

# KIC 011961075

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011961075-01	OBS	No	408.037125	469.959803	3675.6	6.802	18.7	9.2	0.33	3412	2.40	0.02
011961075-02	OBS	No	358.114209	424.631610	3298.1	7.469	15.6	10.8	0.33	3412	1.86	0.03
011961075-03	OBS	No	493.140994	346.393041	2944.5	9.335	13.7	8.2	0.33	3412	1.76	0.02
011961075-04	OBS	No	171.184935	215.375697	2394.0	11.573	11.8	9.0	0.33	3412	1.58	0.08

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011961075-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—CENT_FEW_DIFFS
011961075-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_KIC_POS—HALO_GHOST
011961075-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_KIC_POS
011961075-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_KIC_POS

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

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

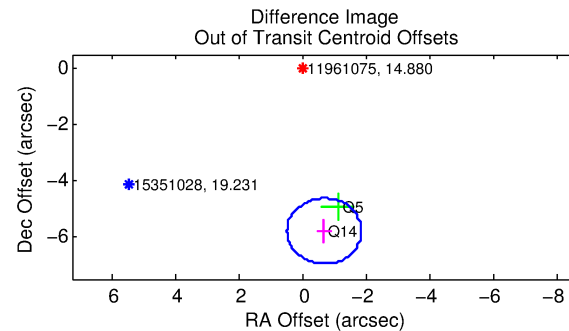
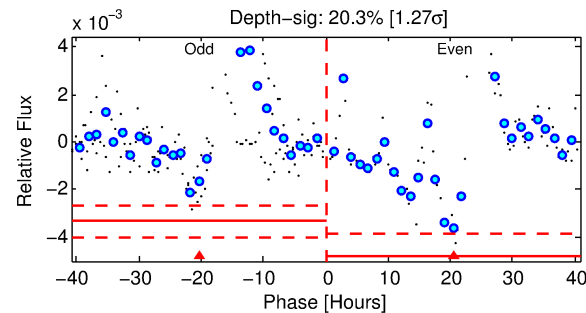
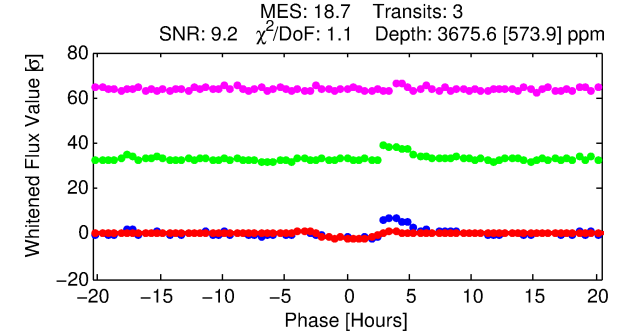
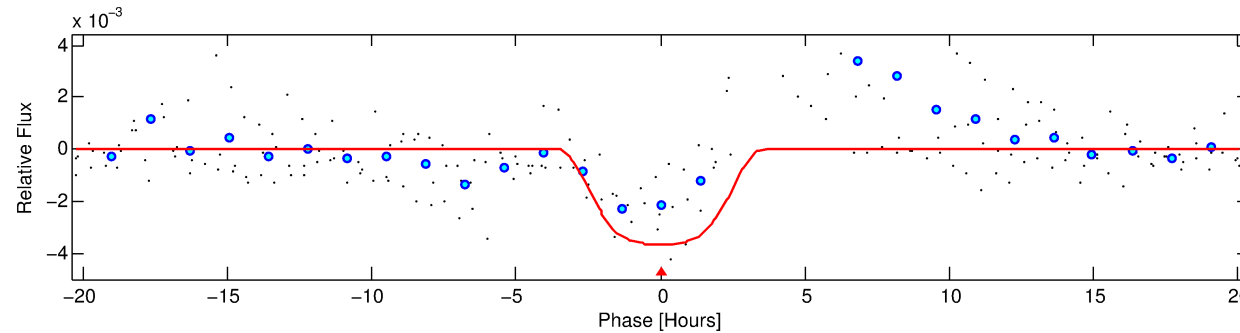
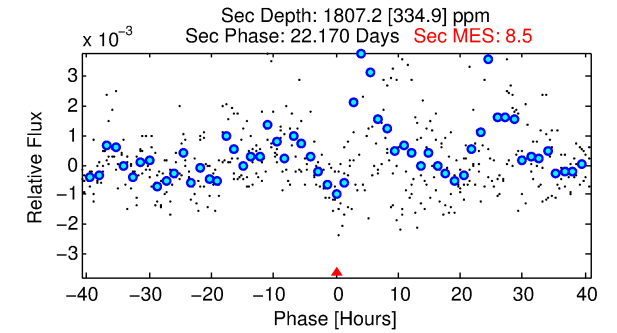
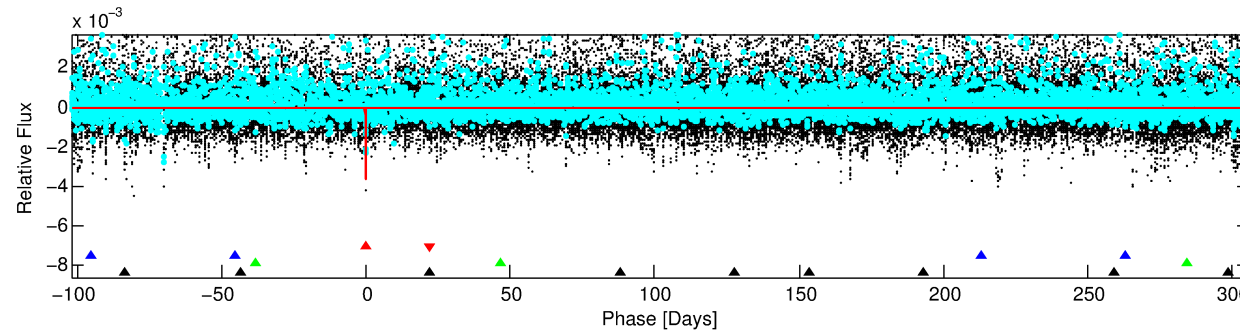
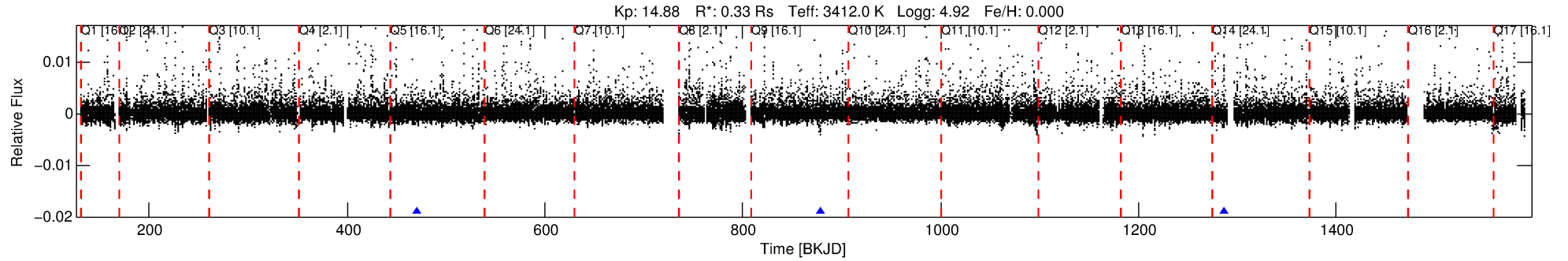
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 011961075-01

No Significant Match Found

# DV One-Page Summary

KIC: 11961075 Candidate: 1 of 4 Period: 408.037 d



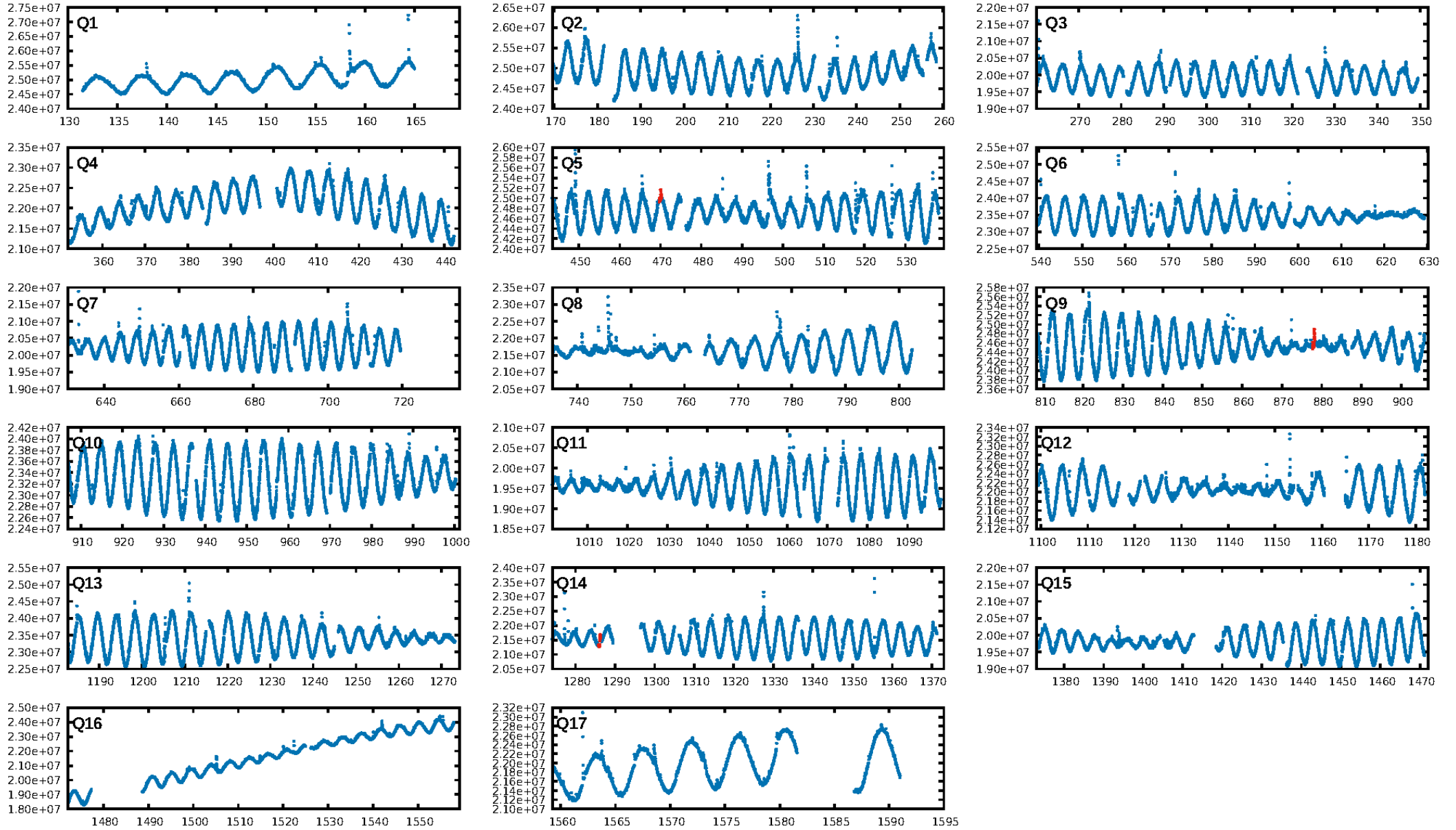
## DV Fit Results:

Period = 408.03713 [0.00859] d  
Epoch = 469.9598 [0.0106] BKJD  
Rp/R\* = 0.0671 [0.0068]  
a/R\* = 259.03 [40.08]  
b = 0.91 [0.03]  
Seff = 0.02 [0.00]  
Teq = 100 [3] K  
Rp = 2.40 [0.35] Re  
a = 0.7409 [0.0565] AU  
Ag = 94701.30 [27429.04] [3.45σ]  
Teffp = 2716 [189] K [13.83σ]

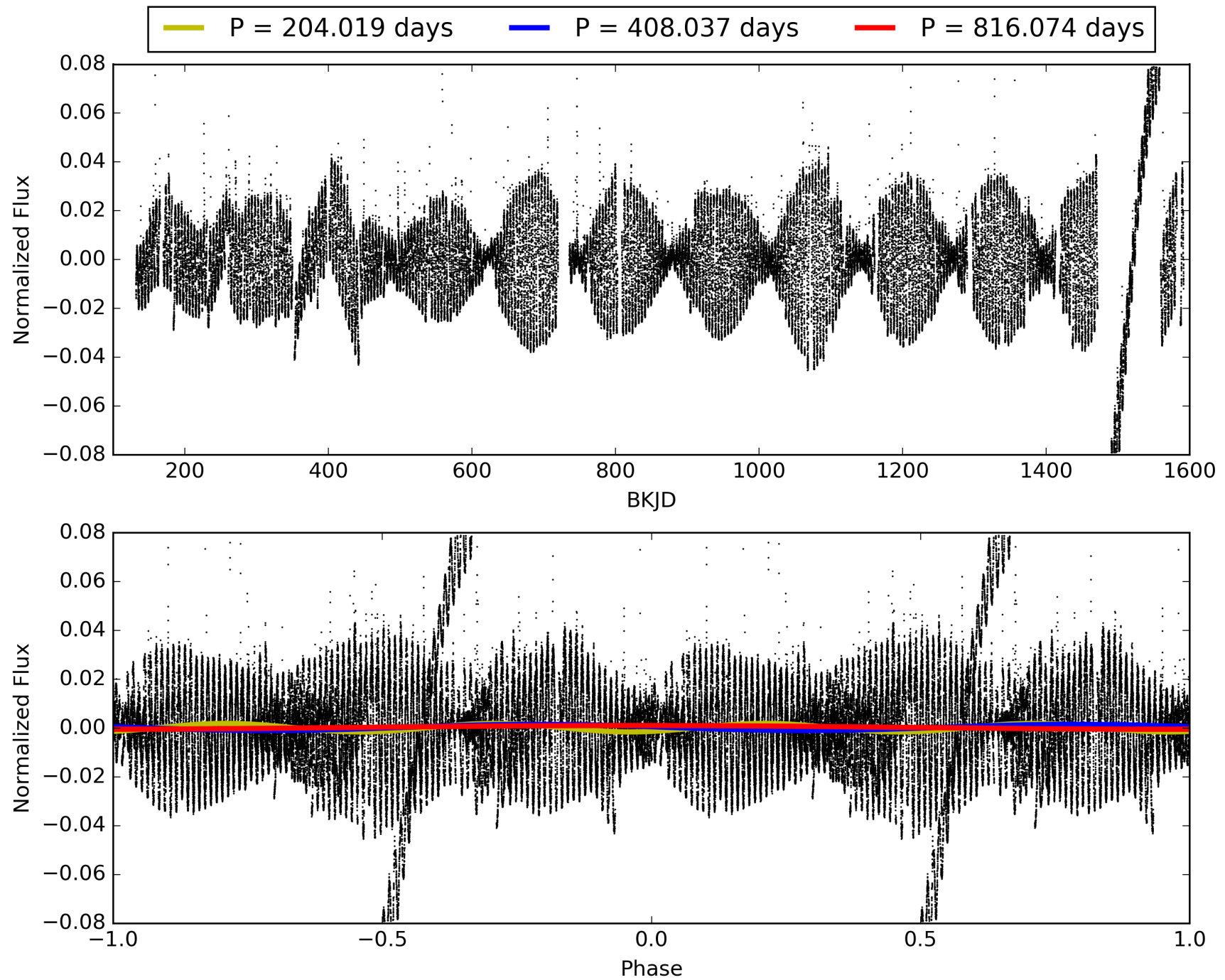
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [118.60σ]  
LongPeriod-sig: 100.0% [176.84σ]  
ModelChiSquare2-sig: 11.2%  
ModelChiSquareGo-sig: 97.2%  
Bootstrap-pfa: 2.18e-17  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 0.753  
Centroid-sig: 0.1%  
Centroid-so: 1.337 arcsec [2.08σ]  
OotOffset-rm: 5.836 arcsec [14.97σ]  
KicOffset-rm: 0.154 arcsec [0.49σ]  
OotOffset-st: 1/0/0/1 [2]  
KicOffset-st: 1/0/0/1 [2]  
DiffImageQuality-fgm: 0.50 [1/2]  
DiffImageOverlap-fno: 1.00 [3/3]

# TCE 011961075-01, PDC Light Curves



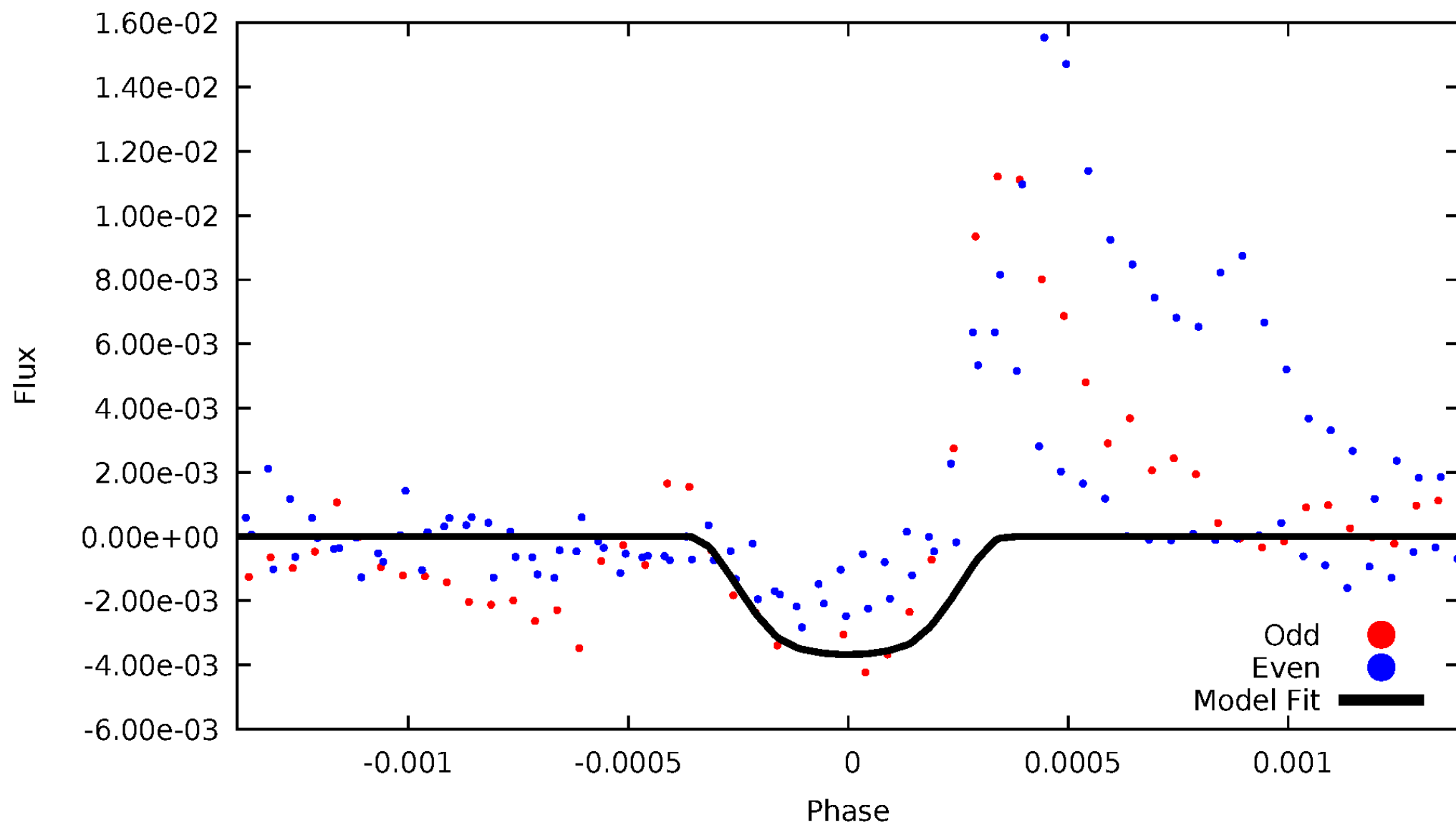
TCE 011961075-01





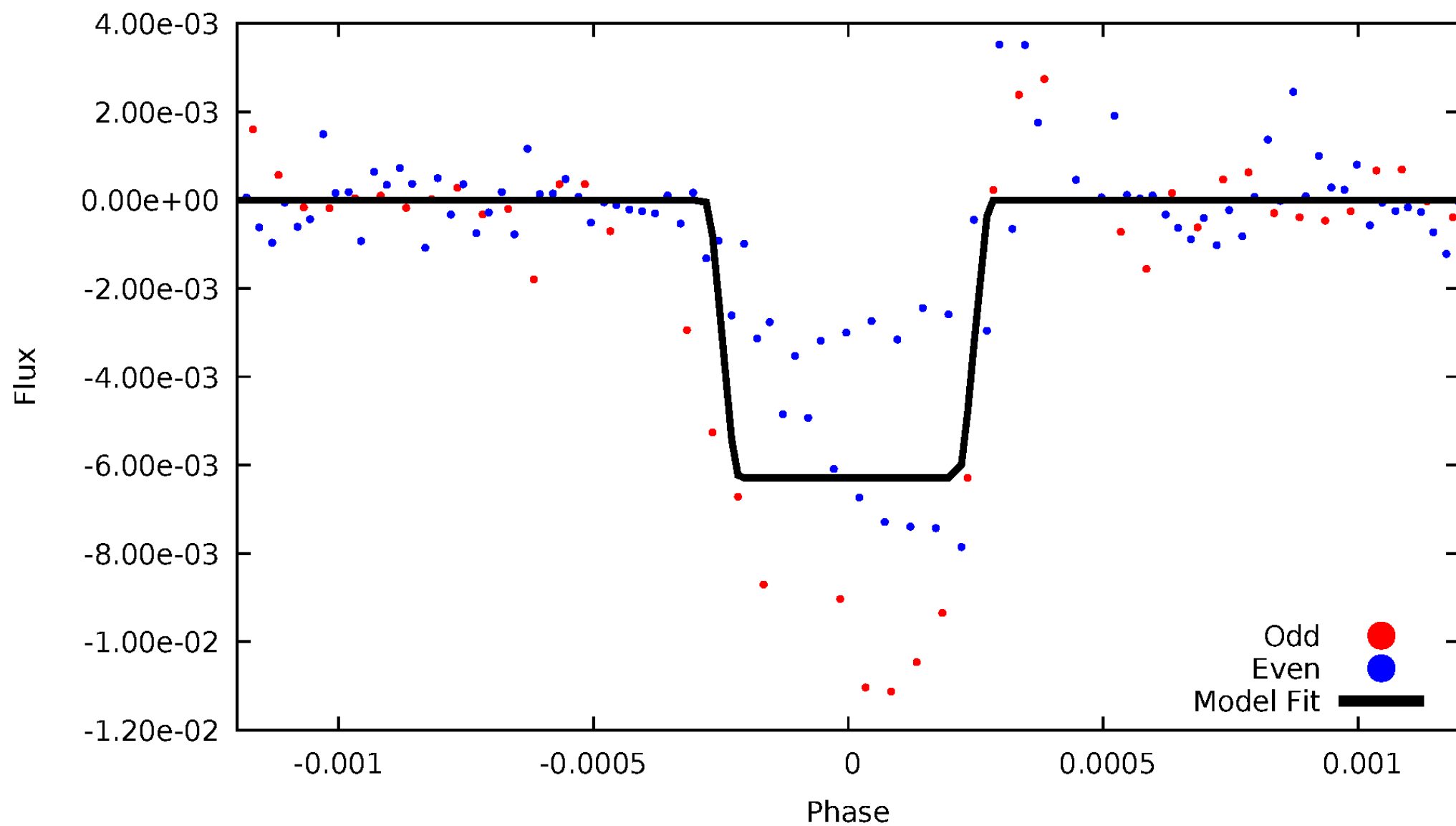
# DV Odd/Even

TCE 011961075-01



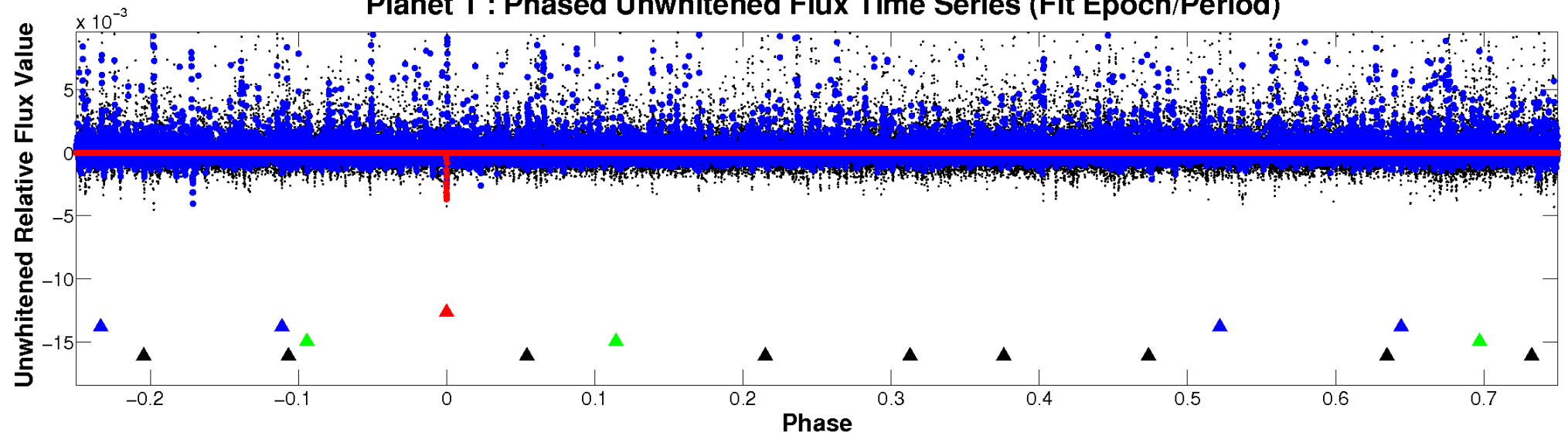
# ALT Odd/Even

TCE 011961075-01

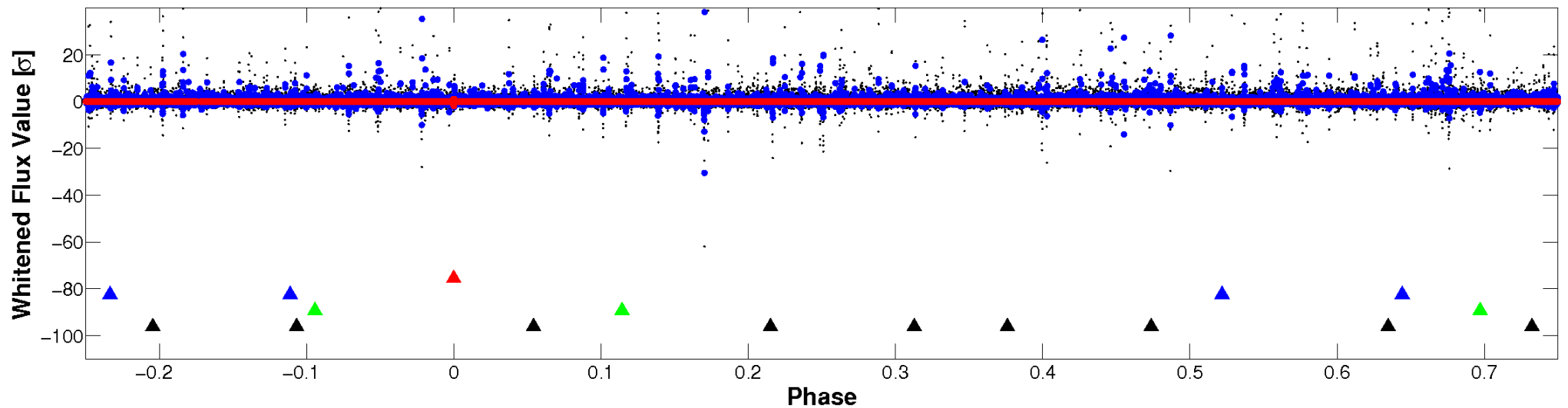


# Non-Whitened Vs. Whitened Light Curve

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

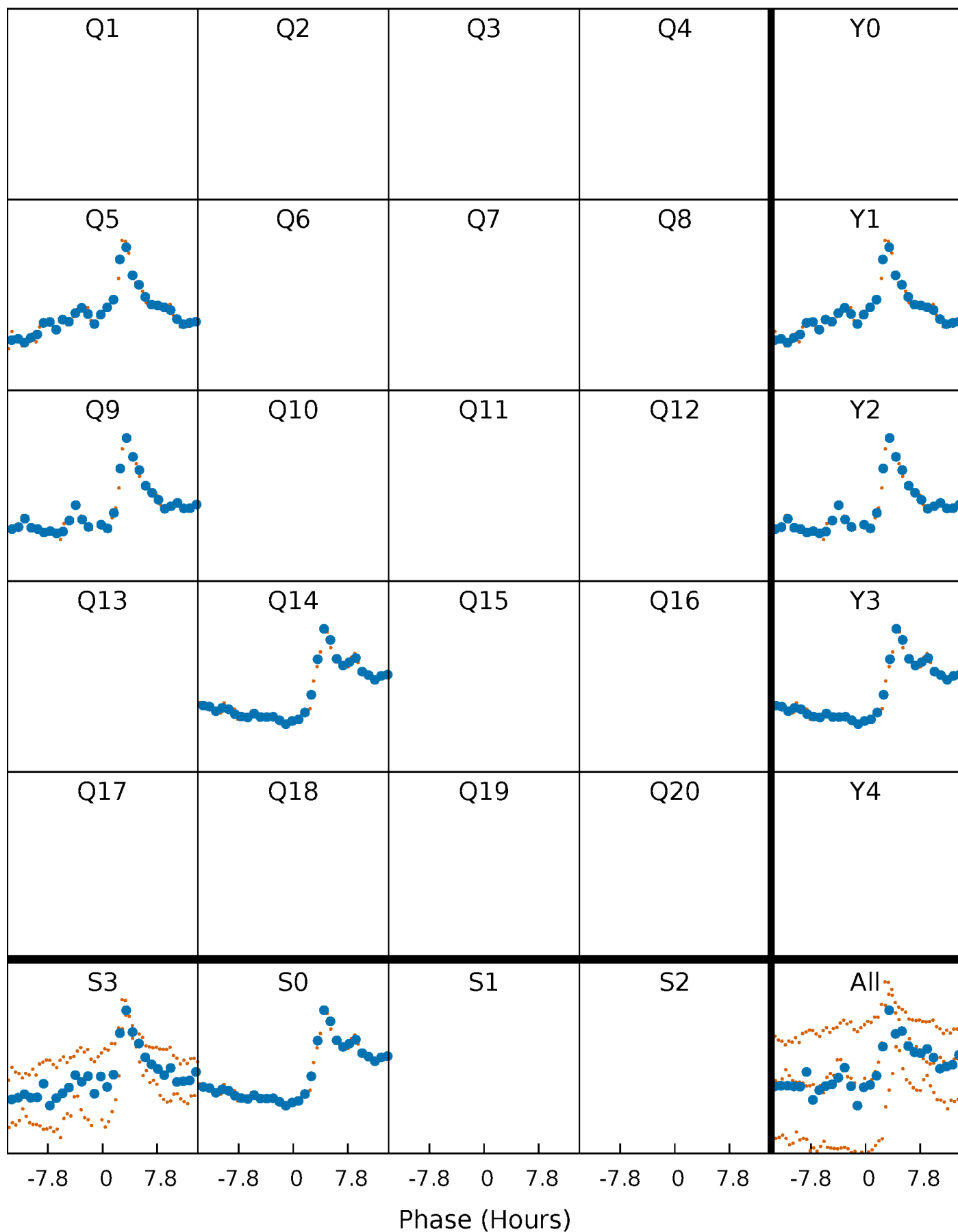


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



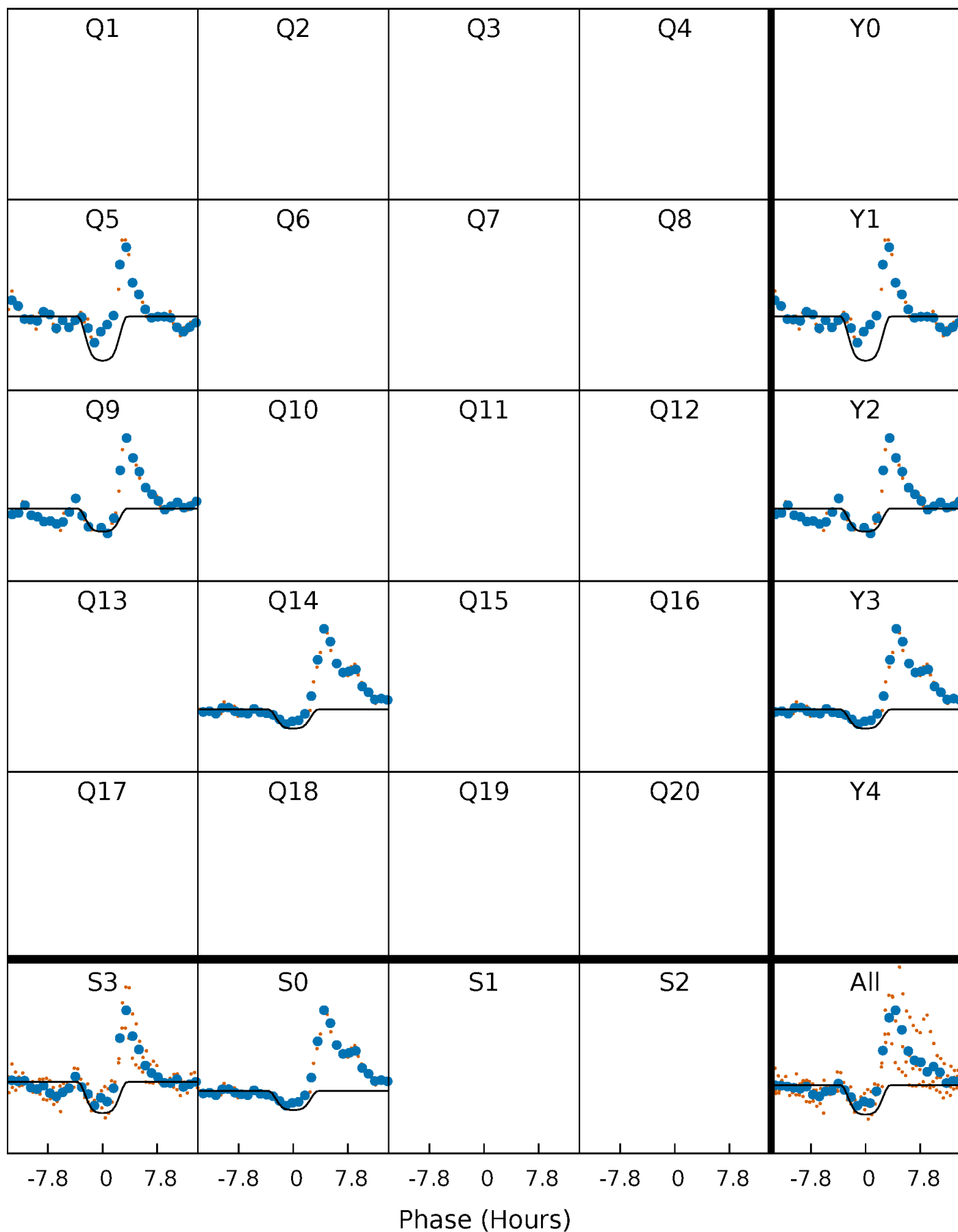
# PDC Quarter-Phased Transit Curves

TCE 011961075-01 P=408.037125 Days  $T_0=469.959803$  (BKJD)



# DV Quarter-Phased Transit Curves

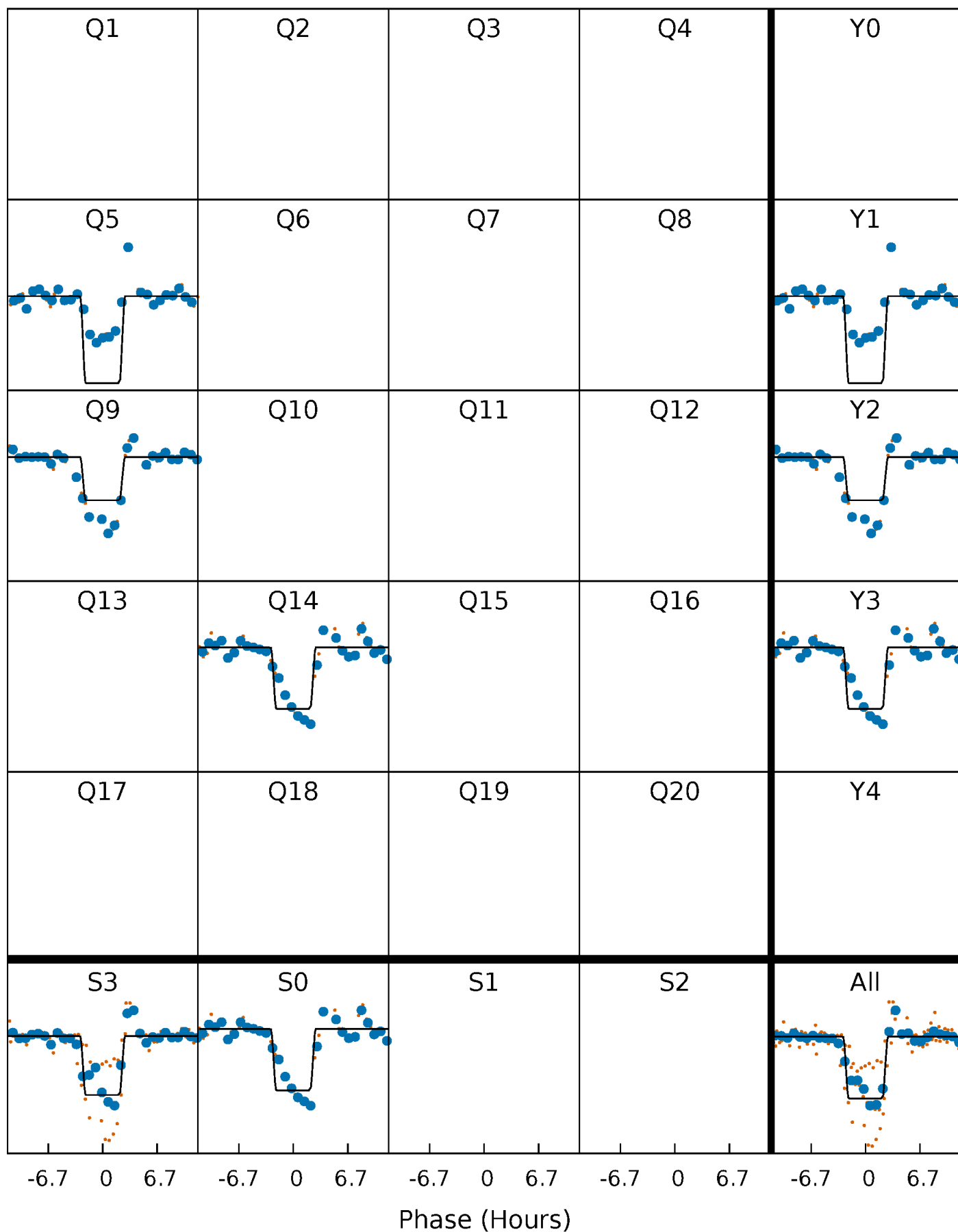
TCE 011961075-01 P=408.037125 Days  $T_0=469.959803$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

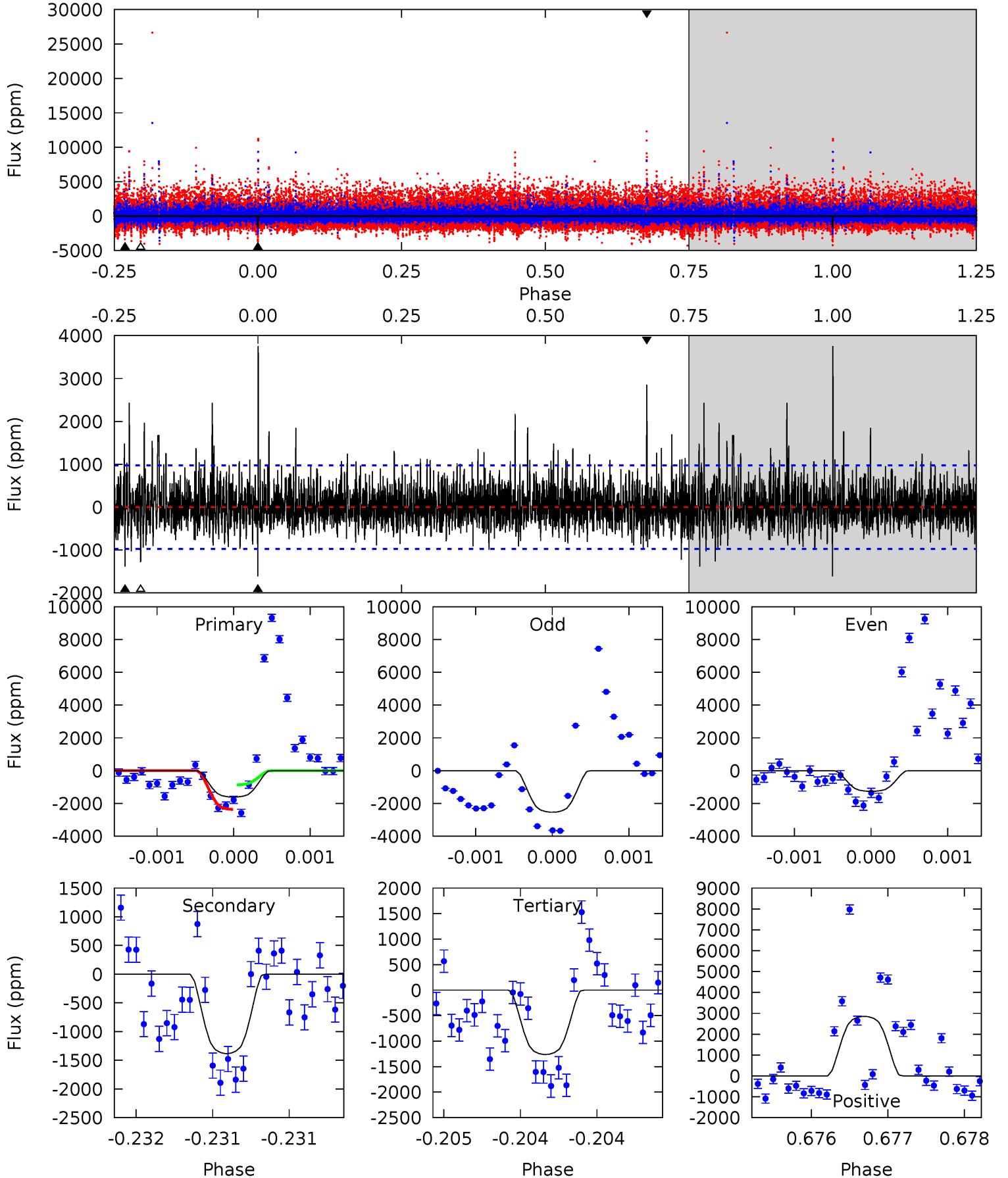
TCE 011961075-01 P=408.044571 Days  $T_0=469.954430$  (BKJD)



# DV Model-Shift Uniqueness Test

011961075-01, P = 408.037125 Days, E = 61.922678 Days

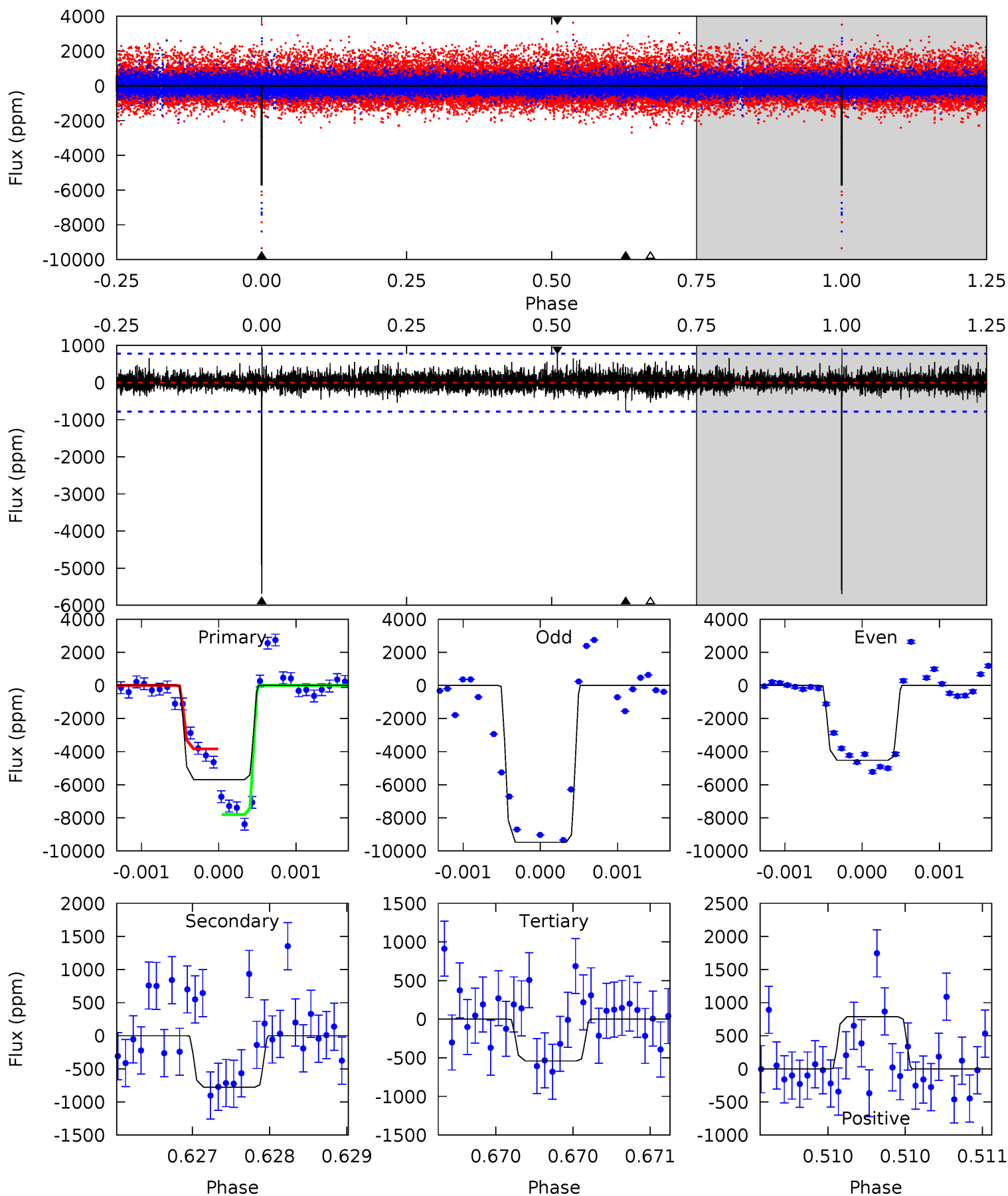
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.12	7.82	7.13	16.1	5.50	3.37	2.17	1.98	-7.00	0.68	-8.30	2.46	0.86	0.70	4.28



# Alt Model-Shift Uniqueness Test

011961075-01, P = 408.044571 Days, E = 61.909859 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
40.5	5.55	3.85	5.62	5.56	3.45	0.92	36.7	34.9	1.69	-0.07	19.9	1.01	0.14	14.6



### Stellar Parameters For KIC 011961075

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$3412^{+44}_{-41}$	$4.919^{+0.042}_{-0.031}$	$0.000^{+0.100}_{-0.100}$	$0.328^{+0.030}_{-0.034}$	$0.325^{+0.041}_{-0.037}$	$13.010^{+2.916}_{-1.983}$
	+1%/-1%	+1%/-1%	+inf%/-inf%	+9%/-10%	+13%/-11%	+22%/-15%
Source	PHO2	PHO2	PHO2	DSEP		

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

### Secondary Eclipse Parameters for KIC 011961075-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-1384 \pm 177$	$2.39^{+0.29}_{-0.26}$	$140^{+3}_{-3}$	$2877^{+105}_{-99}$	$73091^{+22444}_{-16906}$
Alt.	$-778 \pm 140$	$2.81^{+0.33}_{-0.27}$	$140^{+3}_{-3}$	$2555^{+88}_{-79}$	$29418^{+8921}_{-6796}$

$T_{max}$  = 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

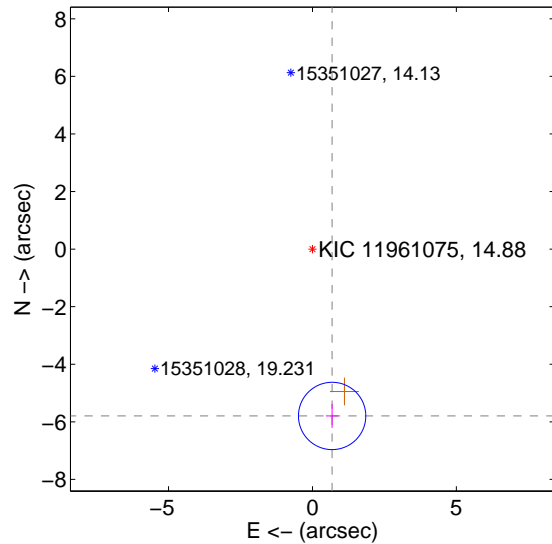
Supplemental centroid analysis for 011961075-01. Kepler magnitude: 14.88. Transit SNR 9.17

There are 1 quarters with good PRF difference image offsets

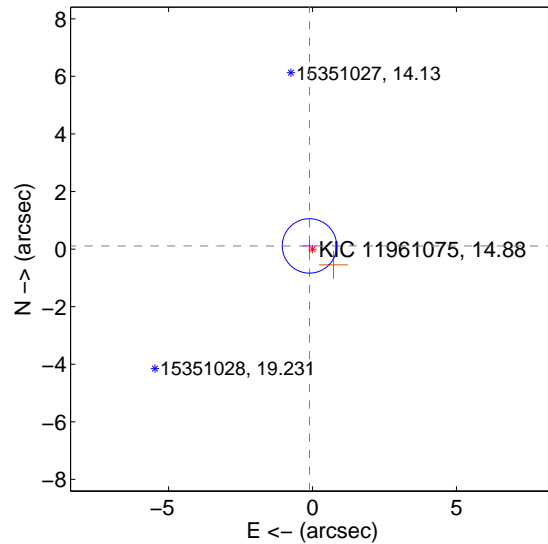
The OOT PRF centroid is offset from the target star catalog position by about 5.98 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b>5.836 <math>\pm</math> 0.390</b>	<b>14.97</b>	-0.684 $\pm$ 0.218	-5.796 $\pm$ 0.417
PRF-fit source offset from KIC position	0.154 $\pm$ 0.315	0.49	0.107 $\pm$ 0.253	0.111 $\pm$ 0.203
photometric centroid source offset	1.34 $\pm$ 0.64	2.08	0.53 $\pm$ 0.24	1.23 $\pm$ 0.69

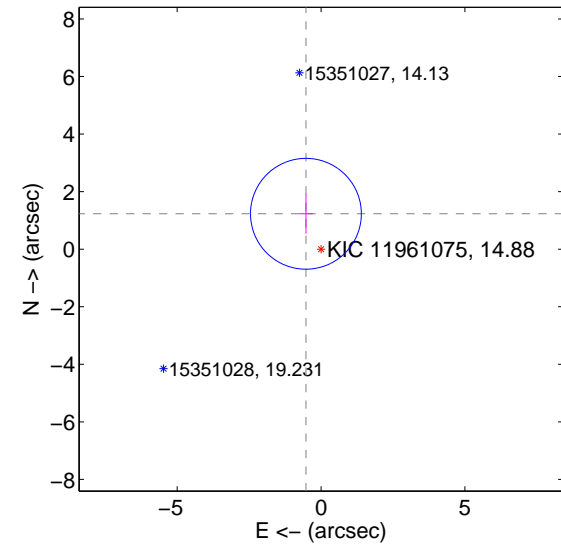
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



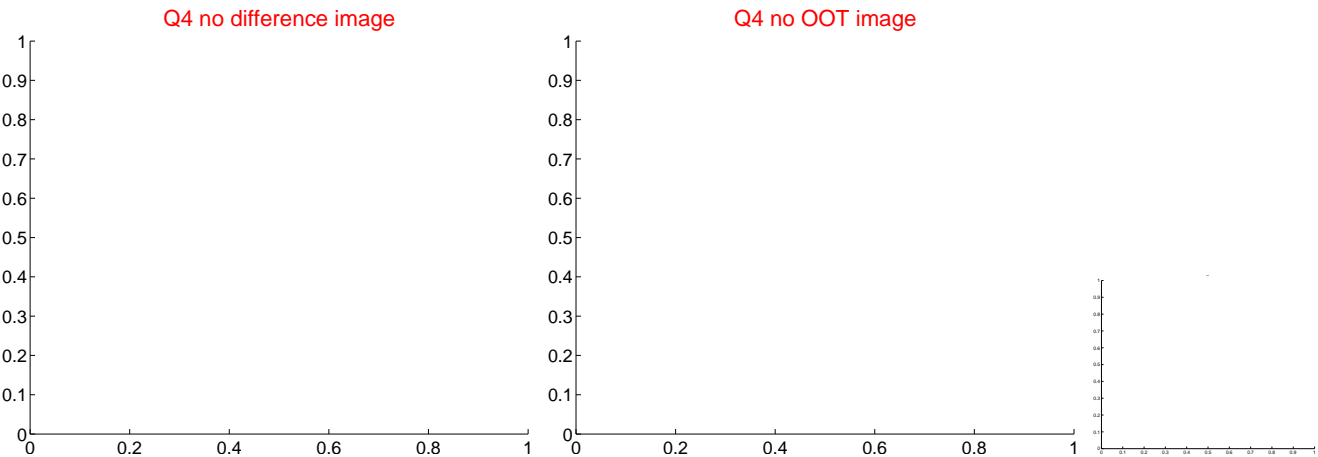
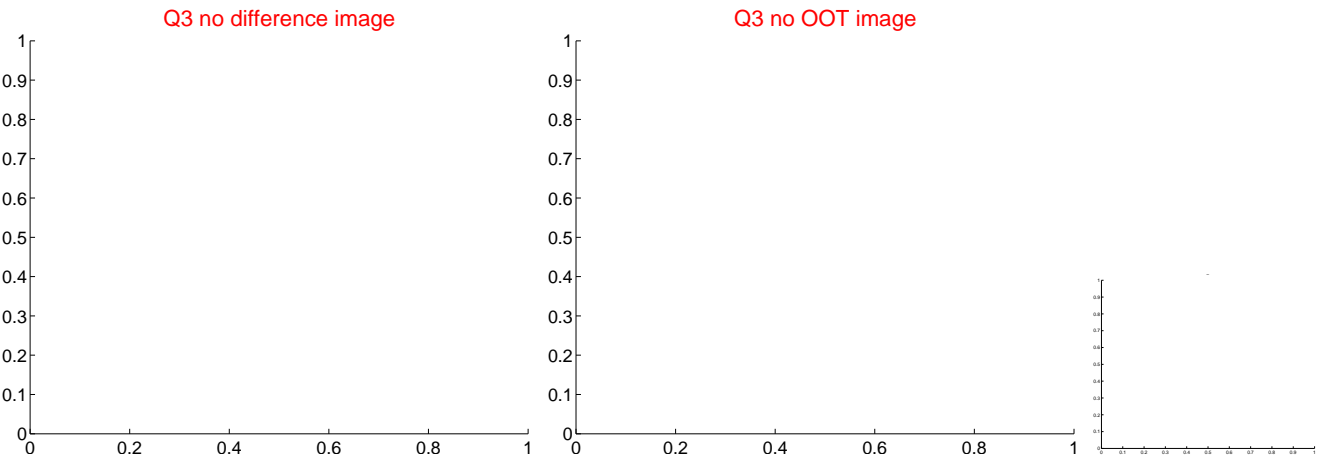
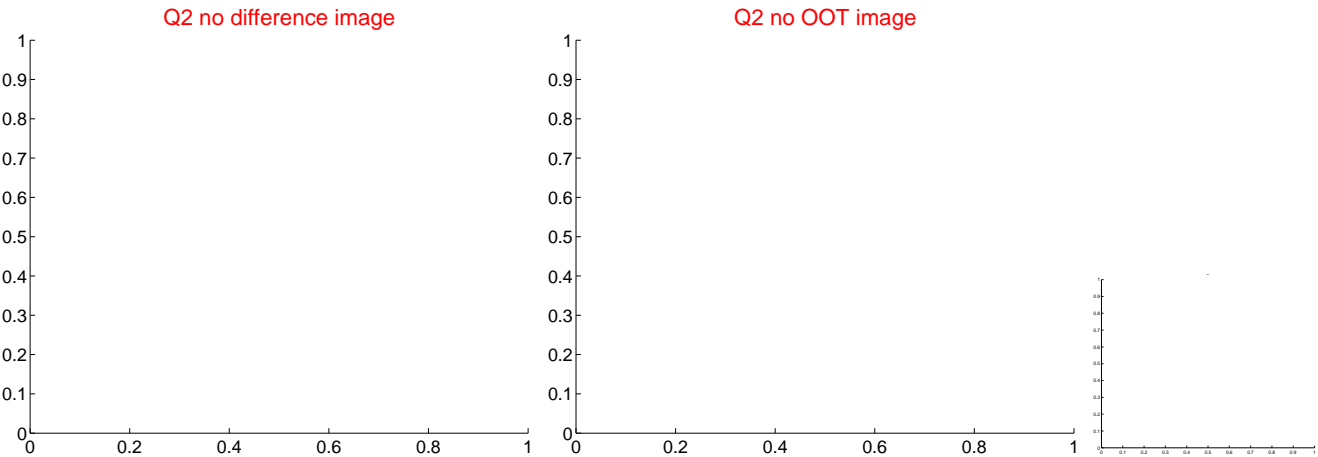
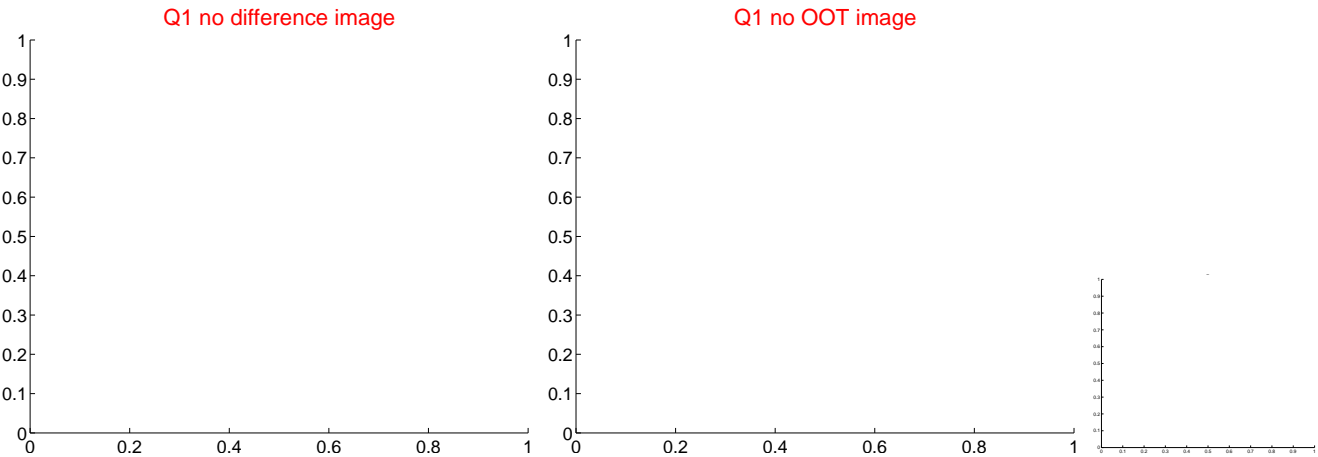
offset from photometric centroids



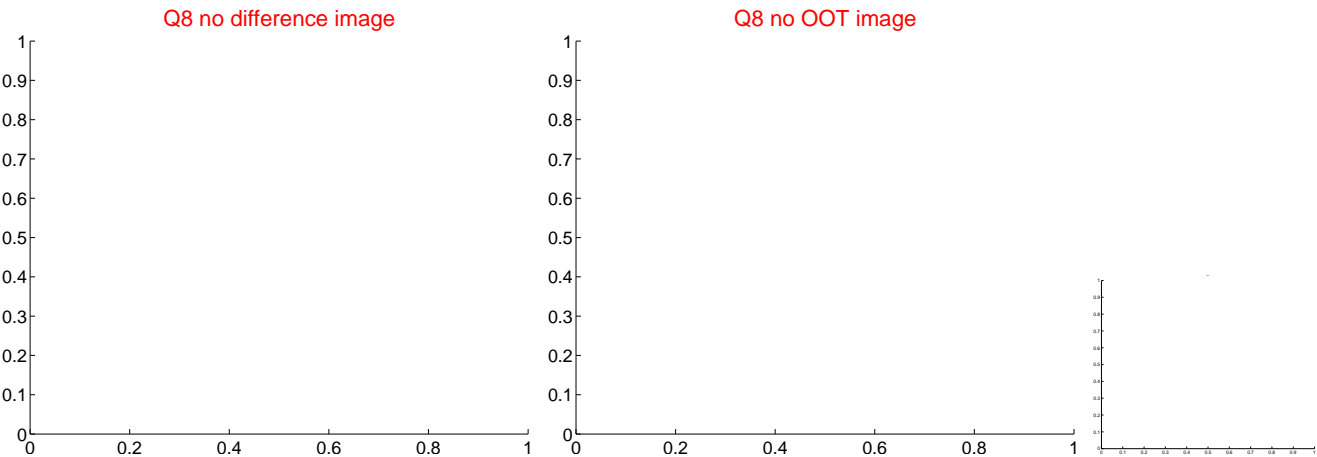
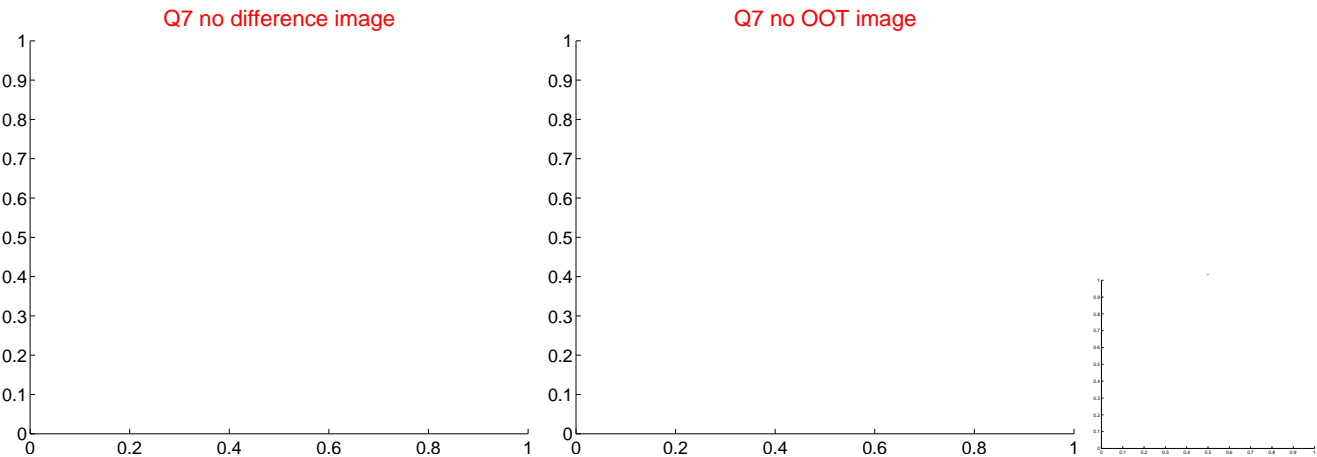
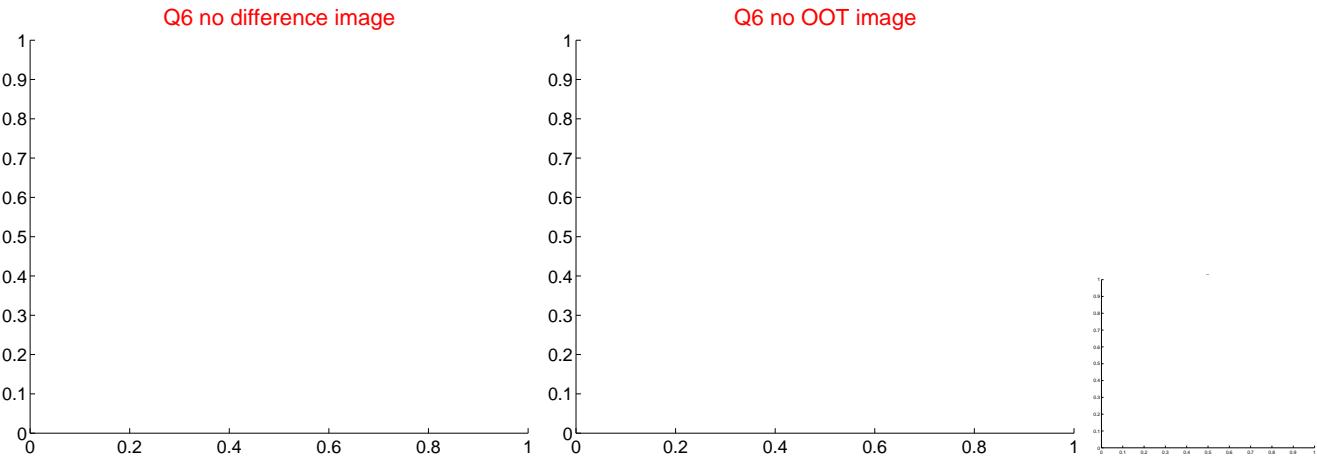
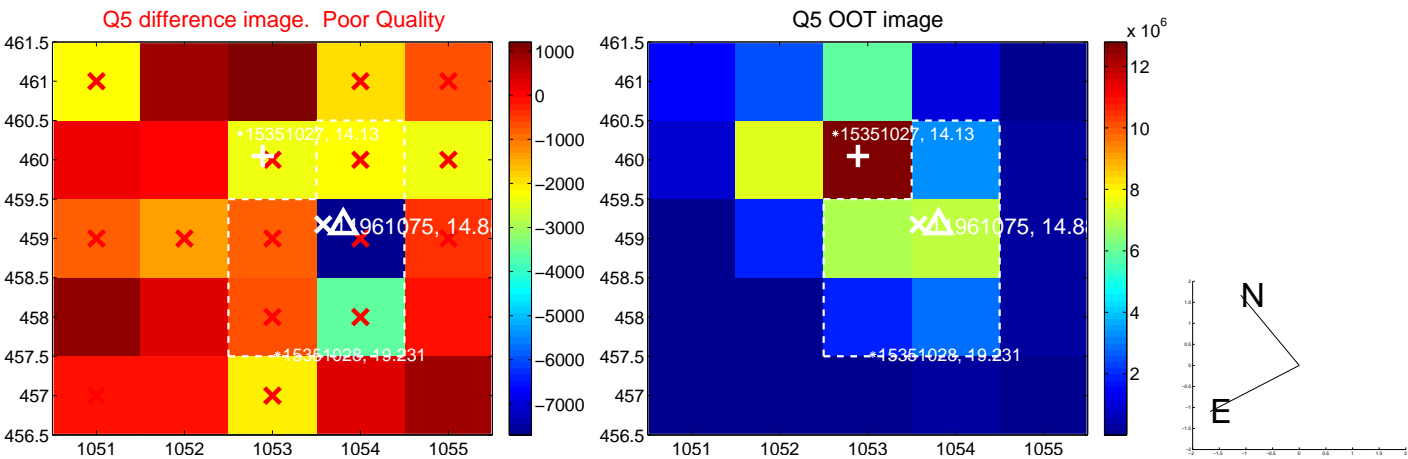
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



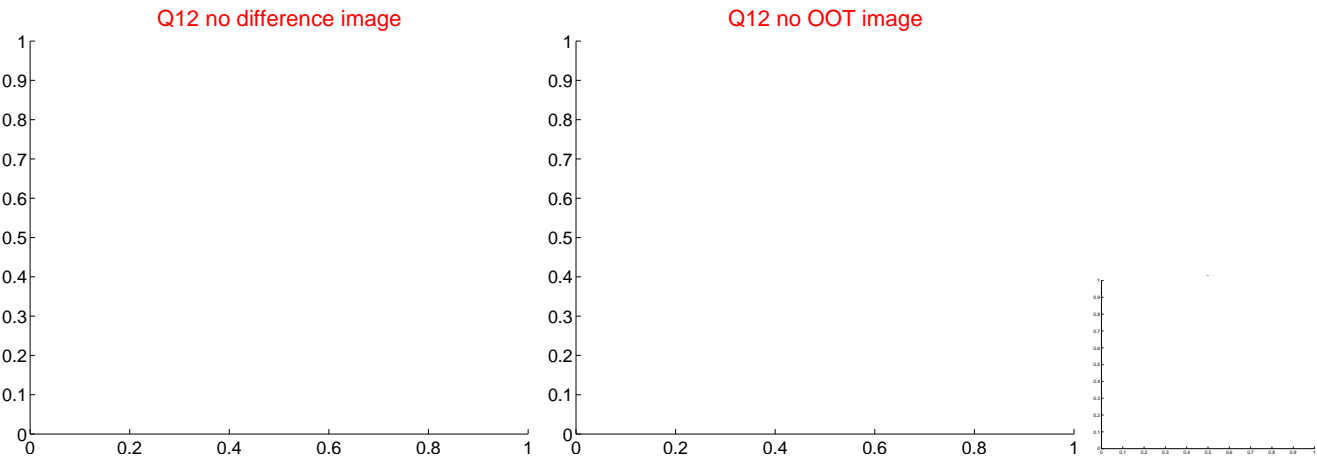
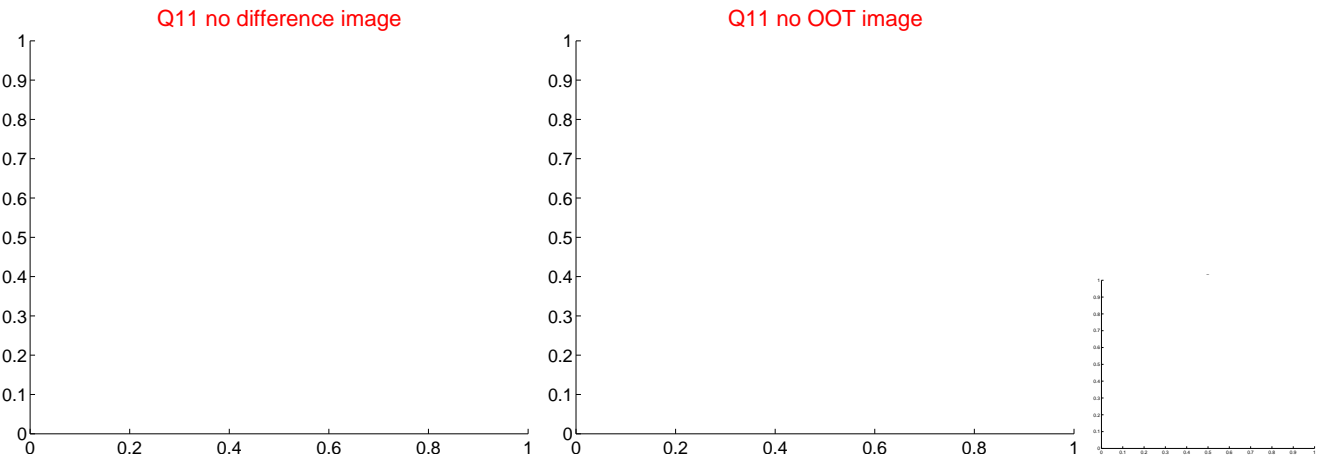
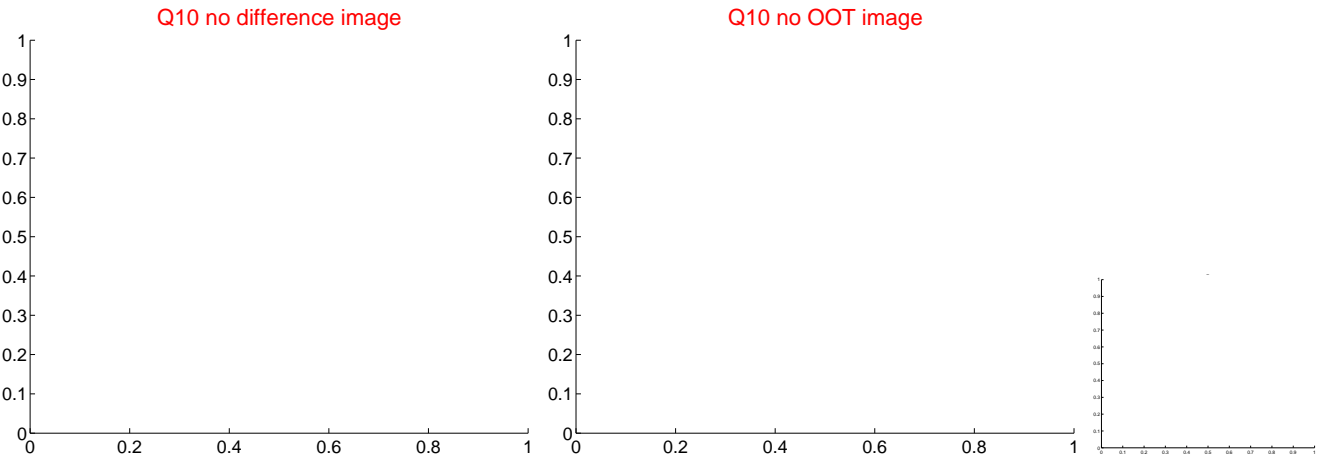
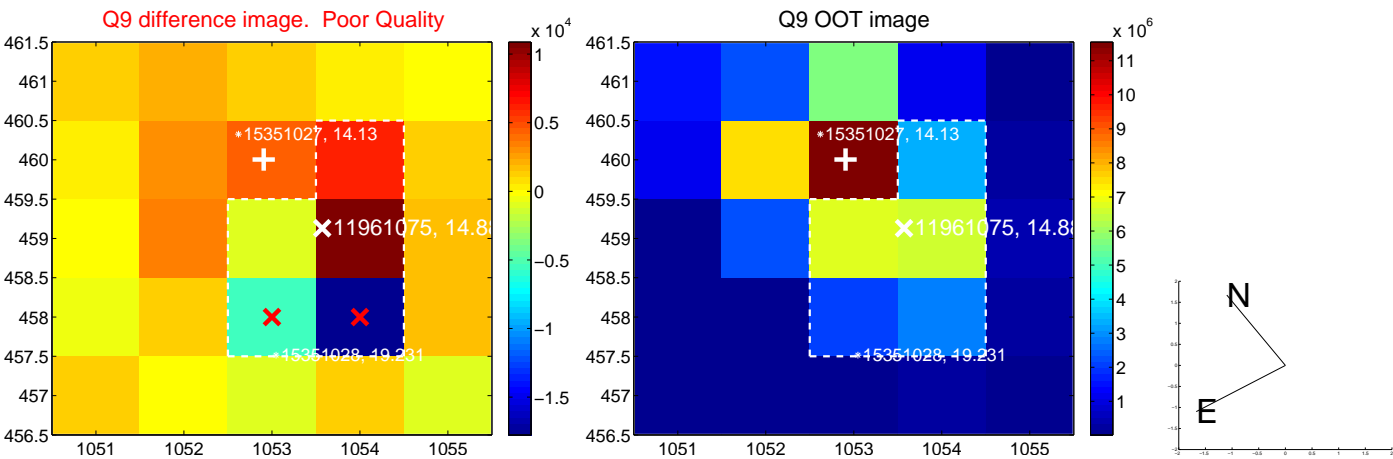
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

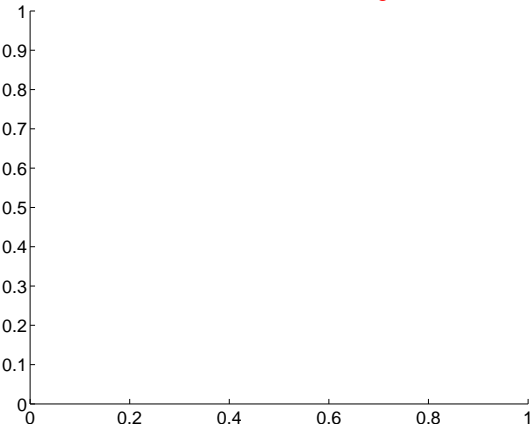


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

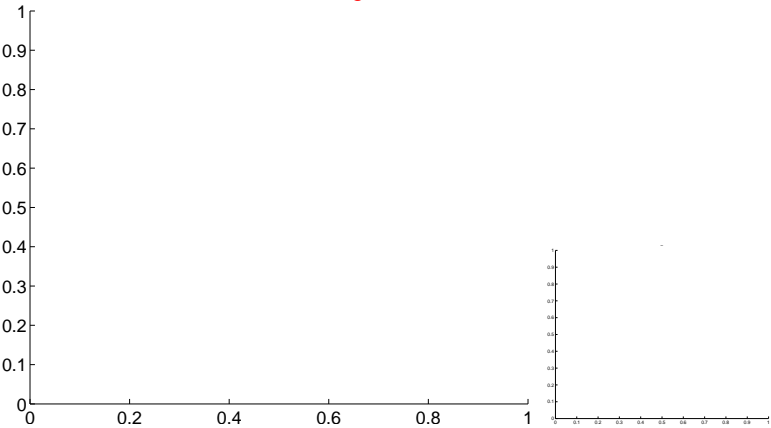


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

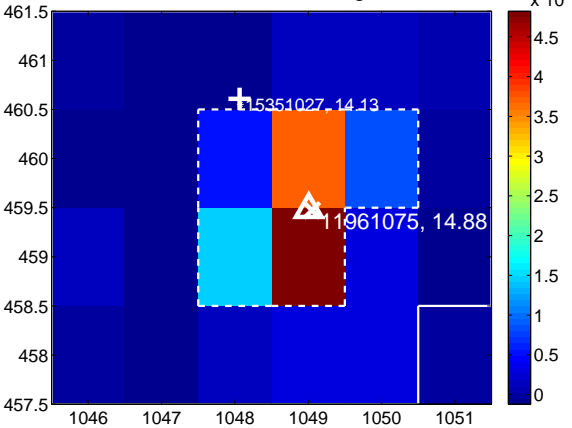
Q13 no difference image



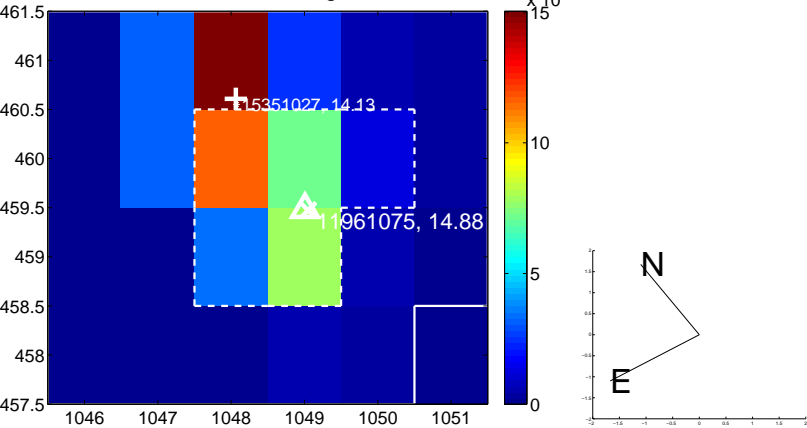
Q13 no OOT image



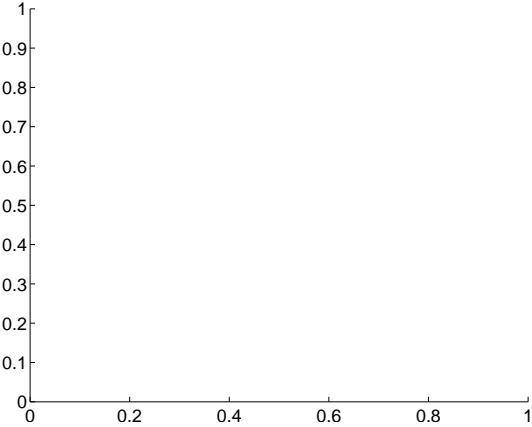
Q14 difference image



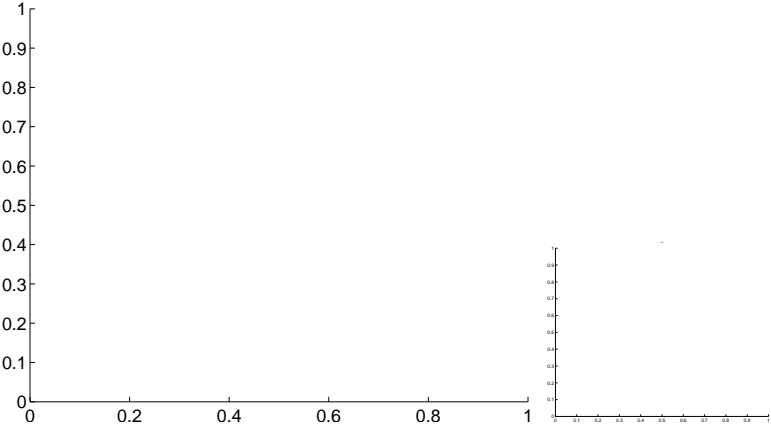
Q14 OOT image



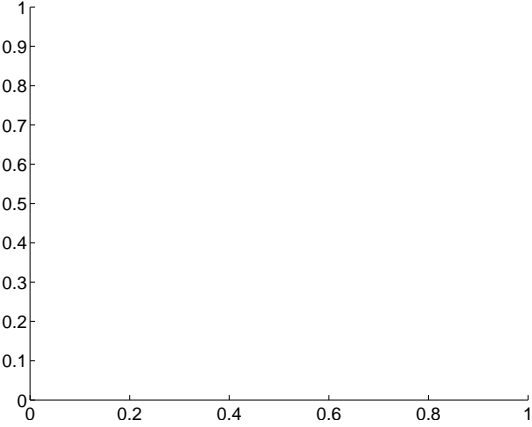
Q15 no difference image



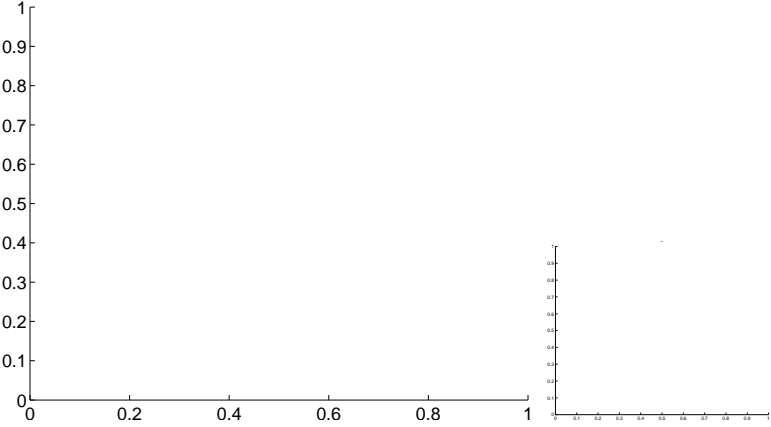
Q15 no OOT image



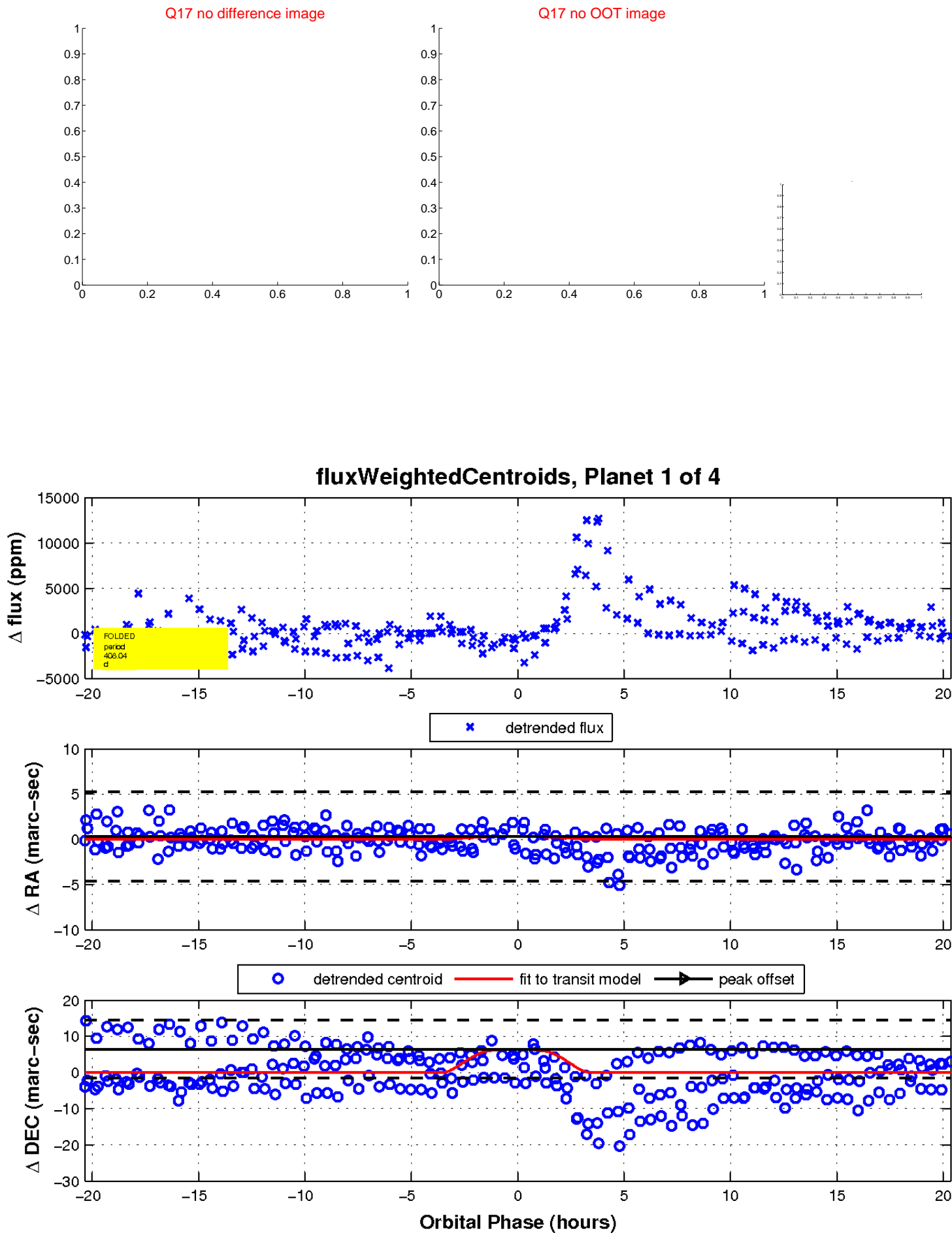
Q16 no difference image



Q16 no OOT image

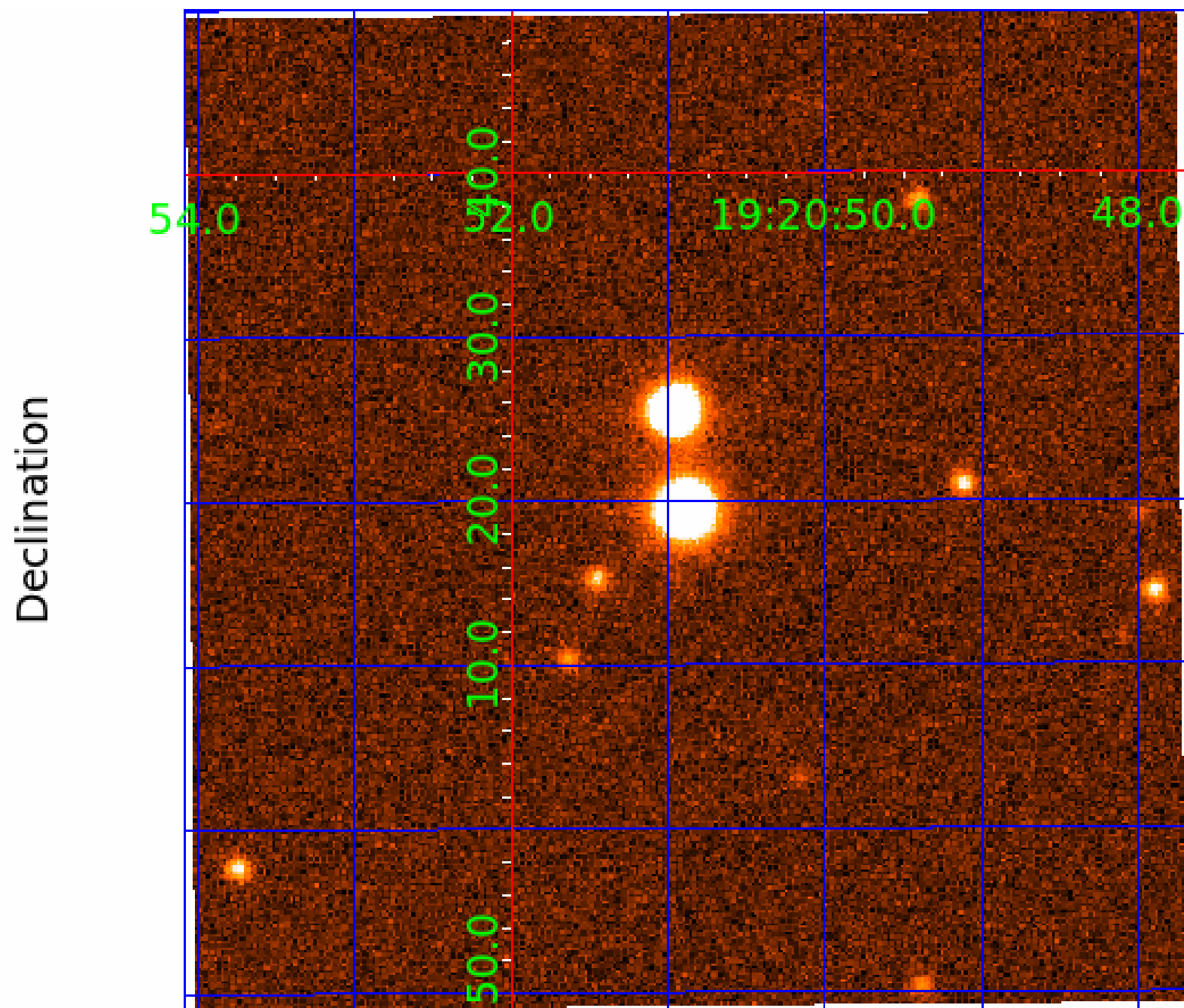


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image



# KIC 011961075

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011961075-01	OBS	No	408.037125	469.959803	3675.6	6.802	18.7	9.2	0.33	3412	2.40	0.02
011961075-02	OBS	No	358.114209	424.631610	3298.1	7.469	15.6	10.8	0.33	3412	1.86	0.03
011961075-03	OBS	No	493.140994	346.393041	2944.5	9.335	13.7	8.2	0.33	3412	1.76	0.02
011961075-04	OBS	No	171.184935	215.375697	2394.0	11.573	11.8	9.0	0.33	3412	1.58	0.08

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011961075-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—CENT_FEW_DIFFS
011961075-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_KIC_POS—HALO_GHOST
011961075-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_KIC_POS
011961075-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_KIC_POS

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

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

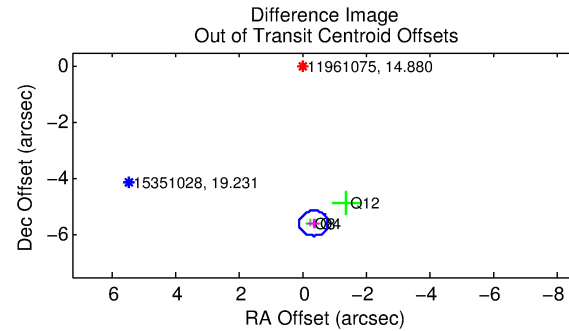
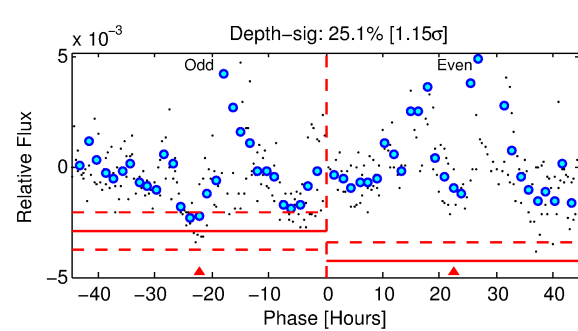
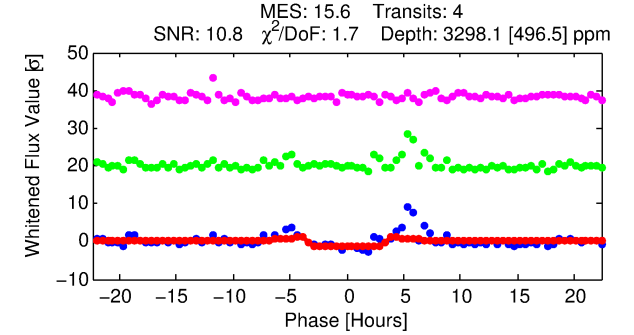
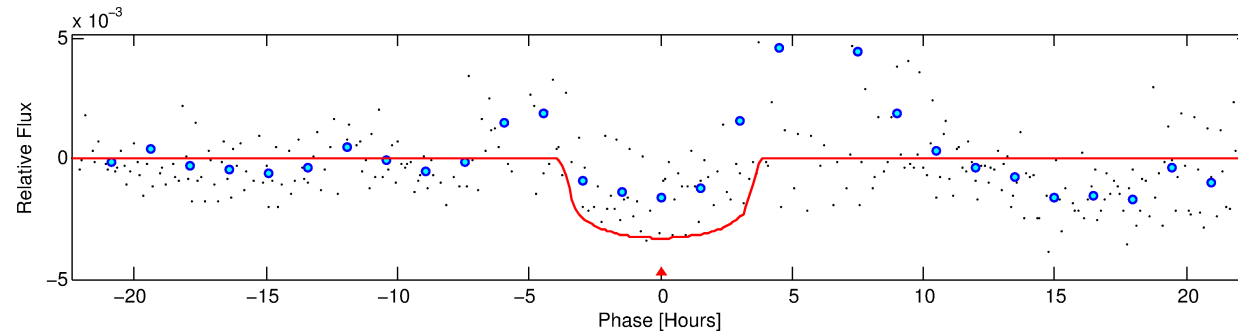
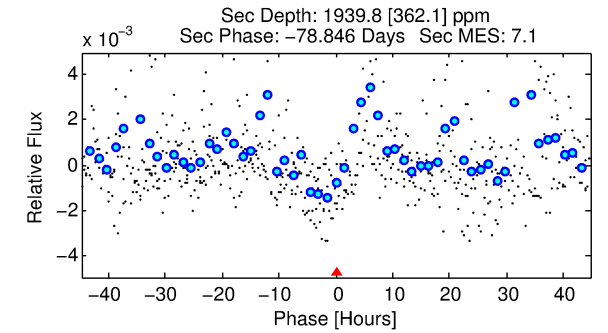
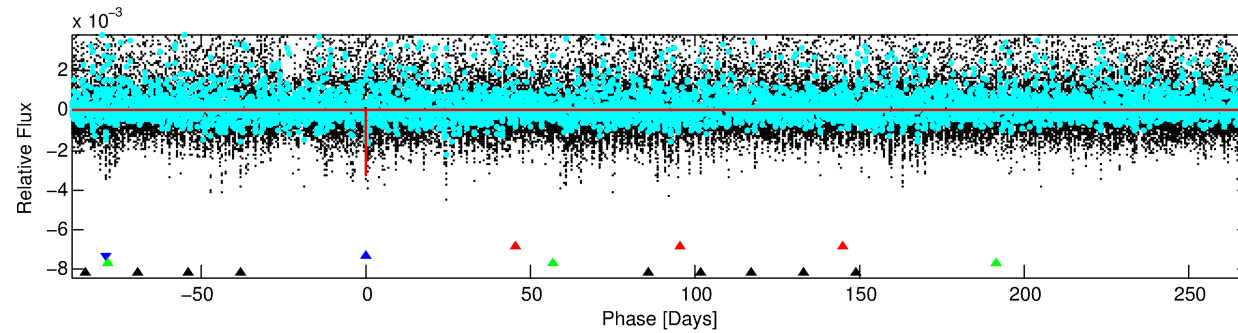
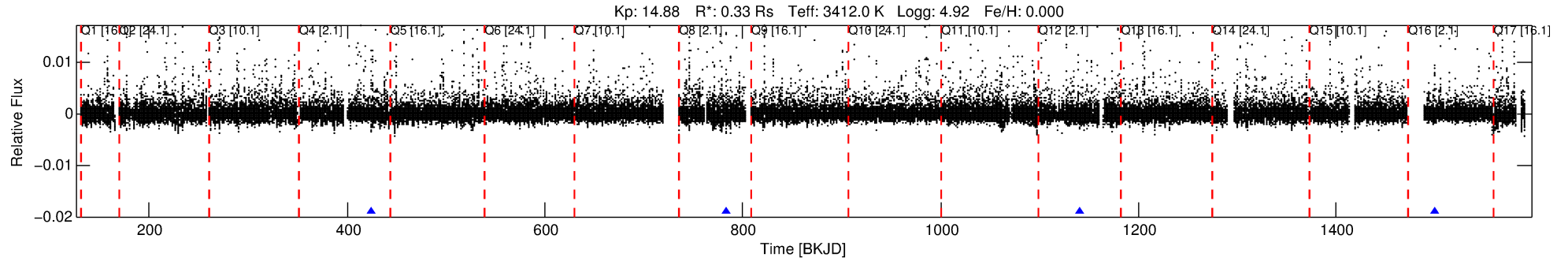
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 011961075-02

No Significant Match Found

# DV One-Page Summary

KIC: 11961075 Candidate: 2 of 4 Period: 358.114 d



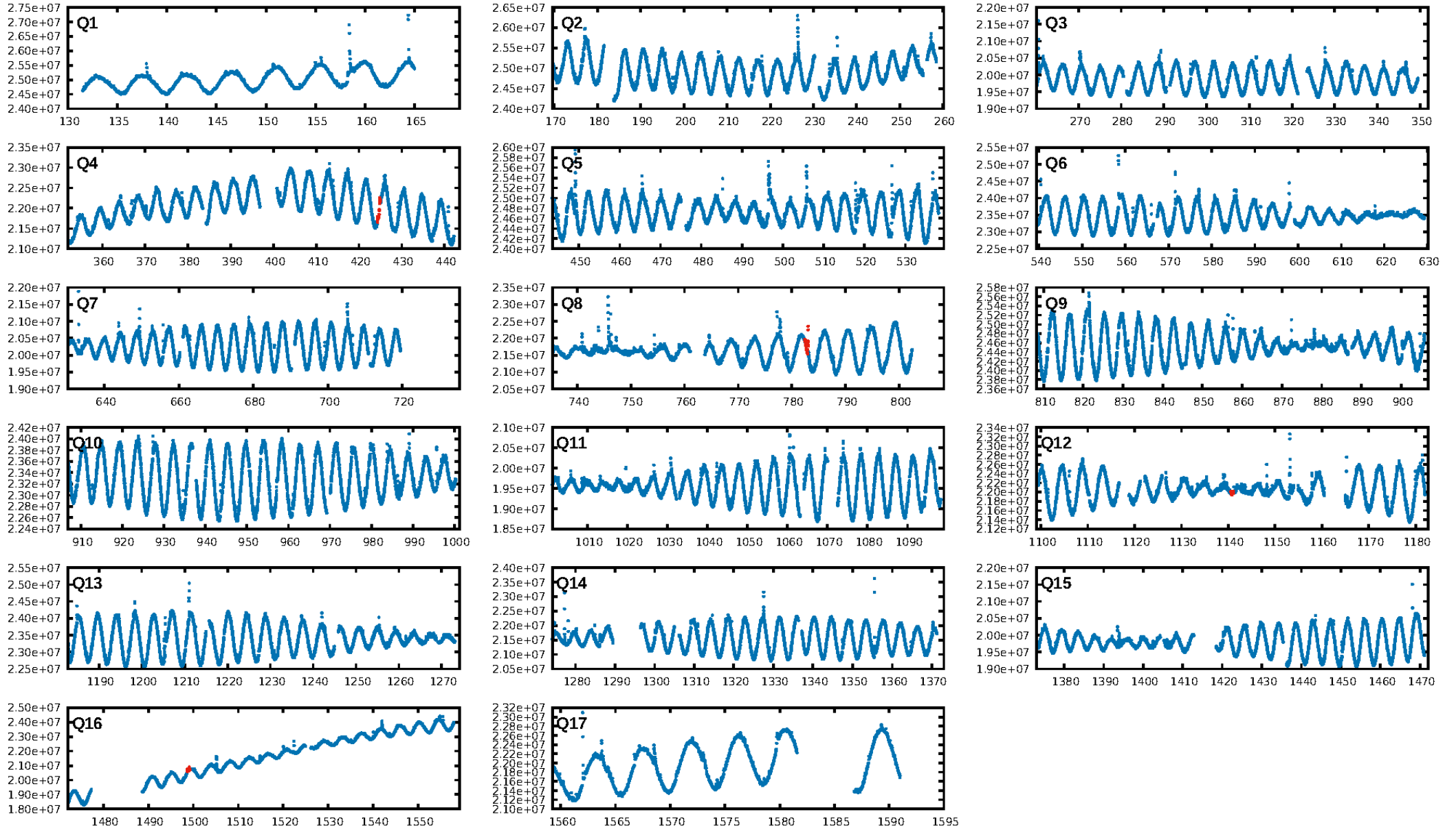
## DV Fit Results:

Period = 358.11421 [0.00400] d  
Epoch = 424.6316 [0.0071] BKJD  
Rp/R\* = 0.0518 [0.0210]  
a/R\* = 385.26 [631.82]  
b = 0.01 [280.62]  
Seff = 0.03 [0.00]  
Teq = 105 [3] K  
Rp = 1.86 [0.78] Re  
a = 0.6791 [0.0518] AU  
Ag = 142920.49 [119475.31] [1.20σ]  
Teffp = 3145 [654] K [4.65σ]

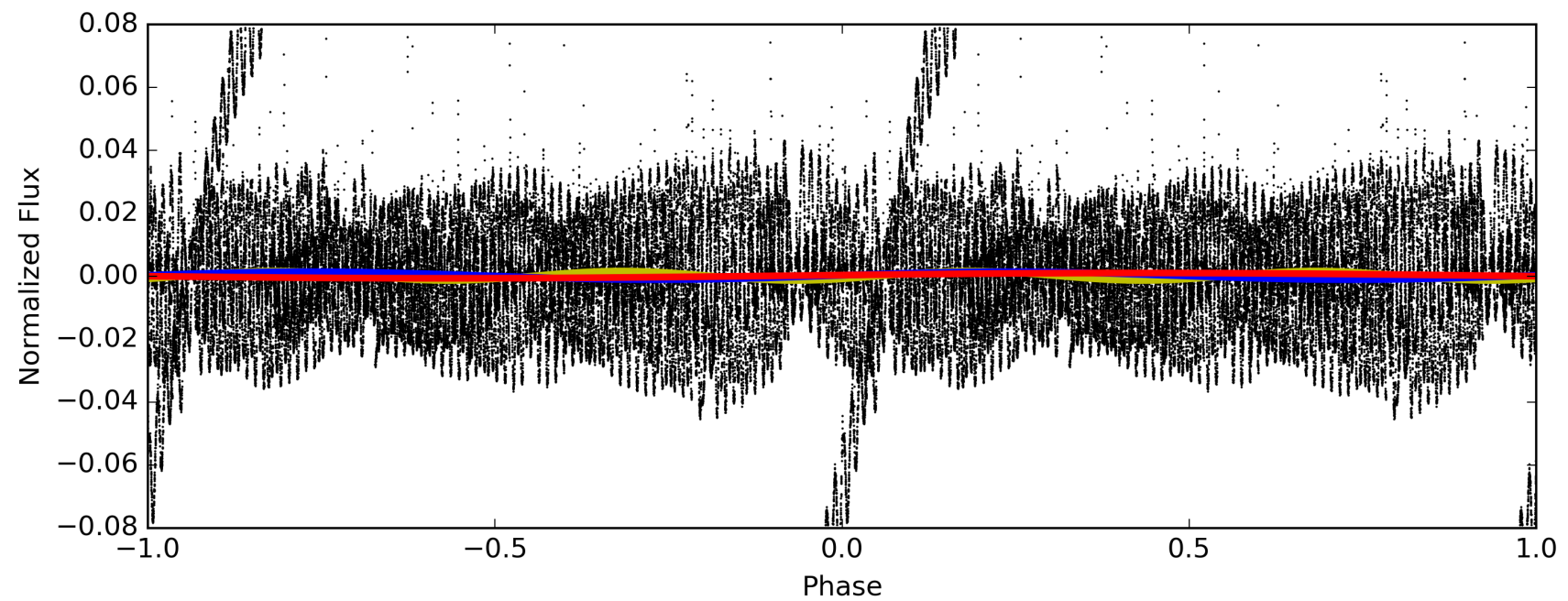
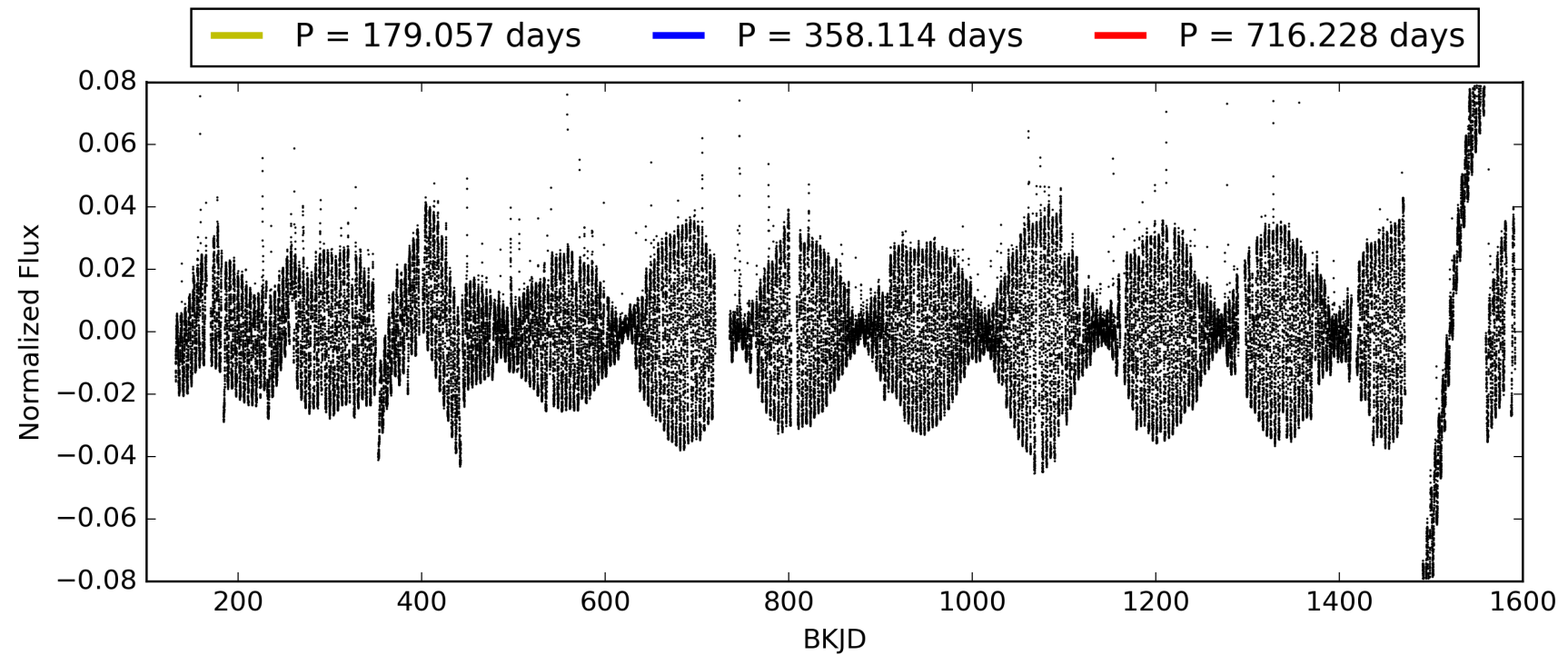
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [325.70σ]  
LongPeriod-sig: 100.0% [118.60σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 7.9%  
Bootstrap-pfa: 1.93e-13  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: 0.1424  
Centroid-sig: 0.0%  
Centroid-so: 1.377 arcsec [2.22σ]  
OotOffset-rm: 5.595 arcsec [37.15σ]  
KicOffset-rm: 0.204 arcsec [0.97σ]  
OotOffset-st: 0/0/3/0 [3]  
KicOffset-st: 0/0/3/0 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 1.00 [3/3]

# TCE 011961075-02, PDC Light Curves



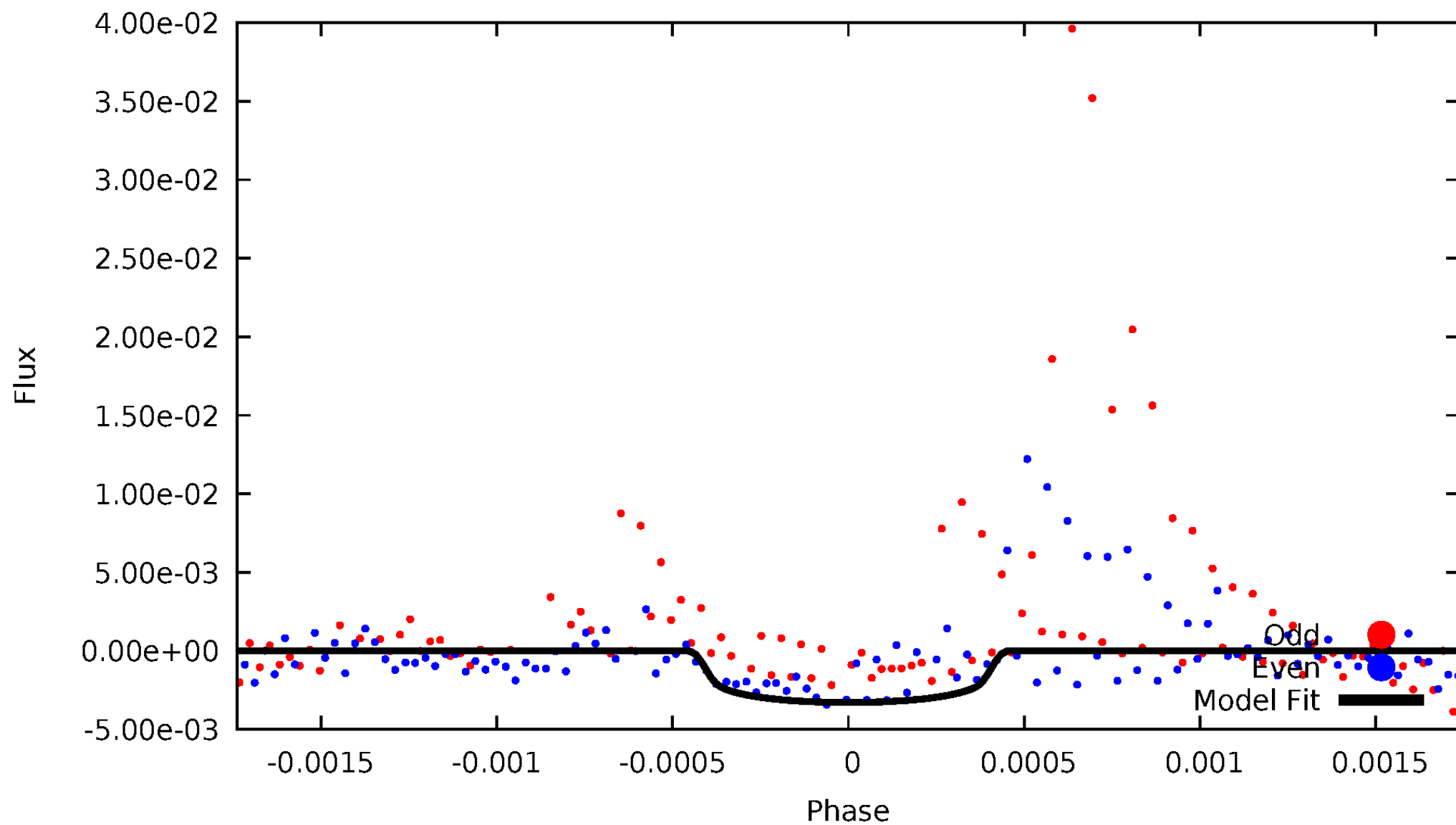
TCE 011961075-02





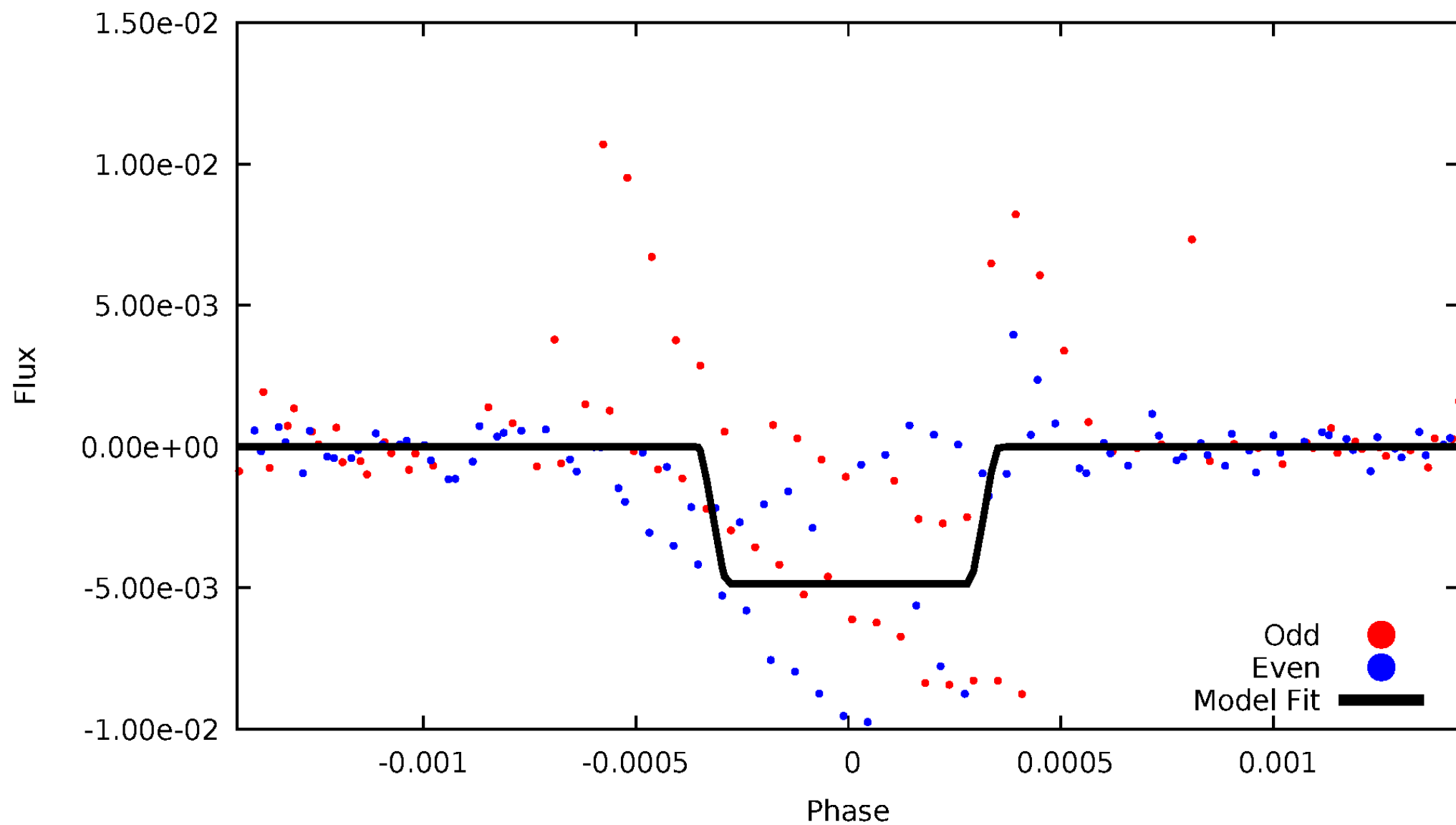
# DV Odd/Even

TCE 011961075-02



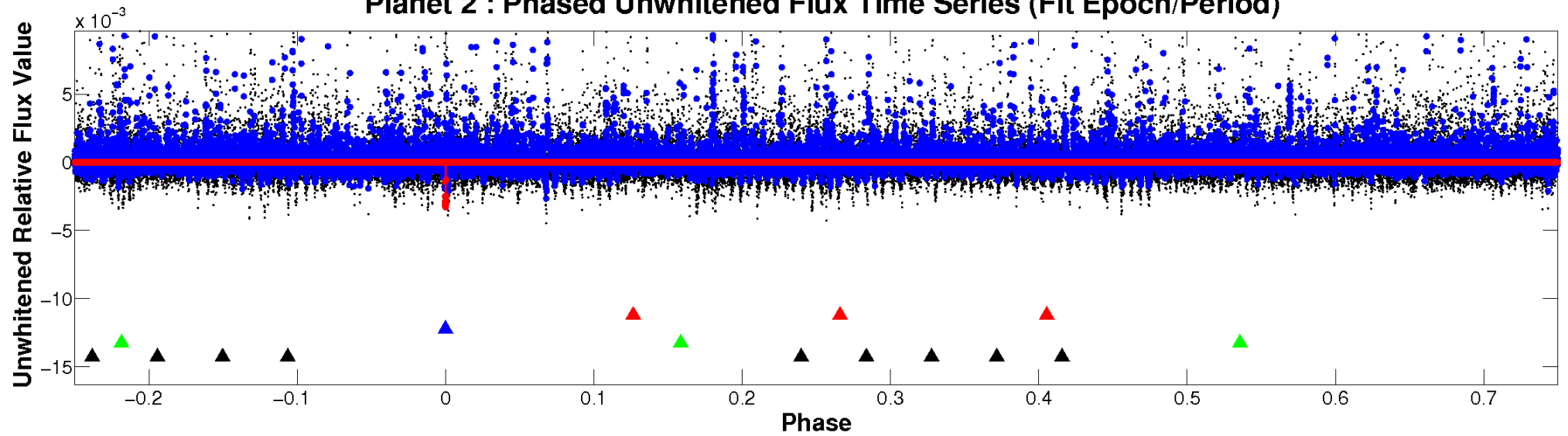
# ALT Odd/Even

TCE 011961075-02

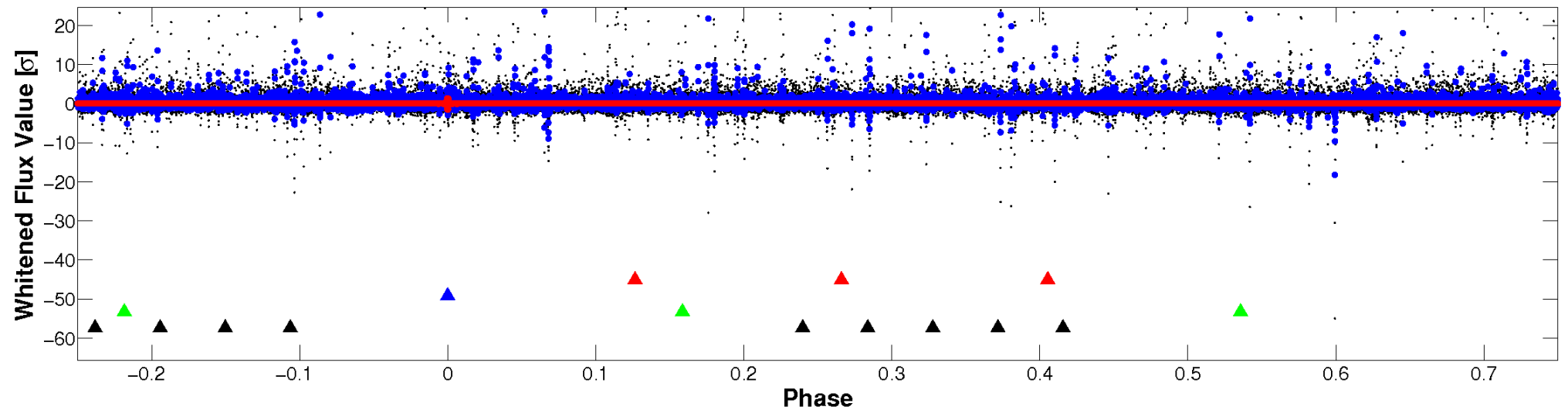


# Non-Whitened Vs. Whitened Light Curve

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



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



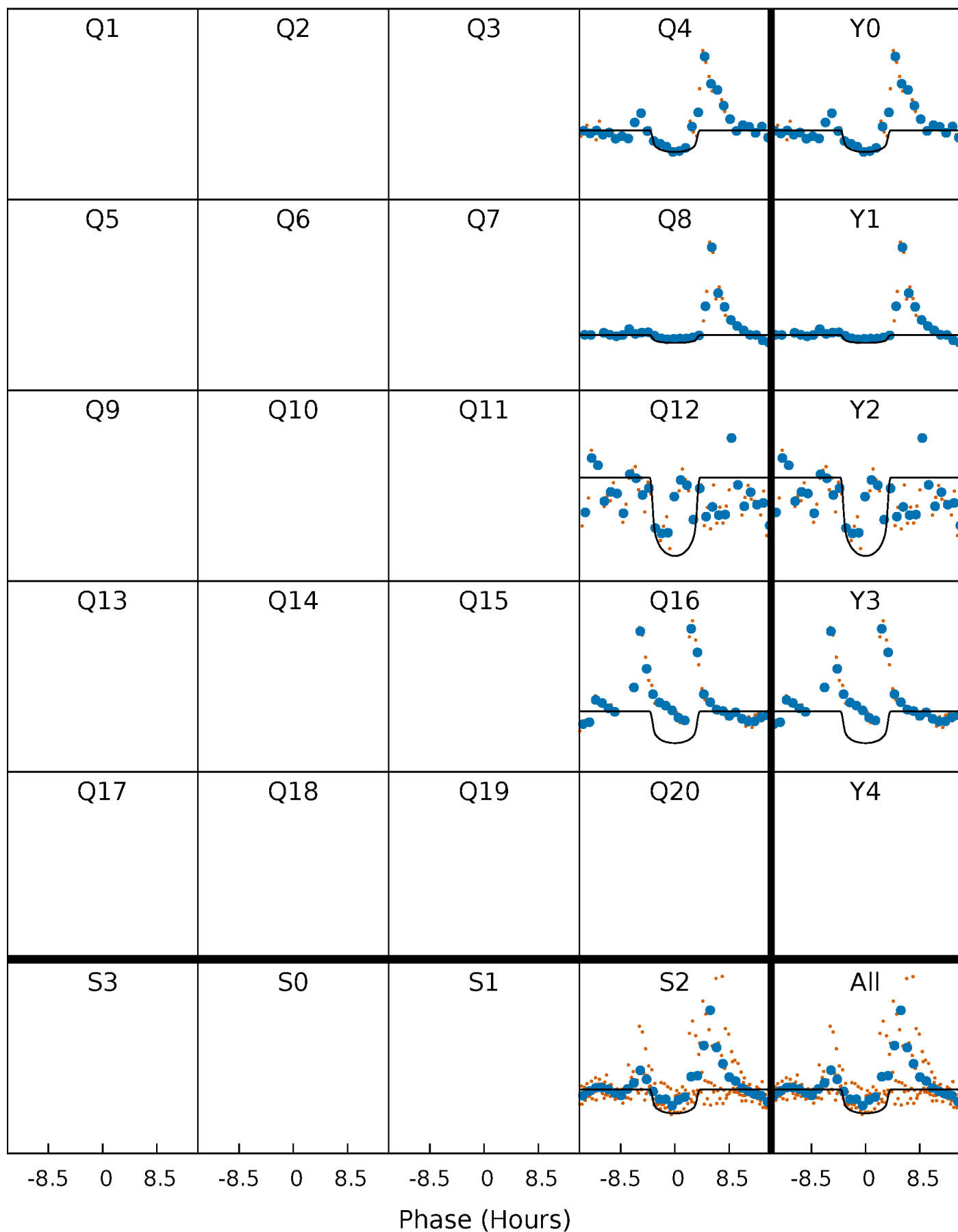
# PDC Quarter-Phased Transit Curves

TCE 011961075-02 P=358.114209 Days  $T_0=424.631610$  (BKJD)



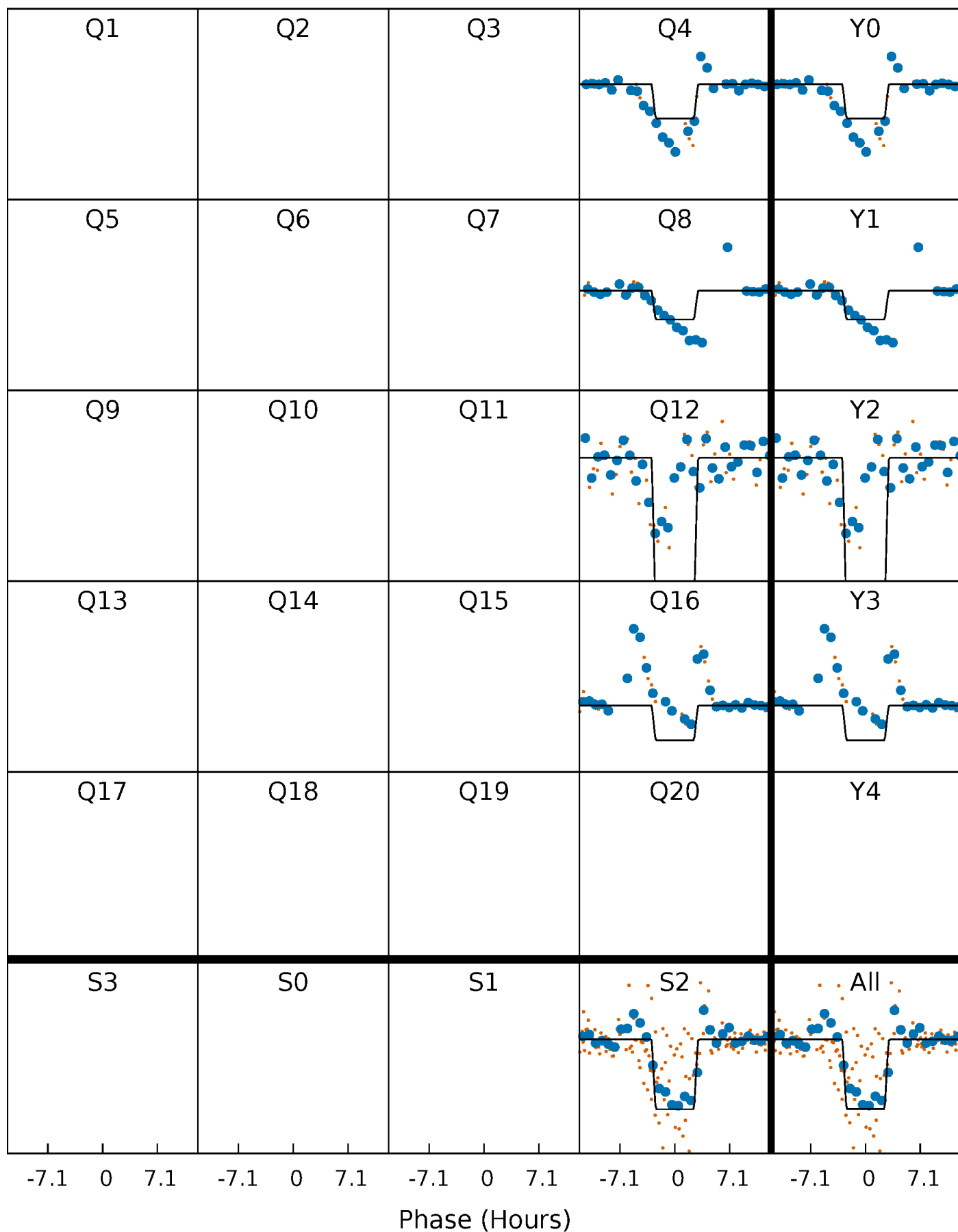
# DV Quarter-Phased Transit Curves

TCE 011961075-02 P=358.114209 Days  $T_0=424.631610$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

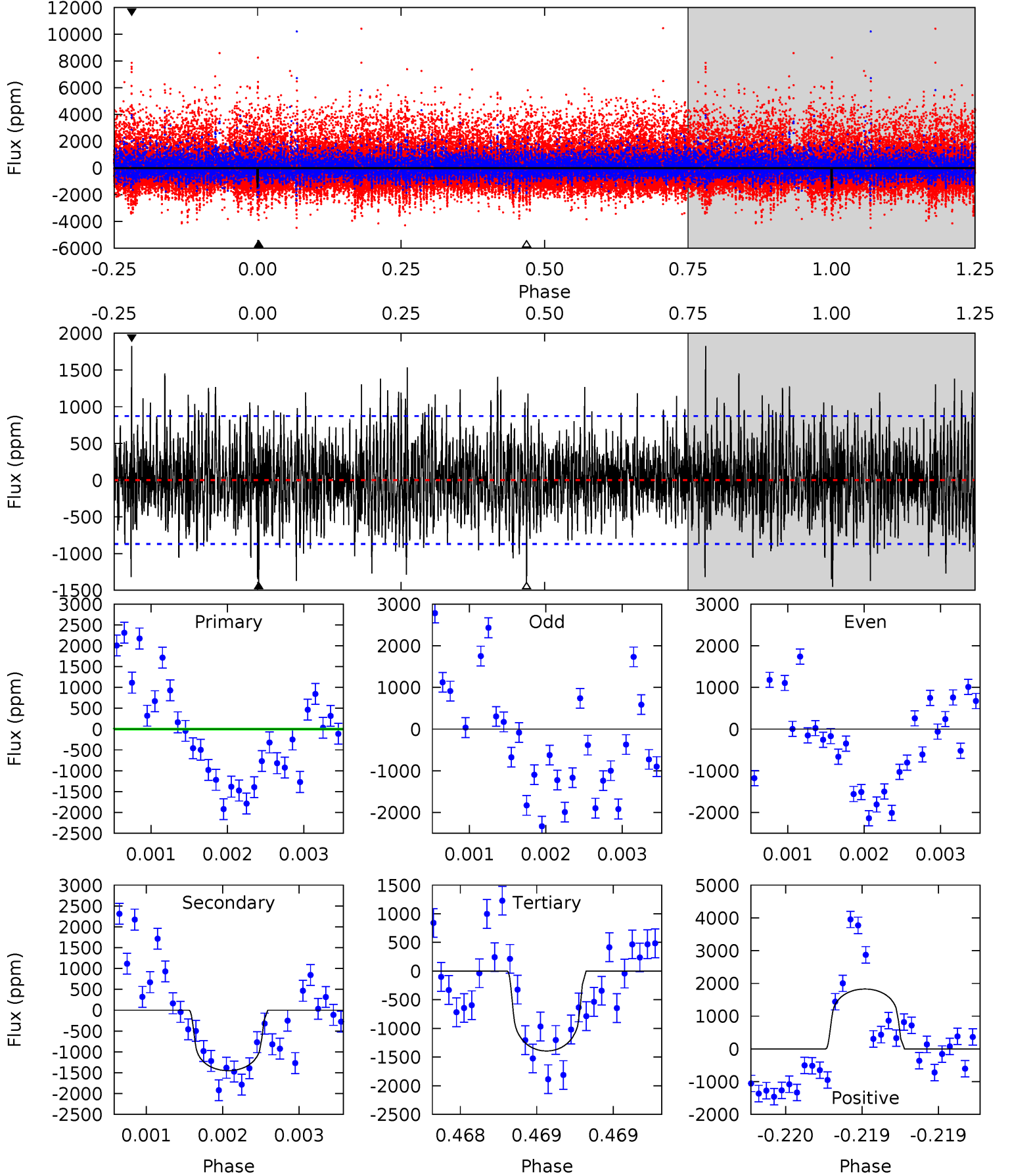
TCE 011961075-02 P=358.091328 Days  $T_0=424.674923$  (BKJD)



# DV Model-Shift Uniqueness Test

011961075-02, P = 358.114209 Days, E = 66.517401 Days

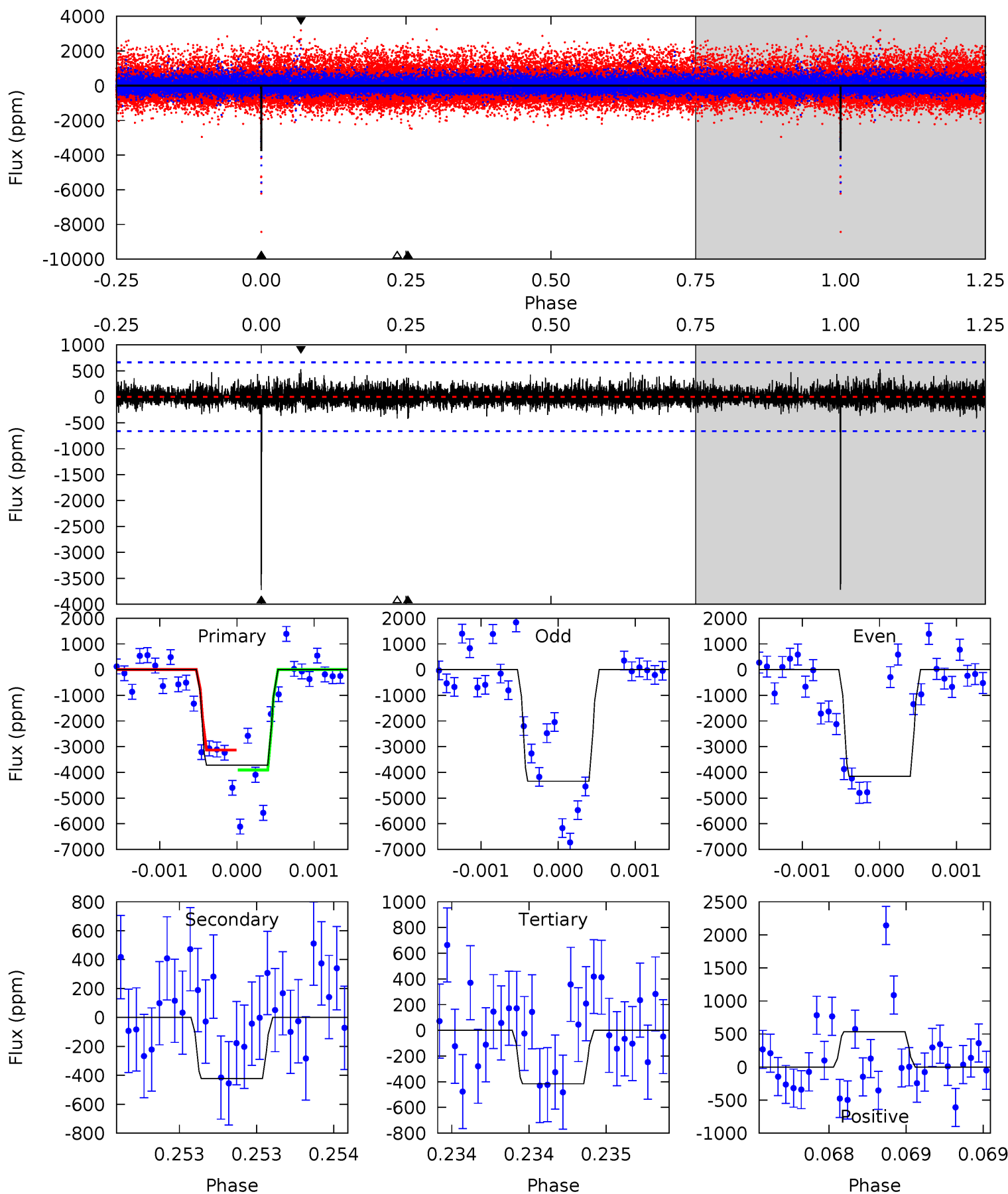
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.94	9.11	8.75	11.5	5.47	3.32	2.51	0.19	-2.53	0.36	-2.37	4.48	0.56	0.56	1.55



# Alt Model-Shift Uniqueness Test

011961075-02,  $P = 358.091328$  Days,  $E = 66.583595$  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
30.9	3.51	3.46	4.43	5.51	3.39	0.86	27.5	26.5	0.05	-0.92	0.95	1.11	0.13	3.26





### Stellar Parameters For KIC 011961075

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$3412^{+44}_{-41}$	$4.919^{+0.042}_{-0.031}$	$0.000^{+0.100}_{-0.100}$	$0.328^{+0.030}_{-0.034}$	$0.325^{+0.041}_{-0.037}$	$13.010^{+2.916}_{-1.983}$
	+1%/-1%	+1%/-1%	+inf%/-inf%	+9%/-10%	+13%/-11%	+22%/-15%
Source	PHO2	PHO2	PHO2	DSEP		

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

### Secondary Eclipse Parameters for KIC 011961075-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-1450 \pm 159$	$1.85^{+0.78}_{-0.70}$	$146^{+3}_{-3}$	$3115^{+486}_{-295}$	$107645^{+169353}_{-53613}$
Alt.	$-422 \pm 120$	$2.55^{+0.75}_{-0.76}$	$146^{+3}_{-3}$	$2432^{+232}_{-173}$	$16511^{+18321}_{-7715}$

$T_{max}$  = 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

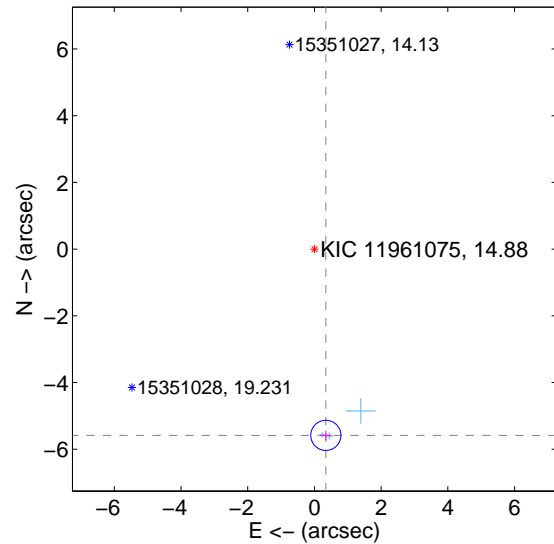
Supplemental centroid analysis for 011961075-02. Kepler magnitude: 14.88. Transit SNR 10.81

There are 3 quarters with good PRF difference image offsets

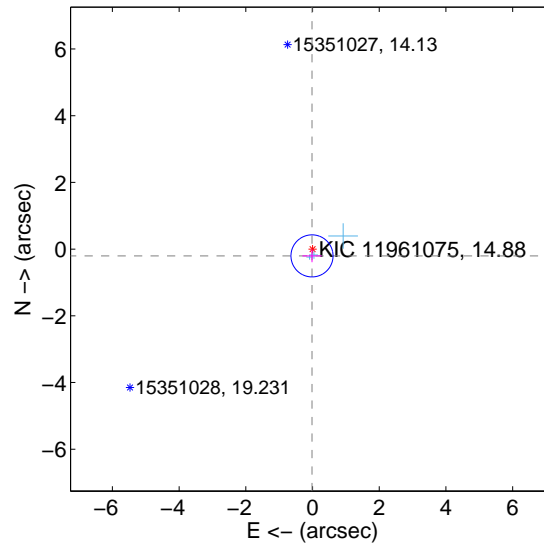
The OOT PRF centroid is offset from the target star catalog position by about 5.27 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$5.595 \pm 0.151$	37.15	$-0.342 \pm 0.170$	$-5.584 \pm 0.151$
PRF-fit source offset from KIC position	$0.204 \pm 0.210$	0.97	$0.016 \pm 0.289$	$-0.203 \pm 0.190$
photometric centroid source offset	$1.38 \pm 0.62$	2.22	$0.71 \pm 0.17$	$1.18 \pm 0.71$

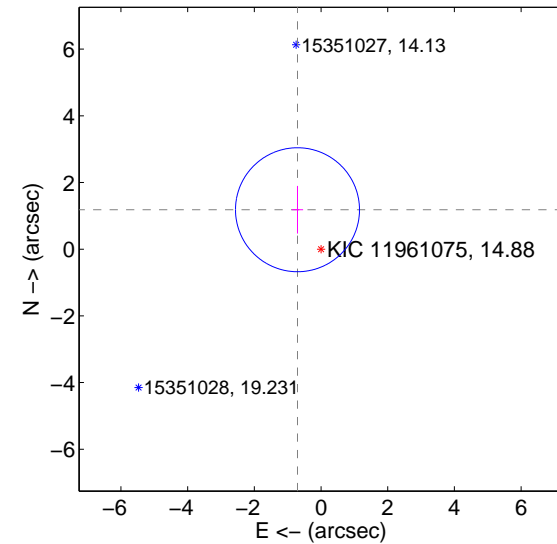
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

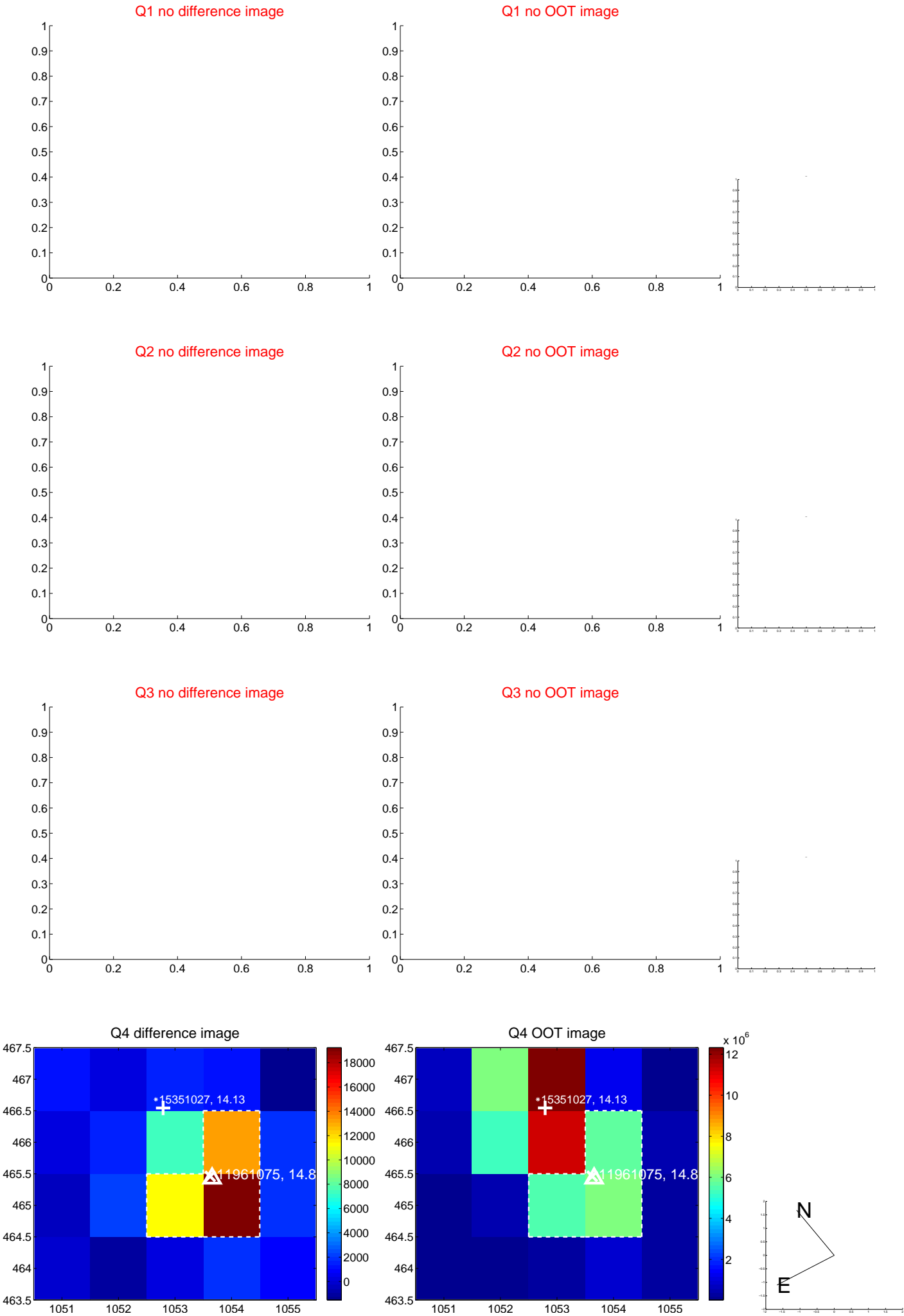


offset from photometric centroids

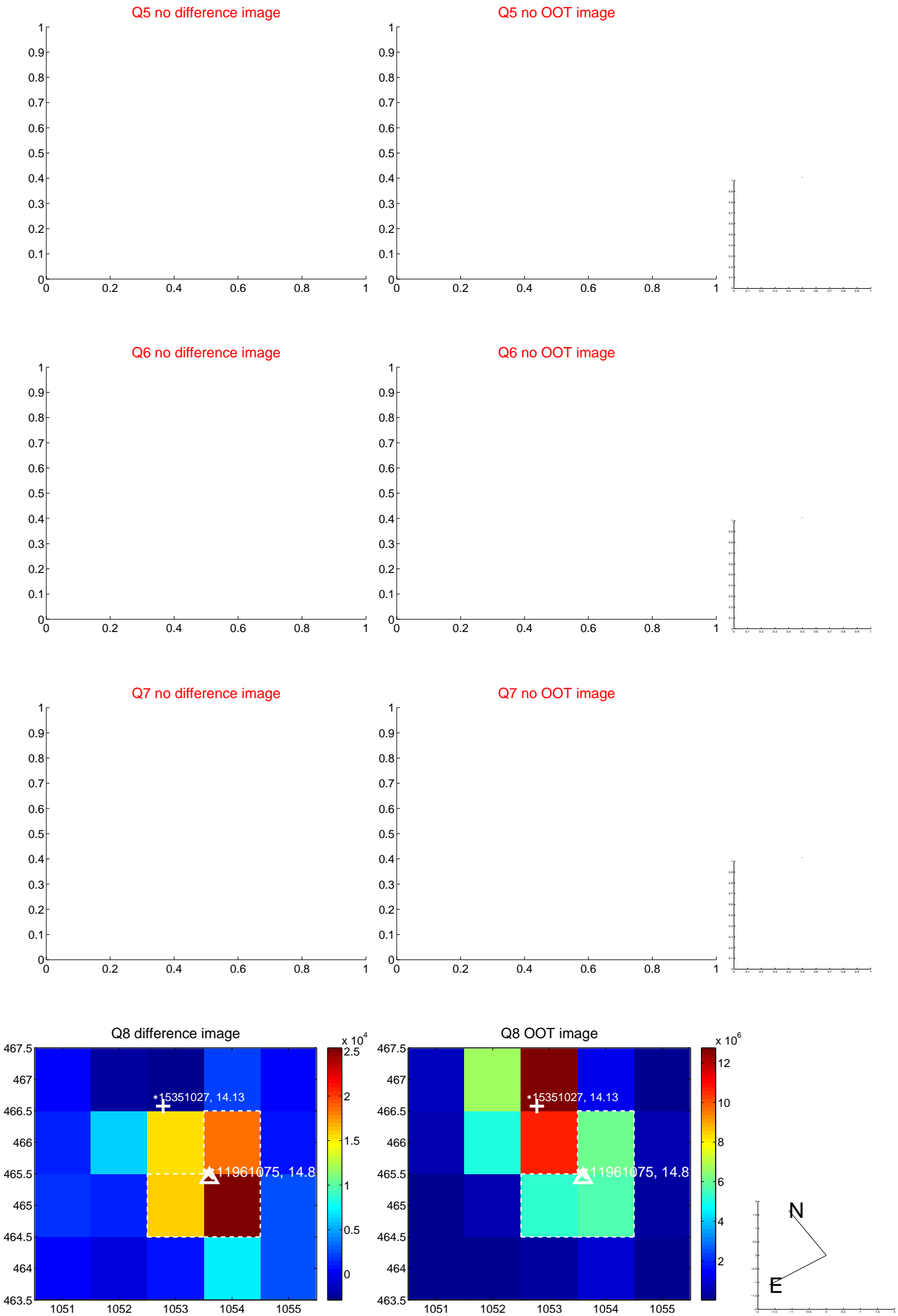


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

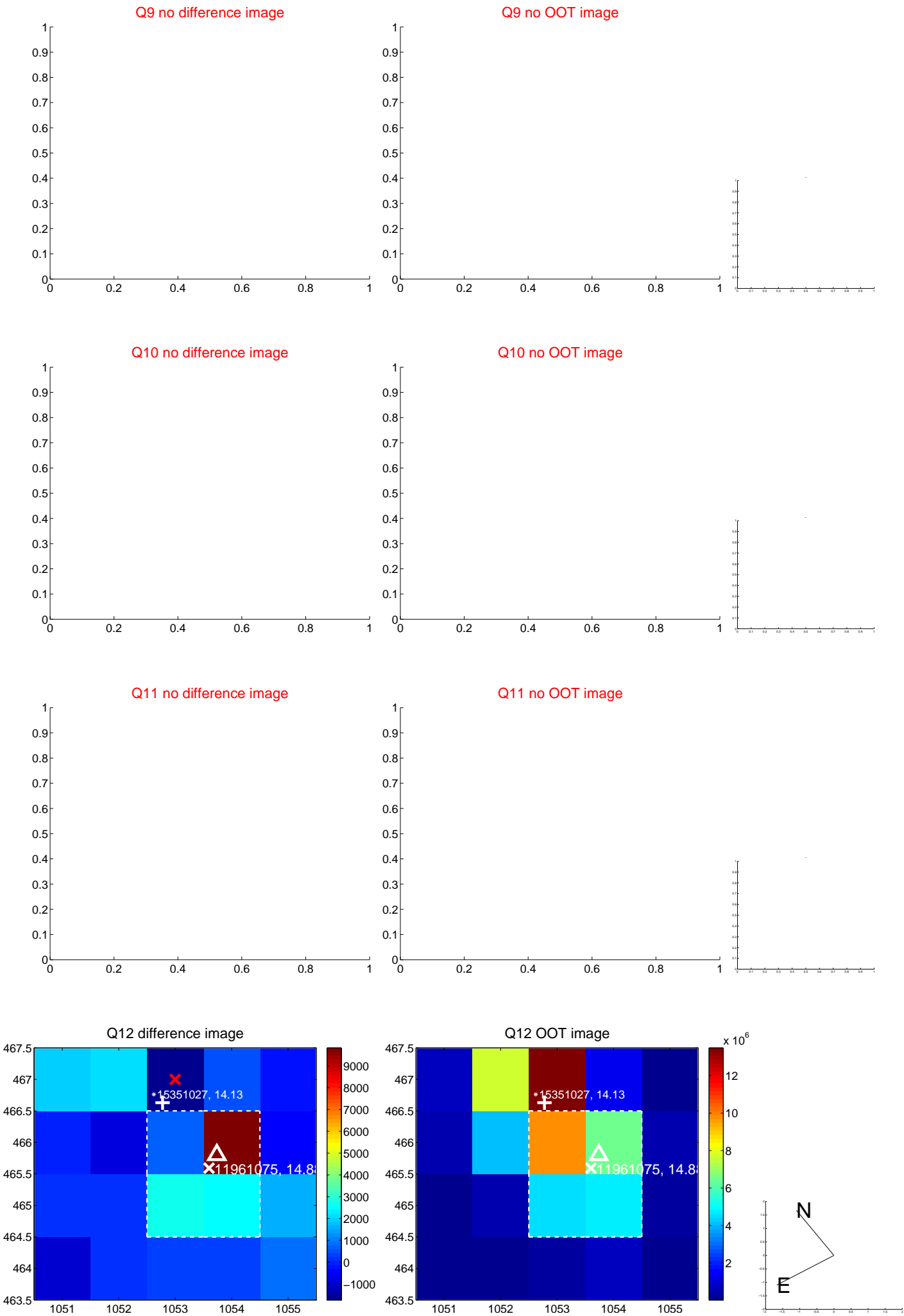
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



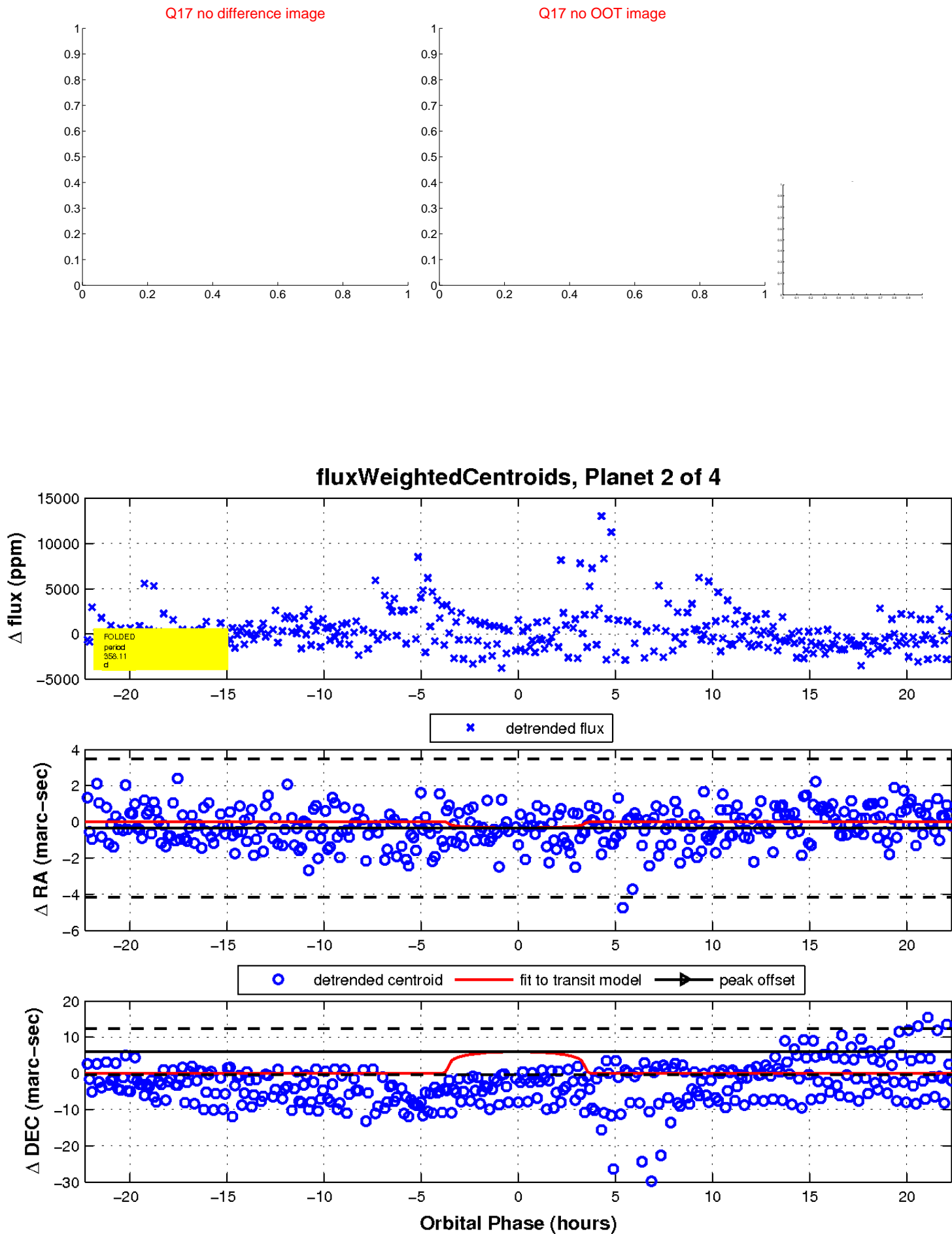
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



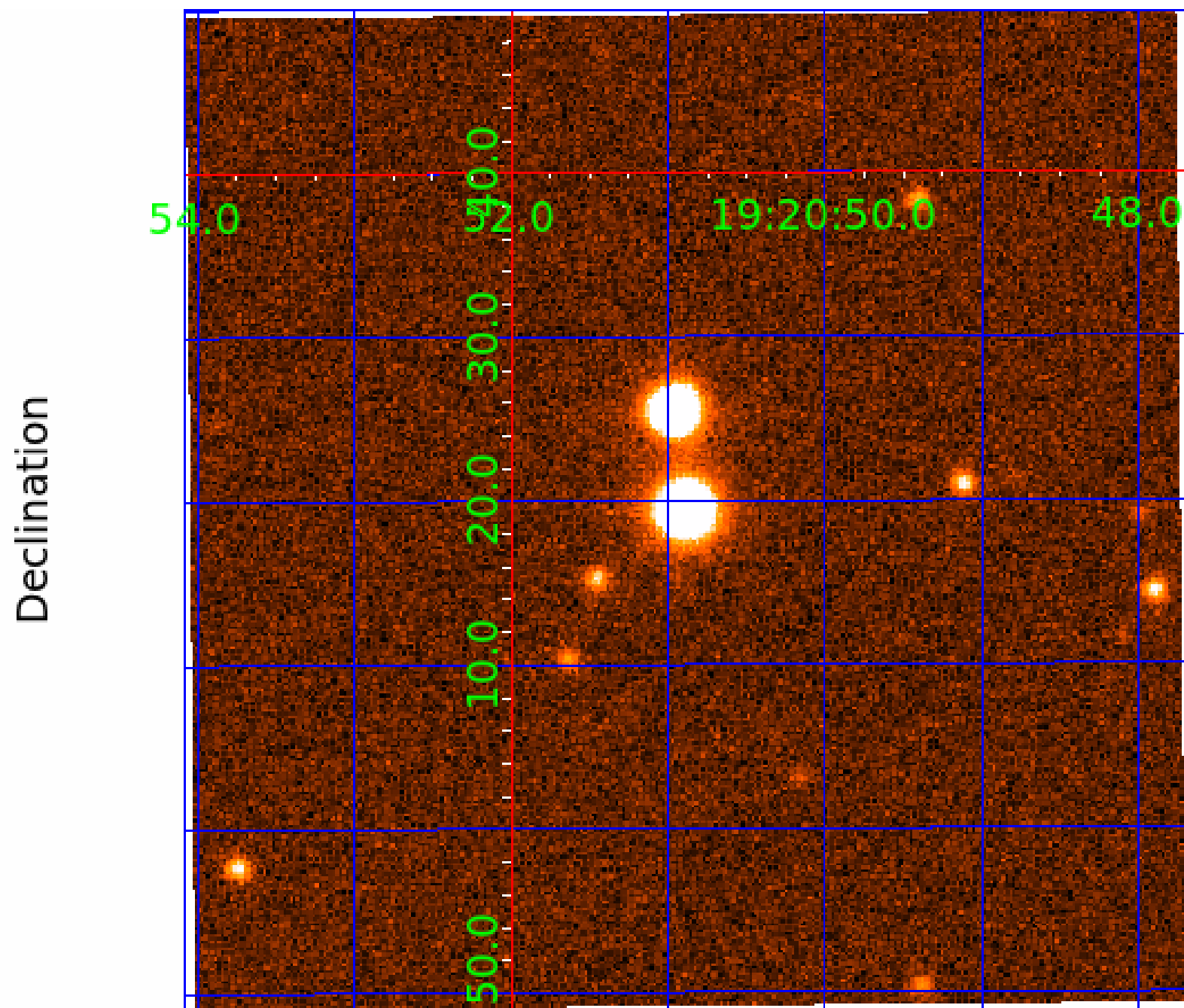
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image





# KIC 011961075

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011961075-01	OBS	No	408.037125	469.959803	3675.6	6.802	18.7	9.2	0.33	3412	2.40	0.02
011961075-02	OBS	No	358.114209	424.631610	3298.1	7.469	15.6	10.8	0.33	3412	1.86	0.03
011961075-03	OBS	No	493.140994	346.393041	2944.5	9.335	13.7	8.2	0.33	3412	1.76	0.02
011961075-04	OBS	No	171.184935	215.375697	2394.0	11.573	11.8	9.0	0.33	3412	1.58	0.08

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011961075-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—CENT_FEW_DIFFS
011961075-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_KIC_POS—HALO_GHOST
011961075-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_KIC_POS
011961075-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_KIC_POS

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

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

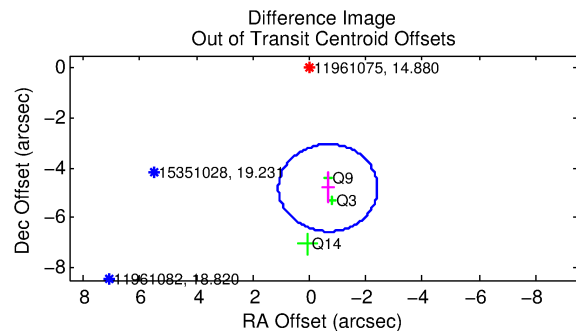
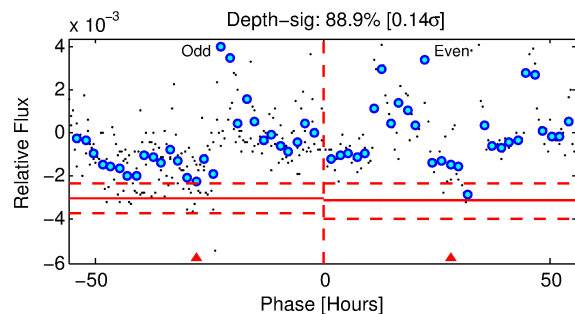
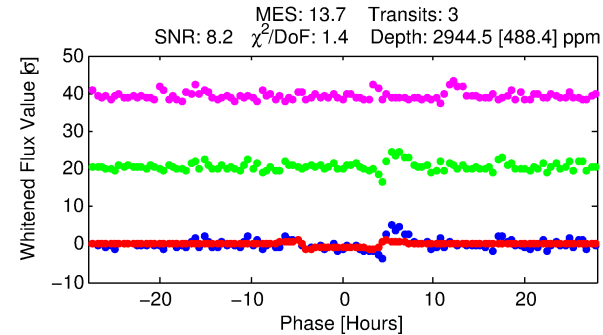
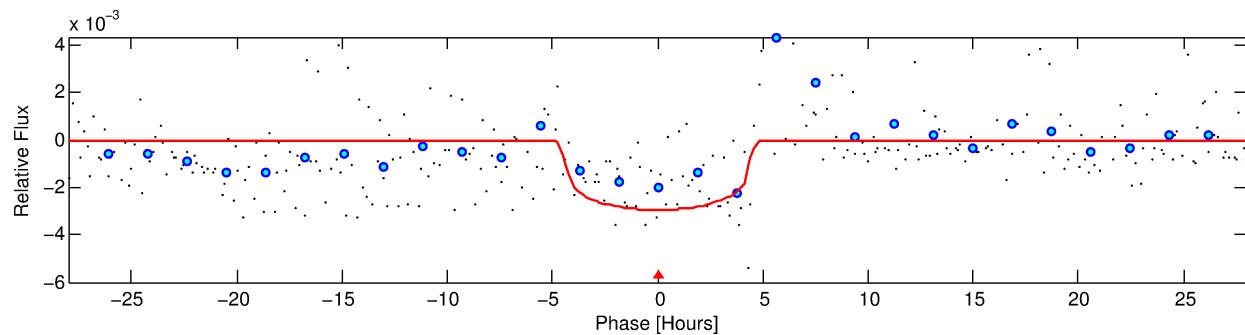
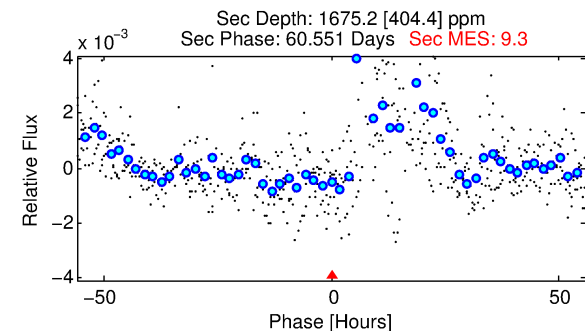
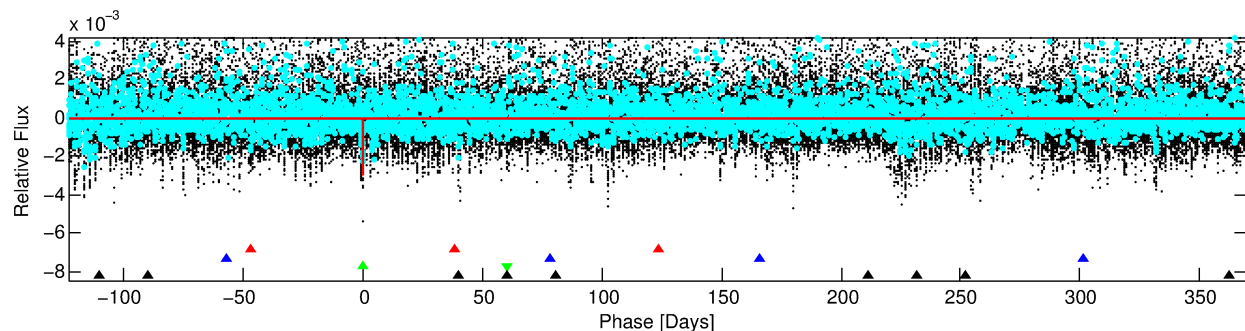
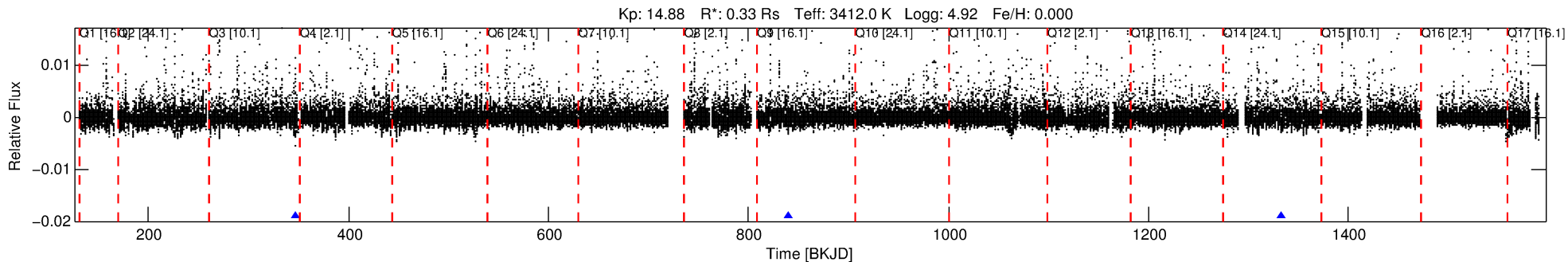
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 011961075-03

No Significant Match Found

# DV One-Page Summary

KIC: 11961075 Candidate: 3 of 4 Period: 493.141 d



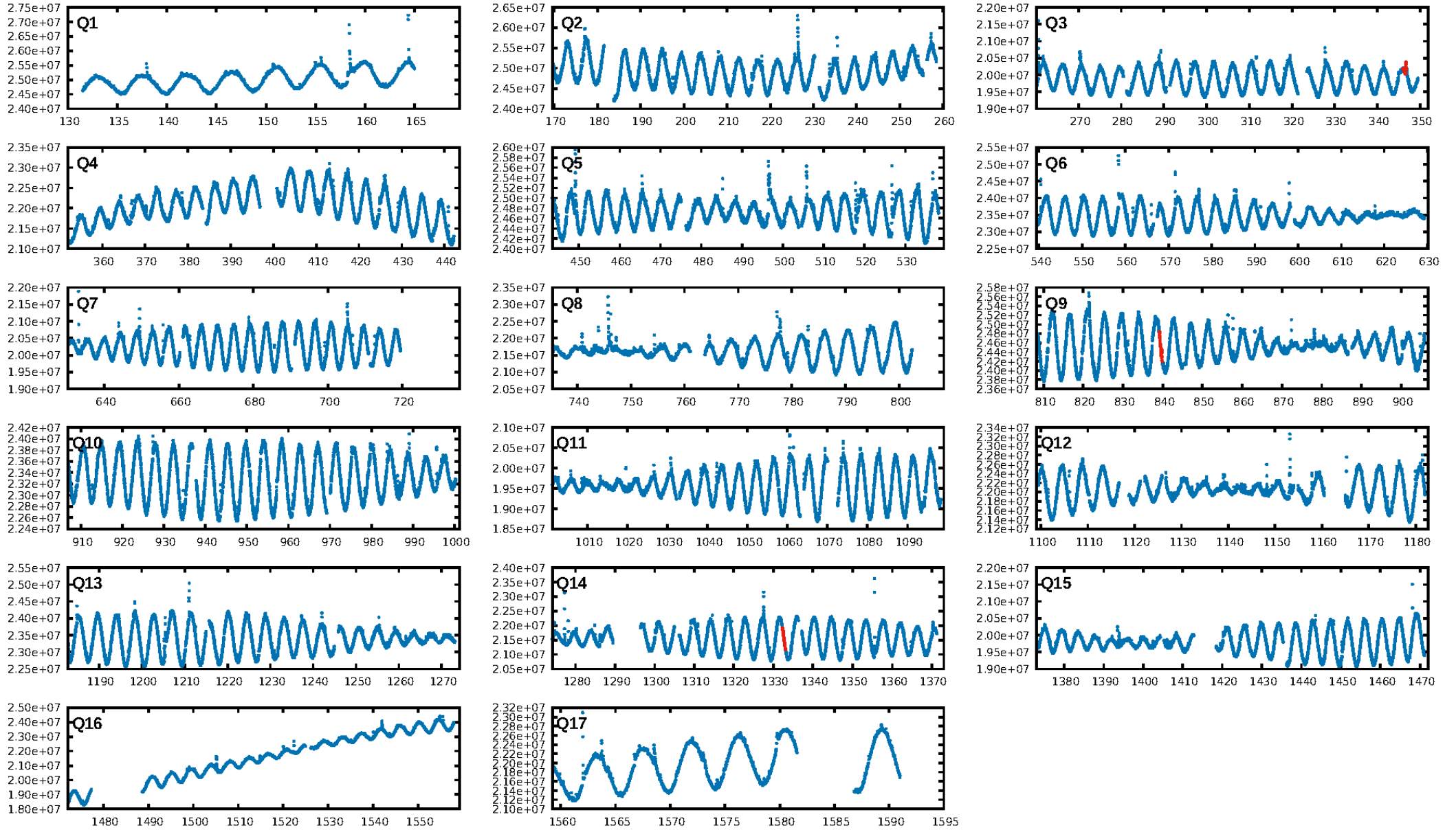
## DV Fit Results:

Period = 493.14099 [0.00767] d  
Epoch = 346.3930 [0.0094] BKJD  
Rp/R\* = 0.0492 [0.0183]  
a/R\* = 415.17 [613.77]  
b = 0.21 [6.88]  
Seff = 0.02 [0.00]  
Teq = 94 [3] K  
Rp = 1.76 [0.68] Re  
a = 0.8406 [0.0641] AU  
Ag = 209720.97 [165480.44] [1.27σ]  
Teffp = 3111 [611] K [4.94σ]

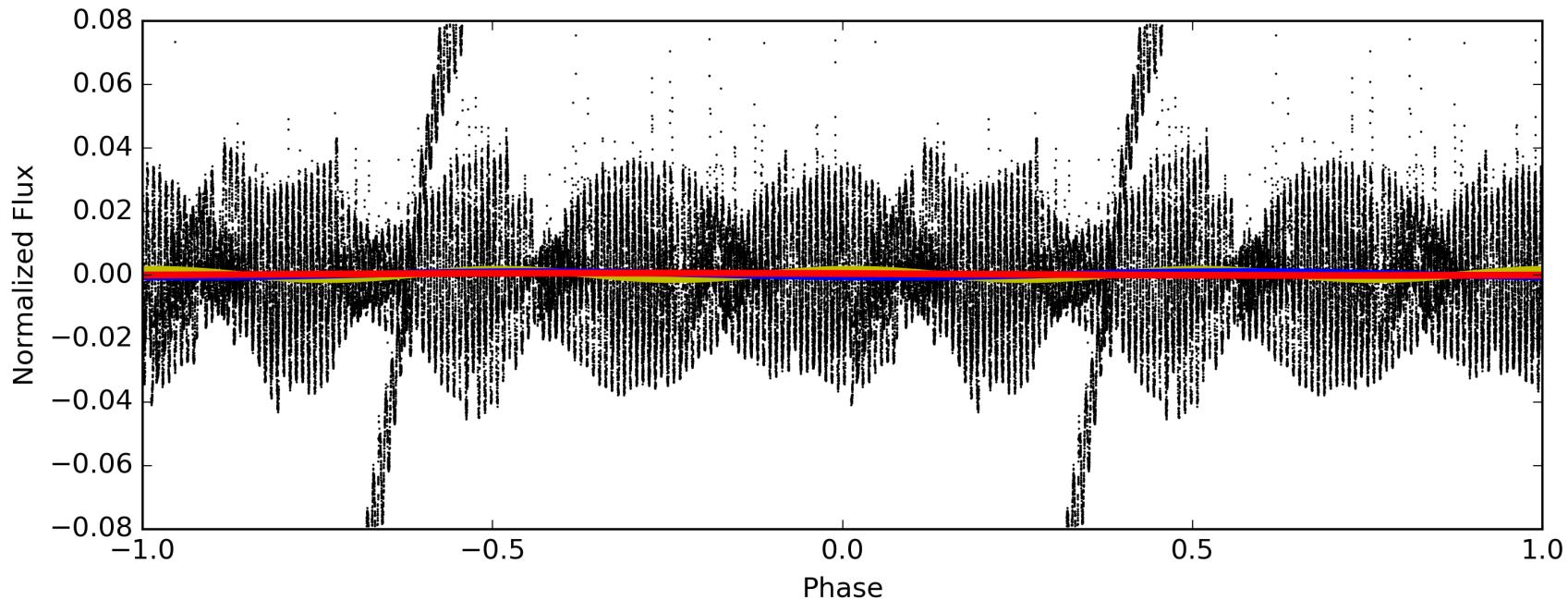
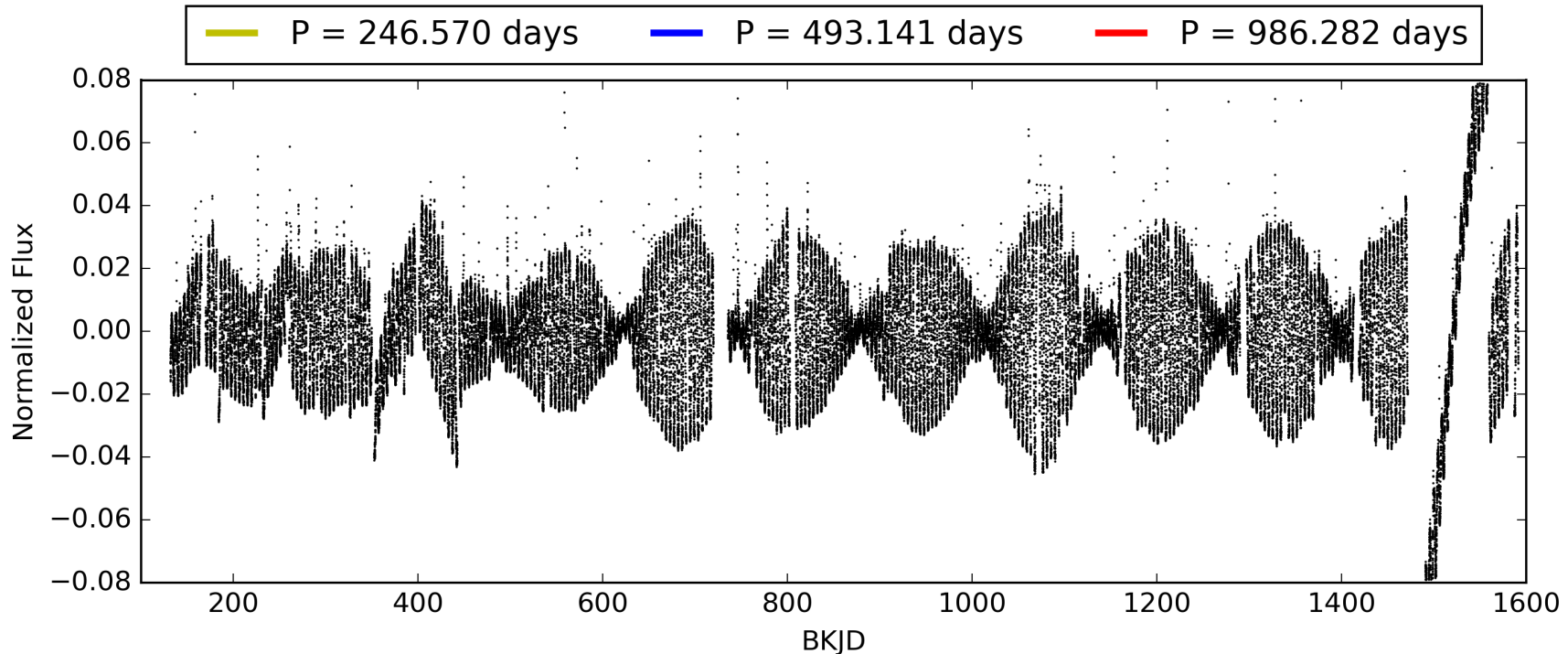
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [176.84σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.1%  
ModelChiSquareGof-sig: 46.1%  
Bootstrap-pfa: 7.23e-10  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 0.6463  
Centroid-sig: 0.0%  
Centroid-so: 0.446 arcsec [0.50σ]  
OotOffset-rm: 4.856 arcsec [8.33σ]  
KicOffset-rm: 0.155 arcsec [0.67σ]  
OotOffset-st: 1/1/0/1 [3]  
KicOffset-st: 1/1/0/1 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 1.00 [3/3]

# TCE 011961075-03, PDC Light Curves

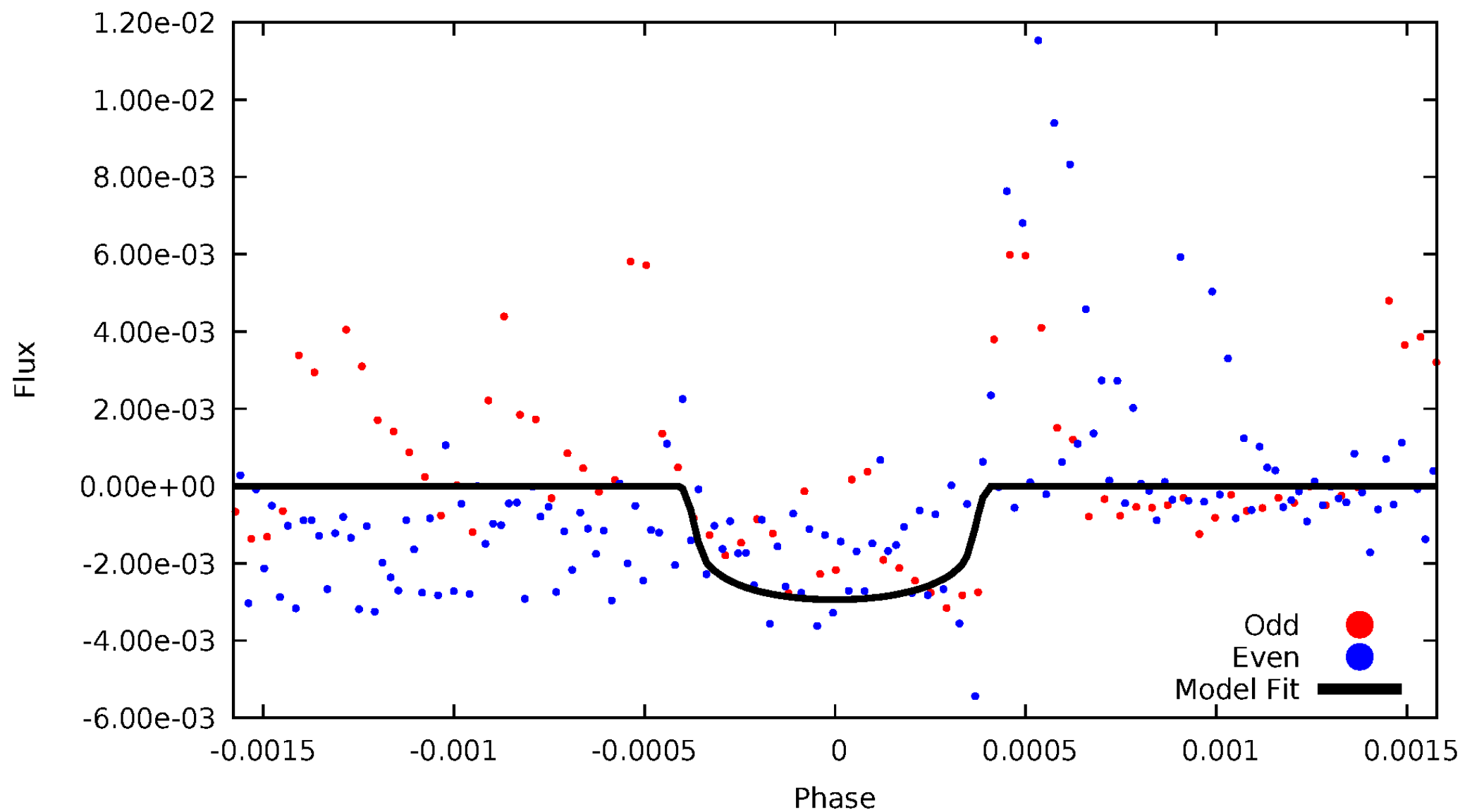


TCE 011961075-03



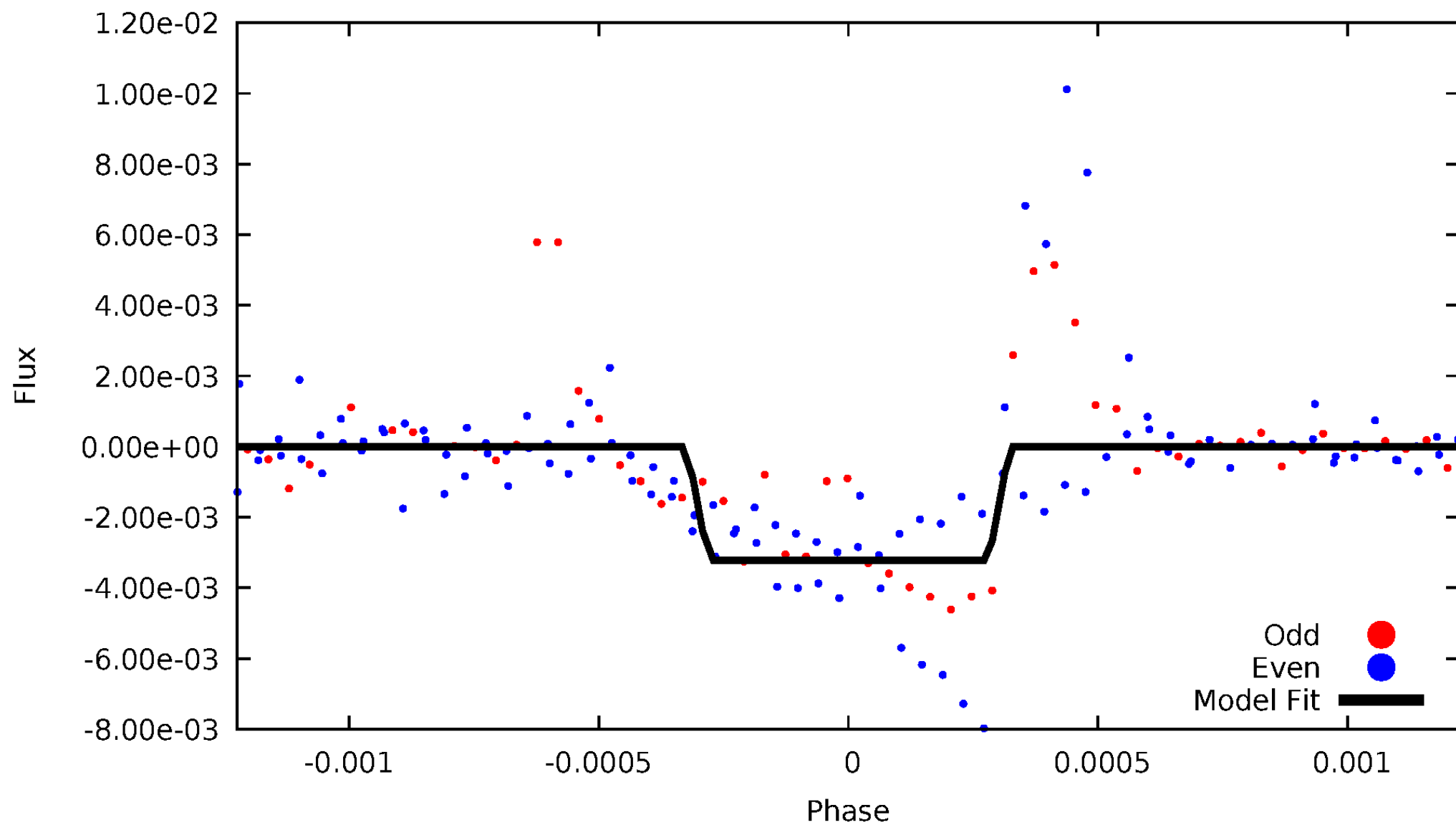
# DV Odd/Even

TCE 011961075-03



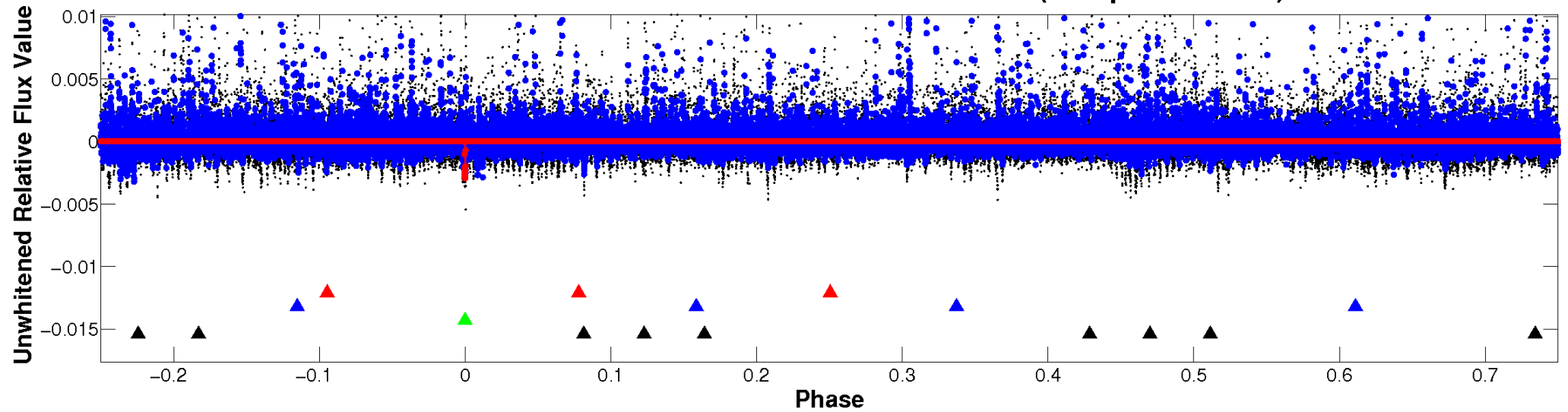
# ALT Odd/Even

TCE 011961075-03

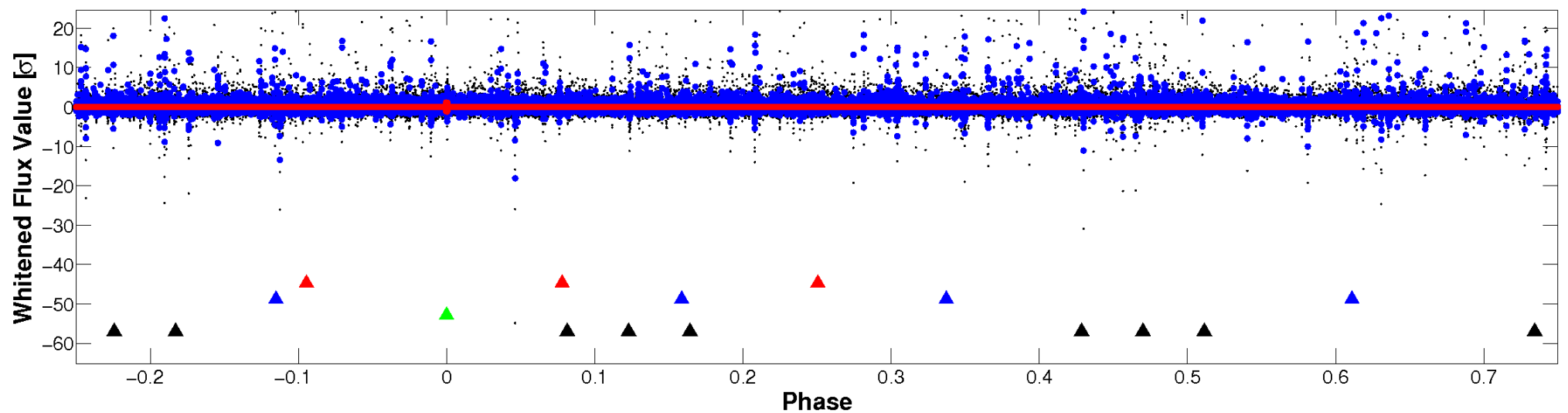


# Non-Whitened Vs. Whitened Light Curve

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

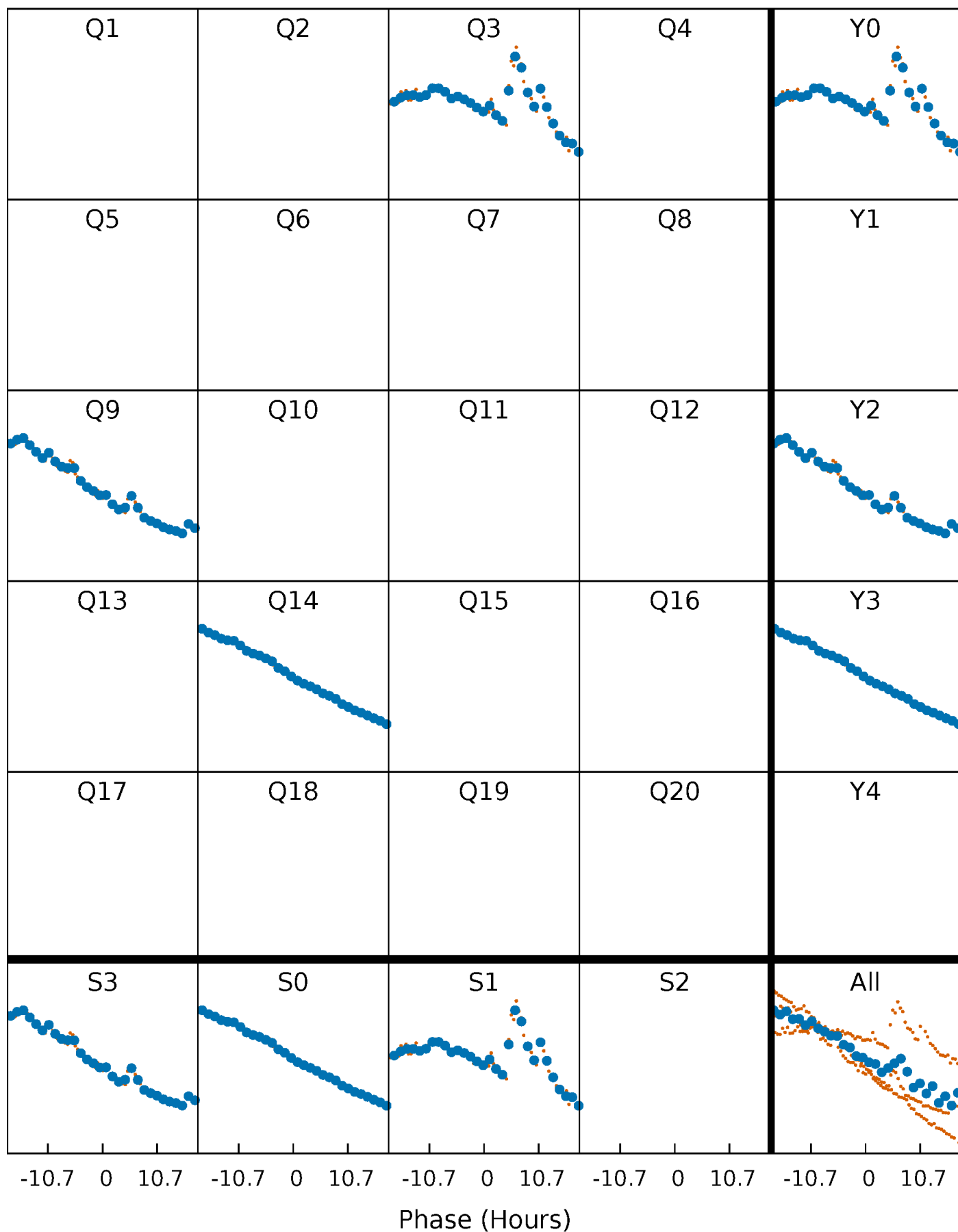


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

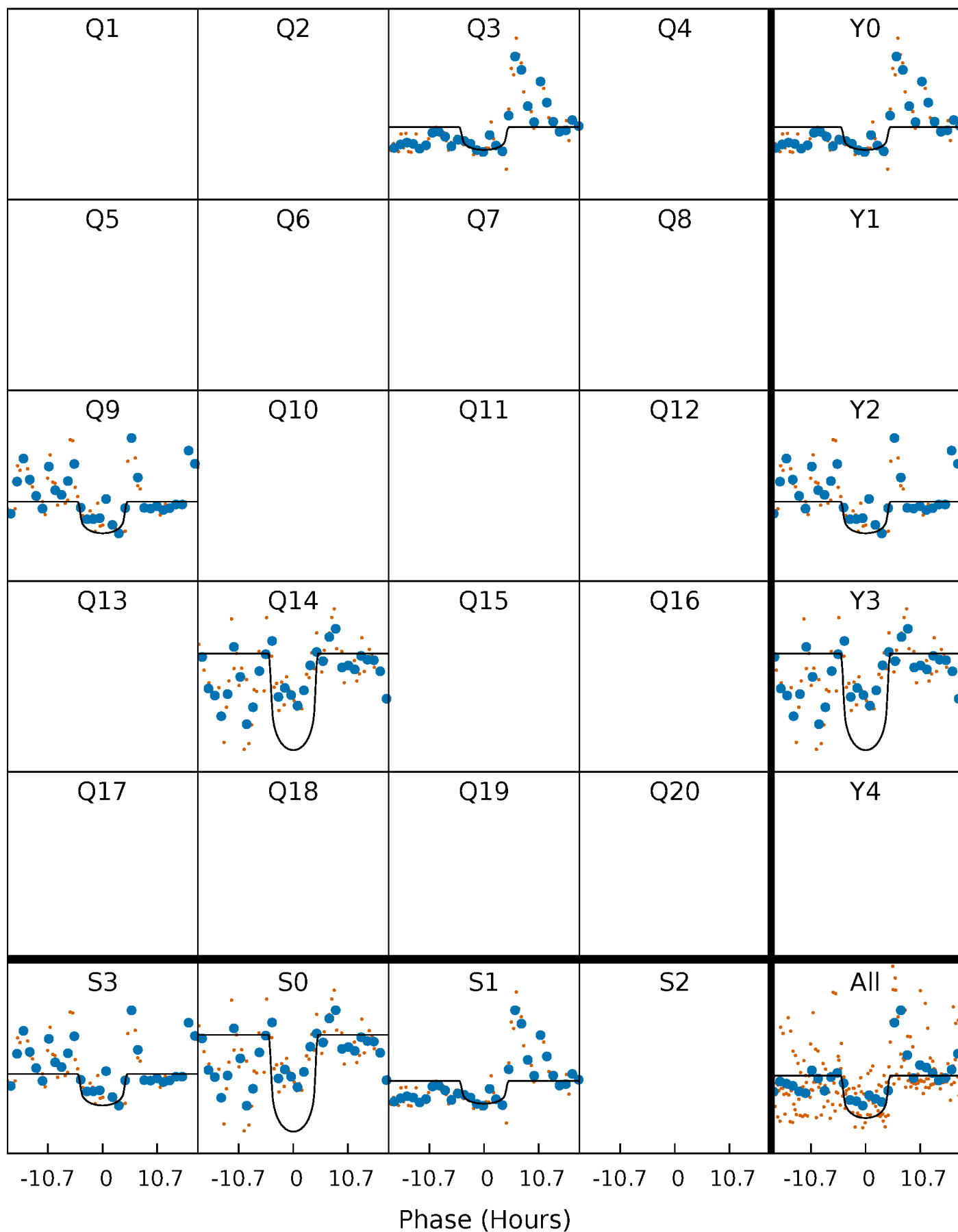
TCE 011961075-03     $P=493.140993$  Days     $T_0=346.393041$  (BKJD)





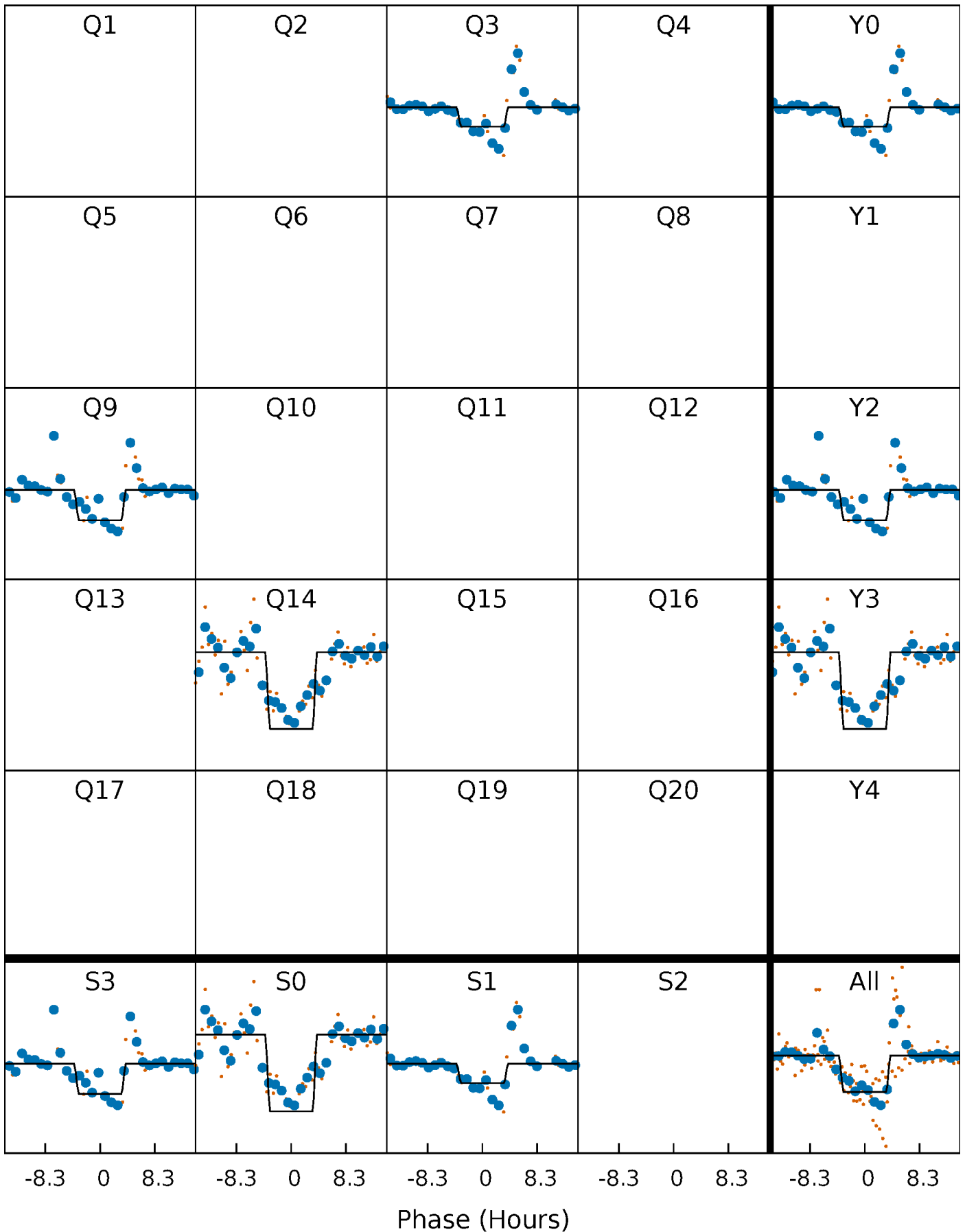
# DV Quarter-Phased Transit Curves

TCE 011961075-03     $P=493.140993$  Days     $T_0=346.393041$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

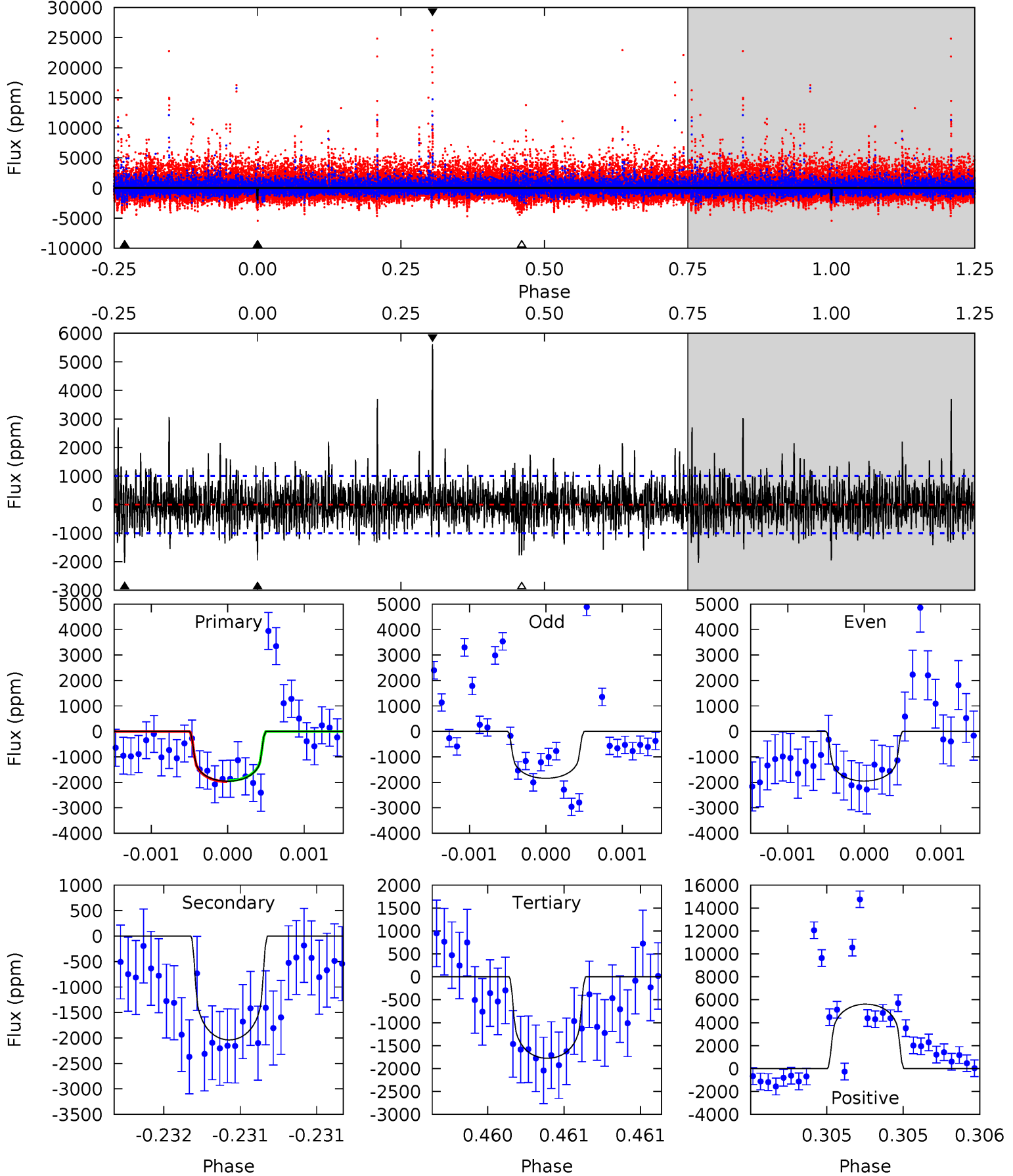
TCE 011961075-03 P=493.136726 Days  $T_0=346.440185$  (BKJD)



# DV Model-Shift Uniqueness Test

011961075-03, P = 493.140993 Days, E = 346.393041 Days

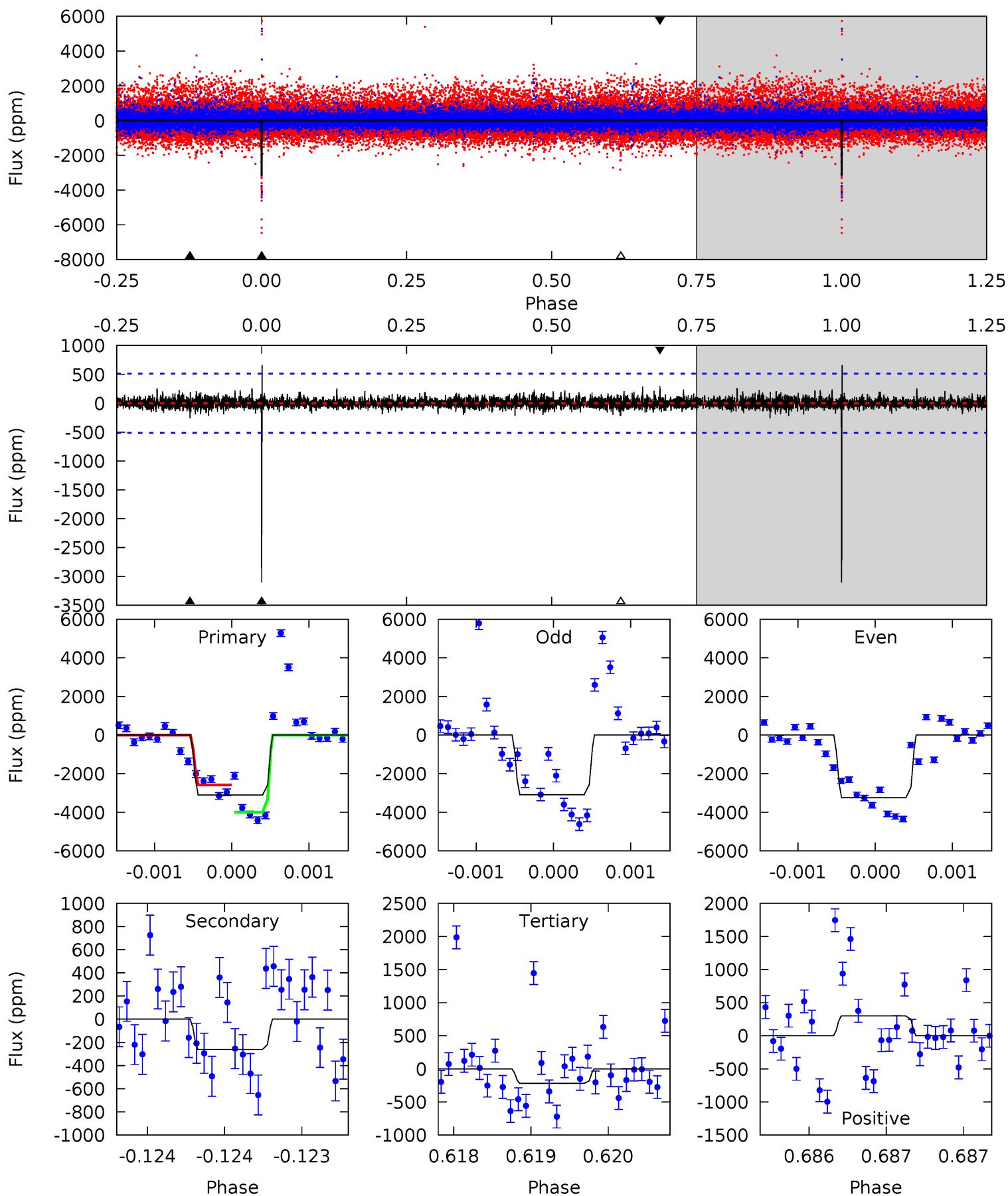
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.7	11.1	9.70	30.6	5.49	3.35	3.10	0.97	-20.0	1.43	-19.5	0.19	1.06	0.73	0.11



# Alt Model-Shift Uniqueness Test

011961075-03, P = 493.136726 Days, E = 346.440185 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
33.5	2.83	2.37	3.23	5.54	3.42	0.57	31.2	30.3	0.46	-0.40	0.75	1.11	0.18	7.48



### Stellar Parameters For KIC 011961075

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$3412^{+44}_{-41}$	$4.919^{+0.042}_{-0.031}$	$0.000^{+0.100}_{-0.100}$	$0.328^{+0.030}_{-0.034}$	$0.325^{+0.041}_{-0.037}$	$13.010^{+2.916}_{-1.983}$
	+1%/-1%	+1%/-1%	+inf%/-inf%	+9%/-10%	+13%/-11%	+22%/-15%
Source	PHO2	PHO2	PHO2	DSEP		

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

### Secondary Eclipse Parameters for KIC 011961075-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-2038 \pm 183$	$1.79^{+0.65}_{-0.64}$	$131^{+3}_{-3}$	$3305^{+528}_{-285}$	$245912^{+362457}_{-113678}$
Alt.	$-262 \pm 93$	$2.06^{+0.66}_{-0.64}$	$131^{+2}_{-3}$	$2415^{+257}_{-193}$	$23952^{+29059}_{-12366}$

$T_{\text{max}}$  = 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

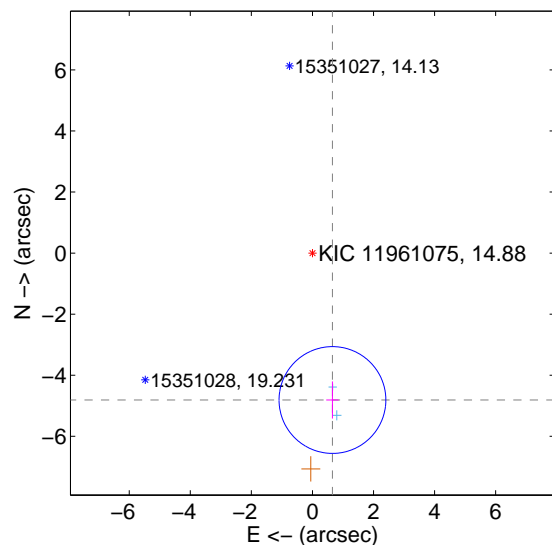
Supplemental centroid analysis for 011961075-03. Kepler magnitude: 14.88. Transit SNR 8.22

There are 2 quarters with good PRF difference image offsets

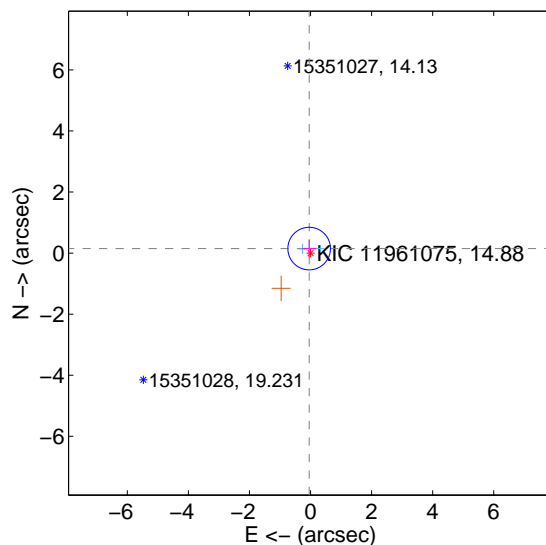
The OOT PRF centroid is offset from the target star catalog position by about 5.98 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$4.856 \pm 0.583$	8.33	$-0.655 \pm 0.205$	$-4.811 \pm 0.608$
PRF-fit source offset from KIC position	$0.155 \pm 0.232$	0.67	$0.045 \pm 0.222$	$0.148 \pm 0.296$
photometric centroid source offset	$0.45 \pm 0.89$	0.50	$0.28 \pm 0.29$	$-0.35 \pm 1.11$

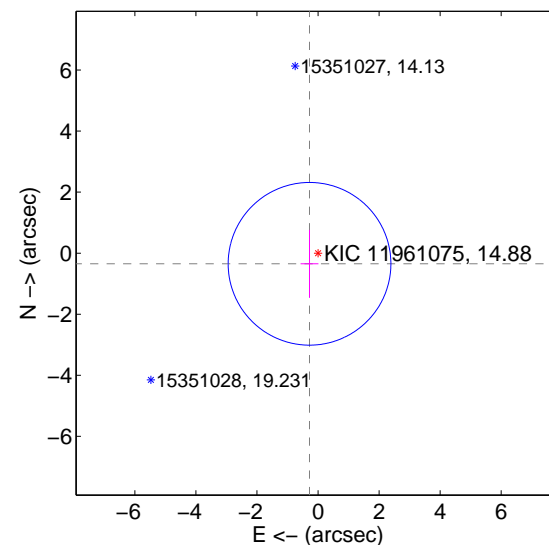
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

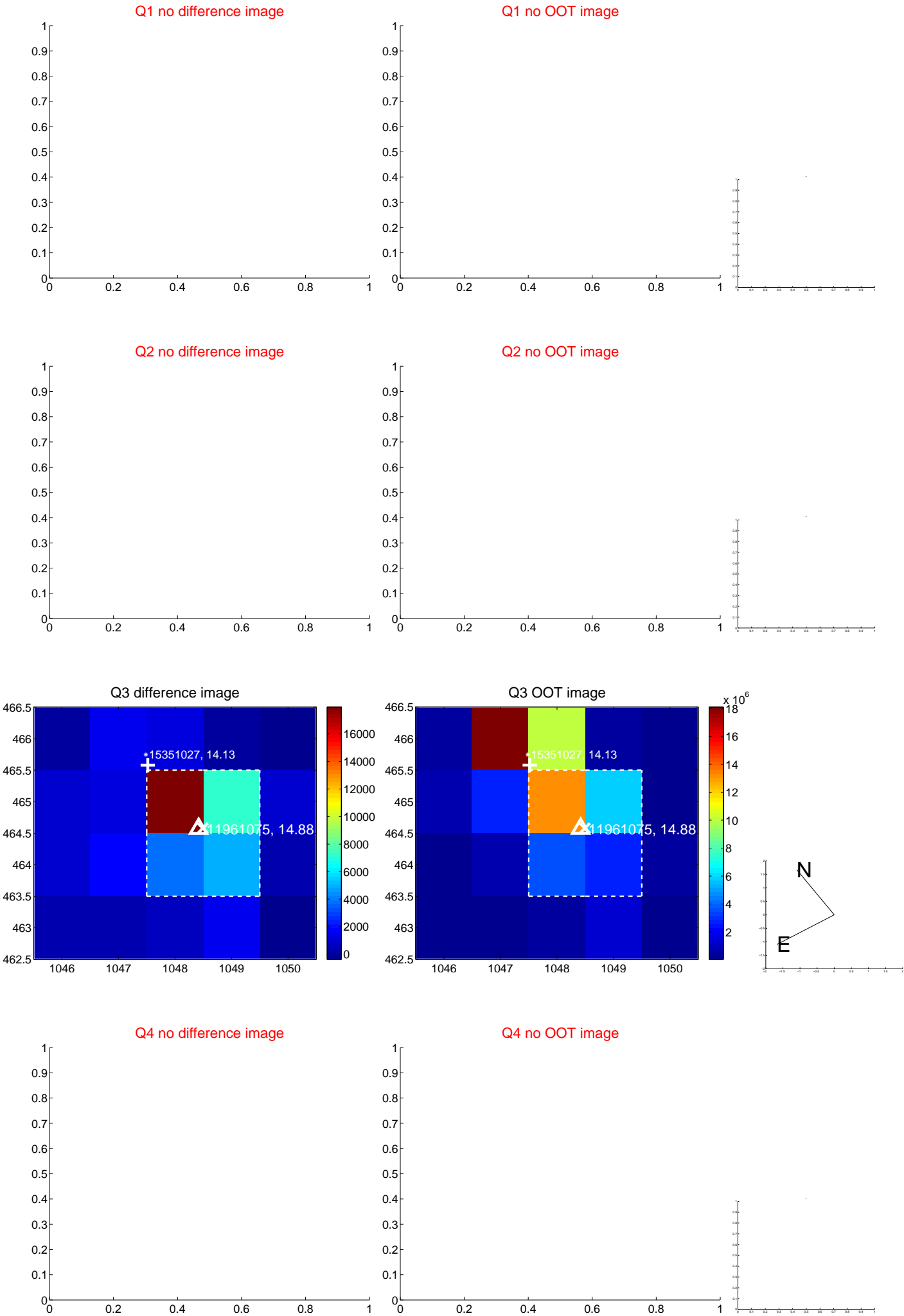


offset from photometric centroids



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

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

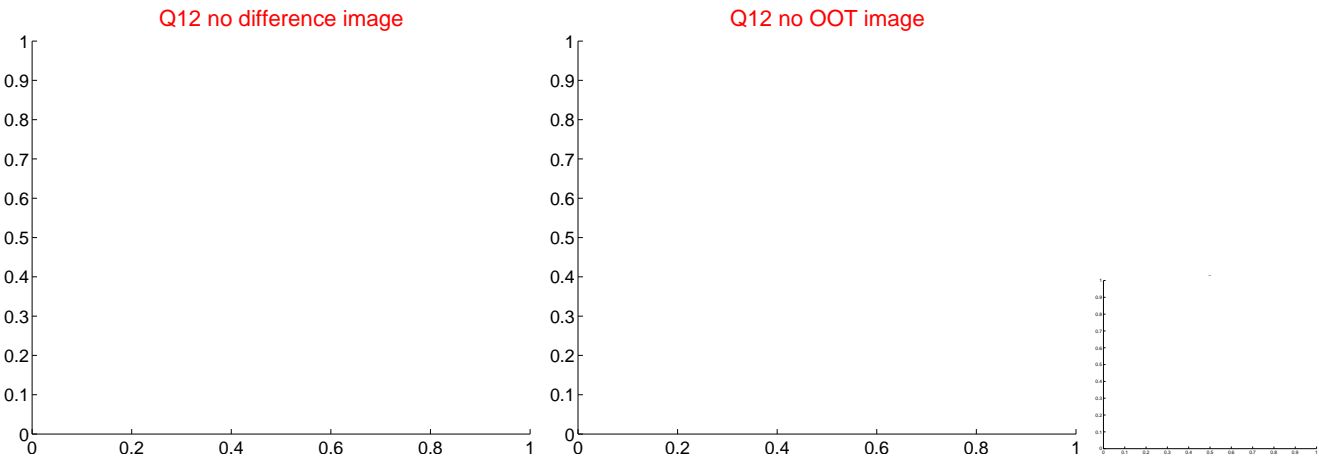
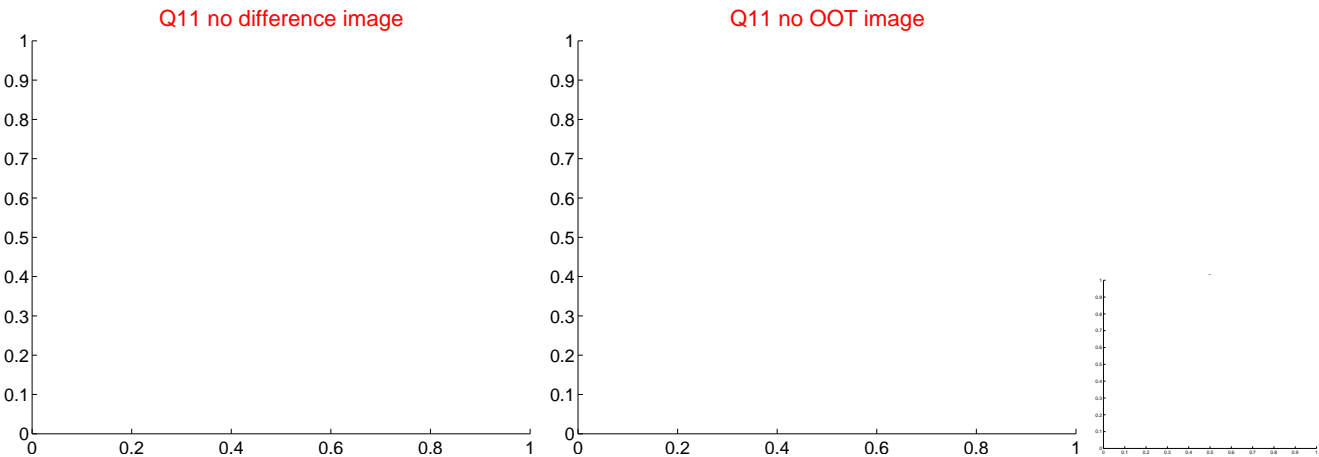
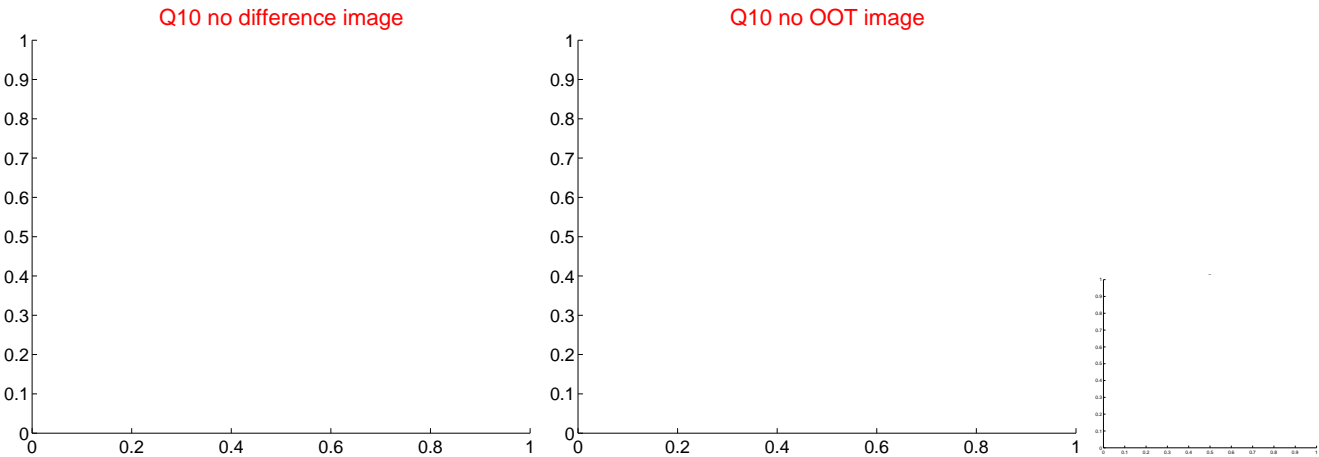
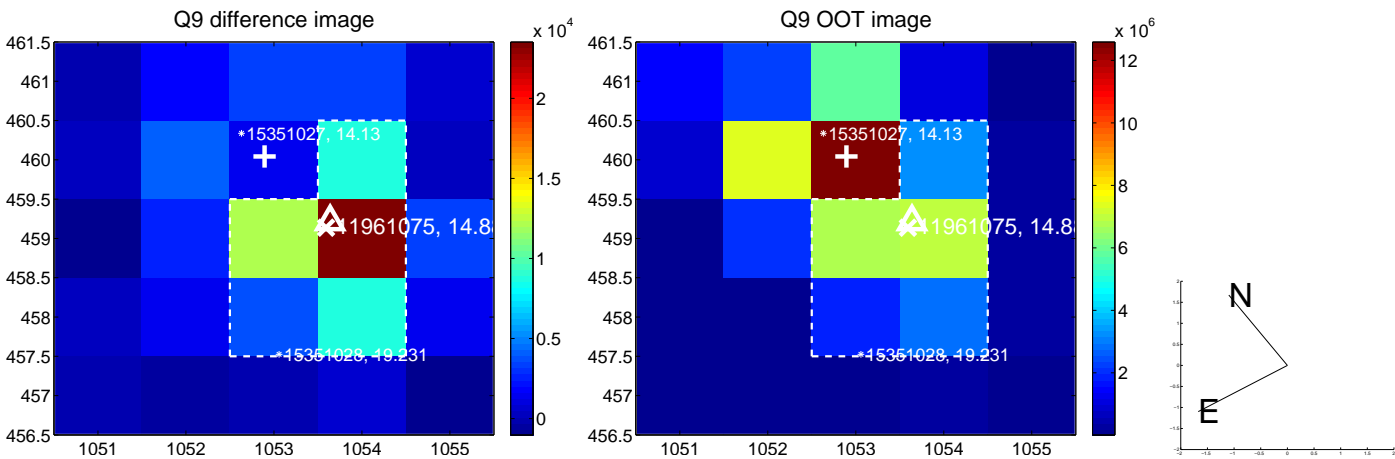


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

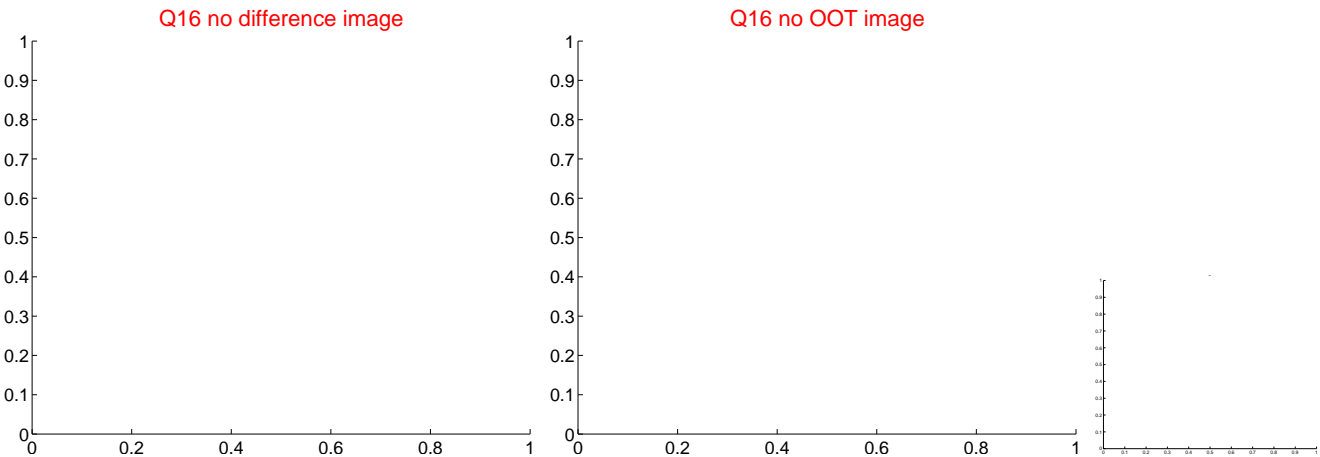
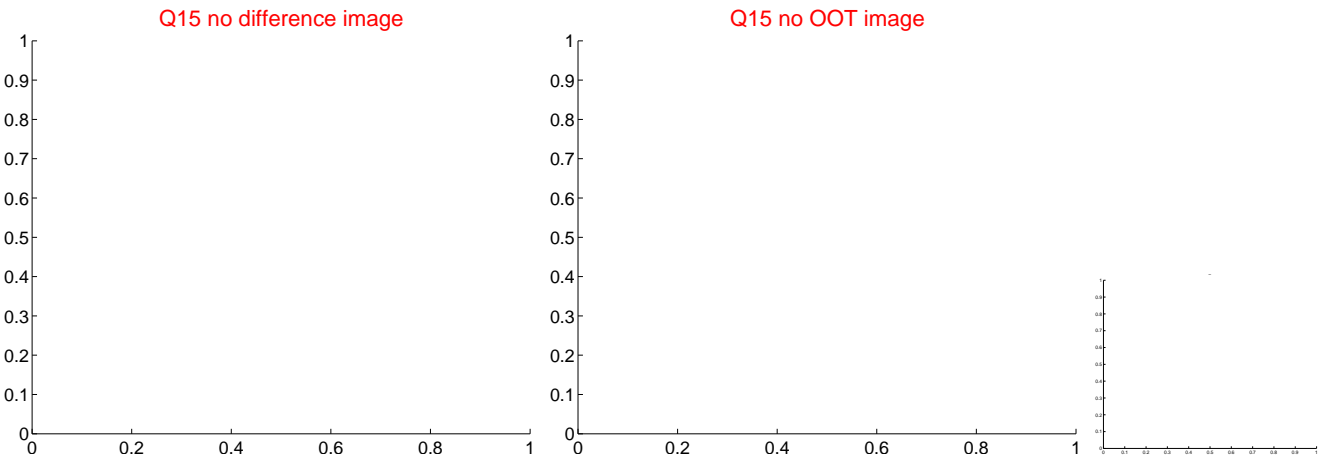
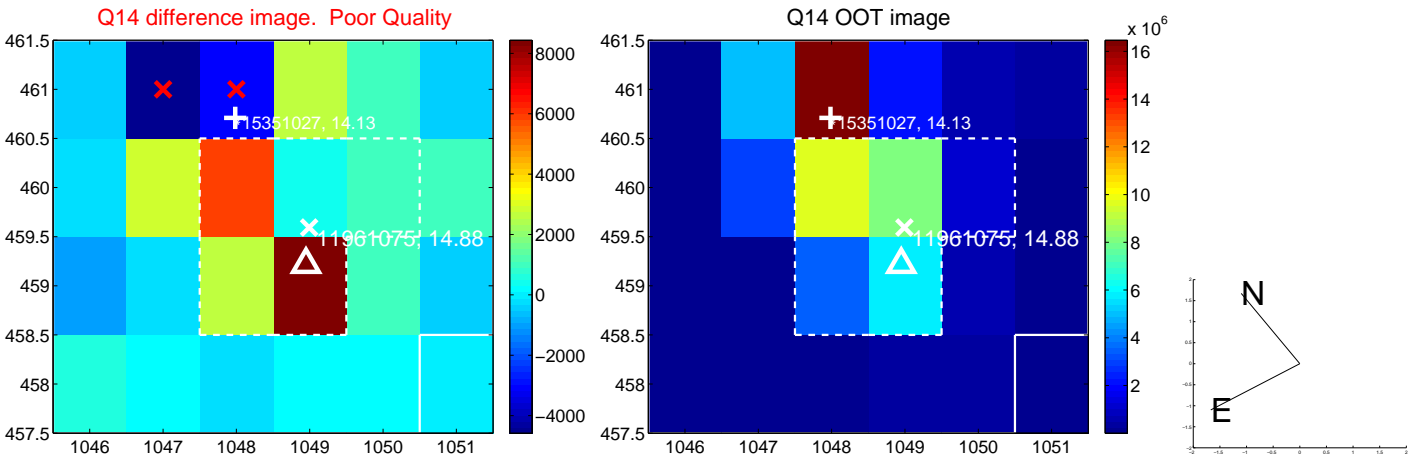
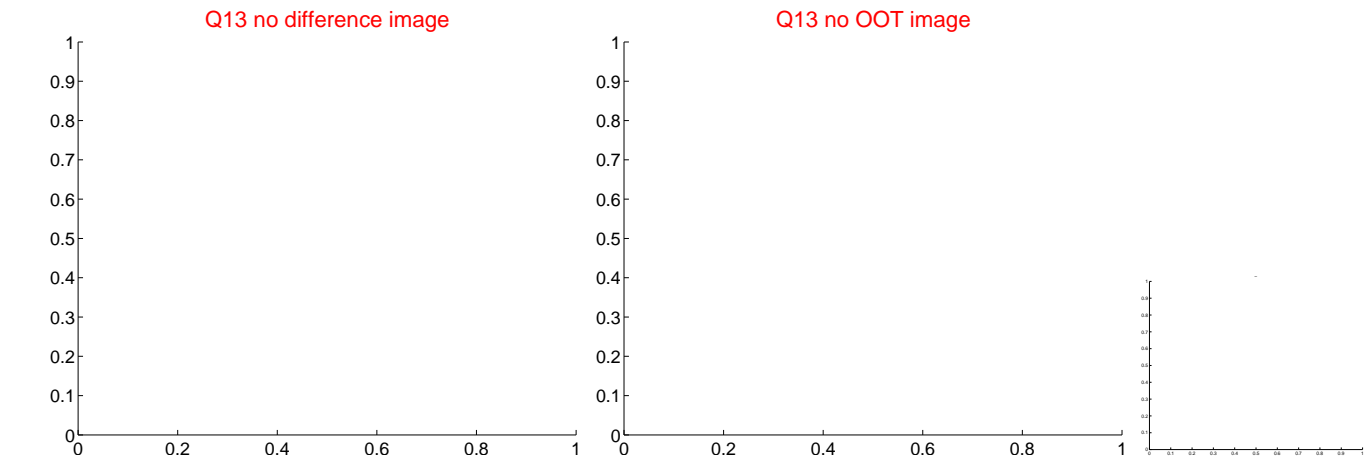




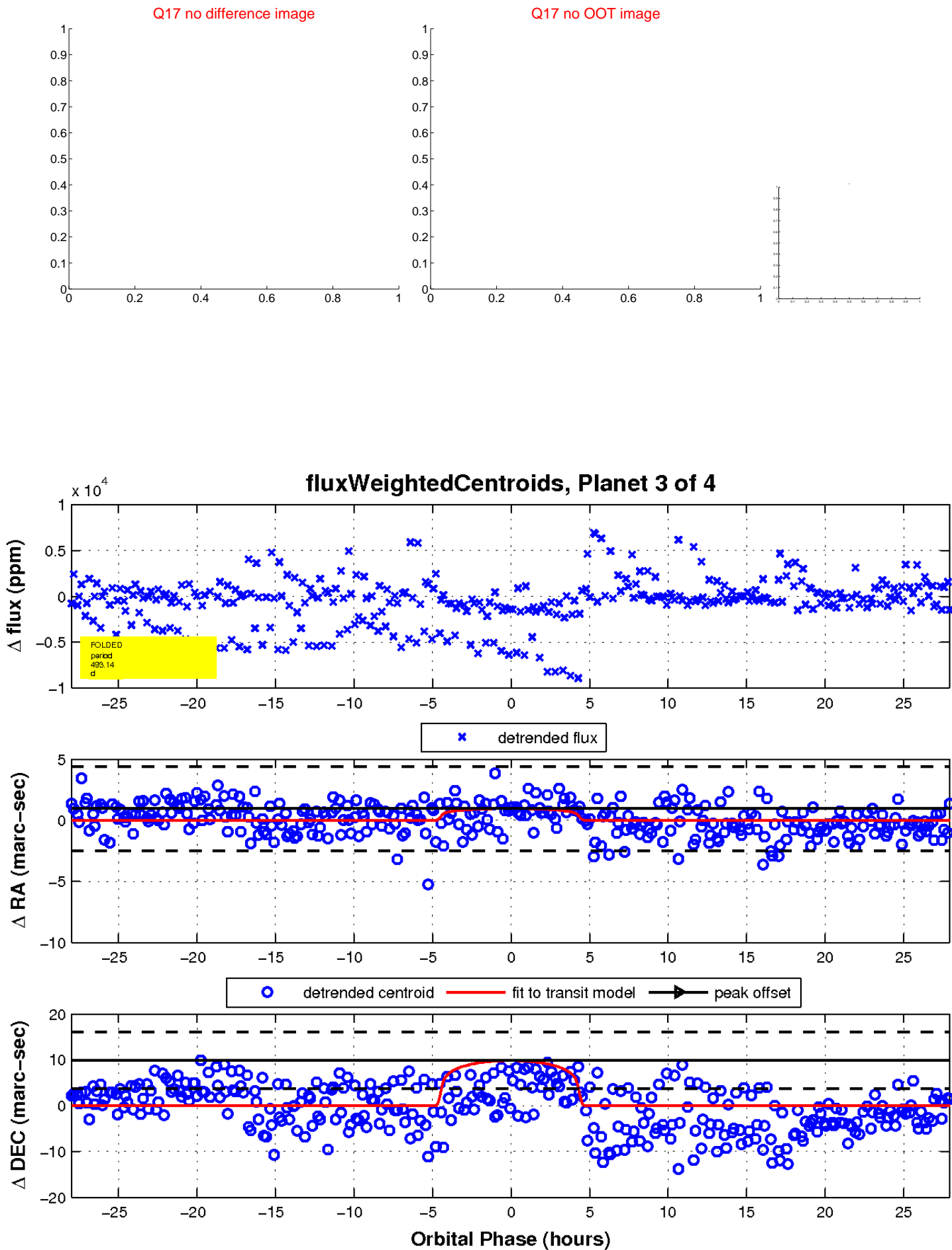
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

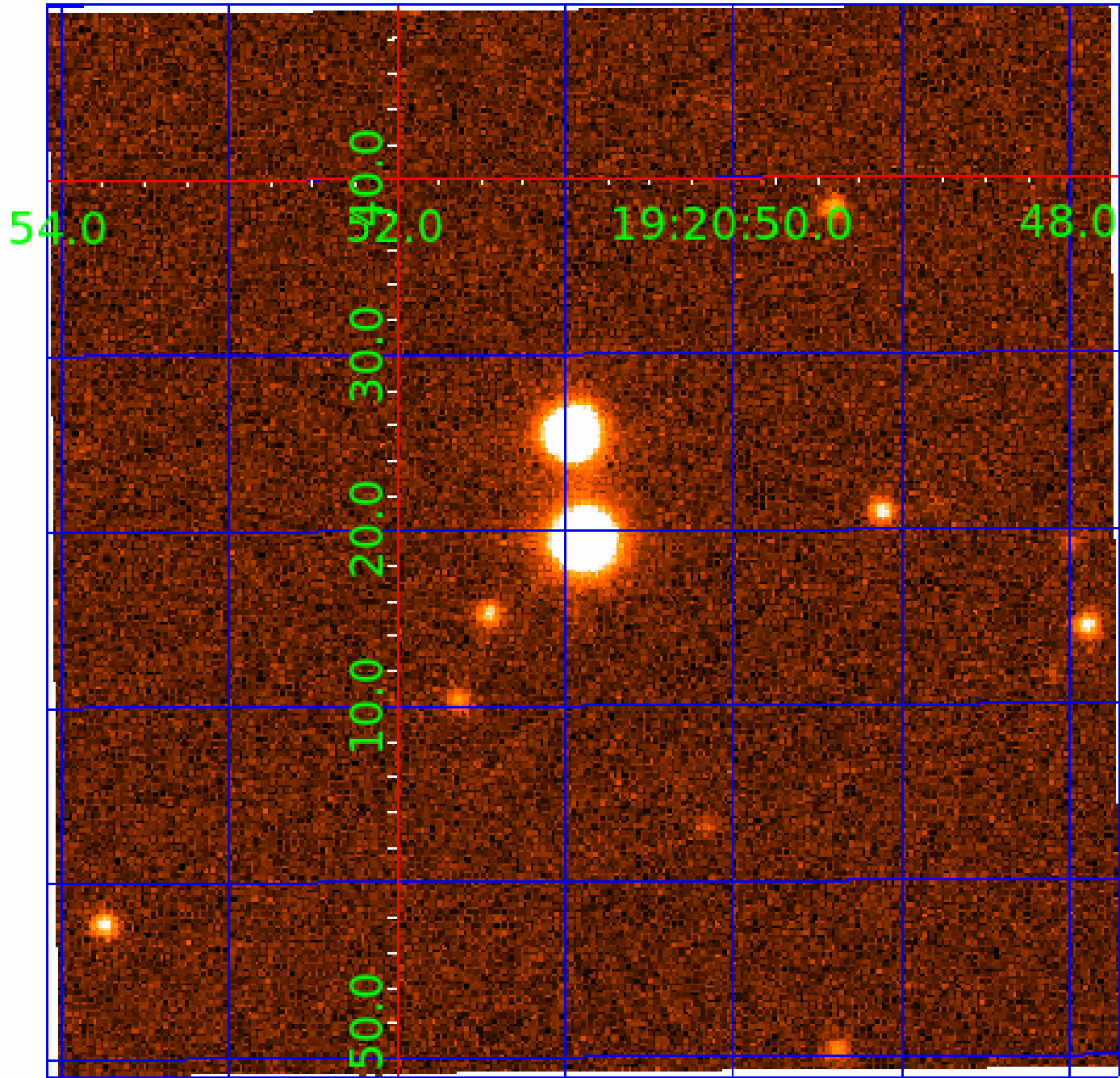


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 011961075

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011961075-01	OBS	No	408.037125	469.959803	3675.6	6.802	18.7	9.2	0.33	3412	2.40	0.02
011961075-02	OBS	No	358.114209	424.631610	3298.1	7.469	15.6	10.8	0.33	3412	1.86	0.03
011961075-03	OBS	No	493.140994	346.393041	2944.5	9.335	13.7	8.2	0.33	3412	1.76	0.02
011961075-04	OBS	No	171.184935	215.375697	2394.0	11.573	11.8	9.0	0.33	3412	1.58	0.08

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011961075-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—CENT_FEW_DIFFS
011961075-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_KIC_POS—HALO_GHOST
011961075-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_KIC_POS
011961075-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_KIC_POS

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

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

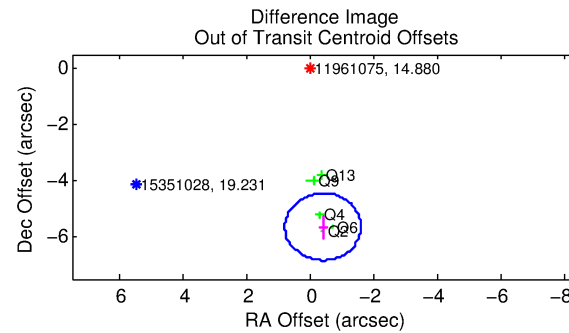
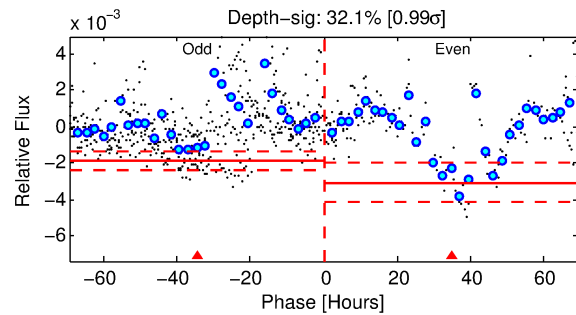
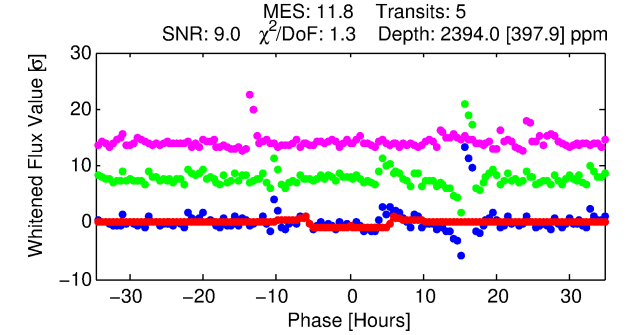
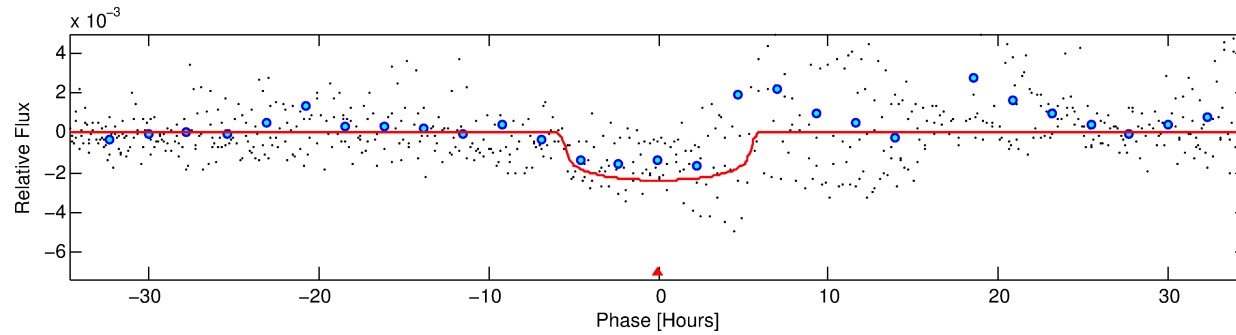
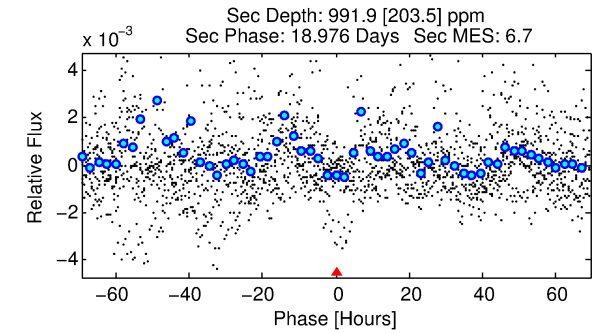
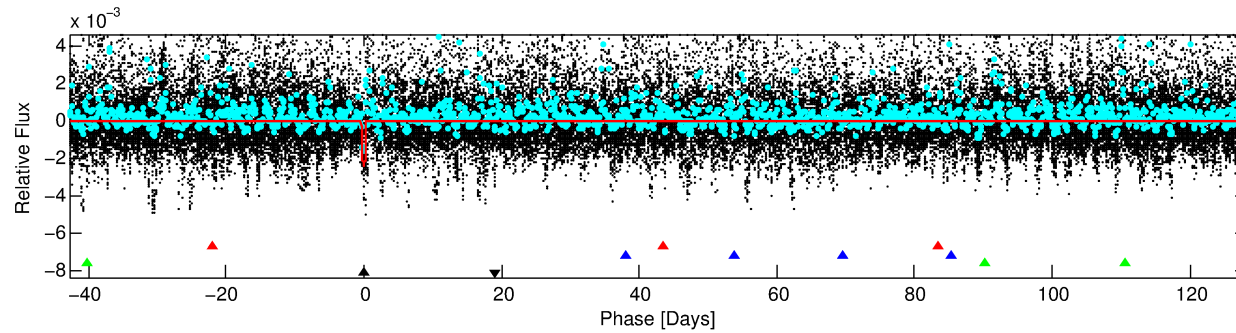
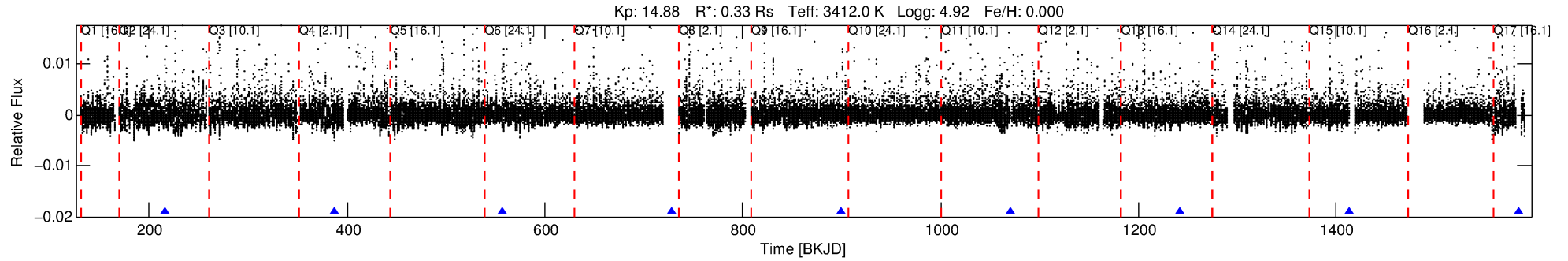
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 011961075-04

No Significant Match Found

# DV One-Page Summary

KIC: 11961075 Candidate: 4 of 4 Period: 171.185 d



## DV Fit Results:

Period = 171.18493 [0.00275] d  
Epoch = 215.3757 [0.0092] BKJD  
Rp/R\* = 0.0442 [0.0144]  
a/R\* = 117.99 [152.33]  
b = 0.00 [264.82]  
Seff = 0.08 [0.01]  
Teq = 134 [4] K  
Rp = 1.58 [0.54] Re  
a = 0.4152 [0.0317] AU  
Ag = 37643.12 [26022.23] [1.45σ]  
Teffp = 2881 [495] K [5.55σ]

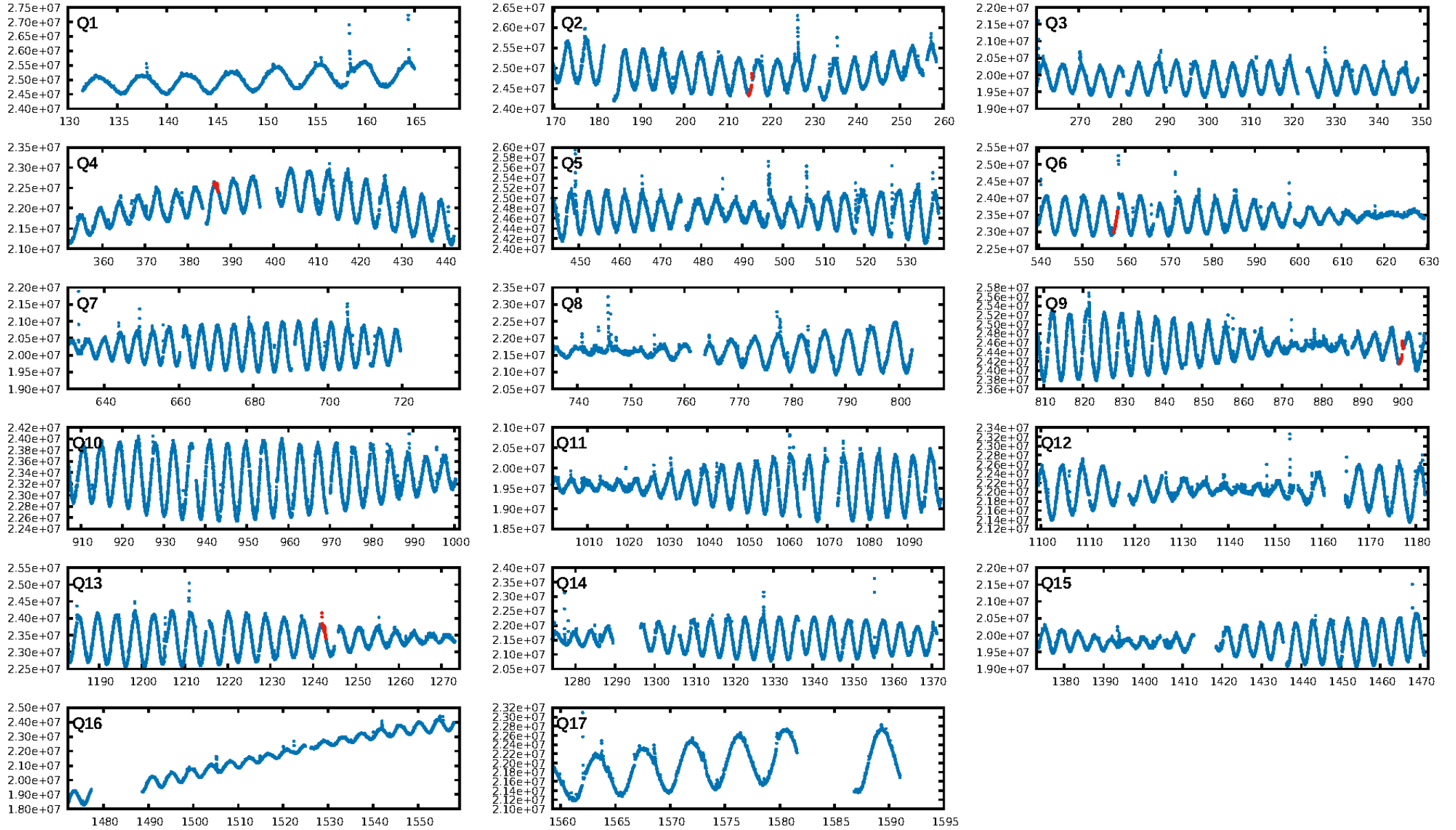
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [325.70σ]  
ModelChiSquare2-sig: 2.7%  
ModelChiSquareGof-sig: 99.9%  
**Bootstrap-pfa: 2.13e-10**  
RollingBand-fgt: 1.00 [5/5]  
**GhostDiagnostic-chr: 0.7099**  
Centroid-sig: 0.0%  
Centroid-so: 0.458 arcsec [1.98σ]  
**OotOffset-rm: 5.655 arcsec [14.21σ]**  
KicOffset-rm: 0.082 arcsec [0.90σ]  
OotOffset-st: 2/0/1/2 [5]  
KicOffset-st: 2/0/1/2 [5]  
DiffImageQuality-fgm: 0.60 [3/5]  
DiffImageOverlap-fno: 1.00 [5/5]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:33:29 Z

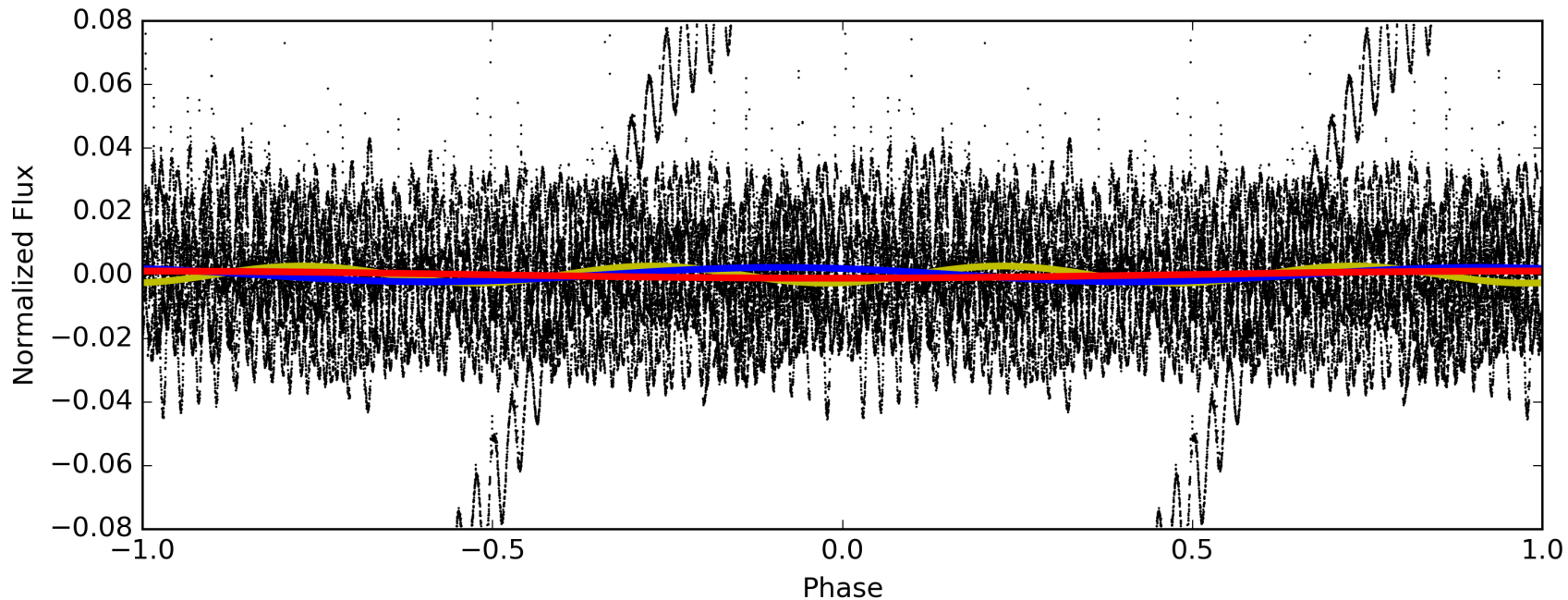
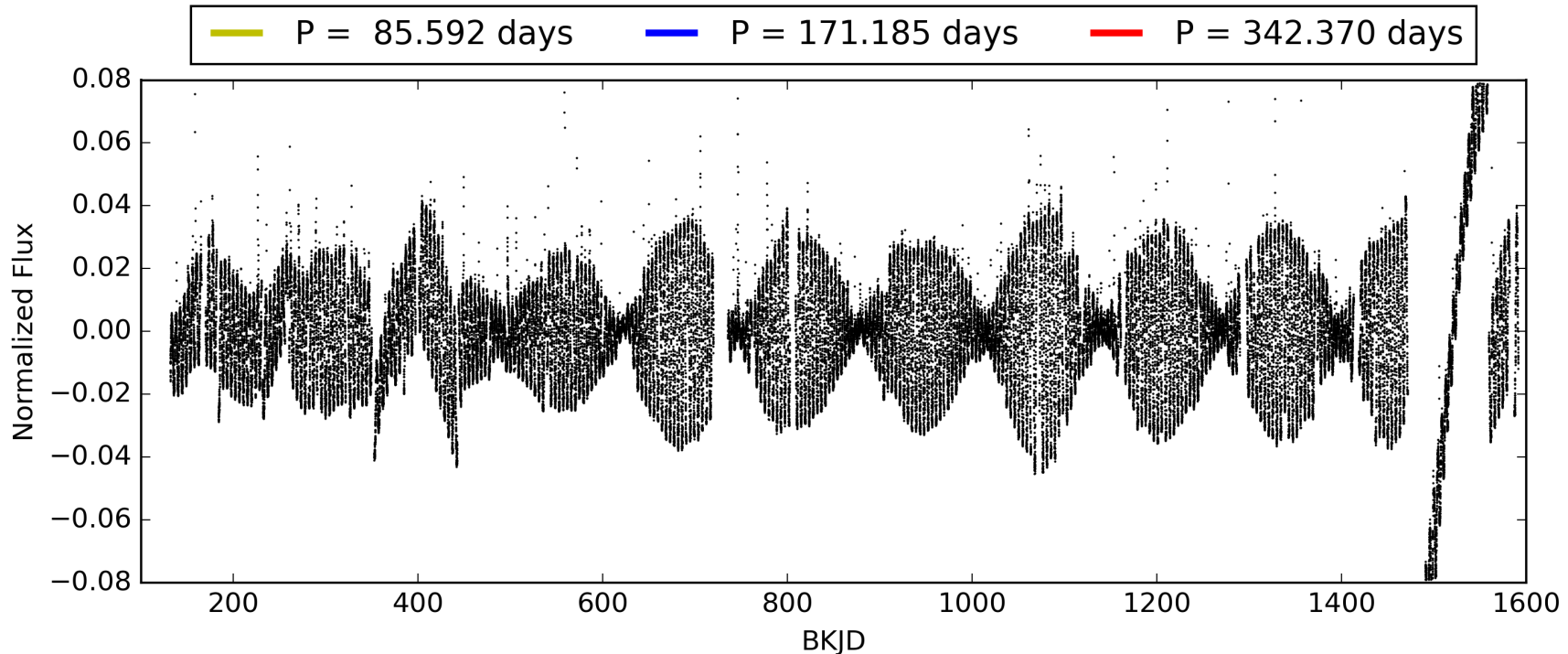
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 011961075-04, PDC Light Curves





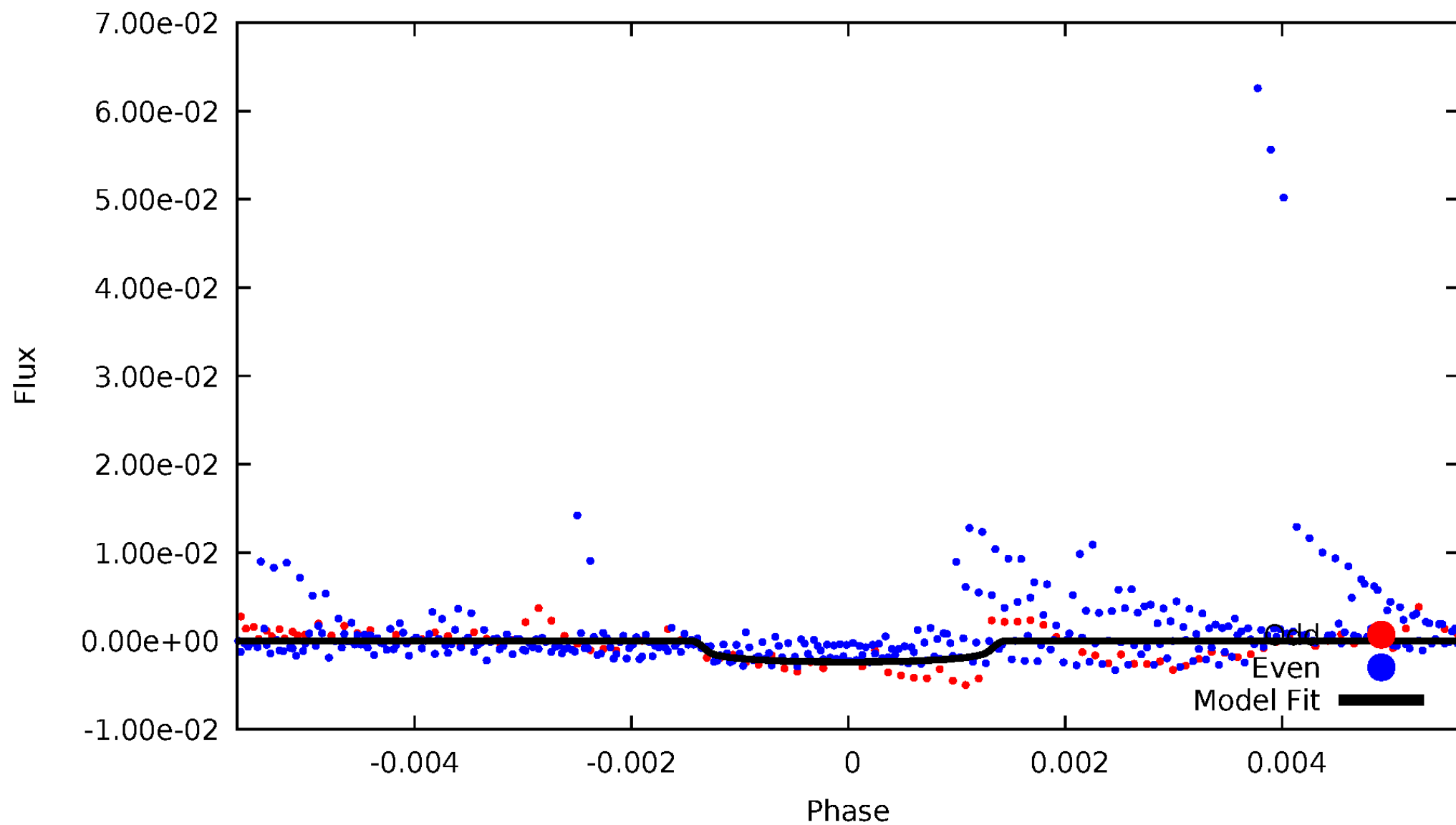
TCE 011961075-04





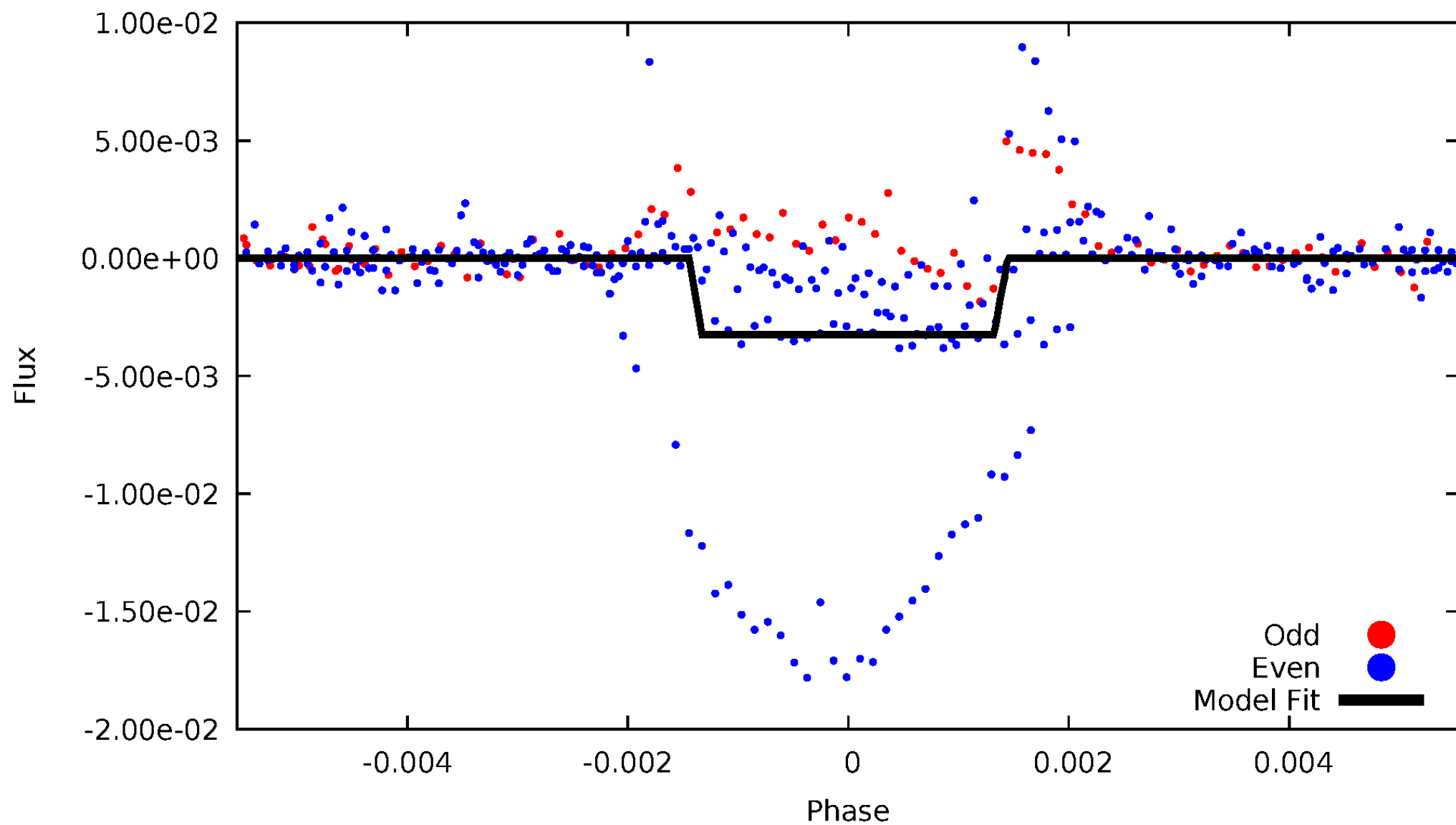
# DV Odd/Even

TCE 011961075-04



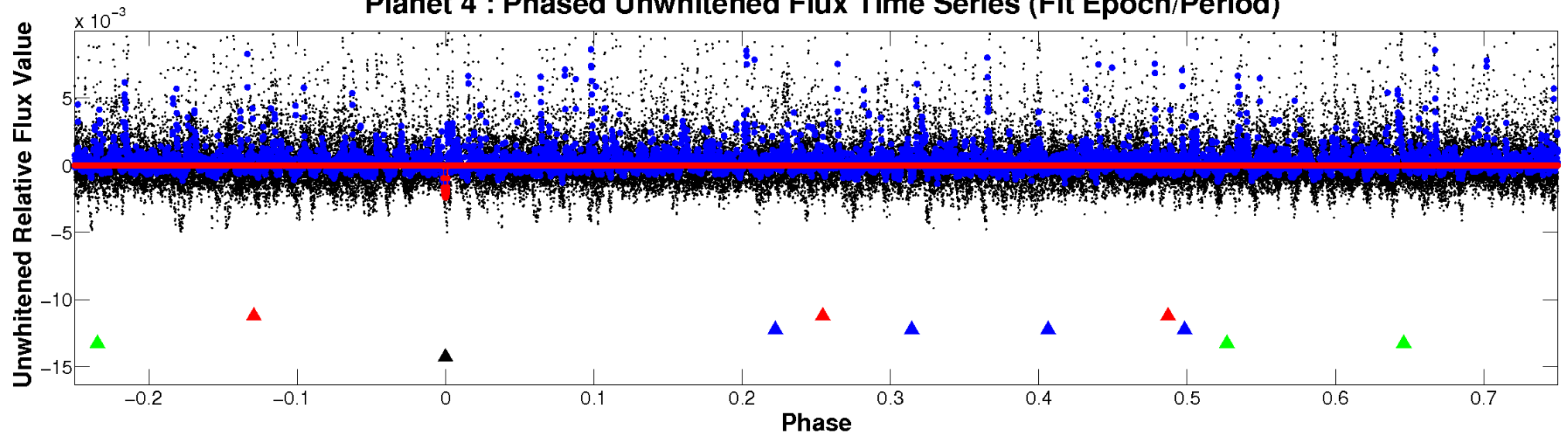
# ALT Odd/Even

TCE 011961075-04

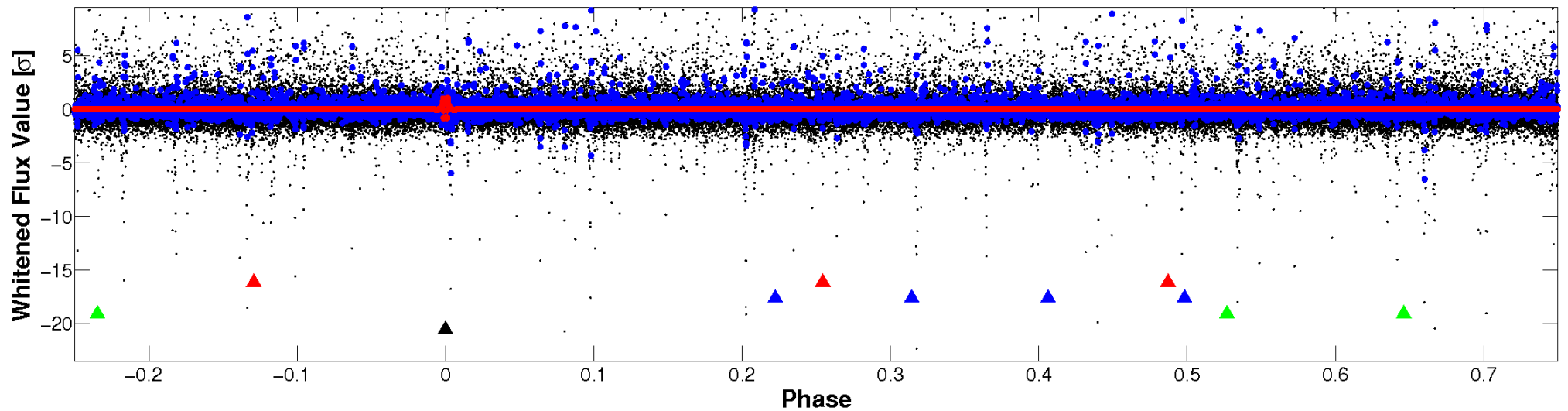


# Non-Whitened Vs. Whitened Light Curve

## Planet 4 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

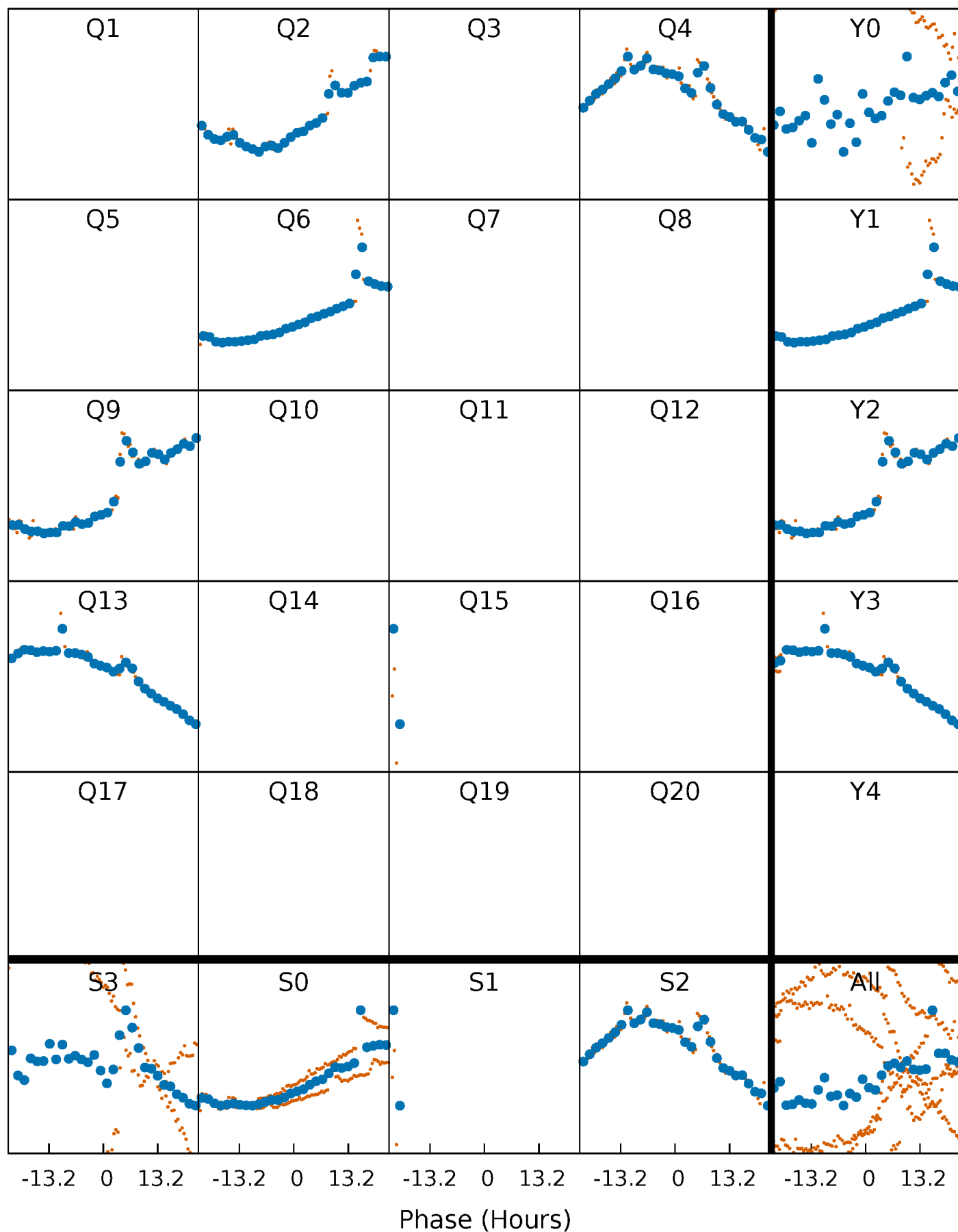


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



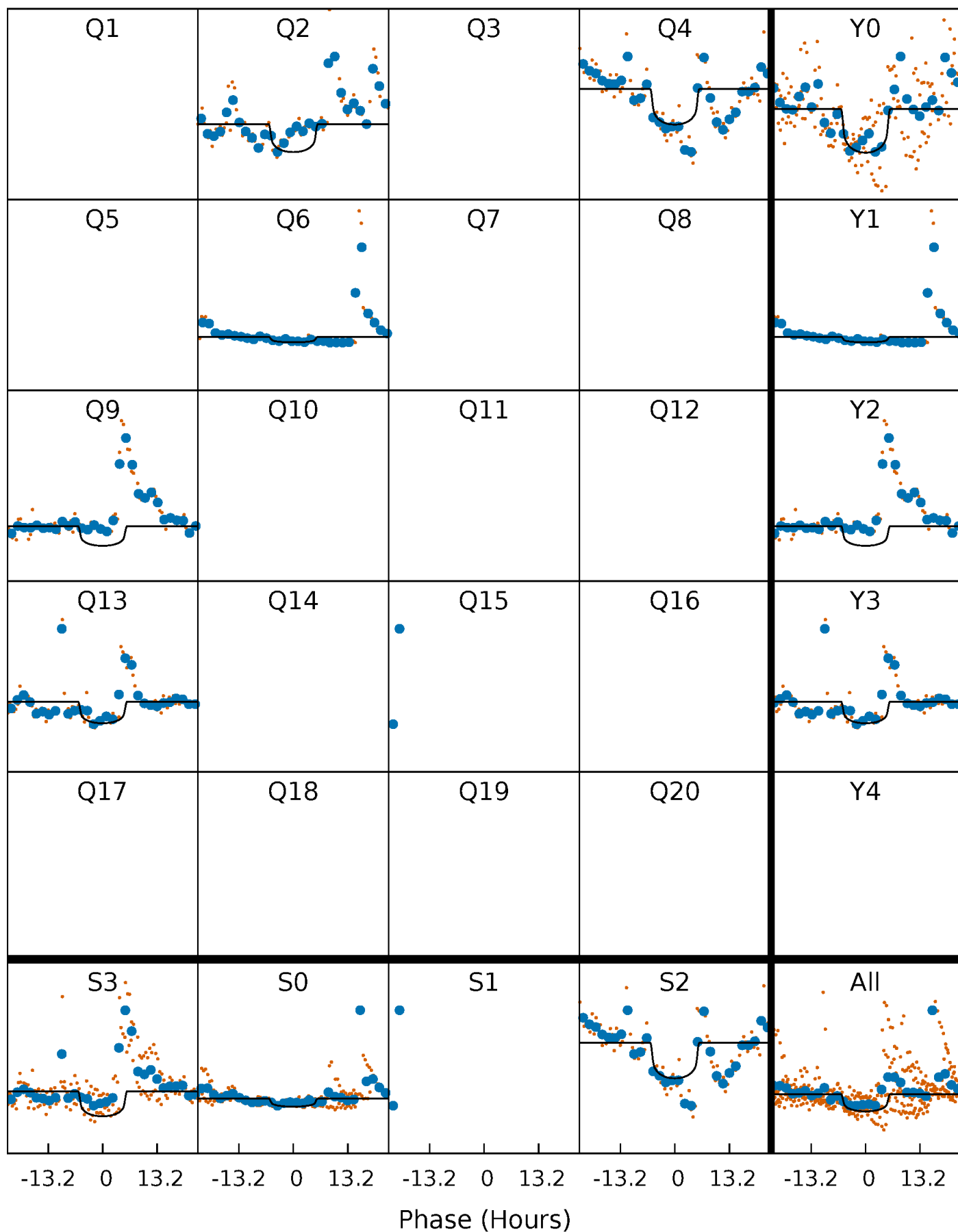
# PDC Quarter-Phased Transit Curves

TCE 011961075-04 P=171.184935 Days  $T_0=215.375697$  (BKJD)



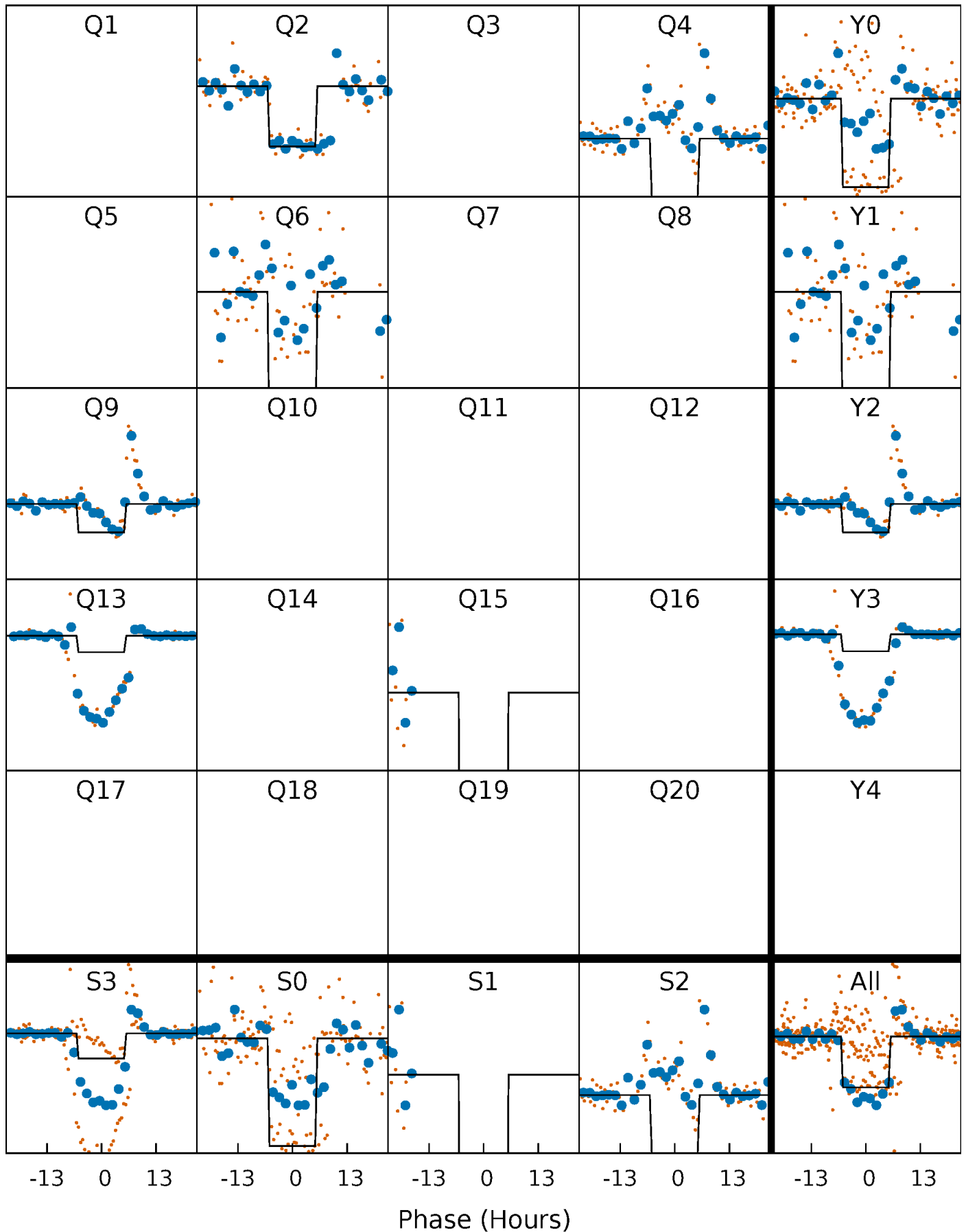
# DV Quarter-Phased Transit Curves

TCE 011961075-04 P=171.184935 Days  $T_0=215.375697$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

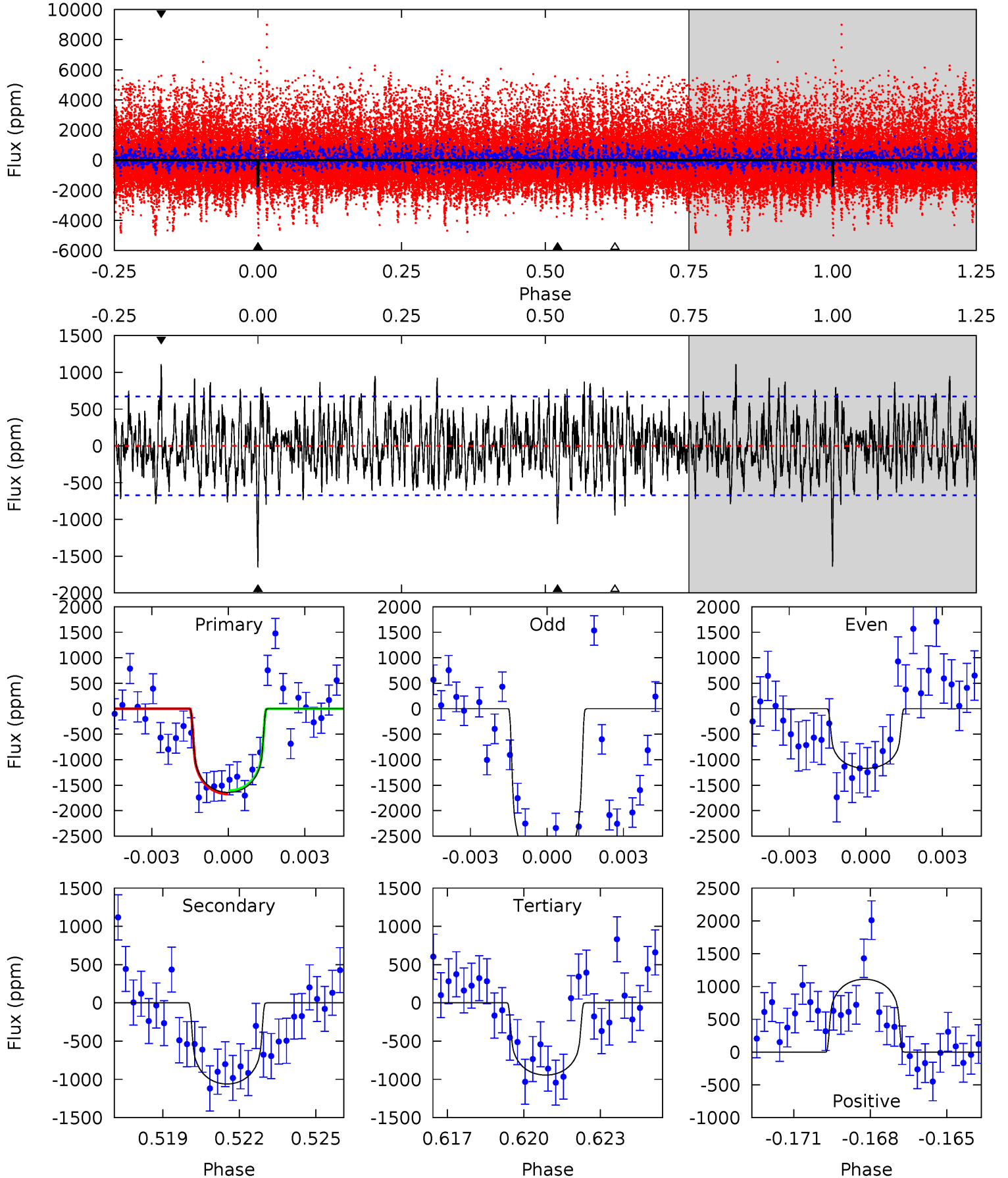
TCE 011961075-04 P=171.165121 Days  $T_0=215.375956$  (BKJD)



# DV Model-Shift Uniqueness Test

011961075-04, P = 171.184935 Days, E = 44.190762 Days

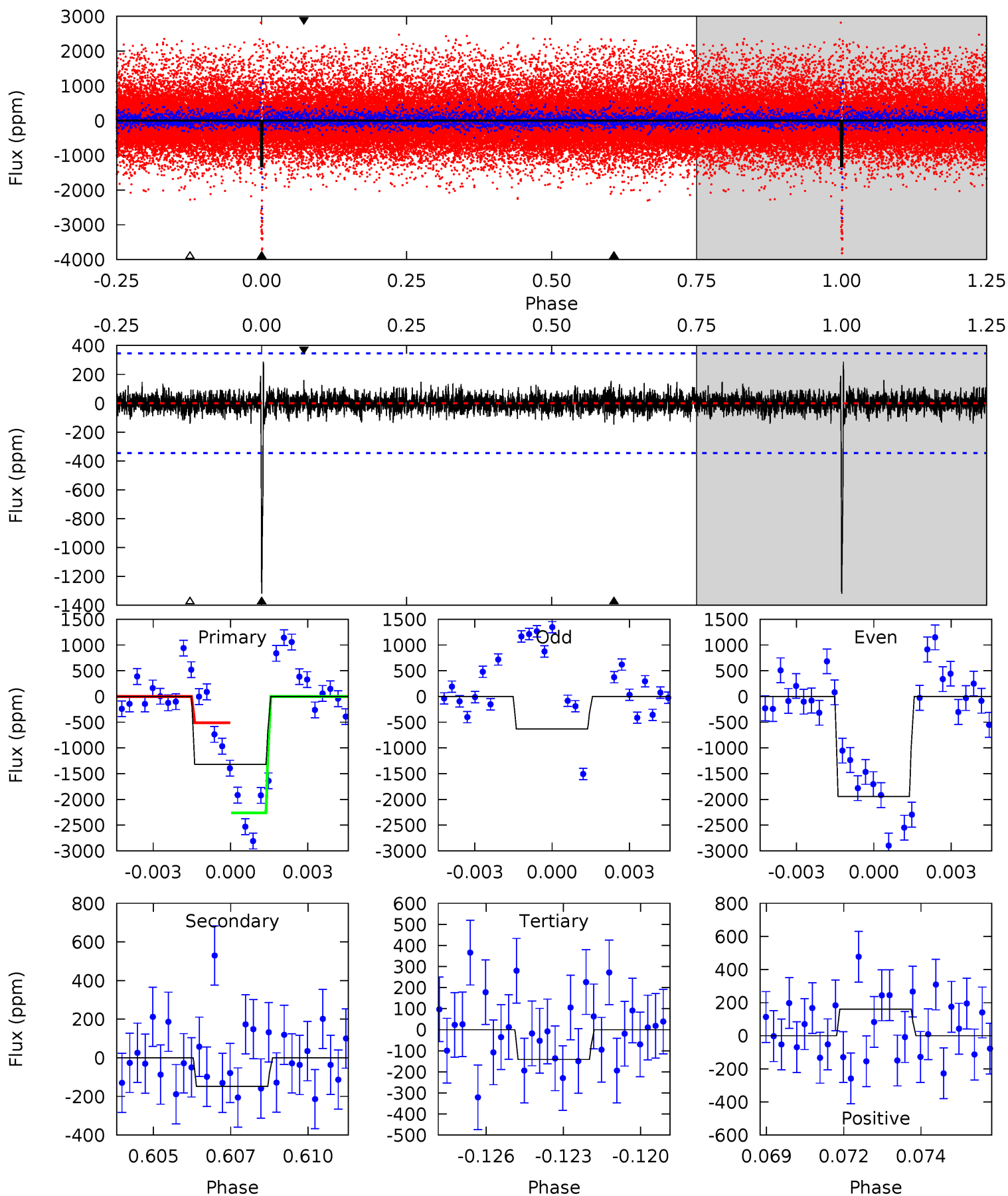
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.9	8.30	7.39	8.70	5.26	2.98	2.47	5.46	4.16	0.91	-0.39	6.34	0.93	0.40	0.24



# Alt Model-Shift Uniqueness Test

011961075-04,  $P = 171.165121$  Days,  $E = 44.210835$  Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.1	2.25	2.15	2.45	5.26	2.98	0.61	18.0	17.7	0.10	-0.20	9.25	2.62	0.18	0





### Stellar Parameters For KIC 011961075

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3412^{+44}_{-41}$	$4.919^{+0.042}_{-0.031}$	$0.000^{+0.100}_{-0.100}$	$0.328^{+0.030}_{-0.034}$	$0.325^{+0.041}_{-0.037}$	$13.010^{+2.916}_{-1.983}$
	+1%/-1%	+1%/-1%	+inf%/-inf%	+9%/-10%	+13%/-11%	+22%/-15%
Source	PHO2	PHO2	PHO2	DSEP		

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

### Secondary Eclipse Parameters for KIC 011961075-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-1060 \pm 128$	$1.56^{+0.50}_{-0.52}$	$187^{+4}_{-4}$	$3122^{+389}_{-246}$	$41510^{+47959}_{-18217}$
Alt.	$-148 \pm 66$	$2.04^{+0.55}_{-0.50}$	$187^{+4}_{-4}$	$2261^{+191}_{-179}$	$3269^{+3574}_{-1695}$

$T_{max}$  = 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

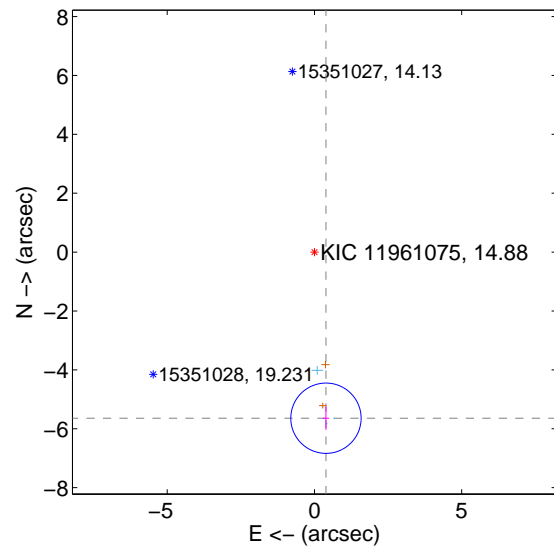
Supplemental centroid analysis for 011961075-04. Kepler magnitude: 14.88. Transit SNR 8.96

There are 3 quarters with good PRF difference image offsets

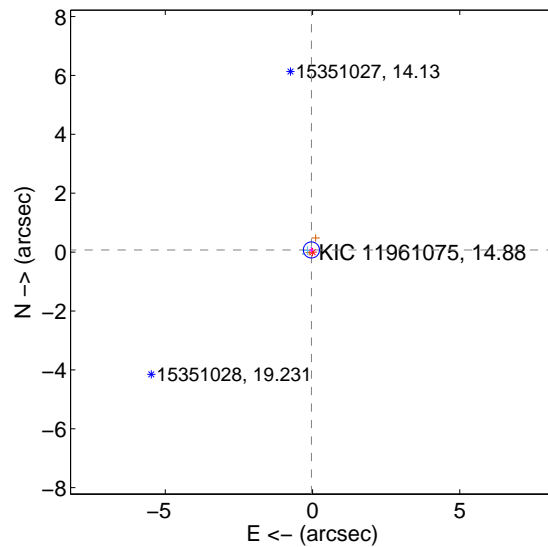
The OOT PRF centroid is offset from the target star catalog position by about 4.31 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$5.655 \pm 0.398$	14.21	$-0.391 \pm 0.113$	$-5.642 \pm 0.395$
PRF-fit source offset from KIC position	$0.082 \pm 0.091$	0.90	$0.038 \pm 0.075$	$0.073 \pm 0.095$
photometric centroid source offset	$0.46 \pm 0.23$	1.98	$0.46 \pm 0.23$	$-0.02 \pm 0.92$

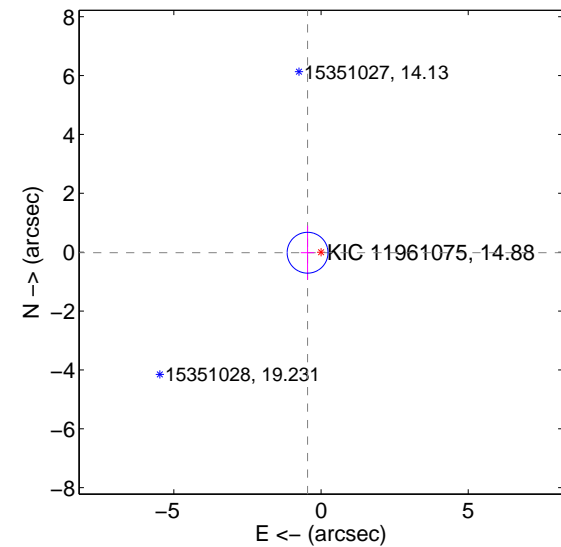
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

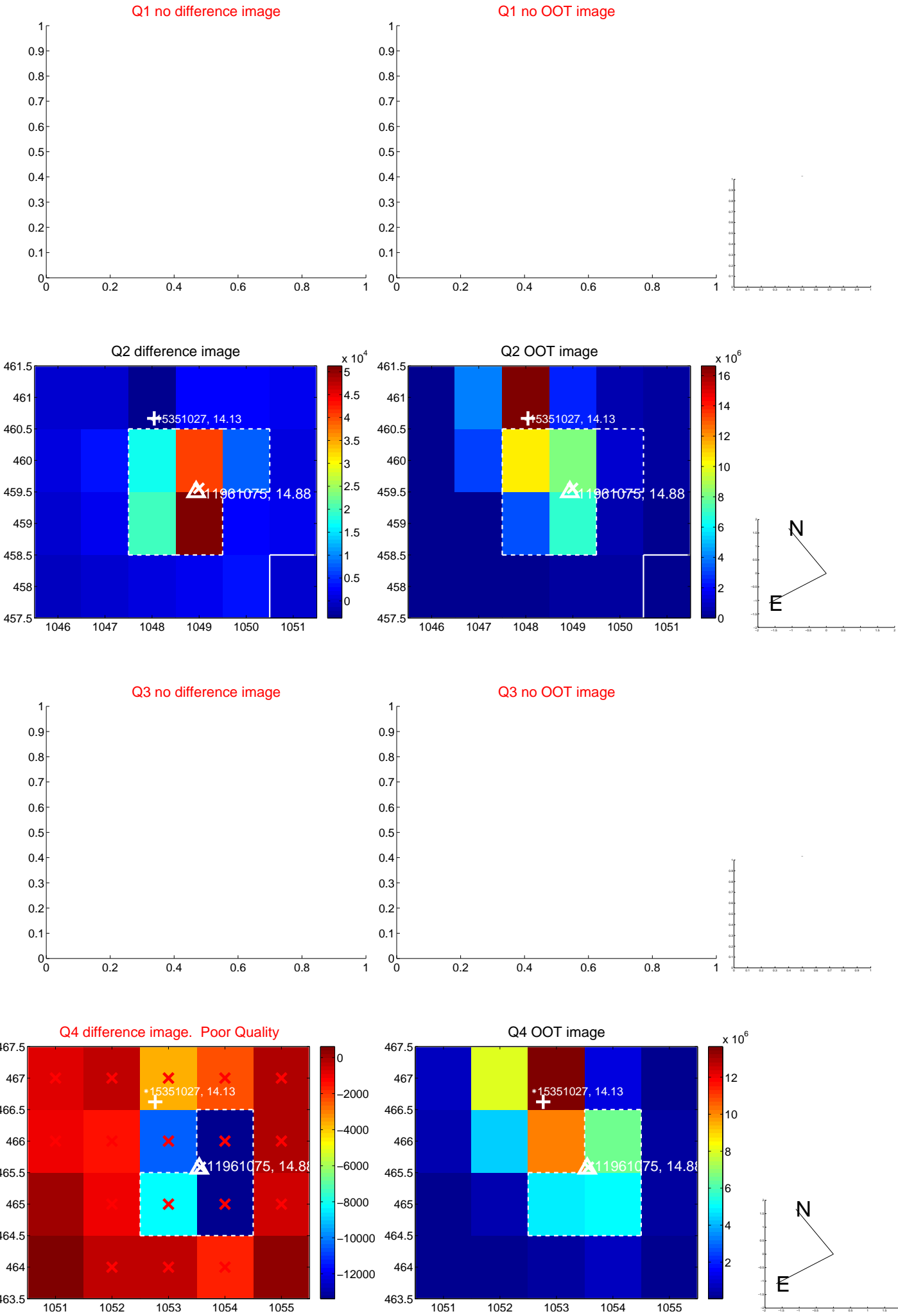


offset from photometric centroids



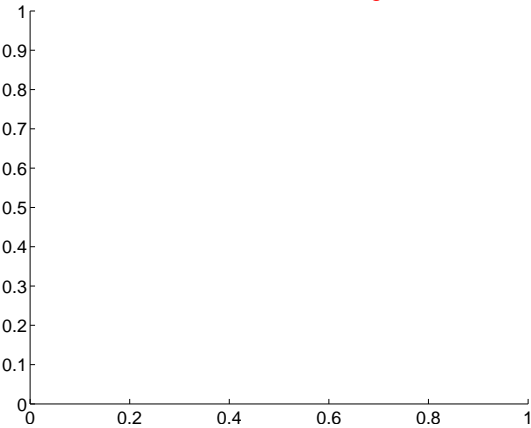
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

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

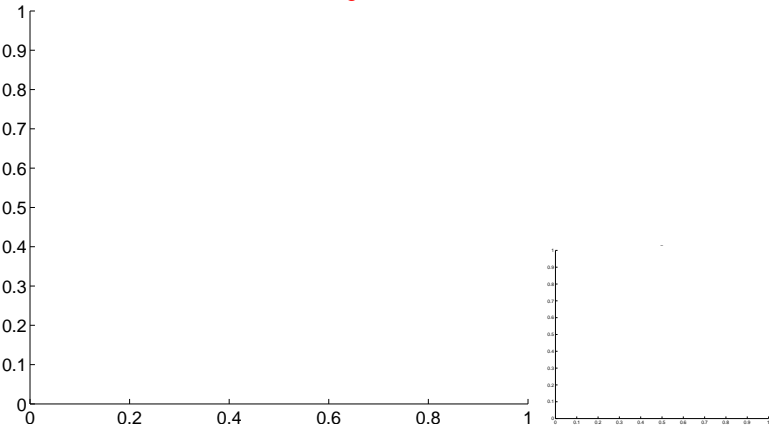


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

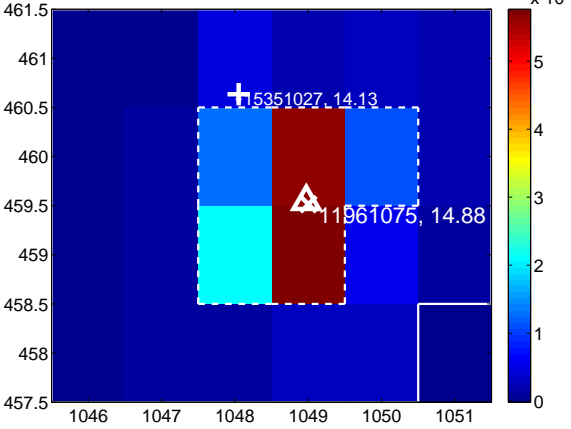
Q5 no difference image



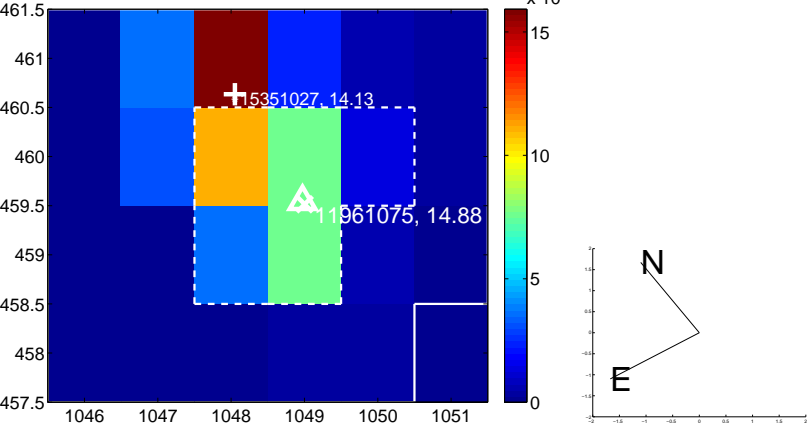
Q5 no OOT image



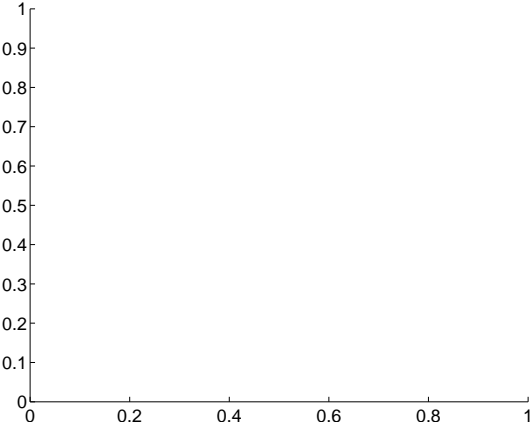
Q6 difference image



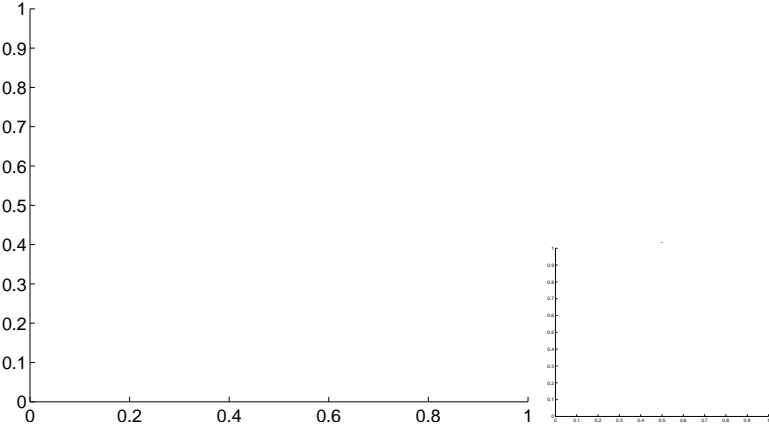
Q6 OOT image



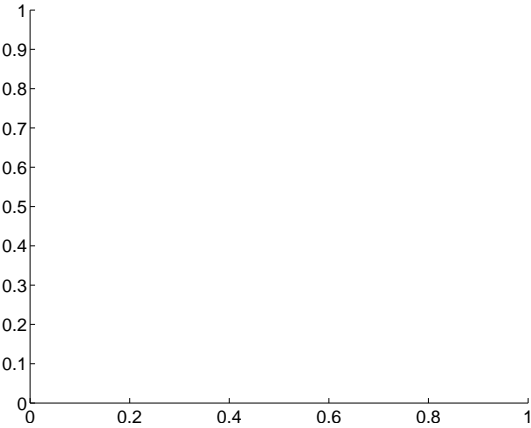
Q7 no difference image



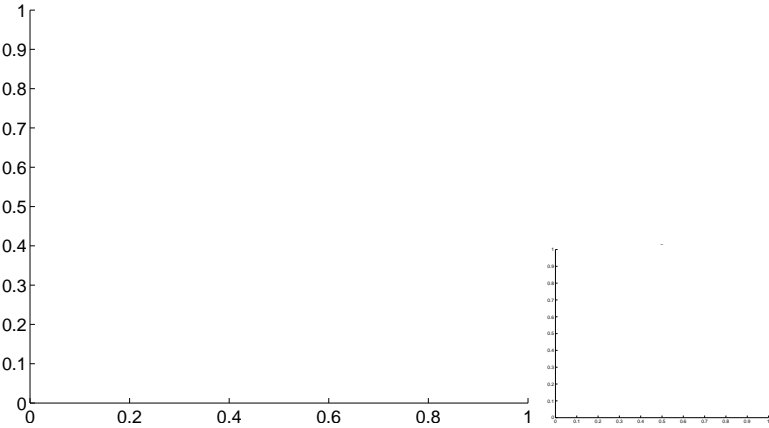
Q7 no OOT image



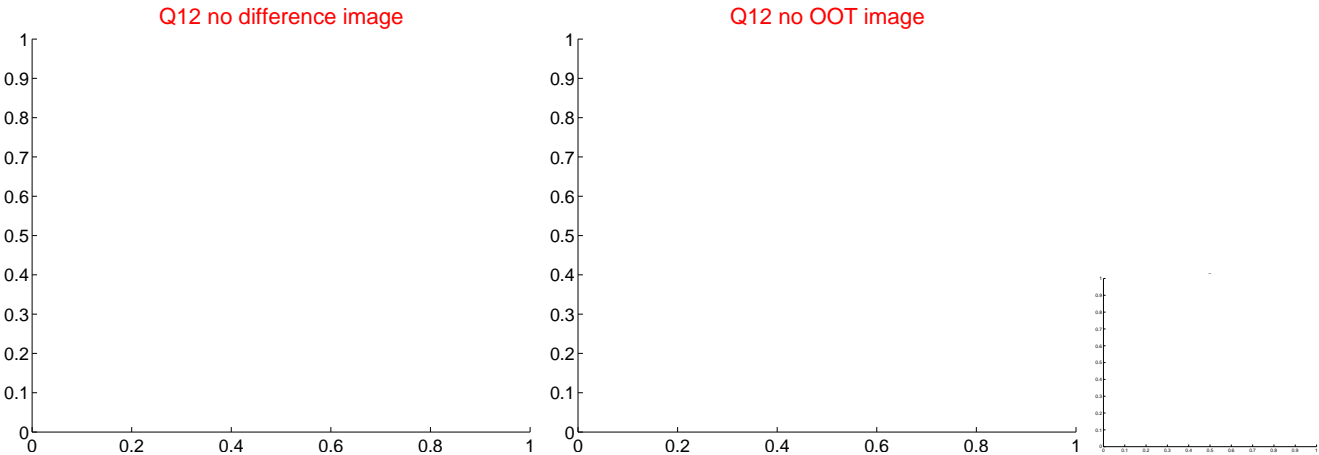
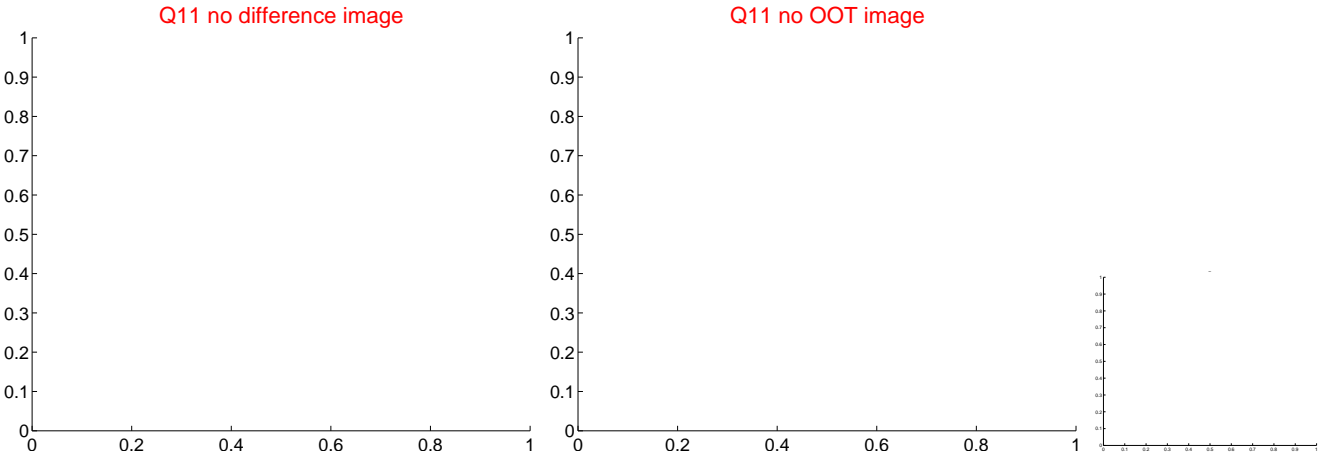
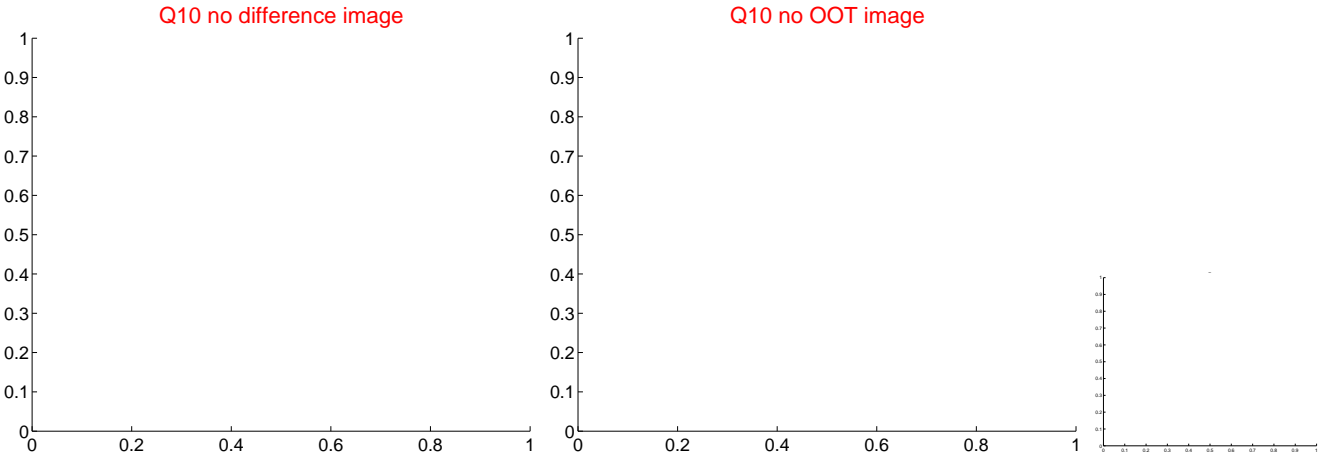
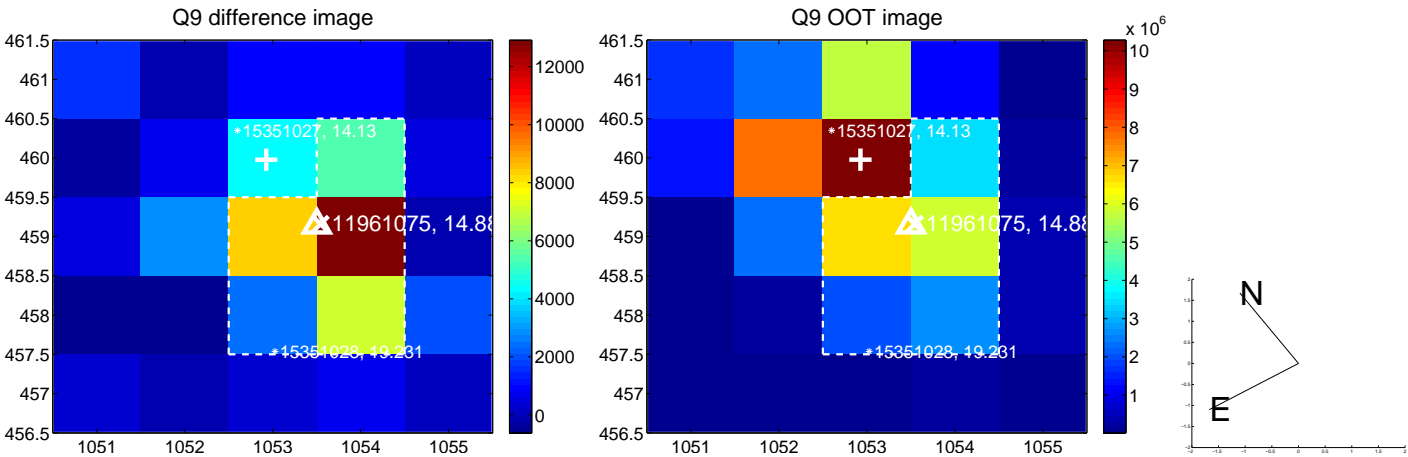
Q8 no difference image



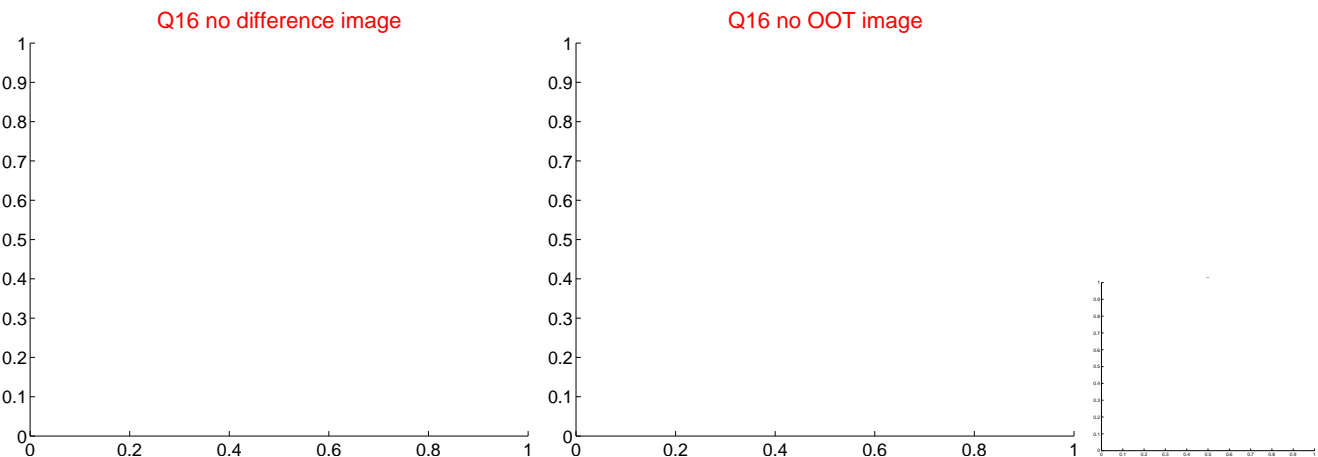
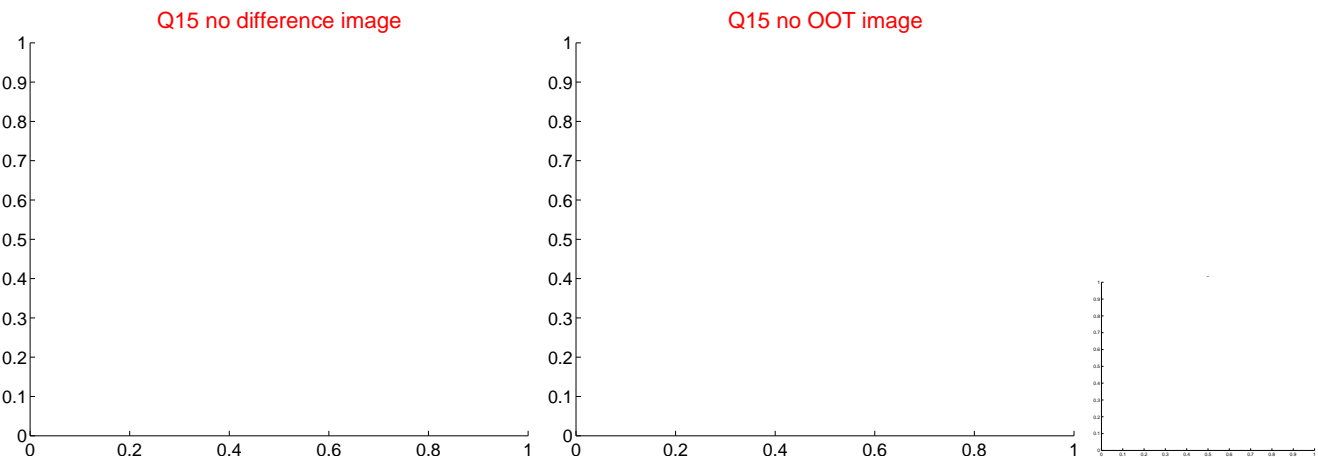
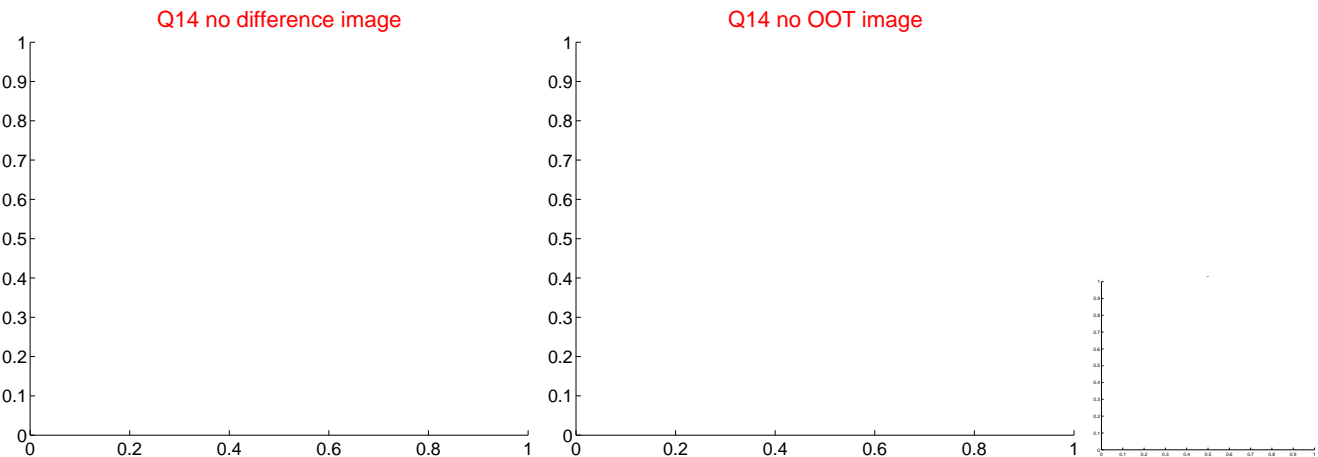
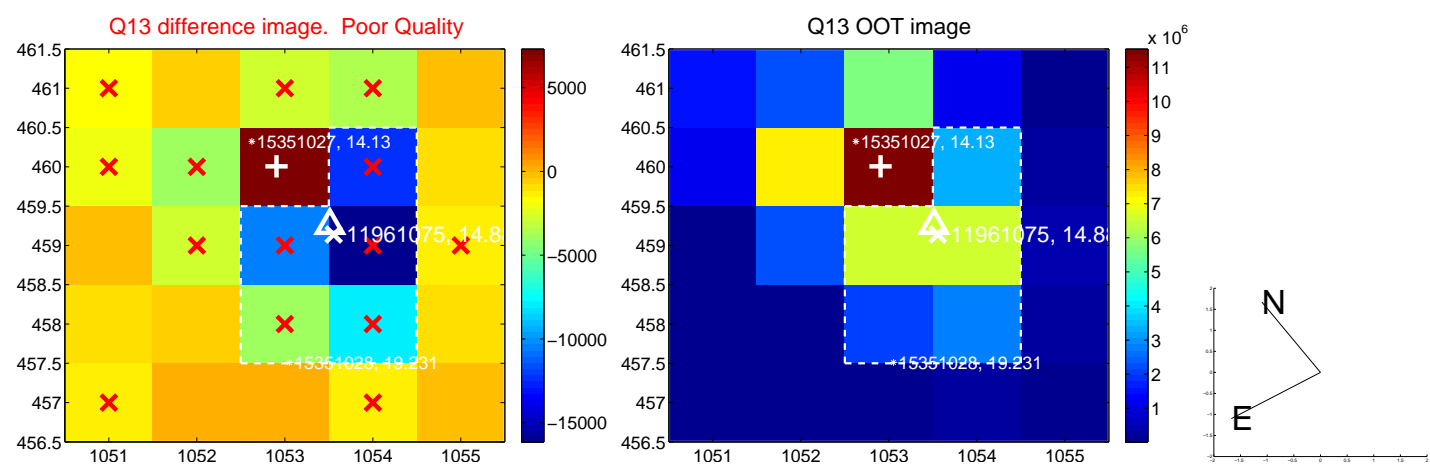
Q8 no OOT image



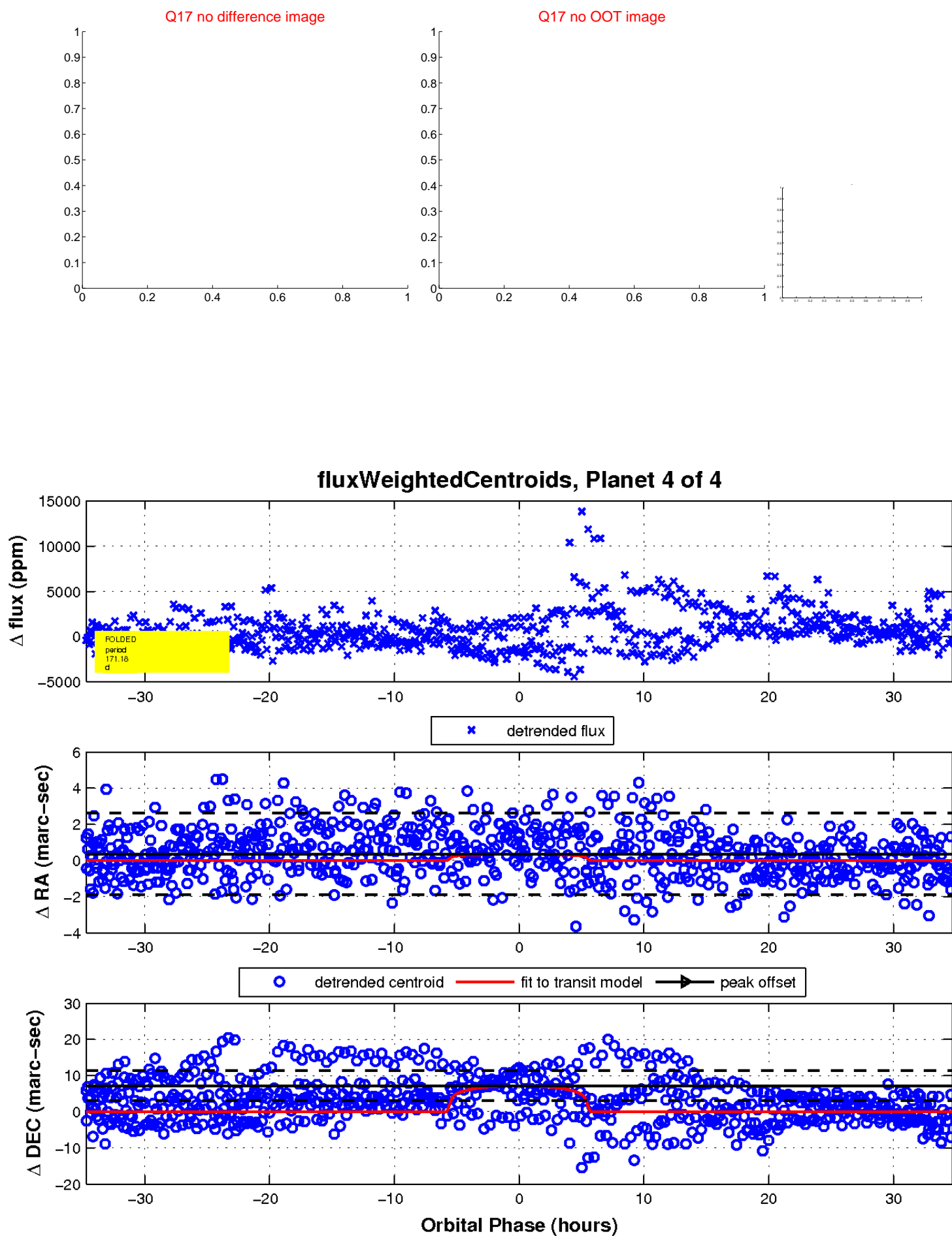
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

