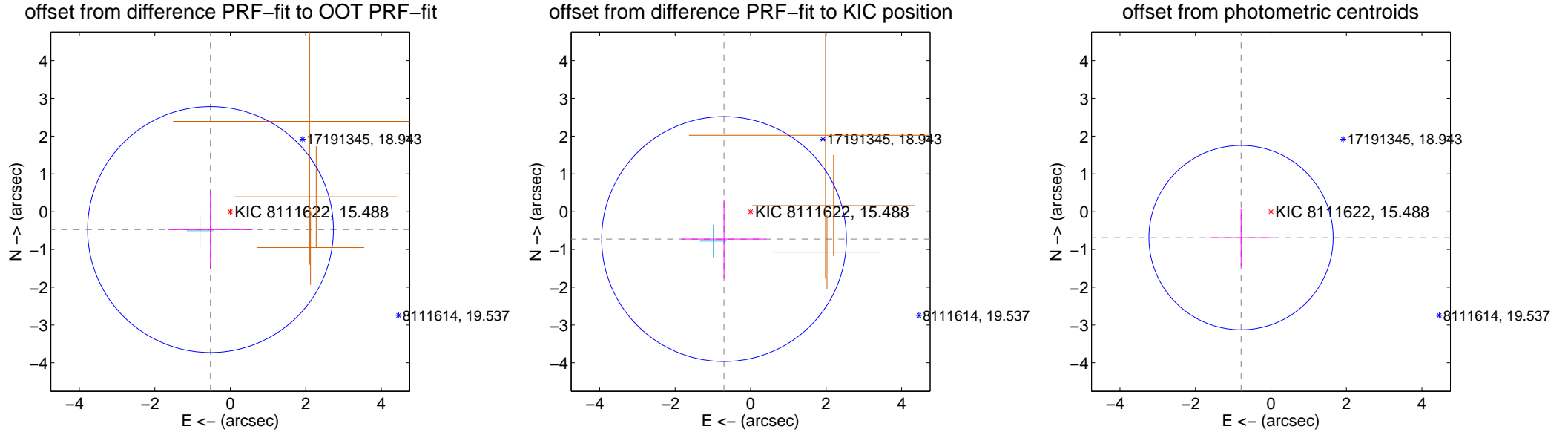
## DV Centroid Data

Supplemental centroid analysis for 008111622-05. Kepler magnitude: 15.49. Transit SNR 7.41

There are 1 quarters with good PRF difference image offsets

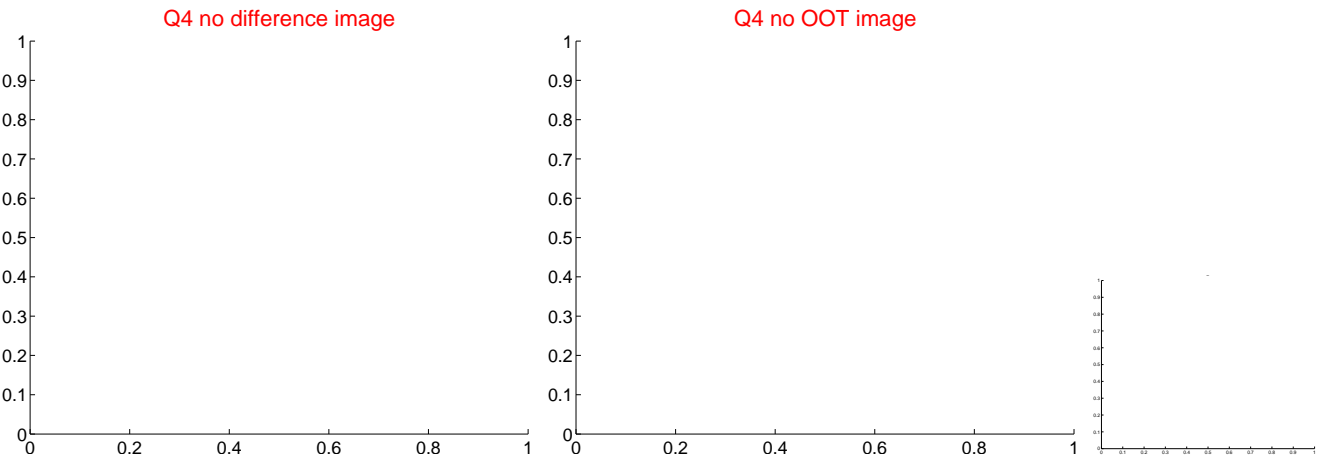
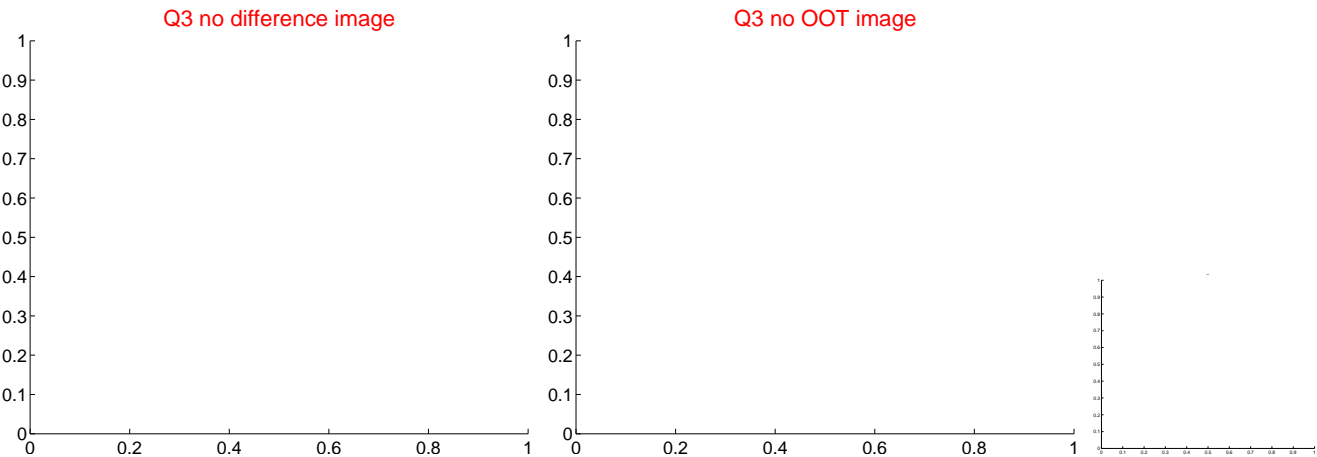
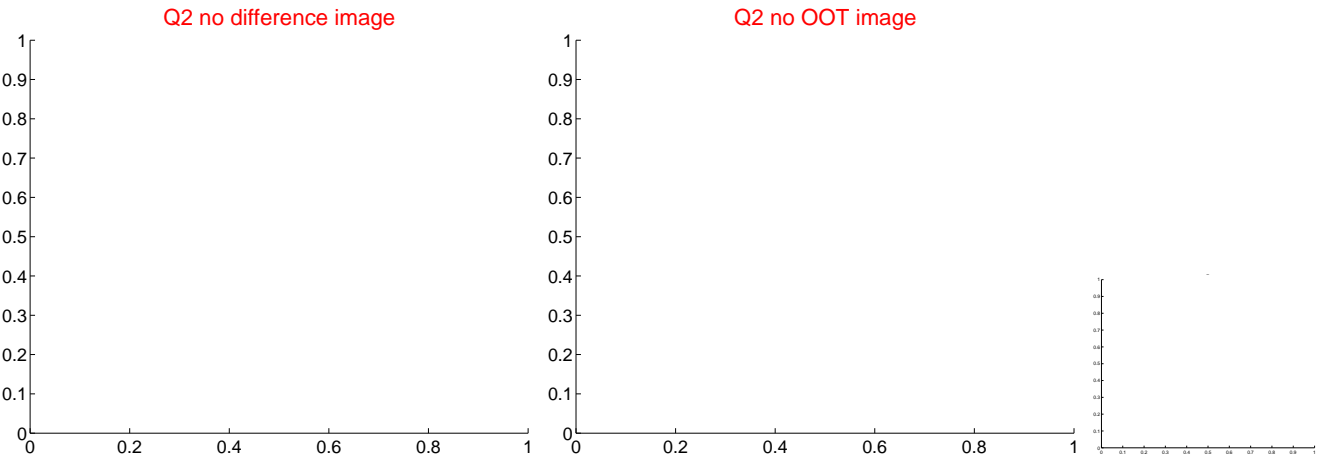
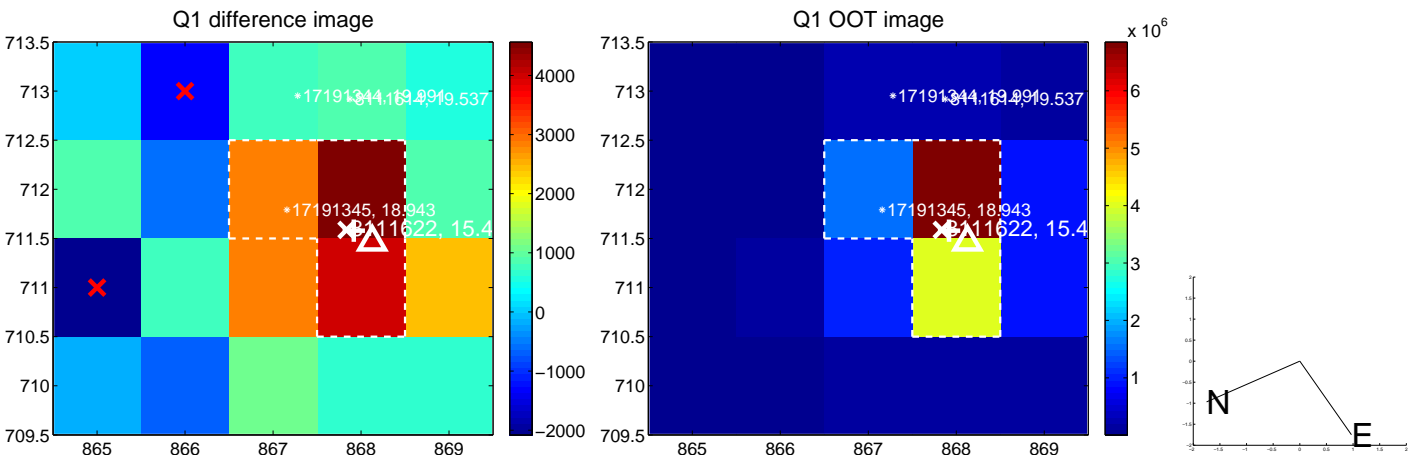
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.706 \pm 1.085$	0.65	$0.524 \pm 1.118$	$-0.473 \pm 1.044$
PRF-fit source offset from KIC position	$1.011 \pm 1.080$	0.94	$0.705 \pm 1.118$	$-0.725 \pm 1.044$
photometric centroid source offset	$1.05 \pm 0.81$	1.29	$0.79 \pm 0.85$	$-0.69 \pm 0.77$

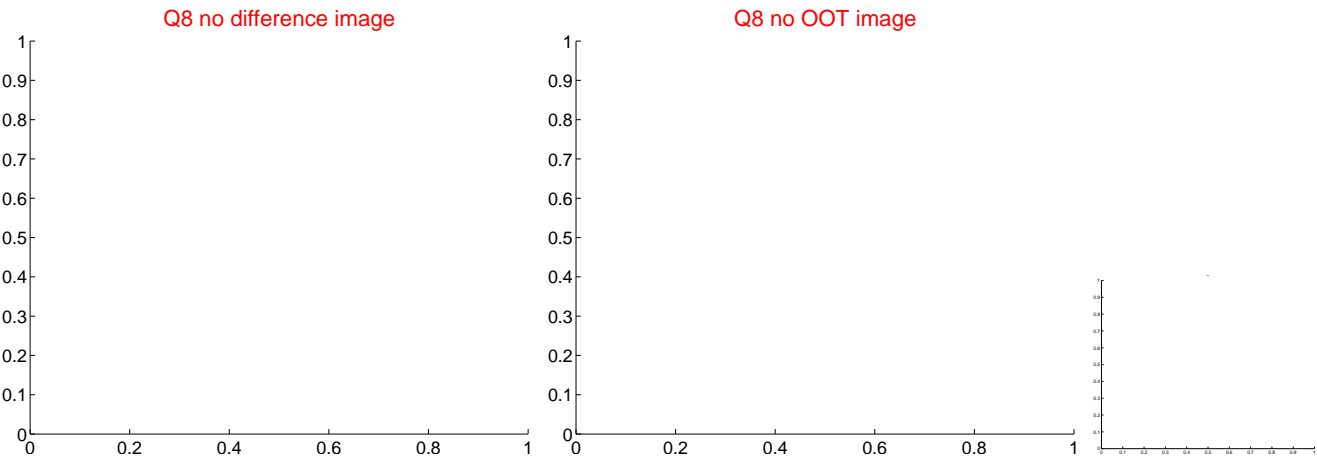
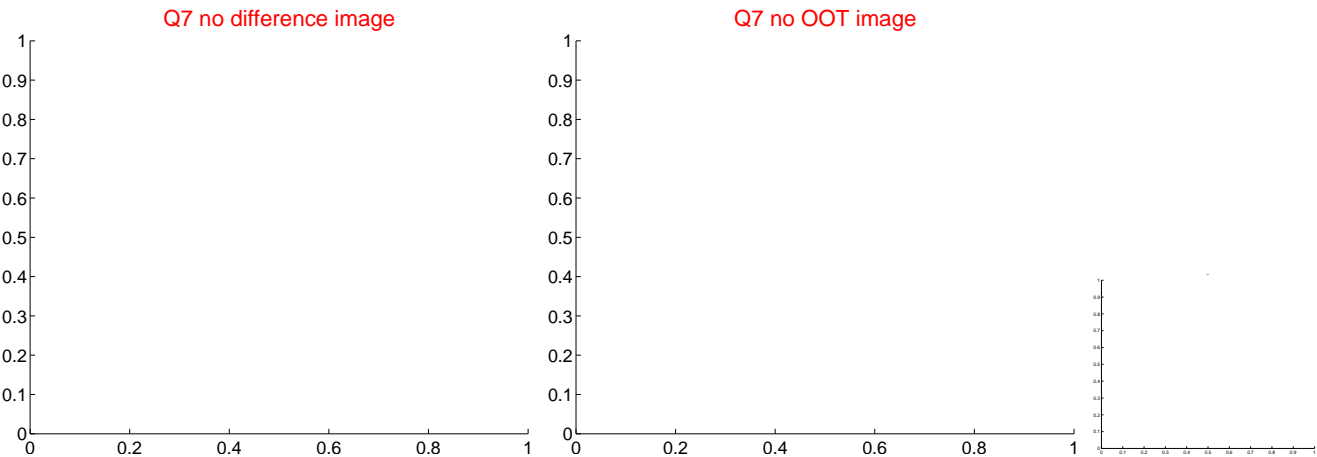
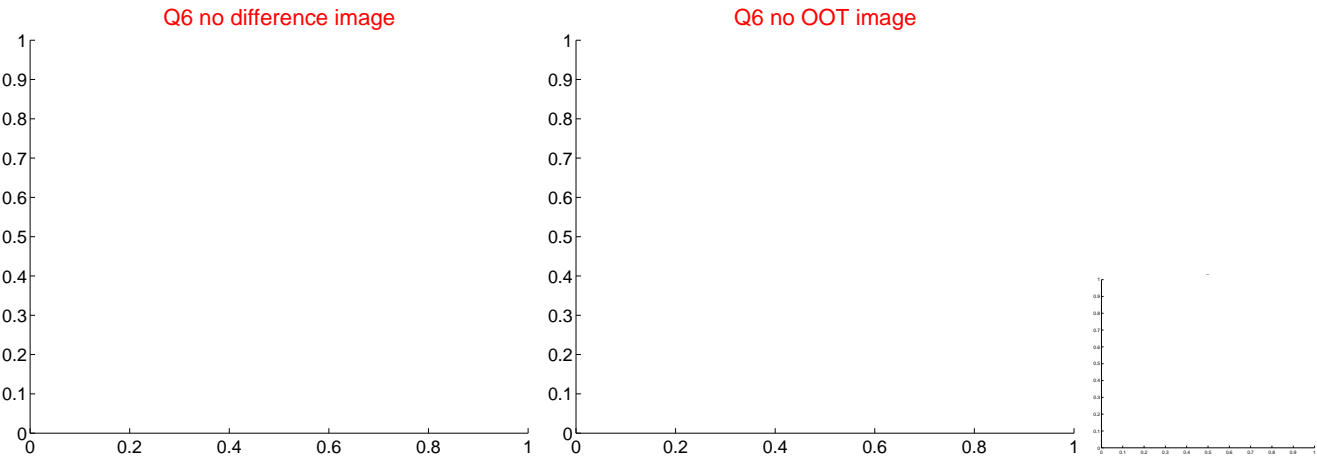
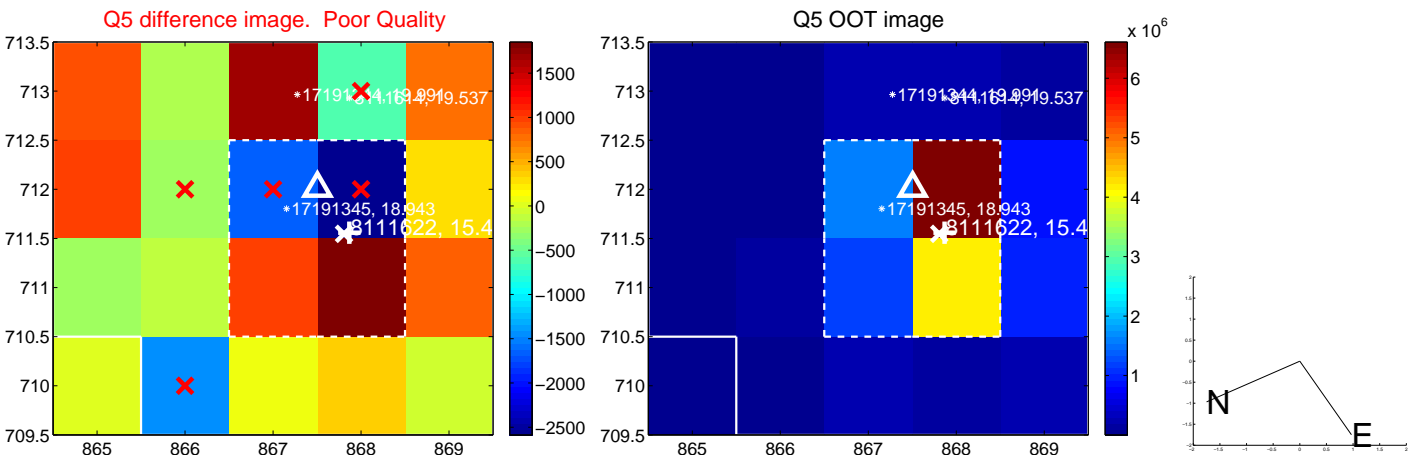


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

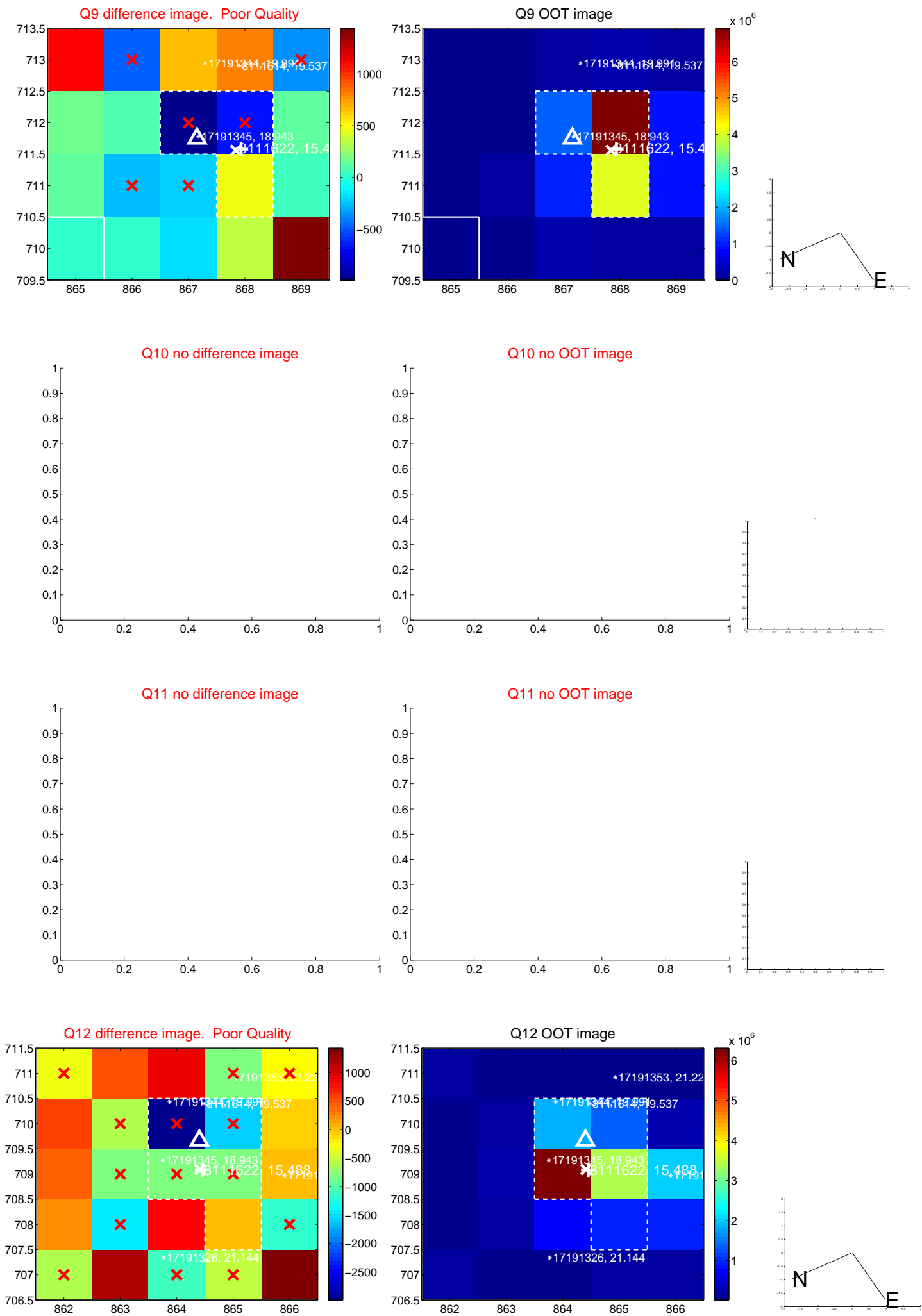
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



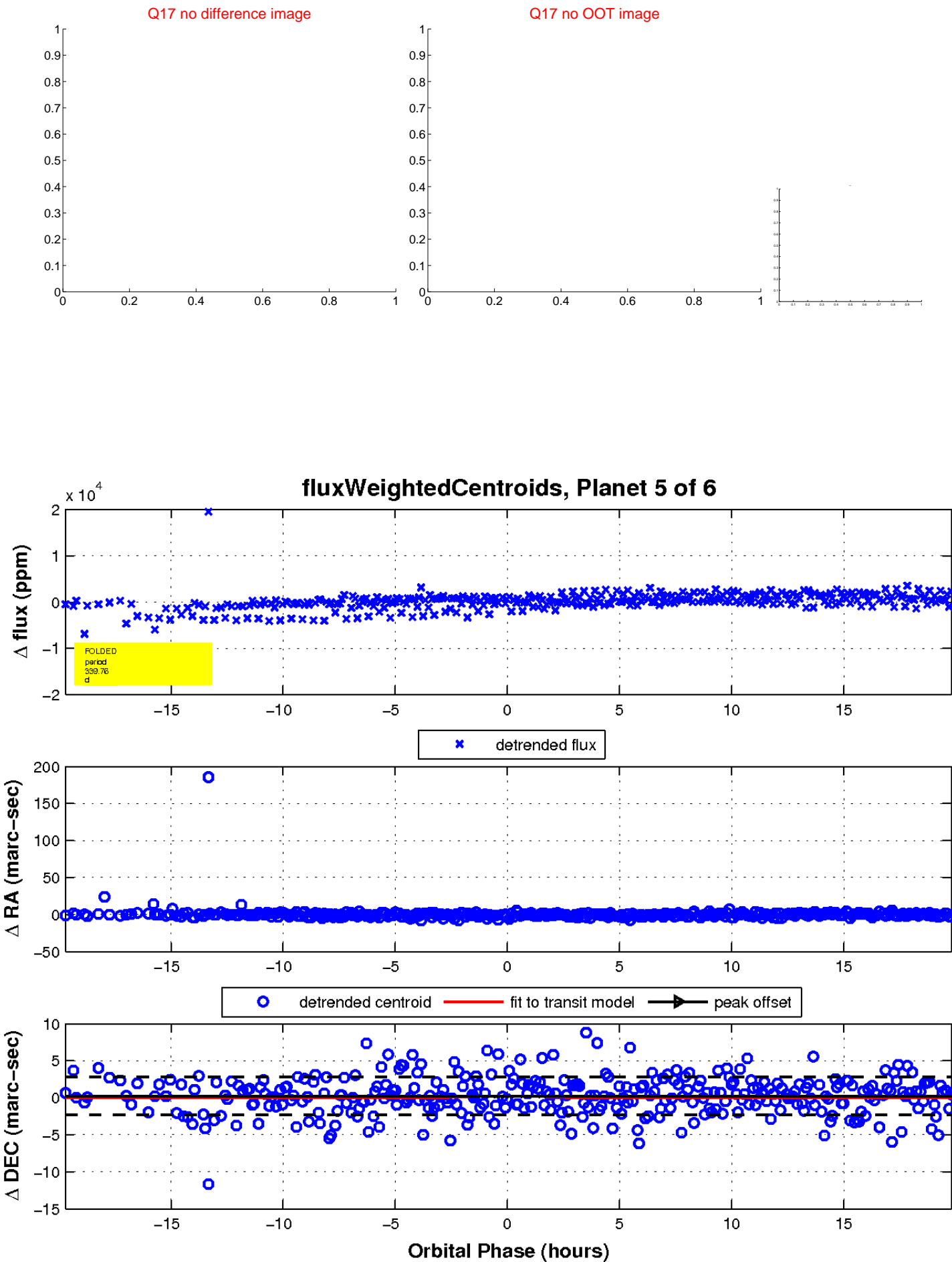
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



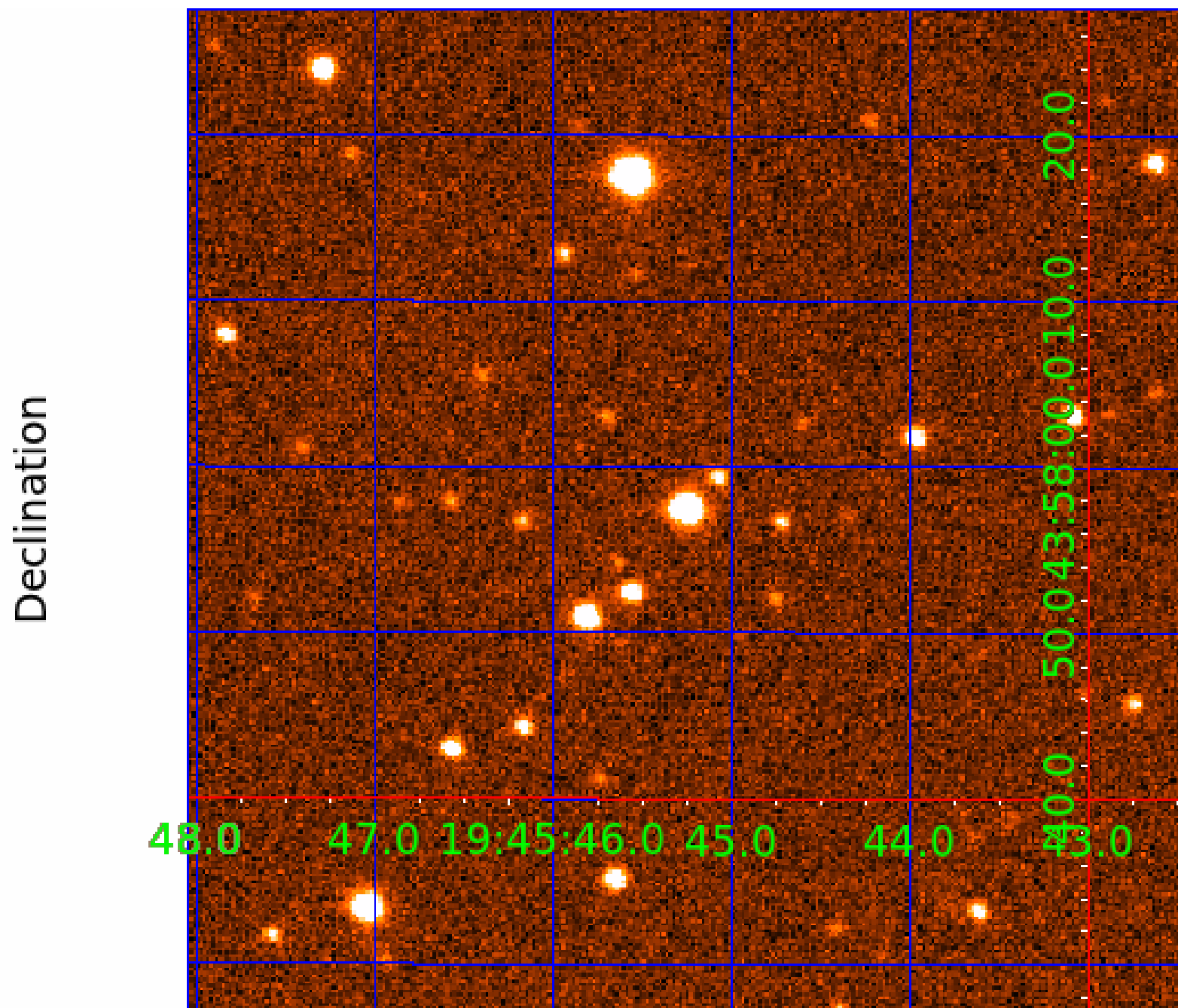
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image





# KIC 008111622

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008111622-01	OBS	6968.01	15.446109	145.532030	324454.7	3.000	9167.1	-1.0	0.90	5838	48.00	57.11
008111622-02	OBS	No	15.446063	132.921345	29042.2	5.005	846.3	812.3	0.90	5838	17.19	57.11
008111622-03	OBS	No	5.148862	135.568763	3.3	3.190	629.2	0.1	0.90	5838	0.19	247.09
008111622-04	OBS	No	5.148855	134.984699	17281.8	15.000	626.6	-1.0	0.90	5838	11.71	247.09
008111622-05	OBS	No	339.756480	146.339456	1522.1	6.611	11.1	7.4	0.90	5838	4.73	0.93
008111622-06	OBS	No	192.159982	310.742053	987.2	10.488	12.9	6.6	0.90	5838	2.94	1.98

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008111622-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_ALT—HAS_SEC_TCE—CENT_NOFITS
008111622-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
008111622-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD—CENT_FEW_MEAS
008111622-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—RESIDUAL_TCE—CENT_NOFITS
008111622-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
008111622-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—INCONSISTENT_TRANS

**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 008111622-06

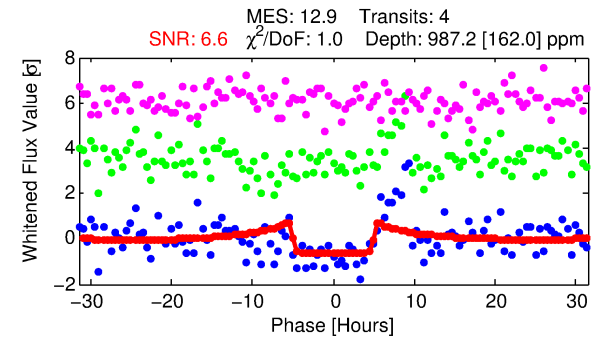
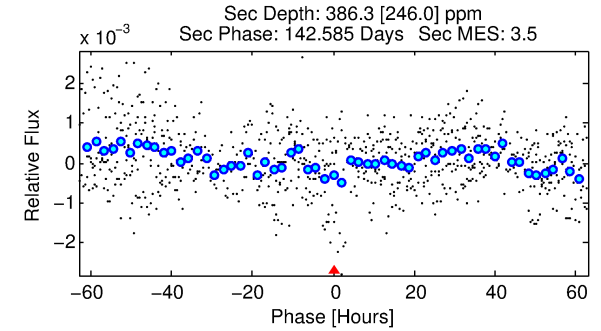
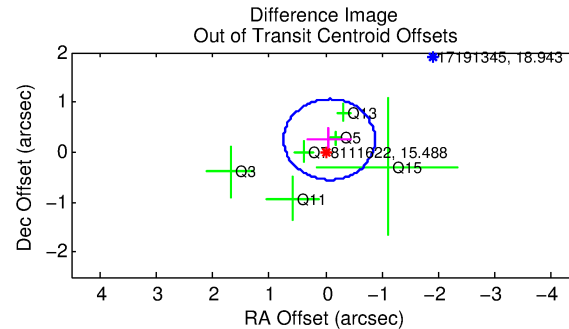
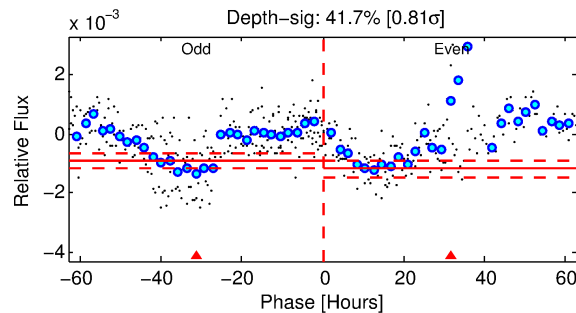
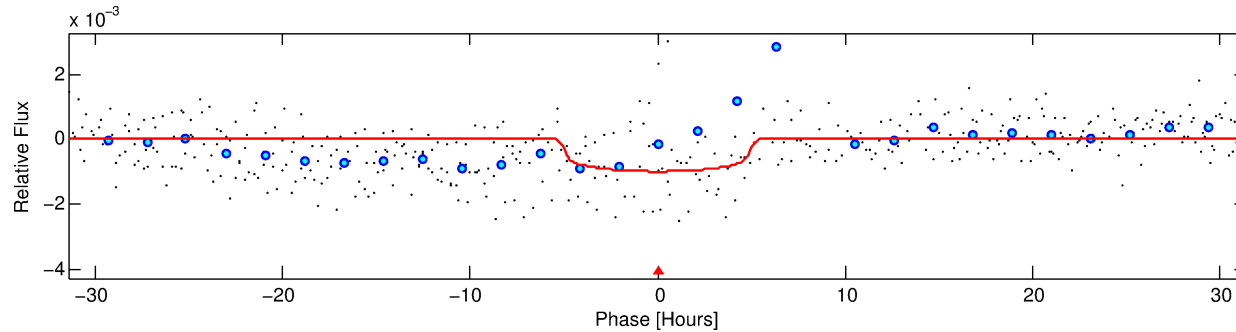
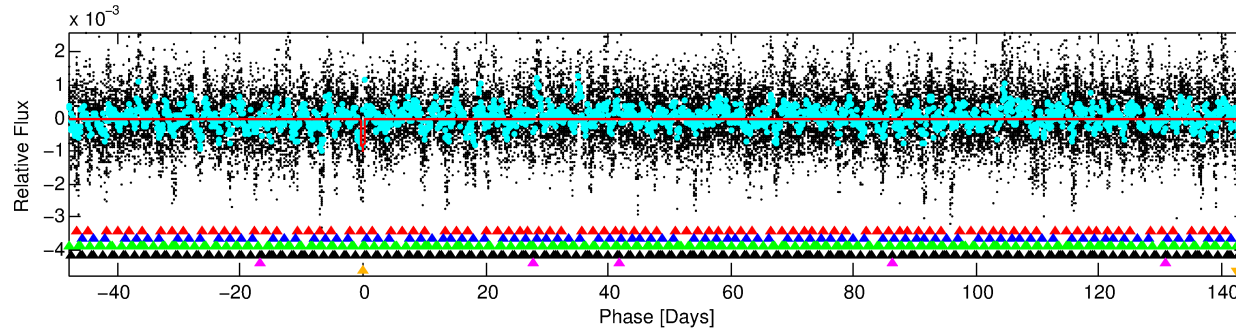
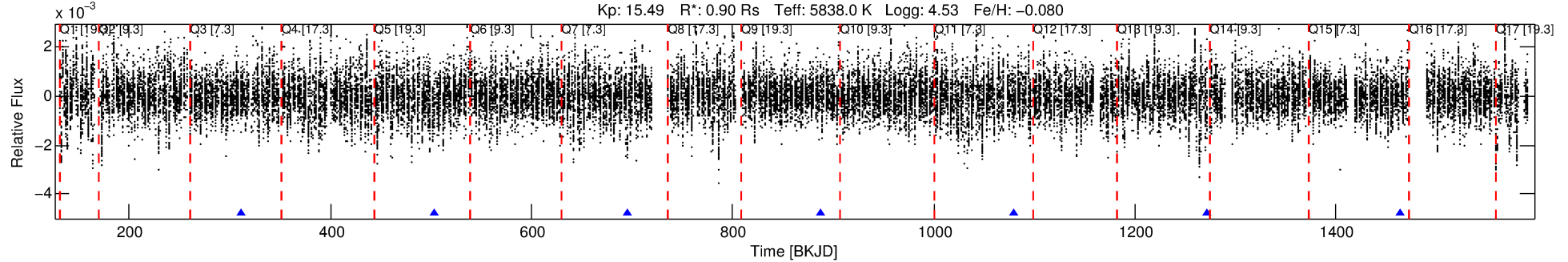
No Significant Match Found

# DV One-Page Summary

KIC: 8111622 Candidate: 6 of 6 Period: 192.160 d

KOI: K06968 Corr: No Ephemeris Match

Kp: 15.49 R\*: 0.90 Rs Teff: 5838.0 K Logg: 4.53 Fe/H: -0.080



## DV Fit Results:

Period = 192.15998 [0.00505] d  
Epoch = 310.7421 [0.0188] BKJD  
Rp/R\* = 0.0301 [0.0105]  
a/R\* = 115.60 [170.77]  
b = 0.62 [1.50]  
Seff = 1.98 [0.80]  
Teq = 303 [31] K  
Rp = 2.94 [1.37] Re  
a = 0.6501 [0.1698] AU  
Ag = 10356.65 [10572.12] [0.98σ]  
Teff = 4718 [1126] K [3.92σ]

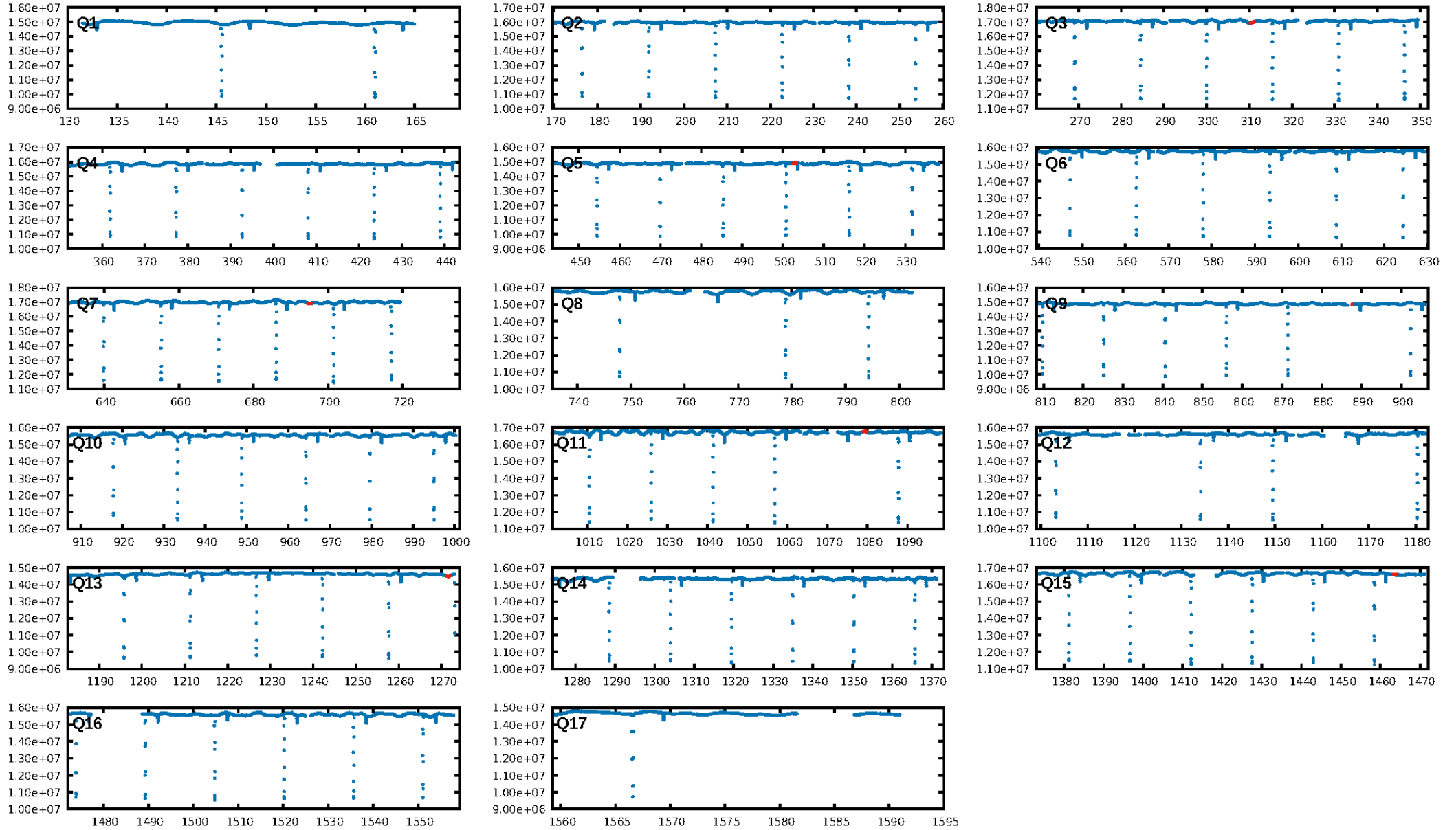
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [388.80σ]  
LongPeriod-sig: 100.0% [285.73σ]  
**ModelChiSquare2-sig: 0.2%**  
ModelChiSquareGof-sig: 99.2%  
Bootstrap-pfa: 7.20e-20  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: -1.676  
Centroid-sig: N/A  
**Centroid-so: 2.511 arcsec [3.05σ]**  
OotOffset-rm: 0.262 arcsec [0.97σ]  
KicOffset-rm: 0.085 arcsec [0.28σ]  
OotOffset-st: 0/4/0/2 [6]  
KicOffset-st: 0/4/0/2 [6]  
DiffImageQuality-fgm: 0.50 [3/6]  
DiffImageOverlap-fno: 0.50 [3/6]

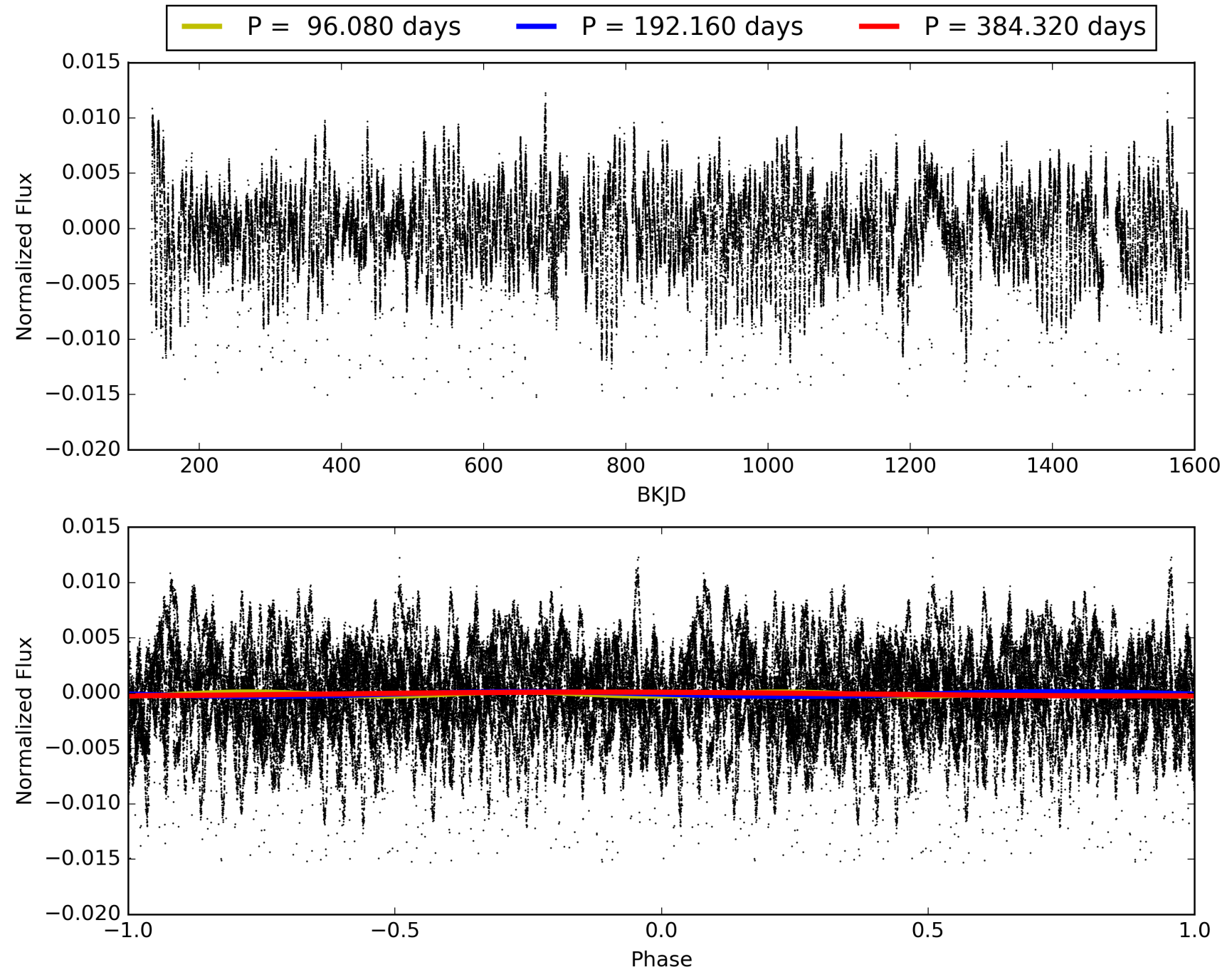
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 14:41:38 Z

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

# TCE 008111622-06, PDC Light Curves

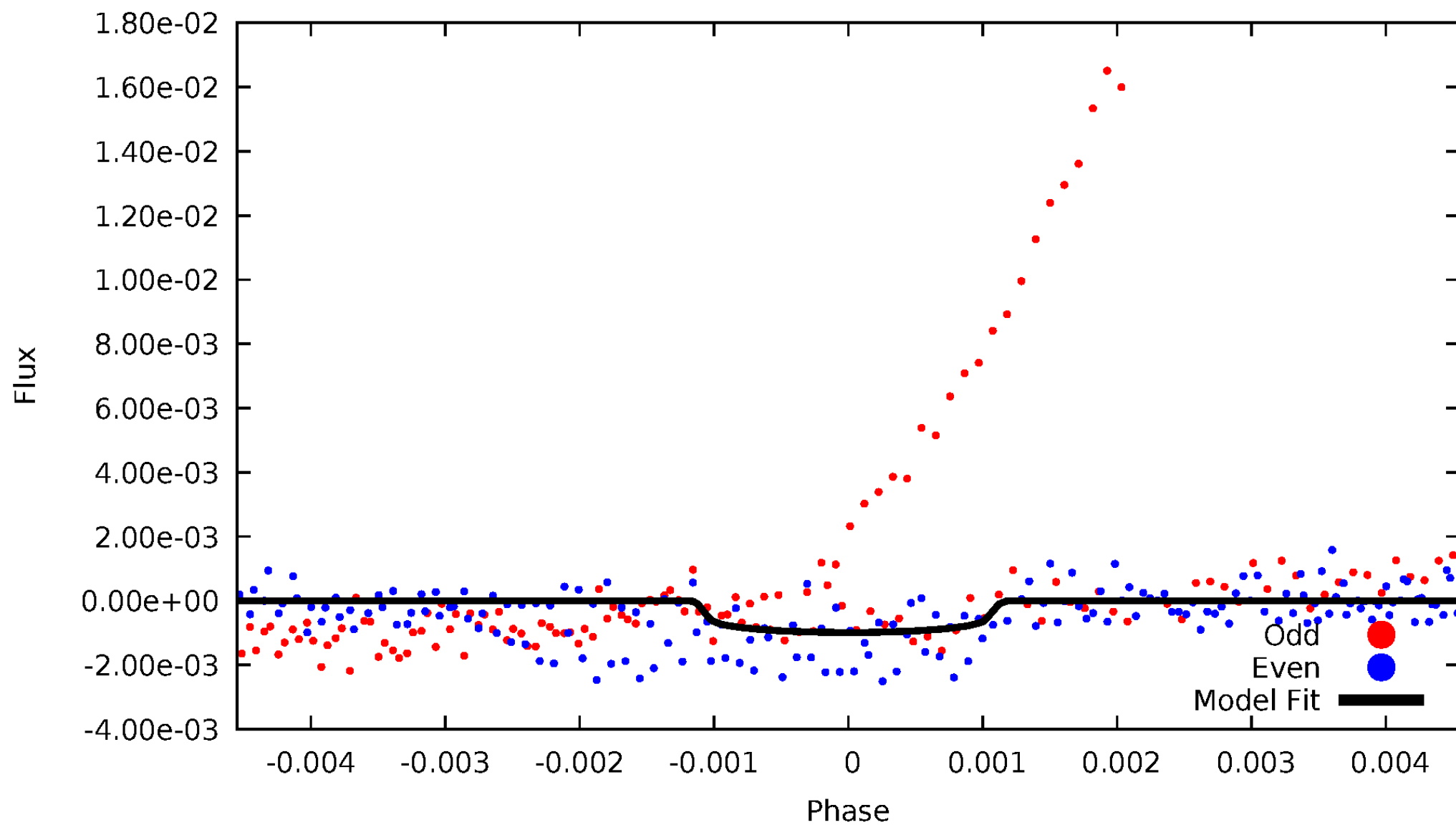


# TCE 008111622-06



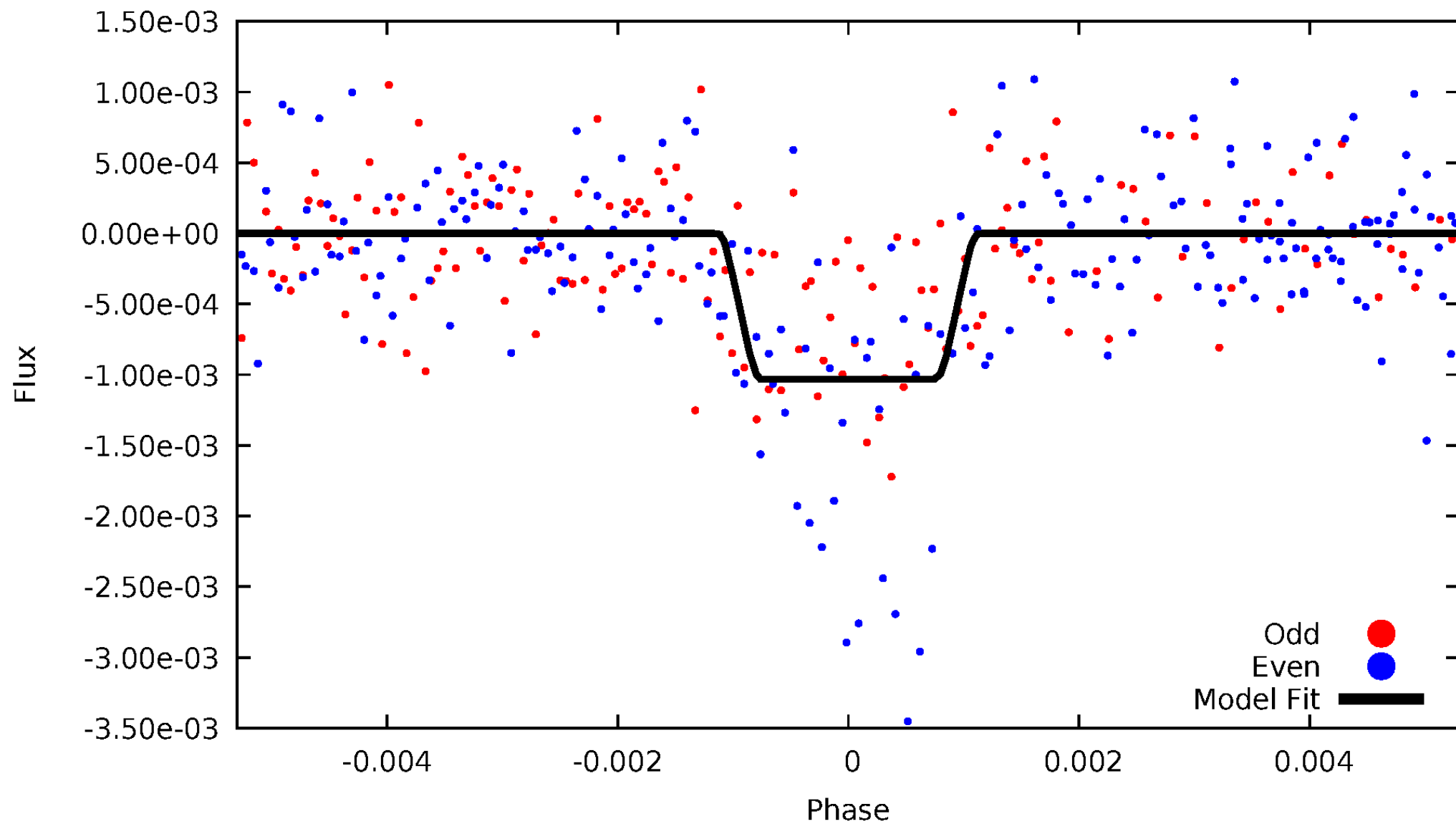
# DV Odd/Even

TCE 008111622-06



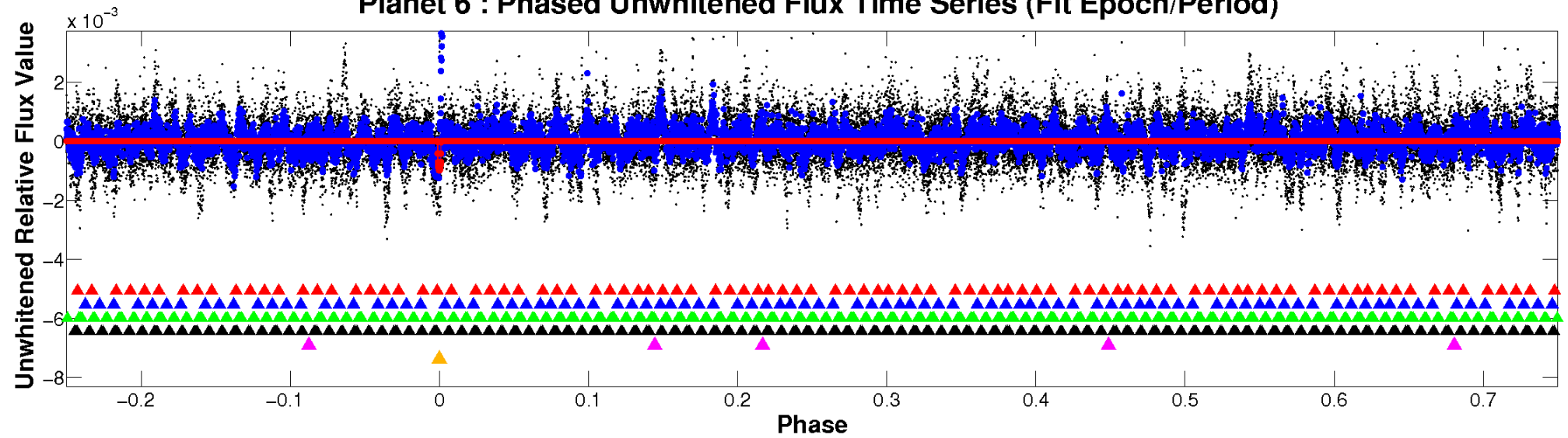
# ALT Odd/Even

TCE 008111622-06

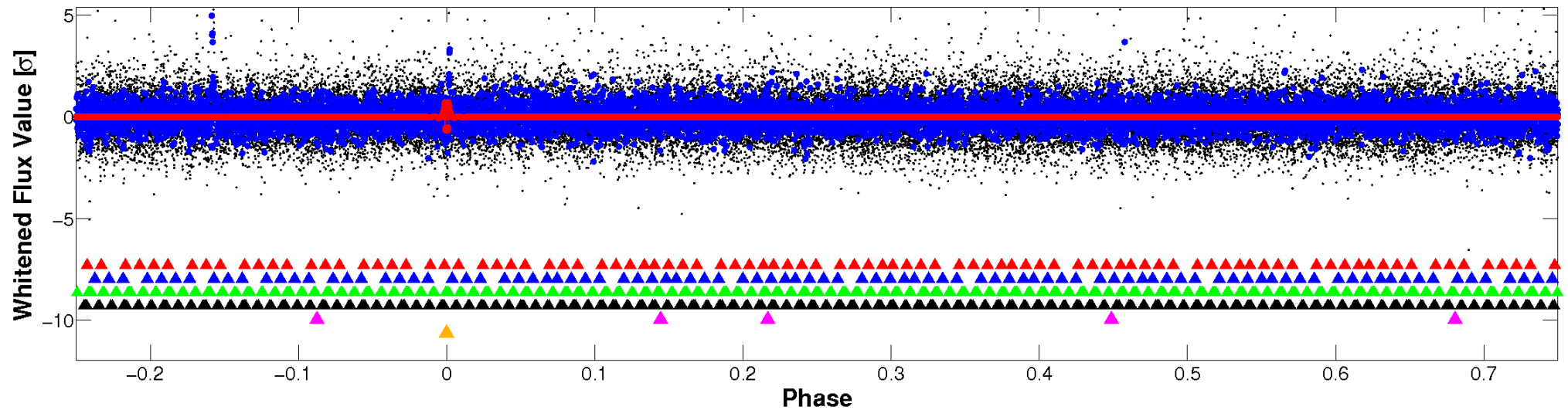


# Non-Whitened Vs. Whitened Light Curve

## Planet 6 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)



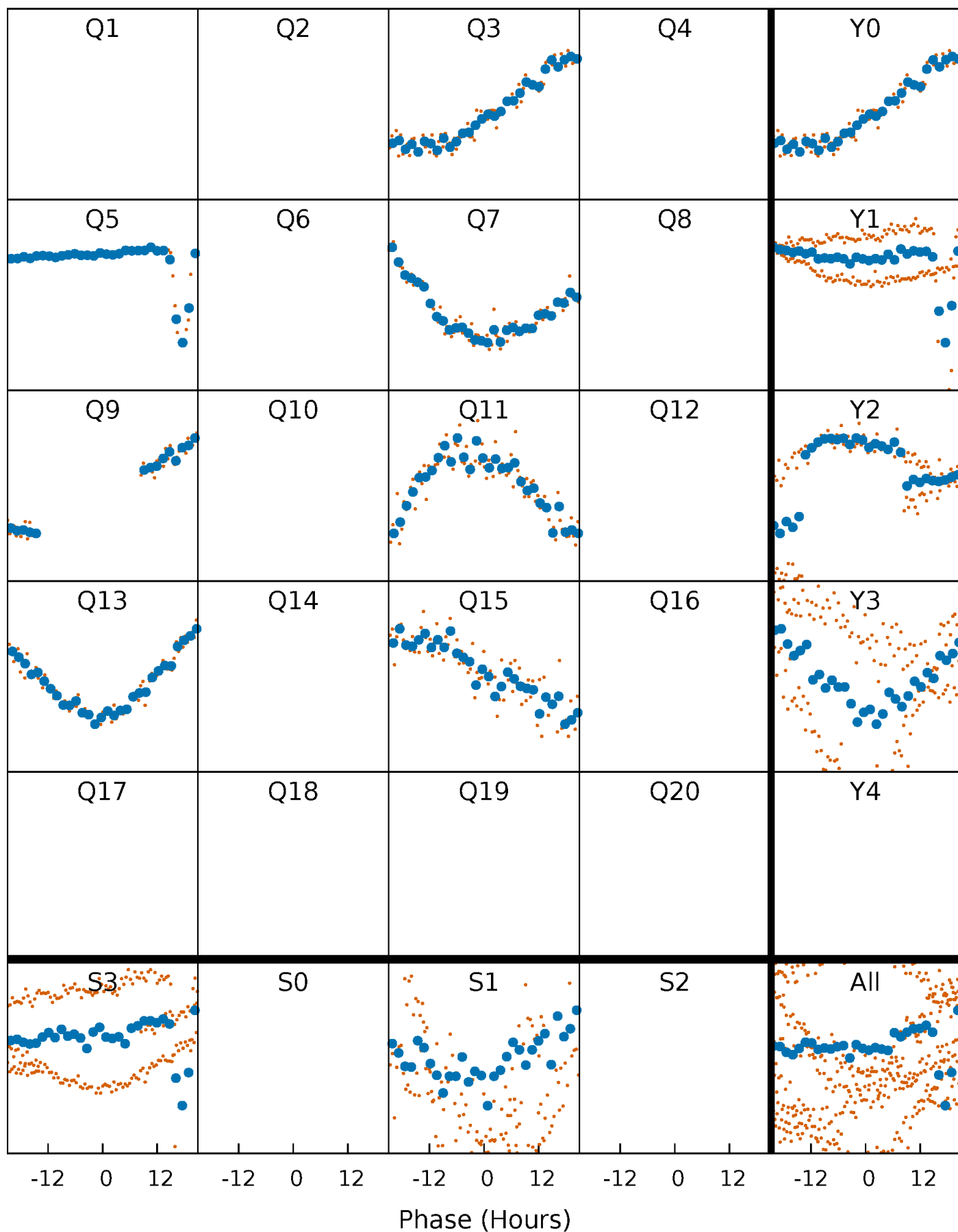
## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

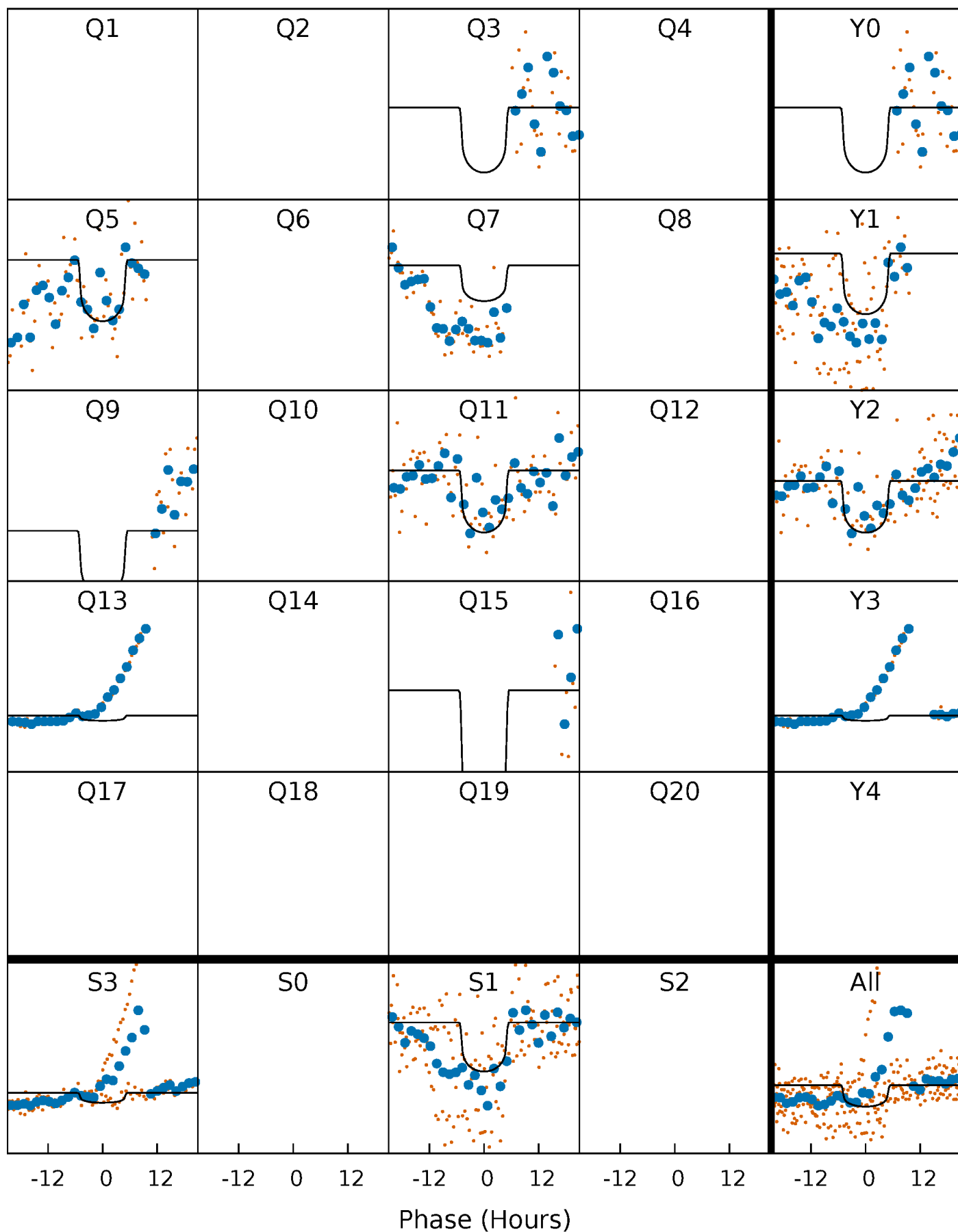
TCE 008111622-06 P=192.159982 Days  $T_0=310.742053$  (BKJD)





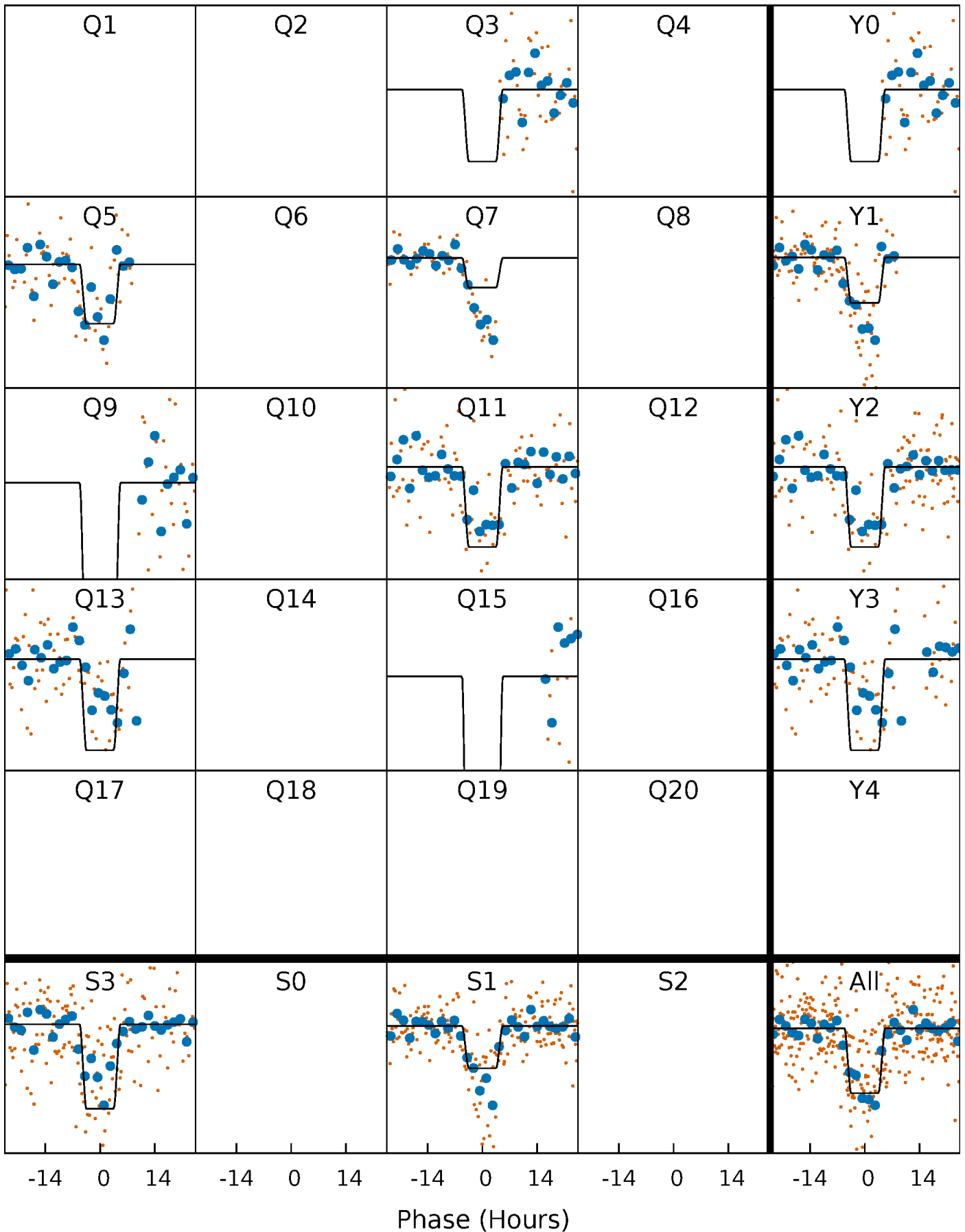
# DV Quarter-Phased Transit Curves

TCE 008111622-06 P=192.159982 Days  $T_0=310.742053$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

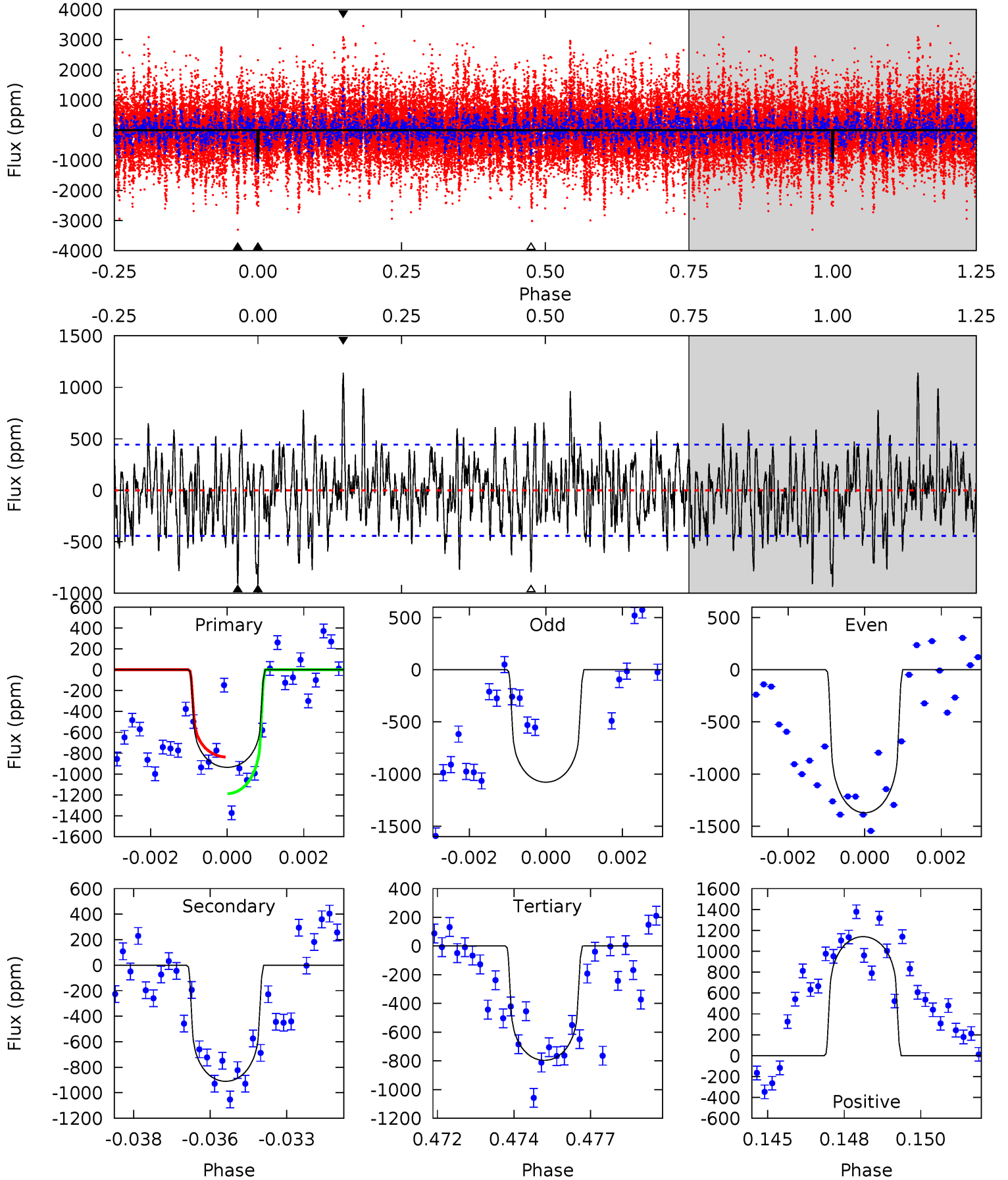
TCE 008111622-06 P=192.150387 Days  $T_0=310.813436$  (BKJD)



# DV Model-Shift Uniqueness Test

008111622-06, P = 192.159982 Days, E = 118.582071 Days

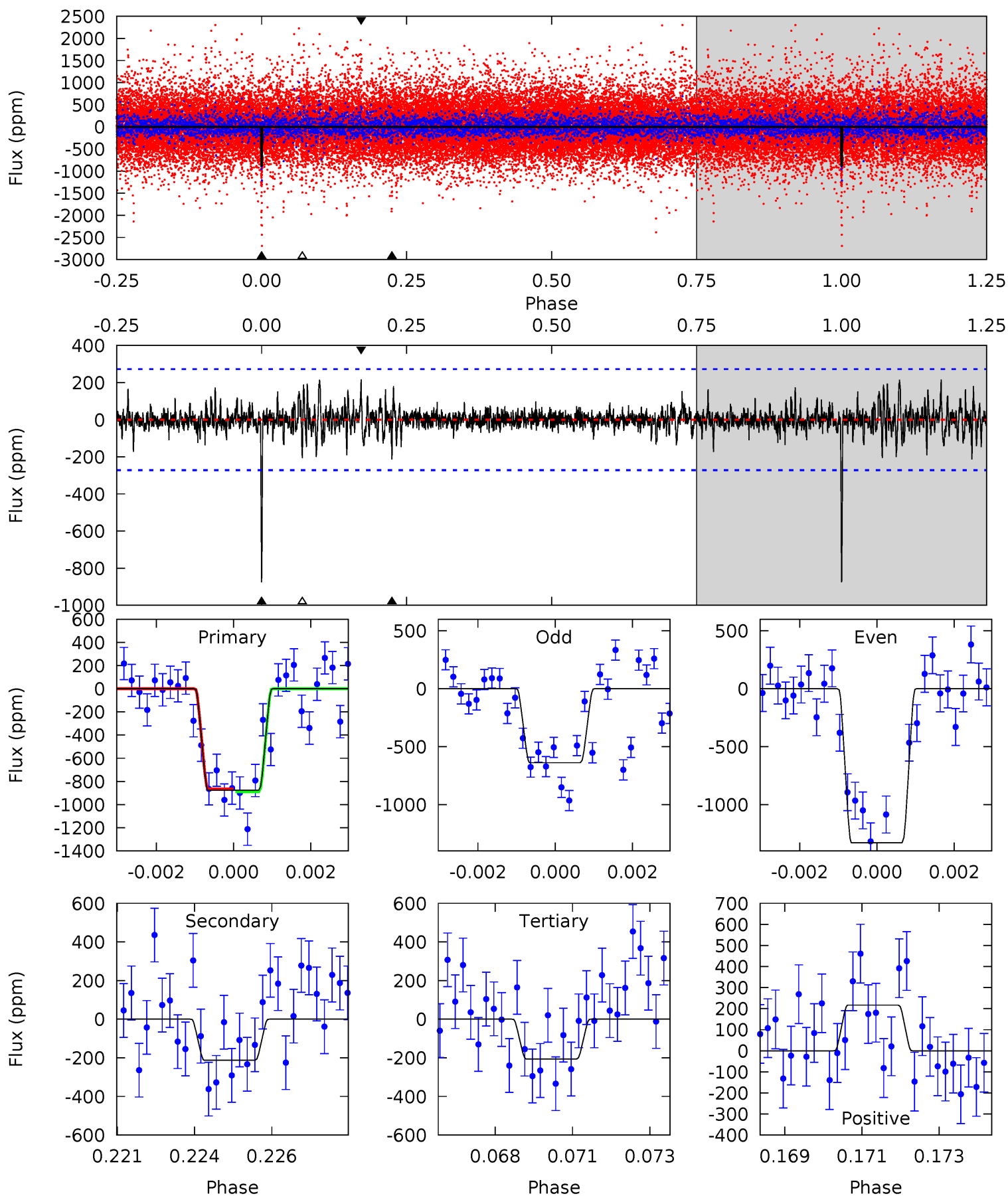
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.2	10.9	9.53	13.6	5.29	3.04	3.27	1.66	-2.45	1.36	-2.75	1.88	0.15	0.55	2.09



# Alt Model-Shift Uniqueness Test

008111622-06, P = 192.150387 Days, E = 118.663049 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	4.15	4.01	4.23	5.30	3.05	0.83	13.0	12.8	0.14	-0.08	6.74	1.07	0.20	0.24



### Stellar Parameters For KIC 008111622

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5838^{+157}_{-192}$	$4.529^{+0.038}_{-0.212}$	$-0.080^{+0.300}_{-0.300}$	$0.897^{+0.275}_{-0.092}$	$0.992^{+0.116}_{-0.127}$	$1.938^{+0.404}_{-1.031}$
	+3%/-3%	+1%/-5%	+375%/-375%	+31%/-10%	+12%/-13%	+21%/-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 008111622-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-910 \pm 84$	$3.07^{+1.20}_{-1.17}$	$432^{+32}_{-20}$	$5867^{+1602}_{-765}$	$22284^{+34591}_{-10773}$
Alt.	$-213 \pm 51$	$3.28^{+1.16}_{-1.08}$	$434^{+29}_{-20}$	$4186^{+752}_{-454}$	$4390^{+5545}_{-2094}$

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

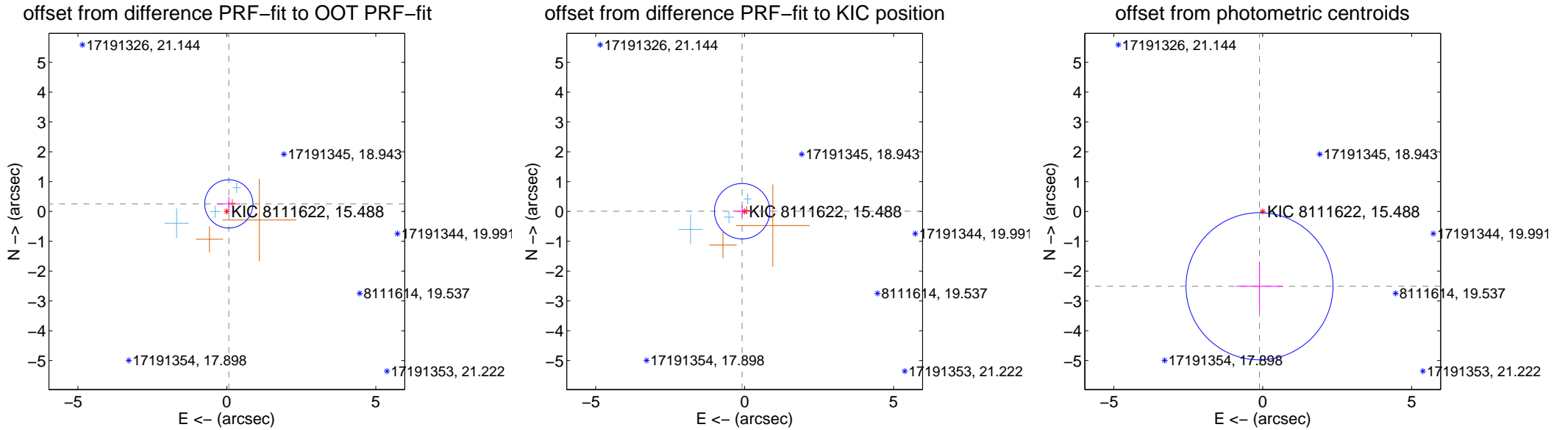
## DV Centroid Data

Supplemental centroid analysis for 008111622-06. Kepler magnitude: 15.49. Transit SNR 6.64

There are 3 quarters with good PRF difference image offsets

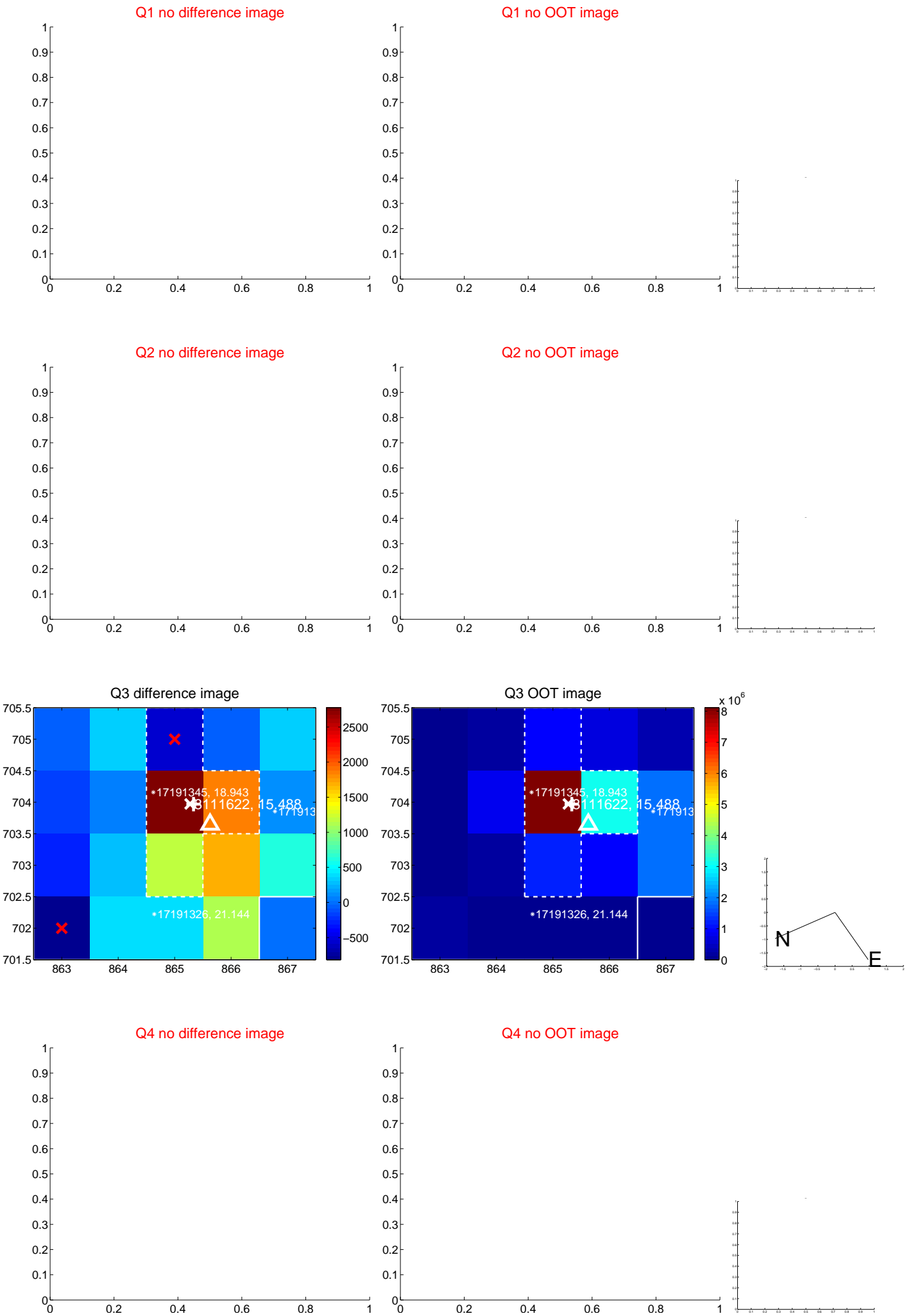
The direct PRF centroid is offset from the target star catalog position by about 0.24 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.262 \pm 0.270$	0.97	$-0.066 \pm 0.388$	$0.254 \pm 0.239$
PRF-fit source offset from KIC position	$0.085 \pm 0.310$	0.28	$0.085 \pm 0.316$	$0.007 \pm 0.204$
photometric centroid source offset	$2.51 \pm 0.82$	3.05	$0.11 \pm 0.79$	$-2.51 \pm 0.82$

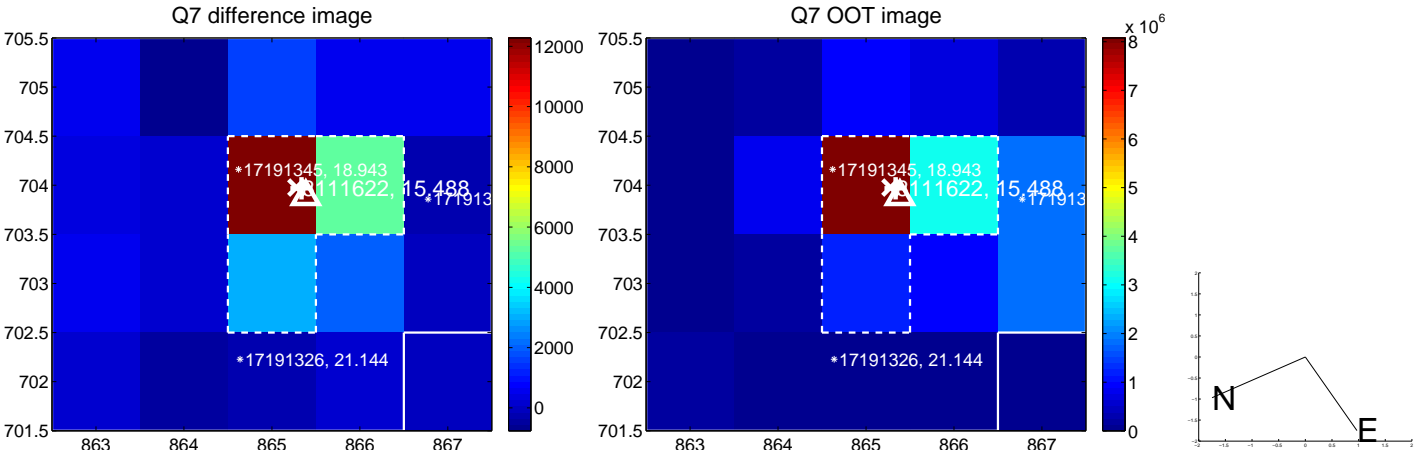
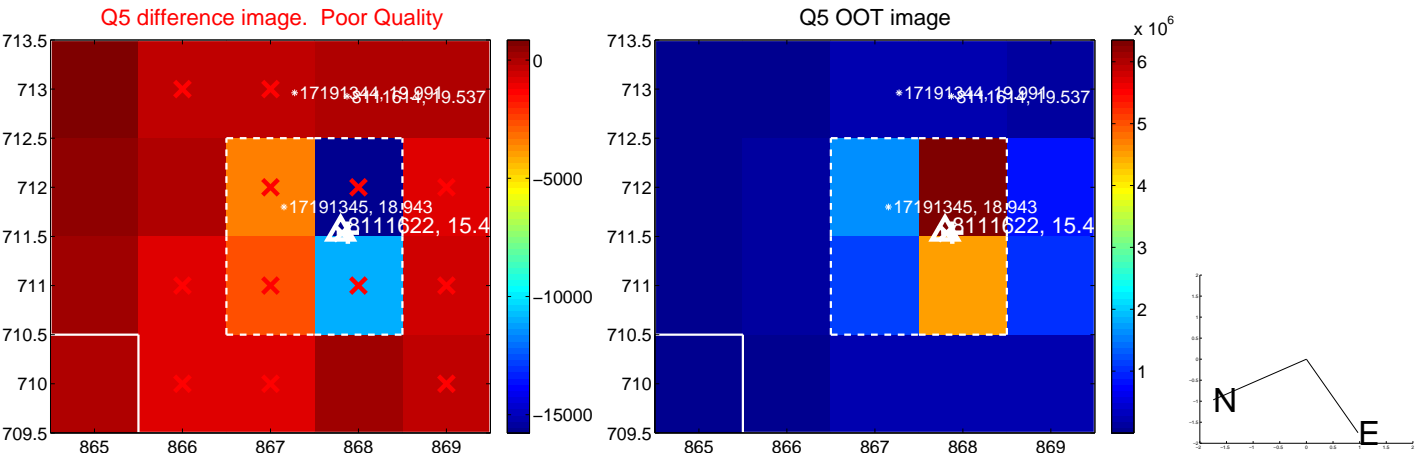


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

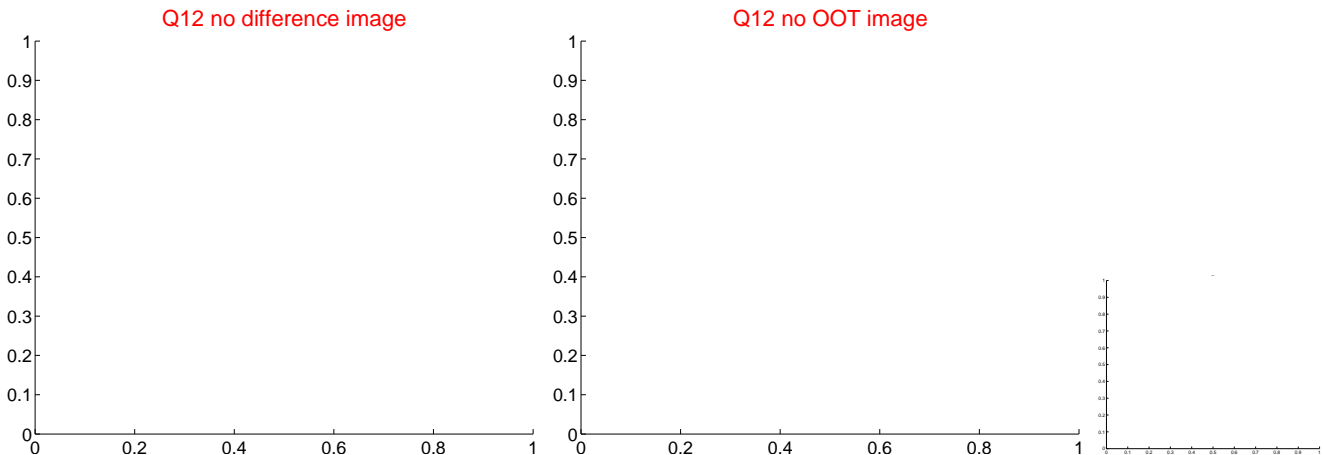
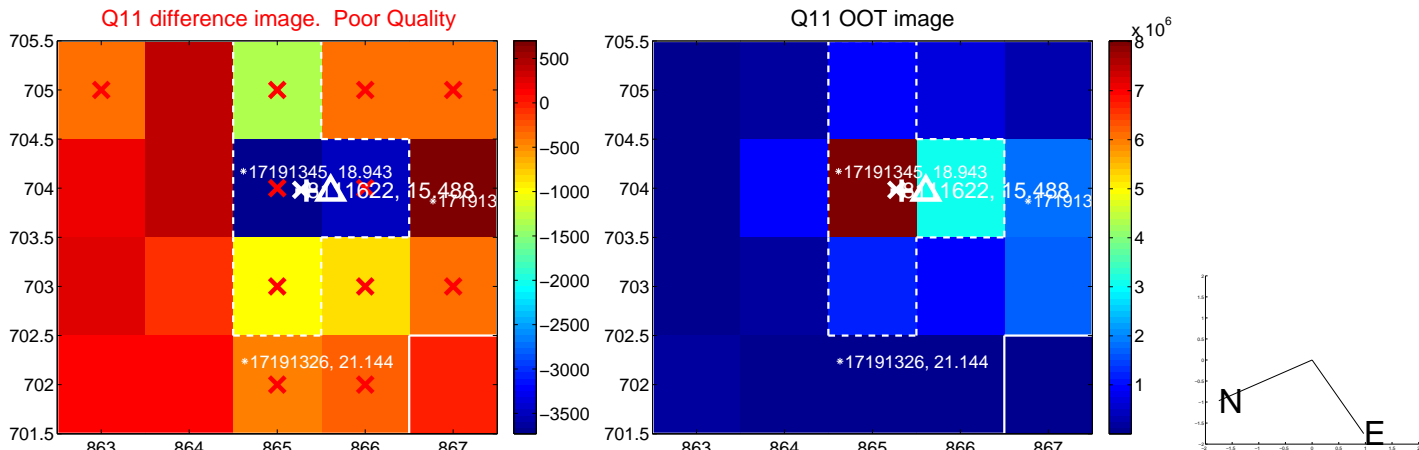
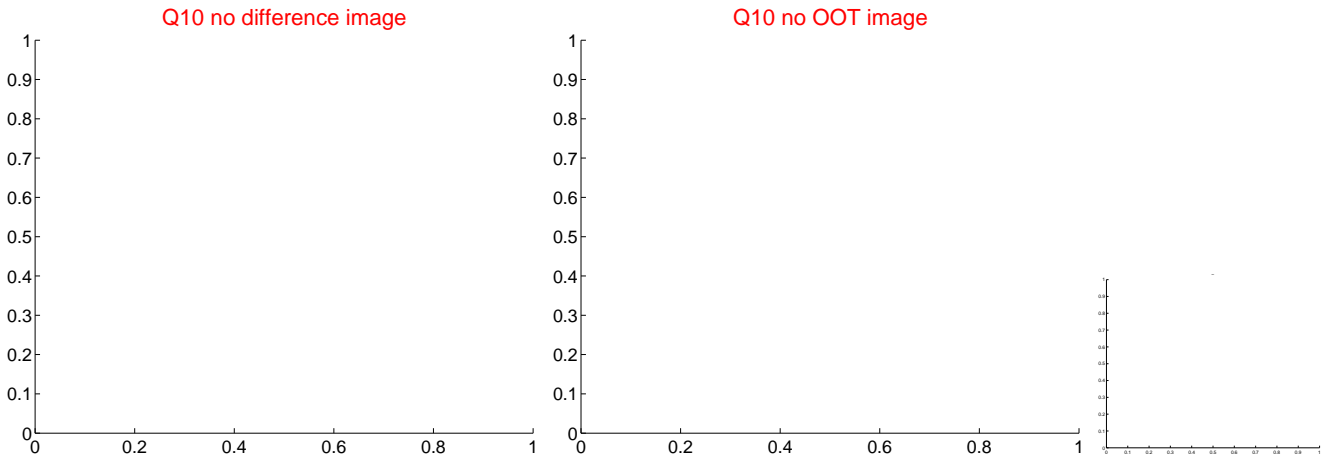
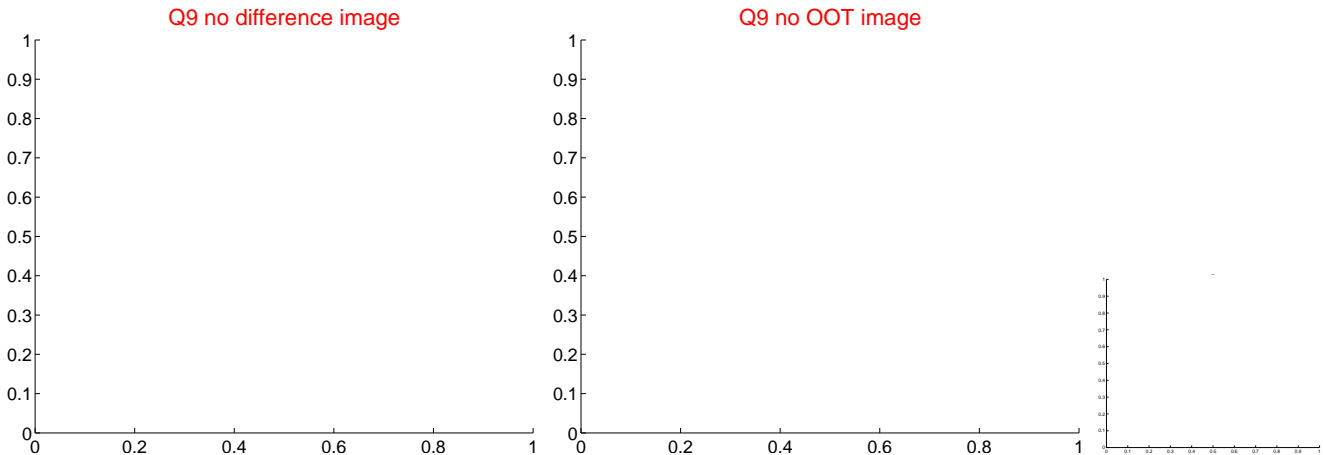


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

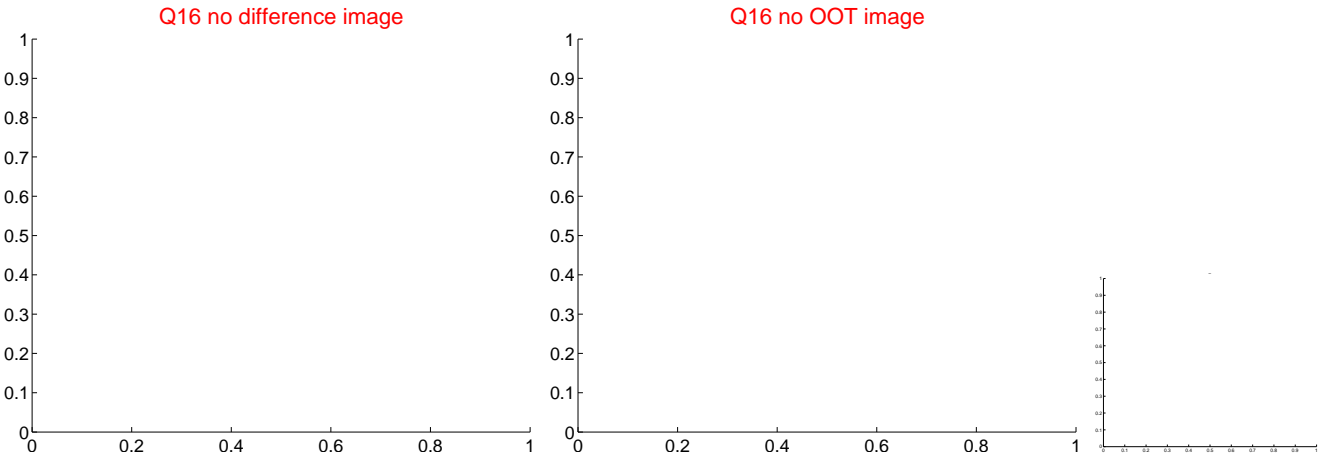
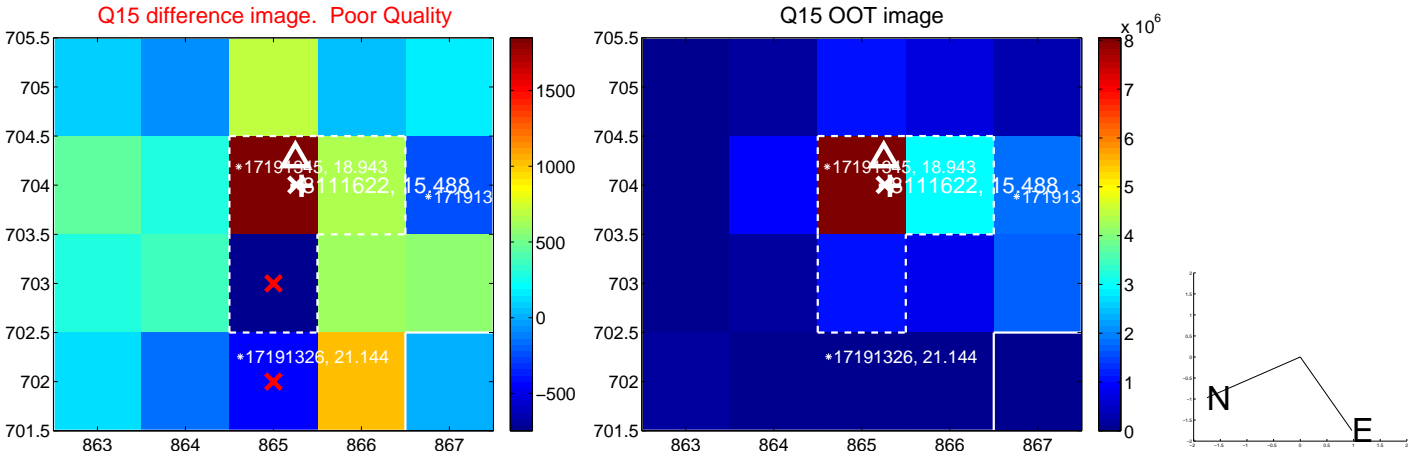
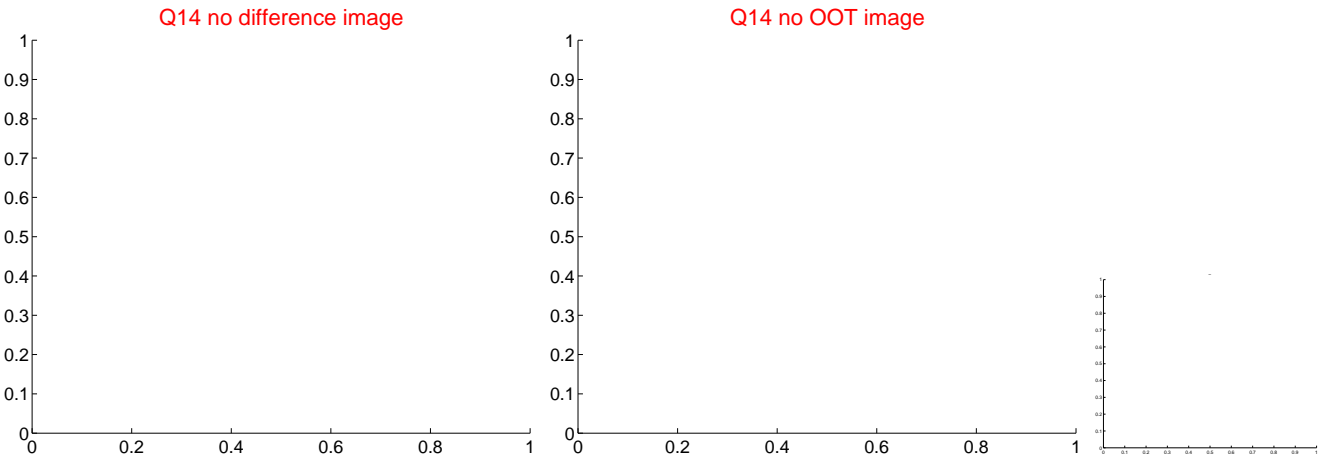
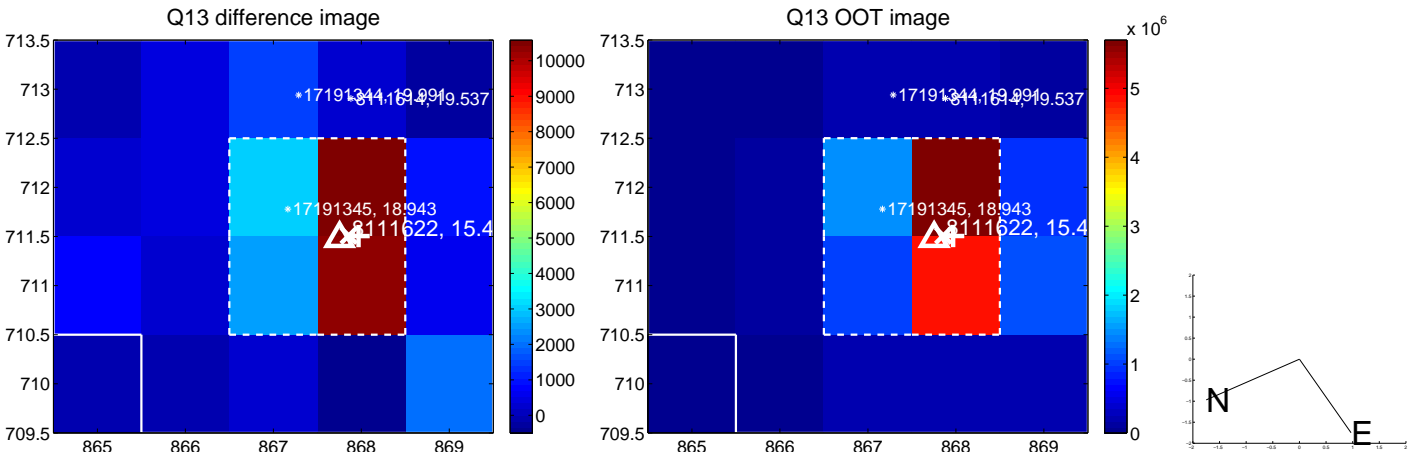




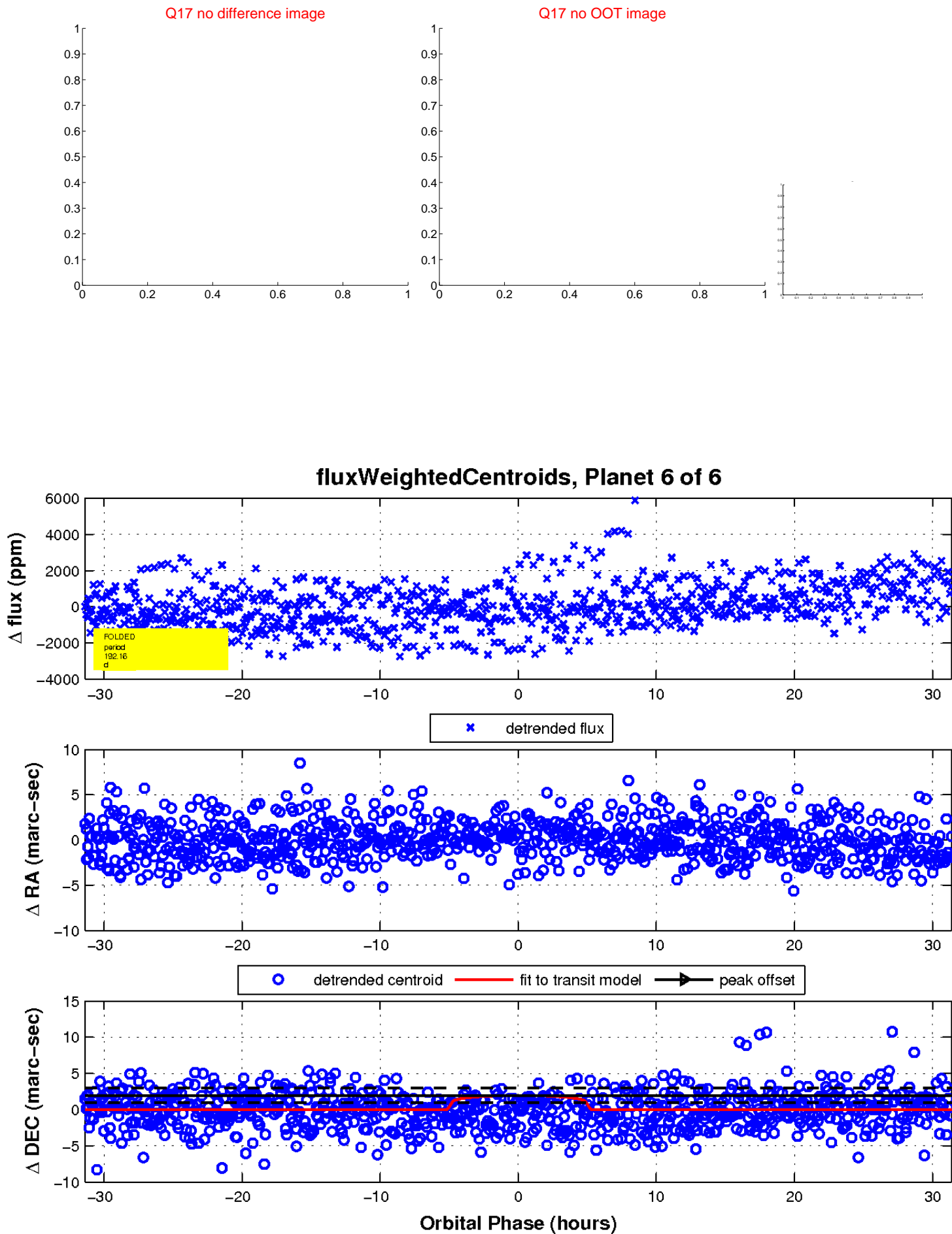
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



white ×: 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.



UKIRT Image

