

# KIC 005955621

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005955621-01	OBS	4624.01	14.080216	137.332160	68.2	3.471	9.4	9.6	1.09	5984	1.04	95.81
005955621-02	OBS	No	372.630075	370.874588	529.1	3.551	8.1	10.8	1.09	5984	2.89	1.22

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005955621-01	OBS	FP	0.00	0	0	1	0	CENT_UNRESOLVED_OFFSET—HALO_GHOST
005955621-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS

**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 005955621-01

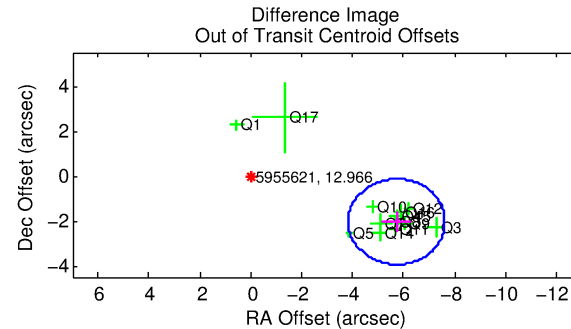
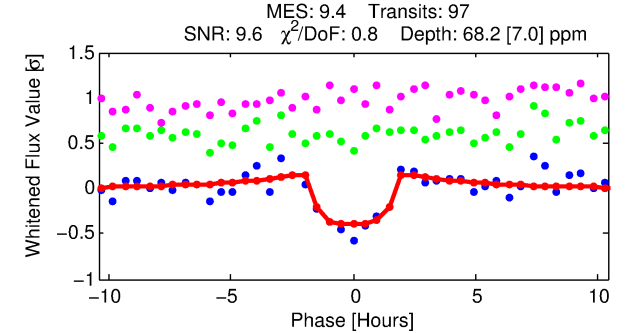
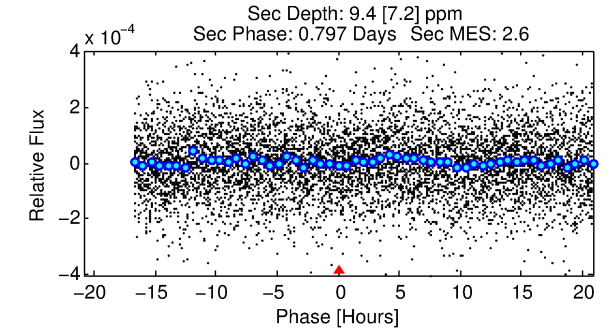
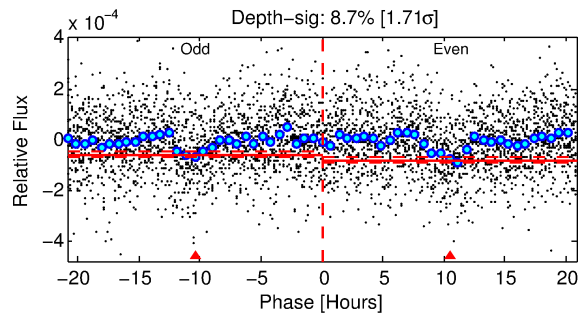
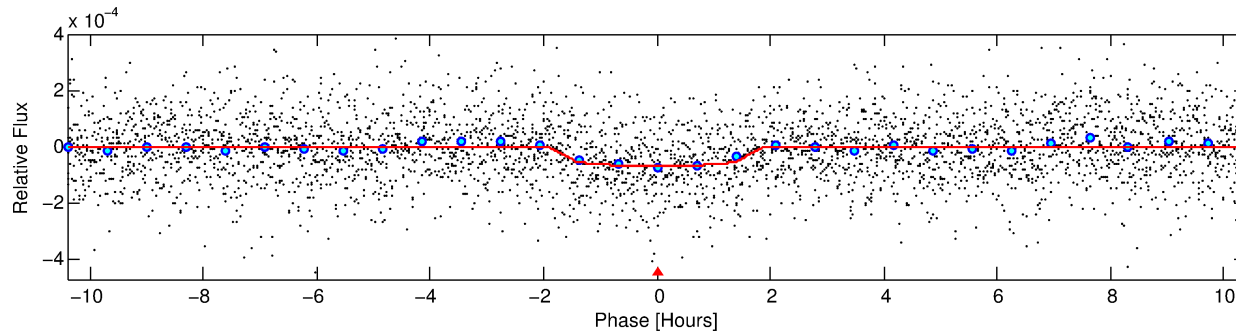
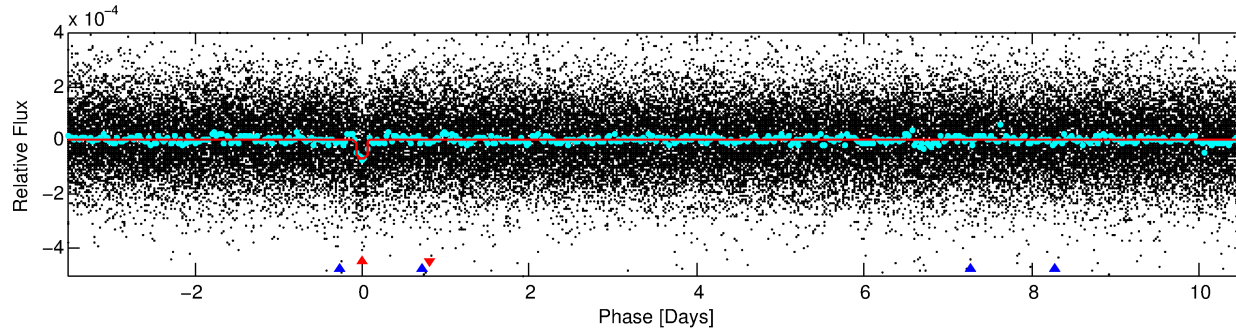
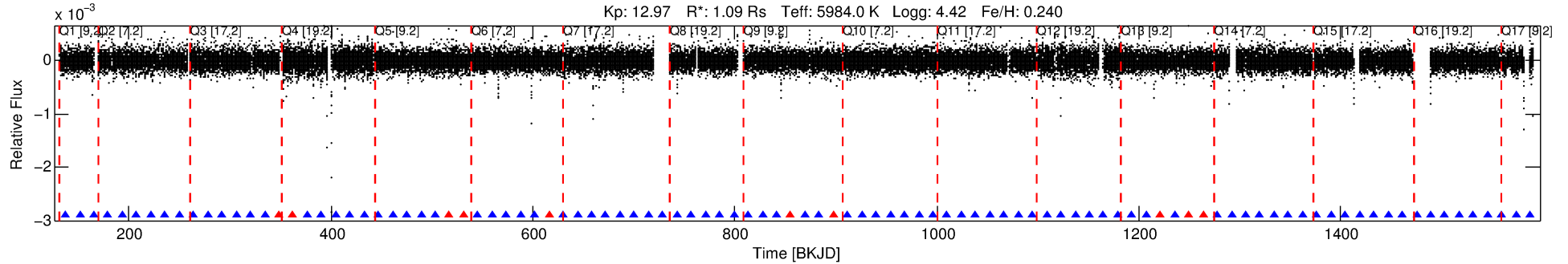
No Significant Match Found

# DV One-Page Summary

KIC: 5955621 Candidate: 1 of 2 Period: 14.080 d

KOI: K04624.01 Corr: 0.953

Kp: 12.97 R\*: 1.09 Rs Teff: 5984.0 K Logg: 4.42 Fe/H: 0.240



## DV Fit Results:

Period = 14.08022 [0.00010] d  
Epoch = 137.3322 [0.0058] BKJD  
Rp/R\* = 0.0087 [0.0043]  
a/R\* = 16.05 [37.59]  
b = 0.87 [0.69]  
Seff = 95.81 [20.03]  
Teff = 798 [42] K  
Rp = 1.04 [0.53] Re  
a = 0.1192 [0.0158] AU  
Ag = 68.14 [85.75] [0.78σ]  
Teffp = 3544 [1102] K [2.49σ]

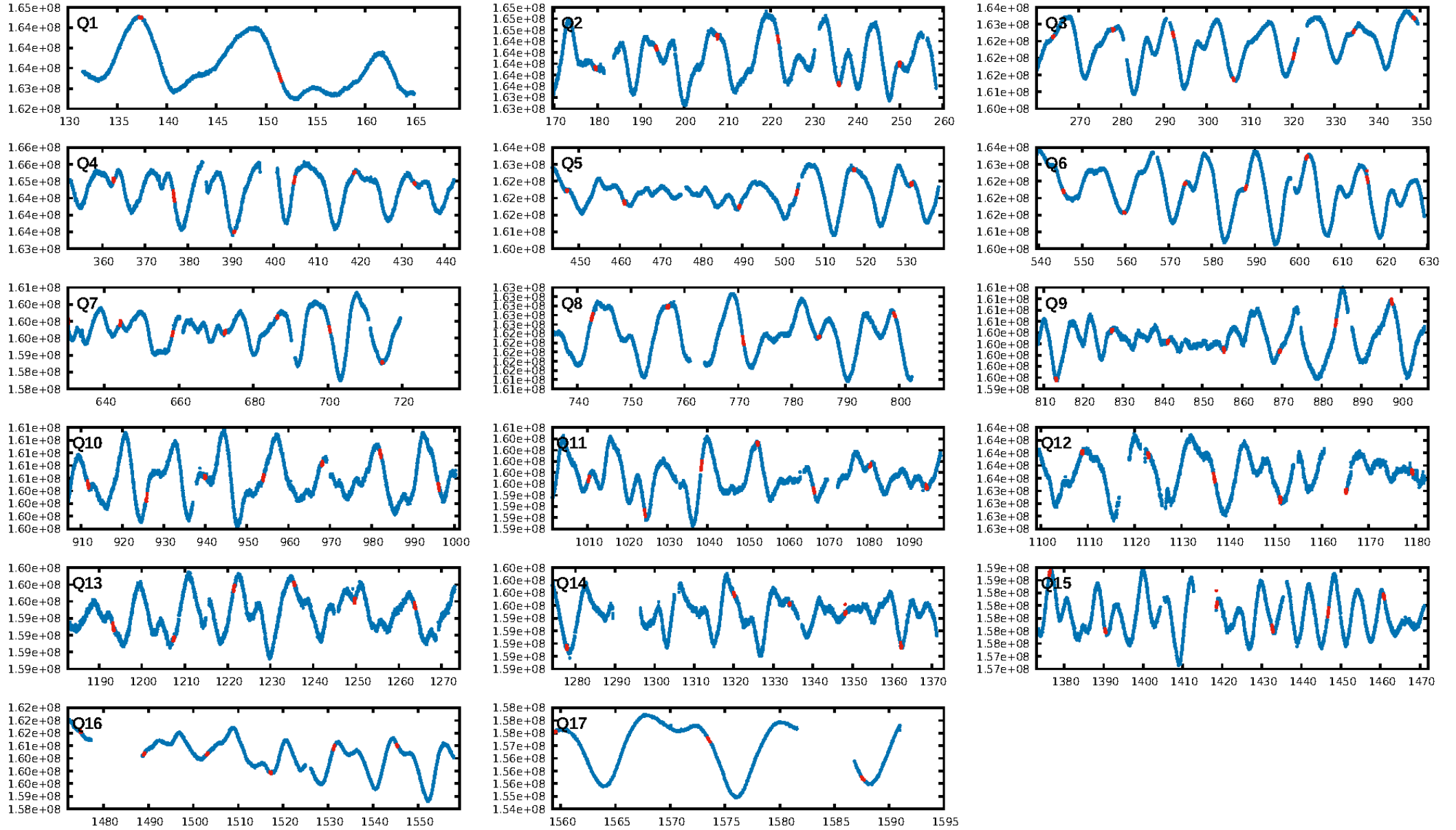
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [1733.00σ]  
ModelChiSquare2-sig: 99.8%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 7.96e-20  
RollingBand-fgt: 0.89 [82/92]  
GhostDiagnostic-chr: 0.1876  
Centroid-sig: 0.0%  
Centroid-so: 9.047 arcsec [9.13σ]  
OotOffset-rm: 6.079 arcsec [9.57σ]  
KicOffset-rm: 6.012 arcsec [8.91σ]  
OotOffset-st: 2/4/4/4 [14]  
KicOffset-st: 2/4/4/4 [14]  
DiffImageQuality-fgm: 0.64 [9/14]  
DiffImageOverlap-fno: 1.00 [17/17]

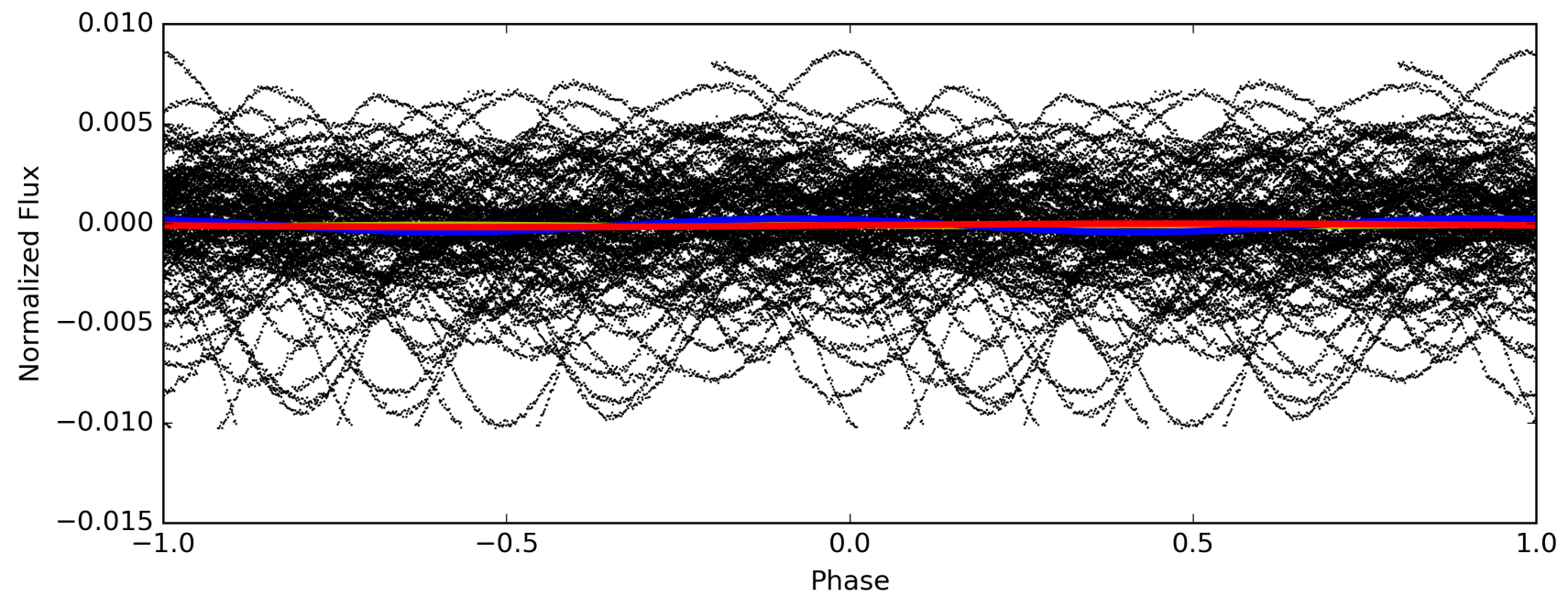
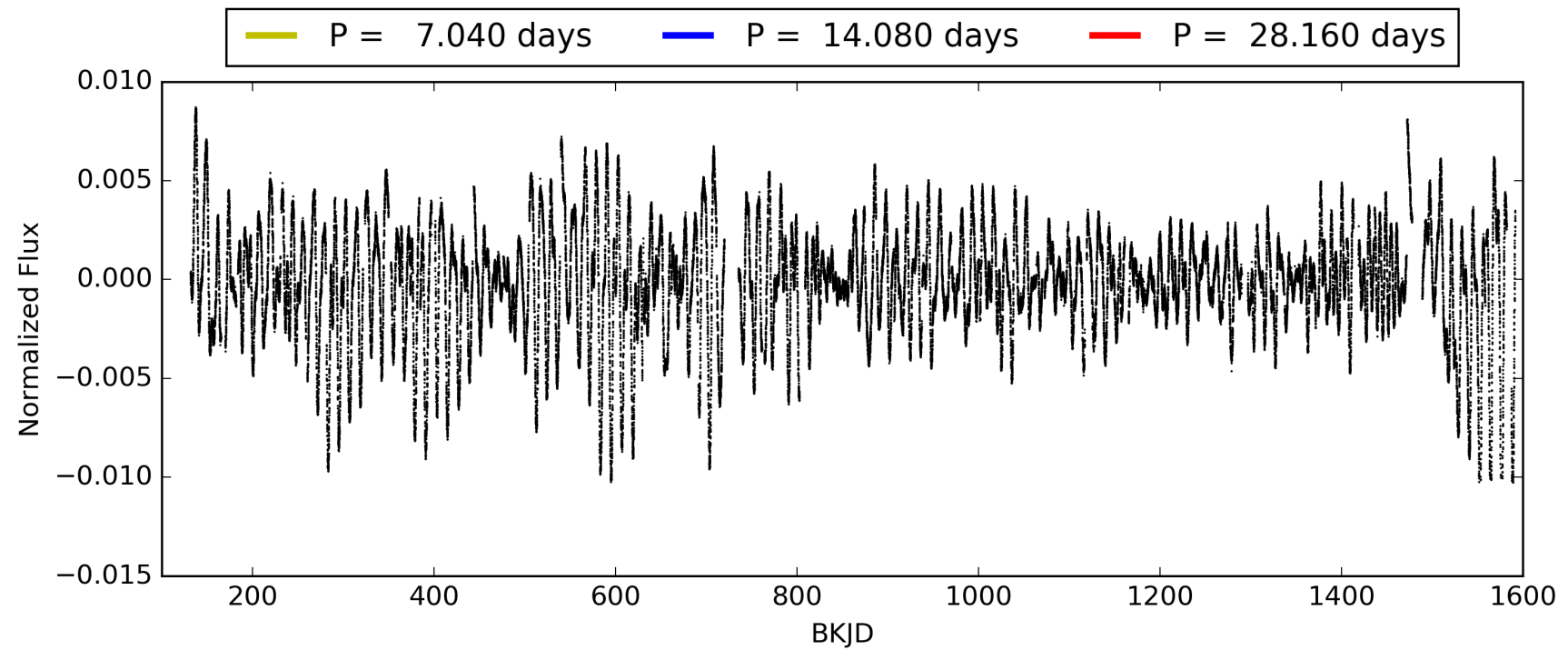
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 19:28:19 Z

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

# TCE 005955621-01, PDC Light Curves

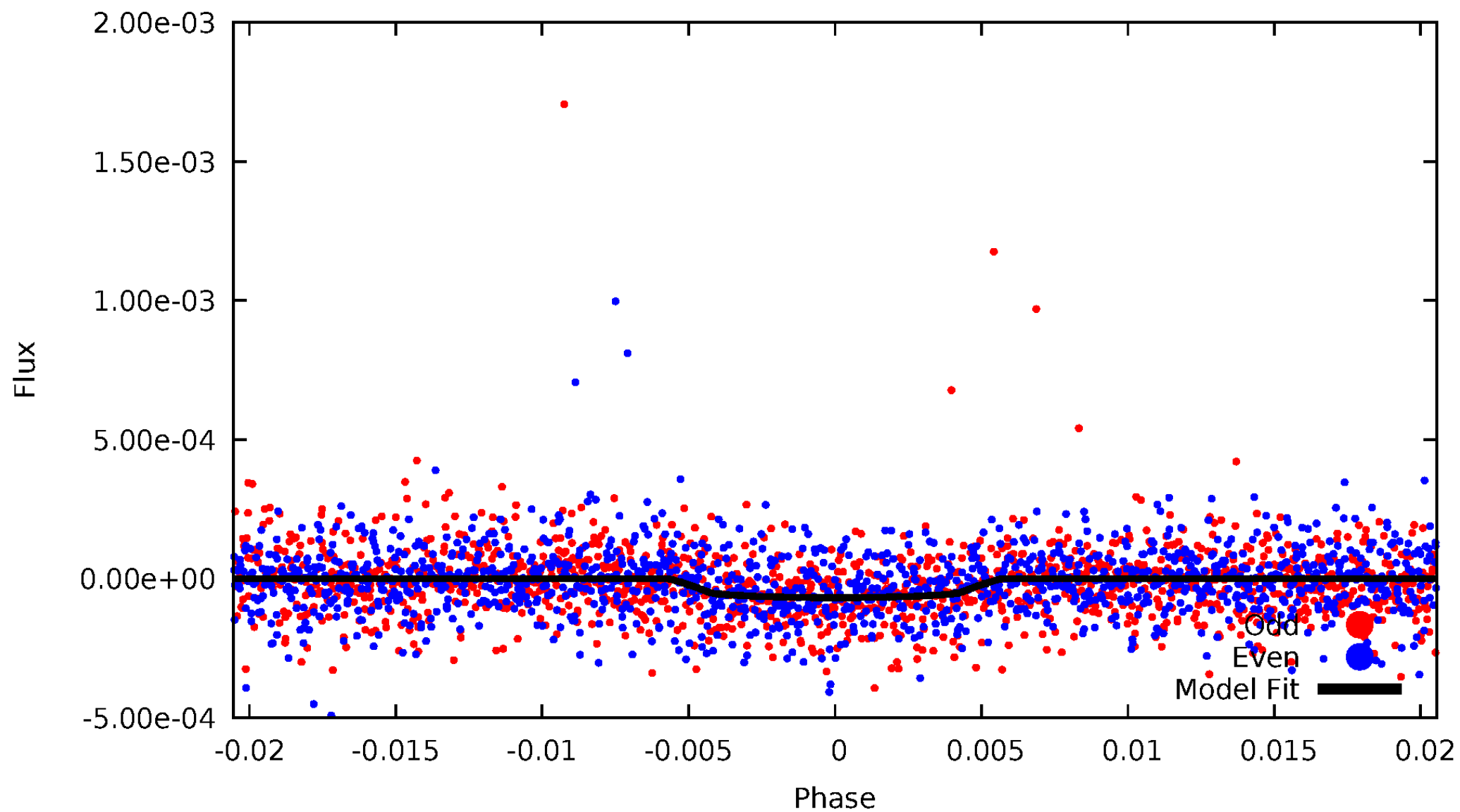


TCE 005955621-01



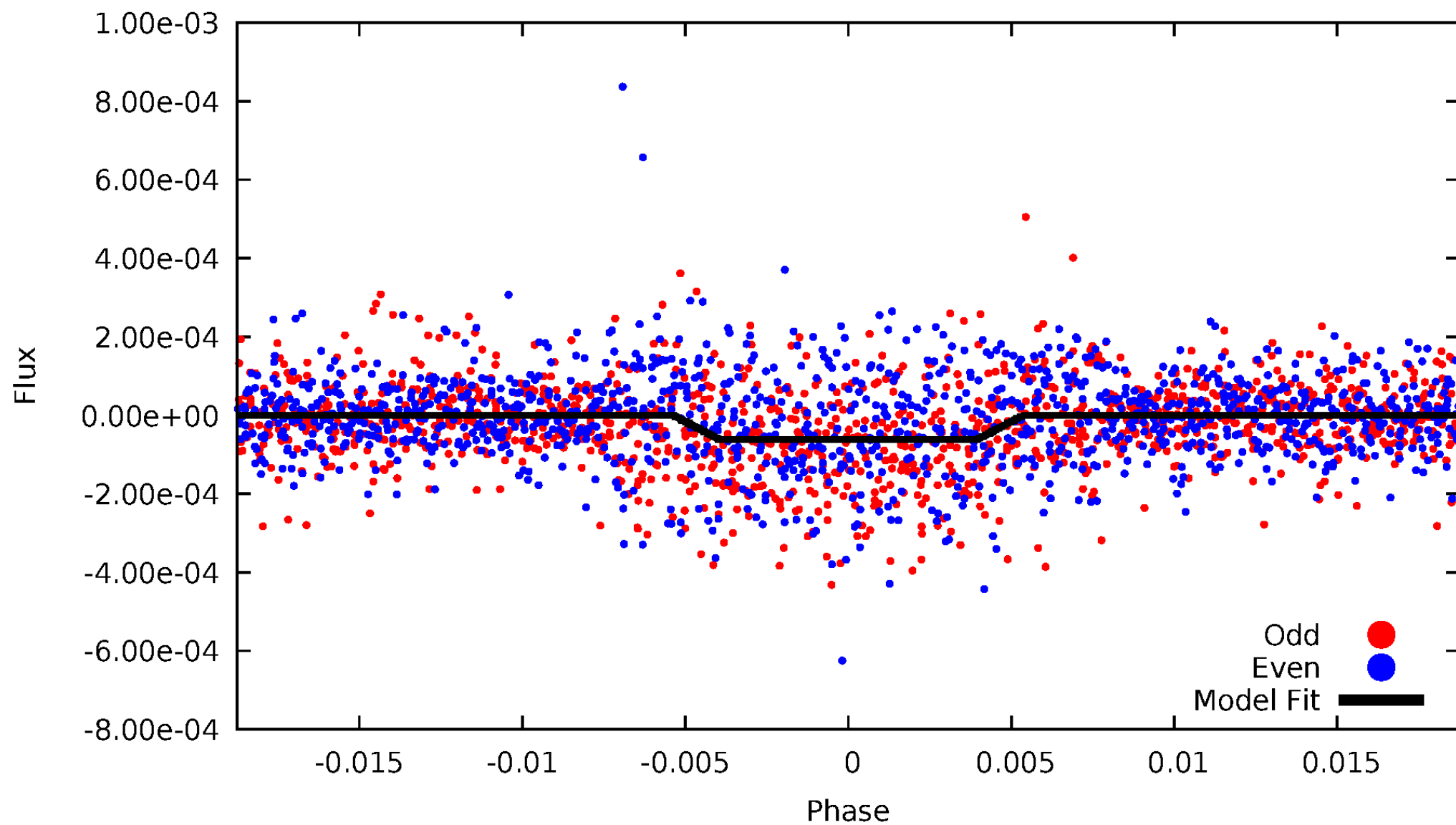
# DV Odd/Even

TCE 005955621-01



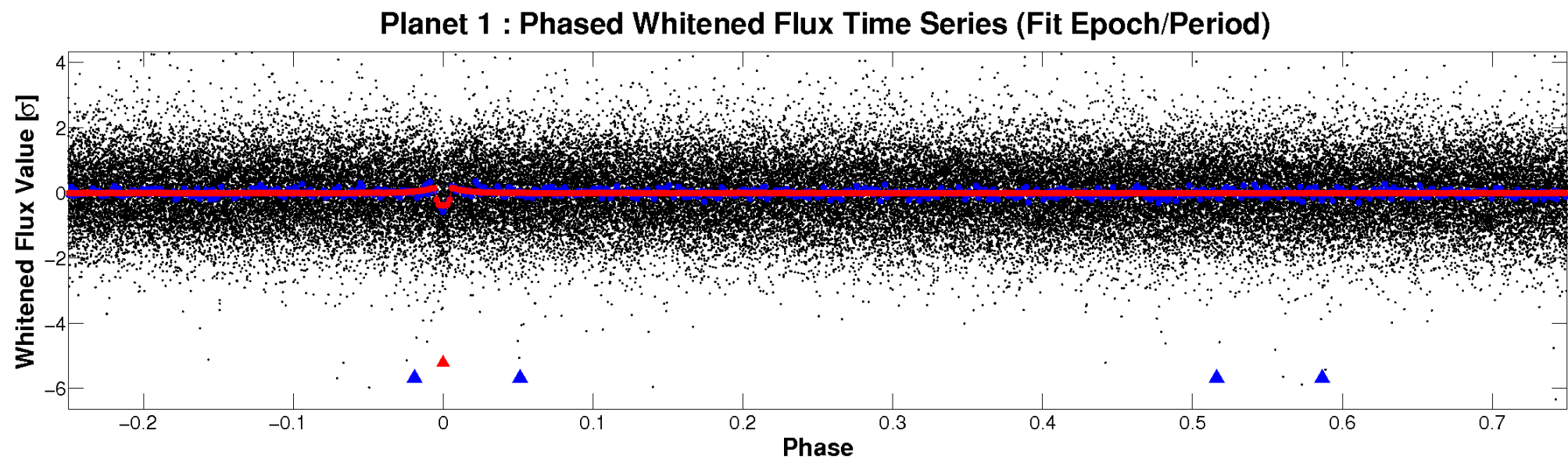
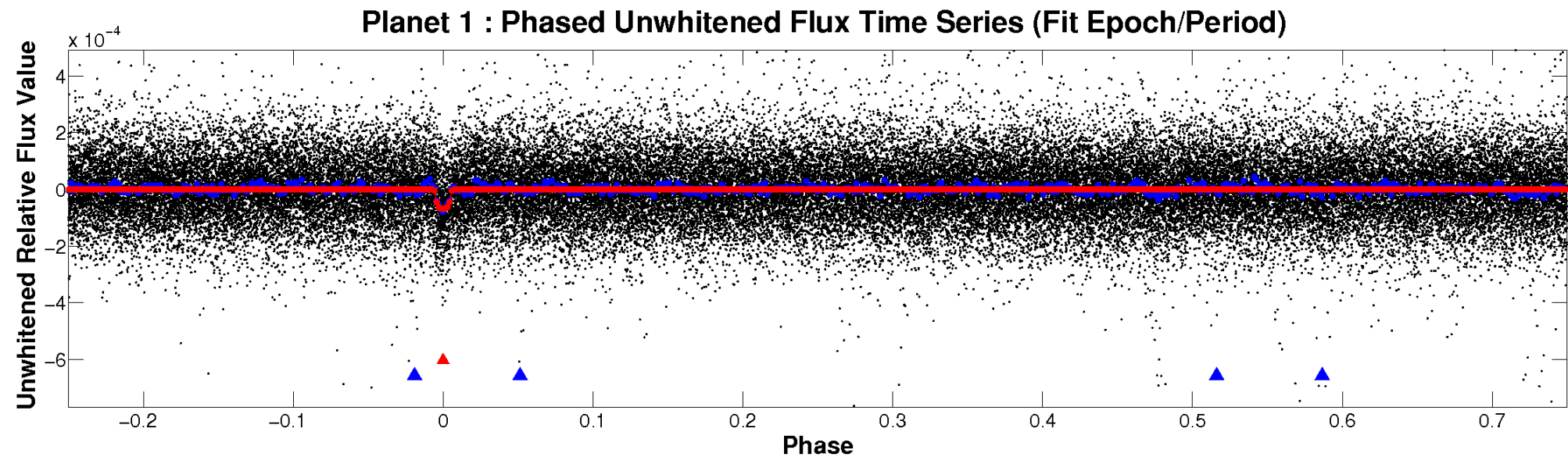
# ALT Odd/Even

TCE 005955621-01



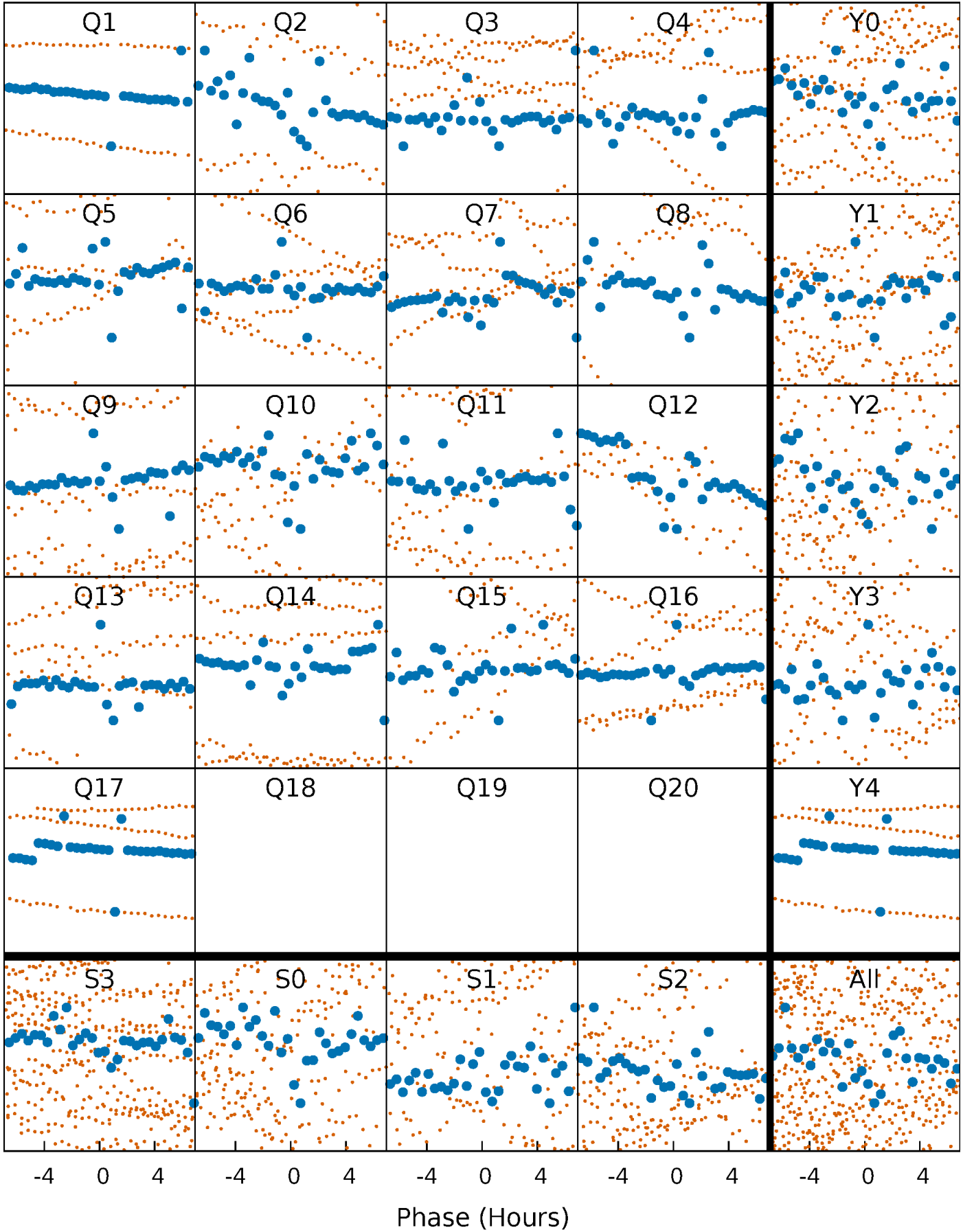


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

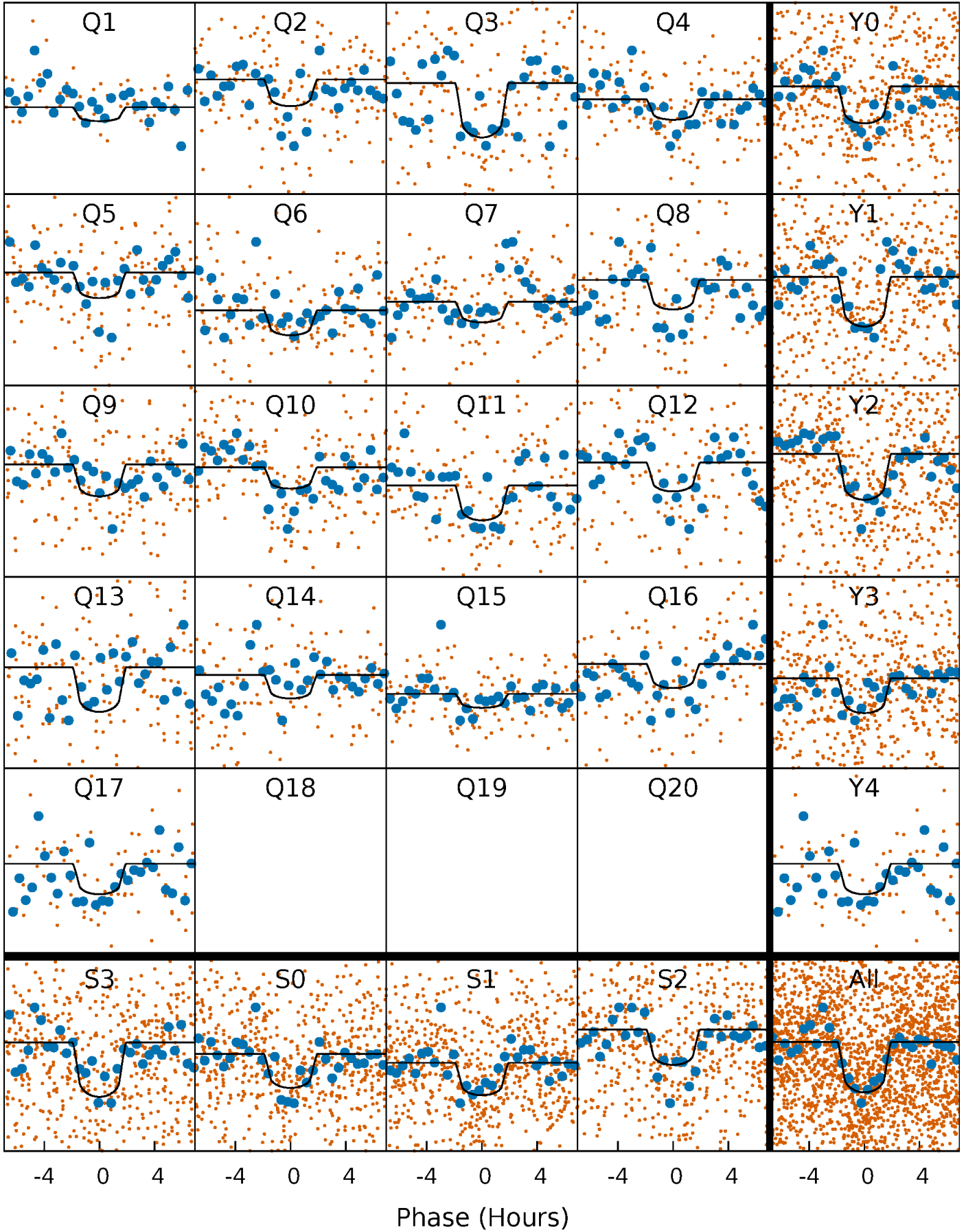
TCE 005955621-01 P= 14.080216 Days  $T_0=137.332160$  (BKJD)





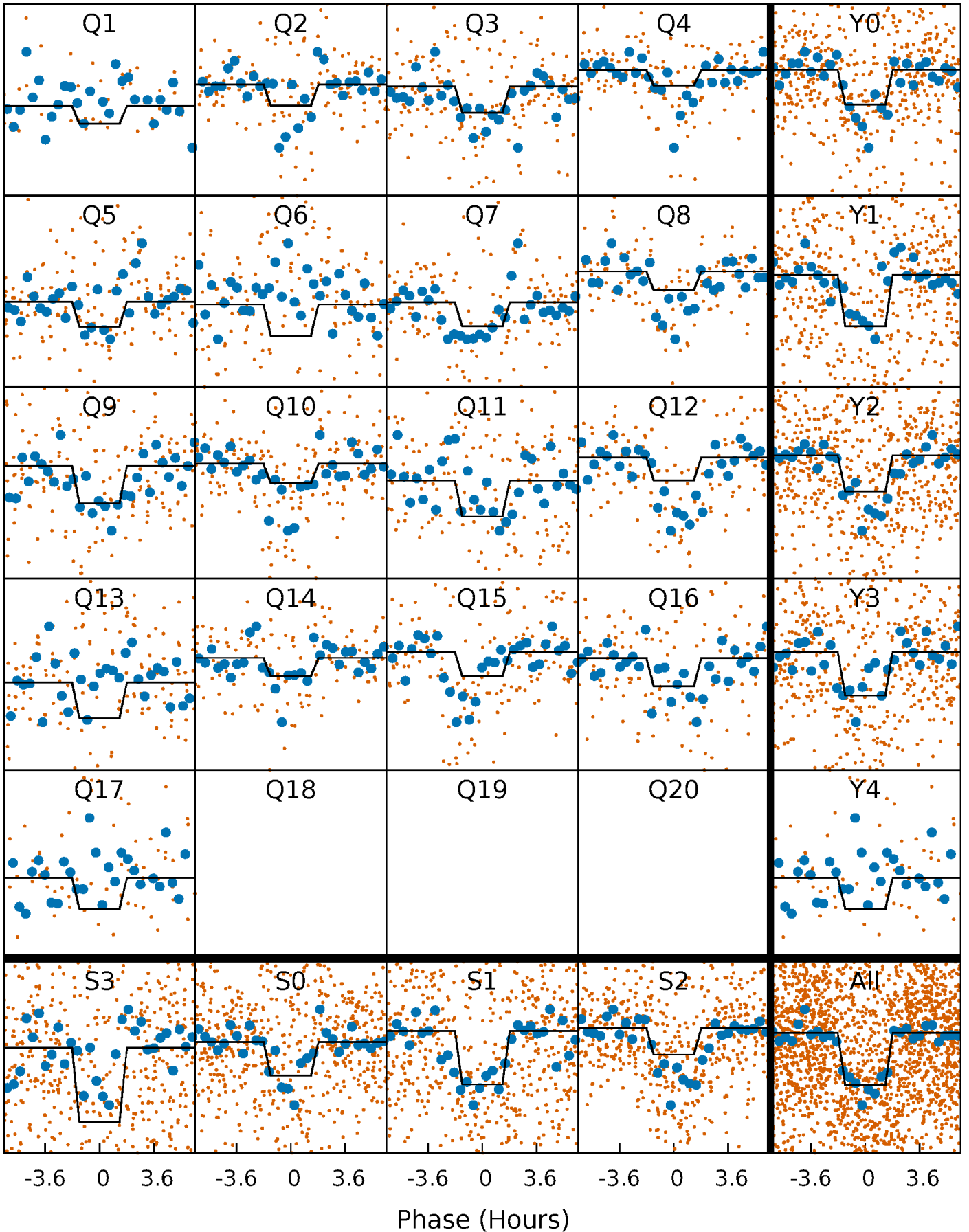
# DV Quarter-Phased Transit Curves

TCE 005955621-01 P= 14.080216 Days  $T_0=137.332160$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

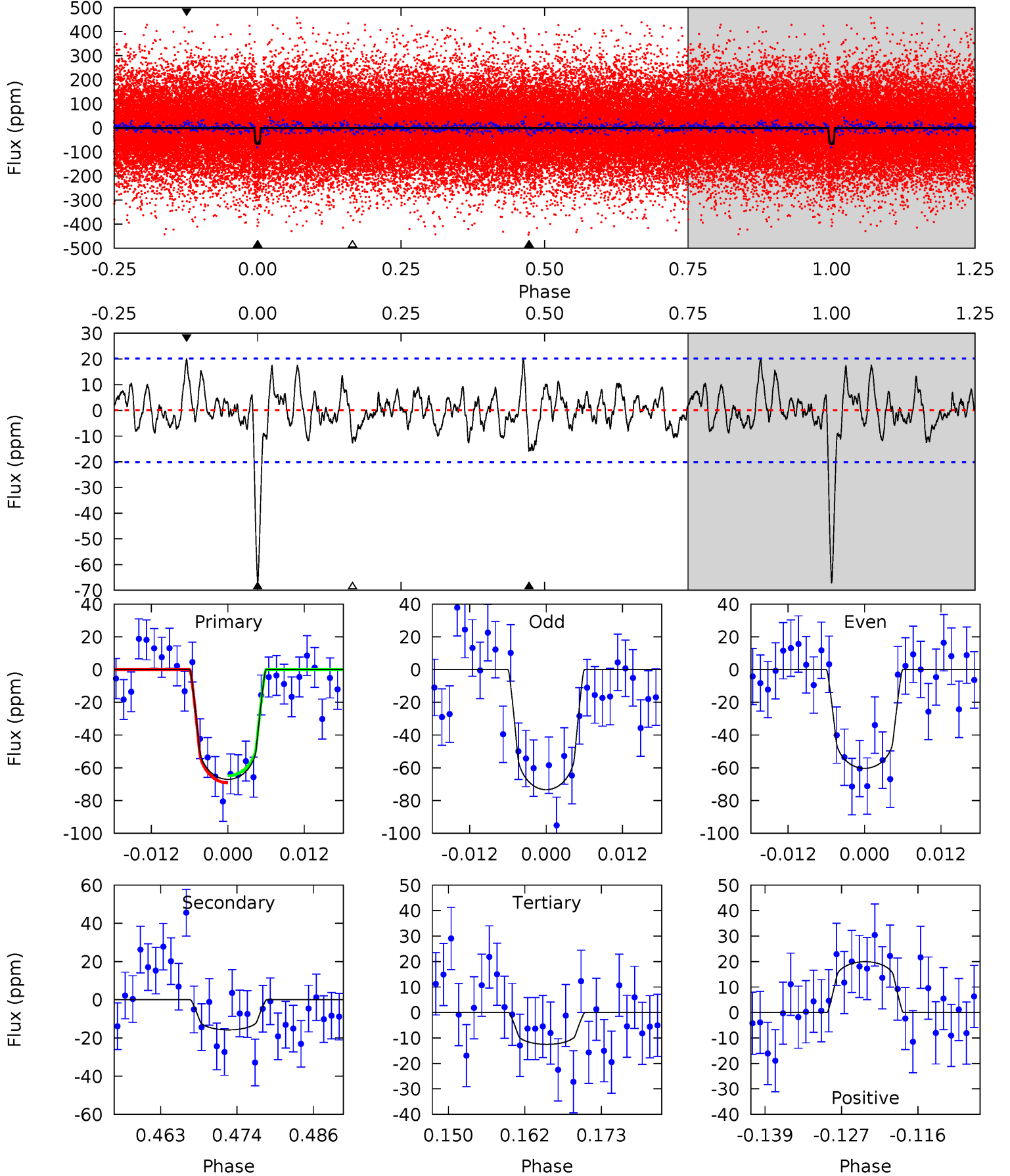
TCE 005955621-01 P= 14.080175 Days  $T_0=137.333243$  (BKJD)



# DV Model-Shift Uniqueness Test

005955621-01, P = 14.080216 Days, E = 123.251944 Days

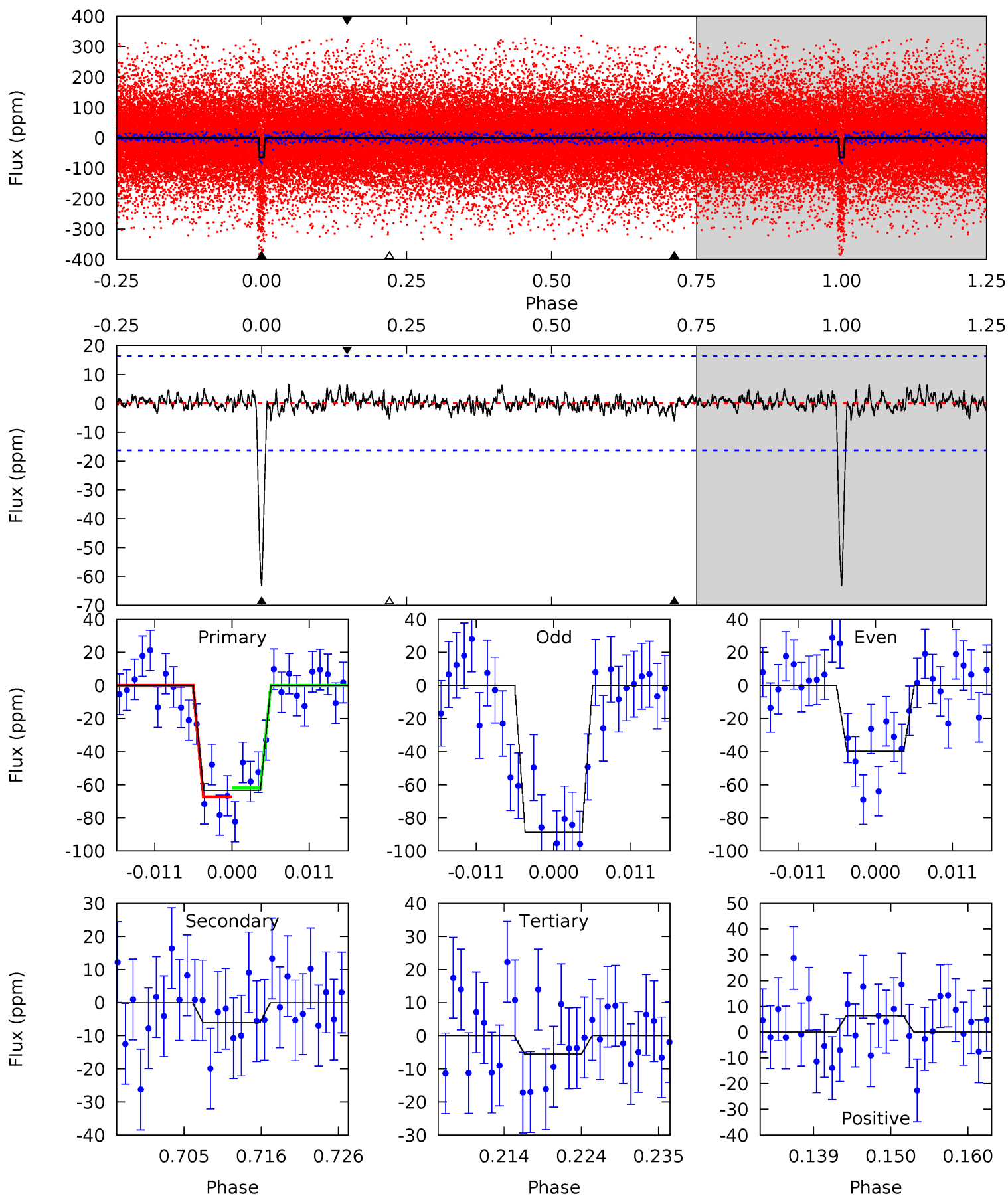
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.6	3.91	3.10	4.95	5.00	2.53	1.42	13.5	11.7	0.81	-1.04	1.62	0.82	0.23	0.53



# Alt Model-Shift Uniqueness Test

005955621-01, P = 14.080175 Days, E = 123.253068 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
19.5	1.86	1.69	1.95	5.01	2.55	0.58	17.8	17.5	0.17	-0.10	7.53	0.78	0.09	0.84



### Stellar Parameters For KIC 005955621

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5984^{+71}_{-89}$	$4.421^{+0.038}_{-0.113}$	$0.240^{+0.150}_{-0.150}$	$1.089^{+0.164}_{-0.059}$	$1.142^{+0.054}_{-0.075}$	$1.247^{+0.186}_{-0.426}$
	+1%/-1%	+1%/-3%	+62%/-62%	+15%/-5%	+5%/-7%	+15%/-34%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 005955621-01 / KOI 4624.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-16 \pm 4$	$1.08^{+0.54}_{-0.54}$	$1123^{+41}_{-29}$	$4194^{+1505}_{-561}$	$100^{+330}_{-56}$
Alt.	$-6 \pm 3$	$0.96^{+0.57}_{-0.50}$	$1121^{+41}_{-27}$	$3660^{+1123}_{-635}$	$46^{+148}_{-33}$

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

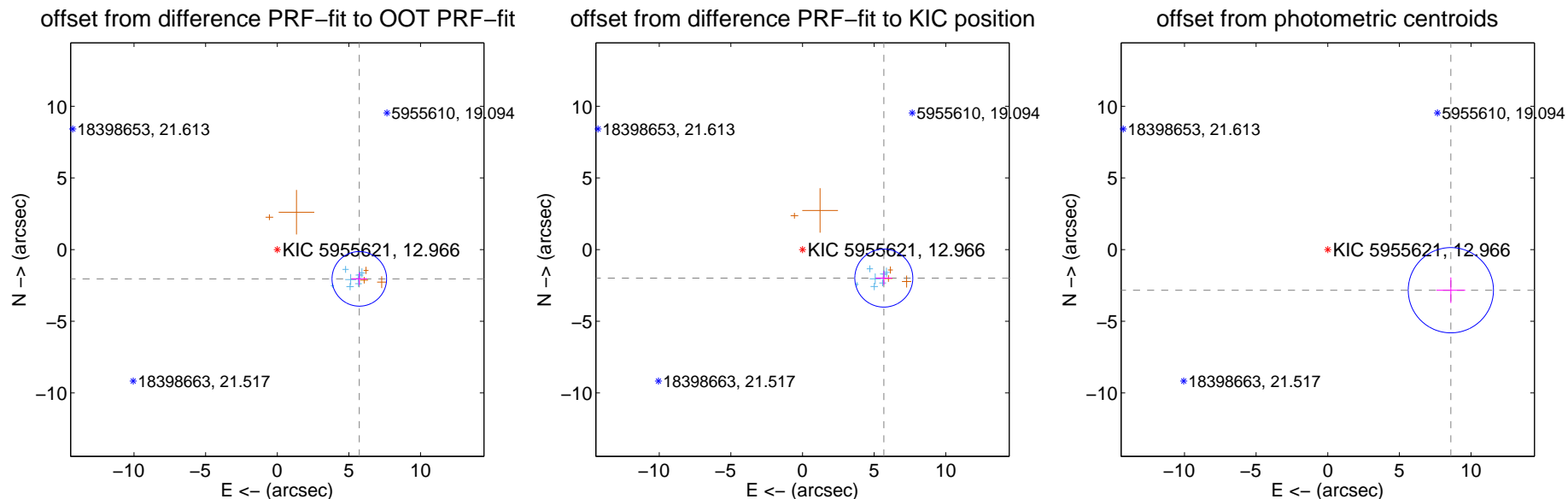
## DV Centroid Data

Supplemental centroid analysis for 005955621-01. Kepler magnitude: 12.97. Transit SNR 9.59

There are 9 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

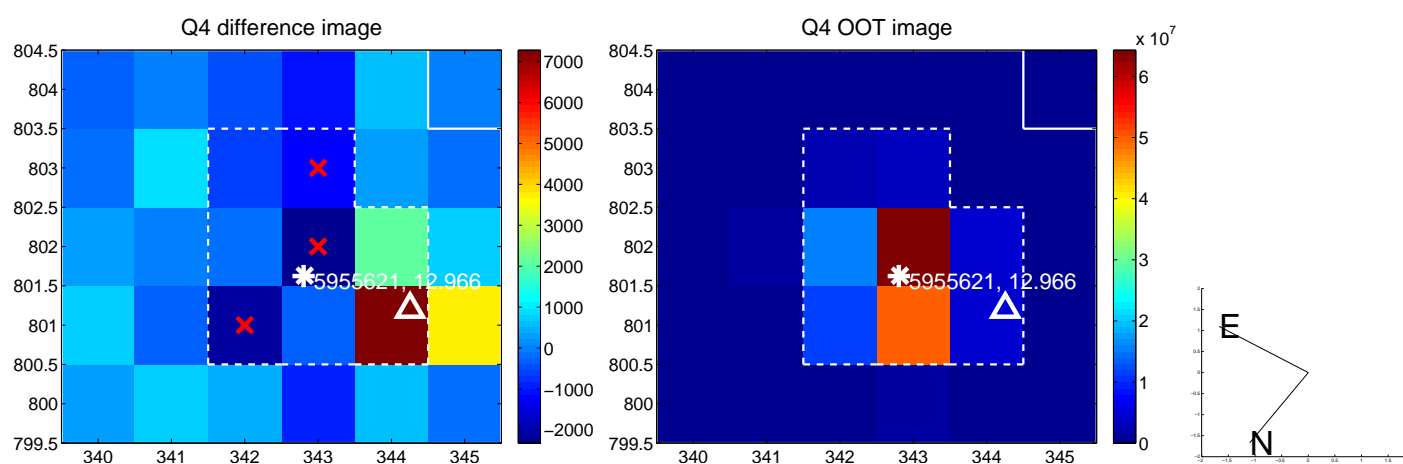
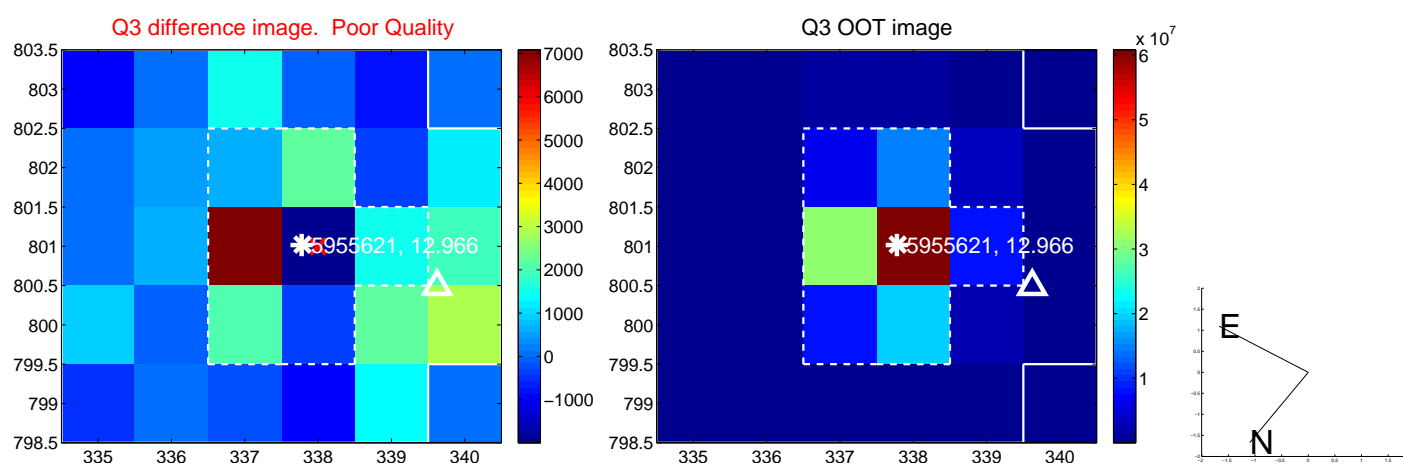
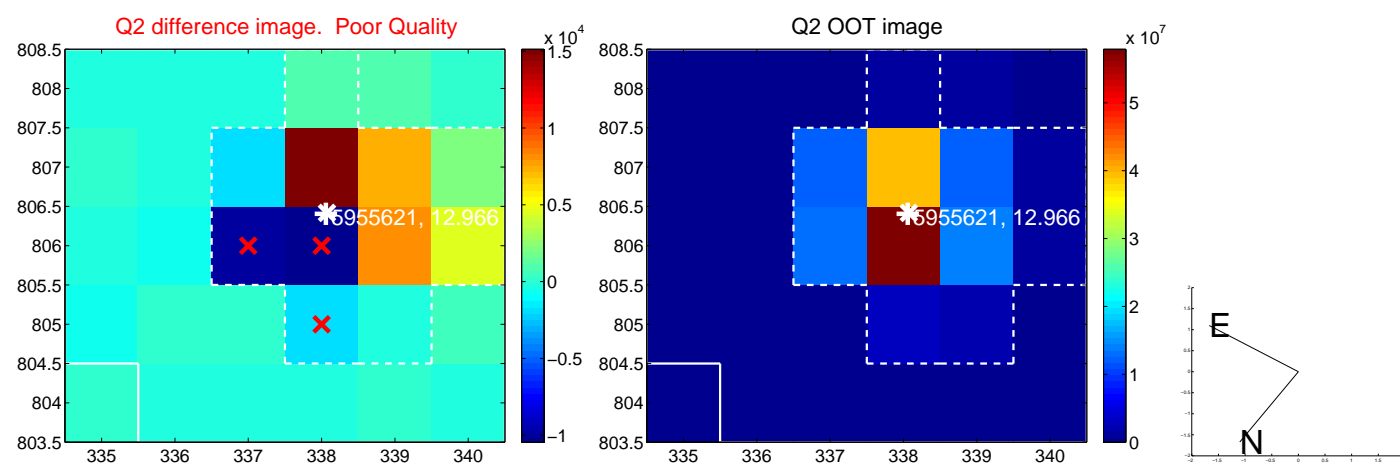
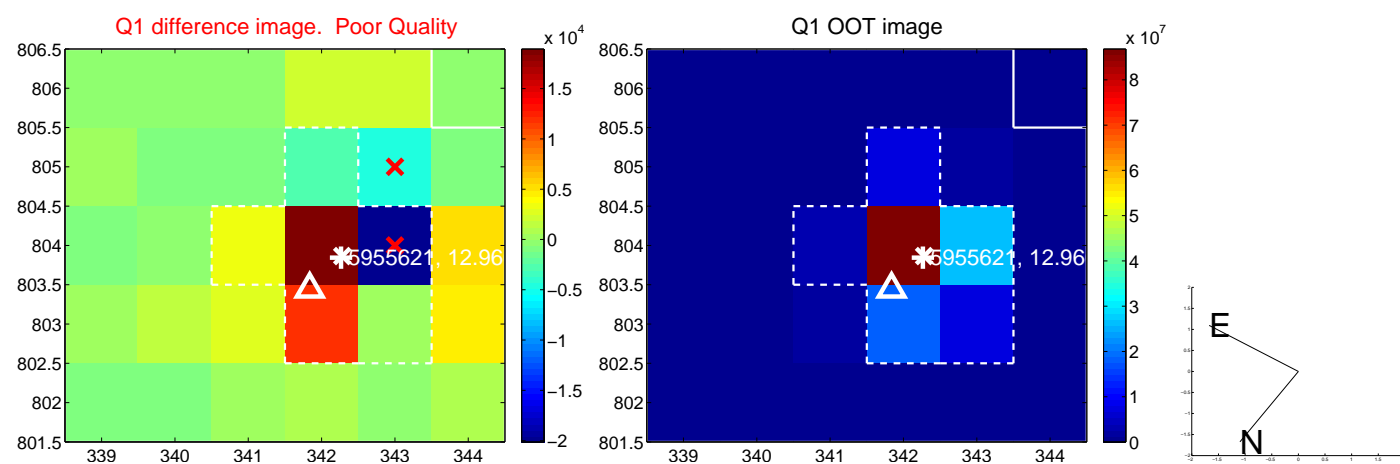
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$6.079 \pm 0.635$	9.57	$-5.726 \pm 0.539$	$-2.042 \pm 0.434$
PRF-fit source offset from KIC position	$6.012 \pm 0.674$	8.91	$-5.674 \pm 0.563$	$-1.988 \pm 0.473$
photometric centroid source offset	$9.05 \pm 0.99$	9.13	$-8.59 \pm 1.00$	$-2.83 \pm 0.89$



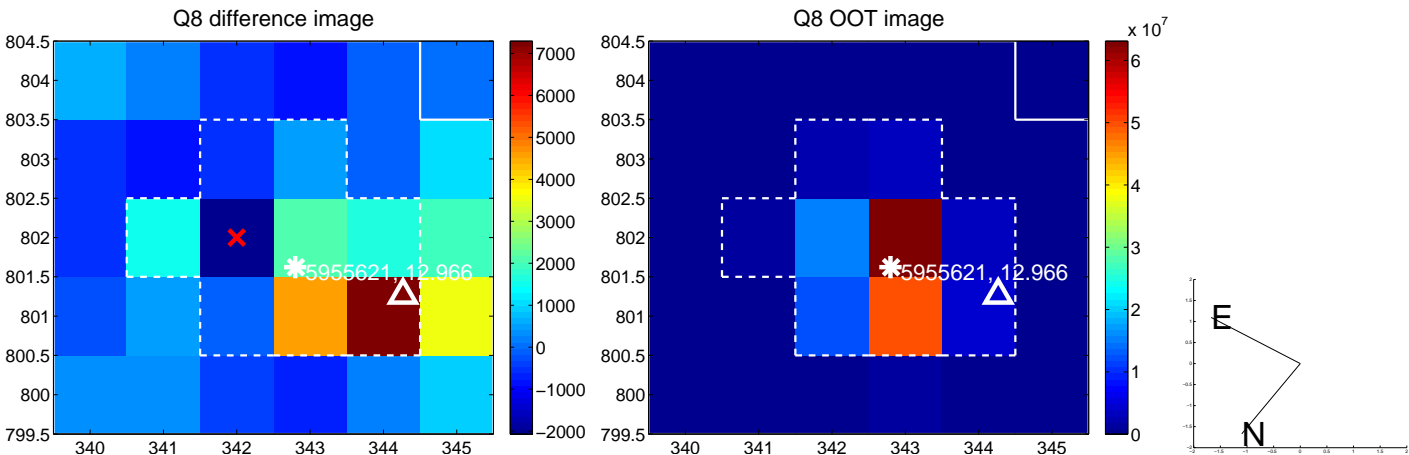
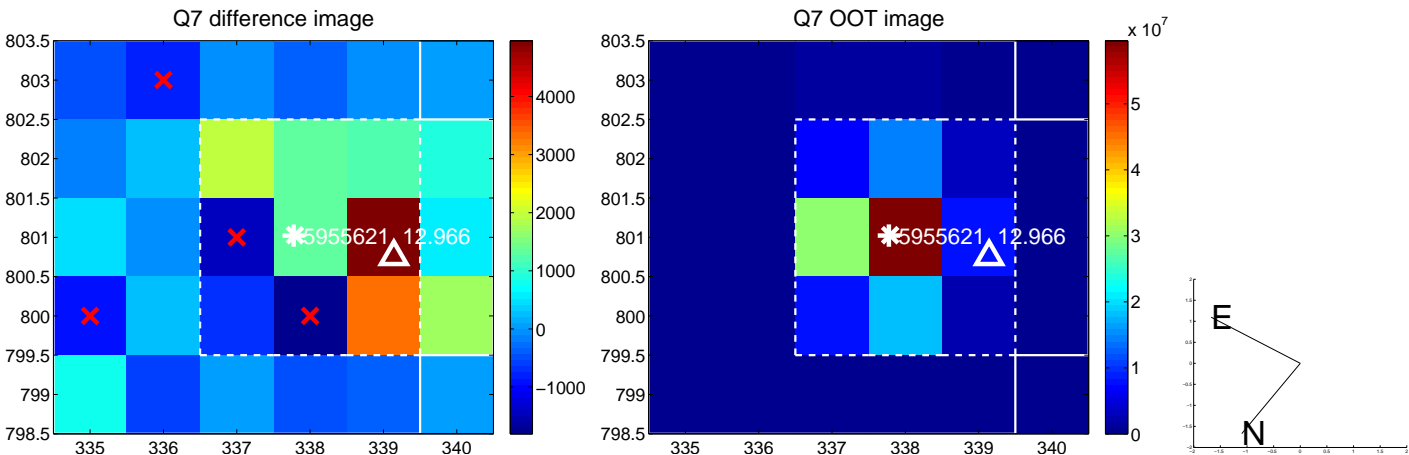
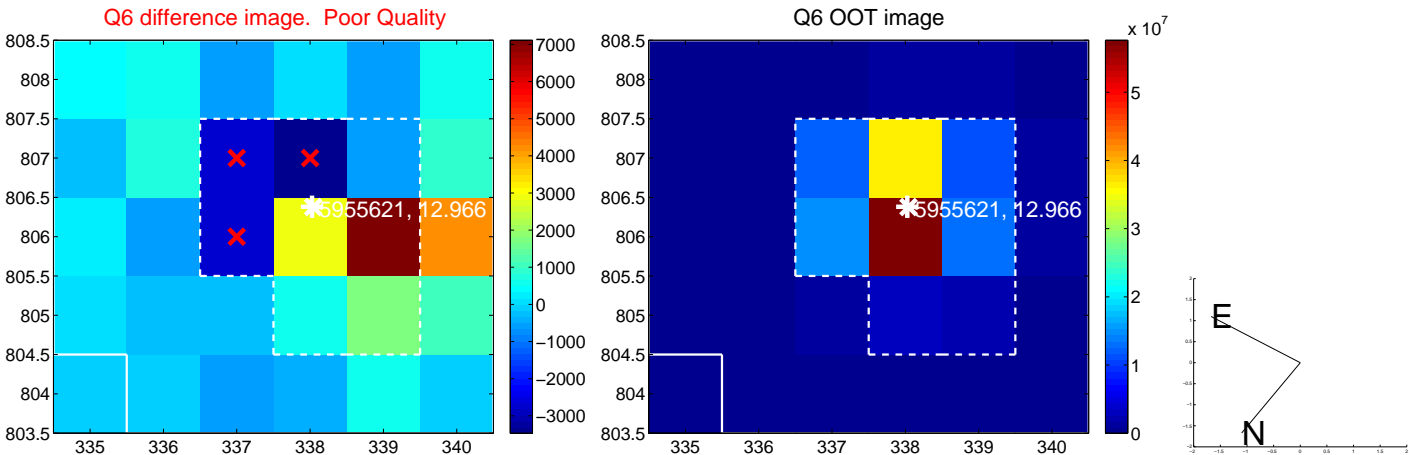
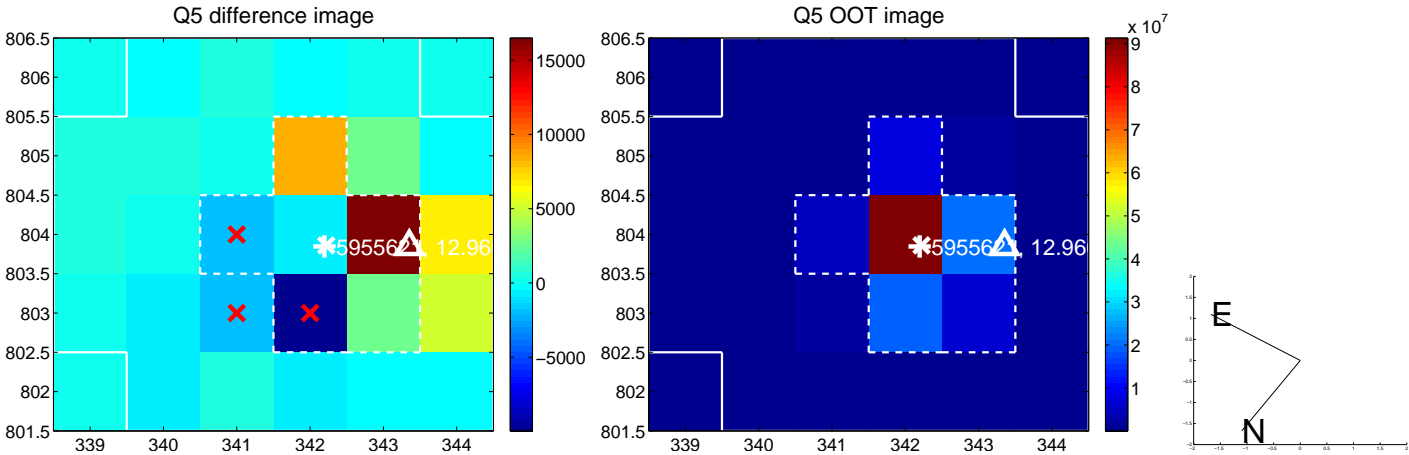
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



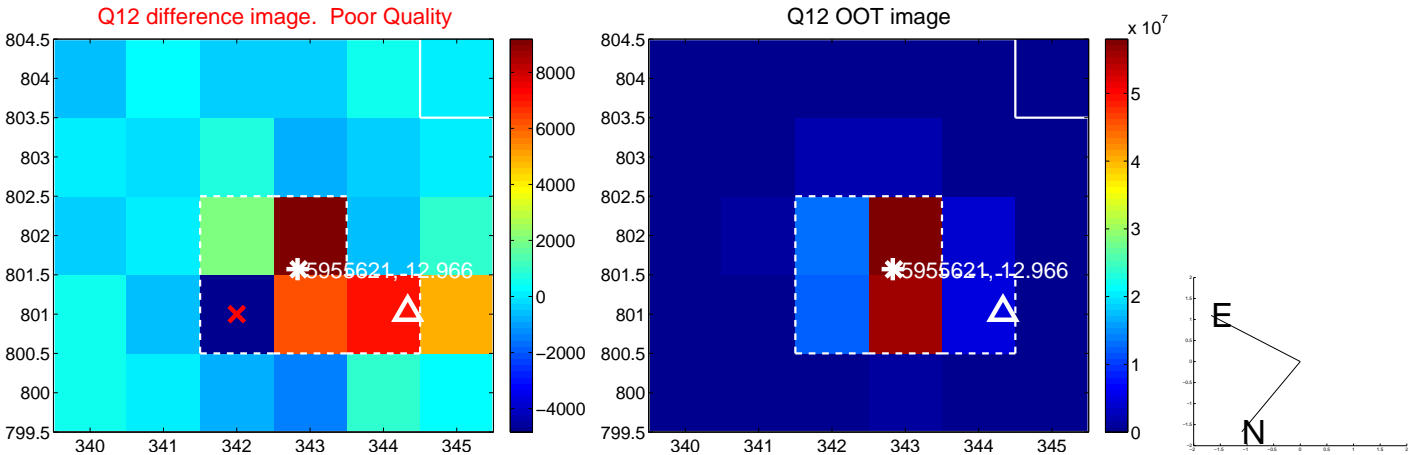
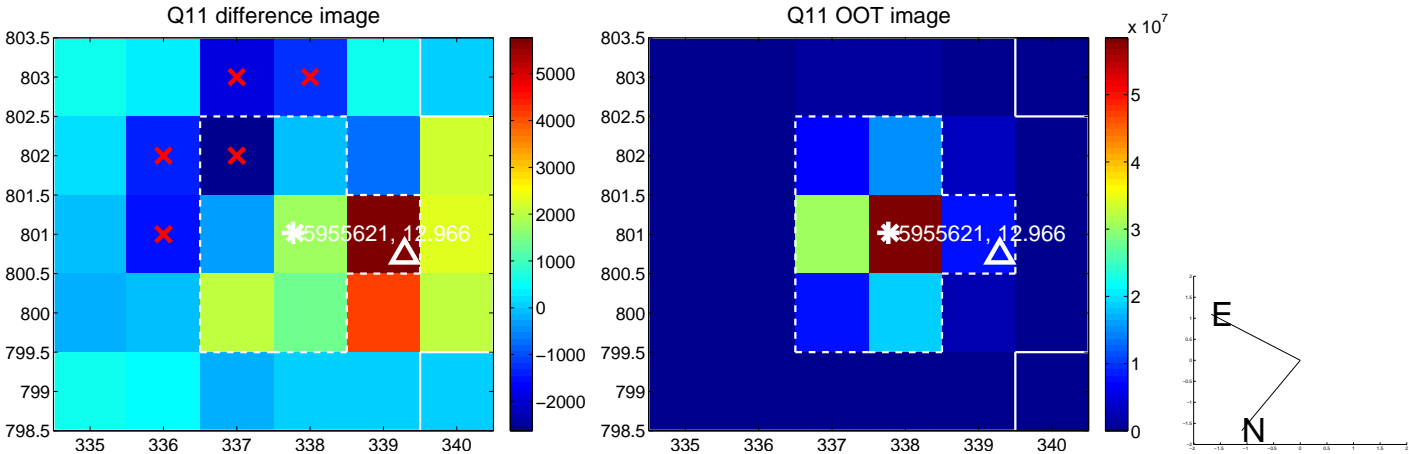
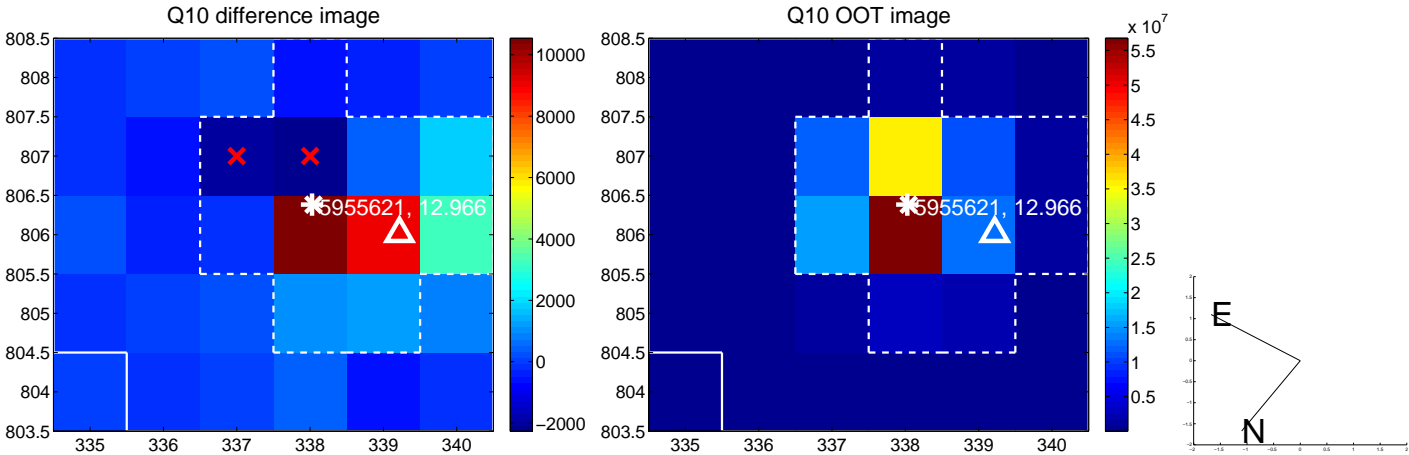
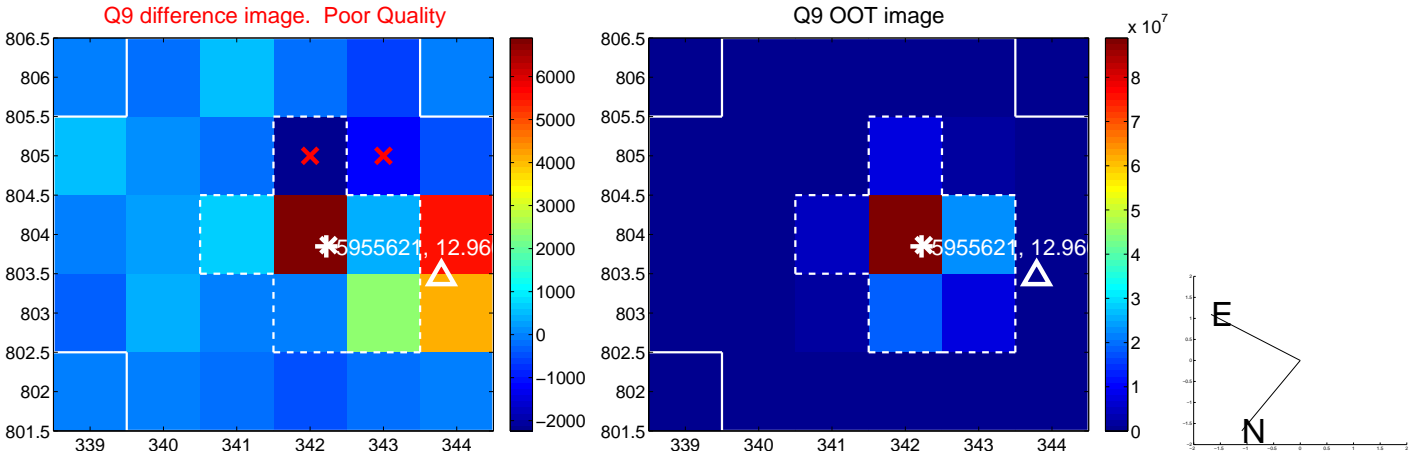
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



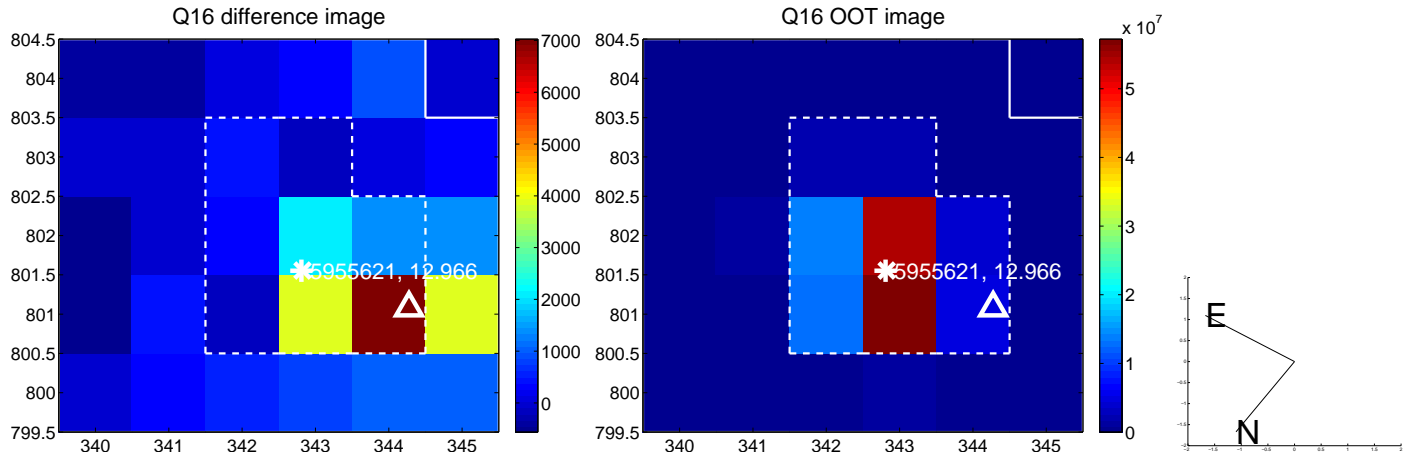
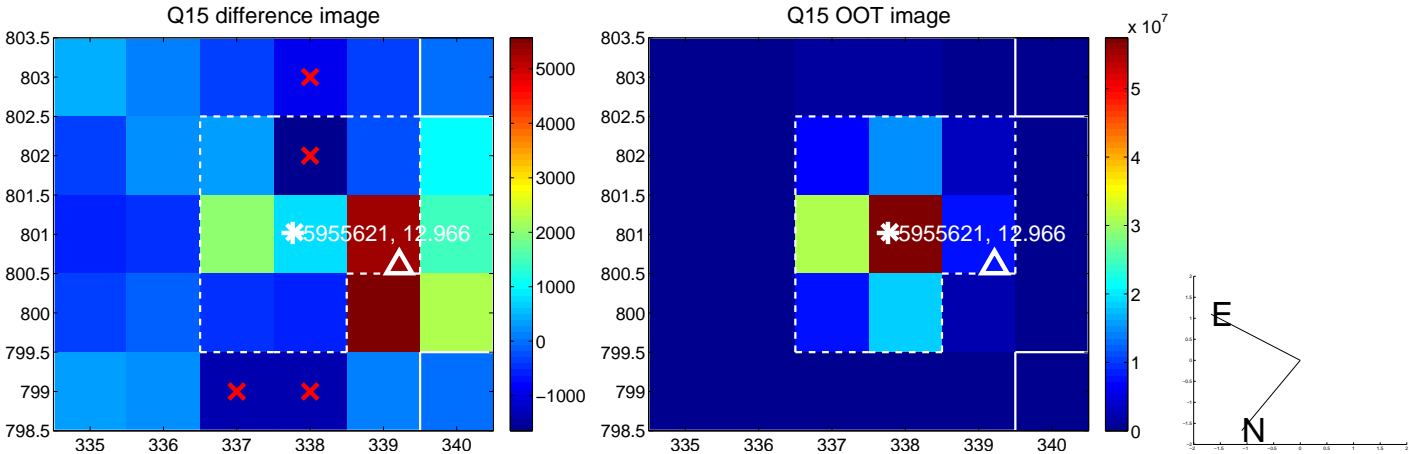
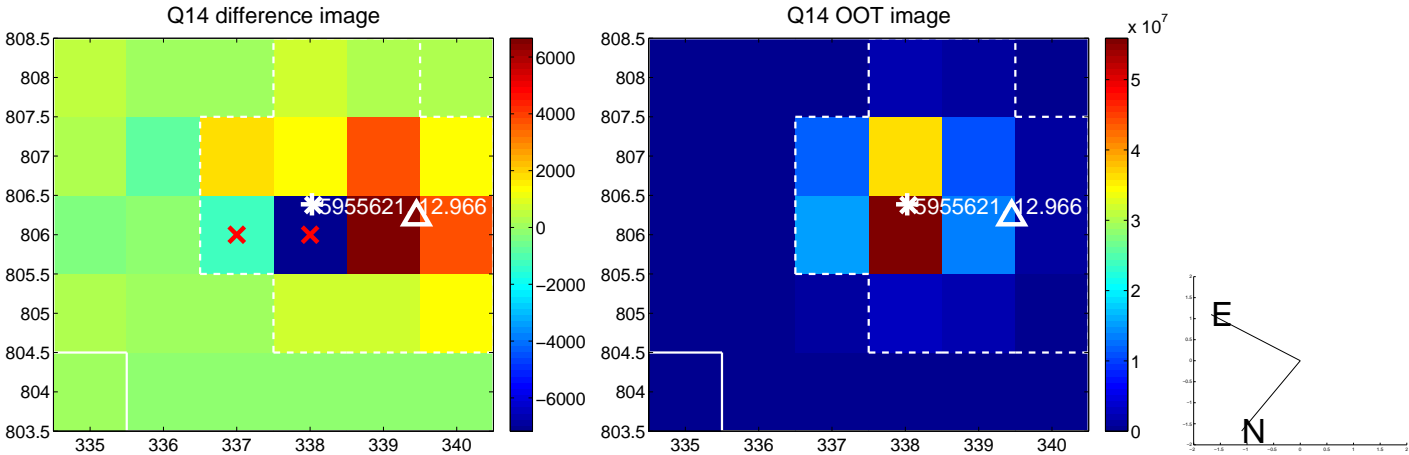
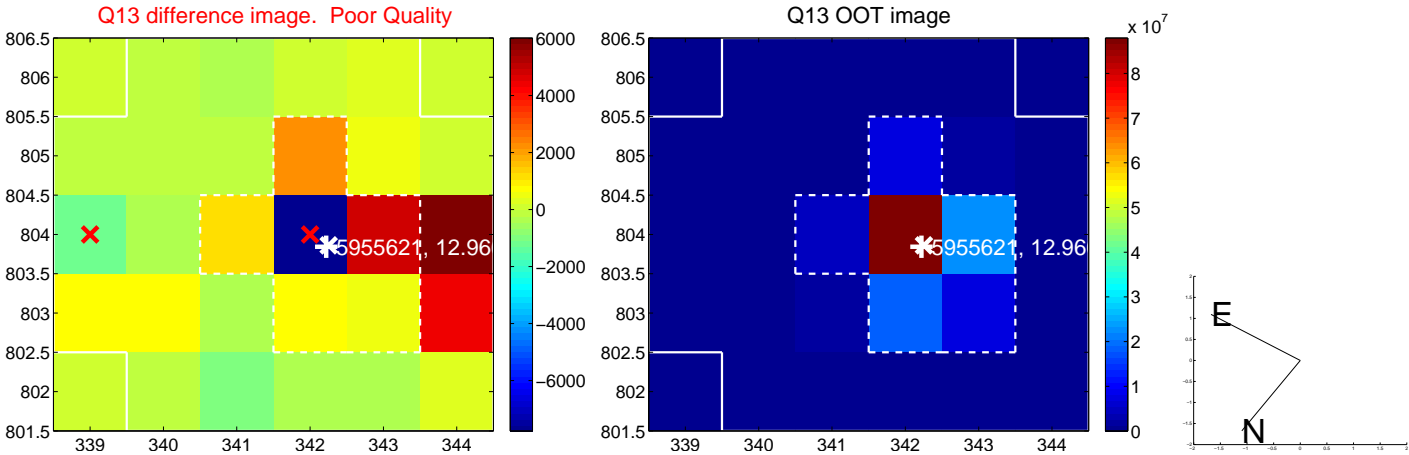
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



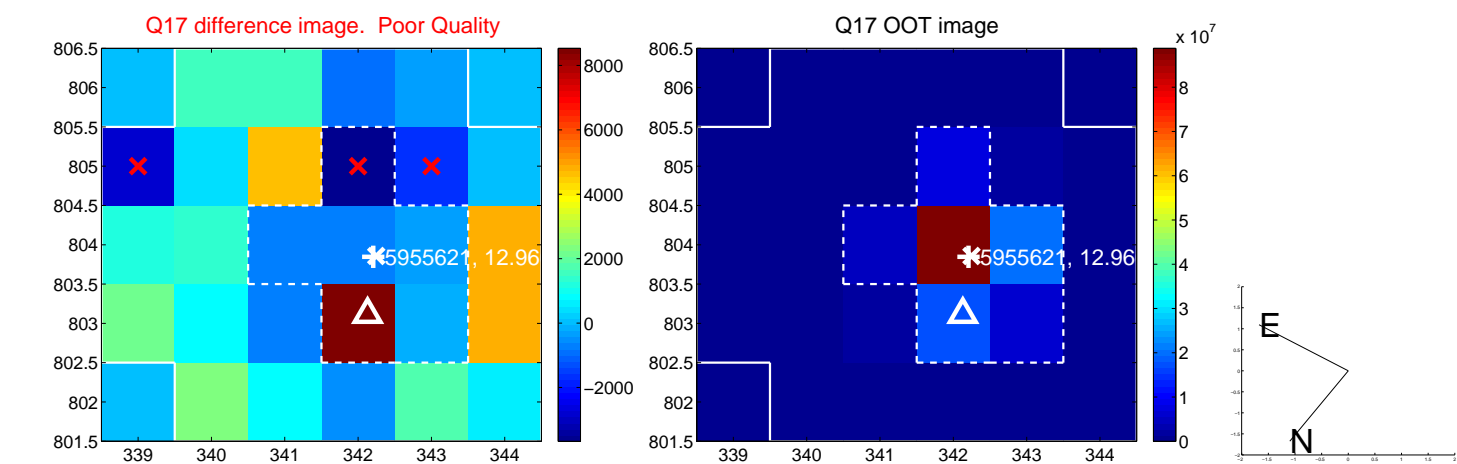
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



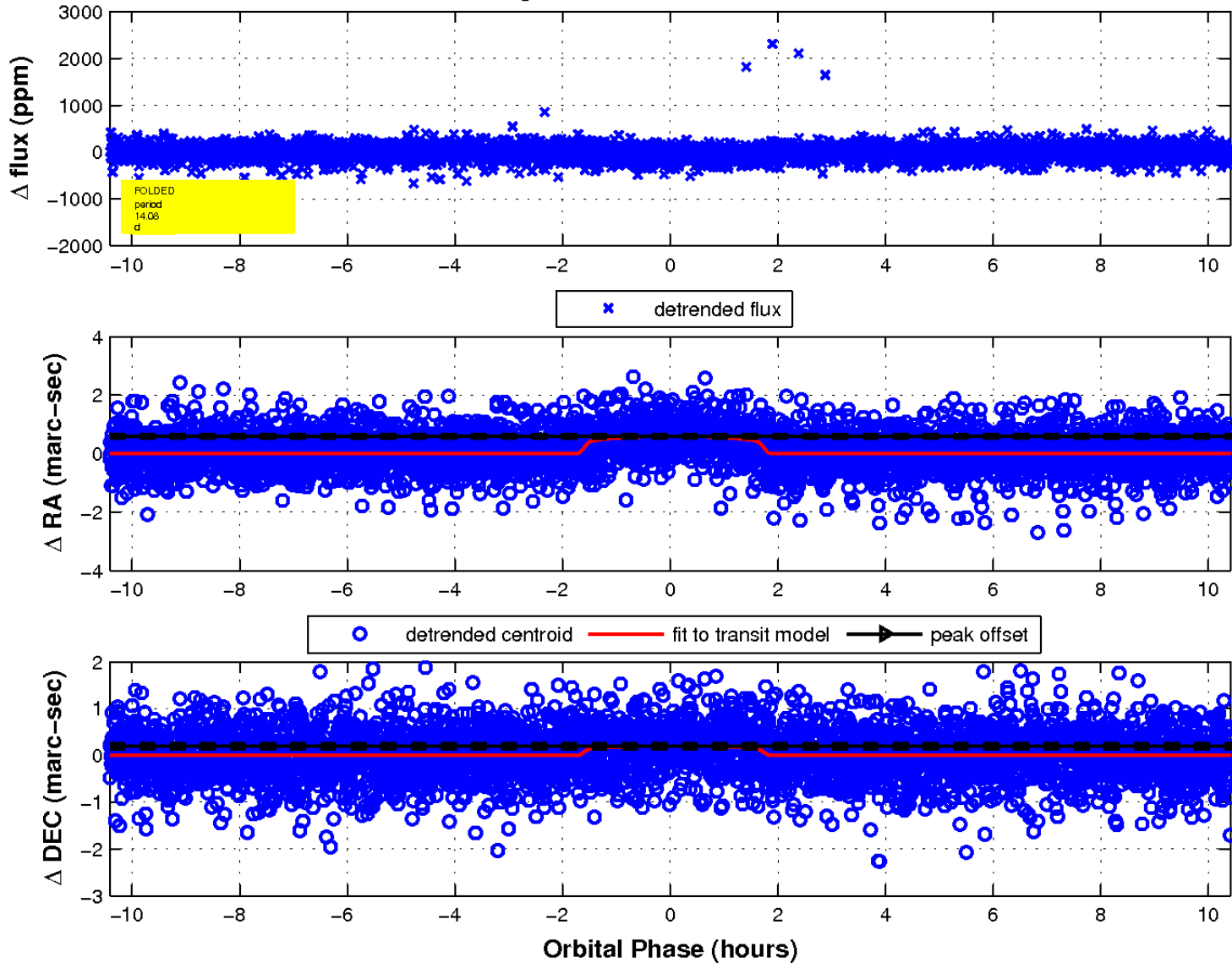
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



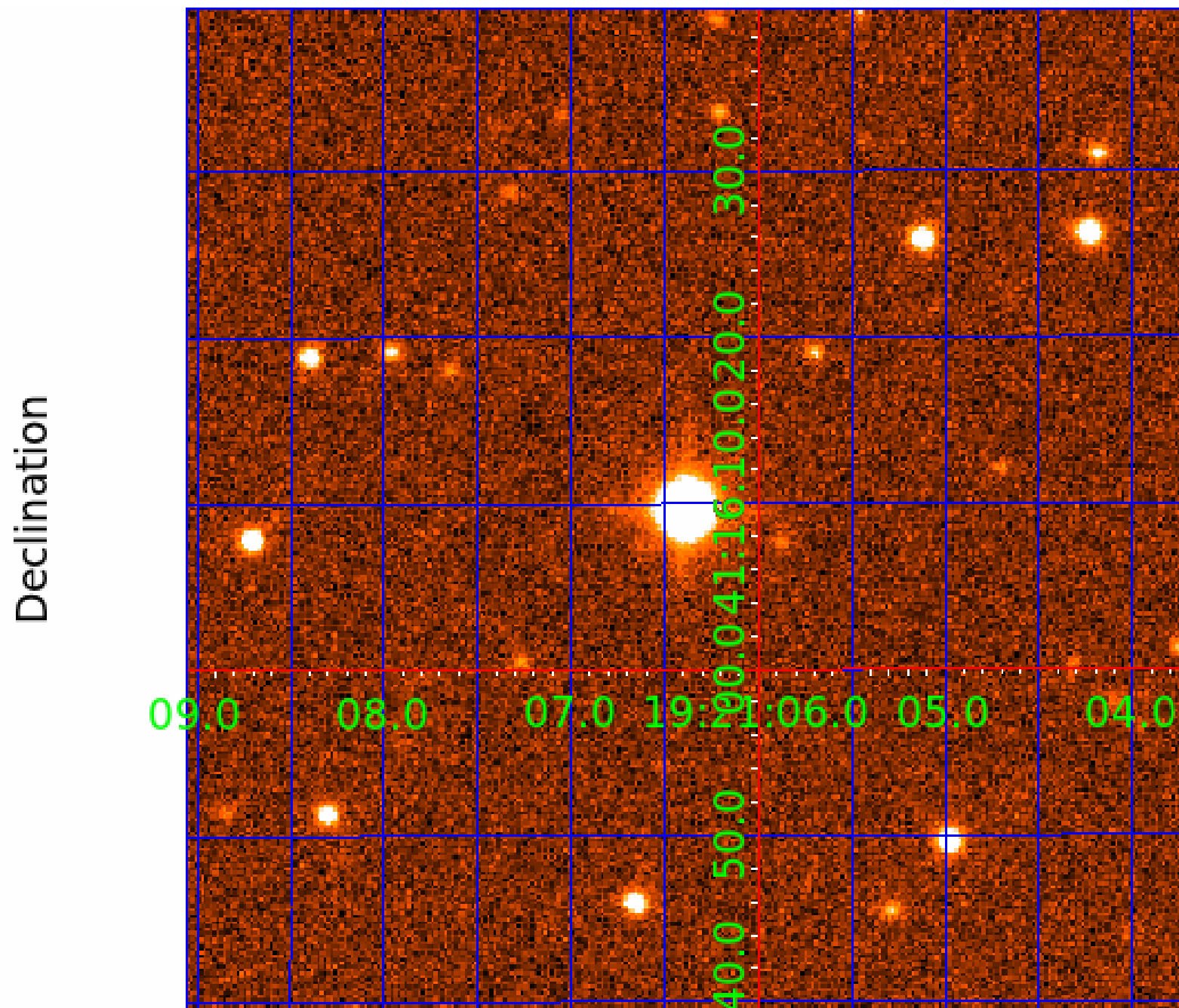
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 2



UKIRT Image





# KIC 005955621

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005955621-01	OBS	4624.01	14.080216	137.332160	68.2	3.471	9.4	9.6	1.09	5984	1.04	95.81
005955621-02	OBS	No	372.630075	370.874588	529.1	3.551	8.1	10.8	1.09	5984	2.89	1.22

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005955621-01	OBS	FP	0.00	0	0	1	0	CENT_UNRESOLVED_OFFSET—HALO_GHOST
005955621-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS

**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.

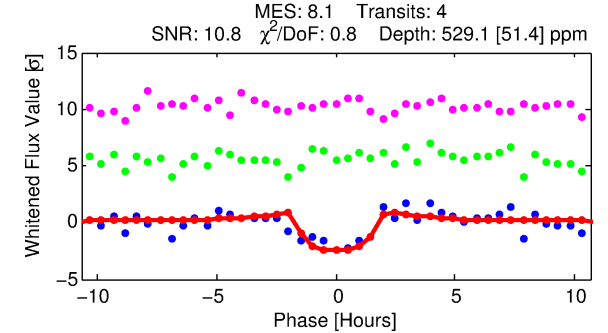
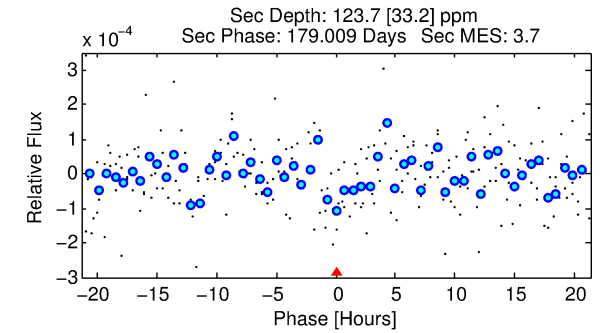
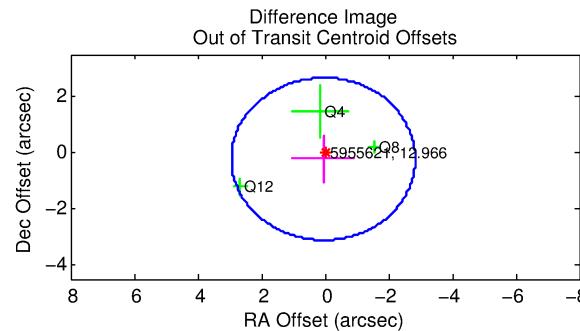
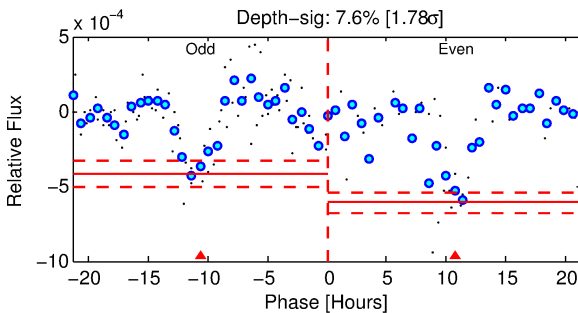
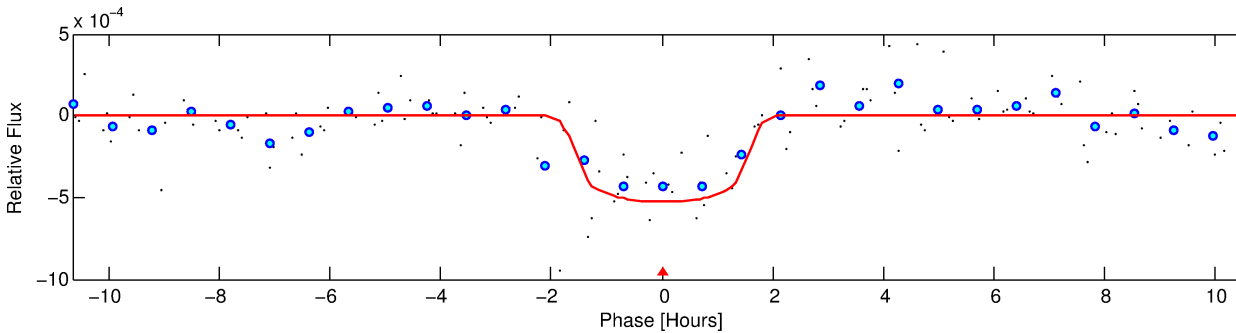
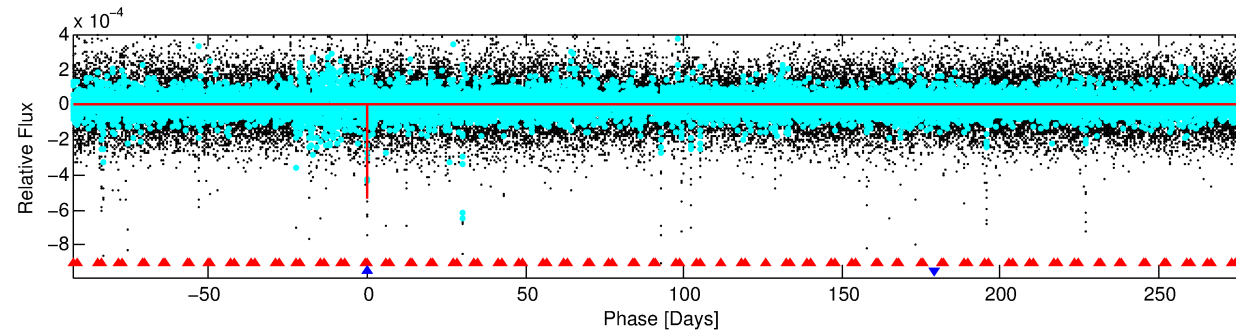
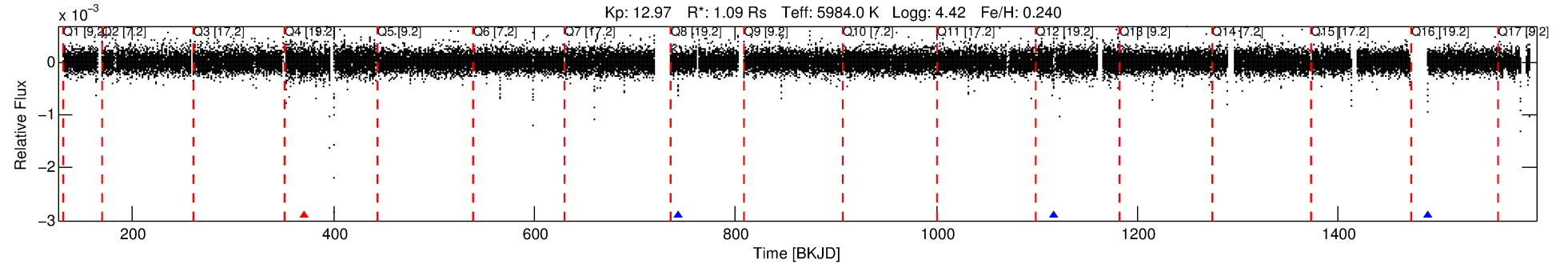
## Ephemeris Match Information For 005955621-02

No Significant Match Found

# DV One-Page Summary

KIC: 5955621 Candidate: 2 of 2 Period: 372.630 d

KOI: K04624 Corr: No Ephemeris Match



## DV Fit Results:

Period = 372.63007 [0.00335] d  
Epoch = 370.8746 [0.0053] BKJD  
Rp/R\* = 0.0243 [0.0084]  
a/R\* = 440.71 [694.85]  
b = 0.86 [0.47]  
Seff = 1.21 [0.25]  
Teq = 268 [14] K  
Rp = 2.89 [1.09] Re  
a = 1.0590 [0.1405] AU  
Ag = 9153.41 [7053.48] [1.30 $\sigma$ ]  
Teffp = 4048 [755] K [5.00 $\sigma$ ]

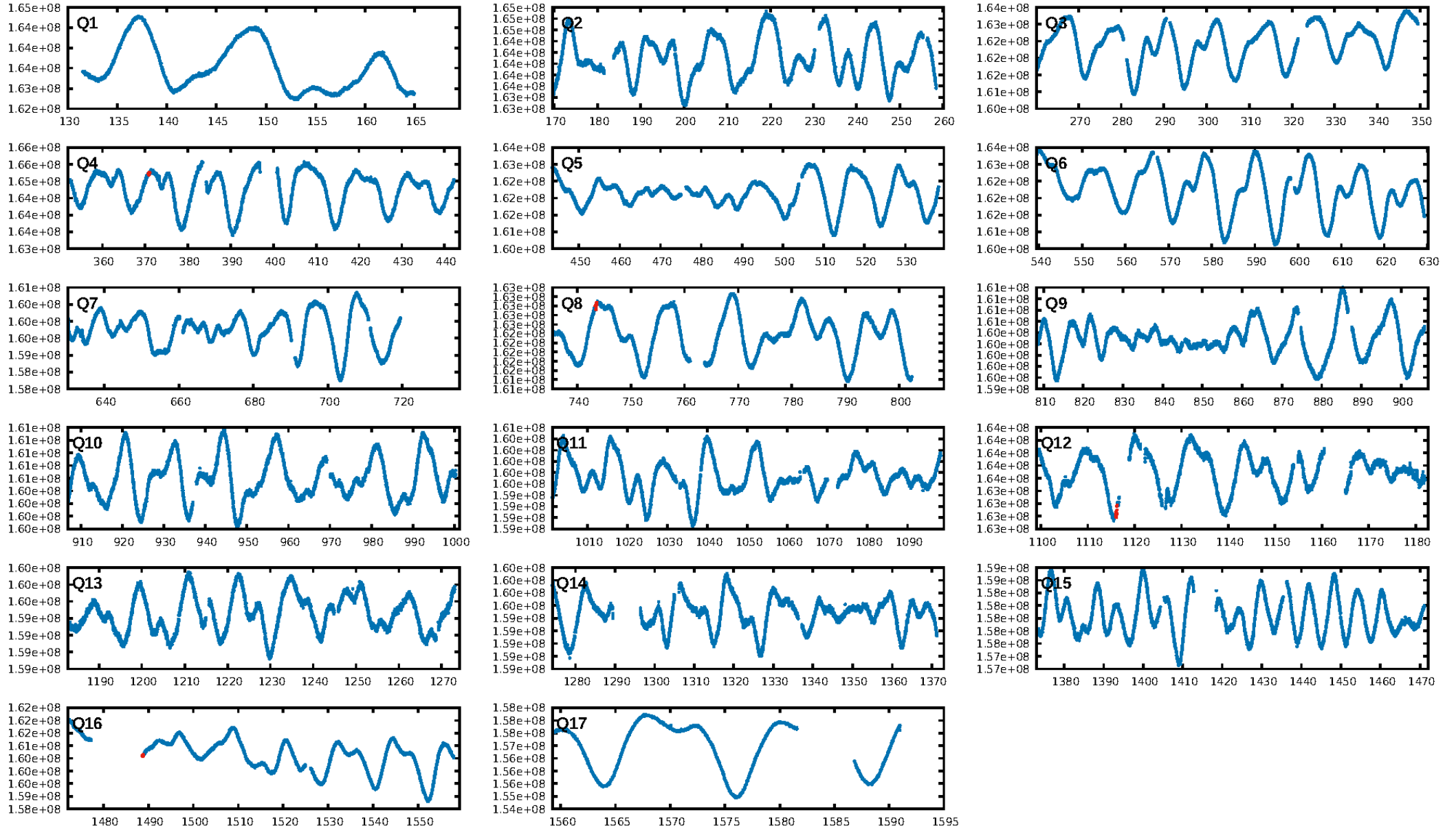
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [1733.00 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 24.9%  
ModelChiSquareGof-sig: 99.8%  
Bootstrap-pfa: 1.59e-09  
RollingBand-fgt: 0.75 [3/4]  
GhostDiagnostic-chr: 0.8165  
Centroid-sig: 34.0%  
Centroid-so: 0.407 arcsec [0.74 $\sigma$ ]  
OotOffset-rm: 0.233 arcsec [0.24 $\sigma$ ]  
OotOffset-st: 0/0/3/0 [3]  
KicOffset-rm: 0.219 arcsec [0.19 $\sigma$ ]  
KicOffset-st: 0/0/3/0 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 1.00 [3/3]

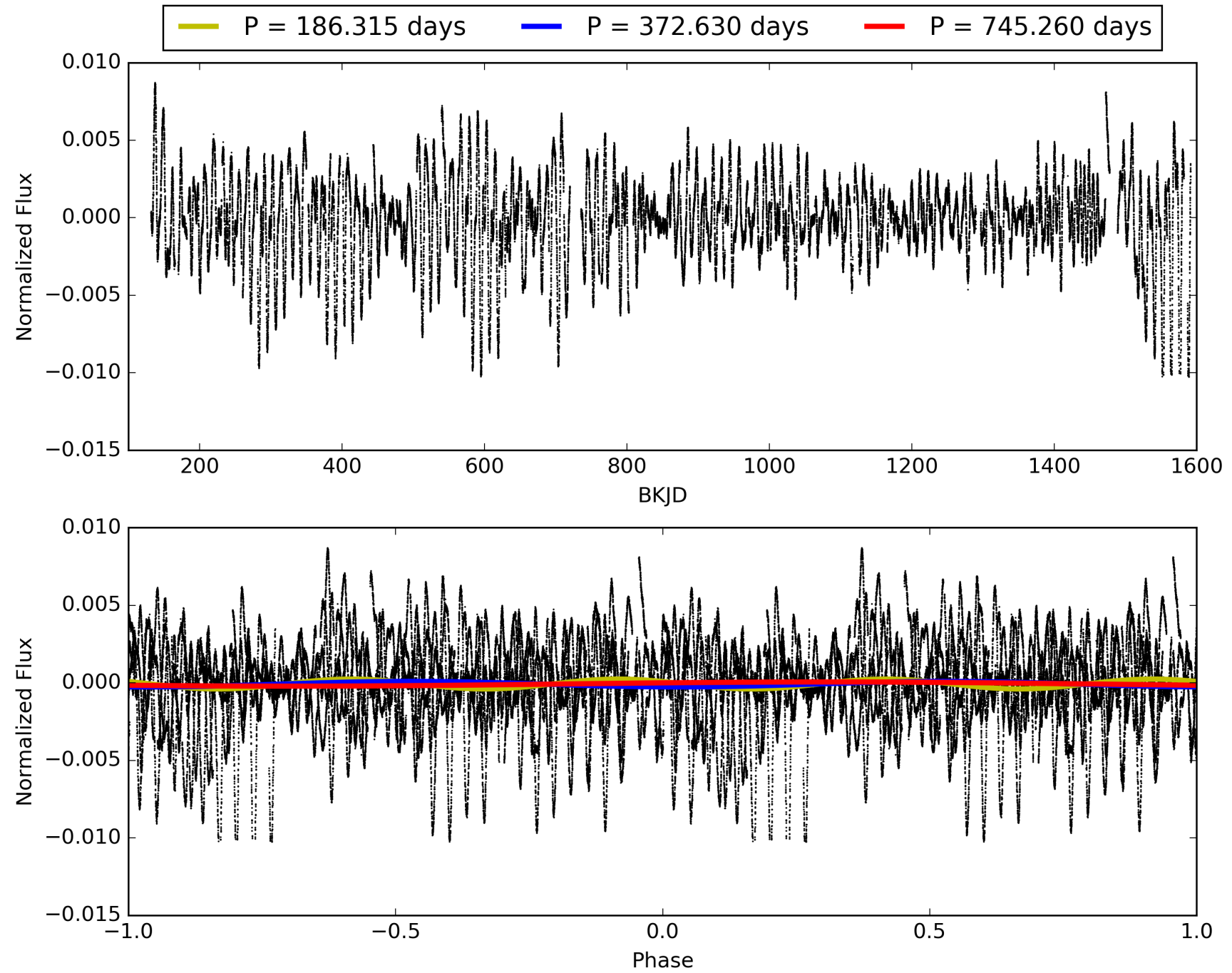
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 19:28:34 Z

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

# TCE 005955621-02, PDC Light Curves

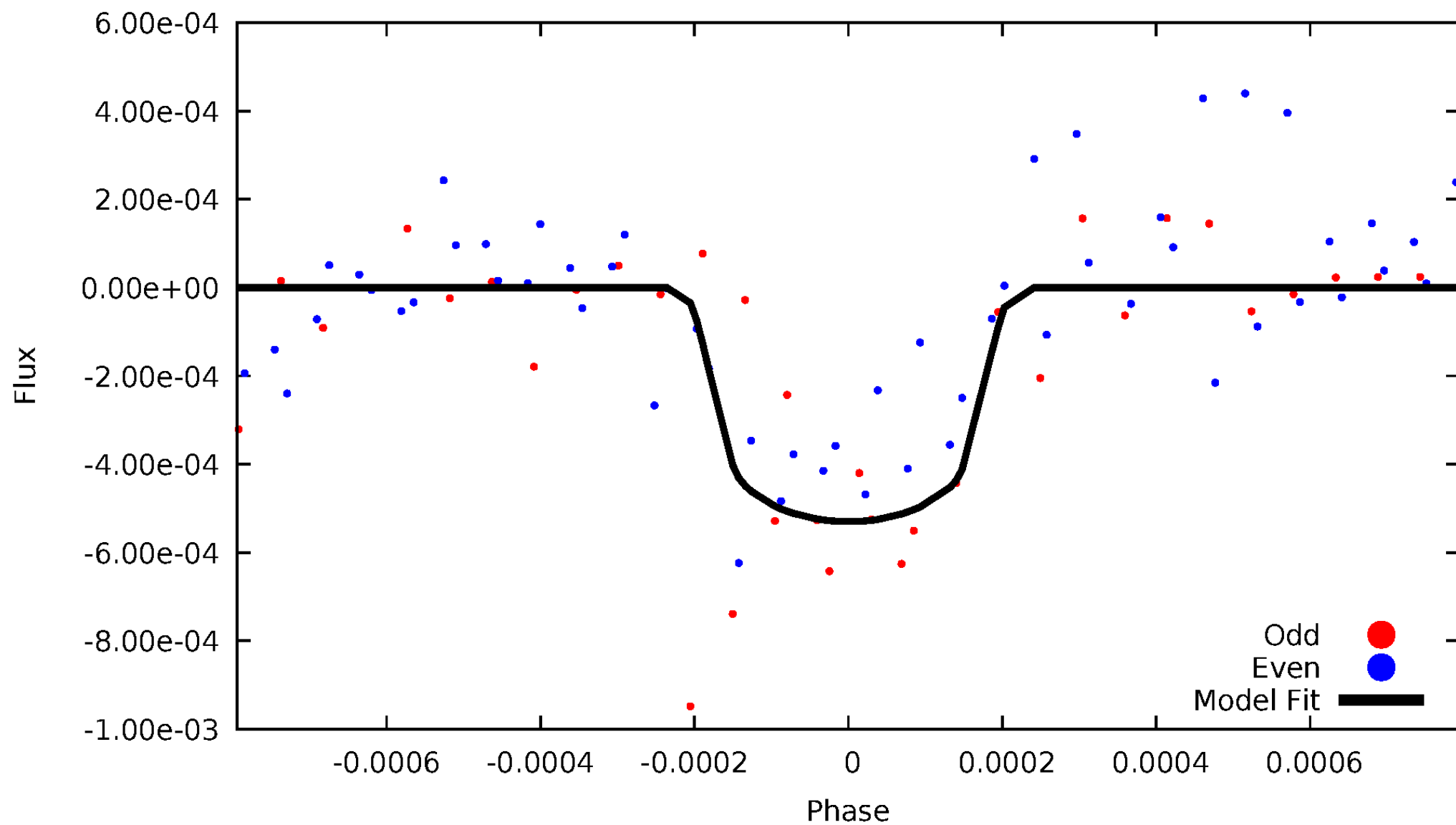


TCE 005955621-02



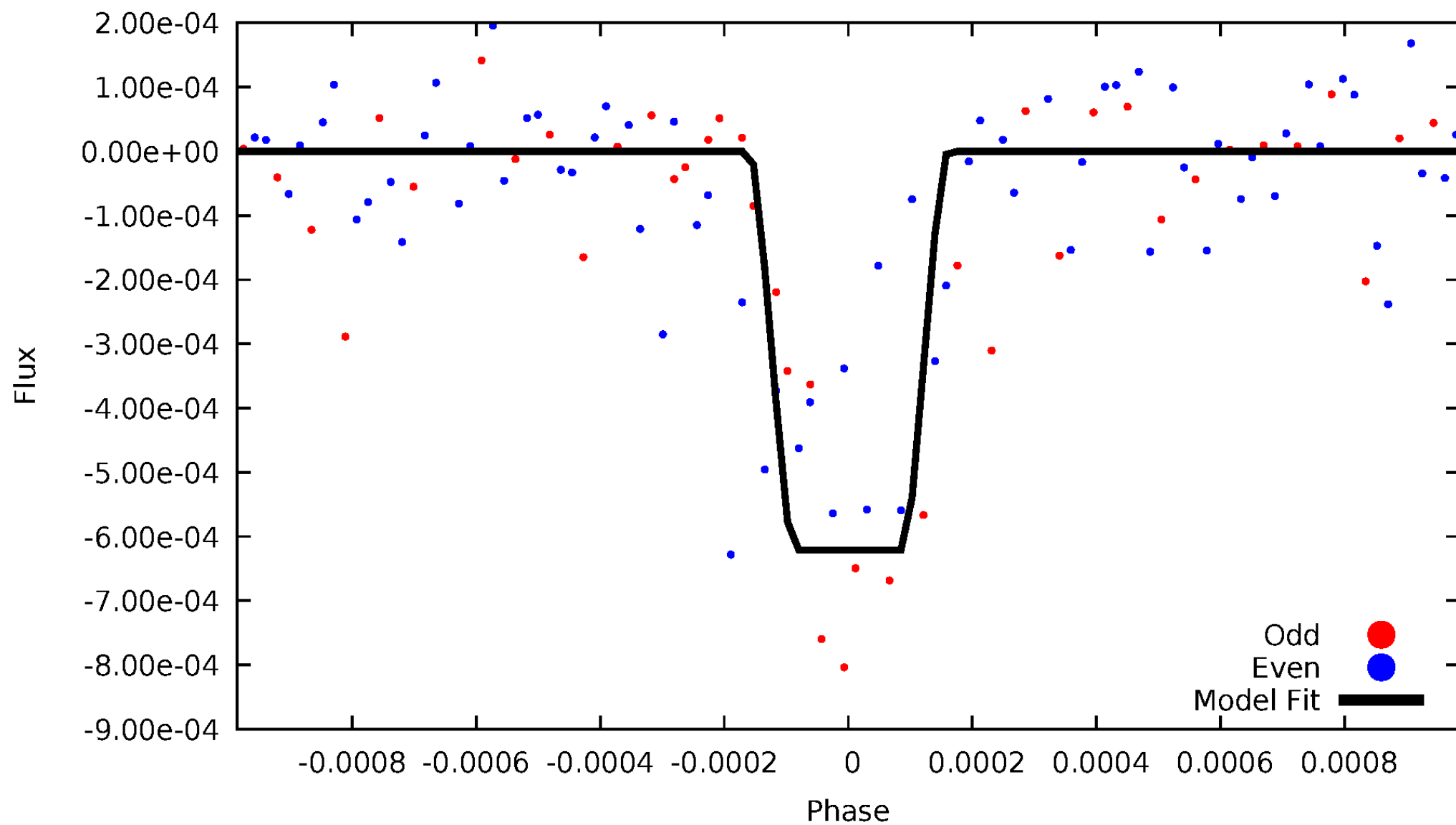
# DV Odd/Even

TCE 005955621-02



# ALT Odd/Even

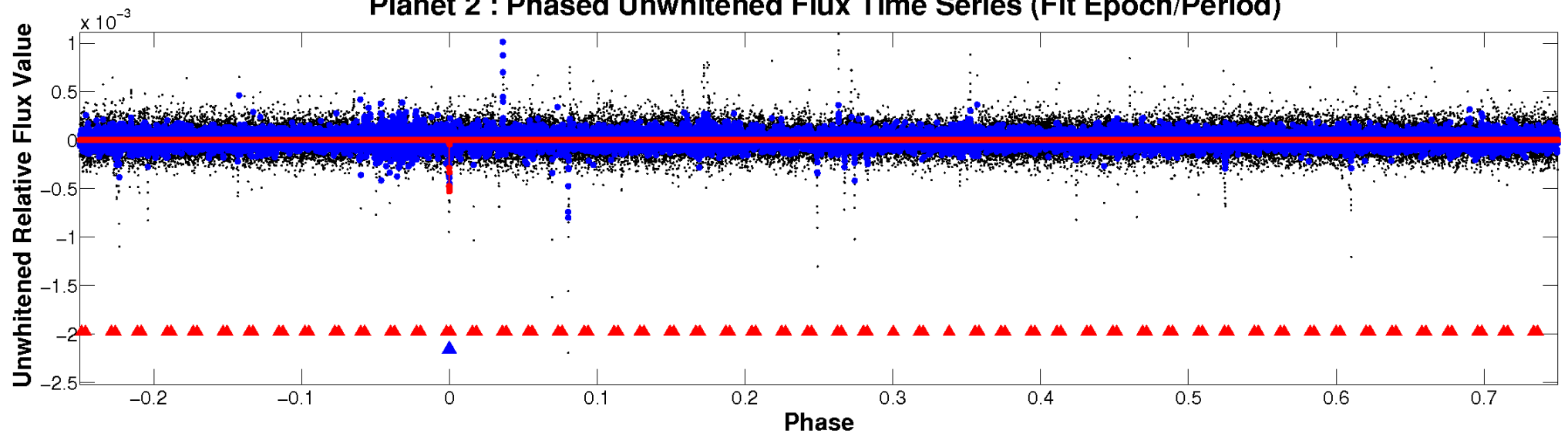
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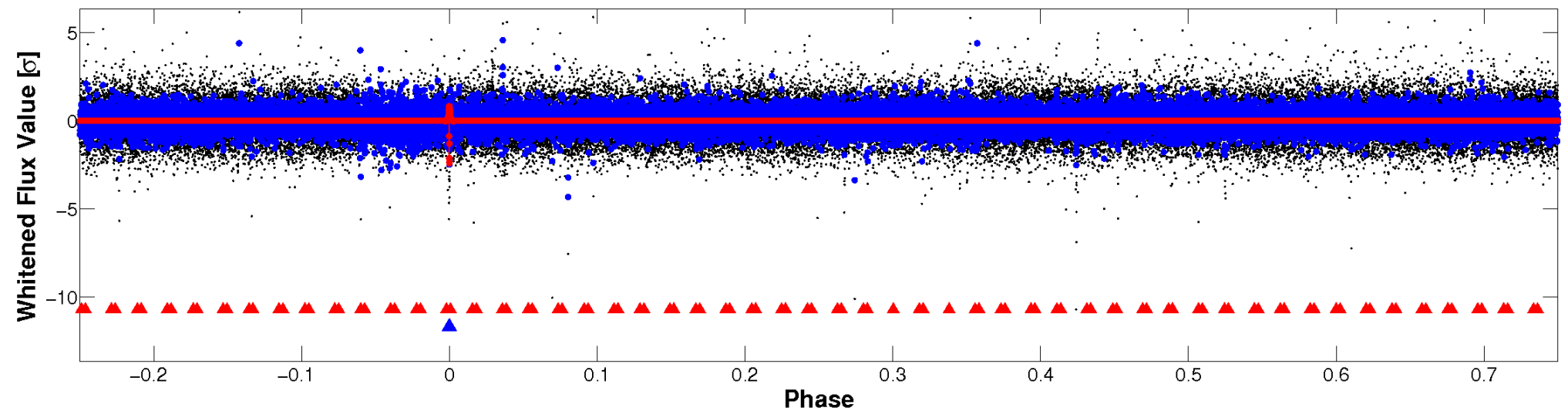


# Non-Whitened Vs. Whitened Light Curve

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

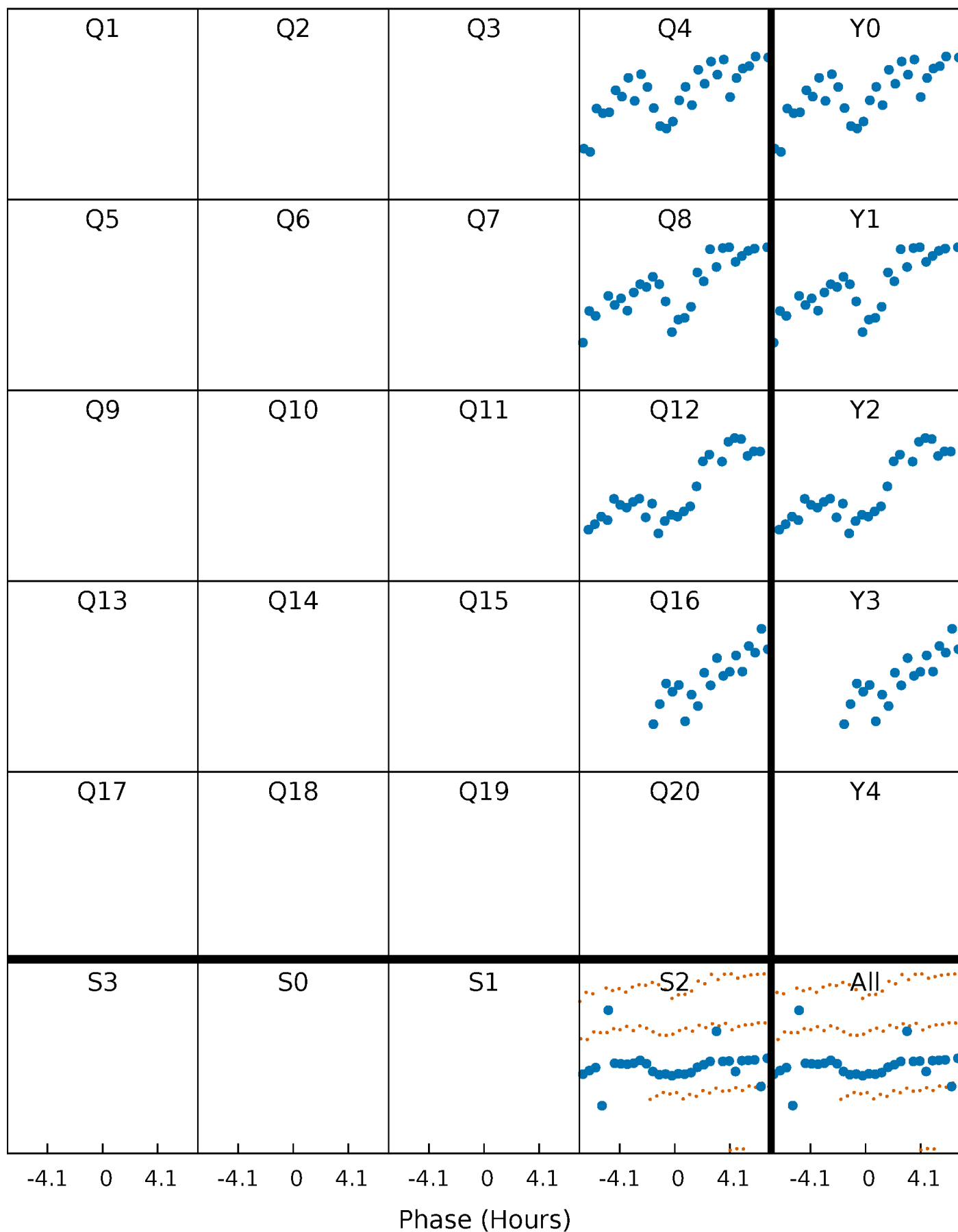


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



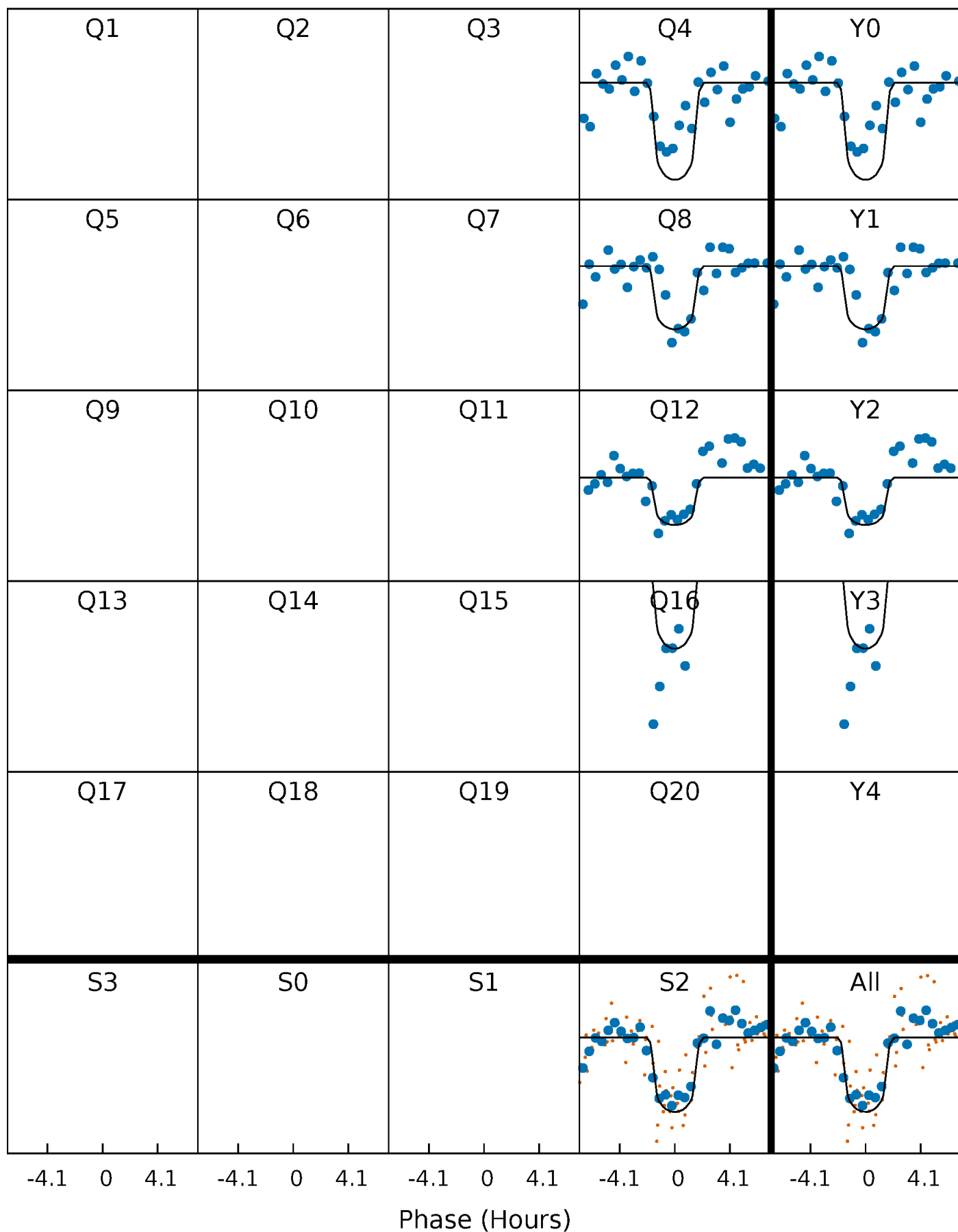
# PDC Quarter-Phased Transit Curves

TCE 005955621-02 P=372.630075 Days  $T_0=370.874588$  (BKJD)



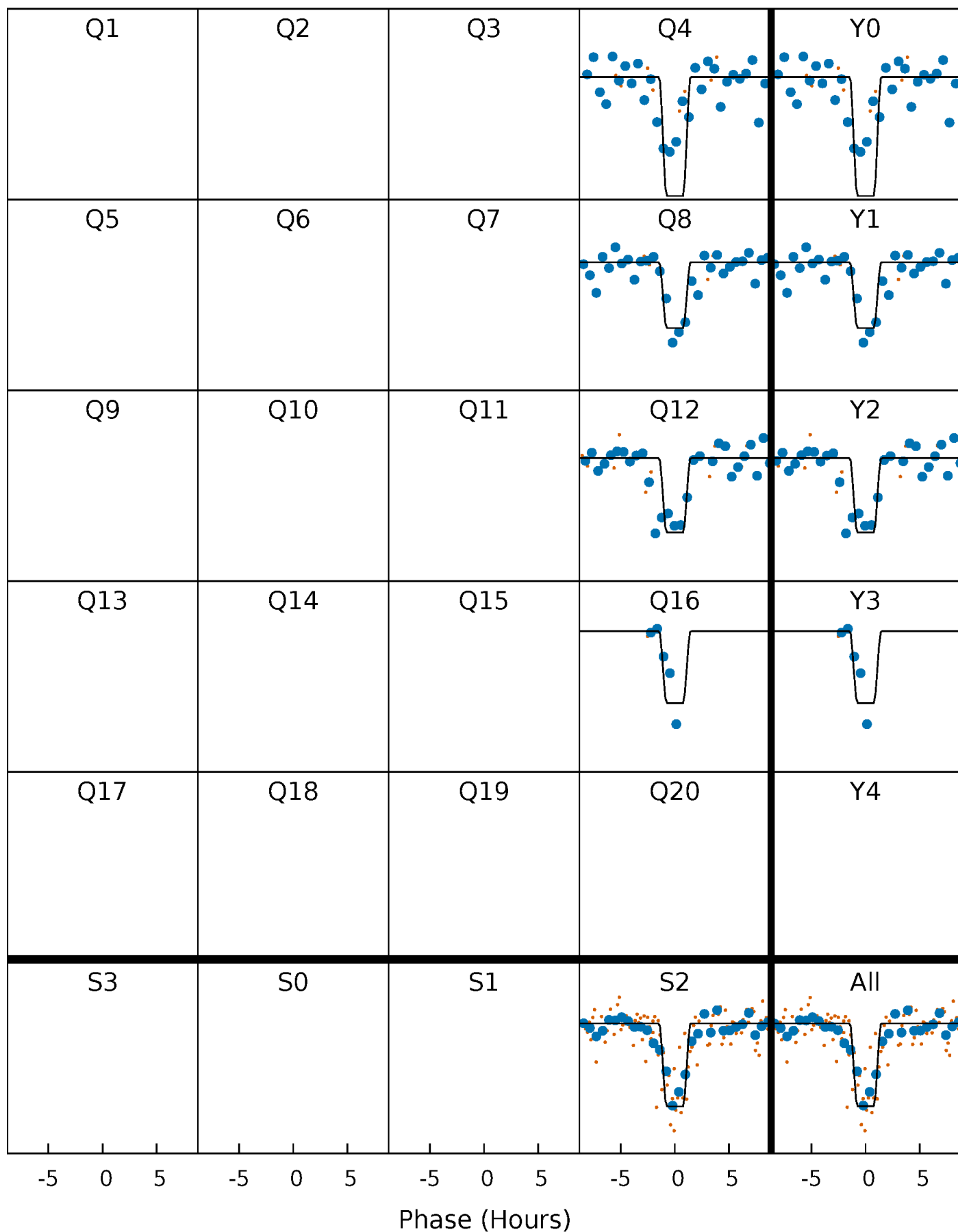
# DV Quarter-Phased Transit Curves

TCE 005955621-02     $P=372.630075$  Days     $T_0=370.874588$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

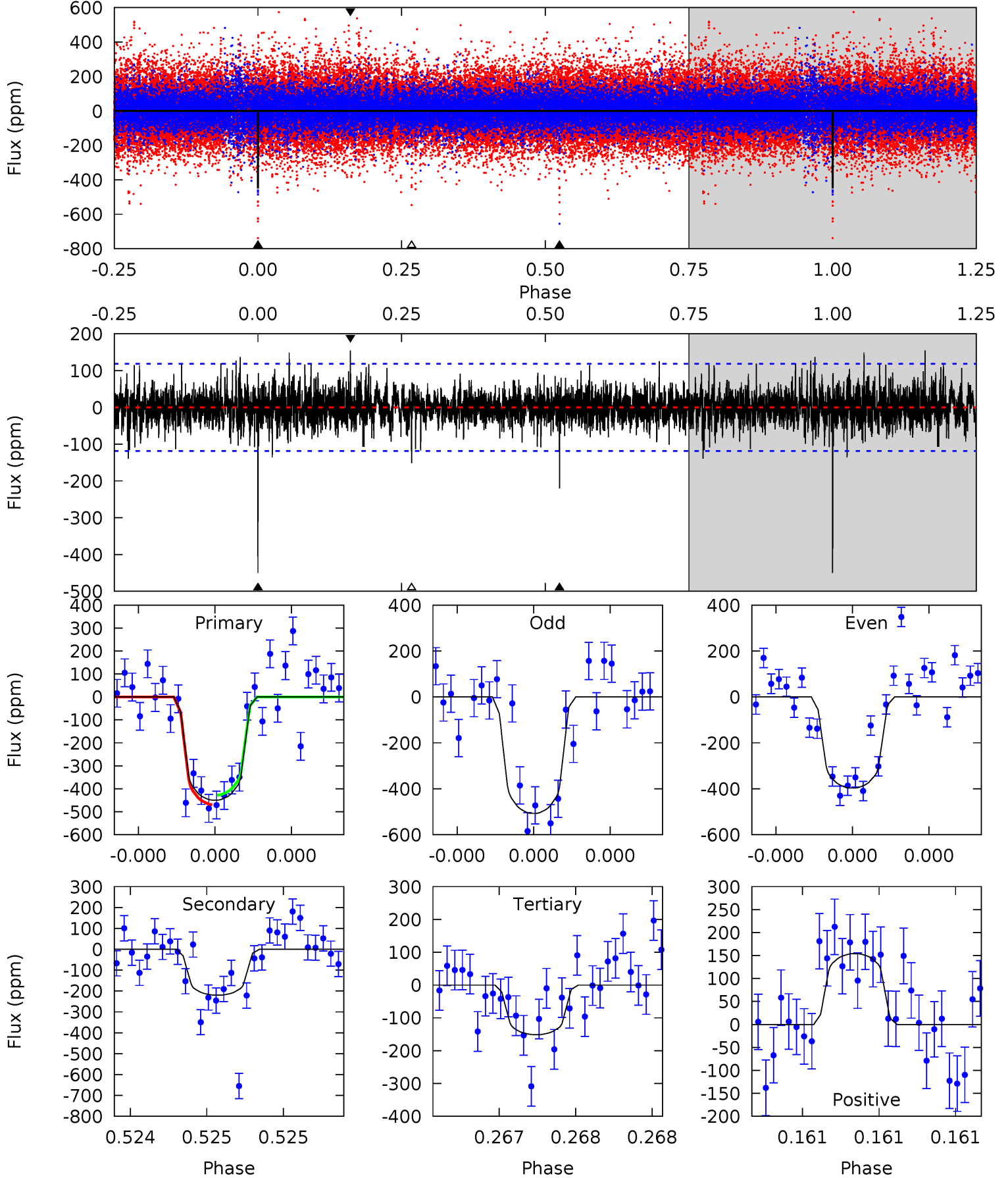
TCE 005955621-02 P=372.640689 Days  $T_0=370.870957$  (BKJD)



# DV Model-Shift Uniqueness Test

005955621-02,  $P = 372.630075$  Days,  $E = 370.874588$  Days

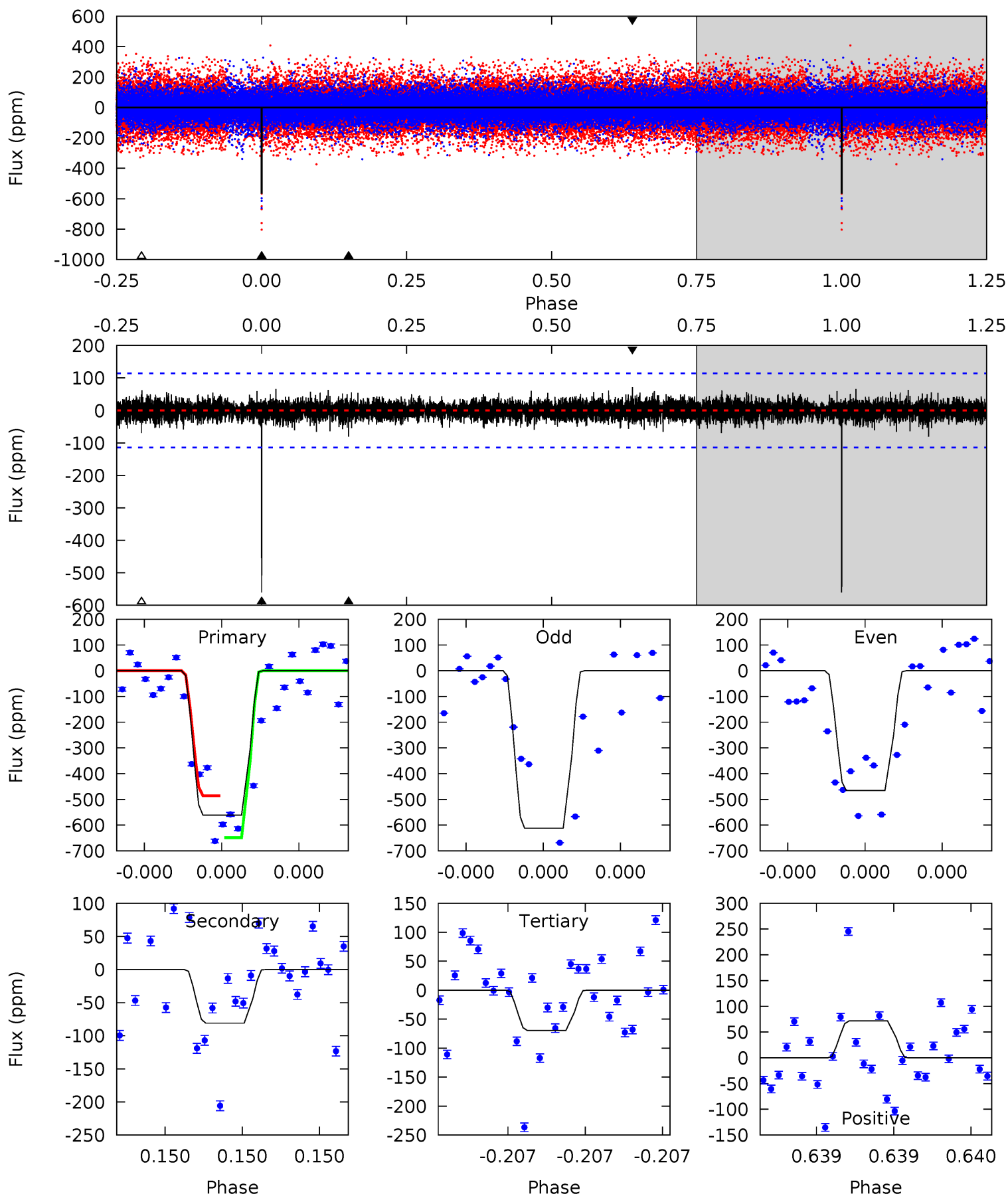
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.2	10.4	7.14	7.28	5.60	3.52	1.47	14.1	14.0	3.25	3.12	2.55	1.00	0.26	0.98



# Alt Model-Shift Uniqueness Test

005955621-02, P = 372.640689 Days, E = 370.870957 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
27.7	4.00	3.44	3.54	5.65	3.59	0.76	24.3	24.2	0.56	0.46	3.69	0.92	0.11	3.86





### Stellar Parameters For KIC 005955621

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5984^{+71}_{-89}$	$4.421^{+0.038}_{-0.113}$	$0.240^{+0.150}_{-0.150}$	$1.089^{+0.164}_{-0.059}$	$1.142^{+0.054}_{-0.075}$	$1.247^{+0.186}_{-0.426}$
	+1%/-1%	+1%/-3%	+62%/-62%	+15%/-5%	+5%/-7%	+15%/-34%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 005955621-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-220 \pm 21$	$2.97^{+1.05}_{-1.01}$	$377^{+14}_{-9}$	$4749^{+995}_{-484}$	$14952^{+18934}_{-6569}$
Alt.	$-81 \pm 20$	$2.95^{+1.07}_{-1.02}$	$376^{+13}_{-9}$	$3938^{+683}_{-420}$	$5492^{+7441}_{-2697}$

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

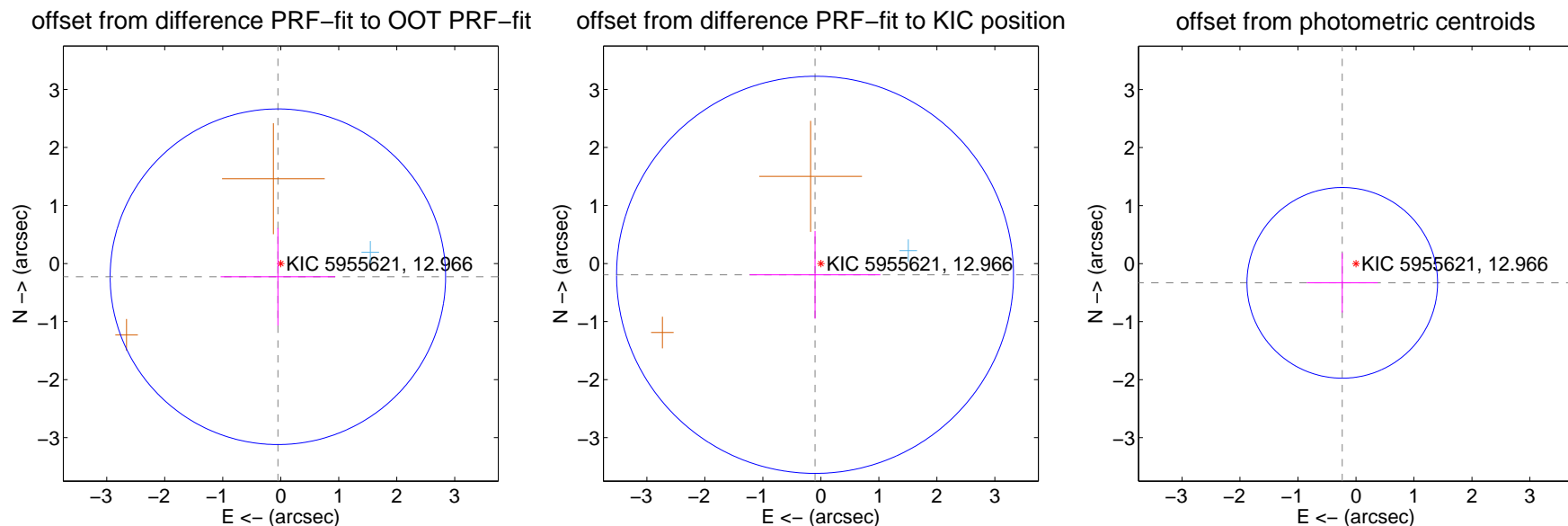
## DV Centroid Data

Supplemental centroid analysis for 005955621-02. Kepler magnitude: 12.97. Transit SNR 10.77

There are 1 quarters with good PRF difference image offsets

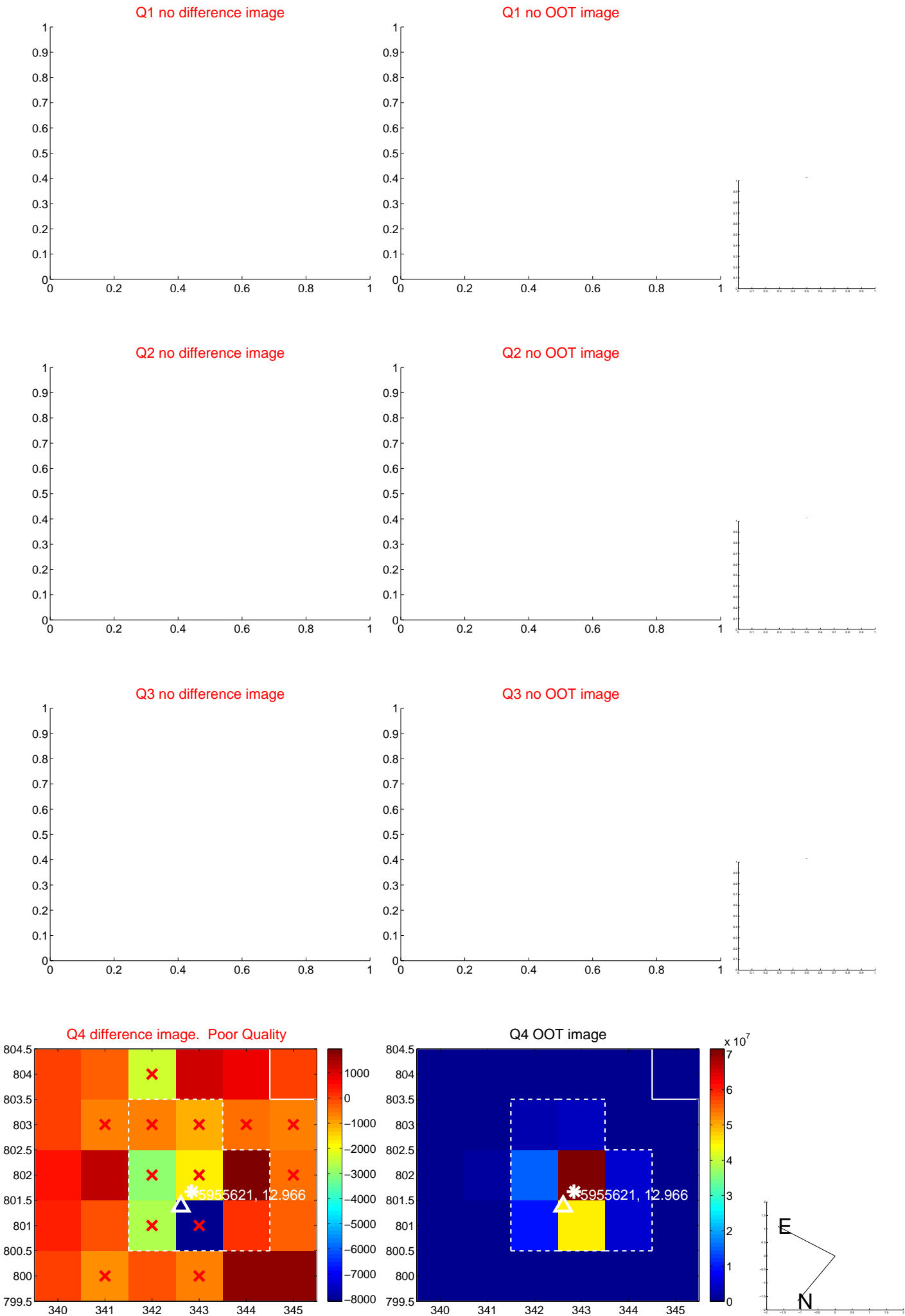
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.233 \pm 0.964$	0.24	$0.050 \pm 0.988$	$-0.228 \pm 0.839$
PRF-fit source offset from KIC position	$0.219 \pm 1.140$	0.19	$0.100 \pm 1.126$	$-0.195 \pm 0.755$
photometric centroid source offset	$0.41 \pm 0.55$	0.74	$0.24 \pm 0.61$	$-0.33 \pm 0.51$

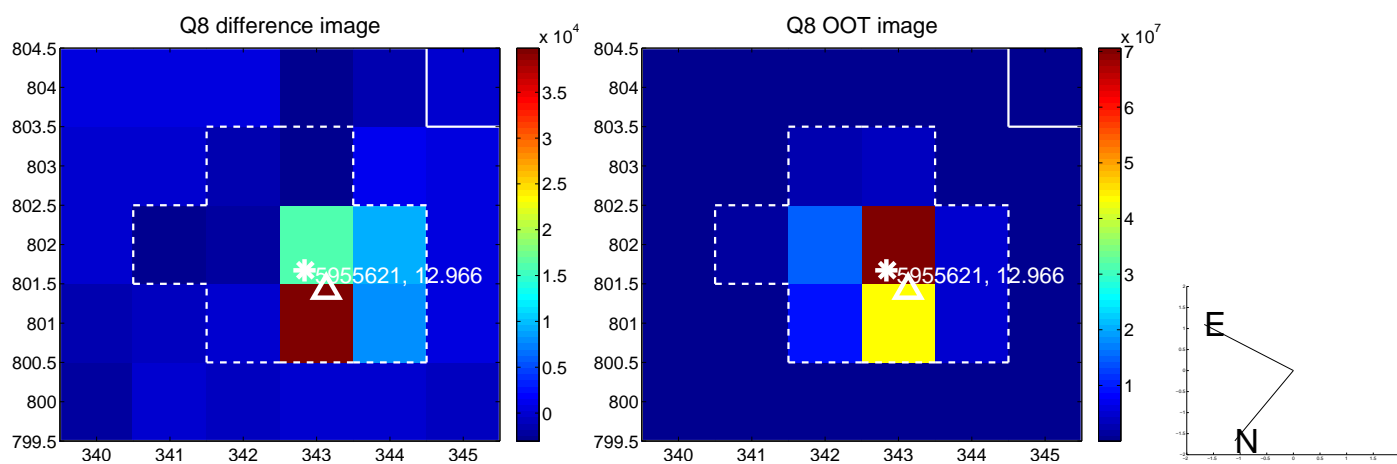
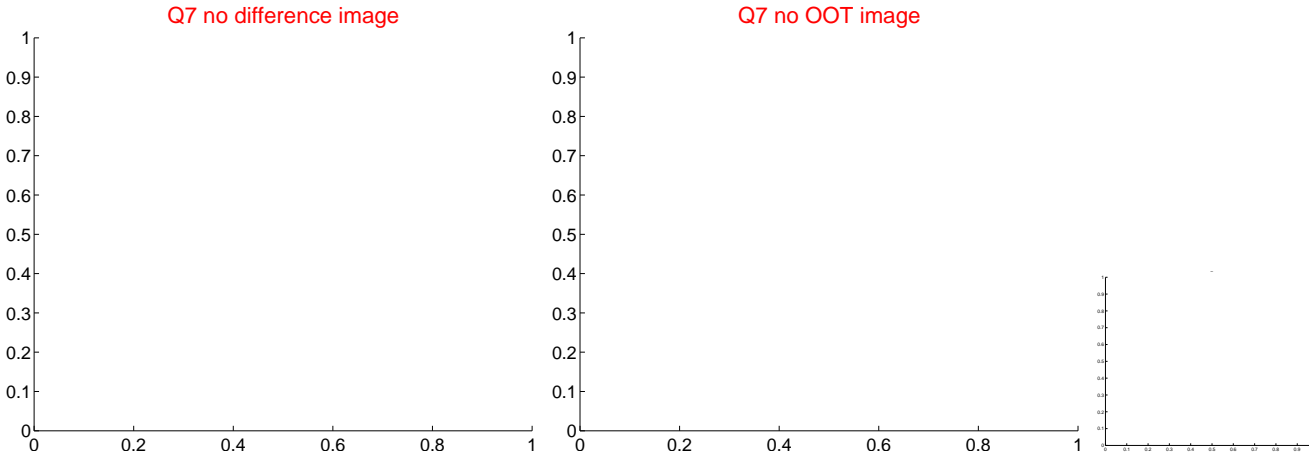
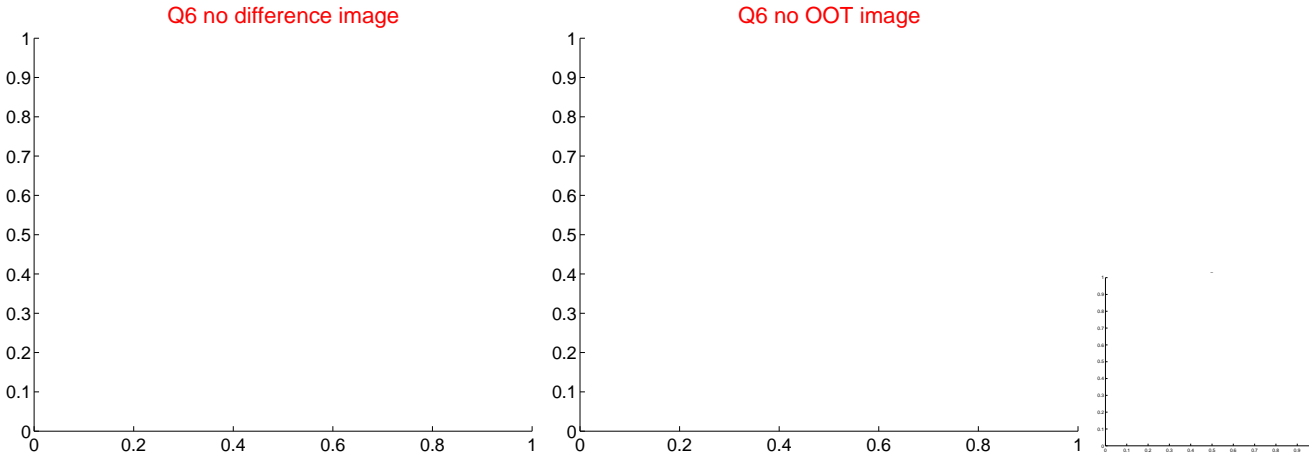
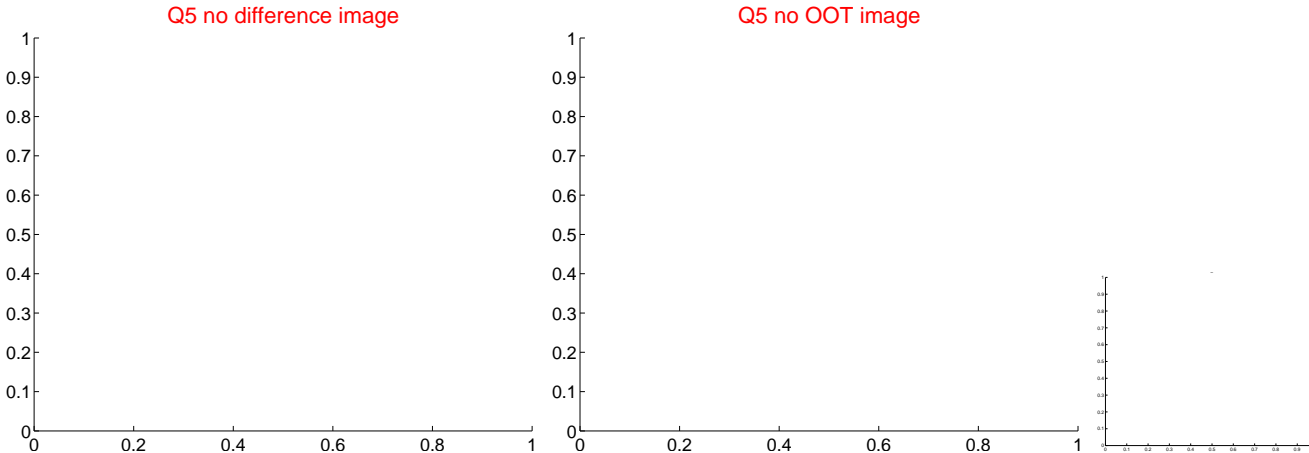


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

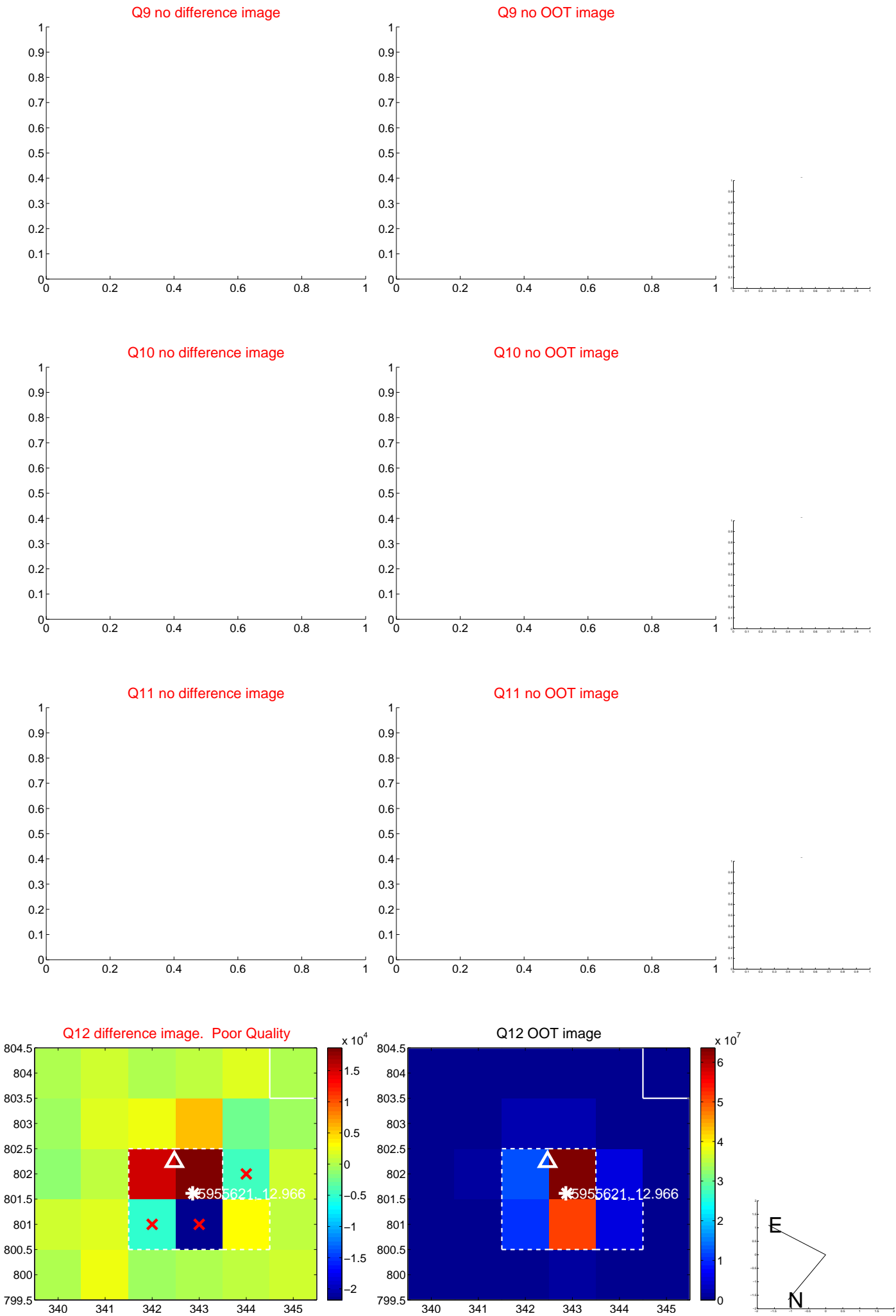
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



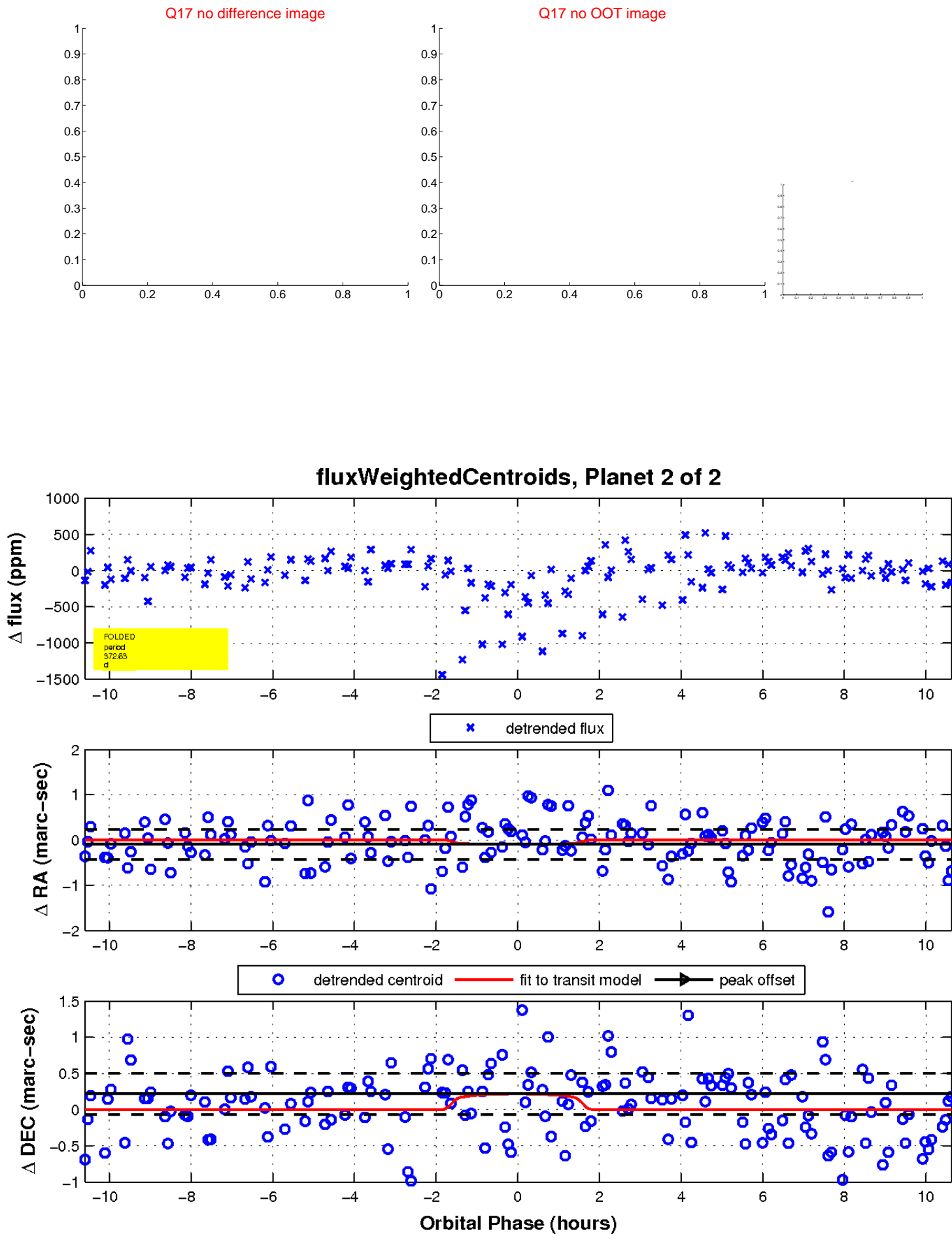
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image

